| STATE | STATE PROJECT REFERENCE NO. | SHEET NO. | TOTAL SHEETS |
|---|---|---|---|
| N.C. | B-3480 | 1 | 22 |

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

# STRUCTURE SUBSURFACE INVESTIGATION

PROJ. REFERENCE NO. *B-3480* F.A. PROJ. *BRSTP-107 (3)*

COUNTY *JACKSON*

PROJECT DESCRIPTION *BRIDGE NO. 39 OVER EAST FORK TUCKASEGEE RIVER ON NC 107*

SITE DESCRIPTION

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## CAUTION NOTICE

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

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DATE *07.01.09*

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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: 33097.1.1*

*ID: B-3480*

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# 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<br>A-3 | A-4, A-5<br>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<br>A-7-6 | | | |
| SYMBOL | | | | | | | | | | | | | | |
| % PASSING<br>#10<br>#40<br>#200 | 50 MX<br>30 MX<br>15 MX | 50 MX<br>25 MX | 51 MN<br>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/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
w - MOISTURE CONTENT
V - VERY
VST - VANE SHEAR TEST
WEA. - WEATHERED
$\gamma$ - UNIT WEIGHT
$\gamma_d$ - DRY UNIT WEIGHT

### EQUIPMENT USED ON SUBJECT PROJECT

DRILL UNITS:
- [ ] MOBILE B-___
- [ ] BK-51
- [X] 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
- [X] CASING [X] W/ ADVANCER
- [X] TRICONE 2 15/16 " 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-3 "LHT 1640' NORTH END CONCRETE WALL of BRIDGE -L- STA. 18+84.67 33.21' RT

ELEVATION: 2158.00 FT.

NOTES:

REVISED 02/23/06

| PROJECT REFERENCE NO. | SHEET |
|---|---|
| B-3480 | 3 OF 22 |

# SITE PLAN

0 50 100
FEET

NAD 83

-L- POC STA.15+96.59=
-Y- POT STA.10+00.00

FALLOW

15+00

WEST FORK TUCKASEGEE

PT Sta. 14+29.26

PC Sta. 15+57.26

BEGIN APPROACH SLAB
-L- Sta.16+81.00

BEGIN BRIDGE
-L- Sta.17+06.00
EL 2,155.65

EAST FORK TUCKASEGEE

CULTIVATED

20+00

END BRIDGE
-L- Sta.18+86.00
EL 2,155.06

CLASS II RIPRAP
TOP ELEV = 2147.99

CLASS II RIPRAP
TOP ELEV = 2148.53

15" CMP W/ 2-ELBOWS
PREFORMED SCOUR HOLE
+83.19
51.32' LT

PC Sta. 20+13.11

9.0' GR

+00.00
43.07' LT

10' MIN. SET BACK

TOB

EB1-A

EB2-A

MH

-L-

EB1-C

B1-C

EB2-C

B2-C

B1-alt

ELEV = 2154.63'

22'

27.5'

18'

15" RCP

CB

TO CULLOWHEE

NC 107

TO GLENVILLE

MH

2GI

15" RCP

WD BENCH

PROPOSED RETAINING WALL

CLASS B RIPRAP

WD GAZEBO

SEPTIC TANK

SAN DRAIN

2.0' ICC

15' 15'

15" RCP

WD DECK

+71.52
42.42' RT

H TR

SEPTIC TANK

CLASS B RIPRAP

B1-B

B2-B

EB2-B

6 IN. DIAM. DECK DRAINS AT RIGHT SIDE ONLY

REMOVE EXIST BRIDGE

BENCHMARK-3

+73.05
32.98' RT

2 S F D

G

SEPTIC TANK

END APPROACH SLAB
-L- Sta.19+11.00

PT Sta. 16+53.55

I S F D

WOODS

SHOOK COVE RD
SR-1135

EAST FORK TUCKASEGEE

TOP OF BANK

WATER SURFACE

WELL

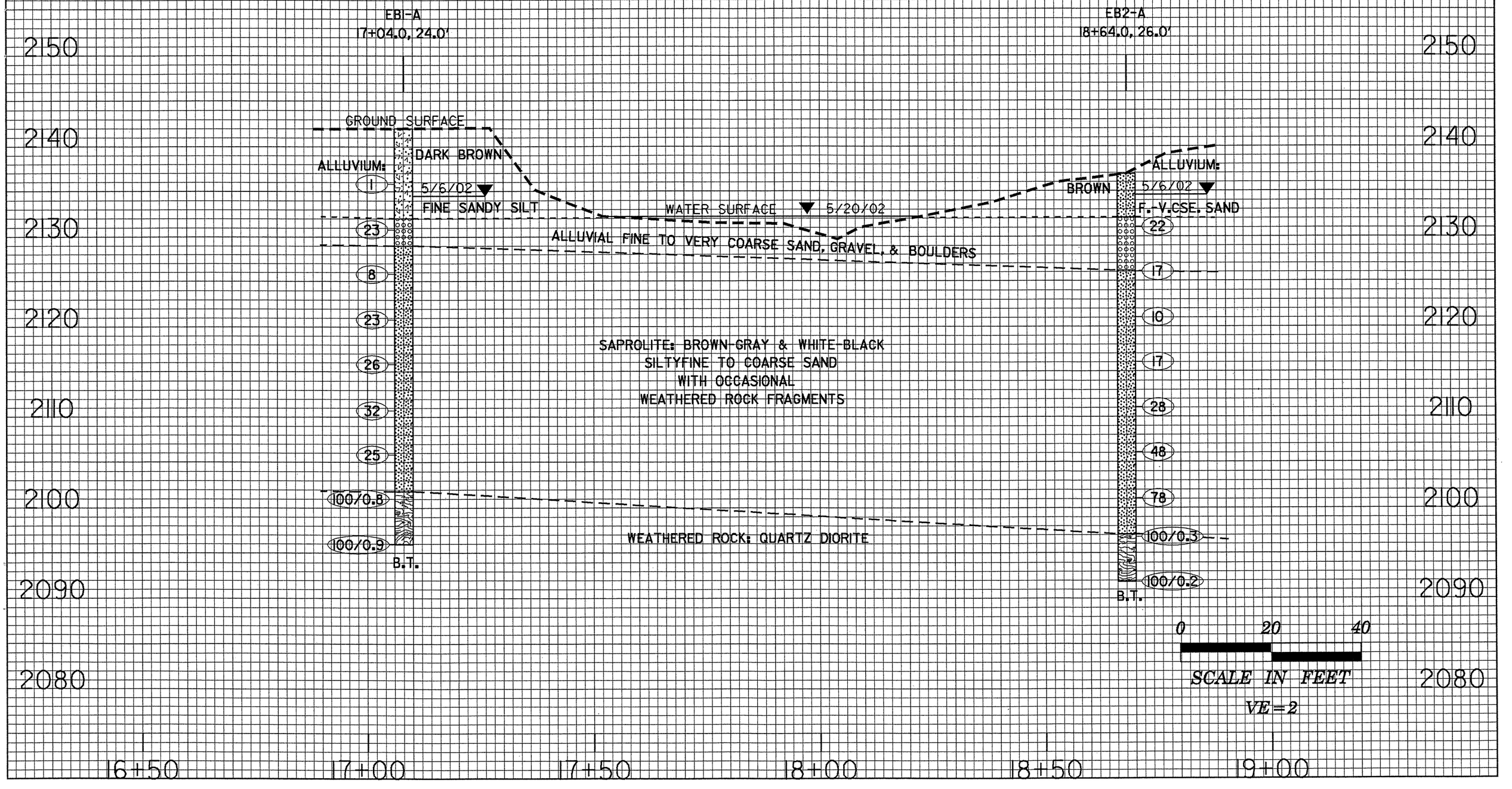
48" WW

APPROXIMATE LOCATION OF SEPTIC TANK-TAIL LINE

PC Sta. 11+90.12

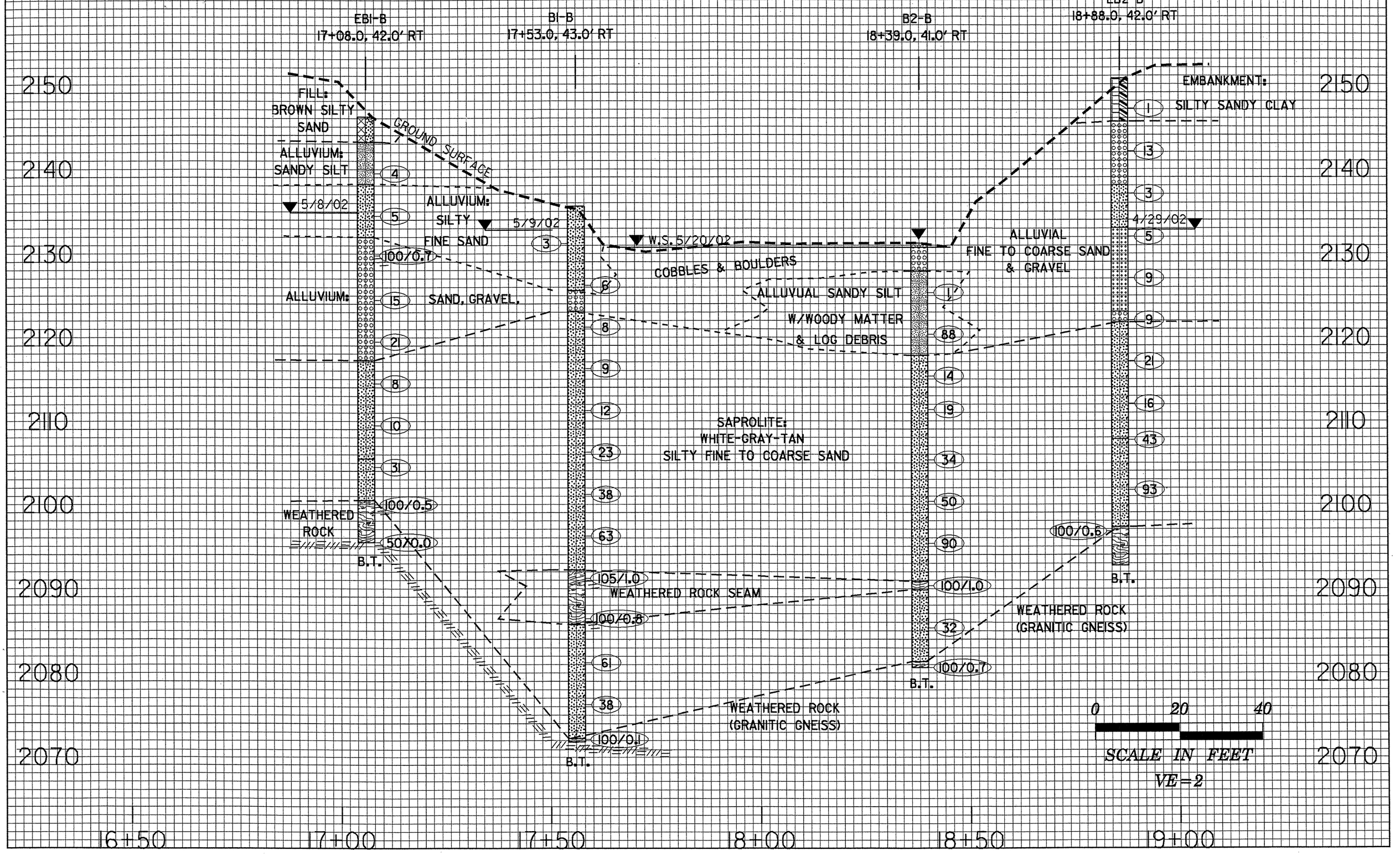
| STATE PROJECT NO. | SHEET NO. | TOTAL SHEETS |
|---|---|---|
| 33097.1.1 (B-3480) | 4 | OF 22 |

