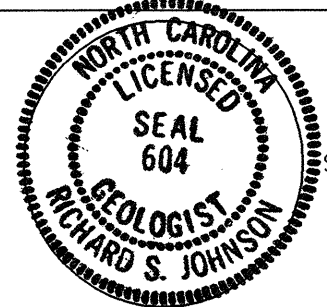


NORTH CAROLINA DIVISION OF HIGHWAYS
 GEOTECHNICAL UNIT

SOIL AND ROCK CLASSIFICATION, LEGEND, AND ABBREVIATIONS

| SOIL LEGEND AND AASHTO CLASSIFICATION | | | | | | | | | | CONSISTENCY OR DENSENESS | | | | |
|---|--|---|--|---|-------------------------|-------------------------|-------------------------|-------------------------|-------------------------|--------------------------|---|--|---|-----|
| GENERAL CLASS. | GRANULAR MATERIALS (≤ 35% PASSING #200) | | | SILT-CLAY MATERIALS (> 35% PASSING #200) | | | | ORGANIC MATERIALS | | PRIMARY SOIL TYPE | COMPACTNESS OR CONSISTENCY | RANGE OF STANDARD PENETRATION RESISTANCE (N - VALUE) | RANGE OF UNCONFINED COMPRESSIVE STRENGTH (qu) (kN / m ²) | |
| GROUP CLASS. | A-1 | A-3 | A-2 | | A-4 | A-5 | A-6 | A-7 | A-1,A-2 A-3 | A-4,A-5 A-6,A-7 | GENERALLY GRANULAR MATERIAL | VERY LOOSE LOOSE MEDIUM DENSE DENSE VERY DENSE | < 4 4 TO 10 10 TO 30 30 TO 50 > 50 | N/A |
| SYMBOL | | | | | | | | | | | | | | |
| % PASSING | #10 #40 #200 | 50 MX 30 MX 15 MX | 50 MX 25 MX 10 MX | 51 MN 10 MX | 35 MX 35 MX 35 MX | 35 MX 35 MX 35 MX | 36 MN 36 MN 36 MN | 36 MN 36 MN 36 MN | 41 MN 41 MN 41 MN | 41 MN 41 MN 41 MN | GRANULAR SOILS | SILT-CLAY SOILS | MUCK, PEAT | |
| (PASSING #40) | LL PI | 6 MX | N.P. | 40 MX 10 MX | 41 MN 10 MX | 40 MX 11 MN | 40 MX 10 MX | 41 MN 11 MN | 41 MN 11 MN | 41 MN 11 MN | SOILS WITH LITTLE OR MODERATE AMOUNTS OF ORGANIC MATTER | | HIGHLY ORGANIC SOILS | |
| GROUP INDEX | 0 | 0 | 0 | 4 MX | 8 MX | 12 MX | 16 MX | NO MX | | | | | | |
| USUAL TYPES OF MAJOR MATERIALS | STONE FRAGS. GRAVEL & SAND | FINE SAND | SILTY OR CLAYEY GRAVEL AND SAND | | SILTY SOILS | CLAYEY SOILS | | | | | | | | |
| * PI OF A-7-5 < (LL-30); PI OF A-7-6 > (LL-30) | | | | | | | | | | | | | | |
| TEXTURE OR GRAIN SIZE | | | | | | | | | | | | | | |
| BOULDER | COBBLE | GRAVEL | COARSE SAND | FINE SAND | SILT | CLAY | | | | | | | | |
| GRAIN (mm) | 305 | 75 | 2 | 0.25 | 0.075 | 0.0075 | | | | | | | | |
| SIZE (IN) | 12 | 3 | | | | | | | | | | | | |
| SOIL MOISTURE - CORRELATION OF TERMS | | | | | | | | | | | | | | |
| SOIL MOISTURE SCALE (ATTERBERG LIMITS) | | FIELD MOISTURE DESCRIPTION | | GUIDE FOR FIELD MOISTURE DESCRIPTION | | | | | | | | | | |
| LL | LIQUID LIMIT | -SATURATED- (SAT.) | USUALLY LIQUID; VERY WET, USUALLY FROM BELOW THE GROUND WATER TABLE | | | | | | | | | | | |
| PL | PLASTIC LIMIT | -WET- (W) | SEMISOLID; REQUIRES DRYING TO ATTAIN OPTIMUM MOISTURE | | | | | | | | | | | |
| OM | OPTIMUM MOISTURE | -MOIST- (M) | SOLID; AT OR NEAR OPTIMUM MOISTURE | | | | | | | | | | | |
| SL | SHRINKAGE LIMIT | -DRY- (D) | REQUIRES ADDITIONAL WATER TO ATTAIN OPTIMUM MOISTURE | | | | | | | | | | | |
| ROCK DESCRIPTION | | | | | | | | | | | | | | |
| IN THE BROADEST MEANING, HARD ROCK IS CONSIDERED TO BE THAT INDURATED EARTH MATERIAL WHICH CANNOT BE SAMPLED BY CONVENTIONAL SOIL SAMPLING TOOLS OR TECHNIQUES. THE BOUNDARY BETWEEN 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 MATERIALS ARE DIVIDED AS FOLLOWS: | | | | | | | | | | | | | | |
| TERM | SYMBOLS | | | DESCRIPTION | | | | | | | | | | |
