

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	B-3159	1	10

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

STRUCTURE
SUBSURFACE INVESTIGATION

CONTENTS

<u>SHEET</u>	<u>DESCRIPTION</u>
1	TITLE SHEET
2	LEGEND
3	SITE PLAN
4-5	CROSS SECTION(S)
6-8	BORE LOGS
9	SOIL TEST RESULTS
10	SITE PHOTOGRAPH (AERIAL)

PROJ. REFERENCE NO. 38331.1.1 (B-3159) F.A. PROJ. STPNHS-0052(31)
COUNTY DAVIDSON
PROJECT DESCRIPTION BRIDGE NO. 27 OVER US 29-64-70 /I-85 BUS.
ON NC 8 /US 52

SITE DESCRIPTION RETAINING WALL #1 & RETAINING WALL #2

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 PLACE BY CONTACTING THE N. C. DEPARTMENT OF TRANSPORTATION, GEOTECHNICAL ENGINEERING UNIT AT 1919 250-4088. NEITHER THE SUBSURFACE PLANS AND REPORTS, NOR THE FIELD BORING 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
J.K. STICKNEY

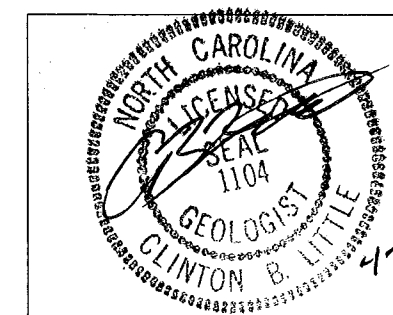
C.L. SMITH

INVESTIGATED BY **J.E. BEVERLY**

CHECKED BY **C.B. LITTLE**

SUBMITTED BY **C.B. LITTLE**

DATE **APRIL 2014**



4-30-14

PROJECT: 38331.1.1 ID: B-3159

DRAWN BY: **J.K. McCLURE**





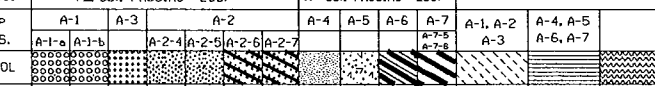
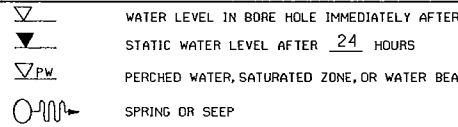
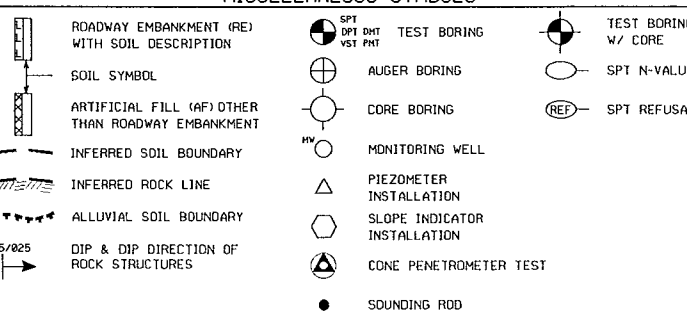
NOTE - THE INFORMATION CONTAINED HEREIN IS NOT APPLIED OR GUARANTEED BY THE N. C. DEPARTMENT OF TRANSPORTATION AS BEING ACCURATE NOR IS IT CONSIDERED TO BE PART OF THE PLANS, SPECIFICATIONS, OR CONTRACT FOR THE PROJECT.

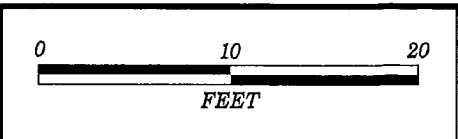
NOTE - BY HAVING REQUESTED THIS INFORMATION THE CONTRACTOR SPECIFICALLY WAIVES ANY CLAIMS FOR INCREASED COMPENSATION OR EXTENSION OF TIME BASED ON DIFFERENCES BETWEEN THE CONDITIONS INDICATED HEREIN AND THE ACTUAL CONDITIONS AT THE PROJECT SITE.

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS
GEOTECHNICAL ENGINEERING UNIT

