٦	STATE	STATE PROJECT REFERENCE NO.	SHRET NO.	TOTAL SHEETS	
	N.C.	14SP.20221.2	1	11	

STATE OF NORTH CAROLINA

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

STRUCTURE SUBSURFACE INVESTIGATION

PROJ. REF	FERENCE 1	NO. <u>1</u>	4 SP .2022	1.2			F	.A. PF	ROJ. <u>N</u> //	4	
COUNTY											
PROJECT	DESCRIPT	ION S	Structure	No.	210087	on	SR	1140	(Myers	Chapel	Rd.)
over Hya	tt Mill Cre	ek									

CONTENTS

SHEET	<u>DESCRIPTION</u>
Γ	TITLE SHEET
2, 2A	LEGEND
3	SITE PLAN
4	BORING LOCATION PLAN
5-8	BORE LOG AND CORE REPORTS
9-10	BUCK CUBE PHOTO

	PERSONNEL
	С. Воусе
	S. Joyner
	M. Brewer, E.I.
	J. Fowler
	J. Hoyle
	M. Hosseini
INVESTIGATED BY_	F&R, Inc.
CHECKED BY	M. Walko, P.E.
SUBMITTED BY	
	February 2014

CAUTION NOTICE

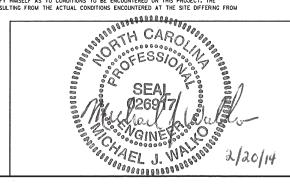
THE SUBSURFACE INFORMATION AND THE SUBSURFACE INVESTIGATION ON WHICH IT IS BASED WERE MADE FOR THE PURPOSE OF STUDY, PLANNING, AND DESIGN, AND NOT FOR CONSTRUCTION OR PAY PURPOSES. THE VARIOUS FIELD BORING LOGS, ROCK CORES, AND SOIL TEST DATA AVAILABLE MAY BE REVIEWED OR INSPECTED IN RALEIGH BY CONTACTING THE N. C. DEPARTMENT OF TRANSPORTATION, GEOTECHNICAL ENGINEERING UNIT AT (919) TO7-6850. NEITHER THE SUBSURFACE PLANS AND REPORTS, NOR THE FIELD BORING LOGS, ROCK CORES, OR SOIL TEST DATA ARE 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 NDICATED IN THE SUBSURFACE INVESTIGATION, THESE WATER LEVELS OR SOIL MOISTURE CONDITIONS MAY VARY CONSIDERABLY WITH TIME ACCORDING TO CLUMATIC 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 PLANS AND DOCUMENTS FOR FINAL DESIGN INFORMATION ON THIS PROJECT. THE DEPARTMENT DOES NOT WARRANT OR GUARANTEE THE SUFFICIENCY OR ACCURACY OF THE NIVESTIGATION MADE, ROP THE INTERPRETATIONS MADE, OR OPPOINT OF THE DEPARTMENT AS TO THE TYPE OF WATERIALS AND CONDITIONS TO BE ENCOUNTERED. THE BIDDIED 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 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.



DRAWN BY: M. Brewer, E.I.

PROJECT REFERENCE	NO.	SHEET NO.
I4SP.2022I.2		2

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION DIVISION OF HIGHWAYS GEOTECHNICAL ENGINEERING UNIT SOIL AND ROCK LEGEND, TERMS, SYMBOLS, AND ABBREVIATIONS

			Ç	SOIL C	DESCR	IPTI	ON									DATION			
THAT CAN E 100 BLOWS CLASSIFICA' CONSISTENC	NSIDERED TO BE PENETRATI PER FOOT AC TION IS BASE Y, COLOR, TEX	ED WIT CCORDI ED ON KTURE,	HE UNCONSOL TH A CONTIN ING TO STAN THE AASHTO MOISTURE, A	LIDATED, S UOUS FLIC DARD PEN SYSTEM, ASHTO CL	SEMI-CON GHT POWI ETRATION BASIC C ASSIFICA	ISOLIDA ER AUG N TEST DESCRIP	TED, OR ER, AND (AASHT TIONS (YIELD O T20 GENERA ER PER	LESS THAN 6, ASTM D-15 ALLY SHALL RTINENT FAC	186). SOIL		WELL GRADED - IND UNIFORM - INDICATE POORLY GRADED) GAP-GRADED - INDIC	ATES A M	AIXTURE OF	RESENTATION ICLES ARE AL F UNIFORM PA NGULARII	OF PARTICLE SIZES L APPROXIMATELY RTICLES OF TWO OF Y OF GRAIN	R MORE	SIZES.	E.
AS MINERAL	OGICAL COMP VER		ON, ANGULARI GRAY.SILTY CLAY.									THE ANGULARITY OR ROUNDNESS OF SOIL GRAINS IS DESIGNATED BY THE TERMS ANGULAR, SUBROUNDED, OR ROUNDED. MINERALOGICAL COMPOSITION							
	S0	IL I	EGEND	AND A	AASH1	0 C	LASS	IFIC	CATION					MINE	RALOGICA	AL COMPOSIT	ION		
GENERAL CLASS.		5% PA	MATERIAL SSING #200		(> :	35% PAS	MATERI SSING *		ORGAN	NIC MATER	IALS	MINERAL NAMES SUC WHENEVER THEY ARE	H AS OUA CONSIDE	RTZ, FELD	IGNIFICANCE.		E USED	IN DESCRIPTION	s
GROUP	A-1	A-3	 	-2	A-4	A-5	A-6	A-7	A-1, A-2	A-4, A-5					COMPRE	SSIBILITY			
CLASS. SYMBOL	A-1-a A-1-b		A-2-4 A-2-5	A-2-6 A-	2-7	133		A-7-6	A-3	A-6, A-7		SLIGHTLY MODERATE HIGHLY CO	LY COMPR	RESSIBLE			IT EQUA	S THAN 31 AL TO 31-50 ATER THAN 50	
% PASSING										SILT-						OF MATERI	AL		
* 40	50 MX 30 MX 50 MX 15 MX 25 MX	51 MN 10 MX	35 MX 35 MX	35 MX 35	МX 36 M	N 36 M	1 36 MN	36 MN	GRANULAR SOILS	CLAY SOILS	PEAT	ORGANIC MATER TRACE OF ORGANIC	MATTER	GRANULA SOILS 2 - 3%	SOIL 3 - 5	S 1	OTHE TRACE	ER MATERIAL 1 - 10%	
LIQUID LIMIT PLASTIC INDEX	6 MX	NP	40 MX 41 MN 10 MX 10 MX						SOILS LITTLE			MODERATELY ORGANIC HIGHLY ORGANIC		3 - 5% 5 - 10% >10%		3% 9	LITTLE SOME HIGHLY	10 - 20% 20 - 35% 35% AND A	BOVE
GROUP INDEX	0	0	0	4 MX	8 M	(12 M)	16 MX	No MX	MODER	ATE	HIGHLY ORGANIC					ND WATER		3377 7113 71	3371
USUAL TYPES	STONE FRAGS.	ETNE	SILTY OF	CI AVEV		ILTY		YEY	AMOUN ORGANI		SOILS	∇	WATER L	EVEL IN		MMEDIATELY AFTER	RORILL	ING	
OF MAJOR MATERIALS GEN. RATING	GRAVEL, AND SAND	FINE SAND	GRAVEL			OILS	102		MATTE			▼			VEL AFTER	- 4			
AS A SUBGRADE	EXC	ELLEN	T TO GOOD			FAIR	TO POO	ır	FAIR TO POOR	POOR	UNSUITABLE	0 000	PERCHED		SATURATED Z	ONE, OR WATER BEA	ARING S	TRATA	
PI	DF A-7-5	SUBG							OUP IS >	LL - 30		O-00-	שרווים נ		00511.411				
		Т.		STENC			STANDA		RANGE (OF UNCONF	INED					EOUS SYMBOL	-5		TEST BORING
PRIMARY	SOIL TYPE	c	CONSISTEI	VCY	PENETR	ATION (N-VA	RESISTE	NCE	COMPRES	SSIVE STR ONS/FT ²	ENGTH	WITH SOIL DESCRIPTION OF OUT TEST BORING W/ CORE						W/ CORE	
GENER			VERY LOOS LOOSE	Ε		4 TO						SOIL SY	MBOL		(AUGER BORING	3	<u> </u>	SPT N-VALUE
GRANUI MATER			MEDIUM DE	NSE		10 TO	30			N/A				(AF) OTHE		CORE BORING		REF)-	SPT REFUSAL
(NON-(COHESIVE)		DENSE VERY DENS			30 TO	0					l .		MBANKMEN BOUNDARY	ντ Υ <u></u>	MONITORING W	/ELL		
GENER			VERY SOFT			2 10	4			<0.25 .25 TO 0.5			D ROCK L		Δ	PIEZOMETER			
SILT-C MATER			MEDIUM ST STIFF			4 TO 8 TO	15		(0.5 TO 1.0 1 TO 2	t	₹₹₹₹₹ ALLUVIA	L SOIL B	BOUNDARY		INSTALLATION SLOPE INDICA			
(COHE:	SIVE)		VERY STIFE	F		15 TO >3				2 TO 4		25/025 DIP & DIP DIRECTION OF							
			TEX	TURE	OR G	RAIN	SIZ	E				ROCK STRUCTURES CONE PENETROMETER TEST							
U.S. STD. SII OPENING (M			4.7	10	4	ø	60 0.25	200				● SQUINDING ROD							
	T					RSE	1	FINE							ABBRE	VIATIONS			
BOULDE (BLDR.)		:08") 8BFE	GRAV		SA	ND . SD.)		SAND (F SE	;	SILT (SL.)	(CL.)	AR - AUGER REFU BT - BORING TERI			FRAGS FI HI HIGHL	Υ		w - MOISTURE V - VERY	
	IM 305		75	2.0	1		0.25		0.05	0.005		CL CLAY CPT - CONE PENE	TRATION	TEST	MED MED MICA MIC	ACEOUS		WEA WEATHE	RED IGHT
SIZE II	N. 12		3	· ·	20000		ON () T	EDMC			CSE COARSE MICA MICACEGUS 7 - UNIT WEIGHT CSE COARSE MOD MODERATELY 7 - DRY UNIT WEIGHT CT - CORING TERMINATEO NP - NON PLASTIC							
SOIL	SO MOISTURE S		MOISTUF	FIELD M								DMT - DILATOMET	ER TEST		ORG ORG	ANIC		SAMPLE AB S - BULK	BREVIATIONS
	RBERG LIMI			DESCRI			COIDE	FUR	FIELD MOIS	STURE DES	CRIPTION	DPT - DYNAMIC PI e - VOID RATIO	ENETHATI	ION TEST	SAP SAPI	SSUREMETER TEST		SS - SPLIT SI	
				- SATUR					IOUID; VERY			EMBANK EMBANK F - FINE	MENT		SDY, - SANI			RS - ROCK	TUBE
LL	T LIOUID	LIMIT	r	(SAT	.,)		FROM	BELO	W THE GRO	OUND WATE	R TABLE	FOSS FOSSILIFE			SL SILT, SLI SLIG	HTLY		RT - RECOMPA CBR - CALIFO	CTED TRIAXIAL
PLASTIC RANGE <				- WET	- (W)				REQUIRES)	FRAC FRACTURE				ONE REFUSAL ON SUBJECT	PRO I	RATIO	Anti- Ozracio
(PI)	PLASTI	C LIM	IT				ALIA	IN UP	TIMUM MOIS					T		SIV SOBOLCI	T	AMMER TYPE:	
	OPTIMUM	ı MOT	ETI IDE	- MOIS	T - (M)		SOL	D: AT	OR NEAR O	OPTIMUM N	KOISTURE	DRILL UNITS:			NCING TOOLS:			AUTOMATIC	MANUAL
OM . SL .	_											MOBILE B	_		CLAY BITS		<u> </u>	-	
	[- -			- DRY	- (D)				ADDITIONAL FIMUM MOIS)	BK-51			6. CONTINUONS	FLIGHT AUGER GERS	-	DRE SIZE:	
				PLA	ASTIC	ITY						X CME-550X			HARD FACED I		1 =		
			1	PLASTICI					DRY STR	ENGTH		[V] CWE-DOWX			TUNGCARBIDE			(]-N <u>02</u>	
NONPLASTIC				0-					VERY L SLIGH			X CME-75				W/ ADVANCER		J-∺——	
MED. PLASTI	CITY			16-					MEDIL	ML		PORTABLE HOL	ST		TRICONE	*STEEL TEETH	H/	AND TOOLS:	DICCER
HIGH PLAST	ICITY				OR MOR				HIGH	1					TRICONE	* TUNG,-CARB.	-	POST HOLE HAND AUGER	
					COLOR							Ш			CORE BIT			SOUNDING RE	
	INS MAY IN										RAY).			18	LUNE BII			VANE SHEAR	
MODIFIE	auch A	- r10	, unitt, 3		, , L., MP		u l	-LOLN	.w. mrchn					-]	

