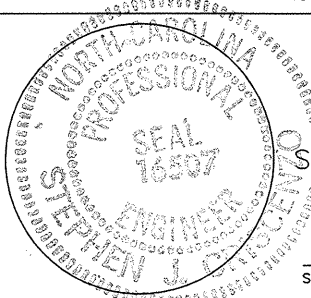


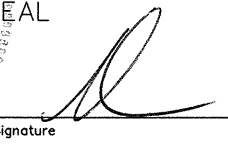
NORTH CAROLINA DIVISION OF HIGHWAYS

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-3	A-6,A-7				
SYMBOL																
% PASSING	#10 #40 #200	50 MX 30 MX 15 MX	50 MX 30 MX 15 MX	51 MN 10 MN	35 MX 35 MX 35 MX	35 MX 35 MX 35 MX	36 MN 36 MN 36 MN	36 MN 36 MN 36 MN	36 MN 36 MN 36 MN	36 MN 36 MN 36 MN	36 MN 36 MN 36 MN	36 MN 36 MN 36 MN	GRANULAR SOILS	SILT-CLAY SOILS	MUCK, PEAT	
(PASSING #40) LL PI		6 MX	N.P.	40 MX 10 MX	41 MN 10 MN	40 MX 10 MN	41 MN 11 MN	40 MX 10 MN	41 MN 10 MN	40 MX 10 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 SIZE (mm)	305	75	2	0.25	0.05	0.005										
GRAIN SIZE (IN)	12	3														
SOIL MOISTURE - CORRELATION OF TERMS																
SOIL MOISTURE SCALE (ATTERBERG LIMITS)			FIELD MOISTURE DESCRIPTION			GUIDE FOR FIELD MOISTURE DESCRIPTION										
PLASTIC RANGE (PI) PL	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)		SOFT WEATHERED ROCK (SWR)			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: <u>CORE RECOVERY (REC.)</u> - TOTAL LENGTH OF ROCK RECOVERED IN THE CORE BARREL DIVIDED BY THE TOTAL LENGTH OF THE CORE RUN TIMES 100%. <u>ROCK QUALITY DESIGNATION (RQD)</u> - 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%.																
ABBREVIATIONS																
ALLUV.	ALLUVIUM	MIC.	MICACEOUS													
AR.	AUGER REFUSAL	N.	N/A													
BLDR.	BOULDER	N/A	NOT APPLICABLE													
CALC.	CALCAREOUS	N.M.	NOT MEASURED													
C.I.	CAVE IN	NS.	NO SAMPLE TAKEN													
CL.	CLAY	ORG.	ORGANIC													
CLY.	CLAYEY	PMT.	PRESSUREMETER SOUNDINGS													
COB.	COBBLE	P.P.	POCKET PENETROMETER													
CPT.	CONE PENETRATION TEST	REF.	REFER TO													
CSE.	COARSE	RES.	RESIDUAL													
DMT.	DILATOMETER SOUNDINGS	S.	SOFT													
DPT.	DYNAMIC PRESSURE TEST	SAT.	SATURATED													
EST.	ESTIMATED	SD.	SAND													
F.	FINE	SDY.	SANDY													
FIAD.	FILLED IMMED. AFTER DRILLING	SED(S).	SEDIMENT(S)													
FOSS.	FOSSILIFEROUS	SL.	SILT, SILTY													
FRAC.	FRAGMENTED	SLI.	SLIGHTLY													
FRAG(S).	FRAGMENT(S)	SPT.	STANDARD PENETRATION TEST													
GR.	GRAVEL	TS.	TOPSOIL													
GS.	SPECIFIC GRAVITY	VST.	VANE SHEAR TEST													
GW.	GROUND WATER	V.	VERY													
J	JOINT SETS	W/	WITH													
BENCH MARK: NCDOT REFERENCE SURVEY POINTS: 80004 (58.703m); 80006 (58.454m); 80011 (58.783m); 80026 (58.430m); T2-764 (64.082m)																
msl. OTHER REFERENCE SURVEY POINTS-SEE LEVEL NOTES.																
STATE PROJECT NO. 8.T311002																
T.I.P. NO. R-2552AB F.A. NO. NHF-60-1(9)																
COUNTY JOHNSTON ROUTE																
SITE DESCRIPTION SITE 1: DUAL STRUCTURES ON CLAYTON BYPASS (-L-) OVER WHITE OAK CREEK (AUSTIN POND)																
PROJECT COORDINATOR B. DEOBALD SUBMITTED BY MACTEC ENGINEERING																
PROJECT GEOLOGIST M. LEAR																
PERSONNEL J. BRYSON																
D. WHITE DATE SUBMITTED 10/16/01																
R. PEED REVISED 09/15/03																
REVISED 10/06/03																



