# This electronic collection of documents is provided for the convenience of the user and is Not a Certified Document –

The documents contained herein were originally issued and sealed by the individuals whose names and license numbers appear on each page, on the dates appearing with their signature on that page.

This file or an individual page shall not be considered a certified document.

CONTENTS

-RETAINING WALL I-

**STATION** 18+50-20+25

<u>SHEET</u>

STATE OF NORTH CAROLINA

DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS
GEOTECHNICAL ENGINEERING UNIT

# STRUCTURE SUBSURFACE INVESTIGATION

PROJ. REFERENCE NO. 34802.1.1 (U-2412A)

COUNTY GUILFORD

PROJECT DESCRIPTION GREENSBORO/HIGH POINT - SR 4121

(GREENSBORO/HIGH POINT RD.) FROM THE PROPOSED

US 311 BYPASS TO SR 1480 (VICKERY CHAPEL ROAD)

SITE DESCRIPTION RETAINING WALL 1- RIGHT OF -Y7- STA. 18+50

RETAINING WALL INVENTORY

SIAIS	SIAIR P	COUBCI REPERENCE NO.	NO.	SHEETS			
N.C.	34802.1	l.1 (U-2412A)	1	3			
STATE	PROJ. NO.	F. A. PROJ. NO.	DESCRIP	TION			
U-	2412A	STP-4121(1)	P.E.				
			R/W &	UTIL.			

### **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 FILED BORING LOGS, ROCK CORES, AND SOLI TEST DATA AVAILABLE WAY BE REVIEWED OR INSPECTED IN RALEIGH BY CONTACTING THE N. C. DEPARTMENT OF TRANSPORTATION, GEOTECHNICAL ENGINEERING UNIT AT (919) 250-408B. NEITHER THE SUBSURFACE PLANS AND REPORTS, NOR THE FIELD BORING LOGS, ROCK CORES, OR SOIL TEST DATA ARE PART OF THE CONTRACT.

GENERAL SOIL AND ROCK STRATA DESCRIPTIONS AND INDICATED BOUNDARIES ARE BASED ON A GEOTECHNICAL INTERPRETATION OF ALL AVAILABLE SUBSURFACE DATA AND MAY NOT NECESSARILY REFLECT THE ACTUAL SUBSURFACE CONDITIONS BETWEEN BORNOS OR BETWEEN SAMPLED STRATA WITHIN THE BORFHOLE, THE LABORATORY SAMPLE DATA AND THE IN STUI UN-PLACED TEST DATA CAN BE RELIED ON ONLY TO THE DEGREE OF RELIABILITY INNERENT IN THE STANDARD TEST METHOD. THE OBSERVED WATER LEVELS OR SOIL MOISTURE CONDITIONS INDICATED IN THE SUBSURFACE INVESTIGATIONS ARE AS RECORDED AT THE TIME OF THE INVESTIGATION. THESE WATER LEVELS OR SOIL MOISTURE CONDITIONS MAY VARY CONSIDERABLY WITH TIME ACCORDING TO CLIMATIC CONDITIONS INCLUDING TEMPERATURES, PRECIPIETION, 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 DOLUMENTS FOR FINAL DESIGN INFORMATION ON THIS PROLECT. THE DEPARTMENT DOES NOT WARRANT OR GUARANTEE THE SUFFICIENCY OR ACCURACY OF THE INVESTIGATION MADE, NOR THE INTERPRETATIONS MADE, OR DINION OF THE DEPARTMENT AS TO THE TYPE OF MATERIALS AND CONDITIONS TO BE ENCOUNTERED. THE BIDDER OR CONTRACTOR IS CAUTIONED TO MAKE SUCH INDEPENDENT SUBSURFACE INVESTIGATIONS AS HE DEEMS NECESSARY TO SATISFY HIMSELF AS TO CONDITIONS TO BE ENCOUNTERED ON THIS PROJECT, THE CONTRACTOR SHALL HAVE NO CLAIM FOR ADDITIONAL COMPENSATION OR FOR AN EXTENSION OF TIME FOR ANY REASON RESULTING FROM THE ACTUAL CONDITIONS TO BE ENCOUNTERED AT THE SITE DIFFERING FROM THOSE MIDICATED IN THE SUBSURFACE INFORMATION.

N.D. MOHS

J. I. MILKOVITS

C.D. CZAJKA

TRIGON/KLEINFELDER

H. HICKS

K. HUEN

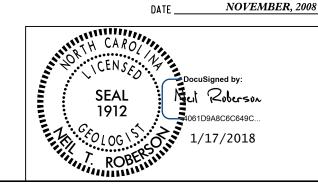
R. TOOTHMAN

B. DUNCAN

INVESTIGATED BY N. D. MOHS

CHECKED BY N. T. ROBERSON

SUBMITTED BY N. T. ROBERSON



PROJE

4802.

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

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

PROJECT REFERENCE NO. SHEET NO.

U-2412A

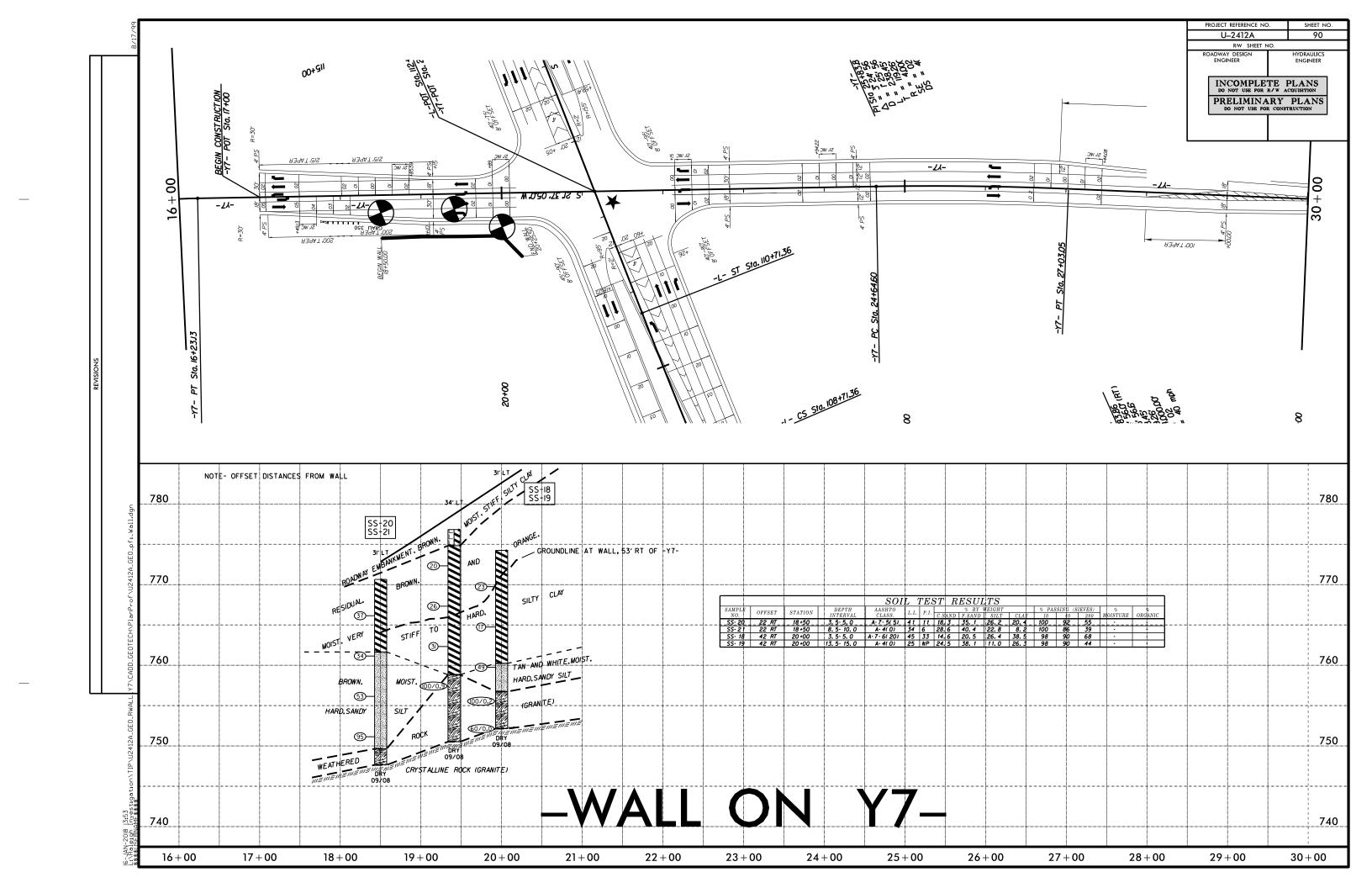
2

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

# SUBSURFACE INVESTIGATION

SOIL AND ROCK LEGEND, TERMS, SYMBOLS, AND ABBREVIATIONS

SOIL DESCRIPTION	GRADATION	ROCK DESCRIPTION	TERMS AND DEFINITIONS
SOIL IS CONSIDERED UNCONSOLIDATED, SEMI-CONSOLIDATED, OR WEATHERED EARTH MATERIALS THAT CAN BE PENETRATED WITH A CONTINUOUS FLIGHT POWER AUGER AND YIELD LESS THAN 100 BLOWS PER FOOT	<u>WELL GRADED</u> - INDICATES A GOOD REPRESENTATION OF PARTICLE SIZES FROM FINE TO COARSE. <u>UNIFORMLY GRADED</u> - INDICATES THAT SOIL PARTICLES ARE ALL APPROXIMATELY THE SAME SIZE.	HARD ROCK IS NON-COASTAL PLAIN MATERIAL THAT WOULD YIELD SPT REFUSAL IF TESTED. AN INFERRED ROCK LINE INDICATES THE LEVEL AT WHICH NON-COASTAL PLAIN MATERIAL WOULD YIELD SPT REFUSAL.	ALLUVIUM (ALLUV.) - SOILS THAT HAVE BEEN TRANSPORTED BY WATER.
ACCORDING TO THE STANDARD PENETRATION TEST (AASHTO T 206, ASTM DI586). SOIL CLASSIFICATION IS BASED ON THE AASHTO SYSTEM. BASIC DESCRIPTIONS GENERALLY INCLUDE THE FOLLOWING:	GAP-GRADED - INDICATES A MIXTURE OF UNIFORM PARTICLE SIZES OF TWO OR MORE SIZES.	SPT REFUSAL IS PENETRATION BY A SPLIT SPOON SAMPLER EQUAL TO OR LESS THAN 0.1 FOOT PER 60 BLOWS IN NON-COASTAL PLAIN MATERIAL, THE TRANSITION BETWEEN SOIL AND ROCK IS OFTEN	AQUIFER - A WATER BEARING FORMATION OR STRATA.
CONSISTENCY, COLOR, TEXTURE, MOISTURE, AASHTO CLASSIFICATION, AND OTHER PERTINENT FACTORS SUCH	ANGULARITY OF GRAINS	REPRESENTED BY A ZONE OF WEATHERED ROCK. ROCK MATERIALS ARE TYPICALLY DIVIDED AS FOLLOWS:	ARENACEOUS - APPLIED TO ROCKS THAT HAVE BEEN DERIVED FROM SAND OR THAT CONTAIN SAND.
AS MINERALOGICAL COMPOSITION, ANGULARITY, STRUCTURE, PLASTICITY, ETC. FOR EXAMPLE,  VERY STIFF, GRAY, SILTY CLAY, MOIST WITH INTERBEDDED FINE SAND LAYERS, HIGHLY PLASTIC, A-7-6	THE ANGULARITY OR ROUNDNESS OF SOIL GRAINS IS DESIGNATED BY THE TERMS:	SI//SI//A	ARGILLACEOUS - APPLIED TO ALL ROCKS OR SUBSTANCES COMPOSED OF CLAY MINERALS, OR HAVING A NOTABLE PROPORTION OF CLAY IN THEIR COMPOSITION, SUCH AS SHALE, SLATE, ETC.
SOIL LEGEND AND AASHTO CLASSIFICATION	ANGULAR, SUBANGULAR, SUBROUNDED, OR ROUNDED.	WEATHERED VIGORIAN NON-COASTAL PLAIN MATERIAL THAT WOULD YIELD SPT N VALUES > 100 BLOWS PER FOOT IF TESTED.	ARTESIAN - GROUND WATER THAT IS UNDER SUFFICIENT PRESSURE TO RISE ABOVE THE LEVEL AT
CENEDAL CRANIII AD MATERIALS SILT-CLAY MATERIALS	MINERALOGICAL COMPOSITION	FINE TO COARSE CRAIN ICNEOUS AND METAMORPHIC POCK THAT	WHICH IT IS ENCOUNTERED, BUT WHICH DOES NOT NECESSARILY RISE TO OR ABOVE THE GROUND
CLASS. (\$\leq 35% PASSING *200) (> 35% PASSING *200) ORGANIC MATERIALS	MINERAL NAMES SUCH AS QUARTZ, FELDSPAR, MICA, TALC, KAOLIN, ETC.	CRYSTALLINE ROCK (CR)  WOULD YIELD SPT REFUSAL IF TESTED. ROCK TYPE INCLUDES GRANITE, ONEISS, GABBRO, SCHIST, ETC.	SURFACE.
GROUP A-1 A-3 A-2 A-4 A-5 A-6 A-7 A-1, A-2 A-4, A-5	ARE USED IN DESCRIPTIONS WHEN THEY ARE CONSIDERED OF SIGNIFICANCE.	NON-CRYSTALLINE SPINE TO COARSE GRAIN METAMORPHIC AND NON-COASTAL PLAIN	CALCAREOUS (CALC.) - SOILS THAT CONTAIN APPRECIABLE AMOUNTS OF CALCIUM CARBONATE.
CLASS. A-1-a A-1-b A-2-4 A-2-5 A-2-6 A-2-7 A-7-5 A-3 A-6, A-7	COMPRESSIBILITY  SLIGHTLY COMPRESSIBLE LL < 31	ROCK (NCR)  SEDIMENTARY ROCK THAT WOULD YEILD SPT REFUSAL IF TESTED. ROCK TYPE INCLUDES PHYLLITE, SLATE, SANDSTONE, ETC.	COLLUVIUM - ROCK FRAGMENTS MIXED WITH SOIL DEPOSITED BY GRAVITY ON SLOPE OR AT BOTTOM OF SLOPE.
SYMBOL 000000000000000000000000000000000000	MODERATELY COMPRESSIBLE LL = 31 - 50	COASTAL PLAIN COASTAL PLAIN SEDIMENTS CEMENTED INTO ROCK, BUT MAY NOT YIELD	CORE RECOVERY (REC.) - TOTAL LENGTH OF ALL MATERIAL RECOVERED IN THE CORE BARREL DIVIDED
% PASSING SILT-	HIGHLY COMPRESSIBLE LL > 50	SEDIMENTARY ROCK SPT REFUSAL, ROCK TYPE INCLUDES LIMESTONE, SANDSTONE, CEMENTED (CP) SHELL BEDS, ETC.	BY TOTAL LENGTH OF CORE RUN AND EXPRESSED AS A PERCENTAGE.
*10 50 MX GRANULAR GRANULAR GLAY PEAT SOILS CLAY PEAT	PERCENTAGE OF MATERIAL	WEATHERING	DIKE - A TABULAR BODY OF IGNEOUS ROCK THAT CUTS ACROSS THE STRUCTURE OF ADJACENT
*200   15 MX   25 MX   10 MX   35 MX   35 MX   35 MX   35 MX   36 MN   36 MN   36 MN   36 MN   36 MN   36 MN	GRANULAR SILT - CLAY ORGANIC MATERIAL SOILS SOILS OTHER MATERIAL	FRESH ROCK FRESH, CRYSTALS BRIGHT, FEW JOINTS MAY SHOW SLIGHT STAINING. ROCK RINGS UNDER	ROCKS OR CUTS MASSIVE ROCK.
MATERIAL	TRACE OF ORGANIC MATTER 2 - 3%, 3 - 5%, TRACE 1 - 10%, LITTLE ORGANIC MATTER 3 - 5%, 5 - 12%, LITTLE 10 - 20%	HAMMER IF CRYSTALLINE.	DIP - THE ANGLE AT WHICH A STRATUM OR ANY PLANAR FEATURE IS INCLINED FROM THE HORIZONTAL.
PASSING *40 48 MX 41 MN	MODERATELY ORGANIC 5 - 10% 12 - 20% SOME 20 - 35%	VERY SLIGHT ROCK GENERALLY FRESH, JOINTS STAINED, SOME JOINTS MAY SHOW THIN CLAY COATINGS IF OPEN,	DIP DIRECTION (DIP AZIMUTH) - THE DIRECTION OR BEARING OF THE HORIZONTAL TRACE OF THE
PI 6 MX NP 10 MX 10 MX 11 MN 11 MN 10 MX 10 MX 11 MN 11 MN 11 MN MODERATE HIGHLY	HIGHLY ORGANIC > 10% > 20% HIGHLY 35% AND ABOVE	(V SLI.) CRYSTALS ON A BROKEN SPECIMEN FACE SHINE BRIGHTLY, ROCK RINGS UNDER HAMMER BLOWS IF OF A CRYSTALLINE NATURE.	LINE OF DIP, MEASURED CLOCKWISE FROM NORTH.
GROUP INDEX 0 0 0 4 MX 8 MX 12 MX 16 MX NO MX AMOUNTS OF SOILS	GROUND WATER	SLIGHT ROCK GENERALLY FRESH, JOINTS STAINED AND DISCOLORATION EXTENDS INTO ROCK UP TO	FAULT - A FRACTURE OR FRACTURE ZONE ALONG WHICH THERE HAS BEEN DISPLACEMENT OF THE
USUAL TYPES STONE FRAGS. FINE SULTY OR CLAYEY SILTY CLAYEY MATTER	▼ WATER LEVEL IN BORE HOLE IMMEDIATELY AFTER DRILLING	(SLI.) 1 INCH. OPEN JOINTS MAY CONTAIN CLAY. IN GRANITOID ROCKS SOME OCCASIONAL FELDSPAR CRYSTALS ARE DULL AND DISCOLORED. CRYSTALLINE ROCKS RING UNDER HAMMER BLOWS.	SIDES RELATIVE TO ONE ANOTHER PARALLEL TO THE FRACTURE.
OF MAJOR GRAVEL, AND MATERIALS SAND SAND GRAVEL AND SAND SOILS SOILS	▼ STATIC WATER LEVEL AFTER 24 HOURS	MODERATE SIGNIFICANT PORTIONS OF ROCK SHOW 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
CEN RATING	<u>∇PW</u> PERCHED WATER, SATURATED ZONE, OR WATER BEARING STRATA	(MOD.) GRANITOID ROCKS, MOST FELDSPARS ARE DULL AND DISCOLORED, SOME SHOW CLAY. ROCK HAS	PARENT MATERIAL.
AS SUBGRADE EXCELLENT TO GOOD FAIR TO POOR POOR UNSUITABLE		DULL SOUND UNDER HAMMER BLOWS AND SHOWS SIGNIFICANT LOSS OF STRENGTH AS COMPARED WITH FRESH ROCK.	FLOOD PLAIN (FP) - LAND BORDERING A STREAM, BUILT OF SEDIMENTS DEPOSITED BY THE STREAM.
PI OF A-7-5 SUBGROUP IS ≤ LL - 30 ; PI OF A-7-6 SUBGROUP IS > LL - 30	SPRING OR SEEP	MODERATELY ALL ROCK EXCEPT QUARTZ DISCOLORED OR STAINED, IN GRANITOID ROCKS, ALL FELDSPARS DULL	FORMATION (FM.) - A MAPPABLE GEOLOGIC UNIT THAT CAN BE RECOGNIZED AND TRACED IN THE
CONSISTENCY OR DENSENESS	MISCELLANEOUS SYMBOLS	SEVERE AND DISCOLORED AND A MAJORITY SHOW KAOLINIZATION. ROCK SHOWS SEVERE LOSS OF STRENGTH	FIELD.
PRIMARY SOIL TYPE COMPACTNESS OR RANGE OF STANDARD RANGE OF UNCONFINED PENETRATION RESISTENCE COMPRESSIVE STRENGTH	ROADWAY EMBANKMENT (RE) 25/025 DIP & DIP DIRECTION	(MOD. SEV.) AND CAN BE EXCAVATED WITH A GEOLOGIST'S PICK. ROCK GIVES "CLUNK" SOUND WHEN STRUCK.  IF TESTED, WOULD YIELD SPT REFUSAL	JOINT - FRACTURE IN ROCK ALONG WHICH NO APPRECIABLE MOVEMENT HAS OCCURRED.
PRIMARY SOIL TYPE CONSISTENCY PENETRATION RESISTENCE COMPRESSIVE STRENGTH (N-VALUE) (TONS/FT <sup>2</sup> )	ROADWAY EMBANKMENT (RE)  ### BOIL DESCRIPTION  ### OF ROCK STRUCTURES	SEVERE ALL ROCK EXCEPT QUARTZ DISCOLORED OR STAINED, ROCK FABRIC CLEAR AND EVIDENT BUT	LEDGE - A SHELF-LIKE RIDGE OR PROJECTION OF ROCK WHOSE THICKNESS IS SMALL COMPARED TO ITS LATERAL EXTENT.
GENERALLY VERY LOOSE < 4	SOIL SYMBOL SPI DAT TEST BORING SLOPE INDICATOR INSTALLATION	(SEV.) REDUCED IN STRENGTH TO STRONG SOIL. IN GRANITOID ROCKS ALL FELDSPARS ARE KAOLINIZED	LENS - A BODY OF SOIL OR ROCK THAT THINS OUT IN ONE OR MORE DIRECTIONS.
GRANULAR MEDIUM DENSE 10 TO 30 N/A	M	TO SOME EXTENT. SOME FRAGMENTS OF STRONG ROCK USUALLY REMAIN.  IF TESTED, WOULD YIELD SPT N VALUES > 100 BPF	MOTTLED (MOT.) - IRREGULARLY MARKED WITH SPOTS OF DIFFERENT COLORS. MOTTLING IN SOILS
MATERIAL DENSE 30 TO 50	ARTIFICIAL FILL (AF) OTHER THAN ROADWAY EMBANKMENT AUGER BORING CONE PENETROMETER	VERY ALL ROCK EXCEPT QUARTZ DISCOLORED OR STAINED. ROCK FABRIC ELEMENTS ARE DISCERNIBLE	USUALLY INDICATES POOR AERATION AND LACK OF GOOD DRAINAGE.
VERT DENSE > 30	<u> </u>	SEVERE BUT MASS IS EFFECTIVELY REDUCED TO SOIL STATUS, WITH ONLY FRAGMENTS OF STRONG ROCK (V SEV.) REMAINING, SAPROLITE IS AN EXAMPLE OF ROCK WEATHERED TO A DEGREE THAT ONLY MINOR	PERCHED WATER - WATER MAINTAINED ABOVE THE NORMAL GROUND WATER LEVEL BY THE PRESENCE OF AN INTERVENING IMPERVIOUS STRATUM.
VERY SOFT         < 2	— INFERRED SOIL BOUNDARY — CORE BORING SOUNDING ROD	VESTIGES OF ORIGINAL ROCK FABRIC REMAIN. <u>IF TESTED, WOULD YIELD SPT N VALUES &lt; 100 BPF</u>	RESIDUAL (RES.) SOIL - SOIL FORMED IN PLACE BY THE WEATHERING OF ROCK.
SILT-CLAY MEDIUM STIFF 4 TO 8 0.5 TO 1.0	INFERRED ROCK LINE  MONITORING WELL  TEST BORING WITH CORE	COMPLETE ROCK REDUCED TO SOIL, ROCK FABRIC NOT DISCERNIBLE, OR DISCERNIBLE ONLY IN SMALL AND	ROCK QUALITY DESIGNATION (ROD) - A MEASURE OF ROCK QUALITY DESCRIBED BY TOTAL LENGTH OF
MATERIAL   STIFF   8 TO 15   1 TO 2	T SPI N VALUE	SCATTERED CONCENTRATIONS. QUARTZ MAY BE PRESENT AS DIKES OR STRINGERS. SAPROLITE IS ALSO AN EXAMPLE.	ROCK SEGMENTS EQUAL TO OR GREATER THAN 4 INCHES DIVIDED BY THE TOTAL LENGTH OF CORE
HARD > 30 > 4	INSTALLATION — SPI NOTHLOE	ROCK HARDNESS	RUN AND EXPRESSED AS A PERCENTAGE.
TEXTURE OR GRAIN SIZE	RECOMMENDATION SYMBOLS	VERY HARD CANNOT BE SCRATCHED BY KNIFE OR SHARP PICK. BREAKING OF HAND SPECIMENS REQUIRES	SAPROLITE (SAP.) - RESIDUAL SOIL THAT RETAINS THE RELIC STRUCTURE OR FABRIC OF THE PARENT ROCK.
U.S. STD. SIEVE SIZE 4 10 40 60 200 270	UNDERCUT UNCLASSIFIED EXCAVATION - UNCLASSIFIED EXCAVATION -	SEVERAL HARD BLOWS OF THE GEOLOGIST'S PICK.	SILL - AN INTRUSIVE BODY OF IGNEOUS ROCK OF APPROXIMATELY UNIFORM THICKNESS AND
OPENING (MM) 4.76 2.00 0.42 0.25 0.075 0.053	SHALLOW SHALLOW STEET OF	HARD CAN BE SCRATCHED BY KNIFE OR PICK ONLY WITH DIFFICULTY. HARD HAMMER BLOWS REQUIRED	RELATIVELY THIN COMPARED WITH ITS LATERAL EXTENT, THAT HAS BEEN EMPLACED PARALLEL TO THE BEDDING OR SCHISTOSITY OF THE INTRUDED ROCKS.
BOULDER COBBLE GRAVEL COARSE FINE SILT CLAY	UNDERCUT ACCEPTABLE DEGRADABLE ROCK EMBANKMENT OR BACKFILL	TO DETACH HAND SPECIMEN.	SLICKENSIDE - POLISHED AND STRIATED SURFACE THAT RESULTS FROM FRICTION ALONG A FAULT
(BLDR.) (COB.) (GR.) (CSE. SD.) (F SD.) (SL.) (CL.)	ABBREVIATIONS	MODERATELY CAN BE SCRATCHED BY KNIFE OR PICK, GOUGES OR GROOVES TO 0.25 INCHES DEEP CAN BE HARD EXCAVATED BY HARD BLOW OF A GEOLOGIST'S PICK, HAND SPECIMENS CAN BE DETACHED	OR SLIP PLANE.
GRAIN MM 305 75 2.0 0.25 0.05 0.005	AR - AUGER REFUSAL MED MEDIUM VST - VANE SHEAR TEST	BY MODERATE BLOWS.	STANDARD PENETRATION TEST (PENETRATION RESISTANCE) (SPT) - NUMBER OF BLOWS (N OR BPF) OF
SIZE IN. 12 3	BT - BORING TERMINATED MICA MICACEOUS WEA WEATHERED  CL CLAY MOD MODERATELY 7 - UNIT WEIGHT	MEDIUM CAN BE GROOVED OR GOUGED 0.05 INCHES DEEP BY FIRM PRESSURE OF KNIFE OR PICK POINT.  HARD CAN BE EXCAVATED IN SMALL CHIPS TO PEICES 1 INCH MAXIMUM SIZE BY HARD BLOWS OF THE	A 140 LB. HAMMER FALLING 30 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
SOIL MOISTURE - CORRELATION OF TERMS	CPT - CONE PENETRATION TEST NP - NON PLASTIC 7d - DRY UNIT WEIGHT	POINT OF A GEOLOGIST'S PICK.	TO OR LESS THAN 0.1 FOOT PER 60 BLOWS.
SOIL MOISTURE SCALE FIELD MOISTURE GUIDE FOR FIELD MOISTURE DESCRIPTION GUIDE FOR FIELD MOISTURE DESCRIPTION	CSE COARSE ORG ORGANIC DMT - DILATOMETER TEST PMT - PRESSUREMETER TEST SAMPLE ABBREVIATIONS	SOFT CAN BE GROVED OR GOUGED READILY BY KNIFE OR PICK. CAN BE EXCAVATED IN FRAGMENTS	STRATA CORE RECOVERY (SREC.) - TOTAL LENGTH OF STRATA MATERIAL RECOVERED DIVIDED BY TOTAL LENGTH OF STRATUM AND EXPRESSED AS A PERCENTAGE.
(HITERDERG LIMITS) DESCRIPTION	DPT - DYNAMIC PENETRATION TEST SAP SAPROLITIC S - BULK	FROM CHIPS TO SEVERAL INCHES IN SIZE BY MODERATE BLOWS OF A PICK POINT. SMALL, THIN PIECES CAN BE BROKEN BY FINGER PRESSURE.	
- SATURATED - USUALLY LIQUID; VERY WET, USUALLY (SAT.) FROM BELOW THE GROUND WATER TABLE	e - VOID RATIO SD SAND, SANDY SS - SPLIT SPOON	VERY CAN BE CARVED WITH KNIFE. CAN BE EXCAVATED READILY WITH POINT OF PICK, PIECES 1 INCH	STRATA ROCK QUALITY DESIGNATION (SRQD) - A MEASURE OF ROCK QUALITY DESCRIBED BY TOTAL LENGTH OF ROCK SEGMENTS WITHIN A STRATUM EQUAL TO OR GREATER THAN 4 INCHES DIVIDED BY
	F - FINE SL SILT, SILTY ST - SHELBY TUBE FOSS FOSSILIFEROUS SLI SLIGHTLY RS - ROCK	SOFT OR MORE IN THICKNESS CAN BE BROKEN BY FINGER PRESSURE. CAN BE SCRATCHED READILY BY	THE TOTAL LENGTH OF STRATA AND EXPRESSED AS A PERCENTAGE.
PLASTIC   SEMISOLID; REQUIRES DRYING TO   SEMISOLID; REQUIRES	FRAC FRACTURED, FRACTURES TCR - TRICONE REFUSAL RT - RECOMPACTED TRIAXIAL	FINGERNAIL.	TOPSOIL (TS.) - SURFACE SOILS USUALLY CONTAINING ORGANIC MATTER.
(PI) PLASTIC LIMIT	FRAGS FRAGMENTS	FRACTURE         SPACING         BEDDING           TERM         SPACING         TERM         THICKNESS	BENCH MARK:
	EQUIPMENT USED ON SUBJECT PROJECT	VERY WIDE MORE THAN 10 FEET VERY THICKLY BEDDED 4 FEET	ELEVATION: FEET
OM OPTIMUM MOISTURE - MOIST - (M) SOLID; AT OR NEAR OPTIMUM MOISTURE	DRILL UNITS: ADVANCING TOOLS: HAMMER TYPE:	WIDE 3 TO 10 FEET THICKLY BEDDED 1.5 - 4 FEET MODERATELY CLOSE 1 TO 3 FEET THINLY BEDDED 0.16 - 1.5 FEET	
SL _ SHRINKAGE LIMIT	CME-45C CLAY BITS AUTOMATIC X MANUAL	CLOSE 0.16 TO 1 FOOT VERY THINLY BEDDED 0.03 - 0.16 FEET	NOTES: ELEVATION OBTAINED FROM .tin FILE DATES 4/26/17
- DRY - (D) REQUIRES ADDITIONAL WATER TO ATTAIN OPTIMUM MOISTURE	6° CONTINUOUS FLIGHT AUGER CORE SIZE:	VERY CLOSE LESS THAN 0.16 FEET THICKLY LAMINATED 0.008 - 0.03 FEET THINLY LAMINATED < 0.008 FEET	
	CME-55   X 8" HOLLOW AUGERS   COME SIZE:	INDURATION	1
PLASTICITY		FOR SEDIMENTARY ROCKS, INDURATION IS THE HARDENING OF MATERIAL BY CEMENTING, HEAT, PRESSURE, ETC.	1
PLASTICITY INDEX (PI) ORY STRENGTH  NON PLASTIC 0-5 VERY LOW	TUNG-CARRIDE INSERTS	RUBBING WITH FINGER FREES NUMEROUS GRAINS;	
SLIGHTLY PLASTIC 6-15 SLIGHT	VANE SHEAR TEST CASING W/ ADVANCER HAND TOOLS:	GENTLE BLOW BY HAMMER DISINTEGRATES SAMPLE.	
MODERATELY PLASTIC 16-25 MEDIUM HIGHLY PLASTIC 26 OR MORE HIGH	POST HOLE DIGGER	MODERATELY INDURATED GRAINS CAN BE SEPARATED FROM SAMPLE WITH STEEL PROBE;	
COLOR	PORTABLE HOIST TRICONESTEEL TEETH HAND AUGER	BREAKS EASILY WHEN HIT WITH HAMMER.	
	X MOBILE B-57 Tricone TUNGCARB. SOUNDING ROD	INDURATED GRAINS ARE DIFFICULT TO SEPARATE WITH STEEL PROBE; DIFFICULT TO BREAK WITH HAMMER.	
DESCRIPTIONS MAY INCLUDE COLOR OR COLOR COMBINATIONS (TAN, RED, YELLOW-BROWN, BLUE-GRAY).	CORE BIT VANE SHEAR TEST	CHARD HAMMED DI DUC DEDITIED TO BREAK CAMPLE.	
MODIFIERS SUCH AS LIGHT, DARK, STREAKED, ETC. ARE USED TO DESCRIBE APPEARANCE.		EXTREMELY INDURATED SAMPLE BREAKS ACROSS GRAINS.	DATE: 8-15-1-



4
7
41
4
Ż
1
<b>1</b>
••

**CONTENTS** 

**DESCRIPTION** 

BORE LOGS & CORE REPORTS

TITLE SHEET

LEGEND

PROFILE

SITE PLAN

CROSS SECTIONS

SOIL TEST RESULTS

CORE PHOTOGRAPHS

SITE PHOTOGRAPH

**SHEET** 

2

3

4

5-9

10-23

24, 25

26-29

30

# **ROJECT: 34802**

DRAWN BY: N.D. MOHS

# STATE OF NORTH CAROLINA

DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS
GEOTECHNICAL ENGINEERING UNIT

# STRUCTURE SUBSURFACE INVESTIGATION

PROJECT DESCRIPTION GREENSBORO/HIGH POINT RD. FROM PROPOSED US 311 BYPASS TO WEST OF ST 1480  SITE DESCRIPTION STRUCTURES NO. 3 & 4 ON -L- (SR 4121,	
COUNTY <u>GUILFORD</u>	
PROJECT DESCRIPTION GREENSBORO/HIGH	POINT RD. FROM
PROPOSED US 311 BYPASS TO WEST OF	F ST 1480
SITE DESCRIPTION STRUCTURES NO. 3 & 4	ON -L- (SR 4121,
GREENSBORO/HIGH POINT RD.) OVER D	EEP RIVER AT
<b>STATION</b> 140 + 22	

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	U-2412A	1	30

### CAUTION NOTICE

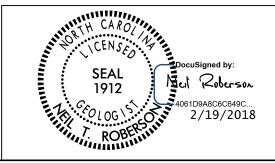
THE SUBSURFACE INFORMATION AND THE SUBSURFACE INVESTIGATION ON WHICH IT IS BASED WERE MADE FOR THE PURPOSE OF STUDY, PLANNING, AND DESIGN, AND NOT FOR CONSTRUCTION OR PAY PURPOSES. THE VARIOUS FILED BORING LOGS, ROCK CORES, AND SOLI TEST DATA AVAILABLE MAY BE REVIEWED OR INSPECTED IN RALEIGH BY CONTACTING THE N. C. DEPARTMENT OF TRANSPORTATION, GEOTECHNICAL ENGINEERING LUNT AT 1989/520-4088, NEITHER THE SUBSUFFACE 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 GEOTECHNICAL INTERPRETATION OF ALL AVAILABLE SUBSURFACE DATA AND MAY NOT NECESSARILY REFLECT THE ACTUAL SUBSURFACE CONDITIONS BETWEEN BORNOS OR BETWEEN SAMPLED STRATA WITHIN THE BORHOLE, THE LABORATORY SAMPLE DATA AND THE IN SITU IN-PLACED TEST DATA CAN BE RELIED ON ONLY TO THE DEGREE OF RELIABILITY INHERENT IN THE STANDARD TEST METHOD. THE OBSERVED WATER LEVELS OR SOIL MOSITURE CONDITIONS SINDICATED 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 TO THE OF 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 INVESTICATION 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 INVESTICATIONS AS HE DEEMS NECESSARY TO SATISFY HIMSELF AS TO CONDITIONS TO BE ENCOUNTERED ON THIS PROJECT. THE CONTRACTOR SHALL HAVE NO CLAIM FOR ADDITIONAL COMPENSATION OR FOR AN EXTENSION OF TIME FOR ANY REASON RESULTING FROM THE ACTUAL CONDITIONS ENCOUNTERED AT THE SITE DIFFERING FROM THEOSE INDICATED IN THE SUBSURFACE INFORMATION.

