

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	35029.1.2(U-4432)	1	14

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

STRUCTURE SUBSURFACE INVESTIGATION

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PROJ. REFERENCE NO. 35029.1.2(U-4432) F.A. PROJ. N/A
COUNTY WAKE
PROJECT DESCRIPTION RALEIGH - SR 1370 (TRYON RD.) FROM WEST OF BRIDGE NO. 259 OVER NORFOLK SOUTHERN RAILROAD TO US70-401/NC 50 (WILMINGTON STREET)
SITE DESCRIPTION BRIDGE NO. 259 ON -L- (SR 1370) OVER -Y2- (NORFOLK SOUTHERN RAILROAD) AT -L- STA. 28+17.07/-Y2- STA. 12+34.99

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) 707-6850. NEITHER THE SUBSURFACE PLANS AND REPORTS, NOR THE FIELD BORING LOGS, ROCK CORES, OR SOIL TEST DATA ARE PART OF THE CONTRACT.

GENERAL SOIL AND ROCK STRATA DESCRIPTIONS AND INDICATED BOUNDARIES ARE BASED ON A GEOTECHNICAL INTERPRETATION OF ALL AVAILABLE SUBSURFACE DATA AND MAY NOT NECESSARILY REFLECT THE ACTUAL SUBSURFACE CONDITIONS BETWEEN BORINGS OR BETWEEN SAMPLED STRATA WITHIN THE BOREHOLE. THE LABORATORY SAMPLE DATA AND THE IN SITU (IN-PLACE) TEST DATA CAN BE RELIED ON ONLY TO THE DEGREE OF RELIABILITY INHERENT IN THE STANDARD TEST METHOD. THE OBSERVED WATER LEVELS OR SOIL MOISTURE CONDITIONS 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.

ID: U-4432

PROJECT: 35029.1.1

PERSONNEL

O. B. OTI

J. I. MILKOVITS

H. R. CONLEY

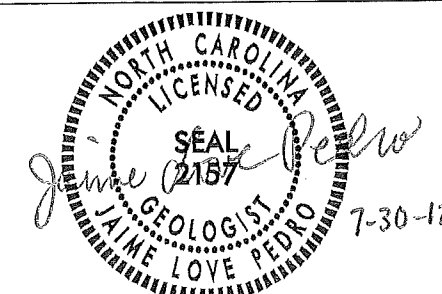
J. R. MATULA

INVESTIGATED BY J.L. PEDRO

CHECKED BY N.T. ROBERSON

SUBMITTED BY J.L. PEDRO

DATE JULY 2012



DRAWN BY: J.L. PEDRO, T.T. WALKER

NOTE - THE INFORMATION CONTAINED HEREIN IS NOT IMPLIED OR GUARANTEED BY THE N.C. DEPARTMENT OF TRANSPORTATION AS BEING ACCURATE NOR IS IT 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

