STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	34783.1.1	1	16

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

STRUCTURE SUBSURFACE INVESTIGATION

PROJ. REFERENCE NO. *34783.1.1* F.A. PROJ. *MA-STP 7533(2)*

COUNTY *CALDWELL*

PROJECT DESCRIPTION *SR-1001 (CONNELLY SPRINGS ROAD) FROM US-321A (NORWOOD STREET) TO SR-1712 (STARCROSS ROAD)*

SITE DESCRIPTION *BRIDGE NO. 51 ON SR 1001 (CONNELLY SPRINGS RD.) OVER US-321 BETWEEN US-321A AND SR-1712*

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CAUTION NOTICE

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PERSONNEL

MM HAGER

DO CHEEK

GK ROSE

INVESTIGATED BY *PQ LOCKAMY*

CHECKED BY *WD FRYE*

SUBMITTED BY *WD FRYE*

DATE *06-03-08*

NORTH CAROLINA LICENSED SEAL 1907 GEOLOGIST Patrick Q. Lockamy

P. Q. Lockamy

6-3-8

PROJECT: 34783.1.1

ID: U-221B

DRAWN BY: *PQ LOCKAMY*

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PROJECT REFERENCE NO.	SHEET NO.
34783.1.1	2/16

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS
GEOTECHNICAL ENGINEERING UNIT

SUBSURFACE INVESTIGATION

SOIL AND ROCK LEGEND, TERMS, SYMBOLS, AND ABBREVIATIONS

SOIL DESCRIPTION

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

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

SOIL LEGEND AND AASHTO CLASSIFICATION

GENERAL CLASS.	GRANULAR MATERIALS (≤ 35% PASSING #200)							SILT-CLAY MATERIALS (> 35% PASSING #200)				ORGANIC MATERIALS		
GROUP CLASS.	A-1		A-3	A-2				A-4	A-5	A-6	A-7	A-1, A-2 A-3	A-4, A-5 A-6, A-7	
	A-1-a	A-1-b		A-2-4	A-2-5	A-2-6	A-2-7				A-7-5 A-7-6			
SYMBOL														
% PASSING #10	50 MX													
#40	30 MX	50 MX	51 MN									GRANULAR SOILS	SILT-CLAY SOILS	MUCK, PEAT
#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 (TONS/FT²)
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 0.50
	MEDIUM STIFF	4 TO 8	0.5 TO 1.0
	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	2.00	0.42	0.25	0.075	0.053

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

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

SOIL MOISTURE - CORRELATION OF TERMS

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

PLASTICITY

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

COLOR

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

GRADATION

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

ANGULARITY OF GRAINS

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

MINERALOGICAL COMPOSITION

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

COMPRESSIBILITY

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

PERCENTAGE OF MATERIAL

ORGANIC MATERIAL	GRANULAR SOILS	SILT - CLAY SOILS	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
- 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
- [ ] 6" CONTINUOUS FLIGHT AUGER
- [X] 8" HOLLOW AUGERS
- [ ] HARD FACED FINGER BITS
- [ ] TUNG.-CARBIDE INSERTS
- [ ] CASING [ ] W/ ADVANCER
- [ ] TRICONE _____" STEEL TEETH
- [ ] TRICONE _____" TUNG.-CARB.
- [ ] CORE BIT
- [ ] _____

HAMMER TYPE:
- [ ] AUTOMATIC [ ] MANUAL

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

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

ROCK DESCRIPTION

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

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

WEATHERING

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

ROCK HARDNESS

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

FRACTURE SPACING

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

BEDDING

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

INDURATION

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

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

TERMS AND DEFINITIONS

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

AQUIFER - A WATER BEARING FORMATION OR STRATA.

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

BENCH MARK: BL-12 218.12 LEFT -L- STA 32+90.60

ELEVATION: 1306.55 FT.

NOTES:

REVISED 02/23/06

BRIDGE ON -L- (SR 1001 - CONNELY SPRINGS ROAD)
NEW ALIGNMENT OVER -Y5- (US 321)
BETWEEN US321A AND SR 1712
REPLACES BRIDGE No. 51

PROJECT REFERENCE NO.	SHEET
U-2211B	3/16

PLAN VIEW

0 50 100
FEET

-BL-13 31+86.37 PINC =
-L- STA. 35+52.72, 228.13' LT

SKEW AT EB1= 91° 42' 46"
SKEW AT B1 = 88° 44' 43"
SKEW AT EB2 = 85° 38' 04"

-BL-12 28+94.30 PINC =
-L- STA.32+90.60
OFFSET 218.12' LT.

