STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	33582.1.1	1	26

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

STRUCTURE SUBSURFACE INVESTIGATION

PROJ. REFERENCE NO. *33582.1.1 (B-4239)* F.A. PROJ. *BRZ-1102(1)*

COUNTY *POLK*

PROJECT DESCRIPTION *BRIDGE NO. 2 OVER NORTH PACOLET RIVER ON SR 1102 (PEARSON FALLS ROAD)*

SITE DESCRIPTION

ID: B-4239

PROJECT: 33582.1.1

CONTENTS

CAUTION NOTICE

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

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

THE BIDDER OR CONTRACTOR IS CAUTIONED THAT DETAILS SHOWN ON THE SUBSURFACE PLANS ARE PRELIMINARY ONLY AND IN MANY CASES THE FINAL DESIGN DETAILS ARE DIFFERENT. FOR BIDDING AND CONSTRUCTION PURPOSES, REFER TO THE CONSTRUCTION PLANS AND DOCUMENTS FOR FINAL DESIGN INFORMATION ON THIS PROJECT. THE DEPARTMENT DOES NOT WARRANT OR GUARANTEE THE SUFFICIENCY OR ACCURACY OF THE INVESTIGATION MADE, NOR THE INTERPRETATIONS MADE, OR OPINION OF THE DEPARTMENT AS TO THE TYPE OF MATERIALS AND CONDITIONS TO BE ENCOUNTERED. THE BIDDER OR CONTRACTOR IS CAUTIONED TO MAKE SUCH INDEPENDENT SUBSURFACE INVESTIGATIONS AS HE DEEMS NECESSARY TO SATISFY HIMSELF AS TO CONDITIONS TO BE ENCOUNTERED ON THIS PROJECT. THE CONTRACTOR SHALL HAVE NO CLAIM FOR ADDITIONAL COMPENSATION OR FOR AN EXTENSION OF TIME FOR ANY REASON RESULTING FROM THE ACTUAL CONDITIONS ENCOUNTERED AT THE SITE DIFFERING FROM THOSE INDICATED IN THE SUBSURFACE INFORMATION.

PERSONNEL

C. MURRAY

J. ESTEP

M.R. MOORE

INVESTIGATED BY *MURRAY*

CHECKED BY *LITTLE*

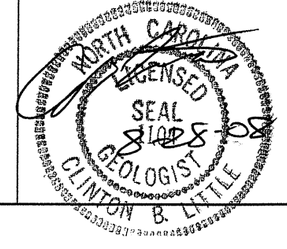
SUBMITTED BY *LITTLE*

DATE *AUGUST 2008*

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.



PROJECT REFERENCE NO.	SHEET NO.
33582.1.1 (B-4239)	2

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS
GEOTECHNICAL ENGINEERING UNIT

SUBSURFACE INVESTIGATION

SOIL AND ROCK LEGEND, TERMS, SYMBOLS, AND ABBREVIATIONS

SOIL DESCRIPTION

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

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

SOIL LEGEND AND AASHTO CLASSIFICATION

GENERAL CLASS.	GRANULAR MATERIALS (≤ 35% PASSING #200)							SILT-CLAY MATERIALS (> 35% PASSING #200)				ORGANIC MATERIALS		
GROUP CLASS.	A-1		A-3	A-2				A-4	A-5	A-6	A-7	A-1, A-2	A-4, A-5	
	A-1-a	A-1-b		A-2-4	A-2-5	A-2-6	A-2-7				A-7-5, A-7-6	A-3	A-6, A-7	
SYMBOL														
% PASSING #10	50 MX													
#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	GRANULAR SOILS	SILT-CLAY SOILS	MUCK, PEAT
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	0		4 MX		8 MX	12 MX	16 MX	No MX			
USUAL TYPES OF MAJOR MATERIALS	STONE FRAGS. GRAVEL, AND SAND		FINE SAND	SILTY OR CLAYEY GRAVEL AND SAND				SILTY SOILS		CLAYEY SOILS				
GEN. RATING AS A SUBGRADE	EXCELLENT TO GOOD							FAIR TO POOR				FAIR TO POOR	POOR	UNSUITABLE

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

CONSISTENCY OR DENSENESS

PRIMARY SOIL TYPE	COMPACTNESS OR CONSISTENCY	RANGE OF STANDARD PENETRATION RESISTENCE (N-VALUE)	RANGE OF UNCONFINED COMPRESSIVE STRENGTH ($TONS/FT^2$)
GENERALLY GRANULAR MATERIAL (NON-COHESIVE)	VERY LOOSE	<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
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
- [ ] 6" CONTINUOUS FLIGHT AUGER
- [X] 8" HOLLOW AUGERS
- [ ] HARD FACED FINGER BITS
- [ ] TUNG.-CARBIDE INSERTS
- [ ] NW CASING [X] W/ ADVANCER
- [ ] TRICONE __" STEEL TEETH
- [ ] TRICONE __" TUNG.-CARB.
- [X] CORE BIT
- [ ] _____

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

CORE SIZE:
- [ ] -B__
- [X] -N XWL
- [ ] -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: BM-2 -BL STATION 8+73 15' RT.

ELEVATION: 1671.93' FT.

NOTES:
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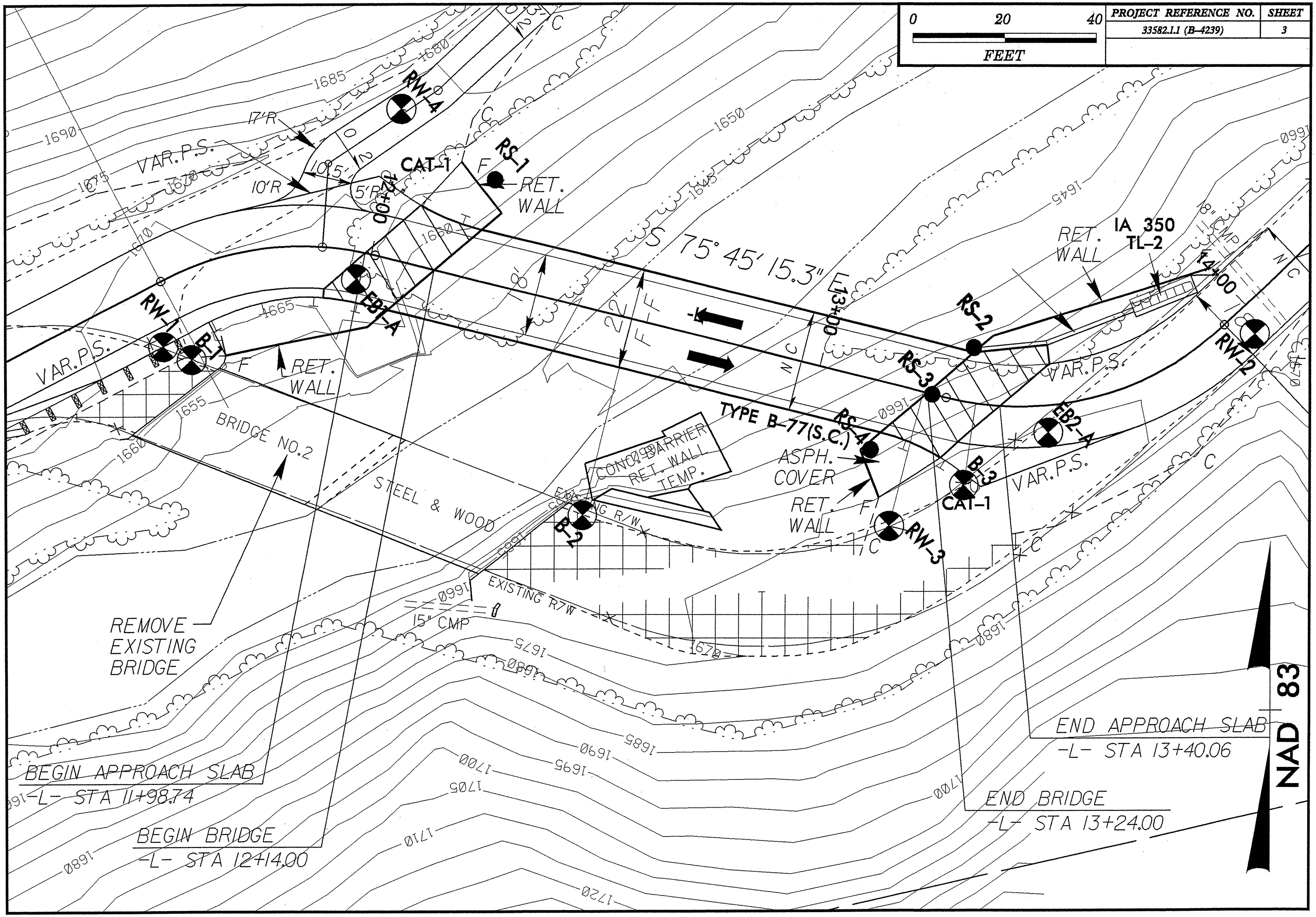
REVISED 02/23/06

PROJECT REFERENCE NO.	SHEET
33582.1.1 (B-4239)	3



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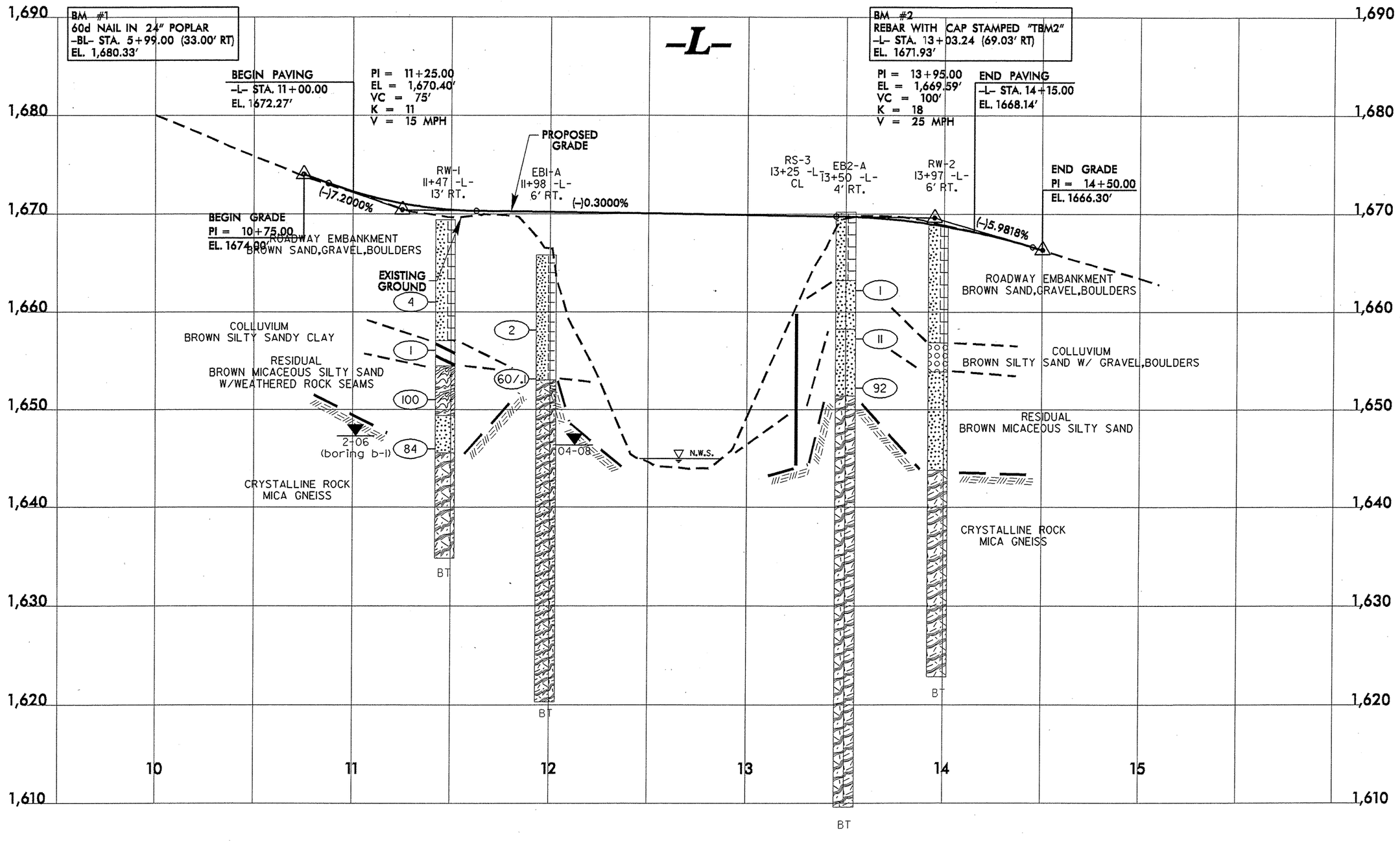
RW-2
RW-3
B-1
B-2
B-3
EB1-A
EB2-A
RS-1
RS-2
RS-3
RS-4
CAT-1
CAT-1
RET. WALL
RET. WALL
RET. WALL
RET. WALL
IA 350
TL-2
S 75° 45' 15.3" E
12+00
13+00
14+00
VAR. P.S.
VAR. P.S.
VAR. P.S.
VAR. P.S.
17'R
10'R
10.5'
5'R
18'
22' F-F
TYPE B-77(S.C.)
CONC. BARRIER
RET. WALL
TEMP.
ASPH.
COVER
8" CMP
15" CMP
BRIDGE NO.2
STEEL & WOOD
EXISTING R/W
REMOVE
EXISTING
BRIDGE
BEGIN APPROACH SLAB
-L- STA 11+98.74
BEGIN BRIDGE
-L- STA 12+14.00
END APPROACH SLAB
-L- STA 13+40.06
END BRIDGE
-L- STA 13+24.00
NAD 83

