

REFERENCE: R-2707C

PROJECT: 34497

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

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	R-2707C	1	15

STRUCTURE
SUBSURFACE INVESTIGATION

CONTENTS

SHEET NO.	DESCRIPTION
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COUNTY Cleveland
PROJECT DESCRIPTION US 74 Bypass from East of NC 226 to East of NC 150

SITE DESCRIPTION Proposed Bridge Structure 4 on -Y3- over -L-

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. THE SUBSURFACE PLANS AND REPORTS, FIELD BORING LOGS, ROCK CORES AND SOIL TEST DATA ARE NOT 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 THE 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.

- NOTES:
1. THE INFORMATION CONTAINED HEREIN IS NOT IMPLIED OR GUARANTEED BY THE N. C. DEPARTMENT OF TRANSPORTATION AS ACCURATE NOR IS IT CONSIDERED PART OF THE PLANS, SPECIFICATIONS OR CONTRACT FOR THE PROJECT.
 2. 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.

PERSONNEL

Robbie DeLost

Mike Morgan

Harold Morris

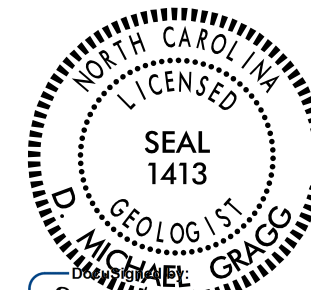
INVESTIGATED BY D. Michael Gragg

DRAWN BY Tamara Stivers

CHECKED BY Kenneth Bussey

SUBMITTED BY HDR|ICA

DATE July 2, 2015



D. Michael Gragg

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8/7/2015

SIGNATURE

DATE



Kenneth R. Bussey, Jr.





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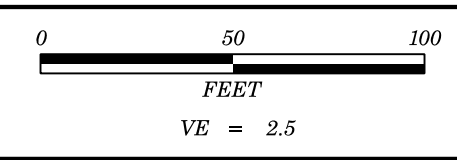
8/10/2015

SIGNATURE

DATE

**NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS
GEOTECHNICAL ENGINEERING UNIT
SUBSURFACE INVESTIGATION
SOIL AND ROCK LEGEND, TERMS, SYMBOLS, AND ABBREVIATIONS**

