

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	33746.1.1(B-4522)	1	17

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

STRUCTURE
SUBSURFACE INVESTIGATION

PROJ. REFERENCE NO. 33746.1.1(B-4522) F.A. PROJ. BRZ-1150(7)
COUNTY GRANVILLE
PROJECT DESCRIPTION BRIDGE NO. 102 ON -L-
(SR 1150, GOOCHS MILL ROAD) OVER TAR RIVER

INVENTORY

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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) 250-4088. NEITHER THE SUBSURFACE PLANS AND REPORTS, NOR THE FIELD BORING LOGS, ROCK CORES, OR SOIL TEST DATA ARE PART OF THE CONTRACT.

GENERAL SOIL AND ROCK STRATA DESCRIPTIONS AND INDICATED BOUNDARIES ARE BASED ON A GEOTECHNICAL INTERPRETATION OF ALL AVAILABLE SUBSURFACE DATA AND MAY NOT NECESSARILY REFLECT THE ACTUAL SUBSURFACE CONDITIONS BETWEEN BORINGS OR BETWEEN SAMPLED STRATA WITHIN THE BOREHOLE, THE LABORATORY SAMPLE DATA AND THE IN SITU (IN-PLACE) TEST DATA CAN BE RELIED ON ONLY TO THE DEGREE OF RELIABILITY INHERENT IN THE STANDARD TEST METHOD. THE OBSERVED WATER LEVELS OR SOIL MOISTURE CONDITIONS INDICATED IN THE SUBSURFACE INVESTIGATIONS ARE AS RECORDED AT THE TIME OF THE INVESTIGATION. THESE WATER LEVELS OR SOIL MOISTURE CONDITIONS MAY VARY CONSIDERABLY WITH TIME ACCORDING TO CLIMATIC CONDITIONS INCLUDING TEMPERATURES, PRECIPITATION, AND WIND, AS WELL AS OTHER NON-CLIMATIC FACTORS.

THE BIDDER OR CONTRACTOR IS CAUTIONED THAT DETAILS SHOWN ON THE SUBSURFACE PLANS ARE PRELIMINARY ONLY AND IN MANY CASES THE FINAL DESIGN DETAILS ARE DIFFERENT. FOR BIDDING AND CONSTRUCTION PURPOSES, REFER TO THE CONSTRUCTION PLANS AND DOCUMENTS FOR FINAL DESIGN INFORMATION ON THIS PROJECT. THE DEPARTMENT DOES NOT WARRANT OR GUARANTEE THE SUFFICIENCY OR ACCURACY OF THE INVESTIGATION MADE, NOR THE INTERPRETATIONS MADE, OR OPINION OF THE DEPARTMENT AS TO THE TYPE OF MATERIALS AND CONDITIONS TO BE ENCOUNTERED. THE BIDDER OR CONTRACTOR IS CAUTIONED TO MAKE SUCH INDEPENDENT SUBSURFACE INVESTIGATIONS AS HE DEEMS NECESSARY TO SATISFY HIMSELF AS TO CONDITIONS TO BE ENCOUNTERED ON THIS PROJECT. THE CONTRACTOR SHALL HAVE NO CLAIM FOR ADDITIONAL COMPENSATION OR FOR AN EXTENSION OF TIME FOR ANY REASON RESULTING FROM THE ACTUAL CONDITIONS ENCOUNTERED AT THE SITE DIFFERING FROM THOSE INDICATED IN THE SUBSURFACE INFORMATION.

PROJECT: 33746.1.1 ID: B-4522

PERSONNEL

J. TURNAGE

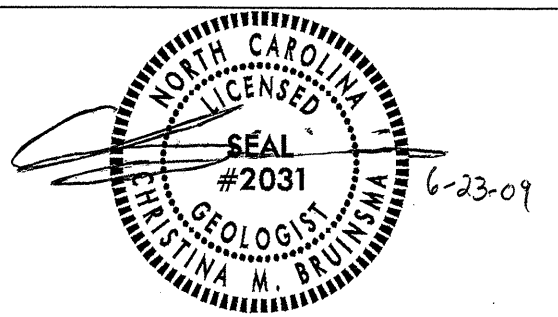
D. DIXON

INVESTIGATED BY C.M. BRUINSMA

CHECKED BY N.T. ROBERSON

SUBMITTED BY N.T. ROBERSON

DATE JUNE 2009



DRAWN BY: T.T. WALKER, C.M. BRUINSMA

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

SUBSURFACE INVESTIGATION

SOIL AND ROCK LEGEND, TERMS, SYMBOLS, AND ABBREVIATIONS

PROJECT REFERENCE NO. 33746.I.(B-4522) SHEET NO. 2

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 (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, GRAVELLY CLAY, MOST WITH INTERBEDDED FINE SAND LAYERS, HEAVY PLASTIC, A-7-6</i>		WELL GRADED - INDICATES A GOOD REPRESENTATION OF PARTICLE SIZES FROM FINE TO COARSE. UNIFORM - INDICATES THAT SOIL PARTICLES ARE ALL APPROXIMATELY THE SAME SIZE. (ALSO POORLY GRADED) GAP-GRADED - INDICATES A MIXTURE OF UNIFORM PARTICLES OF TWO OR MORE SIZES.		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:		ALLUVIUM (ALLUV.) - SOILS THAT HAVE BEEN TRANSPORTED BY WATER. AQUIFER - A WATER BEARING FORMATION OR STRATA. ARENACEOUS - APPLIED TO ROCKS THAT HAVE BEEN DERIVED FROM SAND OR THAT CONTAIN SAND. ARGILLACEOUS - APPLIED TO ALL ROCKS OR SUBSTANCES COMPOSED OF CLAY MINERALS, OR HAVING A NOTABLE PROPORTION OF CLAY IN THEIR COMPOSITION, AS SHALE, SLATE, ETC. ARTESIAN - GROUND WATER THAT IS UNDER SUFFICIENT PRESSURE TO RISE ABOVE THE LEVEL AT WHICH IT IS ENCOUNTERED, BUT WHICH DOES NOT NECESSARILY RISE TO OR ABOVE THE GROUND SURFACE. CALCAREOUS (CALC.) - SOILS THAT CONTAIN APPRECIABLE AMOUNTS OF CALCIUM CARBONATE. COLLUVIUM - ROCK FRAGMENTS MIXED WITH SOIL DEPOSITED BY GRAVITY ON SLOPE OR AT BOTTOM OF SLOPE. CORE RECOVERY (REC.) - TOTAL LENGTH OF ALL MATERIAL RECOVERED IN THE CORE BARREL DIVIDED BY TOTAL LENGTH OF CORE RUN AND EXPRESSED AS A PERCENTAGE. DIKE - A TABULAR BODY OF IGNEOUS ROCK THAT CUTS ACROSS THE STRUCTURE OF ADJACENT ROCKS OR CUTS MASSIVE ROCK. DIP - THE ANGLE AT WHICH A STRATUM OR ANY PLANAR FEATURE IS INCLINED FROM THE HORIZONTAL. DIP DIRECTION (DIP AZIMUTH) - THE DIRECTION OR BEARING OF THE HORIZONTAL TRACE OF THE LINE OF DIP, MEASURED CLOCKWISE FROM NORTH. FAULT - A FRACTURE OR FRACTURE ZONE ALONG WHICH THERE HAS BEEN DISPLACEMENT OF THE SIDES RELATIVE TO ONE ANOTHER PARALLEL TO THE FRACTURE. FISSILE - A PROPERTY OF SPLITTING ALONG CLOSELY SPACED PARALLEL PLANES. FLOAT - ROCK FRAGMENTS ON SURFACE NEAR THEIR ORIGINAL POSITION AND DISLOADED 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 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 PER FOOT. STRATA CORE RECOVERY (SCRC) - 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.			
SOIL LEGEND AND AASHTO CLASSIFICATION		MINERALOGICAL COMPOSITION		WEATHERING					
GENERAL CLASS. GRANULAR MATERIALS (<= 35% PASSING #200) SILT-CLAY MATERIALS (> 35% PASSING #200) ORGANIC MATERIALS		MINERAL NAMES SUCH AS QUARTZ, FELDSPAR, MICA, TALC, KAOLIN, ETC. ARE USED IN DESCRIPTIONS WHENEVER THEY ARE CONSIDERED OF SIGNIFICANCE.		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.					
GROUP CLASS. A-1, A-3, A-2, A-4, A-5, A-6, A-7		COMPRESSIONIBILITY		FRESH					
SYMBOL		SLIGHTLY COMPRESSIBLE MODERATELY COMPRESSIBLE HIGHLY COMPRESSIBLE		ROCK FRESH, CRYSTALLINE BRIGHT, FEW JOINTS MAY SHOW SLIGHT STAINING, ROCK RINGS UNDER HAMMER IF CRYSTALLINE.					
% PASSING #10, #40, #200		LIQUID LIMIT LESS THAN 31 LIQUID LIMIT EQUAL TO 31-50 LIQUID LIMIT GREATER THAN 50		VERY SLIGHT (V SLI) SLIGHT (SLI) MODERATE (MOD.) SEVERE (SEV.) VERY SEVERE (V SEV.) COMPLETE					
LIQUID LIMIT PLASTIC INDEX		PERCENTAGE OF MATERIAL		MODERATELY SEVERE (MOD. SEV.)					
GROUP INDEX		ORGANIC MATERIAL GRANULAR SOILS SILT-CLAY SOILS OTHER MATERIAL		SEVERE (SEV.)					
USUAL TYPES OF MAJOR MATERIALS		TRACE OF ORGANIC MATTER 2-3% LITTLE ORGANIC MATTER 3-5% MODERATELY ORGANIC 5-10% HIGHLY ORGANIC >10%		VERY SEVERE (V SEV.)					
GEN. RATINGS AS A SUBGRADE		GROUND WATER		COMPLETE					
EXCELLENT TO GOOD FAIR TO POOR FAIR TO POOR POOR UNSUITABLE		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		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.					
PI OF A-7-5 SUBGROUP IS <= LL - 30 ; PI OF A-7-6 SUBGROUP IS > LL - 30		MISCELLANEOUS SYMBOLS		ROCK HARDNESS					
PRIMARY SOIL TYPE COMPACTNESS OR CONSISTENCY RANGE OF STANDARD PENETRATION RESISTANCE (N-VALUE) RANGE OF UNCONFINED COMPRESSIVE STRENGTH (TONS/FT ²)		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 SOUNDING ROD		VERY HARD HARD MODERATELY HARD MEDIUM HARD SOFT VERY SOFT					
GENERALY GRANULAR MATERIAL (NON-COHESIVE) GENERALY SILT-CLAY MATERIAL (COHESIVE)		SPT DPT VST PPT TEST BORING AUGER BORING CORE BORING MONITORING WELL PIEZOMETER INSTALLATION SLOPE INDICATOR INSTALLATION SPT N-VALUE SPT REFUSAL		CANNOT BE SCRATCHED BY KNIFE OR SHARP PICK. BREAKING OF HAND SPECIMENS REQUIRES SEVERAL HARD BLOWS OF THE GEOLOGIST'S PICK. CAN BE SCRATCHED BY KNIFE OR PICK ONLY WITH DIFFICULTY. HARD HAMMER BLOWS REQUIRED TO DETACH HAND SPECIMEN. 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. 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. 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. 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 FINGERNAIL.					
TEXTURE OR GRAIN SIZE		ABBREVIATIONS		FRACTURE SPACING		BEDDING			
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		AR - AUGER REFUSAL BT - BORING TERMINATED CL - CLAY CPT - CONE PENETRATION TEST CSE - COARSE DMT - DILATOMETER TEST DPT - DYNAMIC PENETRATION TEST e - VOID RATIO F - FINE FOSS. - FOSSILIFEROUS FRAC. - FRACTURED, FRACTURES FRAGS. - FRAGMENTS HL - HIGHLY MED. - MEDIUM MICA - MICAEOUS 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 % - UNIT WEIGHT %d - DRY UNIT WEIGHT		VERY WIDE WIDE MODERATELY CLOSE CLOSE VERY CLOSE		TERM SPACING MORE THAN 10 FEET 3 TO 10 FEET 1 TO 3 FEET 0.16 TO 1 FEET LESS THAN 0.16 FEET		TERM THICKNESS VERY THICKLY BEDDED THICKLY BEDDED MODERATELY BEDDED VERY THINLY BEDDED THICKLY LAMINATED THINLY LAMINATED > 4 FEET 1.5 - 4 FEET 0.16 - 1.5 FEET 0.03 - 0.16 FEET 0.008 - 0.03 FEET < 0.008 FEET	
SOIL MOISTURE - CORRELATION OF TERMS		EQUIPMENT USED ON SUBJECT PROJECT		INDURATION					
SOIL MOISTURE SCALE (ATTERBERG LIMITS) FIELD MOISTURE DESCRIPTION GUIDE FOR FIELD MOISTURE DESCRIPTION		DRILL UNITS: MOBILE B- BK-51 CME-45C CME-550 PORTABLE HOIST CME-550X		FOR SEDIMENTARY ROCKS, INDURATION IS THE HARDENING OF THE MATERIAL BY CEMENTING, HEAT, PRESSURE, ETC. FRIABLE MODERATELY INDURATED INDURATED EXTREMELY INDURATED					
LL - LIQUID LIMIT PL - PLASTIC LIMIT OM - OPTIMUM MOISTURE SL - SHRINKAGE LIMIT		ADVANCING TOOLS: CLAY BITS 6" CONTINUOUS FLIGHT AUGER 8" HOLLOW AUGERS HARD FACED FINGER BITS TUNG-CARBIDE INSERTS CASING w/ ADVANCER TRICONE 3.25" STEEL TEETH TRICONE TUNG-CARB. CORE BIT		HAMMER TYPE: AUTOMATIC MANUAL CORE SIZE: B WC3 H HAND TOOLS: POST HOLE DIGGER HAND AUGER SOUNDING ROD VANE SHEAR TEST					
PLASTICITY INDEX (PI) DRY STRENGTH				INDURATION					
NONPLASTIC 0-5 VERY LOW LOW PLASTICITY 6-15 SLIGHT MED. PLASTICITY 16-25 MEDIUM HIGH PLASTICITY 26 OR MORE HIGH				RUBBING WITH FINGER FREES NUMEROUS GRAINS; GENTLE BLOW BY HAMMER DISINTEGRATES SAMPLE. GRAINS CAN BE SEPARATED FROM SAMPLE WITH STEEL PROBE; BREAKS EASILY WHEN HIT WITH HAMMER. GRAINS ARE DIFFICULT TO SEPARATE WITH STEEL PROBE; DIFFICULT TO BREAK WITH HAMMER. SHARP HAMMER BLOWS REQUIRED TO BREAK SAMPLE; SAMPLE BREAKS ACROSS GRAINS.					
COLOR									
DESCRIPTIONS MAY INCLUDE COLOR OR COLOR COMBINATIONS (TAN, RED, YELLOW-BROWN, BLUE-GRAY). MODIFIERS SUCH AS LIGHT, DARK, STREAKED, ETC. ARE USED TO DESCRIBE APPEARANCE.									



STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION

BEVERLY EAVES PERDUE
GOVERNOR

EUGENE A. CONTI, JR.
SECRETARY

June 19, 2009

Project: 33746.1.1 (B-4522)
F. A. Number: BRZ-1150(7)
County: GRANVILLE
Description: Bridge No. 102 on -L- (SR 1150, Goochs Mill Road) over Tar River
Subject: **NOTES TO DESIGNER**

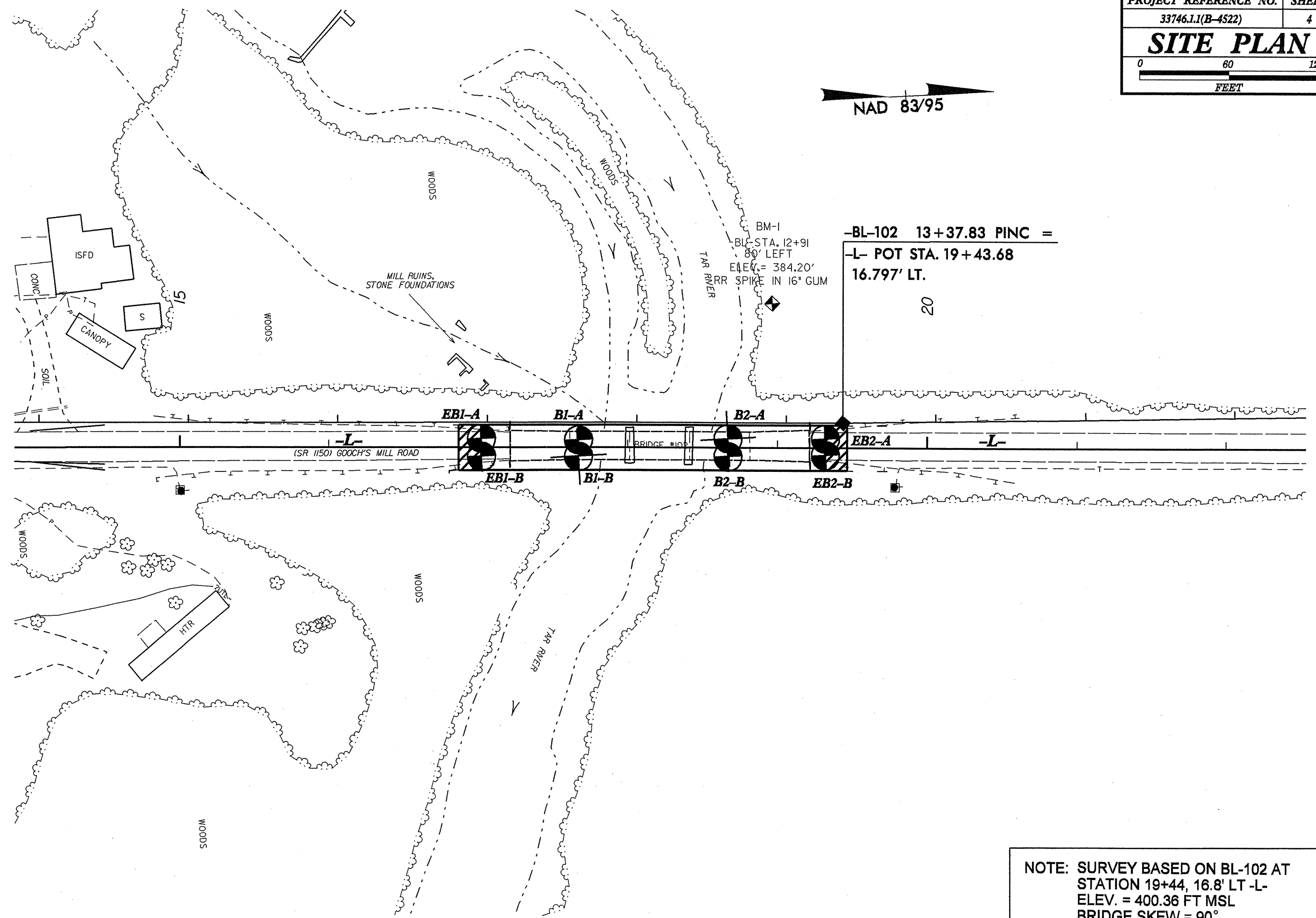
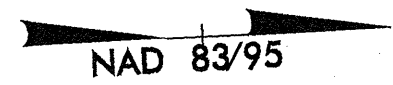
Several areas of concern were noted during the subsurface investigation for Bridge Number 102 over Tar River. These conditions may impact construction.

- Ruins of a previous mill building were found within the existing slope on the left side of End Bent 1. The structure consists of a 10 feet high by 5 feet wide vertical foundation wall. It is unknown how much of the foundation was covered with roadway embankment. This structure may impact side slope construction as well as end bent construction.
- Boulders up to 1 foot in diameter were observed within the channel of Tar River. Isolated boulders may impact bridge construction.

MAILING ADDRESS:
NC DEPARTMENT OF TRANSPORTATION
GEOTECHNICAL ENGINEERING UNIT
1589 MAIL SERVICE CENTER
RALEIGH NC 27699-1589

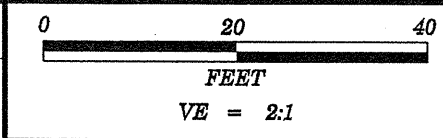
TELEPHONE: 919-250-4088
FAX: 919-250-4237
WEBSITE: WWW.NCDOT.GOV

