PROJECT: 34871.1.1 ID: U-2826A

CONTENTS:

STATE OF NORTH CAROLINA

DEPARTMENT OF TRANSPORTATION

DIVISION OF HIGHWAYS

GEOTECHNICAL ENGINEERING UNIT

STRUCTURE SUBSURFACE INVESTIGATION

STATE PROJECT 34871.1.1 I.D. NO. U-2826A

F.A. PROJECT NHF-52(14)

COUNTY FORSYTH

PROJECT DESCRIPTION BRIDGE No. 256 & 257

OVER NORFOLK SOUTHERN RR AND SR 2456

ON US 52 IN WINSTON-SALEM

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	U-2826A	1	23
STATE PROJ. NO.	F.A. PROJ. NO.	DESCRIPTION	
34871.1.1	NHF-52(14)	P.E.	
		CONST.	

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INVESTIGATED BY S&ME, INC. PERSONNEL L. ENNIS

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NORTH CAROLINA PROFESSIONAL SEAL 14155 ENGINEER ALMER F RIGGS JR 2/20/09

SEAL

SIGNATURE

PROJECT REFERENCE NO.	SHEET NO.
34871.1.1	2

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS
GEOTECHNICAL ENGINEERING UNIT

SUBSURFACE INVESTIGATION

SOIL AND ROCK LEGEND, TERMS, SYMBOLS, AND ABBREVIATIONS

SOIL DESCRIPTION

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

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

SOIL LEGEND AND AASHTO CLASSIFICATION

GENERAL CLASS.	GRANULAR MATERIALS (≤35% PASSING #200)							SILT-CLAY MATERIALS (>35% PASSING #200)				ORGANIC MATERIALS		
GROUP CLASS.	A-1		A-3	A-2				A-4	A-5	A-6	A-7	A-1, A-2 A-3	A-4, A-5 A-6, A-7	
	A-1-a	A-1-b		A-2-4	A-2-5	A-2-6	A-2-7				A-7-5, A-7-6			
SYMBOL														
% PASSING #10	50 MX											GRANULAR SOILS	SILT-CLAY SOILS	MUCK, PEAT
#40	30 MX	50 MX	51 MN											
#200	15 MX	25 MX	10 MX	35 MX	35 MX	35 MX	35 MX	36 MN	36 MN	36 MN	36 MN			
LIQUID LIMIT	6 MX		N.P.	40 MX	41 MN	40 MX	41 MN	40 MX	41 MN	40 MX	41 MN	SOILS WITH LITTLE OR MODERATE AMOUNTS OF ORGANIC MATTER		HIGHLY ORGANIC SOILS
PLASTIC INDEX				10 MX	10 MX	11 MN	11 MN	10 MX	10 MX	11 MN	11 MN			
GROUP INDEX	0		0	0		4 MX		8 MX	12 MX	16 MX	No MX			
USUAL TYPES OF MAJOR MATERIALS	STONE FRAGS. GRAVEL AND SAND		FINE SAND	SILTY OR CLAYEY GRAVEL AND SAND				SILTY SOILS		CLAYEY SOILS				
GEN. RATING AS A SUBGRADE	EXCELLENT TO GOOD							FAIR TO POOR				FAIR TO POOR	POOR	UNSUITABLE

P.I. OF A-7-5 SUBGROUP IS ≤ L.L. - 30 : P.I. OF A-7-6 SUBGROUP IS > L.L. - 30

CONSISTENCY OR DENSENESS

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

TEXTURE OR GRAIN SIZE

U.S. STD. SIEVE SIZE	4	10	40	60	200	270
OPENING (MM)	4.76	2.0	0.42	0.25	0.075	0.053

BOULDER (BLDR.)	COBBLE (COB.)	GRAVEL (GR.)	COARSE SAND (CSE. SD.)	FINE SAND (F. SD.)	SILT (SL.)	CLAY (CL.)

GRAIN SIZE	MM	305	75	2.0	0.25	0.05	0.005
	IN.	12"	3"				

SOIL MOISTURE - CORRELATION OF TERMS

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

PLASTICITY

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

COLOR

DESCRIPTIONS MAY INCLUDE COLOR OR COLOR COMBINATIONS (TAN, RED, YEL-BRN, BLUE-GRAY) MODIFIERS SUCH AS LIGHT, DARK, STREAKED, ETC. ARE USED TO DESCRIBE APPEARANCE.

GRADATION

WELL GRADED- INDICATES A GOOD REPRESENTATION OF PARTICLE SIZES FROM FINE TO COARSE
UNIFORM- INDICATES THAT SOIL PARTICLES ARE ALL APPROXIMATELY THE SAME SIZE. (ALSO POORLY GRADED)
GAP-GRADED- INDICATES A MIXTURE OF UNIFORM PARTICLES OF TWO OR MORE SIZES.

ANGULARITY OF GRAINS

THE ANGULARITY OR ROUNDNESS OF SOIL GRAINS ARE DESIGNATED BY THE TERMS; ANGULAR, SUBANGULAR, SUBROUNDED, OR ROUNDED.

MINERALOGICAL COMPOSITION

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

COMPRESSIBILITY

SLIGHTLY COMPRESSIBLE	LIQUID LIMIT LESS THAN 30
MODERATELY COMPRESSIBLE	LIQUID LIMIT 31-50
HIGHLY COMPRESSIBLE	LIQUID LIMIT GREATER THAN 50

PERCENTAGE OF MATERIAL

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

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

GROUND WATER

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

MISCELLANEOUS SYMBOLS

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

SAMPLE DESIGNATIONS

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

ABBREVIATIONS

AR - AUGER REFUSAL
BT - BORING TERMINATED
CL. - CLAY
CPT - CONE PENETRATION TEST
CSE. - COARSE
DMT - DILATOMETER TEST
DPT - DYNAMIC PENETRATION TEST
e - VOID RATIO
F. - FINE
FOSS. - FOSSILIFEROUS
FRAC. - FRACTURED
FRAGS. - FRAGMENTS
HI. - HIGHLY
MED. - MEDIUM
MICA. - MICACEOUS
MOD. - MODERATELY
NP - NON PLASTIC
ORG. - ORGANIC
PMT - PRESSUREMETER TEST
SAP. - SAPROLITIC
SD. - SAND, SANDY
SL. - SILT, SILTY
SLI. - SLIGHTLY
TCR - TRICONE REFUSAL
W - MOISTURE CONTENT
V - VERY
VST - VANE SHEAR TEST
WEA. - WEATHERED
γ - UNIT WEIGHT
γ_d - DRY UNIT WEIGHT

EQUIPMENT USED ON SUBJECT PROJECT

DRILL UNITS:
- ☐ MOBILE B-___
- ☐ BK-51
- ☐ CME-45
- ☒ DIEDRICH D-50
- ☐ PORTABLE HOIST
- ☒ OTHER CME-550X
- ☐ OTHER _____

ADVANCING TOOLS:
- ☐ DRAG BITS _____
- ☐ 6" CONTINUOUS FLIGHT AUGER
- ☐ 8" HOLLOW AUGERS
- ☐ HARD FACED FINGER BITS
- ☐ TUNG.-CARBIDE INSERTS
- ☐ CASING ☐ W/ ADVANCER
- ☒ TRICONE 2-7/8 " STEEL TEETH
- ☐ TRICONE _____ " TUNG.-CARB.
- ☐ CORE BIT
- ☒ OTHER 3-1/4" H.S.A.

HAMMER TYPE:
- ☒ AUTOMATIC ☐ MANUAL

CORE SIZE:
- ☐ -B_____
- ☐ -N_____
- ☐ -H_____

HAND TOOLS:
- ☐ POST HOLE DIGGER
- ☐ HAND AUGER
- ☐ SOUNDING ROD
- ☐ VANE SHEAR TEST
- ☐ OTHER _____

ROCK DESCRIPTION

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

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

WEATHERING

FRESH	ROCK FRESH, CRYSTALS BRIGHT, FEW JOINTS MAY SHOW SLIGHT STAINING. ROCK RINGS UNDER HAMMER IF CRYSTALLINE.
VERY SLIGHT (V. SLI.)	ROCK GENERALLY FRESH, JOINTS STAINED, SOME JOINTS MAY SHOW THIN CLAY COATINGS IF OPEN, CRYSTALS ON A BROKEN SPECIMEN FACE SHINE BRIGHTLY. ROCK RINGS UNDER HAMMER BLOWS IF OF A CRYSTALLINE NATURE.
SLIGHT (SLI.)	ROCK GENERALLY FRESH, JOINTS STAINED AND DISCOLORATION EXTENDS INTO ROCK UP TO 1 INCH. OPEN JOINTS MAY CONTAIN CLAY. IN GRANITOID ROCKS SOME OCCASIONAL FELDSPAR CRYSTALS ARE DULL AND DISCOLORED. CRYSTALLINE ROCKS RING UNDER HAMMER BLOWS.
MODERATE (MOD.)	SIGNIFICANT PORTIONS OF ROCK SHOW DISCOLORATION AND WEATHERING EFFECTS. IN GRANITOID ROCKS, MOST FELDSPARS ARE DULL AND DISCOLORED, SOME SHOW CLAY. ROCK HAS DULL SOUND UNDER HAMMER BLOWS AND SHOWS SIGNIFICANT LOSS OF STRENGTH AS COMPARED WITH FRESH ROCK.
MODERATELY SEVERE (MOD. SEV.)	ALL ROCK EXCEPT QUARTZ DISCOLORED OR STAINED. IN GRANITOID ROCKS, ALL FELDSPARS DULL AND DISCOLORED AND A MAJORITY SHOW KAOLINIZATION. ROCK SHOWS SEVERE LOSS OF STRENGTH AND CAN BE EXCAVATED WITH A GEOLOGIST'S PICK. ROCK GIVES "CLUNK" SOUND WHEN STRUCK. *IF TESTED, YIELDS SPT REFUSAL*
SEVERE (SEV.)	ALL ROCKS EXCEPT QUARTZ DISCOLORED OR STAINED. ROCK FABRIC CLEAR AND EVIDENT BUT REDUCED IN STRENGTH TO STRONG SOIL. IN GRANITOID ROCKS ALL FELDSPARS ARE KAOLINIZED TO SOME EXTENT. SOME FRAGMENTS OF STRONG ROCK USUALLY REMAIN. *IF TESTED, YIELDS SPT N VALUES > 100 BPF*
VERY SEVERE (V. SEV.)	ALL ROCK EXCEPT QUARTZ DISCOLORED OR STAINED. ROCK FABRIC ELEMENTS ARE DISCERNIBLE BUT THE MASS IS EFFECTIVELY REDUCED TO SOIL STATUS, WITH ONLY FRAGMENTS OF STRONG ROCK REMAINING. SAPROLITE IS AN EXAMPLE OF ROCK WEATHERED TO A DEGREE SUCH THAT ONLY MINOR VESTIGES OF THE ORIGINAL ROCK FABRIC REMAIN. *IF TESTED, YIELDS SPT N VALUES < 100 BPF*
COMPLETE	ROCK REDUCED TO SOIL. ROCK FABRIC NOT DISCERNIBLE, OR DISCERNIBLE ONLY IN SMALL AND SCATTERED CONCENTRATIONS. QUARTZ MAY BE PRESENT AS DIKES OR STRINGERS. SAPROLITE IS ALSO AN EXAMPLE.

ROCK HARDNESS

VERY HARD	CANNOT BE SCRATCHED BY KNIFE OR SHARP PICK. BREAKING OF HAND SPECIMENS REQUIRES SEVERAL HARD BLOWS OF THE GEOLOGISTS PICK.
HARD	CAN BE SCRATCHED BY KNIFE OR PICK ONLY WITH DIFFICULTY. HARD HAMMER BLOWS REQUIRED TO DETACH HAND SPECIMEN.
MODERATELY HARD	CAN BE SCRATCHED BY KNIFE OR PICK. GOUGES OR GROOVES TO 0.25 INCHES DEEP CAN BE EXCAVATED BY HARD BLOW OF A GEOLOGISTS PICK. HAND SPECIMENS CAN BE DETACHED BY MODERATE BLOWS.
MEDIUM HARD	CAN BE GROOVED OR GOUGED 0.05 INCHES DEEP BY FIRM PRESSURE OF KNIFE OR PICK POINT. CAN BE EXCAVATED IN SMALL CHIPS TO PEICES 1 INCH MAXIMUM SIZE BY HARD BLOWS OF THE POINT OF A GEOLOGISTS PICK.
SOFT	CAN BE GROVED OR GOUGED READILY BY KNIFE OR PICK. CAN BE EXCAVATED IN FRAGMENTS FROM CHIPS TO SEVERAL INCHES IN SIZE BY MODERATE BLOWS OF A PICK POINT. SMALL, THIN PIECES CAN BE BROKEN BY FINGER PRESSURE.
VERY SOFT	CAN BE CARVED WITH KNIFE. CAN BE EXCAVATED READILY WITH POINT OF PICK. PIECES 1 INCH OR MORE IN THICKNESS CAN BE BROKEN BY FINGER PRESSURE. CAN BE SCRATCHED READILY BY FINGERNAIL.

