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**STATE OF NORTH CAROLINA**

DEPARTMENT OF TRANSPORTATION

DIVISION OF HIGHWAYS

GEOTECHNICAL ENGINEERING UNIT

**STRUCTURE  
SUBSURFACE INVESTIGATION**

PROJ. REFERENCE NO. 46055.1.1 (B-5341) F.A. PROJ. BRSTP-1767(5)  
 COUNTY ROCKINGHAM  
 PROJECT DESCRIPTION BRIDGE NO. 110 ON SR 1767  
OVER WOLF ISLAND CREEK

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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.

**PROJECT: 46055.1.1 ID: B-5341**

**PERSONNEL**

J. MUESSEN

SDS:

G. SKOGLAND

R. PITTMAN

INVESTIGATED BY D. BROWN

CHECKED BY J. MUESSEN

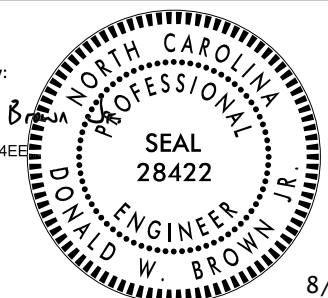
SUBMITTED BY D. BROWN

DATE AUGUST 2014

DocuSigned by:

Donald W. Brown

EB51F212B8384EE



8/13/2014

DRAWN BY: D. BROWN / J. MUESSEN

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**

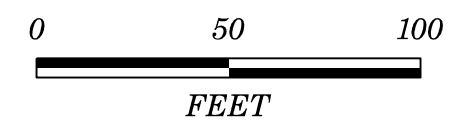
PROJECT REFERENCE NO. 46055.11 (B-5341)	SHEET NO. 2
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**SUBSURFACE INVESTIGATION**

