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REFERENCE: B-5327

PROJECT: 46041

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

STRUCTURE
SUBSURFACE INVESTIGATION

COUNTY PERSON
PROJECT DESCRIPTION REPLACE BRIDGE NO. 49 ON
SR 1300 (CONCORD CHURCH RD) OVER SOUTH
HYCO CREEK

CONTENTS

<u>SHEET NO.</u>	<u>DESCRIPTION</u>
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4	PROFILE
5-8	CROSS SECTIONS
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16	SOIL AND ROCK TEST RESULTS
17	SITE PHOTOGRAPHS

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	B-5327	1	17

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

GOODNIGHT, D. J.

TRIGON EXP.

INVESTIGATED BY DJG

DRAWN BY HUNSBERGER, W. S.

CHECKED BY HAMM, J. R.

SUBMITTED BY FALCON

DATE AUGUST 2016

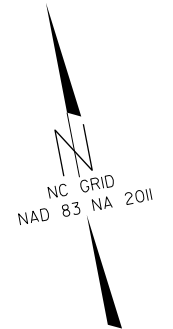
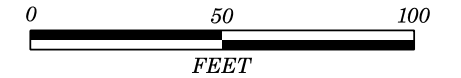


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W. Scott Hunsberger 9/9/2016
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NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS
GEOTECHNICAL ENGINEERING UNIT
SUBSURFACE INVESTIGATION
SOIL AND ROCK LEGEND, TERMS, SYMBOLS, AND ABBREVIATIONS

SOIL DESCRIPTION										GRADATION										ROCK DESCRIPTION										TERMS AND DEFINITIONS									
<p>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, VERY STIFF, GRAY, SILTY CLAY, MOIST WITH INTERBEDDED FINE SAND LAYERS, HIGHLY PLASTIC, A-7-6</p>										<p>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.</p>										<p>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:</p>										<p>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 DISLOGGED FROM PARENT MATERIAL. FLOOD PLAIN (FP) - LAND BORDERING A STREAM, BUILT OF SEDIMENTS DEPOSITED BY THE STREAM. FORMATION (FM) - A MAPPABLE GEOLOGIC UNIT THAT CAN BE RECOGNIZED AND TRACED IN THE FIELD. JOINT - FRACTURE IN ROCK ALONG WHICH NO APPRECIABLE MOVEMENT HAS OCCURRED. LEDGE - A SHELF-LIKE RIDGE OR PROJECTION OF ROCK WHOSE THICKNESS IS SMALL COMPARED TO ITS LATERAL EXTENT. LENS - A BODY OF SOIL OR ROCK THAT THINS OUT IN ONE OR MORE DIRECTIONS. MOTTLED (MOT.) - IRREGULARLY MARKED WITH SPOTS OF DIFFERENT COLORS. MOTTLING IN SOILS USUALLY INDICATES POOR AERATION AND LACK OF GOOD DRAINAGE. PERCHED WATER - WATER MAINTAINED ABOVE THE NORMAL GROUND WATER LEVEL BY THE PRESENCE OF AN INTERVENING IMPERVIOUS STRATUM. RESIDUAL (RES.) SOIL - SOIL FORMED IN PLACE BY THE WEATHERING OF ROCK. ROCK QUALITY DESIGNATION (ROD) - A MEASURE OF ROCK QUALITY DESCRIBED BY TOTAL LENGTH OF ROCK SEGMENTS EQUAL TO OR GREATER THAN 4 INCHES DIVIDED BY THE TOTAL LENGTH OF CORE RUN AND EXPRESSED AS A PERCENTAGE. SAPROLITE (SAP.) - RESIDUAL SOIL THAT RETAINS THE RELIC STRUCTURE OR FABRIC OF THE PARENT ROCK. SILL - AN INTRUSIVE BODY OF IGNEOUS ROCK OF APPROXIMATELY UNIFORM THICKNESS AND RELATIVELY THIN COMPARED WITH ITS LATERAL EXTENT, THAT HAS BEEN EMPLACED PARALLEL TO THE BEDDING OR SCHISTOSITY OF THE INTRUDED ROCKS. SLICKENSIDE - POLISHED AND STRIATED SURFACE THAT RESULTS FROM FRICTION ALONG A FAULT OR SLIP PLANE. STANDARD PENETRATION TEST (PENETRATION RESISTANCE) (SPT) - NUMBER OF BLOWS (IN OR BPF) OF A 140 LB. HAMMER FALLING 30 INCHES REQUIRED TO PRODUCE A PENETRATION OF 1 FOOT INTO SOIL WITH A 2 INCH OUTSIDE DIAMETER SPLIT SPOON SAMPLER. SPT REFUSAL IS PENETRATION EQUAL TO OR LESS THAN 0.1 FOOT PER 60 BLOWS. STRATA CORE RECOVERY (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.</p>									
SOIL LEGEND AND AASHTO CLASSIFICATION										ANGULARITY OF GRAINS										MINERALOGICAL COMPOSITION										COMPRESSION									
<p>GENERAL CLASS. GRANULAR MATERIALS (<= 35% PASSING #200) SILT-CLAY MATERIALS (> 35% PASSING #200) ORGANIC MATERIALS</p>										<p>THE ANGULARITY OR ROUNDNESS OF SOIL GRAINS IS DESIGNATED BY THE TERMS: ANGULAR, SUBANGULAR, SUBROUNDED, OR ROUNDED.</p>										<p>MINERAL NAMES SUCH AS QUARTZ, FELDSPAR, MICA, TALC, KAOLIN, ETC. ARE USED IN DESCRIPTIONS WHEN THEY ARE CONSIDERED OF SIGNIFICANCE.</p>										<p>SLIGHTLY COMPRESSIBLE LL < 31 MODERATELY COMPRESSIBLE LL = 31 - 50 HIGHLY COMPRESSIBLE LL > 50</p>									
CONSISTENCY OR DENSENESS										PERCENTAGE OF MATERIAL										GROUND WATER										WEATHERING									
<p>PRIMARY SOIL TYPE COMPACTNESS OR CONSISTENCY RANGE OF STANDARD PENETRATION RESISTANCE (N-VALUE) RANGE OF UNCONFINED COMPRESSIVE STRENGTH (TONS/FT²)</p>										<p>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</p>										<p>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</p>										<p>FRESH ROCK FRESH, CRYSTALS BRIGHT, FEW JOINTS MAY SHOW SLIGHT STAINING. ROCK RINGS UNDER HAMMER IF CRYSTALLINE. VERY SLIGHT (IV 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. IF TESTED, WOULD YIELD SPT REFUSAL 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. IF TESTED, WOULD YIELD SPT N VALUES > 100 BPF VERY SEVERE (IV SEV.) ALL ROCK EXCEPT QUARTZ DISCOLORED OR STAINED. ROCK FABRIC ELEMENTS ARE DISCERNIBLE BUT MASS IS EFFECTIVELY REDUCED TO SOIL STATUS, WITH ONLY FRAGMENTS OF STRONG ROCK REMAINING. SAPROLITE IS AN EXAMPLE OF ROCK WEATHERED TO A DEGREE THAT ONLY MINOR VESTIGES OF ORIGINAL ROCK FABRIC REMAIN. IF TESTED, WOULD YIELD SPT N VALUES < 100 BPF 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.</p>									
TEXTURE OR GRAIN SIZE										MISCELLANEOUS SYMBOLS										RECOMMENDATION SYMBOLS										ABBREVIATIONS									
<p>U.S. STD. SIEVE SIZE OPENING (MM) 4 10 40 60 200 270 4.76 2.00 0.42 0.25 0.075 0.053</p>										<p>ROADWAY EMBANKMENT (RE) WITH SOIL DESCRIPTION SOIL SYMBOL ARTIFICIAL FILL (AF) OTHER THAN ROADWAY EMBANKMENT INFERRED SOIL BOUNDARY INFERRED ROCK LINE ALLUVIAL SOIL BOUNDARY</p>										<p>UNDERCUT EXCAVATION SHALLOW UNDERCUT UNCLASSIFIED EXCAVATION - UNSUITABLE WASTE UNCLASSIFIED EXCAVATION - ACCEPTABLE DEGRADABLE ROCK UNCLASSIFIED EXCAVATION - ACCEPTABLE, BUT NOT TO BE USED IN THE TOP 3 FEET OF EMBANKMENT OR BACKFILL</p>										<p>AR - AUGER REFUSAL BT - BORING TERMINATED CL - CLAY CPT - COARSE 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. - 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 VST - VANE SHEAR TEST WEA. - WEATHERED W - UNIT WEIGHT W_d - DRY UNIT WEIGHT SAMPLE ABBREVIATIONS S - BULK SS - SPLIT SPOON ST - SHELBY TUBE RS - ROCK RT - RECOMPACTED TRIAXIAL CBR - CALIFORNIA BEARING RATIO</p>									
SOIL MOISTURE - CORRELATION OF TERMS										EQUIPMENT USED ON SUBJECT PROJECT										FRACTURE SPACING										BEDDING									
<p>SOIL MOISTURE SCALE (ATTERBERG LIMITS) FIELD MOISTURE DESCRIPTION GUIDE FOR FIELD MOISTURE DESCRIPTION</p>										<p>DRILL UNITS: CME-45C, CME-55, CME-550, VANE SHEAR TEST, PORTABLE HOIST ADVANCING TOOLS: CLAY BITS, 6" CONTINUOUS FLIGHT AUGER, 8" HOLLOW AUGERS, HARD FACED FINGER BITS, TUNG-CARBIDE INSERTS, CASING w/ ADVANCER, TRICONE 2-15/16" STEEL TEETH, TRICONE TUNG-CARB., CORE BIT HAMMER TYPE: AUTOMATIC, MANUAL CORE SIZE: B, H, N Q2 HAND TOOLS: POST HOLE DIGGER, HAND AUGER, SOUNDING ROD, VANE SHEAR TEST</p>										<p>VERY WIDE MORE THAN 10 FEET WIDE 3 TO 10 FEET MODERATELY CLOSE 1 TO 3 FEET CLOSE 0.16 TO 1 FOOT VERY CLOSE LESS THAN 0.16 FEET</p>										<p>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</p>									
PLASTICITY										INDURATION										BENCH MARK										NOTES									
<p>NON PLASTIC 0-5 VERY LOW SLIGHTLY PLASTIC 6-15 SLIGHT MODERATELY PLASTIC 16-25 MEDIUM HIGHLY PLASTIC 26 OR MORE HIGH</p>										<p>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.</p>										<p>BENCH MARK: B-5327 BL-5 - 36" REBAR WITH ALUMINUM TRAVERSE CAP N: 980520 E: 1972640 -L- 12+50.12, 16 ft LT ELEVATION: 416.80 FEET</p>										<p>FIAD - FILLED IMMEDIATELY AFTER DRILLING</p>									
COLOR										INDURATION										BENCH MARK										NOTES									
<p>DESCRIPTORS MAY INCLUDE COLOR OR COLOR COMBINATIONS (TAN, RED, YELLOW-BROWN, BLUE-GRAY). MODIFIERS SUCH AS LIGHT, DARK, STREAKED, ETC. ARE USED TO DESCRIBE APPEARANCE.</p>										<p>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.</p>										<p>BENCH MARK: B-5327 BL-5 - 36" REBAR WITH ALUMINUM TRAVERSE CAP N: 980520 E: 1972640 -L- 12+50.12, 16 ft LT ELEVATION: 416.80 FEET</p>										<p>FIAD - FILLED IMMEDIATELY AFTER DRILLING</p>									