-Y5-

-L- POC Sta. 33+87.18 =
-Y5- POC Sta. 25+25.29

EB1-A
33+00
40 Lt
L

B1-A
33+19
40 Lt

EB2-A
34+94
40LT
L

-L- POC Sta. 36+00

-L-

EB1-C
32+86
CL
L

BKC
33+78.5
CL
L

EB2-C
35+00
CL
L

EB1-B
32+88
44 Rt
L

B1-B
33+82
40 Rt
L

EB2-B
34+88
40 Rt
L

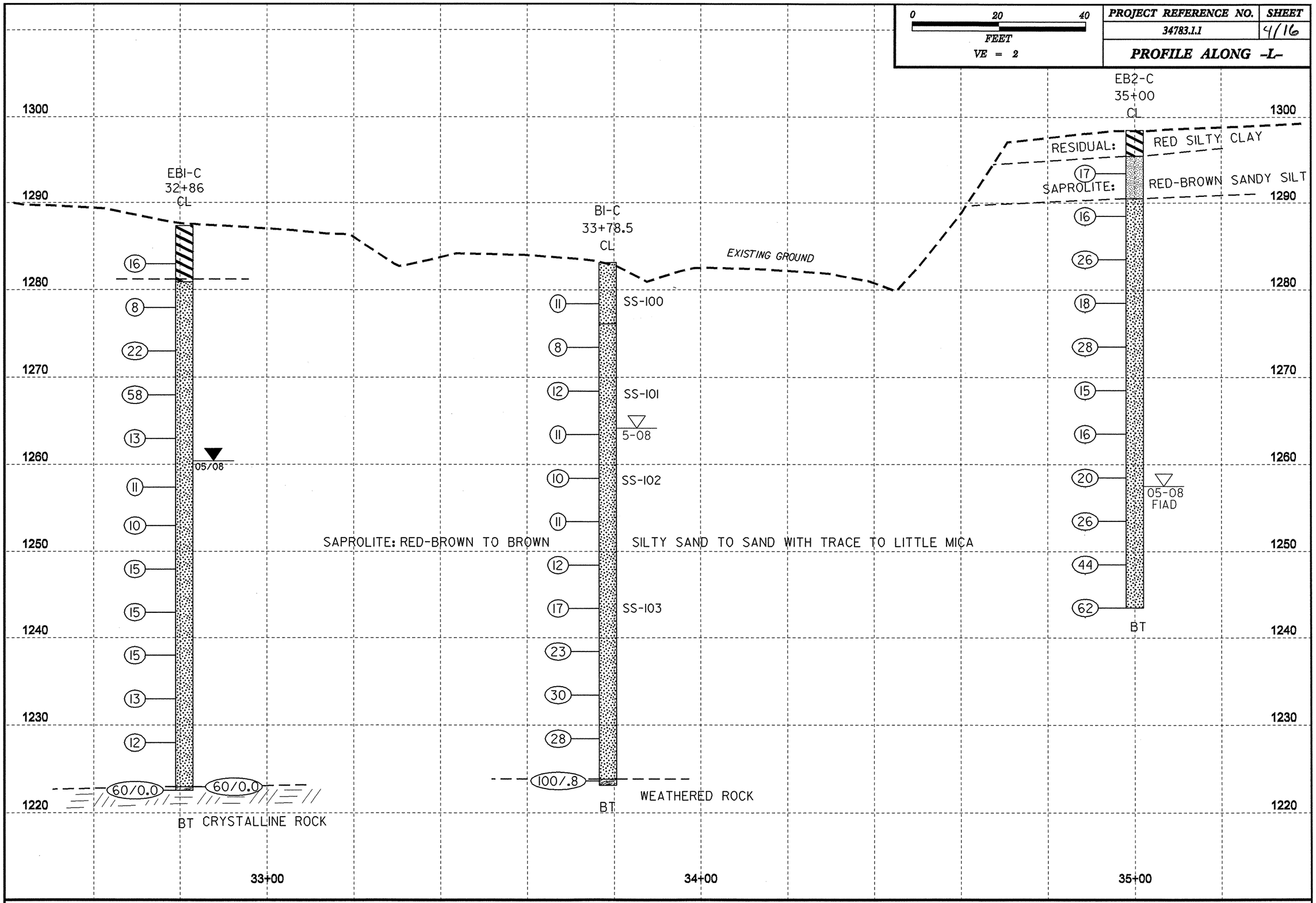
PT Sta. 25+60.87 -Y5-

-Y5-

0	20	40
FEET		
VE = 2		

PROJECT REFERENCE NO.	SHEET
34783.1.1	4/16

PROFILE ALONG -L-



0	10	20
FEET		
VE = 1		

PROJECT REFERENCE NO.	SHEET
34783.1.1	5/16

SECTION THRU EBI ON SKEW OF 91° 42' 46"

