

REFERENCE: R-5963A

PROJECT: 48599

CONTENTS

SHEET NO.	DESCRIPTION
1	TITLE SHEET
2	LEGEND (SOIL & ROCK)
3	SITE PLAN
4	PROFILES
5	SOIL TEST RESULTS

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

STRUCTURE  
SUBSURFACE INVESTIGATION

COUNTY CHATHAM  
PROJECT DESCRIPTION CHATHAM PARK WAY FROM  
US 15-501 TO US 64 BUSINESS

SITE DESCRIPTION RETAINING WALL NO. 1:  
FROM -W1- STA. 10 + 62.91 TO -W1- STA. 13 + 50.00

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	R-5963A	1	

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 PERFORM INDEPENDENT SUBSURFACE INVESTIGATIONS AND MAKE INTERPRETATIONS AS NECESSARY TO CONFIRM CONDITIONS ENCOUNTERED ON THE PROJECT. THE CONTRACTOR SHALL HAVE NO CLAIM FOR ADDITIONAL COMPENSATION OR FOR AN EXTENSION OF TIME FOR ANY REASON RESULTING FROM THE ACTUAL CONDITIONS ENCOUNTERED AT THE SITE DIFFERING FROM THOSE INDICATED IN THE SUBSURFACE INFORMATION.

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

PERSONNEL

P. TOMASIC, P.G.

P. PERRY, E.I.T.

CG2 EXPLORATION

INVESTIGATED BY CG2, PLLC

DRAWN BY K. DE MONTBRUN, P.E.

CHECKED BY M. WALKO, P.E.

SUBMITTED BY CG2, PLLC

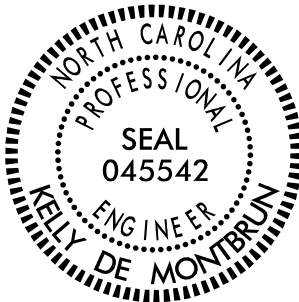
DATE NOVEMBER 2024

Prepared in the Office of:



CAROLINAS  
GEOTECHNICAL  
GROUP

2400 CROWNPOINT EXECUTIVE DRIVE  
SUITE 800  
CHARLOTTE, NC 28227  
(980) 339-8684



Signed by: Kelly De Montbrun 12/04/2024

BAB66070E8D747C SIGNATURE DATE

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																							
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>												WELL GRADED - INDICATES A GOOD REPRESENTATION OF PARTICLE SIZES FROM FINE TO COARSE. UNIFORMLY GRADED - INDICATES THAT SOIL PARTICLES ARE ALL APPROXIMATELY THE SAME SIZE. GAP-GRADED - INDICATES A MIXTURE OF UNIFORM PARTICLE SIZES OF TWO OR MORE SIZES.												HARD ROCK IS NON-COASTAL PLAIN MATERIAL THAT WOULD YIELD SPT REFUSAL IF TESTED. AN INFERRED ROCK LINE INDICATES THE LEVEL AT WHICH NON-COASTAL PLAIN MATERIAL WOULD YIELD SPT REFUSAL. SPT REFUSAL IS PENETRATION BY A SPLIT SPOON SAMPLER EQUAL TO OR LESS THAN 0.1 FOOT PER 60 BLOWS IN NON-COASTAL PLAIN MATERIAL. THE TRANSITION BETWEEN SOIL AND ROCK IS OFTEN REPRESENTED BY A ZONE OF WEATHERED ROCK. ROCK MATERIALS ARE TYPICALLY DIVIDED AS FOLLOWS:												ALLUVIUM (ALLUV.) - SOILS THAT HAVE BEEN TRANSPORTED BY WATER. AQUIFER - A WATER BEARING FORMATION OR STRATA. ARENACEOUS - APPLIED TO ROCKS THAT HAVE BEEN DERIVED FROM SAND OR THAT CONTAIN SAND. ARGILLACEOUS - APPLIED TO ALL ROCKS OR SUBSTANCES COMPOSED OF CLAY MINERALS, OR HAVING A NOTABLE PROPORTION OF CLAY IN THEIR COMPOSITION, SUCH AS SHALE, SLATE, ETC. ARTESIAN - GROUND WATER THAT IS UNDER SUFFICIENT PRESSURE TO RISE ABOVE THE LEVEL AT WHICH IT IS ENCOUNTERED, BUT WHICH DOES NOT NECESSARILY RISE TO OR ABOVE THE GROUND SURFACE. CALCAREOUS (CALC.) - SOILS THAT CONTAIN APPRECIABLE AMOUNTS OF CALCIUM CARBONATE. COLLUVIUM - ROCK FRAGMENTS MIXED WITH SOIL DEPOSITED BY GRAVITY ON SLOPE OR AT BOTTOM OF SLOPE. CORE RECOVERY (REC.) - TOTAL LENGTH OF ALL MATERIAL RECOVERED IN THE CORE BARREL DIVIDED BY TOTAL LENGTH OF CORE RUN AND EXPRESSED AS A PERCENTAGE. DIKE - A TABULAR BODY OF IGNEOUS ROCK THAT CUTS ACROSS THE STRUCTURE OF ADJACENT ROCKS OR CUTS MASSIVE ROCK. DIP - THE ANGLE AT WHICH A STRATUM OR ANY PLANAR FEATURE IS INCLINED FROM THE HORIZONTAL. DIP DIRECTION (DIP AZIMUTH) - THE DIRECTION OR BEARING OF THE HORIZONTAL TRACE OF THE LINE OF DIP, MEASURED CLOCKWISE FROM NORTH. FAULT - A FRACTURE OR FRACTURE ZONE ALONG WHICH THERE HAS BEEN DISPLACEMENT OF THE SIDES RELATIVE TO ONE ANOTHER PARALLEL TO THE FRACTURE. FISSILE - A PROPERTY OF SPLITTING ALONG CLOSELY SPACED PARALLEL PLANES. FLOAT - ROCK FRAGMENTS ON SURFACE NEAR THEIR ORIGINAL POSITION AND DISLOGGED FROM PARENT MATERIAL. FLOOD PLAIN (FP) - LAND BORDERING A STREAM, BUILT OF SEDIMENTS DEPOSITED BY THE STREAM. FORMATION (FM.) - A MAPPABLE GEOLOGIC UNIT THAT CAN BE RECOGNIZED AND TRACED IN THE FIELD. JOINT - FRACTURE IN ROCK ALONG WHICH NO APPRECIABLE MOVEMENT HAS OCCURRED. LEDGE - A SHELF-LIKE RIDGE OR PROJECTION OF ROCK WHOSE THICKNESS IS SMALL COMPARED TO ITS LATERAL EXTENT. LENS - A BODY OF SOIL OR ROCK THAT THINS OUT IN ONE OR MORE DIRECTIONS. MOTTLED (MOT.) - IRREGULARLY MARKED WITH SPOTS OF DIFFERENT COLORS. MOTTLING IN SOILS USUALLY INDICATES POOR AERATION AND LACK OF GOOD DRAINAGE. PERCHED WATER - WATER MAINTAINED ABOVE THE NORMAL GROUND WATER LEVEL BY THE PRESENCE OF AN INTERVENING IMPERVIOUS STRATUM. RESIDUAL (RES.) SOIL - SOIL FORMED IN PLACE BY THE WEATHERING OF ROCK. ROCK QUALITY DESIGNATION (RQD) - 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.																							
SOIL LEGEND AND AASHTO CLASSIFICATION												ANGULARITY OF GRAINS												WEATHERED ROCK (WR)												CRISTALLINE ROCK (CR)																							
GENERAL CLASS.		GRANULAR MATERIALS ( ≤ 35% PASSING #200)						SILT-CLAY MATERIALS ( > 35% PASSING #200)						ORGANIC MATERIALS				FINE TO COARSE GRAIN IGNEOUS AND METAMORPHIC ROCK THAT WOULD YIELD SPT REFUSAL IF TESTED. ROCK TYPE INCLUDES GRANITE, GNEISS, GABBRO, SCHIST, ETC.																																									
GROUP CLASS.		A-1-a		A-1-b		A-3		A-2-4		A-2-5		A-2-6		A-2-7		A-4		A-5		A-6		A-7		A-1-A, A-2 A-3		A-4, A-5 A-6, A-7																																	
SYMBOL																																																											
% PASSING #10 #40 #200		50 MX 30 MX 15 MX		50 MX 25 MX		51 MN 10 MX		35 MX		35 MX		35 MX		35 MX		36 MN		36 MN		36 MN		36 MN				GRANULAR SOILS		SILT-CLAY SOILS		MUCK, PEAT																													
MATERIAL PASSING #40 LL PI		— 6 MX		— NP		40 MX 10 MX		41 MN 10 MX		40 MX 11 MN		41 MN 11 MN		40 MX 10 MX		41 MN 10 MX		40 MX 11 MN		41 MN 11 MN						SOILS WITH LITTLE OR MODERATE AMOUNTS OF ORGANIC MATTER				HIGHLY ORGANIC SOILS																													
GROUP INDEX		0		0		0		4 MX		8 MX		12 MX		16 MX		NO MX																																											
USUAL TYPES OF MAJOR MATERIALS		STONE FRAGS, GRAVEL, AND SAND		FINE SAND		SILTY OR CLAYEY GRAVEL AND SAND				SILTY SOILS		CLAYEY SOILS																																															
GEN. RATING AS SUBGRADE		EXCELLENT TO GOOD						FAIR TO POOR						FAIR TO POOR		POOR		UNSUITABLE																																									
PI OF A-7-5 SUBGROUP IS ≤ LL - 30; PI OF A-7-6 SUBGROUP IS > LL - 30																																																											
CONSISTENCY OR DENSENESS												MISCELLANEOUS SYMBOLS												ROCK HARDNESS												BENCH MARK:																							
PRIMARY SOIL TYPE		COMPACTNESS OR CONSISTENCY		RANGE OF STANDARD PENETRATION RESISTANCE (N-VALUE)				RANGE OF UNCONFINED COMPRESSIVE STRENGTH (TONS/FT <sup>2</sup> )				ROADWAY EMBANKMENT (RE) WITH SOIL DESCRIPTION												DIP & DIP DIRECTION OF ROCK STRUCTURES												SLOPE INDICATOR INSTALLATION																							
GENERAL GRANULAR MATERIAL (NON-COHESIVE)		VERY LOOSE LOOSE MEDIUM DENSE DENSE VERY DENSE		< 4 4 TO 10 10 TO 30 30 TO 50 > 50				N/A				SOIL SYMBOL												TEST BORING												CONE PENETROMETER TEST																							
GENERAL SILT-CLAY MATERIAL (COHESIVE)		VERY SOFT SOFT MEDIUM STIFF STIFF VERY STIFF HARD		2 TO 4 4 TO 8 8 TO 15 15 TO 30 > 30				< 0.25 0.25 TO 0.5 0.5 TO 1.0 1 TO 2 2 TO 4 > 4				INFERRED SOIL BOUNDARY												AUGER BORING												CORE BORING																							
												INFERRED ROCK LINE												MONITORING WELL												TEST BORING WITH CORE																							
												ALLUVIAL SOIL BOUNDARY												PIEZOMETER INSTALLATION												SPT N-VALUE																							
TEXTURE OR GRAIN SIZE												RECOMMENDATION SYMBOLS												ROCK HARDNESS												BENCH MARK:																							
U.S. STD. SIEVE SIZE OPENING (MM)		4 4.75		10 2.00		40 0.42		60 0.25		200 0.075		270 0.053		UNDERCUT												UNCLASSIFIED EXCAVATION - UNSUITABLE WASTE												UNCLASSIFIED EXCAVATION - ACCEPTABLE, BUT NOT TO BE USED IN THE TOP 3 FEET OF EMBANKMENT OR BACKFILL																					
BOULDER (BLDR.)		COBBLE (COB.)		GRAVEL (GR.)		COARSE SAND (CSE. SD.)		FINE SAND (F SD.)		SILT (SL.)		CLAY (CL.)		SHALLOW UNDERCUT												UNCLASSIFIED EXCAVATION - ACCEPTABLE DEGRADABLE ROCK																																	
GRAIN SIZE MM IN.		305 12		75 3		2.0		0.25		0.05		0.005																																															
SOIL MOISTURE - CORRELATION OF TERMS												ABBREVIATIONS												ROCK HARDNESS												BENCH MARK:																							
SOIL MOISTURE SCALE (ATTERBERG LIMITS)		FIELD MOISTURE DESCRIPTION		GUIDE FOR FIELD MOISTURE DESCRIPTION								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 HL - 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 % - UNIT WEIGHT %g - DRY UNIT WEIGHT												SAMPLE ABBREVIATIONS S - BULK SS - SPLIT SPOON ST - SHELBY TUBE RS - ROCK RT - RECOMPACTED TRIAXIAL CBR - CALIFORNIA BEARING RATIO											
LL		LIQUID LIMIT		- SATURATED - (SAT.)								USUALLY LIQUID; VERY WET, USUALLY FROM BELOW THE GROUND WATER TABLE																																															
PLASTIC RANGE (PI)		PLASTIC LIMIT		- WET - (W)								SEMISOLID; REQUIRES DRYING TO ATTAIN OPTIMUM MOISTURE																																															
OM		OPTIMUM MOISTURE SHRINKAGE LIMIT		- MOIST - (M)								SOLID; AT OR NEAR OPTIMUM MOISTURE																																															
SL				- DRY - (D)								REQUIRES ADDITIONAL WATER TO ATTAIN OPTIMUM MOISTURE																																															
PLASTICITY												EQUIPMENT USED ON SUBJECT PROJECT												ROCK HARDNESS												BENCH MARK:																							
PLASTICITY INDEX (PI)		DRY STRENGTH										DRILL UNITS:								ADVANCING TOOLS:								HAMMER TYPE:								TERM												BEDDING											
NON PLASTIC		VERY LOW										<input type="checkbox"/> CME-45C								<input type="checkbox"/> CLAY BITS								<input checked="" type="checkbox"/> AUTOMATIC <input type="checkbox"/> MANUAL								VERY WIDE												THICKLY BEDDED											
SLIGHTLY PLASTIC		SLIGHT										<input type="checkbox"/> CME-55								<input type="checkbox"/> 6" CONTINUOUS FLIGHT AUGER								<input type="checkbox"/> CORE SIZE:								WIDE												1.5 - 4 FEET											
MODERATELY PLASTIC		MEDIUM										<input checked="" type="checkbox"/> CME-550X								<input checked="" type="checkbox"/> 8" HOLLOW AUGERS								<input type="checkbox"/> -B <input type="checkbox"/> -H								MODERATELY CLOSE												THINLY BEDDED											
HIGHLY PLASTIC		HIGH										<input type="checkbox"/> VANE SHEAR TEST								<input type="checkbox"/> HARD FACED FINGER BITS								<input type="checkbox"/> -N								CLOSE												0.03 - 0.16 FEET											
												<input type="checkbox"/> PORTABLE HOIST								<input type="checkbox"/> TUNG.-CARBIDE INSERTS																VERY CLOSE												LESS THAN 0.16 FEET											
												<input checked="" type="checkbox"/> DIEDRICH D-50								<input type="checkbox"/> CASING <input type="checkbox"/> W/ ADVANCER																																							
												<input type="checkbox"/> TRICONE								<input type="checkbox"/> TRICONE																																							
												<input type="checkbox"/> CORE BIT								<input type="checkbox"/> TUNG.-CARB.																																							
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SOIL TEST RESULTS																		
BORING ID	SAMPLE NO.	OFFSET	STATION	NORTHING	EASTING	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT				% PASSING (SIEVES)			% MOISTURE	% ORGANIC
										C. SAND	F. SAND	SILT	CLAY	10	40	200		
RWAL B-03	SS-53	22' LT	11+66 -W1-	704995	1947397	4.1 - 5.6'	A-7-5(48)	74	40	1.0	2.2	24.8	72.0	100.0	99.5	97.3	32.4	ND
RWAL B-03	SS-57	22' LT	11+66 -W1-	704995	1947397	19.1 - 20.6'	A-7-6(20)	49	20	3.9	11.0	35.8	49.3	100.0	98.5	87.4	29.6	ND
RWAL B-04	SS-01	1' LT	12+22 -W1-	704987	1947456	1.0 - 2.5'	A-7-5(47)	78	45	5.3	7.0	16.6	71.1	99.6	96.0	89.2	35.2	ND
RWAL B-04	SS-04	1' LT	12+22 -W1-	704987	1947456	9.3 - 10.8'	A-7-5(33)	63	31	4.5	7.4	27.8	60.3	100.0	97.4	89.8	35.3	ND
RWAL B-05	SS-44	25' LT	12+64 -W1-	705020	1947491	4.3 - 5.8'	A-7-5(15)	46	16	5.8	11.7	35.9	46.6	96.9	93.5	83.0	30.2	ND
RWAL B-06	SS-14	4' RT	13+04 -W1-	705001	1947537	6.0 - 7.5'	A-7-6(11)	42	13	8.8	17.2	32.5	41.5	99.9	95.8	77.7	25.3	ND
RWAL B-07	SS-28	44' LT	13+51 -L-	705011	1947583	1.0 - 2.5'	A-7-6(11)	41	19	11.3	16.8	32.9	39.0	85.8	79.9	65.0	20.2	ND
RWAL B-07	SS-33	44' LT	13+51 -L-	705011	1947583	19.0 - 20.5'	A-7-6(18)	46	18	2.3	10.3	46.4	41.0	98.3	96.8	89.3	39.1	ND



