

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	38493.1.1 (B-4719)	1	20

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

STRUCTURE
SUBSURFACE INVESTIGATION

CONTENTS

<u>SHEET</u>	<u>DESCRIPTION</u>
1	TITLE SHEET
2	LEGEND
3	SITE PLAN
4	PROFILE(S)
5-8	CROSS SECTION(S)
9-14	BORE LOG & CORE REPORT(S)
15	SOIL TEST RESULTS
16-19	CORE PHOTOGRAPH(S)
20	SITE PHOTOGRAPH(S)

PROJ. REFERENCE NO. 38493.1.1 (B-4719) F.A. PROJ. BRZ-1138(15)
COUNTY CABARRUS
PROJECT DESCRIPTION BRIDGE NO. 163 OVER REEDY CREEK
ON SR 1138 BETWEEN SR 1229 AND SR 1139

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 RALEIGH BY CONTACTING THE N. C. DEPARTMENT OF TRANSPORTATION, GEOTECHNICAL ENGINEERING UNIT AT 1919 ZSO-4008. 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-CLMATIC 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

J.K. STICKNEY

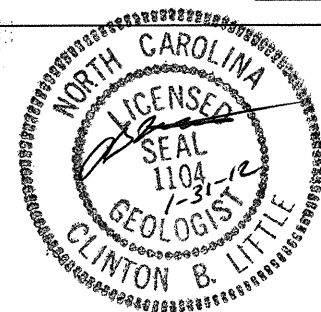
F&R INC.

INVESTIGATED BY J.E. BEVERLY

CHECKED BY C.B. LITTLE

SUBMITTED BY C.B. LITTLE

DATE JANUARY 2012



PROJECT: 38493.1.1
ID: B-4719

DRAWN BY: J.K. McCLURE

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





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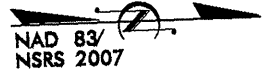
SUBSURFACE INVESTIGATION

SOIL AND ROCK LEGEND, TERMS, SYMBOLS, AND ABBREVIATIONS

PROJECT REFERENCE NO.
38493.11 (B-4719)

