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REFERENCE

SEE SHEET 3 FOR PLAN SHEET LAYOUT AT TIME OF INVESTIGATION

STATE OF NORTH CAROLINA

DEPARTMENT OF TRANSPORTATION **DIVISION OF HIGHWAYS** GEOTECHNICAL ENGINEERING UNIT

# **ROADWAY** SUBSURFACE INVESTIGATION

#### **CONTENTS**

SHEET NO.	<u>DESCRIPTION</u>
1	TITLE SHEET
2	LEGEND
3	PLAN SHEET
4	PAVEMENT DATA SHEET
5-7	DCP RAW DATA LOGS
8-9	PAVEMENT CORE PHOTOS
10-11	LABORATORY TEST RESULTS

COUNTY <u>CARTERET</u>

PROJECT DESCRIPTION ROUNDABOUT AT

THE INTERSECTION OF US 70 (LIVE OAK STREET)

AND NC 101

### PAVEMENT AND SUBGRADE INVESTIGATION

STATE PROJECT REFERENCE NO. U-6058

#### **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 (1991 707-6805). 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 (IM-PLACE) TEST DATA CAN BE RELIED ON ONLY TO THE DEGREE OF RELIABILITY INHERENT IN THE STANDARD TEST METHOD. THE OBSERVED MATER 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 SATISTY 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 CONJUTIONS 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

K. PLUMMER

S. JOHNSON

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INVESTIGATED BY WOOD E&IS, INC.

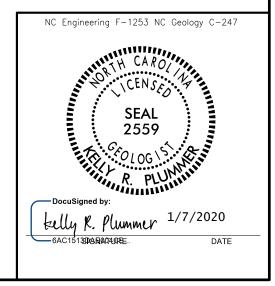
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SUBMITTED BY K. PLUMMER

DATE \_NOVEMBER, 2019

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PROJECT REFERENCE NO.

U-6058

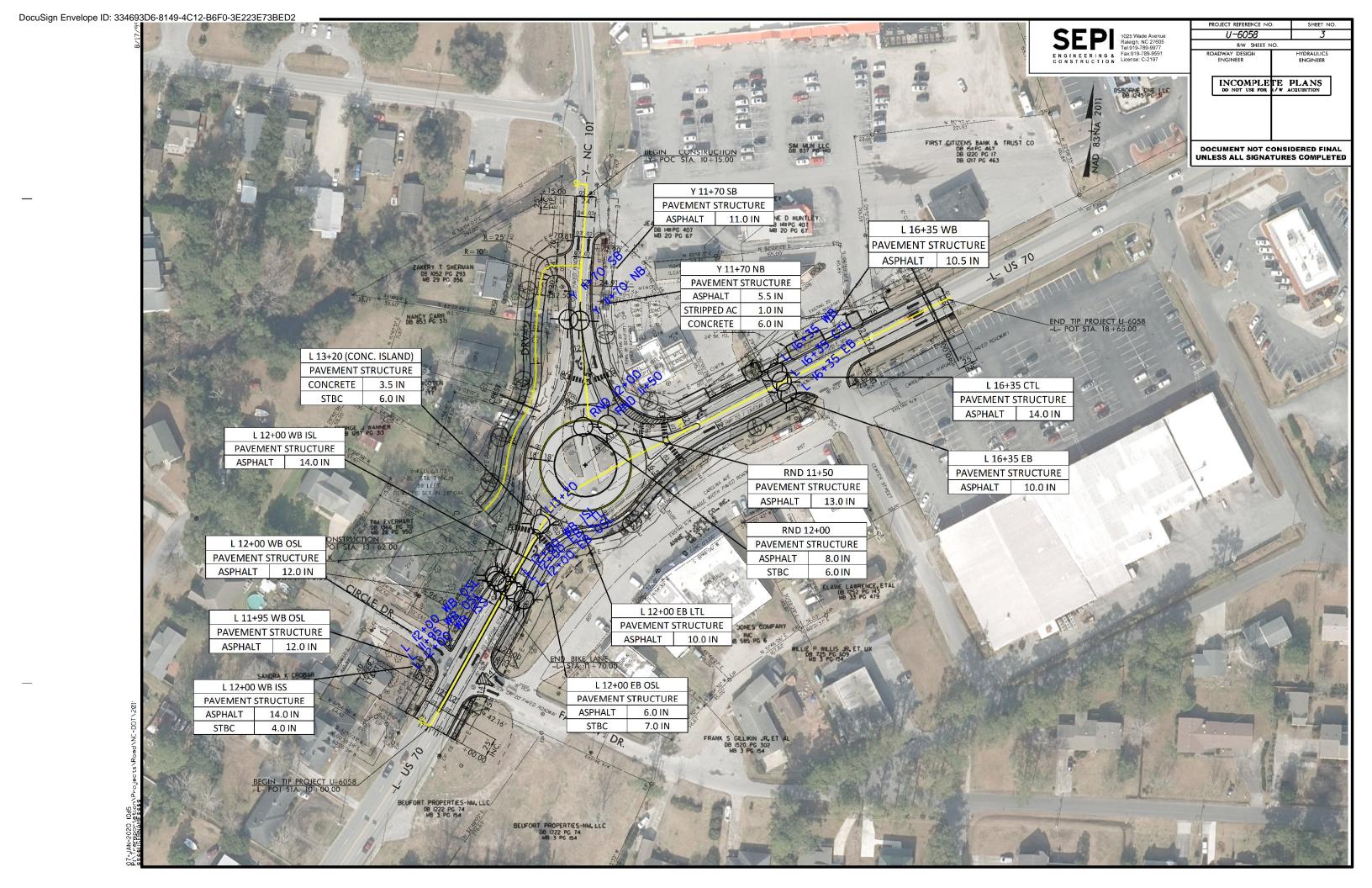
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# NORTH CAROLINA DEPARTMENT OF TRANSPORTATION DIVISION OF HIGHWAYS GEOTECHNICAL ENGINEERING UNIT

