

STATE OF NORTH CAROLINA

DEPARTMENT OF TRANSPORTATION

DIVISION OF HIGHWAYS

GEOTECHNICAL UNIT

STRUCTURE SUBSURFACE INVESTIGATION

STATE PROJECT 33620.1.1 I.D. NO. B-4280
 F.A. PROJECT BRSTP-8(2)
 COUNTY STOKES
 PROJECT DESCRIPTION REPLACEMENT OF
BRIDGE No. 14 OVER TOWN FORK CREEK AND
BRIDGE No. 44 OVER TOWN FORK CREEK OVERFLOW
ON NC 8

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	B-4280	1	50
STATE PROJ. NO.	F.A. PROJ. NO.	DESCRIPTION	
33620.1.1	BRSTP-8(2)	P.E. CONST.	

CAUTION NOTICE

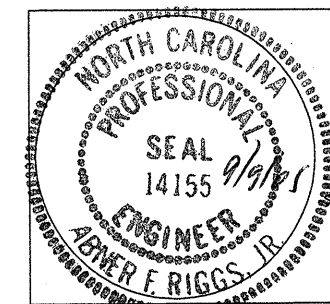
THE SUBSURFACE INFORMATION AND THE SUBSURFACE INVESTIGATION ON WHICH IT IS BASED WAS MADE FOR THE PURPOSE OF STUDY, PLANNING AND DESIGN, AND NOT FOR CONSTRUCTION OR PAY PURPOSES. THE VARIOUS FIELD BORING LOGS, ROCK CORES, AND SOIL TEST DATA AVAILABLE MAY BE REVIEWED OR INSPECTED IN RALEIGH BY CONTACTING THE N. C. DEPARTMENT OF TRANSPORTATION, GEOTECHNICAL UNIT @ (919) 250-4088. NEITHER THE SUBSURFACE PLANS AND REPORTS, NOR THE FIELD BORING LOGS, ROCK CORES, OR SOIL TEST DATA IS 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.

For Letting

INVESTIGATED BY S&ME, INC. PERSONNEL D. BENTS
 CHECKED BY A.F. RIGGS, JR. J. MURPHY
 SUBMITTED BY S&ME, INC. S. LANEY
 DATE AUGUST 19, 2005 S. JOHNSON
K. LEWALLAN
L. SHRADER
J. LITTLE
B. WALLACE
J. LYNCH
C. DEESE
T. PEREZ



Arthur F. Riggs, Jr.
 SIGNATURE

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.

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DRAWN BY: T. PEREZ

PROJECT: 33620.1.1 ID: B-4280

STATE PROJECT NO.: 33620.1.1
 I.D. NO.: B-4280
 FEDERAL PROJECT NO.: BRSTP-8(2)
 COUNTY: Stokes

DESCRIPTION: Bridge No. 14 Over Town Fork Creek & Bridge No. 44 Over Town Fork Creek Overflow on NC 8

SUBJECT: Structure Subsurface Investigation – Inventory Report

Project Description

The project site is located on NC Highway 8 approximately ¼ mile north of its intersection with US Highway 65 in Stokes County, North Carolina at the crossing of Town Fork Creek and Overflow (See Site Vicinity Map, Sheet 5). The proposed project consists of replacement bridge structures. Based on the Bridge Survey and Hydraulic Design Report, the center of the structure for Bridge No. 14 will be at Station 19+10 and Bridge No. 44 will be at Station 25+22, both along the -L- survey line. The new Bridge No. 14 structure will have a clear roadway width of 34.0 feet. The new Bridge No. 14 structure will be 220 feet long with the bents constructed on a skew angle of 120° to the -L- survey line. The new Bridge No. 14 structure will consist of two spans of 70 feet and one of 80 feet. The structure will have four bents (two end bents and two interior bents). The new Bridge No. 44 structure will have a clear roadway width of 33.0 feet. The new Bridge No. 44 structure will be 100 feet long with the bents constructed on a skew angle of 90° to the -L- survey line. The new bridge structure will consist of two spans of 50 feet in each length. The structure will have three bents (two end bents and one interior bent).

Based upon the structural drawings provided by NCDOT, the finished grade elevations for the new Bridge No. 14 structure, at the approaches, will be approximately 667 feet. This will require fill depths of up to approximately 12 feet at the approaches. Finished grade elevations for the new Bridge No. 44 structure, at the approaches, will be approximately 664 feet. This will require fill depths of up to approximately 9 feet at the approaches. For both structures, fill slopes will be constructed at a slope of 1.5:1 (horizontal to vertical) with 2 feet of class II Rip Rap erosion protection.

A geotechnical investigation was conducted between July 18 and July 25, 2005. All borings for both structures were performed adjacent to the existing embankment or structures in the flood plain of Town Fork Creek. Borings B1-A, B2-A, and B2-B for Bridge No. 14 were drilled in the creek bed. All borings were performed with either a Longyear BK-51 or a Diedrich D-50 mounted on an all-terrain carrier. Representative soil samples were collected for visual classification in the field and for laboratory classification analysis by the NCDOT accredited S&ME soil testing laboratory. Shelby tubes were obtained at borings EB1-A and EB2-A between the depth of 8 to 12 feet beneath Bridge No. 14 and at boring EB1-B between the depth of 5 to 7 feet beneath Bridge No. 44 for triaxial and consolidation testing.

Physiography and Geology

The project site is located on NC Highway 8 approximately ¼ mile north of its intersection with US Highway 65 in Stokes County, North Carolina at the crossing of Town Fork Creek and Overflow. The

existing Bridge No. 14 structure is approximately 205.5 feet long with a bridge deck width of approximately 24 feet (outside to outside). The existing Bridge No. 44 structure is approximately 90.3 feet long with a bridge deck width of approximately 24 feet (outside to outside). The existing bridges are situated within the flood plain of Town Fork Creek along a two lane paved road (NC Highway 8). Both bridges consist of a reinforced concrete deck overlain with asphalt on steel girders supported on reinforced concrete pile caps and timber piles. North Carolina Highway 8 runs approximately north and south and has roadway embankment shoulders. The flood plain extends approximately 1000 feet on the north and 450 feet on the south side of the creek and is covered with mostly grass and crop fields with some large to small trees and undergrowth. Overhead power lines and communication lines cross the creek approximately 10 feet west of the existing bridges.

The site is located within the central portion of the Piedmont Physiographic and Geologic Province of North Carolina in Stokes County. The Piedmont Province is typically characterized by gently to steeply sloping topography with well-rounded hills and along rolling ridges with a northeast-southwest trend dissected by a moderate to well developed (mature) dentritic-type drainage system consisting of drainage swales, hollows, tributaries, streams and rivers. The geology of the southern portion of Stokes County, near the project site, primarily consists of recent alluvial sediments underlain by the Pine Hall Formation of Triassic Age. Typically, the recent alluvial sediments consists of silty coarse to fine sands and silty clays. The Pine Hall Formation consists of mudstone, sandstone, and conglomerate and is part of the Dan River Basin which trends southwest to northeast into Virginia. The project site is near the southwestern boundary of the Triassic Basin where the Pine Hall sedimentary rocks contact much older crystalline host bedrock consisting of felsic-rich mica gneiss.

Foundation Materials – Bridge No. 14

The borings were advanced to depths ranging from 21.1 to 31.5 feet (elevations 636.2 to 617.9 feet) at collar elevations ranging from 658.7 to 643.7 feet.

Roadway embankment fill materials were encountered in boring EB1-A to depths of about 2 feet (elevations 654.8 feet) below the collar elevation. The fill material encountered in these borings consists of medium dense brown silty fine sand (A-2-4). Standard penetration test (SPT) N-values in the fill material was 12 blows per foot.

Alluvial deposits were encountered from the ground surface or creek bed, and beneath the embankment fill materials in all borings except B1-A to depths ranging from about 0.8 to 14.0 feet (elevations 644.7 to 642.9 feet) beneath collar elevations. Typically, alluvial deposits encountered consist of very loose to medium dense tan to gray coarse to fine sands (A-2-4) with occasional gravel layers. A layer of very soft to soft gray and tan fine sandy silt (A-4) was encountered in borings EB1-A and EB2-A from a depth of 7.5 to 13 feet (elevations 649.9 to 643.8 feet) beneath the collar elevation. The creek channel typically consists of very thin deposits of loose tan silty coarse to fine sand and gravel (A-2-4). At boring B1-A, alluvial material has been scoured with bedrock exposed. The standard penetration test (SPT) N-values for the alluvial deposits range from Weight-of-Hammer (WOH) to 11 blows per foot.

Beneath the alluvium in borings EB1-A, EB1-B, B1-B, EB2-A, and EB2-B, weathered rock (Triassic) consisting of gray sandstone was encountered and extended to the termination of borings or auger refusal. The weathered rock was encountered at depths ranging from about 7.0 to 23.7 feet (elevations 644.7 to 631.4 feet) beneath the collar elevations. No residual soil was encountered above the weathered rock. Standard penetration

test (SPT) N-values in the weathered rock materials range from 100 blows per 0.7 feet of penetration to 60 blows per 0.1 feet of penetration.

The weathered rock transitions to non-crystalline rock (Triassic) consisting of red-brown and gray sandstone, and red-brown mudstone. The sandstone and mudstone are part of the Pine Hall Formation of the Dan River Basin. The non-crystalline rock was evaluated utilizing rock coring techniques by advancing an NQ2 core barrel. Coring activities recovered 56 to 100 percent of the rock cored. Rock Quality Designation (RQD) values range from 0 to 99 percent. Borings B1-A, B1-B, B2-A, B2-B, and EB2-B were terminated in indurated to extremely indurated sandstone and mudstone at elevations ranging from 617.9 to 633.5 feet. Borings EB1-A and EB2-A were terminated on sandstone at elevations ranging from 636.2 to 635.7 feet. Boring EB1-B was terminated in weathered rock (gray sandstone) at elevation 631.4 feet.

Foundation Materials – Bridge No. 44

The borings were advanced to depths ranging from 16.9 to 36.4 feet (elevations 637.9 to 617.5 feet) at collar elevations ranging from 654.8 to 653.8 feet.

Alluvial deposits were encountered from the ground surface in all borings depths ranging from about 11.0 to 12.5 feet (elevations 643.6 to 642.2 feet) beneath collar elevations. Typically, alluvial deposits encountered consist of very loose to loose tan to gray coarse to fine sands (A-2-4, A-3, A-1-b) with occasional gravel layers. Interbedded with the sands are layers of soft to medium stiff gray and tan fine sandy silt and clay (A-4, A-6, A-7-6). The standard penetration test (SPT) N-values for the alluvial deposits range from 2 to 16 blows per foot.

Beneath the alluvium, residual soils were encountered in boring B1-A at 10 to 11 feet (elevations 643.8 to 642.8) consisting of medium stiff red brown sandy silt (A-4). The residuum transitions to weathered rock (Triassic) in B1-A, and the weathered rock was encountered beneath the alluvium in all other borings consisting of red brown sandstone, gray and white conglomerate, and gray and white sandstone and extended to the termination of borings or auger refusal. The weathered rock was encountered at depths ranging from about 10.3 to 12.5 feet (elevations 642.2 to 643.6 feet) beneath the collar elevations. Standard penetration test (SPT) N-values in the weathered rock materials range from 100 blows per 0.9 feet of penetration to 60 blows per 0.1 feet of penetration.

The weathered rock transitions to non-crystalline rock (Triassic) consisting of red brown and gray sandstone, red brown mudstone, and gray and white conglomerate. The sandstone, mudstone, and conglomerate are part of the Pine Hall Formation of the Dan River Basin. Coring activities recovered 85 to 100 percent of the rock cored. Rock Quality Designation (RQD) values range from 38 to 74 percent. Borings EB1-A and were terminated in indurated red brown sandstone at elevations ranging from 636.0 to 637.9 feet. Borings B1-A and B1-B were terminated in extremely indurated gray and white conglomerate at elevations ranging from 622.3 to 617.5 feet. Borings EB2-A was terminated in extremely indurated dark gray mudstone at elevation 631.7 feet. Boring EB2-B was terminated on sandstone at elevation 630.8 feet.

Notes to Designer

The BK-51 and D-50 drill rigs are equipped with a rope, cathead and Safety Hammer to perform Standard Penetration tests.

Groundwater

Static groundwater levels were measured at Bridge No. 14 within borings EB1-A, EB1-B, EB2-A, and EB2-B at depths ranging from about 6.9 to 13.6 feet (elevations 648.2 to 641.4). Static groundwater levels were measured at Bridge No. 44 within borings EB1-B, B1-A, B1-B, B2-A, B2-B, EB2-A, and EB2-B at depths ranging from about 3.2 to 5.3 feet (elevations 651.2 to 649.5). Groundwater depths were not measured in the remaining borings due to hole cave-in or borings were below creek level. The creek elevation at the time of our field investigation was 644.7 feet on July 22, 2005. The overflow creek was dry on this date.


QUALIFICATIONS OF REPORT

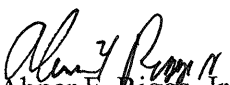
This report has been prepared in accordance with generally accepted geotechnical engineering practice for specific application to this project. The conclusions contained in this report were based on the applicable standards of our profession at the time this report was prepared. No other warranty, expressed or implied, is made.

The conclusions submitted in this report are based, in part, upon the data obtained from the subsurface exploration. The nature and extent of subsurface variations between the borings may not become evident until construction. If variations appear evident, then the conclusions contained in this report may need to be re-evaluated. In the event that any changes in the nature, design, or location of the structure are planned, the conclusions contained in this report will not be considered valid unless the changes are reviewed by S&ME, and the conclusions of the report are modified or verified in writing.

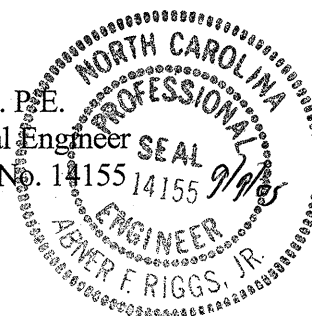
S&ME appreciates the opportunity to be your geotechnical consultant on this project. If you have any questions or need additional information in regard to this report, please contact us.


Very truly yours,
S&ME, Inc.


Duane D. Bents, E.I.
Staff Professional


Abner F. Riggs, Jr. P.E.
Chief Geotechnical Engineer
N.C. Registration No. 14155

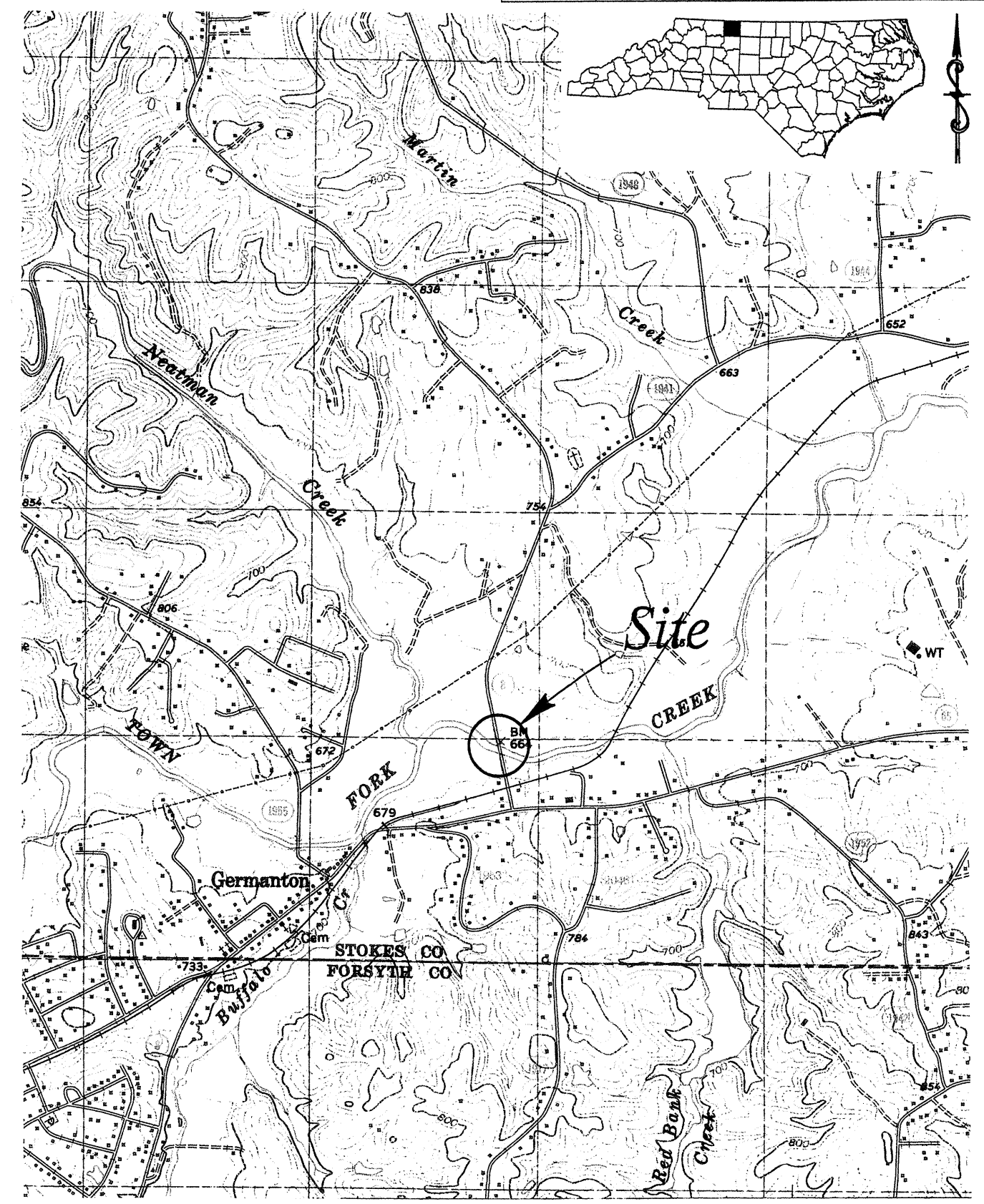
Attachments




Jason D. Murphy, L.G.
Project Geologist
N.C. Registration No. 1690

PROJECT: 33620.1.1 ID: B-4280

ID	STATE PROJECT NO.	SHEET NO.	TOTAL SHEETS
B-4280	33620.1.1	5	50



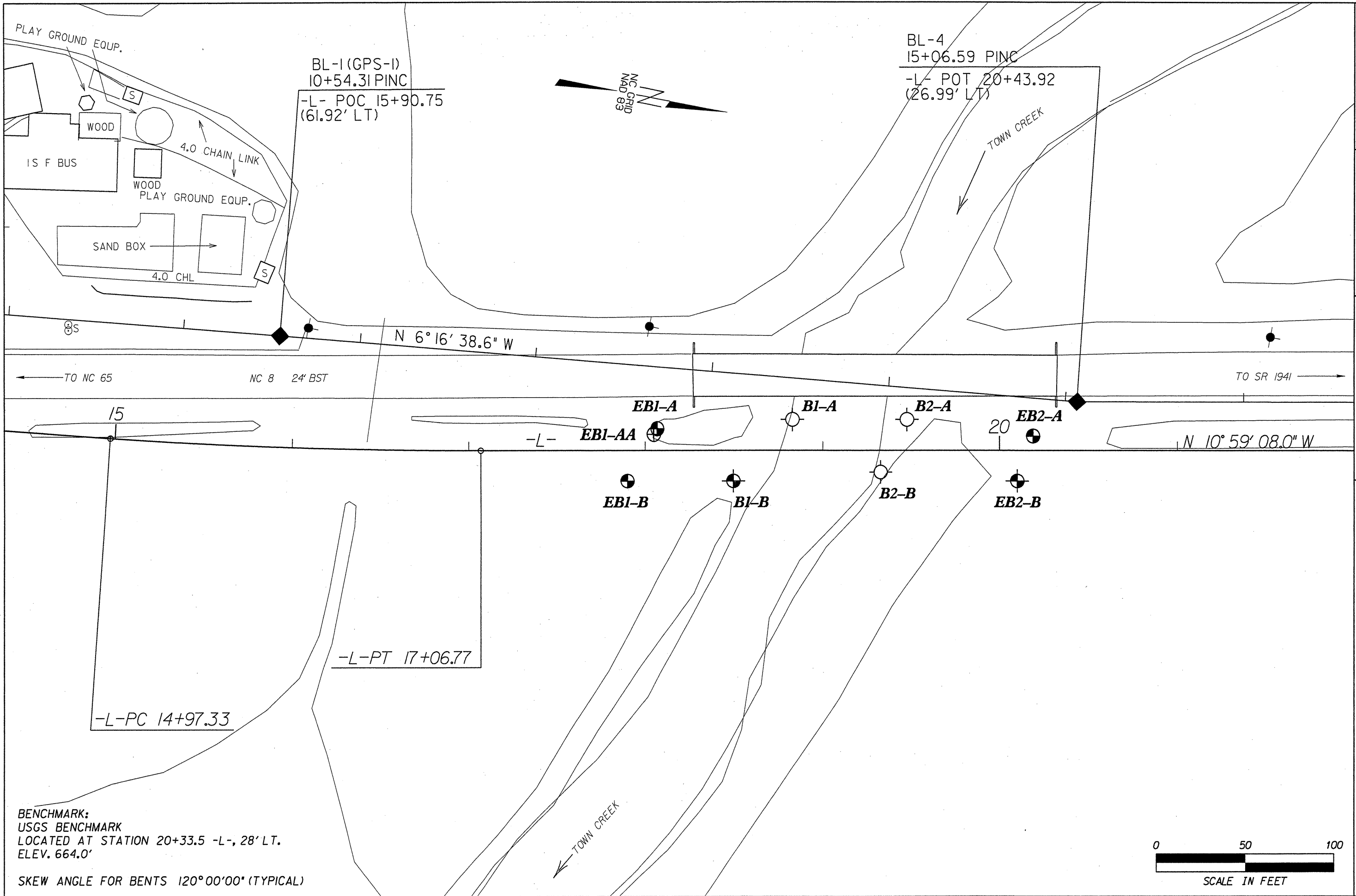
S:\PROJECTS\2005\OTHER DEPTS\1352\05-506\CADD\B-4280 SITE.VIC

SCALE:	1:24,000
CHECKED BY:	AFR
DRAWN BY:	TRP
DATE:	AUGUST 2005
JOB NO.	1352-05-506



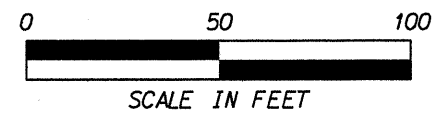
SITE VICINITY MAP
 REPLACEMENT OF BRIDGE No. 14 OVER TOWN FORK CREEK
 AND BRIDGE No. 44 OVER TOWN FORK CREEK OVERFLOW ON NC 8
 STATE PROJECT NO. 33620.1.1 TIP NO. B-4280
 FEDERAL I.D. NO. BRSTP-8(2)
 STOKES COUNTY, NORTH CAROLINA

S:\PROJECTS\2005\OTHER DEPTS.\1352\05-506\CADD\B-4280 SITEPLAN Brg 14



BENCHMARK:
 USGS BENCHMARK
 LOCATED AT STATION 20+33.5 -L-, 28' LT.
 ELEV. 664.0'

SKREW ANGLE FOR BENTS 120°00'00" (TYPICAL)



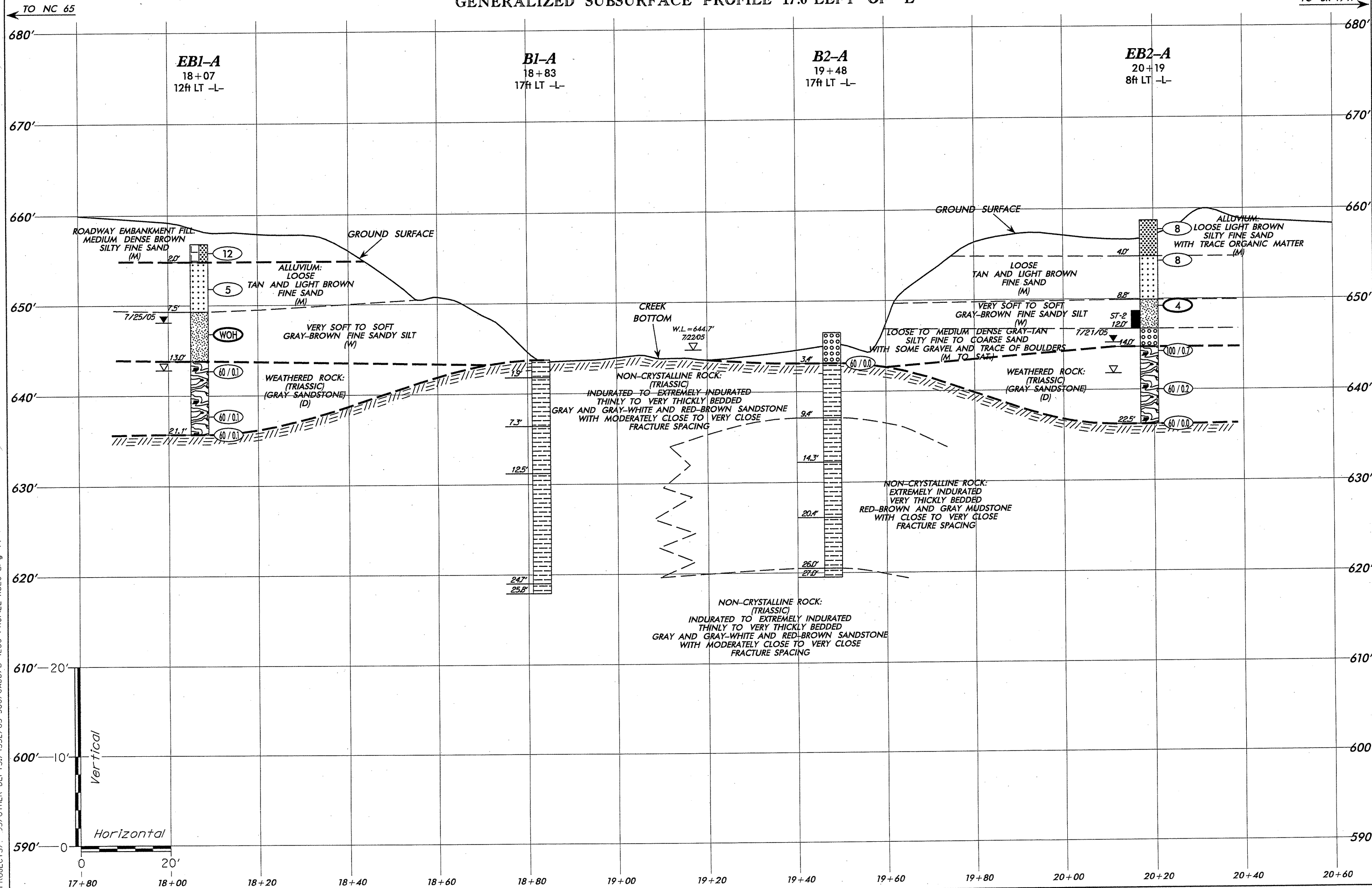
BORING LOCATION PLAN

REPLACEMENT OF BRIDGE No. 14
 OVER TOWN FORK CREEK ON NC 8
 STATE PROJECT No. 33620.1.1 FEDERAL I.D. BRSTP-8(2)
 TIP No. B-4280 STOKES COUNTY, NORTH CAROLINA

APPROVED BY: AFR
 DRAWN BY: TRP
 DATE: AUGUST 2005
 JOB NO. 1352-05-506
 SHEET 6 OF 50

S&ME
 ENVIRONMENTAL SERVICES
 ENGINEERING - TESTING

GENERALIZED SUBSURFACE PROFILE 17.0' LEFT OF -L-



APPROVED BY:	AFR
DRAWN BY:	TRP
DATE:	AUGUST 2005
JOB NO.:	1352-05-506
FIGURE	7 OF 50

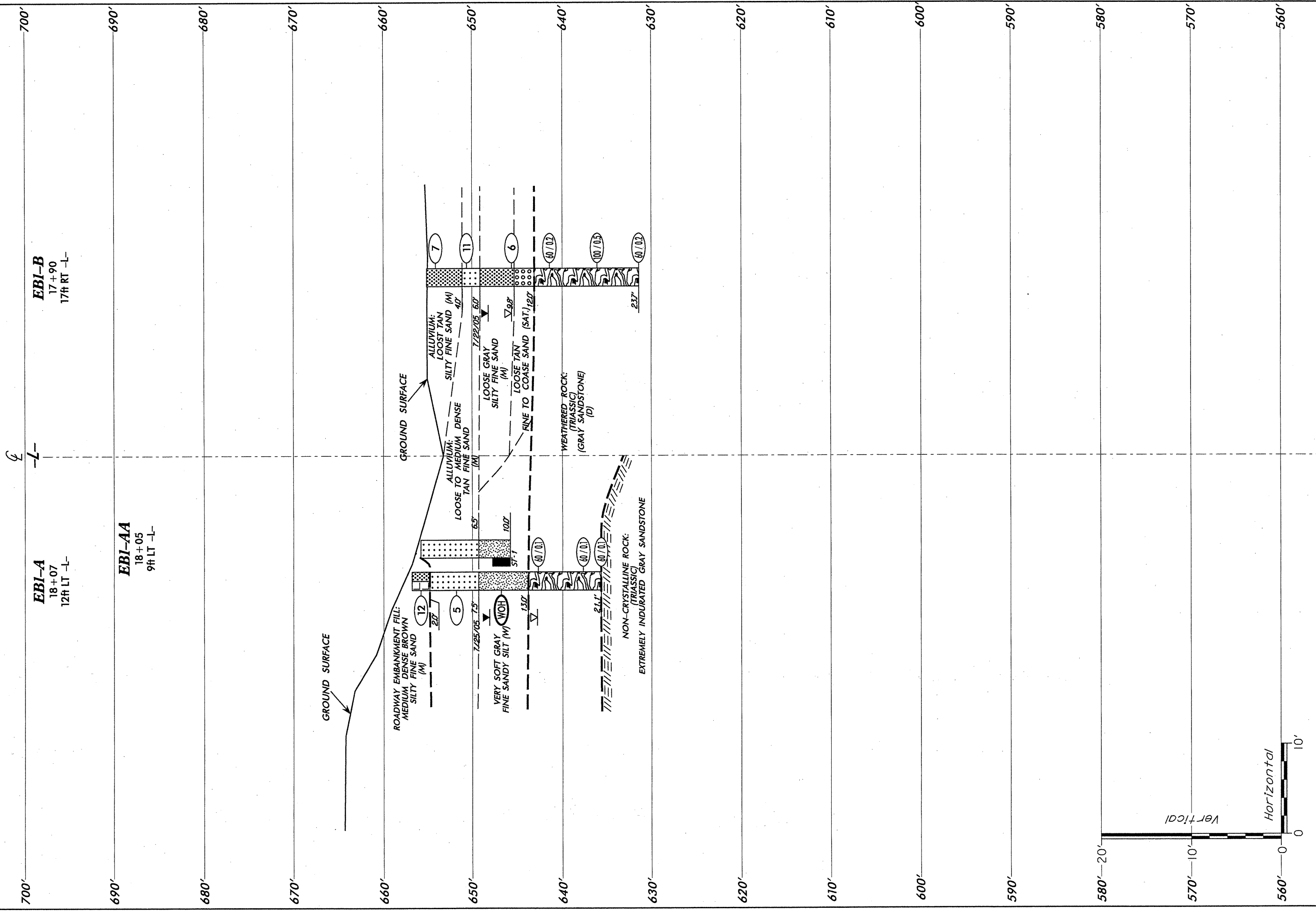
SCALE: (V) 1" = 10'
(H) 1" = 20'