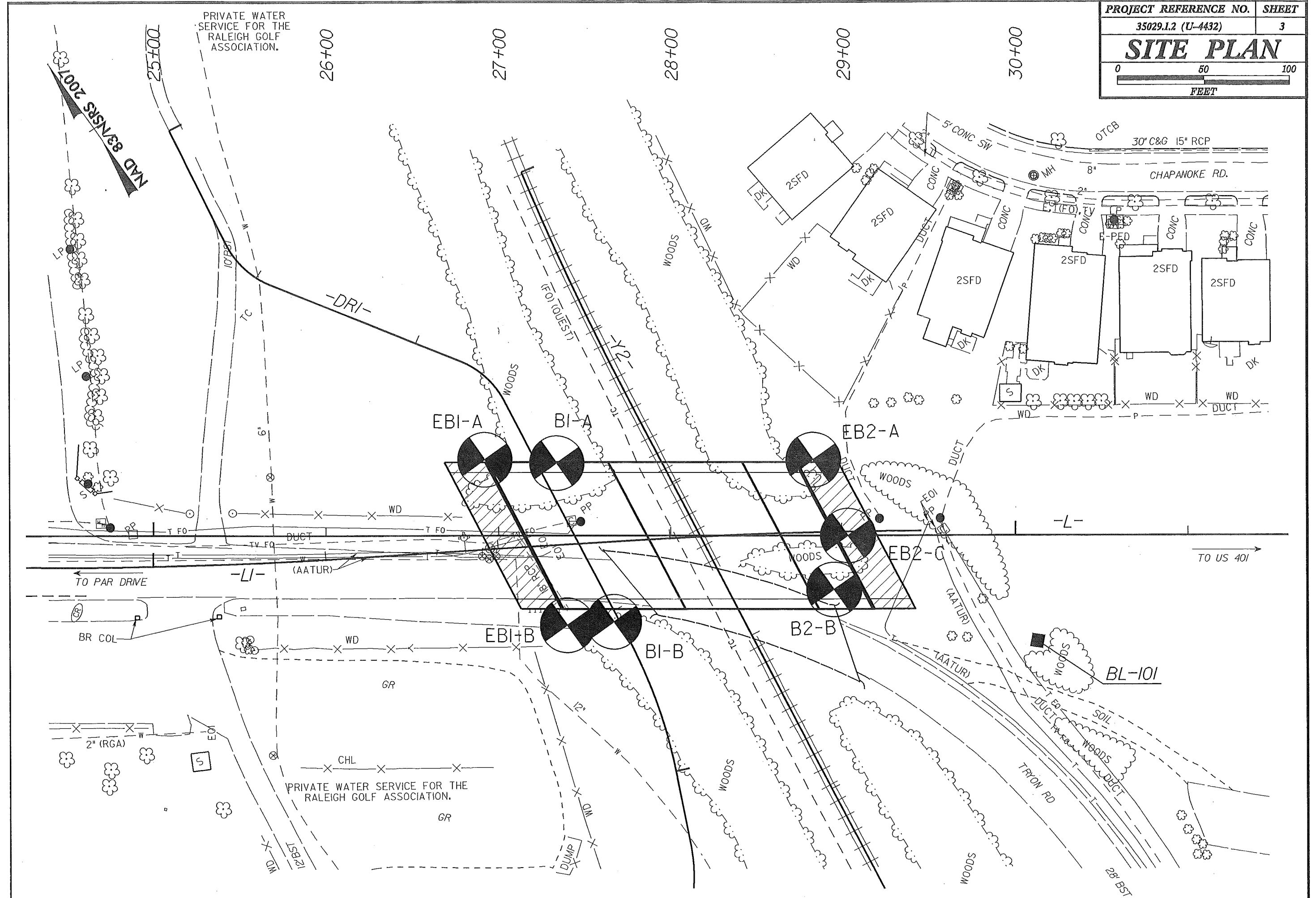
SUBSURFACE INVESTIGATION

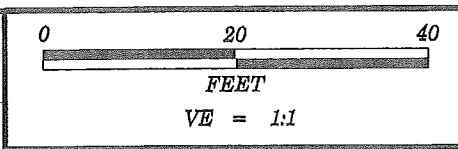
SOIL AND ROCK LEGEND, TERMS, SYMBOLS, AND ABBREVIATIONS

PROJECT REFERENCE NO. 35029.1.2(U-4432)	SHEET NO. 2
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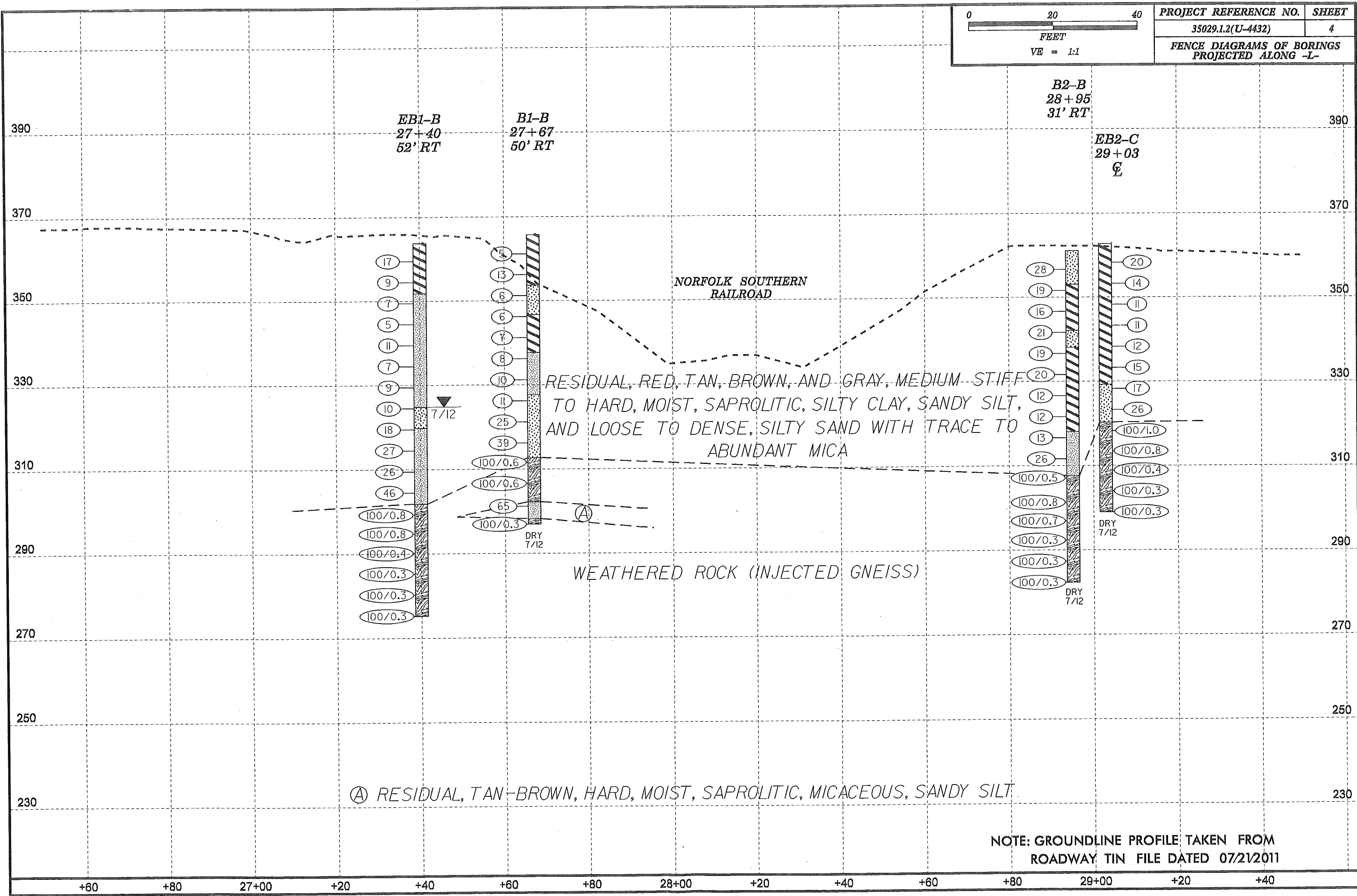
SOIL DESCRIPTION				GRADATION				ROCK DESCRIPTION				TERMS AND DEFINITIONS			
SOIL IS CONSIDERED TO BE THE UNCONSOLIDATED, SEMI-CONSOLIDATED, OR WEATHERED EARTH MATERIALS THAT CAN BE PENETRATED WITH A CONTINUOUS FLIGHT POWER AUGER, AND YIELD LESS THAN 100 BLOWS PER FOOT ACCORDING TO STANDARD PENETRATION TEST (ASTM 1208, 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, GRAY, SILTY CLAY, MOST WITH INTERBEDDED FINE SAND LAYERS, HIGH 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.				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:				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. 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 IN 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, CRYSTALS BRIGHT, FEW JOINTS MAY SHOW SLIGHT STAINING. ROCK RINGS UNDER HAMMER IF CRYSTALLINE. VERY SLIGHT (V SLI.) 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 (SLI.) ROCK GENERALLY FRESH, JOINTS STAINED AND DISCOLORATION EXTENDS INTO ROCK UP TO 1/4 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. <i>IF TESTED, WOULD YIELD SPT REFUSAL</i> 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. <i>IF TESTED, YIELDS SPT N VALUES > 100 BPF</i> 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.							
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 SPT TEST BORE WITH SPT DMT AUGER BORING CORE BORING MONITORING WELL PIEZOMETER INSTALLATION SLOPE INDICATOR INSTALLATION CONE PENETROMETER TEST SOUNDING ROD							
TEXTURE OR GRAIN SIZE				ABBREVIATIONS											
U.S. STD. SIEVE SIZE OPENING (MM) 4 10 40 60 200 270 4.75 2.00 0.42 0.25 0.075 0.053				AR - AUGER REFUSAL BT - BORING TERMINATED CL - CLAY CPT - CONE PENETRATION TEST CSE. - COARSE DMT - DILATOMETER TEST OPT - DYNAMIC PENETRATION TEST o - VOID RATIO F - FINE FOSS. - FOSSILIFEROUS FRAC. - FRACTURED, FRACTURES FRAG. - FRAGMENTS HI. - HIGHLY MED. - MEDIUM MICA - MICACEOUS MOD. - MODERATELY NON - 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 W - UNIT WEIGHT W _d - DRY UNIT WEIGHT S - BULK SS - SPLIT SPOON ST - SHELBY TUBE RS - ROCK RT - RECOMPACTED TRIAXIAL CBR - CALIFORNIA BEARING RATIO											
SOIL MOISTURE - CORRELATION OF TERMS				EQUIPMENT USED ON SUBJECT PROJECT											
SOIL MOISTURE SCALE (ATTERBERG LIMITS) FIELD MOISTURE DESCRIPTION GUIDE FOR FIELD MOISTURE DESCRIPTION				DRILL UNITS: <input type="checkbox"/> MOBILE B- <input type="checkbox"/> BK-51 <input type="checkbox"/> CME-45C <input checked="" type="checkbox"/> CME-55B <input type="checkbox"/> PORTABLE HOIST <input checked="" type="checkbox"/> CME-55											
PLASTICITY				FRACTURE SPACING											
NONPLASTIC LOW PLASTICITY MED. PLASTICITY HIGH PLASTICITY				TERM SPACING 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											
COLOR				BEDDING											
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.				TERM THICKNESS 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											
INDURATION				ELEVATION: 359.30 FT.											
FOR SEDIMENTARY ROCKS, INDURATION IS THE HARDENING OF THE MATERIAL BY CEMENTING, HEAT, PRESSURE, ETC.				NOTES:											

PROJECT REFERENCE NO.	SHEET
35029.1.2 (U-4432)	3
SITE PLAN	
0 50 100 FEET	





PROJECT REFERENCE NO.	SHEET
35029.1.2(U-4432)	4
FENCE DIAGRAMS OF BORINGS PROJECTED ALONG -L-	



EB1-B
27+40
52' RT

B1-B
27+67
50' RT

B2-B
28+95
31' RT

EB2-C
29+03
E

NORFOLK SOUTHERN
RAILROAD

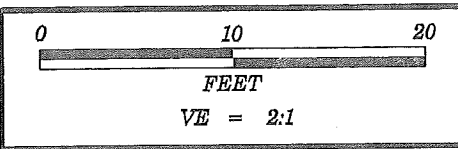
RESIDUAL, RED, TAN, BROWN, AND GRAY, MEDIUM-STIFF
TO HARD, MOIST, SAPROLITIC, SILTY CLAY, SANDY SILT,
AND LOOSE TO DENSE, SILTY SAND WITH TRACE TO
ABUNDANT MICA