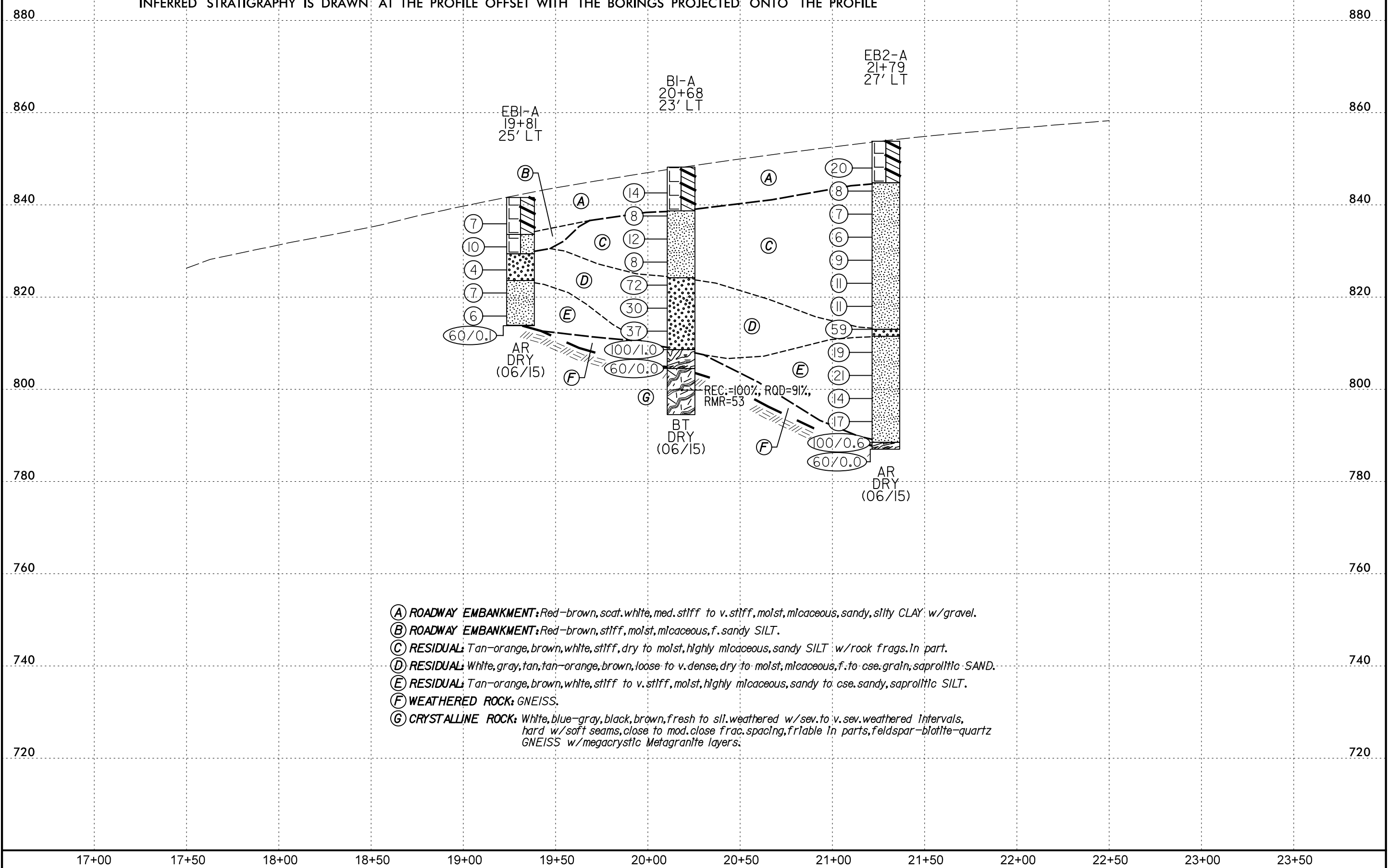
SOIL DESCRIPTION										GRADATION										ROCK DESCRIPTION										TERMS AND DEFINITIONS									
SOIL IS CONSIDERED UNCONSOLIDATED, SEMI-CONSOLIDATED, OR WEATHERED EARTH MATERIALS THAT CAN BE PENETRATED WITH A CONTINUOUS FLIGHT POWER AUGER AND YIELD LESS THAN 100 BLOWS PER FOOT ACCORDING TO THE STANDARD PENETRATION TEST (AASHTO T 206, ASTM D1586). SOIL CLASSIFICATION IS BASED ON THE AASHTO SYSTEM. BASIC DESCRIPTIONS GENERALLY INCLUDE THE FOLLOWING: CONSISTENCY, COLOR, TEXTURE, MOISTURE, AASHTO CLASSIFICATION, AND OTHER PERTINENT FACTORS SUCH AS MINERALOGICAL COMPOSITION, ANGULARITY, STRUCTURE, PLASTICITY, ETC. FOR EXAMPLE, <i>VERY STIFF, GRAY, SILTY CLAY, MOIST WITH INTERBEDDED FINE SAND LAYERS, HIGHLY PLASTIC, A-7-6</i>										WELL GRADED - INDICATES A GOOD REPRESENTATION OF PARTICLE SIZES FROM FINE TO COARSE. UNIFORMLY GRADED - INDICATES THAT SOIL PARTICLES ARE ALL APPROXIMATELY THE SAME SIZE. GAP-GRADED - INDICATES A MIXTURE OF UNIFORM PARTICLE SIZES OF TWO OR MORE SIZES.										HARD ROCK IS NON-COASTAL PLAIN MATERIAL THAT WOULD YIELD SPT REFUSAL IF TESTED, 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:  NON-COASTAL PLAIN MATERIAL THAT WOULD YIELD SPT N VALUES > 100 BLOWS PER FOOT IF TESTED.  FINE TO COARSE GRAIN IGNEOUS AND METAMORPHIC ROCK THAT WOULD YIELD SPT REFUSAL IF TESTED. ROCK TYPE INCLUDES GRANITE, GNEISS, GABBRO, SCHIST, ETC.  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 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, SUCH AS SHALE, SLATE, ETC. ARTESIAN - GROUND WATER THAT IS UNDER SUFFICIENT PRESSURE TO RISE ABOVE THE LEVEL AT WHICH IT IS ENCOUNTERED, BUT WHICH DOES NOT NECESSARILY RISE TO OR ABOVE THE GROUND SURFACE. CALCAREOUS (CALC.) - SOILS THAT CONTAIN APPRECIABLE AMOUNTS OF CALCIUM CARBONATE. COLLUVIUM - ROCK FRAGMENTS MIXED WITH SOIL DEPOSITED BY GRAVITY ON SLOPE OR AT BOTTOM OF SLOPE. CORE RECOVERY (REC.) - TOTAL LENGTH OF ALL MATERIAL RECOVERED IN THE CORE BARREL DIVIDED BY TOTAL LENGTH OF CORE RUN AND EXPRESSED AS A PERCENTAGE. DIKE - A TABULAR BODY OF IGNEOUS ROCK THAT CUTS ACROSS THE STRUCTURE OF ADJACENT ROCKS OR CUTS MASSIVE ROCK. DIP - THE ANGLE AT WHICH A STRATUM OR ANY PLANAR FEATURE IS INCLINED FROM THE HORIZONTAL. DIP DIRECTION (DIP AZIMUTH) - THE DIRECTION OR BEARING OF THE HORIZONTAL TRACE OF THE LINE OF DIP, MEASURED CLOCKWISE FROM NORTH. FAULT - A FRACTURE OR FRACTURE ZONE ALONG WHICH THERE HAS BEEN DISPLACEMENT OF THE SIDES RELATIVE TO ONE ANOTHER PARALLEL TO THE FRACTURE. FISSILE - A PROPERTY OF SPLITTING ALONG CLOSELY SPACED PARALLEL PLANES. FLOAT - ROCK FRAGMENTS ON SURFACE NEAR THEIR ORIGINAL POSITION AND DISLODGED FROM PARENT MATERIAL. FLOOD PLAIN (FP) - LAND BORDERING A STREAM, BUILT OF SEDIMENTS DEPOSITED BY THE STREAM. FORMATION (FM) - A MAPPABLE GEOLOGIC UNIT THAT CAN BE RECOGNIZED AND TRACED IN THE FIELD. JOINT - FRACTURE IN ROCK ALONG WHICH NO APPRECIABLE MOVEMENT HAS OCCURRED. LEDGE - A SHELF-LIKE RIDGE OR PROJECTION OF ROCK WHOSE THICKNESS IS SMALL COMPARED TO ITS LATERAL EXTENT. LENS - A BODY OF SOIL OR ROCK THAT THINS OUT IN ONE OR MORE DIRECTIONS. MOTTLED (MOT.) - IRREGULARLY MARKED WITH SPOTS OF DIFFERENT COLORS. MOTTLING IN SOILS USUALLY INDICATES POOR AERATION AND LACK OF GOOD DRAINAGE. PERCHED WATER - WATER MAINTAINED ABOVE THE NORMAL GROUND WATER LEVEL BY THE PRESENCE OF AN INTERVENING IMPERVIOUS STRATUM. RESIDUAL (RES.) SOIL - SOIL FORMED IN PLACE BY THE WEATHERING OF ROCK. ROCK QUALITY DESIGNATION (RQD) - A MEASURE OF ROCK QUALITY DESCRIBED BY TOTAL LENGTH OF ROCK SEGMENTS EQUAL TO OR GREATER THAN 4 INCHES DIVIDED BY THE TOTAL LENGTH OF CORE RUN AND EXPRESSED AS A PERCENTAGE. SAPROLITE (SAP.) - RESIDUAL SOIL THAT RETAINS THE RELIC STRUCTURE OR FABRIC OF THE PARENT ROCK. SILL - AN INTRUSIVE BODY OF IGNEOUS ROCK OF APPROXIMATELY UNIFORM THICKNESS AND RELATIVELY THIN COMPARED WITH ITS LATERAL EXTENT, THAT HAS BEEN EMPLACED PARALLEL TO THE BEDDING OR SCHISTOSITY OF THE INTRUDED ROCKS. SLICKENSIDE - POLISHED AND STRIATED SURFACE THAT RESULTS FROM FRICTION ALONG A FAULT OR SLIP PLANE. STANDARD PENETRATION TEST (PENETRATION RESISTANCE) (SPT) - NUMBER OF BLOWS (N OR BPF) OF A 140 LB. HAMMER FALLING 30 INCHES REQUIRED TO PRODUCE A PENETRATION OF 1 FOOT INTO SOIL WITH A 2 INCH OUTSIDE DIAMETER SPLIT SPOON SAMPLER. SPT REFUSAL IS PENETRATION EQUAL TO OR LESS THAN 0.1 FOOT PER 60 BLOWS. STRATA CORE RECOVERY (SREC.) - 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										ANGULARITY OF GRAINS										WEATHERING										MINERALOGICAL COMPOSITION									
