NORTH CAROLINA DEPARTMENT OF TRANSPORTATION

DIVISION OF HIGHWAYS

GEOTECHNICAL UNIT

SUBSURFACE INVESTIGATION

	SOIL AND ROCK LEGEND, T	ERMS, SYMBOLS, AND ABBREVIATIONS	
SOIL DESCRIPTION	GRADATION	TERMS AND DEFINITIONS	ABBREVIATIONS
SOIL IS CONSIDERED TO BE THE UNCONSOLIDATED, SEMI-CONSOLIDATED OR WEATHERED EARTH MATERIALS WHICH CAN BE PENETRATED	WELL GRADED - INDICATES A GOOD REPRESENTATION OF PARTICLE SIZES FROM FINE TO COARSE UNIFORM - INDICATES THAT SOIL PARTICLES ARE ALL APPROXIMATELY THE SAME SIZE. (ALSO		BLDR BOULDER PL - PLASTIC LIMIT
WITH A CONTINUOUS FLIGHT POWER AUGER, AND WHICH YIELDS LESS THAN 100 BLOWS ACCORDING TO STANDARD PENETRATION TEST (ASTM D-1586). SOIL CLASSIFICATION IS BASED ON THE AASHTO SYSTEM AND BASIC DESCRIPTIONS GENERALLY SHALL INCLUDE:	POORLY GRADED) GAP-GRADED- INDICATES A MIXTURE OF UNIFORM PARTICLES OF TWO OR MORE SIZES.	APPARENT DIP - THE DIP OF ROCK STRATA NOT PERPENDICULAR TO STRIKE.	CL CLAY PI - PLASTICITY INDEX
CONSISTENCY, COLOR, TEXTURE, MOISTURE, AASHTO CLASSIFICATION AND OTHER PERTINENT FACTORS, SUCH AS, MINERALOGICAL	ANGULARITY OF GRAINS	AQUIFER - A WATER BEARING FORMATION OR STRATA.	COB COBBLE n - POROSITY
COMPOSITION, ANGULARITY STRUCTURE, PLASTICITY, ETC. EXAMPLE: VERY STIFF, GRAY SILTY CLAY, MOIST WITH INTERBEDDED FINE SAND	THE ANGULARITY OR ROUNDNESS OF SOIL GRAINS ARE DESIGNATED BY THE TERMS; ANGULAR,	AUGER REFUSAL (A.R.) - POINT AT WHICH POWER AUGERS WILL NOT PENETRATE.	CSE COARSE SD SAND
LAYERS, HIGHLY PLASTIC, A-7-6.	SUBANGULAR, SUBROUNDED, OR ROUNDED.	BEDDED - SOIL OR ROCK LYING IN A POSITION ESSENTIALLY PARALLEL.	EST ESTIMATED SAT SATURATED
SOIL LEGEND AND AASHTO CLASSIFICATION	MINERALOGICAL COMPOSITION	BEDROCK - ROCK OF RELATIVELY GREAT THICKNESS AND EXTENT IN ITS ORIGINAL LOCATION. CALCAREOUS (CALC.) - SOILS WHICH CONTAIN APPRECIABLE AMOUNTS OF CALCIUM CARBONATE.	F FINE SL SILT, SILTY FOSS FOSSILIFEROUS
GENERAL GRANULAR MATERIALS SILT-CLAY MATERIALS ORGANIC MATERIALS (> 35% PASSING *200)	MINERAL NAMES SUCH AS QUARTZ, FELDSPAR, MICA, TALC, KAOLIN, ETC. ARE USED IN DESCRIPTIONS WHENEVER THEY ARE CONSIDERED OF SIGNIFICANCE.	COHESIVE SOIL - A SOIL THAT WHEN UNCONFINED HAS CONSIDERABLE DRY STRENGTH AND	FRAC FRACTURED SLI SLIGHTLY
GROUP A-1 A-3 A-2 A-4 A-5 A-6 A-7 A-1, A-2 A-4, A-5	COMPRESSIBILITY	SIGNIFICANT COHESION WHEN SUBMERGED.	G _S - SPECIFIC GRAVITY
CLASS. A-1-AA-1-B A-2-4A-2-5A-2-6A-2-7 A-3 A-6, A-7	SLIGHTLY COMPRESSIBLE LIQUID LIMIT LESS THAN 30	COLLUVIUM - ROCK FRAGMENTS MIXED WITH SOIL DEPOSITED BY GRAVITY ON SLOPE OR AT BOTTOM OF SLOPE.	qu - UNCUNFINED CUMPRESSIVE STRENGTH
