

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	33505.1.1 (B-4157)	1	20

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

STRUCTURE
SUBSURFACE INVESTIGATION

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PROJ. REFERENCE NO. 33505.1.1 (B-4157) F.A. PROJ. BRZ-1581 (2)
COUNTY IREDELL
PROJECT DESCRIPTION BRIDGE NO. 140 OVER SNOW CREEK ON
SR 1581 BETWEEN SR 1580 AND SR 1582

SITE DESCRIPTION _____

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 1919 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 (ON-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.

PROJECT: 33505.1.1
ID: B-4157

PERSONNEL

J.K. STICKNEY

C.L. SMITH

H.K. WISE

C.C. MURRAY

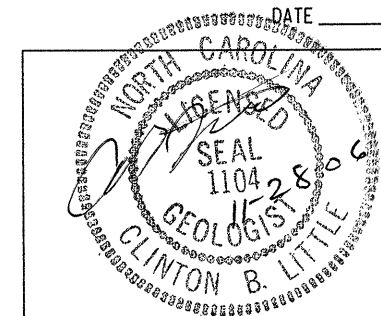
L.N. HARPER

INVESTIGATED BY J.E. BEVERLY

CHECKED BY C.B. LITTLE

SUBMITTED BY C.B. LITTLE

DATE _____



DRAWN BY: J.K. McCLURE /J.E. BEVERLY

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

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

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION

DIVISION OF HIGHWAYS
GEOTECHNICAL ENGINEERING UNIT

SUBSURFACE INVESTIGATION

SOIL AND ROCK LEGEND, TERMS, SYMBOLS, AND ABBREVIATIONS

PROJECT REFERENCE NO. 33505.11(B-4157)	SHEET NO. 2
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SOIL DESCRIPTION										GRADATION										ROCK DESCRIPTION										TERMS AND DEFINITIONS																													
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 (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: <i>VERY STIFF, GRAY, SILTY CLAY, MOST WITH INTERBEDDED FINE SAND LAYERS, HIGH PLASTICITY, A-7-6</i>										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.										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: NON-COASTAL PLAIN MATERIAL THAT WOULD YIELD SPT N VALUES > 100 BLOWS PER FOOT IF TESTED. FINE TO COARSE GRAIN IGNEOUS AND METAMORPHIC ROCK THAT WOULD YIELD SPT REFUSAL IF TESTED. ROCK TYPE INCLUDES GRANITE, GNEISS, GABBRO, SCHIST, ETC. FINE TO COARSE GRAIN METAMORPHIC AND NON-COASTAL PLAIN SEDIMENTARY ROCK THAT WOULD YIELD SPT REFUSAL IF TESTED. ROCK TYPE INCLUDES PHYLLITE, SLATE, SANDSTONE, ETC. COASTAL PLAIN SEDIMENTS CEMENTED INTO ROCK, BUT MAY NOT YIELD SPT REFUSAL. ROCK TYPE INCLUDES LIMESTONE, SANDSTONE, CEMENTED SHELL BEDS, ETC.										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. 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 (ROD) - 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.																													
SOIL LEGEND AND AASHTO CLASSIFICATION										MINERALOGICAL COMPOSITION										WEATHERING										MISCELLANEOUS SYMBOLS																													
GENERAL CLASS. GRANULAR MATERIALS (<= 35% PASSING #200) SILT-CLAY MATERIALS (> 35% PASSING #200) ORGANIC MATERIALS										MINERAL NAMES SUCH AS QUARTZ, FELDSPAR, MICA, TALC, KAOLIN, ETC. ARE USED IN DESCRIPTIONS WHENEVER THEY ARE CONSIDERED OF SIGNIFICANCE.										FRESH ROCK FRESH, CRYSTALS BRIGHT, FEW JOINTS MAY SHOW SLIGHT STAINING, ROCK RINGS UNDER HAMMER IF CRYSTALLINE. VERY SLIGHT (V SL) 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 (SL) 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. <i>IF TESTED, WOULD YIELD SPT REFUSAL</i> 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. <i>IF TESTED, YIELDS SPT N VALUES > 100 BPF</i> 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. <i>IF TESTED, YIELDS SPT N VALUES < 100 BPF</i> 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.										COMPRESSIONIBILITY 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										WATER LEVEL IN BORE HOLE IMMEDIATELY AFTER DRILLING STATIC WATER LEVEL AFTER 24 HOURS PERCHED WATER, SATURATED ZONE, OR WATER BEARING STRATA SPRING OR SEEP									
CONSISTENCY OR DENSENESS										GROUND WATER										ROCK HARDNESS										ABBREVIATIONS																													
PRIMARY SOIL TYPE COMPACTNESS OR CONSISTENCY RANGE OF STANDARD PENETRATION RESISTANCE (N-VALUE) RANGE OF UNCONFINED COMPRESSIVE STRENGTH (TONS/FT ²)										ROADWAY EMBANKMENT (RE) WITH SOIL DESCRIPTION SOIL SYMBOL ARTIFICIAL FILL (AF) OTHER THAN ROADWAY EMBANKMENT INFERRED SOIL BOUNDARY INFERRED ROCK LINE ALLUVIAL SOIL BOUNDARY DIP & DIP DIRECTION OF ROCK STRUCTURES SOUNDING ROD										SPT TEST BORING AUGER BORING CORE BORING MONITORING WELL PIEZOMETER INSTALLATION SLOPE INDICATOR INSTALLATION SPT N-VALUE SPT REFUSAL										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 v - MOISTURE CONTENT V - VERY VST - VANE SHEAR TEST WEA. - WEATHERED γ - UNIT WEIGHT γ _d - DRY UNIT WEIGHT FIAD - FILLED IMMEDIATELY AFTER DRILLING NM - (WATER) NOT MEASURED																													
TEXTURE OR GRAIN SIZE										ROCK HARDNESS										EQUIPMENT USED ON SUBJECT PROJECT										FRACTURE SPACING																													
U.S. STD. SIEVE SIZE OPENING (MM) 4 10 40 60 200 270 4.76 2.00 0.42 0.25 0.075 0.053										CAN 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 FINGER NAIL.										DRILL UNITS: MOBILE B- BK-51 CME-45C CME-550 PORTABLE HOIST										ADVANCING TOOLS: CLAY BITS 6" CONTINUOUS FLIGHT AUGER 8" HOLLOW AUGERS HARD FACED FINGER BITS TUNG-CARBIDE INSERTS CASING w/ ADVANCER TRICONE * STEEL TEETH TRICONE 2 1/8" * TUNG-CARB. CORE BIT										HAMMER TYPE: AUTOMATIC MANUAL CORE SIZE: B N QWL H HAND TOOLS: POST HOLE DIGGER HAND AUGER SOUNDING ROD VANE SHEAR TEST										TERM SPACING THICKNESS VERY WIDE MORE THAN 10 FEET VERY THICKLY BEDDED > 4 FEET WIDE 3 TO 10 FEET THICKLY BEDDED 1.5 - 4 FEET MODERATELY CLOSE 1 TO 3 FEET THINLY BEDDED 0.16 - 1.5 FEET CLOSE 0.16 TO 1 FEET VERY THINLY BEDDED 0.03 - 0.16 FEET VERY CLOSE LESS THAN 0.16 FEET THICKLY LAMINATED 0.008 - 0.03 FEET THINLY LAMINATED < 0.008 FEET									
SOIL MOISTURE - CORRELATION OF TERMS										ROCK HARDNESS										INDURATION										BENCH MARK: NO. 2: RAILROAD SPIKE IN 30' SYCAMORE TREE STA. 25+18.40 -L- 119.38' RT. ELEVATION: 905.17 FT.																													
SOIL MOISTURE SCALE (ATTERBERG LIMITS) FIELD MOISTURE DESCRIPTION GUIDE FOR FIELD MOISTURE DESCRIPTION										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.										INDURATION										NOTES:																													
PLASTICITY										INDURATION										INDURATION										INDURATION																													
PLASTICITY INDEX (PI) DRY STRENGTH										INDURATION										INDURATION										INDURATION																													
NONPLASTIC 0-5 VERY LOW LOW PLASTICITY 6-15 SLIGHT MED. PLASTICITY 16-25 MEDIUM HIGH PLASTICITY 26 OR MORE HIGH										INDURATION										INDURATION										INDURATION																													
COLOR										INDURATION										INDURATION										INDURATION																													
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.										INDURATION										INDURATION										INDURATION																													

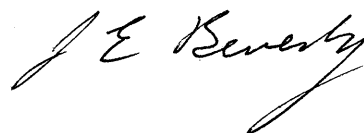
(A-2-4). Alluvium directly overlies weathered biotite gneiss at each boring location. Weathered gneiss occurs at elevation 903.2 feet in boring EB2-A and elevation 902.6 feet in boring EB2-B. Weathered rock extends 1.9 to 3.6 feet before intersecting moderately hard to very hard crystalline rock. Rock elevation at EB2-A is 899.6 feet and elevation 900.7 feet at EB2-B. Boring EB2-A was cored for evaluation purposes.

