

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	39978.1.1(B-4946)	1	15

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

STRUCTURE
SUBSURFACE INVESTIGATION

PROJ. REFERENCE NO. 39978.1.1(B-4946) F.A. PROJ. BRSTP-0070(103)
COUNTY WAKE
PROJECT DESCRIPTION BRIDGE NO. 251 OVER US 401 NORTH
ON US 70/NC 50 AT -L- STATION 25+71
INVENTORY

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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) 250-4086. NEITHER THE SUBSURFACE PLANS AND REPORTS, NOR THE FIELD BORING LOGS, ROCK CORES, OR SOIL TEST DATA ARE PART OF THE CONTRACT.

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

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

PERSONNEL

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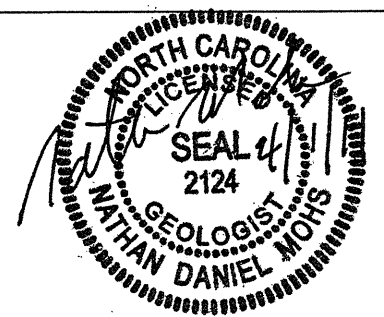
T.T. WALKER

INVESTIGATED BY J.I. MILKOVITS, JR.

CHECKED BY N.D. MOHS

SUBMITTED BY N.T. ROBERSON

DATE APRIL 2011



PROJECT: 39978.1.1 ID: B-4946

DRAWN BY: N.D. MOHS, D.W. FIELDS

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.

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION

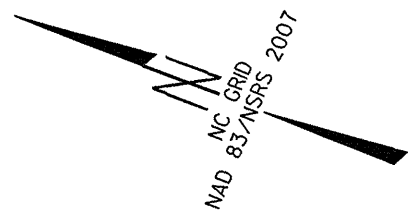
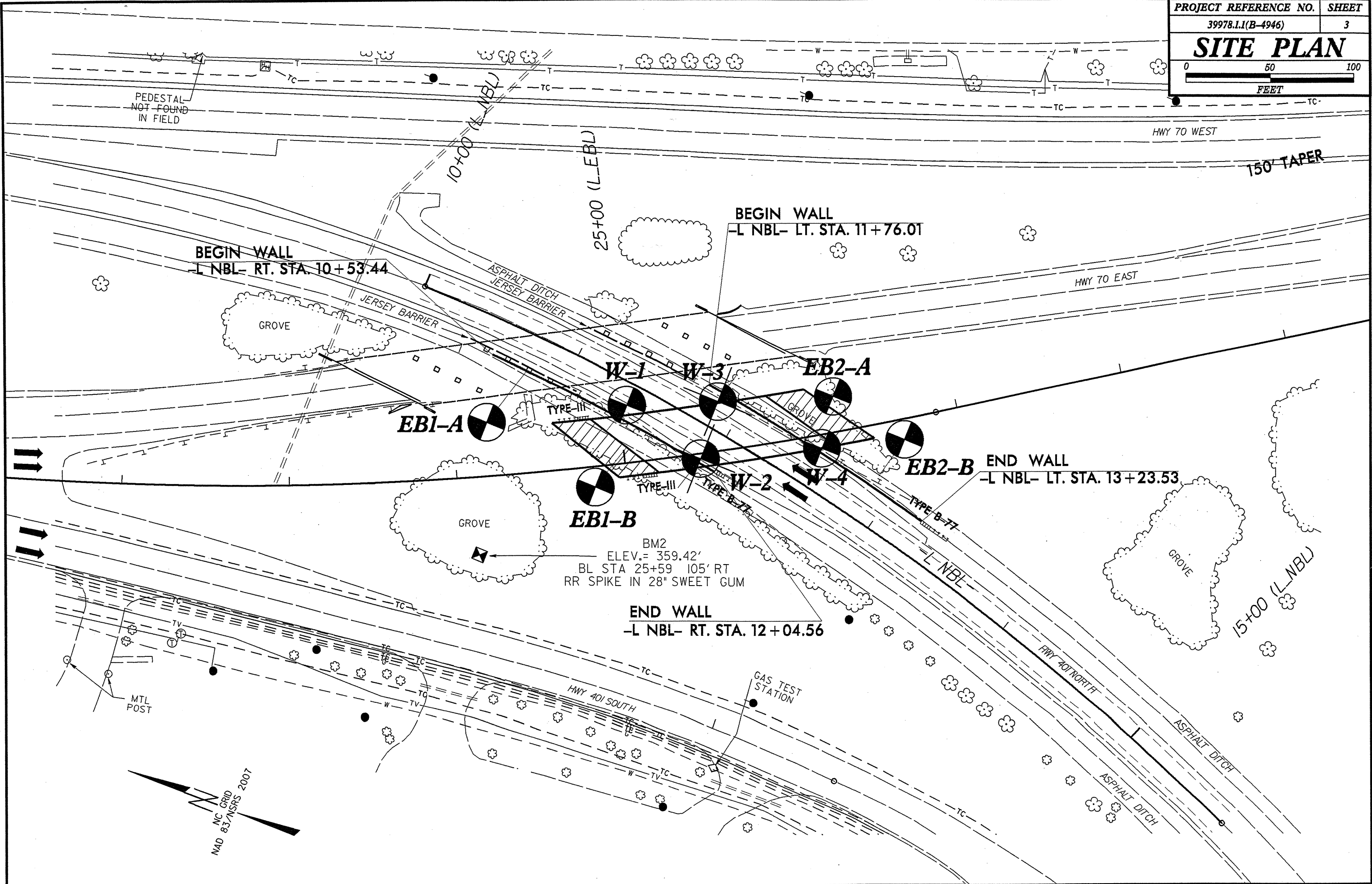
DIVISION OF HIGHWAYS
GEOTECHNICAL ENGINEERING UNIT