SHEET NO.
2

SOIL DESCRIPTION		GRADATION		ROCK DESCRIPTION		TERMS AND DEFINITIONS					
SOIL IS CONSIDERED TO BE THE UNCONSOLIDATED, SEMI-CONSOLIDATED, OR WEATHERED EARTH MATERIALS THAT CAN BE PENETRATED WITH A CONTINUOUS FLIGHT POWER AUGER, AND YIELD LESS THAN 100 BLOWS PER FOOT ACCORDING TO STANDARD PENETRATION TEST (AASHTO T206, ASTM D-1586). SOIL CLASSIFICATION IS BASED ON THE AASHTO SYSTEM. BASIC DESCRIPTIONS GENERALLY SHALL INCLUDE: CONSISTENCY, COLOR, TEXTURE, MOISTURE, AASHTO CLASSIFICATION, AND OTHER PERTINENT FACTORS SUCH AS MINERALOGICAL COMPOSITION, ANGULARITY, STRUCTURE, PLASTICITY, ETC. EXAMPLE: <i>VERY STIFF, GRAY, SILTY CLAY, MOST WITH INTERBEDDED FINE SAND LAYERS, MDRY PLASTIC, A-7-6</i>		WELL GRADED - INDICATES A GOOD REPRESENTATION OF PARTICLE SIZES FROM FINE TO COARSE. UNIFORM - INDICATES THAT SOIL PARTICLES ARE ALL APPROXIMATELY THE SAME SIZE. (ALSO POORLY GRADED). GAP-GRADED - INDICATES A MIXTURE OF UNIFORM PARTICLES OF TWO OR MORE SIZES. ANGULARITY OF GRAINS 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> .		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:  NON-COASTAL PLAIN MATERIAL THAT WOULD YIELD SPT N VALUES > 100 BLOWS PER FOOT IF TESTED.  FINE TO COARSE GRAIN IGNEOUS AND METAMORPHIC ROCK THAT WOULD YIELD SPT REFUSAL IF TESTED. ROCK TYPE INCLUDES GRANITE, GNEISS, GABBRO, SCHIST, ETC.  FINE TO COARSE GRAIN METAMORPHIC AND NON-COASTAL PLAIN SEDIMENTARY ROCK THAT WOULD YIELD SPT REFUSAL IF TESTED. ROCK TYPE INCLUDES PHYLLITE, SLATE, SANDSTONE, ETC.  COASTAL PLAIN SEDIMENTS CEMENTED INTO ROCK, BUT MAY NOT YIELD SPT REFUSAL. ROCK TYPE INCLUDES LIMESTONE, SANDSTONE, CEMENTED SHELL BEDS, ETC.		ALLUVIUM (ALLUV.) - SOILS THAT HAVE BEEN TRANSPORTED BY WATER. AQUIFER - A WATER BEARING FORMATION OR STRATA. ARENACEOUS - APPLIED TO ROCKS THAT HAVE BEEN DERIVED FROM SAND OR THAT CONTAIN SAND. ARGILLACEOUS - APPLIED TO ALL ROCKS OR SUBSTANCES COMPOSED OF CLAY MINERALS, OR HAVING A NOTABLE PROPORTION OF CLAY IN THEIR COMPOSITION, AS SHALE, SLATE, ETC. ARTESIAN - GROUND WATER THAT IS UNDER SUFFICIENT PRESSURE TO RISE ABOVE THE LEVEL AT WHICH IT IS ENCOUNTERED, BUT WHICH DOES NOT NECESSARILY RISE TO OR ABOVE THE GROUND SURFACE. CALCAREOUS (CALC.) - SOILS THAT CONTAIN APPRECIABLE AMOUNTS OF CALCIUM CARBONATE. COLLUVIUM - ROCK FRAGMENTS MIXED WITH SOIL DEPOSITED BY GRAVITY ON SLOPE OR AT BOTTOM OF SLOPE. CORE RECOVERY (REC.) - TOTAL LENGTH OF ALL MATERIAL RECOVERED IN THE CORE BARREL DIVIDED BY TOTAL LENGTH OF CORE RUN AND EXPRESSED AS A PERCENTAGE. DIKE - A TABULAR BODY OF IGNEOUS ROCK THAT CUTS ACROSS THE STRUCTURE OF ADJACENT ROCKS OR CUTS MASSIVE ROCK. DIP - THE ANGLE AT WHICH A STRATUM OR ANY PLANAR FEATURE IS INCLINED FROM THE HORIZONTAL. DIP DIRECTION (DIP AZIMUTH) - THE DIRECTION OR BEARING OF THE HORIZONTAL TRACE OF THE LINE OF DIP, MEASURED CLOCKWISE FROM NORTH. FAULT - A FRACTURE OR FRACTURE ZONE ALONG WHICH THERE HAS BEEN DISPLACEMENT OF THE SIDES RELATIVE TO ONE ANOTHER PARALLEL TO THE FRACTURE. FISSILE - A PROPERTY OF SPLITTING ALONG CLOSELY SPACED PARALLEL PLANES. FLOAT - ROCK FRAGMENTS ON SURFACE NEAR THEIR ORIGINAL POSITION AND DISLODGED FROM PARENT MATERIAL. FLOOD PLAIN (FP) - LAND BORDERING A STREAM, BUILT OF SEDIMENTS DEPOSITED BY THE STREAM. FORMATION (FM) - A MAPPABLE GEOLOGIC UNIT THAT CAN BE RECOGNIZED AND TRACED IN THE FIELD. JOINT - FRACTURE IN ROCK ALONG WHICH NO APPRECIABLE MOVEMENT HAS OCCURRED. LEDGE - A SHELF-LIKE RIDGE OR PROJECTION OF ROCK WHOSE THICKNESS IS SMALL COMPARED TO ITS LATERAL EXTENT. LENS - A BODY OF SOIL OR ROCK THAT THINS OUT IN ONE OR MORE DIRECTIONS. MOTTLED (MOT.) - IRREGULARLY MARKED WITH SPOTS OF DIFFERENT COLORS. MOTTLING IN SOILS USUALLY INDICATES POOR AERATION AND LACK OF GOOD DRAINAGE. PERCHED WATER - WATER MAINTAINED ABOVE THE NORMAL GROUND WATER LEVEL BY THE PRESENCE OF AN INTERVENING IMPERVIOUS STRATUM. RESIDUAL (RES.) SOIL - SOIL FORMED IN PLACE BY THE WEATHERING OF ROCK. ROCK QUALITY DESIGNATION (ROQ) - A MEASURE OF ROCK QUALITY DESCRIBED BY TOTAL LENGTH OF ROCK SEGMENTS EQUAL TO OR GREATER THAN 4 INCHES DIVIDED BY THE TOTAL LENGTH OF CORE RUN AND EXPRESSED AS A PERCENTAGE. SAPROLITE (SAP.) - RESIDUAL SOIL THAT RETAINS THE RELIC STRUCTURE OR FABRIC OF THE PARENT ROCK. SILL - AN INTRUSIVE BODY OF IGNEOUS ROCK OF APPROXIMATELY UNIFORM THICKNESS AND RELATIVELY THIN COMPARED WITH ITS LATERAL EXTENT, THAT HAS BEEN EMPLACED PARALLEL TO THE BEDDING OR SCHISTOSITY OF THE INTRUDED ROCKS. SLICKENSIDE - POLISHED AND STRIATED SURFACE THAT RESULTS FROM FRICTION ALONG A FAULT OR SLIP PLANE. STANDARD PENETRATION TEST (PENETRATION RESISTANCE) (SPT) - NUMBER OF BLOWS (IN OR BPF) OF A 140 LB. HAMMER FALLING 30 INCHES REQUIRED TO PRODUCE A PENETRATION OF 1 FOOT INTO SOIL WITH A 2 INCH OUTSIDE DIAMETER SPLIT SPOON SAMPLER. SPT REFUSAL IS PENETRATION EQUAL TO OR LESS THAN 0.1 FOOT PER 60 BLOWS. STRATA CORE RECOVERY (SREC) - TOTAL LENGTH OF STRATA MATERIAL RECOVERED DIVIDED BY TOTAL LENGTH OF STRATUM AND EXPRESSED AS A PERCENTAGE. STRATA ROCK QUALITY DESIGNATION (SROD) - A MEASURE OF ROCK QUALITY DESCRIBED BY TOTAL LENGTH OF ROCK SEGMENTS WITHIN A STRATUM EQUAL TO OR GREATER THAN 4 INCHES DIVIDED BY THE TOTAL LENGTH OF STRATA AND EXPRESSED AS A PERCENTAGE. TOPSOIL (TS) - SURFACE SOILS USUALLY CONTAINING ORGANIC MATTER.					
SOIL LEGEND AND AASHTO CLASSIFICATION		MINERALOGICAL COMPOSITION		WEATHERING							
GENERAL CLASS. GRANULAR MATERIALS (<= 35% PASSING #200) SILT-CLAY MATERIALS (> 35% PASSING #200) ORGANIC MATERIALS		MINERAL NAMES SUCH AS QUARTZ, FELDSPAR, MICA, TALC, KAOLIN, ETC. ARE USED IN DESCRIPTIONS WHENEVER THEY ARE CONSIDERED OF SIGNIFICANCE.		FRESH ROCK FRESH, CRYSTALS BRIGHT, FEW JOINTS MAY SHOW SLIGHT STAINING, ROCK RINGS UNDER HAMMER IF CRYSTALLINE. VERY SLIGHT (V SLI) ROCK GENERALLY FRESH, JOINTS STAINED, SOME JOINTS MAY SHOW THIN CLAY COATINGS IF OPEN. CRYSTALS ON A BROKEN SPECIMEN FACE SHINE BRIGHTLY. ROCK RINGS UNDER HAMMER BLOWS IF OF A CRYSTALLINE NATURE. SLIGHT (SLI) ROCK GENERALLY FRESH, JOINTS STAINED AND DISCOLORATION EXTENDS INTO ROCK UP TO 1 INCH. OPEN JOINTS MAY CONTAIN CLAY. IN GRANITOID ROCKS SOME OCCASIONAL FELDSPAR CRYSTALS ARE DULL AND DISCOLORED. CRYSTALLINE ROCKS RING UNDER HAMMER BLOWS. MODERATE (MOD.) SIGNIFICANT PORTIONS OF ROCK SHOW DISCOLORATION AND WEATHERING EFFECTS. IN GRANITOID ROCKS, MOST FELDSPARS ARE DULL AND DISCOLORED, SOME SHOW CLAY. ROCK HAS DULL SOUND UNDER HAMMER BLOWS AND SHOWS SIGNIFICANT LOSS OF STRENGTH AS COMPARED WITH FRESH ROCK. MODERATELY SEVERE (MOD. SEV.) ALL ROCK EXCEPT QUARTZ DISCOLORED OR STAINED. IN GRANITOID ROCKS, ALL FELDSPARS DULL AND DISCOLORED AND A MAJORITY SHOW KAOLINIZATION. ROCK SHOWS SEVERE LOSS OF STRENGTH AND CAN BE EXCAVATED WITH A GEOLOGIST'S PICK. ROCK GIVES 'CLUNK' SOUND WHEN STRUCK. <i>IF TESTED, WOULD YIELD SPT REFUSAL</i> SEVERE (SEV.) ALL ROCK EXCEPT QUARTZ DISCOLORED OR STAINED. ROCK FABRIC CLEAR AND EVIDENT BUT REDUCED IN STRENGTH TO STRONG SOIL. IN GRANITOID ROCKS ALL FELDSPARS ARE KAOLINIZED TO SOME EXTENT. SOME FRAGMENTS OF STRONG ROCK USUALLY REMAIN. <i>IF TESTED, YIELDS SPT N VALUES > 100 BPF</i> VERY SEVERE (V SEV.) ALL ROCK EXCEPT QUARTZ DISCOLORED OR STAINED. ROCK FABRIC ELEMENTS ARE DISCERNIBLE BUT THE MASS IS EFFECTIVELY REDUCED TO SOIL STATUS, WITH ONLY FRAGMENTS OF STRONG ROCK REMAINING. SAPROLITE IS AN EXAMPLE OF ROCK WEATHERED TO A DEGREE SUCH THAT ONLY MINOR VESTIGES OF THE ORIGINAL ROCK FABRIC REMAIN. <i>IF TESTED, YIELDS SPT N VALUES < 100 BPF</i> COMPLETE ROCK REDUCED TO SOIL. ROCK FABRIC NOT DISCERNIBLE, OR DISCERNIBLE ONLY IN SMALL AND SCATTERED CONCENTRATIONS. QUARTZ MAY BE PRESENT AS DIKES OR STRINGERS. SAPROLITE IS ALSO AN EXAMPLE.		COMPRESSIBILITY SLIGHTLY COMPRESSIBLE LIQUID LIMIT LESS THAN 31 MODERATELY COMPRESSIBLE LIQUID LIMIT EQUAL TO 31-50 HIGHLY COMPRESSIBLE LIQUID LIMIT GREATER THAN 50		FRESH VERY SLIGHT (V SLI) SLIGHT (SLI) MODERATE (MOD.) MODERATELY SEVERE (MOD. SEV.) SEVERE (SEV.) VERY SEVERE (V SEV.) COMPLETE		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. 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PERCENTAGE OF MATERIAL		GROUND WATER		MISCELLANEOUS SYMBOLS							
ORGANIC MATERIAL GRANULAR SOILS SILT - CLAY SOILS OTHER MATERIAL TRACE OF ORGANIC MATTER 2 - 3% 3 - 5% TRACE 1 - 10% LITTLE ORGANIC MATTER 3 - 5% 5 - 12% LITTLE 10 - 20% MODERATELY ORGANIC 5 - 10% 12 - 20% SOME 20 - 35% HIGHLY ORGANIC >10% >20% HIGHLY 35% AND ABOVE		WATER LEVEL IN BORE HOLE IMMEDIATELY AFTER DRILLING STATIC WATER LEVEL AFTER 24 HOURS PERCHED WATER, SATURATED ZONE, OR WATER BEARING STRATA SPRING OR SEEP		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		TEST BORING W/ CORE SPT N-VALUE SPT REFUSAL AUGER BORING CORE BORING MONITORING WELL PIEZOMETER INSTALLATION SLOPE INDICATOR INSTALLATION CONE PENETROMETER TEST SOUNDING ROD					
CONSISTENCY OR DENSENESS		TEXTURE OR GRAIN SIZE		ABBREVIATIONS							
PRIMARY SOIL TYPE COMPACTNESS OR CONSISTENCY RANGE OF STANDARD PENETRATION RESISTANCE (N-VALUE) RANGE OF UNCONFINED COMPRESSIVE STRENGTH (TDNS/FP) GENERALLY GRANULAR MATERIAL (NON-COHESIVE) VERY LOOSE 4 TO 10 LOOSE 10 TO 30 MEDIUM DENSE 30 TO 50 DENSE >50 VERY DENSE >50 GENERALLY SILT-CLAY MATERIAL (COHESIVE) VERY SOFT <2 SOFT 2 TO 4 MEDIUM STIFF 4 TO 8 STIFF 8 TO 15 VERY STIFF 15 TO 30 HARD >30		U.S. STD. SIEVE SIZE OPENING (MM) 4 10 40 60 200 270 4.75 2.00 0.42 0.25 0.075 0.053 BOULDER (BLDR.) COBBLE (COB.) GRAVEL (GR.) COARSE SAND (CSE, SD.) FINE SAND (F SD.) SILT (SL.) CLAY (CL.) GRAIN SIZE MM 305 75 2.0 0.25 0.05 0.005 IN. 12 3		AR - AUGER REFUSAL BT - BORING TERMINATED CL - CLAY CPT - CONE PENETRATION TEST CSE - COARSE DMT - DILATOMETER TEST DPT - DYNAMIC PENETRATION TEST Ø - VOID RATIO F - FINE FOSS. - FOSSILIFEROUS FRAC. - FRACTURED, FRACTURES FRAGS. - FRAGMENTS HI. - HIGHLY MED. - MEDIUM MICA. - MICACEOUS MOD. - MODERATELY NP - NON PLASTIC ORG. - ORGANIC PMT - PRESSUREMETER TEST SAP. - SAPROLITIC SD. - SAND, SANDY SL. - SILT, SILTY SLI. - SLIGHTLY TCR - TRICONE REFUSAL W - WATER CONTENT V - VERY VST - VANE SHEAR TEST WEA. - WEATHERED WU - UNIT WEIGHT WUd - DRY UNIT WEIGHT SAMPLE ABBREVIATIONS S - BULK SS - SPLIT SPOON ST - SHELBY TUBE RS - ROCK RT - RECOMPACTED TRIAXIAL CBR - CALIFORNIA BEARING RATIO		VERY HARD CANNOT BE SCRATCHED BY KNIFE OR SHARP PICK. BREAKING OF HAND SPECIMENS REQUIRES SEVERAL HARD BLOWS OF THE GEOLOGIST'S PICK. HARD CAN BE SCRATCHED BY KNIFE OR PICK ONLY WITH DIFFICULTY. HARD HAMMER BLOWS REQUIRED TO DETACH HAND SPECIMEN. MODERATELY HARD CAN BE SCRATCHED BY KNIFE OR PICK. GOUGES OR GROOVES TO 0.25 INCHES DEEP CAN BE EXCAVATED BY HARD BLOW OF A GEOLOGIST'S PICK. HAND SPECIMENS CAN BE DETACHED BY MODERATE BLOWS. MEDIUM HARD CAN BE GROOVED OR GOUGED 0.05 INCHES DEEP BY FIRM PRESSURE OF KNIFE OR PICK POINT. CAN BE EXCAVATED IN SMALL CHIPS TO PEICES 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 FINGERNAIL.					
SOIL MOISTURE - CORRELATION OF TERMS		EQUIPMENT USED ON SUBJECT PROJECT		FRACATURE SPACING		BEDDING					
SOIL MOISTURE SCALE (ATTERBERG LIMITS) FIELD MOISTURE DESCRIPTION GUIDE FOR FIELD MOISTURE DESCRIPTION LL - LIQUID LIMIT - SATURATED - USUALLY LIQUID; VERY WET, USUALLY FROM BELOW THE GROUND WATER TABLE PL - PLASTIC LIMIT - WET - (W) SEMISOLID; REQUIRES DRYING TO ATTAIN OPTIMUM MOISTURE OM - OPTIMUM MOISTURE - MOIST - (M) SOLID; AT OR NEAR OPTIMUM MOISTURE SL - SHRINKAGE LIMIT - DRY - (D) REQUIRES ADDITIONAL WATER TO ATTAIN OPTIMUM MOISTURE		DRILL UNITS: MOBILE B- BK-51 CME-45C CME-550 PORTABLE HOIST CME-55 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 HAMMER TYPE: AUTOMATIC MANUAL CORE SIZE: B N H HAND TOOLS: POST HOLE DIGGER HAND AUGER SOUNDING ROD VANE SHEAR TEST		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		TERM THICKNESS VERY THICKLY BEDDED > 4 FEET THICKLY BEDDED 1.5 - 4 FEET THINLY BEDDED 0.16 - 1.5 FEET VERY THINLY BEDDED 0.03 - 0.16 FEET THICKLY LAMINATED 0.008 - 0.03 FEET THINLY LAMINATED < 0.008 FEET					
PLASTICITY		INDURATION		FRACATURE SPACING		BEDDING					
NONPLASTIC 0-5 VERY LOW LOW PLASTICITY 6-15 SLIGHT MED. PLASTICITY 16-25 MEDIUM HIGH PLASTICITY 26 OR MORE HIGH		FOR SEDIMENTARY ROCKS, INDURATION IS THE HARDENING OF THE MATERIAL BY CEMENTING, HEAT, PRESSURE, ETC. 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.		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		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					
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.		FRACATURE SPACING		BEDDING					



