

PROJECT: 38534.1.1 ID: B-4762

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

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	38534.1.1 (B-4762)	1	11

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STRUCTURE
SUBSURFACE INVESTIGATION

PROJ. REFERENCE NO. 38534.1.1 (B-4762) F.A. PROJ. _____

COUNTY HAYWOOD

PROJECT DESCRIPTION BRIDGE No. 72 ON SR-1407
OVER JONATHON CREEK

SITE DESCRIPTION _____

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 WALEIGH 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.

PERSONNEL

M M HAGER

D O CHEEK

C J COFFEY

G K ROSE

INVESTIGATED BY C A DUNNAGAN

CHECKED BY W D FRYE, Jr

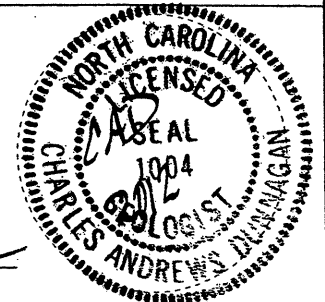
SUBMITTED BY W D FRYE, Jr

DATE APRIL 2012

DRAWN BY: C A DUNNAGAN

NOTE - THE INFORMATION CONTAINED HEREIN IS NOT IMPLIED OR GUARANTEED BY THE N.C. DEPARTMENT OF TRANSPORTATION AS BEING ACCURATE NOR IS IT 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.



C.A. Dunnagan

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS
GEOTECHNICAL ENGINEERING UNIT