LOCATION:
CENTURY CENTER COMPLEX
ENTRANCE B-2
1020 BIRCH RIDGE DRIVE
RALEIGH NC

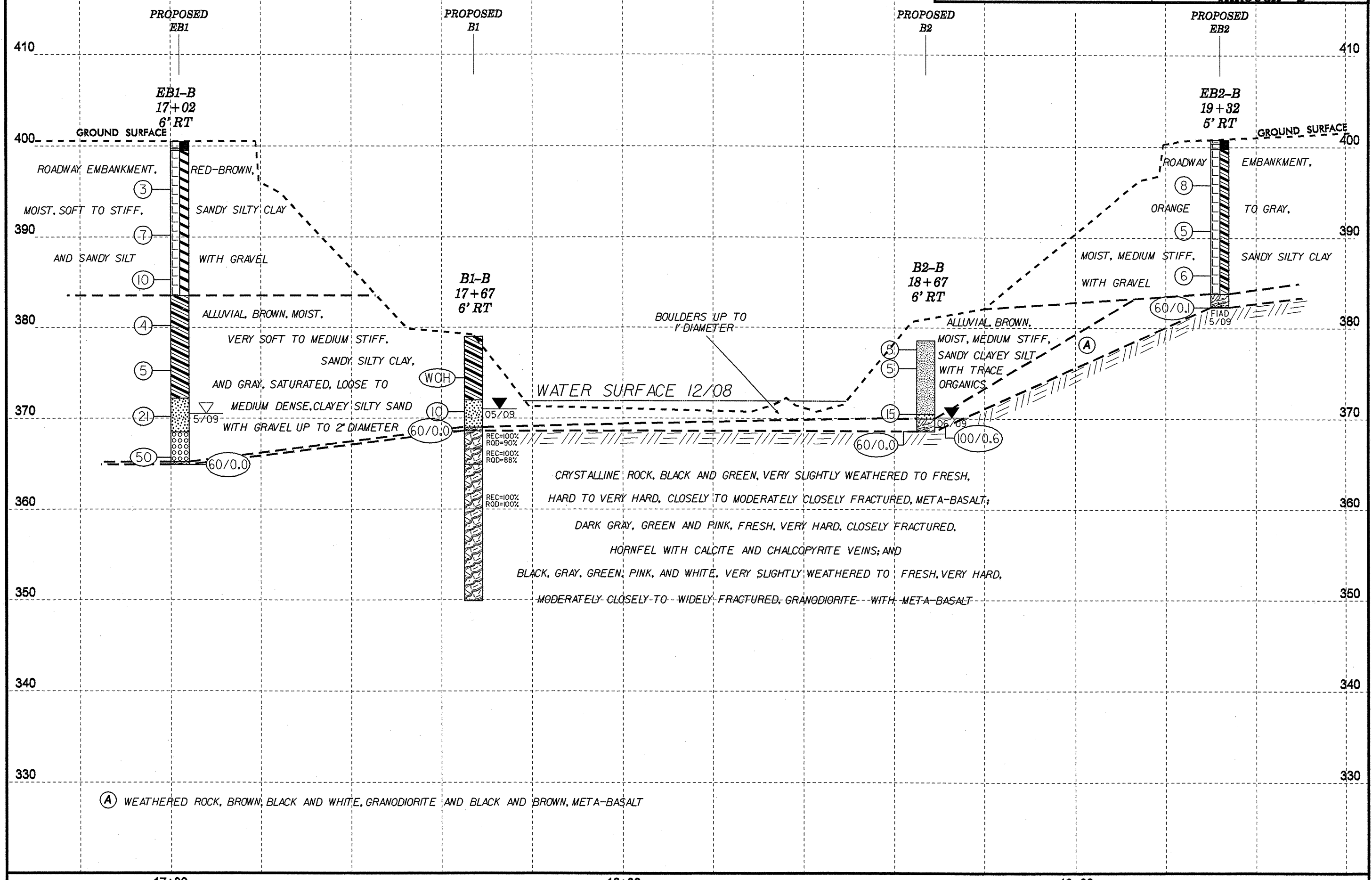


-BL-102 13+37.83 PINC =
 -L- POT STA. 19+43.68
 16.797' LT.

NOTE: SURVEY BASED ON BL-102 AT
 STATION 19+44, 16.8' LT -L-
 ELEV. = 400.36 FT MSL
 BRIDGE SKEW = 90°



PROJECT REFERENCE NO.	SHEET
33746.1.1(B-4522)	5
PROFILE BORINGS PROJECTED THROUGH -L-	



(A) WEATHERED ROCK, BROWN, BLACK AND WHITE, GRANODIORITE AND BLACK AND BROWN, META-BASALT

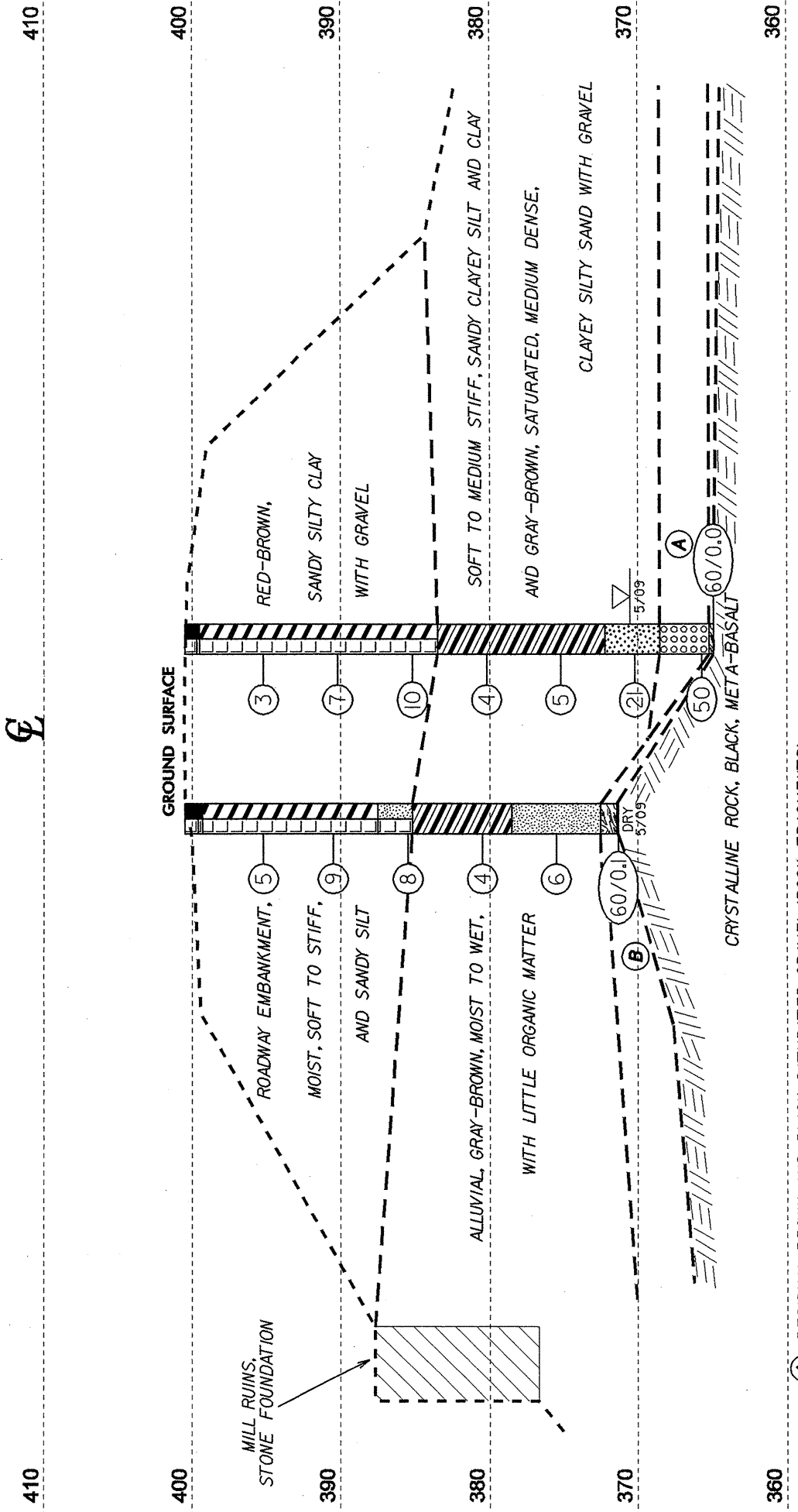
17+00

18+00

19+00

EBl-A
17+02
6' LT

EBl-B
17+02
6' RT



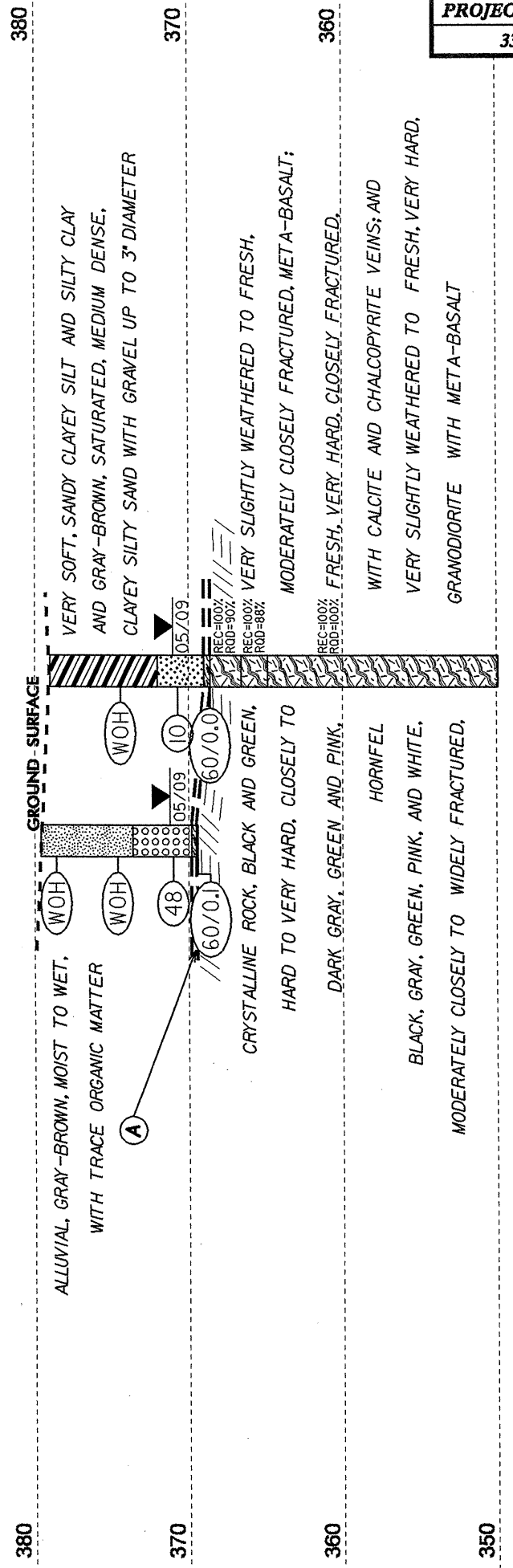
HORIZ. SCALE 0 10 20 (FEET)

VE = 1:1

CROSS SECTION THROUGH END BENT 1

Bl-A
17+67
5' LT

Bl-B
17+67
6' RT



HORIZ. SCALE 0 10 20 (FEET)