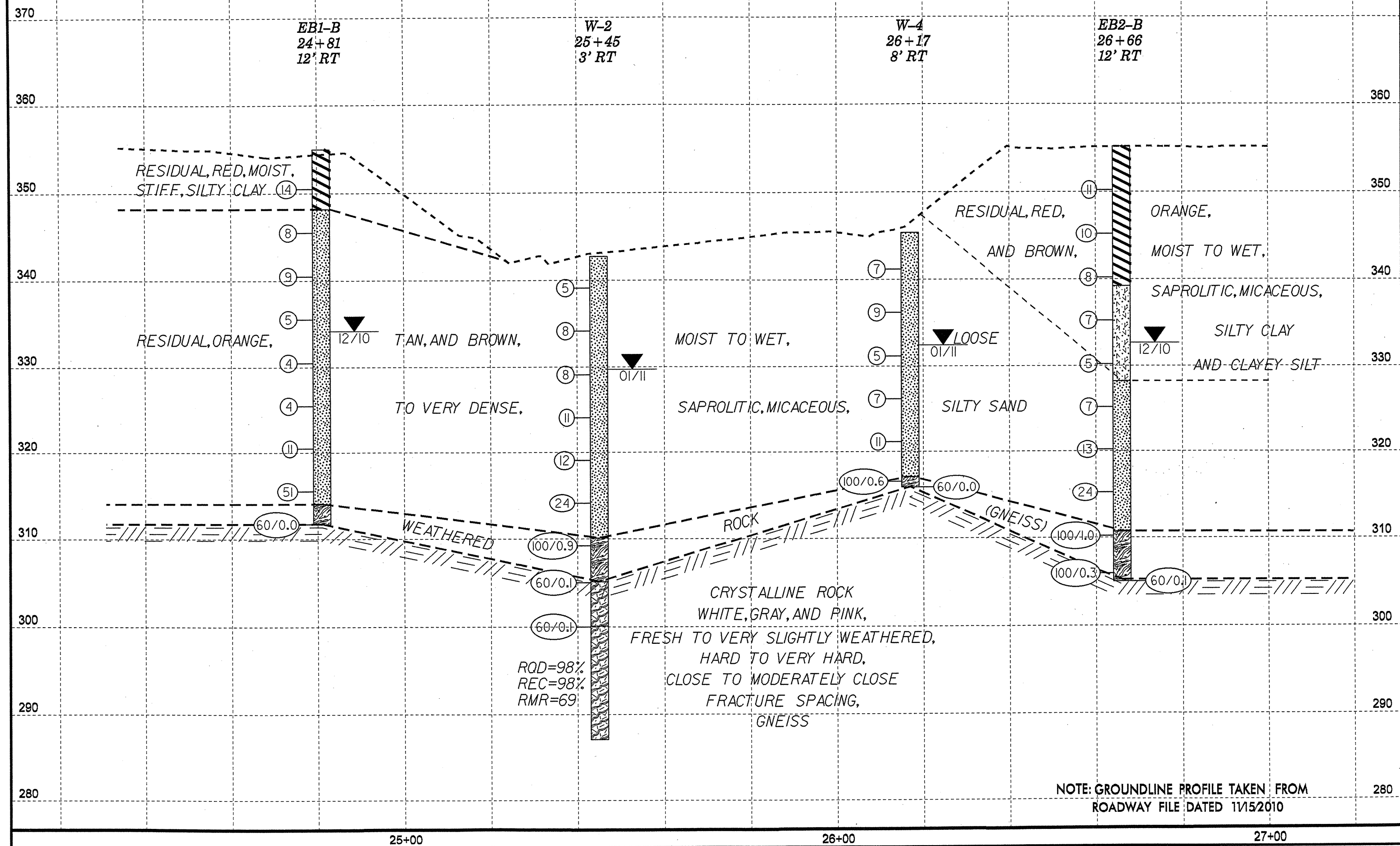
SUBSURFACE INVESTIGATION

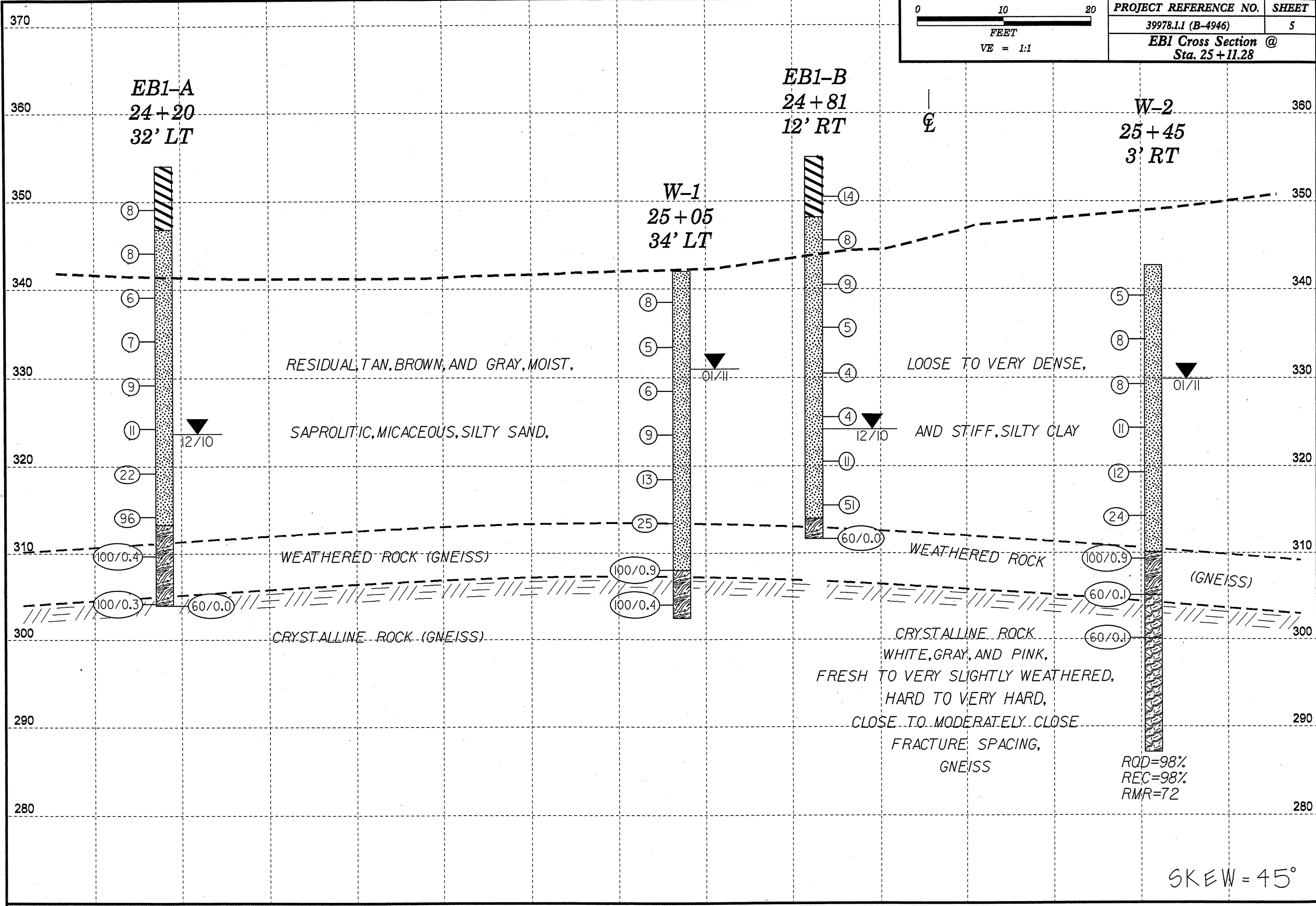
SOIL AND ROCK LEGEND, TERMS, SYMBOLS, AND ABBREVIATIONS

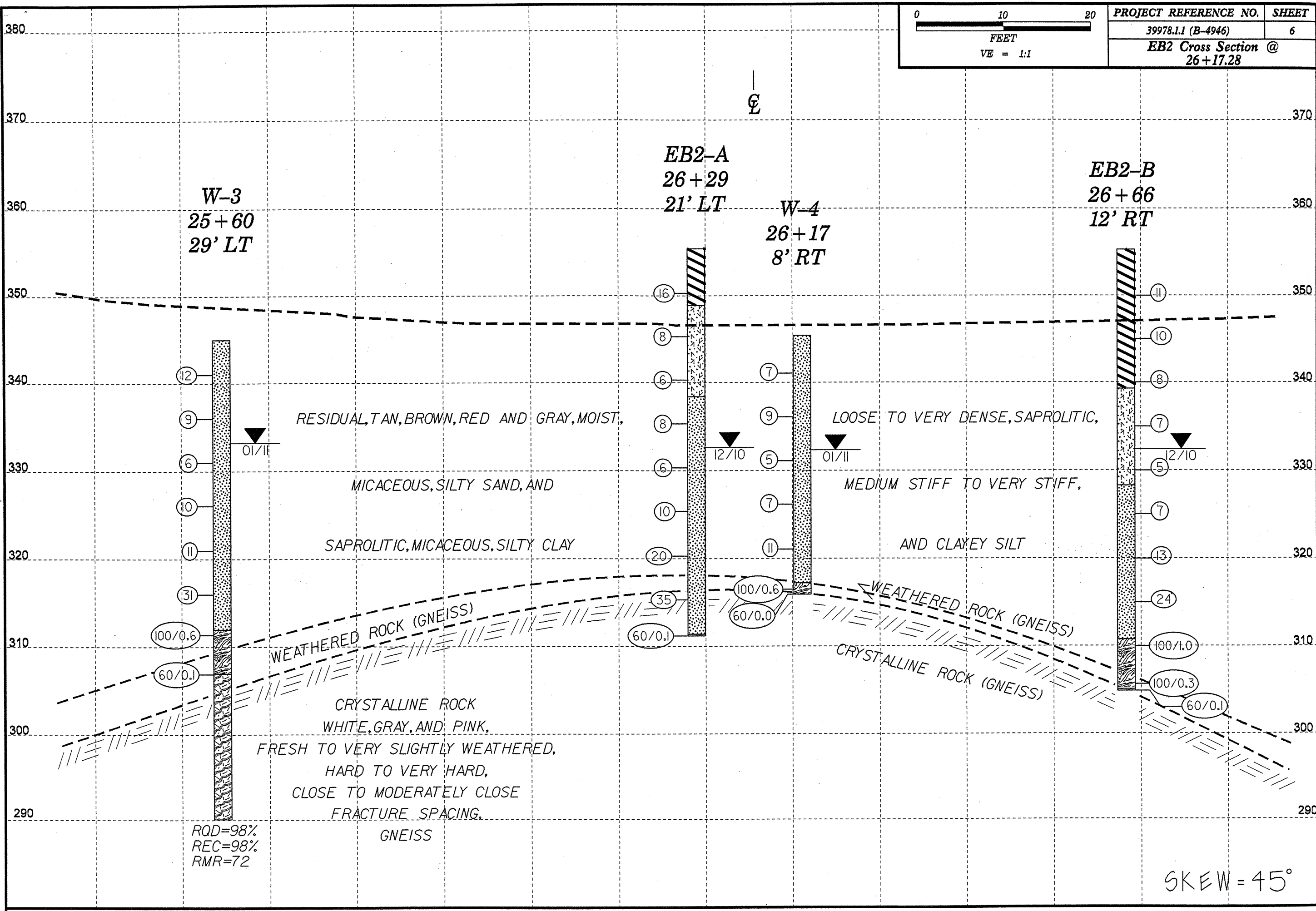
PROJECT REFERENCE NO. 39978J.(B-4946)	SHEET NO. 2
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SOIL DESCRIPTION		GRADATION		ROCK DESCRIPTION		TERMS AND DEFINITIONS			
SOIL IS CONSIDERED TO BE THE UNCONSOLIDATED, SEMI-CONSOLIDATED, OR WEATHERED EARTH MATERIALS THAT CAN BE PENETRATED WITH A CONTINUOUS FLIGHT POWER AUGER, AND YIELD LESS THAN 100 BLOWS PER FOOT ACCORDING TO STANDARD PENETRATION TEST (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: <i>VERY STIFF, BRN. SKTY CLM, MOST WITH INTERBEDDED FINE SAND LAYERS, MHTY PLASTIC, A-7-6</i>		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 POORLY GRADED) GAP-GRADED - INDICATES A MIXTURE OF UNIFORM PARTICLES OF TWO OR MORE SIZES. ANGULARITY OF GRAINS THE ANGULARITY OR ROUNDNESS OF SOIL GRAINS IS DESIGNATED BY THE TERMS: ANGULAR, SUBANGULAR, SUBROUNDED, OR ROUNDED.		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. 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: WEATHERED ROCK (WR) NON-COASTAL PLAIN MATERIAL THAT WOULD YIELD SPT N VALUES > 100 BLOWS PER FOOT IF TESTED. CRYSTALLINE ROCK (CR) FINE TO COARSE GRAIN IGNEOUS AND METAMORPHIC ROCK THAT WOULD YIELD SPT REFUSAL IF TESTED. ROCK TYPE INCLUDES GRANITE, GNEISS, GABBRO, SCHIST, ETC. NON-CRYSTALLINE ROCK (NCR) FINE TO COARSE GRAIN METAMORPHIC AND NON-COASTAL PLAIN SEDIMENTARY ROCK THAT WOULD YIELD SPT REFUSAL IF TESTED. ROCK TYPE INCLUDES PHYLLITE, SLATE, SANDSTONE, ETC. COASTAL PLAIN SEDIMENTARY ROCK (CP) COASTAL PLAIN SEDIMENTS CEMENTED INTO ROCK, BUT MAY NOT YIELD SPT REFUSAL. ROCK TYPE INCLUDES LIMESTONE, SANDSTONE, CEMENTED SHELL BEDS, ETC.		ALLUVIUM (ALLUV.) - SOILS THAT HAVE BEEN TRANSPORTED BY WATER. ADUJFER - 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. 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. CALCAREOUS (CALC.) - SOILS THAT CONTAIN APPRECIABLE AMOUNTS OF CALCIUM CARBONATE. COLLUVIUM - ROCK FRAGMENTS MIXED WITH SOIL DEPOSITED BY GRAVITY ON SLOPE OR AT BOTTOM OF SLOPE. CORE RECOVERY (REC.) - TOTAL LENGTH OF ALL MATERIAL RECOVERED IN THE CORE BARREL DIVIDED BY TOTAL LENGTH OF CORE RUN AND EXPRESSED AS A PERCENTAGE. DIKE - A TABULAR BODY OF IGNEOUS ROCK THAT CUTS ACROSS THE STRUCTURE OF ADJACENT ROCKS OR CUTS MASSIVE ROCK. DIP - THE ANGLE AT WHICH A STRATUM OR ANY PLANAR FEATURE IS INCLINED FROM THE HORIZONTAL. DIP DIRECTION (DIP AZIMUTH) - THE DIRECTION OR BEARING OF THE HORIZONTAL TRACE OF THE LINE OF DIP, MEASURED CLOCKWISE FROM NORTH. FAULT - A FRACTURE OR FRACTURE ZONE ALONG WHICH THERE HAS BEEN DISPLACEMENT OF THE SIDES RELATIVE TO ONE ANOTHER PARALLEL TO THE FRACTURE. FISSILE - A PROPERTY OF SPLITTING ALONG CLOSELY SPACED PARALLEL PLANES. FLOAT - ROCK FRAGMENTS ON SURFACE NEAR THEIR ORIGINAL POSITION AND DISLODGED FROM PARENT MATERIAL. FLOOD PLAIN (FP) - LAND BORDERING A STREAM, BUILT OF SEDIMENTS DEPOSITED BY THE STREAM. FORMATION (FM.) - A MAPPABLE GEOLOGIC UNIT THAT CAN BE RECOGNIZED AND TRACED IN THE FIELD. JOINT - FRACTURE IN ROCK ALONG WHICH NO APPRECIABLE MOVEMENT HAS OCCURRED. LEDGE - A SHELF-LIKE RIDGE OR PROJECTION OF ROCK WHOSE THICKNESS IS SMALL COMPARED TO ITS LATERAL EXTENT. LENS - A BODY OF SOIL OR ROCK THAT THINS OUT IN ONE OR MORE DIRECTIONS. MOTTLED (MOT.) - IRREGULARLY MARKED WITH SPOTS OF DIFFERENT COLORS, MOTTLING IN SOILS USUALLY INDICATES POOR AERATION AND LACK OF GOOD DRAINAGE. PERCHED WATER - WATER MAINTAINED ABOVE THE NORMAL GROUND WATER LEVEL BY THE PRESENCE OF AN INTERVENING IMPERVIOUS STRATUM. 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 EXPRESSED AS A PERCENTAGE. SAPROLITE (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 RELATIVELY THIN COMPARED WITH ITS LATERAL EXTENT, THAT HAS BEEN EMPLACED PARALLEL TO THE BEDDING OR SCHISTOSITY OF THE INTRUDED ROCKS. SLICKENSIDE - POLISHED AND STRIATED SURFACE THAT RESULTS FROM FRICTION ALONG A FAULT OR SLIP PLANE. 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 A 2 INCH OUTSIDE DIAMETER SPLIT SPOON SAMPLER. SPT REFUSAL IS PENETRATION EQUAL TO OR LESS THAN 0.1 FOOT PER 60 BLOWS. STRATA CORE RECOVERY (SCREC.) - TOTAL LENGTH OF STRATA MATERIAL RECOVERED DIVIDED BY TOTAL LENGTH OF STRATUM AND EXPRESSED AS A PERCENTAGE. 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 THE TOTAL LENGTH OF STRATA AND EXPRESSED AS A PERCENTAGE. TOPSOIL (TS.) - SURFACE SOILS USUALLY CONTAINING ORGANIC MATTER.			