# SUBSURFACE INVESTIGATION

SOIL AND ROCK LEGEND, TERMS, SYMBOLS, AND ABBREVIATIONS

1			
SOIL DESCRIPTION	GRADATION	ROCK DESCRIPTION	TERMS AND DEFINITIONS
SOIL IS CONSIDERED UNCONSOLIDATED, SEMI-CONSOLIDATED, OR WEATHERED EARTH MATERIALS THAT CAN	WELL GRADED - INDICATES A GOOD REPRESENTATION OF PARTICLE SIZES FROM FINE TO COARSE.	HARD ROCK IS NON-COASTAL PLAIN MATERIAL THAT WOULD YIELD SPT REFUSAL IF TESTED. AN INFERRED ROCK LINE INDICATES THE LEVEL AT WHICH NON-COASTAL PLAIN MATERIAL WOULD YIELD SPT REFUSAL.	ALLUVIUM (ALLUV.) - SOILS THAT HAVE BEEN TRANSPORTED BY WATER.
BE PENETRATED WITH A CONTINUOUS FLIGHT POWER AUGER AND YIELD LESS THAN 100 BLOWS PER FOOT ACCORDING TO THE STANDARD PENETRATION TEST (AASHTO T 206, ASTM D1586), SOIL CLASSIFICATION	<u>UNIFORMLY GRADED</u> - INDICATES THAT SOIL PARTICLES ARE ALL APPROXIMATELY THE SAME SIZE. <u>GAP-GRADED</u> - INDICATES A MIXTURE OF UNIFORM PARTICLE SIZES OF TWO OR MORE SIZES.	SPT REFUSAL IS PENETRATION BY A SPLIT SPOON SAMPLER EQUAL TO OR LESS THAN 0.1 FOOT PER 60	AQUIFER - A WATER BEARING FORMATION OR STRATA.
IS BASED ON THE AASHTO SYSTEM. BASIC DESCRIPTIONS GENERALLY INCLUDE THE FOLLOWING: CONSISTENCY, COLOR, TEXTURE, MOISTURE, AASHTO CLASSIFICATION, AND OTHER PERTINENT FACTORS SUCH		BLOWS IN NON-COASTAL PLAIN MATERIAL, THE TRANSITION BETWEEN SOIL AND ROCK IS OFTEN REPRESENTED BY A ZONE OF WEATHERED ROCK,	ARENACEOUS - APPLIED TO ROCKS THAT HAVE BEEN DERIVED FROM SAND OR THAT CONTAIN SAND.
AS MINERALOGICAL COMPOSITION, ANGULARITY, STRUCTURE, PLASTICITY, ETC. FOR EXAMPLE,	ANGULARITY OF GRAINS	ROCK MATERIALS ARE TYPICALLY DIVIDED AS FOLLOWS:	ARGILLACEOUS - APPLIED TO ALL ROCKS OR SUBSTANCES COMPOSED OF CLAY MINERALS, OR HAVING
VERY STIFF,GRAY,SILTY CLAY,MOIST WITH INTERBEDDED FINE SAND LAYERS,HIGHLY PLASTIC,A-7-6	THE ANGULARITY OR ROUNDNESS OF SOIL GRAINS IS DESIGNATED BY THE TERMS:  ANGULAR, SUBANGULAR, SUBROUNDED, OR ROUNDED.	WEATHERED NON-COASTAL PLAIN MATERIAL THAT WOULD YIELD SPT N VALUES >	A NOTABLE PROPORTION OF CLAY IN THEIR COMPOSITION, SUCH AS SHALE, SLATE, ETC.
SOIL LEGEND AND AASHTO CLASSIFICATION	MINERALOGICAL COMPOSITION	ROCK (WR) 100 BLOWS PER FOOT IF TESTED.	ARTESIAN - GROUND WATER THAT IS UNDER SUFFICIENT PRESSURE TO RISE ABOVE THE LEVEL AT
GENERAL GRANULAR MATERIALS SILT-CLAY MATERIALS CLASS. (≤ 35% PASSING *200) (> 35% PASSING *200) ORGANIC MATERIALS	MINERAL NAMES SUCH AS QUARTZ, FELDSPAR, MICA, TALC, KAOLIN, ETC.	CRYSTALLINE CRYSTALLINE WOULD YIELD SPT REFUSAL IF TESTED, ROCK TYPE INCLUDES GRANITE,	WHICH IT IS ENCOUNTERED, BUT WHICH DOES NOT NECESSARILY RISE TO OR ABOVE THE GROUND SURFACE.
GROUP A-1 A-3 A-2 A-4 A-5 A-6 A-7 A-1, A-2 A-4, A-5	ARE USED IN DESCRIPTIONS WHEN THEY ARE CONSIDERED OF SIGNIFICANCE.	GNEISS, GABBRO, SCHIST, ETC.	CALCAREOUS (CALC.) - SOILS THAT CONTAIN APPRECIABLE AMOUNTS OF CALCIUM CARBONATE.
CLASS. A-1-a A-1-b A-2-4 A-2-5 A-2-6 A-2-7 A-7-5 A-3 A-6, A-7	COMPRESSIBILITY	NON-CRYSTALLINE FINE TO COARSE GRAIN METAMORPHIC AND NON-COASTAL PLAIN SEDIMENTARY ROCK THAT WOULD YEILD SPT REFUSAL IF TESTED.	COLLUVIUM - ROCK FRAGMENTS MIXED WITH SOIL DEPOSITED BY GRAVITY ON SLOPE OR AT BOTTOM
SYMBOL	SLIGHTLY COMPRESSIBLE LL < 31	ROCK TYPE INCLUDES PHYLLITE, SLATE, SANDSTONE, ETC.	OF SLOPE.
	MODERATELY COMPRESSIBLE LL = 31 - 50 HIGHLY COMPRESSIBLE LL > 50	COASTAL PLAIN COASTAL PLAIN SEDIMENTS CEMENTED INTO ROCK, BUT MAY NOT YIELD SEDIMENTARY ROCK SPT REFUSAL. ROCK TYPE INCLUDES LIMESTONE, SANDSTONE, CEMENTED	CORE RECOVERY (REC.) - TOTAL LENGTH OF ALL MATERIAL RECOVERED IN THE CORE BARREL DIVIDED
7. PASSING SILT-GRANULAR SILT-GRANULAR SILT-MUCK,	PERCENTAGE OF MATERIAL	(CP) SHELL BEDS, ETC.	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
#40 30 MX 50 MX 51 MN S0ILS S0ILS S0ILS S0ILS	GRANULAR SILT - CLAY ORGANIC MATERIAL SOILS SOILS OTHER MATERIAL	- WEATHERING	ROCKS OR CUTS MASSIVE ROCK.
*200   15 MX   25 MX   10 MX   35 MX   35 MX   35 MX   35 MX   36 MN   36 MN   36 MN   36 MN	ORGANIC MATERIAL SOILS SOILS OTHER MATERIAL TRACE OF ORGANIC MATTER 2 - 3% 3 - 5% TRACE 1 - 10%	FRESH ROCK FRESH, CRYSTALS BRIGHT, FEW JOINTS MAY SHOW SLIGHT STAINING. ROCK RINGS UNDER HAMMER IF CRYSTALLINE.	DIP - THE ANGLE AT WHICH A STRATUM OR ANY PLANAR FEATURE IS INCLINED FROM THE
MATERIAL PASSING *40	LITTLE ORGANIC MATTER 3 - 5% 5 - 12% LITTLE 10 - 20%	VERY SLIGHT ROCK GENERALLY FRESH, JOINTS STAINED, SOME JOINTS MAY SHOW THIN CLAY COATINGS IF OPEN,	HORIZONTAL.
LL 40 MX 41 MN LITTLE OR	MODERATELY ORGANIC 5 - 10% 12 - 20% SOME 20 - 35% HIGHLY ORGANIC > 10% > 20% HIGHLY 35% AND ABOVE	(V SLI.) CRYSTALS ON A BROKEN SPECIMEN FACE SHINE BRIGHTLY. ROCK RINGS UNDER HAMMER BLOWS IF	DIP DIRECTION (DIP AZIMUTH) - THE DIRECTION OR BEARING OF THE HORIZONTAL TRACE OF THE LINE OF DIP, MEASURED CLOCKWISE FROM NORTH.
P1 6 MX NP 10 MX 11 MN 11 MN 10 MX 11 MN 11 MN 11 MN 11 MN 11 MN MODERATE HIGHLY	GROUND WATER	OF A CRYSTALLINE NATURE.	FAULT - A FRACTURE OR FRACTURE ZONE ALONG WHICH THERE HAS BEEN DISPLACEMENT OF THE
GROUP INDEX W W 4 MX 8 MX 12 MX 16 MX NU MX AMUUNTS OF SOILS		SLIGHT ROCK GENERALLY FRESH, JOINTS STAINED AND DISCOLORATION EXTENDS INTO ROCK UP TO  (SLI.) 1 INCH. OPEN JOINTS MAY CONTAIN CLAY. IN GRANITOID ROCKS SOME OCCASIONAL FELDSPAR	SIDES RELATIVE TO ONE ANOTHER PARALLEL TO THE FRACTURE.
USUAL TYPES STONE FRAGS. FINE SILTY OR CLAYEY SILTY CLAYEY MATTER		CRYSTALS ARE DULL AND DISCOLORED. CRYSTALLINE ROCKS RING UNDER HAMMER BLOWS.	FISSILE - A PROPERTY OF SPLITTING ALONG CLOSELY SPACED PARALLEL PLANES.
MATERIALS SAND SAND GRAVEL AND SAND SOILS SOILS	lacksquare static water level after $24$ hours	MODERATE SIGNIFICANT PORTIONS OF ROCK SHOW DISCOLORATION AND WEATHERING EFFECTS. IN	FLOAT - ROCK FRAGMENTS ON SURFACE NEAR THEIR ORIGINAL POSITION AND DISLODGED FROM
GEN. RATING EXCELLENT TO GOOD FAIR TO POOR POOR UNSUITABLE	<u> </u>	(MOD.) GRANITOID ROCKS, MOST FELDSPARS ARE DULL AND DISCOLORED, SOME SHOW CLAY. ROCK HAS DULL SOUND UNDER HAMMER BLOWS AND SHOWS SIGNIFICANT LOSS OF STRENGTH AS COMPARED	PARENT MATERIAL.
AS SUBGRADE POUR	SPRING OR SEEP	WITH FRESH ROCK.	FLOOD PLAIN (FP) - LAND BORDERING A STREAM, BUILT OF SEDIMENTS DEPOSITED BY THE STREAM.
PI OF A-7-5 SUBGROUP IS ≤ LL - 30; PI OF A-7-6 SUBGROUP IS > LL - 30		MODERATELY ALL ROCK EXCEPT QUARTZ DISCOLORED OR STAINED, IN GRANITOID ROCKS, ALL FELDSPARS DULL	FORMATION (FM.) - A MAPPABLE GEOLOGIC UNIT THAT CAN BE RECOGNIZED AND TRACED IN THE FIELD.
CONSISTENCY OR DENSENESS	MISCELLANEOUS SYMBOLS	SEVERE AND DISCOLORED AND A MAJORITY SHOW KAOLINIZATION. ROCK SHOWS SEVERE LOSS OF STRENGTH (MOD. SEV.) AND CAN BE EXCAVATED WITH A GEOLOGIST'S PICK. ROCK GIVES "CLUNK" SOUND WHEN STRUCK.	JOINT - FRACTURE IN ROCK ALONG WHICH NO APPRECIABLE MOVEMENT HAS OCCURRED.
PRIMARY SOIL TYPE COMPACTNESS OR CONSISTENCY PENETRATION RESISTENCE COMPRESSIVE STRENGTH	ROADWAY EMBANKMENT (RE) 25/025 DIP & DIP DIRECTION	<u>IF TESTED, WOULD YIELD SPT REFUSAL</u>	LEDGE - A SHELF-LIKE RIDGE OR PROJECTION OF ROCK WHOSE THICKNESS IS SMALL COMPARED TO
(N-VALUE) (TUNS/FT-)	₩ITH SOIL DESCRIPTION FROCK STRUCTURES	SEVERE ALL ROCK EXCEPT QUARTZ DISCOLORED OR STAINED. ROCK FABRIC CLEAR AND EVIDENT BUT	ITS LATERAL EXTENT.
GENERALLY VERY LOOSE 4 TO 10	SOIL SYMBOL  SOIL SYMBOL  SUPPLINT TEST BORING  SLOPE INDICATOR INSTALLATION	(SEV.) REDUCED IN STRENGTH TO STRONG SOIL. IN GRANITOID ROCKS ALL FELDSPARS ARE KAOLINIZED TO SOME EXTENT. SOME FRAGMENTS OF STRONG ROCK USUALLY REMAIN.	<u>LENS</u> - A BODY OF SOIL OR ROCK THAT THINS OUT IN ONE OR MORE DIRECTIONS.
GRANULAR MEDIUM DENSE 10 TO 30 N/A	N The state of the	IF TESTED, WOULD YIELD SPT N VALUES > 100 BPF	MOTTLED (MOT.) - IRREGULARLY MARKED WITH SPOTS OF DIFFERENT COLORS, MOTTLING IN SOILS
(NON-COHESIVE) DENSE 30 TO 50  VERY DENSE > 50	THAN ROADWAY EMBANKMENT AUGER BORING CONE PENETROMETER	VERY ALL ROCK EXCEPT QUARTZ DISCOLORED OR STAINED, ROCK FABRIC ELEMENTS ARE DISCERNIBLE	USUALLY INDICATES POOR AERATION AND LACK OF GOOD DRAINAGE.
