STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	34380.1.1 (R-2201)	1	16

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

STRUCTURE SUBSURFACE INVESTIGATION

PROJ. REFERENCE NO. 34380.1.1 F.A. PROJ. STP-1611(1)

COUNTY FORSYTH/STOKES

PROJECT DESCRIPTION REPLACEMENT OF BRIDGE 347 OVER US 52 (FUTURE I-74) ON SR 1611-SR 1112

SITE DESCRIPTION

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CAUTION NOTICE

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

GENERAL SOIL AND ROCK STRATA DESCRIPTIONS AND INDICATED BOUNDARIES ARE BASED ON A GEOTECHNICAL INTERPRETATION OF ALL AVAILABLE SUBSURFACE DATA AND MAY NOT NECESSARILY REFLECT THE ACTUAL SUBSURFACE CONDITIONS BETWEEN BORINGS OR BETWEEN SAMPLED STRATA WITHIN THE BOREHOLE. THE LABORATORY SAMPLE DATA AND THE IN SITU (IN-PLACE) TEST DATA CAN BE RELIED ON ONLY TO THE DEGREE OF RELIABILITY INHERENT IN THE STANDARD TEST METHOD. THE OBSERVED WATER LEVELS OR SOIL MOISTURE CONDITIONS INDICATED IN THE SUBSURFACE INVESTIGATIONS ARE AS RECORDED AT THE TIME OF THE INVESTIGATION. THESE WATER LEVELS OR SOIL MOISTURE CONDITIONS MAY VARY CONSIDERABLY WITH TIME ACCORDING TO CLIMATIC CONDITIONS INCLUDING TEMPERATURES, PRECIPITATION, AND WIND, AS WELL AS OTHER NON-CLIMATIC FACTORS.

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PERSONNEL
J. STICKNEY
C. SMITH
M. MAULDIN

INVESTIGATED BY STICKNEY
CHECKED BY LITTLE
SUBMITTED BY LITTLE
DATE JULY '08

NORTH CAROLINA LICENSED SEAL 11041 GEOLOGIST CLINTON B. LITTLE

PROJECT: 34380.1.1

ID: R-2201

DRAWN BY: LITTLE

NOTE - THE INFORMATION CONTAINED HEREIN IS NOT IMPLIED OR GUARANTEED BY THE N. C. DEPARTMENT OF TRANSPORTATION AS BEING ACCURATE NOR IT IS CONSIDERED TO BE PART OF THE PLANS, SPECIFICATIONS, OR CONTRACT FOR THE PROJECT.

NOTE - BY HAVING REQUESTED THIS INFORMATION THE CONTRACTOR SPECIFICALLY WAIVES ANY CLAIMS FOR INCREASED COMPENSATION OR EXTENSION OF TIME BASED ON DIFFERENCES BETWEEN THE CONDITIONS INDICATED HEREIN AND THE ACTUAL CONDITIONS AT THE PROJECT SITE.

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS
GEOTECHNICAL ENGINEERING UNIT

PROJECT REFERENCE NO.	SHEET NO.
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SUBSURFACE INVESTIGATION

SOIL AND ROCK LEGEND, TERMS, SYMBOLS, AND ABBREVIATIONS

SOIL DESCRIPTION

SOIL IS CONSIDERED TO BE THE UNCONSOLIDATED, SEMI-CONSOLIDATED, OR WEATHERED EARTH MATERIALS THAT CAN BE PENETRATED WITH A CONTINUOUS FLIGHT POWER AUGER, AND YIELD LESS THAN 100 BLOWS PER 30 CM ACCORDING TO STANDARD PENETRATION TEST (AASHTO T206, ASTM D-1586). SOIL CLASSIFICATION IS BASED ON THE AASHTO SYSTEM. BASIC DESCRIPTIONS GENERALLY SHALL INCLUDE: CONSISTENCY, COLOR, TEXTURE, MOISTURE, AASHTO CLASSIFICATION, AND OTHER PERTINENT FACTORS SUCH AS MINERALOGICAL COMPOSITION, ANGULARITY, STRUCTURE, PLASTICITY, ETC. EXAMPLE:

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

SOIL LEGEND AND AASHTO CLASSIFICATION

GENERAL CLASS.	GRANULAR MATERIALS (≤ 35% PASSING #200)							SILT-CLAY MATERIALS (> 35% PASSING #200)				ORGANIC MATERIALS		
GROUP CLASS.	A-1		A-3	A-2				A-4	A-5	A-6	A-7	A-1, A-2 A-3	A-4, A-5 A-6, A-7	
	A-1-a	A-1-b		A-2-4	A-2-5	A-2-6	A-2-7				A-7-5 A-7-6			
SYMBOL														
% PASSING #10	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		NP	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	8		4 MX		8 MX	12 MX	16 MX	No MX			
USUAL TYPES OF MAJOR MATERIALS	STONE FRAGS. GRAVEL, AND SAND		FINE SAND	SILTY OR CLAYEY GRAVEL AND SAND				SILTY SOILS		CLAYEY SOILS				
GEN. RATING AS A SUBGRADE	EXCELLENT TO GOOD							FAIR TO POOR				FAIR TO POOR	POOR	UNSUITABLE

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

CONSISTENCY OR DENSENESS

PRIMARY SOIL TYPE	COMPACTNESS OR CONSISTENCY	RANGE OF STANDARD PENETRATION RESISTENCE (N-VALUE)	RANGE OF UNCONFINED COMPRESSIVE STRENGTH (kN/m^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	<25
	SOFT	2 TO 4	25 TO 50
	MEDIUM STIFF	4 TO 8	50 TO 100
	STIFF	8 TO 15	100 TO 200
	VERY STIFF	15 TO 30	200 TO 400
	HARD	>30	>400

TEXTURE OR GRAIN SIZE

U.S. STD. SIEVE SIZE	4	10	40	60	200	270
OPENING (MM)	4.76	2.00	0.42	0.25	0.075	0.053

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

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

SOIL MOISTURE - CORRELATION OF TERMS

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

PLASTICITY

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

COLOR

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

GRADATION

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

ANGULARITY OF GRAINS

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

MINERALOGICAL COMPOSITION

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

COMPRESSIBILITY

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

PERCENTAGE OF MATERIAL

ORGANIC MATERIAL	GRANULAR SOILS	SILT - CLAY SOILS	OTHER MATERIAL	
TRACE OF ORGANIC MATTER	2 - 3%	3 - 5%	TRACE	1 - 10%
LITTLE ORGANIC MATTER	3 - 5%	5 - 12%	LITTLE	10 - 20%
MODERATELY ORGANIC	5 - 10%	12 - 20%	SOME	20 - 35%
HIGHLY ORGANIC	>10%	>20%	HIGHLY	35% AND ABOVE

GROUND WATER

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

MISCELLANEOUS SYMBOLS

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

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

ABBREVIATIONS

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

EQUIPMENT USED ON SUBJECT PROJECT

DRILL UNITS:
- [ ] MOBILE B-___
- [ ] BK-51
- [ ] CME-45C
- [X] CME-550
- [ ] PORTABLE HOIST
- [ ] _____
- [ ] _____

ADVANCING TOOLS:
- [ ] CLAY BITS
- [ ] 152mm CONTINUOUS FLIGHT AUGER
- [ ] 203mm HOLLOW AUGERS
- [ ] HARD FACED FINGER BITS
- [ ] TUNG.-CARBIDE INSERTS
- [X] CASING [X] W/ ADVANCER
- [ ] TRICONE _____mm STEEL TEETH
- [ ] TRICONE _____mm TUNG.-CARB.
- [ ] CORE BIT
- [ ] _____

