

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	P-5720	1	8

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

STRUCTURE
SUBSURFACE INVESTIGATION

COUNTY WAKE
 PROJECT DESCRIPTION PROPOSED GRADE-SEPARATION
OF DURANT ROAD (SR 2006) OVER CSX S LINE
RAILROAD IN RALEIGH

CONTENTS

<u>SHEET NO.</u>	<u>DESCRIPTION</u>
1	TITLE SHEET
2	LEGEND
3	SITE PLAN
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5-6	CROSS SECTIONS
7-8	BORING LOGS

REFERENCE: P-5720

PROJECT: 46932

CAUTION NOTICE

THE SUBSURFACE INFORMATION AND THE SUBSURFACE INVESTIGATION ON WHICH IT IS BASED WERE MADE FOR THE PURPOSE OF STUDY, PLANNING AND DESIGN, AND NOT FOR CONSTRUCTION OR PAY PURPOSES. THE VARIOUS FIELD BORING LOGS, ROCK CORES AND SOIL TEST DATA AVAILABLE MAY BE REVIEWED OR INSPECTED IN RALEIGH BY CONTACTING THE N. C. DEPARTMENT OF TRANSPORTATION, GEOTECHNICAL ENGINEERING UNIT AT (919) 707-6850. THE SUBSURFACE PLANS AND REPORTS, FIELD BORING LOGS, ROCK CORES AND SOIL TEST DATA ARE NOT PART OF THE CONTRACT.

GENERAL SOIL AND ROCK STRATA DESCRIPTIONS AND INDICATED BOUNDARIES ARE BASED ON A GEOTECHNICAL INTERPRETATION OF ALL AVAILABLE SUBSURFACE DATA AND MAY NOT NECESSARILY REFLECT THE ACTUAL SUBSURFACE CONDITIONS BETWEEN BORINGS OR BETWEEN SAMPLED STRATA WITHIN THE BOREHOLE. THE LABORATORY SAMPLE DATA AND THE IN SITU (IN-PLACE) TEST DATA CAN BE RELIED ON ONLY TO THE DEGREE OF RELIABILITY INHERENT IN THE STANDARD TEST METHOD. THE OBSERVED WATER LEVELS OR SOIL MOISTURE CONDITIONS INDICATED IN THE SUBSURFACE INVESTIGATIONS ARE AS RECORDED AT THE TIME OF THE INVESTIGATION. THESE WATER LEVELS OR SOIL MOISTURE CONDITIONS MAY VARY CONSIDERABLY WITH TIME ACCORDING TO CLIMATIC CONDITIONS INCLUDING TEMPERATURES, PRECIPITATION AND WIND, AS WELL AS OTHER NON-CLIMATIC FACTORS.

THE BIDDER OR CONTRACTOR IS CAUTIONED THAT DETAILS SHOWN ON THE SUBSURFACE PLANS ARE PRELIMINARY ONLY AND IN MANY CASES THE FINAL DESIGN DETAILS ARE DIFFERENT. FOR BIDDING AND CONSTRUCTION PURPOSES, REFER TO THE CONSTRUCTION PLANS AND DOCUMENTS FOR FINAL DESIGN INFORMATION ON THIS PROJECT. THE DEPARTMENT DOES NOT WARRANT OR GUARANTEE THE SUFFICIENCY OR ACCURACY OF THE INVESTIGATION MADE, NOR THE INTERPRETATIONS MADE, OR OPINION OF THE DEPARTMENT AS TO THE TYPE OF MATERIALS AND CONDITIONS TO BE ENCOUNTERED. THE BIDDER OR CONTRACTOR IS CAUTIONED TO MAKE SUCH INDEPENDENT SUBSURFACE INVESTIGATIONS AS HE DEEMS NECESSARY TO SATISFY HIMSELF AS TO CONDITIONS TO BE ENCOUNTERED ON THE PROJECT. THE CONTRACTOR SHALL HAVE NO CLAIM FOR ADDITIONAL COMPENSATION OR FOR AN EXTENSION OF TIME FOR ANY REASON RESULTING FROM THE ACTUAL CONDITIONS ENCOUNTERED AT THE SITE DIFFERING FROM THOSE INDICATED IN THE SUBSURFACE INFORMATION.

NOTES:

- 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

CAROLINA DRILLING

LANE, R.

INVESTIGATED BY FALCON ENG.

DRAWN BY HILL, M. J.

CHECKED BY HUNSBERGER, W. S.

SUBMITTED BY FALCON ENG.

DATE DECEMBER 2018



DocuSigned by:
Jeremy R Hamm 12/20/2018
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 SIGNATURE DATE

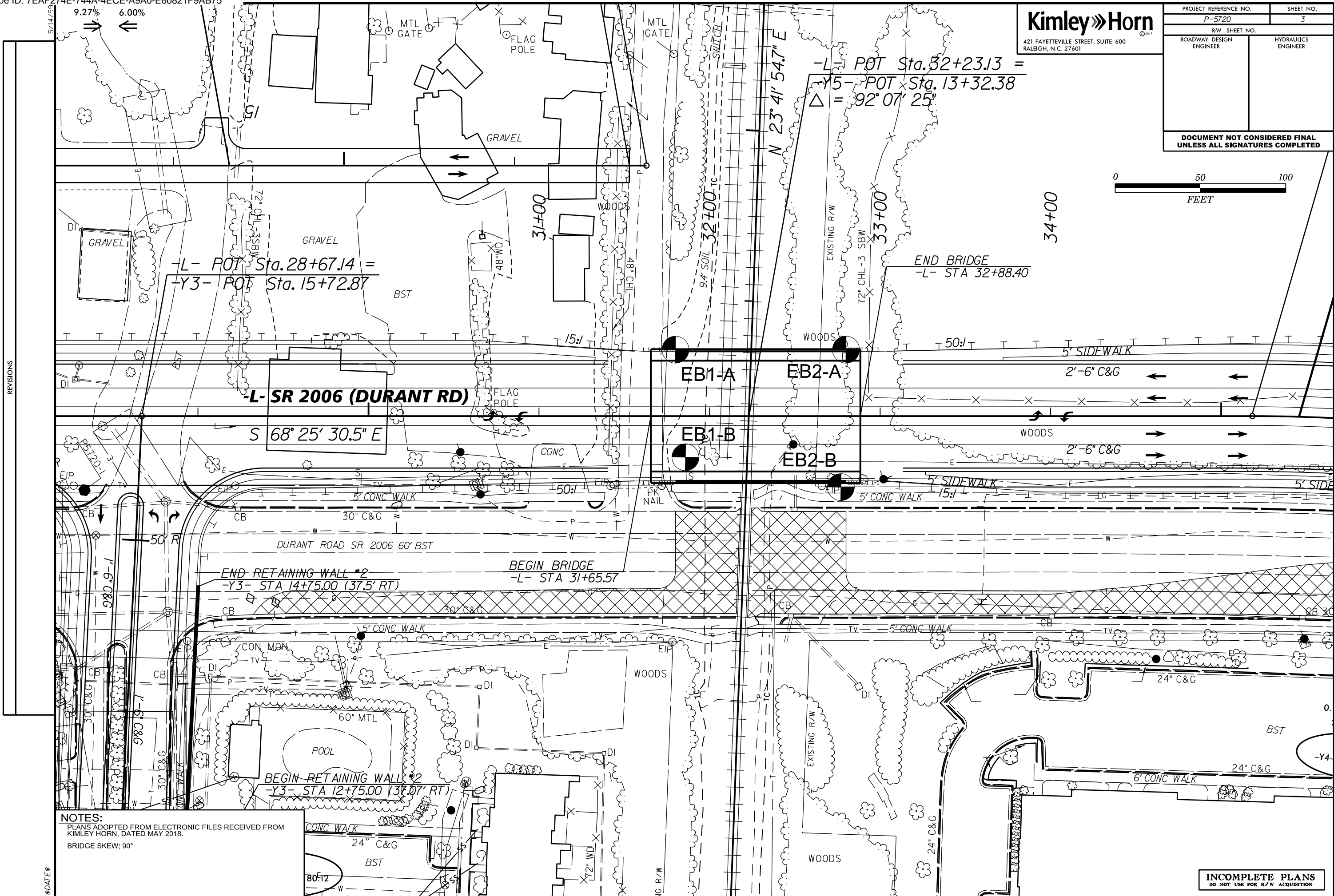
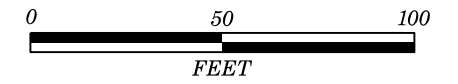
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NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS
GEOTECHNICAL ENGINEERING UNIT
SUBSURFACE INVESTIGATION
SOIL AND ROCK LEGEND, TERMS, SYMBOLS, AND ABBREVIATIONS

SOIL DESCRIPTION										GRADATION										ROCK DESCRIPTION										TERMS AND DEFINITIONS																																																																																																																																														
<p>SOIL IS CONSIDERED UNCONSOLIDATED, SEMI-CONSOLIDATED, OR WEATHERED EARTH MATERIALS THAT CAN BE PENETRATED WITH A CONTINUOUS FLIGHT POWER AUGER AND YIELD LESS THAN 100 BLOWS PER FOOT ACCORDING TO THE STANDARD PENETRATION TEST (AASHTO T 206, ASTM D1586). SOIL CLASSIFICATION IS BASED ON THE AASHTO SYSTEM. BASIC DESCRIPTIONS GENERALLY INCLUDE THE FOLLOWING: CONSISTENCY, COLOR, TEXTURE, MOISTURE, AASHTO CLASSIFICATION, AND OTHER PERTINENT FACTORS SUCH AS MINERALOGICAL COMPOSITION, ANGULARITY, STRUCTURE, PLASTICITY, ETC. FOR EXAMPLE, <i>VERY STIFF, GRAY, SILTY CLAY, MOIST WITH INTERBEDDED FINE SAND LAYERS, HIGHLY PLASTIC, A-7-6</i></p>										<p>WELL GRADED - INDICATES A GOOD REPRESENTATION OF PARTICLE SIZES FROM FINE TO COARSE. UNIFORMLY GRADED - INDICATES THAT SOIL PARTICLES ARE ALL APPROXIMATELY THE SAME SIZE. GAP-GRADED - INDICATES A MIXTURE OF UNIFORM PARTICLE SIZES OF TWO OR MORE SIZES.</p>										<p>HARD ROCK IS NON-COASTAL PLAIN MATERIAL THAT WOULD YIELD SPT REFUSAL IF TESTED, AN INFERRED ROCK LINE INDICATES THE LEVEL AT WHICH NON-COASTAL PLAIN MATERIAL WOULD YIELD SPT REFUSAL. SPT REFUSAL IS PENETRATION BY A SPLIT SPOON SAMPLER EQUAL TO OR LESS THAN 0.1 FOOT PER 60 BLOWS IN NON-COASTAL PLAIN MATERIAL. THE TRANSITION BETWEEN SOIL AND ROCK IS OFTEN REPRESENTED BY A ZONE OF WEATHERED ROCK. ROCK MATERIALS ARE TYPICALLY DIVIDED AS FOLLOWS:</p>										<p>ALLUVIUM (ALLUV.) - SOILS THAT HAVE BEEN TRANSPORTED BY WATER. AQUIFER - A WATER BEARING FORMATION OR STRATA. ARENACEOUS - APPLIED TO ROCKS THAT HAVE BEEN DERIVED FROM SAND OR THAT CONTAIN SAND. ARGILLACEOUS - APPLIED TO ALL ROCKS OR SUBSTANCES COMPOSED OF CLAY MINERALS, OR HAVING A NOTABLE PROPORTION OF CLAY IN THEIR COMPOSITION, SUCH AS SHALE, SLATE, ETC. ARTESIAN - GROUND WATER THAT IS UNDER SUFFICIENT PRESSURE TO RISE ABOVE THE LEVEL AT WHICH IT IS ENCOUNTERED, BUT WHICH DOES NOT NECESSARILY RISE TO OR ABOVE THE GROUND SURFACE. CALCAREOUS (CALC.) - SOILS THAT CONTAIN APPRECIABLE AMOUNTS OF CALCIUM CARBONATE. COLLUVIUM - ROCK FRAGMENTS MIXED WITH SOIL DEPOSITED BY GRAVITY ON SLOPE OR AT BOTTOM OF SLOPE. CORE RECOVERY (REC.) - TOTAL LENGTH OF ALL MATERIAL RECOVERED IN THE CORE BARREL DIVIDED BY TOTAL LENGTH OF CORE RUN AND EXPRESSED AS A PERCENTAGE. DIKE - A TABULAR BODY OF IGNEOUS ROCK THAT CUTS ACROSS THE STRUCTURE OF ADJACENT ROCKS OR CUTS MASSIVE ROCK. DIP - THE ANGLE AT WHICH A STRATUM OR ANY PLANAR FEATURE IS INCLINED FROM THE HORIZONTAL. DIP DIRECTION (DIP AZIMUTH) - THE DIRECTION OR BEARING OF THE HORIZONTAL TRACE OF THE LINE OF DIP, MEASURED CLOCKWISE FROM NORTH. FAULT - A FRACTURE OR FRACTURE ZONE ALONG WHICH THERE HAS BEEN DISPLACEMENT OF THE SIDES RELATIVE TO ONE ANOTHER PARALLEL TO THE FRACTURE. FISSILE - A PROPERTY OF SPLITTING ALONG CLOSELY SPACED PARALLEL PLANES. FLOAT - ROCK FRAGMENTS ON SURFACE NEAR THEIR ORIGINAL POSITION AND DISLOADED FROM PARENT MATERIAL. FLOOD PLAIN (FP) - LAND BORDERING A STREAM, BUILT OF SEDIMENTS DEPOSITED BY THE STREAM. FORMATION (FM) - A MAPPABLE GEOLOGIC UNIT THAT CAN BE RECOGNIZED AND TRACED IN THE FIELD. JOINT - FRACTURE IN ROCK ALONG WHICH NO APPRECIABLE MOVEMENT HAS OCCURRED. LEDGE - A SHELF-LIKE RIDGE OR PROJECTION OF ROCK WHOSE THICKNESS IS SMALL COMPARED TO ITS LATERAL EXTENT. LENS - A BODY OF SOIL OR ROCK THAT THINS OUT IN ONE OR MORE DIRECTIONS. MOTTLED (MOT.) - IRREGULARLY MARKED WITH SPOTS OF DIFFERENT COLORS. MOTTLING IN SOILS USUALLY INDICATES POOR AERATION AND LACK OF GOOD DRAINAGE. PERCHED WATER - WATER MAINTAINED ABOVE THE NORMAL GROUND WATER LEVEL BY THE PRESENCE OF AN INTERVENING IMPERVIOUS STRATUM. RESIDUAL (RES.) SOIL - SOIL FORMED IN PLACE BY THE WEATHERING OF ROCK. ROCK QUALITY DESIGNATION (ROD) - A MEASURE OF ROCK QUALITY DESCRIBED BY TOTAL LENGTH OF ROCK SEGMENTS EQUAL TO OR GREATER THAN 4 INCHES DIVIDED BY THE TOTAL LENGTH OF CORE RUN AND EXPRESSED AS A PERCENTAGE. SAPROLITE (SAP.) - RESIDUAL SOIL THAT RETAINS THE RELIC STRUCTURE OR FABRIC OF THE PARENT ROCK. SILL - AN INTRUSIVE BODY OF IGNEOUS ROCK OF APPROXIMATELY UNIFORM THICKNESS AND RELATIVELY THIN COMPARED WITH ITS LATERAL EXTENT, THAT HAS BEEN EMPLACED PARALLEL TO THE BEDDING OR SCHISTOSITY OF THE INTRUDED ROCKS. SLICKENSIDE - POLISHED AND STRIATED SURFACE THAT RESULTS FROM FRICTION ALONG A FAULT OR SLIP PLANE. STANDARD PENETRATION TEST (PENETRATION RESISTANCE) (SPT) - NUMBER OF BLOWS (N OR BPF) OF A 140 LB. HAMMER FALLING 30 INCHES REQUIRED TO PRODUCE A PENETRATION OF 1 FOOT INTO SOIL WITH A 2 INCH OUTSIDE DIAMETER SPLIT SPOON SAMPLER. SPT REFUSAL IS PENETRATION EQUAL TO OR LESS THAN 0.1 FOOT PER 60 BLOWS. STRATA CORE RECOVERY (SREC.) - TOTAL LENGTH OF STRATA MATERIAL RECOVERED DIVIDED BY TOTAL LENGTH OF STRATUM AND EXPRESSED AS A PERCENTAGE. STRATA ROCK QUALITY DESIGNATION (SROD) - A MEASURE OF ROCK QUALITY DESCRIBED BY TOTAL LENGTH OF ROCK SEGMENTS WITHIN A STRATUM EQUAL TO OR GREATER THAN 4 INCHES DIVIDED BY THE TOTAL LENGTH OF STRATA AND EXPRESSED AS A PERCENTAGE. TOPSOIL (TS.) - SURFACE SOILS USUALLY CONTAINING ORGANIC MATTER.</p>																																																																																																																																														
<p style="text-align: center;">SOIL LEGEND AND AASHTO CLASSIFICATION</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <th rowspan="2">GENERAL CLASS.</th> <th colspan="5">GRANULAR MATERIALS (≤ 35% PASSING #200)</th> <th colspan="5">SILT-CLAY MATERIALS (> 35% PASSING #200)</th> <th colspan="5">ORGANIC MATERIALS</th> </tr> <tr> <th>A-1</th> <th>A-3</th> <th>A-2</th> <th>A-4</th> <th>A-5</th> <th>A-6</th> <th>A-7</th> <th>A-1, A-2</th> <th>A-3</th> <th>A-4, A-5</th> <th>A-6, A-7</th> <th></th> <th></th> <th></th> <th></th> </tr> <tr> <td>GROUP CLASS.</td> <td>A-1-a</td> <td>A-1-b</td> <td>A-2-4</td> <td>A-2-5</td> <td>A-2-6</td> <td>A-2-7</td> <td>A-4</td> <td>A-5</td> <td>A-6</td> <td>A-7</td> <td>A-1, A-2</td> <td>A-3</td> <td>A-4, A-5</td> <td>A-6, A-7</td> <td></td> </tr> <tr> <td>SYMBOL</td> <td colspan="5">[Pattern]</td> <td colspan="5">[Pattern]</td> <td colspan="5">[Pattern]</td> </tr> <tr> <td>% PASSING #10 #40 #200</td> <td>50 MX 30 MX 15 MX</td> <td>50 MX 25 MX</td> <td>51 MN 35 MX 35 MX</td> <td>40 MX 41 MN 10 MX</td> <td>40 MX 41 MN 11 MN</td> <td>40 MX 41 MN 11 MN</td> <td>40 MX 41 MN 11 MN</td> <td>40 MX 41 MN 11 MN</td> <td>40 MX 41 MN 11 MN</td> <td>40 MX 41 MN 11 MN</td> <td>40 MX 41 MN 11 MN</td> <td>40 MX 41 MN 11 MN</td> <td>40 MX 41 MN 11 MN</td> <td>40 MX 41 MN 11 MN</td> <td>40 MX 41 MN 11 MN</td> </tr> <tr> <td>MATERIAL PASSING #40 LL PI</td> <td colspan="5">-</td> <td colspan="5">NP</td> <td colspan="5">-</td> </tr> <tr> <td>GROUP INDEX</td> <td colspan="5">0</td> <td colspan="5">0</td> <td colspan="5">0</td> </tr> <tr> <td>USUAL TYPES OF MAJOR MATERIALS</td> <td colspan="2">STONE FRAGS. 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ARE USED IN DESCRIPTIONS WHEN THEY ARE CONSIDERED OF SIGNIFICANCE.</p>										<p style="text-align: center;">WEATHERING</p> <p>FRESH: ROCK FRESH, CRYSTALS BRIGHT, FEW JOINTS MAY SHOW SLIGHT STAINING. ROCK RINGS UNDER HAMMER IF CRYSTALLINE.</p> <p>VERY SLIGHT (IV SLI.): 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.</p> <p>SLIGHT (SLI.): 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.</p> <p>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.</p> <p>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. <i>IF TESTED, WOULD YIELD SPT REFUSAL</i></p> <p>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. <i>IF TESTED, WOULD YIELD SPT N VALUES > 100 BPF</i></p> <p>VERY SEVERE (IV 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 < 100 BPF</i></p> <p>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.</p>									
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<p style="text-align: center;">TEXTURE OR GRAIN SIZE</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <th>U.S. STD. SIEVE SIZE OPENING (MM)</th> <th>4</th> <th>10</th> <th>40</th> <th>60</th> <th>200</th> <th>270</th> </tr> <tr> <td></td> <td>4.75</td> <td>2.00</td> <td>0.42</td> <td>0.25</td> <td>0.075</td> <td>0.053</td> </tr> <tr> <td>BOULDER (BLDR.)</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>COBBLE (COB.)</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>GRAVEL (GR.)</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>COARSE SAND (CSE. SD.)</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>FINE SAND (F SD.)</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>SILT (SL.)</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>CLAY (CL.)</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> </table>										U.S. STD. SIEVE SIZE OPENING (MM)	4	10	40	60	200	270		4.75	2.00	0.42	0.25	0.075	0.053	BOULDER (BLDR.)							COBBLE (COB.)							GRAVEL (GR.)							COARSE SAND (CSE. SD.)							FINE SAND (F SD.)							SILT (SL.)							CLAY (CL.)							<p style="text-align: center;">RECOMMENDATION SYMBOLS</p> <p>UNDERCUT</p> <p>SHALLOW UNDERCUT</p> <p>UNCLASSIFIED EXCAVATION - UNSUITABLE WASTE</p> <p>UNCLASSIFIED EXCAVATION - ACCEPTABLE DEGRADABLE ROCK</p> <p>UNCLASSIFIED EXCAVATION - ACCEPTABLE, BUT NOT TO BE USED IN THE TOP 3 FEET OF EMBANKMENT OR BACKFILL</p>										<p style="text-align: center;">ROCK HARDNESS</p> <p>VERY HARD: CANNOT BE SCRATCHED BY KNIFE OR SHARP PICK. BREAKING OF HAND SPECIMENS REQUIRES SEVERAL HARD BLOWS OF THE GEOLOGIST'S PICK.</p> <p>HARD: CAN BE SCRATCHED BY KNIFE OR PICK ONLY WITH DIFFICULTY. HARD HAMMER BLOWS REQUIRED TO DETACH HAND SPECIMEN.</p> <p>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.</p> <p>MEDIUM HARD: CAN BE GROUDED OR GOUGED 0.05 INCHES DEEP BY FIRM PRESSURE OF KNIFE OR PICK POINT. CAN BE EXCAVATED IN SMALL CHIPS TO PIECES 1 INCH MAXIMUM SIZE BY HARD BLOWS OF THE POINT OF A GEOLOGIST'S PICK.</p> <p>SOFT: CAN BE GROUDED 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.</p> <p>VERY SOFT: CAN BE CARVED WITH KNIFE. CAN BE EXCAVATED READILY WITH POINT OF PICK. PIECES 1 INCH OR MORE IN THICKNESS CAN BE BROKEN BY FINGER PRESSURE. CAN BE SCRATCHED READILY BY FINGER NAIL.</p>																																																																																									
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<p style="text-align: center;">INDURATION</p> <p>FOR SEDIMENTARY ROCKS, INDURATION IS THE HARDENING OF MATERIAL BY CEMENTING, HEAT, PRESSURE, ETC.</p> <p>FRIABLE: RUBBING WITH FINGER FREES NUMEROUS GRAINS; GENTLE BLOW BY HAMMER DISINTEGRATES SAMPLE.</p> <p>MODERATELY INDURATED: GRAINS CAN BE SEPARATED FROM SAMPLE WITH STEEL PROBE; BREAKS EASILY WHEN HIT WITH HAMMER.</p> <p>INDURATED: GRAINS ARE DIFFICULT TO SEPARATE WITH STEEL PROBE; DIFFICULT TO BREAK WITH HAMMER.</p> <p>EXTREMELY INDURATED: SHARP HAMMER BLOWS REQUIRED TO BREAK SAMPLE; SAMPLE BREAKS ACROSS GRAINS.</p>										<p style="text-align: center;">BENCH MARK:</p> <p>BORING ELEVATIONS TAKEN FROM P5720_Is.tnl_I70522.tin DATED 01/15/18</p> <p>ELEVATION: FEET</p>																																																																																																																																																																		
<p style="text-align: center;">NOTES:</p> <p>FIAD - FILLED IMMEDIATELY AFTER DRILLING</p>										<p style="text-align: right;">DATE: 1-XX-17</p>																																																																																																																																																																		

