# 5208H

DRAWN BY: J. R. HAMM

#### STATE OF NORTH CAROLINA

DEPARTMENT OF TRANSPORTATION
RAIL DIVISION
GEOTECHNICAL ENGINEERING UNIT

#### **CONTENTS**

<u>HEET</u>	<b>DESCRIPTION</b>
i	TITLE SHEET
2	LEGEND
3	BORING LOCATION PLAN
4-5	SUBSURFACE PROFILES
6-10	BORE LOGS
11	LABORATORY TEST RESULTS
12	SITE PHOTOGRAPHS

#### STRUCTURE SUBSURFACE INVESTIGATION

PROJ. REFERENCE	NO. <b>P-5208H</b>	F.A. PROJ
COUNTY MECK	LENBURG	
PROJECT DESCRIF	TION <b>RETAINING</b>	<i>WALL FROM -Y1- STA. 30 + 75</i>
	TO -YI- ST	A. 44 + 05
SITE DESCRIPTION	GRIER ROAD	(SR 2976) GRADE SEPARATION
	FROM SOUTH	OF ORR ROAD (SR 2426) TO
	OLD CONCORD	ROAD (SR 2848)



	STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
\	N.C.	P-5208H	1	12
ERY.GOV	1	1 020011	<u></u>	

#### CAUTION NOTICE

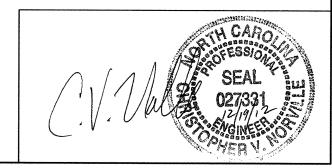
THE SUBSURFACE INFORMATION AND THE SUBSURFACE INVESTIGATION ON WHICH IT IS BASED WERE MADE FOR THE PURPOSE OF STUDY, PLANNING, AND DESIGN, AND NOT FOR CONSTRUCTION OR PAY PURPOSES. THE VARIOUS FIELD BORING LOGS, ROCK CORES, AND SOIL TEST DATA AVAILABLE MAY BE REVEWED OR INSPECTED IN RALEIGH BY CONTACTING THE N. C. DEPARTMENT OF TRANSPORTATION, GEOTECHNICAL ENGINEERING UNIT AT (1919) 250-408B. NEITHER THE SUBSURFACE PLANS AND REPORTS, NOR THE FIELD BORNING 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 SUBSUBFACE DATA AND MAY NOT NECESSARILY REFLECT THE ACTUAL SUBSURFACE CONDITIONS BETWEEN BORINGS OR BETWEEN SAMPLED STRATA MITHIN THE BOREHOLE. THE LABORATORY SAMPLE DATA AND THE IN STIU 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 MOSTURE CONDITIONS NIDICATED IN THE SUBSURFACE INVESTIGATIONS ARE AS RECORDED AT THE TIME OF THE INVESTIGATION. THESE WATER LEVELS OR SOIL MOISTURE CONDITIONS AND 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 SATISTY HUNSLE 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.

_	PERSONNEL  C. V. NORVILLE
	J. R. HAMM
	T. E. EVANS
_	
INVESTIGATED BY	T. E. EVANS
	C. V. NORVILLE
	FALCON ENG.

DECEMBER, 2012



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.

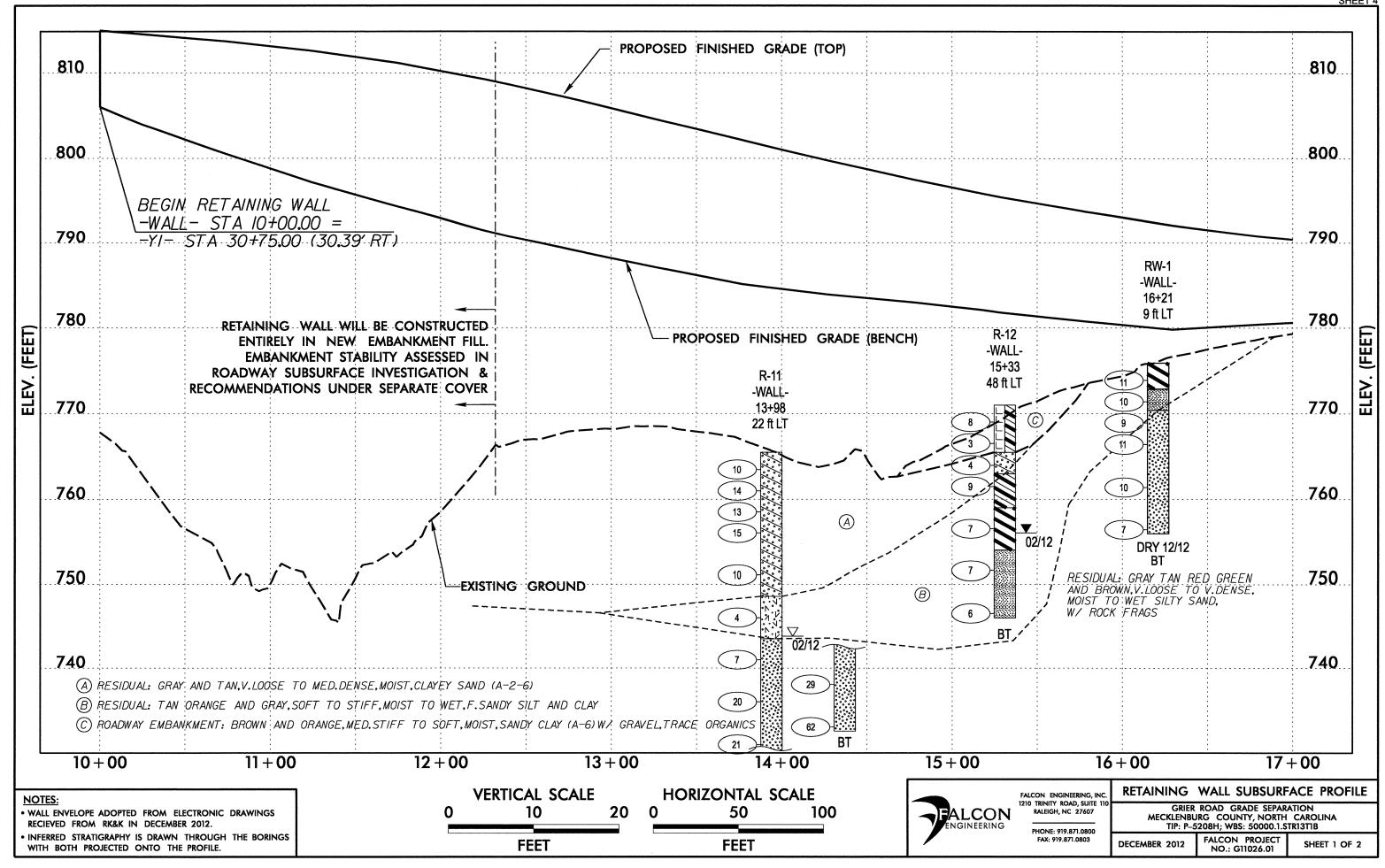
#### PROJECT REFERENCE NO. SHEET NO. P-5208H 2

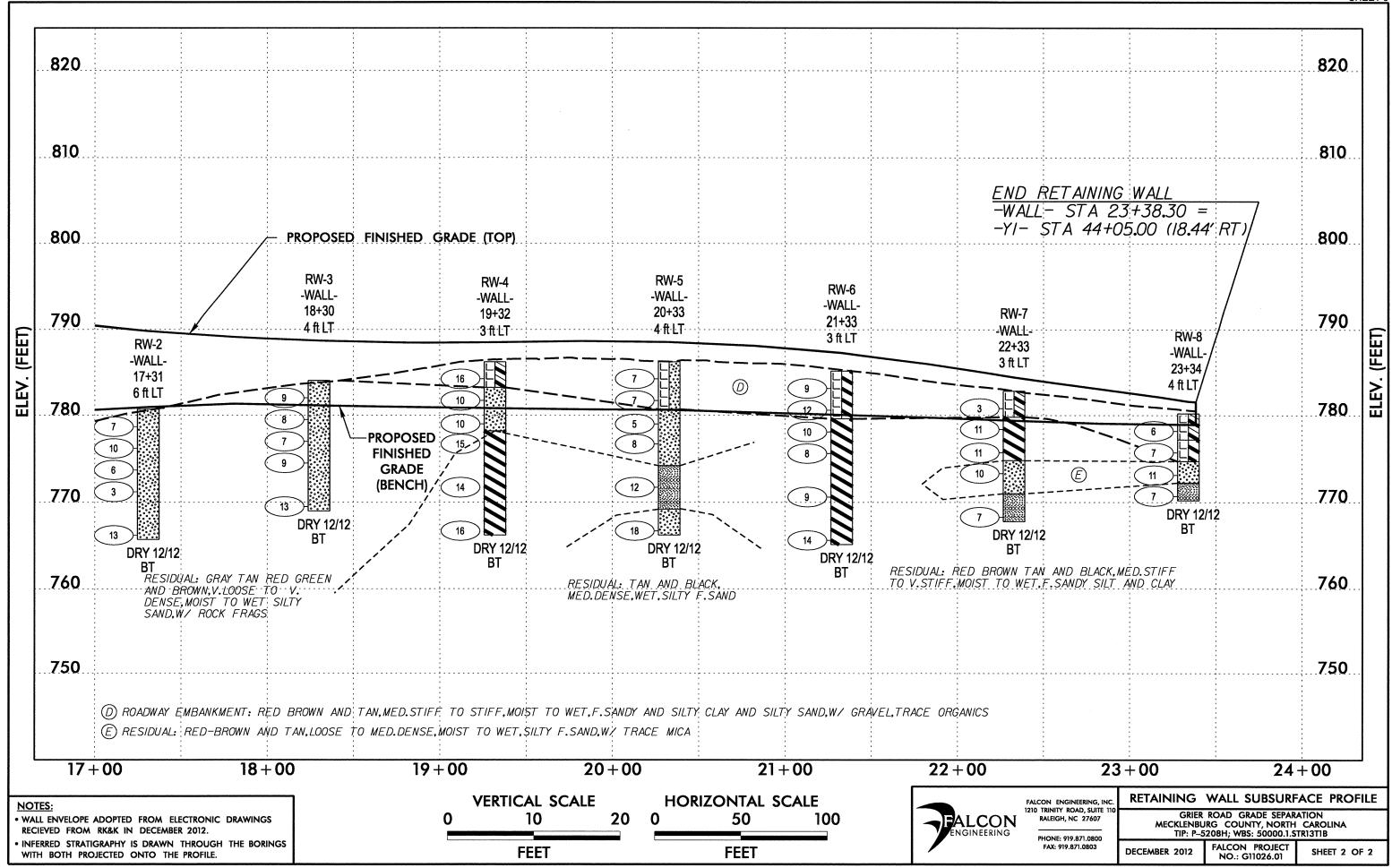
### NORTH CAROLINA DEPARTMENT OF TRANSPORTATION DIVISION OF HIGHWAYS

GEOTECHNICAL ENGINEERING UNIT

## SUBSURFACE INVESTIGATION

	SOIL AND ROC	CK LEGEND, TERMS,	, SYMBOLS,	AND ABBREVI	IATIONS		
SOIL DESCRIPTION	GRADATION				DESCRIPTION		TERMS AND DEFINITIONS
SOIL IS CONSIDERED TO BE THE UNCONSOLIDATED, SEMI-CONSOLIDATED, OR WEATHERED EARTH MATERIALS THAT CAN BE PENETRATED WITH A CONTINUOUS FLIGHT POWER AUGER, AND YIELD LESS THAN 180 BLOWS PER FOOT ACCORDING TO STANDARD PENETRATION TEST (AASHTO T286, ASTM D-1586), SOIL CLASSIFICATION IS BASED ON THE AASHTO SYSTEM, BASIC DESCRIPTIONS GENERALLY SHALL INCLUDE: CONSISTENCY, COLOR, TEXTURE, MOISTURE, AASHTO CLASSIFICATION, AND OTHER PERTINENT FACTORS SUCH	WELL GRADED - INDICATES A GOOD REPRESENTATION OF PARTICLE SIZES FR UNIFORM - INDICATES THAT SOIL PARTICLES ARE ALL APPROXIMATELY THE POORLY GRADED GAP-GRADED - INDICATES A MIXTURE OF UNIFORM PARTICLES OF TWO OR MO ANGULARITY OF GRAINS	ORE SIZES.	ROCK LINE INDICATE SPT REFUSAL IS PE IN NON-COASTAL PL OF WEATHERED ROCK	ES THE LEVEL AT WHICH NON-I NETRATION BY A SPLIT SPOON AIN MATERIAL, THE TRANSITI	NT IF TESTED, WOULD YIELD SPT REFUSAL, A COASTAL PLAIN MATERIAL WOULD YIELD SPT N SAMPLER EQUAL TO OR LESS THAN 0.1 FOO ON BETWEEN SOIL AND ROCK IS OFTEN REPR LOWS:	REFUSAL. T PER 60 BLOWS.	ALLUVIUM (ALLUV.) - SOILS THAT HAVE BEEN TRANSPORTED BY WATER.  AQUIFER - A WATER BEARING FORMATION OR STRATA,  ARENACEOUS - APPLIED TO ROCKS THAT HAVE BEEN DERIVED FROM SAND OR THAT CONTAIN SAND.  ARGILLACEOUS - APPLIED TO ALL ROCKS OR SUBSTANCES COMPOSED OF CLAY MINERALS,
AS MINERALOGICAL COMPOSITION, ANGULARITY, STRUCTURE, PLASTICITY, ETC. EXAMPLE:  VERY STIFF, GRAY, SUTY CLAY, MOST WITH INTERDEDUED FINE SAND LIVERS, MIGHLY PLASTIC, A-7-6	THE ANGULARITY OR ROUNDNESS OF SOIL GRAINS IS DESIGNATED BY THE TI SUBANGULAR, SUBROUNDED, OR ROUNDED.		WEATHERED		PLAIN MATERIAL THAT WOULD YIELD SPT N 1	/ALUES > 100	OR HAVING A NOTABLE PROPORTION OF CLAY IN THEIR COMPOSITION, AS SHALE, SLATE, ETC.
SOIL LEGEND AND AASHTO CLASSIFICATION  GENERAL GRANULAR MATERIALS SILT-CLAY MATERIALS ORGANIC MATERIALS	MINERAL OGICAL COMPOSITION MINERAL NAMES SUCH AS QUARTZ, FELDSPAR, MICA, TALC, KAQLIN, ETC. ARE US WHENEVER THEY ARE CONSIDERED OF SIGNIFICANCE.	N PERCONDITIONS	ROCK (WR)  CRYSTALLINE ROCK (CR)		E GRAIN IGNEOUS AND METAMORPHIC ROCK T		ARTESIAN - GROUND WATER THAT IS UNDER SUFFICIENT PRESSURE TO RISE ABOVE THE LEVEL AT WHICH IT IS ENCOUNTERED, BUT WHICH DOES NOT NECESSARILY RISE TO OR ABOVE THE GROUND SURFACE.
CLASS.     (≤ 35% PASSING *200)     (> 35% PASSING *200)       GROUP     A-1     A-3     A-2     A-4     A-5     A-6     A-7     A-1, A-2     A-4, A-5	COMPRESSIBILITY		NON-CRYSTALLINE	FINE TO COARSE	E GRAIN METAMORPHIC AND NON-COASTAL PL OCK THAT WOULD YEILD SPT REFUSAL IF TE		CALCAREOUS (CALC.) - SOILS THAT CONTAIN APPRECIABLE AMOUNTS OF CALCIUM CARBONATE.  COLLUVIUM - ROCK FRAGMENTS MIXED WITH SOIL DEPOSITED BY GRAYITY ON SLOPE OR AT BOTTOM
CLASS. A-1-a A-1-b A-2-4 A-2-5 A-2-6 A-2-7 A-7-8 A-3 A-6, A-7 SYMBOL 2888 2888 3888 3888 3888 3888 3888 388	SLIGHTLY COMPRESSIBLE LIQUID LIMIT L MODERATELY COMPRESSIBLE LIQUID LIMIT E	LESS THAN 31 EQUAL TO 31-50	ROCK (NCR)  COASTAL PLAIN	INCLUDES PHYLL COASTAL PLAIN	LITE, SLATE, SANDSTONE, ETC. SEDIMENTS CEMENTED INTO ROCK, BUT MAY	NOT YIELD	OF SLOPE.  CORE RECOVERY (REC.) - TOTAL LENGTH OF ALL MATERIAL RECOVERED IN THE CORE BARREL DIVIDED BY TOTAL
V PACSING	HIGHLY COMPRESSIBLE LIQUID LIMIT OF PERCENTAGE OF MATERIAL		SEDIMENTARY ROCK (CP)	SHELL BEDS, ET		, CEMENIEU	LENGTH OF CORE RUN AND EXPRESSED AS A PERCENTAGE.  DIKE - A TABULAR BODY OF IGNEOUS ROCK THAT CUTS ACROSS THE STRUCTURE OF ADJACENT
# 10 58 MX GRANULAR CLAY BEAT	GRANULAR SILT - CLAY	OTHER MATERIAL			ATHERING		ROCKS OR CUTS MASSIVE ROCK.
- 200 15 MX 25 MX 18 MX 35 MX 35 MX 35 MX 36 MN 36 MN 36 MN 36 MN 36 MN	TRACE OF ORGANIC MATTER 2 - 3% 3 - 5% TRAC  LITTLE ORGANIC MATTER 3 - 5% 5 - 12% LITTI	CE 1 - 10% TLE 10 - 20%	HAMMER	IF CRYSTALLINE.	IOINTS MAY SHOW SLIGHT STAINING ROCK RI		<u>OIP</u> - THE ANGLE AT WHICH A STRATUM OR ANY PLANAR FEATURE IS INCLINED FROM THE HORIZONTAL.
LIDIDI CIMIT 48 MX 41 MM 189 MX 10 MM 18 MX 10 MM 18 MX 10 MM 18 MX 10 MM 18 MX 10 MM 10 M	MODERATELY ORGANIC         5 - 10%         12 - 20%         SOME           HIGHLY ORGANIC         >10%         >20%         HIGH	L 20 - 33%	(V SLI.) CRYSTAL		NED, SOME JOINTS MAY SHOW THIN CLAY CO ICE SHINE BRIGHTLY. ROCK RINGS UNDER HAN		<u>DIP DIRECTION (DIP AZIMUTH) -</u> THE DIRECTION OR BEARING OF THE HORIZONTAL TRACE OF THE LINE OF DIP, MEASURED CLOCKWISE FROM NORTH.
USUAL TYPES STONE FRACS. FINE SILTY OR CLAYEY SILTY CLAYEY ORGANIC	GROUND WATER  WATER LEVEL IN BORE HOLE IMMEDIATELY AFTER DR		(SLI.) 1 INCH.	OPEN JOINTS MAY CONTAIN CL	NED AND DISCOLORATION EXTENDS INTO ROCI	FELDSPAR	FAULT - A FRACTURE OR FRACTURE ZONE ALONG WHICH THERE HAS BEEN DISPLACEMENT OF THE SIDES RELATIVE TO ONE ANOTHER PARALLEL TO THE FRACTURE.
MATERIALS SAND SAND GRAVEL AND SAND SOILS SOILS MATTER	STATIC WATER LEVEL AFTER 24 HOURS	,			L CRYSTALLINE ROCKS RING UNDER HAMMER DISCOLORATION AND WEATHERING EFFECTS.		FISSILE - A PROPERTY OF SPLITTING ALONG CLOSELY SPACED PARALLEL PLANES.  FLOAT - ROCK FRAGMENTS ON SURFACE NEAR THEIR ORIGINAL POSITION AND DISLODGED FROM
GEN.RATING AS A EXCELLENT TO GOOD FAIR TO POOR POOR UNSUITABLE SUBGRADE	· Landau de la companya de la compa	NG STRATA	DULL SO		RE DULL AND DISCOLORED, SOME SHOW CLAY. ND SHOWS SIGNIFICANT LOSS OF STRENGTH		PARENT MATERIAL. FLOOD PLAIN (FP) - LAND BORDERING A STREAM, BUILT OF SEDIMENTS DEPOSITED BY
PI OF A-7-5 SUBGROUP IS ≤ LL - 30 :PI OF A-7-6 SUBGROUP IS > LL - 30	SPRING OR SEEP		MODERATELY ALL ROC	CK EXCEPT QUARTZ DISCOLOREI	D OR STAINED. IN GRANITOID ROCKS. ALL FE		THE STREAM.
CONSISTENCY OR DENSENESS  RANGE OF STANDARD  COMPACTNESS OR  C	MISCELLANEOUS SYMBOLS	TEST POPING	(MOD. SEV.) AND CAN	BE EXCAVATED WITH A GEOL	OW KAOLINIZATION. ROCK SHOWS SEVERE LOS OGIST'S PICK. ROCK GIVES "CLUNK" SOUND WH		FORMATION (FM.) - A MAPPABLE GEOLOGIC UNIT THAT CAN BE RECOGNIZED AND TRACED IN THE FIELD.
PRIMARY SOIL TYPE COMPACTNESS OR CONSISTENCY PENETRATION RESISTENCE COMPRESSIVE STRENGTH (N-VALUE) (TONS/FT <sup>2</sup> )	ROADWAY EMBANKMENT (RE)  WITH SOIL DESCRIPTION  OPT ONT TEST BORING	W/ CORE		ED. WOULD YIELD SPT REFUSAL	<u>L</u> D OR STAINED.ROCK FABRIC CLEAR AND EVI	DENT BUT DEDUCED	JOINT - FRACTURE IN ROCK ALONG WHICH NO APPRECIABLE MOVEMENT HAS OCCURRED.
GENERALLY VERY LOOSE	SOIL SYMBOL AUGER BORING		(SEV.) IN STRE		ANITOID ROCKS ALL FELDSPARS ARE KAOLIN		LEDGE - A SHELF-LIKE RIDGE OR PROJECTION OF ROCK WHOSE THICKNESS IS SMALL COMPARED TO ITS LATERAL EXTENT.
MATERIAL MEDIUM DENSE 10 TO 30 N/A	ARTIFICIAL FILL (AF) OTHER - CORE BORING	REF SPT REFUSAL		TED, YIELDS SPT N VALUES > 1			LENS - A BODY OF SOIL OR ROCK THAT THINS OUT IN ONE OR MORE DIRECTIONS.
VERY DENSE >50	THAN ROADWAY EMBANKMENT  INFERRED SOIL BOUNDARY  MONITORING WELL	1	(V SEV.) THE MAS	SS IS EFFECTIVELY REDUCED 1	D OR STAINED, ROCK FABRIC ELEMENTS ARE TO SOIL STATUS, WITH ONLY FRAGMENTS OF E OF ROCK WEATHERED TO A DEGREE SUCH	STRONG ROCK	MOTTLED (MOT). IRREGULARLY MARKED WITH SPOTS OF DIFFERENT COLORS.MOTTLING IN SOILS USUALLY INDICATES POOR AERATION AND LACK OF GOOD DRAINAGE.  PERCHED WATER - WATER MAINTAINED ABOVE THE NORMAL GROUND WATER LEVEL BY THE PRESENCE OF AN
VERY SOFT <2 <0.25  GENERALLY SOFT 2 TO 4 8.25 TO 8.50  SILT-CLAY MEDIUM STIFF 4 TO 8 8.5 TO 1.60	INFERRED ROCK LINE A PIEZOMETER INSTALLATION		VESTIGE	S OF THE ORIGINAL ROCK FAB	PRIC REMAIN. IF TESTED, YIELDS SPT N VAI NOT DISCERNIBLE, OR DISCERNIBLE ONLY IN	UES < 100 BPF	INTERVENING IMPERVIOUS STRATUM.  RESIDUAL (RES.) SOIL - SOIL FORMED IN PLACE BY THE WEATHERING OF ROCK.
MATERIAL STIFF 8 TO 15 1 TO 2 (COHESIVE) VERY STIFF 15 TO 30 2 TO 4 HARD >30 24	SLOPE INDICATOR  25/025 DIP & DIP DIRECTION OF		SCATTER		MAY BE PRESENT AS DIKES OR STRINGERS.		ROCK QUALITY DESIGNATION (ROD) - A MEASURE OF ROCK QUALITY DESCRIBED BY TOTAL LENGTH OF ROCK SEMENTS EQUAL TO OR GREATER THAN 4 INCHES DIVIDED BY THE TOTAL LENGTH OF CORE RUN AND
TEXTURE OR GRAIN SIZE	ROCK STRUCTURES  CONE PENETROME	ETER TEST		ROCK	( HARDNESS		EXPRESSED AS A PERCENTAGE.
U.S. STD. SIEVE SIZE 4 10 40 60 200 270	SOUNDING ROD			F BE SCRATCHED BY KNIFE OR AL HARD BLOWS OF THE GEOLO	SHARP PICK. BREAKING OF HAND SPECIMENS OGIST'S PICK.	REQUIRES	SAPROLITE (SAP.) - RESIDUAL SOIL THAT RETAINS THE RELIC STRUCTURE OR FABRIC OF THE PARENT ROCK.
OPENING (MM) 4.76 2.00 8.42 8.25 8.875 8.853  BOULDER COBBLE GRAVEL COARSE FINE SILT CLAY	ABBREVIATIONS  AR - AUGER REFUSAL MED MEDIUM	VST - VANE SHEAR TEST		SCRATCHED BY KNIFE OR PIC FACH HAND SPECIMEN.	CK ONLY WITH DIFFICULTY, HARD HAMMER BL	OWS REQUIRED	SILL - AN INTRUSIVE BODY OF TOKEOUS 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.
(GLDR.) (GR.) (GR.) (GSE. SD.) (F SD.) (SL.) (CL.) (CL.) (GRAIN MM 305 75 2.0 0.25 0.05 0.095	BT - BORING TERMINATED MICA MICACEOUS CL CLAY MOD MODERATELY	WEA WEATHERED  7 - UNIT WEIGHT	HARD EXCAVA		CK. GOUGES OR GROOVES TO 0.25 INCHES DE DLOGIST'S PICK. HAND SPECIMENS CAN BE DE		SLICKENSIDE - POLISHED AND STRIATED SURFACE THAT RESULTS FROM FRICTION ALONG A FAULT OR SLIP PLANE.
SIZE IN. 12 3	CPT - CONE PENETRATION TEST NP - NON PLASTIC CSE COARSE ORG ORGANIC  DMT - DILATOMETER TEST PMT - PRESSUREMETER TEST	7 <sub>d</sub> - DRY UNIT WEIGHT SAMPLE ABBREVIATIONS	MEDIUM CAN BE	GROOVED OR GOUGED 0.05 IN	NCHES DEEP BY FIRM PRESSURE OF KNIFE O TO PEICES 1 INCH MAXIMUM SIZE BY HARD		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
SOIL MOISTURE - CORRELATION OF TERMS  SOIL MOISTURE SCALE FIELD MOISTURE GUIDE FOR FIELD MOISTURE DESCRIPTION	DMT - DILATOMETER TEST PMT - PRESSUREMETER TEST DPT - DYNAMIC PENETRATION TEST SAP SAPROLITIC 6 - VOID RATIO SD SAND, SANDY	S - BULK SS - SPLIT SPOON	POINT	OF A GEOLOGIST'S PICK.	BY KNIFE OR PICK. CAN BE EXCAVATED IN		A 2 INCH OUTSIDE DIAMETER SPLIT SPOON SAMPLER, SPT REFUSAL IS PENETRATION EQUAL TO OR LESS THAN 0.1 FOOT PER 60 BLOWS.
(ATTERBERG LIMITS)  DESCRIPTION  - SATURATED - USUALLY LIQUID; YERY WET, USUALLY	F - FINE SL SILT, SILTY FOSS FOSSILIFEROUS SLI SLIGHTLY	ST - SHELBY TUBE RS - ROCK	FROM (		SIZE BY MODERATE BLOWS OF A PICK POINT		STRATA CORE RECOVERY (SREC.) - TOTAL LENGTH OF STRATA MATERIAL RECOVERED DIVIDED BY TOTAL LENGTH OF STRATUM AND EXPRESSED AS A PERCENTAGE.
(SAT.) FROM BELOW THE GROUND WATER TABLE  LL LIQUID LIMIT	FRAC FRACTURED, FRACTURES TCR - TRICONE REFUSAL FRAGS FRAGMENTS # - MDISTURE CONTENT HL HIGHLY Y - VERY	RT - RECOMPACTED TRIAXIAL CBR - CALIFORNIA BEARING RATIO	SOFT OR MOR	RE IN THICKNESS CAN BE BROK	EXCAVATED READILY WITH POINT OF PICK. KEN BY FINGER PRESSURE. CAN BE SCRATCH		STRATA ROCK QUALITY DESIGNATION (SROD) - A MEASURE OF ROCK QUALITY DESCRIBED BY TOTAL LENGTH OF ROCK SEGMENTS WITHIN A STRATUM EQUAL TO OR CREATER THAN 4 INCHES DIVIDED BY THE TOTAL LENGTH OF STRATA AND EXPRESSED AS A PERCENTAGE.
PLASTIC   SEMISOLID; REQUIRES DRYING TO ATTAIN OPTIMUM MOISTURE	EQUIPMENT USED ON SUBJECT PR		FINGER	RE SPACING	BEDDING		TOPSOIL (TS.) - SURFACE SOILS USUALLY CONTAINING ORGANIC MATTER.
(PI) PL PLASTIC LIMIT	DRILL UNITS: ADVANCING TOOLS:	HAMMER TYPE:	TERM	SPACING		CKNESS FEET	BENCH MARK:
OM OPTIMUM MOISTURE - MOIST - (M) SOLID; AT OR NEAR OPTIMUM MOISTURE		X AUTOMATIC MANUAL	VERY WIDE WIDE	MORE THAN 10 FEET 3 TO 10 FEET	THICKLY BEDDED 1.5	- 4 FEET - 1.5 FEET	ELEVATION: FT.
SL SHRINKAGE LIMITREQUIRES ADDITIONAL WATER TO	MOBILE B- CLAY BITS  G'CONTINUOUS FLIGHT AUGER	CORE SIZE:	MODERATELY CLOSE CLOSE	0.16 TO 1 FEET	VERY THINLY BEDDED 0.03	- 0.16 FEET - 0.03 FEET	NOTES:
- DRY - (D) ATTAIN OPTIMUM MOISTURE	BK-51 X 8" HOLLOW AUGERS	□-в	VERY CLOSE	LESS THAN 0.16 FEET	THINLY LAMINATED < 0.	008 FEET	FIAD - FILLED-IN AFTER DRILLING
PLASTICITY	CME-45C HARD FACED FINGER BITS		FOR SENIMENTARY POC		DURATION  NING OF THE MATERIAL BY CEMENTING, HEAT,	PRESSURE FTC	
PLASTICITY INDEX (PI) DRY STRENGTH NONPLASTIC 8-5 VERY LOW	CME-55 TUNGCARBIDE INSERTS		FRIABLE		WITH FINGER FREES NUMEROUS GRAINS:	. VILOUUIILE LI I GE	
LOW PLASTICITY 6-15 SLIGHT MED. PLASTICITY 16-25 MEDIUM	CASING W/ ADVANCER	HAND TOOLS:	FRIHOLE	GENTLE	BLOW BY HAMMER DISINTEGRATES SAMPLE.		
HIGH PLASTICITY 26 OR MORE HIGH	PORTABLE HOIST TRICONE STEEL TEETH	POST HOLE DIGGER HAND AUGER	MODERATELY		CAN BE SEPARATED FROM SAMPLE WITH STE EASILY WHEN HIT WITH HAMMER.	EL PROBE:	
COLOR	X CME-55 (TRUCK) TRICONE TUNGCARB.	SOUNDING ROD	INDURATED		ARE DIFFICULT TO SEPARATE WITH STEEL I	PROBE:	
DESCRIPTIONS MAY INCLUDE COLOR OR COLOR COMBINATIONS (TAN, RED, YELLOW-BROWN, BLUE-GRAY).  MODIFIERS SUCH AS LIGHT, DARK, STREAKED, ETC. ARE USED TO DESCRIBE APPEARANCE.	X CME-55 (ATV)	VANE SHEAR TEST	EXTREMELY	INDURATED SHARP I	JLT TO BREAK WITH HAMMER. HAMMER BLOWS REQUIRED TO BREAK SAMPLE	į	
				SAMPLE	BREAKS ACROSS GRAINS.		