_	N.D. MOHS
_	J. HOWARD
_	MACTEC
_	
_	
_	
_	
_	
_	
-	ND MOUS
	Y_N.D. MOHS
CHECKED BY	N.T. ROBERSON
SUBMITTED BY	N.T. ROBERSON

**PERSONNEL** 



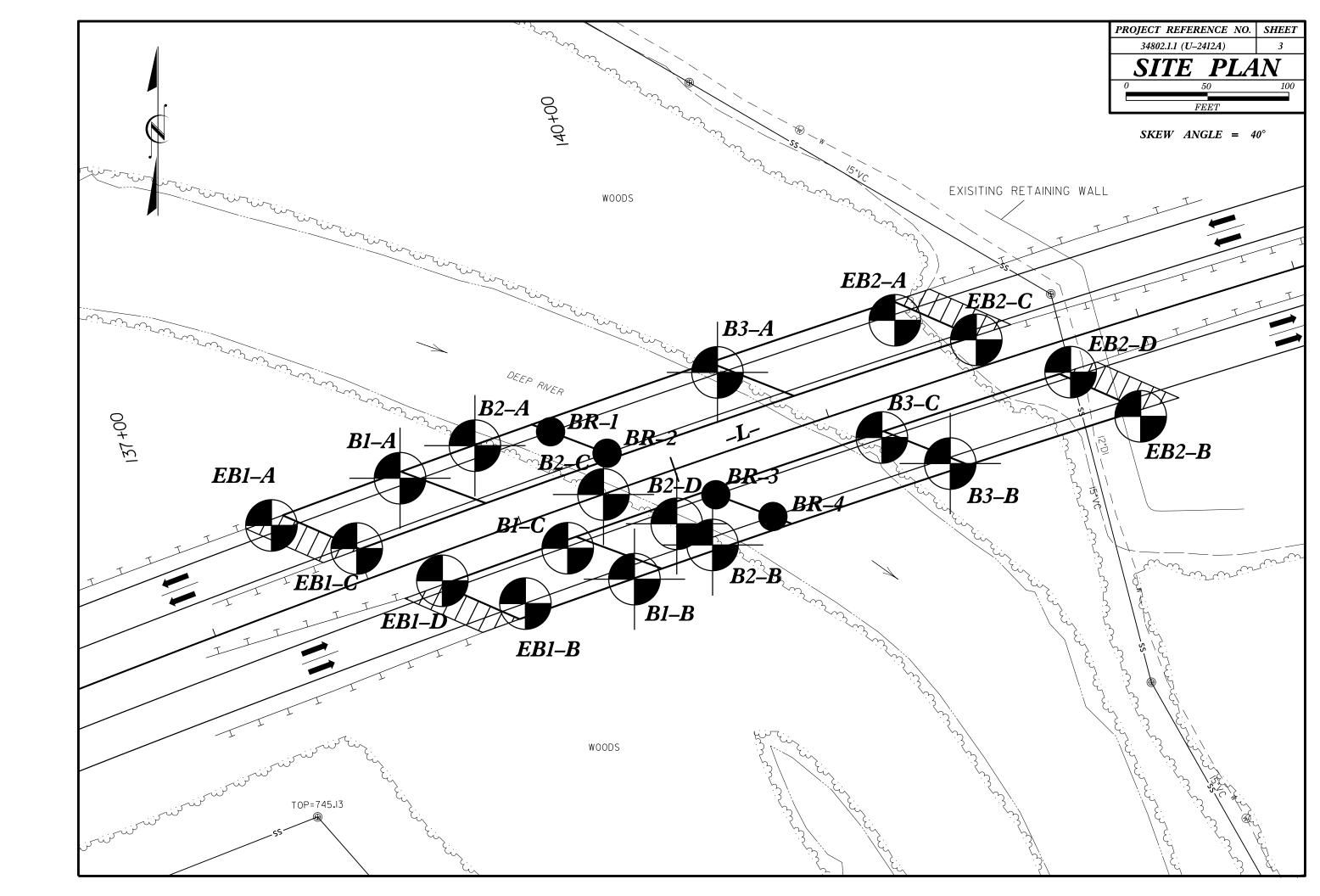
# PROJECT REFERENCE NO. SHEET NO. U-2412A 2

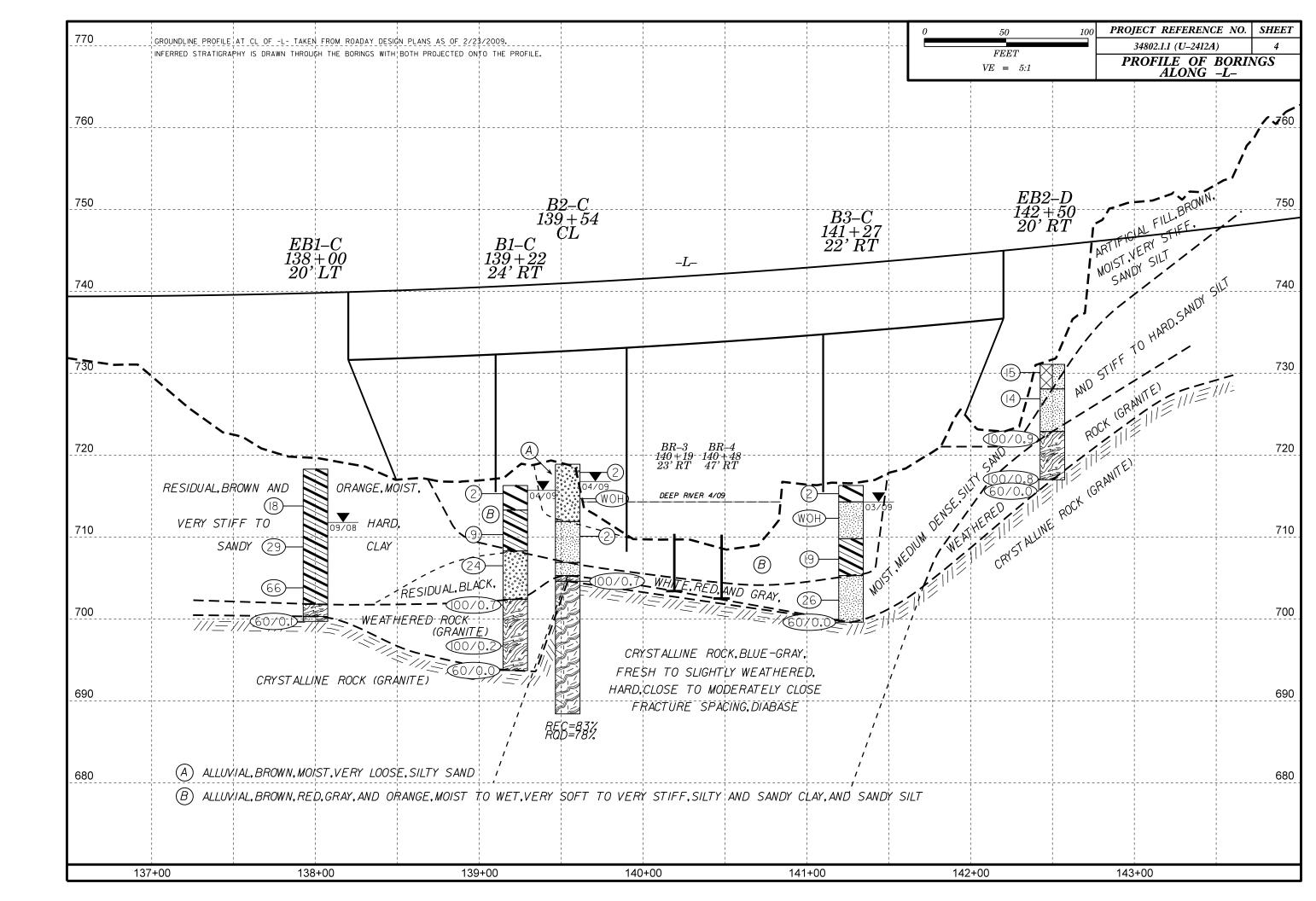
# NORTH CAROLINA DEPARTMENT OF TRANSPORTATION DIVISION OF HIGHWAYS

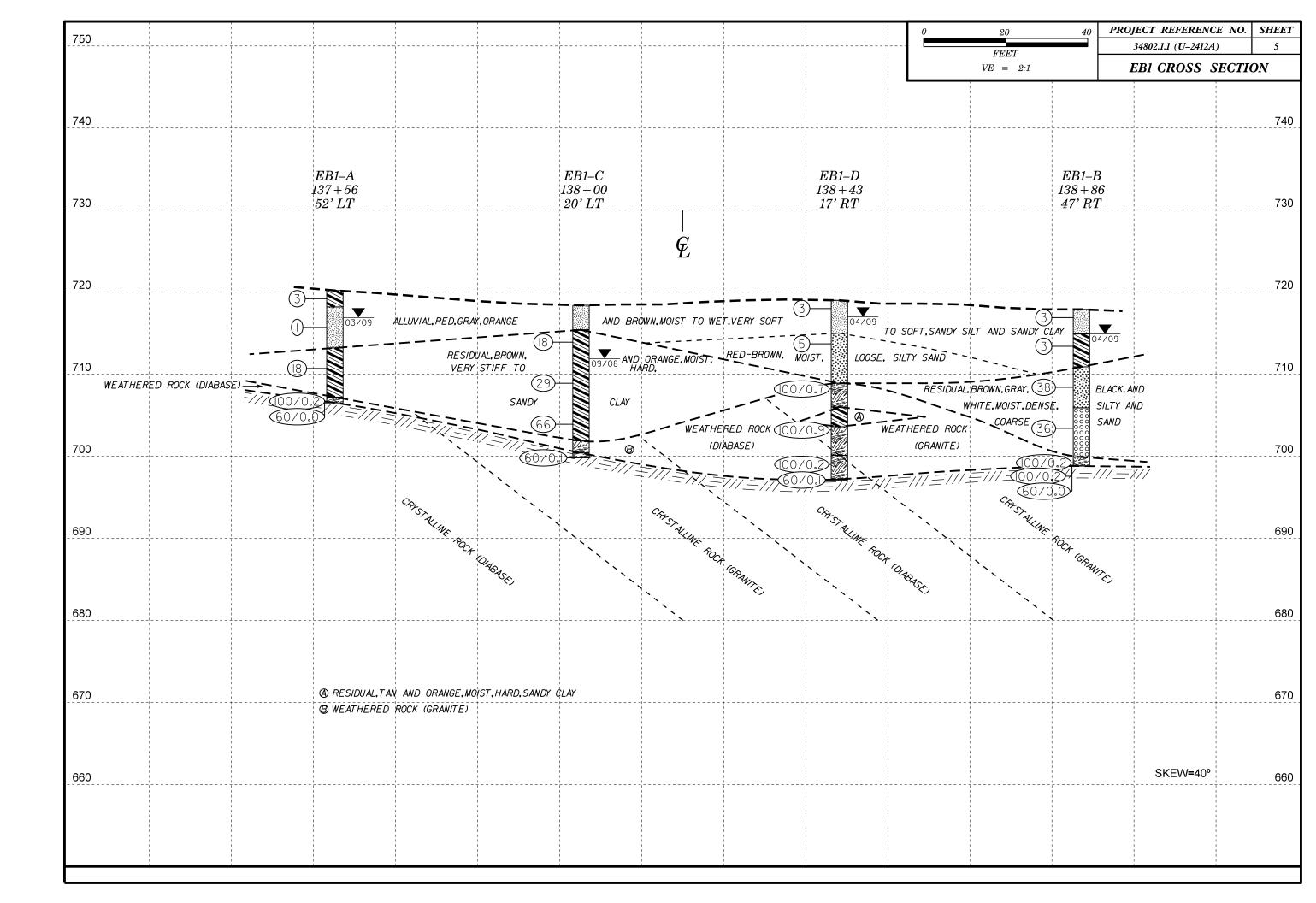
# GEOTECHNICAL ENGINEERING UNIT

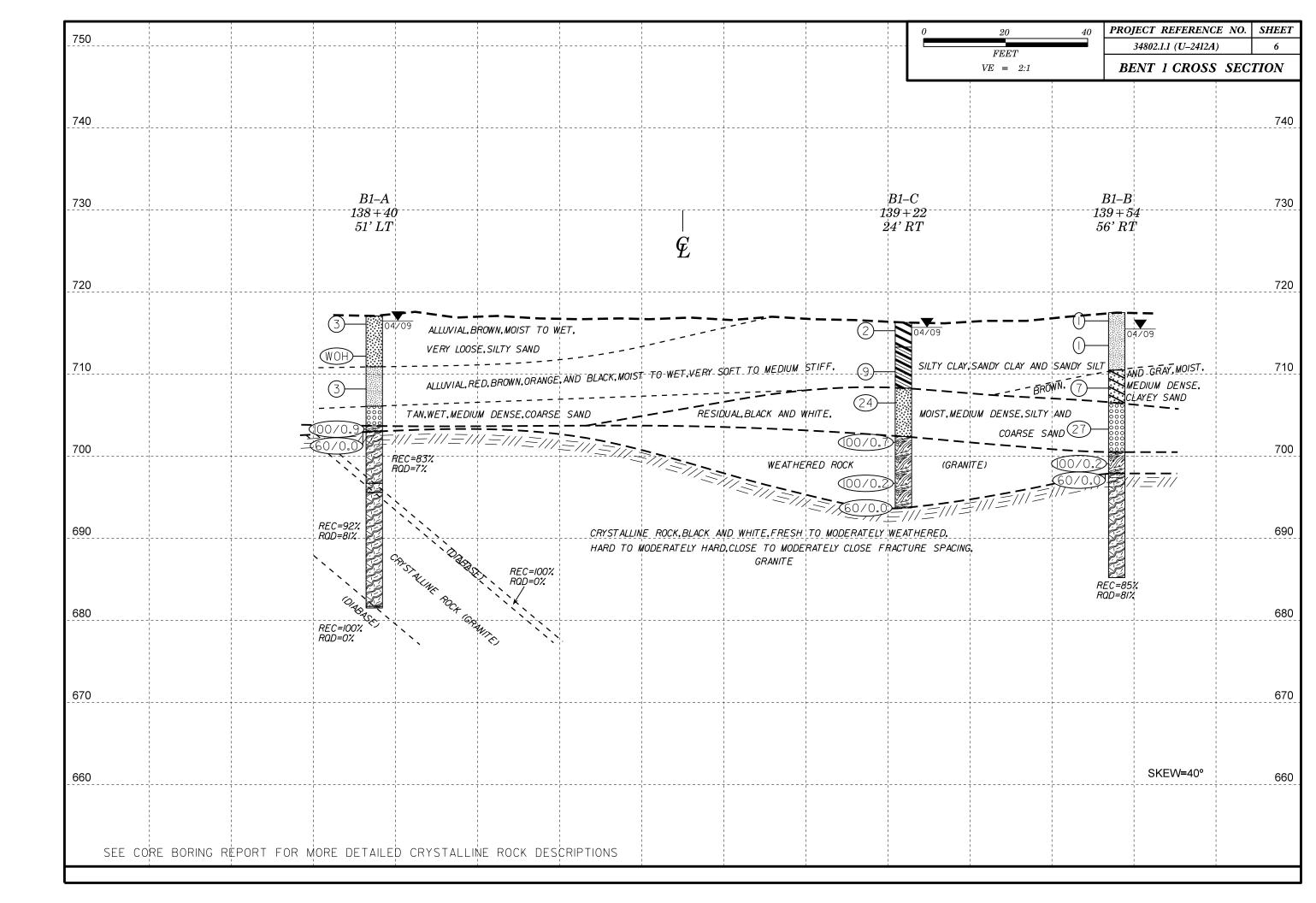
# SUBSURFACE INVESTIGATION

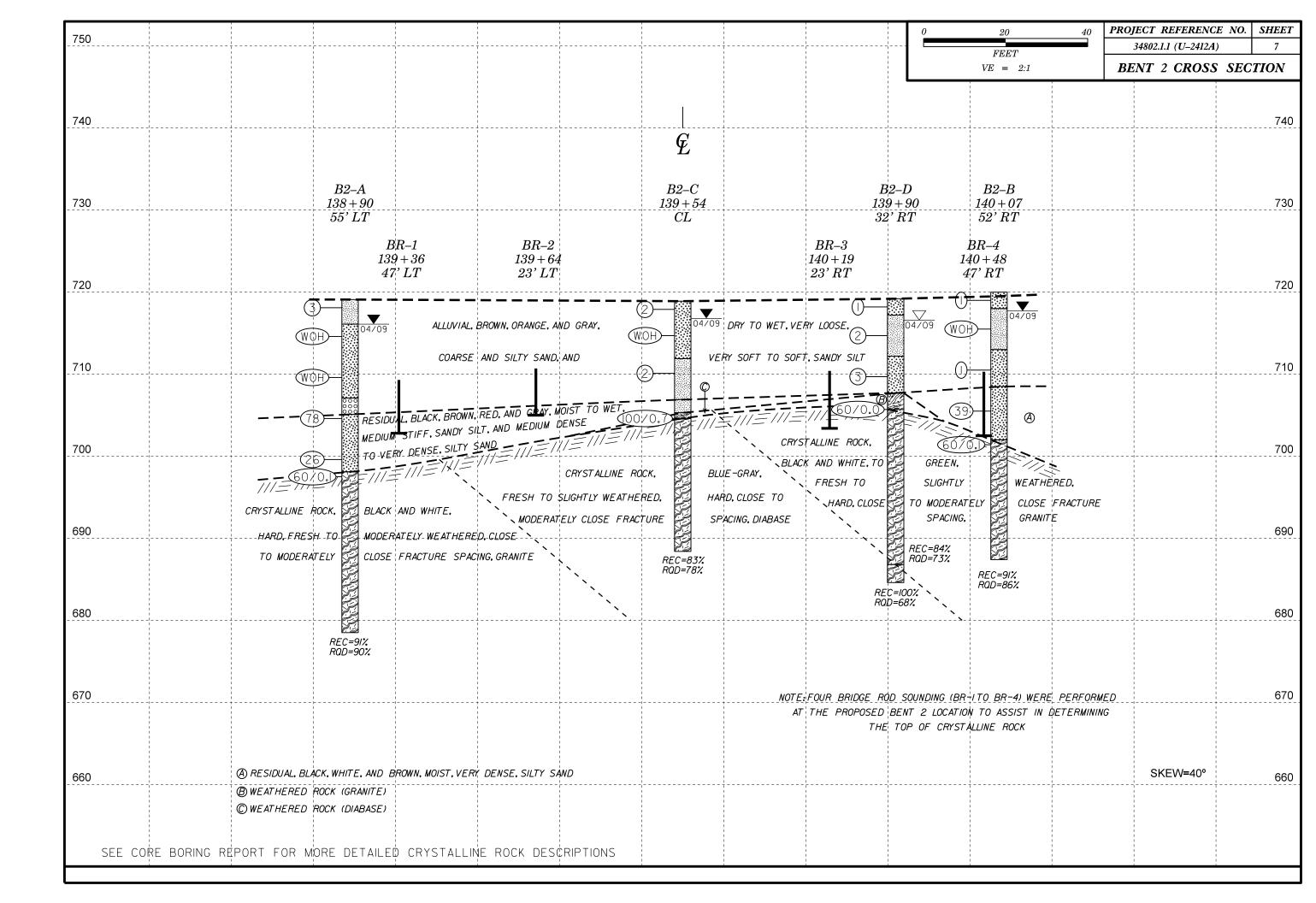
	SOIL AND ROCK LEGEN	D, TERMS, SYMBOLS, AND ABBREVIATIONS	
SOIL DESCRIPTION	GRADATION	ROCK DESCRIPTION	TERMS AND DEFINITIONS
SOIL IS CONSIDERED TO BE THE UNCONSOLIDATED, SEMI-CONSOLIDATED, OR WEATHERED EARTH MATERIALS THAT CAN BE PENETRATED WITH A CONTINUOUS FLIGHT POWER AUGER, AND YIELD LESS THAN 100 BLOWS PER FOOT ACCORDING TO STANDARD PENETRATION TEST (ABSHOT DESCRIPTIONS GENERALLY SHALL INCLUDE: CONSISTENCY, COLOR, TEXTURE, MOISTURE, AASHTO CLASSIFICATION, AND OTHER PERTINENT FACTORS SUCH AS MINERALOGICAL COMPOSITION, ANGULARITY, STRUCTURE, PLASTICITY, ETC. EXAMPLE:  VERY STIFF, ORR SUIT CLAY, MOIST WITH MITEREDUED FME SAMD LATERS, MOISTER, A97-6	WELL GRADED - INDICATES A GOOD REPRESENTATION OF PARTICLE SIZES FROM FINE TO COARS UNIFORM - INDICATES THAT SOIL PARTICLES ARE ALL APPROXIMATELY THE SAME SIZE. (ALSO POORLY GRADED)  GAP-GRADED - INDICATES A MIXTURE OF UNIFORM PARTICLES OF TWO OR MORE SIZES.  ANGULARITY OF GRAINS  THE ANGULARITY OR ROUNDESS OF SOIL GRAINS IS DESIGNATED BY THE TERMS: ANGULAR, SUBANGULAR, SUBROUNDED, OR ROUNDED.	SPT REFUSAL IS PENETRATION BY A SPLIT SPOON SAMPLER EQUAL TO OR LESS THAN 0.1 FOOT PER 60 BLOWS.  IN NON-COASTAL PLAIN MATERIAL. THE TRANSITION BETWEEN SOIL AND ROCK IS OFTEN REPRESENTED BY A ZONE  OF WEATHERED ROCK.  ROCK MATERIALS ARE TYPICALLY DIVIDED AS FOLLOWS:	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,  OR HAVING A NOTABLE PROPORTION OF CLAY IN THEIR COMPOSITION, AS SHALE, SLATE, ETC.
SOIL LEGEND AND AASHTO CLASSIFICATION	MINERALOGICAL COMPOSITION	ROCK (WR)  BLOWS PER FOOT IF TESTED.	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
GENERAL GRANULAR MATERIALS SILT-CLAY MATERIALS CLASS. (≤ 35% PASSING =200) (> 35% PASSING =200) ORGANIC MATERIALS	MINERAL NAMES SUCH AS QUARTZ, FELDSPAR, MICA, TALC, KAOLIN, ETC. ARE USED IN DESCRIPTION WHENEVER THEY ARE CONSIDERED OF SIGNIFICANCE.	WOULD YIELD SPT REFUSAL IF TESTED. ROCK TYPE INCLUDES GRANITE, GNEISS, GABBRO, SCHIST, ETC.	GROUND SURFACE. <u>CALCAREOUS (CALC.)</u> - 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 A-6, A-7 CLASS. A-1-a A-1-b A-2-4 A-2-5 A-2-6 A-2-7 A-2-6 A-2-7 A-3 A-6, A-7	COMPRESSIBILITY  SLIGHTLY COMPRESSIBLE  LIQUID LIMIT LESS THAN 31		COLLUYIUM - ROCK FRAGMENTS MIXED WITH SOIL DEPOSITED BY GRAVITY ON SLOPE OR AT BOTTOM OF SLOPE.
SYMBOL 000000000000000000000000000000000000	MODERATELY COMPRESSIBLE LIQUID LIMIT EQUAL TO 31-50 HIGHLY COMPRESSIBLE LIQUID LIMIT GREATER THAN 50	COASTAL PLAIN COASTAL PLAIN SEDIMENTS CEMENTED INTO ROCK, BUT MAY NOT YIELD SEDIMENTARY ROCK  SEDIMENTARY ROCK  SPECIL BEDS, ETC.  SHELL BEDS, ETC.	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.
X PASSING 10 50 MX GRANULAR SILT- CLAY MUC		WEATHERING	<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	ORGANIC MATERIAL   SOILS   SOILS   OTHER MATERIAL		<u>DIP</u> - THE ANGLE AT WHICH A STRATUM OR ANY PLANAR FEATURE IS INCLINED FROM THE HORIZONTAL.
LIQUID LIMIT PLASTIC INDEX 6 MX NP 18 MX 11 MN 18 MX 11 MN 18 MX 18 MX 11 MN 18 MX 11 MN 18 MX 11 MN 11 MN 18 MX 18 MX 11 MN 11 MN 18 MX 18 MX 11 MN 11 MN LITTLE OR HIGHL	MODERATELY ORGANIC 5 - 10% 12 - 20% SOME 20 - 35%	VERY SLIGHT ROCK GENERALLY FRESH, JOINTS STAINED, SOME JOINTS MAY SHOW THIN CLAY COATINGS IF OPEN,  (V SLI,) CRYSTALS ON A BROKEN SPECIMEN FACE 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 0 0 0 4 MX 8 MX 12 MX 16 MX No MX MODERATE ORGAL ISLIAL TYPES STRING FRACS ORGAL AMOUNTS OF SOILS	GROUND WATER	OF A CRYSTALLINE NATURE.  SLIGHT ROCK GENERALLY FRESH, JOINTS STAINED AND DISCOLORATION EXTENDS INTO ROCK UP TO  (SLI.) I INCH. OPEN JOINTS MAY CONTAIN CLAY, IN GRANITOID ROCKS SOME OCCASIONAL FELDSPAR	<u>FAULT</u> - 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 SAND GRAVEL AND SAND SOILS SOILS MATTER	STATIC WATER LEVEL AFTER 24 HOURS	CRYSTALS ARE DULL AND DISCOLORED, CRYSTALLINE ROCKS RING UNDER HAMMER BLOWS.	FISSILE - A PROPERTY OF SPLITTING ALONG CLOSELY SPACED PARALLEL PLANES.
GEN.RATING AS A EXCELLENT TO GOOD FAIR TO POOR POOR UNSUIT	NBLE PERCHED WATER, SATURATED ZONE, OR WATER BEARING STRATA	MODERATE SIGNIFICANT PORTIONS OF ROCK SHOW DISCOLORATION AND WEATHERING EFFECTS. IN (MOD.) GRANITOID ROCKS, MOST FELDSPARS ARE DULL AND DISCOLORED, SOME SHOW CLAY, ROCK HAS DULL SOUND UNDER HAMMER BLOWS AND SHOWS SIGNIFICANT LOSS OF STRENGTH AS COMPARED	FLOAT - ROCK FRAGMENTS ON SURFACE NEAR THEIR ORIGINAL POSITION AND DISLODGED FROM PARENT MATERIAL.
SUBGRADE   FOUN   PI OF A-7-5 SUBGROUP IS \( \leq \text{LL} - 30 \); PI OF A-7-6 SUBGROUP IS \( \leq \text{LL} - 30 \)	SPRING OR SEEP	WITH FRESH ROCK.  MODERATELY ALL ROCK EXCEPT QUARTZ DISCOLORED OR STAINED. IN GRANITOID ROCKS, ALL FELDSPARS DULL	FLOOD PLAIN (FP) - LAND BORDERING A STREAM, BUILT OF SEDIMENTS DEPOSITED BY THE STREAM.
CONSISTENCY OR DENSENESS  RANGE OF STANDARD RANGE OF UNCONFINED	MISCELLANEOUS SYMBOLS	SEVERE AND DISCOLORED AND A MAJORITY SHOW KAOLINIZATION, ROCK SHOWS SEVERE LOSS OF STRENGTH  (MOD. SEV.) AND CAN BE EXCAVATED WITH A GEOLOGIST'S PICK, ROCK GIVES 'CLUNK' SOUND WHEN STRUCK.	FORMATION (FM.) - A MAPPABLE GEOLOGIC UNIT THAT CAN BE RECOGNIZED AND TRACED IN THE FIELD.
PRIMARY SOIL TYPE COMPRETINESS OF CONSISTENCY PENETRATION RESISTENCE COMPRESSIVE STRENGTH (N-VALUE) (TONS/FT <sup>2</sup> )	WITH SOIL DESCRIPTION DESI	NATIONS IF TESTED, WOULD TIELD SPI REFUSAL	JOINT - FRACTURE IN ROCK ALONG WHICH NO APPRECIABLE MOVEMENT HAS OCCURRED.
GENERALLY VERY LOOSE	S - BULK SA  SOIL SYMBOL  AUGER BORING  SS - SPLIT	(SEV.) IN STRENGTH TO STRONG SOIL. IN GRANITOID ROCKS ALL FELDSPARS ARE KAOLINIZED TO SOME	<u>LEOGE</u> - A SHELF-LIKE RIDGE OR PROJECTION OF ROCK WHOSE THICKNESS IS SMALL COMPARED TO ITS LATERAL EXTENT.
GRANULAR	ARTIFICIAL FILL (AF) OTHER THAN ROADWAY EMBANKMENT THOU INFERRED SOIL BOUNDARY THAN ROADWAY EMBANKMENT SAMPL SAMPL SAMPL	IF TESTED, YIELDS SPT N VALUES > 100 BPF  TUBE  VERY SEVERE ALL ROCK EXCEPT QUARTZ DISCOLORED OR STAINED, ROCK FABRIC ELEMENTS ARE DISCERNIBLE BUT (V SEV.) THE MASS IS EFFECTIVELY REDUCED TO SOIL STATUS, WITH ONLY FRAGMENTS OF STRONG ROCK	<u>LENS</u> - A BODY OF SOIL OR ROCK THAT THINS OUT IN ONE OR MORE DIRECTIONS. <u>MOTTLED (MOT.)</u> - IRREGULARLY MARKED WITH SPOTS OF DIFFERENT COLORS, MOTTLING IN SOILS USUALLY INDICATES POOR AERATION AND LACK OF GOOD DRAINAGE.
VERY SOFT	MMONITORING WELL RS - ROCK S	REMAINING, SAPROLITE IS AN EXAMPLE OF ROCK WEATHERED TO A DEGREE SUCH THAT ONLY MINOR VESTIGES OF THE ORIGINAL ROCK FABRIC REMAIN. <i>IF TESTED, YIELDS SPT N VALUES &lt; 100 BPF</i>	$\underline{\text{PERCHED WATER}}$ - WATER MAINTAINED ABOVE THE NORMAL GROUND WATER LEVEL BY THE PRESENCE OF AN INTERVENING IMPERVIOUS STRATUM.
MATERIAL STIFF 8 TO 15 1 TO 2 (COHESIVE) VERY STIFF 15 TO 30 2 TO 4	→ INSTALLATION RT - RECOMM  SAMPL  SLOPE INDICATOR	SCATTERED CONCENTRATIONS, QUARTZ MAY BE PRESENT AS DIKES OR STRINGERS, SAPROLITE IS ALSO AN EXAMPLE.	RESIDUAL (RES.) SOIL - SOIL FORMED IN PLACE BY THE WEATHERING OF ROCK.  ROCK QUALITY DESIGNATION (ROD) - A MEASURE OF ROCK QUALITY DESCRIBED BY TOTAL LENGTH OF ROCK SEGMENTS EQUAL TO OR GREATER THAN 4 INCHES DIVIDED BY THE TOTAL LENGTH OF CORE RUN AND
HARD >30 >4  TEXTURE OR GRAIN SIZE	ROCK STRUCTURES RATIO	RNIA BEARING SAMPLE ROCK HARDNESS	EXPRESSED AS A PERCENTAGE.
U.S. STD. SIEVE SIZE 4 10 40 60 200 270	SOUNDING ROD REF— SPT REFUSAL	VERY HARD CANNOT BE SCRATCHED BY KNIFE OR SHARP PICK. BREAKING OF HAND SPECIMENS REQUIRES SEVERAL HARD BLOWS OF THE GEOLOGIST'S PICK.	<u>SAPROLITE (SAP.)</u> - RESIDUAL SOIL THAT RETAINS THE RELIC STRUCTURE OR FABRIC OF THE PARENT ROCK.
OPENING (MM)	ABBREVIATIONS  AR - AUGER REFUSAL HI HIGHLY W - MOISTUR	TO DETACH HAND SPECIMEN.	SILL - AN INTRUSIVE BODY OF IGNEOUS ROCK OF APPROXIMATELY UNIFORM THICKNESS AND RELATIVELY THIN COMPARED WITH ITS LATERAL EXTENT, THAT HAS BEEN EMPLACED PARALLEL TO THE BEDDING OR SCHISTOSITY OF THE INTRUDED ROCKS.
(BLDR.) (COB.) (GR.) SANU (SL.) (CL.)	BT - BORING TERMINATED MED MEDIUM V - VERY CL CLAY MICA MICACEOUS VST - VANE	MODERATELY CAN BE SCRATCHED BY KNIFE OR PICK. GOUGES OR GROOVES TO 0.25 INCHES DEEP CAN BE SHEAR TEST HARD EXCAVATED BY HARD BLOW OF A GEOLOGIST'S PICK. HAND SPECIMENS CAN BE DETACHED	SLICKENSIDE - POLISHED AND STRIATED SURFACE THAT RESULTS FROM FRICTION ALONG A FAULT OR SLIP PLANE.
GRAIN MM 305 75 2.0 0.25 0.05 0.005 SIZE IN. 12 3	CPT - CONE PENETRATION TEST MOD MODERATELY WEA WEATH	IGHT MEDIUM CAN BE GROOVED OR GOUGED 0.05 INCHES DEEP BY FIRM PRESSURE OF KNIFE OR PICK POINT.	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 OF TERMS	DMT - DILATOMETER TEST ORG DRGANIC  DPT - DYNAMIC PENETRATION TEST PMT - PRESSUREMETER TEST  DN e - VOID RATIO SAP SAPROLITIC	T WEIGHT HARD CAN BE EXCAVATED IN SMALL CHIPS TO PEICES I INCH MAXIMUM SIZE BY HARD BLOWS OF THE POINT OF A GEOLOGIST'S PICK.  SOFT CAN BE GROVED OR COUGED READILY BY KNIFE OR PICK. CAN BE EXCAVATED IN FRAGMENTS	A 2 INCH OUTSIDE DIAMETER SPLIT SPOON SAMPLER. SPT REFUSAL IS PENETRATION EQUAL TO OR LESS THAN $\pmb{0.1}$ FOOT PER $\pmb{60}$ BLOWS.
(ATTERBERG LIMITS) DESCRIPTION OUTDE OF THE DESCRIPTION  - SATURATED - USUALLY LIQUID; VERY WET, USUALLY	F - FINE SD SAND, SANDY FOSS FOSSILIFEROUS SL SILT, SILTY	FROM CHIPS TO SEVERAL INCHES IN SIZE BY MODERATE BLOWS OF A PICK POINT. SMALL, THIN PIECES CAN BE BROKEN BY FINGER PRESSURE.	
LIC LIQUID LIMIT (SAT.) FROM BELOW THE GROUND WATER TABLE PLASTIC STATE OF THE GROUND	E FRAC FRACTURED, FRACTURES SLI SLIGHTLY FRAGS FRAGMENTS TCR - TRICONE REFUSAL	VERY CAN BE CARVED WITH KNIFE. CAN BE EXCAVATED READILY WITH POINT OF PICK, PIECES 1 INCH SOFT OR MORE IN THICKNESS CAN BE BROKEN BY FINGER PRESSURE. CAN BE SCRATCHED READILY BY FINGERNAIL.	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.
(PI) - WEI - (W) ATTAIN OPTIMUM MOISTURE	EQUIPMENT USED ON SUBJECT PROJECT	FRACTURE SPACING BEDDING  TERM SPACING TERM THICKNESS	TOPSOIL (TS.) - SURFACE SOILS USUALLY CONTAINING ORGANIC MATTER.
	DRILL UNITS: ADVANCING TOOLS: HAMMER TYPE:	VERY MIDE MODE THAN 10 FEFT VERY THICKLY BEDDED > 4 FEET	BENCH MARK: BM-1,141+80,20'LT
OM OPTIMUM MOISTURE - MOIST - (M) SOLID; AT OR NEAR OPTIMUM MOISTU SL SHRINKAGE LIMIT	MOBILE B- CLAY BITS	WIDE 3 TO 10 FEET THINLY BEDDED 0.16 - 1.5 FEET MODERATELY CLOSE 1 TO 3 FEET MEDIT THINLY BEDDED 0.23 - 0.16 FEET	ELEVATION: 720.79 FT.
- DRY - (D) REQUIRES ADDITIONAL WATER TO ATTAIN OPTIMUM MOISTURE	G*CONTINUOUS FLIGHT AUGER   CORE SIZE:   X 8*HOLLOW AUGERS   -B	CLOSE	NOTES:
PLASTICITY	CME-45C X HARD FACED FINGER BITS X-NO	INDURATION	
PLASTICITY INDEX (PI) DRY STRENGTH NONPLASTIC 9-5 VERY LOW	TUNGCARBIDE INSERTS -H	FOR SEDIMENTARY ROCKS, INDURATION IS THE HARDENING OF THE MATERIAL BY CEMENTING, HEAT, PRESSURE, ETC.  RUBBING WITH FINGER FREES NUMEROUS GRAINS;	
LOW PLASTICITY 6-15 SLIGHT	X CASING W/ ADVANCER HAND TOOLS:	FRIABLE HUBBING WITH FINGER FREES NUMEROUS GRAINS;  GENTLE BLOW BY HAMMER DISINTEGRATES SAMPLE.	
HIGH PLASTICITY 26 OR MORE HIGH	PORTABLE HOIST X TRICONE 25% STEEL TEETH POST HOLE TRICONE TUNG, CARB. HAND AUGE	BREAKS EASILY WHEN HIT WITH HAMMER.	
COLOR	X CORE BIT SOUNDING	CRAINC ARE DIFFICULT TO CERARATE WITH CIFEL PROPE	
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.	U VANE SHEA	R TEST EXTREMELY INDURATED SHAPP HAMMER BLOWS REQUIRED TO BREAK SAMPLE;  SAMPLE BREAKS ACROSS GRAINS.	



