

REFERENCE: I-5973

PROJECT: 44990.1.1

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

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	I-5973	1	41

CONTENTS

<u>SHEET NO.</u>	<u>DESCRIPTION</u>
1	TITLE SHEET
2	LEGEND (SOIL & ROCK)
3 - 7	SITE PLANS
8 - 9	PAVEMENT DATA
10 - 16	DCP LOGS
17 - 21	CORE PHOTOS
22 - 41	LAB SUMMARY

**ROADWAY
SUBSURFACE INVESTIGATION**

COUNTY MECKLENBURG
PROJECT DESCRIPTION I-485 AT NC 16 (BROOKSHIRE BLVD)

PAVEMENT AND SUBGRADE INVENTORY

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

T. MILLER

L. GREENE

INVESTIGATED BY D. STROTHER

DRAWN BY C. CHANDLER

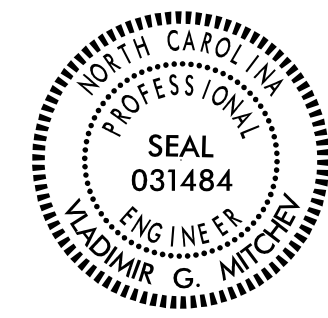
CHECKED BY V. MITCHEV

SUBMITTED BY V. MITCHEV

DATE MAY 2020



3201 SPRING FOREST ROAD
RALEIGH, NC 27616
(919) 872-2660



DocuSigned by:
Vladimir G. Mitchev 11/4/2020

BCFD5CAB5F6E4B7... 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 208, 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>																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																											
SOIL LEGEND AND AASHTO CLASSIFICATION																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																											
<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <th rowspan="2">GENERAL CLASS.</th> <th colspan="7">GRANULAR MATERIALS (≤ 35% PASSING #200)</th> <th colspan="3">SILT-CLAY MATERIALS (> 35% PASSING #200)</th> <th colspan="3">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> </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></td> <td>A-7-5</td> <td>A-7-6</td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>SYMBOL</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>% PASSING #10 #40 #200</td> <td>50 MX 30 MX 15 MX</td> <td>50 MX 25 MX 10 MN</td> <td>35 MX 35 MX 35 MX</td> <td>35 MX 35 MX 35 MX</td> <td>35 MX 35 MX 35 MX</td> <td>35 MX 35 MX 35 MX</td> <td>36 MN 36 MN 36 MN</td> <td>36 MN 36 MN 36 MN</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>MATERIAL PASSING #40 LL PI</td> <td colspan="12"> <table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td>LL</td> <td>6</td> <td>6</td> <td>40 MX</td> <td>41 MN</td> <td>40 MX</td> <td>41 MN</td> <td>40 MX</td> <td>41 MN</td> <td>40 MX</td> <td>41 MN</td> <td>40 MX</td> <td>41 MN</td> <td></td> <td></td> </tr> <tr> <td>PI</td> <td></td> <td></td> <td>NP</td> <td>10 MX</td> <td>10 MN</td> <td>11 MN</td> <td>10 MX</td> <td>10 MN</td> <td>10 MX</td> <td>11 MN</td> <td>10 MX</td> <td>11 MN</td> <td></td> <td></td> </tr> </table> </td> </tr> <tr> <td>GROUP INDEX</td> <td>0</td> <td>0</td> <td>0</td> <td>4 MX</td> <td>8 MX</td> <td>12 MX</td> <td>16 MX</td> <td>NO MX</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>USUAL TYPES OF MAJOR MATERIALS</td> <td>STONE FRAGS. GRAVEL, AND SAND</td> <td>FINE SAND</td> <td colspan="4">SILTY OR CLAYEY GRAVEL AND SAND</td> <td colspan="2">SILTY SOILS</td> <td colspan="2">CLAYEY SOILS</td> <td colspan="2">SOILS WITH LITTLE OR MODERATE AMOUNTS OF ORGANIC MATTER</td> <td colspan="2">HIGHLY ORGANIC SOILS</td> </tr> <tr> <td>GEN. RATING AS SUBGRADE</td> <td colspan="3">EXCELLENT TO GOOD</td> <td colspan="4">FAIR TO POOR</td> <td>FAIR TO POOR</td> <td>POOR</td> <td colspan="2">UNSUITABLE</td> <td colspan="3"></td> </tr> <tr> <td colspan="14" style="text-align: center;">PI OF A-7-5 SUBGROUP IS ≤ LL - 30 ; PI OF A-7-6 SUBGROUP IS > LL - 30</td> </tr> <tr> <td colspan="4" style="text-align: center;">CONSISTENCY OR DENSENESS</td> </tr> <tr> <td>PRIMARY SOIL TYPE</td> <td>COMPACTNESS OR CONSISTENCY</td> <td>RANGE OF STANDARD PENETRATION RESISTANCE (N-VALUE)</td> <td>RANGE OF UNCONFINED COMPRESSIVE STRENGTH (TONS/FT²)</td> </tr> <tr> <td>GENERALLY GRANULAR MATERIAL (NON-COHESIVE)</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> <tr> <td colspan="4" style="text-align: center;">TEXTURE OR GRAIN SIZE</td> </tr> <tr> <td>U.S. STD. SIEVE SIZE (MM)</td> <td>4 4.76</td> <td>10 2.00</td> <td>40 0.42</td> <td>60 0.25</td> <td>200 0.075</td> <td>270 0.053</td> <td></td> </tr> <tr> <td>BOULDER (BLDR.)</td> <td>COBBLE (COB.)</td> <td>GRAVEL (GR.)</td> <td>COARSE SAND (CSE, SD.)</td> <td>FINE SAND (F SD.)</td> <td>SILT (SL.)</td> <td>CLAY (CL.)</td> <td></td> </tr> <tr> <td>GRAIN SIZE</td> <td>MM 305 IN. 12</td> <td>75 3</td> <td>2.0</td> <td>0.25</td> <td>0.05</td> <td>0.005</td> <td></td> </tr> <tr> <td colspan="4" style="text-align: center;">SOIL MOISTURE - CORRELATION OF TERMS</td> </tr> <tr> <td>SOIL MOISTURE SCALE (ATTERBERG LIMITS)</td> <td>FIELD MOISTURE DESCRIPTION</td> <td>GUIDE FOR FIELD MOISTURE DESCRIPTION</td> <td></td> </tr> <tr> <td>LL</td> <td>LIQUID LIMIT</td> <td>- SATURATED - (SAT.)</td> <td>USUALLY LIQUID; VERY WET, USUALLY FROM BELOW THE GROUND WATER TABLE</td> </tr> <tr> <td>PL</td> <td>PLASTIC LIMIT</td> <td>- WET - (W)</td> <td>SEMISOLID; REQUIRES DRYING TO ATTAIN OPTIMUM MOISTURE</td> </tr> <tr> <td>OM</td> <td>OPTIMUM MOISTURE SHRINKAGE LIMIT</td> <td>- MOIST - (M)</td> <td>SOLID; AT OR NEAR OPTIMUM MOISTURE</td> </tr> <tr> <td>SL</td> <td></td> <td>- DRY - (D)</td> <td>REQUIRES ADDITIONAL WATER TO ATTAIN OPTIMUM MOISTURE</td> </tr> <tr> <td colspan="4" style="text-align: center;">PLASTICITY</td> </tr> <tr> <td>NON PLASTIC</td> <td>PLASTICITY INDEX (PI) 0-5</td> <td>DRY STRENGTH VERY LOW</td> <td></td> </tr> <tr> <td>SLIGHTLY PLASTIC</td> <td>6-15</td> <td>SLIGHT</td> <td></td> </tr> <tr> <td>MODERATELY PLASTIC</td> <td>16-25</td> <td>MEDIUM</td> <td></td> </tr> <tr> <td>HIGHLY PLASTIC</td> <td>26 OR MORE</td> <td>HIGH</td> <td></td> </tr> <tr> <td colspan="4" style="text-align: center;">COLOR</td> </tr> <tr> <td colspan="4">DESCRIPTIONS MAY INCLUDE COLOR OR COLOR COMBINATIONS (TAN, RED, YELLOW-BROWN, BLUE-GRAY). MODIFIERS SUCH AS LIGHT, DARK, STREAKED, ETC. ARE USED TO DESCRIBE APPEARANCE.</td> </tr> <tr> <td colspan="4" style="text-align: center;">GRADATION</td> </tr> <tr> <td colspan="4">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.</td> </tr> <tr> <td colspan="4" style="text-align: center;">ANGULARITY OF GRAINS</td> </tr> <tr> <td colspan="4">THE ANGULARITY OR ROUNDNESS OF SOIL GRAINS IS DESIGNATED BY THE TERMS: ANGULAR, SUBANGULAR, SUBROUNDED, OR ROUNDED.</td> </tr> <tr> <td colspan="4" style="text-align: center;">MINERALOGICAL COMPOSITION</td> </tr> <tr> <td colspan="4">MINERAL NAMES SUCH AS QUARTZ, FELDSPAR, MICA, TALC, KAOLIN, ETC. ARE USED IN DESCRIPTIONS WHEN THEY ARE CONSIDERED OF SIGNIFICANCE.</td> </tr> <tr> <td colspan="4" style="text-align: center;">COMPRESSIBILITY</td> </tr> <tr> <td colspan="4">SLIGHTLY COMPRESSIBLE LL < 31 MODERATELY COMPRESSIBLE LL = 31 - 50 HIGHLY COMPRESSIBLE LL > 50</td> </tr> <tr> <td colspan="4" style="text-align: center;">PERCENTAGE OF MATERIAL</td> </tr> <tr> <td colspan="4"> <table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <th>ORGANIC MATERIAL</th> <th>GRANULAR SOILS</th> <th>SILT - CLAY SOILS</th> <th>OTHER MATERIAL</th> </tr> <tr> <td>TRACE OF ORGANIC MATTER</td> <td>2 - 3%</td> <td>3 - 5%</td> <td>TRACE 1 - 10%</td> </tr> <tr> <td>LITTLE ORGANIC MATTER</td> <td>3 - 5%</td> <td>5 - 12%</td> <td>LITTLE 10 - 20%</td> </tr> <tr> <td>MODERATELY ORGANIC</td> <td>5 - 10%</td> <td>12 - 20%</td> <td>SOME 20 - 35%</td> </tr> <tr> <td>HIGHLY ORGANIC</td> <td>> 10%</td> <td>> 20%</td> <td>HIGHLY 35% AND ABOVE</td> </tr> </table> </td> </tr> <tr> <td colspan="4" style="text-align: center;">GROUND WATER</td> </tr> <tr> <td colspan="4"> <p>▽ WATER LEVEL IN BORE HOLE IMMEDIATELY AFTER DRILLING ▽ STATIC WATER LEVEL AFTER 24 HOURS ▽PW PERCHED WATER, SATURATED ZONE, OR WATER BEARING STRATA ○ SPRING OR SEEP</p> </td> </tr> <tr> <td colspan="4" style="text-align: center;">MISCELLANEOUS SYMBOLS</td> </tr> <tr> <td colspan="4"> <p>ROADWAY EMBANKMENT (RE) WITH SOIL DESCRIPTION SOIL SYMBOL ARTIFICIAL FILL (AF) OTHER THAN ROADWAY EMBANKMENT INFERRED SOIL BOUNDARY INFERRED ROCK LINE ALLUVIAL SOIL BOUNDARY</p> <p>25/025 DIP & DIP DIRECTION OF ROCK STRUCTURES SPT TEST BORING AUGER BORING CORE BORING MONITORING WELL PIEZOMETER INSTALLATION</p> <p>SLOPE INDICATOR INSTALLATION CONE PENETROMETER TEST SOUNDING ROD TEST BORING WITH CORE SPT N-VALUE</p> </td> </tr> <tr> <td colspan="4" style="text-align: center;">RECOMMENDATION SYMBOLS</td> </tr> <tr> <td colspan="4"> <p>UNCLASSIFIED EXCAVATION - UNSUITABLE WASTE UNCLASSIFIED EXCAVATION - ACCEPTABLE DEGRADABLE ROCK UNCLASSIFIED EXCAVATION - ACCEPTABLE, BUT NOT TO BE USED IN THE TOP 3 FEET OF EMBANKMENT OR BACKFILL</p> </td> </tr> <tr> <td colspan="4" style="text-align: center;">ABBREVIATIONS</td> </tr> <tr> <td colspan="4"> <p>AR - AUGER REFUSAL BT - BORING TERMINATED CL - CLAY CPT - CONE PENETRATION TEST CSE - COARSE DMT - DILATOMETER TEST DPT - DYNAMIC PENETRATION TEST e - VOID RATIO F - FINE FOSS. - FOSSILIFEROUS FRAC. - FRACTURED, FRACTURES FRAGS. - FRAGMENTS HI. - HIGHLY</p> <p>MED. - MEDIUM MICA - MICACEOUS MOD. - MODERATELY NP - NON PLASTIC ORG. - ORGANIC PMT - PRESSUREMETER TEST SAP. - SAPROLITIC SD. - SAND, SANDY SL. - SILT, SILTY SLI. - SLIGHTLY TCR - TRICONE REFUSAL w - MOISTURE CONTENT V - VERY</p> <p>VST - VANE SHEAR TEST WEA. - WEATHERED UNIT WEIGHT DRY UNIT WEIGHT</p> <p>SAMPLE ABBREVIATIONS S - BULK SS - SPLIT SPOON ST - SHELBY TUBE RS - ROCK RT - RECOMPACTED TRIAXIAL CBR - CALIFORNIA BEARING RATIO</p> </td> </tr> <tr> <td colspan="4" style="text-align: center;">EQUIPMENT USED ON SUBJECT PROJECT</td> </tr> <tr> <td colspan="4"> <p>DRILL UNITS: <input type="checkbox"/> CME-45C <input checked="" type="checkbox"/> CME-55 <input 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 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 checked="" type="checkbox"/> CORE BIT (4.0 INCH CORE) <input checked="" type="checkbox"/> 3.5 inch auger</p> <p>HAMMER TYPE: <input type="checkbox"/> AUTOMATIC <input type="checkbox"/> MANUAL CORE SIZE: <input type="checkbox"/> -B <input type="checkbox"/> -H <input type="checkbox"/> -N HAND TOOLS: <input type="checkbox"/> POST HOLE DIGGER <input type="checkbox"/> HAND AUGER <input type="checkbox"/> SOUNDING ROD <input type="checkbox"/> VANE SHEAR TEST</p> </td> </tr> <tr> <td colspan="2" style="text-align: center;">FRACTURE SPACING</td> <td colspan="2" style="text-align: center;">BEDDING</td> </tr> <tr> <td>TERM</td> <td>SPACING</td> <td>TERM</td> <td>THICKNESS</td> </tr> <tr> <td>VERY WIDE</td> <td>MORE THAN 10 FEET</td> <td>VERY THICKLY BEDDED</td> <td>4 FEET</td> </tr> <tr> <td>WIDE</td> <td>3 TO 10 FEET</td> <td>THICKLY BEDDED</td> <td>1.5 - 4 FEET</td> </tr> <tr> <td>MODERATELY CLOSE</td> <td>1 TO 3 FEET</td> <td>THINLY BEDDED</td> <td>0.16 - 1.5 FEET</td> </tr> <tr> <td>CLOSE</td> <td>0.16 TO 1 FOOT</td> <td>VERY THINLY BEDDED</td> <td>0.03 - 0.15 FEET</td> </tr> <tr> <td>VERY CLOSE</td> <td>LESS THAN 0.16 FEET</td> <td>THICKLY LAMINATED</td> <td>0.008 - 0.03 FEET</td> </tr> <tr> <td></td> <td></td> <td>THINLY LAMINATED</td> <td>< 0.008 FEET</td> </tr> <tr> <td colspan="4" style="text-align: center;">INDURATION</td> </tr> <tr> <td colspan="4">FOR SEDIMENTARY ROCKS, INDURATION IS THE HARDENING OF MATERIAL BY CEMENTING, HEAT, PRESSURE, ETC.</td> </tr> <tr> <td>FRIABLE</td> <td colspan="3">RUBBING WITH FINGER FREES NUMEROUS GRAINS; GENTLE BLOW BY HAMMER DISINTEGRATES SAMPLE.</td> </tr> <tr> <td>MODERATELY INDURATED</td> <td colspan="3">GRAINS CAN BE SEPARATED FROM SAMPLE WITH STEEL PROBE; BREAKS EASILY WHEN HIT WITH HAMMER.</td> </tr> <tr> <td>INDURATED</td> <td colspan="3">GRAINS ARE DIFFICULT TO SEPARATE WITH STEEL PROBE; DIFFICULT TO BREAK WITH HAMMER.</td> </tr> <tr> <td>EXTREMELY INDURATED</td> <td colspan="3">SHARP HAMMER BLOWS REQUIRED TO BREAK SAMPLE; SAMPLE BREAKS ACROSS GRAINS.</td> </tr> <tr> <td colspan="4" style="text-align: center;">TERMS AND DEFINITIONS</td> </tr> <tr> <td colspan="4"> <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 DISLODGED FROM PARENT MATERIAL. FLOOD PLAIN (FP) - LAND BORDERING A STREAM, BUILT OF SEDIMENTS DEPOSITED BY THE STREAM. FORMATION (FM) - A MAPPABLE GEOLOGIC UNIT THAT CAN BE RECOGNIZED AND TRACED IN THE FIELD. JOINT - FRACTURE IN ROCK ALONG WHICH NO APPRECIABLE MOVEMENT HAS OCCURRED. LEDGE - A SHELF-LIKE RIDGE OR PROJECTION OF ROCK WHOSE THICKNESS IS SMALL COMPARED TO ITS LATERAL EXTENT. LENS - A BODY OF SOIL OR ROCK THAT THINS OUT IN ONE OR MORE DIRECTIONS. MOTTLED (MOT.) - IRREGULARLY MARKED WITH SPOTS OF DIFFERENT COLORS. MOTTLING IN SOILS USUALLY INDICATES POOR AERATION AND LACK OF GOOD DRAINAGE. PERCHED WATER - WATER MAINTAINED ABOVE THE NORMAL GROUND WATER LEVEL BY THE PRESENCE OF AN INTERVENING IMPERVIOUS STRATUM. RESIDUAL (RES.) SOIL - SOIL FORMED IN PLACE BY THE WEATHERING OF ROCK. ROCK QUALITY DESIGNATION (RQD) - A MEASURE OF ROCK QUALITY DESCRIBED BY TOTAL LENGTH OF ROCK SEGMENTS EQUAL TO OR GREATER THAN 4 INCHES DIVIDED BY THE TOTAL LENGTH OF CORE RUN AND EXPRESSED AS A PERCENTAGE. SAPROLITE (SAP.) - RESIDUAL SOIL THAT RETAINS THE RELIC STRUCTURE OR FABRIC OF THE PARENT ROCK. SILL - AN INTRUSIVE BODY OF IGNEOUS ROCK OF APPROXIMATELY UNIFORM THICKNESS AND RELATIVELY THIN COMPARED WITH ITS LATERAL EXTENT, THAT HAS BEEN EMPLACED PARALLEL TO THE BEDDING OR SCHISTOSITY OF THE INTRUDED ROCKS. SLICKENSIDE - POLISHED AND STRIATED SURFACE THAT RESULTS FROM FRICTION ALONG A FAULT OR SLIP PLANE. STANDARD PENETRATION TEST (PENETRATION RESISTANCE) (SPT) - NUMBER OF BLOWS (N OR BPF) OF A 140 LB. HAMMER FALLING 30 INCHES REQUIRED TO PRODUCE A PENETRATION OF 1 FOOT INTO SOIL WITH A 2 INCH OUTSIDE DIAMETER SPLIT SPOON SAMPLER. SPT REFUSAL IS PENETRATION EQUAL TO OR LESS THAN 0.1 FOOT PER 60 BLOWS. STRATA CORE RECOVERY (SCRC) - TOTAL LENGTH OF STRATA MATERIAL RECOVERED DIVIDED BY TOTAL LENGTH OF STRATUM AND EXPRESSED AS A PERCENTAGE. STRATA ROCK QUALITY DESIGNATION (SRQD) - 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> </td> </tr> <tr> <td colspan="4" style="text-align: center;">BENCH MARK:</td> </tr> <tr> <td colspan="2"></td> <td colspan="2" style="text-align: center;">ELEVATION: FEET</td> </tr> <tr> <td colspan="4" style="text-align: center;">NOTES:</td> </tr> <tr> <td colspan="2">NB - Northbound Lane</td> <td colspan="2">OSS - Outside Shoulder</td> </tr> <tr> <td colspan="2">SB - Southbound Lane</td> <td colspan="2">ISS - Inside Shoulder</td> </tr> <tr> <td colspan="2">OSL - Outside Lane</td> <td colspan="2">GM - Grass Median</td> </tr> <tr> <td colspan="2">ISL - Inside Lane</td> <td colspan="2">OGS - Outside Grass Shoulder</td> </tr> <tr> <td colspan="2">CL - Center Lane</td> <td colspan="2">PS - Paved Shoulder</td> </tr> <tr> <td colspan="2">LTL - Left Turn Lane</td> <td colspan="2">RTL - Right Turn Lane</td> </tr> <tr> <td colspan="2">CTL - Center Turn Lane</td> <td colspan="2">LTL - Left Lane</td> </tr> <tr> <td colspan="2">RTL - Right Turn Lane</td> <td colspan="2">COL - Collector Lane</td> </tr> <tr> <td colspan="2">DECEL - Deceleration Lane</td> <td colspan="2">RT - Right</td> </tr> <tr> <td colspan="2">ACCEL - Acceleration Lane</td> <td colspan="2">LT - Left</td> </tr> </table>				GENERAL CLASS.	GRANULAR MATERIALS (≤ 35% PASSING #200)							SILT-CLAY MATERIALS (> 35% PASSING #200)			ORGANIC MATERIALS			A-1	A-3	A-2	A-4	A-5	A-6	A-7	A-1, A-2	A-3	A-4, A-5	A-6, A-7				GROUP CLASS.	A-1-a	A-1-b	A-2-4	A-2-5	A-2-6	A-2-7		A-7-5	A-7-6						SYMBOL															% PASSING #10 #40 #200	50 MX 30 MX 15 MX	50 MX 25 MX 10 MN	35 MX 35 MX 35 MX	35 MX 35 MX 35 MX	35 MX 35 MX 35 MX	35 MX 35 MX 35 MX	36 MN 36 MN 36 MN	36 MN 36 MN 36 MN								MATERIAL PASSING #40 LL PI	<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td>LL</td> <td>6</td> <td>6</td> <td>40 MX</td> <td>41 MN</td> <td>40 MX</td> <td>41 MN</td> <td>40 MX</td> <td>41 MN</td> <td>40 MX</td> <td>41 MN</td> <td>40 MX</td> <td>41 MN</td> <td></td> <td></td> </tr> <tr> <td>PI</td> <td></td> <td></td> <td>NP</td> <td>10 MX</td> <td>10 MN</td> <td>11 MN</td> <td>10 MX</td> <td>10 MN</td> <td>10 MX</td> <td>11 MN</td> <td>10 MX</td> <td>11 MN</td> <td></td> <td></td> </tr> </table>												LL	6	6	40 MX	41 MN	40 MX	41 MN	40 MX	41 MN	40 MX	41 MN	40 MX	41 MN			PI			NP	10 MX	10 MN	11 MN	10 MX	10 MN	10 MX	11 MN	10 MX	11 MN			GROUP INDEX	0	0	0	4 MX	8 MX	12 MX	16 MX	NO MX							USUAL TYPES OF MAJOR MATERIALS	STONE FRAGS. GRAVEL, AND SAND	FINE SAND	SILTY OR CLAYEY GRAVEL AND SAND				SILTY SOILS		CLAYEY SOILS		SOILS WITH LITTLE OR MODERATE AMOUNTS OF ORGANIC MATTER		HIGHLY ORGANIC SOILS		GEN. RATING AS SUBGRADE	EXCELLENT TO GOOD			FAIR TO POOR				FAIR TO POOR	POOR	UNSUITABLE					PI OF A-7-5 SUBGROUP IS ≤ LL - 30 ; PI OF A-7-6 SUBGROUP IS > LL - 30														CONSISTENCY OR DENSENESS				PRIMARY SOIL TYPE	COMPACTNESS OR CONSISTENCY	RANGE OF STANDARD PENETRATION RESISTANCE (N-VALUE)	RANGE OF UNCONFINED COMPRESSIVE STRENGTH (TONS/FT ²)	GENERALLY GRANULAR MATERIAL (NON-COHESIVE)	VERY LOOSE LOOSE MEDIUM DENSE DENSE VERY DENSE	< 4 4 TO 10 10 TO 30 30 TO 50 > 50	N/A	GENERALLY SILT-CLAY MATERIAL (COHESIVE)	VERY SOFT SOFT MEDIUM STIFF STIFF VERY STIFF HARD	< 2 2 TO 4 4 TO 8 8 TO 15 15 TO 30 > 30	< 0.25 0.25 TO 0.5 0.5 TO 1.0 1 TO 2 2 TO 4 > 4	TEXTURE OR GRAIN SIZE				U.S. STD. SIEVE SIZE (MM)	4 4.76	10 2.00	40 0.42	60 0.25	200 0.075	270 0.053		BOULDER (BLDR.)	COBBLE (COB.)	GRAVEL (GR.)	COARSE SAND (CSE, SD.)	FINE SAND (F SD.)	SILT (SL.)	CLAY (CL.)		GRAIN SIZE	MM 305 IN. 12	75 3	2.0	0.25	0.05	0.005		SOIL MOISTURE - CORRELATION OF TERMS				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		- DRY - (D)	REQUIRES ADDITIONAL WATER TO ATTAIN OPTIMUM MOISTURE	PLASTICITY				NON PLASTIC	PLASTICITY INDEX (PI) 0-5	DRY STRENGTH VERY LOW		SLIGHTLY PLASTIC	6-15	SLIGHT		MODERATELY PLASTIC	16-25	MEDIUM		HIGHLY PLASTIC	26 OR MORE	HIGH		COLOR				DESCRIPTIONS MAY INCLUDE COLOR OR COLOR COMBINATIONS (TAN, RED, YELLOW-BROWN, BLUE-GRAY). MODIFIERS SUCH AS LIGHT, DARK, STREAKED, ETC. ARE USED TO DESCRIBE APPEARANCE.				GRADATION				WELL GRADED - INDICATES A GOOD REPRESENTATION OF PARTICLE SIZES FROM FINE TO COARSE. UNIFORMLY GRADED - INDICATES THAT SOIL PARTICLES ARE ALL APPROXIMATELY THE SAME SIZE. GAP-GRADED - INDICATES A MIXTURE OF UNIFORM PARTICLE SIZES OF TWO OR MORE SIZES.				ANGULARITY OF GRAINS				THE ANGULARITY OR ROUNDNESS OF SOIL GRAINS IS DESIGNATED BY THE TERMS: ANGULAR, SUBANGULAR, SUBROUNDED, OR ROUNDED.				MINERALOGICAL COMPOSITION				MINERAL NAMES SUCH AS QUARTZ, FELDSPAR, MICA, TALC, KAOLIN, ETC. ARE USED IN DESCRIPTIONS WHEN THEY ARE CONSIDERED OF SIGNIFICANCE.				COMPRESSIBILITY				SLIGHTLY COMPRESSIBLE LL < 31 MODERATELY COMPRESSIBLE LL = 31 - 50 HIGHLY COMPRESSIBLE LL > 50				PERCENTAGE OF MATERIAL				<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <th>ORGANIC MATERIAL</th> <th>GRANULAR SOILS</th> <th>SILT - CLAY SOILS</th> <th>OTHER MATERIAL</th> </tr> <tr> <td>TRACE OF ORGANIC MATTER</td> <td>2 - 3%</td> <td>3 - 5%</td> <td>TRACE 1 - 10%</td> </tr> <tr> <td>LITTLE ORGANIC MATTER</td> <td>3 - 5%</td> <td>5 - 12%</td> <td>LITTLE 10 - 20%</td> </tr> <tr> <td>MODERATELY ORGANIC</td> <td>5 - 10%</td> <td>12 - 20%</td> <td>SOME 20 - 35%</td> </tr> <tr> <td>HIGHLY ORGANIC</td> <td>> 10%</td> <td>> 20%</td> <td>HIGHLY 35% AND ABOVE</td> </tr> </table>				ORGANIC MATERIAL	GRANULAR SOILS	SILT - CLAY SOILS	OTHER MATERIAL	TRACE OF ORGANIC MATTER	2 - 3%	3 - 5%	TRACE 1 - 10%	LITTLE ORGANIC MATTER	3 - 5%	5 - 12%	LITTLE 10 - 20%	MODERATELY ORGANIC	5 - 10%	12 - 20%	SOME 20 - 35%	HIGHLY ORGANIC	> 10%	> 20%	HIGHLY 35% AND ABOVE	GROUND WATER				<p>▽ WATER LEVEL IN BORE HOLE IMMEDIATELY AFTER DRILLING ▽ STATIC WATER LEVEL AFTER 24 HOURS ▽PW PERCHED WATER, SATURATED ZONE, OR WATER BEARING STRATA ○ SPRING OR SEEP</p>				MISCELLANEOUS SYMBOLS				<p>ROADWAY EMBANKMENT (RE) WITH SOIL DESCRIPTION SOIL SYMBOL ARTIFICIAL FILL (AF) OTHER THAN ROADWAY EMBANKMENT INFERRED SOIL BOUNDARY INFERRED ROCK LINE ALLUVIAL SOIL BOUNDARY</p> <p>25/025 DIP & DIP DIRECTION OF ROCK STRUCTURES SPT TEST BORING AUGER BORING CORE BORING MONITORING WELL PIEZOMETER INSTALLATION</p> <p>SLOPE INDICATOR INSTALLATION CONE PENETROMETER TEST SOUNDING ROD TEST BORING WITH CORE SPT N-VALUE</p>				RECOMMENDATION SYMBOLS				<p>UNCLASSIFIED EXCAVATION - UNSUITABLE WASTE UNCLASSIFIED EXCAVATION - ACCEPTABLE DEGRADABLE ROCK UNCLASSIFIED EXCAVATION - ACCEPTABLE, BUT NOT TO BE USED IN THE TOP 3 FEET OF EMBANKMENT OR BACKFILL</p>				ABBREVIATIONS				<p>AR - AUGER REFUSAL BT - BORING TERMINATED CL - CLAY CPT - CONE PENETRATION TEST CSE - COARSE DMT - DILATOMETER TEST DPT - DYNAMIC PENETRATION TEST e - VOID RATIO F - FINE FOSS. - FOSSILIFEROUS FRAC. - FRACTURED, FRACTURES FRAGS. - FRAGMENTS HI. - HIGHLY</p> <p>MED. - MEDIUM MICA - MICACEOUS MOD. - MODERATELY NP - NON PLASTIC ORG. - ORGANIC PMT - PRESSUREMETER TEST SAP. - SAPROLITIC SD. - SAND, SANDY SL. - SILT, SILTY SLI. - SLIGHTLY TCR - TRICONE REFUSAL w - MOISTURE CONTENT V - VERY</p> <p>VST - VANE SHEAR TEST WEA. - WEATHERED UNIT WEIGHT DRY UNIT WEIGHT</p> <p>SAMPLE ABBREVIATIONS S - BULK SS - SPLIT SPOON ST - SHELBY TUBE RS - ROCK RT - RECOMPACTED TRIAXIAL CBR - CALIFORNIA BEARING RATIO</p>				EQUIPMENT USED ON SUBJECT PROJECT				<p>DRILL UNITS: <input type="checkbox"/> CME-45C <input checked="" type="checkbox"/> CME-55 <input 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 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 checked="" type="checkbox"/> CORE BIT (4.0 INCH CORE) <input checked="" type="checkbox"/> 3.5 inch auger</p> <p>HAMMER TYPE: <input type="checkbox"/> AUTOMATIC <input type="checkbox"/> MANUAL CORE SIZE: <input type="checkbox"/> -B <input type="checkbox"/> -H <input type="checkbox"/> -N 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>				FRACTURE SPACING		BEDDING		TERM	SPACING	TERM	THICKNESS	VERY WIDE	MORE THAN 10 FEET	VERY THICKLY BEDDED	4 FEET	WIDE	3 TO 10 FEET	THICKLY BEDDED	1.5 - 4 FEET	MODERATELY CLOSE	1 TO 3 FEET	THINLY BEDDED	0.16 - 1.5 FEET	CLOSE	0.16 TO 1 FOOT	VERY THINLY BEDDED	0.03 - 0.15 FEET	VERY CLOSE	LESS THAN 0.16 FEET	THICKLY LAMINATED	0.008 - 0.03 FEET			THINLY LAMINATED	< 0.008 FEET	INDURATION				FOR SEDIMENTARY ROCKS, INDURATION IS THE HARDENING OF MATERIAL BY CEMENTING, HEAT, PRESSURE, ETC.				FRIABLE	RUBBING WITH FINGER FREES NUMEROUS GRAINS; GENTLE BLOW BY HAMMER DISINTEGRATES SAMPLE.			MODERATELY INDURATED	GRAINS CAN BE SEPARATED FROM SAMPLE WITH STEEL PROBE; BREAKS EASILY WHEN HIT WITH HAMMER.			INDURATED	GRAINS ARE DIFFICULT TO SEPARATE WITH STEEL PROBE; DIFFICULT TO BREAK WITH HAMMER.			EXTREMELY INDURATED	SHARP HAMMER BLOWS REQUIRED TO BREAK SAMPLE; SAMPLE BREAKS ACROSS GRAINS.			TERMS AND DEFINITIONS				<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 DISLODGED FROM PARENT MATERIAL. FLOOD PLAIN (FP) - LAND BORDERING A STREAM, BUILT OF SEDIMENTS DEPOSITED BY THE STREAM. FORMATION (FM) - A MAPPABLE GEOLOGIC UNIT THAT CAN BE RECOGNIZED AND TRACED IN THE FIELD. JOINT - FRACTURE IN ROCK ALONG WHICH NO APPRECIABLE MOVEMENT HAS OCCURRED. LEDGE - A SHELF-LIKE RIDGE OR PROJECTION OF ROCK WHOSE THICKNESS IS SMALL COMPARED TO ITS LATERAL EXTENT. LENS - A BODY OF SOIL OR ROCK THAT THINS OUT IN ONE OR MORE DIRECTIONS. MOTTLED (MOT.) - IRREGULARLY MARKED WITH SPOTS OF DIFFERENT COLORS. MOTTLING IN SOILS USUALLY INDICATES POOR AERATION AND LACK OF GOOD DRAINAGE. PERCHED WATER - WATER MAINTAINED ABOVE THE NORMAL GROUND WATER LEVEL BY THE PRESENCE OF AN INTERVENING IMPERVIOUS STRATUM. RESIDUAL (RES.) SOIL - SOIL FORMED IN PLACE BY THE WEATHERING OF ROCK. ROCK QUALITY DESIGNATION (RQD) - A MEASURE OF ROCK QUALITY DESCRIBED BY TOTAL LENGTH OF ROCK SEGMENTS EQUAL TO OR GREATER THAN 4 INCHES DIVIDED BY THE TOTAL LENGTH OF CORE RUN AND EXPRESSED AS A PERCENTAGE. SAPROLITE (SAP.) - RESIDUAL SOIL THAT RETAINS THE RELIC STRUCTURE OR FABRIC OF THE PARENT ROCK. SILL - AN INTRUSIVE BODY OF IGNEOUS ROCK OF APPROXIMATELY UNIFORM THICKNESS AND RELATIVELY THIN COMPARED WITH ITS LATERAL EXTENT, THAT HAS BEEN EMPLACED PARALLEL TO THE BEDDING OR SCHISTOSITY OF THE INTRUDED ROCKS. SLICKENSIDE - POLISHED AND STRIATED SURFACE THAT RESULTS FROM FRICTION ALONG A FAULT OR SLIP PLANE. STANDARD PENETRATION TEST (PENETRATION RESISTANCE) (SPT) - NUMBER OF BLOWS (N OR BPF) OF A 140 LB. HAMMER FALLING 30 INCHES REQUIRED TO PRODUCE A PENETRATION OF 1 FOOT INTO SOIL WITH A 2 INCH OUTSIDE DIAMETER SPLIT SPOON SAMPLER. SPT REFUSAL IS PENETRATION EQUAL TO OR LESS THAN 0.1 FOOT PER 60 BLOWS. STRATA CORE RECOVERY (SCRC) - TOTAL LENGTH OF STRATA MATERIAL RECOVERED DIVIDED BY TOTAL LENGTH OF STRATUM AND EXPRESSED AS A PERCENTAGE. STRATA ROCK QUALITY DESIGNATION (SRQD) - 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>				BENCH MARK:						ELEVATION: FEET		NOTES:				NB - Northbound Lane		OSS - Outside Shoulder		SB - Southbound Lane		ISS - Inside Shoulder		OSL - Outside Lane		GM - Grass Median		ISL - Inside Lane		OGS - Outside Grass Shoulder		CL - Center Lane		PS - Paved Shoulder		LTL - Left Turn Lane		RTL - Right Turn Lane		CTL - Center Turn Lane		LTL - Left Lane		RTL - Right Turn Lane		COL - Collector Lane		DECEL - Deceleration Lane		RT - Right		ACCEL - Acceleration Lane		LT - Left	
GENERAL CLASS.	GRANULAR MATERIALS (≤ 35% PASSING #200)							SILT-CLAY MATERIALS (> 35% PASSING #200)			ORGANIC MATERIALS																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																
	A-1	A-3	A-2	A-4	A-5	A-6	A-7	A-1, A-2	A-3	A-4, A-5	A-6, A-7																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																
GROUP CLASS.	A-1-a	A-1-b	A-2-4	A-2-5	A-2-6	A-2-7		A-7-5	A-7-6																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																		
SYMBOL																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																											
% PASSING #10 #40 #200	50 MX 30 MX 15 MX	50 MX 25 MX 10 MN	35 MX 35 MX 35 MX	35 MX 35 MX 35 MX	35 MX 35 MX 35 MX	35 MX 35 MX 35 MX	36 MN 36 MN 36 MN	36 MN 36 MN 36 MN																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																			
MATERIAL PASSING #40 LL PI	<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td>LL</td> <td>6</td> <td>6</td> <td>40 MX</td> <td>41 MN</td> <td>40 MX</td> <td>41 MN</td> <td>40 MX</td> <td>41 MN</td> <td>40 MX</td> <td>41 MN</td> <td>40 MX</td> <td>41 MN</td> <td></td> <td></td> </tr> <tr> <td>PI</td> <td></td> <td></td> <td>NP</td> <td>10 MX</td> <td>10 MN</td> <td>11 MN</td> <td>10 MX</td> <td>10 MN</td> <td>10 MX</td> <td>11 MN</td> <td>10 MX</td> <td>11 MN</td> <td></td> <td></td> </tr> </table>												LL	6	6	40 MX	41 MN	40 MX	41 MN	40 MX	41 MN	40 MX	41 MN	40 MX	41 MN			PI			NP	10 MX	10 MN	11 MN	10 MX	10 MN	10 MX	11 MN	10 MX	11 MN																																																																																																																																																																																																																																																																																																																																																																																																																																																																			
LL	6	6	40 MX	41 MN	40 MX	41 MN	40 MX	41 MN	40 MX	41 MN	40 MX	41 MN																																																																																																																																																																																																																																																																																																																																																																																																																																																																																															
PI			NP	10 MX	10 MN	11 MN	10 MX	10 MN	10 MX	11 MN	10 MX	11 MN																																																																																																																																																																																																																																																																																																																																																																																																																																																																																															
GROUP INDEX	0	0	0	4 MX	8 MX	12 MX	16 MX	NO MX																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																			
USUAL TYPES OF MAJOR MATERIALS	STONE FRAGS. GRAVEL, AND SAND	FINE SAND	SILTY OR CLAYEY GRAVEL AND SAND				SILTY SOILS		CLAYEY SOILS		SOILS WITH LITTLE OR MODERATE AMOUNTS OF ORGANIC MATTER		HIGHLY ORGANIC SOILS																																																																																																																																																																																																																																																																																																																																																																																																																																																																																														
GEN. RATING AS SUBGRADE	EXCELLENT TO GOOD			FAIR TO POOR				FAIR TO POOR	POOR	UNSUITABLE																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																	
PI OF A-7-5 SUBGROUP IS ≤ LL - 30 ; PI OF A-7-6 SUBGROUP IS > LL - 30																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																											
CONSISTENCY OR DENSENESS																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																											
PRIMARY SOIL TYPE	COMPACTNESS OR CONSISTENCY	RANGE OF STANDARD PENETRATION RESISTANCE (N-VALUE)	RANGE OF UNCONFINED COMPRESSIVE STRENGTH (TONS/FT ²)																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																								
GENERALLY GRANULAR MATERIAL (NON-COHESIVE)	VERY LOOSE LOOSE MEDIUM DENSE DENSE VERY DENSE	< 4 4 TO 10 10 TO 30 30 TO 50 > 50	N/A																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																								
GENERALLY SILT-CLAY MATERIAL (COHESIVE)	VERY SOFT SOFT MEDIUM STIFF STIFF VERY STIFF HARD	< 2 2 TO 4 4 TO 8 8 TO 15 15 TO 30 > 30	< 0.25 0.25 TO 0.5 0.5 TO 1.0 1 TO 2 2 TO 4 > 4																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																								
TEXTURE OR GRAIN SIZE																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																											
U.S. STD. SIEVE SIZE (MM)	4 4.76	10 2.00	40 0.42	60 0.25	200 0.075	270 0.053																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																					
BOULDER (BLDR.)	COBBLE (COB.)	GRAVEL (GR.)	COARSE SAND (CSE, SD.)	FINE SAND (F SD.)	SILT (SL.)	CLAY (CL.)																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																					
GRAIN SIZE	MM 305 IN. 12	75 3	2.0	0.25	0.05	0.005																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																					
SOIL MOISTURE - CORRELATION OF TERMS																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																											
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		- DRY - (D)	REQUIRES ADDITIONAL WATER TO ATTAIN OPTIMUM MOISTURE																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																								
PLASTICITY																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																											
NON PLASTIC	PLASTICITY INDEX (PI) 0-5	DRY STRENGTH VERY LOW																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																									
SLIGHTLY PLASTIC	6-15	SLIGHT																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																									
MODERATELY PLASTIC	16-25	MEDIUM																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																									
HIGHLY PLASTIC	26 OR MORE	HIGH																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																									
COLOR																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																											
DESCRIPTIONS MAY INCLUDE COLOR OR COLOR COMBINATIONS (TAN, RED, YELLOW-BROWN, BLUE-GRAY). MODIFIERS SUCH AS LIGHT, DARK, STREAKED, ETC. ARE USED TO DESCRIBE APPEARANCE.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																											
GRADATION																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																											
WELL GRADED - INDICATES A GOOD REPRESENTATION OF PARTICLE SIZES FROM FINE TO COARSE. UNIFORMLY GRADED - INDICATES THAT SOIL PARTICLES ARE ALL APPROXIMATELY THE SAME SIZE. GAP-GRADED - INDICATES A MIXTURE OF UNIFORM PARTICLE SIZES OF TWO OR MORE SIZES.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																											
ANGULARITY OF GRAINS																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																											
THE ANGULARITY OR ROUNDNESS OF SOIL GRAINS IS DESIGNATED BY THE TERMS: ANGULAR, SUBANGULAR, SUBROUNDED, OR ROUNDED.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																											
MINERALOGICAL COMPOSITION																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																											
MINERAL NAMES SUCH AS QUARTZ, FELDSPAR, MICA, TALC, KAOLIN, ETC. ARE USED IN DESCRIPTIONS WHEN THEY ARE CONSIDERED OF SIGNIFICANCE.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																											
COMPRESSIBILITY																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																											
SLIGHTLY COMPRESSIBLE LL < 31 MODERATELY COMPRESSIBLE LL = 31 - 50 HIGHLY COMPRESSIBLE LL > 50																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																											
PERCENTAGE OF MATERIAL																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																											
<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <th>ORGANIC MATERIAL</th> <th>GRANULAR SOILS</th> <th>SILT - CLAY SOILS</th> <th>OTHER MATERIAL</th> </tr> <tr> <td>TRACE OF ORGANIC MATTER</td> <td>2 - 3%</td> <td>3 - 5%</td> <td>TRACE 1 - 10%</td> </tr> <tr> <td>LITTLE ORGANIC MATTER</td> <td>3 - 5%</td> <td>5 - 12%</td> <td>LITTLE 10 - 20%</td> </tr> <tr> <td>MODERATELY ORGANIC</td> <td>5 - 10%</td> <td>12 - 20%</td> <td>SOME 20 - 35%</td> </tr> <tr> <td>HIGHLY ORGANIC</td> <td>> 10%</td> <td>> 20%</td> <td>HIGHLY 35% AND ABOVE</td> </tr> </table>				ORGANIC MATERIAL	GRANULAR SOILS	SILT - CLAY SOILS	OTHER MATERIAL	TRACE OF ORGANIC MATTER	2 - 3%	3 - 5%	TRACE 1 - 10%	LITTLE ORGANIC MATTER	3 - 5%	5 - 12%	LITTLE 10 - 20%	MODERATELY ORGANIC	5 - 10%	12 - 20%	SOME 20 - 35%	HIGHLY ORGANIC	> 10%	> 20%	HIGHLY 35% AND ABOVE																																																																																																																																																																																																																																																																																																																																																																																																																																																																																				
ORGANIC MATERIAL	GRANULAR SOILS	SILT - CLAY SOILS	OTHER MATERIAL																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																								
TRACE OF ORGANIC MATTER	2 - 3%	3 - 5%	TRACE 1 - 10%																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																								
LITTLE ORGANIC MATTER	3 - 5%	5 - 12%	LITTLE 10 - 20%																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																								
MODERATELY ORGANIC	5 - 10%	12 - 20%	SOME 20 - 35%																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																								
HIGHLY ORGANIC	> 10%	> 20%	HIGHLY 35% AND ABOVE																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																								
GROUND WATER																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																											
<p>▽ WATER LEVEL IN BORE HOLE IMMEDIATELY AFTER DRILLING ▽ STATIC WATER LEVEL AFTER 24 HOURS ▽PW PERCHED WATER, SATURATED ZONE, OR WATER BEARING STRATA ○ SPRING OR SEEP</p>																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																											
MISCELLANEOUS SYMBOLS																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																											
<p>ROADWAY EMBANKMENT (RE) WITH SOIL DESCRIPTION SOIL SYMBOL ARTIFICIAL FILL (AF) OTHER THAN ROADWAY EMBANKMENT INFERRED SOIL BOUNDARY INFERRED ROCK LINE ALLUVIAL SOIL BOUNDARY</p> <p>25/025 DIP & DIP DIRECTION OF ROCK STRUCTURES SPT TEST BORING AUGER BORING CORE BORING MONITORING WELL PIEZOMETER INSTALLATION</p> <p>SLOPE INDICATOR INSTALLATION CONE PENETROMETER TEST SOUNDING ROD TEST BORING WITH CORE SPT N-VALUE</p>																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																											
RECOMMENDATION SYMBOLS																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																											
<p>UNCLASSIFIED EXCAVATION - UNSUITABLE WASTE UNCLASSIFIED EXCAVATION - ACCEPTABLE DEGRADABLE ROCK UNCLASSIFIED EXCAVATION - ACCEPTABLE, BUT NOT TO BE USED IN THE TOP 3 FEET OF EMBANKMENT OR BACKFILL</p>																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																											
ABBREVIATIONS																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																											
<p>AR - AUGER REFUSAL BT - BORING TERMINATED CL - CLAY CPT - CONE PENETRATION TEST CSE - COARSE DMT - DILATOMETER TEST DPT - DYNAMIC PENETRATION TEST e - VOID RATIO F - FINE FOSS. - FOSSILIFEROUS FRAC. - FRACTURED, FRACTURES FRAGS. - FRAGMENTS HI. - HIGHLY</p> <p>MED. - MEDIUM MICA - MICACEOUS MOD. - MODERATELY NP - NON PLASTIC ORG. - ORGANIC PMT - PRESSUREMETER TEST SAP. - SAPROLITIC SD. - SAND, SANDY SL. - SILT, SILTY SLI. - SLIGHTLY TCR - TRICONE REFUSAL w - MOISTURE CONTENT V - VERY</p> <p>VST - VANE SHEAR TEST WEA. - WEATHERED UNIT WEIGHT DRY UNIT WEIGHT</p> <p>SAMPLE ABBREVIATIONS S - BULK SS - SPLIT SPOON ST - SHELBY TUBE RS - ROCK RT - RECOMPACTED TRIAXIAL CBR - CALIFORNIA BEARING RATIO</p>																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																											
EQUIPMENT USED ON SUBJECT PROJECT																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																											
<p>DRILL UNITS: <input type="checkbox"/> CME-45C <input checked="" type="checkbox"/> CME-55 <input 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 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 checked="" type="checkbox"/> CORE BIT (4.0 INCH CORE) <input checked="" type="checkbox"/> 3.5 inch auger</p> <p>HAMMER TYPE: <input type="checkbox"/> AUTOMATIC <input type="checkbox"/> MANUAL CORE SIZE: <input type="checkbox"/> -B <input type="checkbox"/> -H <input type="checkbox"/> -N 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>																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																											
FRACTURE SPACING		BEDDING																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																									
TERM	SPACING	TERM	THICKNESS																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																								
VERY WIDE	MORE THAN 10 FEET	VERY THICKLY BEDDED	4 FEET																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																								
WIDE	3 TO 10 FEET	THICKLY BEDDED	1.5 - 4 FEET																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																								
MODERATELY CLOSE	1 TO 3 FEET	THINLY BEDDED	0.16 - 1.5 FEET																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																								
CLOSE	0.16 TO 1 FOOT	VERY THINLY BEDDED	0.03 - 0.15 FEET																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																								
VERY CLOSE	LESS THAN 0.16 FEET	THICKLY LAMINATED	0.008 - 0.03 FEET																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																								
		THINLY LAMINATED	< 0.008 FEET																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																								
INDURATION																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																											
FOR SEDIMENTARY ROCKS, INDURATION IS THE HARDENING OF MATERIAL BY CEMENTING, HEAT, PRESSURE, ETC.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																											
FRIABLE	RUBBING WITH FINGER FREES NUMEROUS GRAINS; GENTLE BLOW BY HAMMER DISINTEGRATES SAMPLE.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																										
MODERATELY INDURATED	GRAINS CAN BE SEPARATED FROM SAMPLE WITH STEEL PROBE; BREAKS EASILY WHEN HIT WITH HAMMER.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																										
INDURATED	GRAINS ARE DIFFICULT TO SEPARATE WITH STEEL PROBE; DIFFICULT TO BREAK WITH HAMMER.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																										
EXTREMELY INDURATED	SHARP HAMMER BLOWS REQUIRED TO BREAK SAMPLE; SAMPLE BREAKS ACROSS GRAINS.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																										
TERMS AND DEFINITIONS																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																											
<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 DISLODGED FROM PARENT MATERIAL. FLOOD PLAIN (FP) - LAND BORDERING A STREAM, BUILT OF SEDIMENTS DEPOSITED BY THE STREAM. FORMATION (FM) - A MAPPABLE GEOLOGIC UNIT THAT CAN BE RECOGNIZED AND TRACED IN THE FIELD. JOINT - FRACTURE IN ROCK ALONG WHICH NO APPRECIABLE MOVEMENT HAS OCCURRED. LEDGE - A SHELF-LIKE RIDGE OR PROJECTION OF ROCK WHOSE THICKNESS IS SMALL COMPARED TO ITS LATERAL EXTENT. LENS - A BODY OF SOIL OR ROCK THAT THINS OUT IN ONE OR MORE DIRECTIONS. MOTTLED (MOT.) - IRREGULARLY MARKED WITH SPOTS OF DIFFERENT COLORS. MOTTLING IN SOILS USUALLY INDICATES POOR AERATION AND LACK OF GOOD DRAINAGE. PERCHED WATER - WATER MAINTAINED ABOVE THE NORMAL GROUND WATER LEVEL BY THE PRESENCE OF AN INTERVENING IMPERVIOUS STRATUM. RESIDUAL (RES.) SOIL - SOIL FORMED IN PLACE BY THE WEATHERING OF ROCK. ROCK QUALITY DESIGNATION (RQD) - A MEASURE OF ROCK QUALITY DESCRIBED BY TOTAL LENGTH OF ROCK SEGMENTS EQUAL TO OR GREATER THAN 4 INCHES DIVIDED BY THE TOTAL LENGTH OF CORE RUN AND EXPRESSED AS A PERCENTAGE. SAPROLITE (SAP.) - RESIDUAL SOIL THAT RETAINS THE RELIC STRUCTURE OR FABRIC OF THE PARENT ROCK. SILL - AN INTRUSIVE BODY OF IGNEOUS ROCK OF APPROXIMATELY UNIFORM THICKNESS AND RELATIVELY THIN COMPARED WITH ITS LATERAL EXTENT, THAT HAS BEEN EMPLACED PARALLEL TO THE BEDDING OR SCHISTOSITY OF THE INTRUDED ROCKS. SLICKENSIDE - POLISHED AND STRIATED SURFACE THAT RESULTS FROM FRICTION ALONG A FAULT OR SLIP PLANE. STANDARD PENETRATION TEST (PENETRATION RESISTANCE) (SPT) - NUMBER OF BLOWS (N OR BPF) OF A 140 LB. HAMMER FALLING 30 INCHES REQUIRED TO PRODUCE A PENETRATION OF 1 FOOT INTO SOIL WITH A 2 INCH OUTSIDE DIAMETER SPLIT SPOON SAMPLER. SPT REFUSAL IS PENETRATION EQUAL TO OR LESS THAN 0.1 FOOT PER 60 BLOWS. STRATA CORE RECOVERY (SCRC) - TOTAL LENGTH OF STRATA MATERIAL RECOVERED DIVIDED BY TOTAL LENGTH OF STRATUM AND EXPRESSED AS A PERCENTAGE. STRATA ROCK QUALITY DESIGNATION (SRQD) - 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>																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																											
BENCH MARK:																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																											
		ELEVATION: FEET																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																									
NOTES:																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																											
NB - Northbound Lane		OSS - Outside Shoulder																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																									
SB - Southbound Lane		ISS - Inside Shoulder																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																									
OSL - Outside Lane		GM - Grass Median																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																									
ISL - Inside Lane		OGS - Outside Grass Shoulder																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																									
CL - Center Lane		PS - Paved Shoulder																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																									
LTL - Left Turn Lane		RTL - Right Turn Lane																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																									
CTL - Center Turn Lane		LTL - Left Lane																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																									
RTL - Right Turn Lane		COL - Collector Lane																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																									
DECEL - Deceleration Lane		RT - Right																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																									
ACCEL - Acceleration Lane		LT - Left																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																									