WBS 50	00.1.ST	R13T1	В	TI	P P-5208	H	COUN	TY MECKL	ENBUR	G	(	GEOLOGIST J. HAMI	И		WBS	50000	0.1.STR	13T1B		TIF	P-5208H	COUNTY	MECKLE	NBURG	3		GEOLOGIST J. HAMI	1
SITE DES	CRIPTIC	N GF	IER R	DAD C	RADE SEI	PARATIO	N				······································		GROUNI	D WTR (ft)	SITE	DESCR	RIPTION	GRIE	R RO	AD GI	RADE SEPARATIO	N						GROUND WTR (f
BORING I	IO. R-1	11		S	TATION 1	3+98		OFFSET	22 ft LT	•		LIGNMENT -WALL-	0 HR.	21.7	BOR	RING NO.	. R-12			ST	ATION 15+33		OFFSET .	48 ft LT			ALIGNMENT -WALL-	0 HR. Dr
COLLAR	LEV.	765.5 fl		TO	TAL DEP	TH 45.0	ft	NORTHIN	<b>G</b> 557,	610	E	ASTING 149,827	24 HR.	FIAD	COL	LAR ELI	<b>EV</b> . 77	1.0 ft		то	TAL DEPTH 25.0	ft	NORTHING	<b>3</b> 557,7	736		<b>EASTING</b> 1,479,902	<b>24 HR.</b> 15.
DRILL RIG/	IAMMER	EFF./D/	TE T	RI0055	CME-55 70%	12/08/201	1		DRILL	METHO	D H.S. A	ugers	HAMMER TYPE	Automatic	DRIL	L RIG/HAI	MMER E	FF./DAT	E TRI	19435 C	CME-55 93% 12/08/201	1		DRILL	METHO	D H.S	. Augers	HAMMER TYPE Automatic
DRILLER	R. TO	AMHTC	N	S	ART DATE	02/17/	12	COMP. DA	ATE 02	/17/12		URFACE WATER DE	PTH N/A		DRIL	LER V	v. WHI	CHARD	)	ST	ART DATE 02/17/	12	COMP. DA	TE 02/	17/12		SURFACE WATER DEF	PTH N/A
ELEV DRIV	E DEPT	H BL	ow co	JNT		BLOWS	PER FOO	r	SAMP	<b>V</b> /	L	SOIL AND BO	OCK DESCRIPTION		ELEV	DRIVE	DEPTH	BLOV	w cou	INT	BLOWS	PER FOOT		SAMP.			SOII AND BO	CK DESCRIPTION
(ft) (ft)		0.5ft	0.5ft	0.5ft	0 :	25 	50	75 100	NO.	MO		EV. (ft)		DEPTH (ft)	(ft)	(ft)	(ft)	0.5ft	0.5ft	0.5ft	0 25	50	75 100	NO.	MOI		SOIL AND NO	
770											_				775		1			İ						-		
	İ										<u> </u>						İ									<u> </u>		
	Ŧ										F					-	Ŧ									F	771.0 GROUN	D SURFACE
765	5 1.0		-		<del>                                     </del>		<del></del>		#	-	- 76	RE	ID SURFACE SIDUAL	0.0	770	770.0	1.0	4	4	4							ROADWAY	EMBANKMENT ANGE, SANDY CLAY
	+	2	5	5	- 10		• • •	-		М		TAN, CLAY	EY SAND (A-2-6)			-	†	4	4	4	8				M		(A-6) W/ GRAVE	, TRACE ORGANICS
762	0 3.5	3	5	9	1. 7					١						767.5	3.5	2	1	2	<b>4</b> 2 · · · · · · · · · · · · · · · · · · ·			SS-15	18%			
760	+ 5 + 6.0				• • • 14		1		]]	M					765	765.0	6.0					<u> </u>			1		765.5	SIDUAL
759	+ 8.0	4	6	7	13					м							╁	2	2	2	4				М		GRAY AND TAN, 763.0	CLAYEY SAND (A-2-6)
757	0   8.5	4	6	9	1											762.5	8.5	2	4	5	1.7				м			, SANDY CLAY (A-6)
755	1				15					M					760	] :	<u>†</u>			l	. • 9				""			
	+				/												╁				-						759.0 ORANGE AND GF	22 RAY, SILTY CLAY (A-7)
752	0 13.5	2	4	6	:   : :		: : :									757.5	13.5	2	3	4	•7				_			, , ,
750	1				- •10 -		1			М					755		İ				1	1						
	+				·j. · ·						74	3.5		17.0		-	╁			ļ	-						754.0 GREEN AND BROV	VN, CLAYEY SILT (A-4)
747	0 18.5	1	2	2	1	: : : :	: : :			4		TAN AND ORANGE SAPROLITI	E, FN. SANDY SILT (A IC, TRACE MICA	A-5)		752.5	18.5	2	3	4	7				w			, 0, 0 ( ,
745	+	'	4	2	<b>4</b>		• • •		SS-14	31%	3 1				750		t			l	1.7				"			
	Ŧ				1		Ī			$\nabla$	N V 74			22.0		] -	Ŧ									F		
742	0 23.5		<u> </u>		11:::						-		D BLACK, SILTY SAI ITIC, W/ TRACE MIC			747.5	23.5	1	3	3	1				w			
740	+	2	2	5	7			-		W	-										<b>●</b> 6			<b>-</b>	"			at Elevation 746.0 ft in
	Ŧ				\						F					-	Ţ			l						l F	Residua	ıl: Clayey Silt
737	0 28.5	<u>.                                    </u>			1 / .												‡											
735	+	4	9	11	•2	20				М	-					-	+			l						F		
735	Ţ						1									-	Ŧ		l							1 F		
	0 + 33.5						: : :										İ									lt		
732	+	4	9	12	•	 21 				М							+			l						1 F		
	‡						1		11							-	‡			l						ΙF		
727	0 1 38.5					<u> </u>											İ									ΙĖ		
725	+	6	14	15		29				М						-	+											
	‡															-	‡			l						1 F		
722	0 43.5	<u>.</u>					\:\:\:				<u> </u>						İ									1 E		
		14	34	28	1	<u> </u>	- 62	2		М	72	0.5		45.0			+									F		
725	‡									ļ		Boring Terminated Residua	l at Elevation 720.5 ft al: Silty Sand	in		-	‡			1						1 F		
	<u>†</u>																t									1 E		
	+										<b> </b> -					-	+									F		
	‡															-	‡											
4	+										-						†									1 F		
	Ţ										F						Ţ									F		
	‡															-	‡									1		
	+										<b> </b>						+											
	+	1	1	1					1	1	1 F					1 -	+	1 1	- 1					1	1	1 F		

WBS						P-5208			Y MECKL	ENBUR	3	G	EOLOGIST T. E	VANS			WB	<b>S</b> 50000	.1.STR1	3T1B	Ī	TIP I	P-5208H COUNT	Y MECKLE	ENBURG	3		GEOLOGIST T. EV/	NS
SITE D	ESCRI	PTION	RET	ΓΑΙΝΙΙ	NG WA	LL FROM	-Y1- STA	. 30+75 T	O STA. 44+	+05					GROUNE	WTR (ft)	SITI	E DESCR	IPTION	RETAIN	NING W	VALL	FROM -Y1- STA. 30+75 T	O STA. 44+	05			-	GROUND WTF
BORIN	G NO.	RW-	1		ST	ATION 1	6+21		OFFSET	9 ft LT		Α	LIGNMENT -WA	LL-	0 HR.	Dry	BOI	RING NO.	RW-2		- [	STAT	TION 17+31	OFFSET	6 ft LT			ALIGNMENT -WALL	- 0 HR.
COLLA	R ELE	<b>V</b> . 77	5.9 ft		TC	TAL DEPT	TH 20.01	ft	NORTHIN	<b>G</b> 557,	758	E	<b>ASTING</b> 1,479,9	93	24 HR.	FIAD	COI	LLAR ELE	<b>V</b> . 780	.7 ft	-	TOTA	AL DEPTH 15.0 ft	NORTHING	<b>3</b> 557,8	339		<b>EASTING</b> 1,480,065	24 HR. F
DRILL R	RIG/HAM	MER E	FF./DA	TE T	RI0055 (	ME-55 70%	12/08/201	1		DRILL	METHO	D H.S. Au	ugers	HAM	MER TYPE	Automatic	DRIL	L RIG/HAI	MER EF	F./DATE	TRI0055	55 CME	IE-55 70% 12/08/2011		DRILL I	METHO	DD H.	S. Augers	HAMMER TYPE Automa
DRILLE	ER W.	WHIC	CHAR	D	ST	ART DATE	12/12/	12	COMP. DA	<b>ATE</b> 12	/12/12	S	URFACE WATER	DEPTH N	N/A		DRI	LLER W	. WHIC	HARD		STAR	RT DATE 12/12/12	COMP. DA	TE 12/	12/12		SURFACE WATER D	EPTH N/A
ELEV [	DRIVE L	DEPTH	BLC	w co	UNT			PER FOOT		SAMP	1.7	101	SOIL AN	D ROCK DES	SCRIPTION		ELE\	DRIVE ELEV	DEPTH	BLOW (			BLOWS PER FOOT		SAMP.	/		SOIL AND F	OCK DESCRIPTION
(ft)	(ft)	(ft)	0.5ft	0.5ft	0.5ft	0 2	25 	50	75 100	NO.	МО	G ELE	EV. (ft)			DEPTH (ft)	(ft)	(ft)	(ft)	0.5ft 0.5	oft 0.5f	ift 0	) 25 50	75 100	NO.	МО	ı Ğ	SOIL AND I	COCK DESCRIPTION
780																	785											_	
	<u> </u>											<u> </u>						_									1 E		
	±											775	i.9 GR	OUND SURI	FACE	0.0		_	-								1 6	. 780.7 GROU	IND SURFACE
775	774.9	1.0	3	5	6	1 1 1		<b>-</b>		$\blacksquare$	м		RED-BRO	RESIDUAL DWN. SILTY	_ CLAY (A-7)		780	779.7	- 1.0	3 3	3 4	<del>-</del> TE	1			1.,		_	RESIDUAL AND BLACK, SILTY SAND
	772.4	3.5				T.			1			772	RED-BROW			3.0 -T		777.2	3.5			:	. 7	1 1		M	-	(A-2-4) W/ TRA	CE MICA, ROCK FRAGS.
770	<sub>769.9</sub> ]	60	Э	4	$ $	10	: : : :	ì			M	770	.4	(A-4)		5.5	775	774.7	-	4   5	5		10 -	1 .		М	-	•	
	+		4	4	5	. •9				11	М	E F	TAN AND GF	RAY, SILTY F	Sand (A-2-	4)		- //4./-	- 0.0	4 2	2 4		<b>6</b>	1 .		М	F	<del>-</del> ·	
	767.4 <del>†</del>	8.5	5	5	6	11					М							772.2	8.5	2 1	2	- j	$\underline{f}$ $\ldots$ $ \ldots $	.		М		•	
765	‡						• • • •										770						3			"		-	
يا ا	762.4	13.5																767.2	13.5					.				•	
760	‡		4	6	4	•10		: : : :			М									3 6	7	11:	13.			М		- - 765.7	
100	‡					1.1		1		11								-	-									<ul><li>Boring Terminat</li><li>Resident</li></ul>	ed at Elevation 765.7 ft in ual: Silty Sand
-	757.4	18.5	3	3	4		: : : :	: : : :			N.	755				20.0		-	-									•	
						<b></b> (				4	101	/55	Boring Termi	nated at Elev	ation 755.9 ft	20.0 in			_									<del>-</del>	
	‡												Res	idual: Silty F.	. Sand			]										•	
	‡																											•	
	+											-						_									1 6	<del>-</del>	
	±											ŀĿ															1 E	•	
	+											F						-	-								l F	•	
	Ŧ											l F						-	-								l F	•	
	Ŧ											F						-	-								F	•	
	#										ĺ	F						-									1	<del>-</del>	
	‡										į							-										•	
	‡																	-										•	
	+																	-									1	<del>-</del>	
	‡																										<u> </u>	•	
												<u> </u>						-	_								1 E	, _	
	<u>+</u>										l	l E						-	-								1 -	•	
	Ŧ											F						-	-						l		1 F	•	
	Ŧ											l F						-	-								F	•	
	Ŧ											F						-	-								F	•	
	‡																											•	
	‡											-						-	-									<del>-</del> ·	
	‡																										<b> </b>	•	
												l E															<u> </u>		
	1																	-	-								E		
	Ŧ											<u> </u>															F	•	
	Ŧ											1 -						-									F	_	
	Ŧ											F							-								F	•	
	‡											F															F	•	
	‡											F						-	-									•	
1	İ		l	1							1	I E								- 1					1		I		

BORELOG REPORT					
	MECKLENBURG GEOLOGIST T. EVANS		<b>WBS</b> 50000.1.STR13T1B <b>TIP</b> P-5208H	COUNTY MECKLENBURG	GEOLOGIST T. EVANS
SITE DESCRIPTION RETAINING WALL FROM -Y1- STA. 30+75 TO S	STA. 44+05	GROUND WTR (ft)	SITE DESCRIPTION RETAINING WALL FROM -Y1- STA.	30+75 TO STA. 44+05	GROUND WTR (ft)
BORING NO. RW-3 STATION 18+30 OF	OFFSET 4 ft LT ALIGNMENT -WALL-	0 HR. Dry	BORING NO. RW-4 STATION 19+32	OFFSET 3 ft LT	ALIGNMENT -WALL- 0 HR. Dry
COLLAR ELEV. 784.0 ft TOTAL DEPTH 15.0 ft NC	NORTHING 557,915 EASTING 1,480,129	24 HR. FIAD	COLLAR ELEV. 786.2 ft TOTAL DEPTH 20.0 ft	NORTHING 557,997	<b>EASTING</b> 1,480,190 <b>24 HR</b> . FIAD
DRILL RIG/HAMMER EFF./DATE TRI0055 CME-55 70% 12/08/2011	DRILL METHOD H.S. Augers H.	IAMMER TYPE Automatic	DRILL RIG/HAMMER EFF./DATE TRI0055 CME-55 70% 12/08/2011	DRILL METHOD	H.S. Augers HAMMER TYPE Automatic
	COMP. DATE 12/11/12 SURFACE WATER DEPTH	i N/A	DRILLER W. WHICHARD START DATE 12/11/1		SURFACE WATER DEPTH N/A
ELEV   DRIVE   ELEV   (ft)   DEPTH   BLOW COUNT   0 25 50 75	SAMP. L O SOIL AND ROCK NO. MOI G ELEV. (ft)	DESCRIPTION DEPTH (ft)	The second secon	PER FOOT SAMP. LC CO. NO. MOI G	
780 780.5 = 3.5 3 4 5 9	M RED AND TAN, SILTY GRAV  M M TOUR TOUR TOUR TOUR TOUR TOUR TOUR TOUR	DUAL Y SAND (A-2-4) W/ VEL  15.0 Elevation 769.0 ft in	785	M M M M SS-1 37% W W	ROADWAY EMBANKMENT RED-BROWN AND TAN, F. SANDY CLAY (A-6) W/ ROCK FRAGS. RESIDUAL RED-BROWN AND TAN, SILTY F. SAND (A-2-4) W/ ROCK FRAGS  778.2 RED-BROWN TAN AND BLACK, F. SANDY CLAY (A-7-5) W/ ROCK FRAGS.  Presidual: F. Sandy Clay  Boring Terminated at Elevation 766.2 ft in Residual: F. Sandy Clay

WBS 50					G REP  IP P-5208H			TY MEC	KLEN	IBURG	 }		GEOLOGIST T. EVAN	NS			WBS 50000.1.STR13T1B	T	IP P-5208H COUN	ITY MECKLE	ENBUR			GEOLOGIST T. EVANS	<b>)</b>
SITE DES	SCRIPTIO	ON RE	TAININ	IG W	ALL FROM -	Y1- STA	. 30+75	TO STA.	44+05	5			-		GROUND WTF	? (ft)	SITE DESCRIPTION RETAINI	NG WA	ALL FROM -Y1- STA. 30+75	TO STA. 44+	05				GROUND WTR (ft
BORING I	NO. RV	V-5		S	TATION 20	)+33		OFFSI	ET 4	ft LT			ALIGNMENT -WALL-		0 HR.	Dry	BORING NO. RW-6	S	<b>TATION</b> 21+33	OFFSET	3 ft LT			ALIGNMENT -WALL-	0 HR. Dry
COLLAR	ELEV. 7	786.2 f	t	T	OTAL DEPT	H 20.0	ft	NORT	HING	558,0	81		<b>EASTING</b> 1,480,246		24 HR. F	IAD	COLLAR ELEV. 785.1 ft	T	OTAL DEPTH 20.0 ft	NORTHING	<b>3</b> 558,	165		<b>EASTING</b> 1,480,299	24 HR. FIAD
DRILL RIG/	/HAMMER	EFF./D/	ATE TE	RI0055	CME-55 70%	12/08/20	1	······································	1	DRILL N	METHO	D H.S	S. Augers	HAMN	MER TYPE Automa	tic	DRILL RIG/HAMMER EFF./DATE T	RI0055	CME-55 70% 12/08/2011		DRILL	METH	IOD	H.S. Augers	HAMMER TYPE Automatic
DRILLER	W. WH	HICHAF	₹D	S	TART DATE	12/11/	12	COMP	. DATE	E 12/	11/12		SURFACE WATER DE	PTH N	/A		DRILLER W. WHICHARD	S	TART DATE 12/11/12	COMP. DA	TE 12	/11/1	2	SURFACE WATER DEPT	'H N/A
ELEV ELE (ft) 790	DEPT (ft)	TH BL 0.5ft	0.5ft		0 2		PER FOC		100	SAMP. NO.	MOI	0	SOIL AND RO		DEP	TH (ft)	ELEV (ft) DRIVE (ft) DEPTH (ft) 0.5ft 0.5ft		BLOWS PER FOO 0 25 50	OT 75 100	SAMP NO.	1 /	OI G	SOIL AND ROC	K DESCRIPTION
785 785	52 10	3	2	5	1								ROADWAY		KMENT	0.0	785								SURFACE 0
780 780	$\frac{27 + 35}{62}$	3		4	•7 · · · · · · · · · · · · · · · · · · ·				· -     · -     · -		M M M		780.7	W/ GRA	VEL SILTY SAND	5.5	784.1 1.0 3 4 781.6 - 3.5 5 5 780 779.1 6.0 4 4	5 7 6	9		SS-2	M M		RED-BROWN, S	MBANKMENT SILTY CLAY (A-7)  5  DUAL
775	2.7 + 13.5	3		5 7	8				· -     · -		M W		774.2 RED-BROWN TAN SILT (A-4) V	AND BL	ACK, F. SANDY	12.0	776.6 - 8.5 3 3	5	•8			w			'AN, F. SANDY CLAY 7-5)
770 767	7.7 - 18.5	5			/ .								769.2 TAN AND BLACK,	SILTY F	. SAND (A-2-4)	17.0	770 + 3 4	5				W		- - - -	
	+	- 6	7	11	• • 18	<u> </u>	1	-			W		766.2  Boring Terminated Residual	d at Eleva	ation 766.2 ft in	20.0	766.6 + 18.5   5   5	9	14			w		765.1 Boring Terminated a	20.
	+																								