SYMBOL 000000000000000000000000000000000000	MODERATELY COMPRESSIBLE LIQUID LIMIT 31-50	CORE RECOVERY (% REC.) - TOTAL LENGTH OF ALL ROCK DIVIDED BY TOTAL LENGTH OF CORE	MED MEDIUM 7 - UNIT WEIGHT (WET UNIT WEIGHT)
% PASSING	HIGHLY COMPRESSIBLE LIQUID LIMIT GREATER THAN 50 ROCK DESCRIPTION		W - MOISTURE CONTENT
# 10 50 MX	IN THE BROADEST MEANING, HARD ROCK IS CONSIDERED THAT MATERIAL WHICH CANNOT BE	COQUINA - A ROCK TYPE COMPOSED ESSENTIALLY OF MARINE SHELLS CEMENTED BY CALCIUM CARBONATE. DIKE - IGNEOUS ROCK INTRUSION WHICH IS NARROW COMPARED WITH ITS OTHER DIMENSIONS.	MOT MOTTLED
# 40 30 MX50 MX51 MN PEAT # 200 15 MX25 MX10 MX35 MX35 MX35 MX35 MX36 MN36 MN36 MN36 MN	SAMPLED BY CONVENTIONAL SOIL SAMPLING TOOLS OR TECHNIQUES. THE BOUNDARY BETWEEN	DIP - THE ANGLE BETWEEN A BEDDING PLANE, JOINT PLANE OR FAULT PLANE AND THE	OM - OPTIMUM MOISTURE e - VOID RATIO
	SOIL AND ROCK IS ARBITRARY. TRANSITION BETWEEN SOIL AND ROCK IS OFTEN REPRESENTED BY A ZONE OF "WEATHERED ROCK". FOR THE PURPOSE OF THIS INVESTIGATION, THESE	HORIZONTAL, MEASURED PERPENDICULAR TO THE STRIKE.	ORG ORGANIC V VERY
PLASTIC INDEX 6 MX N.P.10 MX10 MX11 MN11 MN10 MX11 MN11 MN 1 MN11 MN	MATERIALS ARE DIVIDED AS FOLLOWS:	DUMPS - UNCOVERED DEPOSITS OF WASTE MATERIAL SUCH AS WOOD, MASONRY DEBRIS OR GARBAGE.	
GROUP INDEX Ø Ø Ø 4 MX 8 MX 12 MX 16 MX NO MX MODERATE ORGANIC	SOFT MATERIAL THAT CAN BE PENETRATED WITH SOME WEATHERED DIFFICULTY USING POWER AUGERS AND YIELDS	<u>FAULT</u> - A BREAK IN THE CONTINUITY OF A BODY OF ROCK, ATTENDED BY A MOVEMENT ON EITHER OR BOTH SIDES OF THE BREAK.	CALITION NOTICE
USUAL TYPES STONE FRAGS. FINE SILTY OR CLAYEY SILTY CLAYEY ORGANIC		<u>fines</u> - Portions of a soil finer than no. 200 u.s. standard sieve.	CAUTION NOTICE:
OF MAJOR GRAVEL AND SAND GRAVEL AND SAND SOILS SOILS MATTER	ROCK SPT VALUES > 100 BLOWS BUT < SPT REFUSAL (SWR) HARD MATERIAL THAT CAN BE PENETRATED WITH GREA	FISSILITY OR FISSILE - A PROPERTY OF SPLITTING EASILY ALONG CLOSELY SPACED PARALLEL	THE SUBSURFACE INFORMATION AND THE SUBSURFACE INVESTIGATION ON WHICH IT IS BASED WAS MADE
GEN RATING	H (HWR) WEATHERED DIEFICULTY USING POWER AUGERS AND VIELDS	FLOAT - ROCK FRAGMENTS ON SURFACE NEAR THEIR ORIGINAL POSITION AND DISLODGED	FOR THE PURPOSE OF STUDY, PLANNING AND DESIGN, AND NOT FOR CONSTRUCTION OR PAY PURPOSES. SOME DATA OBTAINED MAY BE OMITTED FROM THIS RELEASE.
AS A EXCELLENT TO GOOD FAIR TO POOR POOR UNSUITABL	E ROCK SPT REFUSAL.*	FROM PARENT MATERIAL.	ADDITIONAL INFORMATION MAY BE AVAILABLE, INCLUDING, BUT NOT LIMITED TO THE FOLLOWING:
P.I. OF A-7-5 ≤ L.L 3Ø : P.I. OF A-7-6 > L.L 3Ø	ROCK LINE ** AUGERS, EXCEPT IN THIN LEDGES, AND REQUIRE	FLOODPLAIN - LAND BORDERING A STREAM, BUILT OF SEDIMENTS DEPOSITED BY THE STREAM.	
