

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

**STRUCTURE**  
**SUBSURFACE INVESTIGATION**

PROJ. REFERENCE NO. 33734.1.1(B-4503) F.A. PROJ. BRSTP-1250(2)  
COUNTY EDGECOMBE  
PROJECT DESCRIPTION BRIDGE NO. 7 ON -L- (SR 1250) OVER  
TAR RIVER

**INVENTORY**

**CONTENTS**

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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 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: 33734.1.1 ID: B-4503**

PERSONNEL

O.B. OTI

J.R. MATULA

H.R. CONLEY

D.W. DIXON

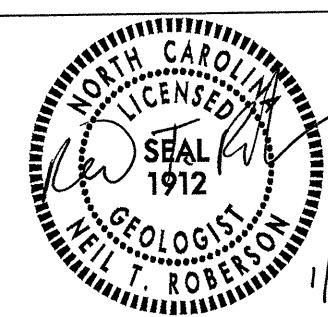
J.R. TURNAGE

INVESTIGATED BY O.B. OTI

CHECKED BY N.T. ROBERSON

SUBMITTED BY N.T. ROBERSON

DATE JANUARY 2010



1/29/2010

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.

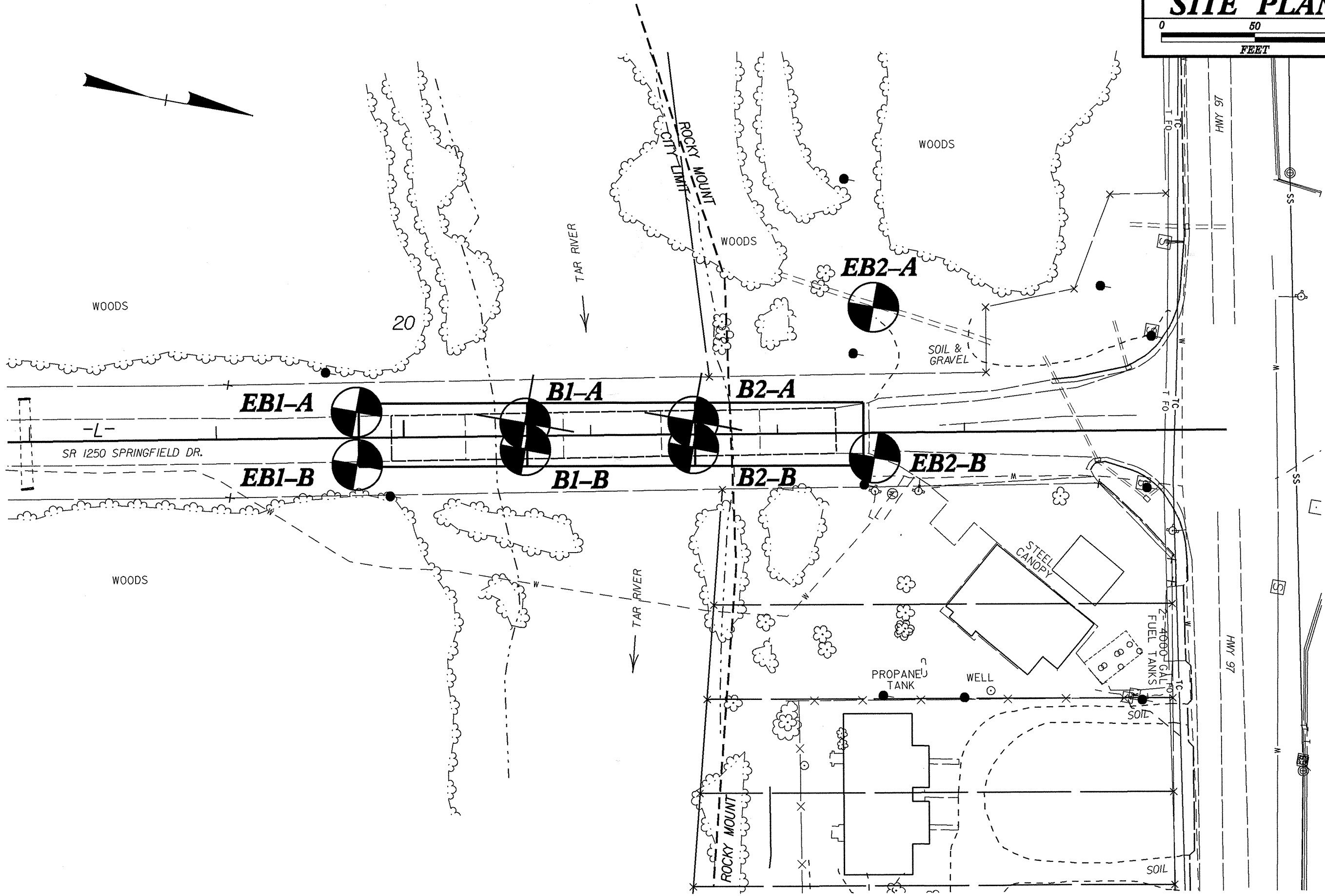
NORTH CAROLINA DEPARTMENT OF TRANSPORTATION  
DIVISION OF HIGHWAYS  
GEOTECHNICAL ENGINEERING UNIT

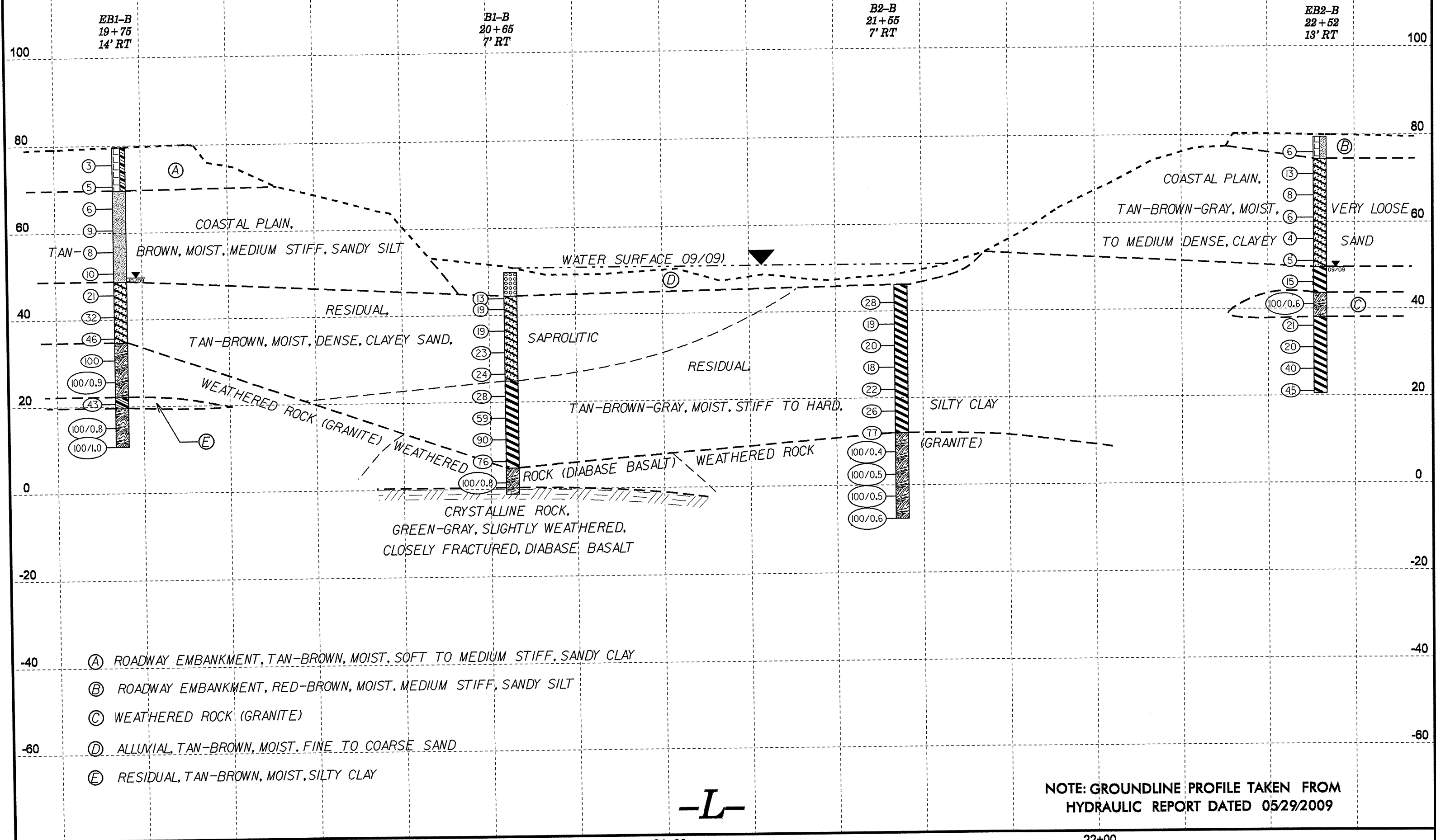
PROJECT REFERENCE NO. 33734.1(KB-4503)  
SHEET NO. 2

