

PROJECT: 33598.1.1 ID. B-4256

STATE OF NORTH CAROLINA

DEPARTMENT OF TRANSPORTATION

DIVISION OF HIGHWAYS

GEOTECHNICAL UNIT

STRUCTURE SUBSURFACE INVESTIGATION

STATE PROJECT 33598.1.1 I.D. NO. B-4256

F.A. PROJECT _____

COUNTY ROWAN/DAVIE

PROJECT DESCRIPTION BRIDGE NO. 80 ON
NC 801 OVER S. YADKIN RIVER

SITE DESCRIPTION _____

STATE	STATE PROJECT REFERENCE NO.	DATE	SCALE
N.C.	B-4256	1	27
STATE PROJ. NO.	F.A. PROJ. NO.	DESCRIPTION	
33598.1.1		P.E.	
		CONST.	

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

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

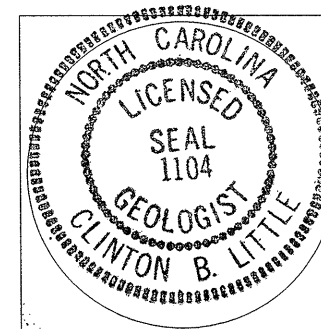
SUBMITTED BY C.B. LITTLE D.K. BRATTON

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 10-19-04
C.B. Little
SIGNATURE

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION

DIVISION OF HIGHWAYS

GEOTECHNICAL UNIT

SUBSURFACE INVESTIGATION

SOIL AND ROCK LEGEND, TERMS, SYMBOLS, AND ABBREVIATIONS

ID	STATE PROJECT NO.	SHEET NO.	TOTAL SHEETS
B-4256	33598.1.1	2	27

SOIL DESCRIPTION		GRADATION		ROCK DESCRIPTION		TERMS AND DEFINITIONS	
<p>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 (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:</p> <p>VERY STIFF, GRAY SILTY CLAY, MOST WITH INTERBEDDED FINE SAND LAYERS, HIGH PLASTIC, A-7-6</p>		<p>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)</p> <p>GAP-GRADED - INDICATES A MIXTURE OF UNIFORM PARTICLES OF TWO OR MORE SIZES.</p> <p>THE ANGULARITY OR ROUNDNESS OF SOIL GRAINS ARE DESIGNATED BY THE TERMS: ANGULAR, SUBANGULAR, SUBROUNDED, OR ROUNDED.</p>		<p>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.</p> <p>ROCK MATERIALS ARE TYPICALLY DIVIDED AS FOLLOWS:</p>		<p>ALLUVIUM (ALLUV.) - SOILS WHICH HAVE BEEN TRANSPORTED BY WATER.</p> <p>AQUIFER - A WATER BEARING FORMATION OR STRATA.</p> <p>ARENACEOUS - APPLIED TO ROCKS THAT HAVE BEEN DERIVED FROM SAND OR THAT CONTAIN SAND.</p> <p>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.</p> <p>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.</p> <p>CALCAREOUS (CALC.) - SOILS WHICH CONTAIN APPRECIABLE AMOUNTS OF CALCIUM CARBONATE.</p> <p>COLLUVIUM - ROCK FRAGMENTS MIXED WITH SOIL DEPOSITED BY GRAVITY ON SLOPE OR AT BOTTOM OF SLOPE.</p> <p>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.</p> <p>DIKE - A TABULAR BODY OF IGNEOUS ROCK THAT CUTS ACROSS THE STRUCTURE OF ADJACENT ROCKS OR CUTS MASSIVE ROCK.</p> <p>DIP - THE ANGLE AT WHICH A STRATUM OR ANY PLANAR FEATURE IS INCLINED FROM THE HORIZONTAL.</p> <p>DIP DIRECTION (DIP AZIMUTH) - THE DIRECTION OR BEARING OF THE HORIZONTAL TRACE OF THE LINE OF DIP, MEASURED CLOCKWISE FROM NORTH.</p> <p>FAULT - A FRACTURE OR FRACTURE ZONE ALONG WHICH THERE HAS BEEN DISPLACEMENT OF THE SIDES RELATIVE TO ONE ANOTHER PARALLEL TO THE FRACTURE.</p> <p>FISSILE - A PROPERTY OF SPLITTING ALONG CLOSELY SPACED PARALLEL PLANES.</p> <p>FLOAT - ROCK FRAGMENTS ON SURFACE NEAR THEIR ORIGINAL POSITION AND DISLODGED FROM PARENT MATERIAL.</p> <p>FLOOD PLAIN (F.P.) - LAND BORDERING A STREAM, BUILT OF SEDIMENTS DEPOSITED BY THE STREAM.</p> <p>FORMATION (FM.) - A MAPPABLE GEOLOGIC UNIT THAT CAN BE RECOGNIZED AND TRACED IN THE FIELD.</p> <p>JOINT - FRACTURE IN ROCK ALONG WHICH NO APPRECIABLE MOVEMENT HAS OCCURRED.</p> <p>LEDGE - A SHELF-LIKE RIDGE OR PROJECTION OF ROCK WHOSE THICKNESS IS SMALL COMPARED TO ITS LATERAL EXTENT.</p> <p>LENS - A BODY OF SOIL OR ROCK THAT THINS OUT IN ONE OR MORE DIRECTIONS.</p> <p>MOTTLED (MOT.) - IRREGULARLY MARKED WITH SPOTS OF DIFFERENT COLORS, MOTTLING IN SOILS USUALLY INDICATES POOR AERATION AND LACK OF GOOD DRAINAGE.</p> <p>PERCHED WATER - WATER MAINTAINED ABOVE THE NORMAL GROUND WATER LEVEL BY THE PRESENCE OF AN INTERVENING IMPERVIOUS STRATUM.</p> <p>RESIDUAL SOIL - SOIL FORMED IN PLACE BY THE WEATHERING OF ROCK.</p> <p>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.</p> <p>SAPROLITE (SAP.) - RESIDUAL SOIL WHICH RETAINS THE RELIC STRUCTURE OR FABRIC OF THE PARENT ROCK.</p> <p>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 INTRODUCED ROCKS.</p> <p>SLICKENSIDE - POLISHED AND STRIATED SURFACE THAT RESULTS FROM FRICTION ALONG A FAULT OR SLIP PLANE.</p> <p>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.</p> <p>STRATA CORE RECOVERY (SREC.) - TOTAL LENGTH OF STRATA MATERIAL RECOVERED DIVIDED BY TOTAL LENGTH OF STRATUM AND EXPRESSED AS A PERCENTAGE.</p> <p>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.</p> <p>TOPSOIL (T.S.) - SURFACE SOILS USUALLY CONTAINING ORGANIC MATTER.</p>	
<p>GENERAL CLASS. GRANULAR MATERIALS (< 35% PASSING #200) SILT-CLAY MATERIALS (> 35% PASSING #200) ORGANIC MATERIALS</p> <p>GROUP CLASS. A-1, A-1-b, A-3, A-2-4, A-2-5, A-2-6, A-2-7, A-4, A-5, A-6, A-7, A-1, A-2, A-3, A-4, A-5, A-6, A-7</p> <p>SYMBOL [Grid patterns]</p> <p>% PASSING: 50 MX, 30 MX, 10 MX, 15 MX, 25 MX, 10 MN, 35 MX, 35 MN, 35 MX, 35 MN, 35 MX, 35 MN, 36 MN, 36 MN, 36 MN, 36 MN</p> <p>LIQUID LIMIT PLASTIC INDEX: 6 MX, N.P., 40 MX, 41 MN, 10 MX, 11 MN, 11 MN, 10 MX, 10 MN, 11 MN, 11 MN</p> <p>GROUP INDEX: 0, 0, 0, 4 MX, 8 MX, 12 MX, 16 MN, No MX</p> <p>USUAL TYPES OF MAJOR MATERIALS: STONE FRAGS, GRAVEL AND SAND; FINE SAND; SILTY OR CLAYEY GRAVEL AND SAND; SILTY SOILS; CLAYEY SOILS</p> <p>GENERALIZING AS A SUBGRADE: EXCELLENT TO GOOD; FAIR TO POOR; FAIR TO POOR; POOR; UNSUITABLE</p> <p>P.I. OF A-7-5 ≤ L.L. - 30; P.I. OF A-7-6 > L.L. - 30</p>		<p>MINERAL NAMES SUCH AS QUARTZ, FELDSPAR, MICA, TALC, KAOLIN, ETC. ARE USED IN DESCRIPTIONS WHENEVER THEY ARE CONSIDERED OF SIGNIFICANCE.</p> <p>COMPRESSIBILITY: SLIGHTLY COMPRESSIBLE (LIQUID LIMIT LESS THAN 30), MODERATELY COMPRESSIBLE (LIQUID LIMIT 31-50), HIGHLY COMPRESSIBLE (LIQUID LIMIT GREATER THAN 50)</p> <p>PERCENTAGE OF MATERIAL: ORGANIC MATERIAL, GRANULAR SOILS, SILT-CLAY SOILS, OTHER MATERIAL</p> <p>GROUND WATER: 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>		<p>WEATHERED ROCK (WR) [Symbol]</p> <p>CRYSTALLINE ROCK (CR) [Symbol]</p> <p>NON-CRYSTALLINE ROCK (NCR) [Symbol]</p> <p>COASTAL PLAIN SEDIMENTARY ROCK (CP) [Symbol]</p> <p>WEATHERING: FRESH, VERY SLIGHT (V.SL.), SLIGHT (SL.), MODERATE (MOD.), SEVERE (SEV.), VERY SEVERE (V.SEV.), COMPLETE</p> <p>ROCK HARDNESS: VERY HARD, HARD, MODERATELY HARD, MEDIUM HARD, SOFT, VERY SOFT</p>		<p>DIKE</p> <p>DIP</p> <p>FAULT</p> <p>FISSILE</p> <p>FLOAT</p> <p>FLOOD PLAIN</p> <p>FORMATION</p> <p>JOINT</p> <p>LEDGE</p> <p>LENS</p> <p>MOTTLED</p> <p>PERCHED WATER</p> <p>RESIDUAL SOIL</p> <p>ROCK QUALITY DESIGNATION</p> <p>SAPROLITE</p> <p>SILL</p> <p>SLICKENSIDE</p> <p>STANDARD PENETRATION TEST</p> <p>STRATA CORE RECOVERY</p> <p>STRATA ROCK QUALITY DESIGNATION</p> <p>TOPSOIL</p>	
<p>CONSISTENCY OR DENSENESS</p> <p>PRIMARY SOIL TYPE: COMPACTNESS OR CONSISTENCY, RANGE OF STANDARD PENETRATION RESISTANCE (N-VALUE), RANGE OF UNCONFINED COMPRESSIVE STRENGTH (TONS/FT²)</p> <p>GENERALLY GRANULAR MATERIAL (NON-COHESIVE): VERY LOOSE, LOOSE, MEDIUM DENSE, DENSE, VERY DENSE</p> <p>GENERALLY SILT-CLAY MATERIAL (COHESIVE): VERY SOFT, MEDIUM STIFF, STIFF, VERY STIFF, HARD</p>		<p>MISCELLANEOUS SYMBOLS</p> <p>ROADWAY EMBANKMENT WITH SOIL DESCRIPTION</p> <p>SOIL SYMBOL</p> <p>ARTIFICIAL FILL OTHER THAN ROADWAY EMBANKMENTS</p> <p>INFERRED SOIL BOUNDARIES</p> <p>INFERRED ROCK LINE</p> <p>ALLUVIAL SOIL BOUNDARY</p> <p>DIP/DIP DIRECTION OF ROCK STRUCTURES</p> <p>SOUNDING ROD</p> <p>SPT TEST BORING</p> <p>AUGER BORING</p> <p>CORE BORING</p> <p>MONITORING WELL</p> <p>PIEZOMETER INSTALLATION</p> <p>SLOPE INDICATOR INSTALLATION</p> <p>SPT N-VALUE</p> <p>SPT REFUSAL</p>		<p>ABBREVIATIONS</p> <p>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., HI. - HIGHLY, MEO. - 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</p>			
<p>TEXTURE OR GRAIN SIZE</p> <p>U.S. STD. SIEVE SIZE OPENING (MM): 4, 10, 40, 200, 270</p> <p>BOULDER (BLDR.), COBBLE (COB.), GRAVEL (GR.), COARSE SAND (CSE. SD.), FINE SAND (F. SD.), SILT (SL.), CLAY (CL.)</p> <p>GRAIN SIZE: MM 305, IN. 12', 75, 3", 2.0, 0.25, 0.075, 0.05, 0.005</p>		<p>EQUIPMENT USED ON SUBJECT PROJECT</p> <p>DRILL UNITS: MOBILE B, BK-SI, CME-45C, CME-550, PORTABLE HOIST, OTHER</p> <p>ADVANCING TOOLS: CLAY BITS, 6" CONTINUOUS FLIGHT AUGER, 8" HOLLOW AUGERS, HARD FACED FINGER BITS, TUNG.-CARBIDE INSERTS, CASING w/ ADVANCER, TRICONE 2 7/8" STEEL TEETH, TRICONE 2 1/8" TUNG.-CARB. CORE BIT, OTHER</p> <p>HAMMER TYPE: AUTOMATIC, MANUAL</p> <p>CORE SIZE: B, NBWL, H</p> <p>HAND TOOLS: POST HOLE DIGGER, HAND AUGER, SOUNDING ROD, VANE SHEAR TEST, OTHER</p>		<p>ROCK HARDNESS</p> <p>VERY HARD, HARD, MODERATELY HARD, MEDIUM HARD, SOFT, VERY SOFT</p>			
<p>SOIL MOISTURE - CORRELATION OF TERMS</p> <p>SOIL MOISTURE SCALE (ATTERBERG LIMITS), FIELD MOISTURE DESCRIPTION, GUIDE FOR FIELD MOISTURE DESCRIPTION</p> <p>LL - LIQUID LIMIT, PL - PLASTIC LIMIT, OM - OPTIMUM MOISTURE, SL - SHRINKAGE LIMIT</p> <p>SATURATED (SAT.), WET (W), MOIST (M), DRY (D)</p>		<p>PLASTICITY</p> <p>PLASTICITY INDEX (PI), DRY STRENGTH</p> <p>NONPLASTIC, LOW PLASTICITY, MED. PLASTICITY, HIGH PLASTICITY</p>		<p>FRACTURE SPACING</p> <p>TERM, SPACING</p>		<p>BEDDING</p> <p>TERM, THICKNESS</p>	
<p>COLOR</p> <p>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.</p>		<p>INDURATION</p> <p>FRIABLE, MODERATELY INDURATED, INDURATED, EXTREMELY INDURATED</p> <p>RUBBING WITH FINGER FREES NUMEROUS GRAINS; GENTLE BLOW BY HAMMER DISINTEGRATES SAMPLE. GRAINS CAN BE SEPARATED FROM SAMPLE WITH STEEL PROBE; BREAKS EASILY WHEN HIT WITH HAMMER. GRAINS ARE DIFFICULT TO SEPARATE WITH STEEL PROBE; DIFFICULT TO BREAK WITH HAMMER. SHARP HAMMER BLOWS REQUIRED TO BREAK SAMPLE; SAMPLE BREAKS ACROSS GRAINS.</p>		<p>NOTES:</p> <p>BENCH MARK: BL-4</p> <p>PINC 23+25.30 =</p> <p>STA. 23+18.83 -L- 61.21RT. ELEVATION: 662.37'</p>			

