STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	A-0009CA	1	5

STATE OF NORTH CAROLINA

DEPARTMENT OF TRANSPORTATION **DIVISION OF HIGHWAYS** GEOTECHNICAL ENGINEERING UNIT

STRUCTURE SUBSURFACE INVESTIGATION

COUNTY GRAHAM

PROJECT DESCRIPTION <u>UPGRADE US</u> 129 FROM SOUTH OF SR 1275 TO NC 143 AND UPGRADE NC 143 FROM US 129 TO SR 1223

SITE DESCRIPTION STRUCTURE ON NC 143 OVER HARWOOD BRANCH AT -L- STATION 144+74.5

CONTENTS

SHEET NO.

2. 2A

3 4-5 **DESCRIPTION**

TITLE SHEET LEGEND (SOIL & ROCK)

SITE PLAN BORE LOGS PERSONNEL

CG2 EXPLORATION

D. GOODNIGHT

INVESTIGATED BY \underline{CG}_2

DRAWN BY __M. BRE WER, P.E.

CHECKED BY R. KRAL, P.E.

SUBMITTED BY CG2

DATE JANUARY 2021

CAUTION NOTICE

THE SUBSURFACE INFORMATION AND THE SUBSURFACE INVESTIGATION ON WHICH IT IS BASED WERE 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 ENGINEERING UNIT AT 1(99) 707-850. THE SUBSURFACE PLANS AND REPORTS, FIELD BORING LOGS, ROCK CORES AND SOIL TEST DATA ARE NOT PART OF THE CONTRACT.

CENERAL 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 (INP-PLACE) TEST DATA CAN BE RELIED ON ONLY TO THE DEGREE OF RELIABILITY INHERENT IN THE STANDARD TEST METHOL 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 DEEM NECESSARY TO SATISFY HIMSELF AS TO CONDITIONS TO BE ENCOUNTERED TO THE 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.

- NOTES:

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

 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.



(980) 339-8684



D. Matthew Brewer 1/20/2022

386129C0A4C1462... SIGNATURE

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

PROJECT REPERENCE NO.	SHEET NO.
A-0009CA	2

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION DIVISION OF HIGHWAYS GEOTECHNICAL ENGINEERING UNIT

SUBSURFACE INVESTIGATION

SOIL AND ROCK LEGEND, TERMS, SYMBOLS, AND ABBREVIATIONS (PAGE 1 OF 2)