VBS 50000.1.STR13T1B	DUNTY MECKLENBURG	GEOLOGIST T. EVANS	S	WBS 50000.1.STR13T1B	TIP P-5208H COUN	TY MECKLENBURG	GEOLOGIST T. EVAN	S
SITE DESCRIPTION RETAINING WALL FROM -Y1- STA. 30	+75 TO STA. 44+05		GROUND WTR (ft)	t) SITE DESCRIPTION RETAININ	G WALL FROM -Y1- STA. 30+75	TO STA. 44+05		GROUND WTR (f
SORING NO. RW-7 STATION 22+33	OFFSET 3 ft LT	ALIGNMENT -WALL-	0 HR. Dry	y BORING NO. RW-8	STATION 23+34	OFFSET 4 ft LT	ALIGNMENT -WALL-	0 HR. Dr
COLLAR ELEV. 782.8 ft TOTAL DEPTH 15.0 ft	NORTHING 558,252	<b>EASTING</b> 1,480,348	24 HR. FIAD	COLLAR ELEV. 780.2 ft	TOTAL DEPTH 10.0 ft	NORTHING 558,340	<b>EASTING</b> 1,480,400	24 HR. FIAI
PRILL RIG/HAMMER EFF./DATE TRI0055 CME-55 70% 12/08/2011	DRILL METHOD	H.S. Augers	HAMMER TYPE Automatic	DRILL RIG/HAMMER EFF./DATE TF	I0055 CME-55 70% 12/08/2011	DRILL METHOD	H.S. Augers	HAMMER TYPE Automatic
ORILLER W. WHICHARD START DATE 12/11/12	COMP. DATE 12/11/12	SURFACE WATER DEPT	TH N/A	DRILLER W. WHICHARD	START DATE 12/11/12	COMP. DATE 12/11/12	SURFACE WATER DEP	TH N/A
LEV   DRIVE   DEPTH   BLOW COUNT   BLOWS PER (ft)   (ft)   0.5ft   0.5ft   0   25   50	400	L SOIL AND ROC	CK DESCRIPTION  DEPTH (ft)	$ \begin{array}{c ccccccccccccccccccccccccccccccccccc$		OT SAMP. L O NO. MOI G	SOIL AND ROO	CK DESCRIPTION
785  781.8		774.8  RED-BROWN AND  (A-771.0  RED-BROWN AND  (A-767.8  RED-BROWN AND  (A-767.8  RED-BROWN AND  (A-767.8  RED-BROWN AND  (A-767.8  RED-BROWN AND  (A-767.8  RED-BROWN AND  (A-767.8  RED-BROWN AND  (A-767.8  RED-BROWN AND	D SURFACE 0.0  EMBANKMENT  ILAY (A-6) W/ TRACE  SANICS 3.0  IDUAL  TAN, F. SANDY CLAY  -7-5) 8.0  TAN, SILTY F. SAND  -2-4) 11.8  TAN, F. SANDY SILT  A-4) 15.0  at Elevation 767.8 ft in F. Sandy Silt	785  780  779.2  780  779.2  776.7  776.7  774.1  6.1  771.7  8.5  771.7  8.5  2  3	3		780.2 GROUNI ROADWAY RED-BROWN ANI 777.2 (A-6) W ROADWAY RED-BROWN ANI (A-2-4) W/ RED-BROWN ANI RED-	D SURFACE EMBANKMENT D TAN, SANDY CLAY // GRAVEL EMBANKMENT ID TAN, SILTY CLAY A-7-5) SIDUAL D TAN, SILTY F. SAND TRACE MICA D TAN, F. SANDY SILT (A-4) at Elevation 770.2 ft in F. Sandy Silt

SHEET 11

#### FALCON

#### 1210 TRINITY ROAD, SUITE 110, RALEIGH, NORTH CAROLINA 27607

#### AASHTO SOIL CLASSIFICATION AND GRADATION SHEET

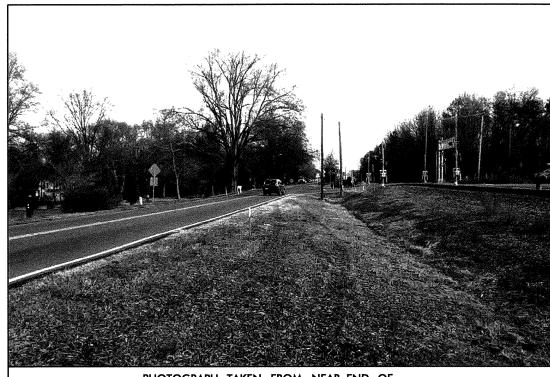
## RETAINING WALL FROM -Y1- STA. 30+75 TO STA. 44+05 WBS NO.: 50000.1.STR13T1B, TIP NO.: P-5208H

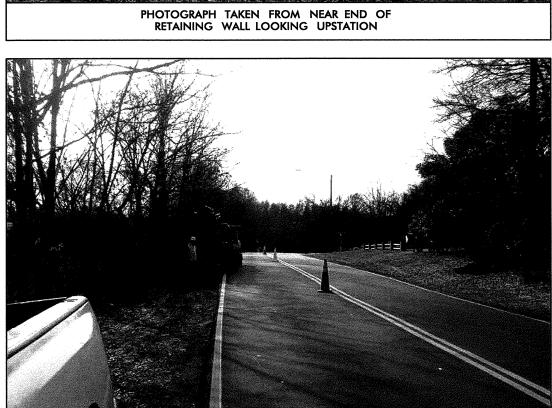
#### MECKLENBURG COUNTY, NORTH CAROLINA

#### FALCON ENGINEERING, INC. PROJECT NO: G11026.01

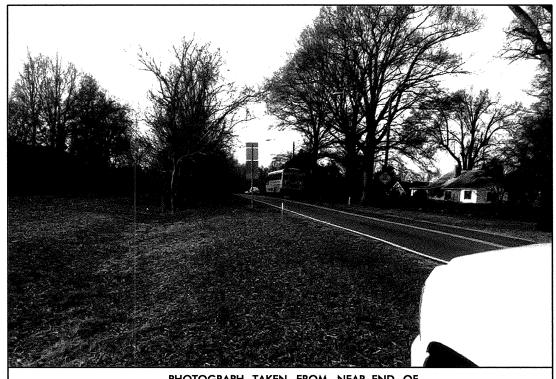
вог	RING	SAMPLE	TOT	TAL SAN	IPLE	Atterk	erg Lim	it Test	Natural Moisture
AAS	SHTO Classific	ation	PERC	ENT PA	SSING		Results		Content
STATION	OFFSET (FEET)	DEPTH (FEET)	#10	#40	#200	LL	PL	PI	%
R-	11	SS-14 *							
	A-5		96	64	44	43	34	9	30.7
13+98	22 ft LT	18.5-20.0							
R-	12	SS-15 *							
	A-6		88	61	40	36	19	17	18.1
15+33	48 ft LT	3.5-5.0							
RV	V-4	SS-1							
	A-7-5		99	89	74	68	51	17	36.9
19+32	3 ft LT	8.5-10.0							
RV	V-6	SS-2							
	A-7-5		100	94	88	69	45	24	33.6
21+33	3 ft LT	6.0-7.5							
RV	V-7	SS-3							
	A-7-5		100	96	82	78	40	38	32.1
22+33	3 ft LT	3.5-5.0							
RV	V-8	SS-4							
	A-7-5		100	95	89	90	35	55	39.5
23+34	4 ft LT	3.5-5.0							

<sup>\*</sup> Samples SS-14 and SS-15 originally included in Roadway Subsurface Investigation and therefore are not numbered sequentially with samples from RW borings.

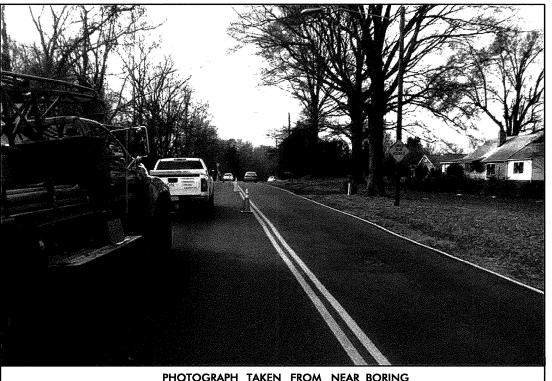




PHOTOGRAPH TAKEN FROM NEAR BORING, RW-5, LOOKING DOWNSTATION



PHOTOGRAPH TAKEN FROM NEAR END OF RETAINING WALL LOOKING DOWNSTATION



PHOTOGRAPH TAKEN FROM NEAR BORING RW-7, LOOKING DOWNSTATION ALONG -YI-



FALCON ENGINEERING, INC. 1210 TRINITY ROAD, SUITE 110 RALEIGH, NC 27607

PHONE: 919.871.0800 FAX: 919.871.0803

#### SITE PHOTOGRAPHS

GRIER ROAD GRADE SEPARATION MECKLENBURG COUNTY, NORTH CAROLINA TIP.: P-5208H, WBS.: 50000.1.STR13T1B

DEC. 2012

FALCON PROJECT NO.: G12026.01

SHEET 1 OF 1

# 208H S TR13

#### STATE OF NORTH CAROLINA

DEPARTMENT OF TRANSPORTATION
RAIL DIVISION
GEOTECHNICAL ENGINEERING UNIT

#### **CONTENTS**

<u>SHEET</u>	<b>DESCRIPTION</b> TITLE SHEET	STRUCTURE
2 3 4-5	LEGEND BORING LOCATION PLAN SUBSURFACE PROFILES	SUBSURFACE INVESTIGATION
6-8 9-14 15 16-17	SUBSURFACE CROSS SECTIONS BORE LOGS, CORE REPORTS, AND CORE PHOTOGRAPHS SOIL AND ROCK LABORATORY TEST RESULTS SITE PHOTOGRAPHS	PROJ. REFERENCE NO. P-5208H F.A. PROJ. N/A  COUNTY MECKLENBURG  PROJECT DESCRIPTION BRIDGE ON SR 2976 BETWEEN  SR 2426 AND SR 2848
		SITE DESCRIPTION GRIER ROAD (SR 2976) GRADE SEPARATION FROM SOUTH OF ORR ROAD (SR 2426) TO OLD CONCORD ROAD (SR 2848)



STATE	STATE PROJECT REPERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	P-5208H	1	17

#### CAUTION NOTICE

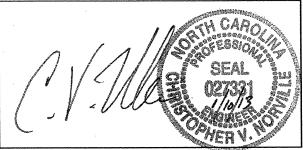
THE SUBSURFACE INFORMATION AND THE SUBSURFACE INVESTIGATION ON WHICH IT IS BASED WERE MADE FOR THE PURPOSE OF STUDY, PLANNING, AND DESIGN, AND NOT FOR CONSTRUCTION OR PAY PURPOSES. THE VARIOUS FIELD BORING LOGS, ROCK CORES, AND SOIL TEST DATA AVAILABLE MAY BE REVEWED OR INSPECTED IN RALEIGH BY CONTACTING THE N.C. DEPARTMENT OF TRANSPORTATION, CEOTECHNICAL ENONEERING LIVIT AT 1991 70-8650. NETHER THE SUBSURFACE PLANS AND REPORTS, NOR THE FIELD BORING LOGS, ROCK CORES, OR SOIL TEST DATA ARE PART OF THE CONTRACT.

CENERAL SOIL AND ROCK STRATA DESCRIPTIONS AND INDICATED BOUNDARIES ARE BASED ON A CECTECHNICAL INTERPRETATION OF ALL AVAILABLE SUBSUBFACE DATA AND MAY NOT NECESSARILY REFLECT THE ACTUAL SUBSURFACE CONDITIONS BETWEEN BORNINGS OR BETWEEN SAMPLED STRATA WITHIN THE BORENOLE. THE LABORATIORY SAMPLE DATA AND THE IN STILL WITH-PLACE) TEST DATA CAN BE RELIED ON ONLY TO THE DESCREE OF RELIABILITY INHERENT IN THE STANDARD TEST METHOD. THE OBSERVED WATER LEVELS OR SOIL MOSITURE CONDITIONS INDICATED IN THE SUBSURFACE INVESTICATIONS ARE AS RECORDED AT THE TIME OF THE INVESTICATION. THESE WATER LEVELS OR SOIL MONSTURE CONDITIONS MAY VARY CONSIDERABLY WITH TIME ACCORDING TO CLIMATIC CONDITIONS MICHORITY OF CONDITIONS MAY ANY CONSIDERABLY WITH TIME ACCORDING TO CLIMATIC CONDITIONS MICHORITY OF CONDITIONS MAY DESCRIPTION.

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 D'URPOSES, REFER TO THE CONSTRUCTION PLANS AND DOCUMENTS FOR FINAL DESIGN INFORMATION ON THIS PROJECT. THE DEFATHENT DOES NOT WARRANT OR GUARANTEE THE SUFFICIENCY OR ACCURACY OF THE INVESTIGATION MADE, NOR THE INTERPRETATIONS MADE, OR OPINION OF THE EPRATHENT 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 HUMBELE 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 BEASON RESULTING FROM THE ACTUAL CONDITIONS ENCOUNTERED AT THE SITE DIFFERING FROM THOSE INDICATED IN THE SUBSURFACE INFORMATION.

***	C. V. NORVILLE
_	J. R. HAMM
_	T. E. EVANS
_	
_	
_	
_	
_	
INVESTIGATED B	T. EVANS /J. HAMM
CHECKED BY	C. V. NORVILLE
	FALCON ENG.
	JANUARY 2013
DATE	J