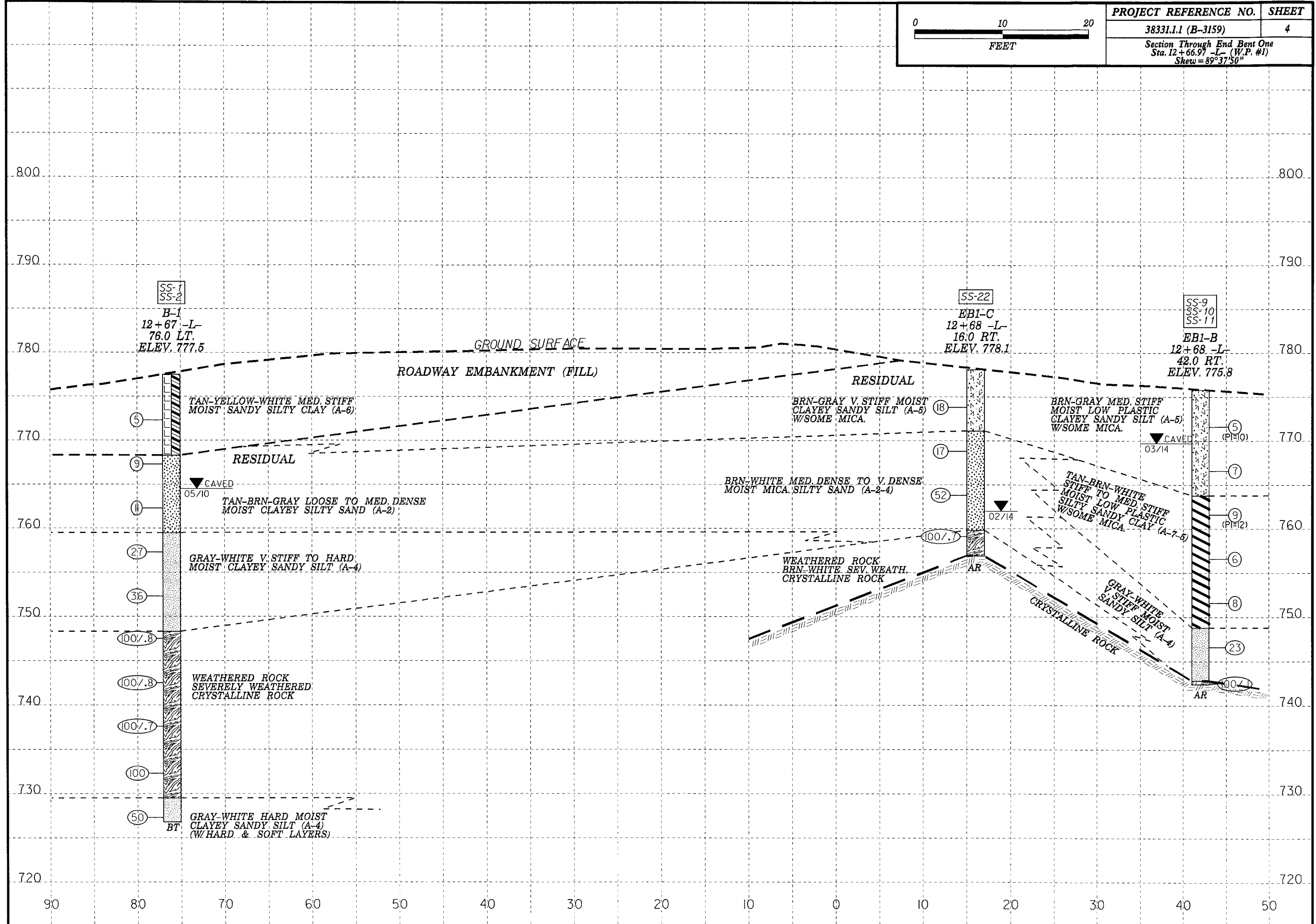
SUBSURFACE INVESTIGATION

SOIL AND ROCK LEGEND, TERMS, SYMBOLS, AND ABBREVIATIONS

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. EXAMPLES: <i>VERY STIFF, GRAY, SILTY CLAY, MOST WITH INTERBEDDED FINE SAND LAYERS, HEAVY 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. MINERALOGICAL COMPOSITION MINERAL NAMES SUCH AS QUARTZ, FELDSPAR, MICA, TALC, KAOLIN, ETC. ARE USED IN DESCRIPTIONS WHENEVER THEY ARE CONSIDERED OF SIGNIFICANCE.	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)  CRYSTALLINE ROCK (CR)  NON-CRYSTALLINE ROCK (NCR)  COASTAL PLAIN SEDIMENTARY ROCK (CPS)	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 (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 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 (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. TOPSOIL (TS) - SURFACE SOILS USUALLY CONTAINING ORGANIC MATTER.
SOIL LEGEND AND AASHTO CLASSIFICATION GENERAL CLASS. GRANULAR MATERIALS (< 35% PASSING #200) SILT-CLAY MATERIALS (> 35% PASSING #200) ORGANIC MATERIALS GROUP CLASS. A-1, A-3, A-2, A-4, A-5, A-6, A-7, A-1, A-2, A-3, A-4, A-5 SYMBOL  % PASSING: #10, #40, #200 LIQUID LIMIT (LL) INDEX: 0 to 10 GROUP INDEX: 0 to 10 USUAL TYPES OF MAJOR MATERIALS: STONE FRAGS, GRAVEL, AND SAND; FINE SAND; SILTY OR CLAYEY GRAVEL AND SAND; SILTY SOILS; CLAYEY SOILS GEN. RATING AS A SUBGRADE: EXCELLENT TO GOOD; FAIR TO POOR; FAIR TO POOR; POOR; UNSUITABLE PI OF A-7-5 SUBGROUP IS ≤ LL - 30; PI OF A-7-6 SUBGROUP IS > LL - 30	COMPRESSIONIBILITY SLIGHTLY COMPRESSIBLE: LIQUID LIMIT LESS THAN 31 MODERATELY COMPRESSIBLE: LIQUID LIMIT EQUAL TO 31-50 HIGHLY COMPRESSIBLE: LIQUID LIMIT GREATER THAN 50 PERCENTAGE OF MATERIAL ORGANIC MATERIAL: GRANULAR SOILS, SILT-CLAY SOILS, OTHER MATERIAL TRACE OF ORGANIC MATTER: 2-3%, 3-5%, 5-12% LITTLE ORGANIC MATTER: 3-5%, 5-12%, 12-20% MODERATELY ORGANIC: 5-10%, 12-20%, >20% HIGHLY ORGANIC: >10%, >20% GROUND WATER  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	WEATHERING FRESH: ROCK FRESH, CRYSTALS 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. <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 PRIMARY SOIL TYPE: GENERALLY GRANULAR MATERIAL (NON-COHESIVE), GENERALLY SILT-CLAY MATERIAL (COHESIVE) COMPACTNESS OR CONSISTENCY: VERY LOOSE, LOOSE, MEDIUM DENSE, DENSE, VERY DENSE RANGE OF STANDARD PENETRATION RESISTANCE (N-VALUE): <4, 4 TO 10, 10 TO 30, 30 TO 50, >50 RANGE OF UNCONFINED COMPRESSIVE STRENGTH (TONS/FT ²): N/A, <0.25, 0.25 TO 1.0, 1 TO 2, 2 TO 4, >4	MISCELLANEOUS SYMBOLS 	ROCK HARDNESS 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 GROOVED OR GOUGED 0.25 INCHES DEEP BY FIRM PRESSURE OF KNIFE OR PICK POINT. CAN BE EXCAVATED IN SMALL CHIPS TO PEICES 1 INCH MAXIMUM SIZE BY HARD BLOWS OF THE POINT OF A GEOLOGIST'S PICK. SOFT: CAN BE GROOVED OR GOUGED READILY BY KNIFE OR PICK. 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.	
TEXTURE OR GRAIN SIZE 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 BOULDER (BLDR.), COBBLE (COB.), GRAVEL (GR.), COARSE SAND (CSE. SD.), FINE SAND (F. SD.), SILT (SL.), CLAY (CL.) GRAIN SIZE: MM 305, 75, 2.0, 0.25, 0.05, 0.005; IN. 12, 3	ABBREVIATIONS AR - AUGER REFUSAL, BT - BORING TERMINATED, CL - CLAY, CPT - CONE PENETRATION TEST, CSE - COARSE, DMT - DILATOMETER TEST, DPT - DYNAMIC PENETRATION TEST, F - VOID RATIO, F - FINE, FOSS. - FOSSILIFEROUS, FRAC. - FRACTURED, FRACTURES, FRAGS. - FRAGMENTS, HI. - HIGHLY, MED. - MEDIUM, MICA - MICAECOUS, 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, VST - VANE SHEAR TEST, WEA. - WEATHERED, W - UNIT WEIGHT, W - 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 SOIL MOISTURE SCALE (ATTERBERG LIMITS), FIELD MOISTURE DESCRIPTION, GUIDE FOR FIELD MOISTURE DESCRIPTION LL - LIQUID LIMIT, PL - PLASTIC LIMIT, OM - OPTIMUM MOISTURE, SL - SHRINKAGE LIMIT SATURATED (SAT.), USUALLY LIQUID; VERY WET, USUALLY FROM BELOW THE GROUND WATER TABLE WET (W), SEMISOLID; REQUIRES DRYING TO ATTAIN OPTIMUM MOISTURE MOIST (M), SOLID; AT OR NEAR OPTIMUM MOISTURE DRY (D), REQUIRES ADDITIONAL WATER TO ATTAIN OPTIMUM MOISTURE	EQUIPMENT USED ON SUBJECT PROJECT DRILL UNITS: MBILE B, BK-51, CME-45C, CME-55B, PORTABLE HOIST ADVANCING TOOLS: CLAY BITS, 6" CONTINUOUS FLIGHT AUGER, 8" HOLLOW AUGERS, HARD FACED FINGER BITS, TUNG-CARBIDE INSERTS, CASING W/ ADVANCER, TRICONE STEEL TEETH, TRICONE 2 1/8" TUNG-CARB., CORE BIT HAMMER TYPE: AUTOMATIC, MANUAL CORE SIZE: B, N, H HAND TOOLS: POST HOLE DIGGER, HAND AUGER, SOUNDING ROD, VANE SHEAR TEST	FRACTURE SPACING TERM: VERY WIDE, WIDE, MODERATELY CLOSE, CLOSE, VERY CLOSE SPACING: MORE THAN 10 FEET, 3 TO 10 FEET, 1 TO 3 FEET, 0.16 TO 1 FEET, LESS THAN 0.16 FEET BEDDING TERM: VERY THICKLY BEDDED, THICKLY BEDDED, THINLY BEDDED, VERY THINLY BEDDED, THICKLY LAMINATED, THINLY LAMINATED THICKNESS: > 4 FEET, 1.5 - 4 FEET, 0.16 - 1.5 FEET, 0.03 - 0.16 FEET, 0.008 - 0.03 FEET, < 0.008 FEET	BENCH MARK: BL-4 16+48.89 - BL - = 14+40.18 - L - 8.70 LT. N 761415.7978 E 1628499.4195 ELEVATION: 786.98 FT. NOTES: SOIL STRATIGRAPHY IS THROUGH THE BORINGS FOR CROSS-SECTIONS.
PLASTICITY PLASTICITY INDEX (PI), DRY STRENGTH NONPLASTIC: 0-5, VERY LOW LOW PLASTICITY: 6-15, SLIGHT MED. PLASTICITY: 16-25, MEDIUM HIGH PLASTICITY: 26 OR MORE, HIGH		INDURATION 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.	
COLOR 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.			