													(PA	4GE	1 OF 2)	
	SOIL DESCRIPTION													GRADATION		
SOIL IS CONSIDERED UNCONSOLIDATED, SEMI-CONSOLIDATED, OR WEATHERED EARTH MATERIALS THAT CAN BE PENETRATED WITH A CONTINUOUS FLIGHT POWER AUGER AND YIELD LESS THAN 100 BLOWS PER FOOT ACCORDING TO THE STANDARD PENETRATION TEST (AASHTO T 206, ASTM DISBAS, SOIL CLASSIFICATION IS BASED ON THE AASHTO SYSTEM, BASIC DESCRIPTIONS GENERALLY INCLUDE THE FOLLOWING: CONSISTENCY, COLOR, TEXTURE, MOISTURE, AASHTO CLASSIFICATION, AND OTHER PERTINENT FACTORS SUCH									ED, OR ER ANI ITO T TONS FICATI	WEATHER D YIELD 206, AST GENERALL ION, AND	LESS TH M D1586 Y INCLU THER P	IAN 100 S). SOIL JDE THE ERTINE) BLOWS PI . CLASSIFI E FOLLOWI NT FACTOR	WELL GRADED - INDICATES A GOOD REPRESENTATION OF PARTICLE SIZES FROM FINE TO COARSE. UNIFORMLY GRADED - INDICATES THAT SOIL PARTICLES ARE ALL APPROXIMATELY THE SAME SIZE. GAP-GRADED - INDICATES A MIXTURE OF UNIFORM PARTICLE SIZES OF TWO OR MORE SIZES. ANGULARITY OF GRAINS		
- "	AS MINERALOGICAL COMPOSITION, ANGULARITY, STRUCTURE, PLASTICITY, ETC. FOR EXAMPLE, VERY STIFF, GRAY, SILTY CLAY, MOIST WITH INTERBEDDED FINE SAND LAYERS, HIGHLY PLASTIC, A-7-6 SOIL LEGEND AND AASHTO CLASSIFICATION										'ERS,HIGI	HLY PLA	STIC, A-7-6	•	THE ANGULARITY OR ROUNDNESS OF SOIL GRAINS IS DESIGNATED BY THE TERMS: ANGULAR, SUBANGULAR, SUBROUNDED, OR ROUNDED.	
GENERAL				AR MA1			ID A			LASS. MATERIALS	FICA				MINERALOGICAL COMPOSITION	
CLASS. GROUP	A-1	(1		PASSIN	G *200					SING #200		ORGANIC MATERIALS A-1, A-2 A-4, A-5			MINERAL NAMES SUCH AS QUARTZ, FELDSPAR, MICA, TALC, KAOLIN, ETC. ARE USED IN DESCRIPTIONS WHEN THEY ARE CONSIDERED OF SIGNIFICANCE.	
CLASS.	A-1-a A	-1-ь	_	A-2-4		A-2-6				A- A-		A-3	A-6, A-7		COMPRESSIBILITY	
SYMBOL						11			171						SLIGHTLY COMPRESSIBLE LL < 31 MODERATELY COMPRESSIBLE LL = 31 - 50	
% PASSING *10	50 MX										CRA	NULAR	SILT-	MUCK,	HIGHLY COMPRESSIBLE LL > 50 PERCENTAGE OF MATERIAL	
*40 *200	30 MX 50			35 MX	35 MX	35 MX	35 MX	36 MN	36 MN	36 MN 36	Si	OILS	CLAY SOILS	PEAT	GRANULAR SILT - CLAY ORGANIC MATERIAL SOILS OTHER MATERIAL	
MATERIAL PASSING *40 LL PI	_ 6 MX						41 MN 11 MN			40 MX 41 11 MN 11		SOILS LITTL	E OR	HIGHLY	TRACE OF ORGANIC MATTER 2 - 3% 3 - 5% TRACE 1 - 10% LITTLE DRGANIC MATTER 3 - 5% 5 - 12% LITTLE 10 - 20% MODERATELY ORGANIC 5 - 10% 12 - 20%. SOME 20 - 35% HIGHLY ORGANIC > 10% > 20%. HIGHLY 35% AND ABOVE	
GROUP INDEX	0		0	(8	4	MX	8 MX	12 MX	16 MX NO	мх	MODE! AMOUN	ITS OF	ORGANIC SOILS	GROUND WATER	
USUAL TYPES OF MAJOR MATERIALS	STONE FR GRAVEL. SAND	AND .	FINE SAND			R CLAY AND SA		SIL SOI		CLAYEY SOILS		ORGA MAT		35.25		
GEN. RATING AS SUBGRADE			XCELL	ENT TO	G00D				FAIR TO POOR FAIR TO POOR UNSU				POOR	UNSUITABLE	∑PW PERCHED WATER, SATURATED ZONE, OR WATER BEARING STRATA ○──────────────────────────────────	
		Р	1 OF A							6 SUBGROU		30			MISCELLANEOUS SYMBOLS	
						S OR	1	RAN	GE OF	STANDAR)		GE OF UNC			
PRIMARY		'PE		CONS		TENCY PENETRATION RESISTENCE					NCE	COMPRESSIVE STRENGTH (TONS/FT ²)			WITH SOIL DESCRIPTION of ROCK STRUCTURES spr spr spr spr spr spr spr sp	
