

PROJECT: 35604.1.1 ID. I-4411

STATE OF NORTH CAROLINA

DEPARTMENT OF TRANSPORTATION

DIVISION OF HIGHWAYS

GEOTECHNICAL UNIT

STRUCTURE SUBSURFACE INVESTIGATION

STATE	STATE PROJECT REFERENCE NO.	SHEET	TOTAL SHEETS
N.C.	I-4411	1	15
STATE PROJ. NO.	F.A. PROJ. NO.	DESCRIPTION	
35604.1.1		P.E.	
		CONST.	

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STATE PROJECT 35604.1.1 I.D. NO. I-4411

F.A. PROJECT _____

COUNTY IREDELL

PROJECT DESCRIPTION BRIDGE OVER I-77
ON SR 1102 BETWEEN SR 1208 &
US 115

SITE DESCRIPTION _____

RETURNED FROM LETTING

INVESTIGATED BY J.E. BEVERLY PERSONNEL J.K. STICKNEY

CHECKED BY C.B. LITTLE C.L. SMITH

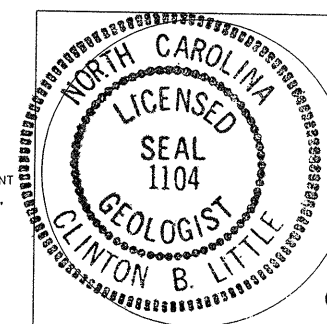
SUBMITTED BY C.B. LITTLE D.K. BRATTON

DATE _____

DRAWN BY: J.K. McCLURE

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.



SEAL 12-02-04
SIGNATURE [Signature]

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS
GEOTECHNICAL UNIT

ID	STATE PROJECT NO.	SHEET NO.	TOTAL SHEETS
I-4411	35604.1.1	2	15

SUBSURFACE INVESTIGATION

SOIL AND ROCK LEGEND, TERMS, SYMBOLS, AND ABBREVIATIONS

SOIL DESCRIPTION				GRADATION				ROCK DESCRIPTION				TERMS AND DEFINITIONS							
SOIL IS CONSIDERED TO BE THE UNCONSOLIDATED, SEMI-CONSOLIDATED OR WEATHERED EARTH MATERIALS WHICH CAN BE PENETRATED WITH A CONTINUOUS FLIGHT POWER AUGER, AND WHICH YIELDS LESS THAN 100 BLOWS PER FOOT ACCORDING TO STANDARD PENETRATION TEST (AASHTO T206, ASTM D-1586). SOIL CLASSIFICATION IS BASED ON THE AASHTO SYSTEM AND 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, MOST WITH INTERBEDDED FINE SAND LAYERS, HIGHLY PLASTIC, A-7-6				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 ARE DESIGNATED BY THE TERMS: ANGULAR, SUBANGULAR, SUBROUNDED, OR ROUNDED.				HARD ROCK IS NON-COASTAL PLAIN MATERIAL THAT WHEN 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 YIELDS SPT N VALUES > 100 BLOWS PER FOOT. 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 YIELD 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.				ALLUVIUM (ALLUV.) - SOILS WHICH 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 WHICH 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 DISLOGED FROM PARENT MATERIAL. FLOOD PLAIN (F.P.) - 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 SOIL - SOIL FORMED IN PLACE BY THE WEATHERING OF ROCK. ROCK QUALITY DESIGNATION (R.Q.D.) - 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 WHICH 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, WHICH 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 B.P.F.) 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 LESS THAN 0.1 FOOT PENETRATION WITH 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 (S.R.Q.D.) - A MEASURE OF ROCK QUALITY DESCRIBED BY: TOTAL LENGTH OF ROCK SEGMENTS WITHIN A STRATUM EQUAL TO OR GREATER THAN 10 CENTIMETERS DIVIDED BY THE TOTAL LENGTH OF STRATA AND EXPRESSED AS A PERCENTAGE. TOPSOIL (T.S.) - SURFACE SOILS USUALLY CONTAINING ORGANIC MATTER.							
SOIL LEGEND AND AASHTO CLASSIFICATION				MINERALOGICAL COMPOSITION				WEATHERING				GROUND WATER							
GRANULAR MATERIALS (>35% PASSING #200) SILT-CLAY MATERIALS (>85% 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. 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 ROCKS 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 B.P.F. 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 B.P.F. 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.				WATER LEVEL IN BORE HOLE IMMEDIATELY AFTER DRILLING. STATIC WATER LEVEL AFTER 24 HOURS. PERCHED WATER, SATURATED ZONE OR WATER BEARING STRATA SPRING OR SEEPAGE							
P.I. OF A-7-5 ≤ L.L. - 30 ; P.I. OF A-7-6 > L.L. - 30				TRACE OF ORGANIC MATTER 2 - 3% MODERATELY ORGANIC 3 - 5% HIGHLY ORGANIC 5 - 10%				TRACE 1 - 10% LITTLE 10 - 20% SOME 20 - 35% HIGHLY 35% AND ABOVE											
CONSISTENCY OR DENSENESS				MISCELLANEOUS SYMBOLS				ROCK HARDNESS				FRACTURE SPACING							
PRIMARY SOIL TYPE COMPACTNESS OR CONSISTENCY RANGE OF STANDARD PENETRATION RESISTANCE (N-VALUE) RANGE OF UNCONFINED COMPRESSIVE STRENGTH (TONS/FT ²)				ROADWAY EMBANKMENT WITH SOIL DESCRIPTION SOIL SYMBOL ARTIFICIAL FILL OTHER THAN ROADWAY EMBANKMENTS INFERRED SOIL BOUNDARIES 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				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, COUGES 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 PIECES 1 INCH MAXIMUM SIZE BY HARD BLOWS OF THE POINT OF A GEOLOGIST'S PICK. SOFT - CAN BE GROOVED 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.				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							
U.S. STD. SIEVE SIZE OPENING (MM) 4 10 40 60 200 270 0.075 0.25 0.425 0.075 0.075				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 FRAGS. - FRAGMENTS HL - HIGHLY MED. - MEDIUM MICA - MICACEOUS MOD. - MODERATELY NP - NON PLASTIC 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 γ _u - UNIT WEIGHT γ _d - DRY UNIT WEIGHT							
TEXTURE OR GRAIN SIZE				ABBREVIATIONS				BEDDING				INDURATION							
BOULDER (BLDR.) COBBLE (COB.) GRAVEL (GR.) COARSE SAND (CSE. SD.) FINE SAND (F. SD.) SILT (SL.) CLAY (CL.)				DRILL UNITS: <input type="checkbox"/> MOBILE B- <input type="checkbox"/> BK-51 <input type="checkbox"/> CME-45C <input checked="" type="checkbox"/> CME-550 <input type="checkbox"/> PORTABLE HOIST <input type="checkbox"/> OTHER _____ <input type="checkbox"/> OTHER _____				ADVANCING TOOLS: <input type="checkbox"/> CLAY BITS <input type="checkbox"/> 6" CONTINUOUS FLIGHT AUGER <input type="checkbox"/> 8" HOLLOW AUGERS <input type="checkbox"/> HARD FACED FINGER BITS <input type="checkbox"/> TUNG.-CARBIDE INSERTS <input checked="" type="checkbox"/> CASING <input type="checkbox"/> W/ ADVANCER <input type="checkbox"/> TRICONE * STEEL TEETH <input checked="" type="checkbox"/> TRICONE 2 15/16" * TUNG.-CARB. <input checked="" type="checkbox"/> CORE BIT <input type="checkbox"/> OTHER _____				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				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.			
SOIL MOISTURE - CORRELATION OF TERMS				EQUIPMENT USED ON SUBJECT PROJECT				HAMMER TYPE				CORE SIZE							
SOIL MOISTURE SCALE (ATTERBERG LIMITS) FIELD MOISTURE DESCRIPTION GUIDE FOR FIELD MOISTURE DESCRIPTION				HAMMER TYPE: <input checked="" type="checkbox"/> AUTOMATIC <input type="checkbox"/> MANUAL				CORE SIZE: <input type="checkbox"/> B- <input checked="" type="checkbox"/> N-XBWL <input type="checkbox"/> H-											
LL - LIQUID LIMIT PL - PLASTIC LIMIT OM - OPTIMUM MOISTURE SL - SHRINKAGE LIMIT				- SATURATED - (SAT.) USUALLY LIQUID; VERY WET, USUALLY FROM BELOW THE GROUND WATER TABLE - WET - (W) SEMISOLID; REQUIRES DRYING TO ATTAIN OPTIMUM MOISTURE - MOIST - (M) SOLID; AT OR NEAR OPTIMUM MOISTURE - DRY - (D) REQUIRES ADDITIONAL WATER TO ATTAIN OPTIMUM MOISTURE				HAND TOOLS: <input type="checkbox"/> POST HOLE DIGGER <input type="checkbox"/> HAND AUGER <input type="checkbox"/> SOUNDING ROD <input type="checkbox"/> VANE SHEAR TEST <input type="checkbox"/> OTHER _____											
PLASTICITY				FRACTURE SPACING				HAMMER TYPE				CORE SIZE							
NONPLASTIC LOW PLASTICITY MED. PLASTICITY HIGH PLASTICITY				PLASTICITY INDEX (PI) DRY STRENGTH 0-5 VERY LOW 6-15 SLIGHT 16-25 MEDIUM 26 OR MORE HIGH				PLASTICITY INDEX (PI) DRY STRENGTH 0-5 VERY LOW 6-15 SLIGHT 16-25 MEDIUM 26 OR MORE HIGH				PLASTICITY INDEX (PI) DRY STRENGTH 0-5 VERY LOW 6-15 SLIGHT 16-25 MEDIUM 26 OR MORE HIGH							
COLOR				FRACTURE SPACING				HAMMER TYPE				CORE SIZE							
DESCRIPTIONS MAY INCLUDE COLOR OR COLOR COMBINATIONS (TAN, RED, YEL.-BRN, BLUE-GRAY) MODIFIERS SUCH AS LIGHT, DARK, STREAKED, ETC. ARE USED TO DESCRIBE APPEARANCE.				PLASTICITY INDEX (PI) DRY STRENGTH 0-5 VERY LOW 6-15 SLIGHT 16-25 MEDIUM 26 OR MORE HIGH				PLASTICITY INDEX (PI) DRY STRENGTH 0-5 VERY LOW 6-15 SLIGHT 16-25 MEDIUM 26 OR MORE HIGH				PLASTICITY INDEX (PI) DRY STRENGTH 0-5 VERY LOW 6-15 SLIGHT 16-25 MEDIUM 26 OR MORE HIGH							