HAMMER TYPE:
- [X] AUTOMATIC [ ] MANUAL

CORE SIZE:
- [ ] -B_____
- [ ] -N_____
- [ ] -H_____

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

ROCK DESCRIPTION

HARD ROCK IS NON-COASTAL PLAIN MATERIAL THAT IF TESTED, WOULD YIELD SPT REFUSAL. AN INFERRED ROCK LINE INDICATES THE LEVEL AT WHICH NON-COASTAL PLAIN MATERIAL WOULD YIELD SPT REFUSAL. SPT REFUSAL IS PENETRATION BY A SPLIT SPOON SAMPLER EQUAL TO OR LESS THAN 3 CM PER 60 BLOWS. IN NON-COASTAL PLAIN MATERIAL, THE TRANSITION BETWEEN SOIL AND ROCK IS OFTEN REPRESENTED BY A ZONE OF WEATHERED ROCK.
ROCK MATERIALS ARE TYPICALLY DIVIDED AS FOLLOWS:

WEATHERED ROCK (WR)	NON-COASTAL PLAIN MATERIAL THAT WOULD YIELD SPT N VALUES > 100 BLOWS PER 30 CM IF TESTED.
CRYSTALLINE ROCK (CR)	FINE TO COARSE GRAIN IGNEOUS AND METAMORPHIC ROCK THAT WOULD YIELD SPT REFUSAL IF TESTED. ROCK TYPE INCLUDES GRANITE, GNEISS, GABBRO, SCHIST, ETC.
NON-CRYSTALLINE ROCK (NCR)	FINE TO COARSE GRAIN METAMORPHIC AND NON-COASTAL PLAIN SEDIMENTARY ROCK THAT WOULD YEILD SPT REFUSAL IF TESTED. ROCK TYPE INCLUDES PHYLLITE, SLATE, SANDSTONE, ETC.
COASTAL PLAIN SEDIMENTARY ROCK (CP)	COASTAL PLAIN SEDIMENTS CEMENTED INTO ROCK, BUT MAY NOT YIELD SPT REFUSAL. ROCK TYPE INCLUDES LIMESTONE, SANDSTONE, CEMENTED SHELL BEDS, ETC.

WEATHERING

FRESH	ROCK FRESH, CRYSTALS BRIGHT, FEW JOINTS MAY SHOW SLIGHT STAINING. ROCK RINGS UNDER HAMMER IF CRYSTALLINE.
VERY SLIGHT (V SLI.)	ROCK GENERALLY FRESH, JOINTS STAINED, SOME JOINTS MAY SHOW THIN CLAY COATINGS IF OPEN, CRYSTALS ON A BROKEN SPECIMEN FACE SHINE BRIGHTLY. ROCK RINGS UNDER HAMMER BLOWS IF OF A CRYSTALLINE NATURE.
SLIGHT (SLI.)	ROCK GENERALLY FRESH, JOINTS STAINED AND DISCOLORATION EXTENDS INTO ROCK UP TO 1 INCH. OPEN JOINTS MAY CONTAIN CLAY. IN GRANITOID ROCKS SOME OCCASIONAL FELDSPAR CRYSTALS ARE DULL AND DISCOLORED. CRYSTALLINE ROCKS RING UNDER HAMMER BLOWS.
MODERATE (MOD.)	SIGNIFICANT PORTIONS OF ROCK SHOW DISCOLORATION AND WEATHERING EFFECTS. IN GRANITOID ROCKS, MOST FELDSPARS ARE DULL AND DISCOLORED, SOME SHOW CLAY. ROCK HAS DULL SOUND UNDER HAMMER BLOWS AND SHOWS SIGNIFICANT LOSS OF STRENGTH AS COMPARED WITH FRESH ROCK.
MODERATELY SEVERE (MOD. SEV.)	ALL ROCK EXCEPT QUARTZ DISCOLORED OR STAINED. IN GRANITOID ROCKS, ALL FELDSPARS DULL AND DISCOLORED AND A MAJORITY SHOW KAOLINIZATION. ROCK SHOWS SEVERE LOSS OF STRENGTH AND CAN BE EXCAVATED WITH A GEOLOGIST'S PICK. ROCK GIVES "CLUNK" SOUND WHEN STRUCK. *IF TESTED, WOULD YIELD SPT REFUSAL*
SEVERE (SEV.)	ALL ROCK EXCEPT QUARTZ DISCOLORED OR STAINED. ROCK FABRIC CLEAR AND EVIDENT BUT REDUCED IN STRENGTH TO STRONG SOIL. IN GRANITOID ROCKS ALL FELDSPARS ARE KAOLINIZED TO SOME EXTENT. SOME FRAGMENTS OF STRONG ROCK USUALLY REMAIN. *IF TESTED, YIELDS SPT N VALUES > 100 BLOWS PER 30 CM*
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 BLOWS PER 30 CM*
COMPLETE	ROCK REDUCED TO SOIL. ROCK FABRIC NOT DISCERNIBLE, OR DISCERNIBLE ONLY IN SMALL AND SCATTERED CONCENTRATIONS. QUARTZ MAY BE PRESENT AS DIKES OR STRINGERS. SAPROLITE IS ALSO AN EXAMPLE.

ROCK HARDNESS

VERY HARD	CANNOT BE SCRATCHED BY KNIFE OR SHARP PICK. BREAKING OF HAND SPECIMENS REQUIRES SEVERAL HARD BLOWS OF THE GEOLOGIST'S PICK.
HARD	CAN BE SCRATCHED BY KNIFE OR PICK ONLY WITH DIFFICULTY. HARD HAMMER BLOWS REQUIRED TO DETACH HAND SPECIMEN.
MODERATELY HARD	CAN BE SCRATCHED BY KNIFE OR PICK. GOUGES OR GROOVES TO 6 MM DEEP CAN BE EXCAVATED BY HARD BLOW OF A GEOLOGIST'S PICK. HAND SPECIMENS CAN BE DETACHED BY MODERATE BLOWS.
MEDIUM HARD	CAN BE GROOVED OR GOUGED 13 MM DEEP BY FIRM PRESSURE OF KNIFE OR PICK POINT. CAN BE EXCAVATED IN SMALL CHIPS TO PEICES 25 MM MAXIMUM SIZE BY HARD BLOWS OF THE POINT OF A GEOLOGIST'S PICK.
SOFT	CAN BE GROVED OR GOUGED READILY BY KNIFE OR PICK. CAN BE EXCAVATED IN FRAGMENTS FROM CHIPS TO SEVERAL INCHES IN SIZE BY MODERATE BLOWS OF A PICK POINT. SMALL, THIN PIECES CAN BE BROKEN BY FINGER PRESSURE.
VERY SOFT	CAN BE CARVED WITH KNIFE. CAN BE EXCAVATED READILY WITH POINT OF PICK. PIECES 25 MM OR MORE IN THICKNESS CAN BE BROKEN BY FINGER PRESSURE. CAN BE SCRATCHED READILY BY FINGERNAIL.

FRACTURE SPACING

TERM	SPACING
VERY WIDE	MORE THAN 3 M
WIDE	3 TO 10 M
MODERATELY CLOSE	30 TO 100 CM
CLOSE	5 TO 30 CM
VERY CLOSE	LESS THAN 5 CM

BEDDING

TERM	THICKNESS
VERY THICKLY BEDDED	> 1 M
THICKLY BEDDED	0.5 - 1 M
THINLY BEDDED	0.05 - 0.5 M
VERY THINLY BEDDED	10 - 50 MM
THICKLY LAMINATED	2.5 - 10 MM
THINLY LAMINATED	< 2.5 MM

INDURATION

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

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

TERMS AND DEFINITIONS

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

AQUIFER - A WATER BEARING FORMATION OR STRATA.