PROJECT REFERENCE NO.	SHEET NO.
1-5973	3
RW SHEET NO.	
ROADWAY ENGINEER	HYDRAULICS ENGINEER
INCOMPLETE PLANS DO NOT USE FOR R/W ACQUISITION	
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED	

REVISIONS

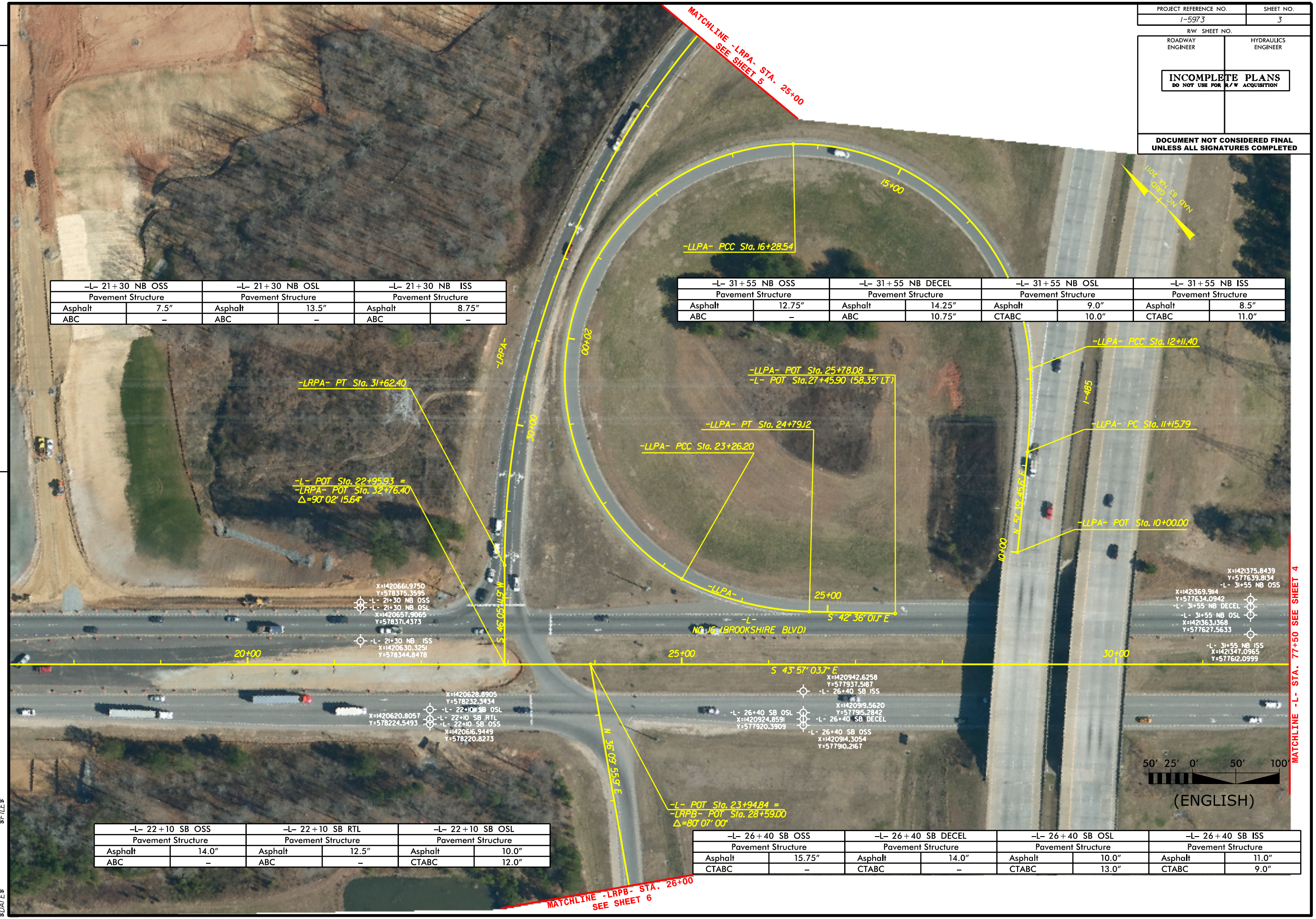
-L- 21+30 NB OSS		-L- 21+30 NB OSL		-L- 21+30 NB ISS	
Pavement Structure		Pavement Structure		Pavement Structure	
Asphalt	7.5"	Asphalt	13.5"	Asphalt	8.75"
ABC	-	ABC	-	ABC	-

-L- 31+55 NB OSS		-L- 31+55 NB DECEL		-L- 31+55 NB OSL		-L- 31+55 NB ISS	
Pavement Structure		Pavement Structure		Pavement Structure		Pavement Structure	
Asphalt	12.75"	Asphalt	14.25"	Asphalt	9.0"	Asphalt	8.5"
ABC	-	ABC	10.75"	CTABC	10.0"	CTABC	11.0"

-L- 22+10 SB OSS		-L- 22+10 SB RTL		-L- 22+10 SB OSL	
Pavement Structure		Pavement Structure		Pavement Structure	
Asphalt	14.0"	Asphalt	12.5"	Asphalt	10.0"
ABC	-	ABC	-	CTABC	12.0"

