

STATE	STATE PROJECT REFERENCE NO.	SHEET	TOTAL
N.C.	40151.1.1 (B-4959)	1	17

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

**STRUCTURE**  
**SUBSURFACE INVESTIGATION**

PROJ. REFERENCE NO. 40151.1.1 (B-4959) F.A. PROJ. BRZ-2719(1)  
COUNTY GUILFORD  
PROJECT DESCRIPTION BRIDGE NO. 193 OVER BUFFALO CREEK  
ON SR 2719

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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) 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.

PERSONNEL

B. Richards, E.I.

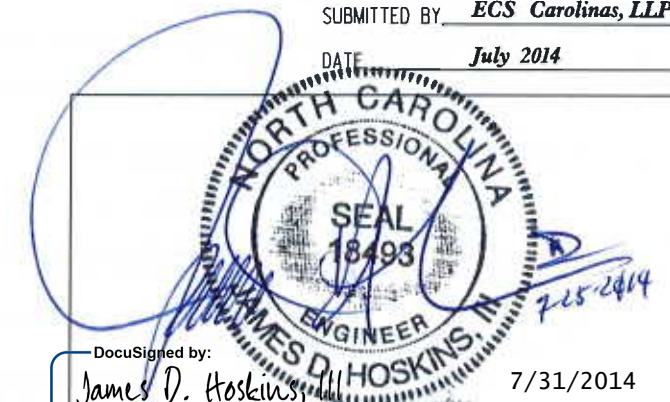
J. Rich

INVESTIGATED BY ECS Carolinas, LLP

CHECKED BY J. Hoskins, III, P.E.

SUBMITTED BY ECS Carolinas, LLP

DATE July 2014



DocuSigned by:  
James D. Hoskins, III 7/31/2014

**PROJECT: 40151.1.1 ID: B-4959**

DRAWN BY: J. Rich

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**

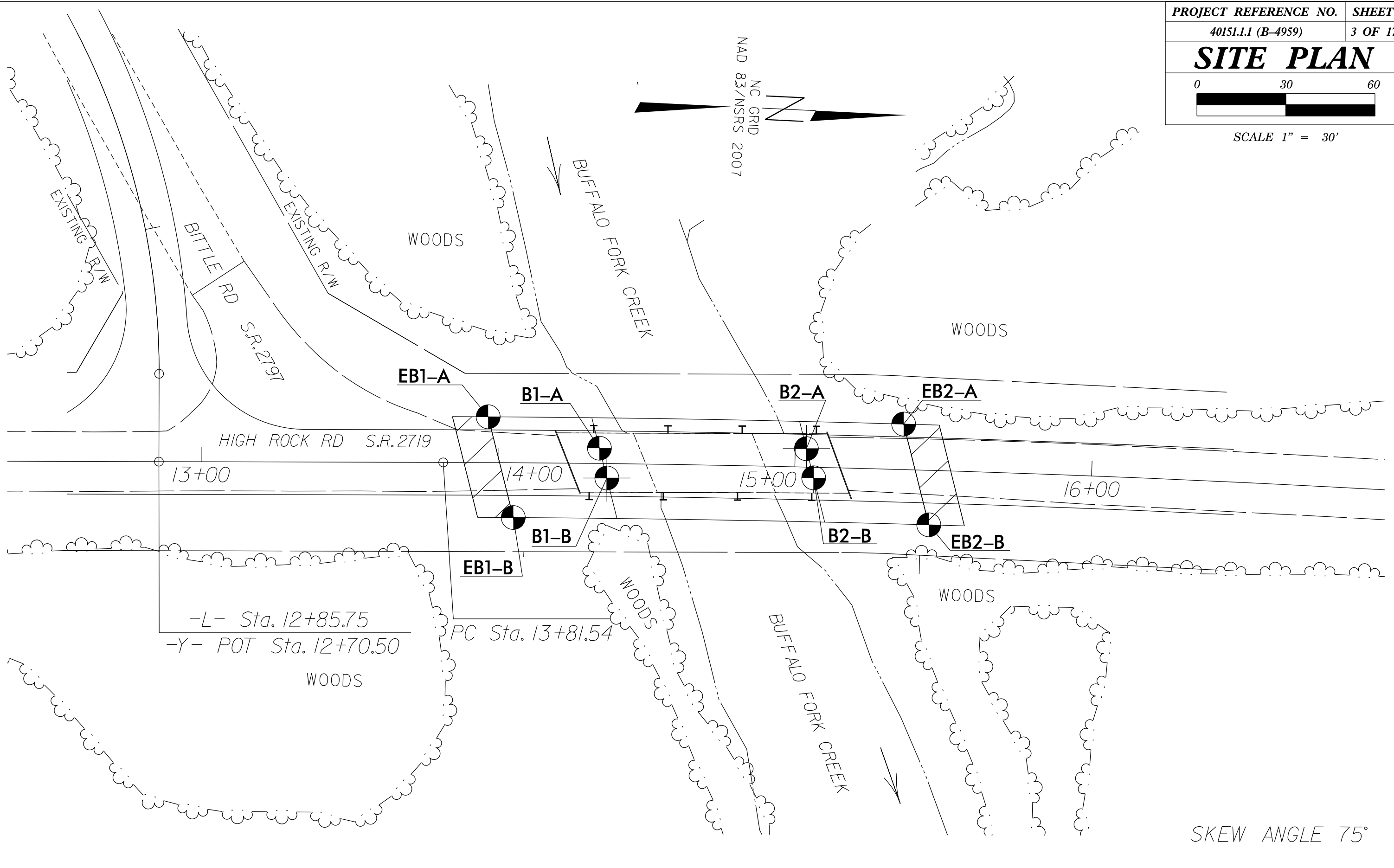
PROJECT REFERENCE NO. 40151.1(I) (B-4959)	SHEET NO. 2
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**SUBSURFACE INVESTIGATION**

