STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	33783.1.1	1	22

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

STRUCTURE SUBSURFACE INVESTIGATION

PROJ. REFERENCE NO. 33783.1.1 **F.A. PROJ.** BRZ-1323 (1)

COUNTY MONTGOMERY

PROJECT DESCRIPTION BRIDGE #121 OVER DENSONS CREEK ON S.R. 1323 (TROY RD./OKEEWEMEE RD.)

SITE DESCRIPTION –

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CAUTION NOTICE

THE SUBSURFACE INFORMATION AND THE SUBSURFACE INVESTIGATION ON WHICH IT IS BASED WERE MADE FOR THE PURPOSE OF STUDY, PLANNING, AND DESIGN, AND NOT FOR CONSTRUCTION OR PAY PURPOSES. THE VARIOUS FIELD BORING LOGS, ROCK CORES, AND SOIL TEST DATA AVAILABLE MAY BE REVIEWED OR INSPECTED IN RALEIGH BY CONTACTING THE N. C. DEPARTMENT OF TRANSPORTATION, GEOTECHNICAL ENGINEERING UNIT AT (919) 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

T. POPE

T. CALLOWAY

S. ZIRPOLO

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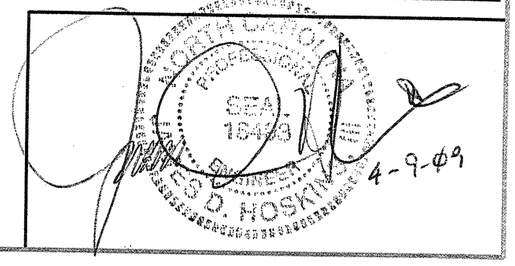
INVESTIGATED BY ECS CAROLINAS, LLP

CHECKED BY JAMES D. HOSKINS, III, P.E.

SUBMITTED BY M. LANDERS

DATE 03/02/2009



DRAWN BY: TAC

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.

ID.B-4582

PROJECT: 33783.1.1

PROJECT REFERENCE NO.	SHEET NO.
33783.1.1	2

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS
GEOTECHNICAL ENGINEERING UNIT

SUBSURFACE INVESTIGATION

SOIL AND ROCK LEGEND, TERMS, SYMBOLS, AND ABBREVIATIONS

SOIL DESCRIPTION

SOIL IS CONSIDERED TO BE THE UNCONSOLIDATED, SEMI-CONSOLIDATED, OR WEATHERED EARTH MATERIALS THAT CAN BE PENETRATED WITH A CONTINUOUS FLIGHT POWER AUGER, AND YIELD LESS THAN 100 BLOWS PER FOOT ACCORDING TO STANDARD PENETRATION TEST (AASHTO T206, ASTM D-1586). SOIL CLASSIFICATION IS BASED ON THE AASHTO SYSTEM. BASIC DESCRIPTIONS GENERALLY SHALL INCLUDE: CONSISTENCY, COLOR, TEXTURE, MOISTURE, AASHTO CLASSIFICATION, AND OTHER PERTINENT FACTORS SUCH AS MINERALOGICAL COMPOSITION, ANGULARITY, STRUCTURE, PLASTICITY, ETC. EXAMPLE:

VERY STIFF, GRAY, SILTY CLAY, MOIST WITH INTERBEDDED FINE SAND LAYERS, HIGHLY PLASTIC, A-7-6

SOIL LEGEND AND AASHTO CLASSIFICATION

GENERAL CLASS.	GRANULAR MATERIALS (≤ 35% PASSING #200)							SILT-CLAY MATERIALS (> 35% PASSING #200)				ORGANIC MATERIALS		
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	
	A-1-a	A-1-b		A-2-4	A-2-5	A-2-6	A-2-7				A-7-5 A-7-6			
SYMBOL														
% PASSING #10 #40 #200	50 MX 30 MX 15 MX	50 MX 25 MX	51 MN 10 MX	35 MX	35 MX	35 MX	35 MX	36 MN	36 MN	36 MN	36 MN	GRANULAR SOILS	SILT-CLAY SOILS	MUCK, PEAT
LIQUID LIMIT PLASTIC INDEX	6 MX		NP	40 MX 10 MX	41 MN 10 MX	40 MX 11 MN	41 MN 11 MN	40 MX 10 MX	41 MN 10 MX	40 MX 11 MN	41 MN 11 MN	SOILS WITH LITTLE OR MODERATE AMOUNTS OF ORGANIC MATTER		HIGHLY ORGANIC SOILS
GROUP INDEX	0		0	0		4 MX		8 MX	12 MX	16 MX	No MX			
USUAL TYPES OF MAJOR MATERIALS	STONE FRAGS. GRAVEL, AND SAND		FINE SAND	SILTY OR CLAYEY GRAVEL AND SAND				SILTY SOILS		CLAYEY SOILS				
GEN. RATING AS A SUBGRADE	EXCELLENT TO GOOD							FAIR TO POOR				FAIR TO POOR	POOR	UNSUITABLE

PI OF A-7-5 SUBGROUP IS ≤ LL - 30 ; PI OF A-7-6 SUBGROUP IS > LL - 30

CONSISTENCY OR DENSENESS

PRIMARY SOIL TYPE	COMPACTNESS OR CONSISTENCY	RANGE OF STANDARD PENETRATION RESISTENCE (N-VALUE)	RANGE OF UNCONFINED COMPRESSIVE STRENGTH ($TONS/FT^2$)
GENERALLY GRANULAR MATERIAL (NON-COHESIVE)	VERY LOOSE LOOSE MEDIUM DENSE DENSE VERY DENSE	<4 4 TO 10 10 TO 30 30 TO 50 >50	N/A
GENERALLY SILT-CLAY MATERIAL (COHESIVE)	VERY SOFT SOFT MEDIUM STIFF STIFF VERY STIFF HARD	<2 2 TO 4 4 TO 8 8 TO 15 15 TO 30 >30	<0.25 0.25 TO 0.50 0.5 TO 1.0 1 TO 2 2 TO 4 >4

TEXTURE OR GRAIN SIZE

U.S. STD. SIEVE SIZE		4	10	40	60	200	270
OPENING (MM)		4.76	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				

SOIL MOISTURE - CORRELATION OF TERMS

SOIL MOISTURE SCALE (ATTERBERG LIMITS)	FIELD MOISTURE DESCRIPTION	GUIDE FOR FIELD MOISTURE DESCRIPTION
	- SATURATED - (SAT.)	USUALLY LIQUID; VERY WET, USUALLY FROM BELOW THE GROUND WATER TABLE
LL — LIQUID LIMIT		
PLASTIC RANGE (PI)	- WET - (W)	SEMISOLID; REQUIRES DRYING TO ATTAIN OPTIMUM MOISTURE
PL — PLASTIC LIMIT		
OM — OPTIMUM MOISTURE	- MOIST - (M)	SOLID; AT OR NEAR OPTIMUM MOISTURE
SL — SHRINKAGE LIMIT		
	- DRY - (D)	REQUIRES ADDITIONAL WATER TO ATTAIN OPTIMUM MOISTURE

PLASTICITY

	PLASTICITY INDEX (PI)	DRY STRENGTH
NONPLASTIC	0-5	VERY LOW
LOW PLASTICITY	6-15	SLIGHT
MED. PLASTICITY	16-25	MEDIUM
HIGH PLASTICITY	26 OR MORE	HIGH

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.

GRADATION

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: ANGULAR, SUBANGULAR, SUBROUNDED, OR ROUNDED.

MINERALOGICAL COMPOSITION

MINERAL NAMES SUCH AS QUARTZ, FELDSPAR, MICA, TALC, KAOLIN, ETC. ARE USED IN DESCRIPTIONS WHENEVER THEY ARE CONSIDERED OF SIGNIFICANCE.

COMPRESSIBILITY

SLIGHTLY COMPRESSIBLE	LIQUID LIMIT LESS THAN 31
MODERATELY COMPRESSIBLE	LIQUID LIMIT EQUAL TO 31-50
HIGHLY COMPRESSIBLE	LIQUID LIMIT GREATER THAN 50

PERCENTAGE OF MATERIAL

ORGANIC MATERIAL	GRANULAR SOILS	SILT - CLAY SOILS
TRACE OF ORGANIC MATTER	2 - 3%	3 - 5%
LITTLE ORGANIC MATTER	3 - 5%	5 - 12%
MODERATELY ORGANIC	5 - 10%	12 - 20%
HIGHLY ORGANIC	>10%	>20%

OTHER MATERIAL	
TRACE	1 - 10%
LITTLE	10 - 20%
SOME	20 - 35%
HIGHLY	35% AND ABOVE

GROUND WATER

- WATER LEVEL IN BORE HOLE IMMEDIATELY AFTER DRILLING
- STATIC WATER LEVEL AFTER 24 HOURS
- PW — PERCHED WATER, SATURATED ZONE, OR WATER BEARING STRATA
- SPRING OR SEEP

MISCELLANEOUS SYMBOLS

- ROADWAY EMBANKMENT (RE) WITH SOIL DESCRIPTION
- SOIL SYMBOL
- ARTIFICIAL FILL (AF) OTHER THAN ROADWAY EMBANKMENT
- INFERRED SOIL BOUNDARY
- INFERRED ROCK LINE
- ALLUVIAL SOIL BOUNDARY
- 25/025 — DIP & DIP DIRECTION OF ROCK STRUCTURES
- SOUNDING ROD
- SPT CPT DPT DMT VST PMT — TEST BORING
- AUGER BORING
- CORE BORING
- MW — MONITORING WELL
- PIEZOMETER INSTALLATION
- SLOPE INDICATOR INSTALLATION
- SPT N-VALUE
- REF — SPT REFUSAL

SAMPLE DESIGNATIONS

- S - BULK SAMPLE
- SS - SPLIT SPOON SAMPLE
- ST - SHELBY TUBE SAMPLE
- RS - ROCK SAMPLE
- RT - RECOMPACTED TRIAXIAL SAMPLE
- CBR - CALIFORNIA BEARING RATIO SAMPLE

ABBREVIATIONS

AR - AUGER REFUSAL
BT - BORING TERMINATED
CL. - CLAY
CPT - CONE PENETRATION TEST
CSE. - COARSE
DMT - DILATOMETER TEST
DPT - DYNAMIC PENETRATION TEST
e - 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 - MOISTURE CONTENT
v - VERY
VST - VANE SHEAR TEST
WEA. - WEATHERED
γ - UNIT WEIGHT
γ_d - DRY UNIT WEIGHT

EQUIPMENT USED ON SUBJECT PROJECT

DRILL UNITS:
- [ ] MOBILE B-__
- [ ] BK-51
- [ ] CME-45C
- [X] CME-55
- [ ] PORTABLE HOIST
- [ ] _____
- [ ] _____

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
- [X] 2.25" HOLLOW AUGERS

HAMMER TYPE:
- [X] AUTOMATIC
- [ ] MANUAL

CORE SIZE:
- [ ] -B____
- [ ] -N____
- [ ] -H O

HAND TOOLS:
- [ ] POST HOLE DIGGER
- [ ] HAND AUGER
- [ ] SOUNDING ROD
- [ ] VANE SHEAR TEST
- [ ] _____

ROCK DESCRIPTION

HARD ROCK IS NON-COASTAL PLAIN MATERIAL THAT IF TESTED, WOULD YIELD SPT REFUSAL, AN INFERRED ROCK LINE INDICATES THE LEVEL AT WHICH NON-COASTAL PLAIN MATERIAL WOULD YIELD SPT REFUSAL. SPT REFUSAL IS PENETRATION BY A SPLIT SPOON SAMPLER EQUAL TO OR LESS THAN 0.1 FOOT PER 60 BLOWS. IN NON-COASTAL PLAIN MATERIAL, THE TRANSITION BETWEEN SOIL AND ROCK IS OFTEN REPRESENTED BY A ZONE OF WEATHERED ROCK.
ROCK MATERIALS ARE TYPICALLY DIVIDED AS FOLLOWS:

WEATHERED ROCK (WR)	NON-COASTAL PLAIN MATERIAL THAT WOULD YIELD SPT N VALUES > 100 BLOWS PER FOOT IF TESTED.
CRYSTALLINE ROCK (CR)	FINE TO COARSE GRAIN IGNEOUS AND METAMORPHIC ROCK THAT WOULD YIELD SPT REFUSAL IF TESTED. ROCK TYPE INCLUDES GRANITE, GNEISS, GABBRO, SCHIST, ETC.
NON-CRYSTALLINE ROCK (NCR)	FINE TO COARSE GRAIN METAMORPHIC AND NON-COASTAL PLAIN SEDIMENTARY ROCK THAT WOULD YEILD SPT REFUSAL IF TESTED. ROCK TYPE INCLUDES PHYLLITE, SLATE, SANDSTONE, ETC.
COASTAL PLAIN SEDIMENTARY ROCK (CP)	COASTAL PLAIN SEDIMENTS CEMENTED INTO ROCK, BUT MAY NOT YIELD SPT REFUSAL. ROCK TYPE INCLUDES LIMESTONE, SANDSTONE, CEMENTED SHELL BEDS, ETC.