AUTHORIZED SIGNATURE

NCDOT CERT NO. 130-04-0212

Prepared in the Office of:

F&ME CONSULTANTS, INC.  
COLUMBIA, SOUTH CAROLINA  
NCDOT LAB CERT. NO. 130-0212

REFERENCE: R-5963A

PROJECT: 48599

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

STRUCTURE  
SUBSURFACE INVESTIGATION

COUNTY CHATHAM  
PROJECT DESCRIPTION CHATHAM PARK WAY FROM  
US 15-501 TO US 64 BUSINESS

SITE DESCRIPTION RETAINING WALL NO. 2:  
FROM -W2- STA. 10 + 62.91 TO -W2- STA. 13 + 50.00

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	R-5963A	1	

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 PERFORM INDEPENDENT SUBSURFACE INVESTIGATIONS AND MAKE INTERPRETATIONS AS NECESSARY TO CONFIRM CONDITIONS ENCOUNTERED ON THE PROJECT. THE CONTRACTOR SHALL HAVE NO CLAIM FOR ADDITIONAL COMPENSATION OR FOR AN EXTENSION OF TIME FOR ANY REASON RESULTING FROM THE ACTUAL CONDITIONS ENCOUNTERED AT THE SITE DIFFERING FROM THOSE INDICATED IN THE SUBSURFACE INFORMATION.

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

PERSONNEL

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CG2 EXPLORATION

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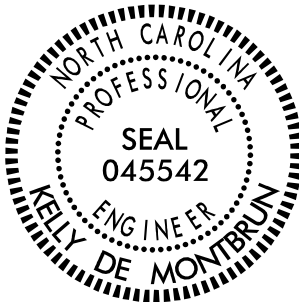
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Prepared in the Office of:



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GEOTECHNICAL  
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Signed by: Kelly De Montbrun 12/04/2024