WILLIAM W. CARRIKER, JR.
LAURA L. CARRIKER
DB 5531 PG 258
DB 440 PG 46

-L- PC Sta. 25+27.62

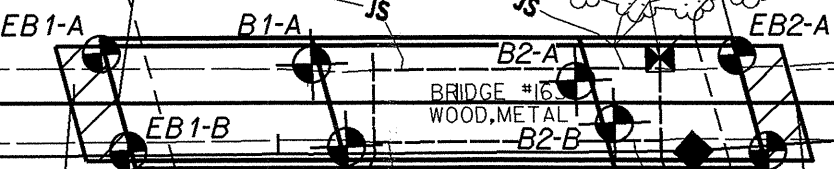
ATX, LLC
DB 5422 PG 276
DB 7929 PG 207

-L- STA. 21+11.52 +/-
BEGIN BRIDGE

-L- STA. 22+76.52 +/-
END BRIDGE

BM #2
-BL- STA 15+00
24' LEFT
ELEV=563.10'

APPX. PROPOSED LOCATION
MIDDLE REEDY CREEK INTERCEPTOR
SS LINE UNDER CONSTRUCTION



BRIDGE #16
WOOD, METAL

TO TIMBER RIDGE RD. SR 1229

TO ROCKY RIVER RD. SR 1139

-L- N 1° 47' 42.2" E

N 2° 13' 04.4" W

SR 1138 HICKORY RIDGE ROAD 21' BST
N 1° 22' 51.5" E

INV=563.59'
INV=562.49'
INV=559.73'
18" RCP
INV=558.86'

