NORTH CAROLINA DEPARTMENT OF TRANSPORTATION DIVISION OF HIGHWAYS GEOTECHNICAL UNIT

ID STATE PROJECT NO. SHEET NO. TOTAL SHEETS B-4039 33405.1.1 2 25

SUBSURFACE INVESTIGATION

SOIL AND ROCK LEGEND, TERMS, SYMBOLS, AND ABBREVIATIONS

	SOIL AND ROCK LEGEND, TERM	MS, SIMBULS, AND ABBREVIATIONS	
SDIL DESCRIPTION	GRADATION	ROCK DESCRIPTION	TERMS AND DEFINITIONS
SDIL IS CONSIDERED TO BE THE UNCONSOLIDATED, SEMI-CONSOLIDATED OR VEATHERED EARTH MATERIALS	WELL GRADED- INDICATES A GOOD REPRESENTATION OF PARTICLE SIZES FROM FINE TO COARSE UNIFORM- INDICATES THAT SOIL PARTICLES ARE ALL APPROXIMATELY THE SAME SIZE. (ALSD	HARD ROCK IS NON-COASTAL PLAIN MATERIAL THAT WHEN TESTED, WOULD YIELD SPT REFUSAL AN INFERRED	ALLUVIUM (ALLUV.) - SDILS WHICH HAVE BEEN TRANSPORTED BY WATER
WHICH CAN BE PENETRATED WITH A CONTINUOUS FLIGHT POWER AUGER, AND WHICH YIELDS LESS THAN 100 BLOWS PER FOOT ACCORDING TO STANDARD PENETRATION TEST (AASHTO 1206, ASTM D-1586). SOIL	PODRLY GRADED) GAP-GRADED- INDICATES A MIXTURE OF UNIFORM PARTICLES OF TWO DR MORE SIZES.	SPT REFUSAL IS PENETRATION BY A SPLIT SPOON SAMPLER EQUAL TO ON LESS THE DISTANCE OF REFUSAL IS PENETRATION BY A SPLIT SPOON SAMPLER EQUAL TO ON LESS THE REPRESENTED BY A ZONE IN NON-COASTAL PLAIN MATERIAL, THE TRANSITION BETVEEN SOIL AND ROCK IS OFTEN REPRESENTED BY A ZONE	AQUIFER - A WATER BEARING FORMATION OR STRATA.
CLASSIFICATION IS BASED ON THE AASHTO SYSTEM AND BASIC DESCRIPTIONS GENERALLY SHALL INCLUDE: CONSISTENCY, COLOR, TEXTURE, MOISTURE, AASHTO CLASSIFICATION, AND OTHER PERTINENT FACTORS SUCH	ANGULARITY DF GRAINS	OF WEATHERED ROCK.	ARENACEOUS - APPLIED TO ROCKS THAT HAVE BEEN DERIVED FROM SAND OR THAT CONTAIN SAND.
AS MINERALDGICAL COMPOSITION, ANGULARITY, STRUCTURE, PLASTICITY, ETC. EXAMPLE: VERY STIFF, CRAY SILTY CLAY, MOIST WITH INTERBEDDED FINE SAND LAYERS, HIGHLY PLASTIC, A-7-6	THE ANGULARITY OR ROUNDNESS OF SOIL GRAINS ARE DESIGNATED BY THE TERMS; ANGULAR, SUBANGULAR, SUBROUNDED, OR ROUNDED.	ROCK MATERIALS ARE TYPICALLY DIVIDED AS FOLDWS: VEATHERED VEATHERED VEATHERED VEATHERED	ARGILLACEDUS - APPLIED TO ALL ROCKS OR SUBSTANCES COMPOSED OF CLAY MINERALS, OR HAVING A NOTABLE PROPORTION OF CLAY IN THEIR COMPOSITION, AS SHALE, SLATE, ETC.