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NORTH CAROLINA DEPARTMENT OF TRANSPORTATION

DIVISION OF HIGHWAYS

GEOTECHNICAL ENGINEERING UNIT

SUBSURFACE INVESTIGATION

SOIL AND ROCK LEGEND, TERMS, SYMBOLS, AND ABBREVIATIONS


SOIL DESCRIPTION										GRADATION										ROCK DESCRIPTION										TERMS AND DEFINITIONS									
SOIL IS CONSIDERED UNCONSOLIDATED, SEMI-CONSOLIDATED, OR WEATHERED EARTH MATERIALS THAT CAN BE PENETRATED WITH A CONTINUOUS FLIGHT POWER AUGER AND YIELD LESS THAN 100 BLOWS PER FOOT ACCORDING TO THE STANDARD PENETRATION TEST (AASHTO T 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>										WELL GRADED - INDICATES A GOOD REPRESENTATION OF PARTICLE SIZES FROM FINE TO COARSE. UNIFORMLY GRADED - INDICATES THAT SOIL PARTICLES ARE ALL APPROXIMATELY THE SAME SIZE. GAP-GRADED - INDICATES A MIXTURE OF UNIFORM PARTICLE SIZES OF TWO OR MORE SIZES.										HARD ROCK IS NON-COASTAL PLAIN MATERIAL THAT WOULD YIELD SPT REFUSAL IF TESTED. AN INFERRED ROCK LINE INDICATES THE LEVEL AT WHICH NON-COASTAL PLAIN MATERIAL WOULD YIELD SPT REFUSAL. SPT REFUSAL IS PENETRATION BY A SPLIT SPOON SAMPLER EQUAL TO OR LESS THAN 0.1 FOOT PER 60 BLOWS IN NON-COASTAL PLAIN MATERIAL. THE TRANSITION BETWEEN SOIL AND ROCK IS OFTEN REPRESENTED BY A ZONE OF WEATHERED ROCK. ROCK MATERIALS ARE TYPICALLY DIVIDED AS FOLLOWS:										ALLUVIUM (ALLUV.) - SOILS THAT HAVE BEEN TRANSPORTED BY WATER. AQUIFER - A WATER BEARING FORMATION OR STRATA. ARENACEOUS - APPLIED TO ROCKS THAT HAVE BEEN DERIVED FROM SAND OR THAT CONTAIN SAND. ARGILLACEOUS - APPLIED TO ALL ROCKS OR SUBSTANCES COMPOSED OF CLAY MINERALS, OR HAVING A NOTABLE PROPORTION OF CLAY IN THEIR COMPOSITION, SUCH AS SHALE, SLATE, ETC. ARTESIAN - GROUND WATER THAT IS UNDER SUFFICIENT PRESSURE TO RISE ABOVE THE LEVEL AT WHICH IT IS ENCOUNTERED, BUT WHICH DOES NOT NECESSARILY RISE TO OR ABOVE THE GROUND SURFACE. CALCAREOUS (CALC.) - SOILS THAT CONTAIN APPRECIABLE AMOUNTS OF CALCIUM CARBONATE. COLLUVIUM - ROCK FRAGMENTS MIXED WITH SOIL DEPOSITED BY GRAVITY ON SLOPE OR AT BOTTOM OF SLOPE. CORE RECOVERY (REC.) - TOTAL LENGTH OF ALL MATERIAL RECOVERED IN THE CORE BARREL DIVIDED BY TOTAL LENGTH OF CORE RUN AND EXPRESSED AS A PERCENTAGE. DIKE - A TABULAR BODY OF IGNEOUS ROCK THAT CUTS ACROSS THE STRUCTURE OF ADJACENT ROCKS OR CUTS MASSIVE ROCK. DIP - THE ANGLE AT WHICH A STRATUM OR ANY PLANAR FEATURE IS INCLINED FROM THE HORIZONTAL. DIP DIRECTION (DIP AZIMUTH) - THE DIRECTION OR BEARING OF THE HORIZONTAL TRACE OF THE LINE OF DIP, MEASURED CLOCKWISE FROM NORTH. FAULT - A FRACTURE OR FRACTURE ZONE ALONG WHICH THERE HAS BEEN DISPLACEMENT OF THE SIDES RELATIVE TO ONE ANOTHER PARALLEL TO THE FRACTURE. FISSILE - A PROPERTY OF SPLITTING ALONG CLOSELY SPACED PARALLEL PLANES. FLOAT - ROCK FRAGMENTS ON SURFACE NEAR THEIR ORIGINAL POSITION AND DISLOGGED FROM PARENT MATERIAL. FLOOD PLAIN (FP) - LAND BORDERING A STREAM, BUILT OF SEDIMENTS DEPOSITED BY THE STREAM. FORMATION (FM.) - A MAPPABLE GEOLOGIC UNIT THAT CAN BE RECOGNIZED AND TRACED IN THE FIELD. JOINT - FRACTURE IN ROCK ALONG WHICH NO APPRECIABLE MOVEMENT HAS OCCURRED. LEDGE - A SHELF-LIKE RIDGE OR PROJECTION OF ROCK WHOSE THICKNESS IS SMALL COMPARED TO ITS LATERAL EXTENT. LENS - A BODY OF SOIL OR ROCK THAT THINS OUT IN ONE OR MORE DIRECTIONS. MOTTLED (MOT.) - IRREGULARLY MARKED WITH SPOTS OF DIFFERENT COLORS. MOTTLING IN SOILS USUALLY INDICATES POOR AERATION AND LACK OF GOOD DRAINAGE. PERCHED WATER - WATER MAINTAINED ABOVE THE NORMAL GROUND WATER LEVEL BY THE PRESENCE OF AN INTERVENING IMPERVIOUS STRATUM. RESIDUAL (RES.) SOIL - SOIL FORMED IN PLACE BY THE WEATHERING OF ROCK. ROCK QUALITY DESIGNATION (ROD) - A MEASURE OF ROCK QUALITY DESCRIBED BY TOTAL LENGTH OF ROCK SEGMENTS EQUAL TO OR GREATER THAN 4 INCHES DIVIDED BY THE TOTAL LENGTH OF CORE RUN AND EXPRESSED AS A PERCENTAGE. SAPROLITE (SAP.) - RESIDUAL SOIL THAT RETAINS THE RELIC STRUCTURE OR FABRIC OF THE PARENT ROCK. SILL - AN INTRUSIVE BODY OF IGNEOUS ROCK OF APPROXIMATELY UNIFORM THICKNESS AND RELATIVELY THIN COMPARED WITH ITS LATERAL EXTENT, THAT HAS BEEN EMPLACED PARALLEL TO THE BEDDING OR SCHISTOSITY OF THE INTRUDED ROCKS. SLICKENSIDE - POLISHED AND STRIATED SURFACE THAT RESULTS FROM FRICTION ALONG A FAULT OR SLIP PLANE. STANDARD PENETRATION TEST (PENETRATION RESISTANCE) (SPT) - NUMBER OF BLOWS (N OR BPF) OF A 140 LB. HAMMER FALLING 30 INCHES REQUIRED TO PRODUCE A PENETRATION OF 1 FOOT INTO SOIL WITH A 2 INCH OUNCE 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.									
SOIL LEGEND AND AASHTO CLASSIFICATION										ANGULARITY OF GRAINS										WEATHERED ROCK (WR)										CRISTALLINE ROCK (CR)									
GENERAL CLASS.		GRANULAR MATERIALS ( ≤ 35% PASSING #200)					SILT-CLAY MATERIALS ( > 35% PASSING #200)					ORGANIC MATERIALS					CRYSTALLINE ROCK (CR)		NON-COASTAL PLAIN MATERIAL THAT WOULD YIELD SPT N VALUES > 100 BLOWS PER FOOT IF TESTED.								FINE TO COARSE GRAIN IGNEOUS AND METAMORPHIC ROCK THAT WOULD YIELD SPT REFUSAL IF TESTED. ROCK TYPE INCLUDES GRANITE, GNEISS, GABBRO, SCHIST, ETC.												
GROUP CLASS.	A-1	A-1-b	A-3	A-2-4	A-2	A-2-5	A-2-6	A-2-7	A-4	A-5	A-6	A-7	A-1, A-2 A-3	A-4, A-5 A-6, A-7	NON-CRYSTALLINE ROCK (NCR)		FINE TO COARSE GRAIN METAMORPHIC AND NON-COASTAL PLAIN SEDIMENTARY ROCK THAT WOULD YIELD SPT REFUSAL IF TESTED. ROCK TYPE INCLUDES PHYLLITE, SLATE, SANDSTONE, ETC.								COASTAL PLAIN SEDIMENTS CEMENTED INTO ROCK, BUT MAY NOT YIELD SPT REFUSAL. ROCK TYPE INCLUDES LIMESTONE, SANDSTONE, CEMENTED SHELL BEDS, ETC.														
SYMBOL																																							
% PASSING #10 #40 #200	50 MX 30 MX 15 MX		50 MX 25 MX		51 MN 10 MX		35 MX 35 MX		35 MX 35 MX		36 MN 36 MN		36 MN 36 MN		GRANULAR SOILS		SILT-CLAY SOILS		MUCK, PEAT																				
MATERIAL PASSING #40 LL PI	— 6 MX		— NP		40 MX 10 MX		41 MN 10 MX		40 MX 11 MN		41 MN 11 MN		40 MX 10 MX		41 MN 11 MN		40 MX 10 MX		41 MN 11 MN		SOILS WITH LITTLE OR MODERATE AMOUNTS OF ORGANIC MATTER								HIGHLY ORGANIC SOILS										
GROUP INDEX	0		0		0		4 MX		8 MX		12 MX		16 MX		NO MX																								
USUAL TYPES OF MAJOR MATERIALS	STONE FRAGS, GRAVEL, AND SAND		FINE SAND		SILTY OR CLAYEY GRAVEL AND SAND				SILTY SOILS		CLAYEY SOILS																												
GEN. RATING AS SUBGRADE	EXCELLENT TO GOOD										FAIR TO POOR					FAIR TO POOR		POOR		UNSUITABLE																			
PI OF A-7-5 SUBGROUP IS ≤ LL - 30; PI OF A-7-6 SUBGROUP IS > LL - 30																																							
CONSISTENCY OR DENSENESS										MISCELLANEOUS SYMBOLS										ROCK HARDNESS										BENCH MARK:									
PRIMARY SOIL TYPE		COMPACTNESS OR CONSISTENCY		RANGE OF STANDARD PENETRATION RESISTANCE (N-VALUE)				RANGE OF UNCONFINED COMPRESSIVE STRENGTH (TONS/FT <sup>2</sup> )						ROADWAY EMBANKMENT (RE) WITH SOIL DESCRIPTION				DIP & DIP DIRECTION OF ROCK STRUCTURES				SLOPE INDICATOR INSTALLATION		SEVERE (SEV.)		ALL ROCK EXCEPT QUARTZ DISCOLORED OR STAINED. IN GRANITOID ROCKS ALL FELDSPARS ARE KAOLINIZED TO SOME EXTENT. SOME FRAGMENTS OF STRONG ROCK USUALLY REMAIN. <i>IF TESTED, WOULD YIELD SPT N VALUES &gt; 100 BPF</i>													
GENERAL		VERY LOOSE		< 4				N/A						SOIL SYMBOL				TEST BORING				CONE PENETROMETER TEST		VERY SEVERE (V SEV.)		ALL ROCK EXCEPT QUARTZ DISCOLORED OR STAINED. ROCK FABRIC ELEMENTS ARE DISCERNIBLE BUT MASS IS EFFECTIVELY REDUCED TO SOIL STATUS, WITH ONLY FRAGMENTS OF STRONG ROCK REMAINING. SAPROLITE IS AN EXAMPLE OF ROCK WEATHERED TO A DEGREE THAT ONLY MINOR VESTIGES OF ORIGINAL ROCK FABRIC REMAIN. <i>IF TESTED, WOULD YIELD SPT N VALUES &lt; 100 BPF</i>													
GENERAL		LOOSE		4 TO 10				0.25 TO 0.5						ARTIFICIAL FILL (AF) OTHER THAN ROADWAY EMBANKMENT				AUGER BORING				CORE BORING		SOUNDING ROD		COMPLETE		ROCK REDUCED TO SOIL. ROCK FABRIC NOT DISCERNIBLE, OR DISCERNIBLE ONLY IN SMALL AND SCATTERED CONCENTRATIONS. QUARTZ MAY BE PRESENT AS DIKES OR STRINGERS. SAPROLITE IS ALSO AN EXAMPLE.											
GENERAL		MEDIUM DENSE		10 TO 30				0.5 TO 1.0						INFERRED SOIL BOUNDARY				MONITORING WELL				PIEZOMETER INSTALLATION		SPT N-VALUE															
GENERAL		DENSE		30 TO 50				1 TO 2						INFERRED ROCK LINE				TEST BORING WITH CORE																					
GENERAL		VERY DENSE		> 50				> 4						ALLUVIAL SOIL BOUNDARY				DIP & DIP DIRECTION OF ROCK STRUCTURES																					
GENERAL		SOFT		2 TO 4				0.25 TO 0.5						INFERRED SOIL BOUNDARY				MONITORING WELL				PIEZOMETER INSTALLATION		SPT N-VALUE															
GENERAL		MEDIUM STIFF		4 TO 8				0.5 TO 1.0						INFERRED ROCK LINE				TEST BORING WITH CORE																					
GENERAL		STIFF		8 TO 15				1 TO 2						ALLUVIAL SOIL BOUNDARY				DIP & DIP DIRECTION OF ROCK STRUCTURES																					
GENERAL		VERY STIFF		15 TO 30				2 TO 4						ALLUVIAL SOIL BOUNDARY				DIP & DIP DIRECTION OF ROCK STRUCTURES																					
GENERAL		HARD		> 30				> 4						ALLUVIAL SOIL BOUNDARY				DIP & DIP DIRECTION OF ROCK STRUCTURES																					
TEXTURE OR GRAIN SIZE										RECOMMENDATION SYMBOLS										ROCK HARDNESS										BENCH MARK:									
U.S. STD. SIEVE SIZE		4		10		40		60		200		270				UNDERCUT				UNCLASSIFIED EXCAVATION - UNSUITABLE WASTE				UNCLASSIFIED EXCAVATION - ACCEPTABLE, BUT NOT TO BE USED IN THE TOP 3 FEET OF EMBANKMENT OR BACKFILL		VERY HARD		CANNOT BE SCRATCHED BY KNIFE OR SHARP PICK. BREAKING OF HAND SPECIMENS REQUIRES SEVERAL HARD BLOWS OF THE GEOLOGIST'S PICK.											
OPENING (MM)		4.76		2.00		0.42		0.25		0.075		0.053				SHALLOW UNDERCUT				UNCLASSIFIED EXCAVATION - UNSUITABLE WASTE				UNCLASSIFIED EXCAVATION - ACCEPTABLE, BUT NOT TO BE USED IN THE TOP 3 FEET OF EMBANKMENT OR BACKFILL		HARD		CAN BE SCRATCHED BY KNIFE OR PICK ONLY WITH DIFFICULTY. HARD HAMMER BLOWS REQUIRED TO DETACH HAND SPECIMEN.											
BOULDER (BLDR.)		COBBLE (COB.)		GRAVEL (GR.)		COARSE SAND (CSE, SD.)		FINE SAND (F SD.)		SILT (SL.)		CLAY (CL.)														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.											
GRAIN SIZE		305 IN.		75 IN.		2.0 IN.		0.25 IN.		0.05 IN.		0.005 IN.														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 PEICES 1 INCH MAXIMUM SIZE BY HARD BLOWS OF THE POINT OF A GEOLOGIST'S PICK.											
SOIL MOISTURE - CORRELATION OF TERMS										ABBREVIATIONS										ROCK HARDNESS										BENCH MARK:									
SOIL MOISTURE SCALE (ATTERBERG LIMITS)		FIELD MOISTURE DESCRIPTION		GUIDE FOR FIELD MOISTURE DESCRIPTION						AR - AUGER REFUSAL		MED. - MEDIUM		VST - VANE SHEAR TEST		WEA. - WEATHERED		UNIT WEIGHT		DRY UNIT WEIGHT		SAMPLE ABBREVIATIONS		SOFT		CAN BE GROVED 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.													
LL		LIQUID LIMIT		USUALLY LIQUID; VERY WET, USUALLY FROM BELOW THE GROUND WATER TABLE						CL. - CLAY		MICA - MICACEOUS		WEA. - WEATHERED		UNIT WEIGHT		DRY UNIT WEIGHT		SAMPLE ABBREVIATIONS		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 FINGERNAIL.															
PL		PLASTIC LIMIT		USUALLY LIQUID; VERY WET, USUALLY FROM BELOW THE GROUND WATER TABLE						CPT - CONE PENETRATION TEST		MOD. - MODERATELY		UNIT WEIGHT		DRY UNIT WEIGHT		SAMPLE ABBREVIATIONS		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 FINGERNAIL.																	
OM		OPTIMUM MOISTURE		USUALLY LIQUID; VERY WET, USUALLY FROM BELOW THE GROUND WATER TABLE						CSE. - COARSE		ORG. - ORGANIC		UNIT WEIGHT		DRY UNIT WEIGHT		SAMPLE ABBREVIATIONS		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 FINGERNAIL.																	
SL		SHRINKAGE LIMIT		USUALLY LIQUID; VERY WET, USUALLY FROM BELOW THE GROUND WATER TABLE						DPT - DILATOMETER TEST		PMT - PRESSUREMETER TEST		UNIT WEIGHT		DRY UNIT WEIGHT		SAMPLE ABBREVIATIONS		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 FINGERNAIL.																	
LL		LIQUID LIMIT		USUALLY LIQUID; VERY WET, USUALLY FROM BELOW THE GROUND WATER TABLE						DPT - DILATOMETER TEST		PMT - PRESSUREMETER TEST		UNIT WEIGHT		DRY UNIT WEIGHT		SAMPLE ABBREVIATIONS		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 FINGERNAIL.																	
PL		PLASTIC LIMIT		USUALLY LIQUID; VERY WET, USUALLY FROM BELOW THE GROUND WATER TABLE						DPT - DILATOMETER TEST		PMT - PRESSUREMETER TEST		UNIT WEIGHT		DRY UNIT WEIGHT		SAMPLE ABBREVIATIONS		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 FINGERNAIL.																	
OM		OPTIMUM MOISTURE		USUALLY LIQUID; VERY WET, USUALLY FROM BELOW THE GROUND WATER TABLE						DPT - DILATOMETER TEST		PMT - PRESSUREMETER TEST		UNIT WEIGHT		DRY UNIT WEIGHT		SAMPLE ABBREVIATIONS		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 FINGERNAIL.																	
SL		SHRINKAGE LIMIT		USUALLY LIQUID; VERY WET, USUALLY FROM BELOW THE GROUND WATER TABLE						DPT - DILATOMETER TEST		PMT - PRESSUREMETER TEST		UNIT WEIGHT		DRY UNIT WEIGHT		SAMPLE ABBREVIATIONS		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 FINGERNAIL.																	
PLASTICITY										EQUIPMENT USED ON SUBJECT PROJECT										ROCK HARDNESS										BENCH MARK:									
PLASTICITY INDEX (PI)		DRY STRENGTH		USUALLY LIQUID; VERY WET, USUALLY FROM BELOW THE GROUND WATER TABLE						DRILL UNITS:		ADVANCING TOOLS:		HAMMER TYPE:		CORE SIZE:		HAND TOOLS:		FRIABLE		RUBBING WITH FINGER FREES NUMEROUS GRAINS; GENTLE BLOW BY HAMMER DISINTEGRATES SAMPLE.																	
NON PLASTIC		VERY LOW		USUALLY LIQUID; VERY WET, USUALLY FROM BELOW THE GROUND WATER TABLE						CME-45C		CLAY BITS		AUTOMATIC		1/8		POST HOLE DIGGER		MODERATELY INDURATED		GRAINS CAN BE SEPARATED FROM SAMPLE WITH STEEL PROBE; BREAKS EASILY WHEN HIT WITH HAMMER.																	
SLIGHTLY PLASTIC		SLIGHT		USUALLY LIQUID; VERY WET, USUALLY FROM BELOW THE GROUND WATER TABLE						CME-55		6" CONTINUOUS FLIGHT AUGER		MANUAL		1/4		HAND AUGER		INDURATED		GRAINS ARE DIFFICULT TO SEPARATE WITH STEEL PROBE; DIFFICULT TO BREAK WITH HAMMER.																	
MODERATELY PLASTIC		MEDIUM		USUALLY LIQUID; VERY WET, USUALLY FROM BELOW THE GROUND WATER TABLE						CME-550X		HARD FACED FINGER BITS				1/2		VANE SHEAR TEST		EXTREMELY INDURATED		SHARP HAMMER BLOWS REQUIRED TO BREAK SAMPLE; SAMPLE BREAKS ACROSS GRAINS.																	
HIGHLY PLASTIC		HIGH		USUALLY LIQUID; VERY WET, USUALLY FROM BELOW THE GROUND WATER TABLE						PORTABLE HOIST		TUNG.-CARBIDE INSERTS				3/4																							
COLOR										EQUIPMENT USED ON SUBJECT PROJECT										ROCK HARDNESS										BENCH MARK:									
DESCRIPTORS MAY INCLUDE COLOR OR COLOR COMBINATIONS (TAN, RED, YELLOW-BROWN, BLUE-GRAY). MODIFIERS SUCH AS LIGHT, DARK, STREAKED, ETC. ARE USED TO DESCRIBE APPEARANCE.		DRY STRENGTH		USUALLY LIQUID; VERY WET, USUALLY FROM BELOW THE GROUND WATER TABLE						DRILL UNITS:		ADVANCING TOOLS:		HAMMER TYPE:		CORE SIZE:		HAND TOOLS:		FRIABLE		RUBBING WITH FINGER FREES NUMEROUS GRAINS; GENTLE BLOW BY HAMMER DISINTEGRATES SAMPLE.																	
NON PLASTIC		VERY LOW		USUALLY LIQUID; VERY WET, USUALLY FROM BELOW THE GROUND WATER TABLE						CME-45C		CLAY BITS		AUTOMATIC		1/8		POST HOLE DIGGER		MODERATELY INDURATED		GRAINS CAN BE SEPARATED FROM SAMPLE WITH STEEL PROBE; BREAKS EASILY WHEN HIT WITH HAMMER.																	
SLIGHTLY PLASTIC		SLIGHT		USUALLY LIQUID; VERY WET, USUALLY FROM BELOW THE GROUND WATER TABLE						CME-55		6" CONTINUOUS FLIGHT AUGER		MANUAL		1/4		HAND AUGER		INDURATED		GRAINS ARE DIFFICULT TO SEPARATE WITH STEEL PROBE; DIFFICULT TO BREAK WITH HAMMER.																	
MODERATELY PLASTIC		MEDIUM		USUALLY LIQUID; VERY WET, USUALLY FROM BELOW THE GROUND WATER TABLE						CME-550X		HARD FACED FINGER BITS				1/2		VANE SHEAR TEST		EXTREMELY INDURATED		SHARP HAMMER BLOWS REQUIRED TO BREAK SAMPLE; SAMPLE BREAKS ACROSS GRAINS.																	
HIGHLY PLASTIC		HIGH		USUALLY LIQUID; VERY WET, USUALLY FROM BELOW THE GROUND WATER TABLE						PORTABLE HOIST		TUNG.-CARBIDE INSERTS				3/4																							
COLOR										EQUIPMENT USED ON SUBJECT PROJECT										ROCK HARDNESS										BENCH MARK:									
DESCRIPTORS MAY INCLUDE COLOR OR COLOR COMBINATIONS (TAN, RED, YELLOW-BROWN, BLUE-GRAY). MODIFIERS SUCH AS LIGHT, DARK, STREAKED, ETC. ARE USED TO DESCRIBE APPEARANCE.		DRY STRENGTH		USUALLY LIQUID; VERY WET, USUALLY FROM BELOW THE GROUND WATER TABLE						DRILL UNITS:		ADVANCING TOOLS:		HAMMER TYPE:		CORE SIZE:		HAND TOOLS:		FRIABLE		RUBBING WITH FINGER FREES NUMEROUS GRAINS; GENTLE BLOW BY HAMMER DISINTEGRATES SAMPLE.																	
NON PLASTIC		VERY LOW		USUALLY LIQUID; VERY WET, USUALLY FROM BELOW THE GROUND WATER TABLE						CME-45C		CLAY BITS		AUTOMATIC		1/8		POST HOLE DIGGER		MODERATELY INDURATED		GRAINS CAN BE SEPARATED FROM SAMPLE WITH STEEL PROBE; BREAKS EASILY WHEN HIT WITH HAMMER.																	
SLIGHTLY PLASTIC		SLIGHT		USUALLY LIQUID; VERY WET, USUALLY FROM BELOW THE GROUND WATER TABLE						CME-55		6" CONTINUOUS FLIGHT AUGER		MANUAL		1/4		HAND AUGER		INDURATED		GRAINS ARE DIFFICULT TO SEPARATE WITH STEEL PROBE; DIFFICULT TO BREAK WITH HAMMER.																	
MODERATELY PLASTIC		MEDIUM		USUALLY LIQUID; VERY WET, USUALLY FROM BELOW THE GROUND WATER TABLE						CME-550X		HARD FACED FINGER BITS				1/2		VANE SHEAR TEST		EXTREMELY INDURATED		SHARP HAMMER BLOWS REQUIRED TO BREAK SAMPLE; SAMPLE BREAKS ACROSS GRAINS.																	
HIGHLY PLASTIC		HIGH		USUALLY LIQUID; VERY WET, USUALLY FROM BELOW THE GROUND WATER TABLE						PORTABLE HOIST		TUNG.-CARBIDE INSERTS				3/4																							
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NON PLASTIC		VERY LOW		USUALLY LIQUID; VERY WET, USUALLY FROM BELOW THE GROUND WATER TABLE						CME-45C		CLAY BITS		AUTOMATIC		1/8		POST HOLE DIGGER		MODERATELY INDURATED		GRAINS CAN BE SEPARATED FROM SAMPLE WITH STEEL PROBE; BREAKS EASILY WHEN HIT WITH HAMMER.																	
SLIGHTLY PLASTIC		SLIGHT		USUALLY LIQUID; VERY WET, USUALLY FROM BELOW THE GROUND WATER TABLE						CME-55		6" CONTINUOUS FLIGHT AUGER		MANUAL		1/4		HAND AUGER		INDURATED		GRAINS ARE DIFFICULT TO SEPARATE WITH STEEL PROBE; DIFFICULT TO BREAK WITH HAMMER.																	
MODERATELY PLASTIC		MEDIUM		USUALLY LIQUID; VERY WET, USUALLY FROM BELOW THE GROUND WATER TABLE						CME-550X		HARD FACED FINGER BITS				1/2		VANE SHEAR TEST		EXTREMELY INDURATED		SHARP HAMMER BLOWS REQUIRED TO BREAK SAMPLE; SAMPLE BREAKS ACROSS GRAINS.																	
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NON PLASTIC		VERY LOW		USUALLY LIQUID; VERY WET, USUALLY FROM BELOW THE GROUND WATER TABLE						CME-45C		CLAY BITS		AUTOMATIC		1/8		POST HOLE DIGGER		MODERATELY INDURATED		GRAINS CAN BE SEPARATED FROM SAMPLE WITH STEEL PROBE; BREAKS EASILY WHEN HIT WITH HAMMER.																	
SLIGHTLY PLASTIC		SLIGHT		USUALLY LIQUID; VERY WET, USUALLY FROM BELOW THE GROUND WATER TABLE						CME-55		6" CONTINUOUS FLIGHT AUGER		MANUAL		1/4		HAND AUGER		INDURATED		GRAINS ARE DIFFICULT TO SEPARATE WITH STEEL PROBE; DIFFICULT TO BREAK WITH HAMMER.																	
MODERATELY PLASTIC		MEDIUM		USUALLY LIQUID; VERY WET, USUALLY FROM BELOW THE GROUND WATER TABLE						CME-550X		HARD FACED FINGER BITS				1/2		VANE SHEAR TEST		EXTREMELY INDURATED		SHARP HAMMER BLOWS REQUIRED TO BREAK SAMPLE; SAMPLE BREAKS ACROSS GRAINS.																	
HIGHLY PLASTIC		HIGH		USUALLY LIQUID; VERY WET, USUALLY FROM BELOW THE GROUND WATER TABLE						PORTABLE HOIST		TUNG.-CARBIDE INSERTS				3/4																							
COLOR																																							