BEGIN TIP PROJECT B-5327
-L- STA 10+00.00



12+00

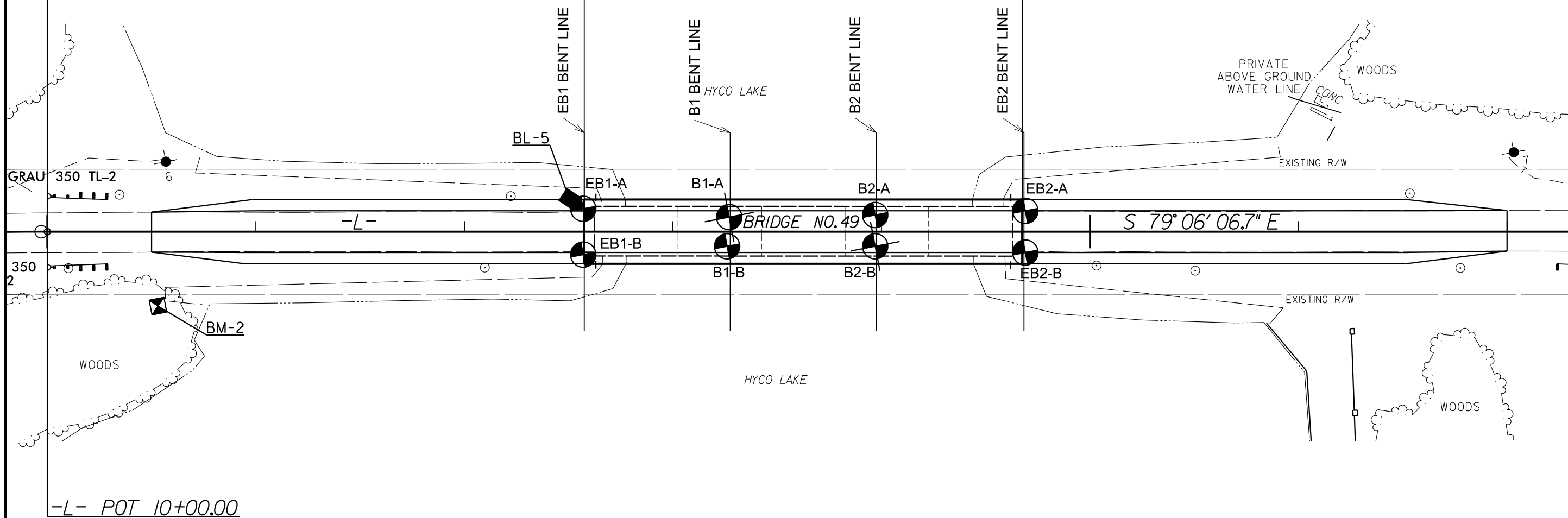
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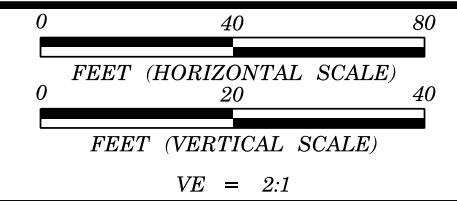
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15+00

BEGIN BRIDGE
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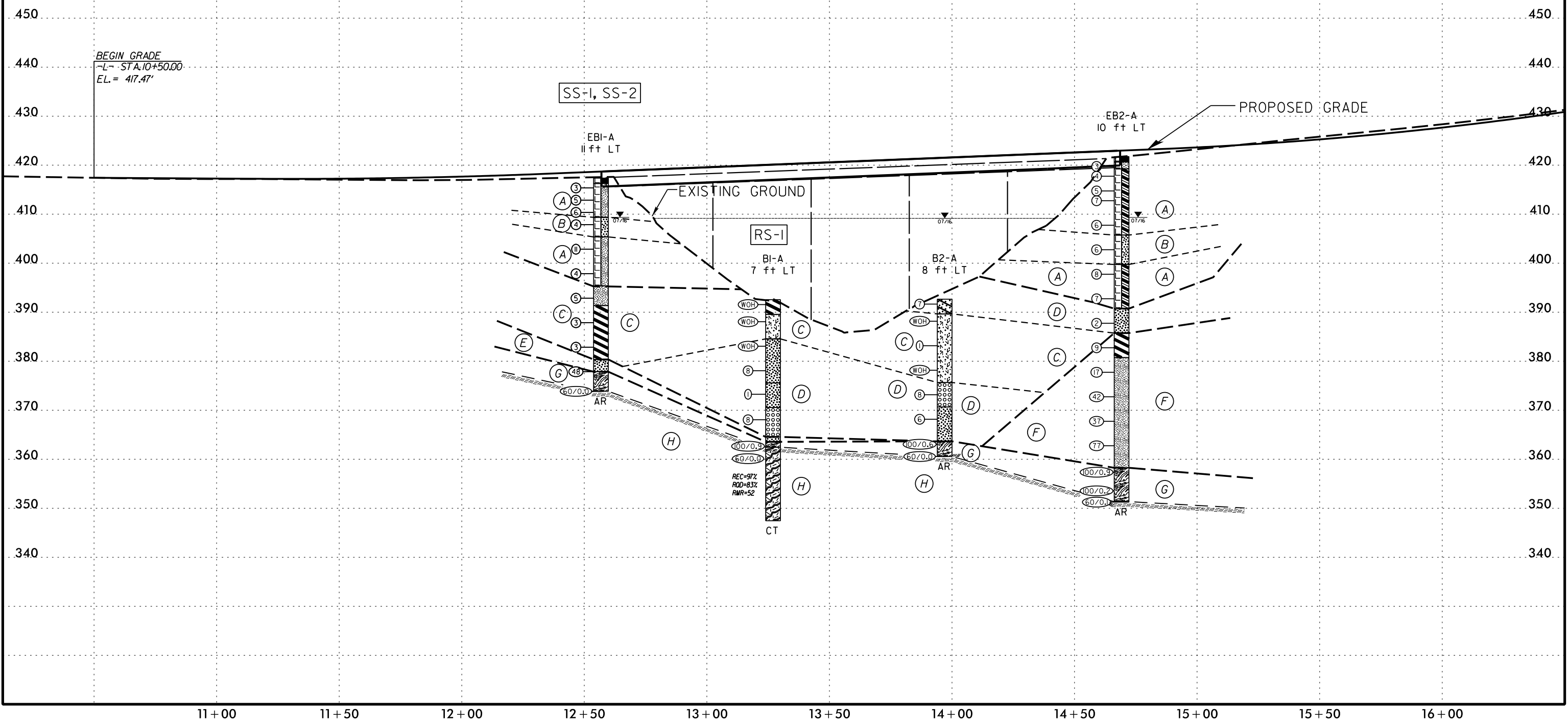
END BRIDGE
-L- STA 14+67.50 ±