BENCH MARK: NO. 2
 8" NAIL IN BASE OF 24" WHITE OAK
 58.35' RT. OF STA. 28 + 70.87 -BY- ELEVATION: 832.90'

NOTES:



STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION

MICHAEL F. EASLEY GOVERNOR
LYNDO TIPPETT SECRETARY
P.O. BOX 25201, RALEIGH, N.C. 27611-5201

November 29, 2004

STATE PROJECT: 35604.1.1 (I-4411)
COUNTY: Iredell
DESCRIPTION: Bridge over I-77 on SR 1102 between SR 1208 and US 115

SUBJECT: Geotechnical Report – Bridge Foundation Investigation

This proposed structure is a replacement for bridge #28 on SR 1102 over I-77. At 90' 7" in width the new structure is a four-lane design that will occupy the same location as the existing bridge. The proposed design calls for 2 spans at 150' 6" each (301' total) at an approximate skew angle of 132°.

Foundation test borings were advanced with a CME-550 drill machine utilizing NW Casing, NXWL, Tri-Cone roller bit and automatic drop hammer. The field investigation for this project was conducted in November of 2004.

Physiography/Geology

The project area is located in southern Iredell County along the I-77 corridor south of the city of Mooresville. The topography surrounding the area is flat to gently sloping. Geologically this site is part of the Charlotte Belt and is underlain by granitic rock.

Site specific soils encountered during this investigation include roadway fill, and residual soils. Existing roadway fill material associated with SR 1102 and I-77 was present at all boring locations and consists of clay (A-7-6) and silt (A-4). Residual soils were also present in all of our boring locations and were fairly homogeneous across the site. Residual soils fall in the AASHTO classifications of clay (A-7-6), silt (A-5), and sand (A-2-4). Weathered rock was encountered at depth below residual soil in all of our test borings.

Foundation Materials

End Bent 1:
Three borings were performed at this bent location which lies west of I-77. Soils encountered along the bent begin with 10 to 15 feet of roadway fill which is composed of red-orange very soft to stiff silty sandy clay (A-7-6) overlying residual soils. Three

residual soil types are sequenced across this bent beginning with 7 to 8 feet of red-brown stiff to very stiff highly plastic sandy silty clay (A-7-6) which extends to approximate elevation 820 feet. Below clay lies 18 to 22 feet of tan-orange stiff to soft micaceous fine sandy clayey silt (A-5). Approximately 10 to 14 feet of gray-white loose to dense silty sand comprises the third residual soil layer which ends at the top of the weathered rock contact. Some 5+ feet below the weathered rock horizon hard rock is encountered. Known weathered and hard rock elevations for this bent are as follows:

<u>Boring Location</u>	<u>Weathered Rock Elevation (feet)</u>	<u>Hard Rock Elevation (feet)</u>
EB1-A	785.00	778.90
EB1-C	791.82	not encountered
EB1-B	784.10	778.40

Bent 1:
Three borings were performed at this bent location in the I-77 median. Each boring encountered approximately 10 feet of roadway fill consisting of brown and red-orange very soft to medium stiff sandy silty clay (A-7-6) overlying residual soil. Approximate elevation 812 feet marks the residual soil horizon where 15 to 35 feet of tan-yellow-brown to gray-white very soft to stiff clayey sandy silt (A-5) and medium dense silty sand (A-2-4) are encountered. Beneath residual soil weathered rock is encountered. Known weathered and hard rock elevations for this bent are as follows:

<u>Boring Location</u>	<u>Weathered Rock Elevation (feet)</u>	<u>Hard Rock Elevation (feet)</u>
B1-A	776.13	N/A
B1-C	787.11	not encountered
B1-B	797.11	787.92

A single core run was performed at boring B1-B for evaluation purposes. The rock was determined to be very hard, fresh granite.