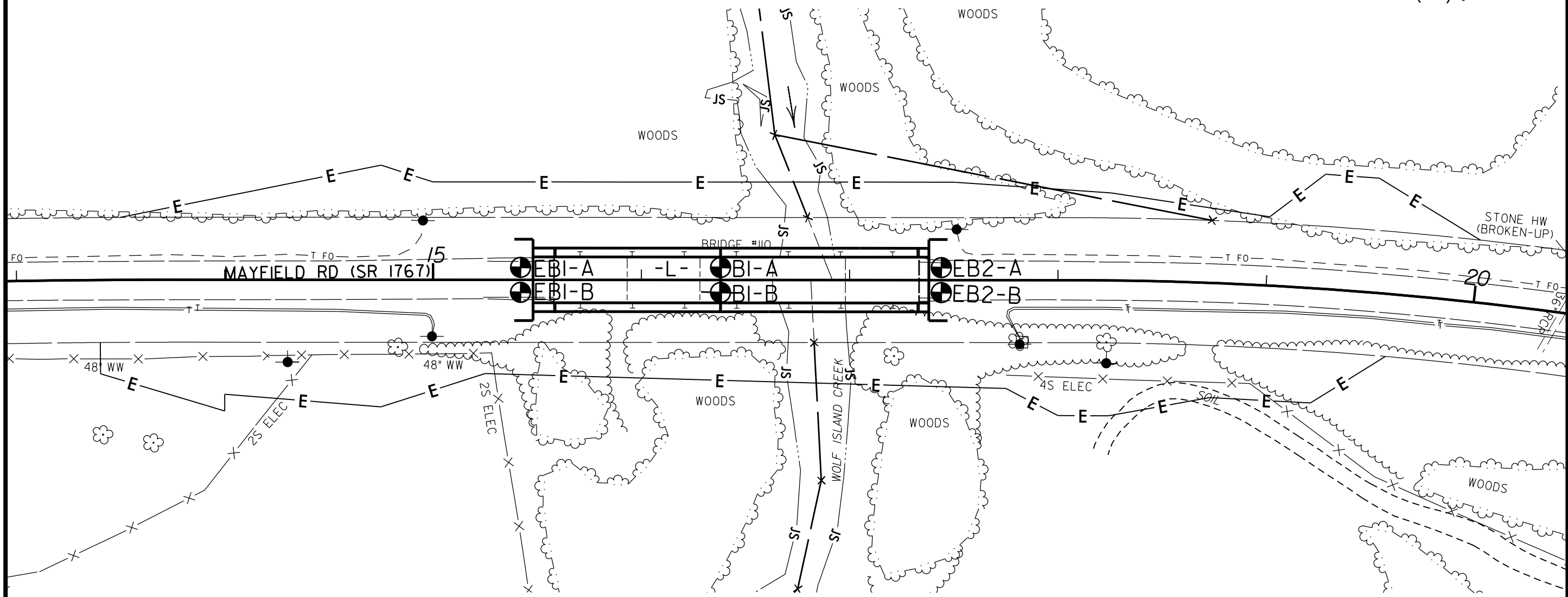
**SOIL AND ROCK LEGEND, TERMS, SYMBOLS, AND ABBREVIATIONS**

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>	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.  THE ANGULARITY OR ROUNDNESS OF SOIL GRAINS IS DESIGNATED BY THE TERMS: ANGULAR, SUBANGULAR, SUBROUNDED, OR ROUNDED.	HARD ROCK IS NON-COASTAL PLAIN MATERIAL THAT IF TESTED, WOULD YIELD SPT REFUSAL, AN INFERRED ROCK LINE INDICATES THE LEVEL AT WHICH NON-COASTAL PLAIN MATERIAL WOULD YIELD SPT REFUSAL. SPT REFUSAL IS PENETRATION BY A SPLIT SPOON SAMPLER EQUAL TO OR LESS THAN 60 BLOWS. IN NON-COASTAL PLAIN MATERIAL, THE TRANSITION BETWEEN SOIL AND ROCK IS OFTEN REPRESENTED BY A ZONE OF WEATHERED ROCK. ROCK MATERIALS ARE TYPICALLY DIVIDED AS FOLLOWS:  WEATHERED ROCK (WR) NON-COASTAL PLAIN MATERIAL THAT WOULD YIELD SPT N VALUES > 100 BLOWS PER FOOT IF TESTED.  CRYSTALLINE ROCK (CR) FINE TO COARSE GRAIN IGNEOUS AND METAMORPHIC ROCK THAT WOULD YIELD SPT REFUSAL IF TESTED. ROCK TYPE INCLUDES GRANITE, ONEISS, GABBRO, SCHIST, ETC.  NON-CRYSTALLINE ROCK (NCR) FINE TO COARSE GRAIN METAMORPHIC AND NON-COASTAL PLAIN SEDIMENTARY ROCK THAT WOULD YIELD SPT REFUSAL IF TESTED. ROCK TYPE INCLUDES PHYLLITE, SLATE, SANDSTONE, ETC.  COASTAL PLAIN SEDIMENTARY ROCK (CP) COASTAL PLAIN SEDIMENTS CEMENTED INTO ROCK, BUT MAY NOT YIELD SPT REFUSAL. ROCK TYPE INCLUDES LIMESTONE, SANDSTONE, CEMENTED SHELL BEDS, ETC.	ALLUVIUM (ALLUV.) - SOILS THAT HAVE BEEN TRANSPORTED BY WATER. 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. 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 60 BLOWS. STRATA CORE RECOVERY (SREC.) - 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.
<b>SOIL LEGEND AND AASHTO CLASSIFICATION</b> GENERAL CLASS. GRANULAR MATERIALS (<= 35% PASSING #200) SILT-CLAY MATERIALS (> 35% PASSING #200) ORGANIC MATERIALS GROUP CLASS. A-1-a, A-1-b, A-2, A-2-4, A-2-5, A-2-6, A-2-7, A-4, A-5, A-6, A-7, A-7-5, A-7-6, A-1, A-2, A-3, A-4, A-5, A-6, A-7 SYMBOL % PASSING: 10, 40, 200 LIQUID LIMIT PLASTIC INDEX GROUP INDEX USUAL TYPES OF MAJOR MATERIALS: STONE FRAGS., GRAVEL, 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	<b>MINERALOGICAL COMPOSITION</b> MINERAL NAMES SUCH AS QUARTZ, FELDSPAR, MICA, TALC, KAOLIN, ETC. ARE USED IN DESCRIPTIONS WHENEVER THEY ARE CONSIDERED OF SIGNIFICANCE.  <b>COMPRESSIBILITY</b> SLIGHTLY COMPRESSIBLE: LIQUID LIMIT LESS THAN 31 MODERATELY COMPRESSIBLE: LIQUID LIMIT EQUAL TO 31-50 HIGHLY COMPRESSIBLE: LIQUID LIMIT GREATER THAN 50  <b>PERCENTAGE OF MATERIAL</b> 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	<b>WEATHERING</b> FRESH: 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 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 &gt; 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 &lt; 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.	<b>TERMS AND DEFINITIONS</b> 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. 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STRATA CORE RECOVERY (SREC.) - 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.
<b>CONSISTENCY OR DENSENESS</b> PRIMARY SOIL TYPE COMPACTNESS OR CONSISTENCY RANGE OF STANDARD PENETRATION RESISTANCE (N-VALUE) RANGE OF UNCONFINED COMPRESSIVE STRENGTH (TONS/FT <sup>2</sup> ) GENERALLY GRANULAR MATERIAL (NON-COHESSIVE) VERY LOOSE, MEDIUM DENSE, DENSE, VERY DENSE 4, 4 TO 10, 10 TO 30, 30 TO 50, >50 N/A GENERALLY SILT-CLAY MATERIAL (COHESSIVE) VERY SOFT, MEDIUM STIFF, STIFF, VERY STIFF, HARD <2, 2 TO 4, 4 TO 8, 8 TO 15, 15 TO 30, >30 <0.25, 0.25 TO 0.50, 0.5 TO 1.0, 1 TO 2, 2 TO 4, >4	<b>MISCELLANEOUS SYMBOLS</b> ROADWAY EMBANKMENT (RE) WITH SOIL DESCRIPTION SOIL SYMBOL ARTIFICIAL FILL (AF) OTHER THAN ROADWAY EMBANKMENT INFERRED SOIL BOUNDARY INFERRED ROCK LINE ALLUVIAL SOIL BOUNDARY DIP & DIP DIRECTION OF ROCK STRUCTURES TEST BORING WITH CORE AUGER BORING CORE BORING MONITORING WELL PIEZOMETER INSTALLATION SLOPE INDICATOR INSTALLATION CONE PENETROMETER TEST SOUNDING ROD	<b>ROCK HARDNESS</b> 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 PEICES 1 INCH MAXIMUM SIZE BY HARD BLOWS OF THE POINT OF A GEOLOGIST'S PICK. SOFT: CAN BE GROVED 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>TEXTURE OR GRAIN SIZE</b> 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 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
<b>SOIL MOISTURE - CORRELATION OF TERMS</b> SOIL MOISTURE SCALE (ATTERBERG LIMITS) FIELD MOISTURE DESCRIPTION GUIDE FOR FIELD MOISTURE DESCRIPTION LL - LIQUID LIMIT - SATURATED - (SAT.) USUALLY LIQUID; VERY WET, USUALLY FROM BELOW THE GROUND WATER TABLE PL - PLASTIC LIMIT - WET - (W) SEMISOLID; REQUIRES DRYING TO ATTAIN OPTIMUM MOISTURE OM - OPTIMUM MOISTURE - MOIST - (M) SOLID; AT OR NEAR OPTIMUM MOISTURE SL - SHRINKAGE LIMIT - DRY - (D) REQUIRES ADDITIONAL WATER TO ATTAIN OPTIMUM MOISTURE	<b>ABBREVIATIONS</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 HI. - HIGHLY MED. - MEDIUM MICA - MICA MOD. - MODERATELY NP - NON PLASTIC ORG. - ORGANIC PMT - PRESSUREMETER TEST SAP. - SAPROLITIC SD. - SAND, SANDY SL. - SILT, SILTY SLI. - SLIGHTLY TCR - TRICONE REFUSAL w - MOISTURE CONTENT V - VERY VST - VANE SHEAR TEST WEA. - WEATHERED W. - UNIT WEIGHT W <sub>d</sub> - DRY UNIT WEIGHT SAMPLE ABBREVIATIONS S - BULK SS - SPLIT SPOON ST - SHELBY TUBE RS - ROCK RT - RECOMPACTED TRIAXIAL RATIO CBR - CALIFORNIA BEARING RATIO	<b>FRACURE SPACING</b> 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  <b>BEDDING</b> 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	<b>EQUIPMENT USED ON SUBJECT PROJECT</b> DRILL UNITS: MOBILE B-____, BK-51, CME-45C, CME-550, 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 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
<b>PLASTICITY</b> NONPLASTIC, LOW PLASTICITY, MED. PLASTICITY, HIGH PLASTICITY PLASTICITY INDEX (PI) DRY STRENGTH VERY LOW, SLIGHT, MEDIUM, HIGH	<b>INDURATION</b> 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.	<b>ROCK HARDNESS</b> 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 PEICES 1 INCH MAXIMUM SIZE BY HARD BLOWS OF THE POINT OF A GEOLOGIST'S PICK. SOFT: CAN BE GROVED 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>FRACURE SPACING</b> 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  <b>BEDDING</b> 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
<b>COLOR</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.	<b>FRACURE SPACING</b> 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  <b>BEDDING</b> 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	<b>FRACURE SPACING</b> 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  <b>BEDDING</b> 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	<b>FRACURE SPACING</b> 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  <b>BEDDING</b> 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
			<b>NOTES:</b> BENCH MARK: BENCHMARK 1 AT -BL- STA 5+12.92, 27.65 FT LT ELEVATION: 534.84 FT.