| HARD ROCK (HR) | CORED ROCK | INFERRED ROCK LINE | MATERIAL THAT CANNOT BE PENETRATED BY POWER AUGERS, EXCEPT IN THIN LEDGES, AND REQUIRES ROCK CORING TOOLS FOR OBTAINING A SAMPLE | | | | | | | | | | | |
| WEATHERED ROCK (WR) | HARD WEATHERED ROCK (HWR) | MATERIAL THAT CAN BE PENETRATED WITH GREAT DIFFICULTY USING POWER AUGERS AND YIELDS SPT REFUSAL | | | | | | | | | | | | |
| | SOFT WEATHERED ROCK (SWR) | MATERIAL THAT CAN BE PENETRATED WITH SOME DIFFICULTY USING POWER AUGERS AND YIELDS SPT VALUES > 100 BLOWS BUT < SPT REFUSAL | | | | | | | | | | | | |
| ¹ SPT REFUSAL ≤ 2.5 cm OF PENETRATION PER 50 BLOWS IN SPT. ² AN INFERRED ROCK LINE INDICATES THE LEVEL AT WHICH AUGERS COULD NO LONGER PENETRATE. THE HARD ROCK SYMBOL IS SHOWN WHEN ROCK IS CORED AND ONLY TO THAT DEPTH CORED. A DESCRIPTION OF ROCK IS GIVEN, INCLUDING: CORE RECOVERY (REC.) - TOTAL LENGTH OF ROCK RECOVERED IN THE CORE BARREL DIVIDED BY THE TOTAL LENGTH OF THE CORE RUN TIMES 100%. ROCK QUALITY DESIGNATION (ROD) - TOTAL LENGTH OF SOUND ROCK SEGMENTS RECOVERED THAT ARE LONGER THAN OR EQUAL TO 0.1 m DIVIDED BY THE TOTAL LENGTH OF THE CORE RUN TIMES 100%. | | | | | | | | | | | | | | |
| ROCK DESCRIPTION | | | | | | | | | | | | | | |
| ALLUV. | ALLUVIUM | MIC. | MICACEOUS | | | | | | | | | | | |
| AR | AUGER REFUSAL | MOT. | MOTTLED | | | | | | | | | | | |
| BLDR. | BOULDER | N | BLOWS / 30 CM | | | | | | | | | | | |
| CALC. | CALCAREOUS | NS | NO SAMPLE TAKEN | | | | | | | | | | | |
| CL. | CLAY | ORG. | ORGANIC | | | | | | | | | | | |
| CLY. | CLAYEY | P.P. | POCKET PENETROMETER | | | | | | | | | | | |
| COB. | COBBLE | REF. | REFER TO | | | | | | | | | | | |
| CSE. | COARSE | RES. | RESIDUAL | | | | | | | | | | | |
| DPT | DYNAMIC PENETRATION TEST | S. | SOFT | | | | | | | | | | | |
| EST. | ESTIMATED | SAT. | SATURATED | | | | | | | | | | | |
| F. | FINE | SD. | SAND | | | | | | | | | | | |
| FIAD | FILLED (IMED. AFTER DRILLING) | SDY. | SANDY | | | | | | | | | | | |
| FOSS. | FOSSILIFEROUS | SED(S). | SEDIMENT(S) | | | | | | | | | | | |
| FRAC. | FRAGMENTED | SL. | SILT, SILTY | | | | | | | | | | | |
| FRAG(S). | FRAGMENT(S) | SLL. | SLIGHTLY | | | | | | | | | | | |
| GR. | GRAVEL | SPT | STANDARD PENETRATION TEST | | | | | | | | | | | |
| GS | SPECIFIC GRAVITY | TS. | TOPSOIL | | | | | | | | | | | |
| GW | GROUND WATER | VST | VANE SHEAR TEST | | | | | | | | | | | |
| MED. | MEDIUM | V. | VERY | | | | | | | | | | | |
| | | W/ | WITH | | | | | | | | | | | |
| BENCH MARK: "BL 1030", -L- STA. 78+34.57, 8.053m RT | | | | | | | | | | | | | | |
| ELEVATION 94.85m | | | | | | | | | | | | | | |
| STATE PROJECT NO. 8.T311002 | | | | | | | | | | | | | | |
| T.I.P. NO. R-2552B F.A. NO. NHF-60-1(9) | | | | | | | | | | | | | | |
| COUNTY JOHNSTON ROUTE US 70 BYPASS | | | | | | | | | | | | | | |
| SITE DESCRIPTION DUAL BRIDGES ON -L- (US 70 BYPASS) OVER -Y10- (SR 1555, BARBER MILL ROAD) | | | | | | | | | | | | | | |
| PROJECT GEOLOGIST S. P. BROWN SUBMITTED BY R. S. JOHNSON | | | | | | | | | | | | | | |
| PERSONNEL E. C. CAMPBELL, H. R. CONLEY, E. A. POPE, M. B. ALLEN, T. T. WALKER DATE SUBMITTED 03/02 | | | | | | | | | | | | | | |



Signature: *Richard S. Johnson*

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