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SOIL TEST RESULTS																		
BORING ID	SAMPLE NO.	OFFSET	STATION	NORTHING	EASTING	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT				% PASSING (SIEVES)			% MOISTURE	% ORGANIC
										C. SAND	F. SAND	SILT	CLAY	10	40	200		
RWAL B-16	SS-2023	2' RT	11+10 -W2-	704857	1947372	1.0 - 2.5'	A-7-5(29)	58	23	1.2	1.7	44.0	53.1	99.3	98.5	96.8	31.9	ND
RWAL B-16	SS-2025	2' RT	11+10 -W2-	704857	1947372	6.0 - 7.5'	A-7-5(24)	53	23	3.8	2.2	45.0	49.0	95.9	93.0	90.5	28.7	ND
RWAL B-17	SS-2009	13' RT	11+41 -W2-	704854	1947404	1.0 - 2.5'	A-7-5(28)	67	29	2.6	2.5	23.0	71.9	85.0	83.2	81.2	31.6	ND
RWAL B-17	SS-2011	13' RT	11+41 -W2-	704854	1947404	6.0 - 7.5'	A-7-5(17)	53	11	1.3	1.8	54.2	42.7	99.8	99.1	97.2	42.9	ND
RWAL B-17	SS-2013	13' RT	11+41 -W2-	704854	1947404	14.0 - 15.5'	A-7-5(18)	54	13	1.1	7.9	58.5	32.5	99.9	99.3	92.8	42.8	ND
RWAL B-17	SS-2014	13' RT	11+41 -W2-	704854	1947404	19.0 - 20.5'	A-7-5(13)	43	12	2.8	8.0	54.4	34.8	96.7	95.2	87.7	35.0	ND
RWAL B-18	SS-2017	14' RT	11+82 -W2-	704862	1947445	1.0 - 2.5'	A-7-6(40)	67	41	2.8	1.3	28.5	67.4	91.6	89.4	88.1	28.9	ND
RWAL B-19	SS-2037	20' RT	12+48 -W2-	704872	1947510	4.5 - 6.0'	A-7-5(28)	63	30	3.2	3.5	38.0	55.3	87.5	85.5	82.2	39.6	ND
RWAL B-19	SS-2040	20' RT	12+48 -W2-	704872	1947510	14.5 - 16.0'	A-4(9)	40	10	7.2	11.6	58.8	22.4	97.6	93.7	81.0	30.0	ND
RWAL B-19	SS-2041	20' RT	12+48 -W2-	704872	1947510	19.5 - 21.0'	A-7-5(13)	41	11	3.0	3.6	58.3	35.1	99.9	97.9	93.8	35.5	ND
RWAL B-20	SS-19	18' RT	13+06 -W2-	704887	1947566	1.0 - 2.5'	A-7-5(53)	81	50	3.0	2.9	14.7	79.4	96.3	94.2	91.5	32.3	ND
RWAL B-20	SS-23	18' RT	13+06 -W2-	704887	1947566	13.5 - 15.0'	A-7-6(11)	41	14	9.4	15.0	36.6	39.0	100.0	94.9	78.4	34.2	ND



AUTHORIZED SIGNATURE

NCDOT CERT NO. 130-04-0212

Prepared in the Office of:

F&ME CONSULTANTS, INC.  
COLUMBIA, SOUTH CAROLINA  
NCDOT LAB CERT. NO. 130-0212

REFERENCE: R-5963A

PROJECT: 48599

CONTENTS

SHEET NO.	DESCRIPTION
1	TITLE SHEET
2	LEGEND (SOIL & ROCK)
3	SITE PLAN
4	PROFILE(S)
5	SOIL TEST RESULTS

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

STRUCTURE  
SUBSURFACE INVESTIGATION

COUNTY CHATHAM  
PROJECT DESCRIPTION CHATHAM PARK WAY FROM  
US 15-501 TO US 64 BUSINESS

SITE DESCRIPTION RETAINING WALL NO. 3:  
FROM -W3- STA. 80+38.61 TO -W3- STA. 81+87.29

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	R-5963A	1	

CAUTION NOTICE

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PERSONNEL

P. PERRY, E.I.T.

CG2 EXPLORATION

INVESTIGATED BY CG2, PLLC

DRAWN BY K. DE MONTBRUN, P.E.

CHECKED BY M. WALKO, P.E.

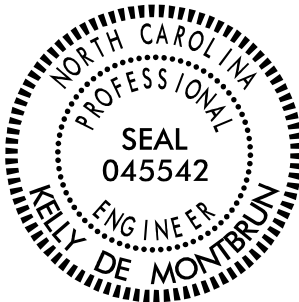
SUBMITTED BY CG2, PLLC

DATE NOVEMBER 2024

Prepared in the Office of:



**CAROLINAS  
GEOTECHNICAL  
GROUP**  
2400 CROWNPOINT EXECUTIVE DRIVE  
SUITE 800  
CHARLOTTE, NC 28227  
(980) 339-8684



Signed by: Kelly De Montbrun 12/04/2024  
BAB66070E9D747C SIGNATURE DATE

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**NORTH CAROLINA DEPARTMENT OF TRANSPORTATION**  
**DIVISION OF HIGHWAYS**

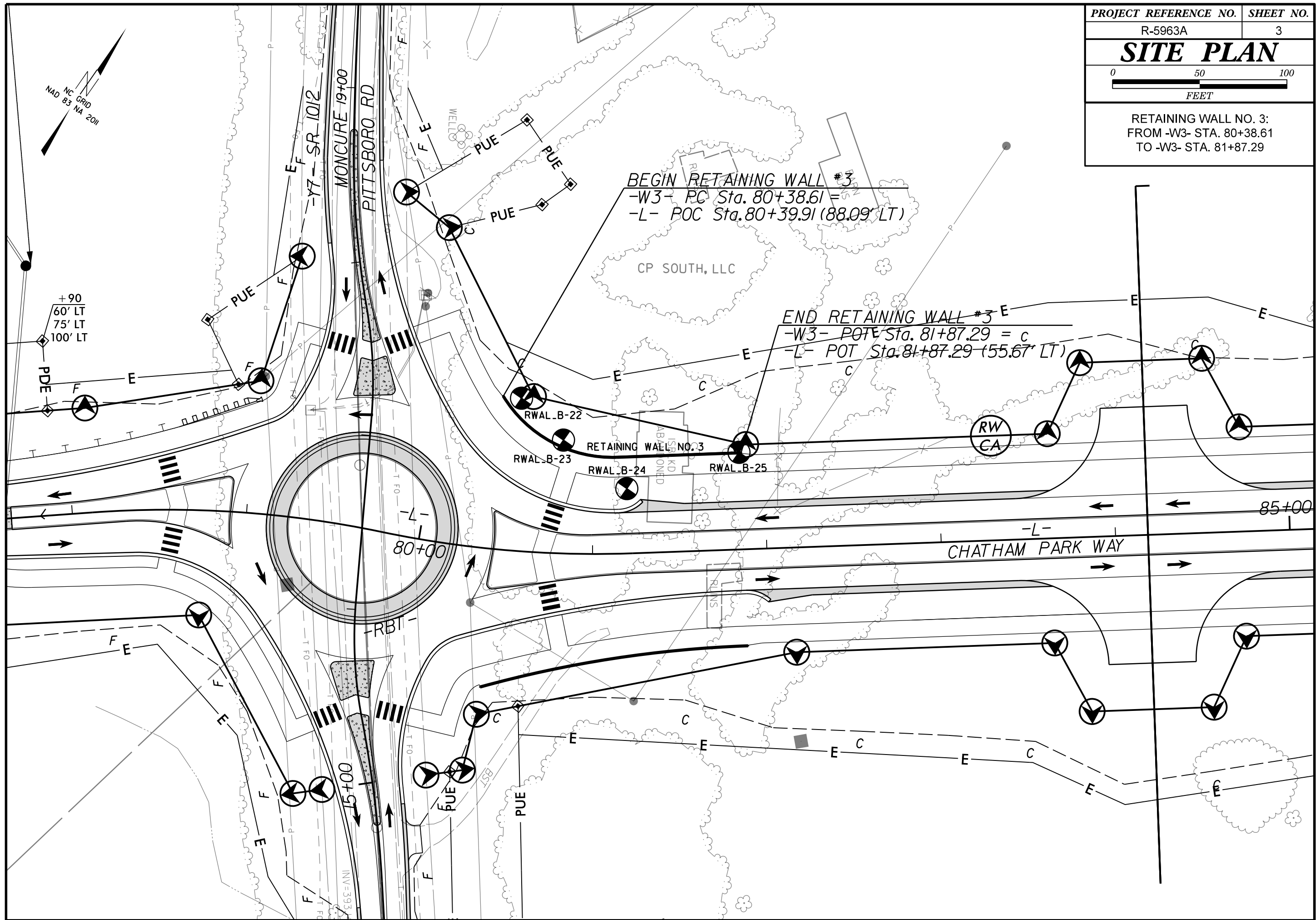
**GEOTECHNICAL ENGINEERING UNIT**

## SUBSURFACE INVESTIGATION

## SOIL AND ROCK LEGEND, TERMS, SYMBOLS, AND ABBREVIATIONS

[illegible]

PROJECT REFERENCE NO.	SHEET NO.
R-5963A	3
<b>SITE PLAN</b>	
0 50 100 FEET	
RETAINING WALL NO. 3: FROM -W3- STA. 80+38.61 TO -W3- STA. 81+87.29	









SOIL TEST RESULTS																		
BORING ID	SAMPLE NO.	OFFSET	STATION	NORTHING	EASTING	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT				% PASSING (SIEVES)			% MOISTURE	% ORGANIC
										C. SAND	F. SAND	SILT	CLAY	10	40	200		
RWAL B-23	SS-522	4' LT	80+83 -W3-	707586	1953542	1.0 - 2.5'	A-7-6(14)	47	20	10.1	4.5	32.3	53.1	81.0	74.4	69.9	18.9	ND
RWAL B-23	SS-523	4' LT	80+83 -W3-	707586	1953542	3.9 - 5.4'	A-7-5(21)	55	14	0.3	0.6	66.3	32.8	100.0	99.9	99.2	45.4	ND
RWAL B-23	SS-525	4' LT	80+83 -W3-	707586	1953542	8.9 - 10.4'	A-4(8)	38	6	1.9	7.0	62.3	28.8	100.0	98.9	94.0	34.5	ND
RWAL B-25	SS-494	CL	81+86 -W3-	707638	1953629	3.9 - 5.4'	A-7-5(30)	60	23	0.2	0.9	49.8	49.1	100.0	100.0	99.0	39.0	ND
RWAL B-25	SS-496	CL	81+86 -W3-	707638	1953629	8.9 - 10.4'	A-7-5(17)	53	13	2.7	8.0	52.2	37.1	100.0	98.3	92.2	40.7	ND
RWAL B-25	SS-498	CL	81+86 -W3-	707638	1953629	18.9 - 20.4'	A-4(8)	38	9	1.9	21.7	52.1	24.3	100.0	99.2	82.2	26.1	ND

Alex M. Armulsky

AUTHORIZED SIGNATURE  
NCDOT CERT NO. 130-04-0212

Prepared in the Office of:  
F&ME CONSULTANTS, INC.  
COLUMBIA, SOUTH CAROLINA  
NCDOT LAB CERT. NO. 130-0212

REFERENCE: R-5963A

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

STRUCTURE  
SUBSURFACE INVESTIGATION

COUNTY CHATHAM  
PROJECT DESCRIPTION CHATHAM PARK WAY FROM  
US 15-501 TO US 64 BUSINESS

SITE DESCRIPTION RETAINING WALL NO. 4:  
FROM -W4- STA. 80+31.51 TO -W4- STA. 81+87.29

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	R-5963A	1	

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PERSONNEL

P. PERRY, E.I.T.

T. WENNER, P.G.

CG2 EXPLORATION

INVESTIGATED BY CG2, PLLC

DRAWN BY K. DE MONTBRUN, P.E.

CHECKED BY M. WALKO, P.E.

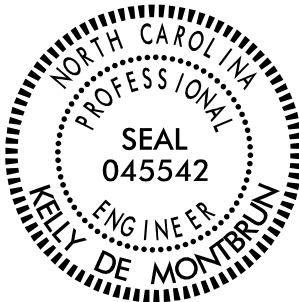
SUBMITTED BY CG2, PLLC

DATE NOVEMBER 2024

Prepared in the Office of:



**CAROLINAS  
GEOTECHNICAL  
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2400 CROWNPOINT EXECUTIVE DRIVE  
SUITE 800  
CHARLOTTE, NC 28227  
(980) 339-8684



Signed by: Kelly De Montbrun 12/04/2024

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NORTH CAROLINA DEPARTMENT OF TRANSPORTATION

DIVISION OF HIGHWAYS

GEOTECHNICAL ENGINEERING UNIT

SUBSURFACE INVESTIGATION

SOIL AND ROCK LEGEND, TERMS, SYMBOLS, AND ABBREVIATIONS

SOIL DESCRIPTION

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, *VERY STIFF, GRAY, SILTY CLAY, MOIST WITH INTERBEDDED FINE SAND LAYERS, HIGHLY PLASTIC, A-7-6*

SOIL LEGEND AND AASHTO CLASSIFICATION

GENERAL CLASS.	GRANULAR MATERIALS (≤ 35% PASSING #200)						SILT-CLAY MATERIALS (> 35% PASSING #200)						ORGANIC MATERIALS					
GROUP CLASS.	A-1		A-3		A-2		A-4		A-5		A-6		A-7		A-1, A-2		A-4, A-5	
SYMBOL	A-1-a	A-1-b	A-2-4		A-2-5		A-2-6		A-2-7		A-4		A-5		A-6		A-7	
% PASSING #10 #40 #200	50 MX 30 MX 15 MX	50 MX 25 MX	51 MN	35 MX	35 MX	35 MX	35 MX	35 MX	36 MN	36 MN	36 MN	36 MN	36 MN	36 MN	36 MN	GRANULAR SOILS	SILT-CLAY SOILS	MUCK, PEAT
MATERIAL PASSING #40 LL PI	— 6 MX		— NP		40 MX 10 MX	41 MN 10 MX	40 MX 11 MN	41 MN 11 MN	40 MX 10 MX	41 MN 11 MN	40 MX 10 MX	41 MN 11 MN	40 MX 10 MX	41 MN 11 MN	40 MX 11 MN	SOILS WITH LITTLE OR MODERATE AMOUNTS OF ORGANIC MATTER		HIGHLY ORGANIC SOILS
GROUP INDEX	0		0		0		4 MX		8 MX		12 MX		16 MX		NO MX			
USUAL TYPES OF MAJOR MATERIALS	STONE FRAGS. OF GRAVEL, AND SAND		FINE SAND		SILTY OR CLAYEY GRAVEL AND SAND				SILTY SOILS		CLAYEY SOILS							
GEN. RATING AS SUBGRADE	EXCELLENT TO GOOD						FAIR TO POOR						FAIR TO POOR		POOR		UNSUITABLE	

PI OF A-7-5 SUBGROUP IS ≤ LL - 30; PI OF A-7-6 SUBGROUP IS > LL - 30

GRADATION

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.