PROJECT REFERENCE NO.	SHEET
38331.1.1 (B-3159)	4
Section Through End Bent One Sta. 12+66.97 -L- (W.P. #1) Skew = 89°37'30"	



SS-1
SS-2
B-1
12+67 -L-
76.0 LT.
ELEV. 777.5

SS-22
EB1-C
12+68 -L-
16.0 RT.
ELEV. 778.1

SS-9
SS-10
SS-11
EB1-B
12+68 -L-
42.0 RT.
ELEV. 775.8

5 TAN-YELLOW-WHITE MED. STIFF
MOIST SANDY SILTY CLAY (A-6)

9 RESIDUAL
11 CAVED
05/10 TAN-BRN-GRAY LOOSE TO MED. DENSE
MOIST CLAYEY SILTY SAND (A-2)

27 GRAY-WHITE V. STIFF TO HARD
MOIST CLAYEY SANDY SILT (A-4)

36
100/.8 WEATHERED ROCK
SEVERELY WEATHERED
CRYSTALLINE ROCK

100
50 BT GRAY-WHITE HARD MOIST
CLAYEY SANDY SILT (A-4)
(W/HARD & SOFT LAYERS)

18 BRN-GRAY V. STIFF MOIST
CLAYEY SANDY SILT (A-5)
W/SOME MICA.

17
52 BRN-WHITE MED. DENSE TO V. DENSE
MOIST MICA, SILTY SAND (A-2-4)

100/.7 WEATHERED ROCK
BRN-WHITE SEV. WEATH.
CRYSTALLINE ROCK

5 BRN-GRAY MED. STIFF
MOIST LOW PLASTIC
CLAYEY SANDY SILT (A-5)
W/SOME MICA.

7
9 (PI=12) TAN-BRN-WHITE
STIFF TO MED. STIFF
MOIST LOW PLASTIC
SILTY SANDY CLAY (A-7-6)
W/SOME MICA.