PROJECT REFERENCE NO.
38534.11 (B-4762) SHEET NO.
2/11

SUBSURFACE INVESTIGATION

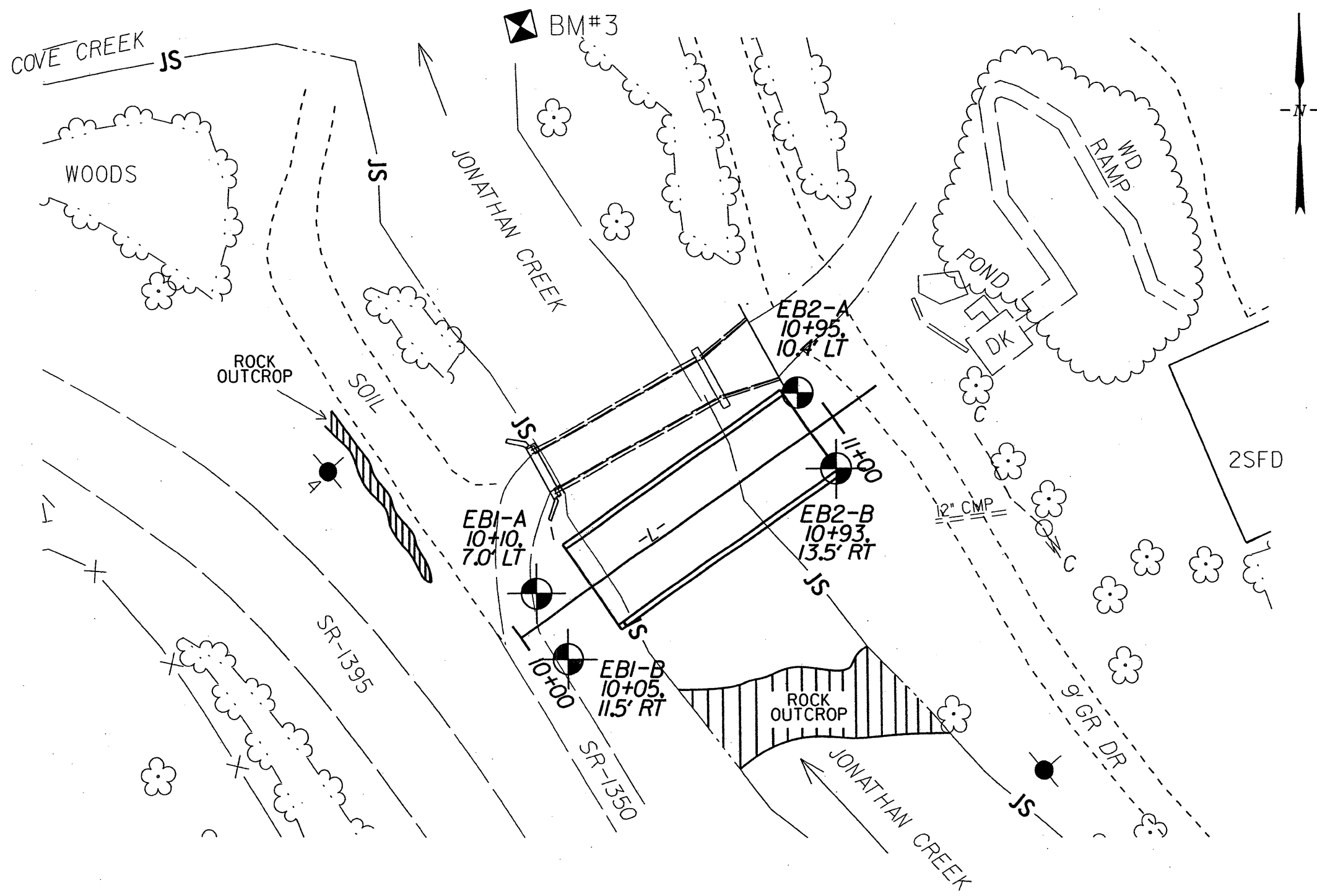
SOIL AND ROCK LEGEND, TERMS, SYMBOLS, AND ABBREVIATIONS

SOIL DESCRIPTION		GRADATION		ROCK DESCRIPTION		TERMS AND DEFINITIONS	
<p>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 THE 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:</p> <p style="text-align: center;"><i>VERY STIFF, GRAY, SILTY CLAY, MOST WITH INTERBEDDED FINE SAND LAYERS, HIGHLY PLASTIC, A-7-6</i></p>		<p>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.</p> <p style="text-align: center;">ANGULARITY OF GRAINS</p> <p>THE ANGULARITY OR ROUNDNESS OF SOIL GRAINS IS DESIGNATED BY THE TERMS: <u>ANGULAR</u>, <u>SUBANGULAR</u>, <u>SUBROUNDED</u>, OR <u>ROUNDED</u>.</p>		<p>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:</p>		<p><u>ALLUVIUM (ALLUV.)</u> - SOILS THAT HAVE BEEN TRANSPORTED BY WATER. <u>AQUIFER</u> - A WATER BEARING FORMATION OR STRATA. <u>ARENACEOUS</u> - APPLIED TO ROCKS THAT HAVE BEEN DERIVED FROM SAND OR THAT CONTAIN SAND. <u>ARGILLACEOUS</u> - APPLIED TO ALL ROCKS OR SUBSTANCES COMPOSED OF CLAY MINERALS, OR HAVING A NOTABLE PROPORTION OF CLAY IN THEIR COMPOSITION, AS SHALE, SLATE, ETC. <u>ARTESIAN</u> - 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. <u>CALCAREOUS (CALC.)</u> - SOILS THAT CONTAIN APPRECIABLE AMOUNTS OF CALCIUM CARBONATE. <u>COLLUVIUM</u> - ROCK FRAGMENTS MIXED WITH SOIL DEPOSITED BY GRAVITY ON SLOPE OR AT BOTTOM OF SLOPE. <u>CORE RECOVERY (REC.)</u> - TOTAL LENGTH OF ALL MATERIAL RECOVERED IN THE CORE BARREL DIVIDED BY TOTAL LENGTH OF CORE RUN AND EXPRESSED AS A PERCENTAGE. <u>DIKE</u> - A TABULAR BODY OF IGNEOUS ROCK THAT CUTS ACROSS THE STRUCTURE OF ADJACENT ROCKS OR CUTS MASSIVE ROCK. <u>DIP</u> - THE ANGLE AT WHICH A STRATUM OR ANY PLANAR FEATURE IS INCLINED FROM THE HORIZONTAL. <u>DIP DIRECTION (DIP AZIMUTH)</u> - THE DIRECTION OR BEARING OF THE HORIZONTAL TRACE OF THE LINE OF DIP, MEASURED CLOCKWISE FROM NORTH. <u>FAULT</u> - A FRACTURE OR FRACTURE ZONE ALONG WHICH THERE HAS BEEN DISPLACEMENT OF THE SIDES RELATIVE TO ONE ANOTHER PARALLEL TO THE FRACTURE. <u>FISSILE</u> - A PROPERTY OF SPLITTING ALONG CLOSELY SPACED PARALLEL PLANES. <u>FLOAT</u> - ROCK FRAGMENTS ON SURFACE NEAR THEIR ORIGINAL POSITION AND DISLOOGED FROM PARENT MATERIAL. <u>FLOOD PLAIN (FP)</u> - LAND BORDERING A STREAM, BUILT OF SEDIMENTS DEPOSITED BY THE STREAM. <u>FORMATION (FM)</u> - A MAPPABLE GEOLOGIC UNIT THAT CAN BE RECOGNIZED AND TRACED IN THE FIELD. <u>JOINT</u> - FRACTURE IN ROCK ALONG WHICH NO APPRECIABLE MOVEMENT HAS OCCURRED. <u>LEDGE</u> - A SHELF-LIKE RIDGE OR PROJECTION OF ROCK WHOSE THICKNESS IS SMALL COMPARED TO ITS LATERAL EXTENT. <u>LENS</u> - A BODY OF SOIL OR ROCK THAT THINS OUT IN ONE OR MORE DIRECTIONS. <u>NOTIRED (NOT.)</u> - IRREGULARLY MARKED WITH SPOTS OF DIFFERENT COLORS, MOTTLING IN SOILS USUALLY INDICATES POOR AERATION AND LACK OF GOOD DRAINAGE. <u>PERCHED WATER</u> - WATER MAINTAINED ABOVE THE NORMAL GROUND WATER LEVEL BY THE PRESENCE OF AN INTERVENING IMPERVIOUS STRATUM. <u>RESIDUAL (RES.) SOIL</u> - SOIL FORMED IN PLACE BY THE WEATHERING OF ROCK. <u>ROCK QUALITY DESIGNATION (RQD)</u> - 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. <u>SAPROLITE (SAP.)</u> - RESIDUAL SOIL THAT RETAINS THE RELIC STRUCTURE OR FABRIC OF THE PARENT ROCK. <u>SILL</u> - 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. <u>SLICKENSIDE</u> - POLISHED AND STRIATED SURFACE THAT RESULTS FROM FRICTION ALONG A FAULT OR SLIP PLANE. <u>STANDARD PENETRATION TEST (PENETRATION RESISTANCE) (SPT)</u> - 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. <u>STRATA CORE RECOVERY (SREC.)</u> - TOTAL LENGTH OF STRATA MATERIAL RECOVERED DIVIDED BY TOTAL LENGTH OF STRATUM AND EXPRESSED AS A PERCENTAGE. <u>STRATA ROCK QUALITY DESIGNATION (SRQD)</u> - 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. <u>TOPSOIL (TS.)</u> - SURFACE SOILS USUALLY CONTAINING ORGANIC MATTER.</p>	
SOIL LEGEND AND AASHTO CLASSIFICATION		MINERALOGICAL COMPOSITION		WEATHERING			