Bent 3:

Two borings performed for this bent location fall in the river channel. Water depth at each boring location varies between 1.5 and 2.5 feet. Alluvium lying along the river bottom extends 1.7 to 2.6 feet in depth and consists of white-gray-brown-tan loose to medium dense clayey silty sand (A-2-4). Residual soil was found underlying boring location B3-A, however at B3-B alluvium sits directly on top of weathered rock. Residual soil consists of up to 5.0 feet of gray-white very dense silty sand (A-1-b). 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>
B3-A	618.72	616.42
B3-B	623.72	613.22

Hard rock was cored at each boring location for evaluation purposes and determined to be granite and meta-diorite.

End Bent 2:

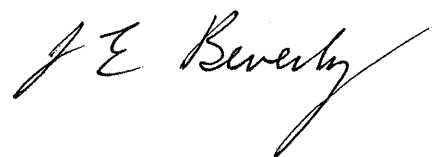
Due to the steep existing roadway fill embankment along the right side of the bent only one boring was performed at this location. This boring falls on land north of the South Yadkin River and encountered 9.0 feet of alluvium which consists of red-brown soft to medium stiff micaceous fine sandy silty clay (A-7-6). The residual soil contact occurs below alluvium at elevation 631.7 feet. Residual material is 9.0 feet in thickness and consists of black-white-yellow medium stiff clayey fine sandy silt (A-4) and tan-yellow-white medium dense silty clayey sand (A-2-7) with weathered rock fragments. Weathered rock was encountered below residual soil at elevation 622.78 feet followed by refusal on hard rock at elevation 618.98 feet.

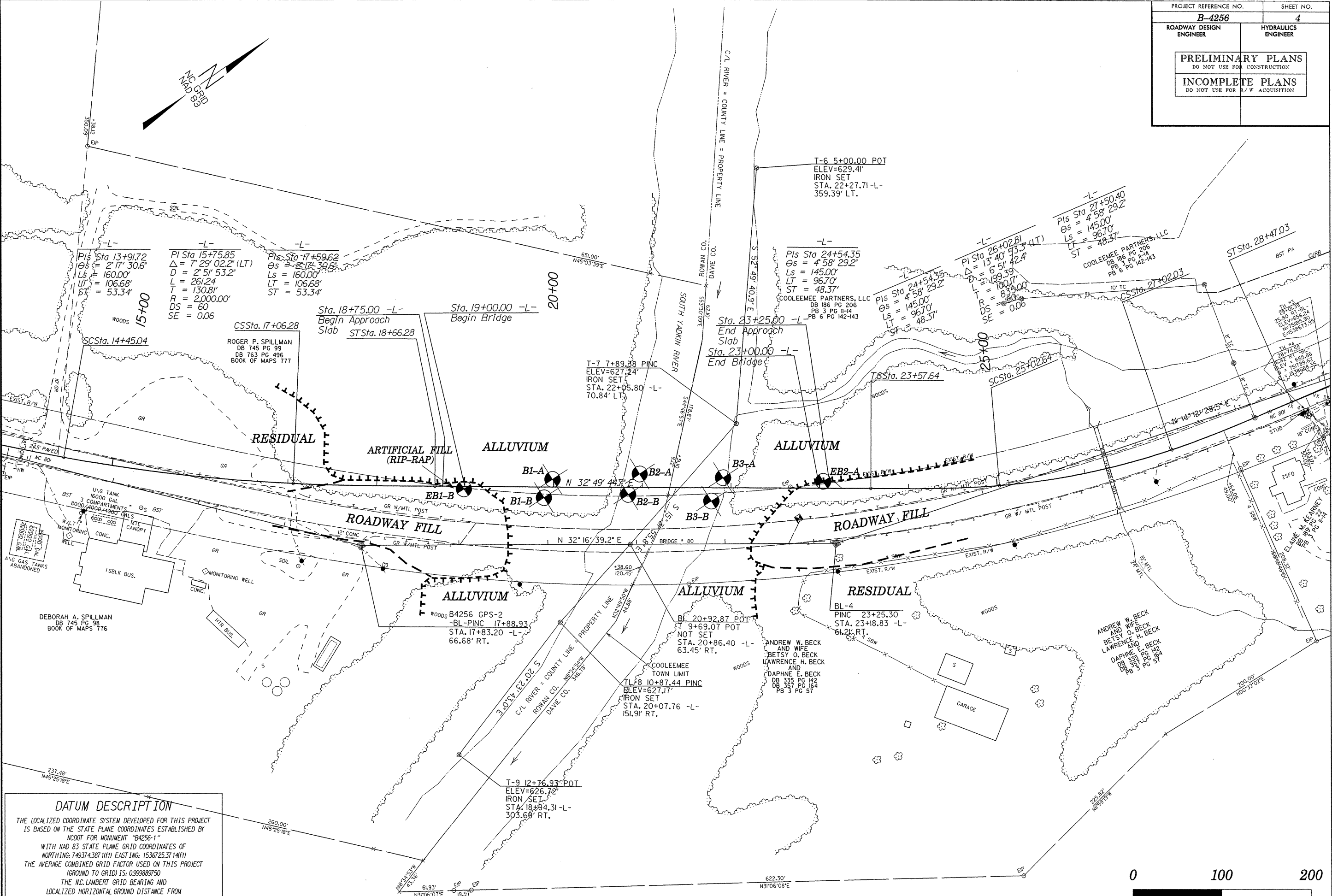
Groundwater

Static groundwater measurements were taken at boring locations after more than 24 hours. Readings indicate a static groundwater table between elevation 630 and 634 feet. Water surface elevation of the river at the time of this investigation was approximately 628 feet.

