

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	33557.1.1(B-4211)	1	21

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

STRUCTURE
SUBSURFACE INVESTIGATION

PROJ. REFERENCE NO. 33557.1.1(B-4211) F.A. PROJ. BRZ-1544(2)
COUNTY NASH
PROJECT DESCRIPTION BRIDGE NO. 56 ON -L- (SR 1544) OVER
TAR RIVER

INVENTORY

CONTENTS

<u>SHEET</u>	<u>DESCRIPTION</u>
1	TITLE SHEET
2	LEGEND
3	SITE PLAN
4	PROFILE(S)
5-7	CROSS SECTION(S)
8-16	BORE LOG & CORE REPORT(S)
17	SOIL TEST RESULTS
18	SCOUR REPORT
19-20	CORE PHOTOGRAPH(S)
21	SITE PHOTOGRAPH(S)

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 1919 250-4088. NEITHER THE SUBSURFACE PLANS AND REPORTS, NOR THE FIELD BORING LOGS, ROCK CORES, OR SOIL TEST DATA ARE PART OF THE CONTRACT.

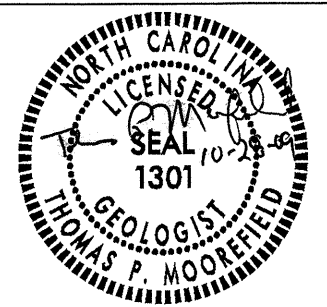
GENERAL SOIL AND ROCK STRATA DESCRIPTIONS AND INDICATED BOUNDARIES ARE BASED ON A GEOTECHNICAL INTERPRETATION OF ALL AVAILABLE SUBSURFACE DATA AND MAY NOT NECESSARILY REFLECT THE ACTUAL SUBSURFACE CONDITIONS BETWEEN BORINGS OR BETWEEN SAMPLED STRATA WITHIN THE BOREHOLE. THE LABORATORY SAMPLE DATA AND 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: 33557.1.1 ID: B-4211

PERSONNEL
C.D. CZJAKA
J.R. TURNAGE
J.R. MATULA

INVESTIGATED BY C.D. CZJAKA
CHECKED BY T.P. MOOREFIELD
SUBMITTED BY N.T. ROBERSON
DATE OCTOBER 2009



DRAWN BY: T.T. WALKER

NOTE - THE INFORMATION CONTAINED HEREIN IS NOT IMPLIED OR GUARANTEED BY THE N. C. DEPARTMENT OF TRANSPORTATION AS BEING ACCURATE NOR IT IS CONSIDERED TO BE PART OF THE PLANS, SPECIFICATIONS, OR CONTRACT FOR THE PROJECT.

NOTE - BY HAVING REQUESTED THIS INFORMATION THE CONTRACTOR SPECIFICALLY WAIVES ANY CLAIMS FOR INCREASED COMPENSATION OR EXTENSION OF TIME BASED ON DIFFERENCES BETWEEN THE CONDITIONS INDICATED HEREIN AND THE ACTUAL CONDITIONS AT THE PROJECT SITE.

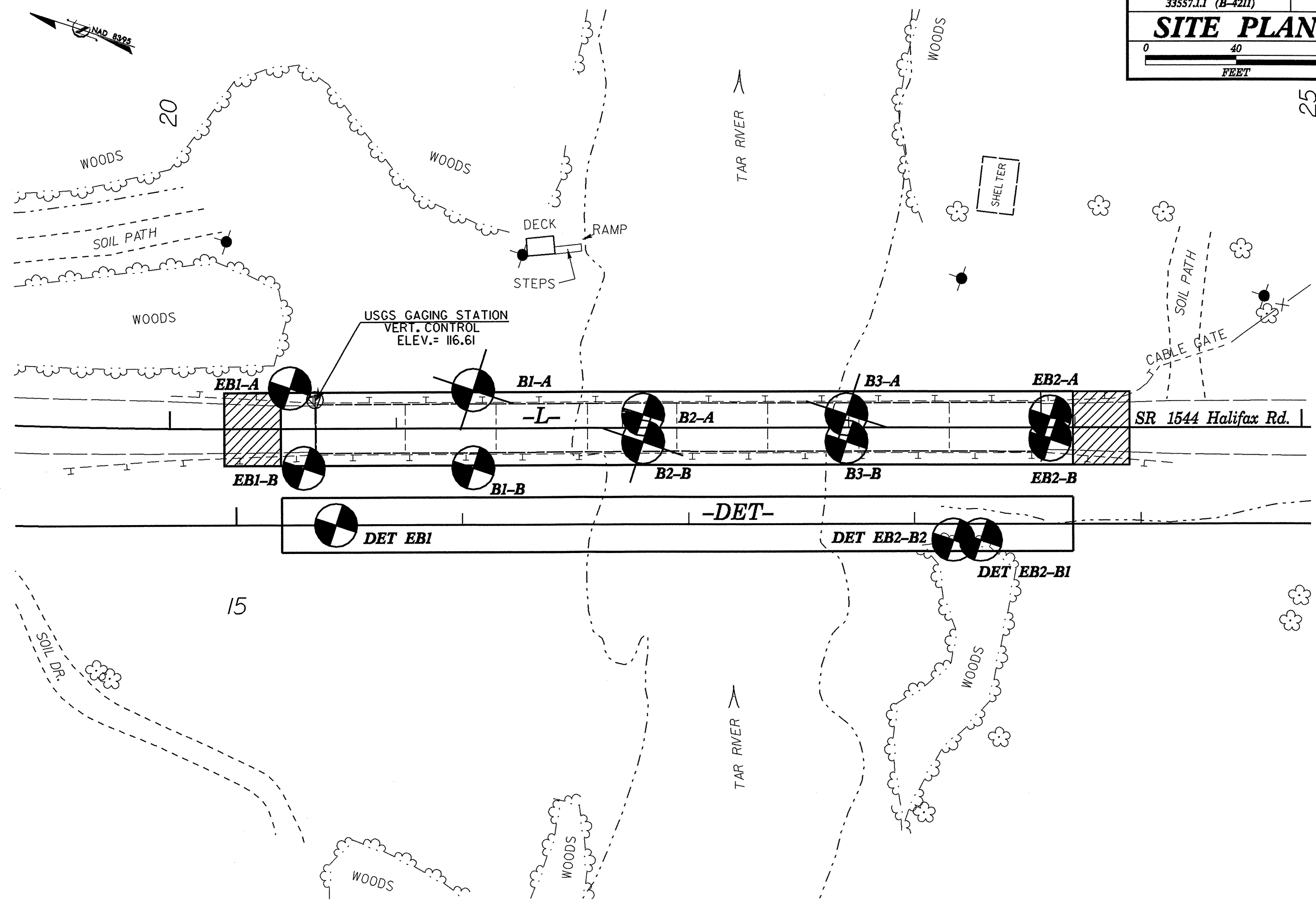
NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS
GEOTECHNICAL ENGINEERING UNIT