EBI-A
33+00
40 LT

EBI-C
32+86
CL

EBI-B
32+88
44 RT

EXISTING GROUND

RESIDUAL: RED-BROWN SILTY CLAY

SAPROLITE: RED BROWN SAND W/ TRACE MICA

WEATHERED ROCK

CRYSTALLINE ROCK - GNEISS

SS-24

SS-25

SS-26

11/07

05/08

05/08

BT

BT

BT

1290
1280
1270
1260
1250
1240
1230
1220

60 50 40 30 20 10 0 10 20 30 40 50 60

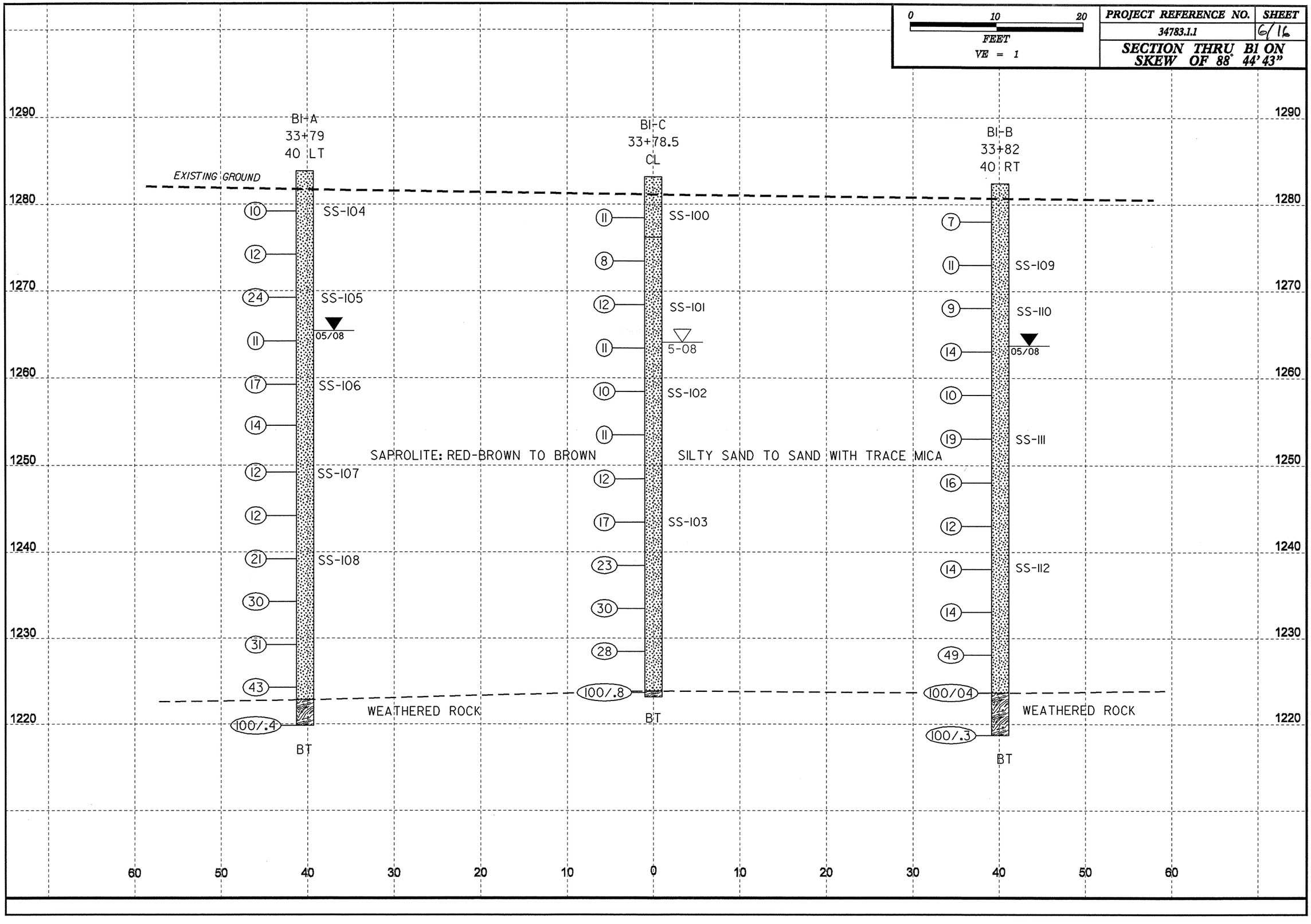
0	10	20

FEET

VE = 1

PROJECT REFERENCE NO.	SHEET
34783.1.1	6/16

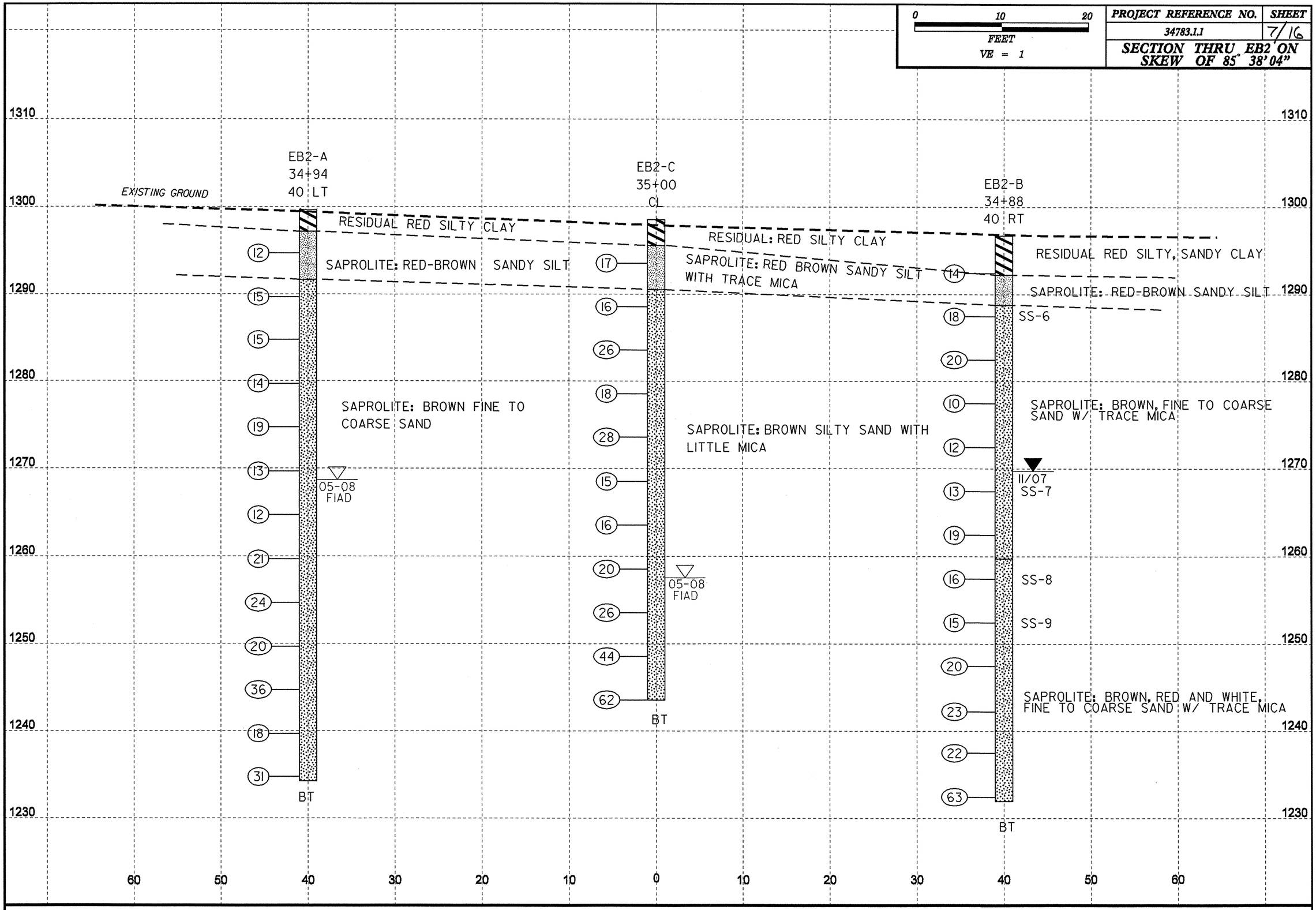
SECTION THRU B1 ON SKEW OF 88° 44' 43"



0	10	20
FEET		
VE = 1		

PROJECT REFERENCE NO.	SHEET
34783.1.1	7/16

SECTION THRU EB2 ON SKEW OF 85° 38' 04"