WEATHERING

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. *IF TESTED, WOULD YIELD SPT REFUSAL*
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. *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.

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 0.25 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.

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

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.

TERMS AND DEFINITIONS

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 (RQD) - A MEASURE OF ROCK QUALITY DESCRIBED BY TOTAL LENGTH OF ROCK SEGMENTS EQUAL TO OR GREATER THAN 4 INCHES DIVIDED BY THE TOTAL LENGTH OF CORE RUN AND EXPRESSED AS A PERCENTAGE.

SAPROLITE (SAP.) - RESIDUAL SOIL THAT RETAINS THE RELIC STRUCTURE OR FABRIC OF THE PARENT ROCK.

SILL - AN INTRUSIVE BODY OF IGNEOUS ROCK OF APPROXIMATELY UNIFORM THICKNESS AND RELATIVELY THIN COMPARED WITH ITS LATERAL EXTENT, THAT HAS BEEN EMPLACED PARALLEL TO THE BEDDING OR SCHISTOSITY OF THE INTRUDED ROCKS.

SLICKENSIDE - POLISHED AND STRIATED SURFACE THAT RESULTS FROM FRICTION ALONG A FAULT OR SLIP PLANE.

STANDARD PENETRATION TEST (PENETRATION RESISTANCE) (SPT) - NUMBER OF BLOWS (N 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 (SRQD) - 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.

BENCH MARK: BL-4 OFF OF S.R. 1323 (TROY RD./OKEEWEMEE RD.)

ELEVATION: 434.47 FT.

NOTES:
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REVISED 02/23/06

PROJECT NO. 33783.1.1	TIP NO. B-4582	
F.A.N. BRZ-1323 (1)		
DATE: 03/02/2009	SCALE: 1" = 2000'	
DRAWN BY: TAC	CHECKED BY/DATE: MWL 03/02/09	DRAWING NO. 3

ECS LLP
CAROLINAS

SITE LOCATION MAP

BRIDGE NO. 121 OVER DENSONS CREEK
ON S.R. 1323 (TROY RD./OKEEWEMEE RD.
STATE PROJECT NO. 33783.1.1
TIP NO. B-4582
MONTGOMERY COUNTY, NORTH CAROLINA

DAVID SINGLETON
DB 257 PG 10

ABAND
WATER STATION
FRAME SHED
CONC
PUMP STATION
NAIL IN BASE
OF TREE
TOP = 418.14'
CONC. DAM
ABAND WATER VALVE
BRICK END
WALL ABAND
N 41°00'52" E
119.00'
CONC DITCH
12" CMP
DIRECTIONAL ONLY
END OF PIPE N/A
SUCK BRANCH
DENSON'S CREEEK
PROPOSED GUARDRAIL
N 41°00'52" E
20.08'
RR SPIKE
EIP
12' SOIL DR
EB1-A
GRAU 350'
B1-A
EB2-A
N 69° 48' 23.0" E
PK NAIL
16+00
17+00
20+00
NAIL & CAP
GRAU 350'
18" RCP
EIP
EB1-B
CONC WW
B1-B
EB2-B
BRIDGE SEAT
ELEV = 431.52'
STEPS
OKEEWEMEE ROAD
GRAU 350'
WOODS
DIRECTIONAL ONLY
END OF PIPE N/A
PROPOSED
LIMITS OF CONSTRUCTION
PROPOSED GUARDRAIL
TYPE III (TYP.)
WOODS
12' APPROACH SLAB
BRIDGE # 121
STEEL, CONC, & WOOD
WITH PAVED DECK
12' APPROACH SLAB
HIGH WATER MARK
ELEV = 419.98'
AS DETERMINED BY
FIELD CREW 8-09-07
BEGIN BRIDGE
-L- STA. 16+35.00
END BRIDGE
-L- STA. 18+00.00
WOODS
CONSERVATION EASEMENT
DB 415 PG 722
S 14°29'
485.9'
3011 0.00
3010 0.00
3013 0.00
3012 0.00
3009 0.00
3008 0.00
3007 0.00
3006 0.00
3005 0.00
3004 0.00

SCALE (IN FEET)
20 40
40 0

PROJECT NO.: 33783.1.1	TIP NO.: B-4582
F.A.N.: BRZ-1323 (1)	
DATE: 03/02/2009	SCALE: 1" = 40'
DRAWN BY: TAC	CHECKED BY/DATE:
DRAWING NO.: 4	

ECS LLP
CAROLINAS

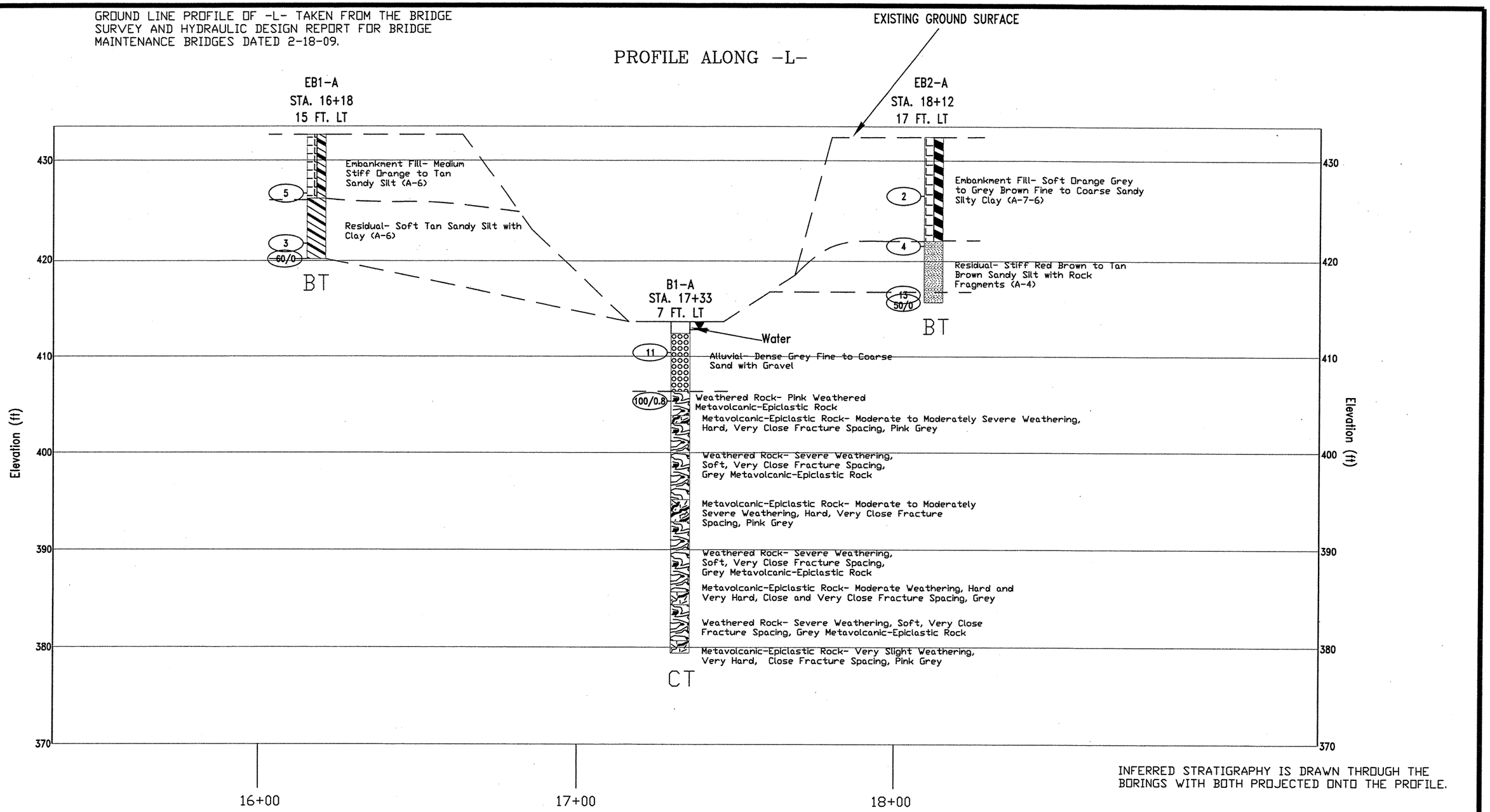
BORING LOCATION DIAGRAM

BRIDGE NO. 121 OVER DENSONS CREEK ON S.R. 1323
(TROY RD./OKEEWEMEE RD.)

MONTGOMERY COUNTY, NORTH CAROLINA

GROUND LINE PROFILE OF -L- TAKEN FROM THE BRIDGE SURVEY AND HYDRAULIC DESIGN REPORT FOR BRIDGE MAINTENANCE BRIDGES DATED 2-18-09.

PROFILE ALONG -L-



INFERRED STRATIGRAPHY IS DRAWN THROUGH THE BORINGS WITH BOTH PROJECTED ONTO THE PROFILE.

SCALE (HORIZONTAL)
15 30
30 0

SCALE (VERTICAL)
5 10
10 0

PROJECT NO. 33783.1.1	TIP NO. B-4582
F.A. NO. BRZ-1323 (1)	
DATE: 03/02/2009	SCALE:
DRAWN BY: TAC	CHECKED BY/DATE:
DRAWING NO. 5	

ECS LLP
CAROLINAS

PROFILE ALONG -L-

BRIDGE NO. 121 OVER DENSONS CREEK ON S.R. 1323 (TROY RD./OKEEWEMEE RD.)

MONTGOMERY, NORTH CAROLINA

PROFILE ALONG -L-

Ground Surface

EB1-B
STA. 16+18
18 FT. RT

4 — Residual- Soft Orange to Tan Sandy Silt (A-6)

4 — Residual- Soft Tan Sandy Silt with Rock Fragments and Clay (A-6)

100/0.9
60/0 — BT Weathered Rock- Tan Weathered Metavolcanic-Epiclastic Rock

B1-B
STA. 17+33
7 FT. RT

Water

25 — Alluvial- Medium Dense Grey Fine to Coarse Sand with Gravel (A-1-a)

Weathered Rock- White Pink Weathered Metavolcanic-Epiclastic Rock

100/0.8 — Crystalline Rock- Slight to Moderate Weathering, Hard to Moderately Hard, Very Close Fracture Spacing, Pink Grey Metavolcanic-Epiclastic Rock

Weathered Rock-Severe Weathering, Soft, Very Close fracture Spacing, Grey Metavolcanic-Epiclastic Rock

Crystalline Rock- Moderate Weathering, Hard, Close and Very Close Fracture Spacing, Grey Metavolcanic-Epiclastic Rock

Weathered Rock-Severe Weathering, Soft, Very Close fracture Spacing, Grey Metavolcanic-Epiclastic Rock

Crystalline Rock- Moderate Weathering, Hard, Close and Very Close Fracture Spacing, Pink Grey Metavolcanic-Epiclastic Rock

Weathered Rock-Severe Weathering, Soft, Very Close fracture Spacing, Grey Metavolcanic-Epiclastic Rock

Crystalline Rock- Moderate Weathering, Hard, Close and Very Close Fracture Spacing, Pink Grey Metavolcanic-Epiclastic Rock

CT

EB2-B
STA. 18+11.2
18 FT. RT

6 — Embankment Fill- Medium Stiff Orange Grey Fine to Coarse Sandy Silty Clay (A-7-6)

8 — Residual- Hard Tan Sandy Silt with Weathered Rock Fragments (A_4)

79
50/0 — BT

Elevation (ft): 430, 420, 410, 400, 390, 380, 370

16+00 | 17+00 | 18+00

GROUND LINE PROFILE OF -L- TAKEN FROM THE BRIDGE SURVEY AND HYDRAULIC DESIGN REPORT FOR BRIDGE MAINTENANCE BRIDGES DATED 2-18-09.