SOIL LEGEND AND AASHTO CLASSIFICATION		MINERALOGICAL COMPOSITION		WEATHERING					
GENERAL CLASS. GRANULAR MATERIALS (<= 35% PASSING #200) SILT-CLAY MATERIALS (> 35% PASSING #200) ORGANIC MATERIALS		MINERAL NAMES SUCH AS QUARTZ, FELDSPAR, MICA, TALC, KAOLIN, ETC. ARE USED IN DESCRIPTIONS WHENEVER THEY ARE CONSIDERED OF SIGNIFICANCE.		ROCK FRESH, CRYSTALLINE BRIGHT, FEW JOINTS MAY SHOW SLIGHT STAINING. ROCK RINGS UNDER HAMMER IF CRYSTALLINE. VERY SLIGHT (V SL.) ROCK GENERALLY FRESH, JOINTS STAINED, SOME JOINTS MAY SHOW THIN CLAY COATINGS IF OPEN. CRYSTALS ON A BROKEN SPECIMEN FACE SHINE BRIGHTLY. ROCK RINGS UNDER HAMMER BLOWS IF OF A CRYSTALLINE NATURE. SLIGHT (SL.) ROCK GENERALLY FRESH, JOINTS STAINED AND DISCOLORATION EXTENDS INTO ROCK UP TO 1 INCH. OPEN JOINTS MAY CONTAIN CLAY. IN GRANITOID ROCKS SOME OCCASIONAL FELDSPAR CRYSTALS ARE DULL AND DISCOLORED. CRYSTALLINE ROCKS RING UNDER HAMMER BLOWS. MODERATE (MOD.) SIGNIFICANT PORTIONS OF ROCK SHOW DISCOLORATION AND WEATHERING EFFECTS. IN 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 WITH FRESH ROCK. MODERATELY SEVERE (MOD. SEV.) ALL ROCK EXCEPT QUARTZ DISCOLORED OR STAINED. IN GRANITOID ROCKS, ALL FELDSPARS DULL AND DISCOLORED AND A MAJORITY SHOW KAOLINIZATION. ROCK SHOWS SEVERE LOSS OF STRENGTH AND CAN BE EXCAVATED WITH A GEOLOGIST'S PICK. ROCK GIVES "CLUNK" SOUND WHEN STRUCK. SEVERE (SEV.) ALL ROCK EXCEPT QUARTZ DISCOLORED OR STAINED. ROCK FABRIC CLEAR AND EVIDENT BUT REDUCED IN STRENGTH TO STRONG SOIL. IN GRANITOID ROCKS ALL FELDSPARS ARE KAOLINIZED TO SOME EXTENT. SOME FRAGMENTS OF STRONG ROCK USUALLY REMAIN. VERY SEVERE (V SEV.) ALL ROCK EXCEPT QUARTZ DISCOLORED OR STAINED. ROCK FABRIC ELEMENTS ARE DISCERNIBLE BUT 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 VESTIGES OF THE ORIGINAL ROCK FABRIC REMAIN. <i>IF TESTED, YIELDS SPT N VALUES < 100 BPF</i> 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 ALSO AN EXAMPLE.		FRESH VERY SLIGHT (V SL.) SLIGHT (SL.) MODERATE (MOD.) MODERATELY SEVERE (MOD. SEV.) SEVERE (SEV.) VERY SEVERE (V SEV.) COMPLETE		NEW YORK STATE UNIVERSITY SCHOOL OF CIVIL AND ENVIRONMENTAL ENGINEERING GEOTECHNICAL ENGINEERING UNIT 100 UNIVERSITY AVENUE STATE COLLEGE, PA 16802 TEL: 814/863-1000 WWW: WWW.CE.CORNELL.EDU	
CONSISTENCY OR DENSENESS		GROUND WATER		MISCELLANEOUS SYMBOLS					
PRIMARY SOIL TYPE COMPACTNESS OR CONSISTENCY RANGE OF STANDARD PENETRATION RESISTANCE (N-VALUE) RANGE OF UNCONFINED COMPRESSIVE STRENGTH (TONS/FT ²)		WATER LEVEL IN BORE HOLE IMMEDIATELY AFTER DRILLING STATIC WATER LEVEL AFTER 24 HOURS PERCHED WATER, SATURATED ZONE, OR WATER BEARING STRATA SPRING OR SEEP		ROADWAY EMBANKMENT (RE) WITH SOIL DESCRIPTION SOIL SYMBOL ARTIFICIAL FILL (AF) OTHER THAN ROADWAY EMBANKMENT INFERRED SOIL BOUNDARY INFERRED ROCK LINE ALLUVIAL SOIL BOUNDARY DIP & DIP DIRECTION OF ROCK STRUCTURES		TEST BORING W/ CORE SPT N-VALUE SPT REFUSAL AUGER BORING CORE BORING MONITORING WELL PIEZOMETER INSTALLATION SLOPE INDICATOR INSTALLATION CONE PENETROMETER TEST SOUNDING ROD			
TEXTURE OR GRAIN SIZE		PERCENTAGE OF MATERIAL		ROCK HARDNESS					
U.S. STD. SIEVE SIZE OPENING (MM) 4 10 40 60 200 270 4.76 2.00 0.42 0.25 0.075 0.053		ORGANIC MATERIAL GRANULAR SOILS SILT - CLAY SOILS OTHER MATERIAL TRACE OF ORGANIC MATTER 2 - 3% 3 - 5% TRACE 1 - 10% LITTLE ORGANIC MATTER 3 - 5% 5 - 12% LITTLE 10 - 20% MODERATELY ORGANIC 5 - 10% 12 - 20% SOME 20 - 35% HIGHLY ORGANIC >10% >20% HIGHLY 35% AND ABOVE		VERY HARD CANNOT BE SCRATCHED BY KNIFE OR SHARP PICK. BREAKING OF HAND SPECIMENS REQUIRES SEVERAL HARD BLOWS OF THE GEOLOGIST'S PICK. HARD CAN BE SCRATCHED BY KNIFE OR PICK ONLY WITH DIFFICULTY. HARD HAMMER BLOWS REQUIRED TO DETACH HAND SPECIMEN. MODERATELY HARD CAN BE SCRATCHED BY KNIFE OR PICK. GOUGES OR GROOVES TO 0.25 INCHES DEEP CAN BE EXCAVATED BY HARD BLOW OF A GEOLOGIST'S PICK. HAND SPECIMENS CAN BE DETACHED BY MODERATE BLOWS. MEDIUM HARD CAN BE GROUVED OR GOUGED 0.05 INCHES DEEP BY FIRM PRESSURE OF KNIFE OR PICK POINT. CAN BE EXCAVATED IN SMALL CHIPS TO PIECES 1 INCH MAXIMUM SIZE BY HARD BLOWS OF THE POINT OF A GEOLOGIST'S PICK. SOFT CAN BE GROUVED OR GOUGED READILY BY KNIFE OR PICK. CAN BE EXCAVATED IN FRAGMENTS FROM CHIPS TO SEVERAL INCHES IN SIZE BY MODERATE BLOWS OF A PICK POINT. SMALL, THIN PIECES CAN BE BROKEN BY FINGER PRESSURE. VERY SOFT CAN BE CARVED WITH KNIFE. CAN BE EXCAVATED READILY WITH POINT OF PICK. PIECES 1 INCH OR MORE IN THICKNESS CAN BE BROKEN BY FINGER PRESSURE. CAN BE SCRATCHED READILY BY FINGER NAIL.		