NCDOT GEOTECHNICAL ENGINEERING UNIT
BORELOG REPORT

PROJECT NO. 34783.1.1	**ID.** U-2211B	**COUNTY** Caldwell	**GEOLOGIST** Hager, M. M.	
SITE DESCRIPTION BRIDGE NO. 51 ON SR-1001 (HIBRITEN RD.) US-321				**GROUND WTR (ft)**
BORING NO. EB1-A	**STATION** 33+00	**OFFSET** 40ft LT	**ALIGNMENT** -L-	**0 HR.** N/A
COLLAR ELEV. 1,289.6 ft	**TOTAL DEPTH** 60.6 ft	**NORTHING** 788,368	**EASTING** 1,253,730	**24 HR.** 26.5
DRILL MACHINE CME-550X	**DRILL METHOD** H.S. Augers		**HAMMER TYPE** Automatic	
START DATE 11/27/07	**COMP. DATE** 11/27/07	**SURFACE WATER DEPTH** N/A	**DEPTH TO ROCK** N/A	

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
1290									1,289.6 GROUND SURFACE 0.0
									RESIDUAL RED BROWN SILTY CLAY
1,285.5	4.1	6	8	10	18	SS-24			
1,282.6	7.0								SAPROLITE: RED BROWN SAND WITH TRACE MICA
1,280.5	9.1	3	8	12	20				
1,275.5	14.1	7	10	10	20	SS-25			
1,270.5	19.1	3	5	8	13				
1,265.5	24.1	3	5	8	13				
1,260.5	29.1	5	7	9	16				
1,255.5	34.1	5	7	9	16	SS-26			
1,250.5	39.1	4	17	24	41				
1,245.5	44.1	1	4	7	11				
1,240.5	49.1	3	4	6	10				
1,235.5	54.1	3	7	15	22				
1,230.5	59.1	9	15	14	29				
1,229.0	60.6								Boring Terminated at Elevation 1,229.0 ft IN MEDIUM DENSE SAPROLITIC SAND

NCDOT BORE SINGLE U2211B_GEO_BRDG_L.GPJ NC_DOT.GDT 5/23/08

NCDOT GEOTECHNICAL ENGINEERING UNIT
BORELOG REPORT

PROJECT NO. 34783.1.1	**ID.** U-2211B	**COUNTY** Caldwell	**GEOLOGIST** Hager, M. M.	
SITE DESCRIPTION BRIDGE NO. 51 ON SR-1001 (HIBRITEN RD.) US-321				**GROUND WTR (ft)**
BORING NO. EB1-C	**STATION** 32+86	**OFFSET** CL	**ALIGNMENT** -L-	**0 HR.** N/A
COLLAR ELEV. 1,287.4 ft	**TOTAL DEPTH** 64.8 ft	**NORTHING** 788,326	**EASTING** 1,253,735	**24 HR.** 27.0
DRILL MACHINE CME-550X	**DRILL METHOD** H.S. Augers		**HAMMER TYPE** Automatic	
START DATE 05/07/08	**COMP. DATE** 05/07/08	**SURFACE WATER DEPTH** N/A	**DEPTH TO ROCK** 64.4 ft	

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
1290									1,287.4 GROUND SURFACE 0.0
									RESIDUAL: RED-BROWN SILTY CLAY
1,284.0	3.4				1				
1,280.9	6.5								SAPROLITE: RED BROWN SAND W/ TRACE MICA
1,279.0	8.4	4	8	8	16				
1,274.0	13.4	3	4	4	8				
1,269.0	18.4	4	8	14	22				
1,264.0	23.4	15	27	31	58				
1,259.0	28.4	1	6	7	13				
1,254.0	33.4	5	7	4	11				
1,249.0	38.4	1	4	6	10				
1,244.0	43.4	3	6	9	15				
1,239.0	48.4	4	6	9	15				
1,234.0	53.4	4	5	10	15				
1,229.0	58.4	4	5	8	13				
1,224.0	63.4	2	5	7	12				
1,222.6	64.8	11	15	60/0.0	60/0.0				
1,223.0	64.4								CRYSTALLINE ROCK - GNEISS 64.8
1,222.6	64.8								Boring Terminated by Auger Refusal at Elevation 1,222.6 ft IN CRYSTALLINE ROCK

NCDOT BORE SINGLE U2211B_GEO_BRDG_L.GPJ NC_DOT.GDT 5/23/08

NCDOT GEOTECHNICAL ENGINEERING UNIT
BOREHOLE REPORT

PROJECT NO. 34783.1.1	**ID.** U-2211B	**COUNTY** Caldwell		**GEOLOGIST** Hager, M. M.
SITE DESCRIPTION BRIDGE NO. 51 ON SR-1001 (HIBRITEN RD.) US-321				**GROUND WTR (ft)**
BORING NO. EB1-B	**STATION** 32+88	**OFFSET** 44ft RT	**ALIGNMENT** -L-	**0 HR.** N/A
COLLAR ELEV. 1,285.4 ft	**TOTAL DEPTH** 62.1 ft	**NORTHING** 788,287	**EASTING** 1,253,757	**24 HR.** 23.7
DRILL MACHINE CME-550X	**DRILL METHOD** H.S. Augers		**HAMMER TYPE** Automatic	
START DATE 05/06/08	**COMP. DATE** 05/06/08	**SURFACE WATER DEPTH** N/A	**DEPTH TO ROCK** N/A	

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)
1290									
									1,285.4 GROUND SURFACE 0.0
									RESIDUAL RED BROWN SILTY CLAY
1,282.0	3.4	4	6	9	15				
									1,278.5 6.9
1,277.0	8.4	2	4	4	8				SAPROLITE: RED-BROWN SAND WITH TRACE MICA
1,272.0	13.4	2	3	4	7				
1,267.0	18.4	2	3	6	9				
1,262.0	23.4	2	6	7	13				
1,257.0	28.4	3	6	7	13				
1,252.0	33.4	2	5	8	13				
1,247.0	38.4	3	5	9	14				
1,242.1	43.3	3	12	9	21				
1,237.1	48.3	2	4	5	9				
1,232.1	53.3	2	8	10	18				
1,227.1	58.3	15	18	28	46				
1,224.8	60.6								
1,223.4	62.0	60/0.1							1,223.4 WEATHERED ROCK 62.0
									Boring Terminated with Standard Penetration Test Refusal at Elevation 1,223.3 ft ON CRYSTALLINE ROCK

