

STATE	STATE PROJECT REFERENCE NO.	SHEET	TOTAL SHEETS
N.C.	38783.1.1 (R-0061C)	1	7

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

STRUCTURE
SUBSURFACE INVESTIGATION

PROJ. REFERENCE NO. 38783.1.1 (R-0061C) F.A. PROJ. NHF-74 (80)
COUNTY COLUMBUS
PROJECT DESCRIPTION PROPOSED INTERCHANGE AT INTERSECTION
OF US 7476 (ANDREW JACKSON HWY.) AND NC 211
(GREEN SWAMP RD.)
SITE DESCRIPTION BRIDGE ON -Y- (NC 211) OVER -L- (US 7476)
AT -Y- STATION 27+00

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<u>SHEET</u>	<u>DESCRIPTION</u>
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7	SOIL TEST RESULTS

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) 250-4088. NEITHER THE SUBSURFACE PLANS AND REPORTS, NOR THE FIELD BORING LOGS, ROCK CORES, OR SOIL TEST DATA ARE 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.

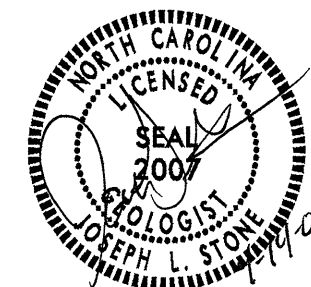
THE BIDDER OR CONTRACTOR IS CAUTIONED THAT DETAILS SHOWN ON THE SUBSURFACE PLANS ARE PRELIMINARY ONLY AND IN MANY CASES THE FINAL DESIGN DETAILS ARE DIFFERENT. FOR BIDDING AND CONSTRUCTION PURPOSES, REFER TO THE CONSTRUCTION PLANS AND DOCUMENTS FOR FINAL DESIGN INFORMATION ON THIS PROJECT. THE DEPARTMENT 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 THIS 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.

PROJECT: 38783.1.1 ID: R-0061C

PERSONNEL

TCB
S&ME
JRS

INVESTIGATED BY JL. STONE
CHECKED BY DN. ARGENBRIGHT
SUBMITTED BY DN. ARGENBRIGHT
DATE APRIL, 2008



DRAWN BY: C. M. KENT, J.R. SWARTLEY

NOTE - THE INFORMATION CONTAINED HEREIN IS NOT IMPLIED OR GUARANTEED BY THE N. C. DEPARTMENT OF TRANSPORTATION AS BEING ACCURATE NOR IT IS CONSIDERED TO BE PART OF THE PLANS, SPECIFICATIONS, OR CONTRACT FOR THE PROJECT.

NOTE - 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.

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS
GEOTECHNICAL ENGINEERING UNIT