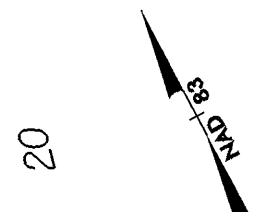
Groundwater

Static groundwater table appears to be in the 900 to 905 elevation range at the site. This is based on 24 hour water readings at boring locations, and the creek surface elevation. Also taken in to consideration was water standing on the ground surface right of End Bent 1 during the project scoping in 2003. That area appears to be a wetland but was not designated as such on the official plans.

Respectfully submitted,

J.E. Beverly, Project Geologic Engineer





WILLIE ALDEANA K. SUMMERS
DB 1434 PG 743

STA. 22+79.50 -L-
1@ 55.0', 1@ 75.0', 1@ 55.0'
120°-00'-00" Skew

BEGIN BRIDGE
-BL-4 22+88.04-PINC
-L- STA 193.73 (17.95' LT)

-TI-21 6+72.68-PINC
ELEV=906.48
REBAR SET

-DRVE2- PTSta. 10+43.63
-DRVE2- PCSta. 10+30.61
-DRVE1- POTSta. 10+00.00

-L- PTSta. 21+77.99

END BRIDGE
-L- POTSta. 23+72.00

-DRIVE2- POTSta. 11+12.83=
-L- POTSta. 25+07.00

BEGIN APPROACH SLAB
-L- POTSta. 21+72.99

-BL-5 27+19.93-PINC
-TI 8+40.30-PINC ELEV=915.89

-DRVE2- PCSta. 10+81.42

+50.00
70.00' LT

-L- STA 23+64.05 (18.74' RT)