SUBSURFACE INVESTIGATION

SOIL AND ROCK LEGEND, TERMS, SYMBOLS, AND ABBREVIATIONS

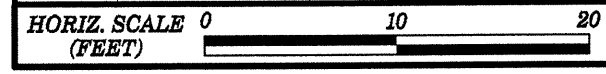
SOIL DESCRIPTION				GRADATION				ROCK DESCRIPTION				TERMS AND DEFINITIONS							
SOIL IS CONSIDERED TO BE THE UNCONSOLIDATED, SEMI-CONSOLIDATED, OR WEATHERED EARTH MATERIALS THAT CAN BE PENETRATED WITH A CONTINUOUS FLIGHT POWER AUGER, AND YIELD LESS THAN 100 BLOWS PER FOOT ACCORDING TO STANDARD PENETRATION 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: VERY STIFF, GRAY, SILTY CLAY, MOST WITH INTERBEDDED FINE SAND LAYERS, HIGHLY PLASTIC, A-7-5				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 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:				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 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, MOTTLED 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 INTRODUCED 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.							
				ANGULARITY OF GRAINS THE ANGULARITY OR ROUNDNESS OF SOIL GRAINS IS DESIGNATED BY THE TERMS: ANGULAR, SUBANGULAR, SUBROUNDED, OR ROUNDED.				WEATHERED ROCK (WR) CRYSTALLINE ROCK (CR) NON-CRYSTALLINE ROCK (NCR) COASTAL PLAIN SEDIMENTARY ROCK (CP)								 <p>NON-COASTAL PLAIN MATERIAL THAT WOULD YIELD SPT N VALUES &gt; 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.</p>			
SOIL LEGEND AND AASHTO CLASSIFICATION				MINERALOGICAL COMPOSITION				WEATHERING				ROCK HARDNESS							
GENERAL CLASS.				MINERAL NAMES SUCH AS QUARTZ, FELDSPAR, MICA, TALC, KAOLIN, ETC. ARE USED IN DESCRIPTIONS WHENEVER THEY ARE CONSIDERED OF SIGNIFICANCE.				FRESH VERY SLIGHT (V SL.) SLIGHT (SL.) MODERATE (MOD.) MODERATELY SEVERE (MOD. SEV.) SEVERE (SEV.) VERY SEVERE (V SEV.) COMPLETE				ROCK FRESH, CRYSTALS BRIGHT, FEW JOINTS MAY SHOW SLIGHT STAINING. ROCK RINGS UNDER HAMMER IF CRYSTALLINE. ROCKS 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. 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. 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. 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 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, YIELDS SPT N VALUES > 100 BPF 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. IF TESTED, YIELDS SPT N VALUES < 100 BPF 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.							
GROUP CLASS.				COMPRESSIBILITY				ROCK HARDNESS				FRACTURE SPACING							
SYMBOL				SLIGHTLY COMPRESSIBLE MODERATELY COMPRESSIBLE HIGHLY COMPRESSIBLE				VERY HARD HARD MODERATELY HARD MEDIUM HARD SOFT VERY SOFT				TERM VERY WIDE WIDE MODERATELY CLOSE CLOSE VERY CLOSE							
SOILS WITH LITTLE OR MODERATE AMOUNTS OF ORGANIC MATTER				LIQUID LIMIT LESS THAN 31 LIQUID LIMIT EQUAL TO 31-50 LIQUID LIMIT GREATER THAN 50				SPACING MORE THAN 10 FEET 3 TO 10 FEET 1 TO 3 FEET 0.16 TO 1 FEET LESS THAN 0.16 FEET				TERM VERY THICKLY BEDDED THICKLY BEDDED THINLY BEDDED VERY THINLY BEDDED THICKLY LAMINATED THINLY LAMINATED							
PERCENTAGE OF MATERIAL				GROUND WATER				BEDDING				INDURATION							
ORGANIC MATERIAL				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				THICKNESS > 4 FEET 1.5 - 4 FEET 0.16 - 1.5 FEET 0.03 - 0.16 FEET 0.008 - 0.03 FEET < 0.008 FEET				FOR SEDIMENTARY ROCKS, INDURATION IS THE HARDENING OF THE MATERIAL BY CEMENTING, HEAT, PRESSURE, ETC. FRIABLE MODERATELY INDURATED INDURATED EXTREMELY INDURATED							
TRACE OF ORGANIC MATTER LITTLE ORGANIC MATTER MODERATELY ORGANIC HIGHLY ORGANIC				SOUNDING ROD				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.											
CONSISTENCY OR DENSENESS				MISCELLANEOUS SYMBOLS				EQUIPMENT USED ON SUBJECT PROJECT				INDURATION							
PRIMARY SOIL TYPE				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				DRILL UNITS MOBILE B- BK-51 CME-45C CME-55B PORTABLE HOIST				ADVANCING TOOLS CLAY BITS 6" CONTINUOUS FLIGHT AUGER 8" HOLLOW AUGERS HARD FACED FINGER BITS TUNG-CARBIDE INSERTS CASING TRICONE * STEEL TEETH TRICONE * TUNG-CARB. CORE BIT				HAMMER TYPE AUTOMATIC MANUAL CORE SIZE B NXXL H HAND TOOLS POST HOLE DIGGER HAND AUGER SOUNDING ROD VANE SHEAR TEST			
GENERAL GRANULAR MATERIAL (NON-COHESIVE)				SOUNDING ROD															
GENERAL SILT-CLAY MATERIAL (COHESIVE)																			
TEXTURE OR GRAIN SIZE				ABBREVIATIONS															
U.S. STD. SIEVE SIZE				HI - HIGHLY MED - MEDIUM MICA - MICACEOUS MOD - MODERATELY NP - NON PLASTIC ORG - ORGANIC SAP. - SAPROLITIC SD - SAND, SANDY SL - SILT, SILTY SLI - SLIGHTLY TCR - TRICONE REFUSAL															
BOULDER (BLDR.)				MO - MOISTURE CONTENT V - VERY VST - VANE SHEAR TEST WEA. - WEATHERED Wd - UNIT WEIGHT Wd - DRY UNIT WEIGHT															
GRAIN SIZE																			
SOIL MOISTURE - CORRELATION OF TERMS																			
SOIL MOISTURE SCALE (ATTERBERG LIMITS)																			
FIELD MOISTURE DESCRIPTION																			
GUIDE FOR FIELD MOISTURE DESCRIPTION																			
LL - LIQUID LIMIT																			
PL - PLASTIC LIMIT																			
OM - OPTIMUM MOISTURE																			
SL - SHRINKAGE LIMIT																			
PLASTICITY																			
NONPLASTIC																			
LOW PLASTICITY																			
MED. PLASTICITY																			
HIGH PLASTICITY																			
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.																			