**SOIL AND ROCK LEGEND, TERMS, SYMBOLS, AND ABBREVIATIONS**

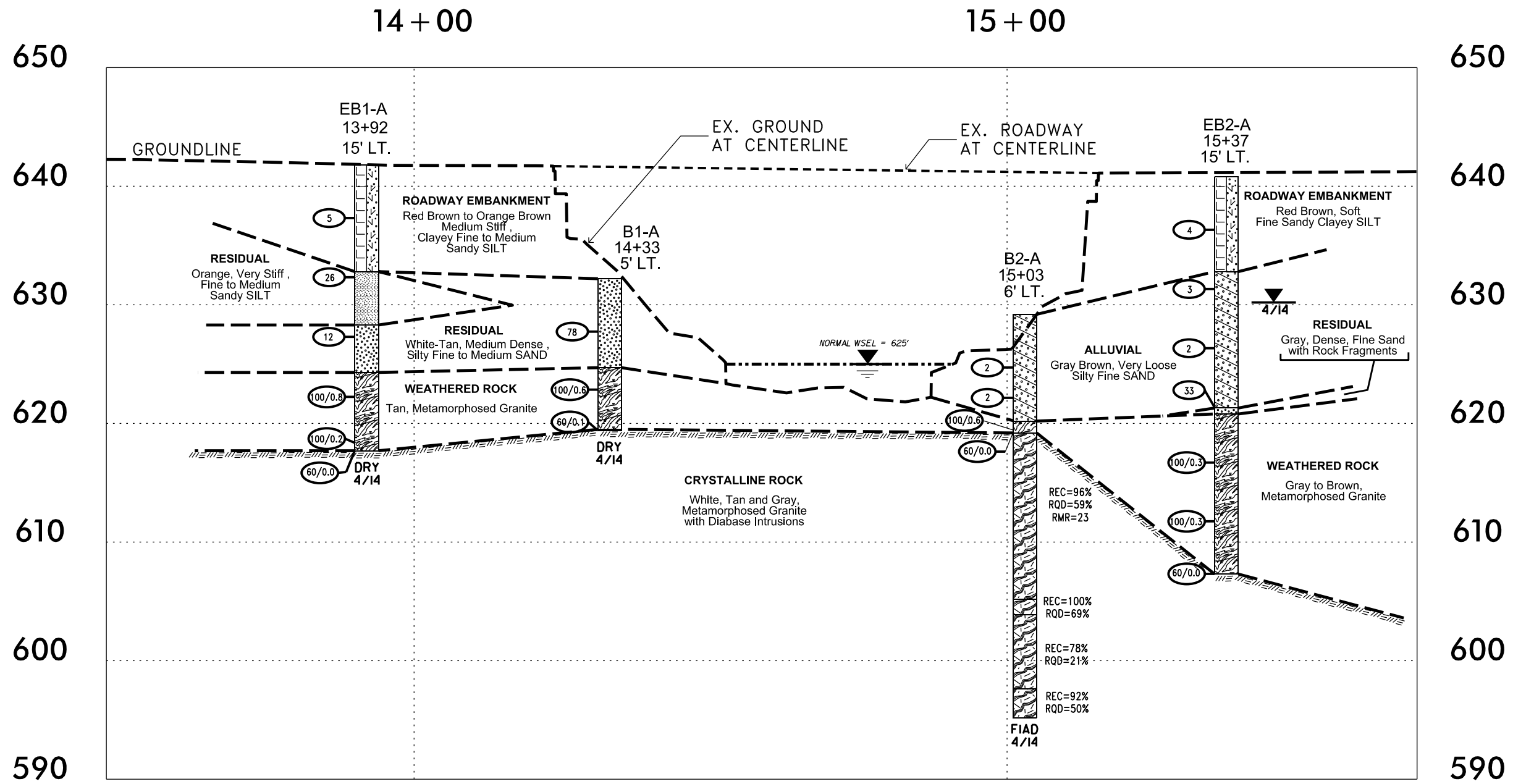
SOIL DESCRIPTION	GRADATION	ROCK DESCRIPTION	TERMS AND DEFINITIONS
SOIL IS CONSIDERED TO BE THE UNCONSOLIDATED, SEMI-CONSOLIDATED, OR WEATHERED EARTH MATERIALS THAT CAN BE PENETRATED WITH A CONTINUOUS FLIGHT POWER AUGER, AND YIELD LESS THAN 100 BLOWS PER FOOT ACCORDING TO STANDARD PENETRATION TEST (AASHTO 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. EXAMPLE: <i>VERY STIFF, GRAY, SILTY CLAY, MOST WITH INTERBEDDED FINE SAND LAYERS, HIGHLY PLASTIC, A-7-6</i>	<b>WELL GRADED</b> - INDICATES A GOOD REPRESENTATION OF PARTICLE SIZES FROM FINE TO COARSE. <b>UNIFORM</b> - INDICATES THAT SOIL PARTICLES ARE ALL APPROXIMATELY THE SAME SIZE. (ALSO POORLY GRADED). <b>GAP-GRADED</b> - INDICATES A MIXTURE OF UNIFORM PARTICLES OF TWO OR MORE SIZES. <b>ANGULARITY OF GRAINS</b> THE ANGULARITY OR ROUNDNESS OF SOIL GRAINS IS DESIGNATED BY THE TERMS: <b>ANGULAR</b> , <b>SUBANGULAR</b> , <b>SUBROUNDED</b> , OR <b>ROUNDED</b> .	<b>HARD ROCK</b> 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: <b>WEATHERED ROCK (WR)</b> <b>CRYSTALLINE ROCK (CR)</b> <b>NON-CRYSTALLINE ROCK (NCR)</b> <b>COASTAL PLAIN SEDIMENTARY ROCK (CP)</b>	<b>ALLUVIUM (ALLUV.)</b> - SOILS THAT HAVE BEEN TRANSPORTED BY WATER. <b>AQUIFER</b> - A WATER BEARING FORMATION OR STRATA. <b>ARENACEOUS</b> - APPLIED TO ROCKS THAT HAVE BEEN DERIVED FROM SAND OR THAT CONTAIN SAND. <b>ARGILLACEOUS</b> - APPLIED TO ALL ROCKS OR SUBSTANCES COMPOSED OF CLAY MINERALS, OR HAVING A NOTABLE PROPORTION OF CLAY IN THEIR COMPOSITION, AS SHALE, SLATE, ETC. <b>ARTESIAN</b> - 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. <b>CALCAREOUS (CALC.)</b> - SOILS THAT CONTAIN APPRECIABLE AMOUNTS OF CALCIUM CARBONATE. <b>COLLUVIUM</b> - ROCK FRAGMENTS MIXED WITH SOIL DEPOSITED BY GRAVITY ON SLOPE OR AT BOTTOM OF SLOPE. <b>CORE RECOVERY (REC.)</b> - TOTAL LENGTH OF ALL MATERIAL RECOVERED IN THE CORE BARREL DIVIDED BY TOTAL LENGTH OF CORE RUN AND EXPRESSED AS A PERCENTAGE. <b>DIKE</b> - A TABULAR BODY OF IGNEOUS ROCK THAT CUTS ACROSS THE STRUCTURE OF ADJACENT ROCKS OR CUTS MASSIVE ROCK. <b>DIP</b> - THE ANGLE AT WHICH A STRATUM OR ANY PLANAR FEATURE IS INCLINED FROM THE HORIZONTAL. <b>DIP DIRECTION (DIP AZIMUTH)</b> - THE DIRECTION OR BEARING OF THE HORIZONTAL TRACE OF THE LINE OF DIP, MEASURED CLOCKWISE FROM NORTH. <b>FAULT</b> - A FRACTURE OR FRACTURE ZONE ALONG WHICH THERE HAS BEEN DISPLACEMENT OF THE SIDES RELATIVE TO ONE ANOTHER PARALLEL TO THE FRACTURE. <b>FISSILE</b> - A PROPERTY OF SPLITTING ALONG CLOSELY SPACED PARALLEL PLANES. <b>FLOAT</b> - ROCK FRAGMENTS ON SURFACE NEAR THEIR ORIGINAL POSITION AND DISLODGED FROM PARENT MATERIAL. <b>FLOOD PLAIN (FP)</b> - LAND BORDERING A STREAM, BUILT OF SEDIMENTS DEPOSITED BY THE STREAM. <b>FORMATION (FM)</b> - A MAPPABLE GEOLOGIC UNIT THAT CAN BE RECOGNIZED AND TRACED IN THE FIELD. <b>JOINT</b> - FRACTURE IN ROCK ALONG WHICH NO APPRECIABLE MOVEMENT HAS OCCURRED. <b>LEDGE</b> - A SHELF-LIKE RIDGE OR PROJECTION OF ROCK WHOSE THICKNESS IS SMALL COMPARED TO ITS LATERAL EXTENT. <b>LENS</b> - A BODY OF SOIL OR ROCK THAT THINS OUT IN ONE OR MORE DIRECTIONS. <b>MOTTLED (MOT.)</b> - IRREGULARLY MARKED WITH SPOTS OF DIFFERENT COLORS. MOTTLING IN SOILS USUALLY INDICATES POOR AERATION AND LACK OF GOOD DRAINAGE. <b>PERCHED WATER</b> - WATER MAINTAINED ABOVE THE NORMAL GROUND WATER LEVEL BY THE PRESENCE OF AN INTERVENING IMPERVIOUS STRATUM. <b>RESIDUAL (RES.) SOIL</b> - SOIL FORMED IN PLACE BY THE WEATHERING OF ROCK. <b>ROCK QUALITY DESIGNATION (ROD)</b> - 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. <b>SAPROLITE (SAP.)</b> - RESIDUAL SOIL THAT RETAINS THE RELIC STRUCTURE OR FABRIC OF THE PARENT ROCK. <b>SILL</b> - 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. <b>SLICKENSIDE</b> - POLISHED AND STRIATED SURFACE THAT RESULTS FROM FRICTION ALONG A FAULT OR SLIP PLANE. <b>STANDARD PENETRATION TEST (PENETRATION RESISTANCE) (SPT)</b> - 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. <b>STRATA CORE RECOVERY (SREC.)</b> - TOTAL LENGTH OF STRATA MATERIAL RECOVERED DIVIDED BY TOTAL LENGTH OF STRATUM AND EXPRESSED AS A PERCENTAGE. <b>STRATA ROCK QUALITY DESIGNATION (SRQD)</b> - 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. <b>TOPSOIL (TS.)</b> - SURFACE SOILS USUALLY CONTAINING ORGANIC MATTER.
<b>SOIL LEGEND AND AASHTO CLASSIFICATION</b>	<b>MINERALOGICAL COMPOSITION</b>	<b>WEATHERING</b>	
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.	<b>FRESH</b> - ROCK FRESH, CRYSTALS BRIGHT, FEW JOINTS MAY SHOW SLIGHT STAINING, ROCK RINGS UNDER HAMMER IF CRYSTALLINE. <b>VERY SLIGHT (V SL.)</b> - 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. <b>SLIGHT (SL.)</b> - 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. <b>MODERATE (MOD.)</b> - 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. <b>MODERATELY SEVERE (MOD. SEV.)</b> - 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> <b>SEVERE (SEV.)</b> - 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 &gt; 100 BPF</i> <b>VERY SEVERE (V SEV.)</b> - 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 &lt; 100 BPF</i> <b>COMPLETE</b> - 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.	