GENERAL CLASS. GRANULAR MATERIALS (<= 35% PASSING #200) SILT-CLAY MATERIALS (> 35% PASSING #200) ORGANIC MATERIALS										THE ANGULARITY OR ROUNDNESS OF SOIL GRAINS IS DESIGNATED BY THE TERMS: ANGULAR, SUBANGULAR, SUBROUNDED, OR ROUNDED.										MINERAL NAMES SUCH AS QUARTZ, FELDSPAR, MICA, TALC, KAOLIN, ETC. ARE USED IN DESCRIPTIONS WHEN THEY ARE CONSIDERED OF SIGNIFICANCE.										SLIGHTLY COMPRESSIBLE LL < 31 MODERATELY COMPRESSIBLE LL = 31 - 50 HIGHLY COMPRESSIBLE LL > 50									
CONSISTENCY OR DENSENESS										PERCENTAGE OF MATERIAL										GROUND WATER										MISCELLANEOUS SYMBOLS									
PRIMARY SOIL TYPE COMPACTNESS OR CONSISTENCY RANGE OF STANDARD PENETRATION RESISTANCE (N-VALUE) RANGE OF UNCONFINED COMPRESSIVE STRENGTH (TONS/FT ²)										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										▽ WATER LEVEL IN BORE HOLE IMMEDIATELY AFTER DRILLING ▽ STATIC WATER LEVEL AFTER 24 HOURS ▽PW PERCHED WATER, SATURATED ZONE, OR WATER BEARING STRATA ○ SPRING OR SEEP										ROADWAY EMBANKMENT (RE) WITH SOIL DESCRIPTION DIP & DIP DIRECTION OF ROCK STRUCTURES SOIL SYMBOL SPT TEST BORING SLOPE INDICATOR INSTALLATION ARTIFICIAL FILL (AF) OTHER THAN ROADWAY EMBANKMENT AUGER BORING CONE PENETROMETER TEST INFERRED SOIL BOUNDARY CORE BORING SOUNDING ROD INFERRED ROCK LINE MONITORING WELL TEST BORING WITH CORE ALLUVIAL SOIL BOUNDARY PIEZOMETER INSTALLATION SPT N-VALUE									
TEXTURE OR GRAIN SIZE										RECOMMENDATION SYMBOLS										ROCK HARDNESS										ABBREVIATIONS									
U.S. STD. SIEVE SIZE OPENING (MM) 4 10 40 60 200 270 4.75 2.00 0.42 0.25 0.075 0.053										UNDERCUT EXCAVATION UNCLASSIFIED EXCAVATION - UNSUITABLE WASTE UNCLASSIFIED EXCAVATION - ACCEPTABLE BUT NOT TO BE USED IN THE TOP 3 FEET OF EMBANKMENT OR BACKFILL SHALLOW UNDERCUT UNCLASSIFIED EXCAVATION - ACCEPTABLE DEGRADABLE ROCK										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.										AR - AUGER REFUSAL HL - HIGHLY V - VERY BT - BORING TERMINATED MED. - MEDIUM VST - VANE SHEAR TEST CL - CLAY MICA - MICACEOUS WEA. - WEATHERED CPT - CONE PENETRATION TEST MOD. - MODERATELY 2 - UNIT WEIGHT CSE. - COARSE NP - NON PLASTIC 4 - DRY UNIT WEIGHT DMT - DILATOMETER TEST ORG. - ORGANIC SAMPLE ABBREVIATIONS DPT - DYNAMIC PENETRATION TEST PMT - PRESSUREMETER TEST S - BULK e - VOID RATIO SAP. - SAPROLITIC SAP. - SPLIT SPOON F - FINE SL. - SAND, SANDY ST - SHELBY TUBE FIAD - FLL IN AFTER DRILLING SO. - SILT, SILTY RS - ROCK FOSS. - FOSSILIFEROUS SO. - SAND, SANDY RT - RECOMPACTED TRIAXIAL FRAC. - FRACTURED, FRACTURES SL. - SILT, SILTY TCR - CALIFORNIA BEARING FRAGS. - FRAGMENTS TCR - TRICONE REFUSAL CR - CALIFORNIA BEARING w - MOISTURE CONTENT w - MOISTURE CONTENT RATIO									
SOIL MOISTURE - CORRELATION OF TERMS										SOIL MOISTURE SCALE (ATTERBERG LIMITS)										EQUIPMENT USED ON SUBJECT PROJECT										FRACATURE SPACING									
FIELD MOISTURE DESCRIPTION GUIDE FOR FIELD MOISTURE DESCRIPTION										SOIL MOISTURE SCALE (ATTERBERG LIMITS) FIELD MOISTURE DESCRIPTION GUIDE FOR FIELD MOISTURE DESCRIPTION										DRILL UNITS: ADVANCING TOOLS: HAMMER TYPE: <input checked="" type="checkbox"/> CME-45C <input type="checkbox"/> CLAY BITS <input checked="" type="checkbox"/> AUTOMATIC <input type="checkbox"/> MANUAL <input type="checkbox"/> CME-55 <input type="checkbox"/> 6" CONTINUOUS FLIGHT AUGER <input type="checkbox"/> CME-550 <input type="checkbox"/> 8" HOLLOW AUGERS <input type="checkbox"/> VANE SHEAR TEST <input type="checkbox"/> HARD FACED FINGER BITS <input type="checkbox"/> PORTABLE HOIST <input type="checkbox"/> TUNG-CARBIDE INSERTS <input type="checkbox"/> <input checked="" type="checkbox"/> CASING <input checked="" type="checkbox"/> W/ ADVANCER <input type="checkbox"/> TRICONE <input type="checkbox"/> *STEEL TEETH <input type="checkbox"/> TRICONE <input type="checkbox"/> *TUNG-CARB. <input type="checkbox"/> <input checked="" type="checkbox"/> CORE BIT										TERM SPACING THICKNESS VERY WIDE MORE THAN 10 FEET VERY THICKLY BEDDED 4 FEET WIDE 3 TO 10 FEET THICKLY BEDDED 1.5 - 4 FEET MODERATELY CLOSE 1 TO 3 FEET THINLY BEDDED 0.16 - 1.5 FEET CLOSE 0.16 TO 1 FOOT VERY THINLY BEDDED 0.03 - 0.16 FEET VERY CLOSE LESS THAN 0.16 FEET THICKLY LAMINATED 0.008 - 0.03 FEET THINLY LAMINATED < 0.008 FEET									
PLASTICITY										INDURATION										NOTES:																			
NON PLASTIC PLASTICITY INDEX (PI) DRY STRENGTH 0-5 VERY LOW SLIGHTLY PLASTIC 6-15 SLIGHT MODERATELY PLASTIC 16-25 MEDIUM HIGHLY PLASTIC 26 OR MORE HIGH										FOR SEDIMENTARY ROCKS, INDURATION IS THE HARDENING OF 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.										BORING ELEVATIONS OBTAINED USING R2707C_Is_tnl_i2080l.tin DATED 2-27-2015																			
COLOR										ELEVATION: NA FEET										DATE: 8-15-14																			
DESCRIPTIONS MAY INCLUDE COLOR OR COLOR COMBINATIONS (TAN, RED, YELLOW-BROWN, BLUE-BROWN). MODIFIERS SUCH AS LIGHT, DARK, STREAKED, ETC. ARE USED TO DESCRIBE APPEARANCE.																																							