PROJECT REFERENCE NO.
38783.J.I(R-0061C) SHEET NO.
2

SUBSURFACE INVESTIGATION

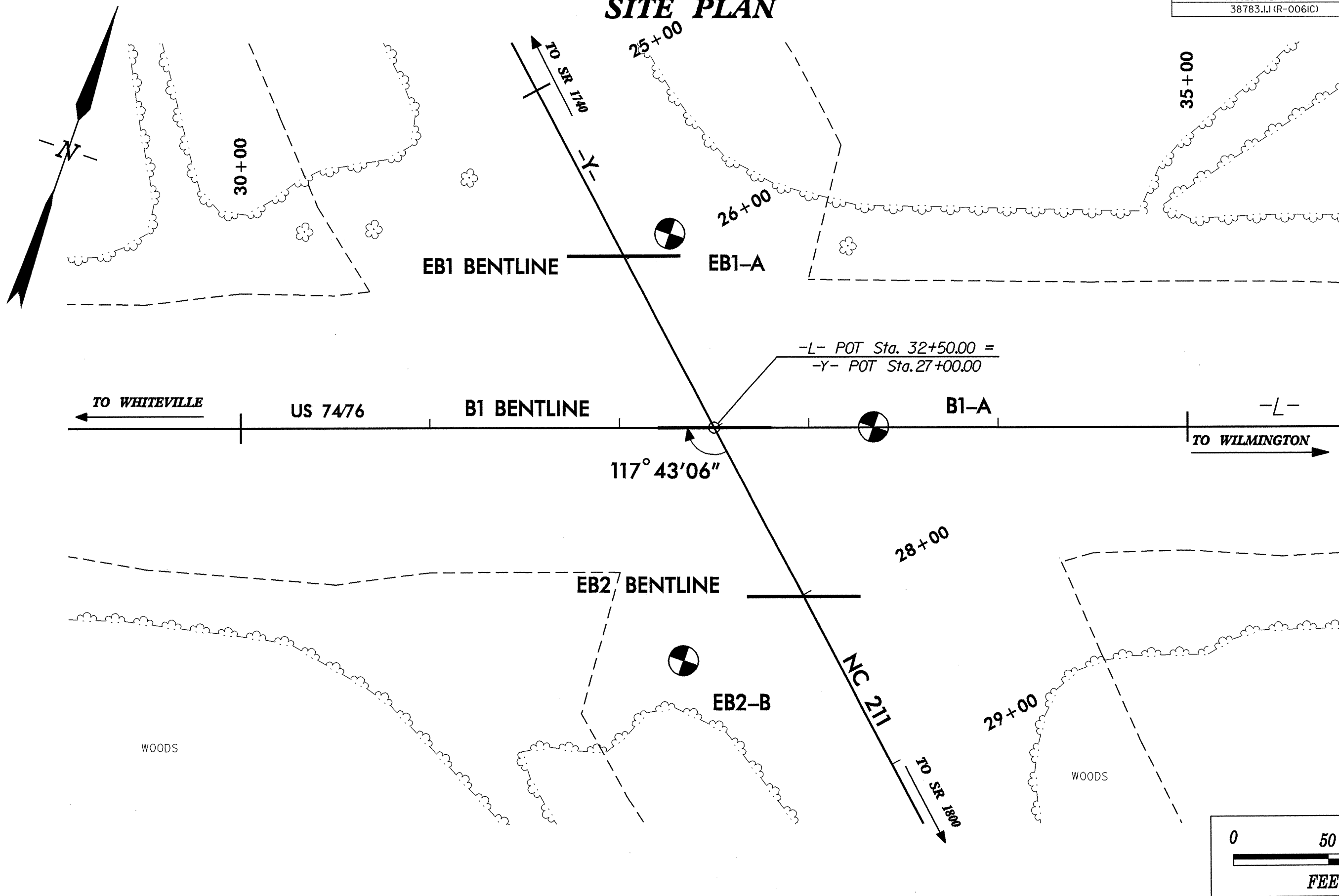
SOIL AND ROCK LEGEND, TERMS, SYMBOLS, AND ABBREVIATIONS

SOIL DESCRIPTION		GRADATION		ROCK DESCRIPTION		TERMS AND DEFINITIONS																																																																																																																																																		
<p>SOIL IS CONSIDERED TO BE THE 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 STANDARD PENETRATION TEST (AASHTO T206, ASTM D-1586). SOIL CLASSIFICATION IS BASED ON THE AASHTO SYSTEM. BASIC DESCRIPTIONS GENERALLY SHALL INCLUDE: CONSISTENCY, COLOR, TEXTURE, MOISTURE, AASHTO CLASSIFICATION, AND OTHER PERTINENT FACTORS SUCH AS MINERALOGICAL COMPOSITION, ANGULARITY, STRUCTURE, PLASTICITY, ETC. EXAMPLE:</p> <p style="text-align: center;"><i>VERY STIFF, GRAY CLAY, MOST WITH INTERBEDDED FINE SAND LAYERS, HEAVY PLASTIC, A-7-6</i></p>		<p>WELL GRADED - INDICATES A GOOD REPRESENTATION OF PARTICLE SIZES FROM FINE TO COARSE. UNIFORM - INDICATES THAT SOIL PARTICLES ARE ALL APPROXIMATELY THE SAME SIZE. (ALSO POORLY GRADED) GAP-GRADED - INDICATES A MIXTURE OF UNIFORM PARTICLES OF TWO OR MORE SIZES.</p> <p style="text-align: center;">ANGULARITY OF GRAINS</p> <p>THE ANGULARITY OR ROUNDNESS OF SOIL GRAINS IS DESIGNATED BY THE TERMS: <u>ANGULAR</u>, <u>SUBANGULAR</u>, <u>SUBROUNDED</u>, OR <u>ROUNDED</u>.