# PROFILE 25 FT LT OF -L-



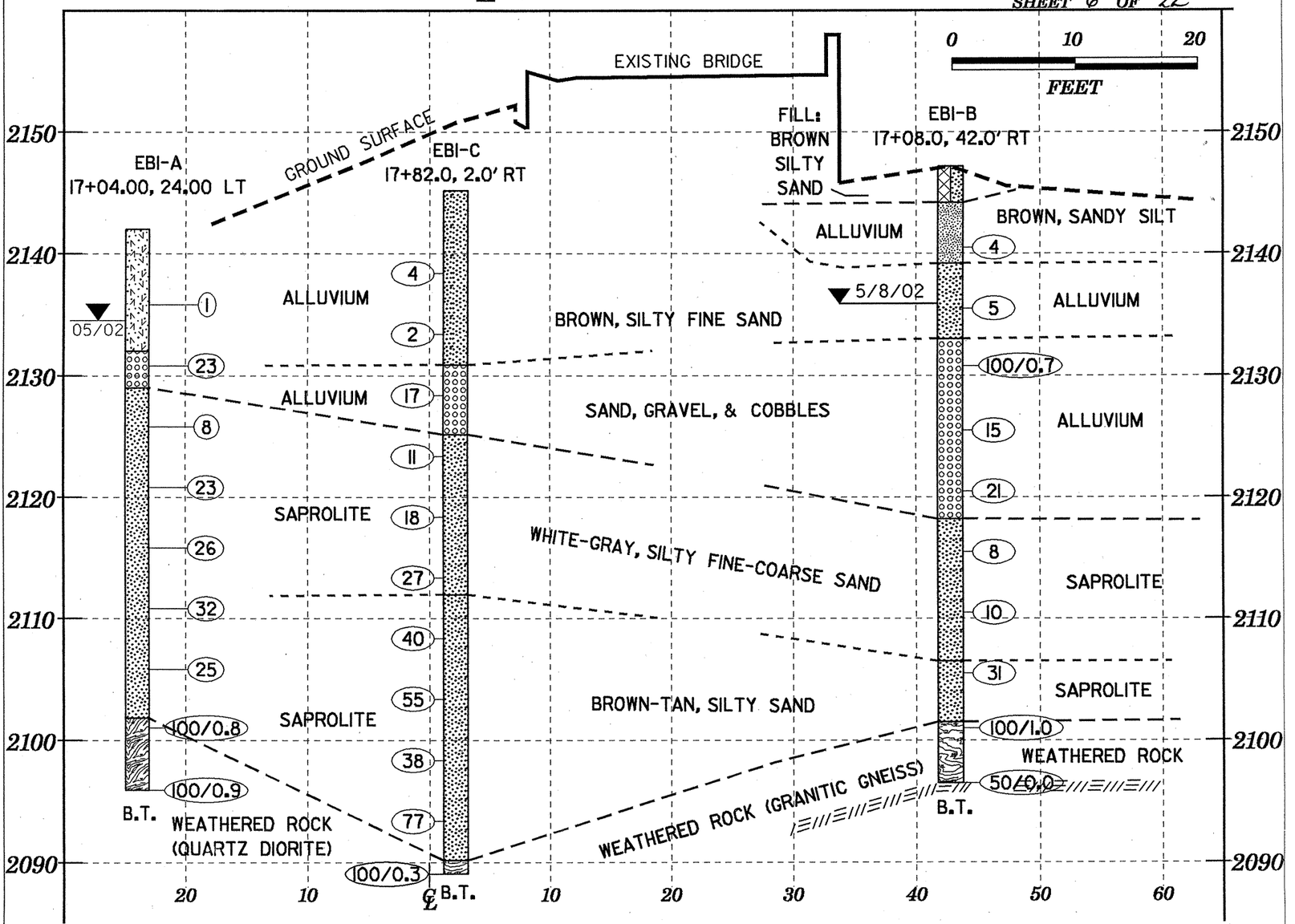
| STATE PROJECT NO. | SHEET NO. | TOTAL SHEETS |
|---|---|---|
| 33097.1.1 (B-3480) | 5 | OF 22 |

# PROFILE 43 FT RIGHT OF -L-



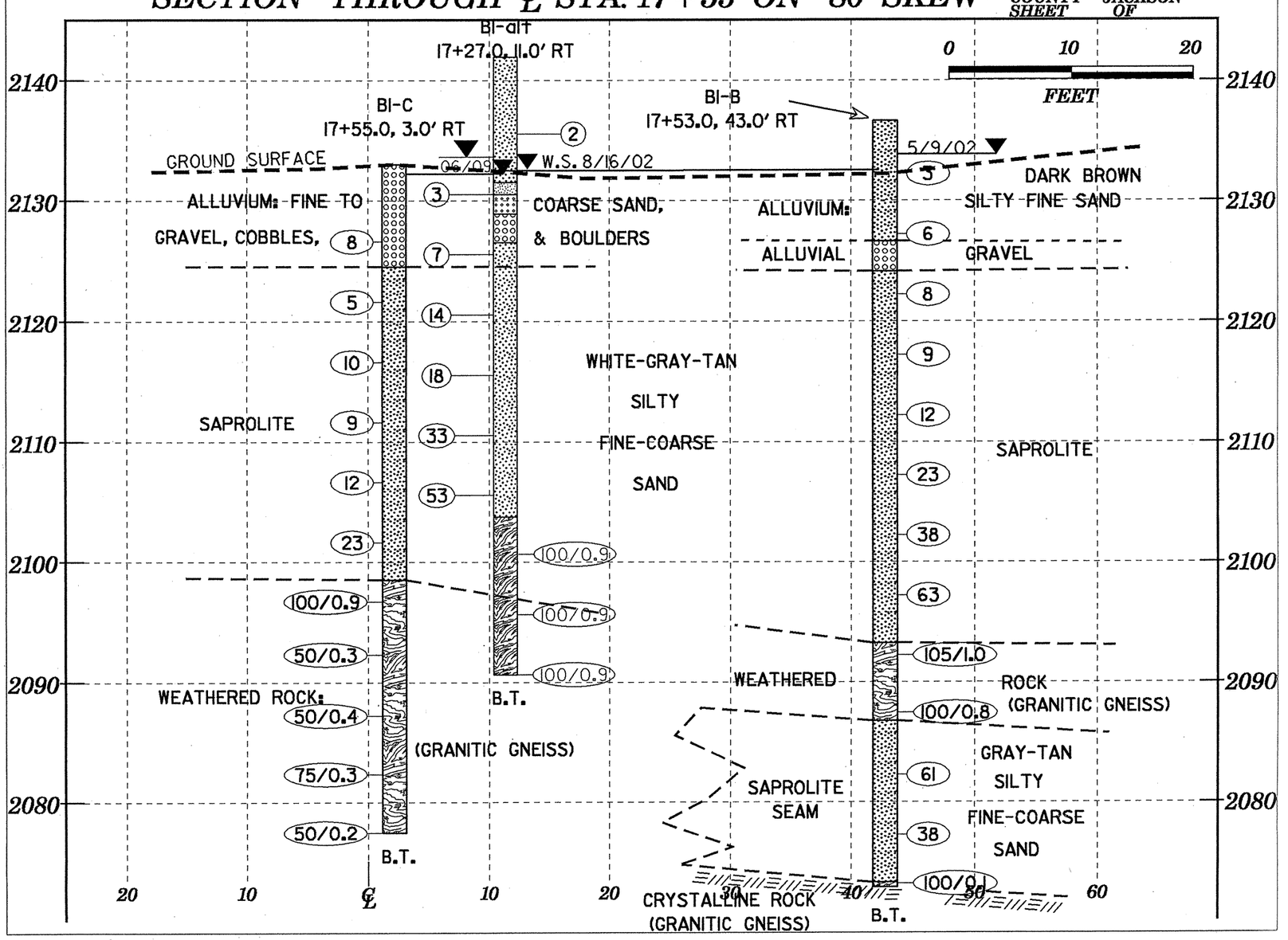
PROJECT 33097.1.1 (B-3480)
COUNTY JACKSON
SHEET 6 OF 22