SAPROLITE (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 RELATIVELY THIN COMPARED WITH ITS LATERAL EXTENT, THAT HAS BEEN EMPLACED PARALLEL TO THE BEDDING OR SCHISTOSITY OF THE INTRUDED ROCKS. SLICKENSIDE - POLISHED AND STRIATED SURFACE THAT RESULTS FROM FRICTION ALONG A FAULT OR SLIP PLANE. 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 A 2 INCH OUTSIDE DIAMETER SPLIT SPOON SAMPLER. SPT REFUSAL IS PENETRATION EQUAL TO OR LESS THAN 0.1 FOOT PER 60 BLOWS. STRATA CORE RECOVERY (SCREC.) - TOTAL LENGTH OF STRATA MATERIAL RECOVERED DIVIDED BY TOTAL LENGTH OF STRATUM AND EXPRESSED AS A PERCENTAGE. 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 THE TOTAL LENGTH OF STRATA AND EXPRESSED AS A PERCENTAGE. TOPSOIL (TS.) - SURFACE SOILS USUALLY CONTAINING ORGANIC MATTER.			
SOIL MOISTURE - CORRELATION OF TERMS		EQUIPMENT USED ON SUBJECT PROJECT		FRACTURE SPACING		BEDDING			
SOIL MOISTURE SCALE (ATTERBERG LIMITS) FIELD MOISTURE DESCRIPTION GUIDE FOR FIELD MOISTURE DESCRIPTION		DRILL UNITS: ADVANCING TOOLS: HAMMER TYPE: CORE SIZE: HAND TOOLS:		TERM SPACING TERM THICKNESS		TERM THICKNESS			
LL LIQUID LIMIT - SATURATED - (SAT) USUALLY LIQUID; VERY WET, USUALLY FROM BELOW THE GROUND WATER TABLE PL PLASTIC LIMIT - WET - (W) SEMISOLID; REQUIRES DRYING TO ATTAIN OPTIMUM MOISTURE OM OPTIMUM MOISTURE SHRINKAGE LIMIT - MOIST - (M) SOLID; AT OR NEAR OPTIMUM MOISTURE SL - DRY - (D) REQUIRES ADDITIONAL WATER TO ATTAIN OPTIMUM MOISTURE		MOBILE B- BK-51 CME-45C CME-55B PORTABLE HOIST		CLAY BITS 6' CONTINUOUS FLIGHT AUGER 6' HOLLOW AUGERS HARD FACED FINGER BITS TUNG-CARBIDE INSERTS CASING W/ ADVANCER TRICONE * STEEL TEETH TRICONE * TUNG-CARB. CORE BIT		VERY WIDE MORE THAN 10 FEET WIDE 3 TO 10 FEET MODERATELY CLOSE 1 TO 3 FEET CLOSE 0.16 TO 1 FEET VERY CLOSE LESS THAN 0.16 FEET		VERY THICKLY BEDDED > 4 FEET THICKLY BEDDED 1.5 - 4 FEET THINLY BEDDED 0.16 - 1.5 FEET VERY THINLY BEDDED 0.03 - 0.16 FEET THICKLY LAMINATED 0.008 - 0.03 FEET THINLY LAMINATED < 0.008 FEET	
PLASTICITY		INDURATION		ROCK QUALITY DESIGNATION (RQD)					
NONPLASTIC 0-5 DRY STRENGTH VERY LOW LOW PLASTICITY 6-15 SLIGHT MED. PLASTICITY 16-25 MEDIUM HIGH PLASTICITY 26 OR MORE HIGH		FOR SEDIMENTARY ROCKS, INDURATION IS THE HARDENING OF THE MATERIAL BY CEMENTING, HEAT, PRESSURE, ETC. FRIABLE RUBBING WITH FINGER FREES NUMEROUS GRAINS; GENTLE BLOW BY HAMMER DISINTEGRATES SAMPLE. MODERATELY INDURATED GRAINS CAN BE SEPARATED FROM SAMPLE WITH STEEL PROBE; BREAKS EASILY WHEN HIT WITH HAMMER. INDURATED GRAINS ARE DIFFICULT TO SEPARATE WITH STEEL PROBE; DIFFICULT TO BREAK WITH HAMMER. EXTREMELY INDURATED SHARP HAMMER BLOWS REQUIRED TO BREAK SAMPLE; SAMPLE BREAKS ACROSS GRAINS.		RQD = (TOTAL LENGTH OF ROCK SEGMENTS EQUAL TO OR GREATER THAN 4 INCHES) / (TOTAL LENGTH OF CORE RUN) * 100					
COLOR		ABBREVIATIONS		BENCH MARK: BM #2 AT BL STA. 25+59 105' RT, RR SPIKE IN 28' SWEET GUM		ELEVATION: 359.42 FT.			
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.		AR - AUGER REFUSAL BT - BORING TERMINATED CL - CLAY CPT - CONE PENETRATION TEST CSE - COARSE DMT - DILATOMETER TEST DPT - DYNAMIC PENETRATION TEST e - VOID RATIO F - FINE FOSS - FOSSILIFEROUS FRAC - FRACTURED, FRACTURES FRAGS - FRAGMENTS HI - HIGHLY MED - MEDIUM MICA - MICACEOUS MOD - MODERATELY NP - NON PLASTIC ORG - ORGANIC PMT - PRESSUREMETER TEST SAP. - SAPROLITIC SD - SAND, SANDY SL - SILT, SILTY SLI - SLIGHTLY TCR - TRICONE REFUSAL w - MOISTURE CONTENT v - VERY VST - VANE SHEAR TEST WEA - WEATHERED UNIT WEIGHT DRY UNIT WEIGHT SAMPLE ABBREVIATIONS S - BULK SS - SPLIT SPOON ST - SHELBY TUBE RS - ROCK RT - RECOMPACTED TRIAXIAL RATIO CBR - CALIFORNIA BEARING RATIO		NOTES:					