PROJECT REFERENCE NO.	SHEET NO.
I4SP.2022I.2	2A

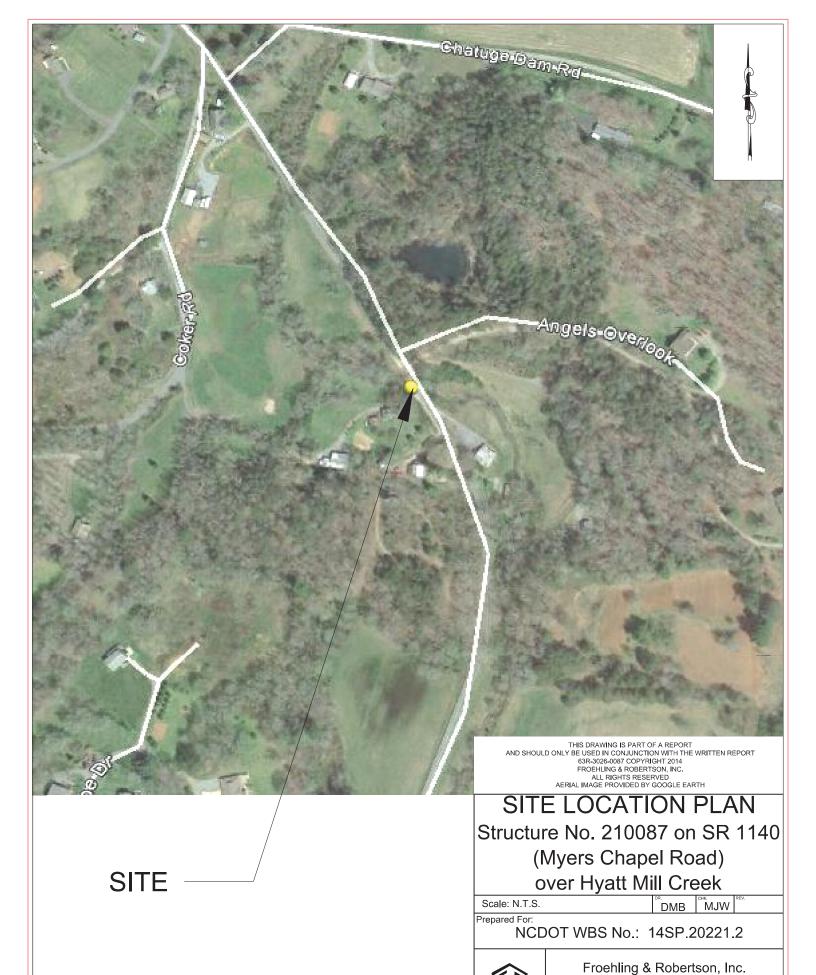
NORTH CAROLINA DEPARTMENT OF TRANSPORTATION

DIVISION OF HIGHWAYS

GEOTECHNICAL ENGINEERING UNIT

SOIL AND ROCK LEGEND, TERMS, SYMBOLS, AND ABBREVIATIONS

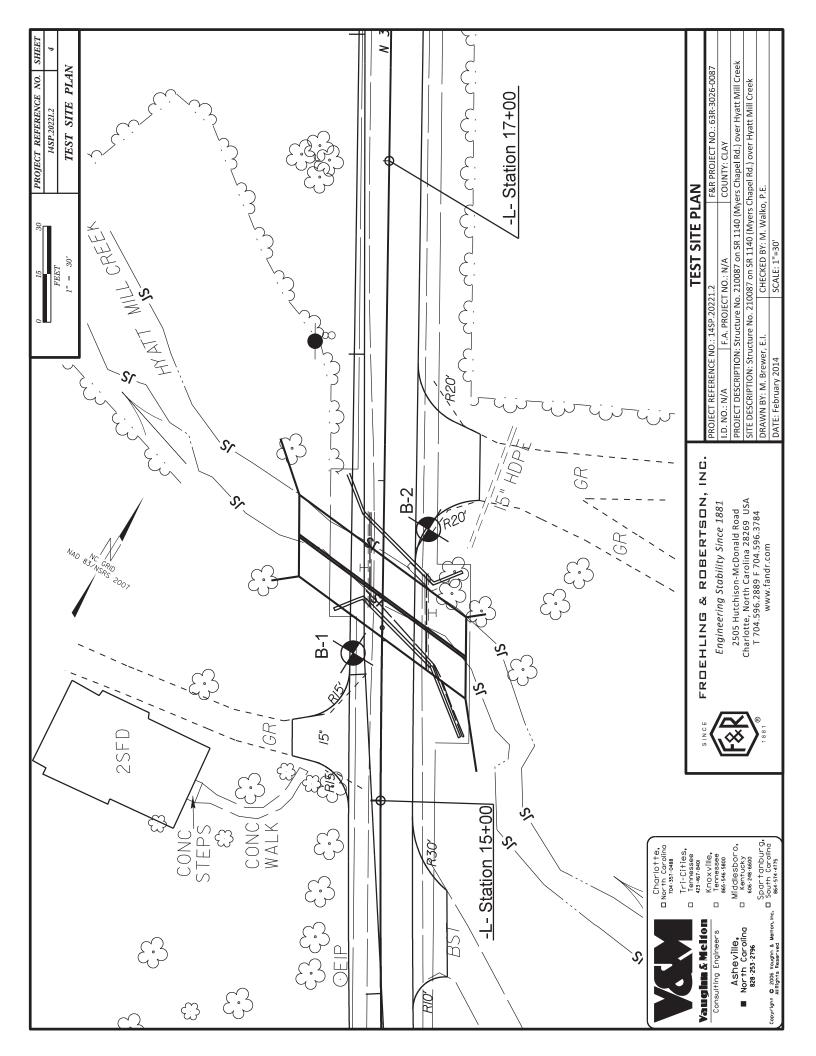
AMORE RECIPION IN INFORMATION OF A PERSONAL MATERIAL THAT YOUR STEEL AND THE SERVICE AND DESCRIPTION OF A PERSONAL PROPERTY OF A PERSONAL			DOCK 5	OCCODENTION.		TEDMS AND DESIRITIONS				
DOCUMENT AND A RECOGNISH PLANT OF STATE AND COLORS OF THE ADMINISTRATION OF THE COLORS OF THE ADMINISTRATION OF THE COLORS OF TH			MATERIAL THAT	IF TESTED, WOULD YIELD SPT REF		TERMS AND DEFINITIONS				
AND DESCRIPTION WITHOUT PROPERTY OF PROJECTS OF A DESCRIPTION OF A DESCRIP	ROCK LINE INDICA	TES THE LEVEL A	IT WHICH NON-CO	DASTAL PLAIN MATERIAL WOULD YI	ELD SPT REFUSAL.					
SOC METERIAL WE THERE AT STREET AND METERIAL THAT VALUE SET AT WALLES SET SE	IN NON-COASTAL P	LAIN MATERIAL.								
MAY SERVE PORT OF TENTED. MAY SERVE PORT OF TEN			IVIDED AS FOLL	DWS:		ARGILLACEOUS - APPLIED TO ALL ROCKS OR SUBSTANCES COMPOSED OF CLAY MINERALS,				
PAGES ASSOCIATION DESCRIPTION ASSOCIATION AND PROCESSES TO A SECURITY OR SECUR	WEATHERED ROCK (WR)	75 75 P	BLOWS PER FOOT	IF TESTED.		ARTESIAN - GROUND WATER THAT IS UNDER SUFFICIENT PRESSURE TO RISE ABOVE THE LEVEL				
DESCRIPTION TO THE TO COPYRE GOVERN THE AND INTO COPYRE TO THE TO COPYRE ON THE TO COPYRE THE TO THE TO COPYR THE TO COPYRE THE	CRYSTALLINE ROCK (CR)		OULD YIELD SPI	refusal if tested, rock type	ROCK THAT INCLUDES GRANITE,	GROUND SURFACE.				
THE STATE OF THE S	NON-CRYSTALLINE ROCK (NCR)	s	EDIMENTARY ROC	K THAT WOULD YEILD SPT REFUSA		COLLUVIUM - ROCK FRAGMENTS MIXED WITH SOIL DEPOSITED BY GRAVITY ON SLOPE OR AT BOTTOM				
MEATHERING MOX FRESH, CENTRAL SHORT, YOUNG HAVE YOUNG THAT SHADURA, RECK RINGS DEED MODE FOR THE CONTROLLER. MOD FOR THE CONTROLLER. MODE FOR THE CONTROLLER. MOD FOR	COASTAL PLAIN SEDIMENTARY ROCK	Ci	OASTAL PLAIN S PT REFUSAL. RO	EDIMENTS CEMENTED INTO ROCK, B CK TYPE INCLUDES LIMESTONE, SAI	UT MAY NOT YIELD NDSTONE, CEMENTED					
PRICE PRICE CREATERS BRIDGET, FEW JOSES SELECT STRINGS FROM THE HORSE AND SELECT STRINGS FROM THE HORSE JOSES STRINGS FROM THE HORSE	CI /	<u> </u>								
FOR SLIGHT AND DECEMBER STREET, JOSEPH STANKED, SOURCE JOSEPH AND SOUR JOSEPH AND SOUR STANKED, SOURCE JOSEPH AND SOURCE				INTS MAY SHOW SLIGHT STAINING.	ROCK RINGS UNDER	DIP - THE ANGLE AT WHICH A STRATUM OR ANY PLANAR FEATURE IS INCLINED FROM THE				
DICK CEREALLY PRESS, Johns STANCE AND DISCOGNATION CONTROLLED THOSE AND DISCOGNATION CONTROLLED AND DISCOGNATION C	V SLI.) CRYSTA	ALS ON A BROKEN	SPECIMEN FACE			DIP DIRECTION (DIP AZIMUTH) - THE DIRECTION OR BEARING OF THE HORIZONTAL TRACE OF				
CHYSTALS ARE DILL AND DISCLOSED, CHYSTALLIRE BIOLS BIND LUMBER HOWERS BLOOS. MITHERIA PROPERTY OF SERVICE OF THE CONTROL AND LINEAR DISCLOSED STREET, MITHERIA HOUR AND A SHARE PROPERTY OF THE PROPERTY OF T	SLIGHT ROCK (GENERALLY FRESH	, JOINTS STAINE							
DAIL SINGUI LIGHT SHAPE LILL AND DISCLOGRED, SINCE SHOW LLAW, DOC HASE DILL SHOUL LIGHT SHAPE LILL AND DISCLOGRED ON STREET, HAS CONVERT ALL ROCK DISCLOFT QUARTY DISCLOGRED ON STANDARD, TO GRAFTED RESCRIPTION AS TREATH AND THE RECORDING AND THE PERCENT AND THE RECORDING AND THE PERCENT SHOULD BE STANDARD AND THE RECORDING AND THE PERCENT SHOULD BE STANDARD AND THE RECORDING AND THE PERCENT SHOULD BE STANDARD AND THE RECORDING AND THE RECORD AND THE RECORDING						FISSILE - A PROPERTY OF SPLITTING ALONG CLOSELY SPACED PARALLEL PLANES.				
WITH FRESH ROCK. SECRETE VALUE OF SECRETIFICATION OF SECRETION OF STATION OF CONTROL OF SECRETIC SECR	(MOD.) GRANIT	OID ROCKS, MOST	FELDSPARS ARE	DULL AND DISCOLORED, SOME SHO	W CLAY. ROCK HAS					
AND DISCOURTED AND A MANDERTY SHOW MACHINATION ROCK SHOPE SEVERE LOSS OF STREAM THE ACCOUNTS THE CARRY SHOW HAS DISCOURTED AND TRACED IN THAT CARRY SHOW HAS DISCOURTED BY STATED BROWN FOR THE CARRY SHOW HAS DISCOURTED BY STATED BROWN FOR THE CARRY SHOW HAS DISCOURTED BY SHAPE BROWN FOR THAT CARRY SHOW HAS DISCOURTED BY SHAPE BROWN FOR THAT CARRY SHOW HAS DISCOURTED BY SHAPE BROWN FOR THAT CARRY SHOW HAS DISCOURTED BY SHAPE BROWN FOR THE SHAPE BROWN FOR THAT CARRY SHAPE BROWN FOR THAT	WITH F	RESH ROCK.				FLOOD PLAIN (FP) - LAND BORDERING A STREAM, BUILT OF SEDIMENTS DEPOSITED BY THE STREAM,				
ALL ROCK EXCEPT QUARTZ DISCOLORED OR STANEO, ROCK FARRIC CLEAR AND EVIENTS BUT REQUEST EVIET SEVERAL ROCK EXCEPT QUARTZ DISCOLORED NO SCALL FLANDARS ARE ANALIZED TO SOME EVIET SEVERAL ROCK EXCEPT QUARTZ DISCOLORED OR STANEO, ROCK FARRIC ELEMBITS ARE DISCOLORED NO STANEO, ROCK FARRIC TO STANEO, ROCK FARRIC ELEMBITS ARE DISCOLORED NO STANEO, ROCK FARRIC REMAIN. **COMPLETE*** **COMPLETE*** **COMPLETE*** **COMPLETE** **	SEVERE AND DI (MOD. SEV.) AND CA	SCOLORED AND A	MAJORITY SHOW WITH A GEOLOG	KAOLINIZATION. ROCK SHOWS SEV	ERE LOSS OF STRENGTH					