<p>GENERAL CLASS. GRANULAR MATERIALS (< 35% PASSING #200) SILT-CLAY MATERIALS (> 35% PASSING #200) ORGANIC MATERIALS</p> <p>GROUP CLASS. A-1, A-3, A-2, A-4, A-5, A-6, A-7, A-1, A-2, A-3, A-4, A-5, A-6, A-7</p> <p>SYMBOL</p> <p>% PASSING #10, #40, #200</p> <p>LIQUID LIMIT, PLASTIC INDEX, GROUP INDEX</p> <p>USUAL TYPES OF MAJOR MATERIALS</p> <p>GEN. RATING AS A SUBGRADE</p>		<p>MINERAL NAMES SUCH AS QUARTZ, FELDSPAR, MICA, TALC, KAOLIN, ETC. ARE USED IN DESCRIPTIONS WHENEVER THEY ARE CONSIDERED OF SIGNIFICANCE.</p> <p style="text-align: center;">COMPRESSIBILITY</p> <p>SLIGHTLY COMPRESSIBLE, MODERATELY COMPRESSIBLE, HIGHLY COMPRESSIBLE</p> <p style="text-align: center;">PERCENTAGE OF MATERIAL</p> <p>ORGANIC MATERIAL, GRANULAR SOILS, SILT-CLAY SOILS, OTHER MATERIAL</p> <p style="text-align: center;">GROUND WATER</p> <p>WATER LEVEL IN BORE HOLE IMMEDIATELY AFTER DRILLING, STATIC WATER LEVEL AFTER 24 HOURS, PERCHED WATER, SATURATED ZONE, OR WATER BEARING STRATA, SPRING OR SEEP</p>		<p>WEATHERED ROCK (WR)</p> <p>CRYSTALLINE ROCK (CR)</p> <p>NON-CRYSTALLINE ROCK (NCR)</p> <p>COASTAL PLAIN SEDIMENTARY ROCK (CP)</p> <p>FRESH, VERY SLIGHT (V SLI), SLIGHT (SLI), MODERATE (MOD.), MODERATELY SEVERE (MOD. SEV.), SEVERE (SEV.), VERY SEVERE (V SEV.), COMPLETE</p>			
CONSISTENCY OR DENSENESS		MISCELLANEOUS SYMBOLS		ROCK HARDNESS			
<p>PRIMARY SOIL TYPE, COMPACTNESS OR CONSISTENCY, RANGE OF STANDARD PENETRATION RESISTANCE (N-VALUE), RANGE OF UNCONFINED COMPRESSIVE STRENGTH (TONS/FT²)</p>		<p>ROADWAY EMBANKMENT (RE) WITH SOIL DESCRIPTION, SOIL SYMBOL, ARTIFICIAL FILL (AF) OTHER THAN ROADWAY EMBANKMENT, INFERRED SOIL BOUNDARY, INFERRED ROCK LINE, ALLUVIAL SOIL BOUNDARY, DIP & DIP DIRECTION OF ROCK STRUCTURES, SOUNDING ROD</p> <p>SPT TEST BORING, AUGER BORING, CORE BORING, MONITORING WELL, PIEZOMETER INSTALLATION, SLOPE INDICATOR INSTALLATION, SPT N-VALUE, SPT REFUSAL</p>		<p>VERY HARD, HARD, MODERATELY HARD, MEDIUM HARD, SOFT, VERY SOFT</p>			
TEXTURE OR GRAIN SIZE		ABBREVIATIONS		EQUIPMENT USED ON SUBJECT PROJECT			
<p>U.S. STD. SIEVE SIZE OPENING (MM), BOULDER (BLDR.), COBBLE (COB.), GRAVEL (GR.), COARSE SAND (CS.SD.), FINE SAND (FS.SD.), SILT (SL.), CLAY (CL.)</p>		<p>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, HL - HIGHLY, MED. - MEDIUM, MICA - MICACEOUS, MOD. - MODERATELY, NP - NON PLASTIC, ORG. - ORGANIC, PHT - PRESSUREMETER TEST, SAP. - SAPROLITIC, SD. - SAND, SANDY, SL. - SILT, SILTY, SLC. - SLIGHTLY, TCR - TRICONE REFUSAL, W - MOISTURE CONTENT, V - VERY, VST - VANE SHEAR TEST, WEA. - WEATHERED, W - UNIT WEIGHT, W - DRY UNIT WEIGHT, FIAD - FILLED IMMEDIATELY AFTER DRILLING, WOH - WEIGHT OF HAMMER</p>		<p>DRILL UNITS: MOBILE B., BK-51, CME-45C, CME-55B, PORTABLE HOIST</p> <p>ADVANCING TOOLS: CLAY BITS, 6" CONTINUOUS FLIGHT AUGER, 8" HOLLOW AUGERS, HARD FACED FINGER BITS, TUNG-CARBIDE INSERTS, CASING W/ ADVANCER, TRICONE STEEL TEETH, TRICONE TUNG-CARB., CORE BIT</p> <p>HAMMER TYPE: AUTOMATIC, MANUAL</p> <p>CORE SIZE: B, N, XL, H</p> <p>HAND TOOLS: POST HOLE DIGGER, HAND AUGER, SOUNDING ROD, VANE SHEAR TEST</p>			
SOIL MOISTURE - CORRELATION OF TERMS		FRACATURE SPACING		BEDDING			
<p>SOIL MOISTURE SCALE (ATTERBERG LIMITS), FIELD MOISTURE DESCRIPTION, GUIDE FOR FIELD MOISTURE DESCRIPTION</p> <p>LL - LIQUID LIMIT, PL - PLASTIC LIMIT, OM - OPTIMUM MOISTURE, SL - SHRINKAGE LIMIT</p>		<p>TERM, SPACING: VERY WIDE, WIDE, MODERATELY CLOSE, CLOSE, VERY CLOSE</p>		<p>TERM, THICKNESS: VERY THICKLY BEDDED, THICKLY BEDDED, THINLY BEDDED, VERY THINLY BEDDED, THICKLY LAMINATED, THINLY LAMINATED</p>			
PLASTICITY		INDURATION		NOTES:			
<p>NONPLASTIC, LOW PLASTICITY, MED. PLASTICITY, HIGH PLASTICITY</p>		<p>FOR SEDIMENTARY ROCKS, INDURATION IS THE HARDENING OF THE MATERIAL BY CEMENTING, HEAT, PRESSURE, ETC.</p> <p>FRIABLE, MODERATELY INDURATED, INDURATED, EXTREMELY INDURATED</p>		<p>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.</p>		<p>BENCH MARK: BM#3 8-INCH SPIKE SET IN BASE OF 16-INCH MAPLE TREE, 107.4 FEET LEFT OF -BL- STA 14+13.86 ELEVATION: 2471.74 FT.</p>	
COLOR							
<p>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.</p>							