PERSONNEL



#### PROJECT REFERENCE NO. SHEET NO. P-5208H 2

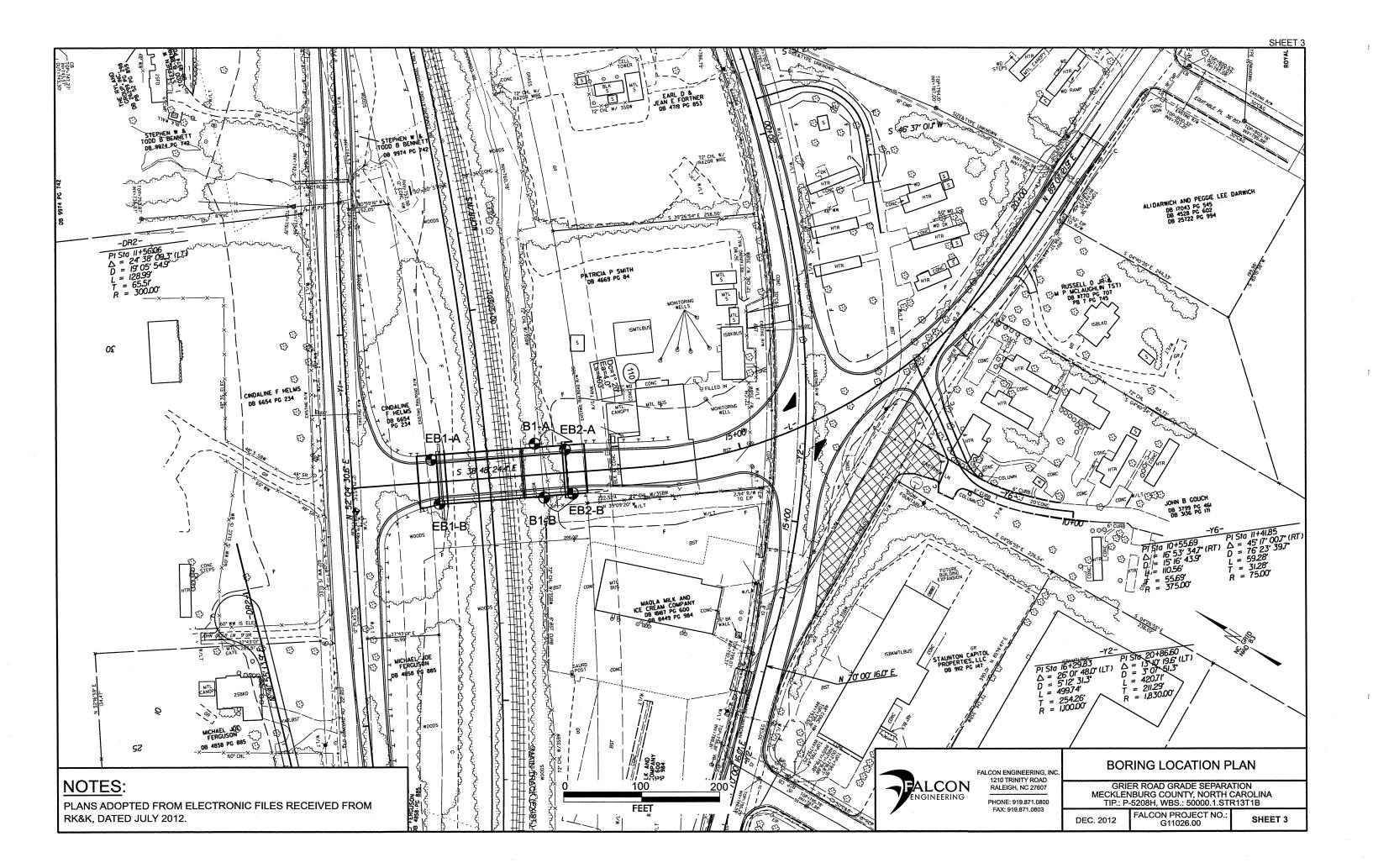
#### NORTH CAROLINA DEPARTMENT OF TRANSPORTATION

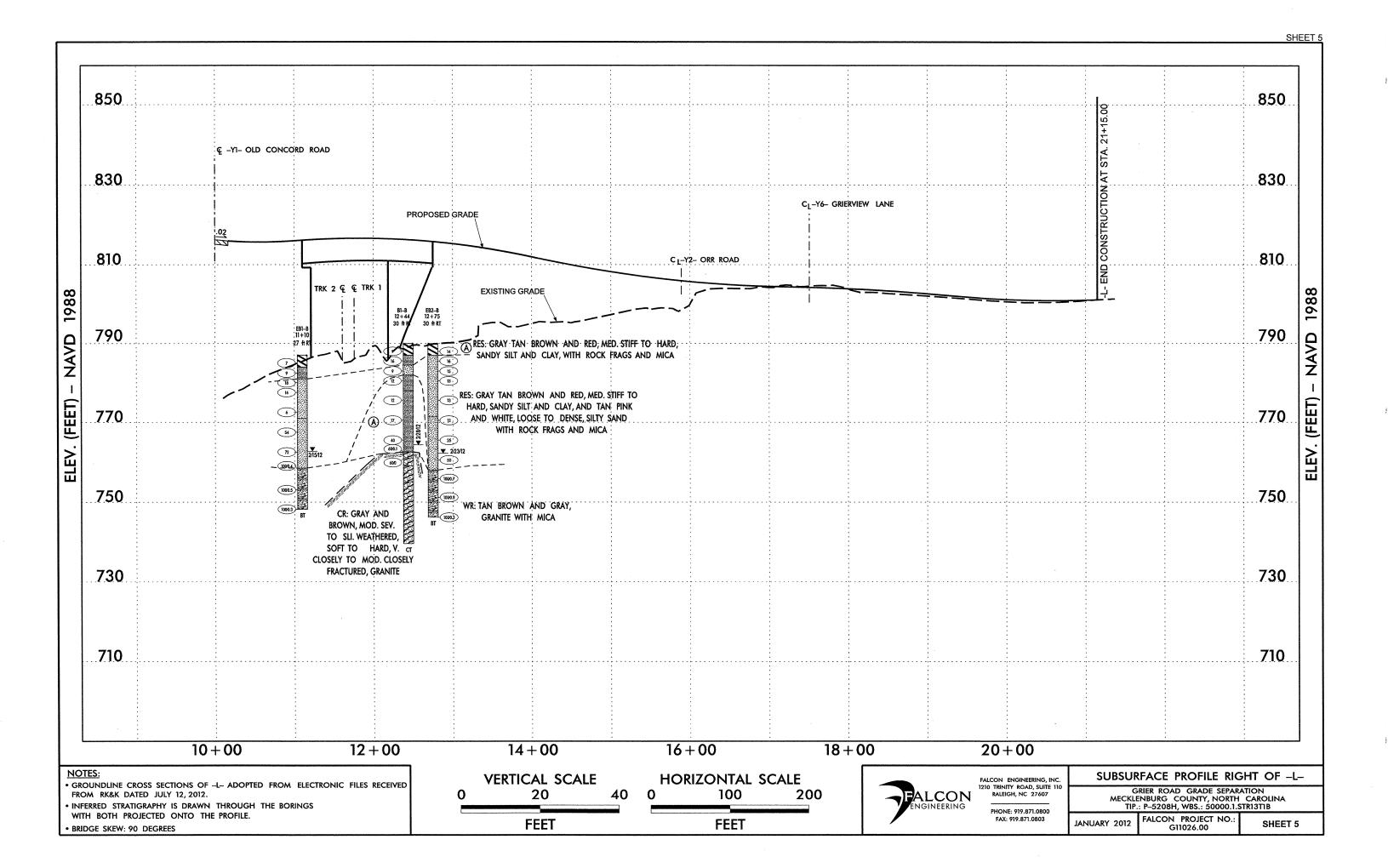
#### DIVISION OF HIGHWAYS

#### GEOTECHNICAL ENGINEERING UNIT

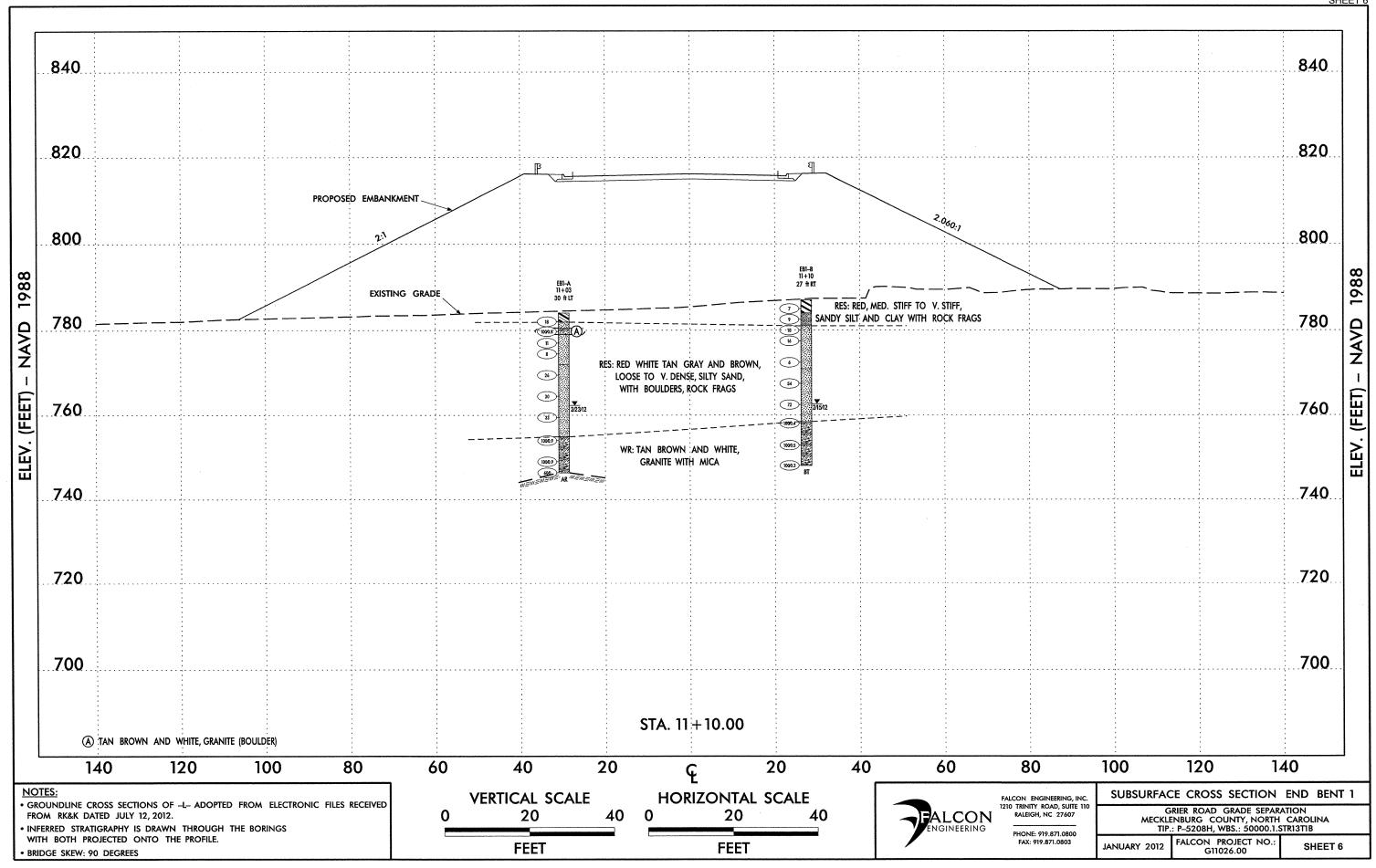
#### SUBSURFACE INVESTIGATION

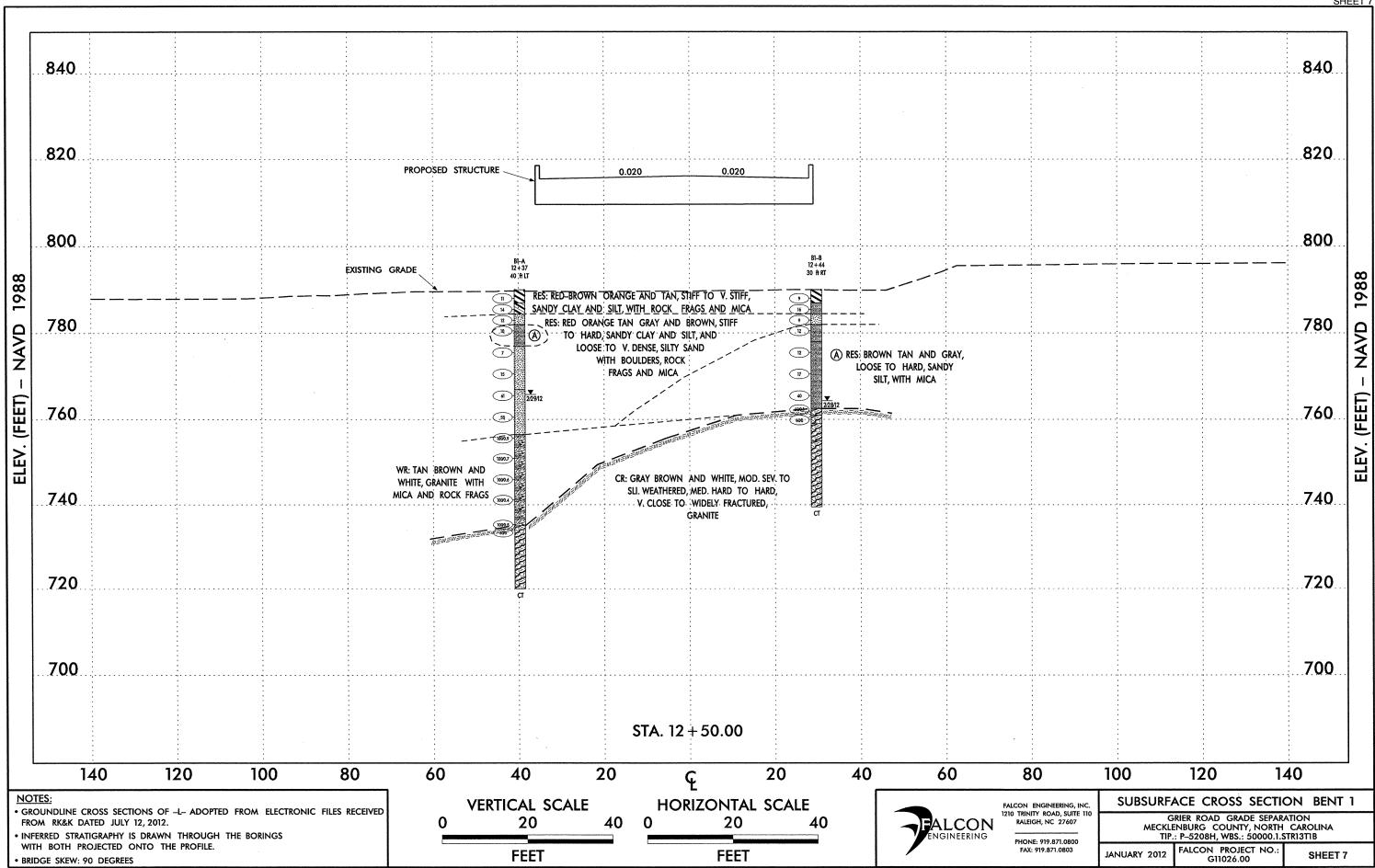
* 10 58 MX S MX S MX S MX S MX S MX S MX S MX				SOIL AND ROO	CK LEGEND, TERM	s, symbo	OLS, AND	ABBREVI	ATIONS		
## April 19   Proceedings   Proceedings   Proceedings   Process	SOIL DESCRIPTION				201 ENG TO 2010CE	UADO COST	TO AION CO. 271. 2			CIUCAL AN INCCOCO	
		IALS	WELL GRADED - INDICATES A GO UNIFORM - INDICATES THAT SOI POORLY GRADED	OUD REPRESENTATION OF PARTICLE SIZES F L PARTICLES ARE ALL APPROXIMATELY THE	RUM FINE TO COARSE. SAME SIZE.(ALSO	ROCK LINE	INDICATES THE LEVI	L AT WHICH NON-	COASTAL PLAIN MATERIAL WOULD Y	TELD SPT REFUSAL.	
Company   Comp	100 BLOWS PER FOOT ACCORDING TO STANDARD PENETRATION TEST (AASHTO T206, ASTM D-1586). S		GAP-GRADED - INDICATES A MIX		ORE SIZES.	IN NON-COA	ASTAL PLAIN MATERI	AL. THE TRANSITI	ON BETWEEN SOIL AND ROCK IS OF	TEN REPRESENTED BY A ZONE	
## A PRINCE OF CONTROL	CONSISTENCY, COLOR, TEXTURE, MOISTURE, AASHTO CLASSIFICATION, AND OTHER PERTINENT FACTORS			S OF SOIL GRAINS IS DESIGNATED BY THE	TERMS: ANGULAR.	ROCK MATER	RIALS ARE TYPICALL		<del></del>		
The content	VERY STIFF, GRAY, SILTY CLAY, MOIST WITH INTERBEDDED FINE SAND LAYERS, HIGHLY PLASTIC, A-7-6				N.I		V/s/\//s	NON-COASTAL P BLOWS PER FOO		SPT N VALUES > 100	ARTESIAN - GROUND WATER THAT IS UNDER SUFFICIENT PRESSURE TO RISE ABOVE THE LEVEL
Column   C	CENEDAL COANIE AD MATERIAL C. CLI T CLAY MATERIAL C.		MINERAL NAMES SUCH AS QUART	Z, FELDSPAR, MICA, TALC, KAOLIN, ETC. ARE U				would yield si	PT REFUSAL IF TESTED, ROCK TYP		
The content of the	CLASS. (≤ 35% PASSING *200) (> 35% PASSING *200) ORGANIC PI		WHENEVER THEY ARE CONSIDERED	D OF SIGNIFICANCE.			TAIL TO THE	GNEISS, GABBRO,	.SCHIST.ETC. E GRAIN METAMORPHIC AND NON-CO	ASTAL PLAIN	
The content of the				BLE LIQUID LIMIT		ROCK (NCR)		SEDIMENTARY RO INCLUDES PHYLL	OCK THAT WOULD YEILD SPT REFUS LITE, SLATE, SANDSTONE, ETC.	GAL IF TESTED. ROCK TYPE	
	oocodoood		MODERATELY COMPRES	SSIBLE LIQUID LIMIT		SEDIMENTARY		_ SPT REFUSAL. F	ROCK TYPE INCLUDES LIMESTONE, SA		
The content of the						ILP)					DIKE - A TABULAR BODY OF IGNEOUS ROCK THAT CUTS ACROSS THE STRUCTURE OF ADJACENT
March	* 40 30 MX 50 MX 51 MN SOILS SOI	PEAT	UKGANIL MATEHIAL	SOILS SOILS		FRESH			OINTS MAY SHOW SLIGHT STAINING	ROCK RINGS UNDER	DIP - THE ANGLE AT WHICH A STRATUM OR ANY PLANAR FEATURE IS INCLINED FROM THE
March   Marc	FORTO CHIT		LITTLE ORGANIC MATTER	3 - 5% 5 - 12% LIT	TLE 10 - 20%		ROCK GENERALLY F	RESH, JOINTS STAIN			
March   Marc	PLASTIC INDEX 6 MX NP 10 MX 10 MX 11 MN 11 MN 10 MX 10 MX 11 MN 11 MN LITTLE OR			>10% >20% HIG		(V SL1.)			CE SHINE BRIGHTLY, ROCK RINGS L	UNDER HAMMER BLOWS IF	THE LINE OF DIP, MEASURED CLOCKWISE FROM NORTH.
### Company of the co	AMOUNTS OF		V W∆TED IEU	<del></del>	PRILLING						
Column   C	OF MAJOR GRAVEL, AND GRAVEL AND SAND SOLLS SOLLS MATTER		l <u> </u>				CRYSTALS ARE DUL	L AND DISCOLORED.	. CRYSTALLINE ROCKS RING UNDER	HAMMER BLOWS.	
Continue   Continue	GEN. RATING	R IMCUITADI F	<u> </u>		NG STRATA		GRANITOID ROCKS, M	IOST FELDSPARS AF	RE DULL AND DISCOLORED, SOME SH	IOW CLAY. ROCK HAS	
Control   Cont	SUBGRADE		SPRING OR	SEEP			WITH FRESH ROCK.				
	CONSISTENCY OR DENSENESS			MISCELLANEOUS SYMBOLS	S	SEVERE	AND DISCOLORED AN	ID A MAJORITY SHO	DW KAOLINIZATION. ROCK SHOWS SE	VERE LOSS OF STRENGTH	FORMATION (FM.) - A MAPPABLE GEOLOGIC UNIT THAT CAN BE RECOGNIZED AND TRACED IN
## ABUNDANCE   17 1 25   10 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	PRIMARY SOIL TYPE COMPACTNESS OR PENETRATION RESISTENCE COMPRESSIVE	STRENGTH		ENT (RE) SPT DMY TEST BORIN		(MOD. SEV.)				SOUND WHEN STRUCK.	
Section   Process   Proc	VERY LODGE	ĭ< )	1 4	•	1						
## APPLICATION OF THE PROPERTY TO A THE PROPERTY	GRANULAR MEDIUM DENSE 4 TO 10		l s*		_	1	EXTENT. SOME FRAM	CMENTS OF STRONG	ROCK USUALLY REMAIN.		4
Marriad   1	(NON-COHESIVE) DENSE 30 TO 50			BANKMENT	•		ALL ROCK EXCEPT	DUARTZ DISCOLORE	D OR STAINED. ROCK FABRIC ELEM		
Section   Sect	VERY SOFT (2 (0.2		- INFERRED SOIL BOI	ORDER!	LL	(V SEV.)	REMAINING. SAPROL	TE IS AN EXAMPLE	E OF ROCK WEATHERED TO A DEGRE	EE SUCH THAT ONLY MINOR	PERCHED WATER - WATER MAINTAINED ABOVE THE NORMAL GROUND WATER LEVEL BY THE PRESENCE OF AN
Margin   1	GENERALLY   SOFT   2 TO 4   0.25 TO	0.50	INFERRED ROCK LI			COMPLETE					
TRYING OR GRAIN STR.	(COHESIVE) VERY STIFF 15 TO 30 2 TO	4		INSTALLATION	OR .		SCATTERED CONCENT				ROCK QUALITY DESIGNATION (RQD) - A MEASURE OF ROCK QUALITY DESCRIBED BY TOTAL LENGTH OF
Month   Mont				ION OF	ETER TEST			ROCK	HARDNESS		EXPRESSED AS A PERCENTAGE.
ABBELIATION   Column   Colum			<b>1</b>	SOUNDING ROD		VERY HARD				SPECIMENS REQUIRES	
Column   C	0.01.01.01.01.01.01.01.01.01.01.01.01.01	<b>,</b>				HARD	CAN BE SCRATCHE	D BY KNIFE OR PIC		AMMER BLOWS REQUIRED	
Windows   Color   Co	BOULDER COBBLE GRAVEL SAND SAND SILT			MED MEDIUM		MODERATELY			CK. GOUGES OR GROOVES TO 0.25 T	INCHES DEEP CAN BE	TO THE BEDDING OR SCHISTOSITY OF THE INTRUDED ROCKS.
SOIL MOISTURE - CORRELATION OF TERMS SOIL MOISTURE SCALE FILE MOIS	(BLDR.) (COB.) (GR.) (CSE. SD.) (F SD.) (SL.)		CL CLAY	MOD MODERATELY	7 - UNIT WEIGHT		EXCAVATED BY HA	RD BLOW OF A GEO			SLIP PLANE.
SOIL MOISTURE   FELD MOISTUR	SIZE IN. 12 3		CSE COARSE	ORG ORGANIC	- 4		CAN BE GROOVED	OR GOUGED 0.05 IN			A 140 LB. HAMMER FALLING 30 INCHES REQUIRED TO PRODUCE A PENETRATION OF 1 FOOT INTO SOIL WITH
A THEREFOR LIMITS   DESCRIPTION   DESCRIPTION   DESCRIPTION   FIRST A MARKED   ST. SELECT VIDE   ST.	COT MOTOTION COME STEEL MOTOTION		DPT - DYNAMIC PENETRATIO	N TEST SAP SAPROLITIC	S - BULK		POINT OF A GEOL	OGIST'S PICK.			
- SATION OF THE MANUAL PLANTED TO A TRANSPORT OF THE PROPERTY HER CONTROL OF THE PROPE		DESCRIPTION				SOFT	FROM CHIPS TO S	EVERAL INCHES IN	SIZE BY MODERATE BLOWS OF A F		STRATA CORE RECOVERY (SREC.) - TOTAL LENGTH OF STRATA MATERIAL RECOVERED DIVIDED BY TOTAL LENGTH
LIDUID LIMIT SIGNAL PRODUCTS CONTROL STREAM A STREAM SECRET STITING A SERVING STREAM A STREAM SECRET STREAM SECRET STREAM A STREAM SECRET						VERY				OF PICK, PIECES 1 INCH	STRATA ROCK QUALITY DESIGNATION (SROD) - A MEASURE OF ROCK QUALITY DESCRIBED BY
SEMISOLIDIS ROUTINES DAYLING	LL LIQUID LIMIT		FRAGS FRAGMENTS	w - MOISTURE CONTENT	CBR - CALIFORNIA BEARING		OR MORE IN THICK				
PLL THIS TO PITCULT MODISTURE - MOIST - MI SOLID: AT OR NEAR OPTIMUM MOISTURE ON OPTIMUM MOISTURE - MOIST - MI SOLID: AT OR NEAR OPTIMUM MOISTURE ON OPTIMUM MOISTURE - MORE THAN 10 FEET SHRY LOW SHRINKAGE LIMIT - MORE THAN 10 FEET SHRY LOW BURGES ADDITIONAL WATER TO ATTAIN MOISTURE - DRY - MO PLASTICITY - MORE AND ALLIE-TO PLASTICITY - MORE AND ALLIE-TO PLASTICITY - MORE AND ALLIE-TO PRISE SURFICITY - MORE AND ALLIE-TO PRISE AND ALL	RANGE - WET - (W) ATTAIN OPTIMUM MOISTURE	G TO				FF		CING			TOPSOIL (TS.) - SURFACE SOILS USUALLY CONTAINING ORGANIC MATTER.
OF THINM MOISTURE SHRINKAGE LIMIT SHRINKAGE LI	PLL - PERSIEC LIPITI		DRILL UNITS:	ADVANCING TOOLS:	1	1				> 4 FEET	BENCH MARK:
REQUIRES ADDITIONAL WATER TO ATTAIN OPTIMUM MOISTURE  PLASTICITY  PLASTICITY INDEX (P) DRY STRENGTH  NONPLASTIC  OF 5 VERY LOW  PLASTICITY 6-15  SLIGHT  HIGH PLASTICITY  GENERAL PORTAGE  OF 5 VERY LOW  LOW PLASTICITY  GENERAL PORTAGE  OF 5 VERY LOW  LOW PLASTICITY  GENERAL PORTAGE  OF 5 VERY LOW  LOW PLASTICITY  GENERAL PORTAGE  OF 5 VERY LOW  LOW PLASTICITY  GENERAL PORTAGE  OF 5 VERY LOW  LOW PLASTICITY  GENERAL PORTAGE  OF 5 VERY LOW  LOW PLASTICITY  GENERAL PORTAGE  OF 5 VERY LOW  LOW PLASTICITY  GENERAL PORTAGE  OF 5 VERY LOW  LOW PLASTICITY  GENERAL PORTAGE  OF 5 VERY LOW  LOW PLASTICITY  GENERAL PROBLEM OF THE MATERIAL BY CEMENTING, HEAT, PRESSURE, ETC.  TIMOL-CARBIDE INSERTS  CASING WY ADVANCER  HAND TOOLS:  HAND AUGER  MODERATELY INDURATED  ORANS ARE DIFFICULT TO SEPARATE HITH HAWMER.  DIFFICULT TO SEPARATE WITH HAWMER.  DIFFICULT TO SEPARATE WITH HAWMER.  WAND SHAPP HAWMER BLOWS REQUIRED TO BREAK SAMPLE;	OW T OF ITHOR HOTSTONE	M MOISTURE	MOBILE B-	CLAY BITS	X AUTOMATIC MANUAL	WIDE	3 TO	10 FEET	THINLY BEDDED	0.16 - 1.5 FEET	-BL-99 PINC 643+88.57 N:556545 E:1478707 ELEVATION: 785.81 FT.
PLASTICITY  PLASTICITY INDEX (PI) DRY STRENGTH  NONPLASTIC  PLASTICITY NOEX (PI) DRY STRENGTH  NONPLASTIC  PLASTICITY  6-15 SLIGHT  MED. PLASTICITY  6-15 SLIGHT  MED. PLASTICITY  16-25 MEDIUM  PORTABLE HOIST  TINDCARBIDE INSERTS  X CASING W/ ADVANCER  HIGH  PORTABLE HOIST  TRICONE STEEL TEETH  IDESCRIPTIONS MAY INCLUDE COLOR OR COLOR COMBINATIONS (TAN, RED, YELLOW-BROWN, BLUE-GRAY).  MODIFIERS SUCH AS LIGHT, DARK, STREAKED, ETC. ARE USED TO DESCRIBE APPEARANCE.  VANE SHEAR TEST  VANE SHEAR TEST  POS SEDIMENTARY ROCKS, INDURATION IS THE HARDENING OF THE MATERIAL BY CEMENTING, HEAT, PRESSURE, ETC.  TUNDCARBIDE INSERTS  TUNGCARBIDE INSERTS  CASING W/ ADVANCER  HAND TOOLS:  HAND TOOLS:  HAND TOOLS:  HAND TOOLS:  HAND TOOLS:  HAND TOOLS:  HAND TOOLS:  HAND TOOLS:  HAND TOOLS:  HAND TOOLS:  HAND TOOLS:  HAND TOOLS:  HAND TOOLS:  HAND TOOLS:  HAND TOOLS:  HAND TOOLS:  HAND TOOLS:  FRIABLE  RUBBING MITH FINGER FRES NUMEROUS GRAINS;  GENTLE BLU BY HAMFER EIS NUMEROUS GRAINS;  BREAKS EASILY WHEN HIT WITH HAMMER.  SOUNDING ROD  DIFFICIAL TO SPRAATE WITH STEEL PROBE;  DIFFICULT TO SPRAATE WITH STEEL PROBE;  DIFFICULT TO SPRAATE WITH STEEL PROBE;  DIFFICULT TO SPRAATE WITH STEEL PROBE;  DIFFICULT TO SPRAATE WITH STEEL PROBE;  DIFFICULT TO SPRAATE WITH STEEL PROBE;  DIFFICULT TO SPRAATE WITH STEEL PROBE;  DIFFICULT TO SPRAATE WITH STEEL PROBE;  DIFFICULT TO SPRAATE WITH STEEL PROBE;  DIFFICULT TO SPRAATE WITH STEEL PROBE;  DIFFICULT TO SPRAATE WITH STEEL PROBE;  DIFFICULT TO SPRAATE WITH STEEL PROBE;  DIFFICULT TO SPRAATE WITH STEEL PROBE;  DIFFICULT TO SPRAATE WITH STEEL PROBE;  DIFFICULT TO SPRAATE WITH STEEL PROBE;  DIFFICULT TO SPRAATE BLUMS REQUIRED TO BREAK SAMPLE;	REQUIRES ADDITIONAL WAT				1	CLOSE	0.16	TO 1 FEET	THICKLY LAMINATED	0.008 - 0.03 FEET	
PLASTICITY INDEX (PI) DRY STRENGTH  NONPLASTIC  PLASTICITY INDEX (PI) DRY STRENGTH  NONPLASTIC  NONPLASTIC  PLASTICITY INDEX (PI) DRY STRENGTH  NONPLASTIC  NONPLASTIC  PLASTICITY 6-15  SLIGHT  MED. PLASTICITY  16-25  MED. PLASTICITY  16-25  MED. PORTABLE HOIST  PORTABLE HOIST  TRICONE STEEL TEETH  HAND TOOLS:  PORTABLE HOIST  TRICONE STEEL TEETH  POST HOLE DIGGER  MODERATELY INDURATED  DESCRIPTIONS MAY INCLUDE COLOR OR COLOR COMBINATIONS (TAN, RED, YELLOW-BROWN, BLUE-GRAY).  MODIFIERS SUCH AS LIGHT, DARK, STREAKED, ETC. ARE USED TO DESCRIBE APPEARANCE.  MAD TOOLS:  HAND TOOLS:  PORTABLE HOIST  TRICONE STEEL TEETH  POST HOLE DIGGER  HAND ADVANCER  HAND TOOLS:  POST HOLE DIGGER  MODERATELY INDURATED  GRAINS CAN BE SEPARATED FROM SAMPLE WITH STEEL PROBE:  BREAKS EASILY WHEN HIT WITH HAMMER.  SOUNDING ROD  DIFFICULT TO BREAK WITH HAMMER.  TO SEDIMENTARY ROCKS, INDURATION IS THE HARDENING, OF THE MATERIAL BY CEMENTING, HEAT, PRESSURE, ETC.  FOR SEDIMENTARY ROCKS, INDURATION IS THE HARDENING OF THE MATERIAL BY CEMENTING, HEAT, PRESSURE, ETC.  FRIABLE  FRIABLE  GENTLE BLOW BY HAMMER DISINTEGRATES SAMPLE.  FRIABLE  GENTLE BLOW BY HAMMER DISINTEGRATES SAMPLE.  FRIABLE  GENTLE BLOW BY HAMMER DISINTEGRATES SAMPLE.  FRIABLE  GENTLE BLOW BY HAMMER DISINTEGRATES SAMPLE.  FRIABLE  FRIABLE  GENTLE BLOW BY HAMMER DISINTEGRATES SAMPLE.  FOR SEDIMENTARY ROCKS, INDURATION IS THE HADDENING, DF THE MATERIAL BY CEMENTING, HEAT, PRESSURE, ETC.  FRIABLE  FRIABLE  FOR SEDIMENTARY ROCKS, INDURATION IS THE HADDENING, DF THE MATERIAL BY CEMENTING, HEAT, PRESSURE, ETC.  FRIABLE  FOR SEDIMENTARY ROCKS, INDURATION IS THE HADDENING OF THE MATERIAL BY CEMENTING, HEAT, PRESSURE, ETC.  FRIABLE  FOR SEDIMENTARY ROCKS, INDURATION IS THE HADDENING OF THE MATERIAL BY CEMENTING, HEAT, PRESSURE, ETC.  FRIABLE  FOR SEDIMENTARY ROCKS, INDURATION IS THE HADDENING OF THE MATERIAL BY CEMENTING, HEAT, PRESSURE, ETC.  FRIABLE  FOR SEDIMENTARY ROCKS, INDURATION IS THE HADDENING OF THE MATERIAL BY CEMENTING, HEAT, PRESSURE, TO.  FOR SEDIMENTARY ROCKS, INDURATIO	ATTAIN OPTIMUM MUISTURE		-			72111 020				< 0.008 FEET	FIAD - FILLED-IN AFTER DRILLING
NONPLASTIC 0-5 VERY LOW PLASTICITY 6-15 SLIGHT MED. PLASTICITY 16-25 MEDIUM HIGH PLASTICITY 26 OR MORE HIGH  DESCRIPTIONS MAY INCLUDE COLOR OR COLOR COMBINATIONS (TAN, RED, YELLOW-BROWN, BLUE-GRAY).  MODIFIERS SUCH AS LIGHT, DARK, STREAKED, ETC. ARE USED TO DESCRIBE APPEARANCE.  MODIFIERS SUCH AS LIGHT, DARK, STREAKED, ETC. ARE USED TO DESCRIBE APPEARANCE.  MODIFIERS SUCH AS LIGHT, DARK, STREAKED, ETC. ARE USED TO DESCRIBE APPEARANCE.  MODIFIERS SUCH AS LIGHT, DARK, STREAKED, ETC. ARE USED TO DESCRIBE APPEARANCE.  MODIFIERS SUCH AS LIGHT, DARK, STREAKED, ETC. ARE USED TO DESCRIBE APPEARANCE.  MODIFIERS SUCH AS LIGHT, DARK, STREAKED, ETC. ARE USED TO DESCRIBE APPEARANCE.  MODIFIERS SUCH AS LIGHT, DARK, STREAKED, ETC. ARE USED TO DESCRIBE APPEARANCE.  MODIFIERS SUCH AS LIGHT, DARK, STREAKED, ETC. ARE USED TO DESCRIBE APPEARANCE.  MODIFIERS SUCH AS LIGHT, DARK, STREAKED, ETC. ARE USED TO DESCRIBE APPEARANCE.  MODIFIERS SUCH AS LIGHT, DARK, STREAKED, ETC. ARE USED TO DESCRIBE APPEARANCE.  MODIFIERS SUCH AS LIGHT, DARK, STREAKED, ETC. ARE USED TO DESCRIBE APPEARANCE.  MODIFIERS SUCH AS LIGHT, DARK, STREAKED, ETC. ARE USED TO DESCRIBE APPEARANCE.  MODIFIERS SUCH AS LIGHT, DARK, STREAKED, ETC. ARE USED TO DESCRIBE APPEARANCE.  MODIFIERS SUCH AS LIGHT, DARK, STREAKED, ETC. ARE USED TO DESCRIBE APPEARANCE.  MODIFIERS SUCH AS LIGHT, DARK, STREAKED, ETC. ARE USED TO DESCRIBE APPEARANCE.  MODIFIERS SUCH AS LIGHT, DARK, STREAKED, ETC. ARE USED TO DESCRIBE APPEARANCE.  MODIFIERS SUCH AS LIGHT, DARK, STREAKED, ETC. ARE USED TO DESCRIBE APPEARANCE.  MODIFIERS SUCH AS LIGHT, DARK, STREAKED, ETC. ARE USED TO DESCRIBE APPEARANCE.  MODIFIERS SUCH AS LIGHT, DARK, STREAKED, ETC. ARE USED TO DESCRIBE APPEARANCE.  MODIFIERS SUCH AS LIGHT, DARK, STREAKED, ETC. ARE USED TO DESCRIBE APPEARANCE.  MODIFIERS SUCH AS LIGHT, DARK, STREAKED, ETC. ARE USED TO DESCRIBE APPEARANCE.  MODIFIERS SUCH AS LIGHT, DARK DARK DARK DARK DARK DARK DARK DARK			CME-45C		X -N 02	FOR SEDIMENT	TARY ROCKS, INDURAT			ING, HEAT, PRESSURE, ETC.	
MED. PLASTICITY  16-25  MEDIUM HIGH HIGH HIGH HIGH HIGH HIGH HIGH HIG	NONPLASTIC 0-5 VERY LOW	-	CME-55		H	FR	RIABLE				
HIGH PLASTICITY  ZE OR MORE  TIGH  COLOR  COLOR  COLOR  COLOR (X CME-55 (TRUCK))  DESCRIPTIONS MAY INCLUDE COLOR OR COLOR COMBINATIONS (TAN, RED, YELLOW-BROWN, BLUE-GRAY).  MODIFIERS SUCH AS LIGHT, DARK, STREAKED, ETC. ARE USED TO DESCRIBE APPEARANCE.  X CME-55 (ATV)  TRICONE 'TUNG,-CARB, SOUNDING ROD INDURATED GRAYN OF SHARP HAMMER WITH STEEL PROBE;  SOUNDING ROD  DIFFICULT TO BREAK WITH HAMMER.  VANE SHEAR TEST  EXTREMELY INDURATED SHARP HAMMER BLOWS REQUIRED TO BREAK SAMPLE;	MED. PLASTICITY 16-25 MEDIUM		PORTABLE HOIST		1	MOI	DERATELY INDURATE	GRAINS	CAN BE SEPARATED FROM SAMPLE		
DESCRIPTIONS MAY INCLUDE COLOR OR COLOR COMBINATIONS (TAN, RED, YELLOW-BROWN, BLUE-GRAY).  MODIFIERS SUCH AS LIGHT, DARK, STREAKED, ETC. ARE USED TO DESCRIBE APPEARANCE.  X CME-55 (ATV)  SOUNDING ROD  INDURATED  SOUNDING ROD  INDURATED  UNRING RED  OFFICULT TO BIFFLOCT TO DIFFLOCT  VANE SHEAR TEST  EXTREMELY INDURATED  SHARP HAMMER BLOWS REQUIRED TO BREAK SAMPLE;			4 🗀		HAND AUGER			BREAKS		H CTCC: DDODE-	
MODIFIERS SUCH AS LIGHT, DARK, STREAKED, ETC. ARE USED TO DESCRIBE APPEARANCE.	DESCRIPTIONS MAY INCLUDE COLOR OR COLOR COMBINATIONS (TAN, RED, YELLOW-BROWN, E			X CORE BIT		INC	DUKATEU	DIFFIC	ULT TO BREAK WITH HAMMER.		
	MODIFIERS SUCH AS LIGHT, DARK, STREAKED, ETC. ARE USED TO DESCRIBE APPEARANC	•	IX LME-55 (ATV)			EXT	TREMELY INDURATED			K SAMPLE:	