PROJECT REFERENCE NO. P-5720	SHEET NO. 3
RW SHEET NO.	HYDRAULICS ENGINEER
ROADWAY DESIGN ENGINEER	

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



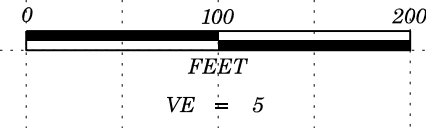
NOTES:
PLANS ADOPTED FROM ELECTRONIC FILES RECEIVED FROM
KIMLEY HORN, DATED MAY 2018.
BRIDGE SKEW: 90°

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

REVISIONS

\$DATE\$

5/14/99

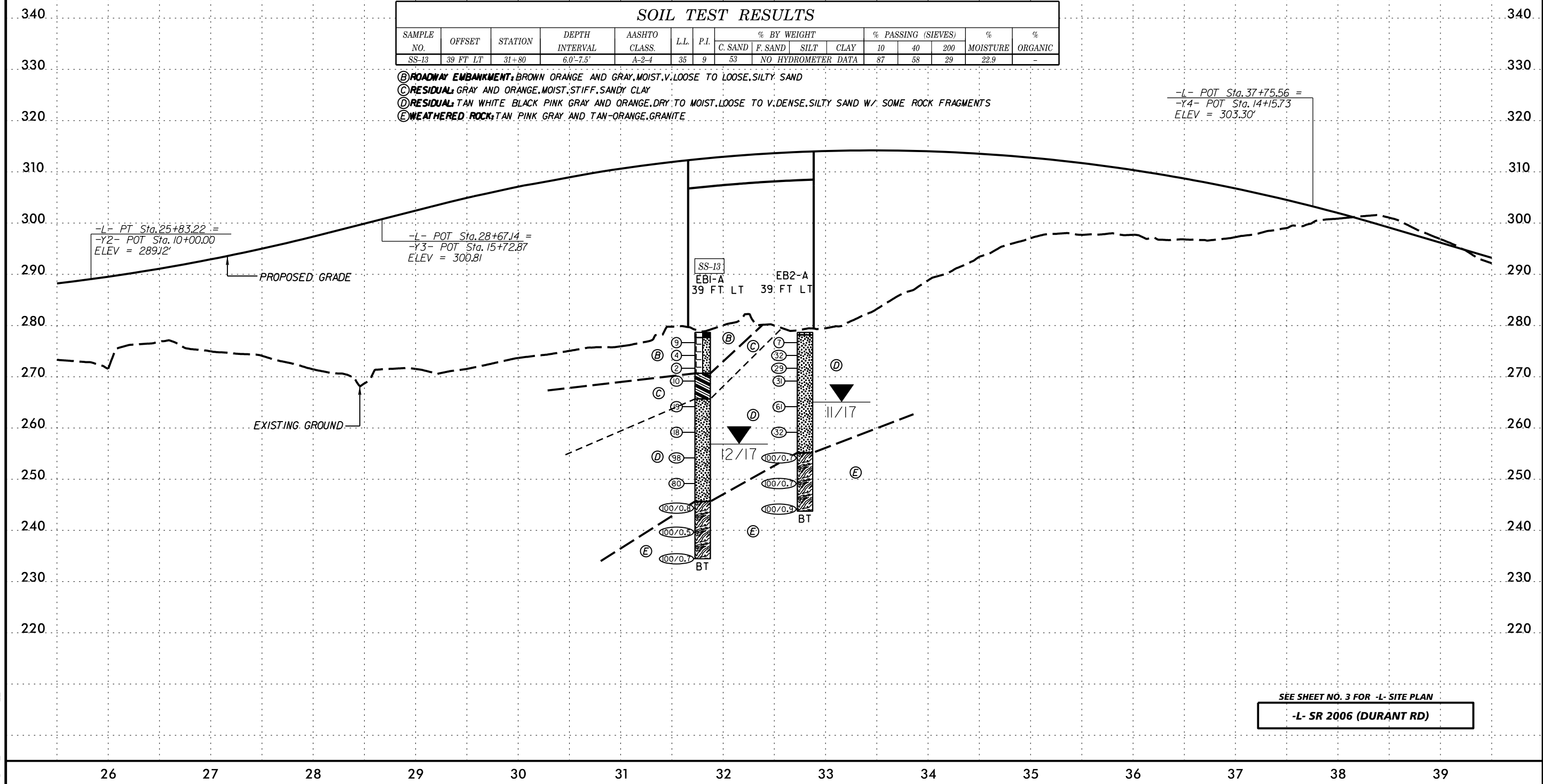


Kimley»Horn
 P.O. BOX 33068 • RALEIGH, N.C. 27636-3068
 ROADWAY DESIGN ENGINEER
 HYDRAULICS ENGINEER

PROJECT REFERENCE NO. P-5720	SHEET NO. 4
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
INCOMPLETE PLANS DO NOT USE FOR R/W ACQUISITION	
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED	

SOIL TEST RESULTS															
SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT				% PASSING (SIEVES)			% MOISTURE	% ORGANIC
							C. SAND	F. SAND	SILT	CLAY	10	40	200		
SS-13	39 FT LT	31+80	6.0'-7.5'	A-2-4	35	9	53	NO HYDROMETER DATA	87	58	29	22.9	-		

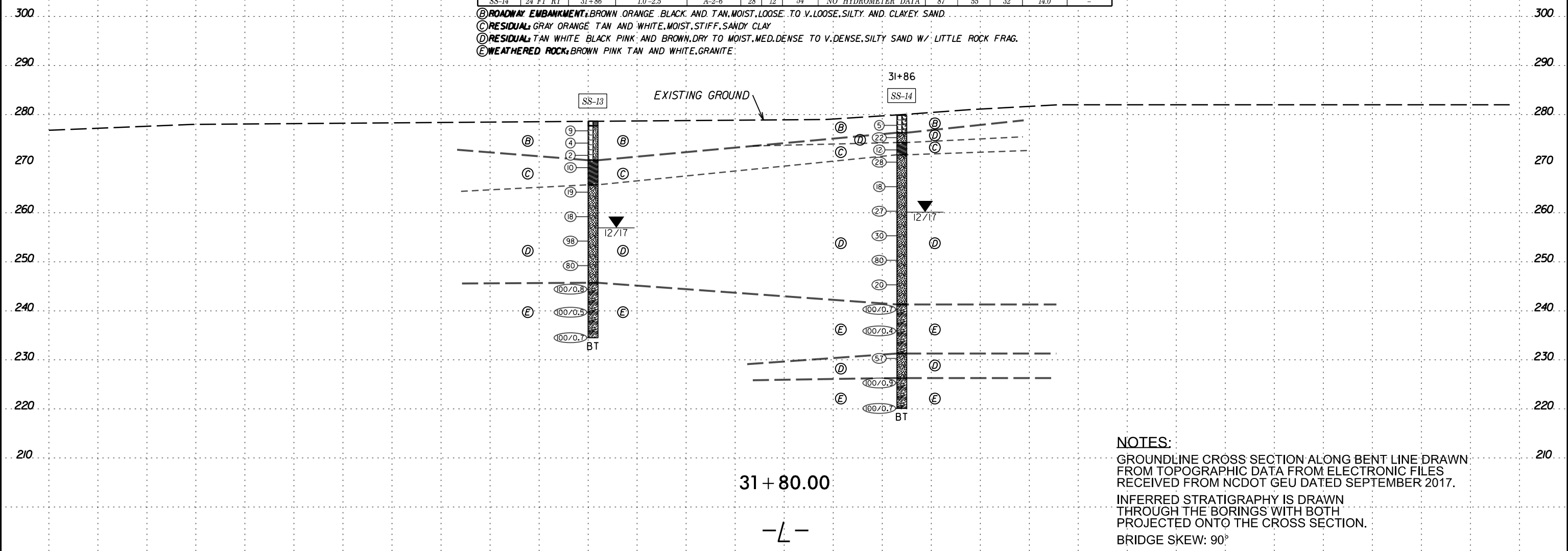
- (B) ROADWAY EMBANKMENT: BROWN ORANGE AND GRAY, MOIST, V. LOOSE TO LOOSE, SILTY SAND
- (C) RESIDUAL: GRAY AND ORANGE, MOIST, STIFF, SANDY CLAY
- (D) RESIDUAL: TAN WHITE BLACK PINK GRAY AND ORANGE, DRY TO MOIST, LOOSE TO V. DENSE, SILTY SAND W/ SOME ROCK FRAGMENTS
- (E) WEATHERED ROCK: TAN PINK GRAY AND TAN-ORANGE, GRANITE



SEE SHEET NO. 3 FOR -L- SITE PLAN
 -L- SR 2006 (DURANT RD)

SOIL TEST RESULTS																
SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	LL	P.I.	% BY WEIGHT				% PASSING (SIEVES)			% MOISTURE	% ORGANIC	
							C. SAND	F. SAND	SILT	CLAY	10	40	200			
SS-13	39 FT LT	31+80	6.0'-7.5'	A-2-4	35	9	53	NO HYDROMETER DATA				87	58	29	22.9	-
SS-14	24 FT RT	31+86	1.0'-2.5'	A-2-6	28	12	54	NO HYDROMETER DATA				87	55	32	14.0	-