GENERA GRANUL	.AR			L	.00SE			< 4 4 TO 10 10 TO 30 N/A							SOIL SYMBOL OPT OMT TEST BORING INSTALLATION INSTALLATION	
	MATERIAL MEDIUM (NON-COHESIVE) VERY I				ENSE					0 50		N/ A			ARTIFICIAL FILL (AF) OTHER AUGER BORING CONE PENETROMETER THAN ROADWAY EMBANKMENT	
GENERA	ALLY				RY SO SOFT	FT				2		< 0.25 0.25 TO 0.5			— INFERRED SOIL BOUNDARY — CORE BORING SOUNDING ROD	
SILT-C MATERI	LAY			MEDI	UM S	TIFF		4 TO 8 8 TO 15				0.5 TO 1.0 1 TO 2			INFERRED ROCK LINE MONITORING WELL TEST BORING WITH CORE	
(COHES				VER	Y STI	TIFF 15 TO 30						2 TO 4			FIEZOMETER OF N-VALUE	
					TE	(TUF	RE O	R GF	RAIN	SIZE					RECOMMENDATION SYMBOLS	
U.S. STD. SI OPENING (M		E.			4 4.7	6	10 2.00	40 0.42		0.25 0	.075 (27Ø 0.053			UNDERCUT UNCLASSIFIED EXCAVATION - UNCLASSIF	
BOULDE (BLDR.			BLE			GRAVEL COARSE FINE (GR.) (CSE. SD.) (F SI						O SILI CLAY			UNDERCUT ACCEPTABLE DEGRADABLE ROCK EMBANKMENT OR BACKFILL ABBRE VIATIONS	
GRAIN M	м 30!	5		75			2.0	(C3L. C		Ø.25		0.05	0.005	 5	AR - AUGER REFUSAL MED MEDIUM VST - VANE SHEAR TEST	
SIZE IN	i. 12			3											BT - BORING TERMINATED MICA MICACEOUS WEA WEATHERED CL CLAY MOD MODERATELY 7 - UNIT WEIGHT	
SOTI	MOISTI		OIL		<u>ISTI</u>					ION C					CPT - CONE PENETRATION TEST NP - NON PLASTIC $\hat{\gamma}_{ m d}$ - DRY UNIT WEIGHT CSE COARSE ORG ORGANIC	
	SOIL MOISTURE SCALE FIELD MOISTURE GUIDE FOR FIELD MOISTURE DES											OMT - DILATOMETER TEST PMT - PRESSUREMETER TEST SAMPLE ABBREVIATIONS OPT - DYNAMIC PENETRATION TEST SAP- SAPROLITIC S - BULK				
LL _	LL LIQUID LIMIT .						TURAT SAT.)	ED -				OUID; VERY WET, USUALLY W THE GROUND WATER TABLE			e - VOID RATIO SD SAND, SANDY SS - SPLIT SPOON F - FINE SL SILT, SILTY ST - SHELBY TUBE FOSS, - FOSSILIFEROUS SLI SLIGHTLY RS - ROCK	
PLASTIC RANGE < (PI) PL]											REQUIRES DRYING TO IMUM MOISTURE			FOSS FOSSILIFEROUS SLI SLIGHTLY RS - ROCK FRAC FRACTURED, FRACTURES TCR - TRICONE REFUSAL RT - RECOMPACTED TRIAXIAL FRAGS FRAGMENTS W- MOISTURE CONTENT CBR - CALIFORNIA BEARING HI HIGHLY V - VERY RATIO	
0M	OM OPTIMUM MOISTURE					- MOIST - (M) SOLID; AT O					r or Ne	R NEAR OPTIMUM MOISTURE			EQUIPMENT USED ON SUBJECT PROJECT DRILL UNITS: ADVANCING TOOLS: HAMMER TYPE:	
SL	SL SHRINKAGE LIMIT				_							DDITIONAL WATER TO IMUM MOISTURE			CME-45C CLAY BITS X AUTOMATIC MANUAL	
	PLASTICITY										J. 1110IY	013	CME-55 CME-55 CORE SIZE: CORE SIZE:			
PLASTICITY INDEX (PI) DRY STRENGTH								PI)		DR	CME-550 HARD FACED FINGER BITS					
NON PLASTIC 0-5 VERY LOW SLIGHTLY PLASTIC 6-15 SLIGHT									VANE SHEAR TEST TUNGCARBIDE INSERTS HAND TOOLS:							
MOI	MODERATELY PLASTIC 16-25 MEDIUM HIGHLY PLASTIC 26 OR MORE HIGH					CASING W/ ADVANCER POST HOLE DIGGER										
	COLOR											TRICONE TUNG,-CARB. COUNDING DOD				
													ROWN, BLUI PPEARANCI		X DIEDRICH D50 CORE BIT SOUNDING ROD VANE SHEAR TEST	
	MODIFIERS SUCH AS LIGHT, DARK, STREAKED, ETC. ARE USED TO DESCRIBE APPEARANCE.															