UNK SIZE & TYPE

UNK SIZE & TYPE

PIEDMONT NATURAL GAS
DB 6005 PG 17

PIEDMONT NATURAL GAS EASEMENT
DB 5531 PG 265

-L- STA. 20+99.10 +/-
BEGIN APPROACH SLAB

-L- STA. 22+88.67 +/-
END APPROACH SLAB

BLUME FAMILY FARM, LLC
DB 7221 PG 12
DB 5531 PG 265
DB 1138 PG 344

-L- STA. 20+40.00 BEGIN TIP PROJECT B-4719

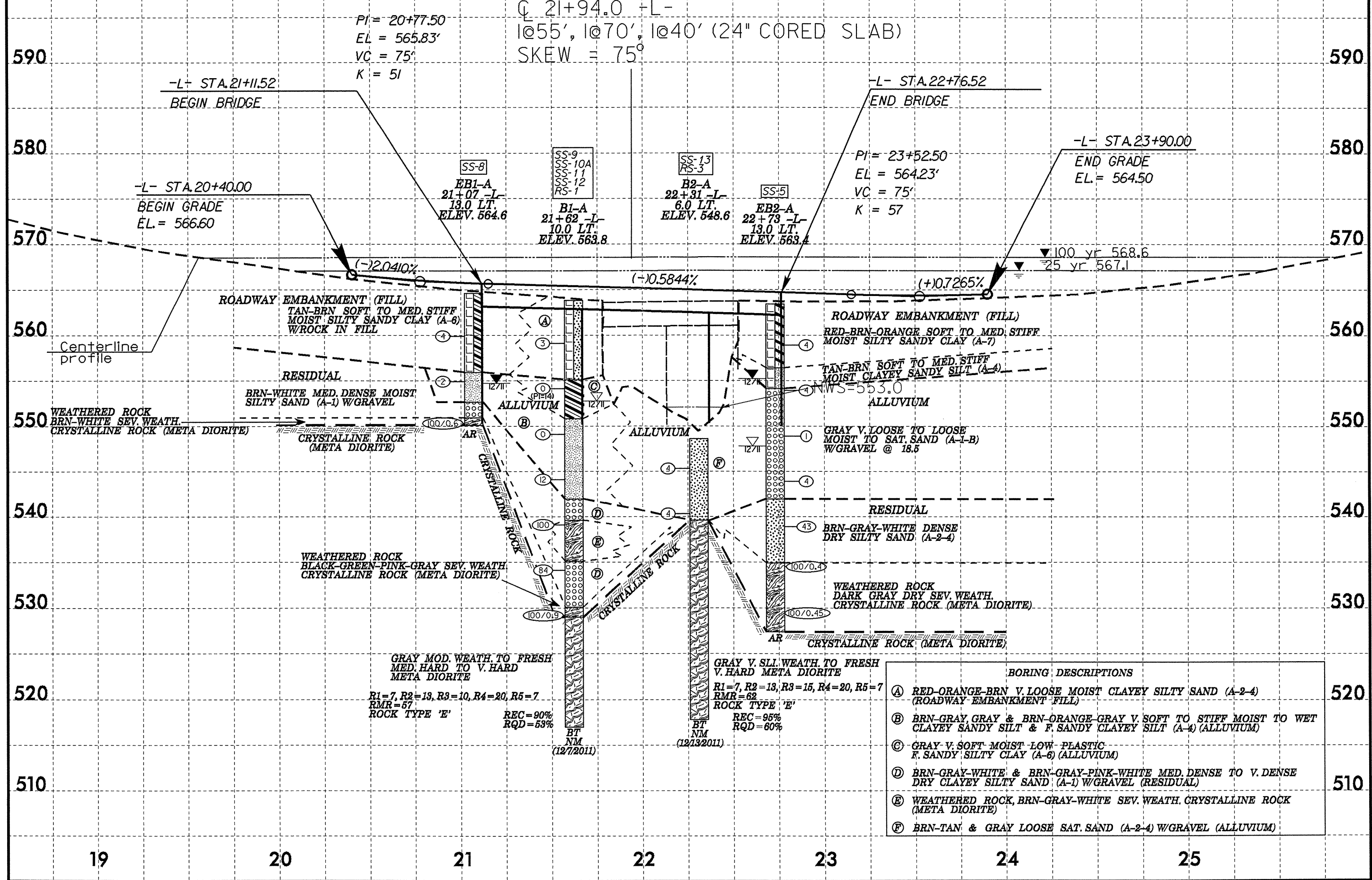
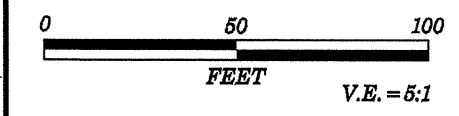
BL-4
-BL- PINC 15+08.35

EIP
N 06° 45' 31" E
372.33'
-L- STA. 23+90.00
END TIP PROJECT B-4719

REEDY CREEK

REEDY CREEK

BM #2 LOCATED 24' LEFT OF
-BL+ STA. 15+00.00 EL. = 563.10'



GRAY MOD. WEATH. TO FRESH
MED. HARD TO V. HARD
META DIORITE
R1=7, R2=13, R3=10, R4=20, R5=7
RMR=57
ROCK TYPE 'E'
REC=90%
RQD=53%

GRAY V. SLL. WEATH. TO FRESH
V. HARD META DIORITE
R1=7, R2=13, R3=15, R4=20, R5=7
RMR=62
ROCK TYPE 'E'
REC=95%
RQD=60%

BORING DESCRIPTIONS	
Ⓐ	RED-ORANGE-BRN V. LOOSE MOIST CLAYEY SILTY SAND (A-2-4) (ROADWAY EMBANKMENT FILL)
Ⓑ	BRN-GRAY GRAY & BRN-ORANGE-GRAY V. SOFT TO STIFF MOIST TO WET CLAYEY SANDY SILT & F. SANDY CLAYEY SILT (A-4) (ALLUVIUM)
Ⓒ	GRAY V. SOFT MOIST LOW PLASTIC F. SANDY SILTY CLAY (A-6) (ALLUVIUM)
Ⓓ	BRN-GRAY-WHITE & BRN-GRAY-PINK-WHITE MED. DENSE TO V. DENSE DRY CLAYEY SILTY SAND (A-1) W/GRAVEL (RESIDUAL)
Ⓔ	WEATHERED ROCK, BRN-GRAY-WHITE SEV. WEATH. CRYSTALLINE ROCK (META DIORITE)
Ⓕ	BRN-TAN & GRAY LOOSE SAT. SAND (A-2-4) W/GRAVEL (ALLUVIUM)