WEATHERED ROCK (INJECTED GNEISS)

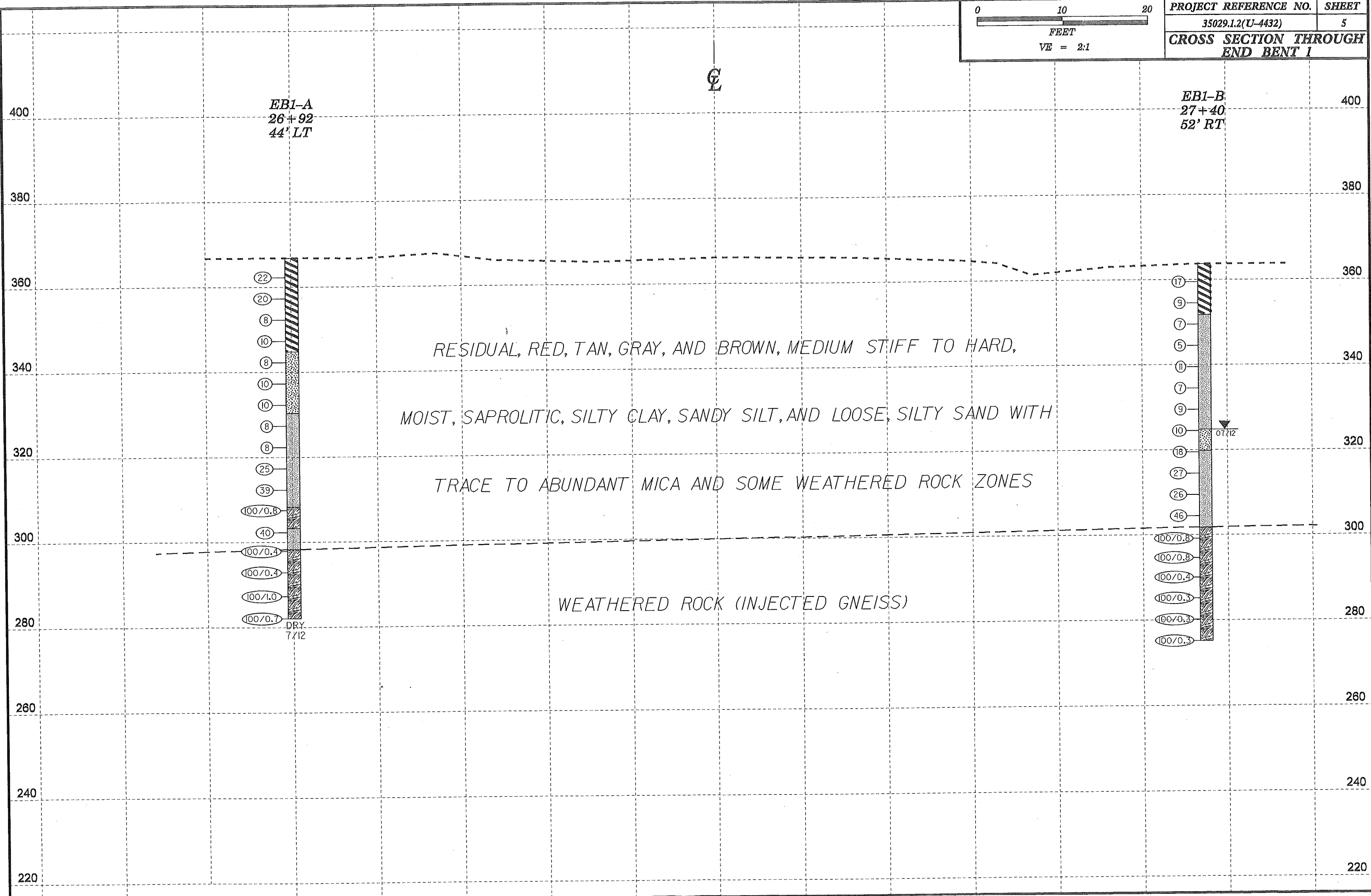
Ⓐ RESIDUAL, TAN-BROWN, HARD, MOIST, SAPROLITIC, MICACEOUS, SANDY SILT

NOTE: GROUNDLINE PROFILE TAKEN FROM
ROADWAY TIN FILE DATED 07/21/2011

+60 +80 27+00 +20 +40 +60 +80 28+00 +20 +40 +60 +80 29+00 +20 +40



PROJECT REFERENCE NO.	SHEET
35029.1.2(U-4432)	5
CROSS SECTION THROUGH END BENT 1	



EB1-A
26+92
44' LT

EB1-B
27+40
52' RT

CL

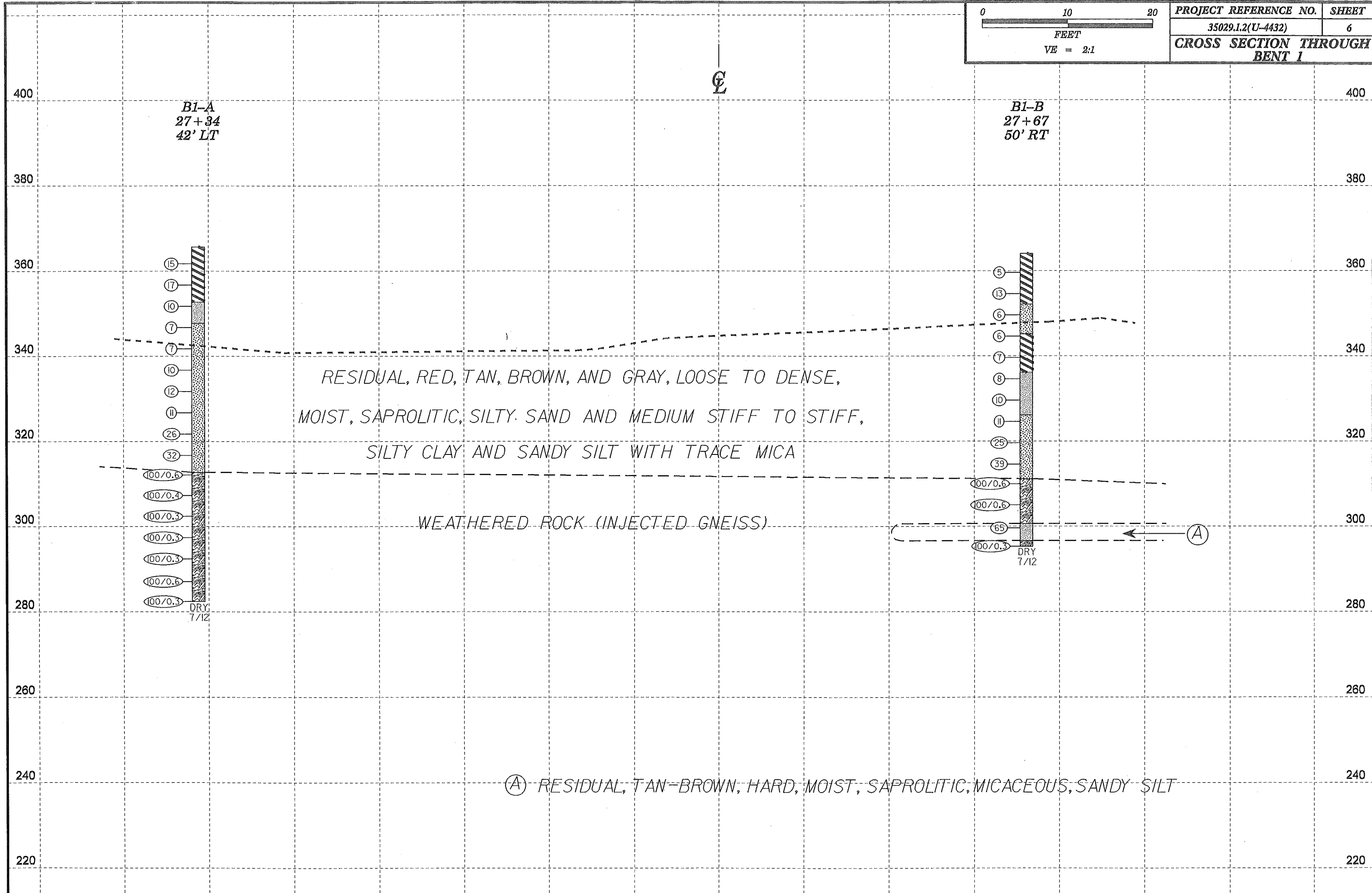
RESIDUAL, RED, TAN, GRAY, AND BROWN, MEDIUM STIFF TO HARD,
MOIST, SAPROLITIC, SILTY CLAY, SANDY SILT, AND LOOSE, SILTY SAND WITH
TRACE TO ABUNDANT MICA AND SOME WEATHERED ROCK ZONES