GROUP CLASS. A-1, A-1-b, A-3, A-2, A-2-5, A-2-6, A-2-7, A-4, A-5, A-6, A-7, A-1, A-2, A-3, A-4, A-5, A-6, A-7	<b>COMPRESSIBILITY</b> SLIGHTLY COMPRESSIBLE MODERATELY COMPRESSIBLE HIGHLY COMPRESSIBLE	<b>WEATHERING</b>	
SYMBOL	<b>PERCENTAGE OF MATERIAL</b>		
% PASSING # 10, # 40, # 200	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		
LIQUID LIMIT PLASTIC INDEX	<b>GROUND WATER</b>		
GROUP INDEX	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		
USUAL TYPES OF MAJOR MATERIALS	<b>MISCELLANEOUS SYMBOLS</b>		
GEN. RATING AS A SUBGRADE	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 BORING AUGER BORING CORE BORING MONITORING WELL PIEZOMETER INSTALLATION SLOPE INDICATOR INSTALLATION CONE PENETROMETER TEST SOUNDING ROD	
PI OF A-7-5 SUBGROUP IS ≤ LL - 30 ; PI OF A-7-6 SUBGROUP IS > LL - 30	<b>ABBREVIATIONS</b>	<b>ROCK HARDNESS</b>	
<b>CONSISTENCY OR DENSENESS</b>	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 HL - HIGHLY	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 0.05 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 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.	<b>SAPROLITE (SAP.)</b> - RESIDUAL SOIL THAT RETAINS THE RELIC STRUCTURE OR FABRIC OF THE PARENT ROCK. <b>SILL</b> - 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. <b>SLICKENSIDE</b> - POLISHED AND STRIATED SURFACE THAT RESULTS FROM FRICTION ALONG A FAULT OR SLIP PLANE. <b>STANDARD PENETRATION TEST (PENETRATION RESISTANCE) (SPT)</b> - 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. <b>STRATA CORE RECOVERY (SREC.)</b> - TOTAL LENGTH OF STRATA MATERIAL RECOVERED DIVIDED BY TOTAL LENGTH OF STRATUM AND EXPRESSED AS A PERCENTAGE. <b>STRATA ROCK QUALITY DESIGNATION (SRQD)</b> - 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. <b>TOPSOIL (TS.)</b> - SURFACE SOILS USUALLY CONTAINING ORGANIC MATTER.
<b>TEXTURE OR GRAIN SIZE</b>	MEG. - 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	<b>ROCK HARDNESS</b>	
U.S. STD. SIEVE SIZE OPENING (MM)	VST - VANE SHEAR TEST WEA. - WEATHERED γ - UNIT WEIGHT γ <sub>d</sub> - DRY UNIT WEIGHT	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 0.05 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 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.	
BOULDER (BLDR.) COBBLE (COB.) GRAVEL (GR.) COARSE SAND (CSE. SD.) FINE SAND (F SD.) SILT (SL.) CLAY (CL.)	<b>EQUIPMENT USED ON SUBJECT PROJECT</b>	<b>FRACTURE SPACING</b>	
GRAIN SIZE MM 305 IN. 12 75 3 2.0 0.25 0.05 0.005	DRILL UNITS: MOBILE B- BK-51 CME-45C CME-550 PORTABLE HOIST CME-550X	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	
<b>SOIL MOISTURE - CORRELATION OF TERMS</b>	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 * TUNG.-CARB. CORE BIT 6" HOLLOW STEM AUGER	<b>TERMINAL SPACING</b>	
SOIL MOISTURE SCALE (ATTERBERG LIMITS) FIELD MOISTURE DESCRIPTION GUIDE FOR FIELD MOISTURE DESCRIPTION	MOBILE B- BK-51 CME-45C CME-550 PORTABLE HOIST CME-550X	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	
LL - LIQUID LIMIT PL - PLASTIC LIMIT OM - OPTIMUM MOISTURE SHRINKAGE LIMIT	CLAY BITS 6" CONTINUOUS FLIGHT AUGER 8" HOLLOW AUGERS HARD FACED FINGER BITS TUNG.-CARBIDE INSERTS CASING W/ ADVANCER TRICONE * STEEL TEETH TRICONE * TUNG.-CARB. CORE BIT 6" HOLLOW STEM AUGER	<b>INDURATION</b>	
USUALLY LIQUID; VERY WET, USUALLY FROM BELOW THE GROUND WATER TABLE SEMISOLID; REQUIRES DRYING TO ATTAIN OPTIMUM MOISTURE SOLID; AT OR NEAR OPTIMUM MOISTURE REQUIRES ADDITIONAL WATER TO ATTAIN OPTIMUM MOISTURE	CLAY BITS 6" CONTINUOUS FLIGHT AUGER 8" HOLLOW AUGERS HARD FACED FINGER BITS TUNG.-CARBIDE INSERTS CASING W/ ADVANCER TRICONE * STEEL TEETH TRICONE * TUNG.-CARB. CORE BIT 6" HOLLOW STEM AUGER	<b>INDURATION</b>	
<b>PLASTICITY</b>	CLAY BITS 6" CONTINUOUS FLIGHT AUGER 8" HOLLOW AUGERS HARD FACED FINGER BITS TUNG.-CARBIDE INSERTS CASING W/ ADVANCER TRICONE * STEEL TEETH TRICONE * TUNG.-CARB. CORE BIT 6" HOLLOW STEM AUGER	<b>INDURATION</b>	
NONPLASTIC 0-5 LOW PLASTICITY 6-15 MED. PLASTICITY 16-25 HIGH PLASTICITY 26 OR MORE	CLAY BITS 6" CONTINUOUS FLIGHT AUGER 8" HOLLOW AUGERS HARD FACED FINGER BITS TUNG.-CARBIDE INSERTS CASING W/ ADVANCER TRICONE * STEEL TEETH TRICONE * TUNG.-CARB. CORE BIT 6" HOLLOW STEM AUGER	<b>INDURATION</b>	
<b>COLOR</b>	CLAY BITS 6" CONTINUOUS FLIGHT AUGER 8" HOLLOW AUGERS HARD FACED FINGER BITS TUNG.-CARBIDE INSERTS CASING W/ ADVANCER TRICONE * STEEL TEETH TRICONE * TUNG.-CARB. CORE BIT 6" HOLLOW STEM AUGER	<b>INDURATION</b>	
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.	CLAY BITS 6" CONTINUOUS FLIGHT AUGER 8" HOLLOW AUGERS HARD FACED FINGER BITS TUNG.-CARBIDE INSERTS CASING W/ ADVANCER TRICONE * STEEL TEETH TRICONE * TUNG.-CARB. CORE BIT 6" HOLLOW STEM AUGER	<b>INDURATION</b>	