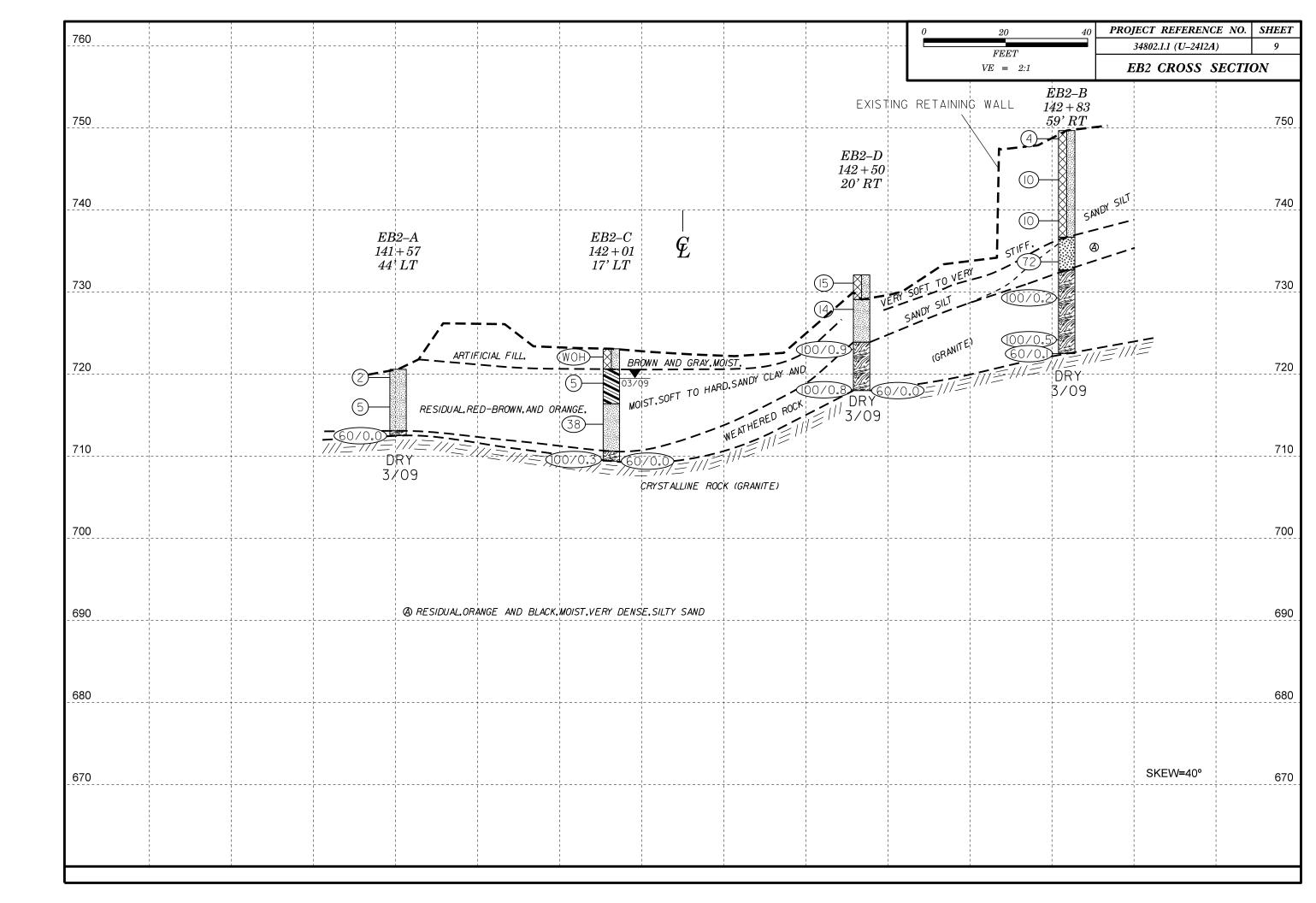


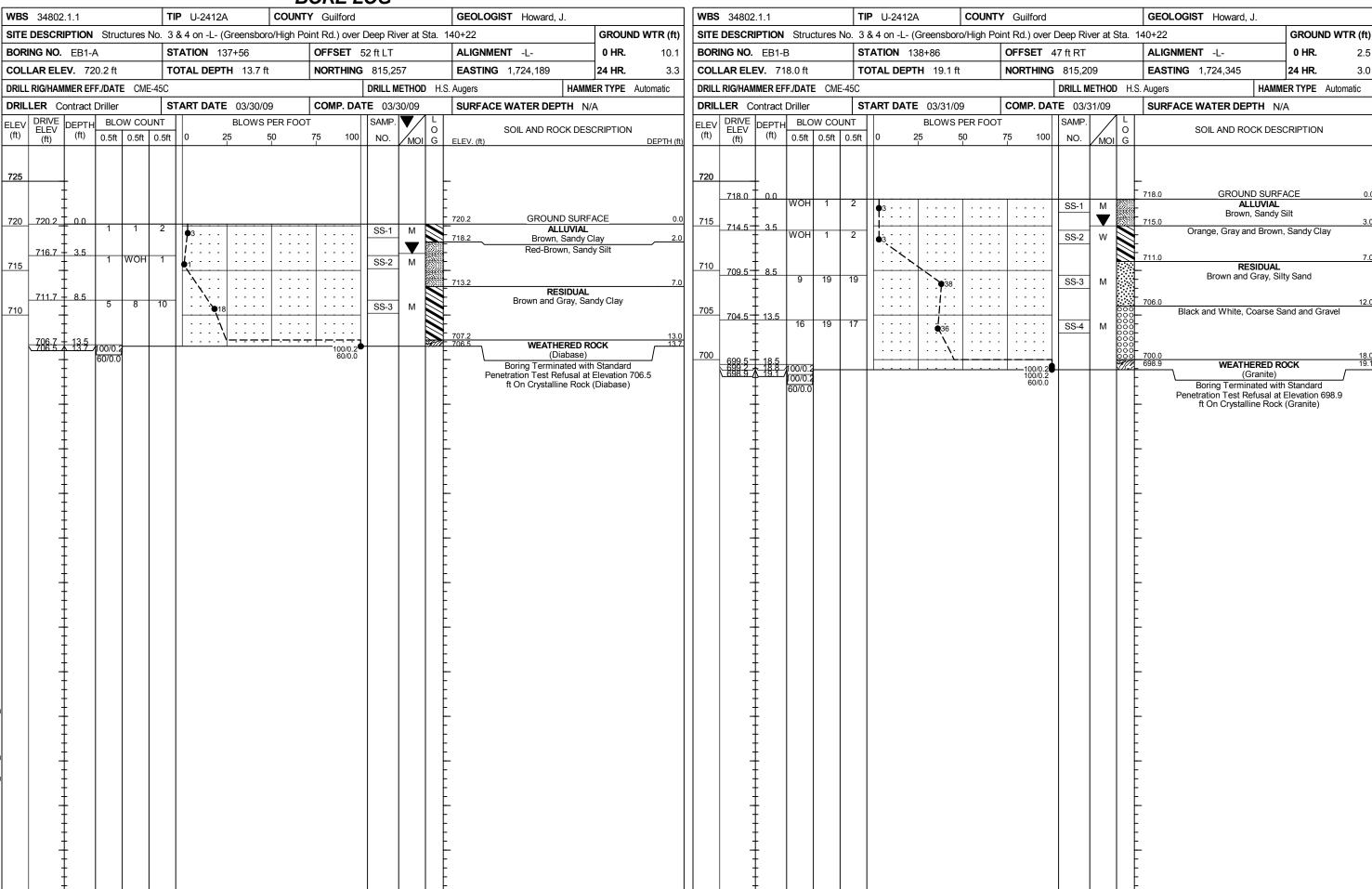


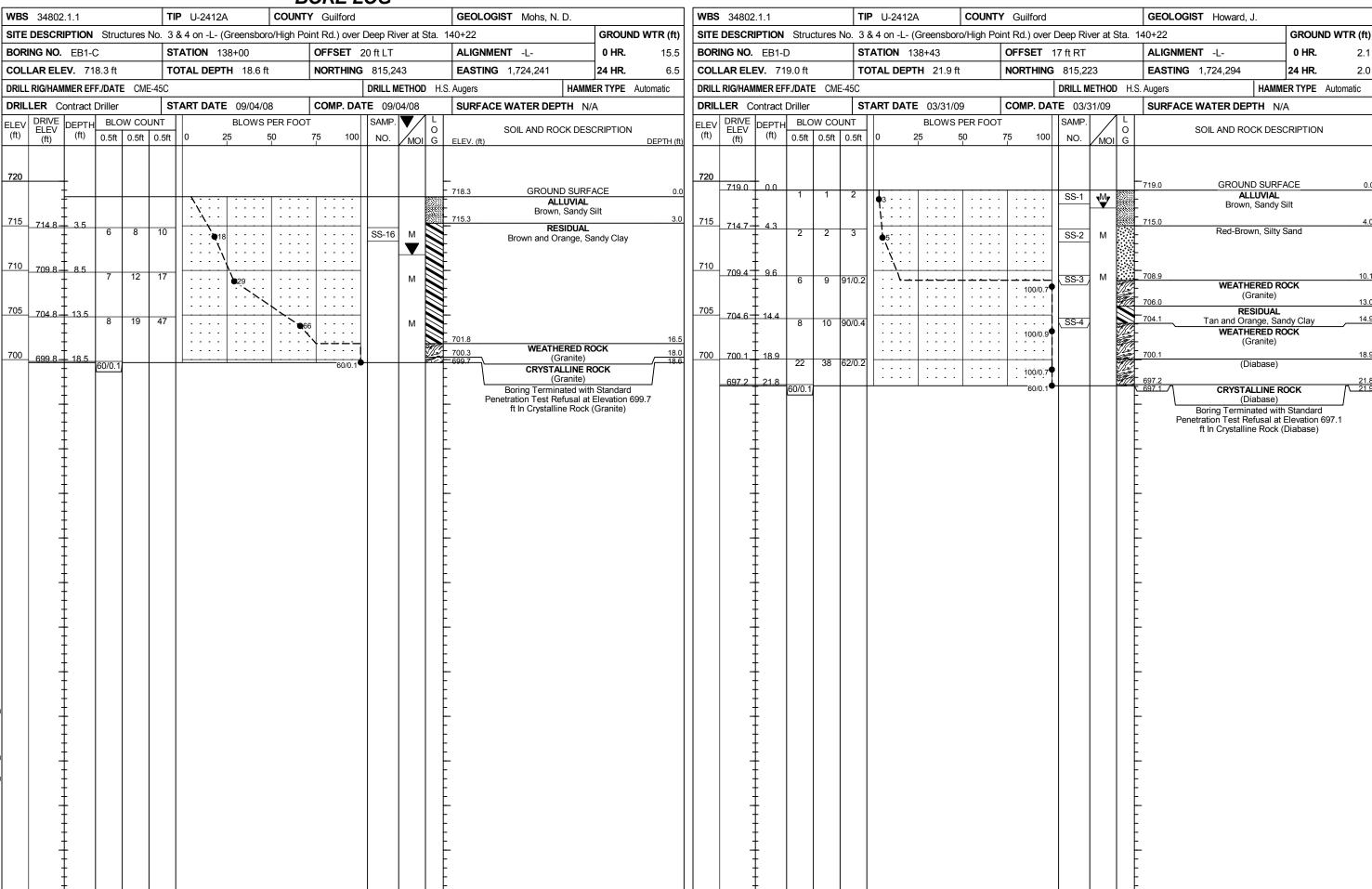




750						0	20 40	PROJECT REFERENCE	
		ii					FEET	34802.1.1 (U-2412A)	· · · · · · · · · · · · · · · · · · ·
							VE = 2:1	BENT 3 CROSS	SECTION
740									740
730	B3–A 140 + 44 48' LT			<i>G</i>	B3–C 141+27 22' RT	11	B3–B 41 + 62 1' RT		730
720				L L					720
710	(WOH) (03/09)	\ <u>/</u>	WIAL, TAN, RED, AND BROWN, MOIST.		WOH 03/09	(WOH)	03/09		710
	= 160/0.0 = 7// /// = /// = CRYS		GRAY, WET. VERY SOFT-TO-VERY		AND -SANDY CLAY  19  VERY STII  26  SANDY SILI	- Allie	Ø ROCK (GRANITE)		700
700	BLAC SLIGH	K AND WHITE.FRESH HTLY WEATHERED.HA E FRACTURE SPACIN	RD, CRYSTALLINE	į	FRESH TO MODERATELY SEVERELY  ARD, VERY CLOSE TO MODERATLEY	i. I	///=/		
690	REC=96% RQD=88%			FRACT	URESPACING; DIABASE	REC=3. RQD=17	7.		690
680							REC=86% RQD=55%		680
670		N.WET.MEDIUM DENS				; ; ; ; ;			670
	© WEATHERE	BLACK AND WHITE,WE D ROCK (GRANITE) E ROCK (GRANITE)R	T.MEDIUM DENSE,SILTY SAND EC=96%.ROD=88%						
660								SKEW=40°	660
SEE CORE BORIN	ng repart for more detailed	CRYSTALLINE	ROCK DESCRIPTIONS						







### **TIP** U-2412A **COUNTY** Guilford **GEOLOGIST** Howard, J. **WBS** 34802.1.1 SITE DESCRIPTION Structures No. 3 & 4 on -L- (Greensboro/High Point Rd.) over Deep River at Sta. 140+22 **GROUND WTR (ft)** OFFSET 51 ft LT **STATION** 138+40 ALIGNMENT -L-BORING NO. B1-A 0 HR. 0.8 COLLAR ELEV. 717.1 ft TOTAL DEPTH 35.6 ft **NORTHING** 815,286 **EASTING** 1,724,268 24 HR. 0.6 DRILL RIG/HAMMER EFF./DATE CME-45C HAMMER TYPE Automatic DRILL METHOD NW Casing W/SPT & Core **DRILLER** Contract Driller **START DATE** 04/01/09 COMP. DATE 04/01/09 SURFACE WATER DEPTH N/A ELEV DRIVE DEPTH BLOW COUNT **BLOWS PER FOOT** SAMP. SOIL AND ROCK DESCRIPTION (ft) 0.5ft 0.5ft 0.5ft (ft) 75 100 NO. MOI G ELEV. (ft) 720 **GROUND SURFACE** 717.1 <u>T 0.0</u> SS-1 ALLUVIAL 715 Brown, Silty Sand 713.2 woн woн woн SS-2 W . . . . 710 Red, Brown, and Black, Sandy Silt 709.2 SS-3 W 705 Tan, Coarse Sand and Gravel 704.2 12.9 703.0 14.1 7 93/0.4 W - 100/0.9 - 60/0.0 WEATHERED ROCK 60/0.0 RS-1 (Granite) CRYSTALLINE ROCK 700 Black and White, Fresh to Slightly Weathered, Hard, Close to Moderately . . . . Close Fracture Spacing, Granite RS-2 REC=83% RQD=67% Blue-Gray, Very Slightly to Severely Weathered, Moderately Hard to Soft, Close 695 Fracture Spacing, 2 Fractures at 40°, 3 at 10°, Diabase REC=100% RQD=0% 690 Black and White, Fresh to Moderately Weathered, Hard to Moderately Hard, Close to Moderately Close Fracture Spacing, 4 Fractures at 80°, Granite 685 REC=92% RQD=81% . . . . . . . . Blue-Gray, Very Slightly Weathered, Moderately Hard, Close Fracture Spacing, REC=100% RQD=0% Boring Terminated at Elevation 681.5 ft In Crystalline Rock (Diabase)

_									C	<b>U</b> I	RE LOG
WBS	34802.1.	1			TIP	U-241	2A	C	TAUC	Υ (	Guilford GEOLOGIST Howard, J.
SITE	DESCRIPT	ION	Stru	ctures No	. 3 & 4	on -L	- (Greens	boro/F	ligh Po	_	Rd.) over Deep River at Sta. 140+22 GROUND WTR (ft)
BORI	NG NO. E	31-A			STAT	ION	138+40			OF	FFSET         51 ft LT         ALIGNMENT         -L-         0 HR.         0.8
COLI	AR ELEV.	717	7.1 ft		TOTA	L DEF	<b>PTH</b> 35.0	6 ft		NO	DRTHING         815,286         EASTING         1,724,268         24 HR.         0.6
DRILL	RIG/HAMME	R EFF	./DATE	CME-	45C						DRILL METHOD NW Casing W/SPT & Core HAMMER TYPE Automatic
DRIL	LER Cont	tract [	Oriller		STAF	RT DAT	<b>ΓΕ</b> 04/0′	1/09		СО	OMP. DATE 04/01/09 SURFACE WATER DEPTH N/A
CORI	E SIZE NO	<b>Q</b>					1 21.5 ft			<u> </u>	
ELEV (ft)		PTH (ft)	RUN (ft)	DRILL RATE (Min/ft)	REC. (ft)	RQD (ft) %	SAMP. NO.	STR. REC. (ft) %	RQD (ft) %	L O G	
703	703.0 + 1 701.5 + 1	4.1 5.6	1.5	N=60/0.0 2:30/1.0 :45/0.5	(1.5) 100% <sub>/</sub>	(1.3) - 87% /	RS-1 /	(5.2) 83%	(4.2) 67%		Begin Coring @ 14.1 ft  703.0 CRYSTALLINE ROCK Black and White, Fresh to Slightly Weathered, Hard, Close to Moderately
700	<u> </u>		5.0	1:15/1.0	(3.9) 78%	(2.9) 58%		00 /0	07 70		Close Fracture Spacing, Granite
695	696.5 _ 2	0.6	5.0	1:45/1.0 2:00/1.0 1:00/1.0 2:30/1.0 1:15/1.0 1:45/1.0	(4.4) 88%	(3.0) 60%	RS-2	100%/	`0%′		Close Fracture Spacing, 2 Fractures at 40°, 3 at 10°, Diabase
690	691.5 2	25.6		1:30/1.0 1:00/1.0 2:30/1.0	(4.8)	(3.8)		(12.8) 92%	(11.3) 81%		Black and White, Fresh to Moderately Weathered, Hard to Moderately Hard, Close to Moderately Close Fracture Spacing, 4 Fractures at 80°, Granite
	686.5 3	0.6		2:00/1.0 2:15/1.0 2:30/1.0 2:00/1.0		76%					
685	+		5.0	2:15/1.0 1:45/1.0 1:30/1.0 1:30/1.0		(4.5) 90%					
	681.5 + 3	5.6		1:30/1.0			Ī	(0.2)	(0.0)		681.7  681.5  Blue-Gray, Very Slightly Weathered, Moderately Hard, Close Fracture  35.4  35.4  35.4
	‡							100%	0%	<u> </u>	Spacing, Diabase Boring Terminated at Elevation 681.5 ft In Crystalline Rock (Diabase)
	‡										‡
										.	<u></u>
											‡
	‡										ţ
	🕇									'	ţ
	‡										‡
	‡									.	<u> </u>
	‡										ţ
	‡										t
	1 1									'	t
	<u> </u>										<u> </u>
	‡									.	<u> </u>
	1 1										<u> </u>
	1 ±										<u> </u>
	1 1									'	ŧ
	<del> </del>										-
	l I										E
	‡										F
	‡										F
	‡										F
	‡										E
											E
	7										F
	‡										F
	‡										<b>+</b>
	‡										F
	‡										E
											F

			E LUG	_	
<b>WBS</b> 34802.1.1	<b>TIP</b> U-2412A	COUNTY Gu		<b>GEOLOGIST</b> Howard, J.	_
SITE DESCRIPTION Struc	ures No. 3 & 4 on -L- (0		.) over Deep River at Sta.		GROUND WTR (ft)
BORING NO. B1-B	STATION 139	9+54 <b>OFF</b>	SET 56 ft RT	ALIGNMENT -L-	<b>0 HR.</b> 2.3
COLLAR ELEV. 717.5 ft	TOTAL DEPTH	I 32.3 ft <b>NOR</b>	<b>THING</b> 815,224	<b>EASTING</b> 1,724,412	<b>24 HR.</b> 2.0
DRILL RIG/HAMMER EFF./DATE	CME-45C		DRILL METHOD N	W Casing W/SPT & Core HAMN	MER TYPE Automatic
<b>DRILLER</b> Contract Driller	START DATE	04/01/09 <b>COM</b>	P. DATE 04/01/09	SURFACE WATER DEPTH	I/A
-;;; *   ELEV   P - ;; . · ·	7 COUNT   0.5ft   0 25	BLOWS PER FOOT 50 75	SAMP. V L O NO. MOI G	SOIL AND ROCK DES	SCRIPTION DEPTH (ft)
717.5 = 0.0					FACE 0.0
715 714 5 3 0 WOH			SS-1 W	- ALLUVIAL Red-Brown and Orang	
	VOH 1 1		SS-2 W	- - - 710.5	7.0
710 709.3 8.2	3 4		SS-3 M	Brown and Gray, Cla - -	ayey Sand
705 704.3 13.2	: XX		   	- 706.5 - RESIDUAL - Black, White and Brown,	
8	10 17	27	SS-4 M 0000	- - - 700.5	17.0
700 699.3 18.2 100/0.2			00/0.2	WEATHERED F	ROCK
697.9 19.6 100/0.2 695 60/0.0			60/0.0 RS-3	CRYSTALLINE I Black and White, Fresh	to Moderately
				Weathered, Hard, Close Close Fracture Spacing, 1 Granite REC=85% RQD	Fracture at 45°,
690				- - -	-0170
‡			RS-4	_ - - 685.2	32.3
				Boring Terminated at Elev Crystalline Rock (f	ation 685.2 ft In Granite)

								C	<u>OI</u>	<u>RE L</u>	<u>OG</u>					
WBS	34802.1.1			TIP	U-241	2A	С	OUNT	Υ (	Guilford			GEOLOGIST Howard	, J.		
SITE	DESCRIPTION	Stru	ctures No	o. 3 &	4 on -L	- (Greens	sboro/F	ligh P	oint I	Rd.) over	Deep River a	Sta.	140+22		GROUN	ID WTR (ft)
BOR	ING NO. B1-B			STA	TION	139+54			OF	FSET 5	66 ft RT		ALIGNMENT -L-		0 HR.	2.3
COL	LAR ELEV. 71	7.5 ft		TOT	AL DE	<b>PTH</b> 32	.3 ft		NC	RTHING	815,224		<b>EASTING</b> 1,724,412		24 HR.	2.0
DRILL	. RIG/HAMMER EF	F./DATI	E CME-	45C							DRILL METHO	D NV	V Casing W/SPT & Core	HAMM	ER TYPE	Automatic
DRIL	LER Contract	Driller		STAI	RT DA	<b>TE</b> 04/0	1/09		CC	MP. DAT	TE 04/01/09		SURFACE WATER DE	PTH N	/A	
COR	E SIZE NQ			I		<b>1</b> 12.7 f										
ELEV (ft)	RUN ELEV (ft) DEPTH (ft)	RUN (ft)	DRILL RATE (Min/ft)	REC. (ft) %	JN RQD (ft) %	SAMP. NO.	STR REC. (ft) %	RATA RQD (ft) %	L O G	ELEV. (f	t)	С	DESCRIPTION AND REMAR	KS		DEPTH (ff
697.9													Begin Coring @ 19.6 ft			
695	697.9 19.6 695.2 22.3	5.0	N=60/0.0 2:30/1.0 3:00/1.0 :45/0.7 1:30/1.0	(2.3) 85% (3.6) 72%	(2.2) 81% (3.6) 72%	RS-3	(10.8) 85%	(10.3) 81%		_ 697.9 _ _			CRYSTALLINE ROCK e, Fresh to Moderately Weath ose Fracture Spacing, 1 Frac			
690	690.2 27.3	5.0	1:30/1.0 3:00/1.0 2:45/1.0 2:30/1.0 2:15/1.0							-						
	685.2 + 32.3	5.0	3:15/1.0 2:30/1.0 2:30/1.0 2:15/1.0 2:00/1.0		(4.5) 90%	RS-4				- - - - 685.2						32.3
	000.2 32.3		2.00/1.0				_			000.2	Boring Ter	minate	d at Elevation 685.2 ft In Crys	stalline Ro	ock (Grani	te)

									ORE L	<u>UG</u>							
	34802.1					<b>P</b> U-2412			<b>f</b> Guilford					ST Howard,			
			Stru	ctures				o/High Poi	int Rd.) over		er at S	Sta.					D WTR (f
BOR	ING NO.	В1-С			S	TATION 1	39+22		OFFSET 2	24 ft RT			ALIGNME	NT -L-		0 HR.	0.
COL	LAR ELE	<b>V</b> . 71	6.3 ft		TO	OTAL DEP	<b>TH</b> 22.6 ft		NORTHING	815,24	43		EASTING	1,724,371		24 HR.	0.
DRILI	RIG/HAMN	MER EF	F./DATI	E CMI	E-45C					DRILL M	ETHOD	) H.S	S. Augers		HAMMER	RTYPE	Automatic
DRIL	LER Co	ntract				TART DATI	E 03/31/09	9	COMP. DA		31/09	<del></del>	SURFACE	WATER DE	PTH N/A		
ELEV (ft)	DRIVE ELEV (ft)	OEPTH (ft)		0.5ft		0 :		PER FOOT	75 100	SAMP.	MOI	O G	ELEV. (ft)	SOIL AND RO	OCK DESC	RIPTION	DEPTH
<b>720</b> 715	716.3	0.0	WOH	1	1	2				SS-1	M		- - - - 716.3		ND SURFACE LLUVIAL ON OFFICE OFFI		,
710	711.3	5.0	3	4	5	\\\.\.\.\.\.\.\.\.\.\.\.\.\.\.\.\.\.\.				SS-2	М		713.3		ı, Sandy Cla		
705	707.5	8.8	5	13	11		24			SS-3	M		- - -		<b>ESIDUAL</b> White, Silty	Sand	
700	702.4	13.9 19.4	48	52/0.2			: Y=1=1=		100/0.7				702.4		HERED ROO Granite)	CK	1;
695		22.6	100/0.2 60/0.0						60/0.0				- - - 693.7	Boring Termi etration Test F	nated with S	Standard	22
													- - - - -				



				D(	ORE LUG		
<b>WBS</b> 3480						GEOLOGIST Howard, J.	
SITE DESCE	RIPTION	Structures			int Rd.) over Deep River at Sta. 14	10+22	GROUND WTR (ft)
ORING NO	. B2-A		ST	<b>TATION</b> 138+90	OFFSET 55 ft LT	ALIGNMENT -L-	<b>0 HR.</b> 3.0
OLLAR EL	. <b>EV.</b> 719	.1 ft	то	OTAL DEPTH 40.6 ft	<b>NORTHING</b> 815,306	<b>EASTING</b> 1,724,314	<b>24 HR.</b> 3.0
RILL RIG/HA	MMER EFF.	/DATE CN	IE-45C		DRILL METHOD NW	Casing W/SPT & Core HAMM	ER TYPE Automatic
RILLER (	Contract D	riller	ST	TART DATE 04/02/09	COMP. DATE 04/02/09	SURFACE WATER DEPTH N/	Α
LEV DRIVE (ft) (ft)	DEPTH_ (ft)	BLOW COU	O.5ft	BLOWS PER FOOT 0 25 50	75 100 NO. MOI G E	SOIL AND ROCK DES	CRIPTION  DEPTH (ft)
719.1	0.0	1 1	2	•3		19.1 GROUND SURF	
715.6	+ 3.5			[:::: :::::	<b>▼</b> 7	Brown, Sandy S	3.0
15 715.6		1 WOH	WOH	0	SS-2 W	Brown and Gray, Sil	ty Sand
710.6	8.5	1 WOH	WOH	0	SS-3 W	707.1	12.0
705.6	13.5	1 29	49		000-7	Brown, Coarse S	and 14.0
	‡	1   29	49		SS-4 W 000 /	<b>RESIDUAL</b> Black, Brown and White	
700.6 697.6	21.5	4 7	19	726		998.1 197.5 CDVSTALLINE D	21.0 OCK 21.6
95	6	0/0.1			RS-5	CRYSTALLINE R (Granite)  Black and White, Fresh to Weathered, Hard, Close to	o Moderately
90	‡					Close Fracture Spacing, 7 F 1 at 70°, Grani REC=92% RQD=	ractures at 10°, te
	<u> </u>				RS-6		
85 .	‡						
80						578.5	40.6
	‡					Boring Terminated at Eleva Crystalline Rock (G	tion 678.5 ft In ranite)
	‡						
	‡						
	‡						
	‡						
	‡						
	‡						
	Ŧ						
	‡						
	<u>‡  </u>						

									<u>C</u>	O	E LOG		
WBS	34802	.1.1			TIP	U-241	12A	С	OUNT	Υ (	ilford	GEOLOGIST Howard, J.	
SITE	DESCR	IPTION	Stru	ctures No	1		-	sboro/F	High P	_	.) over Deep River at Sta.	1	GROUND WTR (ft)
	ING NO.				+		138+90			-	SET 55 ft LT	ALIGNMENT -L-	<b>0 HR.</b> 3.0
	LAR ELE					AL DE	<b>PTH</b> 40.	.6 ft		NC	THING 815,306	<b>EASTING</b> 1,724,314	<b>24 HR.</b> 3.0
	. RIG/HAN									Ι		<del> </del>	R TYPE Automatic
	LER C		Driller		-		TE 04/0			CC	P. DATE 04/02/09	SURFACE WATER DEPTH N/	4
	RUN	1	DUN	DRILL		UN RQD	N 19.0 f	STR	RATA	L			
ELEV (ft)	ELEV (ft)	DEPTH (ft)	(ft)	RATE (Min/ft)	REC. (ft) %	RQD (ft) %	SAMP. NO.	REC. (ft) %	RQD (ft) %	O G	ELEV. (ft)	DESCRIPTION AND REMARKS	DEPTH (ft)
697.5	697.5 -	21.6	4.0	2:15/1.0 1:30/1.0	(4.0)	(4.0)	RS-5	(17.5) 92%	(17.1) 90%			Begin Coring @ 21.6 ft e, Fresh to Moderately Weathered, Hard fracture Spacing, 7 Fractures at 10°, 1 a	
695	693.5	- 25.6 -	5.0	1:30/1.0 1:15/1.0 1:45/1.0	(4.1)	(4.0)	KS-5	, 02,70	0070		moderately close i	radial opacing, Fraction at 10 , Fe	ac ro , Granno
690	-	20.0		1:45/1.0 1:45/1.0 1:00/1.0	82%	80%							
	688.5 -	30.6	5.0	:45/1.0 1:30/1.0 1:45/1.0 1:15/1.0	(4.4) 88%	(4.1) 82%	RS-6						
685	683.5 -	35.6	5.0	1:30/1.0 1:15/1.0 2:00/1.0	(5.0)	(5.0)							
680		40.6		2:00/1.0 2:00/1.0 2:30/1.0	100%	100%					070.5		40.0
	678.5 -	40.6		2:00/1.0							678.5 Boring Terminate	ed at Elevation 678.5 ft In Crystalline Ro	ck (Granite)
	_	E											
	-												
	-												
	-	_											
	-	_											
	_	_											
	-	-											
	-	-											
	-	-											
	-	<del> </del>  -											
	_	<del> </del>											
	-	<del> </del>											
	-	<del> </del>											
	-	<del> -</del>  -											
	-	<del> </del>											
	_	-											
	-	-											
	-	Ė											
	-	<b> </b>											
	-	ļ											
	_	<u> </u>											
	-	<del> </del>											
	-	ļ.											
	-	ļ.											
	-	‡											
	-	‡											
	-	<u> </u>											
	-	ļ.											
	-	ļ .											
	-	+	1	I	I	1	I						

VBS	34802	11			Т	<b>IP</b> U-2412A	COUNTY	RE L	OG			GEOLOGIST Howard, J.	
	DESCRI		I Strı	ucture		3 & 4 on -L- (Greensbor			Deep Ri	ver at	Sta.		GROUND WTR (ft)
	NG NO.					<b>TATION</b> 140+07		FFSET 5				ALIGNMENT -L-	0 HR. 2.1
	AR ELE					OTAL DEPTH 32.6 ft		ORTHING		45		<b>EASTING</b> 1,724,460	24 HR. 2.3
	RIG/HAM				ME-450				DRILL M		NIV	<u>'</u>	IER TYPE Automatic
	LER C					, TART DATE 04/06/09	) C(	OMP. DAT			140	SURFACE WATER DEPTH N	
	DDI /E	DEPTH	T	OW CO		BLOWS F		OMI . DAI	SAMP.	<b>V</b> /	L	SON ACE WATER DEFITE	
EV ft)	ELEV (ft)	(ft)	0.5ft			<del> </del>	0 75	100	NO.	MOI	O G	SOIL AND ROCK DES	CRIPTION  DEPTH (ft)
	(-7)									/ IVIOI	Ť	LLLV. (II)	DLF III (II)
20												720.0 GROUND SURF	FACE 0.0
20	720.0	0.0	1	WOH	1 1	1			SS-1	M		ALLUVIAL	
	- 716.5	3.5								_		718.0 Brown, Silty Sa Brown, Sandy	
15	_	<u> </u>	1	1	WOH	1			SS-2	М			
	-	‡										713.0	7.0
10	711.5	8.5	WOH	WOH	1 1	<b>{                                    </b>			SS-3	W		Gray, Silty Sa	nu
10	-	‡									<u> </u>	708.5	11.5
	- 706.5	13.5		L_		] ::::\ ;:::						RESIDUAL Brown, Black and White	
05	_	-	16	19	20	39			SS-4	М			.,,
	-	‡				:::: ::::::::::::::::::::::::::::::::						700.0	40.0
00	701.5	18.5	60/0.1	-				60/0.1				702.0 CRYSTALLINE F	18.0 ROCK 18.6
,0	-	‡										. (Diabase) Green to Blue-Gray, Fresh	to Very Slightly
	-	‡										Weathered, Hard, Close Close Fracture Spacing, 2 F	Fractures at 45°,
95	-	‡										1 at 20°, 1 at 80°, E REC=91% RQD=	Diabase
	-	‡											
90	-	‡											
90	-	‡										•	
	-	<u> </u>			+							Boring Terminated at Eleva	32.6 ation 687 4 ft In
	-	‡									ļ	Crystalline Rock (D	
	-	‡											
	-	<u> </u>											
	-	‡										•	
	-	‡									ŀ		
	-	t									Ŀ		
	-	<u> </u>									l		
	-	Ĺ									E		
	-	ł									ŀ		
	-	<u> </u>									E		
	-	Ł									l F		
	-	F									F	•	
	-	Ŧ									F		
	_	ļ.											
	-	ļ											
	-	ļ											
	-	‡										•	
	-	‡											
	-	‡									<u> </u>		
	_	t									E		
	-	ł									l F		
	_	F									F		
	-	F									F		
	_	‡											

									С	Ol	RE LOG
WBS	34802.1.	1			TIP	U-241	2A	С	OUNT	Υ (	Guilford GEOLOGIST Howard, J.
SITE	DESCRIPT	ION	Stru	ctures No	. 3 &	4 on -L	- (Greens	sboro/H	ligh P	oint I	Rd.) over Deep River at Sta. 140+22 GROUND WTR (ft)
	NG NO. E				STA	TION	140+07			+	FSET         52 ft RT         ALIGNMENT         -L-         0 HR.         2.1
COL	LAR ELEV.	72	0.0 ft		TOT	AL DE	<b>PTH</b> 32	.6 ft		NC	RTHING 815,245 EASTING 1,724,460 24 HR. 2.3
	RIG/HAMME										DRILL METHOD NW Casing W/SPT & Core HAMMER TYPE Automatic
	LER Cont		Driller		_		<b>TE</b> 04/0			CC	MP. DATE 04/06/09 SURFACE WATER DEPTH N/A
	E SIZE NO			DDILL			<b>1</b> 14.0 f		ΛTΛ	ļ.,	
ELEV (ft)		PTH (ft)	RUN (ft)	DRILL RATE (Min/ft)	REC. (ft)	JN RQD (ft) %	SAMP. NO.	REC. (ft)	ATA RQD (ft) %	L O G	DESCRIPTION AND REMARKS  ELEV. (ft) DEPTH (ft
701.4 700	701.4 + 1	8.6	4.0	1:15/1.0	(2.8)	(2.2)		(12.8)	(12.0)		Begin Coring @ 18.6 ft  701.4 Green to Blue-Gray, Fresh to Very Slightly Weathered, Hard, Close to 18.6
695	697.4 - 2	22.6	5.0	2:30/1.0 3:30/1.0 4:15/1.0 3:45/1.0 2:45/1.0	70%	55% (5.0) 100%		91%	86%		Moderately Close Fracture Spacing, 2 Fractures at 45°, 1 at 20°, 1 at 80°, Diabase
	692.4 - 2	27.6	5.0	2:30/1.0 5:00/1.0 6:30/1.0 7:30/1.0	(5.0)	(4.8)					- - -
690	687.4 + 3	22.6	0.0	3:30/1.0 11:00/1.0 1:45/1.0	100%	96%					
	007.4 3	, <u>c</u> .U		1:45/1.0						7. 2	- 687.4 32.6 Boring Terminated at Elevation 687.4 ft In Crystalline Rock (Diabase)

BORING NO. B2-C  COLLAR ELEV. 718.9 ft  DRILL RIG/HAMMER EFF./DATE CM  DRILLER Contract Driller  ELEV DRIVE DEPTH BLOW COU	No. 3 & 4 on -L- (Greensboro/High Postation 139+54  TOTAL DEPTH 30.5 ft	on the Rd.) over Deep River at Sta. 140+22  OFFSET CL ALIGN	IMENT -L-	GROUND WTR (ft) 0 HR. 1.3
BORING NO. B2-C  COLLAR ELEV. 718.9 ft  DRILL RIG/HAMMER EFF./DATE CM  DRILLER Contract Driller  ELEV DRIVE DEPTH BLOW COU	STATION 139+54  TOTAL DEPTH 30.5 ft	OFFSET CL ALIGN	IMENT -L-	` ´
COLLAR ELEV. 718.9 ft  DRILL RIG/HAMMER EFF./DATE CM  DRILLER Contract Driller  ELEV DRIVE DEPTH BLOW COU	TOTAL DEPTH 30.5 ft			<b>0 HR.</b> 1.3
DRILL RIG/HAMMER EFF./DATE CMI DRILLER Contract Driller ELEV DRIVE DEPTH BLOW COU		NORTHING 815 276 EAST		
DRILLER Contract Driller  ELEV DRIVE DEPTH BLOW COU	- 450	1.0.1.1.1.1.1.0	ING 1,724,393	<b>24 HR.</b> 2.1
ELEV DRIVE DEPTH BLOW COU	<u>45C</u>	DRILL METHOD NW Casing V	N/SPT & Core HAMMER	R TYPE Automatic
CAN ELEV DE TOTAL	<b>START DATE</b> 04/06/09	COMP. DATE 04/06/09 SURFA	ACE WATER DEPTH N/A	
(it) Sisit Sisit	NT BLOWS PER FOOT 0.5ft 0 25 50	75 100 SAMP. NO. MOI G ELEV. (ft	SOIL AND ROCK DESCE	RIPTION DEPTH (ft)
720 718.9 0.0 WOH 1	1 40	718.9	GROUND SURFAC	CE0.0
715.7 + 3.2 WOH 1 \	WOH 1	SS-2 W	Brown and Orange, Silt	y Sand
711.1 7.8 WOH 1	1	SS-3 W	Gray, Sandy Silt	7.0
705 704.6 14.3 15 24 7 	6/0.2	706.9 	RESIDUAL Red and Gray, Sandy WEATHERED ROO	12.0 y Silt 13.6 CK
700			(Diabase)  CRYSTALLINE ROO  Blue-Gray, Fresh to Slightly Very Hard, Close to Moderately Clo	CK Weathered, ose Fracture
695			Spacing, 3 Fractures at 40° REC=83% RQD=78	<sup>3</sup> , Diabase 3%
690				
			Boring Terminated at Elevatic Crystalline Rock (Diat	30.5 on 688.4 ft In base)