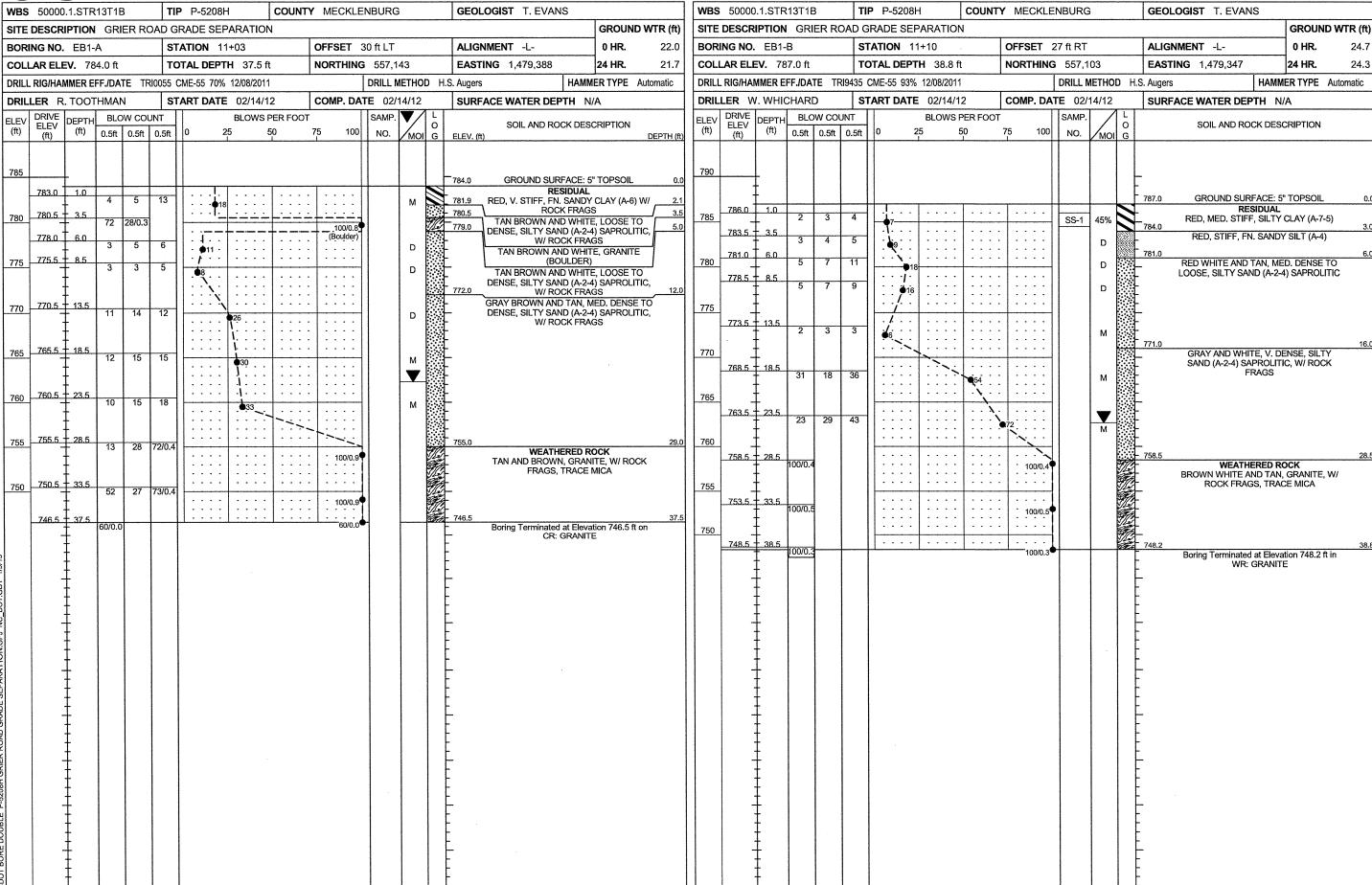










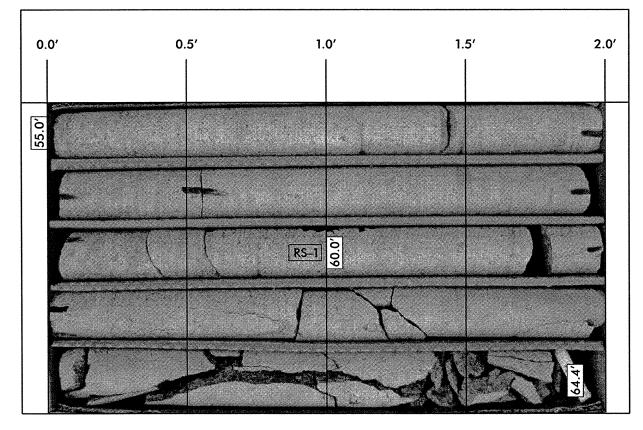


# NCDOT GEOTECHNICAL ENGINEERING UNIT

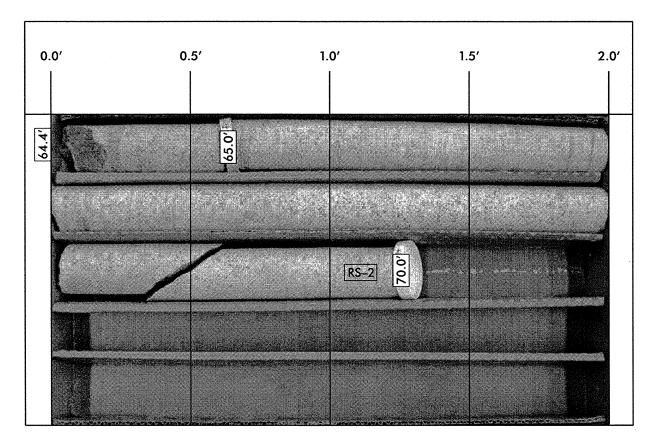
WBS	50000	.1.STR	13T1E	3	TI	<b>P</b> P-5208H	COUNT	Y MECKLE	NBURG	3		GEOLOGIST T. EVANS	
SITE	DESCR	IPTION	GRI	ER RO	DAD G	GRADE SEPARATIO	N						GROUND WTR (f
BORI	NG NO.	B1-A			ST	TATION 12+37		OFFSET 4	40 ft LT			ALIGNMENT -L-	0 HR. 24.4
COLL	AR ELE	<b>EV.</b> 79	0.0 ft		TC	OTAL DEPTH 70.0	ì	NORTHING	557,0	146		<b>EASTING</b> 1,479,480	24 HR. 24.:
DRILL	RIGIHAI	MMER E	FFJDA	TE TR	10055	CME-55 70% 12/08/201	 1		DRILL N	METHOD	M	ud Rotary HAMI	MERTYPE Automatic
DRIL	LER W	/. WHIC	CHAR	D	รา	TART DATE 02/24/	2	COMP. DA	TE 02/	28/12	-,	SURFACE WATER DEPTH N	I/A
ELEV	DRIVE	DEPTH	BLC	M COL	TNL	BLOWS	PER FOOT		SAMP.	<b>V</b> /	L	SOIL AND ROCK DES	CDIDTION
(ft)	ELEV (ft)	(ft)	0.5ft	0.5ft	0.5ft	0 25	50	75 100	NO.	MOI	G	ELEV. (ft.)	DEPTH
											-		
790												790.0 GROUND SURF	
	789.0	1.0	3	5	6	1	: : : :			м		RESIDUAL RED-BROWN AND GRAY	, STIFF, SILTY
	786.5	3.5	3	6	8	$  \cdot X_{\cdot}   \cdot \cdot \cdot$				м		787.0 CLAY (A-7) W/ GRAVEL, I TRACE MICA, RO	
785	784.0	6.0				14	1	1		141		- 784.5 RED-BROWN AND TAN - SANDY CLAY (A-6) W/ GF	
	- - 781.5		4	5	7	12	1::::			M		FRAGS, TRACE MICA	A, ROOTS
780	-701.5		3	4	6	10	1			м		SILTY SAND (A-2-4) SAF	PROLITIC, W/
	-	<u> </u>				: ::: ::::	: : : :					LITTLE MICA BROWN TAN AND GRA	Y, STIFF, FN.
	776.5	13.5	2	3	4	:1: : :   : : : :				١., ا		777.0 SANDY SILT (A-4) SAPRO SAND LAYERS, LITT	
775	-	ł	-		-	97	<del> </del>	+		M		<ul> <li>BROWN TAN AND GRAY, L</li> <li>DENSE, SILTY FN. TO CSI</li> </ul>	OOSE TO MED.
	774.5	1 40 5				: \t:  : : : :	1::::					- SAPROLITIC, W/ LITTLE T	
770	771.5	18.5	4	7	8	15				w		<del>-</del>	
		Ŧ										<u>-</u>	
	766.5	23.5	10	21	40		1			V		767.0 TAN BLACK AND BROW	N, V. DENSE,
765	_	Ŧ	10	"	40		61					SILTY SAND (A-2-4) SAF ROCK FRAG	
		Ŧ					7		İ			-	
760	_761.5	28.5	13	26	24		50			Ь		<del>-</del>	
100	-	‡					1					<del>-</del>	
	756.5	33.5						7.5				- 756.5	3:
755	_	‡	36	64/0.4			1	100/0.9		D		- WEATHERED R BROWN GRAY AND TAN	
		‡					: : : :					TRACE MICA, ROCI	K FRAGS
750	751.5	38.5	43	57/0.2			: : : :	100/0.7		D			
750	-	‡					1						
	746.5	+ + 43.5										<del>-</del>	
745		‡	62	38/0.1			<u> </u>	100/0.6				<u>-</u>	
		‡						:   : : : :				-	
745 740 735 730 725	741.5	48.5	100/0.4	4			: : : :	100/0.4				-	
740	-	‡					1	10004					
	736.5	+ + 53.5					:					737.0	5
735	735.0	55.0	18	43	57/0.3	5	1	100/0.8				BROWN AND GRAY, M 735.0	5
		±	60/0.0	2				60/0.0				CRYSTALLINE I GRAY AND WHITE, M	OD. TO SLI.
		<u> </u>						:   : : : :				WEATHERED, MOD. HAR CLOSE TO WIDELY FI	RACTURED,
730	-	+					1		RS-1	-		GRANITE	
		İ					: : : :	:   : : : :					
725	] .	‡						-				_	
		<u> </u>						:				<del> </del> -	
		Ī										<u></u>	
720		<del>[</del>	-	+		11			RS-2	+		720.0  Boring Terminated at Elev	7 ration 720.0 ft in
		Ŧ										CR: GRANT	
		Ŧ										F	
	-	Ŧ										F	
		‡										‡	
		+	1		1					1	1	ŀ	



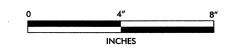
<b>700</b>	).1.STR	13T1E	3	IIP	P-520	8H	0	TAUC	Y N	ECKLENBURG GEOLOGIST T. EV	7113		
SITE DESCR	IPTION	GRI	ER ROAI	D GRA	DE SI	EPARAT	ION					GROUN	D WTR (ft
BORING NO.	. B1-A			STAT	ION	12+37			OF	SET 40 ft LT ALIGNMENT -L-		0 HR.	24.4
COLLAR EL	<b>EV</b> . 79	0.0 ft		TOTA	AL DEI	<b>PTH</b> 70.	0 ft		NO	RTHING 557,046 EASTING 1,479,48	)	24 HR.	24.2
DRILL RIGIHA	MMERE	FF./DA	TE TRIOO	55 CMI	E-55 70	% 12/08/2	011			DRILL METHOD Mud Rotary	HAMI	MER TYPE	Automatic
DRILLER W	v. WHI	HARI	)	STAF	RT DA	<b>FE</b> 02/2	4/12		co	MP. DATE 02/28/12 SURFACE WATER I	EPTH N	I/A	
ORE SIZE	NQ2					15.0 f		<del></del>	L.,				
(ft) RUN ELEV (ft) (ft)	DEPTH (ft)	RUN (ft)	DRILL RATE (Min/ft)	REC. (ft)	RQD (ft)	SAMP. NO.	STR REC. (ft)	RQD (ft)	L 0 G	DESCRIPTION AND REMA	RKS		DEPTH (
735.0	55.0	5.0	4:09/1.0	(5.0)	(4.8)		(14.9)	/12 2\	لارتهج	Begin Coring @ 55.0			55
730 730.0	60.0	5.0	2:48/1.0 2:30/1.0 2:28/1.0 2:36/1.0	100%	96%	RS-1	99%	(12.2) 81%		GRAY AND WHITE, MOD. TO SLI. WEATHER V. CLOSE TO WIDELY FRACTUR	D, MOD. H		
	-	5.0	3:02/1.0 2:54/1.0 2:43/1.0 2:18/1.0	(5.0) 100%	(2.8) 56%	KO-1							
725 725.0	65.0	5.0	2:25/1.0 2:15/1.0 2:32/1.0 3:09/1.0	(4.8) 96%	(4.6) 92%								
720 720.0	70.0		3:32/1.0 3:43/1.0			RS-2				- 720.0			70
	ł									Boring Terminated at Elevation 720.0	t in CR: GF	RANITE	
	<u></u>												



BORING B1-A, BOX 1 OF 2, 55.0 FT TO 64.4 FT



BORING B1-A, BOX 2 OF 2, 64.4 FT TO 70.0 FT





PHONE: 919.871.0800 FAX: 919.871.0803

#### ROCK CORE PHOTOS - BORING B1-A

GRIER ROAD GRADE SEPARATION MECKLENBURG COUNTY, NORTH CAROLINA TIP: P-5208H, WBS: 50000.1.STR13.T1B

JANUARY 2013

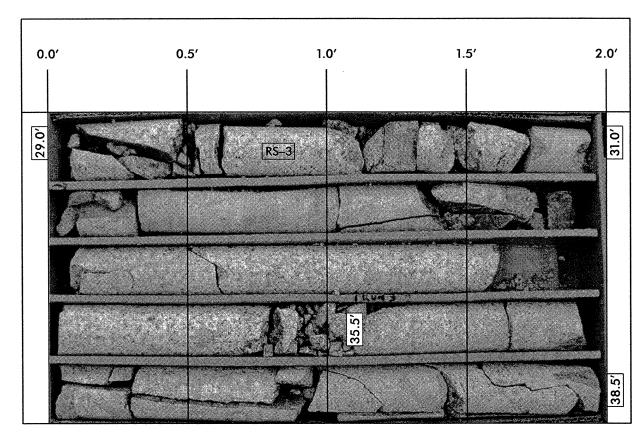
FALCON PROJECT NO.: G11026.00



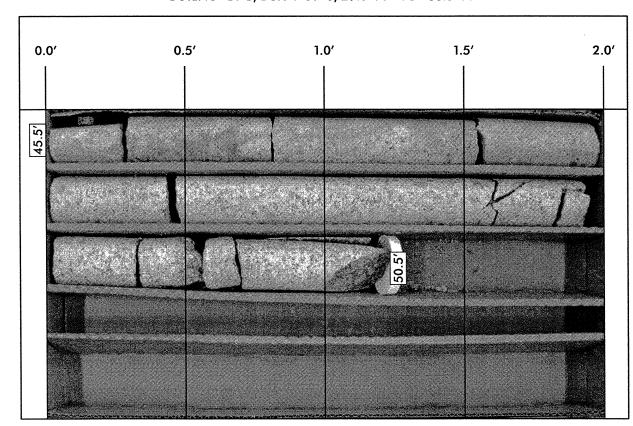
VBS	50000	.1.STR	13T1E	3	TI	P P-5208H	COUNTY	MECKLE	NDOICE			GEOLOGIST J. HAMM	
ITE	DESCRI	PTION	GRI	ER R	DAD G	GRADE SEPARATION	1	<del>v-1-7</del>					GROUND WTR (
ORI	NG NO.	B1-B			ST	TATION 12+44		OFFSET	30 ft RT			ALIGNMENT -L-	OHR. N
OLL	AR ELE	<b>V</b> . 79	0.0 ft		TC	OTAL DEPTH 50.5 ft		NORTHING	556,9	97		<b>EASTING</b> 1,479,430	<b>24 HR</b> . 25
RILL	RIGIHAN	AMER E	FFJDA	TE TI	RI0055 (	CME-55 70% 12/08/2011			DRILL N	IETHO	D Me	ud Rotary HAMI	MER TYPE Automatic
RILI	LER W	. WHIC	CHAR	D	ST	TART DATE 02/23/1	2	COMP. DA	TE 02/	24/12		SURFACE WATER DEPTH	I/A
LEV	DRIVE	DEPTH	BLC	W CO	UNT	BLOWS F	ER FOOT		SAMP.	$\mathbf{V}/$	L	SOIL AND ROCK DES	CDIDTION
(ft)	ELEV (ft)	(ft)	0.5ft	0.5ft	0.5ft	0 25 5	50 L	75 100	NO.	MOI		ELEV. (ft)	DEPTI-
790												790.0 GROUND SURFACE:	
ł	789.0	1.0	3	3	6	9				м		TAN AND ORANGE, STIFF	, SANDY CLAY
	786.5	3.5	5	7	9	1				м		787.0 (A-7) TAN, V. STIFF, SAND	/ SILT (A-4)
785	784.0	6.0				□ 16 · 1. · · · · · ·		1				-784.5 TAN, LOOSE, SILTY S	AND (A-2-4)
	- 781.5 -	- - 8.5	3	4	5	9	: : : :			M		782.0 TAN, STIFF, SANDY	, ,
780		-	3	5	7	i2 · · · · ·				М		- TAN, STIFF, SANDY	SILI (A-4)
	-	-				:::::::::::::::::::::::::::::::::::::	: : : :					778.0 TAN, STIFF TO HARD, FI	I CANDY CILT
75	776.5	- 13.5 -	3	5	7	10	::::			w		. (A-4)	N. SANDI SILI
10	-	-						1				<del>-</del> ·	
	771.5 -	- - 18.5					: : : :					• •	
770	-	_	3	7	10	17	<u> </u>			W		<u>-</u>	
	-	Ī					: : : :					- -	
65	766.5	- 23.5 -	8	16	24	40.	: : : :			w		• •	
	-	F										<del>-</del> - 	
	761.5 761.0	- - 28.5	20/0 4					0000				- 762.5 - 761.0 CRYSTALLINE	
760	761.0	- 29.0	60/0.1 60/0.0					60/0.1 - 60/0.0	RS-3			GRAY AND BROWN 759.0 CRYSTALLINE	GRANITE
	-	-					: : : :					GRAY AND BROWN, SLI. \ MOD. SEV. WEATHERED	VEATHERED TO
755	-						::::					HARD, V. CLOSE TO 755.0 FRACTURED, GF	
	-	F										GRAY AND BROWN, SLI. WEATHERED, SOFT TO	TO MOD. SEV.
	-	F					: : : :					CLOSE TO MOD. CLOSEL	Y FRACTURED,
750	_	F					+					GRAY AND BROWN SLI.	WEATHERED,
		F										MOD. HARD TO HARD, C CLOSELY FRACTURE	
745		F							I BC 4			- - -	
	-	F							RS-4	1			
		Ŧ					::::					<del>-</del> -	
740		<u> </u>	ļ		<b>_</b>		<u> </u>		Ц	<u> </u>	M	- 	ration 739 5 ft in
		ł										- Boring Terminated at Elek - CR: GRANF	
	-											NOTE: 0 HR, GROUND RECORDED DUE 1 PERCOLATION OF WATE TO BOREHOLE DURING	O SLOW R INTRODUCED
	-	<del> </del>  -  -										-  -	
	-	† † †										<del>-</del> - -	
	-	‡ ‡										- - -	
	-	‡										- - -	