# SECTION THROUGH ℄ STA. 17+00 ON 80° SKEW



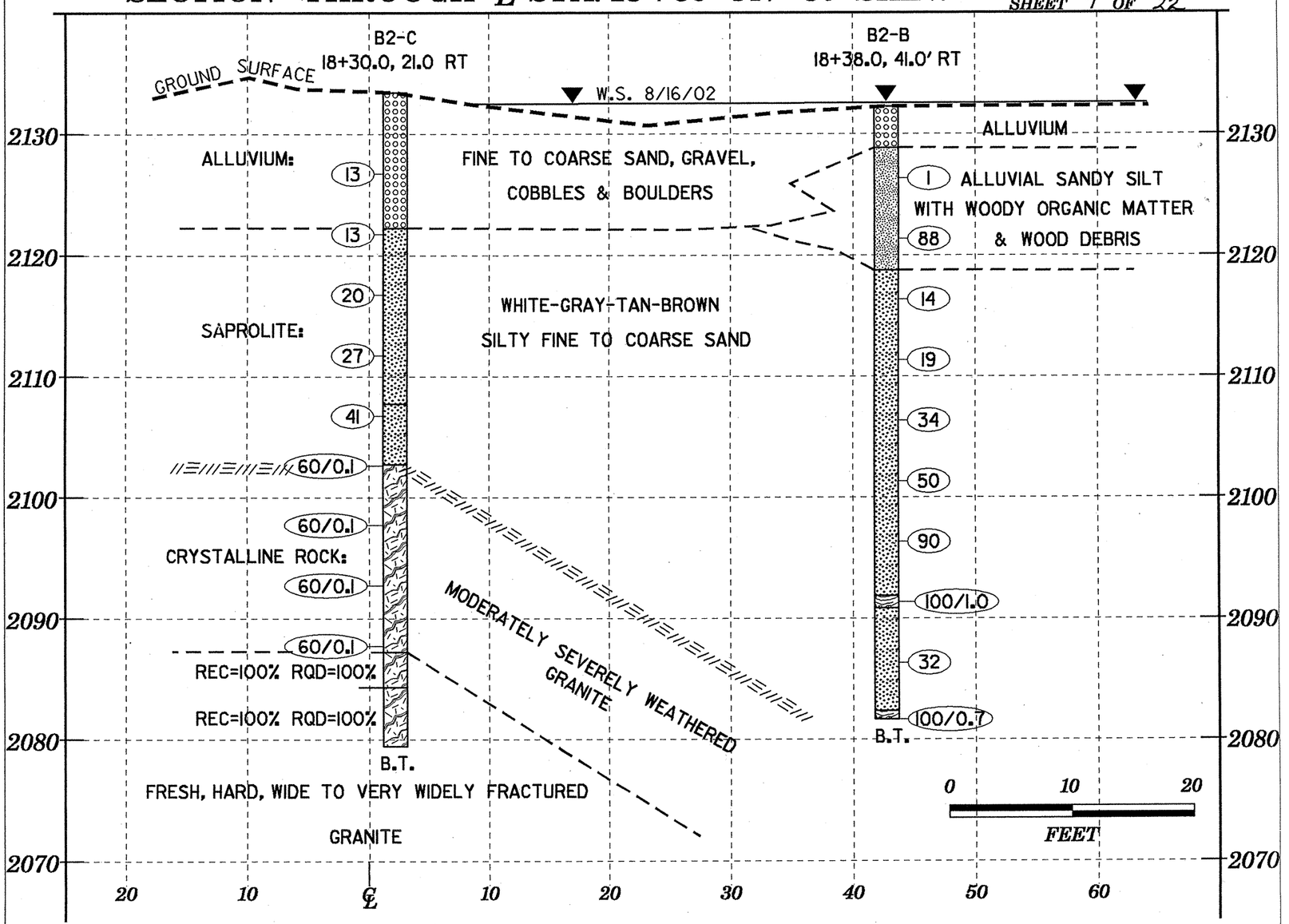

PROJECT 33097.1.1 (B-3480)
COUNTY JACKSON
SHEET OF

# SECTION THROUGH ℄ STA. 17+55 ON 80° SKEW



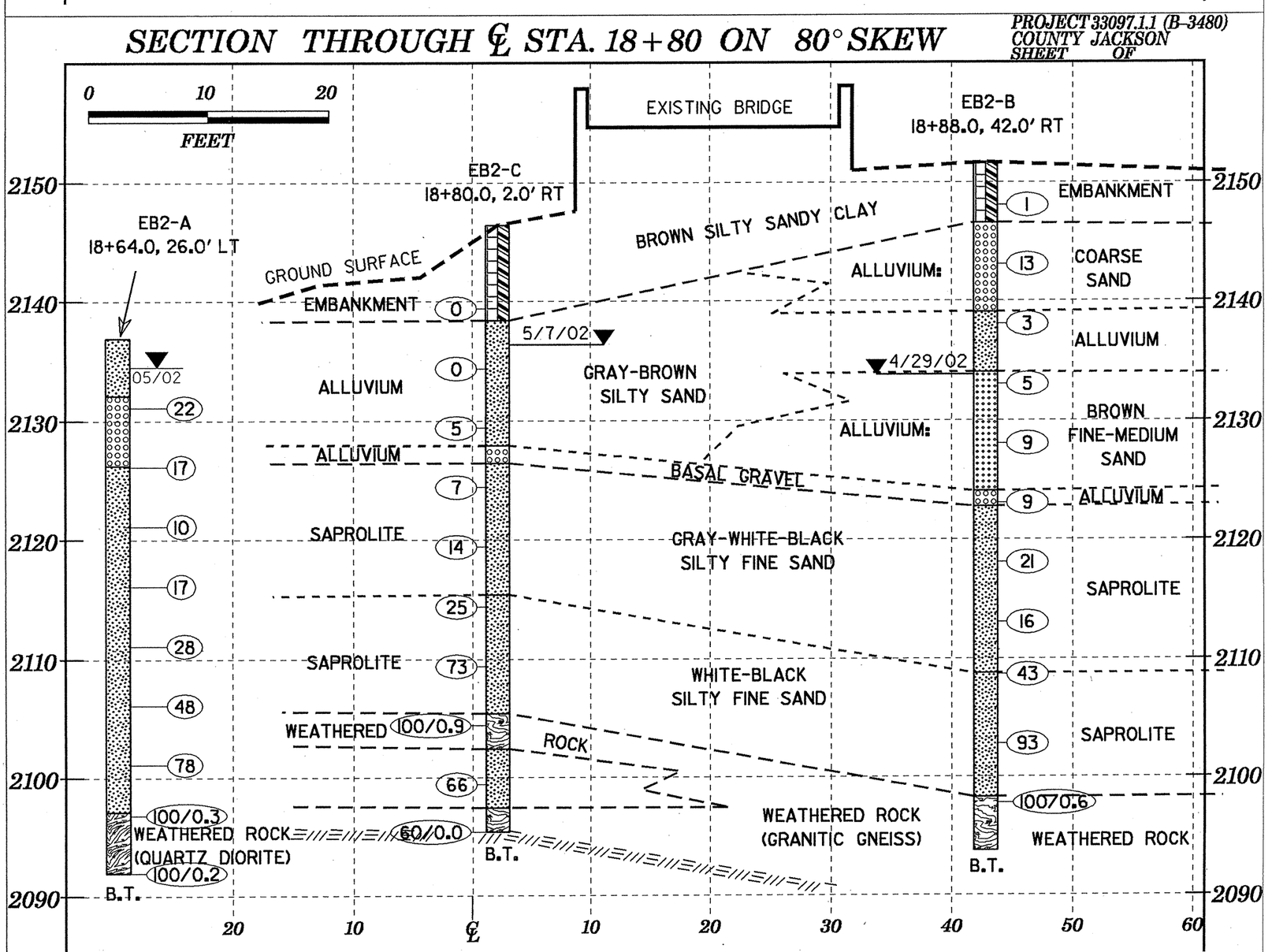
# SECTION THROUGH ℄ STA. 18+30 ON 80° SKEW

PROJECT 33097.1.1 (B-3480)
COUNTY JACKSON
SHEET 7 OF 22




# SECTION THROUGH ℄ STA. 18+80 ON 80° SKEW

PROJECT 33097.1.1 (B-3480)
COUNTY JACKSON
SHEET OF



# NCDOT GEOTECHNICAL ENGINEERING UNIT
# BOREHOLE REPORT

| | | | |
|---|---|---|---|
| **PROJECT NO.** 33097.1.1 | **ID.** B-3480 | **COUNTY** JACKSON | **GEOLOGIST** Mann, J. W. |
| **SITE DESCRIPTION** BRIDGE NO. 39 ON N.C. 107 OVER EAST FORK OF TUCKASEEGEE RIVER | | | **GROUND WTR (ft)** |
| **BORING NO.** EB1-A | **STATION** 17+04 | **OFFSET** 24ft LT | **ALIGNMENT** -L- | **0 HR.** N/A |
| **COLLAR ELEV.** 2,142.0 ft | **TOTAL DEPTH** 46.1 ft | **NORTHING** 577,996 | **EASTING** 769,779 | **24 HR.** 7.5 |
| **DRILL MACHINE** CME-550X | **DRILL METHOD** NW Casing w/ SPT | | **HAMMER TYPE** Automatic | |
| **START DATE** 05/07/02 | **COMP. DATE** 05/07/02 | **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 | ELEV. (ft) | SOIL AND ROCK DESCRIPTION | DEPTH (ft) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 2145 | | | | | | | | | | 2,142.0 | GROUND SURFACE | 0.0 |
| 2140 | 2,136.8 | 5.2 | | | | | | | | | ALLUVIAL<br>DARK, BROWN MICACEOUS FINE SANDY SILT | |
| 2135 | | | 1 | 0 | 1 | 1 | SS-18 | W | | 2,132.0 | | 10.0 |
| 2130 | 2,131.8 | 10.2 | 34 | 14 | 9 | 23 | SS-19 | Sat. | | 2,129.0 | ALLUVIAL<br>VERY COARSE SAND WITH GRAVEL AND BOULDERS | 13.0 |
| 2125 | 2,126.8 | 15.2 | 2 | 3 | 5 | 8 | SS-20 | | | | SAPROLITE<br>BROWN-GRAY, SILTY SAND WITH OCCASIONAL WEATHERD ROCK FRAGMENTS | |
| 2120 | 2,121.8 | 20.2 | 8 | 12 | 11 | 23 | | | | | | |
| 2115 | 2,116.8 | 25.2 | 5 | 10 | 16 | 26 | SS-21 | | | | | |
| 2110 | 2,111.8 | 30.2 | 13 | 12 | 20 | 32 | | | | | | |
| 2105 | 2,106.8 | 35.2 | 5 | 11 | 14 | 25 | SS-22 | | | | | |
| 2100 | 2,101.8 | 40.2 | 53 | 47/0.3 | | 100/0.8 | SS-23 | | | 2,101.8 | WEATHERED ROCK<br>(QUARTZ DIORITE) | 40.2 |
| 2095 | 2,096.8 | 45.2 | 40 | 60/0.4 | | 100/0.9 | | | | 2,095.9 | Boring Terminated with Standard Penetration Test Refusal at Elevation 2,095.9 ft IN WEATHERED ROCK (QUARTZ DIORITE) | 46.1 |
| 2090 | | | | | | | | | | | | |
| 2085 | | | | | | | | | | | | |
| 2080 | | | | | | | | | | | | |
| 2075 | | | | | | | | | | | | |
| 2070 | | | | | | | | | | | | |
| 2065 | | | | | | | | | | | | |

NCDOT BORE SINGLE B3480_GEO_BRDG_107.GPJ NC_DOT.GDT 6/30/09



# NCDOT GEOTECHNICAL ENGINEERING UNIT
# BOREHOLE REPORT

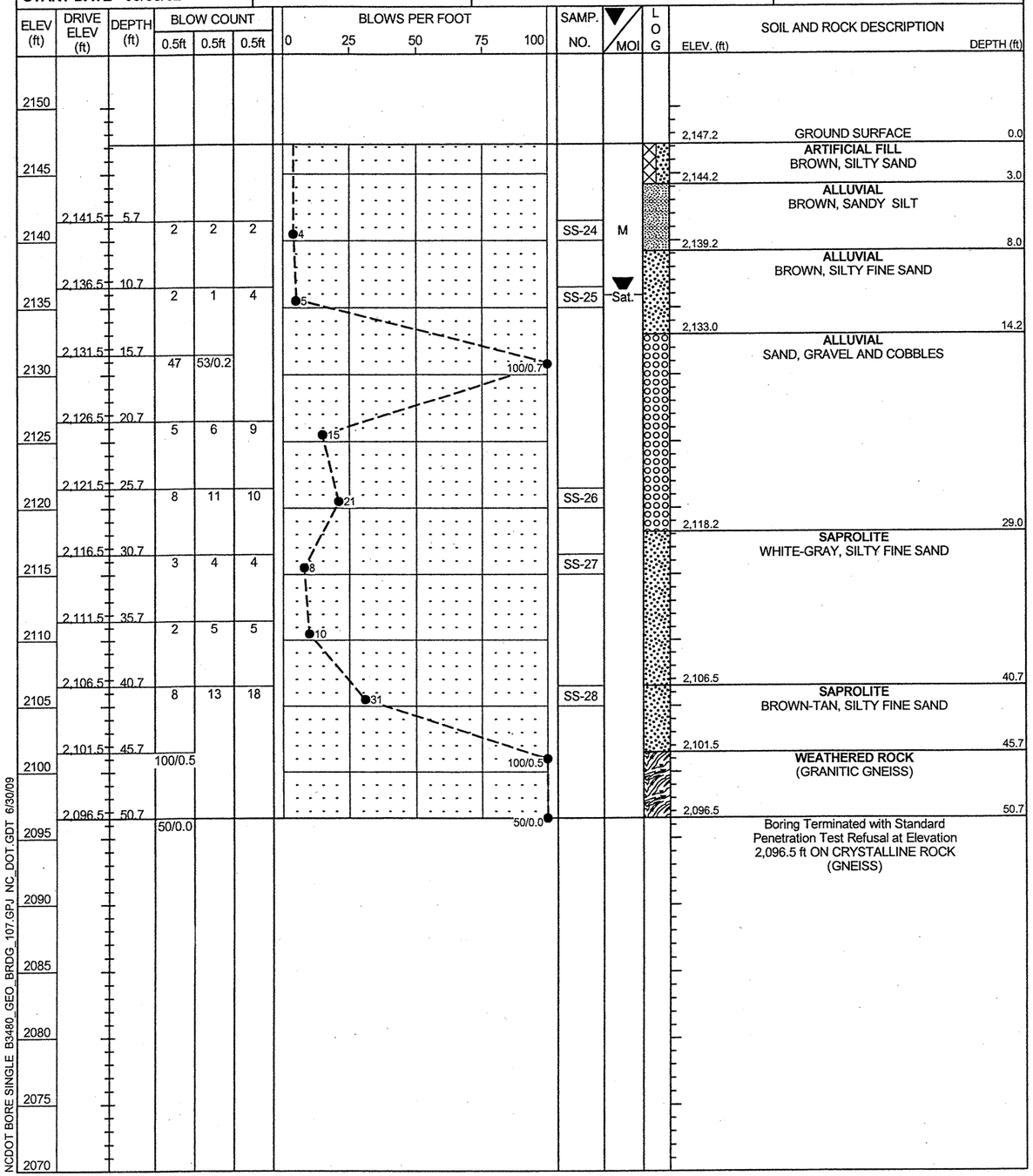
| | | | |
|---|---|---|---|
| **PROJECT NO.** 33097.1.1 | **ID.** B-3480 | **COUNTY** JACKSON | **GEOLOGIST** Mann, J. W. |
| **SITE DESCRIPTION** BRIDGE NO. 39 ON N.C. 107 OVER EAST FORK OF TUCKASEEGEE RIVER | | | **GROUND WTR (ft)** |
| **BORING NO.** EB1-C | **STATION** 17+18 | **OFFSET** 2ft RT | **ALIGNMENT** -L- | **0 HR.** N/A |
| **COLLAR ELEV.** 2,145.2 ft | **TOTAL DEPTH** 56.1 ft | **NORTHING** 578,007 | **EASTING** 769,807 | **24 HR.** N/A |
| **DRILL MACHINE** CME-550X | **DRILL METHOD** NW Casing w/ SPT | | **HAMMER TYPE** Automatic | |
| **START DATE** 05/17/02 | **COMP. DATE** 05/17/02 | **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 | ELEV. (ft) | SOIL AND ROCK DESCRIPTION | DEPTH (ft) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 2150 | | | | | | | | | | 2,145.2 | GROUND SURFACE | 0.0 |
| 2145 | | | | | | | | | | | ALLUVIAL<br>BROWN, SILTY FINE SAND | |
| 2140 | 2,139.4 | 5.8 | 1 | 2 | 2 | 4 | | | | | | |
| 2135 | 2,134.4 | 10.8 | 0 | 1 | 1 | 2 | | | | 2,130.9 | | 14.3 |
| 2130 | 2,129.4 | 15.8 | 12 | 8 | 9 | 17 | | | | | ALLUVIAL<br>SAND, GRAVEL AND COBBLES | |
| 2125 | 2,124.4 | 20.8 | 3 | 5 | 6 | 11 | SS-34 | | | 2,125.2 | | 20.0 |
| 2120 | 2,119.4 | 25.8 | 5 | 8 | 10 | 18 | SS-35 | | | | SAPROLITE<br>WHITE-GRAY, SILTY FINE TO COARSE SAND | |
| 2115 | 2,114.4 | 30.8 | 6 | 13 | 14 | 27 | | | | 2,112.0 | | 33.2 |
| 2110 | 2,109.4 | 35.8 | 11 | 19 | 21 | 40 | | | | | SAPROLITE<br>BROWN-TAN, SILTY SAND | |
| 2105 | 2,104.4 | 40.8 | 10 | 20 | 35 | 55 | | | | | | |
| 2100 | 2,099.4 | 45.8 | 9 | 18 | 20 | 38 | | | | | | |
| 2095 | 2,094.4 | 50.8 | 12 | 30 | 47 | 77 | | | | 2,090.2 | | 55.0 |
| 2090 | 2,089.4 | 55.8 | 100/0.3 | | | 100/0.3 | | | | 2,089.1 | WEATHERED ROCK<br>(GRANITIC GNEISS) | 56.1 |
| 2085 | | | | | | | | | | | Boring Terminated with Standard Penetration Test Refusal at Elevation 2,089.1 ft IN WEATHERED ROCK (GNEISS) | |
| 2080 | | | | | | | | | | | | |
| 2075 | | | | | | | | | | | | |
| 2070 | | | | | | | | | | | | |