S&ME
ENVIRONMENTAL SERVICES
ENGINEERING TESTING

GENERALIZED SUBSURFACE PROFILE 17.0' LEFT OF -L-
STATION 17+80 TO 20+60
REPLACEMENT OF BRIDGE No. 14
OVER TOWN FORK CREEK ON NC 8
TIP No. B-4280 PROJECT No. 33620.1.1 FEDERAL I.D. BRSTP-8(2)
STOKES COUNTY, NORTH CAROLINA

S:\PROJECTS\1352\05-506\CA00\B-4280 PROFILE-XSEC Brg 14

GENERALIZED SUBSURFACE CROSS SECTION THROUGH END BENT No.1



EBI-B
17+90
17# RT -L-

EBI-A
18+07
12# LT -L-

EBI-AA
18+05
9# LT -L-

GENERALIZED SUBSURFACE CROSS SECTION THROUGH END BENT No.1

REPLACEMENT OF BRIDGE No. 14
OVER TOWN FORK CREEK ON NC 8
TIP No. B-4280 PROJECT No. 33620.1.1 FEDERAL I.D. BRSTP-8(2)
STOKES COUNTY, NORTH CAROLINA



SCALE: (V) 1" = 10'
(H) 1" = 10'

DATE: AUGUST 2005

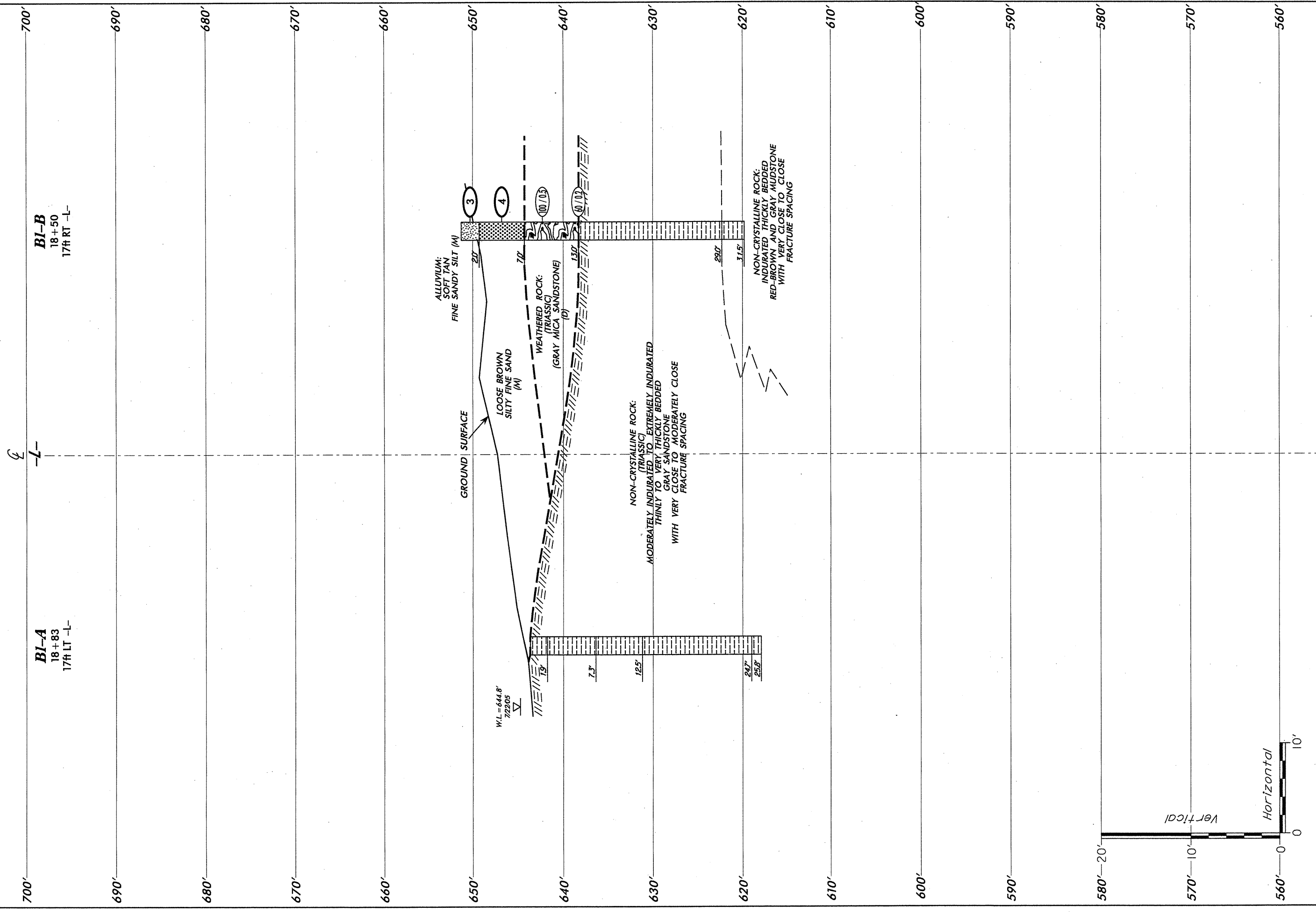
JOB NO. 1352-05-506

APPROVED BY: AFR

DRAWN BY: TRP

FIGURE 8 OF 50

GENERALIZED SUBSURFACE CROSS SECTION THROUGH INTERIOR BENT No.1



BI-A
18+83
17th LT -L-

BI-B
18+50
17th RT -L-

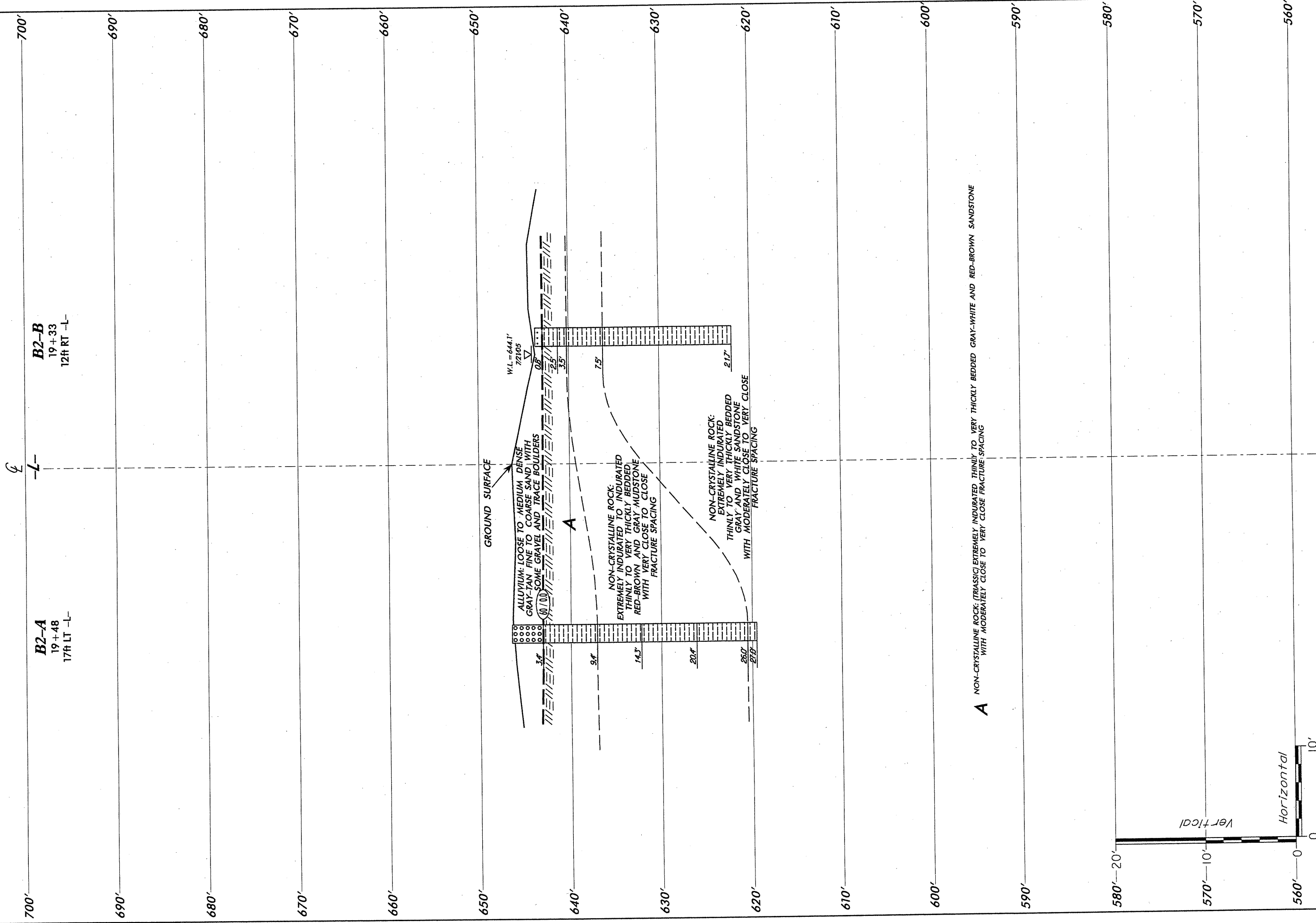
GENERALIZED SUBSURFACE CROSS SECTION THROUGH INTERIOR BENT No.1

REPLACEMENT OF BRIDGE No. 14
OVER TOWN FORK CREEK ON NC 8
TIP No. B-4280 PROJECT No. 33620.1.1 FEDERAL I.D. BRSTP-8(2)
STOKES COUNTY, NORTH CAROLINA



SCALE:	(V) 1" = 10'	APPROVED BY:	AFR
	(H) 1" = 10'	DRAWN BY:	TRP
DATE:	AUGUST 2005	JOB NO.	1352-05-506
		FIGURE	9 OF 50

GENERALIZED SUBSURFACE CROSS SECTION THROUGH INTERIOR BENT No. 2



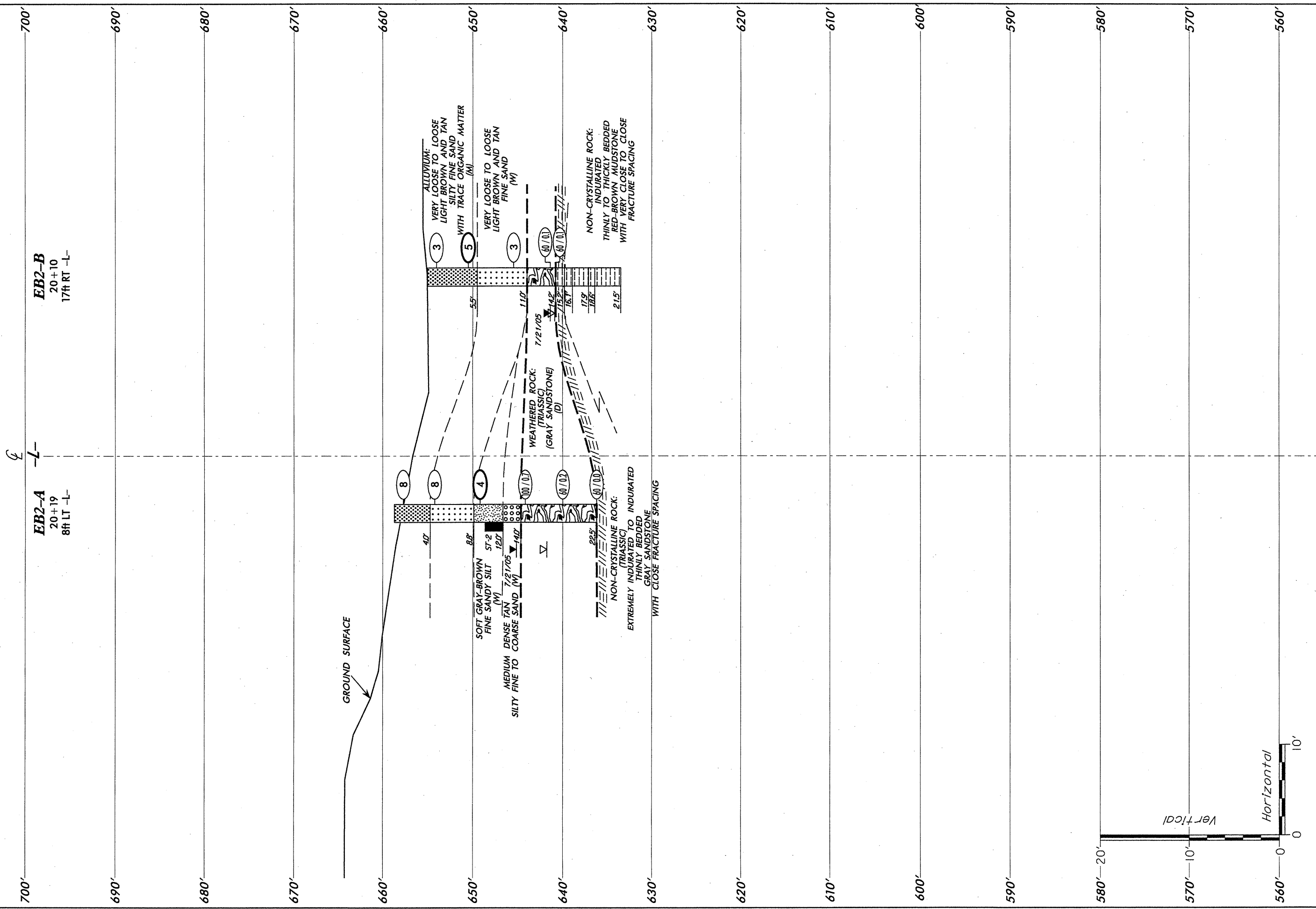
B2-B
19+33
12# RT -L-

B2-A
19+48
17# LT -L-

GENERALIZED SUBSURFACE CROSS SECTION THROUGH INTERIOR BENT No. 2		SCALE: (V) 1" = 10' (H) 1" = 10'		APPROVED BY: AFR
REPLACEMENT OF BRIDGE No. 14 OVER TOWN FORK CREEK ON NC 8		DATE: AUGUST 2005		DRAWN BY: TRP
TIP No. B-4280 PROJECT No. 33620.1.1 FEDERAL I.D. BRSTP-8(2) STOKES COUNTY, NORTH CAROLINA		JOB NO. 1352-05-506		FIGURE 10 OF 50



GENERALIZED SUBSURFACE CROSS SECTION THROUGH END BENT No. 2

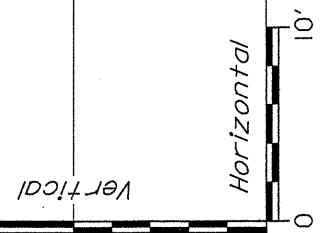


GENERALIZED SUBSURFACE CROSS SECTION THROUGH END BENT No. 2

REPLACEMENT OF BRIDGE No. 14
 OVER TOWN FORK CREEK ON NC 8
 TIP No. B-4280 PROJECT No. 33620.1.1 FEDERAL I.D. BRSTP-8(2)
 STOKES COUNTY, NORTH CAROLINA



SCALE:	(V) 1" = 10'	APPROVED BY:	AFR
	(H) 1" = 10'	DRAWN BY:	TRP
DATE:	AUGUST 2005	FIGURE	11 OF 50
JOB NO.	1352-05-506		





PROJECT NO. 33620.1.1		ID. B-4280		COUNTY STOKES		GEOLOGIST K. LEWALLEN							
SITE DESCRIPTION BRIDGE 14 OVER TOWN FORK CREEK ON NC 8							GROUND WATER (ft)						
BORING NO. EB1-A		BORING LOCATION 18+07		OFFSET 12 ft LT	ALIGNMENT -L-		0 HR. 14.0						
COLLAR ELEV. 656.8 ft		NORTHING 918,551.7		EASTING 1,639,625.1		24 HR. 8.7 on 7/25/05							
TOTAL DEPTH 21.1 ft		DRILL MACHINE BK-51		DRILL METHOD 2 1/4" H.S.A.		HAMMER TYPE MANUAL							
DATE STARTED 7/22/05		COMPLETED 7/22/05		SURFACE WATER DEPTH N/A									
ELEV. (ft)	DEPTH (ft)	BLOW COUNT			BLOWS PER FOOT					SAMP. NO.	LOG MOI	SOIL AND ROCK DESCRIPTION	
		0.5ft	0.5ft	0.5ft	0	20	40	60	80				100
656.8	0.0	1	1	11									GROUND SURFACE
656.8	0.0												ROADWAY EMBANKMENT FILL: MEDIUM DENSE BROWN SILTY FINE SAND (A-2-4)
652.8	4.0	2	2	3									ALLUVIUM: LOOSE TAN FINE SAND (A-3)
647.8	9.0	WOH	WOH	WOH									VERY SOFT GRAY FINE SANDY SILT (A-4)
642.8	14.0	60/0.1											WEATHERED ROCK: (TRIASSIC) (GRAY SANDSTONE)
637.8	19.0	60/0.1											
635.8	21.0	60/0.1											
		60/0.1											1) ADVANCED 2-1/4" HSA TO 21.0 FEET.
													BORING TERMINATED WITH STANDARD PENETRATION TEST REFUSAL AT ELEVATION 635.7 FEET ON NON-CRYSTALLINE ROCK: (TRIASSIC) EXTREMELY INDURATED GRAY SANDSTONE

NCDOT BORE SINGLE BRIDGE 14 1352-05-506.GPJ NCDOT.GDT 8/19/05



PROJECT NO. 33620.1.1		ID. B-4280		COUNTY STOKES		GEOLOGIST K. LEWALLEN							
SITE DESCRIPTION BRIDGE 14 OVER TOWN FORK CREEK ON NC 8							GROUND WATER (ft)						
BORING NO. EB1-AA		BORING LOCATION 18+05		OFFSET 9 ft LT	ALIGNMENT -L-		0 HR. N/M						
COLLAR ELEV. 655.8 ft		NORTHING 918,550.4		EASTING 1,639,628.4		24 HR. N/M							
TOTAL DEPTH 10.0 ft		DRILL MACHINE BK-51		DRILL METHOD 2 1/4" H.S.A.		HAMMER TYPE N/A							
DATE STARTED 7/25/05		COMPLETED 7/25/05		SURFACE WATER DEPTH N/A									
ELEV. (ft)	DEPTH (ft)	BLOW COUNT			BLOWS PER FOOT					SAMP. NO.	LOG MOI	SOIL AND ROCK DESCRIPTION	
		0.5ft	0.5ft	0.5ft	0	20	40	60	80				100
655.8	0.0												GROUND SURFACE
													ALLUVIUM: LOOSE TAN FINE SAND (A-3)
													VERY SOFT GRAY CLAYEY FINE SANDY SILT (A-4)
													WITH TRACE OF COARSE SAND
													1) ADVANCED 2-1/4" HSA TO 8.0 FEET. 2) SHELBY TUBE TAKEN FROM 8.0' TO 10.0'.
													BORING TERMINATED AT ELEVATION 645.8 FEET IN ALLUVIUM: VERY SOFT GRAY FINE SANDY SILT (A-4)

NCDOT BORE SINGLE BRIDGE 14 1352-05-506.GPJ NCDOT.GDT 9/7/05



PROJECT NO. 33620.1.1		ID. B-4280		COUNTY STOKES		GEOLOGIST K. LEWALLEN							
SITE DESCRIPTION BRIDGE 14 OVER TOWN FORK CREEK ON NC 8							GROUND WATER (ft)						
BORING NO. EB1-B		BORING LOCATION 17+90		OFFSET 17 ft RT		ALIGNMENT -L-							
COLLAR ELEV. 655.1 ft		NORTHING 918,540.7		EASTING 1,639,656.7		0 HR. 9.5							
TOTAL DEPTH 23.7 ft		DRILL MACHINE BK-51		DRILL METHOD 2 1/4" H.S.A.		24 HR. 6.9 on 7/22/05							
DATE STARTED 7/21/05		COMPLETED 7/21/05		SURFACE WATER DEPTH N/A		HAMMER TYPE MANUAL							
ELEV. (ft)	DEPTH (ft)	BLOW COUNT			BLOWS PER FOOT					SAMP. NO.	L O G	SOIL AND ROCK DESCRIPTION	
		0.5ft	0.5ft	0.5ft	0	20	40	60	80				100
655.1	0.0	3	3	4	GROUND SURFACE							655.1 0.0	
651.6	3.5	3	6	5	7					M		ALLUVIUM: LOOSE TAN SILTY FINE SAND (A-2-4) 651.1 4.0	
646.6	8.5	1	2	4	11					M		649.1 6.0 MEDIUM DENSE TAN FINE SAND (A-3)	
641.6	13.5	60/0.2			6							645.3 9.8 LOOSE GRAY SILTY FINE SAND (A-2-4)	
636.6	18.5	100/0.5			60/0.2					M		643.1 12.0 LOOSE TAN FINE TO COARSE SAND (A-1-b)	
631.6	23.5	60/0.2			100/0.5					D		631.4 23.7 WEATHERED ROCK: (TRIASSIC) (GRAY SANDSTONE)	
BORING TERMINATED AT ELEVATION 631.4 FEET IN WEATHERED ROCK: (GRAY SANDSTONE)													1) ADVANCED 2-1/4" HSA TO 23.5 FEET.

NCDOT BORE SINGLE BRIDGE 14 1352-05-506.GPJ NCDOT.GDT 8/19/05



PROJECT NO. 33620.1.1		ID. B-4280		COUNTY STOKES		GEOLOGIST K. LEWALLEN								
SITE DESCRIPTION BRIDGE 14 OVER TOWN FORK CREEK ON NC 8							GROUND WATER (ft)							
BORING NO. B1-A		BORING LOCATION 18+83		OFFSET 17 ft LT		ALIGNMENT -L-								
COLLAR ELEV. 643.7 ft		NORTHING 918,625.1		EASTING 1,639,605.8		0 HR. N/A 24 HR. N/A								
TOTAL DEPTH 25.8 ft		DRILL MACHINE BK-51		DRILL METHOD NW CASING ADVANCER/NQ-2 CORE BARREL		HAMMER TYPE MANUAL								
DATE STARTED 7/21/05		COMPLETED 7/22/05		SURFACE WATER DEPTH 1.1 ft										
ELEV. (ft)	DEPTH (ft)	BLOW COUNT			BLOWS PER FOOT					SAMP. NO.	LOG MOI	SOIL AND ROCK DESCRIPTION		
		0.5ft	0.5ft	0.5ft	0	20	40	60	80	100				
644.8												CREEK LEVEL		
643.7												CREEK BOTTOM		
												643.7	0.0	
												641.8	1.9	NON-CRYSTALLINE ROCK: (TRIASSIC) GRAY SANDSTONE
												636.4	7.3	NON-CRYSTALLINE ROCK: EXTREMELY INDURATED TO INDURATED VERY THICKLY BEDDED GRAY SANDSTONE WITH MODERATELY CLOSE TO CLOSE FRACTURE SPACING
												631.2	12.5	NON-CRYSTALLINE ROCK: INDURATED TO MODERATELY INDURATED VERY THICKLY BEDDED GRAY SANDSTONE WITH CLOSE TO VERY CLOSE FRACTURE SPACING
												619.0	24.7	NON-CRYSTALLINE ROCK: EXTREMELY INDURATED THINLY BEDDED GRAY SANDSTONE WITH CLOSE TO VERY CLOSE FRACTURE SPACING
												617.9	25.8	NON-CRYSTALLINE ROCK: EXTREMELY INDURATED THINLY BEDDED GRAY SANDSTONE WITH CLOSE TO VERY CLOSE FRACTURE SPACING
BORING TERMINATED AT ELEVATION 617.9 FEET IN NON-CRYSTALLINE ROCK: EXTREMELY INDURATED GRAY SANDSTONE														
					1) ADVANCED NW-CASING ADVANCER TO 1.9 FEET. 2) ADVANCED NQ-2 CORE BARREL FROM 1.9 TO 25.8 FEET. 3) CREEK WATER USED AS DRILLING FLUID. 4) APPROXIMATE DRILLING FLUID DENSITY 62.4 PCF. 5) NO LOSS OF DRILLING FLUID OBSERVED.									

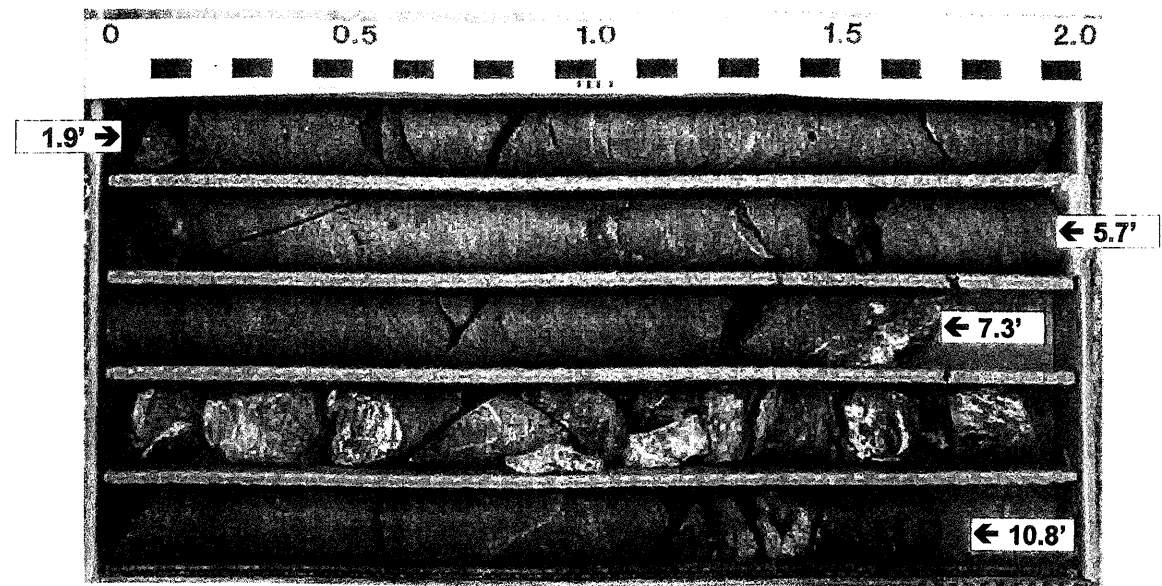
NCDOT BORE SINGLE BRIDGE 14 1352-05-506.GPJ NCDOT.GDT 9/7/05

PROJECT NO. 33620.1.1		ID. B-4280		COUNTY STOKES		GEOLOGIST K. LEWALLEN				
SITE DESCRIPTION BRIDGE 14 OVER TOWN FORK CREEK ON NC 8							GROUND WATER (ft)			
BORING NO. B1-A		BORING LOCATION 18+83		OFFSET 17 ft LT		ALIGNMENT -L-				
COLLAR ELEV. 643.7 ft		NORTHING 918,625.1		EASTING 1,639,605.8		0 HR. N/A 24 HR. N/A				
TOTAL DEPTH 25.8 ft		DRILL MACHINE BK-51		DRILL METHOD NW CASING ADVANCER/NQ-2 CORE BARREL		HAMMER TYPE MANUAL				
DATE STARTED 7/21/05		COMPLETED 7/22/05		SURFACE WATER DEPTH 1.1 ft						
CORE SIZE NQ-2		TOTAL RUN 23.9 ft		DRILLER J. LITTLE						
ELEV. (ft)	DEPTH (ft)	RUN (ft)	DRILL RATE (Min/ft)	RUN REC. (ft) RQD (%)		SAMP. NO.	STRATA REC. (ft) RQD (%)	LOG	DESCRIPTION AND REMARKS	
									641.8	Begin Coring @ 1.9 ft
641.8	1.9	3.8	2:20	(3.8)	(2.2)					
638.0	5.7		2:30	100%	58%					
636.4	7.3	1.6	2:40							
			1:20/0.8							
632.9	10.8	3.5	2:20	(1.6)	(1.4)					
			2:20	100%	88%					
			2:30							
			1:20/0.6	(3.5)	(1.1)					
			2:10	90%	34%					
627.9	15.8	5.0	2:20	(4.5)	(1.7)		(23.3)	(13.9)		
			2:20				97%	58%		
			2:10							
			6:00							
			5:50	(4.9)	(4.7)					
622.9	20.8	5.0	3:20	98%	94%					
			2:40							
			3:00							
			3:20							
			4:00	(5.0)	(2.8)					
			3:00	100%	56%					
			3:00							
617.9	25.8		2:10							
			2:30							
			2:20							
			3:00							
BORING TERMINATED AT ELEVATION 617.9 FEET IN NON-CRYSTALLINE ROCK: EXTREMELY INDURATED GRAY SANDSTONE										
					1) ADVANCED NW-CASING ADVANCER TO 1.9 FEET. 2) ADVANCED NQ-2 CORE BARREL FROM 1.9 TO 25.8 FEET. 3) CREEK WATER USED AS DRILLING FLUID. 4) APPROXIMATE DRILLING FLUID DENSITY 62.4 PCF. 5) NO LOSS OF DRILLING FLUID OBSERVED.					