WEATHERED ROCK (INJECTED GNEISS)

- (22)
 - (20)
 - (8)
 - (10)
 - (8)
 - (10)
 - (10)
 - (8)
 - (8)
 - (25)
 - (39)
 - (100/0.8)
 - (40)
 - (100/0.4)
 - (100/0.4)
 - (100/1.0)
 - (100/0.7)
- DRY
7/12

- (17)
- (9)
- (7)
- (5)
- (11)
- (7)
- (9)
- (10)
- (18)
- (27)
- (26)
- (46)
- (100/0.8)
- (100/0.8)
- (100/0.4)
- (100/0.3)
- (100/0.3)
- (100/0.3)

07/12



B1-A
27+34
42' LT

B1-B
27+67
50' RT

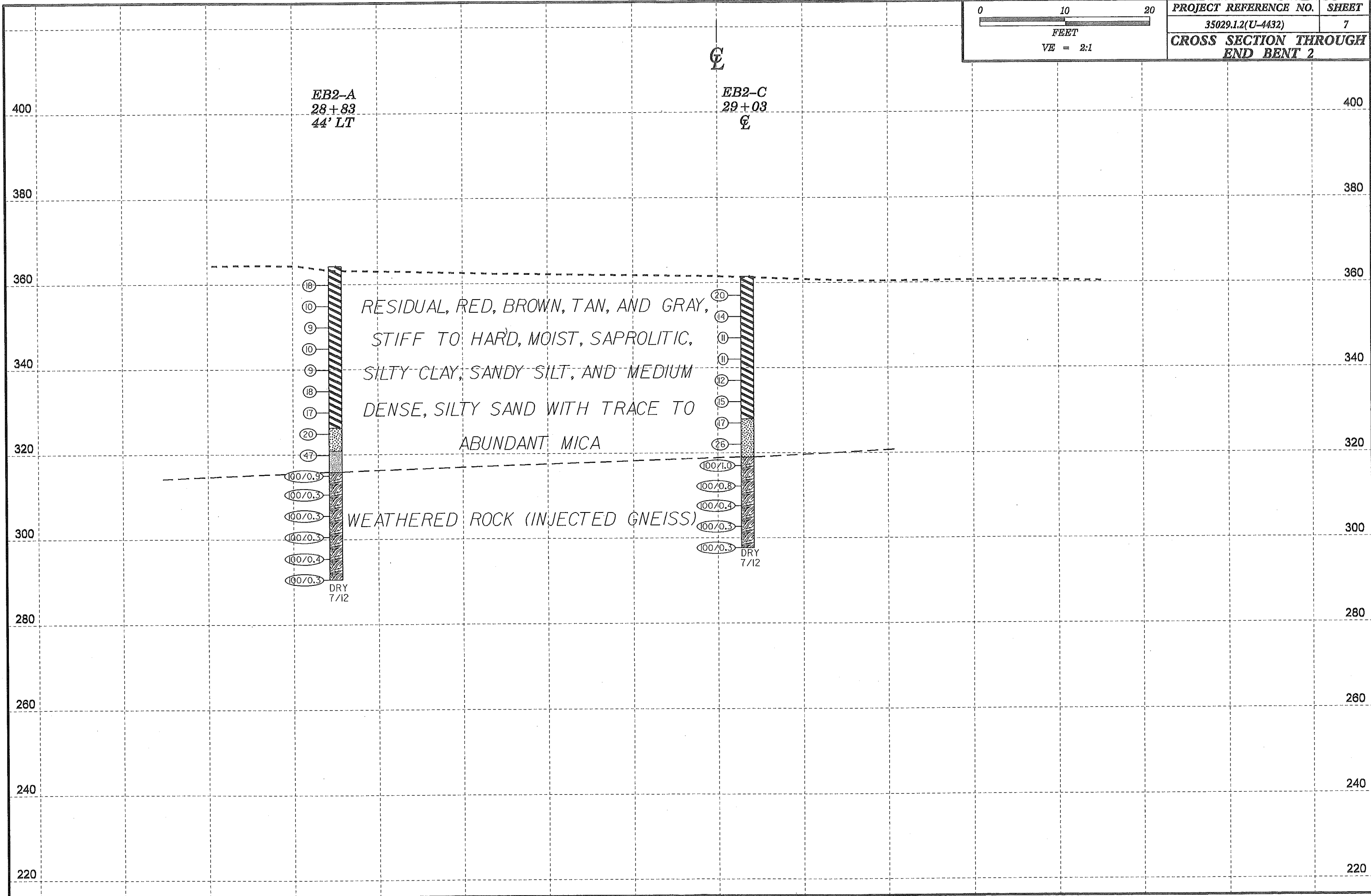
RESIDUAL, RED, TAN, BROWN, AND GRAY, LOOSE TO DENSE,
MOIST, SAPROLITIC, SILTY SAND AND MEDIUM STIFF TO STIFF,
SILTY CLAY AND SANDY SILT WITH TRACE MICA

WEATHERED ROCK (INJECTED GNEISS)

Ⓐ RESIDUAL, TAN-BROWN, HARD, MOIST, SAPROLITIC, MICACEOUS, SANDY SILT

- 15
- 17
- 10
- 7
- 7
- 10
- 12
- 11
- 26
- 32
- 100/0.6
- 100/0.4
- 100/0.3
- 100/0.3
- 100/0.3
- 100/0.3
- 100/0.6
- 100/0.3
- DRY 7/12