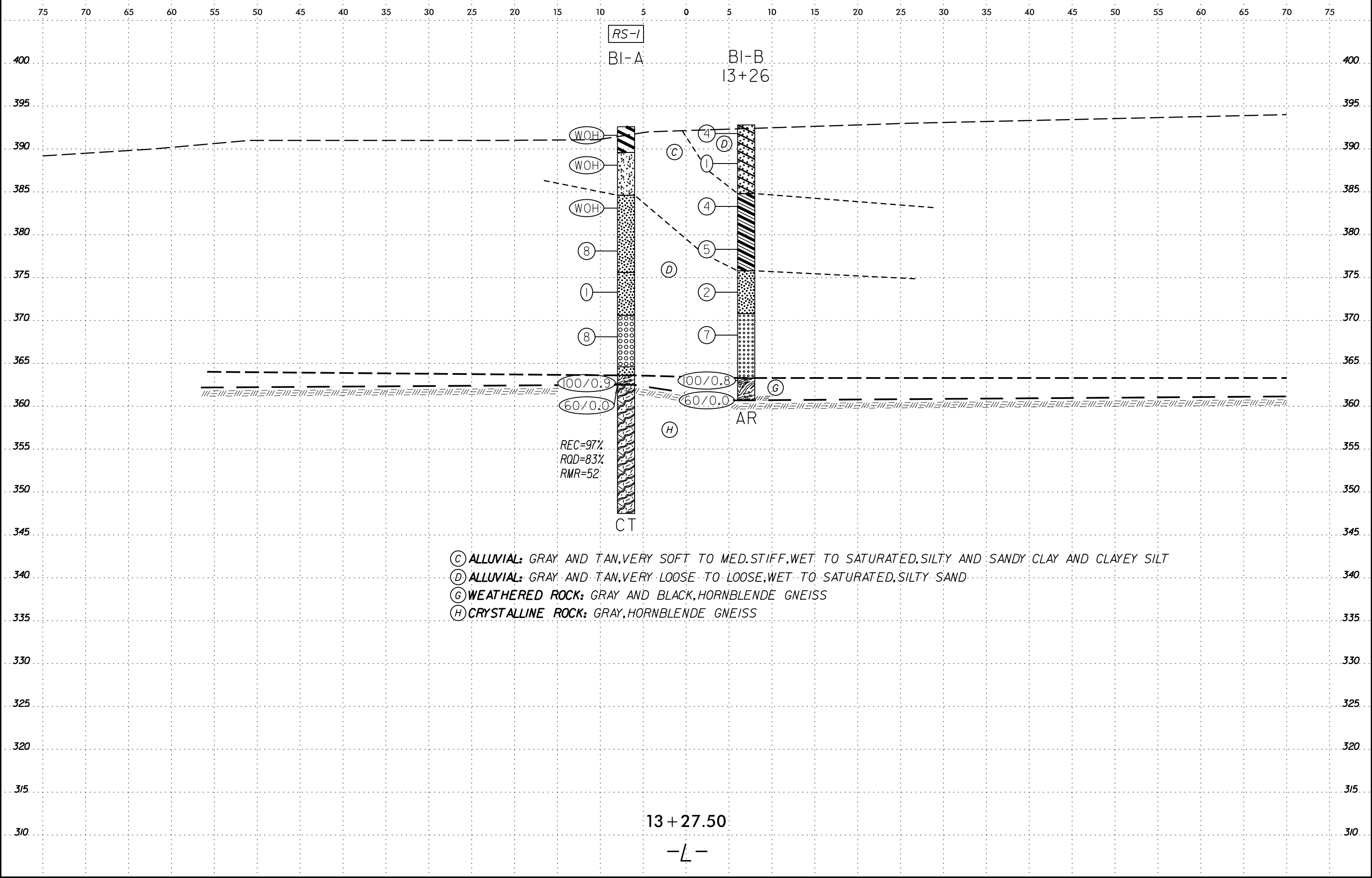


- (A) ROADWAY EMBANKMENT: TAN GRAY AND BROWN, SOFT TO STIFF, MOIST, SANDY SILT AND CLAY W/ TRACE GRAVEL AND TRACE ORGANICS
- (B) ROADWAY EMBANKMENT: TAN AND BROWN, LOOSE TO MED. DENSE, MOIST, SILTY CSE. TO F. SAND W/ TRACE GRAVEL AND ORGANICS
- (C) ALLUVIAL: GRAY AND TAN, VERY SOFT TO STIFF, MOIST, F. SANDY CLAYEY SILT AND SILTY CLAY W/ TRACE GRAVEL
- (D) ALLUVIAL: GRAY AND TAN, VERY LOOSE TO LOOSE, WET, CLAYEY F. SAND
- (E) RESIDUAL: GRAY, DENSE TO VERY DENSE, MOIST, SILTY CSE. TO F. SAND
- (F) RESIDUAL: TAN BROWN AND GRAY, STIFF TO HARD, MOIST, SANDY AND SILTY CLAY AND SANDY SILT W/ TRACE ROCK FRAGMENTS
- (G) WEATHERED ROCK: GRAY GREEN AND BROWN, HORNBLende GNEISS
- (H) CRYSTALLINE ROCK: GREEN AND BROWN, HORNBLende GNEISS

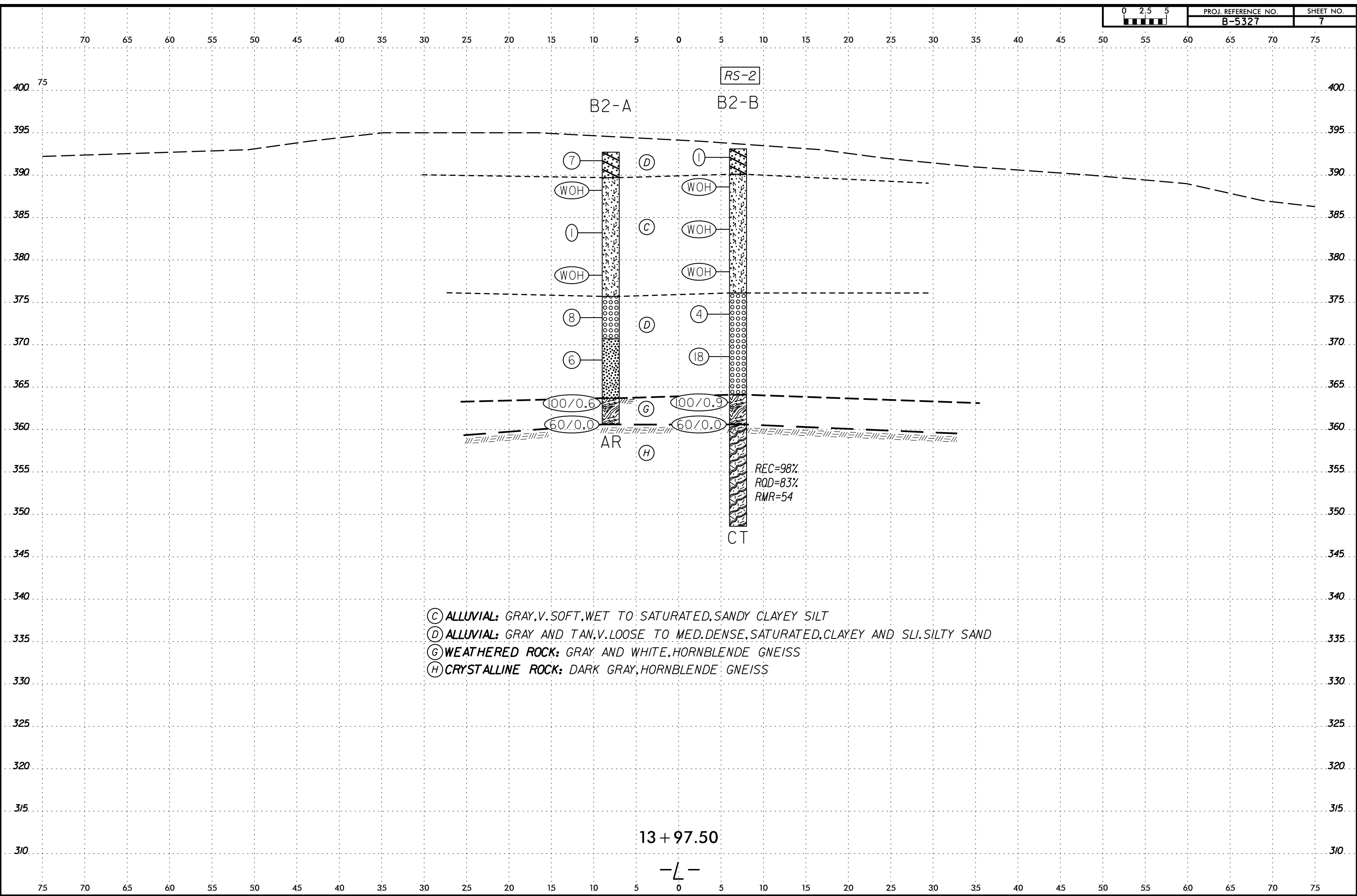
SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	LL	P.I.	% BY WEIGHT				% PASSING (SIEVES)			% MOISTURE	% ORGANIC
							C. SAND	F. SAND	SILT	CLAY	10	40	200		
SS-1	11 ft LT	12+57	13.5-15.0	A-4	37	10	12	25	40	23	83	76	59	20.9	-
SS-2	11 ft LT	12+57	28.5-30.0	A-6	31	13	9	26	34	31	100	95	70	23.6	-



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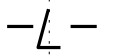