PROJECT REFERENCE NO. 33557.1.1(B-4211)	SHEET NO. 2
--	----------------

SUBSURFACE INVESTIGATION

SOIL AND ROCK LEGEND, TERMS, SYMBOLS, AND ABBREVIATIONS

SOIL DESCRIPTION	GRADATION	ROCK DESCRIPTION	TERMS AND DEFINITIONS
SOIL IS CONSIDERED TO BE THE UNCONSOLIDATED, SEMI-CONSOLIDATED, OR WEATHERED EARTH MATERIALS THAT CAN BE PENETRATED WITH A CONTINUOUS FLIGHT POWER AUGER, AND YIELD LESS THAN 100 BLOWS PER FOOT ACCORDING TO STANDARD PENETRATION TEST (AASHTO T206, ASTM D-1586). SOIL CLASSIFICATION IS BASED ON THE AASHTO SYSTEM. BASIC DESCRIPTIONS GENERALLY SHALL INCLUDE: CONSISTENCY, COLOR, TEXTURE, MOISTURE, AASHTO CLASSIFICATION, AND OTHER PERTINENT FACTORS SUCH AS MINERALOGICAL COMPOSITION, ANGULARITY, STRUCTURE, PLASTICITY, ETC. EXAMPLE: <i>VERY STIFF, GRAY, SILTY CLAY, MOST WITH INTERBEDDED FINE SAND LAYERS, HIGH PLASTIC, A-7-5</i>	WELL GRADED - INDICATES A GOOD REPRESENTATION OF PARTICLE SIZES FROM FINE TO COARSE. UNIFORM - INDICATES THAT SOIL PARTICLES ARE ALL APPROXIMATELY THE SAME SIZE. (ALSO POORLY GRADED) GAP-GRADED - INDICATES A MIXTURE OF UNIFORM PARTICLES OF TWO OR MORE SIZES. THE ANGULARITY OR ROUNDNESS OF SOIL GRAINS IS DESIGNATED BY THE TERMS: ANGULAR, SUBANGULAR, SUBROUNDED, OR ROUNDED.	HARD ROCK IS NON-COASTAL PLAIN MATERIAL THAT IF TESTED, WOULD YIELD SPT REFUSAL. AN INFERRED ROCK LINE INDICATES THE LEVEL AT WHICH NON-COASTAL PLAIN MATERIAL WOULD YIELD SPT REFUSAL. SPT REFUSAL IS PENETRATION BY A SPLIT SPOON SAMPLER EQUAL TO OR LESS THAN 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: WEATHERED ROCK (WR) NON-COASTAL PLAIN MATERIAL THAT WOULD YIELD SPT N VALUES > 100 BLOWS PER FOOT IF TESTED. CRYSTALLINE ROCK (CR) FINE TO COARSE GRAIN IGNEOUS AND METAMORPHIC ROCK THAT WOULD YIELD SPT REFUSAL IF TESTED. ROCK TYPE INCLUDES GRANITE, GNEISS, GABBRO, SCHIST, ETC. NON-CRYSTALLINE ROCK (NCR) FINE TO COARSE GRAIN METAMORPHIC AND NON-COASTAL PLAIN SEDIMENTARY ROCK THAT WOULD YIELD SPT REFUSAL IF TESTED. ROCK TYPE INCLUDES PHYLLITE, SLATE, SANDSTONE, ETC. COASTAL PLAIN SEDIMENTARY ROCK (CP) COASTAL PLAIN SEDIMENTS CEMENTED INTO ROCK, BUT MAY NOT YIELD SPT REFUSAL. ROCK TYPE INCLUDES LIMESTONE, SANDSTONE, CEMENTED SHELL BEDS, ETC.	ALLUVIUM (ALLUV.) - SOILS THAT HAVE BEEN TRANSPORTED BY WATER. AQUIFER - A WATER BEARING FORMATION OR STRATA. ARENACEOUS - APPLIED TO ROCKS THAT HAVE BEEN DERIVED FROM SAND OR THAT CONTAIN SAND. ARGILLACEOUS - APPLIED TO ALL ROCKS OR SUBSTANCES COMPOSED OF CLAY MINERALS, OR HAVING A NOTABLE PROPORTION OF CLAY IN THEIR COMPOSITION, AS SHALE, SLATE, ETC. ARTESIAN - GROUND WATER THAT IS UNDER SUFFICIENT PRESSURE TO RISE ABOVE THE LEVEL AT WHICH IT IS ENCOUNTERED, BUT WHICH DOES NOT NECESSARILY RISE TO OR ABOVE THE GROUND SURFACE. CALCAREOUS (CALC.) - SOILS THAT CONTAIN APPRECIABLE AMOUNTS OF CALCIUM CARBONATE. COLLUVIUM - ROCK FRAGMENTS MIXED WITH SOIL DEPOSITED BY GRAVITY ON SLOPE OR AT BOTTOM OF SLOPE. CORE RECOVERY (REC.) - TOTAL LENGTH OF ALL MATERIAL RECOVERED IN THE CORE BARREL DIVIDED BY TOTAL LENGTH OF CORE RUN AND EXPRESSED AS A PERCENTAGE. DIKE - A TABULAR BODY OF IGNEOUS ROCK THAT CUTS ACROSS THE STRUCTURE OF ADJACENT ROCKS OR CUTS MASSIVE ROCK. DIP - THE ANGLE AT WHICH A STRATUM OR ANY PLANAR FEATURE IS INCLINED FROM THE HORIZONTAL. DIP DIRECTION (DIP AZIMUTH) - THE DIRECTION OR BEARING OF THE HORIZONTAL TRACE OF THE LINE OF DIP, MEASURED CLOCKWISE FROM NORTH. FAULT - A FRACTURE OR FRACTURE ZONE ALONG WHICH THERE HAS BEEN DISPLACEMENT OF THE SIDES RELATIVE TO ONE ANOTHER PARALLEL TO THE FRACTURE. FISSILE - A PROPERTY OF SPLITTING ALONG CLOSELY SPACED PARALLEL PLANES. 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 - A 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 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	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.	FRESH ROCK FRESH, CRYSTALS BRIGHT, FEW JOINTS MAY SHOW SLIGHT STAINING. ROCK RINGS UNDER HAMMER IF CRYSTALLINE. VERY SLIGHT (V SLI.) ROCK GENERALLY FRESH, JOINTS STAINED, SOME JOINTS MAY SHOW THIN CLAY COATINGS IF OPEN. CRYSTALS ON A BROKEN SPECIMEN FACE SHINE BRIGHTLY. ROCK RINGS UNDER HAMMER BLOWS IF OF A CRYSTALLINE NATURE. SLIGHT (SLI.) ROCK GENERALLY FRESH, JOINTS STAINED AND DISCOLORATION EXTENDS INTO ROCK UP TO 1 INCH. OPEN JOINTS MAY CONTAIN CLAY. IN GRANITOID ROCKS SOME OCCASIONAL FELDSPAR CRYSTALS ARE DULL AND DISCOLORED. CRYSTALLINE ROCKS RING UNDER HAMMER BLOWS. MODERATE (MOD.) SIGNIFICANT PORTIONS OF ROCK SHOW DISCOLORATION AND WEATHERING EFFECTS. IN GRANITOID ROCKS, MOST FELDSPARS ARE DULL AND DISCOLORED, SOME SHOW CLAY. ROCK HAS DULL SOUND UNDER HAMMER BLOWS AND SHOWS SIGNIFICANT LOSS OF STRENGTH AS COMPARED WITH FRESH ROCK. MODERATELY SEVERE (MOD. SEV.) ALL ROCK EXCEPT QUARTZ DISCOLORED OR STAINED. IN GRANITOID ROCKS, ALL FELDSPARS DULL AND DISCOLORED AND A MAJORITY SHOW KAOLINIZATION. ROCK SHOWS SEVERE LOSS OF STRENGTH AND CAN BE EXCAVATED WITH A GEOLOGIST'S PICK. ROCK GIVES "CLUNK" SOUND WHEN STRUCK. <i>IF TESTED, WOULD YIELD SPT REFUSAL</i> SEVERE (SEV.) ALL ROCK EXCEPT QUARTZ DISCOLORED OR STAINED. ROCK FABRIC CLEAR AND EVIDENT BUT REDUCED IN STRENGTH TO STRONG SOIL. IN GRANITOID ROCKS ALL FELDSPARS ARE KAOLINIZED TO SOME EXTENT. SOME FRAGMENTS OF STRONG ROCK USUALLY REMAIN. <i>IF TESTED, YIELDS SPT N VALUES > 100 BPF</i> VERY SEVERE (V SEV.) ALL ROCK EXCEPT QUARTZ DISCOLORED OR STAINED. ROCK FABRIC ELEMENTS ARE DISCERNIBLE BUT THE MASS IS EFFECTIVELY REDUCED TO SOIL STATUS, WITH ONLY FRAGMENTS OF STRONG ROCK REMAINING. SAPROLITE IS AN EXAMPLE OF ROCK WEATHERED TO A DEGREE SUCH THAT ONLY MINOR VESTIGES OF THE ORIGINAL ROCK FABRIC REMAIN. <i>IF TESTED, YIELDS SPT N VALUES < 100 BPF</i> COMPLETE ROCK REDUCED TO SOIL. ROCK FABRIC NOT DISCERNIBLE, OR DISCERNIBLE ONLY IN SMALL AND SCATTERED CONCENTRATIONS. QUARTZ MAY BE PRESENT AS DIKES OR STRINGERS. SAPROLITE IS ALSO AN EXAMPLE.	
COMPRESSIONIBILITY	PERCENTAGE OF MATERIAL	GROUND WATER	
SLIGHTLY COMPRESSIBLE MODERATELY COMPRESSIBLE HIGHLY COMPRESSIBLE	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 PERCHED WATER, SATURATED ZONE, OR WATER BEARING STRATA SPRING OR SEEP	
CONSISTENCY OR DENSENESS	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 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 FINGERNAIL.	
TEXTURE OR GRAIN SIZE	ABBREVIATIONS	EQUIPMENT USED ON SUBJECT PROJECT	
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 F - FINE FOSS. - FOSSILIFEROUS FRAC. - FRACTURED, FRACTURES FRAGS. - FRAGMENTS	DRILL UNITS: <input type="checkbox"/> MOBILE B-____ <input type="checkbox"/> BK-51 <input type="checkbox"/> CME-45C <input checked="" type="checkbox"/> CME-550 <input type="checkbox"/> PORTABLE HOIST	
SOIL MOISTURE - CORRELATION OF TERMS	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	ADVANCING TOOLS: <input type="checkbox"/> CLAY BITS <input type="checkbox"/> 6" CONTINUOUS FLIGHT AUGER <input type="checkbox"/> 8" HOLLOW AUGERS <input type="checkbox"/> HARD FACED FINGER BITS <input type="checkbox"/> TUNG-CARBIDE INSERTS <input type="checkbox"/> CASING <input checked="" type="checkbox"/> W/ ADVANCER <input type="checkbox"/> TRICONE _____ * STEEL TEETH <input type="checkbox"/> TRICONE _____ * TUNG-CARB. <input type="checkbox"/> CORE BIT	
SOIL MOISTURE SCALE (ATTERBERG LIMITS) FIELD MOISTURE DESCRIPTION GUIDE FOR FIELD MOISTURE DESCRIPTION	FRAC. - FRACTURED, FRACTURES FRAGS. - FRAGMENTS	HAMMER TYPE: <input checked="" type="checkbox"/> AUTOMATIC <input type="checkbox"/> MANUAL CORE SIZE: <input type="checkbox"/> -B- <input checked="" type="checkbox"/> -N XWL <input type="checkbox"/> -H- HAND TOOLS: <input type="checkbox"/> POST HOLE DIGGER <input type="checkbox"/> HAND AUGER <input type="checkbox"/> SOUNDING ROD <input type="checkbox"/> VANE SHEAR TEST	
LL - LIQUID LIMIT PL - PLASTIC LIMIT OM - OPTIMUM MOISTURE SL - SHRINKAGE LIMIT	- SATURATED - (SAT.) USUALLY LIQUID; VERY WET, USUALLY FROM BELOW THE GROUND WATER TABLE - WET - (W) SEMISOLID; REQUIRES DRYING TO ATTAIN OPTIMUM MOISTURE - MOIST - (M) SOLID; AT OR NEAR OPTIMUM MOISTURE - DRY - (D) REQUIRES ADDITIONAL WATER TO ATTAIN OPTIMUM MOISTURE	FRACURE SPACING TERM SPACING VERY WIDE MORE THAN 10 FEET WIDE 3 TO 10 FEET MODERATELY CLOSE 1 TO 3 FEET CLOSE 0.16 TO 1 FEET VERY CLOSE LESS THAN 0.16 FEET	BEDDING TERM THICKNESS VERY THICKLY BEDDED > 4 FEET THICKLY BEDDED 1.5 - 4 FEET THINLY BEDDED 0.16 - 1.5 FEET VERY THINLY BEDDED 0.03 - 0.16 FEET THICKLY LAMINATED 0.008 - 0.03 FEET THINLY LAMINATED < 0.008 FEET
PLASTICITY	INDURATION	INDURATION	
NONPLASTIC 0-5 VERY LOW LOW PLASTICITY 6-15 SLIGHT MED. PLASTICITY 16-25 MEDIUM HIGH PLASTICITY 26 OR MORE HIGH	FRAGILE 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.	FOR SEDIMENTARY ROCKS, INDURATION IS THE HARDENING OF THE MATERIAL BY CEMENTING, HEAT, PRESSURE, ETC.	BENCH MARK: USE GAUGING STATION-ELEVATION CONTROL MOMENT AT -L- STATION 20+64 13' LT ELEVATION: 116.61 FT. NOTES:
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.			