INFERRED STRATIGRAPHY IS DRAWN THROUGH THE BORINGS WITH BOTH PROJECTED ONTO THE PROFILE.

SCALE (HORIZONTAL): 10, 20, 20, 0

SCALE (VERTICAL): 5, 10, 10, 0

PROJECT NO.: 33783.1.1	TIP NO.: B-4582
F.A. NO.: BRZ-1323 (1)	
DATE: 03/02/2009	SCALE:
DRAWN BY: TAC	CHECKED BY/DATE:
DRAWING NO.: 6	

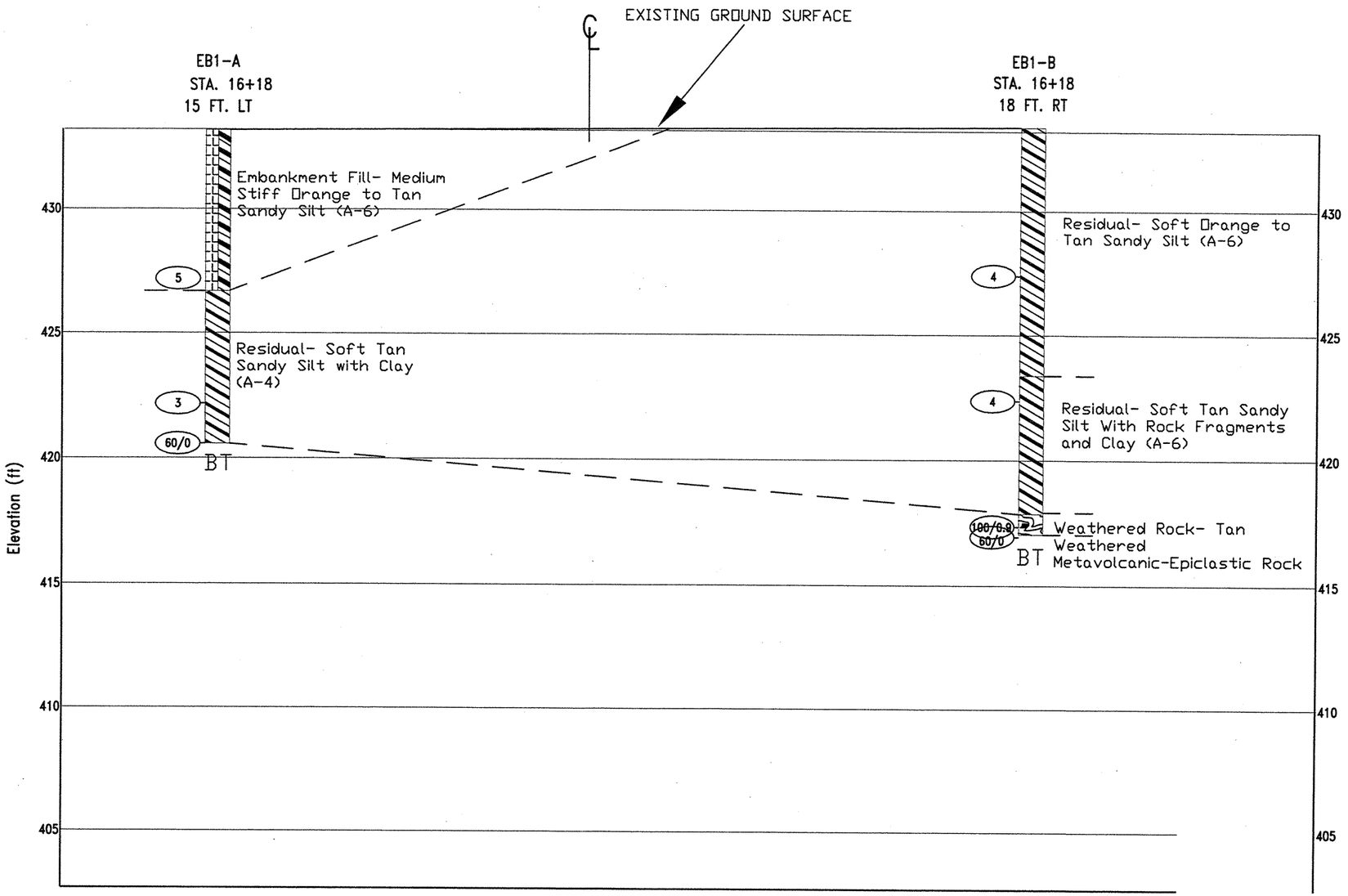
ECS LLP CAROLINAS

PROFILE ALONG -L-

BRIDGE NO. 121 OVER DENSONS CREEK ON S.R. 1323 (TROY RD./OKEEWEMEE RD.)

MONTGOMERY, NORTH CAROLINA

SECTION THROUGH END BENT-1 ON -L-



SCALE (HORIZONTAL)
2.5 5
5 0

SCALE (VERTICAL)
2.5 5
5 0

PROJECT NO. 33783.1.1	TIP NO. B-4582
F.A. NO. BRZ-1323 (1)	
DATE: 03/02/2009	SCALE:
DRAWN BY: TAC	CHECKED BY/DATE:
DRAWING NO. 7	

ECS LLP
CAROLINAS

SECTION THROUGH END BENT-1

BRIDGE NO. 121 OVER DENSONS CREEK ON
S.R. 1323 (TROY RD./OKEEWEMEE RD.)

MONTGOMERY, NORTH CAROLINA

SECTION THROUGH BENT–1 ON –L–

(3) Crystalline Rock- Slight to Moderate Weathering, Hard to Moderately Hard, Very Close Fracture Spacing, Pink Grey Metavolcanic-Epiclastic Rock

(5) Crystalline Rock- Moderate Weathering, Hard, Close and Very Close Fracture Spacing, Grey Metavolcanic-Epiclastic Rock

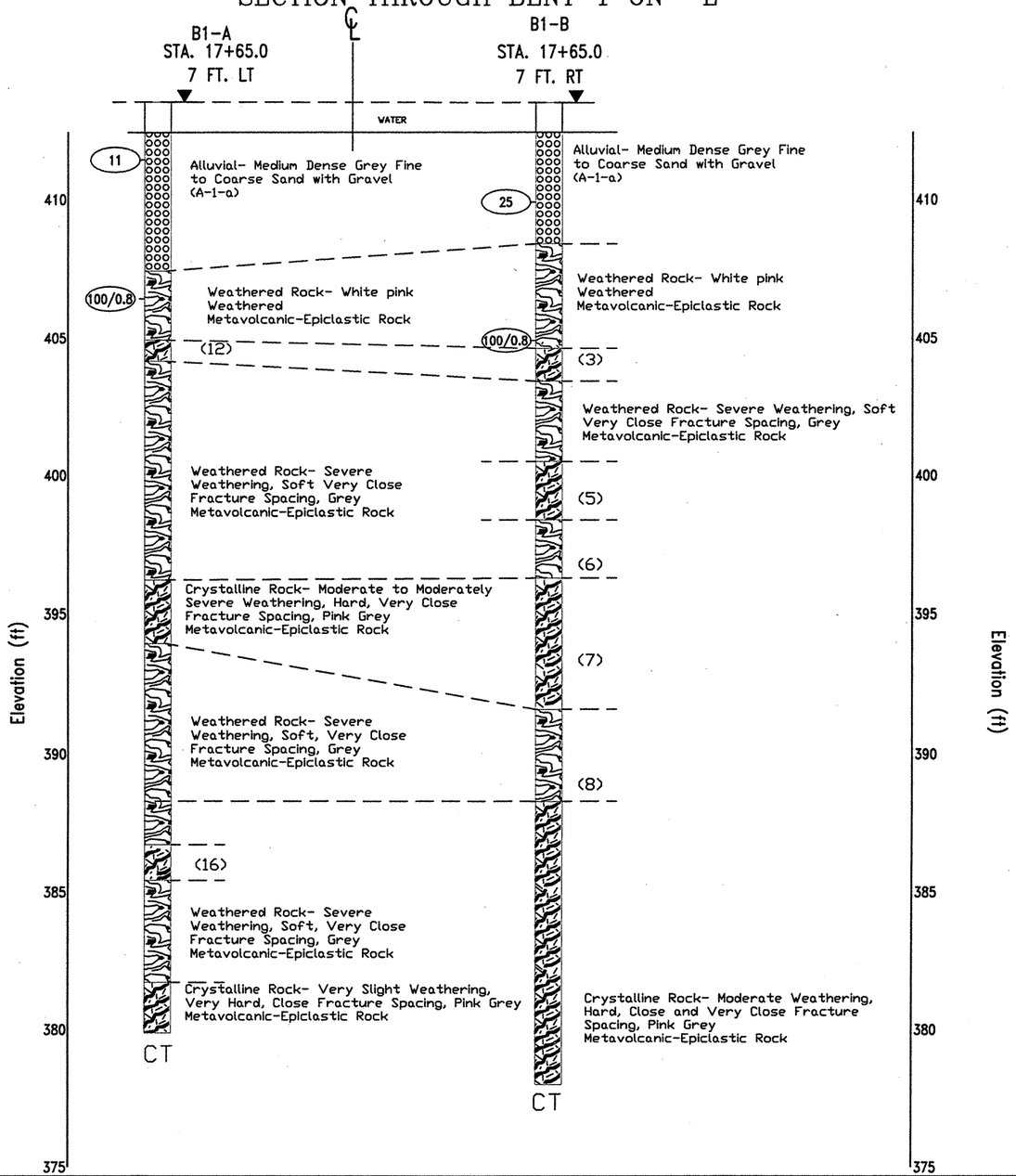
(6) Weathered Rock- Severe Weathering, Soft Very Close Fracture Spacing, Grey Metavolcanic-Epiclastic Rock

(7) Crystalline Rock- Moderate Weathering, Hard, Close and Very Close Fracture Spacing, Pink Grey Metavolcanic-Epiclastic Rock

(8) Weathered Rock- Severe Weathering, Soft Very Close Fracture Spacing, Grey Metavolcanic-Epiclastic Rock

(12) Crystalline Rock- Moderate to Moderately Severe Weathering, Hard, Very Close Fracture Spacing, Pink Grey Metavolcanic-Epiclastic Rock

(16) Crystalline Rock- Moderate Weathering, Hard and Very Hard, Close and Very Close Fracture Spacing, Pink Grey Metavolcanic-Epiclastic Rock



SCALE (HORIZONTAL)
2.5 5
5 0

SCALE (VERTICAL)
2.5 5
5 0

PROJECT NO. 33783.1.1	TIP NO. B-4582
F.A. NO. BRZ-1323 (1)	
DATE: 03/02/2009	SCALE:
DRAWN BY: TAC	CHECKED BY/DATE:
DRAWING NO. 8	