</p>		<p>HARD ROCK IS NON-COASTAL PLAIN MATERIAL THAT IF TESTED, WOULD YIELD SPT REFUSAL. 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.</p> <p>ROCK MATERIALS ARE TYPICALLY DIVIDED AS FOLLOWS:</p>		<p><u>ALLUVIUM (ALLUV.)</u> - SOILS THAT HAVE BEEN TRANSPORTED BY WATER. <u>AQUIFER</u> - A WATER BEARING FORMATION OR STRATA. <u>ARENACEOUS</u> - APPLIED TO ROCKS THAT HAVE BEEN DERIVED FROM SAND OR THAT CONTAIN SAND. <u>ARGILLACEOUS</u> - APPLIED TO ALL ROCKS OR SUBSTANCES COMPOSED OF CLAY MINERALS, OR HAVING A NOTABLE PROPORTION OF CLAY IN THEIR COMPOSITION, AS SHALE, SLATE, ETC. <u>ARTESIAN</u> - 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. <u>CALCAREOUS (CALC.)</u> - SOILS THAT CONTAIN APPRECIABLE AMOUNTS OF CALCIUM CARBONATE. <u>COLLUVIUM</u> - ROCK FRAGMENTS MIXED WITH SOIL DEPOSITED BY GRAVITY ON SLOPE OR AT BOTTOM OF SLOPE. <u>CORE RECOVERY (REC.)</u> - TOTAL LENGTH OF ALL MATERIAL RECOVERED IN THE CORE BARREL DIVIDED BY TOTAL LENGTH OF CORE RUN AND EXPRESSED AS A PERCENTAGE. <u>DIKE</u> - A TABULAR BODY OF IGNEOUS ROCK THAT CUTS ACROSS THE STRUCTURE OF ADJACENT ROCKS OR CUTS MASSIVE ROCK. <u>DIP</u> - THE ANGLE AT WHICH A STRATUM OR ANY PLANAR FEATURE IS INCLINED FROM THE HORIZONTAL. <u>DIP DIRECTION (DIP AZIMUTH)</u> - THE DIRECTION OR BEARING OF THE HORIZONTAL TRACE OF THE LINE OF DIP, MEASURED CLOCKWISE FROM NORTH. <u>FAULT</u> - A FRACTURE OR FRACTURE ZONE ALONG WHICH