

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS
GEOTECHNICAL ENGINEERING UNIT



SUBSURFACE INVESTIGATION

SOIL AND ROCK LEGEND, TERMS, SYMBOLS, AND ABBREVIATIONS

SOIL DESCRIPTION					GRADATION					ROCK DESCRIPTION					TERMS AND DEFINITIONS				
SOIL IS CONSIDERED TO BE THE UNCONSOLIDATED, SEMI-CONSOLIDATED OR WEATHERED EARTH MATERIALS WHICH CAN BE PENETRATED WITH A CONTINUOUS FLIGHT POWER AUGER, AND WHICH YIELDS LESS THAN 100 BLOWS PER 30 cm ACCORDING TO STANDARD PENETRATION TEST (AASHTO T206, ASTM D-1586). SOIL CLASSIFICATION IS BASED ON THE AASHTO SYSTEM AND BASIC DESCRIPTIONS GENERALLY SHALL INCLUDE: CONSISTENCY, COLOR, TEXTURE, MOISTURE, AASHTO CLASSIFICATION, AND OTHER PERTINENT FACTORS SUCH AS MINERALOGICAL COMPOSITION, ANGULARITY, STRUCTURE, PLASTICITY, ETC. EXAMPLE: <i>VERY STIFF, GRAY SILTY CLAY, MOST WITH INTERBEDDED FINE SAND LAYERS, HIGHLY PLASTIC, A-7-6</i>					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 POORLY GRADED). GAP-GRADED - INDICATES A MIXTURE OF UNIFORM PARTICLES OF TWO OR MORE SIZES.					HARD ROCK IS NON-COASTAL PLAIN MATERIAL THAT WHEN TESTED, WOULD YIELD SPT REFUSAL. AN INFERRED ROCK LINE INDICATES THE LEVEL AT WHICH NON-COASTAL PLAIN MATERIAL WOULD YIELD SPT REFUSAL. SPT REFUSAL IS PENETRATION BY A SPLIT SPOON SAMPLER EQUAL TO OR LESS THAN 2.5 cm PER 50 BLOWS. IN NON-COASTAL PLAIN MATERIAL, THE TRANSITION BETWEEN SOIL AND ROCK IS OFTEN REPRESENTED BY A ZONE OF WEATHERED ROCK. ROCK MATERIALS ARE TYPICALLY DIVIDED AS FOLLOWS:					ALLUVIUM (ALLUV.) - SOILS WHICH HAVE BEEN TRANSPORTED BY WATER. AQUIFER - A WATER BEARING FORMATION OR STRATA. ARENACEOUS - APPLIED TO ROCKS THAT HAVE BEEN DERIVED FROM SAND OR THAT CONTAIN SAND. ARGILLACEOUS - APPLIED TO ALL ROCKS OR SUBSTANCES COMPOSED OF CLAY MINERALS, OR HAVING A NOTABLE PROPORTION OF CLAY IN THEIR COMPOSITION, AS SHALE, SLATE, ETC. ARTESIAN - GROUND WATER THAT IS UNDER SUFFICIENT PRESSURE TO RISE ABOVE THE LEVEL AT WHICH IS ENCOUNTERED, BUT WHICH DOES NOT NECESSARILY RISE TO OR ABOVE THE GROUND SURFACE. CALCAREOUS (CALC.) - SOILS WHICH CONTAIN APPRECIABLE AMOUNTS OF CALCIUM CARBONATE. COLLUVIUM - ROCK FRAGMENTS MIXED WITH SOIL DEPOSITED BY GRAVITY ON SLOPE OR AT BOTTOM OF SLOPE. CORE RECOVERY (REC.) - TOTAL LENGTH OF ALL MATERIAL RECOVERED IN THE CORE BARREL DIVIDED BY TOTAL LENGTH OF CORE RUN AND EXPRESSED AS A PERCENTAGE. DIKE - A TABULAR BODY OF IGNEOUS ROCK THAT CUTS ACROSS THE STRUCTURE OF ADJACENT ROCKS OR CUTS MASSIVE ROCK. DIP - THE ANGLE AT WHICH A STRATUM OR ANY PLANAR FEATURE IS INCLINED FROM THE HORIZONTAL. DIP DIRECTION (DIP AZIMUTH) - THE DIRECTION OR BEARING OF THE HORIZONTAL TRACE OF THE LINE OF DIP, MEASURED CLOCKWISE FROM NORTH. FAULT - A FRACTURE OR FRACTURE ZONE ALONG WHICH THERE HAS BEEN DISPLACEMENT OF THE SIDES RELATIVE TO ONE ANOTHER PARALLEL TO THE FRACTURE. FISSILE - A PROPERTY OF SPLITTING ALONG CLOSELY SPACED PARALLEL PLANES. FLOAT - ROCK FRAGMENTS ON SURFACE NEAR THEIR ORIGINAL POSITION AND DISLOGGED FROM PARENT MATERIAL