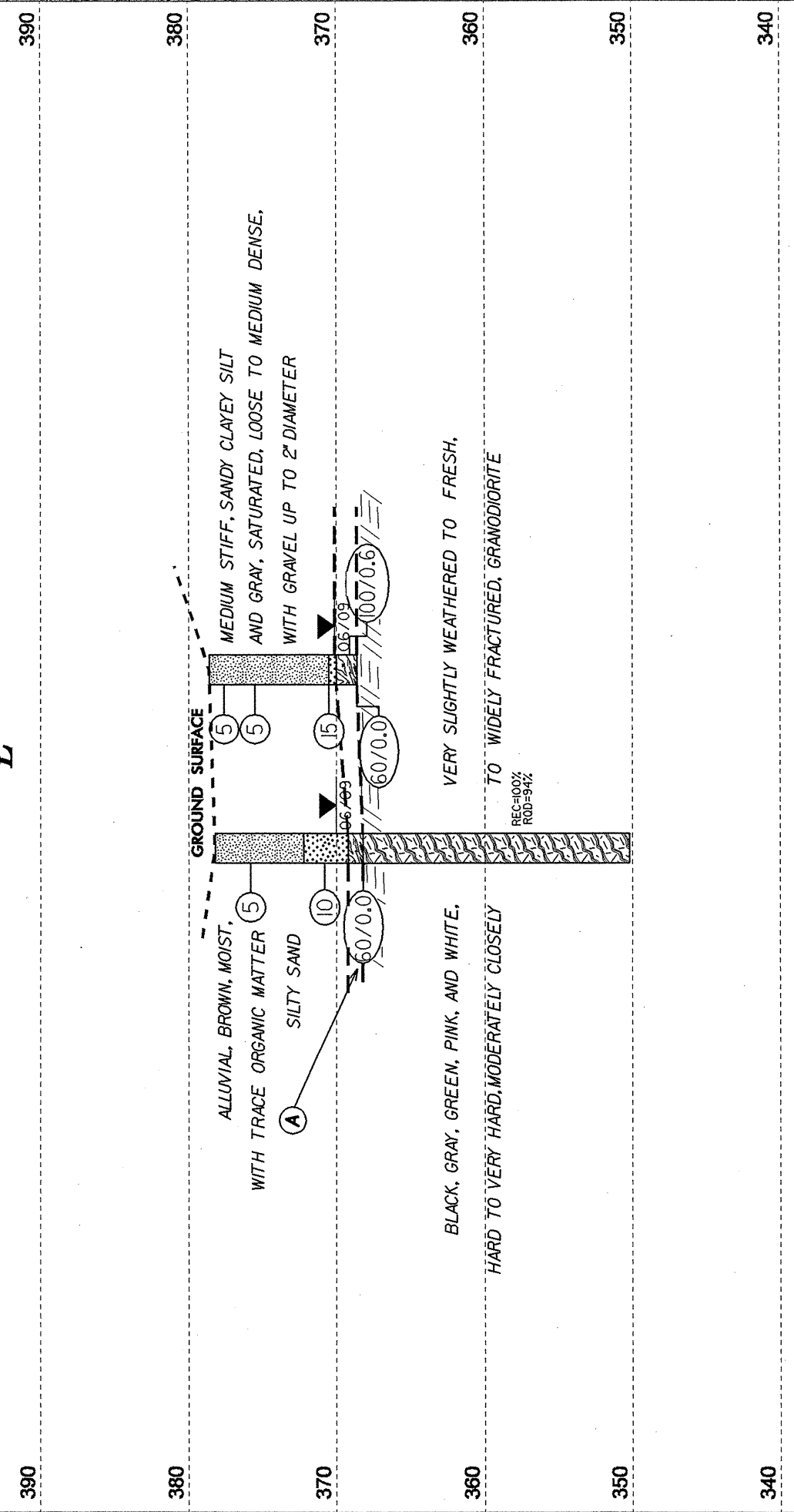
VE = 1:1

CROSS SECTION THROUGH BENT 1

(A) WEATHERED ROCK, BLACK AND BROWN, META-BASALT

B2-A
18+67
6' LT

B2-B
18+67
6' RT

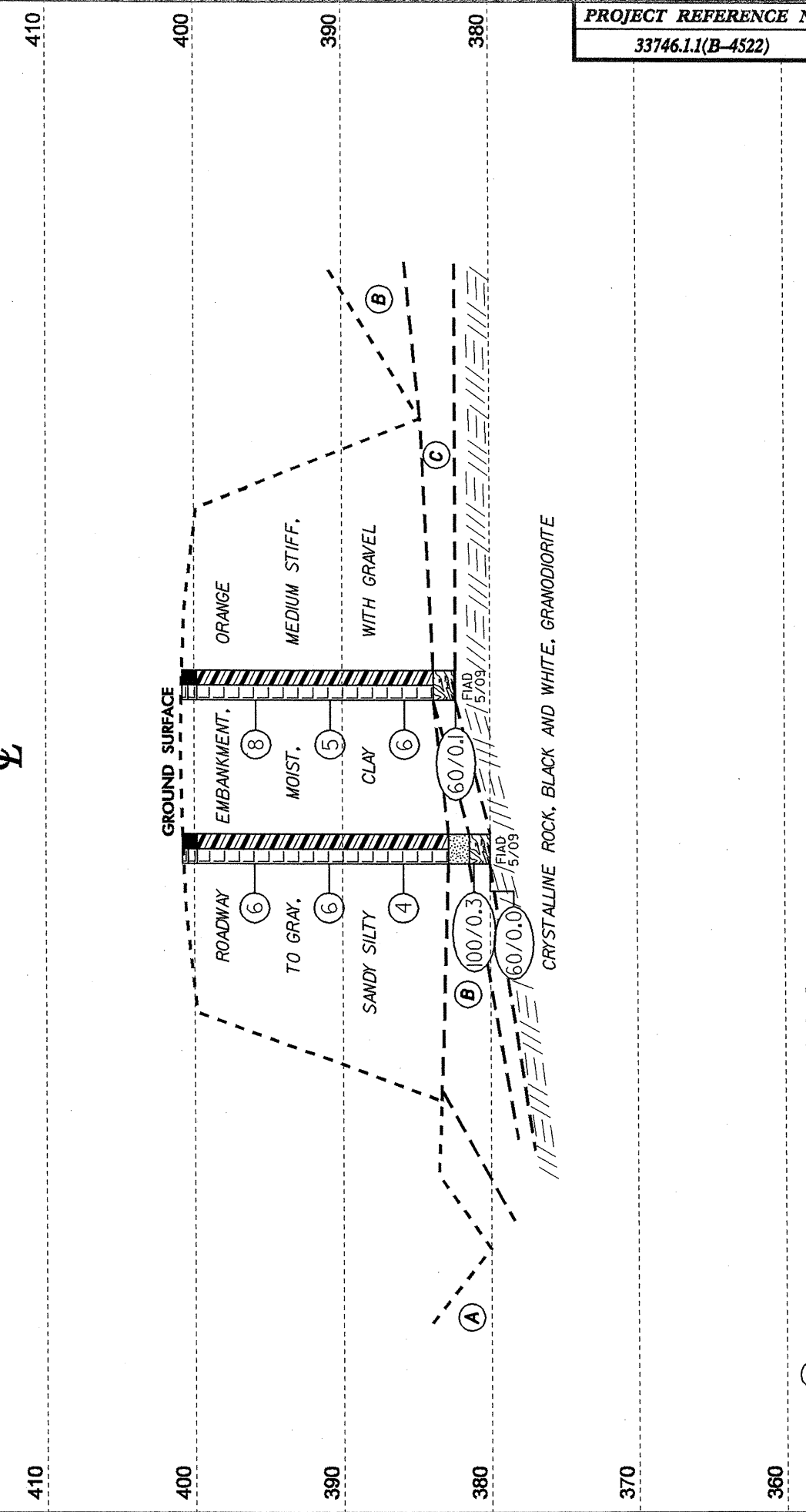


HORIZ. SCALE 0 10 20 (FEET)