NCDOT BORE SINGLE U2211B_GEO_BRDG_L.GPJ NC_DOT.GDT 5/23/08

NCDOT GEOTECHNICAL ENGINEERING UNIT
BORELOG REPORT

PROJECT NO. 34783.1.1	**ID.** U-2211B	**COUNTY** Caldwell	**GEOLOGIST** Hager, M. M.
SITE DESCRIPTION BRIDGE NO. 51 ON SR-1001 (HIBRITEN RD.) US-321			**GROUND WTR (ft)**
BORING NO. B1-A	**STATION** 33+79	**OFFSET** 40ft LT	**ALIGNMENT** -L- — **0 HR.** 19.4
COLLAR ELEV. 1,283.8 ft	**TOTAL DEPTH** 64.0 ft	**NORTHING** 788,403	**EASTING** 1,253,801 — **24 HR.** 18.4
DRILL MACHINE CME-550X	**DRILL METHOD** H.S. Augers		**HAMMER TYPE** Automatic
START DATE 05/13/08	**COMP. DATE** 05/13/08	**SURFACE WATER DEPTH** N/A	**DEPTH TO ROCK** N/A

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
1285									1,283.8 GROUND SURFACE 0.0
									SAPROLITE: RED-BROWN TO BROWN SILTY SAND WITH TRACE MICA
1,280.2	3.6	2	4	6	10	SS-104			
1,275.2	8.6	7	6	6	12				
1,270.2	13.6	5	13	11	24	SS-105	▼		
1,265.2	18.6	2	5	6	11				
1,260.2	23.6	4	7	10	17	SS-106			
1,255.5	28.3	4	5	9	14				
1,250.2	33.6	2	5	7	12	SS-107			
1,245.2	38.6	4	5	7	12				
1,240.2	43.6	4	10	11	21	SS-108			
1,235.2	48.6	9	12	18	30				
1,230.2	53.6	8	11	20	31				
1,225.2	58.6	12	15	28	43				
1,222.8	61.0								WEATHERED ROCK
1,220.2	63.6	100/.4							1,219.8 64.0 Boring Terminated at Elevation 1,219.8 ft IN WEATHERED ROCK

NCDOT BORE SINGLE U2211B_GEO_BRDG_L.GPJ NC_DOT.GDT 5/23/08

NCDOT GEOTECHNICAL ENGINEERING UNIT
BORELOG REPORT

PROJECT NO. 34783.1.1	**ID.** U-2211B	**COUNTY** Caldwell	**GEOLOGIST** Hager, M. M.
SITE DESCRIPTION BRIDGE NO. 51 ON SR-1001 (HIBRITEN RD.) US-321			**GROUND WTR (ft)**
BORING NO. B1C	**STATION** 33+79	**OFFSET** CL	**ALIGNMENT** -L- — **0 HR.** 19.0 Dry
COLLAR ELEV. 1,283.1 ft	**TOTAL DEPTH** 60.0 ft	**NORTHING** 788,370	**EASTING** 1,253,826 — **24 HR.** N/A
DRILL MACHINE CME-550X	**DRILL METHOD** H.S. Augers		**HAMMER TYPE** Automatic
START DATE 05/12/08	**COMP. DATE** 05/12/08	**SURFACE WATER DEPTH** N/A	**DEPTH TO ROCK** N/A

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
1285									1,283.1 GROUND SURFACE 0.0
									SAPROLITE: RED-BROWN SILTY SAND W/ TRACE MICA
1,279.4	3.7								
1,274.4	8.7	2	3	8	11	SS-100			
1,269.4	13.7	2	4	4	8				1,276.1 7.0
1,264.4	18.7	2	6	6	12	SS-101	▽		SAPROLITE: BROWN SILTY SAND W/ TRACE MICA
1,259.4	23.7	2	5	6	11				
1,254.4	28.7	2	4	6	10	SS-102			
1,249.4	33.7	2	4	7	11				
1,244.4	38.7	2	5	7	12				
1,239.4	43.7	5	9	8	17	SS-103			
1,234.4	48.7	6	10	13	23				
1,229.4	53.7	6	12	18	30				
1,224.4	58.7	5	12	16	28				
		9	32	68/.03					1,223.8 59.3
									1,223.1 WEATHERED ROCK 60.0
									Boring Terminated at Elevation 1,223.1 ft IN WEATHERED ROCK

NCDOT BORE SINGLE U2211B_GEO_BRDG_L.GPJ NC_DOT.GDT 5/29/08

NCDOT GEOTECHNICAL ENGINEERING UNIT
BOREHOG REPORT

SHEET 11/16

PROJECT NO. 34783.1.1	**ID.** U-2211B	**COUNTY** Caldwell	**GEOLOGIST** Hager, M. M.	
SITE DESCRIPTION BRIDGE NO. 51 ON SR-1001 (HIBRITEN RD.) US-321				**GROUND WTR (ft)**
BORING NO. BI-B	**STATION** 33+82	**OFFSET** 40ft RT	**ALIGNMENT** -L-	**0 HR.** N/A
COLLAR ELEV. 1,282.4 ft	**TOTAL DEPTH** 63.7 ft	**NORTHING** 788,332	**EASTING** 1,253,839	**24 HR.** 18.7
DRILL MACHINE CME-550X	**DRILL METHOD** H.S. Augers		**HAMMER TYPE** Automatic	
START DATE 05/13/08	**COMP. DATE** 05/13/08	**SURFACE WATER DEPTH** N/A	**DEPTH TO ROCK** N/A	

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)
1285									1,282.4 GROUND SURFACE	0.0
1,279.0	3.4								SAPROLITE: RED-BROWN TO BROWN SAND WITH TRACE MICA	
1,274.0	8.4	2	3	4	7					
1,269.0	13.4	3	5	6	11	SS-109				
1,264.0	18.4	2	4	5	9	SS-110				
1,259.0	23.4	6	5	9	14		▼			
1,254.0	28.4	4	4	6	10					
1,249.0	33.4	4	6	13	19	SS-111				
1,244.0	38.4	4	7	9	16					
1,239.0	43.4	5	5	7	12					
1,234.0	48.4	4	7	7	14	SS-112				
1,229.0	53.4	4	6	8	14					
1,224.0	58.4	10	19	30	49				1,223.6 WEATHERED ROCK	58.8
1,219.0	63.4	100/04							1,218.7 Boring Terminated at Elevation 1,218.7 ft IN WEATHERED ROCK	63.7
		100/.3								