6
8
23 GRAY-WHITE
V. STIFF MOIST
SANDY SILT (A-4)

100/.7
AR CRYSTALLINE ROCK

GROUND SURFACE

ROADWAY EMBANKMENT (FILL)

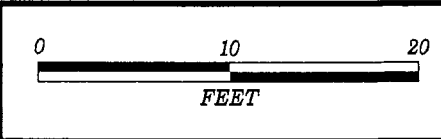
RESIDUAL

RESIDUAL

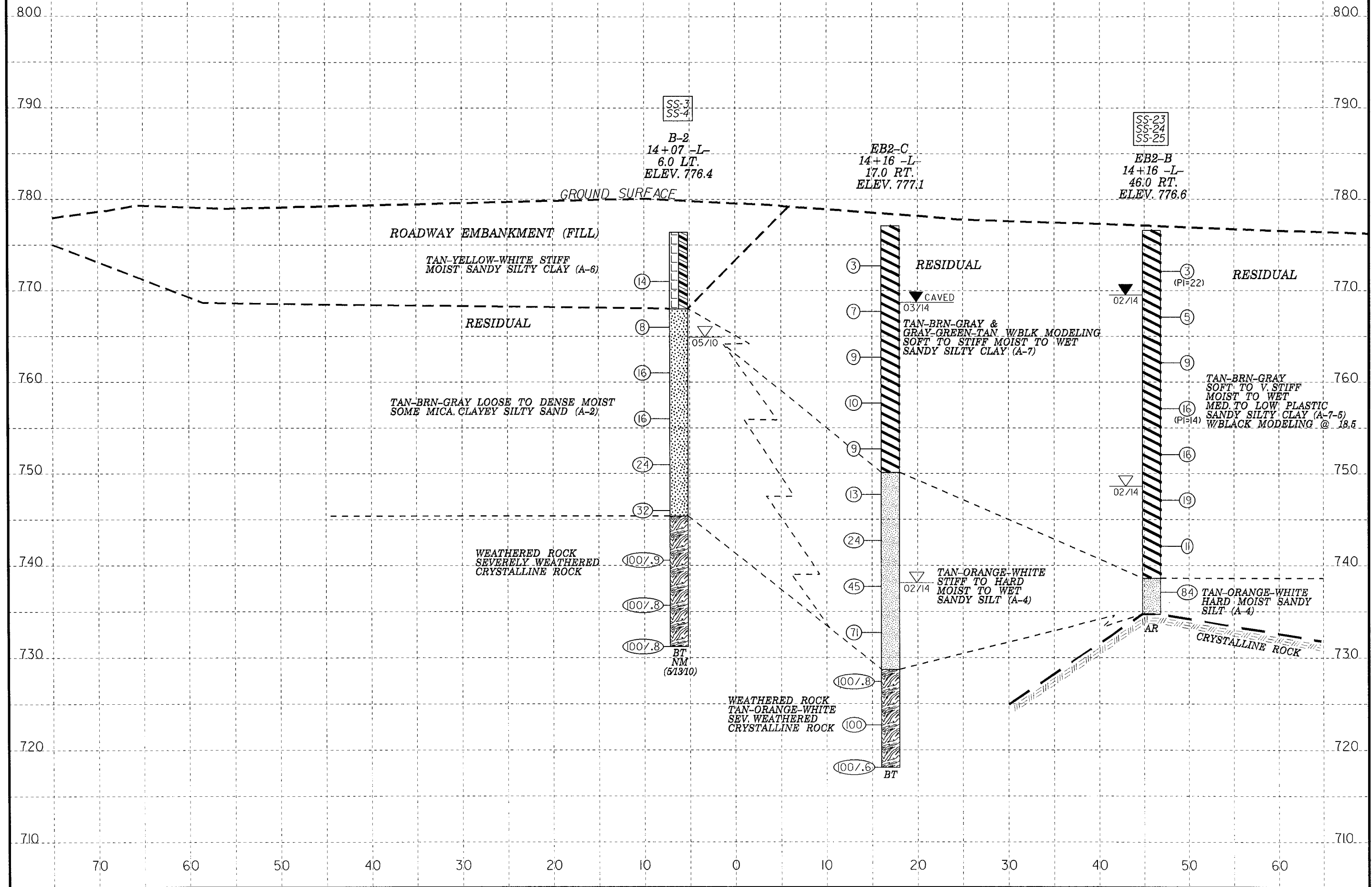
AR

CRYSTALLINE ROCK

AR



PROJECT REFERENCE NO.	SHEET
38331.1.1 (B-3159)	5
Section Through End Bent Two Sta. 14+17.14 -L- (W.P. #3) Skew = 89°37'50"	





NCDOT GEOTECHNICAL ENGINEERING UNIT

BORELOG REPORT

WBS 38331.1.1		TIP B-3159		COUNTY DAVIDSON		GEOLOGIST Stickney, J. K.	
SITE DESCRIPTION BRIDGE NO. 027 OVER US 29-64-70 / I-85 BUS. ON NC 8 / US 52							GROUND WTR (ft)
BORING NO. B-1		STATION 12+67		OFFSET 76 ft LT		ALIGNMENT -L-	
COLLAR ELEV. 777.5 ft		TOTAL DEPTH 50.7 ft		NORTHING 761,241		EASTING 1,628,438	
DRILL RIG/HAMMER EFF./DATE CME-550X		DRILL METHOD NW Casing w/ Advancer/ SPT		HAMMER TYPE Automatic			
DRILLER Smith, C. L.		START DATE 05/11/10		COMP. DATE 05/11/10		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				
780													GROUND SURFACE	0.0
775	773.3	4.2	2	2	3							M	ROADWAY EMBANKMENT TAN-YELLOW-WHITE MED. STIFF MOIST SANDY SILTY CLAY (A-6)	
770	768.3	9.2	2	4	5							SS-1	RESIDUAL TAN-BRN-GRAY LOOSE TO MED. DENSE MOIST CLAYEY SILTY SAND (A-2)	9.2
765	763.3	14.2	4	5	6							M		
760	758.3	19.2	8	12	15							SS-2	RESIDUAL GRAY-WHITE V. STIFF TO HARD MOIST CLAYEY SANDY SILT (A-4)	18.0
755	753.3	24.2	9	15	21							M		
750	748.3	29.2	50	50/3								M	WEATHERED ROCK SEVERELY WEATHERED CRYSTALLINE ROCK	29.2
745	743.3	34.2	42	58/3								M		
740	738.3	39.2	35	65/2								M		
735	733.3	44.2	29	37	63/5							M		
730	728.3	49.2	8	25	25							M	RESIDUAL GRAY-WHITE HARD MOIST CLAYEY SANDY SILT (A-4) (W/ HARD & SOFT LAYERS)	48.0
													Boring Terminated at Elevation 726.8 ft IN GRAY-WHITE HARD MOIST CLAYEY SANDY SILT (A-4)	
													BORING ELEVATION OBTAINED FROM THE B3159_LS_TIN.TIN FILE.	

