

PROJECT: 8.2852301 ID: B-3621

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STATE OF NORTH CAROLINA

DEPARTMENT OF TRANSPORTATION

DIVISION OF HIGHWAYS

GEOTECHNICAL UNIT

STRUCTURE SUBSURFACE INVESTIGATION

STATE	STATE PROJECT REFERENCE NO.	DATE	SCALE
N.C.	B-3621	1	24
STATE PROJ. NO.	F.A. PROJ. NO.	DESCRIPTION	
8.2852301	BRZ-1547(3)	P.E. CONST.	

STATE PROJECT 8.2852301 I.D. NO. B-3621

F.A. PROJECT BRZ-1547(3)

COUNTY BURKE

PROJECT DESCRIPTION Bridge No. 148 over Micol
Creek on SR 1547

SITE DESCRIPTION _____

For Letting

CAUTION NOTICE

THE SUBSURFACE INFORMATION AND THE SUBSURFACE INVESTIGATION ON WHICH IT IS BASED WAS MADE FOR THE PURPOSE OF PREPARING THE SCOPE OF WORK TO BE INCLUDED IN THE REQUEST FOR PROPOSAL. 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 UNIT # (989) 250-4086. THE SUBSURFACE PLANS, BORING LOGS, ROCK CORES, AND SOIL TEST DATA ARE NOT PART OF THE CONTRACT.

SOIL AND ROCK BOUNDARIES WITHIN A BOREHOLE ARE BASED ON GEOTECHNICAL INTERPRETATION UNLESS ENCOUNTERED IN A SAMPLE. INTERPRETED BOUNDARIES MAY NOT NECESSARILY REFLECT ACTUAL SUBSURFACE CONDITIONS BETWEEN SAMPLED STRATA AND BOREHOLE INFORMATION. THE LABORATORY SAMPLE DATA AND THE IN SITU (ON-PLACED) 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 DEPARTMENT DOES NOT WARRANT OR GUARANTEE THE SUFFICIENCY OR ACCURACY OF THE INVESTIGATION MADE OR THE OPINION OF THE DEPARTMENT AS TO THE TYPE OF MATERIALS AND CONDITIONS TO BE ENCOUNTERED. THE BIDDER OR CONTRACTOR IS CAUTIONED TO MAKE SUCH INDEPENDENT SUBSURFACE INVESTIGATIONS AS HE DEEMS NECESSARY TO SATISFY HIMSELF AS TO CONDITIONS TO BE ENCOUNTERED ON THE PROJECT. THE CONTRACTOR SHALL HAVE NO CLAIM FOR ADDITIONAL COMPENSATION OR FOR AN EXTENSION OF TIME FOR ANY REASON RESULTING FROM THE ACTUAL CONDITIONS ENCOUNTERED AT THE SITE DIFFERING FROM THOSE INDICATED IN THE SUBSURFACE INFORMATION.

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.

INVESTIGATED BY D. Hardister PERSONNEL D. Harris

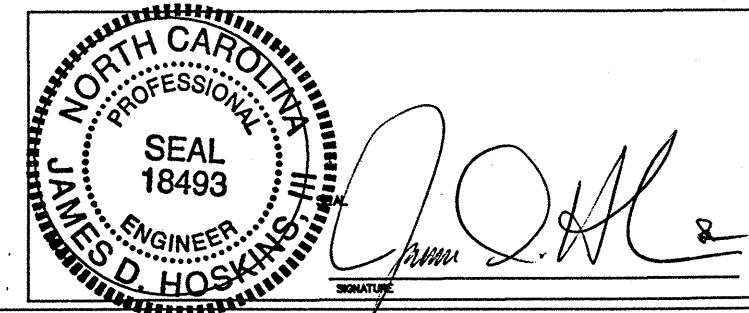
CHECKED BY JD Hoskins III R. Burleson

SUBMITTED BY JD Hoskins III R. Scarlett

DATE June 16, 2003 S. Tierney

R. Benfield

DRAWN BY: D. Hardister



NORTH CAROLINA DEPARTMENT OF TRANSPORTATION

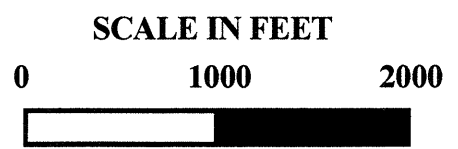
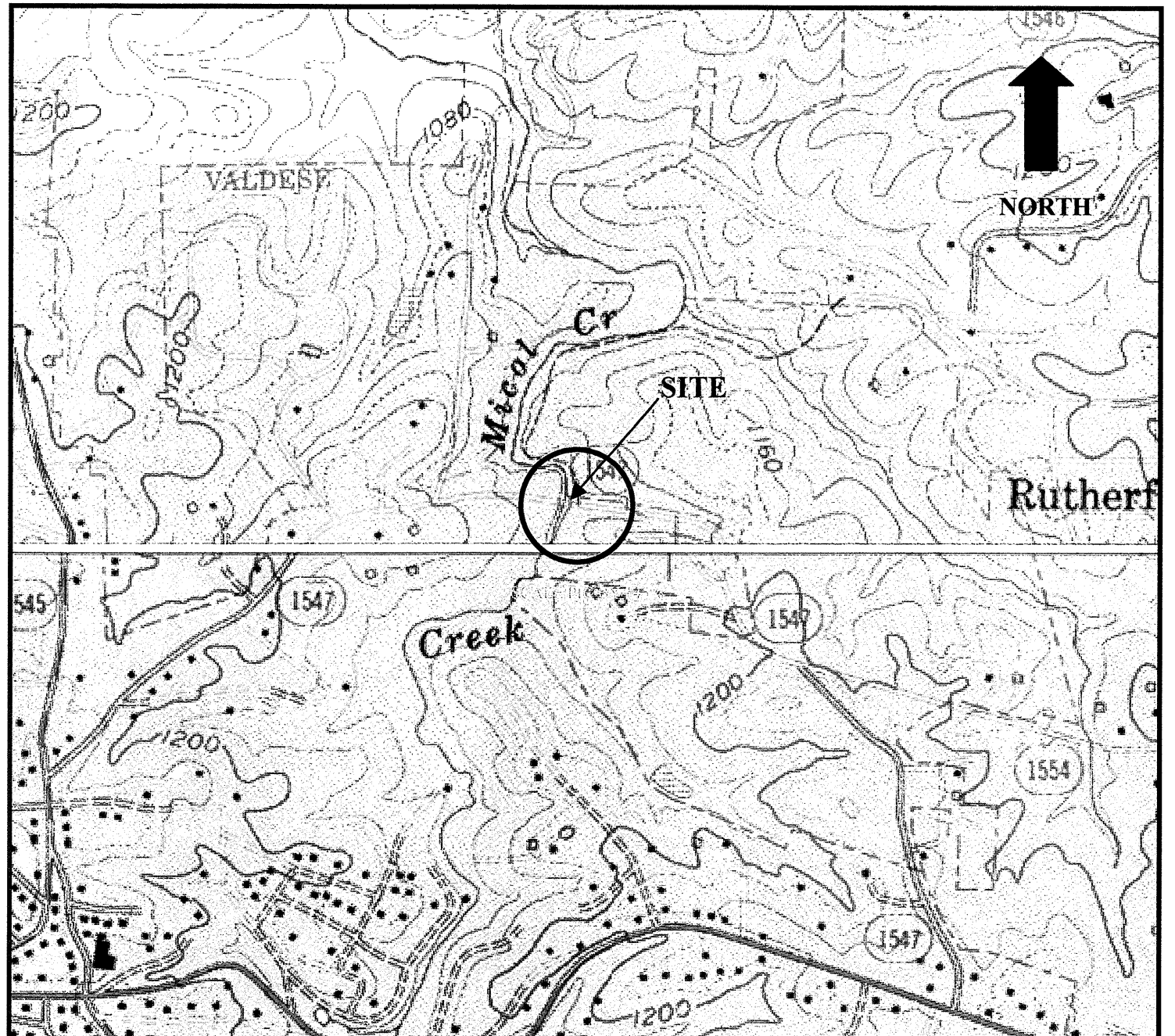
DIVISION OF HIGHWAYS
GEOTECHNICAL UNIT