25

15

SR 1544 Halifax Rd.

USGS GAGING STATION
VERT. CONTROL
ELEV. = 116.61

SHELTER

SOIL PATH

CABLE GATE

TAR RIVER

TAR RIVER

WOODS

WOODS

WOODS

WOODS

SOIL PATH

SOIL DR.

WOODS

WOODS

WOODS

EB1-A

B1-A

B3-A

EB2-A

EB1-B

B1-B

B2-B

B3-B

EB2-B

DET EB1

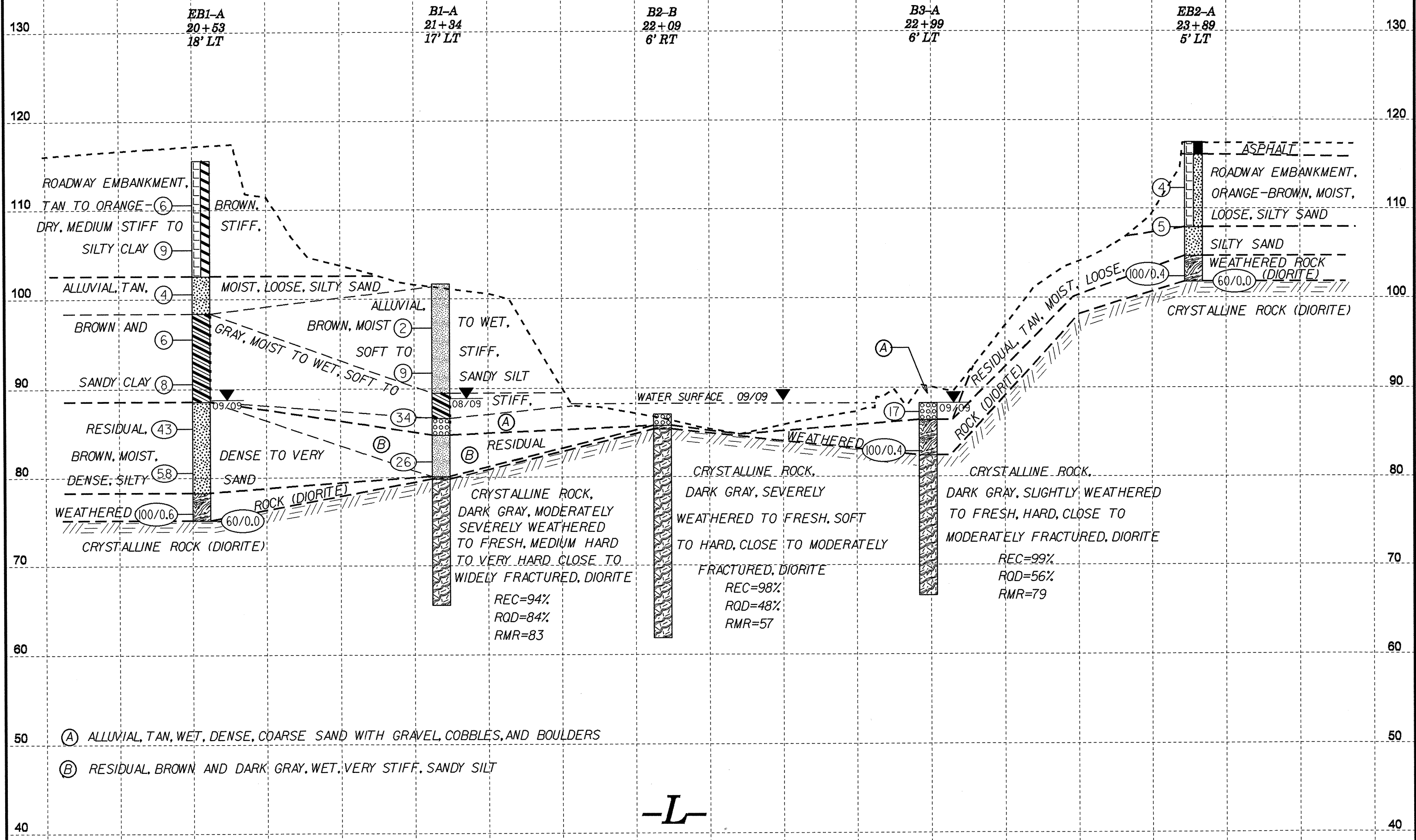
-DET-

DET EB2-B2