									<u></u>	<u>UI</u>	RE LOG	
WBS	34802.	.1.1			TIP	U-241	2A	C	OUNT	Υ (	Geologist Howard, J.	
	DESCRI			ctures No				sboro/F	High Po	_	Rd.) over Deep River at Sta. 140+22 GROUND WTR	(ft)
	ING NO.				STAT	ΓΙΟΝ	139+54			-		1.3
COL	LAR ELE	<b>V</b> . 71	8.9 ft			AL DE	<b>PTH</b> 30.	5 ft		NC		2.1
	. RIG/HAMI			E CME-							DRILL METHOD NW Casing W/SPT & Core HAMMER TYPE Automat	tic
	LER Co		Driller				<b>TE</b> 04/0			CC	MP. DATE 04/06/09 SURFACE WATER DEPTH N/A	
COR	E SIZE		1	DDILL	TOT A		<b>1</b> 16.2 f		ATA			
ELEV (ft)	RUN ELEV (ft)	DEPTH (ft)	RUN (ft)	DRILL RATE (Min/ft)	REC. (ft)	RQD (ft) %	SAMP. NO.	REC. (ft)	RQD (ft) %	L O G	DESCRIPTION AND REMARKS ELEV. (ft) DEPT	ΓΗ (ft
704.6	704.6	14.3	1.2	N=60/0.0	(0.9)	(0.2)		/12 E\	(12.7)		Begin Coring @ 14.3 ft	11.0
700	704.6 -703.4 	- 15.5 - - - - - 20.5	5.0 5.0	N=60/0.0 2:15/1.0 :15/0.2 2:45/1.0 1:00/1.0 2:00/1.0 2:15/1.0 2:00/1.0	(5.0)	(0.3) (25%) (4.1) 82% (5.0)		(13.5) 83%	(12.7) 78%		704.6 CRYSTALLINE ROCK  Blue-Gray, Fresh to Slightly Weathered, Hard, Close to Moderately Close Fracture Spacing, 3 Fractures at 40°, Diabase	14.3
695	693.4	- - - 25.5	5.0	2:00/1.0 1:30/1.0 1:15/1.0 1:30/1.0 1:30/1.0 1:00/1.0		(3.3)						
690	688.4	- - - 30.5	3.0	1:30/1.0 1:30/1.0 1:00/1.0 1:00/1.0 1:15/1.0	68%	66%					688.4	30.5
	000.1	- - -		1.10/1.0							Boring Terminated at Elevation 688.4 ft In Crystalline Rock (Diabase)	00.0

			BORE LOG		
<b>WBS</b> 34802			NTY Guilford	<b>GEOLOGIST</b> Howard, J.	
		. 3 & 4 on -L- (Greensboro/Hig			GROUND WTR (ft)
BORING NO.	B2-D	<b>STATION</b> 139+90	OFFSET 32 ft RT	ALIGNMENT -L-	<b>0 HR.</b> 2.6
COLLAR ELE	<b>EV</b> . 719.2 ft	TOTAL DEPTH 34.6 ft	NORTHING 815,258	<b>EASTING</b> 1,724,438	24 HR. FIAD
DRILL RIG/HAM	MER EFF./DATE CME-4	45C	DRILL METHO	DD NW Casing W/SPT & Core HAMN	MER TYPE Automatic
DRILLER Co		<b>START DATE</b> 04/08/09	COMP. DATE 04/08/09	SURFACE WATER DEPTH N	I/A
ELEV DRIVE ELEV (ft)	DEPTH   BLOW COUNT   (ft)   0.5ft   0.5ft   0.5	<b>⊣</b>	75 100 NO. MO	O SOIL AND ROCK DES	SCRIPTION DEPTH (ft)
720 719.2	0.0 1 WOH 1			719.2 GROUND SURF	
	ļ   '  ''''  '	'   • 1	SS-1   D	717.2 Red-Brown, Silty	Sand <u>2.0</u>
715.7	3.5 1 1 1		SS-2 W	Red-Brown, San	dy Silt
	<u>†</u>				
710 710.7	+ 8.5			712.2 Gray, Silty Sa	7.0 nd
710 710.7	1 WOH 3	3	SS-3 W		
	‡	.\		707.7	11.5
705.7	13.5			WEATHERED R	13.5
705	60/0.0		60/0.0	CRYSTALLINE F Black and White, Fres	
1	<u>†</u>		RS-7	Weathered, Hard, Close	to Moderately
700	+			Close Fracture Spacing, 2 Granite	-ractures at 80°,
$\neg$	Ŧ			REC=75% RQD	
	‡			697.6  Blue-Gray, Fresh to Sligh	
695	‡		RS-8	Hard, Close Fracture Spa REC=92% RQD	acing, Diabase =78%
	<u>†</u>				. 67.0
	+				
690	‡				
	‡				
	‡				
685	<del>†      </del>			684.6 Boring Terminated at Elev	34.6 ation 684 6 ft In
				Crystalline Rock (E	oliabase)

									C	<u>O</u>	RE L	<u>OG</u>					
WBS	34802.	1.1			TIP	U-241	2A	С	OUNT	Υ (	Guilford			GEOLOGIST Howard,	J.		
SITE D	DESCRI	PTION	Stru	ictures No	. 3 &	4 on -L	- (Greens	sboro/H	ligh P	oint F	Rd.) over	Deep River at	Sta. 1	40+22		GROUN	ND WTR (ft)
BORIN	IG NO.	B2-D			STA	TION	139+90			OF	FSET 3	2 ft RT		ALIGNMENT -L-		0 HR.	2.6
COLL	AR ELE	<b>V</b> . 71	9.2 ft		TOT	AL DE	<b>PTH</b> 34	.6 ft		NO	RTHING	815,258		<b>EASTING</b> 1,724,438		24 HR.	FIAD
DRILL F	RIG/HAMI	MER EF	F./DAT	E CME-								DRILL METHO		Casing W/SPT & Core	HAMMI	ER TYPE	Automatic
	ER Co		Driller		<u> </u>		<b>TE</b> 04/0			co	MP. DA	E 04/08/09		SURFACE WATER DEF	TH N/	Α	
	SIZE	NQ		L DDILL	TOTA	AL RUI	N 21.1 f		<b>ΣΛΤΛ</b>	ļ.,							
ELEV (ft)	RUN ELEV (ft)	DEPTH (ft)	RUN (ft)	DRILL RATE (Min/ft)	REC. (ft)	RQD (ft) %	SAMP. NO.	REC. (ft)	RATA RQD (ft) %	L O G	ELEV. (f	t)	DI	ESCRIPTION AND REMARK	(S		DEPTH (ft
705.7 705	705.7	13.5	1.1	N=60/0.0	(0.2)	(0.0)		(6.1)	(5.2)		<b>—</b> 705.7			Begin Coring @ 13.5 ft CRYSTALLINE ROCK			13.5
	705.7 704.6	14.6 -	5.0	N=60/0.0 1:00/1.1 :30/1.0 1:30/1.0 2:00/1.0 2:15/1.0	(0.2) \_18% (3.9) 78%	(0.0) 0% (3.2) 64%	RS-7	75%	(5.2) 64%		705.7  			sh to Slightly Weathered, Hacture Spacing, 2 Fractures at			
700	699.6	- 19.6 - -	5.0	2:30/1.0 2:30/1.0 3:45/1.0 3:00/1.0 3:15/1.0		(4.5) 90%		(11.9)	(10.1)		- - 697.6	Rlue-Grav F	resh to	Slightly Weathered, Hard, C	lose Frac	ture Snar	21.6
695	694.6	- - 24.6 -	5.0	3:15/1.0 3:30/1.0 2:15/1.0 3:15/1.0	(4.8) 96%	(3.8) 76%	RS-8	(11.9) 92%	78%		- - -	blue-Oray, I	resir to	Diabase	1036 1 140	лиге орас	Jing,
690	689.6	- - 29.6 -	5.0	1:45/1.0 1:30/1.0 2:15/1.0 2:45/1.0	(5.0)	(4.3)					- - -						
685	684.6	- - - 34.6		2:45/1.0 3:45/1.0 4:00/1.0 4:30/1.0		86%					- - - - 684.6	Davis a Tarr	:	at Elevation 684.6 ft In Cryst	allina Da	alı (Diaha	34.6

### **TIP** U-2412A **WBS** 34802.1.1 **COUNTY** Guilford **GEOLOGIST** Howard, J. **SITE DESCRIPTION** Structures No. 3 & 4 on -L- (Greensboro/High Point Rd.) over Deep River at Sta. 140+22 GROUND WTR (ft) OFFSET 48 ft LT **STATION** 140+44 ALIGNMENT -L-BORING NO. B3-A 0 HR. 2.3 COLLAR ELEV. 717.3 ft TOTAL DEPTH 26.5 ft **NORTHING** 815,351 **EASTING** 1,724,463 24 HR. 2.0 DRILL RIG/HAMMER EFF./DATE CME-45C DRILL METHOD NW Casing W/SPT & Core HAMMER TYPE Automatic **DRILLER** Contract Driller **START DATE** 03/24/09 COMP. DATE 03/24/09 SURFACE WATER DEPTH N/A ELEV DRIVE ELEV (ft) DEPTH BLOW COUNT (ft) 0.5ft 0.5ft 0.5ft **BLOWS PER FOOT** SAMP. SOIL AND ROCK DESCRIPTION (ft) 0.5ft 0.5ft 0.5ft NO. 75 100 MOI G ELEV. (ft) 720 **GROUND SURFACE** 717.3 1 0.0 WOH ALLUVIAL SS-1 M Brown, Silty Clay 715 Gray, Sandy Silt woн woн woн SS-2 W . . . . 710 708.5 woн woн SS-3 W 705.8 + 11.5 WEATHERED ROCK 705 (Granite) RS-9 CRYSTALLINE ROCK Blue-Gray to Black and White, Fresh to Very Slightly Weathered, Hard, Close Fracture Spacing, Granite REC=96% RQD=88% 700 RS-10 . . . . 695 Boring Terminated at Elevation 690.8 ft In Crystalline Rock (Granite)

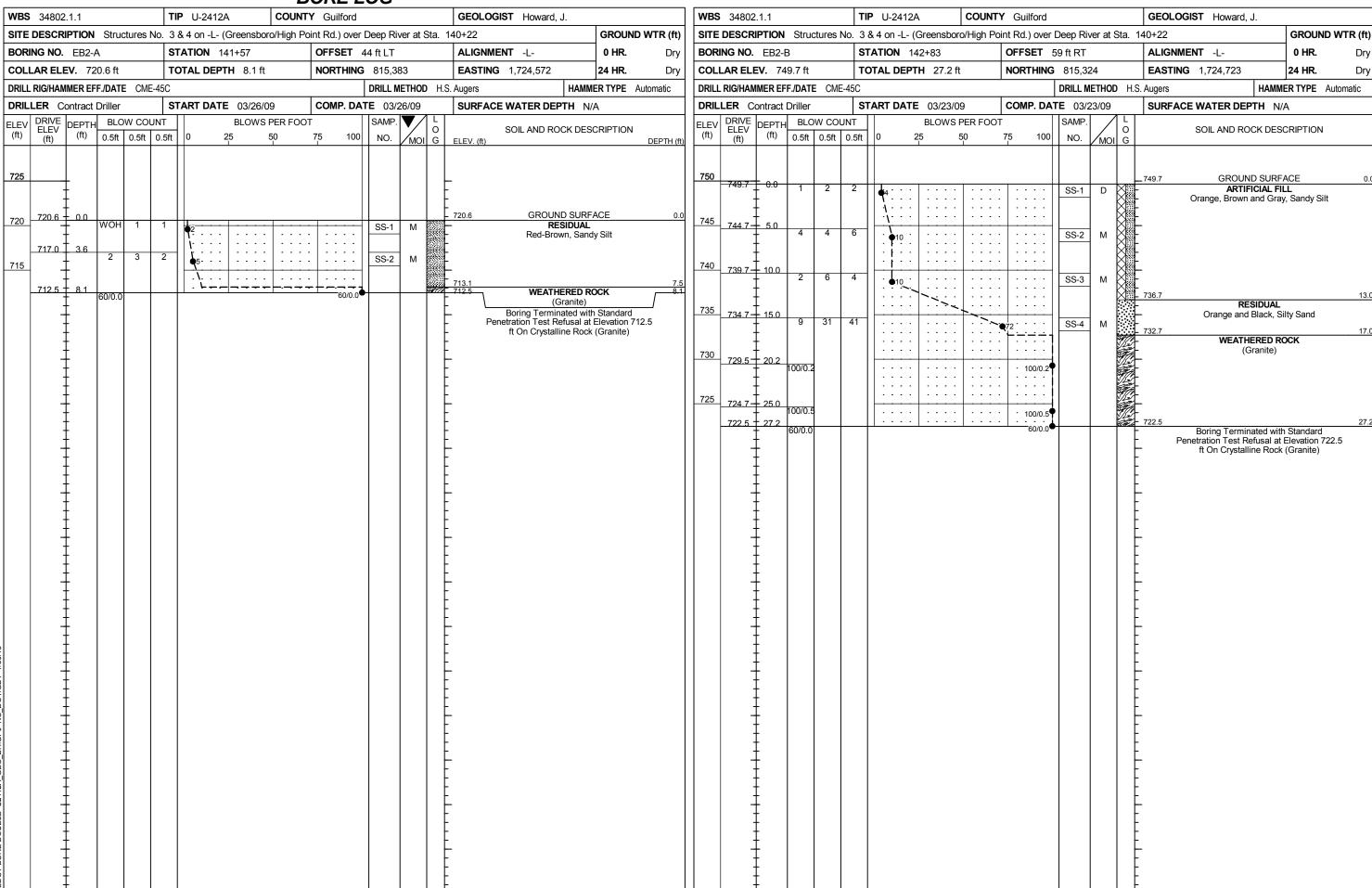
								C	O	RE LOG
<b>WBS</b> 34802.	1.1			TIP	U-241	2A	С	OUNT	Υ (	Guilford GEOLOGIST Howard, J.
SITE DESCRIP	PTION	Stru	ctures No	. 3 &	4 on -L	- (Greens	sboro/H	ligh P	oint	Rd.) over Deep River at Sta. 140+22 GROUND WTR (ft)
BORING NO.						140+44			+	FSET         48 ft LT         ALIGNMENT         -L-         0 HR.         2.3
COLLAR ELE	<b>V</b> . 71	7.3 ft		TOT	AL DE	<b>PTH</b> 26	.5 ft		NC	RTHING 815,351 EASTING 1,724,463 24 HR. 2.0
DRILL RIG/HAMN									1	DRILL METHOD NW Casing W/SPT & Core HAMMER TYPE Automatic
DRILLER Co		Driller		<b></b>		TE 03/2			CC	MP. DATE 03/24/09 SURFACE WATER DEPTH N/A
CORE SIZE I			DRILL			<b>N</b> 15.0 f		ATA	L	
ELEV ELEV (ft)	OEPTH (ft)	(ft)	RATE (Min/ft)	REC. (ft) %	UN RQD (ft) %	SAMP. NO.	STR REC. (ft) %	RQD (ft) %	Ö G	DESCRIPTION AND REMARKS  ELEV. (ft) DEPTH (ft)
705.8 705.8 700.8 700.8	16.5	5.0	N=60/0.0 2:30/1.0 2:45/1.0 2:45/1.0 2:45/1.0 4:00/1.0 2:15/1.0 1:30/1.0 1:30/1.0	(5.0) 100% (4.4) 88%	(4.3) 86% (4.4) 88%	RS-9 RS-10	(14.4) 96%	(13.2) 88%		Begin Coring @ 11.5 ft  -705.8 CRYSTALLINE ROCK 11.5  Blue-Gray to Black and White, Fresh to Very Slightly Weathered, Hard, Close Fracture Spacing, Granite
695	21.5	5.0	1:30/1.0 1:45/1.0 1:45/1.0 1:45/1.0	(5.0) 100%	(4.5) 90%					- - -
690.8	26.5		1:45/1.0 1:30/1.0							

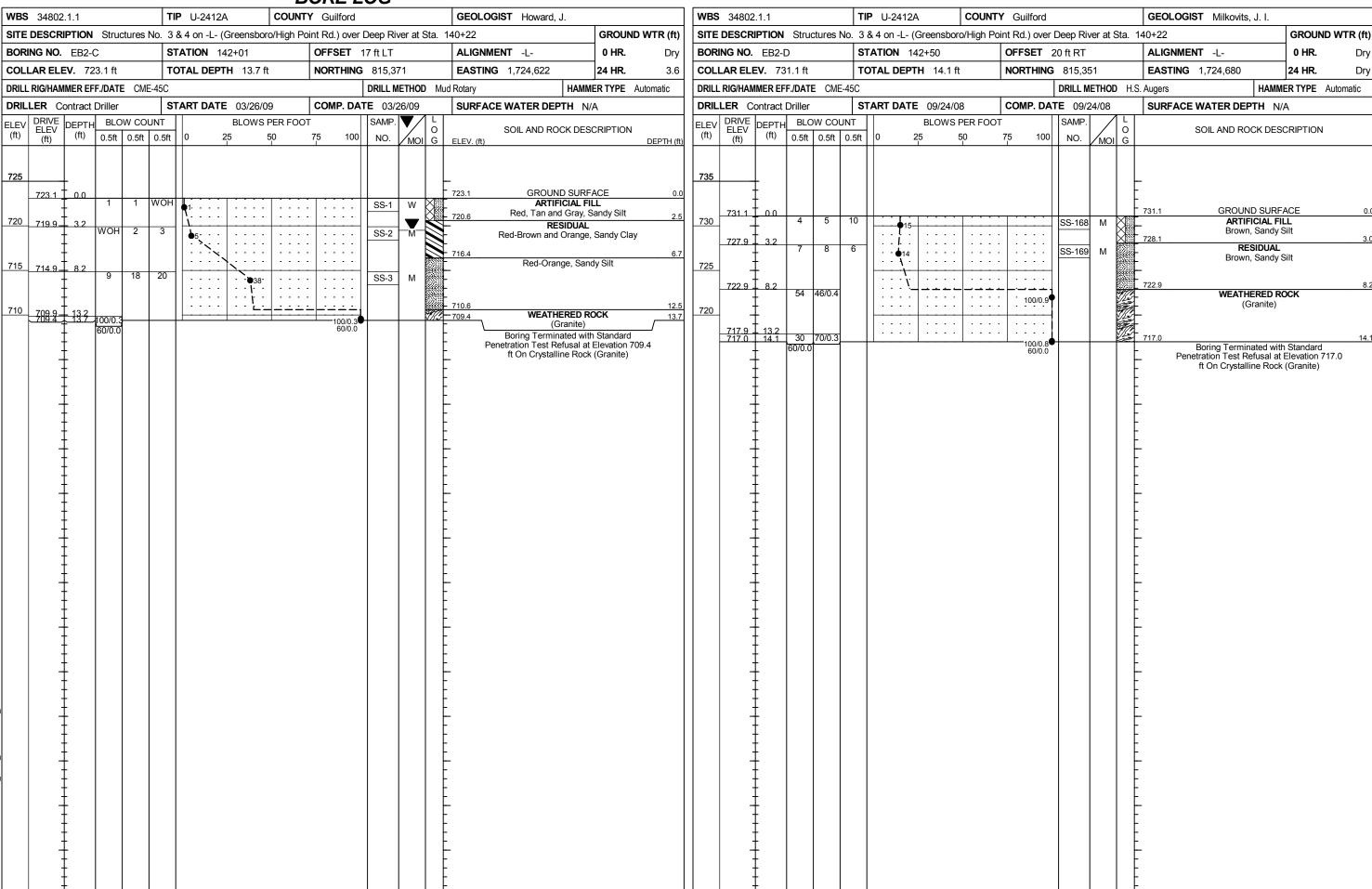
### **TIP** U-2412A **COUNTY** Guilford **GEOLOGIST** Howard, J. **WBS** 34802.1.1 **GROUND WTR (ft)** SITE DESCRIPTION Structures No. 3 & 4 on -L- (Greensboro/High Point Rd.) over Deep River at Sta. 140+22 OFFSET 51 ft RT ALIGNMENT -L-**STATION** 141+62 BORING NO. B3-B 0 HR. 2.0 COLLAR ELEV. 716.9 ft TOTAL DEPTH 41.0 ft **NORTHING** 815,295 **EASTING** 1,724,606 24 HR. 2.0 DRILL RIG/HAMMER EFF./DATE DRILL METHOD NW Casing W/SPT & Core HAMMER TYPE Automatic CME-45C **DRILLER** Contract Driller **START DATE** 03/24/09 COMP. DATE 03/24/09 SURFACE WATER DEPTH N/A ELEV CHI DEPTH BLOW COUNT (ft) (ft) (ft) 0.5ft 0.5ft 0.5ft **BLOWS PER FOOT** SAMP. SOIL AND ROCK DESCRIPTION (ft) 0.5ft 0.5ft 0.5ft 75 100 NO. MOI G ELEV. (ft) **GROUND SURFACE** 716.9 ALLUVIAL SS-1 M 715 Brown, Silty Clay Tan and Gray, Sandy Silt 713.4 + 3.5 woн woн woн SS-2 W . . . . 710 Tan, Silty Sand SS-3 W RESIDUAL 705 Black and White, Silty Sand WEATHERED ROCK 703.4 37 63/0.4 (Granite) 100/0.4 700 698.4 + 18.5 - 60/0.0 CRYSTALLINE ROCK Blue-Gray, Fresh to Weathered, Hard to Very Hard, Close Fracture Spacing, 695 Diabase REC=31% RQD=17% 690 685 . . . . Black and White, Slightly Weathered, Hard, Close Fracture Spacing, Granite . . . . 680 REC=100% RQD=71% Blue-Gray, Fresh to Moderately Severe Weathering, Moderately Hard to Hard, Very Close to Moderately Close Fracture Spacing, Diabase REC=86% RQD=55% Boring Terminated at Elevation 675.9 ft In

								C	Ui	RE LOG				
WBS	34802.1.1			TIP	U-241	2A	C	OUNT	<b>Y</b> (	Guilford		<b>GEOLOGIST</b> Howard, J.		
	DESCRIPTION		ictures No			,	sboro/F	High Po	1	Rd.) over Deep River at Sta	a. 1		┥	ID WTR (ft)
BOR	ING NO. B3-B			STAT	ΓΙΟΝ	141+62			-	FSET 51 ft RT		ALIGNMENT -L-	0 HR.	2.0
COL	LAR ELEV. 71	6.9 ft		TOT	AL DEI	<b>PTH</b> 41.	.0 ft		NO	RTHING 815,295		<b>EASTING</b> 1,724,606	24 HR.	2.0
	. RIG/HAMMER EF										NW			Automatic
	LER Contract	Driller				<b>TE</b> 03/2			СО	<b>MP. DATE</b> 03/24/09		SURFACE WATER DEPTH N	I/A	
COR	E SIZE NQ		I DDILL	l .	AL RUI	<b>V</b> 22.6 f	t   STR	ΔΤΔ						
ELEV (ft)	RUN ELEV (ft) DEPTH (ft)	RUN (ft)	DRILL RATE (Min/ft)	REC. (ft) %	RQD (ft) %	SAMP. NO.	REC. (ft) %	RQD (ft) %	L O G	ELEV. (ft)	DE	ESCRIPTION AND REMARKS		DEPTH (ft
698.5	698.5 + 18.4 695.9   21.0	2.6	4:15/1.0 N=60/0.0 3:15/1.0 2:00/0.6	(2.6) 100%	(0.4) 15%		(4.8) 31%	(2.6) 17%		- 698.5 - Blue-Gray, Fre	sh t	Begin Coring @ 18.4 ft CRYSTALLINE ROCK o Weathered, Hard to Very Hard, Cl	ose Fractu	18.4 re
695	-	5.0	2:00/0.6 3:45/1.0 2:00/1.0 3:00/1.0 3:00/1.0 2:30/1.0	(4.6) 92%	(2.4) 48%					<u>-</u> - -		Spacing, Diabase		
690	690.9 26.0	5.0	2:30/1.0 2:15/1.0 2:15/1.0 2:000/1.0 1:30/1.0		(5.0) 100%					- - -				
685	685.9 31.0	5.0	1:45/1.0 2:30/1.0 3:00/1.0 3:40/1.0		(2.3) 46%					- - - - - 683.2 - 682.5 Black and White				33.7
680	680.9 36.0	5.0	2:30/1.0 4:00/1.0 3:00/1.0 2:15/1.0		(3.0) 60%		(0.7) 100% (5.7) 86%	(0.5) 71% (3.6) 55%		Blue-Gray, Fresh	to I	lightly Weathered, Hard, Close Frac Moderately <b>Septe</b> Weathering, Mod to Moderately Close Fracture Spaci	erately Har	d to
	675.9 41.0		2:30/1.0 2:30/1.0 2:45/1.0	3470	0070		0070	3370		675.9	ted	at Elevation 675.9 ft In Crystalline R	ock (Diaba	41.0

WRS												<u>UG</u>				
	34802					<b>P</b> U-24			COUNT						GEOLOGIST Howard, J.	
SITE	DESCR	IPTION	Struc	ctures	No. 3	& 4 on -l	(Gree	nsboro	)/High Po	int Rd.)	over l	Deep Ri	ver at	Sta. 1	40+22	GROUND WTR (ft
BOR	ing no.	В3-С			S	TATION	141+2	7		OFFS	ET 2	2 ft RT			ALIGNMENT -L-	<b>0 HR.</b> 2.0
COL	LAR ELE	<b>EV</b> . 71	6.3 ft		т	OTAL DE	PTH	16.7 ft		NORT	HING	815,3	11		<b>EASTING</b> 1,724,564	<b>24 HR.</b> 2.0
	RIG/HAM			E CMI	E-45C					•		DRILL N	IETHOI	) H.S	. Augers HAMMI	R TYPE Automatic
DRIL	LER C	ontract l	Driller		S	TART DA	ATE 03	3/25/09	9	COME	P. DA1	E 03/2	25/09		SURFACE WATER DEPTH N/A	4
ELEV	DRIVE ELEV	DEPTH	BLC	W CO	UNT		BL	OWS F	PER FOOT	-		SAMP.	<b>V</b> /		OO! AND DOOK DEGG	DIDTION
(ft)	(ft)	(ft)	0.5ft	0.5ft	0.5ft	0	25	5	50	75	100	NO.	MOI	O G	SOIL AND ROCK DESC	CRIPTION DEPTH (
720														lL	-	
	-	<u> </u>														
	716.3	0.0	WOLL		1	<u> </u>				1				L	716.3 GROUND SURFA	ACE 0
715	-	-	WOH	1	1	<b>P</b> 2						SS-1	M		ALLUVIAL Tan and Red, Silty	Clay2
	713.3	3.0	1	WOH	WOH					: :		SS-2	w	<b>I</b>	Tan and Gray, San	dy Silt
710	-	F				<b> </b>  \(\)			: : : :				İ		_709.8	6.
	708.3	8.0				<del> </del> .									Tan and Gray, Sand	y Clay
	700.5	- 0.0	34	13	6		19				: :	SS-3	w			
705	_	<u> </u>					7 .								705.3 RESIDUAL	11.
	703.3	13.0	7	11	15		:\ :				: :		_		Blue-Gray, Sandy	Silt
	-	<u> </u>	,	''	15		. 26		: : : :			SS-4	D	₩±		
700	699.6	16.7	60/0.0					\ <u></u>		<u> </u>	60/0.0				-699.6	Oten deed
	_	-	00/0.0											l F	Boring Terminated with Penetration Test Refusal at ft On Crystalline Rock	Elevation 699.6

SHEET 21





ER1-A
LDI-A

			S	OIL 7	$\Gamma E$ :	ST	RE	SIII							
SAMPLE															
NO.															ORGANIC
SS-1	52 LT	137+56	0.0-1.5	A-6(5)	37	12	23.0	23.0	29.7	24.2	94	79	56	-	-
SS-2	52 LT	137+56	3.5-5.0	A-4(2)	24	8	21.0	26.1	30.7	22.2	94	80	56	-	-
SS-3	52 LT	137+56	8.5-10.0	A-6(3)	30	15	21.0	38.4	14.3	26.3	100	88	47	-	-

*EB1-B* 

			S	OIL 7	TE.	ST	RE	SUI	LTS						
SAMPLE			DEPTH	AASHTO				% BY V	VEIGHT		% PAS	SING (S	IEVES)	%	%
NO.	OFFSET	STATION	INTERVAL	CLASS.	L.L.	P.I.	C.SAND	F.SAND	SILT	CLAY	10	40	200	MOISTURE	ORGANIC
SS-1	47 RT	138+86	0.0-1.5	A-4(4)	34	9	27.1	15.8	32.9	24.2	97	78	59	-	•
SS-2	47 RT	138+86	3.5-5.0	A-6(3)	31	12	13.5	42.2	18.0	26.3	100	95	52	-	-
SS-3	47 RT	138+86	8.5-10.0	A-2-4(0)	29	10	48.7	23.2	9.9	18.2	79	50	25	-	-
SS-4	47 RT	138+86	13.5-15.0	A-1-a(0)	24	2	48.3	24.6	19.0	8.1	43	27	14	-	

EB1-C

			S	OIL T	TE.	ST	RE	SUI	TS						
SAMPLE	SAMPLE DEPTH AASHTO % BY WEIGHT % PASSING (SIEVES) % %														
NO.	OFFSET	STATION	INTERVAL	CLASS.	L.L.	P.I.	C.SAND	F.SAND	SILT	CLAY	10	40	200	MOISTURE	ORGANIC
SS-16	20 LT	138+00	3.5-5.0	A-6(5)	33	13	18.2	25.1	28.3	28.4	94	83	58	-	-

EB1-D															
			S	OIL 7	TE.	ST	RE	SUI	TS						
SAMPLE			DEPTH	AASHTO				% BY V	/EIGHT		% PAS	SING (S	IEVES)	%	%
NO.	OFFSET	STATION	INTERVAL	CLASS.	L.L.	P.I.	C.SAND	F.SAND	SILT	CLAY	10	40	200	MOISTURE	ORGANIC
SS-1	17 RT	138+43	0.0-1.5	A-4(0)	28	5	38.2	29.1	18.6	14.1	96	75	36	-	-
SS-2	17 RT	138+43	4.3-5.8	A-2-4(0)	18	NP	31.7	41.0	17.2	10.1	100	85	33	-	-
SS-3	17 RT	138+43	9.6-10.6	A-2-4(0)	23	NP	63.6	22.9	5.4	8.1	97	57	15	-	-
SS-4	17 RT	138+43	14.4-15.4	A-6(6)	40	12	18.4	26.3	39.2	16.2	100	91	61	-	-

*B1-A* 

			C	OIL 7	rE	CT	DE	CIII	TC						
			<u> </u>	UIL I		<u>) 1</u>	NL	SUL	<u> </u>						
SAMPLE			DEPTH	AASHTO				% BY W	VEIGHT		% PAS	SING (S	IEVES)	%	%
NO.	OFFSET	STATION	INTERVAL	CLASS.	L.L.	P.I.	C.SAND	F.SAND	SILT	CLAY	10	40	200	MOISTURE	ORGANIC
SS-1	51 LT	138+40	0.0-1.5	Material	Not	inoug	26.4	24.8	32.5	16.3	97	75	55	-	-
SS-2	51 LT	138+40	3.9-5.4	A-2-4(0)	19	NP	38.4	39.2	12.2	10.2	100	78	27	-	
SS-3	51 LT	138+40	7.9-9.4	A-4(2)	30	8	4.9	49.2	23.6	22.4	100	99	57	-	-
SS-4	51 LT	138+40	12.9-13.4	A-1-b(0)	21	NP	56.9	25.8	9.1	8.1	57	32	12	-	-

			$\boldsymbol{S}$	OIL 7	TE.	ST	<b>RE</b>	SUI	LTS						
SAMPLE															
NO.	NO. OFFSET STATION INTERVAL CLASS. L.L. P.I. C.SAND F.SAND SILT CLAY 10 40 200 MOISTURE ORGANIC														
SS-1	NO. OFFSET STATION INTERVAL CLASS. L.L. P.I. C.SAND F.SAND SILT CLAY 10 40 200 MOISTURE ORGANIC														
SS-2	56 RT	139+54	3.0-4.5	A-4(0)	25	7	39.8	23.6	18.3	18.3	100	78	40	-	-
SS-3	56 RT	139+54	8.2-9.7	A-2-6(0)	29	11	36.8	32.3	8.5	22.4	92	71	32	-	
SS-4	56 RT	139+54	13.2-14.7	A-1-b(0)	27	2	57.3	25.6	11.0	6.1	85	50	18	-	-

<i>B1-C</i>															
			S	OIL T	TE.	ST	RE	SUL	LTS						
SAMPLE			DEPTH	AASHTO				% BY W	VEIGHT		% PAS	SING (S	IEVES)	%	%
NO.	OFFSET	STATION	INTERVAL	CLASS.	L.L.	P.I.	C.SAND	F.SAND	SILT	CLAY	10	40	200	MOISTURE	ORGANIC
SS-1	24 RT	139+22	0.0-1.5	A-7-6(11)	43	15	10.0	22.4	37.2	30.5	100	94	74	-	-
SS-2	24 RT	139+22	5.0-6.5	A-6(2)	34	12	16.7	44.5	10.4	28.5	100	93	45	-	-
SS-3	24 RT	139+22	8.8-10.3	A-2-4(0)	22	2	36.8	38.8	14.2	10.2	69	54	21	-	-

B2-A

			S	OIL T	$\Gamma E_{i}$	ST	RE	SUI	LTS						
SAMPLE															
NO.	OFFSET	STATION	INTERVAL	CLASS.	L.L.	P.I.	C.SAND	F.SAND	SILT	CLAY	10	40	200	MOISTURE	ORGANIC
SS-1	55 LT	138+90	0.0-1.5	A-4(0)	28	4	12.8	52.3	20.7	14.2	100	97	42	-	-
SS-2	55 LT	138+90	3.5-5.0	A-2-4(0)	24	2	39.1	30.3	22.5	8.1	100	83	35	-	-
SS-3	55 LT	138+90	8.5-10.0	Material	Not	noug	56.2	25.2	14.5	4.1	82	55	18	-	-
SS-4	55 LT	138+90	13.5-14.0	A-1-b(0)	18	2	62.5	21.6	9.9	6.1	70	35	14	-	-
SS-5	55 LT	138+90	18.5-20.0	A-2-4(0)	28	NP	13.4	59.8	22.7	4.1	95	89	35	-	-

*B2-B* 

			$\boldsymbol{S}$	OIL 7	TE	ST	<b>RE</b>	SUI	LTS						
SAMPLE															
NO.	OFFSET	STATION	INTERVAL	CLASS.	L.L.	P.I.	C.SAND	F.SAND	SILT	CLAY	10	40	200	MOISTURE	ORGANIC
SS-1	52 RT	140+07	0.0-1.5	A-2-4(0)	26	NP	35.4	44.6	11.9	8.1	100	88	24	-	-
SS-2	52 RT	140+07	3.5-5.0	A-4(0)	25	5	31.3	32.1	24.3	12.2	100	84	43	-	-
SS-3	52 RT	140+07	8.5-10.0	A-2-4(0)	21	NP	44.4	41.7	7.8	6.1	100	84	17	-	-
SS-4	52 RT	140+07	13.5-15.0	A-2-4(0)	31	9	39.7	21.0	29.2	10.2	54	37	24	-	-

*B2-C* 

			S	OIL T	TE.	ST	RE	SUL	LTS						
SAMPLE															
NO.	NO. OFFSET STATION INTERVAL CLASS. L.L. P.I. C.SAND F.SAND SILT CLAY 10 40 200 MOISTURE ORGANIC														
SS-1	NO. 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1														
SS-2	CL	139+54	3.2-4.7	A-2-4(0)	23	NP	43.3	33.0	15.6	8.1	100	84	27	-	-
SS-3	CL	139+54	7.8-9.3	A-4(0)	27	6	28.9	37.8	15.0	18.3	100	85	39	-	-
SS-4	CL	139+54	13.1-13.6	A-4(1)	31	3	2.8	36.0	53.0	8.1	92	91	67	-	-

D	<b>つ</b>	$\boldsymbol{T}$
D		IJ

			S	OIL T	$\Gamma E_{s}$	ST	RE	SUL	LTS						
SAMPLE			DEPTH	AASHTO				% BY W	/EIGHT		% PAS	SING (S	IEVES)	%	%
NO.	OFFSET	STATION	INTERVAL	CLASS.	L.L.	P.I.	C.SAND	F.SAND	SILT	CLAY	10	40	200	MOISTURE	ORGANIC
SS-1	32 RT	139+90	0.0-1.5	A-2-4(0)	23	NP	36.0	40.9	15.0	8.1	100	82	28	-	-
SS-2	32 RT	139+90	3.5-5.0	A-4(0)	25	3	37.2	29.5	23.1	10.2	100	77	40	-	-
SS-3	32 RT	139+90	8.5-10.0	A-2-4(0)	20	NP	50.3	34.8	8.9	6.1	100	76	18	-	-

<i>B3-A</i>															
			S	OIL T	$\Gamma E_{i}$	ST	RE	SUL	LTS						
SAMPLE			DEPTH	AASHTO				% BY W	VEIGHT		% PAS	SING (S	IEVES)	%	%
NO.	OFFSET	STATION	INTERVAL	CLASS.	L.L.	P.I.	C.SAND	F.SAND	SILT	CLAY	10	40	200	MOISTURE	ORGANIC
SS-1	48 LT	140+44	0.0-1.5	A-7-6(13)	45	17	3.2	28.5	38.0	30.3	100	99	76	-	-
SS-2	48 LT	140+44	3.8-5.3	A-4(6)	30	9	3.2	28.3	40.2	28.3	100	99	77	-	-
SS-3	48 LT	140+44	8.8-10.3	A-4(0)	20	1	22.8	46.9	14.1	16.2	100	93	37	-	-

### *B3-B*

SOIL TEST RESULTS															
SAMPLE			DEPTH	AASHTO				% BY V	VEIGHT		% PAS	SING (S	IEVES)	%	%
NO.	OFFSET	STATION	INTERVAL	CLASS.	L.L.	P.I.	C.SAND	F.SAND	SILT	CLAY	10	40	200	MOISTURE	ORGANIC
SS-1	51 RT	141+62	0.0-1.5	A-7-6(12)	42	16	12.9	15.8	41.0	30.3	98	89	74	-	-
SS-2	51 RT	141+62	3.5-5.0	A-4(1)	25	7	12.5	39.2	22.0	26.3	100	95	56	-	-
SS-3	51 RT	141+62	8.5-9.9	A-2-4(0)	28	9	32.3	36.2	11.3	20.2	79	66	28	-	-

# *B3-C*

SOIL TEST RESULTS															
SAMPLE			DEPTH	AASHTO				% BY W	/EIGHT		% PAS	SING (S	IEVES)	%	%
NO.	OFFSET	STATION	INTERVAL	CLASS.	L.L.	P.I.	C.SAND	F.SAND	SILT	CLAY	10	40	200	MOISTURE	ORGANIC
SS-1	22 RT	141+27	0.0-1.5	A-7-5(21)	49	19	3.4	8.3	43.8	44.4	100	98	91	-	-
SS-2	22 RT	141+27	3.0-4.5	A-4(0)	26	6	36.8	19.6	25.5	18.2	94	69	45	-	-
SS-3	22 RT	141+27	8.0-9.5	A-6(3)	33	13	19.4	36.8	13.5	30.3	98	91	48	-	-
SS-4	22 RT	141+27	13.0-14.5	A-4(4)	32	5	5.7	23.2	52.9	18.2	98	94	79	-	-