NCDOT BORE SINGLE B3480_GEO_BRDG_107.GPJ NC_DOT.GDT 6/30/09

# NCDOT GEOTECHNICAL ENGINEERING UNIT
# BORELOG REPORT

| | | | |
|---|---|---|---|
| **PROJECT NO.** 33097.1.1 | **ID.** B-3480 | **COUNTY** JACKSON | **GEOLOGIST** Mann, J. W. |
| **SITE DESCRIPTION** BRIDGE NO. 39 ON N.C. 107 OVER EAST FORK OF TUCKASEEGEE RIVER | | | **GROUND WTR (ft)** |
| **BORING NO.** EB1-B | **STATION** 17+08 | **OFFSET** 42ft RT | **ALIGNMENT** -L- | **0 HR.** N/A |
| **COLLAR ELEV.** 2,147.2 ft | **TOTAL DEPTH** 50.7 ft | **NORTHING** 577,991 | **EASTING** 769,845 | **24 HR.** 11.3 |
| **DRILL MACHINE** CME-550X | **DRILL METHOD** NW Casing w/ SPT | | **HAMMER TYPE** Automatic | |
| **START DATE** 05/08/02 | **COMP. DATE** 05/08/02 | **SURFACE WATER DEPTH** N/A | **DEPTH TO ROCK** N/A | |




NCDOT BORE SINGLE B3480_GEO_BRDG_107.GPJ NC_DOT.GDT 6/30/09

# NCDOT GEOTECHNICAL ENGINEERING UNIT
# BOREHOLE REPORT

| | | | |
|---|---|---|---|
| **PROJECT NO.** 33097.1.1 | **ID.** B-3480 | **COUNTY** JACKSON | **GEOLOGIST** Mann, J. W. |
| **SITE DESCRIPTION** BRIDGE NO. 39 ON N.C. 107 OVER EAST FORK OF TUCKASEEGEE RIVER | | | **GROUND WTR (ft)** |
| **BORING NO.** B1-alt | **STATION** 17+27 | **OFFSET** 11ft RT | **ALIGNMENT** -L- | **0 HR.** N/A |
| **COLLAR ELEV.** 2,141.9 ft | **TOTAL DEPTH** 51.3 ft | **NORTHING** 578,014 | **EASTING** 769,818 | **24 HR.** 8.3 |
| **DRILL MACHINE** CME-45C | **DRILL METHOD** NW Casing w/ SPT | | **HAMMER TYPE** Automatic | |
| **START DATE** 06/02/09 | **COMP. DATE** 06/02/09 | **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) |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 2145 | | | | | | | | | | 2,141.9 GROUND SURFACE | 0.0 |
| 2140 | 2,136.5 | 5.4 | 2 | 1 | 1 | 2 | | | | ALLUVIAL<br>TAN-BROWN, SILTY FINE TO COARSE SAND WITH TRACE ROOTS | |
| 2135 | 2,131.5 | 10.4 | WOH | 1 | 2 | 3 | | | | 2,131.5 | 10.4 |
| 2130 | | | | | | | | | | 2,130.5 ALLUVIAL<br>BLACK SANDY SILT WITH TRACE TO LITTLE ORGANIC MATTER | 11.4 |
| 2125 | 2,126.5 | 15.4 | 4 | 3 | 4 | 7 | | | | 2,128.9 ALLUVIAL<br>GRAY SAND | 13.0 |
| 2120 | 2,121.5 | 20.4 | 4 | 5 | 9 | 14 | | | | 2,126.5 ALLUVIAL<br>BASAL GRAVEL | 15.4 |
| 2115 | 2,116.5 | 25.4 | 5 | 8 | 10 | 18 | | | | SAPROLITE<br>DARK GRAY-BLACK SILTY SAND WITH TRACE MICA | |
| 2110 | 2,111.5 | 30.4 | 10 | 14 | 19 | 33 | | | | | |
| 2105 | 2,106.5 | 35.4 | 14 | 19 | 34 | 53 | | | | 2,103.7 | 38.2 |
| 2100 | 2,101.5 | 40.4 | 28 | 36 | 64/0.4 | 100/0.9 | | | | WEATHERED ROCK<br>(GRANITIC GNEISS) | |
| 2095 | 2,096.5 | 45.4 | 28 | 53 | 47/0.4 | 100/0.9 | | | | | |
| 2090 | 2,091.5 | 50.4 | 43 | 57/0.4 | | 100/0.9 | | | | 2,090.6 Boring Terminated with Standard Penetration Test Refusal at Elevation 2,090.6 ft IN WEATHERED ROCK (GNEISS) | 51.3 |
| 2085 | | | | | | | | | | | |
| 2080 | | | | | | | | | | | |
| 2075 | | | | | | | | | | | |
| 2070 | | | | | | | | | | | |
| 2065 | | | | | | | | | | | |

NCDOT BORE SINGLE B3480_GEO_BRDG_107.GPJ NC_DOT.GDT 6/30/09



# NCDOT GEOTECHNICAL ENGINEERING UNIT
# BOREHOLE REPORT

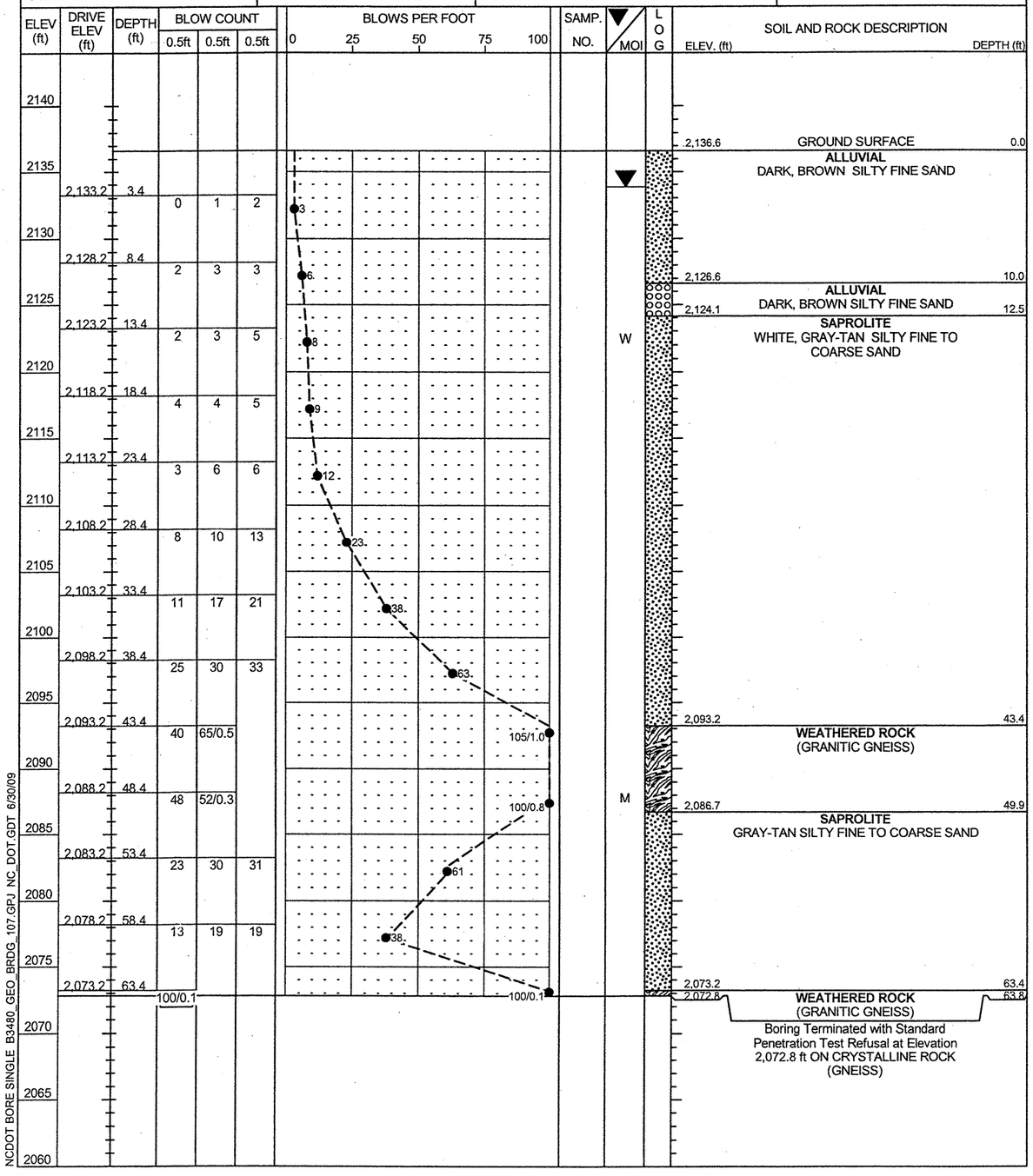
| | | | |
|---|---|---|---|
| **PROJECT NO.** 33097.1.1 | **ID.** B-3480 | **COUNTY** JACKSON | **GEOLOGIST** Mann, J. W. |
| **SITE DESCRIPTION** BRIDGE NO. 39 ON N.C. 107 OVER EAST FORK OF TUCKASEEGEE RIVER | | | **GROUND WTR (ft)** |
| **BORING NO.** B1-C | **STATION** 17+55 | **OFFSET** 3ft RT | **ALIGNMENT** -L- | **0 HR.** 0.8 |
| **COLLAR ELEV.** 2,133.0 ft | **TOTAL DEPTH** 55.6 ft | **NORTHING** 578,044 | **EASTING** 769,813 | **24 HR.** 0.8 |
| **DRILL MACHINE** CME-550X | **DRILL METHOD** NW Casing w/ SPT | | **HAMMER TYPE** Automatic | |
| **START DATE** 08/14/02 | **COMP. DATE** 08/14/02 | **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) |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 2135 | | | | | | | | | | 2,133.0 GROUND SURFACE | 0.0 |
| 2130 | 2,127.6 | 5.4 | 5 | 6 | 2 | 8 | | Sat. | | ALLUVIAL<br>FINE TO COARSE SAND, GRAVEL,COBBLES AND BOULDERS | |
| 2125 | 2,122.6 | 10.4 | 1 | 2 | 3 | 5 | | Sat. | | 2,124.5 | 8.5 |
| 2120 | 2,117.6 | 15.4 | 2 | 4 | 6 | 10 | | Sat. | | SAPROLITE<br>WHITE, GRAY AND TAN SILTY FINE TO COARSE SAND | |
| 2115 | 2,112.6 | 20.4 | 3 | 4 | 5 | 9 | | Sat. | | | |
| 2110 | 2,107.6 | 25.4 | 3 | 5 | 7 | 12 | | Sat. | | | |
| 2105 | 2,102.6 | 30.4 | 5 | 8 | 15 | 23 | | W | | | |
| 2100 | 2,097.6 | 35.4 | 30 | 70 | | | | M | | 2,098.5 | 34.5 |
| 2095 | 2,092.6 | 40.4 | 50/0.3 | | | 50/0.3 | | | | WEATHERED ROCK<br>(GRANITIC GNEISS) | |
| 2090 | 2,087.6 | 45.4 | 50/0.4 | | | 50/0.4 | | | | | |
| 2085 | 2,082.6 | 50.4 | 75/0.3 | | | 75/0.3 | | | | | |
| 2080 | 2,077.6 | 55.4 | 50/0.2 | | | 50/0.2 | | | | 2,077.4 Boring Terminated with Standard Penetration Test Refusal at Elevation 2,077.4 ft IN WEATHERED ROCK (GNEISS) | 55.6 |
| 2075 | | | | | | | | | | | |
| 2070 | | | | | | | | | | | |
| 2065 | | | | | | | | | | | |
| 2060 | | | | | | | | | | | |
| 2055 | | | | | | | | | | | |

NCDOT BORE SINGLE B3480_GEO_BRDG_107.GPJ NC_DOT.GDT 6/30/09

# NCDOT GEOTECHNICAL ENGINEERING UNIT
# BORELOG REPORT

| | | | |
|---|---|---|---|
| **PROJECT NO.** 33097.1.1 | **ID.** B-3480 | **COUNTY** JACKSON | **GEOLOGIST** Mann, J. W. |
| **SITE DESCRIPTION** BRIDGE NO. 39 ON N.C. 107 OVER EAST FORK OF TUCKASEEGEE RIVER | | | **GROUND WTR (ft)** |
| **BORING NO.** B1-B | **STATION** 17+53 | **OFFSET** 43ft RT | **ALIGNMENT** -L- | **0 HR.** N/A |
| **COLLAR ELEV.** 2,136.6 ft | **TOTAL DEPTH** 63.8 ft | **NORTHING** 578,036 | **EASTING** 769,852 | **24 HR.** 2.8 |
| **DRILL MACHINE** CME-550X | **DRILL METHOD** NW Casing w/ SPT | | **HAMMER TYPE** Automatic | |
| **START DATE** 05/08/02 | **COMP. DATE** 05/08/02 | **SURFACE WATER DEPTH** N/A | **DEPTH TO ROCK** N/A | |