<b>PROJECT REFERENCE NO.</b>	<b>SHEET</b>
40151.1.1 (B-4959)	3 OF 17
<b>SITE PLAN</b>	
SCALE 1" = 30'	



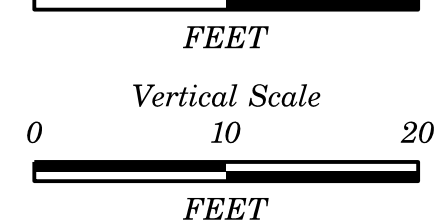
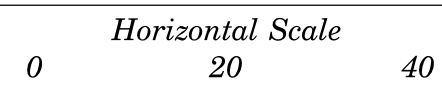
SKEW ANGLE 75°

# PROFILE OF "A" BORINGS



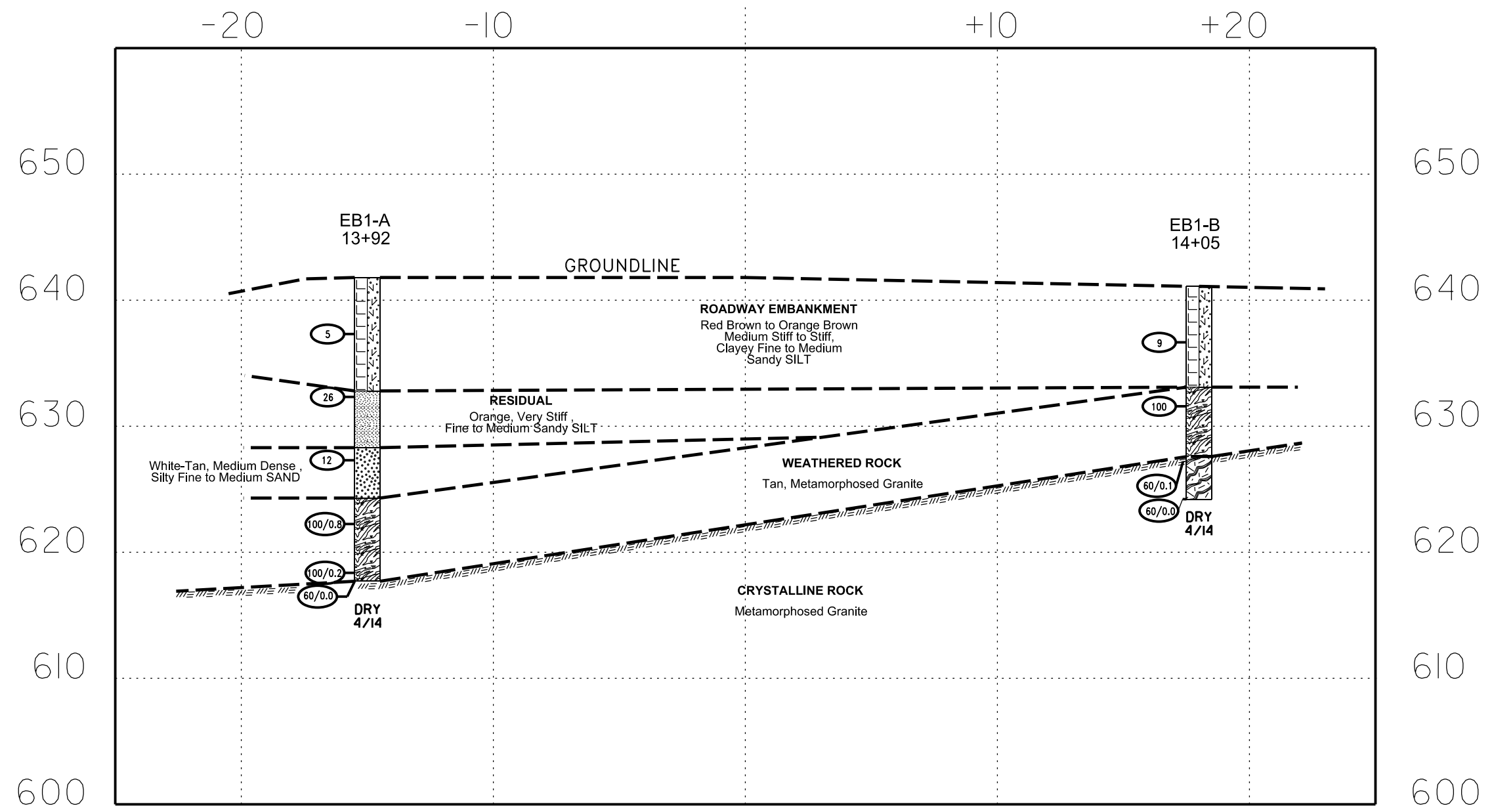
Groundline profile of -L- taken from Bridge Survey and Hydraulic Design Report dated 2-05-14

Inferred stratigraphy is drawn at the profile offset with the borings projected onto the profile.



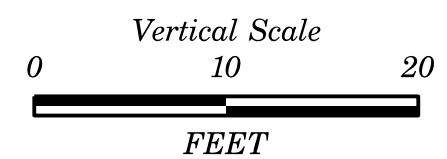
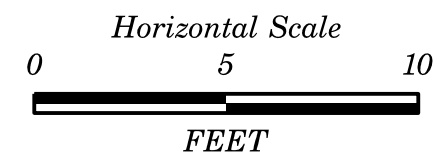
# CROSS SECTION THROUGH EB-1

-L-  
14+01  
SKEW: 76 DEGREES



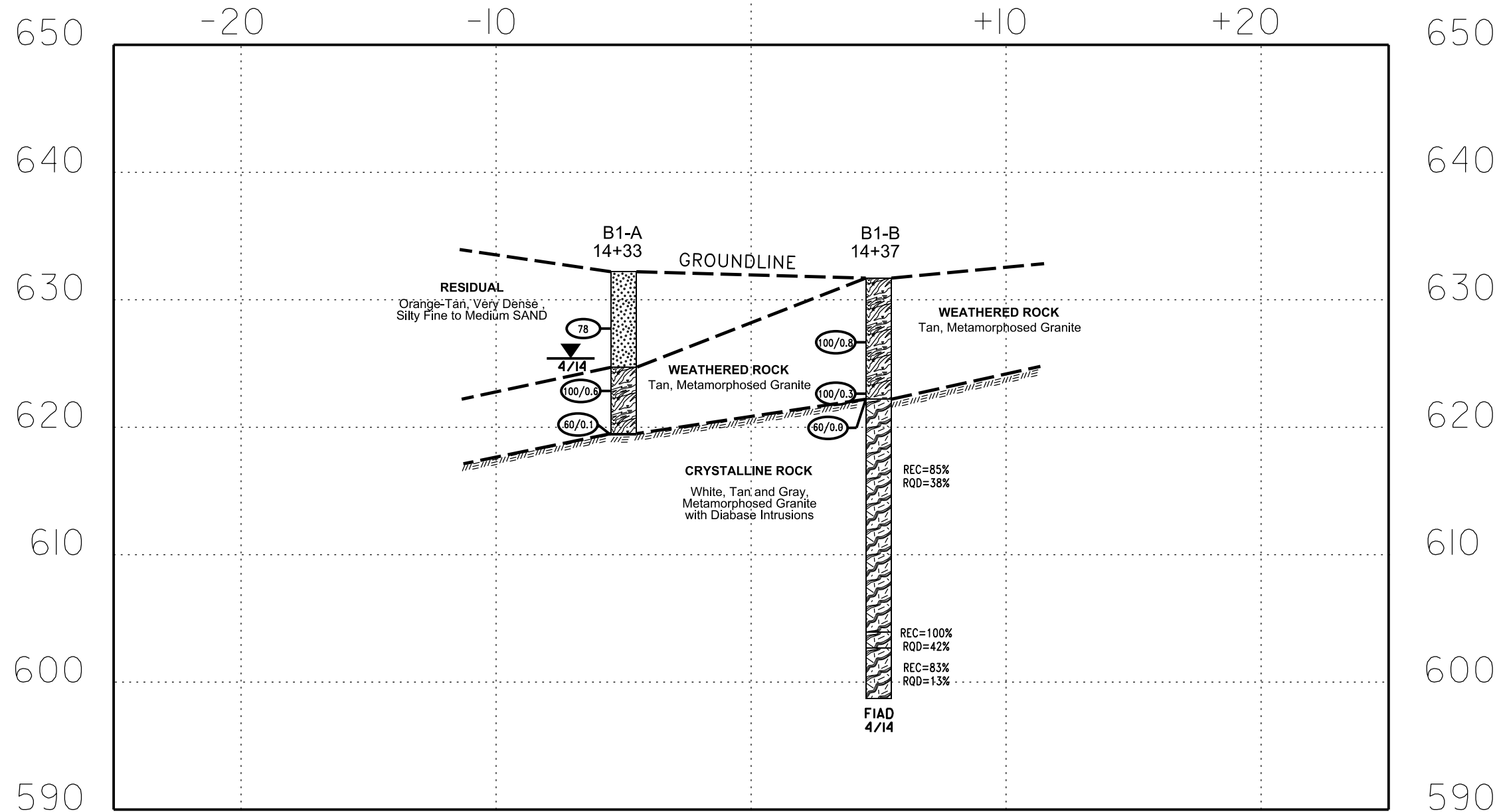
Inferred stratigraphy is drawn at the bent with the borings projected onto the cross section.