FRACTURE SPACING

TERM	SPACING
VERY WIDE	MORE THAN 10 FEET
WIDE	3 TO 10 FEET
MODERATELY CLOSE	1 TO 3 FEET
CLOSE	0.16 TO 1 FEET
VERY CLOSE	LESS THAN 0.16 FEET

BEDDING

TERM	THICKNESS
VERY THICKLY BEDDED	> 4 FEET
THICKLY BEDDED	1.5 - 4 FEET
THINLY BEDDED	0.16 - 1.5 FEET
VERY THINLY BEDDED	0.03 - 0.16 FEET
THICKLY LAMINATED	0.008 - 0.03 FEET
THINLY LAMINATED	< 0.008 FEET

INDURATION

FOR SEDIMENTARY ROCKS, INDURATION IS THE HARDENING OF THE MATERIAL BY CEMENTING, HEAT, PRESSURE, ETC.

FRIABLE	RUBBING WITH FINGER FREES NUMEROUS GRAINS; GENTLE BLOW BY HAMMER DISINTEGRATES SAMPLE.
MODERATELY INDURATED	GRAINS CAN BE SEPARATED FROM SAMPLE WITH STEEL PROBE; BREAKS EASILY WHEN HIT WITH HAMMER.
INDURATED	GRAINS ARE DIFFICULT TO SEPARATE WITH STEEL PROBE; DIFFICULT TO BREAK WITH HAMMER.
EXTREMELY INDURATED	SHARP HAMMER BLOWS REQUIRED TO BREAK SAMPLE; SAMPLE BREAKS ACROSS GRAINS.

TERMS AND DEFINITIONS

ALLUVIUM (ALLUV.) - SOILS WHICH HAVE BEEN TRANSPORTED BY WATER.

AQUIFER - A WATER BEARING FORMATION OR STRATA.

ARENACEOUS - APPLIED TO ROCKS THAT HAVE BEEN DERIVED FROM SAND OR THAT CONTAIN SAND.

ARGILLACEOUS - APPLIED TO ALL ROCKS OR SUBSTANCES COMPOSED OF CLAY MINERALS, OR HAVING A NOTABLE PROPORTION OF CLAY IN THEIR COMPOSITION, AS SHALE, SLATE, ETC.

ARTESIAN - GROUND WATER THAT IS UNDER SUFFICIENT PRESSURE TO RISE ABOVE THE LEVEL AT WHICH IS IS ENCOUNTERED, BUT WHICH DOES NOT NECESSARILY RISE TO OR ABOVE THE GROUND SURFACE.

CALCAREOUS (CALC.) - SOILS WHICH CONTAIN APPRECIABLE AMOUNTS OF CALCIUM CARBONATE.

COLLUVIUM - ROCK FRAGMENTS MIXED WITH SOIL DEPOSITED BY GRAVITY ON SLOPE OR AT BOTTOM OF SLOPE.

CORE RECOVERY (REC.) - TOTAL LENGTH OF ALL MATERIAL RECOVERED IN THE CORE BARREL DIVIDED BY TOTAL LENGTH OF CORE RUN AND EXPRESSED AS A PERCENTAGE.

DIKE - A TABULAR BODY OF IGNEOUS ROCK THAT CUTS ACROSS THE STRUCTURE OF ADJACENT ROCKS OR CUTS MASSIVE ROCK.

DIP - THE ANGLE AT WHICH A STRATUM OR ANY PLANAR FEATURE IS INCLINED FROM THE HORIZONTAL.

DIP DIRECTION (DIP AZIMUTH) - THE DIRECTION OR BEARING OF THE HORIZONTAL TRACE OF THE LINE OF DIP, MEASURED CLOCKWISE FROM NORTH.

FAULT - A FRACTURE OR FRACTURE ZONE ALONG WHICH THERE HAS BEEN DISPLACEMENT OF THE SIDES RELATIVE TO ONE ANOTHER PARALLEL TO THE FRACTURE.

FISSILE - A PROPERTY OF SPLITTING ALONG CLOSELY SPACED PARALLEL PLANES.

FLOAT - ROCK FRAGMENTS ON SURFACE NEAR THEIR ORIGINAL POSITION AND DISLODGED FROM PARENT MATERIAL.

FLOOD PLAIN (F.P.) - LAND BORDERING A STREAM, BUILT OF SEDIMENTS DEPOSITED BY THE STREAM.

FORMATION (FM.) - A MAPPABLE GEOLOGIC UNIT THAT CAN BE RECOGNIZED AND TRACED IN THE FIELD.

JOINT - FRACTURE IN ROCK ALONG WHICH NO APPRECIABLE MOVEMENT HAS OCCURRED.

LEDGE - A SHELF-LIKE RIDGE OR PROJECTION OF ROCK WHOSE THICKNESS IS SMALL COMPARED TO ITS LATERAL EXTENT.

LENS - A BODY OF SOIL OR ROCK THAT THINS OUT IN ONE OR MORE DIRECTIONS.

MOTTLED (MOT.) - IRREGULARLY MARKED WITH SPOTS OF DIFFERENT COLORS. MOTTLING IN SOILS USUALLY INDICATES POOR AERATION AND LACK OF GOOD DRAINAGE.

PERCHED WATER - WATER MAINTAINED ABOVE THE NORMAL GROUND WATER LEVEL BY THE PRESENCE OF AN INTERVENING IMPERVIOUS STRATUM.

RESIDUAL SOIL - SOIL FORMED IN PLACE BY THE WEATHERING OF ROCK.

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

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

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

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

STANDARD PENETRATION TEST (PENETRATION RESISTANCE) (SPT) - NUMBER OF BLOWS (N OR B.P.F.) OF A 140 LB. HAMMER FALLING 30 INCHES REQUIRED TO PRODUCE A PENETRATION OF 1 FOOT INTO SOIL WITH A 2 INCH OUTSIDE DIAMETER SPLIT SPOON SAMPLER. SPT REFUSAL IS LESS THAN 0.1 FOOT PENETRATION WITH 60 BLOWS.

STRATA CORE RECOVERY (SREC.) - TOTAL LENGTH OF STRATA MATERIAL RECOVERED DIVIDED BY TOTAL LENGTH OF STRATUM AND EXPRESSED AS A PERCENTAGE.

STRATA ROCK QUALITY DESIGNATION (S.R.Q.D.) - A MEASURE OF ROCK QUALITY DESCRIBED BY: TOTAL LENGTH OF ROCK SEGMENTS WITHIN A STRATUM EQUAL TO OR GREATER THAN 4 INCHES DIVIDED BY THE TOTAL LENGTH OF STRATA AND EXPRESSED AS A PERCENTAGE.

TOPSOIL (T.S.) - SURFACE SOILS USUALLY CONTAINING ORGANIC MATTER.

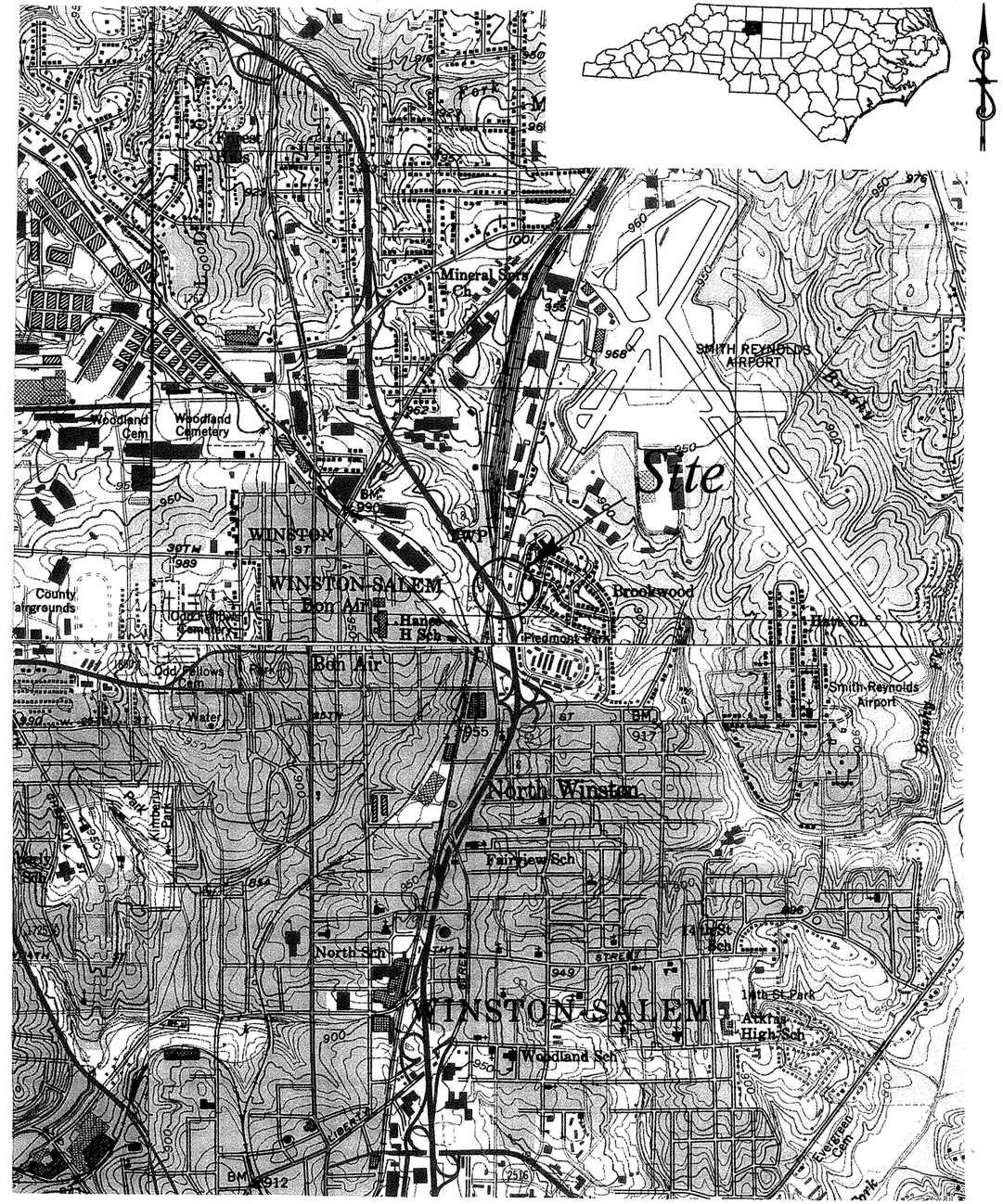
BENCH MARK: BY1-44 NCDOT Traverse Station Rebar & Cap Stamped "BY1-44"
Located at Station 45+75.96, -BY1-
ELEVATION: 933.79'

BENCH MARK: BL-14 NCDOT Traverse Station Rebar & Cap Stamped "GPSJKA-84"
Located at Station 135+86.24, -BL-
ELEVATION: 975.50'

NOTES:

REVISED 02/23/06

ID	STATE PROJECT NO.	SHEET NO.	TOTAL SHEETS
U-2826A	34871.1.1	3	



S:PROJECTS/2008/08-202/GEOTECH/CADD/U-2826A -SITEVIC

SCALE:	1:24,000
CHECKED BY:	AFR
DRAWN BY:	TRP
DATE:	JANUARY 2009
JOB NO.	1051-08-202

S&ME
ENVIRONMENTAL SERVICES
ENGINEERING •TESTING

SITE VICINITY MAP

BRIDGE No. 256 & No. 257
OVER NORFOLK SOUTHERN RR & SR 2456 ON US 52
STATE PROJECT NO. 34871.1.1 TIP NO. U-2826A
FEDERAL I.D. NO. NHF-52(14)
FORSYTH COUNTY, NORTH CAROLINA