WBS 38331.1.1		TIP B-3159		COUNTY DAVIDSON		GEOLOGIST Stickney, J. K.	
SITE DESCRIPTION BRIDGE NO. 027 OVER US 29-64-70 / I-85 BUS. ON NC 8 / US 52							GROUND WTR (ft)
BORING NO. EB1-C		STATION 12+68		OFFSET 16 ft RT		ALIGNMENT -L-	
COLLAR ELEV. 778.1 ft		TOTAL DEPTH 21.2 ft		NORTHING 761,245		EASTING 1,628,530	
DRILL RIG/HAMMER EFF./DATE HFO0072 CME-550 88% 03/19/2014		DRILL METHOD H.S. Augers		HAMMER TYPE Automatic			
DRILLER Smith, C. L.		START DATE 02/25/14		COMP. DATE 02/25/14		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				
780													GROUND SURFACE	0.0
775	774.8	3.3	6	8	10							M	RESIDUAL BRN-GRAY V. STIFF MOIST CLAYEY SANDY SILT (A-5) W/ SOME MICA.	
770	769.8	8.3	3	7	10							SS-22	RESIDUAL BRN-WHITE MED. DENSE TO V. DENSE MOIST MICA. SILTY SAND (A-2-4)	7.0
765	764.8	13.3	15	21	31							M		
760	759.8	18.3	26	74/0.2								M	WEATHERED ROCK BRN-WHITE SEV. WEATH. CRYSTALLINE ROCK	18.3
													Boring Terminated BY AUGER REFUSAL at Elevation 756.9 ft ON CRYSTALLINE ROCK	

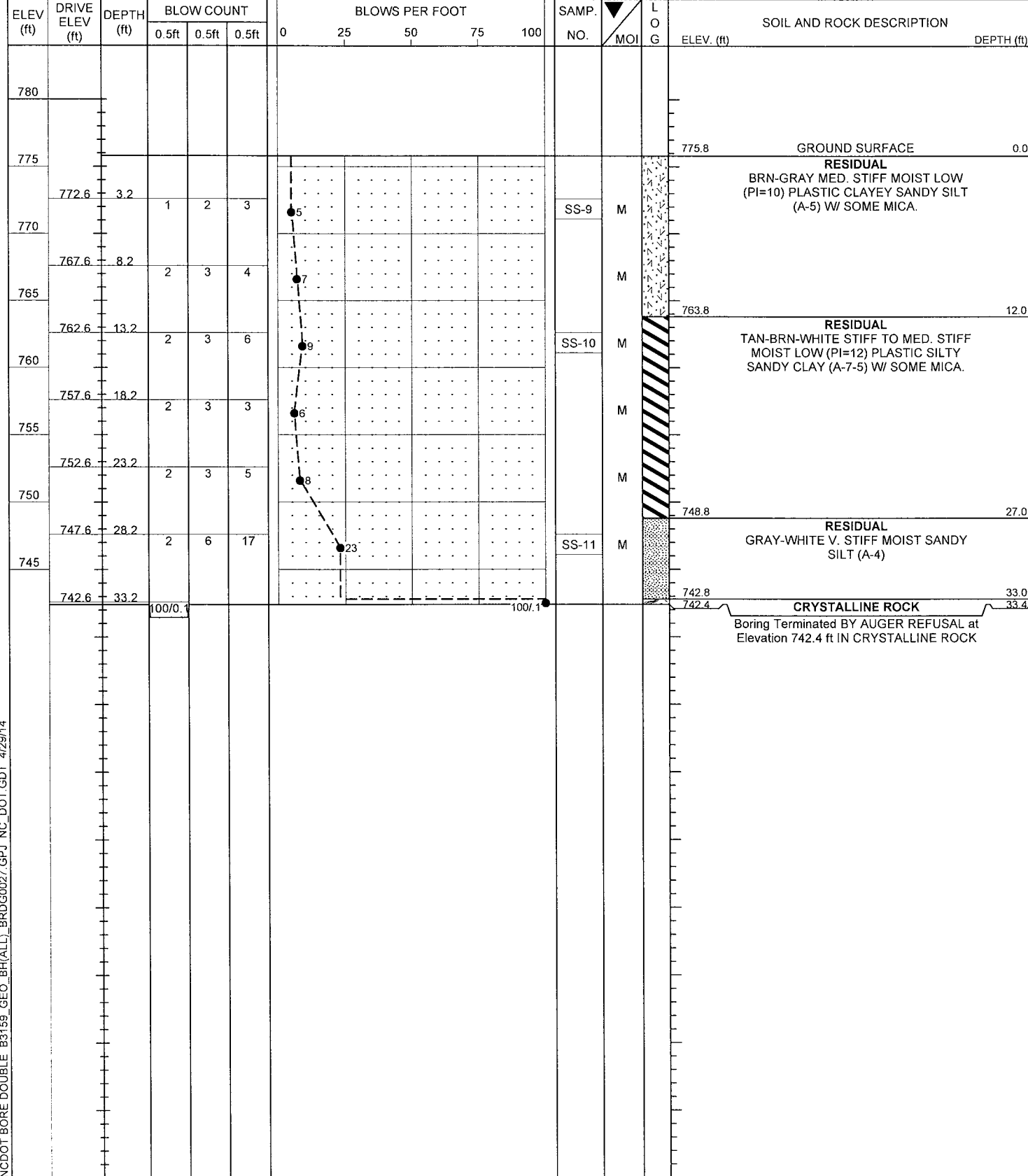
NCDOT BORE DOUBLE B3159_GEO_BH(ALL)_BRDG0027.GPJ NC_DOT_GDT 4/29/14