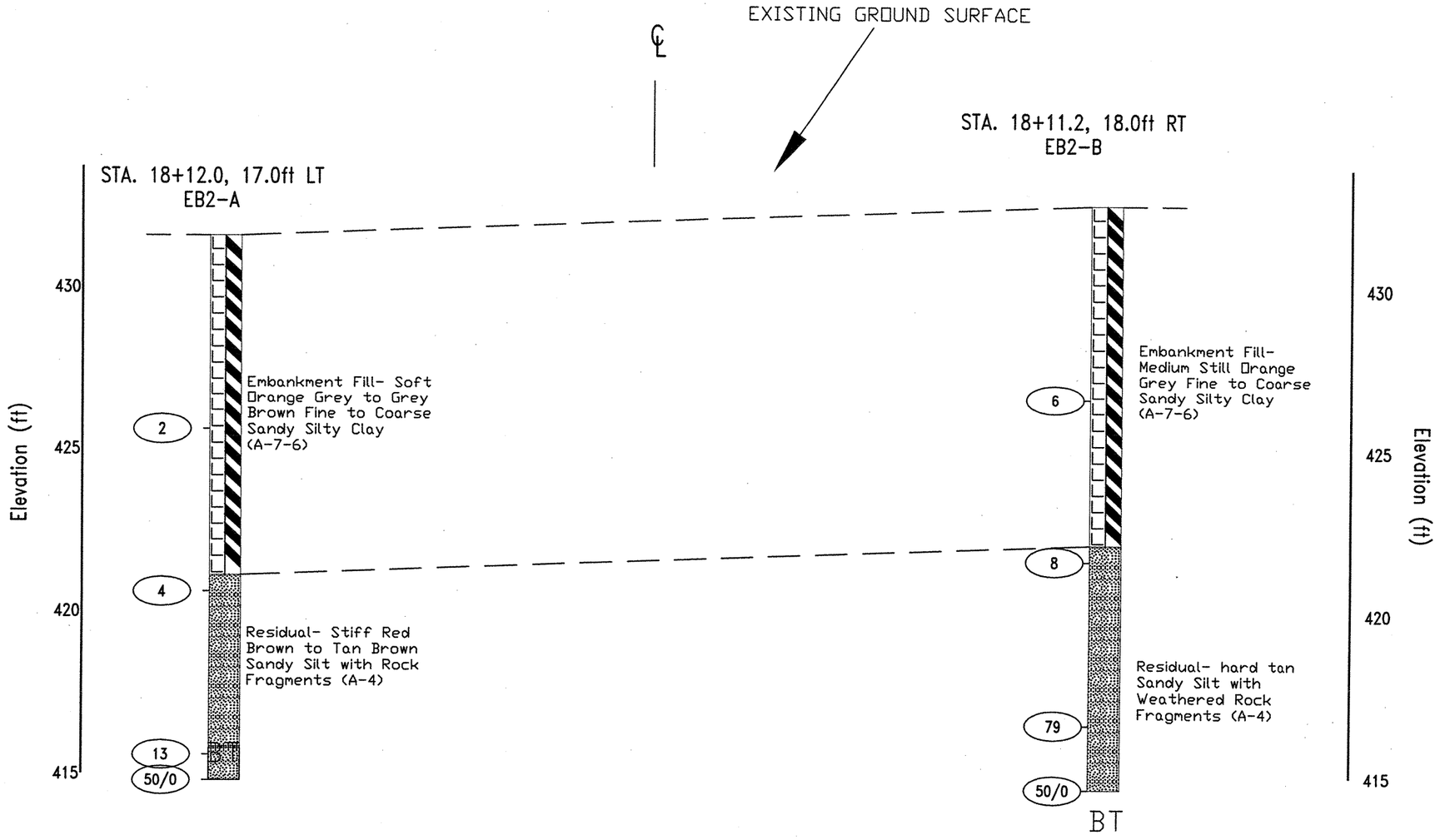
ECS LLP
CAROLINAS

SECTION THROUGH BENT–1 ON –L–

BRIDGE NO. 121 OVER DENSONS CREEK ON S.R. 1323 (TROY RD./OKEEWEMEE RD.)

MONTGOMERY, NORTH CAROLINA

SECTION THROUGH END BENT-2 ON -L-



SCALE (HORIZONTAL)
2.5 5
5 0

SCALE (VERTICAL)
2.5 5
5 0

PROJECT NO. 33783.1.1	TIP NO.: B-4582
F.A. NO.: BRZ-1323 (1)	
DATE: 03/02/2009	SCALE:
DRAWN BY: TAC	CHECKED BY/DATE:
DRAWING NO. 9	

ECS LLP
CAROLINAS

SECTION THROUGH END BENT-2

BRIDGE NO. 121 OVER DENSONS CREEK ON S.R. 1323 (TROY RD./OKEEWEMEE RD.)

MONTGOMERY, NORTH CAROLINA

N.C.D.O.T. GEOTECHNICAL UNIT
BORING LOG

SHEET 1 OF 1

PROJECT NO. 33783.1.1	**ID.** B-4582	**COUNTY** Montgomery	**GEOLOGIST** B. KOLERA
SITE DESCRIPTION Bridge #121 over Denson's Creek on SR 1323 (Troy Rd./Okeewemee Rd.)			**GROUND WATER (ft)**
BORING NO. EB1-A	**STATION** 16+18	**OFFSET** 15ft LT	**ALIGNMENT** -L-	**0 HR.** Dry
COLLAR ELEV. 433.5 ft	**NORTHING** 596,901	**EASTING** 1,741,184.		**24 HR.** Dry
TOTAL DEPTH 12.6 ft	**DRILL MACHINE** CME 55	**DRILL METHOD** HSA	**HAMMER TYPE** Automatic	
DATE STARTED 2/16/09	**COMPLETED** 2/16/09	**SURFACE WATER DEPTH** N/A	**DEPTH TO ROCK**	

ELEV. (ft)	DEPTH (ft)	BLOW COUNT 0.5ft	0.5ft	0.5ft	BLOWS PER FOOT 0 20 40 60 80 100	SAMP. NO.	MOI	LOG	SOIL AND ROCK DESCRIPTION
433.5									433.5 0.00
428.5	5.0						M		Embankment Fill- Medium Stiff Orange to Tan Sandy Silt (A-7-6)
		1	2	3	5				
423.5	10.0						M		427.0 6.5 Residual- Soft Tan Sandy Silt with Clay (A-6)
		1	2	1	3				
420.9	12.6				60/0.0				420.9 12.6
		60/0.0					D		Boring Terminated with Standard Penetration Test Refusal at Elevation 420.9 ft On Crystalline Rock

NCDOT BORE SINGLE 17061_GINT.GPJ NC_DOT.GDT 4/8/09

N.C.D.O.T. GEOTECHNICAL UNIT
BORING LOG

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SHEET 1 OF 1

PROJECT NO. 33783.1.1	**ID.** B-4582	**COUNTY** Montgomery	**GEOLOGIST** B. KOLERA
SITE DESCRIPTION Bridge #121 over Denson's Creek on SR 1323 (Troy Rd./Okeewemee Rd.)			**GROUND WATER (ft)**
BORING NO. EB-1B	**STATION** 16+18	**OFFSET** 18ft RT	**ALIGNMENT** -L-	**0 HR.** Dry
COLLAR ELEV. 433.7 ft	**NORTHING** 596,870.	**EASTING** 1,741,195		**24 HR.** Dry
TOTAL DEPTH 16.3 ft	**DRILL MACHINE** CME 55	**DRILL METHOD** HSA	**HAMMER TYPE** Automatic	
DATE STARTED 2/16/09	**COMPLETED** 2/16/09	**SURFACE WATER DEPTH** N/A	**DEPTH TO ROCK**	

ELEV. (ft)	DEPTH (ft)	BLOW COUNT 0.5ft	0.5ft	0.5ft	BLOWS PER FOOT 0 20 40 60 80 100	SAMP. NO.	MOI	LOG	SOIL AND ROCK DESCRIPTION
433.7									433.7 0.00
428.7	5.0						M		Residual-Soft Orange to Tan Sandy Silt (A-6)
		2	2	2	4				
423.7	10.0						M		423.7 10.0 Residual-Soft Tan Sandy Silt with Rock Fragments and Clay (A-6)
		5	2	2	4	SS-1			
418.7	15.0						M		418.2 15.5
417.4	16.3	7	11	89/0.4	100/0.9 60/0.0				417.4 16.3 Weathered Rock-Tan Weathered Metavolcanic-Epiclastic Rock
		60/0.0					D		Boring Terminated with Standard Penetration Test Refusal at Elevation 417.4 ft On Crystalline Rock

NCDOT BORE SINGLE 17061_GINT.GPJ NC_DOT.GDT 4/8/09

N.C.D.O.T. GEOTECHNICAL UNIT

BORING LOG

SHEET 1 OF 1

PROJECT NO. 33783.1.1	**ID.** B-4582	**COUNTY** Montgomery	**GEOLOGIST** B. KOLERA
SITE DESCRIPTION Bridge #121 over Denson's Creek on SR 1323 (Troy Rd./Okeewemee Rd.)			**GROUND WATER (ft)**
BORING NO. B1-A	**STATION** 17+33	**OFFSET** 7ft LT	**ALIGNMENT** -L-	**0 HR.** N/A
COLLAR ELEV. 412.4 ft	**NORTHING** 596,930	**EASTING** 1,741,296		**24 HR.** N/A
TOTAL DEPTH 33.0 ft	**DRILL MACHINE** CME 55	**DRILL METHOD** Wash/NQ	**HAMMER TYPE** Automatic
DATE STARTED 2/18/09	**COMPLETED** 2/18/09	**SURFACE WATER DEPTH** 1.0	**DEPTH TO ROCK** 8.5 ft

ELEV. (ft)	DEPTH (ft)	BLOW COUNT 0.5ft	0.5ft	0.5ft	BLOWS PER FOOT 0 20 40 60 80 100	SAMP. NO.	MOI	LOG	SOIL AND ROCK DESCRIPTION
413.4					Water Surface				
					Creek Bed				
411.4	1.0								412.4 — 0.00
		6	6	5	11	SS-2	Sat.		Alluvial-Medium Dense Grey Fine to Coarse Sand with Gravel (A-1a)
406.4	6.0								406.4 — 6.0
		13	39	61/0.3	100/0.8		W		Weathered Rock-Pink Weathered Metavolcanic-Epiclastic Rock
									403.9 — 8.5
									403.1 — 9.3 Crystalline Rock-Moderate to Moderately Severe Weathering, Hard, Very Close Fracture Spacing, Pink Grey Metavolcanic-Epiclastic Rock
									Weathered Rock-Severe Weathering, Soft, Very Close Fracture Spacing, Grey Metavolcanic-Epiclastic Rock
									395.2 — 17.2
									392.9 — 19.5 Crystalline Rock-Moderate to Moderately Severe Weathering, Hard, Very Close Fracture Spacing, Pink Grey Metavolcanic-Epiclastic Rock
									Weathered Rock-Severe Weathering, Soft, Very Close Fracture Spacing, Grey Metavolcanic-Epiclastic Rock
									385.7 — 26.7
									384.4 — 28.0 Crystalline Rock-Moderate Weathering, Hard and Very Hard, Close and Very Close Fracture Spacing, Pink Grey Metavolcanic-Epiclastic Rock
									380.7 — 31.7
									379.4 — 33.0 Weathered Rock-Severe Weathering, Soft, Very Close Fracture Spacing, Grey Metavolcanic-Epiclastic Rock
									Crystalline Rock-Very Slight Weathering, Very Hard, Close Fracture Spacing, Pink Grey Metavolcanic-Epiclastic Rock
									Boring Terminated at Elevation 379.4 ft In Metavolcanic-Epiclastic Crystalline Rock

NCDOT BORE SINGLE 17061_GINT.GPJ NC_DOT.GDT 4/8/09

N.C.D.O.T. GEOTECHNICAL UNIT

CORE BORING REPORT

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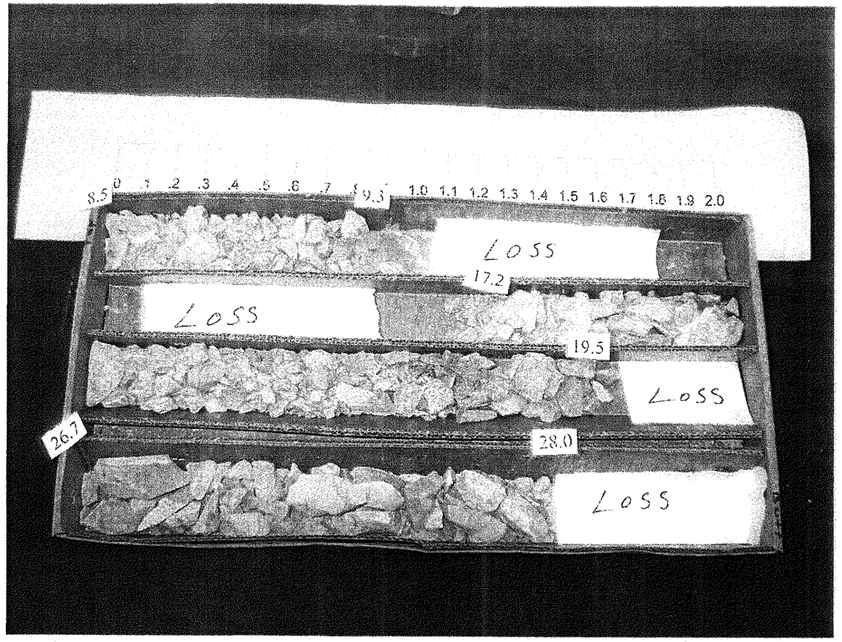
SHEET 1 OF 1