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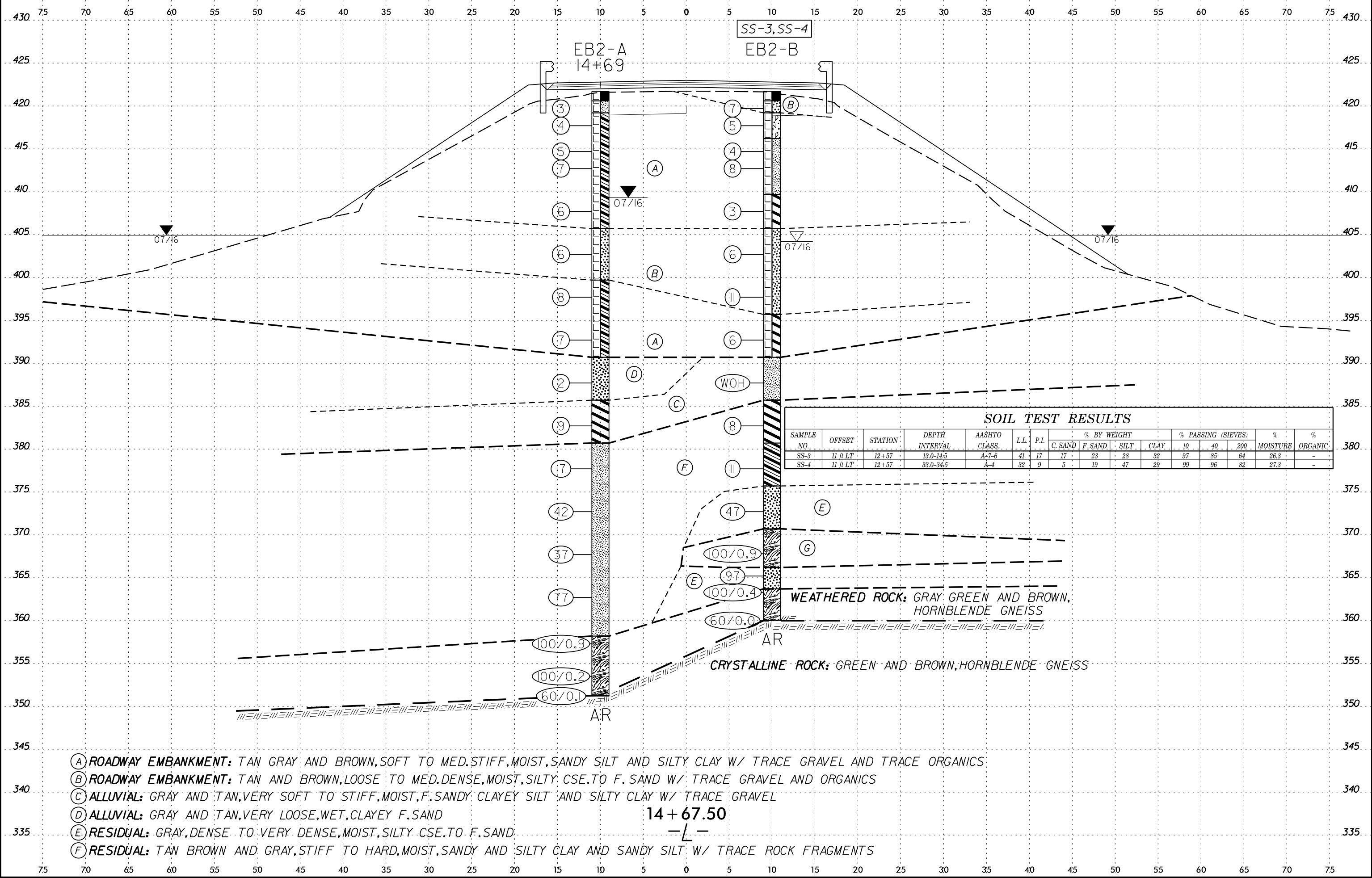


- (C) ALLUVIAL: GRAY, V. SOFT, WET TO SATURATED, SANDY CLAYEY SILT
- (D) ALLUVIAL: GRAY AND TAN, V. LOOSE TO MED. DENSE, SATURATED, CLAYEY AND SLI. SILTY SAND
- (G) WEATHERED ROCK: GRAY AND WHITE, HORNBLLENDE GNEISS
- (H) CRYSTALLINE ROCK: DARK GRAY, HORNBLLENDE GNEISS

13+97.50



8/23/99



- (A) ROADWAY EMBANKMENT: TAN GRAY AND BROWN, SOFT TO MED. STIFF, MOIST, SANDY SILT AND SILTY CLAY W/ TRACE GRAVEL AND TRACE ORGANICS
- (B) ROADWAY EMBANKMENT: TAN AND BROWN, LOOSE TO MED. DENSE, MOIST, SILTY CSE. TO F. SAND W/ TRACE GRAVEL AND ORGANICS
- (C) ALLUVIAL: GRAY AND TAN, VERY SOFT TO STIFF, MOIST, F. SANDY CLAYEY SILT AND SILTY CLAY W/ TRACE GRAVEL
- (D) ALLUVIAL: GRAY AND TAN, VERY LOOSE, WET, CLAYEY F. SAND
- (E) RESIDUAL: GRAY, DENSE TO VERY DENSE, MOIST, SILTY CSE. TO F. SAND
- (F) RESIDUAL: TAN BROWN AND GRAY, STIFF TO HARD, MOIST, SANDY AND SILTY CLAY AND SANDY SILT W/ TRACE ROCK FRAGMENTS

SYTIME

GEOTECHNICAL BORING REPORT

BORE LOG

WBS 46041.1.1		TIP B-5327		COUNTY PERSON		GEOLOGIST D. Goodnight									
SITE DESCRIPTION BRIDGE NO. 49 ON SR 1300 (CONCORD CHURCH RD) OVER SOUTH HYCO CREEK						GROUND WTR (ft)									
BORING NO. EB1-A		STATION 12+57		OFFSET 11 ft LT		ALIGNMENT -L-									
COLLAR ELEV. 417.4 ft		TOTAL DEPTH 43.5 ft		NORTHING 980,520		EASTING 1,972,646									
DRILL RIG/HAMMER EFF./DATE TRI9435 CME-55 85% 02/22/2016		DRILL METHOD H.S. Augers		HAMMER TYPE Automatic											
DRILLER Contract Driller		START DATE 07/11/16		COMP. DATE 07/11/16		SURFACE WATER DEPTH N/A									
ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT			BLOWS PER FOOT					SAMP. NO.	LOG MOI	SOIL AND ROCK DESCRIPTION	DEPTH (ft)	
			0.5ft	0.5ft	0.5ft	0	25	50	75	100					
420														417.4 0.3' TOPSOIL 0.0	
415	416.4	1.0	3	1	2							M	416.3 0.8' AGGREGATE BASE COURSE 1.1		
	413.9	3.5	2	2	3							M	ROADWAY EMBANKMENT		
	411.4	6.0										M	NON-PLASTIC, TAN, SANDY SILT (A-4) WITH TRACE GRAVEL		
410	408.9	8.5	3	2	2							M	409.4 NON-PLASTIC, BROWN, SILTY CSE. TO F. SAND (A-2-4) WITH TRACE GRAVEL 8.0		
405	403.9	13.5	7	6	5							M	405.4 NON-PLASTIC, TAN AND BROWN, SANDY SILT (A-4) WITH TRACE GRAVEL 12.0		
400	398.9	18.5	2	2	2							SS-1 21%			
395	393.9	23.5	WOH	1	4							M	395.4 ALLUVIAL NON-PLASTIC, GRAY, CSE. TO F. SANDY SILT (A-4) WITH TRACE ORGANICS AND WOOD 22.0		
390	388.9	28.5	1	1	2							SS-2 24%	391.4 HIGHLY PLASTIC, TAN AND BROWN, SANDY CLAY (A-6) 26.0		
385	383.9	33.5	WOH	1	2							W			
380	378.9	38.5	44	28	20							W	380.4 RESIDUAL NON-PLASTIC, LIGHT GRAY, SILTY CSE. TO F. SAND (A-2-4) WITH SOME ROCK FRAGMENTS 37.0		
375	373.9	43.5	60/0.0									W	376.9 WEATHERED ROCK GRAY AND WHITE, HORNBLLENDE GNEISS 40.5		
													373.9 Boring Terminated with Standard Penetration Test Refusal at Elevation 373.9 ft on CR: HORNBLLENDE GNEISS 43.5		