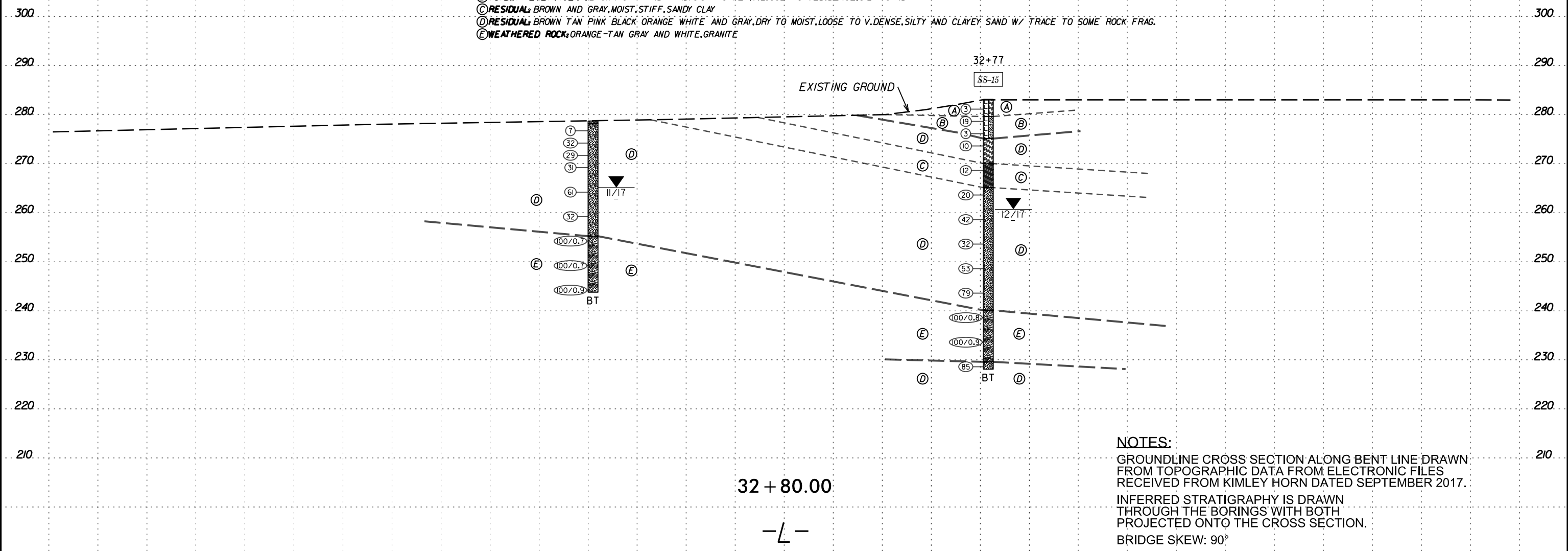
- (B) ROADWAY EMBANKMENT: BROWN ORANGE BLACK AND TAN, MOIST, LOOSE TO V. LOOSE, SILTY AND CLAYEY SAND.
- (C) RESIDUAL: GRAY ORANGE TAN AND WHITE, MOIST, STIFF, SANDY CLAY
- (D) RESIDUAL: TAN WHITE BLACK PINK AND BROWN, DRY TO MOIST, MED. DENSE TO V. DENSE, SILTY SAND W/ LITTLE ROCK FRAG.
- (E) WEATHERED ROCK: BROWN PINK TAN AND WHITE, GRANITE



NOTES:
 GROUNDLINE CROSS SECTION ALONG BENT LINE DRAWN FROM TOPOGRAPHIC DATA FROM ELECTRONIC FILES RECEIVED FROM NCDOT GEU DATED SEPTEMBER 2017.
 INFERRED STRATIGRAPHY IS DRAWN THROUGH THE BORINGS WITH BOTH PROJECTED ONTO THE CROSS SECTION.
 BRIDGE SKEW: 90°

SOIL TEST RESULTS																
SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT				% PASSING (SIEVES)			% MOISTURE	% ORGANIC	
							C. SAND	F. SAND	SILT	CLAY	10	40	200			
SS-15	42 FT RT	32+77	1.0'-2.5'	A-2-6	35	12	45	NO HYDROMETER DATA				91	67	35	19.5	-

- (A) ROADWAY EMBANKMENT: GRAY AND BROWN, MOIST, SOFT, SANDY CLAY
- (B) ROADWAY EMBANKMENT: BROWN GRAY AND TAN, MOIST TO WET, V. LOOSE TO MED. DENSE, SILTY SAND
- (C) RESIDUAL: BROWN AND GRAY, MOIST, STIFF, SANDY CLAY
- (D) RESIDUAL: BROWN TAN PINK BLACK ORANGE WHITE AND GRAY, DRY TO MOIST, LOOSE TO V. DENSE, SILTY AND CLAYEY SAND W/ TRACE TO SOME ROCK FRAG.
- (E) WEATHERED ROCK: ORANGE-TAN GRAY AND WHITE, GRANITE



NOTES:
 GROUNDLINE CROSS SECTION ALONG BENT LINE DRAWN FROM TOPOGRAPHIC DATA FROM ELECTRONIC FILES RECEIVED FROM KIMLEY HORN DATED SEPTEMBER 2017.
 INFERRED STRATIGRAPHY IS DRAWN THROUGH THE BORINGS WITH BOTH PROJECTED ONTO THE CROSS SECTION.
 BRIDGE SKEW: 90°

GEOTECHNICAL BORING REPORT

BORE LOG

WBS 46932.1.1		TIP P-5720		COUNTY WAKE		GEOLOGIST Lane, R.W.										
SITE DESCRIPTION PROPOSED GRADE-SEPARATION OF DURANT RD (SR 2006) OVER CSX S LINE RAILROAD IN RALEIGH							GROUND WTR (ft)									
BORING NO. EB1-A		STATION 31+80		OFFSET 39 ft LT		ALIGNMENT -L-										
COLLAR ELEV. 278.7 ft		TOTAL DEPTH 44.2 ft		NORTHING 781,840		EASTING 2,127,604										
DRILL RIG/HAMMER EFF./DATE BRI7893 CME-550 90% 06/06/2017		DRILL METHOD H.S. Augers		HAMMER TYPE Automatic												
DRILLER Blackley, D.		START DATE 12/01/17		COMP. DATE 12/01/17		SURFACE WATER DEPTH N/A										
ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT			BLOWS PER FOOT					SAMP. NO.	LOG MOI	LOG	SOIL AND ROCK DESCRIPTION	DEPTH (ft)	
			0.5ft	0.5ft	0.5ft	0	25	50	75	100						
280																
	277.7	1.0	7	5	4										278.7	0.0
	275.2	3.5	2	1	3										277.7	1.0
275	272.7	6.0	1	1	1											
	270.2	8.5	4	4	6										270.7	8.0
270	265.2	13.5	5	8	11										265.7	13.0
265	260.2	18.5	8	7	11											
260	255.2	23.5	19	49	49											
255	250.2	28.5	16	31	49											
250	245.2	33.5	58	42/0.3											245.7	33.0
245	240.2	38.5	100/0.5													
240	235.2	43.5	60	40/0.2											234.5	44.2
235																
Boring Terminated at Elevation 234.5 ft In WR (Granite)																

WBS 46932.1.1		TIP P-5720		COUNTY WAKE		GEOLOGIST Lane, R.W.										
SITE DESCRIPTION PROPOSED GRADE-SEPARATION OF DURANT RD (SR 2006) OVER CSX S LINE RAILROAD IN RALEIGH							GROUND WTR (ft)									
BORING NO. EB1-B		STATION 31+86		OFFSET 24 ft RT		ALIGNMENT -L-										
COLLAR ELEV. 279.8 ft		TOTAL DEPTH 59.7 ft		NORTHING 781,779		EASTING 2,127,586										
DRILL RIG/HAMMER EFF./DATE BRI7893 CME-550 90% 06/06/2017		DRILL METHOD H.S. Augers		HAMMER TYPE Automatic												
DRILLER Blackley, D.		START DATE 11/30/17		COMP. DATE 11/30/17		SURFACE WATER DEPTH N/A										
ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT			BLOWS PER FOOT					SAMP. NO.	LOG MOI	LOG	SOIL AND ROCK DESCRIPTION	DEPTH (ft)	
			0.5ft	0.5ft	0.5ft	0	25	50	75	100						
280																
	278.8	1.0	3	3	2										279.8	0.0
	276.3	3.5	6	11	11										276.3	3.5
275	273.8	6.0	5	5	7										274.3	5.5
	271.3	8.5	7	15	13										271.8	8.0
270	266.3	13.5	5	7	11											
265	261.3	18.5	4	12	15											
260	256.3	23.5	29	17	13											
255	251.3	28.5	37	28	52											
250	246.3	33.5	9	9	11											
245	241.3	38.5	24	66	34/0.2										241.3	38.5
240	236.3	43.5	100/0.4													
235	231.3	48.5	18	24	33										231.3	48.5
230	226.3	53.5	23	36	64/0.4										226.3	53.5
225	221.3	58.5	20	78	22/0.2										220.1	59.7
Boring Terminated at Elevation 220.1 ft In WR (Granite)																

NCDOT BORE DOUBLE P5720_GEO_GINT.GPJ NC_DOT.GDT 12/7/18

GEOTECHNICAL BORING REPORT

BORE LOG

WBS 46932.1.1		TIP P-5720		COUNTY WAKE		GEOLOGIST Lane, R.W.									
SITE DESCRIPTION PROPOSED GRADE-SEPARATION OF DURANT RD (SR 2006) OVER CSX S LINE RAILROAD IN RALEIGH						GROUND WTR (ft)									
BORING NO. EB2-A		STATION 32+80		OFFSET 39 ft LT		ALIGNMENT -L-									
COLLAR ELEV. 278.7 ft		TOTAL DEPTH 34.9 ft		NORTHING 781,803		EASTING 2,127,697									
DRILL RIG/HAMMER EFF./DATE BRI7893 CME-550 90% 06/06/2017		DRILL METHOD H.S. Augers		HAMMER TYPE Automatic											
DRILLER Blackley, D.		START DATE 11/27/17		COMP. DATE 11/27/17		SURFACE WATER DEPTH N/A									
ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT			BLOWS PER FOOT					SAMP. NO.	LOG MOI	LOG SOIL AND ROCK DESCRIPTION	DEPTH (ft)	
			0.5ft	0.5ft	0.5ft	0	25	50	75	100					
280														278.7	0.0
	277.7	1.0	3	4	3										
275	275.2	3.5	10	16	16										
	272.7	6.0	13	14	15										
270	270.2	8.5	12	15	16										
265	265.2	13.5	16	25	36										
260	260.2	18.5	16	16	16										
255	255.2	23.5	67	33/0.2										255.2	23.5
250	250.2	28.5	63	37/0.2											
245	245.2	33.5	23	44	56/0.4									243.8	34.9
Boring Terminated at Elevation 243.8 ft In WR (Granite)															

WBS 46932.1.1		TIP P-5720		COUNTY WAKE		GEOLOGIST Lane, R.W.									
SITE DESCRIPTION PROPOSED GRADE-SEPARATION OF DURANT RD (SR 2006) OVER CSX S LINE RAILROAD IN RALEIGH						GROUND WTR (ft)									
BORING NO. EB2-B		STATION 32+77		OFFSET 42 ft RT		ALIGNMENT -L-									
COLLAR ELEV. 283.1 ft		TOTAL DEPTH 55.0 ft		NORTHING 781,729		EASTING 2,127,664									
DRILL RIG/HAMMER EFF./DATE BRI7893 CME-550 90% 06/06/2017		DRILL METHOD H.S. Augers		HAMMER TYPE Automatic											
DRILLER Blackley, D.		START DATE 12/06/17		COMP. DATE 12/06/17		SURFACE WATER DEPTH N/A									
ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT			BLOWS PER FOOT					SAMP. NO.	LOG MOI	LOG SOIL AND ROCK DESCRIPTION	DEPTH (ft)	
			0.5ft	0.5ft	0.5ft	0	25	50	75	100					
285														283.1	0.0
	282.1	1.0	2	1	2										
280	279.6	3.5	6	9	10										
	277.1	6.0	3	2	1										
275	274.6	8.5	4	5	5										
270	269.6	13.5	3	5	7										
265	264.6	18.5	8	9	11										
260	259.6	23.5	15	19	23										
255	254.6	28.5	6	13	19										
250	249.6	33.5	15	27	26										
245	244.6	38.5	11	28	51										
240	239.6	43.5	44	56/0.3										240.1	43.0
235	234.6	48.5	13	28	72/0.4										
230	229.6	53.5	9	44	41									229.6	53.5
														228.1	55.0
Boring Terminated at Elevation 228.1 ft In RESIDUAL (Silty Sand)															

NCDOT BORE DOUBLE P5720_GEO_GINT.GPJ NC_DOT.GDT 12/7/18

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	P-5720	1	17

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

STRUCTURE
SUBSURFACE INVESTIGATION

COUNTY WAKE

PROJECT DESCRIPTION PROPOSED GRADE-SEPARATION
OF DURANT ROAD (SR 2006) OVER CSX S LINE
RAILROAD IN RALEIGH

SITE DESCRIPTION

-W1- -L- STA. 22+00.04, 48.5' LT TO -L- STA. 25+29.95, 48.5' LT

-W2- -Y3- STA. 12+75.00, 42' RT TO -Y3- STA. 15+00.00, 43.54' RT

-WALL 3- -L- STA. 31+11.23, 43.04' RT TO -L- STA. 31+07.73, 43.04' LT

-WALL 4- -L- STA. 33+53.23, 43.04' LT TO -L- STA. 33+45.23, 43.04' RT

CAUTION NOTICE

THE SUBSURFACE INFORMATION AND THE SUBSURFACE INVESTIGATION ON WHICH IT IS BASED WERE MADE FOR THE PURPOSE OF STUDY, PLANNING AND DESIGN, AND NOT FOR CONSTRUCTION OR PAY PURPOSES. THE VARIOUS FIELD BORING LOGS, ROCK CORES AND SOIL TEST DATA AVAILABLE MAY BE REVIEWED OR INSPECTED IN RALEIGH BY CONTACTING THE N. C. DEPARTMENT OF TRANSPORTATION, GEOTECHNICAL ENGINEERING UNIT AT (919) 707-6850. THE SUBSURFACE PLANS AND REPORTS, FIELD BORING LOGS, ROCK CORES AND SOIL TEST DATA ARE NOT PART OF THE CONTRACT.

GENERAL SOIL AND ROCK STRATA DESCRIPTIONS AND INDICATED BOUNDARIES ARE BASED ON A GEOTECHNICAL INTERPRETATION OF ALL AVAILABLE SUBSURFACE DATA AND MAY NOT NECESSARILY REFLECT THE ACTUAL SUBSURFACE CONDITIONS BETWEEN BORINGS OR BETWEEN SAMPLED STRATA WITHIN THE BOREHOLE. THE LABORATORY SAMPLE DATA AND THE IN SITU (IN-PLACE) TEST DATA CAN BE RELIED ON ONLY TO THE DEGREE OF RELIABILITY INHERENT IN THE STANDARD TEST METHOD. THE OBSERVED WATER LEVELS OR SOIL MOISTURE CONDITIONS INDICATED IN THE SUBSURFACE INVESTIGATIONS ARE AS RECORDED AT THE TIME OF THE INVESTIGATION. THESE WATER LEVELS OR SOIL MOISTURE CONDITIONS MAY VARY CONSIDERABLY WITH TIME ACCORDING TO CLIMATIC CONDITIONS INCLUDING TEMPERATURES, PRECIPITATION AND WIND, AS WELL AS OTHER NON-CLIMATIC FACTORS.

THE BIDDER OR CONTRACTOR IS CAUTIONED THAT DETAILS SHOWN ON THE SUBSURFACE PLANS ARE PRELIMINARY ONLY AND IN MANY CASES THE FINAL DESIGN DETAILS ARE DIFFERENT. FOR BIDDING AND CONSTRUCTION PURPOSES, REFER TO THE CONSTRUCTION PLANS AND DOCUMENTS FOR FINAL DESIGN INFORMATION ON THIS PROJECT. THE DEPARTMENT DOES NOT WARRANT OR GUARANTEE THE SUFFICIENCY OR ACCURACY OF THE INVESTIGATION MADE, NOR THE INTERPRETATIONS MADE, OR OPINION OF THE DEPARTMENT AS TO THE TYPE OF MATERIALS AND CONDITIONS TO BE ENCOUNTERED. THE BIDDER OR CONTRACTOR IS CAUTIONED TO MAKE SUCH INDEPENDENT SUBSURFACE INVESTIGATIONS AS HE DEEMS NECESSARY TO SATISFY HIMSELF AS TO CONDITIONS TO BE ENCOUNTERED ON THE PROJECT. THE CONTRACTOR SHALL HAVE NO CLAIM FOR ADDITIONAL COMPENSATION OR FOR AN EXTENSION OF TIME FOR ANY REASON RESULTING FROM THE ACTUAL CONDITIONS ENCOUNTERED AT THE SITE DIFFERING FROM THOSE INDICATED IN THE SUBSURFACE INFORMATION.

NOTES:

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

PERSONNEL

CAROLINA DRILLING

LANE, R.W.

INVESTIGATED BY LANE, R.W.

DRAWN BY CROCKETT, S.C.

CHECKED BY HAMM, J.R.

SUBMITTED BY FALCON ENG.