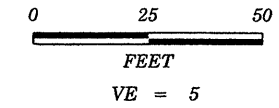
3/11

BRIDGE No. 72 ON SR-1407 OVER JONATHAN CREEK

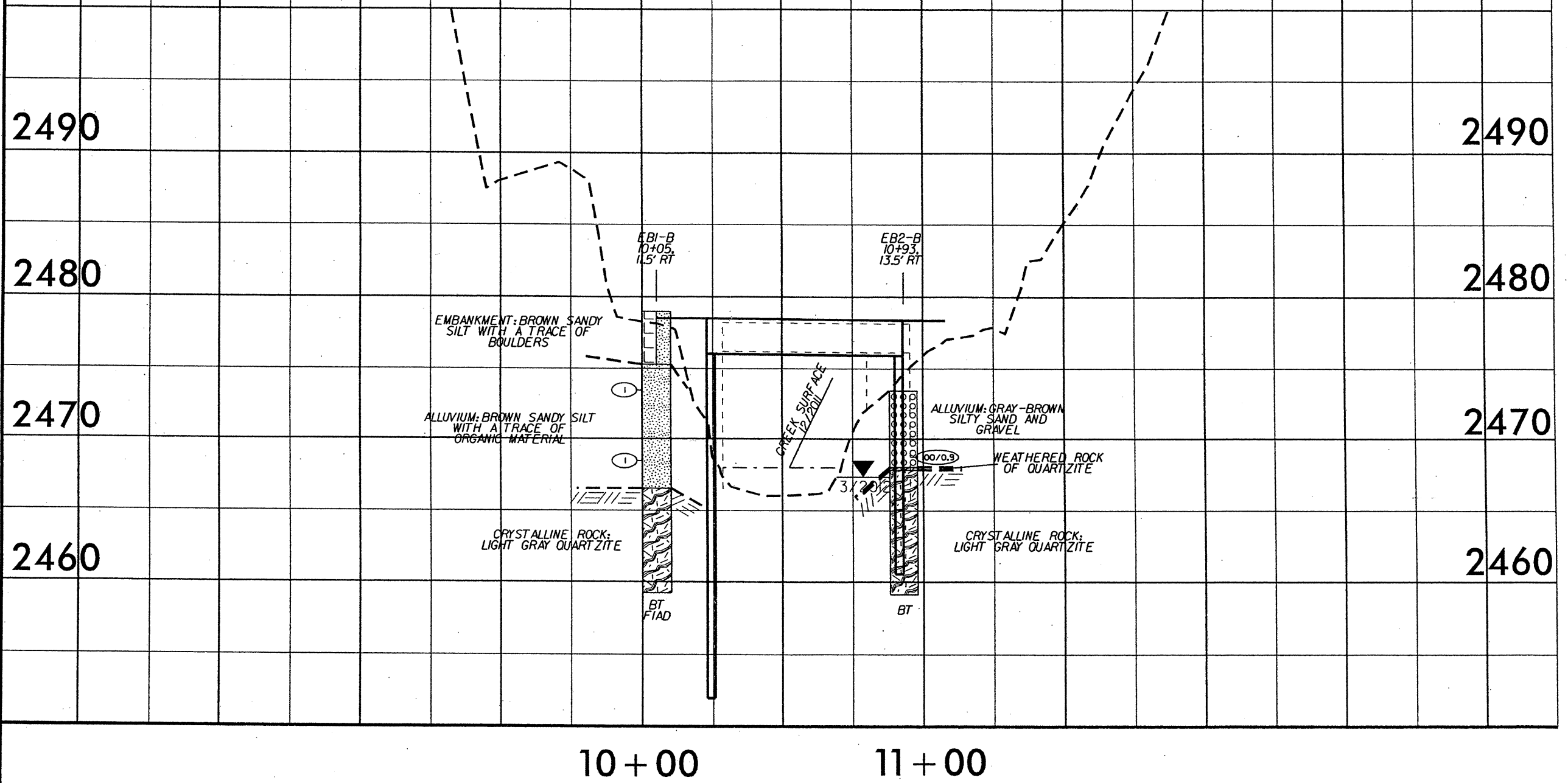
0	25	50	PROJECT REFERENCE NO.	SHEET
FEET			38534.1.1 (B-4762)	
SKEW=90°			PLAN VIEW	