VERY SOFT < 2 < 0.25	INFERRED SOIL BOUNDARY CORE BORING SOUNDING ROD	SEVERE BUT MASS IS EFFECTIVELY REDUCED TO SOIL STATUS, WITH ONLY FRAGMENTS OF STRONG ROCK (V SEV.) REMAINING, SAPROLITE IS AN EXAMPLE OF ROCK WEATHERED TO A DEGREE THAT ONLY MINOR	PERCHED WATER - WATER MAINTAINED ABOVE THE NORMAL GROUND WATER LEVEL BY THE PRESENCE OF AN INTERVENING IMPERVIOUS STRATUM.
GENERALLY SOFT 2 TO 4 0.25 TO 0.5	The state of the s	VESTIGES OF ORIGINAL ROCK FABRIC REMAIN. <u>IF TESTED, WOULD YIELD SPT N VALUES &lt; 100 BPF</u>	RESIDUAL (RES.) SOIL - SOIL FORMED IN PLACE BY THE WEATHERING OF ROCK.
SILT-CLAY   MEDIUM STIFF   4 TO 8   0.5 TO 1.0   MATERIAL   STIFF   8 TO 15   1 TO 2	INFERRED ROCK LINE MONITORING WELL TEST BORING WITH CORE	COMPLETE ROCK REDUCED TO SOIL, ROCK FABRIC NOT DISCERNIBLE, OR DISCERNIBLE ONLY IN SMALL AND	ROCK QUALITY DESIGNATION (ROD) - A MEASURE OF ROCK QUALITY DESCRIBED BY TOTAL LENGTH OF
(COHESIVE) VERY STIFF 15 TO 30 2 TO 4	TTTTT ALLUVIAL SOIL BOUNDARY A PIEZOMETER SPT N-VALUE	SCATTERED CONCENTRATIONS. QUARTZ MAY BE PRESENT AS DIKES OR STRINGERS. SAPROLITE IS ALSO AN EXAMPLE.	ROCK SEGMENTS EQUAL TO OR GREATER THAN 4 INCHES DIVIDED BY THE TOTAL LENGTH OF CORE RUN AND EXPRESSED AS A PERCENTAGE.
HARD > 30 > 4			
		ROCK HARDNESS	SAPROLITE (SAP.) - RESIDIAL SOIL THAT RETAINS THE RELIC STRUCTURE OR FARRIC OF THE PARENT.
TEXTURE OR GRAIN SIZE	RECOMMENDATION SYMBOLS	ROCK HARDNESS  VERY HARD CANNOT BE SCRATCHED BY KNIFE OR SHARP PICK, BREAKING OF HAND SPECIMENS REQUIRES	SAPROLITE (SAP.) - RESIDUAL SOIL THAT RETAINS THE RELIC STRUCTURE OR FABRIC OF THE PARENT ROCK.
TEXTURE OR GRAIN SIZE           U.S. STD. SIEVE SIZE         4         10         40         60         200         270	RECOMMENDATION SYMBOLS	ROCK HARDNESS  VERY HARD CANNOT BE SCRATCHED BY KNIFE OR SHARP PICK, BREAKING OF HAND SPECIMENS REQUIRES SEVERAL HARD BLOWS OF THE GEOLOGIST'S PICK.	ROCK.  SILL - AN INTRUSIVE BODY OF IGNEOUS ROCK OF APPROXIMATELY UNIFORM THICKNESS AND
TEXTURE OR GRAIN SIZE           U.S. STD. SIEVE SIZE         4         10         40         60         200         270           OPENING (MM)         4.76         2.00         0.42         0.25         0.075         0.053	RECOMMENDATION SYMBOLS  UNDERCUT EXCAVATION UNSUITABLE WASTE UNSUITABLE WASTE USED IN THE TOP 3 FEET OF	VERY HARD CANNOT BE SCRATCHED BY KNIFE OR SHARP PICK, BREAKING OF HAND SPECIMENS REQUIRES SEVERAL HARD BLOWS OF THE GEOLOGIST'S PICK.  HARD CAN BE SCRATCHED BY KNIFE OR PICK ONLY WITH DIFFICULTY, HARD HAMMER BLOWS REQUIRED	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
TEXTURE OR GRAIN SIZE	RECOMMENDATION SYMBOLS  UNDERCUT UNCLASSIFIED EXCAVATION - UNCLASSIFIED EXCAVATION - ACCEPTABLE, BUT NOT TO BE	VERY HARD  CANNOT BE SCRATCHED BY KNIFE OR SHARP PICK, BREAKING OF HAND SPECIMENS REQUIRES SEVERAL HARD BLOWS OF THE GEOLOGIST'S PICK.  HARD  CAN BE SCRATCHED BY KNIFE OR PICK ONLY WITH DIFFICULTY, HARD HAMMER BLOWS REQUIRED TO DETACH HAND SPECIMEN.	ROCK. <u>SILL</u> - 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.
TEXTURE OR GRAIN SIZE   U.S. STD. SIEVE SIZE	RECOMMENDATION SYMBOLS  UNCLASSIFIED EXCAVATION - ACCEPTABLE, BUT NOT TO BE USED IN THE TOP 3 FEET OF SHALLOW  UNCLASSIFIED EXCAVATION - STREET OF SHALLOW  UNCLASSIFIED EXCAVATION - STREET OF SHALLOW	VERY HARD CANNOT BE SCRATCHED BY KNIFE OR SHARP PICK, BREAKING OF HAND SPECIMENS REQUIRES SEVERAL HARD BLOWS OF THE GEOLOGIST'S PICK.  HARD CAN BE SCRATCHED BY KNIFE OR PICK ONLY WITH DIFFICULTY, HARD HAMMER BLOWS REQUIRED	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
TEXTURE OR GRAIN SIZE	RECOMMENDATION SYMBOLS  UNDERCUT UNCLASSIFIED EXCAVATION - EXCAVATION UNCLASSIFIED EXCAVATION - EXCAVATION UNCLASSIFIED EXCAVATION - EXCAVATION UNCLASSIFIED EXCAVATION - EXCAVATION UNCLASSIFIED EXCAVATION - ACCEPTABLE DECGRADABLE ROCK  ABBREVIATIONS  AR - AUGER REFUSAL  MED MEDIUM  VST - VANE SHEAR TEST	VERY HARD  CANNOT BE SCRATCHED BY KNIFE OR SHARP PICK. BREAKING OF HAND SPECIMENS REQUIRES SEVERAL HARD BLOWS OF THE GEOLOGIST'S PICK.  HARD  CAN BE SCRATCHED BY KNIFE OR PICK ONLY WITH DIFFICULTY, HARD HAMMER BLOWS REQUIRED TO DETACH HAND SPECIMEN.  MODERATELY  CAN BE SCRATCHED BY KNIFE OR PICK. GOUGES OR GROOVES TO 0.25 INCHES DEEP CAN BE	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
TEXTURE OR GRAIN SIZE	RECOMMENDATION SYMBOLS  UNDERCUT UNCLASSIFIED EXCAVATION - ACCEPTABLE, BUT NOT TO BE USED IN THE TOP 3 FEET OF EMBANKMENT OR BACKFILL  ABBREVIATIONS  AR - AUGER REFUSAL MCD MEDIUM BT - BORING TERMINATED MCA MICACEDUS WEA WEATHERED	VERY HARD  CANNOT BE SCRATCHED BY KNIFE OR SHARP PICK. BREAKING OF HAND SPECIMENS REQUIRES SEVERAL HARD BLOWS OF THE GEOLOGIST'S PICK.  HARD  CAN BE SCRATCHED BY KNIFE OR PICK ONLY WITH DIFFICULTY. HARD HAMMER BLOWS REQUIRED TO DETACH HAND SPECIMEN.  MODERATELY  HARD  EXCAVATED BY HARD BLOW OF A GEOLOGIST'S PICK, HAND SPECIMENS CAN BE DETACHED BY MODERATE BLOWS.  MEDIUM  CAN BE GROOVED OR GOUGED 0.05 INCHES DEEP BY FIRM PRESSURE OF KNIFE OR PICK POINT.	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 I FOOT INTO SOIL
TEXTURE OR GRAIN SIZE	RECOMMENDATION SYMBOLS  UNDERCUT UNCLASSIFIED EXCAVATION - EXCAVATION UNCLASSIFIED EXCAVATION - EXCAVATION UNCLASSIFIED EXCAVATION - EXCAVATION UNCLASSIFIED EXCAVATION - EXCAVATION UNCLASSIFIED EXCAVATION - ACCEPTABLE DECGRADABLE ROCK  ABBREVIATIONS  AR - AUGER REFUSAL  MED MEDIUM  VST - VANE SHEAR TEST	VERY HARD  CANNOT BE SCRATCHED BY KNIFE OR SHARP PICK. BREAKING OF HAND SPECIMENS REQUIRES SEVERAL HARD BLOWS OF THE GEOLOGIST'S PICK.  HARD  CAN BE SCRATCHED BY KNIFE OR PICK ONLY WITH DIFFICULTY. HARD HAMMER BLOWS REQUIRED TO DETACH HAND SPECIMEN.  MODERATELY HARD  CAN BE SCRATCHED BY KNIFE OR PICK. GOUGES OR GROOVES TO 0.25 INCHES DEEP CAN BE EXCAVATED BY HARD BLOW OF A GEOLOGIST'S PICK, HAND SPECIMENS CAN BE DETACHED BY MODERATE BLOWS.	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
TEXTURE OR GRAIN SIZE	RECOMMENDATION SYMBOLS  UNDERCUT UNCLASSIFIED EXCAVATION - ACCEPTABLE, BUT NOT TO BE USED IN THE TOP 3 FEET OF EMBANKMENT OR BACKFILL  SHALLOW UNDERCUT UNCLASSIFIED EXCAVATION - ACCEPTABLE DEGRADABLE ROCK  ABBREVIATIONS  AR - AUGER REFUSAL MCD MEDIUM ST VANE SHEAR TEST MCD MICACEOUS WEA WEATHERED CL CLAY MOD MODERATELY CPT - CONE PENETRATION TEST NP - NON PLASTIC CSE COARSE ORG ORGANIC	VERY HARD  CANNOT BE SCRATCHED BY KNIFE OR SHARP PICK. BREAKING OF HAND SPECIMENS REQUIRES SEVERAL HARD BLOWS OF THE GEOLOGIST'S PICK.  CAN BE SCRATCHED BY KNIFE OR PICK ONLY WITH DIFFICULTY, HARD HAMMER BLOWS REQUIRED TO DETACH HAND SPECIMEN.  MODERATELY HARD  CAN BE SCRATCHED BY KNIFE OR PICK, COUGES OR GROOVES TO 0.25 INCHES DEEP CAN BE EXCAVATED BY HARD BLOW OF A GEOLOGIST'S PICK, HAND SPECIMENS CAN BE DETACHED BY MODERATE BLOWS.  MEDIUM  CAN BE GROOVED OR GOUGED 0.05 INCHES DEEP BY FIRM PRESSURE OF KNIFE OR PICK POINT. CAN BE EXCAVATED IN SMALL CHIPS TO PEICES I INCH MAXIMUM SIZE BY HARD BLOWS OF THE POINT OF A GEOLOGIST'S PICK.  SOFT  CAN BE GROVED OR GOUGED READILY BY KNIFE OR PICK, CAN BE EXCAVATED IN FRAGMENTS	ROCK.  SILL - AN INTRUSIVE BODY OF IGNEOUS ROCK OF APPROXIMATELY UNIFORM THICKNESS AND RELATIVELY THIN COMPARED WITH ITS LATERAL EXTENT, THAT HAS BEEN EMPLACED PARALLEL TO THE BEDDING OR SCHISTOSITY OF THE INTRUDED ROCKS.  SLICKENSIDE - POLISHED AND STRIATED SURFACE THAT RESULTS FROM FRICTION ALONG A FAULT OR SLIP PLANE.  STANDARD PENETRATION TEST (PENETRATION RESISTANCE) (SPT) - NUMBER OF BLOWS (N OR BPF) OF A 140 LB. HAMMER FALLING 30 INCHES REQUIRED TO PRODUCE A PENETRATION OF 1 FOOT INTO SOIL WITH A 2 INCH OUTSIDE DIAMETER SPLIT SPOON SAMPLER. SPT REFUSAL IS PENETRATION EQUAL TO OR LESS THAN 0.1 FOOT PER 60 BLOWS.  STRATA CORE RECOVERY (SREC.) - TOTAL LENGTH OF STRATA MATERIAL RECOVERED DIVIDED BY