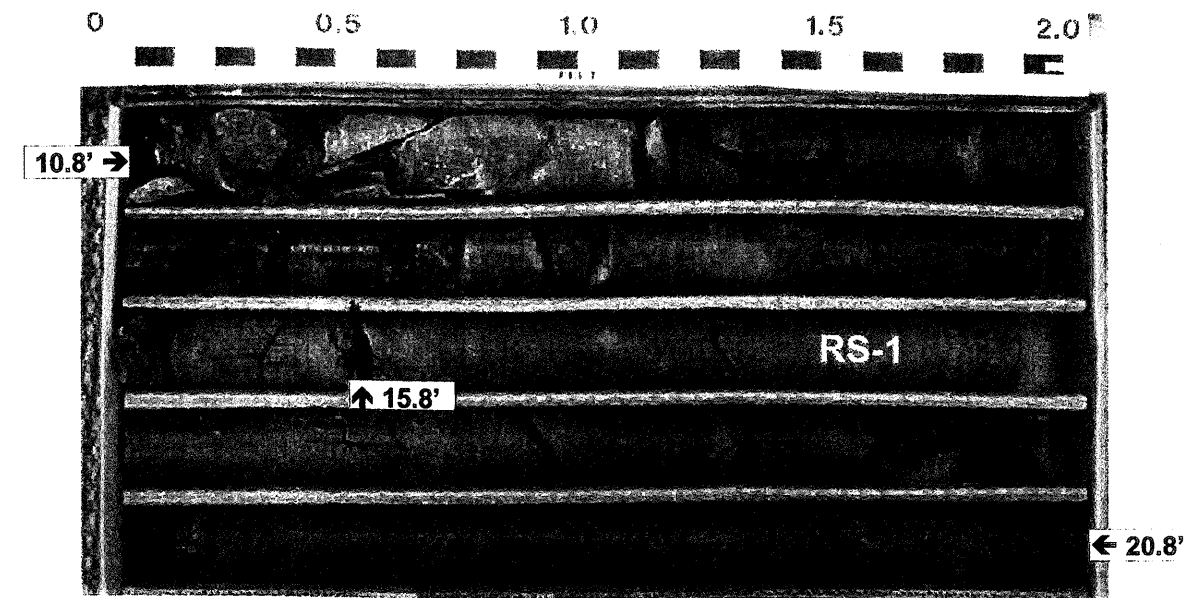
NCDOT CORE SINGLE BRIDGE 14 1352-05-506.GPJ NCDOT.GDT 9/7/05

CORE PHOTOS

Project No: 33620.1.1	TIP No: B-4280	County: Stokes	Boring No.: B1-A
Site Description: Replacement of Bridge No. 14 over Town Fork Creek on NC 8		Driller: J. Little	
Collar Elev.: 643.7 ft.	Core Size: NQ-2	Equipment: BK-51	Geologist: K. Lewallen
Elev. at T.D.: 617.9 ft.	Total Depth: 25.8 ft.	Total Run: 23.9 ft.	Date: 7/22/05



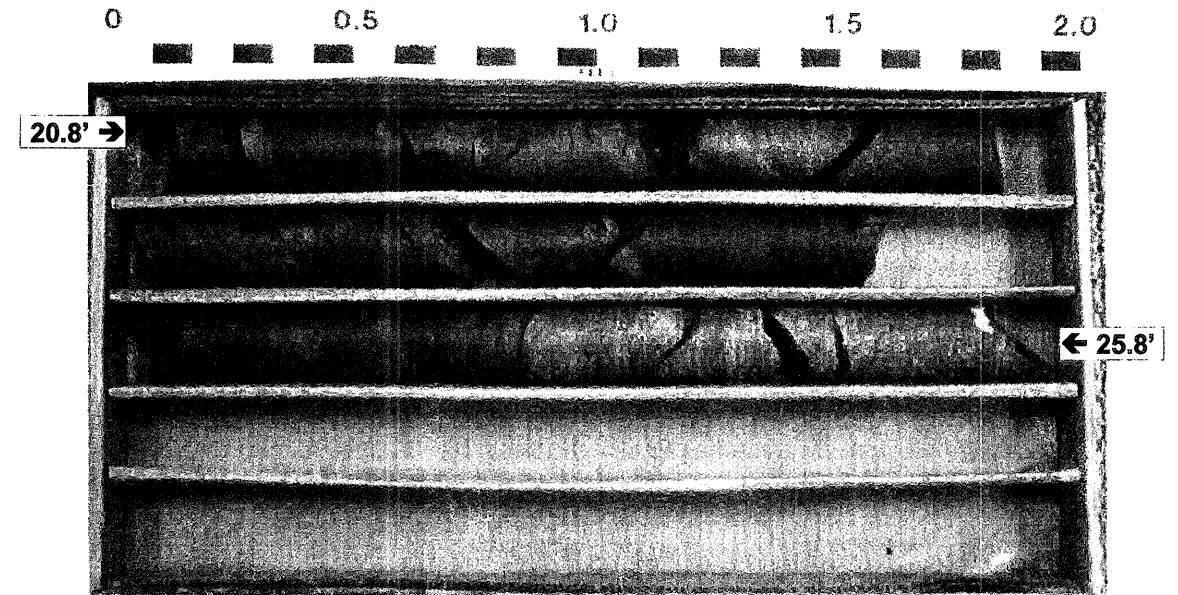
Box 1 of 3
Top of Box @ 1.9 feet; Bottom of Box @ 10.8 feet



Box 2 of 3
Top of Box @ 10.8 feet; Bottom of Box @ 20.8 feet

CORE PHOTOS

Project No: 33620.1.1	TIP No: B-4280	County: Stokes	Boring No.: B1-A
Site Description: Replacement of Bridge No. 14 over Town Fork Creek on NC 8		Driller: J. Little	
Collar Elev.: 643.7 ft.	Core Size: NQ-2	Equipment: BK-51	Geologist: K. Lewallen
Elev. at T.D.: 617.9 ft.	Total Depth: 25.8 ft.	Total Run: 23.9 ft.	Date: 7/22/05



Box 3 of 3
Top of Box @ 20.8 feet; Bottom of Box @ 25.8 feet



PROJECT NO. 33620.1.1		ID. B-4280		COUNTY STOKES		GEOLOGIST K. LEWALLEN							
SITE DESCRIPTION BRIDGE 14 OVER TOWN FORK CREEK ON NC 8						GROUND WATER (ft)							
BORING NO. B1-B		BORING LOCATION 18+50		OFFSET 17 ft RT		ALIGNMENT -L-							
COLLAR ELEV. 651.3 ft		NORTHING 918,599.4		EASTING 1,639,645.4		0 HR. N/A							
TOTAL DEPTH 31.5 ft		DRILL MACHINE BK-51		DRILL METHOD 2 1/4" HSA/NQ-2 CORE BARREL		24 HR. N/M							
DATE STARTED 7/25/05		COMPLETED 7/25/05		SURFACE WATER DEPTH N/A									
ELEV. (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								
651.3												GROUND SURFACE	
651.3		1 1 2			0.3			SS-2		M		649.3 ALLUVIUM: SOFT TAN FINE SANDY SILT (A-4)	
647.8		2 2 2			0.4			SS-3		M		644.3 LOOSE BROWN SILTY FINE SAND (A-2-4)	
642.8		100/0.5			100/0.5					D		638.3 WEATHERED ROCK: (TRIASSIC) (GRAY SANDSTONE)	
638.5		60/0.2			80/0.2					D		638.3 NON-CRYSTALLINE ROCK: (TRIASSIC) EXTREMELY INDURATED VERY THICKLY BEDDED GRAY SANDSTONE WITH CLOSE TO MODERATELY CLOSE FRACTURE SPACING	
								RS-2				622.3 NON-CRYSTALLINE ROCK: INDURATED THICKLY BEDDED RED-BROWN AND GRAY MUDSTONE WITH VERY CLOSE TO CLOSE FRACTURE SPACING	
												619.8 NON-CRYSTALLINE ROCK: INDURATED THICKLY BEDDED RED-BROWN AND GRAY MUDSTONE WITH VERY CLOSE TO CLOSE FRACTURE SPACING	
												BORING TERMINATED AT ELEVATION 619.8 FEET IN NON- CRYSTALLINE ROCK: INDURATED RED-BROWN AND GRAY MUDSTONE	
												1) ADVANCED 2-1/4" HSA TO 12.8 FEET. 2) SET NW CASING TO 13 FEET. 3) ADVANCED NQ-2 CORE BARREL FROM 13 TO 31.5 FEET. 4) CREEK WATER USED AS DRILLING FLUID. 5) APPROXIMATE DRILLING FLUID DENSITY 62.4 PCF. 6) NO LOSS OF DRILLING FLUID OBSERVED.	

NCDOT BORE SINGLE BRIDGE 14 1352-05-506.GPJ NCDOT.GDT 9/7/05

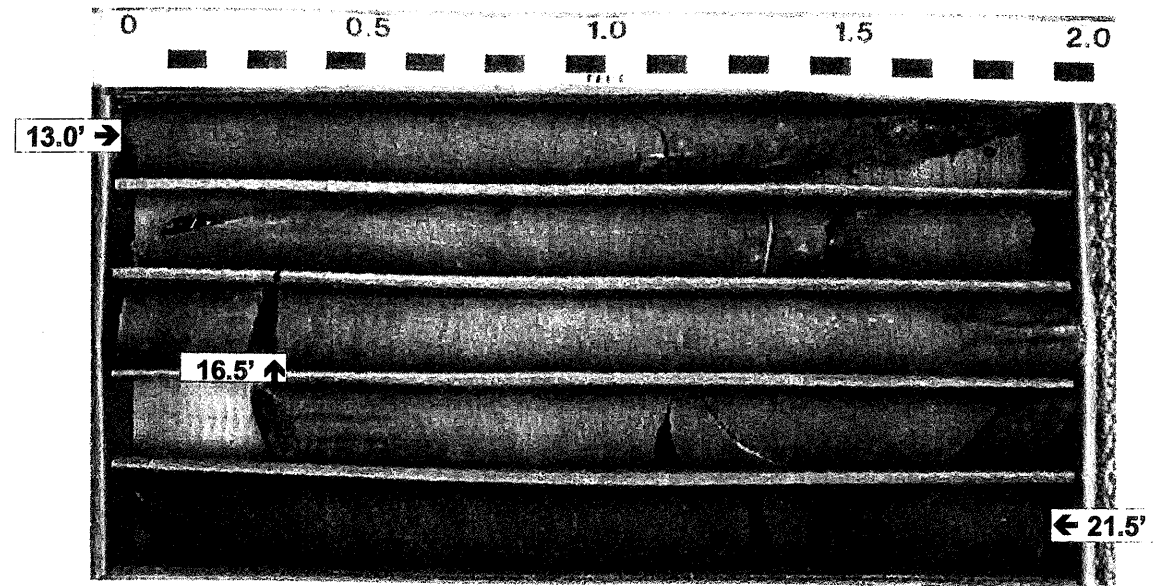


PROJECT NO. 33620.1.1		ID. B-4280		COUNTY STOKES		GEOLOGIST K. LEWALLEN				
SITE DESCRIPTION BRIDGE 14 OVER TOWN FORK CREEK ON NC 8						GROUND WATER (ft)				
BORING NO. B1-B		BORING LOCATION 18+50		OFFSET 17 ft RT		ALIGNMENT -L-				
COLLAR ELEV. 651.3 ft		NORTHING 918,599.4		EASTING 1,639,645.4		0 HR. N/A				
TOTAL DEPTH 31.5 ft		DRILL MACHINE BK-51		DRILL METHOD 2 1/4" HSA/NQ-2 CORE BARREL		24 HR. N/M				
DATE STARTED 7/25/05		COMPLETED 7/25/05		SURFACE WATER DEPTH N/A						
CORE SIZE NQ-2		TOTAL RUN 18.5 ft		DRILLER J. LITTLE						
ELEV. (ft)	DEPTH (ft)	RUN (ft)	DRILL RATE (Min/ft)	RUN REC. (%)	RUN ROD (%)	SAMP. NO.	STRATA REC. (%)	ROD (%)	LOG	DESCRIPTION AND REMARKS
										Begin Coring @ 13.0 ft
638.3	13.0	3.5	1:30	(3.4)	(3.4)		(15.8)	(12.5)		NON-CRYSTALLINE ROCK: (TRIASSIC) EXTREMELY INDURATED VERY THICKLY BEDDED GRAY SANDSTONE WITH CLOSE TO MODERATELY CLOSE FRACTURE SPACING 1 JOINT @ 10°, 2 JOINTS @ 30°, 3 JOINTS @ 45°, AND 9 JOINTS @ 60°
634.8	16.5	5.0	2:00/0.5	(5.0)	(4.4)					
			2:20	100%	88%					
629.8	21.5	5.0	2:20	(4.9)	(3.1)					
			2:20	98%	62%					
			2:10							
624.8	26.5	5.0	1:50			RS-2				
			2:10	(5.0)	(2.2)					
			2:00	100%	44%					
			2:10							
			2:30				(2.5)	(0.6)		
619.8	31.5		3:30	100%	24%					NON-CRYSTALLINE ROCK: INDURATED THICKLY BEDDED RED-BROWN AND GRAY MUDSTONE WITH VERY CLOSE TO CLOSE FRACTURE SPACING 3 JOINTS @ 30°, 3 JOINTS @ 45°, AND 2 JOINTS @ 60° BORING TERMINATED AT ELEVATION 619.8 FEET IN NON- CRYSTALLINE ROCK: INDURATED RED-BROWN AND GRAY MUDSTONE
			4:10							
			3:50							

NCDOT CORE SINGLE BRIDGE 14 1352-05-506.GPJ NCDOT.GDT 9/7/05

CORE PHOTOS

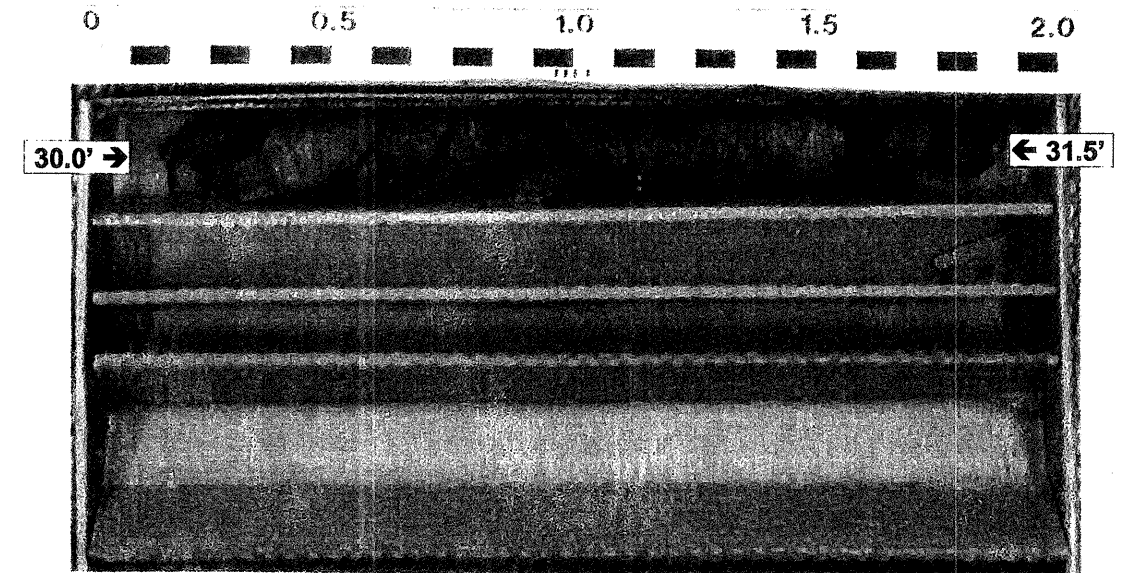
Project No: 33620.1.1	TIP No: B-4280	County: Stokes	Boring No.: B1-B
Site Description: Replacement of Bridge No. 14 over Town Fork Creek on NC 8		Driller: J. Little	
Collar Elev.: 651.3 ft.	Core Size: NQ-2	Equipment: BK-51	Geologist: K. Lewallen
Elev. at T.D.: 619.8 ft.	Total Depth: 31.5 ft.	Total Run: 18.5 ft.	Date: 7/25/05



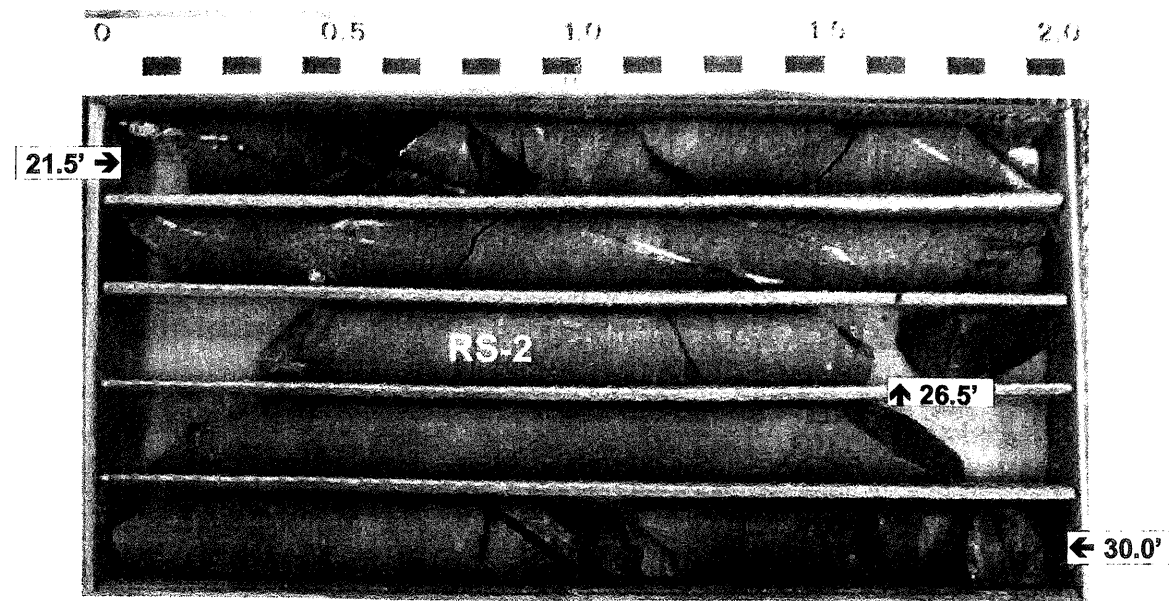
Box 1 of 3
Top of Box @ 13.0 feet; Bottom of Box @ 21.5 feet

CORE PHOTOS

Project No: 33620.1.1	TIP No: B-4280	County: Stokes	Boring No.: B1-B
Site Description: Replacement of Bridge No. 14 over Town Fork Creek on NC 8		Driller: J. Little	
Collar Elev.: 651.3 ft.	Core Size: NQ-2	Equipment: BK-51	Geologist: K. Lewallen
Elev. at T.D.: 619.8 ft.	Total Depth: 31.5 ft.	Total Run: 18.5 ft.	Date: 7/25/05



Box 3 of 3
Top of Box @ 30.0 feet; Bottom of Box @ 31.5 feet



Box 2 of 3
Top of Box @ 21.5 feet; Bottom of Box @ 30.0 feet



PROJECT NO. 33620.1.1		ID. B-4280		COUNTY STOKES		GEOLOGIST D. BENTS				
SITE DESCRIPTION BRIDGE 14 OVER TOWN FORK CREEK ON NC 8							GROUND WATER (ft)			
BORING NO. B2-A		BORING LOCATION 19+48		OFFSET 17 ft LT	ALIGNMENT -L-		0 HR. N/A			
COLLAR ELEV. 646.5 ft		NORTHING 918,689.1		EASTING 1,639,593.5		24 HR. N/M				
TOTAL DEPTH 27.0 ft		DRILL MACHINE BK-51		DRILL METHOD NW ROTARY WASH/NQ-2 CORE BARREL		HAMMER TYPE MANUAL				
DATE STARTED 7/20/05		COMPLETED 7/20/05		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
646.5					GROUND SURFACE					646.5 0.0
643.1	3.4									643.1 3.4
		60/0.0			60/0.0					
										637.1 9.4
										632.2 14.3
										626.1 20.4
										620.5 26.0
										619.5 27.0
BORING TERMINATED AT ELEVATION 619.5 FEET IN NON-CRYSTALLINE ROCK: EXTREMELY INDURATED GRAY-WHITE SANDSTONE										

ALLUVIUM:
LOOSE TO MEDIUM DENSE GRAY-TAN FINE TO COARSE SAND (A-1-b) WITH SOME GRAVEL. TRACE BOULDERS FROM 2.5' TO 3.4'

NON-CRYSTALLINE ROCK: (TRIASSIC)
EXTREMELY INDURATED VERY THICKLY BEDDED GRAY-WHITE SANDSTONE WITH MODERATELY CLOSE FRACTURE SPACING

NON-CRYSTALLINE ROCK: EXTREMELY INDURATED VERY THICKLY BEDDED RED-BROWN MUDSTONE WITH MODERATELY CLOSE FRACTURE SPACING

NON-CRYSTALLINE ROCK: EXTREMELY INDURATED VERY THICKLY BEDDED RED-BROWN MUDSTONE WITH VERY CLOSE TO CLOSE FRACTURE SPACING

NON-CRYSTALLINE ROCK: EXTREMELY INDURATED VERY THICKLY BEDDED RED-BROWN AND GRAY MUDSTONE WITH CLOSE TO VERY CLOSE FRACTURE SPACING

NON-CRYSTALLINE ROCK: EXTREMELY INDURATED THINLY BEDDED GRAY-WHITE SANDSTONE WITH CLOSE TO VERY CLOSE FRACTURE SPACING

- 1) ADVANCED NW CASING TO 3.4 FEET WITH ROTARY WASH.
- 2) ADVANCED NQ-2 CORE BARREL FROM 3.4 TO 27 FEET.
- 3) CREEK WATER USED AS DRILLING FLUID.
- 4) APPROXIMATE DRILLING FLUID DENSITY 62.4 PCF.
- 5) NO LOSS OF DRILLING FLUID OBSERVED.

NCDOT BORE SINGLE BRIDGE 14 1352-05-506.GPJ NCDOT.GDT 9/12/05

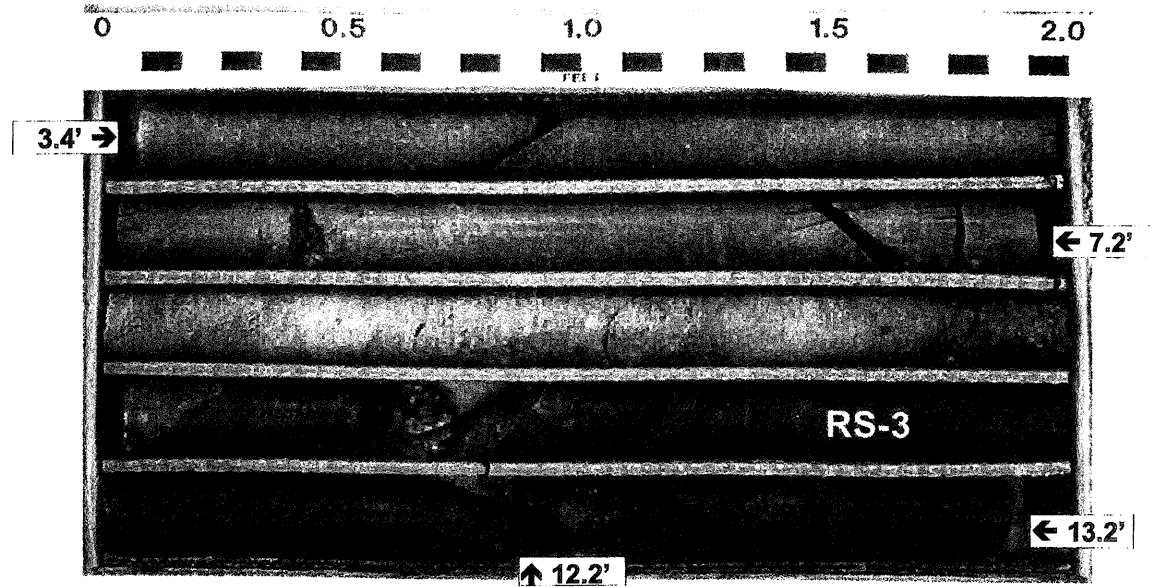


PROJECT NO. 33620.1.1		ID. B-4280		COUNTY STOKES		GEOLOGIST D. BENTS				
SITE DESCRIPTION BRIDGE 14 OVER TOWN FORK CREEK ON NC 8							GROUND WATER (ft)			
BORING NO. B2-A		BORING LOCATION 19+48		OFFSET 17 ft LT	ALIGNMENT -L-		0 HR. N/A			
COLLAR ELEV. 646.5 ft		NORTHING 918,689.1		EASTING 1,639,593.5		24 HR. N/M				
TOTAL DEPTH 27.0 ft		DRILL MACHINE BK-51		DRILL METHOD NW ROTARY WASH/NQ-2 CORE BARREL		HAMMER TYPE MANUAL				
DATE STARTED 7/20/05		COMPLETED 7/20/05		SURFACE WATER DEPTH N/A						
CORE SIZE NQ-2		TOTAL RUN 23.6 ft		DRILLER J. LITTLE						
ELEV. (ft)	DEPTH (ft)	RUN (ft)	DRILL RATE (Min/ft)	REC. (%)	ROD (%)	SAMP. NO.	STRATA REC. (%)	ROD (%)	LOG	DESCRIPTION AND REMARKS
										643.1 Begin Coring @ 3.4 ft 3.4
643.1	3.4	3.8	1:30 1:40 1:40	(3.8) 100%	(3.8) 100%		(6.0) 100%	(5.8) 97%		643.1
639.3	7.2		1:10/0.8 1:40 2:00	(4.8) 96%	(3.6) 72%					637.1
634.3	12.2	5.0	1:50 2:20			RS-3	(16.3) 98%	(7.4) 45%		632.2
629.3	17.2	5.0	1:50 1:30 2:00	(5.0) 100%	(2.1) 42%					626.1
624.3	22.2	5.0	1:30 2:00 2:20	(4.9) 98%	(1.7) 34%					620.5
		4.8	2:10 3:30 3:20	(4.8) 100%	(2.8) 58%					619.5
619.5	27.0		5:00 3:00 2:10/0.8				(1.0) 100%	(0.8) 80%		619.5
NON-CRYSTALLINE ROCK: (TRIASSIC) EXTREMELY INDURATED VERY THICKLY BEDDED GRAY-WHITE SANDSTONE WITH MODERATELY CLOSE FRACTURE SPACING 1 JOINT @ 10°, 1 JOINT @ 30°, AND 3 JOINTS @ 60°										
NON-CRYSTALLINE ROCK: EXTREMELY INDURATED VERY THICKLY BEDDED RED-BROWN MUDSTONE WITH CLOSE FRACTURE SPACING 4 JOINTS @ 10°, 8 JOINTS @ 80°, AND 2 JOINTS @ 80°										
NON-CRYSTALLINE ROCK: EXTREMELY INDURATED VERY THICKLY BEDDED RED-BROWN MUDSTONE WITH VERY CLOSE TO CLOSE FRACTURE SPACING INDETERMINEABLE JOINTS										
NON-CRYSTALLINE ROCK: EXTREMELY INDURATED VERY THICKLY BEDDED RED-BROWN AND GRAY MUDSTONE WITH CLOSE TO VERY CLOSE FRACTURE SPACING 5 JOINTS @ 10°, 6 JOINTS @ 45°, AND 4 JOINTS @ 60°										
NON-CRYSTALLINE ROCK: EXTREMELY INDURATED THINLY BEDDED GRAY-WHITE SANDSTONE WITH CLOSE TO VERY CLOSE FRACTURE SPACING 3 JOINTS @ 30° AND 1 JOINT @ 60°										
BORING TERMINATED AT ELEVATION 619.5 FEET IN NON-CRYSTALLINE ROCK: EXTREMELY INDURATED GRAY-WHITE SANDSTONE										

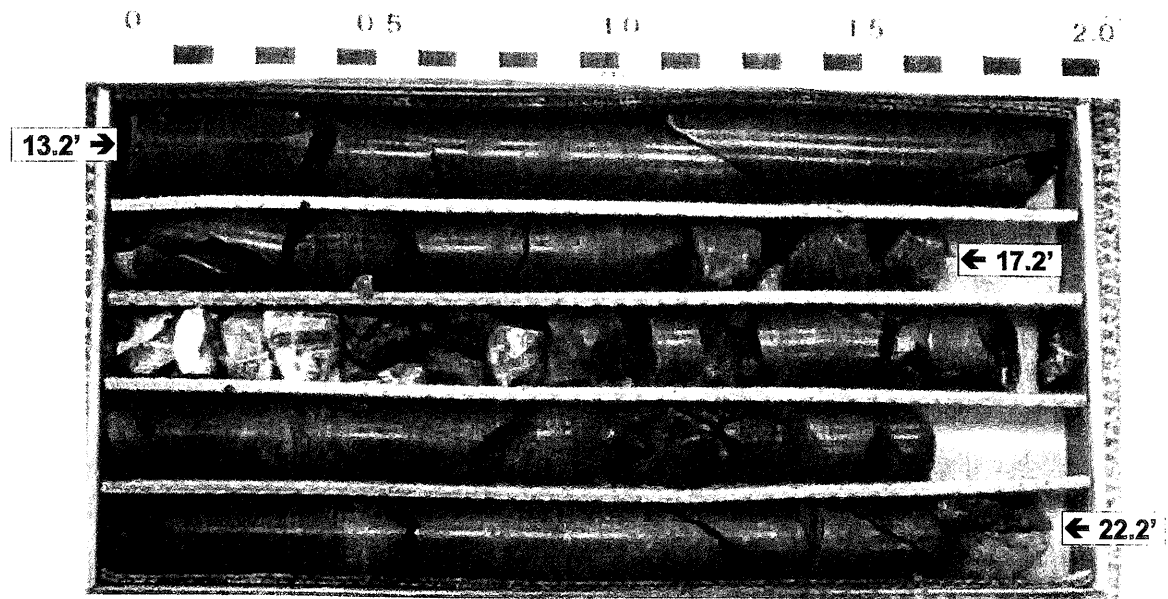
NCDOT CORE SINGLE BRIDGE 14 1352-05-506.GPJ NCDOT.GDT 9/7/05

CORE PHOTOS

Project No: 33620.1.1	TIP No: B-4280	County: Stokes	Boring No.: B2-A
Site Description: Replacement of Bridge No. 14 over Town Fork Creek on NC 8		Driller: J. Little	
Collar Elev.: 646.5 ft.	Core Size: NQ-2	Equipment: BK-51	Geologist: D. Bents
Elev. at T.D.: 619.5 ft.	Total Depth: 27.0 ft.	Total Run: 23.6 ft.	Date: 7/20/05