IN STRENGTH TO STRONG SOIL. IN GRANTED ROCK ALL PELOSHARS ARE KACLINIZED TO SOVE EXPERT, SOME PRANCHING OF STRONG ROCK USED UNITED SO STRONG ROCK USED. FIRSTED, LEEDS SET AN MILLES JEEN AND MILLES SET			-							
LESS TO DESCRIPTIONS SET MY MALES JER BET SET MY MALES JER BET SET MY MALES JER BET SET MY SEVER MEAN DOOR SECRETARY DISCOURCE ON STATUS, WITH DAY PRACEDED AS DESCRIPTION OF STATUS, WITH DAY PRACED THAT ONLY HINDOW SETTINGS OF THE ORIGINAL SAFACITES OF THE ORIGINAL HOLD KARDE SETTING CONCENTRATION. CHART SETTING LESS OF THE ORIGINAL HOLD KARDE SETTING CONCENTRATION. CHART SETTING LESS OF THE ORIGINAL HOLD KARDE SETTING CONCENTRATION. CHART SETTING LESS OF THE ORIGINAL HOLD KARDE SETTING CONCENTRATION. CHART SHAPE SETTING SETTING CONCENTRATION. CHART SHAPE SETTING SETTING SETTING SETTING SETTING SETTING SETTING. CHART SHAPE SETTING SETTING SETTING SETTING SETTING SETTING SETTING SETTING. CHART SHAPE SETTING	SEV.) IN STR	ENGTH TO STRONG	G SOIL. IN GRAN	ITOID ROCKS ALL FELDSPARS ARE						
THE MASS IS EFFECTIVELY REQUIDED TO SOIL STATUS, WITH OWAY PRAMEMENTS OF STRONG ROOK. REMAINING, SARPOLLE IS AN EXAMPLE OF ROOK METHERED TO A DEGREE SUNT HAT ONLY MINING STRONG ROOK. REMAINING, SARPOLLE IS AN EXAMPLE OF ROOK METHERED TO A DEGREE SUNT HAT ONLY MINING STRONG ROOK. RECORD THE REMAINING, SARPOLLE IS AN EXAMPLE OF ROOK METHERED TO A DEGREE SUNT HAT ONLY MINING STRONG ROOK. RECORD THE REMAINING, SARPOLLE TO SOIL OF ROOK METHER TO THE RESERVE OF AN INTERPRETATION OF ROOK. SCATTERED CONCENTRATIONS, DUARTY MAY BE PRESENT AS DIKES OR STRINGERS, SAPROLLTE IS ALSO AN EXAMPLE. VERY MADD CANNET BE SCALATION BY MINITE OR SAMP PICK, DREAKING OF HIND SPECIMENS REQUIRES SURFACE, HARD BLOWS OF THE GOLDIGITS PICK. CAN BE SCALATION BY MINITE OR SAMP PICK, DREAKING OF HIND SPECIMENS REQUIRED STRONG HARD STRONG ROOK OF THE GOLDIGITS PICK. MODERATELY. CAN BE SCALATION BY MINITE OR SAMP PICK, DREAKING OF HIND SPECIMENS CON BE CETAMORED THAN BY SCHOOL OF THE MAD SECRET HAND STRONG PICK DOOK OF THE METHER HAD SHOULD BE SCALATION BY MINITE OR SAMP SPECIMENS CON BE CETAMORED BY CONTROL OF THE METHER HAD SHOULD BE SCALATION BY MINITE OR SAMP SPECIMENS CON BE CETAMORED BY THE CONTROL OF THE METHER HAD SHOULD BE SCALATION BY MINITE OR SAMP SPECIMENS CON BE CETAMORED BY CONTROL OF THE METHER HAD SHOULD BE SCALATION BY MINITE OR SAMP SPECIMENS CON BE CETAMORED BY THE METHER HAD SHOULD BE SCALATION BY MINITE OR SAMP SPECIMENS CON BE CETAMORED BY THE METHER HAD SHOULD BE SCALATION BY MINITE OR SAMP SPECIMENS CON BE CETAMORED BY SHOULD BE SCALATION BY MINITE OR SAMP SPECIMENS CON BE SCALATION BY MINITE OR SAMP SPECIMENS CON BE CETAMORED BY MINITE OR SAMP SPECIMENS CON BE SCALATION BY MINITE OR SAMP SPECIMENS CON BE CETAMORED BY MINITE OR SAMP SPECIMENS CON BE SCALATION BY MINITE OR SAMP SECRET BY MINITE O	IF TES	TED, YIELDS SPT	N VALUES > 100	<u>BPF</u>						
RECOMMENT TO SOUR PROCESS TO SOUR PROCESS TO SOURCE OR DISCESSINGER, SAPROLITE IS ALSO AN EXAMPLE. FROM THE SCAPE CONCENTRATIONS, QUARTY MAY BE PRESENT AS DIRES ON STRINGERS, SAPROLITE IS ALSO AN EXAMPLE. FROM THE SCAPE CONCENTRATIONS, QUARTY MAY BE PRESENT AS DIRES ON STRINGERS, SAPROLITE IS ALSO AN EXAMPLE. FROM THE SCAPE CONCENTRATIONS, QUARTY MAY DEPOSED AND SECRET MAY DESCRIBED BY TOTAL LENGTH OF CORE RUN AN EXAMPLE. FROM THE SCAPE OF SHAPP PICK. BREAKING OF HAND SPECIMENS REQUIRES SEVERAL HAND BLOWS OF THE GEOLOGIST'S PICK. HARD CAN BE SCAPE CHEEN ON WHITE OR PICK COLOGIST'S PICK. HARD CAN BE SCAPE CHEEN ON WHITE OR PICK COLOGIST'S PICK. HARD CAN BE SCAPE CHEEN ON WHITE OR PICK, GOUGES OR GROOVES TO 8,25 INCHES DEEP CAN BE EXCAVATED BY HAND BLOW OF A GEOLOGIST'S PICK. HARD BY HAND BLOW OF A GEOLOGIST'S PICK. HEDIUM CAN BE CHARLED ON SWALL CHIST TO PICKES I INCH HANDIMM SIZE BY HAND BLOWS OF THE COLOGIST'S PICK. HEDIUM CAN BE CHARLED ON SWALL CHIST TO PICKES I INCH HANDIMM SIZE BY HAND BLOWS OF THE COLOGIST'S PICK. FOR CHIST OF THE SCAPE CHIST BROWN AND SECRET OF THE PICK CHIST. FOR CHIST OF THE SCAPE CHIST. FOR CHIST. F	(V SEV.) THE MA REMAIN	ASS IS EFFECTIVE ING. SAPROLITE I	LY REDUCED TO S AN EXAMPLE (SOIL STATUS, WITH ONLY FRAGMEN OF ROCK WEATHERED TO A DEGREE	NTS OF STRONG ROCK SUCH THAT ONLY MINOR	SOILS USUALLY INDICATES POOR AERATION AND LACK OF GOOD DRAINAGE, PERCHED WATER - WATER MAINTAINED ABOVE THE NORMAL GROUND WATER LEVEL BY THE PRESENCE OF A				