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION **DIVISION OF HIGHWAYS** GEOTECHNICAL ENGINEERING UNIT

SUBSURFACE INVESTIGATION

SOIL AND ROCK LEGEND, TERMS, SYMBOLS, AND ABBREVIATIONS

		(PAGE 2	OF 2)			
	DUCK	DESCRIPTION	TERMS AND DEFINITIONS			
ROCK LINE I SPT REFUSA BLOWS IN N REPRESENTE	IS NON-COASTAL PLAIN MATERIAL THI INDICATES THE LEVEL AT WHICH NON- IL IS PENETRATION BY A SPLIT SPOOM	T WOULD YIELD SPT REFUSAL IF TESTED, AN INFERRED COASTAL PLAIN MATERIAL WOULD YIELD SPT REFUSAL. SAMPLER EQUAL TO OR LESS THAN Ø.1 FOOT PER 6Ø RANSITION BETWEEN SOIL AND ROCK IS OFTEN	ALLUVIUM (ALLUV.) - SOILS THAT HAVE BEEN TRANSPORTED BY WATER. ADUIFER - A WATER BEARING FORMATION OR STRATA. ARENACEOUS - APPLIED TO ROCKS THAT HAVE BEEN DERIVED FROM SAND OR THAT CONTAIN SAND.			
WEATHERED	NON-COASTAL I	LAIN MATERIAL THAT WOULD YIELD SPT N VALUES >	ARGILLACEOUS - APPLIED TO ALL ROCKS OR SUBSTANCES COMPOSED OF CLAY MINERALS, OR HAVING A NOTABLE PROPORTION OF CLAY IN THEIR COMPOSITION, SUCH AS SHALE, SLATE, ETC. ARTESIAN - GROUND WATER THAT IS UNDER SUFFICIENT PRESSURE TO RISE ABOVE THE LEVEL AT			
		E GRAIN IGNEOUS AND METAMORPHIC ROCK THAT PT REFUSAL IF TESTED. ROCK TYPE INCLUDES GRANITE,	WHICH IT IS ENCOUNTERED, BUT WHICH DOES NOT NECESSARILY RISE TO OR ABOVE THE GROUND SURFACE.			
NON-CRYSTA ROCK (NCR)	LLINE FINE TO COARS	G GRAIN METAMORPHIC AND NON-COASTAL PLAIN OCK THAT WOULD YEILD SPT REFUSAL IF TESTED. LUDES PHYLLITE, SLATE, SANDSTONE, ETC.	CALCAREOUS (CALC.) - SOILS THAT 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.			
COASTAL PL SEDIMENTAR (CP)		SEDIMENTS CEMENTED INTO ROCK, BUT MAY NOT YIELD ROCK TYPE INCLUDES LIMESTONE, SANDSTONE, CEMENTED C.				
		THERING	<u>DIKE</u> - A TABULAR BODY OF IGNEOUS ROCK THAT CUTS ACROSS THE STRUCTURE OF ADJACENT ROCKS OR CUTS MASSIVE ROCK.			
FRESH	ROCK FRESH, CRYSTALS BRIGHT, FEW S HAMMER IF CRYSTALLINE.	DINTS MAY SHOW SLIGHT STAINING, ROCK RINGS UNDER	DIP - THE ANGLE AT WHICH A STRATUM OR ANY PLANAR FEATURE IS INCLINED FROM THE HORIZONTAL.			
VERY SLIGHT (V SLI.)		ED, SOME JOINTS MAY SHOW THIN CLAY COATINGS IF OPEN, EE SHINE BRIGHTLY. ROCK RINGS UNDER HAMMER BLOWS IF	DIP DIRECTION (DIP AZIMUTH) - THE DIRECTION OR BEARING OF THE HORIZONTAL TRACE OF THE LINE OF DIP, MEASURED CLOCKWISE FROM NORTH.			