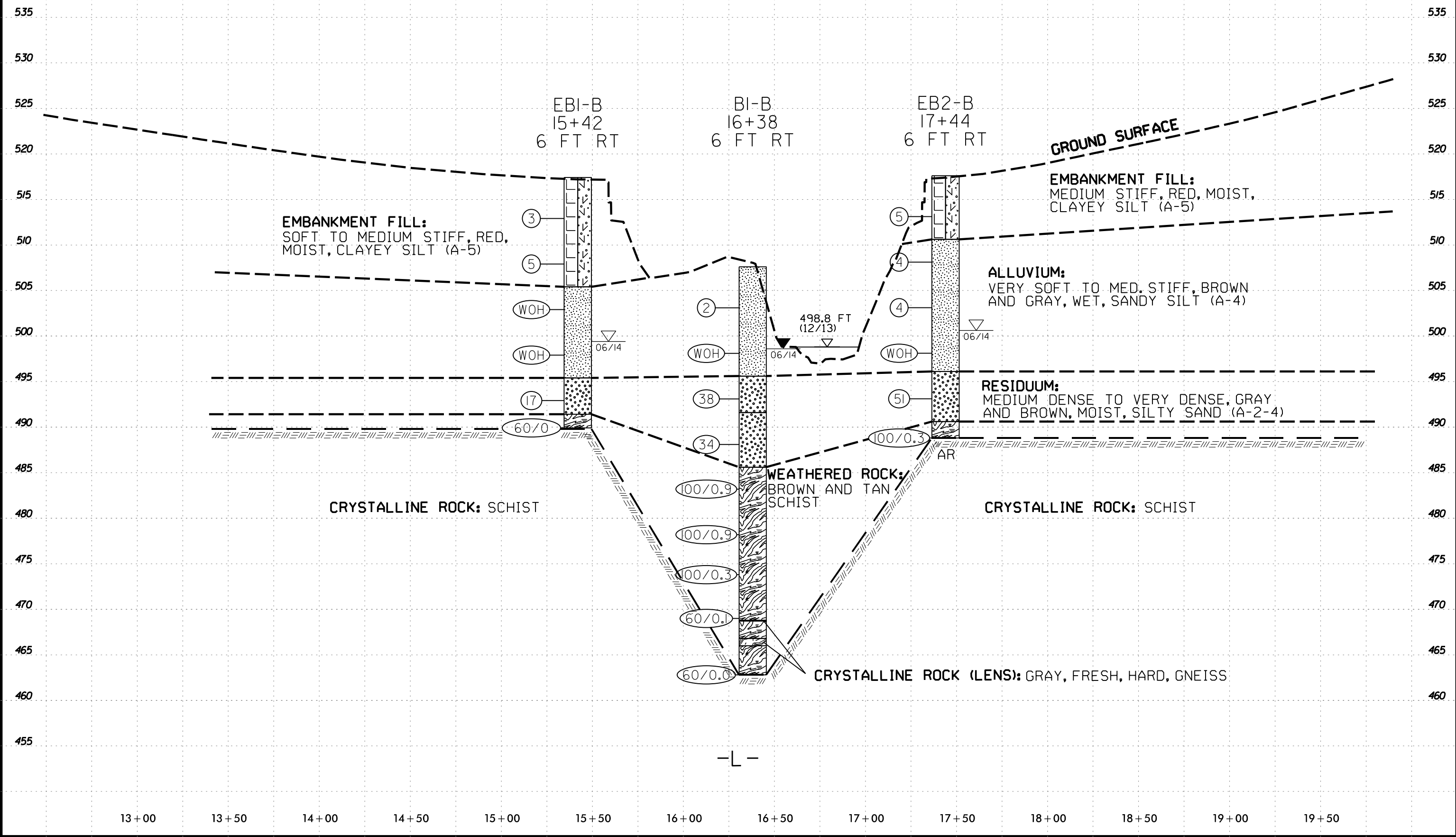
PROJECT REFERENCE NO. 46055JJ (B-5341)	SHEET NO. 3
RW SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
<b>INCOMPLETE PLANS</b> DO NOT USE FOR ACQUISITION <b>PRELIMINARY PLANS</b> DO NOT USE FOR CONSTRUCTION	



SKEW = 90 DEG.