Respectfully submitted,

J.E. Beverly, Project Geologist

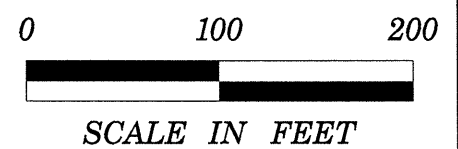


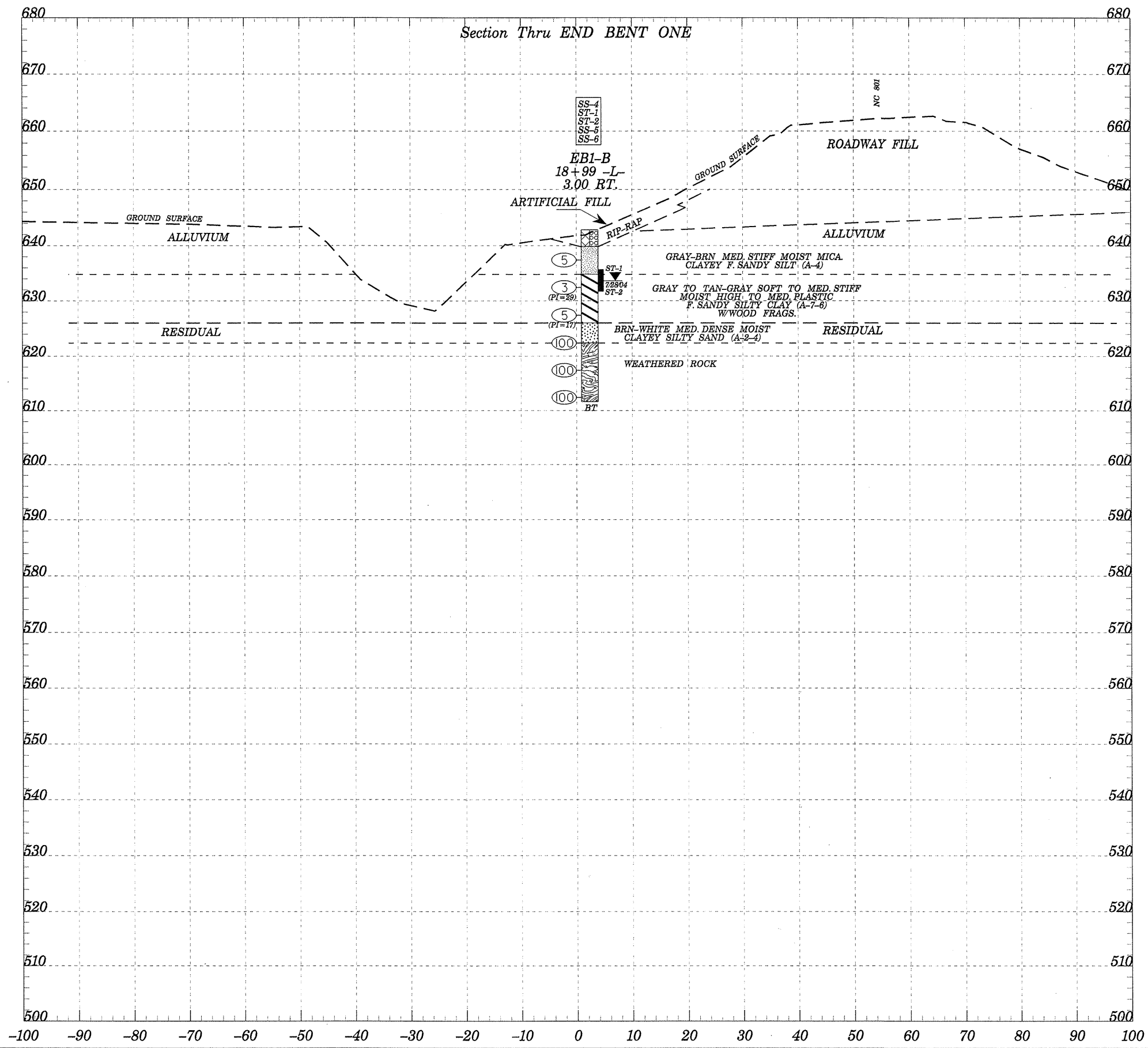


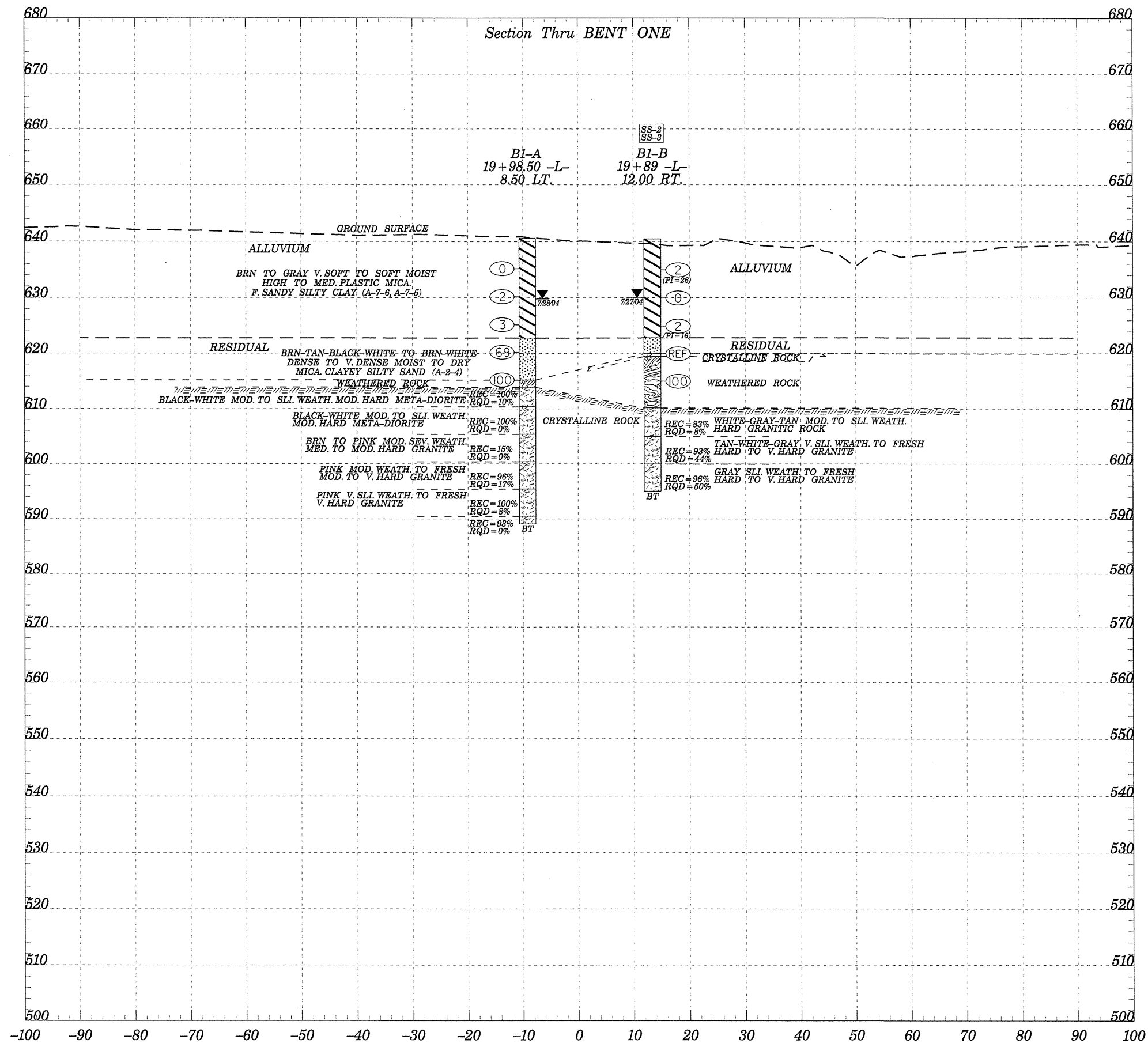
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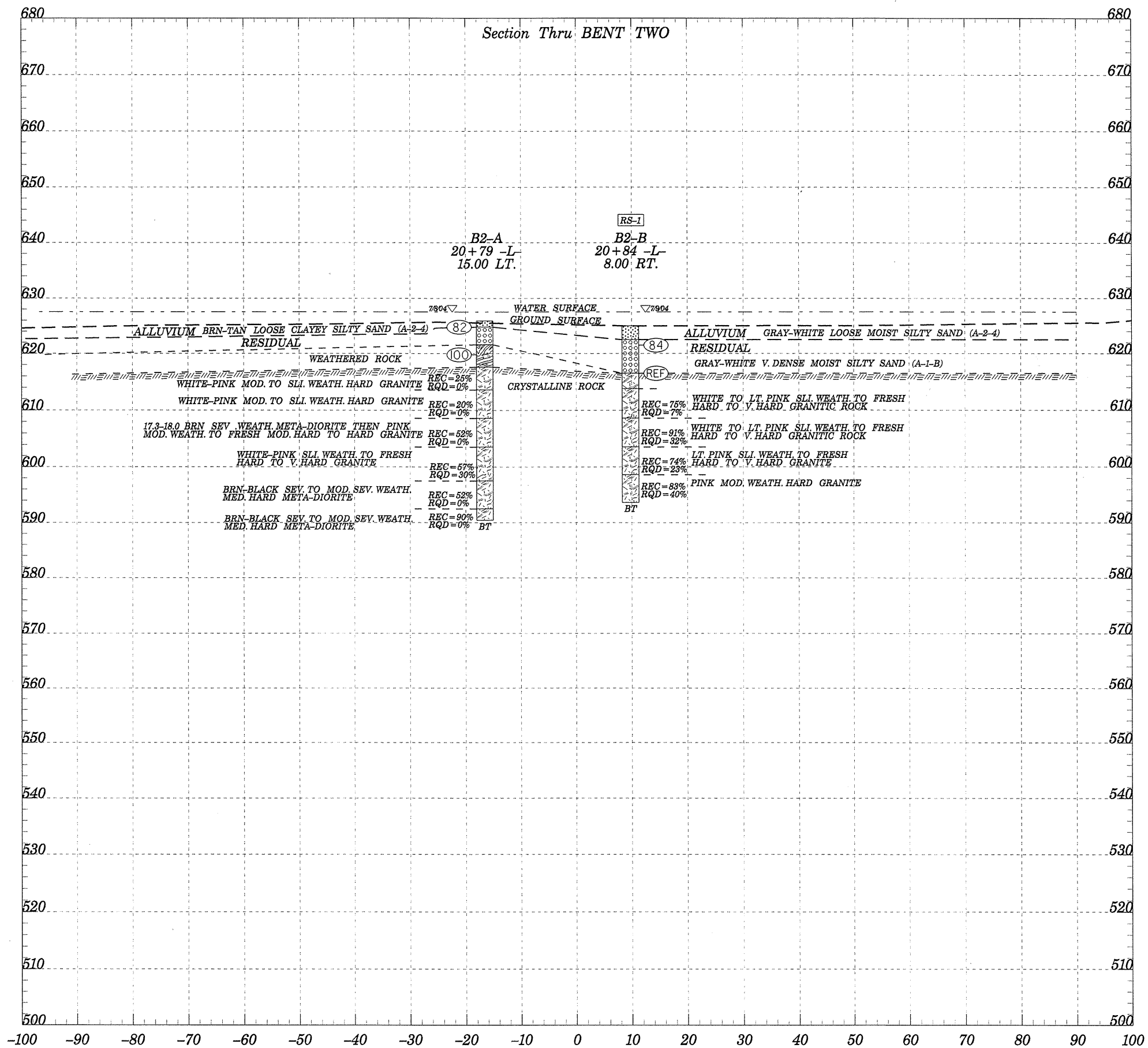
THE LOCALIZED COORDINATE SYSTEM DEVELOPED FOR THIS PROJECT IS BASED ON THE STATE PLANE COORDINATES ESTABLISHED BY NCDOT FOR MONUMENT "B4256-1" WITH NAD 83 STATE PLANE GRID COORDINATES OF NORTHING: 749374387 (111) EASTING: 153672537 (1411) THE AVERAGE COMBINED GRID FACTOR USED ON THIS PROJECT (GROUND TO GRID) IS: 0.999889750 THE N.C. LAMBERT GRID BEARING AND LOCALIZED HORIZONTAL GROUND DISTANCE FROM "B4256-1" TO STATION 10+00.00 IS 1273.66'

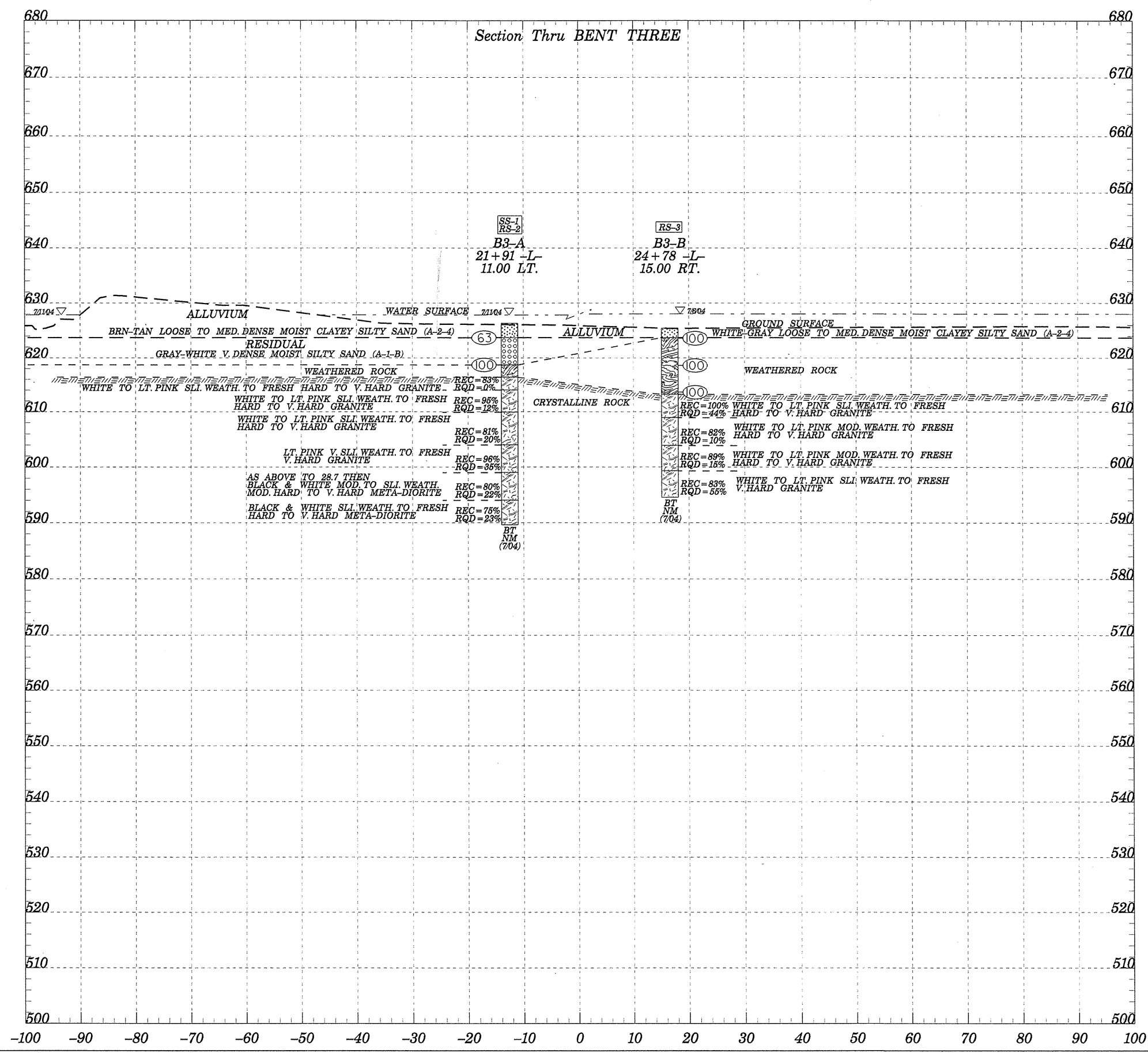
ALL LINEAR DIMENSIONS ARE LOCALIZED HORIZONTAL DISTANCES VERTICAL DATUM USED IS NGVD 29