SCATTERED CONCENTRATIONS. QUANTY MAY BE PRESENT AS DIKES OR STRINGERS. SAPROLITE IS ALSO MEXAMPLE. NOCK GUALITY DESCRIPTION ROOD. A MEASURE OF ROCK QUALITY DESCRIPTION BY TOTAL LENGTH OF CORE RIM AN EXPRESSED AS A PERCENTAGE. MORE AREA. LENGTH OR CANNOT BE SCRATCHED BY KINEF OR SHARP PICK, BREAKING OF HAND SPECIMENS REQUIRES SEVERAL HAND BLOWS OF THE GEOLOGISTS PICK. HARD CAN BE SCRATCHED BY KINEF OR PICK DALY WITH DIFFICULTY, HARD HAMPER BLOWS REQUIRES TO LETCH HAND SPECIMEN. MODERATELY CAN BE SCRATCHED BY KINEF OR PICK COLUES OR GROOVES TO 8.25 INCHES DEEP CAN BE BENEFIT BLOWS. MEDIUM MED										
VERY HARD CANNOT BE SCRATCHED BY KNIFE OR SHARP PICK. BREAKING OF HAND SPECIMENS REQUIRED SEVERAL HARD BLOWS OF THE CEOLOGIST'S PICK. HARD CAN BE SCRATCHED BY KNIFE OR PICK. GOLD STY SPICK. HARD CAN BE SCRATCHED BY KNIFE OR PICK. GOLD STY SPICK. HARD CAN BE SCRATCHED BY KNIFE OR PICK. GOLD STY SPICK. HARD CAN BE SCRATCHE BY KNIFE OR PICK. GOLD STY SPICK. HARD CAN BE SCRATCHE BY HARD BLOW OF A COLLOGIST'S PICK. HAND SPECIMENS CAN BE DETACHED BY CAN BE EXCAVATED BY HARD BLOW OF A COLLOGIST'S PICK. HARD CAN BE CROOVED OR GOLDED A8B INCHES DEEP BY FIRM PRESSURE OF KNIFE OR PICK POINT. HARD CAN BE CROOVED OR GOLDED A8B INCHES DEEP BY FIRM PRESSURE OF KNIFE OR PICK. SOFT CAN BE GROVED OR GOLDED A8B INCHES DEEP BY FIRM PRESSURE OF KNIFE OR PICK. CAN BE EXCAVATED IN FRAMENTS FROM CHIPS TO SEVERAL INCHES IN SIZE BY MOCREATE BLOWS OF A PICK POINT. PICKS CAN BE BORNED BY FINGER PRESSURE. SOFT CAN BE CARVED WITH KNIFE. CAN BE EXCAVATED DRADLLY WITH POINT OF PICK. PIECES I INCH PICKS CAN BE BORNED BY FINGER PRESSURE. FRACTURE SPACING BEDDING IERM SPACING MORE IN HICKLYSSES CAN BE BROKEN BY FINGER PRESSURE. FRACTURE SPACING BEDDING IERM SPACING MORE THAN 16 FEET HICKLY BEDDED A15 10 B FEET HICKLY BEDDED A26 - A FEET HICKLY BEDDED A37 10 B FEET HICKLY BEDDED A37 10 B FEET HICKLY BEDDED A38 FEET HICKLY HARD BLOWS OF THE MATERIAL BY CEMENTING, HEAT, PRESSURE, ETC. BEDDING IERM MOGERATELY CLOSE LESS THAN 61.6 FEET HICKLY BEDDED A38 FEET HICKLY HARD BLOWS OF A PICK BROKEN BY FINGER BROWS OR ANGE, ETC. HICKLY HARD BROKEN BY FINGER PICKS SAME. BENDERMALL. HODITAL BENDERMAND SPRINGERS ON A PERCENTAGE. STATEMENT OF THE MITTIONS THE MATERIAL BY CEMENTING DECRED BY TOTAL LENGTH OF THE MATERIAL BY CORPORATED BY THE MATERIAL BY CHECKED BY THE MAT	SCATTE	RED CONCENTRATI								
SEVERAL HARD BLOWS OF THE CEOLOGIST'S PICK. HARD CAN BE SCRATCHED BY MAIFE OR PICK DOLY WITH DIFFICULTY, HARD HAMMER BLOWS REQUIRED TO LETCH HAND SPECIMEN. MODERATELY CAN BE SCRATCHED BY MAIFE OR PICK. GOUGES OR GROOVES TO 8.25 INCHES DEEP CAN BE HARD BLOWS AND SPECIMENS CAN BE DEFICIALLY CAN BE SCRATCHED BY MAIFE OR PICK. GOUGES OR GROOVES TO 8.25 INCHES DEEP CAN BE MODERATE BLOWS. MEDIUM MEDIUM CAN BE GROOVED OR GOUGED 8.05 INCHES DEEP BY FIRM PRESSURE OF KAIFE OR PICK POINT. HARD CAN BE GROOVED OR GOUGED 8.05 INCHES DEEP BY FIRM PRESSURE OF KAIFE OR PICK POINT. HARD CAN BE GROVED OR GOUGED 8.05 INCHES DEEP BY FIRM PRESSURE OF KAIFE OR PICK POINT. FOR CHIEF TO SEVERAL INCHES IN SIZE BY HARD BLOWS OF THE POINT OF A CEGLOSIST'S PICK. SOFT CAN BE GROVED OR GOUGED READILY BY KAIFE OR PICK. CAN BE EXCAVATED IN FRACMENTS FROM CHIEF TO SEVERAL INCHES IN SIZE BY HARD BLOWS OF A PICK POINT. SHALL THIN PIECES CAN BE BROKEN BY FINGER PRESSURE. VERY VERY VERY VERY OR BE CAPACED WITH KAIFE, CAN BE EXCOVATED READILY. WITH POINT OF PICK, PICES I INCH PICK PICKS INCH PICK PICKS INCH PICK PICKS INCH PICK PICK PICKS INCH PICK PICK PICK PICK PICK PICK PICK PICK			ROCK	HARDNESS						
CAN BE SCRATCHED BY WHIFE OR PICK ONLY WITH DIFFICULTY, MARD MANNER BLOWS REQUIRED TO DETACH MAND SPECIMEN. MODERATELY CAN BE SCRATCHED BY WHIFE OR PICK, COUGES OR GROOVES TO 0.25 INCHES DEEP CAN BE EXCAVATED BY HARD BLOW OF A GEOLOGIST'S PICK. HAND SPECIMENS CAN BE DETACHED BY MODERATE BLOWS. MEDIUM CAN BE GROOVED OR GOUGED 0.05 INCHES DEEP BY FIRM PRESSURE OF KNIFE OR PICK POINT, HARD CAN BE GROOVED OR GOUGED 0.05 INCHES DEEP BY FIRM PRESSURE OF KNIFE OR PICK POINT, HARD CAN BE GROOVED OR GOUGED 0.05 INCHES DEEP BY FIRM PRESSURE OF KNIFE OR PICK POINT, HARD CAN BE EXCAVATED IN SMALL CHIPS TO PEICES I INCH MAXIPUM SIZE BY HARD BLOWS OF THE POINT OF A GEOLOGIST'S PICK. SOFT CAN BE CRAYED BY IN AND COUGED READILY BY WHIFE OR PICK CAN BE EXCAVATED IN FRAMENTS FROM CHIPS TO SCYBRAL, BNCHES IN SIZE BY HODERATE BLOWS OF A PICK POINT, SMALL, THIN POINT OF PICKS I INCH MAXIPUM SIZE BY HARD BLOWS OF THE POINT OF A GEOLOGIST'S PICK. SOFT CAN BE CRAYED WITH KNIFE, CAN BE EXCAVATED READILY WITH POINT OF PICK. SOFT CAN BE CARVED WITH KNIFE, CAN BE EXCAVATED READILY WITH POINT OF PICK, PIECES I INCH MORE IN THICKNESS CAN BE BROKEN BY FINGER PRESSURE, CAN BE SCRAFCHED READILY BY FINGER PRESSURE, CAN BE SCRAFCHED READILY BY FINGER PRESSURE, CAN BE SCRAFCHED READILY BY THICKNESS CAN BE BROKEN BY FINGER PRESSURE, CAN BE SCRAFCHED READILY BY THICKNESS CAN BE BROKEN BY FINGER PRESSURE, CAN BE SCRAFCHED READILY BY THICKNESS CAN BE BROKEN BY FINGER PRESSURE, CAN BE SCRAFCHED READILY BY THICKNESS CAN BE BROKEN BY FINGER PRESSURE, CAN BE SCRAFCHED READILY BY THICKNESS CAN BE SCRAFCHED READILY BY THICKNESS CAN BE BROKEN BY FINGER PRESSURE, CAN BE SCRAFCHED READILY BY THICKNESS CAN BE BROKEN BY FINGER PRESSURE, CAN BE SCRAFCHED READILY BY THICKNESS CAN BE SCRAFCHED READILY BY THICKNESS CAN BE SCRAFCHED READILY BY THICKNESS CAN BE SCRAFCHED BY THICKNESS C					ECIMENS REQUIRES					