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

ROCK QUALITY DESIGNATION (RQD) - A MEASURE OF ROCK QUALITY DESCRIBED BY TOTAL LENGTH OF ROCK SEGMENTS EQUAL TO OR GREATER THAN 10 CM DIVIDED BY THE TOTAL LENGTH OF CORE RUN AND EXPRESSED AS A PERCENTAGE.

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

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

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

STANDARD PENETRATION TEST (PENETRATION RESISTANCE) (SPT) - NUMBER OF BLOWS (N) OF A 63.5 KG HAMMER FALLING 0.76 M REQUIRED TO PRODUCE A PENETRATION OF 30 CM INTO SOIL WITH A 5 CM OUTSIDE DIAMETER SPLIT SPOON SAMPLER. SPT REFUSAL IS PENETRATION EQUAL TO OR LESS THAN 3 CM PER 60 BLOWS.

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

STRATA ROCK QUALITY DESIGNATION (SRQD) - A MEASURE OF ROCK QUALITY DESCRIBED BY TOTAL LENGTH OF ROCK SEGMENTS WITHIN A STRATUM EQUAL TO OR GREATER THAN 10 CM DIVIDED BY THE TOTAL LENGTH OF STRATA AND EXPRESSED AS A PERCENTAGE.

TOPSOIL (TS.) - SURFACE SOILS USUALLY CONTAINING ORGANIC MATTER.

BENCH MARK:
NCGS "KING"

ELEVATION: M

NOTES:
NCGS "KING"

N 279286.0710

E 486925.7710

21+84.22 I -L- 0.733 RT.

ELEVATION 335.4 m

REVISED 02/23/06

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SITE PLAN

0 10 20

METERS

RAMP FROM US 52 S.

US 52 SBL

GRASS MEDIAN

US 52 NBL

BEGIN BRIDGE
-L- Sta 21+96.00

BEGIN APPROACH SLAB
-L- Sta 21+87.659

END APPROACH SLAB
-L- Sta 22+67.341

END BRIDGE
-L- Sta 22+60.00

EB1-A

EB1-C

EB1-B

BI-A

BI-C

BI-B

EB2-A(1)
EB2-A(2)

EB2-C

EB2-B

N 38° 04' 16.6" W

N 27° 56' 06.0" E

PAINTED ISLAND

PAINTED ISLAND

1.5m CONC. SIDEWALK

750 C&G

W/SIGNAL

LT

TO FORSYTH COUNTY

TO STOKES COUNTY

MAIN ST.

EXIST. ASPHALT 9.26m

EXIST. ASPHALT 8.0m

EXIST. ASPHALT 6.8m

7.2m

14.6m

15.8m

+82

+87

REMOVE AND REPLACE EXISTING SHOULDER

EXIT RAMP FR

16

17

22

23

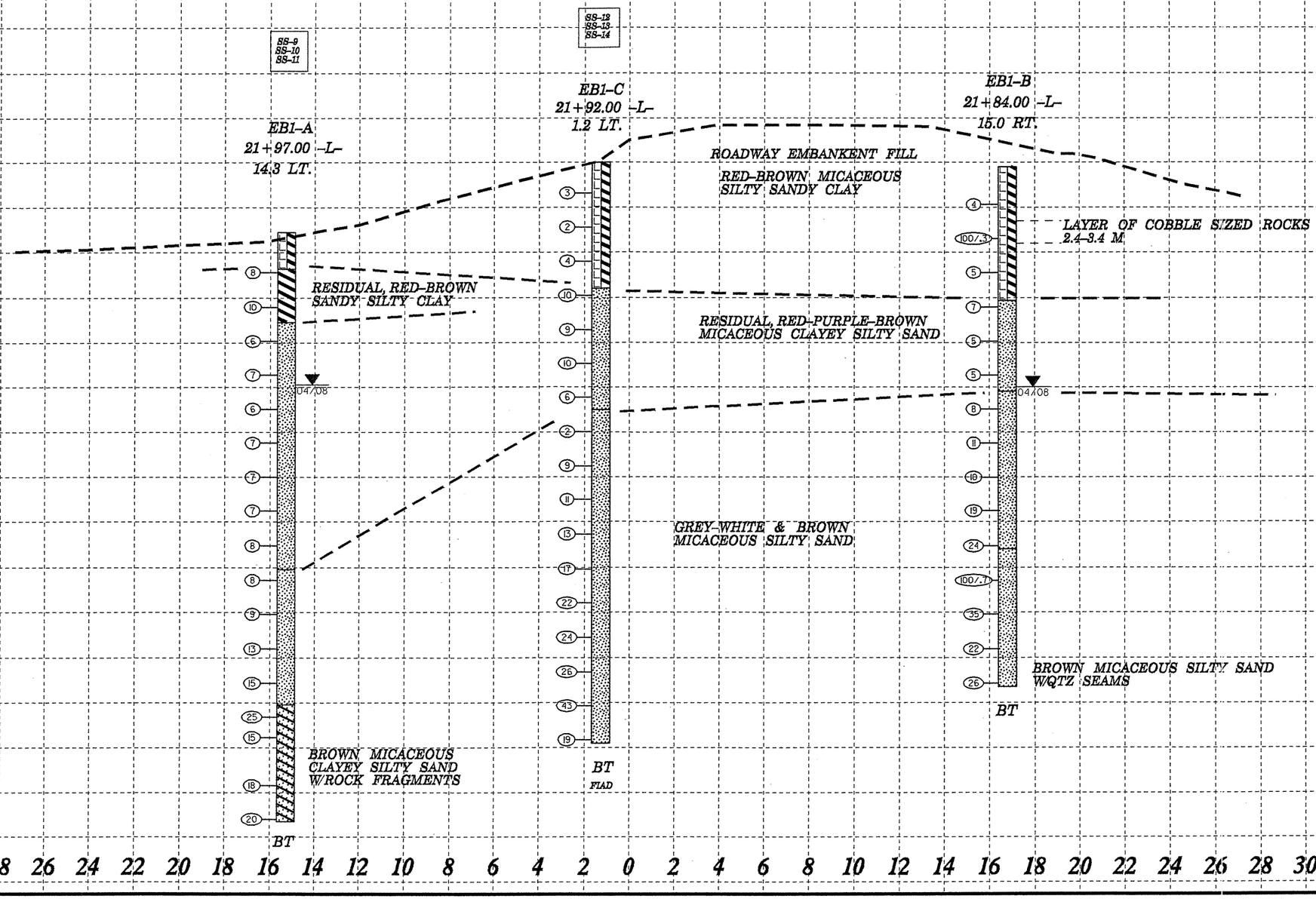
METRIC

0 4 8
METERS

PROJECT REFERENCE NO.	SHEET
34380.1.1 R-2201	4

Section Thru END BENT ONE
W.P. #1 STA. 21+91.571 -L-
Skew=113°59'37.4"

SECTION THROUGH END BENT ONE



METRIC

0 4 8
METERS

PROJECT REFERENCE NO.	SHEET
34380.1.1 R-2201	5

Section Thru BENT ONE
W.P. #2 STA. 22+27.571 -L-
Skew = 113° 59'37.4"

SECTION THROUGH BENT ONE

SS-15
SS-16

B1-A
22+31.00 -L-
8.6 LT.

B1-C
22+28.50 -L-
2.9 LT.

B1-B
22+22.90 -L-
14.3 RT.

RESIDUAL, RED-BROWN-PURPLE MICACEOUS CLAYEY SANDY SILT

BROWN TO GRAY-WHITE MICACEOUS FINE SANDY SILT

04/08

BT

346 344 342 340 338 336 334 332 330 328 326 324 322 320 318 316 314 312 310 308 306 304

34 32 30 28 26 24 22 20 18 16 14 12 10 8 6 4 2 0 2 4 6 8 10 12 14 16 18 20 22 24 26 28 30 32 34

METRIC

0 4 8
METERS

PROJECT REFERENCE NO.	SHEET
34380.1.1 R-2201	6

Section Thru END BENT TWO
W.P. #3 STA. 22+64.371 -L-
Skew = 113° 59'37.4"

SECTION THROUGH END BENT TWO

SS-1
SS-2
SS-3
SS-4
SS-5
SS-6

EB2-A(2)
22+72.0 -L-
12.0 LT.