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TEXTURE OR GRAIN SIZE	RECOMMENDATION SYMBOLS  UNDERCUT UNCLASSIFIED EXCAVATION - ACCEPTABLE, BUT NOT TO BE USED IN THE TOP 3 FEET OF EMBANKMENT OR BACKFILL  AR - AUGER REFUSAL MCD MEDIUM MCA MICACEOUS WEA WEATHERED CL CLAY MOD MODERATELY MCD WINDERCUT MOD MODERATELY MCD WOD WEA WEATHERED MCD WITH WEIGHT MCD WOD WEA WEATHERED MCD WITH WEIGHT MCD WOD WOD WOD WOD WOD WOD WOD WOD WEA WEATHERED MCD WITH WEIGHT MCD WOD WEA WEATHERED MCD WITH WEIGHT MCD WOD WOD WOD WOD WOD WOD WEA WEATHERED MCD WEALH MCD WOD WEALH MCD WE	VERY HARD  CANNOT BE SCRATCHED BY KNIFE OR SHARP PICK. BREAKING OF HAND SPECIMENS REQUIRES SEVERAL HARD BLOWS OF THE GEOLOGIST'S PICK.  CAN BE SCRATCHED BY KNIFE OR PICK ONLY WITH DIFFICULTY, HARD HAMMER BLOWS REQUIRED TO DETACH HAND SPECIMEN.  MODERATELY HARD  CAN BE SCRATCHED BY KNIFE OR PICK, COUGES OR GROOVES TO 0.25 INCHES DEEP CAN BE EXCAVATED BY HARD BLOW OF A GEOLOGIST'S PICK, HAND SPECIMENS CAN BE DETACHED BY MODERATE BLOWS.  MEDIUM  CAN BE GROOVED OR GOUGED 0.05 INCHES DEEP BY FIRM PRESSURE OF KNIFE OR PICK POINT. CAN BE EXCAVATED IN SMALL CHIPS TO PEICES I INCH MAXIMUM SIZE BY HARD BLOWS OF THE POINT OF A GEOLOGIST'S PICK.  SOFT  CAN BE GROVED OR GOUGED READILY BY KNIFE OR PICK, CAN BE EXCAVATED IN FRAGMENTS FROM CHIPS TO SEVERAL INCHES IN SIZE BY MODERATE BLOWS OF A PICK POINT. SMALL, THIN PIECES CAN BE BROKEN BY FINGER PRESSURE.  VERY  CAN BE CARVED WITH KNIFE. CAN BE EXCAVATED READILY WITH POINT OF PICK, PIECES I INCH OR MORE IN THICKNESS CAN BE BROKEN BY FINGER PRESSURE. CAN BE SCRATCHED READILY BY FINGERNAIL.  FRACTURE SPACING  BEDDING  IERM  SPACING  IERM  IHICKNESS	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.  SILVENSIDE - POLISHED AND STRIATED SURFACE THAT RESULTS FROM FRICTION ALONG A FAULT OR SLIP PLANE.  STANDARD PENETRATION TEST (PENETRATION RESISTANCE) (SPT) - NUMBER OF BLOWS (N OR BPF) OF A 140 LB. HAMMER FALLING 30 INCHES REQUIRED TO PRODUCE A PENETRATION OF 1 FOOT INTO SOIL WITH A 2 INCH OUTSIDE DIAMETER SPLIT SPOON SAMPLER. SPT REFUSAL IS PENETRATION EQUAL TO OR LESS THAN 0.1 FOOT PER 60 BLOWS.  STRATA CORE RECOVERY (SREC.) - TOTAL LENGTH OF STRATA MATERIAL RECOVERED DIVIDED BY TOTAL LENGTH OF STRATUM AND EXPRESSED AS A PERCENTAGE.  STRATA ROCK QUALITY DESIGNATION (SROD) - A MEASURE OF ROCK QUALITY DESCRIBED BY TOTAL LENGTH OF ROCK SEGMENTS WITHIN A STRATUM EQUAL TO OR GREATER THAN 4 INCHES DIVIDED BY THE TOTAL LENGTH OF STRATA AND EXPRESSED AS A PERCENTAGE.  TOPSOIL (TS.) - SURFACE SOILS USUALLY CONTAINING ORGANIC MATTER.  BENCH MARK:
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TEXTURE OR GRAIN SIZE	RECOMMENDATION SYMBOLS    WINDERCUT	VERY HARD  CANNOT BE SCRATCHED BY KNIFE OR SHARP PICK. BREAKING OF HAND SPECIMENS REQUIRES SEVERAL HARD BLOWS OF THE GEOLOGIST'S PICK.  HARD  CAN BE SCRATCHED BY KNIFE OR PICK ONLY WITH DIFFICULTY, HARD HAMMER BLOWS REQUIRED TO DETACH HAND SPECIMEN.  MODERATELY HARD  EXCAVATED BY HARD BLOW OF A GEOLOGIST'S PICK, HAND SPECIMENS CAN BE DETACHED BY HARD BLOW OF A GEOLOGIST'S PICK, HAND SPECIMENS CAN BE DETACHED BY HARD BLOW OF A GEOLOGIST'S PICK, HAND SPECIMENS CAN BE DETACHED BY MODERATE BLOWS.  MEDIUM  CAN BE GROOVED OR GOUGED 0.05 INCHES DEEP BY FIRM PRESSURE OF KNIFE OR PICK POINT.  HARD  CAN BE GROVED OR GOUGED READILY BY KNIFE OR PICK. CAN BE EXCAVATED IN FRAGMENTS FROM CHIPS TO SEVERAL INCHES IN SIZE BY MODERATE BLOWS OF A PICK POINT. SMALL, THIN PICCES CAN BE BROKEN BY FINGER PRESSURE.  VERY  CAN BE CARVED WITH KNIFE. CAN BE EXCAVATED READILY WITH POINT OF PICK. PIECES 1 INCH OR MORE IN THICKNESS CAN BE BROKEN BY FINGER PRESSURE. CAN BE SCRATCHED READILY BY FINGERNAIL.  FRACTURE SPACING  TERM  SPACING  VERY WIDE  MORE THAN 10 FEET  WIDE  WIDE  3 TO 10 FEET  THICKLY BEDDED  4 FEET  THICKLY BEDDED  4.15 - 4 FEET  THICKLY BEDDED  5.5 - 4 FEET  THICKLY BEDDED  6.06 - 1.5 FEET  THICKLY LAMINATED  6.008 - 0.03 FEET  THICKLY LAMINATED  7.008 - 0.03 FEET  THICKLY LAMINATED  8.008 - 0.03 FEET  THICKLY LAMINATED  8.008 - 0.03 FEET  THICKLY LAMINATED  8.008 FEET  THICKLY LAMINATED  8.008 - 0.03 FEET  THICKLY LAMINATED  8	ROCK.  SILL - AN INTRUSIVE BODY OF IGNEOUS ROCK OF APPROXIMATELY UNIFORM THICKNESS AND RELATIVELY THIN COMPARED WITH ITS LATERAL EXTENT, THAT HAS BEEN EMPLACED PARALLEL TO THE BEDDING OR SCHISTOSITY OF THE INTRUDED ROCKS.  SLICKENSIDE - POLISHED AND STRIATED SURFACE THAT RESULTS FROM FRICTION ALONG A FAULT OR SLIP PLANE.  STANDARD PENETRATION TEST (PENETRATION RESISTANCE) (SPT) - NUMBER OF BLOWS (N OR BPF) OF A 140 LB. HAMMER FALLING 30 INCHES REQUIRED TO PRODUCE A PENETRATION OF 1 FOOT INTO SOIL WITH A 2 INCH OUTSIDE DIAMETER SPLIT SPOON SAMPLER. SPT REFUSAL IS PENETRATION EQUAL TO OR LESS THAN 0.1 FOOT PER 60 BLOWS.  STRATA CORE RECOVERY (SREC.) - TOTAL LENGTH OF STRATA MATERIAL RECOVERED DIVIDED BY TOTAL LENGTH OF STRATUM AND EXPRESSED AS A PERCENTAGE.  STRATA ROCK QUALITY DESIGNATION (SROD) - A MEASURE OF ROCK QUALITY DESCRIBED BY TOTAL LENGTH OF FORCK SEGMENTS WITHIN A STRATUM EQUAL TO OR GREATER THAN 4 INCHES DIVIDED BY THE TOTAL LENGTH OF STRATA AND EXPRESSED AS A PERCENTAGE.  JOPSOIL (TS.) - SURFACE SOILS USUALLY CONTAINING ORGANIC MATTER.  BENCH MARK:  ELEVATION: N/A FEET  NOTES:
TEXTURE OR GRAIN SIZE	RECOMMENDATION SYMBOLS  UNDERCUT UNCLASSIFIED EXCAVATION - UNSUITABLE WASTE  SHALLOW UNDERCUT UNCLASSIFIED EXCAVATION - ACCEPTABLE BUT NOT TO BE USED IN THE TOP 3 FEET OF EMBANKMENT OR BACKFILL  AR - AUGER REFUSAL MED MEDIUM WED MEDIUM WED MEDIUM WED MEDIUM WED MEDIUM WED MEDIUM WED WED MEDIUM WED WED.	VERY HARD  CANNOT BE SCRATCHED BY KNIFE OR SHARP PICK, BREAKING OF HAND SPECIMENS REQUIRES  SEVERAL HARD BLOWS OF THE GEOLOGIST'S PICK.  CAN BE SCRATCHED BY KNIFE OR PICK ONLY WITH DIFFICULTY, HARD HAMMER BLOWS REQUIRED  TO DETACH HAND SPECIMEN.  MODERATELY  CAN BE SCRATCHED BY KNIFE OR PICK, COUGES OR GROOVES TO 0.25 INCHES DEEP CAN BE  EXCAVATED BY HARD BLOW OF A GEOLOGIST'S PICK, HAND SPECIMENS CAN BE DETACHED  BY MODERATE BLOWS.  MEDIUM  CAN BE GROOVED OR GOUGED 0.05 INCHES DEEP BY FIRM PRESSURE OF KNIFE OR PICK POINT.  HARD  CAN BE GROOVED OR GOUGED REDILY BY KNIFE OR PICK, CAN BE EXCAVATED IN FRAGMENTS  FROM CHIPS TO SEVERAL INCHES IN SIZE BY MODERATE BLOWS OF A PICK POINT. SMALL, THIN PIECES CAN BE BROKEN BY FINGER PRESSURE.  VERY  CAN BE CARVED WITH KNIFE. CAN BE EXCAVATED READILY WITH POINT OF PICK, PIECES 1 INCH  SOFT  OR MORE IN THICKNESS CAN BE BROKEN BY FINGER PRESSURE. CAN BE SCRATCHED READILY BY FINGERWAIL.  FRACTURE SPACING  TERM  VERY WIDE  MORE THAN 10 FEET  WIDE  VERY WIDE  MORE THAN 10 FEET  WIDE  J THICKLY BEDDED  J S - 4 FEET  THICKLY LAMINATED  VERY THINLY BEDDED  J S - 4 FEET  THINLY LAMINATED  VERY THINLY BEDDED  J S - 4 FEET  THINLY BEDDED  J S - 4 FEET  THINLY LAMINATED  VERY THINLY LAMINATED  VERY THINLY LAMINATED  VERY THINLY BEDDED  J S - 4 FEET  THINLY LAMINATED  VERY THINLY BEDDED  J S - 4 FEET  THINLY LAMINATED  VERY THINLY BEDDED  J S - 4 FEET  THINLY LAMINATED  VERY THINLY BEDDED  J S - 4 FEET  THINLY BEDDED  J S - 4 FEET  THINLY LAMINATED  VERY THINLY BEDDED  J S - 4 FEET  THINLY BEDDED  J	ROCK.  SILL - AN INTRUSIVE BODY OF IGNEOUS ROCK OF APPROXIMATELY UNIFORM THICKNESS AND RELATIVELY THIN COMPARED WITH ITS LATERAL EXTENT, THAT HAS BEEN EMPLACED PARALLEL TO THE BEDDING OR SCHISTOSITY OF THE INTRUDED ROCKS.  SLICKENSIDE - POLISHED AND STRIATED SURFACE THAT RESULTS FROM FRICTION ALONG A FAULT OR SLIP PLANE.  STANDARD PENETRATION TEST (PENETRATION RESISTANCE) (SPT) - NUMBER OF BLOWS (N OR BPF) OF A 140 LB. HAMMER FALLING 30 INCHES REQUIRED TO PRODUCE A PENETRATION OF 1 FOOT INTO SOIL WITH A 2 INCH OUTSIDE DIAMETER SPLIT SPOON SAMPLER. SPT REFUSAL IS PENETRATION EQUAL TO OR LESS THAN 0.1 FOOT PER 60 BLOWS.  STRATA CORE RECOVERY (SREC.) - TOTAL LENGTH OF STRATA MATERIAL RECOVERED DIVIDED BY TOTAL LENGTH OF STRATUM AND EXPRESSED AS A PERCENTAGE.  STRATA ROCK QUALITY DESIGNATION (SROD) - A MEASURE OF ROCK QUALITY DESCRIBED BY TOTAL LENGTH OF FORCK SEGMENTS WITHIN A STRATUM EQUAL TO OR GREATER THAN 4 INCHES DIVIDED BY THE TOTAL LENGTH OF STRATA AND EXPRESSED AS A PERCENTAGE.  JOPSOIL (TS.) - SURFACE SOILS USUALLY CONTAINING ORGANIC MATTER.  BENCH MARK:  ELEVATION: N/A FEET  NOTES:
TEXTURE OR GRAIN SIZE  U.S. STD. SIEVE SIZE OPENING (MM)  4.76 2.00 0.42 0.25 0.075 0.053  BOULDER (BLDR.) COBBLE (COB.) GRAYEL (COB.) GRAYEL (COB.) (GR.) GRAYEL (COB.) (GR.) GRAYD (CSE. SD.) GRAYD (CSE. SD.) SAND SAND (F SD.) (F SD.) GRAYD SILT (CLAY (CL.) (FSD.) GRAYD SOLUTION GRAIN MM 305 75 2.0 0.25 0.05 0.005  SOLUTION SIZE IN. 12 3  SOLUTION SOLUTION GRAY (ATTERBERG LIMITS)  SOLUTION OF TERMS  SEMISOLID; REQUIRES DRYING TO ATTAIN OPTIMUM MOISTURE OPTIMUM MOISTURE SHINKAGE LIMIT  - MOIST - (M) SOLUTION OPTIMUM MOISTURE OPTIMUM MOISTURE  PLASTICITY  PLASTICITY  PLASTICITY  PLASTICITY INDEX (P) DAY STRENGTH OF THE MEDIUM MOISTURE OF STRENGTH OF STRENG	RECOMMENDATION SYMBOLS  UNDERCUT UNCLASSIFIED EXCAVATION - UNSUITABLE WASTE UNSUITABLE WASTE  SHALLOW UNDERCUT UNSUITABLE WASTE  UNCLASSIFIED EXCAVATION - ACCEPTABLE, BUT NOT TO BE USED IN THE TOP 3 FEET OF EMBANKMENT OR BACKFILL  AR - AUGER REFUSAL MED MEDIUM WDD MEDIUM WDD MEDIUM WDD MEDIUM WDD MEDIUM WDD MEDIUM WDD WOBERATELY WDD MODERATELY WEA WEATHERED YOUNGERTELY WDD MODERATELY WDD MODERATELY WDD MODERATELY WDD WORDERATELY WDD WORDERATED WDD WORDERATELY WDD	VERY HARD  CANNOT BE SCRATCHED BY KNIFE OR SHARP PICK. BREAKING OF HAND SPECIMENS REQUIRES SEVERAL HARD BLOWS OF THE GEOLOGIST'S PICK.  HARD  CAN BE SCRATCHED BY KNIFE OR PICK ONLY WITH DIFFICULTY, HARD HAMMER BLOWS REQUIRED TO DETACH HAND SPECIMEN.  MODERATELY  CAN BE SCRATCHED BY KNIFE OR PICK, GOUGES OR GROOVES TO 0.25 INCHES DEEP CAN BE EXCAVATED BY HARD BLOW OF A GEOLOGIST'S PICK, HAND SPECIMENS CAN BE DETACHED BY MODERATE BLOWS.  MEDIUM  CAN BE GROOVED OR GOUGED 0.05 INCHES DEEP BY FIRM PRESSURE OF KNIFE OR PICK POINT. CAN BE EXCAVATED IN SMALL CHIPS TO PEICES I INCH MAXIMUM SIZE BY HARD BLOWS OF THE POINT OF A GEOLOGIST'S PICK.  SOFT  CAN BE GROVED OR GOUGED READILY BY KNIFE OR PICK, CAN BE EXCAVATED IN FRAGMENTS FROM CHIPS TO SEVERAL INCHES IN SIZE BY MODERATE BLOWS OF A PICK POINT, SMALL, THIN PIECES CAN BE BROKEN BY FINGER PRESSURE.  VERY  CAN BE CARVED WITH KNIFE, CAN BE EXCAVATED READILY WITH POINT OF PICK, PIECES I INCH OR MORE IN THICKNESS CAN BE BROKEN BY FINGER PRESSURE. CAN BE SCRATCHED READILY BY FINGERWAIL.  FRACTURE SPACING  FRACTURE SPACING  TERM  SPACING  VERY WIDE  MORE THAN 10 FEET  WIDE  ATO 10 FEET  THICKLY BEDDED  THICKNESS  VERY CLOSE  1 TO 3 FEET  THICKLY BEDDED  1.5 - 4 FEET  THICKLY BEDDED  1.5 - 4 FEET  THICKLY BEDDED  1.6 - 1.5 FEET  THICKLY BEDDED  1.6 - 1.6 FEET  THICKLY LAMINATED  COMOBRATELY CLOSE  1 TO 3 FEET  THICKLY LAMINATED  THICKLY LAMINATED  TO SEDIMENTARY ROCKS, INDURATION IS THE HARDENING OF MATERIAL BY CEMENTING, HEAT, PRESSURE, ETC.  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  ORALLS THE COLORS SHOULD BE SEPARATED FROM SAMPLE WITH STEEL PROBE;  DIFFICULT TO BREAK WITH HAMMER.	ROCK.  SILL - AN INTRUSIVE BODY OF IGNEOUS ROCK OF APPROXIMATELY UNIFORM THICKNESS AND RELATIVELY THIN COMPARED WITH ITS LATERAL EXTENT, THAT HAS BEEN EMPLACED PARALLEL TO THE BEDDING OR SCHISTOSITY OF THE INTRUDED ROCKS.  SLICKENSIDE - POLISHED AND STRIATED SURFACE THAT RESULTS FROM FRICTION ALONG A FAULT OR SLIP PLANE.  STANDARD PENETRATION TEST (PENETRATION RESISTANCE) (SPT) - NUMBER OF BLOWS (N OR BPF) OF A 140 LB. HAMMER FALLING 30 INCHES REQUIRED TO PRODUCE A PENETRATION OF 1 FOOT INTO SOIL WITH A 2 INCH OUTSIDE DIAMETER SPLIT SPOON SAMPLER. SPT REFUSAL IS PENETRATION EQUAL TO OR LESS THAN 0.1 FOOT PER 60 BLOWS.  STRATA CORE RECOVERY (SREC.) - TOTAL LENGTH OF STRATA MATERIAL RECOVERED DIVIDED BY TOTAL LENGTH OF STRATUM AND EXPRESSED AS A PERCENTAGE.  STRATA ROCK QUALITY DESIGNATION (SROD) - A MEASURE OF ROCK QUALITY DESCRIBED BY TOTAL LENGTH OF FORCK SEGMENTS WITHIN A STRATUM EQUAL TO OR GREATER THAN 4 INCHES DIVIDED BY THE TOTAL LENGTH OF STRATA AND EXPRESSED AS A PERCENTAGE.  JOPSOIL (TS.) - SURFACE SOILS USUALLY CONTAINING ORGANIC MATTER.  BENCH MARK:  ELEVATION: N/A FEET  NOTES:
TEXTURE OR GRAIN SIZE	RECOMMENDATION SYMBOLS  UNDERCUT UNCLASSIFIED EXCAVATION - UNSUITABLE WASTE UNSUITABLE WASTE  SHALLOW UNDERCUT UNSUITABLE WASTE  UNCLASSIFIED EXCAVATION - ACCEPTABLE, BUT NOT TO BE USED IN THE TOP 3 FEET OF EMBANKMENT OR BACKFILL  AR - AUGER REFUSAL MED MEDIUM WICA MICACEOUS WEA WEATHERED COL CLAY MOD MODERATELY WEA WEATHERED COL CLAY UNIT WEIGHT COL SAND, SANDY SS - SPLIT SPOON SS - SPLIT SPOON SS - SPLIT SPOON SL SILT, SILTY ST - SHELBY TUBE FOSS FOSSILIFEROUS SL SILT, SILTY ST - SHELBY TUBE FAGS FRAGTURED, FRACTURES TCR - TRICONE REFUSAL RT - RECOMPACTED TRIAXIAL FRAGS FRAGMENTS W WOISTURE CONTENT CB - CALIFORNIA BEARING RT - RECOMPACTED TRIAXIAL	VERY HARD  CANNOT BE SCRATCHED BY KNIFE OR SHARP PICK, BREAKING OF HAND SPECIMENS REQUIRES  SEVERAL HARD BLOWS OF THE GEOLOGIST'S PICK.  CAN BE SCRATCHED BY KNIFE OR PICK ONLY WITH DIFFICULTY, HARD HAMMER BLOWS REQUIRED  TO DETACH HAND SPECIMEN.  MODERATELY  CAN BE SCRATCHED BY KNIFE OR PICK, COUGES OR GROOVES TO 0.25 INCHES DEEP CAN BE  EXCAVATED BY HARD BLOW OF A GEOLOGIST'S PICK, HAND SPECIMENS CAN BE DETACHED  BY MODERATE BLOWS.  MEDIUM  CAN BE GROOVED OR GOUGED 0.05 INCHES DEEP BY FIRM PRESSURE OF KNIFE OR PICK POINT.  HARD  CAN BE GROOVED OR GOUGED REDILY BY KNIFE OR PICK, CAN BE EXCAVATED IN FRAGMENTS  FROM CHIPS TO SEVERAL INCHES IN SIZE BY MODERATE BLOWS OF A PICK POINT. SMALL, THIN PIECES CAN BE BROKEN BY FINGER PRESSURE.  VERY  CAN BE CARVED WITH KNIFE. CAN BE EXCAVATED READILY WITH POINT OF PICK, PIECES 1 INCH  SOFT  OR MORE IN THICKNESS CAN BE BROKEN BY FINGER PRESSURE. CAN BE SCRATCHED READILY BY FINGERWAIL.  FRACTURE SPACING  TERM  VERY WIDE  MORE THAN 10 FEET  WIDE  VERY WIDE  MORE THAN 10 FEET  WIDE  J THICKLY BEDDED  J S - 4 FEET  THICKLY LAMINATED  VERY THINLY BEDDED  J S - 4 FEET  THINLY LAMINATED  VERY THINLY BEDDED  J S - 4 FEET  THINLY BEDDED  J S - 4 FEET  THINLY LAMINATED  VERY THINLY LAMINATED  VERY THINLY LAMINATED  VERY THINLY BEDDED  J S - 4 FEET  THINLY LAMINATED  VERY THINLY BEDDED  J S - 4 FEET  THINLY LAMINATED  VERY THINLY BEDDED  J S - 4 FEET  THINLY LAMINATED  VERY THINLY BEDDED  J S - 4 FEET  THINLY BEDDED  J S - 4 FEET  THINLY LAMINATED  VERY THINLY BEDDED  J S - 4 FEET  THINLY BEDDED  J	ROCK.  SILL - AN INTRUSIVE BODY OF IGNEOUS ROCK OF APPROXIMATELY UNIFORM THICKNESS AND RELATIVELY THIN COMPARED WITH ITS LATERAL EXTENT, THAT HAS BEEN EMPLACED PARALLEL TO THE BEDDING OR SCHISTOSITY OF THE INTRUDED ROCKS.  SLICKENSIDE - POLISHED AND STRIATED SURFACE THAT RESULTS FROM FRICTION ALONG A FAULT OR SLIP PLANE.  STANDARD PENETRATION TEST (PENETRATION RESISTANCE) (SPT) - NUMBER OF BLOWS (N OR BPF) OF A 140 LB. HAMMER FALLING 30 INCHES REQUIRED TO PRODUCE A PENETRATION OF 1 FOOT INTO SOIL WITH A 2 INCH OUTSIDE DIAMETER SPLIT SPOON SAMPLER. SPT REFUSAL IS PENETRATION EQUAL TO OR LESS THAN 0.1 FOOT PER 60 BLOWS.  STRATA CORE RECOVERY (SREC.) - TOTAL LENGTH OF STRATA MATERIAL RECOVERED DIVIDED BY TOTAL LENGTH OF STRATUM AND EXPRESSED AS A PERCENTAGE.  STRATA ROCK QUALITY DESIGNATION (SROD) - A MEASURE OF ROCK QUALITY DESCRIBED BY TOTAL LENGTH OF FORCK SEGMENTS WITHIN A STRATUM EQUAL TO OR GREATER THAN 4 INCHES DIVIDED BY THE TOTAL LENGTH OF STRATA AND EXPRESSED AS A PERCENTAGE.  JOPSOIL (TS.) - SURFACE SOILS USUALLY CONTAINING ORGANIC MATTER.  BENCH MARK:  ELEVATION: N/A FEET  NOTES:



#### SHEET 4

### **PAVEMENT INVESTIGATION DATA SHEET**

Project: 47482.1.1 U-6058 TIP:

Route: US-70 and NC101 CARTERET County:

Date: 04/16/19 Notes By: K. PLUMMER

		Wic	dth					Thick	ness				Subgrade	е					GPS Co	oordinates
Position (Sta.,Lane,Shldr.)	Cut/Fill (Est. of Amount) (ft)	Lane(s) (ft)	Shoulder(s) (ft)	Offset Distance (See Notes) (ft)	Crown "C" or Super "S"	Gross to Top of Soil (in)	Asphalt (in)	CONCRETE (in)	RAP (in)	ABC (in)	STBC (in)	Pavement Layering	Description	Sample Number	AASHTO Classification	Soil Moisture %)	4	Asphalt Notes	Northing	Easting
L 11+95 WB OSL	0	OSL - 10.3	OSS - 0.8 ISS - 11.3	8.6 FW	С	12.0	12.0	N/A	N/A	N/A	N/A	Asphalt Soil Subgrade	1.0 - 5.5 ft: CPU: Brown, fine sandy SILT	BK-1	A-4(0)	M/W	N/A 5	Minor fatigue cracking with polished aggregate. Water at 4.0 feet. No DCP test was performed at this location.	362,928	2,706,683
L 12+00 WB OSL	0	OSL - 10.3	OSS - 0.8 ISS - 11.3	7.2 FW	С	12.0	12.0	N/A	N/A	N/A	N/A	Asphalt Soil Subgrade	1.0 - 2.5 ft: CPU: Gray, Silty CLAY 2.5 - 5.5 ft: CPU: Gray, Silty Fine SAND	R-108	A-6 A-2-4	W C	CP 5	.5 Minor fatigue cracking with polished aggregate. Water at 4.9 feet.	362,934	2,706,681
L 12+00 WB ISS	0	OSL - 10.3 ISL - 9.8	ISS - 11.3	5.7 FW	С	18.0	14.0	N/A	N/A	N/A	4.0	Asphalt STBC Soil Subgrade	1.2 - 1.5 ft: STBC: Gray, Silty fine SAND with shells 1.5 - 3.5 ft: CPU: Tan, Clayey SILT 3.5 - 5.5 ft: CPU: Gray, Silty fine SAND	S-102		M 21 W	ICP 5	.5 Minor fatigue cracking with polished aggregate. Water at 5.0 feet.	362,928	2,706,689
L 12+00 WB ISL	0	ISL - 9.8	ISS - 11.3	3.8 FW	С	14.0	14.0	N/A	N/A	N/A	N/A	Asphalt Soil Subgrade	1.2 - 5.5 ft: CPU: Dark gray, Silty fine SAND		A-2-4	W	OCP 5	.5 Some polished aggregate.	362,922	2,706,697
L 12+00 EB LTL	0	LTL - 9.8	OSS - 1.9	3.6 FY	С	10.0	10.0	N/A	N/A	N/A	N/A	Asphalt Soil Subgrade	0.8 - 3.5 ft: CPU: Gray, Clayey fine SAND 3.5 - 5.5 ft: CPU: Tan, Silty fine SAND	S-105	A-4(2) A-2-4	23 W	CP 5	.5 Some polished aggregate. Water at 4.9 feet.	362,915	2,706,706
L 12+00 EB OSL	0	OSL - 10.0	OSS - 1.9	1.6 F Curb	С	13.0	6.0	N/A	N/A	N/A	7.0	Asphalt STBC Soil Subgrade	0.5 - 1.1 ft: STBC: Tan, Silty Fine SAND 1.2 - 3.5 ft: CPU: Tan, Silty fine SAND 3.5 - 5.5 ft: CPU: Tan and gray, Silty CLAY	S-108	A-2-4 A-2-4 A-6(12)	M D	CP 5	.5 Moderate fatigue cracking and longitudinal cracking. Polished aggregate	362,906	2,706,717
L 16+35 EB	0	EB - 10.2	OSS - 1.3	1.6 FW	С	10.0	10.0	N/A	N/A	N/A	N/A	Asphalt Soil Subgrade	0.9 - 3.5 ft: CPU: Gray, Fine sandy CLAY 3.5 - 5.5 ft: CPU: Gray, Silty fine SAND	S-109		20 W	CP 5	Moderate tranverse and logitudinal cracking. Polished aggreate. Water at 4.9 feet	363,178	2,707,032
L 16+35 CTL	0	CTL - 10.1	OSS - 1.3	6.3 LT 4.9 RT	С	14.0	14.0	N/A	N/A	N/A	N/A	Asphalt Soil Subgrade	1.2 - 5.5 ft: CPU: Gray, Silty fine SAND with trace clay		A-2-4	W	CP 5	.5 Polished aggregate. Water at 5.4 feet	363,191	2,707,019
L 16+35 WB	0	WB - 10.3	OSS - 5.0	6.4 FW	С	10.5	10.5	N/A	N/A	N/A	N/A	Asphalt Soil Subgrade	0.8 - 2.0 ft: CPU: Tan, Fine sandy CLAY 3.5 - 5.5 ft: CPU: Gray, Silty fine SAND	S-112	A-6(9) A-2-4	21 W	CP 5	Moderate to severe fatigue, longitudinal, and transverse cracking. Polished aggregate. Water at 4.4 feet.	363,202	2,707,019
Y 11+70 NB	0	NB - 12.5	N/A	7.5 FY	С	12.5	6.5	6.0	N/A	N/A	N/A	Asphalt Concrete Soil Subgrade	CPU: Tan, Silty fine SAND	N/A	N/A	N/A C	ICP N	Moderate to severe fatigue, longitudinal and transverse cracking. A one inch layer of stripped asphalt observed at a depth of approximately 0.5 feet within the pavement structure. Boring not augered due to possible utility.	363,255	2,706,772
Y 11+70 SB	0	SB - 9.7	OSS - 1.0	3.0 FW	С	11.0	11.0	N/A	N/A	N/A	N/A	Asphalt Soil Subgrade	0.9 - 2.0 ft: CPU: Gray, Silty CLAY 2.0 - 5.5 ft: CPU: Tan, gray, Fine sandy CLAY	S-116 S-117	A-6(6) A-6(6)	19 26	OCP 5	.5 Moderate transverse cracking. Polished aggregate. Water at 4.0 feet.	363,256	2,706,758
L 13+20 (Concrete Island)	0	N/A	N/A	N/A	N/A	9.5	N/A	3.5	N/A	N/A	6.0	Concrete STBC Soil Subgrade	0.8 - 2.5 ft: CPU: Tan to Brown, Silty, SAND 2.5 - 7.0 ft: CPU: Brown and Gray, Silty CLAY 7.0 - 10.0 ft: CPU: Tan, Silty, SAND		A-2-4 A-6 A-2-4	N/A N	N/A 1	Performed as SPT boring for previous roadway investigation.	363,001	2,706,733
RND 11+50	0	N/A	N/A	N/A	С	13.0	13.0	N/A	N/A	N/A	N/A	Asphalt Soil Subgrade	1.1 - 3.0 ft: CPU: Black, Sandy SILT 3.0 - 7.0 ft: CPU: Gray, Silty CLAY 7.0 - 10.0 ft: CPU: Tan, Silty, SAND		A-4 A-6 A-2-4	N/A N	N/A 1	Performed as SPT boring for previous roadway investigation.	363,128	2,706,812
RND 12+00	0	N/A	N/A	N/A	С	14.0	8.0	N/A	N/A	N/A	6.0	Asphalt STBC Soil Subgrade	1.2 - 3.0 ft: CPU: Gray, Sandy SILT 3.0 - 7.0 ft: CPU: Gray and Orange, Silty CLAY 7.0 - 10.0 ft: CPU: Tan, Silty, SAND	SS-6	A-4 A-6(10) A-2-4	21	N/A 1	Performed as SPT boring for previous roadway investigation.	363,124	2,706,782

ISL = Inside Lane RTL = Right Turn Lane CTL = Center Turn Lane LTL = Left Turn Lane PS = Paved Shoulder

OSS = Outside Shoulder ISS = Inside Shoulder ACCEL = Acceleration Lane

DECEL = Deceleration Lane IGM = Inside Grass Median OGS = Outside Grass Shoulder

COL = Collector Lane FW = From White FY = From Yellow

RT = Right LT = Left O = Outside I = Inside EB = East Bound WB = West Bound RAP = Reclaimed Asphalt Pavement NM = Not Measured STBC = Soil Type Base Course

