NORTH CAROLINA DEPARTMENT OF TRANSPORTATION

DIVISION OF HIGHWAYS GEOTECHNICAL UNIT

	TO	STATE PROJECT	NO.	SHEET	NO.	TOTAL	SHEETS
	R-26I0A	6.529005T	2		36		
4	<u> </u>			·			



SUBSURFACE INVESTIGATION

SOIL AND ROCK LEGEND, TERMS, SYMBOLS, AND ABBREVIATIONS

						BOIL AND NO.	CR DECEMB, TERM	J, 01 1413	OLAU, 2111D 2113D	71(L) V 171.			,
SOIL DESCRIPTION GRADATION								ROCK DESCRIPTION HARD ROCK IS NON-COASTAL PLAIN MATERIAL THAT WHEN TESTED, WOULD YIELD SPT REFUSAL, AN INFERRED					TERMS AND DEFINITIONS
SOIL IS CONSIDERED TO BE THE UNCONSOLIDATED, SEMI-CONSOLIDATED OR WEATHERED EARTH MATERIALS WHICH LORDED- INDICATES A GOOD REPRESENTATION OF PARTICLE SIZES FROM FINE TO COARSE LANGE FOR THE TO COARSE CALL APPROXIMATELY THE SAME SIZE (ALSO POORLY GRADED).								ROCK LINE INDICATES THE LEVEL AT WHICH NON-COASTAL PLAIN MATERIAL WOULD YIELD SPT REFUSAL.					ALLUVIUM (ALLUV.) - SOILS WHICH HAVE BEEN TRANSPORTED BY WATER.
				is less than 1888 blows per 51, soil classification is	CAP-GRADED- INDICATES A MIXTURE OF UNIFORM PARTICLES OF TWO OR MORE SIZES.				il is penetration by a split stal plain material, the tri				ACLUSER - A WATER BEARING FORMATION OR STRATA.
	aashto system and bas ure aashto classificat			LUDE: CONSISTENCY, COLOR, H. AS MINERAL OGICAL	ANGULARITY OF GRAINS			OF WEATHERED ROCK. ROCK MATERIALS ARE TYPICALLY DIVIDED AS FOLINIS:					ARENACEOUS - APPLIED TO ROCKS THAT HAVE BEEN DERIVED FROM SAND OR THAT CONTAIN SAND.
	NGULARITY, STRUCTURE, PL	ASTICITY, ETC. EXAMP	LEi		THE ANGULARITY OR ROUNDNESS OF SOIL GRAINS ARE DESIGNATED BY THE TERMS, ANGULAR, SUBANGULAR,		WEATHERED NON-COASTAL PLAIN MATERIAL THAT YIELDS SPT N VALUES > 1888 BLOWS				N VALHES 3 100 DLOWS	<u>Argulaceous</u> – Applied to all rocks or substances composed of Clay Minerals, or Having a Notable Proportion of Clay in Their Composition, as shale, slate, etc.	
		Y, MOIST WITH INTERBEDOED I			SUBROUNDED, OR ROUNDED.		ROCK (WR) PER 36 om.				II TALOCO / IND DESIG	ARTESIAN - GROUND WATER THAT IS UNDER SUFFICIENT PRESSURE TO RISE ABOVE THE LEVEL AT WHICH IS	
SOIL LEGEND AND AASHTO CLASSIFICATION				ATION	MINERALOGICAL COMPOSITION MINERAL NAMES SUCH AS QUARTZ, FELDSPAR, MICA, TALC, KAOLIN, ETC. ARE USED IN DESCRIPTIONS WHENEVER			CRYSTALLI	NE Y TIME T	TO COARSE GRAIN IGNEOUS AND METAMORPHIC F LD YIELD SPT REFUSAL IF TESTED, ROCK TYPE I			ENCOUNTERED, BUT WHICH DOES NOT NECESSARILY RISE TO OR ABOVE THE GROUND SURFACE, CALCAREDUS (CALC.) - SOILS WHICH CONTAIN APPRECIABLE AMOUNTS OF CALCIUM CARBONATE.