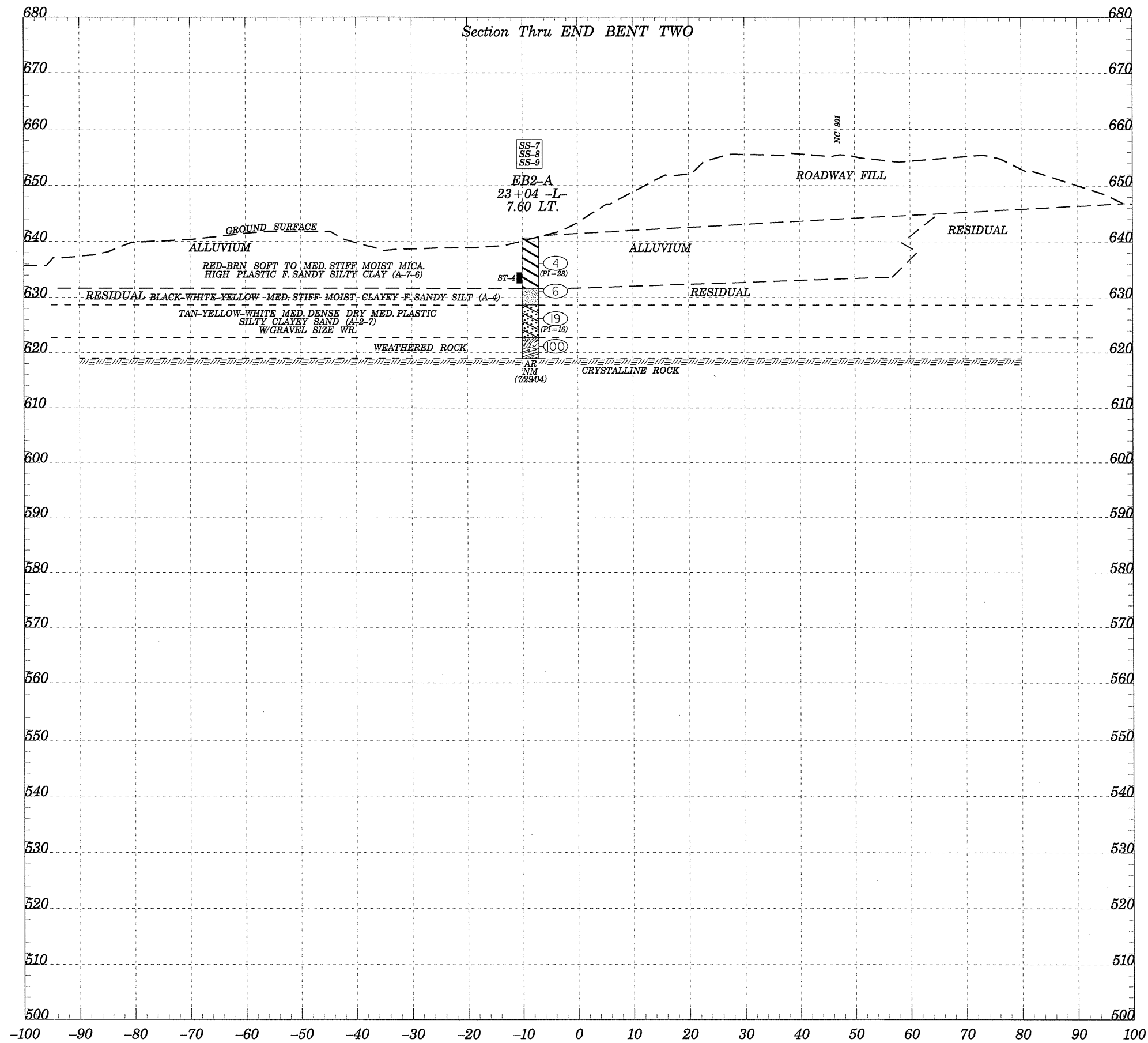


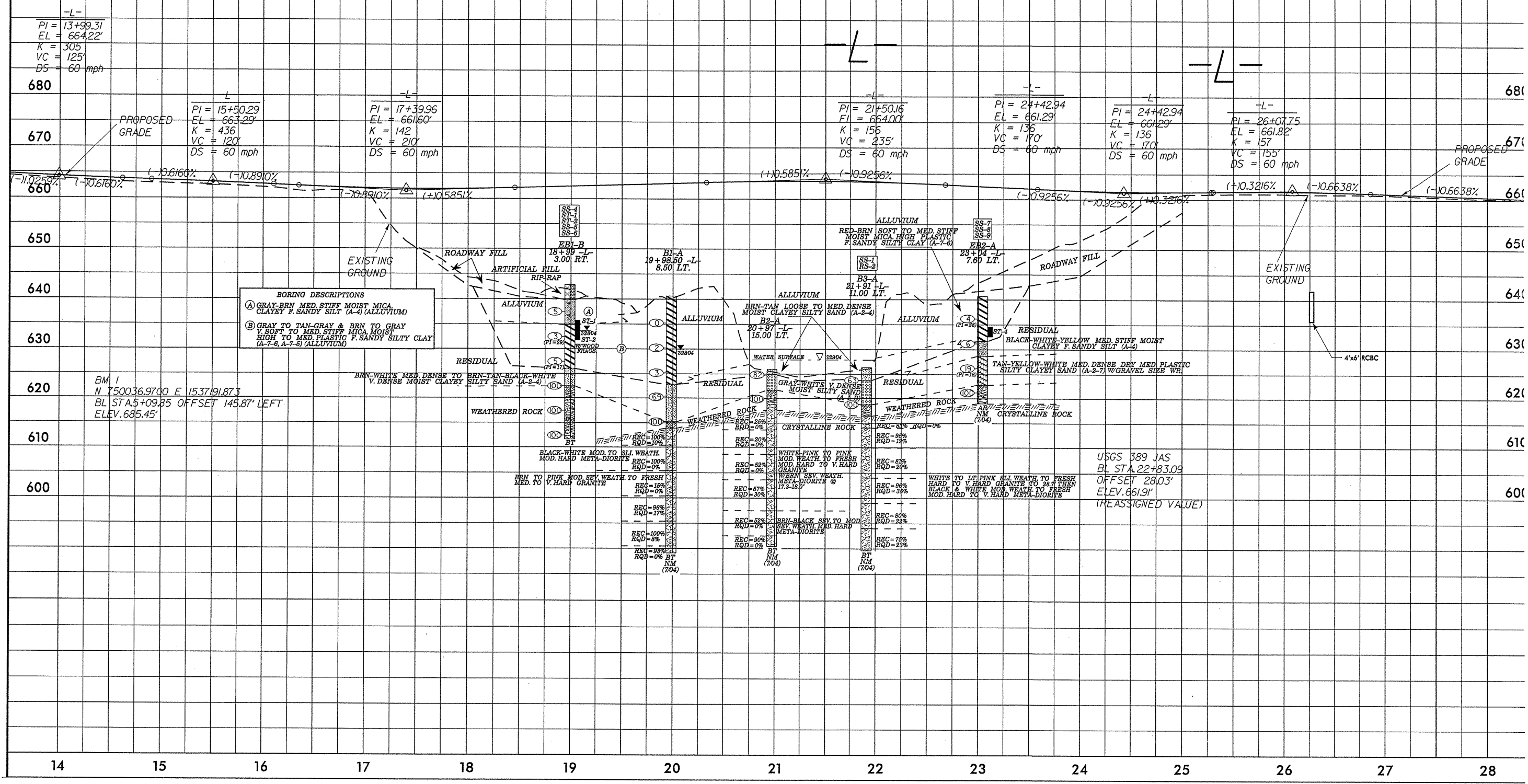












NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
 GEOTECHNICAL UNIT BORING LOG SHEET 1 OF 1

PROJECT NO. 33598.1.1		ID. B-4256		COUNTY ROWAN/DAVIE		GEOLOGIST STICKNEY J.K.									
SITE DESCRIPTION BRIDGE 80 ON NC 801 OVER S. YADKIN RIVER							GROUND WATER								
BORING NO. EBI-B		BORING LOCATION 18+99.00		OFFSET 3.00		ALIGNMENT L									
COLLAR ELEVATION 642.83		NORTHING		EASTING		0 HR. 5.3									
TOTAL DEPTH 31.2		DRILL MACHINE CME-550X		DRILL METHOD NWCASTRI-CONE		HAMMER TYPE AUTOMATIC									
START DATE 72804		COMPLETION DATE 72804		SURFACE WATER DEPTH		DEPTH TO ROCK									
ELEV. (FT.)	DEPTH (FT.)	BLOW COUNT			PEN. (FT.)	BLOWS PER FOOT					SAMPLE NUMBER	MOI.	LOG	SOIL AND ROCK DESCRIPTION	
		0.5'	0.5'	0.5'		0	25	50	75	100					
642.83															
640.00															(ARTIFICIAL FILL) RIP-RAP
635.00	5.4	1	2	3	1	X.5									(ALLUVIUM) GRAY-BRN MED. STIFF MOIST MICA CLAYEY F. SANDY SILT (A-4)
630.00	10.4	Ø	1	2	1	X.3									GRAY TO TAN-GRAY SOFT TO MED. STIFF MOIST HIGH (PI=29) TO MED. (PI=17) PLASTIC F. SANDY SILTY CLAY (A-7-6) W/WOOD FRAGS.
625.00	15.4	1	2	3	1	X.5									
620.00	20.4	14	86		0.9						100 X				(RESIDUAL) BRN-WHITE MED. DENSE MOIST CLAYEY SILTY SAND (A-2-4)
615.00	25.4	100			0.2						100 X				WEATHERED ROCK
610.00	30.4	39	61		0.8						100 X				
605.00															
600.00															
595.00															
590.00															
585.00															
580.00															
575.00															
570.00															
565.00															
TERMINATED BORING AT ELEV. 611.63 IN WEATHERED ROCK															

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
 GEOTECHNICAL UNIT BORING LOG