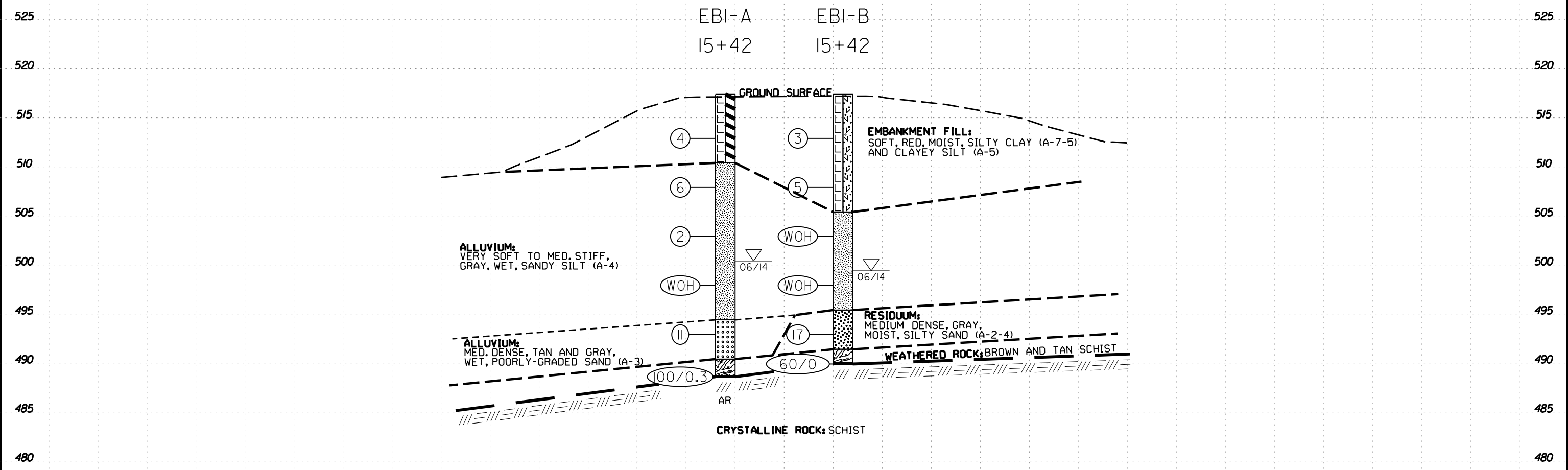


NOTE: GROUND SURFACE PROFILE OF -L- TAKEN FROM ELECTRONIC FILES RECEIVED FROM NCDOT GEU, DATED 6/23/14. INFERRED STRATIGRAPHY IS DRAWN THROUGH THE BORINGS WITH BOTH PROJECTED ONTO THE PROFILE.



75 70 65 60 55 50 45 40 35 30 25 20 15 10 5 0 5 10 15 20 25 30 35 40 45 50 55 60 65 70 75

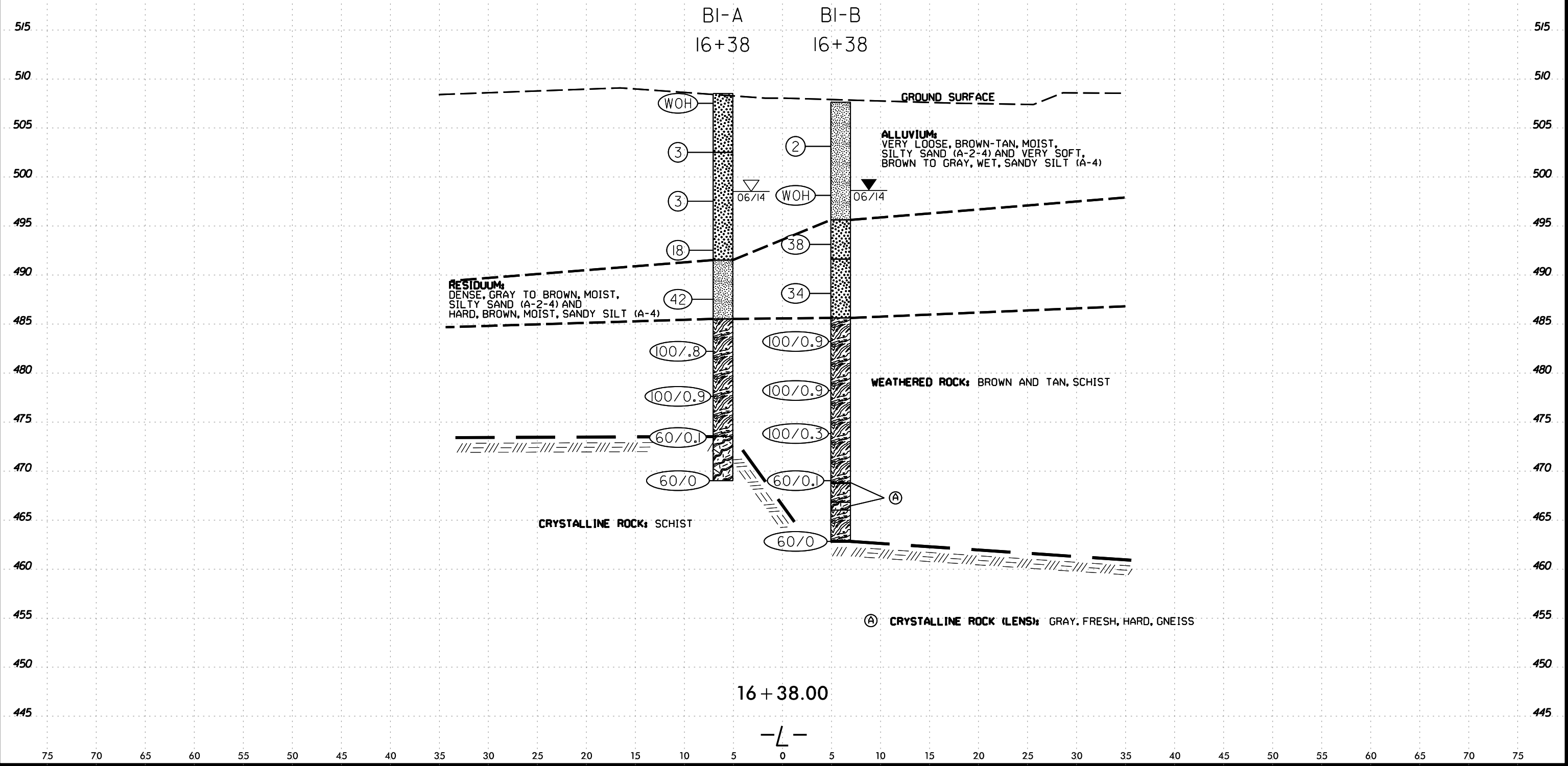
NOTE: GROUND SURFACE PROFILE OF -L- TAKEN FROM ELECTRONIC FILES RECEIVED FROM NCDOT GEU, DATED 6/23/14. INFERRED STRATIGRAPHY IS DRAWN THROUGH THE BORINGS WITH BOTH PROJECTED ONTO THE CROSS SECTION.