GENERAL CLASS.	GRANULAR MATERIA (195% PASSING *200		CLAY MATERIALS PASSING *2000	ORGANIC MATERIALS	THEY ARE CONSIDERED OF SIGNIFICANCE.		NAME OF TAXABLE PARTY O	ROCK (CR)	GNEIS:	SS, GABBRO, SCHIS	ST, ETC.		COLLUVIUM - ROCK FRAGMENTS MIXED WITH SOIL DEPOSITED BY GRAVITY ON SLOPE OR AT BOTTOM OF SLOPE.
	A-1 A-3	A-2 A-4 A-5		A-1, A-2 A-4, A-5	COMPRESSIBILITY			NON-CRYST	ALLINE } centur		in metamorphic and non-co hat vould yeild spt refu		CORE RECOVERY (REC.) - TOTAL LENGTH OF ALL MATERIAL RECOVERED IN THE CORE BARREL DIVIDED BY TOTAL
CLASS. A-1		-5 A-2-6 A-2-7	A-7-8 A-7-4	A-3 A-6, A-7	SLIGHTLY COMPRESS		LESS THAN 30	ROCK (NCR)	INCLU	IDES PHYLLITE, S	Late, sandstone, etc. IENTS CEMENTED INTO ROCK.		LENGTH OF CORE RUN AND EXPRESSED AS A PERCENTAGE.
SYMBOL BOOK	0000000				MODERATELY COMPRESSIBLE HIGHLY COMPRESSIBLE		31-08 GREATER THAN 58	COASTAL PI	RY SPT R	REFUSAL, ROCK T	TYPE INCLUDES LIMESTONE, S		<u>DIKE</u> - A TABULAR BODY OF IGNEOUS ROCK THAT CUTS ACROSS THE STRUCTURE OF ADJACENT ROCKS OR CUTS MASSIVE ROCK.
PASSING				SILT-		PERCENTAGE OF MATERIA		ROCK (CP)	SHELL	BEDS, ETC. WFΔTH	IERING		DIP - THE ANGLE AT WHICH A STRATUM OR ANY PLANAR FEATURE IS INCLINED FROM THE HORIZONTAL.
• 18 58 • 48 36	MX MXSE MXSE MN			GRANULAR CLAY PEAT	ORGANIC MATERIAL	GRANULAR SILT-CLAY SOILS SOILS Q	OTHER MATERIAL						DIP DIRECTION (DIP AZIMUTE) - THE DIRECTION OR BEARING OF THE HORIZONTAL TRACE OF THE LINE OF DIP,
	NX 25 MX 18 MX 35 MX 35	MX35 MX35 MX36 MN	36 MN 36 MN 36 MN	SOILS SOILS	TRACE OF ORGANIC MATTER	2 - 3% 3 - 5% TRA	ACE 1 - 18%	FRESH	ROCK FRESH, CRYSTALS BRIGHT HAMMER IF CRYSTALLINE.	HI, FEW JUINIS	MAT SHUW SLIGHT STAINING	NUCK KINGS UNDER	Measured Clockvise from North. Fault - A Fracture or Fracture zone along which there has been displacement of the sides
TOURD LIMIT	48 MX41 M	N 48 MX41 MN 48 MX	41 MN 48 MX41 MN	SOILS WITH	LITTLE ORGANIC MATTER MODERATELY ORGANIC	3 - 5% 5 - 12% LIT 5 - 16% 12 - 26% SON	TLE 19 - 20% Æ 29 - 35%		ROCK GENERALLY FRESH, JOIN				RELATIVE TO ONE ANOTHER PARALLEL TO THE FRACTURE.