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

PROJECT NO. 33598.1.1		ID. B-4256		COUNTY ROWAN/DAVIE		GEOLOGIST STICKNEY J.K.				
SITE DESCRIPTION BRIDGE 80 ON NC 801 OVER S. YADKIN RIVER							GROUND WATER			
BORING NO. B1-A		BORING LOCATION 19+98.50		OFFSET -8.50		ALIGNMENT L				
COLLAR ELEVATION 640.61		NORTHING		EASTING		0 HR. 7.9				
TOTAL DEPTH 51.5		DRILL MACHINE CME-550X		DRILL METHOD NWCAS/NXL		HAMMER TYPE AUTOMATIC				
START DATE 7/28/04		COMPLETION DATE 7/28/04		SURFACE WATER DEPTH		DEPTH TO ROCK 26.7				
ELEV.	DEPTH (FT.)	BLOW COUNT	PEN. (FT.)	BLOWS PER FOOT				SAMPLE NUMBER	LOG	SOIL AND ROCK DESCRIPTION
		0.5' 1.0' 1.5'		0	25	50	75	100	MOI.	
640.61										
640.00										(ALLUVIUM) BRN TO GRAY V. SOFT TO SOFT MOIST MICA F. SANDY SILTY CLAY (A-7-6, A-7-5)
635.00	5.4	0	0	1					X-0	M
630.00	10.4	1	1	1					X-2	M
625.00	15.4	0	1	2					X-3	M
620.00	20.4	34	30	39					X-69	M
615.00	25.4	100							100 X	
610.00	30.2									CORE1
605.00	35.2									CORE2
600.00	40.2									CORE3
595.00	45.2									CORE4
590.00	50.1									CORE5
585.00										CORE6
580.00										
575.00										
570.00										
565.00										

PROJECT NO: 33598.1.1 PROJECT ID: B-4256 COUNTY: ROWAN/DAVIE GEOLOGIST: J.K. STICKNEY
 SITE DESCRIPTION: BRIDGE 80 ON NC 801 OVER S. YADKIN RIVER DRILLER: C.L. SMITH
 BORING NO: B1-A BORING LOCATION (STA): 19+98.5 -L- OFFSET: 8.5 LT.
 COLLAR ELEV: 640.61 PERSONNEL: D.K. BRATTON CORE SIZE: NXWL
 TOTAL DEPTH: 51.5 DRILL MACHINE: CME-550X DATE STARTED: 7/28/04
 TOTAL RUN: 24.8 DRILL EQUIP: NWCAS/NXL DATE COMPLETED: 7/28/04

ELEV. (FT)	DEPTH (FT)	DRILL RATE (MIN/1.0 FT)	RUN NO.	REC % (FT)	RQD % (FT)	SAMPLE NO.	FIELD CLASSIFICATION AND REMARKS
613.91	26.7	1.11	1	100	10		BLACK-WHITE MOD. TO SLI. WEATH. MOD. HARD META-DIORITE W/ V. CLOSE TO CLOSE FRACTURE SPACING.
610.41	30.2	1.21	2	100	0		BLACK-WHITE MOD. TO SLI. WEATH. MOD. HARD META-DIORITE W/ V. CLOSE TO CLOSE FRACTURE SPACING.
605.41	35.2	1.01	3	15	0		BRN TO PINK MOD. SEV. WEATH. MED. TO MOD. HARD GRANITE W/ V. CLOSE FRACTURE SPACING.
600.41	40.2	1.32	4	96	17		PINK MOD. WEATH. TO FRESH MOD. HARD TO V. HARD GRANITE W/ V. CLOSE TO CLOSE FRACTURE SPACING.
595.41	45.2		5	100	8		PINK MOD. WEATH. TO FRESH MOD. HARD TO V. HARD GRANITE W/ V. CLOSE TO CLOSE FRACTURE SPACING.
590.51	50.1		6	93	0		PINK V. SLI. WEATH. TO FRESH V. HARD GRANITE W/ V. CLOSE TO CLOSE FRACTURE SPACING.
589.11	51.5						
NOTES							

TERMINATED BORING AT
 ELEV. 589.11 IN SLI. WEATH.
 TO FRESH V. HARD
 GRANITE

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
 GEOTECHNICAL UNIT BORING LOG

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

PROJECT NO. 33598.1.1	ID. B-4256	COUNTY ROWAN/DAVIE	GEOLOGIST STICKNEY J.K.
SITE DESCRIPTION BRIDGE 80 ON NC 801 OVER S. YADKIN RIVER			GROUND WATER
BORING NO. B1-B	BORING LOCATION 19+89.00	OFFSET 12.00	ALIGNMENT L
COLLAR ELEVATION 640.46	NORTHING	EASTING	24 HR. 10.5
TOTAL DEPTH 45.5	DRILL MACHINE CME-550X	DRILL METHOD NWCAS/NXWL	HAMMER TYPE AUTOMATIC
START DATE 7/27/04	COMPLETION DATE 7/27/04	SURFACE WATER DEPTH	DEPTH TO ROCK 30.3

PROJECT NO: 33598.1.1 PROJECT ID: B-4256 COUNTY: ROWAN/DAVIE GEOLOGIST: J.K. STICKNEY
 SITE DESCRIPTION: BRIDGE 80 ON NC 801 OVER S. YADKIN RIVER DRILLER: C.L. SMITH
 BORING NO: B1-B BORING LOCATION (STA): 19+89 -L- OFFSET: 12.0 RT.
 COLLAR ELEV: 640.46 PERSONNEL: D.K. BRATTON CORE SIZE: NXWL
 TOTAL DEPTH: 45.5 DRILL MACHINE: CME-550X DATE STARTED: 7/27/04
 TOTAL RUN: 15.2 DRILL EQUIP: NWCAS/NXWL DATE COMPLETED: 7/27/04

ELEV. (FT.)	DEPTH (FT.)	BLOW COUNT			PEN. (FT.)	BLOWS PER FOOT				SAMPLE NUMBER	LOG MOI. G	SOIL AND ROCK DESCRIPTION
		0.5'	0.5'	0.5'		0	25	50	75			
640.46												
640.00												(ALLUVIUM) BRN TO GRAY V. SOFT TO SOFT MOIST HIGH (PI=26) TO MED. (PI=16) PLASTIC MICA. F. SANDY SILTY CLAY
635.00	5.5	0	0	2	1	2						SS-2 M
630.00	10.5	0	0	0	1	0						M
625.00	15.5	0	0	2	1	2						SS-3 M
620.00	20.5	100				0.1						D (RESIDUAL) BRN-WHITE DENSE MOIST TO DRY MICA SILTY SAND (A-2-4)
615.00	25.5	100				0.2						CRYSTALLINE ROCK WEATHERED ROCK
610.00	30.3											CORE1 (CRYSTALLINE ROCK) WHITE-GRAY-TAN MOD. TO SLI. WEATH. HARD GRANITIC ROCK REC=83% RQD=8%
605.00	35.5											CORE2 TAN-WHITE-GRAY V. SLI. WEATH. TO FRESH HARD TO V. HARD GRANITE REC=93% RQD=44%
600.00	40.5											CORE3 GRAY SLI. WEATH. TO FRESH HARD TO V. HARD GRANITE REC=96% RQD=50%
595.00												
590.00												
585.00												
580.00												
575.00												
570.00												
565.00												

ELEV. (FT)	DEPTH (FT)	DRILL RATE (MIN/1.0 FT)	RUN NO.	REC % (FT)	RQD % (FT)	SAMPLE NO.	FIELD CLASSIFICATION AND REMARKS
610.16	30.3		1	83	8		WHITE-GRAY-TAN MOD. TO SLI. WEATH. HARD GRANITIC ROCK W/ V. CLOSE TO CLOSE FRACTURE SPACING
604.96	35.5		2	93	44		TAN-WHITE-GRAY V. SLI. WEATH. TO FRESH HARD TO V. HARD GRANITE W/ CLOSE FRACTURE SPACING.
599.96	40.5		3	96	50		GRAY SLI. WEATH. TO FRESH HARD TO V. HARD GRANITE W/ V. CLOSE TO CLOSE FRACTURE SPACING.
594.96	45.5						

NOTES

TERMINATED BORING AT ELEV. 594.96 IN SLI. WEATH. TO FRESH HARD TO V. HARD GRANITE

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
 GEOTECHNICAL UNIT BORING LOG

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

PROJECT NO. 33598.1.1	ID. B-4256	COUNTY ROWAN/DAVIE	GEOLOGIST STICKNEY J.K.
SITE DESCRIPTION BRIDGE 80 ON NC 801 OVER S. YADKIN RIVER			GROUND WATER
BORING NO. B2-A	BORING LOCATION 20+97.00	OFFSET -15.00	ALIGNMENT L
COLLAR ELEVATION 625.92			0 HR.
NORTHING		EASTING	
TOTAL DEPTH 35.5			24 HR.
DRILL MACHINE CME-45C	DRILL METHOD NWCAS/NXWL	HAMMER TYPE AUTOMATIC	
START DATE 7/8/04	COMPLETION DATE 7/8/04	SURFACE WATER DEPTH 1.6	DEPTH TO ROCK 8.3

PROJECT NO: 33598.1.1 PROJECT ID: B-4256 COUNTY: ROWAN/DAVIE GEOLOGIST: J.K. STICKNEY
 SITE DESCRIPTION: BRIDGE 80 ON NC 801 OVER S. YADKIN RIVER DRILLER: C.L. SMITH
 BORING NO: B2-A BORING LOCATION (STA): 20+97 -L- OFFSET: 15.0 LT.
 COLLAR ELEV: 625.92 PERSONNEL: D.K. BRATTON CORE SIZE: NXWL
 TOTAL DEPTH: 35.5 DRILL MACHINE: CME-45C DATE STARTED: 7/8/04
 TOTAL RUN: 27.2 DRILL EQUIP: NWCAS/NXWL DATE COMPLETED: 7/8/04

ELEV. (FT.)	DEPTH (FT.)	BLOW COUNT			PEN. (FT.)	BLOWS PER FOOT				SAMPLE NUMBER	LOG MOI.	SOIL AND ROCK DESCRIPTION
		0.5	1.0	1.5		0	25	50	75			
625.92												
625.00	1.1	26	36	46	1							(ALLUVIUM) BRN-TAN LOOSE CLAYEY SILTY SAND (A-2-4) (RESIDUAL) GRAY-WHITE V. DENSE SILTY SAND (A-1-B) WEATHERED ROCK
620.00	6.1	100			0.4							CORE1
615.00	8.3											CORE2
610.00	12.3											CORE3
605.00	17.3											CORE4
600.00	22.3											CORE5
595.00	28.4											CORE6
590.00	33.4											
585.00												
580.00												
575.00												
570.00												
565.00												
560.00												
555.00												
550.00												

ELEV. (FT)	DEPTH (FT)	DRILL RATE (MIN/1.0 FT)	RUN NO.	REC % (FT)	RQD % (FT)	SAMPLE NO.	FIELD CLASSIFICATION AND REMARKS
617.62	8.3	2.4	1	25	0		WHITE-PINK MOD. TO SLI. WEATH. HARD GRANITE W/ V. CLOSE TO CLOSE FRACTURE SPACING.
613.62	12.3	2.4	2	20	0		WHITE-PINK MOD. TO SLI. WEATH. HARD GRANITE W/ V. CLOSE TO CLOSE FRACTURE SPACING.
608.62	17.3	2.22	3	52	0		17.3-18.0 BRN SEV. WEATH. META-DIORITE, THEN PINK MOD. WEATH. TO FRESH MOD. HARD TO HARD GRANITE W/ V. CLOSE TO CLOSE FRACTURE SPACING.
603.62	22.3	2.19	4	57	30		WHITE-PINK SLI. WEATH. TO FRESH HARD TO V. HARD GRANITE W/ CLOSE FRACTURE SPACING.
597.52	28.4	2.51	5	52	0		BRN-BLACK SEV. TO MOD. SEV. WEATH. MED. HARD META-DIORITE W/ V. CLOSE FRACTURE SPACING.
592.52	33.4		6	90	0		BRN-BLACK SEV. TO MOD. SEV. WEATH. MED. HARD META-DIORITE W/ V. CLOSE FRACTURE SPACING.
590.42	35.5						
NOTES							