-SBDET- PT Sta. 38+38.44

NORFOLK & SOUTHERN

NAD 83

W/LT 6" VC

EB1-AA (DCP)

W/LT

N 33° 48' 58.9" W

-SBDET-

EB1-A (SPT)

DI

48" CMP

EB1-A (DCP) OFFSET

W/LT

EB2-A (SPT)

EB2-A (DCP)

MTL

6" STEEL

CB

SO

B1-A (DCP)

EB1-D (SPT)

-L-

B1-C (DCP/SPT)

N 33° 48' 58.9" W

EB2-D (SPT)

18" RCP

15" RCP

12" DIP

MTL

-L- PT Sta. 40+76.50

60" CONC

30" C&G

17" CONC

30" C&G

CB

B1-B (DCP)

EB1-B (DCP)

EB1-B (SPT)

W/LT 60" CONC GTS

SR 2456 LIBERTY ST

40' BST

12" CONC

CB W/LT

6" STL

BS

SV

W/LT

EB2-B (DCP)

EB2-B (SPT)

GR

RADIO TOWER

0 50 100

SCALE IN FEET

SOIL

F

S

40

45

BENCHMARK:
BY I-44 NCDOT TRAVERSE STATION REBAR AND CAP STAMPED "BY I-44"
LOCATED AT STATION 45+75.96 -BY I-
ELEV. 933.79'

BENCHMARK:
BL-14 NCDOT TRAVERSE STATION REBAR AND CAP STAMPED "GPS JKA-84"
LOCATED AT STATION 135+86.24 -BL-
ELEV. 975.50'

SKEW ANGLE FOR BENTS:
END BENT No. 1 - 52°02'39", BENT No. 1 - 48°23'18", END BENT No. 2 - 37°54'42" (Tan to Curve)

S:\PROJECTS\2008\08-202\GEOTECH\CADD\U-2826A SITE PLAN BRIDGE 256 & 257.DGN

SCALE: 1" = 50'
DATE: JANUARY 2009
JOB NO. 105 I-08-202
APPROVED BY: AFR
DRAWN BY: TRP
SHEET 4 OF

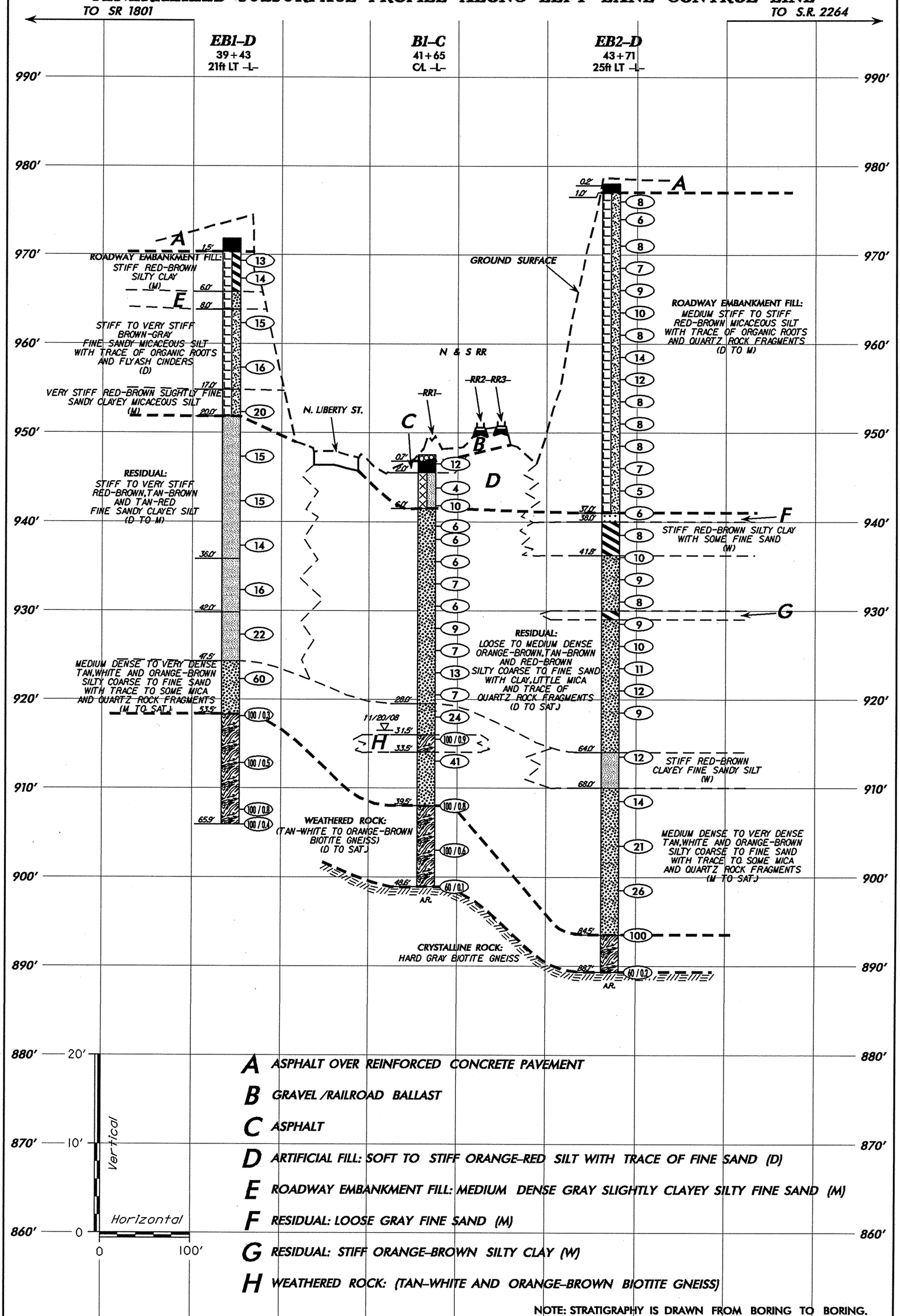
S&ME
ENVIRONMENTAL SERVICES
ENGINEERING TESTING

BORING LOCATION PLAN

REPLACEMENT OF BRIDGE No. 256 & 257
OVER N & S RAILROAD AND SR 2456 ON US 52
TIP No. U-2826A STATE PROJECT No. 34871.1.1 FEDERAL I.D. NHF-52(14)
FORSYTH COUNTY, NORTH CAROLINA

S:PROJECTS/2008/08-202/GEOTECH/CADD/U-2826A PROFILES.DGN

GENERALIZED SUBSURFACE PROFILE ALONG LEFT LANE CONTROL LINE



A ASPHALT OVER REINFORCED CONCRETE PAVEMENT

B GRAVEL /RAILROAD BALLAST

C ASPHALT

D ARTIFICIAL FILL: SOFT TO STIFF ORANGE-RED SILT WITH TRACE OF FINE SAND (D)

E ROADWAY EMBANKMENT FILL: MEDIUM DENSE GRAY SLIGHTLY CLAYEY SILTY FINE SAND (M)

F RESIDUAL: LOOSE GRAY FINE SAND (M)

G RESIDUAL: STIFF ORANGE-BROWN SILTY CLAY (W)

H WEATHERED ROCK: (TAN-WHITE AND ORANGE-BROWN BIOTITE GNEISS)

NOTE: STRATIGRAPHY IS DRAWN FROM BORING TO BORING.

GENERALIZED SUBSURFACE PROFILE ALONG LEFT LANE CONTROL LINE
STATION 38+50 TO 44+50
REPLACEMENT OF BRIDGE No. 256 & 257
OVER NORFOLK & SOUTHERN RAILROAD AND SR 2456 ON US 52
TIP No. U-2826A STATE PROJECT No. 34871.1.1 FEDERAL I.D. NHF-52 (14)
FORSYTH COUNTY, NORTH CAROLINA

S&ME
ENVIRONMENTAL SERVICES
ENGINEERING · TESTING

SCALE:	(V) 1" = 10' (H) 1" = 100'	APPROVED BY:	AFR
DATE:	JANUARY 2009	DRAWN BY:	TRP
JOB NO.	1051-08-202	SHEET	5 OF

N.C.D.O.T. GEOTECHNICAL ENGINEERING UNIT
DCP LOG

PROJECT NO. 34871.1.1	**ID.** U-2826A	**COUNTY** Forsyth	**GEOLOGIST** L.Ennis
SITE DESCRIPTION Bridges No. 256 & 257 over Norfolk Southern Railroad and S.R.2456 on U.S.52			**GROUND WATER (ft)**
BORING NO. EB1-A	**BORING LOCATION** 39+35	**OFFSET** 69.0 ft LT	**ALIGNMENT** -L-	**0 HR.** N/A
COLLAR ELEV. 953.2 ft	**NORTHING** 867,286	**EASTING** 1,635,804		**24 HR.** N/A
TOTAL DEPTH 45.0 ft	**DRILL MACHINE** CME-550x	**DRILL METHOD** DCP	**HAMMER TYPE** AUTOMATIC
DATE STARTED 11/21/08	**COMPLETED** 11/21/08	**SURFACE WATER DEPTH** N/A	

ELEV. (ft)	DEPTH (ft)	BLOW COUNT 0.5ft	0.5ft	0.5ft	BLOWS PER FOOT 0 20 40 60 80 100	SAMP. NO.	MOI	LOG	SOIL AND ROCK DESCRIPTION
953.2									953.2 GROUND SURFACE 0.00
951.7	1.5	1	4	3	7				
950.2	3.0	3	4	4	8				
948.7	4.5	6	4	5	9				
947.2	6.0	6	6	7	13				
945.7	7.5	6	9	7	16				
944.2	9.0	8	7	4	11				
942.7	10.5	4	3	2	5				
941.2	12.0	3	3	6	9				
939.7	13.5	5	4	2	6				
938.2	15.0	3	3	3	6				
936.7	16.5	4	3	3	6				
935.2	18.0	4	5	5	10				
933.7	19.5	7	8	6	14				
932.2	21.0	8	5	6	11				
930.7	22.5	4	8	4	12				
929.2	24.0	7	7	6	13				
927.7	25.5	5	6	7	13				
926.2	27.0	8	7	11	18				
924.7	28.5	10	11	10	21				
923.2	30.0	12	12	12	24				
921.7	31.5	14	13	12	25				
920.2	33.0	16	16	18	34				
918.7	34.5	18	20	18	38				
917.2	36.0	16	21	21	42				
915.7	37.5	20	26	17	43				

NCDOT BORE SINGLE 202X.GPJ NCDOT.GDT 1/6/09

N.C.D.O.T. GEOTECHNICAL ENGINEERING UNIT
DCP LOG

PROJECT NO. 34871.1.1	**ID.** U-2826A	**COUNTY** Forsyth	**GEOLOGIST** L.Ennis
SITE DESCRIPTION Bridges No. 256 & 257 over Norfolk Southern Railroad and S.R.2456 on U.S.52			**GROUND WATER (ft)**
BORING NO. EB1-A	**BORING LOCATION** 39+35	**OFFSET** 69.0 ft LT	**ALIGNMENT** -L-	**0 HR.** N/A
COLLAR ELEV. 953.2 ft	**NORTHING** 867,286	**EASTING** 1,635,804		**24 HR.** N/A
TOTAL DEPTH 45.0 ft	**DRILL MACHINE** CME-550x	**DRILL METHOD** DCP	**HAMMER TYPE** AUTOMATIC
DATE STARTED 11/21/08	**COMPLETED** 11/21/08	**SURFACE WATER DEPTH** N/A	

ELEV. (ft)	DEPTH (ft)	BLOW COUNT 0.5ft	0.5ft	0.5ft	BLOWS PER FOOT 0 20 40 60 80 100	SAMP. NO.	MOI	LOG	SOIL AND ROCK DESCRIPTION
915.8					Continued from previous page				
914.2	39.0	25	45	29	74				
912.7	40.5	36	46	41	87				
911.2	42.0	40	45	15	60				
909.7	43.5	50	51	52	100+				
		50	50	120	100+				BORING TERMINATED AT ELEVATION 908.2 FEET.