End Bent 2:
This bent falls east of I-77 and only 2 borings were performed at this location due to access problems. Both borings encountered 19.7 feet of roadway fill consisting of tan-orange-red-brown soft to medium stiff clayey sandy silt (A-4) and red-orange stiff silty sandy clay (A-7-5). The residual soil horizon occurs below roadway fill at approximate elevation 824 feet and extends about 31 feet in depth before encountering weathered rock followed by hard rock. Residual soil is comprised of 3 different layers bearing different AASHTO classifications. Layers in sequence from top to bottom are red-brown stiff to very stiff highly plastic sandy silty clay (A-7-6), followed by red-tan-orange stiff to medium stiff micaceous clayey sandy silt (A-5), and then gray-white loose to medium dense silty sand (A-2-4). Known weathered and hard rock elevations for this bent are as follows:

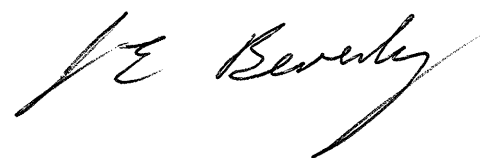
<u>Boring Location</u>	<u>Weathered Rock Elevation (feet)</u>	<u>Hard Rock Elevation (feet)</u>
EB2-C	792.83	788.33
EB2-B	793.08	780.38