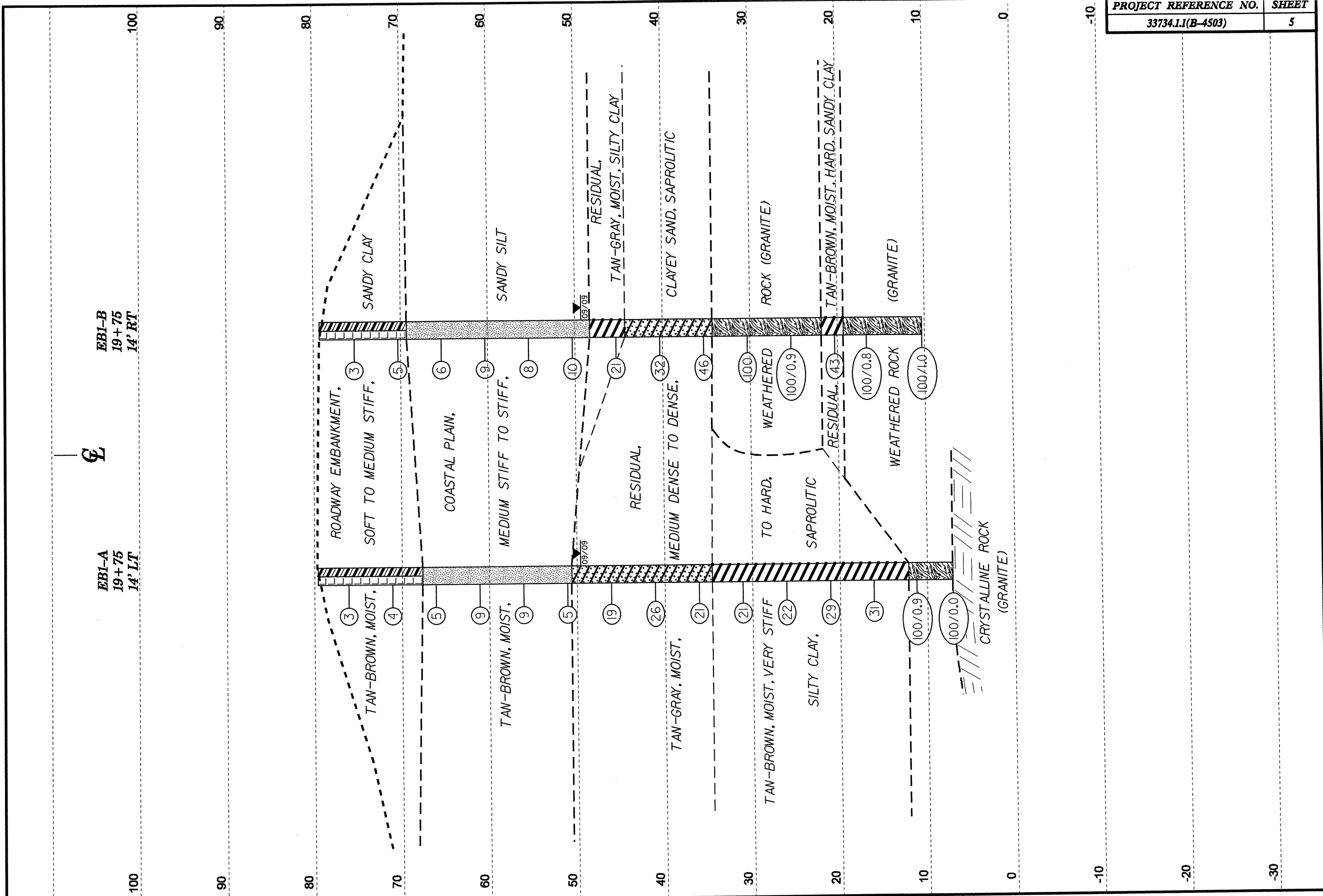
NOTE: GROUNDLINE PROFILE TAKEN FROM HYDRAULIC REPORT DATED 05/29/2009

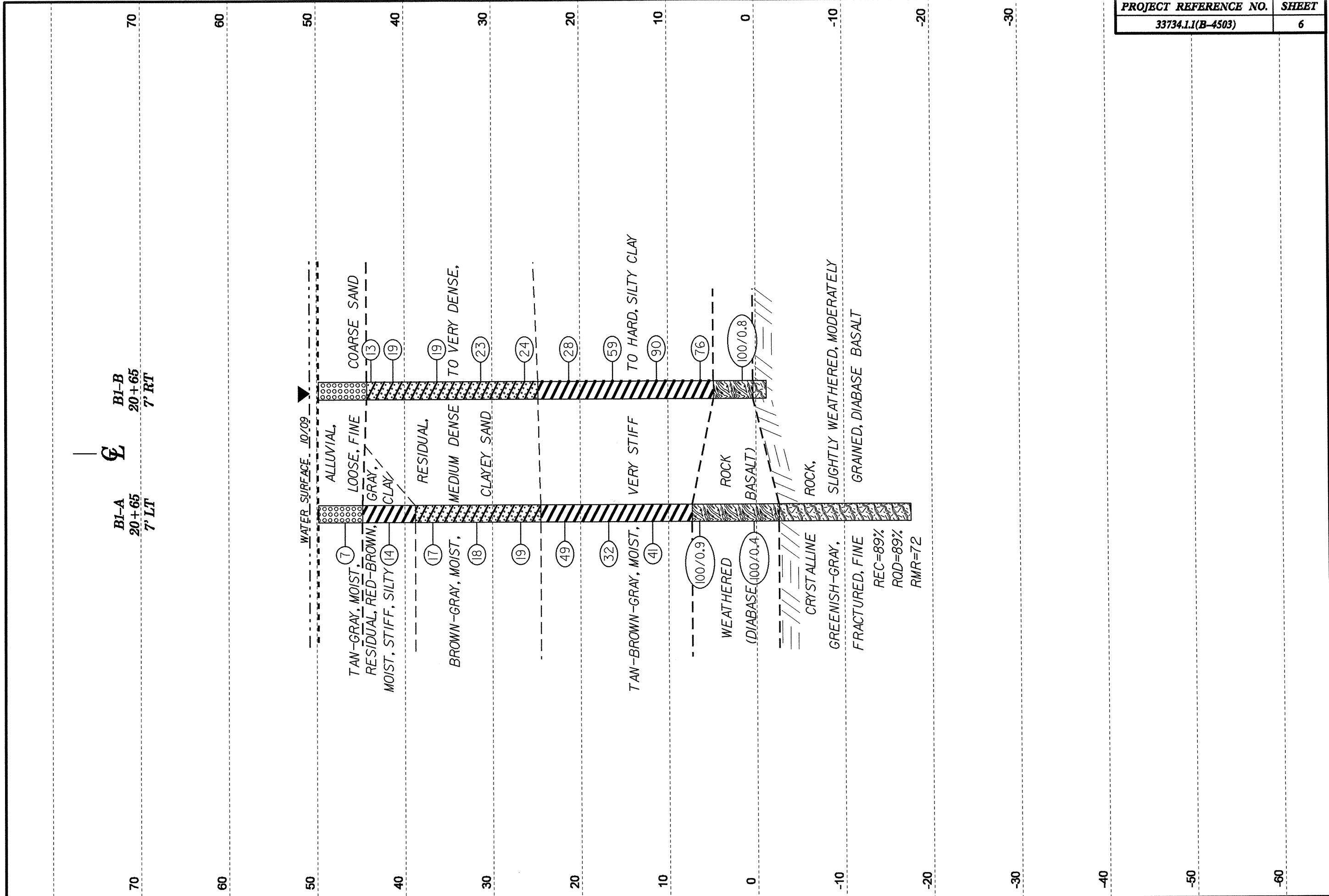
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**CROSS SECTION THROUGH END BENT 1**

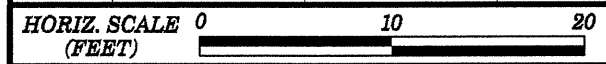




HORIZ. SCALE 0 10 20 (FEET)

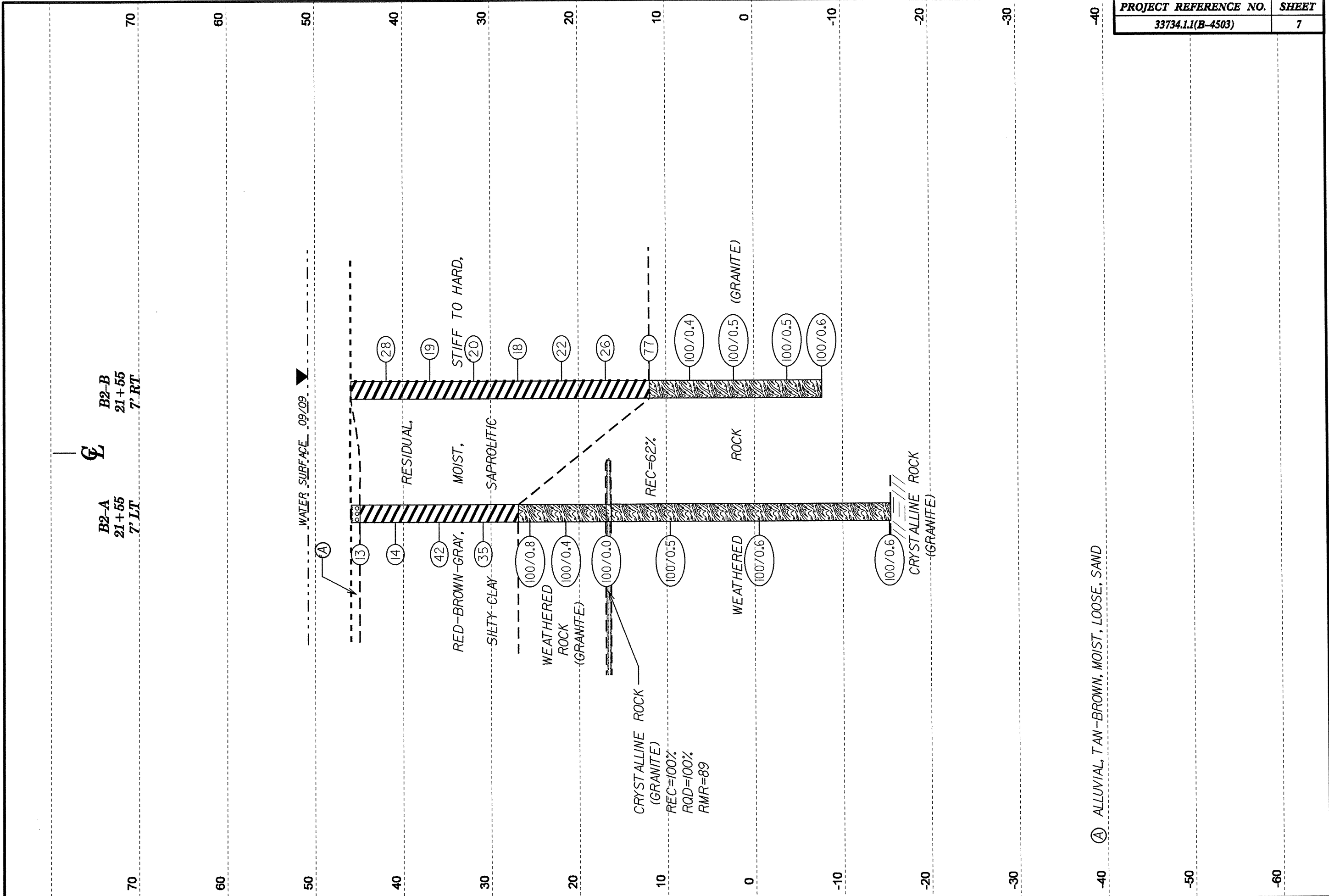
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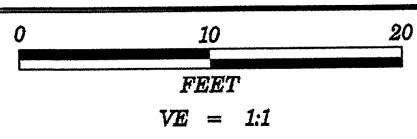


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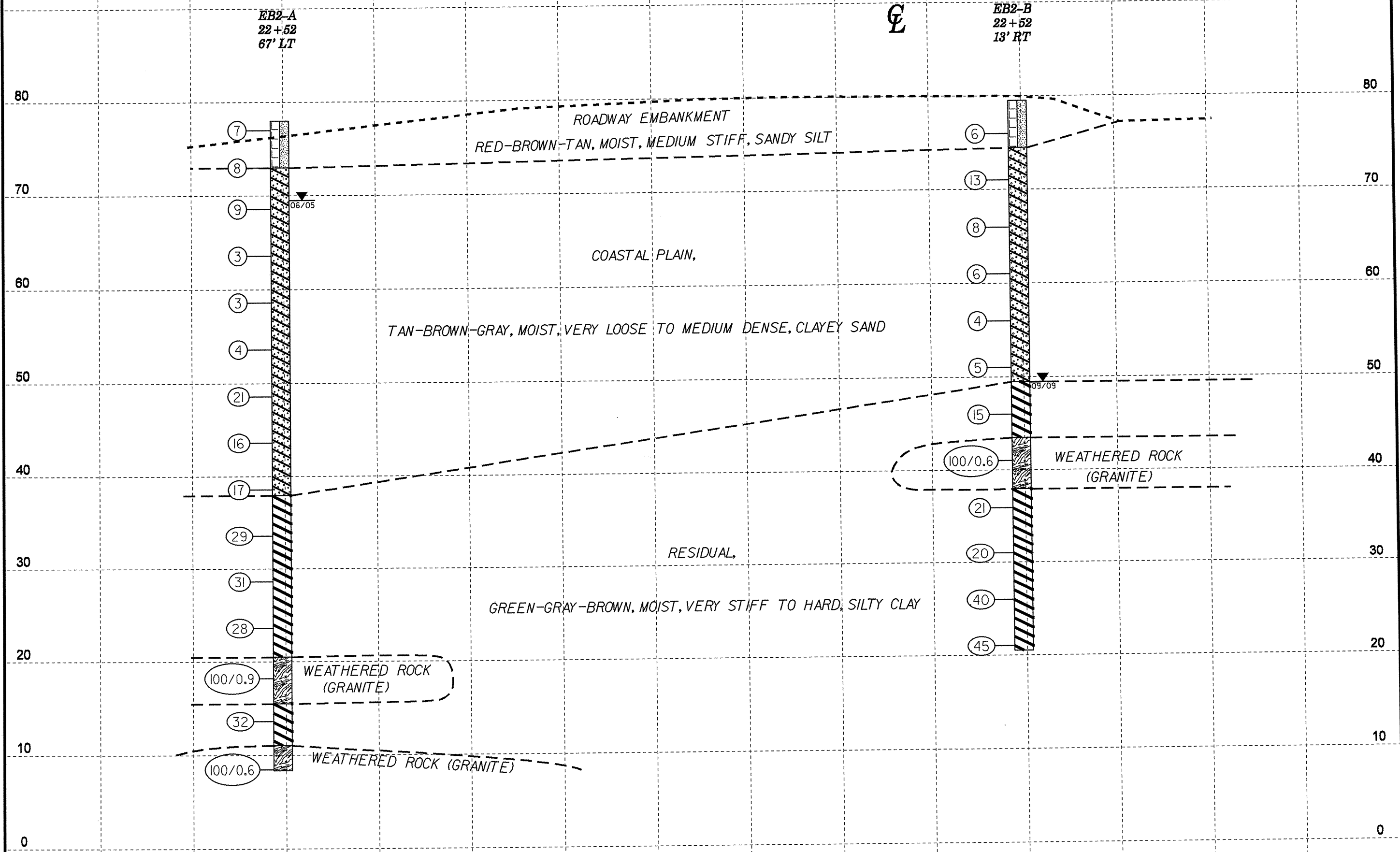
**CROSS SECTION THROUGH BENT 2**