SLIGHT (SLI.)	1 INCH. OPEN JOINTS MAY CONTAIN CL	ED AND DISCOLORATION EXTENDS INTO ROCK UP TO AY. IN GRANITOID ROCKS SOME OCCASIONAL FELDSPAR	FAULT - A FRACTURE OR FRACTURE ZONE ALONG WHICH THERE HAS BEEN DISPLACEMENT OF THE SIDES RELATIVE TO ONE ANOTHER PARALLEL TO THE FRACTURE.			
MODERATE (MOD.)	SIGNIFICANT PORTIONS OF ROCK SHOW	CRYSTALLINE ROCKS RING UNDER HAMMER BLOWS. DISCOLORATION AND WEATHERING EFFECTS. IN E DULL AND DISCOLORED, SOME SHOW CLAY. ROCK HAS	FISSILE - A PROPERTY OF SPLITTING ALONG CLOSELY SPACED PARALLEL PLANES. FLOAT - ROCK FRAGMENTS ON SURFACE NEAR THEIR ORIGINAL POSITION AND DISLODGED FROM PARENT MATERIAL. FLOOD PLAIN (FP) - 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			
	WITH FRESH ROCK.	D SHOWS SIGNIFICANT LOSS OF STRENGTH AS COMPARED				
MODERATELY SEVERE (MOD. SEV.)	AND DISCOLORED AND A MAJORITY SH	OR STAINED. IN GRANITOID ROCKS, ALL FELDSPARS DULL W KAOLINIZATION. ROCK SHOWS SEVERE LOSS OF STRENGTH OGIST'S PICK. ROCK GIVES "CLUNK" SOUND WHEN STRUCK.	FIELD. JOINT - FRACTURE IN ROCK ALONG WHICH NO APPRECIABLE MOVEMENT HAS OCCURRED.			
SEVERE	IF TESTED, WOULD YIELD SPT REFUSA ALL ROCK EXCEPT QUARTZ DISCOLORE	OR STAINED. ROCK FABRIC CLEAR AND EVIDENT BUT	LEDGE - A SHELF-LIKE RIDGE OR PROJECTION OF ROCK WHOSE THICKNESS IS SMALL COMPARED TO ITS LATERAL EXTENT.			
(SEV.)		L. IN GRANITOID ROCKS ALL FELDSPARS ARE KAOLINIZED	LENS - A BODY OF SOIL OR ROCK THAT THINS OUT IN ONE OR MORE DIRECTIONS.			
	<u>IF TESTED, WOULD YIELD SPT N VALU</u>	S > 100 BPF	MOTTLED (MOT.) - IRREGULARLY MARKED WITH SPOTS OF DIFFERENT COLORS, MOTTLING IN SOILS USUALLY INDICATES POOR AERATION AND LACK OF GOOD DRAINAGE.			
VERY SEVERE (V SEV.)	BUT MASS IS EFFECTIVELY REDUCED REMAINING. SAPROLITE IS AN EXAMPLI	DOR STAINED. ROCK FABRIC ELEMENTS ARE DISCERNIBLE O SOIL STATUS, WITH ONLY FRAGMENTS OF STRONG ROCK OF ROCK WEATHERED TO A DEGREE THAT ONLY MINOR	PERCHED WATER - WATER MAINTAINED ABOVE THE NORMAL GROUND WATER LEVEL BY THE PRESENCE OF AN INTERVENING IMPERVIOUS STRATUM.			
COMPLETE		MEMAIN. <u>IF TESTED, WOULD YIELD SPT N VALUES < 100 BPF</u> NOT DISCERNIBLE, OR DISCERNIBLE ONLY IN SMALL AND	RESIDUAL (RES.) SOIL - SOIL FORMED IN PLACE BY THE WEATHERING OF ROCK. ROCK QUALITY DESIGNATION (ROD) - A MEASURE OF ROCK QUALITY DESCRIBED BY TOTAL LENGTH OF			
	SCATTERED CONCENTRATIONS. QUARTZ ALSO AN EXAMPLE.	MAY BE PRESENT AS DIKES OR STRINGERS. SAPROLITE IS	ROCK SEMENTS EQUAL TO DR GREATER THAN 4 INCHES DIVIDED BY THE TOTAL LENGTH OF CORE RUN AND EXPRESSED AS A PERCENTAGE.			