SUBSURFACE INVESTIGATION

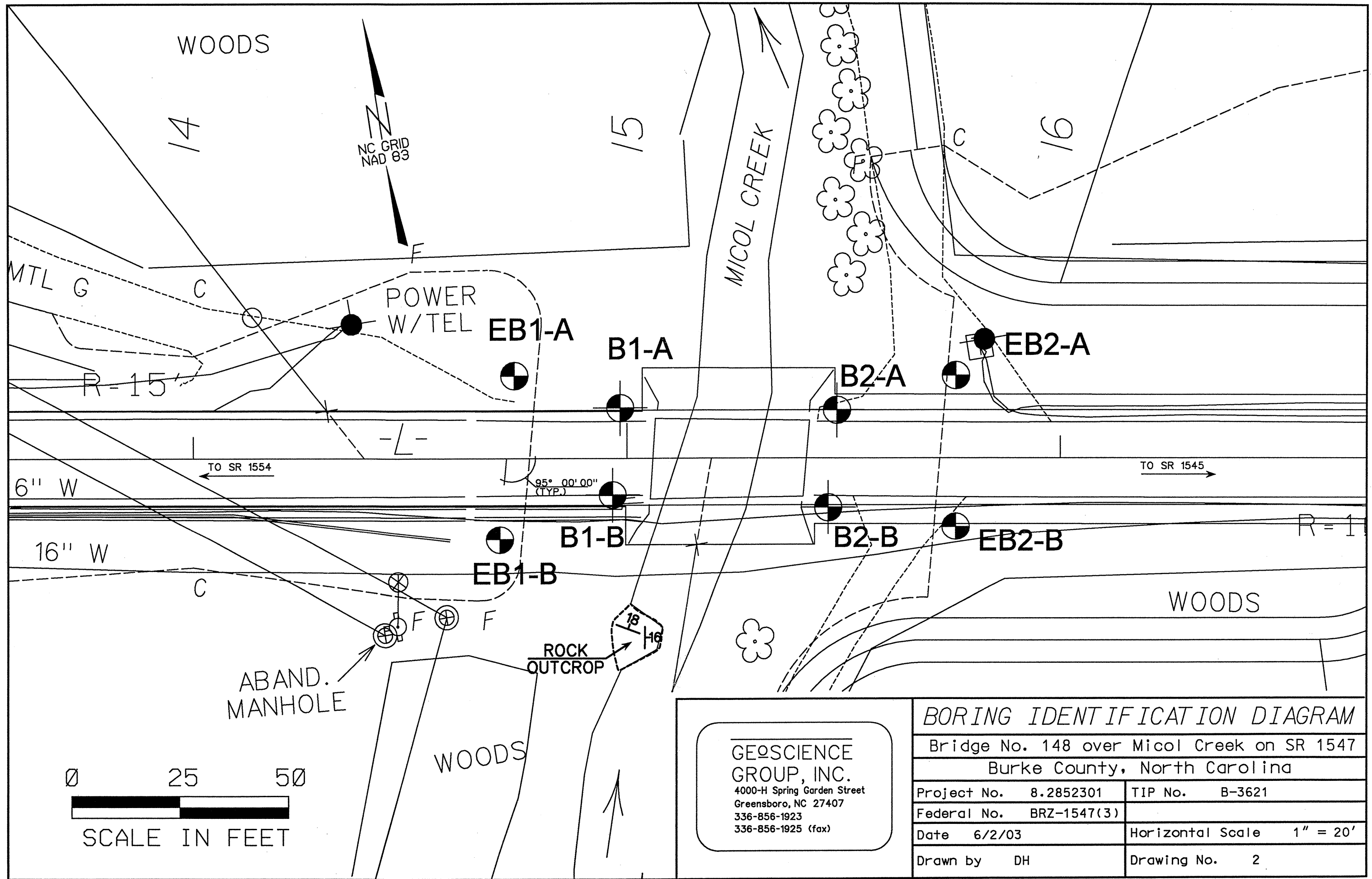
SOIL AND ROCK LEGEND, TERMS, SYMBOLS, AND ABBREVIATIONS

ID	STATE PROJECT NO.	SHEET NO.	TOTAL SHEETS
B-3621	8.2852301	2	24

SOIL DESCRIPTION										GRADATION										ROCK DESCRIPTION										TERMS AND DEFINITIONS									
SOIL IS CONSIDERED TO BE THE UNCONSOLIDATED, SEMI-CONSOLIDATED OR WEATHERED EARTH MATERIALS WHICH CAN BE PENETRATED WITH A CONTINUOUS FLIGHT POWER AUGER, AND WHICH YIELDS LESS THAN 100 BLOWS PER FOOT ACCORDING TO STANDARD PENETRATION TEST (AASHTO T206, ASTM D-1586). SOIL CLASSIFICATION IS BASED ON THE AASHTO SYSTEM AND 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, HIGHLY PLASTIC, A7-6</i>										WELL GRADED - INDICATES A GOOD REPRESENTATION OF PARTICLE SIZES FROM FINE TO COARSE UNIFORM - INDICATES THAT SOIL PARTICLES ARE ALL APPROXIMATELY THE SAME SIZE. (ALSO POORLY GRADED) GAP-GRADED - INDICATES A MIXTURE OF UNIFORM PARTICLES OF TWO OR MORE SIZES. THE ANGULARITY OR ROUNDNESS OF SOIL GRAINS ARE DESIGNATED BY THE TERMS: ANGULAR, SUBANGULAR, SUBROUNDED, OR ROUNDED.										HARD ROCK IS NON-COASTAL PLAIN MATERIAL THAT WHEN 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) CRYSTALLINE ROCK (CR) NON-CRYSTALLINE ROCK (NCR) COASTAL PLAIN SEDIMENTARY ROCK (CP)										ALLOVIUM (ALLUV.) - SOILS WHICH 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 WHICH 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 (F.P.) - 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. 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 SOIL - SOIL FORMED IN PLACE BY THE WEATHERING OF ROCK. ROCK QUALITY DESIGNATION (R.Q.D.) - 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 WHICH 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, WHICH 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 B.P.F. 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 LESS THAN 0.1 FOOT PENETRATION WITH 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 (S.R.Q.D.) - 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 (T.S.) - SURFACE SOILS USUALLY CONTAINING ORGANIC MATTER.									
SOIL LEGEND AND AASHTO CLASSIFICATION										MINERALOGICAL COMPOSITION										WEATHERING																			
GENERAL CLASS. GRANULAR MATERIALS (>85% PASSING #200) SILT-CLAY MATERIALS (>85% PASSING #200) ORGANIC MATERIALS										MINERAL NAMES SUCH AS QUARTZ, FELDSPAR, MICA, TALC, KAOLIN, ETC. ARE USED IN DESCRIPTIONS WHENEVER THEY ARE CONSIDERED OF SIGNIFICANCE.										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 PHYLITE, SLATE, SANDSTONE, ETC. COASTAL PLAIN SEDIMENTS CEMENTED INTO ROCK, BUT MAY NOT YIELD SPT REFUSAL. ROCK TYPE INCLUDES LIMESTONE, SANDSTONE, CEMENTED SHELL BEDS, ETC.																			
GROUP CLASS. A-1, A-2, A-3, A-4, A-5, A-6, A-7										SLIGHTLY COMPRESSIBLE LIQUID LIMIT LESS THAN 30 MODERATELY COMPRESSIBLE LIQUID LIMIT 31-50 HIGHLY COMPRESSIBLE LIQUID LIMIT GREATER THAN 50										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. SEVERE (SEV.) ALL ROCKS 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 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. IF TESTED, YIELDS SPT N VALUES < 100 BPF COMPLETE ROCK REDUCED TO SOIL. ROCK FABRIC NOT DISCERNIBLE, OR DISCERNIBLE ONLY IN SMALL AND SCATTERED CONCENTRATIONS. QUARTZ MAY BE PRESENT AS DIKES OR STRINGERS. SAPROLITE IS ALSO AN EXAMPLE.										PERCENTAGE OF MATERIAL 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									
GROUP INDEX 0 0 0 4 MX 8 MX 12 MX 16 MX No MX										GROUND WATER WATER LEVEL IN BORE HOLE IMMEDIATELY AFTER DRILLING. STATIC WATER LEVEL AT LEAST 8 TO GREATER THAN 24 HOURS. PERCHED WATER, SATURATED ZONE OR WATER BEARING STRATA SPRING OR SEEPAGE										ROCK HARDNESS 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 0.025 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 GROVED OR GOUGED READILY BY KNIFE OR PICK. CAN BE EXCAVATED IN FRAGMENTS FROM CHIPS TO SEVERAL INCHES IN SIZE BY MODERATE BLOWS OF A PICK POINT. SMALL, THIN PIECES CAN BE BROKEN BY FINGER PRESSURE. 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 FINGER NAIL.										MISCELLANEOUS SYMBOLS ROADWAY EMBANKMENT WITH SOIL DESCRIPTION SOIL SYMBOL ARTIFICIAL FILL OTHER THAN ROADWAY EMBANKMENTS INFERRED SOIL BOUNDARIES INFERRED ROCK LINE ALLUVIAL SOIL BOUNDARY DIP/DIP DIRECTION OF ROCK STRUCTURES SOUNDING ROD									
CONSISTENCY OR DENSENESS PRIMARY SOIL TYPE COMPACTNESS OR CONSISTENCY RANGE OF STANDARD PENETRATION RESISTANCE (N-VALUE) RANGE OF UNCONFINED COMPRESSIVE STRENGTH (TONS/FT ²)										ABBEVIATIONS AR - AUGER REFUSAL BT - BORING TERMINATED CL - CLAY CPT - CONE PENETRATION TEST CSE - COARSE CT - CORING TERMINATED DMT - DILATOMETER TEST DPT - DYNAMIC PENETRATION TEST F - FINE FOSS. - FOSSILIFEROUS FRAC. - FRACTURED FRAGS. - FRAGMENTS HSA - HOLLOW STEM AUGER MED. - MEDIUM MIC. - MICACEOUS N/GW - NO GROUNDWATER ENCOUNTERED N/M - NOT MEASURED PMT - PRESSUREMETER TEST SD. - SAND, SANDY SL. - SILT, SILTY SLI. - SLIGHTLY TCR - TRICONE REFUSAL UNIT WEIGHT γ _d - DRY UNIT WEIGHT V - MOISTURE CONTENT V. - VERY VST - VANE SHEAR TEST WOH - WEIGHT OF HAMMER										ROCK HARDNESS (CONT.) 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 0.025 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 GROVED OR GOUGED READILY BY KNIFE OR PICK. CAN BE EXCAVATED IN FRAGMENTS FROM CHIPS TO SEVERAL INCHES IN SIZE BY MODERATE BLOWS OF A PICK POINT. SMALL, THIN PIECES CAN BE BROKEN BY FINGER PRESSURE. 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 FINGER NAIL.																			
TEXTURE OR GRAIN SIZE U.S. STD. SIEVE SIZE OPENING (MM) 4 10 40 60 200 270 4.76 2.0 0.42 0.25 0.075 0.053										EQUIPMENT USED ON SUBJECT PROJECT DRILL UNITS: MOBILE B-51, BK-51, CME-45, CME-550, PORTABLE HOIST, OTHER CME-55 TM, OTHER ADVANCING TOOLS: CLAY BITS, 6" CONTINUOUS FLIGHT AUGER, 6" HOLLOW AUGERS, HARD FACED FINGER BITS, TUNG-CARBIDE INSERTS, CASING w/ ADVANCER, TRICONE * STEEL TEETH, TRICONE * TUNG-CARB., CORE BIT, OTHER HAMMER TYPE: AUTOMATIC, MANUAL CORE SIZE: B, NQ, HQ HAND TOOLS: POST HOLE DIGGER, HAND AUGER, SOUNDING ROD, VANE SHEAR TEST, OTHER										FRACTURE 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 INDURATION FRIABLE RUBBING WITH FINGER FREES NUMEROUS GRAINS; GENTLE BLOW BY HAMMER DISINTEGRATES SAMPLE. MODERATELY INDURATED GRAINS CAN BE SEPARATED FROM SAMPLE WITH STEEL PROBE; BREAKS EASILY WHEN HIT WITH HAMMER. INDURATED GRAINS ARE DIFFICULT TO SEPARATE WITH STEEL PROBE; DIFFICULT TO BREAK WITH HAMMER. EXTREMELY INDURATED SHARP HAMMER BLOWS REQUIRED TO BREAK SAMPLE; SAMPLE BREAKS ACROSS GRAINS.																			
SOIL MOISTURE - CORRELATION OF TERMS SOIL MOISTURE SCALE (ATTERBERG LIMITS) FIELD MOISTURE DESCRIPTION GUIDE FOR FIELD MOISTURE DESCRIPTION										SOIL MOISTURE SCALE (ATTERBERG LIMITS) FIELD MOISTURE DESCRIPTION GUIDE FOR FIELD MOISTURE DESCRIPTION										SOIL MOISTURE SCALE (ATTERBERG LIMITS) FIELD MOISTURE DESCRIPTION GUIDE FOR FIELD MOISTURE DESCRIPTION										SOIL MOISTURE SCALE (ATTERBERG LIMITS) FIELD MOISTURE DESCRIPTION GUIDE FOR FIELD MOISTURE DESCRIPTION									
LL LIQUID LIMIT USUALLY LIQUID; VERY WET, USUALLY FROM BELOW THE GROUND WATER TABLE										LL LIQUID LIMIT USUALLY LIQUID; VERY WET, USUALLY FROM BELOW THE GROUND WATER TABLE										LL LIQUID LIMIT USUALLY LIQUID; VERY WET, USUALLY FROM BELOW THE GROUND WATER TABLE										LL LIQUID LIMIT USUALLY LIQUID; VERY WET, USUALLY FROM BELOW THE GROUND WATER TABLE									
PL PLASTIC LIMIT SEMISOLID; REQUIRES DRYING TO ATTAIN OPTIMUM MOISTURE										PL PLASTIC LIMIT SEMISOLID; REQUIRES DRYING TO ATTAIN OPTIMUM MOISTURE										PL PLASTIC LIMIT SEMISOLID; REQUIRES DRYING TO ATTAIN OPTIMUM MOISTURE										PL PLASTIC LIMIT SEMISOLID; REQUIRES DRYING TO ATTAIN OPTIMUM MOISTURE									
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SL SHRINKAGE LIMIT REQUIRES ADDITIONAL WATER TO ATTAIN OPTIMUM MOISTURE										SL SHRINKAGE LIMIT REQUIRES ADDITIONAL WATER TO ATTAIN OPTIMUM MOISTURE										SL SHRINKAGE LIMIT REQUIRES ADDITIONAL WATER TO ATTAIN OPTIMUM MOISTURE										SL SHRINKAGE LIMIT REQUIRES ADDITIONAL WATER TO ATTAIN OPTIMUM MOISTURE									
PLASTICITY NONPLASTIC PLASTICITY INDEX (PI) DRY STRENGTH LOW PLASTICITY 0-5 VERY LOW MED. PLASTICITY 6-15 SLIGHT HIGH PLASTICITY 16-25 MEDIUM 26 OR MORE HIGH										PLASTICITY INDEX (PI) DRY STRENGTH 0-5 VERY LOW 6-15 SLIGHT 16-25 MEDIUM 26 OR MORE HIGH										PLASTICITY INDEX (PI) DRY STRENGTH 0-5 VERY LOW 6-15 SLIGHT 16-25 MEDIUM 26 OR MORE HIGH										PLASTICITY INDEX (PI) DRY STRENGTH 0-5 VERY LOW 6-15 SLIGHT 16-25 MEDIUM 26 OR MORE HIGH									
COLOR DESCRIPTIONS MAY INCLUDE COLOR OR COLOR COMBINATIONS (TAN, RED, YEL-BRN, BLUE-GRAY) MODIFIERS SUCH AS LIGHT, DARK, STREAKED, ETC. ARE USED TO DESCRIBE APPEARANCE.										DESCRIPTIONS MAY INCLUDE COLOR OR COLOR COMBINATIONS (TAN, RED, YEL-BRN, BLUE-GRAY) MODIFIERS SUCH AS LIGHT, DARK, STREAKED, ETC. ARE USED TO DESCRIBE APPEARANCE.										DESCRIPTIONS MAY INCLUDE COLOR OR COLOR COMBINATIONS (TAN, RED, YEL-BRN, BLUE-GRAY) MODIFIERS SUCH AS LIGHT, DARK, STREAKED, ETC. ARE USED TO DESCRIBE APPEARANCE.										DESCRIPTIONS MAY INCLUDE COLOR OR COLOR COMBINATIONS (TAN, RED, YEL-BRN, BLUE-GRAY) MODIFIERS SUCH AS LIGHT, DARK, STREAKED, ETC. ARE USED TO DESCRIBE APPEARANCE.									
BENCH MARK: BL-3 DISC @ 15+62.86, 13.08' LT -L-										BENCH MARK: BL-3 DISC @ 15+62.86, 13.08' LT -L-										BENCH MARK: BL-3 DISC @ 15+62.86, 13.08' LT -L-										BENCH MARK: BL-3 DISC @ 15+62.86, 13.08' LT -L-									
ELEVATION: 1086.42 FT										ELEVATION: 1086.42 FT										ELEVATION: 1086.42 FT										ELEVATION: 1086.42 FT									
NOTES:										NOTES:										NOTES:										NOTES:									

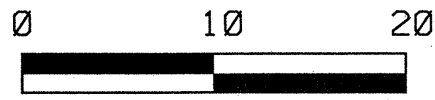
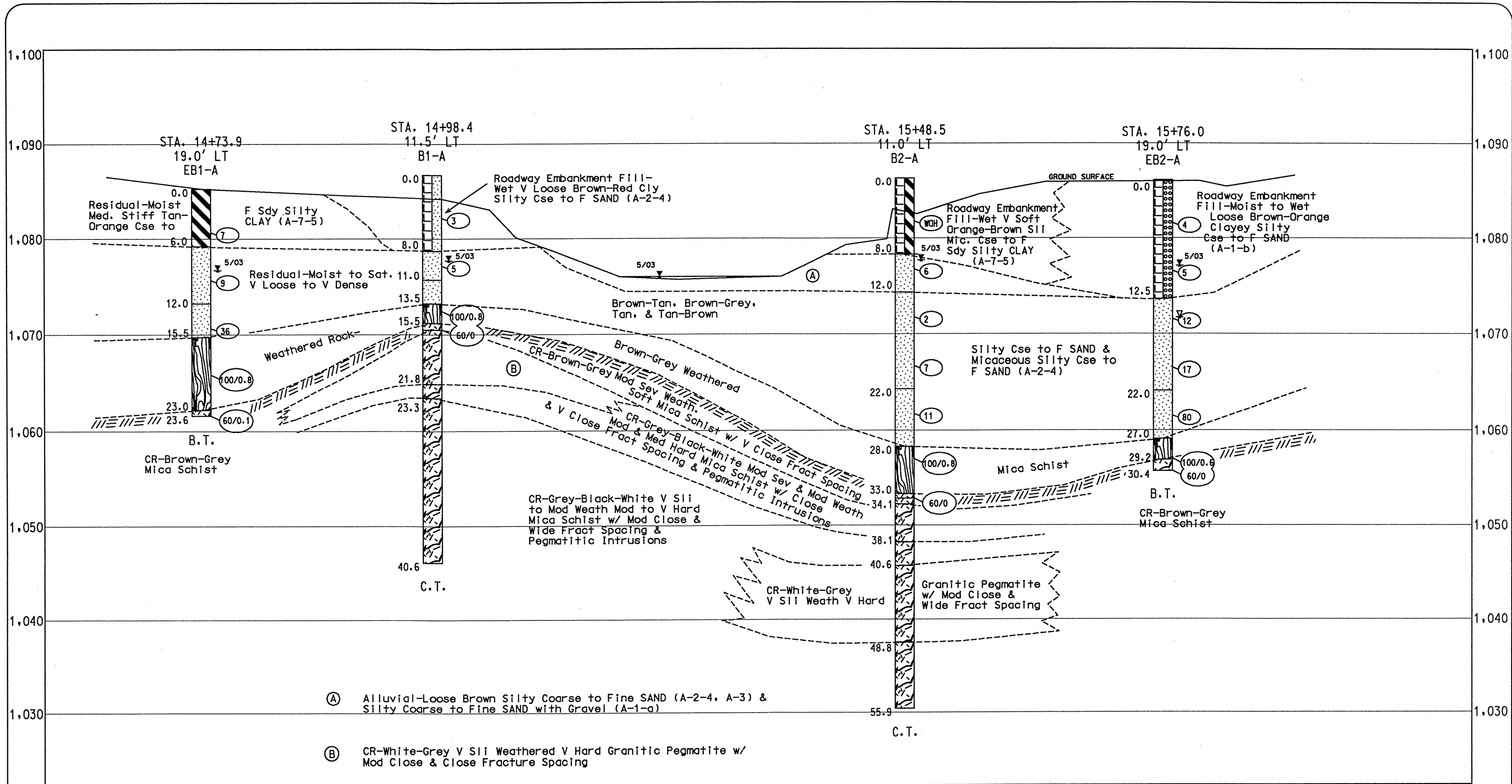


GEOSCIENCE GROUP, INC.		
GREENSBORO, NORTH CAROLINA		
SCALE: 1"=1000'	APPROVED BY: 	DRAWN BY: DH
DATE: 6/12/03		REVISED:
Bridge No. 148 over Micol Creek on SR 1547		
Burke County, North Carolina		
8.2852301 (B-3621)		DRAWING NUMBER
SITE VICINITY MAP		1



GEOSCIENCE GROUP, INC.
 4000-H Spring Garden Street
 Greensboro, NC 27407
 336-856-1923
 336-856-1925 (fax)

BORING IDENTIFICATION DIAGRAM	
Bridge No. 148 over Micol Creek on SR 1547	
Burke County, North Carolina	
Project No. 8.2852301	TIP No. B-3621
Federal No. BRZ-1547(3)	
Date 6/2/03	Horizontal Scale 1" = 20'
Drawn by DH	Drawing No. 2

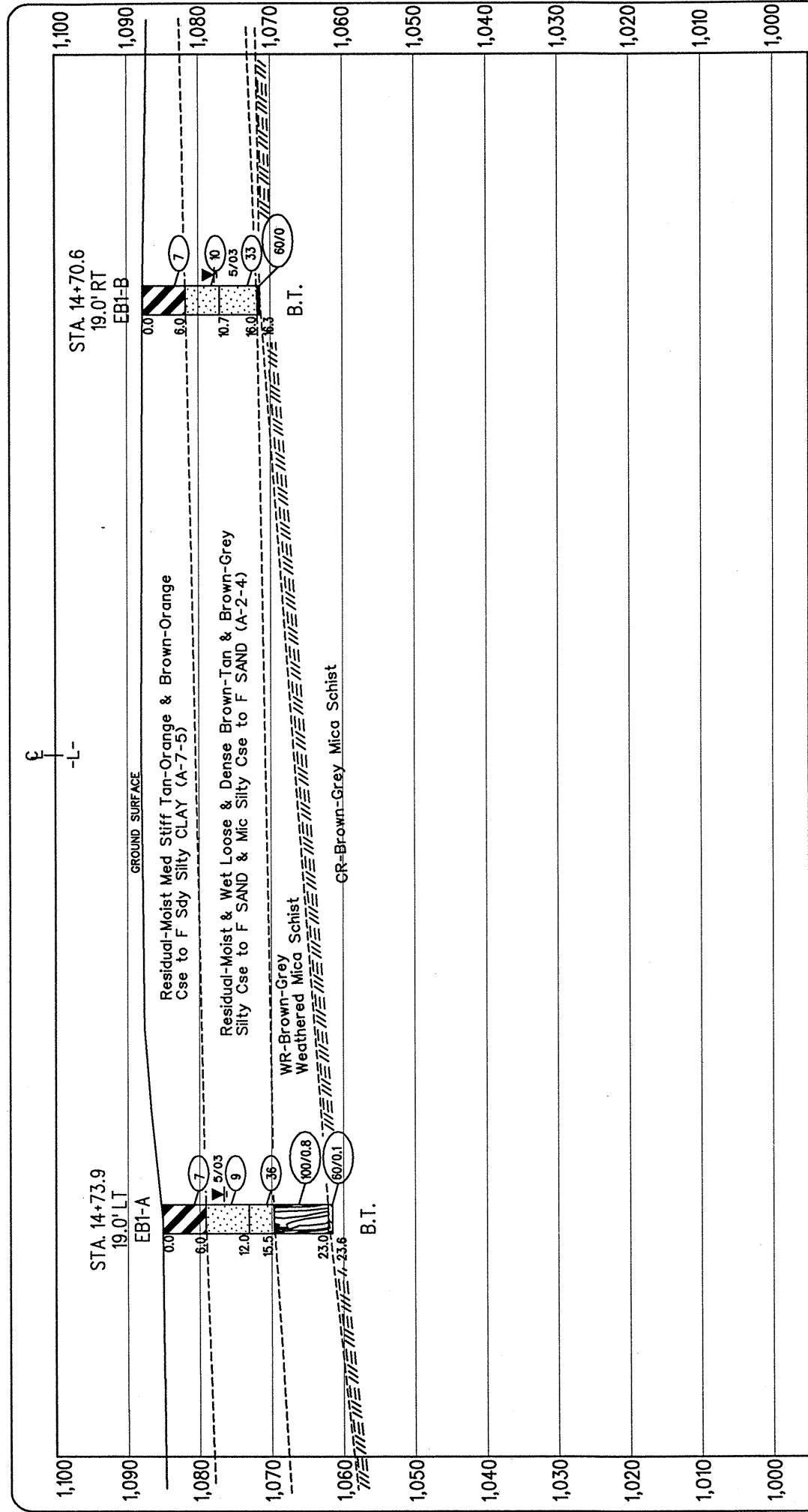


HORIZ. & VERT. SCALE IN FEET

GEOSCIENCE GROUP, INC.
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 Greensboro, NC 27407
 336-856-1923
 336-856-1925 (fax)

SUBSURFACE PROFILE 19.0ft LEFT of -L-

Bridge No. 148 over Micol Creek on SR 1547	
Burke County, North Carolina	
Project No. 8.2852301	TIP No. B-3621
Federal No. BRZ-1547(3)	Vert. Scale 1" = 10'
Date 6/12/03	Horiz. Scale 1" = 10'
Drawn by DH	Drawing No. 3