-L- 26+40 SB OSS		-L- 26+40 SB DECEL		-L- 26+40 SB OSL		-L- 26+40 SB ISS	
Pavement Structure		Pavement Structure		Pavement Structure		Pavement Structure	
Asphalt	15.75"	Asphalt	14.0"	Asphalt	10.0"	Asphalt	11.0"
CTABC	-	CTABC	-	CTABC	13.0"	CTABC	9.0"

\$FILE\$
\$DATE\$



PROJECT REFERENCE NO.	SHEET NO.
I-5973	4
RW SHEET NO.	
ROADWAY ENGINEER	HYDRAULICS ENGINEER
INCOMPLETE PLANS DO NOT USE FOR R/W ACQUISITION	
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED	

-L- 37+60 NB OSS		-L- 37+60 NB RTL		-L- 37+60 NB ISL		-L- 37+60 NB ISS	
Pavement Structure		Pavement Structure		Pavement Structure		Pavement Structure	
Asphalt	13.0"	Asphalt	15.0"	Asphalt	11.0"	Asphalt	10.5"
ABC	-	ABC	-	ABC	15.5"	ABC	17.5"

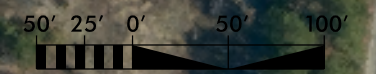
-L- POT Sta. 22+95.93 =
 -LRPC- POT Sta. 30+40.65
 $\Delta = 86^{\circ} 59' 05''$

X=1421796.1309
 Y=577204.6306
 -L- 37+60 NB OSS X=1421791.037
 -L- 37+60 NB RTL Y=577199.7842
 -L- 37+60 NB ISL X=1421773.8371
 -L- 37+60 NB ISS Y=577183.1385
 X=1421767.6685
 Y=577177.1917

-L- 40+00
 NC 16 (BROOKSHIRE BLVD)
 S 43° 57' 03.7" E

N 49° 03' 51.2" E

MAD 88 NA 2011



(ENGLISH)

MATCHLINE - L- STA. 32+00 SEE SHEET 3

MATCHLINE -LRPC- STA. 24+00 SEE SHEET 7

REVISIONS

\$DATE\$

\$FILE\$



PROJECT REFERENCE NO. I-5973	SHEET NO. 5
RW SHEET NO.	
ROADWAY ENGINEER	HYDRAULICS ENGINEER
INCOMPLETE PLANS DO NOT USE FOR R/W ACQUISITION	
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED	



REVISIONS



-LRPA-
 X=1421796.3756
 Y=578554.1264
 -LRPA- 21+05 OSS
 X=1421796.0305
 Y=578543.3606
 -LRPA- 21+05 OSL
 -LRPA- 21+05 ISS
 X=1421795.3685
 Y=578522.1404

-LRPA- 21+05 OSS		-LRPA- 21+05 OSL		-LRPA- 21+05 ISS	
Pavement Structure		Pavement Structure		Pavement Structure	
Asphalt	6.75"	Asphalt	6.75"	Asphalt	5.5"
ABC	10.25"	ABC	9.0"	ABC	8.5"

\$FILE\$
\$DATE\$

PROJECT REFERENCE NO. 1-5973	SHEET NO. 6
RW SHEET NO.	
ROADWAY ENGINEER	HYDRAULICS ENGINEER
INCOMPLETE PLANS DO NOT USE FOR R/W ACQUISITION	
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED	

REVISIONS



-LRPB- 24+80 OSS		-LRPB- 24+80 LN		-LRPB- 24+80 ISS	
Pavement Structure		Pavement Structure		Pavement Structure	
Asphalt	4.0"	Asphalt	4.0"	Asphalt	3.5"
CTABC	10.5"	CTABC	11.0"	CTABC	11.5"



-LRPB- 24+80 LN
X=1420556.9304
Y=577839.8520

-LRPB- 24+80 OSS
X=1420561.5982
Y=577836.4399

-LRPB- 24+80 ISS
X=1420570.9296
Y=577829.6190

MATCHLINE -LRPB- STA. 26+00 SEE SHEET 3

\$DATE\$

\$FILE\$

PROJECT REFERENCE NO.	SHEET NO.
1-5973	7
RW SHEET NO.	
ROADWAY ENGINEER	HYDRAULICS ENGINEER
INCOMPLETE PLANS DO NOT USE FOR R/W ACQUISITION	
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED	

REVISIONS

-LRPC- 17+00 OSS		-LRPC- 17+00 LN		-LRPC- 17+00 ISS	
Pavement Structure		Pavement Structure		Pavement Structure	
Asphalt	6.5"	Asphalt	6.5"	Asphalt	7.0"
ABC	8.0"	ABC	10.0"	ABC	10.0"



X=1420438.4330
Y=576717.7729
-LRPC- 17+00 ISS

X=1420446.4740
Y=576701.1856
-LRPC- 17+00 LN

X=1420450.3067
Y=576693.2791
-LRPC- 17+00 OSS

-LRPC- N 76° 38' 38.7" E

MATCHLINE -LRPC- STA. 24+00 SEE SHEET 4

\$DATE\$

\$FILE\$

PAVEMENT INVESTIGATION DATA SHEET

Project: 44990.1.1
TIP: I-5973

County: Mecklenburg
Route: I-485 at NC 16

Date: 3/01/2020 - 3/03/2020
Notes By: D. Strother

Position (Sta., Lane, Shldr.)	Cut/Fill (Est. Of Amount) (ft)	Width		Offset Distance (ft)	Crown "C" or Super "S"	Thickness						Pavement Layering	Subgrade					GPS Coordinates		
		Lane(s) (ft)	Shoulder(s) (ft)			Gross to Top of Soil (in)	Asphalt (in)	Rounded Gravel Drainage Layer (in)	ABC (in)	Cement Treated ABC (in)	Stabilized Soil Subgrade (in)		Description	Sample Number	AASHTO Classification	Soil Moisture	Probe Depth (ft)	Asphalt Notes	Northing	Easting
-L- 21+30 NB OSS	10.0 Fill	N/A	4.30	2.3 FWL	C	7.50	7.50	N/A	N/A	N/A	N/A	Asphalt	0.0 - 1.2' = Roadway Embankment, Dark Gray, Sandy Silt 1.2 - 5.0' = Roadway Embankment, Tan and Orange, Sandy Silty Clay	S-9 S-10	A-4 A-6	M M	5.00	No Visible Distresses	578374.4	1420662.9
-L- 21+30 NB OSL	10.0 Fill	11.80	4.30	2.5 FWL	C	13.50	13.50	N/A	N/A	N/A	N/A	Asphalt	0.0 - 5.0' = Roadway Embankment, Tan and Orange, Sandy Silty Clay	S-11	A-6	M	5.00	Moderate Severity Transverse and Longitudinal Cracking at IWP, Moderate Severity Longitudinal Cracking at Outside Paving Joint	578373.0	1420656.4
-L- 21+30 NB ISS	10.0 Fill	N/A	3.00	1.5 FY	C	8.75	8.75	N/A	N/A	N/A	N/A	Asphalt	0.0 - 1.0' = Roadway Embankment, Dark Gray, Sandy Silt 1.0 - 5.0' = Roadway Embankment, Tan and Orange, Sandy Silty Clay	REF S-9 S-10 A	A-4 A-6	M M	5.00	No Visible Distresses	578345.6	1420629.6
-L- 22+10 SB OSS	5.0 Fill	N/A	5.30	2.8 FWL	C	14.00	14.00	N/A	N/A	N/A	N/A	Asphalt	No Auger, Utilities	N/A	N/A	N/A	N/A	Low Severity Transverse Cracking	578221.6	1420616.2
-L- 22+10 SB RTL	5.0 Fill	11.80	5.30	5.0 FWL	C	12.50	12.50	N/A	N/A	N/A	N/A	Asphalt	0.0 - 1.5' = Roadway Embankment, Brown and Orange, Sandy Clay 1.5 - 5.0' = Roadway Embankment, Brown, Sandy Clay	S-1 S-2	A-6 A-6	M M	5.00	Moderate Severity Longitudinal and Transverse Cracking at both WP, Core Cracked 2" Top Down, High Severity Longitudinal Cracking at Inside Pavement Joint	578225.8	1420619.6
-L- 22+10 SB OSL	5.0 Fill	12.80	N/A	2.0 FWL	C	22.00	10.00	N/A	N/A	12.00	N/A	Asphalt CTABC	0.0 - 1.0' = Roadway Embankment, Brown and Orange, Sandy Silty Clay 1.0 - 5.0' = Roadway Embankment, Brown and Tan, Sandy Silty Clay	REF S-1 REF S-2	A-6 A-6	M M	5.00	Moderate Severity Longitudinal and Transverse Cracking at both WP, Core Cracked 2" Top Down, High Severity Longitudinal Cracking at Inside Pavement Joint	578231.4	1420629.8
-L- 26+40 SB OSS	AG	N/A	4.80	2.8 FWL	C	15.75	15.75	N/A	N/A	N/A	N/A	Asphalt	0.0 - 5.0' = Residual Soil, Orange, Silty Clay	S-3	A-7-5	M	5.00	Low Severity Transverse Cracking	577909.6	1420914.9
-L- 26+40 SB DECEL	AG	11.80	4.80	5.0 FWL	C	14.00	14.00	N/A	N/A	N/A	N/A	Asphalt	0.0 - 5.0' = Residual Soil, Tan, Gray and Orange, Silty Clay	S-4	A-7-6	M	5.00	Moderate Severity Longitudinal and Transverse Cracking at inside WP, High Severity Longitudinal Cracking at IWP and Pavement Joint, Moderate Severity Block Cracking	577914.0	1420920.8
-L- 26+40 SB OSL	AG	12.00	N/A	2.0 FWL	C	23.00	10.00	N/A	N/A	13.00	N/A	Asphalt CTABC	0.0 - 5.0' = Residual Soil, Tan and Orange, Sandy Clay	S-4 A	A-7-6	M	5.00	Moderate Severity Longitudinal and Transverse Cracking in both WP, Moderate Severity Block Cracking, Core Cracked 4.75" Top Down	577919.0	1420926.2
-L- 26+40 SB ISS	AG	N/A	2.00	1.0 FY	C	20.00	11.00	N/A	N/A	9.00	N/A	Asphalt CTABC	0.0 - 0.8' = Residual Soil, Orange, Sandy Clayey Silt 0.8 - 5.0' = Residual Soil, Tan, Gray and Orange, Sandy Clay	S-5 REF S-4	A-4 A-7-6	M M	5.00	No Visible Distresses	577933.5	1420946.5
-L- 31+55 NB OSS	8.0 Cut	N/A	5.00	3.0 FWL	C	12.75	12.75	N/A	N/A	N/A	N/A	Asphalt	0.0 - 3.0' = Residual Soil, Orange, Sandy Silty Clay Auger Refusal at 4.2' from top of Auger	S-8	A-7-5	M	3.00	Low Severity Transverse Cracking	577641.0	1421374.7
-L- 31+55 NB DECEL	8.0 Cut	11.70	5.00	7.5 FWL	C	25.00	14.25	N/A	10.75	N/A	N/A	Asphalt ABC	0.0 - 1.8' = Residual Soil, Orange, Sandy Silty Clay Auger Refusal at 3.8' from top of Auger	S-8 A	A-7-6	M	1.80	Moderate Severity Longitudinal and Transverse Cracking in both WP, Core Cracked at 1.5" Top Down	577639.5	1421364.7
-L- 31+55 NB OSL	8.0 Cut	11.80	N/A	2.8 FWL	C	19.00	9.00	N/A	N/A	10.00	N/A	Asphalt CTABC	Auger Refusal at 19.5" from top of Asphalt Large Rock, No Sample	N/A	N/A	N/A	N/A	Moderate Severity Longitudinal and Transverse Cracking at both WP	577622.0	1421368.5
-L- 31+55 NB ISS	8.0 Cut	N/A	1.80	0.9 FY	C	19.50	8.50	N/A	N/A	11.00	N/A	Asphalt CTABC	0.0 - 5.0' = Residual Soil, Orange, Sandy Silty Clay	REF S-8	A-7-5	M	5.00	Low Severity Transverse Cracking	577612.2	1421347.0
-L- 37+60 NB OSS	8.0 Fill	N/A	4.10	2.3 FWL	C	13.00	13.00	N/A	N/A	N/A	N/A	Asphalt	0.0 - 1.0' = Roadway Embankment, Orange and Tan, Silty Sandy Clay 1.0 - 5.0' = Roadway Embankment, Orange and Brown, Sandy Silty Clay	S-6 S-7	A-6 A-6	M M	5.00	Low Severity Transverse Cracking	577205.7	1421795.1
-L- 37+60 NB RTL	8.0 Fill	12.00	4.10	2.8 FWL	C	15.00	15.00	N/A	N/A	N/A	N/A	Asphalt	0.0 - 1.0' = Roadway Embankment, Orange and Tan, Silty Sandy Clay 1.0 - 5.0' = Roadway Embankment, Orange and Brown, Sandy Silty Clay	REF S-6 S-7 A	A-6 A-7-6	M M	5.00	Moderate Severity Longitudinal and Transverse Cracking in both WP, Core Cracked 3.75" Top Down	577202.9	1421788.1

Notes:

OSL = Outside Lane
ISL = Inside Lane
CL = Center Lane
LTL = Left Turn Lane

WP = Wheel Path
IWP = Inside Wheel Path
OWP = Outside Wheel Path
C&G = Curb & Gutter

OSS = Outside Shoulder
ISS = Inside Shoulder
GM = Grass Median
OGS = Outside Grass Shoulder


PS = Paved Shoulder
RT LN = Right Lane
LT LN = Left Lane
COL = Collector Lane

CTL = Center Turn Lane
RTL = Right Turn Lane
DECEL = Deceleration Lane
ACCEL = Acceleration Lane

RT = Right
LT = Left
(I) = Inside
(O) = Outside

NB = Northbound
SB = Southbound
FW = From White
FY = From Yellow

FCG = From Curb & Gutter
AG = At Grade
EOP = Edge of Pavement


 S&ME, Inc.
 3201 Spring Forest Road
 Raleigh, North Carolina 27616

PAVEMENT INVESTIGATION DATA SHEET

Project: 44990.1.1
TIP: I-5973

County: Mecklenburg
Route: I-485 at NC 16

Date: 3/01/2020 - 3/03/2020
Notes By: D. Strother

Position (Sta., Lane, Shldr.)	Cut/Fill (Est. Of Amount) (ft)	Width		Offset Distance (ft)	Crown "C" or Super "S"	Thickness						Pavement Layering	Subgrade					Asphalt Notes	GPS Coordinates		
		Lane(s) (ft)	Shoulder(s) (ft)			Gross to Top of Soil (in)	Asphalt (in)	Rounded Gravel Drainage Layer (in)	ABC (in)	Cement Treated ABC (in)	Stabilized Soil Subgrade (in)		Description	Sample Number	AASHTO Classification	Soil Moisture	Probe Depth (ft)		Northing	Easting	
-L- 37+60 NB ISL	8.0 Fill	12.00	1.80	4.0 FY	C	26.50	11.00	N/A	15.50	N/A	N/A	Asphalt ABC	0.0 - 1.0' = Roadway Embankment, Tan and Orange, Sandy Silty Clay 1.0 - 5.0' = Roadway Embankment, Dark Gray, Sandy Silty Clay	REF S-12 REF S-13	A-7-5 A-6	M M	5.00	Moderate Severity Longitudinal and Transverse Cracking at Inside WP, Moderate Severity Longitudinal Cracking at OWP	577186.6	1421770.5	
-L- 37+60 NB ISS	8.0 Fill	N/A	1.80	0.9 FY	C	28.00	10.50	N/A	17.50	N/A	N/A	Asphalt ABC	0.0 - 1.0' = Roadway Embankment, Tan and Orange, Sandy Silty Clay 1.0 - 5.0' = Roadway Embankment, Dark Gray, Sandy Silty Clay	S-12 S-13	A-7-5 A-6	M M	5.00	No Visible Distresses	577178.3	1421766.6	
-LRPA- 21+05 OSS	15.0 Fill	16.00	9.2 CG	N/A	S	17.00	6.75	N/A	10.25	N/A	N/A	Asphalt ABC	0.0 - 5.0' = Roadway Embankment, Orange, Sandy Clay	REF S-17	A-7-5	M	5.00	No Visible Distresses	578554.1	1421797.2	
-LRPA- 21+05 LN	15.0 Fill	16.00	N/A	1.8 FWL	S	15.75	6.75	N/A	9.00	N/A	N/A	Asphalt ABC	0.0 - 5.0' = Roadway Embankment, Orange, Sandy Clay	REF S-17	A-7-5	M	5.00	Low Severity Longitudinal and Transverse Cracking in OWP, High Severity Longitudinal and Fatigue Cracking at Pavement Joint	578543.4	1421794.8	
-LRPA- 21+05 ISS	15.0 Fill	16.00	3.50	1.8 FY	S	14.00	5.50	N/A	8.50	N/A	N/A	Asphalt ABC	0.0 - 5.0' = Roadway Embankment, Orange, Sandy Clay	S-17	A-7-5	M	5.00	No Visible Distresses	578531.7	1421796.8	
-LRPB- 24+80 OSS	10.0 Cut	N/A	4.00	2.0 FWL	S	14.50	4.00	N/A	N/A	10.50	N/A	Asphalt CTABC	0.0 - 5.0' = Residual Soil, Tan, Sandy Silt	S-15	A-4	M	5.00	Low Severity Transverse Cracking	577839.4	1420556.6	
-LRPB- 24+80 LN	10.0 Cut	17.30	N/A	4.5 FWL	S	15.00	4.00	N/A	N/A	11.00	N/A	Asphalt CTABC	0.0 - 5.0' = Residual Soil, Tan, Sandy Silt	REF S-15	A-4	M	5.00	Moderate Longitudinal and Transverse Cracking, Moderate Severity Block Cracking at IWP, Moderate Severity Longitudinal Cracking at Pavement Joint, Core Cracked Full Depth	577837.4	1420562.3	
-LRPB- 24+80 ISS	10.0 Cut	N/A	4.00	2.0 FY	S	15.00	3.50	N/A	N/A	11.50	N/A	Asphalt CTABC	0.0 - 5.0' = Residual Soil, Tan, Sandy Silt	REF S-15	A-4	M	5.00	Moderate Severity Transverse Cracking Every 15'	577827.8	1420569.6	
-LRPC- 17+00 OSS	20.0 Fill	N/A	9.80	5.5 FWL	S	14.50	6.50	N/A	8.00	N/A	N/A	Asphalt ABC	0.0 - 5.0' = Roadway Embankment, Orange and Gray, Sandy Silty Clay	S-16 A	A-7-6	M	5.00	No Visible Distresses	576700.8	1420443.7	
-LRPC- 17+00 LN	20.0 Fill	12.20	N/A	1.5 FWL	S	16.50	6.50	N/A	10.00	N/A	N/A	Asphalt ABC	0.0 - 5.0' = Roadway Embankment, Orange and Gray, Sandy Silty Clay	REF S-16	A-6	M	5.00	Moderate Severity Longitudinal and Transverse Cracking at IWP	576708.2	1420441.5	
-LRPC- 17+00 ISS	20.0 Fill	N/A	7.50	4.5 FY	S	17.00	7.00	N/A	10.00	N/A	N/A	Asphalt ABC	0.0 - 5.0' = Roadway Embankment, Orange and Gray, Sandy Silty Clay	S-16	A-6	M	5.00	No Visible Distresses	576719.4	1420427.9	
-L- 22+10 SB OES	5.0 Fill	N/A	N/A	19.0 FWL	C	N/A	N/A	N/A	N/A	N/A	N/A	N/A	0.8 - 1.5' = Roadway Embankment, Brown and Orange, Sandy Silty Clay	Bulk 1	A-7-6	M	1.50	N/A	578207.9	1420602.2	
-L- 31+55 NB IES	8.0 Cut	N/A	N/A	4.0 FY	C	N/A	N/A	N/A	N/A	N/A	N/A	N/A	0.5 - 1.2' = ABC 1.2 - 2.5' = Residual Soil, Orange, Sandy Silty Clay	Bulk 2	A-6	M	2.50	N/A	577609.5	1421344.2	
-LRPA- 20+95 IES	15.0 Fill	N/A	N/A	12.0 FY	C	N/A	N/A	N/A	N/A	N/A	N/A	N/A	1.0 - 3.0' = Roadway Embankment, Orange, Sandy Clay	Bulk 3	A-7-6	M	3.00	N/A	578517.1	1421804.8	

Notes:

OSL = Outside Lane
ISL = Inside Lane
CL = Center Lane
LTL = Left Turn Lane

WP = Wheel Path
IWP = Inside Wheel Path
OWP = Outside Wheel Path
C&G = Curb & Gutter

OSS = Outside Shoulder
ISS = Inside Shoulder
GM = Grass Median
OGS = Outside Grass Shoulder

PS = Paved Shoulder
RT LN = Right Lane
LT LN = Left Lane
COL = Collector Lane

CTL = Center Turn Lane
RTL = Right Turn Lane
DECEL = Deceleration Lane
ACCEL = Acceleration Lane

RT = Right
LT = Left
(I) = Inside
(O) = Outside

NB = Northbound
SB = Southbound
FW = From White
FY = From Yellow

FCG = From Curb & Gutter
AG = At Grade
EOP = Edge of Pavement

CONE PENETROMETER DATA CODE SHEET				TIP		PROJECT I.D.		ROUTE	
				I-5973		44990.1.1		I-485 at NC16	
TEST LOCATIONS DESCRIPTION				COUNTY		ENGINEER		TECHNICIANS	
				Mecklenburg		VLAD MITCHEV		Darin Strother	
TEST LOCATIONS DESCRIPTION				DATE RUN		TEST LOCATION DESCRIPTION		DATE RUN	
L- 22+10 SB RTL				3/3 to 3/10/2020		L- 22+10 SB OSL		3/3 to 3/10/2020	
DATUM	CUT/FILL	NORTHING	EASTING	DATUM	CUT/FILL	NORTHING	EASTING	DATUM	CUT/FILL
SG	FILL	578225.8	1420619.6	CTABC	FILL	578231.4	1420629.8		
Cumulative Penetration in Centimeters				Cumulative Penetration in Centimeters					
2.7				2.7	0.2		40.2		
4.6	74.3			4.0	0.5		40.8		
6.2	76.0			4.7	0.7		41.3		
7.5	77.4			4.9	1.0		41.8		
8.3	78.6			5.1	1.2		42.2		
9.5	79.9			5.3	1.5		42.7		
11.5	81.1			5.5	1.6		43.2		
13.5	82.3			5.7	1.8		43.7		
15.6	83.4			5.9	1.9		44.2		
17.5	84.5			6.0	2.1		44.8		
19.0	85.3			6.2	2.2		45.5		
20.6				6.3	2.4		46.1		
22.4				6.5	2.6		46.9		
24.4				6.6	2.7		47.7		
26.4				6.7	2.9		48.5		
28.1				6.8	3.1		49.5		
30.4				6.9	3.4		50.5		
32.8				7.0	3.6		51.4		
35.4				7.1	3.9		52.4		
37.9				7.2	4.1		53.4		
40.5				7.3	4.4		54.4		
42.6				7.4	4.6		55.3		
44.5				7.5	4.9		56.1		
46.1				7.6	5.1		57.0		
47.7				7.7	5.4		58.0		
49.0				7.8	5.6		59.1		
50.2				7.9	6.1		60.1		
51.1				8.0	6.5		61.2		
52.1				8.1	7.0		62.3		
52.9				8.2	7.4		63.4		
54.0				8.4	7.9				
54.9				8.5	8.8				
55.8				8.7	9.6				
56.7				8.8	11.0				
57.5				8.9	12.4				
58.2				9.0	14.9				
58.9				9.0	17.1				
59.5				9.1	19.2				
60.2				9.2	21.4				
60.8				9.3	23.6				
61.4				9.4	25.7				
62.0				9.5	27.6				
62.7				9.6	29.5				
63.5				9.7	31.1				
64.0				9.8	32.5				
64.8				9.9	34.1				
65.5				10.1	35.4				
66.0				10.2	36.4				
67.0				10.3	37.3				
67.7					38.0				
68.7				Auger	38.6				
69.7				4.0 cm	39.2				
71.0					39.7				

SG = Subgrade
SS = Stabilized Soil
CTBC = Cement-Treated Base Course
ABC = Aggregate Base Course
ESG = Estimated Subgrade

CONE PENETROMETER DATA CODE SHEET				TIP		PROJECT I.D.		ROUTE	
				I-5973		44990.1.1		I-485 at NC16	
TEST LOCATIONS DESCRIPTION				COUNTY		ENGINEER		TECHNICIANS	
				Mecklenburg		VLAD MITCHEV		Darin Strother	
TEST LOCATIONS DESCRIPTION				DATE RUN		TEST LOCATION DESCRIPTION		DATE RUN	
L- 26+40 SB OSS				3/3 to 3/10/2020		L- 26+40 SB DECEL		3/3 to 3/10/2020	
DATUM	CUT/FILL	NORTHING	EASTING	DATUM	CUT/FILL	NORTHING	EASTING	DATUM	CUT/FILL
SG	AG	577909.6	1420914.9	SG	AG	577914.0	1420920.8		
Cumulative Penetration in Centimeters				Cumulative Penetration in Centimeters					
2.9				2.0			57.5		
4.9				3.1			58.1		
6.4				3.7			58.8		
7.7				4.4			59.5		
8.3				4.8			60.1		
9.3				5.5			60.8		
11.3				6.2			61.5		
14.0				6.9			62.1		
16.7				7.5			62.6		
19.2				8.3			63.4		
21.7				9.2			64.0		
23.6				10.6			64.6		
25.6				12.6			65.2		
27.6				15.5			65.9		
29.5				18.2			66.5		
31.2				20.4			67.0		
32.9				22.5			67.7		
34.6				24.4			68.4		
36.4				26.2			68.9		
38.2				27.8			69.5		
40.0				29.2			70.0		
41.7				30.3			70.5		
43.7				31.4			71.1		
45.7				32.4			71.6		
47.8				33.3			72.2		
49.7				34.2			72.8		
51.3				35.0			73.3		
53.1				35.9			73.9		
54.7				36.8			74.4		
56.3				37.7			75.0		
57.9				38.7			75.5		
60.8				39.6			76.0		
62.3				40.5			76.6		
63.6				41.4			77.1		
64.8				42.3			77.6		
66.1				43.3			78.0		
67.4				44.3			78.5		
68.7				45.1			78.9		
69.8				46.0			79.4		
71.1				46.9			79.8		
72.3				47.7			80.2		
73.6				48.6			80.6		
74.8				49.4			81.0		
75.9				50.1			81.3		
77.2				50.9			81.7		
78.4				51.7			82.0		
79.6				52.4			82.4		
				53.2			82.9		
				53.9			83.3		
				54.7					
				55.4					
				56.0					
				56.6					


S&ME, Inc.
3201 Spring Forest Road
Raleigh, North Carolina 27616

CONE PENETROMETER DATA CODE SHEET				TIP	PROJECT I.D.	ROUTE					
				I-5973	44990.1.1	I-485 at NC16					
				COUNTY	ENGINEER	TECHNICIANS					
				Mecklenburg	VLAD MITCHEV	Darin Strother					
TEST LOCATIONS DESCRIPTION				DATE RUN	TEST LOCATION DESCRIPTION				DATE RUN		
L- 26+40 SB OSL				3/3 to 3/10/2020	L- 26+40 SB ISS				3/3 to 3/10/2020		
DATUM	CUT/FILL	NORTHING	EASTING	DATUM	CUT/FILL	NORTHING	EASTING	DATUM	CUT/FILL	NORTHING	EASTING
CTABC	AG	577919.0	1420926.2	CTABC	AG	577933.5	1420946.5				
Cumulative Penetration in Centimeters						Cumulative Penetration in Centimeters					
3.0	17.5	31.8		0.5	9.4	10.0	61.2				
6.0	17.6	32.8		0.8	9.6	10.2	63.3				
8.2	17.8	33.8		1.1	9.7	10.3	65.3				
9.3	17.9	34.8		1.3		10.5					
10.3	18.0	35.7		1.6	Auger 14.7 cm	10.7					
10.9	18.1	36.7		1.9		10.9					
11.4	18.3	37.6		2.1	0.7	11.1					
11.6	18.4	38.6		2.3	1.1	11.3					
11.8	18.5	39.5		2.5	1.3	11.5					
12.0	18.6	40.3		2.7	1.6	11.7					
12.1		41.1		2.9	1.8	11.9					
12.3	Auger 7.6 cm	41.9		3.1	2.1	12.1					
12.5		42.6		3.3	2.3	12.3					
12.6		43.7		3.5	2.6	12.5					
12.7	0.2	44.9		3.7	3.0	12.7					
12.9	0.5	45.7		3.9	3.3	13.0					
13.0	0.7	46.5		4.1	3.7	13.3					
13.1	1.0	47.3		4.3	4.0	13.6					
13.3	1.2	48.1		4.5	4.2	13.9					
13.4	1.5	48.9		4.6	4.4	14.2					
13.6	1.8	49.7		4.8	4.6	14.5					
13.7	2.1	50.6		4.9	4.8	14.8					
13.8	2.4	51.4		5.0	5.0	15.1					
13.9	2.7	52.1		5.1	5.2	15.4					
14.0	3.1	52.8		5.2	5.4	15.7					
14.2	3.5	53.7		5.3	5.6	16.4					
14.3	4.0	54.6		5.5	5.8	17.0					
14.4	4.4	55.5		5.7	6.0	17.7					
14.5	4.8	56.3		6.0	6.1	18.3					
14.6	5.7	57.1		6.2	6.3	19.0					
14.7	6.5	57.8		6.4	6.4	19.9					
14.8	7.4			6.5	6.6	20.7					
14.9	8.2			6.6	6.7	21.5					
15.0	9.6			6.8	6.8	22.3					
15.1	10.9			6.9	7.0	23.3					
15.3	12.3			7.0	7.1	24.2					
15.4	13.4			7.1	7.3	25.7					
15.5	14.5			7.2	7.4	27.1					
15.6	15.7			7.4	7.6	29.1					
15.7	16.8			7.6	7.7	31.0					
15.9	18.0			7.7	7.9	33.1					
16.0	19.1			7.8	8.0	35.2					
16.1	20.2			8.0	8.2	37.3					
16.3	21.3			8.1	8.3	39.4					
16.4	22.4			8.3	8.5	41.5					
16.6	23.4			8.4	8.6	43.5					
16.7	24.5			8.5	8.8	45.6					
16.8	25.5			8.6	8.9	47.7					
16.9	26.6			8.8	9.1	50.0					
17.0	27.6			8.9	9.3	52.3					
17.2	28.7			9.0	9.4	54.5					
17.3	29.8			9.1	9.6	56.7					
17.4	30.8			9.3	9.8	59.0					