WBS 46041.1.1		TIP B-5327		COUNTY PERSON		GEOLOGIST D. Goodnight									
SITE DESCRIPTION BRIDGE NO. 49 ON SR 1300 (CONCORD CHURCH RD) OVER SOUTH HYCO CREEK						GROUND WTR (ft)									
BORING NO. EB1-B		STATION 12+57		OFFSET 11 ft RT		ALIGNMENT -L-									
COLLAR ELEV. 417.4 ft		TOTAL DEPTH 34.9 ft		NORTHING 980,499		EASTING 1,972,641									
DRILL RIG/HAMMER EFF./DATE TRI9435 CME-55 85% 02/22/2016		DRILL METHOD H.S. Augers		HAMMER TYPE Automatic											
DRILLER Contract Driller		START DATE 07/11/16		COMP. DATE 07/11/16		SURFACE WATER DEPTH N/A									
ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT			BLOWS PER FOOT					SAMP. NO.	LOG MOI	SOIL AND ROCK DESCRIPTION	DEPTH (ft)	
			0.5ft	0.5ft	0.5ft	0	25	50	75	100					
420														417.4 0.3' TOPSOIL 0.0	
415	416.4	1.0	3	1	1							M	416.3 0.8' AGGREGATE BASE COURSE 1.1		
	413.9	3.5	3	1	6							M	ROADWAY EMBANKMENT		
	411.4	6.0										M	411.9 SLI. PLASTIC, TAN, SANDY CLAYEY SILT (A-4) WITH TRACE GRAVEL 5.5		
410	408.9	8.5	3	3	3							M	409.4 NON-PLASTIC, BROWN AND GRAY, SILTY CSE. TO F. SAND (A-2-4) WITH TRACE GRAVEL 8.0		
405	403.9	13.5	4	4	6							M	405.4 NON-PLASTIC, TAN, CSE. TO F. SANDY SILT (A-4) WITH TRACE GRAVEL 12.0		
400	398.9	18.5	2	2	3							W			
395	393.9	23.5	3	1	3							W	395.4 ALLUVIAL NON-PLASTIC, GRAY, CLAYEY SILTY CSE. TO F. SAND (A-2-4) WITH TRACE ORGANICS 22.0		
390	388.9	28.5	1	2	4							W	391.4 HIGHLY PLASTIC, BROWN, SILTY CLAY (A-7) 26.0		
385	383.9	33.5	100/0.2									W	385.9 WEATHERED ROCK DARK GRAY, HORNBLLENDE GNEISS 31.5		
	382.6	34.8	60/0.1										382.6 Boring Terminated with Standard Penetration Test Refusal at Elevation 382.5 ft in CR: HORNBLLENDE GNEISS 34.8		
													382.5 CRYSTALLINE ROCK DARK GRAY, HORNBLLENDE GNEISS 34.9		

NCDOT BORE DOUBLE B5327_GEO_BRDG0049_BORINGS.GPJ_NC_DOT.GDT 7/29/16

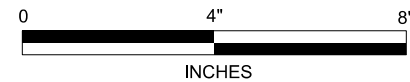
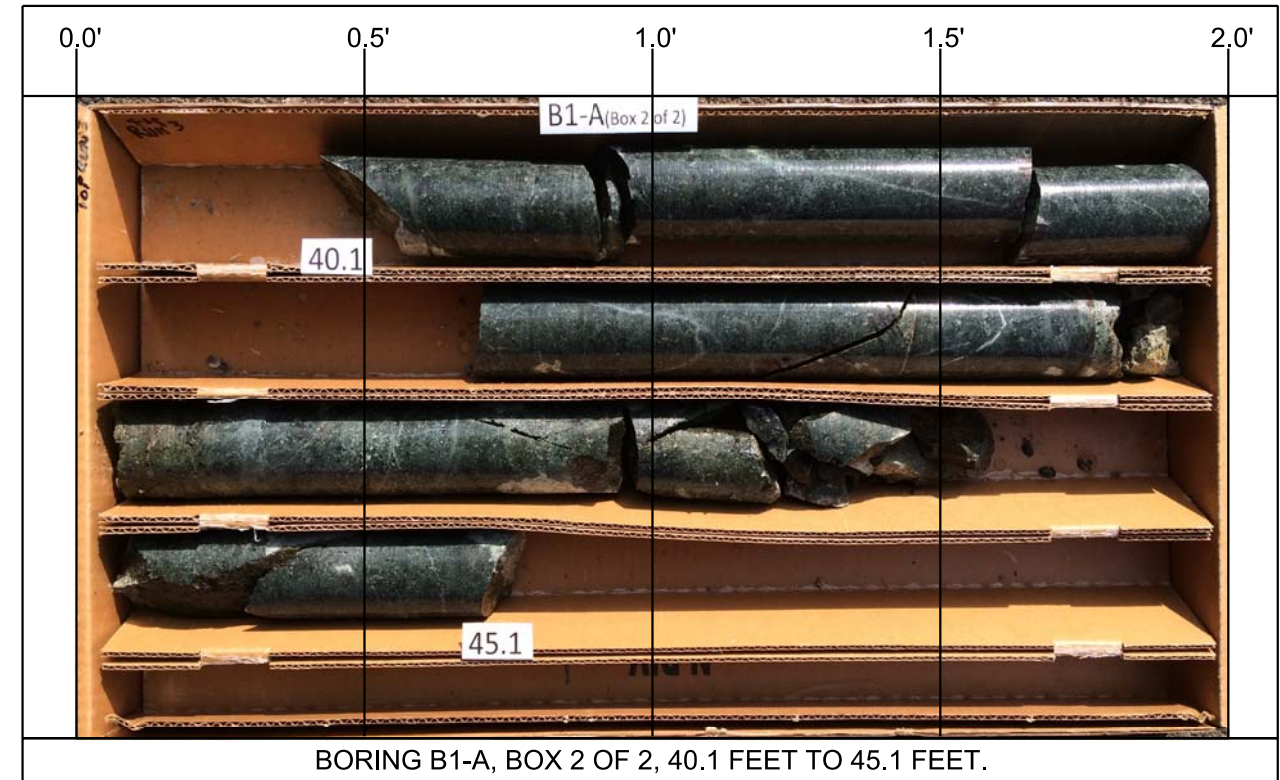
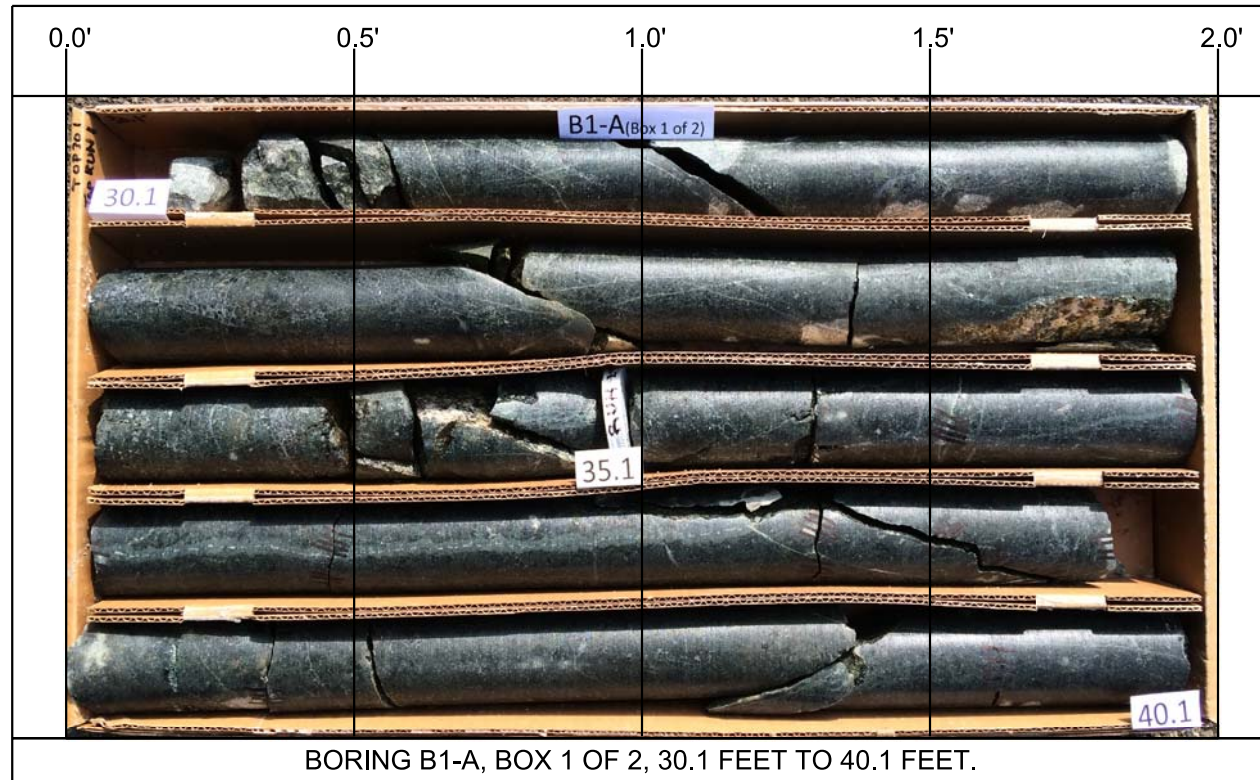
GEOTECHNICAL BORING REPORT

BORE LOG

WBS 46041.1.1		TIP B-5327		COUNTY PERSON		GEOLOGIST D. Goodnight									
SITE DESCRIPTION BRIDGE NO. 49 ON SR 1300 (CONCORD CHURCH RD) OVER SOUTH HYCO CREEK						GROUND WTR (ft)									
BORING NO. B1-A		STATION 13+27		OFFSET 7 ft LT		ALIGNMENT -L-									
COLLAR ELEV. 392.6 ft		TOTAL DEPTH 45.1 ft		NORTHING 980,503		EASTING 1,972,717									
DRILL RIG/HAMMER EFF./DATE TRI9435 CME-55 85% 02/22/2016		DRILL METHOD Wash Boring		HAMMER TYPE Automatic											
DRILLER Contract Driller		START DATE 07/13/16		COMP. DATE 07/14/16		SURFACE WATER DEPTH 17.0									
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					
395															
	392.6	0.0	2	WOH	WOH								W	392.6	0.0
390	389.1	3.5		WOH	WOH								Sat.	389.6	3.0
	384.1	8.5	1	WOH	WOH								W	384.6	8.0
385	379.1	13.5	3										W	379.6	13.5
380	374.3	18.3	1	WOH	1								Sat.	375.6	17.0
375	369.1	23.5	4										W	370.6	22.0
370	364.1	28.5	10											364.6	28.0
365	362.5	30.1	60/0.0											363.6	29.0
360														362.5	30.1
355															
350															
Boring Terminated with Standard Penetration Test Refusal at Elevation 347.5 ft in CR: HORNBLENDE GNEISS BRIDGE DECK 0.7' DECK TO DATUM 25.4' SURFACE WATER DEPTH 17.0'															