CROSS SECTION THROUGH BENT 2

EB2-A
19+32
6' LT

EB2-B
19+32
5' RT

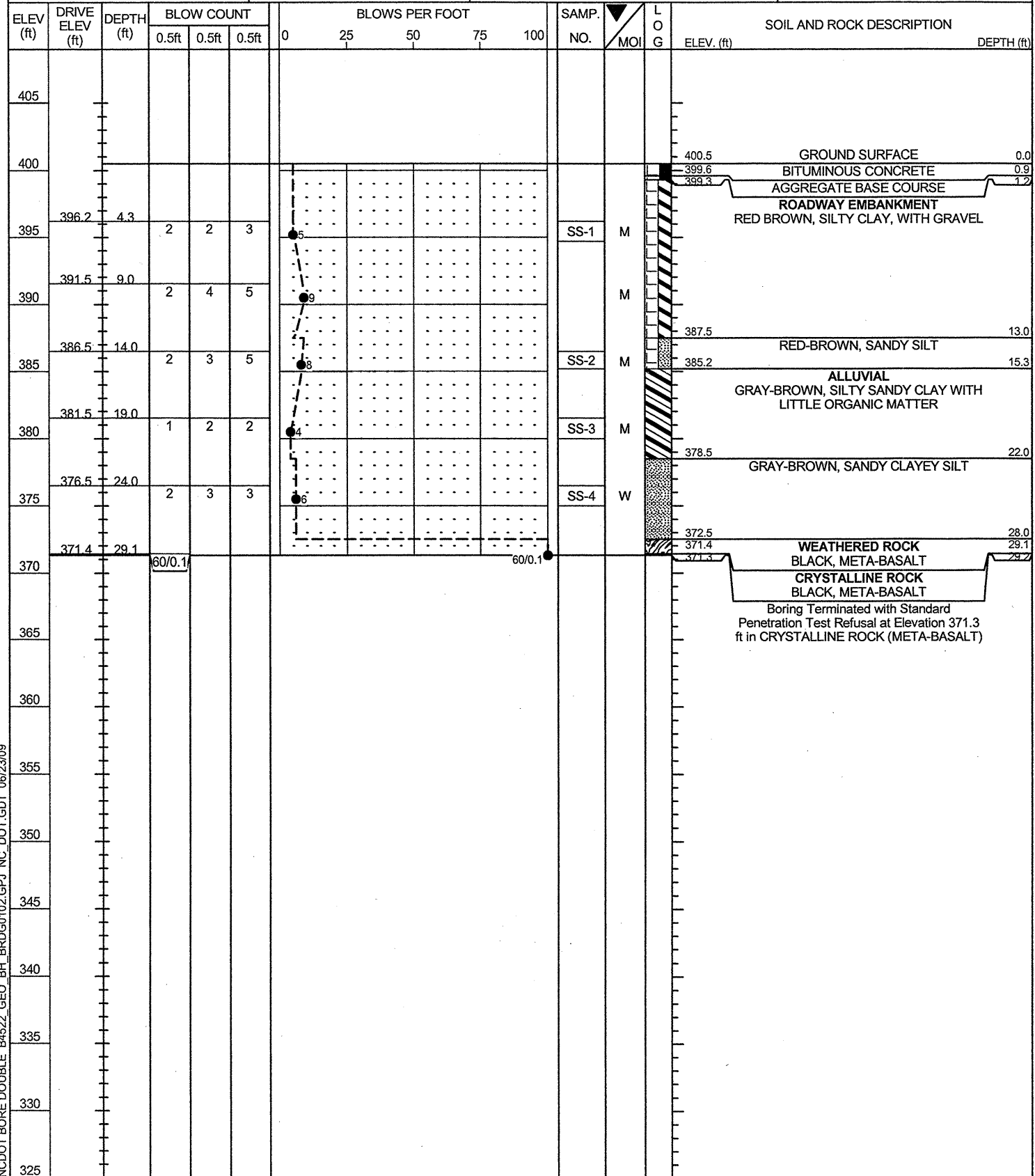


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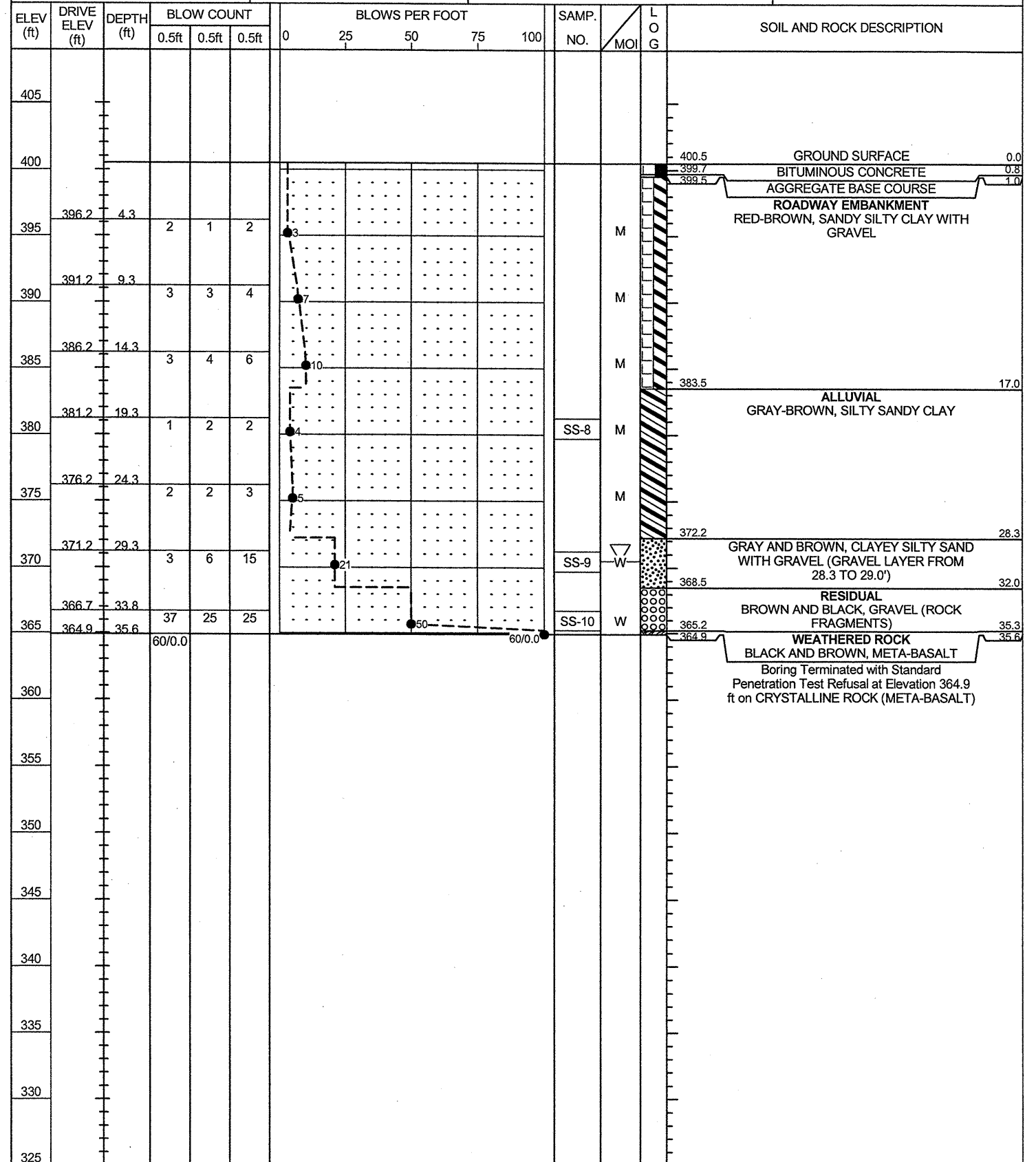
CROSS SECTION THROUGH END BENT 2

- (A) ALLUVIAL, SANDY SILT, CLAY AND SILTY SAND
- (B) RESIDUAL, ORANGE, MOIST, STIFF, SANDY SILT
- (C) WEATHERED ROCK, BLACK, BROWN AND WHITE, GRANODIORITE

PROJECT NO. 33746.1.1	ID. B-4522	COUNTY GRANVILLE	GEOLOGIST Bruinsma, C. M.
SITE DESCRIPTION BRIDGE NO. 102 ON -L- (SR 1150, GOOCHS MILL ROAD) OVER TAR RIVER			GROUND WTR (ft)
BORING NO. EB1-A	STATION 17+02	OFFSET 6ft LT	ALIGNMENT -L-
COLLAR ELEV. 400.5 ft	TOTAL DEPTH 29.2 ft	NORTHING 925,606	EASTING 2,086,431
DRILL MACHINE CME-550X	DRILL METHOD H.S. Augers	HAMMER TYPE Automatic	
START DATE 05/21/09	COMP. DATE 05/21/09	SURFACE WATER DEPTH N/A	DEPTH TO ROCK 29.1 ft



PROJECT NO. 33746.1.1	ID. B-4522	COUNTY GRANVILLE	GEOLOGIST Bruinsma, C. M.
SITE DESCRIPTION BRIDGE NO. 102 ON -L- (SR 1150, GOOCHS MILL ROAD) OVER TAR RIVER			GROUND WTR (ft)
BORING NO. EB1-B	STATION 17+02	OFFSET 6ft RT	ALIGNMENT -L-
COLLAR ELEV. 400.5 ft	TOTAL DEPTH 35.6 ft	NORTHING 925,605	EASTING 2,086,443
DRILL MACHINE CME-550X	DRILL METHOD H.S. Augers	HAMMER TYPE Automatic	
START DATE 05/27/09	COMP. DATE 05/27/09	SURFACE WATER DEPTH N/A	DEPTH TO ROCK 35.6 ft



NCDOT BORE DOUBLE B4522_GEO_BH_BRD60102.GPJ NC_DOT.GDT 06/23/09

PROJECT NO. 33746.1.1	ID. B-4522	COUNTY GRANVILLE	GEOLOGIST Bruinsma, C. M.
SITE DESCRIPTION BRIDGE NO. 102 ON -L- (SR 1150, GOOCHS MILL ROAD) OVER TAR RIVER			GROUND WTR (ft)
BORING NO. B1-B	STATION 17+67	OFFSET 6ft RT	ALIGNMENT -L-
COLLAR ELEV. 379.0 ft	TOTAL DEPTH 29.1 ft	NORTHING 925,670	EASTING 2,086,446
DRILL MACHINE CME-550X	DRILL METHOD NW Casing w/ Core	HAMMER TYPE Automatic	
START DATE 05/28/09	COMP. DATE 05/28/09	SURFACE WATER DEPTH N/A	DEPTH TO ROCK 10.4 ft

PROJECT NO. 33746.1.1	ID. B-4522	COUNTY GRANVILLE	GEOLOGIST Bruinsma, C. M.
SITE DESCRIPTION BRIDGE NO. 102 ON -L- (SR 1150, GOOCHS MILL ROAD) OVER TAR RIVER			GROUND WTR (ft)
BORING NO. B1-B	STATION 17+67	OFFSET 6ft RT	ALIGNMENT -L-
COLLAR ELEV. 379.0 ft	TOTAL DEPTH 29.1 ft	NORTHING 925,670	EASTING 2,086,446
DRILL MACHINE CME-550X	DRILL METHOD NW Casing w/ Core	HAMMER TYPE Automatic	
START DATE 05/28/09	COMP. DATE 05/28/09	SURFACE WATER DEPTH N/A	DEPTH TO ROCK 10.4 ft

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				
380													GROUND SURFACE	0.0
375	375.4	3.6	WOH	WOH	WOH						SS-13	W	ALLUVIAL BROWN, SANDY SILTY CLAY	
370	371.7	7.3	3	4	6						SS-14	W	BROWN, CLAYEY SILTY SAND WITH GRAVEL UP TO 3" DIAMETER	7.0
365	368.6	10.4	60/0.0								RS-1		WEATHERED ROCK BLACK, META-BASALT	10.4
360													CRYSTALLINE ROCK BLACK AND GREEN, META-BASALT	12.4
355													DARK GRAY, GREEN AND PINK, HORNFEL WITH CALCITE AND CHALCOPYRITE VEINS	14.1
350											RS-2		BLACK, GRAY, GREEN, PINK AND WHITE, GRANODIORITE WITH META-BASALT	
345														
340														
335														
330														
325														
320														
315														
310														
305														
300														
295														
290														

ELEV (ft)	RUN ELEV (ft)	DEPTH (ft)	RUN (ft)	DRILL RATE (Min/ft)	RUN		SAMP. NO.	STRATA		LOG	DESCRIPTION AND REMARKS	DEPTH (ft)
					REC. (%)	ROD (ft)		REC. (%)	ROD (ft)			
368.6	368.6	10.4	3.7	2:00 2:00 4:00	(3.7)	(3.3)		(2.0)	(1.8)		Begin Coring @ 10.4 ft	
365	364.9	14.1	5.0	3:45/0.7 2:34 2:20 2:40 3:00 3:30	(5.0)	(5.0)	RS-1	(1.7)	(1.5)		CRYSTALLINE ROCK BLACK AND GREEN, VERY SLIGHTLY WEATHERED TO FRESH, HARD TO VERY HARD, CLOSELY TO MODERATELY CLOSELY FRACTURED, META-BASALT	10.4
360	359.9	19.1	5.0	2:00 1:30 1:30 1:40 2:02	(5.0)	(5.0)		(15.0)	(15.0)		DARK GRAY, GREEN AND PINK, FRESH, VERY HARD, CLOSELY FRACTURED, HORNFEL WITH CALCITE AND CHALCOPYRITE VEINS	14.1
355	354.9	24.1	5.0	2:00 2:25 3:00 3:15 3:45	(5.0)	(5.0)	RS-2				BLACK, GRAY, GREEN, PINK AND WHITE, VERY SLIGHTLY WEATHERED TO FRESH, VERY HARD, MODERATELY CLOSELY TO WIDELY FRACTURED, GRANODIORITE WITH META-BASALT	
350	349.9	29.1									RMR CLASS I (VERY GOOD ROCK)(85)	
345												
340												
335												
330												
325												
320												
315												
310												
305												
300												
295												
290												

CDDOT BORE DOUBLE B4522_GEO_BH_BRDG0102.GPJ NC_DOT_GDT_06/23/09

CDDOT - SINGLE BORE GEO_BH_B2A_FRN10793 INC DOT10501 06/23/09



PROJECT NO. 33746.1.1	ID. B-4522	COUNTY GRANVILLE	GEOLOGIST Bruinsma, C. M.
SITE DESCRIPTION BRIDGE NO. 102 ON -L- (SR 1150, GOOCHS MILL ROAD) OVER TAR RIVER			GROUND WTR (ft)
BORING NO. B2-A	STATION 18+67	OFFSET 6ft LT	ALIGNMENT -L-
COLLAR ELEV. 378.2 ft	TOTAL DEPTH 28.0 ft	NORTHING 925,770	EASTING 2,086,440
DRILL MACHINE CME-550X	DRILL METHOD NW Casing w/ Core	HAMMER TYPE Automatic	
START DATE 06/02/09	COMP. DATE 06/02/09	SURFACE WATER DEPTH N/A	DEPTH TO ROCK 10.1 ft