DATE FEBRUARY 2019

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1	TITLE SHEET
2	LEGEND
3	END BENT MSE WALLS SITE PLAN
4	END BENT 1 MSE WALL SUBSURFACE PROFILE
5	END BENT 2 MSE WALL SUBSURFACE PROFILE
6	WALL #1 SITE PLAN AND SUBSURFACE PROFILE
7	WALL #2 SITE PLAN AND SUBSURFACE PROFILE
8-17	BORE LOGS

REFERENCE: P-5720

PROJECT: 46932

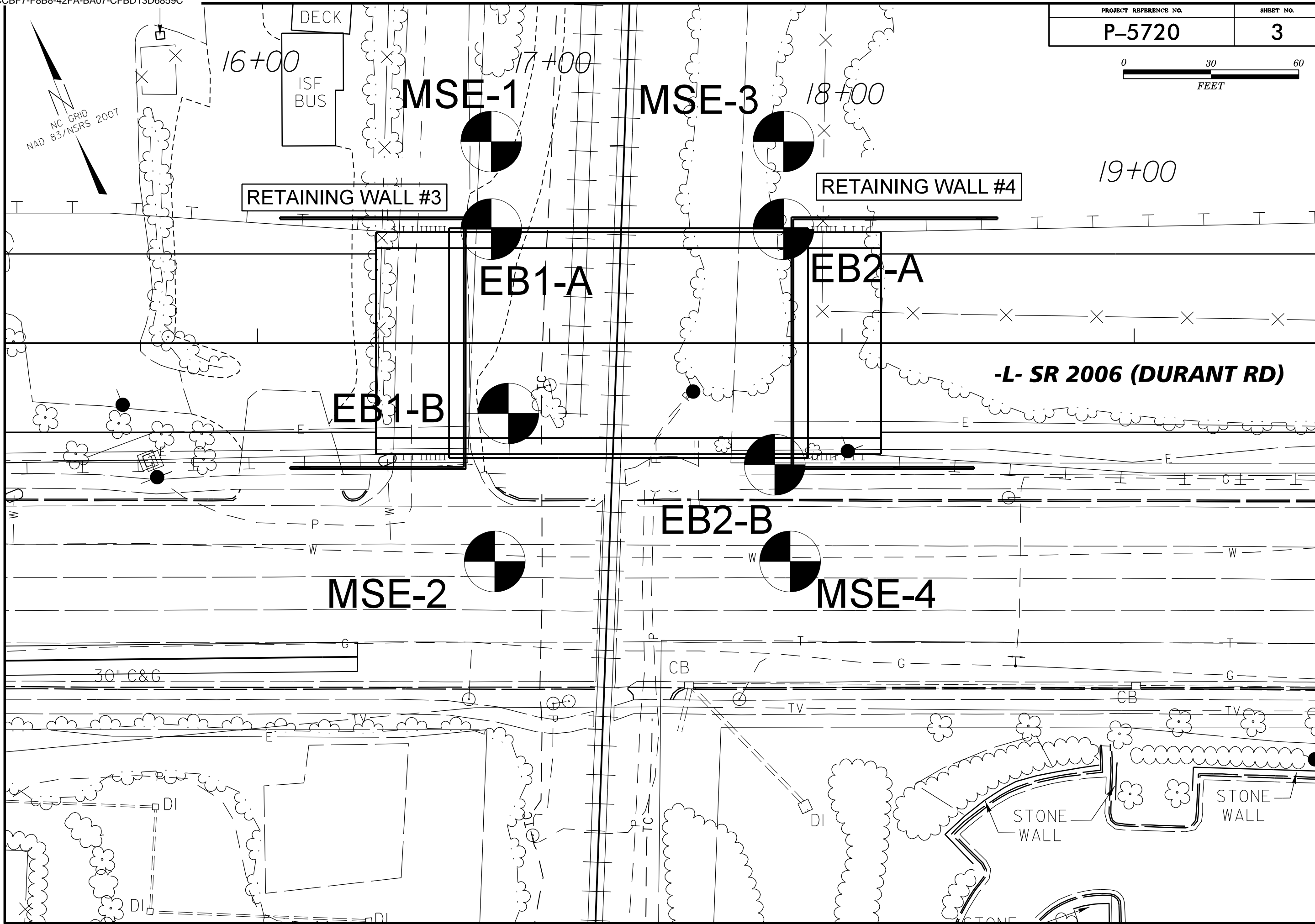


DocuSigned by:
Jeremy R Hamm 2/5/2019
 ED7938089E22487...
 SIGNATURE DATE

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

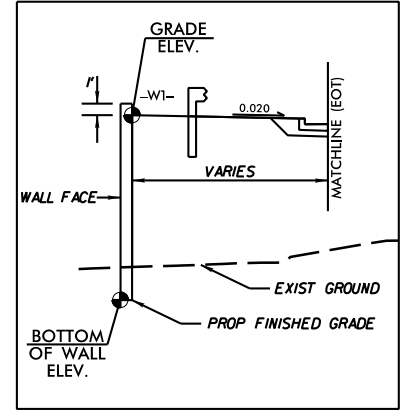
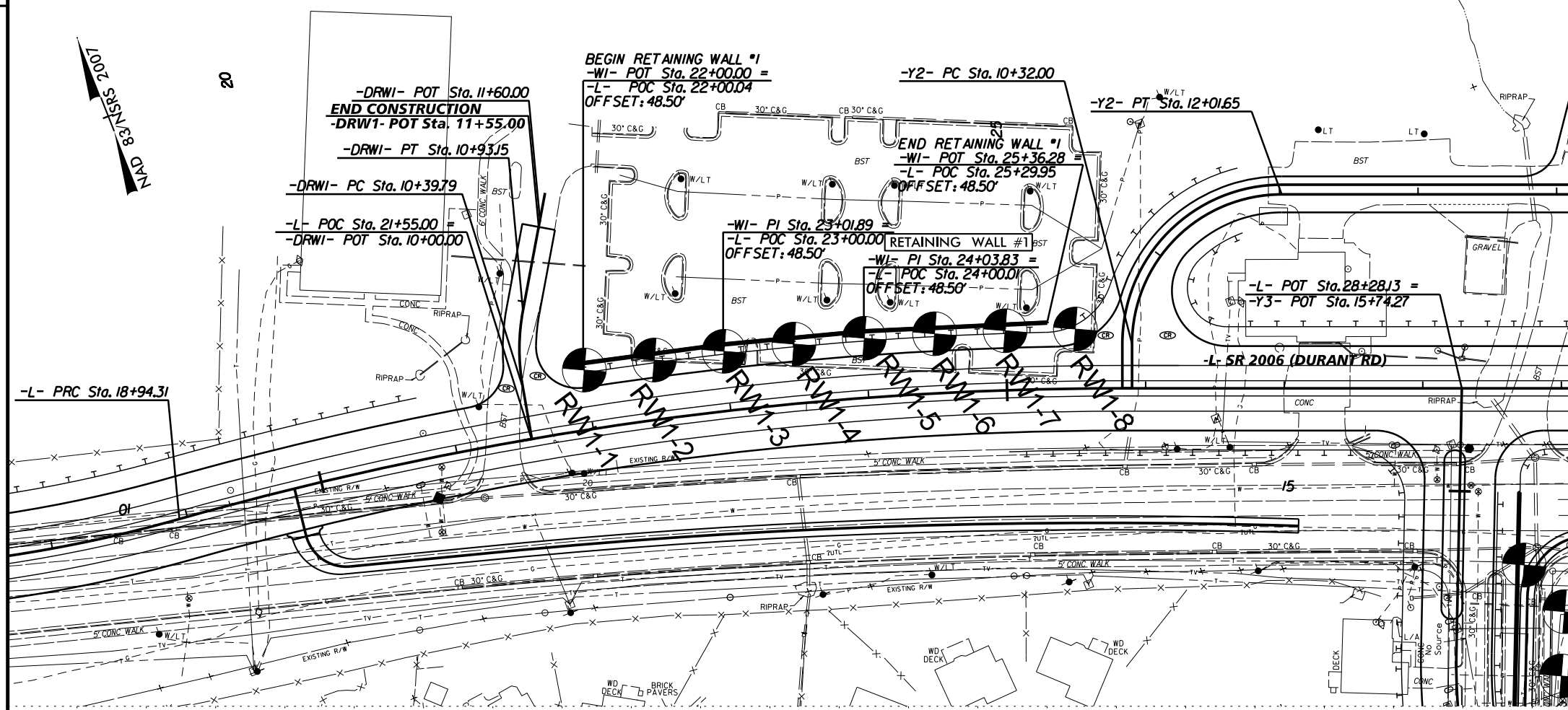
NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS
GEOTECHNICAL ENGINEERING UNIT
SUBSURFACE INVESTIGATION
SOIL AND ROCK LEGEND, TERMS, SYMBOLS, AND ABBREVIATIONS