WBS 46041.1.1		TIP B-5327		COUNTY PERSON		GEOLOGIST D. Goodnight					
SITE DESCRIPTION BRIDGE NO. 49 ON SR 1300 (CONCORD CHURCH RD) OVER SOUTH HYCO CREEK						GROUND WTR (ft)					
BORING NO. B1-A		STATION 13+27		OFFSET 7 ft LT		ALIGNMENT -L-					
COLLAR ELEV. 392.6 ft		TOTAL DEPTH 45.1 ft		NORTHING 980,503		EASTING 1,972,717					
DRILL RIG/HAMMER EFF./DATE TRI9435 CME-55 85% 02/22/2016		DRILL METHOD Wash Boring		HAMMER TYPE Automatic							
DRILLER Contract Driller		START DATE 07/13/16		COMP. DATE 07/14/16		SURFACE WATER DEPTH 17.0					
ELEV (ft)	RUN ELEV (ft)	DEPTH (ft)	RUN (ft)	DRILL RATE (Min/ft)	RUN		STRATA		LOG	DESCRIPTION AND REMARKS	DEPTH (ft)
					REC. (%)	RQD (%)	REC. (%)	RQD (%)			
362.5											
	362.5	30.1	5.0	8:03/1.0 5:29/1.0 5:11/1.0 5:23/1.0 5:01/1.0	(4.8) 96%	(3.8) 76%	RS-1	(14.5) 97%	(12.5) 83%		362.5
360											
	357.5	35.1									362.5
355											
	352.5	40.1	5.0	3:38/1.0 3:50/1.0 4:02/1.0 3:40/1.0 4:03/1.0	(4.9) 98%	(4.9) 98%					362.5
350											
	347.5	45.1	5.0	3:45/1.0 3:53/1.0 3:43/1.0 3:23/1.0 3:29/1.0	(4.8) 96%	(3.8) 76%					362.5
Boring Terminated with Standard Penetration Test Refusal at Elevation 347.5 ft in CR: HORNBLENDE GNEISS											

NCDOT BORE DOUBLE B5327_GEO_BRDG0049_BORINGS.GPJ_NC_DOT.GDT 7/29/16



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ROCK CORE PHOTOGRAPHS

BRIDGE NO. 49 ON SR 1300
(CONCORD CHURCH RD) OVER SOUTH HYCO CREEK
WBS NO.: 46041.1.1 TIP NO.: B-5327
PERSON COUNTY, NC

GEOTECHNICAL BORING REPORT

BORE LOG

WBS 46041.1.1		TIP B-5327		COUNTY PERSON		GEOLOGIST D. Goodnight								
SITE DESCRIPTION BRIDGE NO. 49 ON SR 1300 (CONCORD CHURCH RD) OVER SOUTH HYCO CREEK							GROUND WTR (ft)							
BORING NO. B1-B		STATION 13+26		OFFSET 7 ft RT		ALIGNMENT -L-								
COLLAR ELEV. 392.8 ft		TOTAL DEPTH 32.1 ft		NORTHING 980,488		EASTING 1,972,713								
DRILL RIG/HAMMER EFF./DATE TRI9435 CME-55 85% 02/22/2016		DRILL METHOD Wash Boring		HAMMER TYPE Automatic										
DRILLER Contract Driller		START DATE 07/15/16		COMP. DATE 07/15/16		SURFACE WATER DEPTH 16.9								
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				
395														
	392.8	0.0		2	3	1							W	392.8 0.0
390	389.3	3.5	WOH	WOH	1								Sat.	ALLUVIAL SLI. PLASTIC, GRAY, CLAYEY CSE. TO F. SAND (A-2-6) WITH TRACE ORGANICS
385	384.3	8.5	WOH	2	2								W	384.8 8.0 MOD. PLASTIC, TAN, F. SANDY CLAY (A-6)
380	379.3	13.5		3	3	2							W	375.8 17.0 NON-PLASTIC, GRAY, SILTY CSE. TO F. SAND (A-2-4) WITH TRACE ORGANICS AND TRACE GRAVEL
375	374.3	18.5		3	1	1							Sat.	370.8 22.0 NON-PLASTIC, GRAY, SILTY SAND (A-3)
370	369.3	23.5		3	2	5							W	363.3 29.5 WEATHERED ROCK DARK GRAY AND BLACK, HORNBLENDE GNEISS
365	364.3	28.5		3	5	100/0.3								360.7 32.1 Boring Terminated with Standard Penetration Test Refusal at Elevation 360.7 ft on CR: HORNBLENDE GNEISS
	360.7	32.1	60/0.0											BRIDGE DECK 0.7' DECK TO DATUM 25.2' SURFACE WATER DEPTH 16.9'

WBS 46041.1.1		TIP B-5327		COUNTY PERSON		GEOLOGIST D. Goodnight								
SITE DESCRIPTION BRIDGE NO. 49 ON SR 1300 (CONCORD CHURCH RD) OVER SOUTH HYCO CREEK							GROUND WTR (ft)							
BORING NO. B2-A		STATION 13+97		OFFSET 8 ft LT		ALIGNMENT -L-								
COLLAR ELEV. 392.7 ft		TOTAL DEPTH 32.1 ft		NORTHING 980,490		EASTING 1,972,784								
DRILL RIG/HAMMER EFF./DATE TRI9435 CME-55 85% 02/22/2016		DRILL METHOD Wash Boring		HAMMER TYPE Automatic										
DRILLER Contract Driller		START DATE 07/19/16		COMP. DATE 07/19/16		SURFACE WATER DEPTH 16.8								
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				
395														
	392.7	0.0		6	5	2							Sat.	392.7 0.0
390	389.2	3.5	WOH	WOH	WOH								W	389.7 3.0 ALLUVIAL SLI. PLASTIC, GRAY, CLAYEY CSE. TO F. SAND (A-2-6) WITH TRACE ORGANICS AND GRAVEL
385	384.2	8.5	WOH	WOH	1								Sat.	MOD. PLASTIC, GRAY, F. SANDY CLAYEY SILT (A-5) WITH INTERMITTENT LENSES OF CSE. TO F. SAND AND TRACE ORGANICS
380	379.2	13.5	WOH	1	WOH								W	375.7 17.0 NON-PLASTIC, LIGHT GRAY, F. TO CSE. SAND (A-1-b) WITH TRACE GRAVEL AND WOOD FRAGMENTS
375	374.2	18.5		3	4	4							Sat.	370.7 22.0 NON-PLASTIC, GRAY, SILTY SAND (A-2-4) WITH TRACE GRAVEL
370	369.2	23.5		14	3	3							Sat.	363.7 29.0 WEATHERED ROCK BLACK AND GRAY, HORNBLENDE GNEISS
365	364.2	28.5		10	80	20/0.1								360.6 32.1 Boring Terminated with Standard Penetration Test Refusal at Elevation 360.6 ft on CR: HORNBLENDE GNEISS
	360.6	32.1	60/0.0											BRIDGE DECK 0.7' DECK TO DATUM 26.7' SURFACE WATER DEPTH 16.8'