MODERATELY CAN BE SCRATCHED BY KNIFE OR PICK. GOUGES OR GROOVES TO 8.25 INCHES DEEP CAN BE WERE AND BLOW OF A GEOLOGIST'S PICK, NAMD SPECIMENS CAN BE DETACHED BY MODERATE BLOWS. MEDIUM HARD CAN BE GROOVED OR GOUGED 8.95 INCHES DEEP BY FIRM PRESSURE OF KNIFE OR PICK POINT, CAN BE EXCAVATED IN SMALL CHIPS TO PEICES I INCH MAXIMUM SIZE BY HARD BLOWS OF THE POINT OF A GEOLOGIST'S PICK. SOFT CAN BE GROOVED OR GOUGED READILY BY KNIFE OR PICK POINT, SHOW CHIPS TO SEVERAL INCHES IN SIZE BY MODERATE BLOWS OF A PICK POINT, SMALL, THIN POINT OF A GEOLOGIST'S PICK. SOFT CAN BE CROVED OR GOUGED READILY BY KNIFE OR PICK CAN BE EXCAVATED IN FRAMENTS FROM CHIPS TO SEVERAL INCHES IN SIZE BY MODERATE BLOWS OF A PICK POINT, SMALL, THIN POINT OF PICK, PICKS CAN BE BROKEN BY FINGER PRESSURE, CAN BE SCRATCHED READILY WITH POINT OF PICK, PICKS I INCH SIZE BY MODERATE BLOWS OF A PICK POINT, SMALL, THIN POINT OF PICK, PICKS CAN BE GROVEN BY FINGER PRESSURE, CAN BE SCRATCHED READILY BY FINGER PRICES IN SIZE BY MODERATE BLOWS OF A PICK POINT, SMALL, THIN POINT OF PICK, PICKS CAN BE GROVEN BY FINGER PRESSURE, CAN BE SCRATCHED READILY BY FINGER PRICES IN SIZE BY MODERATE BLOWS OF A PICK POINT, SMALL, THIN POINT OF PICK, PICKS IN SIZE BY MODERATE BLOWS OF A PICK POINT, SMALL, THIN POINT OF PICK, PICKS CAN BE BROKEN BY FINGER PRESSURE, CAN BE SCRATCHED READILY BY FINGER PRICES IN SIZE BY MODERATE BLOWS OF A PICK POINT, SMALL THIN POINT OF PICK, PICKS CAN BE SCRATCHED READILY BY FINGER PRESSURE, CAN BE SCRATCHED READILY BY THINK PROBLED AND STRIATED SOME PRETITATION TEST POON SAMPLER, STRATCH OR PRESSURE AS A PERCENTAGE. FRACTURE SPACING FRACTURE SPACING FRACTURE SPACING IERM SPACING FRACTURE SPACING IERM SPACING FRACTURE SPACING FRACTURE SPACING FRACTURE SPACING INCH STATE AND STRATAM OF STRATAM DEPARTS ON A PICK PICK, PIC	HARD CAN B	E SCRATCHED BY	KNIFE OR PICK		MER BLOWS REQUIRED	RELATIVELY THIN COMPARED WITH ITS LATERAL EXTENT, THAT HAS BEEN EMPLACED PARALLEL				
MEDIUM CAN BE GROOVED OR GOUGED Q. 65. INCISES DEEP BY FIRM PRESSURE OF PRIFE OR PICK POINT, CAN BE CRAVATED IN SHALL CHIPS TO PEICES I INCH MAXIMUM SIZE BY HARD BLOWS OF THE POINT OF A CECLOGIST'S PICK. SOFT CAN BE GROVED OR GOUGED READILY BY KNIFE OR PICK, CAN BE EXCAVATED IN FRAGMENTS PICKS OR SEVERAL INCISES IN SIZE BY MODERATE BLOWS OF A PICK POINT, SMALL, THIN PICES CAN BE BROKEN BY FINGER PRESSURE. VERY CAN BE CARVED WITH KNIFE, CAN BE EXCAVATED READILY WITH POINT OF PICK, PICKS, PICK, OR MORE IN THICKNESS CAN BE BROKEN BY FINGER PRESSURE, CAN BE SCRATCHED READILY BY FINGERMAIL. FRACTURE SPACING IERM SPACING WERY WIDE MORE THAN 10 FEET THICKLY BEDDED 1.5 - 4 FEET THICKLY LAMINATED 4.09.8 - 0.93 FEET CLOSE 0.1 10 FEET THICKLY LAMINATED 4.09.8 - 0.93 FEET THICKLY LAMINATED 4.09 FEET THICKLY LAMINATED 4.09.8 - 0.93 FEET THICKLY LAMINATED 4.09.8 - 0.93 FEET THICKLY LAMINATED 4.09.8 - 0.93 FEET THICKLY LAM	HARD EXCAV	ATED BY HARD BL				SLICKENSIDE - POLISHED AND STRIATED SURFACE THAT RESULTS FROM FRICTION ALONG A FAULT OR				
SOFT CAN BE GROVED OR GOUGED READILY BY KNIFE OR PICK. CAN BE EXCAVATED IN FRAGMENTS FROM CHIPS TO SEVERAL. INCHES IN SIZE BY MODERATE BLOWS OF A PICK POINT. SMALL, THIN PICCES CAN BE RONCEN BY FINGER PRESSURE. VERY CAN BE CARVED WITH KNIFE, CAN BE EXCAVATED READILY WITH POINT OF PICK. PIECES I INCH OR MORE IN THICKNESS CAN BE BROKEN BY FINGER PRESSURE. CAN BE SCRATCHED READILY BY FINGERNALL. FRACTURE SPACING BEDDING IERM SPACING BEDDING IIII LENGTH OF STRATA AND EXPRESSED AS A PERCENTAGE. IOPSOIL LISJ: SUFFACE SOILS USUALLY CONTAINING ORGANIC MATTER. BENCH MARK: SURVEY Information provided by Voughn & Melton, Inc. INDURATED ORAINS AND BE SEPARATED FROM SAMPLE. BENCH MARK: SURVEY INFORMATION: STRATA AND EXPRESSED AS A PERCENTAGE. THAN A 1. FOOT PER 68 BLOWS. STRATA CORE RECOVERY (SRC1): TOTAL LENGTH OF STRATA MATERIAL RECOVERED DIVIDED BY TOTAL LENGTH OF STRATAM AND EXPRESSED AS A PERCENTAGE. STRATA ROCK QUALITY DESIGNATION (SROD) - A MEASURE OF ROCK QUALITY DESCRIBED BY TOTAL LENGTH OF STRATA AND EXPRESSED AS A PERCENTAGE. INCHESTOR OF STRATAM AND EXPRESSED AS A PERCENTAGE. INCHESTOR OF	MEDIUM CAN B	E GROOVED OR GO	SMALL CHIPS TO			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 SOIL WITH				