FLOOD PLAIN (F.P.) - LAND BORDERING A STREAM, BUILT OF SEDIMENTS DEPOSITED BY THE STREAM. FORMATION (FM) - A MAPPABLE GEOLOGIC UNIT THAT CAN BE RECOGNIZED AND TRACED IN THE FIELD. JOINT - FRACTURE IN ROCK ALONG WHICH NO APPRECIABLE MOVEMENT HAS OCCURRED. LEDGE - A SHELF-LIKE RIDGE OR PROJECTION OF ROCK WHOSE THICKNESS IS SMALL COMPARED TO ITS LATERAL EXTENT. LENS - A BODY OF SOIL OR ROCK THAT THINS OUT IN ONE OR MORE DIRECTIONS. MOTTLED (MOT.) - IRREGULARLY MARKED WITH SPOTS OF DIFFERENT COLORS. MOTTLING IN SOILS USUALLY INDICATES POOR AERATION AND LACK OF GOOD DRAINAGE. PERCHED WATER - WATER MAINTAINED ABOVE THE NORMAL GROUND WATER LEVEL BY THE PRESENCE OF AN INTERVENING IMPERVIOUS STRATUM. RESIDUAL SOIL - SOIL FORMED IN PLACE BY THE WEATHERING OF ROCK. ROCK QUALITY DESIGNATION (R.Q.D.) - A MEASURE OF ROCK QUALITY DESCRIBED BY: TOTAL LENGTH OF ROCK SEGMENTS EQUAL TO OR GREATER THAN 10 CENTIMETERS DIVIDED BY THE TOTAL LENGTH OF CORE RUN AND EXPRESSED AS A PERCENTAGE. SAPROLITE (SAP.) - RESIDUAL SOIL WHICH RETAINS THE RELIC STRUCTURE OR FABRIC OF THE PARENT ROCK. SILL - AN INTRUSIVE BODY OF IGNEOUS ROCK OF APPROXIMATELY UNIFORM THICKNESS AND RELATIVELY THIN COMPARED WITH ITS LATERAL EXTENT, WHICH 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.				
SOIL LEGEND AND AASHTO CLASSIFICATION					ANGULARITY OF GRAINS					WEATHERED ROCK (WR)					NON-COASTAL PLAIN MATERIAL THAT YIELDS SPT N VALUES > 100 BLOWS PER 30 cm.				
GENERAL CLASS.					MINERALOGICAL COMPOSITION					CRYSTALLINE ROCK (CR)					FINE TO COARSE GRAIN IGNEOUS AND METAMORPHIC ROCK THAT WOULD YIELD SPT REFUSAL IF TESTED. ROCK TYPE INCLUDES GRANITE, GNEISS, GABBRO, SCHIST, ETC.				
GROUP CLASS.					COMPRESSIBILITY					NON-CRYSTALLINE ROCK (NCR)					FINE TO COARSE GRAIN METAMORPHIC AND NON-COASTAL PLAIN SEDIMENTARY ROCK THAT WOULD YIELD SPT REFUSAL IF TESTED. ROCK TYPE INCLUDES PHYLITE, SLATE, SANDSTONE, ETC.				
SYMBOL					SLIGHTLY COMPRESSIBLE MODERATELY COMPRESSIBLE HIGHLY COMPRESSIBLE					COASTAL PLAIN SEDIMENTARY ROCK (CP)					COASTAL PLAIN SEDIMENTS CEMENTED INTO ROCK, BUT MAY NOT YIELD SPT REFUSAL. ROCK TYPE INCLUDES LIMESTONE, SANDSTONE, CEMENTED SHELL BEDS, ETC.				
GRANULAR MATERIALS (<3% PASSING #200)					PERCENTAGE OF MATERIAL					WEATHERING					FRESH				
SILT-CLAY MATERIALS (>3% PASSING #200)					ORGANIC MATERIAL					MODERATE (MOD.)					SLIGHT (SLI.)				
ORGANIC MATERIALS					TRACE OF ORGANIC MATTER LITTLE ORGANIC MATTER MODERATELY ORGANIC HIGHLY ORGANIC					SEVERE (SEV.)					VERY SEVERE (V. SEV.)				
MUCK, PEAT					GRANULAR SOILS					COMPLETE					VERY HARD				
HIGHLY ORGANIC SOILS					SILT-CLAY SOILS					SOILS WITH LITTLE OR MODERATE AMOUNTS OF ORGANIC MATTER					HARD				
USUAL TYPES OF MAJOR MATERIALS					GROUND WATER					SEVERE (SEV.)					MODERATELY SEVERE (MOD. SEV.)				
EXCELLENT TO GOOD					FAIR TO POOR					PERCHED WATER, SATURATED ZONE OR WATER BEARING STRATA					MODERATE (MOD.)				
FAIR TO POOR					POOR					SPRING OR SEEPAGE					VERY SEVERE (V. SEV.)				