The vertical scale hereon is exaggerated for visual clarity. Please see scale bar.



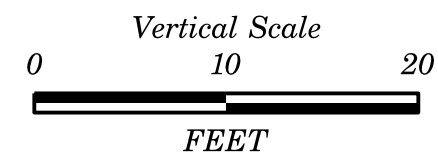
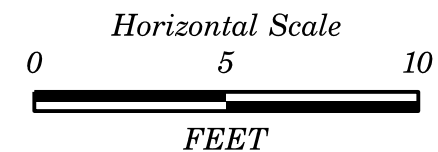
# CROSS SECTION THROUGH B-1

-L-  
14+35  
SKEW: 75 DEGREES



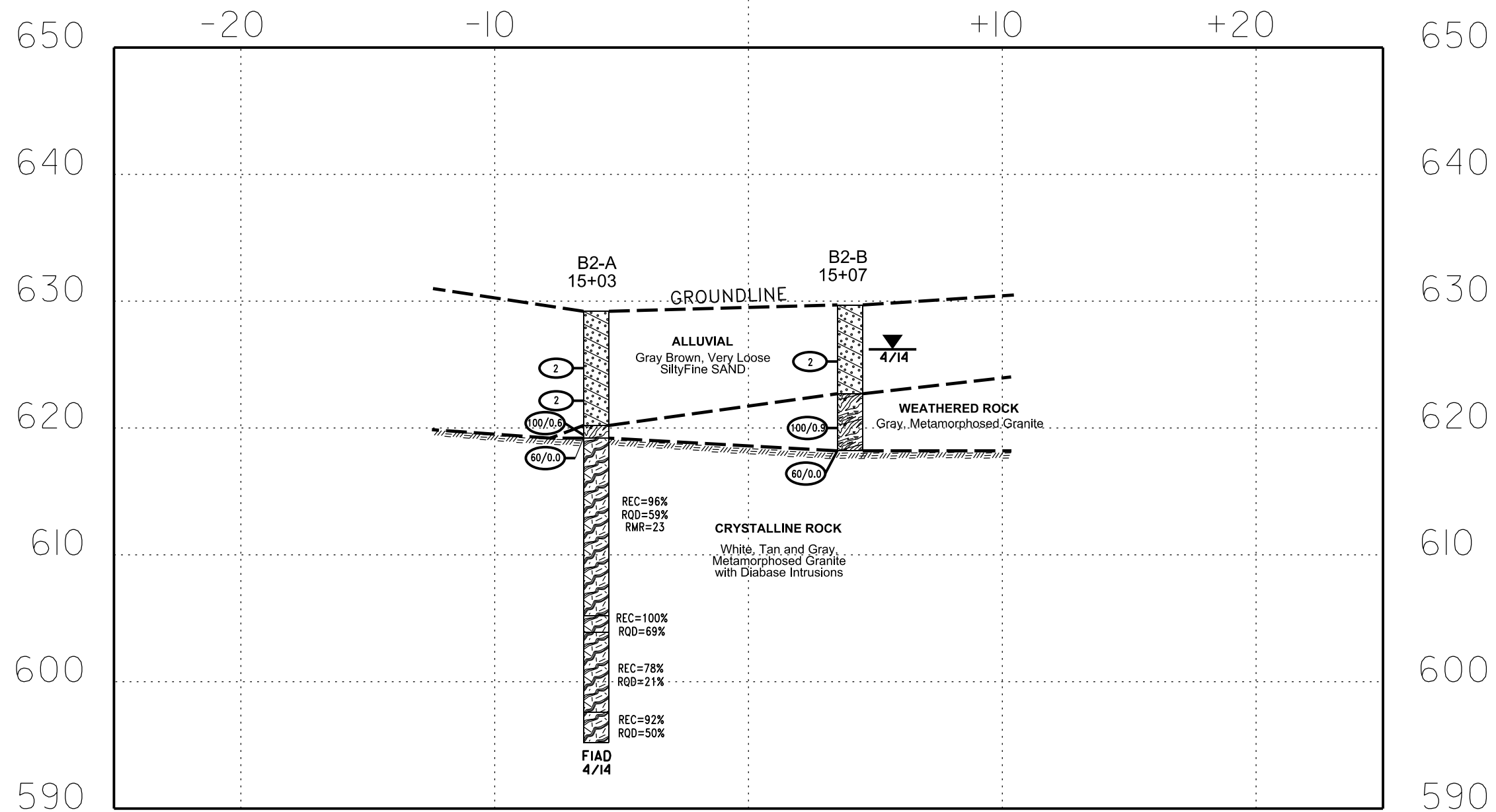
Inferred stratigraphy is drawn at the bent with the borings projected onto the cross section.

The vertical scale hereon is exaggerated for visual clarity. Please see scale bar.



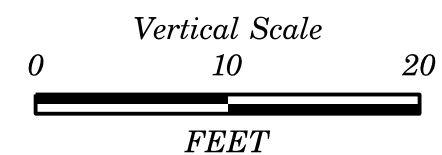
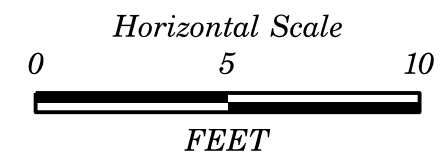
# CROSS SECTION THROUGH B-2

-L-  
15+05  
SKEW: 75 DEGREES



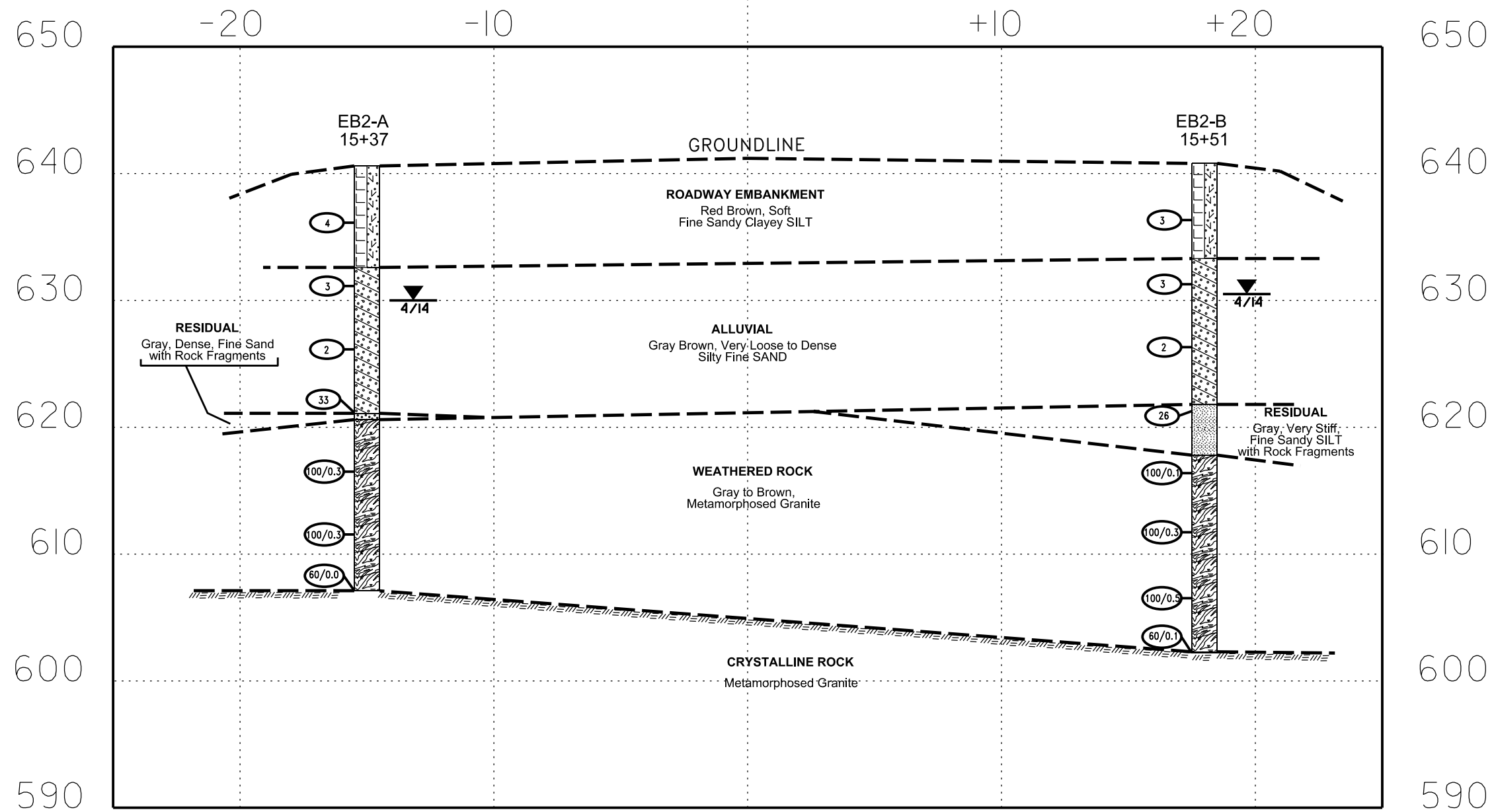
Inferred stratigraphy is drawn at the bent with the borings projected onto the cross section.