NOTE: EB1-A(1)
AUGER REFUSAL
ON BOULDER @ 1.88m

EB2-C
22+68.9 -L-
1.0 LT.

SS-7
SS-8

EB2-B
22+59.0 -L-
14.4 RT.

ROADWAY EMBANKMENT
RED-PURPLE MICACEOUS
CLAYEY SANDY SILT

(FILL) TAN-RED
SILTY CLAYEY SAND

(FILL) GRAY SILTY SANDY CLAY LAYERED
W/SANDY SILT AS ABOVE

04/08

RESIDUAL, RED-PURPLE
MICACEOUS SILTY SANDY CLAY

TAN-BROWN MICACEOUS
SANDY SILTY CLAY

TAN TO GRAY-WHITE
CLAYEY SANDY SILT

GRAY-WHITE SANDY SILTY CLAY
& SANDY CLAYEY SILT

TAN CLAYEY SANDY SILT

344 342 340 338 336 334 332 330 328 326 324 322 320 318 316 314 312 310 308 306 304 302 300

34 32 30 28 26 24 22 20 18 16 14 12 10 8 6 4 2 0 2 4 6 8 10 12 14 16 18 20 22 24 26 28 30 32 34

NCDOT GEOTECHNICAL ENGINEERING UNIT
BORELOG REPORT

PROJECT NO. 34380.1.1	**ID.** R-2201	**COUNTY** FORSYTH	**GEOLOGIST** Stickney, J. K.
SITE DESCRIPTION BRIDGE 347 OVER US 52 ON SR 1611-SR 1112			**GROUND WTR (m)**
BORING NO. EB1-A	**STATION** 21+97.0	**OFFSET** 14.3m LT	**ALIGNMENT** -L- — **0 HR.** N/A
COLLAR ELEV. 330.87 m	**TOTAL DEPTH** 26.21 m	**NORTHING** N/A	**EASTING** N/A — **24 HR.** 6.80
DRILL MACHINE CME-550X	**DRILL METHOD** NW Casing w/ SPT		**HAMMER TYPE** Automatic
START DATE 04/15/08	**COMP. DATE** 04/16/08	**SURFACE WATER DEPTH** N/A	**DEPTH TO ROCK** N/A

ELEV (m)	DRIVE ELEV (m)	DEPTH (m)	BLOW COUNT 15cm	15cm	15cm	BLOWS PER 30 CM 0 25 50 75 100	SAMP. NO.	MOI	LOG	SOIL AND ROCK DESCRIPTION — ELEV. (m) / DEPTH (m)
	331									330.87 / 0.00 GROUND SURFACE
330										**ROADWAY EMBANKMENT** RED-BROWN MICACEOUS SILTY CLAY
	329.38	1.49								329.23 / 1.64
329			2	4	4	8		M		**RESIDUAL** RED-BROWN SANDY SILTY CLAY
328	327.86	3.01								
327			3	4	6	10				326.87 / 4.00 RED-PURPLE-BROWN MICACEOUS CLAYEY SILTY SAND
	326.34	4.53								
326			2	2	4	6	SS-9	M		
325	324.82	6.05								
			2	3	4	7				
324										
323	323.30	7.57	2	2	4	6		M		
322	321.78	9.09								
			2	3	4	7				
321										
320	320.26	10.61	2	3	4	7		M		
319	318.74	12.13								
			2	3	4	7				
318										
317	317.22	13.65	2	3	5	8		M		
316	315.70	15.17								
			3	3	5	8	SS-10			
315										
314	314.18	16.69	2	3	6	9		M		
313	312.66	18.21								
			2	3	10	13				
312										
311	311.14	19.73	4	6	9	15		M		315.87 / 15.00 BROWN MICACEOUS SILTY SAND

PROJECT NO. 34380.1.1	**ID.** R-2201	**COUNTY** FORSYTH	**GEOLOGIST** Stickney, J. K.
SITE DESCRIPTION BRIDGE 347 OVER US 52 ON SR 1611-SR 1112			**GROUND WTR (m)**
BORING NO. EB1-A	**STATION** 21+97.0	**OFFSET** 14.3m LT	**ALIGNMENT** -L- — **0 HR.** N/A
COLLAR ELEV. 330.87 m	**TOTAL DEPTH** 26.21 m	**NORTHING** N/A	**EASTING** N/A — **24 HR.** 6.80
DRILL MACHINE CME-550X	**DRILL METHOD** NW Casing w/ SPT		**HAMMER TYPE** Automatic
START DATE 04/15/08	**COMP. DATE** 04/16/08	**SURFACE WATER DEPTH** N/A	**DEPTH TO ROCK** N/A

ELEV (m)	DRIVE ELEV (m)	DEPTH (m)	BLOW COUNT 15cm	15cm	15cm	BLOWS PER 30 CM 0 25 50 75 100	SAMP. NO.	MOI	LOG	SOIL AND ROCK DESCRIPTION — ELEV. (m) / DEPTH (m)
	311					Match Line				BROWN MICACEOUS SILTY SAND *(continued)*
310										309.87 / 21.00
	309.62	21.25	18	11	14	25	SS-11			BROWN MICACEOUS CLAYEY SILTY SAND W/ ROCK FRAGMENTS
309										
	308.70	22.17	3	6	9	15		M		
308										
307										
	306.58	24.29	7	10	8	18				
306										
305	305.06	25.81	8	9	11	20		M		304.66 / 26.21 Boring Terminated at Elevation 304.66 m MEDIUM DENSE CLAYEY SAND
304										
303										
302										
301										
300										
299										
298										
297										
296										
295										
294										
293										
292										
291										

NCDOT GEOTECHNICAL ENGINEERING UNIT
BORELOG REPORT

PROJECT NO. 34380.1.1	**ID.** R-2201	**COUNTY** FORSYTH	**GEOLOGIST** Stickney, J. K.
SITE DESCRIPTION BRIDGE 347 OVER US 52 ON SR 1611-SR 1112			**GROUND WTR (m)**
BORING NO. EB1-B	**STATION** 21+84.0	**OFFSET** 15.0m RT	**ALIGNMENT** -L- — **0 HR.** N/A
COLLAR ELEV. 333.78 m	**TOTAL DEPTH** 23.09 m	**NORTHING** N/A	**EASTING** N/A — **24 HR.** 9.80
DRILL MACHINE CME-550X	**DRILL METHOD** NW Casing w/ SPT		**HAMMER TYPE** Automatic
START DATE 04/22/08	**COMP. DATE** 04/22/08	**SURFACE WATER DEPTH** N/A	**DEPTH TO ROCK** N/A