CPU = Undivided Coastal Plain AC = Asphalt Concrete

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SHEET 5

CON	NE PENEROMETER DA	TA CODE SHEET	WBS No. 47482.1.1 COUNTY		PROJECT TIP I.D. U-6058 FIELD PROFESSIONAL		Roundab	ROUTE out at US 70 DRILLER	) and NC 101
			Carteret		K. Plummer			Carteret	
	Station (Location) Info	ormation	DATE		Station (Locati	on) Informa	ation		DATE
	L 12+00 WB O		4/16/2019		L 12+0	) WB ISS			4/16/2019
Туре	Test Interval		eference Surface	Туре	Test Interv		Datum o		Subsurface
DCP	Cumulative cm per blow	soil 9	Subgrade	DCP	Cumulative CM p			STBC	
0.00	98.60			0.00	66.75				
1.30 2.10	100.30 101.80			1.92 2.50	69.54 71.94				
2.10	103.50			2.98	71.34				
4.20	103.50			3.72	76.31				
4.80				4.16	78.29				
5.50				4.67	80.22				
6.40				5.11	82.27				
7.50				5.56	84.02				
8.70				5.99	85.73				
10.00				6.39	87.22				
11.40				6.71	88.8				
12.40				7.03	90.35				
13.70				7.34	91.99				
14.50 15.50				7.66 7.97	93.55 95.04				
16.40				8.29	95.04				
17.40				8.53	97.68				
18.30				8.77	98.89				
19.30				9.01	100.17				
20.50				9.25	101.5				
21.50				9.49	102.92				
23.00				9.84	104.36				
24.50				10.19	105.64				
25.70				10.54	106.91				
26.70				10.89	107.99				
27.80				11.24	109.35				
28.80				11.65	110.56	1			
29.80				12.06	111.73				
30.90 31.80				12.47 12.88	112.82				
33.10				13.29					
34.80				13.93					
37.00				14.57					
39.50				15.21					
44.20				15.85					
50.60				16.49					
55.90				17.30					
59.70				18.07					
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77.50				22.81					
79.40				23.74					
81.10				24.60					
82.80				26.12					
84.70				27.72					
86.40				29.89					
87.80				31.65					
89.20				35.56					
90.60				42.32					
91.70				46.34					
93.00				51.21					
94.40				55.90					
95.70 97.20				59.89 63.41					
97.20				03.41					

						WBS	S No.		PROJEC	T TIP I.D.			RO	UTE	
	NIC DENIC		D DATA /	ODE CHE		4748	32.1.1		U-6	058		Rour	ndabout at l	JS 70 and N	C 101
CO	INE PENE	KOWETE	K DATA (	ODE SHE	EI	cot	JNTY		FIELD PRO	FESSIONAL				LLER	
							teret			mmer				ardee	
	Stat	ion (Locatio	n) Informa	tion			ATE				on) Informa	ation			ATE
		L 12+00				4/16	/2019			I 12+0	0 EB LTL				/2019
Туре	Т т	est Interva		Dat	um or Ref	erence Surf		Туре		Test Interv		Dati	ım or Refer		
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14.40								7.88							
16.60								8.22							
18.50								8.56							
20.10								8.90							
21.80								9.24							
23.70								9.58							
25.50								9.92							
27.50								10.26							
30.20								10.60							
34.10								11.08							
38.00								11.56							
41.10								12.04							
44.40								12.52							
51.90								13.00							
60.10								13.66							
69.90								14.32							
76.20								14.98							
83.70								15.64							
90.80								16.60							
98.90								17.70							
107.40								18.90							
112.90								20.40							
116.90								22.00							
								23.90							
								26.50							
								30.00							
								34.00							
								40.20							
								54.30							
								88.90							
								103.10							
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SHEET 6

				WBS				T TIP I.D.		D-:		UTE	IC 101
СО	NE PENEROMETEI	R DATA CODE	SHEET		32.1.1 JNTY	1		FESSIONAL		Koun	dabout at U	JS 70 and N LLER	C 101
					eret			ımmer				eret	
	Station (Locatio				ATE .		Sta	tion (Locatio		ation			ATE
	L 12+00		D.1		/2019			L 16+					/2019
<b>Type</b> DCP	Test Interval Cumulative cm pe			eference Surf	ace	Type DCP		Test Interval lative CM pe		Dati	ım or Refer	ence Subsu bgrade	гтасе
0.00	35.60	1 BIOW		I		0.00	Cumu	lative civi pe	.i biow		3011 30	bgrauc	
1.40	37.50					2.80							
1.80	39.60					4.00							
2.40	42.00					4.80							
3.20 3.80	44.70 48.50					5.70 6.50							
4.40	56.80					7.50							
4.90	62.70					8.40							
5.50	67.40					9.50							
6.00	71.50					10.80							
6.80	75.80					12.70							
7.50 8.10	79.40 82.80					16.70 21.70							
9.00	82.80 85.80					26.00							
9.50	88.70					29.50							
10.20	91.30					32.60							
10.70	93.80					35.30							
11.20	96.30					37.60							
11.60 12.10	98.70 101.00					39.70 41.60							
12.10	101.00					43.50							
13.00						45.20							
13.50						46.70							
14.00						48.30							
15.10						49.80							
15.50						51.20							
16.00 16.60						52.70 54.00							
17.30						55.50							
17.80						56.90							
18.50						58.20							
19.00						59.70							
19.60						61.00							
20.10 20.60						62.50 64.00							
21.00						65.50							
21.50						67.10							
21.90						68.80							
22.40						70.30		$oxed{\Box}$					
22.80						71.70							
23.40 24.00						73.40 74.80				<b>—</b>			
24.50						76.20							
24.90						77.70				<u> </u>			
25.50						78.80							
26.00						80.40							
26.50 26.90						81.80 83.20							
27.50						83.20							
28.10						86.10							
28.60						87.50							
29.30						89.00							
30.00						90.10							
30.90						91.40				-			
31.60 32.60						92.40 93.40		$\vdash$					
33.50						33.40							
34.50													
350												<u> </u>	

со	NE PENEROMETER DATA (	CODE SHEET	WBS No. 47482.1.1 COUNTY		PROJECT U-6 FIELD PRO	058	Roundabout at	DUTE US 70 and NC 101 ILLER
	Station (Location) Informa	tion	Carteret DATE		K. Plui Stat	mmer ion (Location) Inform		ardee DATE
	L 16+35 CTL		4/17/2019			L 16+35 WB		4/17/2019
Туре	Test Interval	Datum or Ref	erence Surface	Туре	1	est Interval	Datum or Refe	rence Subsurface
DCP	Cumulative cm per blow	Soil Su	ıbgrade	DCP	Cumula	ative CM per blow	Soil Su	ubgrade
0.00	72.20			0.00		68.00		
1.00	73.30			5.20		70.00		
2.00	74.40			6.20		71.60		
3.00	75.60			6.80		73.00		
3.50	76.70			7.30		74.50		
4.20	77.70			7.80		76.00		
4.70	78.80			8.40		77.60		
5.10	79.90			8.80		79.00		
5.80	81.00			9.00		80.60		
6.40	82.20			9.30		82.10		
7.00	83.50			9.60		83.50		
7.80	84.70			9.90		84.70		
8.30	85.90			10.20		86.00		
8.90	87.30			10.50		87.20		
9.40	88.50			10.86		88.40		
10.20	89.80			11.22		89.70		
11.00 11.90	91.00 92.20			11.58 11.94		90.80		
12.00	93.40			12.30		93.00		
12.50 13.00	94.70			12.70		94.00		
14.40	96.20			13.10		95.40		
15.80	97.50 99.00			13.50 13.90		96.80 97.80		
18.30	100.40			14.30		98.90		
21.80	101.80			14.50		100.00		
25.10	103.20			14.64		101.00		
27.90	104.50			15.32		102.30		
30.20	104.50			15.66		103.40		
32.30				16.00		104.40		
34.30				16.48		105.40		
36.20				16.96		106.20		
37.80				17.44		107.00		
39.50				17.92		107.90		
41.00				18.40		108.80		
42.60				19.36		109.70		
44.00				20.32				
45.70				21.28				
47.10				22.24				
48.60				23.20				
49.90				25.40				
51.20				29.00				
52.30				32.40				
53.50				35.40				
54.70				38.30				
55.80				40.90				
57.10				43.40				
58.20				45.90				
59.40				47.90				
60.60				49.80				
61.90				51.80				
63.00				53.70				
64.20				55.60				
65.40				57.30				
66.70				59.10				
67.80				60.90				
68.90				62.70				
70.00 71.10				64.70				
/1.10				66.50				

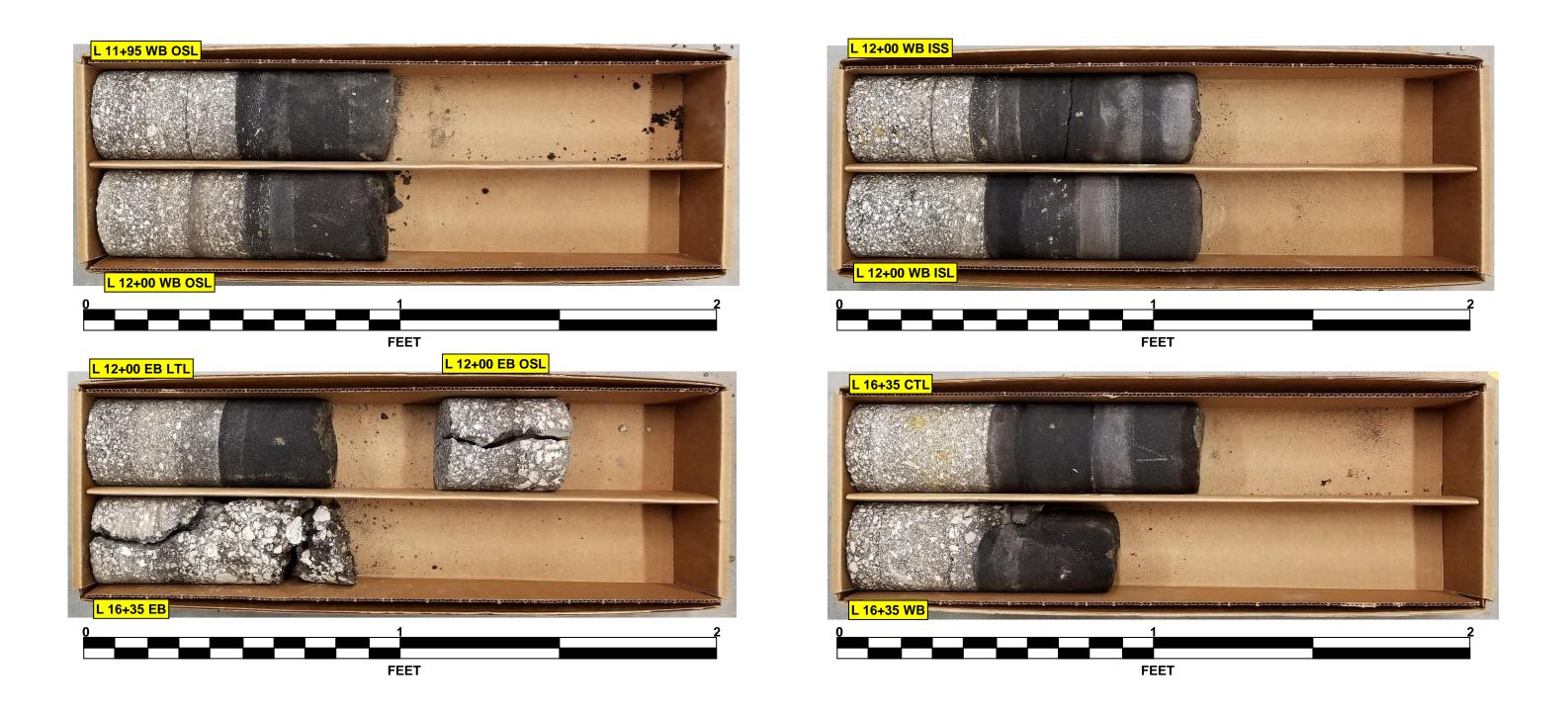
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SHEET 7