ANGULARITY OF GRAINS

THE ANGULARITY OR ROUNDNESS OF SOIL GRAINS IS DESIGNATED BY THE TERMS:  
ANGULAR, SUBANGULAR, SUBROUNDED, OR ROUNDED.

MINERALOGICAL COMPOSITION

MINERAL NAMES SUCH AS QUARTZ, FELDSPAR, MICA, TALC, KAOLIN, ETC. ARE USED IN DESCRIPTIONS WHEN THEY ARE CONSIDERED OF SIGNIFICANCE.

COMPRESSIBILITY

SLIGHTLY COMPRESSIBLE LL < 31  
MODERATELY COMPRESSIBLE LL = 31 - 50  
HIGHLY COMPRESSIBLE LL > 50

PERCENTAGE OF MATERIAL

ORGANIC MATERIAL	GRANULAR SOILS	SILT - CLAY SOILS	OTHER MATERIAL
TRACE OF ORGANIC MATTER	2 - 3%	3 - 5%	TRACE
LITTLE ORGANIC MATTER	3 - 5%	5 - 12%	LITTLE
MODERATELY ORGANIC	5 - 10%	12 - 20%	SOME
HIGHLY ORGANIC	> 10%	> 20%	HIGHLY

GROUND WATER

WATER LEVEL IN BORE HOLE IMMEDIATELY AFTER DRILLING

STATIC WATER LEVEL AFTER 24 HOURS

PERCHED WATER, SATURATED ZONE, OR WATER BEARING STRATA

SPRING OR SEEP

MISCELLANEOUS SYMBOLS

ROADWAY EMBANKMENT (RE) WITH SOIL DESCRIPTION

SOIL SYMBOL

ARTIFICIAL FILL (AF) OTHER THAN ROADWAY EMBANKMENT

INFERRED SOIL BOUNDARY

INFERRED ROCK LINE

ALLUVIAL SOIL BOUNDARY

DIP & DIP DIRECTION OF ROCK STRUCTURES

TEST BORING

AUGER BORING

CORE BORING

MONITORING WELL

PIEZOMETER INSTALLATION

SLOPE INDICATOR INSTALLATION

CONE PENETROMETER TEST

SOUNDING ROD

TEST BORING WITH CORE

SPT N-VALUE

RECOMMENDATION SYMBOLS

UNDERCUT

SHALLOW UNDERCUT

UNCLASSIFIED EXCAVATION - UNSUITABLE WASTE

UNCLASSIFIED EXCAVATION - ACCEPTABLE DEGRADABLE ROCK

UNCLASSIFIED EXCAVATION - ACCEPTABLE, BUT NOT TO BE USED IN THE TOP 3 FEET OF EMBANKMENT OR BACKFILL

ABBREVIATIONS

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  
HL - 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  
γ - UNIT WEIGHT  
γ<sub>d</sub> - DRY UNIT WEIGHT

SAMPLE ABBREVIATIONS  
S - BULK  
SS - SPLIT SPOON  
ST - SHELBY TUBE  
RS - ROCK  
RT - RECOMPACTED TRIAXIAL  
CBR - CALIFORNIA BEARING RATIO

EQUIPMENT USED ON SUBJECT PROJECT

DRILL UNITS:  
☐ CME-45C  
☐ CME-55  
☒ CME-550X  
☐ VANE SHEAR TEST  
☐ PORTABLE HOIST  
☒ MOBILE B-29  
☐

ADVANCING TOOLS:  
☐ CLAY BITS  
☐ 6" CONTINUOUS FLIGHT AUGER  
☒ 8" HOLLOW AUGERS  
☐ HARD FACED FINGER BITS  
☐ TUNG-CARBIDE INSERTS  
☐ CASING ☐ W/ ADVANCER  
☐ TRICONE ☐ STEEL TEETH  
☐ TRICONE ☐ TUNG-CARB.  
☐ CORE BIT  
☐

HAMMER TYPE:  
☒ AUTOMATIC ☐ MANUAL  
  
CORE SIZE:  
☐ -B ☐ -H ☐ -N  
  
HAND TOOLS:  
☐ POST HOLE DIGGER  
☐ HAND AUGER  
☐ SOUNDING ROD  
☐ VANE SHEAR TEST  
☐

ROCK DESCRIPTION

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:

WEATHERED ROCK (WR)

CRYSTALLINE ROCK (CR)

NON-CRYSTALLINE ROCK (NCR)

COASTAL PLAIN SEDIMENTARY ROCK (CP)

NON-COASTAL PLAIN MATERIAL THAT WOULD YIELD SPT N VALUES > 100 BLOWS PER FOOT IF TESTED.

FINE TO COARSE GRAIN IGNEOUS AND METAMORPHIC ROCK THAT WOULD YIELD SPT REFUSAL IF TESTED. ROCK TYPE INCLUDES GRANITE, GNEISS, GABBRO, SCHIST, ETC.

FINE TO COARSE GRAIN METAMORPHIC AND NON-COASTAL PLAIN SEDIMENTARY ROCK THAT WOULD YIELD SPT REFUSAL IF TESTED. ROCK TYPE INCLUDES PHYLLITE, SLATE, SANDSTONE, ETC.

COASTAL PLAIN SEDIMENTS CEMENTED INTO ROCK, BUT MAY NOT YIELD SPT REFUSAL. ROCK TYPE INCLUDES LIMESTONE, SANDSTONE, CEMENTED SHELL BEDS, ETC.

WEATHERING

FRESH  
ROCK FRESH, CRYSTALS BRIGHT, FEW JOINTS MAY SHOW SLIGHT STAINING. ROCK RINGS UNDER HAMMER IF CRYSTALLINE.VERY SLIGHT (V SL.)  
ROCK GENERALLY FRESH, JOINTS STAINED. SOME JOINTS MAY SHOW THIN CLAY COATINGS IF OPEN. CRYSTALS ON A BROKEN SPECIMEN FACE SHINE BRIGHTLY. ROCK RINGS UNDER HAMMER BLOWS IF OF A CRYSTALLINE NATURE.SLIGHT (SL.)  
ROCK GENERALLY FRESH, JOINTS STAINED AND DISCOLORATION EXTENDS INTO ROCK UP TO 1 INCH. OPEN JOINTS MAY CONTAIN CLAY. IN GRANITOID ROCKS SOME OCCASIONAL FELDSPAR CRYSTALS ARE DULL AND DISCOLORED. CRYSTALLINE ROCKS RING UNDER HAMMER BLOWS.MODERATE (MOD.)  
SIGNIFICANT PORTIONS OF ROCK SHOW DISCOLORATION AND WEATHERING EFFECTS. IN GRANITOID ROCKS, MOST FELDSPARS ARE DULL AND DISCOLORED, SOME SHOW CLAY. ROCK HAS DULL SOUND UNDER HAMMER BLOWS AND SHOWS SIGNIFICANT LOSS OF STRENGTH AS COMPARED WITH FRESH ROCK.MODERATELY SEVERE (MOD. SEV.)  
ALL ROCK EXCEPT QUARTZ DISCOLORED OR STAINED. IN GRANITOID ROCKS, ALL FELDSPARS DULL AND DISCOLORED AND A MAJORITY SHOW KAOLINIZATION. ROCK SHOWS SEVERE LOSS OF STRENGTH AND CAN BE EXCAVATED WITH A GEOLOGIST'S PICK. ROCK GIVES "CLUNK" SOUND WHEN STRUCK. *IF TESTED, WOULD YIELD SPT REFUSAL*SEVERE (SEV.)  
ALL ROCK EXCEPT QUARTZ DISCOLORED OR STAINED. ROCK FABRIC CLEAR AND EVIDENT BUT REDUCED IN STRENGTH TO STRONG SOIL. IN GRANITOID ROCKS ALL FELDSPARS ARE KAOLINIZED TO SOME EXTENT. SOME FRAGMENTS OF STRONG ROCK USUALLY REMAIN. *IF TESTED, WOULD YIELD SPT N VALUES > 100 BPF*VERY SEVERE (V SEV.)  
ALL ROCK EXCEPT QUARTZ DISCOLORED OR STAINED. ROCK FABRIC ELEMENTS ARE DISCERNIBLE BUT MASS IS EFFECTIVELY REDUCED TO SOIL STATUS, WITH ONLY FRAGMENTS OF STRONG ROCK REMAINING. SAPROLITE IS AN EXAMPLE OF ROCK WEATHERED TO A DEGREE THAT ONLY MINOR VESTIGES OF ORIGINAL ROCK FABRIC REMAIN. *IF TESTED, WOULD YIELD SPT N VALUES < 100 BPF*COMPLETE  
ROCK REDUCED TO SOIL. ROCK FABRIC NOT DISCERNIBLE, OR DISCERNIBLE ONLY IN SMALL AND SCATTERED CONCENTRATIONS. QUARTZ MAY BE PRESENT AS DIKES OR STRINGERS. SAPROLITE IS ALSO AN EXAMPLE.

TERMS AND DEFINITIONS

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 DISLOOGED 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 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.

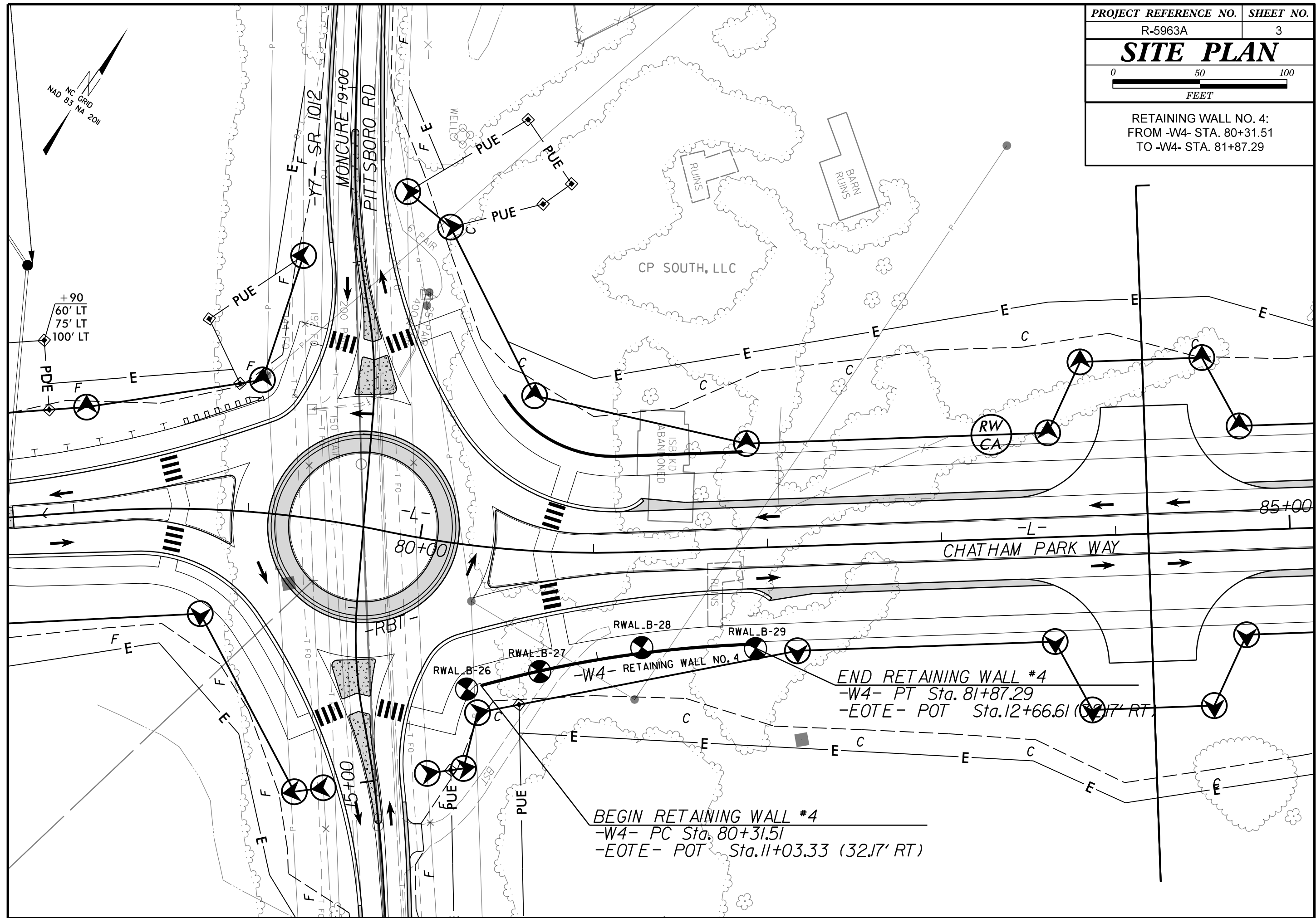
BENCH MARK:  

ELEVATION: FEET

NOTES:  
ROADWAY DESIGN FILES AND WALL ENVELOPES PROVIDED BY NCDOT DATED 07/18/2024.  
BORING COLLAR ELEVATIONS OBTAINED USING CARLSON BRX-7 (SURVEY GRADE GPS).  
FIAD = FILLED IMMEDIATELY AFTER DRILLING


DATE: 8-15-14

PROJECT REFERENCE NO.	SHEET NO.
R-5963A	3
<b>SITE PLAN</b>	
RETAINING WALL NO. 4: FROM -W4- STA. 80+31.51 TO -W4- STA. 81+87.29	