-DRVE2- PTSta. 11+05.04
-L- PCSta. 25+16.81



+00.00
50.00' RT

WILLIE ALDEANA K. SUMMERS
DB 1434 PG 743

DRVE1 POTSta. 10+00.00=
-L- POTSta. 25+00.00

-DRVE1- PCSta. 10+17.07

-DRVE1- PTSta. 10+74.11

-DRVE1- PCSta. 11+10.80

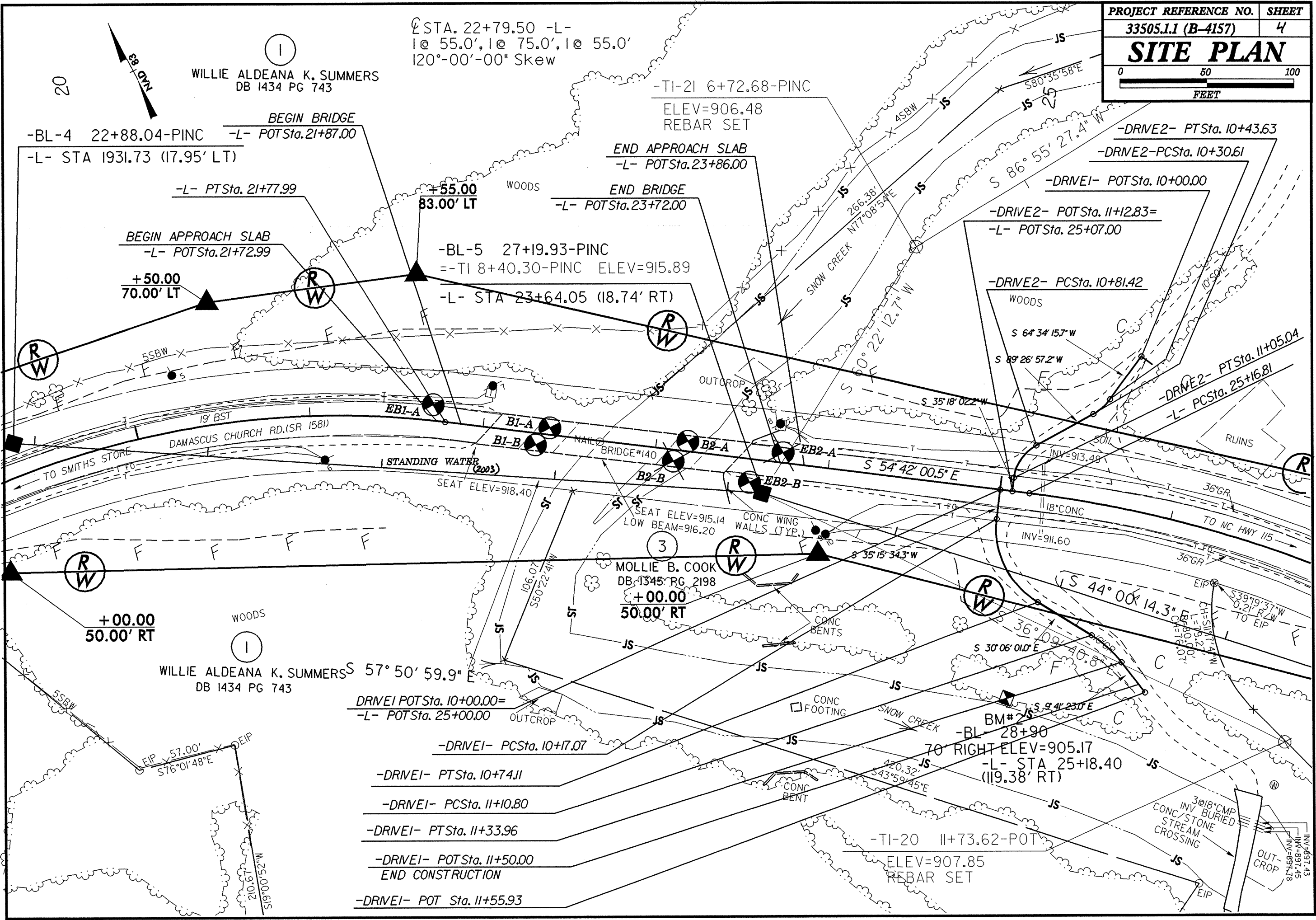
-DRVE1- PTSta. 11+33.96

-DRVE1- POTSta. 11+50.00
END CONSTRUCTION

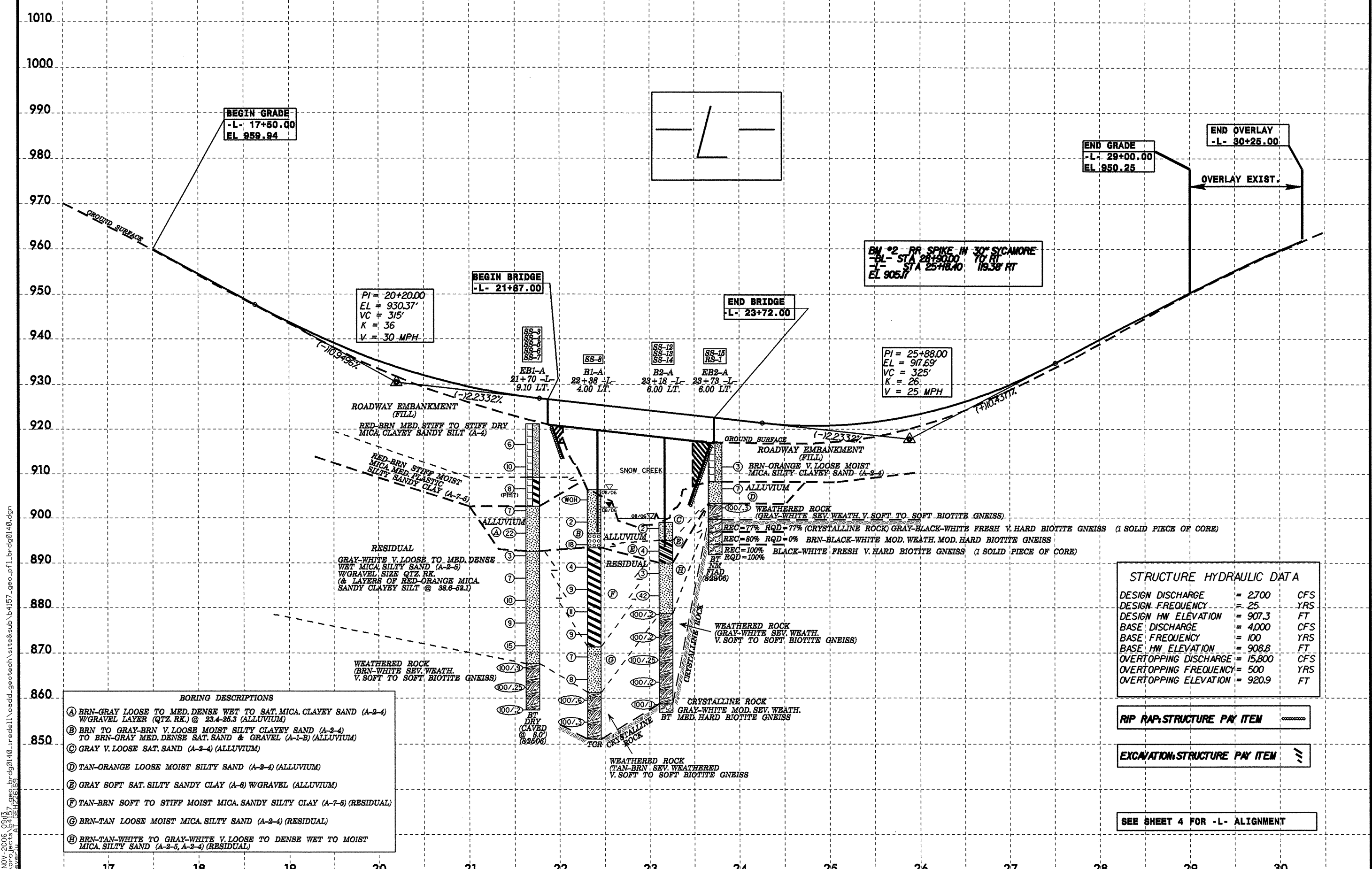
-DRVE1- POT Sta. 11+55.93

-BL- 28+90
70' RIGHT ELEV=905.17
-L- STA 25+18.40
(19.38' RT)

-TI-20 11+73.62-POT
ELEV=907.85
REBAR SET



5/28/99



BM #2 - RR SPIKE IN 30" SYCAMORE
 -L- STA 28+90.00 TO RT
 -L- STA 25+18.40 TO RT
 EL 905.17

PI = 20+20.00
 EL = 930.37
 VC = 315'
 K = 36
 V = 30 MPH

END BRIDGE
 -L- 23+72.00

PI = 25+88.00
 EL = 917.69
 VC = 325'
 K = 26
 V = 25 MPH

END GRADE
 -L- 29+00.00
 EL 950.25

END OVERLAY
 -L- 30+25.00

OVERLAY EXIST.

- BORING DESCRIPTIONS**
- Ⓐ BRN-GRAY LOOSE TO MED. DENSE WET TO SAT. MICA CLAYEY SAND (A-2-4) W/ GRAVEL LAYER (QTZ. RK.) @ 23.4-25.3 (ALLUVIUM)
 - Ⓑ BRN TO GRAY-BRN V. LOOSE MOIST SILTY CLAYEY SAND (A-2-4) TO BRN-GRAY MED. DENSE SAT. SAND & GRAVEL (A-1-B) (ALLUVIUM)
 - Ⓒ GRAY V. LOOSE SAT. SAND (A-2-4) (ALLUVIUM)
 - Ⓓ TAN-ORANGE LOOSE MOIST SILTY SAND (A-2-4) (ALLUVIUM)
 - Ⓔ GRAY SOFT SAT. SILTY SANDY CLAY (A-8) W/ GRAVEL (ALLUVIUM)
 - Ⓕ TAN-BRN SOFT TO STIFF MOIST MICA SANDY SILTY CLAY (A-7-5) (RESIDUAL)
 - Ⓖ BRN-TAN LOOSE MOIST MICA SILTY SAND (A-2-4) (RESIDUAL)
 - Ⓗ BRN-TAN-WHITE TO GRAY-WHITE V. LOOSE TO DENSE WET TO MOIST MICA SILTY SAND (A-2-5, A-2-4) (RESIDUAL)

STRUCTURE HYDRAULIC DATA

DESIGN DISCHARGE	= 2700	CFS
DESIGN FREQUENCY	= 25	YRS
DESIGN HW ELEVATION	= 907.3	FT
BASE DISCHARGE	= 4000	CFS
BASE FREQUENCY	= 100	YRS
BASE HW ELEVATION	= 908.8	FT
OVERTOPPING DISCHARGE	= 15,800	CFS
OVERTOPPING FREQUENCY	= 500	YRS
OVERTOPPING ELEVATION	= 920.9	FT