PROJECT REFERENCE NO.	SHEET NO.
R-2707C	4
PROFILE	

GENERALIZED SUBSURFACE PROFILE 20' Lt. of -Y3-

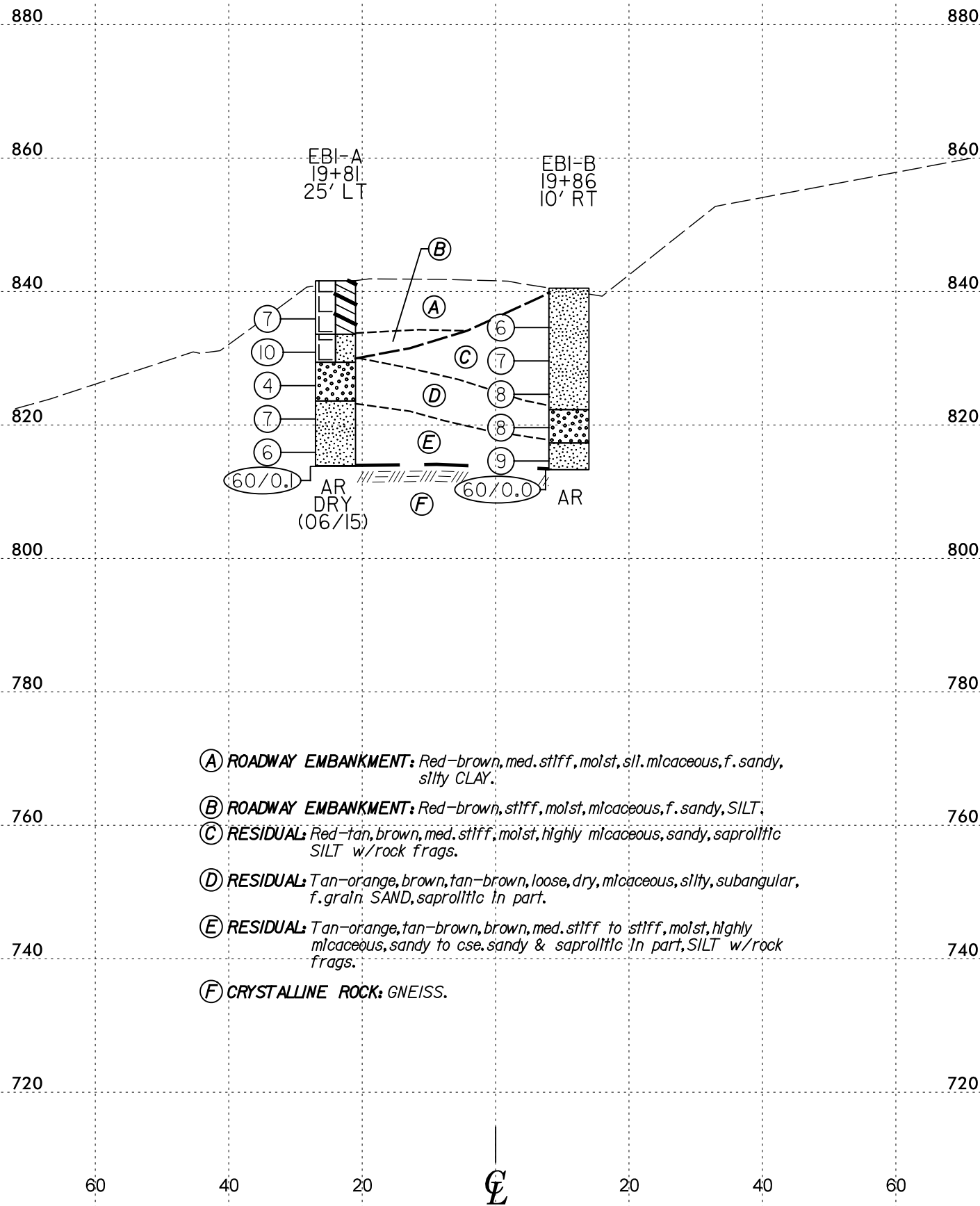
GROUNDLINE PROFILE OBTAINED FROM DTM PROVIDED BY OTHERS
 INFERRED STRATIGRAPHY IS DRAWN AT THE PROFILE OFFSET WITH THE BORINGS PROJECTED ONTO THE PROFILE



- (A) ROADWAY EMBANKMENT: Red-brown, scat. white, med. stiff to v. stiff, moist, micaceous, sandy, silty CLAY w/ gravel.
- (B) ROADWAY EMBANKMENT: Red-brown, stiff, moist, micaceous, f. sandy SILT.
- (C) RESIDUAL: Tan-orange, brown, white, stiff, dry to moist, highly micaceous, sandy SILT w/ rock frags. In part.
- (D) RESIDUAL: White, gray, tan, tan-orange, brown, loose to v. dense, dry to moist, micaceous, f. to cse. grain, saprolitic SAND.
- (E) RESIDUAL: Tan-orange, brown, white, stiff to v. stiff, moist, highly micaceous, sandy to cse. sandy, saprolitic SILT.
- (F) WEATHERED ROCK: GNEISS.
- (G) CRYSTALLINE ROCK: White, blue-gray, black, brown, fresh to sl. weathered w/ sev. to v. sev. weathered intervals, hard w/ soft seams, close to mod. close frac. spacing, friable in parts, feldspar-blotite-quartz GNEISS w/ megacrystic Metagranite layers.