SOIL TEST RESULTS																		
BORING ID	SAMPLE NO.	OFFSET	STATION	NORTHING	EASTING	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT				% PASSING (SIEVES)			% MOISTURE	% ORGANIC
										C. SAND	F. SAND	SILT	CLAY	10	40	200		
RWAL B-26	SS-1070	151' RT	80+85 -L-	707436	1953578	1.0 - 2.5'	A-2-6(0)	37	12	35.0	13.5	25.1	26.4	54.7	39.5	29.5	10.9	ND
RWAL B-26	SS-1071	151' RT	80+85 -L-	707436	1953578	3.5 - 5.0'	A-7-5(17)	47	13	1.7	4.0	57.4	36.9	99.9	98.9	95.1	33.1	ND
RWAL B-27	SS-473	CL	80+66 -W4-	707469	1953607	3.7 - 5.2'	A-7-5(24)	53	21	2.7	4.1	50.2	43.0	99.0	97.1	93.3	36.2	ND
RWAL B-27	SS-476	CL	80+66 -W4-	707469	1953607	13.7 - 15.2'	A-4(7)	33	8	4.0	9.9	69.7	16.4	99.4	96.6	89.2	16.9	ND
RWAL B-28	SS-469	4' LT	81+26 -W4-	707513	1953647	18.8 - 20.3'	A-7-5(10)	42	11	7.8	7.2	66.5	18.5	93.2	88.0	80.9	26.2	ND
RWAL B-29	SS-503	58' RT	81+91 -L-	707550	1953701	8.9 - 10.4'	A-6(18)	40	18	1.3	12.2	57.4	29.1	99.9	99.1	92.2	29.5	ND



AUTHORIZED SIGNATURE

NCDOT CERT NO. 130-04-0212

Prepared in the Office of:

F&ME CONSULTANTS, INC.  
COLUMBIA, SOUTH CAROLINA  
NCDOT LAB CERT. NO. 130-0212



REFERENCE: R-5963A

PROJECT: 48599

CONTENTS

SHEET NO.	DESCRIPTION
1	TITLE SHEET
2	LEGEND (SOIL & ROCK)
3	SITE PLAN
4	PROFILE
5	SOIL TEST RESULTS

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

STRUCTURE  
SUBSURFACE INVESTIGATION

COUNTY CHATHAM  
PROJECT DESCRIPTION CHATHAM PARK WAY FROM  
US 15-501 TO US 64 BUSINESS

SITE DESCRIPTION RETAINING WALL NO. 5:  
FROM -W5- STA. 174 + 00.00 TO -W5- STA. 176 + 98.00

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	R-5963A	1	

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 PERFORM INDEPENDENT SUBSURFACE INVESTIGATIONS AND MAKE INTERPRETATIONS AS NECESSARY TO CONFIRM CONDITIONS ENCOUNTERED ON THE PROJECT. THE CONTRACTOR SHALL HAVE NO CLAIM FOR ADDITIONAL COMPENSATION OR FOR AN EXTENSION OF TIME FOR ANY REASON RESULTING FROM THE ACTUAL CONDITIONS ENCOUNTERED AT THE SITE DIFFERING FROM THOSE INDICATED IN THE SUBSURFACE INFORMATION.

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

PERSONNEL

P. TOMASIC, P.G.

CG2 EXPLORATION

INVESTIGATED BY CG2, PLLC

DRAWN BY K. DE MONTBRUN, P.E.

CHECKED BY M. WALKO, P.E.

SUBMITTED BY CG2, PLLC

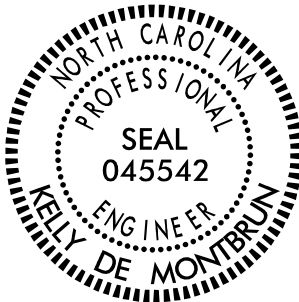
DATE NOVEMBER 2024

Prepared in the Office of:



CAROLINAS  
GEOTECHNICAL  
GROUP

2400 CROWNPOINT EXECUTIVE DRIVE  
SUITE 800  
CHARLOTTE, NC 28227  
(980) 339-8684



Signed by: Kelly De Montbrun 12/04/2024  
BAB66070E98747A SIGNATURE DATE

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																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																							
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>												WELL GRADED - INDICATES A GOOD REPRESENTATION OF PARTICLE SIZES FROM FINE TO COARSE. UNIFORMLY GRADED - INDICATES THAT SOIL PARTICLES ARE ALL APPROXIMATELY THE SAME SIZE. GAP-GRADED - INDICATES A MIXTURE OF UNIFORM PARTICLE SIZES OF TWO OR MORE SIZES.												HARD ROCK IS NON-COASTAL PLAIN MATERIAL THAT WOULD YIELD SPT REFUSAL IF TESTED. AN INFERRED ROCK LINE INDICATES THE LEVEL AT WHICH NON-COASTAL PLAIN MATERIAL WOULD YIELD SPT REFUSAL. SPT REFUSAL IS PENETRATION BY A SPLIT SPOON SAMPLER EQUAL TO OR LESS THAN 0.1 FOOT PER 60 BLOWS IN NON-COASTAL PLAIN MATERIAL. THE TRANSITION BETWEEN SOIL AND ROCK IS OFTEN REPRESENTED BY A ZONE OF WEATHERED ROCK. ROCK MATERIALS ARE TYPICALLY DIVIDED AS FOLLOWS:												ALLUVIUM (ALLUV.) - SOILS THAT HAVE BEEN TRANSPORTED BY WATER. AQUIFER - A WATER BEARING FORMATION OR STRATA. ARENACEOUS - APPLIED TO ROCKS THAT HAVE BEEN DERIVED FROM SAND OR THAT CONTAIN SAND. ARGILLACEOUS - APPLIED TO ALL ROCKS OR SUBSTANCES COMPOSED OF CLAY MINERALS, OR HAVING A NOTABLE PROPORTION OF CLAY IN THEIR COMPOSITION, SUCH AS SHALE, SLATE, ETC. ARTESIAN - GROUND WATER THAT IS UNDER SUFFICIENT PRESSURE TO RISE ABOVE THE LEVEL AT WHICH IT IS ENCOUNTERED, BUT WHICH DOES NOT NECESSARILY RISE TO OR ABOVE THE GROUND SURFACE. CALCAREOUS (CALC.) - SOILS THAT CONTAIN APPRECIABLE AMOUNTS OF CALCIUM CARBONATE. COLLUVIUM - ROCK FRAGMENTS MIXED WITH SOIL DEPOSITED BY GRAVITY ON SLOPE OR AT BOTTOM OF SLOPE. CORE RECOVERY (REC.) - TOTAL LENGTH OF ALL MATERIAL RECOVERED IN THE CORE BARREL DIVIDED BY TOTAL LENGTH OF CORE RUN AND EXPRESSED AS A PERCENTAGE. DIKE - A TABULAR BODY OF IGNEOUS ROCK THAT CUTS ACROSS THE STRUCTURE OF ADJACENT ROCKS OR CUTS MASSIVE ROCK. DIP - THE ANGLE AT WHICH A STRATUM OR ANY PLANAR FEATURE IS INCLINED FROM THE HORIZONTAL. DIP DIRECTION (DIP AZIMUTH) - THE DIRECTION OR BEARING OF THE HORIZONTAL TRACE OF THE LINE OF DIP, MEASURED CLOCKWISE FROM NORTH. FAULT - A FRACTURE OR FRACTURE ZONE ALONG WHICH THERE HAS BEEN DISPLACEMENT OF THE SIDES RELATIVE TO ONE ANOTHER PARALLEL TO THE FRACTURE. FISSILE - A PROPERTY OF SPLITTING ALONG CLOSELY SPACED PARALLEL PLANES. FLOAT - ROCK FRAGMENTS ON SURFACE NEAR THEIR ORIGINAL POSITION AND DISLOGGED FROM PARENT MATERIAL. FLOOD PLAIN (FP) - LAND BORDERING A STREAM, BUILT OF SEDIMENTS DEPOSITED BY THE STREAM. FORMATION (FM.) - A MAPPABLE GEOLOGIC UNIT THAT CAN BE RECOGNIZED AND TRACED IN THE FIELD. JOINT - FRACTURE IN ROCK ALONG WHICH NO APPRECIABLE MOVEMENT HAS OCCURRED. LEDGE - A SHELF-LIKE RIDGE OR PROJECTION OF ROCK WHOSE THICKNESS IS SMALL COMPARED TO ITS LATERAL EXTENT. LENS - A BODY OF SOIL OR ROCK THAT THINS OUT IN ONE OR MORE DIRECTIONS. MOTTLED (MOT.) - IRREGULARLY MARKED WITH SPOTS OF DIFFERENT COLORS. MOTTLING IN SOILS USUALLY INDICATES POOR AERATION AND LACK OF GOOD DRAINAGE. PERCHED WATER - WATER MAINTAINED ABOVE THE NORMAL GROUND WATER LEVEL BY THE PRESENCE OF AN INTERVENING IMPERVIOUS STRATUM. RESIDUAL (RES.) SOIL - SOIL FORMED IN PLACE BY THE WEATHERING OF ROCK. ROCK QUALITY DESIGNATION (ROD) - A MEASURE OF ROCK QUALITY DESCRIBED BY TOTAL LENGTH OF ROCK SEGMENTS EQUAL TO OR GREATER THAN 4 INCHES DIVIDED BY THE TOTAL LENGTH OF CORE RUN AND EXPRESSED AS A PERCENTAGE. SAPROLITE (SAP.) - RESIDUAL SOIL THAT RETAINS THE RELIC STRUCTURE OR FABRIC OF THE PARENT ROCK. SILL - AN INTRUSIVE BODY OF IGNEOUS ROCK OF APPROXIMATELY UNIFORM THICKNESS AND RELATIVELY THIN COMPARED WITH ITS LATERAL EXTENT, THAT HAS BEEN EMPLACED PARALLEL TO THE BEDDING OR SCHISTOSITY OF THE INTRUDED ROCKS. SLICKENSIDE - POLISHED AND STRIATED SURFACE THAT RESULTS FROM FRICTION ALONG A FAULT OR SLIP PLANE. STANDARD PENETRATION TEST (PENETRATION RESISTANCE) (SPT) - NUMBER OF BLOWS (N OR BPF) OF A 140 LB. HAMMER FALLING 30 INCHES REQUIRED TO PRODUCE A PENETRATION OF 1 FOOT INTO SOIL WITH A 2 INCH OUTSIDE DIAMETER SPLIT SPOON SAMPLER. SPT REFUSAL IS PENETRATION EQUAL TO OR LESS THAN 0.1 FOOT PER 60 BLOWS. STRATA CORE RECOVERY (SREC) - TOTAL LENGTH OF STRATA MATERIAL RECOVERED DIVIDED BY TOTAL LENGTH OF STRATUM AND EXPRESSED AS A PERCENTAGE. STRATA ROCK QUALITY DESIGNATION (SROD) - A MEASURE OF ROCK QUALITY DESCRIBED BY TOTAL LENGTH OF ROCK SEGMENTS WITHIN A STRATUM EQUAL TO OR GREATER THAN 4 INCHES DIVIDED BY THE TOTAL LENGTH OF STRATA AND EXPRESSED AS A PERCENTAGE. 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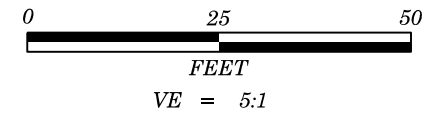


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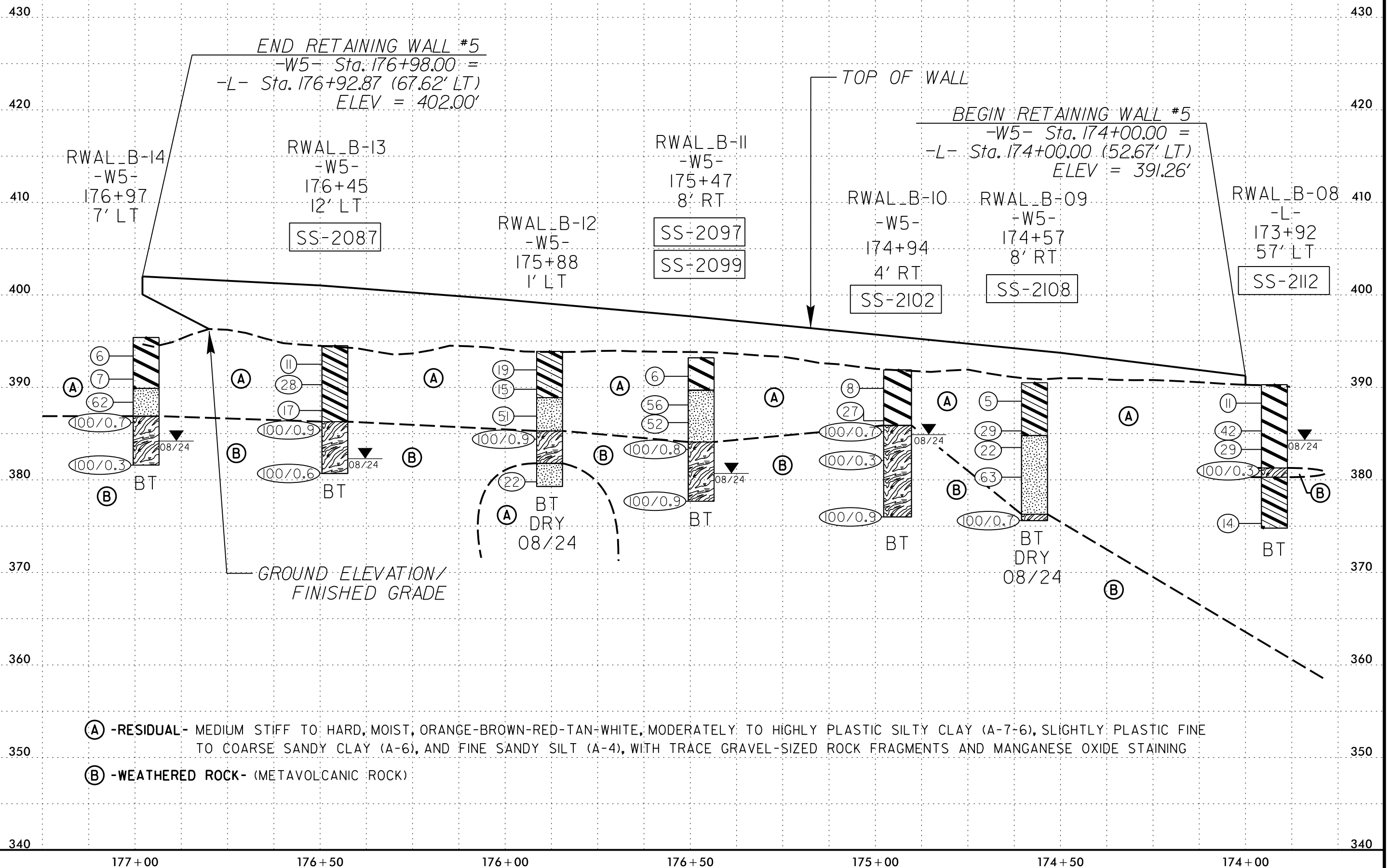
-W5-

EXISTING GROUND LINE AND RETAINING WALL ENVELOPE ALONG  
-W5- TAKEN FROM ROADWAY DESIGN PLANS PROVIDED  
BY NCDOT. INFERRED STRATIGRAPHY IS DRAWN THROUGH THE BORING  
WITH BOTH PROJECTED ONTO THE WALL ENVELOPE.