19

20

21

22

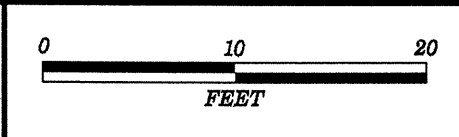
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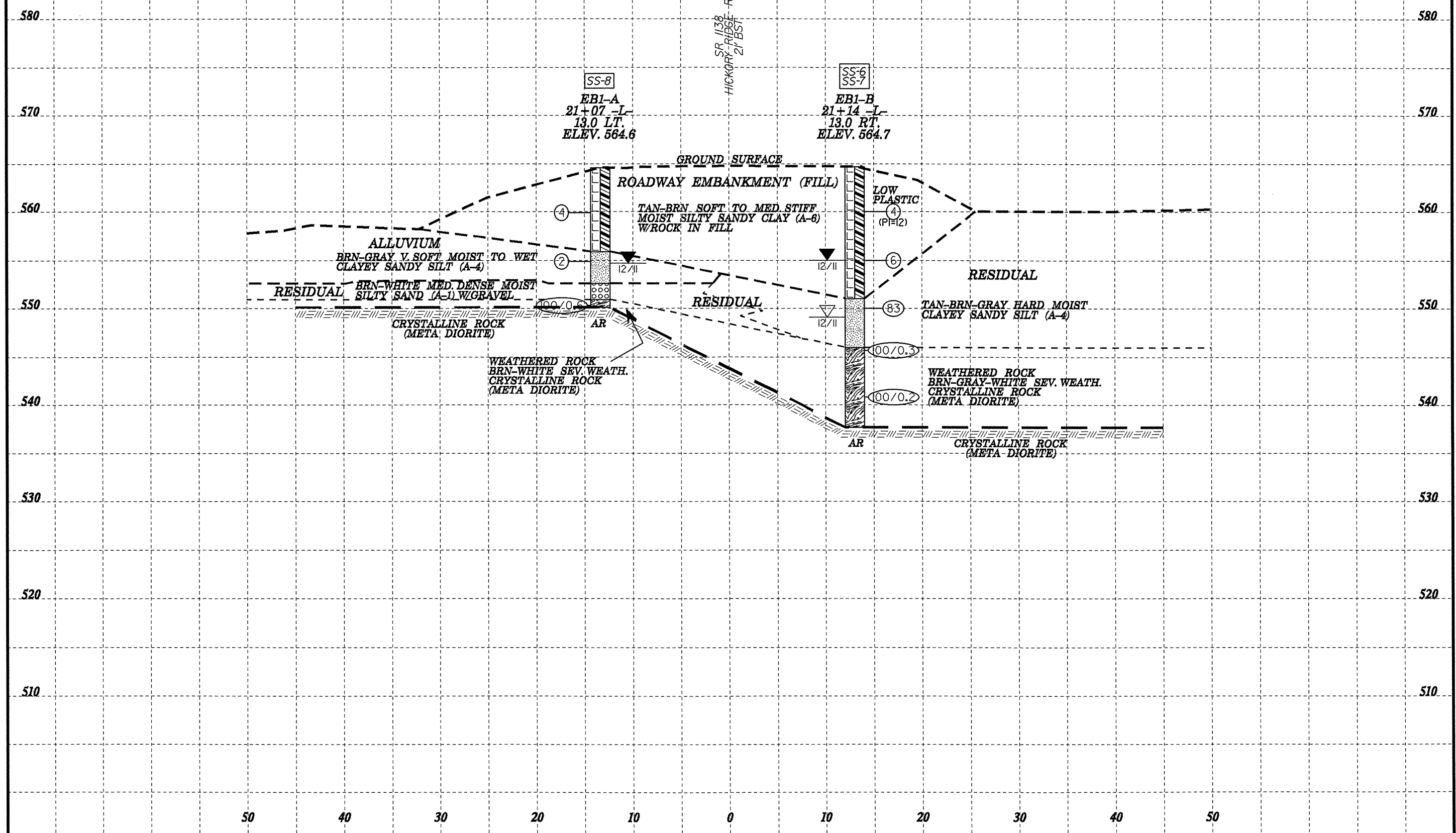
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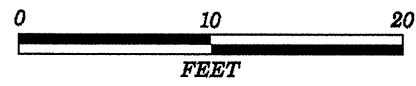
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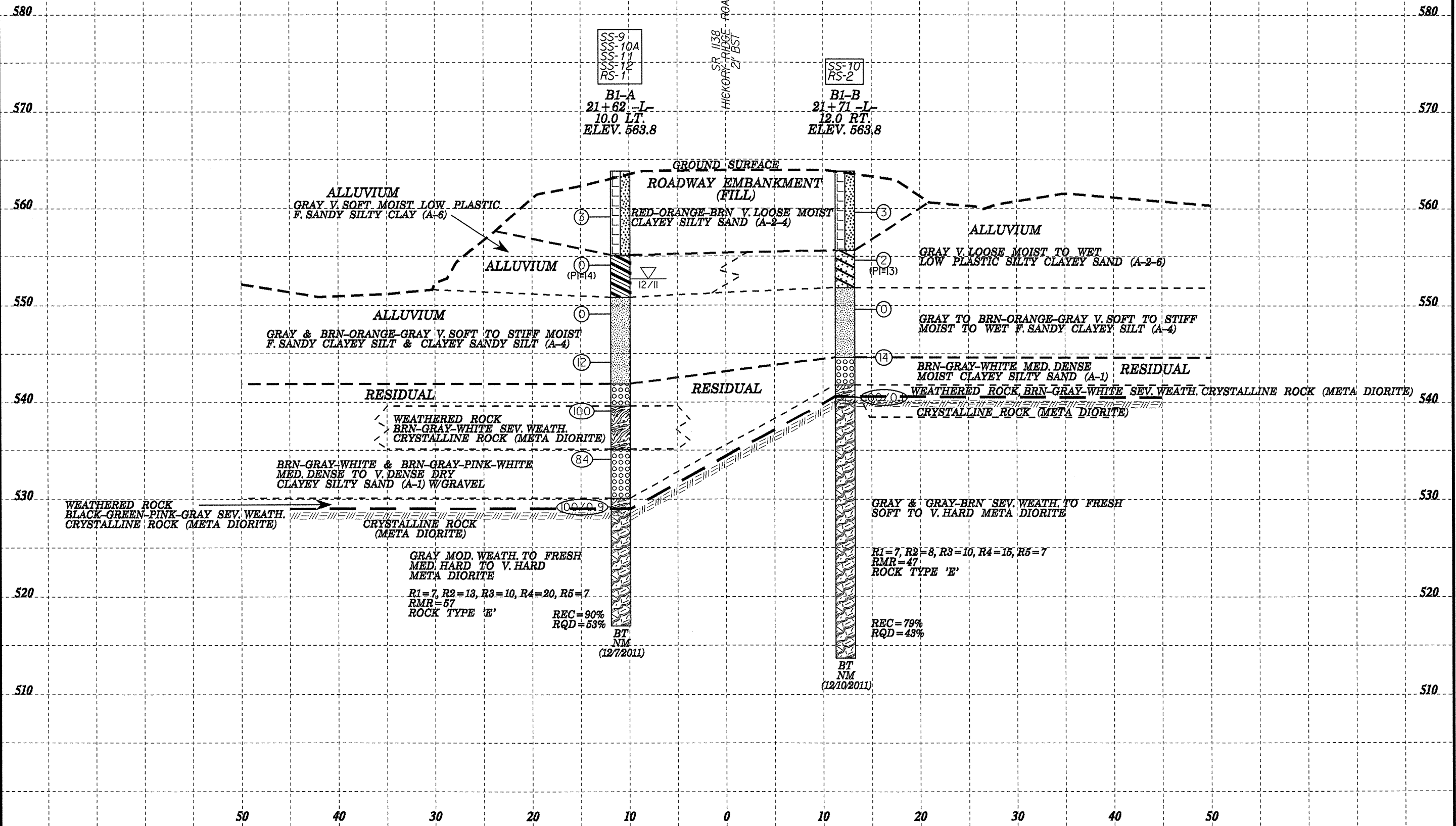


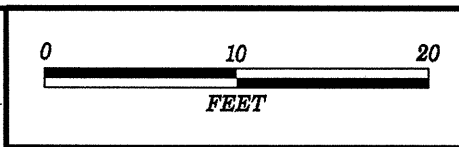
PROJECT REFERENCE NO.	SHEET
38493.1.1 (B-4719)	5
Section thru End Bent One Sta. 21+10.21 -L- (W.P. #1) Skew = 75°00'00"	