0 20 40

VERTICAL SCALE IN FEET

0 6 12

HORIZONTAL SCALE IN FEET

CROSS-SECTION THROUGH END BENT-1

Bridge No. 148 over MicolCreek on SR 1547
Burke County, North Carolina

Project No. 8.2852301
TIP No. B-3621

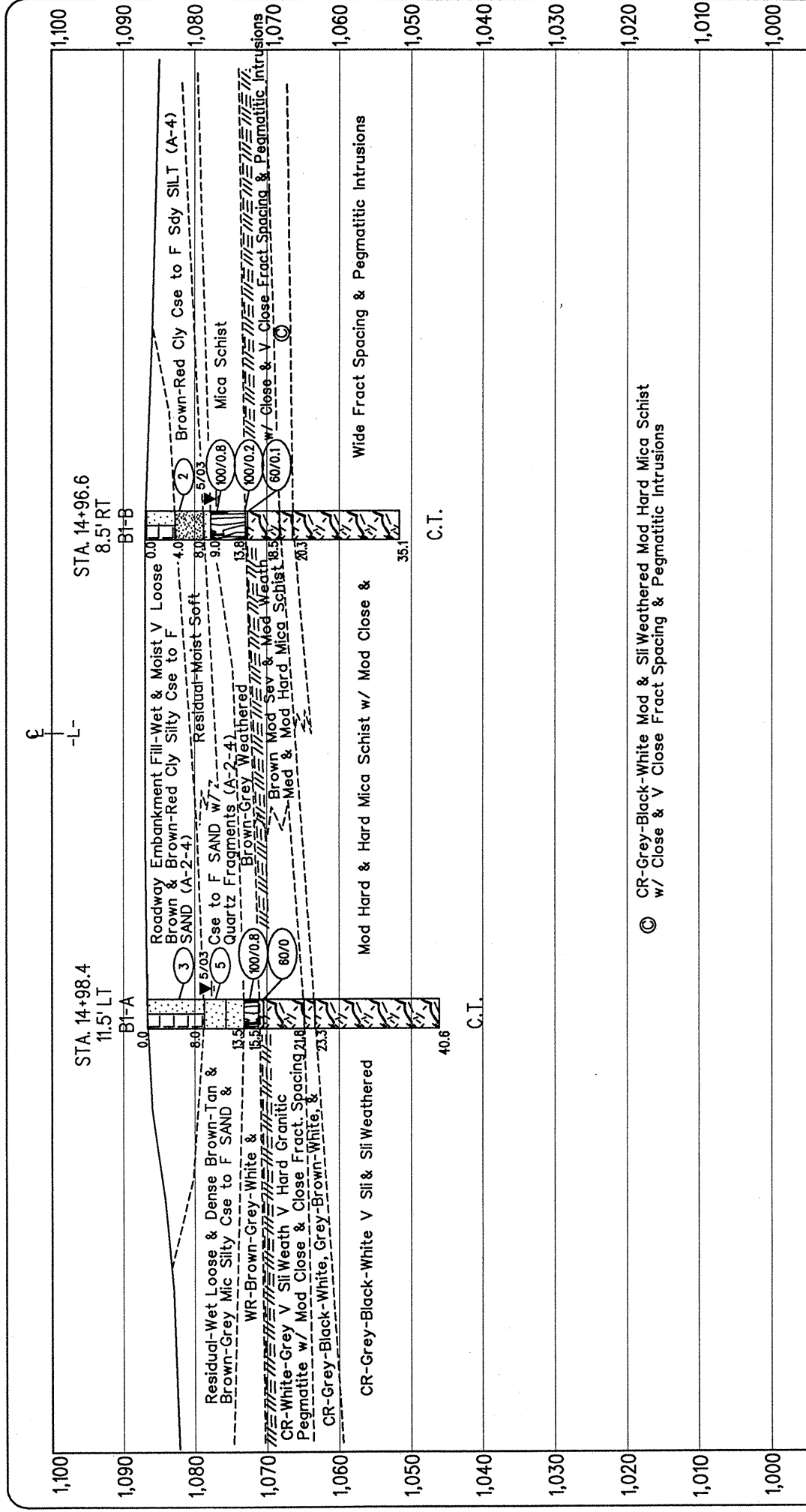
Federal No. BRZ-1547(3)
Vert. Scale 1" = 20'

Date 6/12/03
Horiz. Scale 1" = 6'

Drawn by DH
Drawing No. 4

GEOSCIENCE GROUP, INC.

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336-856-1923
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0 20 40

VERTICAL SCALE IN FEET

0 6 12

HORIZONTAL SCALE IN FEET

CROSS-SECTION THROUGH BENT-1

Bridge No. 148 over MicolCreek on SR 1547
Burke County, North Carolina

Project No. 8.2852301
TIP No. B-3621

Federal No. BRZ-1547(3)
Vert. Scale 1" = 20'

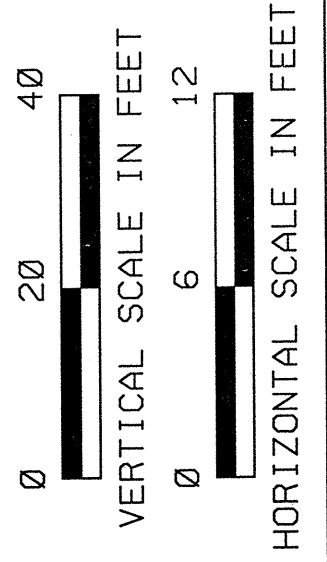
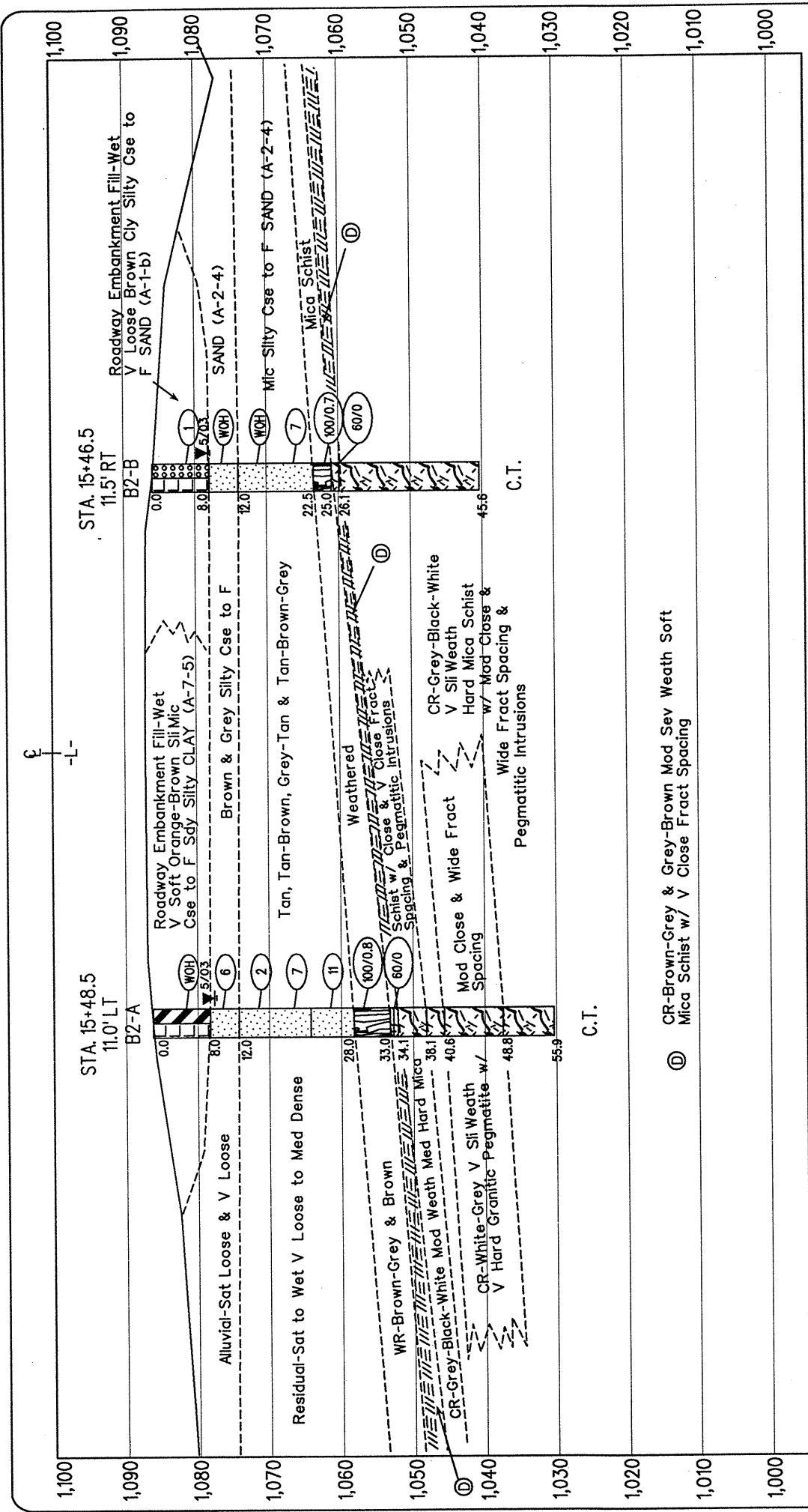
Date 6/12/03
Horiz. Scale 1" = 6'

Drawn by DH
Drawing No. 5

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© CR-Grey-Black-White Mod & Sil Weathered Mod Hard Mica Schist w/ Close & V Close Fract Spacing & Pegmatitic Intrusions

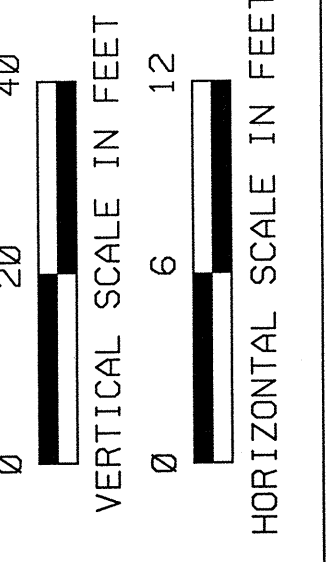
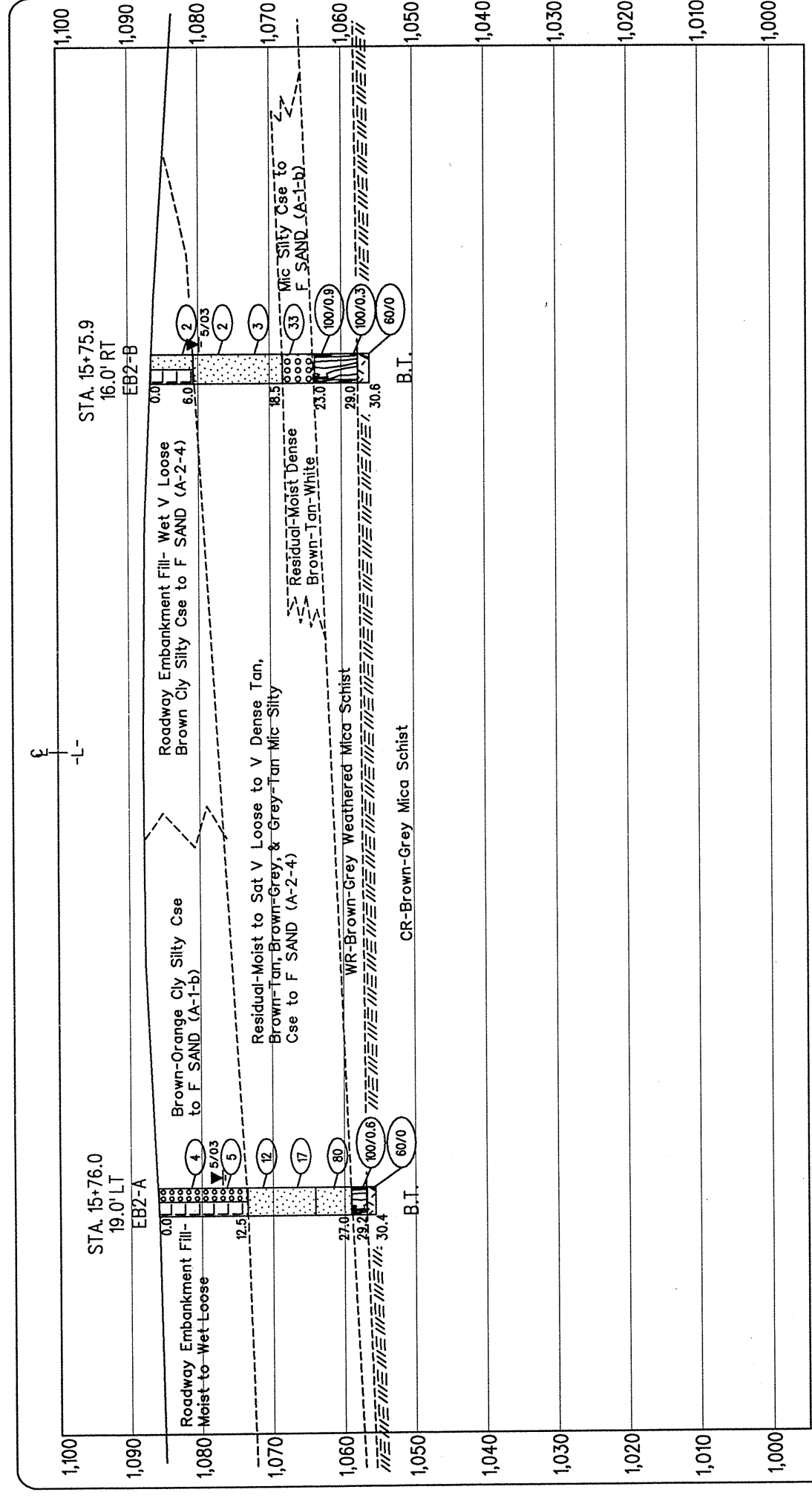


CROSS-SECTION THROUGH BENT-2

Bridge No. 148 over MicolCreek on SR 1547
Burke County, North Carolina

Project No. 8.2852301
Federal No. BRZ-1547(3)
Date 6/12/03
Drawn by DH
Drawing No. 6

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CROSS-SECTION THROUGH END BENT-2

Bridge No. 148 over MicolCreek on SR 1547
Burke County, North Carolina

Project No. 8.2852301
Federal No. BRZ-1547(3)
Date 6/12/03
Drawn by DH
Drawing No. 7

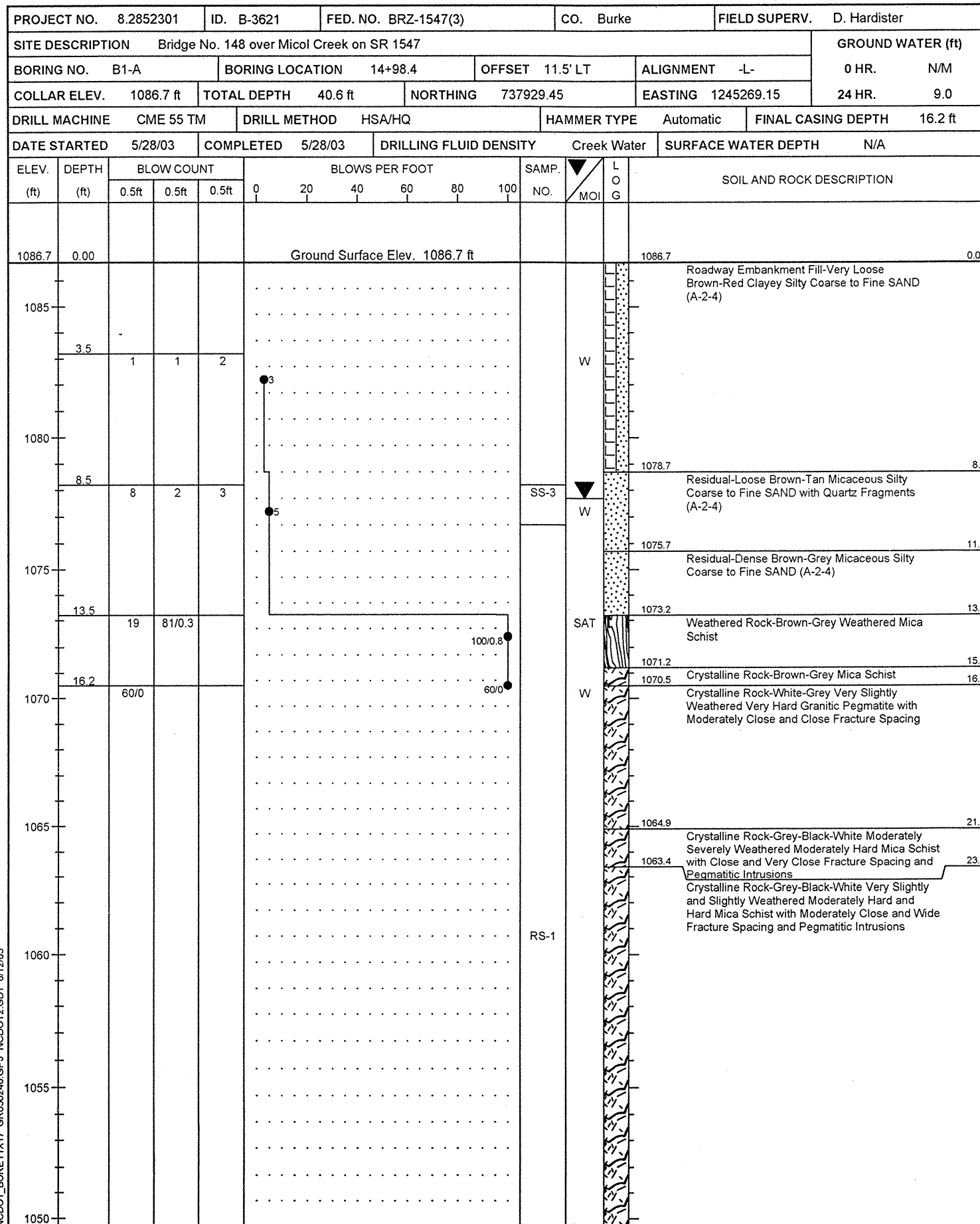
GEOSCIENCE GROUP, INC.
4000-H Spring Garden Street
Greensboro, NC 27407
336-856-1923
336-856-1925 (fax)