UNSATURABLE					MISCELLANEOUS SYMBOLS					ROCK HARDNESS					SOFT				
P.I. OF A-7-5 <= L.L. - 30 ; P.I. OF A-7-6 > L.L. - 30					ROADWAY EMBANKMENT WITH SOIL DESCRIPTION					TEST BORING					HARD				
CONSISTENCY OR DENSENESS					SOIL SYMBOL					AUGER BORING					MODERATELY HARD				
VERY LOOSE					ARTIFICIAL FILL OTHER THAN ROADWAY EMBANKMENTS					CORE BORING					MEDIUM HARD				
LOOSE					INFERRED SOIL BOUNDARIES					MONITORING WELL					HARD				
MEDIUM DENSE					INFERRED ROCK LINE					PIEZOMETER INSTALLATION					VERY HARD				
DENSE					ALLUVIAL SOIL BOUNDARY					SLOPE INDICATOR INSTALLATION					VERY HARD				
VERY DENSE					DIP/DIP DIRECTION OF ROCK STRUCTURES					SPT N-VALUE					VERY HARD				
VERY SOFT					SOUNDING ROD					SPT REFUSAL					VERY HARD				
SOFT					ABBREVIATIONS					FRACTURE SPACING					VERY HARD				
MEDIUM STIFF					AR - AUGER REFUSAL					TERM					VERY HARD				
STIFF					BT - BORING TERMINATED					SPACING					VERY HARD				
VERY STIFF					CL - CLAY					THICKNESS					VERY HARD				
HARD					CPT - CONE PENETRATION TEST					VERY THICKLY BEDDED					VERY HARD				
TEXTURE OR GRAIN SIZE					CSE - COARSE					THICKLY BEDDED					VERY HARD				
U.S. STD. SIEVE SIZE					DMT - DILATOMETER TEST					THINLY BEDDED					VERY HARD				
OPENING (MM)					DPT - DYNAMIC PENETRATION TEST					VERY THINLY BEDDED					VERY HARD				
BOULDER (BLDR.)					F. - FINE					THICKLY LAMINATED					VERY HARD				
COBBLE (COB.)					FOSS. - FOSSILIFEROUS					VERY CLOSE					VERY HARD				
GRAVEL (GR.)					FRAC. - FRACTURED					VERY CLOSE					VERY HARD				
GRAIN SIZE					FRAGS. - FRAGMENTS					VERY CLOSE					VERY HARD				
SOIL MOISTURE - CORRELATION OF TERMS					MED. - MEDIUM					VERY CLOSE					VERY HARD				
FIELD MOISTURE DESCRIPTION					PMT - PRESSUREMETER TEST					VERY CLOSE					VERY HARD				
SATURATED - (SAT.)					SD. - SAND, SANDY					VERY CLOSE					VERY HARD				
WET - (W)					SL. - SILT, SILTY					VERY CLOSE					VERY HARD				
LIQUID LIMIT					SLI. - SLIGHTLY					VERY CLOSE					VERY HARD				
PLASTIC LIMIT					TCR - TRICONE REFUSAL					VERY CLOSE					VERY HARD				
OPTIMUM MOISTURE					UNIT WEIGHT					VERY CLOSE					VERY HARD				
SHRINKAGE LIMIT					DRY UNIT WEIGHT					VERY CLOSE					VERY HARD				
PLASTICITY					MOISTURE CONTENT					VERY CLOSE					VERY HARD				
PLASTICITY INDEX (PI)					VERY					VERY CLOSE					VERY HARD				
DRY STRENGTH					VERY					VERY CLOSE					VERY HARD				
NONPLASTIC					VERY					VERY CLOSE					VERY HARD				
LOW PLASTICITY					VERY					VERY CLOSE					VERY HARD				
MED. PLASTICITY					VERY					VERY CLOSE					VERY HARD				
HIGH PLASTICITY					VERY					VERY CLOSE					VERY HARD				
COLOR					VERY					VERY CLOSE					VERY HARD				
DESCRIPTIONS MAY INCLUDE COLOR OR COLOR COMBINATIONS (TAN, RED, YEL.-BRN, BLUE-GRAY)					VERY					VERY CLOSE					VERY HARD				
MODIFIERS SUCH AS LIGHT, DARK, STREAKED, ETC. ARE USED TO DESCRIBE APPEARANCE.					VERY					VERY CLOSE					VERY HARD				

BENCH MARK: NAIL IN GROUND AT STA. 18+09.550 1.946m LT. -LC1B2-
ELEVATION: 466.02m