0	50	100
FEET		
VE = 5		

PROJECT REFERENCE NO.	SHEET
33582.1.1 (B-4239)	4

-L- PROFILE



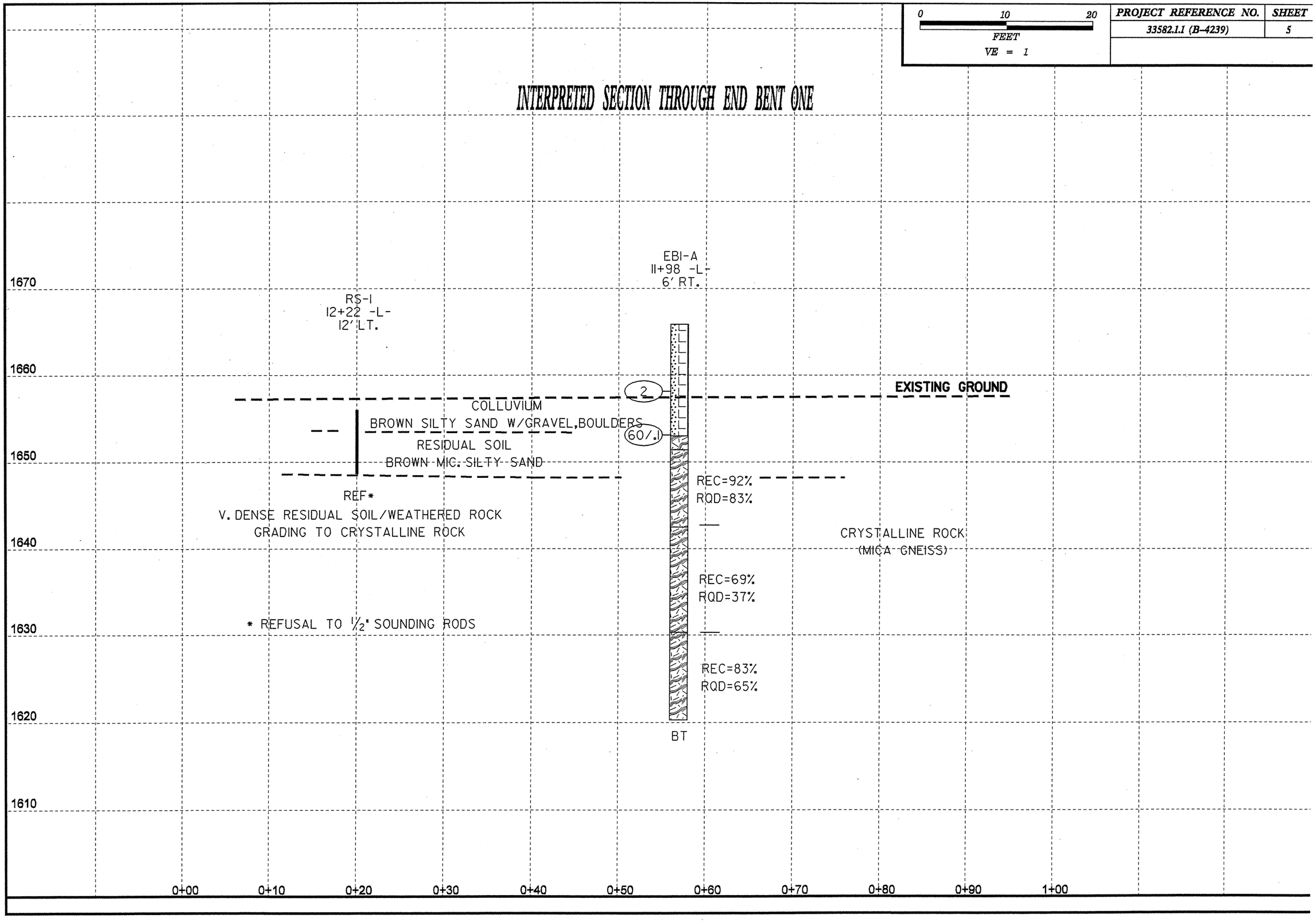
0	10	20

FEET

VE = 1

PROJECT REFERENCE NO.	SHEET
33582.1.1 (B-4239)	5

INTERPRETED SECTION THROUGH END BENT ONE



0	10	20

FEET

VE = 1

PROJECT REFERENCE NO.	SHEET
33582.1.1 (B-4239)	6

INTERPRETED SECTION THROUGH END BENT TWO

RS-2
13+32 -L-
12' LT.

RS-3
13+25 -L-
CL

RS-4
13+15 -L-
12' RT.

ROADWAY EMBANKMENT &/OR COLLUVIUM
W/BOULDERS

RESIDUAL SOIL

RESIDUAL SOIL

RESIDUAL SOIL

REF*

REF*

REF*

VERY DENSE SAND / WEATHERED ROCK
GRADING TO CRYSTALLINE ROCK

* REFUSAL TO 1/2" SOUNDING RODS

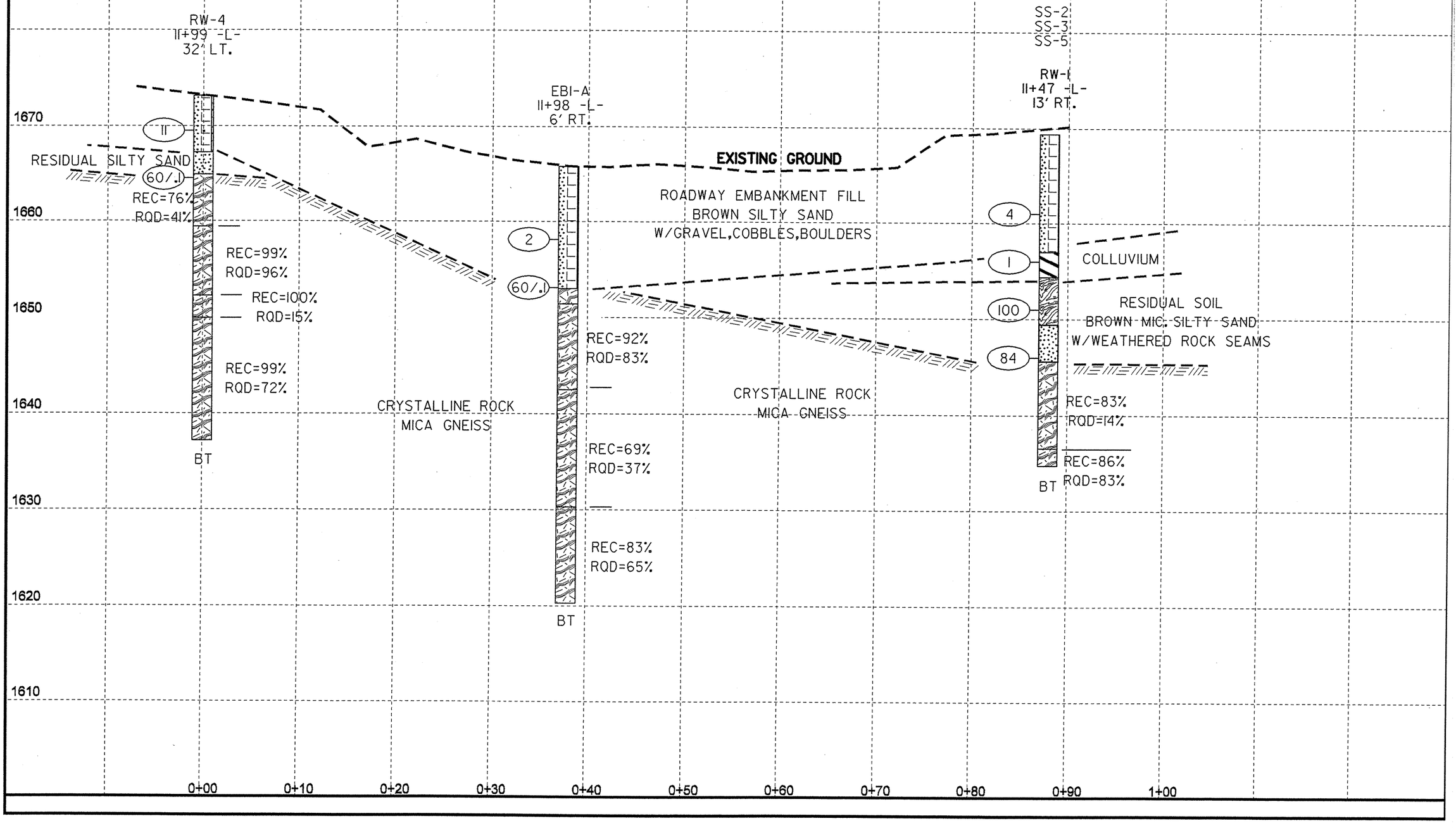
1670
1660
1650
1640
1630
1620
1610

0+00 0+10 0+20 0+30 0+40 0+50 0+60 0+70 0+80 0+90 1+00

0	10	20
FEET		
VE = 1		

PROJECT REFERENCE NO.	SHEET
33582.1.1 (B-4239)	7

SECTION THROUGH BORINGS
RW-4, EB1-A, RW-1



0	10	20
FEET		
VE = 1		

PROJECT REFERENCE NO.	SHEET
33582.1.1 (B-4239)	8

SECTION THROUGH BORINGS
RW-2,EB2-A,B-3,RW3

SS-16

RW-2
13+97 -L-
6' RT.

SS-11
SS-12

EB2-A
13+50 -L-
4' RT.

SS-8
SS-9
SS-10

B-3
13+35 -L-
18' RT.

RW-3
13+23 -L-
30' RT.