W-3
25+60
29' LT

EB2-A
26+29
21' LT

W-4
26+17
8' RT

EB2-B
26+66
12' RT

RESIDUAL, TAN, BROWN, RED AND GRAY, MOIST,

LOOSE TO VERY DENSE, SAPROLITIC,

MICACEOUS, SILTY SAND, AND

MEDIUM STIFF TO VERY STIFF,

SAPROLITIC, MICACEOUS, SILTY CLAY

AND CLAYEY SILT

WEATHERED ROCK (GNEISS)

WEATHERED ROCK (GNEISS)

CRYSTALLINE ROCK
WHITE, GRAY, AND PINK,
FRESH TO VERY SLIGHTLY WEATHERED,
HARD TO VERY HARD,
CLOSE TO MODERATELY CLOSE
FRACTURE SPACING.

CRYSTALLINE ROCK (GNEISS)

RQD=98%
REC=98%
RMR=72

GNEISS

SKEW = 45°

NCDOT GEOTECHNICAL ENGINEERING UNIT
BORELOG REPORT

WBS 39978.1.1	TIP B-4946	COUNTY WAKE	GEOLOGIST Czajka, C. D.
SITE DESCRIPTION BRIDGE NO. 251 OVER US 401 NORTH ON US 70/NC 50 AT -L- STATION 25+71			GROUND WTR (ft)
BORING NO. EB1-A	STATION 24+20	OFFSET 32 ft LT	ALIGNMENT -L-
COLLAR ELEV. 354.0 ft	TOTAL DEPTH 50.0 ft	NORTHING 719,788	EASTING 2,103,827
DRILL RIG/HAMMER EFF./DATE RFO0057 CME-550X 73% 12/06/2005		DRILL METHOD H.S. Augers	HAMMER TYPE Automatic
DRILLER Dixon, D. W.	START DATE 12/22/10	COMP. DATE 12/22/10	SURFACE WATER DEPTH N/A

ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT			BLOWS PER FOOT					SAMP. NO.	LOG MOI	LOG SOIL AND ROCK DESCRIPTION	DEPTH (ft)	
			0.5ft	0.5ft	0.5ft	0	25	50	75	100					
355														GROUND SURFACE	0.0
														RESIDUAL ORANGE, SILTY CLAY	
350	350.1	3.9	5	4	4	8						M			
345	345.1	8.9	3	3	5	8						M		RED, ORANGE, AND BROWN, SAPROLITIC, MICACEOUS, SILTY SAND	7.2
340	340.1	13.9	2	3	3	6						M			
335	335.1	18.9	3	4	3	7						M			
330	330.1	23.9	3	4	5	9						M			
325	325.1	28.9	3	4	7	11						M			
320	320.1	33.9	7	9	13	22						M			
315	315.1	38.9	13	39	57	96						M			
310	310.1	43.9												WEATHERED ROCK (GNEISS)	40.7
305	305.1	48.9													
	304.0	50.0	100/0.3											Boring Terminated with Standard Penetration Test Refusal at Elevation 304.0 ft on CRYSTALLINE ROCK (GNEISS)	50.0

WBS 39978.1.1	TIP B-4946	COUNTY WAKE	GEOLOGIST Mohs, N. D.
SITE DESCRIPTION BRIDGE NO. 251 OVER US 401 NORTH ON US 70/NC 50 AT -L- STATION 25+71			GROUND WTR (ft)
BORING NO. EB1-B	STATION 24+81	OFFSET 12 ft RT	ALIGNMENT -L-
COLLAR ELEV. 355.0 ft	TOTAL DEPTH 43.3 ft	NORTHING 719,714	EASTING 2,103,815
DRILL RIG/HAMMER EFF./DATE RFO0057 CME-550X 73% 12/06/2005		DRILL METHOD H.S. Augers	HAMMER TYPE Automatic
DRILLER Dixon, D. W.	START DATE 12/21/10	COMP. DATE 12/21/10	SURFACE WATER DEPTH N/A

ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT			BLOWS PER FOOT					SAMP. NO.	LOG MOI	LOG SOIL AND ROCK DESCRIPTION	DEPTH (ft)	
			0.5ft	0.5ft	0.5ft	0	25	50	75	100					
355														GROUND SURFACE	0.0
														RESIDUAL RED, SILTY CLAY	
350	351.5	3.5	4	6	8	14						SS-9	M		
345	346.5	8.5	2	4	4	8						SS-8	M		
340	341.5	13.5	2	4	5	9						M			
335	336.5	18.5	3	3	2	5						M		PINK, ORANGE, TAN, BROWN, AND GRAY, MICACEOUS, SAPROLITIC, SANDY SILT	6.8
330	331.5	23.5	1	2	2	4						W			
325	326.5	28.5			2	2						W			
320	321.5	33.5	3	4	7	11						W			
315	316.5	38.5	9	14	37	51						M			
	311.7	43.3	60/0.0											WEATHERED ROCK (GNEISS)	41.0
														Boring Terminated with Standard Penetration Test Refusal at Elevation 311.7 ft on CRYSTALLINE ROCK (GNEISS)	43.3

NCDOT BORE DOUBLE B4946_GEO_BH_BR0251.GPJ NC_DOT_GDT 6/7/11

WBS 39978.1.1		TIP B-4946		COUNTY WAKE		GEOLOGIST Oti, O. B.									
SITE DESCRIPTION BRIDGE NO. 251 OVER US 401 NORTH ON US 70/NC 50 AT -L- STATION 25+71							GROUND WTR (ft)								
BORING NO. W-1		STATION 25+05		OFFSET 34 ft LT		ALIGNMENT -L-	0 HR. N/A								
COLLAR ELEV. 342.0 ft		TOTAL DEPTH 39.5 ft		NORTHING 719,714		EASTING 2,103,867	24 HR. 12.0								
DRILL RIG/HAMMER EFF./DATE RFO0057 CME-550X 73% 12/06/2005				DRILL METHOD H.S. Augers		HAMMER TYPE Automatic									
DRILLER Dixon, D. W.		START DATE 01/04/11		COMP. DATE 01/04/11		SURFACE WATER DEPTH N/A									
ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT			BLOWS PER FOOT					SAMP. NO.	MOI	LOG	SOIL AND ROCK DESCRIPTION	
			0.5ft	0.5ft	0.5ft	0	25	50	75	100					
345															
															342.0 GROUND SURFACE 0.0
340	338.5	3.5	3	4	4	8						SS-8A	M	RESIDUAL TAN-BROWN, MICACEOUS, SAPROLITIC, SILTY SAND	
335	333.5	8.5	2	2	3	5						SS-9	M		
330	328.5	13.5	3	3	3	6						SS-10	W		
325	323.5	18.5	3	4	5	9							W		
320	318.5	23.5	3	5	8	13						SS-11	W		
315	313.5	28.5	13	12	13	25							W		
310	308.5	33.5	15	40	60/0.4						100/0.5			308.0 WEATHERED ROCK (GNEISS) 34.0	
305	303.5	38.5									100/0.4			302.5 WEATHERED ROCK (GNEISS) 39.5	
														Boring Terminated by Auger Refusal at Elevation 302.5 ft on CRYSTALLINE ROCK (GNEISS)	

WBS 39978.1.1	TIP B-4946	COUNTY WAKE	GEOLOGIST Oti, O. B.
SITE DESCRIPTION BRIDGE NO. 251 OVER US 401 NORTH ON US 70/NC 50 AT -L- STATION 25+71			GROUND WTR (ft)
BORING NO. W-2	STATION 25+45	OFFSET 3 ft RT	ALIGNMENT -L-
COLLAR ELEV. 342.7 ft	TOTAL DEPTH 55.6 ft	NORTHING 719,662	EASTING 2,103,854
DRILL RIG/HAMMER EFF./DATE RFO0057 CME-550X 73% 12/06/2005		DRILL METHOD NW Casing W/SPT & Core	HAMMER TYPE Automatic
DRILLER Dixon, D. W.	START DATE 01/06/11	COMP. DATE 01/07/11	SURFACE WATER DEPTH N/A

WBS 39978.1.1	TIP B-4946	COUNTY WAKE	GEOLOGIST Oti, O. B.
SITE DESCRIPTION BRIDGE NO. 251 OVER US 401 NORTH ON US 70/NC 50 AT -L- STATION 25+71			GROUND WTR (ft)
BORING NO. W-2	STATION 25+45	OFFSET 3 ft RT	ALIGNMENT -L-
COLLAR ELEV. 342.7 ft	TOTAL DEPTH 55.6 ft	NORTHING 719,662	EASTING 2,103,854
DRILL RIG/HAMMER EFF./DATE RFO0057 CME-550X 73% 12/06/2005		DRILL METHOD NW Casing W/SPT & Core	HAMMER TYPE Automatic
DRILLER Dixon, D. W.	START DATE 01/06/11	COMP. DATE 01/07/11	SURFACE WATER DEPTH N/A

ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT			BLOWS PER FOOT				SAMP. NO.	LOG	SOIL AND ROCK DESCRIPTION	DEPTH (ft)		
			0.5ft	0.5ft	0.5ft	0	25	50	75					100	
345												342.7	GROUND SURFACE	0.0	
340	340.1	2.6	2	3	2						M		RESIDUAL TAN-BROWN AND GRAY, MICACEOUS, SAPROLITIC, SILTY SAND		
335	335.1	7.6	2	3	5						M				
330	330.1	12.6	2	4	4						M				
325	325.1	17.6	5	5	6						M				
320	320.1	22.6	4	5	7						M				
315	315.1	27.6	5	9	15						M				
310	310.1	32.6	35	65/0.4									WEATHERED ROCK (GNEISS)	32.6	
305	305.1	37.6	60/0.1										CRYSTALLINE ROCK (GNEISS)	37.6	
300	300.1	42.6	60/0.1								RS-1		WHITE, GRAY, AND PINK, FRESH TO VERY SLIGHTLY WEATHERED, HARD TO VERY HARD, CLOSE TO MODERATELY CLOSE FRACTURE SPACING, GNEISS RQD=98% REC=98% RMR=69	42.6	
295															
290															
														Boring Terminated with Casing Advancer Refusal at Elevation 287.1 ft in CRYSTALLINE ROCK (GNEISS)	55.6

ELEV (ft)	RUN ELEV (ft)	DEPTH (ft)	RUN (ft)	DRILL RATE (Min/ft)	RUN		SAMP. NO.	STRATA		LOG	DESCRIPTION AND REMARKS	DEPTH (ft)
					REC. (%)	RQD (%)		REC. (%)	RQD (%)			
300.1		42.6	3.0	1:05/1.0 1:45/1.0 2:00/1.0	(3.0)	(3.0)	RS-1	(12.8)	(12.8)		Begin Coring @ 42.6 ft	42.6
297.1		45.6	5.0	1:45/1.0 2:05/1.0 2:11/1.0 2:00/1.0 2:05/1.0	(4.8)	(4.8)		98%	96%		WHITE, GRAY, AND PINK, FRESH TO VERY SLIGHTLY WEATHERED, HARD TO VERY HARD, CLOSE TO MODERATELY CLOSE FRACTURE SPACING, GNEISS RQD=98% REC=98% RMR=69	
292.1		50.6	5.0	2:20/1.0 2:15/1.0 2:17/1.0 2:10/1.0 2:22/1.0	(5.0)	(5.0)		100%	100%			
287.1		55.6									Boring Terminated with Casing Advancer Refusal at Elevation 287.1 ft in CRYSTALLINE ROCK (GNEISS)	55.6