PROJECT NO.	8.2852301	ID.	B-3621	FED. NO.	BRZ-1547(3)	CO.	Burke	FIELD SUPERV.	D. Hardister					
SITE DESCRIPTION								GROUND WATER (ft)						
Bridge No. 148 over Micol Creek on SR 1547								0 HR.	13.0					
BORING NO.	EB1-A	BORING LOCATION	14+73.9	OFFSET	19.0' LT	ALIGNMENT	-L-	24 HR.						
COLLAR ELEV. 1085.2 ft								8.5						
TOTAL DEPTH		23.6 ft		NORTHING		737940.73		EASTING 1245246.21						
DRILL MACHINE	CME 55 TM	DRILL METHOD	HSA	HAMMER TYPE	Automatic	FINAL CASING DEPTH	N/A							
DATE STARTED	5/27/03	COMPLETED	5/27/03	DRILLING FLUID DENSITY	N/A		SURFACE WATER DEPTH N/A							
ELEV. (ft)	DEPTH (ft)	BLOW COUNT			BLOWS PER FOOT					SAMP. NO.	LOG	SOIL AND ROCK DESCRIPTION		
		0.5ft	0.5ft	0.5ft	0	20	40	60	80				100	
1085.2	0.00	Ground Surface Elev. 1085.2 ft												
1085														
	3.5	3	3	4						SS-1	36.7	Residual-Medium Stiff Tan-Orange Coarse to Fine Sandy Silty CLAY (A-7-5)		
1080														
	8.5	2	5	4						W		1079.2 Residual-Loose Brown-Tan Silty Coarse to Fine SAND (A-2-4)		
1075														
	13.5	9	13	23						M		1073.2 Residual-Dense Brown-Grey Micaceous Silty Coarse to Fine SAND (A-2-4)		
1070														
	18.5	46	54/0.3									W		1069.7 Weathered Rock-Brown-Grey Weathered Mica Schist
1065														
	23.5	60/0.1										M		1062.2 Crystalline Rock-Brown-Grey Mica Schist
														1061.6 Crystalline Rock-Brown-Grey Mica Schist
		Boring Terminated with Standard Penetration Test Refusal at Elev. 1061.6ft in Crystalline Rock (Mica Schist)												

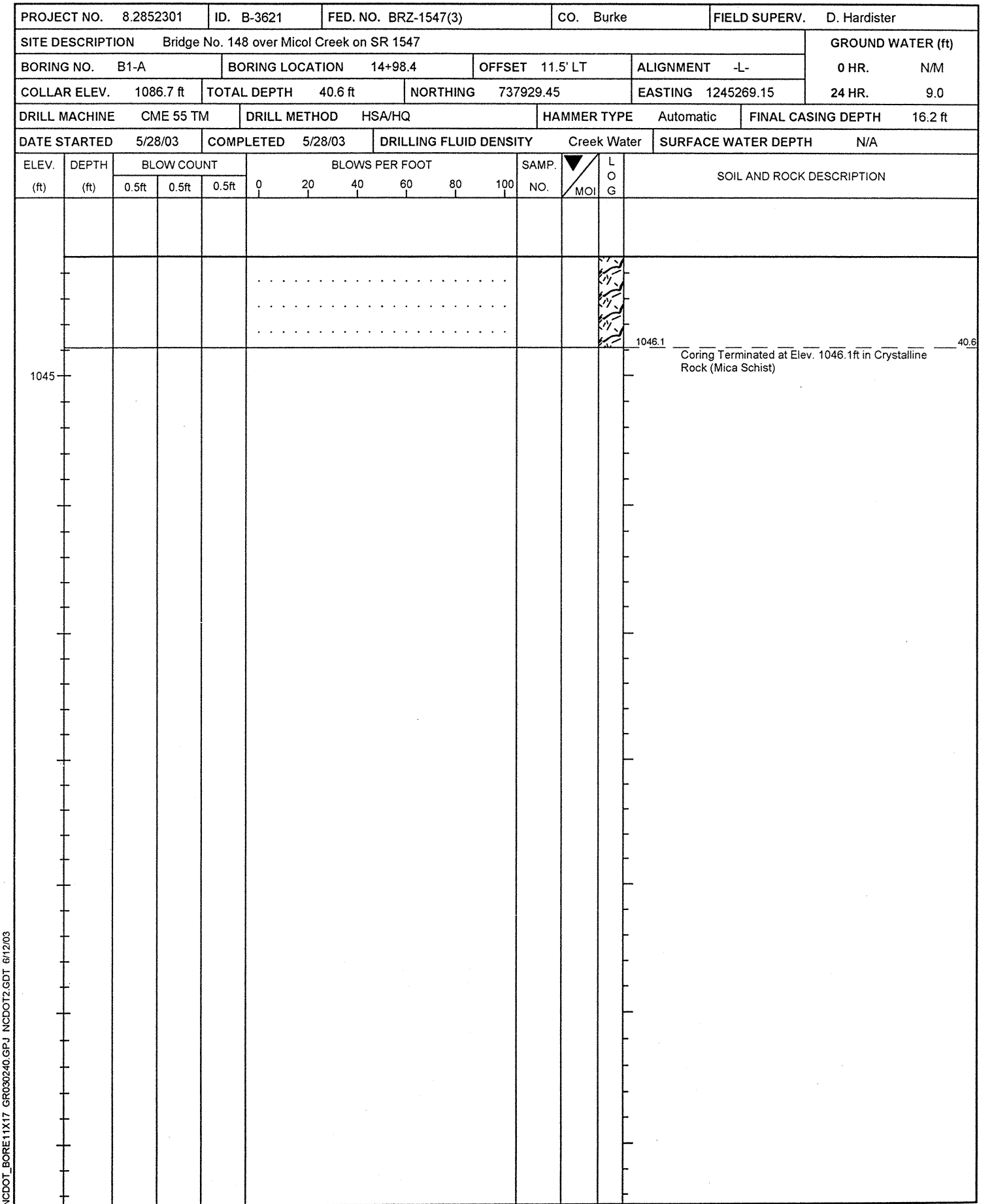
NCDOT_BORE11X17M GR030240.GPJ NCDOT2.GDT 6/12/03

PROJECT NO.	8.2852301	ID.	B-3621	FED. NO.	BRZ-1547(3)	CO.	Burke	FIELD SUPERV.	D. Hardister					
SITE DESCRIPTION								GROUND WATER (ft)						
Bridge No. 148 over Micol Creek on SR 1547								0 HR.	10.8					
BORING NO.	EB1-B	BORING LOCATION	14+70.6	OFFSET	19.0' RT	ALIGNMENT	-L-	24 HR.						
COLLAR ELEV. 1087.8 ft								10.0						
TOTAL DEPTH		16.3 ft		NORTHING		737903.74		EASTING 1245236.86						
DRILL MACHINE	CME 55 TM	DRILL METHOD	HSA	HAMMER TYPE	Automatic	FINAL CASING DEPTH	N/A							
DATE STARTED	5/27/03	COMPLETED	5/27/03	DRILLING FLUID DENSITY	N/A		SURFACE WATER DEPTH N/A							
ELEV. (ft)	DEPTH (ft)	BLOW COUNT			BLOWS PER FOOT					SAMP. NO.	LOG	SOIL AND ROCK DESCRIPTION		
		0.5ft	0.5ft	0.5ft	0	20	40	60	80				100	
1087.8	0.00	Ground Surface Elev. 1087.8 ft												
	3.5	2	2	5						SS-2	30.1	1087.8 Residual-Medium Stiff Brown-Orange Coarse to Fine Sandy Silty CLAY (A-7-5)		
1085														
	8.5	2	2	8						W		1081.8 Residual-Loose Brown-Tan Slightly Micaceous Silty Coarse to Fine SAND (A-2-4)		
1080														
	13.5	5	16	17						W		1077.1 Residual-Dense Brown-Grey Micaceous Silty Coarse to Fine SAND (A-2-4)		
1075														
	16.3	60/0										W		1071.8 Weathered Rock-Brown-Grey Weathered Mica Schist
														1071.5 Boring Terminated with Standard Penetration Test Refusal at Elev. 1071.5ft on Crystalline Rock (Mica Schist)