GENERALIZED SUBSURFACE CROSS SECTION STA. 19+77

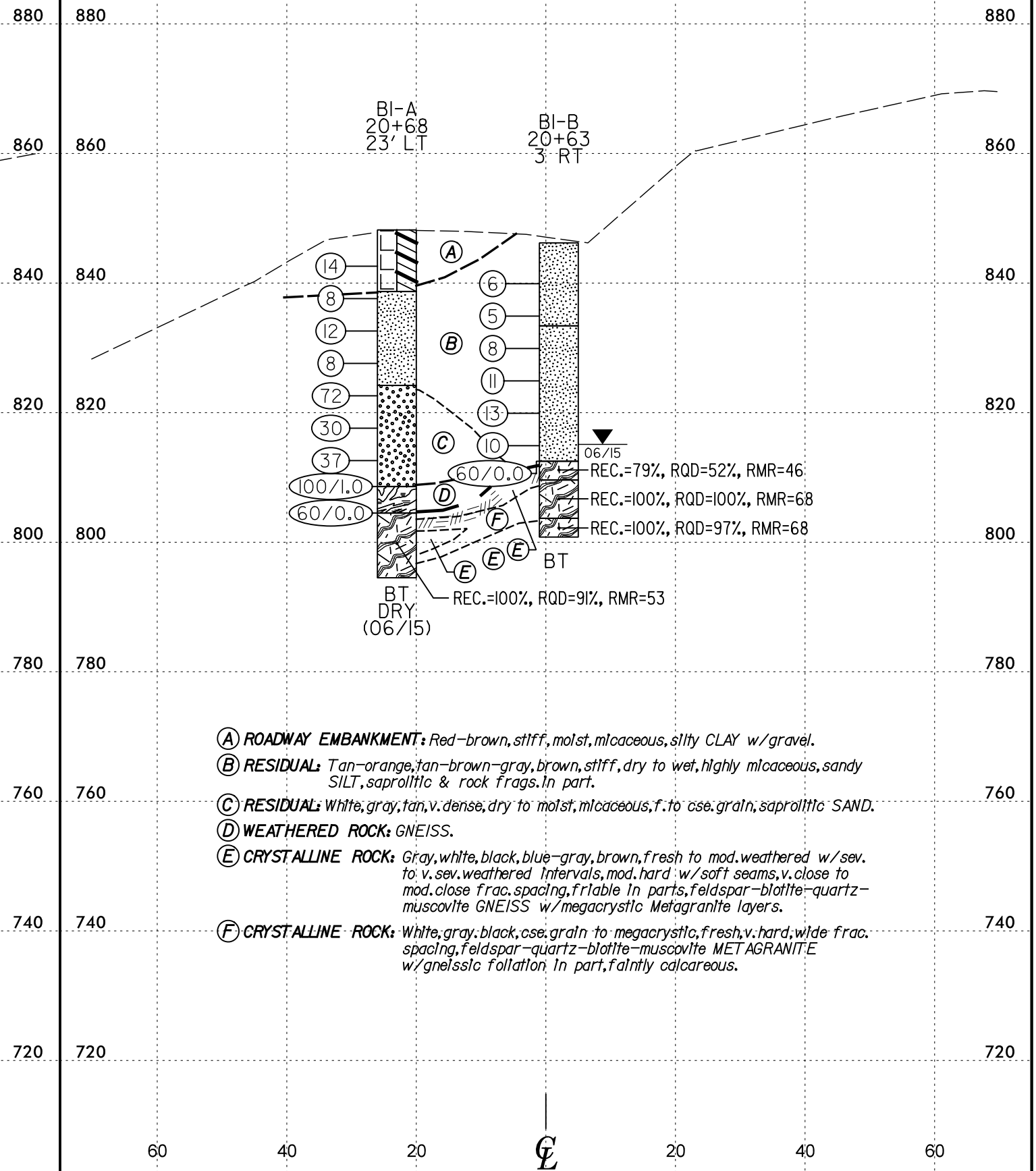
84°22'21" SKEW
-Y3-



- (A) ROADWAY EMBANKMENT: Red-brown, med. stiff, moist, sil. micaceous, f. sandy, silty CLAY.
- (B) ROADWAY EMBANKMENT: Red-brown, stiff, moist, micaceous, f. sandy, SILT.
- (C) RESIDUAL: Red-tan, brown, med. stiff, moist, highly micaceous, sandy, saprolitic SILT w/rock frags.
- (D) RESIDUAL: Tan-orange, brown, tan-brown, loose, dry, micaceous, silty, subangular, f. grain SAND, saprolitic in part.
- (E) RESIDUAL: Tan-orange, tan-brown, brown, med. stiff to stiff, moist, highly micaceous, sandy to cse. sandy & saprolitic in part, SILT w/rock frags.
- (F) CRYSTALLINE ROCK: GNEISS.