EXISTING GROUND

ROADWAY EMBANKMENT
BROWN SILTY SAND
W/GRAVEL, COBBLES, BOULDERS, ASPHALT

COLLUVIUM
BROWN SILTY SAND W/GRAVEL,BOULDERS

RESIDUAL SOIL
BROWN MIC. SILTY SAND
W/WEATHERED ROCK SEAMS

CRYSTALLINE ROCK
MICA GNEISS

CRYSTALLINE ROCK
MICA GNEISS

8
14
100
45
60/.1

1
11
92

34
100/.9
38
100/.9

5
62
37

2-06

BT

REC=67%
RQD=7%

REC=91%
RQD=67%

REC=74%
RQD=21%

REC=100%
RQD=100%

REC=62%
RQD=2%

REC=100%
RQD=89%

REC=72%
RQD=0%

REC=100%
RQD=74%

1670
1660
1650
1640
1630
1620
1610

0+00 0+10 0+20 0+30 0+40 0+50 0+60 0+70 0+80 0+90 1+00

NCDOT GEOTECHNICAL ENGINEERING UNIT
BORELOG REPORT

PROJECT NO. 33582.1.1	**ID.** B-4239	**COUNTY** POLK		**GEOLOGIST** Daniel, T. B.
SITE DESCRIPTION BRIDGE 2 OVER N. PACOLET RIVER ON SR 1102 (PEARSON FALLS ROAD)				**GROUND WTR (ft)**
BORING NO. B-1	**STATION** 11+51	**OFFSET** 19ft RT	**ALIGNMENT** L	**0 HR.** N/A
COLLAR ELEV. 1,669.5 ft	**TOTAL DEPTH** 24.2 ft	**NORTHING** N/A	**EASTING** N/A	**24 HR.** 21.0
DRILL MACHINE CME-550X	**DRILL METHOD** H.S. Augers			**HAMMER TYPE** Automatic
START DATE 02/08/06	**COMP. DATE** 02/08/06	**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)
	1670									1,669.5 — GROUND SURFACE — 0.0
	1,665.9	3.6								**ROADWAY EMBANKMENT** GRAVEL,SAND,ASPHALT DEBRIS
1665			3	3	3	6				
	1,660.9	8.6								
1660			3	3	4	7				
	1,655.9	13.6								1,656.0 — 13.5
1655			1	2	2	4				**COLLUVIUM** BROWN LOOSE SLIGHTLY MICACEOUS SILTY SAND
	1,650.9	18.6								1,650.3 — 19.2
1650			12	88/.1		100/.6				**WEATHERED ROCK** MICA GNEISS
	1,645.9	23.6								1,645.3 — 24.2
1645			100/.3			100/.3				Boring Terminated by Auger Refusal at Elevation 1,645.3 ft
1640										
1635										
1630										
1625										
1620										
1615										
1610										
1605										
1600										
1595										
1590										

NCDOT GEOTECHNICAL ENGINEERING UNIT
BORELOG REPORT

PROJECT NO. 33582.1.1	**ID.** B-4239	**COUNTY** POLK	**GEOLOGIST** Daniel, T. B.
SITE DESCRIPTION BRIDGE 2 OVER N. PACOLET RIVER ON SR 1102 (PEARSON FALLS ROAD)			**GROUND WTR (ft)**
BORING NO. B-2	**STATION** 12+58	**OFFSET** 44ft RT	**ALIGNMENT** L — **0 HR.** N/A
COLLAR ELEV. 1,669.1 ft	**TOTAL DEPTH** 24.8 ft	**NORTHING** N/A	**EASTING** N/A — **24 HR.** 23.4
DRILL MACHINE CME-550X	**DRILL METHOD** H.S. Augers		**HAMMER TYPE** Automatic
START DATE 02/13/06	**COMP. DATE** 02/13/06	**SURFACE WATER DEPTH** N/A	**DEPTH TO ROCK** 22.0 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)
	1670									1,669.1 GROUND SURFACE	0.0
	1,665.9	3.2								**ROADWAY EMBANKMENT** BROWN MIXED SAND & GRAVEL	
1665			2	1	3	4					
	1,660.9	8.2									
1660			1	1	2	3					
	1,655.9	13.2								1,656.4	12.7
1655			9	9	13	22				**RESIDUAL** BROWN-GRAY MED. TO V. DENSE SILTY SAND	
	1,650.9	18.2								1,650.9	18.2
1650			76	24/.1		100/.6				**WEATHERED ROCK** MICA GNEISS	
	1,645.9	23.2								1,647.1	22.0
1645			50/.2			50/.2				**CRYSTALLINE ROCK** MICA GNEISS	
										1,644.3	24.8
1640										Boring Terminated at Elevation 1,644.3 ft CRYSTALLINE ROCK	
1635											
1630											
1625											
1620											
1615											
1610											
1605											
1600											
1595											
1590											

NCDOT BORE DOUBLE B-4239_RMR.GPJ NC_DOT.GDT 08/06/08

NCDOT GEOTECHNICAL ENGINEERING UNIT
BORELOG REPORT

PROJECT NO. 33582.1.1	**ID.** B-4239	**COUNTY** POLK		**GEOLOGIST** Daniel, T. B.
SITE DESCRIPTION BRIDGE 2 OVER N. PACOLET RIVER ON SR 1102 (PEARSON FALLS ROAD)				**GROUND WTR (ft)**
BORING NO. B-3	**STATION** 13+35	**OFFSET** 18ft RT	**ALIGNMENT** L	**0 HR.** N/A
COLLAR ELEV. 1,670.8 ft	**TOTAL DEPTH** 25.8 ft	**NORTHING** N/A	**EASTING** N/A	**24 HR.** 20.0
DRILL MACHINE CME-550X	**DRILL METHOD** H.S. Augers			**HAMMER TYPE** Automatic
START DATE 02/13/06	**COMP. DATE** 02/13/06	**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)
1670	1675									1,670.8 GROUND SURFACE 0.0
	1,667.4	3.4								**ROADWAY EMBANKMENT** BROWN MED. DENSE SILTY SAND & GRAVEL
1665			3	4	8	12				1,664.3 6.5
	1,662.4	8.4								**RESIDUAL** BROWN-GRAY DENSE TO V. DENSE SILTY SAND W/WEATHERED ROCK LEDGES
1660			5	14	20	34				
	1,657.4	13.4								
1655			10	90/.4		100/.9				
	1,652.4	18.4								
1650			40	22	16	38				
	1,647.4	23.4								
1645			24	32	68/.4	100/.9				1,646.7 24.1 **WEATHERED ROCK** 1,645.0 WEATHERED ROCK (MICA GNEISS) 25.8 Boring Terminated at Elevation 1,645.0 ft IN CRYSTALLINE ROCK
1640										
1635										
1630										
1625										
1620										
1615										
1610										
1605										
1600										
1595										

NCDOT BORE DOUBLE B-4239_RMR.GPJ NC_DOT.GDT 08/06/08

NCDOT GEOTECHNICAL ENGINEERING UNIT
BORELOG REPORT

SHEET

PROJECT NO. 33582.1.1	**ID.** B-4239	**COUNTY** POLK	**GEOLOGIST** Murray, C. C.
SITE DESCRIPTION BRIDGE 2 OVER N. PACOLET RIVER ON SR 1102 (PEARSON FALLS ROAD)			**GROUND WTR (ft)**
BORING NO. EB1-A	**STATION** 11+98	**OFFSET** 6ft RT	**ALIGNMENT** L — **0 HR.** N/A
COLLAR ELEV. 1,665.8 ft	**TOTAL DEPTH** 45.5 ft	**NORTHING** N/A	**EASTING** N/A — **24 HR.** 15.0
DRILL MACHINE CME-550X	**DRILL METHOD** NW Casing w/ Core		**HAMMER TYPE** Automatic
START DATE 03/06/08	**COMP. DATE** 03/06/08	**SURFACE WATER DEPTH** N/A	**DEPTH TO ROCK** 12.8 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)
1665										1,665.8 GROUND SURFACE 0.0
										ROADWAY EMBANKMENT BROWN-GRAY CLAYEY SILTY SAND W/ ROCK FRAGMENTS & SMALL BOULDERS
1660	1,659.1	6.7	1	1	1	2		W		
1655	1,654.1	11.7	1	1	60/.1	60/.1		W		1,653.0 12.8
1650										1,651.4 14.4 **CRYSTALLINE ROCK** MOD. SEVERE WEATHERED MICA GNEISS CASING ADVANCER REFUSAL @ 14.4
1645										**CRYSTALLINE ROCK** MICA GNEISS, V. SLIGHTLY WEATHERED W/ MOD. WEATHERED ZONES 15.2-15.5;16.9-17.8' FRACTURE SPACING 0.8' SMOOTH TO SLI. ROUGH CORE LOSS IN INTERVAL 16.9-17.8'
1640										1,642.5 23.3 **CRYSTALLINE ROCK** MICA GNEISS, MOD. SEVERE WEATHERING W/ZONES SLI. WEATHERED @ 28.5-30.5;31.5-32.7;34.4-35.1 FRACTURE SPACING = 0.8' SMOOTH (MICA FACES) CORE LOSS IN INTERVAL 23.3-28.4'
1635										
1630										1,630.3 35.5 **CRYSTALLINE ROCK** MICA GNEISS, SLIGHTLY WEATHERED TO FRESH CORE LOSS FROM 39.2-40.8' FRACTURE SPACING = 0.6' SMOOTH TO SLIGHTLY ROUGH
1625										
1620										1,620.3 45.5 Boring Terminated at Elevation 1,620.3 ft
1615										
1610										
1605										
1600										
1595										
1590										

NCDOT BORE SINGLE B-4239.GPJ NC_DOT.GDT 06/30/08

NCDOT GEOTECHNICAL ENGINEERING UNIT
CORE BORING REPORT

SHEET 12

PROJECT NO. 33582.1.1	**ID.** B-4239	**COUNTY** POLK		**GEOLOGIST** Murray, C. C.
SITE DESCRIPTION BRIDGE 2 OVER N. PACOLET RIVER ON SR 1102 (PEARSON FALLS ROAD)				**GROUND WTR (ft)**
BORING NO. EB1-A	**STATION** 11+98	**OFFSET** 6ft RT	**ALIGNMENT** L	**0 HR.** N/A
COLLAR ELEV. 1,665.8 ft	**TOTAL DEPTH** 45.5 ft	**NORTHING** N/A	**EASTING** N/A	**24 HR.** 15.0
DRILL MACHINE CME-550X	**DRILL METHOD** NW Casing w/ Core		**HAMMER TYPE** Automatic	
START DATE 03/06/08	**COMP. DATE** 03/06/08	**SURFACE WATER DEPTH** N/A	**DEPTH TO ROCK** 12.8 ft	
CORE SIZE NXWL	**TOTAL RUN** 31.1 ft	**DRILLER** Estep, J. E.		

ELEV (ft)	RUN ELEV (ft)	DEPTH (ft)	RUN (ft)	DRILL RATE (Min/ft)	RUN REC. (ft) %	RUN RQD (ft) %	SAMP. NO.	STRATA REC. (ft) %	STRATA RQD (ft) %	LOG	DESCRIPTION AND REMARKS
	1651.42										Begin Coring @ 14.4 ft
1650	1,651.4	14.4	1.1		(1.0) 91%	(0.6) 55%		(8.2) 92%	(7.4) 83%		1,651.4 **CRYSTALLINE ROCK** 14.4 MICA GNEISS, V. SLIGHTLY WEATHERED W/ MOD. WEATHERED ZONES 15.2-15.5;16.9-17.8' FRACTURE SPACING 0.8' SMOOTH TO SLI. ROUGH
	1,650.3	15.5	5.0		(4.6) 92%	(4.2) 83%					AVERAGE Is(50) = 26.27 KSF AXIAL, 13.84 KSF DIAMETRIAL R1=4-0, R2=17, R3=5, R4=6, R5=4, RMR=36-32 ROCK TYPE E
1645	1,645.3	20.5	5.0		(3.8) 76%	(2.7) 54%					1,642.5 23.3
1640	1,640.3	25.5	5.0		(2.4) 48%	(1.5) 29%		(8.4) 69%	(4.5) 37%		**CRYSTALLINE ROCK** MICA GNEISS, MOD. SEVERE WEATHERING W/ZONES SLI. WEATHERED @ 28.5-30.5;31.5-32.7;34.4-35.1 FRACTURE SPACING = 0.8' SMOOTH (MICA FACES) CORE LOSS IN INTERVAL 23.3-28.4'
1635	1,635.3	30.5	5.0		(4.8) 96%	(2.4) 47%					AVERAGE Is(50) = 13.81 KSF AXIAL, 4.98 KSF DIAMETRIAL R1=0, R2=8, R3=5, R4=6, R5=4, RMR=23 ROCK TYPE E
1630	1,630.3	35.5	5.0		(3.6) 72%	(2.5) 50%		(8.3) 83%	(6.5) 65%		1,630.3 35.5
1625	1,625.3	40.5	5.0		(4.7) 94%	(4.5) 90%					**CRYSTALLINE ROCK** MICA GNEISS, SLIGHTLY WEATHERED TO FRESH CORE LOSS FROM 39.2-40.8' FRACTURE SPACING = 0.6' SMOOTH TO SLIGHTLY ROUGH
1620	1,620.3	45.5									AVERAGE Is(50) = 21.44 KSF AXIAL, 13.27 KSF DIAMETRIAL R1=4-0, R2=13, R3=5, R4=6, R5=4, RMR=32-28 ROCK TYPE E
1615											1,620.3 45.5
1610											Boring Terminated at Elevation 1,620.3 ft
1605											
1600											
1595											
1590											
1585											
1580											
1575											