RIP RAP STRUCTURE PAY ITEM

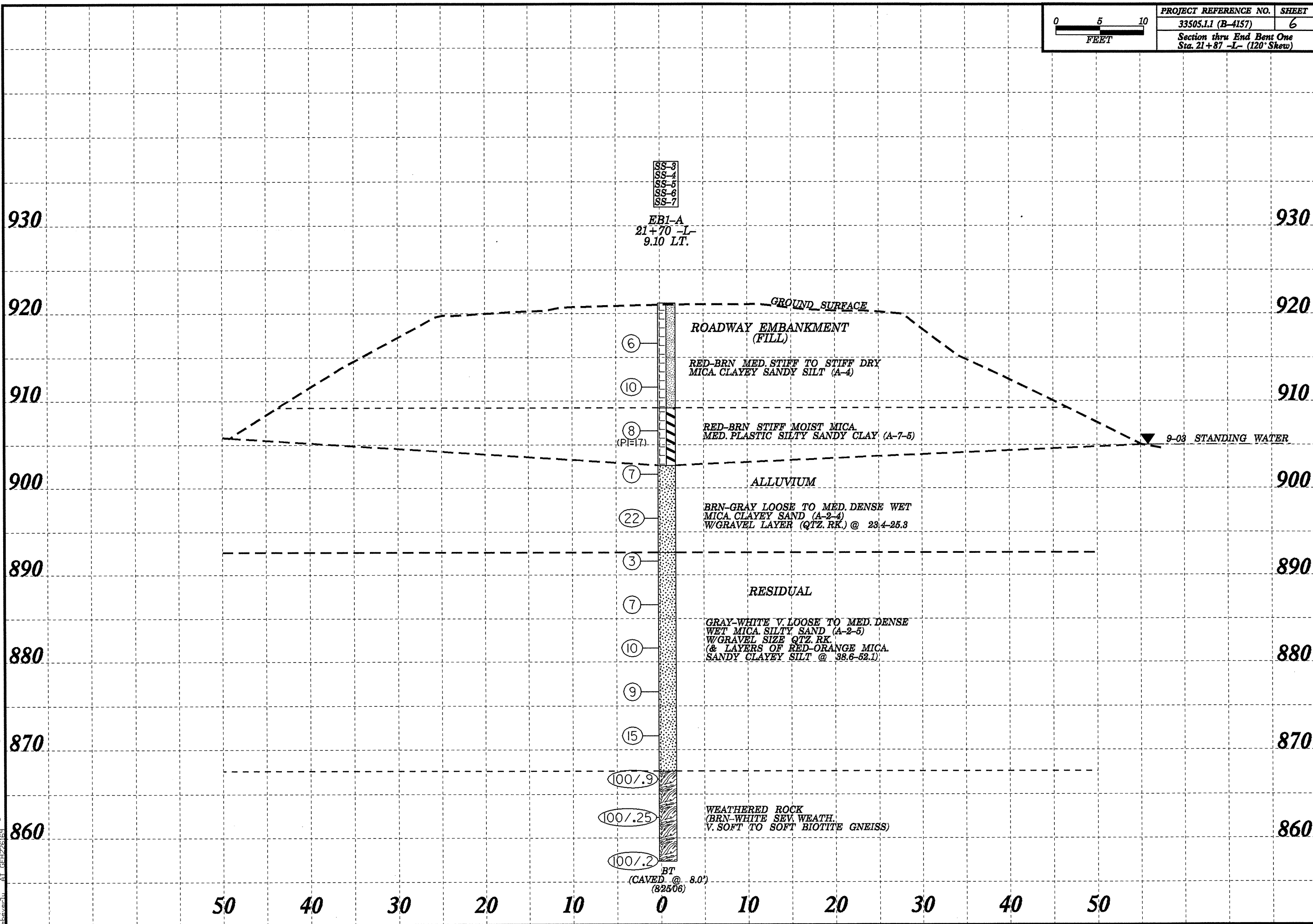
EXCAVATION STRUCTURE PAY ITEM

SEE SHEET 4 FOR -L- ALIGNMENT

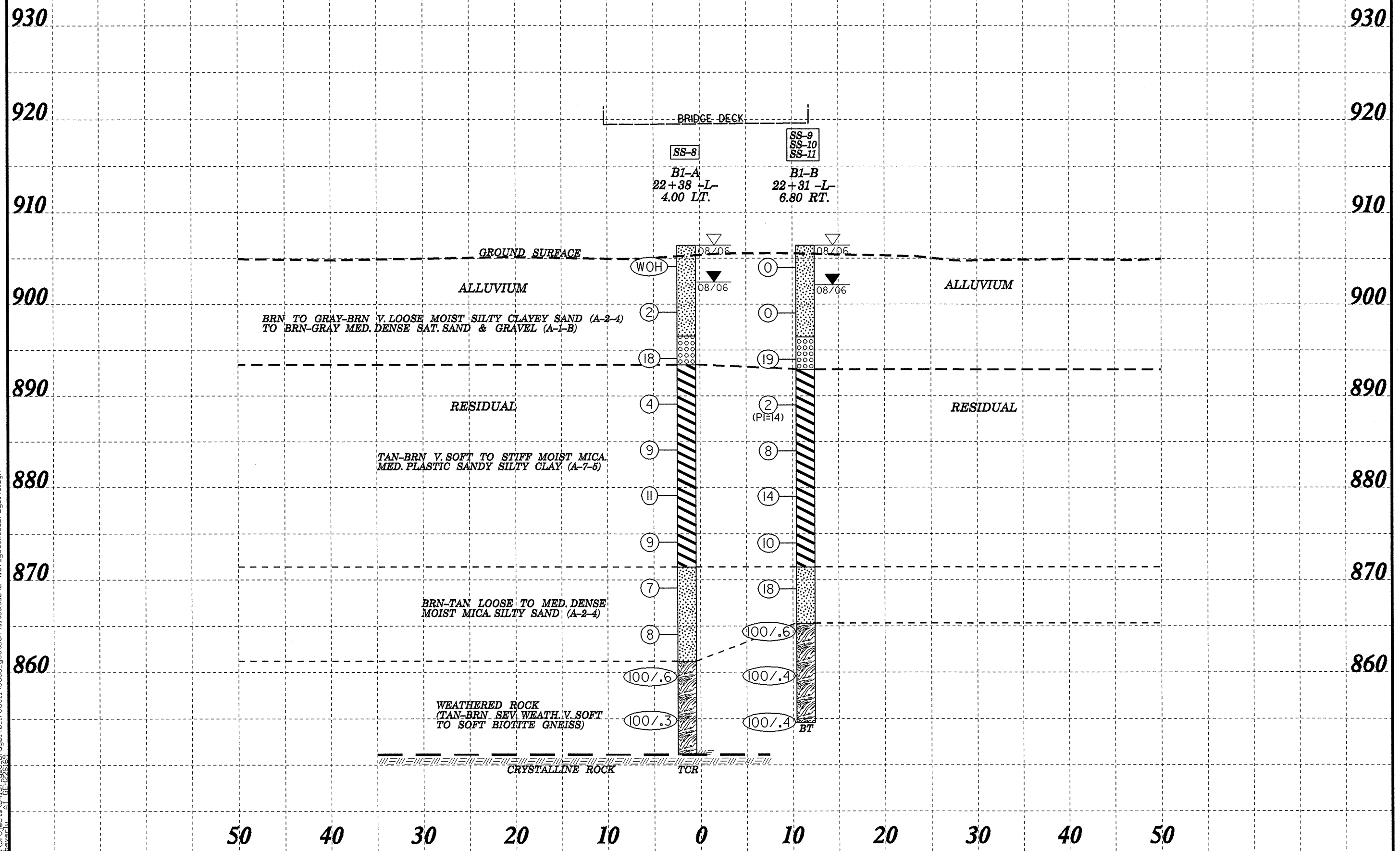
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930

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920

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910

910

900

900

890

890

880

880

870

870

860

860

BRIDGE DECK

SS-12
SS-13
SS-14

B2-A
23+18 -L-
6.00 LT.

RS-2

B2-B
23+11 -L-
6.60 RT.

▽9/1/06 ▽8/30/06 ▽9/1/06

ALLUVIUM

GRAY SOFT SAT.
SILTY SANDY CLAY (A-6)
W/GRAVEL

RESIDUAL

BRN-TAN-WHITE TO GRAY-WHITE V. LOOSE TO DENSE
WET TO MOIST MICA SILTY SAND (A-2-5, A-2-4)

WEATHERED ROCK
(GRAY-WHITE SEV. WEATH.
V. SOFT TO SOFT BIOTITE GNEISS)

CRYSTALLINE ROCK
(GRAY-WHITE MOD. SEV. WEATH.
MED. HARD BIOTITE GNEISS)

ALLUVIUM

GRAY V. LOOSE SAT. TO MOIST SILTY SAND (A-2-4)

RESIDUAL

CRYSTALLINE ROCK

BRN-WHITE-BLACK MOD. SEV. WEATH. TO MOD. WEATH.
MED. HARD TO HARD BIOTITE GNEISS

REC=84%
RQD=27%

GRAY-BLACK-WHITE V. SLI. WEATH. TO FRESH
V. HARD BIOTITE GNEISS

REC=100%
RQD=82%

②

④

③

④②

⑩⑦.②

⑩⑦.②

⑩⑦.②⑤

⑩⑦.②

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BT

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⑨

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③③

⑩⑦.②

⑩⑦.②

BT

50

40

30

20

10

0

10

20

30

40

50

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5/28/99



930

930

920

920

910

910

900

900

890

890

880

880

870

870

860

860

50

40

30

20

10

0

10

20

30

40

50

SS-15

RS-1

EB2-A
23+73 -L-
6.00 LT.

EB2-B
23+56 -L-
13.40 RT.

GROUND SURFACE

ROADWAY EMBANKMENT
(FILL)

BRN-ORANGE V. LOOSE TO
LOOSE MOIST TO DRY MICA.
SILTY CLAYEY SAND (A-2-4)

WRK. FRAGS.

ALLUVIUM
TAN-ORANGE LOOSE MOIST TO
DRY SILTY SAND (A-2-4)

WEATHERED ROCK
(GRAY-WHITE SEV. WEATH.
V. SOFT TO SOFT BIOTITE GNEISS)

GRAY-BLACK-WHITE FRESH V. HARD BIOTITE GNEISS
(1 SOLID PIECE OF CORE)

BRN-BLACK-WHITE MOD. WEATH. MOD. HARD BIOTITE GNEISS

BLACK-WHITE FRESH V. HARD BIOTITE GNEISS
(1 SOLID PIECE OF CORE)

CRYSTALLINE ROCK

AR
DRY
(82506)

100/.3

100/.9

REC=77%
RQD=77%

REC=80%
RQD=0%

REC=100%
RQD=100%

BT
NM
(FIAD)
(82906)

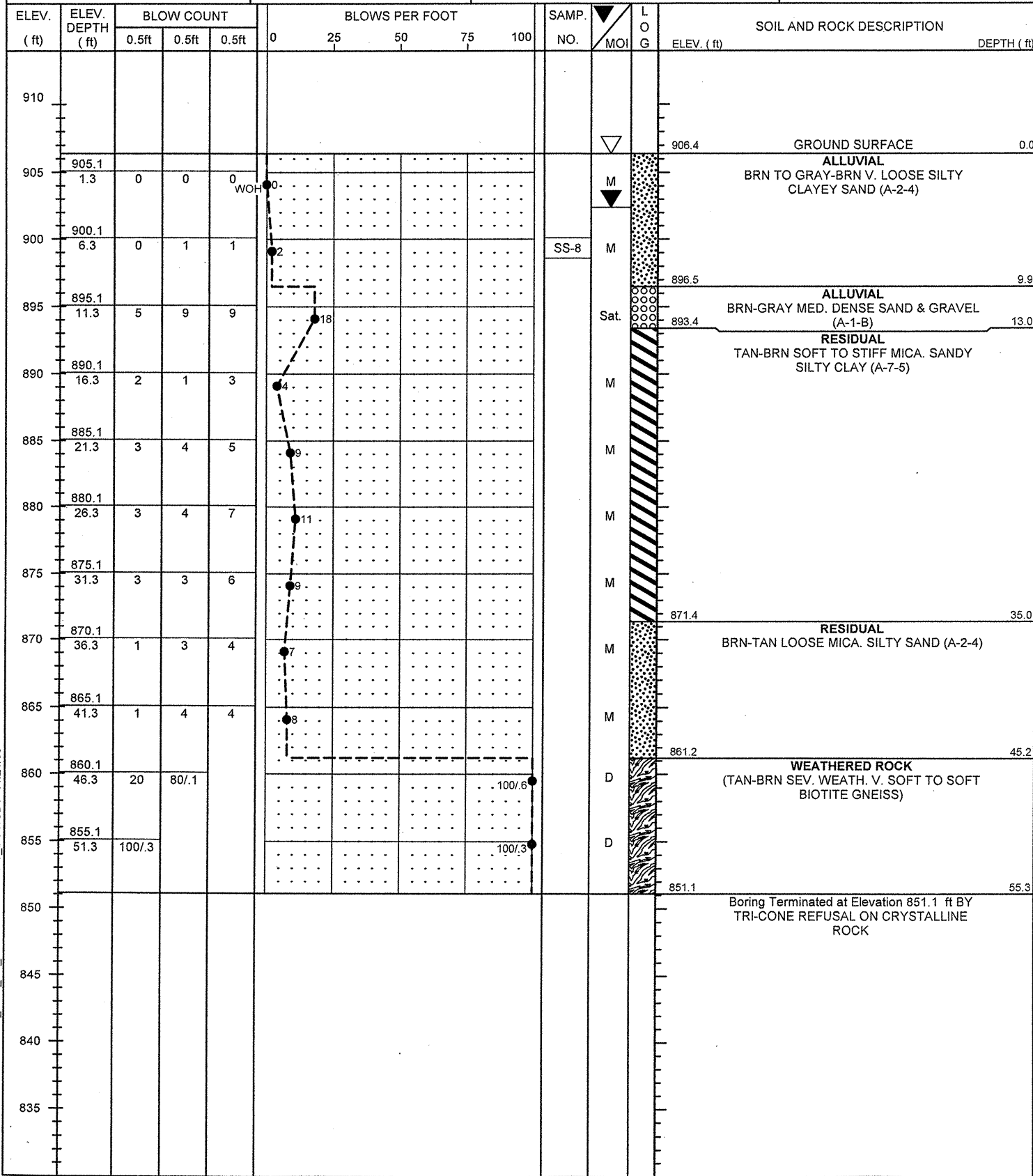
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PROJECT NO. 33505.1.1	ID. B-4157	COUNTY IREDELL	GEOLOGIST Stickney, J. K.
SITE DESCRIPTION BRIDGE 140 OVER SNOW CREEK ON SR 1581			GROUND WTR (ft)
BORING NO. EB1-A	STATION 21+70	OFFSET 9 ft LT	ALIGNMENT -L-
COLLAR ELEV. 921.2 ft	TOTAL DEPTH 63.8 ft	NORTHING 802,199	EASTING 1,413,355
DRILL MACHINE CME-550	DRILL METHOD H.S. Augers	HAMMER TYPE Automatic	
START DATE 08/25/06	COMP. DATE 08/25/06	SURFACE WATER DEPTH N/A	DEPTH TO ROCK N/A