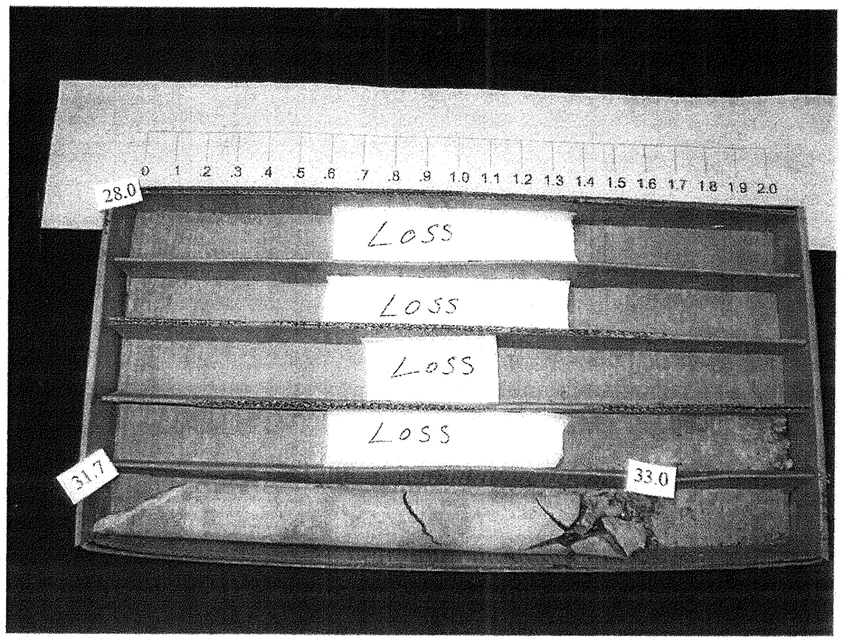
PROJECT NO. 33783.1.1	**ID.** B-4582	**COUNTY** Montgomery	**GEOLOGIST** B. KOLERA
SITE DESCRIPTION Bridge #121 over Denson's Creek on SR 1323 (Troy Rd./Okeewemee Rd.)			**GROUND WATER (ft)**
BORING NO. B1-A	**STATION** 17+33	**OFFSET** 7ft LT	**ALIGNMENT** -L-	**0 HR.** N/A
COLLAR ELEV. 412.4 ft	**NORTHING** 596,930	**EASTING** 1,741,296		**24 HR.** N/A
TOTAL DEPTH 33.0 ft	**DRILL MACHINE** CME 55	**DRILL METHOD** Wash/NQ	**HAMMER TYPE** Automatic
DATE STARTED 2/18/09	**COMPLETED** 2/18/09	**SURFACE WATER DEPTH** 1.0	**DEPTH TO ROCK** 8.5 ft
CORE SIZE NQ	**TOTAL RUN** 24.5 ft	**DRILLER** Contract	

ELEV. (ft)	DEPTH (ft)	RUN (ft)	DRILL RATE (Min/ft)	RUN REC. (ft) %	RUN RQD (ft) %	SAMP. NO.	STRATA REC. (ft) %	STRATA RQD (ft) %	LOG	DESCRIPTION AND REMARKS
										Begin Coring @ 8.5 ft
403.9	8.5	4.5	3:37	(0.8) 18%	(0.0) 0%		(0.8) 100%	(0.0) 0%		403.9 — 8.5 Crystalline Rock-Moderate to Moderately Severe Weathering, Hard, Very Close Fracture Spacing, Pink Grey Metavolcanic-Epiclastic Rock
			3:35				(0.0) 0%	(N/A)		403.1 — 9.3 Many Jts Not Measureable
			3:46							Weathered Rock-Severe Weathering, Soft, Very Close Fracture Spacing, Grey Metavolcanic-Epiclastic Rock
			3:56							
399.4	13.0		2:33/0.5							
		5.0	4:02	(0.7) 14%	(0.0) 0%	RS-1				
			4:00							
			3:59							
			4:13							
394.4	18.0		4:07							395.2 — 17.2
		5.0	4:09	(1.6) 32%	(0.0) 0%		(2.3) 100%	(0.0) 0%		Crystalline Rock-Moderate to Moderately Severe Weathering, Hard, Very Close Fracture Spacing, Pink Grey Metavolcanic-Epiclastic Rock
			4:03							392.9 — 19.5 Many Jts Not Measureable
			4:00				(0.0) 0%	(N/A)		Weathered Rock-Severe Weathering, Soft, Very Close Fracture Spacing, Grey Metavolcanic-Epiclastic Rock
			3:57							
			4:05							
389.4	23.0									
		5.0	4:07	(1.3) 26%	(0.0) 0%					
			4:09							
			4:12							
			4:21							
			4:35				(1.3) 100%	(0.0) 0%		385.7 — 26.7 Crystalline Rock-Moderate Weathering, Hard and Very Hard, Close and Very Close Fracture Spacing, Pink Grey Metavolcanic-Epiclastic Rock
384.4	28.0									384.4 — 28.0 5 Jts @ 80-90°
		5.0	4:30	(1.6) 32%	(1.2) 24%	RS-3	(0.3) 8%	(N/A)		Other Jts Not Measureable
			5:12							Weathered Rock-Severe Weathering, Soft, Very Close Fracture Spacing, Grey Metavolcanic-Epiclastic Rock
			4:45							
			5:07							380.7 — 31.7
			5:31				(1.3) 100%	(1.2) 92%		Crystalline Rock-Very Slight Weathering, Very Hard, Close Fracture Spacing, Pink Grey Metavolcanic-Epiclastic Rock
379.4	33.0									379.4 — 33.0 3 Jts @ 50-60°
										2 Jts @ 30-40°
										Other Jts Not Measureable
										Boring Terminated at Elevation 379.4 ft In Metavolcanic-Epiclastic Crystalline Rock

NCDOT CORE SINGLE 17061_GINT.GPJ NC_DOT.GDT 4/8/09



1. Core from 8.5 feet to 28.0 feet B-1A



2. Core from 28.0 feet to 33.0 feet B-1A

N.C.D.O.T. GEOTECHNICAL UNIT
BORING LOG

SHEET 1 OF 1

PROJECT NO. 33783.1.1	**ID.** B-4582	**COUNTY** Montgomery	**GEOLOGIST** B. KOLERA
SITE DESCRIPTION Bridge #121 over Denson's Creek on SR 1323 (Troy Rd./Okeewemee Rd.)			**GROUND WATER (ft)**
BORING NO. B1-B	**STATION** 17+33	**OFFSET** 7ft RT	**ALIGNMENT** -L-	**0 HR.** N/A
COLLAR ELEV. 412.4 ft	**NORTHING** 596,917	**EASTING** 1,741,300		**24 HR.** N/A
TOTAL DEPTH 35.0 ft	**DRILL MACHINE** CME 55	**DRILL METHOD** Wash/NQ	**HAMMER TYPE** Automatic	
DATE STARTED 2/18/09	**COMPLETED** 2/18/09	**SURFACE WATER DEPTH** 1.0	**DEPTH TO ROCK** 8.8 ft	

ELEV. (ft)	DEPTH (ft)	BLOW COUNT 0.5ft	0.5ft	0.5ft	BLOWS PER FOOT 0 20 40 60 80 100	SAMP. NO.	MOI	LOG	SOIL AND ROCK DESCRIPTION
413.4					Water Surface				
					Creek Bed				412.4 0.00
409.9	2.5								Alluvial-Medium Dense Grey Fine to Coarse Sand with Gravel (A-1-a)
		8	7	18	25		Sat.		
404.9	7.5								407.4 5.0
									Weathered Rock-White Pink Weathered Metavolcanic-Epiclastic Rock
		14	38	62/0.3	100/0.8		W		403.6 8.8
									402.4 10.0
									Crystalline Rock-Slight to Moderate Weathering, Hard to Moderately Hard, Very Close Fracture Spacing, Pink Grey Metavolcanic-Epiclastic Rock
									399.5 12.9
									Weathered Rock-Severe Weathering, Soft, Very Close Fracture Spacing, Grey Metavolcanic-Epiclastic Rock
									397.4 15.0
									Crystalline Rock-Moderate Weathering, Hard, Close and Very Close Fracture Spacing, Grey Metavolcanic-Epiclastic Rock
									395.3 17.1
									Weathered Rock-Severe Weathering, Soft, Very Close Fracture Spacing, Grey Metavolcanic-Epiclastic Rock
									390.6 21.8
									Crystalline Rock-Moderate Weathering, Hard, Close and Very Close Fracture Spacing, Pink Grey Metavolcanic-Epiclastic Rock
									387.3 25.1
									Weathered Rock-Severe Weathering, Soft, Very Close Fracture Spacing, Grey Metavolcanic-Epiclastic Rock
									Crystalline Rock-Moderate Weathering, Hard, Close and Very Close Fracture Spacing, Pink Grey Metavolcanic-Epiclastic Rock
									377.4 35.0
									Boring Terminated at Elevation 377.4 ft In Metavolcanic-Epiclastic Crystalline Rock

NCDOT BORE SINGLE 17061_GINT.GPJ NC_DOT.GDT 4/8/09

N.C.D.O.T. GEOTECHNICAL UNIT
CORE BORING REPORT

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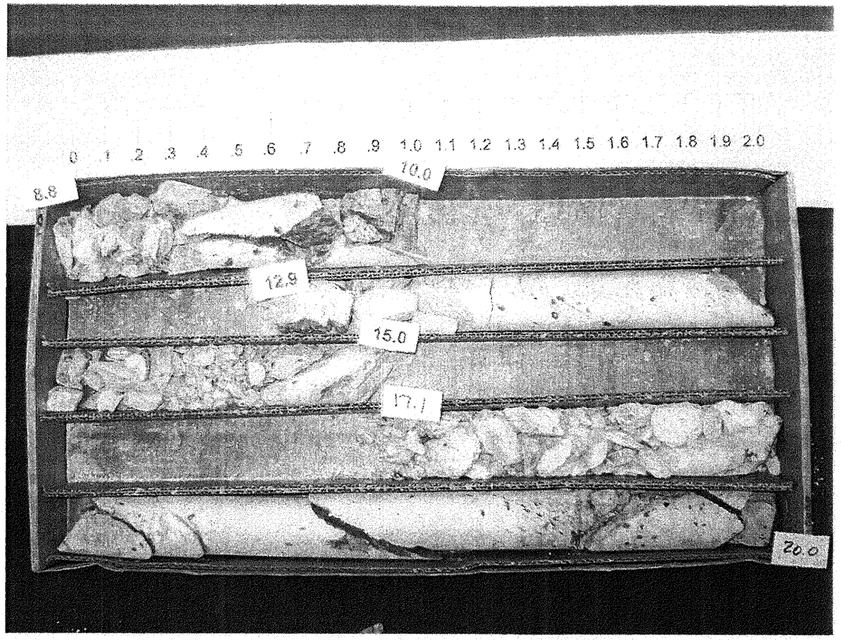
SHEET 1 OF 1