SG = Subgrade
SS = Stabilized Soil
CTBC = Cement-Treated Base Course
ABC = Aggregate Base Course
ESG = Estimated Subgrade

CONE PENETROMETER DATA CODE SHEET				TIP	PROJECT I.D.	ROUTE					
				I-5973	44990.1.1	I-485 at NC16					
				COUNTY	ENGINEER	TECHNICIANS					
				Mecklenburg	VLAD MITCHEV	Darin Strother					
TEST LOCATIONS DESCRIPTION				DATE RUN	TEST LOCATION DESCRIPTION				DATE RUN		
L- 31+55 NB OSS				3/3 to 3/10/2020	L- 31+55 NB DECEL				3/3 to 3/10/2020		
DATUM	CUT/FILL	NORTHING	EASTING	DATUM	CUT/FILL	NORTHING	EASTING	DATUM	CUT/FILL	NORTHING	EASTING
SG	CUT	577641.0	1421374.7	ABC	CUT	577639.5	1421364.7				
Cumulative Penetration in Centimeters						Cumulative Penetration in Centimeters					
4.1				2.8	20.7	80.5					
8.0				4.0	21.2	80.5					
10.7				4.5	21.8						
13.8				5.1	22.3						
16.6				5.6	23.1						
19.5				6.0	24.0						
22.5				6.5	24.8						
25.7				6.8	25.7						
28.8				7.1	26.5						
32.0				7.3	27.3						
35.5				7.6	28.1						
39.1				7.9	29.4						
42.7				8.2	30.6						
46.5				8.5	33.0						
50.6				8.7	35.3						
55.0				9.0	38.6						
58.8				9.3	42.5						
61.7				9.6	45.8						
63.8				10.0	48.6						
65.7				10.3	51.9						
68.1				10.7	54.5						
70.0				11.0	56.4						
72.2				11.2	58.8						
73.4				11.4	61.2						
76.2				11.7	64.1						
78.1				11.9	66.7						
79.3				12.1	69.5						
80.4				12.4	72.1						
81.5				12.7	76.9						
82.5				13.0	78.5						
83.6				13.3	78.8						
84.6				13.6	79.1						
85.6				13.8	79.2						
				14.1	79.3						
				14.3	79.4						
				14.6	79.5						
				14.8	79.5						
				15.0	79.6						
				15.3	79.6						
				15.5	79.7						
				15.8	79.8						
				16.0	79.8						
				16.3	79.9						
				16.6	79.9						
				16.9	80.0						
				17.1	80.1						
				17.5	80.1						
				17.9	80.2						
				18.3	80.2						
				18.8	80.3						
				19.2	80.3						
				19.6	80.4						
				20.1	80.4						


S&M, Inc.
3201 Spring Forest Road
Raleigh, North Carolina 27616

CONE PENETROMETER DATA CODE SHEET				TIP	PROJECT I.D.	ROUTE					
				I-5973	44990.1.1	I-485 at NC16					
				COUNTY	ENGINEER	TECHNICIANS					
				Mecklenburg	VLAD MITCHEV	Darin Strother					
TEST LOCATIONS DESCRIPTION				DATE RUN	TEST LOCATION DESCRIPTION	DATE RUN					
L- 31+55 NB OSL				3/3 to 3/10/2020	L- 31+55 NB ISS				3/3 to 3/10/2020		
DATUM	CUT/FILL	NORTHING	EASTING	DATUM	CUT/FILL	NORTHING	EASTING	DATUM	CUT/FILL	NORTHING	EASTING
CTABC	CUT	577622.0	1421368.5	CTABC	CUT	577612.2	1421347.0				
Cumulative Penetration in Centimeters						Cumulative Penetration in Centimeters					
1.5		12.9		1.1		0.5	2.0				
3.3				1.1		0.7	2.4				
4.6		Auger				0.9	2.7				
5.1		13.0 cm				1.1	3.1				
5.4			DCP			1.2	3.5				
5.7		0.0	REFUSAL			1.4	4.4				
6.0		0.0				1.6	5.4				
6.3		0.1				1.7	6.3				
6.6		0.1				1.8	7.3				
6.8		0.1				1.9	8.2				
7.0		0.1				2.0	11.4				
7.3		0.1				2.1	17.6				
7.5		0.2				2.3	21.7				
7.7		0.2				2.5	25.0				
7.9		0.2				2.7	28.1				
8.0		0.2				2.9	31.4				
8.2		0.2				3.1	34.6				
8.4		0.2				3.2	37.4				
8.5		0.2				3.3	39.6				
8.6		0.3				3.4	40.7				
8.7		0.3				3.4	42.2				
8.9		0.3				3.5	44.6				
9.0		0.3				3.7	46.7				
9.1		0.3				3.9	48.6				
9.3		0.3				4.2	50.5				
9.4		0.3				4.4	52.4				
9.6		0.3				4.6	54.2				
9.8		0.4				4.7	55.8				
9.9		0.4				4.8	57.3				
10.0		0.4				5.0	58.9				
10.2		0.4				5.1	60.6				
10.3		0.4				5.2	62.1				
10.5		0.5				5.3	63.3				
10.6		0.5				5.5	65.4				
10.7		0.5				5.6	67.4				
10.9		0.5				5.8					
11.0		0.5				5.9					
11.2		0.6				6.0					
11.3		0.6				6.2					
11.4		0.6				6.3					
11.6		0.6				6.5					
11.7		0.6				6.6					
11.9		0.7				6.8					
12.0		0.7				6.9					
12.1		0.7				7.1					
12.2		0.7				7.3					
12.3		0.8				7.4					
12.3		0.8									
12.4		0.9				Auger					
12.5		0.9				17.2 cm					
12.6		0.9				0.8					
12.7		1.0				1.4					
12.8		1.0				1.6					

SG = Subgrade
SS = Stabilized Soil
CTBC = Cement-Treated Base Course
ABC = Aggregate Base Course
ESG = Estimated Subgrade

CONE PENETROMETER DATA CODE SHEET				TIP	PROJECT I.D.	ROUTE					
				I-5973	44990.1.1	I-485 at NC16					
				COUNTY	ENGINEER	TECHNICIANS					
				Mecklenburg	VLAD MITCHEV	Darin Strother					
TEST LOCATIONS DESCRIPTION				DATE RUN	TEST LOCATION DESCRIPTION	DATE RUN					
L- 37+60 NB OSS				3/3 to 3/10/2020	L- 37+60 NB RTL				3/3 to 3/10/2020		
DATUM	CUT/FILL	NORTHING	EASTING	DATUM	CUT/FILL	NORTHING	EASTING	DATUM	CUT/FILL	NORTHING	EASTING
SG	FILL	577205.7	1421795.1	SG	FILL	577202.9	1421788.1				
Cumulative Penetration in Centimeters						Cumulative Penetration in Centimeters					
6.3		63.8		2.6		77.2					
10.4		64.7		4.9		79.1					
12.5		65.6		6.8		80.9					
14.5		66.5		7.8		81.7					
16.8		67.5		8.9		82.4					
19.6		68.5		10.4		83.2					
22.3		69.5									
24.5		70.8									
26.7		72.1									
28.8		73.5									
30.3		74.8									
31.5		76.1									
32.5		77.4									
33.5		78.4									
34.5		79.5									
35.7		80.5									
36.9		81.4									
38.1		82.3									
39.4		83.2									
40.7		84.1									
42.1		85.0									
43.6		85.8									
44.7											
45.8											
46.6											
47.3											
48.0											
48.7											
49.3											
50.0											
50.6											
51.2											
51.8											
52.1											
52.7											
53.4											
53.9											
54.5											
55.0											
55.5											
56.0											
56.6											
57.1											
57.7											
58.2											
58.7											
59.3											
59.8											
60.5											
61.1											
61.7											
62.4											
63.1											

 S&M, Inc.
3201 Spring Forest Road
Raleigh, North Carolina 27616

CONE PENETROMETER DATA CODE SHEET				TIP		PROJECT I.D.		ROUTE		
				I-5973		44990.1.1		I-485 at NC16		
				COUNTY		ENGINEER		TECHNICIANS		
				Mecklenburg		VLAD MITCHEV		Darin Strother		
TEST LOCATIONS DESCRIPTION				DATE RUN		TEST LOCATION DESCRIPTION		DATE RUN		
L- 37+60 NB ISL				3/3 to 3/10/2020		L- 37+60 NB ISS		3/3 to 3/10/2020		
DATUM	CUT/ FILL	NORTHING	EASTING	DATUM	CUT/ FILL	NORTHING	EASTING	DATUM	EASTING	
ABC	FILL	577186.6	1421770.5	ABC	FILL	577178.3	1421766.6			
Cumulative Penetration in Centimeters				Cumulative Penetration in Centimeters						
4.3	13.1	8.1	26.1	1.0	9.1	7.3	12.7	43.4		
5.2		Auger 8.0cm	8.2	27.3	1.5	9.2	7.4	12.8	44.0	
6.4			8.3	28.5	1.7	9.3	7.5	12.9	44.7	
6.8			8.4	29.6	2.0	9.4	7.5	13.0	45.1	
7.1	1.1		8.6	30.6	2.2		Auger 16.1cm	7.6	13.1	45.7
7.3	1.5		8.7	31.6	2.5			7.7	13.2	46.3
7.6	1.8		8.9	32.6	2.7			7.8	13.3	47.0
7.8	2.1		9.0	33.6	2.9	0.8	7.8	13.4	47.6	
8.1	2.3		9.2	34.6	3.1	1.2	7.9	13.5	48.3	
8.3	2.6		9.3	35.7	3.2	1.5	7.9	13.6	48.9	
8.5	2.9		9.5	36.7	3.4	1.7	8.0	13.8	49.5	
8.8	3.0		9.6	37.7	3.6	2.0	8.1	13.9	50.0	
9.0	3.2		9.8	38.7	3.8	2.2	8.2	14.0	50.7	
9.2	3.3		10.0	39.7	4.0	2.5	8.2	14.2	51.4	
9.3	3.5		10.1	40.7	4.2	2.6	8.3	14.4	52.0	
9.4	3.6		10.3	41.8	4.4	2.7	8.4	14.6	52.6	
9.6	3.7		10.4	42.8	4.6	2.9	8.5	14.8	53.2	
9.7	3.8		10.6	43.7	4.8	3.0	8.6	15.0	53.8	
9.8	4.0		10.7	44.7	4.9	3.1	8.7	15.3	54.4	
9.9	4.1		10.8	45.4	5.1	3.3	8.8	15.6	55.0	
10.0	4.2		11.0	46.1	5.2	3.5	8.9	15.8	55.6	
10.1	4.3		11.1	47.2	5.4	3.6	9.0	16.1	56.2	
10.1	4.4		11.2	48.3	5.5	3.8	9.1	16.4	56.8	
10.2	4.6		11.4	49.5	5.6	4.0	9.3	16.8	57.4	
10.3	4.7		11.6	50.6	5.8	4.1	9.4	17.2	58.0	
10.4	4.8		11.8	51.6	5.9	4.2	9.5	17.6	58.6	
10.5	4.9		12.0	52.6	6.0	4.3	9.6	18.0	59.1	
10.6	5.1		12.1	53.5	6.1	4.4	9.7	18.4	59.7	
10.6	5.2		12.3	54.5	6.3	4.5	9.8	19.1	60.3	
10.7	5.4		12.5	55.4	6.4	4.6	9.9	19.8	60.9	
10.8	5.5		12.6	56.2	6.6	4.8	10.0	20.5	61.7	
10.9	5.6		12.8	57.0	6.7	4.9	10.1	21.2	62.4	
11.0	5.7		13.0	57.7	6.8	5.0	10.2	21.9	63.1	
11.1	5.9		13.2	58.7	7.0	5.2	10.3	23.0	63.7	
11.2	6.0		13.5	59.6	7.1	5.3	10.4	24.1	64.3	
11.3	6.1		13.7	60.3	7.3	5.4	10.5	25.6	64.9	
11.4	6.2		13.9	61.0	7.4	5.6	10.6	27.0	65.5	
11.5	6.3		14.2	61.9	7.5	5.7	10.7	28.6	66.0	
11.6	6.5		14.5	62.7	7.6	5.8	10.9	30.1	66.7	
11.7	6.6		14.8	63.5	7.7	5.9	11.0	31.4	67.3	
11.8	6.7		15.1	64.3	7.8	6.0	11.1	32.7		
11.9	6.8		15.4	65.2	7.9	6.2	11.2	33.8		
12.0	6.9		15.7	66.0	8.0	6.3	11.4	34.9		
12.1	7.0		16.2		8.1	6.4	11.5	35.9		
12.2	7.1		16.8		8.2	6.5	11.7	36.8		
12.3	7.2		17.3		8.3	6.6	11.8	37.7		
12.4	7.3		17.9		8.5	6.6	11.9	38.6		
12.5	7.4		18.4		8.6	6.7	12.0	39.3		
12.6	7.5		19.4		8.7	6.8	12.1	40.0		
12.7	7.6		20.4		8.8	6.9	12.2	40.7		
12.8	7.7		21.9		8.9	7.0	12.3	41.4		
12.9	7.8		23.3		9.0	7.1	12.4	42.1		
13.0	7.9		24.7		9.0	7.2	12.5	42.7		

CONE PENETROMETER DATA CODE SHEET				TIP		PROJECT I.D.		ROUTE	
				I-5973		44990.1.1		I-485 at NC16	
				COUNTY		ENGINEER		TECHNICIANS	
				Mecklenburg		VLAD MITCHEV		Darin Strother	
TEST LOCATIONS DESCRIPTION				DATE RUN		TEST LOCATION DESCRIPTION		DATE RUN	
LRPA- 21+05 OSS				3/3 to 3/10/2020		LRPA- 21+05 LN		3/3 to 3/10/2020	
DATUM	CUT/ FILL	NORTHING	EASTING	DATUM	CUT/ FILL	NORTHING	EASTING	DATUM	EASTING
ABC	FILL	578554.1	1421797.2	ABC	FILL	578543.4	1421794.8		
Cumulative Penetration in Centimeters				Cumulative Penetration in Centimeters					
1.2	14.7	28.7		0.5	14.6	64.2			
1.7	14.9	29.2		1.0	14.9	65.0			
2.1	15.2	30.0		1.3	15.2	66.0			
2.4	15.4	30.7		1.6	15.5	67.0			
2.7	15.6	31.5		2.0	15.9	68.1			
2.9	15.8	33.0		2.3	16.3	69.1			
3.2	16.1	34.5		2.6	16.8	70.2			
3.5	16.3	36.2		2.9	17.2	71.3			
3.8	16.6	37.9		3.2	17.6	72.4			
4.1	16.8	38.9		3.5	18.0	73.5			
4.4	17.0	39.8		3.7	18.5	74.9			
4.7	17.1	40.6		4.0	18.9	76.3			
5.0	17.3	41.3		4.2	19.4	78.2			
5.3	17.4	42.2		4.4	19.8	80.0			
5.5	17.6	43.0		4.6	20.1	81.9			
5.8	17.8	43.9		4.8	20.4	83.8			
6.0	18.0	44.7		5.0	20.7	86.0			
6.3	18.2	45.8		5.2	22.0	88.1			
6.5	18.4	46.9		5.4	22.3	90.1			
6.7	18.6	48.1		5.6	23.0	92.1			
6.9	18.8	49.3		5.8	23.7	93.8			
7.1	19.0	50.6		6.0	24.5	95.4			
7.3	19.2	51.8		6.3	25.2	96.7			
7.5	19.5	53.1		6.6	25.9	97.9			
7.7	19.7	54.3		6.9	27.1	99.0			
8.0	19.9	55.5		7.2	28.4	100.0			
8.2	20.1	56.7		7.5	29.6				
8.4	20.3	57.9		7.7	32.4				
8.6	20.5	59.0		7.9	35.2				
8.9	20.7	60.2		8.2	37.0				
9.1	21.0	61.3		8.4	38.7				
9.4	21.2	62.7		8.6	40.3				
9.6	21.5	64.1		8.9	41.9				
9.9	21.7	65.7		9.2	42.9				
10.2	22.0	67.2		9.5	43.9				
10.4	22.2	68.8		9.8	44.7				
10.7	22.5	70.3		10.1	45.5				
11.0	22.7	71.8		10.4	46.5				
11.3	23.0	73.2		10.7	47.4				
11.5	23.2	74.9		10.9	48.4				
11.8	23.5	76.6		11.2	49.5				
12.0	23.7	78.7		11.5	50.3				
12.3	24.0	80.8		11.7	51.0				
12.5	24.2	82.8		12.0	51.9				
12.7	24.5	84.7		12.2	52.8				
13.0	24.9	87.0		12.5	54.2				
13.2	25.3	89.2		12.7	55.5				
13.4	25.7	91.3		13.0	57.0				
13.6	26.1	93.4		13.2	58.4				
13.8	26.5	95.0		13.5	59.5				
14.0	27.0	96.5		13.7	61.4				
14.3	27.6	97.9		14.0	62.4				
14.5	28.1	99.2		14.3	63.3				

SG = Subgrade
SS = Stabilized Soil
CTBC = Cement-Treated Base Course
ABC = Aggregate Base Course
ESG = Estimated Subgrade



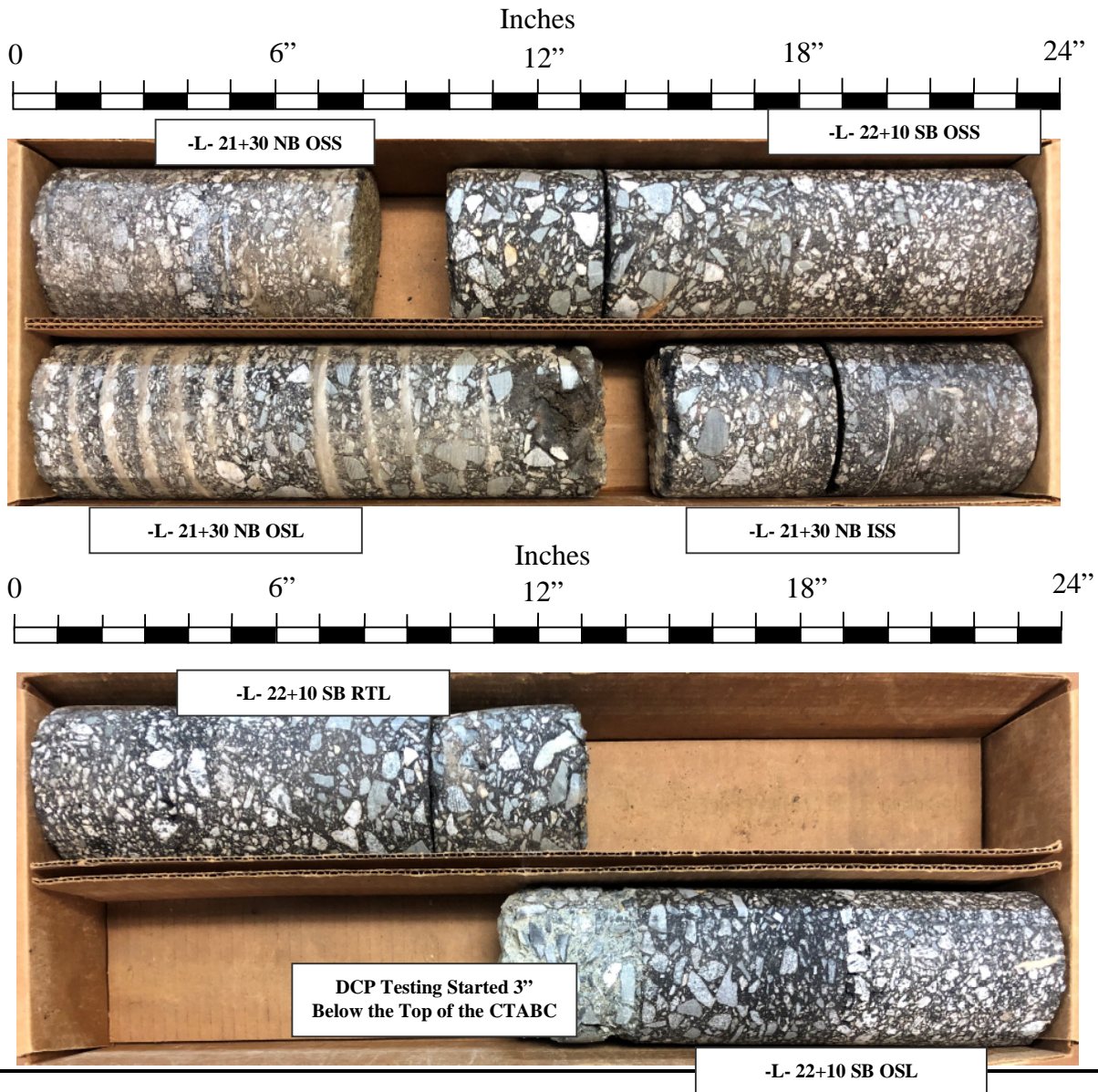
CONE PENETROMETER DATA CODE SHEET				TIP		PROJECT I.D.		ROUTE	
				I-5973		44990.1.1		I-485 at NC16	
COUNTY				ENGINEER		TECHNICIANS			
Mecklenburg				VLAD MITCHEV		Darin Strother			
TEST LOCATIONS DESCRIPTION				DATE RUN		TEST LOCATION DESCRIPTION		DATE RUN	
LRPA- 21+05 ISS				3/3 to 3/10/2020		LRPB- 24+80 OSS		3/3 to 3/10/2020	
DATUM	CUT/ FILL	NORTHING	EASTING	DATUM	CUT/ FILL	NORTHING	EASTING		
ABC	FILL	578531.7	1421796.8	CTABC	CUT	577839.4	1420566.6		
Cumulative Penetration in Centimeters				Cumulative Penetration in Centimeters					
4.20	29.00	100.4		5.4	39.4	61.7	85.5		
5.20	31.10	101.8		9.0	39.8	62.1	85.9		
5.60	34.9	103.4		11.0	40.3	62.5	86.4		
6.00	38.7			12.7	40.7	63.0	86.7		
6.40	42.4			13.9	41.2	63.4	87.1		
6.70	44.8			14.9	41.7	63.8	87.4		
7.10	46.4			15.6	42.2	64.1	87.7		
7.40	48.6			16.4	42.6	64.5	88.1		
7.80	50.7			17.1	42.9	65.0	88.4		
8.20	52.9			17.8	43.3	65.4	88.9		
8.70	54.8			18.5	43.7	65.9	89.4		
9.10	57.0			19.2	44.2	66.4	89.9		
9.50	59.0			20.0	44.6	66.8	90.5		
9.70	60.7			20.8	45.1	67.3	91.0		
10.00	61.8			21.5	45.5	67.7	91.6		
10.20	62.7			22.0	46.0	68.2	92.0		
10.50	63.6			22.5	46.4	68.6	92.4		
10.70	64.4			23.0	46.9	69.1	92.8		
10.90	65.3			23.5	47.3	69.6	93.3		
11.10	66.0			24.0	47.8	70.1	93.7		
11.40	66.7			24.5	48.2	70.5	94.2		
11.60	67.3			25.0	48.7	71.0			
11.80	68.0			25.5	49.2	71.4			
12.10	68.5			26.0	49.6	71.9			
12.40	69.1			26.5	50.1	72.3			
12.80	69.8			27.0	50.5	72.8			
13.10	70.5			27.5	50.9	73.3			
13.40	71.3			27.9	51.3	73.8			
13.70	72.0			28.3	51.7	74.3			
13.90	72.9			28.7	52.0	74.8			
14.20	73.9			29.1	52.4	75.2			
14.40	75.0			29.5	52.8	75.7			
14.70	75.9			29.9	53.2	76.1			
15.00	77.0			30.4	53.6	76.6			
15.30	77.8			31.0	54.0	77.0			
15.70	78.7			31.5	54.4	77.4			
16.00	79.7			31.9	54.8	77.9			
16.30	80.7			32.2	55.2	78.3			
16.70	81.7			32.6	55.6	78.7			
17.10	82.8			33.0	56.0	79.2			
17.40	83.9			33.4	56.4	79.6			
17.80	85.2			33.8	56.8	80.0			
18.20	86.4			34.3	57.2	80.4			
18.90	87.6			34.9	57.6	80.8			
19.50	88.6			35.4	58.1	81.3			
20.20	89.9			35.9	58.5	81.7			
20.80	91.2			36.5	58.9	82.2			
21.50	92.3			37.0	59.4	82.7			
22.40	93.5			37.4	59.8	83.1			
23.20	94.8			37.9	60.2	83.6			
24.10	96.1			38.3	60.6	84.1			
25.50	97.5			38.7	61.0	84.5			
26.90	99.0			39.0	61.4	85.0			

CONE PENETROMETER DATA CODE SHEET				TIP		PROJECT I.D.		ROUTE	
				I-5973		44990.1.1		I-485 at NC16	
COUNTY				ENGINEER		TECHNICIANS			
Mecklenburg				VLAD MITCHEV		Darin Strother			
TEST LOCATIONS DESCRIPTION				DATE RUN		TEST LOCATION DESCRIPTION		DATE RUN	
LRPB- 24+80 LN				3/3 to 3/10/2020		LRPB- 24+80 ISS		3/3 to 3/10/2020	
DATUM	CUT/ FILL	NORTHING	EASTING	DATUM	CUT/ FILL	NORTHING	EASTING		
CTABC	CUT	577837.4	1420562.3	CTABC	CUT	577827.8	1420569.6		
Cumulative Penetration in Centimeters				Cumulative Penetration in Centimeters					
0.9	8.8	23.6	50.2	72.9	3.6	7.0	36.4		
1.4	8.9	24.2	50.6		4.5	7.4	36.9		
1.7	9.1	24.7	51.0		4.9	7.8	37.3		
1.8	9.2	25.3	51.4		5.3	8.2	37.7		
2.1	9.4	25.8	51.9		5.5	8.6	38.1		
2.3	9.5	26.4	52.3		5.8	9.1	38.5		
2.6		26.9	52.8		6.0	9.6	38.9		
2.8		27.5	53.2		6.3	10.0	39.3		
3.1		28.0	53.7		6.5	10.5	39.6		
3.3		28.6	54.1		6.7	11.0	40.0		
3.4	0.4	29.1	54.5		6.9	11.7	40.3		
3.6	0.8	29.7	54.9		7.0	12.3	40.7		
3.7	1.3	30.2	55.3		7.2	13.0	41.0		
3.9	1.8	30.8	55.7		7.4	13.6	41.2		
4.0	2.2	31.3	56.1		7.6	14.3	41.5		
4.2	2.6	32.0	56.5		7.8	15.0	41.7		
4.3	3.1	32.4	57.0		8.0	15.7	42.0		
4.5	3.5	33.0	57.4		8.2	16.3	42.2		
4.6	4.0	33.4	57.8		8.4	17.0	42.4		
4.7	4.4	34.0	58.3		8.5	17.7	42.7		
4.8	5.0	34.5	58.8		8.7	18.4	42.9		
4.9	5.5	35.0	59.2		8.8	19.1	43.1		
5.0	6.1	35.5	59.7		9.0	19.9	43.4		
5.1	6.6	36.0	60.2		9.1	20.6	43.6		
5.3	7.2	36.5	60.7		9.2	21.3	43.9		
5.5	7.7	37.0	61.2		9.4	21.9	44.1		
5.6	8.1	37.5	61.6		9.5	22.6	44.4		
5.8	8.6	38.0	62.1		9.7	23.2	44.7		
5.9	9.0	38.5	62.6		9.8	23.9	44.9		
6.0	9.5	39.0	63.0		9.9	24.5	45.2		
6.1	10.0	39.5	63.5		10.0	25.1	45.4		
6.3	10.5	40.0	63.9		10.1	25.7	45.7		
6.4	11.1	40.5	64.4		10.2	26.2	46.1		
6.5	11.6	41.0	64.8		10.3	26.8	46.5		
6.6	12.1	41.6	65.1			27.4	46.8		
6.7	12.7	42.1	65.5			27.9	47.2		
6.8	13.2	42.6	65.8			28.4	47.6		
6.9	13.8	43.1	66.2			28.9	47.8		
7.0	14.3	43.6	66.5		2.4	29.4	48.0		
7.1	14.9	44.2	67.0		3.0	29.9	48.1		
7.2	15.4	44.7	67.4		3.3	30.4	48.3		
7.4	16.0	45.2	67.9		3.5	30.9	48.5		
7.5	16.5	45.6	68.3		3.8	31.3			
7.6	17.0	46.1	68.8		4.1	31.8			
7.7	17.6	46.5	69.2		4.3	32.3			
7.9	18.3	47.0	69.6		4.6	32.8			
8.0	19.0	47.4	70.0		4.8	33.2			
8.2	19.7	47.8	70.4		5.1	33.7			
8.3	20.4	48.2	70.8		5.4	34.1			
8.4	21.1	48.6	71.2		5.7	34.6			
8.5	21.7	49.0	71.6		6.0	35.1			
8.6	22.3	49.4	72.1		6.3	35.5			
8.7	23.0	49.8	72.5		6.6	36.0			

SG = Subgrade
SS = Stabilized Soil
CTBC = Cement-Treated Base Course
ABC = Aggregate Base Course
ESG = Estimated Subgrade



Project No.: 44990.1.1	I.D. No.: I-5973	County: Mecklenburg	Dates: 3/3/20 to 3/10/20
Site Description: Brookshire Blvd and I-485			
Consultant: S&ME, Inc.	Core Size: 4 - inch	Drill Machine: CME-55	
Geologist / Engineer: Darin Strother			