Ⓐ ALLUVIAL, TAN-BROWN, MOIST, LOOSE, SAND



PROJECT REFERENCE NO.	SHEET
33734.1.1(B-4503)	8
CROSS SECTION THROUGH END BENT 2	

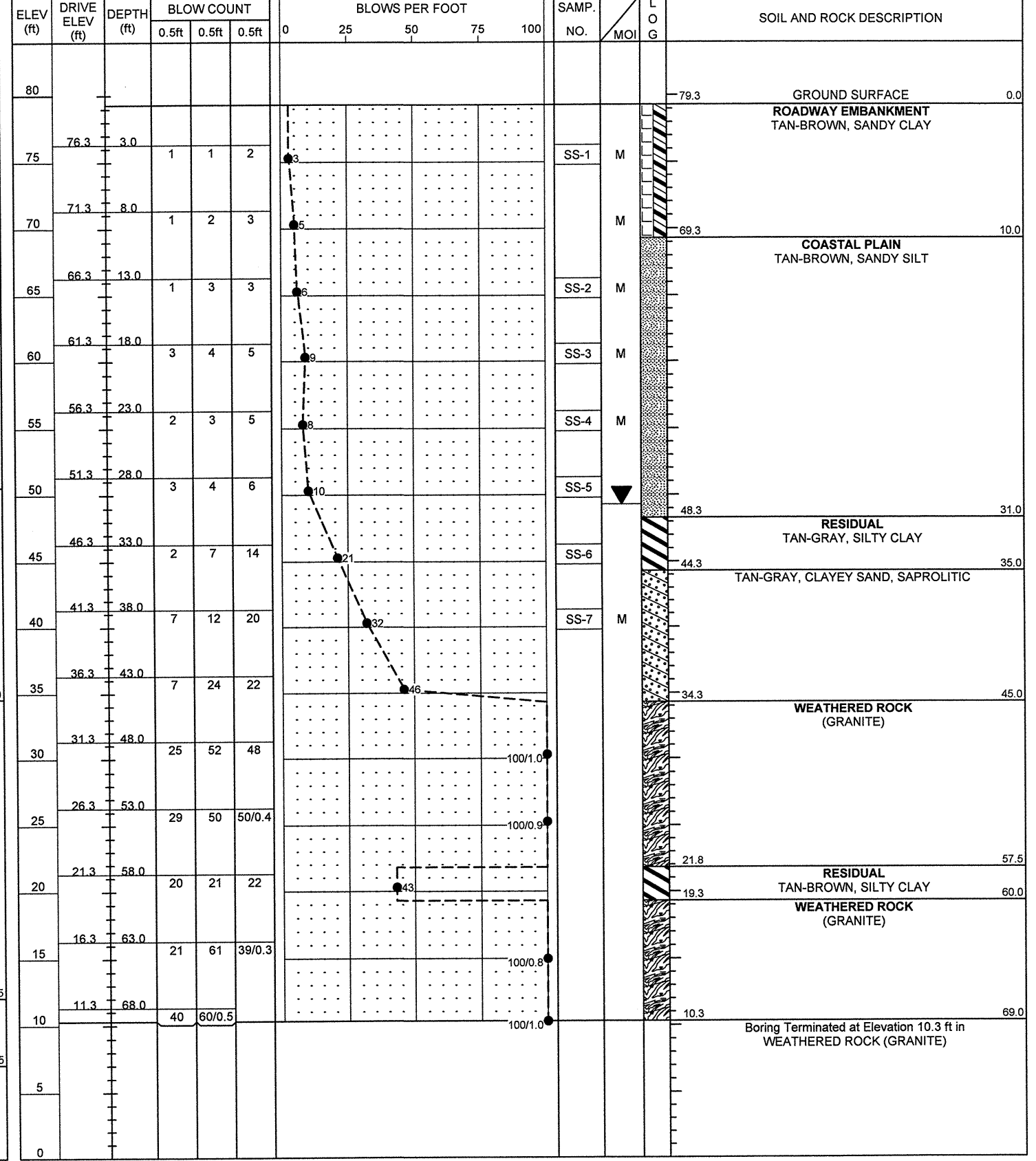
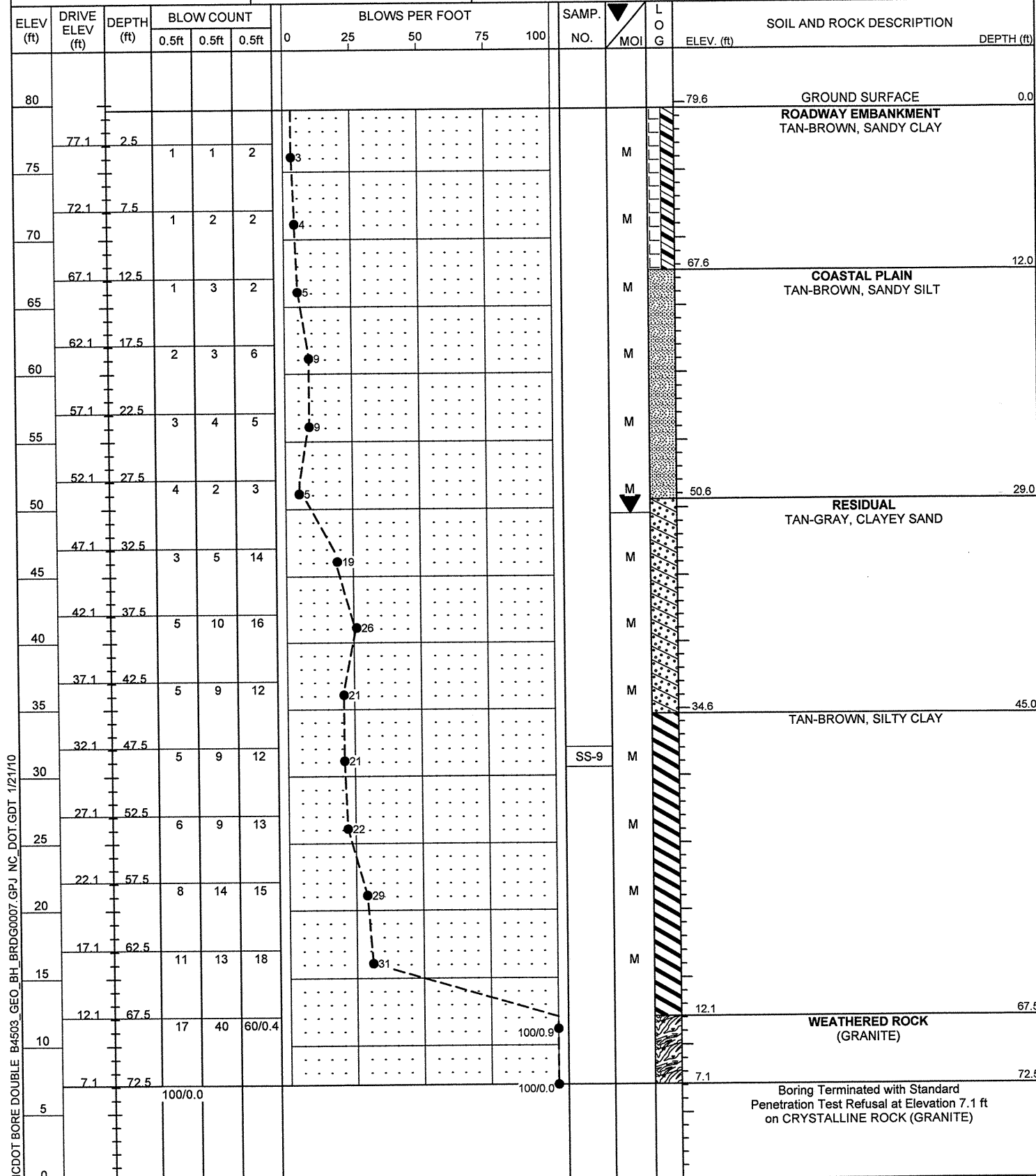




**NCDOT GEOTECHNICAL ENGINEERING UNIT**  
**BORELOG REPORT**

PROJECT NO. 33734.1.1	ID. B-4503	COUNTY EDGECOMBE	GEOLOGIST Oti, O. B.
SITE DESCRIPTION BRIDGE NO. 7 ON -L- (SR 1250) OVER TAR RIVER			GROUND WTR (ft)
BORING NO. EB1-A	STATION 19+75	OFFSET 14ft LT	ALIGNMENT -L-
COLLAR ELEV. 79.6 ft	TOTAL DEPTH 72.5 ft	NORTHING 813,014	EASTING 2,367,564
DRILL MACHINE CME-550	DRILL METHOD Mud Rotary	HAMMER TYPE Automatic	
START DATE 09/24/09	COMP. DATE 09/24/09	SURFACE WATER DEPTH N/A	DEPTH TO ROCK N/A