NCDOT CORE SINGLE B-4239_RMR.GPJ NC_DOT.GDT 08/06/08

NCDOT GEOTECHNICAL ENGINEERING UNIT
BORELOG REPORT

SHEET

PROJECT NO. 33582.1.1	**ID.** B-4239	**COUNTY** POLK	**GEOLOGIST** Murray, C. C.
SITE DESCRIPTION BRIDGE 2 OVER N. PACOLET RIVER ON SR 1102 (PEARSON FALLS ROAD)			**GROUND WTR (ft)**
BORING NO. EB2-A	**STATION** 13+50	**OFFSET** 4ft RT	**ALIGNMENT** L — **0 HR.** N/A
COLLAR ELEV. 1,670.2 ft	**TOTAL DEPTH** 60.6 ft	**NORTHING** N/A	**EASTING** N/A — **24 HR.** N/A
DRILL MACHINE CME-550X	**DRILL METHOD** NW Casing w/ Core		**HAMMER TYPE** Automatic
START DATE 03/14/08	**COMP. DATE** 03/14/08	**SURFACE WATER DEPTH** N/A	**DEPTH TO ROCK** 18.8 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)
1675										
1670										1,670.2 — GROUND SURFACE — 0.0
1665										**ROADWAY EMBANKMENT** BROWN LOOSE SILTY SAND W/GRAVEL & BOULDERS
	1,663.2	7.0	1	0	1	1		W		1,663.2 — **COLLUVIUM** BROWN V. LOOSE CLAYEY SILTY SAND — 7.0
1660										
	1,658.2	12.0	3	3	8	11	SS-11	W		1,658.2 — **RESIDUAL** BROWN MED. TO V. DENSE MICACEOUS SILTY SAND — 12.0
1655										
	1,653.2	17.0	8	40	52	92	SS-12	M		1,651.4 — **CRYSTALLINE ROCK** MICA GNEISS W/AMPHIBOLITE SEAMS SEVERE TO MODERATE WEATHERING FRACTURE SPACING 0.3' — 18.8
1650										
1645										
1640										
1635										
1630										1,629.6 — **CRYSTALLINE ROCK** MICA GNEISS FRESH FRACTURE SPACING 1.3' SMOOTH (MICA) 2 JTS @45 DEG, PARTING ON 10 DEG FOLIATION — 40.6
1625										
1620										
1615										
1610										1,609.6 — Boring Terminated at Elevation 1,609.6 ft — 60.6
1605										
1600										
1595										

NCDOT BORE SINGLE B-4239.GPJ NC_DOT.GDT 06/30/08

NCDOT GEOTECHNICAL ENGINEERING UNIT
CORE BORING REPORT

SHEET 13

PROJECT NO. 33582.1.1	**ID.** B-4239	**COUNTY** POLK		**GEOLOGIST** Murray, C. C.
SITE DESCRIPTION BRIDGE 2 OVER N. PACOLET RIVER ON SR 1102 (PEARSON FALLS ROAD)				**GROUND WTR (ft)**
BORING NO. EB2-A	**STATION** 13+50	**OFFSET** 4ft RT	**ALIGNMENT** L	**0 HR.** N/A
COLLAR ELEV. 1,670.2 ft	**TOTAL DEPTH** 60.6 ft	**NORTHING** N/A	**EASTING** N/A	**24 HR.** N/A
DRILL MACHINE CME-550X	**DRILL METHOD** NW Casing w/ Core		**HAMMER TYPE** Automatic	
START DATE 03/14/08	**COMP. DATE** 03/14/08	**SURFACE WATER DEPTH** N/A	**DEPTH TO ROCK** 18.8 ft	
CORE SIZE NXWL	**TOTAL RUN** 41.8 ft	**DRILLER** Estep, J. E.		

ELEV (ft)	RUN ELEV (ft)	DEPTH (ft)	RUN (ft)	DRILL RATE (Min/ft)	RUN REC. (ft) %	RUN RQD (ft) %	SAMP. NO.	STRATA REC. (ft) %	STRATA RQD (ft) %	LOG	DESCRIPTION AND REMARKS
											ELEV. (ft) — DEPTH (ft)
1651.38											Begin Coring @ 18.8 ft
1650	1,651.4	18.8	1.8		(1.5) 83%	(0.0) 0%		(13.5) 62%	(0.5) 2%		1,651.4 — **CRYSTALLINE ROCK** MICA GNEISS W/AMPHIBOLITE SEAMS SEVERE TO MODERATE WEATHERING FRACTURE SPACING 0.3' — 18.8
	1,649.6	20.6	5.0		(3.2) 64%	(0.0) 0%					AVERAGE Is(50) = 9 KSF AXIAL, 4.48 KSF DIAMETRIAL R1=0, R2=3, R3=10, R4=6, R5=7, RMR=26 ROCK TYPE E
1645	1,644.6	25.6	2.5		(1.7) 68%	(0.0) 0%					
	1,642.1	28.1	2.5		(2.0) 80%	(0.0) 0%					
1640	1,639.6	30.6	2.5		(0.9) 36%	(0.0) 0%					
	1,637.1	33.1	2.5		(1.4) 56%	(0.5) 20%					
1635	1,634.6	35.6	5.0		(2.8) 56%	(0.0) 0%					
1630	1,629.6	40.6	5.0		(5.0) 100%	(3.8) 76%		(19.9) 100%	(17.7) 89%		1,629.6 — **CRYSTALLINE ROCK** MICA GNEISS FRESH FRACTURE SPACING 1.3' SMOOTH (MICA) 2 JTS @45 DEG, PARTING ON 10 DEG FOLIATION — 40.6
1625	1,624.6	45.6	5.0		(5.0) 100%	(4.6) 92%					AVERAGE Is(50) = 25.45 KSF AXIAL, 12.34 KSF DIAMETRIAL R1=0-4, R2=17, R3=20, R4=1, R5=4, RMR=38-42 ROCK TYPE E
1620	1,619.6	50.6	5.0		(4.9) 98%	(4.5) 90%					
1615	1,614.6	55.6	5.0		(5.0) 100%	(4.8) 96%					
1610	1,609.6	60.6									1,609.6 — Boring Terminated at Elevation 1,609.6 ft — 60.6
1605											
1600											
1595											
1590											
1585											
1580											
1575											

NCDOT CORE SINGLE B-4239.GPJ NC_DOT.GDT 06/30/08

NCDOT GEOTECHNICAL ENGINEERING UNIT
BORELOG REPORT

PROJECT NO. 33582.1.1	**ID.** B-4239	**COUNTY** POLK	**GEOLOGIST** Murray, C. C.
SITE DESCRIPTION BRIDGE 2 OVER N. PACOLET RIVER ON SR 1102 (PEARSON FALLS ROAD)			**GROUND WTR (ft)**
BORING NO. RW-1	**STATION** 11+47	**OFFSET** 13ft RT	**ALIGNMENT** L — **0 HR.** N/A
COLLAR ELEV. 1,669.4 ft	**TOTAL DEPTH** 34.6 ft	**NORTHING** N/A	**EASTING** N/A — **24 HR.** N/A
DRILL MACHINE CME-550X	**DRILL METHOD** NW Casing w/ Core		**HAMMER TYPE** Automatic
START DATE 03/18/08	**COMP. DATE** 03/18/08	**SURFACE WATER DEPTH** N/A	**DEPTH TO ROCK** 23.8 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)
	1670									1,669.4 GROUND SURFACE	0.0
1665										**ROADWAY EMBANKMENT** BROWN LOOSE SILTY SAND W/GRAVEL	
	1,662.0	7.4									
1660			2	2	2	4	SS-2	M			
	1,657.0	12.4								1,657.0	12.4
1655			0	0	1	1	SS-3	W		**COLLUVIUM** BROWN V. SOFT SILTY SANDY CLAY	
	1,652.0	17.4								1,654.4	15.0
1650			8	92						**RESIDUAL** WEATHERED ROCK (SEVERELY WEATHERED MICA GNEISS)	
	1,647.0	22.4								1,649.4	20.0
1645			15	10	74	84	SS-5			**RESIDUAL** BROWN V. DENSE SILTY SAND (VERY SEVERELY WEATHERED MICA GNEISS)	
1640										1,645.6	23.8
										CRYSTALLINE ROCK SLIGHT TO SEVERE WEATHERED MICA GNEISS FRACTURE SPACING 0.15' SMOOTH 1 JT @85 1 JT@45; OTHER BREAKS ALONG MICA FOLIATION PLANES @10	
1635										1,636.6	32.8
										CRYSTALLINE ROCK MICA GNEISS CORE LOSS IN INTERVAL 33.7-33.9' FRESH EXCEPT IN LOSS INTERVAL 1 JT @45 - ROUGH, 3@20-SMOOTH IRON STAINS ON JT SURFACES, NO INFILLING	
1630										1,634.8	34.6
										Boring Terminated at Elevation 1,634.8 ft FRESH MICA GNEISS	
1625											
1620											
1615											
1610											
1605											
1600											
1595											
1590											

NCDOT BORE SINGLE B-4239_RMR.GPJ NC_DOT.GDT 08/06/08

NCDOT GEOTECHNICAL ENGINEERING UNIT
CORE BORING REPORT

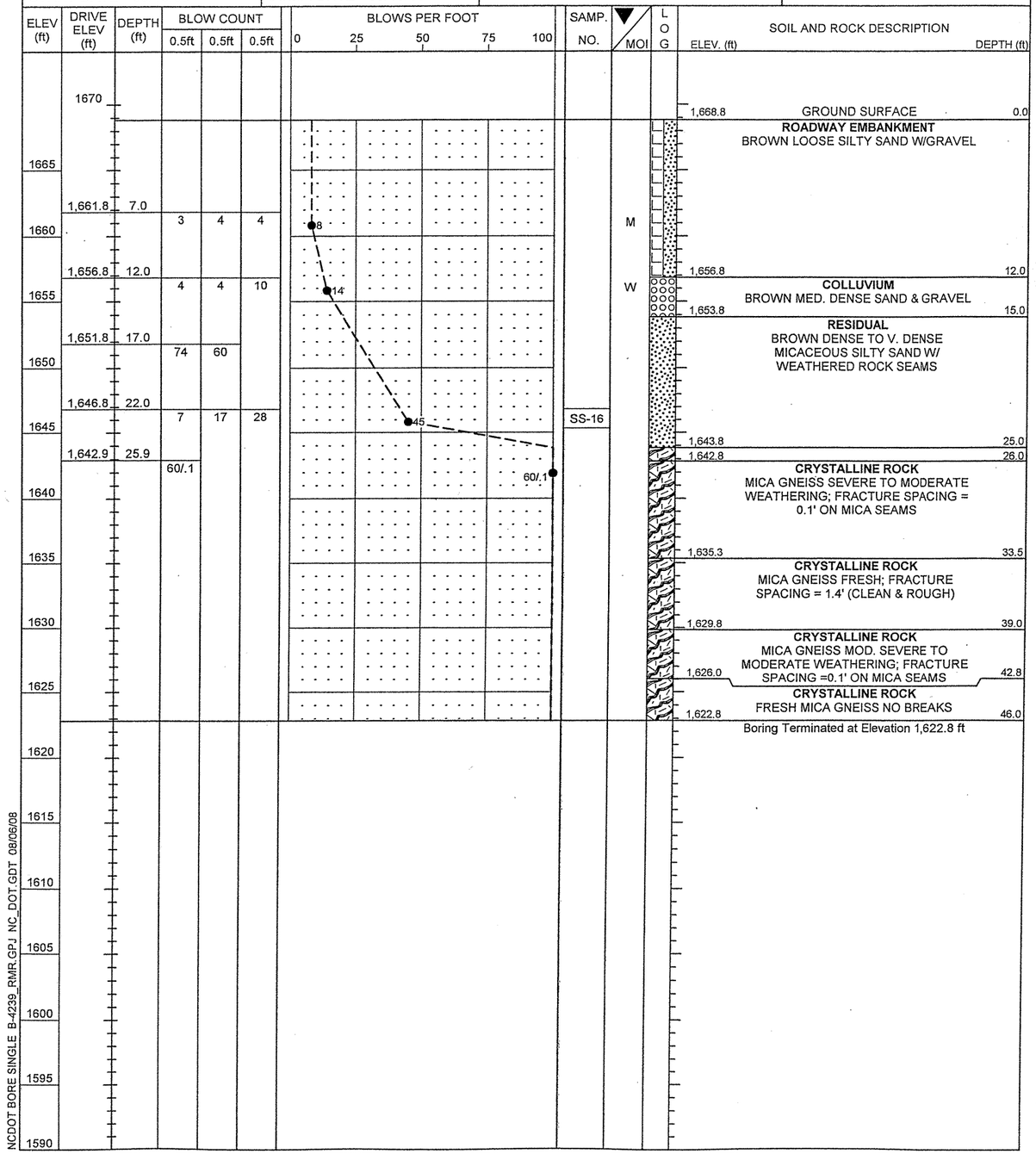
PROJECT NO. 33582.1.1	**ID.** B-4239	**COUNTY** POLK	**GEOLOGIST** Murray, C. C.
SITE DESCRIPTION BRIDGE 2 OVER N. PACOLET RIVER ON SR 1102 (PEARSON FALLS ROAD)			**GROUND WTR (ft)**
BORING NO. RW-1	**STATION** 11+47	**OFFSET** 13ft RT	**ALIGNMENT** L — **0 HR.** N/A
COLLAR ELEV. 1,669.4 ft	**TOTAL DEPTH** 34.6 ft	**NORTHING** N/A	**EASTING** N/A — **24 HR.** N/A
DRILL MACHINE CME-550X	**DRILL METHOD** NW Casing w/ Core		**HAMMER TYPE** Automatic
START DATE 03/18/08	**COMP. DATE** 03/18/08	**SURFACE WATER DEPTH** N/A	**DEPTH TO ROCK** 23.8 ft
CORE SIZE NXWL	**TOTAL RUN** 10.8 ft	**DRILLER** Estep, J. E.	