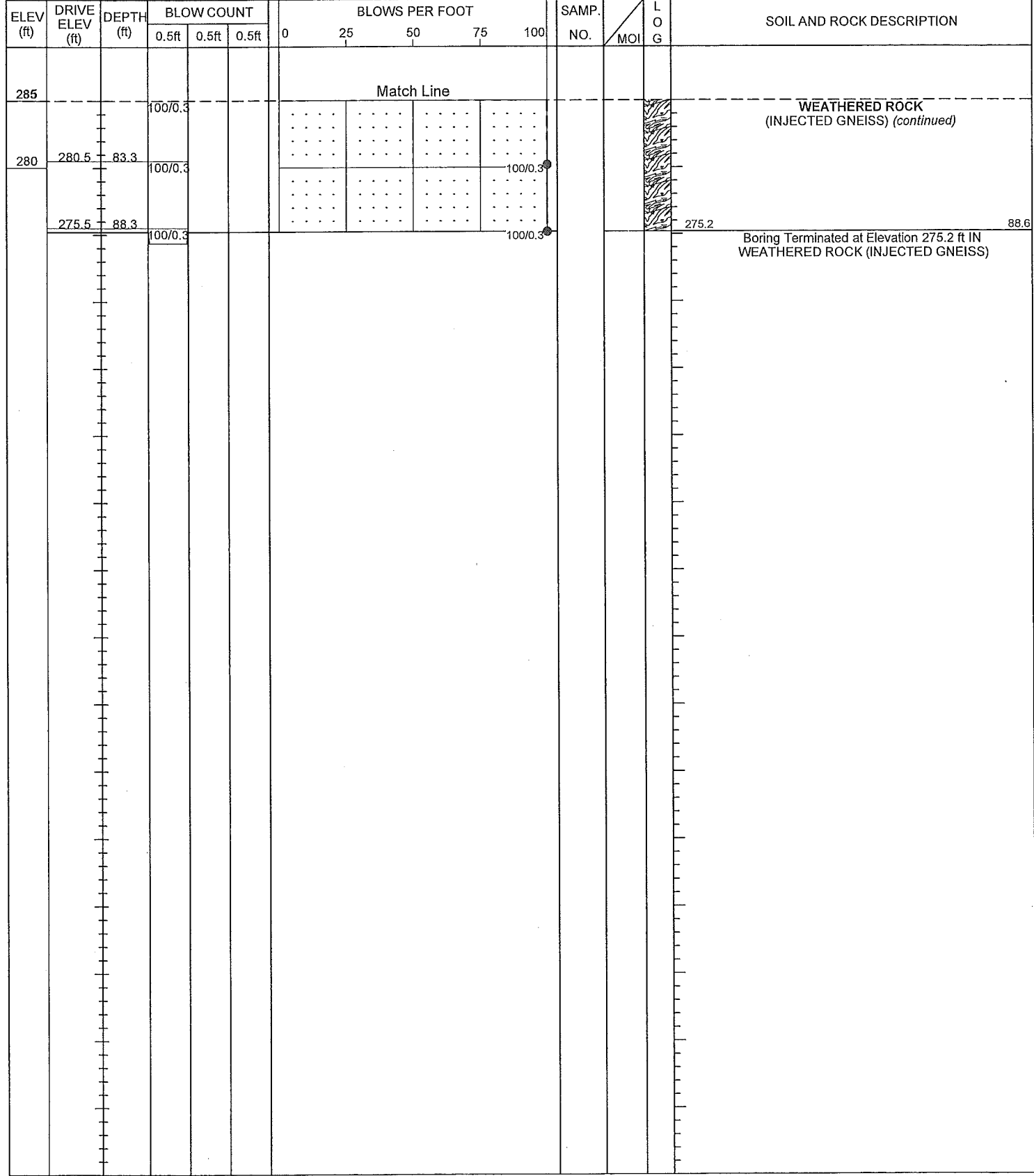
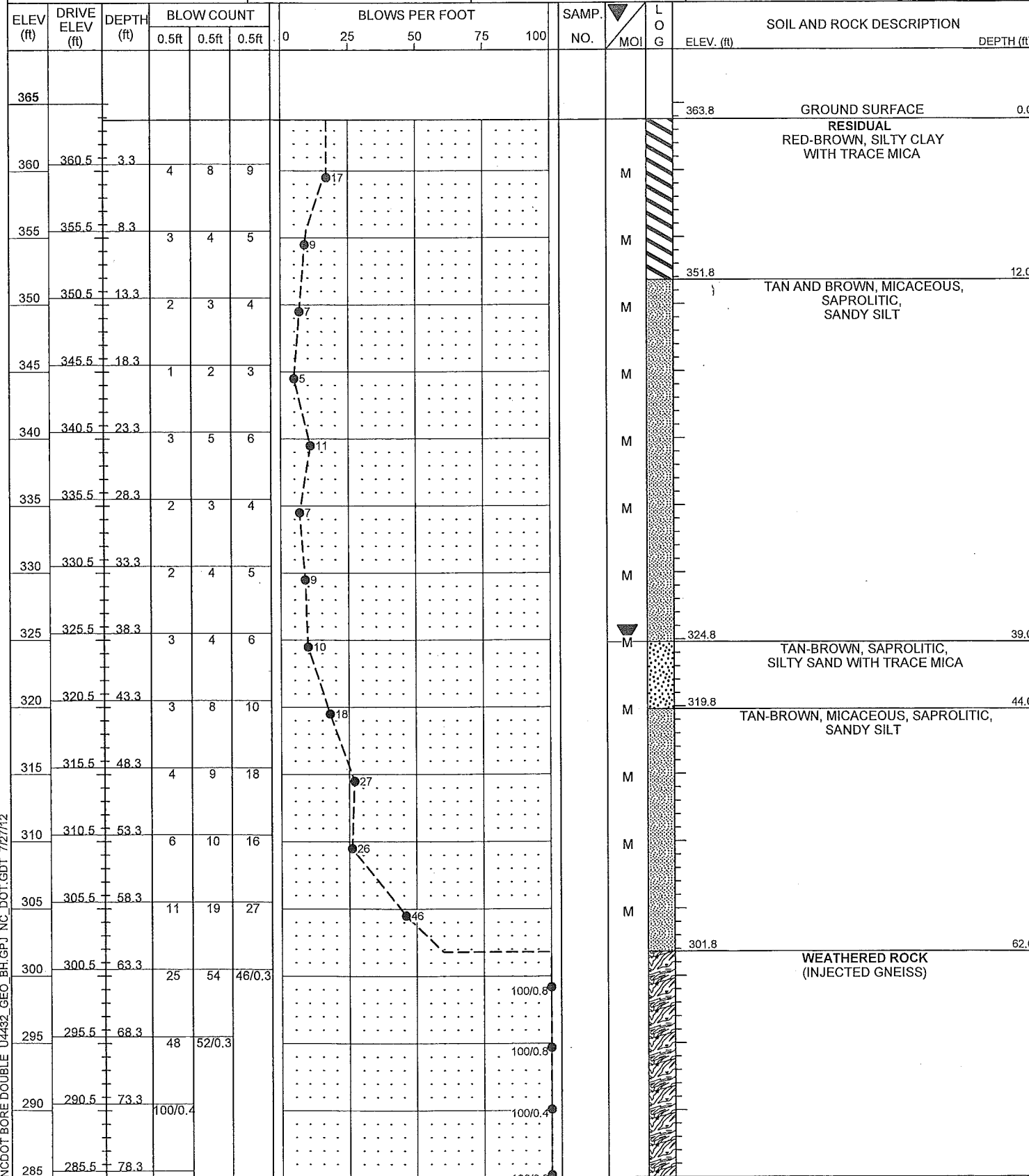
- 5
- 13
- 6
- 6
- 7
- 8
- 10
- 11
- 25
- 39
- 100/0.6
- 100/0.6
- 65
- 100/0.3
- DRY 7/12





WBS 35029.1.2	TIP U-4432	COUNTY WAKE	GEOLOGIST Oti, O. B.	
SITE DESCRIPTION BRIDGE NO. 259 ON -L- (TRYON RD.) OVER NORFOLK SOUTHERN RAILWAY				GROUND WTR (ft)
BORING NO. EB1-B	STATION 27+40	OFFSET 52 ft RT	ALIGNMENT -L-	0 HR. Dry
COLLAR ELEV. 363.8 ft	TOTAL DEPTH 88.6 ft	NORTHING 723,178	EASTING 2,100,026	24 HR. 39.0
DRILL RIG/HAMMER EFF./DATE RFO0074 CME-55 92% 07/12/2011		DRILL METHOD H.S. Augers	HAMMER TYPE Automatic	
DRILLER Conley, H. R.	START DATE 07/12/12	COMP. DATE 07/12/12	SURFACE WATER DEPTH N/A	