NCDOT BORE SINGLE B3480_GEO_BRDG_107.GPJ NC_DOT.GDT 6/30/09

# NCDOT GEOTECHNICAL ENGINEERING UNIT
# BORELOG REPORT

| | | | |
|---|---|---|---|
| **PROJECT NO.** 33097.1.1 | **ID.** B-3480 | **COUNTY** JACKSON | **GEOLOGIST** Mann, J. W. |
| **SITE DESCRIPTION** BRIDGE NO. 39 ON N.C. 107 OVER EAST FORK OF TUCKASEEGEE RIVER | | | **GROUND WTR (ft)** |
| **BORING NO.** B2-C | **STATION** 18+30 | **OFFSET** 2ft RT | **ALIGNMENT** -L- | **0 HR.** N/A |
| **COLLAR ELEV.** 2,133.4 ft | **TOTAL DEPTH** 54.0 ft | **NORTHING** 578,118 | **EASTING** 769,821 | **24 HR.** 0.9 |
| **DRILL MACHINE** CME-550X | **DRILL METHOD** NW Casing w/ SPT | | **HAMMER TYPE** Automatic | |
| **START DATE** 08/13/02 | **COMP. DATE** 08/13/02 | **SURFACE WATER DEPTH** N/A | **DEPTH TO ROCK** 30.7 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) |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | 2,133.4 GROUND SURFACE | 0.0 |
| | | | | | | | | | | **ALLUVIAL** FINE TO COARSE SAND, GRAVEL AND COBBLES | |
| | 2,127.7 | 5.7 | 8 | 8 | 5 | 13 | | Sat. | | | |
| | 2,122.7 | 10.7 | 4 | 5 | 8 | 13 | | W | | 2,122.2 **SAPROLITE** WHITE AND GRAY SILTY FINE TO COARSE SAND | 11.2 |
| | 2,117.7 | 15.7 | 7 | 9 | 11 | 20 | | W | | | |
| | 2,112.7 | 20.7 | 7 | 12 | 15 | 27 | | W | | | |
| | 2,107.7 | 25.7 | 5 | 13 | 28 | 41 | | W | | 2,107.7 **SAPROLITE** TAN, BROWN SILTY FINE SAND | 25.7 |
| | 2,102.7 | 30.7 | 60/0.1 | | | 60/0.1 | | | | 2,102.7 **CRYSTALLINE ROCK** (MODERATELY SEVERE WEATHERED GRANITE) | 30.7 |
| | 2,097.7 | 35.7 | 60/0.1 | | | 60/0.1 | | | | | |
| | 2,092.7 | 40.7 | 60/0.1 | | | 60/0.1 | | | | | |
| | 2,087.7 | 45.7 | 60/0.1 | | | 60/0.1 | | | | 2,087.2 **CRYSTALLINE ROCK** FRESH, SOUND GRANITE REC=100% RQD=100% | 46.2 |
| | | | | | | | | | | 2,084.3 **CRYSTALLINE ROCK** FRESH, SOUND GRANITE REC=100% RQD=100% | 49.1 |
| | | | | | | | | | | 2,079.4 Boring Terminated with Standard Penetration Test Refusal at Elevation 2,079.4 ft IN HARD ROCK (GRANITE) | 54.0 |

NCDOT BORE SINGLE B3480_GEO_BRDG_107.GPJ NC_DOT.GDT 6/30/09



# NCDOT GEOTECHNICAL ENGINEERING UNIT
# CORE BORING REPORT

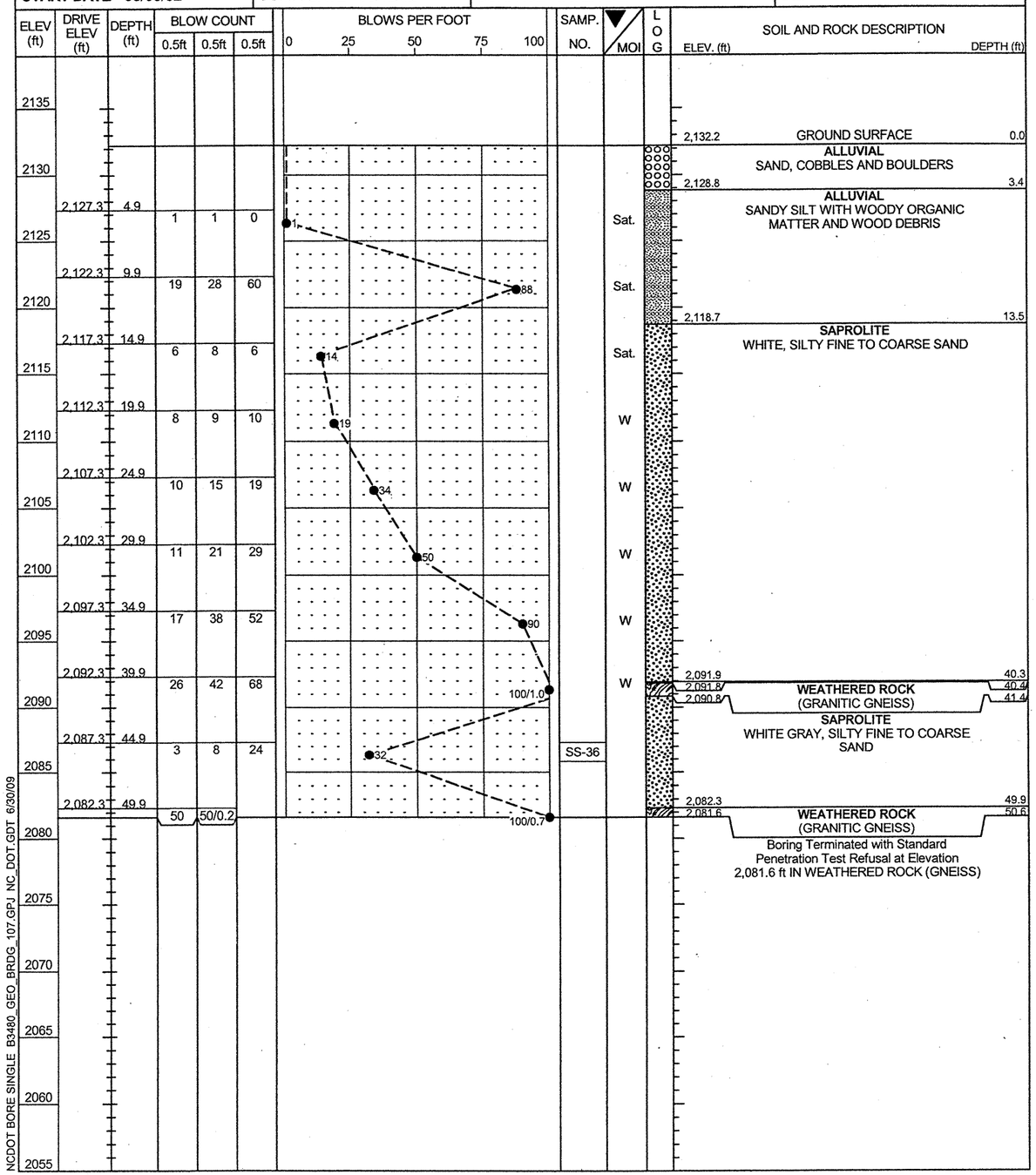
| | | | | |
|---|---|---|---|---|
| **PROJECT NO.** 33097.1.1 | **ID.** B-3480 | **COUNTY** JACKSON | | **GEOLOGIST** Mann, J. W. |
| **SITE DESCRIPTION** BRIDGE NO. 39 ON N.C. 107 OVER EAST FORK OF TUCKASEEGEE RIVER | | | | **GROUND WTR (ft)** |
| **BORING NO.** B2-C | **STATION** 18+30 | **OFFSET** 2ft RT | **ALIGNMENT** -L- | **0 HR.** N/A |
| **COLLAR ELEV.** 2,133.4 ft | **TOTAL DEPTH** 54.0 ft | **NORTHING** 578,118 | **EASTING** 769,821 | **24 HR.** 0.9 |
| **DRILL MACHINE** CME-550X | **DRILL METHOD** NW Casing w/ SPT | | **HAMMER TYPE** Automatic | |
| **START DATE** 08/13/02 | **COMP. DATE** 08/13/02 | **SURFACE WATER DEPTH** N/A | **DEPTH TO ROCK** 30.7 ft | |
| **CORE SIZE** NXWL | **TOTAL RUN** 7.8 ft | | **DRILLER** Williams, J. T. | |

| 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) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 2087.22 | | | | | | | | | | | Begin Coring @ 46.2 ft | |
| | 2,087.2 | 46.2 | 2.9 | | (2.9) 100% | (2.9) 100% | | | | | 2,087.2 **CRYSTALLINE ROCK** WHITE, FINE TO COARSE-GRAINED, MASSIVE, QUARTZ DIORITE ROCK IS FRESH AND HARD WITH WIDE TO VERY WIDE FRACTURE SPACING. NO EVIDENT FOLIATION. | 46.2 |
| | 2,084.3 | 49.1 | 4.9 | | (4.9) 100% | (4.9) 100% | RS-1 | | | | 2,084.3 **CRYSTALLINE ROCK** | 49.1 |
| | 2,079.4 | 54.0 | | | | | | | | | 2,079.4 Boring Terminated with Standard Penetration Test Refusal at Elevation 2,079.4 ft IN HARD ROCK (GRANITE) | 54.0 |

NCDOT CORE SINGLE B3480_GEO_BRDG_107.GPJ NC_DOT.GDT 7/1/09

# NCDOT GEOTECHNICAL ENGINEERING UNIT
# BORELOG REPORT

| | | | |
|---|---|---|---|
| **PROJECT NO.** 33097.1.1 | **ID.** B-3480 | **COUNTY** JACKSON | **GEOLOGIST** Mann, J. W. |
| **SITE DESCRIPTION** BRIDGE NO. 39 ON N.C. 107 OVER EAST FORK OF TUCKASEEGEE RIVER | | | **GROUND WTR (ft)** |
| **BORING NO.** B2-B | **STATION** 18+38 | **OFFSET** 41ft RT | **ALIGNMENT** -L- | **0 HR.** N/A |
| **COLLAR ELEV.** 2,132.2 ft | **TOTAL DEPTH** 50.6 ft | **NORTHING** 578,121 | **EASTING** 769,862 | **24 HR.** N/A |
| **DRILL MACHINE** CME-550X | **DRILL METHOD** NW Casing w/ SPT | | **HAMMER TYPE** Automatic | |
| **START DATE** 08/08/02 | **COMP. DATE** 08/12/02 | **SURFACE WATER DEPTH** N/A | **DEPTH TO ROCK** N/A | |




NCDOT BORE SINGLE B3480_GEO_BRDG_107.GPJ NC_DOT.GDT 6/30/09

# NCDOT GEOTECHNICAL ENGINEERING UNIT
# BORELOG REPORT

| | | | |
|---|---|---|---|
| **PROJECT NO.** 33097.1.1 | **ID.** B-3480 | **COUNTY** JACKSON | **GEOLOGIST** Mann, J. W. |
| **SITE DESCRIPTION** BRIDGE NO. 39 ON N.C. 107 OVER EAST FORK OF TUCKASEEGEE RIVER | | | **GROUND WTR (ft)** |
| **BORING NO.** EB2-A | **STATION** 18+64 | **OFFSET** 26ft LT | **ALIGNMENT** -L- | **0 HR.** N/A |
| **COLLAR ELEV.** 2,136.9 ft | **TOTAL DEPTH** 45.0 ft | **NORTHING** 578,155 | **EASTING** 769,798 | **24 HR.** 2.3 |
| **DRILL MACHINE** CME-550X | **DRILL METHOD** NW Casing w/ SPT | | **HAMMER TYPE** Automatic | |
| **START DATE** 05/06/02 | **COMP. DATE** 05/06/02 | **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) |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | 2,136.9 | GROUND SURFACE 0.0 |
| | | | | | | | | | | | ALLUVIAL<br>BROWN, SILTY FINE TO VERY COARSE SAND |
| | 2,132.1 | 4.8 | | | | | | | | 2,132.1 | 4.8 |
| | | | 10 | 13 | 9 | 22 | SS-8 | Sat. | | | ALLUVIAL<br>FINE COARSE SAND AND GRAVEL |
| | 2,127.1 | 9.8 | | | | | | | | 2,126.2 | 10.7 |
| | | | 12 | 12 | 5 | 17 | SS-9 | | | | SAPROLITE<br>WHITE-BLACK, FINE TO COARSE SAND |
| | 2,122.1 | 14.8 | | | | | | | | | |
| | | | 2 | 5 | 5 | 10 | SS-10 | | | | |
| | 2,117.1 | 19.8 | | | | | | | | | |
| | | | 6 | 7 | 10 | 17 | | | | | |
| | 2,112.1 | 24.8 | | | | | | | | | |
| | | | 7 | 13 | 15 | 28 | SS-11 | | | | |
| | 2,107.1 | 29.8 | | | | | | | | | |
| | | | 10 | 21 | 27 | 48 | | | | | |
| | 2,102.1 | 34.8 | | | | | | | | | |
| | | | 20 | 37 | 41 | 78 | SS-12 | | | | |
| | 2,097.1 | 39.8 | 100/0.3 | | | 100/0.3 | | | | 2,097.1 | 39.8 |
| | | | | | | | | | | | WEATHERED ROCK<br>(QUARTZ DIORITE) |
| | 2,092.1 | 44.8 | 100/0.2 | | | 100/0.2 | | | | 2,091.9 | 45.0 |
| | | | | | | | | | | | Boring Terminated with Standard Penetration Test Refusal at Elevation 2,091.9 ft IN WEATHERED ROCK (QUARTZ DIORITE) |