Prepared in the Office of:  
**CGE** CAROLINAS  
GEOTECHNICAL  
GROUP



PROJECT REFERENCE NO.	SHEET NO.
R-5963A	4
RETAINING WALL NO. 5 PROFILE: BORINGS PROJECTED ALONG WALL ENVELOPE	



SOIL TEST RESULTS																		
BORING ID	SAMPLE NO.	OFFSET	STATION	NORTHING	EASTING	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT				% PASSING (SIEVES)			%	%
										C. SAND	F. SAND	SILT	CLAY	10	40	200	MOISTURE	ORGANIC
RWAL B-08	SS-2112	57' LT	173+92 -L-	716139	1955579	1.0 - 2.5'	A-7-6(29)	56	28	5.0	3.6	34.1	57.3	96.9	92.8	89.6	24.0	ND
RWAL B-09	SS-2108	8' RT	174+57 -W5-	716201	1955603	4.2 - 5.7'	A-6(12)	37	14	3.4	2.9	62.8	30.9	88.6	86.4	83.9	12.4	ND
RWAL B-10	SS-2102	4' RT	174+94 -W5-	716238	1955606	1.0 - 2.5'	A-7-6(17)	46	19	9.0	4.4	47.8	38.8	93.7	86.8	82.0	28.8	ND
RWAL B-11	SS-2097	8' RT	175+47 -W5-	716289	1955620	1.0 - 2.5'	A-7-6(22)	49	27	5.5	5.5	43.8	45.2	89.3	85.3	81.2	30.8	ND
RWAL B-11	SS-2099	8' RT	175+47 -W5-	716289	1955620	6.0 - 7.5'	A-4(9)	36	10	7.5	7.6	68.3	16.6	98.5	93.4	85.5	28.5	ND
RWAL B-13	SS-2087	12' LT	176+45 -W5-	716389	1955618	1.0 - 2.5'	A-6(7)	35	13	7.1	4.6	47.5	40.8	73.5	69.5	65.6	24.9	ND

Alex M. Armulsky

AUTHORIZED SIGNATURE  
NCDOT CERT NO. 130-04-0212

Prepared in the Office of:  
F&ME CONSULTANTS, INC.  
COLUMBIA, SOUTH CAROLINA  
NCDOT LAB CERT. NO. 130-0212

REFERENCE: R-5963A

PROJECT: 48599

CONTENTS

SHEET NO.	DESCRIPTION
1	TITLE SHEET
2	LEGEND (SOIL & ROCK)
3	SITE PLAN
4	PROFILE
5	SOIL TEST RESULTS

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

STRUCTURE  
SUBSURFACE INVESTIGATION

COUNTY CHATHAM  
PROJECT DESCRIPTION CHATHAM PARK WAY FROM  
US 15-501 TO US 64 BUSINESS

SITE DESCRIPTION RETAINING WALL NO. 6:  
FROM -W6- STA. 174+00.00 TO -W6- STA. 176+69.41

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	R-5963A	1	

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 PERFORM INDEPENDENT SUBSURFACE INVESTIGATIONS AND MAKE INTERPRETATIONS AS NECESSARY TO CONFIRM CONDITIONS ENCOUNTERED ON THE PROJECT. THE CONTRACTOR SHALL HAVE NO CLAIM FOR ADDITIONAL COMPENSATION OR FOR AN EXTENSION OF TIME FOR ANY REASON RESULTING FROM THE ACTUAL CONDITIONS ENCOUNTERED AT THE SITE DIFFERING FROM THOSE INDICATED IN THE SUBSURFACE INFORMATION.

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

PERSONNEL

P. PERRY, E.I.T.

CG2 EXPLORATION

INVESTIGATED BY CG2, PLLC

DRAWN BY K. DE MONTBRUN, P.E.

CHECKED BY M. WALKO, P.E.

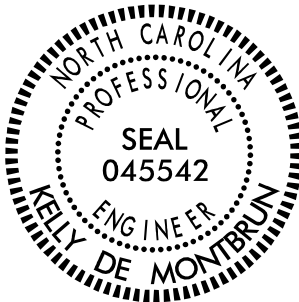
SUBMITTED BY CG2, PLLC

DATE NOVEMBER 2024

Prepared in the Office of:



**CAROLINAS  
GEOTECHNICAL  
GROUP**  
2400 CROWNPOINT EXECUTIVE DRIVE  
SUITE 800  
CHARLOTTE, NC 28227  
(980) 339-8684