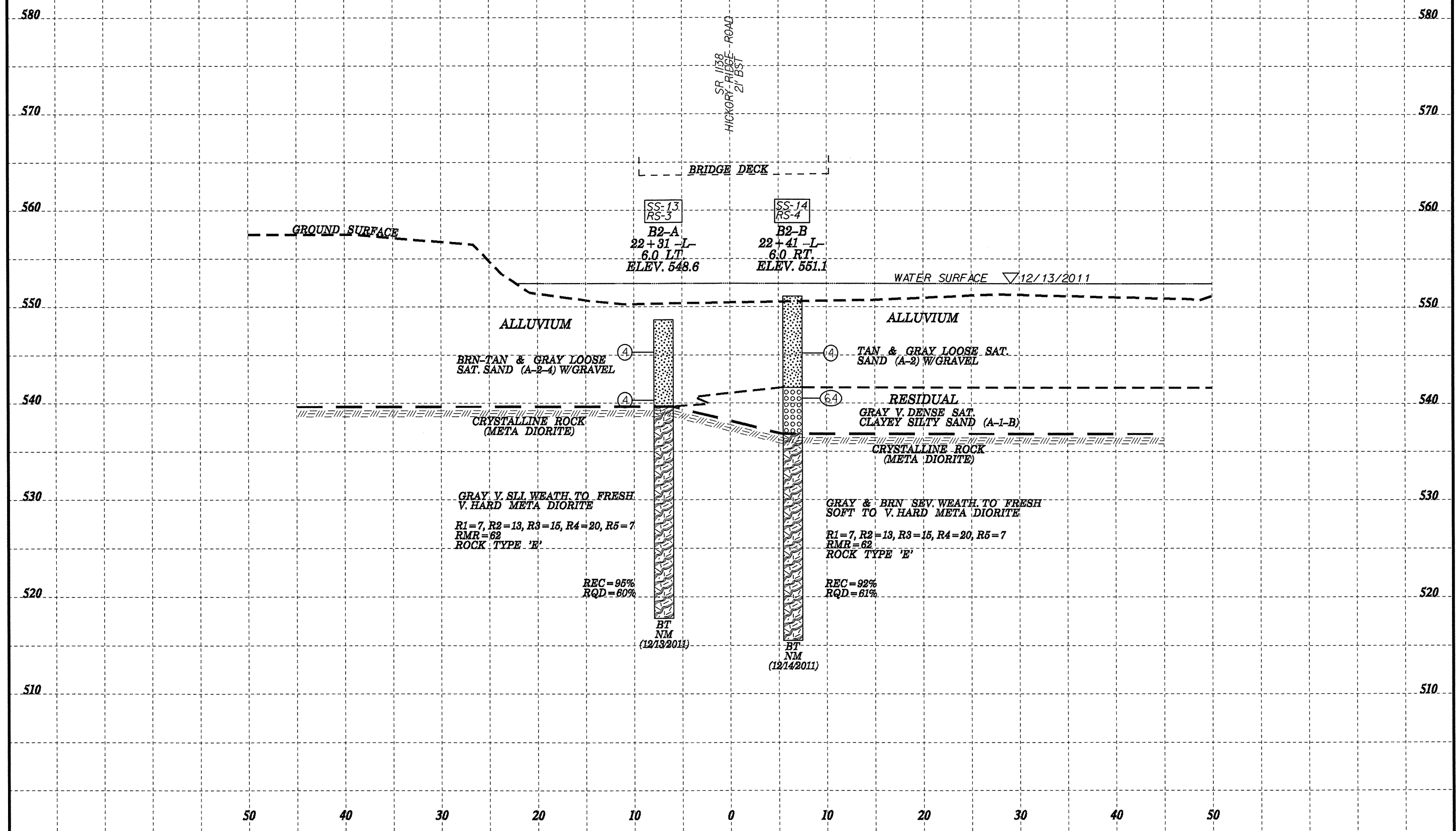


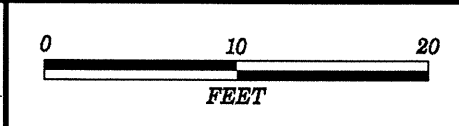
PROJECT REFERENCE NO.	SHEET
38493.1.1 (B-4719)	6
Section thru Bent One Sta. 21+66.44 -L- (W.P. #2) Skew = 75°00'00"	



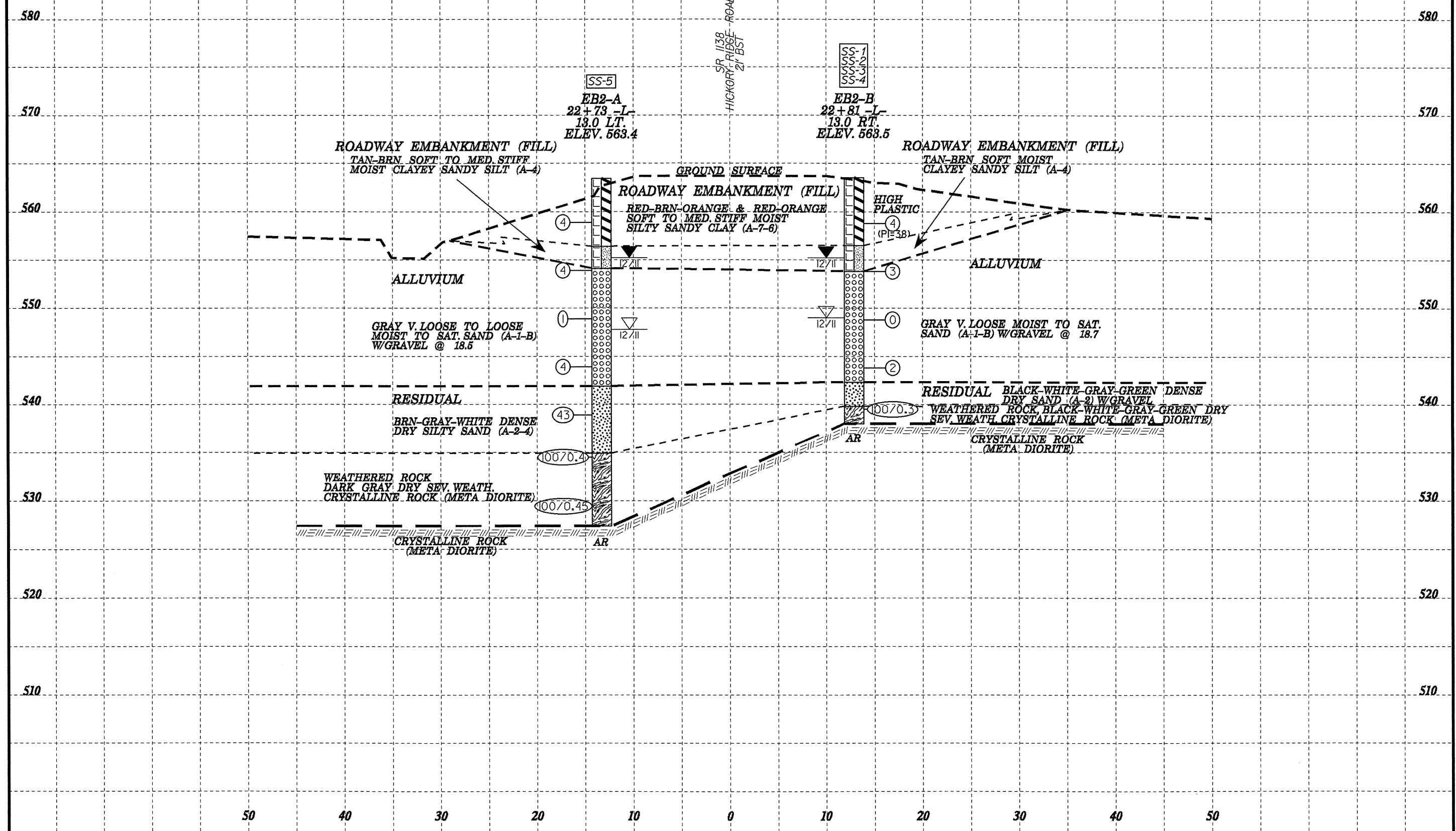


PROJECT REFERENCE NO.	SHEET
38493.1.1 (B-4719)	7
Section thru Bent Two Sta. 22+36.57 -L- (W.P. #3) Skew = 75°00'00"	





PROJECT REFERENCE NO.	SHEET
38493.1.1 (B-4719)	8
Section thru End Bent Two Sta. 22+77.80 -L- (W.P. #4) Skew = 75°00'00"	



WBS 38493.1.1		TIP B-4719		COUNTY CABARRUS		GEOLOGIST Stickney, J. K.										
SITE DESCRIPTION BRIDGE NO. 163 OVER REEDY CREEK ON SR 1138 BETWEEN SR 1229 & SR 1139						GROUND WTR (ft)										
BORING NO. B1-B		STATION 21+71		OFFSET 12 ft RT		ALIGNMENT -L-										
COLLAR ELEV. 563.8 ft		TOTAL DEPTH 50.1 ft		NORTHING 565,304		EASTING 1,515,412										
DRILL RIG/HAMMER EFF./DATE F&R060 CME-55		DRILL METHOD NW Casing W/SPT & Core		HAMMER TYPE Automatic												
DRILLER Contract Driller		START DATE 12/08/11		COMP. DATE 12/09/11		SURFACE WATER DEPTH N/A										
ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT			BLOWS PER FOOT					SAMP. NO.	LOG	SOIL AND ROCK DESCRIPTION	ELEV. (ft)	DEPTH (ft)	
			0.5ft	0.5ft	0.5ft	0	25	50	75	100						
565														563.8	0.0	GROUND SURFACE
560	560.6	3.2	1	1	2							M		555.6	8.2	ROADWAY EMBANKMENT RED-ORANGE-BRN V. LOOSE MOIST CLAYEY SILTY SAND (A-2-4)
555	555.6	8.2	0	1	1							SS-10 M/W		551.8	12.0	ALLUVIAL GRAY V. LOOSE MOIST TO WET LOW (PI=13) PLASTIC SILTY CLAYEY SAND (A-2-6)
550	550.6	13.2	0	0	0							M/W		544.6	19.2	ALLUVIAL GRAY TO BRN-ORANGE-GRAY V. SOFT TO STIFF MOIST TO WET F. SANDY CLAYEY SILT (A-4)
545	545.6	18.2	5	6	8							M		541.8	22.0	RESIDUAL BRN-GRAY-WHITE MED. DENSE MOIST CLAYEY SILTY SAND (A-1)
540	540.6	23.2	100/0.1											540.6	23.2	WEATHERED ROCK BRN-GRAY-WHITE SEV. WEATH. CRYSTALLINE ROCK (META DIORITE)
535														540.5	23.3	CRYSTALLINE ROCK META DIORITE
530														540.5	23.3	CRYSTALLINE ROCK GRAY & GRAY-BRN SEV. WEATH. TO FRESH SOFT TO V. HARD META DIORITE
525												RS-2				
520																
515																
														513.7	50.1	Boring Terminated at Elevation 513.7 ft IN CRYSTALLINE ROCK (META DIORITE)