### EB2-A

SOIL TEST RESULTS															
SAMPLE			DEPTH	AASHTO				% BY V	VEIGHT		% PAS	SING (S	SIEVES)	%	%
NO.	OFFSET	STATION	INTERVAL	CLASS.	L.L.	P.I.	C.SAND	F.SAND	SILT	CLAY	10	40	200	MOISTURE	ORGANIC
SS-1	44 LT	141+57	0.0-1.5	A-4(0)	24	5	28.5	25.1	26.3	20.2	95	76	50	-	-
SS-2	44 LT	141+57	3.6-5.1	A-4(2)	27	10	27.9	22.2	23.6	26.3	98	80	53	-	-

## EB2-B

SOIL TEST RESULTS															
SAMPLE			DEPTH	AASHTO				% BY V	VEIGHT		% PAS	SING (S	IEVES)	%	%
NO.	OFFSET	STATION	INTERVAL	CLASS.	L.L.	P.I.	C.SAND	F.SAND	SILT	CLAY	10	40	200	MOISTURE	ORGANIC
SS-1	59 RT	142+83	0.0-1.5	A-4(1)	29	8	30.7	25.5	23.6	20.2	96	76	48	-	-
SS-2	59 RT	142+83	5.0-6.5	A-4(2)	30	7	24.0	26.3	29.5	20.2	95	78	54	-	-
SS-3	59 RT	142+83	10.0-11.5	A-4(0)	29	8	37.6	24.2	22.0	16.2	93	67	40	-	-
SS-4	59 RT	142+83	15.0-16.5	A-2-4(0)	19	NP	36.1	39.0	15.9	9.1	100	82	32	•	•

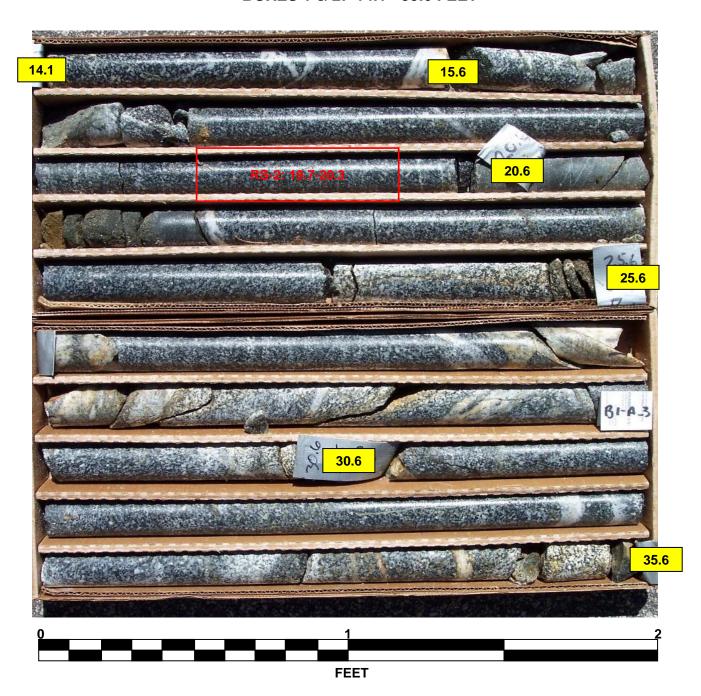
# EB2-C

SOIL TEST RESULTS															
SAMPLE			DEPTH	AASHTO				% BY W	/EIGHT		% PAS	SING (S	IEVES)	%	%
NO.	OFFSET	STATION	INTERVAL	CLASS.	L.L.	P.I.	C.SAND	F.SAND	SILT	CLAY	10	40	200	MOISTURE	ORGANIC
SS-1	17 LT	142+01	0.0-1.5	A-4(1)	30	5	21.6	26.1	32.1	20.2	99	84	59	-	-
SS-2	17 LT	142+01	3.2-4.7	A-6(5)	29	12	21.0	21.4	27.3	30.3	99	85	62	-	-
SS-3	17 LT	142+01	8.2-9.7	A-4(3)	27	9	22.6	21.8	27.3	28.3	100	85	61	-	-

EB2-D															
			$\boldsymbol{S}$	OIL 7	TE.	ST	RE	SUL	TS						
SAMPLE			DEPTH	AASHTO				% BY W	/EIGHT		% PAS	SING (S	IEVES)	%	%
NO.	OFFSET	STATION	INTERVAL	CLASS.	L.L.	P.I.	C.SAND	F.SAND	SILT	CLAY	10	40	200	MOISTURE	ORGANIC
SS-168	20 RT	142+50	0.0-1.5	A-4(2)	28	9	28.1	23.0	24.8	24.0	95	76	51	-	-
SS-169	20 RT	142+50	3.2-4.7	A-4(2)	29	9	29.9	22.0	24.0	24.0	95	74	50	-	-

			R	OCK :	TEST	RESU	LTS		
SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	H/D RATIO	UNIT WT lbs/ft3	Ultimate lbf	Ultimate ksi	Ultimate (corrected) ksi	Sec. Mod. @ 40% Mpsi
RS-1	51 LT	138+40	14.8-15.4			S	AMPLE DAMAG	ED	
RS-2	51 LT	138+40	19.7-20.3	2.21	182.5	66900	24.6	24.9	6.37
RS-3	56 RT	139+54	19.6-20.3	2.15	184.1	62700	23.1	23.3	8.59
RS-4	56 RT	139+54	28.7-29.3	2.19	168.8	60900	22.4	22.6	7.43
RS-5	55 LT	138+90	22.9-23.5	2.19	184.4	65200	24.0	24.2	8.06
RS-6	55 LT	138+90	29.9-30.5	2.15	182.5	43200	15.9	16.0	6.07
RS-7	32 RT	139+90	15.7-16.3	2.24	166.7	35300	13.0	13.2	4.30
RS-8	32 RT	139+90	22.9-23.6	2.21	178.2	90200	33.2	33.6	7.22
RS-9	48 LT	140+44	12.9-13.4	2.21	178.2	55400	20.4	20.6	6.60
RS-10	48 LT	140+44	16.5-17.0	2.16	182.7	48200	18.3	18.5	6.70

**B1-A**BOXES 1 & 2: 14.1 - 35.6 FEET



**B1-B**BOXES 1 & 2: 19.6 - 32.3 FEET





**B2-A**BOXES 1 & 2: 21.6 - 40.6 FEET



**B2-B**BOXES 1 & 2: 18.6 - 32.6 FEET





**B2-C**BOXES 1 & 2: 14.3 - 30.5 FEET

20.5 B2-B-3 30.5

0 1 2
FEET

**B2-D**BOXES 1 & 2: 13.5 - 34.6 FEET



**B3-A**BOXES 1 & 2: 11.5 - 26.5 FEET

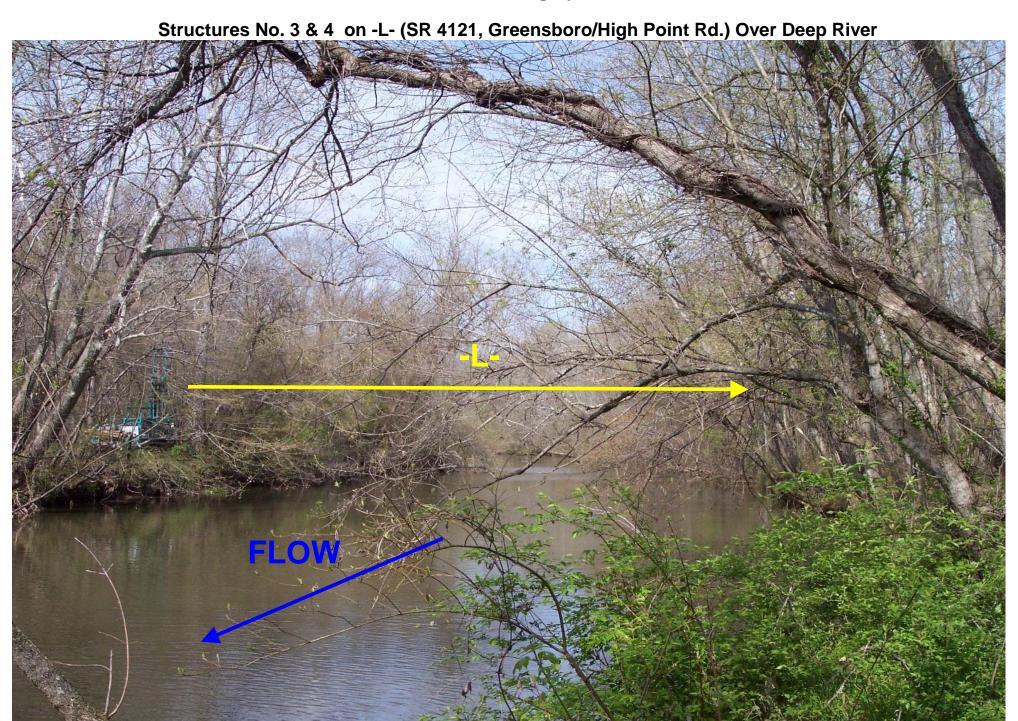




**B3-B**BOXES 1, 2 & 3: 18.4 - 41.0 FEET



# Site Photograph



**Looking North** 

7
2
41
Ċ
5
_
Ä

**CONTENTS** 

2

4

9-18

19

20

21, 22

23

**DESCRIPTION** 

BORE LOGS & CORE REPORTS

TITLE SHEET

LEGEND

PROFILE

SITE PLAN

CROSS SECTIONS

SCOUR REPORT

SOIL TEST RESULTS

CORE PHOTOGRAPHS

SITE PHOTOGRAPH

# OJECT: 34802.1.1

DRAWN BY: N.D. MOHS

# STATE OF NORTH CAROLINA

DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS
GEOTECHNICAL ENGINEERING UNIT

# STRUCTURE SUBSURFACE INVESTIGATION

PROJ. REFERENCE NO. 34802.1.1 (U-2412A) F.A. PROJ. STP-4121(1)
COUNTY GUILFORD
PROJECT DESCRIPTION GREENSBORO/HIGH POINT RD. FROM
PROPOSED US 311 BYPASS TO WEST OF SR 1480
SITE DESCRIPTION STRUCTURES NO. 5 & 6 ON -L- (SR 4121,

GREENSBORO/HIGH POINT RD.) OVER BULL RUN CREEK

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOT
N.C.	34802.1.1 (U-2412A)	1	19

### **CAUTION NOTICE**

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

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

THE BIDDER OR CONTRACTOR IS CAUTIONED THAT DETAILS SHOWN ON THE SUBSURFACE PLANS ARE PRELIMINARY ONLY AND IN MANY CASES THE FINAL DESIGN DETAILS ARE DIFFERENT, FOR BIDDING AND CONSTRUCTION PURPOSES, REFER TO THE CONSTRUCTION PLANS AND DOCUMENTS FOR FINAL DESIGN INFORMATION ON THIS PROJECT. THE DEPARTMENT DOES NOT WARRANT OR GUARANTEE THE SUFFICIENCY OR ACCURACY OF THE INVESTICATION MADE, NOT THE INTERFERTATIONS 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 INVESTICATIONS AS HE DEEMS NECESSARY TO SATISFY HIMSELF AS TO CONDITIONS TO BE ENCOUNTERED ON THIS PROJECT. THE CONTRACTOR SHALL HAVE NO CLAIM FOR ADDITIONAL COMPENSATION OR FOR AN EXTENSION OF TIME FOR ANY REASON RESULTING FROM THE ACTUAL CONDITIONS ENCOUNTERED AT THE SITE DIFFERING FROM THOSE INDICATED IN THE SUBSURFACE INFORMATION.

N.D. MOHS

T.T. WALKER

MACTEC

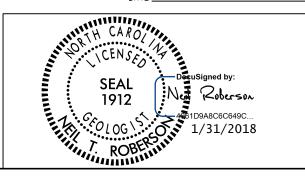
INVESTIGATED BY N.D. MOHS

CHECKED BY C.D. CZAJKA

SUBMITTED BY N.T. ROBERSON

DATE MAY 2009

**PERSONNEL** 



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.

AT STATION 155+03

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

# PROJECT REFERENCE NO. SHEET NO. 34802.I.I (U-2412A) 2

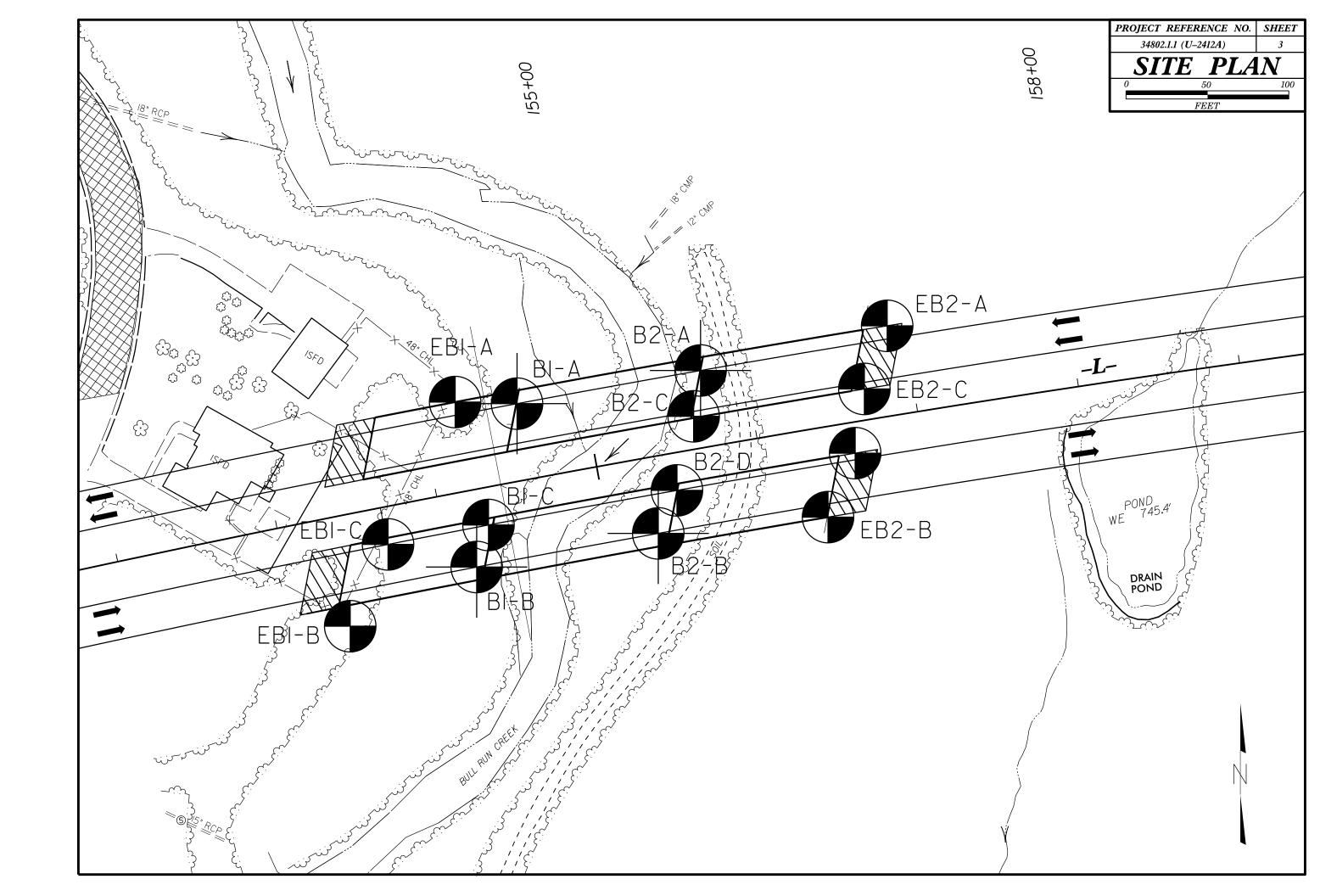
### NORTH CAROLINA DEPARTMENT OF TRANSPORTATION

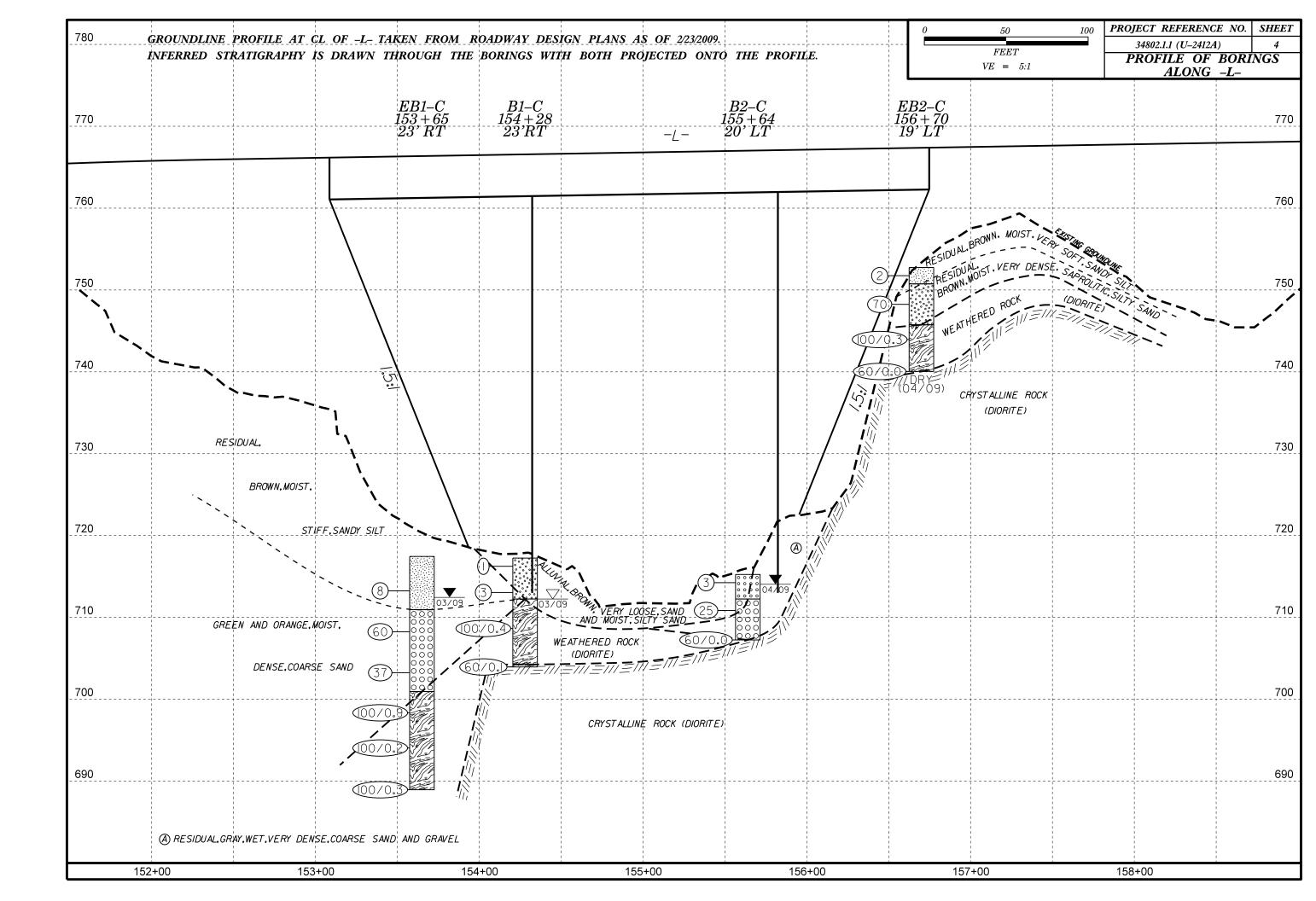
### DIVISION OF HIGHWAYS

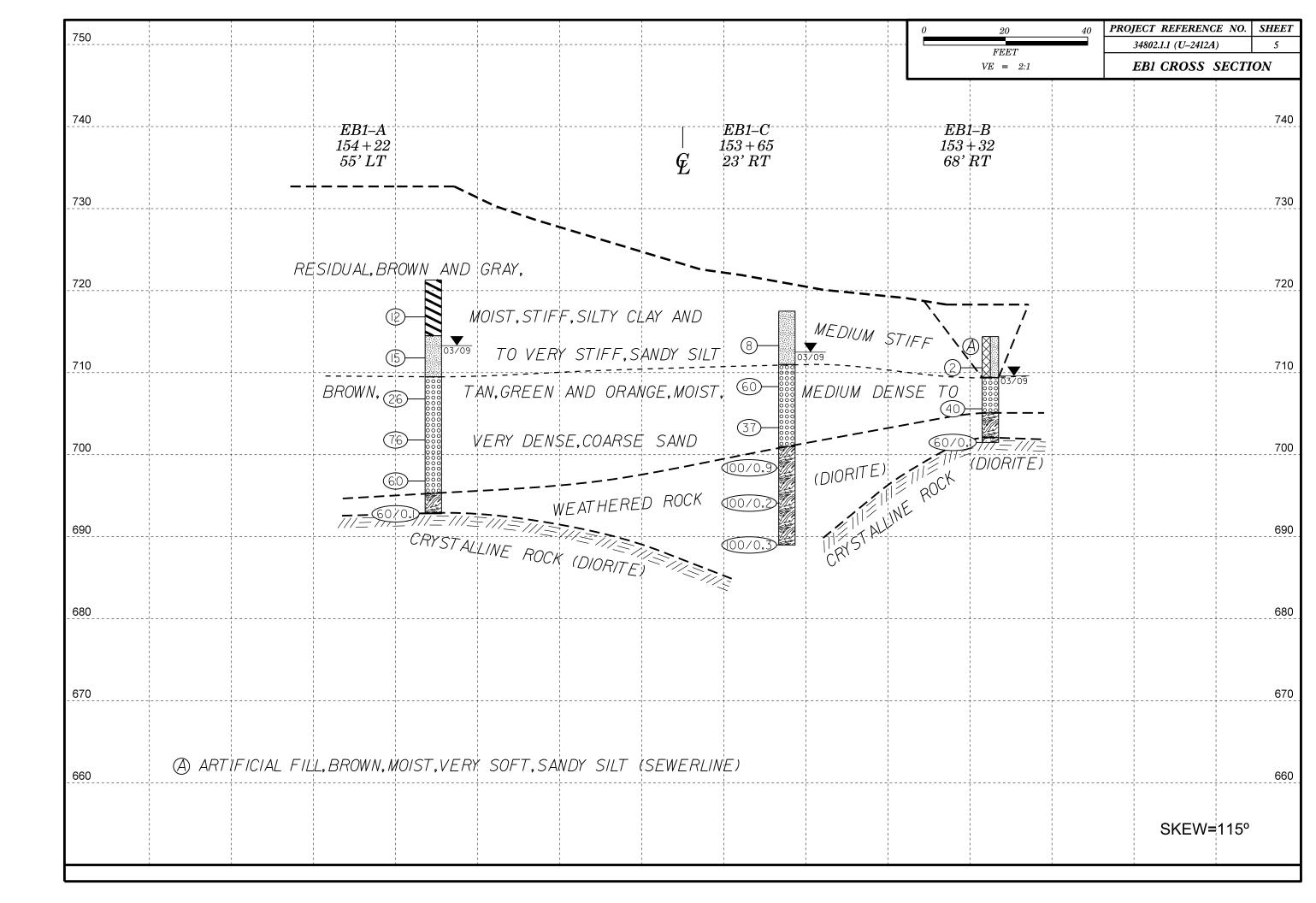
GEOTECHNICAL ENGINEERING UNIT

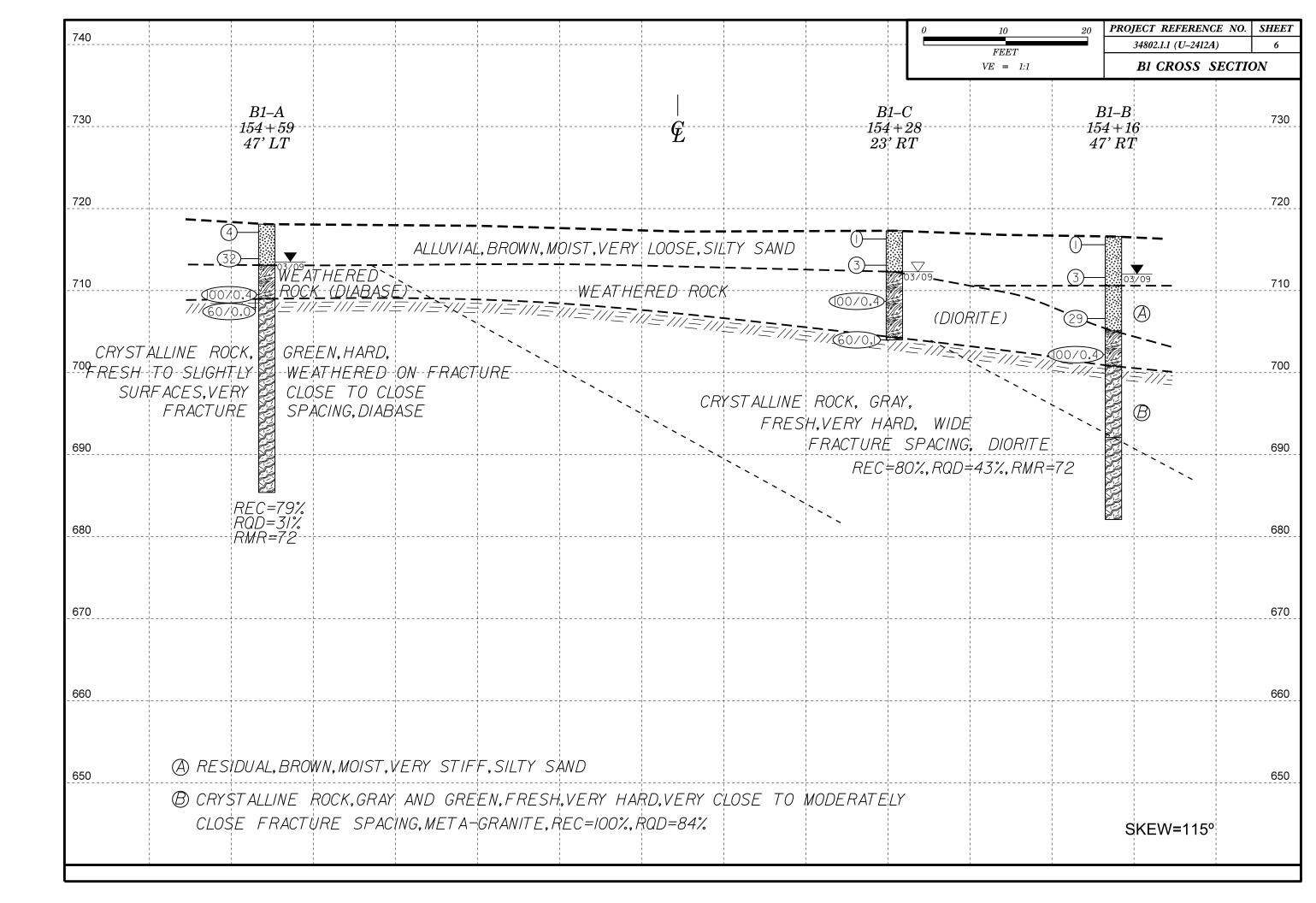
# SUBSURFACE INVESTIGATION

	SOIL AND ROCK LEGEND, TERM	MS, SYMBOLS, AND ABBREVIATIONS	
SOIL DESCRIPTION	GRADATION	ROCK DESCRIPTION	TERMS AND DEFINITIONS
SOIL IS CONSIDERED TO BE THE UNCONSOLIDATED, SEMI-CONSOLIDATED, OR WEATHERED EARTH MATERIALS	WELL GRADED - INDICATES A GOOD REPRESENTATION OF PARTICLE SIZES FROM FINE TO COARSE.  UNIFORM - INDICATES THAT SOIL PARTICLES ARE ALL APPROXIMATELY THE SAME SIZE. (ALSO	HARD ROCK IS NON-COASTAL PLAIN MATERIAL THAT IF TESTED, WOULD YIELD SPT REFUSAL, AN INFERRED ROCK LINE INDICATES THE LEVEL AT WHICH NON-COASTAL PLAIN MATERIAL WOULD YIELD SPT REFUSAL.	ALLUVIUM (ALLUV.) - SOILS THAT HAVE BEEN TRANSPORTED BY WATER.
THAT CAN BE PENETRATED WITH A CONTINUOUS FLIGHT POWER AUGER, AND YIELD LESS THAN 100 BLOWS PER FOOT ACCORDING TO STANDARD PENETRATION TEST (AASHTO T206, ASTM D-1586). SOIL	POORLY GRADED) GAP-GRADED - INDICATES A MIXTURE OF UNIFORM PARTICLES OF TWO OR MORE SIZES.	SPT REFUSAL IS PENETRATION BY A SPLIT SPOON SAMPLER EQUAL TO OR LESS THAN 0.1 FOOT PER 60 BLOWS. IN NON-COASTAL PLAIN MATERIAL, THE TRANSITION BETWEEN SOIL AND ROCK IS OFTEN REPRESENTED BY A ZONE	AGUIFER - A WATER BEARING FORMATION OR STRATA.
CLASSIFICATION IS BASED ON THE AASHTO SYSTEM. BASIC DESCRIPTIONS GENERALLY SHALL INCLUDE: CONSISTENCY, COLOR, TEXTURE, MOISTURE, AASHTO CLASSIFICATION, AND OTHER PERTINENT FACTORS SUCH	ANGULARITY OF GRAINS	OF WEATHERED ROCK, ROCK MATERIALS ARE TYPICALLY DIVIDED AS FOLLOWS:	ARENACEOUS - APPLIED TO MUCKS THAT HAVE BEEN DERIVED FROM SAND OR THAT CONTAIN SAND.
AS MINERALOGICAL COMPOSITION, ANGULARITY, STRUCTURE, PLASTICITY, ETC. EXAMPLE:	THE ANGULARITY OR ROUNDNESS OF SOIL GRAINS IS DESIGNATED BY THE TERMS: ANGULAR, SUBANGULAR, SUBROUNDED, OR ROUNDED.	WEATHERED NON-COASTAL PLAIN MATERIAL THAT WOULD YIELD SPT N VALUES > 100	ARGILLACEOUS - APPLIED TO ALL ROCKS OR SUBSTANCES COMPOSED OF CLAY MINERALS, OR HAVING A NOTABLE PROPORTION OF CLAY IN THEIR COMPOSITION, AS SHALE, SLATE, ETC.
VERY STIFF, GRAY, SULY CLN, NOIST WITH INTERBEDDED FINE SAND LIVERS, HIGHLY PLASTIC, A-7-6  SOIL LEGEND AND AASHTO CLASSIFICATION	MINERALOGICAL COMPOSITION	ROCK (WR) BLOWS PER FOOT IF TESTED.	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
CENEDAL CRANIII AD MATERIAL C. CILITICI AV MATERIAL C.	MINERAL NAMES SUCH AS QUARTZ, FELDSPAR, MICA, TALC, KAOLIN, ETC. ARE USED IN DESCRIPTIONS	CRYSTALLINE ROCK (CR) FINE TO COARSE GRAIN IGNEOUS AND METAMORPHIC ROCK THAT WOULD YIELD SPT REFUSAL IF TESTED. ROCK TYPE INCLUDES GRANITE,	GROUND SURFACE.
CLASS. (≤ 35% PASSING #200) (> 35% PASSING #200) UNGANIC MATERIALS	WHENEVER THEY ARE CONSIDERED OF SIGNIFICANCE.	CNEISS, GABBRO, SCHIST, ETC.	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-1-0 A-1-1 A-2-4 A-2-5 A-2-6 A-2-7 A-1-0 A-2-6 A-7-6 A	COMPRESSIBILITY SLIGHTLY COMPRESSIBLE LIQUID LIMIT LESS THAN 31	NON-CRYSTALLINE  NON-CRYSTALLINE  SEDIMENTARY ROCK THAT WOULD YELLD SPT REFUSAL IF TESTED. ROCK TYPE  INCLUDES PHYLLITE, SANESTONE, ETC.	COLLUVIUM - ROCK FRAGMENTS MIXED WITH SOIL DEPOSITED BY GRAVITY ON SLOPE OR AT BOTTOM OF SLOPE.
SYMBOL 000000000000000000000000000000000000	MODERATELY COMPRESSIBLE LIQUID LIMIT EQUAL TO 31-50	COASTAL PLAIN COASTAL PLAIN SEDIMENTS CEMENTED INTO ROCK, BUT MAY NOT YIELD	CORE RECOVERY (REC.) - TOTAL LENGTH OF ALL MATERIAL RECOVERED IN THE CORE BARREL DIVIDED BY TOTAL
7 PASSING	HIGHLY COMPRESSIBLE LIQUID LIMIT GREATER THAN 50  PERCENTAGE OF MATERIAL	(CP) SHELL BEDS, ETC.	LENGTH OF CORE RUN AND EXPRESSED AS A PERCENTAGE.
# 10   50 MX	K. ORGANIC MATERIAL GRANULAR SILT - CLAY	WEATHERING	DIKE - 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	TRACE OF ORGANIC MATTER 2 - 3% 3 - 5% TRACE 1 - 10%	FRESH ROCK FRESH, CRYSTALS BRIGHT, FEW JOINTS MAY SHOW SLIGHT STAINING, ROCK RINGS UNDER HAMMER IF CRYSTALLINE.	DIP - THE ANGLE AT WHICH A STRATUM OR ANY PLANAR FEATURE IS INCLINED FROM THE HORIZONTAL.
LIQUID LIMIT 40 MX 41 MN 40 MX 41 MN 40 MX 41 MN 40 MX 41 MN SOILS WITH	LITTLE ORGANIC MATTER 3 - 5% 5 - 12% LITTLE 10 - 20% MODERATELY ORGANIC 5 - 10% 12 - 20% SOME 20 - 35%	VERY SLIGHT ROCK GENERALLY FRESH, JOINTS STAINED, SOME JOINTS MAY SHOW THIN CLAY COATINGS IF OPEN,	DIP DIRECTION (DIP AZIMUTH) - THE DIRECTION OR BEARING OF THE HORIZONTAL TRACE OF
PLASTIC INDEX 6 MX NP 10 MX 10 MX 11 MN 11 MN 10 MX 10 MX 11 MN 11 MN LITTLE OR HIGH	Y HIGHLY ORGANIC >10% >20% HIGHLY 35% AND ABOVE	(V SLI.) CRYSTALS ON A BROKEN SPECIMEN FACE SHINE BRIGHTLY. ROCK RINGS UNDER HAMMER BLOWS IF  OF A CRYSTALLINE NATURE.	THE LINE OF DIP, MEASURED CLOCKWISE FROM NORTH.
GROUP INDEX   0   0   4 MX   8 MX   12 MX   16 MX   No MX   MODERATE   ORGANIC   ORG		SLIGHT ROCK GENERALLY FRESH, JOINTS STAINED AND DISCOLORATION EXTENDS INTO ROCK UP TO	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 GRAVEL, AND GRAVEL AND	WATER LEVEL IN BURE HULE IMMEDIATELY AFTER DRILLING	(SLI.) 1 INCH. OPEN JOINTS MAY CONTAIN CLAY. IN GRANITOID ROCKS SOME OCCASIONAL FELDSPAR CRYSTALS ARE DULL AND DISCOLORED. CRYSTALLINE ROCKS RING UNDER HAMMER BLOWS.	FISSILE - A PROPERTY OF SPLITTING ALONG CLOSELY SPACED PARALLEL PLANES.
MATERIALS SANU	——————————————————————————————————————	MODERATE SIGNIFICANT PORTIONS OF ROCK SHOW DISCOLORATION AND WEATHERING EFFECTS. IN GRANITOID ROCKS, MOST FELDSPARS ARE DULL AND DISCOLORED, SOME SHOW CLAY. ROCK HAS	FLOAT - ROCK FRAGMENTS ON SURFACE NEAR THEIR ORIGINAL POSITION AND DISLODGED FROM
AS A EXCELLENT TO GOOD FAIR TO POOR POOR UNSUI	ABLE 200125 WHILE	DULL SOUND UNDER HAMMER BLOWS AND 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	──	WITH FRESH ROCK.  MODERATELY ALL ROCK EXCEPT QUARTZ DISCOLORED OR STAINED. IN GRANITOID ROCKS, ALL FELDSPARS DULL	THE STREAM.
CONSISTENCY OR DENSENESS	MISCELLANEOUS SYMBOLS	SEVERE AND DISCOLORED AND A MAJORITY SHOW KAOLINIZATION. ROCK SHOWS SEVERE LOSS OF STRENGTH (MOD, SEV.) AND CAN BE EXCAVATED WITH A GEOLOGIST'S PICK. ROCK GIVES 'CLUNK' SOUND WHEN STRUCK.	FORMATION (FM.) - A MAPPABLE GEOLOGIC UNIT THAT CAN BE RECOGNIZED AND TRACED IN THE FIELD.
PRIMARY SOIL TYPE COMPACTNESS OR CONSISTENCY RANGE OF STANDARD PENETRATION RESISTENCE (N-VALUE) (TONS/F1²)	ROADWAY EMBANKMENT (RE)  WITH SOIL DESCRIPTION  SPT CPT  DEST CPT  SAMPLE  DESIGNATIONS  SET CPT  SAMPLE  DESIGNATIONS	IF TESTED, WOULD YIELD SPT REFUSAL	JOINT - FRACTURE IN ROCK ALONG WHICH NO APPRECIABLE MOVEMENT HAS OCCURRED.
VERY LONGE	S - BULK SAMPLE	SEVERE ALL ROCK EXCEPT QUARTZ DISCOLORED OR STAINED. ROCK FABRIC CLEAR AND EVIDENT BUT REDUCED (SEV.)  IN STRENGTH TO STRONG SOIL. IN GRANITOID ROCKS ALL FELDSPARS ARE KAOLINIZED TO SOME	LEDGE - A SHELF-LIKE RIDGE OR PROJECTION OF ROCK WHOSE THICKNESS IS SMALL COMPARED TO
GRANULAR LOOSE 4 TO 10	SOIL SYMBOL AUGER BORING SS - SPLIT SPOON	EXTENT. SOME FRAGMENTS OF STRONG ROCK USUALLY REMAIN.  IF TESTED, YIELDS SPT N VALUES > 100 BPF	ITS LATERAL EXTENT.  LENS - A BODY OF SOIL OR ROCK THAT THINS OUT IN ONE OR MORE DIRECTIONS.
MATERIAL DENSE 30 TO 50	ARTIFICIAL FILL (AF) OTHER SAMPLE THAN ROADWAY EMBANKMENT - CORE BORING ST - SHELBY TUBE	VERY SEVERE ALL ROCK EXCEPT QUARTZ DISCOLORED OR STAINED, ROCK FABRIC ELEMENTS ARE DISCERNIBLE BUT	MOTTLED (MOT.) - IRREGULARLY MARKED WITH SPOTS OF DIFFERENT COLORS. MOTTLING IN
VERY DENSE >50	— INFERRED SOIL BOUNDARY SAMPLE	(V SEV.) THE MASS IS EFFECTIVELY REDUCED TO SOIL STATUS, WITH ONLY FRAGMENTS OF STRONG ROCK REMAINING, SAPROLITE IS AN EXAMPLE OF ROCK WEATHERED TO A DEGREE SUCH THAT ONLY MINOR	SOILS USUALLY INDICATES POOR AERATION AND LACK OF GOOD DRAINAGE.  PERCHED WATER - WATER MAINTAINED ABOVE THE NORMAL GROUND WATER LEVEL BY THE PRESENCE OF AN
GENERALLY SOFT 2 TO 4 0.25 TO 0.50	MONITORING WELL RS - ROCK SAMPLE	VESTIGES OF THE ORIGINAL ROCK FABRIC REMAIN. IF TESTED, VIELDS SPT N VALUES < 100 BPF	INTERVENING IMPERVIOUS STRATUM.
SILT-CLAY	PIEZOMETER INSTALLATION SAMPLE SAMPLE	COMPLETE ROCK REDUCED TO SOIL. ROCK FABRIC NOT DISCERNIBLE, OR DISCERNIBLE ONLY IN SMALL AND SCATTERED CONCENTRATIONS, QUARTZ 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 24	SLOPE INDICATOR	ALSO AN EXAMPLE.	ROCK QUALITY DESIGNATION (ROD) - 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	25/025 DIP & DIP DIRECTION OF / INSTALLATION CBR - CALIFORNIA BEARING RATIO SAMPLE SPT N-VALUE	ROCK HARDNESS	EXPRESSED AS A PERCENTAGE.
U.S. STD. SIEVE SIZE 4 10 40 60 200 270	SOUNDING ROD     REF SPT REFUSAL	VERY HARD CANNOT BE SCRATCHED BY KNIFE OR SHARP PICK. BREAKING OF HAND SPECIMENS REQUIRES SEVERAL HARD BLOWS OF THE GEOLOGIST'S PICK.	SAPROLITE (SAP.) - RESIDUAL SOIL THAT RETAINS THE RELIC STRUCTURE OR FABRIC OF THE PARENT ROCK.
OPENING (MM) 4.76 2.00 0.42 0.25 0.075 0.053	ABBREVIATIONS	HARD CAN BE SCRATCHED BY KNIFE OR PICK ONLY WITH DIFFICULTY. HARD HAMMER BLOWS REQUIRED	SILL - AN INTRUSIVE BODY OF IGNEOUS ROCK OF APPROXIMATELY UNIFORM THICKNESS AND RELATIVELY THIN COMPARED WITH ITS LATERAL EXTENT, THAT HAS BEEN EMPLACED PARALLEL
BOULDER COBBLE GRAVEL COARSE FINE SILT CLAY	AR - AUGER REFUSAL HI HIGHLY w - MOISTURE CONTENT	TO DETACH HAND SPECIMEN.	TO THE BEDDING OR SCHISTOSITY OF THE INTRUDED ROCKS.
(BLDR.) (COB.) (GR.) (CSE. SD.) (F SD.) (SL.) (CL.	BT - BORING TERMINATED MED MEDIUM V - VERY  CL CLAY MICA MICACEOUS VST - VANE SHEAR TEST	MODERATELY CAN BE SCRATCHED BY KNIFE OR PICK. GOUGES OR GROOVES TO 0.25 INCHES DEEP CAN BE HARD EXCAVATED BY HARD BLOW OF A GEOLOGIST'S PICK. HAND SPECIMENS CAN BE DETACHED	SLICKENSIDE - POLISHED AND STRIATED SURFACE THAT RESULTS FROM FRICTION ALONG A FAULT OR SLIP PLANE.
GRAIN MM 305 75 2.0 0.25 0.05 0.005 SIZE IN. 12 3	CPT - CONE PENETRATION TEST MOD MODERATELY WEA, - WEATHERED  CSE COARSE NP - NON PLASTIC 7 - UNIT WEIGHT	BY MODERATE BLOWS.  MEDIUM CAN BE GROOVED OR GOUGED 0.05 INCHES DEEP BY FIRM PRESSURE OF KNIFE OR PICK POINT.	STANDARD PENETRATION TEST (PENETRATION RESISTANCE) (SPT) - NUMBER OF BLOWS (N OR BPF) OF
SOIL MOISTURE - CORRELATION OF TERMS	DMT - DILATOMETER TEST ORG ORGANIC $\gamma_{ m d}$ - DRY UNIT WEIGHT	HARD CAN BE EXCAVATED IN SMALL CHIPS TO PEICES I INCH MAXIMUM SIZE BY HARD BLOWS OF THE POINT OF A GEOLOGIST'S PICK.	A 140 LB. HAMMER FALLING 30 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
SOIL MOISTURE SCALE FIELD MOISTURE GUIDE FOR FIELD MOISTURE DESCRIPT  (ATTERBERG LIMITS) DESCRIPTION		SOFT CAN BE GROVED OR GOUGED READILY BY KNIFE OR PICK. CAN BE EXCAVATED IN FRAGMENTS	THAN 0.1 FOOT PER 60 BLOWS.
- SATURATED - USUALLY LIQUID; VERY WET, USUALLY	F - FINE SD SAND, SANDY FOSS, - FOSSILIFEROUS SL SILT, SILTY	FROM CHIPS TO SEVERAL INCHES IN SIZE BY MODERATE BLOWS OF A PICK POINT. SMALL, THIN PIECES CAN BE BROKEN BY FINGER PRESSURE.	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 TAE	_E FRAC FRACTURED, FRACTURES SLI SLIGHTLY FRAGS FRAGMENTS TCR - TRICONE REFUSAL	VERY CAN BE CARVED WITH KNIFE. CAN BE EXCAVATED READILY WITH POINT OF PICK. PIECES I INCH SOFT OR MORE IN THICKNESS CAN BE BROKEN 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
PLASTIC SEMISOLID: REQUIRES DRYING TO		FINGERNALL.	TOTAL LENGTH OF STRATA AND EXPRESSED AS A PERCENTAGE.
RANGE - WET - (W) ATTAIN OPTIMUM MOISTURE	EQUIPMENT USED ON SUBJECT PROJECT	FRACTURE SPACING BEDDING  TERM SPACING TERM THICKNESS	TOPSOIL (TS.) - SURFACE SOILS USUALLY CONTAINING ORGANIC MATTER.
	DRILL UNITS: ADVANCING TOOLS: HAMMER TYPE:	VERY WIDE MORE THAN 10 FEFT VERY THICKLY BEDDED > 4 FEET	BENCH MARK: BL-175, 150+62.58, 752.80 FEET BL-177, 156+88.80, 759.66 FEET
OM OPTIMUM MOISTURE - MOIST - (M) SOLID; AT OR NEAR OPTIMUM MOISTU SL SHRINKAGE LIMIT	RE	WIDE 3 TO 10 FEET THICKLY BEDDED 1.5 - 4 FEET	DE 111, 130, 00,00, 133,00 TEET
REQUIRES ADDITIONAL WATER TO	6° CONTINUOUS FLIGHT AUGER CORE SIZE:	MODERATELY CLOSE	NOTES:
- DRY - (D) ATTAIN OPTIMUM MOISTURE	BK-51 X 8* HOLLOW AUGERS	VERY CLUSE LESS THAN 0.16 FEET THINLY LAMINATED < 0.008 FEET	
PLASTICITY	CME-45C X HARD FACED FINGER BITS X-NO	INDURATION  FOR SEDIMENTARY ROCKS, INDURATION IS THE HARDENING OF THE MATERIAL BY CEMENTING, HEAT, PRESSURE, ETC.	
PLASTICITY INDEX (PI) DRY STRENGTH NONPLASTIC 0-5 VERY LOW	TUNGCARBIDE INSERTS	DURDING WITH FINESD FORCE NUMEROUS CRAINS.	
LOW PLASTICITY 6-15 SLIGHT	X CME-55 X CASING W/ ADVANCER HAND TOOLS:	FRIABLE GENTLE BLOW BY HAMMER DISINTEGRATES SAMPLE.	
MED. PLASTICITY 16-25 MEDIUM HIGH PLASTICITY 26 OR MORE HIGH	PORTABLE HOIST TRICONE STEEL TEETH POST HOLE DIGGER	MODERATELY INDURATED GRAINS CAN BE SEPARATED FROM SAMPLE WITH STEEL PROBE; BREAKS EASILY WHEN HIT WITH HAMMER.	
COLOR	X TRICONE 25/8 TUNGCARB. HAND AUGER		
DESCRIPTIONS MAY INCLUDE COLOR OR COLOR COMBINATIONS (TAN, RED, YELLOW-BROWN, BLUE-GRAY).	X CORE BIT SOUNDING ROD VANE SHEAR TEST	INDURATED GRAINS ARE DIFFICULT TO SEPARATE WITH STEEL PROBE; DIFFICULT TO BREAK WITH HAMMER.	
MODIFIERS SUCH AS LIGHT, DARK, STREAKED, ETC. ARE USED TO DESCRIBE APPEARANCE.	U   U   vane shear lest	EXTREMELY INDURATED SHARP HAMMER BLOWS REQUIRED TO BREAK SAMPLE; SAMPLE BREAKS ACROSS GRAINS.	
		Similar States (10,000 States)	1