SOIL LEGEND AND AASHTO CLASSIFICATION	MINERALOGICAL COMPOSITION	ROCK (WR) PER FOOT.	ARTESIAN - GROUND WATER THAT IS UNDER SUFFICIENT PRESSURE TO RISE ABOVE THE LEVEL
GENERAL GRANULAR MATERIALS SILT-CLAY MATERIALS DEGANIC MATERIALS	MINERAL NAMES SUCH AS QUARTZ, FELDSPAR, MICA, TALC, KADLIN, ETC. ARE USED IN DESCRIPTIONS	CRYSTALLINE RDCK (CR) FINE TO CDARSE GRAIN IGNEOUS AND METAMORPHIC RDCK THAT WOULD YIELD SPT REFUSAL IF TESTED. RDCK TYPE INCLUDES GRANITE,	AT WHICH IS IS ENCOUNTERED, BUT WHICH DOES NOT NECESSARILY RISE TO OR ABOVE THE GROUND SURFACE.
CEMSS: (233% PASSING #200) (>35% PASSING #200)	WHENEVER THEY ARE CONSIDERED OF SIGNIFICANCE.	GNEISS, GABBRO, SCHIST, ETC.	CALCAREDUS (CALC.) - SDILS WHICH CONTAIN APPRECIABLE AMOUNTS OF CALCIUM CARBONATE.
GROUP A-1 A-3 A-2 A-4 A-5 A-6 A-7 A-1, A-2 A-4, A-5 CLASS. A-1-a A-1-b A-2-4A-2-4A-2-4A-2-1 A-2-4A-3 A-6, A-7	COMPRESSIBILITY SLIGHTLY COMPRESSIBLE LIQUID LIMIT LESS THAN 30	NDN-CRYSTALLINE FINE TO CDARSE GRAIN METAMORPHIC AND NON-CDASTAL PLAIN RDCK (NCR) SEDIMENTARY RDCK THAT VOULD YELLD SPT REFUSAL IF TESTED. RDCK TYPE INCLUDES PHYLLITE, SLATE, SANDSTONE, ETC.	COLLUVIUM - ROCK FRAGMENTS MIXED WITH SOIL DEPOSITED BY GRAVITY ON SLOPE OR AT BOTTOM OF SLOPE.
SYMBOL COCOSCOSCOSCOSCOSCOSCOSCOSCOSCOSCOSCOSCO	MDDERATELY COMPRESSIBLE LIQUID LIMIT 31-50 HIGHLY COMPRESSIBLE LIQUID LIMIT GREATER THAN 50	CDASTAL PLAIN CDASTAL PLAIN SEDIMENTS CEMENTED INTO ROCK BUT MAY NOT YIELD	CORE RECOVERY (REC.) - TOTAL LENGTH OF ALL MATERIAL RECOVERED IN THE CORE BARREL DIVIDED BY TOTAL
X PASSING 211.	PERCENTAGE OF MATERIAL	CCP) SHELL BEDS, ETC.	LENGTH UP CURE KUN AND EXPRESSED AS A PERCENTAGE.
# 10	DRGANIC MATERIAL GRANULAR SILT- CLAY SDILS SDILS DIHER MATERIAL	WEATHERING	DIKE - A TABULAR BODY OF IGNEOUS ROCK THAT CUTS ACROSS THE STRUCTURE OF ADJACENT ROCKS OR CUTS MASSIVE ROCK.