ELEV (ft)	RUN ELEV (ft)	DEPTH (ft)	RUN (ft)	DRILL RATE (Min/ft)	RUN REC. (ft) %	RUN RQD (ft) %	SAMP. NO.	STRATA REC. (ft) %	STRATA RQD (ft) %	LOG	DESCRIPTION AND REMARKS — ELEV. (ft)	DEPTH (ft)
	1645.62										Begin Coring @ 23.8 ft	
	1,645.6	23.8	2.3		(2.1) 91%	(1.3) 57%		(7.5) 83%	(1.3) 14%		1,645.6 **CRYSTALLINE ROCK** SLIGHT TO SEVERE WEATHERED MICA GNEISS FRACTURE SPACING 0.15' SMOOTH 1 JT @85 1 JT@45; OTHER BREAKS ALONG MICA FOLIATION PLANES @10	23.8
	1,643.3	26.1	5.0		(4.1) 82%	(0.0) 0%						
1640												
	1,638.3	31.1	3.5		(2.9) 81%	(1.5) 43%					1,636.6	32.8
1635	1,634.8	34.6						(1.6) 86%	(1.5) 83%		1,634.8 **CRYSTALLINE ROCK** MICA GNEISS CORE LOSS IN INTERVAL 33.7-33.9' FRESH EXCEPT IN LOSS INTERVAL 1 JT @45 - ROUGH, 3@20-SMOOTH IRON STAINS ON JT SURFACES, NO INFILLING	34.6
1630											Boring Terminated at Elevation 1,634.8 ft FRESH MICA GNEISS	
1625												
1620												
1615												
1610												
1605												
1600												
1595												
1590												
1585												
1580												
1575												
1570												

NCDOT CORE SINGLE B-4239.GPJ NC_DOT.GDT 05/16/08

NCDOT GEOTECHNICAL ENGINEERING UNIT
BORELOG REPORT

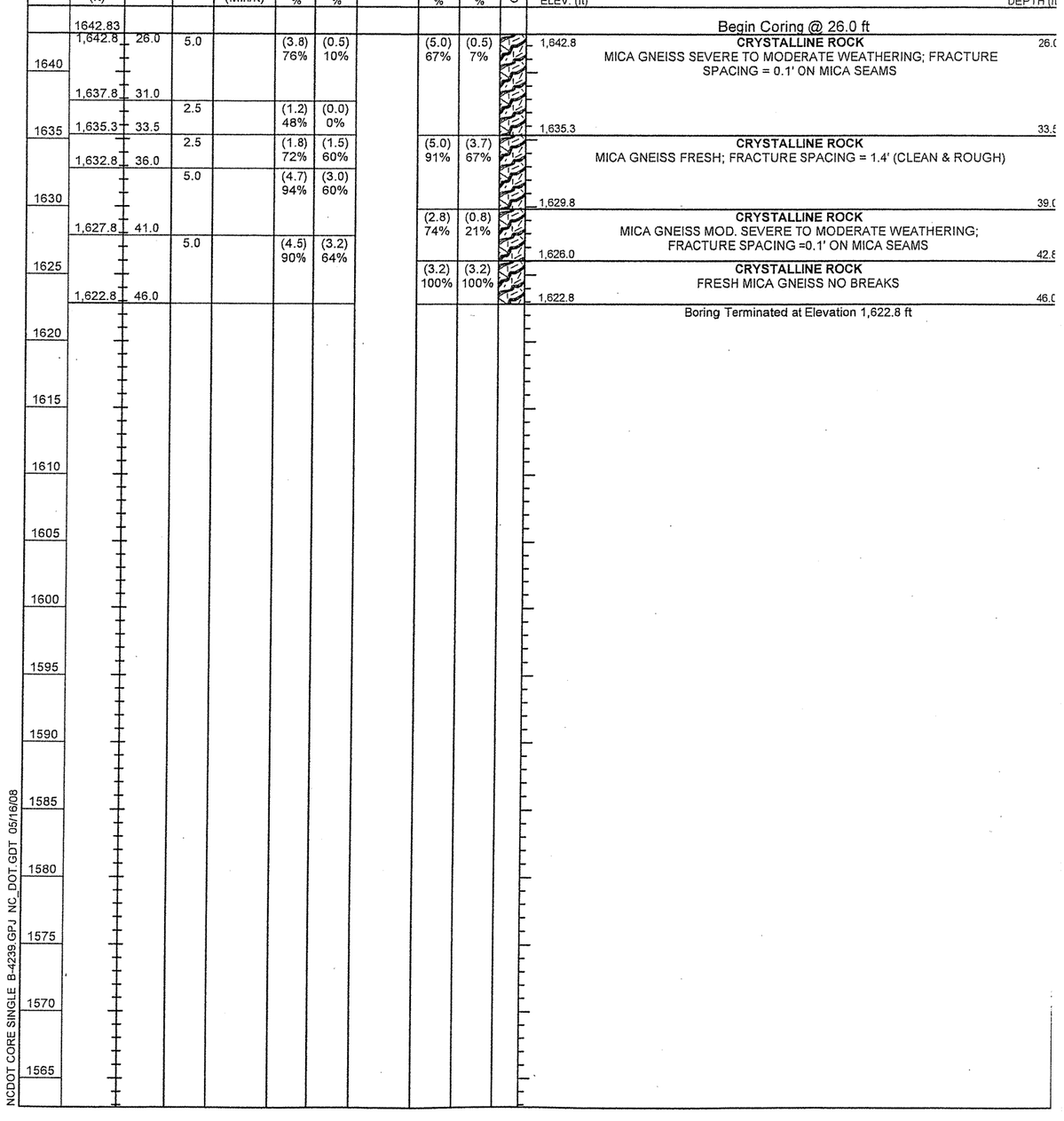
PROJECT NO. 33582.1.1	**ID.** B-4239	**COUNTY** POLK	**GEOLOGIST** Murray, C. C.
SITE DESCRIPTION BRIDGE 2 OVER N. PACOLET RIVER ON SR 1102 (PEARSON FALLS ROAD)			**GROUND WTR (ft)**
BORING NO. RW-2	**STATION** 13+97	**OFFSET** 6ft RT	**ALIGNMENT** L — **0 HR.** N/A
COLLAR ELEV. 1,668.8 ft	**TOTAL DEPTH** 46.0 ft	**NORTHING** N/A	**EASTING** N/A — **24 HR.** N/A
DRILL MACHINE CME-550X	**DRILL METHOD** NW Casing w/ Core		**HAMMER TYPE** Automatic
START DATE 03/13/08	**COMP. DATE** 03/13/08	**SURFACE WATER DEPTH** N/A	**DEPTH TO ROCK** 25.0 ft



NCDOT BORE SINGLE B-4239_RMR.GPJ NC_DOT.GDT 08/06/08

NCDOT GEOTECHNICAL ENGINEERING UNIT
CORE BORING REPORT

PROJECT NO. 33582.1.1	**ID.** B-4239	**COUNTY** POLK	**GEOLOGIST** Murray, C. C.
SITE DESCRIPTION BRIDGE 2 OVER N. PACOLET RIVER ON SR 1102 (PEARSON FALLS ROAD)			**GROUND WTR (ft)**
BORING NO. RW-2	**STATION** 13+97	**OFFSET** 6ft RT	**ALIGNMENT** L — **0 HR.** N/A
COLLAR ELEV. 1,668.8 ft	**TOTAL DEPTH** 46.0 ft	**NORTHING** N/A	**EASTING** N/A — **24 HR.** N/A
DRILL MACHINE CME-550X	**DRILL METHOD** NW Casing w/ Core		**HAMMER TYPE** Automatic
START DATE 03/13/08	**COMP. DATE** 03/13/08	**SURFACE WATER DEPTH** N/A	**DEPTH TO ROCK** 25.0 ft
CORE SIZE NXWL	**TOTAL RUN** 20.0 ft		**DRILLER** Estep, J. E.



NCDOT CORE SINGLE B-4239.GPJ NC_DOT.GDT 05/16/08

NCDOT GEOTECHNICAL ENGINEERING UNIT
BORELOG REPORT

SHEET

PROJECT NO. 33582.1.1	**ID.** B-4239	**COUNTY** POLK	**GEOLOGIST** Murray, C. C.
SITE DESCRIPTION BRIDGE 2 OVER N. PACOLET RIVER ON SR 1102 (PEARSON FALLS ROAD)			**GROUND WTR (ft)**
BORING NO. RW-3	**STATION** 13+23	**OFFSET** 30ft RT	**ALIGNMENT** L — **0 HR.** N/A
COLLAR ELEV. 1,670.9 ft	**TOTAL DEPTH** 40.9 ft	**NORTHING** N/A	**EASTING** N/A — **24 HR.** N/A
DRILL MACHINE CME-550X	**DRILL METHOD** NW Casing w/ Core		**HAMMER TYPE** Automatic
START DATE 03/18/08	**COMP. DATE** 03/18/08	**SURFACE WATER DEPTH** N/A	**DEPTH TO ROCK** 19.9 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)
										1,670.9 — GROUND SURFACE — 0.0
										ROADWAY EMBANKMENT BROWN LOOSE SILTY SAND TRACE MICA
	1,663.7	7.2	2	3	2	5	SS-8	D		1,662.2 — 8.7
										ROADWAY EMBANKMENT BROWN MEDE. DENSE SILTY SAND TRACE MICA W/ BOULDERS
	1,658.7	12.2	20	32	30	62	SS-9	D		1,657.2 — 13.7
										RESIDUAL BROWN DENSE SILTY SAND LITTLE MICA
	1,653.7	17.2	5	8	29	37	SS-10	D		1,651.0 — 19.9
										CRYSTALLINE ROCK GRANITIC GNEISS V. SEVERE TO MOD SEVERELY WEATHERED FRACTURE SPACING 0.2' ROUGH
										1,633.8 — 37.1
										CRYSTALLINE ROCK GRANITIC GNEISS FRESH FRACTURE SPACING = 0.4' ROUGH MOST BREAKS ALONG 10 DEG FOLIATION; 1 JT @45, 1@90
										1,630.0 — 40.9
										Boring Terminated at Elevation 1,630.0 ft

NCDOT BORE SINGLE B-4239.GPJ NC_DOT.GDT 06/30/08

NCDOT GEOTECHNICAL ENGINEERING UNIT
CORE BORING REPORT

SHEET 16

PROJECT NO. 33582.1.1	**ID.** B-4239	**COUNTY** POLK		**GEOLOGIST** Murray, C. C.
SITE DESCRIPTION BRIDGE 2 OVER N. PACOLET RIVER ON SR 1102 (PEARSON FALLS ROAD)				**GROUND WTR (ft)**
BORING NO. RW-3	**STATION** 13+23	**OFFSET** 30ft RT	**ALIGNMENT** L	**0 HR.** N/A
COLLAR ELEV. 1,670.9 ft	**TOTAL DEPTH** 40.9 ft	**NORTHING** N/A	**EASTING** N/A	**24 HR.** N/A
DRILL MACHINE CME-550X	**DRILL METHOD** NW Casing w/ Core			**HAMMER TYPE** Automatic
START DATE 03/18/08	**COMP. DATE** 03/18/08	**SURFACE WATER DEPTH** N/A		**DEPTH TO ROCK** 19.9 ft
CORE SIZE NXWL	**TOTAL RUN** 21.0 ft	**DRILLER** Estep, J. E.		