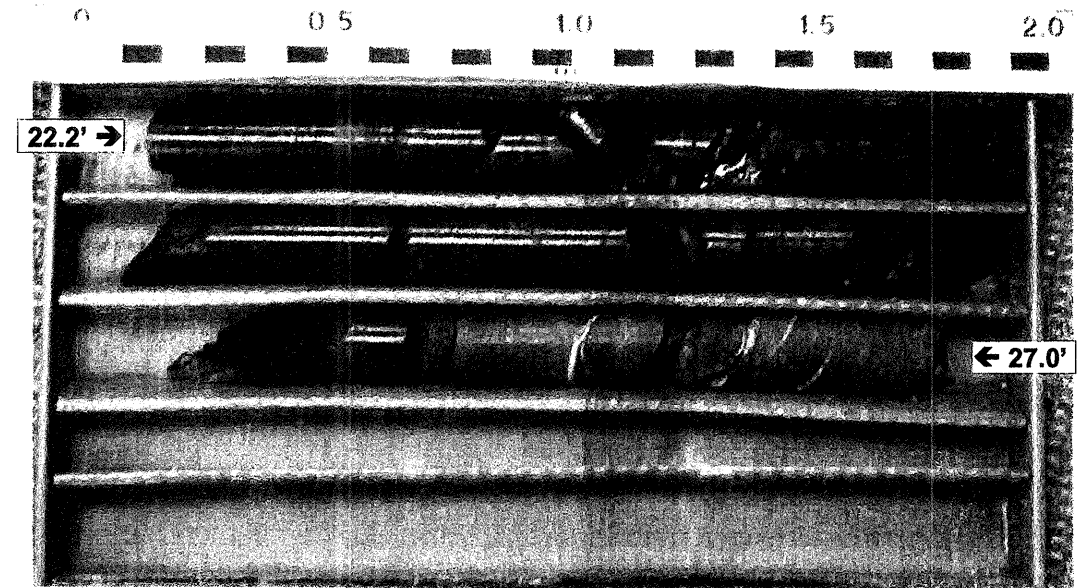
Box 1 of 3
Top of Box @ 3.4 feet; Bottom of Box @ 13.2 feet



Box 2 of 3
Top of Box @ 13.2 feet; Bottom of Box @ 22.2 feet

CORE PHOTOS

Project No: 33620.1.1	TIP No: B-4280	County: Stokes	Boring No.: B2-A
Site Description: Replacement of Bridge No. 14 over Town Fork Creek on NC 8		Driller: J. Little	
Collar Elev.: 646.5 ft.	Core Size: NQ-2	Equipment: BK-51	Geologist: D. Bents
Elev. at T.D.: 619.5 ft.	Total Depth: 27.0 ft.	Total Run: 23.6 ft.	Date: 7/20/05



Box 3 of 3
Top of Box @ 22.2 feet; Bottom of Box @ 27.0 feet



PROJECT NO. 33620.1.1		ID. B-4280		COUNTY STOKES		GEOLOGIST K. LEWALLEN							
SITE DESCRIPTION BRIDGE 14 OVER TOWN FORK CREEK ON NC 8							GROUND WATER (ft)						
BORING NO. B2-B		BORING LOCATION 19+33		OFFSET 12 ft RT	ALIGNMENT -L-	0 HR. N/A	24 HR. N/A						
COLLAR ELEV. 643.7 ft		NORTHING 918,679.9		EASTING 1,639,624.8									
TOTAL DEPTH 21.7 ft		DRILL MACHINE BK-51	DRILL METHOD NW CASING ADVANCER/NQ-2 CORE BARREL		HAMMER TYPE MANUAL								
DATE STARTED 7/21/05		COMPLETED 7/21/05		SURFACE WATER DEPTH 0.4 ft									
ELEV. (ft)	DEPTH (ft)	BLOW COUNT			BLOWS PER FOOT					SAMP. NO.	LOG MOI	SOIL AND ROCK DESCRIPTION	
		0.5ft	0.5ft	0.5ft	0	20	40	60	80				100
644.1													CREEK LEVEL
643.7													CREEK BOTTOM
													ALLUVIUM: LOOSE TAN FINE SAND (A-3)
													NON-CRYSTALLINE ROCK: (TRIASSIC) RED-BROWN SANDSTONE NON-CRYSTALLINE ROCK: EXTREMELY INDURATED THINLY BEDDED RED-BROWN SANDSTONE WITH CLOSE TO VERY CLOSE FRACTURE SPACING
													NON-CRYSTALLINE ROCK: EXTREMELY INDURATED THINLY BEDDED RED-BROWN TO GRAY MUDSTONE WITH CLOSE TO VERY CLOSE FRACTURE SPACING
													NON-CRYSTALLINE ROCK: EXTREMELY INDURATED THINLY BEDDED RED-BROWN TO GRAY MUDSTONE WITH CLOSE TO VERY CLOSE FRACTURE SPACING
													NON-CRYSTALLINE ROCK: EXTREMELY INDURATED VERY THICKLY BEDDED GRAY AND WHITE SANDSTONE WITH MODERATELY CLOSE TO CLOSE FRACTURE SPACING
													BORING TERMINATED AT ELEVATION 622.0 FEET IN NON-CRYSTALLINE ROCK: EXTREMELY INDURATED GRAY AND WHITE SANDSTONE

NCDOT BORE SINGLE BRIDGE 14 1352-05-506.GPJ NCDOT.GDT 9/7/05



PROJECT NO. 33620.1.1		ID. B-4280		COUNTY STOKES		GEOLOGIST K. LEWALLEN				
SITE DESCRIPTION BRIDGE 14 OVER TOWN FORK CREEK ON NC 8							GROUND WATER (ft)			
BORING NO. B2-B		BORING LOCATION 19+33		OFFSET 12 ft RT	ALIGNMENT -L-	0 HR. N/A	24 HR. N/A			
COLLAR ELEV. 643.7 ft		NORTHING 918,679.9		EASTING 1,639,624.8						
TOTAL DEPTH 21.7 ft		DRILL MACHINE BK-51	DRILL METHOD NW CASING ADVANCER/NQ-2 CORE BARREL		HAMMER TYPE MANUAL					
DATE STARTED 7/21/05		COMPLETED 7/21/05		SURFACE WATER DEPTH 0.4 ft						
CORE SIZE NQ-2		TOTAL RUN 19.2 ft		DRILLER J. LITTLE						
ELEV. (ft)	DEPTH (ft)	RUN (ft)	DRILL RATE (Min/ft)	RUN		SAMP. NO.	STRATA		LOG	DESCRIPTION AND REMARKS
				REC. (ft) %	RQD (ft) %		REC. (ft) %	RQD (ft) %		
										Begin Coring @ 2.5 ft
641.2	2.5	4.2	1:50 6:10 5:10 5:00	(4.0) 95%	(1.3) 31%		(0.9) 90%	(0.0) 0%		NON-CRYSTALLINE ROCK: (TRIASSIC) EXTREMELY INDURATED THINLY BEDDED RED-BROWN SANDSTONE WITH CLOSE TO VERY CLOSE FRACTURE SPACING 3 JOINTS @ 30° AND 3 JOINTS @ 60°
637.0	6.7	5.0	1:00/0.2 3:00 2:40 2:10 2:40 2:20	(5.0) 100%	(4.3) 86%		(3.9) 98%	(0.9) 23%		NON-CRYSTALLINE ROCK: EXTREMELY INDURATED THINLY BEDDED RED-BROWN TO GRAY MUDSTONE WITH CLOSE TO VERY CLOSE FRACTURE SPACING 8 JOINTS @ 45° AND 1 JOINT @ 80°
632.0	11.7	5.0	2:30 2:30 2:30 2:30	(5.0) 100%	(5.0) 100%		(14.2) 100%	(13.7) 96%		NON-CRYSTALLINE ROCK: EXTREMELY INDURATED VERY THICKLY BEDDED GRAY AND WHITE SANDSTONE WITH MODERATELY CLOSE TO CLOSE FRACTURE SPACING 5 JOINTS @ 45° AND 3 JOINTS @ 60°
627.0	16.7	5.0	2:30 2:40 2:30 3:00 2:30	(5.0) 100%	(4.5) 90%					BORING TERMINATED AT ELEVATION 622.0 FEET IN NON-CRYSTALLINE ROCK: EXTREMELY INDURATED GRAY AND WHITE SANDSTONE
622.0	21.7		2:30 3:00 2:30							

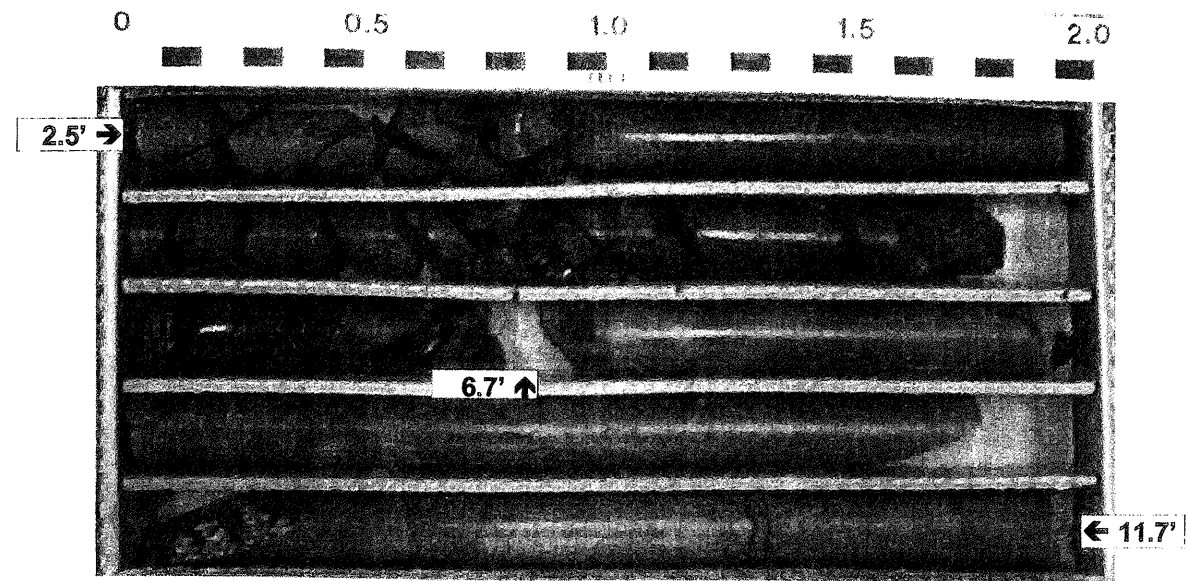
NCDOT CORE SINGLE BRIDGE 14 1352-05-506.GPJ NCDOT.GDT 9/7/05

CORE PHOTOS

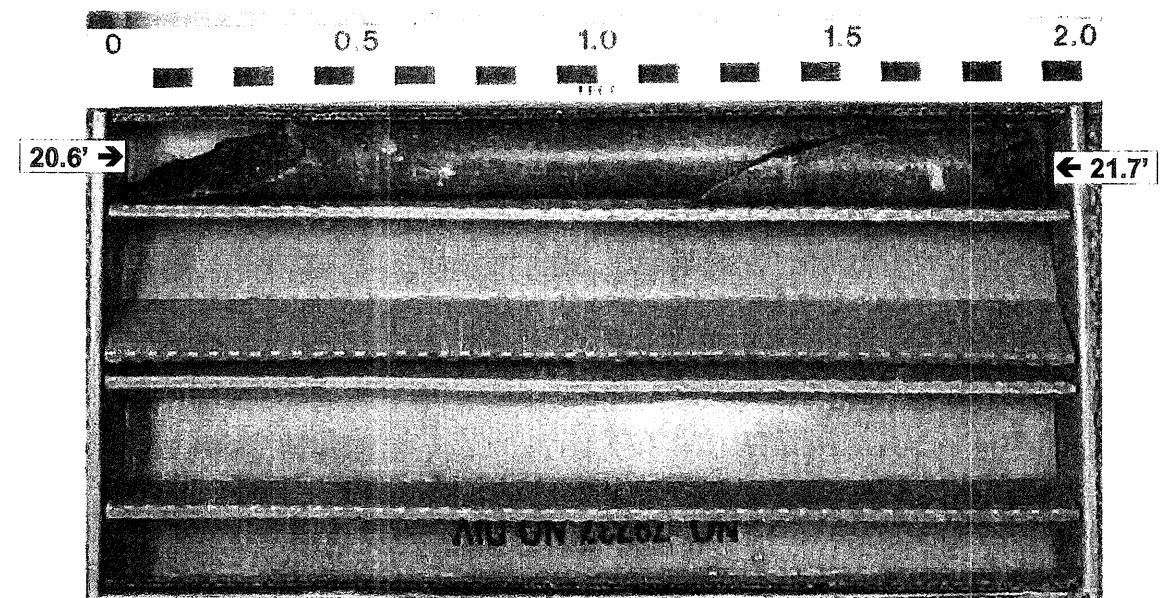
Project No: 33620.1.1	TIP No: B-4280	County: Stokes	Boring No.: B2-B
Site Description: Replacement of Bridge No. 14 over Town Fork Creek on NC 8		Driller: J. Little	
Collar Elev.: 643.7 ft.	Core Size: NQ-2	Equipment: BK-51	Geologist: K. Lewallen
Elev. at T.D.: 622.0 ft.	Total Depth: 21.7 ft.	Total Run: 19.2 ft.	Date: 7/21/05

CORE PHOTOS

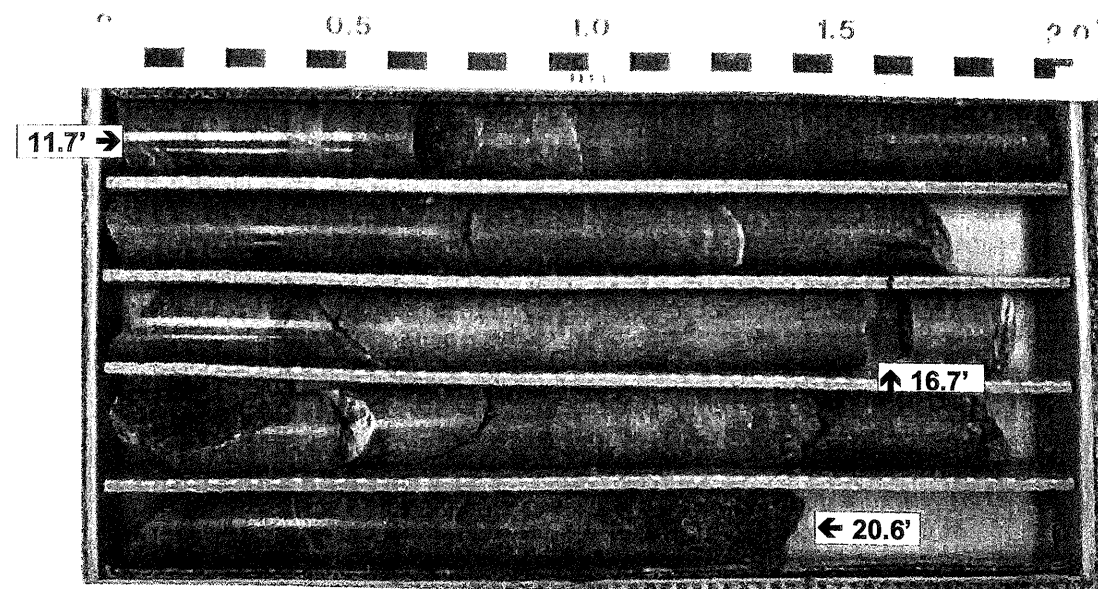
Project No: 33620.1.1	TIP No: B-4280	County: Stokes	Boring No.: B2-B
Site Description: Replacement of Bridge No. 14 over Town Fork Creek on NC 8		Driller: J. Little	
Collar Elev.: 643.7 ft.	Core Size: NQ-2	Equipment: BK-51	Geologist: K. Lewallen
Elev. at T.D.: 622.0 ft.	Total Depth: 21.7 ft.	Total Run: 19.2 ft.	Date: 7/21/05



Box 1 of 3
Top of Box @ 2.5 feet; Bottom of Box @ 11.7 feet



Box 3 of 3
Top of Box @ 20.6 feet; Bottom of Box @ 21.7 feet



Box 2 of 3
Top of Box @ 11.7 feet; Bottom of Box @ 20.6 feet



PROJECT NO. 33620.1.1		ID. B-4280		COUNTY STOKES		GEOLOGIST D. BENTS							
SITE DESCRIPTION BRIDGE 14 OVER TOWN FORK CREEK ON NC 8							GROUND WATER (ft)						
BORING NO. EB2-A		BORING LOCATION 20+19		OFFSET 8 ft LT	ALIGNMENT -L-	0 HR. 16.9	16.9						
COLLAR ELEV. 658.7 ft		NORTHING 918,760.5		EASTING 1,639,588.7		24 HR. 13.5 on 7/21/05	13.5 on 7/21/05						
TOTAL DEPTH 22.5 ft		DRILL MACHINE Diedrich D-50		DRILL METHOD 2 1/4" H.S.A.		HAMMER TYPE MANUAL							
DATE STARTED 7/20/05		COMPLETED 7/20/05		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
658.7													GROUND SURFACE
658.7	0.0	2	3	5							M		ALLUVIUM: LOOSE LIGHT BROWN SILTY FINE SAND (A-2-4)
655.2	3.5	4	4	4							M		WITH TRACE ORGANIC MATTER LOOSE LIGHT BROWN FINE SAND (A-3)
650.2	8.5	1	2	2							SS-4 ST-2	W	SOFT GRAY-BROWN COARSE TO FINE SANDY SILT (A-4)
645.2	13.5	18	72	28/0.2								D	WITH LITTLE CLAY MEDIUM DENSE TAN SILTY FINE TO COARSE SAND (A-1-b)
640.2	18.5	60/0.2										D	WEATHERED ROCK: (TRIASSIC) (GRAY SANDSTONE)
636.2	22.5	60/0.0										D	
BORING TERMINATED WITH STANDARD PENETRATION TEST REFUSAL AT ELEVATION 636.2 FEET ON NON-CRYSTALLINE ROCK: (TRIASSIC) EXTREMELY INDURATED GRAY SANDSTONE												1) ADVANCED 2-1/4" HSA TO 22.5 FEET. 2) SHELBY TUBE TAKEN FROM 10.0' TO 12.0'.	

NCDOT BORE SINGLE BRIDGE 14 1352-05-506.GPJ NCDOT.GDT 9/7/05



PROJECT NO. 33620.1.1		ID. B-4280		COUNTY STOKES		GEOLOGIST K. LEWALLEN							
SITE DESCRIPTION BRIDGE 14 OVER TOWN FORK CREEK ON NC 8							GROUND WATER (ft)						
BORING NO. EB2-B		BORING LOCATION 20+10		OFFSET 17 ft RT	ALIGNMENT -L-	0 HR. 14.1	14.1						
COLLAR ELEV. 655.0 ft		NORTHING 918,756.2		EASTING 1,639,614.9		24 HR. 13.6 on 7/21/05	13.6 on 7/21/05						
TOTAL DEPTH 21.5 ft		DRILL MACHINE BK-51		DRILL METHOD 2 1/4" HSA/NQ-2 CORE BARREL		HAMMER TYPE MANUAL							
DATE STARTED 7/20/05		COMPLETED 7/20/05		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
655.0													GROUND SURFACE
655.0	0.0	2	1	2							M		ALLUVIUM: VERY LOOSE TO LOOSE TAN SILTY FINE SAND (A-2-4)
651.5	3.5	3	2	3							SS-5	M	VERY LOOSE TAN FINE SAND (A-3)
646.5	8.5	1	2	1								W	
641.5	13.5											D	WEATHERED ROCK: (TRIASSIC) (GRAY SANDSTONE)
640.8	14.1											D	INDURATED THINLY BEDDED GRAY SANDSTONE
639.8												D	NON-CRYSTALLINE ROCK: (TRIASSIC) INDURATED THINLY BEDDED GRAY SANDSTONE WITH CLOSE FRACTURE SPACING
638.9												D	NON-CRYSTALLINE ROCK: INDURATED THINLY BEDDED RED-BROWN MUDSTONE WITH VERY CLOSE FRACTURE SPACING
637.1												D	NON-CRYSTALLINE ROCK: INDURATED THICKLY BEDDED RED-BROWN MUDSTONE WITH VERY CLOSE TO CLOSE FRACTURE SPACING
636.4												D	NON-CRYSTALLINE ROCK: INDURATED THICKLY BEDDED RED-BROWN MUDSTONE WITH VERY CLOSE TO CLOSE FRACTURE SPACING
633.5												D	NON-CRYSTALLINE ROCK: INDURATED THICKLY BEDDED RED-BROWN MUDSTONE WITH VERY CLOSE TO CLOSE FRACTURE SPACING
BORING TERMINATED AT ELEVATION 633.5 FEET IN NON-CRYSTALLINE ROCK: INDURATED RED-BROWN MUDSTONE												1) ADVANCED 2-1/4" HSA TO 14.1 FEET. 2) SET NW CASING TO 14.2 FEET. 3) ADVANCED NQ-2 CORE BARREL FROM 14.2 TO 21.5 FEET. 4) CREEK WATER USED AS DRILLING FLUID. 5) APPROXIMATE DRILLING FLUID DENSITY 62.4 PCF. 6) NO LOSS OF DRILLING FLUID OBSERVED.	

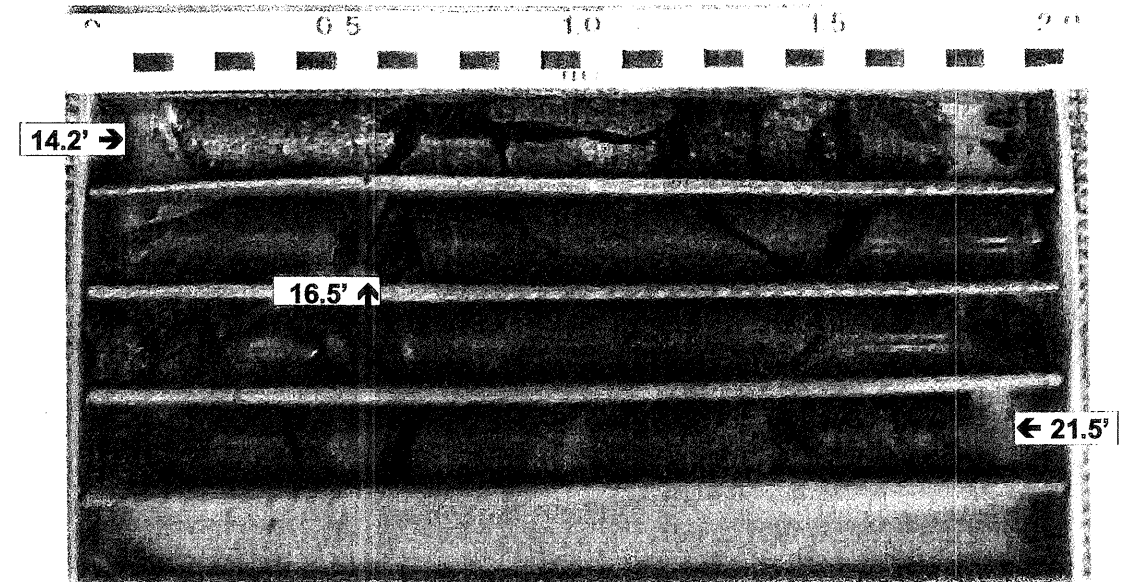
NCDOT BORE SINGLE BRIDGE 14 1352-05-506.GPJ NCDOT.GDT 9/7/05

PROJECT NO. 33620.1.1	ID. B-4280	COUNTY STOKES	GEOLOGIST K. LEWALLEN
SITE DESCRIPTION BRIDGE 14 OVER TOWN FORK CREEK ON NC 8			GROUND WATER (ft)
BORING NO. EB2-B	BORING LOCATION 20+10	OFFSET 17 ft RT	ALIGNMENT -L-
COLLAR ELEV. 655.0 ft	NORTHING 918,756.2	EASTING 1,639,614.9	0 HR. 14.1
TOTAL DEPTH 21.5 ft	DRILL MACHINE BK-51	DRILL METHOD 2 1/4" HSA/NQ-2 CORE BARREL	24 HR. 13.6 on 7/21/05
DATE STARTED 7/20/05	COMPLETED 7/20/05	SURFACE WATER DEPTH N/A	
CORE SIZE NQ-2	TOTAL RUN 7.3 ft	DRILLER J. LITTLE	

ELEV. (ft)	DEPTH (ft)	RUN (ft)	DRILL RATE (Min/ft)	RUN		SAMP. NO.	STRATA		L O G	DESCRIPTION AND REMARKS
				REC. (%)	RQD (%)		REC. (%)	RQD (%)		
										Begin Coring @ 14.2 ft
640.8	14.2	2.3	2:00	(1.9)	(0.8)		(1.0)	(0.4)		14.2
638.5	16.5		3:00	83%	35%		100%	40%		15.2
		5.0	1:10/0.3	(4.9)	(3.7)		(5.8)	(4.1)		16.1
			2:00	98%	74%		92%	65%		17.9
			1:50							18.6
633.5	21.5		1:50							21.5
			2:00							
			1:40							

CORE PHOTOS

Project No: 33620.1.1	TIP No: B-4280	County: Stokes	Boring No.: EB2-B
Site Description: Replacement of Bridge No. 14 over Town Fork Creek on NC 8			Driller: J. Little
Collar Elev.: 655.0 ft.	Core Size: NQ-2	Equipment: BK-51	Geologist: K. Lewallen
Elev. at T.D.: 633.5 ft.	Total Depth: 21.5 ft.	Total Run: 7.3 ft.	Date: 7/20/05



Box 1 of 1
Top of Box @ 14.2 feet; Bottom of Box @ 21.5 feet

LABORATORY SUMMARY SHEET

PROJECT NO.: 33620.1.1
 TIP NO.: B-4280
 COUNTY: STOKES
 BRIDGE 14 OVER TOWN FORK CREEK ON NC 8



SOIL TEST RESULTS																	
BORING NO.	SAMPLE NO.	STATION	OFFSET	LINE	DEPTH INTERVAL (FT)	AASHTO CLASS.	L.L.	P.L.	% BY WEIGHT				% PASSING SIEVES			% MOISTURE	% ORGANIC
									C. SAND	F.SAND	SILT	CLAY	10	40	200		
EB1-A	SS-1	18+07	12 FT LT	-L-	9.0-10.5	A-4(2)	31	10	5	54	16	25	100	99	48	-	-
EB1-AA	ST-1	18+05	9 FT LT	-L-	8.0-10.0	A-4(2)	31	10	5	56	18	22	100	100	50	35.9	-
B1-B	SS-2	18+50	17 FT RT	-L-	0.0-1.5	A-4(6)	34	10	3	37	33	27	100	99	71	-	-
B1-B	SS-3	18+50	17 FT RT	-L-	3.5-5.0	A-2-4(0)	23	NP	18	59	10	12	100	97	28	-	-
EB2-A	SS-4	20+19	8 FT LT	-L-	8.5-10.0	A-4(2)	29	8	11	46	22	21	100	95	53	-	-
EB2-A	ST-2	20+19	8 FT LT	-L-	10.0-12.0	A-4(0)	25	5	14	54	15	17	100	95	44	20.8	-
EB2-B	SS-5	20+10	17 FT RT	-L-	3.5-5.0	A-2-4(0)	28	NP	18	72	4	6	100	99	13	-	-
--	S-1	19+48	25 FT LT	-L-	surface	A-1-a(0)	20	NP	20	9	1	1	30	15	2	-	-
--	S-2	19+44	40 FT LT	-L-	surface	A-3(0)	31	NP	43	41	4	2	91	73	9	-	-

Consolidation Test Results										
Borehole	Sample	Depth (ft)	AASHTO Classification	C _c	C _v (ft ² /day)	t ₉₀ (min)	γ, Initial (lbs/ft ³)	Initial Moisture, %	G _s	Initial Voids Ratio, e
EB1-AA	ST-1	8.0-10.0	(A-4)	0.261	0.772	2.495	112.60	35.9	2.656	1.0008
EB2-A	ST-2	10.0-12.0	(A-4)	0.144	1.424	1.373	117.19	20.8	2.658	0.7101

Triaxial Compression Test (Consolidated Undrained)											
Borehole	Sample	Depth (ft)	AASHTO Classification	c' (lbs/in ²)	Φ' (degrees)	c _T (lbs/in ²)	Φ _T (degrees)	γ, Initial (lbs/ft ³)	Initial Moisture, %	G _s	Initial Voids Ratio, e
EB1-AA	ST-1	8.0-10.0	(A-4)	0.62	27	0.96	12.5	113.19	36.03	2.654	0.99

ROCK CORE UNCONFINED COMPRESSION TEST RESULTS													
Sample #	Bridge #	Boring #	Depth (ft)	Rock Type	Geologic Map Unit	Run RQD	Length (ft)	Diameter (ft)	Unit Weight (PCF)	Unconfined Compressive Strength (PSI)	Young's Modulus (PSI)	Splitting Tensile Strength (PSI)	Remarks
RS-1	14	B1-A	16.5 - 17.1	Sandstone	Trdp	94%	4.380	1.980	--	16,434	--	--	
RS-2	14	B1-B	25.2 - 26.1	Sandstone	Trdp	44%	4.405	1.995	--	5,752	--	--	
RS-3	14	B2-A	10.5 - 11.4	Mudstone	Trdp	72%	4.346	1.992	--	7,435	--	--	

NOTES: Natural Moisture Content Test Method - AASHTO T 265-93
 Atterberg Limits Test Methods - AASHTO T 88-94 and T 90-94
 Grain Size Test Results Test Method - AASHTO T-88-93
 Consolidation Test Method - ASTM D2435-96
 Triaxial Compression Test (Consolidation Undrained) Method - ASTM D4767-95
 Unconfined Compression - ASTM D2938

GEOTECHNICAL UNIT FIELD SCOUR REPORT

PROJECT: 33620.1.1 ID: B-4280 COUNTY: STOKES

DESCRIPTION(1): REPLACEMENT OF BRIDGE NO. 14 OVER TOWN FORK CREEK ON NC 8

INFORMATION ON EXISTING BRIDGES Information obtained from: X field inspection microfilm(Reel: Pos:) X othe Bridge Survey and Hydraulic Design Report

COUNTY BRIDGE NO. 14 BRIDGE LENGTH 205.5 NO. BENTS IN: CHANNEL 2 FLOOD PLAIN 6

FOUNDATION TYPE: CONCRETE OR TIMBER POSTS ON CONCRETE SPREAD FOOTINGS AT INTERIOR BENTS AND TIMBER PILES WITH REINFORCED CONCRETE CAP AT END BENTS

EVIDENCE OF SCOUR(2):

ABUTMENTS OR END BENT SLOPES: NONE OBSERVED

INTERIOR BENTS: SCOUR HOLE UPSTREAM FACE OF B4

CHANNEL BED: NON OBSERVED

CHANNEL BANKS: SOME SCOURING OF NORTH BANK BENEATH BRIDGE

EXISTING SCOUR PROTECTION:

TYPE(3): RIP RAP AT INTERIOR AND END BENTS. CONCRETE APRON COVERS END BENT SLOPES

EXTENT(4): RIP RAP GENERALLY EXTENDS 5 FEET OR MORE FROM BENTS, EXCEPT AT INTERIOR BENTS IN CREEK

EFFECTIVENESS(5): MOSTLY EFFECTIVE. RIP RAP HAS BEEN DISPLACED FROM INTERIOR BENTS IN CREEK

OBSTRUCTIONS(6) (DAMS, DEBRIS, ETC.): SIGNIFICANT DEBRIS AT B2, B3 & SOME AT B4. DEBRIS ALSO

DOWNSTREAM ALONG NORTH BANK

DESIGN INFORMATION

CHANNEL BED MATERIAL(7) (SAMPLE RESULTS ATTACHED): TAN SILTY FINE SAND (A-2-4), FINE SAND (A-3),

AND GRAY TAN FINE TO COARSE SAND (A-1-a) AND GRAVELLY SAND (A-1-b) WITH BOULDERS

CHANNEL BANK MATERIAL(8) (SAMPLE RESULTS ATTACHED): TAN FINE SAND (A-3) AND TAN TO BROWN

SILTY FINE SAND (A-2-4)

CHANNEL BANK COVER(9): UNDERBRUSH, SMALL TO LARGE TREES

FLOOD PLAIN WIDTH(10): +/- 450 FEET SOUTH OF BRIDGE, +/- 1000 FEET NORTH OF BRIDGE

FLOOD PLAIN COVER(11): MOSTLY GRASS & CROP FIELDS, SOME UNDERBRUSH & SMALL TO LARGE TREES

DESIGN INFORMATION CONT.