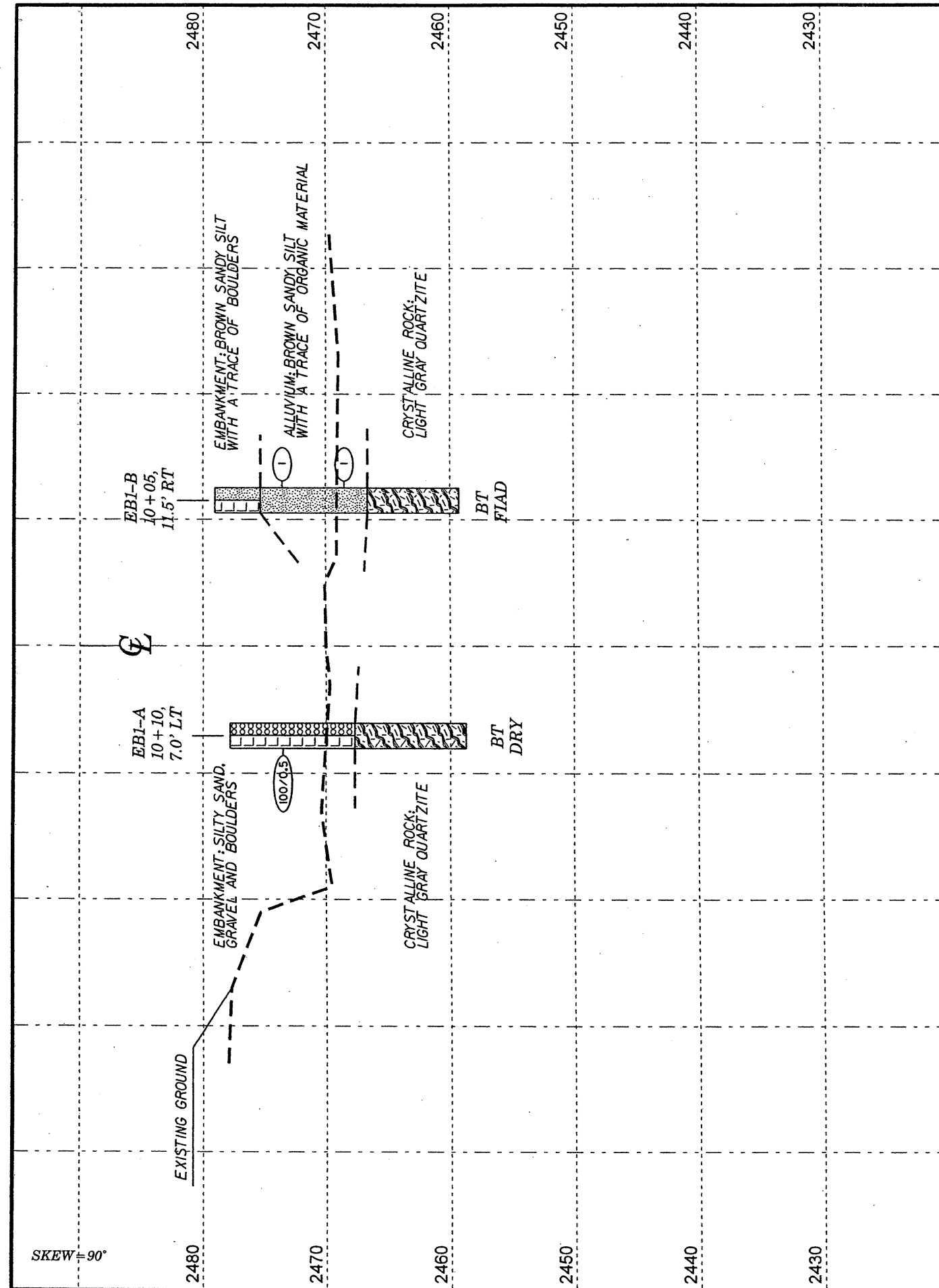


BRIDGE No. 72 ON SR-1407 OVER JONATHAN CREEK



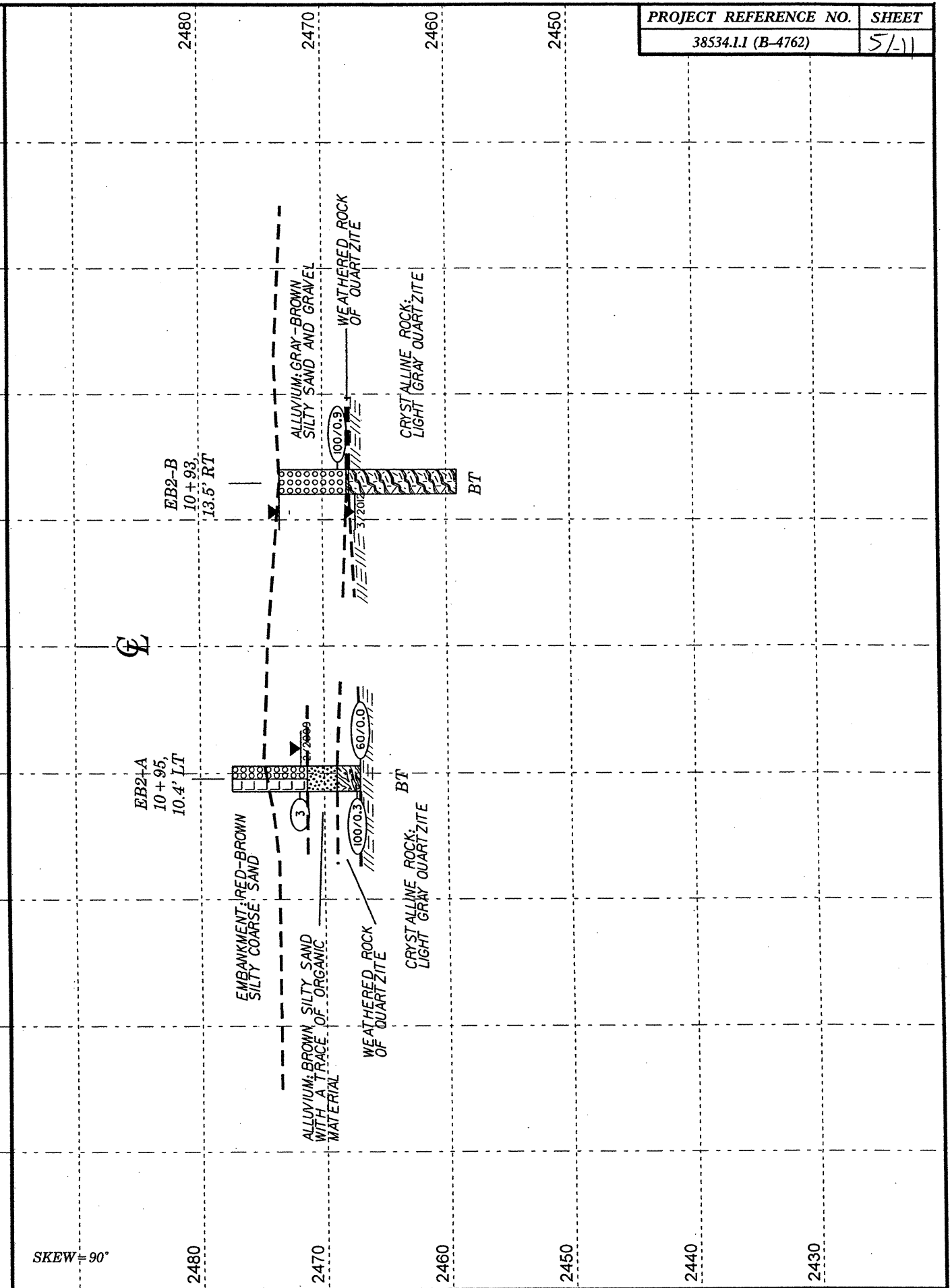
PROJECT REFERENCE NO.	SHEET
38534.1.1 (B-4762)	4/11
Centerline Profile	





HORIZ. SCALE 0 10 20 (FEET)

VE = 1



HORIZ. SCALE 0 10 20 (FEET)

VE = 1

CROSS SECTION: END BENT ONE

CROSS SECTION: END BENT TWO



NCDOT GEOTECHNICAL ENGINEERING UNIT
BORELOG REPORT

SHEET

WBS 38534.1.1		TIP B-4762		COUNTY HAYWOOD		GEOLOGIST Hager, M. M.							
SITE DESCRIPTION Bridge No. 72 on SR-1407 over Jonathan Creek.							GROUND WTR (ft)						
BORING NO. EB1-A		STATION 10+10		OFFSET 7 ft LT		ALIGNMENT -L-							
COLLAR ELEV. 2,477.7 ft		TOTAL DEPTH 19.0 ft		NORTHING 699,902		EASTING 808,033							
DRILL RIG/HAMMER EFF./DATE AFO0071 CME-550X 72% 09/03/2009		DRILL METHOD NW Casing W/SPT & Core		HAMMER TYPE Automatic									
DRILLER Coffey, Jr., C.		START DATE 03/23/12		COMP. DATE 03/23/12		SURFACE WATER DEPTH N/A							
ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT			BLOWS PER FOOT				SAMP. NO.	L O G	SOIL AND ROCK DESCRIPTION	DEPTH (ft)
			0.5ft	0.5ft	0.5ft	0	25	50	75				
2480													
												2,477.7	0.0
2475	2,473.4	4.3	86	14/0.0					100/0.5				
2470													
												2,467.6	10.1
2465													
2460													
												2,458.7	19.0
Boring Terminated at Elevation 2,458.7 ft in light gray quartzite.													

NCDOT BORE SINGLE BORE&CORE_LOGS.GPJ NC_DOT.GDT 4/2/12



NCDOT GEOTECHNICAL ENGINEERING UNIT
CORE BORING REPORT

SHEET

6/11

WBS 38534.1.1		TIP B-4762		COUNTY HAYWOOD		GEOLOGIST Hager, M. M.					
SITE DESCRIPTION Bridge No. 72 on SR-1407 over Jonathan Creek.							GROUND WTR (ft)				
BORING NO. EB1-A		STATION 10+10		OFFSET 7 ft LT		ALIGNMENT -L-					
COLLAR ELEV. 2,477.7 ft		TOTAL DEPTH 19.0 ft		NORTHING 699,902		EASTING 808,033					
DRILL RIG/HAMMER EFF./DATE AFO0071 CME-550X 72% 09/03/2009		DRILL METHOD NW Casing W/SPT & Core		HAMMER TYPE Automatic							
DRILLER Coffey, Jr., C.		START DATE 03/23/12		COMP. DATE 03/23/12		SURFACE WATER DEPTH N/A					
ELEV (ft)	RUN ELEV (ft)	DEPTH (ft)	RUN (ft)	DRILL RATE (Min/ft)	RUN		STRATA		L O G	DESCRIPTION AND REMARKS	DEPTH (ft)
					REC. (ft) %	ROD (ft) %	REC. (ft) %	ROD (ft) %			
2467.63	2,467.6	10.1	3.9	0.9/0.9 1.6/0.0 1.9/0.0 2.3/0.0	(2.9) 74%	(2.8) 72%				2,467.6	10.1
2465	2,463.7	14.0		1.9/0.0 1.7/0.0 1.6/0.0 1.3/0.0 1.5/0.0	(4.8) 96%	(4.8) 96%					
2460	2,458.7	19.0									
Boring Terminated at Elevation 2,458.7 ft in light gray quartzite.											