	ALE DEALES CO		ADE 6115	WBS No 47482.1		PROJECT TIP I.D. U-6058	Roun	<b>RO</b> I dabout at U	JTE IS 70 and NC	101
СО	NE PENEROMETE	R DATA CO	DE SHEET	COUNT		FIELD PROFESSIONAL		DRIL		
				Cartere	t	K. Plummer		Cart	eret	
	Station (Locati		on	DATE			on) Information		DAT	
		-70 NB		4/17/20:			70 SB		4/17/2	
<b>Type</b> DCP	Test Interva			ference Surface ubgrade	Type DCP	Test Interva Cumulative CM pe		Soil Sul	ence Subsurf	ace
0.00	Cumulative cm pe	el blow	3011 3	dubgraue	0.00	19.14			ugraue	
7.02					1.00	19.48				
11.52					1.50	19.82	95.30			
16.49					2.00	20.16	96.40			
19.85					2.60	20.50				
22.88					2.90	20.80	98.50			
27.22					3.50	21.10	99.50			
31.85					3.70	21.40	100.50			
34.47 37.41					4.20 4.70	21.70 22.00	101.50 102.50		_	
40.25					5.00	22.40			_	
43.22					5.30	22.80	104.30			
45.97					5.50	23.20	105.20			
47.95					5.88	23.60	106.00			
49.81					6.26	24.00	106.80			
51.91					6.64	24.62	107.60			
54.19					7.02	25.24	108.30			
56.73 58.72					7.40 7.68	25.86 26.48	109.10 109.80			
60.14					7.96	27.10	109.80			
61.46					8.24	28.50			_	
63.18					8.52	30.20				
64.70					8.80	33.10				
66.44					9.12	36.00				
68.00					9.44	39.00				
69.59					9.76	41.90				
71.05					10.08	44.60				
72.39 73.71					10.40 10.70	47.00 49.10				
75.71					11.00	51.20			_	
77.15					11.30	53.20				
78.92					11.60	55.00				
81.07					11.90	56.80				
81.95					12.16	58.50				
82.39					12.42	60.20				
82.59					12.68	61.90			_	
82.95 83.10					12.94 13.20	63.50 65.10			-	
83.48					13.46	66.70				
83.85					13.72	68.30				
84.13					13.98	69.60				
84.46					14.24	71.10				
84.69					14.50	72.50				
					14.80	73.90				
					15.10 15.40	75.10 76.50				
					15.40	76.50				
					16.00	79.00				
					16.28	80.10				
					16.56	81.60				
					16.84	82.90				
					17.12	84.10				
					17.40	85.50				
					17.68	86.70				
					17.96 18.24	88.00 89.20			-	
					18.24	90.50				
					18.80	91.60				
					10.00	51.00				

						WBS	S No.		PROJEC	T TIP I.D.			RO	UTE	
C	ONE PENE	ROMETE	R DATA	CODE SHE	ET		JNTY			FESSIONAL			DRII	LLER	
						Car	teret		K. Plu	mmer		l.	S. Ha		
	Star	ion (Locatio	on) Informa	ition		D/	ATE		Stat	ion (Locatio	on) intorma	ation		DA	TE
Туре		Test Interva		Da	tum or Ref		ace	Туре		Test Interva		Datu	ım or Refer		rface
DCP	Cumu	lative cm pe	er blow		Soil Su	bgrade		DCP	Cumul	ative CM pe	er blow		Soil Su	bgrade	
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### **PAVEMENT CORE PHOTOGRAPHS**



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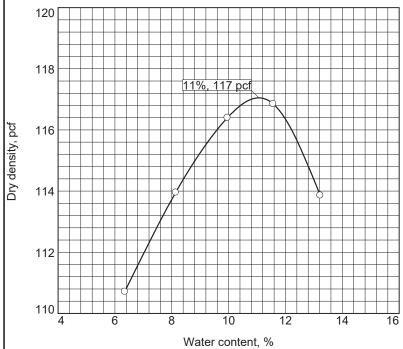
## PAVEMENT CORE PHOTOGRAPHS



### U-6058 - ROUNDABOUT AT THE INTERSECTION OF US 70 (LIVE OAK STREET) AND NC 101

						SOIL	ΓEST	RES	SULTS								
SAMPLE	STATION	POSITION	OFFSET	LINE	DEPTH	AASHTO	1.1	DΙ		% BY WE	IGHT		% PA	SSING SI	EVES	%	%
NO.	STATION	FOSITION	DISTANCE (ft)	LINE	INTERVAL (ft)	CLASS.	L.L.	Г.І.	C. SAND	F. SAND	SILT	CLAY	10	40	200	Moisture	ORGANIC
BK-1	11+95	WB OSL	8.6 FW	L	1.0-5.0	A-4(0)	18	5	20.4	32.1	27.1	18.5	98.1	89.6	46.4	-	-
S-108	12+00	EB OSL	1.6 FC	L	1.2-3.5	A-6(12)	18	6	5.2	18.7	45.4	30.6	99.9	97.7	76.8	21.8	-
S-102	12+00	WB ISS	5.7 FW	L	1.5-3.5	A-4(4)	30	17	8.3	29.9	32.1	29.7	100.0	97.6	62.6	20.9	-
S-105	12+00	EB LTL	3.6 FY	L	0.8-3.5	A-4(2)	19	12	10.2	36.2	28.3	25.3	100.0	97.3	54.6	23.1	-
S-109	16+35	EB	1.6 FW	L	0.9-3.5	A-6(5)	17	4	3.6	34.8	37.8	23.7	99.9	99.3	62.6	20.1	-
S-112	16+35	WB	6.4 FW	L	0.8-2.0	A-6(9)	26	13	3.2	31.7	39.5	25.6	100.0	99.5	66.4	20.9	-
S-116	11+70	SB	3.0 FW	Y	0.9-2.0	A-6(6)	32	18	10.2	27.9	31.4	30.5	100.0	96.7	62.8	18.5	-
S-117	11+70	SB	3.0 FW	Υ	2.0-5.5	A-6(6)	32	19	4.0	36.3	43.9	15.8	100.0	99.1	62.0	25.5	-

ААНТО	T99 /	AS	NCDC	T	MODII	FIED
						Curve No



Curve No. 19/060

Preparation M	lethod		
Rammer: Wi	t5.5 1	b Drop	12 in.
Ту	pe		
		Blows per	
Mold Size	0.	03333 cu. ft.	
Test Performe			
Passing	#4	Sieve	
%>#4	0.1	% <no.200< th=""><th>46.4</th></no.200<>	46.4
-		– <sup>70&lt;10.200</sup> – 18 PI	
	_	Sp.G. (D 854	
USCS (D			
	-	A-4(0)	
Date: Sampl			
	ed		
		2019-05-01	1
m . 1.D		ASR	

COMPACTION TESTING DATA
AASHTO T 99-15 Method A Standard

	AASHTO 1 99-19 Method A Standard							
	1	2	3	4	5	6		
WM + WS	5881.0	5964.0	6036.0	6072.0	6050.0			
WM	4101.0	4101.0	4101.0	4101.0	4101.0			
WW + T #1	797.8	867.4	876.9	794.1	788.4			
WD + T #1	767.7	824.0	824.1	741.7	729.5			
TARE #1	293.4	290.7	293.9	288.7	284.1			
WW + T #2								
WD + T #2								
TARE #2								
MOIST.	6.3	8.1	10.0	11.6	13.2			
DRY DENS.	110.7	114.0	116.4	116.9	113.9			

**TEST RESULTS** 

SIEVE TEST RESULTS

Opening Size	% Passing	Specs.
.375	100.0	
#4	99.9	
#10	98.1	
#20	95.8	
#40	89.6	
#60	77.7	
#200	46.4	
0.0574 mm.	47.1	
#270	45.6	
0.0062 mm.	18.5	

**Material Description** 

Maximum dry densi	ty = 117 pcf		Brown SILT with Sand
Optimum moisture =	= 11 %	Remarks:	
<b>Project No.</b> 64681990	26 Client: NCDOT		
Project: U-6058 US 7	0 & US 101 Beaufort R		
○ <b>Source</b> : L 11+95	<b>Depth:</b> 1.0 -5.0	Sample No.: BK-1	Checked by:
	WOO	od.	Title:

Density (pcf) 117.5	Molded Percent of Max. Dens. 100.4	Moisture (%)	Density (pcf) 110.3	Percent of Max. Dens.	Moistur (%) 12.2		0.20 in. 8.5	Correction (in.)	(lbs.)	Max Swe (%)
(pcf)	Percent of Max. Dens.	(%)	(pcf)	Percent of Max. Dens.	(%)	0.10 in.	0.20 in.	Correction (in.)	(lbs.)	Swe (%)
(pcf)	Percent of Max. Dens.	(%)	(pcf)	Percent of Max. Dens.	(%)	0.10 in.	0.20 in.	Correction (in.)	(lbs.)	Swe (%)
	Molded								Curcharas	Max
	_		. ,	Soaked				Limanuitu	Surcharge	
0				4 0.5	0				72	96
0					0					
150					2					
300					%)    3 <b>%</b>					
450					6 —					
600					8					
750		DLAI								
	450 ————————————————————————————————————	600 450 300 0 0.1	750 600 450 300 150 Penetration De	750 600 450 300 150 Penetration Depth (in.)	AASHTO  750  600  450  150  Penetration Depth (in.)	AASHTO T 193  750  600  450  300  150  Penetration Depth (in.)	AASHTO T 193-13  750  600  450  300  150  Penetration Depth (in.)	AASHTO T 193-13  750  450  300  150  Penetration Depth (in.)  AASHTO T 193-13  10  0  0  10  10  10  10  10  10  10	150	AASHTO T 193-13  750  450  450  Penetration Depth (in.)  AASHTO T 193-13  10  10  10  10  10  10  10  10  10

<b>Project No:</b> 6468199026					
Project: U-6058 US 70 & US 101 Beaufort Roundabout					
Source of Sample: L 11+95 Depth: 1.0 -5.0					
Sample Number: BK-1					
Date: ND					

Brown SILT with Sand

wood.

Test Description/Remarks:

11

18

5

NCDOT Modified

117

SC-SM

Figure \_\_\_