CONSISTENCY OR DENSENESS	(HR) SSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSS		FIELD BORING LOGS ROCK CORES
PRIMARY SOIL TYPE COMPACTNESS OR PENETRATION RESISTENCE COMPRESSIVE STRENGTH	*SPT REFUSAL ≤2.5cm OF PENETRATION PER 50 BLOWS. **AN INFERRED ROCK LINE INDICATES THE LEVEL AT WHICH AUGERS COULD NO LONGER	FRACTURE - A CRACK LARGE ENOUGH TO BE VISIBLE TO THE UNAIDED EYE.	SOIL & ROCK TEST DATA
CONSISTENCY (BLOWS) (KN/m²)	PENETRATE. THE HARD ROCK SYMBOL IS SHOWN WHEN ROCK IS CORED AND ONLY TO THAT	FRIABLE - EASY TO BREAK OR CRUMBLE. GRANULAR MATERIAL - SOIL THAT WHEN UNCONFINED HAS LITTLE OR NO DRY STRENGTH AND HAS	SUBSURFACE REPORT
VERY LOOSE <4	DEPTH CORED. A DESCRIPTION OF ROCK IS GIVEN INCLUDING:	LITTLE OR NO COHESION WHEN SUBMERGED.	THIS INFORMATION MAY BE VIEWED BY APPOINTMENT BY CONTACTING THE N.C. DEPARTMENT OF TRANSPORTATION, GEOTECHNICAL UNIT @ (919) 250-4088. NEITHER THE SUBSURFACE PLANS AND REPORT
GENERALLY LOOSE 4 TO 10 GRANULAR MEDIUM DENSE 10 TO 30 N/A	CORE RECOVERY (REC.) - TOTAL LENGTH OF ROCK RECOVERED IN THE CORE BARREL DIVIDED BY THE TOTAL LENGTH OF THE CORE RUN TIMES 100%.	GROUNDWATER (G.W.) - WATER THAT IS FREE TO MOVE THROUGH SOIL MASS UNDER THE INFLUENCE OF GRAVITY.	NOR THE FIELD BORING LOGS, ROCK CORES, OR SOIL TEST DATA IS PART OF THE CONTRACT.
MATERIAL DENSE 30 TO 50	ROCK QUALITY DESIGNATION (RQD)- TOTAL LENGTH OF SOUND ROCK SEGMENTS RECOVERED	GROUNDWATER LEVEL - LEVEL OF WATER WITH RESPECT TO EXISTING GROUND SURFACE.	GENERAL SOIL AND ROCK STRATA DESCRIPTIONS AND INDICATED BOUNDARIES ARE BASED ON A
VEDY COST	THAT ARE LONGER THAN OR EQUAL TO Ø.1m DIVIDED	HARDPAN - A GENERAL TERM USED TO DESCRIBE A HARD CEMENTED SOIL LAYER WHICH DOES	GEOTECHNICAL INTERPRETATION OF ALL AVAILABLE SUBSURFACE DATA AND MAY NOT NECESSARILY
SOFT 2 TO 4 25 TO 50	BY THE TOTAL LENGTH OF THE CORE RUN TIMES 100% GROUND WATER		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
SILT-CLAY MEDIUM STIFF 4 TO 8 50 TO 100 STIFF 8 TO 15	WATER LEVEL IN BORE HOLE IMMEDIATELY AFTER DRILLING.	INDURATED - EARTH MATERIAL HARDENED BY HEAT, PRESSURE OR CEMENTATION. INTERBEDDED - ALTERNATING LENSES OR LAYERS OF SOIL AND/OR ROCK MATERIALS.	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
MATERIAL VERY STIFF 15 TO 30 200 TO 400	STATIC WATER LEVEL AFTERHOURS.	JOINT - FRACTURE IN ROCK ALONG WHICH NO APPRECIABLE MOVEMENT HAS OCCURRED.	INVESTIGATIONS ARE AS RECORDED AT THE TIME OF THE INVESTIGATION. THESE WATER LEVELS OR SO
HARD >3Ø >400		LAMINATED - VERY THIN ALTERNATING LAYERS LESS THAN ICM.	MOISTURE CONDITIONS MAY VARY CONSIDERABLY WITH TIME ACCORDING TO CLIMATIC CONDITIONS INCLUING TEMPERATURES, PRECIPITATION AND WIND, AS WELL AS OTHER NON-CLIMATIC FACTORS.