VERY CAN BE CARVED WITH KNIFE. CAN BE SCACAMATED READILY WITH POINT OF PICK. PIECES 1 INCH OR MORE IN THICKNESS CAN BE BROKEN BY FINGER PRESSURE. CAN BE SCRATCHED READILY BY FINGERNAIL. FRACTURE SPACING IERM SPACING VERY WIDE MORE THAN 10 FEET WIDE 3 10 10 FEET WIDE 3 10 10 FEET CLOSE 0.16 1 FEET VERY CLOSE 0.66 1 TO 3 FEET VERY CLOSE 1 TO 3 FEET VERY THICKLY LAMINATED 4.080 - 0.03 FEET VERY CLOSE 1 TO 3 FEET VERY CLOSE 1 THICKLY LAMINATED 4.080 - 0.03 FEET VERY CLOSE 1 TO 3 FEET VERY CLOSE 1 THICKLY LAMINATED 4.080 - 0.03 FEET VERY CLOSE 1 THICKLY LAMINATED 5.0808 - 0.03 FEET VERY CLOSE 1 THICKLY LAMINATED 5.0808 - 0.03 FEET VERY CLOSE 1 TO 3 FEET VERY CLOSE 1 THICKLY LAMINATED 5.0808 - 0.03 FEET VERY CLOSE 1 TO 3 FEET VERY CLOSE 1 THICKLY LAMINATED 5.0808 - 0.03 FEET VERY CLOSE 1 TO 3 FEET	SOFT CAN B	E GROVED OR GOL	UGED READILY B			THAN 0.1 FOOT PER 60 BLOWS. STRATA CORE RECOVERY (SREC.) - TOTAL LENGTH OF STRATA MATERIAL RECOVERED DIVIDED BY TOTAL LENGTH				
TIRM SPACING TERM SPACING TERM SPACING VERY WIDE MORE THAN 10 FEET THICKLY BEDDED 1.5 - 4 FEET THICKLY BEDDED 0.6.6 - 1.5 - 4 FEET THICKLY BEDDED 0.6.6 - 1.5 - 4 FEET THICKLY LAMINATED 0.608 - 0.83 FEET THICKLY LAMINATED 0.608 FEET THICKLY LAMINATED 0.608 - 0.83 FEET THICKLY LAM	VERY CAN B	E CARVED WITH K	NIFE. CAN BE E	XCAVATED READILY WITH POINT OF		STRATA ROCK QUALITY DESIGNATION (SROD) - A MEASURE OF ROCK QUALITY DESCRIBED BY				
TERM SPACING IERM SPACING VERY WIDE MORE THAN 10 FEET THICKLY BEDDED 1.5 - 4 FEET THICKLY BEDDED 1.5 - 4 FEET THICKLY BEDDED 1.5 - 4 FEET OLGSE OLGS	FINGER	RNAIL.				TOTAL LENGTH OF STRATA AND EXPRESSED AS A PERCENTAGE.				
VERY WIDE MORE THAN 10 FEET WIDE 3 TO 10 FEET WIDE 3 TO 10 FEET WIDE 3 TO 10 FEET WIDE AGE THAN 10 FEET WIDE 3 TO 10 FEET WIDE AGE THAN 10 FEET WIDE 3 TO 10 FEET WINLY BEDDED 1.5 - 4 FEET WIDE AGE THAN 10 FEET WERY THINLY BEDDED 1.5 - 4 FEET WERY CLOSE 0.16 TO 1 FEET WERY THINLY BEDDED 0.09 - 0.03 - 0.16 FEET WERY THINLY LAMINATED 0.090 - 0.03 FEET WERY CLOSE LESS THAN 0.16 FEET WERY THINLY LAMINATED 0.090 FEET WERY THINLY LAMINATED WERY THINLY LAMINATED 0.090 FEET WERY CLOSE CONTROL BEDDED 1.5 - 4 FEET WERY THINLY LAMINATED 0.090 FEET WERY CLOSE LESS THAN 0.16 FEET WERY THINLY LAMINATED 0.090 FEET WERY THINLY LAMINATED WERY THINLY LAMINATED 0.090 FEET WERY THINLY BEDDED 1.5 - 4 FEET WERY THINLY BEDDED 0.09 TO SHEET WERY THI										
WIDE 3 TO 10 FEET THICKLY BEDDED 1.5 - 4 FEET MODERATELY CLOSE 0.16 TO 1 FEET THINLY BEDDED 0.66 - 1.5 FEET VERY THINLY BEDDED 0.03 - 0.03 FEET VERY THINLY BEDDED 0.03 - 0.03 FEET THICKLY LAMINATED 0.000 FEET THIC			_	VERY THICKLY BEDDED	> 4 FEET	DELIVED MAKK! SURVEY INTORMATION PROVIDED BY VAUGHO & Melton, Inc.				
CLOSE VERY CLOSE LESS THAN 0.16 FEET THICKLY LAMINATED 0.088 - 0.03 FEET THICKLY LAMINATED 1.088 - 0.03 FEET CO.088 - 0.03 FEET THICKLY LAMINATED 1.088 - 0.03 FEET CO.088 - 0.03 FEET C				THINLY BEDDED	0.16 - 1.5 FEET	ELEVATION: FT.				
INDURATION OR SEDIMENTARY ROCKS, INDURATION IS THE HARDENING OF THE MATERIAL BY CEMENTING, HEAT, PRESSURE, ETC. FRIABLE RUBBING WITH FINGER FREES NUMEROUS GRAINS; GENTLE BLOW BY HAMMER DISINTEGRATES SAMPLE. MODERATELY INDURATED GRAINS CAN BE SEPARATED FROM SAMPLE WITH STEEL PROBE; BREAKS EASILY WHEN HIT WITH HAMMER. INDURATED GRAINS ARE DIFFICULT TO SEPARATE WITH STEEL PROBE; DIFFICULT TO BREAK WITH HAMMER. EXTREMELY INDURATED SHARP HAMMER BLOWS REQUIRED TO BREAK SAMPLE;	CLOSE	Ø.16 TO 1 F	EET	THICKLY LAMINATED	0.008 - 0.03 FEET	NOTES:				
OR SEDIMENTARY ROCKS, INDURATION IS THE HARDENING OF THE MATERIAL BY CEMENTING, HEAT, PRESSURE, ETC. FRIABLE RUBBING WITH FINGER FREES NUMEROUS GRAINS; GENTLE BLOW BY HAMMER DISINTEGRATES SAMPLE. MODERATELY INDURATED GRAINS CAN BE SEPARATED FROM SAMPLE WITH STEEL PROBE; BREAKS EASILY WHEN HIT WITH HAMMER. INDURATED GRAINS ARE DIFFICULT TO SEPARATE WITH STEEL PROBE; DIFFICULT TO BREAK WITH HAMMER. EXTREMELY INDURATED SHARP HAMMER BLOWS REQUIRED TO BREAK SAMPLE;			 UQNI		/ M'000 LEE!					
MODERATELY INDURATED GRAINS CAN BE SEPARATED FROM SAMPLE WITH STEEL PROBE; BREAKS EASILY WHEN HIT WITH HAMMER. INDURATED GRAINS ARE DIFFICULT TO SEPARATE WITH STEEL PROBE; DIFFICULT TO BREAK WITH HAMMER. EXTREMELY INDURATED SHARP HAMMER BLOWS REQUIRED TO BREAK SAMPLE;	OR SEDIMENTARY ROC	KS, INDURATION 19			G, HEAT, PRESSURE, ETC.					
BREAKS EASILY WHEN HIT WITH HAMMER. INDURATED GRAINS ARE DIFFICULT TO SEPARATE WITH STEEL PROBE; DIFFICULT TO BREAK WITH HAMMER. EXTREMELY INDURATED SHARP HAMMER BLOWS REQUIRED TO BREAK SAMPLE;	FRIABLE									
DIFFICULT TO BREAK WITH HAMMER, EXTREMELY INDURATED SHARP HAMMER BLOWS REQUIRED TO BREAK SAMPLE;	MODERATEL	Y INDURATED			ITH STEEL PROBE:					
	INDURATED				STEEL PROBE:					
	EXTREMELY	INDURATED	SHARP HAI	MMER BLOWS REQUIRED TO BREAK	SAMPLE;					