NCDOT BORE SINGLE BORE&CORE_LOGS.GPJ NC_DOT.GDT 4/2/12

WBS 38534.1.1		TIP B-4762		COUNTY HAYWOOD		GEOLOGIST Hager, M. M.							
SITE DESCRIPTION Bridge No. 72 on SR-1407 over Jonathan Creek.							GROUND WTR (ft)						
BORING NO. EB1-B		STATION 10+05		OFFSET 12 ft RT		ALIGNMENT -L-							
COLLAR ELEV. 2,479.0 ft		TOTAL DEPTH 19.7 ft		NORTHING 699,885		EASTING 808,041							
DRILL RIG/HAMMER EFF./DATE AFO0071 CME-550X 72% 09/03/2009		DRILL METHOD NW Casing W/SPT & Core		HAMMER TYPE Automatic									
DRILLER Cheek, D. O.		START DATE 03/22/12		COMP. DATE 03/22/12		SURFACE WATER DEPTH N/A							
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				
2480												2,479.0 GROUND SURFACE	0.0
												ROADWAY EMBANKMENT Brown sandy silt with trace of boulders.	
2475	2,474.5	4.5	WOH	1	WOH						W	2,475.3 ALLUVIAL Brown sandy silt with a trace of organic material.	3.7
2470	2,469.5	9.5	WOH	WOH	1								
2465												2,466.6 CRYSTALLINE ROCK Light gray quartzite.	12.4
2460												2,459.3 Boring Terminated at Elevation 2,459.3 ft in light gray quartzite.	19.7

NCDOT BORE SINGLE BORE&CORE_LOGS.GPJ NC_DOT.GDT 4/2/12

7/11

WBS 38534.1.1		TIP B-4762		COUNTY HAYWOOD		GEOLOGIST Hager, M. M.						
SITE DESCRIPTION Bridge No. 72 on SR-1407 over Jonathan Creek.							GROUND WTR (ft)					
BORING NO. EB1-B		STATION 10+05		OFFSET 12 ft RT		ALIGNMENT -L-						
COLLAR ELEV. 2,479.0 ft		TOTAL DEPTH 19.7 ft		NORTHING 699,885		EASTING 808,041						
DRILL RIG/HAMMER EFF./DATE AFO0071 CME-550X 72% 09/03/2009		DRILL METHOD NW Casing W/SPT & Core		HAMMER TYPE Automatic								
DRILLER Cheek, D. O.		START DATE 03/22/12		COMP. DATE 03/22/12		SURFACE WATER DEPTH N/A						
CORE SIZE NXWL			TOTAL RUN 6.9 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 (ft) %	ROD (ft) %		REC (ft) %	ROD (ft) %			
2466.17											Begin Coring @ 12.8 ft	
2465	2,466.2	12.8	1.9	1.5/0.0	(1.6)	(1.6)					CRYSTALLINE ROCK Light gray quartzite with a trace of pyrite. Fresh; very hard. a) Joint @ 50° b) Parting along foliation @ 60° (continued)	
	2,464.3	14.7		1.8/0.9	84%	84%						
			5.0	1.7/0.0	(5.0)	(5.0)						
2460	2,459.3	19.7		1.9/0.0	100%	100%					Boring Terminated at Elevation 2,459.3 ft in light gray quartzite.	19.7
				1.9/0.0								
				1.4/0.0								
				1.2/0.0								

NCDOT BORE SINGLE BORE&CORE_LOGS.GPJ NC_DOT.GDT 4/3/12



NCDOT GEOTECHNICAL ENGINEERING UNIT
BORELOG REPORT

SHEET

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WBS 38534.1.1		TIP B-4762		COUNTY HAYWOOD		GEOLOGIST Hager, M. M.										
SITE DESCRIPTION Bridge No. 72 on SR-1407 over Jonathan Creek.							GROUND WTR (ft)									
BORING NO. EB2-A		STATION 10+95		OFFSET 10 ft LT		ALIGNMENT -L-	0 HR. N/A									
COLLAR ELEV. 2,477.4 ft		TOTAL DEPTH 10.3 ft		NORTHING 699,955		EASTING 808,102	24 HR. 5.5									
DRILL RIG/HAMMER EFF./DATE AFO0071 CME-550X 72% 09/03/2009				DRILL METHOD NW Casing w/ SPT		HAMMER TYPE Automatic										
DRILLER N/A		START DATE 02/17/09		COMP. DATE 02/17/09		SURFACE WATER DEPTH N/A										
ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT			BLOWS PER FOOT					SAMP. NO.	LOG	SOIL AND ROCK DESCRIPTION			
			0.5ft	0.5ft	0.5ft	0	25	50	75	100			ELEV. (ft)	DEPTH (ft)		
2480														2,477.4	0.0	GROUND SURFACE
2475														2,473.0	4.4	ROADWAY EMBANKMENT Red-brown silty coarse sand.
2470														2,471.4	6.0	ALLUVIAL Brown silty sand with a trace of organic material.
														2,469.0	8.4	
														2,467.1	10.3	WEATHERED ROCK Weathered rock of quartzite. Boring Terminated at Elevation 2,467.1 ft on light gray quartzite. Drilled by G K Rose.

