

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
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5-6	CROSS SECTIONS
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**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

**REFERENCE: P-5720**

**PROJECT: 46932**



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

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

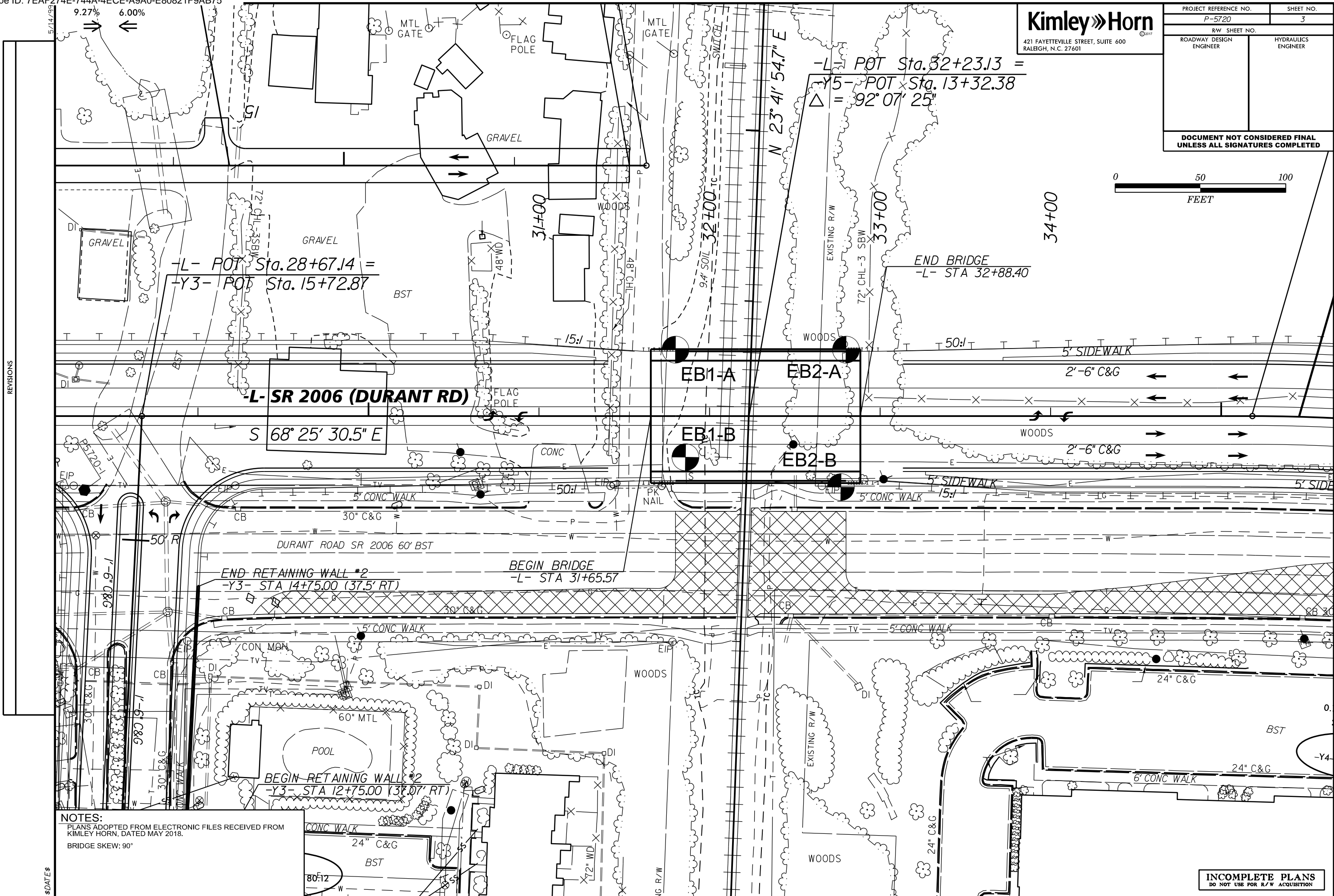
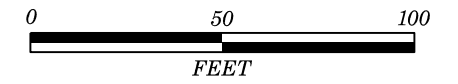
# NORTH CAROLINA DEPARTMENT OF TRANSPORTATION DIVISION OF HIGHWAYS GEOTECHNICAL ENGINEERING UNIT