THERE HAS BEEN DISPLACEMENT OF THE SIDES RELATIVE TO ONE ANOTHER PARALLEL TO THE FRACTURE. <u>FISSILE</u> - A PROPERTY OF SPLITTING ALONG CLOSELY SPACED PARALLEL PLANES. <u>FLOAT</u> - ROCK FRAGMENTS ON SURFACE NEAR THEIR ORIGINAL POSITION AND DISLOGGED FROM PARENT MATERIAL. <u>FLOOD PLAIN (FP)</u> - LAND BORDERING A STREAM, BUILT OF SEDIMENTS DEPOSITED BY THE STREAM. <u>FORMATION (FM)</u> - A MAPPABLE GEOLOGIC UNIT THAT CAN BE RECOGNIZED AND TRACED IN THE FIELD. <u>JOINT</u> - FRACTURE IN ROCK ALONG WHICH NO APPRECIABLE MOVEMENT HAS OCCURRED. <u>LEDGE</u> - A SHELF-LIKE RIDGE OR PROJECTION OF ROCK WHOSE THICKNESS IS SMALL COMPARED TO ITS LATERAL EXTENT. <u>LENS</u> - A BODY OF SOIL OR ROCK THAT THINS OUT IN ONE OR MORE DIRECTIONS. <u>MOTTLED (MOT.)</u> - IRREGULARLY MARKED WITH SPOTS OF DIFFERENT COLORS, MOTTLING IN SOILS USUALLY INDICATES POOR AERATION AND LACK OF GOOD DRAINAGE. <u>PERCHED WATER</u> - WATER MAINTAINED ABOVE THE NORMAL GROUND WATER LEVEL BY THE PRESENCE OF AN INTERVENING IMPERVIOUS STRATUM. <u>RESIDUAL (RES.) SOIL</u> - SOIL FORMED IN PLACE BY THE WEATHERING OF ROCK. <u>ROCK QUALITY DESIGNATION (ROD)</u> - 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.</p>																																																																																																																																																		
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SITE PLAN