NCDOT BORE DOUBLE B4946 GEO. BH. BR0251.GPJ NC_DOT.GDT 6/7/11

WBS 39978.1.1	TIP B-4946	COUNTY WAKE	GEOLOGIST Oti, O. B.	
SITE DESCRIPTION BRIDGE NO. 251 OVER US 401 NORTH ON US 70/NC 50 AT -L- STATION 25+71				GROUND WTR (ft)
BORING NO. W-3	STATION 25+60	OFFSET 29 ft LT	ALIGNMENT -L-	0 HR. N/A
COLLAR ELEV. 344.9 ft	TOTAL DEPTH 54.9 ft	NORTHING 719,665	EASTING 2,103,890	24 HR. 11.8
DRILL RIG/HAMMER EFF./DATE RFO0057 CME-550X 73% 12/06/2005		DRILL METHOD NW Casing W/SPT & Core	HAMMER TYPE Automatic	
DRILLER Dixon, D. W.	START DATE 01/13/11	COMP. DATE 01/14/11	SURFACE WATER DEPTH N/A	

WBS 39978.1.1	TIP B-4946	COUNTY WAKE	GEOLOGIST Oti, O. B.	
SITE DESCRIPTION BRIDGE NO. 251 OVER US 401 NORTH ON US 70/NC 50 AT -L- STATION 25+71				GROUND WTR (ft)
BORING NO. W-3	STATION 25+60	OFFSET 29 ft LT	ALIGNMENT -L-	0 HR. N/A
COLLAR ELEV. 344.9 ft	TOTAL DEPTH 54.9 ft	NORTHING 719,665	EASTING 2,103,890	24 HR. 11.8
DRILL RIG/HAMMER EFF./DATE RFO0057 CME-550X 73% 12/06/2005		DRILL METHOD NW Casing W/SPT & Core	HAMMER TYPE Automatic	
DRILLER Dixon, D. W.	START DATE 01/13/11	COMP. DATE 01/14/11	SURFACE WATER DEPTH N/A	

ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT			BLOWS PER FOOT					SAMP. NO.	LOG	SOIL AND ROCK DESCRIPTION	ELEV. (ft)	DEPTH (ft)
			0.5ft	0.5ft	0.5ft	0	25	50	75	100					
345														344.9	0.0
340	341.9	3.0	2	4	8										
335	336.9	8.0	2	4	5										
330	331.9	13.0	2	2	4										
325	326.9	18.0	3	4	6										
320	321.9	23.0	5	5	6										
315	316.9	28.0	9	11	20										
310	311.9	33.0	70	30/0.1										311.9	33.0
305	306.9	38.0	60/0.1											306.9	38.0
300															
295															
290															

ELEV (ft)	RUN ELEV (ft)	DEPTH (ft)	RUN (ft)	DRILL RATE (Min/ft)	RUN		SAMP. NO.	STRATA		LOG	DESCRIPTION AND REMARKS	ELEV. (ft)	DEPTH (ft)
					REC. (%)	RQD (%)		REC. (%)	RQD (%)				
306.9	306.9	38.0	1.9	1:10/0.9	(1.6)	(1.6)							
305	305.0	39.9	5.0	1:11/1.0	84%	84%	RS-2	(16.6)	(16.6)		306.9	38.0	
				1:13/1.0	(5.0)	(5.0)							
				1:25/1.0	100%	100%							
				1:36/1.0									
300	300.0	44.9	5.0	1:11/1.0	(5.0)	(5.0)							
				1:34/1.0	100%	100%							
				1:41/1.0									
				1:52/1.0									
295	295.0	49.9	5.0	1:16/1.0	(5.0)	(5.0)							
				1:22/1.0	100%	100%							
				1:31/1.0									
				1:43/1.0									
290	290.0	54.9		1:41/1.0							290.0	54.9	

NCDOT BORE DOUBLE B4946_GEO_BH_BR0251.GPJ NC_DOT_GDT 6/7/11

Boring Terminated with Casing Advancer Refusal at Elevation 290.0 ft in CRYSTALLINE ROCK (GNEISS)

Boring Terminated with Casing Advancer Refusal at Elevation 290.0 ft in CRYSTALLINE ROCK (GNEISS)

WBS 39978.1.1		TIP B-4946		COUNTY WAKE		GEOLOGIST Oti, O. B.									
SITE DESCRIPTION BRIDGE NO. 251 OVER US 401 NORTH ON US 70/NC 50 AT -L- STATION 25+71							GROUND WTR (ft)								
BORING NO. W-4		STATION 26+17		OFFSET 8 ft RT		ALIGNMENT -L-	0 HR. 13.0								
COLLAR ELEV. 345.4 ft		TOTAL DEPTH 29.5 ft		NORTHING 719,587		EASTING 2,103,870	24 HR. 13.0								
DRILL RIG/HAMMER EFF./DATE RFO0057 CME-550X 73% 12/06/2005				DRILL METHOD H.S. Augers		HAMMER TYPE Automatic									
DRILLER Dixon, D. W.		START DATE 01/05/11		COMP. DATE 01/05/11		SURFACE WATER DEPTH N/A									
ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT			BLOWS PER FOOT					SAMP. NO.	MOI	LOG	SOIL AND ROCK DESCRIPTION	
			0.5ft	0.5ft	0.5ft	0	25	50	75	100					
350															
345															345.4 GROUND SURFACE 0.0
340	342.2	3.2	3	3	4	•	•	•	•	•	SS-12	M		RESIDUAL RED-BROWN AND TAN-BROWN, MICACEOUS, SAPROLITIC, SILTY SAND	
335	337.2	8.2	3	4	5	•	•	•	•	•	SS-13	M			
330	332.2	13.2	2	2	3	•	•	•	•	•	SS-14	M			
325	327.2	18.2	2	3	4	•	•	•	•	•		M			
320	322.2	23.2	2	5	6	•	•	•	•	•	SS-15	M			
	317.2	28.2													
	315.9	29.5	70	30/0.1										315.9 29.5	
			60/0.0												WEATHERED ROCK (GNEISS) Boring Terminated with Standard Penetration Test Refusal at Elevation 315.9 ft on CRYSTALLINE ROCK (GNEISS)