## 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 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><b>SOIL LEGEND AND AASHTO CLASSIFICATION</b></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 (&gt; 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> <th>A-16</th><th>A-17</th><th>A-18</th><th>A-19</th><th>A-20</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-8</td><td>A-9</td><td>A-10</td><td>A-11</td><td>A-12</td><td>A-13</td><td>A-14</td><td>A-15</td><td>A-16</td><td>A-17</td> </tr> <tr> <td>SYMBOL</td> <td colspan="5">[Pattern]</td><td colspan="5">[Pattern]</td><td colspan="5">[Pattern]</td><td colspan="5">[Pattern]</td> </tr> </table>										GENERAL CLASS.	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	A-16	A-17	A-18	A-19	A-20	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-8	A-9	A-10	A-11	A-12	A-13	A-14	A-15	A-16	A-17	SYMBOL	[Pattern]					[Pattern]					[Pattern]					[Pattern]					<p><b>ANGULARITY OF GRAINS</b></p> <p>THE ANGULARITY OR ROUNDNESS OF SOIL GRAINS IS DESIGNATED BY THE TERMS: ANGULAR, SUBANGULAR, SUBROUNDED, OR ROUNDED.</p>										<p><b>WEATHERED ROCK (WR)</b></p> <p>NON-COASTAL PLAIN MATERIAL THAT WOULD YIELD SPT N VALUES &gt; 100 BLOWS PER FOOT IF TESTED.</p>										<p><b>CRYSTALLINE ROCK (CR)</b></p> <p>FINE TO COARSE GRAIN IGNEOUS AND METAMORPHIC ROCK THAT WOULD YIELD SPT REFUSAL IF TESTED. ROCK TYPE INCLUDES GRANITE, GNEISS, GABBRO, SCHIST, ETC.</p>									
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<p><b>MINERALOGICAL COMPOSITION</b></p> <p>MINERAL NAMES SUCH AS QUARTZ, FELDSPAR, MICA, TALC, KAOLIN, ETC. ARE USED IN DESCRIPTIONS WHEN THEY ARE CONSIDERED OF SIGNIFICANCE.</p>										<p><b>COMPRESSION</b></p> <p>SLIGHTLY COMPRESSIBLE LL &lt; 31 MODERATELY COMPRESSIBLE LL = 31 - 50 HIGHLY COMPRESSIBLE LL &gt; 50</p>										<p><b>NON-CRYSTALLINE ROCK (NCR)</b></p> <p>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.</p>										<p><b>COASTAL PLAIN SEDIMENTARY ROCK (CP)</b></p> <p>COASTAL PLAIN SEDIMENTS CEMENTED INTO ROCK, BUT MAY NOT YIELD SPT REFUSAL. ROCK TYPE INCLUDES LIMESTONE, SANDSTONE, CEMENTED SHELL BEDS, ETC.</p>																																																																																							
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<p><b>TEXTURE OR GRAIN SIZE</b></p> <table border="1" style="width: 100%; text-align: center;"> <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>BOULDER (BLDR.)</td> <td></td><td></td><td></td><td></td><td></td><td></td> </tr> <tr> <td>COBBLE (COB.)</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>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	BOULDER (BLDR.)							COBBLE (COB.)	4.75	2.00	0.42	0.25	0.075	0.053	GRAVEL (GR.)							COARSE SAND (CSE. SD.)							FINE SAND (F SD.)							SILT (SL.)							CLAY (CL.)							<p><b>SOIL MOISTURE - CORRELATION OF TERMS</b></p> <table border="1" style="width: 100%; text-align: center;"> <tr> <th>SOIL MOISTURE SCALE (ATTERBERG LIMITS)</th> <th>FIELD MOISTURE DESCRIPTION</th> <th>GUIDE FOR FIELD MOISTURE DESCRIPTION</th> </tr> <tr> <td>LL - LIQUID LIMIT</td> <td>- SATURATED - (SAT.)