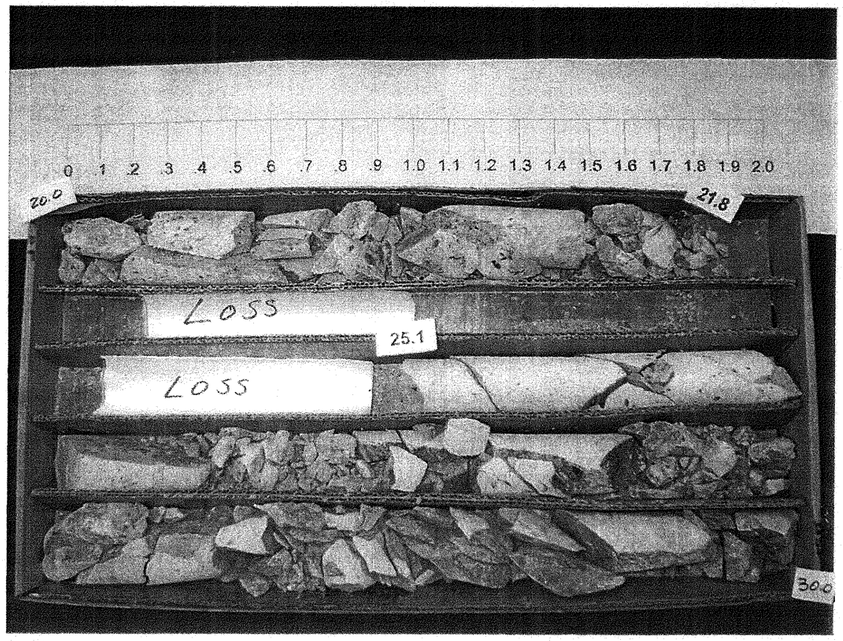
PROJECT NO. 33783.1.1	**ID.** B-4582	**COUNTY** Montgomery	**GEOLOGIST** B. KOLERA
SITE DESCRIPTION Bridge #121 over Denson's Creek on SR 1323 (Troy Rd./Okeewemee Rd.)			**GROUND WATER (ft)**
BORING NO. B1-B	**STATION** 17+33	**OFFSET** 7ft RT	**ALIGNMENT** -L-	**0 HR.** N/A
COLLAR ELEV. 412.4 ft	**NORTHING** 596,917	**EASTING** 1,741,300.		**24 HR.** N/A
TOTAL DEPTH 35.0 ft	**DRILL MACHINE** CME 55	**DRILL METHOD** Wash/NQ	**HAMMER TYPE** Automatic	
DATE STARTED 2/18/09	**COMPLETED** 2/18/09	**SURFACE WATER DEPTH** 1.0	**DEPTH TO ROCK** 8.8 ft	
CORE SIZE NQ	**TOTAL RUN** 26.2 ft	**DRILLER** Contract		

ELEV. (ft)	DEPTH (ft)	RUN (ft)	DRILL RATE (Min/ft)	RUN REC. (ft) %	RUN RQD (ft) %	SAMP. NO.	STRATA REC. (ft) %	STRATA RQD (ft) %	LOG	DESCRIPTION AND REMARKS
										Begin Coring @ 8.8 ft
403.6	8.8	1.2	1:07	(1.1) 92%	(0.0) 0%		(1.1) 92%	(0.0) 0%		403.6 8.8 Crystalline Rock-Slight to Moderate Weathering, Hard to Moderately Hard, Very Close Fracture Spacing, Pink Grey Metavolcanic-Epiclastic Rock
402.4	10.0									402.4 10.0 2 Jts @ 80-90°
		5.0	4:27/0.2	(2.1) 42%	(0.6) 12%		(0.0) 0%	(N/A)		Weathered Rock-Severe Weathering, Soft, Very Close Fracture Spacing, Grey Metavolcanic-Epiclastic Rock
			4:24							399.5 12.9
			4:38							Crystalline Rock-Moderate Weathering, Hard, Close and Very Close Fracture Spacing, Grey Metavolcanic-Epiclastic Rock
			4:45							
			4:42				(2.1) 100%	(0.6) 29%		
397.4	15.0		4:21							397.4 15.0 2 Jts @ 60-80° Other Jts Not Measureable
		5.0	4:37	(2.9) 58%	(0.8) 16%		(0.0) 0%	(N/A)		Weathered Rock-Severe Weathering, Soft, Very Close Fracture Spacing, Grey Metavolcanic-Epiclastic Rock
			4:42							395.3 17.1
			5:12				(4.7) 100%	(0.8) 17%		Crystalline Rock-Moderate Weathering, Hard, Close and Very Close Fracture Spacing, Pink Grey Metavolcanic-Epiclastic Rock
			5:09							5 Jts @ 30-50°
392.4	20.0		5:14							Other Jts Not Measureable
		5.0	5:12	(1.8) 36%	(0.0) 0%					
			5:09							
			5:07				(0.0) 0%	(N/A)		390.6 21.8 Weathered Rock-Severe Weathering, Soft, Very Close Fracture Spacing, Grey Metavolcanic-Epiclastic Rock
			5:15							
387.4	25.0		5:18							387.3 25.1
		5.0	5:21	(4.9) 98%	(0.4) 8%		(9.9) 100%	(2.3) 23%		Crystalline Rock-Moderate Weathering, Hard, Close and Very Close Fracture Spacing, Pink Grey Metavolcanic-Epiclastic Rock
			5:22							10 Jts @ 25-40°
			5:31							3 Jts @ 55-70°
			5:19							6 Jts @ 80-90°
382.4	30.0		4:45							Other Jts Not Measureable
		5.0	5:23	(5.0) 100%	(1.9) 38%	RS-2				
			5:27							
			5:19							
			5:23							
377.4	35.0		5:36							377.4 35.0 Boring Terminated at Elevation 377.4 ft In Metavolcanic-Epiclastic Crystalline Rock

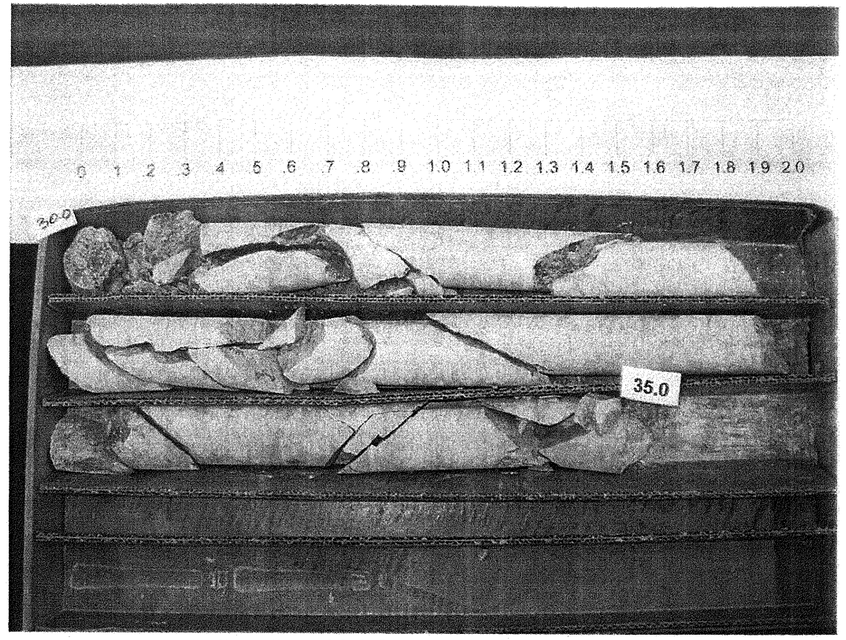
NCDOT CORE SINGLE 17061_GINT.GPJ NC_DOT.GDT 4/8/09



3. Core from 8.8 feet to 20 feet B-1B



4. Core from 20.0 feet to 30.0 feet B-1B



5. Core from 30.0 feet to 35.0 feet B-1B

N.C.D.O.T. GEOTECHNICAL UNIT
BORING LOG

SHEET 1 OF 1

PROJECT NO. 33783.1.1	**ID.** B-4582	**COUNTY** Montgomery	**GEOLOGIST** B. KOLERA
SITE DESCRIPTION Bridge #121 over Denson's Creek on SR 1323 (Troy Rd./Okeewemee Rd.)			**GROUND WATER (ft)**
BORING NO. EB2-A	**STATION** 18+12	**OFFSET** 17ft LT	**ALIGNMENT** -L-	**0 HR.** Dry
COLLAR ELEV. 432.4 ft	**NORTHING** 596,971	**EASTING** 1,741,367		**24 HR.** Dry
TOTAL DEPTH 16.8 ft	**DRILL MACHINE** CME 55	**DRILL METHOD** HSA	**HAMMER TYPE** Automatic	
DATE STARTED 2/16/09	**COMPLETED** 2/16/09	**SURFACE WATER DEPTH** N/A	**DEPTH TO ROCK**	

ELEV. (ft)	DEPTH (ft)	BLOW COUNT 0.5ft	0.5ft	0.5ft	BLOWS PER FOOT 0 20 40 60 80 100	SAMP. NO.	MOI	LOG	SOIL AND ROCK DESCRIPTION
432.4									432.4 0.00
427.4	5.0	1	1	1	2	SS-3	M		Embankment Fill-Soft Orange Grey to Grey Brown Fine to Coarse Sandy Silty Clay (A-7-6)
422.4	10.0	2	2	2	4 13		M		421.9 10.5 Residual-Stiff Red Brown to Tan Brown Sandy Silt with Rock Fragments (A-4)
417.4	15.0								
415.6	16.8	1	4	9	50/0.0		M		415.6 16.8
		50/0.0					D		Boring Terminated with Standard Penetration Test Refusal at Elevation 415.6 ft On Crystalline Rock

NCDOT BORE SINGLE 17061_GINT.GPJ NC_DOT.GDT 4/8/09

N.C.D.O.T. GEOTECHNICAL UNIT
BORING LOG

15

SHEET 1 OF 1

PROJECT NO. 33783.1.1	**ID.** B-4582	**COUNTY** Montgomery	**GEOLOGIST** B. KOLERA
SITE DESCRIPTION Bridge #121 over Denson's Creek on SR 1323 (Troy Rd./Okeewemee Rd.)			**GROUND WATER (ft)**
BORING NO. EB2-B	**STATION** 18+11	**OFFSET** 18ft RT	**ALIGNMENT** -L-	**0 HR.** Dry
COLLAR ELEV. 433.2 ft	**NORTHING** 596,935	**EASTING** 1,741,379		**24 HR.** Dry
TOTAL DEPTH 18.0 ft	**DRILL MACHINE** CME 55	**DRILL METHOD** HSA	**HAMMER TYPE** Automatic	
DATE STARTED 2/16/09	**COMPLETED** 2/16/09	**SURFACE WATER DEPTH** N/A	**DEPTH TO ROCK**	

ELEV. (ft)	DEPTH (ft)	BLOW COUNT 0.5ft	0.5ft	0.5ft	BLOWS PER FOOT 0 20 40 60 80 100	SAMP. NO.	MOI	LOG	SOIL AND ROCK DESCRIPTION
433.2									433.2 0.00
428.2	5.0	2	2	4	6		M		Embankment Fill-Medium Stiff Orange Grey Fine to Coarse Sandy Silty Clay (A-7-6)
422.7	10.5	9	5	3	8 79	SS-4	M		422.7 10.5 Residual-Hard Tan Sandy Silt with Weathered Rock Fragments (A-4)
418.2	15.0	4	11	68			M		415.2 18.0
415.2	18.0	50/0.0			50/0.0		D		Boring Terminated with Standard Penetration Test Refusal at Elevation 415.2 ft On Crystalline Rock

NCDOT BORE SINGLE 17061_GINT.GPJ NC_DOT.GDT 4/8/09

SUMMARY OF LABORATORY TEST DATA FOR NCDOT
Project No. 33783.1.1 (B-4582)
Bridge No. 121 over Denson's Creek on SR 1323
Montgomery County, North Carolina

Boring No.	Sample Depth (ft)	Sample No.	Natural Moisture Content	AASHTO Class	Atterberg Limits		Gradation Results							
					L.L.	P.L.	Pass #10 Sieve	Pass #40 Sieve	Pass #200 Sieve	Gravel (%)	Coarse Sand (%)	Fine Sand (%)	Silt (%)	Clay (%)
EB1-B	10.0-11.5	SS-1	NA	A-6	34	12	89	83	77.4	6.3	10.7	5.6	40.8	36.6
B1-A	1.0-2.5	SS-2	NA	A-1-a	NP	NP	33.8	14.4	6.2	50.4	35.2	8.2	4.1	2.1
EB-2A	5.0-6.5	SS-3	NA	A-7-6	41	16	78.8	72.3	17.8	0	8.5	5	40.9	45.6
EB-2B	10.5-11.5	SS-4	NA	A-4	21	NP	100	92.9	61.2	0	7.1	31.7	42.3	18.9
Creek Shoulder	0	S-5	NA	A-4	25	NP	98.3	88.4	38.8	0	18.6	42.6	33	5.8
Creek Bottom	0	S-6	NA	A-1-b	NP	NP	70.1	63.7	3.9	29.9	54.7	11.5	3.3	0.6