NCDOT BORE SINGLE U2211B_GEO_BRDG_L.GPJ NC_DOT.GDT 5/30/08

NCDOT GEOTECHNICAL ENGINEERING UNIT
BORELOG REPORT

PROJECT NO. 34783.1.1	**ID.** U-2211B	**COUNTY** Caldwell		**GEOLOGIST** Hager, M. M.
SITE DESCRIPTION BRIDGE NO. 51 ON SR-1001 (HIBRITEN RD.) US-321				**GROUND WTR (ft)**
BORING NO. EB2-A	**STATION** 34+94	**OFFSET** 40ft LT	**ALIGNMENT** -L-	**0 HR.** 31.0 FIAD
COLLAR ELEV. 1,299.7 ft	**TOTAL DEPTH** 65.5 ft	**NORTHING** 788,449	**EASTING** 1,253,909	**24 HR.** N/A
DRILL MACHINE CME-550X	**DRILL METHOD** H.S. Augers		**HAMMER TYPE** Automatic	
START DATE 05/08/08	**COMP. DATE** 05/08/08	**SURFACE WATER DEPTH** N/A	**DEPTH TO ROCK** N/A	

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)
1300									1,299.7 GROUND SURFACE	0.0
1,295.7	4.0								RESIDUAL RED SILTY CLAY	
1,290.7	9.0	2	6	6	12				1,297.2 SAPROLITE: RED-BROWN SANDY SILT	2.5
1,285.7	14.0	3	5	10	15				1,291.7 SAPROLITE: BROWN FINE TO COARSE SAND	8.0
1,280.7	19.0	6	10	5	15					
1,275.7	24.0	4	7	7	14					
1,270.7	29.0	8	10	9	19					
1,265.7	34.0	2	5	8	13					
1,260.7	39.0	WOH	6	6	12					
1,255.7	44.0	6	8	13	21					
1,250.7	49.0	6	12	12	24					
1,245.7	54.0	4	10	10	20					
1,240.7	59.0	16	16	20	36					
1,235.7	64.0	7	8	10	18					
		5	12	19	31				1,234.2 Boring Terminated at Elevation 1,234.2 ft IN DENSE SAPROLITIC SAND	65.5

NCDOT BORE SINGLE U2211B_GEO_BRDG_L.GPJ NC_DOT.GDT 5/23/08

NCDOT GEOTECHNICAL ENGINEERING UNIT
BORELOG REPORT

PROJECT NO. 34783.1.1	**ID.** U-2211B	**COUNTY** Caldwell		**GEOLOGIST** Hager, M. M.
SITE DESCRIPTION BRIDGE NO. 51 ON SR-1001 (HIBRITEN RD.) US-321				**GROUND WTR (ft)**
BORING NO. EB2-C	**STATION** 35+00	**OFFSET** CL	**ALIGNMENT** -L-	**0 HR.** 41.0 FIAD
COLLAR ELEV. 1,298.5 ft	**TOTAL DEPTH** 55.5 ft	**NORTHING** 788,414	**EASTING** 1,253,930	**24 HR.** N/A
DRILL MACHINE CME-550X	**DRILL METHOD** H.S. Augers		**HAMMER TYPE** Automatic	
START DATE 05/22/08	**COMP. DATE** 05/22/08	**SURFACE WATER DEPTH** N/A	**DEPTH TO ROCK** N/A	

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)
1300									1,298.5 GROUND SURFACE	0.0
1,294.5	4.0								RESIDUAL: RED SILTY CLAY	
1,289.5	9.0	3	7	10	17				1,295.5 SAPROLITE: RED BROWN SANDY SILT WITH TRACE MICA	3.0
1,284.5	14.0	5	7	9	16				1,290.5 SAPROLITE: BROWN SILTY SAND WITH LITTLE MICA	8.0
1,279.5	19.0	7	11	15	26					
1,274.5	24.0	7	9	9	18					
1,269.5	29.0	6	15	13	28					
1,264.5	34.0	5	6	9	15					
1,259.5	39.0	4	8	8	16					
1,254.5	44.0	6	10	10	20					
1,249.5	49.0	6	12	14	26					
1,244.5	54.0	10	20	24	44					
		10	34	28	62				1,243.5 Boring Terminated at Elevation 1,243.0 ft IN VERY DENSE SAPROLITIC SAND WITH LITTLE MICA	55.0

NCDOT BORE SINGLE U2211B_GEO_BRDG_L.GPJ NC_DOT.GDT 5/23/08

NCDOT GEOTECHNICAL ENGINEERING UNIT
BORELOG REPORT

PROJECT NO. 34783.1.1	**ID.** U-2211B	**COUNTY** Caldwell		**GEOLOGIST** Hager, M. M.
SITE DESCRIPTION BRIDGE NO. 51 ON SR-1001 (HIBRITEN RD.) US-321				**GROUND WTR (ft)**
BORING NO. EB2-B	**STATION** 34+88	**OFFSET** 40ft RT	**ALIGNMENT** -L-	**0 HR.** N/A
COLLAR ELEV. 1,296.7 ft	**TOTAL DEPTH** 64.8 ft	**NORTHING** 788,373	**EASTING** 1,253,933	**24 HR.** 27.0
DRILL MACHINE CME-550X	**DRILL METHOD** H.S. Augers		**HAMMER TYPE** Automatic	
START DATE 10/31/07	**COMP. DATE** 10/31/07	**SURFACE WATER DEPTH** N/A	**DEPTH TO ROCK** N/A	