TEXTURE OR GRAIN SIZE	PERCHED WATER, SATURATED ZONE OR WATER BEARING STRATA	LAYER - SUBJECT MATERIAL GREATER THAN ICM IN THICKNESS.	
U.S. STD. SIEVE SIZE 4 10 40 60 200 270	SPRING OR SEEPAGE	<u>LEDGE</u> - A SHELF-LIKE RIDGE OR PROJECTION OF ROCK WHOSE THICKNESS IS SMALL COMPARED TO ITS LATERAL EXTENT.	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
OPENING (MM) 4.76 2.0 0.42 0.25 0.075 0.053	MISCELLANEOUS SYMBOLS AND ABBREVIATIONS		AND CONSTRUCTION PURPOSES, REFER TO THE CONSTRUCTION PLANS AND DOCUMENTS FOR FINAL DES
BOULDER COBBLE GRAVEL COARSE FINE SAND SILT CLAY	ROADWAY EMBANKMENT WITH SOIL DESCRIPTION WITH SOIL DESCRIPTION DESCRIPTION SPT SAMPLE DPT TEST BORING DESIGNATIONS		INFORMATION ON THIS PROJECT. THE DEPARTMENT DOES NOT WARRANT OR GUARANTEE THE SUFFICIEN OR ACCURACY OF THE INVESTIGATION MADE, NOR THE INTERPRETATIONS MADE OR OPINIONS OF THE
SAND SAND	WITH SOIL DESCRIPTION OPT TEST BORING DESIGNATIONS VST	MARL - A NON-INDURATED, CALCAREOUS DEPOSIT OF CLAYS, SILTS AND SANDS, OFTEN CONTAINING SHELLS.	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
GRAIN MM 305 75 2.0 0.25 0.05 0.005 SIZE IN. 12" 3"	SOIL SYMBOL AUGER BORING S- BULK SAMPLE	MICACEOUS SOIL (MIC.) - A SOIL OR ROCK TYPE CONTAINING AN APPRECIABLE AMOUNT OF MICA.	NECESSARY TO SATISFY HIMSELF AS TO CONDITIONS TO BE ENCOUNTERED ON THIS PROJECT. THE
	SS- SPLIT SPOON	MUCK (MK.) - A HIGHLY ORGANIC SOIL OF VERY SOFT CONSISTENCY, GENERALLY FOUND ON	CONTRACTOR SHALL HAVE NO CLAIM FOR ADDITIONAL COMPENSATION OR FOR AN EXTENSION OF TIME ANY REASON RESULTING FROM THE ACTUAL CONDITIONS ENCOUNTERED AT THE SITE DIFFERING FROM
SOIL MOISTURE - CORRELATION OF TERMS SOIL MOISTURE SCALE FIELD MOISTURE COURSE FOR FIELD MOISTURE PERCENTATION	ROADWAY EMBANKMENTS - CORE BORING SHIPLE	TIDAL FLATS, LAKE OR STREAM FLOODPLAINS.	THOSE INDICATED IN THE SUBSURFACE INFORMATION.
(ATTERBERG LIMITS) PIELD MOISTORE GUIDE FOR FIELD MOISTURE DESCRIPTION	MONITORING WELL SAMPLE	PEAT (PT) - A FIBROUS MASS OF ORGANIC MATTER IN VARIOUS STAGES OF DECOMPOSITION. PERCHED WATER - WATER MAINTAINED ABOVE THE NORMAL GROUND WATER LEVEL BY THE PRESENCE	NOTE – THE INFORMATION CONTAINED HEREIN IS NOT IMPLIED OR GUARANTEED BY THE N.C. DEPARTME
- SATURATED - USUALLY LIQUID; VERY WET, USUALLY	RS- ROCK SAMPLE	OF AN INTERVENING IMPERVIOUS STRATUM.	OF TRANSPORTATION AS BEING ACCURATE NOR IS IT CONSIDERED TO BE PART OF THE PLANS,
(SAT.) FROM BELOW THE GROUND WATER TABLE	ALLUVIAL/RESIDUAL BOUNDARIES PIEZOMETER INSTALLATION	RESIDUAL SOIL - SOIL FORMED IN PLACE BY THE WEATHERING OF ROCK.	SPECIFICATIONS, OR CONTRACT FOR THE PROJECT.