NCDOT_BORE11X17M GR030240.GPJ NCDOT2.GDT 6/12/03



NCDOT_BORE11X17 GR030240.GPJ NCDOT2.GDT 6/12/03

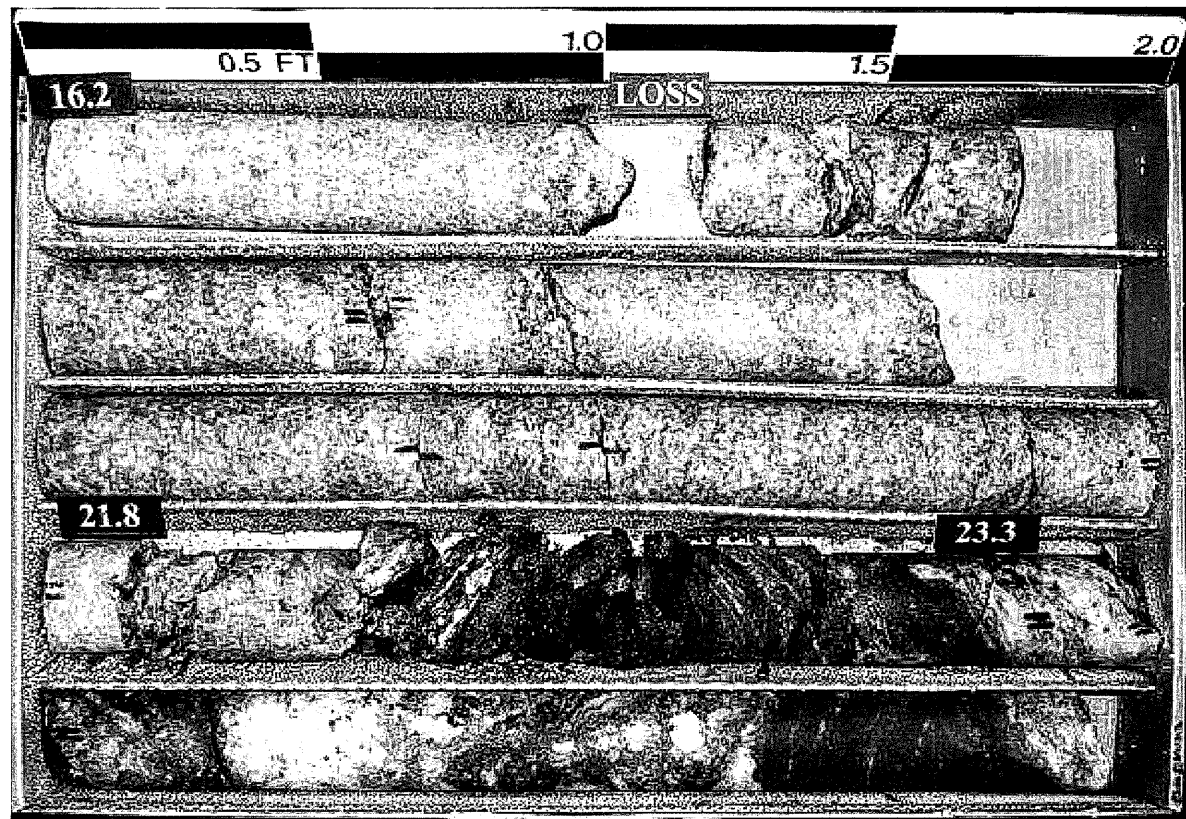


NCDOT_BORE11X17 GR030240.GPJ NCDOT2.GDT 6/12/03

8.2852301/B-3621

B1-A

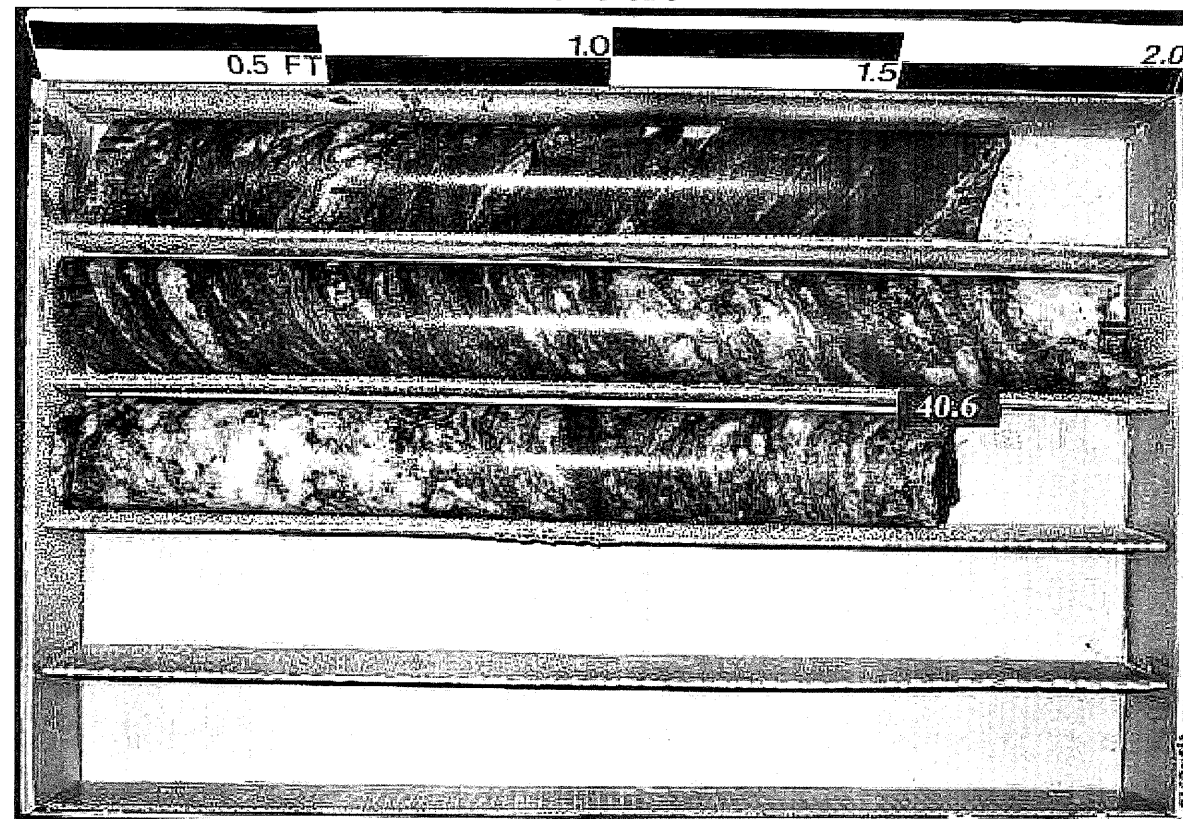
Box 1 of 3



8.2852301/B-3621

B1-A

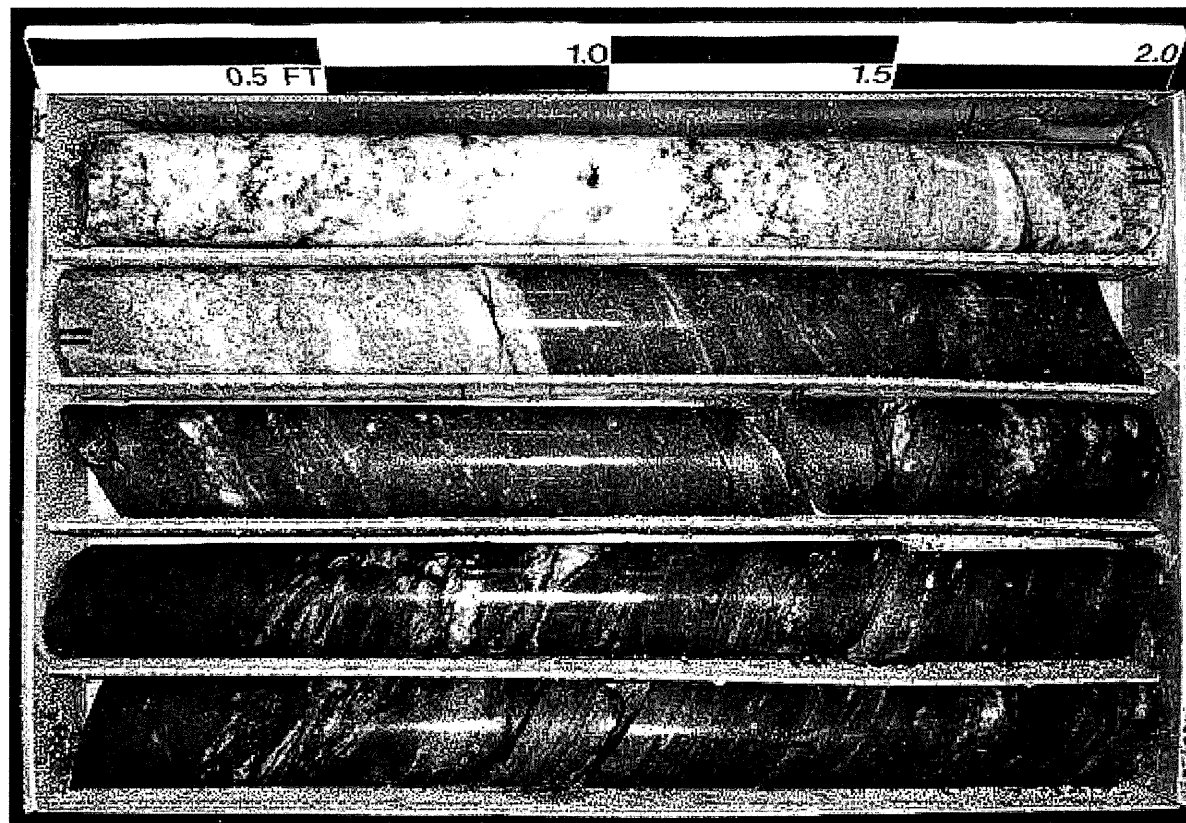
Box 3 of 3



8.2852301/B-3621

B1-A

Box 2 of 3



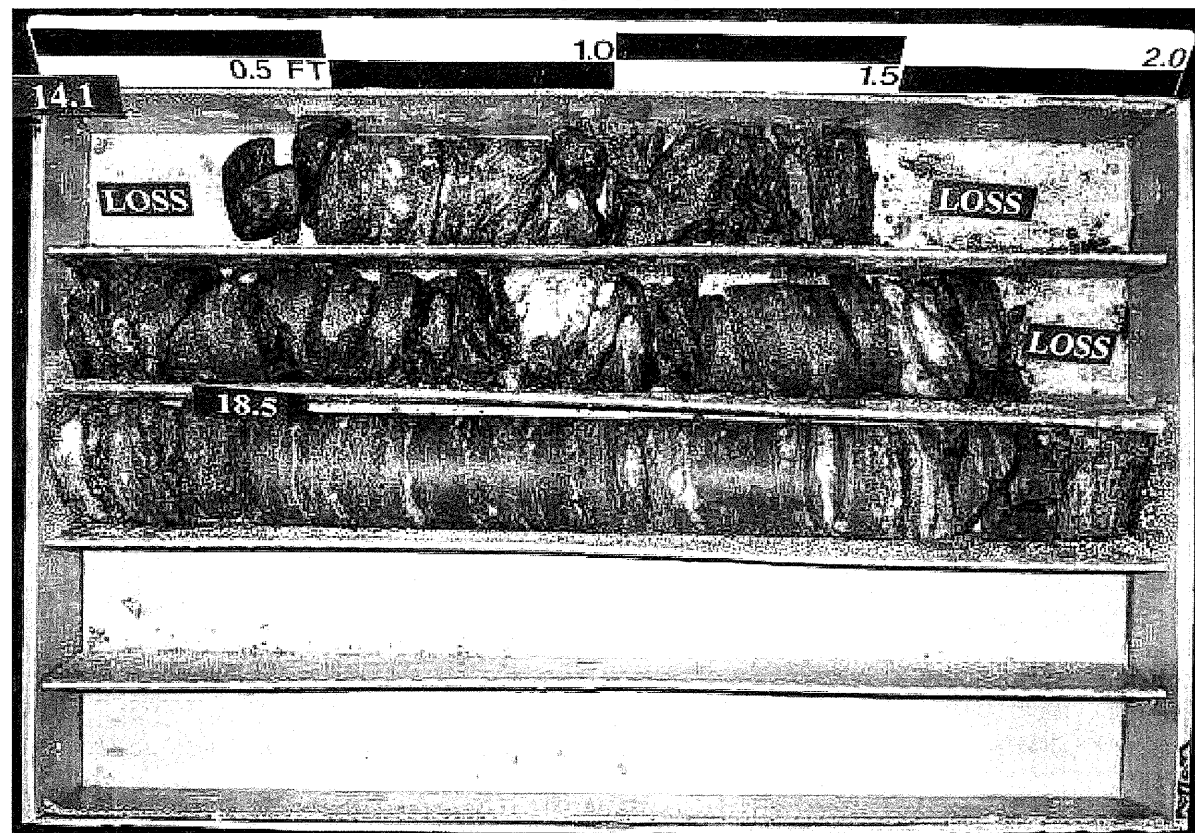
PROJECT NO.	8.2852301	ID.	B-3621	FED. NO.	BRZ-1547(3)	CO.	Burke	FIELD SUPERV.	D. Hardister						
SITE DESCRIPTION								GROUND WATER (ft)							
Bridge No. 148 over Micol Creek on SR 1547								0 HR.	N/M						
BORING NO.	B1-B	BORING LOCATION	14+96.6	OFFSET	8.5' RT	ALIGNMENT	-L-								
COLLAR ELEV.	1086.8 ft	TOTAL DEPTH	35.1 ft	NORTHING	737909.92	EASTING	1245264.21	24 HR.	9.7						
DRILL MACHINE	CME 55 TM	DRILL METHOD	HSA/HQ	HAMMER TYPE	Automatic	FINAL CASING DEPTH	14.1 ft								
DATE STARTED	5/27/03	COMPLETED	5/27/03	DRILLING FLUID DENSITY	Creek Water	SURFACE WATER DEPTH	N/A								
ELEV. (ft)	DEPTH (ft)	BLOW COUNT			BLOWS PER FOOT					SAMP. NO.	LOG	SOIL AND ROCK DESCRIPTION			
		0.5ft	0.5ft	0.5ft	0	20	40	60	80				100		
1086.8	0.00				Ground Surface Elev. 1086.8 ft							1086.8	0.00		
	3.5	2	1	1							SS-4	19.6	1082.8	4.0	Roadway Embankment Fill-Very Loose Brown Clayey Silty Coarse to Fine SAND (A-2-4)
	8.5	21	58	42/0.3							D		1077.8	8.0	Residual-Soft Brown-Red Clayey Coarse to Fine Sandy SILT (A-4)
	13.5										D		1077.8	9.0	Residual-Dense Brown-Grey Micaceous Silty Coarse to Fine SAND (A-2-4)
	14.0	100/0.2									D		1073.0	13.8	Weathered Rock-Brown-Grey-White Weathered Mica Schist
	14.0	60/0.1									D		1072.7	14.1	Crystalline Rock-Brown-Grey-White Mica Schist
											D		1068.3	18.5	Crystalline Rock-Grey-Brown-White and Brown Moderately Severely and Moderately Weathered Medium and Moderately Hard Mica Schist with Close and Very Close Fracture Spacing
											RS-2		1066.5	20.3	Crystalline Rock-Grey-Black-White Moderately and Slightly Weathered Moderately Hard Mica Schist with Close and Very Close Fracture Spacing and Pegmatitic Intrusions
													1066.5	20.3	Crystalline Rock-Grey-Black-White Slightly and Very Slightly Weathered Hard Mica Schist with Moderately Close and Wide Fracture Spacing and Pegmatitic Intrusions
													1051.7	35.1	Coring Terminated at Elev. 1051.7ft in Crystalline Rock (Mica Schist)

NCDOT_BORE#11X17 GR030240.GPJ NCDOT2.GDT 6/12/03

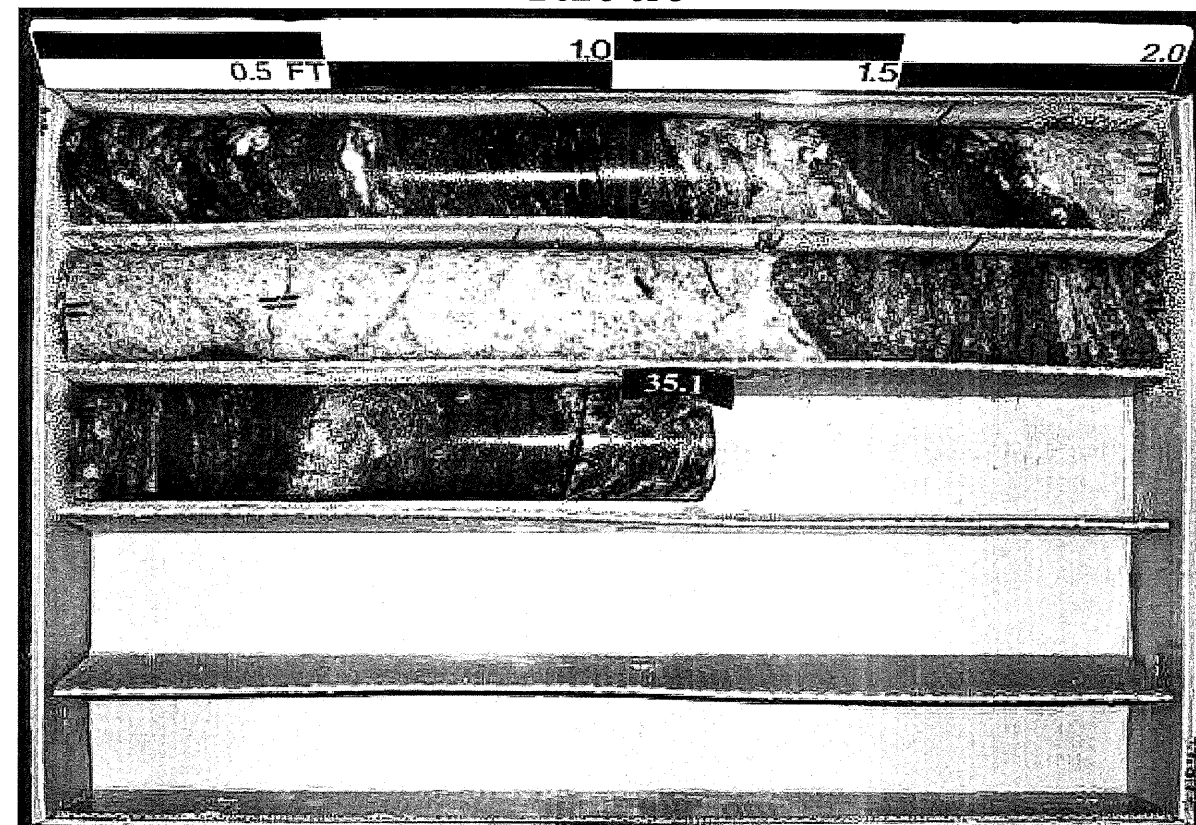
PROJECT NO.	8.2852301	ID.	B-3621	FED. NO.	BRZ-1547(3)	CO.	Burke	FIELD SUPERV.	D. Hardister
SITE DESCRIPTION								GROUND WATER (ft)	
Bridge No. 148 over Micol Creek on SR 1547								0 HR.	N/M
BORING NO.	B1-B	BORING LOCATION	14+96.6	OFFSET	8.5' RT	ALIGNMENT	-L-		
COLLAR ELEV.	1086.8 ft	TOTAL DEPTH	35.1 ft	NORTHING	737909.92	EASTING	1245264.21	24 HR.	9.7
DRILL MACHINE	CME 55 TM	DRILL METHOD	HSA/HQ	HAMMER TYPE	Automatic	FINAL CASING DEPTH	14.1 ft		
DATE STARTED	5/27/03	COMPLETED	5/27/03	DRILLING FLUID DENSITY	Creek Water	SURFACE WATER DEPTH	N/A		
ELEV. (ft)	DEPTH (ft)	RUN (ft)	DRILL RATE (Min./ft)	RUN		SAMP. NO.	STRATA		DESCRIPTION AND REMARKS
				REC. (%)	RQD (%)		REC. (%)	RQD (%)	
1072.7									Begin Coring @ 1072.7 ft
1072.7	14.1	1.0	3:00	(0.9) 90%	(0.0) 0%		(3.5) 80%	(0.0) 0%	Crystalline Rock-Grey-Brown-White and Brown Moderately Severely and Moderately Weathered Medium and Moderately Hard Mica Schist with Close and Very Close Fracture Spacing 7 JTS @ 0-10° 8 JTS @ 10-20° 8 JTS @ 20-30° 3 JTS @ 30-40° 2 JTS @ 40-50° Other Jts Not Discernible
1071.7	15.1		2:24	(4.2) 84%	(1.1) 22%				
1071.7	15.1	5.0							
			1:16						
			2:08						
			3:03						
			2:28						
1066.7	20.1						(1.8) 100%	(1.1) 61%	1068.30
1066.7	20.1	5.0	3:25	(5.0) 100%	(4.8) 96%				1066.50
			4:01						
			3:15						
			3:27						
			3:29						
1061.7	25.1								
1061.7	25.1	5.0	3:38	(5.0) 100%	(4.8) 96%				
			3:03						
			2:48						
			2:36						
			3:21						
1056.7	30.1								
1056.7	30.1	5.0	2:44	(5.0) 100%	(5.0) 100%				
			4:49						
			4:58						
			4:30						
			4:10						
1051.7	35.1								1051.70
Coring Terminated at Elev. 1051.7ft in Crystalline Rock (Mica Schist)									

NCDOT_BORE#2-11X17 GR030240.GPJ NCDOT2.GDT 6/12/03

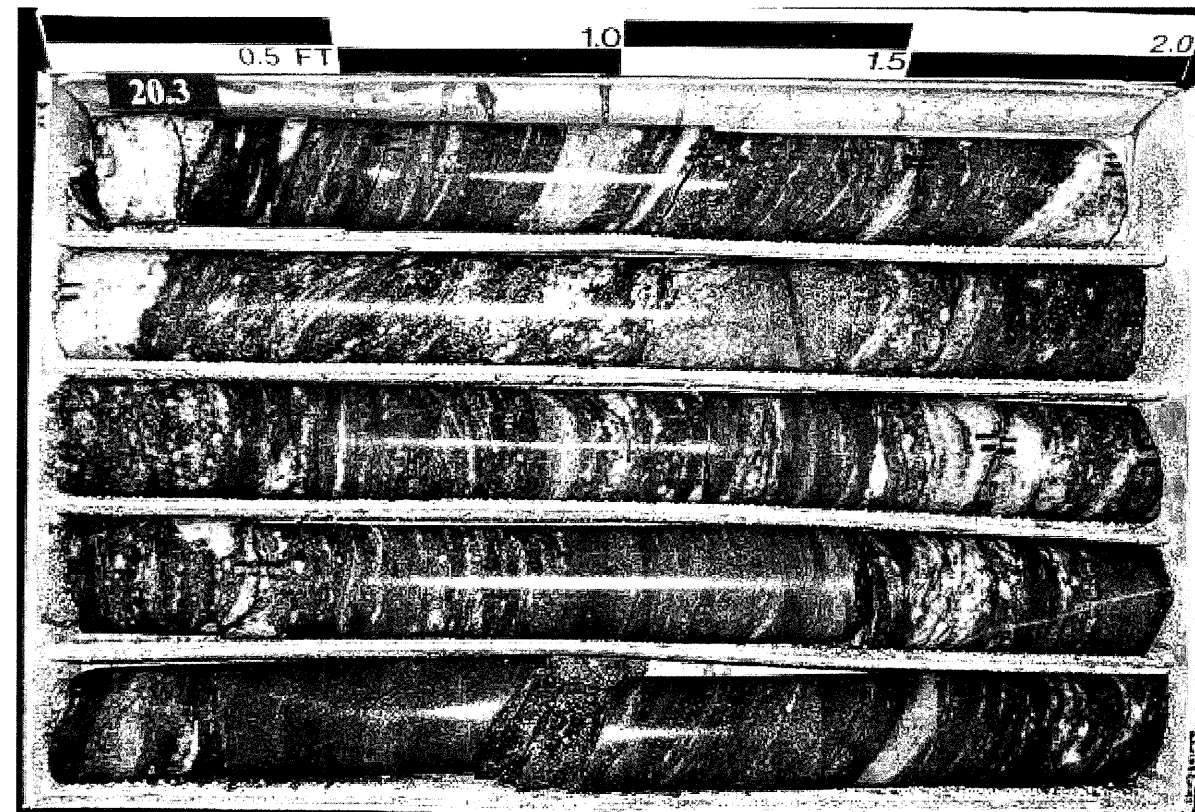
8.2852301/B-3621
B1-B
Box 1 of 3



8.2852301/B-3621
B1-B
Box 3 of 3



8.2852301/B-3621
B1-B
Box 2 of 3



PROJECT NO.	8.2852301	ID.	B-3621	FED. NO.	BRZ-1547(3)	CO.	Burke	FIELD SUPERV.	D. Hardister			
SITE DESCRIPTION								GROUND WATER (ft)				
Bridge No. 148 over Micol Creek on SR 1547								0 HR.	N/M			
BORING NO.	B2-A	BORING LOCATION	15+48.5	OFFSET	11.0' LT	ALIGNMENT	-L-					
COLLAR ELEV.	1086.3 ft	TOTAL DEPTH	55.9 ft	NORTHING	737920.95	EASTING	1245318.57	24 HR.	8.6			
DRILL MACHINE	CME 55 TM	DRILL METHOD	HSA/HQ	HAMMER TYPE	Automatic	FINAL CASING DEPTH	33.5 ft					
DATE STARTED	5/28/03	COMPLETED	5/28/03	DRILLING FLUID DENSITY	Creek Water	SURFACE WATER DEPTH	N/A					
ELEV. (ft)	DEPTH (ft)	BLOW COUNT			BLOWS PER FOOT					SAMP. NO.	LOG	SOIL AND ROCK DESCRIPTION
		0.5ft	0.5ft	0.5ft	0	20	40	60	80			
1086.3	0.00	Ground Surface Elev. 1086.3 ft										
1085	3.5	WOH	WOH	WOH							W	Roadway Embankment Fill-Very Soft Orange-Brown Slightly Micaceous Coarse to Fine Sandy Silty CLAY (A-7-5)
1080	8.5	3	2	4							W	
1075	13.5	1	WOH	2							SAT	Alluvial-Loose Brown Silty Coarse to Fine SAND (A-2-4)
1070	18.5	2	2	5							SAT	Residual-Very Loose to Loose Tan Micaceous Silty Coarse to Fine SAND (A-2-4)
1065	23.5	6	4	7							W	Residual-Medium Dense Tan-Brown Micaceous Silty Coarse to Fine SAND (A-2-4)
1060	28.5	58	42/0.3								W	Weathered Rock-Brown-Grey Weathered Mica Schist
1055	33.5	60/0									W	Crystalline Rock-Brown-Grey Mica Schist
1050											W	Crystalline Rock-Brown-Grey Moderately Severely Weathered Soft Mica Schist with Very Close Fracture Spacing
											W	Crystalline Rock-Grey-Black-White Moderately Weathered Medium Hard Mica Schist with Close and Very Close Fracture Spacing and Pegmatitic