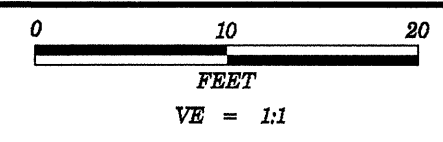
DET EB2-B1

-L-

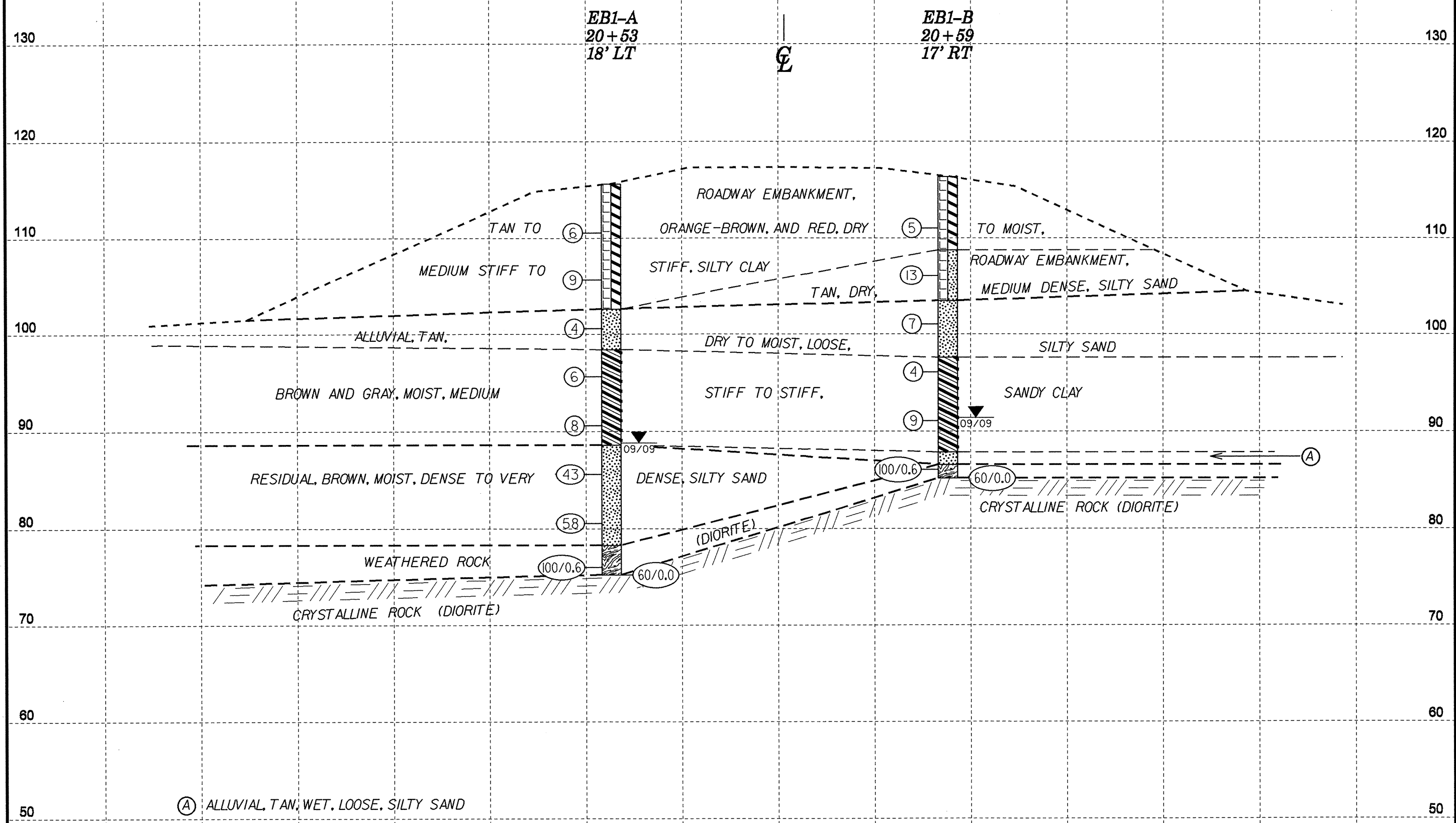
B2-A

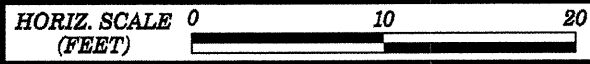
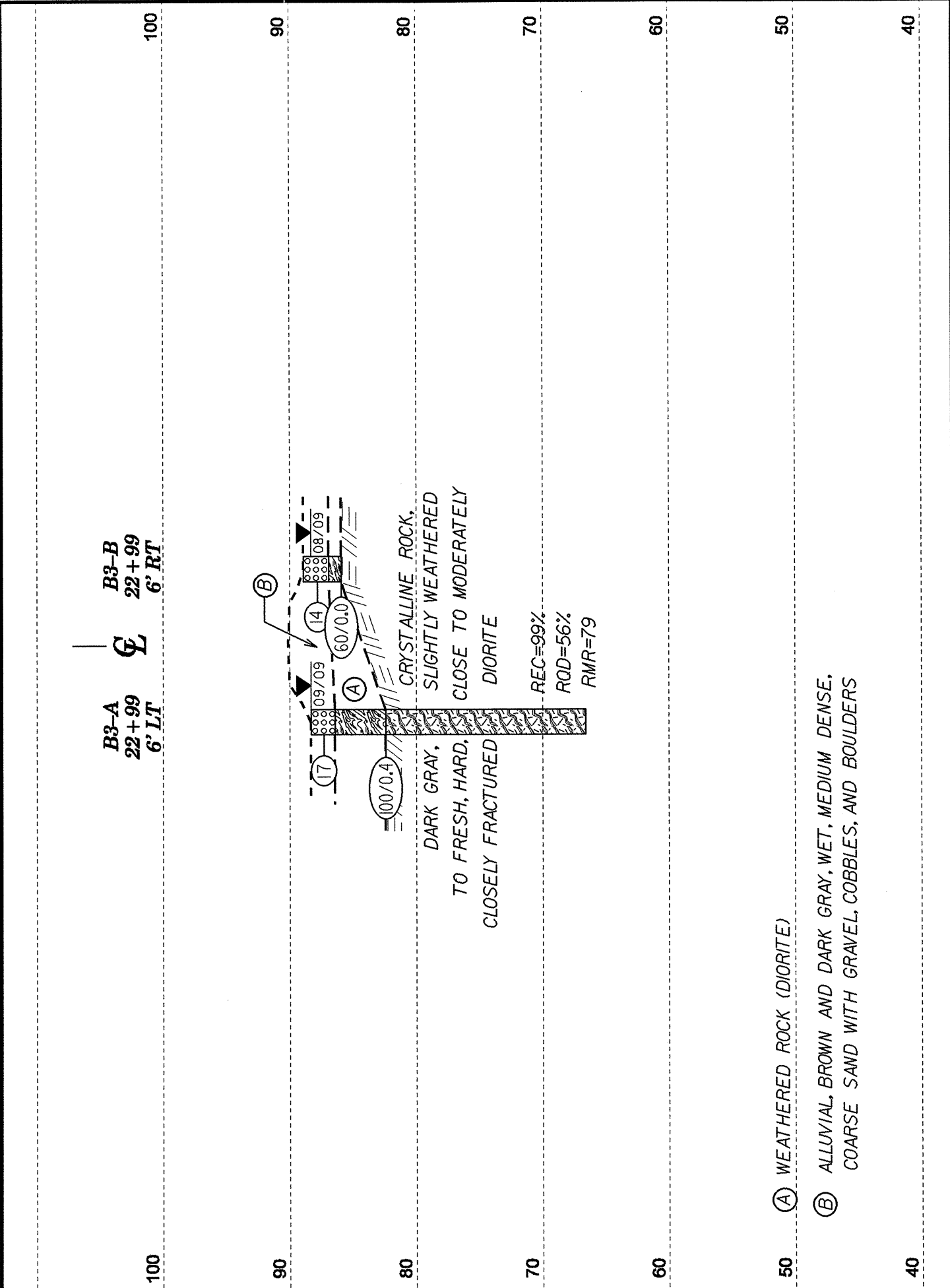


-L-



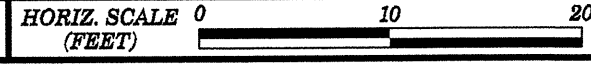
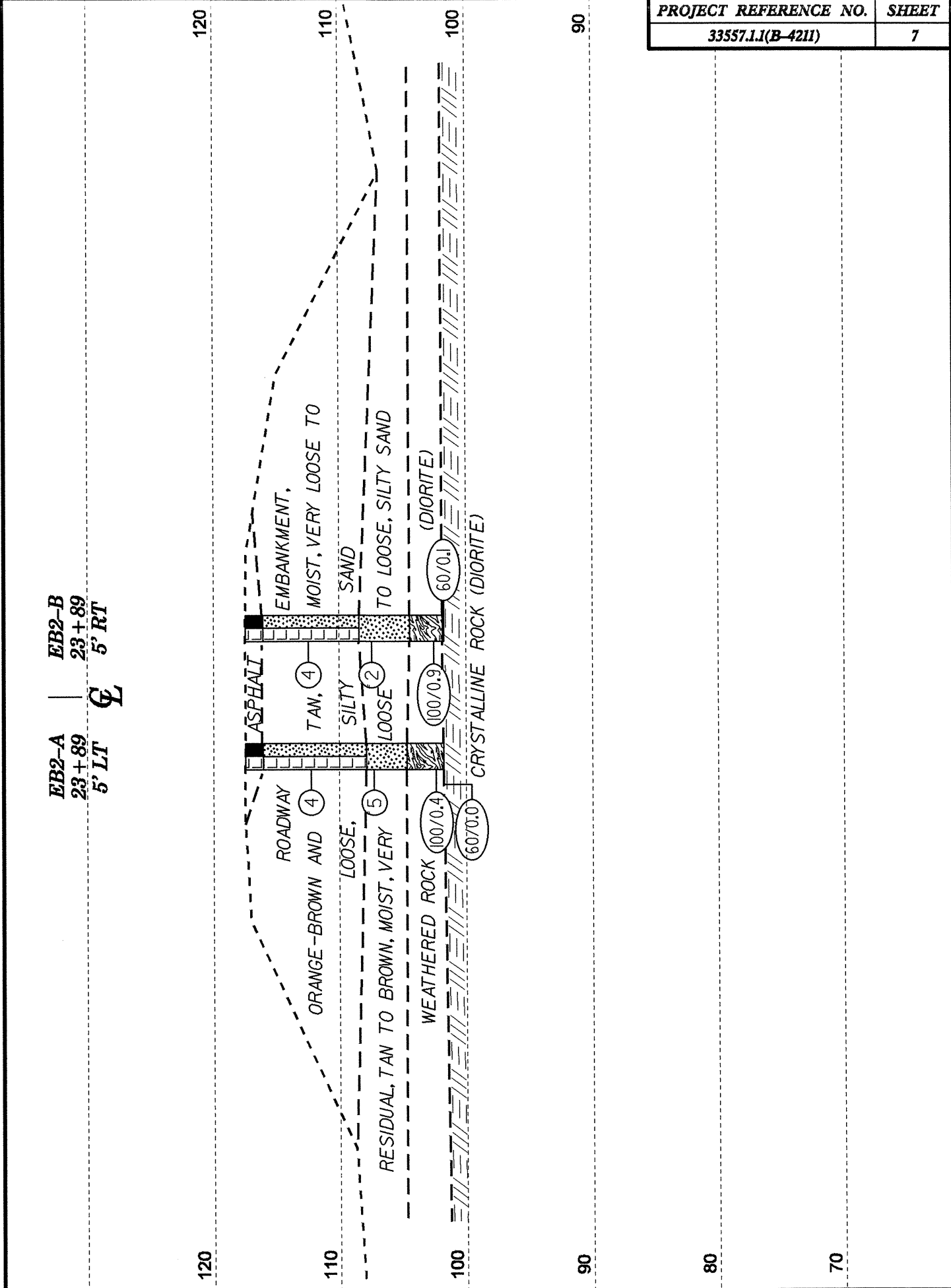
PROJECT REFERENCE NO.	SHEET
33557.1.1(B-4211)	5
CROSS SECTION THROUGH END BENT 1	