SOIL DESCRIPTION										GRADATION										ROCK DESCRIPTION										TERMS AND DEFINITIONS																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																										
<p>SOIL IS CONSIDERED UNCONSOLIDATED, SEMI-CONSOLIDATED, OR WEATHERED EARTH MATERIALS THAT CAN BE PENETRATED WITH A CONTINUOUS FLIGHT POWER AUGER AND YIELD LESS THAN 100 BLOWS PER FOOT ACCORDING TO THE STANDARD PENETRATION TEST (AASHTO T 206, ASTM D1586). SOIL CLASSIFICATION IS BASED ON THE AASHTO SYSTEM. BASIC DESCRIPTIONS GENERALLY INCLUDE THE FOLLOWING: CONSISTENCY, COLOR, TEXTURE, MOISTURE, AASHTO CLASSIFICATION, AND OTHER PERTINENT FACTORS SUCH AS MINERALOGICAL COMPOSITION, ANGULARITY, STRUCTURE, PLASTICITY, ETC. FOR EXAMPLE, <i>VERY STIFF, GRAY, SILTY CLAY, MOIST WITH INTERBEDDED FINE SAND LAYERS, HIGHLY PLASTIC, A-7-6</i></p>										<p>WELL GRADED - INDICATES A GOOD REPRESENTATION OF PARTICLE SIZES FROM FINE TO COARSE. UNIFORMLY GRADED - INDICATES THAT SOIL PARTICLES ARE ALL APPROXIMATELY THE SAME SIZE. GAP-GRADED - INDICATES A MIXTURE OF UNIFORM PARTICLE SIZES OF TWO OR MORE SIZES.</p>										<p>HARD ROCK IS NON-COASTAL PLAIN MATERIAL THAT WOULD YIELD SPT REFUSAL IF TESTED, AN INFERRED ROCK LINE INDICATES THE LEVEL AT WHICH NON-COASTAL PLAIN MATERIAL WOULD YIELD SPT REFUSAL. SPT REFUSAL IS PENETRATION BY A SPLIT SPOON SAMPLER EQUAL TO OR LESS THAN 0.1 FOOT PER 60 BLOWS IN NON-COASTAL PLAIN MATERIAL. THE TRANSITION BETWEEN SOIL AND ROCK IS OFTEN REPRESENTED BY A ZONE OF WEATHERED ROCK. ROCK MATERIALS ARE TYPICALLY DIVIDED AS FOLLOWS:</p>										<p>ALLUVIUM (ALLUV.) - SOILS THAT HAVE BEEN TRANSPORTED BY WATER. AQUIFER - A WATER BEARING FORMATION OR STRATA. ARENACEOUS - APPLIED TO ROCKS THAT HAVE BEEN DERIVED FROM SAND OR THAT CONTAIN SAND. ARGILLACEOUS - APPLIED TO ALL ROCKS OR SUBSTANCES COMPOSED OF CLAY MINERALS, OR HAVING A NOTABLE PROPORTION OF CLAY IN THEIR COMPOSITION, SUCH AS SHALE, SLATE, ETC. ARTESIAN - GROUND WATER THAT IS UNDER SUFFICIENT PRESSURE TO RISE ABOVE THE LEVEL AT WHICH IT IS ENCOUNTERED, BUT WHICH DOES NOT NECESSARILY RISE TO OR ABOVE THE GROUND SURFACE. CALCAREOUS (CALC.) - SOILS THAT CONTAIN APPRECIABLE AMOUNTS OF CALCIUM CARBONATE. COLLUVIUM - ROCK FRAGMENTS MIXED WITH SOIL DEPOSITED BY GRAVITY ON SLOPE OR AT BOTTOM OF SLOPE. CORE RECOVERY (REC.) - TOTAL LENGTH OF ALL MATERIAL RECOVERED IN THE CORE BARREL DIVIDED BY TOTAL LENGTH OF CORE RUN AND EXPRESSED AS A PERCENTAGE. DIKE - A TABULAR BODY OF IGNEOUS ROCK THAT CUTS ACROSS THE STRUCTURE OF ADJACENT ROCKS OR CUTS MASSIVE ROCK. DIP - THE ANGLE AT WHICH A STRATUM OR ANY PLANAR FEATURE IS INCLINED FROM THE HORIZONTAL. DIP DIRECTION (DIP AZIMUTH) - THE DIRECTION OR BEARING OF THE HORIZONTAL TRACE OF THE LINE OF DIP, MEASURED CLOCKWISE FROM NORTH. FAULT - A FRACTURE OR FRACTURE ZONE ALONG WHICH THERE HAS BEEN DISPLACEMENT OF THE SIDES RELATIVE TO ONE ANOTHER PARALLEL TO THE FRACTURE. FISSILE - A PROPERTY OF SPLITTING ALONG CLOSELY SPACED PARALLEL PLANES. FLOAT - ROCK FRAGMENTS ON SURFACE NEAR THEIR ORIGINAL POSITION AND DISLOGGED FROM PARENT MATERIAL. FLOOD PLAIN (FP) - LAND BORDERING A STREAM, BUILT OF SEDIMENTS DEPOSITED BY THE STREAM. FORMATION (FM) - A MAPPABLE GEOLOGIC UNIT THAT CAN BE RECOGNIZED AND TRACED IN THE FIELD. JOINT - FRACTURE IN ROCK ALONG WHICH NO APPRECIABLE MOVEMENT HAS OCCURRED. LEDGE - A SHELF-LIKE RIDGE OR PROJECTION OF ROCK WHOSE THICKNESS IS SMALL COMPARED TO ITS LATERAL EXTENT. LENS - A BODY OF SOIL OR ROCK THAT THINS OUT IN ONE OR MORE DIRECTIONS. MOTTLED (MOT.) - IRREGULARLY MARKED WITH SPOTS OF DIFFERENT COLORS. MOTTLING IN SOILS USUALLY INDICATES POOR AERATION AND LACK OF GOOD DRAINAGE. PERCHED WATER - WATER MAINTAINED ABOVE THE NORMAL GROUND WATER LEVEL BY THE PRESENCE OF AN INTERVENING IMPERVIOUS STRATUM. RESIDUAL (RES.) SOIL - SOIL FORMED IN PLACE BY THE WEATHERING OF ROCK. ROCK QUALITY DESIGNATION (ROD) - A MEASURE OF ROCK QUALITY DESCRIBED BY TOTAL LENGTH OF ROCK SEGMENTS EQUAL TO OR GREATER THAN 4 INCHES DIVIDED BY THE TOTAL LENGTH OF CORE RUN AND EXPRESSED AS A PERCENTAGE. SAPROLITE (SAP.) - RESIDUAL SOIL THAT RETAINS THE RELIC STRUCTURE OR FABRIC OF THE PARENT ROCK. SILL - AN INTRUSIVE BODY OF IGNEOUS ROCK OF APPROXIMATELY UNIFORM THICKNESS AND RELATIVELY THIN COMPARED WITH ITS LATERAL EXTENT, THAT HAS BEEN EMPLACED PARALLEL TO THE BEDDING OR SCHISTOSITY OF THE INTRUDED ROCKS. SLICKENSIDE - POLISHED AND STRIATED SURFACE THAT RESULTS FROM FRICTION ALONG A FAULT OR SLIP PLANE. STANDARD PENETRATION TEST (PENETRATION RESISTANCE) (SPT) - NUMBER OF BLOWS (N OR BPF) OF A 140 LB. HAMMER FALLING 30 INCHES REQUIRED TO PRODUCE A PENETRATION OF 1 FOOT INTO SOIL WITH A 2 INCH OUTSIDE DIAMETER SPLIT SPOON SAMPLER. SPT REFUSAL IS PENETRATION EQUAL TO OR LESS THAN 0.1 FOOT PER 60 BLOWS. STRATA CORE RECOVERY (SREC.) - TOTAL LENGTH OF STRATA MATERIAL RECOVERED DIVIDED BY TOTAL LENGTH OF STRATUM AND EXPRESSED AS A PERCENTAGE. STRATA ROCK QUALITY DESIGNATION (SROD) - A MEASURE OF ROCK QUALITY DESCRIBED BY TOTAL LENGTH OF ROCK SEGMENTS WITHIN A STRATUM EQUAL TO OR GREATER THAN 4 INCHES DIVIDED BY THE TOTAL LENGTH OF STRATA AND EXPRESSED AS A PERCENTAGE. TOPSOIL (TS.) - SURFACE SOILS USUALLY CONTAINING ORGANIC MATTER.</p>																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																										
<p>SOIL LEGEND AND AASHTO CLASSIFICATION</p> <table border="1" style="width: 100%; text-align: center;"> <tr> <th rowspan="2">GENERAL CLASS.</th> <th colspan="5">GRANULAR MATERIALS (≤ 35% PASSING #200)</th> <th colspan="5">SILT-CLAY MATERIALS (> 35% PASSING #200)</th> <th colspan="5">ORGANIC MATERIALS</th> </tr> <tr> <th>A-1</th><th>A-2</th><th>A-3</th><th>A-4</th><th>A-5</th> <th>A-6</th><th>A-7</th><th>A-8</th><th>A-9</th><th>A-10</th> <th>A-11</th><th>A-12</th><th>A-13</th><th>A-14</th><th>A-15</th> </tr> <tr> <td>GROUP CLASS.</td> <td>A-1-a</td><td>A-1-b</td><td>A-2-4</td><td>A-2-5</td><td>A-2-6</td><td>A-2-7</td><td>A-4</td><td>A-5</td><td>A-6</td><td>A-7</td> <td>A-1, A-2</td><td>A-3</td><td>A-4, A-5</td><td>A-6, A-7</td><td></td> </tr> <tr> <td>SYMBOL</td> <td colspan="5">[Pattern]</td> <td colspan="5">[Pattern]</td> <td colspan="5">[Pattern]</td> </tr> <tr> <td>% PASSING #10 #40 #200</td> <td>50 MX 30 MX 15 MX</td> <td>50 MX 25 MX 10 MX</td> <td>51 MN 35 MX 35 MX</td> <td>40 MX 41 MN 10 MX</td> <td>40 MX 41 MN 11 MN</td> <td>40 MX 41 MN 11 MN</td> <td>40 MX 41 MN 11 MN</td> <td>40 MX 41 MN 11 MN</td> <td>40 MX 41 MN 11 MN</td> <td>40 MX 41 MN 11 MN</td> <td>GRANULAR SOILS</td> <td>SILT-CLAY SOILS</td> <td>MUCK, PEAT</td> <td colspan="3"></td> </tr> <tr> <td>MATERIAL PASSING #40 LL PI</td> <td colspan="5"></td> <td colspan="5"></td> <td colspan="5">SOILS WITH LITTLE OR MODERATE AMOUNTS OF ORGANIC MATTER</td> <td colspan="5">HIGHLY ORGANIC SOILS</td> </tr> <tr> <td>GROUP INDEX</td> <td colspan="5">0</td> <td colspan="5">0</td> <td colspan="5">4 MX 8 MX 12 MX 16 MX NO MX</td> <td colspan="5"></td> </tr> <tr> <td>USUAL TYPES OF MAJOR MATERIALS</td> <td colspan="2">STONE FRAGS. GRAVEL, AND SAND</td> <td colspan="2">FINE SAND</td> <td colspan="2">SILTY OR CLAYEY GRAVEL AND SAND</td> <td colspan="2">SILTY SOILS</td> <td colspan="2">CLAYEY SOILS</td> <td colspan="5"></td> <td colspan="5"></td> </tr> <tr> <td>GEN. RATING AS SUBGRADE</td> <td colspan="5">EXCELLENT TO GOOD</td> <td colspan="5">FAIR TO POOR</td> <td colspan="5">FAIR TO POOR</td> <td colspan="5">POOR</td> <td colspan="5">UNSUITABLE</td> </tr> <tr> <td colspan="10">PI OF A-7-5 SUBGROUP IS ≤ LL - 30 ; PI OF A-7-6 SUBGROUP IS > LL - 30</td> <td colspan="10"></td> <td colspan="10"></td> <td colspan="10"></td> </tr> <tr> <td colspan="10"> <p>CONSISTENCY OR DENSENESS</p> <table border="1" style="width: 100%;"> <tr> <th>PRIMARY SOIL TYPE</th> <th>COMPACTNESS OR CONSISTENCY</th> <th>RANGE OF STANDARD PENETRATION RESISTANCE (N-VALUE)</th> <th>RANGE OF UNCONFINED COMPRESSIVE STRENGTH (TONS/FT²)</th> </tr> <tr> <td>GENERALLY GRANULAR MATERIAL (NON-COHESSIVE)</td> <td>VERY LOOSE LOOSE MEDIUM DENSE DENSE VERY DENSE</td> <td>< 4 4 TO 10 10 TO 30 30 TO 50 > 50</td> <td>N/A</td> </tr> <tr> <td>GENERALLY SILT-CLAY MATERIAL (COHESIVE)</td> <td>VERY SOFT SOFT MEDIUM STIFF STIFF VERY STIFF HARD</td> <td>< 2 2 TO 4 4 TO 8 8 TO 15 15 TO 30 > 30</td> <td>< 0.25 0.25 TO 0.5 0.5 TO 1.0 1 TO 2 2 TO 4 > 4</td> </tr> </table> </td> <td colspan="10"> <p>MISCELLANEOUS SYMBOLS</p> <table border="1" style="width: 100%;"> <tr> <td>[Symbol]</td> <td>ROADWAY EMBANKMENT (RE) WITH SOIL DESCRIPTION</td> <td>[Symbol]</td> <td>DIP & DIP DIRECTION OF ROCK STRUCTURES</td> </tr> <tr> <td>[Symbol]</td> <td>SOIL SYMBOL</td> <td>[Symbol]</td> <td>SPT TEST BORING</td> </tr> <tr> <td>[Symbol]</td> <td>ARTIFICIAL FILL (AF) OTHER THAN ROADWAY EMBANKMENT</td> <td>[Symbol]</td> <td>AUGER BORING</td> </tr> <tr> <td>[Symbol]</td> <td>INFERRED SOIL BOUNDARY</td> <td>[Symbol]</td> <td>CORE BORING</td> </tr> <tr> <td>[Symbol]</td> <td>INFERRED ROCK LINE</td> <td>[Symbol]</td> <td>MONITORING WELL</td> </tr> <tr> <td>[Symbol]</td> <td>ALLUVIAL SOIL BOUNDARY</td> <td>[Symbol]</td> <td>PIEZOMETER INSTALLATION</td> </tr> <tr> <td>[Symbol]</td> <td></td> <td>[Symbol]</td> <td>SLOPE INDICATOR INSTALLATION</td> </tr> <tr> <td>[Symbol]</td> <td></td> <td>[Symbol]</td> <td>CONE PENETROMETER TEST</td> </tr> <tr> <td>[Symbol]</td> <td></td> <td>[Symbol]</td> <td>SOUNDING ROD</td> </tr> <tr> <td>[Symbol]</td> <td></td> <td>[Symbol]</td> <td>TEST BORING WITH CORE</td> </tr> <tr> <td>[Symbol]</td> <td></td> <td>[Symbol]</td> <td>SPT N-VALUE</td> </tr> </table> </td> <td colspan="10"> <p>ROCK HARDNESS</p> <table border="1" style="width: 100%;"> <tr> <th>VERY HARD</th> <td>CANNOT BE SCRATCHED BY KNIFE OR SHARP PICK. 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SD.)</th> <th>FINE SAND (F SD.)</th> <th>SILT (SL.)</th> <th>CLAY (CL.)</th> </tr> <tr> <td>GRAIN SIZE</td> <td>MM 305</td> <td>75</td> <td>2.0</td> <td>0.25</td> <td>0.05</td> <td>0.005</td> </tr> <tr> <td></td> <td>IN. 12</td> <td>3</td> <td></td> <td></td> <td></td> <td></td> </tr> </table> </td> <td colspan="10"> <p>ABBREVIATIONS</p> <table border="1" style="width: 100%;"> <tr> <td>AR - AUGER REFUSAL</td> <td>MED. - MEDIUM</td> <td>VST - VANE SHEAR TEST</td> </tr> <tr> <td>BT - BORING TERMINATED</td> <td>MICA - MICACEOUS</td> <td>WEA. - WEATHERED</td> </tr> <tr> <td>CL - CLAY</td> <td>MOD. - MODERATELY</td> <td>UNIT WEIGHT</td> </tr> <tr> <td>CPT - CONE PENETRATION TEST</td> <td>NP - NON PLASTIC</td> <td>DRY UNIT WEIGHT</td> </tr> <tr> <td>CSE - COARSE</td> <td>ORG. - ORGANIC</td> <td>SAMPLE ABBREVIATIONS</td> </tr> <tr> <td>DMT - DILATOMETER TEST</td> <td>PMT - PRESSUREMETER TEST</td> <td>S - BULK</td> </tr> <tr> <td>DPT - DYNAMIC PENETRATION TEST</td> <td>SAP. - SAPROLITIC</td> <td>SS - SPLIT SPOON</td> </tr> <tr> <td>e - VOID RATIO</td> <td>SD. - SAND, SANDY</td> <td>ST - SHELBY TUBE</td> </tr> <tr> <td>F - FINE</td> <td>SL. - SILTY, SILTY</td> <td>RS - ROCK</td> </tr> <tr> <td>FOSS. - FOSSILIFEROUS</td> <td>SLI. - SLIGHTLY</td> <td>RT - RECOMPACTED TRIAXIAL</td> </tr> <tr> <td>FRAC. - FRACTURED, FRACTURES</td> <td>TCR - TRICONE REFUSAL</td> <td>CBR - CALIFORNIA BEARING RATIO</td> </tr> <tr> <td>FRAGS. - FRAGMENTS</td> <td>w - MOISTURE CONTENT</td> <td></td> </tr> <tr> <td>HI. - HIGHLY</td> <td>V - VERY</td> <td></td> </tr> </table> </td> </tr> <tr> <td colspan="10"> <p>SOIL MOISTURE - CORRELATION OF TERMS</p> <table border="1" style="width: 100%;"> <tr> <th>SOIL MOISTURE SCALE (ATTERBERG LIMITS)</th> <th>FIELD MOISTURE DESCRIPTION</th> <th>GUIDE FOR FIELD MOISTURE DESCRIPTION</th> </tr> <tr> <td rowspan="2">LL - LIQUID LIMIT PL - PLASTIC LIMIT</td> <td>- SATURATED - (SAT.)</td> <td>USUALLY LIQUID; VERY WET, USUALLY FROM BELOW THE GROUND WATER TABLE</td> </tr> <tr> <td>- WET - (W)</td> <td>SEMISOLID; REQUIRES DRYING TO ATTAIN OPTIMUM MOISTURE</td> </tr> <tr> <td rowspan="2">OM - OPTIMUM MOISTURE SL - SHRINKAGE LIMIT</td> <td>- MOIST - (M)</td> <td>SOLID; AT OR NEAR OPTIMUM MOISTURE</td> </tr> <tr> <td>- DRY - (D)</td> <td>REQUIRES ADDITIONAL WATER TO ATTAIN OPTIMUM MOISTURE</td> </tr> </table> </td> <td colspan="10"> <p>EQUIPMENT USED ON SUBJECT PROJECT</p> <table border="1" style="width: 100%;"> <tr> <td>DRILL UNITS:</td> <td>ADVANCING TOOLS:</td> <td>HAMMER TYPE:</td> </tr> <tr> <td><input type="checkbox"/> CME-45C</td> <td><input type="checkbox"/> CLAY BITS</td> <td><input checked="" type="checkbox"/> AUTOMATIC <input type="checkbox"/> MANUAL</td> </tr> <tr> <td><input type="checkbox"/> CME-55</td> <td><input type="checkbox"/> 6" CONTINUOUS FLIGHT AUGER</td> <td>CORE SIZE:</td> </tr> <tr> <td><input checked="" type="checkbox"/> CME-550</td> <td><input checked="" type="checkbox"/> 8" HOLLOW AUGERS</td> <td><input type="checkbox"/> -B <input type="checkbox"/> -H <input type="checkbox"/> -N</td> </tr> <tr> <td><input type="checkbox"/> VANE SHEAR TEST</td> <td><input type="checkbox"/> HARD FACED FINGER BITS</td> <td>HAND TOOLS:</td> </tr> <tr> <td><input type="checkbox"/> PORTABLE HOIST</td> <td><input type="checkbox"/> TUNG-CARBIDE INSERTS</td> <td><input type="checkbox"/> POST HOLE DIGGER</td> </tr> <tr> <td><input type="checkbox"/></td> <td><input type="checkbox"/> CASING <input type="checkbox"/> W/ ADVANCER</td> <td><input type="checkbox"/> HAND AUGER</td> </tr> <tr> <td><input type="checkbox"/></td> <td><input type="checkbox"/> TRICONE _____ *STEEL TEETH</td> <td><input type="checkbox"/> SOUNDING ROD</td> </tr> <tr> <td><input type="checkbox"/></td> <td><input type="checkbox"/> TRICONE _____ *TUNG-CARB.</td> <td><input type="checkbox"/> VANE SHEAR TEST</td> </tr> <tr> <td><input type="checkbox"/></td> <td><input type="checkbox"/> CORE BIT</td> <td></td> </tr> <tr> <td><input type="checkbox"/></td> <td></td> <td></td> </tr> </table> </td> </tr> <tr> <td colspan="10"> <p>PLASTICITY</p> <table border="1" style="width: 100%;"> <tr> <th>NON PLASTIC</th> <th colspan="2">PLASTICITY INDEX (PI)</th> <th>DRY STRENGTH</th> </tr> <tr> <td>SLIGHTLY PLASTIC</td> <td>0-5</td> <td></td> <td>VERY LOW</td> </tr> <tr> <td>MODERATELY PLASTIC</td> <td>6-15</td> <td></td> <td>SLIGHT</td> </tr> <tr> <td>HIGHLY PLASTIC</td> <td>16-25</td> <td></td> <td>MEDIUM</td> </tr> <tr> <td></td> <td>26 OR MORE</td> <td></td> <td>HIGH</td> </tr> </table> </td> <td colspan="10"> <p>FRACATURE SPACING</p> <table border="1" style="width: 100%;"> <tr> <th>TERM</th> <th>SPACING</th> </tr> <tr> <td>VERY WIDE</td> <td>MORE THAN 10 FEET</td> </tr> <tr> <td>WIDE</td> <td>3 TO 10 FEET</td> </tr> <tr> <td>MODERATELY CLOSE</td> <td>1 TO 3 FEET</td> </tr> <tr> <td>CLOSE</td> <td>0.16 TO 1 FOOT</td> </tr> <tr> <td>VERY CLOSE</td> <td>LESS THAN 0.16 FEET</td> </tr> </table> </td> </tr> <tr> <td colspan="10"> <p>COLOR</p> <p>DESCRIPTIONS MAY INCLUDE COLOR OR COLOR COMBINATIONS (TAN, RED, YELLOW-BROWN, BLUE-BROWN). 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GRANULAR MATERIALS (≤ 35% PASSING #200)					SILT-CLAY MATERIALS (> 35% PASSING #200)					ORGANIC MATERIALS					A-1	A-2	A-3	A-4	A-5	A-6	A-7	A-8	A-9	A-10	A-11	A-12	A-13	A-14	A-15	GROUP CLASS.	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	A-1, A-2	A-3	A-4, A-5	A-6, A-7		SYMBOL	[Pattern]					[Pattern]					[Pattern]					% PASSING #10 #40 #200	50 MX 30 MX 15 MX	50 MX 25 MX 10 MX	51 MN 35 MX 35 MX	40 MX 41 MN 10 MX	40 MX 41 MN 11 MN	40 MX 41 MN 11 MN	40 MX 41 MN 11 MN	40 MX 41 MN 11 MN	40 MX 41 MN 11 MN	40 MX 41 MN 11 MN	GRANULAR SOILS	SILT-CLAY SOILS	MUCK, PEAT				MATERIAL PASSING #40 LL PI											SOILS WITH LITTLE OR MODERATE AMOUNTS OF ORGANIC MATTER					HIGHLY ORGANIC SOILS					GROUP INDEX	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. 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<p>BENCH MARK:</p> <p>BORING ELEVATIONS TAKEN FROM P5720.ncdot.fs.i70522 DATED 5/22/17</p> <p>ELEVATION: FEET</p>										<p>DATE: 1-XX-17</p>																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																														



RETAINING WALL #1 ENVELOPE

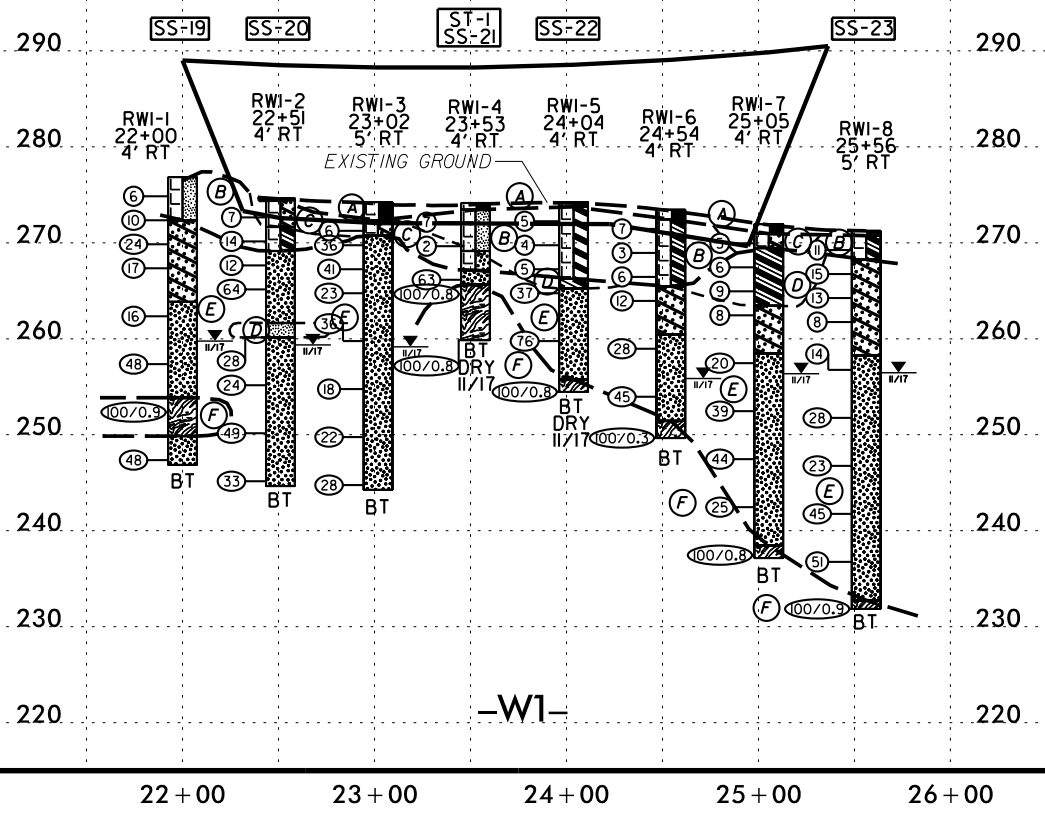
PROJECT REFERENCE NO. P-5720	SHEET NO. 4
RW SHEET NO.	
ROADWAY DESIGN ENGINEER	GEOTECHNICAL ENGINEER
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED	