VERY HARD		HARDNESS SHARP PICK, BREAKING OF HAND SPECIMENS REQUIRES	SAPROLITE (SAP.) - RESIDUAL SOIL THAT RETAINS THE RELIC STRUCTURE OR FABRIC OF THE PAREN ROCK.			
HARD	SEVERAL HARD BLOWS OF THE GEOLOG CAN BE SCRATCHED BY KNIFE OR PICE		SILL - AN INTRUSIVE BODY OF IGNEOUS ROCK OF APPROXIMATELY UNIFORM THICKNESS AND RELATIVELY THIN COMPARED WITH ITS LATERAL EXTENT, THAT HAS BEEN EMPLACED PARALLEL TO THE BEDDING OR SCHISTOSITY OF THE INTRUDED ROCKS.			
MODERATELY HARD	EXCAVATED BY HARD BLOW OF A GEOL	. GOUGES OR GROOVES TO 0.25 INCHES DEEP CAN BE DGIST'S PICK. HAND SPECIMENS CAN BE DETACHED	SLICKENSIDE - POLISHED AND STRIATED SURFACE THAT RESULTS FROM FRICTION ALONG A FAULT OR SLIP PLANE.			
MEDIUM HARD		HES DEEP BY FIRM PRESSURE OF KNIFE OR PICK POINT. O PEICES I INCH MAXIMUM SIZE BY HARD BLOWS OF THE	STANDARD PENETRATION TEST (PENETRATION RESISTANCE) (SPT) - NUMBER OF BLOWS (N OR BPF) OF A 140 LB. HAMMER FALLING 30 INCHES REQUIRED TO PRODUCE A PENETRATION OF 1 FOOT INTO SOI WITH A 2 INCH OUTSIDE DIAMETER SPLIT SPOON SAMPLER. SPT REFUSAL IS PENETRATION EQUAL TO OR LESS THAN 0.1 FOOT PER 60 BLOWS.			
SOFT	CAN BE GROVED OR GOUGED READILY FROM CHIPS TO SEVERAL INCHES IN	Y KNIFE OR PICK, CAN BE EXCAVATED IN FRAGMENTS IZE BY MODERATE BLOWS OF A PICK POINT. SMALL, THIN	STRATA CORE RECOVERY (SREC.) - TOTAL LENGTH OF STRATA MATERIAL RECOVERED DIVIDED BY TOTAL LENGTH OF STRATUM AND EXPRESSED AS A PERCENTAGE.			
VERY SOFT		ESSURE. XXCAVATED READILY WITH POINT OF PICK, PIECES 1 INCH N BY FINGER PRESSURE. CAN BE SCRATCHED READILY BY	STRATA ROCK QUALITY DESIGNATION (SROD) - A MEASURE OF ROCK QUALITY DESCRIBED BY TOTAL LENGTH OF ROCK SEGMENTS WITHIN A STRATUM EQUAL TO OR GREATER THAN 4 INCHES DIVIDED BY THE TOTAL LENGTH OF STRATA AND EXPRESSED AS A PERCENTAGE. TOPSOIL (TS.) - SURFACE SOILS USUALLY CONTAINING ORGANIC MATTER.			
	FRACTURE SPACING	BEDDING	BENCH MARK: N/A			
TERM VERY WID		TERM THICKNESS VERY THICKLY BEDDED 4 FEET THICKLY BEDDED 15 - 4 FEET	ELEVATION: FEET			
WIDE MODERATI CLOSE VERY CLO	3 TO 10 FEET 1 TO 3 FEET 0.16 TO 1 FOOT 0SE LESS THAN 0.16 FEET	THICKLY BEDDED 1.5 - 4 FEET THINLY BEDDED 0.16 - 1.5 FEET VERY THINLY BEDDED 0.03 - 0.16 FEET THICKLY LAMINATED 0.008 FEET THINLY LAMINATED 0.008 FEET	NOTES: ROADWAY DESIGN FILES DATED 7/11/2021 PROVIDED BY TGS ENGINEERS			
		URATION	FIAD = FILLED IMMEDIATELY AFTER DRILLING			
EUD CEUTME	NITARY ROCKS INDURATION IS THE HAS	DENING OF MATERIAL BY CEMENTING HEAT DESCRIPE FTC	1			