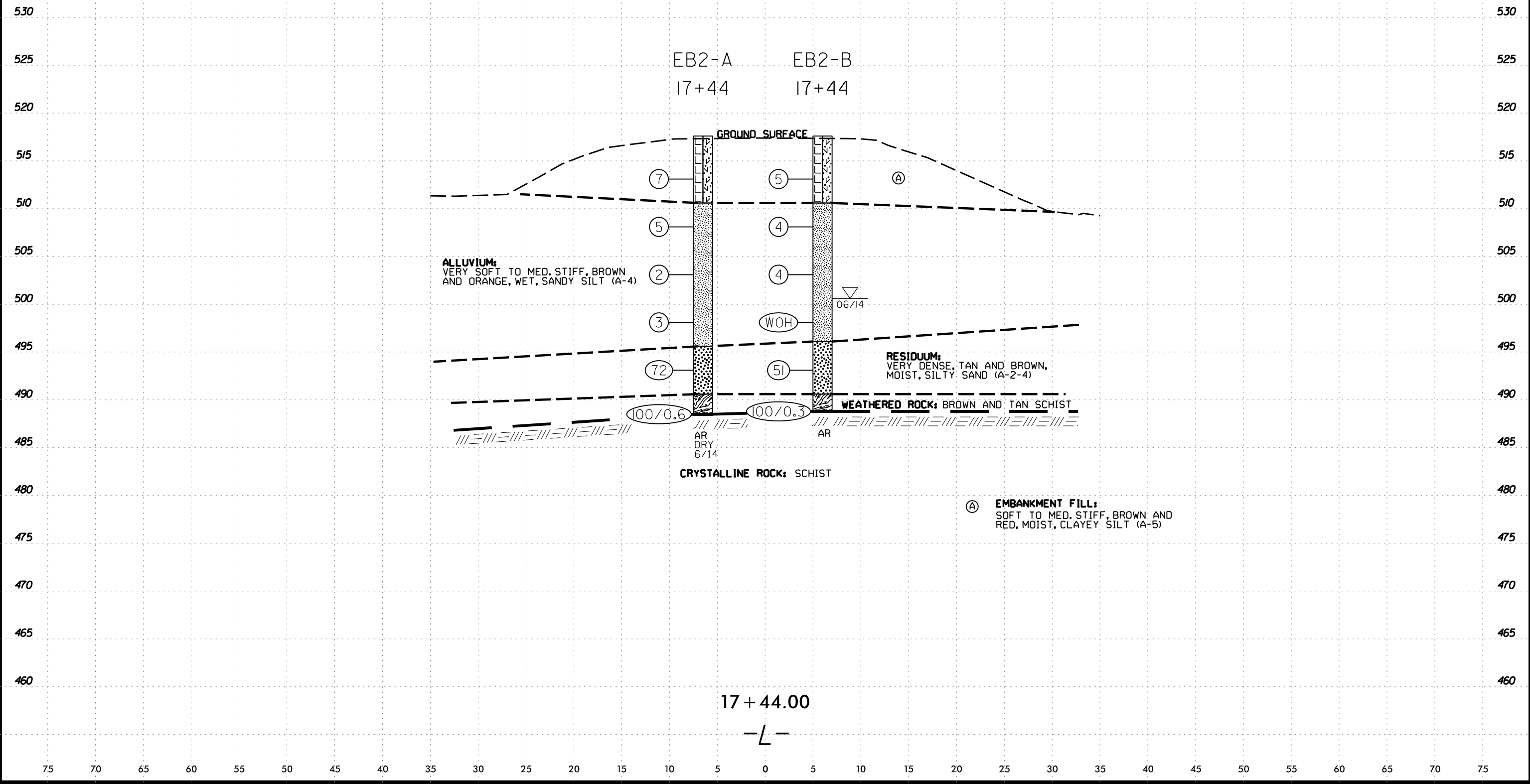
75 70 65 60 55 50 45 40 35 30 25 20 15 10 5 0 5 10 15 20 25 30 35 40 45 50 55 60 65 70 75

75 70 65 60 55 50 45 40 35 30 25 20 15 10 5 0 5 10 15 20 25 30 35 40 45 50 55 60 65 70 75

NOTE: GROUND SURFACE PROFILE OF -L- TAKEN FROM ELECTRONIC FILES RECEIVED FROM NCDOT GEU, DATED 6/23/14, INFERRED STRATIGRAPHY IS DRAWN THROUGH THE BORINGS WITH BOTH PROJECTED ONTO THE CROSS SECTION.