# 200 15 MX 25 MX10 MX 35 MX35 MX35 MX35 MX36 MN36 MN36 MN36 MN	TRACE OF DRGANIC MATTER 2 - 3% 3 - 5% TRACE 1 - 10%	FRESH RDCK FRESH, CRYSTALS BRIGHT, FEW JDINTS MAY SHOW SLIGHT STAINING. RDCK RINGS UNDER HAMMER IF CRYSTALLINE.	DIP - THE ANGLE AT WHICH A STRATUM OR ANY PLANAR FEATURE IS INCLINED FROM THE
LIQUID LIMIT 40 MX/41 MN 40 MX/41 MN 40 MX/41 MN 40 MX/41 MN SDILS WITH PLASTIC INDEX 6 MX N.P. 10 MX 10 MX 11 MN 10 MX 10 MX 11 MN 11 MN LYTTLE DD	MDDERATELY DRGANIC 5 - 10% 12 - 20% SDME 20 - 35%	VERY SLIGHT ROCK GENERALLY FRESH, JOINTS STAINED, SOME JOINTS MAY SHOW THIN CLAY COLATINGS IF DEFN	HORIZONTAL. DIP DIRECTION (DIP AZIMUTH) - THE DIRECTION OR BEARING OF THE HORIZONTAL TRACE OF
GROUP INDEX 0 0 0 4 MX 8 MX 12 MX 16 MX MX MD MX MX MD MX MX MD MX MX MD MX MX MDDERATE DRGANIC	HIGHLY DRGANIC >10% >20% HIGHLY 35% AND ABOVE	(V. SLI.) CRYSTALS ON A BROKEN SPECIMEN FACE SHINE BRIGHTLY. ROCK RINGS UNDER HAMMER BLOWS IF OF A CRYSTALLINE NATURE.	THE LINE OF DIP, MEASURED CLOCKVISE FROM NORTH.
USUAL TYPES STONE FRAGS. THE STUTY OF CLAYEY STUTY OF STU		SLIGHT ROCK GENERALLY FRESH, JOINTS STAINED AND DISCOLORATION EXTENDS INTO ROCK UP TO	FAULT - A FRACTURE OR FRACTURE ZONE ALONG WHICH THERE HAS BEEN DISPLACEMENT OF THE SIDES RELATIVE TO DNE ANDTHER PARALLEL TO THE FRACTURE.
DF MAJOR GRAVEL AND FINE SILTY DR CLAYEY SILTY CLAYEY DRGANIC MATERIALS SAND SAND GRAVEL AND SAND SDILS MATTER	WATER LEVEL IN BORE HOLE IMMEDIATELY AFTER DRILLING. STATIC WATER LEVEL AFTER 24 HOURS.	(SLI.) 1 INCH. DPEN JDINTS MAY CONTAIN CLAY. IN GRANITDID ROCKS SOME DOCASIONAL FELDSPAR CRYSTALS ARE DULL AND DISCOLORED. CRYSTALLINE ROCKS RING UNDER HAMMER BLOVS.	FISSILE - A PROPERTY OF SPLITTING ALONG CLOSELY SPACED PARALLEL PLANES.
GEN. RATING	V PW DEDOUGH WATER CALLED TO THE PARTY OF T	MODERATE SIGNIFICANT PORTIONS OF ROCK SHOW DISCOLDRATION AND WEATHERING EFFECTS. IN	FLOAT - ROCK FRAGMENTS ON SURFACE NEAR THEIR DRIGINAL POSITION AND DISLODGED FROM
AS A EXCELLENT TO GOOD FAIR TO POOR POOR UNSUITABLE	LE STATE STATE STATE STATE	(MDD.) 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.
P.I. DF A-7-5≤ L.L 30 : P.I. DF A-7±6 L.L 30	SPRING DR SEEPAGE	WITH FRESH ROCK. MODERATELY ALL ROCK EXCEPT QUARTZ DISCOLORED OR STAINED. IN GRANITOID ROCKS, ALL FELDSPARS DULL	FLOOD PLAIN (F.P.) - LAND BORDERING A STREAM, BUILT OF SEDIMENTS DEPOSITED BY THE STREAM.
CONSISTENCY OR DENSENESS COMPAGNIES ON RANGE OF STANDARD RANGE OF UNCONFINED	MISCELLANEDUS. SYMBOLS	SEVERE AND DISCOLDRED AND A MAJORITY SHOW KADLINIZATION. ROCK SHOWS SEVERE LOSS OF STRENGTH	FORMATION (FM.) - A MAPPABLE GEOLOGIC UNIT THAT CAN BE RECOGNIZED AND TRACED IN
PRIMARY SOIL TYPE COMPACTNESS OR COMPSISTENCY PENETRATION RESISTENCE COMPRESSIVE STRENGTH (N-VALUE) (TONS/FP)	RDADWAY EMBANKMENT WITH SDIL DESCRIPTION PSY CPT SPT C	(MDD. SEV.) AND CAN BE EXCAVATED WITH A GEDLOGIST'S PICK. ROCK GIVES 'CLUNK' SOUND WHEN STRUCK. IF TESTED, WOULD YIELD SPT REFUSAL.	THE FIELD. JOINT - FRACTURE IN ROCK ALONG WHICH NO APPRECIABLE MOVEMENT HAS OCCURRED.