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						
380																
375	376.8	1.4	2	2	3							SS-17	M	ALLUVIAL BROWN, SANDY CLAYEY SILT, MOTTLED		
370	371.8	6.4	4	5	5							Sat.		GRAY, GRAVELLY SILTY SAND, WITH WOOD FROM 6.4 TO 6.8'	6.0	
365	368.1	10.1	60/0.0											WEATHERED ROCK BROWN, BLACK AND WHITE, GRANODIORITE	10.1	
360														CRYSTALLINE ROCK WHITE AND BLACK, GRANODIORITE		
350																350.2

C:\DOT\BORE\DOUBLE\B4522_GEO_BH_BRDG0102.GPJ NC DOT GDT 06/23/09

PROJECT NO. 33746.1.1	ID. B-4522	COUNTY GRANVILLE	GEOLOGIST Bruinsma, C. M.
SITE DESCRIPTION BRIDGE NO. 102 ON -L- (SR 1150, GOOCHS MILL ROAD) OVER TAR RIVER			GROUND WTR (ft)
BORING NO. B2-A	STATION 18+67	OFFSET 6ft LT	ALIGNMENT -L-
COLLAR ELEV. 378.2 ft	TOTAL DEPTH 28.0 ft	NORTHING 925,770	EASTING 2,086,440
DRILL MACHINE CME-550X	DRILL METHOD NW Casing w/ Core	HAMMER TYPE Automatic	
START DATE 06/02/09	COMP. DATE 06/02/09	SURFACE WATER DEPTH N/A	DEPTH TO ROCK 10.1 ft

ELEV (ft)	RUN ELEV (ft)	DEPTH (ft)	RUN (ft)	DRILL RATE (Min/ft)	RUN		SAMP. NO.	STRATA		LOG	DESCRIPTION AND REMARKS	DEPTH (ft)
					REC. (%)	RQD (%)		REC. (%)	RQD (%)			
368.1											Begin Coring @ 10.1 ft	
365	368.1	10.1	3.1	1:56	(3.1)	(3.1)		(17.9)	(16.9)		CRYSTALLINE ROCK	10.1
	365.0	13.2	4.9	1:45	100%	100%		100%	94%		GRAY, WHITE, PINK AND BLACK, FRESH, HARD TO VERY HARD, CLOSELY TO WIDELY FRACTURED, GRANODIORITE	
				2:00							RMR CLASS I (VERY GOOD ROCK) (82)	
360	360.1	18.1	4.9	0:15/0.1	(4.9)	(4.7)						
				1:33	100%	96%						
				1:22								
				1:45								
				1:40								
355	355.2	23.0	5.0	1:35	(4.9)	(4.7)						
				1:15	100%	96%						
				1:13								
				1:20								
				1:35/0.9								
350	350.2	28.0	5.0	1:07	(5.0)	(4.4)						
				1:00	100%	88%						
				1:07								
				1:14								
				1:24								
345												
340												
335												
330												
325												
320												
315												
310												
305												
300												
295												
290												

C:\DOT\BORE\DOUBLE\B4522_GEO_BH_BRDG0102.GPJ NC DOT GDT 06/23/09

Boring Terminated at Elevation 350.2 ft in CRYSTALLINE ROCK (GRANODIORITE)

Boring Terminated at Elevation 350.2 ft in CRYSTALLINE ROCK (GRANODIORITE)



NCDOT GEOTECHNICAL ENGINEERING UNIT
BORELOG REPORT

PROJECT NO. 33746.1.1	ID. B-4522	COUNTY GRANVILLE	GEOLOGIST Bruinsma, C. M.
SITE DESCRIPTION BRIDGE NO. 102 ON -L- (SR 1150, GOOCHS MILL ROAD) OVER TAR RIVER			GROUND WTR (ft)
BORING NO. B2-B	STATION 18+67	OFFSET 6ft RT	ALIGNMENT -L-
COLLAR ELEV. 378.6 ft	TOTAL DEPTH 10.0 ft	NORTHING 925,770	EASTING 2,086,452
DRILL MACHINE CME-550X	DRILL METHOD NW Casing w/ Advancer	HAMMER TYPE Automatic	
START DATE 06/01/09	COMP. DATE 06/01/09	SURFACE WATER DEPTH N/A	DEPTH TO ROCK 10.0 ft

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					
380															
	378.6	0.0												GROUND SURFACE	0.0
	376.5	2.1	1	2	3	5	5	5	5	5	SS-15	M	ALLUVIAL BROWN TO GRAY, CLAYEY SANDY SILT WITH TRACE ORGANICS		
375			3	3	2							M			
	371.5	7.1													
	369.7	8.9	5	5	10						SS-16A		GRAY, SILTY SAND WITH GRAVEL UP TO 2" DIAMETER	8.1	
370			10	90/0.1							SS-16B				8.6
	368.6	10.0								100/0.6				368.6	10.0
365													WEATHERED ROCK TAN, WHITE AND BROWN, GRANODIORITE		
													Boring Terminated with Standard Penetration Test Refusal at Elevation 368.6 ft on CRYSTALLINE ROCK (GRANODIORITE)		
360															
355															
350															
345															
340															
335															
330															
325															
320															
315															
310															
305															
300															

NCDOT BORE SINGLE B4522_GEO_BH_BRDG0102.GPJ NC_DOT_GDT 06/23/09

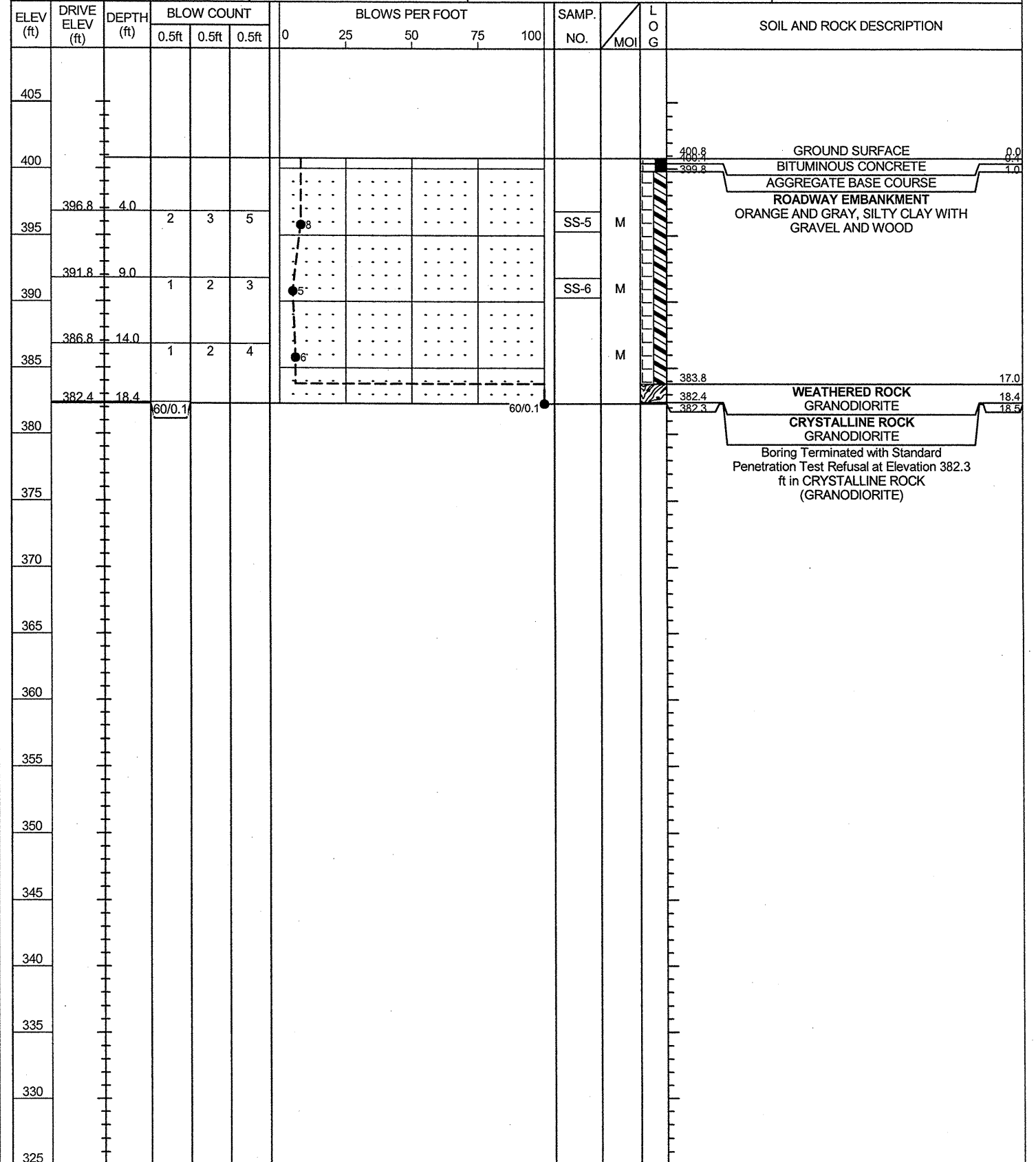
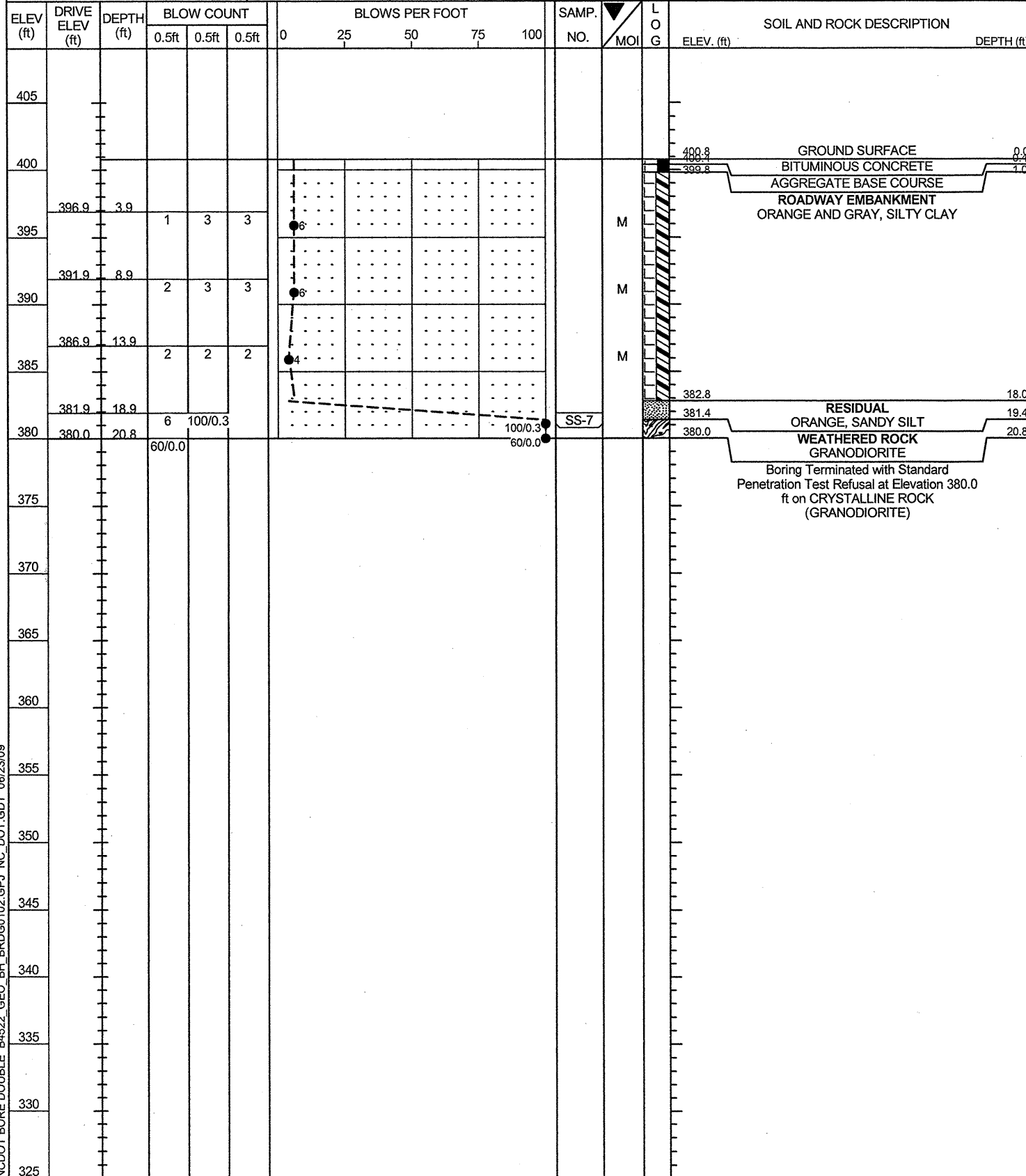