STREAM IS X DEGRADING AGGRADING (12)

OTHER OBSERVATIONS AND COMMENTS: TOWN FORK CREEK OVERFLOW WAS NOT FLOWING

DURING EXPLORATION

CHANNEL MIGRATION TENDENCY (13): NO MIGRATION

REPORTED BY: Duane D. Bents DATE: 7/22/2005

GEOTECHNICALLY ADJUSTED SCOUR ELEVATION (14):

Table with 4 columns: Location, 100 yr, 500 yr. Rows include B1-A, B1-B, B2-A, B2-B with corresponding elevation values.

REPORTED BY: David H. DATE: 9/2/05

NCDOT GEOTECHNICAL UNIT INSTRUCTIONS

- List of 14 instructions for geotechnical unit field scour reports, including details on site description, scour evidence, protection, channel bed/bank material, and scour elevation.

Particle Size Analysis of Soils

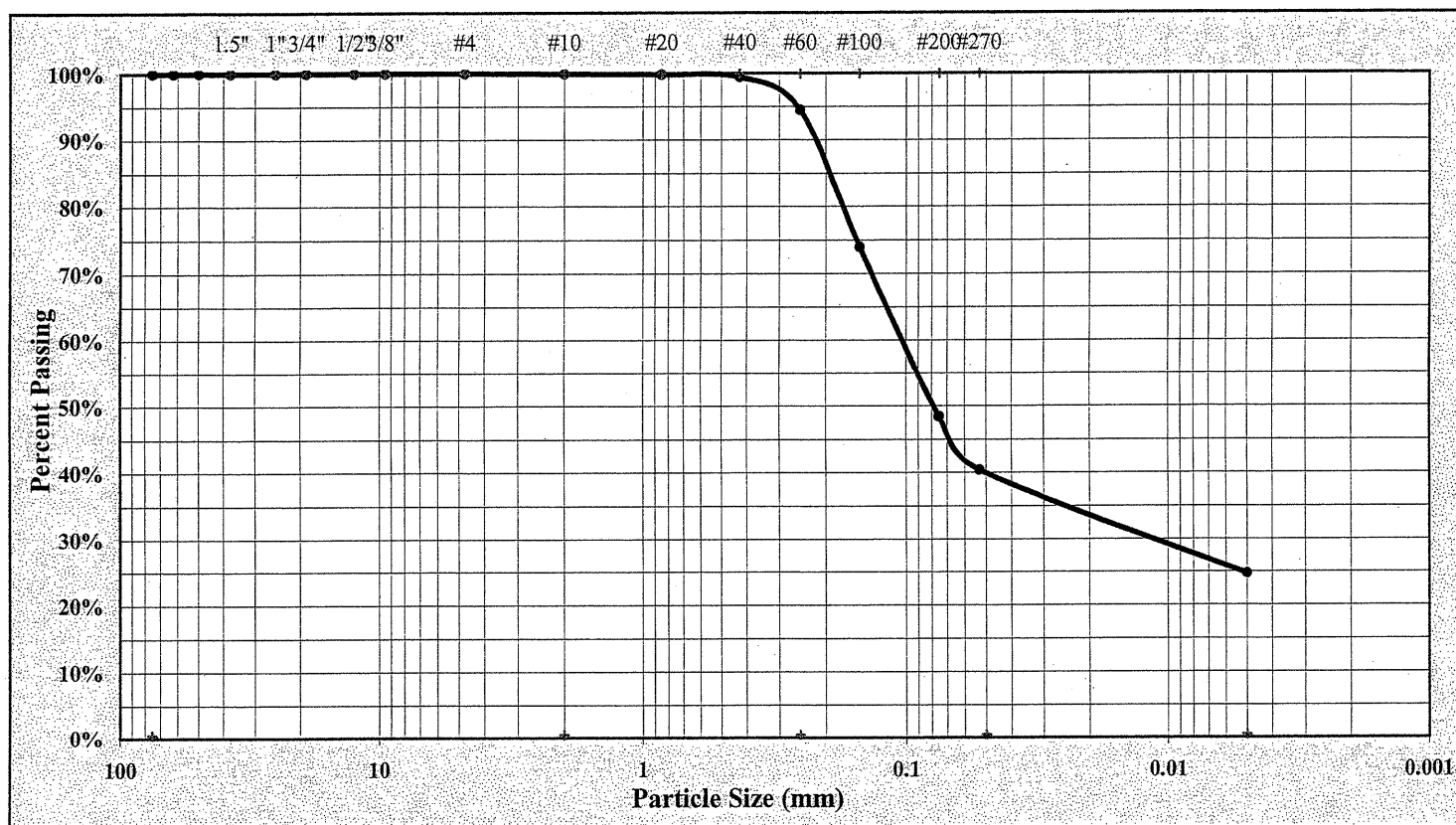
AASHTO T 88 as Modified by NCDOT



S&ME Project #: **1352-05-506**
 Project Name: **Bridge 14 over Town Fork Creek on NC 8**
 Client Name: **NCDOT**
 Client Address:
 State Project #: **33620.1.1** F.A. Project No: **BRSTP-9(2)** TIP NO: **B-4280**

Report Date: **8/11/2005**
 Test Date(s): **08/08 - 08/11/2005**

Boring #: **EB1-A** Sample #: **SS-1** Sample Date: **Unknown**
 Location: **18+07** Offset: **12' LT** Depth: **9' - 10.5'**
 Sample Description: **Gray fine sandy Silt A-4 (2)**



As Defined by NCDOT		Fine Sand	< 0.25 mm and > 0.05 mm		
Gravel	< 75 mm and > 2.00 mm	Silt	< 0.05 and > 0.005 mm		
Coarse Sand	< 2.00 mm and > 0.25 mm	Clay	< 0.005 mm		
Maximum Particle Size	#4	Coarse Sand	5.4%	Silt	16.0%
Gravel	0.1%	Fine Sand	54.1%	Clay	25.0%
Apparent Relative Density		Moisture Content		% Passing #200	48.4%
Liquid Limit	31	Plastic Limit	21	Plastic Index	10

Soil Mortar (-#10 Sieve)

Coarse Sand	Fine Sand	Silt	Clay
5.4%	54.2%	15.7%	24.7%

Description of Sand & Gravel Particles: Rounded Angular Hard & Durable Soft Weathered & Friable

Mechanical Stirring Apparatus (A) Length of Dispersion Period: 1 min. Dispersing Agent: Sodium Hexametaphosphate: 40 g./ Liter

References: AASHTO T88: Particle Size Analysis of Soils as Modified by the NCDOT
 AASHTO T87: Dry Preparation of Disturbed Soil and Soil Aggregate Samples for Test AASHTO T265: Laboratory Determination of Moisture Content of Soils
 AASHTO T89: Determining the Liquid Limit of Soils AASHTO T90: Determining the Plastic Limit & Plasticity Index of Soils
 AASHTO M 145: The Classification of Soils and Soil Aggregate Mixtures for Highway Construction Purposes ASTM D 854: Specific Gravity of Soils

Technical Responsibility: Mal Karajan _____ Laboratory Supervisor
 Signature Signature

Particle Size Analysis of Soils

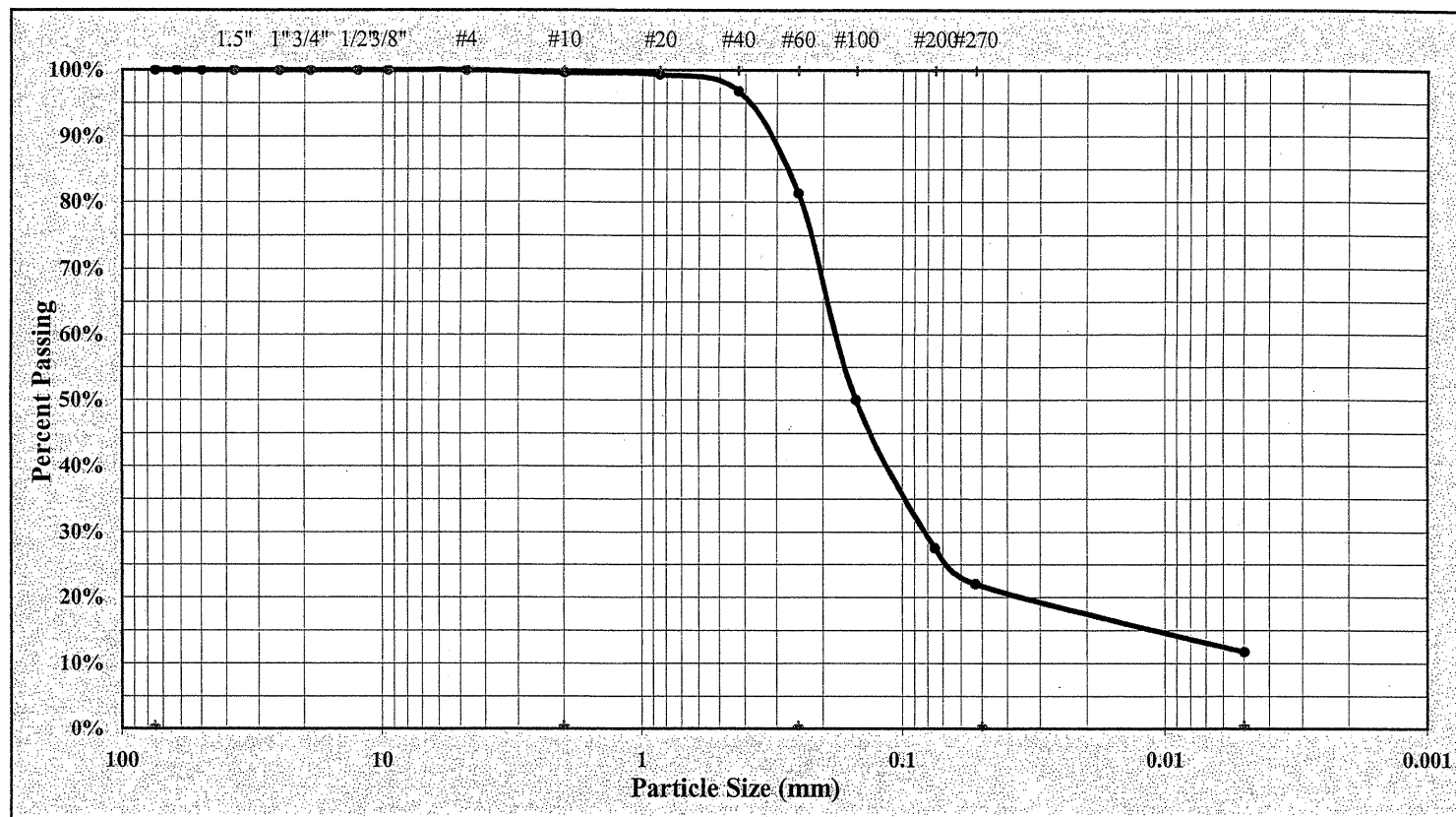
AASHTO T 88 as Modified by NCDOT



S&ME Project #: **1352-05-506**
 Project Name: **Bridge 14 over Town Fork Creek on NC 8**
 Client Name: **NCDOT**
 Client Address:
 State Project #: **33620.1.1** F.A. Project No: **BRSTP-9(2)** TIP NO: **B-4280**

Report Date: **8/11/2005**
 Test Date(s): **08/08 - 08/11/2005**

Boring #: **B1-B** Sample #: **SS-3** Sample Date: **Unknown**
 Location: **18+50** Offset: **17' RT** Depth: **3.5' - 5'**
 Sample Description: **Brown Silty Fine Sand A-2-4 (0)**



As Defined by NCDOT		Fine Sand	< 0.25 mm and > 0.05 mm		
Gravel	< 75 mm and > 2.00 mm	Silt	< 0.05 and > 0.005 mm		
Coarse Sand	< 2.00 mm and > 0.25 mm	Clay	< 0.005 mm		
Maximum Particle Size	#4	Coarse Sand	18.3%	Silt	10.0%
Gravel	0.4%	Fine Sand	59.3%	Clay	12.0%
Apparent Relative Density		Moisture Content		% Passing #200	27.5%
Liquid Limit	23	Plastic Limit	0	Plastic Index	N.P.

Soil Mortar (-#10 Sieve)

Coarse Sand	Fine Sand	Silt	Clay
18.4%	59.5%	10.4%	11.7%

Description of Sand & Gravel Particles: Rounded Angular Hard & Durable Soft Weathered & Friable

Mechanical Stirring Apparatus (A) Length of Dispersion Period: 1 min. Dispersing Agent: Sodium Hexametaphosphate: 40 g./ Liter

References: AASHTO T88: Particle Size Analysis of Soils as Modified by the NCDOT
 AASHTO T87: Dry Preparation of Disturbed Soil and Soil Aggregate Samples for Test AASHTO T265: Laboratory Determination of Moisture Content of Soils
 AASHTO T89: Determining the Liquid Limit of Soils AASHTO T90: Determining the Plastic Limit & Plasticity Index of Soils
 AASHTO M 145: The Classification of Soils and Soil Aggregate Mixtures for Highway Construction Purposes ASTM D 854: Specific Gravity of Soils

Technical Responsibility: Mal Karajan _____ Laboratory Supervisor
 Signature Signature

Particle Size Analysis of Soils

AASHTO T 88 as Modified by NCDOT

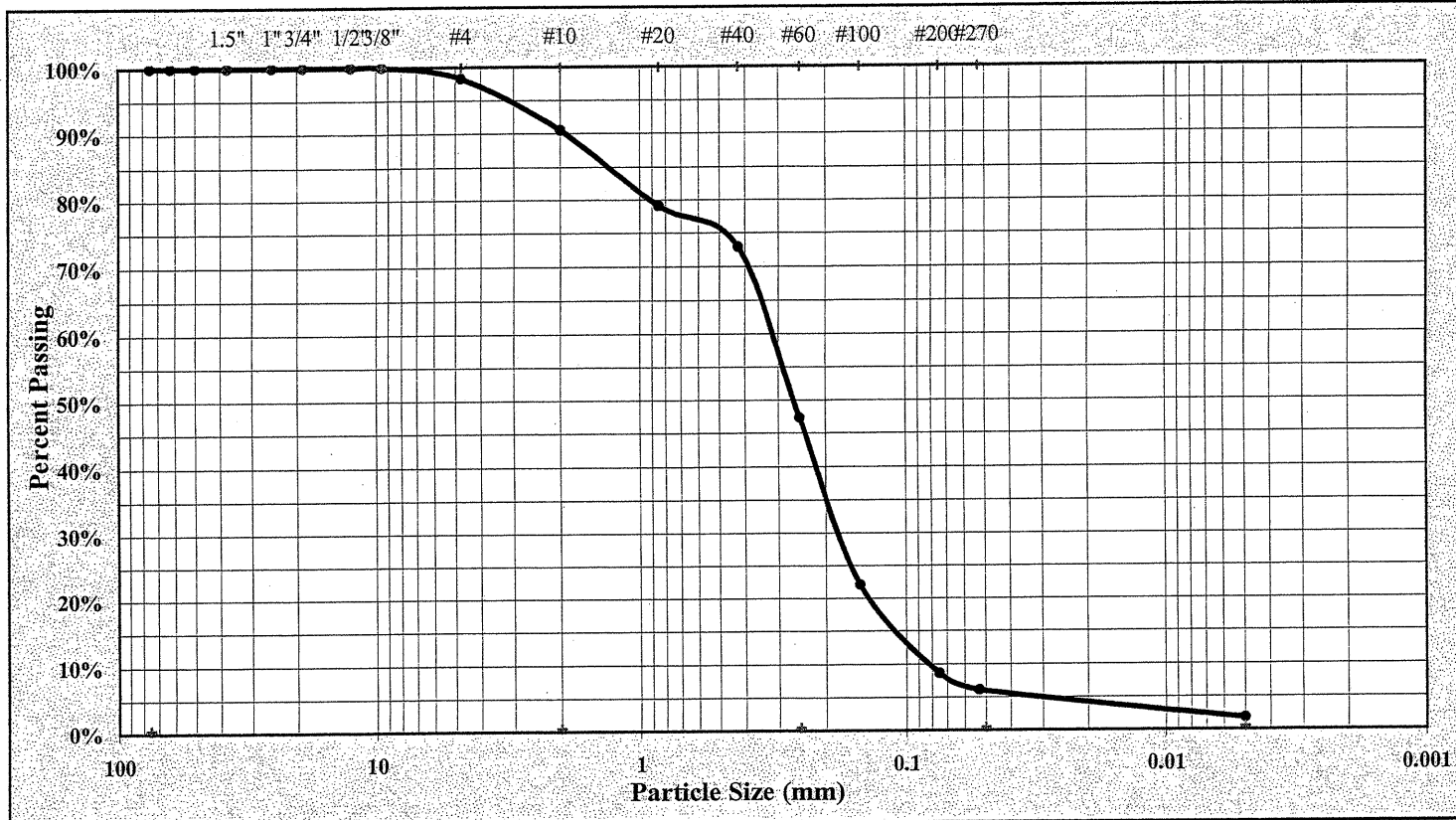


S&ME Project #: **1352-05-506**
 Project Name: **Bridge 14 Over Town Fork Creek on NC 8**
 Client Name: **NCDOT**
 Client Address:
 State Project #: **33620.1.1**

Report Date: **8/11/2005**
 Test Date(s): **08/08 - 08/11/2005**

F.A. Project No: **BRSTP-8(2)** TIP NO: **B-4280**

Boring #: **Grab** Sample #: **S-2** Sample Date: **Unknown**
 Location: **19+44** Offset: **40' LT** Depth: **N/A**
 Sample Description: **Tan Fine SAND A-3 (0)**



As Defined by NCDOT		Fine Sand	< 0.25 mm and > 0.05 mm
Gravel	< 75 mm and > 2.00 mm	Silt	< 0.05 and > 0.005 mm
Coarse Sand	< 2.00 mm and > 0.25 mm	Clay	< 0.005 mm
Maximum Particle Size	1"	Coarse Sand	43.2%
		Fine Sand	41.2%
Gravel	9.5%	Silt	4.0%
		Clay	2.0%
Apparent Relative Density		Moisture Content	% Passing #200 8.6%
Liquid Limit	31	Plastic Limit	0
		Plastic Index	N.P.

Soil Mortar (-#10 Sieve)

Coarse Sand 47.7% Fine Sand 45.6% Silt 4.7% Clay 2.0%

Description of Sand & Gravel Particles: Rounded Angular Hard & Durable Soft Weathered & Friable

Mechanical Stirring Apparatus (A) Length of Dispersion Period: 1 min. Dispersing Agent: Sodium Hexametaphosphate: 40 g / Liter

References: AASHTO T88: Particle Size Analysis of Soils as Modified by the NCDOT AASHTO T265: Laboratory Determination of Moisture Content of Soils
 AASHTO T87: Dry Preparation of Disturbed Soil and Soil Aggregate Samples for Test AASHTO T90: Determining the Plastic Limit & Plasticity Index of Soils
 AASHTO T89: Determining the Liquid Limit of Soils
 AASHTO M 145: The Classification of Soils and Soil Aggregate Mixtures for Highway Construction Purposes ASTM D 854: Specific Gravity of Soils

Technical Responsibility: Mal Karajan Laboratory Supervisor

Particle Size Analysis of Soils

AASHTO T 88 as Modified by NCDOT

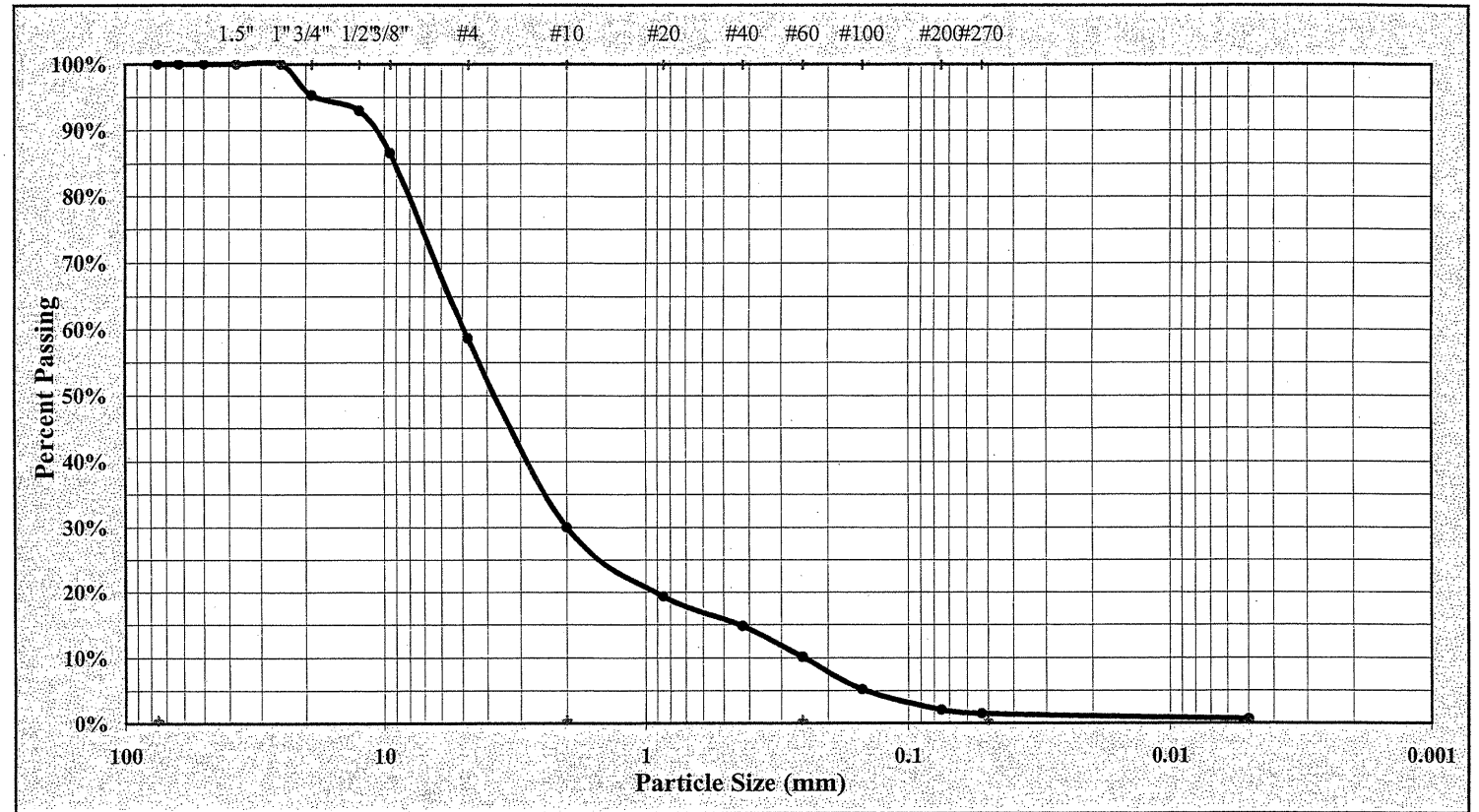


S&ME Project #: **1352-05-506**
 Project Name: **Bridge 14 over Town Fork Creek on NC 8**
 Client Name: **NCDOT**
 Client Address:
 State Project #: **33620.1.1**

Report Date: **8/11/2005**
 Test Date(s): **08/08 - 08/11/2005**

F.A. Project No: **BRSTP-9(8)** TIP NO: **B-4280**

Boring #: **Grab** Sample #: **S-1** Sample Date:
 Location: **19+48** Offset: **25' LT** Depth: **Surface**
 Sample Description: **Tan Brown Coarse to fine sand with gravel A-1-a (0)**



As Defined by NCDOT		Fine Sand	< 0.25 mm and > 0.05 mm
Gravel	< 75 mm and > 2.00 mm	Silt	< 0.05 and > 0.005 mm
Coarse Sand	< 2.00 mm and > 0.25 mm	Clay	< 0.005 mm
Maximum Particle Size	1"	Coarse Sand	19.9%
		Fine Sand	8.6%
Gravel	70.0%	Silt	1.0%
		Clay	1.0%
Apparent Relative Density		Moisture Content	% Passing #200 2.1%
Liquid Limit	20	Plastic Limit	0
		Plastic Index	N.P.

Soil Mortar (-#10 Sieve)

Coarse Sand 66.3% Fine Sand 28.6% Silt 2.8% Clay 2.3%

Description of Sand & Gravel Particles: Rounded Angular Hard & Durable Soft Weathered & Friable

Mechanical Stirring Apparatus (A) Length of Dispersion Period: 1 min. Dispersing Agent: Sodium Hexametaphosphate: 40 g / Liter

References: AASHTO T88: Particle Size Analysis of Soils as Modified by the NCDOT AASHTO T265: Laboratory Determination of Moisture Content of Soils
 AASHTO T87: Dry Preparation of Disturbed Soil and Soil Aggregate Samples for Test AASHTO T90: Determining the Plastic Limit & Plasticity Index of Soils
 AASHTO T89: Determining the Liquid Limit of Soils
 AASHTO M 145: The Classification of Soils and Soil Aggregate Mixtures for Highway Construction Purposes ASTM D 854: Specific Gravity of Soils

Technical Responsibility: Mal Karajan Laboratory Supervisor



Photograph No. 1:
This photograph was taken from the right side of the existing bridge, looking north.



Photograph No. 3:
This photograph was taken from the right side of the -L- alignment, looking west, across proposed End Bent No. 1.



Photograph No. 2:
This photograph was taken at proposed End Bent No. 1, looking north, upstation, along the -L- alignment.



Photograph No. 4:
This photograph was taken from the right side of the -L- alignment, looking west, across proposed Interior Bent No. 1.



Photograph No. 5:
This photograph was taken from the right side of the -L- alignment, looking west, across proposed Interior Bent No. 2.



Photograph No. 7:
This photograph was taken from the existing bridge, looking west (upstream).



Photograph No. 6:
This photograph was taken from the right side of the -L- alignment, looking west, across proposed End Bent No. 2.



Photograph No. 8:
This photograph was taken from the existing bridge, looking east (downstream).

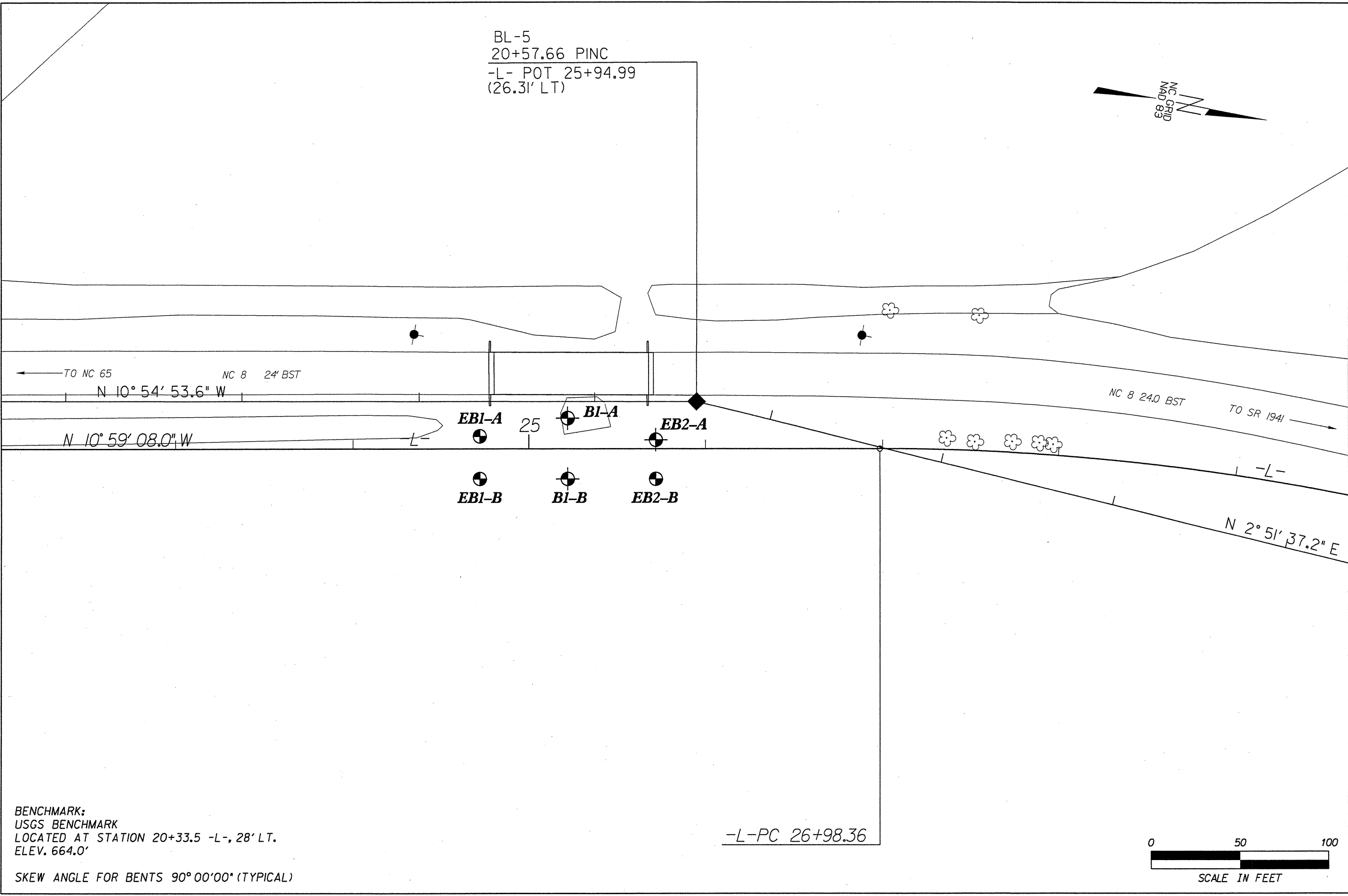


Photograph No. 9:
This photograph was taken from the right side of the existing bridge, looking south.