NCDOT BORE SINGLE B4719_GEO_BH_BRD00163_CABARRUS.GPJ NC_DOT_GDT 1/20/12

WBS 38493.1.1		TIP B-4719		COUNTY CABARRUS		GEOLOGIST Stickney, J. K.						
SITE DESCRIPTION BRIDGE NO. 163 OVER REEDY CREEK ON SR 1138 BETWEEN SR 1229 & SR 1139						GROUND WTR (ft)						
BORING NO. B1-B		STATION 21+71		OFFSET 12 ft RT		ALIGNMENT -L-						
COLLAR ELEV. 563.8 ft		TOTAL DEPTH 50.1 ft		NORTHING 565,304		EASTING 1,515,412						
DRILL RIG/HAMMER EFF./DATE F&R060 CME-55		DRILL METHOD NW Casing W/SPT & Core		HAMMER TYPE Automatic								
DRILLER Contract Driller		START DATE 12/08/11		COMP. DATE 12/09/11		SURFACE WATER DEPTH N/A						
CORE SIZE N				TOTAL RUN 26.8 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) %	RQD (ft) %		REC. (ft) %	RQD (ft) %			
540.5	540.5	23.3	1.8		(1.3)	(0.9)		(21.1)	(11.6)		Begin Coring @ 23.3 ft	23.3
540	538.7	25.1	5.0		(2.5)	(0.0)		79%	43%		CRYSTALLINE ROCK GRAY & GRAY-BRN SEV. WEATH. TO FRESH SOFT TO V. HARD META DIORITE W/ V. CLOSE TO WIDE FRACTURE SPACING. R1=7, R2=8, R3=10, R4=15, R5=7 RMR=47 ROCK TYPE 'E'	
535	533.7	30.1	5.0		(4.8)	(1.7)						
530	528.7	35.1	5.0		(4.9)	(3.1)	RS-2					
525	523.7	40.1	5.0		(3.4)	(1.7)						
520	518.7	45.1	5.0		(4.2)	(4.2)						
515	513.7	50.1										
											Boring Terminated at Elevation 513.7 ft IN CRYSTALLINE ROCK (META DIORITE)	50.1

NCDOT CORE SINGLE B4719_GEO_BH_BRD00163_CABARRUS.GPJ NC_DOT_GDT 1/25/12

WBS 38493.1.1		TIP B-4719		COUNTY CABARRUS		GEOLOGIST Stickney, J. K.										
SITE DESCRIPTION BRIDGE NO. 163 OVER REEDY CREEK ON SR 1138 BETWEEN SR 1229 & SR 1139							GROUND WTR (ft)									
BORING NO. B2-A		STATION 22+31		OFFSET 6 ft LT		ALIGNMENT -L-										
COLLAR ELEV. 548.6 ft		TOTAL DEPTH 30.8 ft		NORTHING 565,364		EASTING 1,515,397										
DRILL RIG/HAMMER EFF./DATE F&R060 CME-55		DRILL METHOD NW Casing W/SPT & Core		HAMMER TYPE Automatic												
DRILLER Contract Driller		START DATE 12/09/11		COMP. DATE 12/12/11		SURFACE WATER DEPTH 0.6ft										
ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT			BLOWS PER FOOT					SAMP. NO.	MOI	LOG	SOIL AND ROCK DESCRIPTION	DEPTH (ft)	
			0.5ft	0.5ft	0.5ft	0	25	50	75	100						
550																548.6
																GROUND SURFACE
	546.3	2.3	4	2	2								Sat.			539.6
545																
	541.3	7.3	1	2	2								Sat.			539.6
540																
535																
530													RS-3			
525																
520																
																517.8
Boring Terminated at Elevation 517.8 ft IN CRYSTALLINE ROCK (META DIORITE)																

NCDOT BORE SINGLE B4719 GEO BH BRDG0163 CABARRUS.GPJ NC_DOT.GDT 1/20/12

WBS 38493.1.1		TIP B-4719		COUNTY CABARRUS		GEOLOGIST Stickney, J. K.						
SITE DESCRIPTION BRIDGE NO. 163 OVER REEDY CREEK ON SR 1138 BETWEEN SR 1229 & SR 1139							GROUND WTR (ft)					
BORING NO. B2-A		STATION 22+31		OFFSET 6 ft LT		ALIGNMENT -L-						
COLLAR ELEV. 548.6 ft		TOTAL DEPTH 30.8 ft		NORTHING 565,364		EASTING 1,515,397						
DRILL RIG/HAMMER EFF./DATE F&R060 CME-55		DRILL METHOD NW Casing W/SPT & Core		HAMMER TYPE Automatic								
DRILLER Contract Driller		START DATE 12/09/11		COMP. DATE 12/12/11		SURFACE WATER DEPTH 0.6ft						
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) %			
539.6	539.6	9.0	1.7		(1.1)	(0.0)		(20.7)	(13.0)			539.6
	537.9	10.7	4.9		65%	0%		95%	60%			9.0
535					(4.9)	(3.1)						
	533.0	15.6	5.1		100%	63%						
	532.8	15.7			(4.9)	(2.1)						
530					96%	41%	RS-3					
	527.8	20.8	5.0		(4.8)	(4.7)						
525					96%	94%						
	522.8	25.8	5.0		(5.0)	(3.1)						
520					100%	62%						
	517.8	30.8										517.8
Boring Terminated at Elevation 517.8 ft IN CRYSTALLINE ROCK (META DIORITE)												

NCDOT BORE SINGLE B4719 GEO BH BRDG0163 CABARRUS.GPJ NC_DOT.GDT 1/25/12

WBS 38493.1.1										TIP B-4719		COUNTY CABARRUS		GEOLOGIST Stickney, J. K.			
SITE DESCRIPTION BRIDGE NO. 163 OVER REEDY CREEK ON SR 1138 BETWEEN SR 1229 & SR 1139										GROUND WTR (ft)							
BORING NO. B2-B		STATION 22+41		OFFSET 6 ft RT		ALIGNMENT -L-		0 HR.		N/A							
COLLAR ELEV. 551.1 ft		TOTAL DEPTH 35.6 ft		NORTHING 565,374		EASTING 1,515,408		24 HR.		N/A							
DRILL RIG/HAMMER EFF./DATE F&R060 CME-55				DRILL METHOD NW Casing W/SPT & Core				HAMMER TYPE Automatic									
DRILLER Contract Driller		START DATE 12/13/12		COMP. DATE 12/13/12		SURFACE WATER DEPTH 0.7ft											
ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT			BLOWS PER FOOT					SAMP. NO.	LOG	SOIL AND ROCK DESCRIPTION	ELEV. (ft)	DEPTH (ft)		
			0.5ft	0.5ft	0.5ft	0	25	50	75	100							
555																	
														551.1	0.0	WATER SURFACE (12/13/12)	
550																GROUND SURFACE	
545	546.2	4.9	2	2	2								Sat.			ALLUVIAL TAN & GRAY LOOSE SAT. SAND (A-2) W/ GRAVEL	
540	541.5	9.6	7	23	41								SS-14			RESIDUAL GRAY V. DENSE SAT. CLAYEY SILTY SAND (A-1-B)	
535																CRYSTALLINE ROCK GRAY & BRN SEV. WEATH. TO FRESH SOFT TO V. HARD META DIORITE	
530																	
525													RS-4				
520																	
														515.5	35.6	Boring Terminated at Elevation 515.5 ft IN CRYSTALLINE ROCK (META DIORITE)	