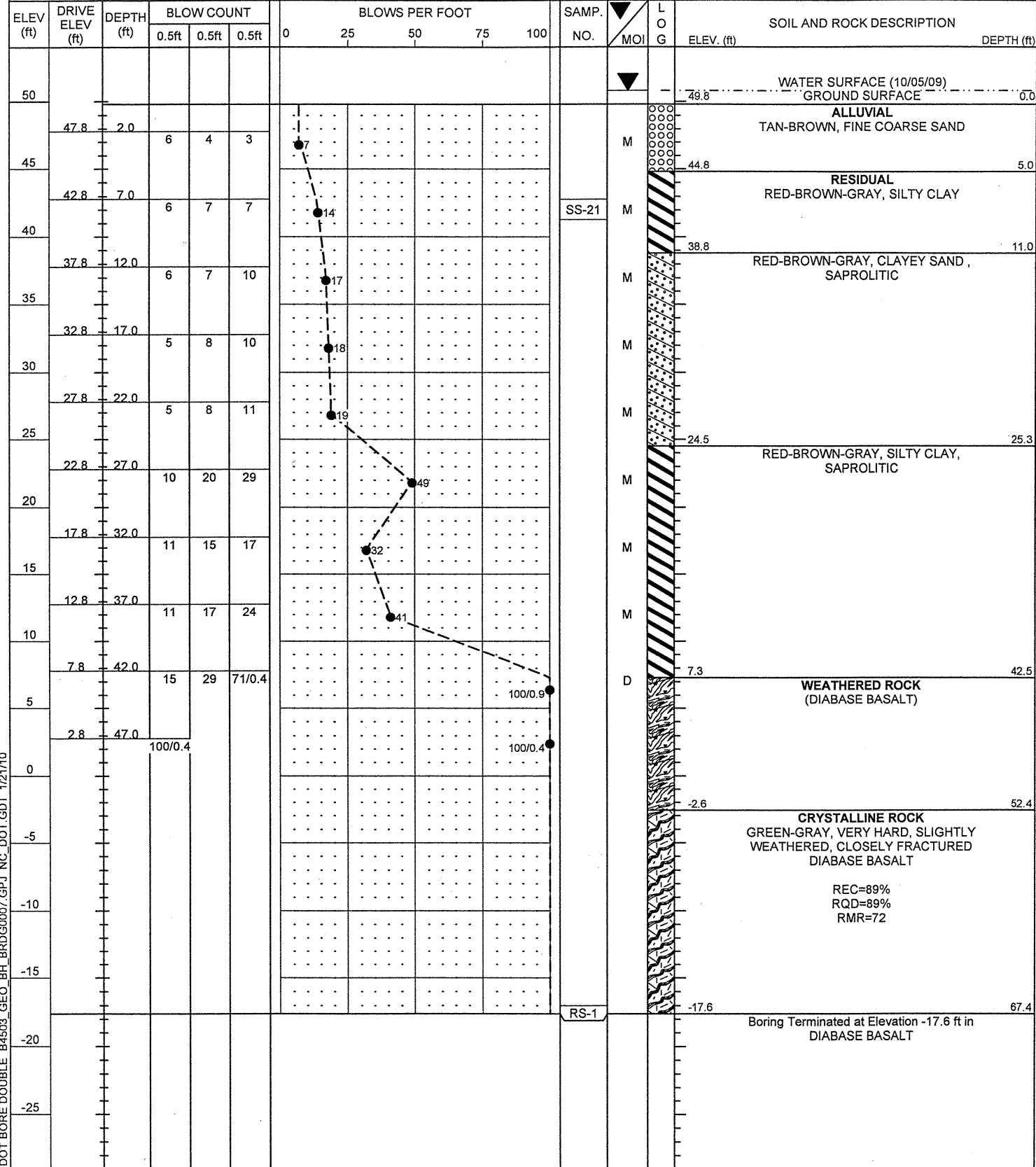
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SITE DESCRIPTION BRIDGE NO. 7 ON -L- (SR 1250) OVER TAR RIVER			GROUND WTR (ft)
BORING NO. EB1-B	STATION 19+75	OFFSET 14ft RT	ALIGNMENT -L-
COLLAR ELEV. 79.3 ft	TOTAL DEPTH 69.0 ft	NORTHING 813,020	EASTING 2,367,592
DRILL MACHINE CME-550	DRILL METHOD Mud Rotary	HAMMER TYPE Automatic	
START DATE 09/23/09	COMP. DATE 09/23/09	SURFACE WATER DEPTH N/A	DEPTH TO ROCK N/A



NCDOT BORE DOUBLE: B4503\_GEO\_BH\_BRDGG007.GPJ, NC\_DOT\_GDT\_1/21/10

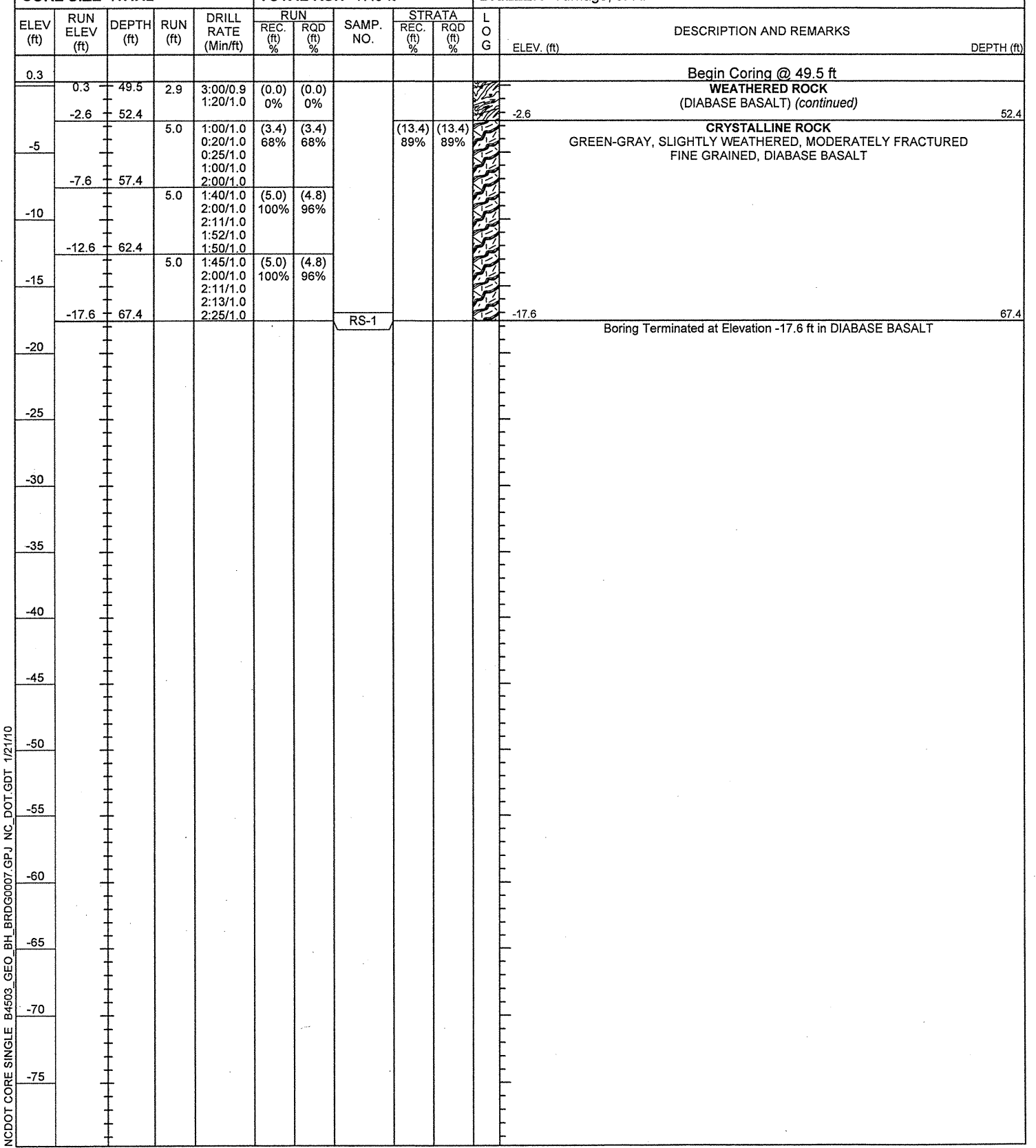
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**BORELOG REPORT**

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SITE DESCRIPTION BRIDGE NO. 7 ON -L- (SR 1250) OVER TAR RIVER			GROUND WTR (ft)
BORING NO. B1-A	STATION 20+65	OFFSET 7ft LT	ALIGNMENT -L-
COLLAR ELEV. 49.8 ft	TOTAL DEPTH 67.4 ft	NORTHING 813,104	EASTING 2,367,555
DRILL MACHINE CME-550	DRILL METHOD Mud Rotary	HAMMER TYPE Automatic	
START DATE 10/05/09	COMP. DATE 10/05/09	SURFACE WATER DEPTH 1.0ft	DEPTH TO ROCK 52.4 ft



**NCDOT GEOTECHNICAL ENGINEERING UNIT**  
**CORE BORING REPORT**

PROJECT NO. 33734.1.1	ID. B-4503	COUNTY EDGECOMBE	GEOLOGIST Oti, O. B.
SITE DESCRIPTION BRIDGE NO. 7 ON -L- (SR 1250) OVER TAR RIVER			GROUND WTR (ft)
BORING NO. B1-A	STATION 20+65	OFFSET 7ft LT	ALIGNMENT -L-
COLLAR ELEV. 49.8 ft	TOTAL DEPTH 67.4 ft	NORTHING 813,104	EASTING 2,367,555
DRILL MACHINE CME-550	DRILL METHOD Mud Rotary	HAMMER TYPE Automatic	
START DATE 10/05/09	COMP. DATE 10/05/09	SURFACE WATER DEPTH 1.0ft	DEPTH TO ROCK 52.4 ft