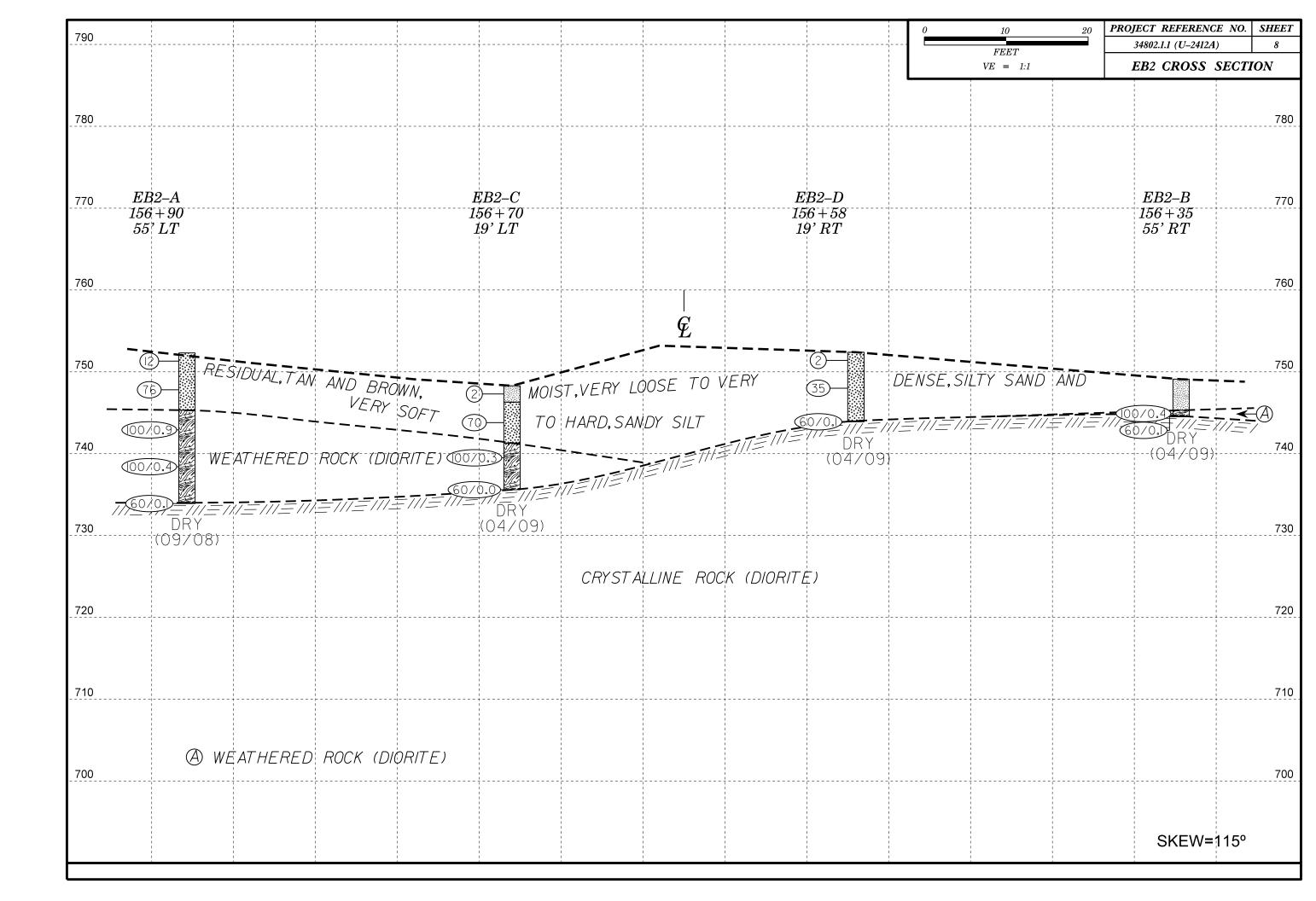


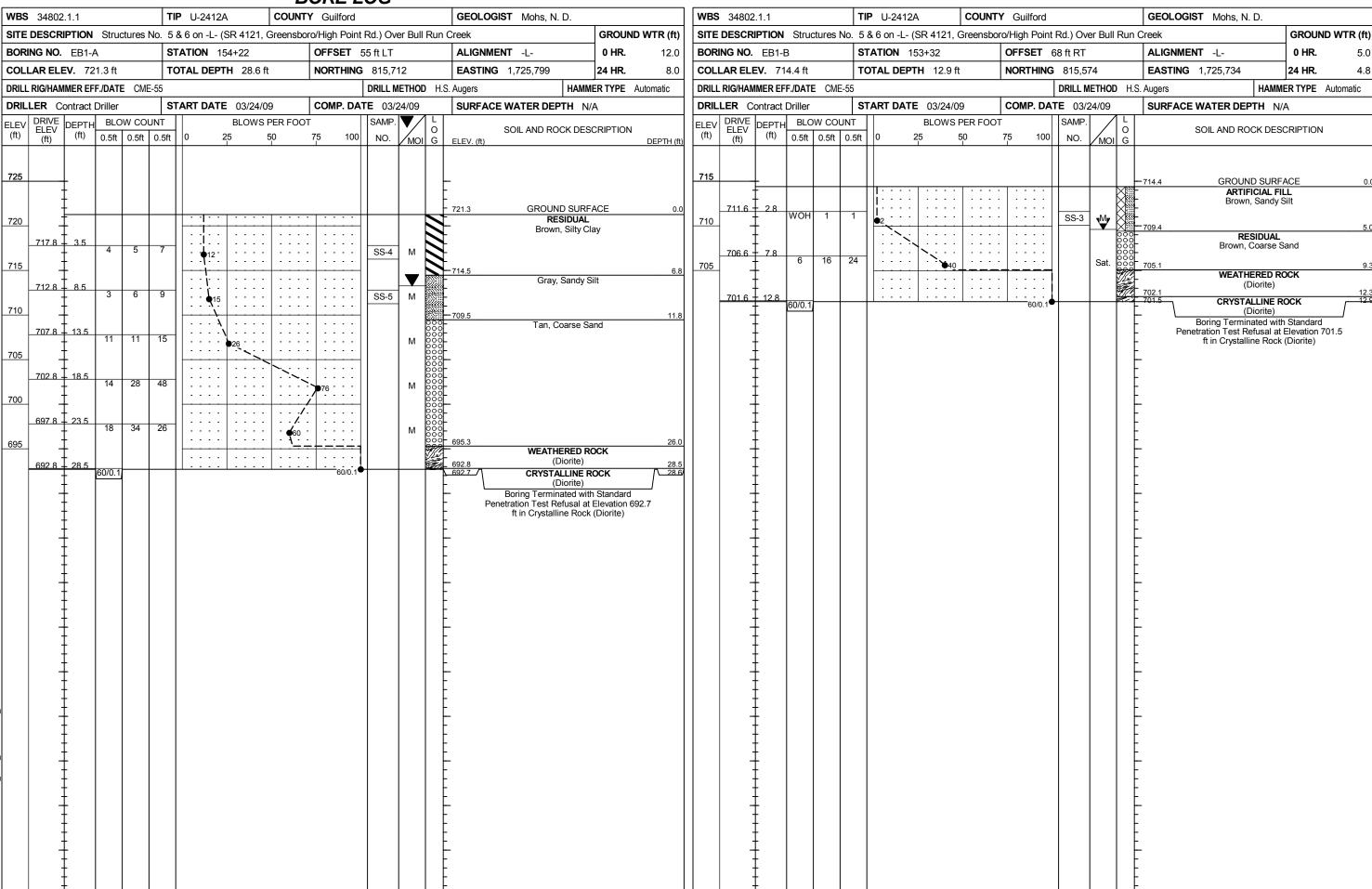






750				1 1 1		0	10 20	PROJECT REFER	
				, , , ,	†	j	$\overline{FEET}$	34802.1.1 (U-2	
				1 1 1 1 1			VE = 1:1	B2 CROS	S SECTION
740									740
_730	B2–A 155 + 73 47' LT	B2- 155 - 20' .	+ <i>64</i>	E	B2–D 155+46 23' RT	<del>3</del>	B2- 155+ 47' I	30	730
720				 		 	 		720
_710 <i>F</i>	WOH)  WOH  WOH  WOH  WOH  WOH  WOH  WOH	BROWN, 3 GRAY, 25 ENSE, 60/0.0	04/09 MOIST,VE MOIST TO SAT.,	RY LOOSE,	SAND  (7) 04  04  7//=7//=60/0.09//=/ HARD, FRESH, MODE I C, MASSIVE, DIABASE,	77=775-77 RATFLY CL	A 60/0.0 = 1/1 = 1/1 = 1/1 OSE TO WIDE	04/09 //= ///= / FRACTURE	710
	7/7=7/7=// CRYS7	TALLINE ROCK	GRAY,VERY HARD,F	RESH,MOL	DERATELY CLOSE TO	1			700
690	REC=96% ROD=81% RMR=72	FRACTURE S	SPACING, MASSIVE TO	D WEAKLY	FOLIATED, DIORITE		REC=1 RQD=1 RMR=	00% 72	690
680									680
670									670
660	(A) RESIDUAL, BRO	DWN, MOIST TO	WET, MEDIUM STIF	F TO VER	Y STIFF,SANDY SILT				660
								SK	EW=115°





	<u>D</u>	ORE LOG		
<b>NBS</b> 34802.1.1	TIP U-2412A COUNTY	' Guilford	GEOLOGIST Mohs, N. D.	
SITE DESCRIPTION Structures No	o. 5 & 6 on -L- (SR 4121, Greensbor	o/High Point Rd.) Over Bull Run C	Creek	GROUND WTR (ft)
BORING NO. EB1-C	<b>STATION</b> 153+65	OFFSET 23 ft RT	ALIGNMENT -L-	<b>0 HR.</b> 9.0
COLLAR ELEV. 717.5 ft	TOTAL DEPTH 28.5 ft	<b>NORTHING</b> 815,624	<b>EASTING</b> 1,725,758	<b>24 HR.</b> 5.0
DRILL RIG/HAMMER EFF./DATE CME-5	5	DRILL METHOD H.S.	Augers HAMMI	ER TYPE Automatic
DRILLER Contract Driller	START DATE 03/24/09	COMP. DATE 03/24/09	SURFACE WATER DEPTH N//	4
LEV CHIP CHIP CHIP CHIP CHIP CHIP CHIP CHIP	I I	75 100   NO   /   0	SOIL AND ROCK DESC	CRIPTION DEPTH (f
720			717.5 GROUND SURFA	ACE 0.
715 714.3 3.2 5 4	4		<b>RESIDUAL</b> Brown, Sandy S	
710 709.3 8.2 36 28 3	32	▼	711.0 Green and Orange, Coa	6. arse Sand
705 704.3 13.2		SS-2 M 6000 0000 0000 0000 0000 0000 0000		
700 699.3 18.2	21	M 0000	701.0 WEATHERED RO	
695		- 100/0.9	(Diorite)	
694.3 23.2 100/0.2		100/0.2		
689.3 28.2		100/0.3	Boring Terminated at Eleva	28
			Weathered Rock (D	Diorite)

SHEET 10

	В	ORE LOG		
/BS 34802.1.1	TIP U-2412A COUNT	<b>f</b> Guilford	GEOLOGIST Mohs, N. D.	
ITE DESCRIPTION Structures No	o. 5 & 6 on -L- (SR 4121, Greensbo	o/High Point Rd.) Over Bull Run C	Creek	GROUND WTR (ft)
ORING NO. B1-A	<b>STATION</b> 154+59	OFFSET 47 ft LT	ALIGNMENT -L-	<b>0 HR</b> . N/A
OLLAR ELEV. 718.1 ft	TOTAL DEPTH 32.7 ft	<b>NORTHING</b> 815,711	<b>EASTING</b> 1,725,837	<b>24 HR.</b> 4.6
RILL RIG/HAMMER EFF./DATE CME-5	55	DRILL METHOD SPT	Core Boring HAMME	R TYPE Automatic
RILLER Contract Driller	<b>START DATE</b> 03/27/09	<b>COMP. DATE</b> 03/27/09	SURFACE WATER DEPTH N/A	4
ELEV CHIP (ft) DEPTH BLOW COUNTY (ft) 0.5ft 0.5ft C	NT BLOWS PER FOOT 0.5ft 0 25 50	75 100   100   10	SOIL AND ROCK DESC	CRIPTION DEPTH (ft)
20 718.1 0.0 WOH 1 1 15 714.9 3.2 1 2	30 32	M	718.1 GROUND SURFA ALLUVIAL Brown, Silty Sar 713.1	
10 709.9 8.2 709.0 9.1 100/0.4 60/0.0			WEATHERED RO (Diabase)  709.0  CRYSTALLINE RO	9.1
05			Green,Fresh to Slightly W Fracture Surfaces, Hard, V Close Fracture Spacing Aphanitic, Diaba REC=79%	eathered on /ery Close to , Massive,
00		RS-3	RQD=31% RMR=72	
95				
90				
			685.4  Boring Terminated at Elevat	32.7
			Crystalline Rock (Dia	audose)

									C	U	RE L	<u>UG</u>							
WBS	34802	2.1.1			TIP	U-241	2A	C	OUNT	Υ (	Guilford			GEOLO	OGIST	Mohs,	N. D.		
SITE	DESCR	IPTION	Stru	ctures No	5 &	6 on -L	- (SR 412	21, Gre	ensbo	oro/H	ligh Point	Rd.) Ov	er Bull Run	Creek				GROUN	ID WTR (ft)
BORI	NG NO.	B1-A			STA	TION	154+59			OF	FSET 4	7 ft LT		ALIGN	MENT	-L-		0 HR.	N/A
COLI	AR ELI	<b>EV</b> . 71	8.1 ft		тот	AL DE	<b>PTH</b> 32.	.7 ft		NC	RTHING	815,7	11	EASTIN	NG 1,	725,837		24 HR.	4.6
DRILL	RIG/HAN	IMER EF	F./DATI	E CME-	55							DRILL M	ETHOD SP	PT Core Bori	ing		HAMM	ER TYPE	Automatic
DRIL	LER C	ontract	Driller		STAI	RT DA	<b>TE</b> 03/2	7/09		CC	MP. DAT	TE 03/2	27/09	SURFA	CE W	ATER DE	PTH N	/A	
COR	E SIZE	NQ					<b>V</b> 23.6 f												
ELEV (ft)	ELEV	DEPTH (ft)	RUN (ft)	DRILL RATE	REC. (ft) %	RQD (ft) %	SAMP. NO.	STR REC. (ft) %	RQD	L			С	DESCRIPTI	ION AN	D REMA	RKS		
709	(ft)	(**)	(1.7)	(Min/ft)		%′		%′	(ft) %	G	ELEV. (1	t)		Begin (	Corina	@ 9.1 ft			DEPTH (ft)
	709.0	9.1	3.6	N=60/0.0 2:47/1.0 3:30/1.0	(3.6) 100%	(1.8) 50%		(18.6) 79%	(7.2) 31%		709.0	Gree	n,Fresh to Sl	CRYS	STALLII thered	NE ROCK on Fractu	re Surface	s, Hard, Ve	9.1 ery
705	705.4	12.7	5.0	4:11/1.0 1:00/0.6	(5.0)	(2.7)					‡	С	ose to Close		Spacing REC=7 RQD=3	79%	, Aphanitic	, Diabase	
		Ī		N=60/0.0 2:47/1.0 3:30/1.0 4:11/1.0 1:00/0.6 2:46/1.0 2:21/1.0 3:36/1.0	100%	54%	RS-3				Ę F				RMR=				
700	700.4	17.7	5.0	2:36/1.0	(4.0)	(2.7)					-								
				3:14/1.0 3:02/1.0 2:31/1.0 2:04/1.0	80%	54%					<u>}</u>								
695	695.4	22.7	5.0	2:38/1.0 2:00/1.0	(4.0) 80%	(0.5) 10%					-								
690	690.4 -	27.7		2:33/1.0 2:50/1.0 1:30/1.0															
090	-		5.0	2:15/1.0 2:27/1.0 2:03/1.0	(2.0) 40%	(0.5) 10%					<del> -</del>								
	685.4 <sup>-</sup>	32.7		1:54/1.0 2:16/1.0							- 685.4								32.7
	-	†									_	Borin	g Terminated	d at Elevation	on 685.	4 ft in Cry	stalline Ro	ock (Diaba	se)
		‡									-								
	-	‡									L								
		‡									-								
		t									_								
	=	Ł									F								
		-									-								
		F									F								
	-	F									F								
		ļ									F								
	_	‡									Ļ								
		‡									ļ								
		‡									<u>L</u>								
	-	<u> </u>									F								
		t									E								
	_	Ł									L								
	-	F									F								
		Ŧ									F								
	_	‡									F								
		‡									ļ.								
		‡									ļ								
	-	<u> </u>									F								
	-	ł									E								
		F									F								
	-	F									F								
	:	‡									F								
	-	‡									Ļ								
											<u> </u>								
	-	t									E								
	_	<u> </u>									<u> </u>								

								<u>D</u>	UKE L	. <u>UG</u>				
	34802					<b>P</b> U-2412/			<b>f</b> Guilford				GEOLOGIST Mohs, N. D.	
SITE	DESCR	RIPTION	Str	uctures	No. 5	& 6 on -L-	(SR 4121,	Greensbo	ro/High Poir			II Run		GROUND WTR (ft)
BORI	NG NO.	B1-E	3		S	TATION 1	54+16		OFFSET	47 ft RT			ALIGNMENT -L-	<b>0 HR</b> . N/A
COLI	AR EL	<b>EV</b> . 7	16.6 ft		T	OTAL DEPT	<b>H</b> 34.5 ft	:	NORTHING	815,6	811		<b>EASTING</b> 1,725,812	<b>24 HR.</b> 4.6
ORILL	RIG/HAI	MER E	F./DAT	E C	ME-55					DRILL N	/ETHO	<b>D</b> SF	PT Core Boring HAMM	ER TYPE Automatic
DRIL	LER C	Contract	Driller	•	S	TART DATE	03/25/0	9	COMP. DA	TE 03/	25/09		SURFACE WATER DEPTH N/	A
ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	0.5ft	0.5ft		0 2		PER FOOT	75 100	SAMP. NO.	MO	L O I G	SOIL AND ROCK DESC	CRIPTION DEPTH (f
720 715	716.6	0.0	WOH	WOH	1	<b>1</b>					M		GROUND SURFA ALLUVIAL Brown, Silty Sa	
710	712.6	4.0	2	1	2	•3					-Sat		- 710.6 - RESIDUAL Brown, Silty Sa	6.0
705	707.6	9.0	8	11	18		29			SS-7	M	4774	705.1 WEATHERED RO	11.
700	702.6	14.0	100/0.	4					100/0.4				(Diorite) . 700.8  — CRYSTALLINE R	15.8 <b>DCK</b>
695	- - -	‡ + +								RS-4			Gray and Green, Very Hard Close to Moderately Clos Spacing, Weakly Foliated, REC=80% RQD=43%	se Fracture
690	- -	† 											RMR=72 692.1 Gray, Very Hard, Fresh, W Spacing, Massive, Phane	/ide Fracture
685	·	† 											REC=100% RQD=84% RMR=72	
		<u> </u>											682.1  Boring Terminated at Eleva	34.tion 682.1 ft in
	-												Crystalline Rock (D	norite)
	- - - -	† - - - - - - -											- - - - -	

									<u> </u>	U	KE L	UG						
WBS	34802	2.1.1			TIP	U-241	12A	C	OUNT	Υ	Guilford			GEOLOG	SIST Mohs, N	. D.	_	
SITE	DESCR	IPTION	Stru	ictures No	5. 5 &	6 on -L	(SR 412	21, Gre	eensbo	oro/F	ligh Point	Rd.) Over	Bull Run (	Creek			GROUN	D WTR (ft)
BOR	ING NO.	B1-B	3		STA	TION	154+16			OF	FSET 4	7 ft RT		ALIGNM	ENT -L-		0 HR.	N/A
COLI	LAR EL	<b>EV</b> . 7	16.6 ft		тот	AL DE	<b>PTH</b> 34.	.5 ft		NC	RTHING	815,611		EASTING	1,725,812		24 HR.	4.6
DRILL	. RIG/HAN	MER EF	F./DAT	E CME-	·55					•		DRILL MET	HOD SPT	Γ Core Borin	g	HAMM	ER TYPE	Automatic
DRIL	LER C	contract	Driller		STA	RT DA	<b>TE</b> 03/2	5/09		CC	MP. DA	E 03/25/	09	SURFAC	E WATER DEF	TH N/	Ά	
COR	E SIZE	NQ			тот	AL RU	<b>N</b> 18.7 f	t										
ELEV	RUN ELEV	DEPTH	RUN	DRILL RATE	REC.	JN RQD	SAMP.	STR REC.	ATA RQD	L			DI	ESCRIPTIO	N AND REMARI	/c		
(ft)	(ft)	(ft)	(ft)	(Min/ft)	(ft) %	(ft) %	NO.	(ft) %	(ft) %	Ğ	ELEV. (f	:)	D	ESCRIPTIO	IN AND REWAR	\ <u> </u>		DEPTH (ft)
700.8 700															ring @ 15.8 ft			
700	700.8_	15.8	3.7	3:10/1.0 3:20/1.0	(2.0)	(0.0) 0%		(7.0) 80%	(3.7) 43%		700.8	Gray ar	nd Green, V		ALLINE ROCK resh, Very Close	to Mode	rately Clos	15.8 se
	697.1	19.5		2:33/1.0 3:15/0.7	(5.0)	(0.7)						-	Fracture		eakly Foliated, NEC=80%	leta-Grar	nite	
695	_	<u> </u>	5.0	1:48/1.0 3:20/1.0 2:58/1.0	(5.0) 100%	(3.7) 74%	RS-4	1			_			R	QD=43% RMR=72			
		<u> </u>		2:58/1.0 3:07/1.0 3:10/1.0										'	NIVII (-12			
	692.1	24.5	5.0	2:50/1.0	l (5.0)	(3.4)		(10.0)	(8.4) 84%		692.1	Gray, Ve	ery Hard, Fr	resh, Wide	Fracture Spacing	g, Massive	e, Phanerit	24.5 ic,
690	_	Ŧ		2:20/1.0	100%	68%		100%	84%		-			RI	Diorite EC=100%			
	687.1	29.5		3:46/1.0 4:18/1.0							-			R	QD=84% RMR=72			
685		Ŧ	5.0	5:20/1.0 5:23/1.0	(5.0) 100%	(5.0) 100%	]				<b>.</b>			·	WIN - 12			
	-	‡		6:28/1.0 7:50/1.0	1.00%	,					-							
	682.1	34.5		6:30/1.0			-				682.1	Boring	Terminated	l at Elevatio	n 682.1 ft in Crys	talline R	ock (Diorite	34.5
	_	‡									F	209			002		2011	,
		‡									ţ							
		<u>†</u>									E							
	-	+									⊢							
		Ŧ									F							
		‡									F							
	-	‡									F							
		‡									ţ							
		ŧ									Ł							
		+									F							
		Ŧ									F							
	_	‡									F							
		‡									ļ.							
		‡									ţ							
	-	<u> </u>									F							
		+									}							
		Ŧ									F							
	-	‡									F							
		‡									ţ							
		ŧ									Ł							
	-	Ŧ									F							
		Ŧ									F							
	_	‡									Ļ							
		‡									ţ							
		‡									ţ							
	-	ŧ									F							
		Ŧ									F							
		Ŧ									F							
	-	‡									<u> </u>							
		‡									ţ							
		±									Ł							
		Ŧ									F							
	] :	‡									F							
		∔									<u> </u>							

										D(	JKE	L	UG							
WBS :	34802	.1.1			TII	P U-24	12A		COU	NTY	Guilfor	d				GEOLOGI	ST Mohs, N	. D.		
SITE DI	ESCRI	PTION	Stru	ctures	No. 5	& 6 on -l	L- (SR	4121,	Greens	boro	/High Po	int	Rd.) Ove	er Bull	Run	Creek			GROU	ND WTR (ft)
BORING	G NO.	B1-C			ST	ATION	154+	+28			OFFSET	2	3 ft RT			ALIGNME	NT -L-		0 HR.	5.0
COLLA	AR ELE	<b>V</b> . 71	17.3 ft		тс	TAL DE	EPTH	13.3 f	t		NORTHI	NG	815,63	36		EASTING	1,725,820		24 HR.	N/A
DRILL RI	RIG/HAM	MER EF	F./DAT	E CME	E-55								DRILL M	ETHO	) H.S	S. Augers		HAMN	IER TYPE	Automatic
DRILLE	ER Co	ontract	Driller		ST	ART DA	ATE	03/24/0	)9		COMP. I	DAT	TE 03/2	24/09		SURFACE	WATER DE	PTH N	/A	
ELEV (ft)	ORIVE ELEV (ft)	DEPTH (ft)	0.5ft	0.5ft	-	0	25 	BLOWS	PER FO		75 1	00	SAMP. NO.	MOI	L O G	ELEV. (ft)	SOIL AND RO	OCK DES	SCRIPTION	N DEPTH (f
720	717.3	- - - 00														_ · 717.3	GROU	ND SURF	ACE	0.
715	714.1	-		WOH	1	1		· · · ·				· -	SS-6	М			Al	LUVIAL n, Silty Sa		<u>.</u>
	-	-	1	2	1	<b>4</b> 3 · · ·			<u> </u>	<u> </u>		-		√M7		712.3				5.
710	709.1	8.2	100/0.4	Ī			-				. 100/0	.4				- - - -	WEATH (	IERED R Diorite)	OCK	
705	704.1	- - <sub>13.2</sub>					-		+			4				- - <sub>704.3</sub>				13.
			60/0.1								60/0					Pend		tefusal at	h Standard Elevation	1704.0