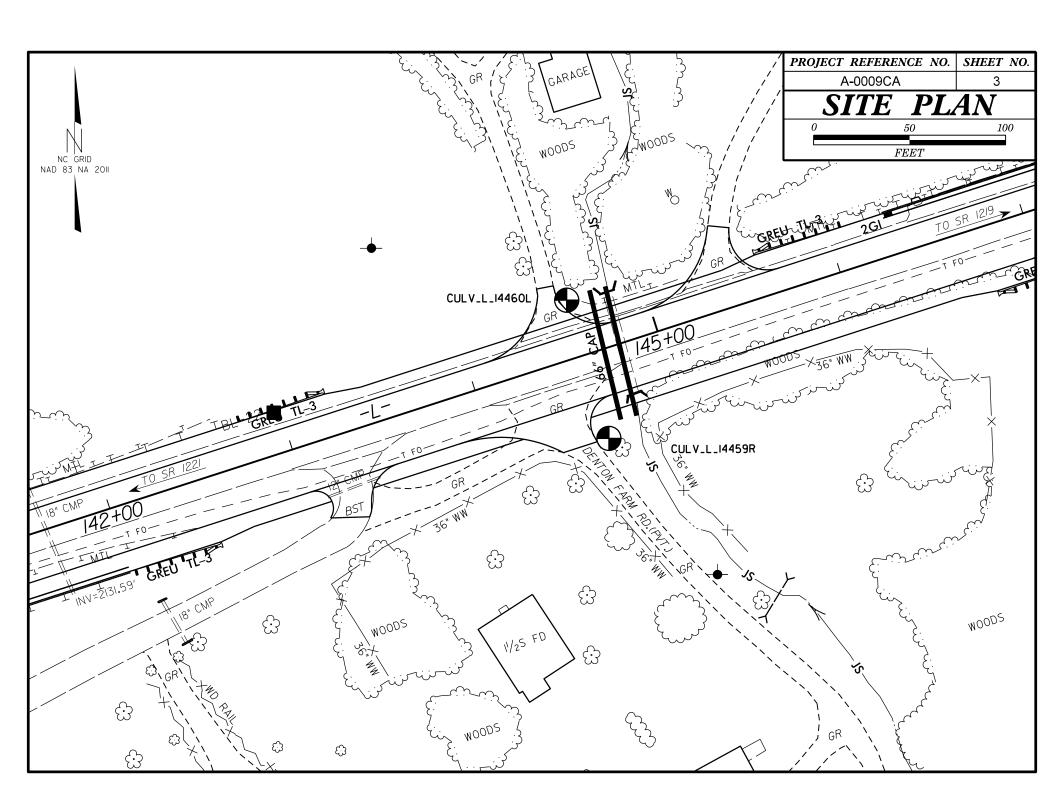
FOR SEDIMENTARY ROCKS, INDURATION IS THE HARDENING OF MATERIAL BY CEMENTING, HEAT, PRESSURE, ETC. RUBBING WITH FINGER FREES NUMEROUS GRAINS: FRIABLE GENTLE BLOW BY HAMMER DISINTEGRATES SAMPLE. GRAINS CAN BE SEPARATED FROM SAMPLE WITH STEEL PROBE; BREAKS EASILY WHEN HIT WITH HAMMER. MODERATELY INDURATED