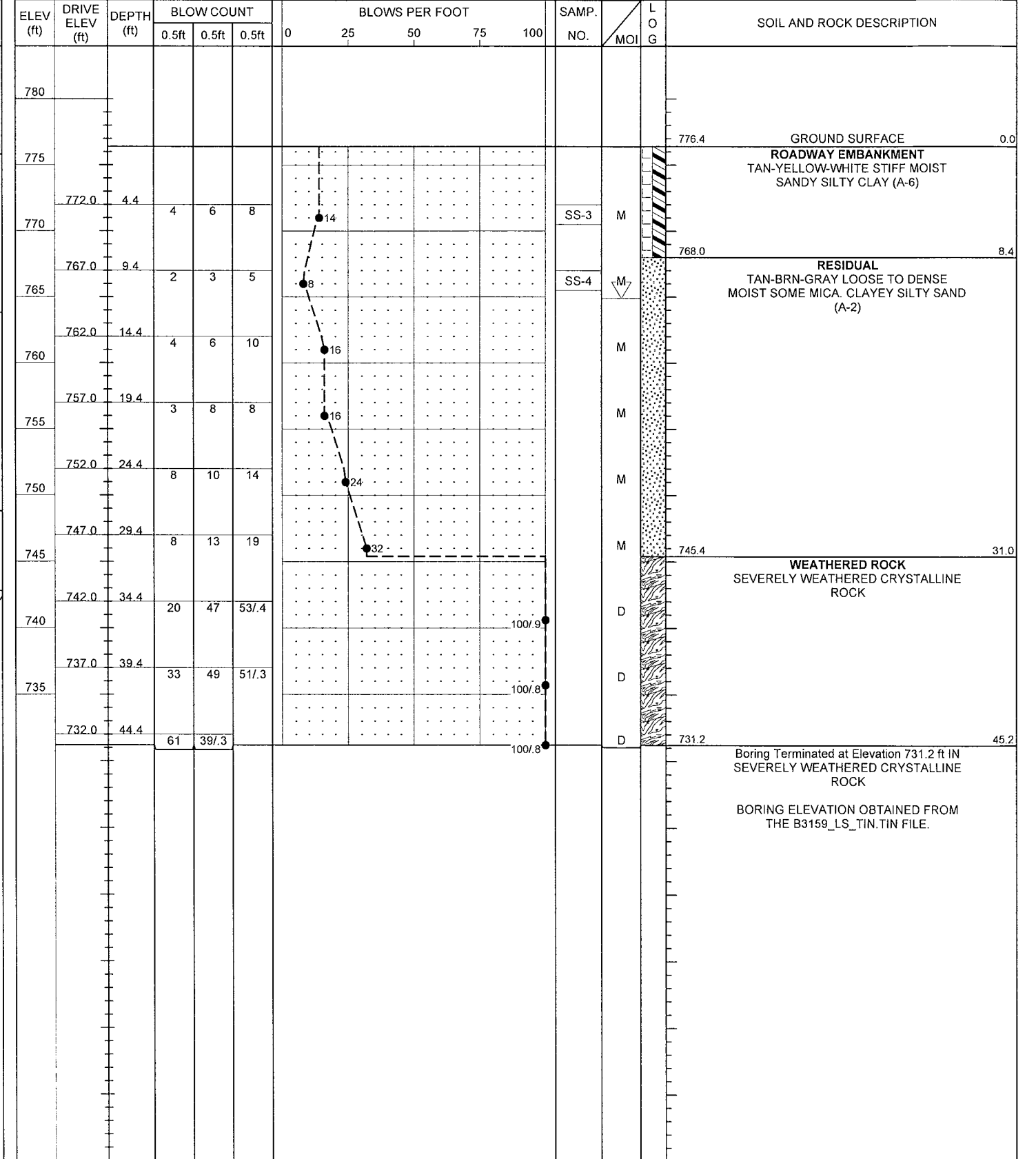
NCDOT GEOTECHNICAL ENGINEERING UNIT

BORELOG REPORT

WBS 38331.1.1	TIP B-3159	COUNTY DAVIDSON	GEOLOGIST Stickney, J. K.
SITE DESCRIPTION BRIDGE NO. 027 OVER US 29-64-70 / I-85 BUS. ON NC 8 / US 52			GROUND WTR (ft)
BORING NO. EB1-B	STATION 12+68	OFFSET 42 ft RT	ALIGNMENT -L-
COLLAR ELEV. 775.8 ft	TOTAL DEPTH 33.4 ft	NORTHING 761,245	EASTING 1,628,556
DRILL RIG/HAMMER EFF./DATE HFO0072 CME-550 88% 03/19/2014		DRILL METHOD H.S. Augers	HAMMER TYPE Automatic
DRILLER Smith, C. L.	START DATE 02/25/14	COMP. DATE 02/25/14	SURFACE WATER DEPTH N/A



WBS 38331.1.1	TIP B-3159	COUNTY DAVIDSON	GEOLOGIST Stickney, J. K.
SITE DESCRIPTION BRIDGE NO. 027 OVER US 29-64-70 / I-85 BUS. ON NC 8 / US 52			GROUND WTR (ft)
BORING NO. B-2	STATION 14+07	OFFSET 6 ft LT	ALIGNMENT -L-
COLLAR ELEV. 776.4 ft	TOTAL DEPTH 45.2 ft	NORTHING 761,383	EASTING 1,628,503
DRILL RIG/HAMMER EFF./DATE CME-550X		DRILL METHOD NW Casing w/ Advancer/ SPT	HAMMER TYPE Automatic
DRILLER Smith, C. L.	START DATE 05/13/10	COMP. DATE 05/13/10	SURFACE WATER DEPTH N/A