The vertical scale hereon is exaggerated for visual clarity. Please see scale bar.



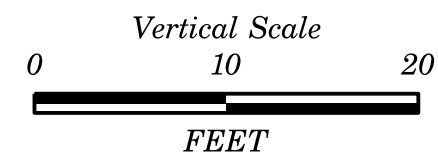
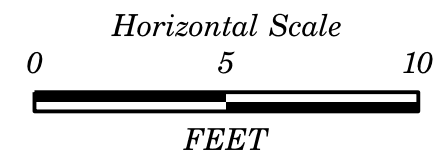
# CROSS SECTION THROUGH EB-2

-L-  
15+41  
SKEW: 74 DEGREES



Inferred stratigraphy is drawn at the bent with the borings projected onto the cross section.

The vertical scale hereon is exaggerated for visual clarity. Please see scale bar.







# NCDOT GEOTECHNICAL ENGINEERING UNIT

## BORELOG REPORT

WBS 40151.1.1	TIP B-4959	COUNTY GUILFORD	GEOLOGIST B. Richards, E.I.
SITE DESCRIPTION Bridge No. 193 Over Buffalo Creek on SR 2719			GROUND WTR (ft)
BORING NO. EB1-A	STATION 13+97	OFFSET 15 ft LT	ALIGNMENT -L-
COLLAR ELEV. 641.8 ft	TOTAL DEPTH 24.1 ft	NORTHING 875,128	EASTING 1,818,780
DRILL RIG/HAMMER EFF./DATE AME9553 CME-550X 72% 04/01/2011		DRILL METHOD H.S. Augers	HAMMER TYPE Automatic
DRILLER B. Boyce	START DATE 03/31/14	COMP. DATE 03/31/14	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					
645															
640	638.3	3.5	1	2	3							W	GROUND SURFACE ROADWAY EMBANKMENT Red Brown to Orange Brown, Medium Stiff, Clayey Fine to Medium Sandy SILT (A-5)	0.0	
635	633.3	8.5	6	10	16							M	RESIDUAL Orange, Very Stiff, Fine to Medium Sandy SILT (A-4)	9.0	
630	628.3	13.5	14	8	4							M	White Tan, Medium Dense, Silty Fine to Medium SAND (A-2-4)	13.5	
625	623.3	18.5	34	66/0.3									WEATHERED ROCK Tan, Metamorphosed Granite	17.5	
620	618.3 617.7	23.5 24.1	100/0.2 60/0.0										Boring Terminated with Standard Penetration Test Refusal at Elevation 617.7 ft on CR (Metamorphosed Granite)  (Note: 0.3' Topsoil)	24.1	

WBS 40151.1.1	TIP B-4959	COUNTY GUILFORD	GEOLOGIST B. Richards, E.I.
SITE DESCRIPTION Bridge No. 193 Over Buffalo Creek on SR 2719			GROUND WTR (ft)
BORING NO. EB1-B	STATION 14+05	OFFSET 18 ft RT	ALIGNMENT -L-
COLLAR ELEV. 641.1 ft	TOTAL DEPTH 16.9 ft	NORTHING 875,138	EASTING 1,818,814
DRILL RIG/HAMMER EFF./DATE AME9553 CME-550X 72% 04/01/2011		DRILL METHOD H.S. Augers	HAMMER TYPE Automatic
DRILLER B. Boyce	START DATE 03/31/14	COMP. DATE 03/31/14	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					
645															
640	637.6	3.5	2	4	5							W	GROUND SURFACE ROADWAY EMBANKMENT Brown, Stiff, Fine Sandy Clayey SILT, with Rock Fragments (A-5)	0.0	
635	632.6	8.5	11	17	83/0.5								WEATHERED ROCK Orange Tan, Metamorphosed Granite	8.0	
630	627.6	13.5	60/0.1										CRYSTALLINE ROCK Orange Tan, Metamorphosed Granite	13.5	
625	624.2	16.9	60/0.0										Boring Terminated with Standard Penetration Test Refusal at Elevation 624.2 ft in CR (Metamorphosed Granite)  (Note: 0.3' Topsoil)	16.9	





# NCDOT GEOTECHNICAL ENGINEERING UNIT CORE BORING REPORT

WBS 40151.1.1		TIP B-4959		COUNTY GUILFORD		GEOLOGIST B. Richards, E.I.					
SITE DESCRIPTION Bridge No. 193 Over Buffalo Creek on SR 2719							GROUND WTR (ft)				
BORING NO. B1-B		STATION 14+37		OFFSET 5 ft RT		ALIGNMENT -L-					
COLLAR ELEV. 631.7 ft		TOTAL DEPTH 33.0 ft		NORTHING 875,169		EASTING 1,818,799					
DRILL RIG/HAMMER EFF./DATE AME9553 CME-550X 72% 04/01/2011				DRILL METHOD H.S. Augers		HAMMER TYPE Automatic					
DRILLER B. Boyce		START DATE 04/01/14		COMP. DATE 04/01/14		SURFACE WATER DEPTH N/A					
CORE SIZE NQ		TOTAL RUN 23.5 ft									
ELEV (ft)	RUN ELEV (ft)	DEPTH (ft)	RUN (ft)	DRILL RATE (Min/ft)	RUN		STRATA		L O G	DESCRIPTION AND REMARKS	DEPTH (ft)
					REC. (ft) %	RQD (ft) %	REC. (ft) %	RQD (ft) %			
622.16										Begin Coring @ 9.5 ft	
620	622.2	9.5	3.5	1:43/0.5 <i>N=60/0.0</i>	(2.9) 83%	(1.8) 51%	(15.6) 85%	(6.9) 38%		622.2 White and Tan, Slightly Weathered, Hard, Moderately Fractured, Moderate Jointing, Joint Angles 30-70 degrees, Metamorphosed Granite (RMR=28)	9.5
	618.7	13.0	5.0	4:02/1.0 3:05/1.0	(3.5) 70%	(1.1) 22%					
615				5:06/1.0 3:54/1.0 3:39/1.0 1:17/1.0							
	613.7	18.0	5.0	2:02/1.0	(4.8) 96%	(2.3) 46%					
610				2:59/1.0 3:40/1.0 4:39/1.0 4:35/1.0 4:27/1.0							
	608.7	23.0	5.0	4:31/1.0	(4.6) 92%	(1.7) 34%					
605				3:22/1.0 3:30/1.0 3:42/1.0 2:51/1.0							
	603.7	28.0	5.0	3:40/1.0	(4.2) 84%	(1.3) 26%	(1.2) 100%	(0.5) 42%		603.9 <b>CRYSTALLINE ROCK</b> Gray, Moderately Weathered, Very Hard, Moderately Fractured, Moderate Jointing, Joint Angles 20-80 degrees, Diabase	27.8
600				2:42/1.0 3:08/1.0 3:08/1.0 3:01/1.0			(3.3) 83%	(0.5) 13%		602.7 <b>CRYSTALLINE ROCK</b> White and Tan, Slightly Weathered, Hard, Moderately Fractured, Moderate Jointing, Joint Angles 30-70 degrees, Metamorphosed Granite	29.0
	598.7	33.0								598.7 Boring Terminated at Elevation 598.7 ft in CR (Metamorphosed Granite)	33.0