NCDOT GEOTECHNICAL ENGINEERING UNIT

BORELOG REPORT

PROJECT NO. 33746.1.1	ID. B-4522	COUNTY GRANVILLE	GEOLOGIST Mohs, N. D.
SITE DESCRIPTION BRIDGE NO. 102 ON -L- (SR 1150, GOOCHS MILL ROAD) OVER TAR RIVER			GROUND WTR (ft)
BORING NO. EB2-A	STATION 19+32	OFFSET 6ft LT	ALIGNMENT -L-
COLLAR ELEV. 400.8 ft	TOTAL DEPTH 20.8 ft	NORTHING 925,835	EASTING 2,086,444
DRILL MACHINE CME-550X	DRILL METHOD H.S. Augers	HAMMER TYPE Automatic	
START DATE 05/22/09	COMP. DATE 05/22/09	SURFACE WATER DEPTH N/A	DEPTH TO ROCK 20.8 ft

PROJECT NO. 33746.1.1	ID. B-4522	COUNTY GRANVILLE	GEOLOGIST Mohs, N. D.
SITE DESCRIPTION BRIDGE NO. 102 ON -L- (SR 1150, GOOCHS MILL ROAD) OVER TAR RIVER			GROUND WTR (ft)
BORING NO. EB2-B	STATION 19+32	OFFSET 5ft RT	ALIGNMENT -L-
COLLAR ELEV. 400.8 ft	TOTAL DEPTH 18.5 ft	NORTHING 925,834	EASTING 2,086,455
DRILL MACHINE CME-550X	DRILL METHOD H.S. Augers	HAMMER TYPE Automatic	
START DATE 05/22/09	COMP. DATE 05/22/09	SURFACE WATER DEPTH N/A	DEPTH TO ROCK 18.4 ft



NCDOT BORE DOUBLE B4522 GEO BH BRDG0102.GPJ NC DOT.GDT 06/23/09

EB1-A

SOIL TEST RESULTS															
SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT				% PASSING (SIEVES)			%	%
							C.SAND	F.SAND	SILT	CLAY	10	40	200		
SS-1	6 LT	17+02	4.3-5.8	A-7-6(13)	44	23	11.5	16.4	24.8	47.3	87	80	66	-	-
SS-2	6 LT	17+02	14.0-15.3	A-4(3)	28	7	7.2	31.2	34.8	26.7	100	98	67	-	-
SS-3	6 LT	17+02	19.0-20.5	A-6(9)	33	13	2.9	26.1	34.0	37.0	100	99	79	-	-
SS-4	6 LT	17+02	24.0-25.5	A-4(3)	30	10	20.1	30.4	22.7	26.7	99	87	56	-	-

EB1-B

SOIL TEST RESULTS															
SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT				% PASSING (SIEVES)			%	%
							C.SAND	F.SAND	SILT	CLAY	10	40	200		
SS-8	6 RT	17+02	19.3-20.8	A-6(12)	35	14	1.0	21.8	40.2	37.0	100	100	85	-	-
SS-9	6 RT	17+02	29.3-30.8	A-2-4(0)	24	3	29.2	35.1	17.2	18.5	73	61	31	-	-
SS-10	6 RT	17+02	33.8-35.3	A-1-b(0)	28	5	34.1	18.7	30.7	16.4	39	28	20	-	-

B1-A

SOIL TEST RESULTS															
SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT				% PASSING (SIEVES)			%	%
							C.SAND	F.SAND	SILT	CLAY	10	40	200		
SS-11	5 LT	17+67	4.0-5.5	A-4(4)	30	8	12.3	24.7	34.2	28.8	100	98	67	-	-
SS-12	5 LT	17+67	7.6-9.1	A-1-a(0)	22	3	49.1	21.8	16.8	12.3	35	22	11	-	-

B1-B

SOIL TEST RESULTS															
SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT				% PASSING (SIEVES)			%	%
							C.SAND	F.SAND	SILT	CLAY	10	40	200		
SS-13	6 RT	17+67	3.6-5.1	A-6(8)	33	11	4.1	21.2	41.8	32.9	100	99	80	-	-
SS-14	6 RT	17+67	7.3-8.8	A-2-4(0)	24	7	47.9	20.1	11.4	20.6	52	37	18	-	-

B2-A

SOIL TEST RESULTS															
SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT				% PASSING (SIEVES)			%	%
							C.SAND	F.SAND	SILT	CLAY	10	40	200		
SS-17	6 LT	18+67	1.4-2.9	A-4(5)	28	9	7.4	23.0	40.8	28.8	100	97	75	-	-

B2-B

SOIL TEST RESULTS															
SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT				% PASSING (SIEVES)			%	%
							C.SAND	F.SAND	SILT	CLAY	10	40	200		
SS-15	6 RT	18+67	0.0-1.5	A-4(6)	29	10	4.9	27.5	40.8	26.7	100	99	74	-	-
SS-16A	6 RT	18+67	7.1-8.1	A-4(2)	25	8	14.2	30.8	28.3	26.7	100	97	59	-	-
SS-16B	6 RT	18+67	8.1-8.6	A-2-4(0)	22	3	39.1	30.4	16.1	14.4	65	53	22	-	-

EB2-A

SOIL TEST RESULTS															
SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT				% PASSING (SIEVES)			%	%
							C.SAND	F.SAND	SILT	CLAY	10	40	200		
SS-7	6 LT	19+32	18.9-19.4	A-4(0)	33	9	28.8	25.5	21.1	24.7	77	62	39	-	-

EB2-B

SOIL TEST RESULTS															
SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT				% PASSING (SIEVES)			%	%
							C.SAND	F.SAND	SILT	CLAY	10	40	200		
SS-5	5 RT	19+32	4.0-5.5	A-6(11)	40	16	11.1	17.5	30.3	41.1	97	91	74	-	-
SS-6	5 RT	19+32	9.0-10.5	A-6(8)	35	13	14.2	19.3	33.6	32.9	99	90	71	-	-

B1-B

ROCK TEST RESULTS									
SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AREA (in ²)	UNIT WEIGHT (lbs/ft ³)	H/D RATIO	ULTIMATE LOAD (ksi)	ULTIMATE LOAD (lbf)	SEC MOD @ 40% (Mpsi)
RS-1	6 RT	17+67	11.7-12.4	2.7465	184.1	2.19	40.1	110100	13.58
RS-2	6 RT	17+67	24.7-25.3	2.7465	177	2.19	43.1	118300	25.9

B2-A

ROCK TEST RESULTS									
SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AREA (in ²)	UNIT WEIGHT (lbs/ft ³)	H/D RATIO	ULTIMATE LOAD (ksi)	ULTIMATE LOAD (lbf)	SEC MOD @ 40% (Mpsi)
RS-3	6 LT	18+67	15.5-16.2	2.7465	177	2.21	16.74	46000	10.26



**FIELD
 SCOUR REPORT**

WBS: 33746.1.1 TIP: B-4522 COUNTY: Granville

DESCRIPTION(1): Bridge No. 102 on -L- (SR 1150, Goochs Mill Road) over Tar River

EXISTING BRIDGE

Information from: Field Inspection Microfilm _____ (reel _____ pos: _____)
 Other (explain) Hydraulics Report

Bridge No.: 1 Length: 200 Total Bents: 6 Bents in Channel: 2 Bents in Floodplain: 4
 Foundation Type: Driven wooden piles, with brace h-piles, piles on spread footing for bents in channel

EVIDENCE OF SCOUR(2)

Abutments or End Bent Slopes: None evident.

Interior Bents: Some scour on downstream side of existing bent 2 and 3 (concrete footings).

Channel Bed: Scour to channel bed appears extensive, and in many areas, the channel has been scoured to weathered or crystalline rock (notably at Station 18+40, 20 feet right of -L-)

Channel Bank: Banks are extensively scoured, with near vertical morphology, up to 8 feet. Evidence of eddy scouring was noted at Station 18+40, 10 to 40 feet right of existing Bent 3.

EXISTING SCOUR PROTECTION

Type(3): No rip-rap evident. Possible weir system used as a form of scour protection in channel.

Extent(4): Two weirs were noted, from the south bank to ex. Bent 2, and from Bent 3 to the north bank.

Effectiveness(5): effective in decreasing flow rates near piers located in channel.

Obstructions(6): None observed at the time of investigation.

INSTRUCTIONS

- 1 Describe the specific site's location, including route number and body of water crossed.
- 2 Note scour evidence at existing end bents or abutments (e.g. undermining, sloughing, degradations).
- 3 Note existing scour protection (e.g. rip rap).
- 4 Describe extent of existing scour protection.
- 5 Describe whether or not the scour protection appears to be working.
- 6 Note obstructions such as dams, fallen trees, debris at bents, etc.
- 7 Describe the channel bed material based on observation and/or samples. Include any lab results with report.
- 8 Describe the channel bank material based on observation and/or samples. Include any lab results with report.
- 9 Describe the material covering the banks (e.g. grass, trees, rip rap, none).
- 10 Determine the approximate floodplain width from field observation or a topographic map.
- 11 Describe the material covering the floodplain (e.g. grass, trees, crops).
- 12 Use professional judgement to specify if the stream is degrading, aggrading, or static.
- 13 Describe potential and direction of the stream to migrate laterally during the bridge's life (approx. 100 years).
- 14 Give the design scour elevation (DSE) expected over the life of the bridge (approx. 100 years). This elevation can be given as a range across the site, or for each bent. Discuss the relationship between the Hydraulics Unit theoretical scour and the DSE. If the DSE is dependent on scour counter measures, explain (e.g. rip rap armoring on slopes). The DSE is based on the erodability of materials, giving consideration to the influence of joints, foliation, bedding characteristics, % core recovery, % RQD, differential weathering, shear strength, observations at existing structures, other tests deemed appropriate, and overall geologic conditions at the site.