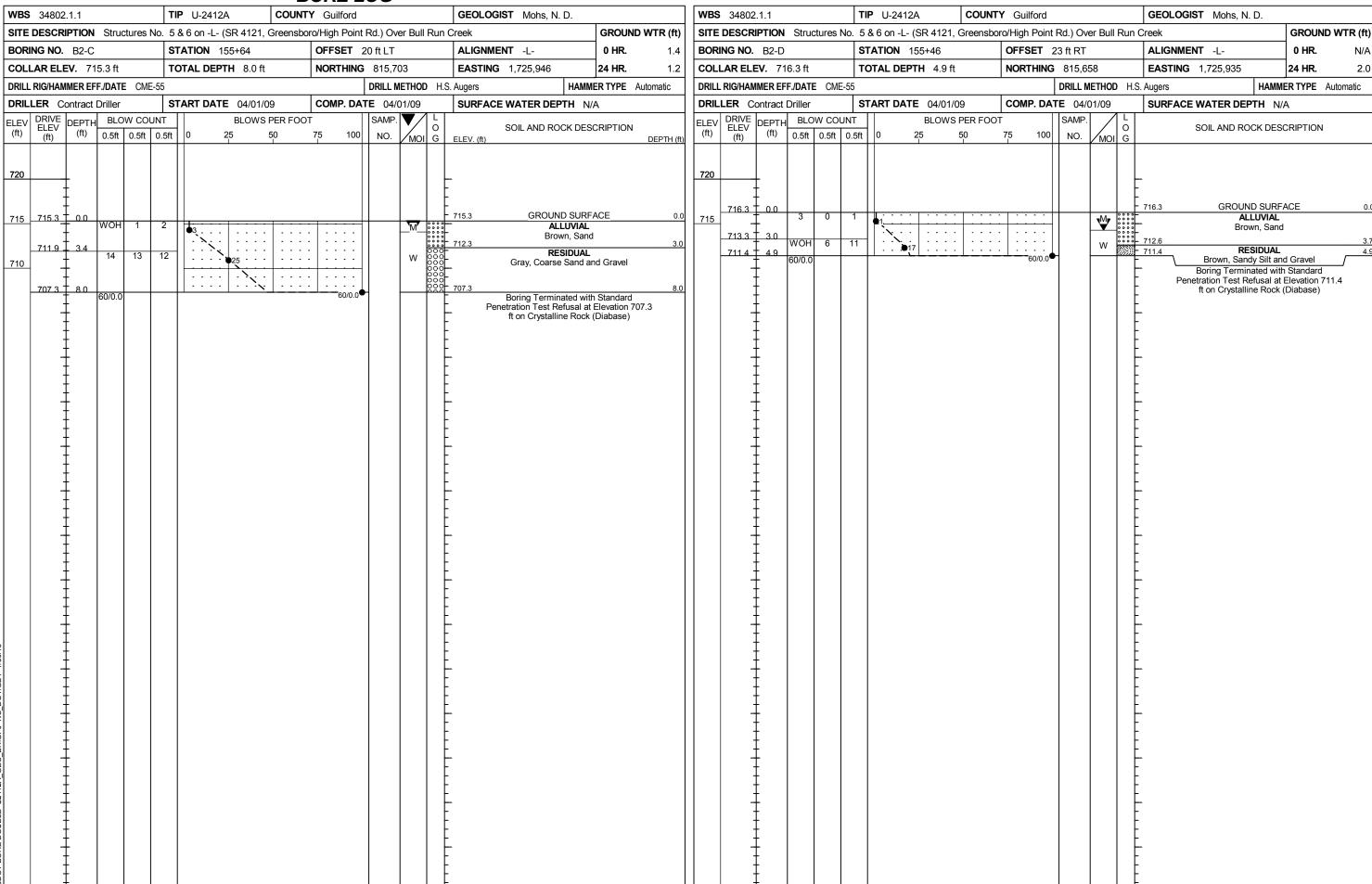
SHEET 13

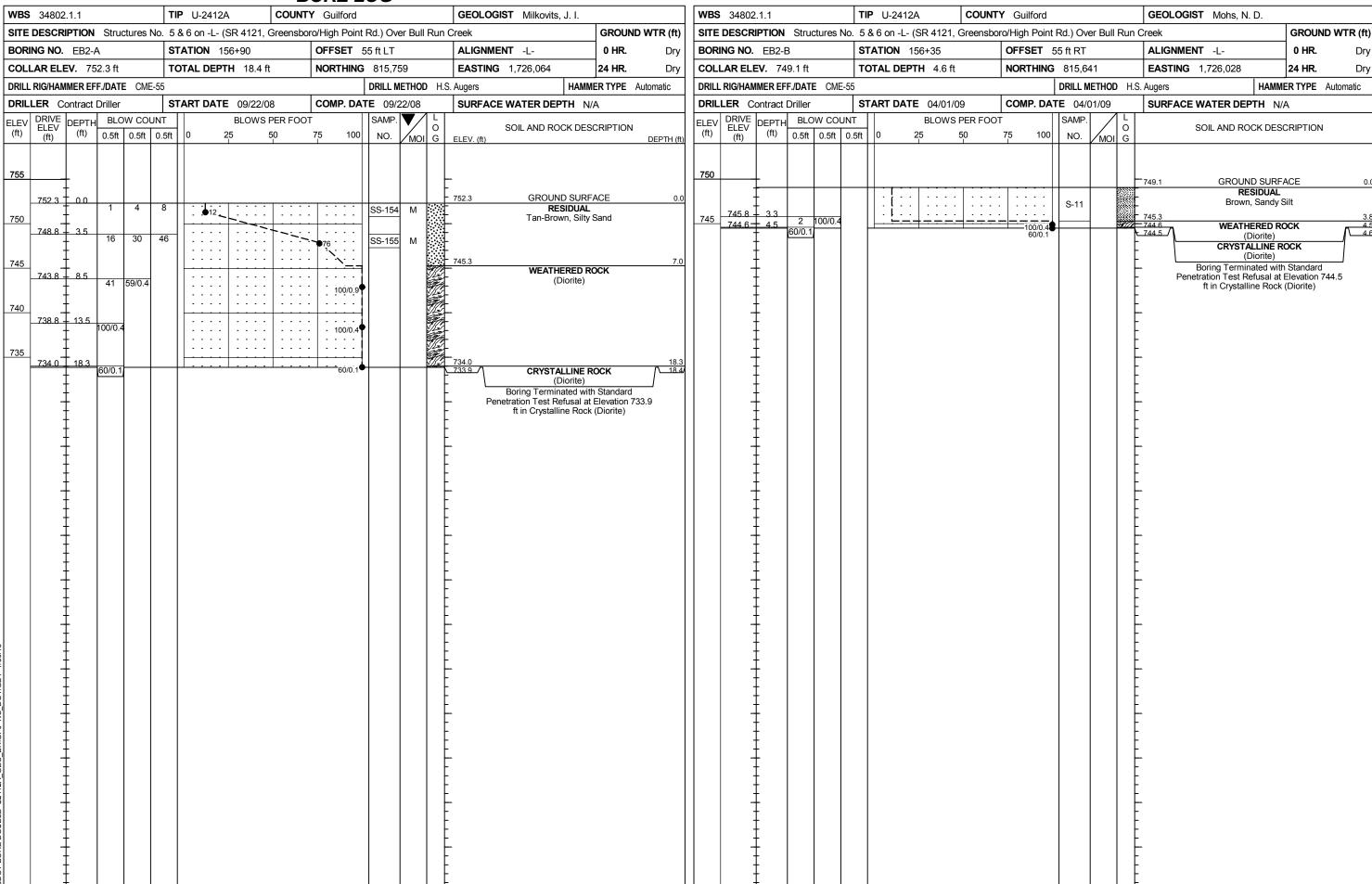
						B	ORE L	<u>.OG</u>					
WBS	34802.1.1				<b>IP</b> U-2412A		Y Guilford				GEOLOGIST Mohs, N. D.		
	DESCRIPTION		ucture		5 & 6 on -L- (SR 4121,	Greensbo	1		ver Bul	l Run	Creek	GROUND V	VTR (ft)
BORI	NG NO. B2-A	4		S.	<b>TATION</b> 155+73		OFFSET	47 ft LT			ALIGNMENT -L-	0 HR.	N/A
COLI	AR ELEV. 7	16.4 ft		T	OTAL DEPTH 23.3 f	t	NORTHING	815,7	'31		<b>EASTING</b> 1,725,950	24 HR.	2.3
DRILL	RIG/HAMMER E	FF./DAT	E C	ME-55				DRILL N	TETHOD	) SP	T Core Boring HAMM	<b>ER TYPE</b> Au	tomatic
DRIL	LER Contract	Drille	•	S	TART DATE 03/31/0	9	COMP. DA		31/09		SURFACE WATER DEPTH N/	'A	
ELEV (ft)	DRIVE ELEV (ft) DEPTH (ft)	0.5ft	0.5ft		4	PER FOO <sup>-</sup>	T 75 100	SAMP.	MOI	L O G	SOIL AND ROCK DESC ELEV. (ft)		DEPTH (ft)
720											-		
	716.4 0.0	IWOF	I WOL	I WOH		T	-		ļ	-	716.4 GROUND SURF. ALLUVIAL	ACE	0.0
715	$\pm$	""	, , , , O F		0			S-8	<b>W</b>	0000	- ALLUVIAL Brown, Sand		
	712.7 3.7	1 1	16	27	:::::					0000	712.2		4.2
710	711.1 7 5.3	6	7	10	4	3			M Sat.	000- 000- 000	RESIDUAL Brown, Coarse Sand, Grave	l. and Boulder	s
	‡				17				Jai.	0000		, <b>2001001</b>	-
	707.7 + 8.7	5	14	23				SS-9	Sat.				
705	±							000			_		
	+					\.:-					703.1		13.3
	Ŧ						.			F	CRYSTALLINE R Grav. Fresh. Very Hard. Mo	derately Close	-
700	‡							RS-1	1		Fracture Spacing, Massiv Foliatied, Phaneritic	e to Weakly	-
	‡										REC=96%	, Dioiile	
005	‡										RQD=81% RMR=72		
695	$\pm$				<del>   </del>	<del> </del>	<del>                                     </del>				-		
	<del> I</del>	-									Boring Terminated at Eleva	tion 693.1 ft in	23.3
	Ŧ									F	Crystalline Rock (D		
	‡										-		
	t												
	Ŧ									l F			
	‡										-		
	‡									<u> </u>			
	+									F			
	Ŧ									l F	_		
	‡	1											
	<u> </u>									<u> </u>	_		
	Ŧ									F	_		
	‡												
	‡									<u> </u>	_		
	+	1								-			
	‡									F			
	‡									<u> </u>	-		
		1											
	Ŧ									F			
	‡	1								<u> </u>	_		
	‡									<u> </u>			
	+									F			
	‡	1								F	-		
	‡												
	+	1											
	‡										-		
	‡									<u> </u>			
	+									F			
	‡									-	_		
	‡												
	+									ŀ			

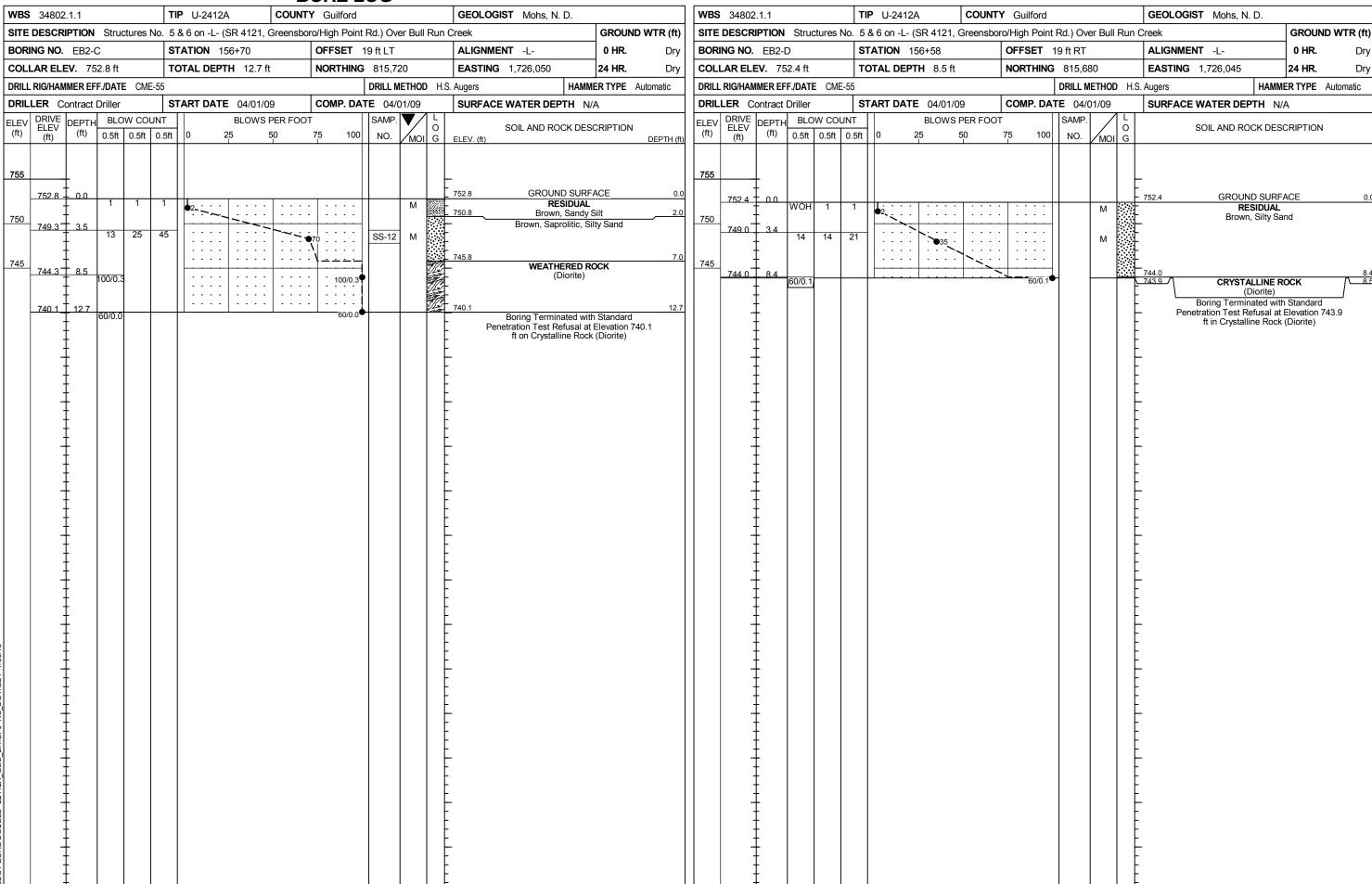
								<u>C</u>	O	RE LOG
<b>-</b>	34802.1.1				U-241					Guilford GEOLOGIST Mohs, N. D.
<b>-</b>			ictures No			-	21, Gre	ensbo	_	High Point Rd.) Over Bull Run Creek  GROUND WTR (ft)
	NG NO. B2-A			_		155+73			$\vdash$	FFSET 47 ft LT ALIGNMENT -L- 0 HR. N/A
-	LAR ELEV. 71				AL DE	<b>PTH</b> 23	.3 ft		NC	ORTHING         815,731         EASTING         1,725,950         24 HR.         2.3
	RIG/HAMMER EF								l	DRILL METHOD SPT Core Boring HAMMER TYPE Automatic
	LER Contract	Driller				TE 03/3			CC	OMP. DATE 03/31/09 SURFACE WATER DEPTH N/A
	RUN DERTH		DRILL		JN	<b>N</b> 10.0 f	t STR	ATA	L	
(ft)	ELEV DEPTH (ft)	(ft)	RATE (Min/ft)	REC. (ft) %	RQD (ft) %	SAMP. NO.	REC. (ft) %	RQD (ft) %	Ö G	DESCRIPTION AND REMARKS
703.1	703.1 13.3	5.0	2:05/1.0	(4.6)	(4.0)		(9.6)	(8.1)		Begin Coring @ 13.3 ft  703.1 CRYSTALLINE ROCK 13.3
700	698.1 18.3		4:07/1.0 4:06/1.0 4:03/1.0 6:03/1.0	92%	80%	RS-1	(9.6) 96%	(8.1) 81%		Gray, Fresh, Very Hard, Moderately Close Fracture Spacing, Massive to Weakly Foliatied, Phaneritic, Diorite REC=96% RQD=81%
695	+	5.0	6:13/1.0 6:22/1.0 7:45/1.0 13:12/1.0	100%	(4.1) 82%					RMR=72
	693.1 23.3		17:00/1.0							693.1 23.3  Boring Terminated at Elevation 693.1 ft in Crystalline Rock (Diorite)
	\****\****\****\***\****\****\****\****\****									

<b>VBS</b> 34802.1.1		ORE LOG Y Guilford	GEOLOGIST Mohs, N. D.	
	No. 5 & 6 on -L- (SR 4121, Greensbo		ļ	GROUND WTR (ft)
BORING NO. B2-B	STATION 155+30	OFFSET 47 ft RT		OHR. N/A
COLLAR ELEV. 716.2 ft	TOTAL DEPTH 18.2 ft	NORTHING 815,631		4 HR. 2.5
	1E-55	<u> </u>	T Core Boring HAMMER	
DRILLER Contract Driller	START DATE 03/31/09	COMP. DATE 03/31/09	SURFACE WATER DEPTH N/A	THE Automato
LEV DRIVE DEPTH BLOW COU	JNT BLOWS PER FOO	SAMP. V L	SOIL AND ROCK DESCR	IPTION
720	0.5ft 0 25 50		ELEV. (ft)  716.2 GROUND SURFAC	<u> </u>
715 2 2	5	SS-10 M	RESIDUAL Brown, Sandy Silt and G	Gravel 3.4
712.0 = 3.4   60/0.0		60/0.0 RS-2	CRYSTALLINE ROC Green, Fresh, Very Hard, Mode to Wide Fracture Spacing, I Aphanitic, Diabase	K erately Close Massive,
705			REC=90% RQD=89% RMR=72	13.2
700			Gray, Fresh, Very Hard, Wide Spacing, Massive, Phaneriti REC=90% RQD=89%	e Fracture
+ + +		-	698.0 RMR=72  Boring Terminated at Elevation Crystalline Rock (Dior	n 698.0 ft in

<b>WBS</b> 3	34802.1.1			TIP	U-241	2A	C			ORE LOG  Guilford GEOLOGIST Mohs, N. D.
	SCRIPTION	l Stru	ictures No							/High Point Rd.) Over Bull Run Creek GROUND WTR (f
BORING	<b>NO</b> . B2-l					155+30			_	OFFSET 47 ft RT ALIGNMENT -L- 0 HR. N/.
COLLAF	R ELEV. 7	16.2 ft		тот	AL DE	<b>PTH</b> 18.	.2 ft		N	IORTHING 815,631 EASTING 1,725,924 24 HR. 2.
DRILL RIC	G/HAMMER E	FF./DAT	E CME-	55						DRILL METHOD SPT Core Boring HAMMER TYPE Automatic
DRILLEI	R Contrac	Driller		STAI	RT DA	<b>TE</b> 03/3	1/09		C	COMP. DATE 03/31/09 SURFACE WATER DEPTH N/A
CORE S	SIZE NQ					<b>N</b> 14.8 f				
CLEV EI	RUN ELEV (ft)	RUN (ft)	DRILL RATE (Min/ft)	REC. (ft) %	JN RQD (ft) %	SAMP. NO.	STR REC. (ft) %	RQD (ft) %	L O G	D DESCRIPTION AND REMARKS
712.8										Begin Coring @ 3.4 ft
710	12.8 3.4	5.0	N=60/0.0 4:54/1.0 3:58/1.0 3:17/1.0 2:56/1.0 2:16/0.8 2:41/1.0 2:36/1.0 2:51/1.0	(4.0) 83% (4.8) 96%	(3.9) 81% (4.8) 96%	RS-2	(8.8) , 90%	(8.7) 89%		712.8 CRYSTALLINE ROCK Green, Fresh, Very Hard, Moderately Close to Wide Fracture Spacing, Massive, Aphanitic, Diabase REC=90% RQD=89% RQD=89% RMR=72
70	03.0 13.2		2:32/1.0 2:30/1.0							703.0
700	<u> </u>	5.0	2:51/1.0 2:53/1.0 3:20/1.0 3:10/1.0	(5.0) 100%	(5.0) 100%		(5.0) 100%	(5.0) 100%	1	Gray, Fresh, Very Hard, Wide Fracture Spacing, Massive, Phaneritic, Diorite REC=90% RQD=89%
69	<u>98.0 † 18.2</u>		3:10/1.0							698.0 RMR=72 18  Boring Terminated at Elevation 698.0 ft in Crystalline Rock (Diorite)
	+									







_	$\mathbf{r}$	-	٠.
- 14	ĸ	•	
• •	,	•	-/-
_	_	•	_

				S	OIL T	TE.	ST	RE	SUL	LTS						
SA	AMPLE			DEPTH	AASHTO				% BY V	VEIGHT		% PAS	SING (S	IEVES)	%	%
	NO.	OFFSET	STATION	INTERVAL	CLASS.	L.L.	P.I.	C.SAND	F.SAND	SILT	CLAY	10	40	200	MOISTURE	ORGANIC
	SS-4	55 LT	154+22	3.5-5.0	A-7-6(15)	41	22	13.1	14.9	29.8	42.3	99	91	75	-	-
	SS-5	55 LT	154+22	8.5-10.5	A-4(0)	35	NP	12.9	47.7	31.4	8.0	100	97	50	-	•

## EB1-B

			S	OIL T	TE.	ST	RE	SUL	TS						
SAMPLE			DEPTH	AASHTO				% BY W	VEIGHT		% PAS	SING (S	IEVES)	%	%
NO.	OFFSET	STATION	INTERVAL	CLASS.	L.L.	P.I.	C.SAND	F.SAND	SILT	CLAY	10	40	200	MOISTURE	ORGANIC
SS-3	68 RT	153+32	2.8-4.3	A-4(0)	25	6	33.8	26.8	19.3	20.1	97	78	41	-	-

## EB1-C

			S	OIL 7	TE.	ST	<i>RE</i>	SUL	LTS						
SAMPLE			DEPTH	AASHTO				% BY V	VEIGHT		% PAS	SING (S	IEVES)	%	%
NO.	OFFSET	STATION	INTERVAL	CLASS.	L.L.	P.I.	C.SAND	F.SAND	SILT	CLAY	10	40	200	MOISTURE	ORGANIC
SS-1	23 RT	153+65	3.2-4.7	A-4(0)	25	7	31.6	33.6	16.7	18.1	98	79	39	-	-
SS-2	23 RT	153+65	8.2-9.7	A-1-b(0)	20	NP	49.7	25.4	16.9	8.0	58	37	17	-	•

#### *B1-B*

			S	OIL T	TE	ST	<b>RE</b>	SUI	LTS						
SAMPLE			DEPTH	AASHTO				% BY V	VEIGHT		% PAS	SING (S	IEVES)	%	%
NO.	OFFSET	STATION	INTERVAL	CLASS.	L.L.	P.I.	C.SAND	F.SAND	SILT	CLAY	10	40	200	MOISTURE	ORGANIC
SS-7	47 RT	154+16	9.0-10.5	A-2-4(0)	28	NP	51.3	24.9	15.7	8.0	92	56	27	•	-

## *B1-C*

			S	OIL T	TE.	ST	<i>RE</i>	SUL	TS						
SAMPLE			DEPTH	AASHTO				% BY W	/EIGHT		% PAS	SING (S	IEVES)	%	%
NO.	OFFSET	STATION	INTERVAL	CLASS.	L.L.	P.I.	C.SAND	F.SAND	SILT	CLAY	10	40	200	MOISTURE	ORGANIC
SS-6	23 RT	154+28	0.0-1.5	A-2-4(0)	24	NP	47.9	33.2	12.9	6.0	98	77	22	-	•

## *B2-A*

			S	OIL T	TE.	ST	<i>RE</i>	SUL	LTS						
SAMPLE			DEPTH	AASHTO				% BY V	/EIGHT		% PAS	SING (S	IEVES)	%	%
NO.	OFFSET	STATION	INTERVAL	CLASS.	L.L.	P.I.	C.SAND	F.SAND	SILT	CLAY	10	40	200	MOISTURE	ORGANIC
S-8	47 LT	155+73	0.0-3.7	A-3(0)	29	NP	37.9	55.5	2.6	4.0	100	96	9		-
SS-9	47 LT	155+73	8.7-10.2	A-1-b(0)	22	2	42.2	24.6	21.0	12.1	50	35	19	-	-

#### *B2-B*

			S	OIL T	TE.	ST	<i>RE</i>	SUL	TS						
SAMPLE			DEPTH	AASHTO				% BY V	VEIGHT		% PAS	SING (S	IEVES)	%	%
NO.	OFFSET	STATION	INTERVAL	CLASS.	L.L.	P.I.	C.SAND	F.SAND	SILT	CLAY	10	40	200	MOISTURE	ORGANIC
SS-10	47 RT	155+30	0.0-1.5	A-4(0)	27	6	23.0	23.4	31.3	22.2	79	67	47	-	-

## EB2-A

			S	OIL 7	TE.	ST	RE	SUL	LTS						
SAMPLE			DEPTH	AASHTO				% BY W	VEIGHT		% PAS	SING (S	IEVES)	%	%
NO.	OFFSET	STATION	INTERVAL	CLASS.	L.L.	P.I.	C.SAND	F.SAND	SILT	CLAY	10	40	200	MOISTURE	ORGANIC
SS-154	55 LT	156+90	0.0-1.5	A-2-4(0)	26	NP	47.3	25.6	15.1	12.0	92	61	29	-	-
SS-155	55 LT	156+90	3.5-5.0	A-2-4(0)	25	4	49.5	23.9	13.5	13.0	93	60	29	-	-

#### *EB2-B*

			S	OIL T	TE.	ST	<b>RE</b>	SUI	LTS						
SAMPLE			DEPTH	AASHTO				% BY V	VEIGHT		% PAS	SING (S	SIEVES)	%	%
NO.	OFFSET	STATION	INTERVAL	CLASS.	L.L.	P.I.	C.SAND	F.SAND	SILT	CLAY	10	40	200	MOISTURE	ORGANIC
S-11	55 RT	156+35	0.0-3.8	A-4(2)	29	5	16.0	23.0	36.8	24.2	97	87	66		

## EB2-C

			S	OIL 7	TE	ST	RE.	SUL	LTS						
SAMPLE			DEPTH	AASHTO				% BY W	/EIGHT		% PAS	SING (S	IEVES)	%	%
NO.	OFFSET	STATION	INTERVAL	CLASS.	L.L.	P.I.	C.SAND	F.SAND	SILT	CLAY	10	40	200	MOISTURE	ORGANIC
SS-12	19 LT	156+70	3.5-5.0	A-2-4(0)	23	3	40.6	28.2	19.1	12.1	95	71	34	-	-

			R	OCK .	TEST	RESU	LTS		
SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	H/D RATIO	UNIT WT lbs/ft3	Ultimate lbf	Ultimate ksi	Ultimate (corrected) ksi	Sec. Mod. @ 40% Mpsi
RS-1	47 LT	155+73	15.0-15.5	2.44	168.3	65600	23.9	24.4	8.47
RS-2	47 RT	155+30	4.4-5.2	.717	629	92400	33.7	27.7	13.13
RS-3	47 LT	154+59	15.3-16.1	.701	629	92200	33.6	27.5	11.04
RS-4	47 RT	154+16	19.5-20.1	2.41	166.4	69600	25.4	25.9	0.27

ID: U	
34802.1.1	
IECT:	
PRO	

STATE	OF	NORTH	<b>CAROLINA</b>
		1101111	

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

#### **CONTENTS DESCRIPTION**

2 LEGEND	
3 SITE PLAN	
4 PROFILE	
5,6 CROSS SEC	TIC

CTIONS

7-10 BORE LOGS & CORE REPORT SOIL TEST RESULTS 12 CORE PHOTOGRAPHS

SITE PHOTOGRAPH

## **STRUCTURE** SUBSURFACE INVESTIGATION

PROJ. REFERENCE NO. 34802.1.1 (U-2412A)

F.A. PROJ. <u>STP-4121(1)</u>

COUNTY \_\_GUILFORD

PROJECT DESCRIPTION GREENSBORO/HIGH POINT RD. FROM PROPOSED US 311 BYPASS TO WEST OF SR 1480

SITE DESCRIPTION <u>STRUCTURE NO. 7 ON</u> <u>-Y8- (SR 1352, OAKDALE</u> RD.) OVER -L- (GREENSBORO/HIGH POINT RD.) AT STATION 14 + 98

#### **CAUTION NOTICE**

STATE STATE PROJECT REFERENCE NO. N.C. 34802.1.1 (U-2412A)

13 1

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

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

THE BIDDER OR CONTRACTOR IS CAUTIONED THAT DETAILS SHOWN ON THE SUBSUBFACE 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 CUARANTEE THE SUFFICIENCY OR ACCURACY OF THE INVESTIGATION MADE, NOR THE INTERPRETATIONS MADE, OR DINION OF THE DEPARTMENT AS TO THE TYPE OF MATERIALS AND CONDITIONS TO BE ENCOUNTERED. THE BIDDER OR CONTRACTOR IS CAUTIONED TO MAKE SUCH INDEPENDENT SUBSUBFACE INVESTIGATIONS AS HE DEEMS NECESSARY TO SATISFY HIMSELF AS TO CONDITIONS TO BE ENCOUNTERED ON THIS PROJECT. THE CONTRACTOR SHALL HAVE NO CLAIM FOR ADDITIONAL COMPENSATION OR FOR AN EXTENSION OF TIME FOR ANY REASON RESULTING FROM THE ACTUAL CONDITIONS ENCOUNTERED AT THE SITE DIFFERING FROM THOSE MIDICATED IN THE SUBSUBFACE INFORMATION. THOSE INDICATED IN THE SUBSURFACE INFORMATION.