ELEV (ft)	RUN ELEV (ft)	DEPTH (ft)	RUN (ft)	DRILL RATE (Min/ft)	RUN REC. (ft) %	RUN RQD (ft) %	SAMP. NO.	STRATA REC. (ft) %	STRATA RQD (ft) %	LOG	DESCRIPTION AND REMARKS
											ELEV. (ft) — DEPTH (ft)
1650.96											Begin Coring @ 19.9 ft
	1,651.0	19.9	1.0		(1.0) 100%	(0.0) 0%		(12.4) 72%	(0.0) 0%		1,651.0 — **CRYSTALLINE ROCK** 19.9
	1,650.0	20.9	2.5		(1.5) 60%	(0.0) 0%					GRANITIC GNEISS V. SEVERE TO MOD SEVERELY WEATHERED FRACTURE SPACING 0.2' ROUGH
	1,647.5	23.4	2.5		(1.6) 64%	(0.0) 0%					AVERAGE Is(50) = 5.25 KSF AXIAL, 1.69 KSF DIAMETRIAL R1=0, R2=3, R3=10, R4=12, R5=7, RMR=32 ROCK TYPE E
1645	1,645.0	25.9	2.5		(2.0) 80%	(0.0) 0%					
	1,642.5	28.4	2.5		(1.4) 56%	(0.0) 0%					
1640	1,640.0	30.9	5.0		(4.4) 88%	(0.6) 12%					
1635	1,635.0	35.9	5.0		(4.1) 82%	(2.8) 56%		(3.8) 100%	(2.8) 74%		1,633.8 — 37.1
1630	1,630.0	40.9									**CRYSTALLINE ROCK** GRANITIC GNEISS FRESH FRACTURE SPACING = 0.4' ROUGH MOST BREAKS ALONG 10 DEG FOLIATION; 1 JT @45, 1@90
1625											1,630.0 — 40.9
1620											AVERAGE Is(50) = 9.47 KSF AXIAL, 6.42 KSF DIAMETRIAL R1=0, R2=13, R3=10, R4=20, R5=4, RMR=47 ROCK TYPE E
1615											Boring Terminated at Elevation 1,630.0 ft
1610											
1605											
1600											
1595											
1590											
1585											
1580											
1575											

NCDOT CORE SINGLE B-4239.GPJ NC_DOT.GDT 06/30/08

NCDOT GEOTECHNICAL ENGINEERING UNIT
BORELOG REPORT

SHEET

PROJECT NO. 33582.1.1	**ID.** B-4239	**COUNTY** POLK	**GEOLOGIST** Murray, C. C.
SITE DESCRIPTION BRIDGE 2 OVER N. PACOLET RIVER ON SR 1102 (PEARSON FALLS ROAD)			**GROUND WTR (ft)**
BORING NO. RW-4	**STATION** 11+99	**OFFSET** 32ft LT	**ALIGNMENT** L — **0 HR.** N/A
COLLAR ELEV. 1,673.2 ft	**TOTAL DEPTH** 36.0 ft	**NORTHING** N/A	**EASTING** N/A — **24 HR.** N/A
DRILL MACHINE CME-550X	**DRILL METHOD** NW Casing w/ Core		**HAMMER TYPE** Automatic
START DATE 03/17/08	**COMP. DATE** 03/17/08	**SURFACE WATER DEPTH** N/A	**DEPTH TO ROCK** 8.3 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)
1675										
										1,673.2 — GROUND SURFACE — 0.0
1670	1,670.5	2.7	3	5	6	11		D		**ROADWAY EMBANKMENT** BROWN SILTY SAND TRACE MICA
										1,667.2 — 6.0
1665	1,665.5	7.7	17	60/.1		60/.1				**RESIDUAL** BROWN SILTY SAND TRACE MICA — 1,664.9 — 8.3
1660										**CRYSTALLINE ROCK** MICA GNEISS MOD. WEATHERED TO FRESH FRACTURE SPACING = 0.25' SMOOTH (MICA) WEATHERED & FRACTURED ZONES@: 10.2-11.5'; 12.4 TO 13.8' — 1,659.4 — 13.8
1655										**CRYSTALLINE ROCK** MICA GNEISS FRESH FRACTURE SPACING = 1.45' SMOOTH (MICA) — 1,652.2 — 21.0
1650										**CRYSTALLINE ROCK** MICA GNEISS MOD. SEVERE WEATHERING FRACTURE SPACING = 0.16' ROUGH — 1,649.9 — 23.3
1645										**CRYSTALLINE ROCK** MICA GNEISS FRESH FRACTURE SPACING = 0.45' 6 JTS@45, 1@75 ROUGH 21 BREAKS ON FOLIATION SMOOTH (MICA)
1640										
1635										1,637.2 — 36.0 — Boring Terminated at Elevation 1,637.2 ft
1630										
1625										
1620										
1615										
1610										
1605										
1600										
1595										

NCDOT BORE SINGLE B-4239.GPJ NC_DOT.GDT 06/30/08

NCDOT GEOTECHNICAL ENGINEERING UNIT
CORE BORING REPORT

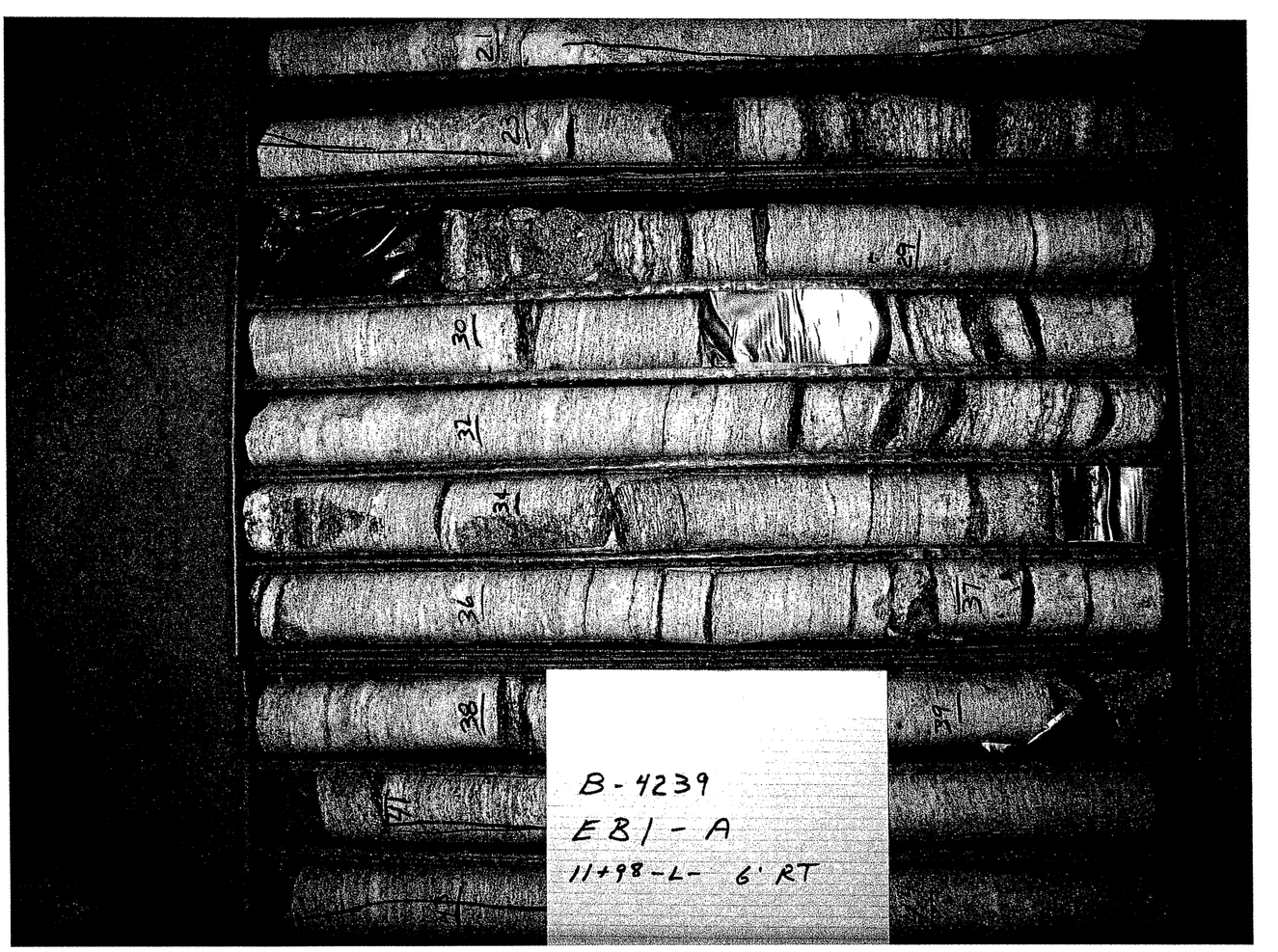
SHEET 17

PROJECT NO. 33582.1.1	**ID.** B-4239	**COUNTY** POLK		**GEOLOGIST** Murray, C. C.
SITE DESCRIPTION BRIDGE 2 OVER N. PACOLET RIVER ON SR 1102 (PEARSON FALLS ROAD)				**GROUND WTR (ft)**
BORING NO. RW-4	**STATION** 11+99	**OFFSET** 32ft LT	**ALIGNMENT** L	**0 HR.** N/A
COLLAR ELEV. 1,673.2 ft	**TOTAL DEPTH** 36.0 ft	**NORTHING** N/A	**EASTING** N/A	**24 HR.** N/A
DRILL MACHINE CME-550X	**DRILL METHOD** NW Casing w/ Core			**HAMMER TYPE** Automatic
START DATE 03/17/08	**COMP. DATE** 03/17/08	**SURFACE WATER DEPTH** N/A		**DEPTH TO ROCK** 8.3 ft
CORE SIZE NXWL	**TOTAL RUN** 27.6 ft	**DRILLER** Estep, J. E.		