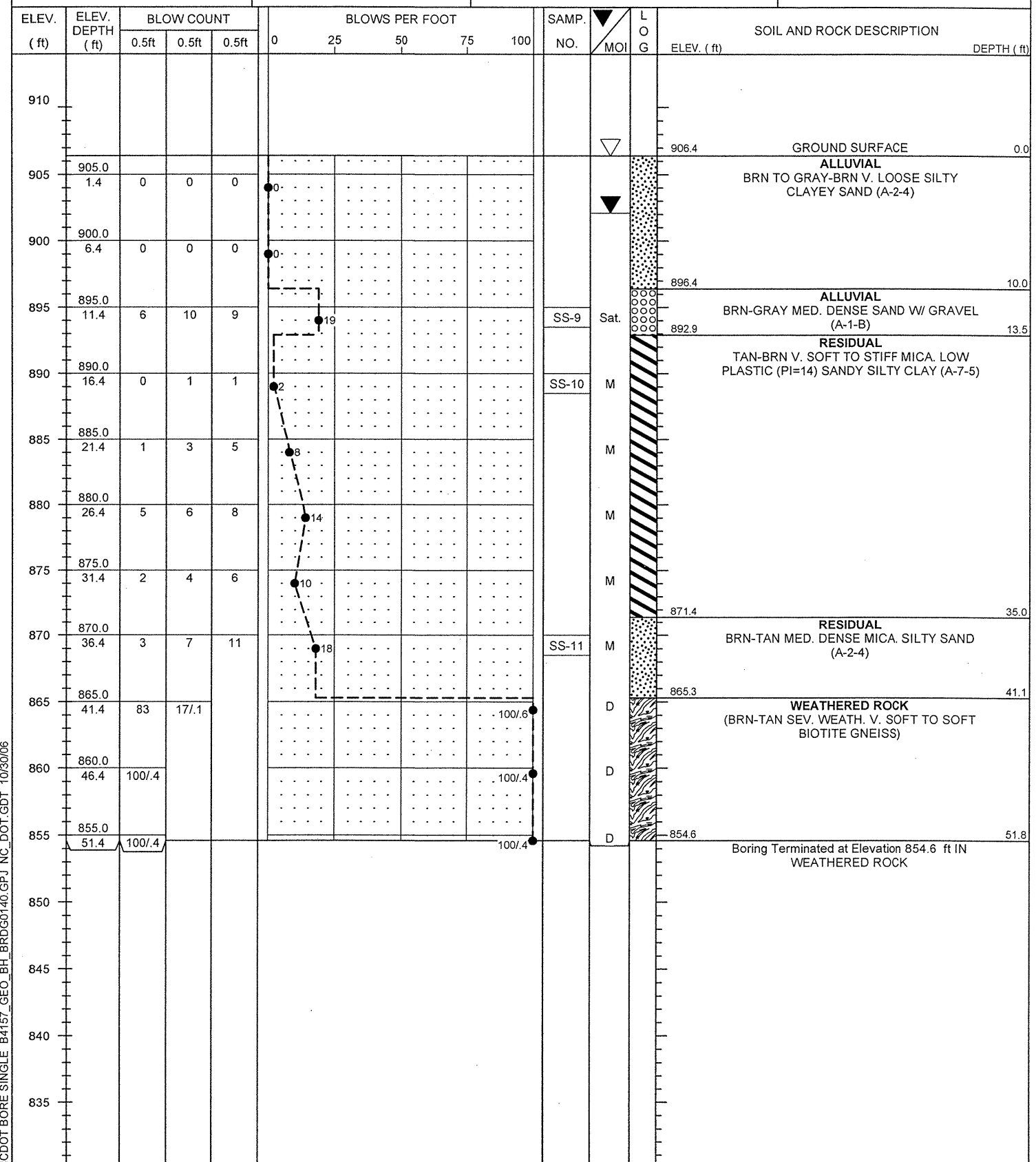
ELEV. (ft)	ELEV. DEPTH (ft)	BLOW COUNT			BLOWS PER FOOT					SAMP. NO.	LOG MOI	L O G	SOIL AND ROCK DESCRIPTION	DEPTH (ft)	
		0.5ft	0.5ft	0.5ft	0	25	50	75	100						
925															
921.2													GROUND SURFACE	0.0	
917.6	3.6	2	3	3									ROADWAY EMBANKMENT RED-BRN MED. STIFF TO STIFF MICA. CLAYEY SANDY SILT (A-4)		
912.6	8.6	5	5	5											
909.2													ROADWAY EMBANKMENT RED-BRN STIFF MICA. MED. PLASTIC (PI=17) SILTY SANDY CLAY (A-7-5)	12.0	
907.6	13.6	3	4	4											
902.6	18.6	3	3	4									ALLUVIAL BRN-GRAY LOOSE TO MED. DENSE MICA. CLAYEY SAND (A-2-4) W/ GRAVEL LAYER (QTZ. RK.) @ 23.4-25.3	18.6	
897.6	23.6	8	10	12											
892.6	28.6	1	2	1									RESIDUAL GRAY-WHITE V. LOOSE TO MED. DENSE MICA. SILTY SAND (A-2-5) W/ GRAVEL SIZE QTZ. RK. (& LAYERS OF RED-ORANGE MICA. SANDY CLAYEY SILT @ 38.6-52.1)	28.6	
887.6	33.6	1	2	5											
882.6	38.6	1	5	5											
877.6	43.6	2	4	5											
872.6	48.6	3	6	9											
867.6	53.6	46	54/4										WEATHERED ROCK (BRN-WHITE SEV. WEATH. V. SOFT TO SOFT BIOTITE GNEISS)	53.6	
862.6	58.6	100/25													
857.6	63.6	100/2											Boring Terminated at Elevation 857.4 ft IN WEATHERED ROCK	63.8	

NCDOT BORE SINGLE B4157_GEO_BH_BRD0140.GPJ NC_DOT_GDT_10/30/06

PROJECT NO. 33505.1.1	ID. B-4157	COUNTY IREDELL	GEOLOGIST Stickney, J. K.
SITE DESCRIPTION BRIDGE 140 OVER SNOW CREEK ON SR 1581			GROUND WTR (ft)
BORING NO. B1-A	STATION 22+38	OFFSET 4 ft LT	ALIGNMENT -L-
COLLAR ELEV. 906.4 ft	TOTAL DEPTH 55.3 ft	NORTHING 802,155	EASTING 1,413,407
DRILL MACHINE CME-550	DRILL METHOD NW Casing w/ SPT	HAMMER TYPE Automatic	
START DATE 08/29/06	COMP. DATE 08/29/06	SURFACE WATER DEPTH N/A	DEPTH TO ROCK 55.3 ft