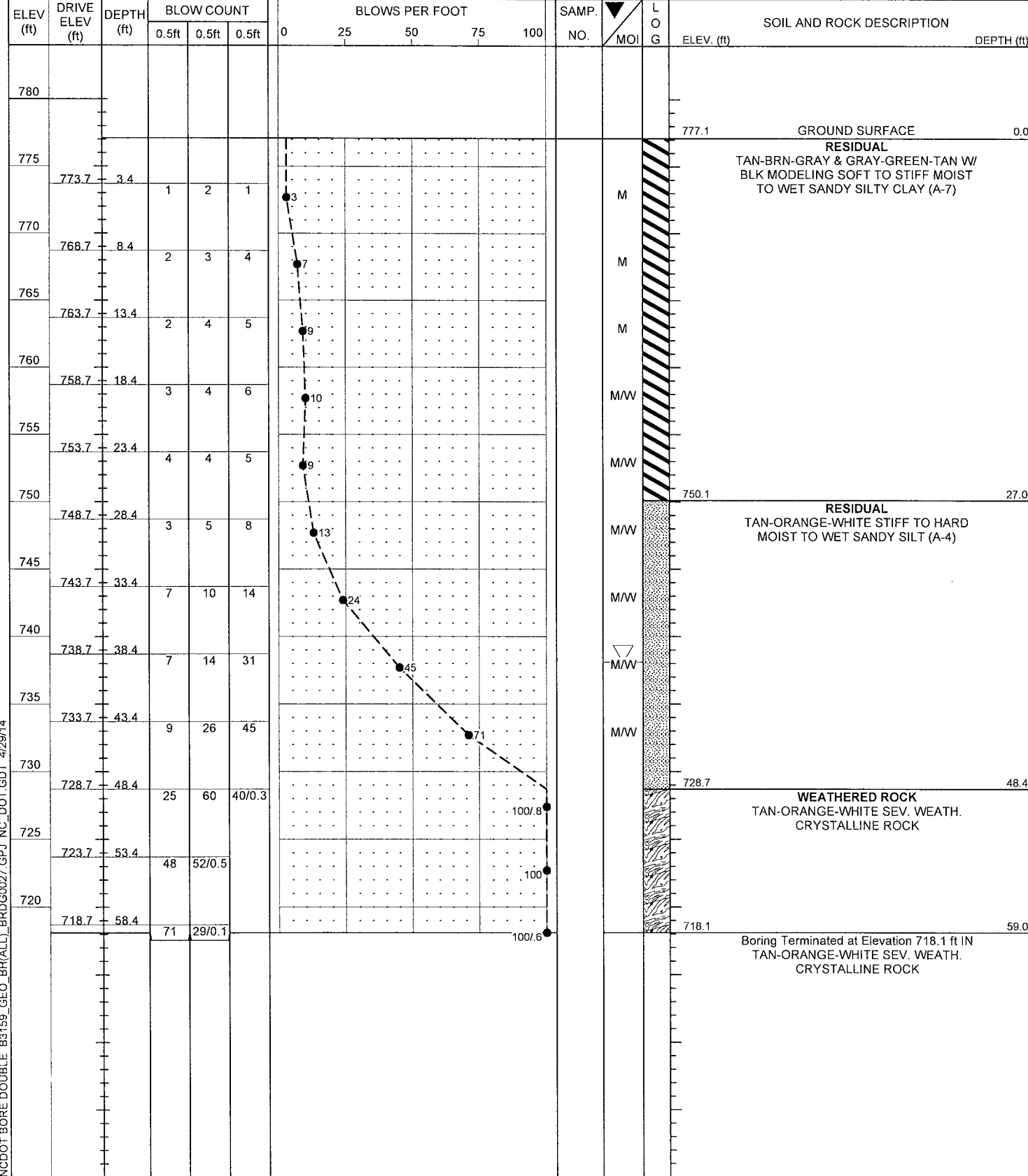
NCDOT BORE DOUBLE B3159_GEO_BH(ALL)_BRDG0027.GPJ NC_DOT_GDT 4/29/14



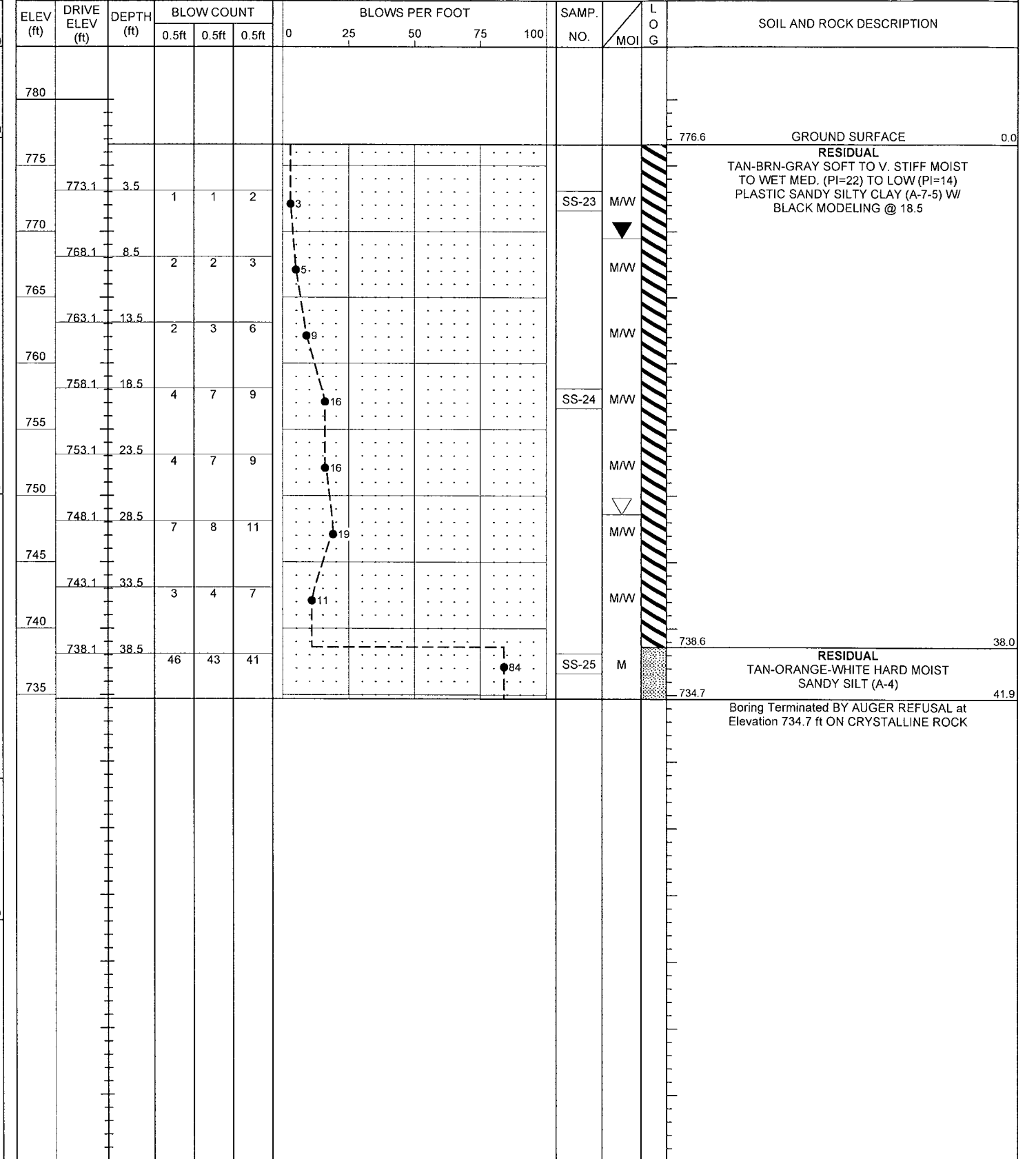
NCDOT GEOTECHNICAL ENGINEERING UNIT

BORELOG REPORT

WBS 38331.1.1	TIP B-3159	COUNTY DAVIDSON	GEOLOGIST Stickney, J. K.
SITE DESCRIPTION BRIDGE NO. 027 OVER US 29-64-70 / I-85 BUS. ON NC 8 / US 52			GROUND WTR (ft)
BORING NO. EB2-C	STATION 14+16	OFFSET 17 ft RT	ALIGNMENT -L-
COLLAR ELEV. 777.1 ft	TOTAL DEPTH 59.0 ft	NORTHING 761,392	EASTING 1,628,526
DRILL RIG/HAMMER EFF./DATE HFO0072 CME-550 88% 03/19/2014		DRILL METHOD H.S. Augers	HAMMER TYPE Automatic
DRILLER Smith, C. L.	START DATE 02/28/14	COMP. DATE 02/28/14	SURFACE WATER DEPTH N/A



WBS 38331.1.1	TIP B-3159	COUNTY DAVIDSON	GEOLOGIST Stickney, J. K.
SITE DESCRIPTION BRIDGE NO. 027 OVER US 29-64-70 / I-85 BUS. ON NC 8 / US 52			GROUND WTR (ft)
BORING NO. EB2-B	STATION 14+16	OFFSET 46 ft RT	ALIGNMENT -L-
COLLAR ELEV. 776.6 ft	TOTAL DEPTH 41.9 ft	NORTHING 761,393	EASTING 1,628,555
DRILL RIG/HAMMER EFF./DATE HFO0072 CME-550 88% 03/19/2014		DRILL METHOD H.S. Augers	HAMMER TYPE Automatic
DRILLER Smith, C. L.	START DATE 02/26/14	COMP. DATE 02/26/14	SURFACE WATER DEPTH N/A



NCDOT BORE DOUBLE B3159_GEO_BH(ALL)_BRDG0027.GPJ NC_DOT_GDT_4/29/14

TEST RESULTS

PROJECT: 38331.1.1 (B-3159)

COUNTY: DAVIDSON

SITE DESCRIPTION: BRIDGE NO. 027 OVER US 29-64-70 / I-85 BUS. ON NC 8 / US 52
(RETAINING WALL #1 & RETAINING WALL #2)

SHEET
9

SOIL SAMPLE RESULTS														ROCK SAMPLE RESULTS													
SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS	N	L.L.	P.I.	% BY WEIGHT				% PASSING SIEVES			% MOISTURE	% ORGANIC	UNIT WT. (d)	VOID RATIO	SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	RQD	UNIT WT (pcf)	Q(ksf)	E(MPsi)	
								C. SAND	F. SAND	SILT	CLAY	10	40	200													
B-1																											
SS-1	76.0 LT	12+67 -L-	9.7-10.7	A-2-4(0)	9	39	3	30.2	44.3	19.4	6.1	98	82	33													
SS-2	76.0 LT	12+67 -L-	19.7-20.7	A-2-4(0)	27	25	NP	18.6	62.7	16.7	2	100	92	32													
EB1-C																											
SS-22	16.0 RT.	12+68 -L-	9.8-10.8	A-2-4(0)	17	29	NP	34.8	37.6	23.6	4.0	100	80	35	-	-											
EB1-B																											
SS-9	42.0 RT.	12+68 -L-	3.7-4.7	A-5(7)	5	52	10	7.1	43.7	39.1	10.1	100	97	61	-	-											
SS-10	42.0 RT.	12+68 -L-	13.7-14.7	A-7-5(1)	9	43	12	26.3	41.3	24.4	8.1	100	88	39	-	-											
SS-11	42.0 RT.	12+68 -L-	28.7-29.7	A-4(0)	23	30	NP	21.0	38.4	36.5	4.0	100	89	53	-	-											
B-2																											
SS-3	6.0 LT.	14+07 -L-	4.9-5.9	A-6(7)	14	39	21	18.6	35.5	19.4	26.5	99	91	52													
SS-4	6.0 LT.	14+07 -L-	9.9-10.9	A-2-4(0)	8	37	3	25.7	48	18.2	8.2	100	88	34													
EB2-B																											
SS-23	45.8 RT.	14+16 -L-	4.0-5.0	A-7-5(18)	3	60	22	6.3	29.3	40.1	24.3	100	97	73	-	-											
SS-24	45.8 RT.	14+16 -L-	19.0-20.0	A-7-5(9)	16	55	14	16.2	34.0	41.8	8.1	100	91	60	-	-											
SS-25	45.8 RT.	14+16 -L-	44.0-45.0	A-4(0)	84	32	NP	26.5	44.3	25.2	4.0	100	87	38	-	-											

BORINGS B-1 & B-2 ARE FROM PROJECT: 38331.1.1 (B-3159) PDEA