ELEV (ft)	RUN ELEV (ft)	DEPTH (ft)	RUN (ft)	DRILL RATE (Min/ft)	RUN REC. (ft) %	RUN RQD (ft) %	SAMP. NO.	STRATA REC. (ft) %	STRATA RQD (ft) %	LOG	DESCRIPTION AND REMARKS
											ELEV. (ft) — DEPTH (ft)
1664.86											Begin Coring @ 8.3 ft
	1,664.9	8.3	2.7		(2.1) 78%	(1.9) 70%		(4.2) 76%	(2.3) 41%		1,664.9 — **CRYSTALLINE ROCK** MICA GNEISS MOD. WEATHERED TO FRESH FRACTURE SPACING = 0.25' SMOOTH (MICA) WEATHERED & FRACTURED ZONES@: 10.2-11.5'; 12.4 TO 13.8' — 8.3
	1,662.2	11.0	5.0		(4.3) 86%	(2.5) 49%					
1660											1,659.4 — 13.8 — AVERAGE Is(50) = 17.57 KSF AXIAL, 6.13 KSF DIAMETRIAL R1=0, R2=8, R3=10, R4=6, R5=7, RMR=21 ROCK TYPE E
	1,657.2	16.0	5.0		(4.9) 98%	(4.1) 81%		(7.1) 99%	(6.9) 96%		**CRYSTALLINE ROCK** MICA GNEISS FRESH FRACTURE SPACING = 1.45' SMOOTH (MICA)
1655											1,652.2 — 21.0
	1,652.2	21.0	5.0		(5.0) 100%	(3.0) 60%		(2.3) 100%	(0.4) 15%		1,649.9 — 23.3 — AVERAGE Is(50) = 26.63 KSF AXIAL, 12.51 KSF DIAMETRIAL R1=4-0, R2=20, R3=20, R4=6, R5=4, RMR=54-50 ROCK TYPE E
1650								(12.6) 99%	(9.1) 72%		**CRYSTALLINE ROCK** MICA GNEISS MOD. SEVERE WEATHERING FRACTURE SPACING = 0.16' ROUGH
	1,647.2	26.0	5.0		(5.0) 100%	(4.2) 84%					AVERAGE Is(50) = 7.27 KSF AXIAL, 1.13 KSF DIAMETRIAL R1=0, R2=3, R3=5, R4=0, R5=4, RMR=12 ROCK TYPE E
1645											**CRYSTALLINE ROCK** MICA GNEISS FRESH FRACTURE SPACING = 0.45' 6 JTS@45, 1@75 ROUGH 21 BREAKS ON FOLIATION SMOOTH (MICA)
	1,642.2	31.0	4.9		(4.9) 100%	(3.0) 61%					
1640											1,637.2 — 36.0 — AVERAGE Is(50) = 15.37 KSF AXIAL, 5.09 KSF DIAMETRIAL R1=0, R2=13, R3=10, R4=6, R5=4, RMR=33 ROCK TYPE E
	1,637.3	35.9									Boring Terminated at Elevation 1,637.2 ft
1635											
1630											
1625											
1620											
1615											
1610											
1605											
1600											
1595											
1590											
1585											