NOTE: GROUND SURFACE PROFILE OF -L- TAKEN FROM ELECTRONIC FILES RECEIVED FROM NCDOT GEU, DATED 6/23/14. INFERRED STRATIGRAPHY IS DRAWN THROUGH THE BORINGS WITH BOTH PROJECTED ONTO THE CROSS SECTION.





**NCDOT GEOTECHNICAL ENGINEERING UNIT**  
**BORELOG REPORT**

WBS 46055.1.1	TIP B-5341	COUNTY ROCKINGHAM	GEOLOGIST J. MUESSEN
SITE DESCRIPTION BRIDGE NO. 110 ON SR 1767 OVER WOLF ISLAND CREEK			GROUND WTR (ft)
BORING NO. EB1-A	STATION 15+42	OFFSET 6 ft LT	ALIGNMENT -L-
COLLAR ELEV. 517.4 ft	TOTAL DEPTH 28.8 ft	NORTHING 994,499	EASTING 1,835,883
DRILL RIG/HAMMER EFF./DATE AFO3163 CME-550X 85% 05/14/2014		DRILL METHOD H.S. Augers	HAMMER TYPE Automatic
DRILLER G. SKOGLAND	START DATE 06/09/14	COMP. DATE 06/09/14	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				
520													ROADWAY SURFACE	0.0
515	513.9	3.5	WOH	2	2							M	ROADWAY EMBANKMENT RED, SILTY CLAY	
510	508.9	8.5		2	3	3						M	ALLUVIAL GRAY, FINE SANDY SILT WITH SOME WOOD FRAGMENTS	7.0
505	503.9	13.5		1	1	1						W		
500	498.9	18.5	WOH	WOH	WOH							W		
495	493.9	23.5		2	6	5						W	TAN AND GRAY, POORLY-GRADED COARSE SAND WITH TRACE WOOD FRAGMENTS AND TRACE GRAVEL	23.0
490	488.9	28.5										W	WEATHERED ROCK TAN AND BROWN SCHIST	27.0
													Boring Terminated by Auger Refusal at Elevation 488.6 ft on crystalline rock (schist)	28.8

WBS 46055.1.1	TIP B-5341	COUNTY ROCKINGHAM	GEOLOGIST J. MUESSEN
SITE DESCRIPTION BRIDGE NO. 110 ON SR 1767 OVER WOLF ISLAND CREEK			GROUND WTR (ft)
BORING NO. EB1-B	STATION 15+42	OFFSET 6 ft RT	ALIGNMENT -L-
COLLAR ELEV. 517.4 ft	TOTAL DEPTH 27.5 ft	NORTHING 994,499	EASTING 1,835,895
DRILL RIG/HAMMER EFF./DATE AFO3163 CME-550X 85% 05/14/2014		DRILL METHOD H.S. Augers	HAMMER TYPE Automatic
DRILLER G. SKOGLAND	START DATE 06/06/14	COMP. DATE 06/06/14	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				
520													ROADWAY SURFACE	0.0
515	513.9	3.5		1	2	1						M	ROADWAY EMBANKMENT RED, CLAYEY SILT	
510	508.9	8.5		2	2	3						M		
505	503.9	13.5	WOH	WOH	WOH							W	ALLUVIAL GRAY, FINE SANDY SILT	12.0
500	498.9	18.5	WOH	WOH	WOH							W		
495	493.9	23.5		4	9	8						M	RESIDUAL GRAY, SILTY SAND WITH SMALL GRAVEL	22.0
490	489.9	27.5											WEATHERED ROCK BROWN AND TAN SCHIST	26.0
													Boring Terminated with Standard Penetration Test Refusal at Elevation 489.9 ft on crystalline rock (schist)	27.5

NCDOT BORE DOUBLE B5341\_GEO\_BRG0110\_BH.GPJ NC\_DOT.GDT 08/13/14



# NCDOT GEOTECHNICAL ENGINEERING UNIT BORELOG REPORT

WBS 46055.1.1	TIP B-5341	COUNTY ROCKINGHAM	GEOLOGIST J. MUESSEN	
SITE DESCRIPTION BRIDGE NO. 110 ON SR 1767 OVER WOLF ISLAND CREEK				GROUND WTR (ft)
BORING NO. B1-A	STATION 16+38	OFFSET 6 ft LT	ALIGNMENT -L-	0 HR. 10.0
COLLAR ELEV. 508.5 ft	TOTAL DEPTH 39.5 ft	NORTHING 994,595	EASTING 1,835,880	24 HR. FIAD
DRILL RIG/HAMMER EFF./DATE AFO3163 CME-550X 85% 05/14/2014		DRILL METHOD H.S. Augers	HAMMER TYPE Automatic	
DRILLER G. SKOGLAND	START DATE 06/09/14	COMP. DATE 06/09/14	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	DEPTH (ft)	
			0.5ft	0.5ft	0.5ft	0	25	50	75	100						
520																
515																
510																
508.5	508.5	0.0	WOH	WOH	WOH	0								508.5	GROUND SURFACE	0.0
505																
503.5	503.5	5.0	1	2	1	3							M	502.5	ALLUVIAL BROWN-TAN, SILTY SAND	6.0
500																
498.5	498.5	10.0	WOH	2	1	3							W			
495																
493.5	493.5	15.0	1	4	14	18							W	491.5	RESIDUAL BROWN, SANDY SILT	17.0
490																
488.5	488.5	20.0	9	24	18	42							W			
485																
483.5	483.5	25.0	22	46	54/0.3									485.5	WEATHERED ROCK BROWN AND TAN SCHIST	23.0
480																
478.5	478.5	30.0	30	70/0.4												
475																
473.5	473.5	35.0	60/0.1											473.5	CRYSTALLINE ROCK BROWN AND TAN SCHIST	35.0
470																
469.0	469.0	39.5	60/0.0											469.0	Boring Terminated with Standard Penetration Test Refusal at Elevation 469.0 ft in crystalline rock (schist)	39.5