LASTIC INCEX	6 MX N.P. 18 MX 18 I	1X 11 MN 1 MN 18 MX	18 MX 11 MN 11 MN	LITTLE OR HIGHLY	HIGHLY ORGANIC		HLY 35% AND ABOVE		CRYSTALS ON A BROKEN SPEC OF A CRYSTALLINE NATURE.	CIMEN FACE SHII	NE BRIGHTLY, ROCK RINGS UN	IDER HAMMER BLOWS IF	FISSILE - A PROPERTY OF SPLITTING ALONG CLOSELY SPACED PARALLEL PLANES.
ROUP INDEX	8 8 8	4 MX 8 MX	12 MX 16 MX No MX	MODERATE ORGANIC AMOUNTS OF SOILS		GROUND WATER		l .	ROCK GENERALLY FRESH, JOIN	NTS STAINED AN	D DISCOLORATION EXTENDS 1	NTO ROCK UP TO	FLOAT - ROCK FRAGMENTS ON SURFACE NEAR THEIR ORIGINAL POSITION AND DISLODGED FROM PARENT MATERIA
isual types sto of major (GRA)	MEI VALUE STELL		LTY CLAYEY	ORGANIC	▼ WATER	LEVEL IN BORE HOLE IMMEDIATELY AFTER	DRILLING.		2.5 cm. OPEN JOINTS MAY CO				FLOOD PLAIN (F.P.) - LAND BORDERING A STREAM, BUILT OF SEDIMENTS DEPOSITED BY THE STREAM.
	SAND SAND GRAVEL	. AND SAND SO	ILS SOILS	MATTER	STATIC V	WATER LEVEL AFTER 24 HOURS.		i	SIGNIFICANT PORTIONS OF RO				FORMATION (FM.) - A MAPPABLE GEOLOGIC UNIT THAT CAN BE RECOGNIZED AND TRACED IN THE FIELD.
EN. RATING				FAIR TO DOOR INTERNAL	<u> </u>	WATER, SATURATED ZONE OR WATER BEAR	ING STRATA	0MODJ)	GRANITOID ROCKS, MOST FELDS	OSPARS ARE DULI	L AND DISCOLORED, SOME SH	OW CLAY, ROCK HAS	JOINT - FRACTURE IN ROCK ALONG WHICH NO APPRECIABLE MOVEMENT HAS OCCURRED.
AS A SUBGRADE	EXCELLENT TO GO	י ן ע	FAIR TO POOR	POOR POOR UNSUITABL	0 000				DULL SOUND UNDER HAMMER E WITH FRESH ROCK.	BLOWS AND SHOW	WS SIGNIFICANT LOSS OF ST	RENGTH AS COMPARED	LEDGE - A SHELF-LIKE RIDGE OR PROJECTION OF ROCK WHOSE THICKNESS IS SMALL COMPARED TO ITS LATERAL EXTENT.
_	P.I. OF A-7-5	≤ L.L 30 : P.I.	OF A-7-6 > L.L.	- 30	O'lli SPRING C	DR SEEPAGE		l .	ALL ROCK EXCEPT QUARTZ DIS	ISCOLORED OR S	TAINED, IN GRANITOID ROCKS	, ALL FELDSPARS DULL	LENS - A BODY OF SOIL OR ROCK THAT THINS OUT IN ONE OR MORE DIRECTIONS.
	CONS	SISTENCY OR		DANCE OF INCOMPTUED		MISCELLANEOUS SYMBOLS			AND DISCOLORED AND A MAJOR AND CAN BE EXCAVATED WITH				MOTTLED (MOT.) - IRREGULARLY MARKED WITH SPOTS OF DIFFERENT COLORS, MOTTLING IN SOILS USUALLY
PRIMARY SOIL	TYPE COMPACTNE	SS UN PENETRA	e of Standard Tion resistence	RANGE OF UNCONFINED COMPRESSIVE STRENGTH	ROADWAY EMBANK		IG SAMPLE		IF TESTED, WOULD YIELD SPT		The four bales seems	out of house	Indicates poor aeration and lack of good drainage. Perched Water - Water Maintained above the normal ground water level by the presence of an
			(N-VALUE)	(kN/m²)	WITH SOIL DESCR		DESIGNATIONS		ALL ROCKS EXCEPT QUARTZ D				Intervening impervious stratum.