NCDOT_BORE11X17 GR030240.GPJ NCDOT2.GDT 6/12/03

PROJECT NO.	8.2852301	ID.	B-3621	FED. NO.	BRZ-1547(3)	CO.	Burke	FIELD SUPERV.	D. Hardister			
SITE DESCRIPTION								GROUND WATER (ft)				
Bridge No. 148 over Micol Creek on SR 1547								0 HR.	N/M			
BORING NO.	B2-A	BORING LOCATION	15+48.5	OFFSET	11.0' LT	ALIGNMENT	-L-					
COLLAR ELEV.	1086.3 ft	TOTAL DEPTH	55.9 ft	NORTHING	737920.95	EASTING	1245318.57	24 HR.	8.6			
DRILL MACHINE	CME 55 TM	DRILL METHOD	HSA/HQ	HAMMER TYPE	Automatic	FINAL CASING DEPTH	33.5 ft					
DATE STARTED	5/28/03	COMPLETED	5/28/03	DRILLING FLUID DENSITY	Creek Water	SURFACE WATER DEPTH	N/A					
ELEV. (ft)	DEPTH (ft)	BLOW COUNT			BLOWS PER FOOT					SAMP. NO.	LOG	SOIL AND ROCK DESCRIPTION
		0.5ft	0.5ft	0.5ft	0	20	40	60	80			
												Intrusions
											RS-3	Crystalline Rock-Grey-Black-White Very Slightly Weathered Hard Mica Schist with Moderately Close Fracture Spacing and Pegmatitic Intrusions
1045												Crystalline Rock-White-Grey Very Slightly Weathered Very Hard Granitic Pegmatite with Moderately Close and Wide Fracture Spacing
1040												
1035												Crystalline Rock-Grey-Black-White Very Slightly Weathered Hard Mica Schist with Moderately Close Fracture Spacing and Pegmatitic Intrusions
												Coring Terminated at Elev. 1030.4ft in Crystalline Rock (Mica Schist)

NCDOT_BORE11X17 GR030240.GPJ NCDOT2.GDT 6/12/03

PROJECT NO.	8.2852301	ID.	B-3621	FED. NO.	BRZ-1547(3)	CO.	Burke	FIELD SUPERV.	D. Hardister		
SITE DESCRIPTION								BRIDGE No. 148 over Micol Creek on SR 1547		GROUND WATER (ft)	
BORING NO.	B2-A	BORING LOCATION		15+48.5	OFFSET	11.0' LT	ALIGNMENT	-L-	0 HR.	N/M	
COLLAR ELEV.	1086.3 ft	TOTAL DEPTH		55.9 ft	NORTHING	737920.95	EASTING		1245318.57	24 HR.	8.6
DRILL MACHINE	CME 55 TM	DRILL METHOD		HSA/HQ	HAMMER TYPE	Automatic	FINAL CASING DEPTH		33.5 ft		
DATE STARTED	5/28/03	COMPLETED		5/28/03	DRILLING FLUID DENSITY	Creek Water	SURFACE WATER DEPTH		N/A		
CORE SIZE		HQ		TOTAL RUN		22.4 ft		DRILLER		D. Harris	
ELEV. (ft)	DEPTH (ft)	RUN (ft)	DRILL RATE (Min./ft)	RUN		SAMP. NO.	STRATA		DESCRIPTION AND REMARKS		
				REC. %	RQD %		REC. %	RQD %			
1052.8									Begin Coring @ 1052.8 ft		
1052.8	33.5	2.4	3:58	(1.8) 75%	(1.3) 54%		(0.0) 0%	(0.0) 0%	1052.20	Crystalline Rock-Brown-Grey Moderately Severely Weathered Soft Mica Schist with Very Close Fracture Spacing	34.1
			2:14				(4.0) 100%	(2.2) 55%		No Discernible Jts Crystalline Rock-Grey-Black-White Moderately Weathered Medium Hard Mica Schist with Close and Very Close Fracture Spacing and Pegmatitic Intrusions	
1050.4	35.9		0:52/0.4								
1050.4	35.9	5.0	3:06	(5.0) 100%	(3.7) 74%					4 JTS @ 0-10° 4 JTS @ 10-20° 6 JTS @ 40-50° 1 JT @ 50-60° 1 JT @ 80-90° Other Jts Not Discernible	
			4:27								
			3:35			RS-3	(2.5) 100%	(2.5) 100%	1048.20	Crystalline Rock-Grey-Black-White Very Slightly Weathered Hard Mica Schist with Moderately Close Fracture Spacing and Pegmatitic Intrusions	38.1
			3:27							1 JT @ 50-60°	
			3:33								
1045.4	40.9						(8.2) 100%	(8.1) 99%	1045.70	Crystalline Rock-White-Grey Very Slightly Weathered Very Hard Granitic Pegmatite with Moderately Close and Wide Fracture Spacing	40.6
1045.4	40.9	5.0	2:44	(5.0) 100%	(5.0) 100%					1 JT @ 0-10° 3 JTS @ 10-20°	
			3:15								
			2:54								
			3:30								
			4:40								
1040.4	45.9										
1040.4	45.9	5.0	4:09	(4.8) 96%	(4.7) 94%						
			4:44								
			3:53								
			3:00				(6.9) 97%	(6.5) 92%	1037.50	Crystalline Rock-Grey-Black-White Very Slightly Weathered Hard Mica Schist with Moderately Close Fracture Spacing and Pegmatitic Intrusions	48.8
			2:05							3 JTS @ 0-10° 2 JTS @ 10-20° 1 JT @ 70-80°	
1035.4	50.9										
1035.4	50.9	5.0	2:12	(5.0) 100%	(4.6) 92%						
			2:35								
			4:01								
			5:43								
			5:33								
1030.4	55.9								1030.40		55.9

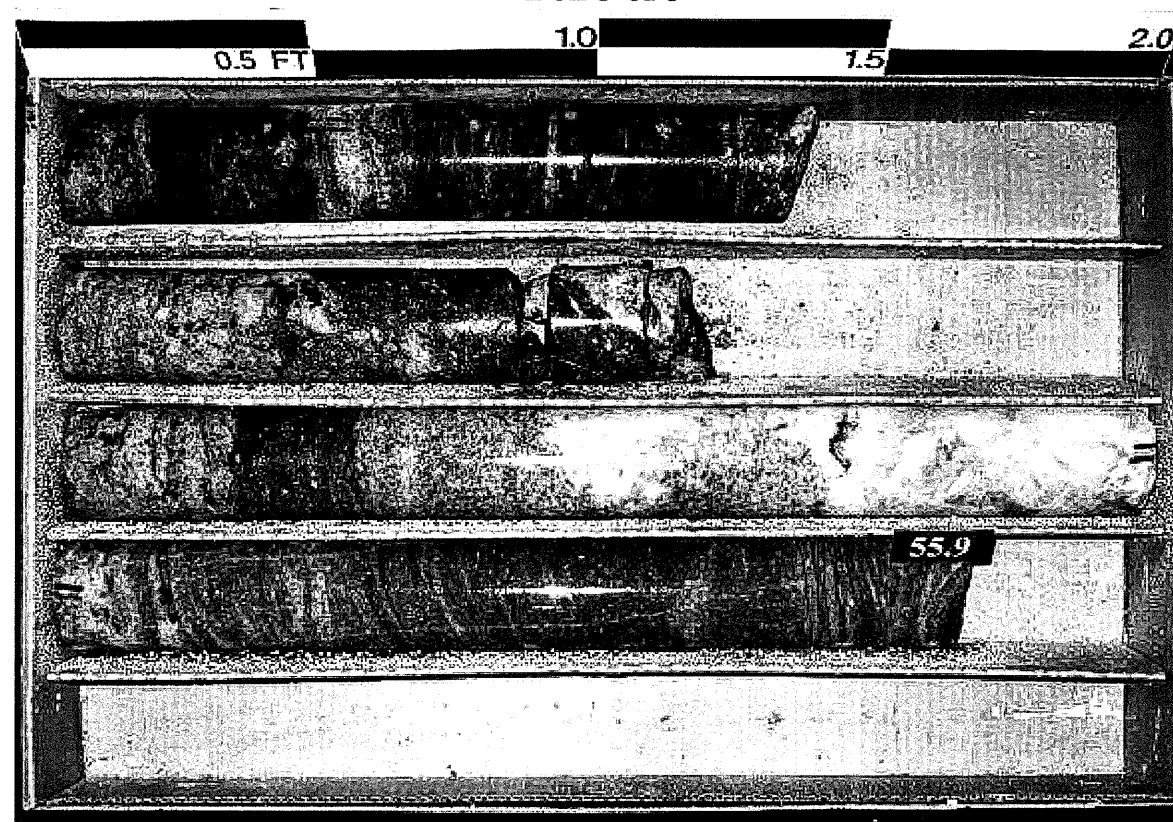
NCDOT_CORE#2-11X17 GR030240.GPJ NCDOT2.GDT 6/12/03

PROJECT NO.	8.2852301	ID.	B-3621	FED. NO.	BRZ-1547(3)	CO.	Burke	FIELD SUPERV.	D. Hardister		
SITE DESCRIPTION								BRIDGE No. 148 over Micol Creek on SR 1547		GROUND WATER (ft)	
BORING NO.	B2-A	BORING LOCATION		15+48.5	OFFSET	11.0' LT	ALIGNMENT	-L-	0 HR.	N/M	
COLLAR ELEV.	1086.3 ft	TOTAL DEPTH		55.9 ft	NORTHING	737920.95	EASTING		1245318.57	24 HR.	8.6
DRILL MACHINE	CME 55 TM	DRILL METHOD		HSA/HQ	HAMMER TYPE	Automatic	FINAL CASING DEPTH		33.5 ft		
DATE STARTED	5/28/03	COMPLETED		5/28/03	DRILLING FLUID DENSITY	Creek Water	SURFACE WATER DEPTH		N/A		
CORE SIZE		HQ		TOTAL RUN		22.4 ft		DRILLER		D. Harris	
ELEV. (ft)	DEPTH (ft)	RUN (ft)	DRILL RATE (Min./ft)	RUN		SAMP. NO.	STRATA		DESCRIPTION AND REMARKS		
				REC. %	RQD %		REC. %	RQD %			
										Coring Terminated at Elev. 1030.4ft in Crystalline Rock (Mica Schist)	

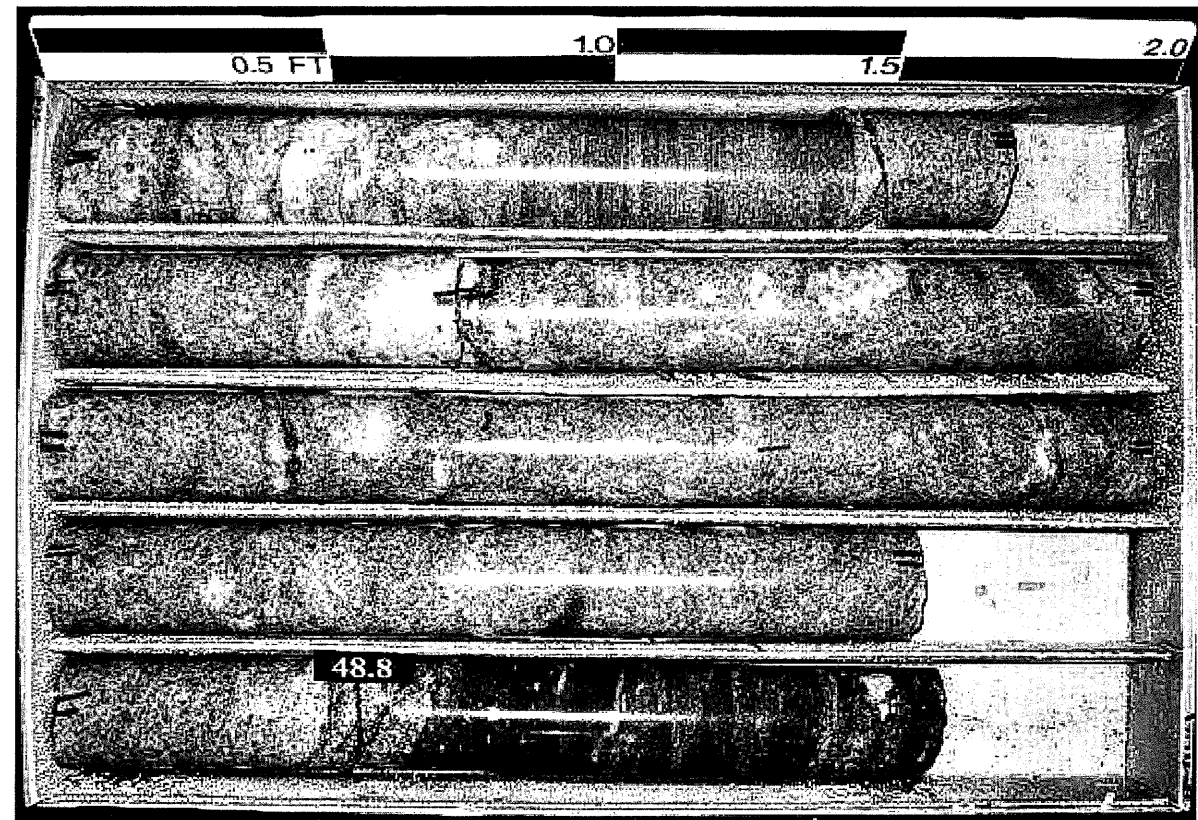
8.2852301/B-3621
B2-A
Box 1 of 3



8.2852301/B-3621
B2-A
Box 3 of 3



8.2852301/B-3621
B2-A
Box 2 of 3



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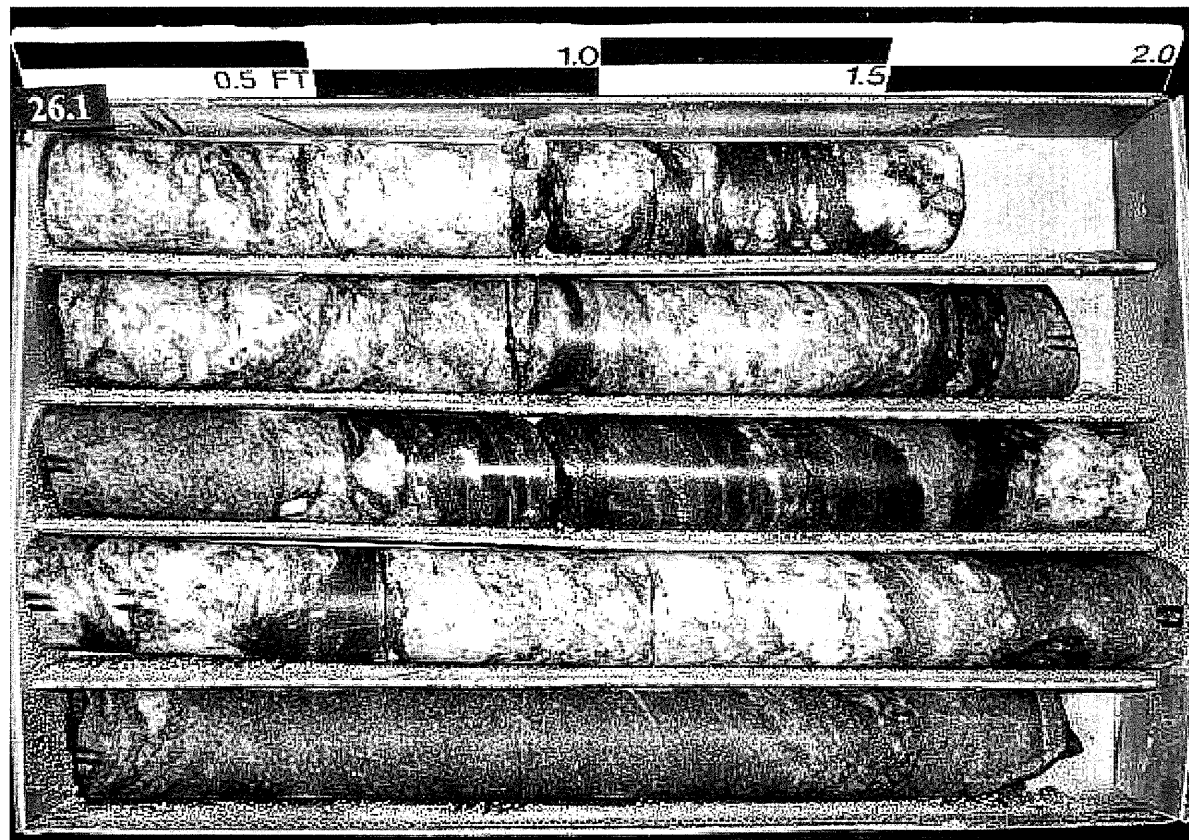
GEOSCIENCE GROUP, INC.
CORE BORING REPORT