</td> <td>USUALLY LIQUID; VERY WET, USUALLY FROM BELOW THE GROUND WATER TABLE</td> </tr> <tr> <td>PL - PLASTIC LIMIT</td> <td>- WET - (W)</td> <td>SEMISOLID; REQUIRES DRYING TO ATTAIN OPTIMUM MOISTURE</td> </tr> <tr> <td>OM - OPTIMUM MOISTURE SHRINKAGE LIMIT</td> <td>- MOIST - (M)</td> <td>SOLID; AT OR NEAR OPTIMUM MOISTURE</td> </tr> <tr> <td>SL - SHRINKAGE LIMIT</td> <td>- DRY - (D)</td> <td>REQUIRES ADDITIONAL WATER TO ATTAIN OPTIMUM MOISTURE</td> </tr> </table>										SOIL MOISTURE SCALE (ATTERBERG LIMITS)	FIELD MOISTURE DESCRIPTION	GUIDE FOR FIELD MOISTURE DESCRIPTION	LL - LIQUID LIMIT	- SATURATED - (SAT.)	USUALLY LIQUID; VERY WET, USUALLY FROM BELOW THE GROUND WATER TABLE	PL - 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 - SHRINKAGE LIMIT	- DRY - (D)	REQUIRES ADDITIONAL WATER TO ATTAIN OPTIMUM MOISTURE	<p><b>EQUIPMENT USED ON SUBJECT PROJECT</b></p> <p>DRILL UNITS: <input type="checkbox"/> CME-45C <input type="checkbox"/> CME-55 <input checked="" type="checkbox"/> CME-550 <input type="checkbox"/> VANE SHEAR TEST <input type="checkbox"/> PORTABLE HOIST</p> <p>ADVANCING TOOLS: <input type="checkbox"/> CLAY BITS <input type="checkbox"/> 6" CONTINUOUS FLIGHT AUGER <input checked="" type="checkbox"/> 8" HOLLOW AUGERS <input type="checkbox"/> HARD FACED FINGER BITS <input type="checkbox"/> TUNG-CARBIDE INSERTS <input type="checkbox"/> CASING <input type="checkbox"/> W/ ADVANCER <input type="checkbox"/> TRICONE * STEEL TEETH <input type="checkbox"/> TRICONE * TUNG-CARB. <input type="checkbox"/> CORE BIT</p> <p>HAMMER TYPE: <input checked="" type="checkbox"/> AUTOMATIC <input type="checkbox"/> MANUAL</p> <p>CORE SIZE: <input type="checkbox"/> -B <input type="checkbox"/> -H <input type="checkbox"/> -N</p> <p>HAND TOOLS: <input type="checkbox"/> POST HOLE DIGGER <input type="checkbox"/> HAND AUGER <input type="checkbox"/> SOUNDING ROD <input type="checkbox"/> VANE SHEAR TEST</p>																										
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<p><b>COLOR</b></p> <p>DESCRIPTIONS MAY INCLUDE COLOR OR COLOR COMBINATIONS (TAN, RED, YELLOW-BROWN, BLUE-BROWN). MODIFIERS SUCH AS LIGHT, DARK, STREAKED, ETC. ARE USED TO DESCRIBE APPEARANCE.</p>										<p><b>INDURATION</b></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. MODERATELY INDURATED GRAINS CAN BE SEPARATED FROM SAMPLE WITH STEEL PROBE; BREAKS EASILY WHEN HIT WITH HAMMER. INDURATED GRAINS ARE DIFFICULT TO SEPARATE WITH STEEL PROBE; DIFFICULT TO BREAK WITH HAMMER. EXTREMELY INDURATED SHARP HAMMER BLOWS REQUIRED TO BREAK SAMPLE; SAMPLE BREAKS ACROSS GRAINS.</p>																																																																																																											
<p><b>BENCH MARK:</b> BORING ELEVATIONS TAKEN FROM P5720_Is.tnl_I70522.tin DATED 01/15/18 ELEVATION: FEET</p>										<p><b>NOTES:</b> FIAD - FILLED IMMEDIATELY AFTER DRILLING</p>																																																																																																											