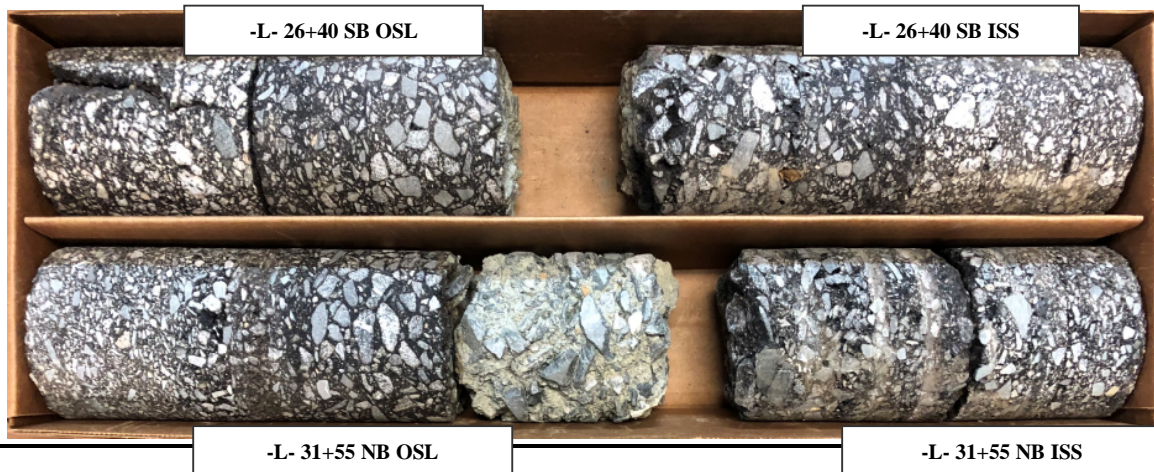
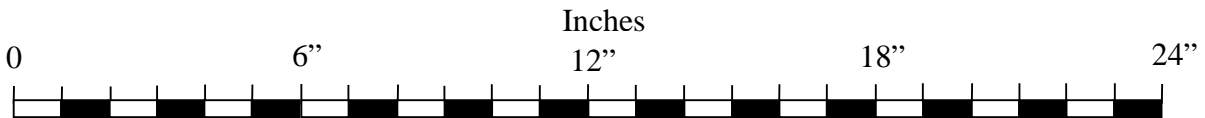
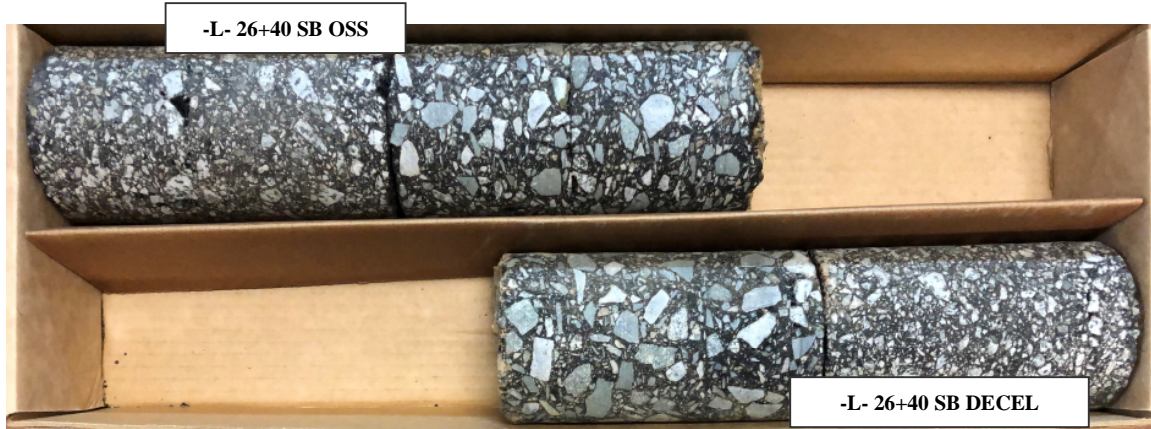
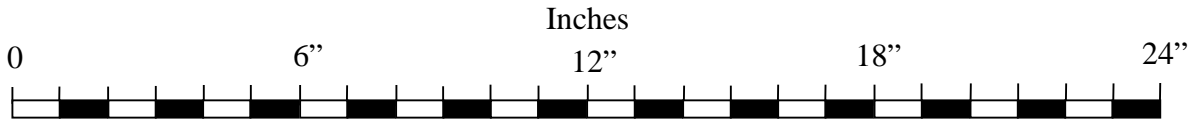
Notes:

OSL = Outside Lane	ACCEL = Acceleration Lane	MED = Median
ISL = Inside Lane	PS = Paved Shoulder	
RTL = Right Turn Lane	LTL = Left Turn Lane	
OSS = Outside Shoulder	ISS = Inside Shoulder	



S&ME, Inc.
3201 Spring Forest Road
Raleigh, North Carolina 27616

Project No.: 44990.1.1	I.D. No.: I-5973	County: Mecklenburg	Dates: 3/3/20 to 3/10/20
Site Description: Brookshire Blvd and I-485			
Consultant: S&ME, Inc.	Core Size: 4 - inch	Drill Machine: CME-55	
Geologist / Engineer: Darin Strother			



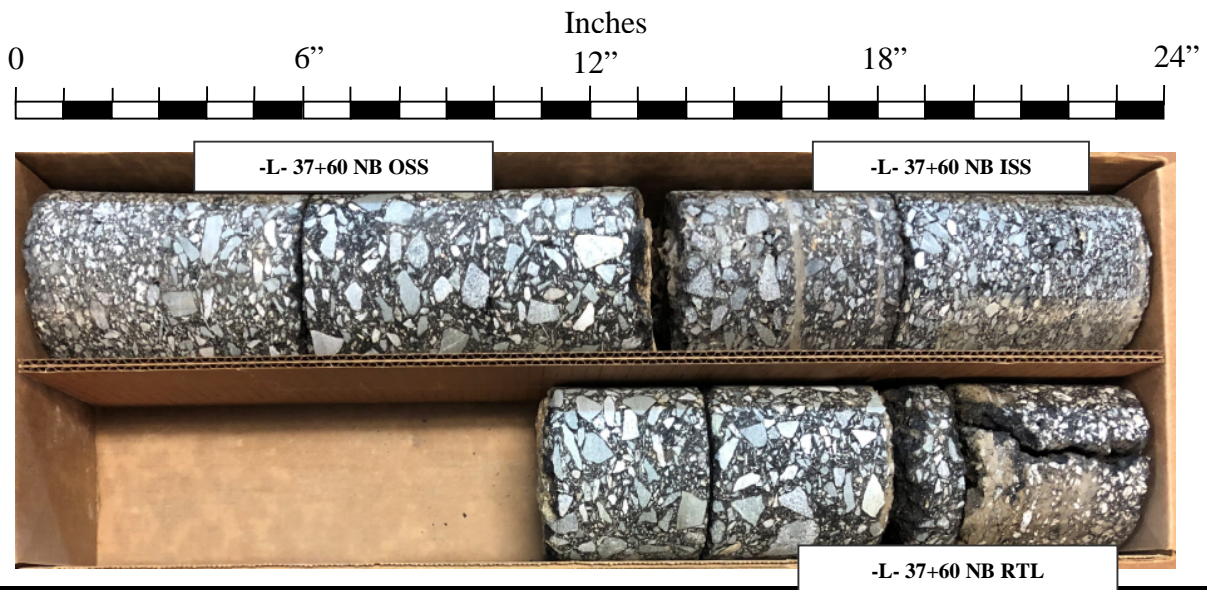
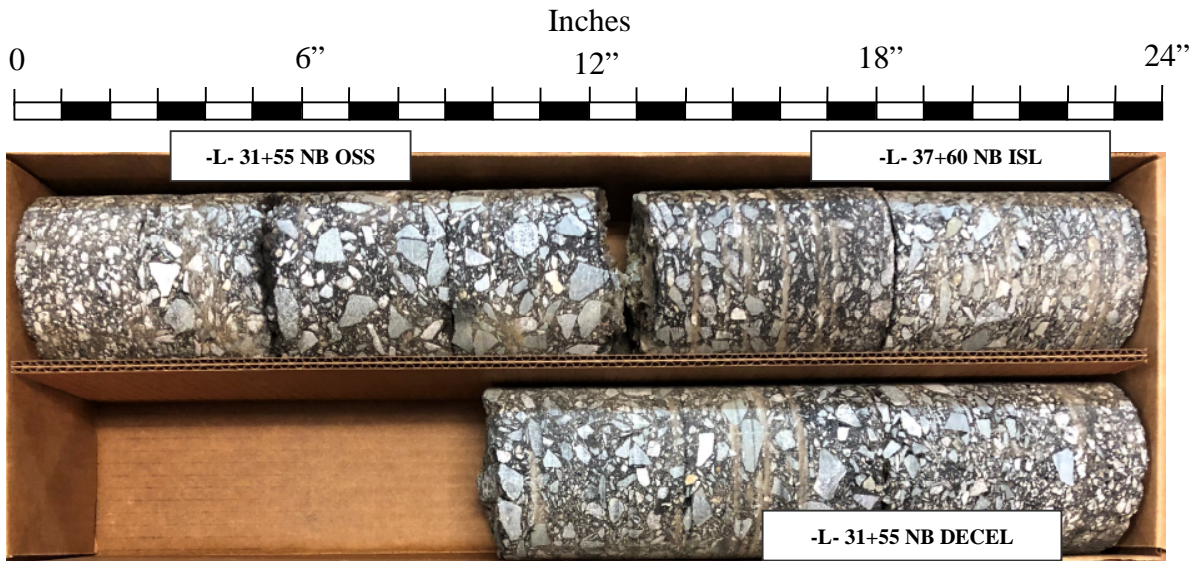
Notes:

- | | | |
|------------------------|---------------------------|--------------|
| OSL = Outside Lane | ACCEL = Acceleration Lane | MED = Median |
| ISL = Inside Lane | PS = Paved Shoulder | |
| RTL = Right Turn Lane | LTL = Left Turn Lane | |
| OSS = Outside Shoulder | ISS = Inside Shoulder | |



S&ME, Inc.
3201 Spring Forest Road
Raleigh, North Carolina 27616

Project No.: 44990.1.1	I.D. No.: I-5973	County: Mecklenburg	Dates: 3/3/20 to 3/10/20
Site Description: Brookshire Blvd and I-485			
Consultant: S&ME, Inc.	Core Size: 4 - inch	Drill Machine: CME-55	
Geologist / Engineer: Darin Strother			



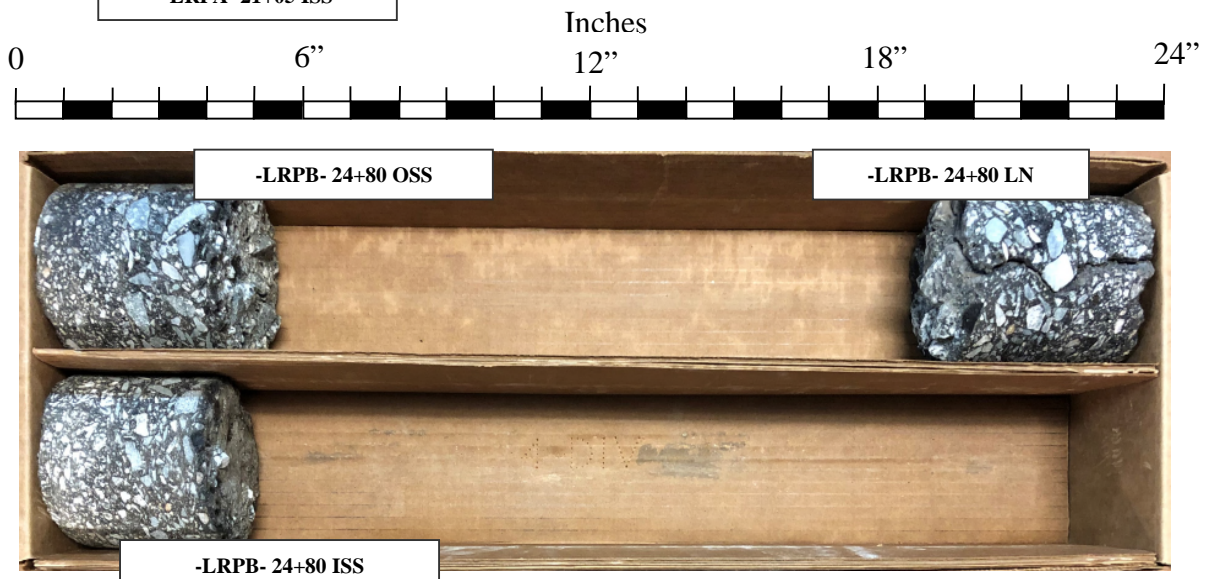
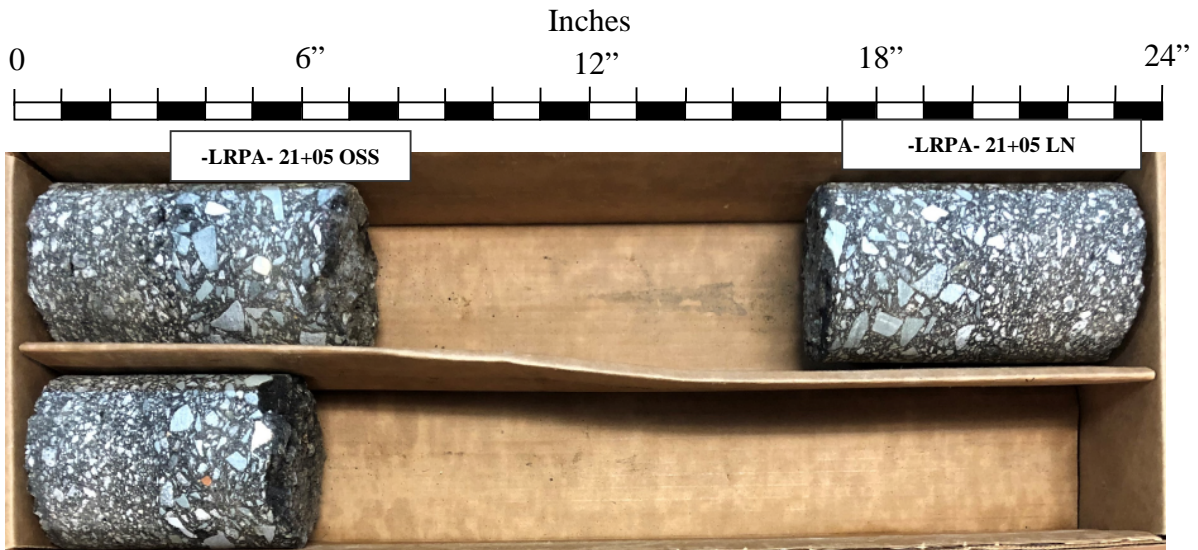
Notes:

- | | | |
|------------------------|---------------------------|--------------|
| OSL = Outside Lane | ACCEL = Acceleration Lane | MED = Median |
| ISL = Inside Lane | PS = Paved Shoulder | |
| RTL = Right Turn Lane | LTL = Left Turn Lane | |
| OSS = Outside Shoulder | ISS = Inside Shoulder | |



S&ME, Inc.
3201 Spring Forest Road
Raleigh, North Carolina 27616

Project No.: 44990.1.1	I.D. No.: I-5973	County: Mecklenburg	Dates: 3/3/20 to 3/10/20
Site Description: Brookshire Blvd and I-485			
Consultant: S&ME, Inc.	Core Size: 4 - inch	Drill Machine: CME-55	
Geologist / Engineer: Darin Strother			



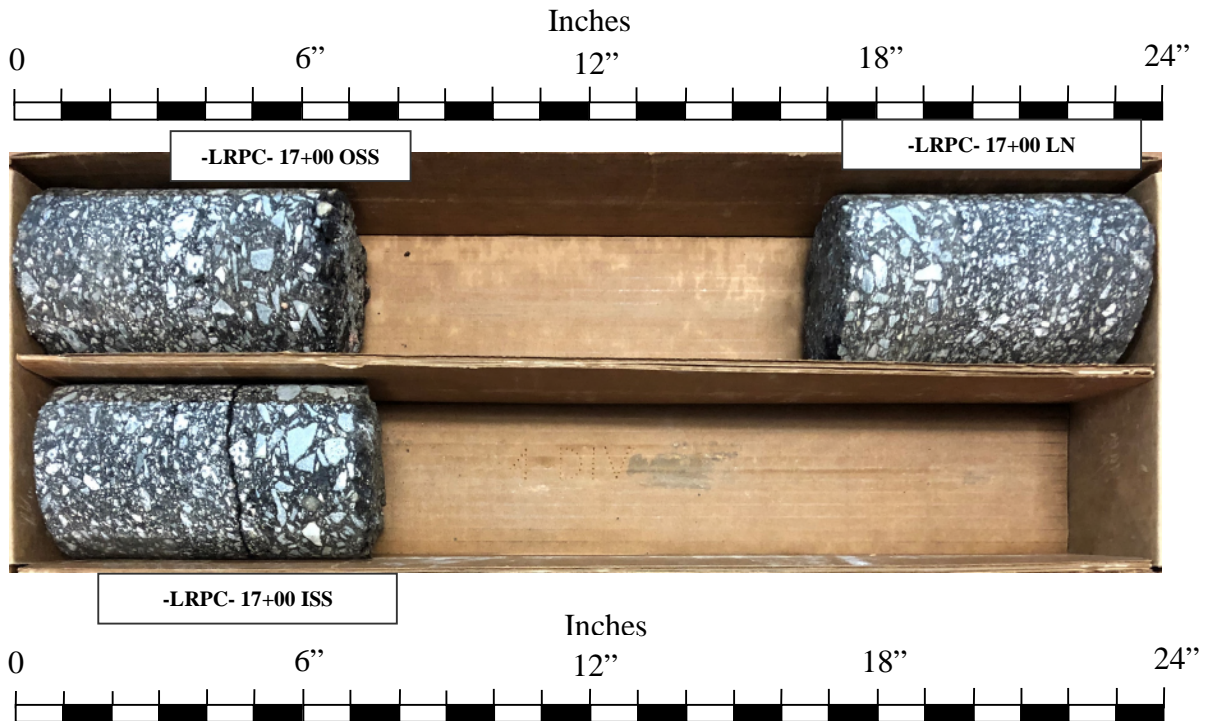
Notes:

- | | | |
|------------------------|---------------------------|--------------|
| OSL = Outside Lane | ACCEL = Acceleration Lane | MED = Median |
| ISL = Inside Lane | PS = Paved Shoulder | |
| RTL = Right Turn Lane | LTL = Left Turn Lane | |
| OSS = Outside Shoulder | ISS = Inside Shoulder | |



S&ME, Inc.
 3201 Spring Forest Road
 Raleigh, North Carolina 27616

<i>Project No.:</i> 44990.1.1	<i>I.D. No.:</i> I-5973	<i>County:</i> Mecklenburg	<i>Dates:</i> 3/3/20 to 3/10/20
<i>Site Description:</i> Brookshire Blvd and I-485			
<i>Consultant:</i> S&ME, Inc.		<i>Core Size:</i> 4 - inch	<i>Drill Machine:</i> CME-55
<i>Geologist / Engineer:</i> Darin Strother			



Notes:

- | | | |
|------------------------|---------------------------|--------------|
| OSL = Outside Lane | ACCEL = Acceleration Lane | MED = Median |
| ISL = Inside Lane | PS = Paved Shoulder | |
| RTL = Right Turn Lane | LTL = Left Turn Lane | |
| OSS = Outside Shoulder | ISS = Inside Shoulder | |



S&ME, Inc.
 3201 Spring Forest Road
 Raleigh, North Carolina 27616



SUMMARY OF LABORATORY TEST DATA

Soil Classification and Gradation

S&ME, Inc. Raleigh, 3201 Spring Forest Road, Raleigh, North Carolina 27616

S&ME Project #:	6205-20-004	Date Report	3/24/2020
State Project No.:	44990.1.1	County:	Mecklenburg
Federal ID No.:	N/A	TIP No.:	I-5973
Project Name:	I-77 from I-485 at NC 16		
Client Name:	NCDOT	Client Address:	Raleigh, NC

Boring No.	Sample No.	Boring No.	Offset	Alignment	Sample Depth (ft)	AASHTO Classification	Total % Passing				Total Mortar Fraction (%)				LL	PL	PI	Moist. %
							Sieve #				Coarse Sand	Fine Sand	Silt	Clay				
							10	40	60	200								
22+10 SB RTL	S-1	C-2	N/A	-L-	0.0-1.5	A-6 (4)	95	70	63	50.0	34	18	26	22	36	22	14	16.9
22+10 SB RTL	S-2	C-2	N/A	-L-	1.5-5.0	A-6 (6)	100	81	72	53.8	28	24	22	26	37	21	16	14.4
26+40 SB OSS	S-3	C-4	N/A	-L-	0.0-5.0	A-7-5 (22)	100	83	76	67.4	24	11	18	47	62	30	32	25.8
26+40 SB DECEL	S-4	C-5	N/A	-L-	0.0-5.0	A-7-6 (15)	100	83	73	56.4	27	22	12	39	60	29	31	27.6
26+40 SB OSL	S-4A	C-6	N/A	-L-	0.0-5.0	A-7-6 (15)	100	80	70	60.4	30	12	18	40	55	27	28	24.2
26+40 SB ISS	S-5	C-7	N/A	-L-	0.0-0.8	A-4 (1)	97	72	56	39.0	42	21	18	19	38	28	10	15.3
37+60 NB OSS	S-6	C-8	N/A	-L-	0.0-1.0	A-6 (7)	98	85	79	70.1	20	12	34	34	32	19	13	14.0
37+60 NB OSS	S-7	C-8	N/A	-L-	1.0-5.0	A-6 (8)	97	81	73	59.8	25	19	20	36	39	23	16	16.7
37+60 NB RTL	S-7A	C-9	N/A	-L-	1.0-5.0	A-7-6 (16)	99	85	79	67.6	20	16	30	34	53	29	24	22.9
31+55 NB OSS	S-8	C-12	N/A	-L-	0.0-3.0	A-7-5 (12)	100	91	82	72.0	18	14	38	30	52	37	15	27.8
31+55 NB DECEL	S-8A	C-13	N/A	-L-	0.0-1.8	A-7-6 (7)	100	87	76	62.1	24	19	37	20	41	28	13	29.6
21+30 NB OSS	S-9	C-16	N/A	-L-	0.0-1.2	A-4 (0)	78	57	51	35.8	35	27	30	8	28	23	5	10.9
21+30 NB OSS	S-10	C-16	N/A	-L-	1.2-5.0	A-6 (3)	92	69	63	49.3	31	20	29	20	34	22	12	17.5
21+30 NB ISS	S-10A	C-18	N/A	-L-	1.0-5.0	A-6 (7)	99	76	68	54.2	32	18	28	22	40	23	17	19.0
21+30 NB OSL	S-11	C-17	N/A	-L-	0.0-5.0	A-6 (3)	88	67	60	47.2	31	21	28	20	33	21	12	16.2
37+60 NB ISS	S-12	C-11	N/A	-L-	0.0-1.0	A-7-5 (7)	97	81	69	53.0	29	21	26	24	48	30	18	17.8
37+60 NB ISS	S-13	C-11	N/A	-L-	1.0-5.0	A-6 (5)	99	82	70	54.7	29	21	25	25	35	20	15	14.1



SUMMARY OF LABORATORY TEST DATA

Soil Classification and Gradation

S&ME, Inc. Raleigh, 3201 Spring Forest Road, Raleigh, North Carolina 27616

S&ME Project #:	6205-20-004	Date Report	3/24/2020
State Project No.:	44990.1.1	County:	Mecklenburg
Federal ID No.:	N/A	TIP No.:	I-5973
Project Name:	I-77 from I-485 at NC 16		
Client Name:	NCDOT	Client Address:	Raleigh, NC

Boring No.	Sample No.	Boring No.	Offset	Alignment	Sample Depth (ft)	AASHTO Classification	Total % Passing				Total Mortar Fraction (%)				LL	PL	PI	Moist. %
							Sieve #				Coarse Sand	Fine Sand	Silt	Clay				
							10	40	60	200								
24+80 OSS	S-15	C-22	N/A	-LRPB-	0.0-5.0	A-4 (2)	100	85	76	54.6	24	32	30	14	32	24	8	12.4
17+00 ISS	S-16	C-27	N/A	-LRPC-	0.0-5.0	A-6 (5)	98	83	75	56.0	23	26	30	21	38	25	13	16.4
17+00 OSS	S-16A	C-25	N/A	-LRPC-	0.0-5.0	A-7-6 (6)	94	77	71	55.3	25	23	32	20	41	27	14	23.8
21+05 ISS	S-17	C-21	N/A	-LRPA-	0.0-5.0	A-7-5 (10)	91	66	60	49.7	34	14	18	34	56	30	26	17.6
22+10 SB OES	Bulk-1	C-1	N/A	-L-	1-3	A-7-6 (7)	93	72	65	54.3	30	15	21	34	44	26	18	17.4
31+55 NB IES	Bulk-2	C-15	N/A	-L-	1-3	A-6 (5)	96	79	68	51.9	30	20	26	24	40	26	14	18.6
20+95 IES	Bulk-3	C-8	N/A	-LRPA-	1-3	A-7-6 (4)	92	65	58	47.3	37	16	19	28	43	28	15	17.6

References / Comments / Deviations: NP=Non-Plastic
 AASHTO T88: Particle Size Analysis of Soils as Modified by the NCDOT
 AASHTO T89: Determining the Liquid Limit of Soils
 AASHTO T90: Determining the Plastic Limit & Plasticity Index of Soils
 AASHTO T265: Laboratory Determination of Moisture Content of Soils
 AASHTO M145: The Classification of Soils and Soil Aggregate Mixtures for Highway Construction Purposes

Mal Krajan, ET
 Technician Name:


 Signature

104-01-0703
 Certification #

Vlad Mitchev, P.E.
 Technical Responsibility:

Project Manager
 Position

This report shall not be reproduced, except in full, without the written approval of S&ME, Inc.

MOISTURE - DENSITY REPORT

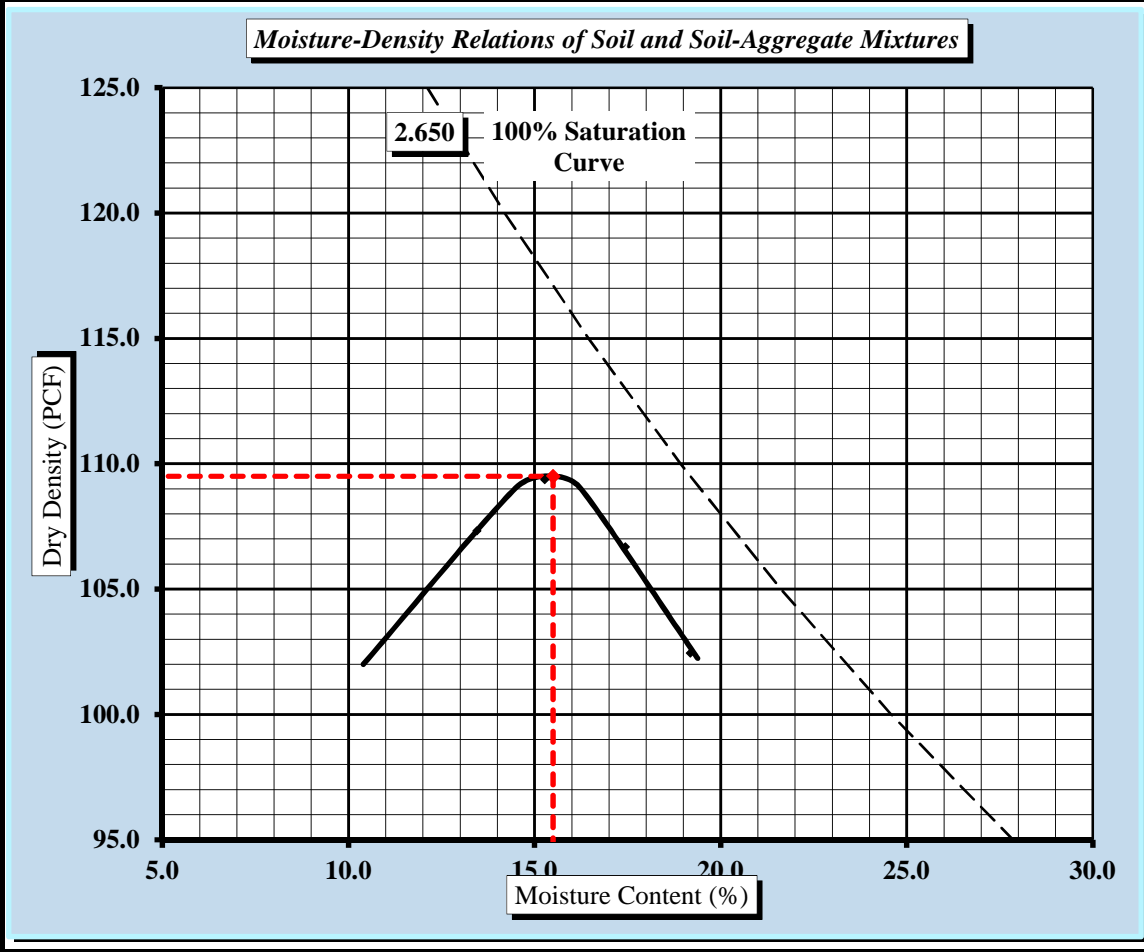


Quality Assurance

S&ME, Inc. Raleigh: 3201 Spring Forest Road, Raleigh, NC 27616			
S&ME Project #:	6205-20-004	Report Date:	3/10/2020
Project Name:	I-5973	Test Date(s):	3/9 - 3/10/20
Client Name:			
Client Address:			
Boring #:	C-1	Sample #:	Bulk 1
Location:	-L- 22+10 SB OES	Offset:	19.0 FWL
Sample Description:	Brown Fine to Coarse Sandy Silty CLAY (A-7-6) (7)		

Maximum Dry Density	109.5	PCF.	Optimum Moisture Content	15.5%
---------------------	-------	------	--------------------------	-------

AASHTO T99 - - Method A



Soil Properties	
Natural Moisture Content	17.4%
Assumed Specific Gravity	2.650
Liquid Limit	44
Plastic Limit	26
Plastic Index	18
% Passing	
3/4"	100.0%
3/8"	100.0%
#4	99.0%
#10	93.0%
#40	72.0%
#60	65.0%
#200	54.3%
Oversize Fraction	
Bulk Gravity	
% Moisture	
% Oversize	
MDD	
Opt. MC	

Moisture-Density Curve Displayed: Fine Fraction Corrected for Oversize Fraction (ASTM D 4718)
 Sieve Size used to separate the Oversize Fraction: #4 Sieve 3/8 inch Sieve 3/4 inch Sieve
 Mechanical Rammer Manual Rammer Moist Preparation Dry Preparation

References / Comments / Deviations:

AASHTO T265: Laboratory Determination of Moisture Content of Soils
 AASHTO T 99: Moisture-Density Relations of Soil Using a 5.5 Lb. Rammer and a 12" Drop

Mal Krajan, ET
 Technical Responsibility

Signature

Laboratory Manager
 Position

3/10/2020
 Date

This report shall not be reproduced, except in full, without the written approval of S&ME, Inc.