NCDOT BORE SINGLE BORE&CORE LOGSS.GPJ NC_DOT_GDT_4/3/12

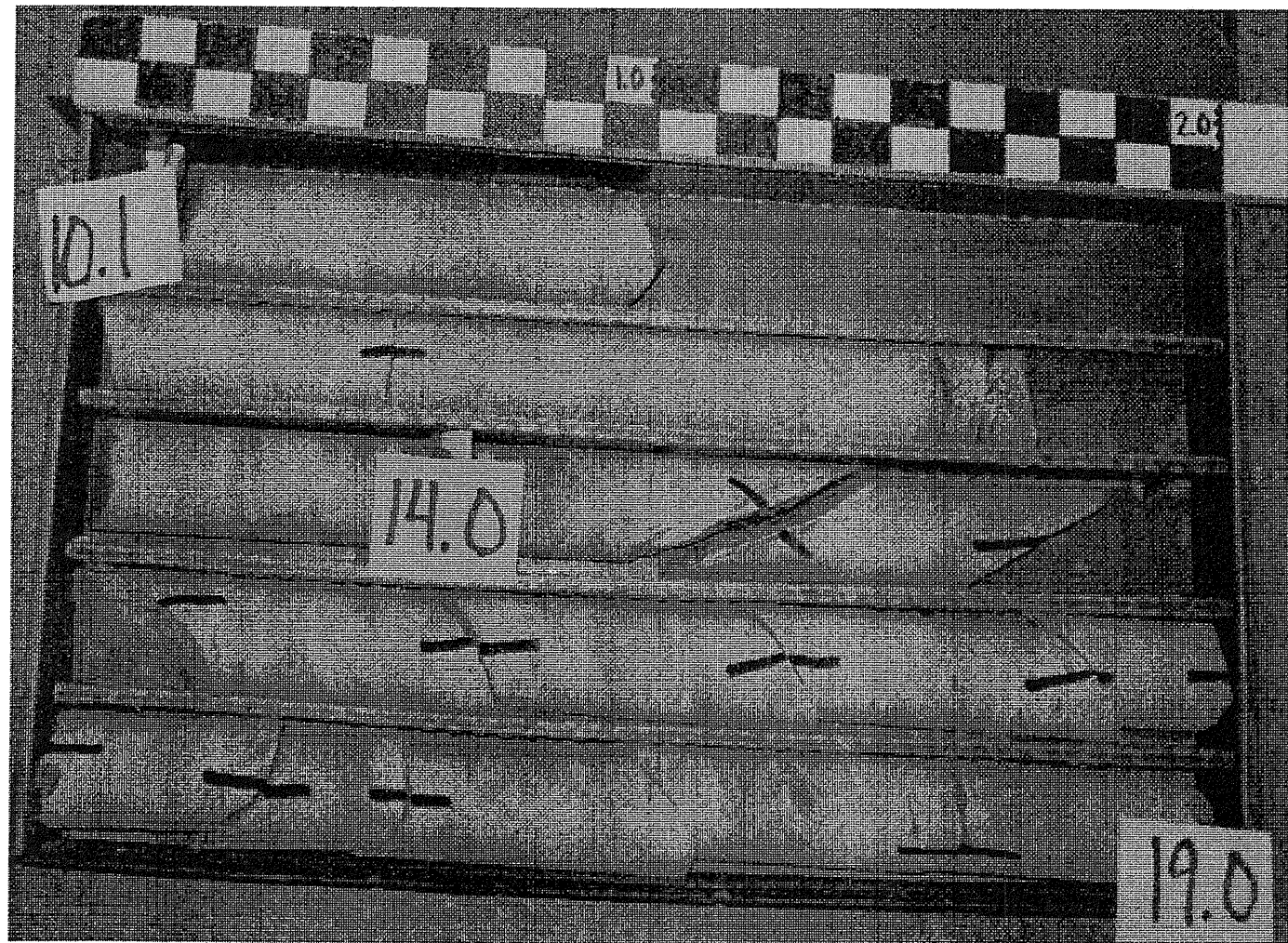
WBS 38534.1.1		TIP B-4762		COUNTY HAYWOOD		GEOLOGIST Hager, M. M.									
SITE DESCRIPTION Bridge No. 72 on SR-1407 over Jonathan Creek.						GROUND WTR (ft)									
BORING NO. EB2-B		STATION 10+93		OFFSET 14 ft RT		ALIGNMENT -L-									
COLLAR ELEV. 2,473.5 ft		TOTAL DEPTH 14.3 ft		NORTHING 699,935		EASTING 808,111									
DRILL RIG/HAMMER EFF./DATE AFO0071 CME-550X 72% 09/03/2009		DRILL METHOD NW Casing W/SPT & Core		HAMMER TYPE Automatic											
DRILLER Coffey, Jr., C.		START DATE 03/22/12		COMP. DATE 03/22/12		SURFACE WATER DEPTH N/A									
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					
2475															
2470	2,468.8	4.7													
2465		8													
2460															