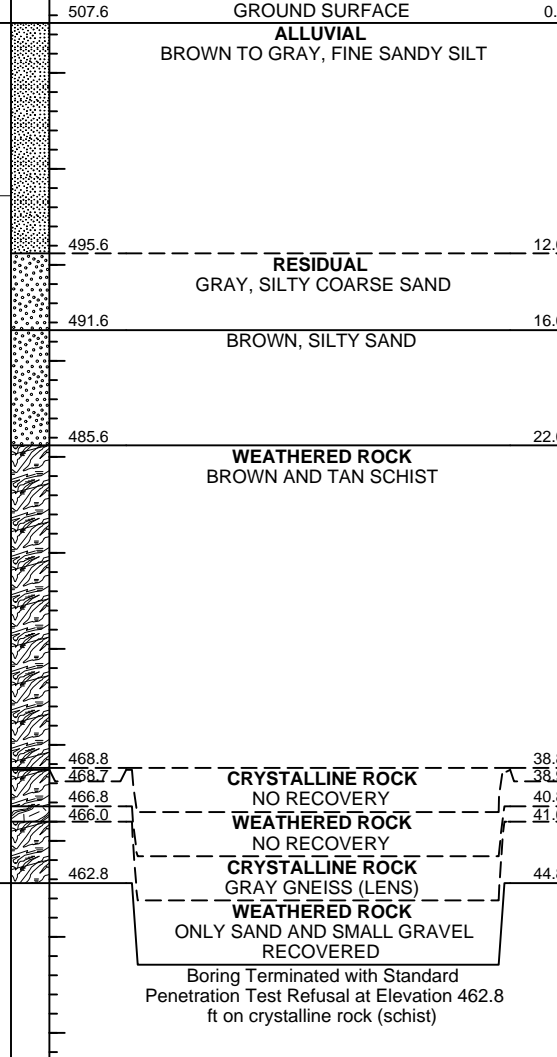
NCDOT BORE DOUBLE BS341\_GEO\_BRG0110\_BH.GPJ NC\_DOT\_GDT\_08/13/14

**NCDOT GEOTECHNICAL ENGINEERING UNIT**  
**BORELOG REPORT**

WBS 46055.1.1		TIP B-5341		COUNTY ROCKINGHAM		GEOLOGIST J. MUESSEN									
SITE DESCRIPTION BRIDGE NO. 110 ON SR 1767 OVER WOLF ISLAND CREEK							GROUND WTR (ft)								
BORING NO. B1-B		STATION 16+38		OFFSET 6 ft RT		ALIGNMENT -L-									
COLLAR ELEV. 507.6 ft		TOTAL DEPTH 44.8 ft		NORTHING 994,595		EASTING 1,835,892									
DRILL RIG/HAMMER EFF./DATE AFO3163 CME-550X 85% 05/14/2014		DRILL METHOD H.S. Augers		HAMMER TYPE Automatic											
DRILLER G. SKOGLAND		START DATE 06/06/14		COMP. DATE 06/06/14		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					
520															
515															
510															
505	504.1	3.5	1	1	1										
500	499.1	8.5	WOH	WOH	WOH										
495	494.1	13.5	9	13	25										
490	489.1	18.5	10	14	20										
485	484.1	23.5	38	62/0.4											
480	479.1	28.5	24	76/0.4											
475	474.1	33.5	100/0.3												
470	469.1	38.5	60/0.1												
465	462.8	44.8	60/0.0												

WBS 46055.1.1		TIP B-5341		COUNTY ROCKINGHAM		GEOLOGIST J. MUESSEN			
SITE DESCRIPTION BRIDGE NO. 110 ON SR 1767 OVER WOLF ISLAND CREEK							GROUND WTR (ft)		
BORING NO. B1-B		STATION 16+38		OFFSET 6 ft RT		ALIGNMENT -L-			
COLLAR ELEV. 507.6 ft		TOTAL DEPTH 44.8 ft		NORTHING 994,595		EASTING 1,835,892			
DRILL RIG/HAMMER EFF./DATE AFO3163 CME-550X 85% 05/14/2014		DRILL METHOD H.S. Augers		HAMMER TYPE Automatic					
DRILLER G. SKOGLAND		START DATE 06/06/14		COMP. DATE 06/06/14		SURFACE WATER DEPTH N/A			
CORE SIZE NQ			TOTAL RUN 6.0 ft					LOG	DESCRIPTION AND REMARKS
ELEV (ft)	RUN ELEV (ft)	DEPTH (ft)	RUN (ft)	DRILL RATE (Min/ft)	RUN REC. (ft) %	RQD (ft) %	SAMP. NO.		
468.8	468.8	38.8	1.0	0:21/1.0	(0.0)	(0.0)		(0.0)	
465	467.8	39.8	5.0	0:26/1.0	0%	0%		(0.0)	
				1:30/1.0	(0.8)	(0.8)		(0.0)	
				2:06/1.0	15%	15%		(0.0)	
				2:57/1.0				(0.8)	
				2:42/1.0				94%	
				N=60/0.0				0%	