GRAINS ARE DIFFICULT TO SEPARATE WITH STEEL PROBE: INDURATED

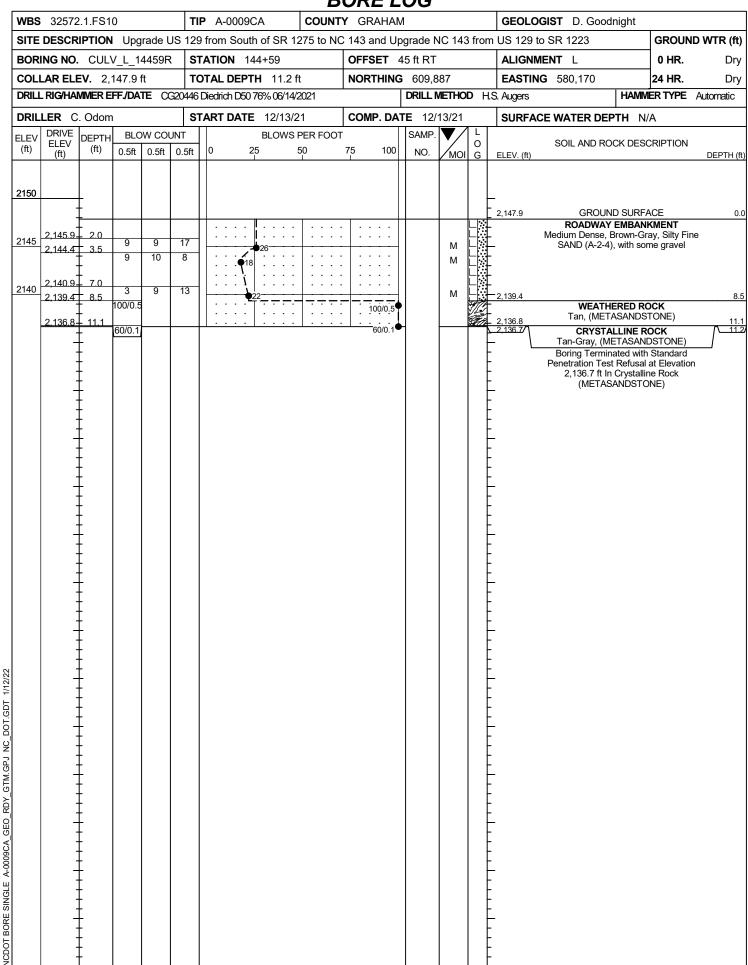
DIFFICULT TO BREAK WITH HAMMER.

SHARP HAMMER BLOWS REQUIRED TO BREAK SAMPLE: EXTREMELY INDURATED SAMPLE BREAKS ACROSS GRAINS.

DATE: 8-15-14



GEOTECHNICAL BORING REPORT BORE LOG



GEOTECHNICAL BORING REPORT BORE LOG