GENERALLY VERY LOOSE <4	DESIDINATIONS	SEVERE ALL ROCKS EXCEPT QUARTZ DISCOLORED OR STAINED, ROCK FABRIC CLEAR AND EVIDENT BUT	·
GRANULAR LODSE 4 TO 10	SDIL SYMBOL AUGER BORING S- BULK SAMPLE	(SEV.) REDUCED IN STRENGTH TO STRONG SOIL. IN GRANITOID ROCKS ALL FELDSPARS ARE KADLINIZED TO SOME EXTENT. SOME FRAGMENTS OF STRONG ROCK USUALLY REMAIN.	ITS LATERAL EXTENT.
(NON-COHESIVE) DENSE 30 TO 50	ARTIFICIAL FILL OTHER THAN SS- SPLIT SPOON ROADWAY EMBANKMENTS CORE BORING SAMPLE	IF TESTED, YIELDS SPI N VALUES > 100 BPF VERY SEVERE ALL ROCK EXCEPT QUARTZ DISCOLDRED OR STAINED. ROCK FABRIC ELEMENTS ARE DISCERNIBLE BUT	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
VEDV COFF	INFERRED SDIL BOUNDARIES	(V. SEV.) THE MASS IS EFFECTIVELY REDUCED TO SOIL STATUS WITH DNLY FRAGMENTS DE STRONG POCK	SDILS USUALLY INDICATES POOR AERATION AND LACK OF GOOD DRAINAGE.
GENERALLY SDFT 2 TD 4 0.25 TD 0.5	MONITORING WELL SAMPLE SINFERRED ROCK LINE RS- ROCK SAMPLE	REMAINING. SAPROLITE IS AN EXAMPLE OF ROCK WEATHERED TO A DEGREE SUCH THAT DNLY MINDR VESTIGES OF THE ORIGINAL ROCK FABRIC REMAIN. <i>IF TESTED, YIELDS SPT N VALUES (100 BPF</i>	PERCHED WATER - WATER MAINTAINED ABOVE THE NORMAL GROUND WATER LEVEL BY THE PRESENCE OF AN INTERVENING IMPERVIOUS STRATUM.
SILT-CLAY MEDIUM STIFF 4 TO 8	PIEZDMETER TTTTT ALLUVIAL SDIL BDUNDARY ART- RECOMPACTED	COMPLETE ROCK REDUCED TO SOIL. ROCK FABRIC NOT DISCERNIBLE, OR DISCERNIBLE ONLY IN SMALL AND	RESIDUAL SDIL - SDIL FORMED IN PLACE BY THE WEATHERING OF ROCK.
(CDHESIVE) VERY STIFF 15 TD 30 2 TD 4 HARD >30 >4	SLOPE INDICATOR TRIAXIAL SAMPLE	SCATTERED CONCENTRATIONS. QUARTZ MAY BE PRESENT AS DIKES OR STRINGERS. SAPROLITE IS ALSO AN EXAMPLE.	ROCK QUALITY DESIGNATION (R.Q.D.) - A MEASURE OF ROCK QUALITY DESCRIBED BY: TOTAL LENGTH OF
TEXTURE DR GRAIN SIZE	RDCK STRUCTURES	RDCK HARDNESS	RDCK SEGMENTS EQUAL TO DR GREATER THAN 4 INCHES DIVIDED BY THE TOTAL LENGTH OF CORE RUN AND EXPRESSED AS A PERCENTAGE.