PROJECT REFERENCE NO. P-5720	SHEET NO. 3
RW SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
<b>DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED</b>	

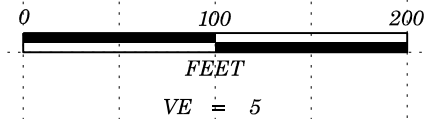


REVISIONS

**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

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
<b>INCOMPLETE PLANS</b> DO NOT USE FOR R/W ACQUISITION	
<b>DOCUMENT NOT CONSIDERED FINAL</b> UNLESS ALL SIGNATURES COMPLETED	

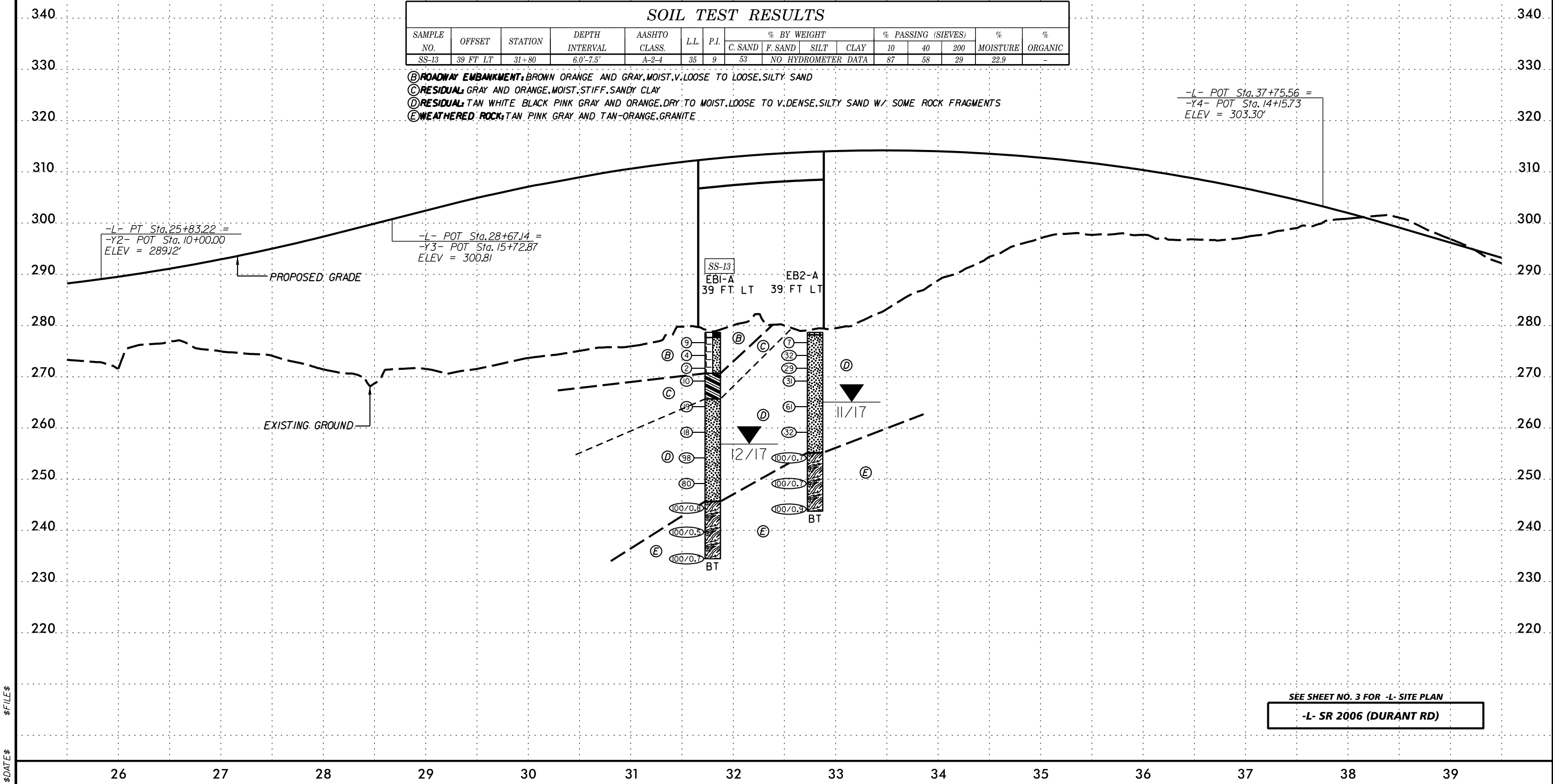
SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT				% PASSING (SIEVES)			% MOISTURE	% ORGANIC
							C. SAND	F. SAND	SILT	CLAY	10	40	200		
SS-13	39 FT LT	31+80	6.0'-7.5'	A-2-4	35	9	53	NO HYDROMETER DATA	87	58	29	22.9	-		