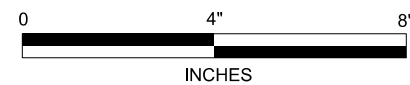
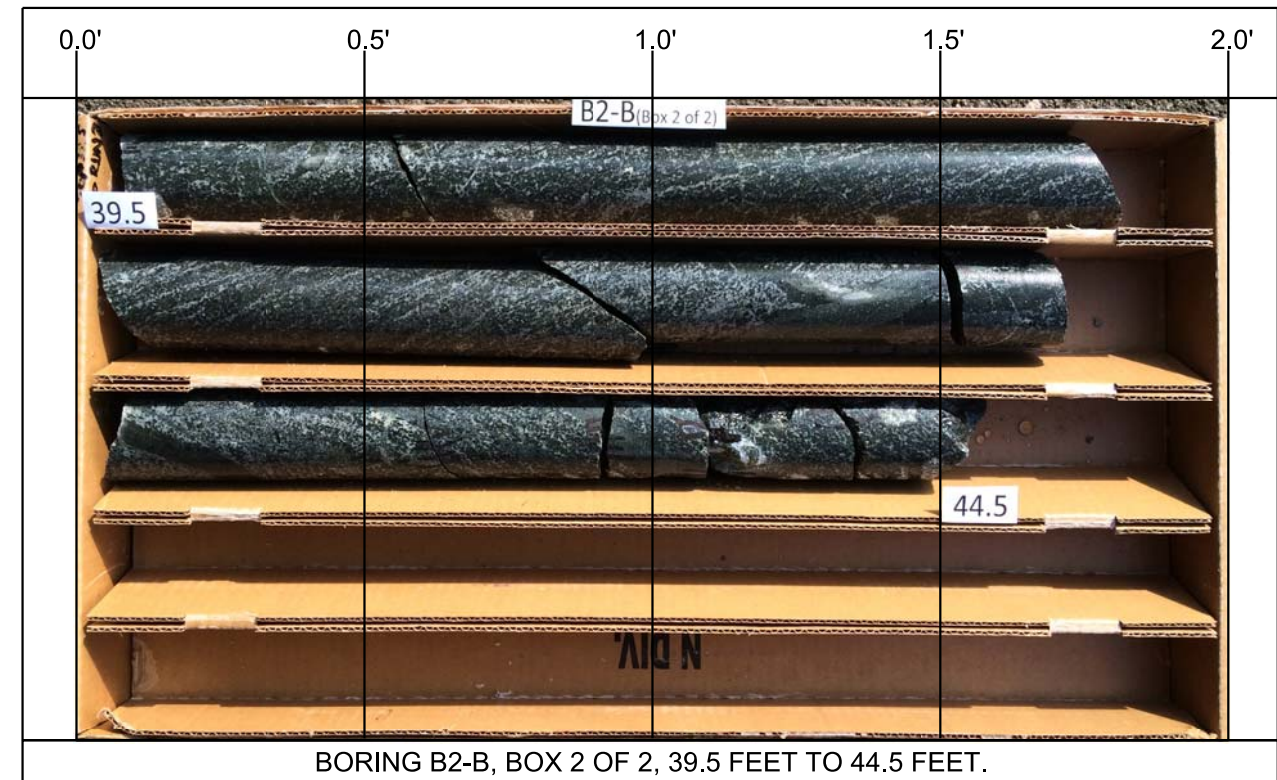
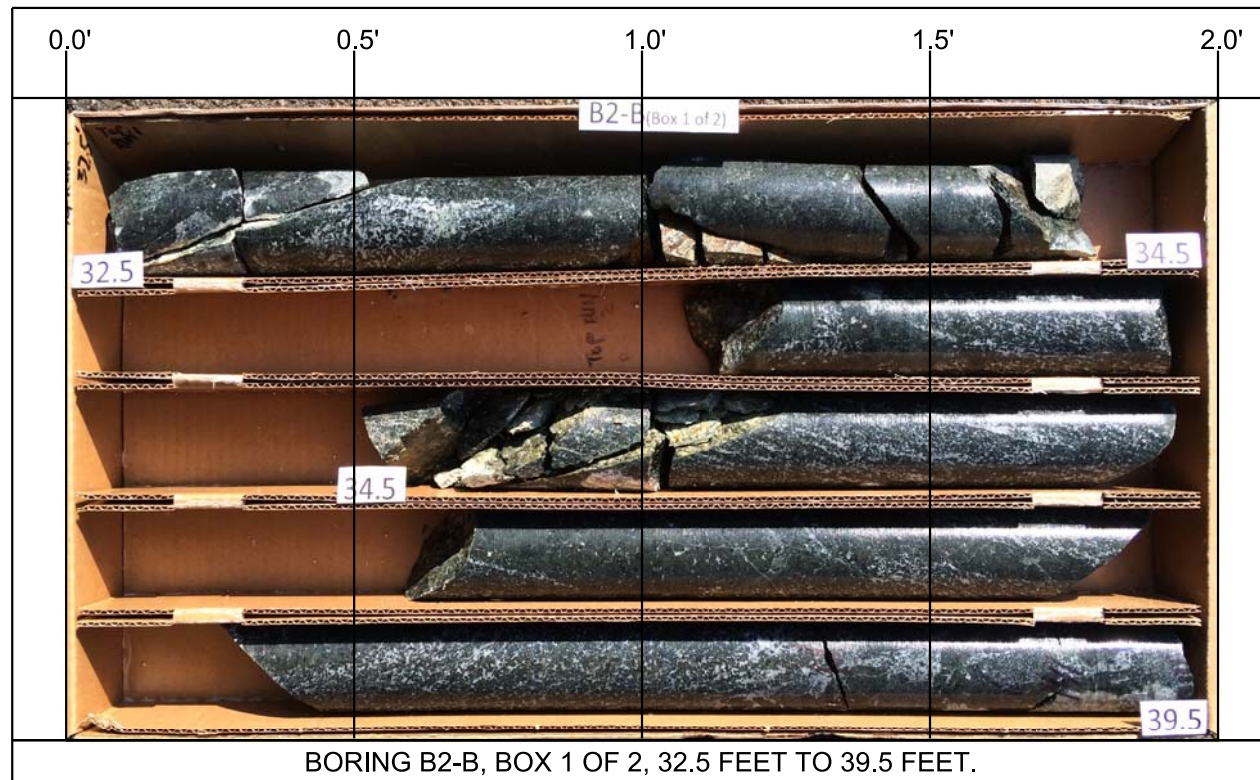
NCDOT BORE DOUBLE B5327_GEO_BRDG0049_BORINGS.GPJ NC_DOT.GDT 7/29/16

GEOTECHNICAL BORING REPORT

CORE LOG

WBS 46041.1.1		TIP B-5327		COUNTY PERSON		GEOLOGIST D. Goodnight								
SITE DESCRIPTION BRIDGE NO. 49 ON SR 1300 (CONCORD CHURCH RD) OVER SOUTH HYCO CREEK						GROUND WTR (ft)								
BORING NO. B2-B		STATION 13+97		OFFSET 7 ft RT		ALIGNMENT -L-								
COLLAR ELEV. 393.1 ft		TOTAL DEPTH 44.5 ft		NORTHING 980,474		EASTING 1,972,780								
DRILL RIG/HAMMER EFF./DATE TRI9435 CME-55 85% 02/22/2016		DRILL METHOD Wash Boring		HAMMER TYPE Automatic										
DRILLER Contract Driller		START DATE 07/18/16		COMP. DATE 07/18/16		SURFACE WATER DEPTH 16.5								
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				
395														
	393.1	0.0	1	WOH	1									393.1 0.0
390	389.6	3.5	WOH	WOH	WOH									390.1 -3.0
	384.6	8.5	WOH	WOH	WOH									
385	379.6	13.5	WOH	WOH	WOH									
380	374.6	18.5	1	2	2									376.1 -17.0
375	369.6	23.5	2	8	10									
370	364.6	28.5	8	17	83/0.4									
365	360.6	32.5	60/0.0											364.1 29.0
360														360.6 32.5
355														
350														
														348.6 44.5

WBS 46041.1.1		TIP B-5327		COUNTY PERSON		GEOLOGIST D. Goodnight	
SITE DESCRIPTION BRIDGE NO. 49 ON SR 1300 (CONCORD CHURCH RD) OVER SOUTH HYCO CREEK						GROUND WTR (ft)	
BORING NO. B2-B		STATION 13+97		OFFSET 7 ft RT		ALIGNMENT -L-	
COLLAR ELEV. 393.1 ft		TOTAL DEPTH 44.5 ft		NORTHING 980,474		EASTING 1,972,780	
DRILL RIG/HAMMER EFF./DATE TRI9435 CME-55 85% 02/22/2016		DRILL METHOD Wash Boring		HAMMER TYPE Automatic			
DRILLER Contract Driller		START DATE 07/18/16		COMP. DATE 07/18/16		SURFACE WATER DEPTH 16.5	
CORE SIZE NQZ Wireline			TOTAL RUN 12.0 ft			LOG	DESCRIPTION AND REMARKS
ELEV (ft)	RUN ELEV (ft)	DEPTH (ft)	RUN (ft)	DRILL RATE (Min/ft)	REC. RUN (ft) %		
360.6	360.6	32.5	2.0	3:50/1.0	(1.8)	(0.5)	Begin Coring @ 32.5 ft
	358.6	34.5	5.0	3:57/1.0	90%	25%	CRYSTALLINE ROCK
355				3:55/1.0	100%	88%	GRAY AND BLACK, SLIGHT TO V. SLIGHT WEATHERING, MODERATELY HARD TO HARD, CLOSE TO MODERATELY CLOSE FRACTURED HORNBLLENDE GNEISS
	353.6	39.5	5.0	3:38/1.0			R1= 9, R2 = 17, R3 = 8, R4 = 20, R5 = 0, RMR = 54 CLASS III, TYPE E
350				3:57/1.0			
				4:03/1.0			
	348.6	44.5		4:18/1.0	(5.0)	(5.0)	Boring Terminated with Standard Penetration Test Refusal at Elevation 348.6 ft in CR: HORNBLLENDE GNEISS
				3:51/1.0	100%	100%	BRIDGE DECK 0.6' DECK TO DATUM 26.3' SURFACE WATER DEPTH 16.5'
				3:50/1.0			
				4:30/1.0			
				5:15/1.0			