2505 Hutchison-McDonald Road Charlotte, North Carolina

Proj.: 63R-3026-0087 | Date: February 2014 |

Sheet No. 3



NCDOT BORE SINGLE 63R-3026-0087 CULVERT 210087 BORELOGS,GPJ NC DOT.GDT 11/13/13

TIP N/A **COUNTY CLAY** 14SP.20221.2 **GEOLOGIST** M.Brewer SITE DESCRIPTION Structure No. 210087 on SR 1140 (Myers Chapel Road) over Hyatt Mill Creek **GROUND WTR (ft)** BORING NO. B-1 **STATION** 15+46 OFFSET 9 ft LT ALIGNMENT -L-0 HR. 15.0 **COLLAR ELEV.** 1,818.3 ft TOTAL DEPTH 21.0 ft **NORTHING** 498,962 **EASTING** 563,073 **FIAD** 24 HR. DRILL METHOD H.S. Augers DRILL RIG/HAMMER EFF./DATE F&R4637 CME-75 86% 10/05/2012 **HAMMER TYPE** Automatic **START DATE** 09/26/13 DRILLER J. Fowler **COMP. DATE** 09/26/13 SURFACE WATER DEPTH N/A **BLOW COUNT BLOWS PER FOOT** SAMP DEPTH ELEV 0 SOIL AND ROCK DESCRIPTION (ft) (ft) 0 100 0.5ft 0.5ft 0.5ft NO. MOL G ELEV. (ft) DEPTH (ft) 1820 **GROUND SURFACE** 1,818.3 1,818.3 0 0 ROADWAY EMBANKMENT М 1,816.3 Brown, fine to coarse sandy SILT (A-4), with 1815 1,814.8 trace gravel & trace clay. 27 Brown, silty fine to coarse SAND (A-2-4), with trace gravel 1,811.3 Brown, highly fine to coarse sandy SILT 1810 1,809.8 8.5 (A-4(0)), with some clay. 8 26% SS-1 1,806.3 12.0 RESIDUAL 1805 1,804.8 13.5 Gray-orange-black, silty fine to coarse SAND 50 48 ™ (A-2-4), with some gravel-sized rock fragments. 1,802.3 16.0 16.0 60/0.0 • • 60/0.0 **CRYSTALLINE ROCK** 1800 White-gray-black, (BIOTITE GNEISS) 1,797.3 Boring Terminated at Elevation 1,797.3 ft IN CRYSTALLINE ROCK (BIOTITE GNEISS)

	TIP N/A COUNT	Y CLAY	GEOLOGIST M.Brewer	
SITE DESCRIPTION Structure No. 2				GROUND WTR (ft
	STATION 15+46	OFFSET 9 ft LT	ALIGNMENT -L-	0 HR. 15.0
	TOTAL DEPTH 21.0 ft	NORTHING 498,962	EASTING 563,073	24 HR. FIAD
DRILL RIG/HAMMER EFF./DATE F&R463	L	DRILL METHOD H.S	<u> </u>	ER TYPE Automatic
DRILLER J. Fowler	START DATE 09/26/13	COMP. DATE 09/26/13	SURFACE WATER DEPTH N/	
CORE SIZE NQ2	TOTAL RUN 5.0 ft			
ELEV RUN DEPTH RUN DRILL	RUN SAMP. REC. RQD	L		
(ft) ELEV (ft) (ft) RATE (Min/ft)	(ft) (ft) NO. (ft) (ft) %	O D D	ESCRIPTION AND REMARKS	DEPTH (f
802.3			Begin Coring @ 16.0 ft	-
1,802.3	(4.7) (2.9) 94% 58% (4.7) (2.9) 94% 58%	1,802.3 Slightly weathered, r	CRYSTALLINE ROCK moderately hard to hard, white-gray-bla	16. ick, (BIOTITE
5:13/1.0		GNEISS),	with very close to close fracture spacing	ng.
1,797.3 + 21.0 5:04/1.0		1,797.3 Boring Terminated	d at Elevation 1,797.3 ft IN CRYSTALL (BIOTITE GNEISS)	INE ROCK

WBS 1	4SP.20221	.2		Т	TP N/A	COUNTY CLAY				GEOLOGIST M. Brewer	
SITE DE	SCRIPTION	l Stru	cture	No. 2	10087 on SR 1140 (M	lyers Chapel Road) o	ver Hyat	t Mill C	reel	<	GROUND WTR (f
BORING	NO. B-2			S	STATION 15+85	OFFSET	14 ft RT			ALIGNMENT -L-	0 HR. 10.
COLLAI	R ELEV. 1,	819.11	ft	T	OTAL DEPTH 25.81	t NORTHIN	G 499,0	07		EASTING 563,073	24 HR. FIA
ORILL RI	G/HAMMER E	FF./DA	TE F8	kR3763	3 CME-550X 82% 10/05/20	12	DRILL I	METHO	D H	I.S. Augers HAMI	MER TYPE Automatic
DRILLE	R C. Boyc	Э		S	TART DATE 09/17/1	3 COMP. DA	TE 09/	17/13		SURFACE WATER DEPTH N	I/A
/#\ E	RIVE LEV (ft) DEPTH (ft)	' 	0.5ft		- 	PER FOOT 50 75 100	SAMP. NO.	MOI	L O G	SOIL AND ROCK DES	SCRIPTION DEPTH
1,815 1810 1,8 1805	319.1 0.0 315.6 3.5 310.6 8.5 303.3 15.8	3 12 100/0.5 60/0.0	3 19	11		100/0.5	SS-2	M 9%		1,819.1 GROUND SURF ROADWAY EMBAN I,817.1 Brown, fine sandy SILT (A gravel Brown-orange, silty fine to (A-2-4(0)), with trace gi 1,803.3 Gray-orange-black, (BIOT CRYSTALLINE F White-orange-gray, (BIOT White-gray-black, (BIOT CRYSTALLINE ROCK (BIOT CRY	ikment -4), with trace coarse SAND avel & clay. OCK TITE GNEISS) TE GNEISS) TE GNEISS) 1 2 2 3 3 3 4 4 4 5 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7

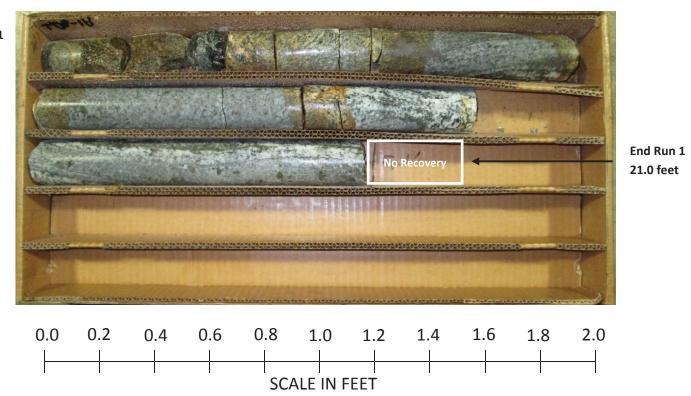
NCDOT CORE SINGLE 63R-3026-0087 CULVERT 210087 BORELOGS.GPJ NC_DOT.GDT 10/23/13

CURE E	BURING REPURI			
WBS 14SP.20221.2	TIP N/A COUNT	Y CLAY	GEOLOGIST M. Brewer	
SITE DESCRIPTION Structure No	o. 210087 on SR 1140 (Myers Cha	pel Road) over Hyatt Mill Creek		GROUND WTR (ft)
BORING NO. B-2	STATION 15+85	OFFSET 14 ft RT	ALIGNMENT -L-	0 HR . 10.8
COLLAR ELEV. 1,819.1 ft	TOTAL DEPTH 25.8 ft	NORTHING 499,007	EASTING 563,073	24 HR. FIAD
DRILL RIG/HAMMER EFF./DATE F&R3	3763 CME-550X 82% 10/05/2012	DRILL METHOD H.S	. Augers HAMM	ER TYPE Automatic
DRILLER C. Boyce	START DATE 09/17/13	COMP. DATE 09/17/13	SURFACE WATER DEPTH N/	A
CORE SIZE NQ2	TOTAL RUN 10.0 ft			
ELEV RUN ELEV (ft) DEPTH RUN RATE (Min/ft)	RUN 10.0 ft RUN REC. RQD R(ft) (ft) (ft)	L O D D	ESCRIPTION AND REMARKS	DEPTH (ft)
1803.3			Begin Coring @ 15.8 ft	
1,803.3 + 15.8 5.0 2:46/1.0 1:57/1.0 1:55/1.0 1:55/1.0 2:17/1.0	98% 64% 94% 0% (8.3) (8.3) (8.3) 100% 100%	GNEI GNEI	CRYSTALLINE ROCK loderately hard to hard, white-orange-g SS), with very close fracture spacing y-black, (BIOTITE GNEISS), with close	
1,798.3	(5.0) (5.0) 100% 100%	Treat, naid, wine-gra	close fracture spacing.	e to moderately
1,793.3 + 25.8 2:53/1.0 3:29/1.0		1,793.3		25.8
		Boring Terminated	d at Elevation 1,793.3 ft IN CRYSTALL (BIOTITE GNEISS)	INE ROCK
			(BIOTITE GNEISS)	