MOISTURE - DENSITY REPORT

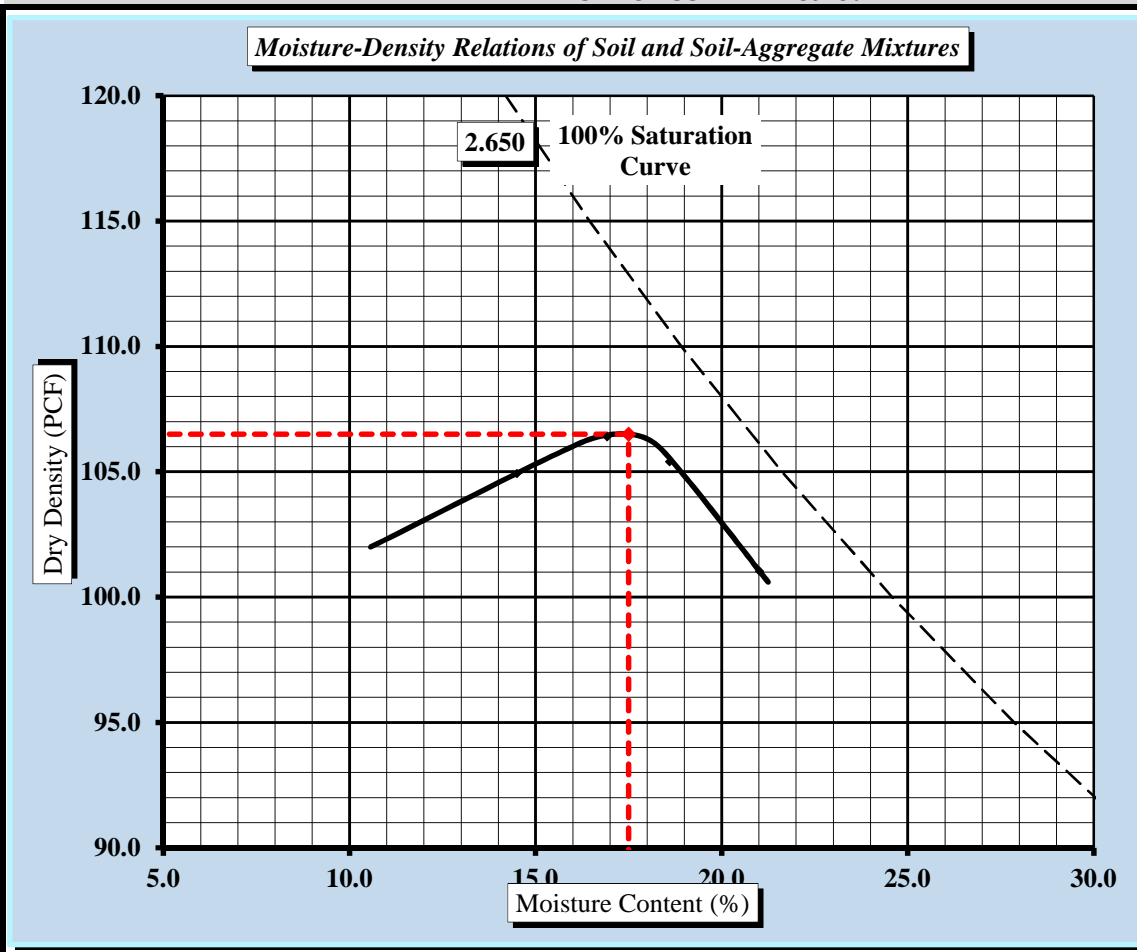


Quality Assurance

S&ME, Inc. Raleigh: 3201 Spring Forest Road, Raleigh, NC 27616			
S&ME Project #:	6205-20-004	Report Date:	3/10/2020
Project Name:	I-5973	Test Date(s):	3/9 - 3/10/20
Client Name:			
Client Address:			
Boring #:	C-15	Sample #:	Bulk 2
Location:	-L- 31+55 NB IES	Offset:	4.0' FY
Sample Description:	Brown Fine to Coarse Sandy Clayey SILT (A-6) (5)		

Maximum Dry Density	106.5	PCF.	Optimum Moisture Content	17.5%
---------------------	-------	------	--------------------------	-------

AASHTO T99 - - Method A



Soil Properties	
Natural Moisture Content	18.6%
Assumed Specific Gravity	2.650
Liquid Limit	40
Plastic Limit	26
Plastic Index	14
% Passing	
3/4"	100.0%
3/8"	100.0%
#4	100.0%
#10	96.0%
#40	79.0%
#60	68.0%
#200	51.9%
Oversize Fraction	
Bulk Gravity	
% Moisture	
% Oversize	
MDD	
Opt. MC	

Moisture-Density Curve Displayed: Fine Fraction Corrected for Oversize Fraction (ASTM D 4718)
 Sieve Size used to separate the Oversize Fraction: #4 Sieve 3/8 inch Sieve 3/4 inch Sieve
 Mechanical Rammer Manual Rammer Moist Preparation Dry Preparation

References / Comments / Deviations:

AASHTO T265: Laboratory Determination of Moisture Content of Soils
 AASHTO T 99: Moisture-Density Relations of Soil Using a 5.5 Lb. Rammer and a 12" Drop

Mal Krajan, ET
 Technical Responsibility

Signature

Laboratory Manager
 Position

3/10/2020
 Date

This report shall not be reproduced, except in full, without the written approval of S&ME, Inc.

MOISTURE - DENSITY REPORT

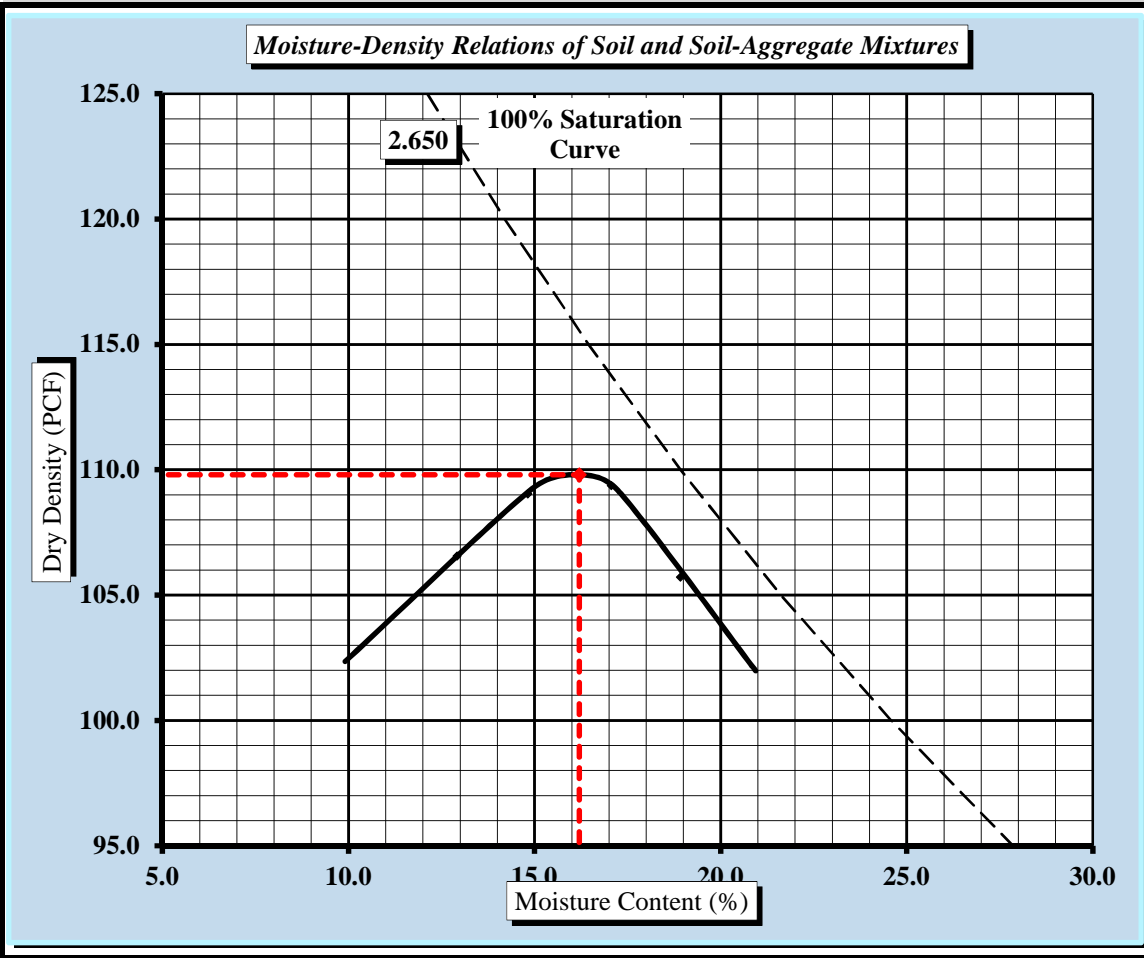


Quality Assurance

S&ME, Inc. Raleigh: 3201 Spring Forest Road, Raleigh, NC 27616			
S&ME Project #:	6205-20-004	Report Date:	3/12/2020
Project Name:	I-5973 PDI I-485 at NC 16	Test Date(s):	3/11 - 3/12/20
Client Name:	NCDOT		
Client Address:	Raleigh, NC		
Boring #:	C-8	Sample #:	Bulk 3
Location:	-LRPA- 20+95 IES	Offset:	12.0' FY
Sample Description:	Brown Fine to Coarse Sandy Silty CLAY (A-7-6) (4)		

Maximum Dry Density	109.8	PCF.	Optimum Moisture Content	16.2%
---------------------	-------	------	--------------------------	-------

AASHTO T99 - - Method A



Soil Properties	
Natural Moisture Content	17.6%
Assumed Specific Gravity	2.650
Liquid Limit	43
Plastic Limit	28
Plastic Index	15
% Passing	
3/4"	100.0%
3/8"	100.0%
#4	99.0%
#10	92.0%
#40	65.0%
#60	58.0%
#200	47.3%
Oversize Fraction	
Bulk Gravity	
% Moisture	
% Oversize	
MDD	
Opt. MC	

Moisture-Density Curve Displayed: Fine Fraction Corrected for Oversize Fraction (ASTM D 4718)
 Sieve Size used to separate the Oversize Fraction: #4 Sieve 3/8 inch Sieve 3/4 inch Sieve
 Mechanical Rammer Manual Rammer Moist Preparation Dry Preparation

References / Comments / Deviations:

AASHTO T265: Laboratory Determination of Moisture Content of Soils
 AASHTO T 99: Moisture-Density Relations of Soil Using a 5.5 Lb. Rammer and a 12" Drop

Mal Krajan, ET
 Technical Responsibility

Signature

Laboratory Manager
 Position

3/12/2020
 Date

This report shall not be reproduced, except in full, without the written approval of S&ME, Inc.

MOISTURE - DENSITY REPORT

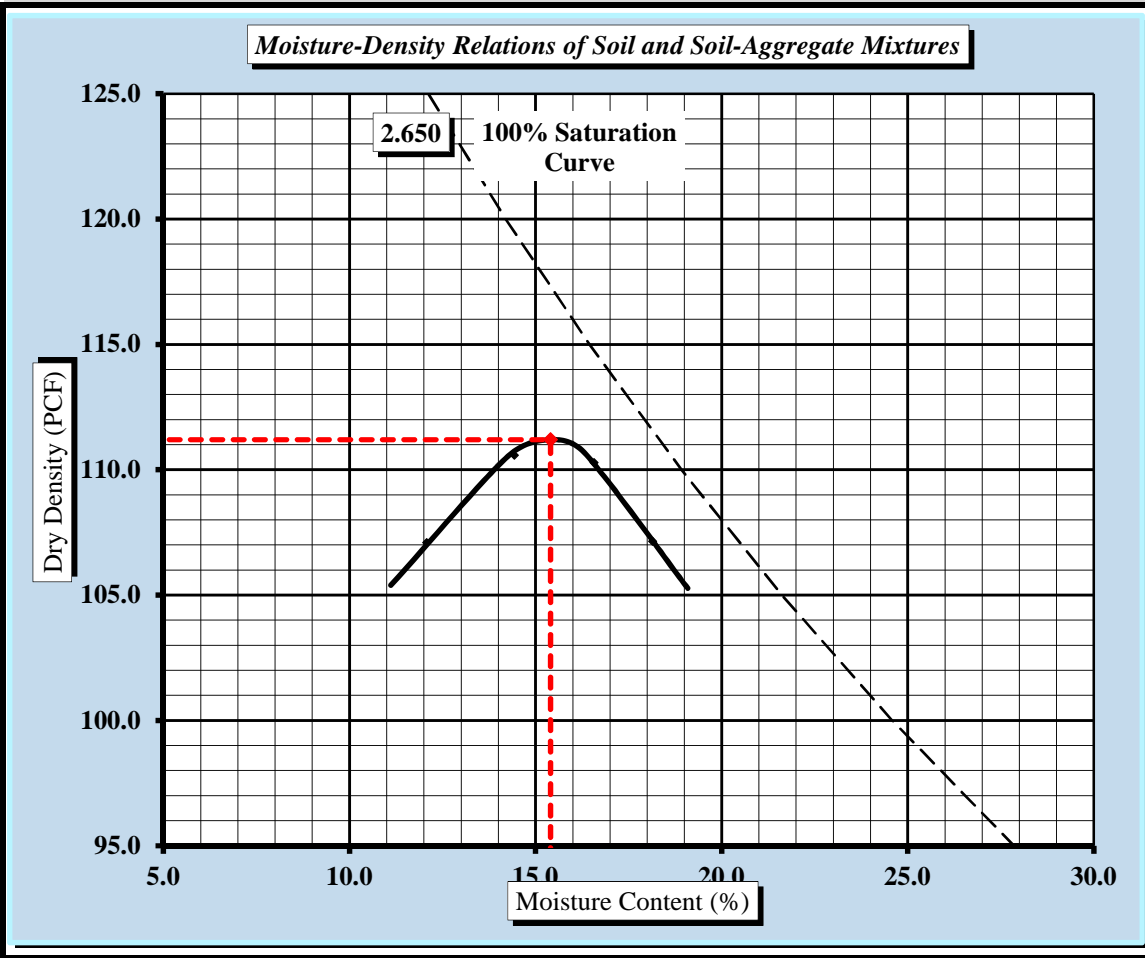


Quality Assurance

S&ME, Inc. Raleigh: 3201 Spring Forest Road, Raleigh, NC 27616			
S&ME Project #:	6205-20-004	Report Date:	3/11/2020
Project Name:	I-5973	Test Date(s):	3/9 - 3/11/20
Client Name:			
Client Address:			
Boring #:	C-1	Sample #:	Bulk 1
Location:	-L- 22+10 SB OES	Offset:	19.0' FWL
Sample Description:	Soil-Cement Treated (5% Cement)		

Maximum Dry Density	111.2	PCF.	Optimum Moisture Content	15.4%
---------------------	-------	------	--------------------------	-------

AASHTO T-134 -- Method A



Soil Properties	
Natural Moisture Content	ND
Assumed Specific Gravity	2.650
Liquid Limit	ND
Plastic Limit	ND
Plastic Index	ND
% Passing	
3/4"	100.0%
3/8"	100.0%
#4	100.0%
#10	ND
#40	ND
#60	ND
#200	ND
Oversize Fraction	
Bulk Gravity	
% Moisture	
% Oversize	
MDD	
Opt. MC	

Moisture-Density Curve Displayed: Fine Fraction Corrected for Oversize Fraction (ASTM D 4718)
 Sieve Size used to separate the Oversize Fraction: #4 Sieve 3/8 inch Sieve 3/4 inch Sieve
 Mechanical Rammer Manual Rammer Moist Preparation Dry Preparation

References / Comments / Deviations: ND=Not Determined.
 ASTM D 2216: Laboratory Determination of Water (Moisture) Content of Soil and Rock by Mass
 ASTM D 558: Moisture-Density Relations of Soil-Cement Mixtures

Mal Krajan, ET
 Technical Responsibility

Signature

Laboratory Manager
 Position

3/11/2020
 Date

This report shall not be reproduced, except in full, without the written approval of S&ME, Inc.

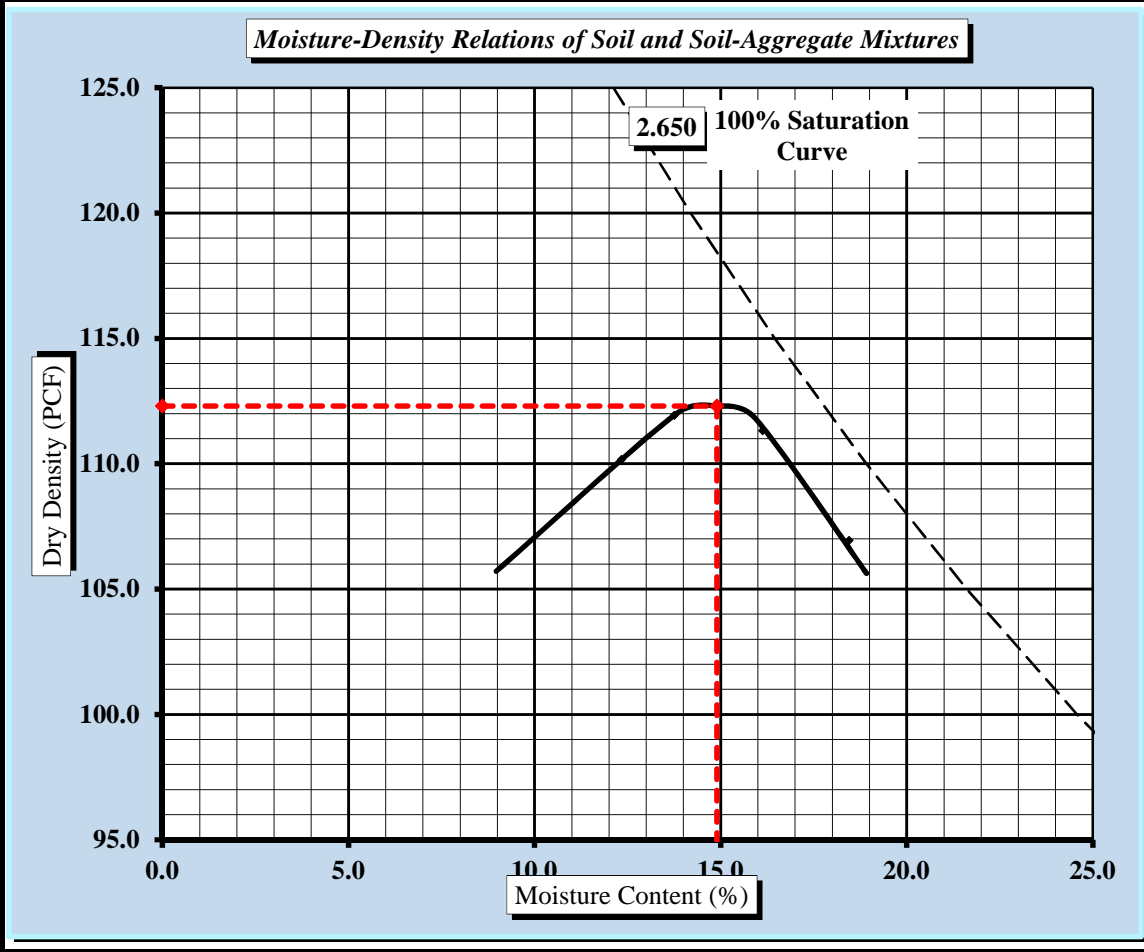
MOISTURE - DENSITY REPORT



Quality Assurance

S&ME, Inc. Raleigh: 3201 Spring Forest Road, Raleigh, NC 27616			
S&ME Project #:	6205-20-004	Report Date:	3/11/2020
Project Name:	I-5973	Test Date(s):	3/9 - 3/11/20
Client Name:			
Client Address:			
Boring #:	C-1	Sample #:	Bulk 1
Location:	-L- 22+10 SB OES	Offset:	19.0' FWL
Sample Description:	Soil-Cement Treated (10% Cement)		
		Sample Date:	3/4/2020
		Depth (ft):	1-3 ft.

Maximum Dry Density	112.3	PCF.	Optimum Moisture Content	14.9%
AASHTO T-134 - - Method A				



Soil Properties	
Natural Moisture Content	ND
Assumed Specific Gravity	2.650
Liquid Limit	ND
Plastic Limit	ND
Plastic Index	ND
% Passing	
3/4"	100.0%
3/8"	100.0%
#4	100.0%
#10	ND
#40	ND
#60	ND
#200	ND
Oversize Fraction	
Bulk Gravity	
% Moisture	
% Oversize	
MDD	
Opt. MC	

Moisture-Density Curve Displayed: Fine Fraction Corrected for Oversize Fraction (ASTM D 4718)
 Sieve Size used to separate the Oversize Fraction: #4 Sieve 3/8 inch Sieve 3/4 inch Sieve
 Mechanical Rammer Manual Rammer Moist Preparation Dry Preparation

References / Comments / Deviations:

ASTM D 2216: Laboratory Determination of Water (Moisture) Content of Soil and Rock by Mass
 ASTM D 558: Moisture-Density Relations of Soil-Cement Mixtures

Mal Krajan, ET
 Technical Responsibility

Signature

Laboratory Manager
 Position

3/11/2020
 Date

This report shall not be reproduced, except in full, without the written approval of S&ME, Inc.

MOISTURE - DENSITY REPORT

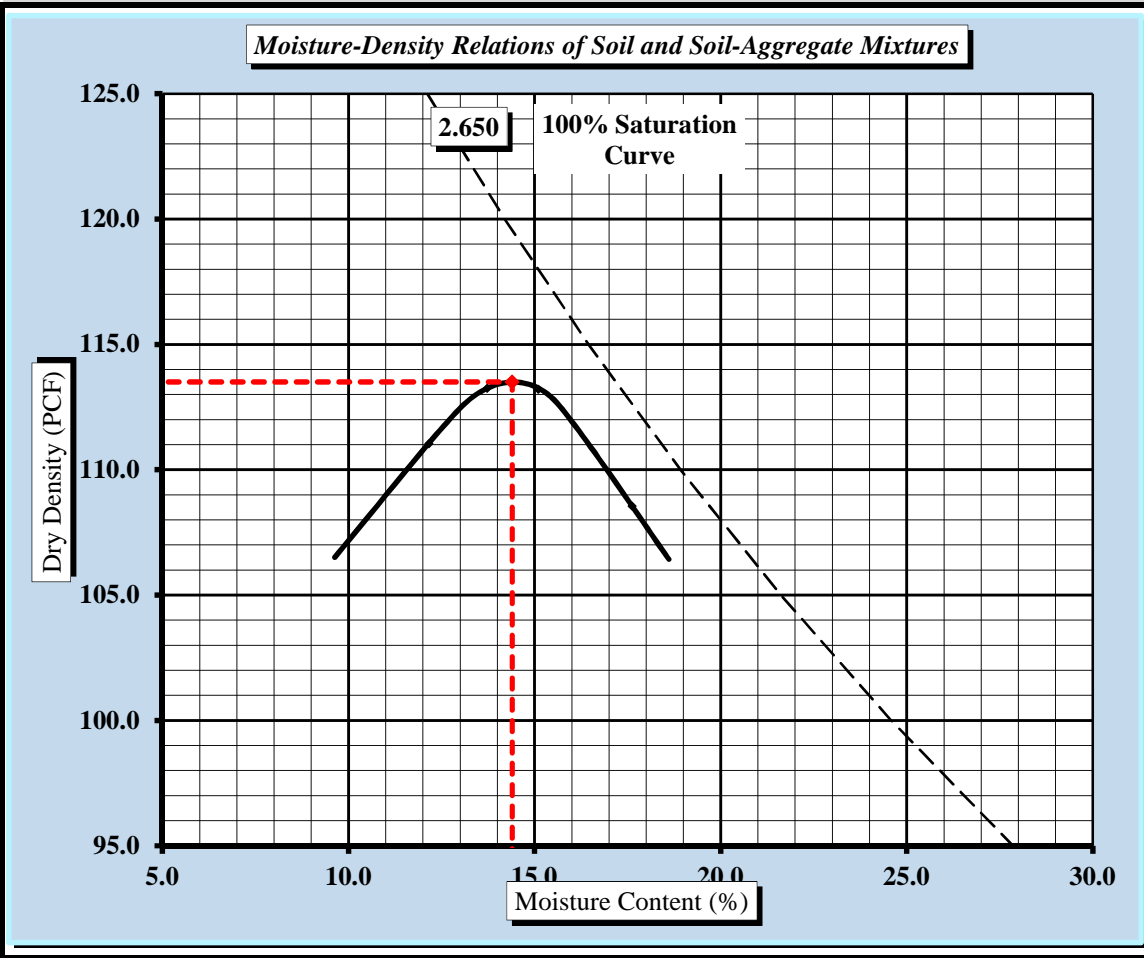


Quality Assurance

S&ME, Inc. Raleigh: 3201 Spring Forest Road, Raleigh, NC 27616			
S&ME Project #:	6205-20-004	Report Date:	3/11/2020
Project Name:	I-5973	Test Date(s):	3/9 - 3/11/20
Client Name:			
Client Address:			
Boring #:	C-1	Sample #:	Bulk 1
Location:	-L- 22+10 SB OES	Offset:	19.0' FWL
Sample Description:	Soil-Cement Treated (15% Cement)		

Maximum Dry Density	113.5	PCF.	Optimum Moisture Content	14.4%
---------------------	-------	------	--------------------------	-------

AASHTO T-134 -- Method A



Soil Properties	
Natural Moisture Content	ND
Assumed Specific Gravity	2.650
Liquid Limit	44
Plastic Limit	26
Plastic Index	18
% Passing	
3/4"	100.0%
3/8"	100.0%
#4	100.0%
#10	ND
#40	ND
#60	ND
#200	ND
Oversize Fraction	
Bulk Gravity	
% Moisture	
% Oversize	
MDD	
Opt. MC	

Moisture-Density Curve Displayed: Fine Fraction Corrected for Oversize Fraction (ASTM D 4718)
 Sieve Size used to separate the Oversize Fraction: #4 Sieve 3/8 inch Sieve 3/4 inch Sieve
 Mechanical Rammer Manual Rammer Moist Preparation Dry Preparation

References / Comments / Deviations:

ASTM D 2216: Laboratory Determination of Water (Moisture) Content of Soil and Rock by Mass
 ASTM D 558: Moisture-Density Relations of Soil-Cement Mixtures

Mal Krajan, ET
 Technical Responsibility

Signature

Laboratory Manager
 Position

3/11/2020
 Date

This report shall not be reproduced, except in full, without the written approval of S&ME, Inc.