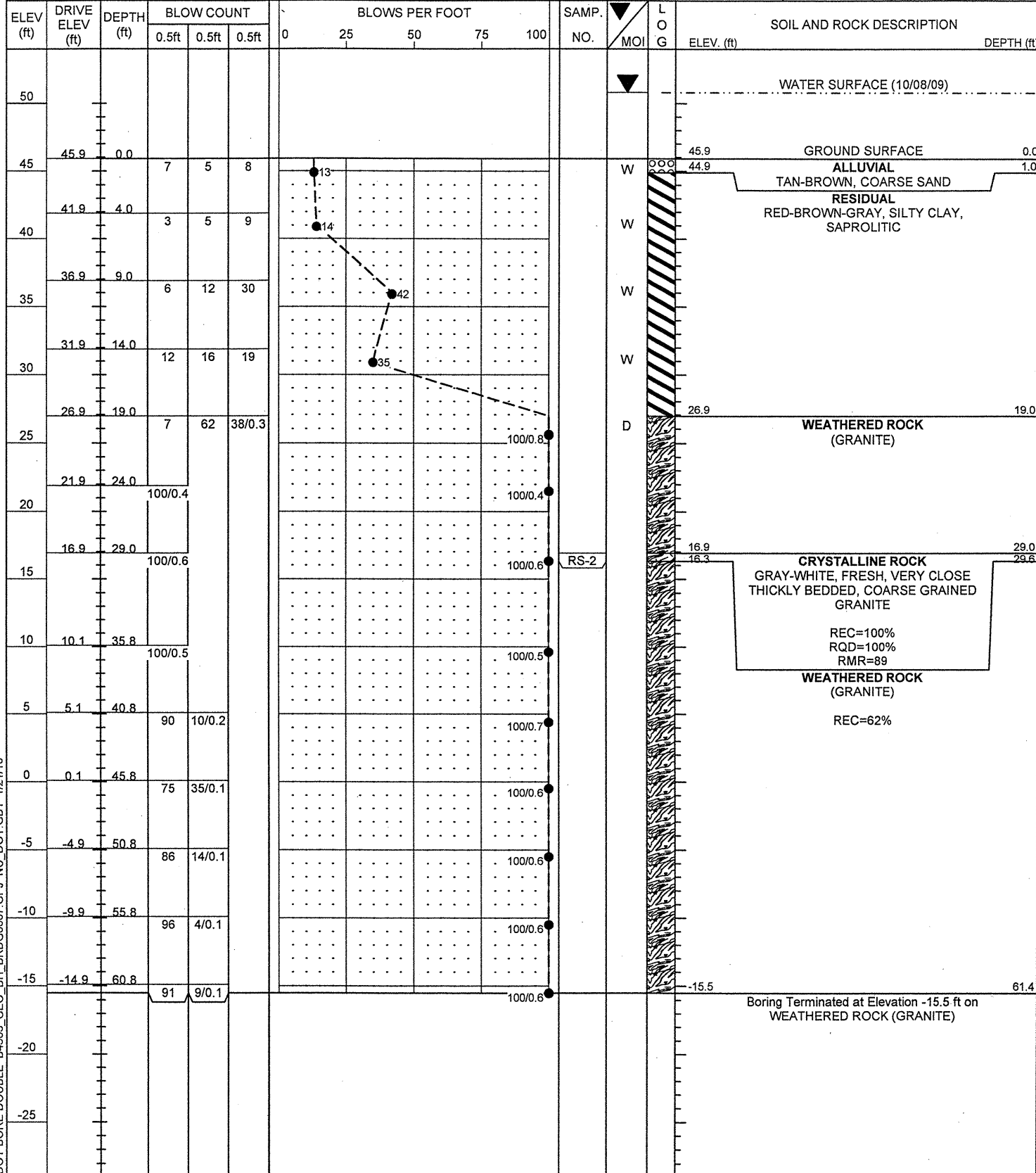
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C:\DOT\BORE\SINGLE\B4503\_GEO\_BH\_BRD0007.GPJ NC\_DOT.GDT 1/21/10



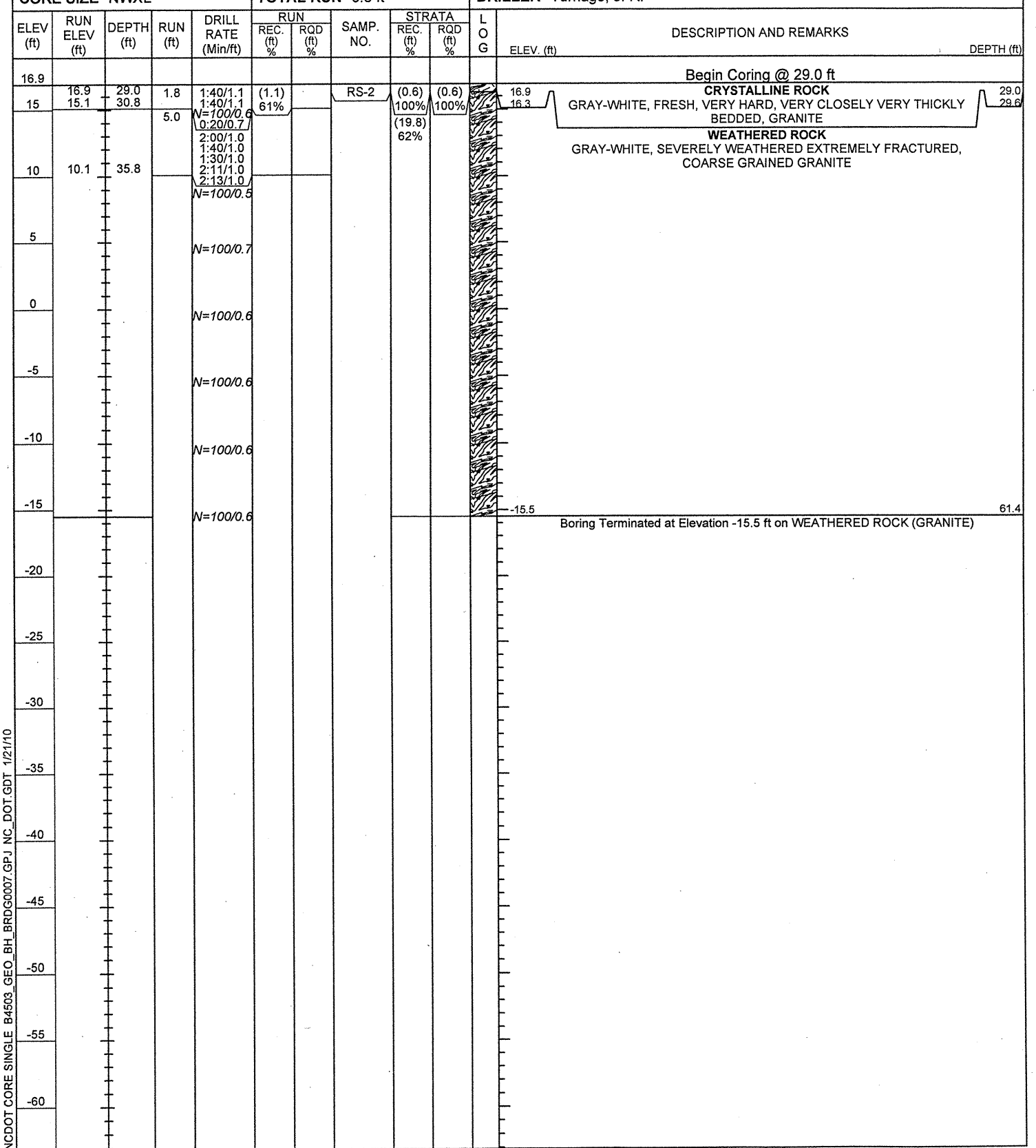
**NCDOT GEOTECHNICAL ENGINEERING UNIT**  
**BORELOG REPORT**

PROJECT NO. 33734.1.1	ID. B-4503	COUNTY EDGECOME	GEOLOGIST Oti, O. B.
SITE DESCRIPTION BRIDGE NO. 7 ON -L- (SR 1250) OVER TAR RIVER			GROUND WTR (ft)
BORING NO. B2-A	STATION 21+55	OFFSET 7ft LT	ALIGNMENT -L-
COLLAR ELEV. 45.9 ft	TOTAL DEPTH 61.4 ft	NORTHING 813,193	EASTING 2,367,538
DRILL MACHINE CME-550	DRILL METHOD Mud Rotary	HAMMER TYPE Automatic	
START DATE 10/08/09	COMP. DATE 10/08/09	SURFACE WATER DEPTH 4.9ft	DEPTH TO ROCK 29.0 ft



**NCDOT GEOTECHNICAL ENGINEERING UNIT**  
**CORE BORING REPORT**

PROJECT NO. 33734.1.1	ID. B-4503	COUNTY EDGECOME	GEOLOGIST Oti, O. B.
SITE DESCRIPTION BRIDGE NO. 7 ON -L- (SR 1250) OVER TAR RIVER			GROUND WTR (ft)
BORING NO. B2-A	STATION 21+55	OFFSET 7ft LT	ALIGNMENT -L-
COLLAR ELEV. 45.9 ft	TOTAL DEPTH 61.4 ft	NORTHING 813,193	EASTING 2,367,538
DRILL MACHINE CME-550	DRILL METHOD Mud Rotary	HAMMER TYPE Automatic	
START DATE 10/08/09	COMP. DATE 10/08/09	SURFACE WATER DEPTH 4.9ft	DEPTH TO ROCK 29.0 ft
CORE SIZE NWXL	TOTAL RUN 6.8 ft	DRILLER Turnage, J. R.	