ECS LLP CAROLINAS

Terry L. Pope
NCDOT Cert. 110-08-1103

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
GEOTECHNICAL ENGINEERING UNIT

FIELD SCOUR REPORT

WBS: 33783.1.1 TIP: B-4582 COUNTY: Montgomery

DESCRIPTION(1): Bridge No. 121 over Denson's Creek on SR 1323 (Troy/Okeewemee Road)

EXISTING BRIDGE

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

Bridge No.: 121 Length: 113.47 Total Bents: 4 Bents in Channel: 0 Bents in Floodplain: 2
Foundation Type: Concrete Piers

EVIDENCE OF SCOUR(2)

Abutments or End Bent Slopes: Minimal, Existing rip-rap effective

Interior Bents: Minimal, Existing rip-rap effective

Channel Bed: Scour pockets near center of channel

Channel Bank: Some scour of banks, both upstream and downstream of existing bridge

EXISTING SCOUR PROTECTION

Type(3): Concrete wing walls at end bents. Rip-rap at end slopes

Extent(4): Full width of existing bridge and interior bents

Effectiveness(5): Effective (Minimal scouring around bents)

Obstructions(6): Dam approximately 150 feet upstream

INSTRUCTIONS

1 Describe the specific site's location, including route number and body of water crossed.
2 Note scour evidence at existing end bents or abutments (e.g. undermining, sloughing, degradations).
3 Note existing scour protection (e.g. rip rap).
4 Describe extent of existing scour protection.
5 Describe whether or not the scour protection appears to be working.
6 Note obstructions such as dams, fallen trees, debris at bents, etc.
7 Describe the channel bed material based on observation and/or samples. Include any lab results with report.
8 Describe the channel bank material based on observation and/or samples. Include any lab results with report.
9 Describe the material covering the banks (e.g. grass, trees, rip rap, none).
10 Determine the approximate floodplain width from field observation or a topographic map.
11 Describe the material covering the floodplain (e.g. grass, trees, crops).
12 Use professional judgement to specify if the stream is degrading, aggrading, or static.
13 Describe potential and direction of the stream to migrate laterally during the bridge's life (approx. 100 years).
14 Give the design scour elevation (DSE) expected over the life of the bridge (approx. 100 years). This elevation can be given as a range across the site, or for each bent. Discuss the relationship between the Hydraulics Unit theoritical scour and the DSE. If the DSE is dependent on scour counter measures, explain (e.g. rip rap armoring on slopes). The DSE is based on the erodability of materials, giving consideration to the influence of joints, foliation, bedding characteristics, % core recovery, % RQD, differential weathering, shear strength, observations at existing structures, other tests deemed appropriate, and overall geologic conditions at the site.

DESIGN INFORMATION

Channel Bed Material(7): A-3 Tan Fine to Coarse SAND with Gravel (S-6)

Channel Bank Material(8): A-7-6 Tan Fine to Coarse Clayey SAND (S-5)

Channel Bank Cover(9): Grass, underbrush, and wooded areas both upstream and downstream

Floodplain Width(10): 100 feet

Floodplain Cover(11): Grass, rip-rap, underbrush, and trees

Stream is(12): Aggrading x Degrading ____ Static ____

Channel Migration Tendency(13): To the south

Observations and Other Comments: ____

Reported by: M. Landers, ECS Carolinas, LLP **Date:** 2/18/2009

DESIGN SCOUR ELEVATIONS(14) Feet x Meters ____

BENTS B1										
411.6										

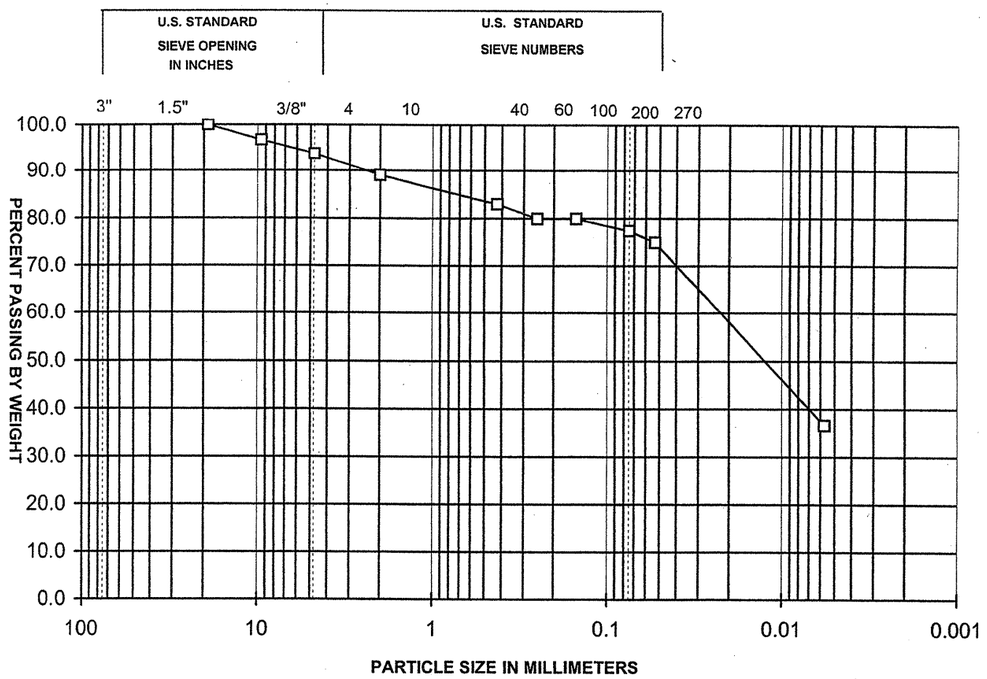
Comparison of DSE to Hydraulics Unit theoretical scour:
Geotechnical Engineering Unit agrees with Hydraulics Unit's theoretical scour elevation of 411.6 feet for Bent 1.

DSE determined by: William F. Goforth, PG **Date:** 4/28/2009

SOIL ANALYSIS RESULTS FROM CHANNEL BED AND BANK MATERIAL

Bed or Bank	Bank	Bed					
Sample No.	S-5	S-6					
Retained #4	0	29.9					
Passed #10	98.3	70.1					
Passed #40	88.4	63.7					
Passed #200	38.8	3.9					
Coarse Sand	18.6	54.7					
Fine Sand	42.6	11.5					
Silt	33	3.3					
Clay	5.8	0.6					
LL	25	NP					
PI	NP	NP					
AASHTO	A-4	A-1-b					
Station							
Offset							
Depth	0	0					

COBBLE	GRAVEL	SAND		SILT	CLAY
		COARSE	FINE		

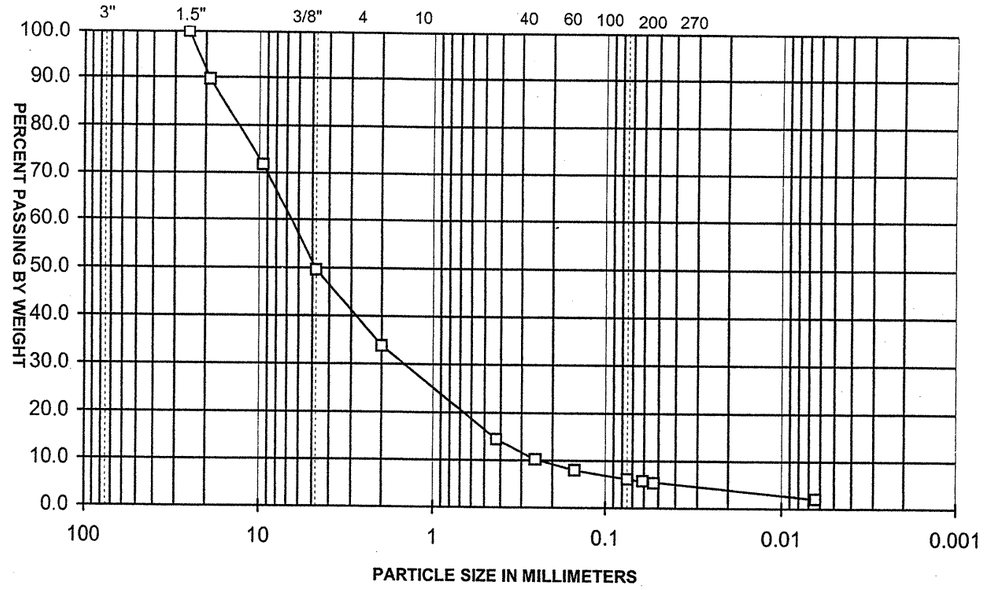


Boring/ Sample No.	Depth (feet)	Symbol	LL	PI	Description
EB - 1B SS - 1	10.0 - 11.5	□	34	12	Red Brown Fine to Coarse Sandy SILT with Clay (A-6)
/		■			
/		△			
/		▲			

Project: NCDOT Bridge 4582
Project No.: 09.17061
Date: 3/2/09

ECS Carolinas, LLP
Greensboro, North Carolina
Particle Size Distribution Curves

COBBLE	GRAVEL	SAND		SILT	CLAY
		COARSE	FINE		

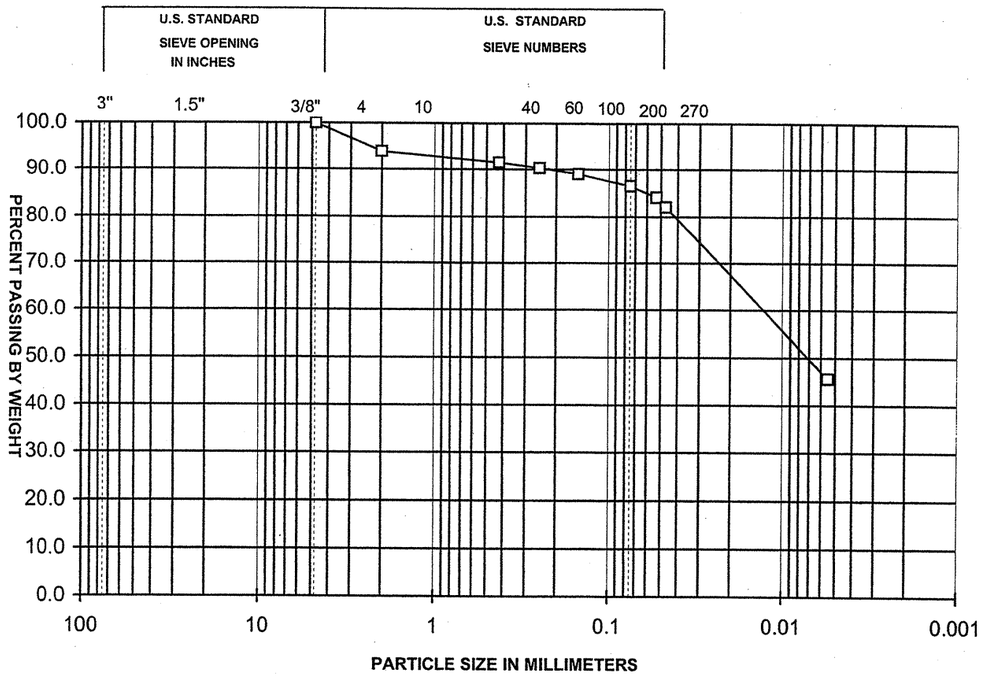


Boring/ Sample No.	Depth (feet)	Symbol	LL	PI	Description
B1 - A SS - 2	1 - 2.5	□	NP	NP	Tan Fine to Coarse SAND with Gravel (A-1-a)
/		■			
/		△			
/		▲			