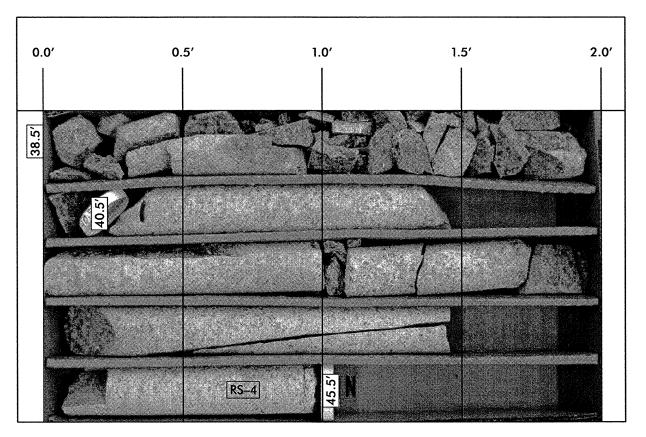
	30000	.1.315	13T1E	3	ПР	P-520	IOH .	C	TMUC	Y N	IECKLENBURG		GEOLOGIST J. HAMM	1		
SITE	DESCR	IPTION	GRI	ER ROA	D GRA	DE S	EPARAT	ION							GROUN	ID WTR (f
BOR	ING NO.	B1-B			STAT	NO	12+44			OF	FSET 30 ft RT		ALIGNMENT -L-		0 HR.	N/.
COL	LAR ELE	EV. 79	0.0 ft		TOTA	L DE	PTH 50.	.5 ft		NO	RTHING 556,997		<b>EASTING</b> 1,479,430		24 HR.	25.
DRILL	RIGIHAI	MMER E	FF./DA	TE TRIOO	55 CM	E-55 70	0% 12/08/2	2011		L	DRILL METHO	D Mud	d Rotary	HAMME	RTYPE	Automatic
DRIL	LER W	/. WHI	CHARI	)	STAF	RT DA	TE 02/2	3/12		co	MP. DATE 02/24/12		SURFACE WATER DEF	TH N/A	4	
COR	E SIZE	NQ2			TOTA	L RUI	N 21.5 f	t								
ELEV (ft)	ELEV	DEPTH (ft)	RUN (ft)	DRILL RATE	REC.	RQD	SAMP.	STR REC.	RQD	L O		D	ESCRIPTION AND REMARK	s		<del></del>
	(ft)	1.19	(",	(Min/ft)	(ft)	(ft) %		(#)	(ft) %	G	ELEV. (ft)		Desir Online C 00 0 II	<del></del>		DEPTH
761 760	761.0	29.0	2.0	2:30/1.0	(2.0)	(0.7)	RS-3	(2.0)	(0.7)		761.0		Begin Coring @ 29.0 ft CRYSTALLINE ROCK			25
	759.0	31.0	4.5	4:00/1.0 2:00/1.0	100% (4.5)	35%	( K3-3	(4.5)	(3.0)				I, SLI. WEATHERED TO MOD D, V. CLOSE TO CLOSELY F			
	-	F		4:00/1.0 1:50/1.0	100%	67%		113%	75%		- GRAY AND BI	ROWN,	SLI. TO MOD. SEV. WEATH	IERED, SO	OFT TO N	
755	754.5-	- 35.5		2:00/1.0 1:30/0.5				(15.0)	(7.7)		(55.0		TO MOD. CLOSELY FRACT SLI. WEATHERED, MOD. HA			OSE 35
	-	ļ	5.0	1:10/1.0 1:25/1.0 1:00/1.0	(4.7) 94%	(1.0) 20%		97%	50%				D. CLOSELY FRACTURED,			-
750	-	-		1:25/1.0							<del>-</del>					
100	749.5-	40.5	5.0	2:53/1.0 1:43/1.0	(5.0)	(3.4)					<del></del> -					
	-	ţ		1:27/1.0 1:48/1.0	100%	68%					<del>-</del>					
745	744.5-	45.5		2:34/1.0 2:57/1.0			RS-4				<del>-</del>					
	-		5.0	2:28/1.0 2:30/1.0	(5.0) 100%	(3.3) 66%		1			<del></del>					
	-	<u> </u>		2:03/1.0	100%	00 /6					- -					
740	739.5-	50.5		1:54/1.0							—739.5	- T	inated at Elevation 739.5 ft in	CD. CDA	NUTE	51



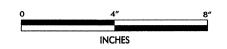
BORING B1-B, BOX 1 OF 3, 29.0 FT TO 38.5 FT



BORING B1-B, BOX 3 OF 3, 45.5 FT TO 50.5 FT



BORING B1-B, BOX 2 OF 3, 38.5 FT TO 45.5 FT





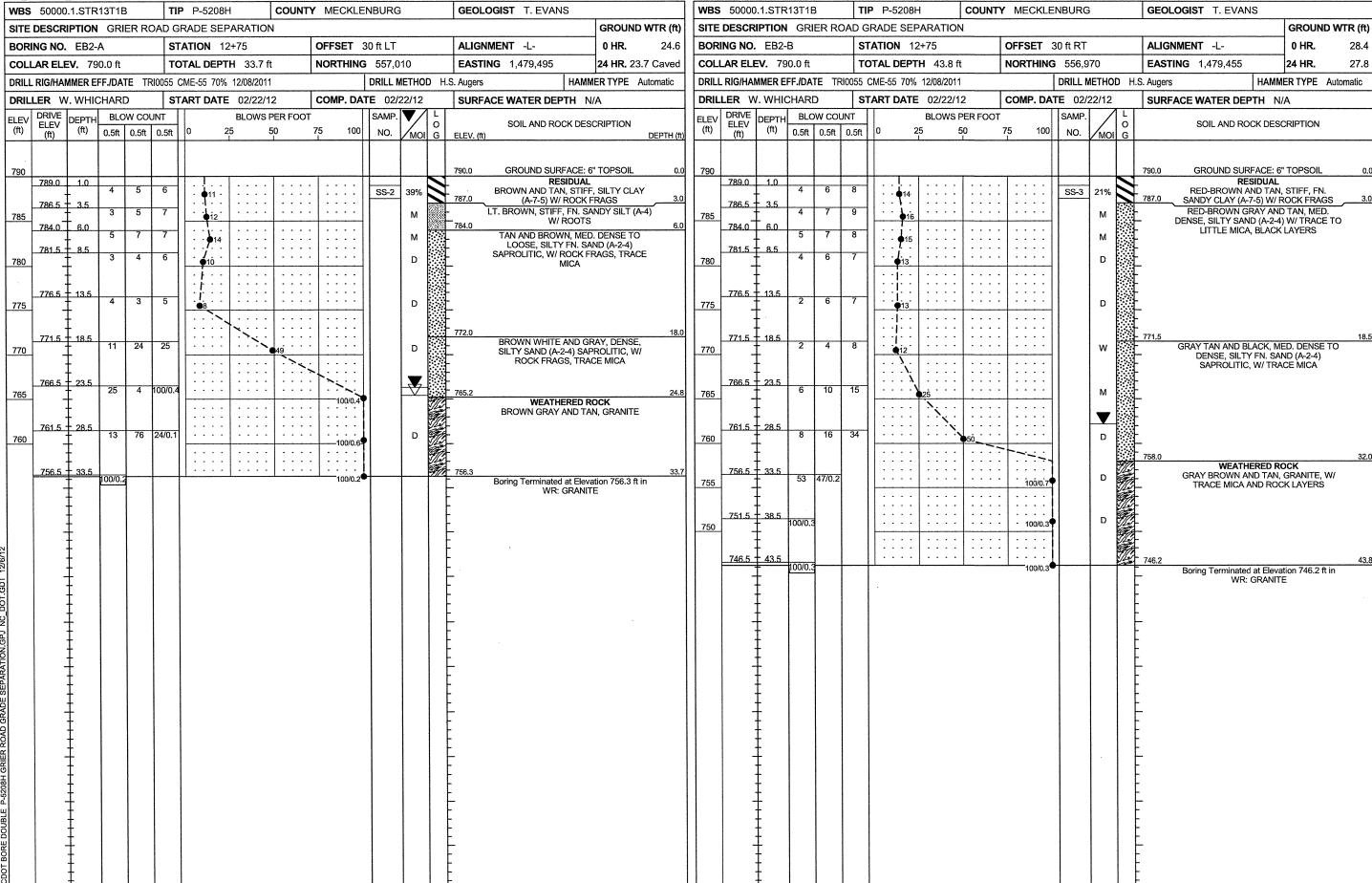
> PHONE: 919.871.0800 FAX: 919.871.0803

ROCK CORE PHOTOS - BORING B1-B

GRIER ROAD GRADE SEPARATION MECKLENBURG COUNTY, NORTH CAROLINA TIP: P-5208H, WBS: 50000.1.STR13.TIB

JANUARY 2013 FA

FALCON PROJECT NO.: G11026.00



#### AASHTO SOIL CLASSIFICATION AND GRADATION SHEET

#### **GRIER ROAD GRADE SEPARATION**

WBS NO.: 50000.1.STR13T1B, TIP NO.: P-5208H MECKLENBURG COUNTY, NORTH CAROLINA

FALCON ENGINEERING, INC. PROJECT NO: G11026.00

#### LABORATORY SUMMARY SHEET FOR ROCK CORE SAMPLES

#### GRIER ROAD GRADE SEPARATION

WBS NO.: 50000.1.STR13T1B, TIP NO.: P-5208H MECKLENBURG COUNTY, NORTH CAROLINA

FALCON ENGINEERING, INC. PROJECT NO: G11026.00

	BORING SAI  AASHTO Classification		E TOTAL SAMPLE PERCENT PASSING			Atterberg Limit Test Results			Natural Moisture Content	Sample	Boring	Denth (ff)	Rock Type	Geologic	Run RQD		Diameter	Unit Weight	Unconfined Compressive	Young's Modulus	Splitting Tensile
STATION	OFFSET (FEET)	DEPTH (FEET)	#10	#40	#200	LL	PL	PI	%	No.	Doming	Dopui (it)	Mook Type	Map Unit		(ft)	(ft)	(PCF)	Strength (PSI)	(PSI)	Strength (PSI)
EB1	31-B SS-1																				
	A-7-5		100	100	91	75	50	25	45.4	RS-1	B1-A	59.2-60.5	Granite	PzZq	96%	0.36	0.17	169.1	23,121	3,991,182	-
11+10	27' RT	1.0 - 2.5				<u> </u>			1			<u> </u>									
EB2	EB2-A SS-																				
	A-7-5		100	96	87	84	39	45	39.0	RS-2	B1-A	69.0-70.0	Granite	PzZq	92%	0.37	0.16	168.5	9,975	2,572,312	-
12+75	30' LT	1.0 - 2.5																			
EB2	2-B	SS-3																			
	A-7-5	-	95	68	54	50	32	18	20.9	RS-3	B1-B	29.5-30.0	Granite	PzZq	35%	0.33	0.16	166.7	10,647	1,572,528	-
1275	30' RT	1.0 - 2.5																			
			. •							RS-4	B1-B	44.5-45.5	Granite	PzZq	68%	0.38	0.16	167.9	12,662	1,985,792	•



PHOTO TAKEN FROM NEAR END BENT 1, LOOKING DOWNSTATION (ALONG -L-). BORING EB1-B IS SHOWN IN FOREGROUND.

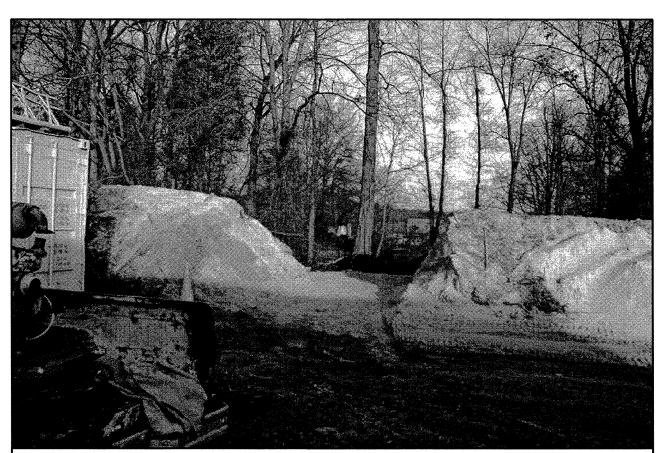


PHOTO TAKEN FROM NEAR END BENT 2, LOOKING DOWNSTATION (ALONG -L-) TOWARD B1-A. AS SHOWN ABOVE, EXCAVATION WAS REQUIRED TO ACCESS BORINGS B1-A AND B1-B. BORING EB2-A IS SHOWN BY TRAFFIC CONE.



> PHONE: 919.871.0800 FAX: 919.871.0803

#### SITE PHOTOS

GRIER ROAD GRADE SEPARATION MECKLENBURG COUNTY, NORTH CAROLINA TIP: P–5208H, WBS: 50000.1.STR13.TIB

JANUARY 2013

FALCON PROJECT NO.: G11026.00



PHOTO TAKEN FROM NEAR END BENT 2, LOOKING DOWNSTATION (ALONG -L-). BORING B1-A IS SHOWN IN FOREGROUND.



PHOTO TAKEN FROM NEAR END BENT 1, LOOKING UPSTATION (ALONG -L-) TOWARD B1-A (LEFT) AND B1-B (RIGHT), BEYOND EXISTING RAIL LINE SHOWN ABOVE.



> PHONE: 919.871.0800 FAX: 919.871.0803

#### SITE PHOTOS

GRIER ROAD GRADE SEPARATION MECKLENBURG COUNTY, NORTH CAROLINA TIP: P–5208H, WBS: 50000.1.STR13.TIB

JANUARY 2013

FALCON PROJECT NO.: G11026.00

# 208H TR13TI 50000.1.S

#### STATE OF NORTH CAROLINA

DEPARTMENT OF TRANSPORTATION
RAIL DIVISION
GEOTECHNICAL ENGINEERING UNIT

#### CONTENTS

<u>SHEET</u>	<b>DESCRIPTION</b>	
1	TITLE SHEET	
2	LEGEND	
3	BORING LOCATION PLAN	
4-5	SUBSURFACE PROFILES	
6-10	BORE LOGS	
11	LABORATORY TEST RESULTS	
12	SITE PHOTOGRAPHS	

#### STRUCTURE SUBSURFACE INVESTIGATION

PROJ. REFERENCE NO COUNTY <u>MECKLE</u>		F.A.	PROJ.
PROJECT DESCRIPTIO			-Y1- STA. 30+75
	ROM SOUTH		D (SR 2426) TO



STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL
N.C.	P-5208H	1	12

#### CAUTION NOTICE

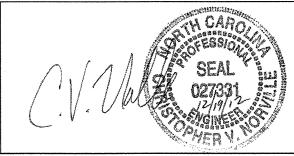
THE SUBSURFACE INFORMATION AND THE SUBSURFACE INVESTIGATION ON WHICH IT IS BASED WERE MADE FOR THE PURPOSE OF STUDY, PLANNING, AND DESIGN, AND NOT FOR CONSTRUCTION OR PAY PURPOSES. THE VARIOUS FELD BORING LOCS, ROKE CORES, AND SOLE TEST DATA AVAILABLE MAY BE REVIEWED OR INSPECTED IN RALEIGH BY CONTACTING THE N. C. DEPARTMENT OF TRANSPORTATION, GEOTECHNICAL ENGINEERING UNIT AT (1919) 250-4088. NEITHER THE SUBSURFACE PLANS AND REPORTS, NOR THE FIELD BORING LOCK, ROCK CORES, OR SOLE 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 BORNOS OR BETWEEN SAMPLED STRATA WITHIN THE BORFHOLE, THE LABORATIORY SAMPLE DATA AND THE IN STILL GIN-PLACED TEST DATA CAN BE RELIED ON ONLY TO THE DEGREE OF RELIABILITY WHERENT IN THE STANDARD TEST METHOD. THE OBSERVED WATER LEVELS OR SOIL MOSTURE CONDITIONS MIDICATED IN THE SUBSURFACE INVESTICATIONS ARE AS RECORDED AT THE TIME OF THE INVESTICATION. THESE WATER LEVELS OR SOIL MOISTURE CONDITIONS AND 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 PLANS AND DOLOUMENTS 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, NO EPHION 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 SATISTY HUNSELF AS TO CONDITIONS TO BE ENCOUNTEED ON THIS PROJECT. THE CONTRACTOR SHALL HAVE NO CLAM FOR ADDITIONAL COMPENSATION OR FOR AN EXTENSION OF TIME FOR ANY REASON RESULTING FROM THE ACTUAL CONDITIONS ENCOUNTERED AT THE SITE DIFFERENCE FROM THIS PROME THE SITE DIFFERENCE FROM THIS PROME THE SITE DIFFERENCE FROM THIS PROME THE SITE DIFFERENCE FROM THIS ENDICATED IN THE SUBSURFACE INFORMATION.

***	C. V. NORVILLE
_	J. R. HAMM
_	T. E. EVANS
_	
_	
_	
_	
_	***************************************
	Y_T. E. EVANS
INVESTIGATED B	
CHECKED BY	C. V. NORVILLE FALCON ENG.