Photograph No. 10:
This photograph was taken at proposed End Bent No. 2, looking south, downstation, along the -L- alignment.

S:\PROJECTS\2005\OTHER DEPTS.\1352\05-506\CADD\B-4280 SITEPLAN Bfg 44



BL-5
 20+57.66 PINC
 -L- POT 25+94.99
 (26.31' LT)



← TO NC 65
 NC 8 24' BST
 N 10° 54' 53.6" W

NC 8 24.0 BST
 TO SR 194I →

N 10° 59' 08.0" W

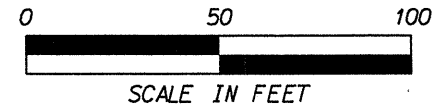
N 2° 51' 37.2" E

EB1-A 25 BI-A EB2-A
 EB1-B BI-B EB2-B

-L-PC 26+98.36

BENCHMARK:
 USGS BENCHMARK
 LOCATED AT STATION 20+33.5 -L-, 28' LT.
 ELEV. 664.0'

SKREW ANGLE FOR BENTS 90° 00' 00" (TYPICAL)

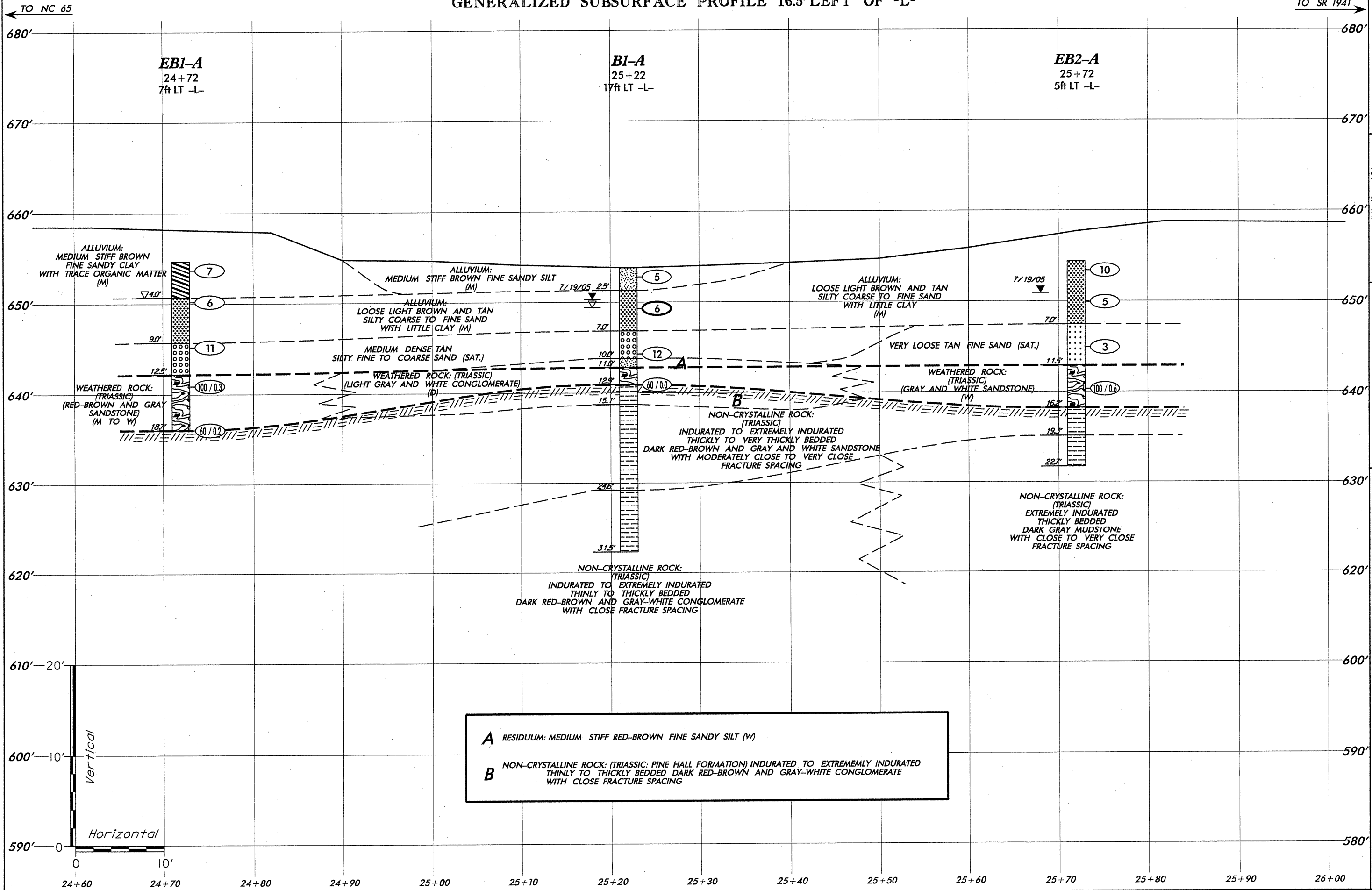


APPROVED BY:	AFR
DRAWN BY:	TRP
SHEET	31 OF 50
SCALE:	1" = 50'
DATE:	AUGUST 2005
JOB NO.	1352-05-506



BORING LOCATION PLAN
 REPLACEMENT OF BRIDGE No. 44
 OVER TOWN FORK CREEK OVERFLOW ON NC 8
 TIP No. B-4280 STATE PROJECT No. 33620.1.1 FEDERAL I.D. BRSTP-8(2)
 STOKES COUNTY, NORTH CAROLINA

GENERALIZED SUBSURFACE PROFILE 16.5' LEFT OF -L-



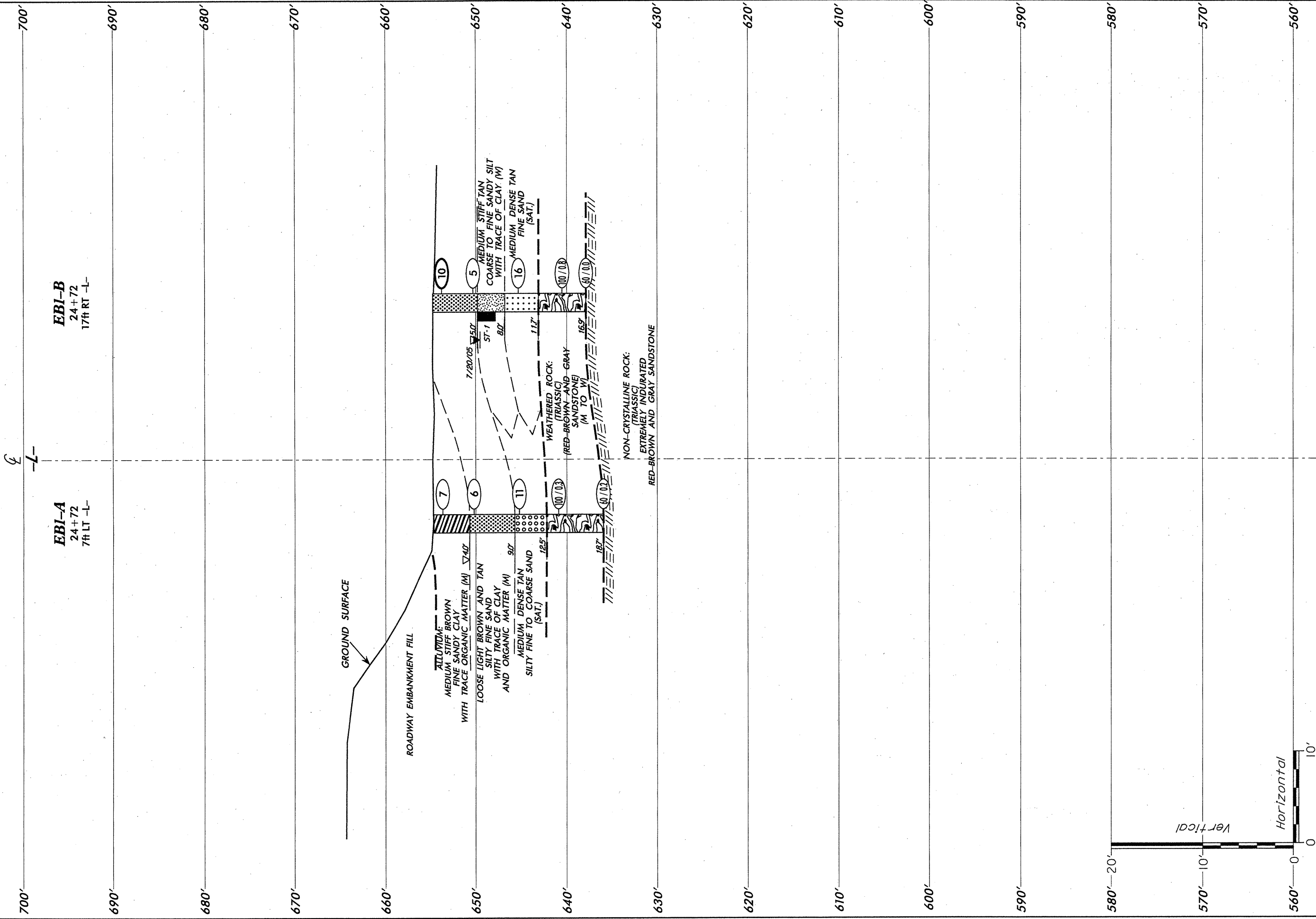
APPROVED BY:	AFR
DRAWN BY:	TRP
DATE:	AUGUST 2005
JOB NO.:	1352-05-506
FIGURE:	32 OF 50



GENERALIZED SUBSURFACE PROFILE 16.5' LEFT OF -L-
STATION 24+60 TO 26+00
REPLACEMENT OF BRIDGE NO. 44
OVER TOWN FORK CREEK OVERFLOW ON NC 8
TIP No. B-4280 PROJECT No. 33620.1.1 FEDERAL I.D. BRSTP-8(2)
STOKES COUNTY, NORTH CAROLINA

S:\PROJECTS\2005\OTHER DEPTS.\1352\05-506\CADD\B-4280 PROFILE-XSEC Brg 44

GENERALIZED SUBSURFACE CROSS SECTION THROUGH END BENT No.1



GENERALIZED SUBSURFACE CROSS SECTION THROUGH END BENT No.1

REPLACEMENT OF BRIDGE No. 44
OVER TOWN FORK CREEK OVERFLOW ON NC 8
TIP No. B-4280 PROJECT No. 33520.1.1 FEDERAL I.D. BRSTP-8(2)
STOKES COUNTY, NORTH CAROLINA



SCALE: (V) 1" = 10'
(H) 1" = 10'

DATE: AUGUST 2005

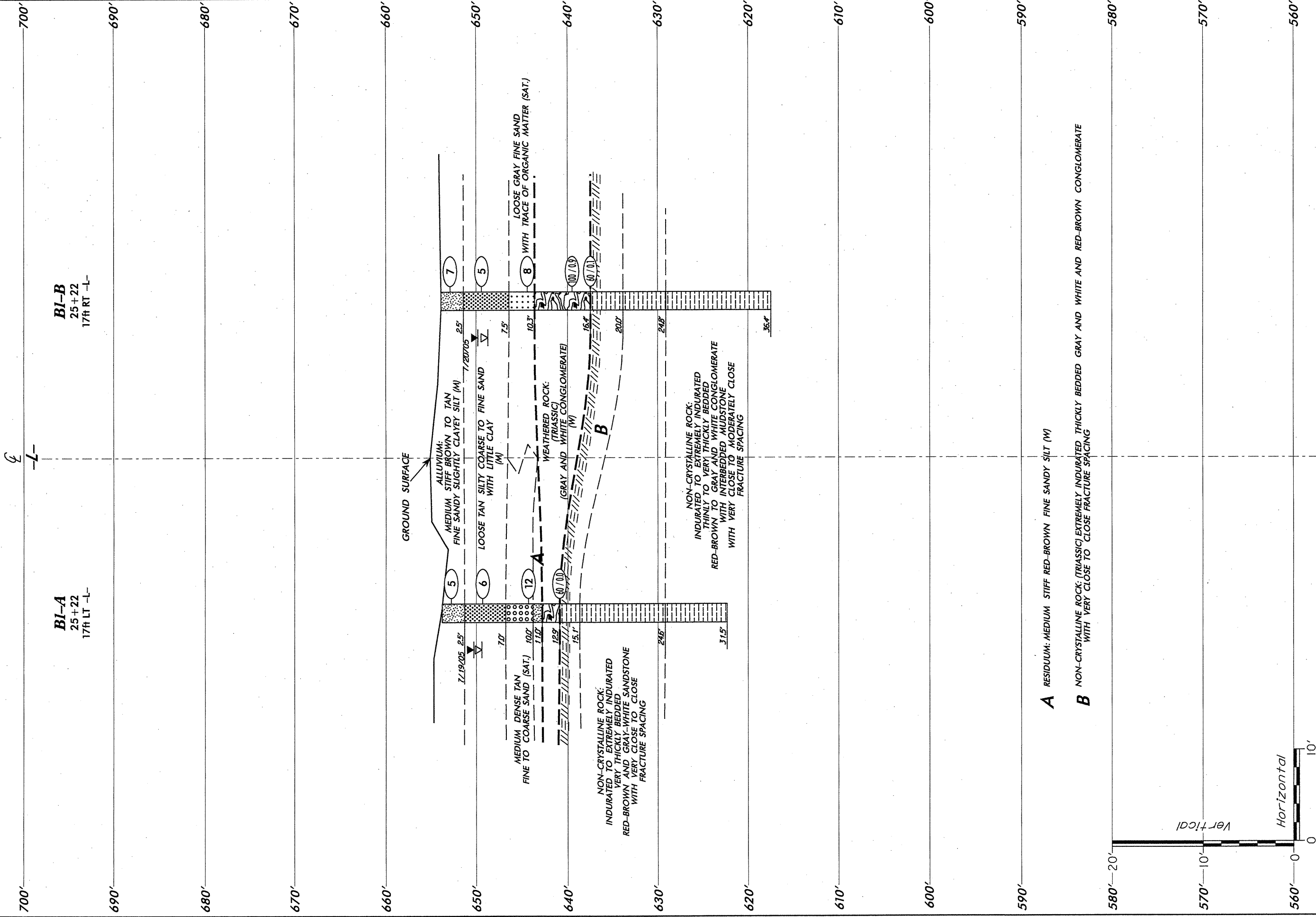
JOB NO. 1352-05-506

APPROVED BY: AFR

DRAWN BY: TRP

FIGURE 33 OF 50

GENERALIZED SUBSURFACE CROSS SECTION THROUGH INTERIOR BENT No.1



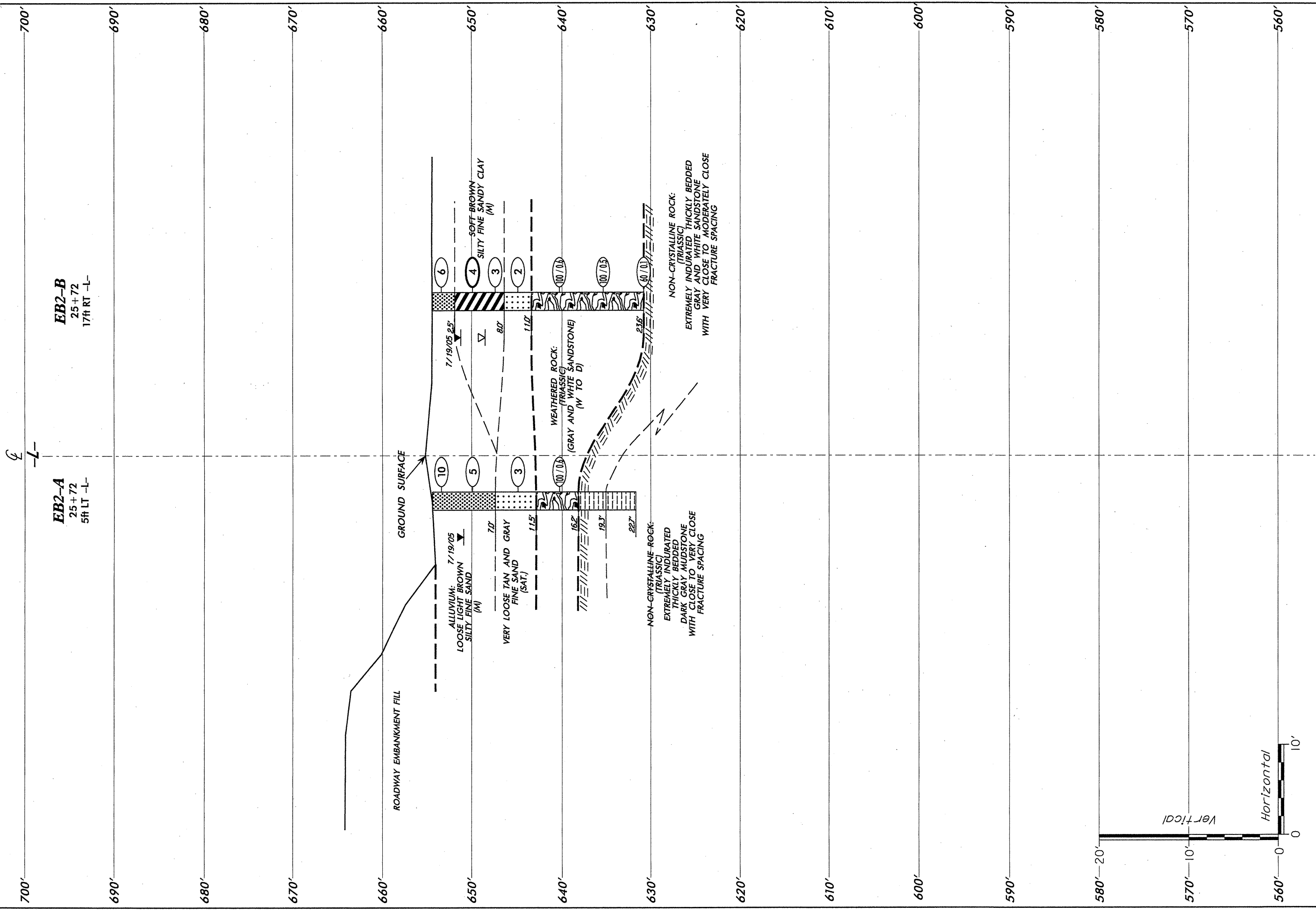
GENERALIZED SUBSURFACE CROSS SECTION THROUGH INTERIOR BENT No.1

REPLACEMENT OF BRIDGE No. 44
OVER TOWN FORK CREEK OVERFLOW ON NC 8
TIP No. B-4280 PROJECT No. 33620.1.1 FEDERAL I.D. BRSTP-8(2)
STOKES COUNTY, NORTH CAROLINA



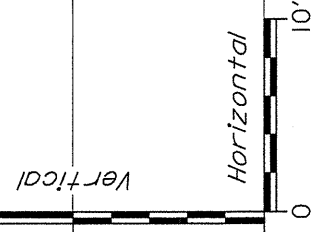
SCALE:	(V) 1" = 10' (H) 1" = 10'	APPROVED BY:	AFR
DATE:	AUGUST 2005	DRAWN BY:	TRP
JOB NO.	1352-05-506	FIGURE	34 OF 50

GENERALIZED SUBSURFACE CROSS SECTION THROUGH END BENT No.2



EB2-B
25+72
17# RT -L-

EB2-A
25+72
5# LT -L-



GENERALIZED SUBSURFACE CROSS SECTION THROUGH END BENT No.2

REPLACEMENT OF BRIDGE No. 44
OVER TOWN FORK CREEK OVERFLOW ON NC 8
TIP No. B-4280 PROJECT No. 33620.1.1 FEDERAL I.D. BRSTP-8(2)
STOKES COUNTY, NORTH CAROLINA



SCALE:	(V) 1" = 10'	APPROVED BY:	AFR
	(H) 1" = 10'	DRAWN BY:	TRP
DATE:	AUGUST 2005	JOB NO.:	1352-05-506
		FIGURE	35 OF 50



PROJECT NO. 33620.1.1		ID. B-4280		COUNTY STOKES		GEOLOGIST D. BENTS							
SITE DESCRIPTION BRIDGE 44 OVER TOWN FORK CREEK OVERFLOW ON NC 8							GROUND WATER (ft)						
BORING NO. EB1-A		BORING LOCATION 24+72		OFFSET 7 ft LT	ALIGNMENT -L-		0 HR. 4.0						
COLLAR ELEV. 654.7 ft		NORTHING 919,205.4		EASTING 1,639,503.3		24 HR. N/M							
TOTAL DEPTH 18.7 ft		DRILL MACHINE Diedrich D-50		DRILL METHOD 2 1/4" HSA		HAMMER TYPE MANUAL							
DATE STARTED 7/19/05		COMPLETED 7/19/05		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
654.7	0.0	4	4	3									GROUND SURFACE
654.7	0.0											M	654.7 0.0
651.2	3.5	3	3	3								M	650.7 4.0
646.2	8.5	3	5	6								Sat.	645.7 9.0
641.2	13.5	100/0.3										M	642.2 12.5
636.2	18.5	60/0.2										W	636.0 18.7
BORING TERMINATED WITH STANDARD PENETRATION TEST REFUSAL AT ELEVATION 636.0 FEET ON NON-CRYSTALLINE ROCK: (TRIASSIC) EXTREMELY INDURATED RED-BROWN AND GRAY SANDSTONE												1) ADVANCED 2-1/4" HSA TO 18.5 FEET.	

NCDOT BORE SINGLE BRIDGE 44 1352-05-506.GPJ NCDOT.GDT 9/7/05



PROJECT NO. 33620.1.1		ID. B-4280		COUNTY STOKES		GEOLOGIST D. BENTS							
SITE DESCRIPTION BRIDGE 44 OVER TOWN FORK CREEK OVERFLOW ON NC 8							GROUND WATER (ft)						
BORING NO. EB1-B		BORING LOCATION 24+72		OFFSET 17 ft RT	ALIGNMENT -L-		0 HR. 5.0						
COLLAR ELEV. 654.8 ft		NORTHING 919,209.9		EASTING 1,639,526.4		24 HR. 5.3 on 7/20/05							
TOTAL DEPTH 16.9 ft		DRILL MACHINE Diedrich D-50		DRILL METHOD 2 1/4" HSA		HAMMER TYPE MANUAL							
DATE STARTED 7/19/05		COMPLETED 7/19/05		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
654.8	0.0	5	5	5									GROUND SURFACE
654.8	0.0												654.8 0.0
651.3	3.5	3	2	3									649.8 5.0
646.3	8.5	WOH	5	11									646.8 8.0
641.3	13.5	19	81/0.3										643.1 11.7
637.9	16.9	60/0.0											637.9 16.9
BORING TERMINATED WITH STANDARD PENETRATION TEST REFUSAL AT ELEVATION 637.9 FEET ON NON-CRYSTALLINE ROCK: (TRIASSIC) EXTREMELY INDURATED RED-BROWN AND GRAY SANDSTONE												1) ADVANCED 2-1/4" HSA TO 16.9 FEET.	

NCDOT BORE SINGLE BRIDGE 44 1352-05-506.GPJ NCDOT.GDT 9/7/05



PROJECT NO. 33620.1.1		ID. B-4280		COUNTY STOKES		GEOLOGIST K. LEWALLEN								
SITE DESCRIPTION BRIDGE 44 OVER TOWN FORK CREEK OVERFLOW ON NC 8							GROUND WATER (ft)							
BORING NO. B1-A		BORING LOCATION 25+22		OFFSET 17 ft LT		ALIGNMENT -L-								
COLLAR ELEV. 653.8 ft		NORTHING 919,252.7		EASTING 1,639,484.5		0 HR. 4.4								
TOTAL DEPTH 31.5 ft		DRILL MACHINE BK-51		DRILL METHOD 2 1/4" HSA/NQ-2 CORE BARREL		24 HR. 3.5 on 7/19/05								
DATE STARTED 7/18/05		COMPLETED 7/18/05		SURFACE WATER DEPTH N/A										
ELEV. (ft)	DEPTH (ft)	BLOW COUNT			BLOWS PER FOOT					SAMP. NO.	LOG MOI	LOG G	SOIL AND ROCK DESCRIPTION	
		0.5ft	0.5ft	0.5ft	0	20	40	60	80					100
653.8														GROUND SURFACE
653.8	0.0	2	3	2										ALLUVIUM: MEDIUM STIFF BROWN FINE SANDY SILT (A-4)
650.3	3.5	3	3	3										LOOSE TAN SILTY COARSE TO FINE SAND (A-2-4)
645.3	8.5													WITH LITTLE CLAY MEDIUM DENSE TAN FINE TO COARSE SAND (A-1-b)
640.9	12.9													RESIDUUM: MEDIUM STIFF RED-BROWN FINE SANDY SILT (A-4)
														WEATHERED ROCK: (TRIASSIC) (LIGHT GRAY AND WHITE CONGLOMERATE)
														NON-CRYSTALLINE ROCK: (TRIASSIC) EXTREMELY INDURATED THICKLY BEDDED
														LIGHT GRAY AND WHITE CONGLOMERATE WITH CLOSE FRACTURE SPACING
														NON-CRYSTALLINE ROCK: INDURATED TO EXTREMELY INDURATED VERY THICKLY BEDDED
														DARK RED-BROWN AND GRAY SANDSTONE
														WITH CLOSE TO VERY CLOSE FRACTURE SPACING
														NON-CRYSTALLINE ROCK: INDURATED TO EXTREMELY INDURATED THINLY TO THICKLY BEDDED
														DARK RED-BROWN TO GRAY AND WHITE CONGLOMERATE
														WITH CLOSE FRACTURE SPACING
														1) ADVANCED 2-1/4" HSA TO 12.9 FEET. 2) SET CASING TO 12.9 FEET. 3) ADVANCED NQ-2 CORE BARREL FROM 12.9 TO 31.5 FEET. 4) CREEK WATER USED AS DRILLING FLUID. 5) APPROXIMATE DRILLING FLUID DENSITY 62.4 PCF. 6) NO LOSS OF DRILLING FLUID OBSERVED.
														BORING TERMINATED AT ELEVATION 622.3 FEET IN NON-CRYSTALLINE ROCK: EXTREMELY INDURATED GRAY AND WHITE CONGLOMERATE

NCDOT BORE SINGLE BRIDGE 44 1352-05-506.GPJ NCDOT.GDT 9/8/05



PROJECT NO. 33620.1.1		ID. B-4280		COUNTY STOKES		GEOLOGIST K. LEWALLEN				
SITE DESCRIPTION BRIDGE 44 OVER TOWN FORK CREEK OVERFLOW ON NC 8							GROUND WATER (ft)			
BORING NO. B1-A		BORING LOCATION 25+22		OFFSET 17 ft LT		ALIGNMENT -L-				
COLLAR ELEV. 653.8 ft		NORTHING 919,252.7		EASTING 1,639,484.5		0 HR. 4.4				
TOTAL DEPTH 31.5 ft		DRILL MACHINE BK-51		DRILL METHOD 2 1/4" HSA/NQ-2 CORE BARREL		24 HR. 3.5 on 7/19/05				
DATE STARTED 7/18/05		COMPLETED 7/18/05		SURFACE WATER DEPTH N/A						
CORE SIZE NQ-2		TOTAL RUN 18.6 ft		DRILLER J. LITTLE						
ELEV. (ft)	DEPTH (ft)	RUN (ft)	DRILL RATE (Min/ft)	RUN		SAMP. NO.	STRATA		LOG G	DESCRIPTION AND REMARKS
				REC. (ft) %	RQD (ft) %		REC. (ft) %	RQD (ft) %		
										Begin Coring @ 12.9 ft
640.9	12.9	3.6	2:00	(3.2)	(1.8)		(2.2)	(1.3)		NON-CRYSTALLINE ROCK: (TRIASSIC) EXTREMELY INDURATED THICKLY BEDDED
637.3	16.5		2:20	89%	50%		100%	59%		LIGHT GRAY AND WHITE CONGLOMERATE WITH CLOSE FRACTURE SPACING 3 JOINTS @ 45°
632.3	21.5	5.0	1:40/0.6	(5.0)	(3.5)		96%	60%		NON-CRYSTALLINE ROCK: INDURATED TO EXTREMELY INDURATED VERY THICKLY BEDDED
627.3	26.5		2:20	100%	70%					DARK RED-BROWN AND GRAY SANDSTONE WITH CLOSE TO VERY CLOSE FRACTURE SPACING 6 JOINTS @ 45°, 3 JOINTS @ 60°, AND 1 JOINT @ 80°
622.3	31.5	5.0	1:30	(5.0)	(3.3)		100%	71%		NON-CRYSTALLINE ROCK: INDURATED TO EXTREMELY INDURATED THINLY TO THICKLY BEDDED
			2:40							DARK RED-BROWN TO GRAY AND WHITE CONGLOMERATE WITH CLOSE FRACTURE SPACING 5 JOINTS @ 10° AND 3 JOINTS @ 45°
			2:10							BORING TERMINATED AT ELEVATION 622.3 FEET IN NON-CRYSTALLINE ROCK: EXTREMELY INDURATED GRAY AND WHITE CONGLOMERATE
			2:20							
			1:40							
			2:00							
			1:50							
			1:50							