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
1300									ELEV. (ft) DEPTH (ft)
1,296.7	0.0								GROUND SURFACE
1,293.4	3.3								RESIDUAL RED SILTY, SANDY CLAY
		4	6	8	14				
1,292.2	4.5								SAPROLITE: RED-BROWN SANDY SILT
1,288.4	8.3								
		7	10	8	18	SS-6			
1,288.7	8.0								SAPROLITE: BROWN, FINE TO COARSE SAND W/ TRACE MICA
1,283.4	13.3								
		9	11	9	20				
1,278.4	18.3								
		4	4	6	10				
1,273.4	23.3								
		3	5	7	12				
1,268.4	28.3								
		5	6	7	13	SS-7			
1,263.4	33.3								
		1	8	11	19				
1,259.7	37.0								SAPROLITE: BROWN, RED AND WHITE, FINE TO COARSE SAND W/ TRACE MICA
1,258.4	38.3								
		4	8	8	16	SS-8			
1,253.4	43.3								
		4	4	11	15	SS-9			
1,248.4	48.3								
		3	8	12	20				
1,243.2	53.5								
		5	11	12	23				
1,238.4	58.3								
		12	11	11	22				
1,233.4	63.3								
		11	15	48	63				
1,231.9	64.8								Boring Terminated at Elevation 1,231.9 ft IN VERY DENSE SAPROLITIC FINE TO COARSE SAND

NCDOT BORE SINGLE U2211B_GEO_BRDG_L.GPJ NC_DOT.GDT 5/23/08

JCS

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS-MATERIALS AND TESTS UNIT
SOILS TEST REPORT-SOILS LABORATORY

T.I.P. ID #:	--

REPORT ON SAMPLES OF:	Soils for Quality

PROJECT:	U2211B	COUNTY:	Caldwell	Owner:	NCDOT
DATE SAMPLED:	11.07	DATE RECEIVED:	11.9.07	DATE REPORTED:	11.14.07
SAMPLED FROM:	-Y5-	SAMPLED BY:	P. Q. Lockamy		
SUBMITTED BY:	W. D. Frye	2002	STANDARD SPECIFICATION		
LABORATORY:	Asheville				

TEST RESULTS

Project Sample No.							SS-6	SS-7
Lab Sample No. A							156553	156554
HiCAMS Sample #							--	--
Retained #4 Sieve %							0.0	0.0
Passing #10 Sieve %							97	96
Passing #40 Sieve %							83	74
Passing #200 Sieve %							25	23

MINUS #10 FRACTION

Soil Mortar - 100%								
Coarse Sand -Ret. #60							30	40
Fine Sand - Ret. #270							52	44
Silt 0.05-0.005 mm %							10	6
Clay < 0.005 mm %							8	10
Passing # 40 Sieve %	--	--	--	--	--	--	--	--
Passing # 200 Sieve %	--	--	--	--	--	--	--	--

Liquid Limit							37	40
Plastic Index							NP	NP
AASHTO Classification							A-2-4 (0)	A-2-4 (0)
Quantity								
Line							-L-	-L-
Station							34+88	34+88
Offset							40 Rt	40 Rt
Depth (ft) From:							8.8	28.8
To:							9.8	29.8

Remarks:

A-156547 - 156554

CC:

P. Q. Lockamy	
File	

SOILS ENGINEER:	

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NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS-MATERIALS AND TESTS UNIT
SOILS TEST REPORT-SOILS LABORATORY

T.I.P. ID #:	--

REPORT ON SAMPLES OF:	Soils for Quality

PROJECT:	U2211B	COUNTY:	Caldwell	Owner:	NCDOT
DATE SAMPLED:	11.07	DATE RECEIVED:	11.9.07	DATE REPORTED:	11.14.07
SAMPLED FROM:	-L-	SAMPLED BY:	P. Q. Lockamy		
SUBMITTED BY:	W. D. Frye	2002	STANDARD SPECIFICATION		
LABORATORY:	Asheville				

TEST RESULTS

Project Sample No.	SS-8	SS-9						
Lab Sample No. A	156555	156556						
HiCAMS Sample #	--	--						
Retained #4 Sieve %	0.0	0.0						
Passing #10 Sieve %	86	95						
Passing #40 Sieve %	57	66						
Passing #200 Sieve %	26	17						

MINUS #10 FRACTION

Soil Mortar - 100%								
Coarse Sand -Ret. #60	46	49						
Fine Sand - Ret. #270	30	38						
Silt 0.05-0.005 mm %	16	5						
Clay < 0.005 mm %	8	8						
Passing # 40 Sieve %	--	--	--	--	--	--	--	--
Passing # 200 Sieve %	--	--	--	--	--	--	--	--

Liquid Limit	42	47						
Plastic Index	NP	NP						
AASHTO Classification	A-2-5 (0)	A-2-5 (0)						
Quantity								
Line	-L-	-L-						
Station	34+88	34+88						
Offset.	40 Rt	40 Rt						
Depth (ft) From:	38.8	43.8						
To:	39.8	43.8						

Remarks:

A-156555 - 156562

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NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS-MATERIALS AND TESTS UNIT
SOILS TEST REPORT-SOILS LABORATORY

T.I.P. ID #:	U-2211B

REPORT ON SAMPLES OF:	Soils for Quality

PROJECT:	34783.1.1	COUNTY:	Caldwell	Owner:	NCDOT
DATE SAMPLED:	11.07	DATE RECEIVED:	12.3.07	DATE REPORTED:	12.6.07
SAMPLED FROM:	- L -	SAMPLED BY:	P. Q. Lockamy		
SUBMITTED BY:	W. D. Frye		2002	STANDARD SPECIFICATION	
LABORATORY:	Asheville				

TEST RESULTS

Project Sample No.	SS-24	SS-25	SS-26					
Lab Sample No. A	156699	156700	156701					
HiCAMS Sample #	--	--	--					
Retained #4 Sieve %	0.0	0.0	0.0					
Passing #10 Sieve %	99	89	97					
Passing #40 Sieve %	80	64	84					
Passing #200 Sieve %	55	23	20					

MINUS #10 FRACTION

Soil Mortar - 100%								
Coarse Sand -Ret. #60	28	44	31					
Fine Sand - Ret. #270	19	37	56					
Silt 0.05-0.005 mm %	13	9	5					
Clay < 0.005 mm %	40	10	8					
Passing # 40 Sieve %	--	--	--	--	--	--	--	--
Passing # 200 Sieve %	--	--	--	--	--	--	--	--

Liquid Limit	57	43	42					
Plastic Index	16	NP	NP					
AASHTO Classification	A-7-5 (8)	A-2-5 (0)	A-2-5 (0)					
Quantity								
Line	-L-	-L-	-L-					
Station	33+00	33+00	33+00					
Offset	40 Lt	40 Lt	40 Lt					
Depth (ft) From:	4.6	14.6	34.6					
To:	5.6	15.6	35.6					