PROJECT NO. 33505.1.1	ID. B-4157	COUNTY IREDELL	GEOLOGIST Stickney, J. K.
SITE DESCRIPTION BRIDGE 140 OVER SNOW CREEK ON SR 1581			GROUND WTR (ft)
BORING NO. B1-B	STATION 22+31	OFFSET 7 ft RT	ALIGNMENT -L-
COLLAR ELEV. 906.4 ft	TOTAL DEPTH 51.8 ft	NORTHING 802,151	EASTING 1,413,395
DRILL MACHINE CME-550	DRILL METHOD NW Casing w/ SPT	HAMMER TYPE Automatic	
START DATE 08/28/06	COMP. DATE 08/28/06	SURFACE WATER DEPTH N/A	DEPTH TO ROCK N/A



NCDOT BORE SINGLE B4157_GEO_BH_BRD0140.GPJ NC_DOT_GDT 11/21/06

NCDOT BORE SINGLE B4157_GEO_BH_BRD0140.GPJ NC_DOT_GDT 10/30/06



NCDOT GEOTECHNICAL ENGINEERING UNIT

BORELOG REPORT

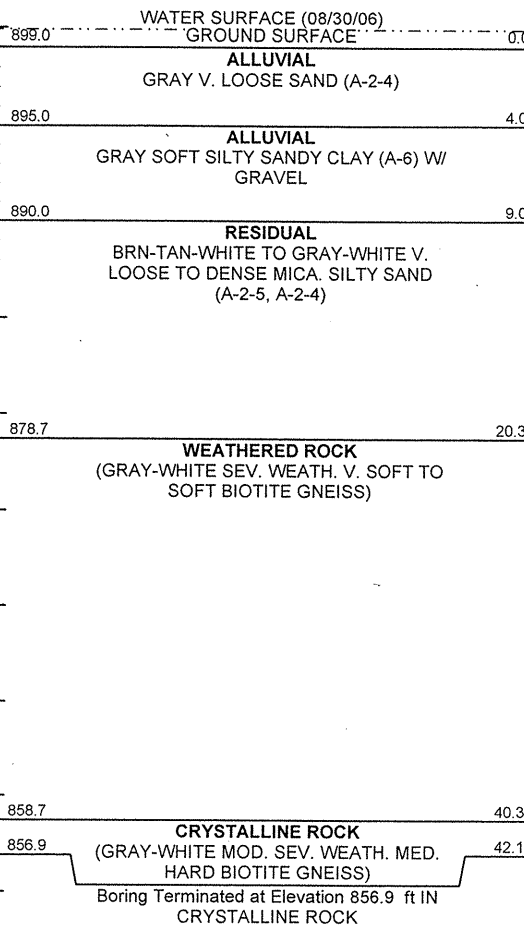
SHEET

Sheet 12

PROJECT NO. 33505.1.1	ID. B-4157	COUNTY IREDELL	GEOLOGIST Stickney, J. K.
SITE DESCRIPTION BRIDGE 140 OVER SNOW CREEK ON SR 1581			GROUND WTR (ft)
BORING NO. B2-A	STATION 23+18	OFFSET 6 ft LT	ALIGNMENT -L-
COLLAR ELEV. 899.0 ft	TOTAL DEPTH 42.1 ft	NORTHING 802,111	EASTING 1,413,474
DRILL MACHINE CME-550	DRILL METHOD NW Casing w/ SPT	HAMMER TYPE Automatic	
START DATE 08/30/06	COMP. DATE 08/30/06	SURFACE WATER DEPTH 0.9	DEPTH TO ROCK 40.3

ELEV. (ft)	ELEV. DEPTH (ft)	BLOW COUNT			BLOWS PER FOOT					SAMP. NO.	MOI	LOG	SOIL AND ROCK DESCRIPTION	DEPTH (ft)	
		0.5ft	0.5ft	0.5ft	0	25	50	75	100						
900	898.7	0.3	1	1	1										
895	893.7	5.3	1	2	2										
890	888.7	10.3	1	1	2										
885	883.7	15.3	10	9	33										
880	878.7	20.3	100/2												
875	873.7	25.3	100/2												
870	868.7	30.3	100/25												
865	863.7	35.3	100/2												
860	858.7	40.3	100/1												
855															
850															
845															
840															
835															
830															
825															

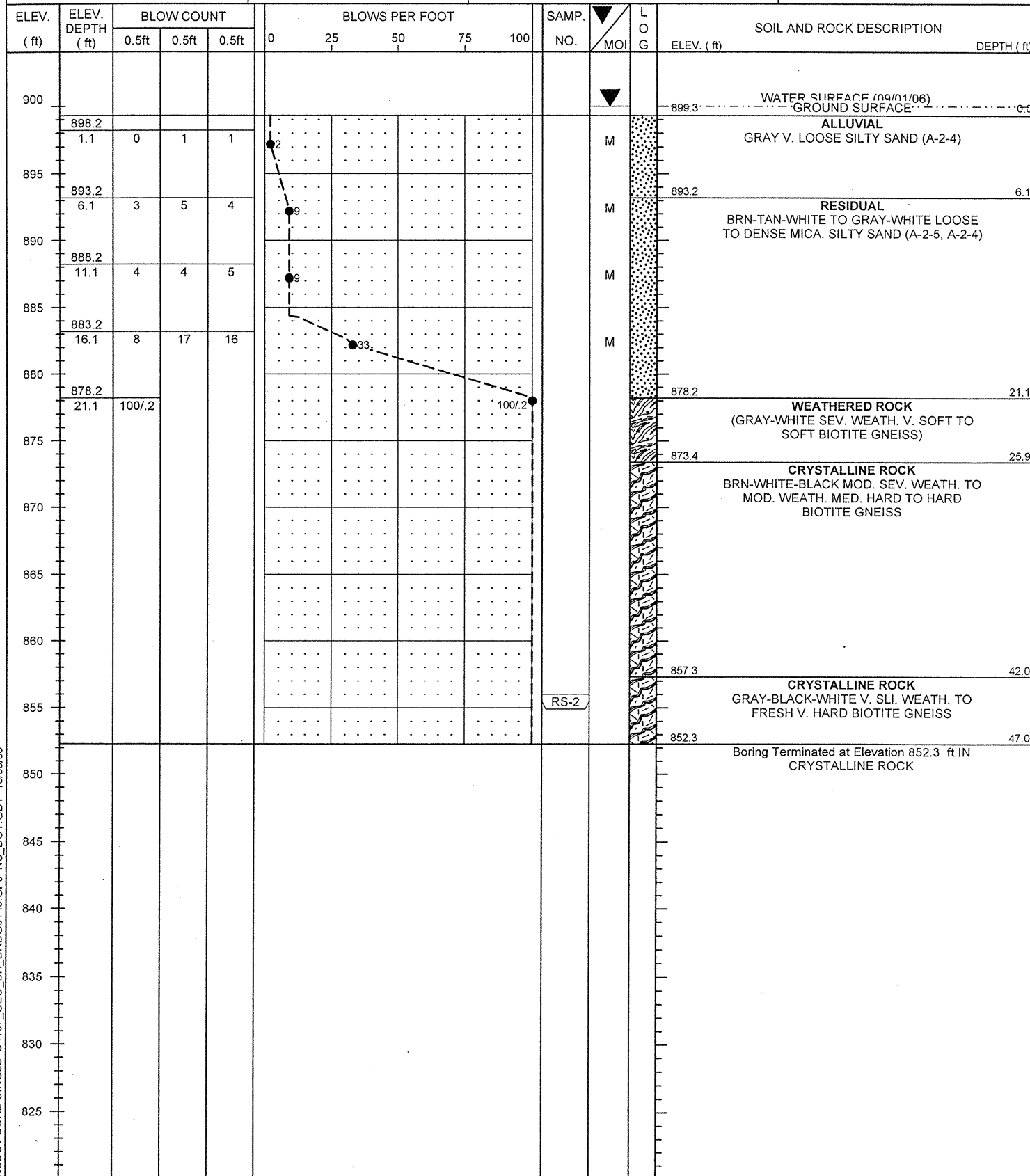
NCDOT BORE SINGLE B4157_GEO_BH_BRD0140.GPJ NC_DOT_GDT 10/30/06



NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS
GEOTECHNICAL UNIT CORE BORING REPORT