- (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

-L- POT Sta. 37+75.56 =  
 -Y4- POT Sta. 14+15.73  
 ELEV = 303.30'

-L- PT Sta. 25+83.22 =  
 -Y2- POT Sta. 10+00.00  
 ELEV = 289.12'

-L- POT Sta. 28+67.14 =  
 -Y3- POT Sta. 15+72.87  
 ELEV = 300.81'

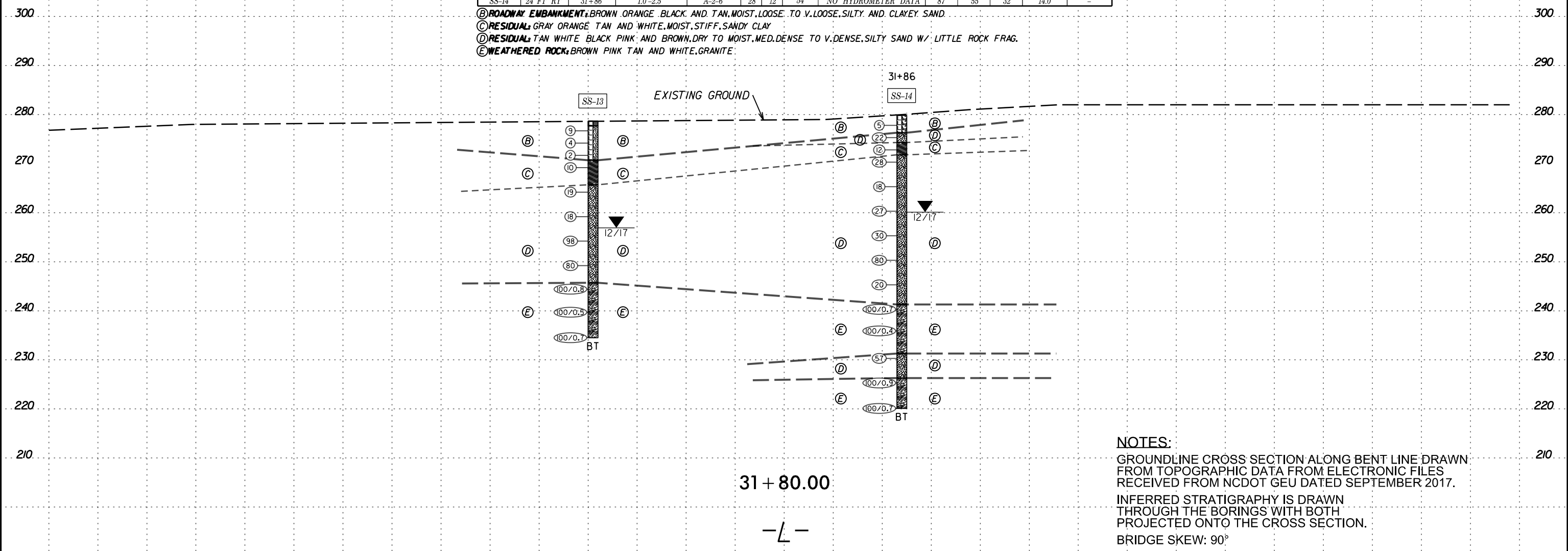


SEE SHEET NO. 3 FOR -L- SITE PLAN  
 -L- SR 2006 (DURANT RD)