Remarks:

A-156699 - 156706

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DIVISION OF HIGHWAYS-MATERIALS AND TESTS UNIT
SOILS TEST REPORT-SOILS LABORATORY

T.I.P. ID #:	U-2211B

REPORT ON SAMPLES OF:	Soils for Quality

PROJECT:	34783.1.1	COUNTY:	Caldwell	Owner:	NCDOT
DATE SAMPLED:	5.12.08	DATE RECEIVED:	5.13.08	DATE REPORTED:	5.28.08
SAMPLED FROM:	B1-C	SAMPLED BY:	P. Q. Lockamy		
SUBMITTED BY:	W. D. Frye		2002	STANDARD SPECIFICATION	
LABORATORY:	Asheville				

TEST RESULTS

Project Sample No.	SS-100	SS-101	SS-102	SS-103				
Lab Sample No. A	157563	157564	157565	157566				
HiCAMS Sample #	--	--	--	--				
Retained #4 Sieve %	0.0	0.0	0.0	0.0				
Passing #10 Sieve %	98	92	99	90				
Passing #40 Sieve %	78	59	84	53				
Passing #200 Sieve %	30	26	27	23				

MINUS #10 FRACTION

Soil Mortar - 100%								
Coarse Sand -Ret. #60	39	48	30	54				
Fine Sand - Ret. #270	37	30	53	23				
Silt 0.05-0.005 mm %	8	10	7	9				
Clay < 0.005 mm %	16	12	10	14				
Passing # 40 Sieve %	--	--	--	--				
Passing # 200 Sieve %	--	--	--	--				

Liquid Limit	34	40	37	32				
Plastic Index	NP	NP	NP	NP				
AASHTO Classification	A-2-4 (0)	A-2-4 (0)	A-2-4 (0)	A-2-4 (0)				
Quantity								
Texture								
Station	33+79	33+79	33+79	33+79				
Hole No.								
Depth (ft) From:	4.2	14.2	24.2	39.2				
To:	5.2	15.2	25.2	40.2				

Remarks:

A-157563 - 157566

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NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS-MATERIALS AND TESTS UNIT
SOILS TEST REPORT-SOILS LABORATORY

T.I.P. ID #:	U-2211B

REPORT ON SAMPLES OF:	Soils for Quality

PROJECT:	34783.1.1	COUNTY:	Caldwell	Owner:	NCDOT
DATE SAMPLED:	5.13.08	DATE RECEIVED:	5.14.08	DATE REPORTED:	5.28.08
SAMPLED FROM:	B1-A	SAMPLED BY:	P. Q. Lockamy		
SUBMITTED BY:	W. D. Frye		2002	STANDARD SPECIFICATION	
LABORATORY:	Asheville				

TEST RESULTS

Project Sample No.	SS-104	SS-105	SS-106	SS-107	SS-108	SS-109	SS-110	SS-111
Lab Sample No. A	157588	157589	157590	157591	157592	157593	157594	157595
HiCAMS Sample #	--	--	--	--	--	--	--	--
Retained #4 Sieve %	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Passing #10 Sieve %	97	99	95	100	93	95	99	89
Passing #40 Sieve %	88	86	86	95	79	70	87	76
Passing #200 Sieve %	32	24	33	31	27	26	31	30

MINUS #10 FRACTION

Soil Mortar - 100%								
Coarse Sand -Ret. #60	21	33	22	17	30	41	26	28
Fine Sand - Ret. #270	56	51	53	61	48	38	51	48
Silt 0.05-0.005 mm %	13	8	17	18	16	13	15	18
Clay < 0.005 mm %	10	8	8	4	6	8	8	6
Passing # 40 Sieve %	--	--	--	--	--	--	--	--
Passing # 200 Sieve %	--	--	--	--	--	--	--	--

Liquid Limit	42	40	35	35	38	37	35	34
Plastic Index	NP	NP	NP	NP	NP	NP	NP	NP
AASHTO Classification	A-2-5 (0)	A-2-4 (0)	A-2-4 (0)	A-2-4 (0)	A-2-4 (0)	A-2-4 (0)	A-2-4 (0)	A-2-4 (0)
Quantity								
Texture								
Station	33+79	33+79	33+79	33+79	33+79	33+82	33+82	33+82
Hole No.								
Depth (ft) From:	4.1	14.1	24.1	34.1	44.1	8.9	13.9	28.9
To:	5.1	15.1	25.1	35.1	45.1	9.9	14.9	29.9

Remarks:

A-157588 - 157595

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DIVISION OF HIGHWAYS-MATERIALS AND TESTS UNIT
SOILS TEST REPORT-SOILS LABORATORY

T.I.P. ID #:	U-2211B

REPORT ON SAMPLES OF:	Soils for Quality

PROJECT:	34783.1.1 (cont.)	COUNTY:	Caldwell	Owner:	NCDOT
DATE SAMPLED:	5.13.08	DATE RECEIVED:	5.14.08	DATE REPORTED:	5.28.08
SAMPLED FROM:	B1-B	SAMPLED BY:	P. Q. Lockamy		
SUBMITTED BY:	W. D. Frye		2002	STANDARD SPECIFICATION	
LABORATORY:	Asheville				

TEST RESULTS

Project Sample No.	SS-112							
Lab Sample No. A	157596							
HiCAMS Sample #	--							
Retained #4 Sieve %	0.0							
Passing #10 Sieve %	96							
Passing #40 Sieve %	73							
Passing #200 Sieve %	16							

MINUS #10 FRACTION

Soil Mortar - 100%								
Coarse Sand -Ret. #60	46							
Fine Sand - Ret. #270	42							
Silt 0.05-0.005 mm %	6							
Clay < 0.005 mm %	6							
Passing # 40 Sieve %	--							
Passing # 200 Sieve %	--							

Liquid Limit	32							
Plastic Index	NP							
AASHTO Classification	A-2-4 (0)							
Quantity								
Texture								
Station	33+82							
Hole No.								
Depth (ft) From:	43.9							
To:	44.9							

Remarks:

A-157596

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