ELEV (m)	DRIVE ELEV (m)	DEPTH (m)	BLOW COUNT 15cm	15cm	15cm	BLOWS PER 30 CM 0 25 50 75 100	SAMP. NO.	MOI	LOG	SOIL AND ROCK DESCRIPTION — ELEV. (m) / DEPTH (m)
	334									333.78 / 0.00 GROUND SURFACE
333										**ROADWAY EMBANKMENT** RED-BROWN MICACEOUS SILTY SANDY CLAY W/LAYER OF COBBLE SIZE ROCK FILL @2.4-3.4m
	332.42	1.36								
332			1	2	2	4		M		
331	330.90	2.88								
330			100/.3			100/.3				
	329.38	4.40								
329			1	2	3	5		M		
328	327.86	5.92								327.86 / 5.92
327			2	3	4	7				**RESIDUAL** RED-BROWN-PURPLE MICACEOUS CLAYEY SILTY SAND
	326.34	7.44								
326			2	2	3	5		M		
325	324.82	8.96								
324			1	2	3	5				
	323.30	10.48								323.78 / 10.00
323			2	4	4	8		M		BROWN MICACEOUS SILTY SAND
322	321.78	12.00								
321			3	5	6	11				
	320.26	13.52								
320			4	4	6	10		M		
319	318.74	15.04								
318			5	9	10	19				
317	317.22	16.56	7	11	13	24		M		316.78 / 17.00
316										BROWN MICACEOUS SILTY SAND W/QTZ SEAMS
	315.70	18.08								
315			15	60	40/.2	100/.7				
	314.18	19.60								
314			11	15	20	35		M		

PROJECT NO. 34380.1.1	**ID.** R-2201	**COUNTY** FORSYTH	**GEOLOGIST** Stickney, J. K.
SITE DESCRIPTION BRIDGE 347 OVER US 52 ON SR 1611-SR 1112			**GROUND WTR (m)**
BORING NO. EB1-B	**STATION** 21+84.0	**OFFSET** 15.0m RT	**ALIGNMENT** -L- — **0 HR.** N/A
COLLAR ELEV. 333.78 m	**TOTAL DEPTH** 23.09 m	**NORTHING** N/A	**EASTING** N/A — **24 HR.** 9.80
DRILL MACHINE CME-550X	**DRILL METHOD** NW Casing w/ SPT		**HAMMER TYPE** Automatic
START DATE 04/22/08	**COMP. DATE** 04/22/08	**SURFACE WATER DEPTH** N/A	**DEPTH TO ROCK** N/A

ELEV (m)	DRIVE ELEV (m)	DEPTH (m)	BLOW COUNT 15cm	15cm	15cm	BLOWS PER 30 CM 0 25 50 75 100	SAMP. NO.	MOI	LOG	SOIL AND ROCK DESCRIPTION
	314					Match Line				BROWN MICACEOUS SILTY SAND W/QTZ SEAMS *(continued)*
313										
	312.66	21.12								
312			6	9	13	22				
311	311.14	22.64								
			8	12	14	26		M		310.69 / 23.09
310										Boring Terminated at Elevation 310.69 m MEDIUM DENSE CLAYEY SAND
309										
308										
307										
306										
305										
304										
303										
302										
301										
300										
299										
298										
297										
296										
295										
294										

NCDOT GEOTECHNICAL ENGINEERING UNIT
BORELOG REPORT

PROJECT NO. 34380.1.1	**ID.** R-2201	**COUNTY** FORSYTH	**GEOLOGIST** Stickney, J. K.
SITE DESCRIPTION BRIDGE 347 OVER US 52 ON SR 1611-SR 1112			**GROUND WTR (m)**
BORING NO. EB1-C	**STATION** 21+92.0	**OFFSET** 1.2m LT	**ALIGNMENT** -L- / **0 HR.** N/A
COLLAR ELEV. 334.02 m	**TOTAL DEPTH** 25.82 m	**NORTHING** N/A	**EASTING** N/A / **24 HR.** FIAD
DRILL MACHINE CME-550X	**DRILL METHOD** NW Casing w/ SPT		**HAMMER TYPE** Automatic
START DATE 04/18/08	**COMP. DATE** 04/22/08	**SURFACE WATER DEPTH** N/A	**DEPTH TO ROCK** N/A

ELEV (m)	DRIVE ELEV (m)	DEPTH (m)	BLOW COUNT 15cm	15cm	15cm	BLOWS PER 30 CM 0 25 50 75 100	SAMP. NO.	MOI	LOG	SOIL AND ROCK DESCRIPTION
334	335									334.02 GROUND SURFACE 0.00
333	332.97	1.05								**ROADWAY EMBANKMENT** RED-BROWN MICACEOUS SILTY SANDY CLAY
332			1	1	2	3	SS-12	M		
331	331.45	2.57	2	1	1	2				
330	329.93	4.09								
329			2	2	2	4		M		
328	328.41	5.61	4	4	6	10	SS-13			328.41 5.61 **RESIDUAL** RED-PURPLE-BROWN MICACEOUS CLAYEY SILTY SAND
327	326.89	7.13								
326			2	4	5	9		M		
325	325.37	8.65	3	4	6	10				
324	323.85	10.17								
323			2	3	3	6		M		
322	322.33	11.69	1	1	1	2	SS-14	Sat.		323.02 11.00 GREY-WHITE & BROWN MICACEOUS SILTY SAND
321	320.81	13.21								
320			3	4	5	9				
319	319.29	14.73	4	4	7	11		W		
318	317.77	16.25								
317			5	6	7	13				
316	316.25	17.77	6	7	10	17		W		
315	314.73	19.29								

PROJECT NO. 34380.1.1	**ID.** R-2201	**COUNTY** FORSYTH	**GEOLOGIST** Stickney, J. K.
SITE DESCRIPTION BRIDGE 347 OVER US 52 ON SR 1611-SR 1112			**GROUND WTR (m)**
BORING NO. EB1-C	**STATION** 21+92.0	**OFFSET** 1.2m LT	**ALIGNMENT** -L- / **0 HR.** N/A
COLLAR ELEV. 334.02 m	**TOTAL DEPTH** 25.82 m	**NORTHING** N/A	**EASTING** N/A / **24 HR.** FIAD
DRILL MACHINE CME-550X	**DRILL METHOD** NW Casing w/ SPT		**HAMMER TYPE** Automatic
START DATE 04/18/08	**COMP. DATE** 04/22/08	**SURFACE WATER DEPTH** N/A	**DEPTH TO ROCK** N/A

ELEV (m)	DRIVE ELEV (m)	DEPTH (m)	BLOW COUNT 15cm	15cm	15cm	BLOWS PER 30 CM 0 25 50 75 100	SAMP. NO.	MOI	LOG	SOIL AND ROCK DESCRIPTION
315						Match Line				
314			5	9	13	22				GREY-WHITE & BROWN MICACEOUS SILTY SAND *(continued)*
313	313.21	20.81	5	9	15	24		W		
312	311.69	22.33	6	12	14	26				
311	310.17	23.85	9	18	25	43		W		
310	308.65	25.37	6	8	11	19				308.20 25.82 Boring Terminated at Elevation 308.20 m MEDIUM DENSE CLAYEY SAND
309										
308										
307										
306										
305										
304										
303										
302										
301										
300										
299										
298										
297										
296										
295										

NCDOT GEOTECHNICAL ENGINEERING UNIT
BORELOG REPORT

PROJECT NO. 34380.1.1	**ID.** R-2201	**COUNTY** FORSYTH	**GEOLOGIST** Stickney, J. K.
SITE DESCRIPTION BRIDGE 347 OVER US 52 ON SR 1611-SR 1112			**GROUND WTR (m)**
BORING NO. B1-A	**STATION** 22+31.0	**OFFSET** 8.6m LT	**ALIGNMENT** -L- **0 HR.** N/A
COLLAR ELEV. 329.60 m	**TOTAL DEPTH** 15.34 m	**NORTHING** 279,331.8	**EASTING** 486,939.4 **24 HR.** 5.30
DRILL MACHINE CME-550X	**DRILL METHOD** NW Casing w/ SPT		**HAMMER TYPE** Automatic
START DATE 04/23/08	**COMP. DATE** 04/23/08	**SURFACE WATER DEPTH** N/A	**DEPTH TO ROCK** N/A