NCDOT BORE SINGLE 202X.GPJ NCDOT.GDT 1/6/09

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

DCP LOG

SHEET 1 OF 1

PROJECT NO. 34871.1.1	**ID.** U-2826A	**COUNTY** Forsyth	**GEOLOGIST** L.Ennis
SITE DESCRIPTION Bridges No. 256 & 257 over Norfolk Southern Railroad and S.R.2456 on U.S.52			**GROUND WATER (ft)**
BORING NO. EB1-AA	**BORING LOCATION** 38+50	**OFFSET** 119.0 ft LT **ALIGNMENT** -L-	**0 HR.** N/A
COLLAR ELEV. 955.8 ft	**NORTHING** 867,193	**EASTING** 1,635,794	**24 HR.** N/A
TOTAL DEPTH 30.0 ft	**DRILL MACHINE** CME-550x	**DRILL METHOD** DCP	**HAMMER TYPE** AUTOMATIC
DATE STARTED 11/21/08	**COMPLETED** 11/21/08	**SURFACE WATER DEPTH** N/A	

ELEV. (ft)	DEPTH (ft)	BLOW COUNT 0.5ft	0.5ft	0.5ft	BLOWS PER FOOT 0 20 40 60 80 100	SAMP. NO.	MOI	LOG	SOIL AND ROCK DESCRIPTION
955.8									955.8 GROUND SURFACE 0.00
955.8	0.0	8	4	3	7				
954.3	1.5	3	3	3	6				
952.8	3.0	3	3	3	6				
951.3	4.5	3	3	3	6				
949.8	6.0	3	3	2	5				
948.3	7.5	3	3	6	9				
946.8	9.0	5	3	4	7				
945.3	10.5	3	3	4	7				
943.8	12.0	3	3	3	6				
942.3	13.5	4	3	2	5				
940.8	15.0	3	3	3	6				
939.3	16.5	2	3	2	5				
937.8	18.0	3	2	3	5				
936.3	19.5	3	2	3	5				
934.8	21.0	3	3	3	6				
933.3	22.5	3	4	4	8				
931.8	24.0	5	5	5	10				
930.3	25.5	7	16	35	51				
928.8	27.0	31	35	38	73				
927.3	28.5	43	63	120	100+				BORING TERMINATED AT ELEVATION 925.8 FEET.

NCDOT BORE SINGLE 202X.GPJ NCDOT.GDT 1/6/09

NCDOT GEOTECHNICAL ENGINEERING UNIT
BOREHOLE REPORT

PROJECT NO. 34871.1.1	**ID.** U-2826A	**COUNTY** Forsyth		**GEOLOGIST** T.Cleary/L.Ennis
SITE DESCRIPTION Bridges No. 256 & 257 over Norfolk Southern Railroad and S.R. 2456 on U.S.52				**GROUND WTR (ft)**
BORING NO. EB1-D	**STATION** 39+43	**OFFSET** 21ft LT	**ALIGNMENT** -L-	**0 HR.** N/A
COLLAR ELEV. 971.8 ft	**TOTAL DEPTH** 65.9 ft	**NORTHING** 867,315	**EASTING** 1,635,843	**24 HR.** N/M
DRILL MACHINE Diedrich D-50	**DRILL METHOD** 3-1/4" HSA/Mud Rotary Wash W/2-7/8" Tricone		**HAMMER TYPE** Automatic	
START DATE 11/20/08	**COMP. DATE** 11/21/08	**SURFACE WATER DEPTH** N/A		**DEPTH TO ROCK** N/A

ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT 0.5ft	0.5ft	0.5ft	BLOWS PER FOOT 0 25 50 75 100	SAMP. NO.	MOI	LOG	SOIL AND ROCK DESCRIPTION ELEV. (ft)	DEPTH (ft)
	975									971.8	
										ASPHALT PAVEMENT	0.0
970	970.3	1.5								970.3	
										Asphalt (3/4 Inch) Reinforced Concrete (17-1/4 Inches)	1.5
	968.3	3.5	3	4	9	13		M		**Roadway Embankment Fill**: Stiff Red-Brown Silty CLAY (A-7-5)	
965			5	7	7	14		M			
	963.3	8.5								965.8	6.0
			5	7	8	15		D		963.8	8.0
960										Medium Dense Gray Slightly Clayey Silty Fine SAND (A-2-4)	
	958.3	13.5								Stiff to Very Stiff Brown-Gray Fine Sandy Micaceous SILT (A-5) With Trace of Organic Roots and Flyash Cinders (13' - 15')	
			4	8	8	16		D			
955										954.8	17.0
	953.3	18.5								Very Stiff Red-Brown Slightly Fine Sandy Clayey Micaceous SILT (A-5)	
			4	7	13	20		M		951.8	20.0
950										**Residual**: Stiff Red-Brown Clayey SILT (A-4)	
	948.3	23.5									
			5	6	9	15		M			
945											
	943.3	28.5									
			6	7	8	15		M			
940											
	938.3	33.5									
			5	7	7	14		M			
935										935.8	36.0
	933.3	38.5								Very Stiff Tan-Brown Fine Sandy SILT (A-4)	
			4	6	10	16		D		929.8	42.0
930										Very Stiff Tan-Red, Brown Clayey SILT (A-4)	
	928.3	43.5									
			8	9	13	22		M		924.3	47.5
925										Very Dense Tan-White Silty Fine SAND (A-2-4) With Some Mica	
	923.3	48.5									
			18	23	37	60		M		918.3	53.5
920										**Weathered Rock**: (Tan-White Biotite Gneiss) With Quartz Rock Fragments	
	918.3	53.5	100/0.3			100/0.3		D			
915											
	913.3	58.5	100/0.5			100/0.5		D			
910											
	908.3	63.5									
			87	13/0.3		100/0.8		D			
	906.3	65.5								905.9	65.9
905			100/0.4			100/0.4		D		Boring Terminated at Elevation 905.9 ft in Weathered Rock: (Tan-White Biotite Gneiss).	
900										1) Advanced 3-1/4" HSA to 30.0 feet. 2) Advanced 2-7/8" Tricone to 65.5 feet. 3) Water w/Quickgel added used as drilling fluid. 4) Drilling Fluid density approximately 62.4 pcf.	
895											

NCDOT BORE SINGLE 51-202D.GPJ NC_DOT.GDT 02/10/09

NCDOT GEOTECHNICAL ENGINEERING UNIT
BOREHOLE REPORT

PROJECT NO. 34871.1.1	**ID.** U-2826A	**COUNTY** Forsyth		**GEOLOGIST** T.Cleary/L.Ennis
SITE DESCRIPTION Bridges No. 256 & 257 over Norfolk Southern Railroad and S.R. 2456 on U.S.52				**GROUND WTR (ft)**
BORING NO. EB1-D	**STATION** 39+43	**OFFSET** 21ft LT	**ALIGNMENT** -L-	**0 HR.** N/A
COLLAR ELEV. 971.8 ft	**TOTAL DEPTH** 65.9 ft	**NORTHING** 867,315	**EASTING** 1,635,843	**24 HR.** N/M
DRILL MACHINE Diedrich D-50	**DRILL METHOD** 3-1/4" HSA/Mud Rotary Wash W/2-7/8" Tricone		**HAMMER TYPE** Automatic	
START DATE 11/20/08	**COMP. DATE** 11/21/08	**SURFACE WATER DEPTH** N/A		**DEPTH TO ROCK** N/A

ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT 0.5ft	0.5ft	0.5ft	BLOWS PER FOOT 0 25 50 75 100	SAMP. NO.	MOI	LOG	SOIL AND ROCK DESCRIPTION ELEV. (ft)	DEPTH (ft)
	895					Match Line					
890											
885											
880											
875											
870											
865											
860											
855											
850											
845											
840											
835											
830											
825											
820											
815										5) No loss of drilling fluid observed. 6) Hole grouted full depth at completion of drilling. 7) No soil samples tested due to possible contamination.	

NCDOT BORE SINGLE 51-202D.GPJ NC_DOT.GDT 2/10/09

N.C.D.O.T. GEOTECHNICAL ENGINEERING UNIT
DCP LOG

SHEET 1 OF 1

PROJECT NO. 34871.1.1	**ID.** U-2826A	**COUNTY** Forsyth	**GEOLOGIST** L.Ennis
SITE DESCRIPTION Bridges No. 256 & 257 over Norfolk Southern Railroad and S.R.2456 on U.S.52			**GROUND WATER (ft)**
BORING NO. EB1-B	**BORING LOCATION** 40+11	**OFFSET** 90.0 ft RT	**ALIGNMENT** -L-	**0 HR.** N/A
COLLAR ELEV. 951.4 ft	**NORTHING** 867,432	**EASTING** 1,635,904		**24 HR.** N/A
TOTAL DEPTH 34.7 ft	**DRILL MACHINE** CME-550x	**DRILL METHOD** DCP	**HAMMER TYPE** AUTOMATIC	
DATE STARTED 11/21/08	**COMPLETED** 11/21/08	**SURFACE WATER DEPTH** N/A		

ELEV. (ft)	DEPTH (ft)	BLOW COUNT 0.5ft	0.5ft	0.5ft	BLOWS PER FOOT 0 20 40 60 80 100	SAMP. NO.	MOI	LOG	SOIL AND ROCK DESCRIPTION
951.4									
951.4	0.0	3	3	3	6				951.4 GROUND SURFACE 0.00
949.9	1.5	2	1	2	3				
948.4	3.0	3	2	3	5				
946.9	4.5	4	2	3	5				
945.4	6.0	4	2	3	5				
943.9	7.5	4	5	4	9				
942.4	9.0	5	4	5	9				
940.9	10.5	4	5	6	11				
939.4	12.0	6	7	7	14				
937.9	13.5	7	5	8	13				
936.4	15.0	8	10	10	20				
934.9	16.5	12	13	14	27				
933.4	18.0	15	14	14	28				
931.9	19.5	17	15	16	31				
930.4	21.0	16	19	18	37				
928.9	22.5	21	19	21	40				
927.4	24.0	19	21	20	41				
925.9	25.5	20	18	22	40				
924.4	27.0	20	21	20	41				
922.9	28.5	23	25	26	51				
921.4	30.0	26	32	37	69				
919.9	31.5	48	54	56	100+				
918.4	33.0	45	74	120	100+				
916.9	34.5	60/0.2			60/0.2				BORING TERMINATED AT ELEVATION 916.7 FEET.

NCDOT BORE SINGLE 202X.GPJ NCDOT.GDT 1/6/09

N.C.D.O.T. GEOTECHNICAL ENGINEERING UNIT
DCP LOG

SHEET 1 OF 1

PROJECT NO. 34871.1.1	**ID.** U-2826A	**COUNTY** Forsyth	**GEOLOGIST** L.Ennis
SITE DESCRIPTION Bridges No. 256 & 257 over Norfolk Southern Railroad and S.R.2456 on U.S.52			**GROUND WATER (ft)**
BORING NO. B1-A	**BORING LOCATION** 41+26	**OFFSET** 44.0 ft LT	**ALIGNMENT** -L-	**0 HR.** N/A
COLLAR ELEV. 949.8 ft	**NORTHING** 867,457	**EASTING** 1,635,727		**24 HR.** N/A
TOTAL DEPTH 32.2 ft	**DRILL MACHINE** CME-550x	**DRILL METHOD** DCP	**HAMMER TYPE** AUTOMATIC	
DATE STARTED 11/20/08	**COMPLETED** 11/20/08	**SURFACE WATER DEPTH** N/A		

ELEV. (ft)	DEPTH (ft)	BLOW COUNT 0.5ft	0.5ft	0.5ft	BLOWS PER FOOT 0 20 40 60 80 100	SAMP. NO.	MOI	LOG	SOIL AND ROCK DESCRIPTION
949.8									
949.8	0.0	5	15	4	19				949.8 GROUND SURFACE 0.00
948.3	1.5	2	2	1	3				
946.8	3.0	1	2	2	4				
945.3	4.5	3	4	3	7				
943.8	6.0	3	3	2	5				
942.3	7.5	4	3	3	6				
940.8	9.0	4	3	3	6				
939.3	10.5	4	3	3	6				
937.8	12.0	4	3	4	7				
936.3	13.5	3	4	4	8				
934.8	15.0	3	4	3	7				
933.3	16.5	4	3	3	6				
931.8	18.0	4	5	4	9				
930.3	19.5	6	4	6	10				
928.8	21.0	4	6	5	11				
927.3	22.5	5	4	5	9				
925.8	24.0	5	5	4	9				
924.3	25.5	5	5	4	9				
922.8	27.0	3	4	6	10				
921.3	28.5	11	20	21	41				
919.8	30.0	21	30	61	91				
918.3	31.5	120	60/0.2		100+				BORING TERMINATED AT ELEVATION 917.6 FEET.