PROJECT NO. 33505.1.1	ID. B-4157	COUNTY IREDELL	GEOLOGIST Stickney, J. K.
SITE DESCRIPTION BRIDGE 140 OVER SNOW CREEK ON SR 1581			GROUND WTR (ft)
BORING NO. B2-B	STATION 23+11	OFFSET 7 ft RT	ALIGNMENT -L-
COLLAR ELEV. 899.3 ft	TOTAL DEPTH 47.0 ft	NORTHING 802,105	EASTING 1,413,461
DRILL MACHINE CME-550	DRILL METHOD NW Casing w/ SPT Core	HAMMER TYPE Automatic	
START DATE 09/01/06	COMP. DATE 09/01/06	SURFACE WATER DEPTH 0.7	DEPTH TO ROCK 25.9

PROJECT NO: 33505.1.1 PROJECT ID: B-4157 COUNTY: IREDELL
 SITE DESCRIPTION: BRIDGE 140 OVER SNOW CREEK ON SR 1581
 BORING NO: B2-B BORING LOCATION (STA): 23+11
 COLLAR ELEV: 899.3 PERSONNEL: K. WISE
 TOTAL DEPTH: 47.0 DRILL MACHINE: CME-550
 TOTAL RUN: 21.1 DRILL EQUIP: NXWL, TRI-CONE
 GEOLOGIST: J.E. BEVERLY
 DRILLER: C.L. SMITH
 OFFSET: 7 RT
 CORE SIZE: NXWL
 DATE STARTED: 9-1-06
 DATE COMPLETED: 9-1-06



ELEV. (FT)	RUN DEPTH (FT)	RUN REC (%)	RUN RQD (%)	STRATA DEPTH (FT)	STRATA REC (%)	STRATA RQD (%)	STRATA ELEV (FT)	SAMP NO.	FIELD CLASSIFICATION AND REMARKS
873.4	25.9	100	0	25.9	84	27	873.4		BROWN-WHITE-BLACK MOD. SEVERELY WEATHERED TO SEVERELY WEATHERED, MEDIUM HARD TO HARD, BIOTITE GNEISS WITH VERY CLOSE TO CLOSE FRACTURE SPACING
872.3	27.0	72	30						
867.3	32.0	90	22						
862.3	37.0	90	28						
857.3	42.0	100	82	42.0	100	82	857.3	RS-2	GRAY-BLACK-WHITE VERY SLIGHTLY WEATHERED TO FRESH, VERY HARD, BIOTITE GNEISS WITH CLOSE TO WIDE FRACTURE SPACING
852.3	47.0			47.0			852.3		

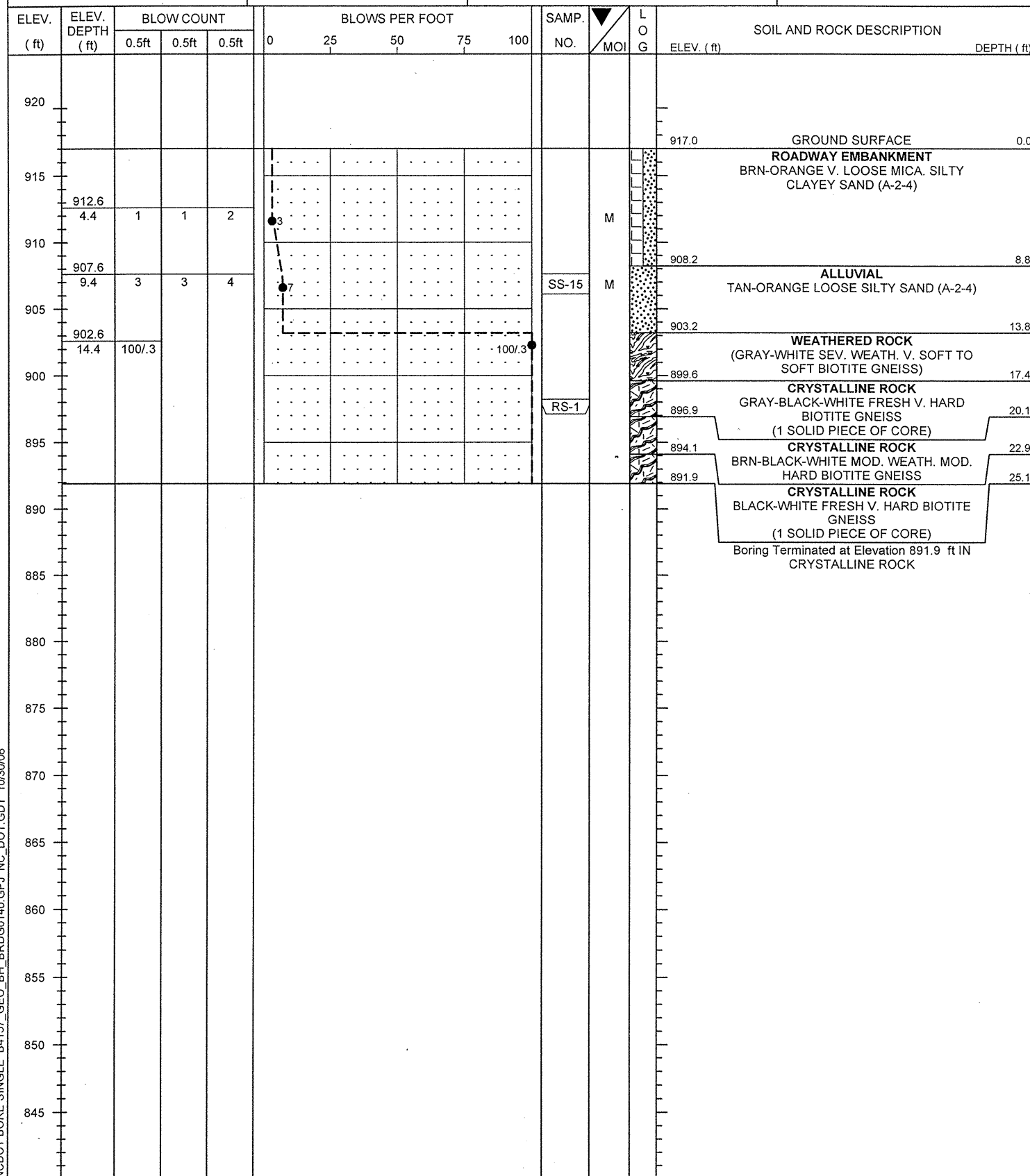
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NCDOT BORE SINGLE B4157_GEO_BH_BRD00140.GPJ NC_DOT_GDT 10/30/06

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS
GEOTECHNICAL UNIT CORE BORING REPORT

PROJECT NO. 33505.1.1	ID. B-4157	COUNTY IREDELL	GEOLOGIST Stickney, J. K.
SITE DESCRIPTION BRIDGE 140 OVER SNOW CREEK ON SR 1581			GROUND WTR (ft)
BORING NO. EB2-A	STATION 23+73	OFFSET 6 ft LT	ALIGNMENT -L-
COLLAR ELEV. 917.0 ft	TOTAL DEPTH 25.1 ft	NORTHING 802,079	EASTING 1,413,519
DRILL MACHINE CME-550	DRILL METHOD NW Casing w/ SPT Core	HAMMER TYPE Automatic	
START DATE 08/29/06	COMP. DATE 08/29/06	SURFACE WATER DEPTH N/A	DEPTH TO ROCK 17.4

PROJECT NO: 33505.1.1 PROJECT ID: B-4157 COUNTY: IREDELL
 SITE DESCRIPTION: BRIDGE 140 OVER SNOW CREEK ON SR 1581
 BORING NO: EB2-A BORING LOCATION (STA): 23+73
 COLLAR ELEV: 917.0 PERSONNEL: K. WISE
 TOTAL DEPTH: 25.1 DRILL MACHINE: CME-550
 TOTAL RUN: 7.7' DRILL EQUIP: NXWL, TRI-CONE
 GEOLOGIST: J.E. BEVERLY
 DRILLER: C.L. SMITH
 OFFSET: 6' LT
 CORE SIZE: NXWL
 DATE STARTED: 8-29-06
 DATE COMPLETED: 8-29-06



ELEV. (FT)	RUN DEPTH	RUN REC	RUN RQD	STRATA DEPTH	STRATA REC	STRATA RQD	STRATA ELEV	SAMP NO.	FIELD CLASSIFICATION AND REMARKS
899.6	17.4	77	77	17.4	77	77	899.6	RS-1	GRAY-BLACK-WHITE, FRESH, VERY HARD BIOTITE GNEISS (1 SOLID PIECE OF CORE)
896.9	20.1			20.1					
		88	44	20.1	80	0			BROWN-BLACK-WHITE, MOD. WEATHERED, MODERATELY HARD BIOTITE GNEISS WITH VERY CLOSE TO CLOSE FRACTURE SPACING
				22.9			894.1		
				22.9	100	100	894.1		BLACK-WHITE, FRESH, VERY HARD BIOTITE GNEISS (1 SOLID PIECE OF CORE)
891.9	25.1			25.1			891.1		