ELEV (m)	DRIVE ELEV (m)	DEPTH (m)	BLOW COUNT 15cm	15cm	15cm	BLOWS PER 30 CM 0 25 50 75 100	SAMP. NO.	MOI	LOG	SOIL AND ROCK DESCRIPTION ELEV. (m)	DEPTH (m)
	330									329.60 GROUND SURFACE	0.00
329										**RESIDUAL** RED-BROWN-PURPLE MICACEOUS CLAYEY SANDY SILT	
	328.39	1.21									
328			1	2	3	5					
327	326.87	2.73									
			1	3	4	7					
326											
	325.35	4.25									
325			1	3	2	5					
324	323.83	5.77									
			1	2	4	6					
323											
	322.31	7.29								322.60	7.00
322			1	2	3	5				BROWN TO GRAY-WHITE FINE SANDY SILT	
321	320.79	8.81									
			1	2	4	6					
320											
	319.27	10.33									
319			2	2	4	6					
318	317.75	11.85									
			3	5	7	12					
317											
	316.23	13.37									
316			3	4	8	12					
315	314.71	14.89									
			3	4	7	11				314.26	15.34
314										Boring Terminated at Elevation 314.26 m STIFF FINE SANDY SILT	
313											
312											
311											
310											

PROJECT NO. 34380.1.1	**ID.** R-2201	**COUNTY** FORSYTH	**GEOLOGIST** Stickney, J. K.
SITE DESCRIPTION BRIDGE 347 OVER US 52 ON SR 1611-SR 1112			**GROUND WTR (m)**
BORING NO. B1-B	**STATION** 22+22.9	**OFFSET** 14.3m RT	**ALIGNMENT** -L- **0 HR.** N/A
COLLAR ELEV. 329.60 m	**TOTAL DEPTH** 15.53 m	**NORTHING** 279,313.9	**EASTING** 486,955.9 **24 HR.** 6.60
DRILL MACHINE CME-550X	**DRILL METHOD** NW Casing w/ SPT		**HAMMER TYPE** Automatic
START DATE 04/23/08	**COMP. DATE** 04/23/08	**SURFACE WATER DEPTH** N/A	**DEPTH TO ROCK** N/A

ELEV (m)	DRIVE ELEV (m)	DEPTH (m)	BLOW COUNT 15cm	15cm	15cm	BLOWS PER 30 CM 0 25 50 75 100	SAMP. NO.	MOI	LOG	SOIL AND ROCK DESCRIPTION ELEV. (m)	DEPTH (m)
	330									329.60 GROUND SURFACE	0.00
329										**RESIDUAL** RED-BROWN-PURPLE MICACEOUS CLAYEY SANDY SILT	
	328.20	1.40									
328			1	2	3	5	SS-15				
327	326.68	2.92									
			1	2	4	6					
326											
	325.16	4.44									
325			2	3	4	7					
324	323.64	5.96									
			1	3	5	8					
323											
	322.12	7.48								322.60	7.00
322			1	3	4	7	SS-16			BROWN MICACEOUS FINE SANDY SILT	
321	320.60	9.00									
			1	3	5	8					
320											
	319.08	10.52									
319			2	3	5	8					
318	317.56	12.04									
			2	4	8	12					
317											
	316.04	13.56									
316			3	5	6	11					
315	314.52	15.08									
			4	6	10	16				314.07	15.53
314										Boring Terminated at Elevation 314.07 m STIFF FINE SANDY SILT	
313											
312											
311											
310											

NCDOT GEOTECHNICAL ENGINEERING UNIT
BOREHOLE REPORT

PROJECT NO. 34380.1.1	**ID.** R-2201	**COUNTY** FORSYTH	**GEOLOGIST** Stickney, J. K.	
SITE DESCRIPTION BRIDGE 347 OVER US 52 ON SR 1611-SR 1112				**GROUND WTR (m)**
BORING NO. B1-C	**STATION** 22+28.5	**OFFSET** 2.9m LT	**ALIGNMENT** -L-	**0 HR.** N/A
COLLAR ELEV. 329.40 m	**TOTAL DEPTH** 15.33 m	**NORTHING** 279,326.9	**EASTING** 486,943.3	**24 HR.** 5.50
DRILL MACHINE CME-550X	**DRILL METHOD** NW Casing w/ SPT		**HAMMER TYPE** Automatic	
START DATE 04/22/08	**COMP. DATE** 04/22/08	**SURFACE WATER DEPTH** N/A	**DEPTH TO ROCK** N/A	

ELEV (m)	DRIVE ELEV (m)	DEPTH (m)	BLOW COUNT 15cm	15cm	15cm	BLOWS PER 30 CM 0 25 50 75 100	SAMP. NO.	MOI	LOG	SOIL AND ROCK DESCRIPTION
										ELEV. (m) DEPTH (m)
	330									329.40 GROUND SURFACE 0.00
329										**RESIDUAL** RED-BROWN-PURPLE MICACEOUS CLAYEY SANDY SILT
	328.20	1.20								
328			1	2	3	5				
327										
	326.68	2.72								
326			2	2	3	5				
325										
	325.16	4.24								
324			1	2	2	4				
	323.64	5.76								
323			1	2	3	5				
	322.12	7.28								322.40 7.00
322			1	2	4	6				BROWN TO GRAY-WHITE MICACEOUS FINE SANDY SILT
321										
	320.60	8.80								
320			1	3	5	8				
319										
	319.08	10.32								
318			1	3	4	7				
	317.56	11.84								
317			2	5	6	11				
316										
	316.04	13.36								
315			4	4	7	11				
	314.52	14.88								
314			5	7	8	15				314.07 15.33
313										Boring Terminated at Elevation 314.07 m STIFF FINE SANDY SILT
312										
311										
310										

NCDOT BORE DOUBLE R2201_GEO_BR.GPJ NC_DOT.GDT 06/30/08

NCDOT GEOTECHNICAL ENGINEERING UNIT
BORELOG REPORT

PROJECT NO. 34380.1.1	**ID.** R-2201	**COUNTY** FORSYTH	**GEOLOGIST** Stickney, J. K.
SITE DESCRIPTION BRIDGE 347 OVER US 52 ON SR 1611-SR 1112			**GROUND WTR (m)**
BORING NO. EB2-A(1)	**STATION** 22+72.0	**OFFSET** 12.4m LT	**ALIGNMENT** -L-	**0 HR.** N/A
COLLAR ELEV. 333.40 m	**TOTAL DEPTH** 1.88 m	**NORTHING** N/A	**EASTING** N/A	**24 HR.** Dry
DRILL MACHINE CME-550X	**DRILL METHOD** H.S. Augers		**HAMMER TYPE** Automatic	
START DATE 04/03/08	**COMP. DATE** 04/03/08	**SURFACE WATER DEPTH** N/A	**DEPTH TO ROCK** N/A	

ELEV (m)	DRIVE ELEV (m)	DEPTH (m)	BLOW COUNT 15cm	15cm	15cm	BLOWS PER 30 CM 0 25 50 75 100	SAMP. NO.	MOI	LOG	SOIL AND ROCK DESCRIPTION
										ELEV. (m) DEPTH (m)
	334									333.40 GROUND SURFACE 0.00
333										**ROADWAY EMBANKMENT** RED-PURPLE MICACEOUS CLAYEY SANDY SILT
	332.54	0.86								
332			1	3	3	6	SS-1			331.52 1.88
331										Boring Terminated by Auger Refusal at Elevation 331.52 m BOULDER
330										
329										
328										
327										
326										
325										
324										
323										
322										
321										
320										
319										
318										
317										
316										
315										
314										