NCDOT BORE SINGLE BORE&CORE LOGS.GPJ NC_DOT.GDT 4/2/12

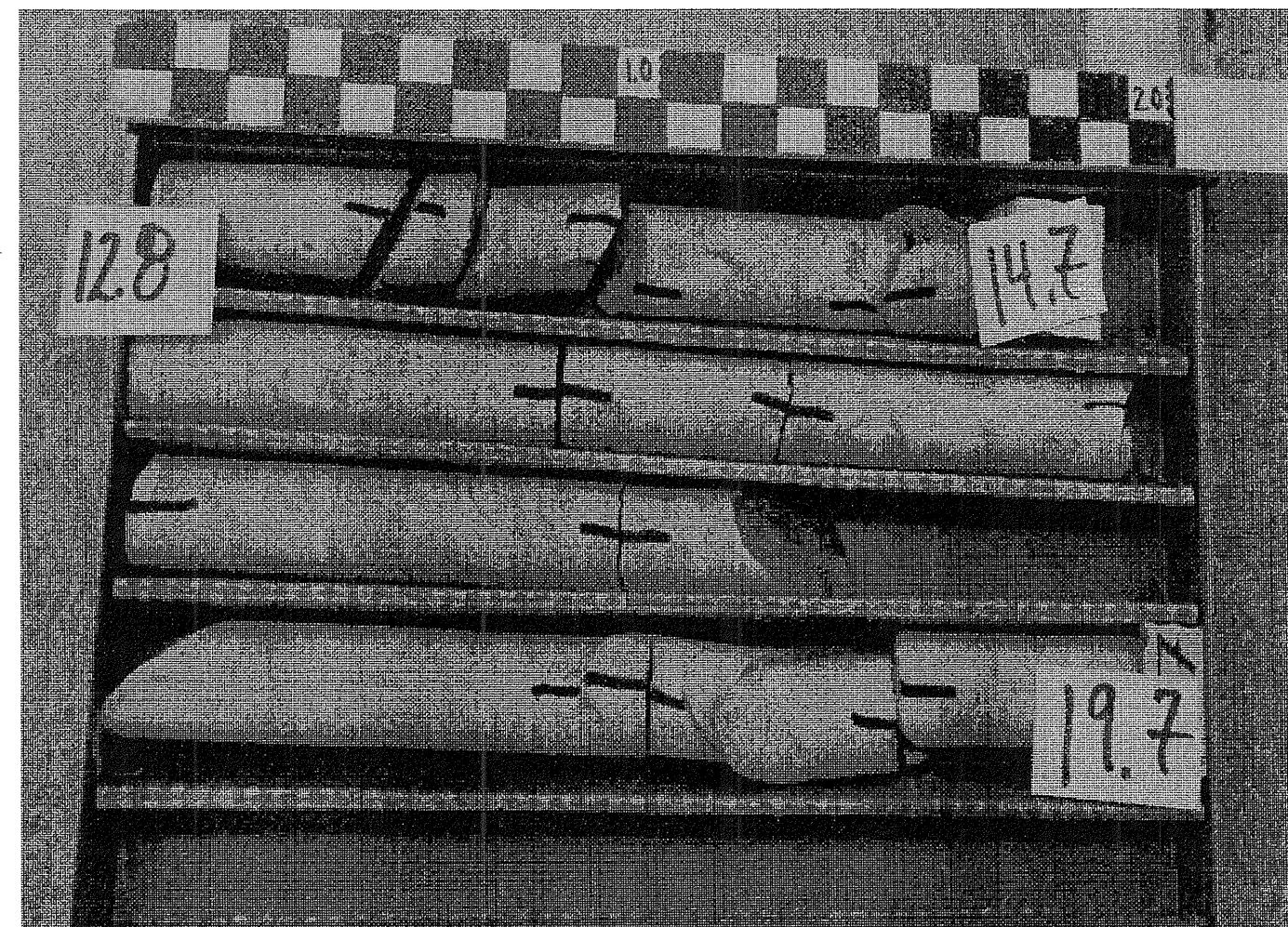
9/11

WBS 38534.1.1		TIP B-4762		COUNTY HAYWOOD		GEOLOGIST Hager, M. M.						
SITE DESCRIPTION Bridge No. 72 on SR-1407 over Jonathan Creek.						GROUND WTR (ft)						
BORING NO. EB2-B		STATION 10+93		OFFSET 14 ft RT		ALIGNMENT -L-						
COLLAR ELEV. 2,473.5 ft		TOTAL DEPTH 14.3 ft		NORTHING 699,935		EASTING 808,111						
DRILL RIG/HAMMER EFF./DATE AFO0071 CME-550X 72% 09/03/2009		DRILL METHOD NW Casing W/SPT & Core		HAMMER TYPE Automatic								
DRILLER Coffey, Jr., C.		START DATE 03/22/12		COMP. DATE 03/22/12		SURFACE WATER DEPTH N/A						
ELEV (ft)	RUN ELEV (ft)	DEPTH (ft)	RUN (ft)	DRILL RATE (Min/ft)	TOTAL RUN 8.0 ft		SAMP. NO.	STRATA		LOG	DESCRIPTION AND REMARKS	DEPTH (ft)
					REC. (%)	ROD (%)		REC. (%)	ROD (%)			
2467.25	2,467.3	6.2	3.1	2.5/0.0	(3.0)	(3.0)						
2465	2,464.2	9.3	4.9	1.5/0.0	97%	97%						
2460	2,459.3	14.2		2.6/1.1								
				1.4/0.0	(4.9)							
				2.0/0.0	100%							
				2.6/0.0								
				2.8/0.0								
				3.9/0.0								

NCDOT BORE SINGLE BORE&CORE LOGS.GPJ NC_DOT.GDT 4/2/12

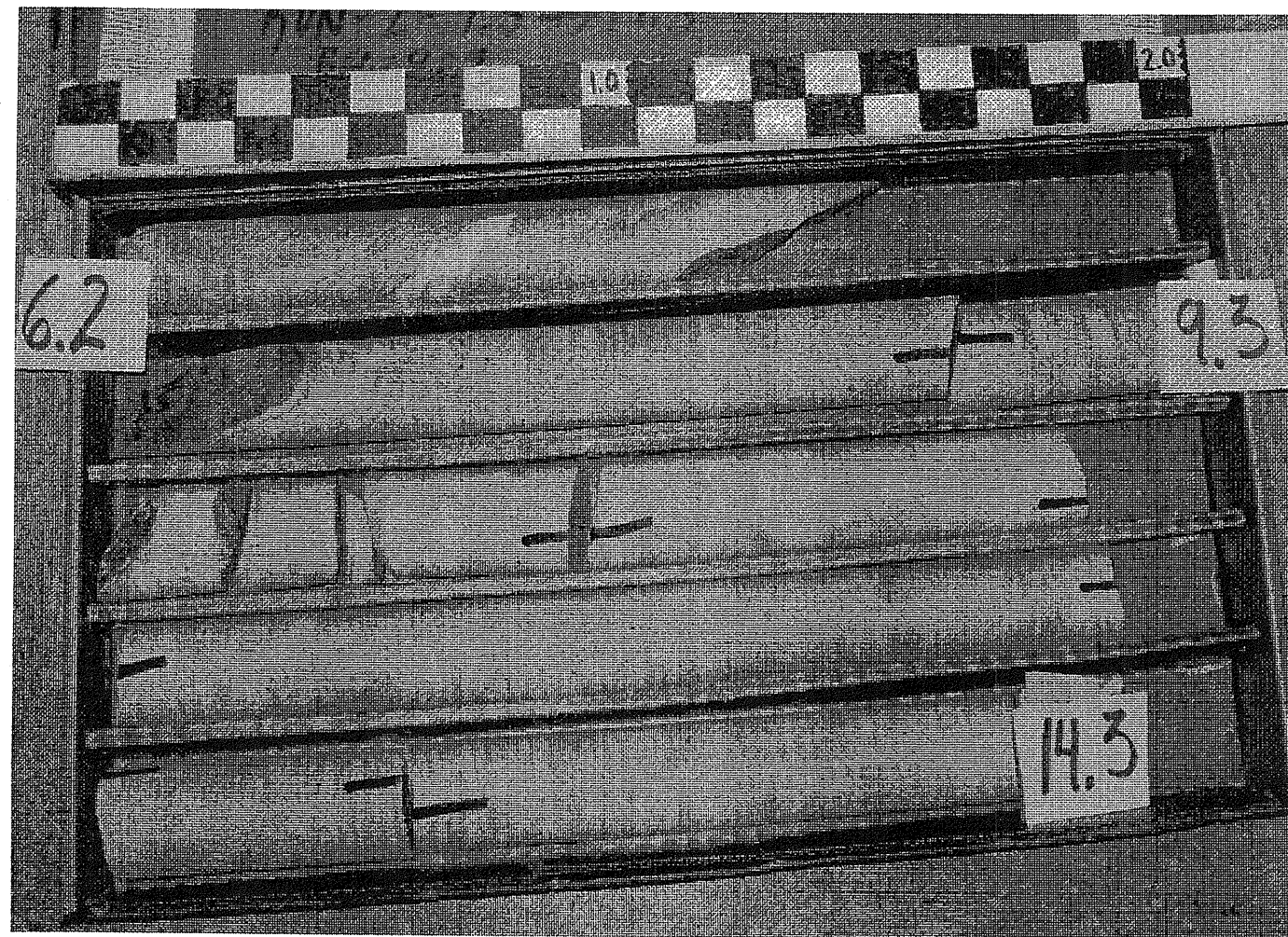


38534.1.1 (B-4762)
 Haywood Co.
 Bridge No. 72 on SR-1407
 Over Jonathon Creek
 EB1-A
 Box 1 of 1



38534.1.1 (B-4762)
 Haywood Co.
 Bridge No. 72 on SR-1407
 Over Jonathon Creek
 EB1-B
 Box 1 of 1

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38534.1.1 (B-4762)
Haywood Co.
Bridge No. 72 on SR-1407
Over Jonathon Creek
EB2-B
Box 1 of 1