VE = 1:1

CROSS SECTION THROUGH BENT 3

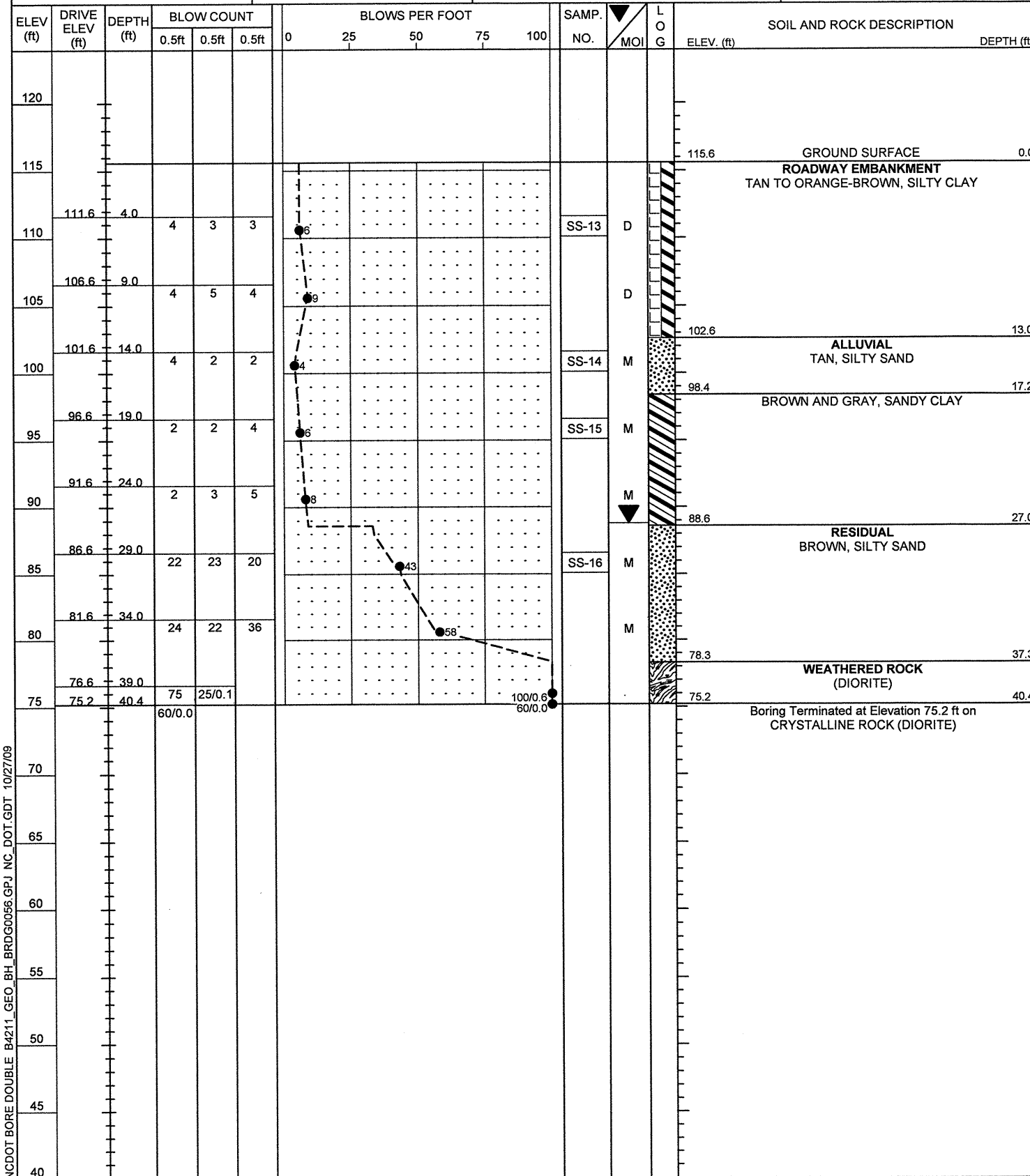


VE = 1:1

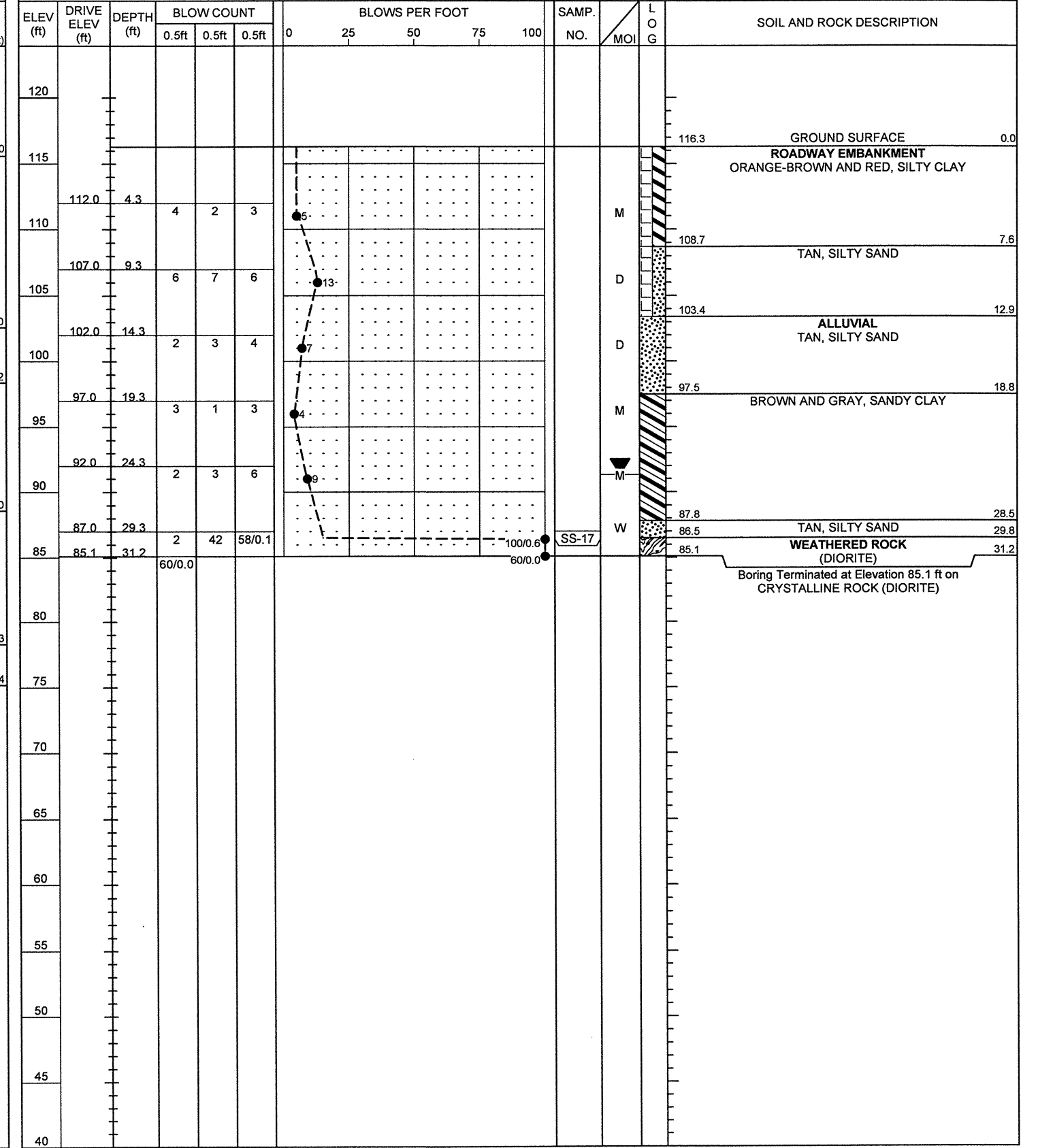
CROSS SECTION THROUGH END BENT 2

NC DOT GEOTECHNICAL ENGINEERING UNIT
BORELOG REPORT

PROJECT NO. 33557.1.1	ID. B-4211	COUNTY NASH	GEOLOGIST Czajka, C. D.
SITE DESCRIPTION BRIDGE NO. 56 ON -L- (SR 1544) OVER TAR RIVER			GROUND WTR (ft)
BORING NO. EB1-A	STATION 20+53	OFFSET 18ft LT	ALIGNMENT -L-
COLLAR ELEV. 115.6 ft	TOTAL DEPTH 40.4 ft	NORTHING 784,473	EASTING 2,335,976
DRILL MACHINE CME-550	DRILL METHOD H.S. Augers	HAMMER TYPE Automatic	
START DATE 09/03/09	COMP. DATE 09/03/09	SURFACE WATER DEPTH N/A	DEPTH TO ROCK 40.4 ft



PROJECT NO. 33557.1.1	ID. B-4211	COUNTY NASH	GEOLOGIST Czajka, C. D.
SITE DESCRIPTION BRIDGE NO. 56 ON -L- (SR 1544) OVER TAR RIVER			GROUND WTR (ft)
BORING NO. EB1-B	STATION 20+59	OFFSET 17ft RT	ALIGNMENT -L-
COLLAR ELEV. 116.3 ft	TOTAL DEPTH 31.2 ft	NORTHING 784,456	EASTING 2,335,945
DRILL MACHINE CME-550	DRILL METHOD H.S. Augers	HAMMER TYPE Automatic	
START DATE 09/03/09	COMP. DATE 09/03/09	SURFACE WATER DEPTH N/A	DEPTH TO ROCK 31.2 ft



NC DOT BORE DOUBLE B4211_GEO_BH_BRD0056.GPJ NC_DOT.GDT 10/27/09

NCDOT GEOTECHNICAL ENGINEERING UNIT
BORELOG REPORT

PROJECT NO. 33557.1.1	ID. B-4211	COUNTY NASH	GEOLOGIST Czajka, C. D.
SITE DESCRIPTION BRIDGE NO. 56 ON -L- (SR 1544) OVER TAR RIVER			GROUND WTR (ft)
BORING NO. B1-B	STATION 21+34	OFFSET 17ft RT	ALIGNMENT -L-
COLLAR ELEV. 101.5 ft	TOTAL DEPTH 20.5 ft	NORTHING 784,385	EASTING 2,335,968
DRILL MACHINE CME-550	DRILL METHOD H.S. Augers	HAMMER TYPE Automatic	
START DATE 08/25/09	COMP. DATE 08/25/09	SURFACE WATER DEPTH N/A	DEPTH TO ROCK 20.5 ft

ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT			BLOWS PER FOOT					SAMP. NO.	LOG MOI	LOG G	SOIL AND ROCK DESCRIPTION	DEPTH (ft)
			0.5ft	0.5ft	0.5ft	0	25	50	75	100					
105														GROUND SURFACE	0.0
100	98.5	3.0	1	1	1						SS-4	M		ALLUVIAL LIGHT BROWN TO BROWN, AND GRAY, SANDY SILT	
95	93.5	8.0	3	6	5						SS-5	M			
90	88.5	13.0	5	6	7										
85	83.5	18.0	9	12	32						SS-6	D		RESIDUAL BROWN, SAPROLITIC SANDY SILT	15.7
80	81.0	20.5	60/0.0			60/0.0								WEATHERED ROCK (DIORITE)	19.7
														Boring Terminated at Elevation 81.0 ft on CRYSTALLINE ROCK (DIORITE)	20.5

PROJECT NO. 33557.1.1	ID. B-4211	COUNTY NASH	GEOLOGIST Czajka, C. D.
SITE DESCRIPTION BRIDGE NO. 56 ON -L- (SR 1544) OVER TAR RIVER			GROUND WTR (ft)
BORING NO. B2-A	STATION 22+09	OFFSET 6ft LT	ALIGNMENT -L-
COLLAR ELEV. 87.2 ft	TOTAL DEPTH 3.0 ft	NORTHING 784,321	EASTING 2,336,014
DRILL MACHINE CME-550	DRILL METHOD H.S. Augers	HAMMER TYPE Automatic	
START DATE 08/27/09	COMP. DATE 08/27/09	SURFACE WATER DEPTH 1.1ft	DEPTH TO ROCK 3.0 ft

ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT			BLOWS PER FOOT					SAMP. NO.	LOG MOI	LOG G	SOIL AND ROCK DESCRIPTION	DEPTH (ft)
			0.5ft	0.5ft	0.5ft	0	25	50	75	100					
90	86.9	0.3												GROUND SURFACE	0.0
85	84.2	3.0	9	7	12						SS-10	W		ALLUVIAL BLACK, COARSE SAND WITH GRAVEL, COBBLES AND BOULDERS	2.8
80			60/0.0			60/0.0								WEATHERED ROCK (DIORITE)	3.0
														Boring Terminated at Elevation 84.2 ft on CRYSTALLINE ROCK (DIORITE)	

NCDOT BORE DOUBLE B4211_GEO_BH_BRD0056.GPJ NC_DOT.GDT 10/27/09

PROJECT NO. 33557.1.1	ID. B-4211	COUNTY NASH	GEOLOGIST Czajka, C. D.
SITE DESCRIPTION BRIDGE NO. 56 ON -L- (SR 1544) OVER TAR RIVER			GROUND WTR (ft)
BORING NO. B2-B	STATION 22+09	OFFSET 6ft RT	ALIGNMENT -L-
COLLAR ELEV. 87.1 ft	TOTAL DEPTH 25.2 ft	NORTHING 784,317	EASTING 2,336,002
DRILL MACHINE CME-550	DRILL METHOD NW Casing W/SPT & Core	HAMMER TYPE Automatic	
START DATE 09/02/09	COMP. DATE 09/02/09	SURFACE WATER DEPTH 1.2ft	DEPTH TO ROCK 1.7 ft