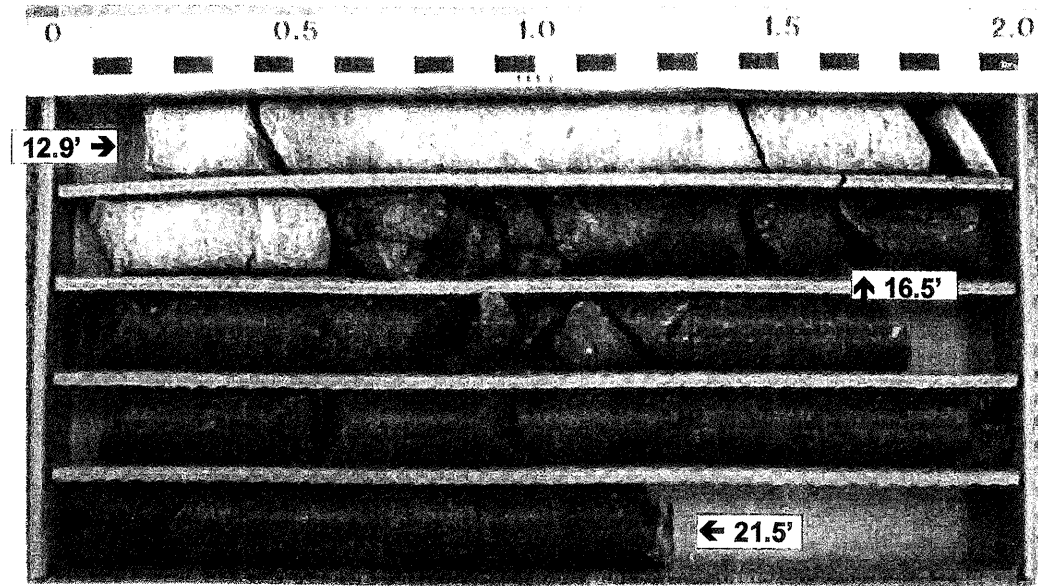
NCDOT CORE SINGLE BRIDGE 44 1352-05-506.GPJ NCDOT.GDT 9/7/05

CORE PHOTOS

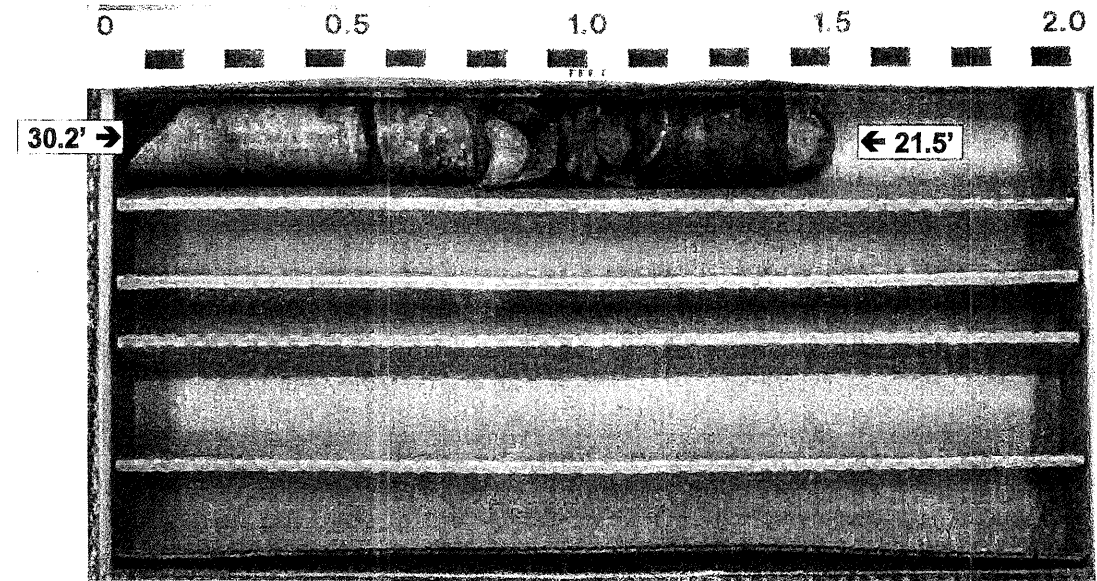
Project No: 33620.1.1	TIP No: B-4280	County: Stokes	Boring No.: B1-A
Site Description: Replacement of Bridge No. 44 over Town Fork Creek Overflow on NC 8		Driller: J. Little	
Collar Elev.: 653.8 ft.	Core Size: NQ-2	Equipment: BK-51	Geologist: K. Lewallen
Elev. at T.D.: 622.3 ft.	Total Depth: 31.5 ft.	Total Run: 18.6 ft.	Date: 7/18/05

CORE PHOTOS

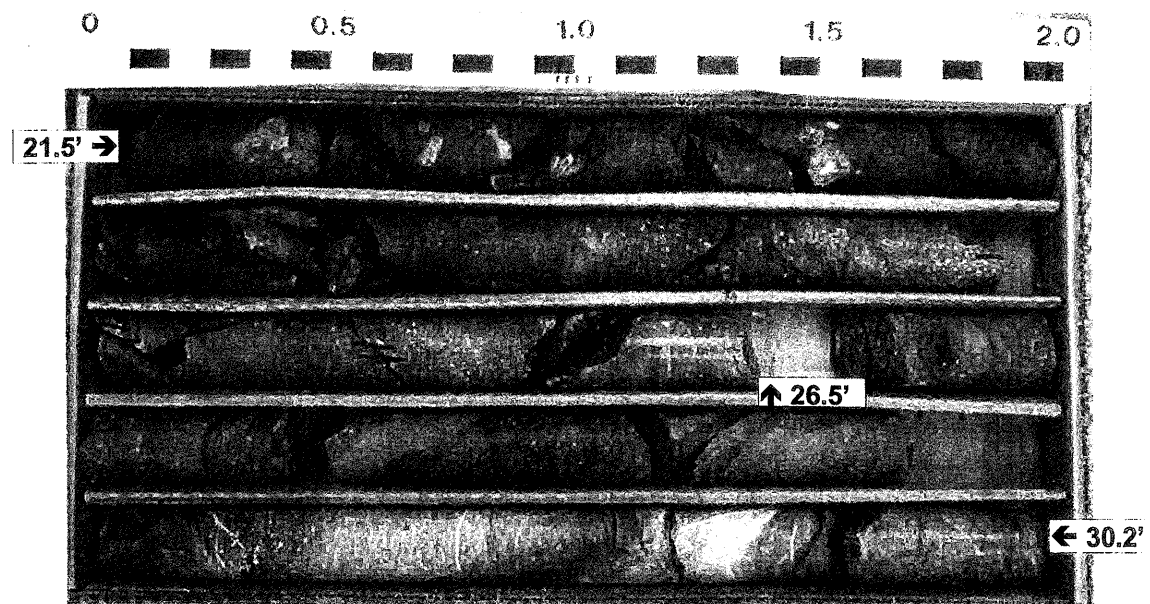
Project No: 33620.1.1	TIP No: B-4280	County: Stokes	Boring No.: B1-A
Site Description: Replacement of Bridge No. 44 over Town Fork Creek Overflow on NC 8		Driller: J. Little	
Collar Elev.: 653.8 ft.	Core Size: NQ-2	Equipment: BK-51	Geologist: K. Lewallen
Elev. at T.D.: 622.3 ft.	Total Depth: 31.5 ft.	Total Run: 18.6 ft.	Date: 7/18/05



Box 1 of 3
Top of Box @ 12.9 feet; Bottom of Box @ 21.5 feet



Box 3 of 3
Top of Box @ 30.2 feet; Bottom of Box @ 31.5 feet



Box 2 of 3
Top of Box @ 21.5 feet; Bottom of Box @ 30.2 feet



PROJECT NO. 33620.1.1		ID. B-4280		COUNTY STOKES		GEOLOGIST K. LEWALLEN							
SITE DESCRIPTION BRIDGE 44 OVER TOWN FORK CREEK OVERFLOW ON NC 8						GROUND WATER (ft)							
BORING NO. B1-B		BORING LOCATION 25+22		OFFSET 17 ft RT		ALIGNMENT -L-							
COLLAR ELEV. 653.9 ft		NORTHING 919,259.0		EASTING 1,639,516.9		24 HR. 4.1 on 7/20/05							
TOTAL DEPTH 36.4 ft		DRILL MACHINE BK-51		DRILL METHOD 2 1/4" HSA/NQ-2 CORE BARREL		HAMMER TYPE MANUAL							
DATE STARTED 7/19/05		COMPLETED 7/19/05		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
653.9	0.0	3	3	4									GROUND SURFACE
650.4	3.5	2	3	2									ALLUVIUM: MEDIUM STIFF TAN FINE SANDY SLIGHTLY CLAYEY SILT (A-4)
645.4	8.5	1	2	6									LOOSE TAN SILTY FINE SAND (A-2-4)
640.4	13.5	34	66/0.4										LOOSE GRAY FINE SAND (A-3)
637.6	16.3	60/0.1											WITH TRACE OF ORGANIC MATTER WEATHERED ROCK: (TRIASSIC) (GRAY AND WHITE CONGLOMERATE)
													NON-CRYSTALLINE ROCK: (TRIASSIC) EXTREMELY INDURATED THICKLY BEDDED GRAY AND WHITE TO RED-BROWN CONGLOMERATE WITH VERY CLOSE TO CLOSE FRACTURE SPACING
													NON-CRYSTALLINE ROCK: (TRIASSIC) EXTREMELY INDURATED VERY THICKLY BEDDED RED-BROWN TO GRAY AND WHITE SANDSTONE WITH VERY CLOSE TO CLOSE FRACTURE SPACING
													NON-CRYSTALLINE ROCK: (TRIASSIC) EXTREMELY INDURATED VERY THICKLY BEDDED RED-BROWN TO GRAY AND WHITE CONGLOMERATE WITH INTERBEDDED MUDSTONE WITH VERY CLOSE TO MODERATELY CLOSE FRACTURE SPACING
													BORING TERMINATED AT ELEVATION 617.5 FEET IN NON-CRYSTALLINE ROCK: EXTREMELY INDURATED GRAY AND WHITE CONGLOMERATE

- 1) ADVANCED 2-1/4" HSA TO 16.3 FEET.
- 2) SET CASING TO 16.4 FEET.
- 3) ADVANCED NQ-2 CORE BARREL FROM 16.4 TO 36.4 FEET.
- 4) CREEK WATER USED AS DRILLING FLUID.
- 5) APPROXIMATE DRILLING FLUID DENSITY 62.4 PCF.
- 6) NO LOSS OF DRILLING FLUID OBSERVED.

NCDOT BORE SINGLE BRIDGE 44 1352-05-506.GPJ NCDOT.GDT 9/8/05



PROJECT NO. 33620.1.1		ID. B-4280		COUNTY STOKES		GEOLOGIST K. LEWALLEN				
SITE DESCRIPTION BRIDGE 44 OVER TOWN FORK CREEK OVERFLOW ON NC 8						GROUND WATER (ft)				
BORING NO. B1-B		BORING LOCATION 25+22		OFFSET 17 ft RT		ALIGNMENT -L-				
COLLAR ELEV. 653.9 ft		NORTHING 919,259.0		EASTING 1,639,516.9		24 HR. 4.1 on 7/20/05				
TOTAL DEPTH 36.4 ft		DRILL MACHINE BK-51		DRILL METHOD 2 1/4" HSA/NQ-2 CORE BARREL		HAMMER TYPE MANUAL				
DATE STARTED 7/19/05		COMPLETED 7/19/05		SURFACE WATER DEPTH N/A						
CORE SIZE NQ-2		TOTAL RUN 20.0 ft		DRILLER J. LITTLE						
ELEV. (ft)	DEPTH (ft)	RUN (ft)	DRILL RATE (Min/ft)	RUN		SAMP. NO.	STRATA		LOG	DESCRIPTION AND REMARKS
				REC. (%)	RQD (%)		REC. (%)	RQD (%)		
										Begin Coring @ 16.4 ft
637.5	16.4	5.0	2:10 1:50 1:40	(5.0) 100%	(1.8) 36%		(3.6) 100%	(1.8) 50%		NON-CRYSTALLINE ROCK: (TRIASSIC) EXTREMELY INDURATED THICKLY BEDDED GRAY AND WHITE TO RED-BROWN CONGLOMERATE WITH VERY CLOSE TO CLOSE FRACTURE SPACING 4 JOINTS @ 45° AND 1 JOINT @ 60°
632.5	21.4	5.0	1:40 2:00	(5.0) 100%	(2.8) 56%	RS-1	(4.8) 100%	(1.8) 38%		NON-CRYSTALLINE ROCK: (TRIASSIC) EXTREMELY INDURATED VERY THICKLY BEDDED RED-BROWN TO GRAY AND WHITE SANDSTONE WITH VERY CLOSE TO CLOSE FRACTURE SPACING 3 JOINTS @ 30° AND 7 JOINTS @ 45°
627.5	26.4	5.0	1:50 1:40 1:20 1:30	(4.5) 90%	(2.9) 58%		(11.1) 96%	(8.4) 72%		NON-CRYSTALLINE ROCK: (TRIASSIC) EXTREMELY INDURATED VERY THICKLY BEDDED RED-BROWN TO GRAY AND WHITE CONGLOMERATE WITH INTERBEDDED MUDSTONE WITH VERY CLOSE TO MODERATELY CLOSE FRACTURE SPACING 8 JOINTS @ 45° AND 4 JOINTS @ 60°
622.5	31.4	5.0	2:00 1:50 1:40 1:20 1:30	(5.0) 100%	(4.5) 90%	RS-2				
617.5	36.4		1:50 1:20 1:20 2:00							BORING TERMINATED AT ELEVATION 617.5 FEET IN NON-CRYSTALLINE ROCK: EXTREMELY INDURATED GRAY AND WHITE CONGLOMERATE

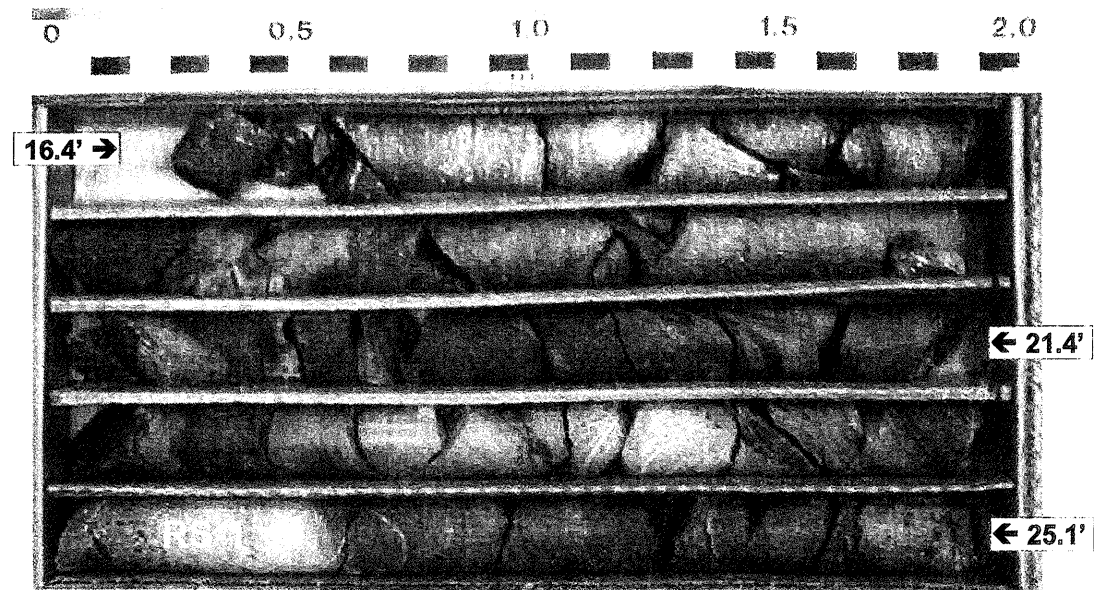
NCDOT CORE SINGLE BRIDGE 44 1352-05-506.GPJ NCDOT.GDT 9/7/05

CORE PHOTOS

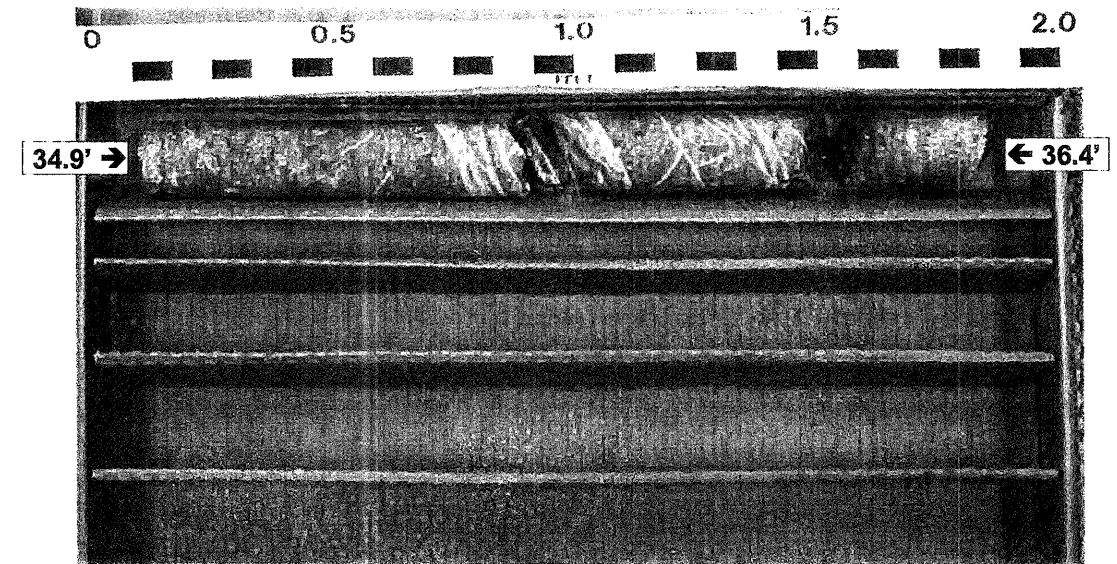
Project No: 33620.1.1	TIP No: B-4280	County: Stokes	Boring No.: B1-B
Site Description: Replacement of Bridge No. 44 over Town Fork Creek Overflow on NC 8		Driller: J. Little	
Collar Elev.: 653.9 ft.	Core Size: NQ-2	Equipment: BK-51	Geologist: K. Lewallen
Elev. at T.D.: 617.5 ft.	Total Depth: 36.4 ft.	Total Run: 20.0 ft.	Date: 7/19/05

CORE PHOTOS

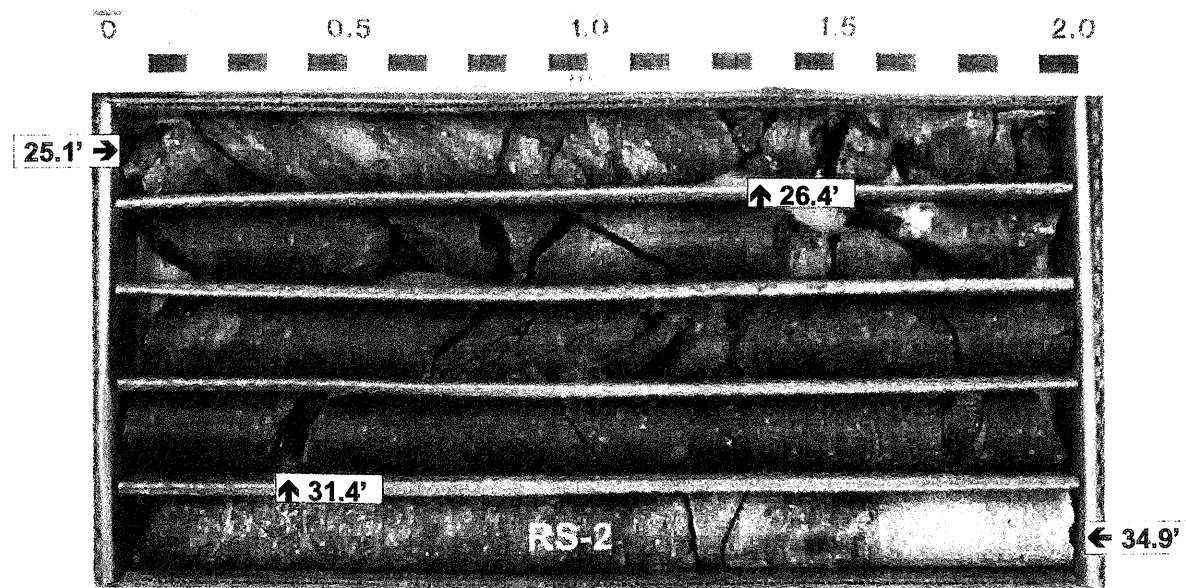
Project No: 33620.1.1	TIP No: B-4280	County: Stokes	Boring No.: B1-B
Site Description: Replacement of Bridge No. 44 over Town Fork Creek Overflow on NC 8		Driller: J. Little	
Collar Elev.: 653.9 ft.	Core Size: NQ-2	Equipment: BK-51	Geologist: K. Lewallen
Elev. at T.D.: 617.5 ft.	Total Depth: 36.4 ft.	Total Run: 20.0 ft.	Date: 7/19/05



Box 1 of 3
Top of Box @ 16.4 feet; Bottom of Box @ 25.1 feet



Box 3 of 3
Top of Box @ 34.9 feet; Bottom of Box @ 36.4 feet



Box 2 of 3
Top of Box @ 25.1 feet; Bottom of Box @ 34.9 feet



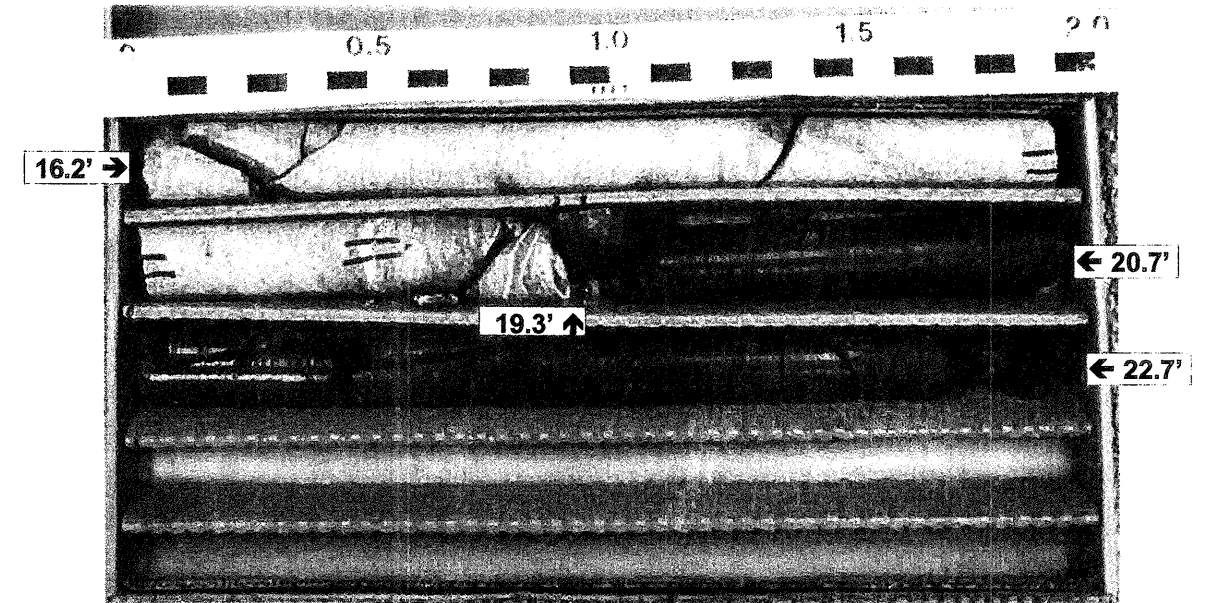
PROJECT NO. 33620.1.1		ID. B-4280		COUNTY STOKES		GEOLOGIST D. BENTS							
SITE DESCRIPTION BRIDGE 44 OVER TOWN FORK CREEK OVERFLOW ON NC 8							GROUND WATER (ft)						
BORING NO. EB2-A		BORING LOCATION 25+72		OFFSET 5 ft LT	ALIGNMENT -L-		0 HR. N/A						
COLLAR ELEV. 654.4 ft		NORTHING 919,304.0		EASTING 1,639,486.2		24 HR. 3.5 on 7/19/05							
TOTAL DEPTH 22.7 ft		DRILL MACHINE Diedrich D-50		DRILL METHOD 2 1/4" HSA/NQ-2 CORE BARREL		HAMMER TYPE MANUAL							
DATE STARTED 7/18/05		COMPLETED 7/18/05		SURFACE WATER DEPTH N/A									
ELEV. (ft)	DEPTH (ft)	BLOW COUNT			BLOWS PER FOOT					SAMP. NO.	LOG MOI	L O G	SOIL AND ROCK DESCRIPTION
		0.5ft	0.5ft	0.5ft	0	20	40	60	80				
654.4	0.0	5	5	5	GROUND SURFACE								654.4 0.0
650.9	3.5	2	2	3	10						M		ALLUVIUM: LOOSE LIGHT BROWN SILTY FINE SAND (A-2-4)
645.9	8.5	2	1	2	5						M		647.4 7.0
640.9	13.5	87	13/0.1		3						Sat.		VERY LOOSE TAN FINE SAND (A-3)
					100/0.6						W		642.9 11.5
													WEATHERED ROCK: (TRIASSIC) (GRAY AND WHITE SANDSTONE)
													638.2 16.2
													NON-CRYSTALLINE ROCK: (TRIASSIC) EXTREMELY INDURATED THICKLY BEDDED GRAY AND WHITE SANDSTONE WITH VERY CLOSE TO MODERATELY CLOSE FRACTURE SPACING
													635.1 19.3
													631.7 22.7
													NON-CRYSTALLINE ROCK: EXTREMELY INDURATED THICKLY BEDDED DARK GRAY MUDSTONE WITH CLOSE TO VERY CLOSE FRACTURE SPACING
													1) ADVANCED 2-1/4" HSA TO 16.2 FEET. 2) SET CASING TO 16.2 FEET. 3) ADVANCED NQ-2 CORE BARREL FROM 16.2 TO 22.7 FEET. 4) CREEK WATER USED AS DRILLING FLUID. 5) APPROXIMATE DRILLING FLUID DENSITY 62.4 PCF. 6) NO LOSS OF DRILLING FLUID OBSERVED.
													BORING TERMINATED AT ELEVATION 631.7 FEET IN NON-CRYSTALLINE ROCK: EXTREMELY INDURATED DARK GRAY MUDSTONE

NCDOT BORE SINGLE BRIDGE 44 1352-05-506.GPJ NCDOT.GDT 9/8/05

PROJECT NO. 33620.1.1		ID. B-4280		COUNTY STOKES		GEOLOGIST D. BENTS				
SITE DESCRIPTION BRIDGE 44 OVER TOWN FORK CREEK OVERFLOW ON NC 8						GROUND WATER (ft)				
BORING NO. EB2-A		BORING LOCATION 25+72		OFFSET 5 ft LT		ALIGNMENT -L-				
COLLAR ELEV. 654.4 ft		NORTHING 919,304.0		EASTING 1,639,486.2		0 HR. N/A				
TOTAL DEPTH 22.7 ft		DRILL MACHINE Diedrich D-50		DRILL METHOD 2 1/4" HSA/NQ-2 CORE BARREL		24 HR. 3.5 on 7/19/05				
DATE STARTED 7/18/05		COMPLETED 7/18/05		SURFACE WATER DEPTH N/A		HAMMER TYPE MANUAL				
CORE SIZE NQ-2		TOTAL RUN 6.5 ft		DRILLER L. SCHRADER						
ELEV. (ft)	DEPTH (ft)	RUN (ft)	DRILL RATE (Min/ft)	RUN		SAMP. NO.	STRATA		LOG	DESCRIPTION AND REMARKS
				REC. (ft) %	RQD (ft) %		REC. (ft) %	RQD (ft) %		
										638.2 Begin Coring @ 16.2 ft 16.2
638.2	16.2	3.1	1:00/0.5	(2.9)	(2.3)		(2.9)	(2.3)		
635.1	19.3		1:00	94%	74%		94%	74%		NON-CRYSTALLINE ROCK: (TRIASSIC) 19.3
633.7	20.7	1.4	0:10/0.1	(1.1)	(0.9)		(2.9)	(1.5)		EXTREMELY INDURATED THICKLY BEDDED GRAY AND WHITE SANDSTONE WITH VERY CLOSE TO MODERATELY CLOSE FRACTURE SPACING 1 JOINT @ 10°, 2 JOINTS @ 45°, AND 2 JOINTS @ 60°
631.7	22.7	2.0	3:20	79%	64%					
			1:30/0.4	(1.8)	(0.6)					NON-CRYSTALLINE ROCK: EXTREMELY INDURATED THICKLY BEDDED DARK GRAY MUDSTONE WITH CLOSE TO VERY CLOSE FRACTURE SPACING 2 JOINTS @ 10°, 2 JOINTS @ 30°, 2 JOINTS @ 45°, AND 1 JOINT @ 90°
			2:00	90%	30%					BORING TERMINATED AT ELEVATION 631.7 FEET IN NON-CRYSTALLINE ROCK: EXTREMELY INDURATED DARK GRAY MUDSTONE
			3:00							

CORE PHOTOS

Project No: 33620.1.1	TIP No: B-4280	County: Stokes	Boring No.: EB2-A
Site Description: Replacement of Bridge No. 44 over Town Fork Creek Overflow on NC 8			Driller: J. Little
Collar Elev.: 654.4 ft.	Core Size: NQ-2	Equipment: BK-51	Geologist: D. Bents
Elev. at T.D.: 631.7 ft.	Total Depth: 22.7 ft.	Total Run: 6.5 ft.	Date: 7/18/05



Box 1 of 1
Top of Box @ 16.2 feet; Bottom of Box @ 22.7 feet



PROJECT NO. 33620.1.1		ID. B-4280		COUNTY STOKES		GEOLOGIST K. LEWALLEN												
SITE DESCRIPTION BRIDGE 44 OVER TOWN FORK CREEK OVERFLOW ON NC 8							GROUND WATER (ft)											
BORING NO. EB2-B		BORING LOCATION 25+72		OFFSET 17 ft RT	ALIGNMENT -L-	0 HR. 5.9												
COLLAR ELEV. 654.4 ft		NORTHING 919,308.1		EASTING 1,639,507.3		24 HR. 3.2 on 7/19/05												
TOTAL DEPTH 23.6 ft		DRILL MACHINE BK-51		DRILL METHOD 2 1/4" HSA		HAMMER TYPE MANUAL												
DATE STARTED 7/18/05		COMPLETED 7/18/05		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					
654.4					GROUND SURFACE							654.4	0.0					
654.4	0.0	2	2	4								651.9	2.5					
650.9	3.5	2	2	2														
648.4	6.0	2	2	1														
645.9	8.5	2	2	1														
		1	1	1														
640.9	13.5	68			32/0.1							646.4	8.0					
		100/0.5										643.4	11.0					
635.9	18.5																	
630.9	23.5																	
		60/0.1			60/0.1													
BORING TERMINATED WITH STANDARD PENETRATION TEST REFUSAL AT ELEVATION 630.8 FEET ON NON-CRYSTALLINE ROCK: (TRIASSIC) EXTREMELY INDURATED GRAY AND WHITE SANDSTONE												1) ADVANCED 2-1/4" HSA TO 23.5 FEET.						