SHEET 1 OF 1

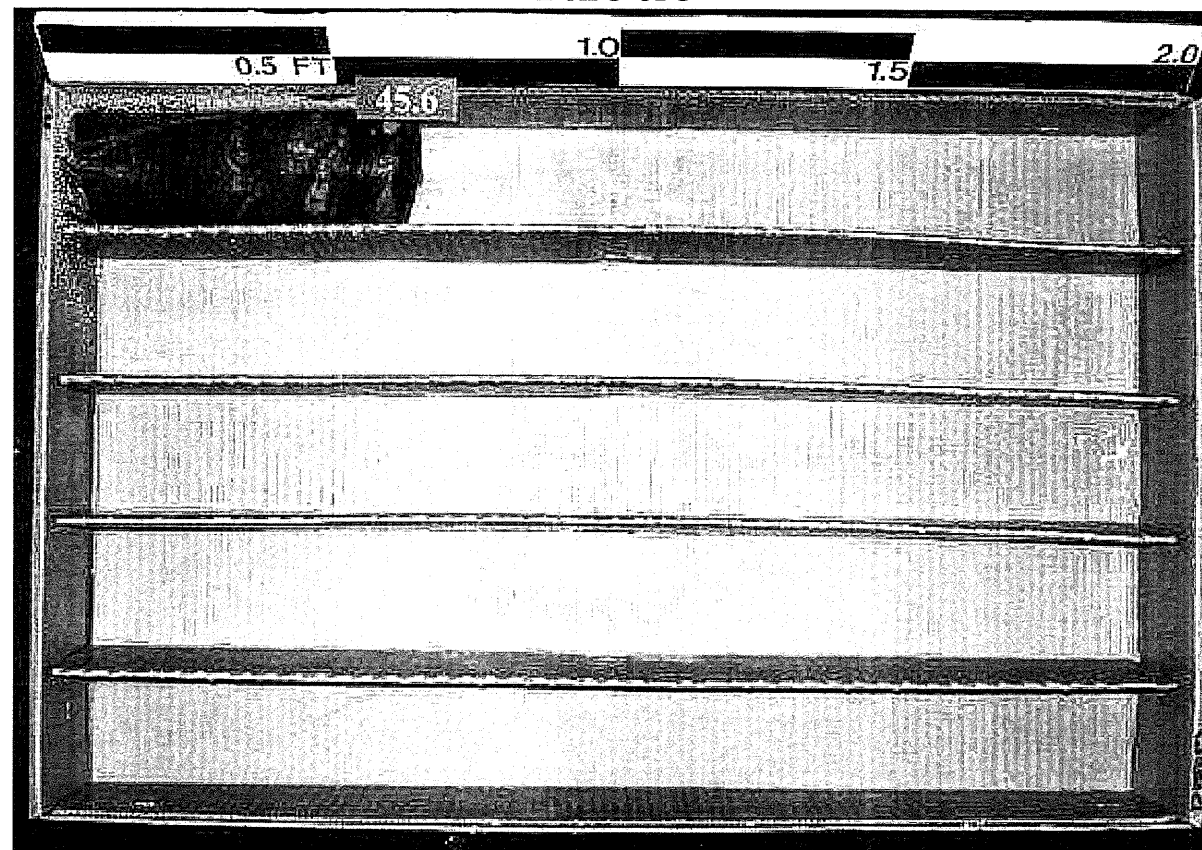
PROJECT NO.	8.2852301	ID.	B-3621	FED. NO.	BRZ-1547(3)	CO.	Burke	FIELD SUPERV.	D. Hardister	
SITE DESCRIPTION									GROUND WATER (ft)	
Bridge No. 148 over Micol Creek on SR 1547									0 HR. N/M	
BORING NO.	B2-B	BORING LOCATION			15+46.5	OFFSET	11.5' RT	ALIGNMENT	-L-	
COLLAR ELEV.	1086.0 ft	TOTAL DEPTH		45.6 ft	NORTHING	737899.00	EASTING		1245313.03	
DRILL MACHINE	CME 55 TM	DRILL METHOD			HSA/HQ	HAMMER TYPE	Automatic	FINAL CASING DEPTH		26.1 ft
DATE STARTED	5/29/03	COMPLETED		5/29/03	DRILLING FLUID DENSITY		Creek Water	SURFACE WATER DEPTH		N/A
CORE SIZE			HQ	TOTAL RUN			19.5 ft	DRILLER		D. Harris
ELEV. (ft)	DEPTH (ft)	RUN (ft)	DRILL RATE (Min./ft)	RUN		SAMP. NO.	STRATA		DESCRIPTION AND REMARKS	
				REC. (ft) %	RQD (ft) %		REC. %	RQD %		
1059.9									Begin Coring @ 1059.9 ft	
1059.9	26.1	4.5	7.06	(4.4) 98%	(4.1) 91%		(19.3) 99%	(18.7) 96%	Crystalline Rock-Grey-Black-White Very Slightly Weathered Hard Mica Schist with Moderately Close and Wide Fracture Spacing and Pegmatitic Intrusions 8 JTS @ 0-10° 3 JTS @ 10-20° 2 JTS @ 20-30° 2 JTS @ 30-40° 1 JT @ 60-70°	
			6.29							
			7.30							
			7.06							
1055.4	30.6		2.09/0.5							
1055.4	30.6	5.0	5.49	(4.9) 98%	(4.9) 98%					
			8.28							
			10.08							
			11.36							
			8.39			RS-4				
1050.4	35.6									
1050.4	35.6	5.0	3.05	(5.0) 100%	(4.7) 94%					
			5.58							
			4.46							
			4.02							
			2.57							
1045.4	40.6									
1045.4	40.6	5.0	4.22	(5.0) 100%	(5.0) 100%					
			3.50							
			3.26							
			4.01							
			3.24							
									1040.40	
									45.6	
Coring Terminated at Elev. 1040.4ft in Crystalline Rock (Mica Schist)										

NCDOT_CORE#2-11X17 GR030240.GPJ NCDOT2.GDT 6/12/03

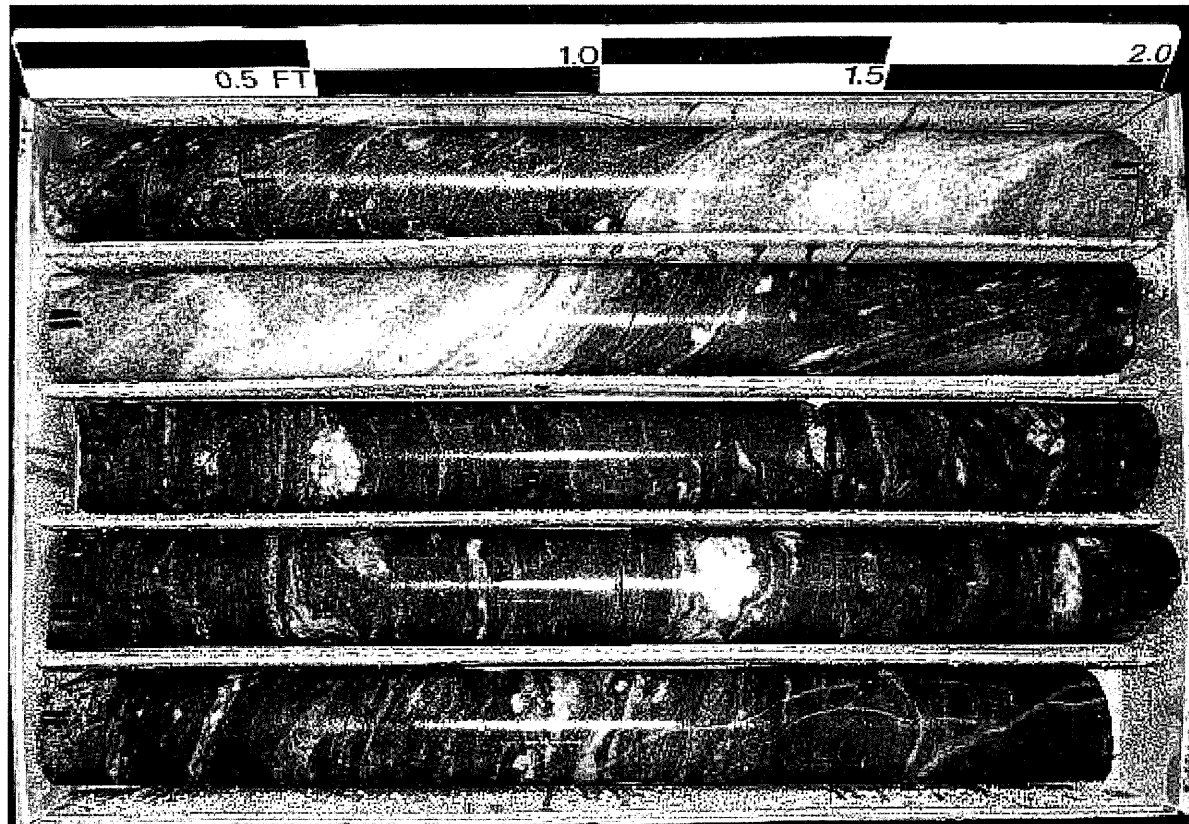
8.2852301/B-3621
B2-B
Box 1 of 3



8.2852301/B-3621
B2-B
Box 3 of 3



8.2852301/B-3621
B2-B
Box 2 of 3



PROJECT NO.	8.2852301	ID.	B-3621	FED. NO.	BRZ-1547(3)	CO.	Burke	FIELD SUPERV.	D. Hardister			
SITE DESCRIPTION								GROUND WATER (ft)				
Bridge No. 148 over Micol Creek on SR 1547								0 HR.	14.4			
BORING NO.	EB2-A	BORING LOCATION	15+76.0	OFFSET	19.0' LT	ALIGNMENT	-L-					
COLLAR ELEV.	1086.1 ft	TOTAL DEPTH	30.4 ft	NORTHING	737924.44	EASTING	1245346.93	24 HR.	9.0			
DRILL MACHINE	CME 55 TM	DRILL METHOD	HSA	HAMMER TYPE	Automatic	FINAL CASING DEPTH	N/A					
DATE STARTED	5/27/03	COMPLETED	5/27/03	DRILLING FLUID DENSITY	N/A	SURFACE WATER DEPTH	N/A					
ELEV. (ft)	DEPTH (ft)	BLOW COUNT			BLOWS PER FOOT					SAMP. NO.	LOG	SOIL AND ROCK DESCRIPTION
		0.5ft	0.5ft	0.5ft	0	20	40	60	80			
1086.1	0.00	Ground Surface Elev. 1086.1 ft										
1085	3.5	5	2	2						SS-8	M	Roadway Embankment Fill-Loose Brown-Orange Clayey Silty Coarse to Fine SAND (A-1-b)
1080	8.5	4	3	2							W	
1075	13.5	5	6	6							W	Residual-Medium Dense Tan to Brown-Tan Micaceous Silty Coarse to Fine SAND (A-2-4)
1070	18.5	17	11	6							W	
1065	23.5	26	40	40							SAT	Residual-Very Dense Brown-Grey Micaceous Silty Coarse to Fine SAND (A-2-4)
1060	28.5	44	56/0.1								W	Weathered Rock-Brown-Grey Weathered Mica Schist
	30.4	60/0									W	Crystalline Rock-Brown-Grey Mica Schist
											W	Boring Terminated with Standard Penetration Test Refusal at Elev. 1055.7ft in Crystalline Rock (Mica Schist)

NCDOT_BORE11X17M_GR030240.GPJ NCDOT2.GDT 6/12/03

PROJECT NO.	8.2852301	ID.	B-3621	FED. NO.	BRZ-1547(3)	CO.	Burke	FIELD SUPERV.	D. Hardister				
SITE DESCRIPTION								GROUND WATER (ft)					
Bridge No. 148 over Micol Creek on SR 1547								0 HR.	11.0				
BORING NO.	EB2-B	BORING LOCATION	15+75.9	OFFSET	16.0' RT	ALIGNMENT	-L-						
COLLAR ELEV.	1086.7 ft	TOTAL DEPTH	30.6 ft	NORTHING	737889.89	EASTING	1245341.28	24 HR.	6.8				
DRILL MACHINE	CME 55 TM	DRILL METHOD	HSA	HAMMER TYPE	Automatic	FINAL CASING DEPTH	N/A						
DATE STARTED	5/29/03	COMPLETED	5/29/03	DRILLING FLUID DENSITY	N/A	SURFACE WATER DEPTH	N/A						
ELEV. (ft)	DEPTH (ft)	BLOW COUNT			BLOWS PER FOOT					SAMP. NO.	LOG	SOIL AND ROCK DESCRIPTION	
		0.5ft	0.5ft	0.5ft	0	20	40	60	80				100
1086.7	0.00	Ground Surface Elev. 1086.7 ft											
1085	3.5	2	1	1						SS-9	W	Roadway Embankment Fill-Very Loose Brown Clayey Silty Coarse to Fine SAND (A-2-4)	
1080	8.5	2	1	1							SAT	Residual-Very Loose Grey-Tan to Brown-Grey Micaceous Silty Coarse to Fine SAND (A-2-4)	
1075	13.5	2	2	1							W		
1070	18.5	2	10	23							SS-10	M	Residual-Dense Brown-Tan-White Micaceous Silty Coarse to Fine SAND (A-1-b)
1065	23.5	8	92/0.4								M	Weathered Rock-Brown-Grey Weathered Mica Schist	
1060	28.5	100/0.3									M	Crystalline Rock-Brown-Grey Mica Schist	
	30.6	60/0									M	Boring Terminated with Standard Penetration Test Refusal at Elev. 1056.1ft in Crystalline Rock (Mica Schist)	

NCDOT_BORE11X17M_GR030240.GPJ NCDOT2.GDT 6/12/03

SUMMARY OF LABORATORY TEST DATA FOR NCDOT

8.2852301/B-3621
 Bridge No. 148 over Micol Creek on SR 1547
 Burke County, North Carolina

Boring No.	Sample Depth (ft.)	Sample Type	Natural Moisture Content (%)	AASHTO Class	N Value	Atterberg Limits				Gradation Results						
						L.L.	P.L.	P.I.	P.S.	Pass #10 Sieve	Pass #40 Sieve	Pass #200 Sieve	Pass #270 Sieve	Coarse Sand (Ret. #60) (%)	Fine Sand (Ret. #270) (%)	Silt (%)
EB1-A	3.5-5.0	SS-1	36.7	A-7-5(5)	7	55	44	11	96	80	53	49	26	23	9	42
EB1-B	3.5-5.0	SS-2	30.1	A-7-5(6)	7	46	33	13	95	78	55	52	26	19	10	45
B1-A	8.5-10.0	SS-3	N/A	A-2-4(0)	5	37	NP	NP	84	61	16	13	43	41	10	6
B1-B	3.5-5.0	SS-4	19.6	A-4(1)	2	26	17	9	96	78	42	38	30	30	12	28
B2-A	8.5-10.0	SS-5	N/A	A-2-4(0)	6	24	NP	NP	51	37	15	13	41	34	16	9
B2-B	3.5-5.0	SS-6	N/A	A-1-b(0)	1	23	NP	NP	72	50	21	17	46	30	12	12
B2-B	8.5-10.0	SS-7	N/A	A-2-4(0)	WOH	23	NP	NP	94	75	27	22	38	38	11	13
EB2-A	3.5-5.0	SS-8	N/A	A-1-b(0)	4	25	22	3	71	49	23	20	44	28	12	16
EB2-B	3.5-5.0	SS-9	N/A	A-2-4(0)	2	24	NP	NP	96	73	35	30	37	32	19	12
EB2-B	18.5-20.0	SS-1	N/A	A-1-b(0)	33	31	NP	NP	69	45	12	9	53	34	12	1
BANK	0.0-1.5	S-1	N/A	A-1-a(0)	N/A	17	NP	NP	27	15	1	0	75	24	1	0
BED	0.0-1.5	S-2	N/A	A-3(0)	N/A	29	NP	NP	99	83	9	7	52	41	5	2

GEOSCIENCE GROUP, INC.
 GREENSBORO, NORTH CAROLINA
 PROJECT NUMBER: GR03.0240.GE
 PAGE: 1 OF 1

PROJECT #: 8.2852301 (B-3621)
 COUNTY: Burke
 DESCRIPTION: Bridge No. 148 over Micol Creek on SR 1547

SAMPLE #	CHANNEL BED MATERIAL			CHANNEL BANK MATERIAL			
	S-2			S-1	SS-4	SS-5	SS-7
RETAINED #4	6			1	1	2	1
PASSING #10	27			99	96	51	94
PASSING #40	15			83	78	37	75
PASSING #200	1			9	42	15	27
COARSE SAND	75			52	30	41	38
FINE SAND	24			41	30	34	38
SILT	1			5	12	16	11
CLAY	0			2	28	9	13
LL	17			29	26	24	23
PL	NP			NP	17	NP	NP
AASHTO CLASSIFICATION	A-1-a(0)			A-3(0)	A-4(1)	A-2-4(0)	A-2-4(0)
STATION	15+15			15+08	14+96.6	15+48.5	15+46.5
OFFSET	CL			10' LT	8.5' RT	11.0' LT	11.5' RT
DEPTH	0.0-0.5			0.0-0.5	3.5-5.0	8.5-10.0	8.5-10.0

GEOTECHNICAL UNIT FIELD SCOUR REPORT

PROJECT: 8.2852301 ID: B-3621 COUNTY: Burke

DESCRIPTION(1): Bridge No. 148 over Micol Creek on SR 1547

INFORMATION ON EXISTING BRIDGES Information obtained from: X field inspection microfilm(Reel: Pos:) other

COUNTY BRIDGE NO. 148 BRIDGE LENGTH 42' NO. BENTS IN: CHANNEL 0 FLOOD PLAIN 2

FOUNDATIONTYPE: Timber piles

EVIDENCE OF SCOUR(2):

ABUTMENTS OR END BENT SLOPES: None

INTERIOR BENTS: N/A

CHANNEL BED: None

CHANNEL BANKS: Sloughing of banks upstream and downstream

EXISTING SCOUR PROTECTION:

TYPE(3): Timber wingwalls

EXTENT(4): 8' outside of bridge

EFFECTIVENESS(5): Good

OBSTRUCTIONS(6)(DAMS,DEBRIS,ETC.): None

DESIGN INFORMATION

CHANNEL BED MATERIAL(7) (SAMPLE RESULTS ATTACHED): Boulders, Cobbles, and Silty Course to Fine

SAND with Gravel (A-1-a)

CHANNEL BANK MATERIAL(8) (SAMPLE RESULTS ATTACHED): Alluvial-Brown Silty Course to Fine SAND (A-3),

Residual -Brown - Red Silty Course to Fine SAND (A-2-4)

FOUNDATION BEARING MATERIAL(9): Residual soil, W.R., C.R.

CHANNEL BANK COVER(10): Grass, small trees

FLOOD PLAIN WIDTH(11): 50'

FLOOD PLAIN COVER(12): Grass, underbrush, trees

DESIGN INFORMATION CONT.

STREAM IS X DEGRADING AGGRADING (13)

OTHER OBSERVATIONS AND COMMENTS:

CHANNEL MIGRATION TENDENCY (14): Slightly West

REPORTED BY: [Signature] DATE: 6/12/03 GEOSCIENCE GROUP, INC.