APPROX. WALL FACE AREA = 5800 SF

SOIL TEST RESULTS																
SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS	LL	P.I.	% BY WEIGHT				% PASSING (SIEVES)			% MOISTURE		% ORGANIC
							C. SAND	F. SAND	SILT	CLAY	10	40	200	MOISTURE	%	
SS-19	4 FT RT	22+00	1.0'-2.5'	A-4	23	7	-	-	-	-	95	64	36	12	-	-
SS-20	4 FT RT	22+51	3.5'-5.0'	-	-	-	-	-	-	99	87	65	27	-	-	
SS-21	4 FT RT	23+53	3.5'-5.0'	A-4	30	9	-	-	-	85	67	38	20	-	-	
SS-22	4 FT RT	24+04	1.0'-2.5'	A-7-5	62	17	-	-	-	89	74	48	29	-	-	
SS-23	5 FT RT	25+56	1.0'-2.5'	A-6	40	17	-	-	-	93	65	44	14	-	-	
ST-1	4 FT RT	23+53	5.0'-7.0'	A-2-4	24	7	43	26	16	16	89	71	32	17	-	

- (A) ROADWAY EMBANKMENT: BITUMINOUS CONCRETE AND BASE COURSE AGGREGATE
- (B) ROADWAY EMBANKMENT: TAN, BROWN, AND GRAY, MOIST, SOFT TO STIFF, SANDY SILT, SANDY CLAY, AND SILTY CLAY (A-4, A-6, A-7-5)
- (C) ROADWAY EMBANKMENT: BROWN AND TAN, MOIST, VERY LOOSE TO LOOSE, SILTY AND CLAYEY SAND (A-2-4, A-2-6)
- (D) RESIDUAL: GRAY AND ORANGE, DRY TO MOIST, MEDIUM STIFF TO STIFF, SANDY CLAY (A-6)
- (E) RESIDUAL: PINK, BROWN, WHITE, AND GRAY, DRY TO WET, LOOSE TO VERY DENSE, SILTY AND CLAYEY SAND (A-2-4, A-2-6)
- (F) WEATHERED ROCK: PINK, GRAY, AND TAN, GRANITE



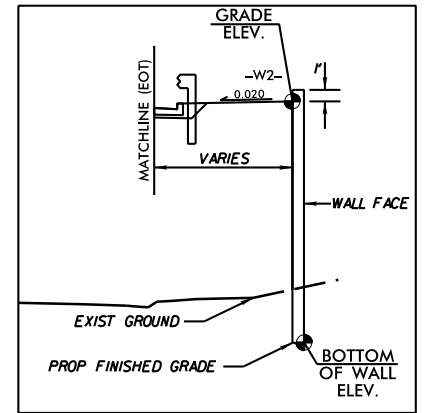
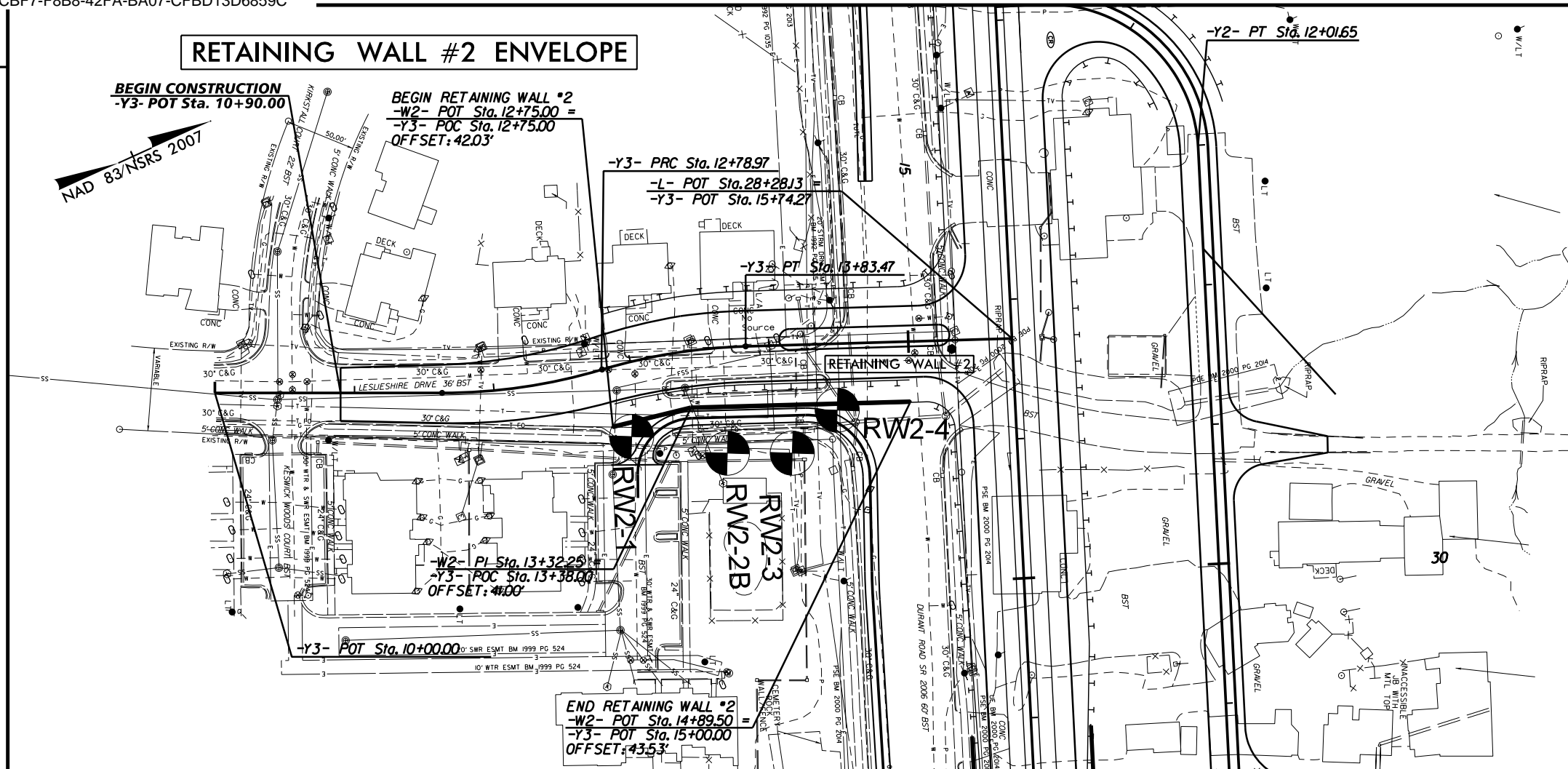
DATE \$

RETAINING WALL #2 ENVELOPE

Kimley»Horn
 421 FAYETTEVILLE STREET, SUITE 600
 RALEIGH, N.C. 27601

PROJECT REFERENCE NO. P-5720	SHEET NO. 5
RW SHEET NO.	GEOTECHNICAL ENGINEER
ROADWAY DESIGN ENGINEER	

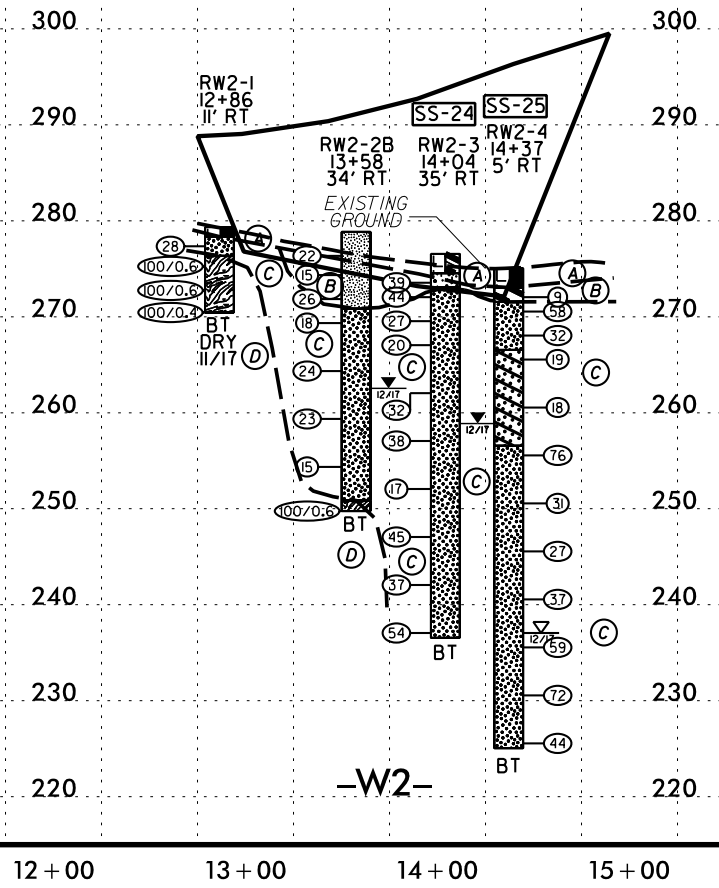
**DOCUMENT NOT CONSIDERED FINAL
UNLESS ALL SIGNATURES COMPLETED**



APPROX. WALL FACE AREA = 4100 SF

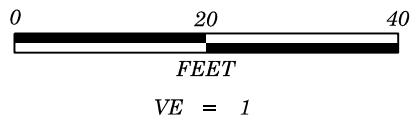
SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS	LL	P.I.	% BY WEIGHT				% PASSING (SIEVES)			% MOISTURE	% ORGANIC
							C. SAND	F. SAND	SILT	CLAY	10	40	200		
SS-24	35 FT RT	14+04	2'-3.5'	A-5	41	5	-	-	-	96	72	44	24	-	
SS-25	5 FT RT	14+37	2'-3.5'	A-7-6	59	37	-	-	-	77	51	38	17	-	

- (A) ROADWAY EMBANKMENT: BITUMINOUS CONCRETE AND BASE COURSE AGGREGATE
- (B) RESIDUAL: BROWN AND GRAY, MOIST, STIFF TO HARD, SANDY SILT, CLAYEY SILT, AND SILTY CLAY (A-4, A-5, A-7-6) WITH SOME ROCK FRAGMENTS.
- (C) RESIDUAL: TAN, WHITE, AND ORANGE, DRY TO WET, MEDIUM DENSE TO VERY DENSE, SILTY AND CLAYEY SAND (A-2-4, A-2-6) SAPROLITIC WITH ROCK FRAGMENTS
- (D) WEATHERED ROCK: TAN, PINK, AND GRAY, GRANITE



REVISIONS

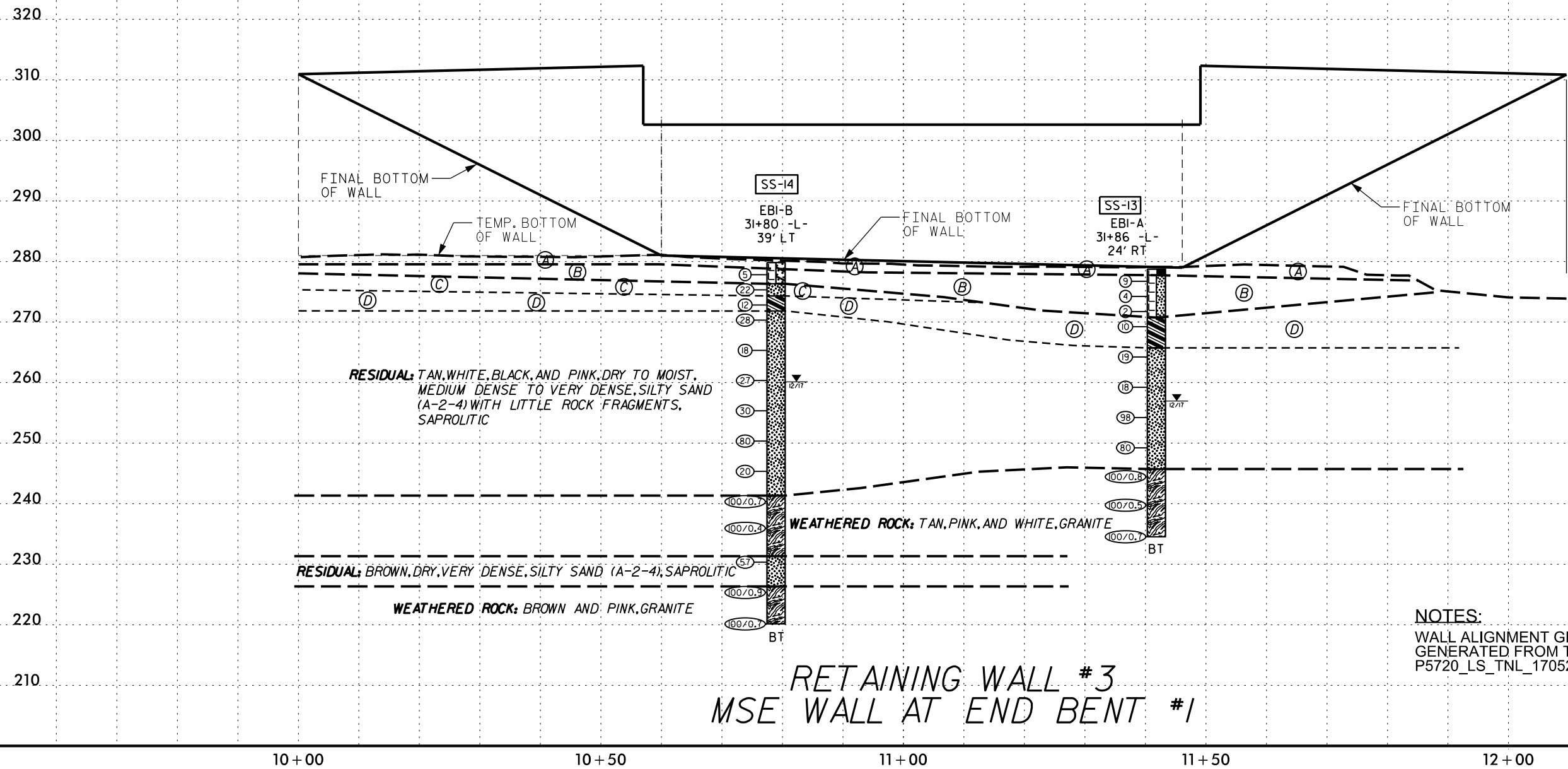
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PROJECT REFERENCE NO.	SHEET NO.
P-5720	6
RETAINING WALL #3 MSE WALL PROFILE AT END BENT #1	

SOIL TEST RESULTS															
SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT				% PASSING (SIEVES)			% MOISTURE	% ORGANIC
							C. SAND	F. SAND	SILT	CLAY	10	40	200		
SS-13	39 FT LT	31+80	6.0'-7.5'	A-2-4	35	9	-	-	-	-	87	58	29	23	-
SS-14	24 FT RT	31+86	1.0'-2.5'	A-2-6	28	12	-	-	-	-	87	55	32	14	-

- (A) ROADWAY EMBANKMENT: BASE COURSE AGGREGATE
- (B) ROADWAY EMBANKMENT: BROWN, ORANGE, AND BLACK, MOIST, VERY LOOSE TO LOOSE, SILTY AND CLAYEY SAND (A-2-4, A-2-6)
- (C) RESIDUAL: TAN AND WHITE, MOIST, MEDIUM DENSE, SILTY SAND (A-2-4), SAPROLITIC
- (D) RESIDUAL: GRAY AND ORANGE, MOIST, STIFF, SANDY CLAY (A-6)



RESIDUAL: TAN, WHITE, BLACK, AND PINK, DRY TO MOIST, MEDIUM DENSE TO VERY DENSE, SILTY SAND (A-2-4) WITH LITTLE ROCK FRAGMENTS, SAPROLITIC

WEATHERED ROCK: TAN, PINK, AND WHITE, GRANITE

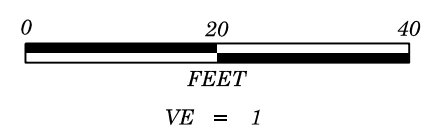
RESIDUAL: BROWN, DRY, VERY DENSE, SILTY SAND (A-2-4), SAPROLITIC

WEATHERED ROCK: BROWN AND PINK, GRANITE

NOTES:
WALL ALIGNMENT GROUNDLINE PROFILE
GENERATED FROM TIN FILE
P5720_LS_TNL_170522.TIN DATED MAY, 2017.