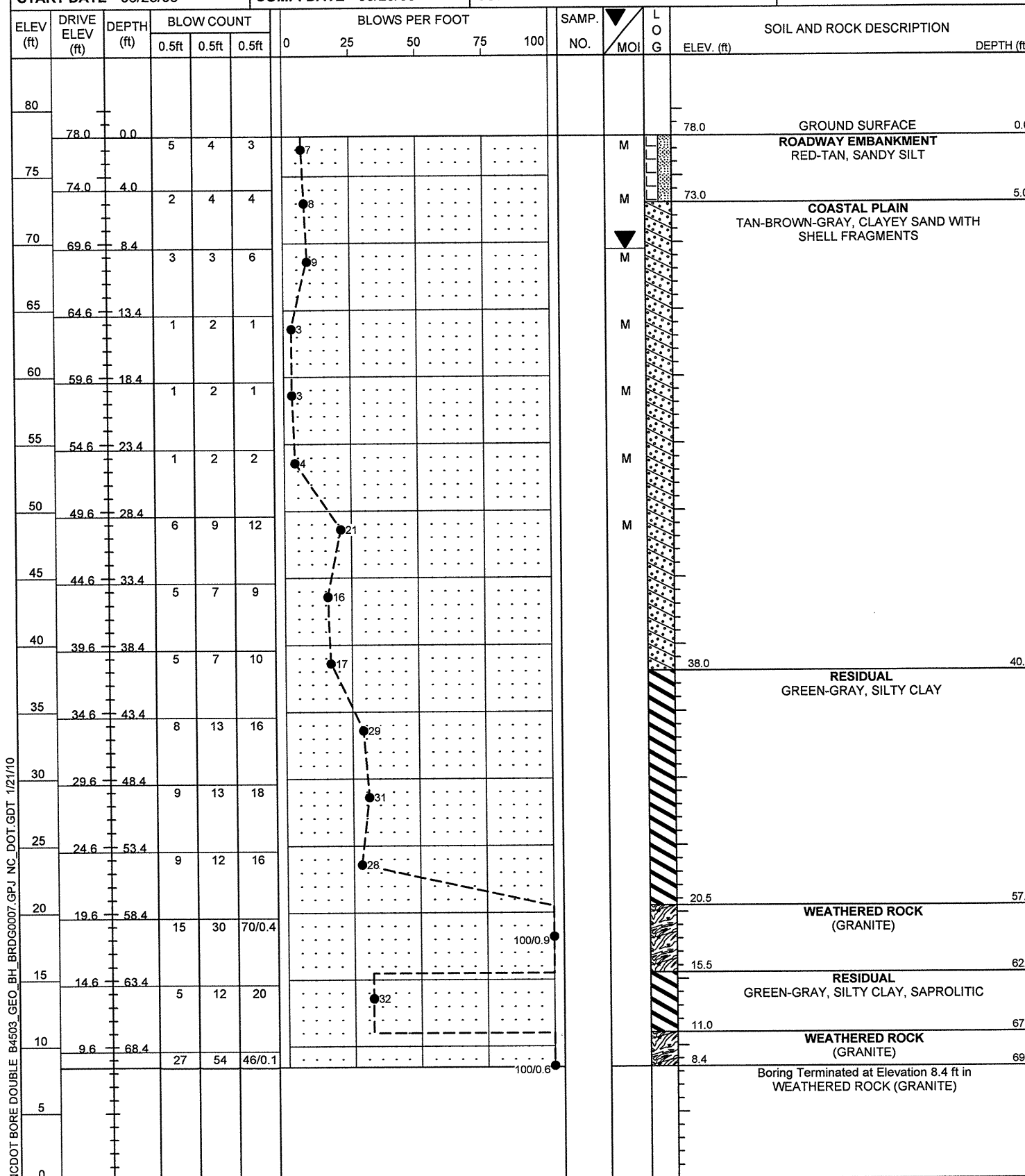
CDDOT BORE DOUBLE B4503\_GEO\_BH\_BRDGG007.GPJ NC\_DOT.GDT 1/21/10

CDDOT BORE SINGLE B4503\_GEO\_BH\_BRDGG007.GPJ NC\_DOT.GDT 1/21/10

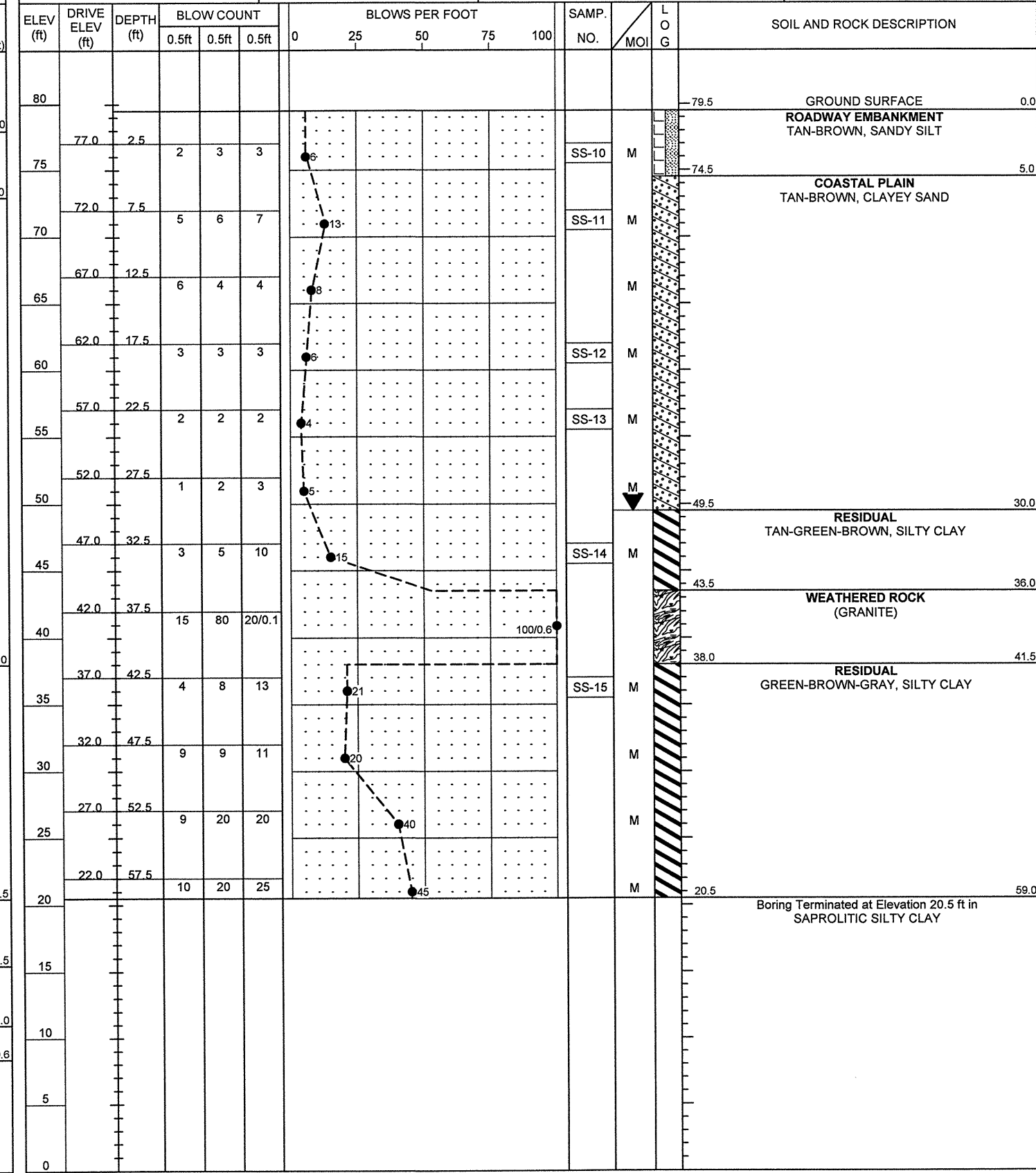


**NCDOT GEOTECHNICAL ENGINEERING UNIT**  
**BORELOG REPORT**

PROJECT NO. 33734.1.1	ID. B-4503	COUNTY EDGEcombe	GEOLOGIST K.B.O.
SITE DESCRIPTION BRIDGE NO. 7 ON -L- (SR 1250) OVER TAR RIVER			GROUND WTR (ft)
BORING NO. EB2-A	STATION 22+52	OFFSET 67ft LT	ALIGNMENT -L-
COLLAR ELEV. 78.0 ft	TOTAL DEPTH 69.6 ft	NORTHING 813,302	EASTING 2,367,593
DRILL MACHINE CME-45B	DRILL METHOD Mud Rotary	HAMMER TYPE Manual	
START DATE 06/23/05	COMP. DATE 06/23/05	SURFACE WATER DEPTH N/A	DEPTH TO ROCK N/A



PROJECT NO. 33734.1.1	ID. B-4503	COUNTY EDGEcombe	GEOLOGIST Oti, O. B.
SITE DESCRIPTION BRIDGE NO. 7 ON -L- (SR 1250) OVER TAR RIVER			GROUND WTR (ft)
BORING NO. EB2-B	STATION 22+52	OFFSET 13ft RT	ALIGNMENT -L-
COLLAR ELEV. 79.5 ft	TOTAL DEPTH 59.0 ft	NORTHING 813,292	EASTING 2,367,540
DRILL MACHINE CME-550	DRILL METHOD Mud Rotary	HAMMER TYPE Automatic	
START DATE 09/28/09	COMP. DATE 09/28/09	SURFACE WATER DEPTH N/A	DEPTH TO ROCK N/A



NCDOT BORE DOUBLE B4503\_GEO\_BH\_BRD007.GPJ NC\_DOT\_GDT\_12/1/10

**EB1-A**

<b>SOIL TEST RESULTS</b>															
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	14' LT	19+75	47.5-49.0	A-7-5(46)	79	41	2.2	3.6	46.1	48.1	95	94	91	-	-

**EB1-B**

<b>SOIL TEST RESULTS</b>															
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	14' RT	19+75	3.0-4.5	A-6(2)	28	11	29.7	27.7	22.6	20.0	91	73	47	-	-
SS-2	14' RT	19+75	13.0-14.5	A-4(0)	24	5	5.4	48.7	25.9	20.0	98	97	56	-	-
SS-3	14' RT	19+75	18.0-19.5	A-4(0)	21	2	11.0	48.9	26.1	14.0	99	98	49	-	-
SS-4	14' RT	19+75	23.0-24.5	A-4(5)	28	9	5.2	29.1	39.7	26.1	100	99	75	-	-
SS-5	14' RT	19+75	28.0-29.5	A-4(0)	18	NP	23.9	43.8	18.2	14.0	100	97	38	-	-
SS-6	14' RT	19+75	33.0-34.5	A-7-6(3)	41	20	47.7	14.3	18.9	19.0	92	58	37	-	-
SS-7	14' RT	19+75	38.0-39.5	A-2-6(1)	37	17	53.5	11.8	18.6	16.0	88	48	32	-	-
SS-8	14' RT	19+75	58.0-59.5	A-7-6(18)	56	32	22.4	13.4	26.1	38.1	92	78	62	-	-

**B1-A**

<b>SOIL TEST RESULTS</b>															
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-21	7' LT	20+65	7.0-8.5	A-7-5(47)	82	43	0.8	5.0	48.1	46.1	93	93	90	-	-