NCDOT BORE SINGLE 202X.GPJ NCDOT.GDT 1/6/09

SHEET

NCDOT GEOTECHNICAL ENGINEERING UNIT
BORELOG REPORT

PROJECT NO. 34871.1.1	**ID.** U-2826A	**COUNTY** Forsyth	**GEOLOGIST** L. Ennis
SITE DESCRIPTION Bridges No. 256 & 257 over Norfolk Southern Railroad and S.R. 2456 on U.S.52			**GROUND WTR (ft)**
BORING NO. B1-C	**STATION** 41+65	**OFFSET** CL	**ALIGNMENT** -L-	**0 HR.** 31.0
COLLAR ELEV. 947.5 ft	**TOTAL DEPTH** 48.6 ft	**NORTHING** 867,513	**EASTING** 1,635,742	**24 HR.** N/M
DRILL MACHINE CME-550X	**DRILL METHOD** 3-1/4" HSA		**HAMMER TYPE** Automatic	
START DATE 11/20/08	**COMP. DATE** 11/20/08	**SURFACE WATER DEPTH** N/A	**DEPTH TO ROCK** N/A	

ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT 0.5ft	0.5ft	0.5ft	BLOWS PER FOOT 0 25 50 75 100	SAMP. NO.	MOI	LOG	SOIL AND ROCK DESCRIPTION — ELEV. (ft)	DEPTH (ft)
	950										
	947.5	0.0								947.5 GROUND SURFACE	0.0
										946.8 Gravel (8 Inches)	0.7
										945.5 Asphalt (16 Inches)	2.0
945	944.8	2.7	8	8	4	12		D		**Artificial Fill**: Soft to Stiff Orange-Brown SILT (A-4)	
	942.8	4.7	2	2	2	4		D			
	940.5	7.0	3	4	6	10		D		941.5 With Trace of Fine Sand	6.0
940	939.0	8.5	3	3	3	6		D		**Residual**: Loose to Medium Dense Tan-Brown and Red-Brown Silty Fine SAND (A-2-4)	
	936.5	11.0	3	3	3	6		D			
935	934.0	13.5	3	3	3	6		D		With Trace of Quartz Rock Fragments and Some Coarse Sand	
	931.5	16.0	3	3	4	7		D			
930	929.0	18.5	3	3	3	6		D			
	926.5	21.0	3	4	5	9		D			
925	924.0	23.5	4	3	4	7		D			
	921.5	26.0	4	6	7	13		D			
920	919.0	28.5	3	2	5	7		M		919.5	28.0
	916.5	31.0	5	8	16	24		W		Medium Dense Orange-Brown, Tan and White Silty Coarse to Fine SAND (A-2-4)	
915	914.0	33.5	58	42/0.4		100/0.9		Sat.		916.0 With Trace of Mica and Quartz Rock Fragments	31.5
										914.0 **Weathered Rock**: (Tan-White and Orange-Brown Biotite Gneiss)	33.5
			5	10	31	41		Sat.		Dense Orange-Brown, Tan and White Silty Coarse to Fine SAND (A-2-4) With Trace of Mica	
910	909.0	38.5								908.0 **Weathered Rock**: (Orange-Brown Biotite Gneiss)	39.5
			14	28	72/0.3	100/0.8		Sat.			
905	904.0	43.5									
			92	8/0.1		100/0.6		Sat.			
900	899.0	48.5								898.9	48.6
			60/0.1			60/0.1		Sat.		Boring Terminated with Standard Penetration Test Refusal at Elevation 898.9 ft on Crystalline Rock: Hard Gray Biotite Gneiss.	
895											
890										1) Advanced 3-1/4" HSA to 48.5 feet. 2) Hole grouted full depth at completion of drilling. 3) No soil samples tested due to possible contamination.	
885											
880											
875											
870											

NCDOT BORE SINGLE 51-202D.GPJ NC_DOT.GDT 2/10/09

SHEET 10 OF
N.C.D.O.T. GEOTECHNICAL ENGINEEREING UNIT
DCP LOG

SHEET 1 OF 1

PROJECT NO. 34871.1.1	**ID.** U-2826A	**COUNTY** Forsyth	**GEOLOGIST** L.Ennis	
SITE DESCRIPTION Bridges No. 256 & 257 over Norfolk Southern Railroad and S.R.2456 on U.S.52				**GROUND WATER (ft)**
BORING NO. B1-C	**BORING LOCATION** 41+65	**OFFSET** 0.0 ft CL	**ALIGNMENT** -L-	**0 HR.** N/A
COLLAR ELEV. 947.5 ft	**NORTHING** 867,513	**EASTING** 1,635,742		**24 HR.** N/A
TOTAL DEPTH 36.0 ft	**DRILL MACHINE** CME-550x	**DRILL METHOD** DCP	**HAMMER TYPE** AUTOMATIC	
DATE STARTED 11/20/08	**COMPLETED** 11/20/08	**SURFACE WATER DEPTH** N/A		

ELEV. (ft)	DEPTH (ft)	BLOW COUNT 0.5ft	0.5ft	0.5ft	BLOWS PER FOOT 0 20 40 60 80 100	SAMP. NO.	MOI	LOG	SOIL AND ROCK DESCRIPTION
947.5									947.5 GROUND SURFACE 0.00
946.0	1.5	10	12	11	23				
944.5	3.0	3	3	2	5				
943.0	4.5	2	2	4	6				
941.5	6.0	5	3	3	6				
940.0	7.5	2	3	2	5				
938.5	9.0	3	4	4	8				
937.0	10.5	4	4	4	8				
935.5	12.0	3	3	4	7				
934.0	13.5	3	3	2	5				
932.5	15.0	4	3	5	8				
931.0	16.5	5	4	4	8				
929.5	18.0	4	5	5	10				
928.0	19.5	4	4	4	8				
926.5	21.0	4	4	4	8				
925.0	22.5	6	6	5	11				
923.5	24.0	5	4	5	9				
922.0	25.5	6	7	6	13				
920.5	27.0	5	4	2	6				
919.0	28.5	4	7	12	19				
917.5	30.0	12	13	13	26				
916.0	31.5	16	17	12	29				
914.5	33.0	11	14	18	32				
913.0	34.5	28	33	41	74				
		32	54	160	100+5				BORING TERMINATED AT ELEVATION 911.5 FEET.

NCDOT BORE SINGLE 202X.GPJ NCDOT.GDT 1/6/09

N.C.D.O.T. GEOTECHNICAL ENGINEERING UNIT
DCP LOG

SHEET 1 OF 2

PROJECT NO. 34871.1.1	**ID.** U-2826A	**COUNTY** Forsyth	**GEOLOGIST** L.Ennis
SITE DESCRIPTION Bridges No. 256 & 257 over Norfolk Southern Railroad and S.R.2456 on U.S.52			**GROUND WATER (ft)**
BORING NO. B1-B	**BORING LOCATION** 42+15	**OFFSET** 57.0 ft RT	**ALIGNMENT** -L-	**0 HR.** N/A
COLLAR ELEV. 947.1 ft	**NORTHING** 867,587	**EASTING** 1,635,762		**24 HR.** N/A
TOTAL DEPTH 44.5 ft	**DRILL MACHINE** CME-550x	**DRILL METHOD** DCP	**HAMMER TYPE** AUTOMATIC
DATE STARTED 11/21/08	**COMPLETED** 11/21/08	**SURFACE WATER DEPTH** N/A	

ELEV. (ft)	DEPTH (ft)	BLOW COUNT 0.5ft	0.5ft	0.5ft	BLOWS PER FOOT 0 20 40 60 80 100	SAMP. NO.	MOI	LOG	SOIL AND ROCK DESCRIPTION
947.1									947.1 GROUND SURFACE 0.00
947.1	0.0	13	15	16	31				
945.6	1.5	15	9	3	12				
944.1	3.0	2	2	1	3				
942.6	4.5	2	1	2	3				
941.1	6.0	2	5	7	12				
939.6	7.5	6	3	2	5				
938.1	9.0	3	3	2	5				
936.6	10.5	3	3	3	6				
935.1	12.0	4	3	6	9				
933.6	13.5	8	11	9	20				
932.1	15.0	8	5	4	9				
930.6	16.5	4	6	8	14				
929.1	18.0	10	8	7	15				
927.6	19.5	7	5	5	10				
926.1	21.0	4	5	6	11				
924.6	22.5	8	7	7	14				
923.1	24.0	6	5	7	12				
921.6	25.5	4	4	4	8				
920.1	27.0	6	6	5	11				
918.6	28.5	6	5	5	10				
917.1	30.0	7	10	9	19				
915.6	31.5	11	11	12	23				
914.1	33.0	12	11	17	28				
912.6	34.5	23	26	27	53				
911.1	36.0	21	27	32	59				
909.6	37.5								

NCDOT BORE SINGLE 202X.GPJ NCDOT.GDT 1/6/09

N.C.D.O.T. GEOTECHNICAL ENGINEERING UNIT
DCP LOG

SHEET 2 OF 2

PROJECT NO. 34871.1.1	**ID.** U-2826A	**COUNTY** Forsyth	**GEOLOGIST** L.Ennis
SITE DESCRIPTION Bridges No. 256 & 257 over Norfolk Southern Railroad and S.R.2456 on U.S.52			**GROUND WATER (ft)**
BORING NO. B1-B	**BORING LOCATION** 42+15	**OFFSET** 57.0 ft RT	**ALIGNMENT** -L-	**0 HR.** N/A
COLLAR ELEV. 947.1 ft	**NORTHING** 867,587	**EASTING** 1,635,762		**24 HR.** N/A
TOTAL DEPTH 44.5 ft	**DRILL MACHINE** CME-550x	**DRILL METHOD** DCP	**HAMMER TYPE** AUTOMATIC
DATE STARTED 11/21/08	**COMPLETED** 11/21/08	**SURFACE WATER DEPTH** N/A	

ELEV. (ft)	DEPTH (ft)	BLOW COUNT 0.5ft	0.5ft	0.5ft	BLOWS PER FOOT 0 20 40 60 80 100	SAMP. NO.	MOI	LOG	SOIL AND ROCK DESCRIPTION
909.7					Continued from previous page				
908.1	39.0	27	27	19	46				
906.6	40.5	22	27	26	53				
905.1	42.0	28	39	37	76				
903.6	43.5	35	40	57	97				
		57	120		100+				BORING TERMINATED AT ELEVATION 902.6 FEET.

NCDOT BORE SINGLE 202X.GPJ NCDOT.GDT 1/6/09

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

DCP LOG

SHEET 1 OF 1

PROJECT NO. 34871.1.1	**ID.** U-2826A	**COUNTY** Forsyth	**GEOLOGIST** T.Cleary
SITE DESCRIPTION Bridges No. 256 & 257 over Norfolk Southern Railroad and S.R.2456 on U.S.52			**GROUND WATER (ft)**
BORING NO. EB2-A	**BORING LOCATION** 42+59	**OFFSET** 82.0 ft LT	**ALIGNMENT** -L-	**0 HR.** N/A
COLLAR ELEV. 952.9 ft	**NORTHING** 867,546	**EASTING** 1,635,622		**24 HR.** N/A
TOTAL DEPTH 33.0 ft	**DRILL MACHINE** CME-550x	**DRILL METHOD** DCP	**HAMMER TYPE** AUTOMATIC	
DATE STARTED 11/22/08	**COMPLETED** 11/22/08	**SURFACE WATER DEPTH** N/A		

ELEV. (ft)	DEPTH (ft)	BLOW COUNT 0.5ft	0.5ft	0.5ft	BLOWS PER FOOT 0 20 40 60 80 100	SAMP. NO.	MOI	LOG	SOIL AND ROCK DESCRIPTION
952.9									952.9 GROUND SURFACE 0.00
952.9	0.0	3	5	7	12				
951.4	1.5								
		9	7	7	14				
949.9	3.0								
		5	4	5	9				
948.4	4.5								
		4	2	3	5				
946.9	6.0								
		2	2	2	4				
945.4	7.5								
		4	3	3	6				
943.9	9.0								
		3	3	3	6				
942.4	10.5								
		3	4	4	8				
940.9	12.0								
		4	5	5	10				
939.4	13.5								
		5	5	4	9				
937.9	15.0								
		5	7	6	13				
936.4	16.5								
		5	5	7	12				
934.9	18.0								
		6	7	7	14				
933.4	19.5								
		7	7	7	14				
931.9	21.0								
		6	7	6	13				
930.4	22.5								
		5	5	5	10				
928.9	24.0								
		5	6	7	13				
927.4	25.5								
		6	6	8	14				
925.9	27.0								
		7	7	9	16				
924.4	28.5								
		10	9	9	18				
922.9	30.0								
		9	8	9	17				
921.4	31.5								
		21	33	120	100+				
									BORING TERMINATED AT ELEVATION 919.9 FEET.