TERMINATED BORING AT
 ELEV. 590.42 IN SEV. TO
 MOD. SEV. WEATH. MED.
 HARD META-DIORITE

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 GEOTECHNICAL UNIT BORING LOG

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

PROJECT NO. 33598.1.1	ID. B-4256	COUNTY ROWAN/DAVIE	GEOLOGIST STICKNEY J.K.
SITE DESCRIPTION BRIDGE 80 ON NC 801 OVER S. YADKIN RIVER			GROUND WATER
BORING NO. B2-B	BORING LOCATION 20+84.00	OFFSET 8.00	ALIGNMENT L
COLLAR ELEVATION 625.02	NORTHING	EASTING	0 HR.
TOTAL DEPTH 31.4	DRILL MACHINE CME-45C	DRILL METHOD NWCAS/NXWL	HAMMER TYPE AUTOMATIC
START DATE 7/9/04	COMPLETION DATE 7/9/04	SURFACE WATER DEPTH 2.5	DEPTH TO ROCK 8.5

PROJECT NO: 33598.1.1 PROJECT ID: B-4256 COUNTY: ROWAN/DAVIE GEOLOGIST: J.K. STICKNEY
 SITE DESCRIPTION: BRIDGE 80 ON NC 801 OVER S. YADKIN RIVER DRILLER: C.L. SMITH
 BORING NO: B2-B BORING LOCATION (STA): 20+84 -L- OFFSET: 8.0 RT.
 COLLAR ELEV: 625.02 PERSONNEL: D.K. BRATTON CORE SIZE: NXWL
 TOTAL DEPTH: 31.4 DRILL MACHINE: CME-45C DATE STARTED: 7/9/04
 TOTAL RUN: 20.2 DRILL EQUIP: NWCAS/NXWL DATE COMPLETED: 7/9/04

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			
625.02												
625.00												(ALLUVIUM) GRAY-WHITE LOOSE MOIST SILTY SAND (A-2-4)
620.00	3.5	44	48	36	1							(RESIDUAL) GRAY-WHITE V. DENSE MOIST SILTY SAND (A-1-B)
615.00	8.5	100			0.1							(CRYSTALLINE ROCK)
610.00	11.2											WHITE TO LT. PINK SLI. WEATH. TO FRESH HARD TO V. HARD GRANITIC ROCK REC=75% RQD=7%
605.00	16.4											WHITE TO LT. PINK SLI. WEATH. TO FRESH HARD TO V. HARD GRANITIC ROCK REC=91% RQD=32%
600.00	21.4											LT. PINK SLI. WEATH. TO FRESH HARD TO V. HARD GRANITE REC=74% RQD=23%
595.00	26.4											PINK MOD. WEATH. HARD GRANITE REC=83% RQD=40%
590.00												
585.00												
580.00												
575.00												
570.00												
565.00												
560.00												
555.00												
550.00												

ELEV. (FT)	DEPTH (FT)	DRILL RATE (MIN/1.0 FT)	RUN NO.	REC % (FT)	RQD % (FT)	SAMPLE NO.	FIELD CLASSIFICATION AND REMARKS
613.82	11.2	1.79	1	75	7		WHITE TO LIGHT PINK SLI. WEATH. TO FRESH HARD TO V. HARD GRANITIC ROCK W/ V. CLOSE TO CLOSE FRACTURE SPACING.
608.62	16.4	1.44	2	91	32	RS-1 (19.1-19.6)	WHITE TO LIGHT PINK SLI. WEATH. TO FRESH HARD TO V. HARD GRANITIC ROCK W/ V. CLOSE TO CLOSE FRACTURE SPACING.
603.62	21.4		3	74	23		LIGHT PINK SLI. WEATH. TO FRESH HARD TO V. HARD GRANITE W/ V. CLOSE TO CLOSE FRACTURE SPACING.
598.62	26.4		4	83	40		PINK MOD. WEATH. HARD GRANITE W/ CLOSE FRACTURE SPACING.
593.62	31.4						
NOTES							

TERMINATED BORING AT
 ELEV. 593.62 IN MOD.
 WEATH. HARD GRANITE

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
 GEOTECHNICAL UNIT BORING LOG SHEET 1 OF 1

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

PROJECT NO. 33598.1.1	ID. B-4256	COUNTY ROWAN/DAVIE	GEOLOGIST STICKNEY J.K.
SITE DESCRIPTION BRIDGE 80 ON NC 801 OVER S. YADKIN RIVER			GROUND WATER
BORING NO. B3-A	BORING LOCATION 21+91.00	OFFSET -11.00	ALIGNMENT L
COLLAR ELEVATION 626.32	NORTHING	EASTING	0 HR.
TOTAL DEPTH 36.7	DRILL MACHINE CME-45C	DRILL METHOD NWCAS/NXWL	HAMMER TYPE AUTOMATIC
START DATE 7/1/04	COMPLETION DATE 7/1/04	SURFACE WATER DEPTH 1.5	DEPTH TO ROCK 9.9

PROJECT NO: 33598.1.1 PROJECT ID: B-4256 COUNTY: ROWAN/DAVIE GEOLOGIST: J.K. STICKNEY
 SITE DESCRIPTION: BRIDGE 80 ON NC 801 OVER S. YADKIN RIVER DRILLER: C.L. SMITH
 BORING NO: B3-A BORING LOCATION (STA): 21+91 -L- OFFSET: 11.0 LT.
 COLLAR ELEV: 626.32 PERSONNEL: D.K. BRATTON CORE SIZE: NXWL
 TOTAL DEPTH: 36.7 DRILL MACHINE: CME-45C DATE STARTED: 7/11/04
 TOTAL RUN: 26.8 DRILL EQUIP: NWCAS/NXWL DATE COMPLETED: 7/11/04

ELEV. (FT.)	DEPTH (FT.)	BLOW COUNT			PEN. (FT.)	BLOWS PER FOOT				SAMPLE NUMBER	MOI.	LOG	SOIL AND ROCK DESCRIPTION
		0.5	1.0	1.5		0	25	50	75				
626.32													
625.00	2.6	17	25	38	1								(ALLUVIUM) BRN-TAN LOOSE TO MED. DENSE MOIST CLAYEY SILTY SAND (A-2-4)
620.00	7.6	26	41	59	0.9								(RESIDUAL) GRAY-WHITE V. DENSE MOIST SILTY SAND (A-1-B)
615.00	9.9												WEATHERED ROCK
610.00	12.3												(CRYSTALLINE ROCK) WHITE TO LT. PINK SLI. WEATH. TO FRESH HARD TO V. HARD GRANITE REC=83% RQD=0%
605.00	16.4												WHITE TO LT. PINK SLI. WEATH. TO FRESH HARD TO V. HARD GRANITE REC=95% RQD=12%
600.00	22.3												WHITE TO LT. PINK SLI. WEATH. TO FRESH HARD TO V. HARD GRANITE REC=81% RQD=20%
595.00	27.3												LT. PINK V. SLI. WEATH. TO FRESH V. HARD GRANITE REC=96% RQD=35%
590.00	32.3												AS ABOVE TO 28.7 THEN BLACK & WHITE MOD. TO SLI. WEATH. MOD. HARD TO V. HARD META-DIORITE REC=80% RQD=22%
585.00													BLACK & WHITE SLI. WEATH. TO FRESH HARD TO V. HARD META-DIORITE REC=75% RQD=23%
580.00													
575.00													
570.00													
565.00													
560.00													
555.00													
550.00													

ELEV. (FT)	DEPTH (FT)	DRILL RATE (MIN/1.0 FT)	RUN NO.	REC % (FT)	RQD % (FT)	SAMPLE NO.	FIELD CLASSIFICATION AND REMARKS
616.42	9.9	2.5	1	83	0		WHITE TO LIGHT PINK SLI. WEATH. TO FRESH HARD TO V. HARD GRANITE W/ V. CLOSE TO CLOSE FRACTURE SPACING.
614.02	12.3	3.01	2	95	12		WHITE TO LIGHT PINK SLI. WEATH. TO FRESH HARD TO V. HARD GRANITE W/ V. CLOSE TO CLOSE FRACTURE SPACING.
609.92	16.4		3	81	20	RS-2 (21.7-22.2)	WHITE TO LIGHT PINK SLI. WEATH. TO FRESH HARD TO V. HARD GRANITE W/ V. CLOSE TO CLOSE FRACTURE SPACING.
604.02	22.3		4	96	35		LIGHT PINK V. SLI. WEATH. TO FRESH V. HARD GRANITE W/ V. CLOSE TO CLOSE FRACTURE SPACING.
599.02	27.3		5	80	22		AS ABOVE TO 28.7' THEN BLACK & WHITE MOD. TO SLI. WEATH. MOD. HARD TO V. HARD META-DIORITE W/ V. CLOSE TO CLOSE FRACTURE SPACING.
594.02	32.3		6	75	23		BLACK & WHITE SLI. WEATH. TO FRESH HARD TO V. HARD META-DIORITE W/ V. CLOSE TO CLOSE FRACTURE SPACING.
589.62	36.7						

NOTES

TERMINATED BORING AT ELEV. 589.62 IN SLI. WEATH. TO FRESH HARD TO V. HARD META-DIORITE

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 GEOTECHNICAL UNIT BORING LOG

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

PROJECT NO. 33598.1.1	ID. B-4256	COUNTY ROWAN/DAVIE	GEOLOGIST STICKNEY J.K.
SITE DESCRIPTION BRIDGE 80 ON NC 801 OVER S. YADKIN RIVER			GROUND WATER
BORING NO. B3-B	BORING LOCATION 21+78.00	OFFSET 15.00	ALIGNMENT L
COLLAR ELEVATION 625.42	NORTHING	EASTING	0 HR.
TOTAL DEPTH 30.9	DRILL MACHINE CME-45C	DRILL METHOD NWCAS/NXWL	HAMMER TYPE AUTOMATIC
START DATE 7/6/04	COMPLETION DATE 7/6/04	SURFACE WATER DEPTH 2.6	DEPTH TO ROCK 12.2

PROJECT NO: 33598.1.1 PROJECT ID: B-4256 COUNTY: ROWAN/DAVIE GEOLOGIST: J.K. STICKNEY
 SITE DESCRIPTION: BRIDGE 80 ON NC 801 OVER S. YADKIN RIVER DRILLER: C.L. SMITH
 BORING NO: B3-B BORING LOCATION (STA): 21+78 -L- OFFSET: 15.0 RT.
 COLLAR ELEV: 625.42 PERSONNEL: D.K. BRATTON CORE SIZE: NXWL
 TOTAL DEPTH: 30.9 DRILL MACHINE: CME-45C DATE STARTED: 7/6/04
 TOTAL RUN: 18.7 DRILL EQUIP: NWCAS/NXWL DATE COMPLETED: 7/6/04

ELEV. (FT.)	DEPTH (FT.)	BLOW COUNT			PEN. (FT.)	BLOWS PER FOOT				SAMPLE NUMBER	MOI.	LOG	SOIL AND ROCK DESCRIPTION
		0.5'	0.5'	0.5'		0	25	50	75				
625.42													
625.00	1.8	17	83		0.7							M	(ALLUVIUM) WHITE-GRAY LOOSE TO MED. DENSE MOIST CLAYEY SILTY SAND (A-2-4)
620.00	6.8	100			0.3							M	WEATHERED ROCK
615.00	11.8	100			0.3							M	(CRYSTALLINE ROCK) WHITE TO LT. PINK SLI. WEATH. TO FRESH V. HARD GRANITE REC=100% RQD=44%
610.00	16.5												CORE1 RS-3
605.00	21.5												CORE2
600.00	26.1												CORE3
595.00													CORE4
590.00													
585.00													
580.00													
575.00													
570.00													
565.00													
560.00													
555.00													
550.00													