Project: NCDOT Bridge 4582
Project No.: 09.17061
Date: 3/2/09

ECS Carolinas, LLP
Greensboro, North Carolina
Particle Size Distribution Curves

COBBLE	GRAVEL	SAND		SILT	CLAY
		COARSE	FINE		



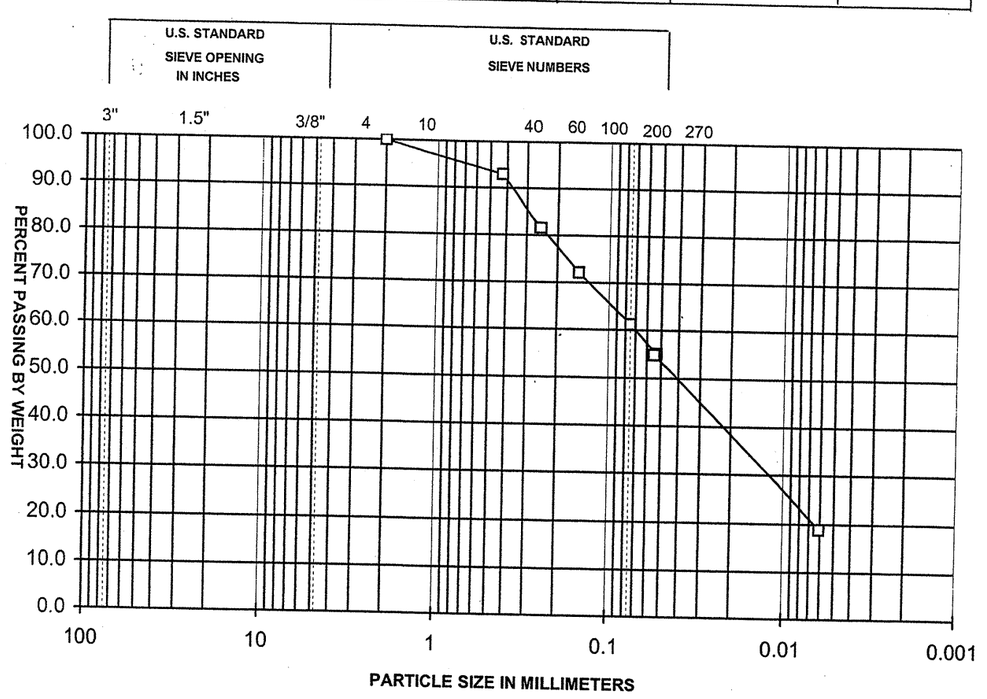
Boring/ Sample No.	Depth (feet)	Symbol	LL	PI	Description
EB - 2A SS - 3	5.0-6.5	□	41	16	Red Brown Silty Fine to Coarse Sandy CLAY (A-7-6)
/		■			
/		△			
/		▲			

Project: NCDOT Bridge 4582
Project No.: 09.17061

Date: 3/2/09

ECS Carolinas, LLP
Greensboro, North Carolina
Particle Size Distribution Curves

COBBLE	GRAVEL	SAND		SILT	CLAY
		COARSE	FINE		



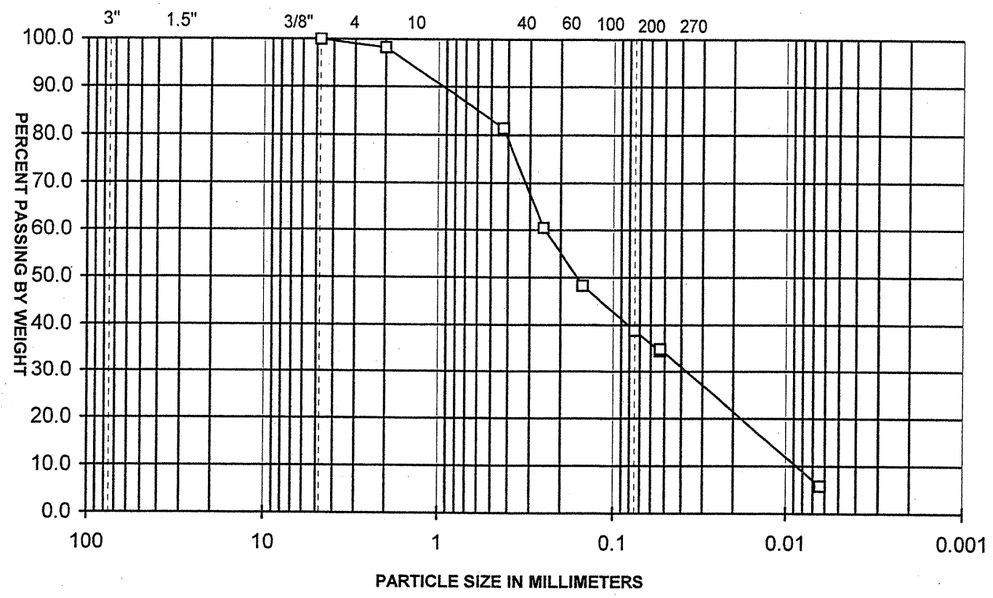
Boring/ Sample No.	Depth (feet)	Symbol	LL	PI	Description
EB - 2B SS - 4	10.0 - 11.5	□	21	NP	Tan Fine to Coarse Sandy SILT with Clay (A-4)
/		■			
/		△			
/		▲			

Project: NCDOT Bridge 4582
Project No.: 09.17061

Date: 3/2/09

ECS Carolinas, LLP
Greensboro, North Carolina
Particle Size Distribution Curves

COBBLE	GRAVEL	SAND		SILT	CLAY
		COARSE	FINE		



Boring/ Sample No.	Depth (feet)	Symbol	LL	PI	Description
S-5	-0	□	25	NP	Tan Fine to Coarse Clayey SAND (A-4)
/		■			
/		△			CREEK SHOULDER
/		▲			

Project: NCDOT Bridge 4582
Project No.: 09.17061
Date: 4/8/09

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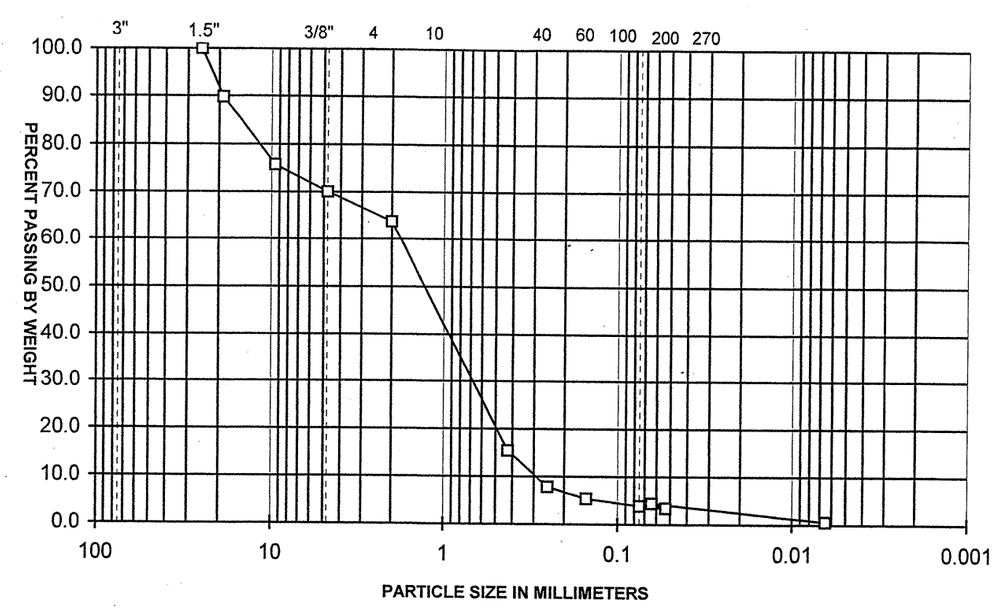
Greensboro, North Carolina
Particle Size Distribution Curves

COBBLE	GRAVEL	SAND		SILT	CLAY
		COARSE	FINE		



Boring/ Sample No.	Depth (feet)	Symbol	LL	PI	Description
S-6	-0	□	NP	NP	Tan Fine to Coarse Sand with Gravel (A-1-b)
/		■			
/		△			CREEK BOTTOM
/		▲			

Project: NCDOT Bridge 4582
Project No.: 09.17061
Date: 4/8/09

ECS Carolinas, LLP
Greensboro, North Carolina
Particle Size Distribution Curves

ECS CAROLINAS, LLP
Geotechnical • Construction Materials • Environmental • Facilities

Unconfined Compressive Strength of Rock Cores

Job Name: NCDOT Bridge 4582
Job #: 09.17061

CORE		DIAMETER (in)	AREA (SQ IN)	LENGTH (IN)	L/D	CORRECTION FACTOR*	LOAD (LB)	CORRECTED COMPRESSIVE STRENGTH (PSI)
RS-1	B-1A 13.6 - 14.0 Feet	1.862	2.72	3.877	2.08	1	16780	6170
RS-2	B-1B 33.1 - 33.5 Feet	1.863	2.73	3.957	2.12	1	16090	5900
RS-3	B-1A 31.8 - 32.3 Feet	1.861	2.72	3.930	2.11	1	30990	11390

Terry L. Pope, Lab manager
NCDOT CERT. 110-08-1103

SITE PHOTOGRAPHS

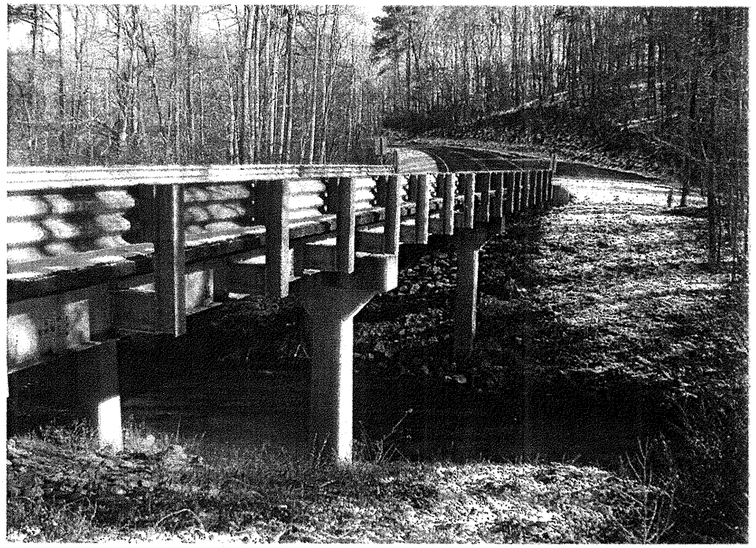
NCDOT Project No. 33783.1.1 (B-4582)
Bridge No. 121 over Denson's Creek on SR 1323 (Troy Road/Okeewemee Road)
Montgomery County, North Carolina

View Looking Upsteam of Denson's Creek

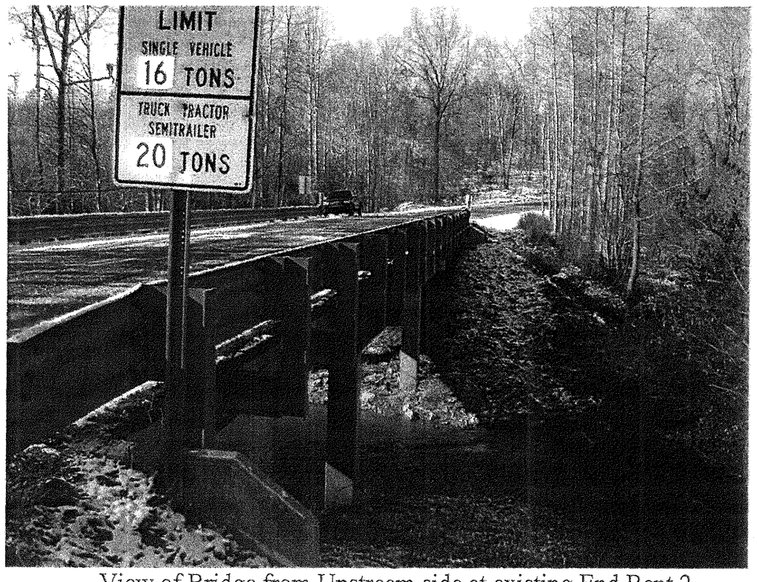
View Looking Downstream of Denson's Creek

SITE PHOTOGRAPHS

NCDOT Project No. 33783.1.1 (B-4582)
Bridge No. 121 over Denson's Creek on SR 1323 (Troy Road/Okeewemee Road)
Montgomery County, North Carolina



View of Bridge from Downstream side at existing End Bent 1



View of Bridge from Upstream side at existing End Bent 2