Signature 

CAUTION NOTICE

THE SUBSURFACE INFORMATION AND THE SUBSURFACE INVESTIGATION ON WHICH IT IS BASED WAS MADE FOR THE PURPOSE OF STUDY, PLANNING AND DESIGN, AND NOT FOR CONSTRUCTION OR PAY PURPOSES. THE VARIOUS FIELD BORING LOGS, ROCK CORES, AND SOIL TEST DATA AVAILABLE MAY BE REVIEWED OR INSPECTED IN RALEIGH BY CONTACTING THE N. C. DEPARTMENT OF TRANSPORTATION, GEOTECHNICAL UNIT @ (919) 250-4088. NEITHER THE SUBSURFACE PLANS AND REPORTS, NOR THE FIELD BORING LOGS, ROCK CORES, OR SOIL TEST DATA IS PART OF THE CONTRACT.

GENERAL SOIL AND ROCK STRATA DESCRIPTIONS AND INDICATED BOUNDARIES ARE BASED ON A GEOTECHNICAL INTERPRETATION OF ALL AVAILABLE SUBSURFACE DATA AND MAY NOT NECESSARILY REFLECT THE ACTUAL SUBSURFACE CONDITIONS BETWEEN BORINGS OR BETWEEN SAMPLED STRATA WITHIN THE BOREHOLE. THE LABORATORY SAMPLE DATA AND THE IN SITU (IN-PLACE) TEST DATA CAN BE RELIED ON ONLY TO THE DEGREE OF RELIABILITY INHERENT IN THE STANDARD TEST METHOD. THE OBSERVED WATER LEVELS OR SOIL MOISTURE CONDITIONS INDICATED IN THE SUBSURFACE INVESTIGATIONS ARE AS RECORDED AT THE TIME OF THE INVESTIGATION. THESE WATER LEVELS OR SOIL MOISTURE CONDITIONS MAY VARY CONSIDERABLY WITH TIME ACCORDING TO CLIMATIC CONDITIONS INCLUDING TEMPERATURES, PRECIPITATION AND WIND, AS WELL AS OTHER NON-CLIMATIC FACTORS.

THE BIDDER OR CONTRACTOR IS CAUTIONED THAT DETAILS SHOWN ON THE SUBSURFACE PLANS ARE PRELIMINARY ONLY AND IN MANY CASES THE FINAL DESIGN DETAILS ARE DIFFERENT. FOR BIDDING AND CONSTRUCTION PURPOSES, REFER TO THE CONSTRUCTION PLANS AND DOCUMENTS FOR FINAL DESIGN INFORMATION ON THIS PROJECT. THE DEPARTMENT DOES NOT WARRANT OR GUARANTEE THE SUFFICIENCY OR ACCURACY OF THE INVESTIGATION MADE, NOR THE INTERPRETATIONS MADE OR OPINION OF THE DEPARTMENT AS TO THE TYPE OF MATERIALS AND CONDITIONS TO BE ENCOUNTERED. THE BIDDER OR CONTRACTOR IS CAUTIONED TO MAKE SUCH INDEPENDENT SUBSURFACE INVESTIGATIONS AS HE DEEMS NECESSARY TO SATISFY HIMSELF AS TO CONDITIONS TO BE ENCOUNTERED ON THIS PROJECT. THE CONTRACTOR SHALL HAVE NO CLAIM FOR ADDITIONAL COMPENSATION OR FOR AN EXTENSION OF TIME FOR ANY REASON RESULTING FROM THE ACTUAL CONDITIONS ENCOUNTERED AT THE SITE DIFFERING FROM THOSE INDICATED IN THE SUBSURFACE INFORMATION.

NOTE - THE INFORMATION CONTAINED HEREIN IS NOT IMPLIED OR GUARANTEED BY THE N. C. DEPARTMENT OF TRANSPORTATION AS BEING ACCURATE NOR IT IS CONSIDERED TO BE PART OF THE PLANS, SPECIFICATIONS, OR CONTRACT FOR THE PROJECT.

NOTE - BY HAVING REQUESTED THIS INFORMATION THE CONTRACTOR SPECIFICALLY WAIVES ANY CLAIMS FOR INCREASED COMPENSATION OR EXTENSION OF TIME BASED ON DIFFERENCES BETWEEN THE CONDITIONS INDICATED HEREIN AND THE ACTUAL CONDITIONS AT THE PROJECT SITE.