NCDOT BORE DOUBLE R2201_GEO_BR.GPJ NC_DOT.GDT 06/26/08

NCDOT GEOTECHNICAL ENGINEERING UNIT
BORELOG REPORT

PROJECT NO. 34380.1.1	**ID.** R-2201	**COUNTY** FORSYTH	**GEOLOGIST** Stickney, J. K.
SITE DESCRIPTION BRIDGE 347 OVER US 52 ON SR 1611-SR 1112			**GROUND WTR (m)**
BORING NO. EB2-A(2)	**STATION** 22+72.0	**OFFSET** 12.0m LT	**ALIGNMENT** -L- — **0 HR.** N/A
COLLAR ELEV. 333.40 m	**TOTAL DEPTH** 32.16 m	**NORTHING** 279,369.6	**EASTING** 486,955.6 — **24 HR.** 9.00
DRILL MACHINE CME-550X	**DRILL METHOD** H.S. Augers		**HAMMER TYPE** Automatic
START DATE 04/03/08	**COMP. DATE** 04/03/08	**SURFACE WATER DEPTH** N/A	**DEPTH TO ROCK** N/A

ELEV (m)	DRIVE ELEV (m)	DEPTH (m)	BLOW COUNT 15cm	15cm	15cm	BLOWS PER 30 CM 0 25 50 75 100	SAMP. NO.	MOI	LOG	SOIL AND ROCK DESCRIPTION ELEV. (m)	DEPTH (m)
	334									333.40 GROUND SURFACE	0.00
333	332.53	0.87								**ROADWAY EMBANKMENT** RED-BROWN-PURPLE MICACEOUS CLAYEY SANDY SILT	
332			1	2	3	5					
331	331.01	2.39								331.40 TAN-RED SILTY CLAYEY SAND	2.00
330			2	4	9	13	SS-2				
329	329.49	3.91	4	8	13	21	SS-3			329.40 **RESIDUAL** RED-PURPLE MICACEOUS SILTY SANDY CLAY	4.00
328	327.97	5.43									
327			2	4	6	10	SS-4				
	326.45	6.95									
326			3	4	5	9	SS-5				
325	324.93	8.47									
324			3	3	4	7					
	323.41	9.99									
323			3	4	6	10					
322	321.89	11.51									
321			2	3	4	7					
	320.37	13.03									
320			1	2	2	4					
319	318.85	14.55									
318			2	2	3	5					
	317.33	16.07								317.40 TAN CLAYEY SANDY SILT	16.00
317			2	3	4	7					
316	315.81	17.59									
315			1	3	3	6					
	314.39	19.01									
314			1	3	6	9					

PROJECT NO. 34380.1.1	**ID.** R-2201	**COUNTY** FORSYTH	**GEOLOGIST** Stickney, J. K.
SITE DESCRIPTION BRIDGE 347 OVER US 52 ON SR 1611-SR 1112			**GROUND WTR (m)**
BORING NO. EB2-A(2)	**STATION** 22+72.0	**OFFSET** 12.0m LT	**ALIGNMENT** -L- — **0 HR.** N/A
COLLAR ELEV. 333.40 m	**TOTAL DEPTH** 32.16 m	**NORTHING** 279,369.6	**EASTING** 486,955.6 — **24 HR.** 9.00
DRILL MACHINE CME-550X	**DRILL METHOD** H.S. Augers		**HAMMER TYPE** Automatic
START DATE 04/03/08	**COMP. DATE** 04/03/08	**SURFACE WATER DEPTH** N/A	**DEPTH TO ROCK** N/A

ELEV (m)	DRIVE ELEV (m)	DEPTH (m)	BLOW COUNT 15cm	15cm	15cm	BLOWS PER 30 CM 0 25 50 75 100	SAMP. NO.	MOI	LOG	SOIL AND ROCK DESCRIPTION
	314					Match Line				TAN CLAYEY SANDY SILT *(continued)*
313	312.87	20.53								
312			2	4	4	8				
311	311.35	22.05	2	4	5	9				
310	309.83	23.57								
309			3	5	9	14				
308	308.31	25.09	4	6	8	14				
307	306.25	27.15								
306			5	5	9	14				
305	304.73	28.67								
304			7	7	8	15				
303	303.21	30.19								
302			6	11	11	22				
301	301.69	31.71	12	14	16	30				301.24 Boring Terminated at Elevation 301.24 m V. STIFF CLAYEY SANDY SILT 32.16
300										
299										
298										
297										
296										
295										
294										

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PROJECT NO. 34380.1.1	**ID.** R-2201	**COUNTY** FORSYTH	**GEOLOGIST** Stickney, J. K.
SITE DESCRIPTION BRIDGE 347 OVER US 52 ON SR 1611-SR 1112			**GROUND WTR (m)**
BORING NO. EB2-B	**STATION** 22+59.0	**OFFSET** 14.4m RT	**ALIGNMENT** -L- / **0 HR.** N/A
COLLAR ELEV. 335.00 m	**TOTAL DEPTH** 31.00 m	**NORTHING** 279,345.7	**EASTING** 486,972.9 / **24 HR.** 10.80
DRILL MACHINE CME-550X	**DRILL METHOD** NW Casing w/ SPT		**HAMMER TYPE** Automatic
START DATE 04/10/08	**COMP. DATE** 04/11/08	**SURFACE WATER DEPTH** N/A	**DEPTH TO ROCK** N/A

ELEV (m)	DRIVE ELEV (m)	DEPTH (m)	BLOW COUNT 15cm	15cm	15cm	BLOWS PER 30 CM 0 25 50 75 100	SAMP. NO.	MOI	LOG	SOIL AND ROCK DESCRIPTION ELEV. (m)	DEPTH (m)
	335									335.00 GROUND SURFACE	0.00
	334.24	0.76								**ROADWAY EMBANKMENT** RED-PURPLE MICACEOUS CLAYEY SANDY SILT	
334			2	2	3	5					
333	332.72	2.28								333.50 GRAY SILTY SANDY CLAY LAYERED W/ SANDY SILT AS ABOVE	1.50
332			2	3	4	7	SS-7				
331	331.20	3.80									
330			2	2	3	5					
329	329.68	5.32								329.38 **RESIDUAL** RED-PURPLE MICACEOUS SILTY SANDY CLAY	5.62
328			3	5	6	11					
327	327.25	7.75									
326			2	2	3	5					
325	325.73	9.27									
324			2	3	3	6					
323	324.21	10.79									
322			1	3	2	5					
321	322.69	12.31									
320			2	2	4	6					
319	321.17	13.83									
318			2	3	4	7					
317	319.65	15.35									
316			2	5	9	14					
315	318.13	16.87									
314			2	4	8	12					
313	316.61	18.39									
312			3	5	7	12					
311	315.09	19.91									
310			5	6	9	15					
309										320.00 TAN-BROWN MICACEOUS SANDY SILTY CLAY	15.00

PROJECT NO. 34380.1.1	**ID.** R-2201	**COUNTY** FORSYTH	**GEOLOGIST** Stickney, J. K.
SITE DESCRIPTION BRIDGE 347 OVER US 52 ON SR 1611-SR 1112			**GROUND WTR (m)**
BORING NO. EB2-B	**STATION** 22+59.0	**OFFSET** 14.4m RT	**ALIGNMENT** -L- / **0 HR.** N/A
COLLAR ELEV. 335.00 m	**TOTAL DEPTH** 31.00 m	**NORTHING** 279,345.7	**EASTING** 486,972.9 / **24 HR.** 10.80
DRILL MACHINE CME-550X	**DRILL METHOD** NW Casing w/ SPT		**HAMMER TYPE** Automatic
START DATE 04/10/08	**COMP. DATE** 04/11/08	**SURFACE WATER DEPTH** N/A	**DEPTH TO ROCK** N/A