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ROCK CORE PHOTOGRAPHS

BRIDGE NO. 49 ON SR 1300
(CONCORD CHURCH RD) OVER SOUTH HYCO CREEK
WBS NO.: 46041.1.1 TIP NO.: B-5327
PERSON COUNTY, NC

GEOTECHNICAL BORING REPORT

BORE LOG

WBS 46041.1.1		TIP B-5327		COUNTY PERSON		GEOLOGIST D. Goodnight										
SITE DESCRIPTION BRIDGE NO. 49 ON SR 1300 (CONCORD CHURCH RD) OVER SOUTH HYCO CREEK						GROUND WTR (ft)										
BORING NO. EB2-A		STATION 14+69		OFFSET 10 ft LT		ALIGNMENT -L-										
COLLAR ELEV. 421.7 ft		TOTAL DEPTH 70.5 ft		NORTHING 980,478		EASTING 1,972,857										
DRILL RIG/HAMMER EFF./DATE TRI9435 CME-55 85% 02/22/2016		DRILL METHOD H.S. Augers		HAMMER TYPE Automatic												
DRILLER Contract Driller		START DATE 07/13/16		COMP. DATE 07/13/16		SURFACE WATER DEPTH N/A										
ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT			BLOWS PER FOOT					SAMP. NO.	LOG MOI	SOIL AND ROCK DESCRIPTION	DEPTH (ft)		
			0.5ft	0.5ft	0.5ft	0	25	50	75	100						
425																
420	420.7	1.0	1	2	1								M	0.3' TOPSOIL	0.0	
													M	0.7' AGGREGATE BASE COURSE	1.1	
	418.7	3.0	2	2	2								M	ROADWAY EMBANKMENT NON-PLASTIC, TAN AND BROWN, CSE. TO F. SANDY SILT (A-4) WITH TRACE GRAVEL	2.5	
415	415.7	6.0	2	2	3								M	MOD. PLASTIC, BROWN, CSE. TO F. SANDY CLAY (A-6) WITH TRACE GRAVEL		
	413.7	8.0	2	3	4								M			
410	408.7	13.0	3	3	3								M			
405	403.7	18.0	2	2	4								M	NON-PLASTIC, TAN AND BROWN, SILTY CSE. TO F. SAND (A-2-4) WITH TRACE GRAVEL	16.0	
400	398.7	23.0	2	3	5								M	MOD. PLASTIC, BROWN, CSE. TO F. SANDY CLAY (A-6)	22.0	
395	393.7	28.0	2	3	4								M			
390	388.7	33.0	WOH	WOH	2								M	ALLUVIAL MOD. PLASTIC, TAN AND GRAY, CLAYEY F. SAND (A-2-5)	31.0	
385	383.7	38.0	3	4	5								M	RESIDUAL HIGHLY PLASTIC, TAN, SILTY CLAY (A-7) WITH TRACE ROCK FRAGMENTS	36.0	
380	378.7	43.0	4	6	11								M	NON-PLASTIC, TAN AND GRAY, CSE. TO F. SANDY SILT (A-4)	41.0	
375	373.7	48.0	13	17	25								M			
370	368.7	53.0	14	14	23								M			
365	363.7	58.0	16	28	49								M			
360	358.7	63.0	18	49	51/0.4								M			
355	353.7	68.0	100/0.2										M	WEATHERED ROCK GREEN AND BROWN, HORNBLLENDE GNEISS	63.5	
	351.3	70.4	60/0.1										M	CRYSTALLINE ROCK GREEN AND BROWN, HORNBLLENDE GNEISS	70.4	
																Boring Terminated with Standard Penetration Test Refusal at Elevation 351.2 ft in CR: HORNBLLENDE GNEISS

NCDOT BORE DOUBLE B5327_GEO_BRDG0049_BORINGS.GPJ_NC_DOT.GDT 7/29/16

WBS 46041.1.1		TIP B-5327		COUNTY PERSON		GEOLOGIST D. Goodnight										
SITE DESCRIPTION BRIDGE NO. 49 ON SR 1300 (CONCORD CHURCH RD) OVER SOUTH HYCO CREEK						GROUND WTR (ft)										
BORING NO. EB2-B		STATION 14+69		OFFSET 10 ft RT		ALIGNMENT -L-										
COLLAR ELEV. 421.7 ft		TOTAL DEPTH 61.7 ft		NORTHING 980,458		EASTING 1,972,855										
DRILL RIG/HAMMER EFF./DATE TRI9435 CME-55 85% 02/22/2016		DRILL METHOD H.S. Augers		HAMMER TYPE Automatic												
DRILLER Contract Driller		START DATE 07/11/16		COMP. DATE 07/12/16		SURFACE WATER DEPTH N/A										
ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT			BLOWS PER FOOT					SAMP. NO.	LOG MOI	SOIL AND ROCK DESCRIPTION	DEPTH (ft)		
			0.5ft	0.5ft	0.5ft	0	25	50	75	100						
425																
420	420.7	1.0	2	3	4								M	0.3' TOPSOIL	0.0	
													M	0.8' AGGREGATE BASE COURSE	1.1	
	418.7	3.0	5	2	3								M	ROADWAY EMBANKMENT NON-PLASTIC, TAN AND BROWN, SILTY CSE. TO F. SAND (A-2-4) WITH TRACE GRAVEL	2.5	
415	415.7	6.0	2	1	3								M	SLI. PLASTIC, BROWN, SANDY CLAYEY SILT (A-5) WITH TRACE GRAVEL	5.5	
	413.7	8.0	3	4	4								M	NON-PLASTIC, TAN AND BROWN, SANDY SILT (A-4) WITH TRACE GRAVEL		
410	408.7	13.0	1	1	2								M	SLI. PLASTIC, BROWN AND GRAY, SILTY CLAY (A-7-6) WITH TRACE GRAVEL	12.0	
405	403.7	18.0	3	3	3								M	NON-PLASTIC, TAN AND BROWN, SILTY CSE. TO F. SAND (A-2-4) WITH TRACE GRAVEL AND ORGANICS	16.0	
400	398.7	23.0	3	3	8								M			
395	393.7	28.0	2	2	4								M	HIGHLY PLASTIC, GRAY, CSE. TO F. SANDY SILTY CLAY (A-7) WITH TRACE ORGANICS	26.0	
390	388.7	33.0	WOH	WOH	WOH								M	ALLUVIAL MOD. PLASTIC, GRAY, F. SANDY SILT (A-4) WITH TRACE ORGANICS	31.0	
385	383.7	38.0	2	3	5								M	RESIDUAL HIGHLY PLASTIC, TAN, F. SANDY SILTY CLAY (A-7)	36.0	
380	378.7	43.0	3	4	7								M	MOD. PLASTIC, BROWN, SILTY CSE. TO F. SANDY CLAY (A-6)	41.0	
375	373.7	48.0	8	17	30								M	NON-PLASTIC, GRAY, SILTY CSE. TO F. SAND (A-2-4)	46.0	
370	368.7	53.0	57	43/0.4									M	WEATHERED ROCK GRAY, HORNBLLENDE GNEISS	51.0	
365	366.2	55.5	40	38	59								M	RESIDUAL NON-PLASTIC, GRAY, SILTY CSE. TO F. SAND (A-2-4)	55.5	
360	360.0	61.7	100/0.4										M	WEATHERED ROCK GRAY, HORNBLLENDE GNEISS	61.7	
			60/0.0													Boring Terminated with Standard Penetration Test Refusal at Elevation 360.0 ft on CR: HORNBLLENDE GNEISS

NCDOT BORE DOUBLE B5327_GEO_BRDG0049_BORINGS.GPJ_NC_DOT.GDT 7/29/16

AASHTO SOIL CLASSIFICATION AND GRADATION SHEET

BRIDGE NO. 49 ON SR 1300 (CONCORD CHURCH RD) OVER SOUTH HYCO CREEK

TIP NO.: B-5327

PERSON COUNTY, NORTH CAROLINA

FALCON ENGINEERING, INC. PROJECT NO: G16032.00

LABORATORY SUMMARY SHEET FOR ROCK CORE SAMPLES

BRIDGE NO. 49 ON SR 1300 (CONCORD CHURCH RD) OVER SOUTH HYCO CREEK

TIP NO.: B-5327

PERSON COUNTY, NORTH CAROLINA

FALCON ENGINEERING, INC. PROJECT NO: G16032.00

BORING		SAMPLE	TOTAL SAMPLE			Atterberg Limit Test Results			COARSE SAND (%)	FINE SAND (%)	SILT (%)	CLAY (%)
AASHTO Classification			PERCENT PASSING									
STATION	OFFSET (FEET)	DEPTH (FEET)	#10	#40	#200	LL	PL	PI				
EB1-A		SS-1	83	76	59	37	27	10	12	25	40	23
A-4												
12+57 -L-	11' LT	13.5-15.0										
EB1-A		SS-2	100	95	70	31	18	13	9	26	34	31
A-6												
12+57 -L-	11' LT	28.5-30.0										
EB2-B		SS-3	97	85	64	41	24	17	17	23	28	32
A-7-6												
14+69 -L-	10' RT	13.0-14.5										
EB2-B		SS-4	99	96	82	32	23	9	5	19	47	29
A-4												
14+69 -L-	10' RT	33.0-34.5										

Sample No.	Boring	Depth (ft)	Rock Type	Geologic Map Unit	Run RQD	Length (ft)	Diameter (ft)	Unit Weight (PCF)	Unconfined Compressive Strength (PSI)	Young's Modulus (PSI)	Rock Mass Rating (RMR)
RS-1	B1-A	31.4-31.8	AMPHIBOLITE	CZg	83%	0.33	0.16	185.5	10,407	3,697,321	52
RS-2	B2-B	33.1-33.5	AMPHIBOLITE	CZg	83%	0.33	0.16	192.4	16,338	3,048,190	54



LOOKING UPSTATION ALONG -L-



LOOKING UPSTATION FROM LEFT OF EB1, DOWNSTREAM LEFT.



LOOKING DOWNSTATION FROM RIGHT OF EB2, DOWNSTREAM RIGHT.

 FALCON ENGINEERING, INC.
1210 TRINITY ROAD, SUITE 110
RALEIGH, NC 27607
PHONE: 919.871.0800
FAX: 919.871.0803

SITE PHOTOGRAPHS
BRIDGE NO. 49 ON SR 1300
(CONCORD CHURCH RD) OVER SOUTH HYCO CREEK
WBS NO.: 46041.1.1 TIP NO.: B-5327
PERSON COUNTY, NC