U.S. STD. SIEVE SIZE 4 10 40 60 200 270	● - SDUNDING RDD REFD—— SPT REFUSAL	VERY HARD CANNOT BE SCRATCHED BY KNIFE OR SHARP PICK. BREAKING OF HAND SPECIMENS REQUIRES	SAPPOLITE (SAP.) - RESIDUAL SOIL WHICH RETAINS THE RELIC STRUCTURE OR FABRIC OF THE
DPENING (MM) 4.76 2.0 0.42 0.25 0.075 0.053	ABBREVIATIONS	SEVERAL HARD BLOWS OF THE GEOLOGISTS PICK. HARD CAN BE SCRATCHED BY KNIFE OR PICK ONLY WITH DIFFICULTY. HARD HAMMER BLOWS REQUIRED	PARENT ROCK. SILL - AN INTRUSIVE BODY OF IGNEOUS ROCK OF APPROXIMATELY UNIFORM THICKNESS AND
BOULDER COBBLE GRAVEL COARSE FINE SILT CLAY		TO DETACH HAND SPECIMEN.	RELATIVELY THIN COMPARED WITH ITS LATERAL EXTENT, WHICH HAS BEEN EMPLACED PARALLEL TO THE BEDDING OR SCHISTOSITY OF THE INTRODED ROCKS
(CL) (CL)	BT - BORING TERMINATED SD SAND, SANDY	MODERATELY CAN BE SCRATCHED BY KNIFE OR PICK. GDUGES OR GRODVES TO 0.25 INCHES DEEP CAN BE HARD EXCAVATED BY HARD BLOW OF A GEOLOGISTS PICK. HAND SPECIMENS CAN BE DETACHED	SLICKENSIDE - POLISHED AND STRIATED SURFACE THAT RESULTS FROM FRICTION ALONG A FAULT OR
GRAIN MM 305 75 2.0 0.25 0.05 0.005 SIZE IN 12' 3'	CL CLAY SL SILTY CPT - CDNE PENETRATION TEST SLI - SLIGHTLY	BY MODERATE BLOWS.	SLIP PLANE.
SDIL MOISTURE - CORRELATION OF TERMS	CSE CDARSE TCR - TRICDNE REFUSAL	MEDIUM CAN BE GROOVED OR GOUGED 0.05 INCHES DEEP BY FIRM PRESSURE OF KNIFE OR PICK POINT. HARD CAN BE EXCAVATED IN SMALL CHIPS TO PEICES 1 INCH MAXIMUM SIZE BY HARD BLOWS OF THE	STANDARD PENETRATION TEST (PENETRATION RESISTANCE) (SPT) - NUMBER OF BLOWS (N OR B.P.F.) OF A 140 LB. HAMMER FALLING 30 INCHES REQUIRED TO PRODUCE A PENETRATION OF 1 FOOT INTO SOIL WITH
SOIL MOISTURE SCALE FIELD MOISTURE GUIDE FOR FIELD MOISTURE	TIPT - DYNAMIC PENETRATION TEST - UNII WEIGHT	PDINT OF A GEOLOGISTS PICK.	A 2 INCH DUTSIDE DIAMETER SPLIT SPOON SAMPLER. SPT REFUSAL IS LESS THAN 0.1 FOOT PENETRATION WITH 60 BLOWS.
CHITEKOEKO FINITOS DESCRIPTUM	F FINE W - MUISTURE CONTENT	SDFT CAN BE GROVED OR GOUGED READILY BY KNIFE OR PICK. CAN BE EXCAVATED IN FRAGMENTS FROM CHIPS TO SEVERAL INCHES IN SIZE BY MODERATE BLOVS OF A PICK POINT. SMALL, THIN	STRATA CORE RECOVERY (SREC.) - TOTAL LENGTH OF STRATA MATERIAL RECOVERED DIVIDED BY TOTAL LENGTH
- SATURATED - USUALLY LIQUID; VERY WET, USUALLY (SAT.) FROM BELOW THE GROUND WATER TABLE	FDSS FDSSILIFERDUS V VERY FRAC FRACTURED VST - VANE SHEAR TEST	PIECES CAN BE BROKEN BY FINGER PRESSURE. VERY CAN BE CARVED WITH KNIFE. CAN BE EXCAVATED READILY WITH POINT OF PICK. PIECES 1 INCH	OF STRATUM AND EXPRESSED AS A PERCENTAGE. STRATA ROCK QUALITY DESIGNATION (S.R.O.D.) - A MEASURE OF ROCK QUALITY DESCRIBED BY:
LL LIQUID LIMIT	FRAGS FRAGMENTS MED MEDIUM	SOFT OR MORE IN THICKNESS CAN BE BROKEN BY FINGER PRESSURE. CAN BE SCRATCHED READILY BY	TOTAL LENGTH DF ROCK SEGMENTS WITHIN A STREAM EQUAL TO DR GREATER THAN 4 INCHES DIVIDED BY THE TOTAL LENGTH DF STRATA AND EXPRESSED AS A PERCENTAGE.