NCDOT BORE SINGLE 202X.GPJ NCDOT.GDT 1/6/09

NCDOT GEOTECHNICAL ENGINEERING UNIT
BOREHOLE REPORT

PROJECT NO. 34871.1.1	**ID.** U-2826A	**COUNTY** Forsyth	**GEOLOGIST** L. Ennis
SITE DESCRIPTION Bridges No. 256 & 257 over Norfolk Southern Railroad and S.R. 2456 on U.S.52			**GROUND WTR (ft)**
BORING NO. EB2-D	**STATION** 43+71	**OFFSET** 25ft LT	**ALIGNMENT** -L-	**0 HR.** N/M
COLLAR ELEV. 978.0 ft	**TOTAL DEPTH** 88.7 ft	**NORTHING** 867,671	**EASTING** 1,635,607	**24 HR.** N/M
DRILL MACHINE CME-550X	**DRILL METHOD** 3-1/4" HSA		**HAMMER TYPE** Automatic	
START DATE 11/20/08	**COMP. DATE** 11/21/08	**SURFACE WATER DEPTH** N/A	**DEPTH TO ROCK** N/A	

ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT 0.5ft	0.5ft	0.5ft	BLOWS PER FOOT 0 25 50 75 100	SAMP. NO.	MOI	LOG	SOIL AND ROCK DESCRIPTION
										ELEV. (ft) / DEPTH (ft)
	980									
	977.0	1.0								978.0 / 0.0 — ASPHALT PAVEMENT
										977.8 / 0.2 — Asphalt (2 Inches)
975	975.0	3.0	4	4	4	8		D		977.0 / 1.0 — Concrete (10 Inches)
	972.0	6.0	3	3	3	6		D		**Roadway Embankment Fill**: Medium Stiff to Stiff Red-Brown Micaceous SILT (A-5) With Trace of Organic Roots and Quartz Rock Fragments
970	969.5	8.5	3	3	5	8		D		
	967.0	11.0	3	3	4	7		D		
965	964.5	13.5	3	4	5	9		M		
	962.0	16.0	2	4	6	10		M		
960	959.5	18.5	3	3	5	8		M		
	957.0	21.0	2	8	6	14		M		
955	954.5	23.5	4	4	8	12		M		
	952.0	26.0	4	4	4	8		M		
950	949.5	28.5	3	4	4	8		M		
	947.0	31.0	3	4	4	8		M		
945	944.5	33.5	3	3	4	7		M		
	942.0	36.0	2	2	3	5		M		
940	939.5	38.5	2	3	3	6		M		941.0 / 37.0 — **Residual**: Loose Gray Fine SAND (A-3)
	937.0	41.0	2	2	6	8		W		940.0 / 38.0 — Stiff Red-Brown Silty CLAY (A-7-6) With Some Fine Sand
935	934.5	43.5	3	5	5	10		M		936.2 / 41.8 — Loose Red and Orange-Brown Silty Fine SAND (A-2-4) With Little Mica
	932.0	46.0	3	4	5	9		M		
930	929.5	48.5	4	4	4	8		M		930.0 / 48.0 — Stiff Orange-Brown Silty CLAY (A-7-6)
	927.0	51.0	4	4	5	9		W		929.0 / 49.0 — Loose to Medium Dense Orange-Brown, Red-Brown and White-Pink Silty Coarse to Fine SAND (A-2-4) With Clay and Trace of Rock Fragments
925	924.5	53.5	4	5	5	10		M		
	922.0	56.0	3	5	6	11		W		
920	919.5	58.5	5	6	6	12		W		
			1	4	5	9		Sat.		
915	914.5	63.5								914.0 / 64.0 — Stiff Red-Brown Clayey Fine Sandy SILT (A-4)
			3	5	7	12		W		910.0 / 68.0 — Medium Dense Tan-White and Tan-Brown Silty Fine SAND (A-2-4) With Trace of Rock Fragments
910	909.5	68.5								
			3	4	10	14		Sat.		
905	904.5	73.5								
			10	8	13	21		Sat.		
900										

NCDOT BORE SINGLE 51-202D.GPJ NC_DOT.GDT 2/10/09

NCDOT GEOTECHNICAL ENGINEERING UNIT
BOREHOLE REPORT

PROJECT NO. 34871.1.1	**ID.** U-2826A	**COUNTY** Forsyth	**GEOLOGIST** L. Ennis
SITE DESCRIPTION Bridges No. 256 & 257 over Norfolk Southern Railroad and S.R. 2456 on U.S.52			**GROUND WTR (ft)**
BORING NO. EB2-D	**STATION** 43+71	**OFFSET** 25ft LT	**ALIGNMENT** -L-	**0 HR.** N/M
COLLAR ELEV. 978.0 ft	**TOTAL DEPTH** 88.7 ft	**NORTHING** 867,671	**EASTING** 1,635,607	**24 HR.** N/M
DRILL MACHINE CME-550X	**DRILL METHOD** 3-1/4" HSA		**HAMMER TYPE** Automatic	
START DATE 11/20/08	**COMP. DATE** 11/21/08	**SURFACE WATER DEPTH** N/A	**DEPTH TO ROCK** N/A	

ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT 0.5ft	0.5ft	0.5ft	BLOWS PER FOOT 0 25 50 75 100	SAMP. NO.	MOI	LOG	SOIL AND ROCK DESCRIPTION
										ELEV. (ft) / DEPTH (ft)
	900					Match Line				
	899.5	78.5	10	12	14	26		W		Medium Dense Tan-White and Tan-Brown Silty Fine SAND (A-2-4) With Trace of Rock Fragments *(continued)*
895	894.5	83.5	15	31	69	100/1.0		W		893.5 / 84.5 — **Weathered Rock**: (Tan-Brown Biotite Gneiss)
890	889.5	88.5	60/0.2			60/0.2		W		889.3 / 88.7 — Boring Terminated at Elevation 889.3 ft in Weathered Rock (Tan-Brown Gneiss).
885										1) Advanced 3-1/4" HSA to 88.5 feet. 2) Hole grouted full depth at completion of drilling. 3) No soil samples tested due to possible contamination.
880										
875										
870										
865										
860										
855										
850										
845										
840										
835										
830										
825										
820										

NCDOT BORE SINGLE 51-202D.GPJ NC_DOT.GDT 2/10/09

N.C.D.O.T. GEOTECHNICAL ENGINEERING UNIT
DCP LOG

PROJECT NO. 34871.1.1	**ID.** U-2826A	**COUNTY** Forsyth	**GEOLOGIST** T.Cleary
SITE DESCRIPTION Bridges No. 256 & 257 over Norfolk Southern Railroad and S.R.2456 on U.S.52			**GROUND WATER (ft)**
BORING NO. EB2-B	**BORING LOCATION** 45+08	**OFFSET** 103.0 ft RT	**ALIGNMENT** -L-	**0 HR.** N/A
COLLAR ELEV. 948.4 ft	**NORTHING** 867,855	**EASTING** 1,635,364		**24 HR.** N/A
TOTAL DEPTH 45.1 ft	**DRILL MACHINE** CME-550x	**DRILL METHOD** DCP	**HAMMER TYPE** AUTOMATIC	
DATE STARTED 11/22/08	**COMPLETED** 11/22/08	**SURFACE WATER DEPTH** N/A		

ELEV. (ft)	DEPTH (ft)	BLOW COUNT 0.5ft	0.5ft	0.5ft	BLOWS PER FOOT 0 20 40 60 80 100	SAMP. NO.	MOI	LOG	SOIL AND ROCK DESCRIPTION
948.4									948.4 GROUND SURFACE 0.00
948.4	0.0	3	4	4	8				
946.9	1.5	2	3	2	5				
945.4	3.0	2	4	3	7				
943.9	4.5	3	4	5	9				
942.4	6.0	4	3	4	7				
940.9	7.5	6	6	8	14				
939.4	9.0	7	10	10	20				
937.9	10.5	11	12	11	23				
936.4	12.0	11	13	11	24				
934.9	13.5	6	7	8	15				
933.4	15.0	8	8	9	17				
931.9	16.5	9	8	10	18				
930.4	18.0	10	12	11	23				
928.9	19.5	12	12	10	22				
927.4	21.0	12	12	14	26				
925.9	22.5	12	11	10	21				
924.4	24.0	9	10	10	20				
922.9	25.5	10	12	11	23				
921.4	27.0	12	11	10	21				
919.9	28.5	10	7	7	14				
918.4	30.0	8	9	8	17				
916.9	31.5	11	10	11	21				
915.4	33.0	10	10	8	18				
913.9	34.5	9	10	11	21				
912.4	36.0	13	17	16	33				
910.9	37.5								

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N.C.D.O.T. GEOTECHNICAL ENGINEERING UNIT
DCP LOG

PROJECT NO. 34871.1.1	**ID.** U-2826A	**COUNTY** Forsyth	**GEOLOGIST** T.Cleary
SITE DESCRIPTION Bridges No. 256 & 257 over Norfolk Southern Railroad and S.R.2456 on U.S.52			**GROUND WATER (ft)**
BORING NO. EB2-B	**BORING LOCATION** 45+08	**OFFSET** 103.0 ft RT	**ALIGNMENT** -L-	**0 HR.** N/A
COLLAR ELEV. 948.4 ft	**NORTHING** 867,855	**EASTING** 1,635,364		**24 HR.** N/A
TOTAL DEPTH 45.1 ft	**DRILL MACHINE** CME-550x	**DRILL METHOD** DCP	**HAMMER TYPE** AUTOMATIC	
DATE STARTED 11/22/08	**COMPLETED** 11/22/08	**SURFACE WATER DEPTH** N/A		

ELEV. (ft)	DEPTH (ft)	BLOW COUNT 0.5ft	0.5ft	0.5ft	BLOWS PER FOOT 0 20 40 60 80 100	SAMP. NO.	MOI	LOG	SOIL AND ROCK DESCRIPTION
911.0					Continued from previous page				
909.4	39.0	12	12	14	26				
907.9	40.5	10	13	14	27				
906.4	42.0	14	15	17	32				
904.9	43.5	16	17	15	32				
903.4	45.0	16	24	120	100+				
		60/0.1			60/0.1				BORING TERMINATED AT ELEVATION 903.3 FEET.

NCDOT BORE SINGLE 202X.GPJ NCDOT.GDT 1/6/09

NCDOT GEOTECHNICAL ENGINEERING UNIT
BORELOG REPORT

PROJECT NO. 34871.1.1	**ID.** U2826A	**COUNTY** FORSYTH	**GEOLOGIST** Todd, R. W.	
SITE DESCRIPTION US 52 REPLACEMENT OF BR # 256 & 257 OVER NORFOLK SOUTHERN RR IN WINSTON- SALEM				**GROUND WTR (ft)**
BORING NO. EB1-A	**STATION** 38+35	**OFFSET** 80ft LT	**ALIGNMENT** -L-	**0 HR.** NM
COLLAR ELEV. 954.3 ft	**TOTAL DEPTH** 65.5 ft	**NORTHING** 867,196	**EASTING** 1,635,836	**24 HR.** 27.0
DRILL MACHINE CME-550	**DRILL METHOD** H.S. Augers		**HAMMER TYPE** Automatic	
START DATE 12/14/04	**COMP. DATE** 12/14/04	**SURFACE WATER DEPTH** N/A	**DEPTH TO ROCK** N/A	

ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT 0.5ft	0.5ft	0.5ft	BLOWS PER FOOT 0 25 50 75 100	SAMP. NO.	MOI	LOG	SOIL AND ROCK DESCRIPTION (ELEV. (ft) / DEPTH (ft))
955										954.3 GROUND SURFACE 0.0
										RESIDUAL
										RED-BROWN-TAN W/BLK STRK MED. STIFF TO STIFF MOIST MED TO LOW PLASTIC (PI=19,13) SANDY SILTY CLAY (A-7-5)
950	950.3	4.0	2	3	5	8	SS-1	M		
945	945.3	9.0	3	4	5	9	SS-2	M		
940	940.3	14.0	2	3	3	6		M		
935	935.3	19.0	2	3	3	6	SS-3	D		936.3 18.0
930	930.3	24.0	4	6	7	13		D		RESIDUAL
925	925.3	29.0	2	5	6	11	SS-4	W		GRAY-WHITE LOOSE TO MED. DENSE MOIST SILTY SAND (A-2-4)
920	920.3	34.0	2	4	7	11		M		926.3 28.0
915	915.3	39.0	2	4	8	12		M		RESIDUAL
910	910.3	44.0	4	6	10	16	SS-5	M		BROWN-BLACK STIFF MOIST SANDY SILT (A-5)
905	905.3	49.0	2	8	12	20		M		911.3 43.0
900	900.3	54.0	20	65	35/.3	100/.8		W		RESIDUAL
895	895.3	59.0	20	29	47	76		M		GRAY-BROWN-TAN V. STIFF MOIST SANDY SILT (A-4)
890	890.3	64.0	20	25	25	50		M		901.3 53.0
885										RESIDUAL
880										GRAY-WHITE V. DENSE MOIST SILTY SAND (A-2-4) W/ ROCK FRAGS.
875										888.8 65.5
										Boring Terminated at Elevation 888.8 ft V. DENSE MOIST SILTY SAND (A-2-4) WITH ROCK FRAGS.