NCDOT CORE SINGLE B4959\_GEO\_BH.GPJ NC\_DOT.GDT 7/28/14

### CORE PHOTOGRAPHS

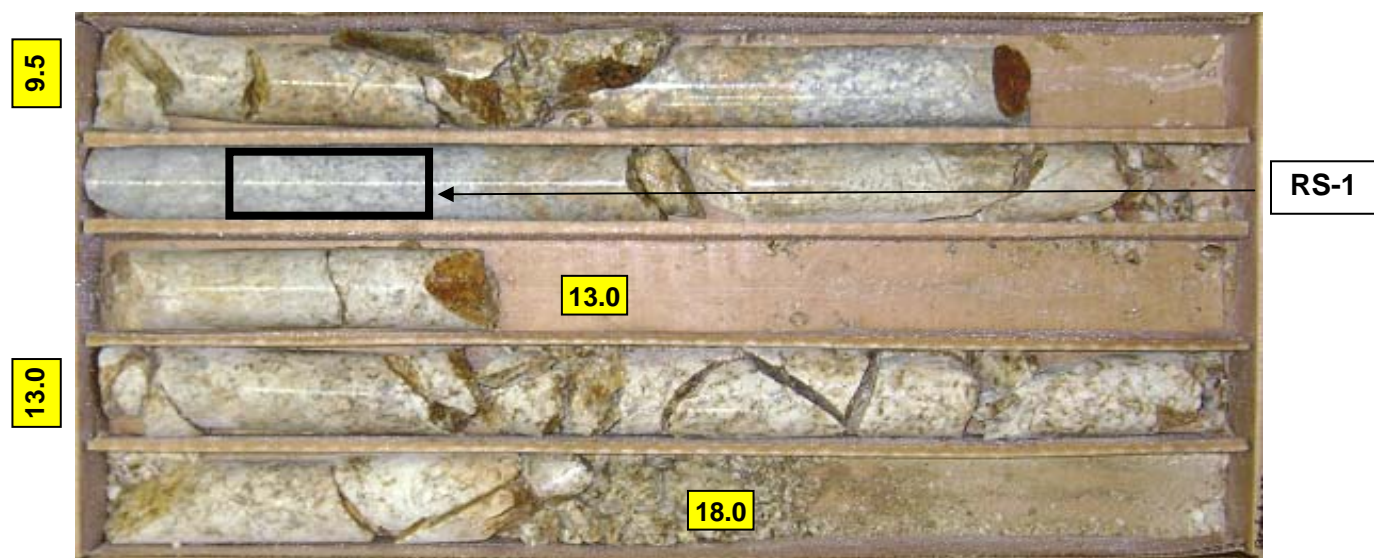
WBS No. 40151.1.1

TIP No. B-4959

Project Description: Bridge No. 193 Over Buffalo Creek on SR-2719  
Guilford County, North Carolina