Signed by: Kelly De Montbrun 12/04/2024  
BAB66070E9D747C SIGNATURE DATE

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NORTH CAROLINA DEPARTMENT OF TRANSPORTATION

DIVISION OF HIGHWAYS

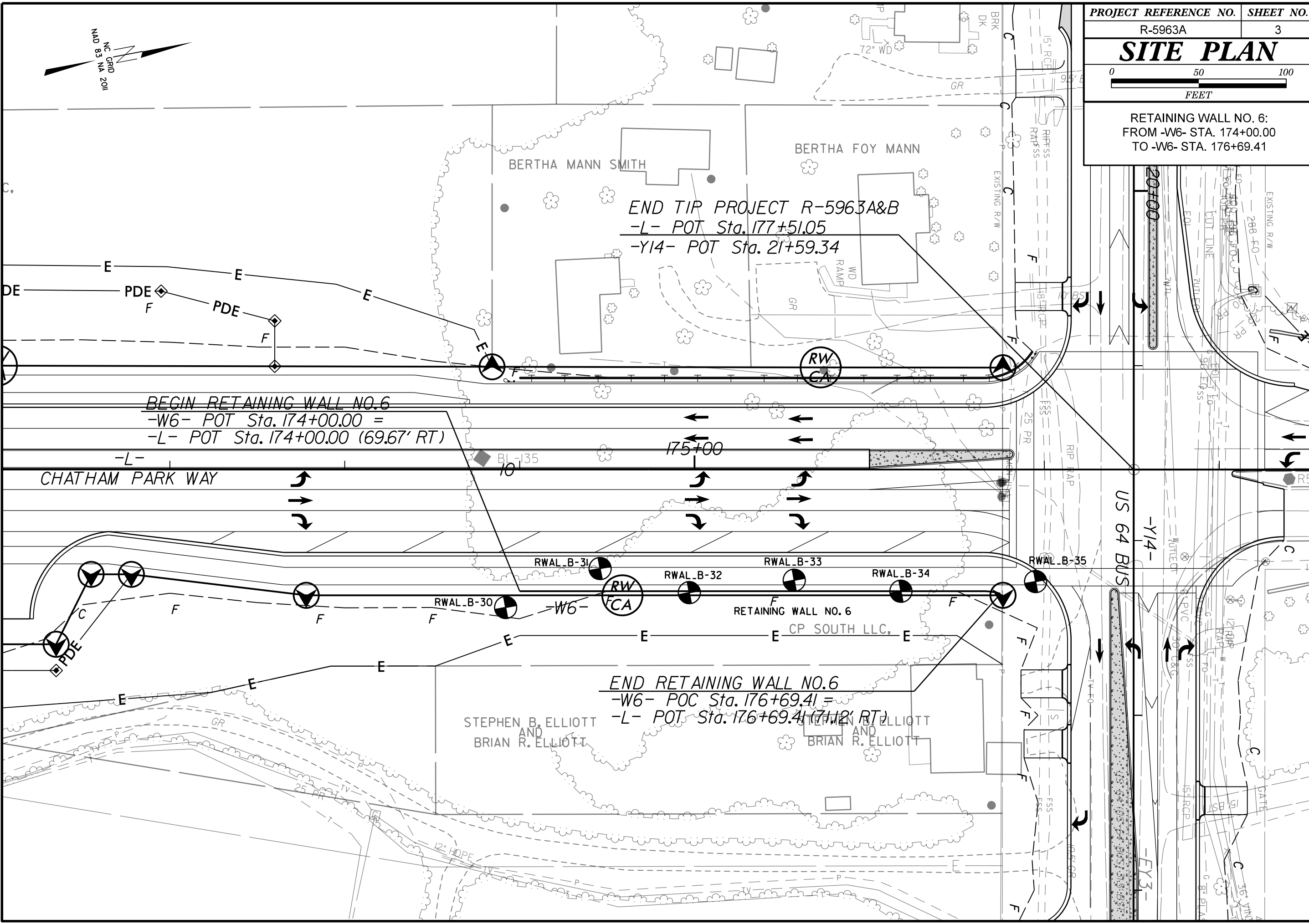
GEOTECHNICAL ENGINEERING UNIT

SUBSURFACE INVESTIGATION

SOIL AND ROCK LEGEND, TERMS, SYMBOLS, AND ABBREVIATIONS

SOIL DESCRIPTION												GRADATION												ROCK DESCRIPTION												TERMS AND DEFINITIONS											
SOIL IS CONSIDERED UNCONSOLIDATED, SEMI-CONSOLIDATED, OR WEATHERED EARTH MATERIALS THAT CAN BE PENETRATED WITH A CONTINUOUS FLIGHT POWER AUGER AND YIELD LESS THAN 100 BLOWS PER FOOT ACCORDING TO THE STANDARD PENETRATION TEST (AASHTO T 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>												WELL GRADED - INDICATES A GOOD REPRESENTATION OF PARTICLE SIZES FROM FINE TO COARSE. UNIFORMLY GRADED - INDICATES THAT SOIL PARTICLES ARE ALL APPROXIMATELY THE SAME SIZE. GAP-GRADED - INDICATES A MIXTURE OF UNIFORM PARTICLE SIZES OF TWO OR MORE SIZES.												HARD ROCK IS NON-COASTAL PLAIN MATERIAL THAT WOULD YIELD SPT REFUSAL IF TESTED. AN INFERRED ROCK LINE INDICATES THE LEVEL AT WHICH NON-COASTAL PLAIN MATERIAL WOULD YIELD SPT REFUSAL. SPT REFUSAL IS PENETRATION BY A SPLIT SPOON SAMPLER EQUAL TO OR LESS THAN 0.1 FOOT PER 60 BLOWS IN NON-COASTAL PLAIN MATERIAL. THE TRANSITION BETWEEN SOIL AND ROCK IS OFTEN REPRESENTED BY A ZONE OF WEATHERED ROCK. ROCK MATERIALS ARE TYPICALLY DIVIDED AS FOLLOWS:												ALLUVIUM (ALLUV.) - SOILS THAT HAVE BEEN TRANSPORTED BY WATER. AQUIFER - A WATER BEARING FORMATION OR STRATA. ARENACEOUS - APPLIED TO ROCKS THAT HAVE BEEN DERIVED FROM SAND OR THAT CONTAIN SAND. ARGILLACEOUS - APPLIED TO ALL ROCKS OR SUBSTANCES COMPOSED OF CLAY MINERALS, OR HAVING A NOTABLE PROPORTION OF CLAY IN THEIR COMPOSITION, SUCH AS SHALE, SLATE, ETC. ARTESIAN - GROUND WATER THAT IS UNDER SUFFICIENT PRESSURE TO RISE ABOVE THE LEVEL AT WHICH IT IS ENCOUNTERED, BUT WHICH DOES NOT NECESSARILY RISE TO OR ABOVE THE GROUND SURFACE. CALCAREOUS (CALC.) - SOILS THAT CONTAIN APPRECIABLE AMOUNTS OF CALCIUM CARBONATE. COLLUVIUM - ROCK FRAGMENTS MIXED WITH SOIL DEPOSITED BY GRAVITY ON SLOPE OR AT BOTTOM OF SLOPE. CORE RECOVERY (REC.) - TOTAL LENGTH OF ALL MATERIAL RECOVERED IN THE CORE BARREL DIVIDED BY TOTAL LENGTH OF CORE RUN AND EXPRESSED AS A PERCENTAGE. DIKE - A TABULAR BODY OF IGNEOUS ROCK THAT CUTS ACROSS THE STRUCTURE OF ADJACENT ROCKS OR CUTS MASSIVE ROCK. DIP - THE ANGLE AT WHICH A STRATUM OR ANY PLANAR FEATURE IS INCLINED FROM THE HORIZONTAL. DIP DIRECTION (DIP AZIMUTH) - THE DIRECTION OR BEARING OF THE HORIZONTAL TRACE OF THE LINE OF DIP, MEASURED CLOCKWISE FROM NORTH. FAULT - A FRACTURE OR FRACTURE ZONE ALONG WHICH THERE HAS BEEN DISPLACEMENT OF THE SIDES RELATIVE TO ONE ANOTHER PARALLEL TO THE FRACTURE. FISSILE - A PROPERTY OF SPLITTING ALONG CLOSELY SPACED PARALLEL PLANES. FLOAT - ROCK FRAGMENTS ON SURFACE NEAR THEIR ORIGINAL POSITION AND DISLOGGED FROM PARENT MATERIAL. FLOOD PLAIN (FP) - LAND BORDERING A STREAM, BUILT OF SEDIMENTS DEPOSITED BY THE STREAM. FORMATION (FM.) - A MAPPABLE GEOLOGIC UNIT THAT CAN BE RECOGNIZED AND TRACED IN THE FIELD. JOINT - FRACTURE IN ROCK ALONG WHICH NO APPRECIABLE MOVEMENT HAS OCCURRED. LEDGE - A SHELF-LIKE RIDGE OR PROJECTION OF ROCK WHOSE THICKNESS IS SMALL COMPARED TO ITS LATERAL EXTENT. LENS - A BODY OF SOIL OR ROCK THAT THINS OUT IN ONE OR MORE DIRECTIONS. MOTTLED (MOT.) - IRREGULARLY MARKED WITH SPOTS OF DIFFERENT COLORS. MOTTLING IN SOILS USUALLY INDICATES POOR AERATION AND LACK OF GOOD DRAINAGE. PERCHED WATER - WATER MAINTAINED ABOVE THE NORMAL GROUND WATER LEVEL BY THE PRESENCE OF AN INTERVENING IMPERVIOUS STRATUM. RESIDUAL (RES.) SOIL - SOIL FORMED IN PLACE BY THE WEATHERING OF ROCK. ROCK QUALITY DESIGNATION (RQD) - 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.											
SOIL LEGEND AND AASHTO CLASSIFICATION												ANGULARITY OF GRAINS												WEATHERED ROCK (WR)												CRISTALLINE ROCK (CR)											
GENERAL CLASS.		GRANULAR MATERIALS (≤ 35% PASSING #200)						SILT-CLAY MATERIALS (> 35% PASSING #200)						ORGANIC MATERIALS				FINE TO COARSE GRAIN IGNEOUS AND METAMORPHIC ROCK THAT WOULD YIELD SPT REFUSAL IF TESTED. ROCK TYPE INCLUDES GRANITE, GNEISS, GABBRO, SCHIST, ETC.		NON-COASTAL PLAIN SEDIMENTARY ROCK THAT WOULD YIELD SPT REFUSAL IF TESTED. ROCK TYPE INCLUDES PHYLLITE, SLATE, SANDSTONE, ETC.		COASTAL PLAIN SEDIMENTS CEMENTED INTO ROCK, BUT MAY NOT YIELD SPT REFUSAL. ROCK TYPE INCLUDES LIMESTONE, SANDSTONE, CEMENTED SHELL BEDS, ETC.																									
GROUP CLASS.	A-1-a	A-1-b	A-3	A-2-4	A-2-5	A-2-6	A-2-7	A-4	A-5	A-6	A-7	A-1, A-2	A-3	A-4, A-5	A-6, A-7																																
SYMBOL																																															
% PASSING	50 MX 30 MX 50 MX 51 MN 35 MX 35 MX 35 MX 35 MX 36 MN 36 MN 36 MN 36 MN						36 MN 36 MN 36 MN 36 MN						GRANULAR SOILS				SILT-CLAY SOILS				MUCK, PEAT																										
MATERIAL PASSING #40	—						—						40 MX 41 MN 40 MX 41 MN 40 MX 41 MN 40 MX 41 MN 40 MX 41 MN 40 MX 41 MN				SOILS WITH LITTLE OR MODERATE AMOUNTS OF ORGANIC MATTER				HIGHLY ORGANIC SOILS																										
LL	—						—						40 MX 41 MN 40 MX 41 MN 40 MX 41 MN 40 MX 41 MN 40 MX 41 MN 40 MX 41 MN				40 MX 41 MN 40 MX 41 MN 40 MX 41 MN 40 MX 41 MN				40 MX 41 MN 40 MX 41 MN 40 MX 41 MN 40 MX 41 MN																										
PI	6 MX						NP						10 MX 10 MX 11 MN 11 MN 10 MX 10 MX 11 MN 11 MN 10 MX 10 MX 11 MN 11 MN				10 MX 10 MX 11 MN 11 MN 10 MX 10 MX 11 MN 11 MN				10 MX 10 MX 11 MN 11 MN 10 MX 10 MX 11 MN 11 MN																										
GROUP INDEX	0						0						4 MX				8 MX 12 MX 16 MX NO MX				8 MX 12 MX 16 MX NO MX																										
USUAL TYPES OF MAJOR MATERIALS	STONE FRAGS, GRAVEL, AND SAND						FINE SAND						SILTY OR CLAYEY GRAVEL AND SAND				SILTY SOILS				CLAYEY SOILS																										
GEN. RATING AS SUBGRADE	EXCELLENT TO GOOD						FAIR TO POOR						FAIR TO POOR				POOR				UNSATURABLE																										
PI OF A-7-5 SUBGROUP IS ≤ LL - 30; PI OF A-7-6 SUBGROUP IS > LL - 30																																															
CONSISTENCY OR DENSENESS												MISCELLANEOUS SYMBOLS												ROCK HARDNESS												BEDDING											
PRIMARY SOIL TYPE		COMPACTNESS OR CONSISTENCY		RANGE OF STANDARD PENETRATION RESISTANCE (N-VALUE)				RANGE OF UNCONFINED COMPRESSIVE STRENGTH (TONS/FT <sup>2</sup> )				ROADWAY EMBANKMENT (RE) WITH SOIL DESCRIPTION		25/025 DIP & DIP DIRECTION OF ROCK STRUCTURES		SLOPE INDICATOR INSTALLATION		CONE PENETROMETER TEST		SOUNDING ROD		TEST BORING WITH CORE		SPT N-VALUE																							
GENERALLY GRANULAR MATERIAL (NON-COHESIVE)		VERY LOOSE LOOSE MEDIUM DENSE DENSE VERY DENSE		< 4 4 TO 10 10 TO 30 30 TO 50				N/A				ARTIFICIAL FILL (AF) OTHER THAN ROADWAY EMBANKMENT		AUGER BORING		CORE BORING		MONITORING WELL		PIEZOMETER INSTALLATION																											
GENERALLY SILT-CLAY MATERIAL (COHESIVE)		VERY SOFT SOFT MEDIUM STIFF STIFF VERY STIFF HARD		< 2 2 TO 4 4 TO 8 8 TO 15 15 TO 30 > 30				< 0.25 0.25 TO 0.5 0.5 TO 1.0 1 TO 2 2 TO 4 > 4				INFERRED SOIL BOUNDARY		CORE BORING		MONITORING WELL		PIEZOMETER INSTALLATION																													
TEXTURE OR GRAIN SIZE												RECOMMENDATION SYMBOLS												ROCK HARDNESS												BEDDING											
U.S. STD. SIEVE SIZE		4		10		40		60		200		270		UNDERCUT		UNCLASSIFIED EXCAVATION - UNSUITABLE WASTE		UNCLASSIFIED EXCAVATION - ACCEPTABLE DEGRADABLE ROCK		UNCLASSIFIED EXCAVATION - ACCEPTABLE DEGRADABLE ROCK		UNCLASSIFIED EXCAVATION - ACCEPTABLE DEGRADABLE ROCK		UNCLASSIFIED EXCAVATION - ACCEPTABLE DEGRADABLE ROCK																							
OPENING (MM)		4.76		2.00		0.42		0.25		0.075		0.053		SHALLOW UNDERCUT		UNCLASSIFIED EXCAVATION - UNSUITABLE WASTE		UNCLASSIFIED EXCAVATION - ACCEPTABLE DEGRADABLE ROCK		UNCLASSIFIED EXCAVATION - ACCEPTABLE DEGRADABLE ROCK		UNCLASSIFIED EXCAVATION - ACCEPTABLE DEGRADABLE ROCK		UNCLASSIFIED EXCAVATION - ACCEPTABLE DEGRADABLE ROCK																							
BOULDER (BLDR.)		COBBLE (COB.)		GRAVEL (GR.)		COARSE SAND (CSE, SD.)		FINE SAND (F SD.)		SILT (SL.)		CLAY (CL.)																																			
GRAIN SIZE		305		75		2.0		0.25		0.05		0.005																																			
SOIL MOISTURE - CORRELATION OF TERMS												EQUIPMENT USED ON SUBJECT PROJECT												INDURATION												BENCH MARK:											
SOIL MOISTURE SCALE (ATTERBERG LIMITS)		FIELD MOISTURE DESCRIPTION		GUIDE FOR FIELD MOISTURE DESCRIPTION				AR - AUGER REFUSAL		MED. - MEDIUM		VST - VANE SHEAR TEST		TERM		SPACING		TERM		THICKNESS		TERM		THICKNESS																							
LL		LIQUID LIMIT		- SATURATED - (SAT.)				USUALLY LIQUID; VERY WET, USUALLY FROM BELOW THE GROUND WATER TABLE				BT - BORING TERMINATED		MICA. - MICACEOUS		WEA. - WEATHERED		VERY THICKLY BEDDED		4 FEET		VERY THICKLY BEDDED		1.5 - 4 FEET																							
PL		PLASTIC LIMIT		- WET - (W)				SEMISOLID; REQUIRES DRYING TO ATTAIN OPTIMUM MOISTURE				CL. - CLAY		MOD. - MODERATELY		UNIT WEIGHT		THICKLY BEDDED		0.16 - 1.5 FEET		THINLY BEDDED		0.03 - 0.16 FEET																							
OM		OPTIMUM MOISTURE		- MOIST - (M)				SOLID; AT OR NEAR OPTIMUM MOISTURE				CPT - CONE PENETRATION TEST		NP - NON PLASTIC		DRY UNIT WEIGHT		FROM CHIPS TO SEVERAL INCHES IN SIZE BY MODERATE BLOWS OF A PICK POINT. SMALL, THIN PIECES CAN BE BROKEN BY FINGER PRESSURE.		VERY THINLY BEDDED		0.008 - 0.03 FEET		VERY THINLY BEDDED		0.008 - 0.03 FEET																					
SL		SHRINKAGE LIMIT		- DRY - (D)				REQUIRES ADDITIONAL WATER TO ATTAIN OPTIMUM MOISTURE				CSE. - COARSE		ORG. - ORGANIC		SAMPLE ABBREVIATIONS		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.		THICKLY LAMINATED		0.008 - 0.03 FEET		THINLY LAMINATED		< 0.008 FEET																					
PLASTICITY												EQUIPMENT USED ON SUBJECT PROJECT												INDURATION												BENCH MARK:											
NON PLASTIC		SLIGHTLY PLASTIC		MODERATELY PLASTIC		HIGHLY PLASTIC		PLASTICITY INDEX (PI)		DRY STRENGTH		DRILL UNITS:		ADVANCING TOOLS:		HAMMER TYPE:		CORE SIZE:		HAND TOOLS:		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.																					
0-5		6-15		16-25		26 OR MORE		VERY LOW		SLIGHT		CME-45C		CLAY BITS		AUTOMATIC		-B		POST HOLE DIGGER		MODERATELY INDURATED		GRAINS CAN BE SEPARATED FROM SAMPLE WITH STEEL PROBE; BREAKS EASILY WHEN HIT WITH HAMMER.																							
VERY LOW		SLIGHT		MEDIUM		HIGH		CME-55		6" CONTINUOUS FLIGHT AUGER		MANUAL		8" HOLLOW AUGERS		CORE SIZE:		-H		HAND AUGER		INDURATED		GRAINS ARE DIFFICULT TO SEPARATE WITH STEEL PROBE; DIFFICULT TO BREAK WITH HAMMER.																							
CME-550X		HARD FACED FINGER BITS		TUNG.-CARBIDE INSERTS		CASING		W/ ADVANCER		TRICONE		STEEL TEETH		CME-550X		TUNG.-CARBIDE INSERTS		CASING		W/ ADVANCER		EXTREMELY INDURATED		SHARP HAMMER BLOWS REQUIRED TO BREAK SAMPLE; SAMPLE BREAKS ACROSS GRAINS.																							
COLOR												EQUIPMENT USED ON SUBJECT PROJECT												INDURATION												BENCH MARK:											
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.												EQUIPMENT USED ON SUBJECT PROJECT												INDURATION												BENCH MARK:											
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.												EQUIPMENT USED ON SUBJECT PROJECT												INDURATION												BENCH MARK:											

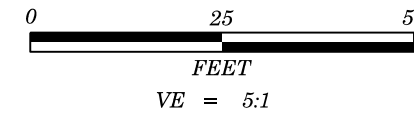
RETAINING WALL NO. 6:  
FROM -W6- STA. 174+00.00  
TO -W6- STA. 176+69.41



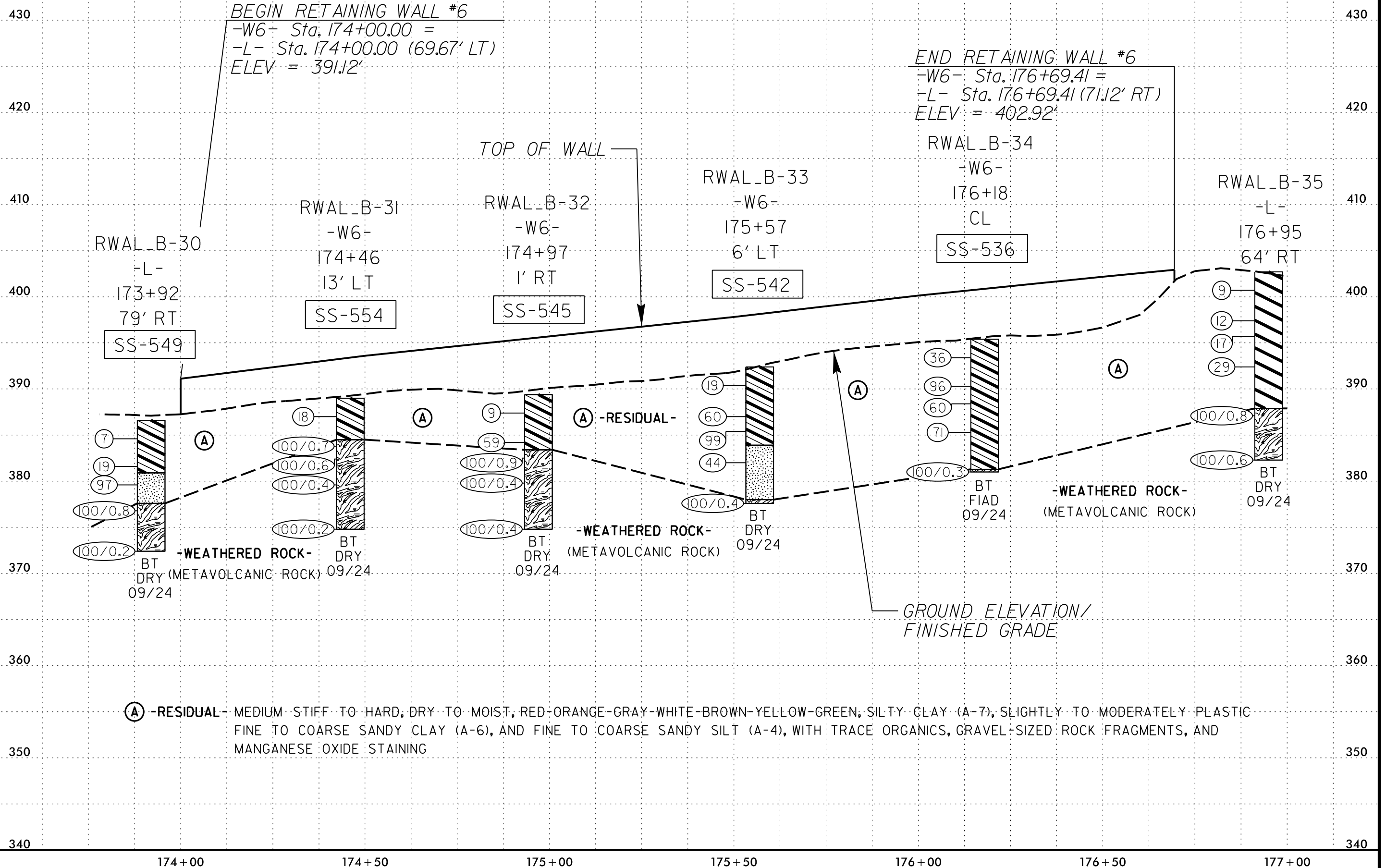
5/14/99

-W6-


EXISTING GROUND LINE AND RETAINING WALL ENVELOPE ALONG  
-W6- TAKEN FROM ROADWAY DESIGN PLANS PROVIDED  
BY NCDOT. INFERRED STRATIGRAPHY IS DRAWN THROUGH THE BORING  
WITH BOTH PROJECTED ONTO THE WALL ENVELOPE.



PROJECT REFERENCE NO.	SHEET NO.
R-5963A	4
RETAINING WALL NO. 6 PROFILE: BORINGS PROJECTED ALONG WALL ENVELOPE	



SOIL TEST RESULTS																		
BORING ID	SAMPLE NO.	OFFSET	STATION	NORTHING	EASTING	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT				% PASSING (SIEVES)			% MOISTURE	% ORGANIC
										C. SAND	F. SAND	SILT	CLAY	10	40	200		
RWAL B-30	SS-549	79' RT	173+92 -L-	716114	1955713	1.0 - 2.5'	A-6(11)	39	20	15.8	11.4	39.6	33.2	86.3	75.8	64.9	20.8	ND
RWAL B-31	SS-554	13' LT	174+46 -W6-	716171	1955701	1.0 - 2.5'	A-6(11)	38	14	6.7	8.8	59.8	24.7	91.6	87.4	79.8	18.6	ND
RWAL B-32	SS-545	1' RT	174+97 -W6-	716219	1955724	1.0 - 2.5'	A-6(3)	38	15	30.9	8.7	31.7	28.7	73.3	54.2	45.5	25.7	ND
RWAL B-33	SS-542	6' LT	175+57 -W6-	716279	1955728	3.5 - 5.0'	A-6(4)	29	12	19.4	20.9	39.0	20.7	92.3	80.1	58.6	12.0	ND
RWAL B-34	SS-536	CL	176+18 -W6-	716338	1955745	1.0 - 2.5'	A-6(10)	38	15	14.3	6.1	58.9	20.7	88.4	78.2	71.3	11.8	ND



AUTHORIZED SIGNATURE

NCDOT CERT NO. 130-04-0212

Prepared in the Office of:

F&ME CONSULTANTS, INC.  
COLUMBIA, SOUTH CAROLINA  
NCDOT LAB CERT. NO. 130-0212