MOISTURE - DENSITY REPORT

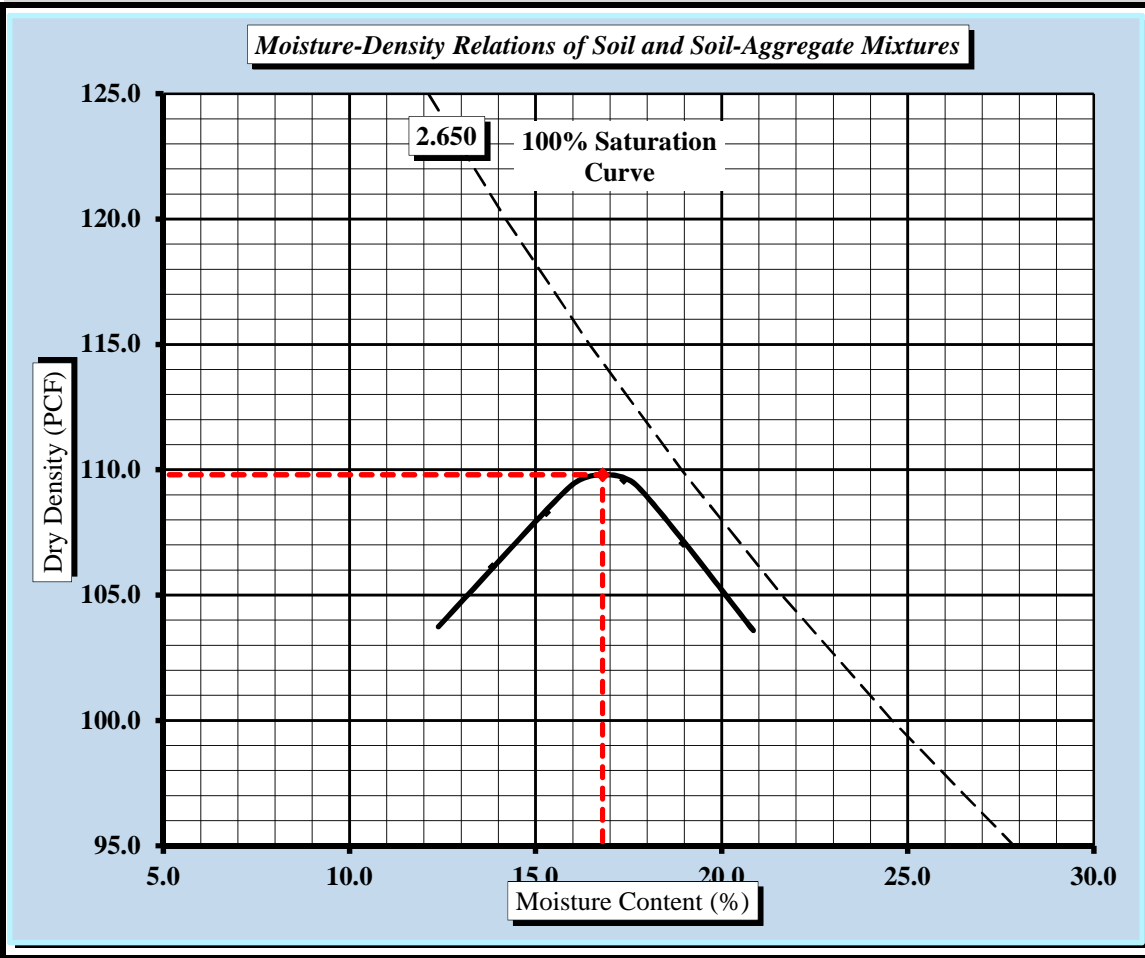


Quality Assurance

S&ME, Inc. Raleigh: 3201 Spring Forest Road, Raleigh, NC 27616			
S&ME Project #:	6205-20-004	Report Date:	3/11/2020
Project Name:	I-5973	Test Date(s):	3/9/20-3/11/20
Client Name:			
Client Address:			
Boring #:	C-15	Sample #:	Bulk 2
Location:	-L- 31+55 NB IES	Offset:	4.0' FY
Sample Description:	Soil-Cement Treated (5% Cement)		

Maximum Dry Density	109.8	PCF.	Optimum Moisture Content	16.8%
---------------------	-------	------	--------------------------	-------

AASHTO T-134 -- Method A



Soil Properties	
Natural Moisture Content	ND
Assumed Specific Gravity	2.650
Liquid Limit	ND
Plastic Limit	ND
Plastic Index	ND
% Passing	
3/4"	100.0%
3/8"	100.0%
#4	100.0%
#10	ND
#40	ND
#60	ND
#200	ND
Oversize Fraction	
Bulk Gravity	
% Moisture	
% Oversize	
MDD	
Opt. MC	

Moisture-Density Curve Displayed: Fine Fraction Corrected for Oversize Fraction (ASTM D 4718)
 Sieve Size used to separate the Oversize Fraction: #4 Sieve 3/8 inch Sieve 3/4 inch Sieve
 Mechanical Rammer Manual Rammer Moist Preparation Dry Preparation

References / Comments / Deviations: ND=Not Determined.
 ASTM D 2216: Laboratory Determination of Water (Moisture) Content of Soil and Rock by Mass
 ASTM D 558: Moisture-Density Relations of Soil-Cement Mixtures

Mal Krajan, ET
 Technical Responsibility

Signature

Laboratory Manager
 Position

3/11/2020
 Date

This report shall not be reproduced, except in full, without the written approval of S&ME, Inc.

MOISTURE - DENSITY REPORT

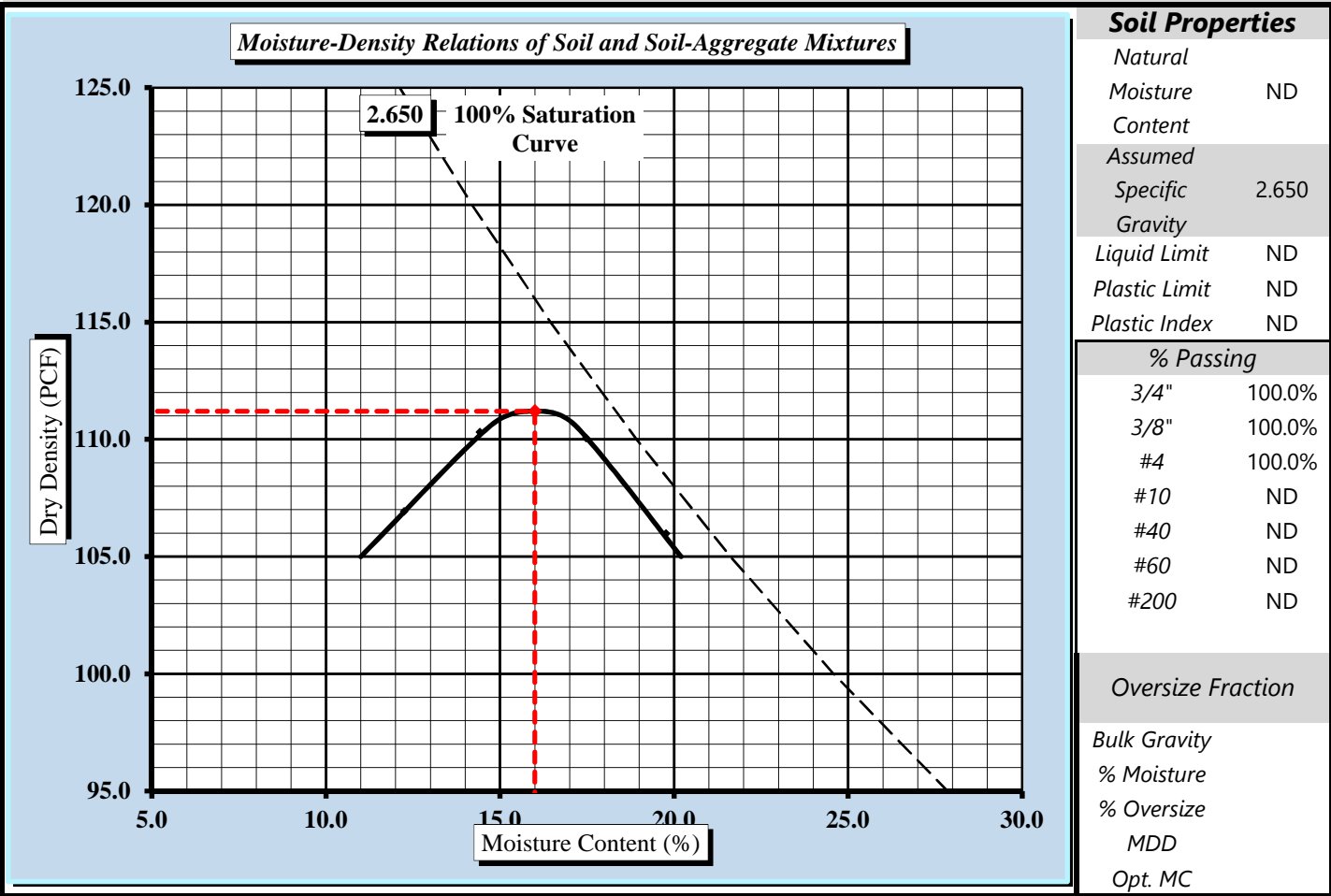


Quality Assurance

S&ME, Inc. Raleigh: 3201 Spring Forest Road, Raleigh, NC 27616			
S&ME Project #:	6205-20-004	Report Date:	3/11/2020
Project Name:	I-5973	Test Date(s):	3/9 - 3/11/20
Client Name:			
Client Address:			
Boring #:	C-15	Sample #:	Bulk 2
Location:	-L- 31+55 NB IES	Offset:	4.0' FY
Sample Description:	Soil-Cement Treated (10% Cement)		

Maximum Dry Density	111.2	PCF.	Optimum Moisture Content	16.0%
---------------------	-------	------	--------------------------	-------

AASHTO T-134 -- Method A



Moisture-Density Curve Displayed: Fine Fraction Corrected for Oversize Fraction (ASTM D 4718)
 Sieve Size used to separate the Oversize Fraction: #4 Sieve 3/8 inch Sieve 3/4 inch Sieve
 Mechanical Rammer Manual Rammer Moist Preparation Dry Preparation

References / Comments / Deviations: ND=Not Determined.
 ASTM D 2216: Laboratory Determination of Water (Moisture) Content of Soil and Rock by Mass
 ASTM D 558: Moisture-Density Relations of Soil-Cement Mixtures

Mal Krajan, ET
 Technical Responsibility

Signature

Laboratory Manager
 Position

3/11/2020
 Date

This report shall not be reproduced, except in full, without the written approval of S&ME, Inc.

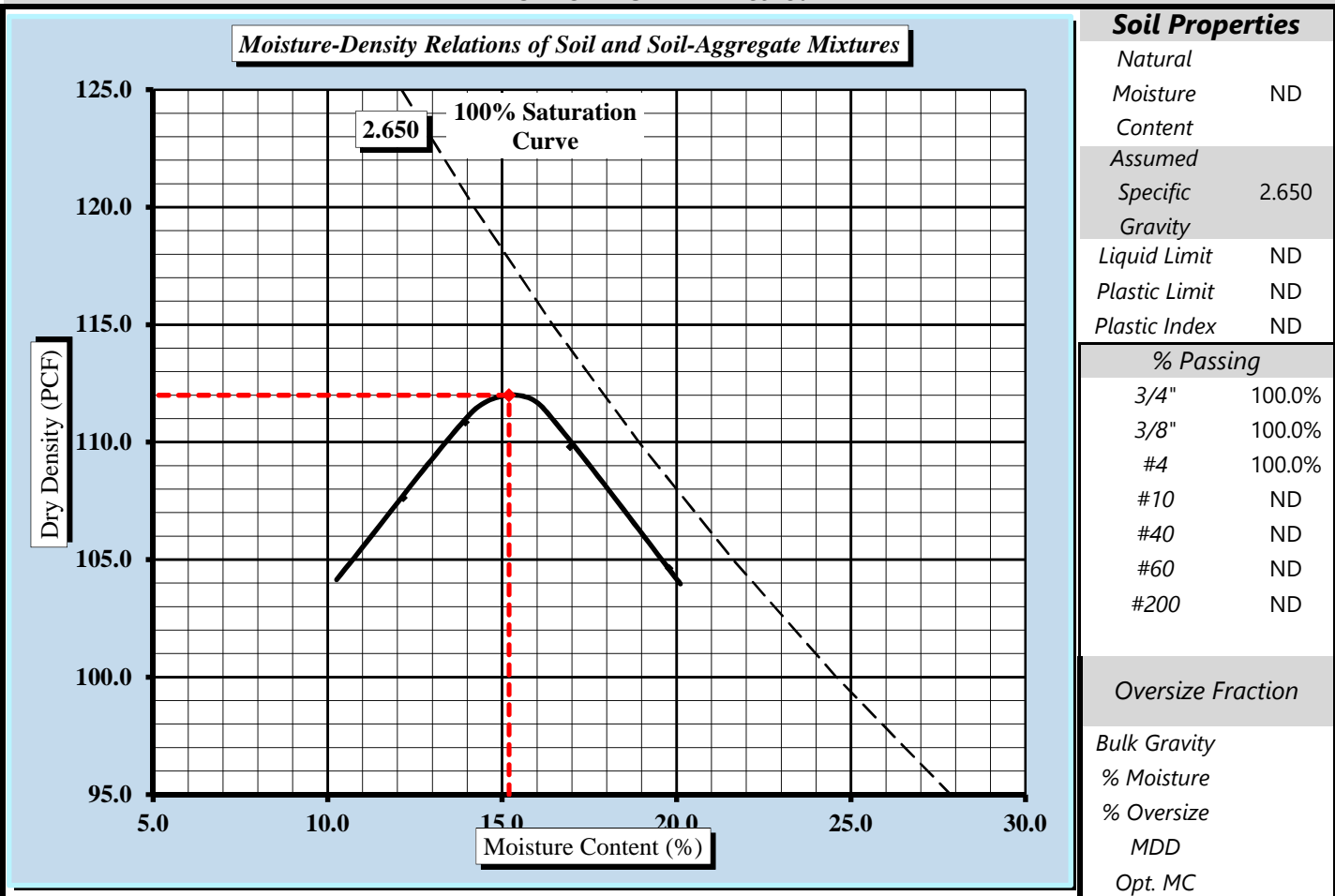
MOISTURE - DENSITY REPORT



Quality Assurance

S&ME, Inc. Raleigh: 3201 Spring Forest Road, Raleigh, NC 27616			
S&ME Project #:	6205-20-004	Report Date:	3/11/2020
Project Name:	I-5973	Test Date(s):	3/9/20-3/11/20
Client Name:			
Client Address:			
Boring #:	C-15	Sample #:	Bulk 2
Location:	-L- 31+55 NB IES	Offset:	4.0' FY
Sample Description:	Soil-Cement Treated		
		Sample Date:	3/4/2020
		Depth (ft):	1.2-2.5

Maximum Dry Density	112.0	PCF.	Optimum Moisture Content	15.2%
AASHTO T-134 -- Method A				



Moisture-Density Curve Displayed: Fine Fraction Corrected for Oversize Fraction (ASTM D 4718)

Sieve Size used to separate the Oversize Fraction: #4 Sieve 3/8 inch Sieve 3/4 inch Sieve

Mechanical Rammer Manual Rammer Moist Preparation Dry Preparation

References / Comments / Deviations: ND=Not Determined.
 ASTM D 2216: Laboratory Determination of Water (Moisture) Content of Soil and Rock by Mass
 ASTM D 558: Moisture-Density Relations of Soil-Cement Mixtures

Mal Krajan, ET
 Technical Responsibility

Signature

Laboratory Manager
 Position

3/11/2020
 Date

This report shall not be reproduced, except in full, without the written approval of S&ME, Inc.

MOISTURE - DENSITY REPORT

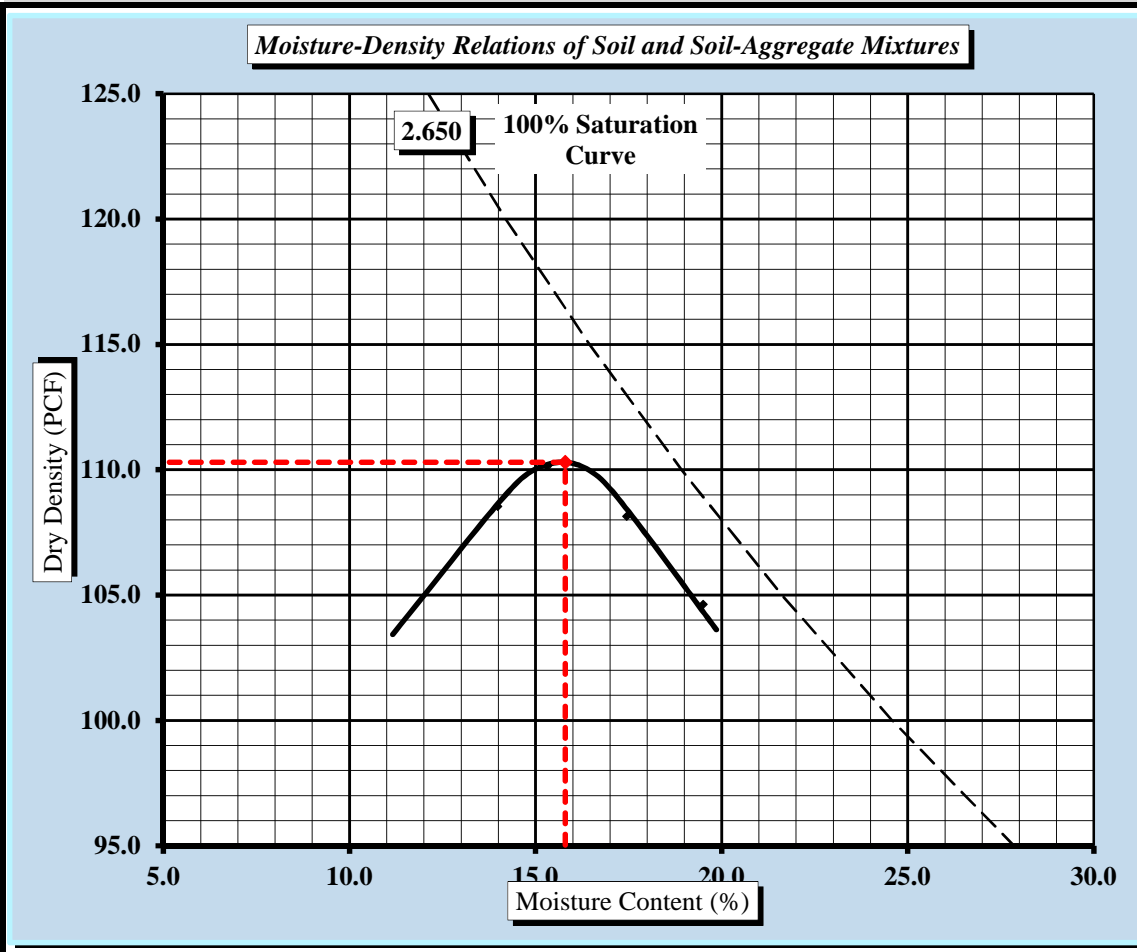


Quality Assurance

S&ME, Inc. Raleigh: 3201 Spring Forest Road, Raleigh, NC 27616			
S&ME Project #:	6205-20-004	Report Date:	3/15/20
Project Name:	I-5973 PDI I-485 at NC 16	Test Date(s):	3/11 - 3/15/20
Client Name:	NCDOT		
Client Address:	Raleigh, NC		
Boring #:	C-8	Sample #:	Bulk 3
Location:	-LRPA- 20+95 IES	Offset:	12.0' FY
Sample Description:	Soil-Cement Treated (5% Cement)		

Maximum Dry Density	110.3	PCF.	Optimum Moisture Content	15.8%
---------------------	-------	------	--------------------------	-------

AASHTO T-134 - - Method A



Soil Properties	
Natural Moisture Content	ND
Assumed Specific Gravity	2.650
Liquid Limit	ND
Plastic Limit	ND
Plastic Index	ND
% Passing	
3/4"	100.0%
3/8"	100.0%
#4	100.0%
#10	ND
#40	ND
#60	ND
#200	ND
Oversize Fraction	
Bulk Gravity	
% Moisture	
% Oversize	
MDD	
Opt. MC	

Moisture-Density Curve Displayed: Fine Fraction Corrected for Oversize Fraction (ASTM D 4718)
 Sieve Size used to separate the Oversize Fraction: #4 Sieve 3/8 inch Sieve 3/4 inch Sieve
 Mechanical Rammer Manual Rammer Moist Preparation Dry Preparation

References / Comments / Deviations: ND=Not Determined.
 AASHTO T265: Laboratory Determination of Moisture Content of Soils
 ASTM D 558: Moisture-Density Relations of Soil-Cement Mixtures

Mal Krajan, ET
 Technical Responsibility

Signature

Laboratory Manager
 Position

3/12/2020
 Date

This report shall not be reproduced, except in full, without the written approval of S&ME, Inc.

MOISTURE - DENSITY REPORT

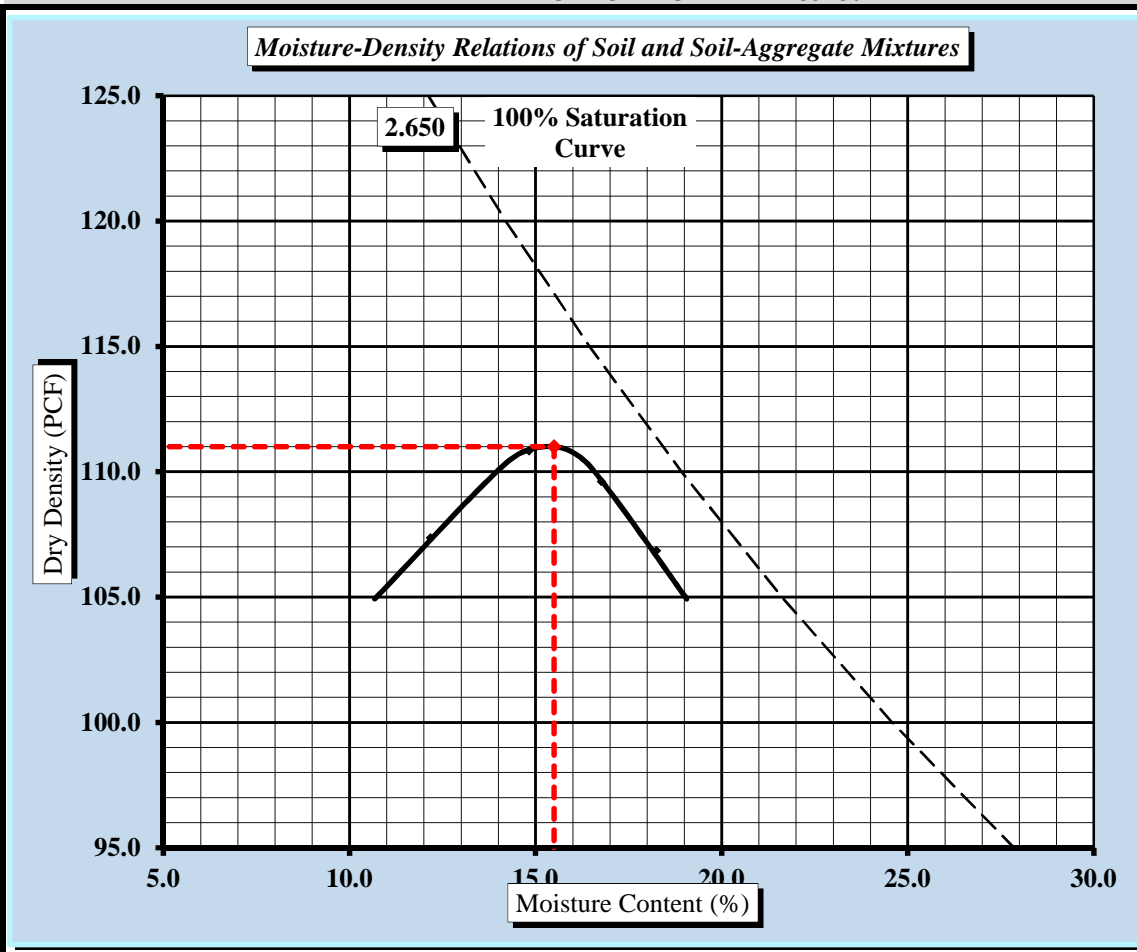


Quality Assurance

S&ME, Inc. Raleigh: 3201 Spring Forest Road, Raleigh, NC 27616			
S&ME Project #:	6205-20-004	Report Date:	3/15/20
Project Name:	I-5973 PDI I-485 at NC 16	Test Date(s):	3/11 - 3/15/20
Client Name:	NCDOT		
Client Address:	Raleigh, NC		
Boring #:	C-8	Sample #:	Bulk 3
Location:	-LRPA- 20+95 IES	Offset:	12.0' FY
Sample Description:	Soil-Cement Treated (10% Cement)		

Maximum Dry Density	111.0	PCF.	Optimum Moisture Content	15.5%
---------------------	-------	------	--------------------------	-------

AASHTO T-134 -- Method A



Soil Properties	
Natural Moisture Content	ND
Assumed Specific Gravity	2.650
Liquid Limit	ND
Plastic Limit	ND
Plastic Index	ND
% Passing	
3/4"	100.0%
3/8"	100.0%
#4	100.0%
#10	ND
#40	ND
#60	ND
#200	ND
Oversize Fraction	
Bulk Gravity	
% Moisture	
% Oversize	
MDD	
Opt. MC	

Moisture-Density Curve Displayed: Fine Fraction Corrected for Oversize Fraction (ASTM D 4718)
 Sieve Size used to separate the Oversize Fraction: #4 Sieve 3/8 inch Sieve 3/4 inch Sieve
 Mechanical Rammer Manual Rammer Moist Preparation Dry Preparation

References / Comments / Deviations: ND=Not Determined.
 AASHTO T265: Laboratory Determination of Moisture Content of Soils
 ASTM D 558: Moisture-Density Relations of Soil-Cement Mixtures

Mal Krajan, ET
 Technical Responsibility

Signature

Laboratory Manager
 Position

3/12/2020
 Date

This report shall not be reproduced, except in full, without the written approval of S&ME, Inc.

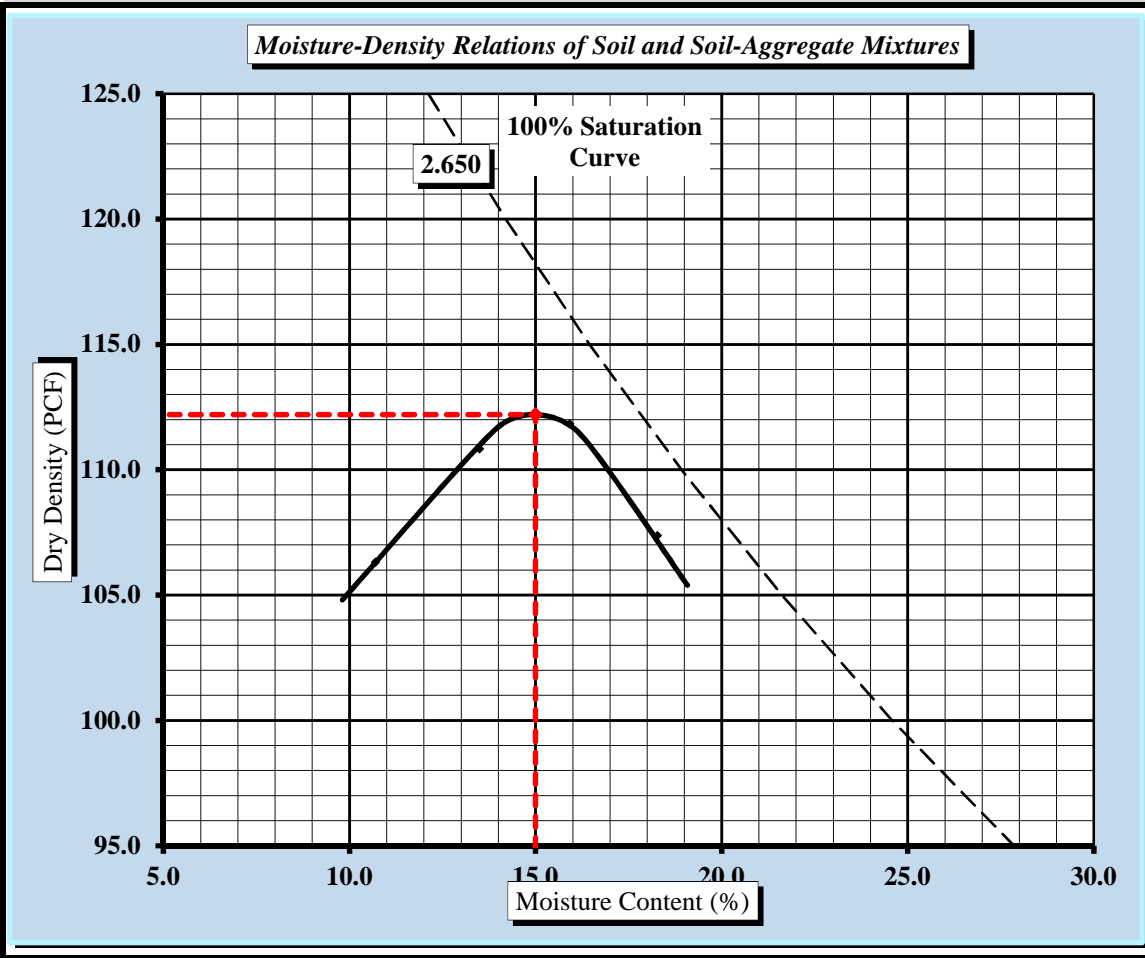
MOISTURE - DENSITY REPORT



Quality Assurance

S&ME, Inc. Raleigh: 3201 Spring Forest Road, Raleigh, NC 27616			
S&ME Project #:	6205-20-004	Report Date:	3/15/20
Project Name:	I-5973 PDI I-485 at NC 16	Test Date(s):	3/11 - 3/15/20
Client Name:	NCDOT		
Client Address:	Raleigh, NC		
Boring #:	C-8	Sample #:	Bulk 3
Location:	-LRPA- 20+95 IES	Sample Date:	3/5/2020
	Offset:	12.0' FY	Depth (ft): 1 - 3
Sample Description:	Soil-Cement Treated (15% Cement)		

Maximum Dry Density	112.2	PCF.	Optimum Moisture Content	15.0%
AASHTO T-134 -- Method A				



Soil Properties	
Natural Moisture Content	ND
Assumed Specific Gravity	2.650
Liquid Limit	ND
Plastic Limit	ND
Plastic Index	ND
% Passing	
3/4"	100.0%
3/8"	100.0%
#4	100.0%
#10	ND
#40	ND
#60	ND
#200	ND
Oversize Fraction	
Bulk Gravity	
% Moisture	
% Oversize	
MDD	
Opt. MC	

Moisture-Density Curve Displayed: Fine Fraction Corrected for Oversize Fraction (ASTM D 4718)
 Sieve Size used to separate the Oversize Fraction: #4 Sieve 3/8 inch Sieve 3/4 inch Sieve
 Mechanical Rammer Manual Rammer Moist Preparation Dry Preparation

References / Comments / Deviations: ND=Not Determined.
 AASHTO T265: Laboratory Determination of Moisture Content of Soils
 ASTM D 558: Moisture-Density Relations of Soil-Cement Mixtures

Mal Krajan, ET
 Technical Responsibility

Signature

Laboratory Manager
 Position

3/12/2020
 Date

This report shall not be reproduced, except in full, without the written approval of S&ME, Inc.