B1-B

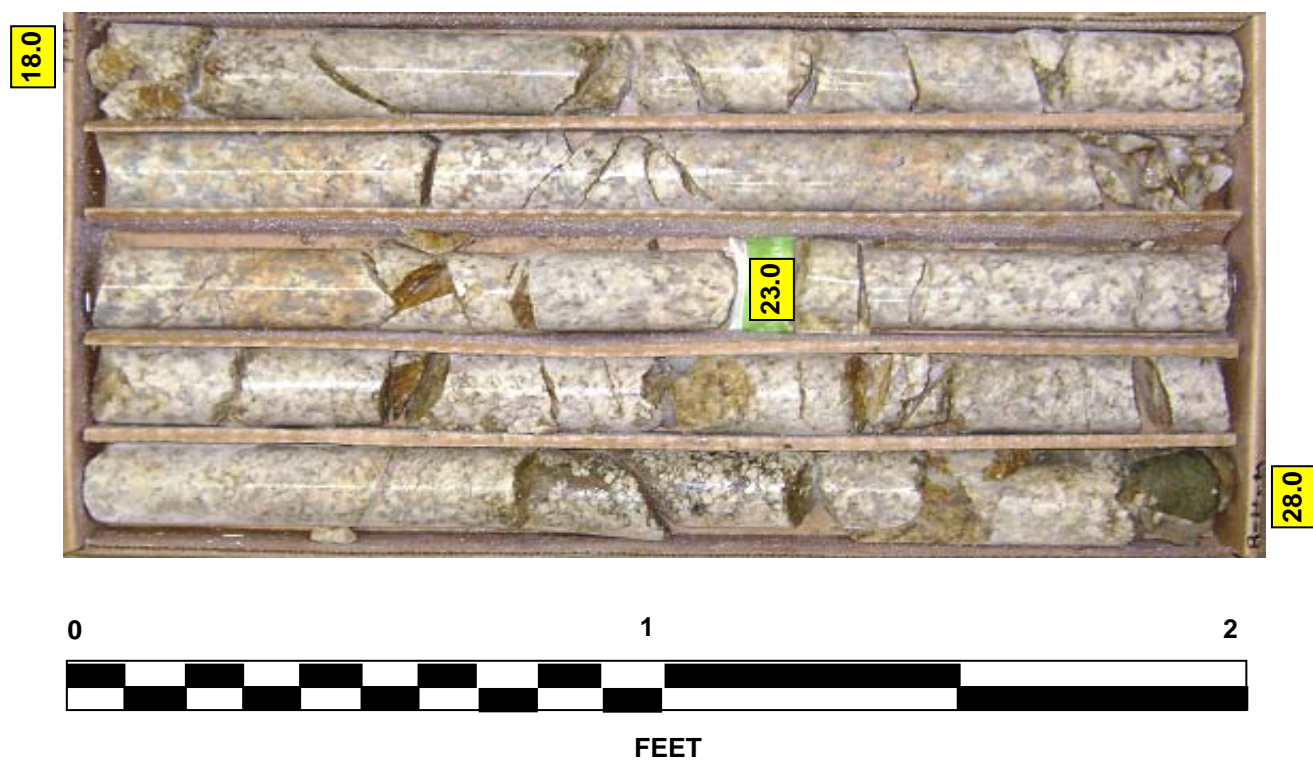
Box 1: 9.0 Feet to 18.0 Feet



Box 3: 28.0 Feet to 33.0 Feet



Box 2: 18.0 Feet to 28.0 Feet







# NCDOT GEOTECHNICAL ENGINEERING UNIT CORE BORING REPORT

WBS 40151.1.1		TIP B-4959		COUNTY GUILFORD		GEOLOGIST B. Richards, E.I.					
SITE DESCRIPTION Bridge No. 193 Over Buffalo Creek on SR 2719							GROUND WTR (ft)				
BORING NO. B2-A		STATION 15+04		OFFSET 6 ft LT		ALIGNMENT -L-					
COLLAR ELEV. 629.2 ft		TOTAL DEPTH 34.0 ft		NORTHING 875,236		EASTING 1,818,786					
DRILL RIG/HAMMER EFF./DATE AME9553 CME-550X 72% 04/01/2011				DRILL METHOD H.S. Augers		HAMMER TYPE Automatic					
DRILLER B. Boyce		START DATE 04/01/14		COMP. DATE 04/01/14		SURFACE WATER DEPTH N/A					
CORE SIZE NQ		TOTAL RUN 24.0 ft									
ELEV (ft)	RUN ELEV (ft)	DEPTH (ft)	RUN (ft)	DRILL RATE (Min/ft)	RUN		STRATA		L O G	DESCRIPTION AND REMARKS	DEPTH (ft)
					REC. (ft) %	RQD (ft) %	REC. (ft) %	RQD (ft) %			
619.15										Begin Coring @ 10.0 ft	
	619.2	10.0	4.0	2:26/1.0 <i>N=60/0.0</i>	(3.7) 93%	(1.4) 35%	(13.5) 96%	(8.2) 59%		619.2	10.0
615	615.2	14.0	5.0	2:26/1.0 3:15/1.0 2:42/1.0 3:11/1.0	(4.9) 98%	(2.9) 58%					
610	610.2	19.0	5.0	3:04/1.0 3:05/1.0 4:09/1.0 4:09/1.0 3:50/1.0	(4.9) 98%	(3.9) 78%					
605	605.2	24.0	5.0	4:09/1.0 4:05/1.0 4:20/1.0 4:01/1.0 3:50/1.0	(4.9) 98%	(3.9) 78%			RS-2	605.2	24.0
			5.0	2:21/1.0 3:11/1.0 2:24/1.0 2:05/1.0 1:53/1.0	(3.7) 74%	(1.4) 28%	(1.3) 100%	(0.9) 69%		603.9	25.3
600	600.2	29.0	5.0	2:39/1.0 2:49/1.0 3:05/1.0 2:19/1.0 3:01/1.0	(4.7) 94%	(2.2) 44%	(4.9) 78%	(1.3) 21%			
			5.0	2:39/1.0 2:49/1.0 3:05/1.0 2:19/1.0 3:01/1.0	(4.7) 94%	(2.2) 44%	(2.2) 92%	(1.2) 50%		597.6	31.6
	595.2	34.0								595.2	34.0
<p style="text-align: center;"><b>CRYSTALLINE ROCK</b> White and Tan, Slightly Weathered, Hard to Very Hard, Moderately Fractured, Slight to Moderate Jointing, Joint Angles 20-70 degrees, Metamorphosed Granite (RMR=23)</p> <p style="text-align: center;"><b>CRYSTALLINE ROCK</b> Gray, Slightly Weathered, Very Hard, Moderately Fractured, Moderate Jointing, Joint Angles 25-65 degrees, Diabase</p> <p style="text-align: center;"><b>CRYSTALLINE ROCK</b> White and Tan, Slightly Weathered, Hard to Very Hard, Moderately Fractured, Slight to Moderate Jointing, Joint Angles 20-70 degrees, Metamorphosed Granite</p> <p style="text-align: center;"><b>CRYSTALLINE ROCK</b> Gray, Slightly Weathered, Very Hard, Moderately Fractured, Moderate Jointing, Joint Angles 25-65 degrees, Diabase</p> <p style="text-align: center;">Boring Terminated at Elevation 595.2 ft in CR (Metamorphosed Granite)</p>											

NCDOT CORE SINGLE B4959 GEO.BH.GPJ NC\_DOT.GDT 7/28/14

### CORE PHOTOGRAPHS

WBS No. 40151.1.1

TIP No. B-4959

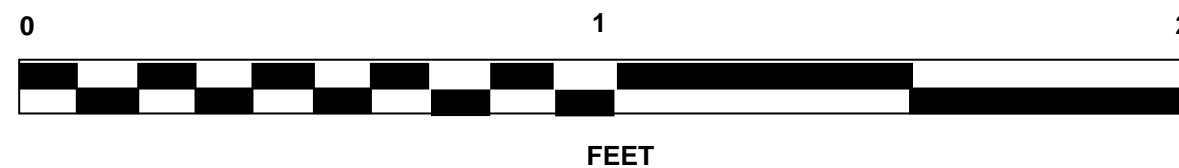
Project Description: Bridge No. 193 Over Buffalo Creek on SR-2719  
Guilford County, North Carolina

B2-A

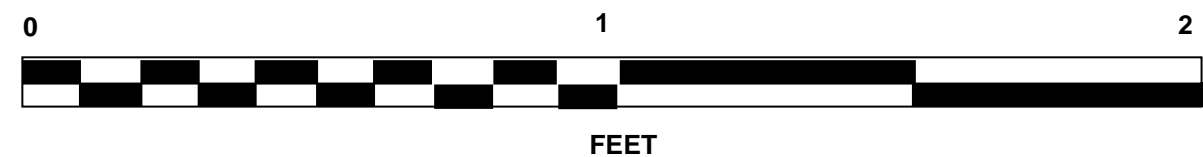
Box 1: 10.0 Feet to 19.0 Feet



Box 3: 29.0 Feet to 34.0 Feet



Box 2: 19.0 Feet to 29.0 Feet





# NCDOT GEOTECHNICAL ENGINEERING UNIT

## BORELOG REPORT

WBS 40151.1.1	TIP B-4959	COUNTY GUILFORD	GEOLOGIST B. Richards, E.I.
SITE DESCRIPTION Bridge No. 193 Over Buffalo Creek on SR 2719			GROUND WTR (ft)
BORING NO. EB2-A	STATION 15+36	OFFSET 15 ft LT	ALIGNMENT -L-
COLLAR ELEV. 640.6 ft	TOTAL DEPTH 33.5 ft	NORTHING 875,268	EASTING 1,818,776
DRILL RIG/HAMMER EFF./DATE AME9553 CME-550X 72% 04/01/2011		DRILL METHOD H.S. Augers	HAMMER TYPE Automatic
DRILLER B. Boyce	START DATE 03/31/14	COMP. DATE 03/31/14	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					
645															
640														640.6	GROUND SURFACE
															ROADWAY EMBANKMENT Red Brown, Soft, Fine Sandy Clayey SILT (A-5)
635	637.1	3.5	2	1	3										
630	632.1	8.5	2	2	1										ALLUVIAL Brown, Very Loose, Silty Fine SAND (A-2-6)
625	627.1	13.5	WOH	1	1										
620	622.1	18.5	1	3	30										RESIDUAL Gray, Dense, Fine SAND, with Rock Fragments (A-2-4)
615	617.1	23.5	100/0.3												WEATHERED ROCK Gray to Brown, Metamorphosed Granite
610	612.1	28.5	100/0.3												
	607.1	33.5	60/0.0												Boring Terminated with Standard Penetration Test Refusal at Elevation 607.1 ft on CR (Metamorphosed Granite)  (Note: 0.5' Topsoil)

WBS 40151.1.1	TIP B-4959	COUNTY GUILFORD	GEOLOGIST B. Richards, E.I.
SITE DESCRIPTION Bridge No. 193 Over Buffalo Creek on SR 2719			GROUND WTR (ft)
BORING NO. EB2-B	STATION 15+46	OFFSET 18 ft RT	ALIGNMENT -L-
COLLAR ELEV. 640.8 ft	TOTAL DEPTH 38.6 ft	NORTHING 875,278	EASTING 1,818,810
DRILL RIG/HAMMER EFF./DATE AME9553 CME-550X 72% 04/01/2011		DRILL METHOD H.S. Augers	HAMMER TYPE Automatic
DRILLER B. Boyce	START DATE 03/31/14	COMP. DATE 03/31/14	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					
645															
640														640.8	GROUND SURFACE
															ROADWAY EMBANKMENT Red Brown, Soft, Fine Sandy Clayey SILT (A-5)
635	637.3	3.5	WOH	1	2										
630	632.3	8.5	1	2	1										ALLUVIAL Brown, Very Loose, Silty Fine SAND (A-2-6)
625	627.3	13.5	WOH	1	1										
620	622.3	18.5	WOH	8	18										RESIDUAL Gray, Very Stiff, Fine Sandy SILT, with Rock Fragments (A-4)
615	617.3	23.5	90	10/0.1											WEATHERED ROCK Tan to Green, Metamorphosed Granite
610	612.3	28.5	100/0.3												
	607.3	33.5	100/0.5												
605	602.3	38.5	60/0.1												CRYSTALLINE ROCK Green Metamorphosed Granite Boring Terminated with Standard Penetration Test Refusal at Elevation 602.2 ft in CR (Metamorphosed Granite)  (Note: 0.4' Topsoil)

NCDOT BORE DOUBLE B4959\_GEO\_BH.GPJ NC\_DOT.GDT 7/28/14





Photograph No. 1  
At EB1 Looking West across Bridge No. 193 in Guilford County



Photograph No. 3  
At B2 Looking West across Bridge No. 193 in Guilford County



Photograph No. 2  
At B1 Looking West across Bridge No. 193 in Guilford County



Photograph No. 4  
At EB2 Looking West across Bridge No. 193 in Guilford County