PERSONNEL



#### NORTH CAROLINA DEPARTMENT OF TRANSPORTATION

#### DIVISION OF HIGHWAYS

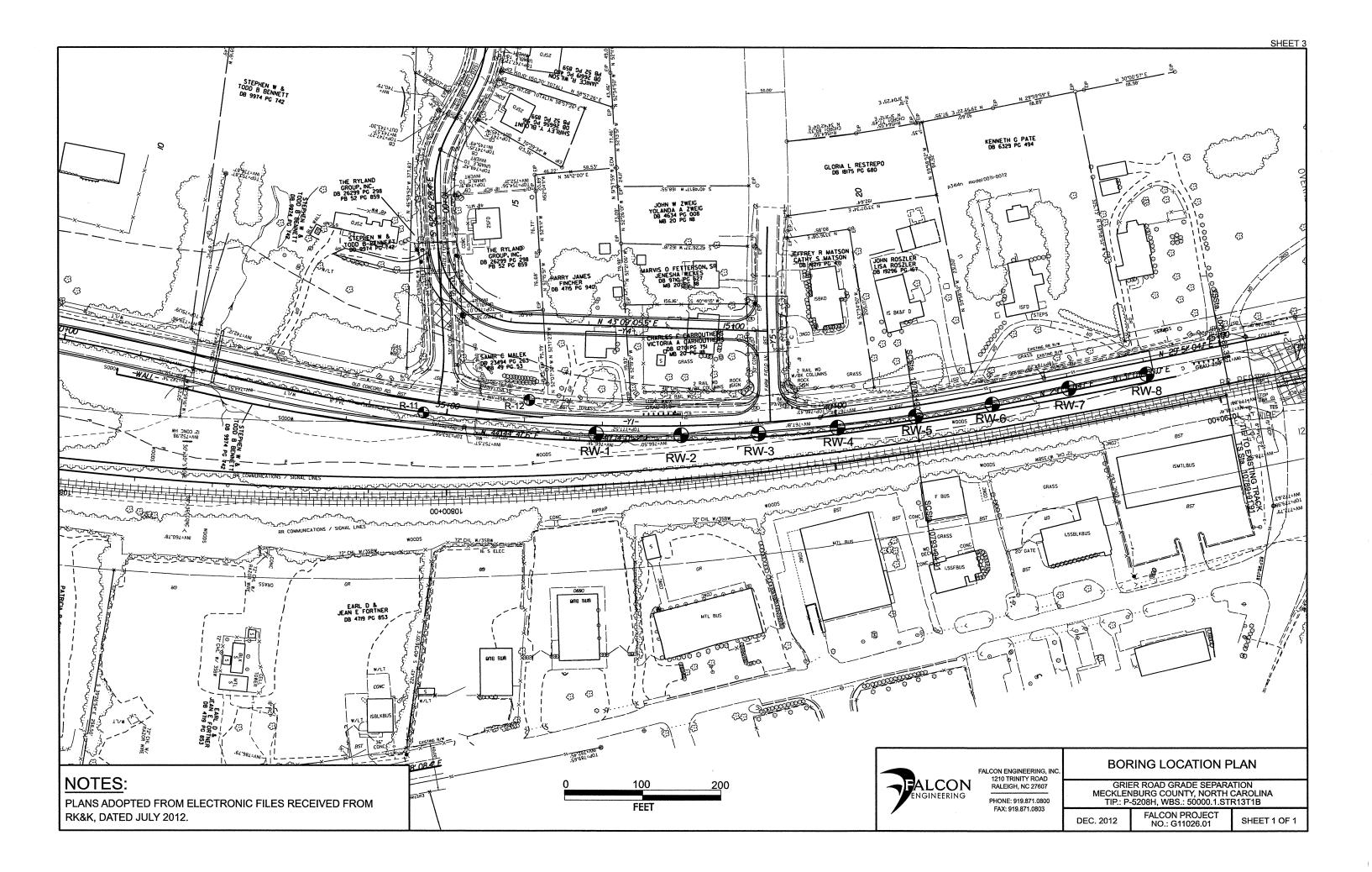
#### GEOTECHNICAL ENGINEERING UNIT

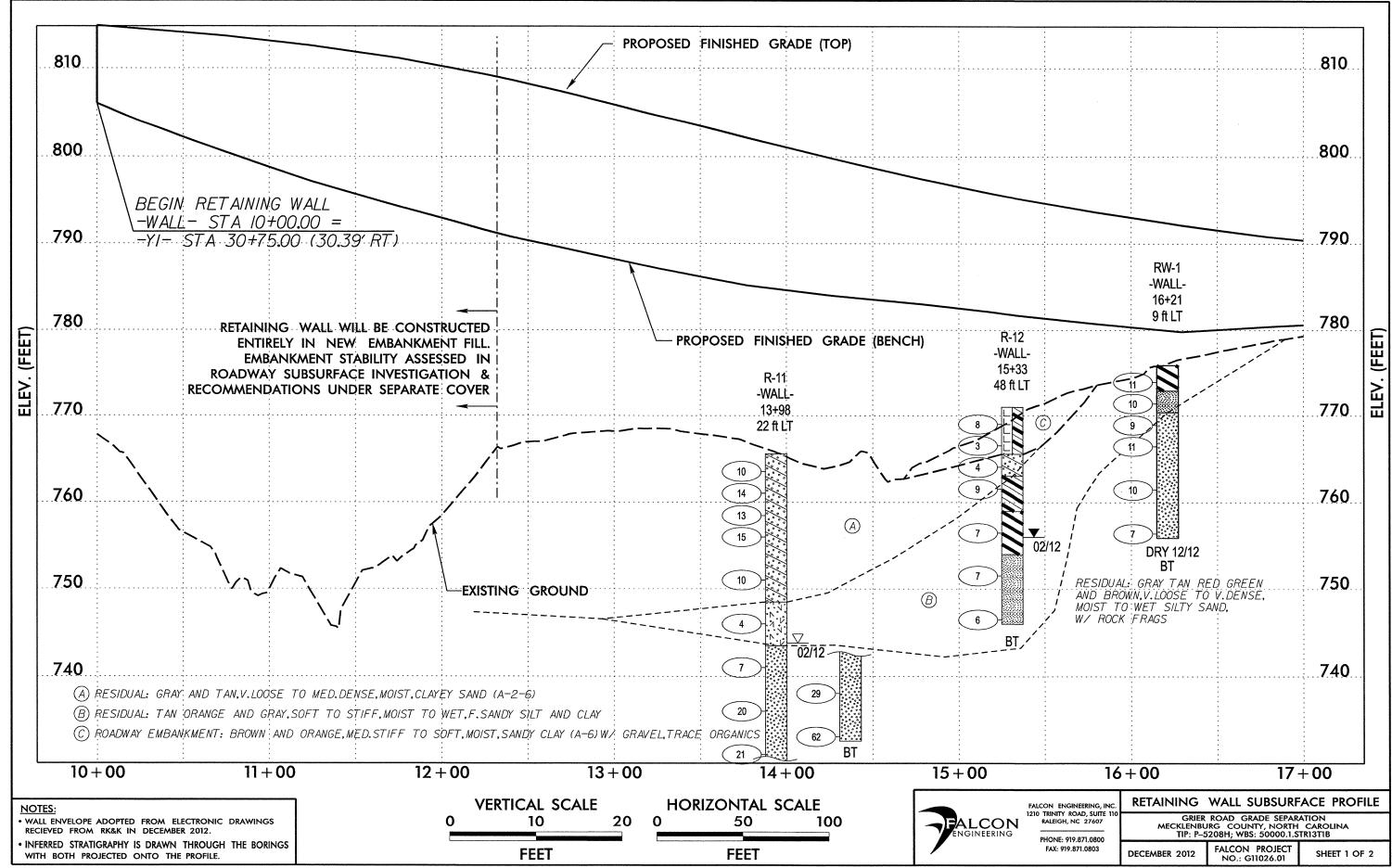
#### SUBSURFACE INVESTIGATION

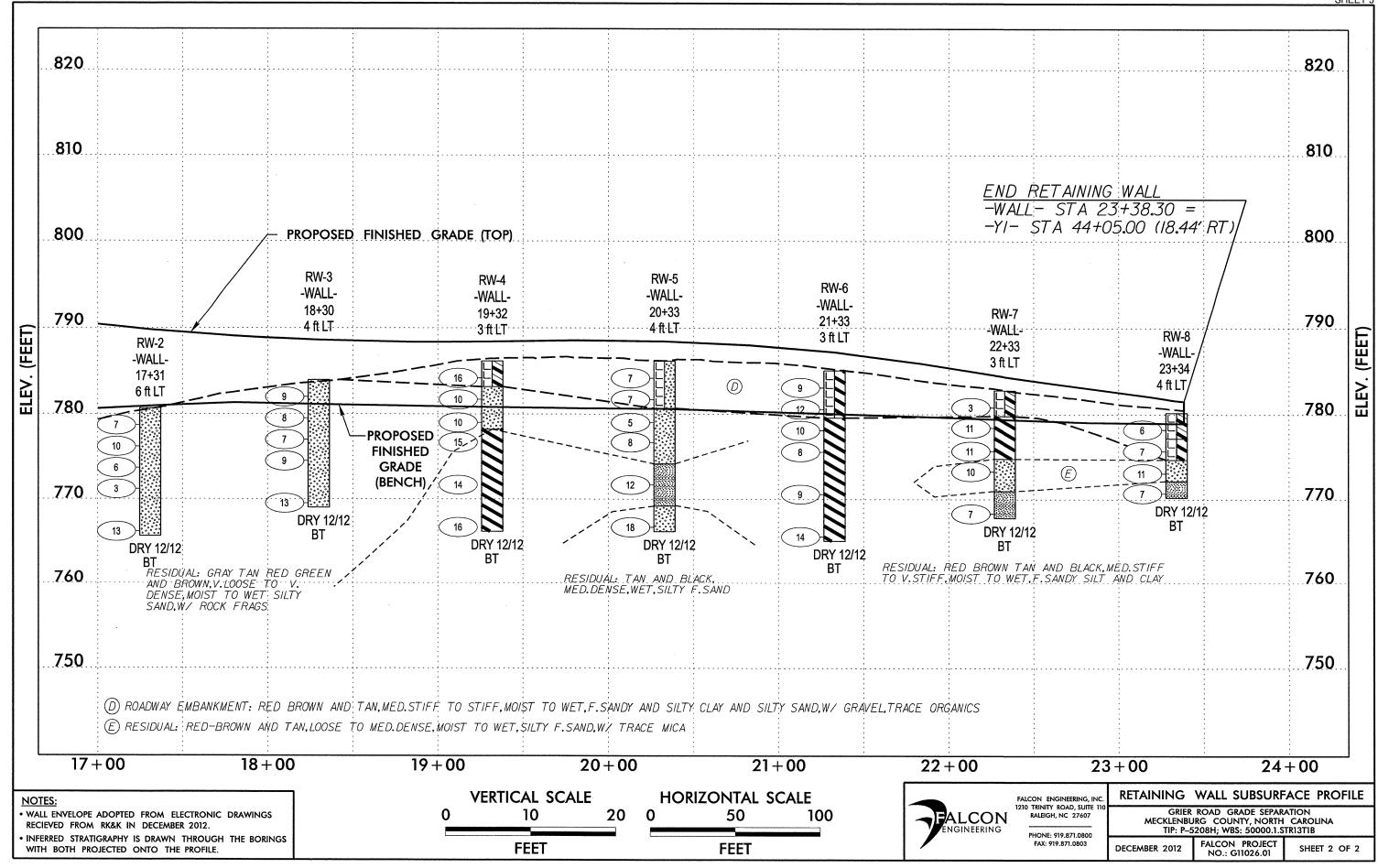
	SOIL AND BOO	CV I ECENID TEDMS	S, SYMBOLS, AND ABBREVI	ATIONIC	
		A LEGEND, TERMS			
SOIL DESCRIPTION  SOIL IS CONSIDERED TO BE THE UNCONSOLIDATED, SEMI-CONSOLIDATED, OR WEATHERED EARTH MATERIALS THAT CAN BE PENETRATED WITH A CONTINUOUS FLIGHT POWER AUGER, AND YIELD LESS THAN	GRADATION  WILL GRADED - INDICATES A GOOD REPRESENTATION OF PARTICLE SIZES FR UNIFORM - INDICATES THAT SOIL PARTICLES ARE ALL APPROXIMATELY THE POORLY GRADED)	ROM FINE TO COARSE. SAME SIZE.(ALSO	HARD ROCK IS NON-COASTAL PLAIN MATERIAL THA ROCK LINE INDICATES THE LEVEL AT WHICH NON-C	DESCRIPTION  IT IF TESTED, WOULD YIELD SPT REFUSAL, AN INFERRED  COASTAL PLAIN MATERIAL WOULD YIELD SPT REFUSAL.  SAMPLER EQUAL TO OR LESS THAN 0.1 FOOT PER 60 BLOWS.	TERMS AND DEFINITIONS  ALLUVIUM (ALLUV.) - SOILS THAT HAVE BEEN TRANSPORTED BY WATER.
100 BLOWS PER FOOT ACCORDING TO STANDARD PENETRATION TEST (AASHTO T206, ASTM D-1586). SOIL CLASSIFICATION IS BASED ON THE AASHTO SYSTEM, BASIC DESCRIPTIONS GENERALLY SHALL INCLUDE: CONSISTENCY, COLOR, TEXTURE, MOISTURE, AASHTO CLASSIFICATION, AND OTHER PERTINENT FACTORS SUCH AS MIMERALOGICAL COMPOSITION, ANDULARITY, STRUCTURE, PLASTICITY, ETC. EXAMPLE:	GAP-GRADED - INDICATES A MIXTURE OF UNIFORM PARTICLES OF TWO OR MC  ANGULARITY OF GRAINS  THE ANGULARITY OR ROUNDNESS OF SOIL GRAINS IS DESIGNATED BY THE T		IN NON-COASTAL PLAIN MATERIAL. THE TRANSITION OF WEATHERED ROCK. ROCK MATERIALS ARE TYPICALLY DIVIDED AS FOLL	ON BETWEEN SOIL AND ROCK IS OFTEN REPRESENTED BY A ZONE	ACUIFER - A WATER BEARING FORMATION OR STRATA.  ARENACEOUS - APPLIED TO ROCKS THAT HAVE BEEN DERIVED FROM SAND OR THAT CONTAIN SAND.  ARGILLACEOUS - APPLIED TO ALL ROCKS OR SUBSTANCES COMPOSED OF CLAY MINERALS,
VERY STIFF, GRAY, SILTY CLAY, MOST WITH INTERGEDGED FINE SAMD LAYERS, HIGHLY PLASTIC, A-7-6	SUBANGULAR, SUBROUNDED, OR ROUNDED.		WEATHERED NON-COASTAL PI	LAIN MATERIAL THAT WOULD YIELD SPT N VALUES > 100	OR HAVING A NOTABLE PROPORTION OF CLAY IN THEIR COMPOSITION, AS SHALE, SLATE, ETC.  ARTESIAN - GROUND WATER THAT IS UNDER SUFFICIENT PRESSURE TO RISE ABOVE THE LEVEL
SOIL LEGEND AND AASHTO CLASSIFICATION  GENERAL GRANULAR MATERIALS SILT-CLAY MATERIALS	MINERAL OGICAL COMPOSITION MINERAL NAMES SUCH AS QUARTZ, FELDSPAR, MICA, TALC, KADLIN, ETC. ARE US		CRYSTALLINE FINE TO COARSE	E GRAIN IGNEOUS AND METAMORPHIC ROCK THAT PT REFUSAL IF TESTED. ROCK TYPE INCLUDES GRANITE,	AT WHICH IT IS ENCOUNTERED, BUT WHICH DOES NOT NECESSARILY RISE TO OR ABOVE THE GROUND SURFACE.
CLASS. (≤ 35% PASSING #200) (> 35% PASSING #200) UHGANIC MATERIALS	WHENEVER THEY ARE CONSIDERED OF SIGNIFICANCE.		GNEISS, GABBRO,		CALCAREOUS (CALC.) - SOILS THAT CONTAIN APPRECIABLE AMOUNTS OF CALCIUM CARBONATE.
GROUP A-1 A-3 A-2 A-4 A-5 A-6 A-7 A-1, A-2 A-4, A-5 CLASS. A-1-a A-1-b A-2-4 A-2-5 A-2-6 A-2-7 A-2-5 A-2-6 A-2-7 A-2-5 A-2-6 A-2-7 A-2-5 A-2-6 A-2-7 A-2-5 A-2-6 A-2-7 A-2-5 A-2-6 A-2-7 A-2-7 A	COMPRESSIBILITY  SLIGHTLY COMPRESSIBLE  LIQUID LIMIT 1		NCLUDES PHYLL	OCK THAT WOULD YEILD SPT REFUSAL IF TESTED. ROCK TYPE LITE, SLATE, SANDSTONE, ETC.	COLLUVIUM - ROCK FRAGMENTS MIXED WITH SOIL DEPOSITED BY GRAVITY ON SLOPE OR AT BOTTOM OF SLOPE.
SYMBOL COORDINATION CONTROL CO	HIGHLY COMPRESSIBLE LIQUID LIMIT (	EQUAL TO 31-50 GREATER THAN 50		SEDIMENTS CEMENTED INTO ROCK, BUT MAY NOT YIELD NOCK TYPE INCLUDES LIMESTONE, SANDSTONE, CEMENTED	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.
% PASSING SILT- MUCK, CRANULAR CLAY SOLT	PERCENTAGE OF MATERIAL  ORGANIC MATERIAL  GRANULAR SILT - CLAY  COLUMN C			ATHERING	<u>DIKE</u> - A TABULAR BODY OF IGNEOUS ROCK THAT CUTS ACROSS THE STRUCTURE OF ADJACENT ROCKS OR CUTS MASSIVE ROCK.
40 38 MX 58 MX 51 MN 200 15 MX 25 MX 10 MX 35 MX 35 MX 35 MX 35 MX 35 MX 36 MN 36 MN 36 MN 36 MN SOILS SOILS	SOILS   SOIL		FRESH ROCK FRESH, CRYSTALS BRIGHT, FEW JI HAMMER IF CRYSTALLINE.	OINTS MAY SHOW SLIGHT STAINING ROCK RINGS UNDER	DIP - THE ANGLE AT WHICH A STRATUM OR ANY PLANAR FEATURE IS INCLINED FROM THE HORIZONTAL.
LIQUID LIMIT PLASTIC NODEX 6 MX NP 16 MX 11 MN 146 MX 11 MN 18 MX 11 MN 148 MX 11 MN SOILS WITH PLASTIC NODEX 6 MX NP 16 MX 18 MX 11 MN 11 MN 18 MX 18 MX 11 MN 11 MN LITTLE OR HIGHLY	MODERATELY ORGANIC         5 - 10%         12 - 20%         SOMM           HIGHLY ORGANIC         >10%         >20%         HIGH	E 20 - 35%		NED, SOME JOINTS MAY SHOW THIN CLAY COATINGS IF OPEN, CE SHINE BRIGHTLY. ROCK RINGS UNDER HAMMER BLOWS IF	<u>DIP DIRECTION (DIP AZIMUTH) -</u> THE DIRECTION OR BEARING OF THE HORIZONTAL TRACE OF THE LINE OF DIP, MEASURED CLOCKWISE FROM NORTH.
GROUP INDEX 8 8 8 8 4 4 MX 8 MX 12 MX 16 MX No MX AMOUNTS OF AMOUNTS OF SOILS  USUAL TYPES TONE FRACE. FINE SILTY OR CLAYEY SILTY CLAYEY ORGANIC  ORGANIC	GROUND WATER  ✓ WATER LEVEL IN BORE HOLE IMMEDIATELY AFTER DE	RILLING	SLIGHT ROCK GENERALLY FRESH, JOINTS STAIN (SLI.) 1 INCH. OPEN JOINTS MAY CONTAIN CL	NED 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.
OF MAJOR GRAVEL AND MATERIALS SAND SAND GRAVEL AND SAND SOILS SOILS MATTER MATERIALS CORN ARTING CORN	STATIC WATER LEVEL AFTER 24 HOURS		MODERATE SIGNIFICANT PORTIONS OF ROCK SHOW	CRYSTALLINE ROCKS RING UNDER HAMMER BLOWS. DISCOLORATION AND WEATHERING EFFECTS. IN	FISSILE - A PROPERTY OF SPLITTING ALONG CLOSELY SPACED PARALLEL PLANES.  FLOAT - ROCK FRAGMENTS ON SURFACE NEAR THEIR ORIGINAL POSITION AND DISLODGED FROM
AS A EXCELLENT TO GOOD FAIR TO POOR POOR POOR UNSUITABLE SUBGRADE	PERCHED WATER, SATURATED ZONE, OR WATER BEARIN  SPRING OR SEEP	NG STRATA		RE DULL AND DISCOLORED, SOME SHOW CLAY. ROCK HAS ND SHOWS SIGNIFICANT LOSS OF STRENGTH AS COMPARED	PARENT MATERIAL.  FLOOD PLAIN (FP) - LAND BORDERING A STREAM, BUILT OF SEDIMENTS DEPOSITED BY
PI OF A-7-5 SUBGROUP IS ≤ LL - 30 ; PI OF A-7-6 SUBGROUP IS > LL - 30  CONSISTENCY OR DENSENESS	MISCELLANEOUS SYMBOLS		MODERATELY ALL ROCK EXCEPT QUARTZ DISCOLORED	D OR STAINED. IN GRANITOID ROCKS, ALL FELDSPARS DULL DW KAOLINIZATION. ROCK SHOWS SEVERE LOSS OF STRENGTH	THE STREAM.  FORMATION (FM.) - A MAPPABLE GEOLOGIC UNIT THAT CAN BE RECOGNIZED AND TRACED IN
PRIMARY SOIL TYPE COMPACTNESS OR PENETRATION RESISTENCE COMPRESSIVE STRENGTH	ROADWAY EMBANKMENT (RE) SPT DRY DRY DRY TEST BORING	1		OGIST'S PICK. ROCK GIVES "CLUNK" SOUND WHEN STRUCK.	THE FIELD.  JOINT - FRACTURE IN ROCK ALONG WHICH NO APPRECIABLE MOVEMENT HAS OCCURRED.
CONSISTENCY CONSISTENCY (N-VALUE) (TONS/F12 )  VERY LOOSE (4		W/ CORE  SPT N-VALUE	SEVERE ALL ROCK EXCEPT QUARTZ DISCOLORER	D OR STAINED ROCK FABRIC CLEAR AND EVIDENT BUT REDUCED ANITOID ROCKS ALL FELOSPARS ARE KAOLINIZED TO SOME	LEDGE - A SHELF-LIKE RIDGE OR PROJECTION OF ROCK WHOSE THICKNESS IS SMALL COMPARED TO
GENERALLY LOOSE 4 TO 10 GRANULAR MEDIUM DENSE 10 TO 30  N/A	ACTIFICIAL FILL (AF) OTHER CORE BORING	(REF) SPT REFUSAL	EXTENT. SOME FRAGMENTS OF STRONG IF TESTED, YIELDS SPT N VALUES > 1	ROCK USUALLY REMAIN.	ITS LATERAL EXTENT.  LENS - A BODY OF SOIL OR ROCK THAT THINS OUT IN ONE OR MORE DIRECTIONS.
(NON-COHESIVE) DENSE 30 TO 50  VERY DENSE >50	THAN ROADWAY EMBANKMENT			D OR STAINED. ROCK FABRIC ELEMENTS ARE DISCERNIBLE BUT TO SOIL STATUS, WITH ONLY FRAGMENTS OF STRONG ROCK	MOTILED (MOT.) - IRREGULARLY MARKED WITH SPOTS OF DIFFERENT COLORS, MOTILING IN SOILS USUALLY INDICATES POOR AERATION AND LACK OF GOOD DRAINAGE.
VERY SOFT (2 (0.25 GENERALLY SOFT 2 TO 4 0.25 TO 0.50	INFERRED SOIL BOUNDARY MONITORING WELL	L	REMAINING, SAPROLITE IS AN EXAMPLE	TO SOLE SHIP SHOULD THE PROPERTY OF SHOULD HOLK OF SOLE SUCH THAT ONLY MINOR RIC REMAIN. IF TESTED, YIELDS SPT N VALUES (100 BPF	PERCHED WATER - WATER MAINTAINED ABOVE THE NORMAL GROUND WATER LEVEL BY THE PRESENCE OF AN INTERVENING IMPERVIOUS STRATUM.
SILT-CLAY         MEDIUM STIFF         4 TO 8         0.5 TO 1.0           MATERIAL         STIFF         8 TO 15         1 TO 2	INFERRED ROCK LINE    A   PIEZUME IER	e e	COMPLETE ROCK REDUCED TO SOIL. ROCK FABRIC	NOT DISCERNIBLE, OR DISCERNIBLE ONLY IN SMALL AND MAY BE PRESENT AS DIKES OR STRINGERS. SAPROLITE IS	RESIDUAL (RES.) SOIL - SOIL FORMED IN PLACE BY THE WEATHERING OF ROCK.
(COHESIVE) VERY STIFF 15 TO 30 2 TO 4 HARD >30 >4	25/825 DIP & DIP DIRECTION OF		ALSO AN EXAMPLE.		ROCK QUALITY DESIGNATION (RQD) - A MEASURE OF ROCK QUALITY DESCRIBED BY TOTAL LENGTH OF ROCK SEGMENTS EQUAL TO OR GREATER THAN 4 INCHES DIVIDED BY THE TOTAL LENGTH OF CORE RUN AND
TEXTURE OR GRAIN SIZE	ROCK STRUCTURES  CONE PENETROME	ETER TEST		C HARDNESS SHARP PICK, BREAKING OF HAND SPECIMENS REQUIRES	EXPRESSED AS A PERCENTAGE.  SAPPOLITE (SAP.) - RESIDUAL SOIL THAT RETAINS THE RELIC STRUCTURE OR FABRIC OF THE
U.S. STD. SIEVE SIZE 4 10 40 60 200 270  OPENING (MM) 4.76 2.00 0.42 0.25 0.075 0.053	SOUNDING ROD		SEVERAL HARD BLOWS OF THE GEOLO		PARENT ROCK. <u>SILL</u> - AN INTRUSIVE BODY OF IGNEOUS ROCK OF APPROXIMATELY UNIFORM THICKNESS AND
BOULDER	### ABBRE VIATIONS  AR - AUGER REFUSAL MED MEDIUM  BT - BORING TERMINATED MICA, - MICACEGUS	VST - VANE SHEAR TEST WEA WEATHERED	TO DETACH HAND SPECIMEN.	CK. GOUGES OR GROOVES TO 0.25 INCHES DEEP CAN BE	RELATIVELY THIN COMPARED WITH ITS LATERAL EXTENT, THAT HAS BEEN EMPLACED PARALLEL TO THE BEDDING OR SCHISTOSITY OF THE INTRUDED ROCKS.  SLICKENSIDE - POLISHED AND STRIATED SURFACE THAT RESULTS FROM FRICTION ALONG A FAULT OR
GRAIN MM 305 75 2.0 0.25 0.05 0.005	CL CLAY MOD MODERATELY CPT - CONE PENETRATION TEST NP - NON PLASTIC	7 - UNIT WEIGHT	HARD EXCAVATED BY HARD BLOW OF A GEO BY MODERATE BLOWS.	DLOGIST'S PICK. HAND SPECIMENS CAN BE DETACHED	SLIP PLANE.
SOIL MOISTURE - CORRELATION OF TERMS  SOIL MOISTURE SCALE   FIELD MOISTURE   CHARGE FOR STATE A	CSE COARSE ORG ORGANIC DMT - DILATOMETER TEST PMT - PRESSUREMETER TEST DPT - DYNAMIC PENETRATION TEST SAP SAPROLITIC	SAMPLE ABBREVIATIONS S - BULK		ICHES DEEP BY FIRM PRESSURE OF KNIFE OR PICK POINT. TO PEICES 1 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 3 INCHES REQUIRED TO PRODUCE A PENETRATION OF 1 FOOT INTO SOIL WITH A 2 INCH OUTSIDE DIAMETER SPLIT SPOON SAMPLER. SPT REFUSAL IS PENETRATION EQUAL TO OR LESS THAN 0.1 FOOT PER 60 BLOWS.
(ATTERBERG LIMITS) DESCRIPTION GUIDE FOR FIELD MUISTURE DESCRIPTION	e - VOID RATIO SD SAND, SANDY F - FINE SL SILT, SILTY FOSS FOSSILIFEROUS SLI SLIGHTLY	SS - SPLIT SPOON ST - SHELBY TUBE RS - ROCK		BY KNIFE OR PICK. CAN BE EXCAVATED IN FRAGMENTS SIZE BY MODERATE BLOWS OF A PICK POINT. SMALL, THIN PRESSURE.	STRATA CORE RECOVERY SERCI. TOTAL LENGTH OF STRATA MATERIAL RECOVERED DIVIDED BY TOTAL LENGTH OF STRATUM AND EXPRESSED AS A PERCENTAGE.
- SATURATED - USUALLY LIQUID: VERY WET, USUALLY (SAT.) FROM BELOW THE GROUND WATER TABLE (SAT.) STORM	FRAC FRACTURED, FRACTURES  FRAGS FRAGMENTS  # - MOISTURE CONTENT  HI HIGHLY  V - VERY	RT - RECOMPACTED TRIAXIAL CBR - CALIFORNIA BEARING RATIO	VERY CAN BE CARVED WITH KNIFE. CAN BE SOFT OR MORE IN THICKNESS CAN BE BROK	EXCAVATED READILY WITH POINT OF PICK. PIECES 1 INCH KEN 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.
PLASTIC   SEMISOLID; REQUIRES DRYING TO ATTAIN OPTIMUM MOISTURE	EQUIPMENT USED ON SUBJECT P		FINGERNAIL. FRACTURE SPACING	BEDDING	TOPSOIL (TS.) - SURFACE SOILS USUALLY CONTAINING ORGANIC MATTER.
(PI) PLASTIC LIMIT ATTAIN OPTIMUM MOISTURE	DRILL UNITS: ADVANCING TOOLS:	HAMMER TYPE:	TERM SPACING VERY WIDE MORE THAN 10 FEET	TERM THICKNESS  VERY THICKLY BEDDED > 4 FEET	BENCH MARK:
OM OPTIMUM MOISTURE - MOIST - (M) SOLID; AT OR NEAR OPTIMUM MOISTURE SL SHRINKAGE LIMIT	MOBILE 8 CLAY BITS	X AUTOMATIC MANUAL	WIDE 3 TO 10 FEET MODERATELY CLOSE 1 TO 3 FEET	THICKLY BEDDED 1.5 - 4 FEET THINLY BEDDED 0.16 - 1.5 FEET	ELEVATION: FT.
REQUIRES ADDITIONAL WATER TO ATTAIN OPTIMUM MOISTURE	6* CONTINUOUS FLIGHT AUGER  BK-51 X 8* HOLLOW AUGERS	CORE SIZE:	CLOSE 0.16 TO 1 FEET VERY CLOSE LESS THAN 0.16 FEET	VERY THINLY BEDDED 0.03 - 0.16 FEET THICKLY LAMINATED 0.008 - 0.03 FEET THINLY LAMINATED < 0.008 FEET	NOTES: FIAD - FILLED-IN AFTER DRILLING
PLASTICITY	CME-45C HARD FACED FINGER BITS			DURATION	
PLASTICITY INDEX (PI) DRY STRENGTH NONPLASTIC 0-5 VERY LOW	TUNGCARBIDE INSERTS	П-н	OHIODHO	WING OF THE MATERIAL BY CEMENTING, HEAT, PRESSURE, ETC.	
NONPLASTIC         0-5         VERY LOW           LOW PLASTICITY         6-15         SLIGHT           MED. PLASTICITY         16-25         MEDIUM	CME-55 CASING W/ ADVANCER	HAND TOOLS:	GENTLE	BLOW BY HAMMER DISINTEGRATES SAMPLE.	
HIGH PLASTICITY 26 OR MORE HIGH	PORTABLE HOIST TRICONE STEEL TEETH	POST HOLE DIGGER HAND AUGER		CAN BE SEPARATED FROM SAMPLE WITH STEEL PROBE: EASILY WHEN HIT WITH HAMMER.	
COLOR  DESCRIPTIONS MAY INCLUDE COLOR OR COLOR COMBINATIONS (TAN BED VELLOU-BROWN BLUE-CRAY)	X CME-55 (TRUCK) TRICONE TUNG,-CARB.	SOUNDING ROD		ARE DIFFICULT TO SEPARATE WITH STEEL PROBE; ULT TO BREAK WITH HAMMER.	
DESCRIPTIONS MAY INCLUDE COLOR OR COLOR COMBINATIONS (TAN, RED, YELLOW-BROWN, BLUE-GRAY).  MODIFIERS SUCH AS LIGHT, DARK, STREAKED, ETC. ARE USED TO DESCRIBE APPEARANCE.	X CME-55 (ATV)	VANE SHEAR TEST	EXTREMELY INDURATED SHARP I	HAMMER BLOWS REQUIRED TO BREAK SAMPLE; BREAKS ACROSS GRAINS.	