PROJECT REFERENCE NO.
38783.I.I (R-0061C)

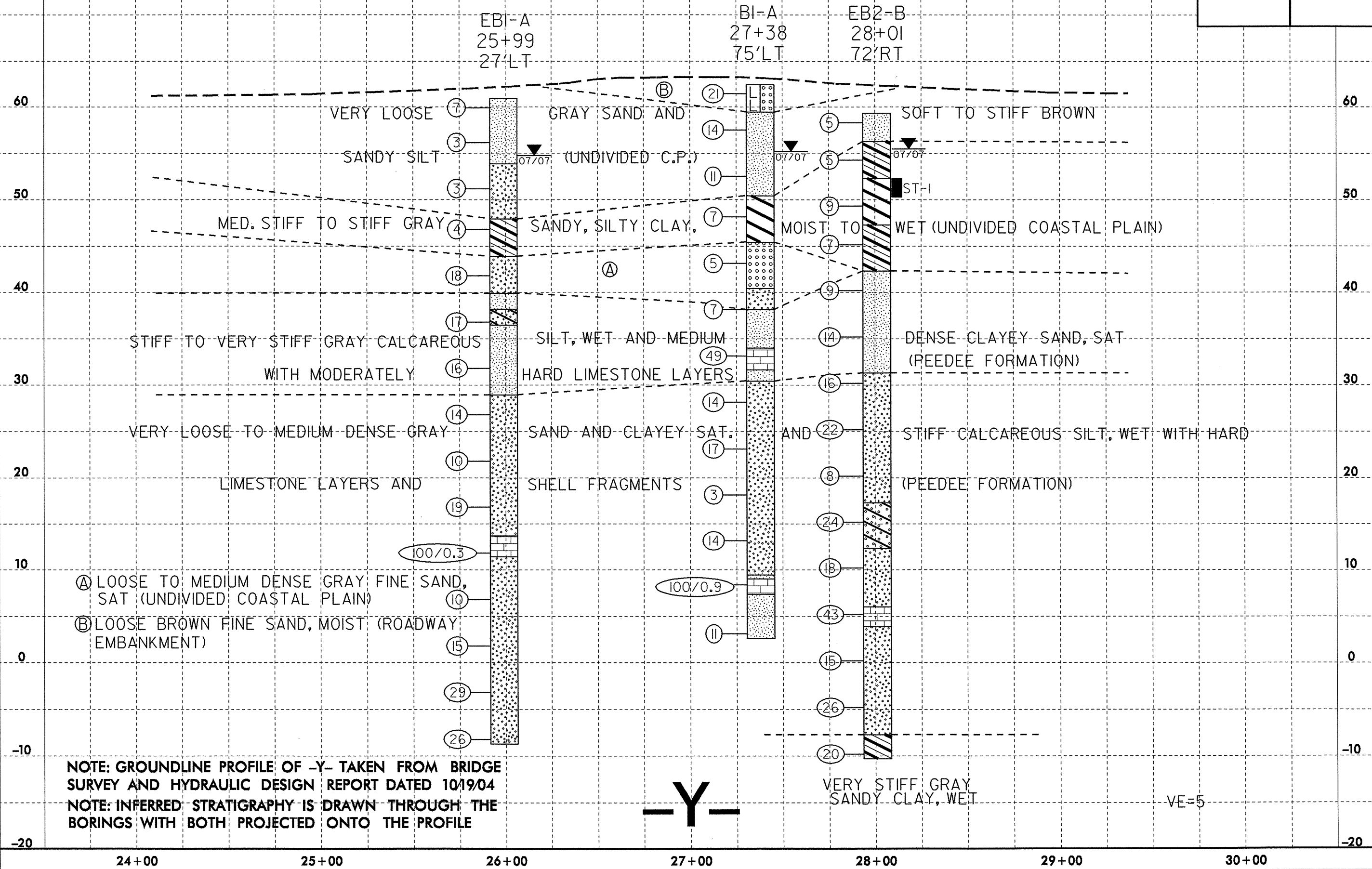
SHEET NO.
3



5/14/99
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PROFILE THROUGH BORINGS PROJECT ALONG -Y-

PROJECT REFERENCE NO. R-0061C	SHEET NO. 4
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
<div style="border: 1px solid black; padding: 2px; display: inline-block;"> INCOMPLETE PLANS <small>DO NOT USE FOR ACQUISITION</small> </div>	
<div style="border: 1px solid black; padding: 2px; display: inline-block;"> PRELIMINARY PLANS <small>DO NOT USE FOR CONSTRUCTION</small> </div>	



NOTE: GROUNDLINE PROFILE OF -Y- TAKEN FROM BRIDGE SURVEY AND HYDRAULIC DESIGN REPORT DATED 10/19/04
NOTE: INFERRED STRATIGRAPHY IS DRAWN THROUGH THE BORINGS WITH BOTH PROJECTED ONTO THE PROFILE





NCDOT GEOTECHNICAL ENGINEERING UNIT

BORELOG REPORT

PROJECT NO. 38783.1.1	ID. R-0061C	COUNTY Columbus	GEOLOGIST Bottoms, T. C.
SITE DESCRIPTION BRIDGE ON -Y- (NC 211) OVER -L- (US 74/76)			GROUND WTR (ft)
BORING NO. EB1-A	STATION 25+99	OFFSET 27ft LT	ALIGNMENT -Y-
COLLAR ELEV. 60.9 ft	TOTAL DEPTH 69.6 ft	NORTHING 211,442	EASTING 2,175,340
DRILL MACHINE Mobile B-57	DRILL METHOD Mud Rotary	HAMMER TYPE Manual	
START DATE 07/12/07	COMP. DATE 07/12/07	SURFACE WATER DEPTH N/A	DEPTH TO ROCK 47.2 ft