WBS 35029.1.2	TIP U-4432	COUNTY WAKE	GEOLOGIST Oti, O. B.	
SITE DESCRIPTION BRIDGE NO. 259 ON -L- (TRYON RD.) OVER NORFOLK SOUTHERN RAILWAY				GROUND WTR (ft)
BORING NO. EB1-B	STATION 27+40	OFFSET 52 ft RT	ALIGNMENT -L-	0 HR. Dry
COLLAR ELEV. 363.8 ft	TOTAL DEPTH 88.6 ft	NORTHING 723,178	EASTING 2,100,026	24 HR. 39.0
DRILL RIG/HAMMER EFF./DATE RFO0074 CME-55 92% 07/12/2011		DRILL METHOD H.S. Augers	HAMMER TYPE Automatic	
DRILLER Conley, H. R.	START DATE 07/12/12	COMP. DATE 07/12/12	SURFACE WATER DEPTH N/A	



NCDOT BORE DOUBLE U4432_GEO_BH.GPJ NC_DOT.GDT 7/27/12

WBS 35029.1.2		TIP U-4432		COUNTY WAKE		GEOLOGIST Oti, O. B.										
SITE DESCRIPTION BRIDGE NO. 259 ON -L- (TRYON RD.) OVER NORFOLK SOUTHERN RAILWAY								GROUND WTR (ft)								
BORING NO. B1-A		STATION 27+34		OFFSET 42 ft LT		ALIGNMENT -L-		0 HR. Dry	24 HR. Dry							
COLLAR ELEV. 365.7 ft		TOTAL DEPTH 83.3 ft		NORTHING 723,258		EASTING 2,100,075										
DRILL RIG/HAMMER EFF./DATE RFO0074 CME-55 92% 07/12/2011				DRILL METHOD H.S. Augers		HAMMER TYPE Automatic										
DRILLER Conley, H. R.		START DATE 07/13/12		COMP. DATE 07/16/12		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	ELEV. (ft)	DEPTH (ft)
			0.5ft	0.5ft	0.5ft	0	25	50	75	100						
370															365.7	0.0
365																
360	362.7	3.0	2	6	9	●						M				
355	357.7	8.0	5	9	8	●						M				
350	352.7	13.0	4	5	5	●						M				
345	347.7	18.0	2	3	4	●						M				
340	342.7	23.0	2	3	4	●						M				
335	337.7	28.0	3	5	5	●						M				
330	332.7	33.0	5	6	6	●						M				
325	327.7	38.0	3	5	6	●						M				
320	322.7	43.0	7	12	14	●						M				
315	317.7	48.0	14	21	11	●						M				
310	312.7	53.0	40	60/0.1								M			312.7	53.0
305	307.7	58.0														
300	302.7	63.0														
295	297.7	68.0														
290	292.7	73.0														

NCDOT BORE DOUBLE U4432 GEO_BH.GPJ NC_DOT_GDT_7/27/12

WBS 35029.1.2		TIP U-4432		COUNTY WAKE		GEOLOGIST Oti, O. B.										
SITE DESCRIPTION BRIDGE NO. 259 ON -L- (TRYON RD.) OVER NORFOLK SOUTHERN RAILWAY								GROUND WTR (ft)								
BORING NO. B1-A		STATION 27+34		OFFSET 42 ft LT		ALIGNMENT -L-		0 HR. Dry	24 HR. Dry							
COLLAR ELEV. 365.7 ft		TOTAL DEPTH 83.3 ft		NORTHING 723,258		EASTING 2,100,075										
DRILL RIG/HAMMER EFF./DATE RFO0074 CME-55 92% 07/12/2011				DRILL METHOD H.S. Augers		HAMMER TYPE Automatic										
DRILLER Conley, H. R.		START DATE 07/13/12		COMP. DATE 07/16/12		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	ELEV. (ft)	DEPTH (ft)
			0.5ft	0.5ft	0.5ft	0	25	50	75	100						
290																
285	287.7	78.0	80	20/0.1												
	282.7	83.0	100/0.3													
															282.4	83.3
															Boring Terminated at Elevation 282.4 ft IN WEATHERED ROCK (INJECTED GNEISS)	

WBS 35029.1.2		TIP U-4432		COUNTY WAKE		GEOLOGIST Oti, O. B.								
SITE DESCRIPTION BRIDGE NO. 259 ON -L- (TRYON RD.) OVER NORFOLK SOUTHERN RAILWAY							GROUND WTR (ft)							
BORING NO. B1-B		STATION 27+67		OFFSET 50 ft RT		ALIGNMENT -L-	0 HR. Dry							
COLLAR ELEV. 364.1 ft		TOTAL DEPTH 68.8 ft		NORTHING 723,164		EASTING 2,100,049	24 HR. Dry							
DRILL RIG/HAMMER EFF./DATE RFO0074 CME-55 92% 07/12/2011					DRILL METHOD H.S. Augers		HAMMER TYPE Automatic							
DRILLER Conley, H. R.			START DATE 07/17/12		COMP. DATE 07/18/12		SURFACE WATER DEPTH N/A							
ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT			BLOWS PER FOOT					SAMP. NO.	LOG	SOIL AND ROCK DESCRIPTION	
			0.5ft	0.5ft	0.5ft	0	25	50	75	100				
365														364.1 GROUND SURFACE 0.0
360	360.6	3.5	2	2	3	5						M		RESIDUAL RED-BROWN, SILTY CLAY
355	355.6	8.5	3	6	7	13						M		
350	350.6	13.5	2	3	3	6						M		352.1 TAN-BROWN, SILTY SAND 12.0
345	345.6	18.5	2	3	3	6						M		345.1 RED-BROWN, SILTY CLAY WITH TRACE MICA 19.0
340	340.6	23.5	2	3	4	7						M		
335	335.6	28.5	3	4	4	8						M		336.1 TAN-GRAY, MICACEOUS, SAPROLITIC, SANDY SILT 28.0
330	330.6	33.5	4	5	5	10						M		
325	325.6	38.5	2	4	7	11						M		326.1 TAN-BROWN, SAPROLITIC, SILTY SAND 38.0
320	320.6	43.5	4	10	15	25						M		
315	315.6	48.5	4	7	32	39						M		
310	310.6	53.5	60	40/0.1					100/0.6			M		311.1 WEATHERED ROCK (INJECTED GNEISS) 53.0
305	305.6	58.5	65	35/0.1					100/0.6			M		
300	300.6	63.5	18	28	37				65			M		300.6 RESIDUAL TAN-BROWN, MICACEOUS, SAPROLITIC, SANDY SILT 63.5
	295.6	68.5	100/0.3						100/0.3					296.6 WEATHERED ROCK (INJECTED GNEISS) 67.5
														295.3 WEATHERED ROCK (INJECTED GNEISS) 68.8
														Boring Terminated at Elevation 295.3 ft IN WEATHERED ROCK (INJECTED GNEISS)

WBS 35029.1.2		TIP U-4432		COUNTY WAKE		GEOLOGIST Oti, O. B.									
SITE DESCRIPTION BRIDGE NO. 259 ON -L- (TRYON RD.) OVER NORFOLK SOUTHERN RAILWAY							GROUND WTR (ft)								
BORING NO. B2-B		STATION 28+95		OFFSET 44 ft RT		ALIGNMENT -L-									
COLLAR ELEV. 361.1 ft		TOTAL DEPTH 78.8 ft		NORTHING 723,095		EASTING 2,100,157									
DRILL RIG/HAMMER EFF./DATE RFO0074 CME-55 92% 07/12/2011							DRILL METHOD H.S. Augers								
DRILLER Conley, H. R.							HAMMER TYPE Automatic								
START DATE 06/29/12		COMP. DATE 06/29/12		SURFACE WATER DEPTH N/A											
ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT			BLOWS PER FOOT					SAMP. NO.	LOG MOI	SOIL AND ROCK DESCRIPTION	DEPTH (ft)	
			0.5ft	0.5ft	0.5ft	0	25	50	75	100					
370															
365															
360															
	357.6	3.5		7	12	16									
355															
	352.6	8.5		6	8	11									
350															
	347.6	13.5		6	9	7									
345															
	342.6	18.5		7	10	11									
340															
	337.6	23.5		7	10	9									
335															
	332.6	28.5		6	9	11									
330															
	327.6	33.5		5	5	7									
325															
	322.6	38.5		4	6	6									
320															
	317.6	43.5		4	5	8									
315															
	312.6	48.5		7	12	14									
310															
	307.6	53.5													
305															
	302.6	58.5		25	51	49/0.3									
300															
	297.6	63.5		73		27/0.2									
295															
	292.6	68.5													
290															