NCDOT BORE DOUBLE B5341\_GEO\_BRG0110\_BH.GPJ NC\_DOT.GDT 08/13/14



Begin Coring @ 38.8 ft  
 468.8 - 38.8 ft: CRYSTALLINE ROCK NO RECOVERY  
 468.7 - 40.8 ft: WEATHERED ROCK NO RECOVERY  
 466.0 - 41.6 ft: WEATHERED ROCK NO RECOVERY  
 462.8 - 44.8 ft: CRYSTALLINE ROCK GRAY, FRESH, HARD GNEISS (LENS) WEATHERED ROCK ONLY SAND AND SMALL GRAVEL RECOVERED  
 Boring Terminated with Standard Penetration Test Refusal at Elevation 462.8 ft on crystalline rock (schist)

**CORE PHOTOGRAPH**

WBS NO.: 46055.1.1

TIP NO.: B-5341

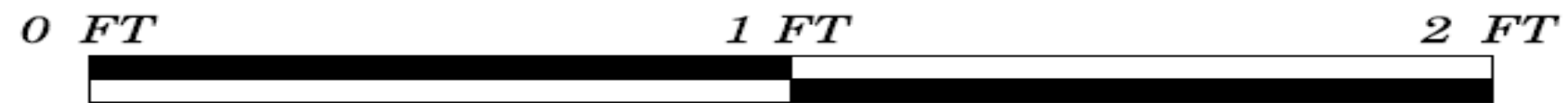
DESCRIPTION: BRIDGE 110 ON SR 1767 OVER WOLF ISLAND CREEK  
ROCKINGHAM COUNTY

**B1-B**

RUN #1: 38.8 FEET TO 39.8 FEET

No Recovery

RUN #2: 39.8 FEET TO 44.8 FEET





# NCDOT GEOTECHNICAL ENGINEERING UNIT

## BORELOG REPORT

WBS 46055.1.1		TIP B-5341		COUNTY ROCKINGHAM		GEOLOGIST J. MUESSEN										
SITE DESCRIPTION BRIDGE NO. 110 ON SR 1767 OVER WOLF ISLAND CREEK							GROUND WTR (ft)									
BORING NO. EB2-A		STATION 17+44		OFFSET 7 ft LT		ALIGNMENT -L-										
COLLAR ELEV. 517.6 ft		TOTAL DEPTH 29.1 ft		NORTHING 994,701		EASTING 1,835,878										
DRILL RIG/HAMMER EFF./DATE AFO3163 CME-550X 85% 05/14/2014				DRILL METHOD H.S. Augers		HAMMER TYPE Automatic										
DRILLER G. SKOGLAND		START DATE 06/09/14		COMP. DATE 06/09/14		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						
520														517.6	ROADWAY SURFACE	0.0
515	514.1	3.5	3	3	4								M	ROADWAY EMBANKMENT BROWN, CLAYEY SILT		
510	509.1	8.5	3	3	2								W	ALLUVIAL ORANGE-BROWN TO GRAY, SANDY SILT	7.0	
505	504.1	13.5	WOH	WOH	2								W			
500	499.1	18.5	WOH	1	2								W			
495	494.1	23.5	25	30	42								M	RESIDUAL TAN, SILTY SAND	22.0	
490	489.1	28.5	76	24/0.1										WEATHERED ROCK BROWN AND TAN SCHIST	27.0	
														488.5	WEATHERED ROCK BROWN AND TAN SCHIST	29.1
															Boring Terminated by Auger Refusal at Elevation 488.5 ft on crystalline rock (schist)	

WBS 46055.1.1		TIP B-5341		COUNTY ROCKINGHAM		GEOLOGIST J. MUESSEN										
SITE DESCRIPTION BRIDGE NO. 110 ON SR 1767 OVER WOLF ISLAND CREEK							GROUND WTR (ft)									
BORING NO. EB2-B		STATION 17+44		OFFSET 6 ft RT		ALIGNMENT -L-										
COLLAR ELEV. 517.6 ft		TOTAL DEPTH 28.8 ft		NORTHING 994,701		EASTING 1,835,889										
DRILL RIG/HAMMER EFF./DATE AFO3163 CME-550X 85% 05/14/2014				DRILL METHOD H.S. Augers		HAMMER TYPE Automatic										
DRILLER G. SKOGLAND		START DATE 06/06/14		COMP. DATE 06/06/14		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						
520														517.6	ROADWAY SURFACE	0.0
515	514.1	3.5	1	2	3								M	ROADWAY EMBANKMENT RED, CLAYEY SILT		
510	509.1	8.5	2	2	2								W	ALLUVIAL BROWN-ORANGE TO GRAY, FINE SANDY SILT	7.0	
505	504.1	13.5	3	3	1								W			
500	499.1	18.5	WOH	WOH	WOH								W			
495	494.1	23.5	10	14	37								M	RESIDUAL BROWN, SILTY FINE SAND	21.5	
490	489.1	28.5	100/0.3											490.6	WEATHERED ROCK BROWN AND TAN SCHIST	27.0
														488.8	WEATHERED ROCK BROWN AND TAN SCHIST	28.8
															Boring Terminated by Auger Refusal at Elevation 488.8 ft on crystalline rock (schist)	

NCDOT BORE DOUBLE B5341\_GEO\_BRG0110\_BH.GPJ NC\_DOT.GDT 08/13/14





PHOTOGRAPH 1: VIEW OF SR 1767 ACROSS BRIDGE 110, LOOKING NORTH (UP STATION).



PHOTOGRAPH 2: VIEW OF EAST SIDE OF BRIDGE 110 FROM NORTH END.