DESIGN INFORMATION

Channel Bed Material(7): Silty sand, coarse sand, gravel, and boulders

Channel Bank Material(8): Sandy silt and sandy clay.

Channel Bank Cover(9): Moderate to large trees, shrubs and grasses.

Floodplain Width(10): 400 - 500 feet

Floodplain Cover(11): Moderate to large trees, shrubs and grasses.

Stream is(12): Aggrading _____ Degrading Static _____

Channel Migration Tendency(13): Migration to the north.

Observations and Other Comments: A dam is located approximately 500 feet upstream of the structure. The fluvial system appears flashy in nature. Stone weirs evident under bridge.

DESIGN SCOUR ELEVATIONS(14)

Feet x Meters

BENTS

B1	B2													
368.6	368.6													

Comparison of DSE to Hydraulics Unit theoretical scour:
 The GSE is 7.9 and 13.2 feet higher than the theoretical elevation shown for Bent 1 and Bent 2, respectively, on the Bridge and Hydraulic Design Report for the 100 year storm event.

SOIL ANALYSIS RESULTS FROM CHANNEL BED AND BANK MATERIAL

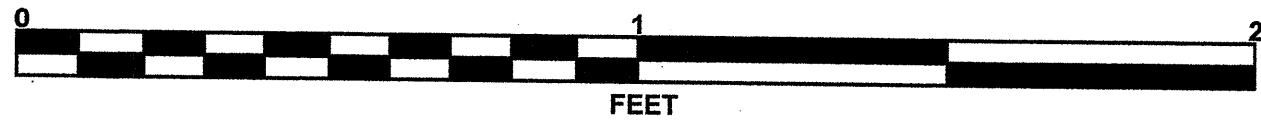
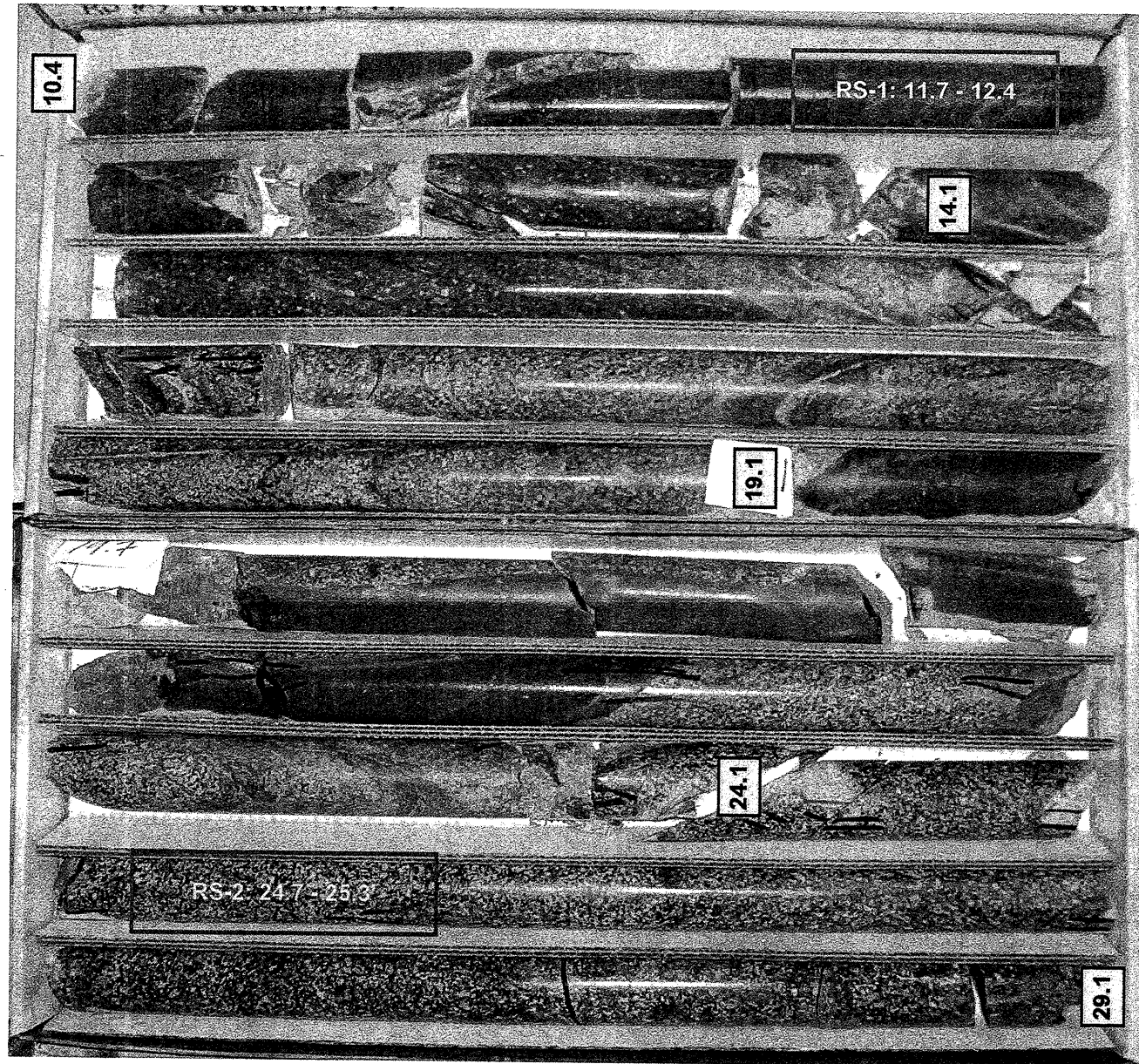
Bed or Bank														
Sample No.														
Retained #4														
Passed #10														
Passed #40														
Passed #200														
Coarse Sand														
Fine Sand														
Silt														
Clay														
LL														
PI														
AASHTO														
Station														
Offset														
Depth														

Reported by: 
 Christina M. Bruinsma, L.G.

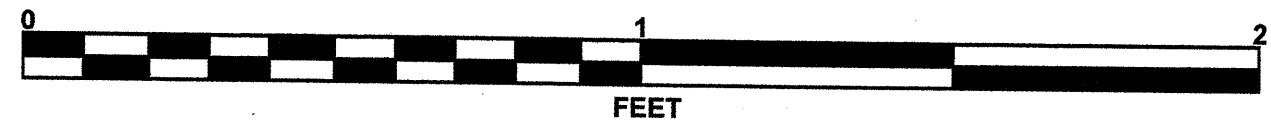
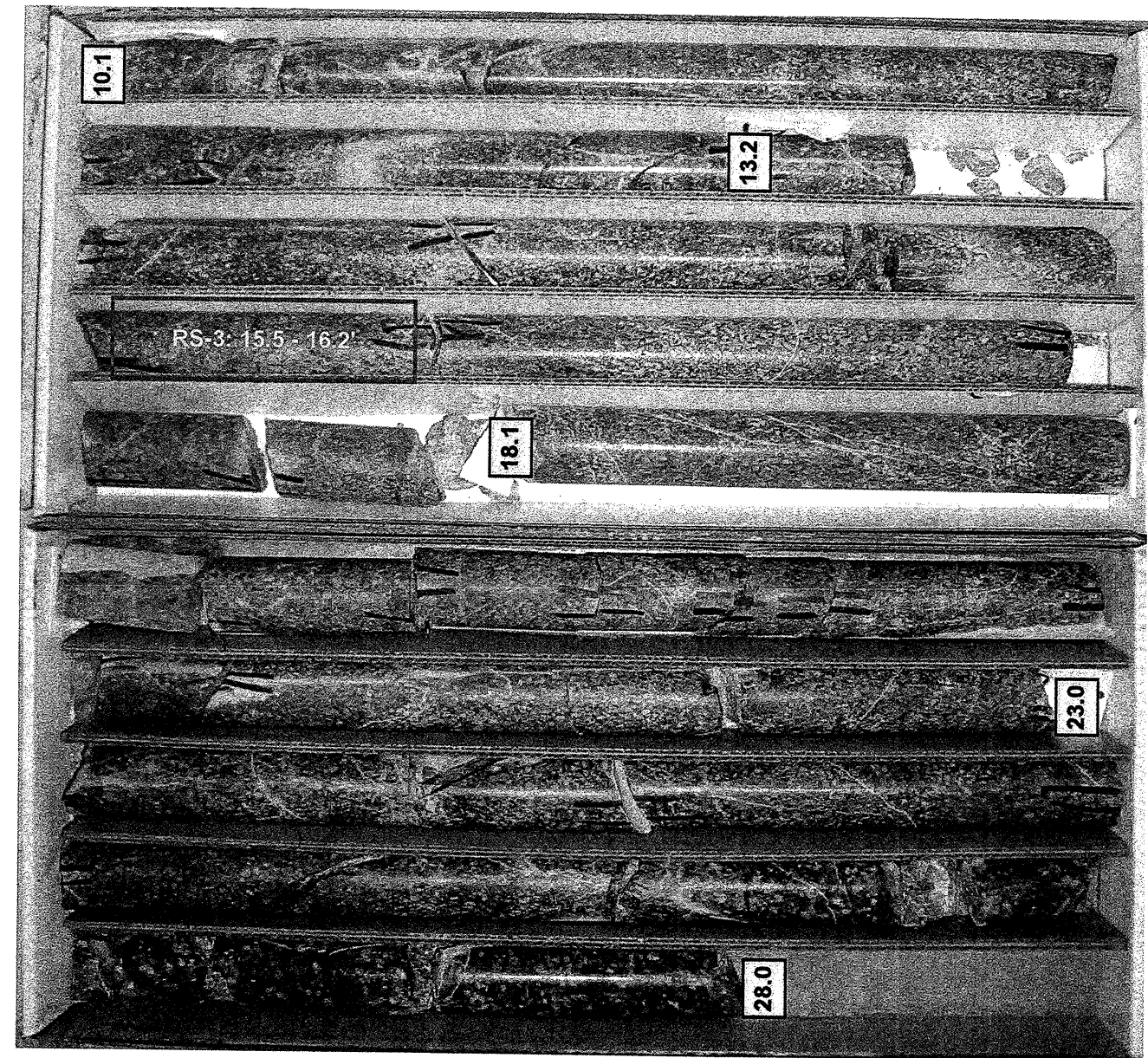
Date: 6/1/2009

CORE PHOTOGRAPHS

B1-B
BOXES 1 & 2: 10.4 - 29.1 FEET



B2-A
BOX 1 & 2: 10.1 - 28.0 FEET



SITE PHOTO

BRIDGE NO. 102 ON -L- (SR 1150, GOOCHS MILL ROAD) OVER TAR RIVER, AT APPROXIMATE -L- STATION 18+70



LOOKING SOUTHWEST