PROJECT REFERENCE NO. P-5208H

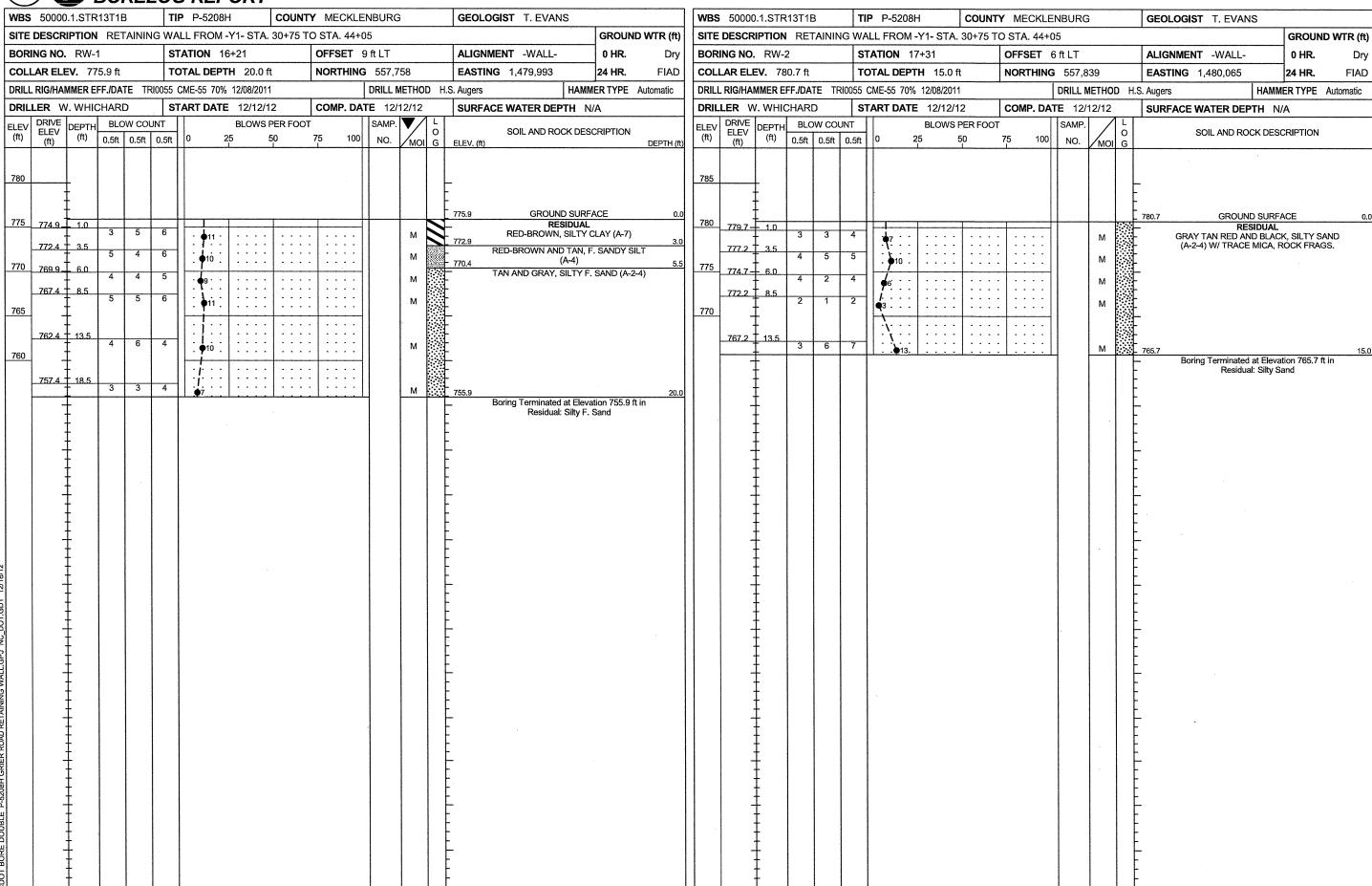
SHEET NO.







W BOREL	OG REPORT						
WBS 50000.1.STR13T1B	TIP P-5208H COUNTY	MECKLENBURG	GEOLOGIST J. HAMM	WBS 50000.1.STR13T1B	TIP P-5208H COUN	TY MECKLENBURG	GEOLOGIST J. HAMM
SITE DESCRIPTION GRIER ROA	AD GRADE SEPARATION		GROUND WTR (ft)	SITE DESCRIPTION GRIER R	ROAD GRADE SEPARATION		GROUND WTR (ft)
BORING NO. R-11	STATION 13+98 O	OFFSET 22 ft LT	ALIGNMENT -WALL- 0 HR. 21.7	BORING NO. R-12	STATION 15+33	OFFSET 48 ft LT	ALIGNMENT -WALL- 0 HR. Dry
COLLAR ELEV. 765.5 ft	TOTAL DEPTH 45.0 ft N	NORTHING 557,610	<b>EASTING</b> 149,827 <b>24 HR.</b> FIAD	COLLAR ELEV. 771.0 ft	TOTAL DEPTH 25.0 ft	NORTHING 557,736	<b>EASTING</b> 1,479,902 <b>24 HR.</b> 15.0
DRILL RIG/HAMMER EFF./DATE TRIO	0055 CME-55 70% 12/08/2011	DRILL METHOD H.S.	. Augers HAMMER TYPE Automatic	DRILL RIG/HAMMER EFF./DATE T	RI9435 CME-55 93% 12/08/2011	DRILL METHOD H	.S. Augers HAMMER TYPE Automatic
DRILLER R. TOOTHMAN	START DATE 02/17/12 C	COMP. DATE 02/17/12	SURFACE WATER DEPTH N/A	DRILLER W. WHICHARD	START DATE 02/17/12	COMP. DATE 02/17/12	SURFACE WATER DEPTH N/A
ELEV DRIVE DEPTH BLOW COUN	T BLOWS PER FOOT	SAMP. V L	SOIL AND ROCK DESCRIPTION	ELEV DRIVE DEPTH BLOW CO	DUNT BLOWS PER FOO	OT SAMP.	SOIL AND ROCK DESCRIPTION
(ft) (ft) (ft) 0.5ft 0.5ft 0	0.5ft 0 25 50 75		ELEV. (ft) DEPTH (ft)	(ft) (ft) (ft) 0.5ft 0.5ft	0.5ft 0 25 50	75 100 NO. MOI G	SOIL AND NOON BESON! HOW
770				775			<u> </u>
765			765.5 GROUND SURFACE 0.0	770 770.0 1.0	<del>                                     </del>		771.0 GROUND SURFACE 0.1  ROADWAY EMBANKMENT
764.5 T 1.0 I	5 . 1		RESIDUAL TAN, CLAYEY SAND (A-2-6)	4 4	4	м 📙	BROWN AND ORANGE, SANDY CLAY (A-6) W/ GRAVEL, TRACE ORGANICS
762.0 3.5	. 10	M M		767.5 3.5 2 1	$\begin{array}{ c c c c c c c c c c c c c c c c c c c$		
3 5	9 • 14	M			3	55-15   18%	- - 765.5 5.6
759.5 6.0 4 6	7			765 765.0 6.0 2 2	2 4		<b>RESIDUAL</b> GRAY AND TAN, CLAYEY SAND (A-2-6)
	•13.	M M		762.5	1 1 1		763.0 8.0 TAN AND GRAY, SANDY CLAY (A-6)
4 6	9	M			5		
755				760			759.0 12.0
				757.5 + 13.5			ORANGE AND GRAY, SILTY CLAY (A-7)
752.0 13.5 2 4	6   . j	· · · ·		+ 2 3	4		
750	1 700			755			
1			748.5 17.0 TAN AND ORANGE, FN. SANDY SILT (A-5)		<u>   i: : :   : : : :   : : :  </u>		GREEN AND BROWN, CLAYEY SILT (A-4)
747.0 18.5 1 2	$\frac{1}{2}$		SAPROLITIC, TRACE MICA	752.5	4   4	·   · · · ·         w	_
745	4	SS-14 31% N		750		·   · · · · ·	- 
						.	
742.0 23.5 2 2	5		GRAY WHITE AND BLACK, SILTY SAND (A-2-4) SAPROLITIC, W/ TRACE MICA	747.5 † 23.5   1   3	3		
740	7	W			1 0		746.0 25.0  Boring Terminated at Elevation 746.0 ft in
	. \						Residual: Clayey Silt
737.0 28.5							-
	11 20	M					-
735							
732.0 33.5					·		_
Ö	12	M   M					-
732.0 33.5 4 9 ON ON ON ON ON ON ON ON ON ON ON ON ON							<u>-</u>
727.0 38.5							_
725 725 6 14	15	м					_
							<del>-</del> -
722.0 43.5							_
14 34	28	м	720.5 45.0				<del>-</del> -
SOAL +			Boring Terminated at Elevation 720.5 ft in Residual: Silty Sand	]			<del> </del>
			Nesidual. Silty Sand				-
위 1 1 1							
2508							<u> </u>
							_
DOUBLE + + + + + + + + + + + + + + + + + + +							-
E DE L			- W. C.				<del>-</del>
98							-
							<u>-</u>
žl l l l	1	1 1 1 1			1 1		



BUNLLUG KLFUKT		7	[		
	MECKLENBURG	GEOLOGIST T. EVANS	<del></del>	TY MECKLENBURG	GEOLOGIST T. EVANS
SITE DESCRIPTION RETAINING WALL FROM -Y1- STA. 30+75 TO		ALIGNMENT -WALL- GROUND WTR (ft)  O HR. Dry	SITE DESCRIPTION RETAINING WALL FROM -Y1- STA. 30+75 T	<u> </u>	GROUND WTR (ft)
	OFFSET 4 ft LT	· · · · · · · · · · · · · · · · · · ·	BORING NO. RW-4 STATION 19+32	OFFSET 3 ft LT	ALIGNMENT -WALL- 0 HR. Dry
	NORTHING 557,915  DRILL METHOD H.S	Augers HAMMER TYPE Automatic	COLLAR ELEV. 786.2 ft TOTAL DEPTH 20.0 ft	NORTHING 557,997    DRILL METHOD	EASTING 1,480,190 24 HR. FIAD
DRILL RIG/HAMMER EFF./DATE TRI0055 CME-55 70% 12/08/2011			DRILL RIG/HAMMER EFF./DATE TRI0055 CME-55 70% 12/08/2011	<del></del>	
	COMP. DATE 12/11/12    SAMP. ▼	SURFACE WATER DEPTH N/A	DRILLER     W. WHICHARD     START DATE     12/11/12       ELEV     DRIVE DEPTH     BLOW COUNT     BLOWS PER FOO	COMP. DATE 12/11/12  T   SAMP.   1	SURFACE WATER DEPTH N/A
I FIFV I	75 100 NO. MOI G	SOIL AND ROCK DESCRIPTION  ELEV. (ft) DEPTH (ft)	ELEV (ft) DEPTH BLOW COUNT BLOWS PER FOO' (ft) (ft) 0.5ft 0.5ft 0.5ft 0 25 50	75 100 NO. MOI	O SOIL AND ROCK DESCRIPTION G
785		784.0 GROUND SURFACE 0.0	790		_
783.0 1.0 3 4 5	: : : :   M	RESIDUAL RED AND TAN, SILTY SAND (A-2-4) W/			TAGES COOLIND SUBFACE
780 780.5 3.5 3 4 4	· · · · ·	GRAVEL	785 785.2 1.0		786.2 GROUND SURFACE 0.0 ROADWAY EMBANKMENT
778.0 1 6.0			782.7 - 3.5	M L	RED-BROWN AND TAN, F. SANDY CLAY (A-6) W/ ROCK FRAGS. 3.0
775 775.5 + 8.5	· · · · ·       M   M		<u> </u>	:   · · · · ·     M	RESIDUAL RED-BROWN AND TAN, SILTY F. SAND
775 775.5 7 8.5 3 4 5	<del>   </del>		780 780.0 6.2 4 5 5		(A-2-4) W/ ROCK FRAGS 778.2 8.0
	::::		777.7 + 8.5		RED-BROWN TAN AND BLACK, F. SANDY
770 770.5 13.5 6 6 7	· · · · ·         w	700.0	775		CLAY (A-7-5) W/ ROCK FRAGS.
- 13	<del></del>	Boring Terminated at Elevation 769.0 ft in	772.7 + 13.5		
		Residual: Silty Sand	770 5 6 8	:   : : : :     w	<u> </u>
				<del>-  </del>     <b>[</b>	<u>\$</u>
			767.7 + 18.5	:   : : : :     w	766.2 20.0
					Boring Terminated at Elevation 766,2 ft in Residual: F. Sandy Clay
TI BORE DOUBLE P-\$208H GRIER ROAD RETAINING WALLGPJ NC_DOT.GDT 12/18/12					

<b>WBS</b> 50000.1.ST	TR13T1B	TII	P-5208H	(	COUNTY	MECKL	ENBURG	}		GEOLO	OGIST T	Γ. EVAN	s			WBS	5000	0.1.STR	13T1B		TIP	P-5208	Н	cou	NTY MEC	LENBU	RG		GEOI	OGIST T. EVANS	
SITE DESCRIPTIO	N RETAI	<del></del>	····		30+75 TO	STA. 44+	05							GROUND W	TR (ft)	SITE	DESC	RIPTION	RETA	AINING \	WALI	L FROM	-Y1- ST	A. 30+75	5 TO STA. 4	1+05					GROUND WTR (ff
BORING NO. RW	V-5	ST	ATION 20	+33	1	OFFSET	4 ft LT			ALIGN	MENT -	WALL-		0 HR.	Dry	-		. RW-6			STA	TION 2	1+33	·	OFFSET	3 ft L	Γ		ALIG	NMENT -WALL-	0 HR. Dry
COLLAR ELEV. 7	786.2 ft	ТС	TAL DEPTH	20.0 ft		NORTHIN					NG 1,48			4 HR.		COL	LAR EL	<b>EV.</b> 78	5.1 ft		тот	TAL DEPT	TH 20.0	) ft	NORTH					ING 1,480,299	24 HR. FIAD
DRILL RIG/HAMMER	EFF./DATE	TRI0055 (	ME-55 70%	12/08/2011			DRILL I	METHO	D H.S.	Augers			HAMMER	RTYPE Auto	omatic	DRIL	L RIG/HA	MMER E	FF./DATE			ME-55 70%				DRIL	L ME	THOD	H.S. Augers	HAM	MER TYPE Automatic
DRILLER W. WH			ART DATE	12/11/12	<u> </u>	COMP. DA				SURFA	CE WAT	ER DEP	TH N/A			DRIL		V. WHIC			·	RT DATE	12/11	/12	COMP.	DATE 1	12/11	/12	SURF	ACE WATER DEPTH	N/A
ELEV DRIVE ELEV (ft) DEPT	0.5ft 0.		0 25	BLOWS PE		5 100	SAMP. NO.		101	ELEV. (ft)		AND RO	CK DESCR		EPTH (ft)	ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	0.5ft	0.5ft 0.5		0 :	BLOW 25	S PER FC		00 NO	.	MOI G	3	SOIL AND ROCK DE	SCRIPTION
790																790													_		
785 785.2 1.0			<del>                                     </del>		<u></u>	· · · · ·			- 7	'86.2	Pr		D SURFAC		0.0	785		† † ‡											785.1	GROUND SUR	FACE n
<b>-</b>	3	2 5	<b>•</b> 7 · ·				11	М			RED-BF	ROWN AN	ID TAN, SII N/ GRAVE	LTY SAND		765	784.1	1.0	3	4 5	<u>. H</u>	-;	T			.     -			<b>+</b>	ROADWAY EMBA RED-BROWN, SILTY	NKMENT
782.7 + 3.5		3 4	7			: : : :		м				(A-2-4) \	W GRAVE	L.			781.6	+ + 3.5				. 9	: : :					M	‡	RED-BROWN, SIL1 Y	CLAY (A-7)
780 780.0 6.2	3	2 3	1							780.7		RES	SIDUAL		5.5	780	779.1	+ 60	5	5   7	7	12	ļ · · ·	-		$\dashv I$		М	779.6		5
777.7 + 8.5			5					М	4				ID TAN, SII ROCK FRA	LTY SAND AGS.				+	4	4 6	6	- 10 -	: : :		1	.   SS	-2 3	34%	\$	<b>RESIDUA</b> RED-BROWN AND TAN,	
775	3	3 5	. 8					M								775	776.6	+ 8.5 +	3	3 5	5	: <u>†</u> : :	: : :	1	ı			w	\$	(A-7-5)	
<b>T</b>	_		- 1							74.2	RED-BRO	WN TAN	AND BLAC	K. F. SANDY	12.0	110	•	‡				-				1 1			<b>}</b>		
772.7 + 13.5	5 4	5 7	12					w		`			ROCK FE				771.6	† + 13.5				:::::		- 1		-			\$		
770			· · ·			• • • •			L	769.2					17.0	770		‡	3	4 5	5	. •9	<u> </u>					w	‡		
767.7 + 18.5	5	7 44	: : \ :	1							TAN AND	BLACK,	SILTY F. S	AND (A-2-4)				‡					: : :			-			\$		
<del> </del>	6	7 11	• 18	• • • •			Ц	W			Boring Te	erminated	at Elevatio	n 766.2 ft in	20.0		766.6	+ 18.5 +	5	5 9	9	14	: : :	1				w	765.1		20.
									F				Silty F. Sa					‡			$\top$								F	Boring Terminated at Ele- Residual: F. San	vation 765.1 ft in
<del>                                      </del>																		+++++++++++++++++++++++++++++++++++++++													

WDD 50000 4 CTD40T4P	7	NTV MECKLENDIDO	CEOLOGIST T EVANG	WBS 50000.1.STR13T1B	TIP P-5208H COUN	NTV MECKLENBURG	CEOLOGIST T EVANG
WBS 50000.1.STR13T1B SITE DESCRIPTION RETAINING		NTY MECKLENBURG	GEOLOGIST T. EVANS  GROUND WTR (ft)		IG WALL FROM -Y1- STA. 30+75	NTY MECKLENBURG	GEOLOGIST T. EVANS  GROUND WTR (ft)
BORING NO. RW-7	STATION 22+33	OFFSET 3 ft LT	ALIGNMENT -WALL- 0 HR. Dry	BORING NO. RW-8	STATION 23+34	OFFSET 4 ft LT	ALIGNMENT -WALL- 0 HR. Dry
COLLAR ELEV. 782.8 ft	TOTAL DEPTH 15.0 ft	NORTHING 558,252	EASTING 1,480,348 24 HR. FIAD	COLLAR ELEV. 780.2 ft	TOTAL DEPTH 10.0 ft	NORTHING 558,340	<b>EASTING</b> 1,480,400 <b>24 HR.</b> FIAD
DRILL RIG/HAMMER EFF./DATE TR		DRILL METHOD H.	<u> </u>	DRILL RIG/HAMMER EFF./DATE TR		DRILL METHOD	
DRILLER W. WHICHARD	START DATE 12/11/12	COMP. DATE 12/11/12	SURFACE WATER DEPTH N/A	DRILLER W. WHICHARD	START DATE 12/11/12	COMP. DATE 12/11/12	SURFACE WATER DEPTH N/A
			SURFACE WATER DEFTH N/A	DRIVE DESTRUCTION COL		<del></del>	. 1
ELEV CRIVE COUCHING (ft) CRIVE (f	1	75 100 NO. MOI G	SOIL AND ROCK DESCRIPTION  ELEV. (ft) DEPTH (ft)	(#) ELEV (#)	<del></del>	75 100 NO. MOI G	SOIL AND ROCK DESCRIPTION
785  781.8	2 3	SS-3 32% W M M M	## BROWN, SANDY CLAY (A-6) W/ TRACE ORGANICS    RESIDUAL   RED-BROWN AND TAN, F. SANDY CLAY (A-7-5)	779.2 1.0 3 3 3 776.7 - 3.5 2 3 774.1 6.1 4 5 771.7 - 8.5 2 3	3 4 7 	SS-4 40% W	780.2 GROUND SURFACE 0.  ROADWAY EMBANKMENT RED-BROWN AND TAN, SANDY CLAY (A-6) W/ GRAVEL 3.I  774.7 RED-BROWN AND TAN, SILTY CLAY (A-7-5) 772.2 RESIDUAL RED-BROWN AND TAN, SILTY F. SAND (A-2-4) W/ TRACE MICA  RED-BROWN AND TAN, F. SANDY SILT (A-4) Boring Terminated at Elevation 770.2 ft in
VCDOT BORE DOUBLE P-5208H GRIER ROAD RETAINING WALL,GPJ NC_DOT.GDT 12/18/12         1   1   1   1   1   1   1   1   1   1			Residual: F. Sandy Silt				Residual: F. Sandy Silt

			,	
·				

SHEET 11

#### **FALCON**

#### 1210 TRINITY ROAD, SUITE 110, RALEIGH, NORTH CAROLINA 27607

#### AASHTO SOIL CLASSIFICATION AND GRADATION SHEET

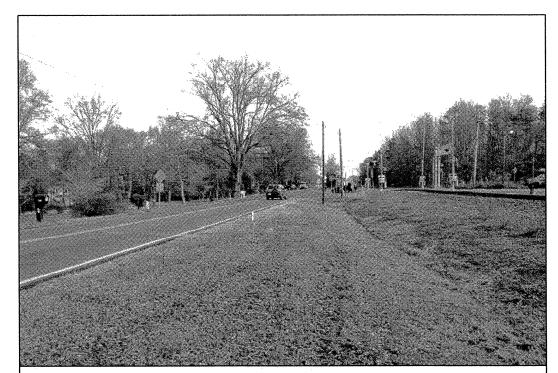
#### RETAINING WALL FROM -Y1- STA. 30+75 TO STA. 44+05 WBS NO.: 50000.1.STR13T1B, TIP NO.: P-5208H

#### MECKLENBURG COUNTY, NORTH CAROLINA

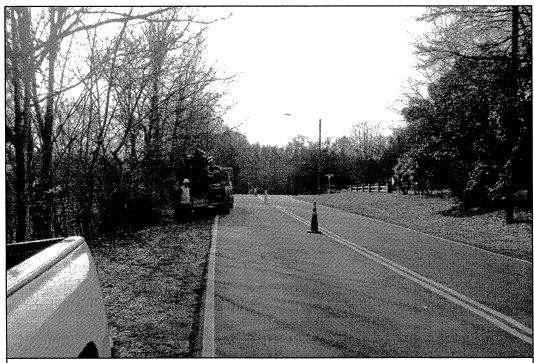
#### FALCON ENGINEERING, INC. PROJECT NO: G11026.01

BORING SAMPLE		тот	TAL SAM	IPLE	Atterb	erg Lim	Natural Moisture			
AAS	HTO Classific	ation	PERC	ENT PA	SSING		Results	Content		
STATION	OFFSET (FEET)	DEPTH (FEET)	#10	#40	#200	LL	PL	PI	%	
R-	11	SS-14 *								
	A-5		96	64	44	43	34	9	30.7	
13+98	22 ft LT	18.5-20.0								
R-										
	A-6		88	61	40	36	19	17	18.1	
15+33	48 ft LT	3.5-5.0								
RV	RW-4 SS-1									
	A-7-5	×	99	89	74	68	51	17	36.9	
19+32	3 ft LT	8.5-10.0								
RV	V-6	SS-2		94	88	69	45	24	33.6	
	A-7-5		100							
21+33	3 ft LT	6.0-7.5								
RV	V-7	SS-3								
	A-7-5		100	96	82	78	40	38	32.1	
22+33	3 ft LT	3.5-5.0								
RW-8 SS-4				95				55		
	A-7-5				89	90	35		39.5	
23+34 4 ft LT		3.5-5.0	1							

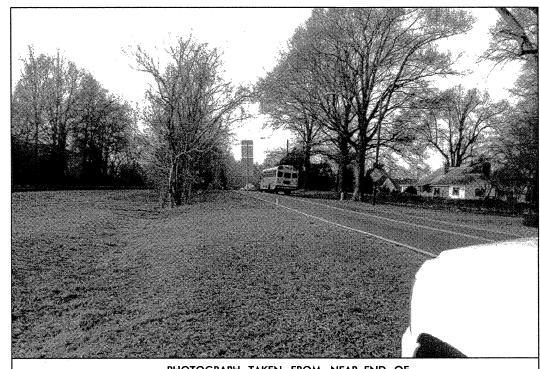
<sup>\*</sup> Samples SS-14 and SS-15 originally included in Roadway Subsurface Investigation and therefore are not numbered sequentially with samples from RW borings.







PHOTOGRAPH TAKEN FROM NEAR BORING, RW-5, LOOKING DOWNSTATION



PHOTOGRAPH TAKEN FROM NEAR END OF RETAINING WALL LOOKING DOWNSTATION



PHOTOGRAPH TAKEN FROM NEAR BORING RW-7, LOOKING DOWNSTATION ALONG -YI-



PHONE: 919.871.0800 FAX: 919.871.0803

#### SITE PHOTOGRAPHS

GRIER ROAD GRADE SEPARATION MECKLENBURG COUNTY, NORTH CAROLINA TIP.: P-5208H, WBS.: 50000.1.STR13T1B

DEC. 2012

FALCON PROJECT NO.: G12026.01

SHEET 1 OF 1