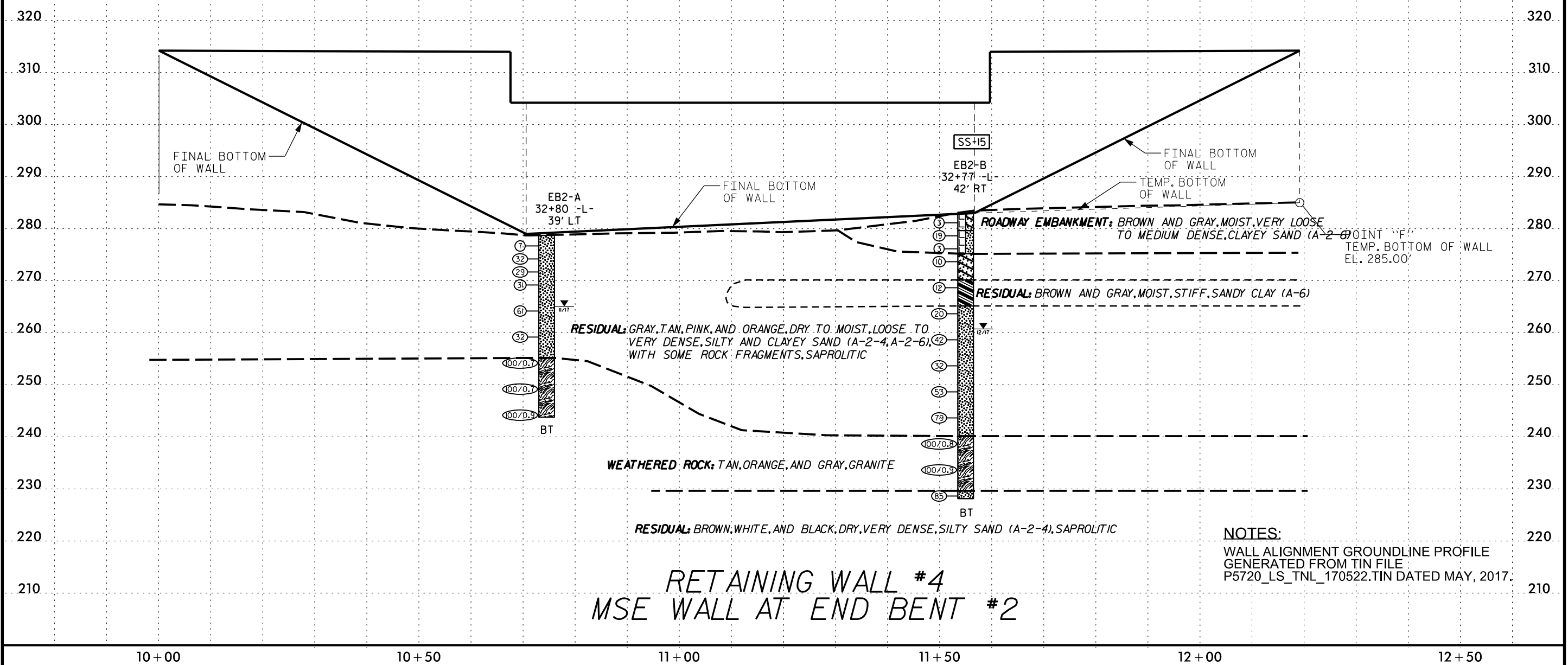
RETAINING WALL #3 MSE WALL AT END BENT #1

10+00 10+50 11+00 11+50 12+00



PROJECT REFERENCE NO.	SHEET NO.
P-5720	7
RETAINING WALL #4 MSE WALL PROFILE AT END BENT #2	

SOIL TEST RESULTS															
SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT				% PASSING (SIEVES)			% MOISTURE	% ORGANIC
							C. SAND	F. SAND	SILT	CLAY	10	40	200		
SS-15	42 FT RT	32+77	1.0'-2.5'	A-2-6	35	9	-	-	-	-	91	67	35	20	-



GEOTECHNICAL BORING REPORT

BORE LOG

WBS 46932.1.1		TIP P-5720		COUNTY WAKE		GEOLOGIST Lane, R.W.										
SITE DESCRIPTION PROPOSED GRADE-SEPARATION OF DURANT RD (SR 2006) OVER CSX S LINE RAILROAD IN RALEIGH							GROUND WTR (ft)									
BORING NO. RW2-2		STATION 13+57		OFFSET 39 ft RT		ALIGNMENT -Y3-										
COLLAR ELEV. 278.1 ft		TOTAL DEPTH 5.0 ft		NORTHING 781,706		EASTING 2,127,245										
DRILL RIGHAMMER EFF./DATE BRI7893 CME-550 90%06/06/2017			DRILL METHOD H.S. Augers			HAMMER TYPE Automatic										
DRILLER Blackley, D.		START DATE 12/07/17		COMP. DATE 12/07/17		SURFACE WATER DEPTH N/A										
ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT			BLOWS PER FOOT					SAMP. NO.	MOI	LOG	SOIL AND ROCK DESCRIPTION	DEPTH (ft)	
			0.5ft	0.5ft	0.5ft	0	25	50	75	100						
280																
	277.1	1.0	5	9	14										278.1	0.0
275	274.6	3.5	8	14	15										273.1	5.0
Boring Terminated at 5.0' below ground surface after hitting irrigation line at Elevation 273.1 ft																

WBS 46932.1.1		TIP P-5720		COUNTY WAKE		GEOLOGIST Lane, R.W.										
SITE DESCRIPTION PROPOSED GRADE-SEPARATION OF DURANT RD (SR 2006) OVER CSX S LINE RAILROAD IN RALEIGH							GROUND WTR (ft)									
BORING NO. MSE-1		STATION 31+80		OFFSET 69 ft LT		ALIGNMENT -L-										
COLLAR ELEV. 278.6 ft		TOTAL DEPTH 30.0 ft		NORTHING 781,868		EASTING 2,127,615										
DRILL RIGHAMMER EFF./DATE BRI7893 CME-550 90%06/06/2017			DRILL METHOD H.S. Augers			HAMMER TYPE Automatic										
DRILLER Blackley, D.		START DATE 12/01/17		COMP. DATE 12/01/17		SURFACE WATER DEPTH N/A										
ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT			BLOWS PER FOOT					SAMP. NO.	MOI	LOG	SOIL AND ROCK DESCRIPTION	DEPTH (ft)	
			0.5ft	0.5ft	0.5ft	0	25	50	75	100						
280																
	277.6	1.0	5	5	3										278.6	0.0
275	275.1	3.5	5	4	3											
	272.6	6.0	4	2	2											
270	270.1	8.5	2	1	2										271.1	7.5
265	265.1	13.5	3	5	4										265.6	13.0
260	260.1	18.5	4	4	6											
255	255.1	23.5	4	9	12										255.6	23.0
250	250.1	28.5	10	15	13										248.6	30.0
Boring Terminated at Elevation 248.6 ft In RESIDUAL (A-2-4)																

NCDOT BORE DOUBLE P5720_GEO_GINT.GPJ NC_DOT.GDT 2/5/19

GEOTECHNICAL BORING REPORT

BORE LOG

WBS 46932.1.1		TIP P-5720		COUNTY WAKE		GEOLOGIST Lane, R.W.	
SITE DESCRIPTION PROPOSED GRADE-SEPARATION OF DURANT RD (SR 2006) OVER CSX S LINE RAILROAD IN RALEIGH							GROUND WTR (ft)
BORING NO. MSE-2		STATION 31+81		OFFSET 75 ft RT		ALIGNMENT -L-	
COLLAR ELEV. 282.0 ft		TOTAL DEPTH 19.9 ft		NORTHING 781,734		EASTING 2,127,563	
DRILL RIGHAMMER EFF/DATE BRI7893 CME-550 90%06/06/2017				DRILL METHOD H.S. Augers		HAMMER TYPE Automatic	
DRILLER Blackley, D.		START DATE 12/05/17		COMP. DATE 12/05/17		SURFACE WATER DEPTH N/A	

ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT			BLOWS PER FOOT					SAMP. NO.	LOG MOI	LOG G	SOIL AND ROCK DESCRIPTION	DEPTH (ft)	
			0.5ft	0.5ft	0.5ft	0	25	50	75	100						
285																
280	280.5	1.5	21	16	12											282.0 0.0
	278.5	3.5	7	12	20											280.5 1.5
	276.0	6.0	5	7	8											278.5 3.5
	273.5	8.5	22	48	52/0.4											274.0 8.0
	268.5	13.5	22	44	54											269.0 13.0
	263.5	18.5	25	16	84/0.4											264.0 18.0
																262.1 19.9

WBS 46932.1.1		TIP P-5720		COUNTY WAKE		GEOLOGIST Lane, R.W.	
SITE DESCRIPTION PROPOSED GRADE-SEPARATION OF DURANT RD (SR 2006) OVER CSX S LINE RAILROAD IN RALEIGH							GROUND WTR (ft)
BORING NO. MSE-3		STATION 32+80		OFFSET 69 ft LT		ALIGNMENT -L-	
COLLAR ELEV. 278.2 ft		TOTAL DEPTH 30.0 ft		NORTHING 781,831		EASTING 2,127,708	
DRILL RIGHAMMER EFF/DATE BRI7893 CME-550 90%06/06/2017				DRILL METHOD H.S. Augers		HAMMER TYPE Automatic	
DRILLER Blackley, D.		START DATE 11/27/17		COMP. DATE 11/27/17		SURFACE WATER DEPTH N/A	

ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT			BLOWS PER FOOT					SAMP. NO.	LOG MOI	LOG G	SOIL AND ROCK DESCRIPTION	DEPTH (ft)	
			0.5ft	0.5ft	0.5ft	0	25	50	75	100						
280																
	277.2	1.0	2	8	10											278.2 0.0
	274.7	3.5	7	9	15											277.2 1.0
	272.2	6.0	5	6	7											274.7 3.5
	269.7	8.5	7	9	13											272.2 6.0
	264.7	13.5	5	10	11											269.7 8.5
	259.7	18.5	12	12	14											264.7 13.5
	254.7	23.5	8	16	36											259.7 18.5
	249.7	28.5	27	44	51											254.7 23.5
																249.7 28.5

NCDOT BORE DOUBLE P5720_GEO_GINT.GPJ NC_DOT.GDT 2/5/19

GEOTECHNICAL BORING REPORT

BORE LOG

WBS 46932.1.1	TIP P-5720	COUNTY WAKE	GEOLOGIST Lane, R.W.	
SITE DESCRIPTION PROPOSED GRADE-SEPARATION OF DURANT RD (SR 2006) OVER CSX S LINE RAILROAD IN RALEIGH				GROUND WTR (ft)
BORING NO. MSE-4	STATION 32+82	OFFSET 75 ft RT	ALIGNMENT -L-	0 HR. 26.9
COLLAR ELEV. 282.8 ft	TOTAL DEPTH 30.0 ft	NORTHING 781,729	EASTING 2,127,664	24 HR. FIAD
DRILL RIG/HAMMER EFF/DATE BRI7893 CME-550 90%06/06/2017		DRILL METHOD H.S. Augers	HAMMER TYPE Automatic	
DRILLER Blackley, D.		START DATE 12/04/17	COMP. DATE 12/04/17	SURFACE WATER DEPTH N/A

ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT			BLOWS PER FOOT					SAMP. NO.	LOG	SOIL AND ROCK DESCRIPTION	DEPTH (ft)	
			0.5ft	0.5ft	0.5ft	0	25	50	75	100					
285														282.8	0.0
280	281.3	1.5		6	5	8						SS-17	11%	ROADWAY EMBANKMENT ORANGE AND GRAY, SILTY SAND (A-2-4)	3.5
	279.2	3.6		5	5	3						M		GRAY, CLAYEY SAND (A-2-6)	6.0
275	276.8	6.0		3	4	6						SS-18	9%	ALLUVIAL GRAY, SILTY SAND (A-2-4) W/ TRACE ORGANICS	8.0
	274.3	8.5		4	3	4								M	
270	269.3	13.5		5	10	14						M		BROWN, SANDY SILT (A-4)	17.0
	264.3	18.5		42	33	33						D		TAN, WHITE, AND PINK, SILTY SAND (A-2-4), SAPROLITIC, W/ LITTLE ROCK FRAGS.	30.0
260	259.3	23.5		19	16	17						D			
	254.3	28.5		13	20	28						D			

Boring Terminated at Elevation 252.8 ft In RESIDUAL (A-2-4)

WBS 46932.1.1	TIP P-5720	COUNTY WAKE	GEOLOGIST Lane, R.W.	
SITE DESCRIPTION PROPOSED GRADE-SEPARATION OF DURANT RD (SR 2006) OVER CSX S LINE RAILROAD IN RALEIGH				GROUND WTR (ft)
BORING NO. RW1-1	STATION 22+00	OFFSET 43 ft LT	ALIGNMENT -L-	0 HR. 19.6
COLLAR ELEV. 276.9 ft	TOTAL DEPTH 30.0 ft	NORTHING 782,178	EASTING 2,126,678	24 HR. 17.1
DRILL RIG/HAMMER EFF/DATE BRI7893 CME-550 90%06/06/2017		DRILL METHOD H.S. Augers	HAMMER TYPE Automatic	
DRILLER Blackley, D.		START DATE 11/29/17	COMP. DATE 11/29/17	SURFACE WATER DEPTH N/A

ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT			BLOWS PER FOOT					SAMP. NO.	LOG	SOIL AND ROCK DESCRIPTION	DEPTH (ft)	
			0.5ft	0.5ft	0.5ft	0	25	50	75	100					
280														276.9	0.0
275	275.9	1.0		3	3	3						SS-19	12%	ROADWAY EMBANKMENT TAN, SANDY SILT (A-4)	4.5
	273.4	3.5		3	4	6								M	
270	270.9	6.0		7	10	14						D		PINK, TAN, AND BLACK, SILTY SAND (A-2-4), SAPROLITIC W/ SOME ROCK FRAGS.	13.0
	268.4	8.5		5	8	9								D	
265	263.4	13.5		13	10	6						M		WEATHERED ROCK PINK, GRANITE	27.0
	258.4	18.5		15	23	25								D	
255	253.4	23.5		33	67/0.4						D				
	248.4	28.5		22	25	23									

Boring Terminated at Elevation 246.9 ft In RESIDUAL (A-2-4)

NCDOT BORE DOUBLE P5720_GEO_GINT.GPJ NC_DOT.GDT 2/5/19

GEOTECHNICAL BORING REPORT

BORE LOG

WBS 46932.1.1		TIP P-5720		COUNTY WAKE		GEOLOGIST Lane, R.W.										
SITE DESCRIPTION PROPOSED GRADE-SEPARATION OF DURANT RD (SR 2006) OVER CSX S LINE RAILROAD IN RALEIGH							GROUND WTR (ft)									
BORING NO. RW1-2		STATION 22+50		OFFSET 43 ft LT		ALIGNMENT -L-										
COLLAR ELEV. 274.7 ft		TOTAL DEPTH 30.0 ft		NORTHING 782,166		EASTING 2,126,728										
DRILL RIGHAMMER EFF./DATE BRI7893 CME-550 90%06/06/2017				DRILL METHOD H.S. Augers		HAMMER TYPE Automatic										
DRILLER Blackley, D.		START DATE 11/29/17		COMP. DATE 11/29/17		SURFACE WATER DEPTH N/A										
ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT			BLOWS PER FOOT					SAMP. NO.	LOG	SOIL AND ROCK DESCRIPTION	DEPTH (ft)		
			0.5ft	0.5ft	0.5ft	0	25	50	75	100						
275														274.7	0.0	0.2' TOPSOIL
	273.7	1.0	6	4	3									271.7	3.0	ROADWAY EMBANKMENT BROWN, CLAYEY SAND (A-2-6)
	271.2	3.5	3	4	10									269.2	5.5	GRAY, SANDY CLAY (A-6)
270																RESIDUAL TAN, ORANGE, PINK, AND WHITE, SILTY SAND (A-2-4), SAPROLITIC W/ SOME ROCK FRAGS.
	268.7	6.0	11	8	4											
	266.2	8.5	12	24	40											
265																
	261.2	13.5	4	5	23									261.7	13.0	BROWN, SANDY SILT (A-4), SAPROLITIC
260														260.2	14.5	PINK, TAN, WHITE, AND BROWN, SILTY SAND (A-2-4), SAPROLITIC W/ LITTLE ROCK FRAGS.
	256.2	18.5	5	5	19											
255																
	251.2	23.5	6	14	35											
250																
	246.2	28.5	69	19	14											
245																
Boring Terminated at Elevation 244.7 ft In RESIDUAL (A-2-4)																