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				
65													
60.9	60.9	0.0										60.9	GROUND SURFACE
57.2	57.2	3.7	2	3	4							SS-60	UNDIVIDED COASTAL PLAIN BROWN SANDY SILT, MOIST TO WET
52.2	52.2	8.7	2	2	1							SS-61	UNDIVIDED COASTAL PLAIN GRAY FINE SAND, SAT.
47.8	47.8	13.1	2	2	2							SS-62	UNDIVIDED COASTAL PLAIN GRAY SANDY CLAY, WET.
42.8	42.8	18.1	5	8	10							SS-63	UNDIVIDED COASTAL PLAIN GRAY FINE SAND, SAT.
37.8	37.8	23.1	7	8	9							SS-64	COASTAL PLAIN GRAY CALCAREOUS SILT, WET (PEEDEE FORMATION)
32.8	32.8	28.1	9	9	7								COASTAL PLAIN GRAY CLAYEY SAND, SAT
27.8	27.8	33.1	9	7	7								COASTAL PLAIN GRAY CALCAREOUS SILT, WET
22.8	22.8	38.1	4	6	4							SS-65	COASTAL PLAIN GRAY SAND, SAT.
17.8	17.8	43.1	13	9	10							SS-66	COASTAL PLAIN SEDIMENTARY ROCK GRAY LIMESTONE
12.8	12.8	48.1	40	100/0.3									COASTAL PLAIN GRAY SAND, SAT
7.8	7.8	53.1	5	5	5							SS-67	COASTAL PLAIN SEDIMENTARY ROCK GRAY LIMESTONE
2.8	2.8	58.1	8	7	8								COASTAL PLAIN GRAY SAND, SAT
-2.2	-2.2	63.1	8	14	15							SS-68	COASTAL PLAIN GRAY SAND, SAT
-7.2	-7.2	68.1	10	12	14								Boring Terminated at Elevation -8.7 ft IN MEDIUM DENSE SAND

PROJECT NO. 38783.1.1	ID. R-0061C	COUNTY Columbus	GEOLOGIST Bottoms, T. C.
SITE DESCRIPTION BRIDGE ON -Y- (NC 211) OVER -L- (US 74/76)			GROUND WTR (ft)
BORING NO. B1-A	STATION 27+38	OFFSET 75ft LT	ALIGNMENT -Y-
COLLAR ELEV. 62.5 ft	TOTAL DEPTH 59.8 ft	NORTHING 211,381	EASTING 2,175,475
DRILL MACHINE Mobile B-57	DRILL METHOD Mud Rotary	HAMMER TYPE Manual	
START DATE 07/12/07	COMP. DATE 07/12/07	SURFACE WATER DEPTH N/A	DEPTH TO ROCK 28.3 ft

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				
65													
62.5	62.5	0.0										62.5	GROUND SURFACE
58.6	58.6	3.9	6	8	13							SS-51	ROADWAY EMBANKMENT BROWN FINE SAND, MOIST.
53.6	53.6	8.9	6	9	5							SS-52	UNDIVIDED COASTAL PLAIN BROWN SANDY SILT, MOIST TO WET
49.2	49.2	13.3	4	5	6							SS-53	UNDIVIDED COASTAL PLAIN GRAY SILTY CLAY, WET.
44.2	44.2	18.3	3	2	3							SS-54	UNDIVIDED COASTAL PLAIN GRAY SAND, SAT.
39.2	39.2	23.3	3	2	3							SS-55	UNDIVIDED COASTAL PLAIN GRAY SAND, SAT.
34.2	34.2	28.3	10	38	11							SS-56	COASTAL PLAIN GRAY CALCAREOUS SILT, WET (PEEDEE FORMATION)
29.2	29.2	33.3	6	7	7								COASTAL PLAIN GRAY CLAYEY SAND, SAT
24.2	24.2	38.3	10	11	6								COASTAL PLAIN SEDIMENTARY ROCK GRAY LIMESTONE
19.2	19.2	43.3	3	1	2								COASTAL PLAIN GRAY CALCAREOUS SILT, WET
14.2	14.2	48.3	7	6	8								COASTAL PLAIN GRAY SAND, SAT
9.2	9.2	53.3	32	76	24/0.4							SS-57	COASTAL PLAIN GRAY SAND, SAT
4.2	4.2	58.3	5	5	6								COASTAL PLAIN GRAY SAND, SAT
9.7	9.7	52.8											COASTAL PLAIN GRAY CALCAREOUS SILT, WET
7.5	7.5	55.0											COASTAL PLAIN SEDIMENTARY ROCK GRAY LIMESTONE
2.7	2.7	59.8											COASTAL PLAIN GRAY CALCAREOUS SILT, WET
													Boring Terminated at Elevation 2.7 ft IN STIFF CALCAREOUS SILT