NCDOT BORE SINGLE BRIDGE 44 1352-05-508.GPJ NCDOT.GDT 9/7/05

LABORATORY SUMMARY SHEET



PROJECT NO.: 33620.1.1

TIP NO.: B-4280

COUNTY: STOKES

BRIDGE 44 OVER TOWN FORK CREEK OVERFLOW ON NC 8

SOIL TEST RESULTS

BORING NO.	SAMPLE NO.	STATION	OFFSET	LINE	DEPTH INTERVAL (FT)	AASHTO CLASS.	L.L.	P.L.	% BY WEIGHT				% PASSING SIEVES			% MOISTURE	% ORGANIC
									C. SAND	F.SAND	SILT	CLAY	10	40	200		
EB1-B	SS-1	24+72	17 FT RT	-L-	0.0-1.5	A-2-4(0)	22	NP	6	75	10	8	100	100	29	-	-
EB1-B	ST-1	24+72	17 FT RT	-L-	5.0-7.0	A-4(0)	22	3	13	58	20	9	100	98	37	26.1	-
B1-A	SS-2	25+22	17 FT LT	-L-	3.5-5.0	A-2-4(0)	26	NP	16	60	13	11	100	98	30	-	-
B1-B	SS-3	25+22	17 FT RT	-L-	0.0-1.5	A-4(1)	28	6	6	53	22	19	100	97	51	-	-
EB2-B	SS-4	25+72	17 FT RT	-L-	3.5-5.0	A-7-6(13)	42	18	3	32	31	34	100	99	76	-	-

Consolidation Test Results

Borehole	Sample	Depth (ft)	AASHTO Classification	C _c	C _v (ft ² /day)	t ₉₀ (min)	γ, Initial (lbs/ft ³)	Initial Moisture, %	G _s	Initial Voids Ratio, e
EB1-B	ST-1	5.0-7.0	(A-4)	0.064	3.366	0.615	121.15	26.1	2.664	0.7296

ROCK CORE UNCONFINED COMPRESSION TEST RESULTS

Sample #	Bridge #	Boring #	Depth (ft)	Rock Type	Geologic Map Unit	Run RQD	Length (ft)	Diameter (ft)	Unit Weight (PCF)	Unconfined Compressive Strength (PSI)	Young's Modulus (PSI)	Splitting Tensile Strength (PSI)	Remarks
RS-1	44	B1-B	23.3 - 23.9	Sandstone	Trdp	56%	4.387	1.990	--	16,365	--	--	
RS-2	44	B1-B	33.3 - 34.1	Conglomerate	Trdp	90%	4.435	1.995	--	12,438	--	--	

NOTES: Natural Moisture Content Test Method - AASHTO T 265-93
 Atterberg Limits Test Methods - AASHTO T 88-94 and T 90-94
 Grain Size Test Results Test Method - AASHTO T-88-93
 Consolidation Test Method - ASTM D2435-96
 Unconfined Compression - ASTM D2938

GEOTECHNICAL UNIT FIELD SCOUR REPORT

PROJECT: 33620.1.1 ID: B-4280 COUNTY: STOKES

DESCRIPTION(1): REPLACEMENT OF BRIDGE NO. 44 OVER TOWN FORK CREEK OVERFLOW ON NC 8

INFORMATION ON EXISTING BRIDGES Information obtained from: field inspection
 microfilm(Reel: _____ Pos: _____)
 other Bridge Survey and Hydraulic Design Report

COUNTY BRIDGE NO. 44 BRIDGE LENGTH 90.3 NO. BENTS IN: CHANNEL 0 FLOOD PLAIN 4

FOUNDATION TYPE: TIMBER PILES WITH REINFORCED CONCRETE CAPS

EVIDENCE OF SCOUR(2):

ABUTMENTS OR END BENT SLOPES: NONE OBSERVED

INTERIOR BENTS: SCOUR HOLES AT BOTH INTERIOR BENTS

CHANNEL BED: NONE OBSERVED

CHANNEL BANKS: N/A

EXISTING SCOUR PROTECTION:

TYPE(3): NO SCOUR PROTECTION AT INTERIOR BENTS. CONCRETE APRON COVERS END BENT SLOPES

EXTENT(4):

EFFECTIVENESS(5): CONCRETE APRON IS MOSTLY EFFECTIVE AT END BENTS

OBSTRUCTIONS(6) (DAMS,DEBRIS,ETC.): DEBRIS AND DIRT PILES OBSERVED BENEATH BRIDGE

DESIGN INFORMATION

CHANNEL BED MATERIAL(7) (SAMPLE RESULTS ATTACHED): TAN AND BROWN SILTY FINE SAND (A-2-4)

FINE SANDY SILT (A-4)

CHANNEL BANK MATERIAL(8) (SAMPLE RESULTS ATTACHED): NO BANKS

CHANNEL BANK COVER(9): N/A

FLOOD PLAIN WIDTH(10): +/- 1,100 FEET SOUTH OF BRIDGE, +/- 500 FEET NORTH OF BRIDGE

FLOOD PLAIN COVER(11): MOSTLY GRASS & CROP FIELDS, SOME UNDERBRUSH & SMALL TO LARGE TREES

DESIGN INFORMATION CONT.

STREAM IS DEGRADING AGGRADING (12)

OTHER OBSERVATIONS AND COMMENTS: SANDBAR EXTENDS DOWNSTREAM FROM B4 AND ONE FORMING DOWNSTREAM FROM B3. DRAINAGE DITCH EMPTIES INTO CREEK APPROXIMATELY 25 FT UPSTREAM OF BRIDGE ON NORTH BANK. SIGNIFICANT DEBRIS OBSERVED AROUND INTERIOR BENTS

CHANNEL MIGRATION TENDENCY (13): MIGRATION TENDENCY TO THE SOUTH

REPORTED BY: Duane D. Bents *[Signature]* DATE: 7/22/2005
S&ME, Inc.

GEOTECHNICALLY ADJUSTED SCOUR ELEVATION (14):

Location	100 yr	500 yr
B1-A	644.9'	642.2'
B1-B	644.9'	642.8

REPORTED BY: *[Signature]* DATE: 9/2/05
NCDOT GEOTECHNICAL UNIT

- INSTRUCTIONS**
- GIVE THE DESCRIPTION OF THE SPECIFIC SITE GIVING ROUTE NUMBER AND BODY OF WATER CROSSED.
 - NOTE ANY EVIDENCE OF SCOUR AT THE EXISTING END BENTS OR ABUTMENTS (UNDERMINING, SLOUGHING, SCOUR LOCATIONS, DEGRADATIONS, ETC.)
 - NOTE ANY EXISTING SCOUR PROTECTION (RIP RAP, ETC.)
 - DESCRIBE THE EXTENT OF ANY EXISTING SCOUR PROTECTION.
 - DESCRIBE WHETHER OR NOT THE SCOUR PROTECTION APPEARS TO BE WORKING.
 - NOTE ANY DAMS, FALLEN TREES, DEBRIS AT BENTS, ETC.
 - DESCRIBE THE CHANNEL BED MATERIAL: A SAMPLE SHOULD BE TAKEN FOR GRAIN SIZE DISTRIBUTION, ATTACH LAB RESULTS.
 - DESCRIBE THE CHANNEL BANK MATERIAL: A SAMPLE SHOULD BE TAKEN FOR GRAIN SIZE DISTRIBUTION, ATTACH LAB RESULTS.
 - DESCRIBE THE BANK COVERING (GRASS, TREES, RIP RAP, NONE, ETC.)
 - GIVE THE APPROXIMATE FLOOD PLAIN WIDTH (ESTIMATE).
 - DESCRIBE THE FLOOD PLAIN COVERING (GRASS, TREES, CROPS, ETC.)
 - CHECK THE APPROPRIATE SPACE AS TO WHETHER THE STREAM IS DEGRADING OR AGGRADING
 - DESCRIBE THE POTENTIAL OF THE BODY OF WATER TO MIGRATE LATERALLY DURING THE LIFE OF THE BRIDGE (APPROXIMATELY 100 YEARS).
 - GIVE THE GEOTECHNICALLY ADJUSTED SCOUR ELEVATION EXPECTED OVER THE LIFE OF THE BRIDGE (APPROXIMATELY 100 YEARS). THIS CAN BE GIVEN AS AN ELEVATION RANGE ACROSS THE SITE, OR ON A BENT BY BENT BASIS WHERE VARIATIONS EXIST. DISCUSS RELATIONSHIP BETWEEN THE HYDRAULICS THEORETICAL SCOUR AND THE GEOTECHNICALLY ADJUSTED SCOUR ELEVATION. THE GEOTECHNICALLY ADJUSTED SCOUR ELEVATION IS BASED ON THE ERODABILITY OF MATERIALS WITH CONSIDERATION FOR JOINTING, FOLIATION, BEDDING ORIENTATION AND FREQUENCY; CORE RECOVERY PERCENTAGE; PERCENTAGE RQD; DIFFERENTIAL WEATHERING, SHEAR STRENGTH; OBSERVATIONS AT EXISTING STRUCTURES; OTHER TESTS DEEMED APPROPRIATE; AND OVERALL GEOLOGIC CONDITIONS AT THE SITE.

Particle Size Analysis of Soils

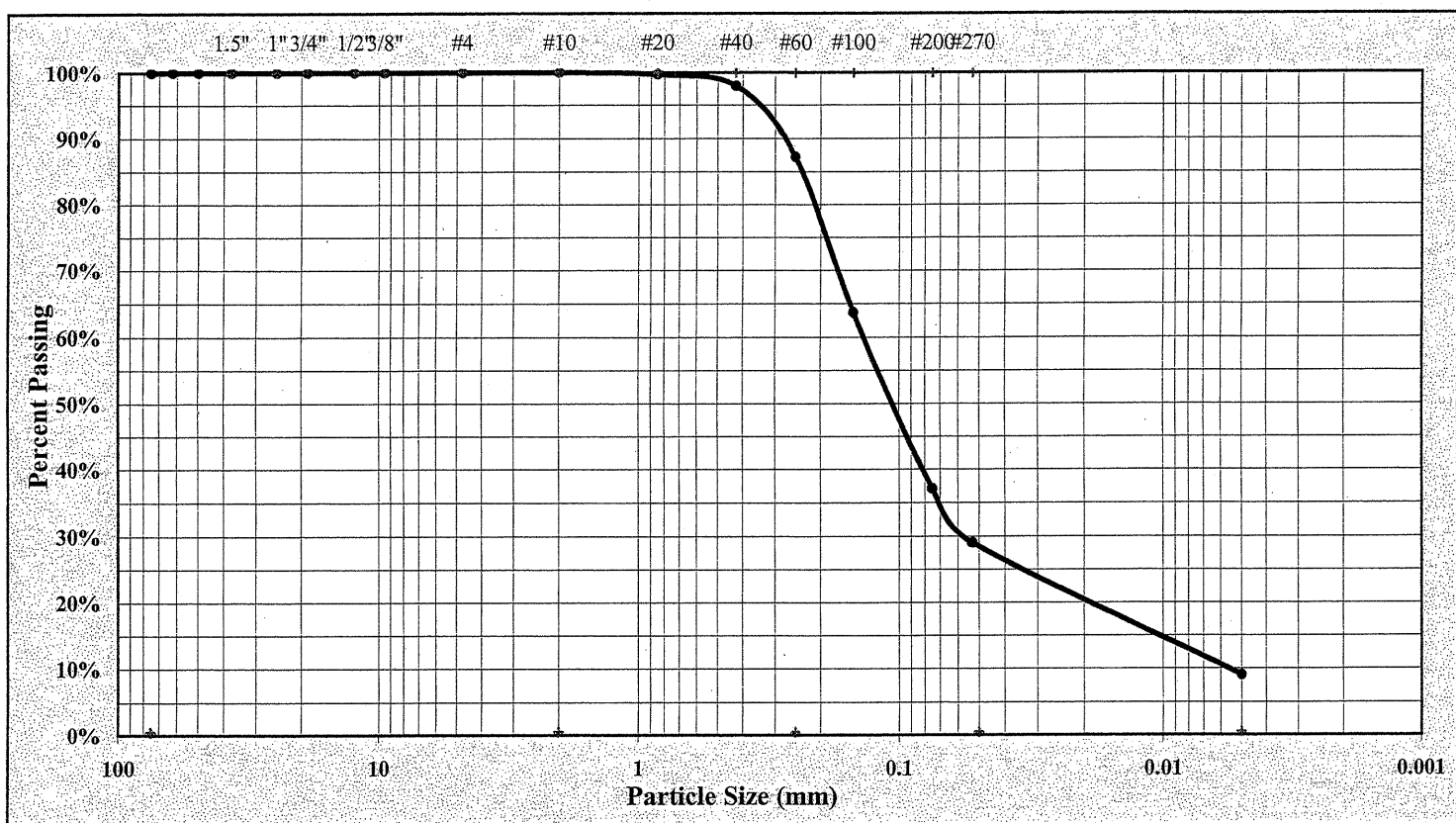
AASHTO T 88 as Modified by NCDOT



S&ME Project #: **1352-05-506**
 Project Name: **Bridge 44 over Town Fork Creek Overflow on NC 8**
 Client Name: **NCDOT**
 Client Address:
 State Project #: **33620.1.1** F.A. Project No: **BRSTP-8(2)** TIP NO: **B-4280**

Report Date: **8/11/2005**
 Test Date(s): **08/08 - 08/11/2005**

Boring #: **EB1-B** Sample #: **ST-1** Sample Date: **7/19/05**
 Location: **24+72** Offset: **17' RT** Depth: **5' - 7'**
 Sample Description: **Tan Coarse to Fine Sandy Silt with trace of clay A-4 (0)**



As Defined by NCDOT		Fine Sand	< 0.25 mm and > 0.05 mm		
Gravel	< 75 mm and > 2.00 mm	Silt	< 0.05 and > 0.005 mm		
Coarse Sand	< 2.00 mm and > 0.25 mm	Clay	< 0.005 mm		
Maximum Particle Size	#4	Coarse Sand	12.8%	Silt	20.0%
Gravel	0.0%	Fine Sand	58.2%	Clay	9.0%
Apparent Relative Density		Moisture Content		% Passing #200	37.1%
Liquid Limit	22	Plastic Limit	19	Plastic Index	3

Soil Mortar (-#10 Sieve)

Coarse Sand	12.8%	Fine Sand	58.2%	Silt	20.0%	Clay	9.0%
Description of Sand & Gravel Particles: Rounded <input type="checkbox"/> Angular <input type="checkbox"/> Hard & Durable <input type="checkbox"/> Soft <input type="checkbox"/> Weathered & Friable <input type="checkbox"/>							
Mechanical Stirring Apparatus (A) Length of Dispersion Period: 1 min. Dispersing Agent: Sodium Hexametaphosphate: 40 g./ Liter							

References: AASHTO T88: Particle Size Analysis of Soils as Modified by the NCDOT
 AASHTO T87: Dry Preparation of Disturbed Soil and Soil Aggregate Samples for Test AASHTO T265: Laboratory Determination of Moisture Content of Soils
 AASHTO T89: Determining the Liquid Limit of Soils AASHTO T90: Determining the Plastic Limit & Plasticity Index of Soils
 AASHTO M 145: The Classification of Soils and Soil Aggregate Mixtures for Highway Construction Purposes ASTM D 854: Specific Gravity of Soils

Technical Responsibility: Mal Karajan _____ Laboratory Supervisor _____
 Signature Signature

Particle Size Analysis of Soils

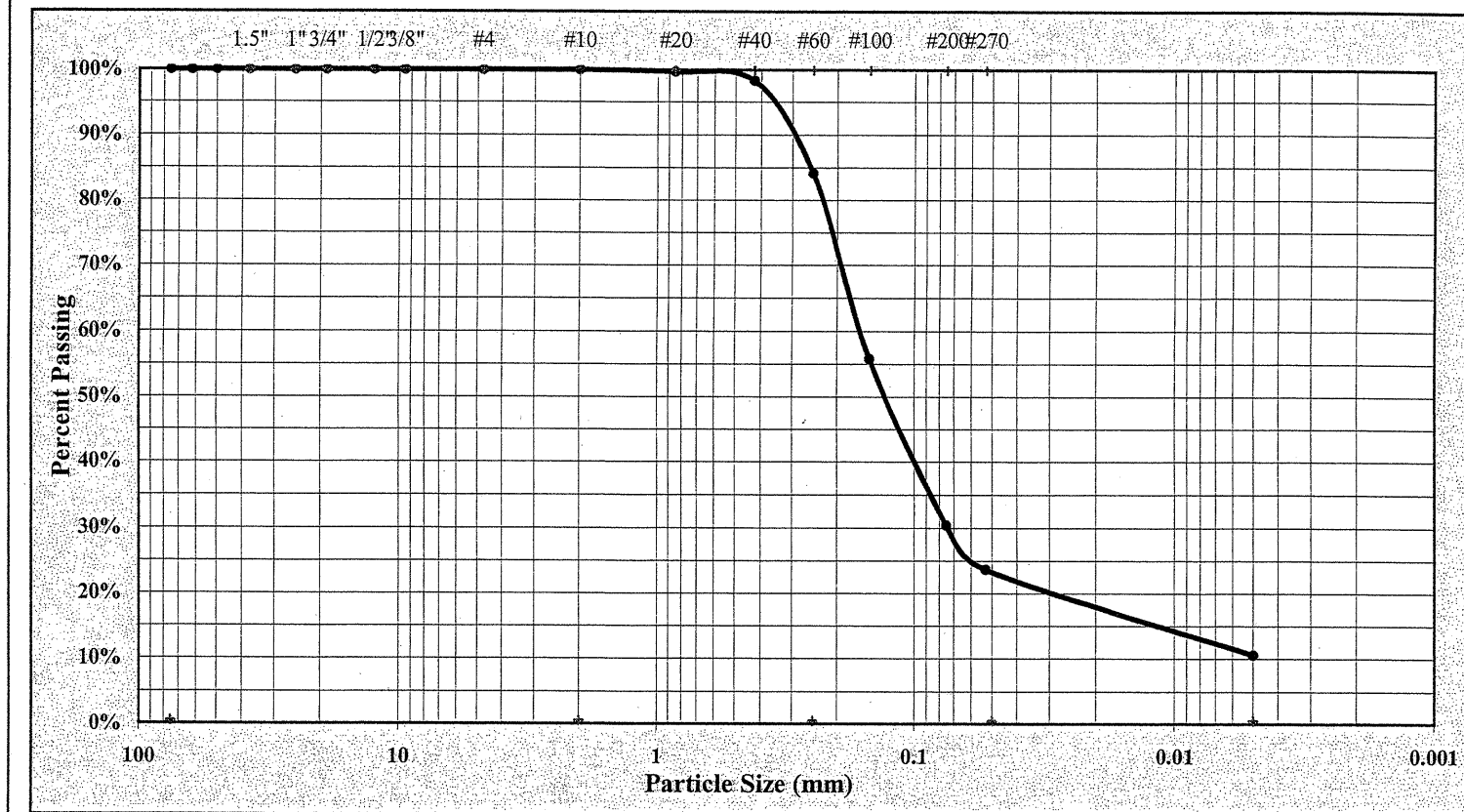
AASHTO T 88 as Modified by NCDOT



S&ME Project #: **1352-05-506**
 Project Name: **Bridge 44 over Town Fork Creek Overflow on NC 8**
 Client Name: **NCDOT**
 Client Address:
 State Project #: **33620.1.1** F.A. Project No: **BRSTP-8(2)** TIP NO: **B-4280**

Report Date: **8/11/2005**
 Test Date(s): **08/08 - 08/11/2005**

Boring #: **B1-A** Sample #: **SS-2** Sample Date: **7/18/05**
 Location: **25+22** Offset: **17' LT** Depth: **3.5 - 5'**
 Sample Description: **Tan Silty Coarse to Fine Sand with little Clay A-2-4 (0)**



As Defined by NCDOT		Fine Sand	< 0.25 mm and > 0.05 mm		
Gravel	< 75 mm and > 2.00 mm	Silt	< 0.05 and > 0.005 mm		
Coarse Sand	< 2.00 mm and > 0.25 mm	Clay	< 0.005 mm		
Maximum Particle Size	#10	Coarse Sand	15.9%	Silt	13.0%
Gravel	0.0%	Fine Sand	60.4%	Clay	11.0%
Apparent Relative Density		Moisture Content		% Passing #200	30.4%
Liquid Limit	26	Plastic Limit	0	Plastic Index	N.P.

Soil Mortar (-#10 Sieve)

Coarse Sand	15.9%	Fine Sand	60.4%	Silt	13.2%	Clay	10.5%
Description of Sand & Gravel Particles: Rounded <input type="checkbox"/> Angular <input type="checkbox"/> Hard & Durable <input type="checkbox"/> Soft <input type="checkbox"/> Weathered & Friable <input type="checkbox"/>							
Mechanical Stirring Apparatus (A) Length of Dispersion Period: 1 min. Dispersing Agent: Sodium Hexametaphosphate: 40 g./ Liter							

References: AASHTO T88: Particle Size Analysis of Soils as Modified by the NCDOT
 AASHTO T87: Dry Preparation of Disturbed Soil and Soil Aggregate Samples for Test AASHTO T265: Laboratory Determination of Moisture Content of Soils
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 AASHTO M 145: The Classification of Soils and Soil Aggregate Mixtures for Highway Construction Purposes ASTM D 854: Specific Gravity of Soils

Technical Responsibility: Mal Karajan _____ Laboratory Supervisor _____
 Signature Signature



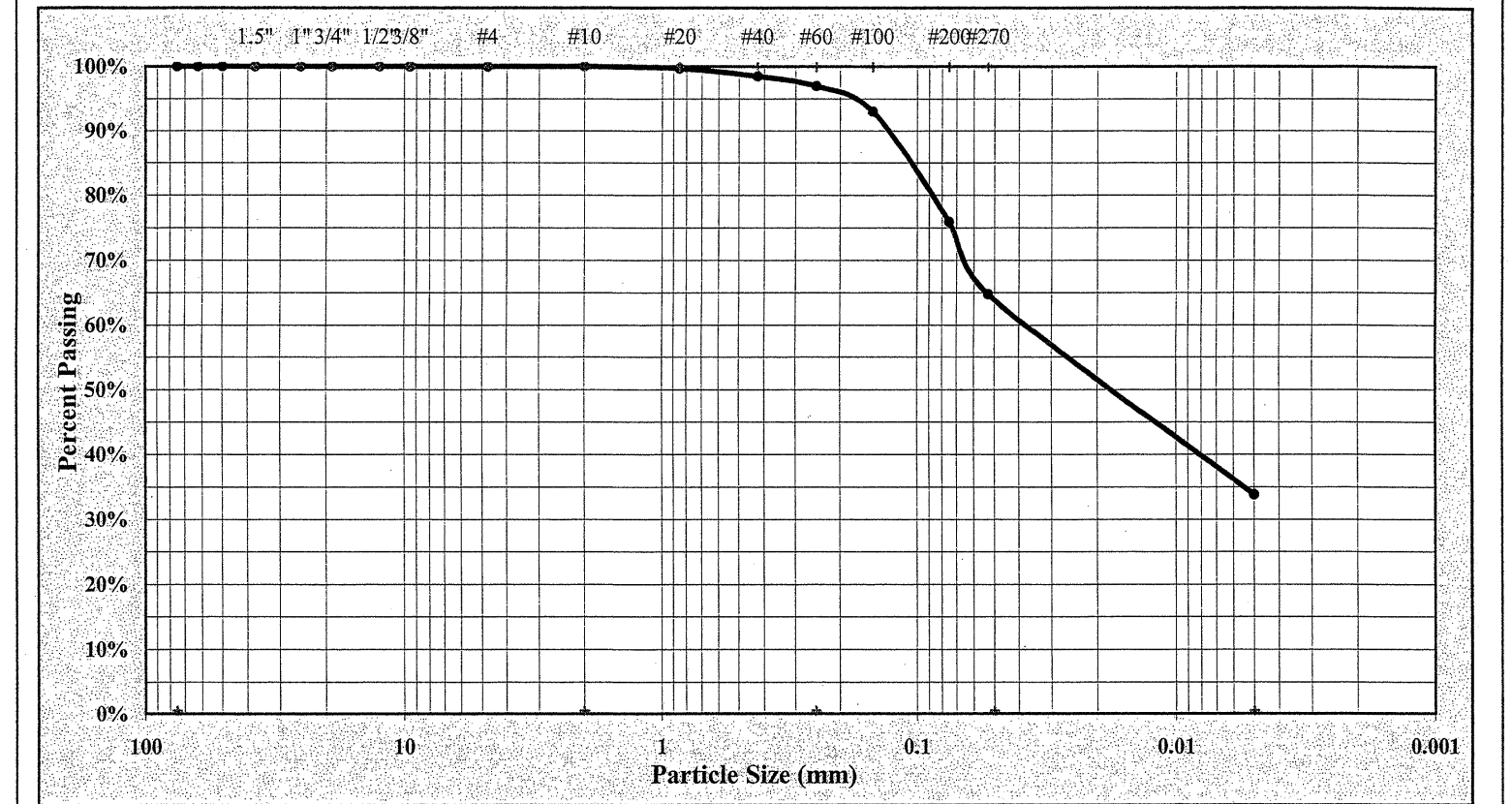
Particle Size Analysis of Soils

AASHTO T 88 as Modified by NCDOT

S&ME Project #: **1352-05-506**
 Project Name: **Bridge 44 over Town Fork Creek Overflow on NC 8**
 Client Name: **NCDOT**
 Client Address:
 State Project #: **33620.1.1** F.A. Project No: **BRSTP-8(2)** TIP NO: **B-4280**

Report Date: **8/11/2005**
 Test Date(s): **08/08 - 08/11/2005**

Boring #:	EB2-B	Sample #:	SS-4	Sample Date:	7/18/05
Location:	25+72	Offset:	17' RT	Depth:	3.5' - 5'
Sample Description:	Brown Silty Fine Sandy Clay A-7-6 (13)				



As Defined by NCDOT		Fine Sand	< 0.25 mm and > 0.05 mm
Gravel	< 75 mm and > 2.00 mm	Silt	< 0.05 and > 0.005 mm
Coarse Sand	< 2.00 mm and > 0.25 mm	Clay	< 0.005 mm

Maximum Particle Size	#10	Coarse Sand	3.0%	Silt	31.0%
Gravel	0.0%	Fine Sand	32.2%	Clay	34.0%
Apparent Relative Density		Moisture Content		% Passing #200	75.9%
Liquid Limit	42	Plastic Limit	24	Plastic Index	18

Soil Mortar (-#10 Sieve)

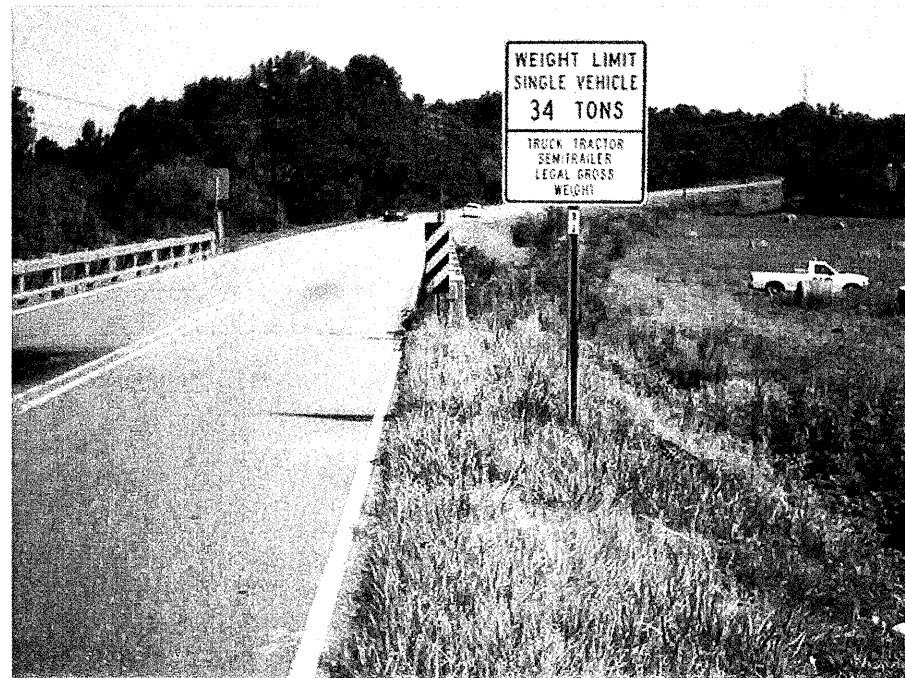
Coarse Sand	3.0%	Fine Sand	32.2%	Silt	31.0%	Clay	33.8%
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Description of Sand & Gravel Particles: Rounded Angular Hard & Durable Soft Weathered & Friable

Mechanical Stirring Apparatus (A) Length of Dispersion Period: 1 min. Dispersing Agent: Sodium Hexametaphosphate: 40 g./ Liter

References: AASHTO T88: Particle Size Analysis of Soils as Modified by the NCDOT
 AASHTO T87: Dry Preparation of Disturbed Soil and Soil Aggregate Samples for Test
 AASHTO T89: Determining the Liquid Limit of Soils
 AASHTO M 145: The Classification of Soils and Soil Aggregate Mixtures for Highway Construction Purposes
 AASHTO T265: Laboratory Determination of Moisture Content of Soils
 AASHTO T90: Determining the Plastic Limit & Plasticity Index of Soils
 ASTM D 854: Specific Gravity of Soils

Technical Responsibility: Mal Karajan Laboratory Supervisor
Signature Signature



Photograph No. 1:
This photograph was taken from the right side of the existing bridge, looking north.



Photograph No. 3:
This photograph was taken from the left side of the -L- alignment, looking east, across proposed End Bent No. 1.



Photograph No. 2:
This photograph was taken at proposed End Bent No. 1, looking north, upstation, along the -L- alignment.



Photograph No. 4:
This photograph was taken from the left side of the -L- alignment, looking east, across proposed Interior Bent No. 1.



Photograph No. 5:
This photograph was taken from the left side of the -L- alignment, looking east, across proposed End Bent No. 2.



Photograph No. 7:
This photograph was taken from the existing bridge, looking east (downstream).



Photograph No. 6:
This photograph was taken from the existing bridge, looking west (upstream).



Photograph No. 8:
This photograph was taken from the right side of the existing bridge, looking south.



Photograph No. 9:
This photograph was taken at proposed End Bent No. 2, looking south, downstation, along the -L- alignment.