GENERALL		1	4 4 TO 10		SOIL SYMBOL	AUGER BORING	S- BULK SAMPLE		IN STRENGTH TO STRONG SOIL EXTENT, SOME FRAGMENTS OF			: KAULINIZED IU SUME	<u>RESIDUAL SOIL</u> - SOIL FORMED IN PLACE BY THE WEATHERING OF ROCK.
GRANULAF MATERIAL	MEDIUM	DENSE	18 TO 38	N/A	ARTIFICIAL FILL		SS- SPLIT SPOON		IF TESTED, YIELDS SPT N YA				ROCK QUALITY DESIGNATION (R.Q.D.) - A MEASURE OF ROCK QUALITY DESCRIBED BY, TOTAL LENGTH OF
(NON-COL	ESIVE) DENSE VERY DE		38 TO 58		ROADWAY EMBANK	MENTS — CORE BURING	SAMPLE ST- SHELBY TUBE	VERY SEVERE (V. SEV.)	ALL ROCK EXCEPT QUARTZ DIS	iscolored or s reduced to soil	TAINED, ROCK FABRIC ELEME STATUS WITH ONLY FRAGME	ints are discernible but Fints of strong rock remaining	ROCK SEGMENTS EQUAL TO OR GREATER THAN 18 CENTEMETERS DIVIDED BY THE TOTAL LENGTH OF CORE RUN AND EXPRESSED AS A PERCENTAGE.
	VERY SO	FT	(2	(25	INFERRED SOIL B	OUNDARIES MONITORING WEL	CAMPI C		SAPROLITE IS AN EXAMPLE OF	of rock weather	red to a degree such tha	T ONLY MINOR VESTIGES OF THE	SAPROLITE (SAP.) - RESIDUAL SOIL WHICH RETAINS THE RELIC STRUCTURE OR FABRIC OF THE PARENT ROCK.
GENERALI SILT-CLA		TUM STIFF 4 TO 8 TIFF 8 TO 15	4 TO 8 59 TO 199 8 TO 15 199 TO 299		ヨガヨカミ INFERRED ROCK I	0	RS- ROCK SAMPLE	į.	ORIGINAL ROCK FABRIC REMAIN. <u>IF TESTED YIELDS SPT N VALUES < 1888 BLOWS PER 38 cm.</u>			SILL - AN INTRUSIVE BODY OF IGNEOUS ROCK OF APPROXIMATELY UNIFORM THICKNESS AND RELATIVELY THIN	
MATERIAL	STIFF			TTTTT ALLUVIAL SOIL BOUNDARY INSTALLATION		RT- RECOMPACTED		ROCK REDUCED TO SOIL, ROCK FABRIC NOT DISCERNIBLE, OR DISCERNIBLE ONLY IN SMALL AND SCATTERED CONCENTRATIONS, QUARTZ MAY BE PRESENT AS DIKES OR STRINGERS, SAPROLITE IS			COMPARED WITH ITS LATERAL EXTENT, WHICH HAS BEEN EMPLACED PARALLEL TO THE BEDDING OR SCHISTOSITY OF THE INTRUDED ROCKS.		
(COHESIV	E) VERY ST.	IFF 1	15 TO 3Ø	200 TO 490 >400	25/825 DIP/DIP DIRECTIO	ON OF SLOPE INDICATO			also an example.				SLICKENSIDE - POLISHED AND STRIATED SURFACE THAT RESULTS FROM FRICTION ALONG A FAULT OR
					ROCK STRUCTURE	is _	CBR - CBR SAMPLE			ROCK H	ARDNESS		SLIP PLANE.