\$DATE\$

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	-

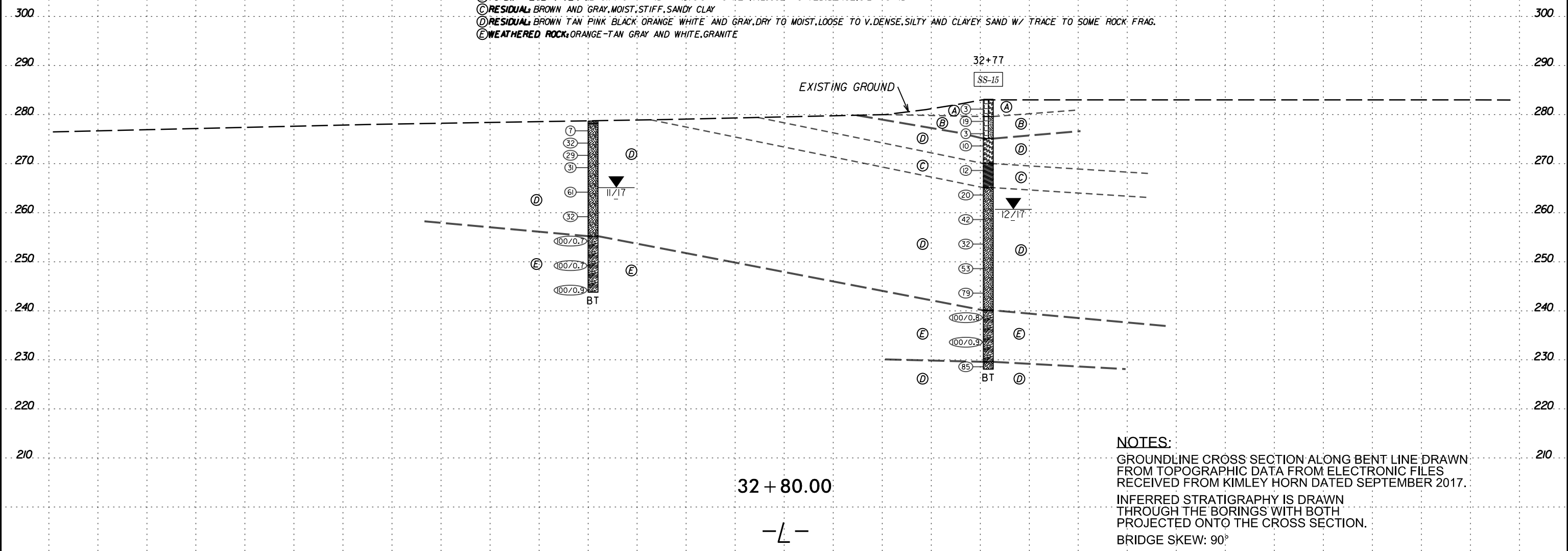
- (B) ROADWAY EMBANKMENT: BROWN ORANGE BLACK AND TAN, MOIST, LOOSE TO V. LOOSE, SILTY AND CLAYEY SAND.
- (C) RESIDUAL: GRAY ORANGE TAN AND WHITE, MOIST, STIFF, SANDY CLAY
- (D) RESIDUAL: TAN WHITE BLACK PINK AND BROWN, DRY TO MOIST, MED. DENSE TO V. DENSE, SILTY SAND W/ LITTLE ROCK FRAG.
- (E) WEATHERED 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										
	265.2	13.5	16	25	36										
265	265.2	13.5	16	25	36										
260	260.2	18.5	16	16	16										
	255.2	23.5	67	33/0.2										255.2	23.5
255	255.2	23.5	67	33/0.2											
250	250.2	28.5	63	37/0.2											
	245.2	33.5	23	44	56/0.4									243.8	34.9
245	245.2	33.5	23	44	56/0.4										
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										
	269.6	13.5	3	5	7										
270	269.6	13.5	3	5	7										
265	264.6	18.5	8	9	11										
	259.6	23.5	15	19	23										
260	259.6	23.5	15	19	23										
255	254.6	28.5	6	13	19										
	249.6	33.5	15	27	26										
250	249.6	33.5	15	27	26										
245	244.6	38.5	11	28	51										
	239.6	43.5	44	56/0.3											
240	239.6	43.5	44	56/0.3											
235	234.6	48.5	13	28	72/0.4										
	229.6	53.5	9	44	41										
230	229.6	53.5	9	44	41										
Boring Terminated at Elevation 228.1 ft In RESIDUAL (Silty Sand)															

NCDOT BORE DOUBLE P5720\_GEO\_GINT.GPJ NC\_DOT.GDT 12/7/18