GENERALIZED SUBSURFACE CROSS SECTION STA. 20+70

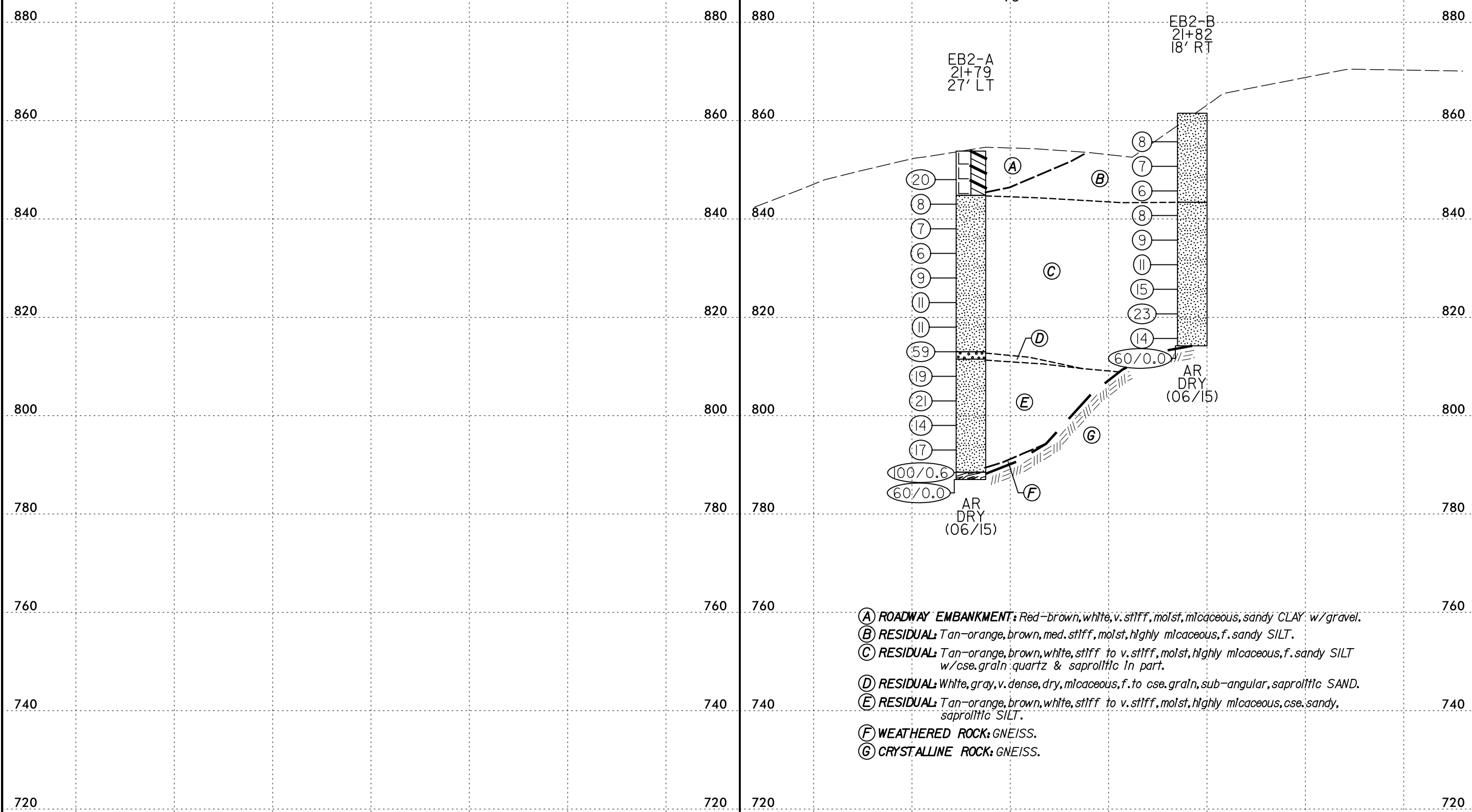
84°22'21" SKEW
-Y3-



- (A) ROADWAY EMBANKMENT: Red-brown, stiff, moist, micaceous, silty CLAY w/gravel.
- (B) RESIDUAL: Tan-orange, tan-brown-gray, brown, stiff, dry to wet, highly micaceous, sandy SILT, saprolitic & rock frags. in part.
- (C) RESIDUAL: White, gray, tan, v. dense, dry to moist, micaceous, f. to cse. grain, saprolitic SAND.
- (D) WEATHERED ROCK: GNEISS.
- (E) CRYSTALLINE ROCK: Gray, white, black, blue-gray, brown, fresh to mod. weathered w/sev. to v. sev. weathered intervals, mod. hard w/soft seams, v. close to mod. close frac. spacing, friable in parts, feldspar-biotite-quartz-muscovite GNEISS w/megacrystic Metagranite layers.
- (F) CRYSTALLINE ROCK: White, gray, black, cse. grain to megacrystic, fresh, v. hard, wide frac. spacing, feldspar-quartz-biotite-muscovite METAGRANITE w/gneissic foliation in part, faintly calcareous.

GENERALIZED SUBSURFACE CROSS SECTION STA. 21+92

84°22'21" SKEW
-Y3-



- (A) ROADWAY EMBANKMENT: Red-brown, white, v. stiff, moist, micaceous, sandy CLAY w/gravel.
- (B) RESIDUAL: Tan-orange, brown, med. stiff, moist, highly micaceous, f. sandy SILT.
- (C) RESIDUAL: Tan-orange, brown, white, stiff to v. stiff, moist, highly micaceous, f. sandy SILT w/cse. grain quartz & saprolitic in part.
- (D) RESIDUAL: White, gray, v. dense, dry, micaceous, f. to cse. grain, sub-angular, saprolitic SAND.
- (E) RESIDUAL: Tan-orange, brown, white, stiff to v. stiff, moist, highly micaceous, cse. sandy, saprolitic SILT.
- (F) WEATHERED ROCK: GNEISS.
- (G) CRYSTALLINE ROCK: GNEISS.

HORIZ. SCALE 0 20 40 (FEET)

VE = NONE

HORIZ. SCALE 0 20 40 (FEET)

VE = NONE

END BENT 2 - CROSS SECTION

NCDOT GEOTECHNICAL ENGINEERING UNIT
BORELOG REPORT

WBS 34491.1.2	TIP R-2707C	COUNTY CLEVELAND	GEOLOGIST Delost, Robbie
SITE DESCRIPTION Proposed Bridge (Structure 4) on -Y3- over -L-			GROUND WTR (ft)
BORING NO. B1-A	STATION 20+68	OFFSET 23 ft LT	ALIGNMENT -Y3-
COLLAR ELEV. 848.2 ft	TOTAL DEPTH 53.7 ft	NORTHING 582,851	EASTING 1,242,719
DRILL RIG/HAMMER EFF./DATE HDR0404 CME-45C 90% 08/25/2014		DRILL METHOD SPT Core Boring	HAMMER TYPE Automatic
DRILLER Morgan, M.	START DATE 06/09/15	COMP. DATE 06/09/15	SURFACE WATER DEPTH N/A

ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT			BLOWS PER FOOT					SAMP. NO.	LOG	SOIL AND ROCK DESCRIPTION	
			0.5ft	0.5ft	0.5ft	0	25	50	75	100				ELEV. (ft)
850														848.2 GROUND SURFACE 0.0
845														ROADWAY EMBANKMENT Red-brown, stiff, micaceous, silty CLAY w/gravel (A-6).
840	843.6	4.6	6	6	8									
835	838.6	9.6	4	3	5									838.7 RESIDUAL 9.5
830	833.6	14.6	5	5	7									Tan-orange, brown, stiff, highly micaceous, sandy SILT (4-4).
825	828.6	19.6	4	4	4									
820	823.6	24.6	38	10	62									824.2 24.0
815	818.6	29.6	8	12	18									White, gray, tan, v. dense, micaceous, fine to cse. grain, saprolitic SAND (A-2-4).
810	813.6	34.6	11	26	11									
805	808.6	39.6	100/1.0											808.6 WEATHERED ROCK 39.6
800	804.5	43.7	60/0.0											804.5 43.7
795														794.5 53.7
														Boring Terminated at Elevation 794.5 ft in Crystalline Rock (Gneiss).