RANGE < SEMISOLID; REQUIRES DRYING TO	EQUIPMENT USED ON SUBJECT PROJECT	FINGERNAIL. FRACTURE SPACING BEDDING	<u>IDPSDIL (I.S.) -</u> SURFACE SDILS USUALLY CONTAINING DRGANIC MATTER.
(PI) PL PLASTIC LIMIT ATTAIN OPTIMUM MOISTURE	DRILL UNITS: ADVANCING TODLS: HAMMER TYPE:	TERM SPACING TERM THICKNESS	BENCH MARK: BM2: -L- STA. 12+73, 185 LEFT 8" NAIL SET
DM DPTIMUM MDISTURE - MDIST - (M) SDLID; AT DR NEAR DPTIMUM MDISTURE	AUTOMATIC MANUAL	VERY VIDE MORE THAN 10 FEET VERY THICKLY BEDDED > 4 FEET VIDE 3 TO 10 FEET THICKLY BEDDED 1.5 - 4 FEET	IN BASE OF 12" BIRCH.
SL SHRINKAGE LIMIT	MDRICE R-	MODERATELY CLOSE 1 TD 3 FEET THINLY BEDDED 0.16 - 1.5 FEET	ELEVATION: 1085.31 FT.
- DRY - (D) REQUIRES ADDITIONAL WATER TO ATTAIN OPTIMUM MOISTURE	BK-51	VERY CLOSE LESS THAN DIG FFFT THICKLY LAMINATED 0.008 - 0.03 FEET	NDTES:
PLASTICITY		THINLY LAMINATED < 0.008 FEET INDURATION	
PLASTICITY INDEX (PI) DRY STRENGTH	TING -CAPRIDE INSERTS	FOR SEDIMENTARY ROCKS, INDURATION IS THE HARDENING OF THE MATERIAL BY CEMENTING, HEAT, PRESSURE, ETC.	
NONPLASTIC	CME-550X	FRIABLE RUBBING WITH FINGER FREES NUMEROUS GRAINS;	
MED. PLASTICITY 16-25 MEDIUM HIGH PLASTICITY 26 DR MORE HIGH	PORTABLE HOIST TRICONE STEEL TEETH POST HOLE DIGGER	GENTLE BLOW BY HAMMER DISINTEGRATES SAMPLE. MODERATELY INDURATED GRAINS CAN BE SEPARATED FROM SAMPLE WITH STEEL PROBE:	
CDLDR	TOYODAS A TIME CARD HAND AUGER	MODERATELY INDURATED GRAINS CAN BE SEPARATED FROM SAMPLE WITH STEEL PROBE; BREAKS EASILY WHEN HIT WITH HAMMER.	
DESCRIPTIONS MAY INCLUDE COLOR OR COLOR COMBINATIONS (TAN, RED, YEL-BRN, BLUE-GRAY)	DTHER CORE BIT SDUNDING RDD	INDURATED GRAINS ARE DIFFICULT TO SEPARATE WITH STEEL PROBE;	
MODIFIERS SUCH AS LIGHT, DARK, STREAKED, ETC. ARE USED TO DESCRIBE APPEARANCE.	OTHER OTHER AUGES VANE SHEAR TEST	DIFFICULT TO BREAK WITH HAMMER. EXTREMELY INDURATED SHARP HAMMER BLDVS REQUIRED TO BREAK SAMPLE;	
	DTHER	SAMPLE BREAKS ACROSS GRAINS.	