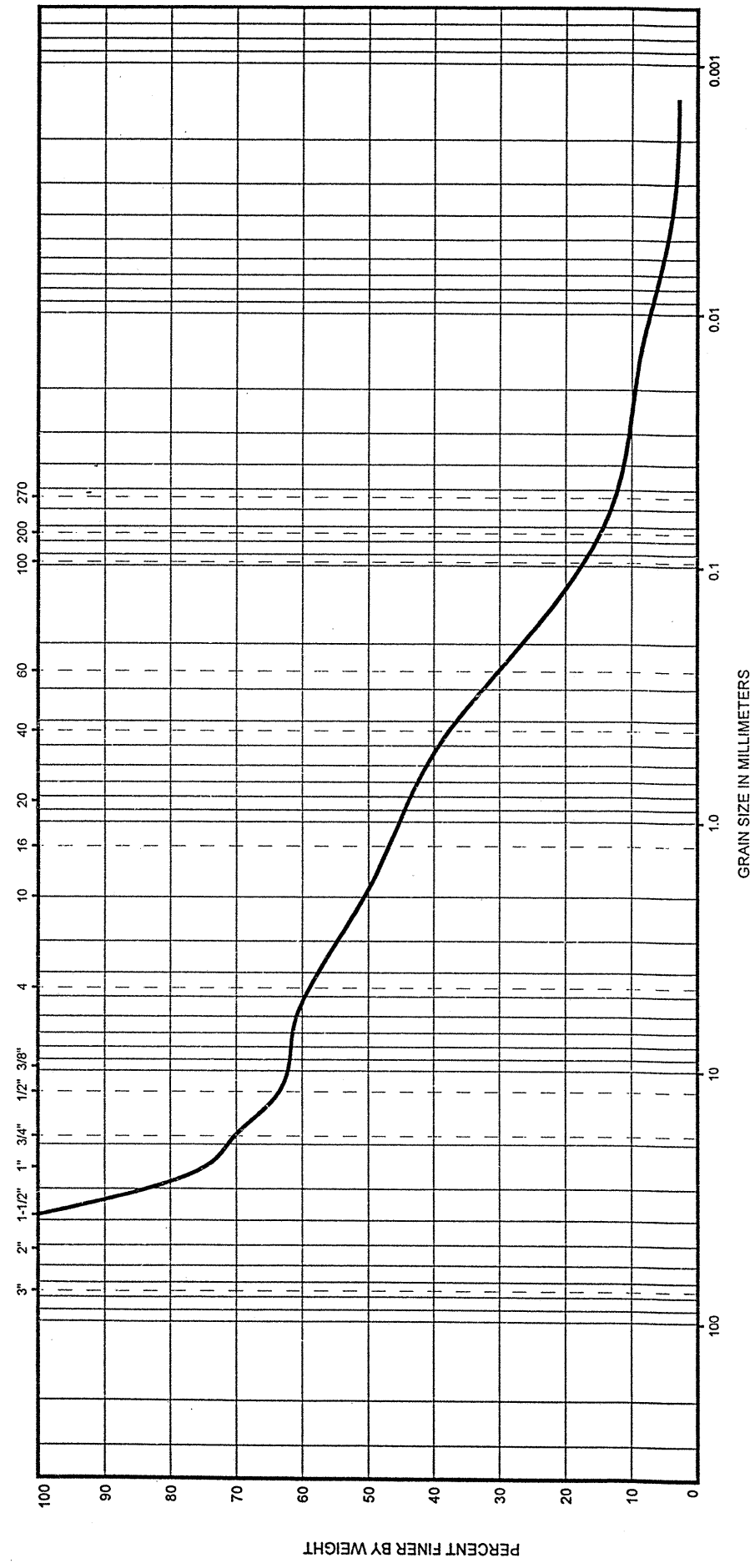
GEOTECHNICALLY ADJUSTED SCOUR ELEVATION (15):

Table with 5 columns: Year, B1-A, B1-B, B2-A, B2-B. Rows for 100-year and 500-year.

REPORTED BY: [Signature] DATE: 6-30-03 NCDOT GEOTECHNICAL UNIT INSTRUCTIONS

- (1) GIVE THE DESCRIPTION OF THE SPECIFIC SITE GIVING ROUTE NUMBER AND BODY OF WATER CROSSED. (2) NOTE ANY EVIDENCE OF SCOUR AT THE EXISTING END BENTS OR ABUTMENTS (UNDERMINING, SLOUGHING, SCOUR LOCATIONS, DEGRADATIONS, ETC.)

U.S. STANDARD SIEVE SIZES

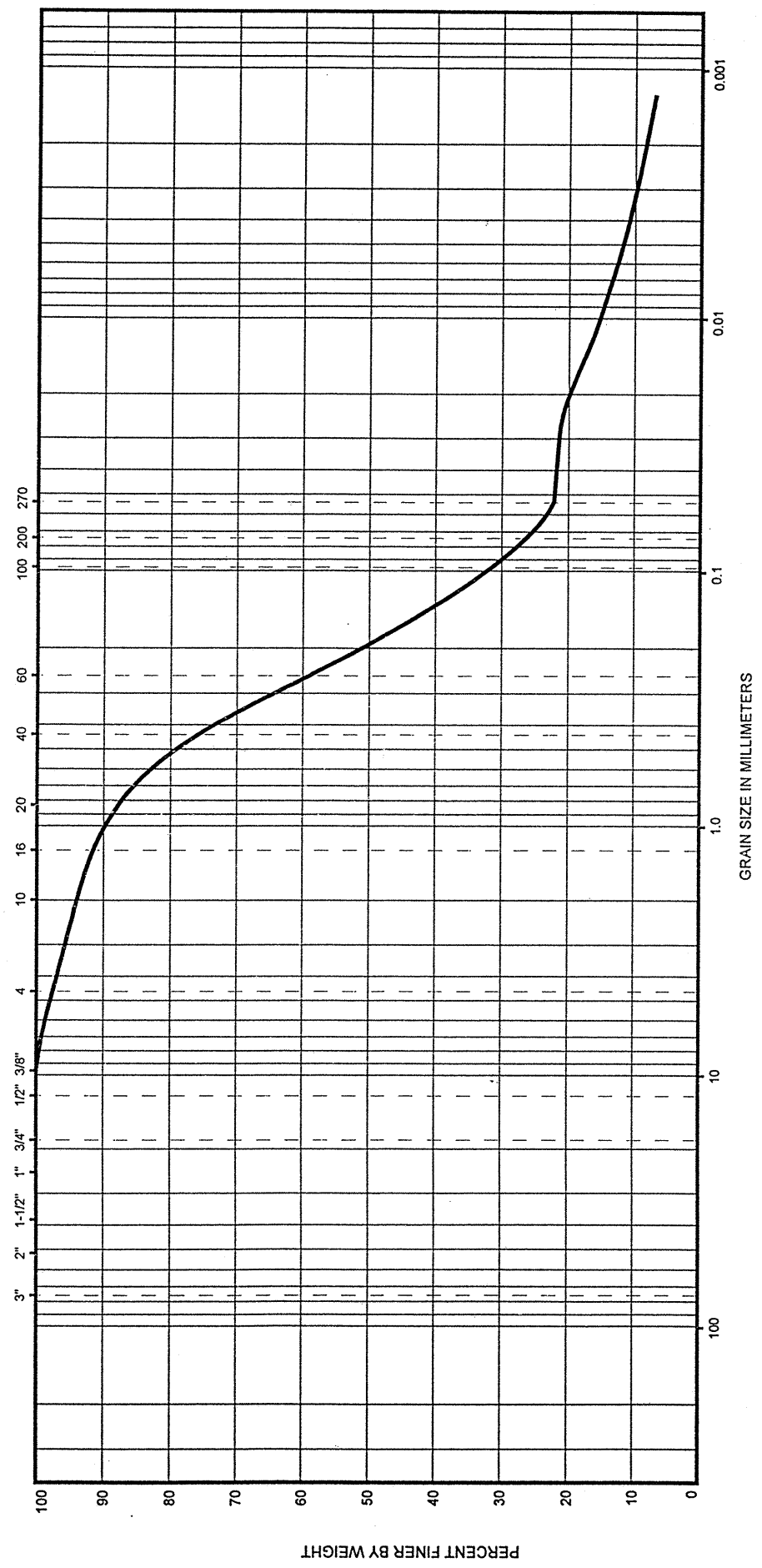


BOUL DERS	COBBLES		GRAVEL		SAND		FINES	
	COARSE		FINE		COARSE		FINE	

SAMPLE ID.	DEPTH(FT)	NMC %	GRAVEL		SAND		DESCRIPTION OR CLASSIFICATION
			LL	PL	PI	PI	
B2-A SS-5	8.5 - 10.0	N/A	24	NP	NP	NP	Alluvial-Loose Brown Silty Coarse to Fine SAND (A-2-4)

GRAIN SIZE DISTRIBUTION
 Bridge No. 148 over Micol Creek on SR 1547
 Burke County, NC
 State Project No. 8.2852301 (B-3621)

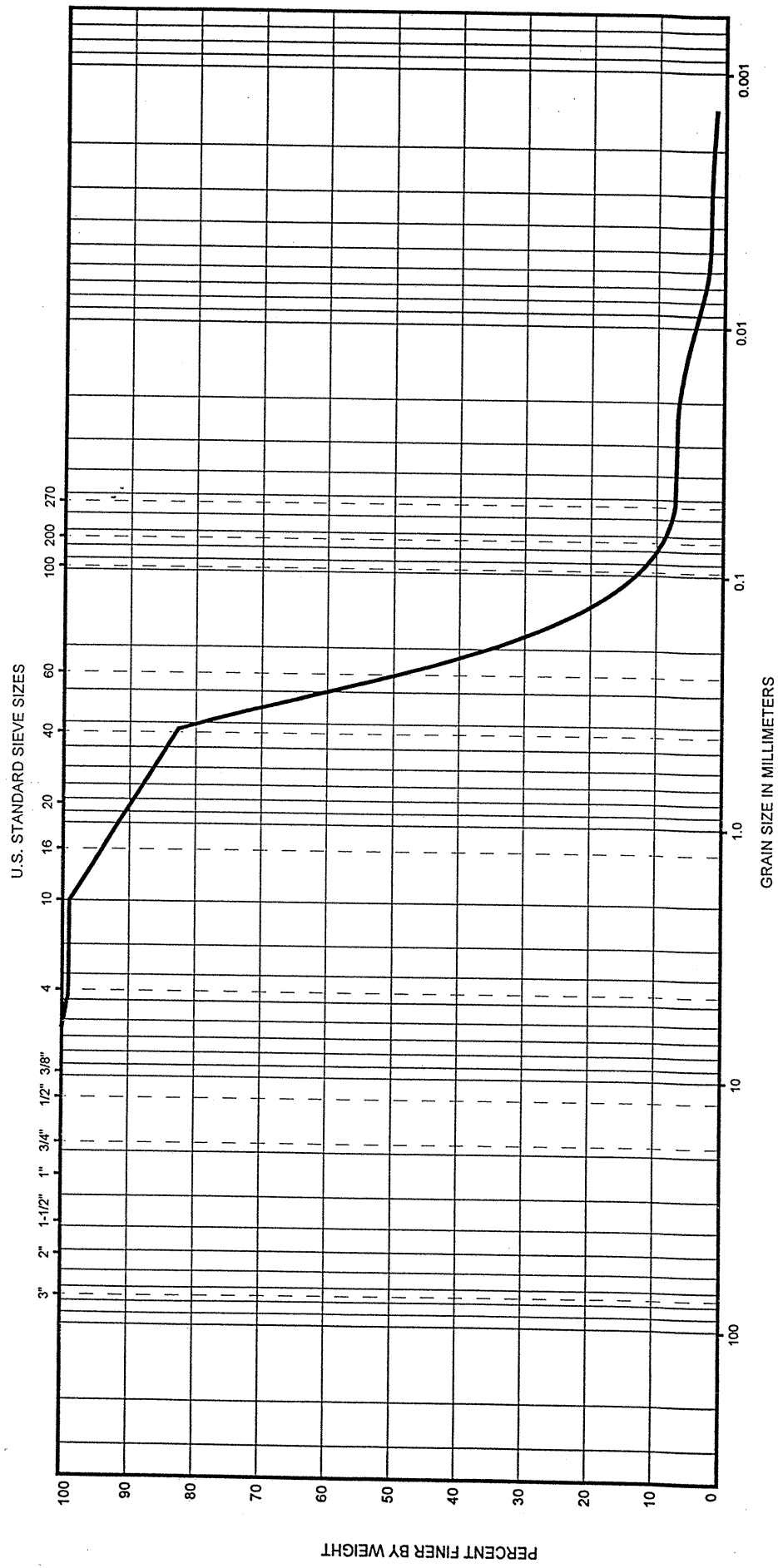
U.S. STANDARD SIEVE SIZES



BOUL DERS	COBBLES		GRAVEL		SAND		FINES	
	COARSE		FINE		COARSE		FINE	

SAMPLE ID.	DEPTH(FT)	NMC %	GRAVEL		SAND		DESCRIPTION OR CLASSIFICATION
			LL	PL	PI	PI	
B2-B SS-7	8.5 - 10.0	N/A	23	NP	NP	NP	Alluvial-Very Loose Grey Silty Coarse to Fine SAND (A-2-4)

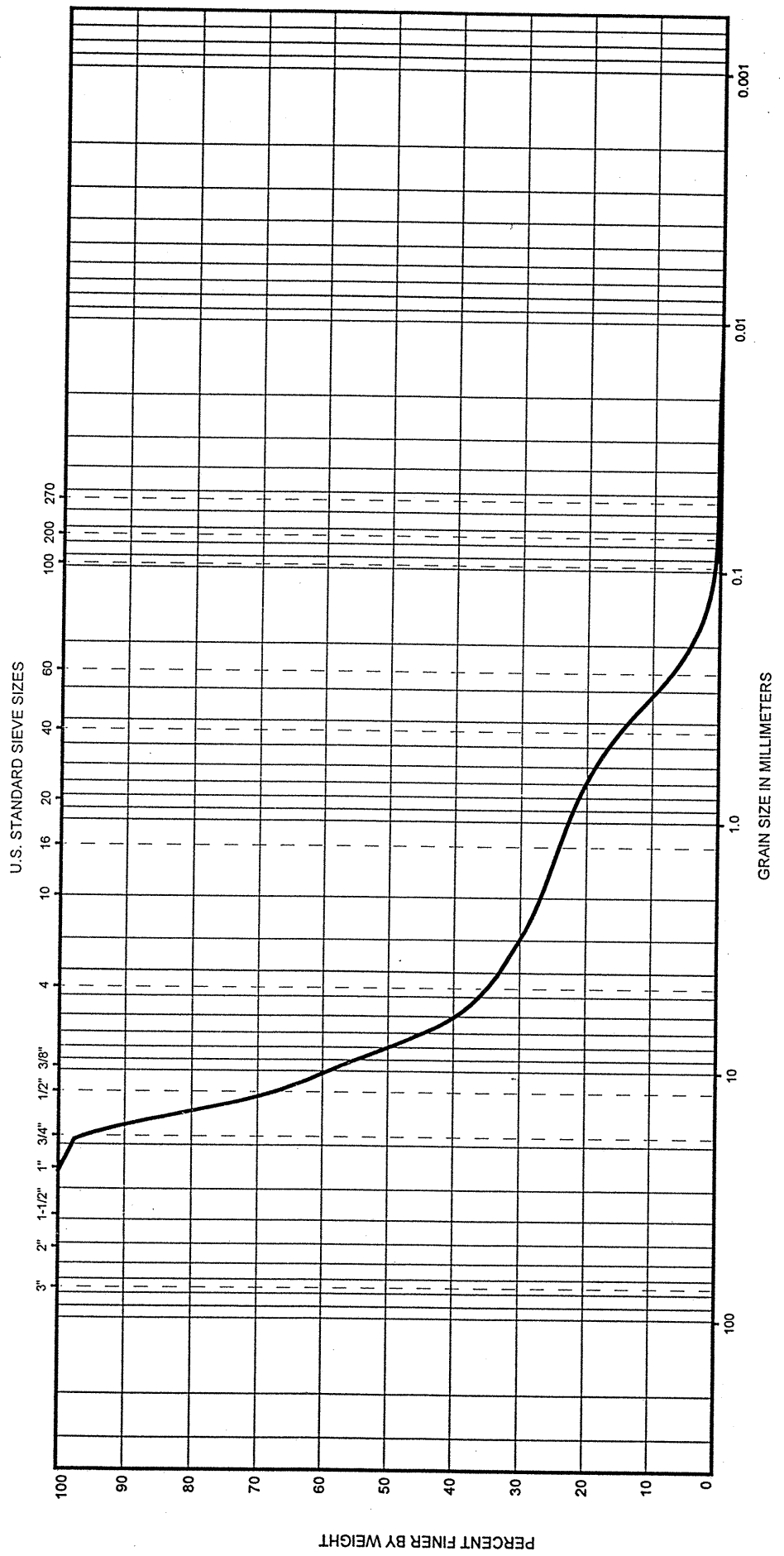
GRAIN SIZE DISTRIBUTION
 Bridge No. 148 over Micol Creek on SR 1547
 Burke County, NC
 State Project No. 8.2852301 (B-3621)



BOUL DERS	COBBLES		GRAVEL		SAND		FINES	
	COARSE		FINE		COARSE		FINE	

SAMPLE ID.	DEPTH(FT)	NMC %	DESCRIPTION OR CLASSIFICATION		
			LL	PL	PI
BANK S-1	0.0 - 0.5	N/A	29	NP	NP

GRAIN SIZE DISTRIBUTION
 Bridge No. 148 over Micol Creek on SR 1547
 Burke County, NC
 State Project No. 8.2852301 (B-3621)



BOUL DERS	COBBLES		GRAVEL		SAND		FINES	
	COARSE		FINE		COARSE		FINE	

SAMPLE ID.	DEPTH(FT)	NMC %	DESCRIPTION OR CLASSIFICATION		
			LL	PL	PI
BED S-2	0.0 - 0.5	N/A	17	NP	NP

GRAIN SIZE DISTRIBUTION
 Bridge No. 148 over Micol Creek on SR 1547
 Burke County, NC
 State Project No. 8.2852301 (B-3621)