NCDOT CORE SINGLE B-4239.GPJ NC_DOT.GDT 06/30/08

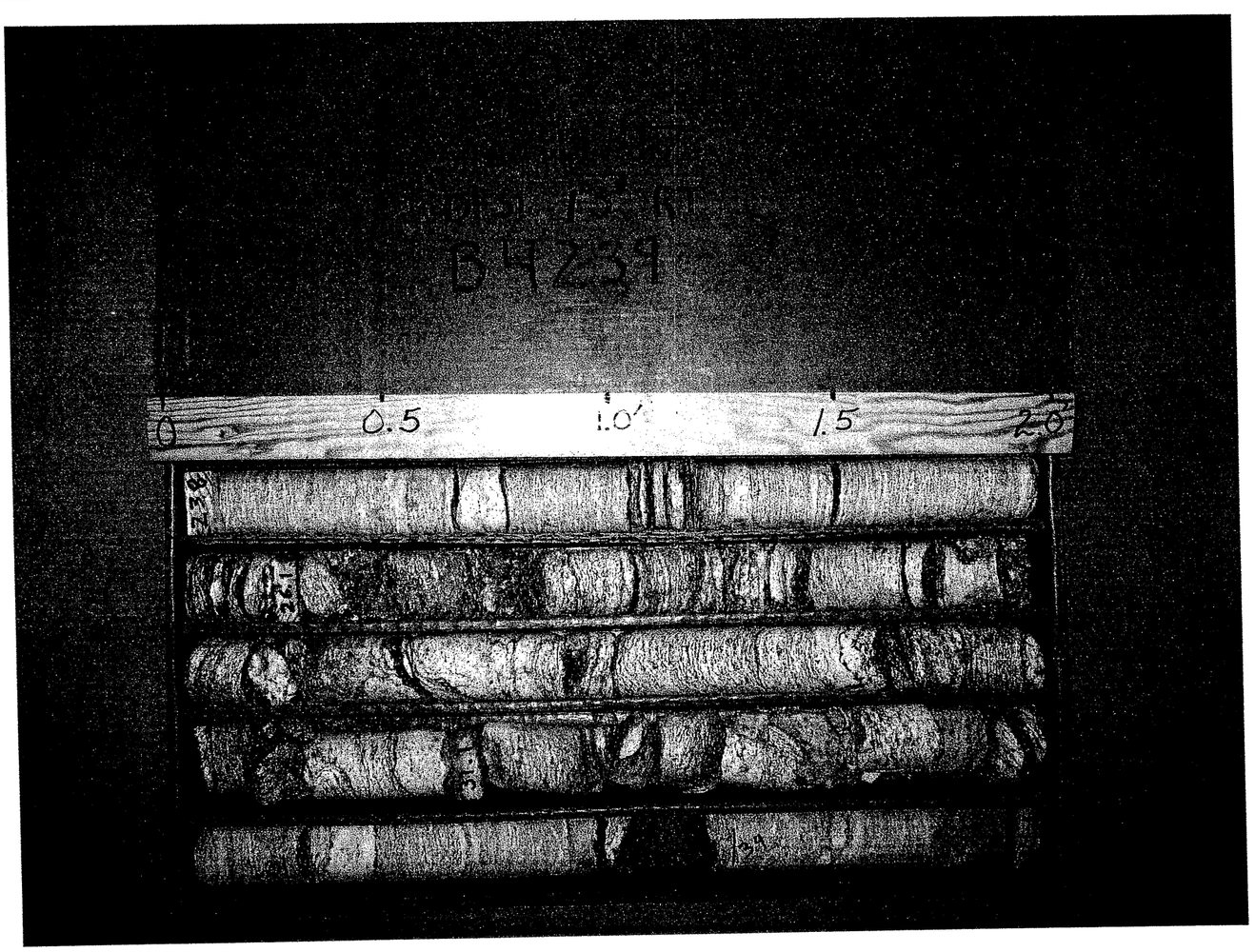

B-4239
EB1-A
11+98-L- 6' RT

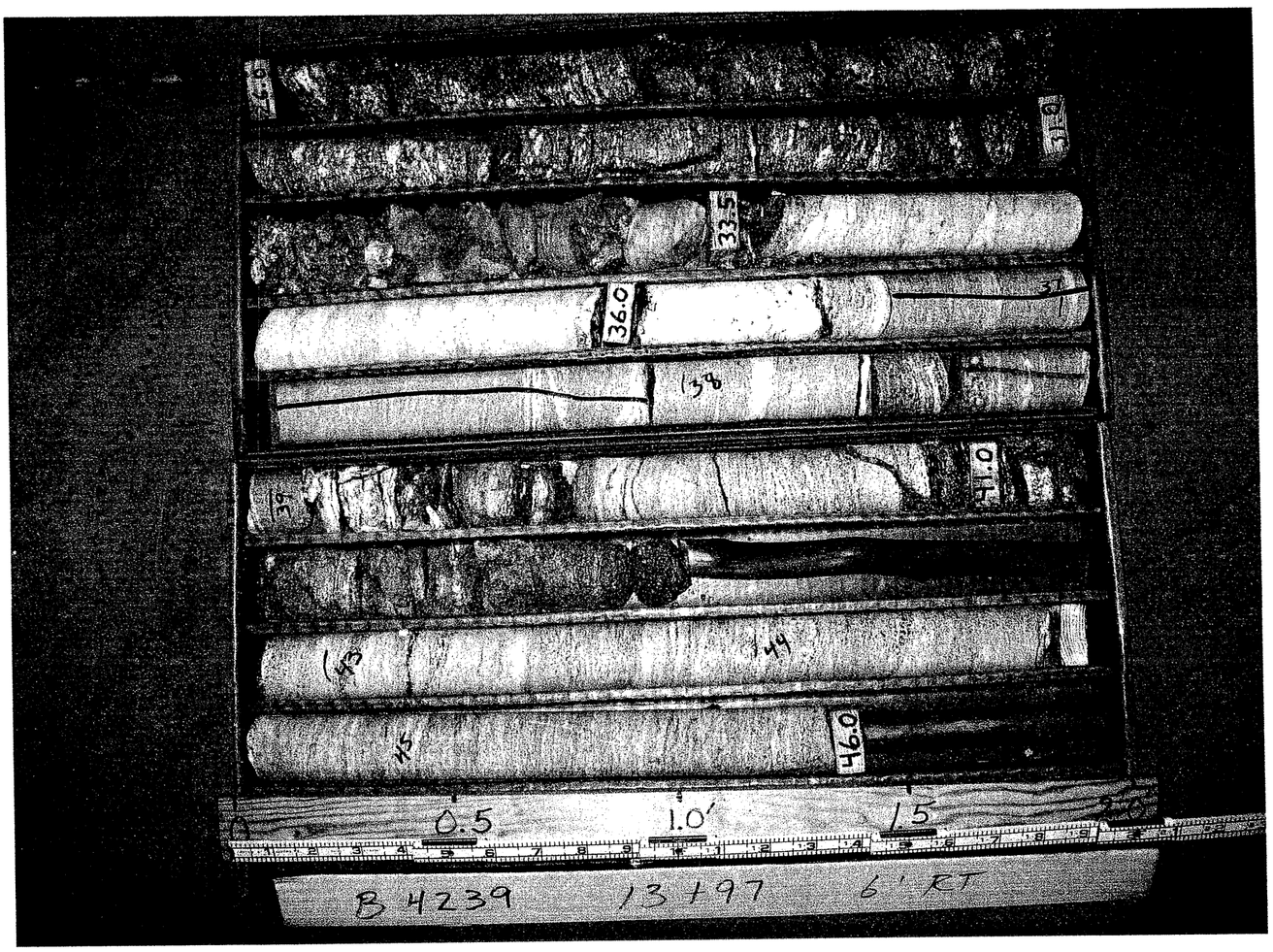

B-4239
EB1-A
11+98-L- 6' RT

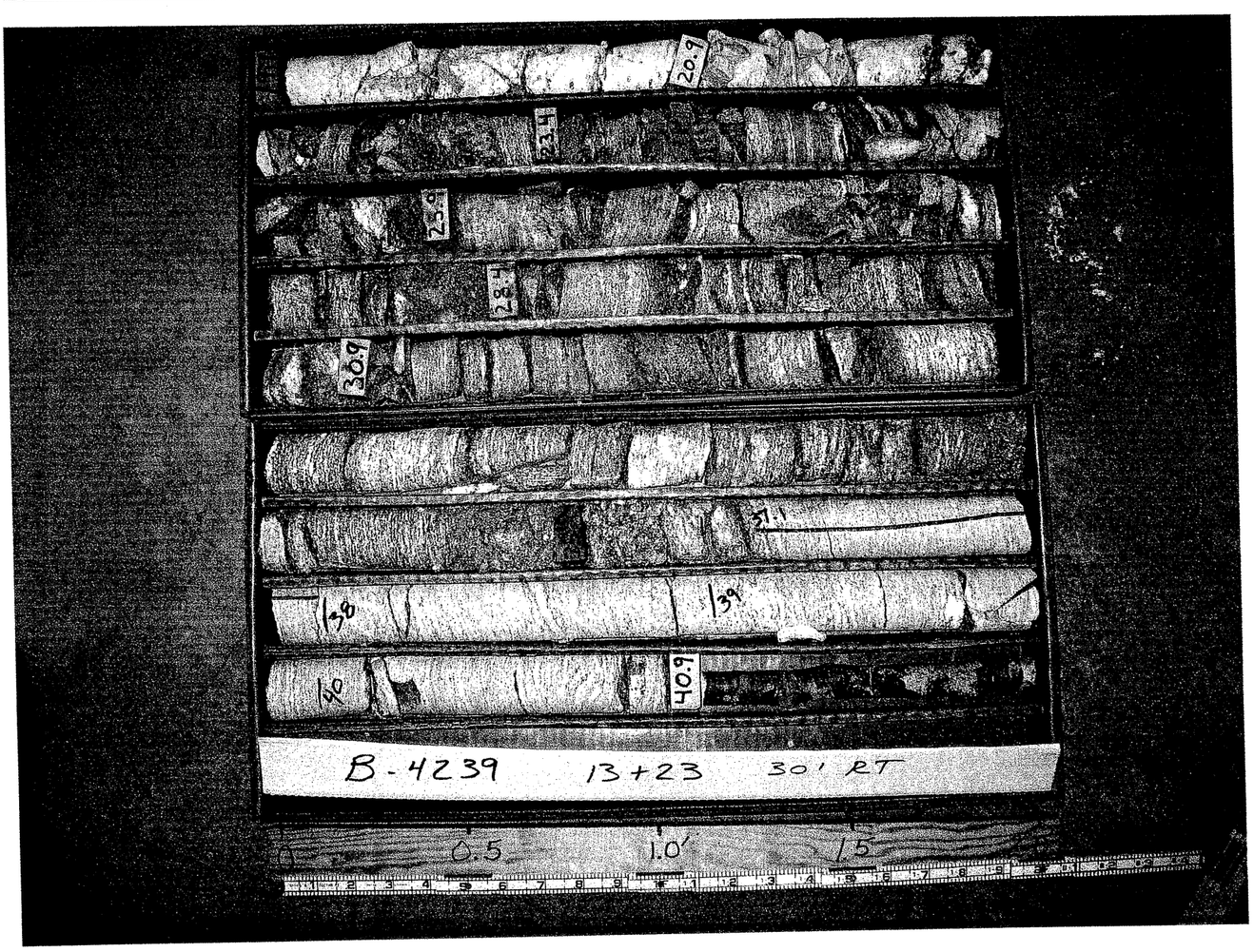

B-4239
EB1 - A
11+98 -L- 6' RT


25.6
28.1
30.6
33.1
35.6
0.5
1.0'
1.5
2.0
B-4239 13+50 4RT 1/2

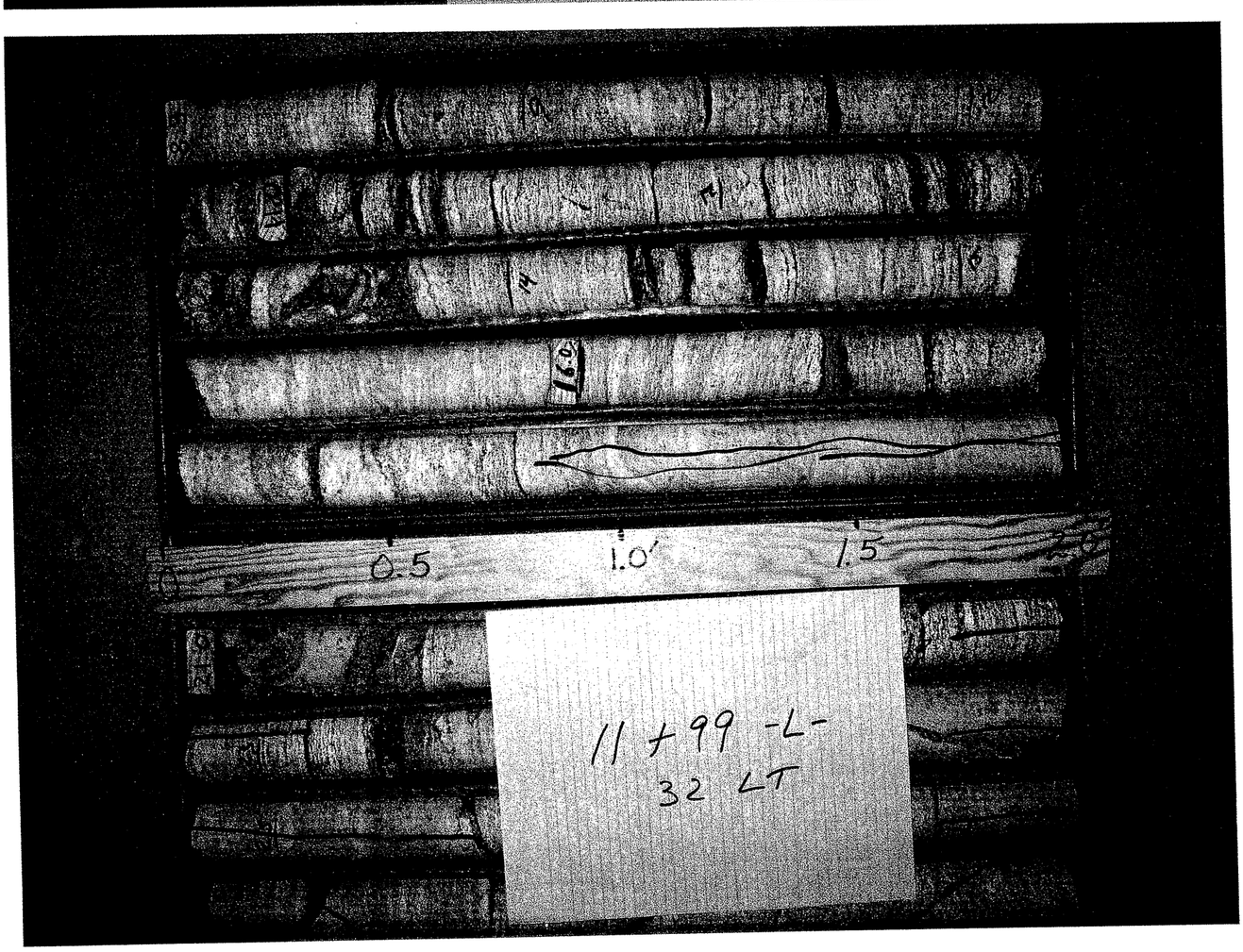

50.6
55.6
0.5
1.0'
1.5
2.0
B-4239 13+50 4RT 1/2


B4239
0.5
1.0'
1.5
2.0


33.5
36.0
46.0
0.5
1.0'
1.5
B 4239 13+97 6' RT


20.9
23.1
28.0
38.7
38.9
40.9
B-4239 13+23 30' RT
0.5
1.0'
1.5


26.0
11+99 -L-
32 LT


0.5
1.0'
1.5
11+99 -L-
32 LT


26.0
0.5
1.0'
1.5
11+99 -L-
32 LT


11+99 -L-
32 LT
31.0
0.5
1.0'

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

T. I. P. No. B-4239

REPORT ON SAMPLES OF SOILS FOR QUALITY

Project 33582.1.1 **County** POLK **Owner**
Date: Sampled **Received** 3/31/08 **Reported** 4/2/2008
Sampled from BRIDGE **By** J E ESTEP
Submitted by N WAINAINA 1995 **Standard Specifications**

744559 TO 744568
8/5/08

TEST RESULTS

Proj. Sample No.		SS-2	SS-3	SS-5	SS-7	SS-8	SS-9
Lab. Sample No.		744559	744560	744561	744562	744563	744564
Retained #4 Sieve	%	18	-	8	4	23	2
Passing #10 Sieve	%	75	100	85	87	69	95
Passing #40 Sieve	%	54	87	64	54	51	81
Passing #200 Sieve	%	23	55	20	14	17	25

MINUS NO. 10 FRACTION

SOIL MORTAR - 100%							
Coarse Sand Ret - #60	%	43.1	24.8	40.9	55.1	41.1	27.2
Fine Sand Ret - #270	%	29.4	23.8	41.4	32.3	40.5	54.8
Silt 0.05 - 0.005 mm	%	13.3	23.2	7.6	2.5	12.3	11.9
Clay < 0.005 mm	%	14.1	28.2	10.1	10.1	6.0	6.0
Passing #40 Sieve	%	-	-	-	-	-	-
Passing #200 Sieve	%	-	-	-	-	-	-

L. L.		31	43	30	30	35	27
P. I.		6	13	NP	NP	NP	NP
AASHTO Classification		A-2-4(0)	A-7-5(6)	A-2-4(0)	A-2-4(0)	A-2-4(0)	A-2-4(0)
Station		11+47	11+47	11+47	11+99	13+23	13+23
OFFSET		13 RT	13 RT	13 RT	32 LT	30 RT	30 RT
ALIGNMENT		CL	CL	CL	CL	CL	CL
Depth (Ft)		7.40	12.40	22.40	7.70	7.20	12.20
	to	8.90	13.90	23.70	8.30	8.70	13.70

cc: J E ESTEP
Soils File

Soils Engineer

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

T. I. P. No. B-4239

REPORT ON SAMPLES OF SOILS FOR QUALITY

Project 33582.1.1 **County** POLK **Owner**
Date: Sampled **Received** 3/31/08 **Reported** 4/2/2008
Sampled from BRIDGE **By** J E ESTEP
Submitted by N WAINAINA 1995 **Standard Specifications**

744559 TO 744568
8/5/08

TEST RESULTS

Proj. Sample No.		SS-10	SS-11	SS-12	SS-16		
Lab. Sample No.		744565	744566	744567	744568		
Retained #4 Sieve	%	11	25	11	10		
Passing #10 Sieve	%	80	69	81	86		
Passing #40 Sieve	%	61	53	63	68		
Passing #200 Sieve	%	25	16	18	22		

MINUS NO. 10 FRACTION

SOIL MORTAR - 100%							
Coarse Sand Ret - #60	%	36.9	42.1	37.7	40.5		
Fine Sand Ret - #270	%	37.9	40.5	47.2	38.8		
Silt 0.05 - 0.005 mm	%	17.1	9.3	11.1	6.6		
Clay < 0.005 mm	%	8.1	8.1	4.0	14.1		
Passing #40 Sieve	%	-	-	-	-		
Passing #200 Sieve	%	-	-	-	-		

L. L.		32	38	28	32		
P. I.		NP	NP	NP	NP		
AASHTO Classification		A-2-4(0)	A-2-4(0)	A-2-4(0)	A-2-4(0)		
Station		13+23	13+50	13+50	13+97		
OFFSET		30 RT	4 RT	4 RT	6 RT		
ALIGNMENT		CL	CL	CL	CL		
Depth (Ft)		17.20	12.00	17.00	22.00		
	to	18.70	13.50	18.50	23.50		

Soils Engineer

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
GEOTECHNICAL ENGINEERING UNIT

FIELD SCOUR REPORT

WBS: 33582.1.1 TIP: B-4239 COUNTY: POLK

DESCRIPTION(1): BRIDGE 2 OVER NORTH PACOLET RIVER ON SR 1102 (PEARSON FALLS RD.)

EXISTING BRIDGE

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

Bridge No.: 2 Length: 83' Total Bents: 3 Bents in Channel: 1 Bents in Floodplain: 0
Foundation Type: STONE ABUTMENTS @END BENTS, SILL/FOOTING W/TIMBER POSTS @INTERIOR

EVIDENCE OF SCOUR(2)

Abutments or End Bent Slopes: SOME MINOR UNDERMINING AND/OR CONCRETE DETERIORATION
RIP-RAP PREVIOUSLY PLACED AT NW CORNER

Interior Bents: MINOR UNDERMINING / CONCRETE DEGRADATION

Channel Bed: FLOWING ON ROCK, MINOR SCOUR

Channel Bank: MINOR SCOUR, HISTORY OF SLOPE INSTABILITY

EXISTING SCOUR PROTECTION

Type(3): RIP-RAP

Extent(4): NW CORNER AT BASE OF ABUTMENT

Effectiveness(5): GOOD

Obstructions(6): MINOR SCATTERED TREE LIMBS, ETC. (HISTORICALLY HIGH DEBRIS AREA)

INSTRUCTIONS

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

DESIGN INFORMATION

Channel Bed Material(7): ROCK

Channel Bank Material(8): RESIDUAL SANDY SOIL W/AREAS OF COLLUVIUM
JERSEY BARRIER RETAINING WALL AS SLOPE REPAIR, EAST APPROACH

Channel Bank Cover(9): TREES

Floodplain Width(10): NONE

Floodplain Cover(11): N/A

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

Channel Migration Tendency(13): MINOR, TOWARD END BENT TWO

Observations and Other Comments: ____

DESIGN SCOUR ELEVATIONS(14) Feet ____ Meters ____

Single span structure with no end bent impact.

Comparison of DSE to Hydraulics Unit theoretical scour:
They Hydraulics Unit predicts zero scour.

SOIL ANALYSIS RESULTS FROM CHANNEL BED AND BANK MATERIAL

Bed or Bank							
Sample No.							
Retained #4							
Passed #10							
Passed #40							
Passed #200							
Coarse Sand							
Fine Sand							
Silt							
Clay							
LL							
PI							
AASHTO							
Station							
Offset							
Depth							

Template Revised 02/07/06

Reported by: [signature] **Date:** 8-28-08