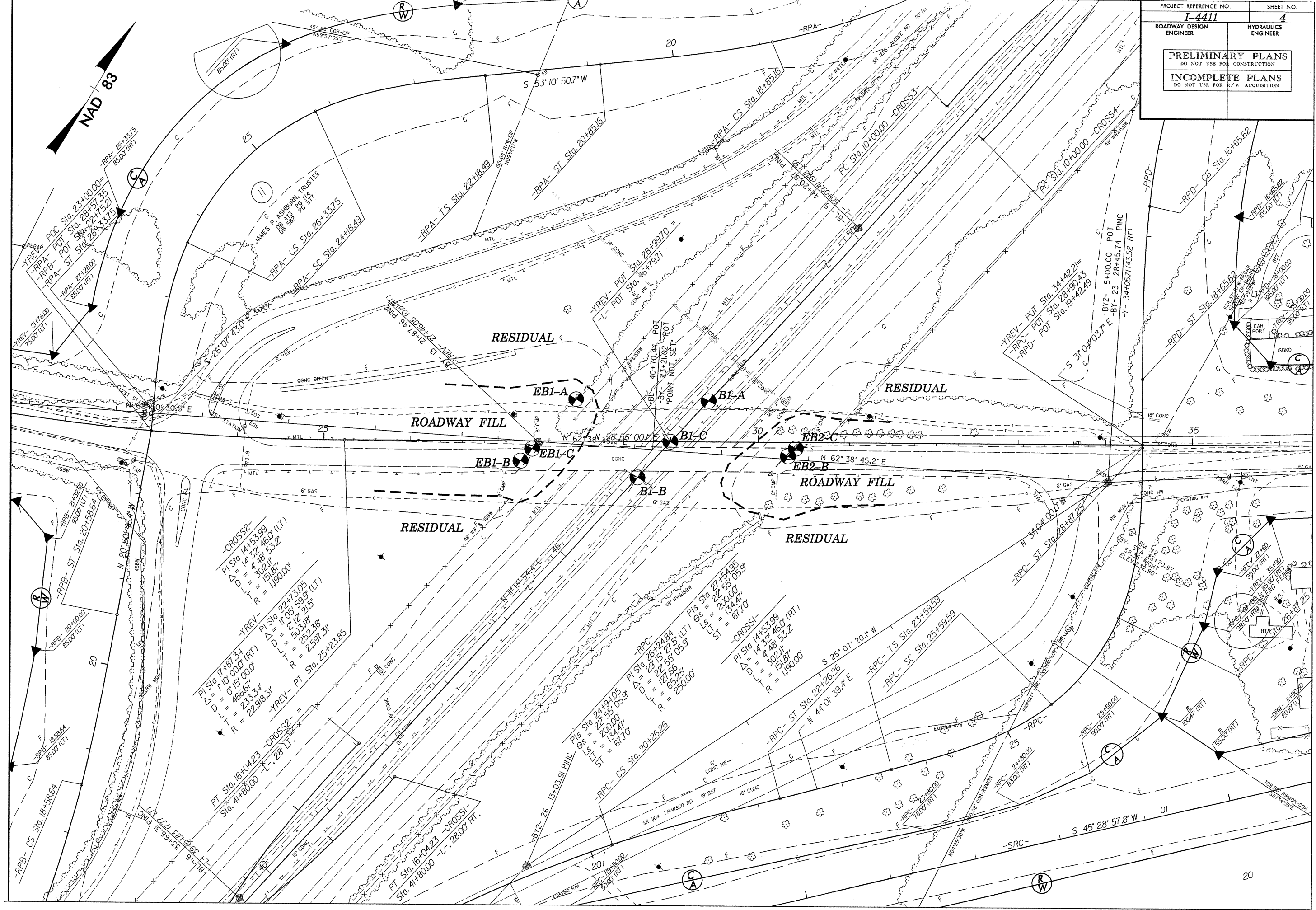
Groundwater

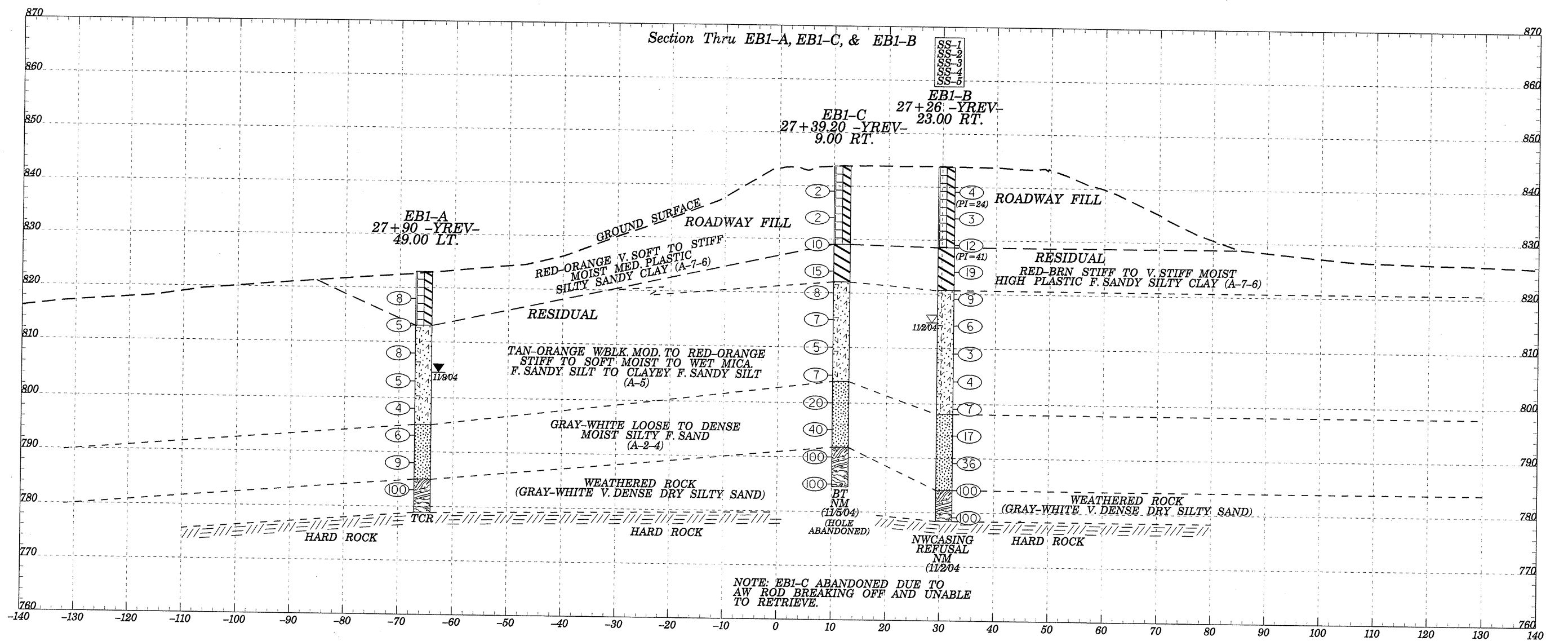
Static groundwater measurements taken greater than 24 hours after boring completion indicate a groundwater table between elevation 802.5 and 804.6 feet.