Structure No. 087 on SR 1140 over Hyatt Mill Creek CORE PHOTOGRAPHS: B-1: Station 15+46, 9' LT

Begin Run 1 16.0 feet

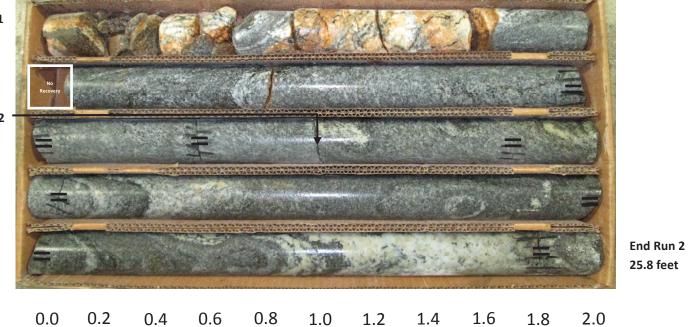


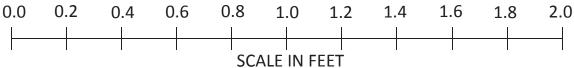


Structure No. 087 on SR 1140 over Hyatt Mill Creek CORE PHOTOGRAPHS: B-2: Station 15+85, 14' RT



Begin Run 2 20.8 feet







APPENDIX C LABORATORY TEST RESULTS



North Carolina Department of Transportation Division of Highways Materials and Test Unit Soils Laboratory

T.I.P. ID NO.:

14SP.20221.2

REPORT ON SAMPLES OF:

SOIL FOR QUALITY

 PROJECT:
 Bridge 210087
 COUNTY:
 Clay

 DATE SAMPLED:
 9-17-2013; 9-26-2013
 RECEIVED: 10-22-2013

 SAMPLED FROM:
 On Site
 REPORTED: 11-4-2013

 SUBMITTED BY:
 Froehling & Robertson, Inc.
 BY:
 M. Grabski

TEST RESULTS

PROJ. SAMPLE NO.	B1	B2			
LAB SAMPLE NO.	SS-1	SS-2			
Retained #4 Sieve %	0.0	9.6			
Passing #10 Sieve %	100.0	84.1			
Passing #40 Sieve %	84.1	63.7			
Passing #200 Sieve %	42.6	26.9			

MINUS #10 FRACTION

SOIL MORTAR - 100%					
Coarse Sand Ret - #60 %	31.0	38.2			
Fine Sand Ret - #270 %	29.7	37.0			
Silt 0.053 - 0.010 mm %	20.8	17.4			
Clay < 0.010 mm %	18.5	7.4			
L.L.	29	24			
P.L.	22	23			
P.I.	7	1			
AASHTO Classification	A-4(0)	A-2-4(0)			
Station	15+46	15+85			
Offset from Center Line	9' LT	14' RT			
Depth (in.)	8.5	3.5			
to	10.0	5.0			
Moisture Content	26.4	9.3			
Organic Content	NT	NT			

NT = Not Tested

NP = Not Plastic

NA = Not Applicable

Michael J. Walko, P.E.

Soils Engineer



APPENDIX D SUPPORTING CALCULATIONS

_	_ =			II N. House			PUKI	T								
	BS 14SP,20221.2 TIP N/A COUNT TE DESCRIPTION Structure No. 210087 on SR 1140 (Myers Cha					Y CLAY				GEOLOGIST M.Bre						
			Str	ucture				lyers Cha			tt Mill (Creel	(GROUN	D WTR (ft
						ATION 15+46 OFFS			ftLT			ALIGNMENT -L-	0 HR.	15.0		
_	COLLAR ELEV. 1,818.3 ft TOTAL DEPTH 21.0 ft					NORTHING				EASTING 563,073	24 HR.	FIAD				
-			F./DA	TE F	 -		6% 10/05/2012						.S. Augers		RTYPE	Automatic
	LER J. Fo		DI C			TART DA	ATE 09/26/1		COMP. DA		_	111	SURFACE WATER D	EPTH N/A	Α	
ELEV (ft)	I FIFV IDE		0,5ft	0,5ft		0		PER FOOT	75 100	SAMP. NO.	МОІ	0	SOIL AND I	ROCK DESC	RIPTION	DEPTH (f
1820	1,818.3 0		4	4	9 27		3				M.		ROADW/ 1,816.3 Brown, fine to contrace gr Brown, silty fine	avel & trace of to coarse SA	MËNT ILT (A-4), v clay. AND (A-2-4	<i>i</i>
1810	1,809.B B.	5	8	1	1	♥ 2				SS-1	26%		Brown, highly fi (A-4(0))	n trace gravel ne to coarse , with some c	sandy SIL	
1805	1,804.8 13 1,802.3 16		27	50	48				98		ŹŴ		Gray-orange-black (A-2-4), with s	ome gravel-s		
1800	1,802.3	6	0/0,0				1 1		60/0:0	genomena nichtegnülde en geza		が	Characteristics	agments. ALLINE ROC ck, (BIOTITE CAVATIO	CMEIGOL	
						Eln 1'of = 180 Excan to R Excan 0.6'	vert = 18 Foundation 1.71 = 6 val 15 A each Bo lation E of Rect of the	302.7 on Cor Some NTICIP Hom Glevati	nditioning of Rock Dated of AVATION				Boring Terminater CRYSTALLINE F	dat Elevation	1,797.3 ft	21.0 IN s)

NCDOT GEOTECHNICAL ENGINEERING UNIT BORELOG REPORT

	s 14SP					TIP N/A	I	Y CLAY				GEOLOGIST M. Brewer		
SITI	DESCF	RIPTIC	N St	ructure	No. 2	210087 on SR 1140 (N	yers Cha	pel Road) o	ver Hyal	t Mill	Cree	k	GROUN	D WTR (f
	RING NO				!	STATION 15+85		OFFSET	14 ft RT	•		ALIGNMENT -L-	0 HR.	10.
	LAR EL					FOTAL DEPTH 25.81		NORTHING				EASTING 563,073	24 HR.	FIAD
				ATE F		3 CME-550X 82% 10/05/20						I.S. Augers HAMM	IER TYPE	Automatic
	LER C		1	014100		START DATE 09/17/1		COMP, DA	1	_	A .	SURFACE WATER DEPTH N	/A	
ELEV (ft)	ELEV (ft)	DEPT (ft)	' <i>'</i>	OW CC		[]	PER FOOT 50	75 100	SAMP.	17	0	SOIL AND ROCK DESC	CRIPTION	
	1 (19				1				1	MO	G	ELEV, (ft)		DEPTH
1820														
	1,819.1	00	3	4	4		,			М		1,819.1 GROUND SURFA		
	1,815.6-	25				 				"		1.817.1 Brown, fine sandy SILT (A- gravel		e2
1815	1,010.0	- 0.0	3	3	3	1 ●6			SS-2	9%		Brown-orange, silty fine to (A-2-4(0)), with trace gra		p_,
	-		ļ					: : : :				· · · · · · · · · · · · · · · · · · ·	voi a olay.	
1810	1,810.6-	- 8.5 -	12	19	11	\$ 30				1\1		-		
	1	-						::::		_M_		•		
1805	1,805.6	- - 13.5	400/0			:::: <u>:::</u>	<u> </u>	<u> : : : : </u>				· <u>1,805.6</u>		13
	1,803.3	- 15.8	100/0.					100/0.5				WEATHERED RO 1,803.3 Gray-orange-black, (BIOTI) 15.
			60/0,0	Parametriconieso				• • 60/0.0	on the second distriction of the second dist			CRYSTALLINE RO 1,801.6 White-orange-gray, (BIOTI		17
800	1	-										White-gray-black, (BIOTIT	E GNEISS)	
	‡											Boltom of EXCAVAT	MOI	
795	4	•					• • • •					_		
	‡	· ·			ļ		• • • •					1,793.3 Boring Terminated at Elevation	n 1 702 2 H	25.
	‡					E Invert = 1 I'of Found after = 1801.7' = B EXCAVATION.	802 7	1			F	CRYSTALLINE ROCK (BIOT		
	‡	•				E mocre	2001				F			
	‡					L'CE	(,,,	dition			F			
	\pm	•				I or round call	n con	JULIANING			F			
	1					= 1801,7' = 8	ottom	of			E			
	#	,	:				<i>C</i>	^			E			
	‡					EXCAVATION.	Jome	Kock			t			
1	‡					Removal is A		i i			þ			
	‡						1	1			F	•		
	‡					to Reach Bo	rtom .	of			F			
	\pm					S A. A	Elava	4.5	ĺ		F			
	+					EXCAVATION	aevu	11011	ŀ		E			
	‡		.			1.6 of Rock	Even	in time			E			
	‡			.							þ			
	‡					~ 40 cyd fo	ir thi	5			·þ			
	‡					•		1			F			
	Ŧ					Side of the	culve	rt.			F			
	Ŧ		- [F			
	+++++++++++++++++++++++++++++++++++++++		ĺ								F			
	Ī			ŀ							F			
	I										F			
	Ŧ										F			
	\pm										E			
	Ŧ										E			
	+				ŀ						F			Í