NCDOT BORE SINGLE B4719 GEO BH BRD0163 CABARRUS.GPJ NC_DOT.GDT 1/20/12

WBS 38493.1.1										TIP B-4719		COUNTY CABARRUS		GEOLOGIST Stickney, J. K.			
SITE DESCRIPTION BRIDGE NO. 163 OVER REEDY CREEK ON SR 1138 BETWEEN SR 1229 & SR 1139										GROUND WTR (ft)							
BORING NO. B2-B		STATION 22+41		OFFSET 6 ft RT		ALIGNMENT -L-		0 HR.		N/A							
COLLAR ELEV. 551.1 ft		TOTAL DEPTH 35.6 ft		NORTHING 565,374		EASTING 1,515,408		24 HR.		N/A							
DRILL RIG/HAMMER EFF./DATE F&R060 CME-55				DRILL METHOD NW Casing W/SPT & Core				HAMMER TYPE Automatic									
DRILLER Contract Driller		START DATE 12/13/12		COMP. DATE 12/13/12		SURFACE WATER DEPTH 0.7ft											
CORE SIZE N					TOTAL RUN 21.3 ft												
ELEV (ft)	RUN ELEV (ft)	DEPTH (ft)	RUN (ft)	DRILL RATE (Min/ft)	RUN		SAMP. NO.	STRATA		LOG	DESCRIPTION AND REMARKS	ELEV. (ft)	DEPTH (ft)				
					REC. (%)	RQD (%)		REC. (%)	RQD (%)								
536.8		14.3	3.8		(2.9)	(0.6)		(19.6)	(13.0)			536.8	14.3				
535	536.8				76%	16%		92%	61%								
	533.0	18.1	4.8		(4.5)	(3.7)											
530					94%	77%											
	528.2	22.9	5.2		(5.2)	(2.8)											
525					100%	54%											
	523.0	28.1	5.0		(4.6)	(3.5)	RS-4										
520					92%	70%											
	518.0	33.1	2.5		(2.4)	(2.4)											
	515.5	35.6			96%	96%						515.5	35.6				

NCDOT CORE SINGLE B4719 GEO BH BRD0163 CABARRUS.GPJ NC_DOT.GDT 1/25/12

WBS 38493.1.1		TIP B-4719		COUNTY CABARRUS		GEOLOGIST Stickney, J. K.												
SITE DESCRIPTION BRIDGE NO. 163 OVER REEDY CREEK ON SR 1138 BETWEEN SR 1229 & SR 1139							GROUND WTR (ft)											
BORING NO. EB2-A		STATION 22+73		OFFSET 13 ft LT		ALIGNMENT -L-												
COLLAR ELEV. 563.4 ft		TOTAL DEPTH 36.0 ft		NORTHING 565,407		EASTING 1,515,391												
DRILL RIG/HAMMER EFF./DATE F&R060 CME-55		DRILL METHOD H.S. Augers		HAMMER TYPE Automatic														
DRILLER Contract Driller		START DATE 12/05/11		COMP. DATE 12/05/11		SURFACE WATER DEPTH N/A												
ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT			BLOWS PER FOOT					SAMP. NO.	MOI	LOG	SOIL AND ROCK DESCRIPTION	DEPTH (ft)			
			0.5ft	0.5ft	0.5ft	0	25	50	75	100								
565																563.4	GROUND SURFACE	0.0
560	559.9	3.5	1	2	2								M			556.4	ROADWAY EMBANKMENT RED-BRN-ORANGE SOFT TO MED. STIFF MOIST SILTY SANDY CLAY (A-7)	7.0
555	554.9	8.5	1	2	2								M			554.1	ROADWAY EMBANKMENT TAN-BRN SOFT TO MED. STIFF MOIST CLAYEY SANDY SILT (A-4)	9.3
550	549.9	13.5	0	0	1								M/W				ALLUVIAL GRAY V. LOOSE TO LOOSE MOIST TO SAT. SAND (A-1-B) W/ GRAVEL @ 18.5	18.5
545	544.9	18.5	1	2	2								Sat.					21.5
540	539.9	23.5	16	20	23								SS-5	D			RESIDUAL BRN-GRAY-WHITE DENSE DRY SILTY SAND (A-2-4)	28.5
535	534.9	28.5	100/0.4										D				WEATHERED ROCK DARK GRAY DRY SEV. WEATH. CRYSTALLINE ROCK (META DIORITE)	28.5
530	529.9	33.5	100/0.45															36.0
Boring Terminated BY AUGER REFUSAL at Elevation 527.4 ft ON CRYSTALLINE ROCK (META DIORITE)																		

NCDOT BORE SINGLE B4719_GEO_BH_BRD0163_CABARRUS.GPJ NC_DOT.GDT 1/20/12

WBS 38493.1.1		TIP B-4719		COUNTY CABARRUS		GEOLOGIST Stickney, J. K.												
SITE DESCRIPTION BRIDGE NO. 163 OVER REEDY CREEK ON SR 1138 BETWEEN SR 1229 & SR 1139							GROUND WTR (ft)											
BORING NO. EB2-B		STATION 22+81		OFFSET 13 ft RT		ALIGNMENT -L-												
COLLAR ELEV. 563.5 ft		TOTAL DEPTH 25.5 ft		NORTHING 565,414		EASTING 1,515,417												
DRILL RIG/HAMMER EFF./DATE F&R060 CME-55		DRILL METHOD H.S. Augers		HAMMER TYPE Automatic														
DRILLER Contract Driller		START DATE 12/05/11		COMP. DATE 12/05/11		SURFACE WATER DEPTH N/A												
ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT			BLOWS PER FOOT					SAMP. NO.	MOI	LOG	SOIL AND ROCK DESCRIPTION	DEPTH (ft)			
			0.5ft	0.5ft	0.5ft	0	25	50	75	100								
565																563.5	GROUND SURFACE	0.0
560	559.8	3.7	1	2	2								SS-1	M			ROADWAY EMBANKMENT RED-ORANGE SOFT TO MED. STIFF MOIST HIGH (PI=38) PLASTIC SILTY SANDY CLAY (A-7-6)	7.0
555	554.8	8.7	1	1	2								SS-2	M			ROADWAY EMBANKMENT TAN-BRN SOFT MOIST CLAYEY SANDY SILT (A-4)	9.7
550	549.8	13.7	0	0	0								SS-3	M/W			ALLUVIAL GRAY V. LOOSE MOIST TO SAT. SAND (A-1-B) W/ GRAVEL @ 18.7	18.7
545	544.8	18.7	0	1	1								SS-4	Sat.				21.2
540	539.8	23.7	100/0.3										D				RESIDUAL BLACK-WHITE-GRAY-GREEN DENSE DRY SAND (A-2) W/ GRAVEL	23.7
Boring Terminated BY AUGER REFUSAL at Elevation 538.0 ft ON CRYSTALLINE ROCK (META DIORITE)																		

NCDOT BORE SINGLE B4719_GEO_BH_BRD0163_CABARRUS.GPJ NC_DOT.GDT 1/20/12

38493.1.1 (B-4719)
CABARRUS COUNTY
BRIDGE NO. 163 OVER REEDY CREEK ON SR 1138 BETWEEN SR 1229 AND SR 1139

CORE PHOTOS



38493.1.1 (B-4719)
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CORE PHOTOS

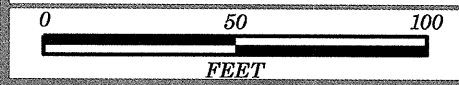


38493.1.1 (B-4719)
CABARRUS COUNTY
BRIDGE NO. 163 OVER REEDY CREEK ON SR 1138 BETWEEN SR 1229 AND SR 1139

CORE PHOTOS



Aerial Photo



NAD 83
NSRS 2007

UNK SIZE & TYPE

-L- STA.21+11.52 +/-
BEGIN BRIDGE

-L- STA.22+76.52 +/-
END BRIDGE

BM #2
-BL- STA 15+00
24' LEFT
ELEV=563.10'

-L- PC Sta. 25+27.62

20

25

REEDY CREEK

TO TIMBER RIDGE RD. SR 1229

N 1° 47' 42.2" E

SR 1138 HICKORY RIDGE ROAD 21' BST

BRIDGE #163
WOOD METAL

N 2° 13' 04.4" W

N 1° 22' 51.5" E

200PR

200PR

TO ROCKY RIVER RD. SR 1139

UNK SIZE & TYPE

UNK SIZE & TYPE

-L- STA.20+99.10 +/-
BEGIN APPROACH SLAB

-L- STA.22+88.67 +/-
END APPROACH SLAB

BL-4

-BL- PINC 15+08.35

-L- STA.20+40.00 BEGIN TIP PROJECT B-4719

REEDY CREEK

-L- STA.23+90.00
END TIP PROJECT B-4719