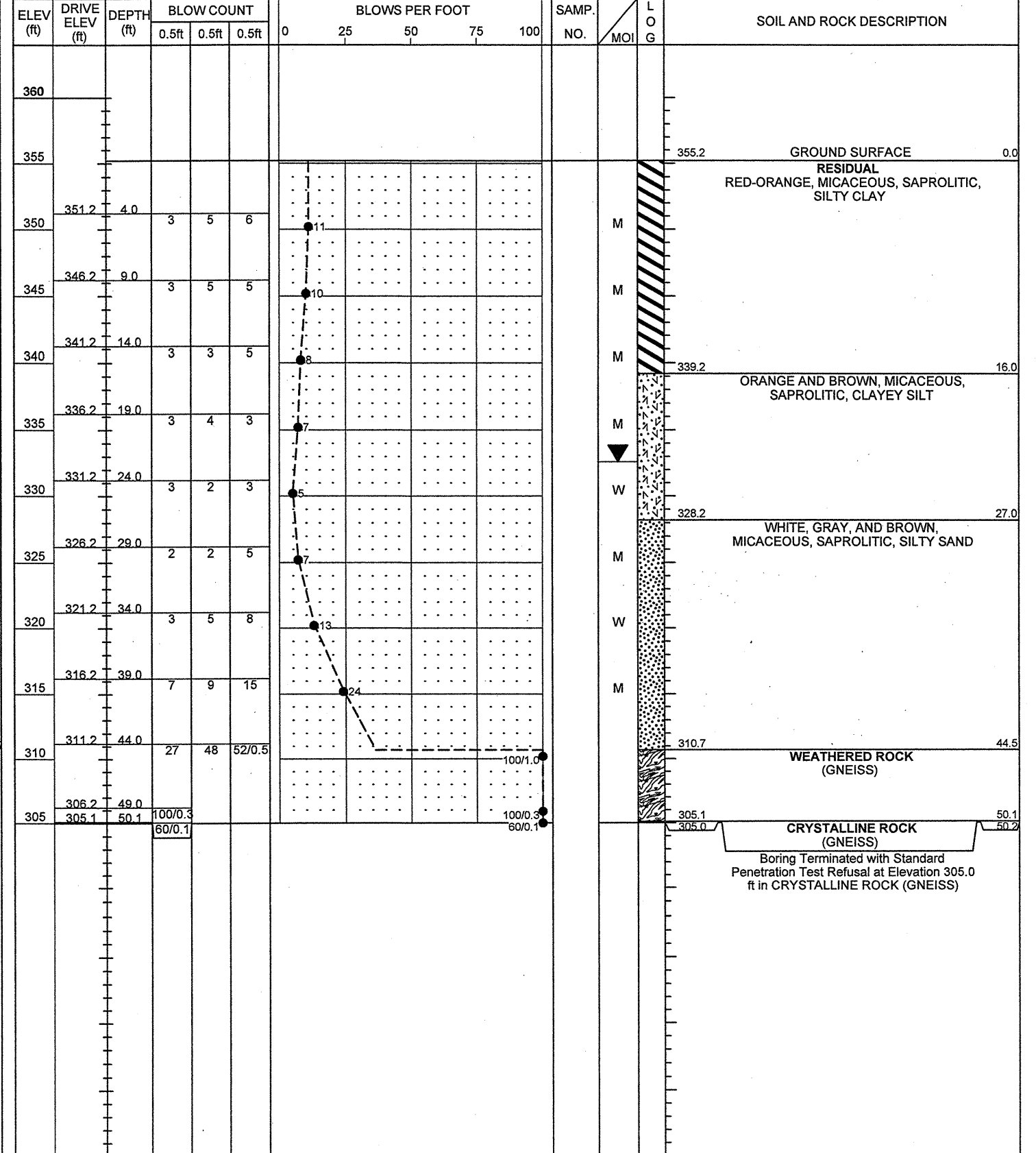
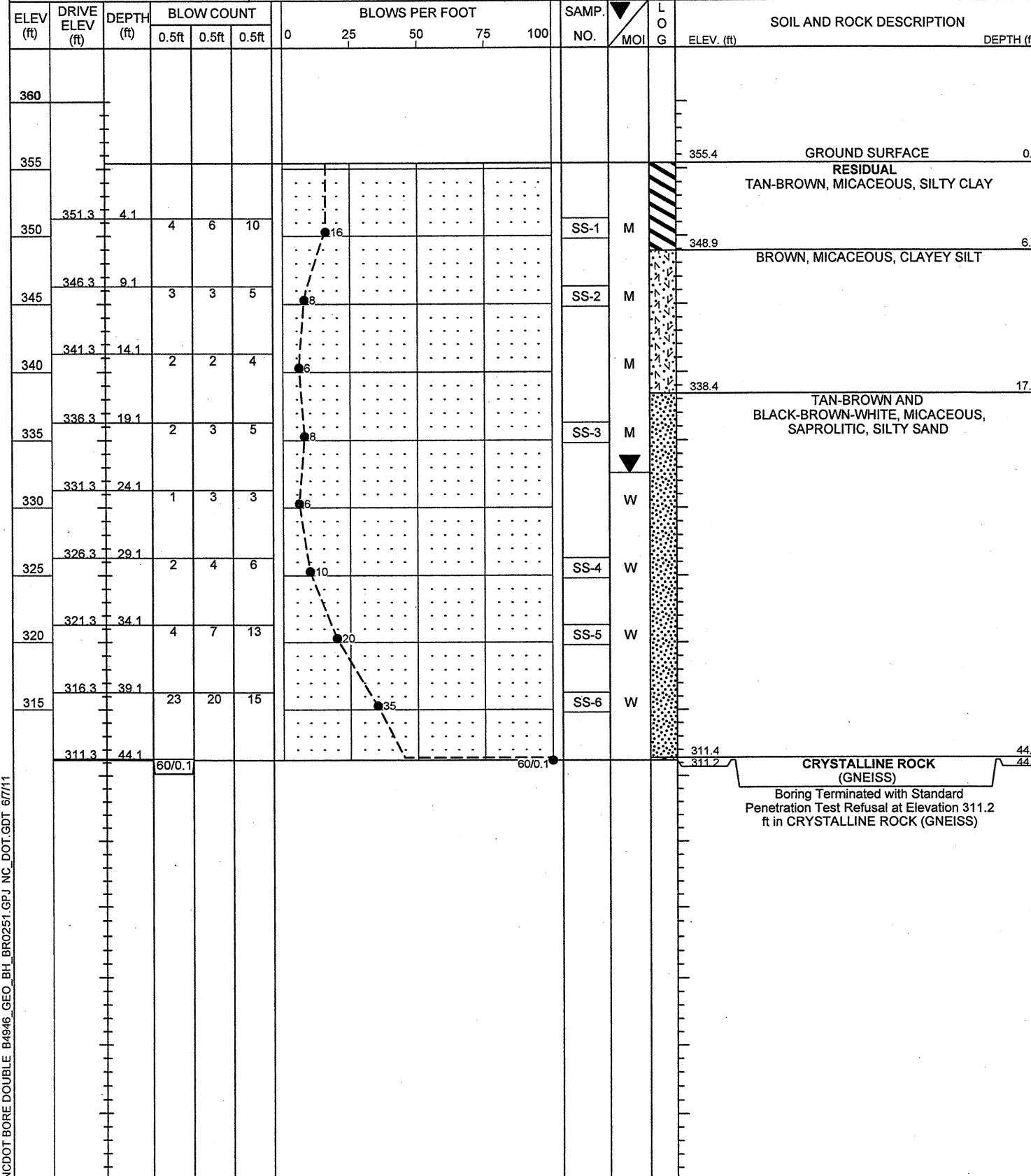


NCDOT GEOTECHNICAL ENGINEERING UNIT

BORELOG REPORT

WBS 39978.1.1	TIP B-4946	COUNTY WAKE	GEOLOGIST Milkovits, J. I.	
SITE DESCRIPTION BRIDGE NO. 251 OVER US 401 NORTH ON US 70/NC 50 AT -L- STATION 25+71				GROUND WTR (ft)
BORING NO. EB2-A	STATION 26+29	OFFSET 21 ft LT	ALIGNMENT -L-	0 HR. 24.7
COLLAR ELEV. 355.4 ft	TOTAL DEPTH 44.2 ft	NORTHING 719,602	EASTING 2,103,918	24 HR. 22.8
DRILL RIG/HAMMER EFF./DATE RFO0057 CME-550X 73% 12/06/2005		DRILL METHOD H.S. Augers	HAMMER TYPE Automatic	
DRILLER Dixon, D. W.	START DATE 12/15/10	COMP. DATE 12/15/10	SURFACE WATER DEPTH N/A	

WBS 39978.1.1	TIP B-4946	COUNTY WAKE	GEOLOGIST Mohs, N. D.	
SITE DESCRIPTION BRIDGE NO. 251 OVER US 401 NORTH ON US 70/NC 50 AT -L- STATION 25+71				GROUND WTR (ft)
BORING NO. EB2-B	STATION 26+66	OFFSET 12 ft RT	ALIGNMENT -L-	0 HR. 23.0
COLLAR ELEV. 355.2 ft	TOTAL DEPTH 50.2 ft	NORTHING 719,553	EASTING 2,103,910	24 HR. 22.6
DRILL RIG/HAMMER EFF./DATE RFO0057 CME-550X 73% 12/06/2005		DRILL METHOD H.S. Augers	HAMMER TYPE Automatic	
DRILLER Dixon, D. W.	START DATE 12/21/10	COMP. DATE 12/21/10	SURFACE WATER DEPTH N/A	



NCDOT BORE DOUBLE B4946 GEO_BH_BR0251.GPJ NC_DOT.GDT 6/7/11

EB1-B

SOIL TEST RESULTS															
SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT				% PASSING (SIEVES)			% MOISTURE	% ORGANIC
							C.SAND	F.SAND	SILT	CLAY	10	40	200		
SS-7	12' RT	24+81	3.5-5.0	A-7-5(9)	66	21	33.9	18.6	15.2	32.3	100	79	50	-	-
SS-8	12' RT	24+81	8.5-10.0	A-2-5(0)	45	5	41.6	32.7	17.7	8.1	100	77	30	-	-

ROCK TEST RESULTS									
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	3' RT	25+45	42.6-43.6	2.14	186.2	26100	9.63	9.71	11.59
RS-2	29' LT	25+60	38.0-38.9	2.22	163.4	39700	15	15.18	7.17

W-1

SOIL TEST RESULTS															
SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT				% PASSING (SIEVES)			% MOISTURE	% ORGANIC
							C.SAND	F.SAND	SILT	CLAY	10	40	200		
SS-8A	34' LT	25+05	3.5-5.0	A-2-5(0)	50	2	37.7	35.0	19.2	8.1	99	82	32	-	-
SS-9	34' LT	25+05	8.5-10.0	A-2-4(0)	31	NP	50.2	31.4	12.4	6.0	100	69	23	-	-
SS-10	34' LT	25+05	13.5-15.0	A-2-5(0)	43	NP	56.6	27.4	12.0	4.0	99	69	19	-	-
SS-11	34' LT	25+05	23.5-25.0	A-2-4(0)	40	NP	43.5	35.9	16.6	4.0	100	78	26	-	-

W-4

SOIL TEST RESULTS															
SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT				% PASSING (SIEVES)			% MOISTURE	% ORGANIC
							C.SAND	F.SAND	SILT	CLAY	10	40	200		
SS-12	8' RT	26+17	3.2-4.7	A-2-5(0)	58	5	58.8	10.3	20.8	10.1	97	68	33	-	-
SS-13	8' RT	26+17	8.2-9.7	A-2-4(0)	39	3	41.7	30.0	20.2	8.1	96	68	33	-	-
SS-14	8' RT	26+17	13.2-14.7	A-2-5(0)	44	NP	42.5	40.7	10.8	6.0	100	88	20	-	-
SS-15	8' RT	26+17	23.2-24.7	A-2-5(0)	49	NP	39.5	39.7	12.8	8.1	100	88	25	-	-