Respectfully submitted,

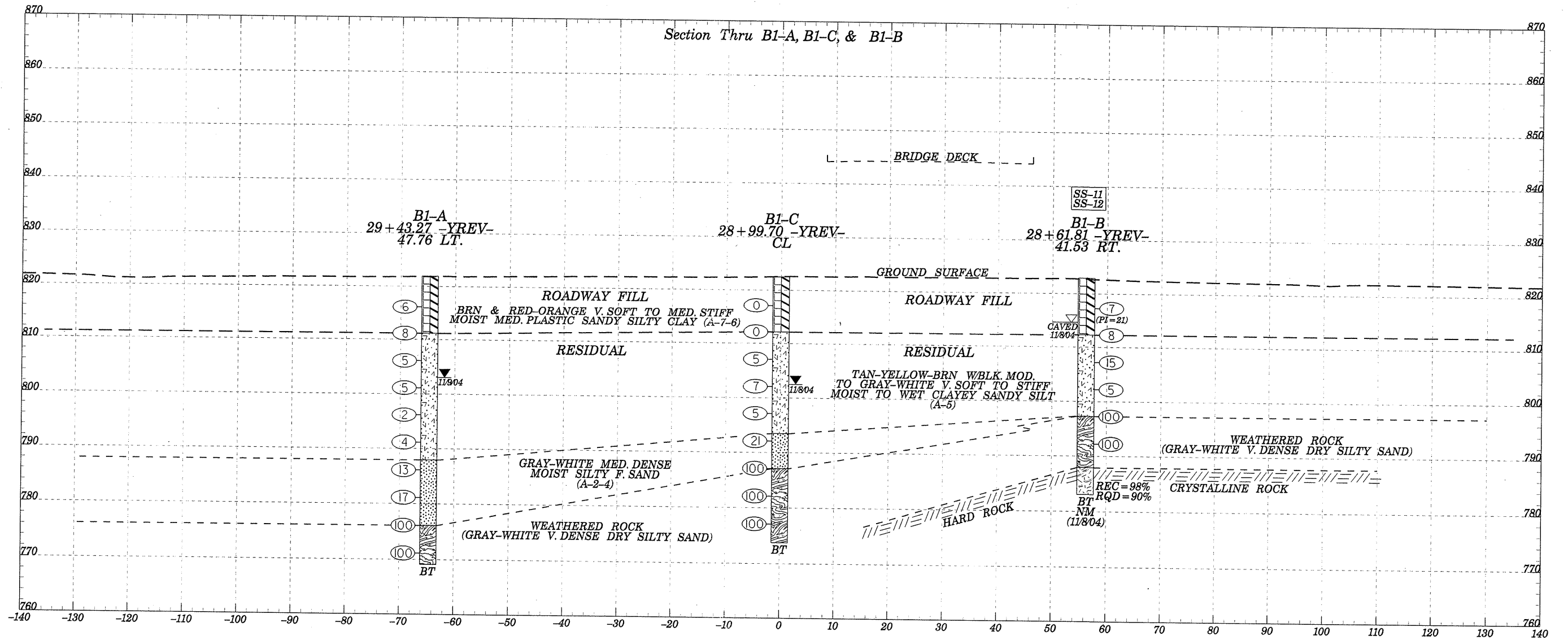
J.E. Beverly, Project Geologist

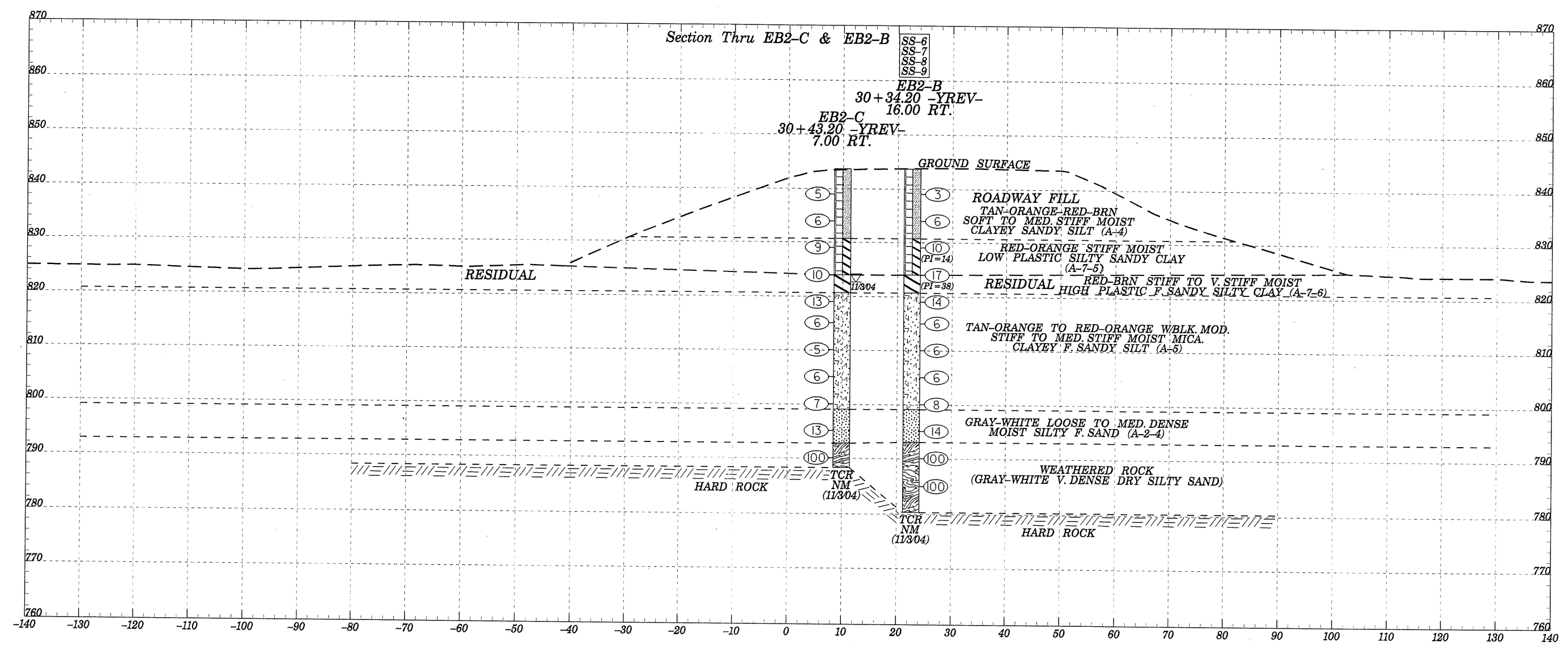
A handwritten signature in cursive script, appearing to read "J.E. Beverly". The signature is written in dark ink and is positioned below the typed name.



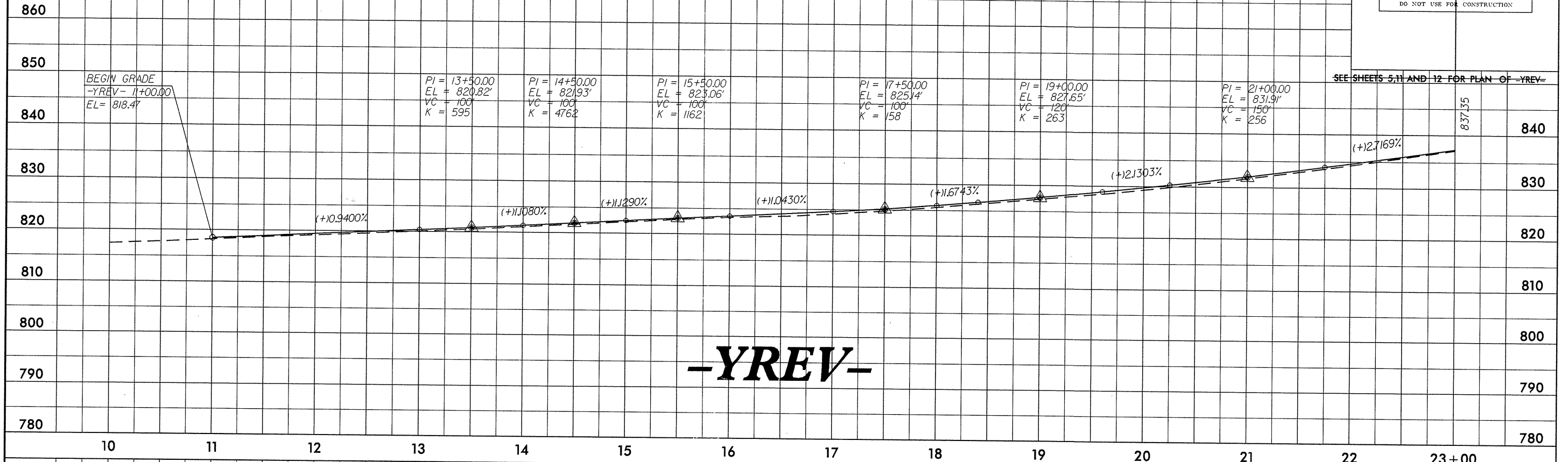


PROJECT REFERENCE NO. I-4411	SHEET NO. 6
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
PRELIMINARY PLANS DO NOT USE FOR CONSTRUCTION	
INCOMPLETE PLANS DO NOT USE FOR R/W ACQUISITION	



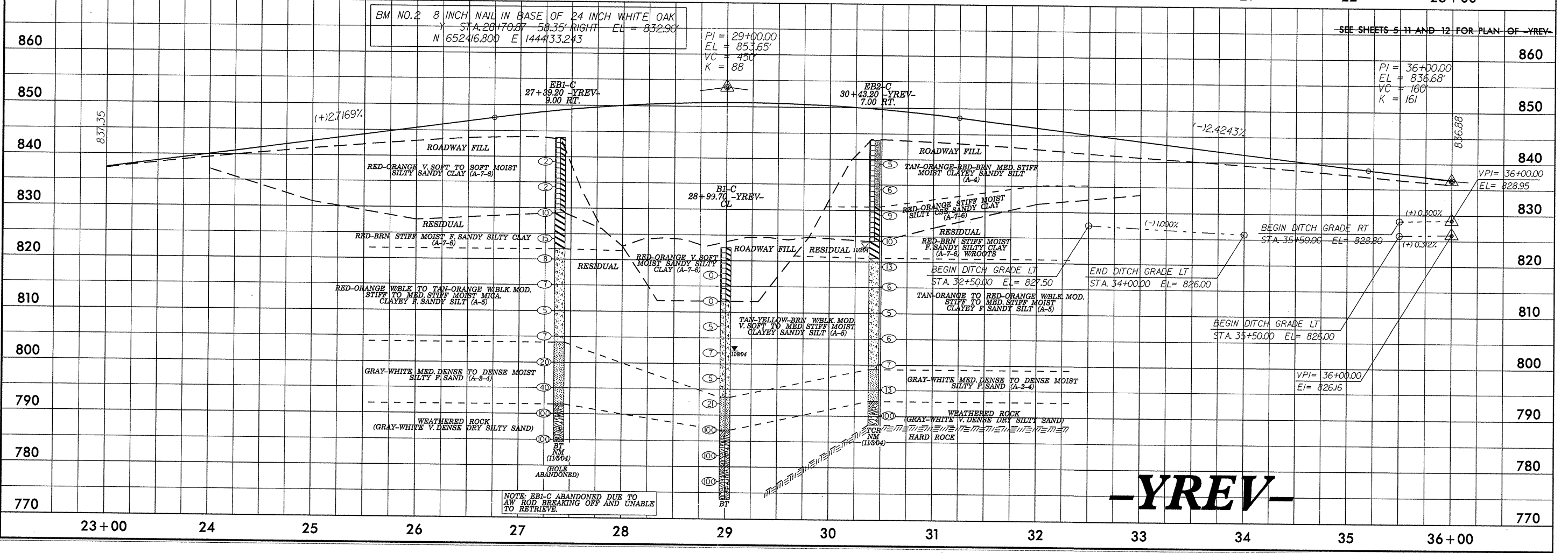


SEE SHEETS 5, 11 AND 12 FOR PLAN OF -YREV-



-YREV-

SEE SHEETS 5, 11 AND 12 FOR PLAN OF -YREV-



-YREV-

REVISIONS
NO. DESCRIPTION
1. TIME
2. TIME
3. TIME
4. TIME
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48. TIME
49. TIME
50. TIME