					SOUNDING ROD	SPT N-VALUE		VERY HARD CANNOT BE SCRATCHED BY KNIFE OR SHARP PICK, BREAKING OF HAND SPECIMENS REQUIRES					STANDARD PENETRATION TEST OPENETRATION RESISTANCE (SPT) - NUMBER OF BLOWS 00 OF A 63.5 kg HAMMER FALLING 8.76 METERS REDUIRED TO PRODUCE A PENETRATION OF 38 cm INTO SOIL WITH
U.S. STD. SIEVE SIZE 4 10 40 60 200 270 OPENING 04M0 4.76 2.0 0.42 0.25 0.075 0.053 -					a			Several hard blows of the geologists pick. HARD CAN BE SCRATCHED BY KNIFE OR PICK ONLY WITH DIFFICULTY, HARD HAMMER BLOWS REQUIRED				WHER BLOWS REQUIRED	A 5 om OUTSIDE DIAMETER SPLIT SPOON SAMPLER, SPT REFUSAL IS LESS THAN 2.5 om PENETRATION WITH 50 BLOWS.
BOULDER COBBLE GRAVEL COARSE FINE SILT CLAY					AD AIRCE SECTION	ABBREVIATIONS	V - MOISTURE CONTENT	14440	TO DETACH HAND SPECIMEN.				STRATA CORE RECOVERY (SREC.) - TOTAL LENGTH OF STRATA MATERIAL RECOVERED DIVIDED BY TOTAL LENGTH
(BLDRJ)		GRJ (CSE			AR - AUGER REFUSAL BT - BORING TERMINATED	HSA - HOLLOW STEM AUGER MED MEDIUM	V VERY	MODERATELY HARD	CAN BE SCRATCHED BY KNIFF EXCAVATED BY HARD BLOW O				OF STRATUM AND EXPRESSED AS A PERCENTAGE.
GRAIN MM		2.8	Ø.25	0.25 2.865	CL CLAY CPT - CONE PENETRATION 1	MIC MICACEOUS NGWE - NO GROUNDVATER ENCOUNTER	VST - VANE SHEAR TEST WOH - WEIGHT OF HAMMER	1888	BY MODERATE BLOWS.	OI II OCOCOODI		, and services	STRATA ROCK QUALITY DESIGNATION (S.R.Q.D.) - A MEASURE OF ROCK QUALITY DESCRIBED BY: TOTAL LENGTH OF ROCK SEGMENTS WITHIN A STRATUM EQUAL TO OR GREATER THAN 18 CENTIMETERS DIVIDED
SIZE IN.					CSE COARSE	N/M - NOT MEASURED PMT - PRESSUREMETER TEST		Medium Haro	CAN BE GROOVED OR GOUGED CAN BE EXCAVATED IN SMALL				BY THE TOTAL LENGTH OF STRATA AND EXPRESSED AS A PERCENTAGE.
SOIL MOISTURE - CORRELATION OF TERMS				rerms	DIT - DILATOMETER TEST SD SAND, SANDY		III III	POINT OF A GEOLOGISTS PIC				TOPSOIL (T.S.) - SURFACE SOILS USUALLY CONTAINING ORGANIC MATTER.	