PROJECT NO. 33557.1.1	ID. B-4211	COUNTY NASH	GEOLOGIST Czajka, C. D.
SITE DESCRIPTION BRIDGE NO. 56 ON -L- (SR 1544) OVER TAR RIVER			GROUND WTR (ft)
BORING NO. B2-B	STATION 22+09	OFFSET 6ft RT	ALIGNMENT -L-
COLLAR ELEV. 87.1 ft	TOTAL DEPTH 25.2 ft	NORTHING 784,317	EASTING 2,336,002
DRILL MACHINE CME-550	DRILL METHOD NW Casing W/SPT & Core	HAMMER TYPE Automatic	
START DATE 09/02/09	COMP. DATE 09/02/09	SURFACE WATER DEPTH 1.2ft	DEPTH TO ROCK 1.7 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					
90															
87.1	87.1	0.0													
85			WOH	4	96										
80															
75															
70															
65															
60															
55															
50															
45															
40															
35															
30															
25															
20															
15															
10															

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 (%)			
85.4												
85.4	85.4	1.7	3.5	0:38/0.5 1:21/1.0 1:37/1.0 1:48/1.0	(3.4) 97%	(0.5) 14%		(23.1) 98%	(11.3) 48%		Begin Coring @ 1.7 ft CRYSTALLINE ROCK	1.7
80	81.9	5.2	5.0	1:35/1.0 2:50/1.0 3:03/1.0 3:21/1.0 3:26/1.0	(4.7) 94%	(4.0) 80%	RS-2				DARK GRAY, SEVERELY WEATHERED TO FRESH, SOFT TO HARD, CLOSELY TO MODERATELY CLOSELY FRACTURED, DIORITE, SEVERELY WEATHERED ZONE 17.2' TO 17.4' RMR=57	
75	76.9	10.2	5.0	3:37/1.0 2:15/1.0 1:12/1.0 1:15/1.0 0:59/1.0	(5.0) 100%	(1.1) 22%						
70	71.9	15.2	5.0	0:50/1.0 0:50/1.0 2:30/1.0 1:06/1.0 1:25/1.0	(5.0) 100%	(2.0) 40%	RS-3					
65	66.9	20.2	5.0	1:18/1.0 1:15/1.0 1:20/1.0 1:24/1.0 1:28/1.0	(5.0) 100%	(3.7) 74%	RS-4					
60	61.9	25.2									Boring Terminated at Elevation 61.9 ft in CRYSTALLINE ROCK (DIORITE)	25.2
55												
50												
45												
40												
35												
30												
25												
20												
15												
10												

NCDOT BORE DOUBLE B4211_GEO_BH_BRD0056.GPJ NC_DOT.GDT 10/29/09

NCDOT CORE SINGLE B4211_GEO_BH_BRD0056.GPJ NC_DOT.GDT 10/29/09

PROJECT NO. 33557.1.1	ID. B-4211	COUNTY NASH	GEOLOGIST Czajka, C. D.
SITE DESCRIPTION BRIDGE NO. 56 ON -L- (SR 1544) OVER TAR RIVER			GROUND WTR (ft)
BORING NO. B3-A	STATION 22+99	OFFSET 6ft LT	ALIGNMENT -L-
COLLAR ELEV. 88.3 ft	TOTAL DEPTH 21.7 ft	NORTHING 784,235	EASTING 2,336,042
DRILL MACHINE CME-550	DRILL METHOD NW Casing W/SPT & Core	HAMMER TYPE Automatic	
START DATE 09/01/09	COMP. DATE 09/01/09	SURFACE WATER DEPTH N/A	DEPTH TO ROCK 5.9 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					
90															
	88.3	0.0											88.3	GROUND SURFACE	0.0
			4	7	10								86.4	ALLUVIAL BROWN, COARSE SAND WITH GRAVEL, COBBLES, AND BOULDERS	1.9
85	83.3	5.0											82.4	WEATHERED ROCK (DIORITE)	5.9
			100/0.4											CRYSTALLINE ROCK DARK GRAY, VERY SLIGHTLY WEATHERED TO FRESH, HARD, CLOSE TO MODERATELY CLOSELY FRACTURED, DIORITE	
80															
75															
70															
65															
60															
55															
50															
45															
40															
35															
30															
25															
20															
15															
10															

NCDOT BORE DOUBLE B4211_GEO_BH_BRD0056.GPJ NC_DOT_GDT 10/29/09

PROJECT NO. 33557.1.1	ID. B-4211	COUNTY NASH	GEOLOGIST Czajka, C. D.
SITE DESCRIPTION BRIDGE NO. 56 ON -L- (SR 1544) OVER TAR RIVER			GROUND WTR (ft)
BORING NO. B3-A	STATION 22+99	OFFSET 6ft LT	ALIGNMENT -L-
COLLAR ELEV. 88.3 ft	TOTAL DEPTH 21.7 ft	NORTHING 784,235	EASTING 2,336,042
DRILL MACHINE CME-550	DRILL METHOD NW Casing W/SPT & Core	HAMMER TYPE Automatic	
START DATE 09/01/09	COMP. DATE 09/01/09	SURFACE WATER DEPTH N/A	DEPTH TO ROCK 5.9 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 (%)			
82.4	82.4	0.0	0.8	1:00/0.8	(0.7)	(0.0)		(15.7)	(8.9)		Begin Coring @ 5.9 ft	
80	81.6	1.6	5.0	1:17/1.0	88%	0%					CRYSTALLINE ROCK	5.9
				1:13/1.0	(5.0)	(1.8)					DARK GRAY, VERY SLIGHTLY WEATHERED TO FRESH, HARD, CLOSE TO MODERATELY CLOSELY FRACTURED, DIORITE	
				1:25/1.0	100%	36%						
75	76.6	11.7	5.0	1:45/1.0	(5.0)	(3.0)	RS-5				RMR=79	
				1:50/1.0	100%	60%						
				1:55/1.0								
70	71.6	16.7	5.0	1:41/1.0	(5.0)	(4.1)	RS-6					
				1:48/1.0	100%	82%						
				1:47/1.0								
65	66.6	21.7		1:40/1.0							Boring Terminated at Elevation 66.6 ft in CRYSTALLINE ROCK (DIORITE)	21.7
				1:56/1.0								
60												
55												
50												
45												
40												
35												
30												
25												
20												
15												
10												

NCDOT CORE SINGLE B4211_GEO_BH_BRD0056.GPJ NC_DOT_GDT 10/29/09

PROJECT NO. 33557.1.1	ID. B-4211	COUNTY NASH	GEOLOGIST Czajka, C. D.
SITE DESCRIPTION BRIDGE NO. 56 ON -L- (SR 1544) OVER TAR RIVER			GROUND WTR (ft)
BORING NO. EB2-A	STATION 23+89	OFFSET 5ft LT	ALIGNMENT -L-
COLLAR ELEV. 117.5 ft	TOTAL DEPTH 15.7 ft	NORTHING 784,149	EASTING 2,336,069
DRILL MACHINE CME-550	DRILL METHOD H.S. Augers	HAMMER TYPE Automatic	
START DATE 08/27/09	COMP. DATE 08/27/09	SURFACE WATER DEPTH N/A	DEPTH TO ROCK 15.7 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					
120														GROUND SURFACE	0.0
117.5														ASPHALT	1.4
116.1														ROADWAY EMBANKMENT ORANGE-BROWN, SILTY SAND	
113.3	113.3	4.2	2	2	2								M		
110	108.3	9.2	3	3	2										
108.3													SS-8	M	
107.9														RESIDUAL TAN, SILTY SAND	9.6
105	103.3	14.2	49	12	88/0.4									WEATHERED ROCK (DIORITE)	12.8
103.3															
101.8	101.8	15.7	60/0.0											Boring Terminated at Elevation 101.8 ft on CRYSTALLINE ROCK (DIORITE)	15.7
101.8															

PROJECT NO. 33557.1.1	ID. B-4211	COUNTY NASH	GEOLOGIST Czajka, C. D.
SITE DESCRIPTION BRIDGE NO. 56 ON -L- (SR 1544) OVER TAR RIVER			GROUND WTR (ft)
BORING NO. EB2-B	STATION 23+89	OFFSET 5ft RT	ALIGNMENT -L-
COLLAR ELEV. 117.5 ft	TOTAL DEPTH 15.7 ft	NORTHING 784,146	EASTING 2,336,060
DRILL MACHINE CME-550	DRILL METHOD H.S. Augers	HAMMER TYPE Automatic	
START DATE 08/27/09	COMP. DATE 08/27/09	SURFACE WATER DEPTH N/A	DEPTH TO ROCK 15.6 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					
120														GROUND SURFACE	0.0
117.5														ASPHALT	1.4
116.1														ROADWAY EMBANKMENT TAN AND BROWN, SILTY SAND	
113.5	113.5	4.0	2	2	2								SS-7	M	
110	108.5	9.0	1	1	1									M	
108.5														RESIDUAL BROWN, SILTY SAND	9.0
105	103.5	14.0	33	67/0.4										WEATHERED ROCK (DIORITE)	13.0
103.5															
101.9	101.9	15.6	60/0.1											Boring Terminated at Elevation 101.8 ft in CRYSTALLINE ROCK (DIORITE)	15.6
101.9															

NCDOT BORE DOUBLE B4211_GEO_BH_BRD6056.GPJ NC_DOT.GDT 10/29/09

NCDOT GEOTECHNICAL ENGINEERING UNIT
BORELOG REPORT

PROJECT NO. 33557.1.1	ID. B-4211	COUNTY NASH	GEOLOGIST Czajka, C. D.
SITE DESCRIPTION BRIDGE NO. 56 ON -L- (SR 1544) OVER TAR RIVER			GROUND WTR (ft)
BORING NO. DET_EB2-B1	STATION 18+29	OFFSET 7ft RT	ALIGNMENT -DET-
COLLAR ELEV. 103.4 ft	TOTAL DEPTH 2.9 ft	NORTHING 784,162	EASTING 2,336,008
DRILL MACHINE CME-550	DRILL METHOD H.S. Augers	HAMMER TYPE Automatic	
START DATE 09/03/09	COMP. DATE 09/03/09	SURFACE WATER DEPTH N/A	DEPTH TO ROCK 2.8 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					
105														GROUND SURFACE	0.0
103.4	103.4	0.0												RESIDUAL BROWN, SILTY SAND	2.0
100.6	100.6	2.8	1	4	2						SS-18	M		WEATHERED ROCK (DIORITE)	2.8
														CRYSTALLINE ROCK (DIORITE)	2.9
														Boring Terminated at Elevation 100.5 ft in CRYSTALLINE ROCK (DIORITE)	