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
 GEOTECHNICAL UNIT BORING LOG

SHEET 1 OF 1

PROJECT NO. 35604.1.1.2		ID. I-4411		COUNTY IREDELL		GEOLOGIST STICKNEY J.K.							
SITE DESCRIPTION BRIDGE OVER I-77 ON SR 1102 BETWEEN SR 1208 & US 115							GROUND WATER						
BORING NO. EB1-A		BORING LOCATION 27+90.00		OFFSET -49.00		ALIGNMENT YREV							
COLLAR ELEVATION 823.00		NORTHING 653190.4705		EASTING 1445828.9111		0 HR.							
TOTAL DEPTH 44.1		DRILL MACHINE CME-550X		DRILL METHOD NWCASTRI-CONE		HAMMER TYPE AUTOMATIC							
START DATE 11/9/04		COMPLETION DATE 11/9/04		SURFACE WATER DEPTH		DEPTH TO ROCK 44.1							
ELEV. (FT.)	DEPTH (FT.)	BLOW COUNT			PEN. (FT.)	BLOWS PER FOOT				SAMPLE NUMBER	LOG	SOIL AND ROCK DESCRIPTION	
		0.5'	0.5'	0.5'		0	25	50	75				100
823.00													(ROADWAY FILL) RED-ORANGE STIFF MOIST SILTY SANDY CLAY (A-7-6)
820.00	5	2	3	5	1							X-8	M
815.00	10	1	2	3	1							X-5	M
810.00	15	2	3	5	1							X-8	M
805.00	20	1	2	3	1							X-5	M
800.00	25	1	2	2	1							X-4	M
795.00	30	3	2	4	1							X-6	M
790.00	35	3	4	5	1							X-9	M
785.00	40	100			0.2							-100 X	M
780.00													
775.00													
770.00													
765.00													
760.00													
755.00													
750.00													
745.00													

TRI-CONE REFUSAL AT
 ELEV. 778.90 ON
 HARD ROCK

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
 GEOTECHNICAL UNIT BORING LOG

SHEET 1 OF 1

PROJECT NO. 35604.1.1.2		ID. I-4411		COUNTY IREDELL		GEOLOGIST STICKNEY J.K.							
SITE DESCRIPTION BRIDGE OVER I-77 ON SR 1102 BETWEEN SR 1208 & US 115							GROUND WATER						
BORING NO. EB1-C		BORING LOCATION 27+39.20		OFFSET 9.00		ALIGNMENT YREV							
COLLAR ELEVATION 843.72		NORTHING 653114.5750		EASTING 1445815.3275		0 HR.							
TOTAL DEPTH 59.2		DRILL MACHINE CME-550X		DRILL METHOD NWCASTRI-CONE		HAMMER TYPE AUTOMATIC							
START DATE 11/5/04		COMPLETION DATE 11/5/04		SURFACE WATER DEPTH		DEPTH TO ROCK							
ELEV. (FT.)	DEPTH (FT.)	BLOW COUNT			PEN. (FT.)	BLOWS PER FOOT				SAMPLE NUMBER	LOG	SOIL AND ROCK DESCRIPTION	
		0.5'	0.5'	0.5'		0	25	50	75				100
843.72													(ROADWAY FILL) RED-ORANGE V. SOFT TO SOFT MOIST SILTY SANDY CLAY (A-7-6)
840.00	4.7	1	1	1	1							X-2	M
835.00	9.7	0	1	1	1							X-2	M
830.00	14.7	1	4	6	1							X-10	M
825.00	19.7	4	6	9	1							X-15	M
820.00	23.7	2	4	4	1							X-8	M
815.00	28.7	2	3	4	1							X-7	M
810.00	33.7	1	2	3	1							X-5	M
805.00	38.7	2	3	4	1							X-7	M
800.00	43.7	6	9	11	1							X-20	M
795.00	48.7	15	19	21	1							X-40	M
790.00	53.7	100			0.5							-100 X	D
785.00	58.7	100			0.5							-100 X	D
780.00													
775.00													
770.00													
765.00													

BORING TERMINATED AT
 ELEV. 784.52 IN WEATHERED
 ROCK (HOLE ABANDONED,
 AW ROD BROKE, UNABLE
 TO RETRIEVE)

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
 GEOTECHNICAL UNIT BORING LOG

SHEET 1 OF 1

PROJECT NO. 35604.1.1.2		ID. I-4411		COUNTY IREDELL		GEOLOGIST STICKNEY J.K.							
SITE DESCRIPTION BRIDGE OVER I-77 ON SR 1102 BETWEEN SR 1208 & US 115							GROUND WATER						
BORING NO. EB1-B		BORING LOCATION 27+26.00		OFFSET 23.00		ALIGNMENT YREV							
COLLAR ELEVATION 843.70		NORTHING 653095.7714		EASTING 1445811.2453		0 HR. 29.1							
TOTAL DEPTH 65.3		DRILL MACHINE CME-550X		DRILL METHOD NWCASING		HAMMER TYPE AUTOMATIC							
START DATE 11/20/04		COMPLETION DATE 11/20/04		SURFACE WATER DEPTH		DEPTH TO ROCK 65.3							
ELEV. (FT.)	DEPTH (FT.)	BLOW COUNT			PEN. (FT.)	BLOWS PER FOOT				SAMPLE NUMBER	LOG	SOIL AND ROCK DESCRIPTION	
		0.5'	1.0'	0.5'		0	25	50	75				100
843.70													(ROADWAY FILL) RED-ORANGE SOFT MOIST MED. PLASTIC (PI=24) SILTY SANDY CLAY (A-7-6)
840.00	4.6	0	2	2	1	X 4						SS-1	M
835.00	9.6	0	1	2	1	X 3							
830.00	14.6	2	4	8	1	X 12						SS-2	M
825.00	19.6	5	9	10	1	X 19							(RESIDUAL) RED-BRN STIFF TO V. STIFF MOIST HIGH PLASTIC (PI=41) F. SANDY SILTY CLAY (A-7-6)
820.00	24.6	3	4	5	1	X 9						SS-3	M/W
815.00	29.6	1	3	3	1	X 6							RED-ORANGE WBLK. MOD. TO TAN-ORANGE WBLK. MOD. STIFF TO SOFT MOIST TO WET MICA CLAYEY F. SANDY SILT (A-5)
810.00	34.6	1	1	2	1	X 3						SS-4	M/W
805.00	39.6	1	2	2	1	X 4							
800.00	44.6	1	2	5	1	X 7							
795.00	49.6	5	6	11	1	X 17						SS-5	M
790.00	54.6	10	15	21	1	X 36							GRAY-WHITE MED. DENSE TO DENSE MOIST MICA SILTY F. SAND (A-2-4)
785.00	59.6	30	70		0.8								D
780.00	64.6	44	56		0.7								WEATHERED ROCK (GRAY-WHITE V. DENSE DRY SILTY SAND)
775.00													
770.00													
765.00													