NCDOT BORE SINGLE B3480_GEO_BRDG_107.GPJ NC_DOT.GDT 6/30/09



# NCDOT GEOTECHNICAL ENGINEERING UNIT
# BORELOG REPORT

| | | | |
|---|---|---|---|
| **PROJECT NO.** 33097.1.1 | **ID.** B-3480 | **COUNTY** JACKSON | **GEOLOGIST** Mann, J. W. |
| **SITE DESCRIPTION** BRIDGE NO. 39 ON N.C. 107 OVER EAST FORK OF TUCKASEEGEE RIVER | | | **GROUND WTR (ft)** |
| **BORING NO.** EB2-C | **STATION** 18+80 | **OFFSET** 2ft RT | **ALIGNMENT** -L- | **0 HR.** N/A |
| **COLLAR ELEV.** 2,146.4 ft | **TOTAL DEPTH** 51.0 ft | **NORTHING** 578,168 | **EASTING** 769,828 | **24 HR.** 10.0 |
| **DRILL MACHINE** CME-550X | **DRILL METHOD** NW Casing w/ SPT | | **HAMMER TYPE** Automatic | |
| **START DATE** 05/06/02 | **COMP. DATE** 05/07/02 | **SURFACE WATER DEPTH** N/A | **DEPTH TO ROCK** N/A | |

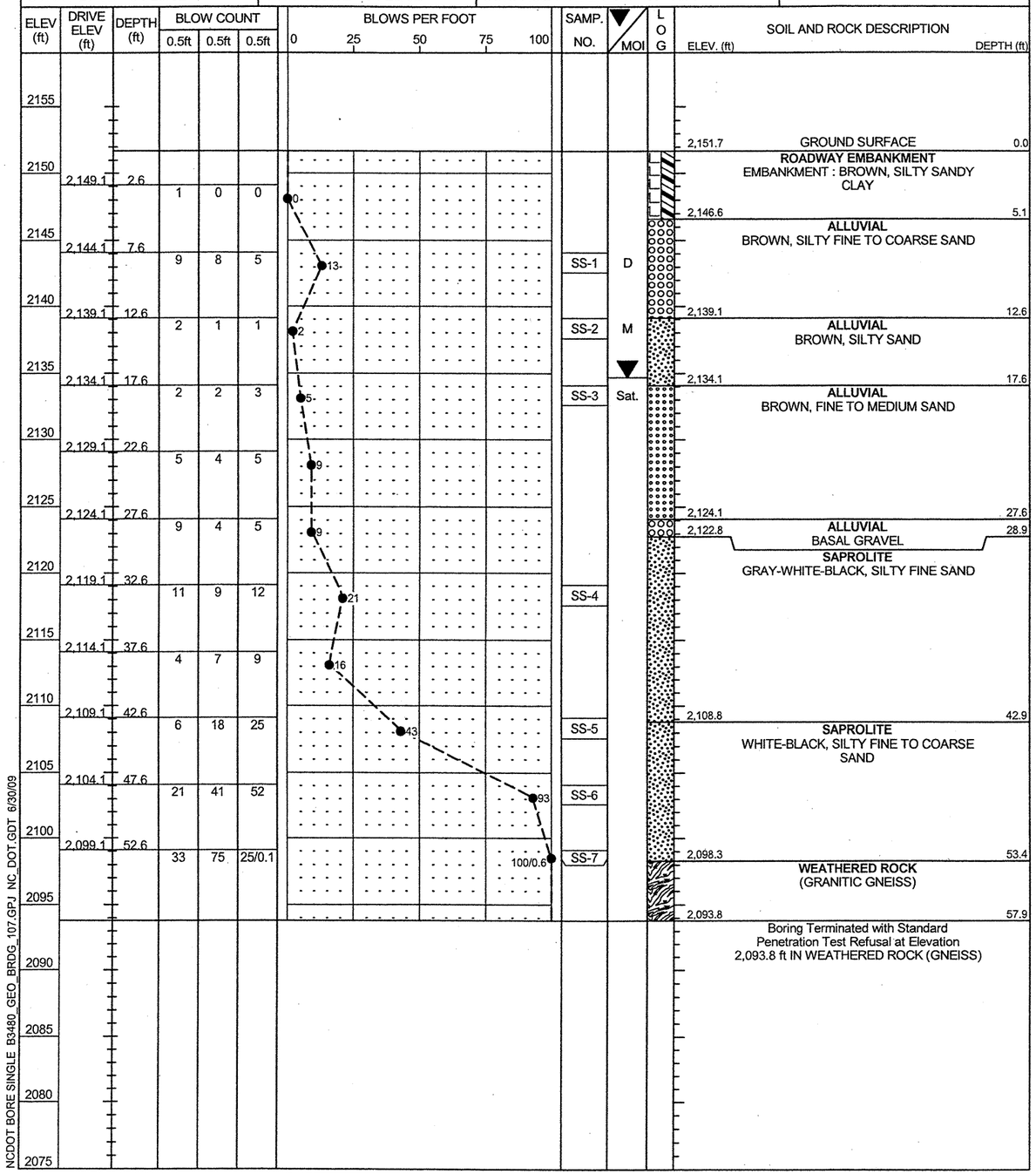
| ELEV (ft) | DRIVE ELEV (ft) | DEPTH (ft) | BLOW COUNT 0.5ft | 0.5ft | 0.5ft | BLOWS PER FOOT 0 25 50 75 100 | SAMP. NO. | MOI | LOG | SOIL AND ROCK DESCRIPTION ELEV. (ft) | DEPTH (ft) |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | 2,146.4 | GROUND SURFACE 0.0 |
| | | | | | | | | | | | EMBANKMENT : BROWN, SILTY SANDY CLAY |
| | 2,140.4 | 6.0 | 0 | 0 | 0 | 0 | SS-13 | W | | 2,138.4 | 8.0 |
| | | | | | | | | | | | ALLUVIAL<br>GRAY - BROWN, SILTY SAND |
| | 2,135.4 | 11.0 | 1 | 0 | 0 | 0 | | Sat. | | | |
| | 2,130.4 | 16.0 | 2 | 3 | 2 | 5 | | | | 2,127.9 | 18.5 |
| | 2,125.4 | 21.0 | 4 | 3 | 4 | 7 | SS-14 | | | 2,126.4 | 20.0 |
| | | | | | | | | | | | ALLUVIAL<br>SAND AND GRAVEL |
| | 2,120.4 | 26.0 | 4 | 6 | 8 | 14 | | | | | SAPROLITE<br>GRAY-BLACK, SILTY FINE SAND |
| | 2,115.4 | 31.0 | 5 | 11 | 14 | 25 | SS-15 | | | 2,115.4 | 31.0 |
| | | | | | | | | | | | SAPROLITE<br>WHITE-BLACK, SILTY FINE SAND |
| | 2,110.4 | 36.0 | 17 | 30 | 43 | 73 | SS-16 | | | | |
| | 2,105.4 | 41.0 | 30 | 47 | 53/0.4 | 100/0.9 | SS-17 | | | 2,105.4 | 41.0 |
| | | | | | | | | | | | WEATHERED ROCK<br>(GRANITIC GNEISS) |
| | | | | | | | | | | 2,102.4 | 44.0 |
| | | | | | | | | | | | SAPROLITE<br>WHITE-BLACK, SILTY FINE SAND |
| | 2,100.4 | 46.0 | 25 | 40 | 26 | 66 | | | | 2,097.4 | 49.0 |
| | 2,095.4 | 51.0 | 60/0.0 | | | 60/0.0 | | | | 2,095.4 | WEATHERED ROCK<br>(GRANITIC GNEISS) 51.0 |
| | | | | | | | | | | | Boring Terminated with Standard Penetration Test Refusal at Elevation 2,095.4 ft ON CRYSTALLINE ROCK (GNEISS) |

NCDOT BORE SINGLE B3480_GEO_BRDG_107.GPJ NC_DOT.GDT 6/30/09

# NCDOT GEOTECHNICAL ENGINEERING UNIT
# BOREHOLE REPORT



| | | | | |
|---|---|---|---|---|
| **PROJECT NO.** 33097.1.1 | **ID.** B-3480 | **COUNTY** JACKSON | **GEOLOGIST** Mann, J. W. | |
| **SITE DESCRIPTION** BRIDGE NO. 39 ON N.C. 107 OVER EAST FORK OF TUCKASEEGEE RIVER | | | | **GROUND WTR (ft)** |
| **BORING NO.** EB2-B | **STATION** 18+88 | **OFFSET** 42ft RT | **ALIGNMENT** -L- | **0 HR.** N/A |
| **COLLAR ELEV.** 2,151.7 ft | **TOTAL DEPTH** 57.9 ft | **NORTHING** 578,170 | **EASTING** 769,869 | **24 HR.** 17.0 |
| **DRILL MACHINE** CME-550X | **DRILL METHOD** NW Casing w/ SPT | | **HAMMER TYPE** Automatic | |
| **START DATE** 04/29/02 | **COMP. DATE** 04/29/02 | **SURFACE WATER DEPTH** N/A | **DEPTH TO ROCK** N/A | |