**B1-B**

<b>SOIL TEST RESULTS</b>															
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-20	7' RT	20+65	7.5-9.0	A-7-6(13)	53	28	27.5	17.2	35.3	20.0	95	77	57	-	-
SS-22	7' RT	20+65	17.5-19.0	A-2-7(3)	42	25	40.7	22.0	15.2	22.0	86	61	35	-	-
SS-23	7' RT	20+65	27.5-29.0	A-7-6(11)	62	38	30.9	19.2	11.8	38.1	82	63	44	-	-
SS-24	7' RT	20+65	42.5-44.0	A-7-7(6)	22	NP	78.9	14.7	2.4	4.0	97	46	7	-	-

**B2-B**

<b>SOIL TEST RESULTS</b>															
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-16	7' RT	21+55	3.0-4.5	A-7-6(23)	68	40	23.0	8.0	30.9	38.1	88	71	62	-	-
SS-17	7' RT	21+55	8.0-9.5	A-7-5(46)	86	46	2.4	2.8	34.7	60.1	88	86	84	-	-
SS-18	7' RT	21+55	18.0-19.5	A-7-5(48)	80	46	1.4	5.6	34.9	58.1	94	93	89	-	-
SS-19	7' RT	21+55	28.0-29.5	A-7-5(46)	93	53	0.2	3.6	34.1	62.1	79	79	77	-	-

**EB2-B**

<b>SOIL TEST RESULTS</b>															
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	13' RT	22+52	2.5-4.0	A-4(0)	19	3	32.9	31.1	22.0	14.0	80	61	39	-	-
SS-11	13' RT	22+52	7.5-9.0	A-2-7(2)	45	25	56.6	15.6	3.7	24.0	84	48	25	-	-
SS-12	13' RT	22+52	17.5-19.0	A-1-b(0)	24	NP	83.5	9.1	3.4	4.0	68	18	6	-	-
SS-13	13' RT	22+52	22.5-24.0	A-2-6(0)	30	11	27.5	43.0	10.5	19.0	74	59	25	-	-
SS-14	13' RT	22+52	32.5-34.0	A-7-5(44)	74	40	1.4	11.8	46.7	40.1	100	99	91	-	-
SS-15	13' RT	22+52	42.5-44.0	A-7-5(51)	87	53	2.0	8.2	29.7	60.1	92	91	84	-	-

**B1-A**

<b>ROCK TEST RESULTS</b>									
SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AREA (in <sup>2</sup> )	UNIT WEIGHT (lbs/ft <sup>3</sup> )	H/D RATIO	ULTIMATE LOAD (ksi)	ULTIMATE LOAD (lbf)	SEC MOD @ 40% (Mpsi)
RS-1	7' LT	20+65	66.8-67.4	2.7318	198	1.75	23.7	26400	13.61

**B2-A**

<b>ROCK TEST RESULTS</b>									
SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AREA (in <sup>2</sup> )	UNIT WEIGHT (lbs/ft <sup>3</sup> )	H/D RATIO	ULTIMATE LOAD (ksi)	ULTIMATE LOAD (lbf)	SEC MOD @ 40% (Mpsi)
RS-2	7' LT	21+55	29.0-29.6	2.7318	159.7	1.99	10.75	11740	10.83



**NORTH CAROLINA DEPARTMENT OF TRANSPORTATION  
GEOTECHNICAL ENGINEERING UNIT**

**FIELD  
SCOUR REPORT**

WBS: 33734.1.1 TIP: B-4503 COUNTY: Edgecombe

DESCRIPTION(1): Bridge No. 7 on -L- (SR 1250) over the Tar River

**EXISTING BRIDGE**

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

Bridge No.: 7 Length: 240+/- Total Bents: 6 Bents in Channel: 2 Bents in Floodplain: 4  
Foundation Type: Steel H-piles

**EVIDENCE OF SCOUR(2)**

Abutments or End Bent Slopes: None

Interior Bents: Minor local scour at both piers in channel

Channel Bed: Minor local and contraction scour, wood debris around interior Bent 3

Channel Bank: Local scour around Bent 1 and Bent 4

**EXISTING SCOUR PROTECTION**

Type(3): Concrete covered End Bent slopes.

Extent(4): Concrete =80' L x 30' W +/-

Effectiveness(5): Both are effective

Obstructions(6): None

**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): C.P., tan-brown , silty sand (SS-12)

Channel Bank Material(8): Coastal plain, tan -brown, clayey sand (SS-11)

Channel Bank Cover(9): Grass vines,shrubs, small and large trees

Floodplain Width(10): +/- 700 feet.

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

Stream is(12): Aggrading \_\_\_\_\_ Degrading X Static \_\_\_\_\_

Channel Migration Tend.(13): North towards End Bent 2

Observations and Other Comments: Wood debris round bent 3.

**DESIGN SCOUR ELEVATIONS(14)**

Feet X Meters \_\_\_\_\_

**BENTS**

B1-A	B1-B	B2-A	B2-B
39.0	39.0	38.9	38.9

Comparison of DSE to Hydraulics Unit theoretical scour:  
Design Scour Elevations are 4.4 feet higher at bent 1 and 5.9 feet higher at bent 2 compared to the Hydraulics Unit's estimates for the 100year storm events

**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: *Amshu B. Jh.*

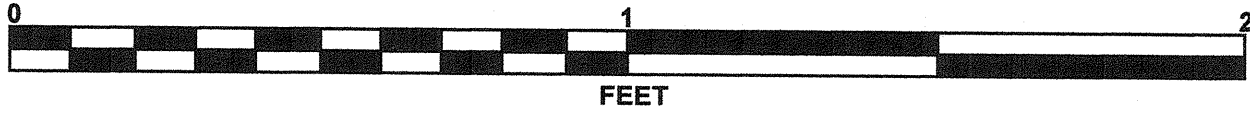
Date: 1/29/10



# CORE PHOTOGRAPHS

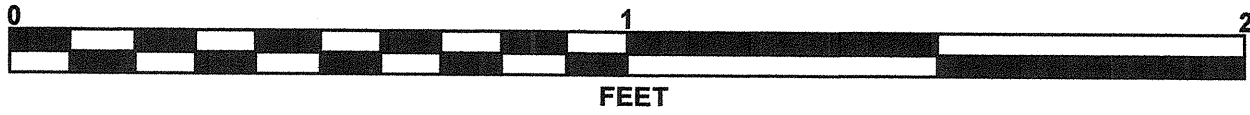
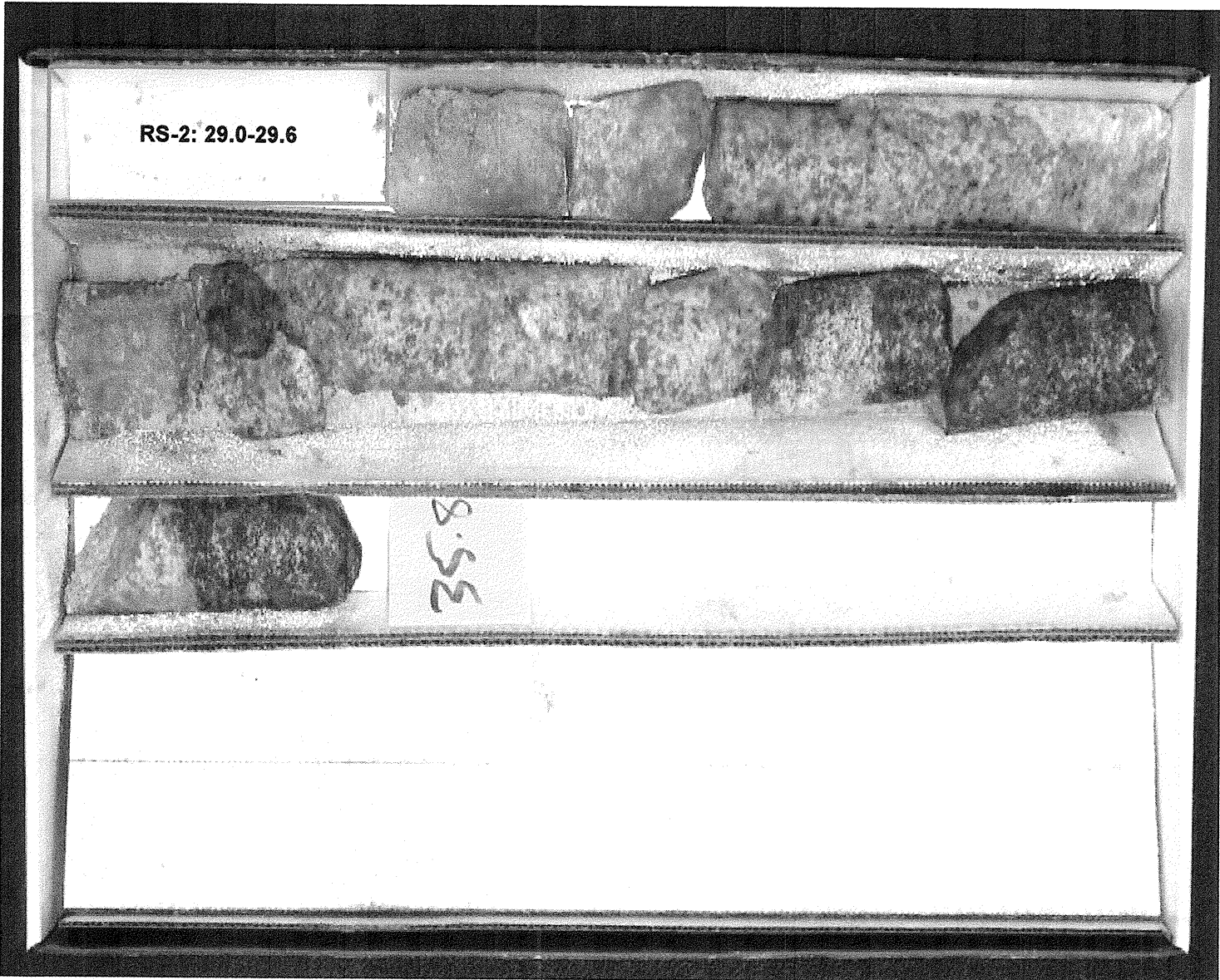
## B1-A

BOXES 1 & 2: 52.4-67.4 FEET



## B2-A

BOX 1: 29.0-29.6 FEET



SITE PHOTO

BRIDGE NO. 7 OVER TAR RIVER ON SR 1250



LOOKING EAST TOWARD END BENT 1