PLASTIC CEMICOLIDA PEQUIPES PRVING TO	DIP DIRECTION AND DIP OF STRUCTURES / SLOPE INDICATOR . SOUNDING ROD	ROCK - SEE LEGEND ROCK QUALITY DESIGNATION (R.Q.D.) - A MEASURE OF ROCK QUALITY DESCRIBED BY: TOTAL	NOTE – BY HAVING REQUESTED THIS INFORMATION THE CONTRACTOR SPECIFICALLY WAIVES ANY CLAIMS FOR INCREASED COMPENSATION OR EXTENSION OF TIME BASED ON DIFFERENCES BETWEEN THE
RANGE - WET - (W) SEMISOLID; REQUIRES DRYING TO ATTAIN OPTIMUM MOISTURE	INSTALLATION	LENGTH OF ROCK SEGMENTS EQUAL TO OR GREATER THAN O.I METER DIVIDED BY THE TOTAL	CONDITIONS INDICATED HEREIN AND THE ACTUAL CONDITIONS AT THE PROJECT SITE.
(PI) PLASTIC LIMIT	APPARENT DIP SPT N-COUNT	LENGTH OF CORE RUN EXPRESSED AS A PERCENTAGE.	·
OM OPTIMUM MOISTURE - MOIST - (M) SOLID: AT OR NEAR OPTIMUM MOISTURE	(NORMAL TO)	SANITARY LANDFILLS - COMPACTED AND/OR COVERED LAYERS OF SOIL AND WASTE PRODUCTS. SAPROLITE (SAP.) - RESIDUAL SOIL WHICH RETAINS THE RELIC STRUCTURE OR FABRIC OF	NOTES:
SL _ SHRINKAGE LIMIT	EQUIPMENT USED ON SUBJECT PROJECT	THE PARENT ROCK.	
REQUIRES ADDITIONAL WATER TO - DRY - (D) ATTAIN OPTIMUM MOISTURE	DRILL UNITS: AUGER TOOLS: HAMMER TYPE:	SLICKENSIDE - POLISHED AND STRIATED SURFACE THAT RESULTS FROM FRICTION ALONG A FAULT OR SLIP PLAIN.	
	MOBILE B • (152 mm) CONTINUOUS FLIGHT AUTOMATIC MANUAL	SILL - AN IGNEOUS SHEET OF INTRUSIVE ROCK WHOSE THICKNESS IS SLIGHT COMPARED TO	
PLASTICITY PLASTICITY INDEX DRY STRENGTH	BK-51 8" (203 mm) HOLLOW AUGERS CORE BORING TOOLS:	ITS LATERAL EXTENT. SOME - PRESENCE OF 5% TO 30% OF SUBJECT MATERIAL.	
WEBY LOW	CME-4518 HARD FACED FINGER BITS -AX -BX -NX	STANDARD PENETRATION TEST (PENETRATION RESISTANCE)(SPT) - NUMBER OF BLOWS (N) OF A 63.5 kg	
LOW PLASTICITY 6-15 SLIGHT		HAMMER FALLING 0.76 METERS REQUIRED TO PRODUCE A PENETRATION OF 30 cm INTO SOIL WITH A	
MED. PLASTICITY 16-25 MEDIUM HIGH PLASTICITY 26 OR MORE HIGH	CME-550 TUNG CARBIDE INSERTS HAND TOOLS:	5 cm OUTSIDE DIAMETER SPLIT SPOON SAMPLER. SPT REFUSAL IS PENETRATION RESISTANCE OF LESS THAN 2.5 cm WITH 50 BLOWS.	
COLOR	PORTABLE HOIST CLAY BITS	STRIKE - THE DIRECTION OR BEARING OF A HORIZONTAL LINE IN THE PLANE OF AN INCLINED STRATUM, JOINT, FAULT OR OTHER STRUCTURAL PLANE.	
	OTHER OTHER TALLOWS 74,6 WINDING ROD	SUBGRADE - THE SOIL PREPARED TO SUPPORT A STRUCTURE OR A PAVEMENT SYSTEM.	
DESCRIPTIONS MAY INCLUDE COLOR OR COLOR COMBINATIONS (TAN, RED, YEL-BRN, BLUE-GRAY) MODIFIERS SUCH AS LIGHT, DARK, MOTTLED, STREAKED, ETC. ARE USED TO DESCRIBE APPEARANCE	SOUNDING ROD	TOPSOIL (T.S.) - SURFACE SOILS USUALLY CONTAINING ORGANIC MATTER.	
THE SOLD TO BESCHIEF HITEHIANCE	OTHER VANE SHEAR TEST	TRACE - PRESENCE OF LESS THAN 5% OF SUBJECT MATERIAL.	REVISED NOVEMBER II, 19
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STATE PROJECT NO. SHEET NO. TOTAL SHEETS
2 63