# SOIL TEST RESULTS



| SAMPLE NO. | OFFSET | STATION | DEPTH INTERVAL | AASHTO CLASS. | L.L. | PL. I. | % BY WEIGHT | | | | % PASSING SIEVES | | | % MOISTURE | % ORGANIC |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | C. SAND | F. SAND | SILT | CLAY | 10 | 40 | 200 | | |
| SS-1 | 42' RT | 18+88 | 8.1-9.1 | A-1-B (0) | 25 | NP | 56 | 32 | 8 | 4 | 53 | 32 | 9 | | |
| SS-2 | 42' RT | 18+88 | 13.1-14.1 | A-2-4 (0) | 39 | NP | 41 | 34 | 13 | 12 | 91 | 71 | 27 | | |
| SS-3 | 42' RT | 18+88 | 18.1-19.1 | A-3 (0) | 19 | NP | 49 | 48 | 1 | 2 | 100 | 94 | 4 | | |
| SS-4 | 42' RT | 18+88 | 33.1-34.1 | A-2-4 (0) | 26 | NP | 40 | 42 | 14 | 4 | 99 | 74 | 26 | | |
| SS-5 | 42' RT | 18+88 | 43.1-44.1 | A-2-4 (0) | 26 | NP | 41 | 43 | 12 | 4 | 100 | 75 | 23 | | |
| SS-6 | 42' RT | 18+88 | 48.4-49.4 | A-2-4 (0) | 26 | NP | 39 | 43 | 14 | 4 | 100 | 74 | 26 | | |
| SS-7 | 42' RT | 18+88 | 53.4-54.4 | A-2-4 (0) | 28 | NP | 42 | 41 | 13 | 4 | 99 | 75 | 24 | | |
| SS-8 | 26' LT | 18+64 | 5.3-6.3 | A-1-A (0) | 28 | NP | 60 | 31 | 7 | 2 | 48 | 27 | 6 | | |
| SS-9 | 26' LT | 18+64 | 10.7-11.3 | A-2-4 (0) | 29 | NP | 55 | 31 | 10 | 4 | 84 | 53 | 16 | | |
| SS-10 | 26' LT | 18+64 | 15.3-16.3 | A-2-4 (0) | 29 | NP | 43 | 41 | 12 | 4 | 98 | 73 | 22 | | |
| SS-11 | 26' LT | 18+64 | 25.3-26.3 | A-2-4 (0) | 31 | NP | 41 | 44 | 11 | 4 | 99 | 75 | 22 | | |
| SS-12 | 26' LT | 18+64 | 35.3-36.3 | A-2-4 (0) | 28 | NP | 39 | 47 | 12 | 2 | 99 | 80 | 21 | | |
| SS-13 | 2' RT | 18+80 | 6.5-7.5 | A-6 (3) | 34 | 13 | 34 | 28 | 14 | 24 | 100 | 79 | 43 | | |
| SS-14 | 2' RT | 18+80 | 21.5-22.5 | A-2-4 (0) | 35 | NP | 44 | 42 | 10 | 4 | 99 | 73 | 20 | | |
| SS-15 | 2' RT | 18+80 | 31.5-32.5 | A-2-4 (0) | 32 | NP | 41 | 44 | 11 | 4 | 99 | 76 | 22 | | |
| SS-16 | 2' RT | 18+80 | 41.5-42.5 | A-2-4 (0) | 27 | NP | 41 | 45 | 10 | 4 | 100 | 78 | 22 | | |
| SS-17 | 2' RT | 18+80 | 46.5-47.5 | A-2-4 (0) | 21 | NP | 38 | 49 | 9 | 4 | 100 | 79 | 22 | | |
| SS-18 | 24' LT | 17+04 | 5.7-6.7 | A-5 (0) | 42 | NP | 9 | 67 | 18 | 6 | 100 | 99 | 36 | | |
| SS-19 | 24' LT | 17+04 | 10.7-11.7 | A-1-A (0) | 29 | NP | 51 | 40 | 7 | 2 | 44 | 31 | 2 | | |
| SS-20 | 24' LT | 17+04 | 15.7-16.7 | A-2-4 (0) | 33 | NP | 50 | 44 | 4 | 2 | 98 | 73 | 11 | | |
| SS-21 | 24' LT | 17+04 | 25.7-26.7 | A-2-4 (0) | 30 | NP | 50 | 36 | 10 | 4 | 85 | 56 | 17 | | |
| SS-22 | 24' LT | 17+04 | 35.7-36.7 | A-2-4 (0) | 33 | NP | 51 | 41 | 6 | 2 | 99 | 73 | 13 | | |
| SS-23 | 24' LT | 17+04 | 40.7-41.5 | A-2-4 (0) | 20 | NP | 46 | 45 | 5 | 4 | 100 | 77 | 15 | | |
| SS-24 | 42' RT | 17+08 | 6.2-7.2 | A-4 (0) | 36 | NP | 11 | 62 | 19 | 8 | 100 | 98 | 36 | | |
| SS-25 | 42' RT | 17+08 | 11.2-12.2 | A-2-4 (0) | 33 | NP | 17 | 69 | 10 | 4 | 100 | 98 | 22 | | |
| SS-26 | 42' RT | 17+08 | 26.2-27.2 | A-1-B (0) | 27 | NP | 51 | 38 | 7 | 4 | 68 | 47 | 11 | | |
| SS-27 | 42' RT | 17+08 | 31.2-32.2 | A-2-4 (0) | 27 | NP | 43 | 45 | 8 | 4 | 98 | 71 | 22 | | |
| SS-28 | 42' RT | 17+08 | 41.2-42.2 | A-2-4 (0) | 24 | NP | 44 | 44 | 8 | 4 | 98 | 72 | 19 | | |
| SS-29 | 43' RT | 17+53 | 13.9-14.9 | A-2-4 (0) | 29 | NP | 40 | 44 | 12 | 4 | 98 | 75 | 23 | | |
| SS-30 | 43' RT | 17+53 | 28.9-29.9 | A-2-4 (0) | 25 | NP | 41 | 48 | 9 | 2 | 98 | 76 | 21 | | |
| SS-31 | 43' RT | 17+53 | 38.9-39.9 | A-2-4 (0) | 22 | NP | 38 | 49 | 11 | 2 | 99 | 78 | 22 | | |
| SS-32 | 43' RT | 17+53 | 48.9-49.2 | A-2-4 (0) | 20 | NP | 38 | 48 | 12 | 2 | 100 | 81 | 23 | | |
| SS-33 | 43' RT | 17+53 | 58.9-59.9 | A-2-4 (0) | 29 | NP | 40 | 50 | 8 | 2 | 100 | 79 | 19 | | |
| SS-34 | 2' RT | 17+18 | 21.3-22.3 | A-2-4 (0) | 32 | NP | 47 | 41 | 10 | 2 | 100 | 73 | 17 | | |
| SS-35 | 2' RT | 17+18 | 26.3-27.3 | A-2-4 (0) | 39 | NP | 52 | 37 | 7 | 4 | 100 | 67 | 17 | | |
| SS-36 | 41' RT | 18+38 | 45.4-46.4 | A-2-4 (0) | 28 | NP | 43 | 44 | 9 | 4 | 97 | 73 | 19 | | |
| RS-1 | 2' RT | 18+30 | 48.1-49.1 | | | | | | | | | | | | |

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
GEOTECHNICAL ENGINEERING UNIT

# FIELD SCOUR REPORT

WBS: 33097.1.1 TIP: B-3480 COUNTY: JACKSON

DESCRIPTION(1): BRIDGE NO. 39 ON NC 107 OVER EAST FORK TUCKASEGEE RIVER

## EXISTING BRIDGE

Information from: Field Inspection X Microfilm ____ (reel ____ pos: ____)
Other (explain) BSR dated Feb. 2009

Bridge No.: 39 Length: 180 Total Bents: 5 Bents in Channel: 3 Bents in Floodplain: 2
Foundation Type: Concrete Piers

**EVIDENCE OF SCOUR(2)**

Abutments or End Bent Slopes: None

Interior Bents: Minor scour adjacent to interior bents

Channel Bed: None noted

Channel Bank: Undercutting of bank upstream on EB1 end

**EXISTING SCOUR PROTECTION**

Type(3): Rip-rap atEnd Bent Two

Extent(4): Minimal

Effectiveness(5): Minimal

Obstructions(6): Evidence of old wooden pilings from previous bridge

**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): Sand, Cobbles, Boulders

Channel Bank Material(8): Alluvial Silt & Sand

Channel Bank Cover(9): Trees, grass undergrowth

Floodplain Width(10): Extensive: Site is at the confluence with the West Fork Tuckasegee River

Floodplain Cover(11): Trees and grass

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

Channel Migration Tendency(13): Toward End Bent One

Observations and Other Comments: ____

**DESIGN SCOUR ELEVATIONS(14)** Feet X Meters ____

| BENTS B1 | B2 | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| 2123 | 2123 | | | | | | | | | |
| | | | | | | | | | | |
| | | | | | | | | | | |
| | | | | | | | | | | |
| | | | | | | | | | | |
| | | | | | | | | | | |

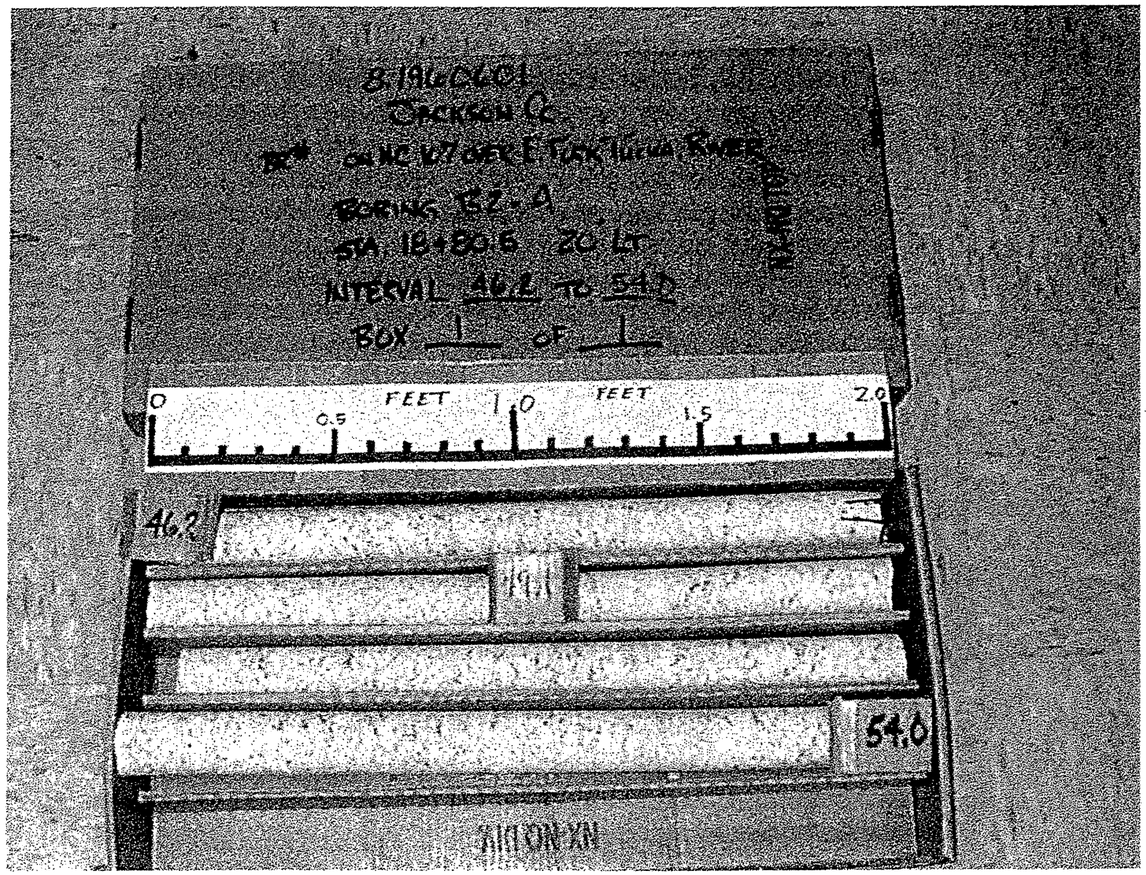
Comparison of DSE to Hydraulics Unit theoretical scour:
DSE is in agreement with the Hydraulics Unit theoretical scour.

**SOIL ANALYSIS RESULTS FROM CHANNEL BED AND BANK MATERIAL**

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| Bed or Bank | See Sheet 16, "Soil Test Results", for samples | | | | | | |
| Sample No. | | | | | | | |
| Retained #4 | | | | | | | |
| Passed #10 | | | | | | | |
| Passed #40 | | | | | | | |
| Passed #200 | | | | | | | |
| Coarse Sand | | | | | | | |
| Fine Sand | | | | | | | |
| Silt | | | | | | | |
| Clay | | | | | | | |
| LL | | | | | | | |
| PI | | | | | | | |
| AASHTO | | | | | | | |
| Station | | | | | | | |
| Offset | | | | | | | |
| Depth | | | | | | | |



**Reported by:** J. W. Mann **Date:** 8/20/2002
Rev.:7/1/09

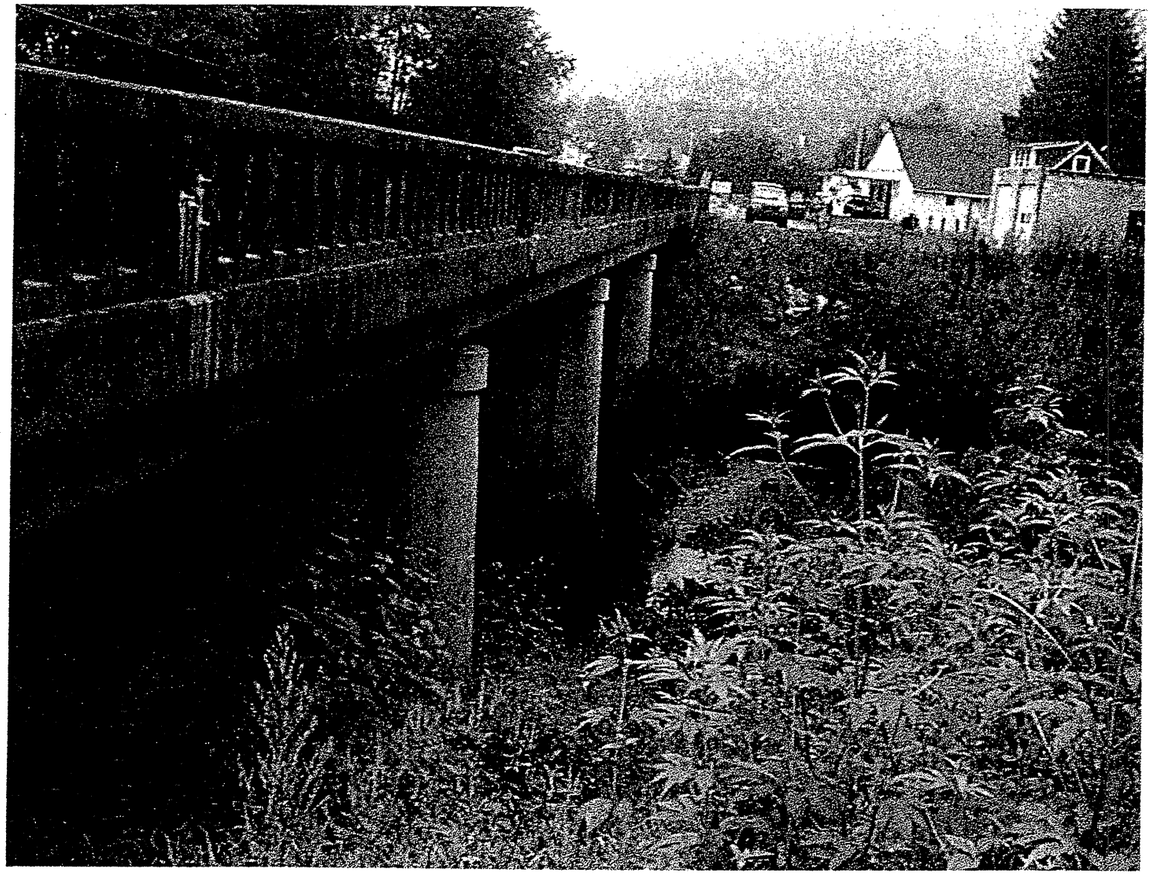



8.1960601 (B-3480)
JACKSON COUNTY
BRIDGE NO. 39 0N NC 107 OVER EAST FORK TUCKASEGEE RIVER

B2-A@ STATION 18+80.5, 20' LT (-L-)