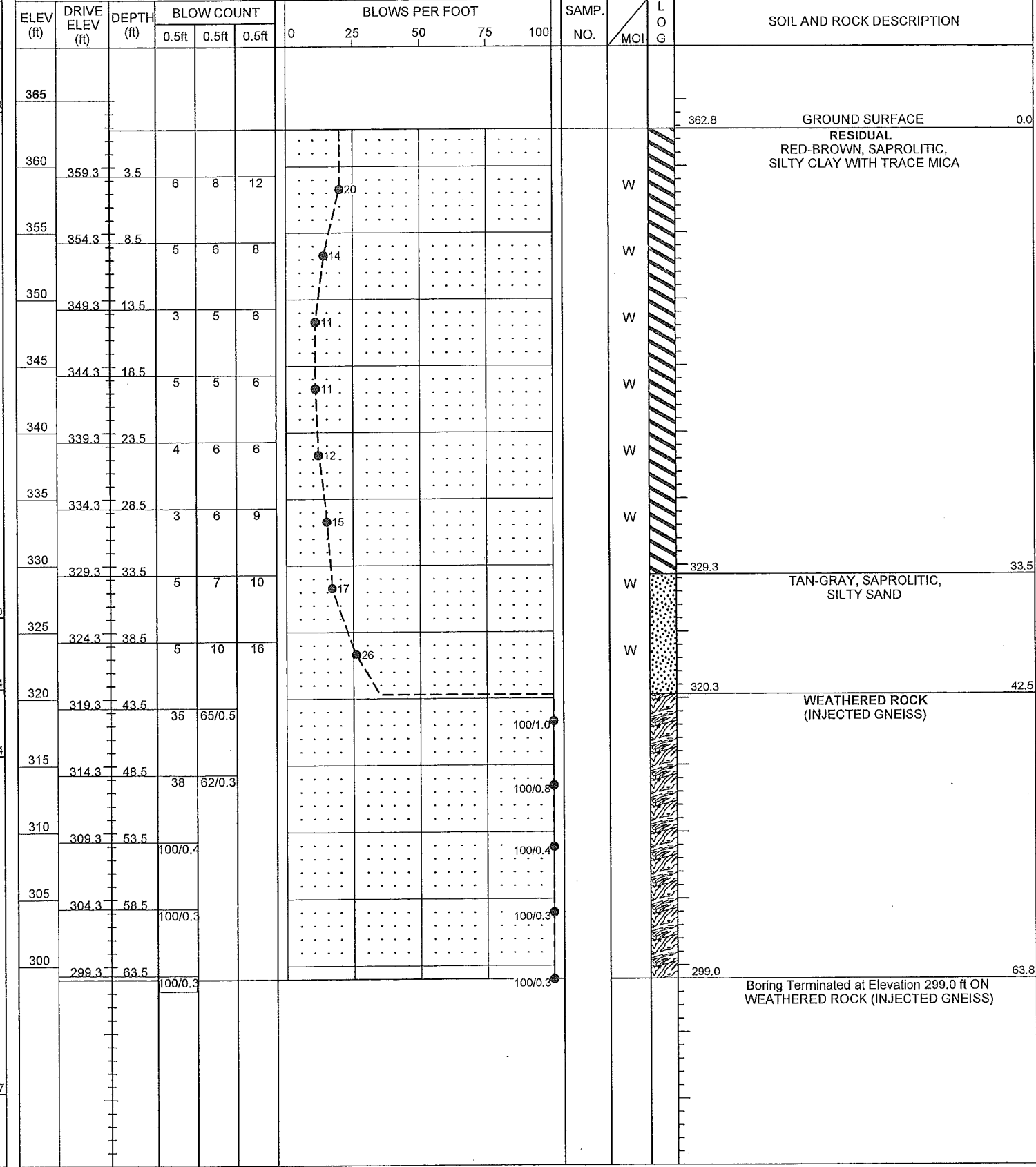
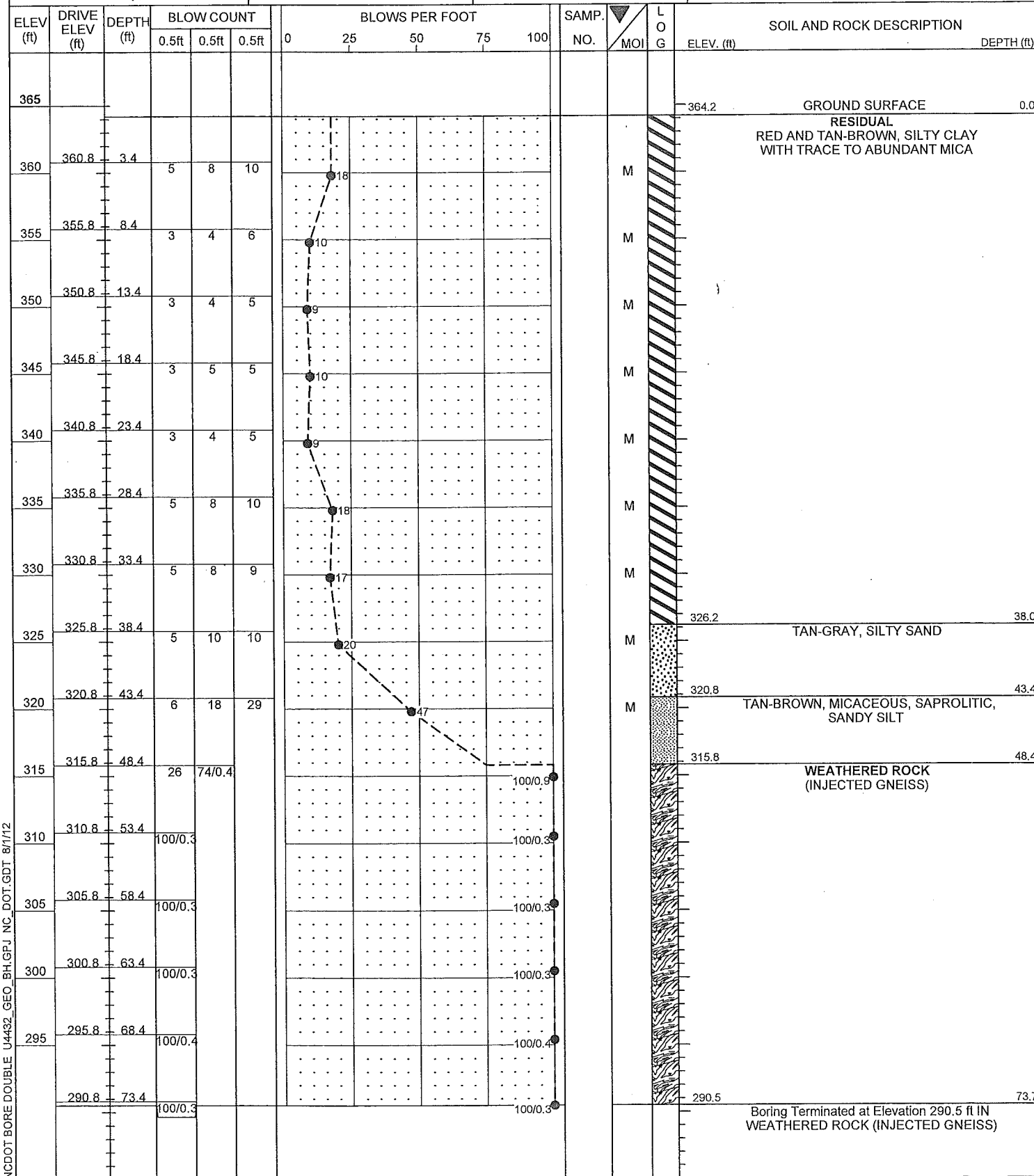
WBS 35029.1.2		TIP U-4432		COUNTY WAKE		GEOLOGIST Oti, O. B.									
SITE DESCRIPTION BRIDGE NO. 259 ON -L- (TRYON RD.) OVER NORFOLK SOUTHERN RAILWAY							GROUND WTR (ft)								
BORING NO. B2-B		STATION 28+95		OFFSET 44 ft RT		ALIGNMENT -L-									
COLLAR ELEV. 361.1 ft		TOTAL DEPTH 78.8 ft		NORTHING 723,095		EASTING 2,100,157									
DRILL RIG/HAMMER EFF./DATE RFO0074 CME-55 92% 07/12/2011							DRILL METHOD H.S. Augers								
DRILLER Conley, H. R.							HAMMER TYPE Automatic								
START DATE 06/29/12		COMP. DATE 06/29/12		SURFACE WATER DEPTH N/A											
ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT			BLOWS PER FOOT					SAMP. NO.	LOG MOI	SOIL AND ROCK DESCRIPTION	DEPTH (ft)	
			0.5ft	0.5ft	0.5ft	0	25	50	75	100					
290															
	287.6	73.5													
285															
	282.6	78.5													
280															