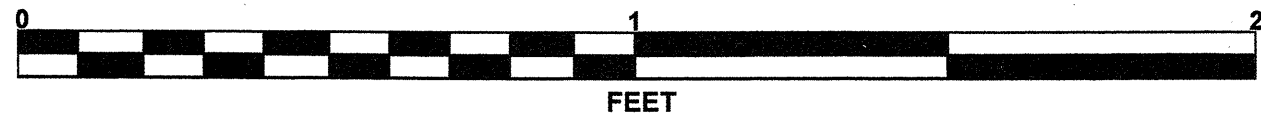
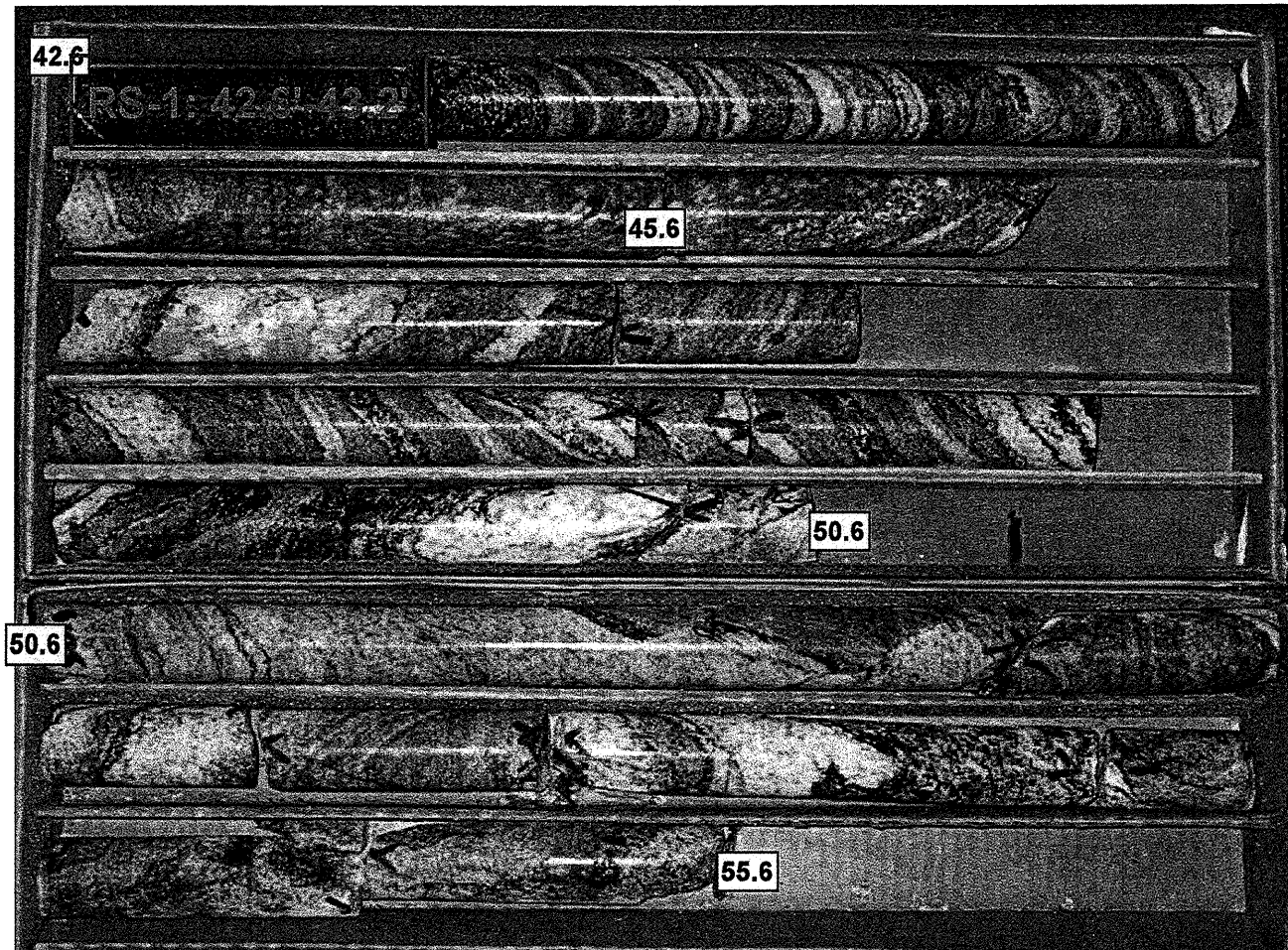
EB2-A

SOIL TEST RESULTS															
SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT				% PASSING (SIEVES)			% MOISTURE	% ORGANIC
							C.SAND	F.SAND	SILT	CLAY	10	40	200		
SS-1	21' LT	26+29	4.1-5.6	A-7-5(5)	65	17	37.9	21.6	12.2	28.3	100	76	44	-	-
SS-2	21' LT	26+29	9.1-10.6	A-5(0)	52	7	37.7	30.3	19.9	12.1	100	82	36	-	-
SS-3	21' LT	26+29	19.1-20.6	A-2-4(0)	40	3	53.1	21.8	15.0	10.1	99	62	28	-	-
SS-4	21' LT	26+29	29.1-30.6	A-2-5(0)	52	NP	47.4	28.7	17.9	6.1	99	71	28	-	-
SS-5	21' LT	26+29	34.1-35.6	A-2-4(0)	34	3	49.8	26.3	15.7	8.1	91	58	26	-	-
SS-6	21' LT	26+29	39.1-40.6	A-2-4(0)	26	NP	58.8	24.9	11.2	5.0	98	56	20	-	-

Core Photographs

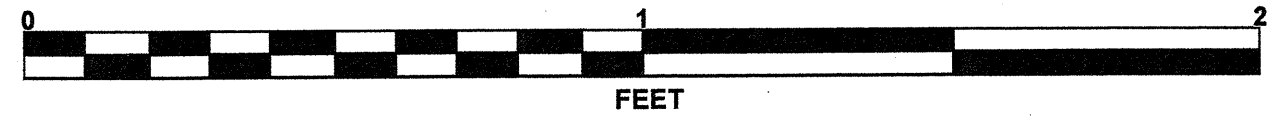
W-2

Boxes 1 & 2: 42.6 - 55.6 Feet



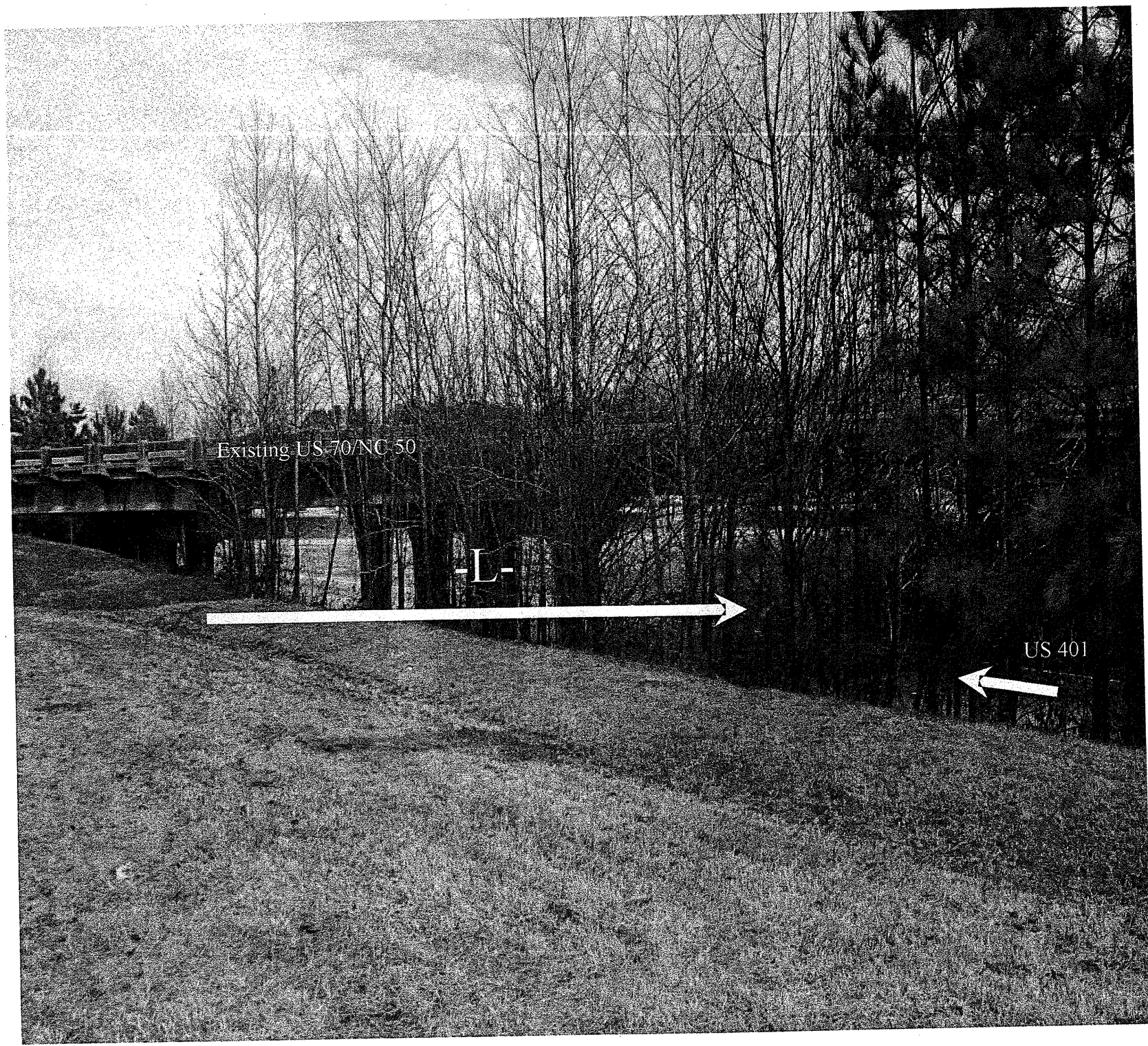
W-3

Boxes 1 & 2: 38.0 - 54.9 Feet



Site Photograph

Bridge No. 251 over US 401 North on US 70/NC 50 at -L- Station 25+71



Looking North East from End Bent 1