PROJECT NO. 34871.1.1	**ID.** U2826A	**COUNTY** FORSYTH	**GEOLOGIST** Todd, R. W.	
SITE DESCRIPTION US 52 REPLACEMENT OF BR # 256 & 257 OVER NORFOLK SOUTHERN RR IN WINSTON- SALEM				**GROUND WTR (ft)**
BORING NO. EB1-B	**STATION** 40+50	**OFFSET** 100ft RT	**ALIGNMENT** -L-	**0 HR.** NM
COLLAR ELEV. 947.8 ft	**TOTAL DEPTH** 20.0 ft	**NORTHING** 867,471	**EASTING** 1,635,890	**24 HR.** NM
DRILL MACHINE CME-550	**DRILL METHOD** H.S. Augers		**HAMMER TYPE** Automatic	
START DATE 12/14/04	**COMP. DATE** 12/14/04	**SURFACE WATER DEPTH** N/A	**DEPTH TO ROCK** N/A	

ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT 0.5ft	0.5ft	0.5ft	BLOWS PER FOOT 0 25 50 75 100	SAMP. NO.	MOI	LOG	SOIL AND ROCK DESCRIPTION
950										947.8 GROUND SURFACE 0.0
										ROADWAY EMBANKMENT
945										BROWN MED. STIFF MOIST SANDY SILT (A-4)
	942.8	5.0	2	3	2	5		M		
940										937.3 10.5
	937.8	10.0	3	3	3	6		M		RESIDUAL
935										GRAY-TAN STIFF MOIST SILTY CLAY (A-6) (SOIL HAS ODOR, POSSIBLE CONTAMINATION)
	932.8	15.0	2	3	3	6		M		
930										927.8 20.0
925										Boring Terminated at Elevation 927.8 ft IN MED. STIFF SILTY CLAY (A-6)
920										
915										
910										
905										
900										
895										
890										
885										
880										
875										
870										

NORTH CAROLINA LICENSED SEAL 1360 GEOLOGIST JOHN L PILIPCHUK 1-13-09

NCDOT GEOTECHNICAL ENGINEERING UNIT
BORELOG REPORT

PROJECT NO. 34871.1.1	**ID.** U2826A	**COUNTY** FORSYTH	**GEOLOGIST** Todd, R. W.	
SITE DESCRIPTION US 52 REPLACEMENT OF BR # 256 & 257 OVER NORFOLK SOUTHERN RR IN WINSTON- SALEM				**GROUND WTR (ft)**
BORING NO. EB2-A	**STATION** 43+00	**OFFSET** 85ft LT	**ALIGNMENT** -L-	**0 HR.** NM
COLLAR ELEV. 949.1 ft	**TOTAL DEPTH** 51.1 ft	**NORTHING** 867,578	**EASTING** 1,635,597	**24 HR.** 24.0
DRILL MACHINE CME-550	**DRILL METHOD** H.S. Augers		**HAMMER TYPE** Automatic	
START DATE 12/15/04	**COMP. DATE** 12/15/04	**SURFACE WATER DEPTH** N/A	**DEPTH TO ROCK** N/A	

ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT 0.5ft	0.5ft	0.5ft	BLOWS PER FOOT 0 25 50 75 100	SAMP. NO.	MOI	LOG	SOIL AND ROCK DESCRIPTION
										ELEV. (ft) DEPTH (ft)
950										949.1 GROUND SURFACE 0.0
										RESIDUAL
945	944.5	4.6	2	2	2	4	SS-15	M		BROWN MED. STIFF MOIST SANDY SILT (A-6)
940	939.5	9.6	2	3	3	6				941.6 7.5
935	934.5	14.6	3	4	6	10	SS-16	D		**RESIDUAL**
930	929.5	19.6	4	5	7	12		D		BROWN-TAN STIFF TO HAD MOIST SANDY SILT (A-4)
925	924.5	24.6	4	5	10	15		D		
920	919.5	29.6	6	9	17	26		M		
915	914.5	34.6	9	14	25	39		D		
910	909.5	39.6	10	20	25	45		D		
905	904.5	44.6	25	100/.1		100/.1		D		
900	899.5	49.6	18	38	53	91		D		898.0 51.1
895										Boring Terminated at Elevation 898.0 ft IN HARD MOIST SANDY SILT (A4)
890										
885										
880										
875										
870										

PROJECT NO. 34871.1.1	**ID.** U2826A	**COUNTY** FORSYTH	**GEOLOGIST** Todd, R. W.	
SITE DESCRIPTION US 52 REPLACEMENT OF BR # 256 & 257 OVER NORFOLK SOUTHERN RR IN WINSTON- SALEM				**GROUND WTR (ft)**
BORING NO. EB2-B	**STATION** 45+25	**OFFSET** 110ft RT	**ALIGNMENT** -L-	**0 HR.** NM
COLLAR ELEV. 948.6 ft	**TOTAL DEPTH** 58.9 ft	**NORTHING** 867,874	**EASTING** 1,635,633	**24 HR.** 24.0
DRILL MACHINE CME-550	**DRILL METHOD** H.S. Augers		**HAMMER TYPE** Automatic	
START DATE 12/14/04	**COMP. DATE** 12/14/04	**SURFACE WATER DEPTH** N/A	**DEPTH TO ROCK** 58.9 ft	

ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT 0.5ft	0.5ft	0.5ft	BLOWS PER FOOT 0 25 50 75 100	SAMP. NO.	MOI	LOG	SOIL AND ROCK DESCRIPTION
										ELEV. (ft) DEPTH (ft)
950										948.6 GROUND SURFACE 0.0
										ROADWAY EMBANKMENT
945	944.8	3.8	2	2	2	4	SS-9	M		BRN MED. STIFF MOIST V. MICA. SANDY SILT (A-4)
940	939.8	8.8	4	7	8	15	SS-10	M		942.6 6.0
935	934.8	13.8	2	2	2	4	SS-11	M		**RESIDUAL**
930	929.8	18.8	2	3	3	6		M		RED-BROWN V. STIFF MOIST SANDY CLAY HIGH PLASTIC (PI=30) SANDY CLAY (A-7-6)
925	924.8	23.8	2	3	4	7	SS-12	W		936.1 12.5
920	919.8	28.8	2	2	3	5		W		**RESIDUAL**
915	914.8	33.8	1	2	2	4		W		RED-BROWN MED. STIFF MOIST V. MICA. SANDY SILT (A-5)
910	909.8	38.8	4	5	4	9	SS-13	W		
905	904.8	43.8	3	4	5	9		W		
900	899.8	48.8	3	20	41	61	SS-14	M		
895	894.8	53.8	57	43/.4		100/.9		D		911.6 37.0
890	889.8	58.8	100/.1			100/.1				**RESIDUAL**
885										BROWN LOOSE TO V. DENSE MOIST MICA SILTY SAND (A-2-4)
880										894.8 53.8
875										**WEATHERED ROCK**
870										(SEV. WEATH. CRYSTALLINE ROCK)
										891.6 57.0
										CRYSTALLINE ROCK
										889.7 58.9
										Boring Terminated at Elevation 889.7 ft ON HARD CRYSTALLINE ROCK

NORTH CAROLINA LICENSED SEAL 1360 GEOLOGIST JOHN L PILIPCHUK

M & T Form 503

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAY
MATERIALS & TESTS UNIT
SOILS LABORATORY

T. I. P. No. U-2826A

REPORT ON SAMPLES OF SOILS FOR QUALITY

Project 34871.1.1 **County** FORSYTH **Owner**

Date: Sampled 12/4/04 **Received** 12/21/04 **Reported** ########

Sampled from **By** J P ROGERS

Submitted by N WAINAINA 1995 **Standard Specifications**

718857 TO 718870
1/3/05

TEST RESULTS

Proj. Sample No.		SS-1	SS-2	SS-3	SS-4	SS-5	SS-6
Lab. Sample No.		718857	718858	718859	718860	718861	718862
Retained #4 Sieve	%	-	-	-	-	4	20
Passing #10 Sieve	%	100	100	100	100	89	69
Passing #40 Sieve	%	99	98	78	97	83	55
Passing #200 Sieve	%	76	81	33	56	45	21

MINUS NO. 10 FRACTION

SOIL MORTAR - 100%							
Coarse Sand Ret - #60	%	4.9	3.2	32.7	9.3	14.0	30.2
Fine Sand Ret - #270	%	24.7	23.9	41.6	46.0	46.0	44.8
Silt 0.05 - 0.005 mm	%	29.8	42.4	19.7	36.5	31.8	18.9
Clay < 0.005 mm	%	40.6	30.4	6.1	8.1	8.1	6.1
Passing #40 Sieve	%	-	-	-	-	-	-
Passing #200 Sieve	%	-	-	-	-	-	-

L. L.		52	53	37	44	37	28
P. I.		19	13	NP	NP	NP	NP
AASHTO Classification		A-7-5(16)	A-7-5(14)	A-2-4(0)	A-5(1)	A-4(0)	A-2-4(0)
Station							
Hole No.		EB1-A	EB1-A	EB1-A	EB1-A	EB1-A	EB1-A
Depth (Ft)		4.00	9.00	19.00	29.00	44.00	54.00
	to	5.50	10.50	20.50	30.50	45.50	55.30

cc: J P ROGERS
Soils File

Soils Engineer

M & T Form 503

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAY
MATERIALS & TESTS UNIT
SOILS LABORATORY

T. I. P. No. U-2826A

REPORT ON SAMPLES OF SOILS FOR QUALITY

Project 34871.1.1 County FORSYTH Owner

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718857 TO 718870
1/3/05

TEST RESULTS

Proj. Sample No.		SS-9	SS-10	SS-11	SS-12	SS-13	SS-14
Lab. Sample No.		718863	718864	718865	718866	718867	718868
Retained #4 Sieve	%	-	-	-	-	-	5
Passing #10 Sieve	%	96	97	100	99	100	89
Passing #40 Sieve	%	86	90	92	93	97	71
Passing #200 Sieve	%	40	65	52	38	34	24

MINUS NO. 10 FRACTION

SOIL MORTAR - 100%							
Coarse Sand Ret - #60	%	19.7	14.8	18.9	11.6	15.8	35.9
Fine Sand Ret - #270	%	44.2	20.1	35.5	58.6	57.2	42.8
Silt 0.05 - 0.005 mm	%	17.8	14.4	27.4	21.7	20.9	15.2
Clay < 0.005 mm	%	18.3	50.7	18.3	8.1	6.1	6.1
Passing #40 Sieve	%	-	-	-	-	-	-
Passing #200 Sieve	%	-	-	-	-	-	-

L. L.		32	55	41	43	30	35
P. I.		1	30	6	NP	NP	NP
AASHTO Classification		A-4(0)	A-7-6(18)	A-5(2)	A-5(0)	A-2-4(0)	A-2-4(0)
Station							
Hole No.		EB2-B	EB2-B	EB2-B	EB2-B	EB2-B	EB2-B
Depth (Ft)			8.80	13.80	23.80	38.80	48.80
	to		10.30	15.30	25.30	40.30	50.30

Soils Engineer

M & T Form 503

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAY
MATERIALS & TESTS UNIT
SOILS LABORATORY