NCDOT BORE DOUBLE U4432 GEO. BH.GPJ NC.DOT.GDT 7/27/12

NCDOT GEOTECHNICAL ENGINEERING UNIT
BORELOG REPORT

WBS 35029.1.2	TIP U-4432	COUNTY WAKE	GEOLOGIST Oti, O. B.
SITE DESCRIPTION BRIDGE NO. 259 ON -L- (TRYON RD.) OVER NORFOLK SOUTHERN RAILWAY			GROUND WTR (ft)
BORING NO. EB2-A	STATION 28+83	OFFSET 44 ft LT	ALIGNMENT -L-
COLLAR ELEV. 364.2 ft	TOTAL DEPTH 73.7 ft	NORTHING 723,173	EASTING 2,100,198
DRILL RIG/HAMMER EFF./DATE RFO0074 CME-55 92% 07/12/2011		DRILL METHOD H.S. Augers	HAMMER TYPE Automatic
DRILLER Conley, H. R.	START DATE 07/09/12	COMP. DATE 07/09/12	SURFACE WATER DEPTH N/A

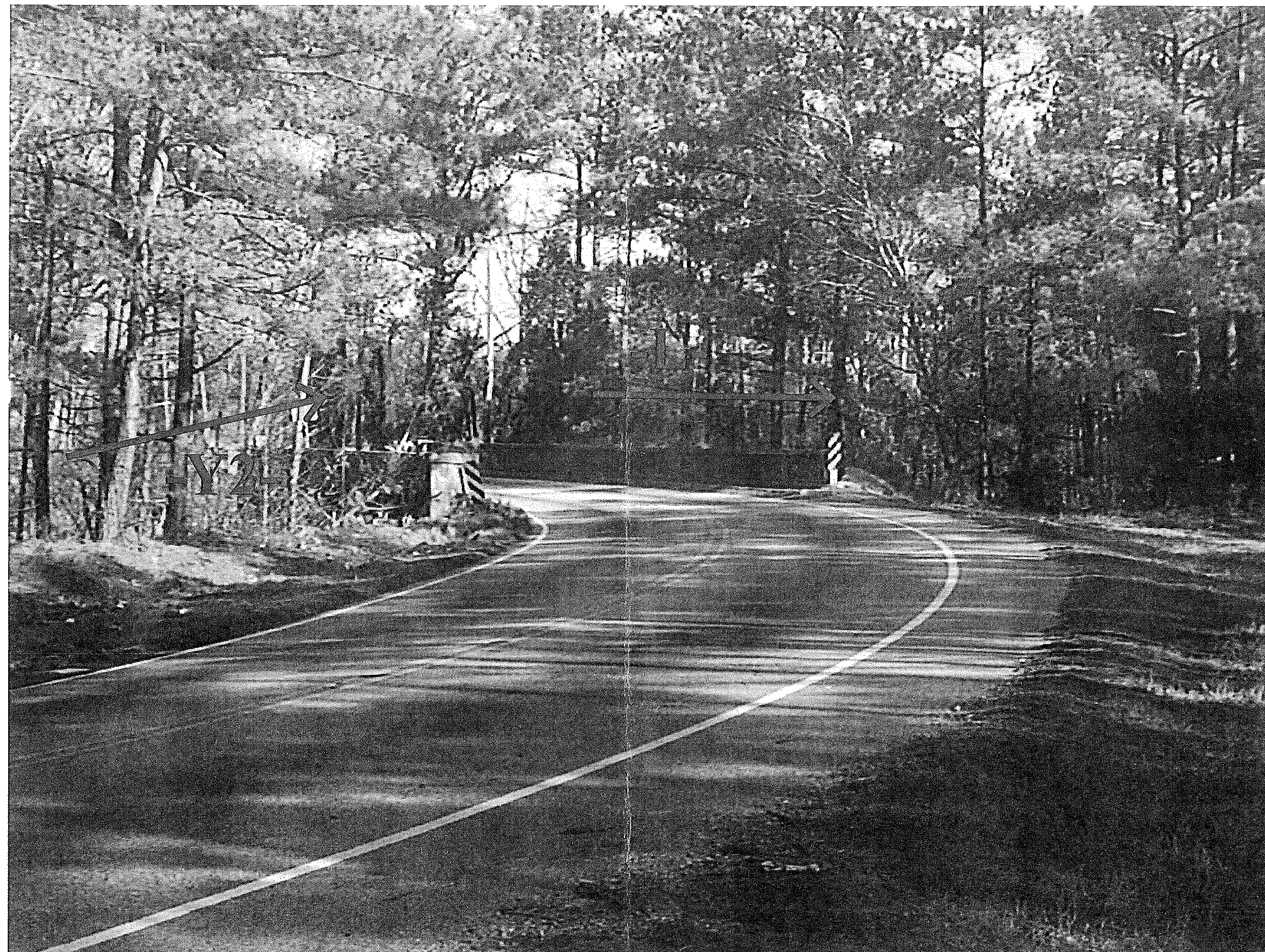
WBS 35029.1.2	TIP U-4432	COUNTY WAKE	GEOLOGIST Oti, O. B.
SITE DESCRIPTION BRIDGE NO. 259 ON -L- (TRYON RD.) OVER NORFOLK SOUTHERN RAILWAY			GROUND WTR (ft)
BORING NO. EB2-C	STATION 29+03	OFFSET CL	ALIGNMENT -L-
COLLAR ELEV. 362.8 ft	TOTAL DEPTH 63.8 ft	NORTHING 723,126	EASTING 2,100,189
DRILL RIG/HAMMER EFF./DATE RFO0067 CME-550X 77% 03/15/2010		DRILL METHOD H.S. Augers	HAMMER TYPE Automatic
DRILLER Conley, H. R.	START DATE 02/28/12	COMP. DATE 02/28/12	SURFACE WATER DEPTH N/A



NCDOT BORE DOUBLE U4432 GEO_BH.GPJ NC_DOT_GDT_8/1/12

SITE PHOTOGRAPH

Bridge No. 259 on -L- (SR 1370) over -Y2- (Norfolk Southern Railroad)



Looking North towards End Bent 2