BOX 1 OF 1

DEPTH: 46.2-54.0'

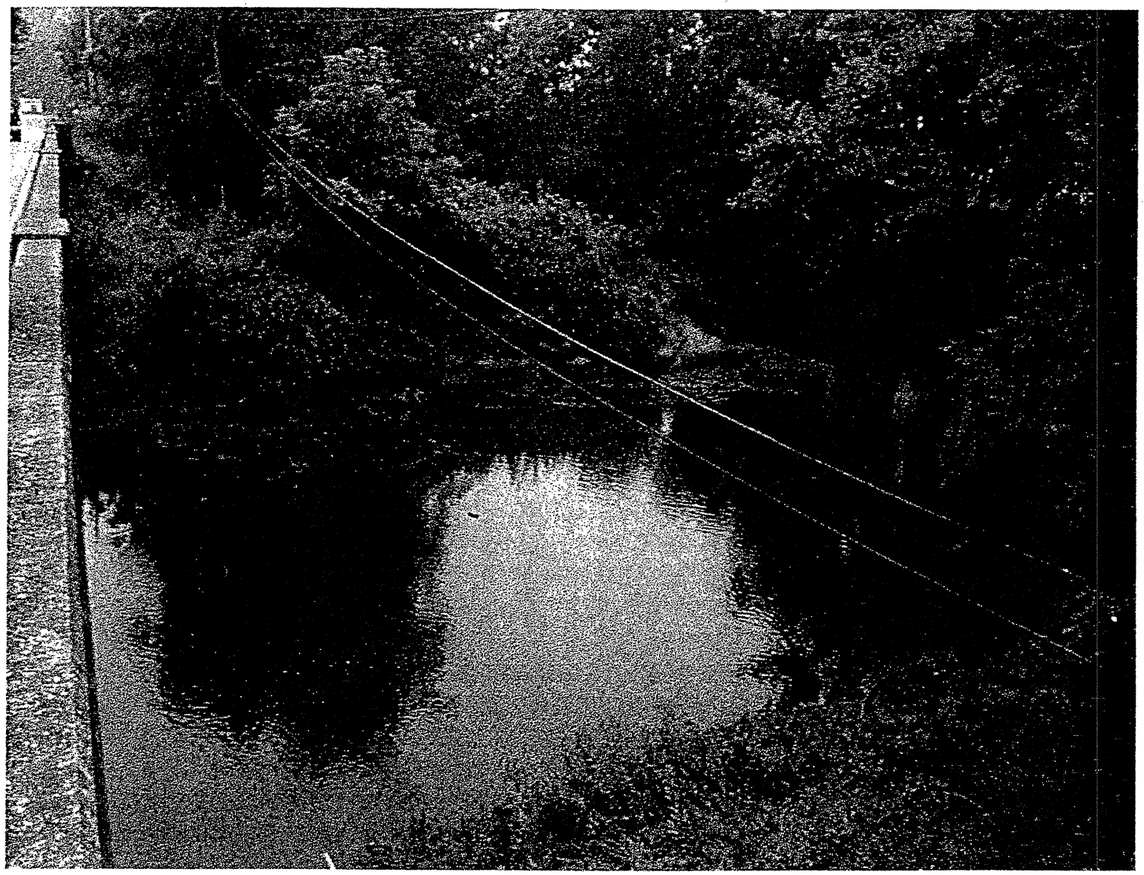


8.1960601 (B-3480)
JACKSON COUNTY
BRIDGE NO. 39 0N NC 107 OVER EAST FORK TUCKASEGEE RIVER

UPSTREAM UPSTATION

8.1960601 (B-3480)
JACKSON COUNTY
BRIDGE NO. 39 0N NC 107 OVER EAST FORK TUCKASEGEE RIVER

UPSTREAM BACKSTATION

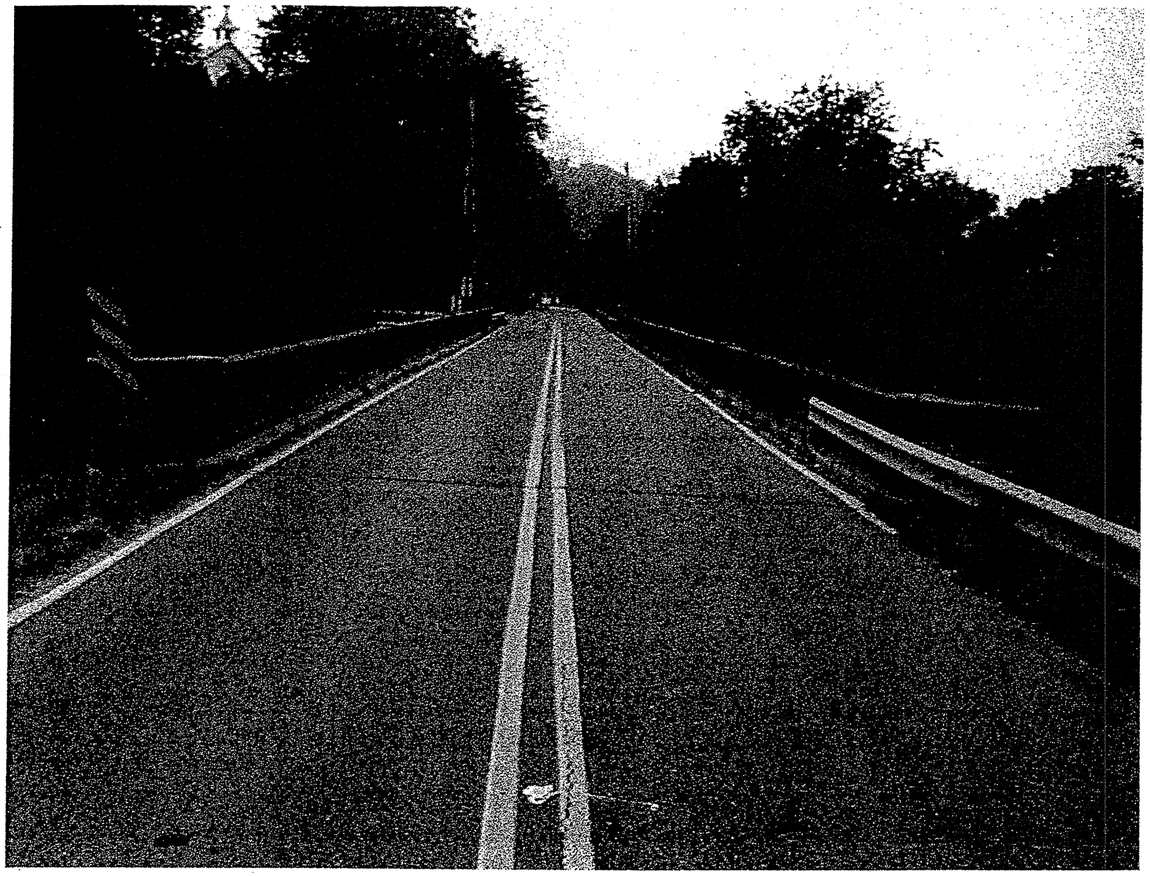


8.1960601 (B-3480)
JACKSON COUNTY
BRIDGE NO. 39 0N NC 107 OVER EAST FORK TUCKASEGEE RIVER

DOWNSTREAM CONFLUENCE

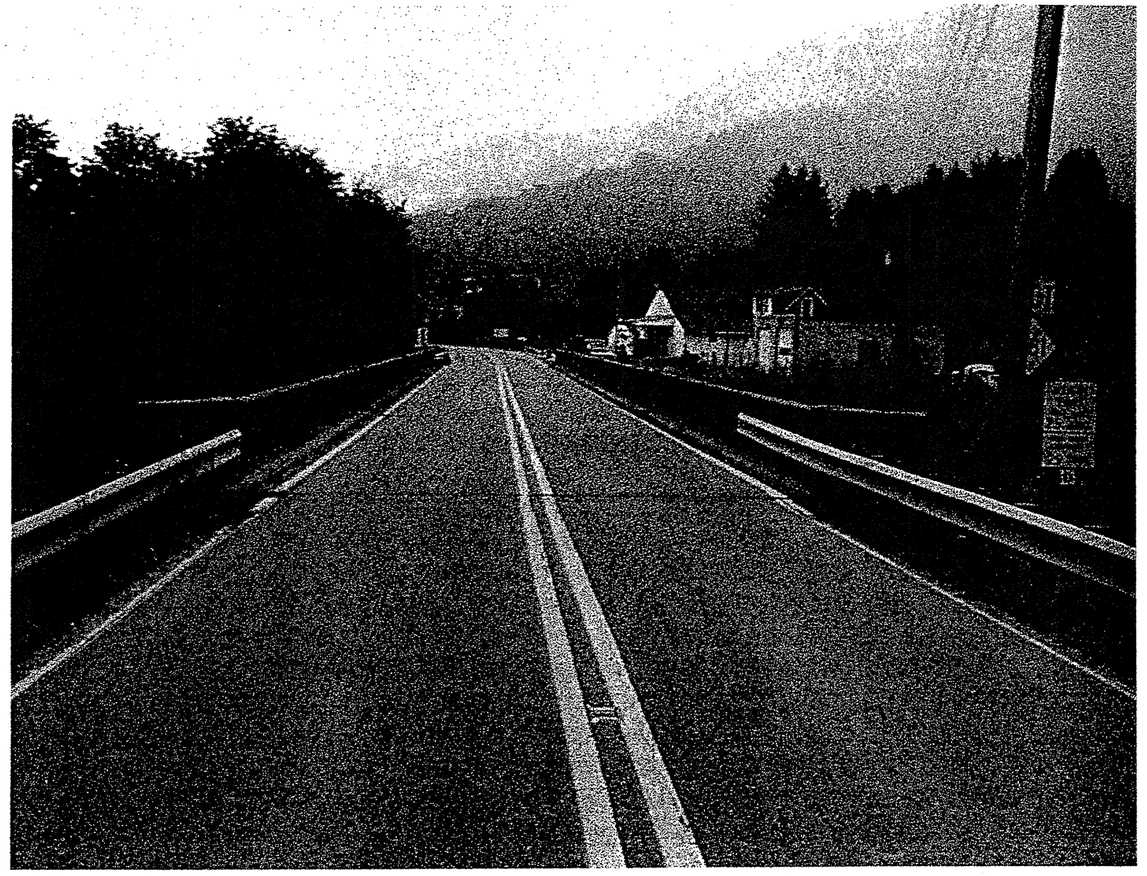
8.1960601 (B-3480)
JACKSON COUNTY
BRIDGE NO. 39 0N NC 107 OVER EAST FORK TUCKASEGEE RIVER

CONFLUENCE OF EAST FORK & TUCKASEGEE RIVERS



8.1960601 (B-3480)
JACKSON COUNTY
BRIDGE NO. 39 0N NC 107 OVER EAST FORK TUCKASEGEE RIVER

DOWNSTATION



8.1960601 (B-3480)
JACKSON COUNTY
BRIDGE NO. 39 0N NC 107 OVER EAST FORK TUCKASEGEE RIVER

UPSTATION

8.1960601 (B-3480)
JACKSON COUNTY
BRIDGE NO. 39 0N NC 107 OVER EAST FORK TUCKASEGEE RIVER

UPSTREAM VIEW SHOWING LOG DEBRIS BETWEEN BENTS ONE & TWO