> N.D. MOHS **MACTEC**

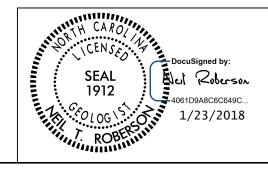
PERSONNEL

INVESTIGATED BY N.D. MOHS

N.T. ROBERSON

SUBMITTED BY\_\_\_\_N.T. ROBERSON

APRIL 2009



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

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

## PROJECT REFERENCE NO. SHEET NO. 34802.I.I (U-24I2A) 2

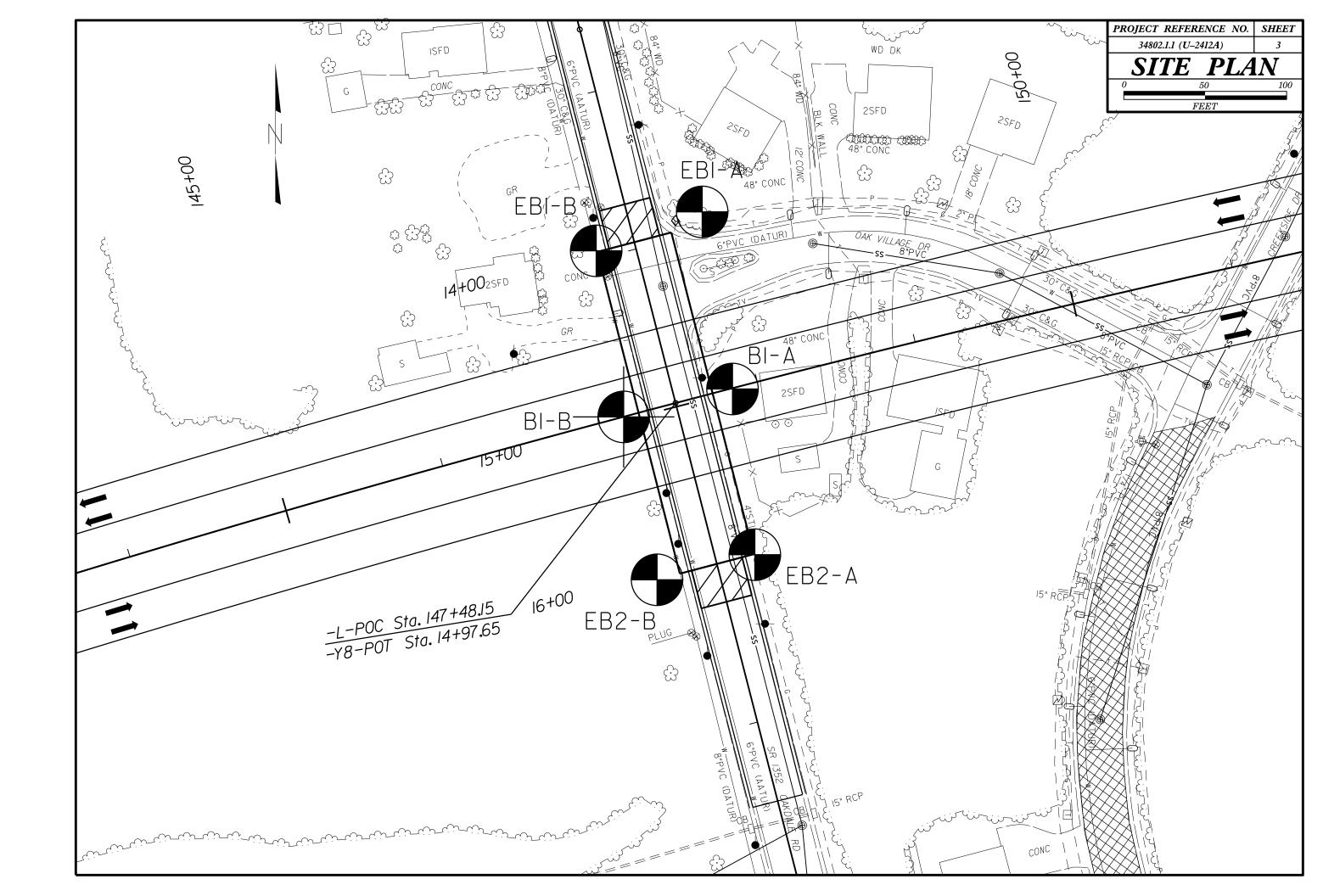
#### NORTH CAROLINA DEPARTMENT OF TRANSPORTATION

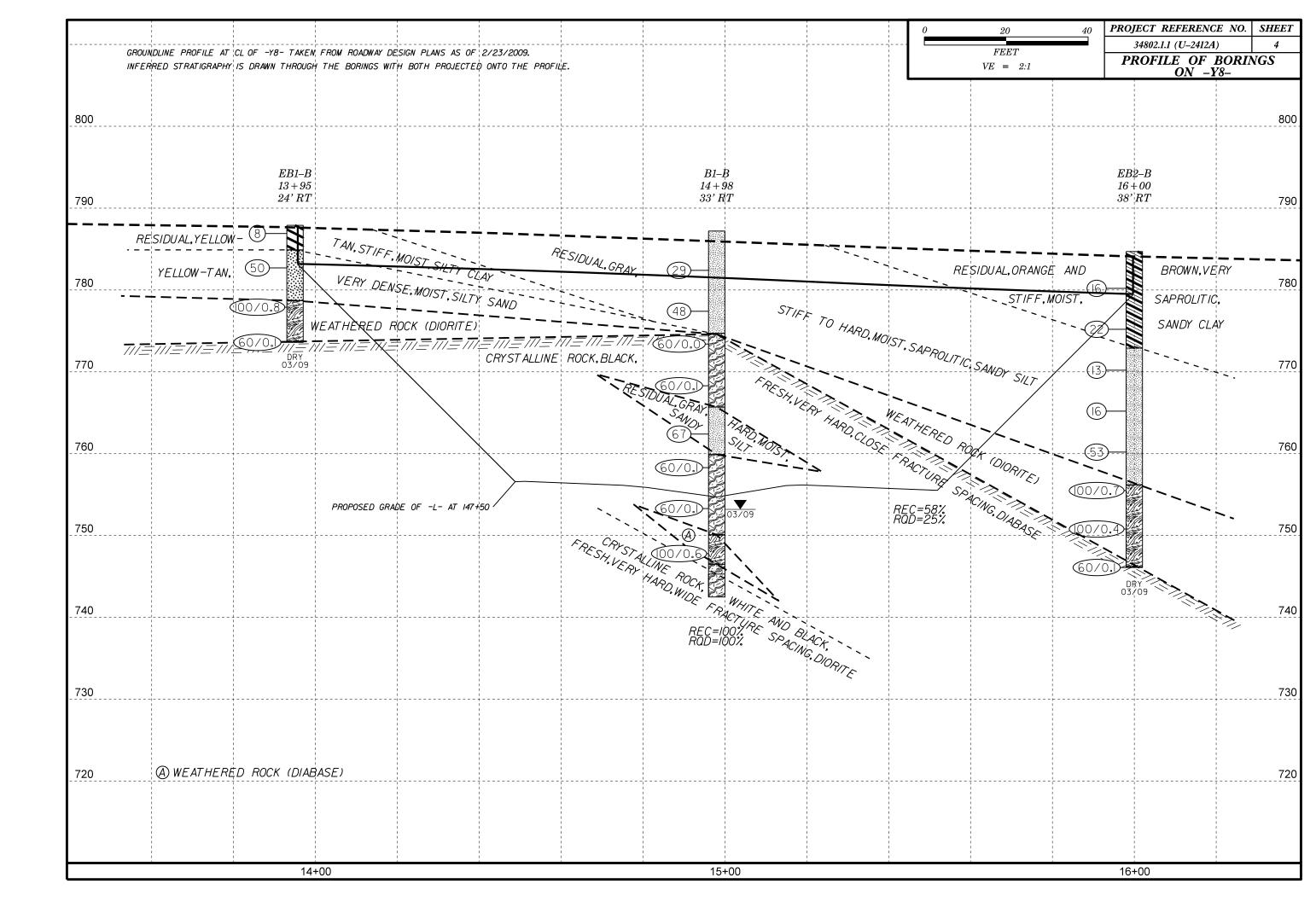
#### DIVISION OF HIGHWAYS

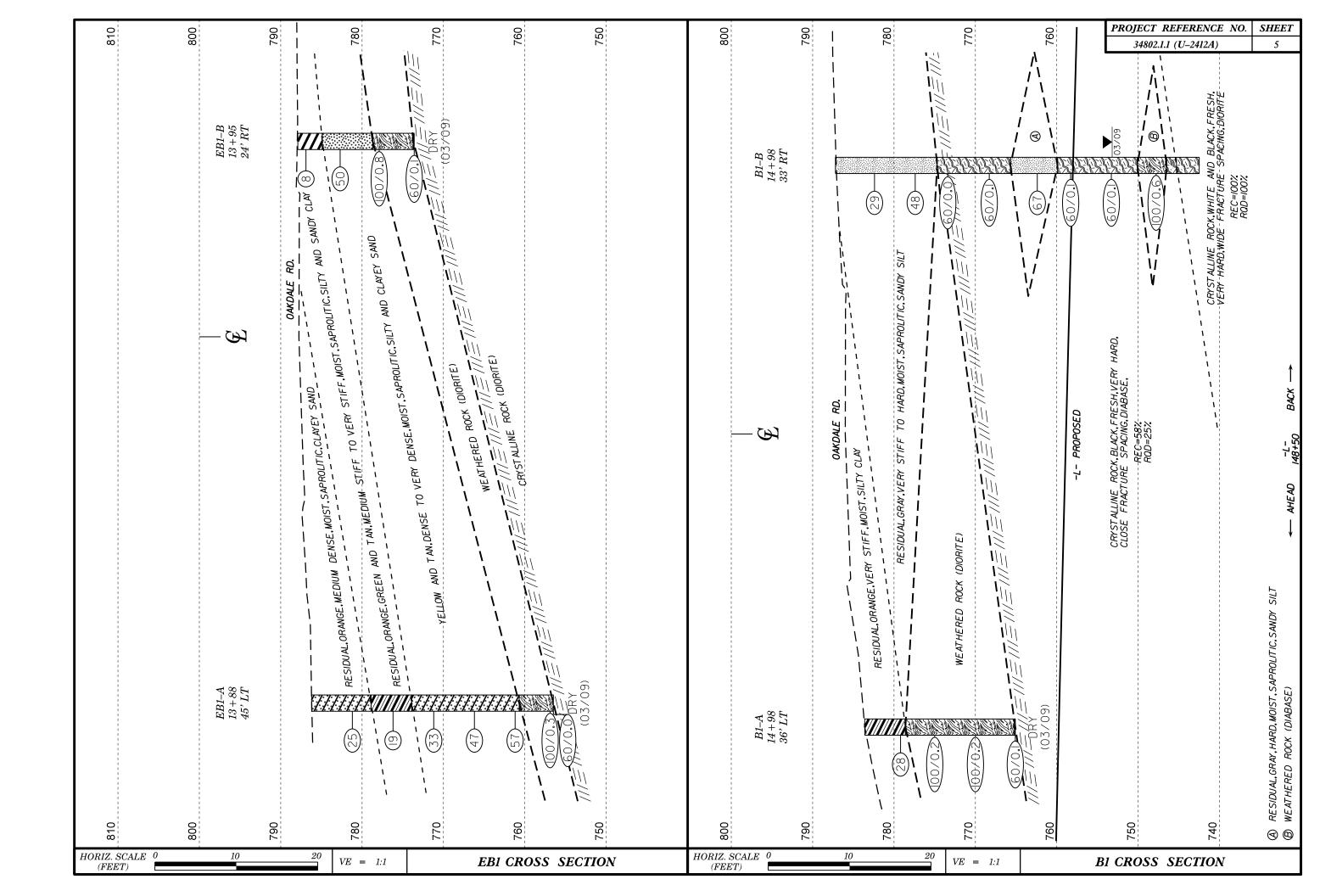
GEOTECHNICAL ENGINEERING UNIT

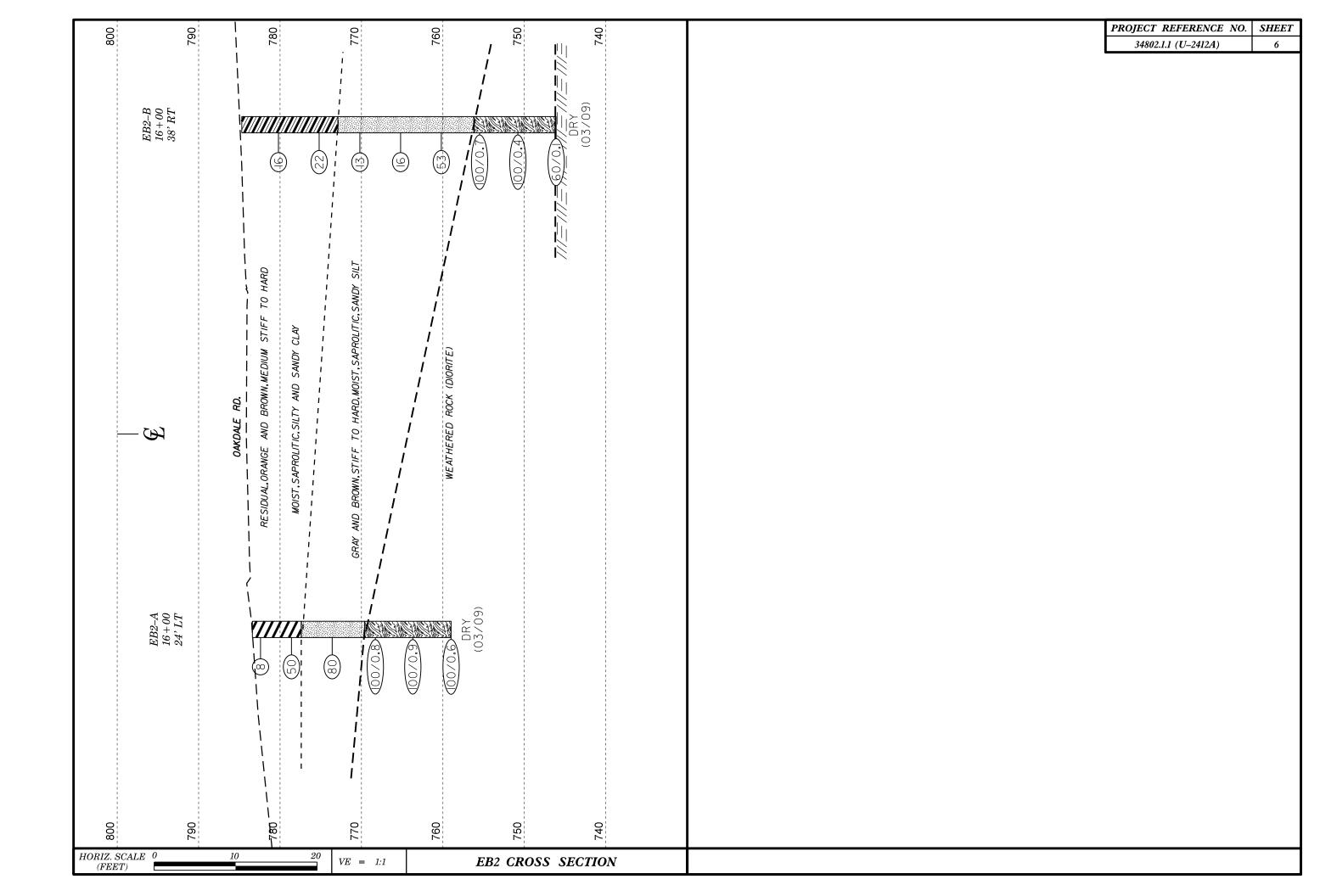
## SUBSURFACE INVESTIGATION

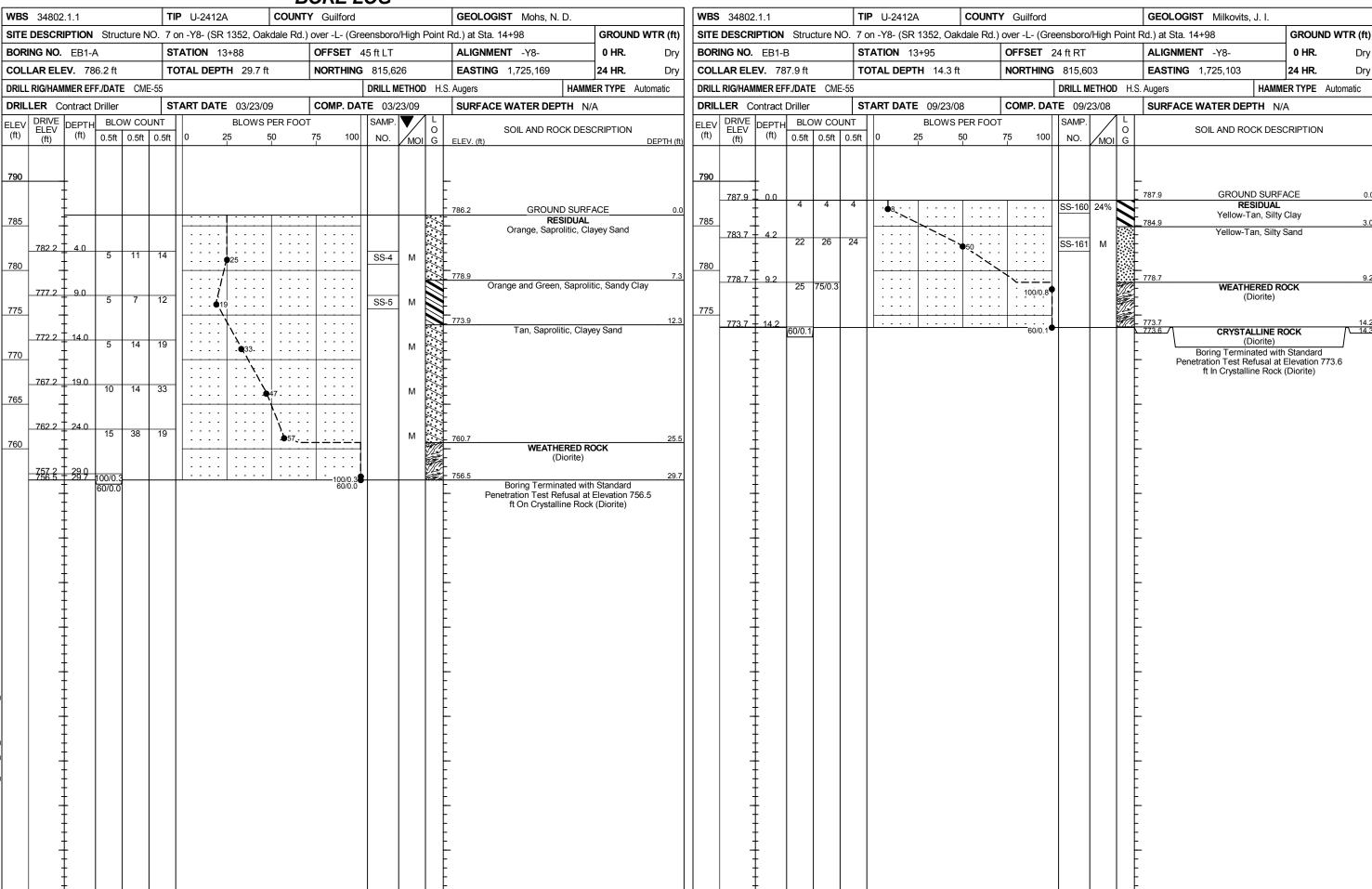
	SOIL AND ROC	CK LEGEND, TERM	s, symbols	, AND ABBREVI	ATIONS	
SOIL DESCRIPTION	GRADATION				DESCRIPTION	TERMS AND DEFINITIONS
SOIL IS CONSIDERED TO BE THE UNCONSOLIDATED, SEMI-CONSOLIDATED, OR WEATHERED EARTH MATERIALS THAT CAN BE PENETRATED WITH A CONTINUOUS FLIGHT POWER AUGER, AND YIELD LESS THAN 100 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 MINERALOGICAL COMPOSITION, ANGULARITY, STRUCTURE, PLASTICITY, ETC. EXAMPLE:  VERY SIFF, GRANSURY CAN, WOST WITH MITEREDEDDED PINE SAND LAVERS, MINERY PLASTIC. A-7-6	WELL GRADED - INDICATES A GOOD REPRESENTATION OF PARTICLE SIZES FF UNIFORM - INDICATES THAT SOIL PARTICLES ARE ALL APPROXIMATELY THE POORLY GRADED - INDICATES A MIXTURE OF UNIFORM PARTICLES OF TWO OR MIXTURE OF UNIFORM PARTICLES OF TWO OR MIXTURE OF UNIFORM PARTICLES OF TWO OR MIXTURE OF SOIL GRAINS IS DESIGNATED BY THE 1 SUBANGULAR, SUBROUNDED, OR ROUNDED.	SAME SIZE. (ALSO)	ROCK LINE INDICA SPT REFUSAL IS F IN NON-COASTAL F OF WEATHERED RO ROCK MATERIALS OF	NTES THE LEVEL AT WHICH NON-C PENETRATION BY A SPLIT SPOON PLAIN MATERIAL, THE TRANSITIO DCK. ARE TYPICALLY DIVIDED AS FOLI	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. ON BETWEEN SOIL AND ROCK IS OFTEN REPRESENTED BY A ZONE LOWS:  "LAIN MATERIAL THAT WOULD YIELD SPT N VALUES > 100	ARGILLACEOUS - APPLIED TO ALL ROCKS OR SUBSTANCES COMPOSED OF CLAY MINERALS, OR HAVING A NOTABLE PROPORTION OF CLAY IN THEIR COMPOSITION, AS SHALE, SLATE, ETC.
SOIL LEGEND AND AASHTO CLASSIFICATION	MINERAL OGICAL COMPOSITIO		ROCK (WR)  CRYSTALLINE	BLOWS PER FOO	OT IF TESTED.  E GRAIN IGNEOUS AND METAMORPHIC ROCK THAT PT REFUSAL IF TESTED. ROCK TYPE INCLUDES GRANITE.	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)   C>35% PASSING "200)   GRGANIC MATERIALS   CROUP   A-1   A-3   A-2   A-4   A-5   A-6   A-7   A-1, A-2   A-4, A-5	WHENEVER THEY ARE CONSIDERED OF SIGNIFICANCE.  COMPRESSIBILITY	SED IN DESCRIPTIONS	ROCK (CR)  NON-CRYSTALLINE	GNEISS, GABBRO,		CALCAREOUS (CALC.) - SOILS THAT CONTAIN APPRECIABLE AMOUNTS OF CALCIUM CARBONATE.  COLLUVIUM - ROCK FRAGMENTS MIXED WITH SOIL DEPOSITED BY GRAVITY 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-7-6 A-7 SYMBOL 000000000000000000000000000000000000	SLIGHTLY COMPRESSIBLE LIQUID LIMIT   MODERATELY COMPRESSIBLE LIQUID LIMIT	LESS THAN 31 EQUAL TO 31-50 GREATER THAN 50	ROCK (NCR)  COASTAL PLAIN SEDIMENTARY ROCK	INCLUDES PHYLL COASTAL PLAIN	LITE, SLATE, SANDSTONE, ETC. SEDIMENTS CEMENTED INTO ROCK, BUT MAY NOT YIELD ROCK TYPE INCLUDES LIMESTONE, SANDSTONE, CEMENTED	OF SLOPE.  CORE RECOVERY (REC.) - TOTAL LENGTH OF ALL MATERIAL RECOVERED IN THE CORE BARREL DIVIDED BY TOTAL
% PASSING SILT-	PERCENTAGE OF MATERIAL		(CP)	SHELL BEDS, ETC	C. ATHERING	LENGTH OF CORE RUN AND EXPRESSED AS A PERCENTAGE.  DIKE - A TABULAR BODY OF IGNEOUS ROCK THAT CUTS ACROSS THE STRUCTURE OF ADJACENT
10	TRACE OF ORGANIC MATTER 2 - 3% 3 - 5% TRACE	OTHER MATERIAL  CE 1 - 10%	FRESH ROCK		OINTS MAY SHOW SLIGHT STAINING ROCK RINGS UNDER	ROCKS OR CUTS MASSIVE ROCK.  DIP - THE ANGLE AT WHICH A STRATUM OR ANY PLANAR FEATURE IS INCLINED FROM THE HORIZONTAL.
LIGUID LIMIT   48 MX 41 MN 50ILS WITH   PLASTIC INDEX 6 MX NP 18 MX 18 MX 11 MN 11 MN 11 MN 11 MN 11 MN LITTLE OR HIGHLY	LITTLE ORGANIC MATTER 3 - 5%, 5 - 12%, LITT   MODERATELY ORGANIC 5 - 10%, 12 - 20%, SOM   HIGHLY ORGANIC >10%, >20%, HIGH	1E 20 - 35%	VERY SLIGHT ROCK (V SLI.) CRYST	GENERALLY FRESH, JOINTS STAIN TALS ON A BROKEN SPECIMEN FAC	NED, SOME JOINTS MAY SHOW THIN CLAY COATINGS IF OPEN, CE SHINE BRIGHTLY, ROCK RINGS UNDER HAMMER BLOWS IF	DIP DIRECTION (DIP AZIMUTH) - THE DIRECTION OR BEARING OF THE HORIZONTAL TRACE OF THE LINE OF DIP, MEASURED CLOCKWISE FROM NORTH.
GROUP INDEX 0 0 0 4 MX 8 MX 12 MX 16 MX No MX MODERATE ORGANI			SLIGHT ROCK		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 SAND GRAVEL AND SAND GRAVEL AND SAND SOILS SOILS MATTER	STATIC WATER LEVEL AFTER 24 HOURS		CRYST	TALS ARE DULL AND DISCOLORED.	. CRYSTALLINE ROCKS RING UNDER HAMMER BLOWS. DISCOLORATION AND WEATHERING EFFECTS. IN	FISSILE - A PROPERTY OF SPLITTING ALONG CLOSELY SPACED PARALLEL PLANES.
GEN. RATING AS A EXCELLENT TO GOOD FAIR TO POOR POOR UNSUITAB		NG STRATA	(MOD.) GRANII	TOID ROCKS, MOST FELDSPARS AF SOUND UNDER HAMMER BLOWS AN	TO SCOLUMN THE WEATHERING EFFECTS. IN RE DULL AND DISCOLORED, SOME SHOW CLAY, ROCK HAS NO SHOWS SIGNIFICANT LOSS OF STRENGTH AS COMPARED	FLOAT - ROCK FRAGMENTS ON SURFACE NEAR THEIR ORIGINAL POSITION AND DISLODGED FROM PARENT MATERIAL.  FLOOD PLAIN (FP) - LAND BORDERING A STREAM, BUILT OF SEDIMENTS DEPOSITED BY
PI OF A-7-5 SUBGROUP IS ≤ LL - 30; PI OF A-7-6 SUBGROUP IS > LL - 30	SPRING OR SEEP		MODERATELY ALL R		D OR STAINED. IN GRANITOID ROCKS, ALL FELDSPARS DULL	THE STREAM.
CONSISTENCY OR DENSENESS  COMPACTNESS OR RANGE OF UNCONFINED  COMPACTNESS OR RANGE OF STANDARD COMPACTNESS OR C	MISCELLANEOUS SYMBOLS		(MOD. SEV.) AND C	AN BE EXCAVATED WITH A GEOLG	OW KAOLINIZATION. ROCK SHOWS SEVERE LOSS OF STRENGTH OGIST'S PICK. ROCK GIVES 'CLUNK' SOUND WHEN STRUCK.	FORMATION (FM.) - A MAPPABLE GEOLOGIC UNIT THAT CAN BE RECOGNIZED AND TRACED IN THE FIELD.
PRIMARY SOIL TYPE COMPRETINESS OR CONSISTENCY PENETRATION RESISTENCE (N-VALUE) COMPRESSIVE STRENGTH (TONS/F12 )	ROADWAY EMBANKMENT (RE)  WITH SOIL DESCRIPTION  POT DAT TEST BORING	IG DESIGNATIONS S - BULK SAMPLE		<u>STED, WOULD YIELD SPT REFUSAL</u> ROCK EXCEPT QUARTZ DISCOLOREO	: D OR STAINED.ROCK FABRIC CLEAR AND EVIDENT BUT REDUCED	JOINT - FRACTURE IN ROCK ALONG WHICH NO APPRECIABLE MOVEMENT HAS OCCURRED.
GENERALLY VERY LOOSE (4 CONTROL CONTRO	SOIL SYMBOL AUGER BORING	SS - SPLIT SPOON	(SEV.) IN STE	NT. SOME FRAGMENTS OF STRONG		LEDGE - A SHELF-LIKE RIDGE OR PROJECTION OF ROCK WHOSE THICKNESS IS SMALL COMPARED TO ITS LATERAL EXTENT.
MATERIAL MEDIUM DENSE 10 TO 30 (NON-COHESIVE) VERY DENSE >50	ARTIFICIAL FILL (AF) OTHER THAN ROADWAY EMBANKMENT  OTHER CORE BORING  INFERRED SOIL BOUNDARY	SAMPLE ST - SHELBY TUBE SAMPLE	VERY SEVERE ALL RI	MASS IS EFFECTIVELY REDUCED T	D OR STAINED, ROCK FABRIC ELEMENTS ARE DISCERNIBLE BUT TO SOIL STATUS, WITH ONLY FRAGMENTS OF STRONG ROCK	LENS - A BODY OF SOIL OR ROCK THAT THINS OUT IN ONE OR MORE DIRECTIONS.  MOTILED (MOI.) - IRREGULARLY MARKED WITH SPOTS OF DIFFERENT COLORS, MOTILING IN SOILS USUALLY INDICATES POOR AERATION AND LACK OF GOOD DRAINAGE.
VERY SOFT	MONITORING WEL	RS - ROCK SAMPLE			OF ROCK WEATHERED TO A DEGREE SUCH THAT ONLY MINOR RIC REMAIN. <u>IF TESTED, YIELDS SPT N VALUES &lt; 100 BPF</u>	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           (COHESIVE)         VERY STIFF         15 TO 30         2 TO 4           HARD         >30         >4	PIEZOMETER  TTTT ALLUVIAL SOIL BOUNDARY  25/025 DIP & DIP DIRECTION OF  SLOPE INSTALLATION INSTALLATION	RT - RECOMPACTED TRIAXIAL SAMPLE IR CBR - CALIFORNIA BEARING	SCATTE		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.  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  SPT N-VALUE	RATIO SAMPLE			HARDNESS	EXPRESSED AS A PERCENTAGE.
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     REF— SPT REFUSAL		SEVE	RAL HARD BLOWS OF THE GEOLO		SAPPOLITE (SAP) - RESIDUAL SOIL THAT RETAINS THE RELIC STRUCTURE OR FABRIC OF THE PARENT ROCK.  SILL - AN INTRUSIVE BODY OF IGNEOUS ROCK OF APPROXIMATELY UNIFORM THICKNESS AND
BOULDER   COBBLE   GRAVEL   SAND	ABBREVIATIONS  AR - AUGER REFUSAL HI HIGHLY BT - BORING TERMINATED MED MEDIUM	w - MOISTURE CONTENT V - VERY	то о	ETACH 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.
GRAIN MM 305 75 2.0 0.25 0.05 0.005 SIZE IN, 12 3	CL CLAY MICA MICACEOUS CPT - CONE PENETRATION TEST MOD MODERATELY	VST - VANE SHEAR TEST WEA WEATHERED	HARD EXCA BY M	NVATED BY HARD BLOW OF A GEO MODERATE BLOWS.	DLOGIST'S PICK. HAND SPECIMENS CAN BE DETACHED	SLICKENSIDE - POLISHED AND STRIATED SURFACE THAT RESULTS FROM FRICTION ALONG A FAULT OR SLIP PLANE.  STANDARD PENETRATION TEST (PENETRATION RESISTANCE) (SPT) - NUMBER OF BLOWS (N OR BPF) OF
SOIL MOISTURE - CORRELATION OF TERMS	CSE COARSE NP - NON PLASTIC DMT - DILATOMETER TEST ORG ORGANIC DPT - DYNAMIC PENETRATION TEST PMT - PRESSUREMETER TEST	$\gamma$ - UNIT WEIGHT $\gamma_{ m d}$ - DRY UNIT WEIGHT	HARD CAN POINT	BE EXCAVATED IN SMALL CHIPS T OF A GEOLOGIST'S PICK.	ICHES DEEP BY FIRM PRESSURE OF KNIFE OR PICK POINT. TO PEICES I INCH MAXIMUM SIZE BY HARD BLOWS OF THE	A 140 LB. HAMMER FALLING 30 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 GOIDE FOR FIELD MOISTORE DESCRIPTION	e - VOID RATIO SAP SAPROLITIC   F - FINE SD SAND, SANDY   FOSS FOSSILIFEROUS SL SILT, SILTY		FROM		BY KNIFE OR PICK. CAN BE EXCAVATED IN FRAGMENTS SIZE BY MODERATE BLOWS OF A PICK POINT. SMALL, THIN PRESSURE.	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	FRAC FRACTURED, FRACTURES SLI SLIGHTLY FRAGS FRAGMENTS TCR - TRICONE REFUSAL		SOFT OR M		EXCAVATED READILY WITH POINT OF PICK, PIECES 1 INCH EN 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.
RANGE   RANGE   - WET - (W) SEMISOLID; REQUIRES DRYING TO ATTAIN OPTIMUM MOISTURE  (PI) PL PLASTIC LIMIT	EQUIPMENT USED ON SUBJECT P	ROJECT		URE SPACING	BEDDING THIS (A) FOR	TOPSOIL (TS.) - SURFACE SOILS USUALLY CONTAINING ORGANIC MATTER.
PLC	DRILL UNITS: ADVANCING TOOLS:	HAMMER TYPE:  X AUTOMATIC MANUAL	TERM VERY WIDE	<u>SPACING</u> MORE THAN 10 FEET	TERM THICKNESS  VERY THICKLY BEDDED > 4 FEET	BENCH MARK: BL-173, -L- STA. 145+64, 13.6' LT
OM OPTIMUM MOISTURE - MOIST - (M) SOLID; AT OR NEAR OPTIMUM MOISTURE SL SHRINKAGE LIMIT	MOBILE B- CLAY BITS	X AUTOMATIC MANORE	WIDE MODERATELY CLO	3 TO 10 FEET DSE 1 TO 3 FEET	THICKLY BEDDED 1.5 - 4 FEET THINLY BEDDED 0.16 - 1.5 FEET	ELEVATION: 783.23 FT.
REQUIRES ADDITIONAL WATER TO - DRY - (D) ATTAIN OPTIMUM MOISTURE	BK-51 G* CONTINUOUS FLIGHT AUGER  X 8* HOLLOW AUGERS	CORE SIZE:	CLOSE VERY CLOSE	0.16 TO 1 FEET 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:
PLASTICITY	CME-45C X HARD FACED FINGER BITS	X-NO	EOD CEDIMENTARY DO		DURATION  JUNE OF THE MATERIAL BY CEMENTING HEAT PRESSURE ETC.	
PLASTICITY INDEX (PI) DRY STRENGTH NONPLASTIC 0-5 VERY LOW	T TUNGCARBIDE INSERTS				WITH FINGER FREES NUMEROUS GRAINS;	
LOW PLASTICITY 6-15 SLIGHT MED. PLASTICITY 16-25 MEDIUM	X CASING W/ ADVANCER	HAND TOOLS:	FRIABLE	GENTLE	BLOW BY HAMMER DISINTEGRATES SAMPLE.	
HIGH PLASTICITY 26 OR MORE HIGH  COLOR	PORTABLE HOIST X TRICONE 25% STEEL TEETH TRICONE 1 TUNGCARB.	POST HOLE DIGGER  HAND AUGER		BREAKS	CAN BE SEPARATED FROM SAMPLE WITH STEEL PROBE; EASILY WHEN HIT WITH HAMMER.	
DESCRIPTIONS MAY INCLUDE COLOR OR COLOR COMBINATIONS (TAN, RED, YELLOW-BROWN, BLUE-GRAY).	X CORE BIT	SOUNDING ROD	INDURATED		ARE DIFFICULT TO SEPARATE WITH STEEL PROBE; LT TO BREAK WITH HAMMER.	
MODIFIERS SUCH AS LIGHT, DARK, STREAKED, ETC. ARE USED TO DESCRIBE APPEARANCE.		VANE SHEAR TEST	EXTREMELY		HAMMER BLOWS REQUIRED TO BREAK SAMPLE; BREAKS ACROSS GRAINS.	









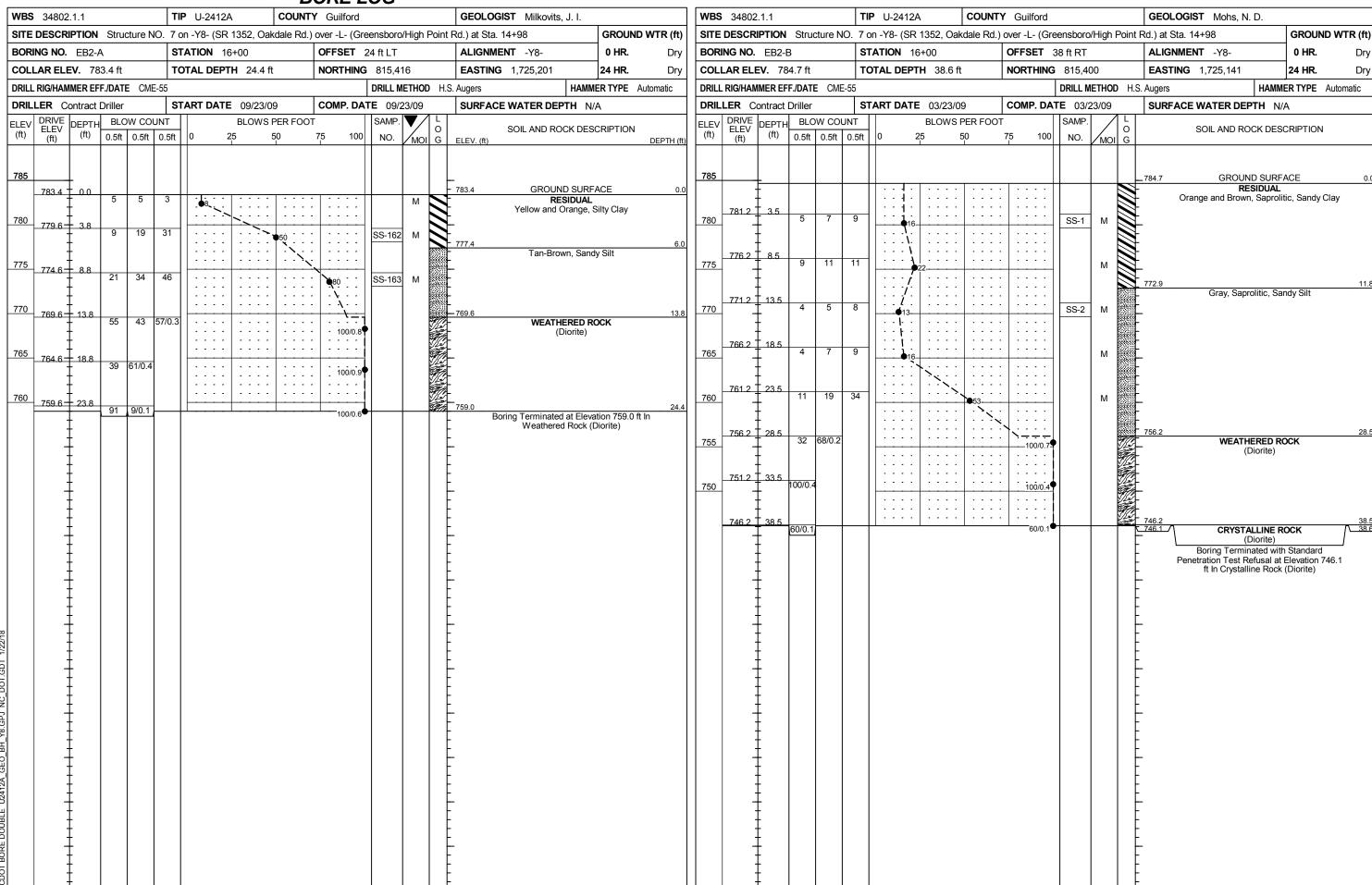


									1						+		
WBS	34802	.1.1			TI	<b>P</b> U-24	12A		COUN	TY Gu	uilford				GEOLOGIST Mohs, N. D.		
SITE	DESCR	IPTION	Struc	cture N	NO. 7 (	on -Y8- (	SR 13	352, Oal	kdale Rd	.) over	-L- (Gre	eensboro	/High	Point	Rd.) at Sta. 14+98	GROUND W	/TR (ft)
BOR	ING NO.	B1-A			S	TATION	14+	98		OFF	SET	36 ft LT			ALIGNMENT -Y8-	0 HR.	Dry
COLI	LAR ELE	<b>EV</b> . 78	3.6 ft		т	OTAL DE	PTH	18.5 f	t	NOF	RTHING	815,5	18		<b>EASTING</b> 1,725,187	24 HR.	Dry
	RIG/HAN			E CMI	E-55					'		DRILL N	METHO	D H.S	. Augers HAMMI	R TYPE Auto	
	LER C					TART DA	ATE.	03/23/0	9	CON	/IP. DA	TE 03/			SURFACE WATER DEPTH N//		
ELEV	DRIVE ELEV	DEPTH	BLC	w co	UNT		ı	BLOWS	PER FO	T T		SAMP.	<b>V</b> /	1 4 1	OO! AND DOOK DEGG	DIDTION	
(ft)	(ft)	(ft)	0.5ft			0	25		50	75	100	NO.	МОІ	O I G	SOIL AND ROCK DESC		DEPTH (ft)
785		<u> </u>													- 783.6 GROUND SURFA	ACE	0.0
						:::	:			: :					<b>RESIDUAL</b> Orange, Silty Cl		
780	780.2	3.4					-  ¦								Orange, Silty Or	ay	
	-	Ŧ	6	9	19		. •	28			·	SS-3	М		778.6	-014	5.0
		†					-								WEATHERED RO (Diorite)	CK	
775	775.2	8.4	100/0.2				-				100/0.2	•			-		
		‡				:::											
		<u> </u>				: : :	:			-   -	: : :						
770	770.2	13.4	100/0.2			<del> </del>			<del> </del>		100/0.2	•			-		
	-	t				: : :					: : :						
	765.2	<u> 18.4</u>	1			1	-	<u></u> -	<u> </u>		[				765.2 -765.1_∕\ CRYSTALLINE R		18.4 /\18.5/
	-	F	60/0.1								60/0.1				CRYSTALLINE RO (Diorite)	OCK	18.5/
		ļ													Boring Terminated with	Standard	,
	_	ţ													Penetration Test Refusal at I ft In Crystalline Rock		
	-	ł													·	,	
	-	Ŧ															
		‡													-		
		ł															
	-	ŀ															
	_	‡													-		
		‡															
	ĺ .	t															
	-	F													-		
	] -	ļ															
		‡															
	<u> </u>	t													-		
	-	+															
	-	Į															
	<u> </u>	‡													-		
	] -	t															
	-	+												F			
	-	Ī													-		
		‡															
	_	ţ												E	_		
	-	+												F			
	-	Ī															
	_	‡													-		
		t															
		+												F			
	_	‡													-		
		t															
	-	+												F			
	_	‡													-		
		‡															
	-	+															
	( -	t	1	1	1	I						1	1	1 F			

SHEET 8

#### **TIP** U-2412A **COUNTY** Guilford GEOLOGIST Mohs, N. D. **WBS** 34802.1.1 **GROUND WTR (ft)** SITE DESCRIPTION Structure NO. 7 on -Y8- (SR 1352, Oakdale Rd.) over -L- (Greensboro/High Point Rd.) at Sta. 14+98 OFFSET 33 ft RT STATION 14+98 **ALIGNMENT** -Y8-BORING NO. B1-B 0 HR. N/A COLLAR ELEV. 787.2 ft TOTAL DEPTH 44.7 ft **NORTHING** 815,500 **EASTING** 1,725,120 24 HR. 34.0 DRILL RIG/HAMMER EFF./DATE CME-55 DRILL METHOD HAMMER TYPE Automatic NW Casing w/ Core **DRILLER** Contract Driller **START DATE** 03/30/09 COMP. DATE 03/30/09 SURFACE WATER DEPTH N/A ELEV DRIVE ELEV (ft) DEPTH BLOW COUNT (ft) 0.5ft 0.5ft 0.5ft **BLOWS PER FOOT** SAMP. SOIL AND ROCK DESCRIPTION (ft) 0.5ft 0.5ft 0.5ft 75 100 NO. MOI G ELEV. (ft) 790 **GROUND SURFACE** RESIDUAL Gray, Saprolitic, Sandy Silt 785 783.4 + 3.8 М 780 14 21 Μ 775 CRYSTALLINE ROCK 773.4 † 13.8 60/0.0 -60/0.0 (Diabase) 770 768.4 † 18.8 - -60/0.1¶ 765 RESIDUAL Gray, Saprolitic, Sandy Silt М 760 CRYSTALLINE ROCK 758.4 † 28.8 60/0.1 -60/0.1 755 Y 753.4 + 33.8 750.1 750.1 746.5 745.3 -60/0.1 750 WEATHERED ROCK (Diabase) 65 35/0.1 100/0.6 40.7 CRYSTALLINE ROCK 41.9 745 (Diabase) . . . . . . . . . . . . (Diorite) 44.7 Boring Terminated at Elevation 742.5 ft In Crystalline Rock (Diorite)

WIRD 34802.1.1   TIP U 2412A
BORING NO. B1-B   STATION 14+98   OFFSET 33 ft RT   ALIGNMENT -Y8-   O HR. N/A
COLLAR ELEV. 787.2 ft   TOTAL DEPTH 44.7 ft   NORTHING 815,500   EASTING 1,725,120   24 HR.   34.0
DRILL RIG/HAMMER EFF./DATE   CME-55   DRILL METHOD   NW Casing w/ Core   HAMMER TYPE   Automatic
DRILLER   Contract Driller   START DATE   03/30/09   COMP. DATE   03/30/09   SURFACE WATER DEPTH   N/A
CORE SIZE   NQ   TOTAL RUN   4.0 ft
RUN   City   RUN   RATE   RUN   REC.   RQD   RQD   REC.   RQD   RQD   REC.   RQD
ELEV   C(ft)   ELEV   C(ft)   (ft)   (ft)
745



SHEET 11 34802.1.1 (U-2412A)

#### EB1-A

$\mu \nu \tau$															
	SOIL TEST RESULTS														
SAMPLE			DEPTH	AASHTO				% BY W	/EIGHT		% PAS	SING (S	IEVES)	%	%
NO.	OFFSET	STATION	INTERVAL	CLASS.	L.L.	P.I.	C.SAND	F.SAND	SILT	CLAY	10	40	200	MOISTURE	ORGANIC
SS-4	45 LT	13+88	4.0-5.5	A-2-6(1)	38	19	48.6	19.5	13.8	18.1	82	51	29	-	-
SS-5	45 LT	13+88	9.0-10.5	A-6(5)	36	13	22.5	25.3	30.1	22.1	96	84	55	-	•

## *EB1-B*

	SOIL TEST RESULTS														
SAMPLE			DEPTH	AASHTO				% BY W	/EIGHT		% PAS	SING (S	IEVES)	%	%
NO.	OFFSET	STATION	INTERVAL	CLASS.	L.L.	P.I.	C.SAND	F.SAND	SILT	CLAY	10	40	200	MOISTURE	ORGANIC
SS-160	24 RT	13+95	0.0-1.5	A-7-6(11)	43	23	27.3	16.2	12.4	44.1	97	80	58	24	-
SS-161	24 RT	13+95	4.2-5.7	A-2-4(0)	28	7	50.7	21.3	12.9	15.0	90	56	29	•	•

## *B1-A*

			S	OIL 7	TE.	ST	SOIL ILST RESCEIS										
SAMPLE			DEPTH	AASHTO				% BY W	/EIGHT		% PAS	SING (S	IEVES)	%	%		
NO.	OFFSET	STATION	INTERVAL	CLASS.	L.L.	P.I.	C.SAND	F.SAND	SILT	CLAY	10	40	200	MOISTURE	ORGANIC		
SS-3	36 LT	14+98	3.4-4.9	A-7-6(5)	42	21	32.6	26.5	16.8	24.1	100	81	45	•	•		

#### EB2-B

<u> 1302-0</u>															
	SOIL TEST RESULTS														
SAMPLE			DEPTH	AASHTO				% BY W	/EIGHT		% PAS	SING (S	IEVES)	%	%
NO.	OFFSET	STATION	INTERVAL	CLASS.	L.L.	P.I.	C.SAND	F.SAND	SILT	CLAY	10	40	200	MOISTURE	ORGANIC
SS-1	38 RT	16+00	3.5-5.0	A-6(11)	38	13	1.8	24.1	47.9	26.1	100	99	82	-	-
SS-2	38 RT	16+00	13.5-15.0	A-4(5)	36	9	12.3	30.2	43.5	14.1	100	97	65	-	-

	SHEET 12	
34802.1.1	(U-2412A)	

## CORE PHOTOGRAPH B1-B

BOX 1: 40.7 - 44.7 FEET





## Site Photograph



Looking East