PROJECT NO. 33557.1.1	ID. B-4211	COUNTY NASH	GEOLOGIST Czajka, C. D.
SITE DESCRIPTION BRIDGE NO. 56 ON -L- (SR 1544) OVER TAR RIVER			GROUND WTR (ft)
BORING NO. DET_EB2-B2	STATION 18+17	OFFSET 7ft RT	ALIGNMENT -DET-
COLLAR ELEV. 102.5 ft	TOTAL DEPTH 3.1 ft	NORTHING 784,173	EASTING 2,336,004
DRILL MACHINE CME-550	DRILL METHOD H.S. Augers	HAMMER TYPE Automatic	
START DATE 09/03/09	COMP. DATE 09/03/09	SURFACE WATER DEPTH N/A	DEPTH TO ROCK 3.1 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					
105														GROUND SURFACE	0.0
102.5	102.5													RESIDUAL BROWN, SILTY SAND	2.7
99.8	99.8	3.1												WEATHERED ROCK (DIORITE)	3.1
														Boring Terminated at Elevation 99.4 ft on CRYSTALLINE ROCK (DIORITE)	

NCDOT BORE DOUBLE B4211_GEO_BH_BRD0056.GPJ NC_DOT.GDT 10/27/09

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-13	18'LT	20+53	4.0-5.5	A-7-6(11)	43	22	13.6	27.9	13.3	45.2	98	91	62	-	-
SS-14	18'LT	20+53	14.0-15.5	A-2-4(0)	17	NP	29.5	47.6	10.6	12.3	98	81	29	-	-
SS-15	18'LT	20+53	19.0-20.5	A-6(16)	39	18	1.0	19.5	38.4	41.1	100	100	87	-	-
SS-16	18'LT	20+53	29.0-30.5	A-2-4(0)	29	2	32.2	39.0	20.5	8.2	88	68	34	-	-

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-17	17'RT	20+59	29.3-29.8	A-2-4(0)	32	8	58.1	16.2	11.3	14.4	86	44	24	-	-

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	17'LT	21+34	3.9-5.4	A-4(3)	27	7	6.2	30.6	32.4	30.8	99	97	73	-	-
SS-12	17'LT	21+34	13.9-15.0	A-6(17)	38	19	4.5	11.1	39.2	45.2	100	98	90	-	-

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-4	17'RT	21+34	3.0-4.5	A-4(2)	25	7	8.8	34.9	27.5	28.7	100	98	65	-	-
SS-5	17'RT	21+34	8.0-9.5	A-4(6)	29	9	5.7	23.6	39.8	30.8	100	98	79	-	-
SS-6	17'RT	21+34	18.0-19.5	A-4(0)	31	1	28.1	40.5	23.2	8.2	93	76	39	-	-

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-10	6'LT	22+09	0.3-1.8	A-1-b(0)	22	NP	82.5	11.7	1.6	4.1	60	21	5	-	-

B3-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-9	6'RT	22+99	0.1-1.6	A-1-b(0)	24	3	69.0	17.2	7.6	6.2	70	30	11	-	-

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-8	5'LT	23+89	9.6-10.7	A-2-4(0)	19	NP	30.6	52.8	8.4	8.2	95	78	23	-	-

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-7	5'RT	23+89	4.0-5.5	A-2-4(0)	23	8	47.4	26.9	7.2	18.5	96	64	29	-	-

DET EB1

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	CL	15+44	3.2-4.7	A-4(0)	17	NP	15.2	35.5	37.0	12.3	99	91	59	-	-
SS-2	CL	15+44	8.2-9.7	A-6(14)	38	16	1.2	19.1	38.6	41.1	100	100	87	-	-
SS-3	CL	15+44	19.1-19.7	A-4(0)	30	NP	8.0	50.9	34.9	6.2	100	97	62	-	-

DET EB1-B2

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-18	7'RT	18+29	0.0-1.5	A-2-4(0)	17	1	33.5	39.2	12.9	14.4	92	72	30	-	-

B1-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-1	17 LT	20+59	23.9-24.4	2.7759	175.9	2.13	25.30	69900	10.02

B2-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-2	6 RT	22+09	6.3-6.8	2.7759	168.0	2.13	4.87	13430	8.76
RS-3	6 RT	22+09	15.9-16.5	2.7759	177.1	2.11	11.50	31700	9.83
RS-4	6 RT	22+09	2.16-22.0	2.7759	177.4	2.01	2.74	7600	1.94

B3-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-5	6 RT	22+99	10.4-10.9	2.7759	177.3	2.18	8.15	22400	11.43
RS-5 Rerun	6 RT	22+99	10.4-10.9	2.7759	177.3	2.18	14.28	39300	6.65
RS-6	6 LT	22+99	17.4-17.9	2.7759	179.4	2.18	21.8	60000	12.72



**FIELD
SCOUR REPORT**

WBS: 33557.1.1 TIP: B-4211 COUNTY: Nash

DESCRIPTION(1): Bridge No. 56 on -L- (SR 1544) over Tar River

EXISTING BRIDGE

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

Bridge No.: 56 Length: 321' Total Bents: 9 Bents in Channel: 4 Bents in Floodplain: 5
Foundation Type: Spread footings in channel and timber piles in flood plain

EVIDENCE OF SCOUR(2)

Abutments or End Bent Slopes: None

Interior Bents: None

Channel Bed: None

Channel Bank: None

EXISTING SCOUR PROTECTION

Type(3): Some rip rap along channel bank

Extent(4): Very minimal, most rip rap is located downstream at the steps and canoe launch

Effectiveness(5): Somewhat effective

Obstructions(6): Minor debris, large boulders and rock outcrops

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): Coarse alluvial sand (A-1-b) with gravel, cobbles, and boulders. Sample SS-10.

Channel Bank Material(8): North channel bank, alluvial sandy silt (A-4). Samples SS-4 and SS-5.
South channel bank, residual silty sand (A-2-4). Sample SS-8.

Channel Bank Cover(9): Grass, trees, and shrubs.

Floodplain Width(10): 350' +/-

Floodplain Cover(11): Grass, trees and shrubs.

Stream is(12): Aggrading _____ Degrading Static _____

Channel Migration Tendency(13): South

Observations and Other Comments: _____

DESIGN SCOUR ELEVATIONS(14)

Feet X Meters _____

BENTS

B1	B2	B3								
93.8	85.0	85.0								

Comparison of DSE to Hydraulics Unit theoretical scour:
The Geotechnical Engineering Unit agrees with the Hydraulics Unit's theoretical scour at elevation 93.8 feet at Bent 1 but raises the theoretical scour elevation to 85.0 feet from 73.8 feet at Bents 2 and 3.

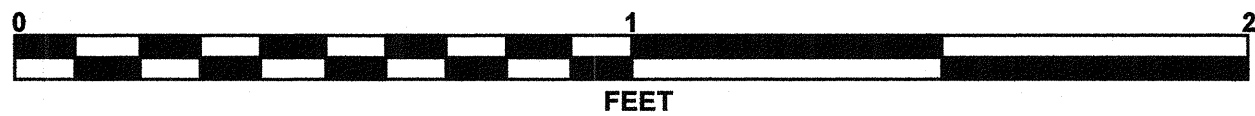
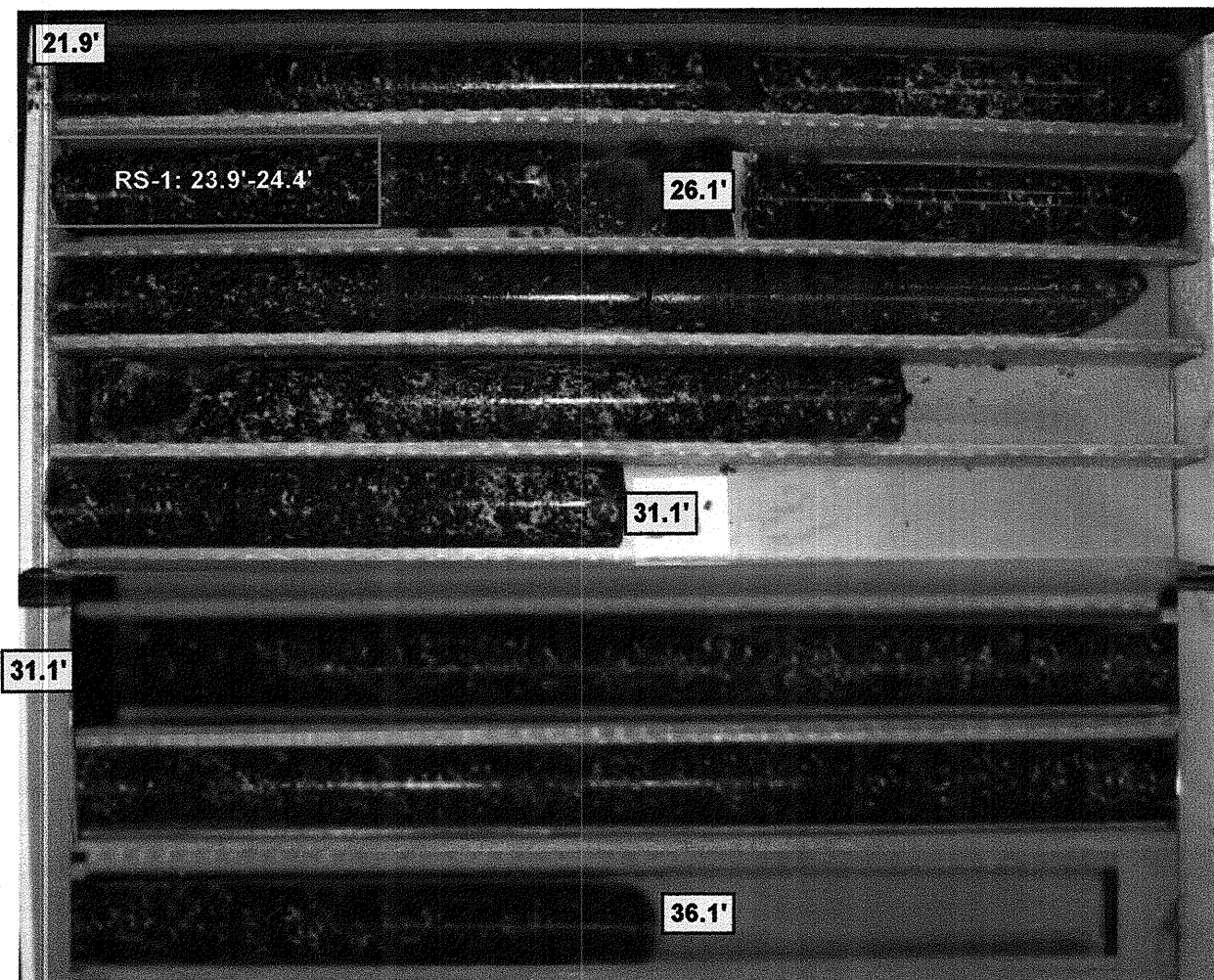
SOIL ANALYSIS RESULTS FROM CHANNEL BED AND BANK MATERIAL