CASING REFUSAL AT ELEV.
778.40 ON HARD ROCK

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
 GEOTECHNICAL UNIT BORING LOG

SHEET 1 OF 1

PROJECT NO. 35604.1.1.2		ID. I-4411		COUNTY IREDELL		GEOLOGIST STICKNEY J.K.							
SITE DESCRIPTION BRIDGE OVER I-77 ON SR 1102 BETWEEN SR 1208 & US 115							GROUND WATER						
BORING NO. B1-A		BORING LOCATION 29+43.27		OFFSET -47.76		ALIGNMENT YREV							
COLLAR ELEVATION 821.93		NORTHING 653268.5010		EASTING 1445960.8371		0 HR. 15.2							
TOTAL DEPTH 52.8		DRILL MACHINE CME-550X		DRILL METHOD NWCAS TRI-CONE		HAMMER TYPE AUTOMATIC							
START DATE 11/9/04		COMPLETION DATE 11/9/04		SURFACE WATER DEPTH		DEPTH TO ROCK							
ELEV. (FT.)	DEPTH (FT.)	BLOW COUNT			PEN. (FT.)	BLOWS PER FOOT				SAMPLE NUMBER	LOG	SOIL AND ROCK DESCRIPTION	
		0.5'	1.0'	0.5'		0	25	50	75				100
821.93													(ROADWAY FILL) BRN MED. STIFF MOIST SANDY SILTY CLAY (A-7-6)
820.00													
815.00	5.8	2	3	3	1	X 6						M	
810.00	10.8	1	3	5	1	X 8						M	(RESIDUAL) TAN-YELLOW-BRN WBLK. MOD. TO GRAY-WHITE STIFF TO SOFT MOIST TO WET CLAYEY SANDY SILT (A-5)
805.00	15.8	1	2	3	1	X 5							
800.00	20.8	1	2	3	1	X 5						M	
795.00	25.8	1	1	1	1	X 2						M/W	
790.00	30.8	1	1	3	1	X 4						M/W	
785.00	35.8	3	5	8	1	X 13						M	GRAY-WHITE MED. DENSE MOIST SILTY F. SAND (A-2-4)
780.00	40.8	6	7	10	1	X 17						M	
775.00	45.8	72	28		0.6					100 X		D	WEATHERED ROCK (GRAY-WHITE V. DENSE DRY SILTY SAND)
770.00	50.8	100			0.3					100 X			
765.00													
760.00													
755.00													
750.00													
745.00													

TERMINATED BORING AT
ELEV. 769.13 IN
WEATHERED ROCK

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION GEOTECHNICAL UNIT BORING LOG

SHEET 1 OF 1

PROJECT NO. 35604.1.1.2	ID. I-441	COUNTY IREDELL	GEOLOGIST STICKNEY J.K.
SITE DESCRIPTION BRIDGE OVER I-77 ON SR 1102 BETWEEN SR 1208 & US 115			GROUND WATER
BORING NO. B1-C	BORING LOCATION 28+99.70	OFFSET 0.00	ALIGNMENT YREV
COLLAR ELEVATION 822.51			0 HR. 18.4
NORTHING 653205.1077		EASTING 1445948.1623	
TOTAL DEPTH 48.8			24 HR. 20
DRILL MACHINE CME-550X		DRILL METHOD NWCASTRI-CONE	HAMMER TYPE AUTOMATIC
START DATE 11/804		COMPLETION DATE 11/804	SURFACE WATER DEPTH
		DEPTH TO ROCK	

ELEV.	DEPTH (FT.)	BLOW COUNT			PEN. (FT.)	BLOWS PER FOOT					SAMPLE NUMBER	MOL.	LOG	SOIL AND ROCK DESCRIPTION	
		0.5'	0.5'	0.5'		0	25	50	75	100					
822.51															
820.00	5.4	Ø	Ø	Ø	1	X 0								M	(ROADWAY FILL) RED-ORANGE V. SOFT MOIST SANDY SILTY CLAY (A-7-6)
815.00	10.4	Ø	Ø	Ø	1	X 0								M	(RESIDUAL) TAN-YELLOW-BRN WBLK. MOD. V. SOFT TO MED. STIFF MOIST CLAYEY SANDY SILT (A-5)
810.00	15.4	1	2	3	1	X 5								M	
805.00	20.4	1	3	4	1	X 7								M	
800.00	25.4	1	2	3	1	X 5								M	
795.00	30.4	3	5	16	1	X 21								M	GRAY-WHITE MED. DENSE MOIST SILTY F. SAND (A-2-4)
790.00	35.4	35	65		1									D	WEATHERED ROCK (GRAY-WHITE V. DENSE DRY SILTY SAND)
785.00	40.4	56	44		0.8										
780.00	45.4	100			0.2										
775.00															
770.00															
765.00															
760.00															
755.00															
750.00															
745.00															

TERMINATED BORING AT
ELEV. 773.71 IN
WEATHERED ROCK

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
 GEOTECHNICAL UNIT BORING LOG