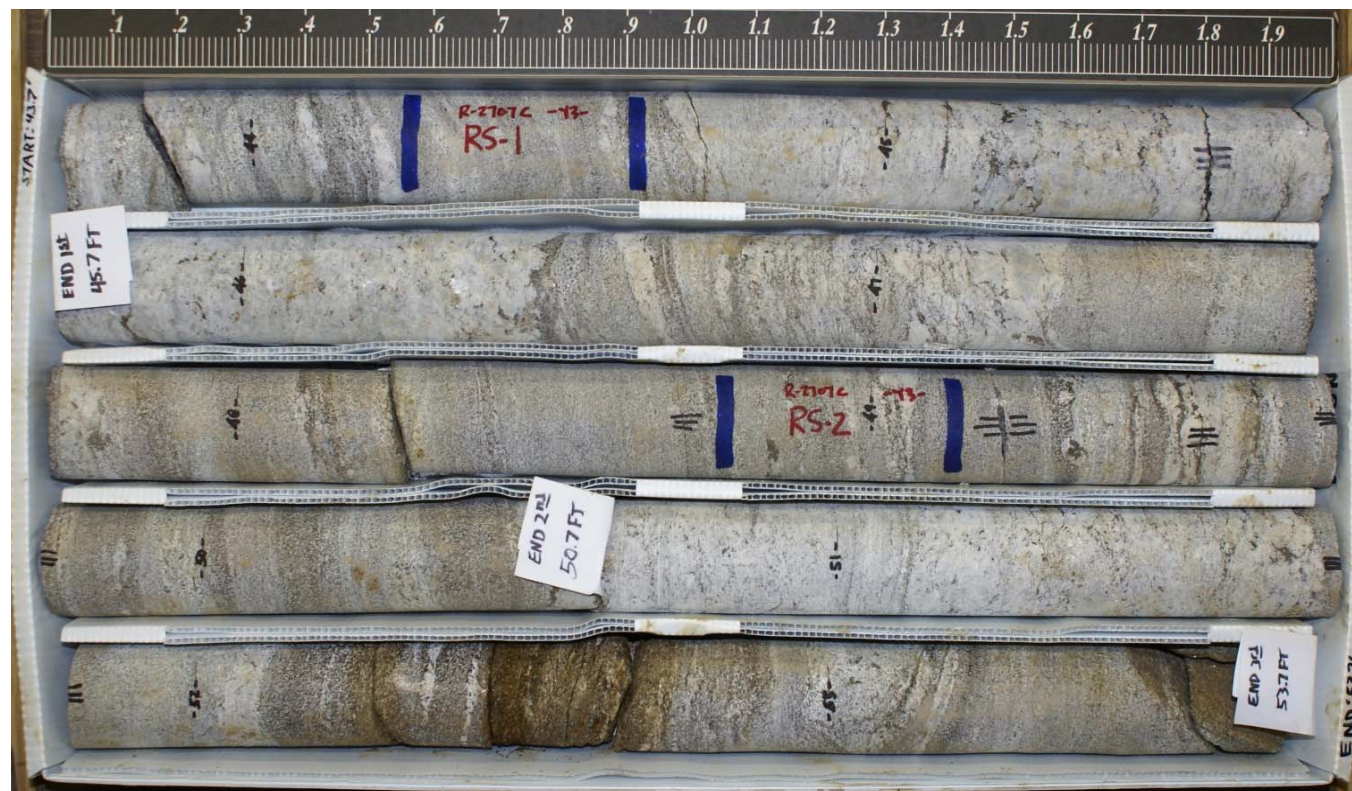
NCDOT BORE DOUBLE R2707C_GEO_BRDG_Y3 OVER L.GPJ NC_DOT_GDT 6/30/15

NCDOT GEOTECHNICAL ENGINEERING UNIT
CORE BORING REPORT

WBS 34491.1.2		TIP R-2707C		COUNTY CLEVELAND		GEOLOGIST Delost, Robbie					
SITE DESCRIPTION Proposed Bridge (Structure 4) on -Y3- over -L-							GROUND WTR (ft)				
BORING NO. B1-A		STATION 20+68		OFFSET 23 ft LT		ALIGNMENT -Y3-					
COLLAR ELEV. 848.2 ft		TOTAL DEPTH 53.7 ft		NORTHING 582,851		EASTING 1,242,719					
DRILL RIG/HAMMER EFF./DATE HDR0404 CME-45C 90% 08/25/2014				DRILL METHOD SPT Core Boring		HAMMER TYPE Automatic					
DRILLER Morgan, M.		START DATE 06/09/15		COMP. DATE 06/09/15		SURFACE WATER DEPTH N/A					
CORE SIZE NQ2		TOTAL RUN 10.0 ft									
ELEV (ft)	RUN ELEV (ft)	DEPTH (ft)	RUN (ft)	DRILL RATE (Min/ft)	RUN		STRATA		LOG	DESCRIPTION AND REMARKS	DEPTH (ft)
					REC. (ft) %	RQD (ft) %	REC. (ft) %	RQD (ft) %			
804.5	804.5	43.7	2.0	N=60/0.0 2:03 3:07	(2.0) 100%	(1.8) 90%	(10.0) 100%	(9.1) 91%		Begin Coring @ 43.7 ft	43.7
	802.5	45.7	5.0	2:36 2:01 1:54 1:36	(5.0) 100%	(4.9) 98%				CRYSTALLINE ROCK White, blue-gray, black, brown, fresh to slight, weathered, w/sev. to v. sev. weathered intervals (52.4'-53.7'), hard, w/soft seams, mod. close to close frags., friable, in parts, feldspar biotite, quartz, Gneiss w/megacrystic, metagranite layers (44.7'-46.5' & 50.7'-51.9'). 9@0°-20°; 2@40° R1=7, R2=17, R3=10, R4=12, R5=7, RMR=53 Rock Type E	
800	797.5	50.7	3.0	1:52 2:02 1:32	(3.0) 100%	(2.4) 80%					
795	794.5	53.7									
Boring Terminated at Elevation 794.5 ft in Crystalline Rock (Gneiss).											

NCDOT CORE DOUBLE R2707C_GEO_BRDG_Y3 OVER L.GPJ NC_DOT.GDT 7/6/15

CORE PHOTOGRAPHIC RECORD
PROPOSED BRIDGE STRUCTURE 4 ON -Y3- OVER -L-
WBS 34491.1.2 TIP R-2707C



B1-A, 20+68, 23' LT. Box 1 of 1

NCDOT GEOTECHNICAL ENGINEERING UNIT
BORELOG REPORT

WBS 34491.1.2		TIP R-2707C		COUNTY CLEVELAND		GEOLOGIST Delost, Robbie									
SITE DESCRIPTION Proposed Bridge (Structure 4) on -Y3- over -L-							GROUND WTR (ft)								
BORING NO. B1-B		STATION 20+63		OFFSET 3 ft RT		ALIGNMENT -Y3-									
COLLAR ELEV. 846.2 ft		TOTAL DEPTH 45.4 ft		NORTHING 582,848		EASTING 1,242,693									
DRILL RIG/HAMMER EFF./DATE HDR0404 CME-45C 90% 08/25/2014				DRILL METHOD NW Casing W/SPT & Core		HAMMER TYPE Automatic									
DRILLER Morgan, M.		START DATE 06/08/15		COMP. DATE 06/08/15		SURFACE WATER DEPTH N/A									
ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT			BLOWS PER FOOT					SAMP. NO.	LOG	SOIL AND ROCK DESCRIPTION		
			0.5ft	0.5ft	0.5ft	0	25	50	75	100			ELEV. (ft)	DEPTH (ft)	
850															
845														846.2	GROUND SURFACE 0.0
840	840.9	5.3	1	3	3							M			
835	835.9	10.3	2	2	3							W			
830	830.9	15.3	4	3	5							M		833.4	Tan-brown-gray, stiff, highly micaceous, cse. sandy, saprolitic SILT w/rock frags. (A-4). 12.8
825	825.9	20.3	4	5	6							M			
820	820.9	25.3	4	4	9							M			
815	815.9	30.3	5	4	6							M			
810	812.5	33.7	60/0.0										RS-3	812.5	CRYSTALLINE ROCK Gneiss 33.7
														809.6	Metagranite 36.6
														803.7	Gneiss 42.5
														800.8	Gneiss 45.4
															Boring Terminated at Elevation 800.8 ft in Crystalline Rock (Gneiss). Boring relocated due to underground utilities and steep embankment.

