NORTH CAROLINA DIVISION OF HIGHWAYS

GEOTECHNICAL UNIT

SOIL AND ROCK CLASSIFICATION, LEGEND, AND ABBREVIATIONS

SOIL LEGEND AND AASHTO CLASSIFICATION

GENERAL CLASS.	GRANULAR MATERIALS (≤ 35% PASSING #200)							SILT-CLAY MATERIALS (> 35% PASSING #200)				ORGANIC MATERIALS		
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	
	A-1-a	A-1-b		A-2-4	A-2-5	A-2-6	A-2-7				A-7-5 A-7-6			
SYMBOL														
% PASSING #10	50 MX											GRANULAR SOILS	SILT-CLAY SOILS	MUCK, PEAT
#40	30 MX	50 MX	51 MN											
#200	15 MX	25 MX	10 MX	35 MX	35 MX	35 MX	35 MX	36 MN	36 MN	36 MN	36 MN			
(PASSING #40) LL				40 MX	41 MN	40 MX	41 MN	40 MX	41 MN	40 MX	41 MN	SOILS WITH LITTLE OR MODERATE AMOUNTS OF ORGANIC MATTER		HIGHLY ORGANIC SOILS
PI	6 MX		N.P.	10 MX	10 MX	11 MN	11 MN	10 MX	10 MX	11 MN	11 MN			
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 SIZE	305 mm	75 mm	2 mm	0.25 mm	0.05 mm	0.005 mm
	12 IN	3 IN				

SOIL MOISTURE - CORRELATION OF TERMS

SOIL MOISTURE SCALE (ATTERBERG LIMITS)	FIELD MOISTURE DESCRIPTION	GUIDE FOR FIELD MOISTURE DESCRIPTION
	-SATURATED- (SAT.)	USUALLY LIQUID; VERY WET, USUALLY FROM BELOW THE GROUND WATER TABLE
LL LIQUID LIMIT		
PLASTIC RANGE (PI)	-WET- (W)	SEMISOLID; REQUIRES DRYING TO ATTAIN OPTIMUM MOISTURE
PL PLASTIC LIMIT		
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 [2]	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 [1]
		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 (RQD) - 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%.

NORTH CAROLINA PROFESSIONAL SEAL 19670 ENGINEER DOUGLAS O. BELL

SEAL

Douglas O. Bell

Signature

CONSISTENCY OR DENSENESS

PRIMARY SOIL TYPE	COMPACTNESS OR CONSISTENCY	RANGE OF STANDARD PENETRATION RESISTANCE (N - VALUE)	RANGE OF UNCONFINED COMPRESSIVE STRENGTH (q_u) (kN / m²)
GENERALLY GRANULAR MATERIAL	VERY LOOSE	< 4	N/A
	LOOSE	4 TO 10	
	MEDIUM DENSE	10 TO 30	
	DENSE	30 TO 50	
	VERY DENSE	> 50	
GENERALLY SILT-CLAY MATERIAL	VERY SOFT	< 2	< 25
	SOFT	2 TO 4	25 TO 50
	MEDIUM STIFF	4 TO 8	50 TO 100
	STIFF	8 TO 15	100 TO 200
	VERY STIFF	15 TO 30	200 TO 400
	HARD	> 30	> 400

GROUND WATER

- WATER LEVEL IN BORE HOLE — IMMEDIATELY AFTER DRILLING (I.A.D.) / SOON AFTER DRILLING (_____ HRS.)
- STATIC WATER LEVEL (AFTER 24 HRS.)
- PERCHED WATER (PW), SATURATED ZONE, OR WATER BEARING STRATA
- SPRING OR SEEPAGE

MISCELLANEOUS SYMBOLS AND ABBREVIATIONS

- ROADWAY EMBANKMENT WITH SOIL DESCRIPTION
- SOIL SYMBOL
- ARTIFICIAL FILL OTHER THAN ROADWAY EMBANKMENTS
- INFERRED SOIL BOUNDARIES
- 25° STRIKE AND DIP
- APPARENT DIP (NORMAL TO_____)
- ROD SOUNDING
- SPT / DPT / VST TEST BORING
- AUGER BORING
- CORE BORING
- PIEZOMETER INSTALLATION
- SLOPE INDICATOR INSTALLATION
- SPT N-VALUE
- MONITORING WELL

SAMPLE DESIGNATIONS: S-BULK SAMPLE; SS-SPLIT SPOON SAMPLE; ST-SHELBY TUBE SAMPLE; RS-ROCK SAMPLE

ABBREVIATIONS

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 IMMED. AFTER DRILLING	SDY.	SANDY
FOSS.	FOSSILIFEROUS	SED(S).	SEDIMENT(S)
FRAC.	FRACTURED	SL.	SILT, SILTY
FRAG(S).	FRAGMENT(S)	SLI.	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: TBM: Sta. 22+69.622, 16.633 m RT -Y5- Elev. = 42.953 m

STATE PROJECT NO. 6.469002T

T.I.P. NO. R-0513C F.A. NO. NA

COUNTY Robeson ROUTE -Y1-

SITE DESCRIPTION Bridge on -Y1- (SR 1164, Back Swamp Road) Over -L- (Proposed US 74)

PROJECT GEOLOGIST TJRoberson SUBMITTED BY DOBell

PERSONNEL MHStephens

MSeiler

DATE SUBMITTED 5/7/01

REV. 8/11/98