WBS 46932.1.1		TIP P-5720		COUNTY WAKE		GEOLOGIST Lane, R.W.										
SITE DESCRIPTION PROPOSED GRADE-SEPARATION OF DURANT RD (SR 2006) OVER CSX S LINE RAILROAD IN RALEIGH							GROUND WTR (ft)									
BORING NO. RW1-3		STATION 23+00		OFFSET 43 ft LT		ALIGNMENT -L-										
COLLAR ELEV. 274.3 ft		TOTAL DEPTH 30.0 ft		NORTHING 782,154		EASTING 2,126,777										
DRILL RIGHAMMER EFF./DATE BRI7893 CME-550 90%06/06/2017				DRILL METHOD H.S. Augers		HAMMER TYPE Automatic										
DRILLER Blackley, D.		START DATE 11/28/17		COMP. DATE 11/28/17		SURFACE WATER DEPTH N/A										
ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT			BLOWS PER FOOT					SAMP. NO.	LOG	SOIL AND ROCK DESCRIPTION	DEPTH (ft)		
			0.5ft	0.5ft	0.5ft	0	25	50	75	100						
275														274.3	0.0	0.3' BITUMINOUS CONCRETE
	272.3	2.0	4	3	3									272.4	1.9	1.6' BASE COURSE AGGREGATE
	270.8	3.5	5	12	24									270.8	3.5	ROADWAY EMBANKMENT TAN, CLAYEY SAND (A-2-6)
270																RESIDUAL PINK, BROWN, WHITE, BLuish-GRAY, AND TAN, SILTY SAND (A-2-4), SAPROLITIC W/ SOME ROCK FRAGS.
	268.3	6.0	12	19	22											
	265.8	8.5	14	12	11											
265																
	260.8	13.5	10	15	21											
260																
	255.8	18.5	7	8	10											
255																
	250.8	23.5	8	9	13											
250																
	245.8	28.5	7	13	15											
245																
Boring Terminated at Elevation 244.3 ft In RESIDUAL (A-2-4)																

NCDOT BORE DOUBLE P5720_GEO_GINT.GPJ NC_DOT.GDT 2/5/19

GEOTECHNICAL BORING REPORT

BORE LOG

WBS 46932.1.1		TIP P-5720		COUNTY WAKE		GEOLOGIST Lane, R.W.	
SITE DESCRIPTION PROPOSED GRADE-SEPARATION OF DURANT RD (SR 2006) OVER CSX S LINE RAILROAD IN RALEIGH							GROUND WTR (ft)
BORING NO. RW1-4		STATION 23+50		OFFSET 43 ft LT		ALIGNMENT -L-	
COLLAR ELEV. 274.2 ft		TOTAL DEPTH 14.3 ft		NORTHING 782,140		EASTING 2,126,826	
DRILL RIGHAMMER EFF./DATE BRI7893 CME-550 90%06/06/2017				DRILL METHOD H.S. Augers		HAMMER TYPE Automatic	
DRILLER Blackley, D.		START DATE 11/28/17		COMP. DATE 11/28/17		SURFACE WATER DEPTH N/A	

ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT			BLOWS PER FOOT					SAMP. NO.	LOG	SOIL AND ROCK DESCRIPTION	DEPTH (ft)	
			0.5ft	0.5ft	0.5ft	0	25	50	75	100					
275															
	273.2	1.0	3	4	3									0.2' BITUMINOUS CONCRETE 0.5' BASE COURSE AGGREGATE" ROADWAY EMBANKMENT	0.0
	270.7	3.5	1	1	1									BROWN, SANDY SILT (A-4), MICACEOUS	5.0
	267.2	7.0												BROWN, SILTY SAND (A-2-4) MICACEOUS	7.0
	265.7	8.5	6	19	44									RESIDUAL GRAY AND TAN, SILTY SAND (A-2-4), SAPROLITIC	8.5
	260.7	13.5	44	56/0.3										WEATHERED ROCK GRAY AND TAN, GRANITE	14.3
														Boring Terminated at Elevation 259.9 ft In WR Granite	
														Other Samples: ST-1 (5.0 - 7.0)	

WBS 46932.1.1		TIP P-5720		COUNTY WAKE		GEOLOGIST Lane, R.W.	
SITE DESCRIPTION PROPOSED GRADE-SEPARATION OF DURANT RD (SR 2006) OVER CSX S LINE RAILROAD IN RALEIGH							GROUND WTR (ft)
BORING NO. RW1-5		STATION 24+00		OFFSET 43 ft LT		ALIGNMENT -L-	
COLLAR ELEV. 274.3 ft		TOTAL DEPTH 19.8 ft		NORTHING 782,125		EASTING 2,126,874	
DRILL RIGHAMMER EFF./DATE BRI7893 CME-550 90%06/06/2017				DRILL METHOD H.S. Augers		HAMMER TYPE Automatic	
DRILLER Blackley, D.		START DATE 11/28/17		COMP. DATE 11/28/17		SURFACE WATER DEPTH N/A	

ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT			BLOWS PER FOOT					SAMP. NO.	LOG	SOIL AND ROCK DESCRIPTION	DEPTH (ft)	
			0.5ft	0.5ft	0.5ft	0	25	50	75	100					
275															
	273.3	1.0	2	3	2									0.2' BITUMINOUS CONCRETE 0.3' BASE COURSE AGGREGATE ROADWAY EMBANKMENT	0.0
	270.8	3.5	2	2	2									ORANGE, GRAY, AND BROWN, CLAY (A-7-5), MICACEOUS W/ SAND LENSES	5.0
	268.3	6.0	WOH	2	3									RESIDUAL GRAY, SANDY CLAY (A-6)	8.0
	265.8	8.5	3	15	22									PINK, TAN, WHITE, AND GRAY, SILTY SAND (A-2-4), SAPROLITIC W/ SOME ROCK FRAGS.	9.0
	260.8	13.5	20	28	48									WEATHERED ROCK RED ORANGE AND TAN, GRANITE	18.5
	255.8	18.5	44	55	45/0.3									Boring Terminated at Elevation 254.5 ft In WR Granite	19.8

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GEOTECHNICAL BORING REPORT

BORE LOG

WBS 46932.1.1		TIP P-5720		COUNTY WAKE		GEOLOGIST Lane, R.W.	
SITE DESCRIPTION PROPOSED GRADE-SEPARATION OF DURANT RD (SR 2006) OVER CSX S LINE RAILROAD IN RALEIGH							GROUND WTR (ft)
BORING NO. RW1-6		STATION 24+50		OFFSET 43 ft LT		ALIGNMENT -L-	
COLLAR ELEV. 273.5 ft		TOTAL DEPTH 23.8 ft		NORTHING 782,110		EASTING 2,126,923	
DRILL RIGHAMMER EFF./DATE BRI7893 CME-550 90%06/06/2017				DRILL METHOD H.S. Augers		HAMMER TYPE Automatic	
DRILLER Blackley, D.		START DATE 11/28/17		COMP. DATE 11/28/17		SURFACE WATER DEPTH N/A	

ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT			BLOWS PER FOOT					SAMP. NO.	LOG MOI	SOIL AND ROCK DESCRIPTION	DEPTH (ft)		
			0.5ft	0.5ft	0.5ft	0	25	50	75	100						
275																
	272.5	1.0	3	3	4								M	0.3' BITUMINOUS CONCRETE 0.7' BASE COURSE AGGREGATE	1.0	
	270.0	3.5	4	2	1								M	ROADWAY EMBANKMENT GRAY AND BROWN, SANDY CLAY (A-6) W/ SAND LENSES		
	267.5	6.0	2	3	3								M			
	265.0	8.5	4	4	8								M	RESIDUAL GREEN-GRAY AND ORANGE, CLAYEY SAND (A-2-6), SAPROLITIC	8.0	
	260.0	13.5	11	11	17								M	PINK, TAN, AND BROWN, SILTY SAND (A-2-4), SAPROLITIC W/ SOME ROCK FRAGS.	13.0	
	255.0	18.5	16	24	21								M			
	250.0	23.5											M	WEATHERED ROCK PINK AND TAN, GRANITE	22.0	
															23.8	
															Boring Terminated at Elevation 249.7 ft In WR Granite	

WBS 46932.1.1		TIP P-5720		COUNTY WAKE		GEOLOGIST Lane, R.W.	
SITE DESCRIPTION PROPOSED GRADE-SEPARATION OF DURANT RD (SR 2006) OVER CSX S LINE RAILROAD IN RALEIGH							GROUND WTR (ft)
BORING NO. RW1-7		STATION 25+00		OFFSET 43 ft LT		ALIGNMENT -L-	
COLLAR ELEV. 272.0 ft		TOTAL DEPTH 34.8 ft		NORTHING 782,093		EASTING 2,126,971	
DRILL RIGHAMMER EFF./DATE BRI7893 CME-550 90%06/06/2017				DRILL METHOD H.S. Augers		HAMMER TYPE Automatic	
DRILLER Blackley, D.		START DATE 11/27/17		COMP. DATE 11/27/17		SURFACE WATER DEPTH N/A	

ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT			BLOWS PER FOOT					SAMP. NO.	LOG MOI	SOIL AND ROCK DESCRIPTION	DEPTH (ft)		
			0.5ft	0.5ft	0.5ft	0	25	50	75	100						
275																
	271.0	1.0	3	3	2								M	0.3' BITUMINOUS CONCRETE 0.7' BASE COURSE AGGREGATE	1.0	
	268.5	3.5	3	3	3								M	ROADWAY EMBANKMENT BROWN, CLAYEY SAND (A-2-6) W/ TRACE ORGANICS	2.5	
	266.0	6.0	2	3	6								M	RESIDUAL GRAY AND ORANGE, SANDY CLAY (A-6)	8.5	
	263.5	8.5	3	3	5								M	GRAY, CLAYEY SAND (A-2-6) W/ TRACE ROCK FRAGS.	8.5	
	258.5	13.5	8	11	9								M	PINK, WHITE, BROWN, RED, AND TAN, SILTY SAND (A-2-4), SAPROLITIC W/ SOME ROCK FRAGS.	13.5	
	253.5	18.5	13	18	21								M			
	248.5	23.5	13	19	25								M			
	243.5	28.5	11	13	12								M			
	238.5	33.5	10	42	58/0.3								M	WEATHERED ROCK PINK, TAN, BLACK, AND WHITE, GRANITE	33.5	
															34.8	
															Boring Terminated at Elevation 237.2 ft In WR Granite	

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GEOTECHNICAL BORING REPORT

BORE LOG

WBS 46932.1.1		TIP P-5720		COUNTY WAKE		GEOLOGIST Lane, R.W.	
SITE DESCRIPTION PROPOSED GRADE-SEPARATION OF DURANT RD (SR 2006) OVER CSX S LINE RAILROAD IN RALEIGH							GROUND WTR (ft)
BORING NO. RW1-8		STATION 25+50		OFFSET 43 ft LT		ALIGNMENT -L-	
COLLAR ELEV. 271.3 ft		TOTAL DEPTH 39.4 ft		NORTHING 782,075		EASTING 2,127,018	
DRILL RIGHAMMER EFF./DATE BRI7893 CME-550 90%06/06/2017				DRILL METHOD H.S. Augers		HAMMER TYPE Automatic	
DRILLER Blackley, D.		START DATE 11/27/17		COMP. DATE 11/27/17		SURFACE WATER DEPTH N/A	

ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT			BLOWS PER FOOT					SAMP. NO.	MOI	LOG	SOIL AND ROCK DESCRIPTION	DEPTH (ft)
			0.5ft	0.5ft	0.5ft	0	25	50	75	100					
275															
270	270.3	1.0	8	5	6									0.2' BITUMINOUS CONCRETE 0.3' AGGREGATE COURSE BASE ROADWAY EMBANKMENT TAN-ORANGE, SANDY CLAY (A-6) RESIDUAL GRAY AND ORANGE, CLAYEY SAND (A-2-6)	0.0 0.5 3.0
265	265.3	6.0	5	6	7										
260	262.8	8.5	3	4	4										
255	257.8	13.5	2	5	9										
250	252.8	18.5	6	12	16										
245	247.8	23.5	8	13	10										
240	242.8	28.5	17	21	24										
235	237.8	33.5	19	24	27										
	232.8	38.5	50	50/0.4										WEATHERED ROCK PINK, WHITE, AND BROWN, GRANITE Boring Terminated at Elevation 231.9 ft In WR Granite	38.5 39.4

WBS 46932.1.1		TIP P-5720		COUNTY WAKE		GEOLOGIST Lane, R.W.	
SITE DESCRIPTION PROPOSED GRADE-SEPARATION OF DURANT RD (SR 2006) OVER CSX S LINE RAILROAD IN RALEIGH							GROUND WTR (ft)
BORING NO. RW2-1		STATION 12+99		OFFSET 31 ft RT		ALIGNMENT -Y3-	
COLLAR ELEV. 279.4 ft		TOTAL DEPTH 8.9 ft		NORTHING 781,656		EASTING 2,127,213	
DRILL RIGHAMMER EFF./DATE BRI7893 CME-550 90%06/06/2017				DRILL METHOD H.S. Augers		HAMMER TYPE Automatic	
DRILLER Blackley, D.		START DATE 12/07/17		COMP. DATE 12/07/17		SURFACE WATER DEPTH N/A	

ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT			BLOWS PER FOOT					SAMP. NO.	MOI	LOG	SOIL AND ROCK DESCRIPTION	DEPTH (ft)
			0.5ft	0.5ft	0.5ft	0	25	50	75	100					
280															
275	278.4	1.0	7	8	20									0.5' BITUMINOUS CONCRETE 0.5' AGGREGATE COURSE BASE RESIDUAL TAN AND WHITE, SILTY SAND (A-2-4), SAPROLITIC WEATHERED ROCK TAN, PINK, AND GRAY, GRANITE	0.0 1.0 3.0 8.9
	275.9	3.5	81	19/0.1											
	273.4	6.0	90	10/0.1											
	270.9	8.5	100/0.4												

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GEOTECHNICAL BORING REPORT

BORE LOG

WBS 46932.1.1		TIP P-5720		COUNTY WAKE		GEOLOGIST Lane, R.W.										
SITE DESCRIPTION PROPOSED GRADE-SEPARATION OF DURANT RD (SR 2006) OVER CSX S LINE RAILROAD IN RALEIGH							GROUND WTR (ft)									
BORING NO. RW2-2B		STATION 13+67		OFFSET 43 ft RT		ALIGNMENT -Y3-										
COLLAR ELEV. 278.9 ft		TOTAL DEPTH 29.1 ft		NORTHING 781,714		EASTING 2,127,252										
DRILL RIGHAMMER EFF./DATE BRI7893 CME-550 90%06/06/2017			DRILL METHOD H.S. Augers		HAMMER TYPE Automatic											
DRILLER Blackley, D.		START DATE 12/08/17		COMP. DATE 12/08/17		SURFACE WATER DEPTH N/A										
ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT			BLOWS PER FOOT					SAMP. NO.	LOG	SOIL AND ROCK DESCRIPTION			
			0.5ft	0.5ft	0.5ft	0	25	50	75	100			ELEV. (ft)	DEPTH (ft)		
280														278.9	0.0	0.3' TOPSOIL
	277.4	1.5														
	275.4	3.5	8	9	13											
	272.9	6.0	5	6	9											
	270.4	8.5	6	10	16											
	270.4	8.5	3	5	13											
	265.4	13.5	10	8	16											
	260.4	18.5	19	13	10											
	255.4	23.5	18	7	8											
	250.4	28.5	66	34/0.1												
														250.9	28.0	WEATHERED ROCK
														249.8	29.1	TAN, GRANITE
																Boring Terminated at Elevation 249.8 ft in WR Granite

WBS 46932.1.1		TIP P-5720		COUNTY WAKE		GEOLOGIST Lane, R.W.										
SITE DESCRIPTION PROPOSED GRADE-SEPARATION OF DURANT RD (SR 2006) OVER CSX S LINE RAILROAD IN RALEIGH							GROUND WTR (ft)									
BORING NO. RW2-3		STATION 14+14		OFFSET 43 ft RT		ALIGNMENT -Y3-										
COLLAR ELEV. 276.6 ft		TOTAL DEPTH 40.0 ft		NORTHING 781,756		EASTING 2,127,272										
DRILL RIGHAMMER EFF./DATE BRI7893 CME-550 90%06/06/2017			DRILL METHOD H.S. Augers		HAMMER TYPE Automatic											
DRILLER Blackley, D.		START DATE 12/11/17		COMP. DATE 12/11/17		SURFACE WATER DEPTH N/A										
ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT			BLOWS PER FOOT					SAMP. NO.	LOG	SOIL AND ROCK DESCRIPTION			
			0.5ft	0.5ft	0.5ft	0	25	50	75	100			ELEV. (ft)	DEPTH (ft)		
280														276.6	0.0	
	274.6	2.0												274.6	2.0	ROADWAY EMBANKMENT
	273.1	3.5	8	17	22									273.1	3.5	TAN, CLAY (A-6)
	270.6	6.0	18	21	23											RESIDUAL
	270.6	6.0	10	13	14											TAN, SILT (A-5)
	268.1	8.5	7	9	11											TAN, BLACK, PINK, GREEN, AND WHITE, SILTY SAND (A-2-4), SAPROLITIC W/ SOME ROCK FRAGS.
	266.1	10.5	10	13	14											
	263.1	13.5	7	9	11											
	263.1	13.5	7	12	20											
	258.1	18.5	11	18	20											
	255.1	23.5	8	8	9											
	253.1	23.5	8	8	9											
	248.1	28.5	15	17	28											
	243.1	33.5	10	17	20											
	238.1	38.5	15	23	31											
														236.6	40.0	Boring Terminated at Elevation 236.6 ft In RESIDUAL (A-2-4)

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