NOTES

NCDOT BORE SINGLE B4157_GEO_BH_BRD0140.GPJ NC_DOT_GDT 10/30/06

PROJECT NO. 33505.1.1	ID. B-4157	COUNTY IREDELL	GEOLOGIST Stickney, J. K.
SITE DESCRIPTION BRIDGE 140 OVER SNOW CREEK ON SR 1581			GROUND WTR (ft)
BORING NO. EB2-B	STATION 23+56	OFFSET 13 ft RT	ALIGNMENT -L-
COLLAR ELEV. 916.9 ft	TOTAL DEPTH 16.2 ft	NORTHING 802,073	EASTING 1,413,494
DRILL MACHINE CME-550	DRILL METHOD H.S. Augers	HAMMER TYPE Automatic	
START DATE 08/25/06	COMP. DATE 08/25/06	SURFACE WATER DEPTH N/A	DEPTH TO ROCK 16.2

ELEV. (ft)	ELEV. DEPTH (ft)	BLOW COUNT			BLOWS PER FOOT					SAMP. NO.	MOI	LOG	SOIL AND ROCK DESCRIPTION			
		0.5ft	0.5ft	0.5ft	0	25	50	75	100				ELEV. (ft)	DEPTH (ft)		
920														916.9	0.0	GROUND SURFACE
915	913.1 3.8	1	2	2								D				ROADWAY EMBANKMENT BRN-ORANGE LOOSE MICA. SILTY CLAYEY SAND (A-2-4) W/ RK. FRAGS.
910	908.1 8.8	3	3	3								D		908.1	8.8	ALLUVIAL TAN-ORANGE LOOSE SILTY SAND (A-2-4)
905	903.1 13.8	8	92/4									D		902.6	14.3	WEATHERED ROCK (GRAY-WHITE SEV. WEATH. V. SOFT TO SOFT BIOTITE GNEISS)
900														900.7	16.2	Boring Terminated by Auger Refusal at Elevation 900.7 ft ON CRYSTALLINE ROCK

NCDOT BORE SINGLE B4157_GEO_BH_BRDG0140.GPJ NC_DOT_GDT 10/30/06



FIELD SCOUR REPORT

WBS: 33505.1.1 TIP: B-4157 COUNTY: Iredell

DESCRIPTION(1): Bridge 140 over Snow Creek on SR 1581

EXISTING BRIDGE

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

Bridge No.: 140 Length: 145' 6" Total Bents: 7 Bents in Channel: 2 Bents in Floodplain: 7
 Foundation Type: Vertical abutments and timber piers

EVIDENCE OF SCOUR(2)

Abutments or End Bent Slopes: None observed

Interior Bents: None observed

Channel Bed: None observed

Channel Bank: Between B-4 and B-5 the banks are undermined, likely from debris buildup at B-4

EXISTING SCOUR PROTECTION

Type(3): None

Extent(4):

Effectiveness(5):

Obstructions(6): Debris upstream at B-4 (logs / limbs)

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, or aggrading.
- 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 theoretical 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 (Reference SS-8)

Channel Bank Material(8): sand (Ref. SS-5)

Channel Bank Cover(9): small trees, shrubs and grass

Floodplain Width(10): appx. 300'

Floodplain Cover(11): Mature trees, shrubs and grass

Stream is(12): Aggrading Degrading Undetermined

Channel Migration Tendency(13): Significant potential to the west

Observations and Other Comments: NCDOT Hydro report puts Q500 scour at elevation 897' for B1 and 893' for B2. Soil at these elevations is alluvial sand (A-2-4, A-1-b) and/or alluvial clay (A-6).

DESIGN SCOUR ELEVATIONS(14)

Feet Meters

BENTS

	B1	B2	B3	B4									
	891	891											

Comparison of DSE to Hydraulics Unit theoretical scour:

Lowered B1 scour from 897' to 891' due to lateral migration potential.

Lowered B2 scour from 893' to 891'.

SOIL ANALYSIS RESULTS FROM CHANNEL BED AND BANK MATERIAL

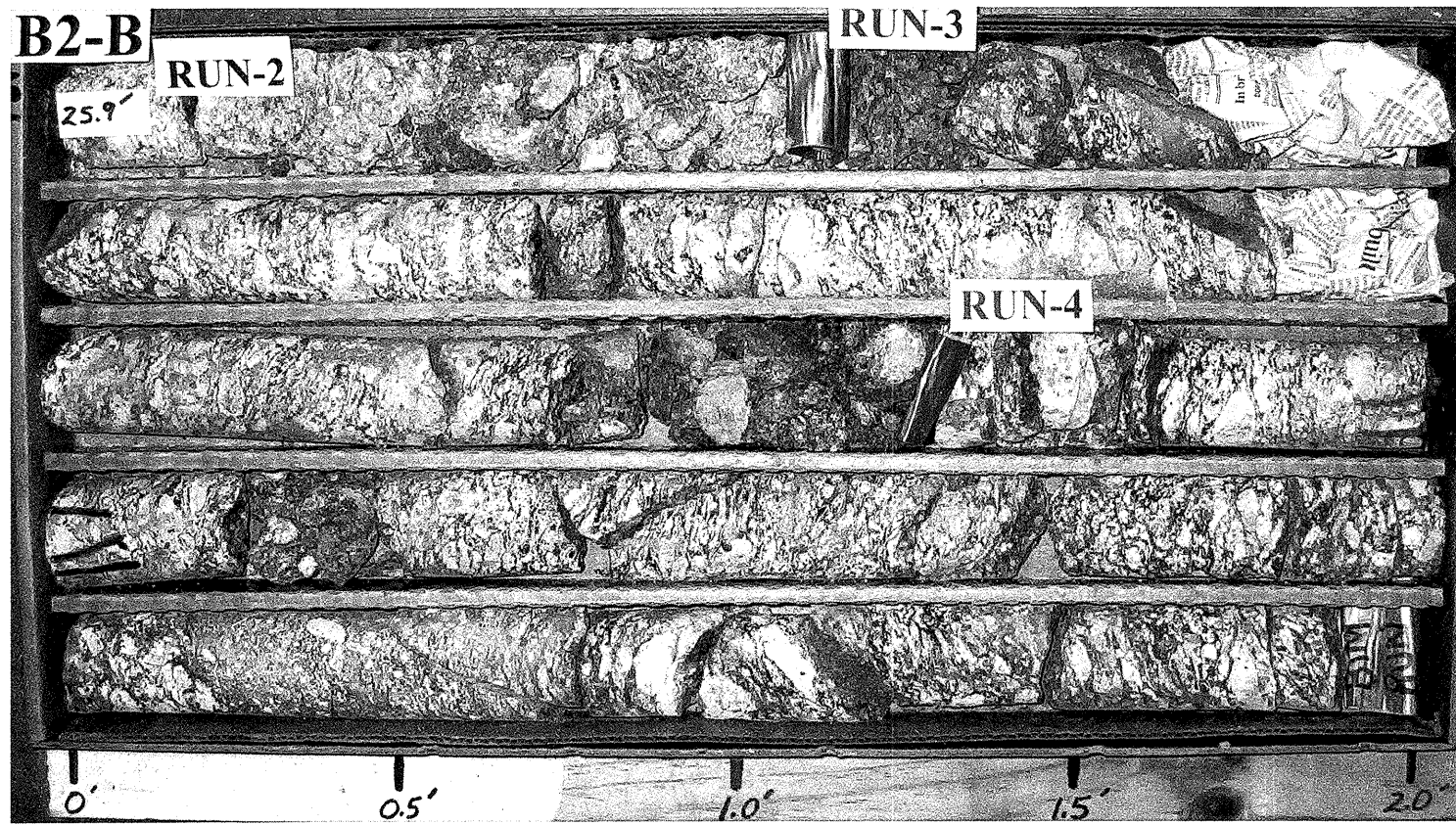
Bed or Bank													
Sample No.													
Retained #4													
Passed #10													
Passed #40													
Passed #200													
Coarse Sand													
Fine Sand													
Silt													
Clay													
LL													
PI													
AASHTO													
Station										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

Reported by: JKS / JEB / CBL

Date: 11/22/2006

33505.1.1 (B-4157)
IREDELL COUNTY
BRIDGE NO. 140 OVER SNOW CREEK ON SR 1581

CORE PHOTOS



33505.1.1 (B-4157)
IREDELL COUNTY
BRIDGE NO. 140 OVER SNOW CREEK ON SR 1581

CORE PHOTOS



33505.1.1 (B-4157)
IREDELL COUNTY
BRIDGE NO. 140 OVER SNOW CREEK ON SR 1581

PHOTOS