	ISTURE SCALE ERG LIMITS)	FIELD MOISTURE DESCRIPTION	GUIDE FOR	FIELD MOISTURE DESCRIPTION	DPT - DYNAMIC PENETRATIO • - VOID RATIO	SCI - SCIGNICI		SOFT	CAN BE GROVED OR GOUGED			ATED IN FRAGMENTS F A PICK POINT, SMALL, THIN	BENCH MARK: *962 Rebar - Sta. 18+04.666, CL -L-
T		- SATURATED -	IKINI V I	IQUID, VERY WET, USUALLY	F FINE	TCR - TRICONE REFUSAL			PIECES CAN BE BROKEN BY I			F H FICK FOURTS SPINIS THUS	
				W THE GROUND WATER TABLE	FOSS FOSSILIFEROUS 7 - UNIT WEIGHT 7d - DRY UNIT WEIGHT			VERY	can be carved with knife. Can be excavated readily or more in thickness can be broken by finger pres				ELEVATION: 81.44 lm
LASTIC T	LIQUID LIMIT _				FRAGS FRAGMENTS			SOFT OR MORE IN THICKNESS CAN BE BROKEN BY FINGER PRESSURE FINGERNAIL.		PINOCH PRESSURE ON BE	SUMMONED REMOILT DI	NOTES:	
RANGE <		- WET - (W)		REQUIRES DRYING TO TIMUM MOISTURE	EQU	JIPMENT USED ON SUBJECT P	ROJECT	FF	RACTURE SPACING			DING	K 4574
"" PLL+	PLASTIC LIMIT _				DRILL UNITS	ADVANCING TOOLS	HAMMER TYPE:	IERM	SPACING		TERM VERY THICKLY BEDOED	THICKNESS > 1 m	X
on L	OPTIMUM MOISTURE	- MOIST - (M)	SOLID; AT	OR NEAR OPTIMUM MOISTURE		CLAY BITS	AUTOMATIC MANUAL	VERY VIDE VIDE	MORE THAN 3 m 1 TO 3 m	•	THICKLY BEDOED	6.5 - 1 m	/ \frac{1}{2} ArtificialFill Symbol Used For
SL_	SHRINKAGE LIMIT _				MOBILE B	152 mm HOLLOW AUGER		MODERATE	LY CLOSE 369 TO 1669 cm		THINLY BEDOED VERY THINLY BEDOED	8.95 - 8.5 m 18 - 58 mm	XX See a algebra
1		- DRY - (D)		ADDITIONAL WATER TO TIMUM MOISTURE	BK-51		CORE SIZE	CLOSE VERY CLOS	5 TO 36 om SE LESS THAN 5 or	Den .	THICKLY LAMINATED THINLY LAMINATED	2.5 - 18 mm < 2.5 mm	
				TENON POISTORE	- L	283 mm HOLLOW AUGERS	│			INDURA		\ 23 IMI	X ,7
	PLASTICITY PLASTICITY PROCESSES PROCESSES		CME-45 HARD FACED FINGER BITS		X-Ng	FOR SEDIMENTARY ROCKS, INDURATION IS THE HARDENING OF THE MATERIAL BY CEMENTING, HEAT, PRESSURE, ETC.							
NONPLASTIC		PLASTICITY INDEX (PI)	x (PD	DRY STRENGTH VERY LOW	X CME-55Ø	TUNGCARBIDE INSERTS	□-+			RUBBING WITH FINGER FREES NUMEROUS GRAINS		RAINS	
LOW PLASTICE		6-15		SLIGHT	IZJ LITE-008	CASING W/ ADVANCER	HAND TOOLS	FRI	APLE		BY HAMMER DISINTEGRATES		
MED. PLASTICI HIGH PLASTIC		16-25 26 OR MOR	MEDIUM DRE HIGH		PORTABLE HOIST	TRECONE 75 mm STEEL TEETH	POST HOLE DIGGER	MOC	ERATELY INDURATED		BE SEPARATED FROM SAMPLE LY WHEN HIT WITH HAMMER.	WITH STEEL PROBE	
COLOR					T OTHER CHE-EE	TRICONE mm TUNGCARB.	HAND AUGER				•	u eren 2000e.	
DESCRIPTION	TONS MAY THIS USE CO.		······································	D, YEL-BRN, BLUE-GRAY)	OTHER CME-55	CORE BIT	SOUNDING ROD	IND	URATED		difficult to separate vit Dereak with Hammer.	n ofEEL FRANCE	
	SUCH AS LIGHT, DARK				OTHER	OTHER	VANE SHEAR TEST	EXT	REMELY INDURATED		R BLOWS REQUIRED TO BREA	K SAMPLE;	
					1		OTHER	L		SAMPLE BREA	KS ACROSS GRAINS.		
													REVISED 09/15/00