ELEV. (FT)	DEPTH (FT)	DRILL RATE (MIN/1.0 FT)	RUN NO.	REC % (FT)	RQD % (FT)	SAMPLE NO.	FIELD CLASSIFICATION AND REMARKS
613.22	12.2		1	100	44	RS-3 (13.5-13.9)	WHITE TO LIGHT PINK SLI. WEATH. TO FRESH V. HARD GRANITE W/ V. CLOSE TO MOD. CLOSE FRACTURE SPACING.
608.92	16.5		2	82	10		WHITE TO LIGHT PINK MOD. WEATH. TO FRESH HARD TO V. HARD GRANITE W/ V. CLOSE TO CLOSE FRACTURE SPACING.
603.92	21.5		3	89	15		WHITE TO LIGHT PINK SLI. WEATH. TO FRESH HARD TO V. HARD GRANITE W/ V. CLOSE TO CLOSE FRACTURE SPACING.
599.32	26.1		4	83	55		LIGHT PINK SLI. WEATH. TO FRESH V. HARD GRANITE W/ V. CLOSE TO CLOSE FRACTURE SPACING.
594.52	30.9						
NOTES							

TERMINATED BORING AT
 ELEV. 594.52 IN SLI. WEATH.
 TO FRESH V. HARD
 GRANITE

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION GEOTECHNICAL UNIT BORING LOG

SHEET 1 OF 1

PROJECT NO. 33598.1.1	ID. B-4256	COUNTY ROWANDAVIE	GEOLOGIST STICKNEY J.K.
SITE DESCRIPTION BRIDGE 80 ON NC 801 OVER S. YADKIN RIVER			GROUND WATER
BORING NO. EB2-A	BORING LOCATION 23+04.00	OFFSET -7.60	ALIGNMENT L
COLLAR ELEVATION 640.68			0 HR. DRY
NORTHING		EASTING	24 HR. NM
TOTAL DEPTH 21.7	DRILL MACHINE CME-550X	DRILL METHOD H.S. AUGERS	HAMMER TYPE AUTOMATIC
START DATE 7/29/04	COMPLETION DATE 7/29/04	SURFACE WATER DEPTH	DEPTH TO ROCK 21.7

ELEV. (FT.)	DEPTH (FT.)	BLOW COUNT			PEN. (FT.)	BLOWS PER FOOT					SAMPLE NUMBER	MOI.	LOG	SOIL AND ROCK DESCRIPTION	
		0.5'	0.5'	0.5'		0	25	50	75	100					
640.68															
640.00															
635.00	4.5	1	2	2	1	X 4						SS-7 ST-4	M	(ALLUVIUM) RED-BRN SOFT TO MED. STIFF MOIST MICA HIGH (PI=28) PLASTIC F. SANDY SILTY CLAY (A-7-6)	
630.00	9.5	1	2	4	1	X 6						SS-8	M	(RESIDUAL) BLACK-WHITE-YELLOW MED. STIFF MOIST CLAYEY F. SANDY SILT (A-4)	
625.00	14.5	7	8	11	1	X 19						SS-9	D	TAN-YELLOW-WHITE MED. DENSE DRY MED. (PI=16) PLASTIC SILTY CLAYEY SAND (A-2-7) WGRAVEL SIZE WR	
620.00	19.5	100			0.2					100 X		D	D	WEATHERED ROCK	
615.00															
610.00															
605.00															
600.00															
595.00															
590.00															
585.00															
580.00															
575.00															
570.00															
565.00															

AUGER REFUSAL AT
ELEV. 618.98 ON
HARD ROCK

TEST RESULTS

PROJECT: 33598.1.1 B-4256

COUNTY: ROWAN/DAVIE

SITE DESCRIPTION: BRIDGE NO. 80 ON NC 801 OVER S. YADKIN RIVER

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-4	3.0 RT.	18+99	5.90-6.90	A-4(3)	5	30	9	8.3	45.2	18	28.5	100	97	56				
SS-5			10.90-11.90	A-7-6(32)	3	57	29	3.1	4.7	33.3	59	100	98	94				
SS-6			15.90-16.90	A-7-6(13)	5	44	17	3.3	30.3	29.8	36.6	100	99	75				
ST-1			7.10-9.10	A-4(0)		30	6	26.5	31.1	22.2	20.2	82	72	39	18.01		97.95	0.5932
ST-1(2&3)			7.10-9.10	A-7-6(32)		56	29	1.4	4.8	47.3	46.5	100	99	96	43.235		76.205	1.14775
ST-2			9.10-11.10	A-7-6(20)		47	20	1.8	13.1	31.8	53.2	99	98	88	44.5	6.5	74.66	1.2408
B1-B																		
SS-2	12.0 RT.	19+89	6.00-7.00	A-7-6(20)	2	48	26	1	29.5	30.8	38.7	100	100	77				
SS-3			11.00-12.00	A-7-5(13)	2	47	16	2.2	28.7	30.4	38.7	100	99	76				
B3-A																		
SS-1	11.0 LT.	21+91	3.10-4.10	A-1-b(0)	63	22	NP	44	36.8	12	7.1	60	41	15				
EB2-A																		
SS-7	7.60 LT.	23+04	5.00-6.00	A-7-6(29)	4	53	28	1.2	11.2	32.7	54.9	100	100	91				
SS-8			10.00-11.00	A-4(4)	6	30	9	6.9	37.2	33.5	22.4	100	98	66				
SS-9			15.00-16.00	A-2-7(1)	19	41	16	21.2	34.2	22.3	22.4	66	56	35				
ST-4			6.10-8.10	A-7-6(30)		53	28	1.2	7.1	4.8	46.8	100	100	94	46.7		72.69	1.2945

ROCK SAMPLE RESULTS

SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	RQD	UNIT WT	Q(MPa) (MPsi)	E(MPa) (MPsi)
RS-1	8.00 RT.	20+84 (B2-B)	19.10-19.60	32%	CURRENTLY BEING TESTED		
RS-2	11.00 LT.	21+91 (B3-A)	21.70-22.20	20%	CURRENTLY BEING TESTED		
RS-3	15.00 RT.	21+78 (B3-B)	13.50-13.90	44%	CURRENTLY BEING TESTED		

GEOTECHNICAL UNIT FIELD SCOUR REPORT

PROJECT: 33598.1.1 TIP NO.: B-4256 COUNTY: ROWAN / DAVIE

DESCRIPTION(1): BRIDGE NO. 80 ON NC 801 OVER S. YADKIN RIVER

◆ **INFORMATION ON EXISTING BRIDGES** Information obtained from Field Inspection
 Microfilm (Reel: Position:)
 Other

COUNTY BRIDGE NO. 80 BRIDGE LENGTH 367.5' NO. BENTS 8 NO. BENTS IN: CHANNEL 3 FLOODPLAIN 8

FOUNDATION TYPE: CONCRETE ABUTMENT

EVIDENCE OF SCOUR(2):

ABUTMENTS OR END BENT SLOPES: NONE

INTERIOR BENTS: NONE

CHANNEL BED: NONE

CHANNEL BANKS: STEEP & UNSTABLE W/ TREES LEANING IN TOWARDS THE CHANNEL (UNDERMINING PRESENT)

◆ **EXISTING SCOUR PROTECTION:**

TYPE(3): RIP/RAP

EXTENT(4): AROUND ENTIRE ABUTMENT OF END BENT 1 & END BENT 2

EFFECTIVENESS(5): GOOD

OBSTRUCTIONS(6) (DAMS, DEBRIS, ETC.): LIMBS & LOGS ON BENT 3, BENT 4, & BENT 5

◆ **DESIGN INFORMATION**

CHANNEL BED MATERIAL(7) (Sample Results Attached): SILTY SAND (REFERENCE SS-1, A-1-b)

CHANNEL BANK MATERIAL(8) (Sample Results Attached): F. SANDY SILTY CLAY (REFERENCE SS-2, A-7-6 OR SS-3, A-7-5)

CHANNEL BANK COVER(9): MATURE TREES & SHRUBS

FLOOD PLAIN WIDTH(10): 590'+/- (STA. 17+60+/- to 22+50+/-)

FLOOD PLAIN COVER(11): MATURE TREES & SHRUBS

STREAM IS: DEGRADING AGGRADING (12)

OTHER OBSERVATIONS AND COMMENTS:

◆
◆
◆**DESIGN INFORMATION CONT.**

CHANNEL MIGRATION TENDENCY(13): SLIGHT TO NONE

GEOTECHNICAL ADJUSTED SCOUR ELEVATIONS (14):

*Theoretical 100 and 500 year scour boundaries predicted on the NCDOT Hydro Report place maximum local scour between elevation**608 and 610 feet. The occurrence of weathered and hard rock boundaries at interior bent locations is significantly higher in elevation than**theoretical scour. Approximate elevation range of weathered rock is 615 to 623 feet. Scour penetration should not greatly exceed the weathered**rock horizon. We therefore recommend scour elevations be adjusted upward on a bent by bent basis to an elevation 1 to 2 feet below**the occurrence of weathered rock. Following are weathered and/or hard rock elevations relative to all boring locations: EB1-B : 622.4', B1-A : 615.2',**B1-B : 619.9', B2-A : 621.6', B2-B: 616.5', B3-A : 618.7', B3-B : 623.7', EB2-A : 622.7'*

REPORTED BY: J.K. STICKNEY / J.E. BEVERLY DATE: JULY 29, 2004

INSTRUCTIONS

- (1) GIVE THE DESCRIPTION OF THE SPECIFIC SITE GIVING ROUTE NUMBER AND BODY OF WATER CROSSED.
- (2) NOTE ANY EVIDENCE OF SCOUR AT THE EXISTING END BENTS OR ABUTMENTS (UNDERMINING, SLOUGHING, SCOUR LOCATIONS DEGRADATIONS, ETC.)
- (3) NOTE ANY EXISTING SCOUR PROTECTION (RIPRAP, ETC.)
- (4) DESCRIBE THE EXTENT OF ANY EXISTING SCOUR PROTECTION.
- (5) DESCRIBE WHETHER OR NOT THE SCOUR PROTECTION APPEARS TO BE WORKING.
- (6) NOTE ANY DAMS, FALLEN TREES, DEBRIS AT BENTS, ETC.
- (7) DESCRIBE THE CHANNEL BED MATERIAL; A SAMPLE SHOULD BE TAKEN FOR GRAIN SIZE DISTRIBUTION, ATTACH LAB RESULTS.
- (8) DESCRIBE THE CHANNEL BANK MATERIAL; A SAMPLE SHOULD BE TAKEN FOR GRAIN SIZE DISTRIBUTION, ATTACH LAB RESULTS.
- (9) DESCRIBE THE BANK COVERING (GRASS, TREES, RIPRAP, NONE, ETC.)
- (10) GIVE THE APPROXIMATE FLOOD PLAIN WIDTH (ESTIMATE).
- (11) DESCRIBE THE FLOOD PLAIN COVERING (GRASS, TREES, CROPS, ETC.)
- (12) CHECK THE APPROPRIATE SPACE AS TO WHETHER THE STREAM IS DEGRADING OR AGGRADING.
- (13) DESCRIBE THE POTENTIAL OF THE BODY OF WATER TO MIGRATE Laterally DURING THE LIFE OF THE BRIDGE (APPROXIMATELY 100 YEARS).
- (14) GIVE THE GEOTECHNICAL ADJUSTED SCOUR ELEVATION EXPECTED OVER THE LIFE OF THE BRIDGE (APPROXIMATELY 100 YEARS). THIS CAN BE GIVEN AS AN ELEVATION RANGE ACROSS THE SITE, OR ON A BENT BY BENT BASIS WHERE VARIATIONS EXIST. DISCUSS RELATIONSHIP BETWEEN THE HYDRAULICS THEORETICAL SCOUR AND THE GEOTECHNICAL ADJUSTED SCOUR ELEVATION. IF THE GEOTECHNICAL ADJUSTED SCOUR ELEVATION IS DEPENDENT ON SCOUR COUNTER MEASURES, EXPLAIN. (RIPRAP ARMORING ON SLOPES, ETC.) THE GEOTECHNICAL ADJUSTED SCOUR ELEVATION IS BASED ON THE ERODABILITY OF MATERIALS WITH CONSIDERATION FOR JOINTING, FOLIATION, BEDDING ORIENTATION AND FREQUENCY; CORE RECOVERY PERCENTAGE; PERCENT RQD; DIFFERENTIAL WEATHERING; SHEAR STRENGTH; OBSERVATIONS AT EXISTING STRUCTURES; OTHER TESTS DEEMED APPROPRIATE; AND OVERALL GEOLOGIC CONDITIONS AT THE SITE.