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										

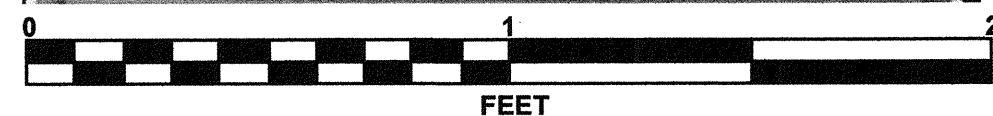
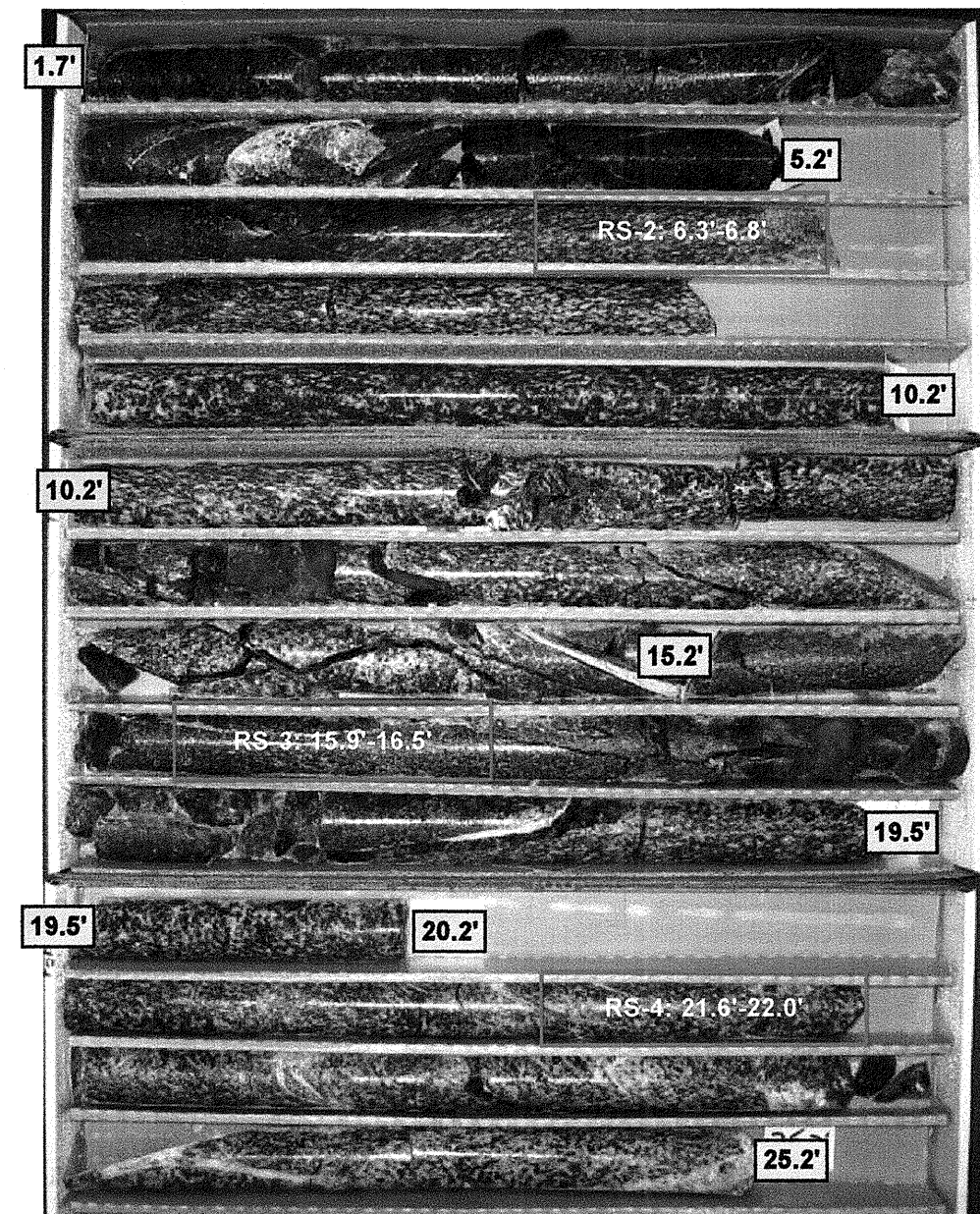
Reported by: Tom P. M... L.G.
FOR DOUG CZJAKA Date: 9/4/2009

CORE PHOTOGRAPHS

B1-A
BOXES 1 & 2: 21.9 - 36.1 FEET

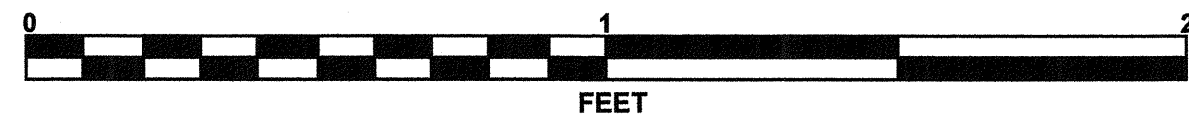
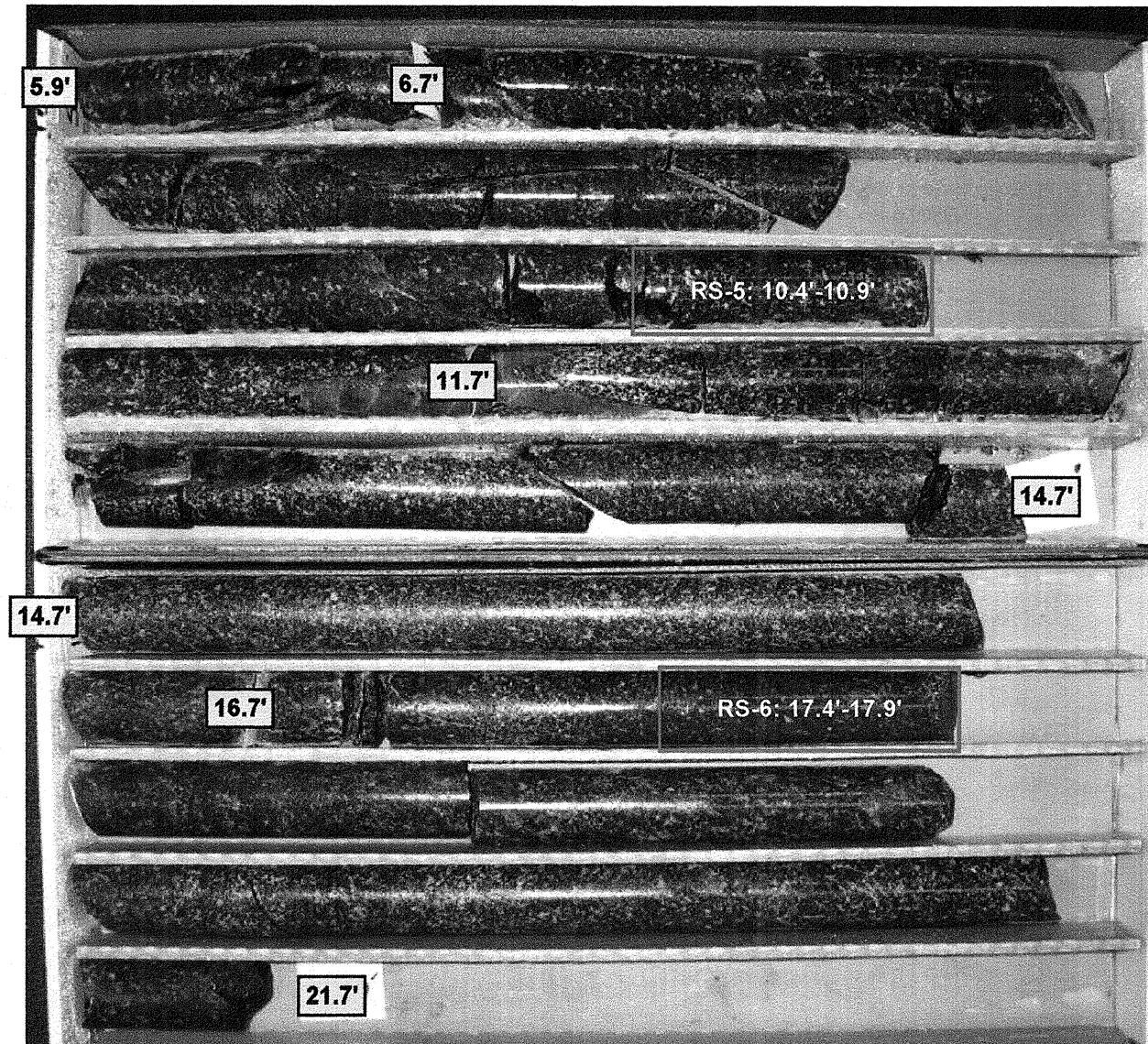


B2-B
BOXES 1 - 3: 1.7 - 25.2 FEET



CORE PHOTOGRAPHS

B3-A BOXES 1 & 2: 6.7 - 21.7 FEET



SITE PHOTOGRAPH

Bridge No. 56 on -L- (SR 1554) Over Tar River



Looking Southwest