NCDOT BORE DOUBLE R2707C_GEO_BRDG_Y3 OVER L.GPJ NC_DOT.GDT 7/6/15



NCDOT GEOTECHNICAL ENGINEERING UNIT

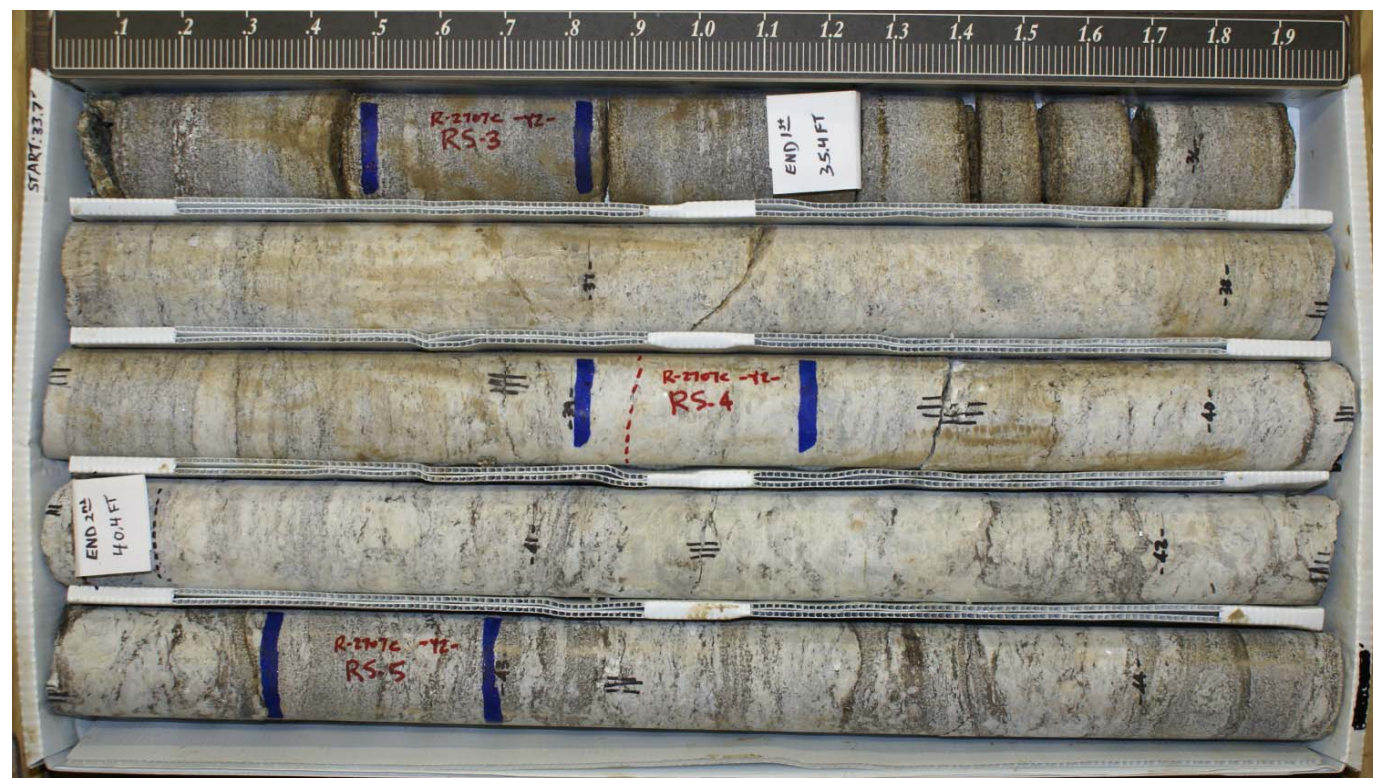
CORE BORING REPORT

WBS 34491.1.2		TIP R-2707C		COUNTY CLEVELAND		GEOLOGIST Delost, Robbie					
SITE DESCRIPTION Proposed Bridge (Structure 4) on -Y3- over -L-							GROUND WTR (ft)				
BORING NO. B1-B		STATION 20+63		OFFSET 3 ft RT		ALIGNMENT -Y3-					
COLLAR ELEV. 846.2 ft		TOTAL DEPTH 45.4 ft		NORTHING 582,848		EASTING 1,242,693					
DRILL RIG/HAMMER EFF./DATE HDR0404 CME-45C 90% 08/25/2014				DRILL METHOD NW Casing W/SPT & Core		HAMMER TYPE Automatic					
DRILLER Morgan, M.		START DATE 06/08/15		COMP. DATE 06/08/15		SURFACE WATER DEPTH N/A					
CORE SIZE NQ2		TOTAL RUN 11.7 ft									
ELEV (ft)	RUN ELEV (ft)	DEPTH (ft)	RUN (ft)	DRILL RATE (Min/ft)	RUN		STRATA		LOG	DESCRIPTION AND REMARKS	DEPTH (ft)
					REC. (ft) %	RQD (ft) %	SAMP. NO.	REC. (ft) %			
812.5										Begin Coring @ 33.7 ft	
	812.5	33.7	1.7	N=60/0.0	(1.2)	(1.1)	(2.3)	(1.5)		CRYSTALLINE ROCK	33.7
810	810.8	35.4	5.0	3:35 1:30/0.7	71%	65%	79%	52%	RS-3	Gray, white, black, sli. to mod. weathered w/seams sev. to v. sev., mod. hard to hard, v. close to close frac. spacing, friable at discontinuities, feldspar-biotite-muscovite gneiss w/trc. garnets.	36.6
				2:07 2:34 2:32 2:13 1:58	(4.9) 98%	(4.4) 88%	(5.9) 100%	(5.9) 100%	RS-4	10@0°-10° R1=4, R2=13, R3=10, R4=12, R5=7, RMR=46 Rock Type E	
805	805.8	40.4	5.0	2:11 2:47 1:22 1:55 1:59	(5.0) 100%	(5.0) 100%	(2.9) 100%	(2.8) 97%	RS-5	White, gray, black, cse grain to megacrystic, fresh, v. hard, wide frac. spacing, feldspar-quartz-biotite-muscovite, metagranite, w/gneissic foliation in part, faintly calcareous	42.5
										1@40° R1=4, R2=20, R3=20, R4=20, R5=4, RMR=68 Rock Type E	45.4
	800.8	45.4								Gray, black, white, fresh, hard, mod. close frac. spacing, feldspar-biotite-gneiss, faintly calcareous	
										2@10°-15° R1=4, R2=20, R3=20, R4=20, R5=4, RMR=68 Rock Type E	
										Boring Terminated at Elevation 800.8 ft in Crystalline Rock (Gneiss).	
										Boring relocated due to underground utilities and steep embankment.	

NCDOT CORE DOUBLE R2707C_GEO_BRDG_Y3 OVER LGPJ_NC_DOT.GDT 7/6/15

CORE PHOTOGRAPHIC RECORD

PROPOSED BRIDGE STRUCTURE 4 ON -Y3- OVER -L-
WBS 34491.1.2 TIP R-2707C



B1-B, 20+63, 3' RT. Box 1 of 2



B1-B, 20+63, 3' RT. Box 2 of 2

