

**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-4-A-5	A-6-A-7								
SYMBOL																			
% PASSING	50 MX 30 MX 15 MX	50 MX 30 MX 15 MX	50 MX 30 MX 15 MX	50 MX 30 MX 15 MX	50 MX 30 MX 15 MX	50 MX 30 MX 15 MX	50 MX 30 MX 15 MX	50 MX 30 MX 15 MX	50 MX 30 MX 15 MX	50 MX 30 MX 15 MX	50 MX 30 MX 15 MX	50 MX 30 MX 15 MX	50 MX 30 MX 15 MX	50 MX 30 MX 15 MX	50 MX 30 MX 15 MX	50 MX 30 MX 15 MX			
(PASSING #40)																			
PI	6 MX	N.P.	40 MX 10 MX	41 MN 10 MN	40 MX 10 MX	41 MN 11 MN	40 MX 10 MX	41 MN 11 MN	40 MX 10 MX	41 MN 11 MN	40 MX 10 MX	41 MN 11 MN	40 MX 10 MX	41 MN 11 MN	40 MX 10 MX	41 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		SOILS WITH LITTLE OR MODERATE AMOUNTS OF ORGANIC MATTER		HIGHLY ORGANIC SOILS		MUCK, PEAT						
<p align="center">* PI OF A-7-5 ≤ (LL-30); PI OF A-7-6 > (LL-30)</p>																			
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																			
<p>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:</p>																			
TERM	SYMBOLS		DESCRIPTION																
HARD ROCK (HR)			MATERIAL THAT CANNOT BE PENETRATED BY POWER AUGERS, EXCEPT IN THIN LEDGES, AND REQUIRES ROCK CORING TOOLS FOR OBTAINING A SAMPLE																
WEATHERED ROCK (WR)			MATERIAL THAT CAN BE PENETRATED WITH GREAT DIFFICULTY USING POWER AUGERS AND YIELDS SPT REFUSAL																
			MATERIAL THAT CAN BE PENETRATED WITH SOME DIFFICULTY USING POWER AUGERS AND YIELDS SPT VALUES > 100 BLOWS BUT < SPT REFUSAL																
<p>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 10 cm DIVIDED BY THE TOTAL LENGTH OF THE CORE RUN TIMES 100%.</p>																			
<p align="center">Signature: </p>																			
GROUND WATER																			
<p>▽ WATER LEVEL IN BORE HOLE [IMMEDIATELY AFTER DRILLING (I.A.D.) SOON AFTER DRILLING (< 0.5 HRS.)] ▽ STATIC WATER LEVEL (AFTER > 24 HRS.) ▽ PERCHED WATER (PW), SATURATED ZONE, OR WATER BEARING STRATA (M) SPRING OR SEEPAGE</p>																			
MISCELLANEOUS SYMBOLS AND ABBREVIATIONS																			
ABBREVIATIONS																			
ALLUV.	ALLUVIUM	MOT.	MOTTLED																
AR	AUGER REFUSAL	MR	MUD ROTARY																
BGS	BELOW GROUND SURFACE	N	BLOWS / 30 CM																
BLDR.	BOULDER	NS	NO SAMPLE TAKEN																
CALC.	CALCAREOUS	ORG.	ORGANIC																
CL.	CLAY	PHOS.	PHOSPHATE (IC)																
CLY.	CLAYEY	PLAG.	PLAGIOCLASE																
COB.	COBBLE	P.P.	POCKET PENETROMETER																
CSE.	COARSE	QTZ.	QUARTZ																
DPT	DYNAMIC PENETRATION TEST	R.C.P.	RECENT COASTAL PLAIN																
EST.	ESTIMATED	REF.	REFER TO																
F.	FINE	RES.	RESIDUAL																
FIAD	FILLED IMMED. AFTER DRILLING	S.	SOFT																
FOSS.	FOSSILIFEROUS	SAT.	SATURATED																
FRAC.	FRACTURED	SD.	SAND																
FRAG(S).	FRAGMENT(S)	SDY.	SANDY																
GR.	GRAVEL	SED(S).	SEDIMENT(S)																
GS	SPECIFIC GRAVITY	SL.	SILT, SILTY																
GW	GROUND WATER	SLI.	SLIGHTLY																
HSA	HOLLOW STEM AUGER	SPT	STANDARD PENETRATION TEST																
LS.	LIMESTONE	TS.	TOPSOIL																
MED.	MEDIUM	VST	VANE SHEAR TEST																
MIC.	MICACEOUS	V.	VERY																
MOD.	MODERATE(LY)	W/	WITH																
<p>BENCH MARK: 79+27.163 -BL- @ 8+19.131 -BY4-, NCDOT GPS CONTROL (R513C-07) elev. 41.184m</p>																			
<p>STATE PROJECT NO. 6.469002T</p>																			
<p>T.I.P. NO. R-0513C F.A. NO. N/A</p>																			
<p>COUNTY Robeson ROUTE US 74</p>																			
<p>SITE DESCRIPTION Bridge on -Y4- (SR 2413) over -L- (US 74)</p>																			
<p>PROJECT GEOLOGIST S.V. HUDSON SUBMITTED BY S.V. HUDSON</p>																			
<p>PERSONNEL J. K. BECKEN DATE SUBMITTED 04/30/01</p>																			
<p>C. K. RAY RESUBMITTED 05/29/01</p>																			
<p>B. D. FOWLER</p>																			
<p align="right">REV. 8/11/98</p>																			

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