NCDOT BORE DOUBLE R0016C_GEO_RDWY_NEW.GPJ_NC_DOT.GDT 04/14/08

R-0061C
BRIDGE ON -Y- (NC 211) OVER -L- (US 74/76)

HOLE #	SAMPLE #	PASS 10	PASS 40	PASS 200	CSESAND	FINESAND	SI	CL	LL	PI	CLASS	DEPTH	ORG.	MOI.
EB2-B	SS-41	100	99	40	2.1	62	15.2	20.7	18	3	A-4(0)	1.00-1.50		
	SS-42	100	99	42	2.1	59.9	6	32.1	37	21	A-6(4)	4.00-5.50		
	SS-43	100	99	79	1.9	22.1	56.4	19.6	46	31	A-7-6(24)	9.00-10.50		
	SS-44	100	92	40	25.2	38.2	8.7	27.9	33	19	A-6(3)	13.10-14.60		
	SS-45	92	79	20	33.1	47.6	4.9	14.5	21	NP	A-2-4(0)	28.10-29.60		
	SS-46	99	91	29	19	53.6	10.9	16.5	22	NP	A-2-4(0)	38.10-39.60		
	SS-47	100	79	30	40.5	30.9	4.8	23.8	27	12	A-2-6(0)	43.10-44.60		
	SS-48	100	91	20	27	54.4	3.1	15.5	20	NP	A-2-4(0)	48.10-49.60		
	SS-49	100	80	23	46.4	31.4	4.6	17.6	25	8	A-2-4(0)	58.10-59.60		
	SS-50	100	90	51	22.3	33.7	12.9	31	36	21	A-6(7)	68.10-69.60		
B1-A	SS-51	100	94	10	17.3	73.4	0	9.3	22	NP	A-3(0)	1.00-1.50		
	SS-52	100	100	46	1	58.5	19.8	20.7	16	2	A-4(0)	3.90-5.40		
	SS-53	100	100	38	1.4	65	14.9	18.6	18	3	A-4(0)	8.90-10.40		
	SS-54	100	100	61	1	45.9	11.7	41.4	45	30	A-7-6(0)	13.30-14.80		
	SS-55	100	94	8	27.2	65.6	0	7.2	22	NP	A-3(0)	18.30-19.80		
	SS-56	98	81	17	30.6	54.8	4.2	10.3	27	NP	A-2-4(0)	23.30-24.30		
	SS-57	96	86	33	18.6	48.6	14.2	18.6	21	NP	A-2-4(0)	43.30-44.80		
	SS-58	93	85	22	26.8	51.7	3.9	17.6	20	NP	A-2-4(0)	48.30-49.80		
	SS-59	100	95	36	17.6	57.2	11.8	13.4	19	NP	A-4(0)	53.40-54.70		
EB1-A	SS-60	100	98	50	2.9	51.7	18.5	26.9	21	8	A-4(1)	1.00-1.50		
	SS-61	100	98	26	3.8	75.1	3.5	17.6	21	NP	A-2-4(0)	8.70-10.20		
	SS-62	100	100	41	1	61.4	8.6	29	33	16	A-6(3)	13.10-14.60		
	SS-63	100	98	16	17.2	68.3	4.2	10.3	20	NP	A-2-4(0)	18.10-19.60		
	SS-64	96	75	35	33.7	31.2	8.2	26.9	31	15	A-2-6(1)	23.10-24.50		
	SS-65	95	85	25	23.2	52.5	9.8	14.5	21	NP	A-2-4(0)	38.10-39.60		
	SS-66	100	90	23	29.2	49.4	3.8	17.6	21	3	A-2-4(0)	43.10-44.60		
	SS-67	100	87	26	34.9	41.9	4.7	18.6	22	3	A-2-4(0)	53.10-54.60		
	SS-68	100	86	25	38.5	41.3	6.8	13.4	21	2	A-2-4(0)	63.10-64.60		