T. I. P. No. U-2826A

REPORT ON SAMPLES OF SOILS FOR QUALITY

Project 34871.1.1 **County** FORSYTH **Owner**

Date: Sampled 12/4/04 **Received** 12/21/04 **Reported** ########

Sampled from **By** J P ROGERS

Submitted by N WAINAINA 1995 **Standard Specifications**

718857 TO 718870
1/3/05

TEST RESULTS

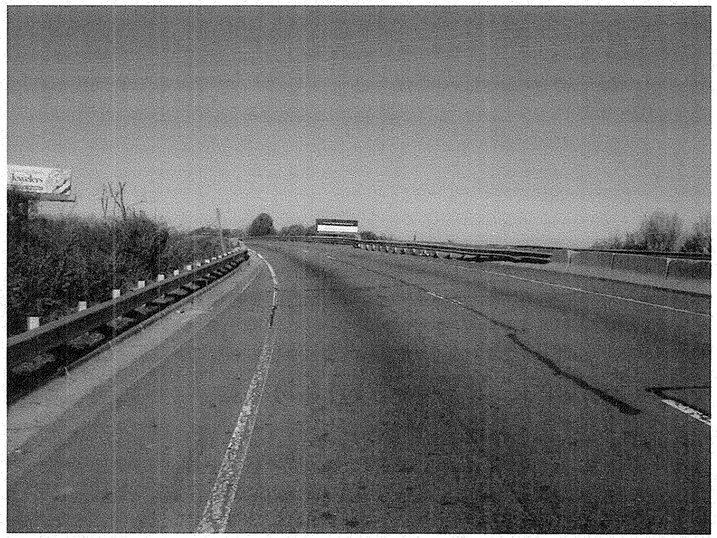
Proj. Sample No.		SS-15	SS-16				
Lab. Sample No.		718869	718870				
Retained #4 Sieve	%	1	-				
Passing #10 Sieve	%	86	100				
Passing #40 Sieve	%	72	96				
Passing #200 Sieve	%	45	37				

MINUS NO. 10 FRACTION

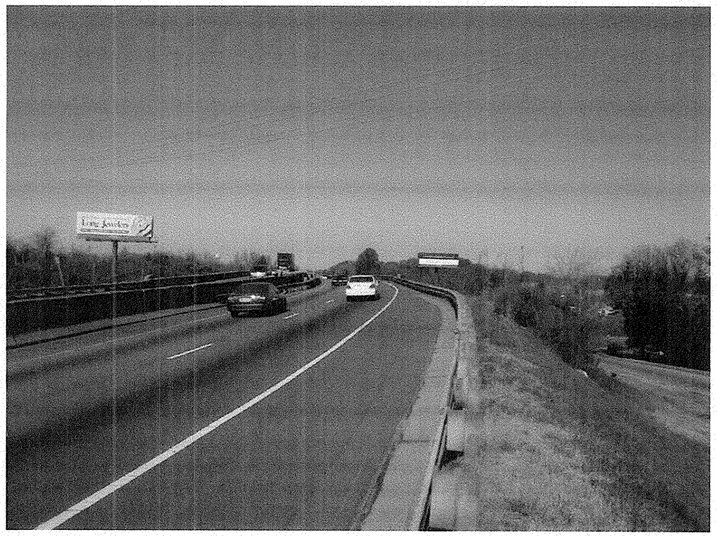
SOIL MORTAR - 100%							
Coarse Sand Ret - #60	%	22.7	18.7				
Fine Sand Ret - #270	%	28.0	50.1				
Silt 0.05 - 0.005 mm	%	20.9	19.1				
Clay < 0.005 mm	%	28.4	12.2				
Passing #40 Sieve	%	-	-				
Passing #200 Sieve	%	-	-				

L. L.	39	27				
P. I.	11	NP				
AASHTO Classification	A-6(2)	A-4(0)				
Station						
Hole No.	EB2-A	EB2-A				
Depth (Ft)	0.00	14.60				
to	6.00	16.10				

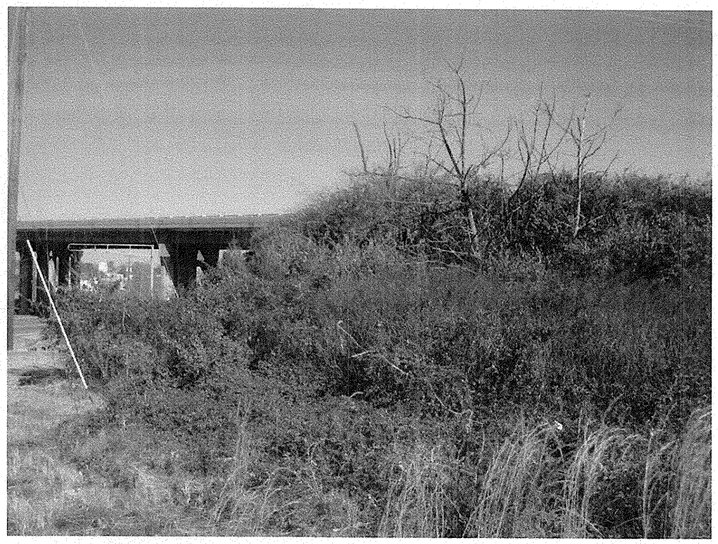
Soils Engineer



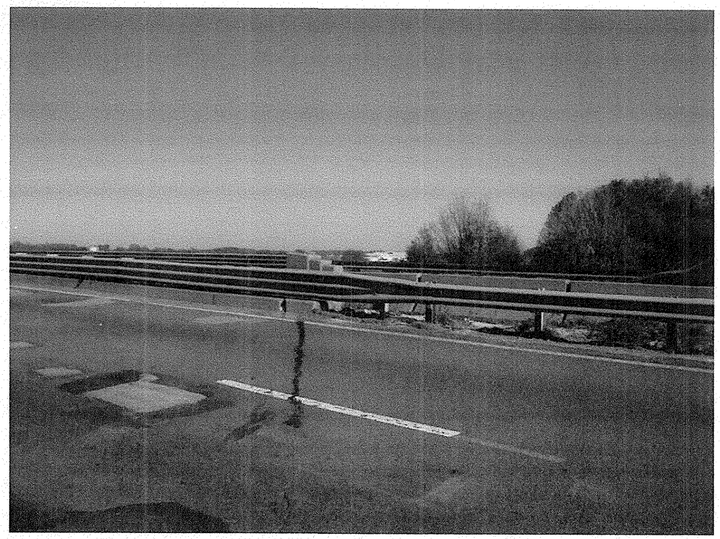
Photograph No. 1:
This photograph was taken from the east approach, left of the -L- alignment, looking northwest.



Photograph No. 2:
This photograph was taken from the east approach, right of the -L- alignment, looking northwest.

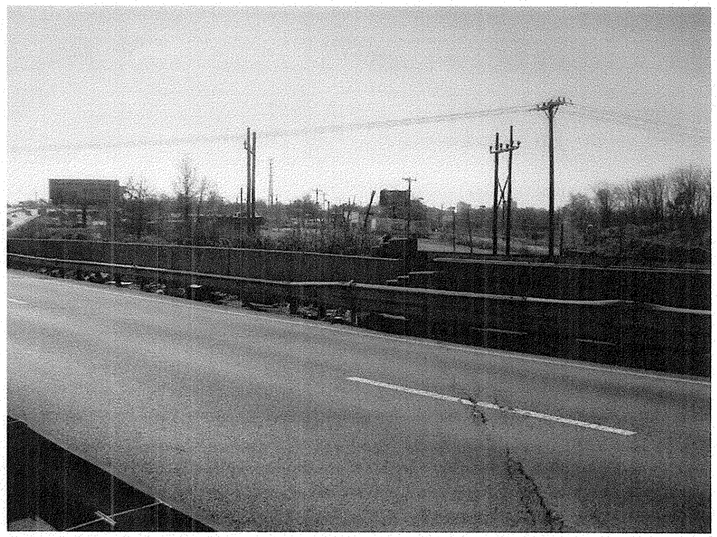


Photograph No. 3:
This photograph was taken at the toe of the existing embankment, from the left side of the -L- alignment, looking north, across proposed End Bent No. 1.

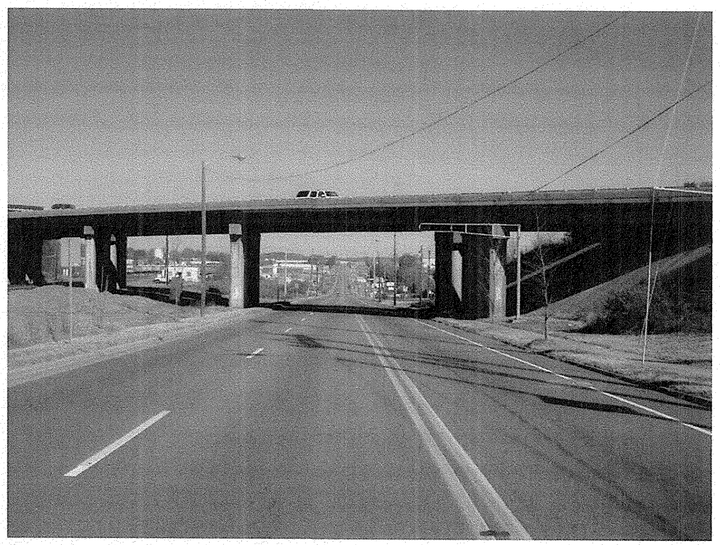


Photograph No. 4:
This photograph was taken at the top of the existing embankment, from the left side of the -L- alignment, looking north, across proposed End Bent No. 1.

Photograph No. 5:
This photograph was taken at the toe of the existing embankment, from the right side of the -L- alignment, looking south, across proposed End Bent No. 1.

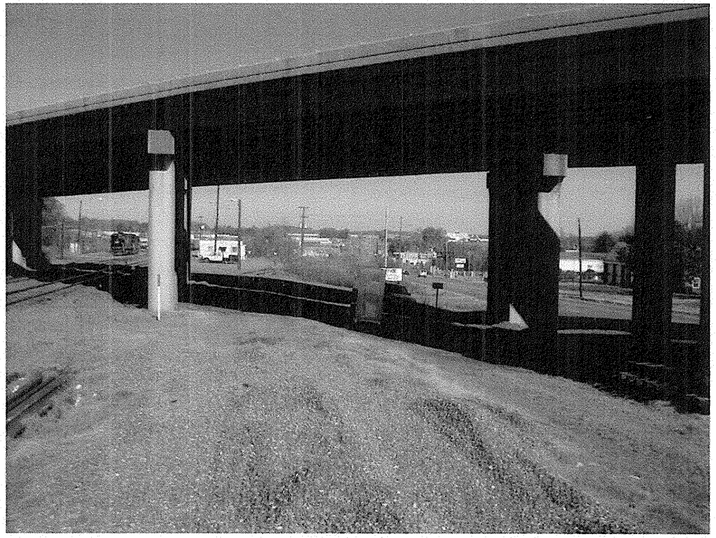


Photograph No. 6:
This photograph was taken at the top of the existing embankment, from the right side of the -L- alignment, looking south, across proposed End Bent No. 1.



Photograph No. 7:
This photograph was taken from the left side of the -L- alignment, along North Liberty Street (SR 2456), looking north.

Photograph No. 8:
This photograph was taken from the right side of the -L- alignment, along North Liberty Street (SR 2456), looking south.



Photograph No. 9:
This photograph was taken from the left side of the -L- alignment, looking north, across proposed Interior Bent No. 1.

Photograph No. 10:
This photograph was taken from the right side of the -L- alignment, looking south, across proposed Interior Bent No. 1.

Photograph No. 11:
This photograph was taken from the left side of the -L- alignment, along the Norfolk Southern Railroad tracks, looking north.

Photograph No. 12:
This photograph was taken from the right side of the -L- alignment, along the Norfolk & Southern Railroad tracks, looking south.

Photograph No. 13:
This photograph was taken at the top of the existing embankment from the left side of the -L- alignment, looking north, across proposed End Bent No. 2.

Photograph No. 14:
This photograph was taken at the toe of the existing embankment from the right side of the -L- alignment, looking south, across proposed End Bent No. 2.

Photograph No. 15:
This photograph was taken at the top of the existing embankment, from the right side of the -L- alignment, looking south, across proposed End Bent No. 2.

Photograph No. 16:
This photograph was taken from the west approach, left of the -L- alignment, looking southeast.

Photograph No. 17
This photograph was taken from the west approach, right of the -L- alignment, looking southeast.