Compressive Strength of Molded Soil-Cement Cylinder

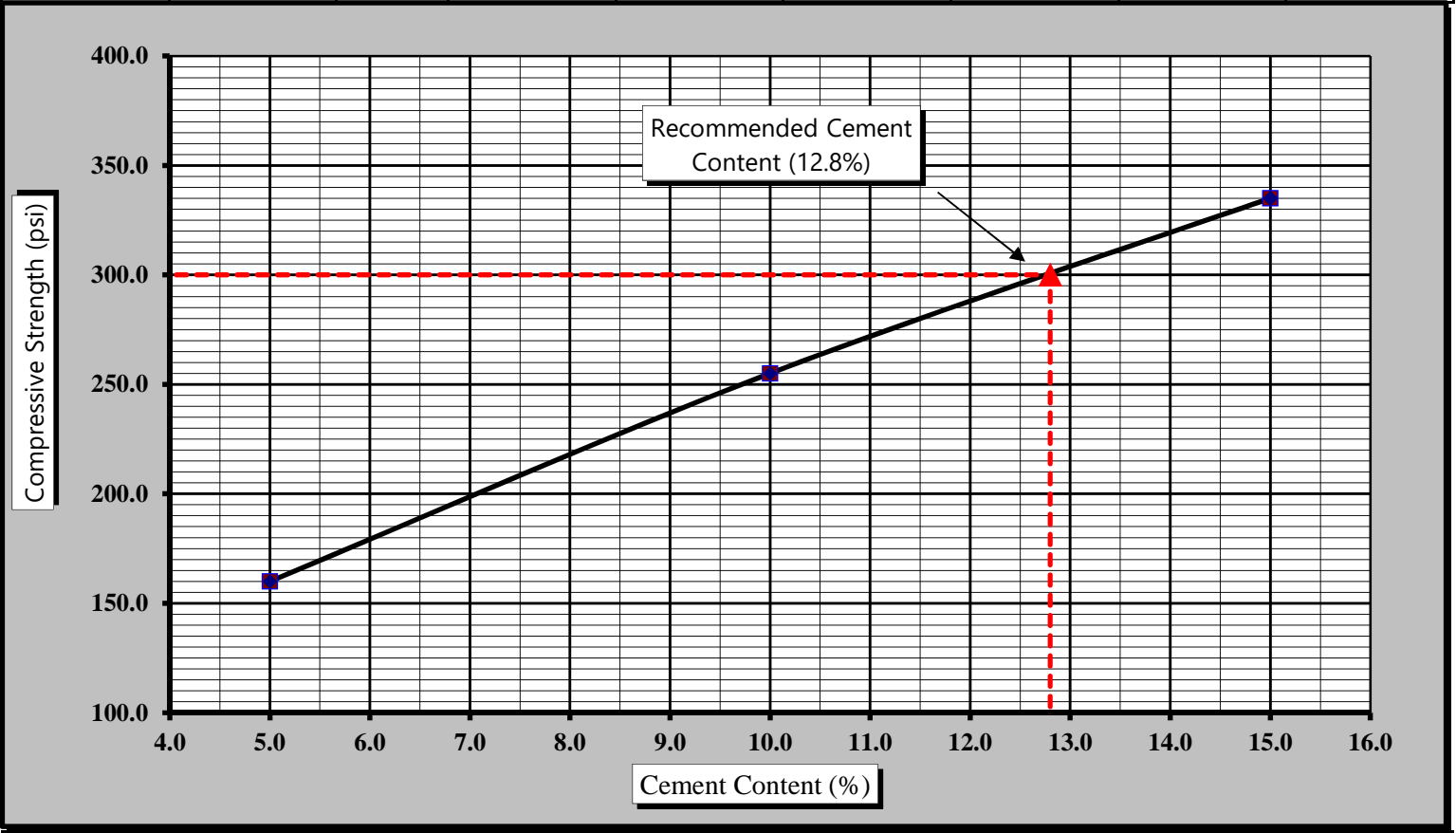


ASTM D1633

S&ME, Inc. Raleigh, 3201 Spring Forest Road, Raleigh, North Carolina 27616

Project #:	6205-20-004	Report Date:	3/19/2020
Project Name:	I-5973 PDI I-485 at NC 16	Test Date(s):	3/11 - 3/19/2020
Client Name:	NCDOT		
Client Address:	Raleigh, NC		
Boring #:	C-1	Sample #:	Bulk 1
Location:	-L- 22+10 SB OES	Offset:	19.0' FWL
Sample Description:	Soil-Cement Treated		
Mix Type:	Cement Treated		

% Cement By Weight	MDD (pcf)	Opt. Moist. (%)	Avg. Molded Specimens (pcf)	Average Max. Load (lbf)	Avg. Area (in ²)	Avg. Comp. Str. (psi)	Corr. Factor (L/D)	Corr. Avg. Comp. Str. (psi)
5	111.2	15.4	111.1	2186	12.57	174	0.91	160
10	112.3	14.9	112.1	3525	12.57	280	0.91	255
15	113.5	14.4	113.4	4655	12.57	370	0.91	335



Notes / Deviations / References:

- ASTM D599: Test Methods for Wetting-and Drying Tests of Compacted Soil-Cement Mixtures
- ASTM D560: Test Methods for Freezing-and-Thawing Tests of Compacted Soil-Cement Mixtures
- ASTM 1632: Making and Curing Soil-Cement Compression and Flexure Test Specimens in the Laboratory

Mal Krajan, ET
 Technical Responsibility

 Signature

Laboratory Manager
 Position

3/19/2020
 Date

This report shall not be reproduced, except in full, without the written approval of S&ME, Inc.

Compressive Strength of Molded Soil-Cement Cylinder

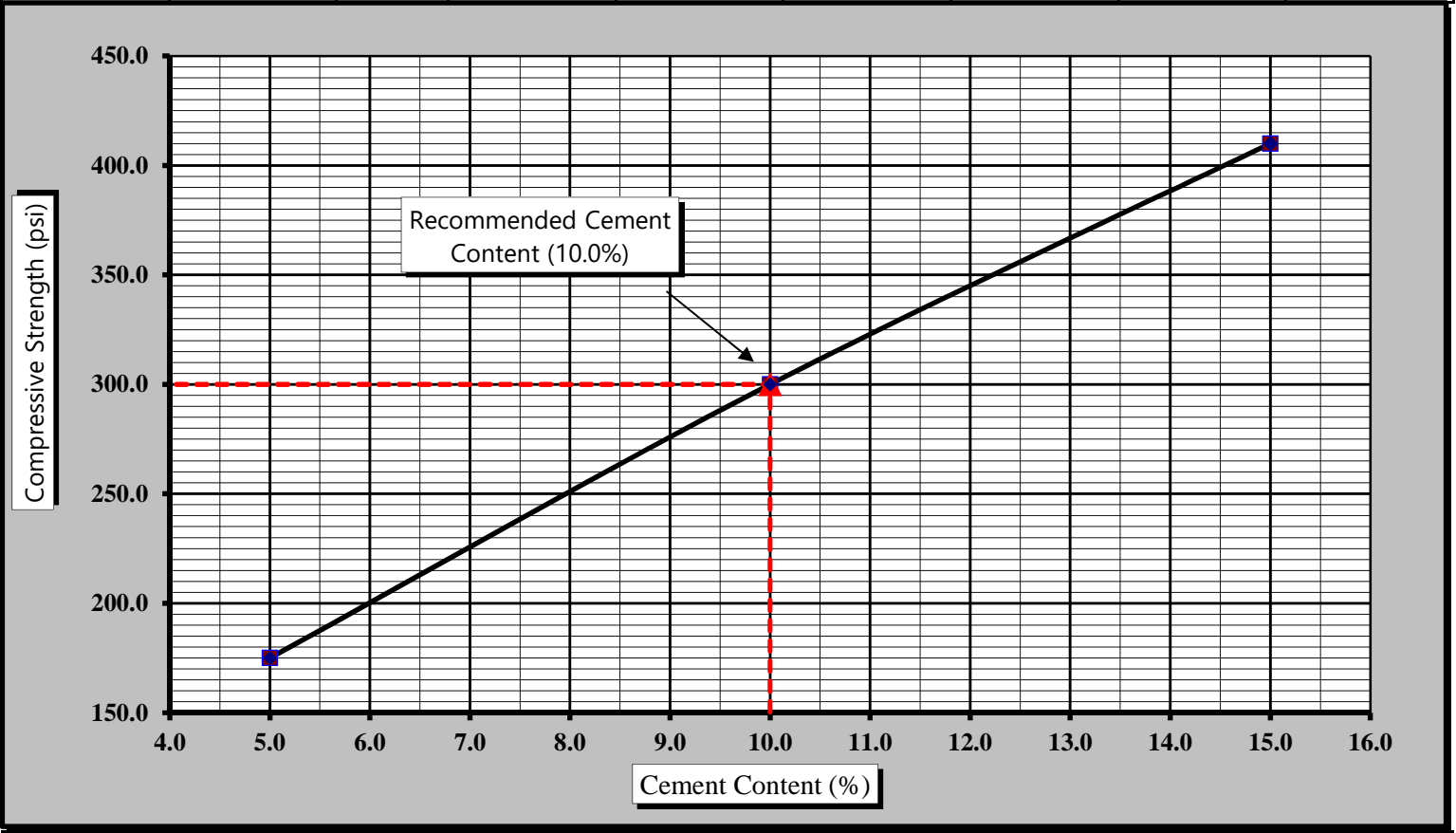


ASTM D1633

S&ME, Inc. Raleigh, 3201 Spring Forest Road, Raleigh, North Carolina 27616

Project #:	6205-20-004	Report Date:	3/19/2020
Project Name:	I-5973 PDI I-485 at NC 16	Test Date(s):	3/11 - 3/19/2020
Client Name:	NCDOT		
Client Address:	Raleigh, NC		
Boring #:	C-15	Sample #:	Bulk 2
Location:	-L- 31+55 NB IES	Offset:	4.0' FY
Sample Description:	Soil-Cement Treated		
Mix Type:	Cement Treated		

% Cement By Weight	MDD (pcf)	Opt. Moist. (%)	Avg. Molded Specimens (pcf)	Average Max. Load (lbf)	Avg. Area (in ²)	Avg. Comp. Str. (psi)	Corr. Factor (L/D)	Corr. Avg. Comp. Str. (psi)
5	109.8	16.8	110.1	2445	12.57	195	0.91	175
10	111.2	16.0	111.1	4171	12.57	332	0.91	300
15	112.0	15.2	111.9	5683	12.57	452	0.91	410



Notes / Deviations / References:

- ASTM D599: Test Methods for Wetting-and Drying Tests of Compacted Soil-Cement Mixtures
- ASTM D560: Test Methods for Freezing-and-Thawing Tests of Compacted Soil-Cement Mixtures
- ASTM 1632: Making and Curing Soil-Cement Compression and Flexure Test Specimens in the Laboratory

Mal Krajan, ET
 Technical Responsibility

 Signature

Laboratory Manager
 Position

3/19/2020
 Date

This report shall not be reproduced, except in full, without the written approval of S&ME, Inc.

Compressive Strength of Molded Soil-Cement Cylinder

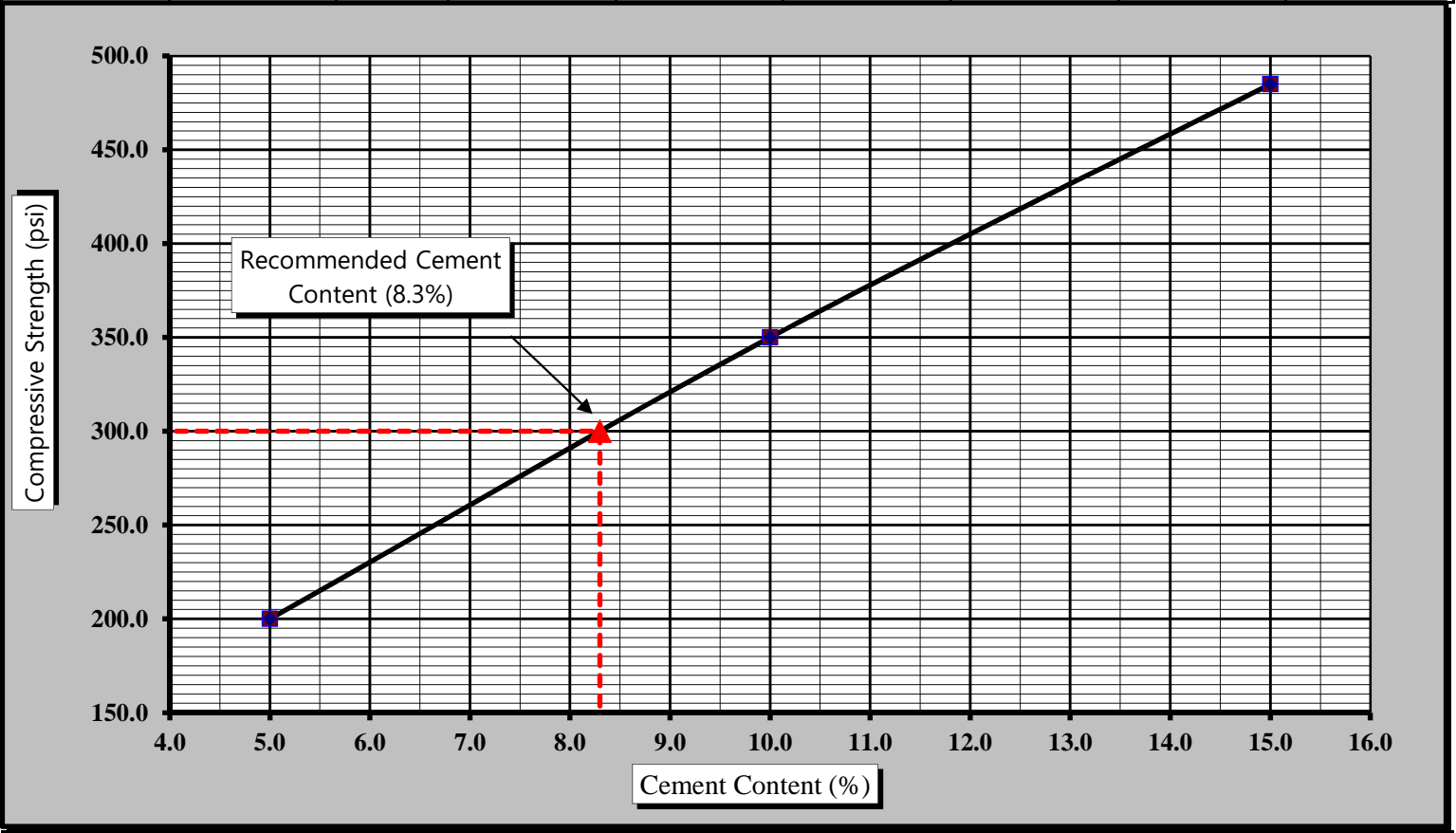


ASTM D1633

S&ME, Inc. Raleigh, 3201 Spring Forest Road, Raleigh, North Carolina 27616

Project #:	6205-20-004	Report Date:	3/20/2020
Project Name:	I-5973 PDI I-485 at NC 16	Test Date(s):	3/12 - 3/20/2020
Client Name:	NCDOT		
Client Address:	Raleigh, NC		
Boring #:	C-8	Sample #:	Bulk 3
Location:	-LRPA- 20+95 IES	Offset:	12.0' FY
Sample Description:	Soil-Cement Treated		
Mix Type:	Cement Treated		

% Cement By Weight	MDD (pcf)	Opt. Moist. (%)	Avg. Molded Specimens (pcf)	Average Max. Load (lbf)	Avg. Area (in ²)	Avg. Comp. Str. (psi)	Corr. Factor (L/D)	Corr. Avg. Comp. Str. (psi)
5	110.3	15.8	110.3	2748	12.57	219	0.91	200
10	111.0	15.5	111.1	4838	12.57	385	0.91	350
15	122.2	15.0	122.1	6665	12.57	530	0.91	485



Notes / Deviations / References:

- ASTM D599: Test Methods for Wetting-and Drying Tests of Compacted Soil-Cement Mixtures
- ASTM D560: Test Methods for Freezing-and-Thawing Tests of Compacted Soil-Cement Mixtures
- ASTM 1632: Making and Curing Soil-Cement Compression and Flexure Test Specimens in the Laboratory

Mal Krajan, ET
 Technical Responsibility

 Signature

Laboratory Manager
 Position

3/20/2020
 Date

This report shall not be reproduced, except in full, without the written approval of S&ME, Inc.

CBR (CALIFORNIA BEARING RATIO) OF LABORATORY COMPACTED SOIL



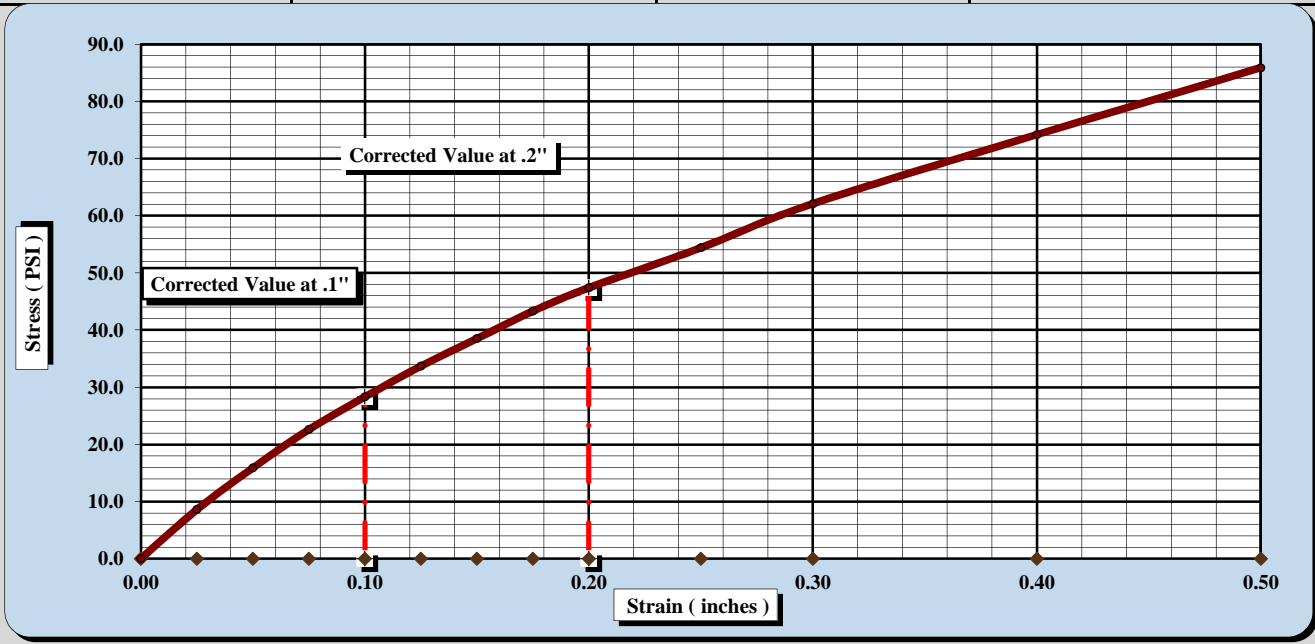
AASHTO T 193

S&ME, Inc. Raleigh: 3201 Spring Forest Road, Raleigh, NC 27616

Project #:	6205-20-004	Report Date:	3/17/2020
Project Name:	I-5973 PDI I-485 at NC 16	Test Date(s)	3/10 - 3/17/20
Client Name:	NCDOT		
Client Address:	Raleigh, NC		
Boring #:	N/A	Sample #:	Bulk 1
		Sample Date:	3/4/2020
Location:	-L- 22+10 SB OES	Offset:	19.0' FWL
		Depth (ft):	1 - 3 ft.
Sample Description:	Brown Fine to Coarse Sandy Silty CLAY (A-7-6) (7)		

AASHTO T99	Method A	Maximum Dry Density:	109.5 PCF	Optimum Moisture Content:	15.5%
Compaction Test performed on grading complying with CBR spec.				% Retained on the 3/4" sieve:	0.0%

Uncorrected CBR Values		Corrected CBR Values	
CBR at 0.1 in.	2.8	CBR at 0.1 in.	2.8
CBR at 0.2 in.	3.2	CBR at 0.2 in.	3.2



CBR Sample Preparation:

The entire gradation was used and compacted in a 6" CBR mold in accordance with AASHTO T 193, Section 5.1.1

Before Soaking		After Soaking	
Compactive Effort (Blows per Layer)	56	Final Dry Density (PCF)	108.9
Initial Dry Density (PCF)	108.9	Average Final Moisture Content	22.6%
Moisture Content of the Compacted Specimen	15.7%	Moisture Content (top 1" after soaking)	24.6%
Percent Compaction	99.5%	Percent Swell	0.2%

Soak Time:	96 hrs.	Surcharge Weight	10.0
Liquid Limit	44	Surcharge Wt. per sq. Ft.	50.9
		Plastic Index	18

Notes/Deviations/References:

Test specimen compacted to 100% at optimum moisture.

Mal Krajan, ET
Technical Responsibility

Signature

Laboratory Manager
Position

3/17/2020
Date

This report shall not be reproduced, except in full without the written approval of S&ME, Inc.

CBR (CALIFORNIA BEARING RATIO) OF LABORATORY COMPACTED SOIL



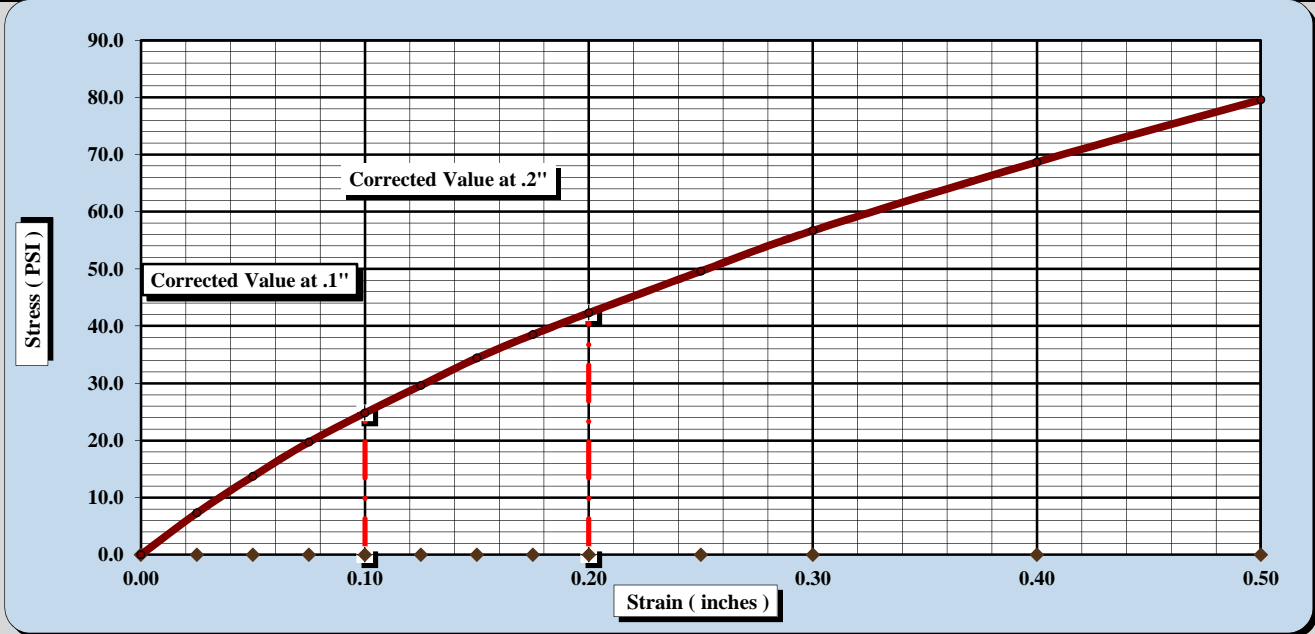
AASHTO T 193

S&ME, Inc. Raleigh: 3201 Spring Forest Road, Raleigh, NC 27616

Project #:	6205-20-004	Report Date:	3/17/2020
Project Name:	I-5973 PDI I-485 at NC 16	Test Date(s)	3/10 - 3/17/20
Client Name:	NCDOT		
Client Address:	Raleigh, NC		
Boring #:	C-15	Sample #:	Bulk 2
		Sample Date:	3/4/2020
Location:	-L- 31+55 NB IES	Offset:	4.0' FY
		Depth (ft):	1 - 3 ft.
Sample Description:	Brown Fine to Coarse Sandy Clayey SILT (A-6) (5)		

AASHTO T99	Method A	Maximum Dry Density:	106.5 PCF	Optimum Moisture Content:	17.5%
Compaction Test performed on grading complying with CBR spec.				% Retained on the 3/4" sieve:	0.0%

Uncorrected CBR Values		Corrected CBR Values	
CBR at 0.1 in.	2.5	CBR at 0.2 in.	2.8
CBR at 0.1 in.	2.5	CBR at 0.2 in.	2.8



CBR Sample Preparation:

The entire gradation was used and compacted in a 6" CBR mold in accordance with AASHTO T 193, Section 5.1.1

Before Soaking		After Soaking	
Compactive Effort (Blows per Layer)	56	Final Dry Density (PCF)	106.4
Initial Dry Density (PCF)	106.8	Average Final Moisture Content	19.1%
Moisture Content of the Compacted Specimen	17.6%	Moisture Content (top 1" after soaking)	19.4%
Percent Compaction	100.3%	Percent Swell	0.6%

Soak Time:	96 hrs.	Surcharge Weight	10.0
Liquid Limit	40	Surcharge Wt. per sq. Ft.	50.9
		Plastic Index	14

Notes/Deviations/References:

Test specimen compacted to 100% at optimum moisture.

Mal Krajan, ET
Technical Responsibility

Signature

Laboratory Manager
Position

3/17/2020
Date

This report shall not be reproduced, except in full without the written approval of S&ME, Inc.

CBR (CALIFORNIA BEARING RATIO) OF LABORATORY COMPACTED SOIL



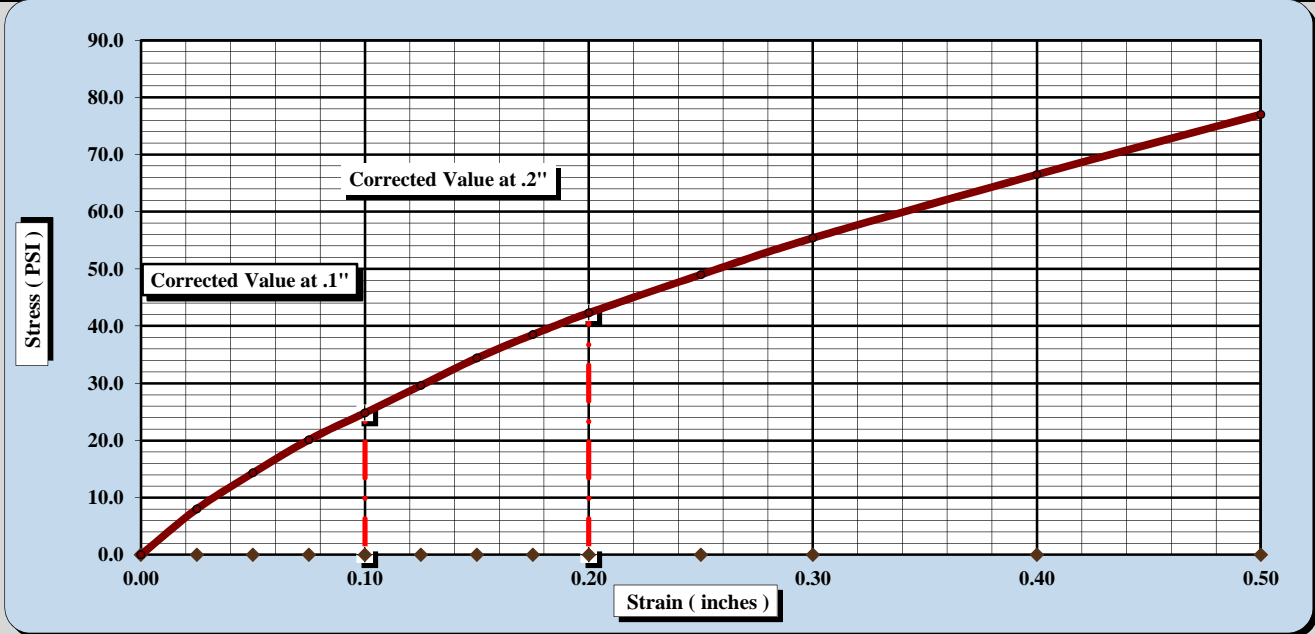
AASHTO T 193

S&ME, Inc. Raleigh: 3201 Spring Forest Road, Raleigh, NC 27616

Project #:	6205-20-004	Report Date:	3/17/2020
Project Name:	I-5973 PDI I-485 at NC 16	Test Date(s)	3/10 - 3/17/20
Client Name:	NCDOT		
Client Address:	Raleigh, NC		
Boring #:	C-8	Sample #:	Bulk 3
		Sample Date:	3/5/20
Location:	-LRPA- 20+95 IES	Offset:	12.0' FY
		Depth (ft):	1 - 3 ft.
Sample Description:	Brown Fine to Coarse Sandy Silty CLAY (A-7-6) (4)		

AASHTO T99	Method A	Maximum Dry Density:	109.8 PCF	Optimum Moisture Content:	16.2%
Compaction Test performed on grading complying with CBR spec.				% Retained on the 3/4" sieve:	0.0%

Uncorrected CBR Values		Corrected CBR Values	
CBR at 0.1 in.	2.5	CBR at 0.2 in.	2.8
		CBR at 0.1 in.	2.5
		CBR at 0.2 in.	2.8



CBR Sample Preparation:

The entire gradation was used and compacted in a 6" CBR mold in accordance with AASHTO T 193, Section 5.1.1

Before Soaking		After Soaking	
Compactive Effort (Blows per Layer)	56	Final Dry Density (PCF)	110.0
Initial Dry Density (PCF)	110.4	Average Final Moisture Content	17.6%
Moisture Content of the Compacted Specimen	16.4%	Moisture Content (top 1" after soaking)	18.3%
Percent Compaction	100.5%	Percent Swell	0.6%

Soak Time:	96 hrs.	Surcharge Weight	10.0
Liquid Limit	43	Surcharge Wt. per sq. Ft.	50.9
		Plastic Index	15

Notes/Deviations/References:

Test specimen compacted to 100% at optimum moisture.

Mal Krajan, ET
Technical Responsibility

Signature

Laboratory Manager
Position

3/17/2020
Date

This report shall not be reproduced, except in full without the written approval of S&ME, Inc.