SHEET 1 OF 1

PROJECT NO. 35604.1.1.2		ID. I-4411		COUNTY IREDELL		GEOLOGIST STICKNEY J.K.							
SITE DESCRIPTION BRIDGE OVER I-77 ON SR 1102 BETWEEN SR 1208 & US 115							GROUND WATER						
BORING NO. EB2-C		BORING LOCATION 30+43.20		OFFSET 7.00		ALIGNMENT YREV							
COLLAR ELEVATION 843.73		NORTHING 653273.1627		EASTING 1446074.6920		24 HR.							
TOTAL DEPTH 55.4		DRILL MACHINE CME-550X		DRILL METHOD NWCASTRI-CONE		HAMMER TYPE AUTOMATIC							
START DATE 11/30/04		COMPLETION DATE 11/30/04		SURFACE WATER DEPTH		DEPTH TO ROCK 55.4							
ELEV. (FT.)	DEPTH (FT.)	BLOW COUNT			PEN. (FT.)	BLOWS PER FOOT				SAMPLE NUMBER	LOG	SOIL AND ROCK DESCRIPTION	
		0.5'	0.5'	0.5'		0	25	50	75				100
843.73													(ROADWAY FILL) TAN-ORANGE-RED-BRN MED. STIFF MOIST CLAYEY SANDY SILT (A-4)
840.00	4.7	1	2	3	1	X5						M	
835.00	9.7	1	2	4	1	X6							
830.00	14.7	3	4	5	1	X9						M	RED-ORANGE STIFF MOIST SILTY CSE. SANDY CLAY (A-7-5)
825.00	19.7	3	5	5	1	X10							
820.00	24.7	3	6	7	1	X13						M	(RESIDUAL) RED-BRN STIFF MOIST F. SANDY SILTY CLAY (A-7-6) W/ROOTS
815.00	28.6	1	3	3	1	X6							TAN-ORANGE TO RED-ORANGE W/BLK. MOD. STIFF TO MED. STIFF MOIST CLAYEY F. SANDY SILT (A-5)
810.00	33.6	1	2	3	1	X5						M	
805.00	38.6	2	2	4	1	X6							
800.00	43.6	2	2	5	1	X7						M	GRAY-WHITE MED. DENSE MOIST SILTY F. SAND (A-2-4)
795.00	48.6	3	5	8	1	X13							
790.00	53.6	100			0.3							D	WEATHERED ROCK (GRAY-WHITE V. DENSE DRY SILTY SAND)
785.00													
780.00													
775.00													
770.00													
765.00													TRI-CONE REFUSAL AT ELEV. 788.33 ON HARDROCK

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
 GEOTECHNICAL UNIT BORING LOG

SHEET 1 OF 1

PROJECT NO. 35604.1.1.2		ID. I-4411		COUNTY IREDELL		GEOLOGIST STICKNEY J.K.							
SITE DESCRIPTION BRIDGE OVER I-77 ON SR 1102 BETWEEN SR 1208 & US 115							GROUND WATER						
BORING NO. EB2-B		BORING LOCATION 30+34.20		OFFSET 16.00		ALIGNMENT YREV							
COLLAR ELEVATION 843.78		NORTHING 653260.8093		EASTING 1446071.6272		24 HR.							
TOTAL DEPTH 63.4		DRILL MACHINE CME-550X		DRILL METHOD NWCASTRI-CONE		HAMMER TYPE AUTOMATIC							
START DATE 11/30/04		COMPLETION DATE 11/30/04		SURFACE WATER DEPTH		DEPTH TO ROCK 63.4							
ELEV. (FT.)	DEPTH (FT.)	BLOW COUNT			PEN. (FT.)	BLOWS PER FOOT				SAMPLE NUMBER	LOG	SOIL AND ROCK DESCRIPTION	
		0.5'	0.5'	0.5'		0	25	50	75				100
843.78													(ROADWAY FILL) TAN-ORANGE-RED-BRN SOFT TO MED. STIFF MOIST CLAYEY SANDY SILT (A-4)
840.00	4.7	2	1	2	1	X3						SS-6	M
835.00	9.7	1	2	4	1	X6							
830.00	14.7	3	5	5	1	X10						SS-7	M
825.00	19.7	4	7	10	1	X17						SS-8	M
820.00	24.7	4	6	8	1	X14							(RESIDUAL) RED-BRN V. STIFF MOIST HIGH PLASTIC (PI=38) F. SANDY SILTY CLAY (A-7-6)
815.00	28.7	2	2	4	1	X6						SS-9	M
810.00	33.7	2	2	4	1	X6							TAN-ORANGE TO RED-ORANGE W/BLK. MOD. STIFF TO MED. STIFF MOIST MICA. CLAYEY F. SANDY SILT (A-5)
805.00	38.7	2	2	4	1	X6							
800.00	43.7	1	3	5	1	X8							
795.00	48.7	3	6	8	1	X14						M	GRAY-WHITE LOOSE TO MED. DENSE MOIST SILTY F. SAND (A-2-4)
790.00	53.7	100			0.5							D	WEATHERED ROCK (GRAY-WHITE V. DENSE DRY SILTY SAND)
785.00	58.7	77	23		0.6								
780.00													
775.00													
770.00													
765.00													TRI-CONE REFUSAL AT ELEV. 780.38 ON HARD ROCK

TEST RESULTS

PROJECT: 35604.1.1 I-4411

COUNTY: IREDELL

SITE DESCRIPTION: BRIDGE OVER I-77 ON SR 1102 BETWEEN SR 1208 AND US 115

SOIL SAMPLE RESULTS

SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS	N	L.L.	P.I.	% BY WEIGHT				% PASSING SIEVES			% MOISTURE	% ORGANIC	UNIT WT. (d)	VOID RATIO
								C. SAND	F. SAND	SILT	CLAY	10	40	200				
EB1-B																		
SS-1	23 RT	27+26	5.10-6.10	A-7-6(12)	4	48	24	29.2	14.3	20.2	36.3	99	77	58				
SS-2	23 RT	27+26	15.10-16.10	A-7-6(39)	12	70	41	5.8	12.9	18.8	62.4	100	97	84				
SS-3	23 RT	27+26	25.10-26.10	A-5(3)	9	61	NP	4.8	44.7	38.4	12.1	100	98	60				
SS-4	23 RT	27+26	35.10-36.10	A-5(1)	3	63	NP	6.0	55.6	30.3	8.1	100	99	48				
SS-5	23 RT	27+26	51.10-52.10	A-2-4(0)	17	39	NP	12.7	68.7	16.6	2.0	100	98	28				
B1-B																		
SS-11	38 RT	46+79.71	6.20-7.20	A-7-6(14)	7	46	21	12.3	20.3	31.1	36.3	100	95	71				
SS-12	38 RT	46+79.71	11.20-12.20	A-5(0)	8	46	NP	31.0	25.0	33.9	10.1	100	76	50				
EB2-B																		
SS-6	16 RT	30+34.2	5.20-6.20	A-4(0)	3	40	5	37.5	25.2	23.3	14.1	99	72	42				
SS-7	16 RT	30+34.2	15.20-16.20	A-7-5(6)	10	51	14	32.0	19.1	20.6	28.2	97	72	51				
SS-8	16 RT	30+34.2	20.20-21.20	A-7-6(32)	17	63	36	5.8	13.9	19.8	60.4	100	97	82				
SS-9	16 RT	30+34.2	29.20-30.20	A-5(9)	6	60	6	6.8	31.2	39.8	22.2	100	97	71				

ROCK SAMPLE RESULTS

SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	RQD	UNIT WT	Q(MPa) (MPsi)	E(MPa) (MPsi)
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35604.1.1 (I-4411)
IREDELL COUNTY
BRIDGE OVER I-77 ON SR 1102 BETWEEN SR 1208 AND US 115
CORE PHOTO