ELEV (m)	DRIVE ELEV (m)	DEPTH (m)	BLOW COUNT 15cm	15cm	15cm	BLOWS PER 30 CM 0 25 50 75 100	SAMP. NO.	MOI	LOG	SOIL AND ROCK DESCRIPTION
	315					Match Line				TAN-BROWN MICACEOUS SANDY SILTY CLAY *(continued)*
314										
313	313.57	21.43	6	6	8	14				
312	312.05	22.95	5	7	9	16				
311	310.53	24.47								
310			4	8	9	17				
309	309.01	25.99								
308			3	7	7	14				
307	307.49	27.51								
306	305.97	29.03	3	7	8	15				
305			5	6	12	18				
304	304.45	30.55	4	9	17	26				304.00 GRAY-WHITE SANDY SILTY CLAY & SANDY CLAYEY SILT / Boring Terminated at Elevation 304.00 m V. STIFF CLAYEY SANDY SILTY CLAY
303										313.00
302										22.00
301										31.00
300										
299										
298										
297										
296										
295										

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PROJECT NO. 34380.1.1	**ID.** R-2201	**COUNTY** FORSYTH	**GEOLOGIST** Stickney, J. K.
SITE DESCRIPTION BRIDGE 347 OVER US 52 ON SR 1611-SR 1112			**GROUND WTR (m)**
BORING NO. EB2-C	**STATION** 22+68.9	**OFFSET** 1.0m LT	**ALIGNMENT** -L- / **0 HR.** N/A
COLLAR ELEV. 336.10 m	**TOTAL DEPTH** 32.32 m	**NORTHING** 279,361.7	**EASTING** 486,963.9 / **24 HR.** 11.60
DRILL MACHINE CME-550X	**DRILL METHOD** NW Casing w/ SPT		**HAMMER TYPE** Automatic
START DATE 04/09/08	**COMP. DATE** 04/09/08	**SURFACE WATER DEPTH** N/A	**DEPTH TO ROCK** N/A

ELEV (m)	DRIVE ELEV (m)	DEPTH (m)	BLOW COUNT 15cm	15cm	15cm	BLOWS PER 30 CM 0 25 50 75 100	SAMP. NO.	MOI	LOG	SOIL AND ROCK DESCRIPTION ELEV. (m)	DEPTH (m)
	337									336.10 GROUND SURFACE	0.00
336										**ROADWAY EMBANKMENT** RED-PURPLE MICACEOUS CLAYEY SANDY SILT	
335											
	334.67	1.43									
334			1	2	3	5					
333	333.15	2.95									
			2	4	4	8					
332	331.63	4.47									
331			1	3	4	7					
	330.11	5.99									
330			1	3	6	9					
329	328.59	7.51									
			2	3	4	7					
328	327.07	9.03									
327			2	3	5	8					
326	325.55	10.55									
			2	2	4	6					
325	324.03	12.07									
324			1	2	3	5					
323	322.51	13.59									
			1	2	3	5					
322	320.99	15.11									
321			1	2	4	6					
320	319.47	16.63								329.66	6.44
			2	4	5	9				**RESIDUAL** RED-PURPLE MICACEOUS SILTY SANDY CLAY	
319	317.95	18.15									
318			3	4	6	10					
317											
316											
315											
314											
313											
312											
311											
310											
309											
308											
307											
306											
305											
304											
303											
302											
301											
300											
299											
298											
297										320.10 TAN TO GRAY-WHITE CLAYEY SANDY SILT	16.00

PROJECT NO. 34380.1.1	**ID.** R-2201	**COUNTY** FORSYTH	**GEOLOGIST** Stickney, J. K.
SITE DESCRIPTION BRIDGE 347 OVER US 52 ON SR 1611-SR 1112			**GROUND WTR (m)**
BORING NO. EB2-C	**STATION** 22+68.9	**OFFSET** 1.0m LT	**ALIGNMENT** -L- / **0 HR.** N/A
COLLAR ELEV. 336.10 m	**TOTAL DEPTH** 32.32 m	**NORTHING** 279,361.7	**EASTING** 486,963.9 / **24 HR.** 11.60
DRILL MACHINE CME-550X	**DRILL METHOD** NW Casing w/ SPT		**HAMMER TYPE** Automatic
START DATE 04/09/08	**COMP. DATE** 04/09/08	**SURFACE WATER DEPTH** N/A	**DEPTH TO ROCK** N/A

ELEV (m)	DRIVE ELEV (m)	DEPTH (m)	BLOW COUNT 15cm	15cm	15cm	BLOWS PER 30 CM 0 25 50 75 100	SAMP. NO.	MOI	LOG	SOIL AND ROCK DESCRIPTION
	317					Match Line				
	316.43	19.67								TAN TO GRAY-WHITE CLAYEY SANDY SILT *(continued)*
316			2	4	5	9				
315	314.91	21.19								
			2	5	6	11				
314	313.35	22.75								
313			3	4	7	11				
312	311.83	24.27								
			4	4	8	12				
311	310.31	25.79								
310			3	5	6	11				
309	308.79	27.31								
			5	9	13	22				
308	307.27	28.83								
307			4	7	14	21				
306	305.75	30.35								
			5	8	12	20				
305	304.23	31.87								
304			6	7	9	16				303.78 Boring Terminated at Elevation 303.78 m V. STIFF CLAYEY SANDY SILT 32.32
303										
302										
301										
300										
299										
298										
297										

SOIL TEST RESULTS

SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT				% PASSING (SIEVES)			% MOISTURE	% ORGANIC
							C.SAND	F.SAND	SILT	CLAY	10	40	200		
SS-1	12.4 LT	22+72	1.2-1.5	A-5(2)	50	10	19.1	42.2	22.4	16.2	94	86	41	-	-
SS-2	12.4 LT	22+72	2.5-2.8	A-2-4(0)	23	10	19.1	48.5	10.1	22.3	95	81	35	-	-
SS-3	12.4 LT	22+72	4.1-4.4	A-7-5(25)	73	39	17.1	18.9	9.2	54.8	98	90	65	-	-
SS-4	12.4 LT	22+72	5.6-5.9	A-7-5(14)	70	21	11.2	33.1	21.2	34.5	100	97	61	-	-
SS-5	12.4 LT	22+72	7.1-7.4	A-7-5(5)	63	13	16.6	40.4	24.7	18.3	100	94	48	-	-
SS-6	12.4 LT	22+72	16.2-16.5	A-5(3)	49	7	10.2	42.8	32.8	14.2	100	96	54	-	-
SS-7	14.4 RT.	22+59	2.4-2.7	A-7-6(14)	54	27	19.3	21.7	16.3	42.6	95	86	58	-	-
SS-8	14.4 RT	22+59	15.5-15.8	A-7-5(9)	58	13	19.9	20.5	37.3	22.3	95	83	61	-	-
SS-9	14.3 RT	21+97	4.7-5.0	A-2-5(0)	57	NP	28.7	49.4	13.6	8.2	84	70	23	-	-
SS-10	14.3 RT	21+97	15.3-15.6	A-2-5(0)	49	NP	34.3	46.2	15.5	4.1	98	82	24	-	-
SS-11	14.3 RT	21+97	21.4-21.7	A-2-7(0)	48	11	15.4	53.1	17.1	14.4	91	83	34	-	-
SS-12	1.2 LT	21+92	1.2-1.5	A-7-5(5)	53	16	19.5	38.6	19.4	22.6	99	90	47	-	-
SS-13	1.2 LT	21+92	5.8-6.1	A-2-5(0)	54	NP	24.2	55.0	12.6	8.2	100	94	26	-	-
SS-14	1.2 LT	21+92	11.8-12.1	A-2-5(0)	51	NP	44.7	37.5	13.6	4.1	97	68	22	-	-
SS-15	14.3 RT	22+22.9	1.6-1.9	A-5(1)	57	7	15.0	49.2	19.4	16.4	100	97	42	-	-
SS-16	14.3 RT	22+22.9	7.6-7.9	A-5(0)	42	NP	3.5	67.9	22.5	6.2	100	99	37	-	-