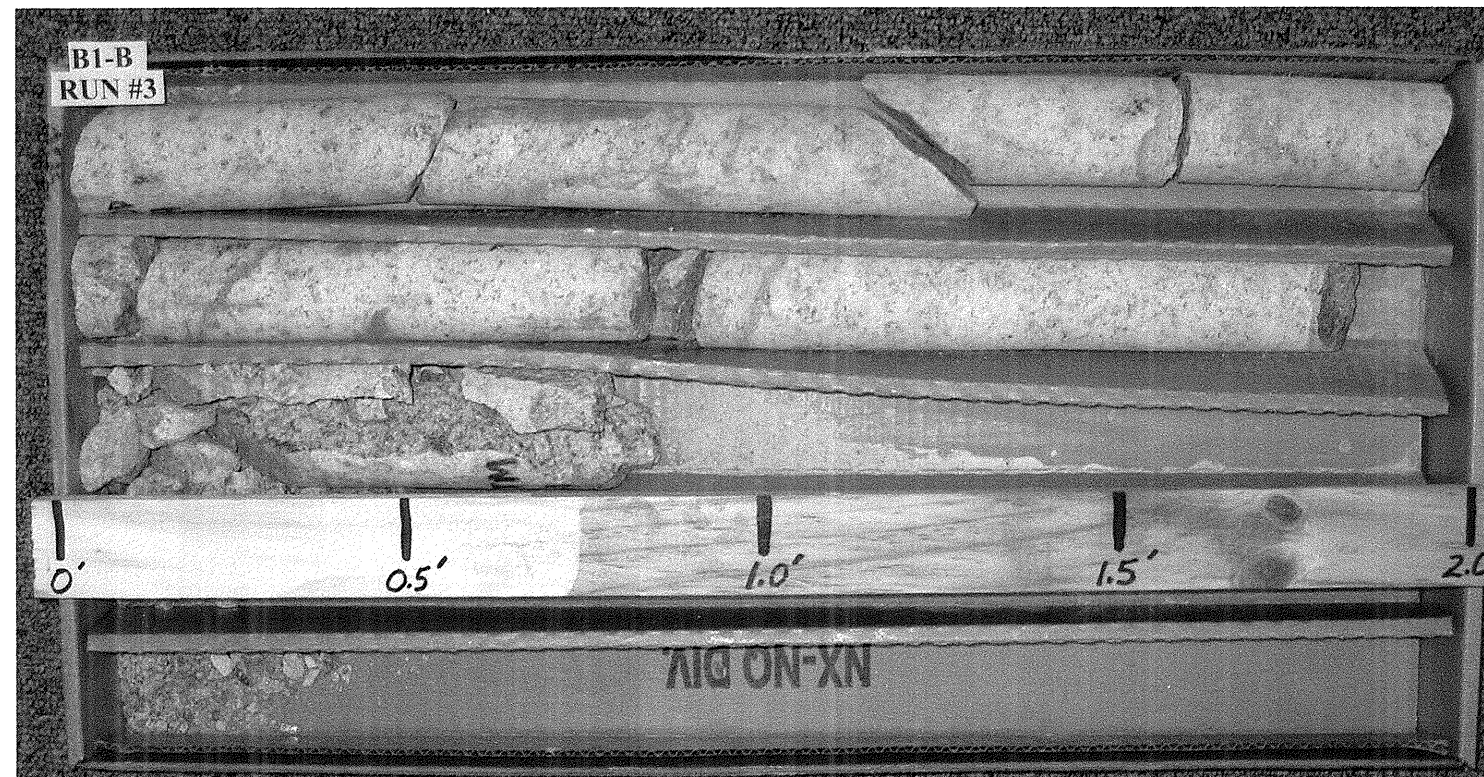
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BRIDGE NO. 80 ON NC 801 OVER S. YADKIN RIVER

CORE PHOTOS



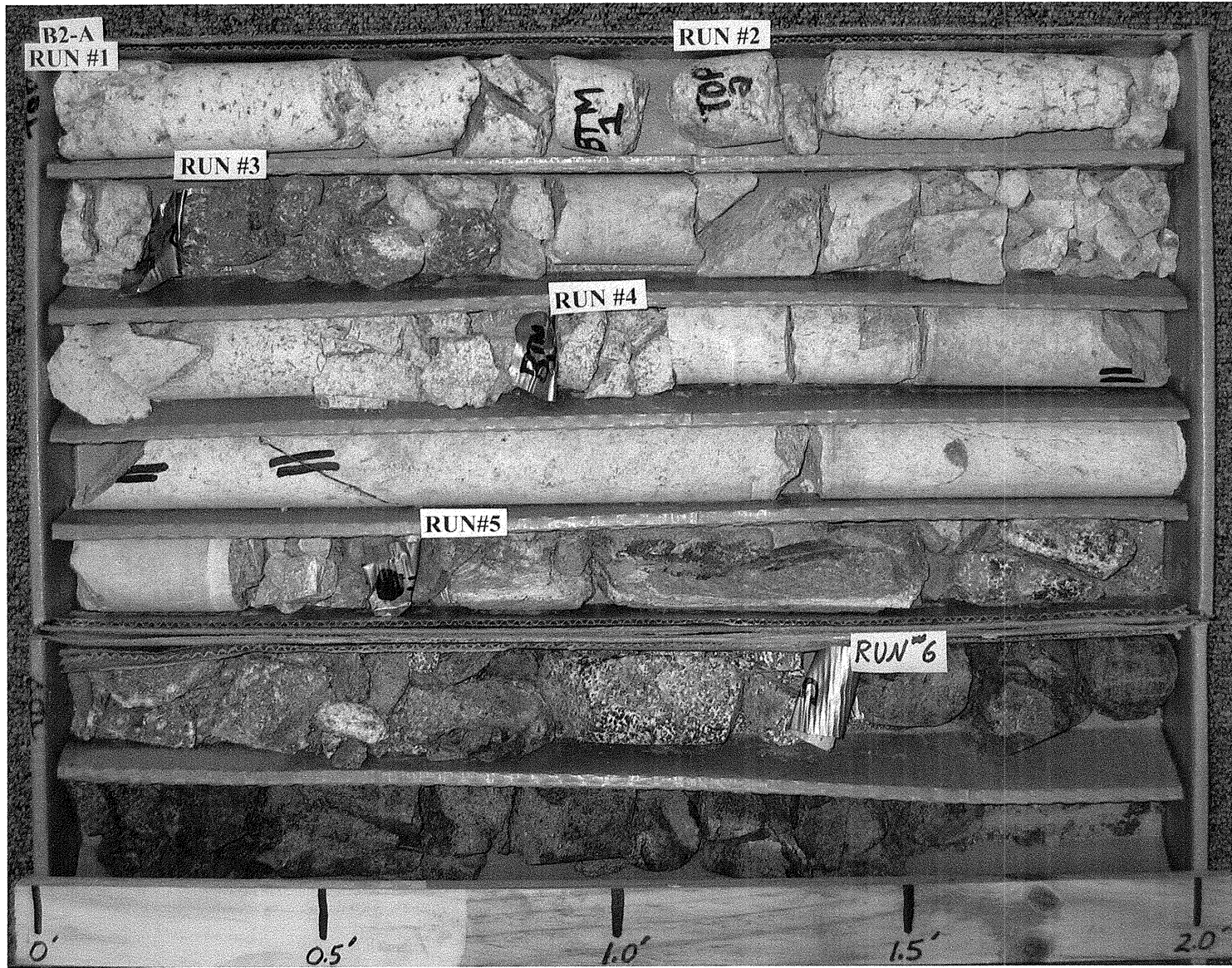
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CORE PHOTOS



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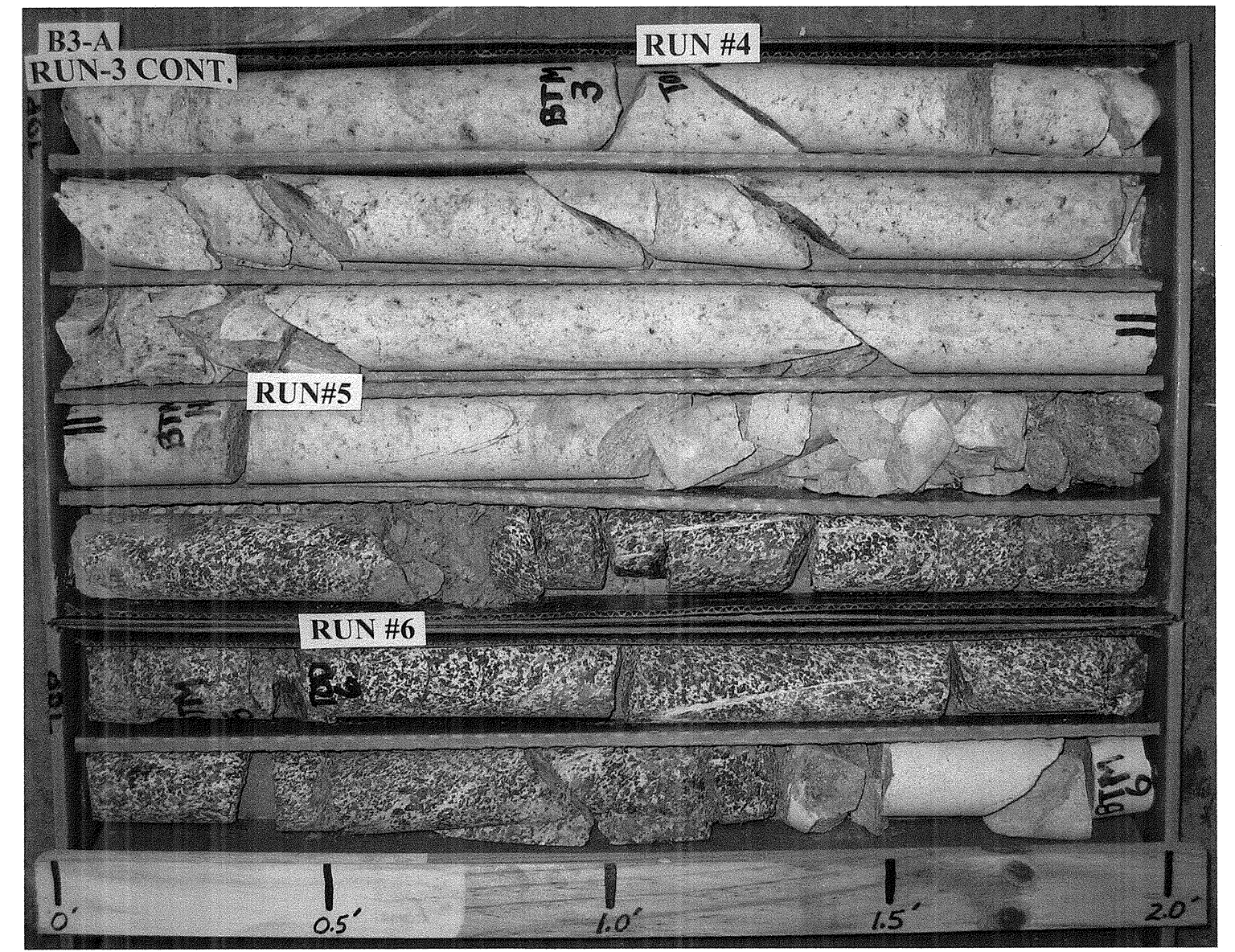
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SITE PHOTOS

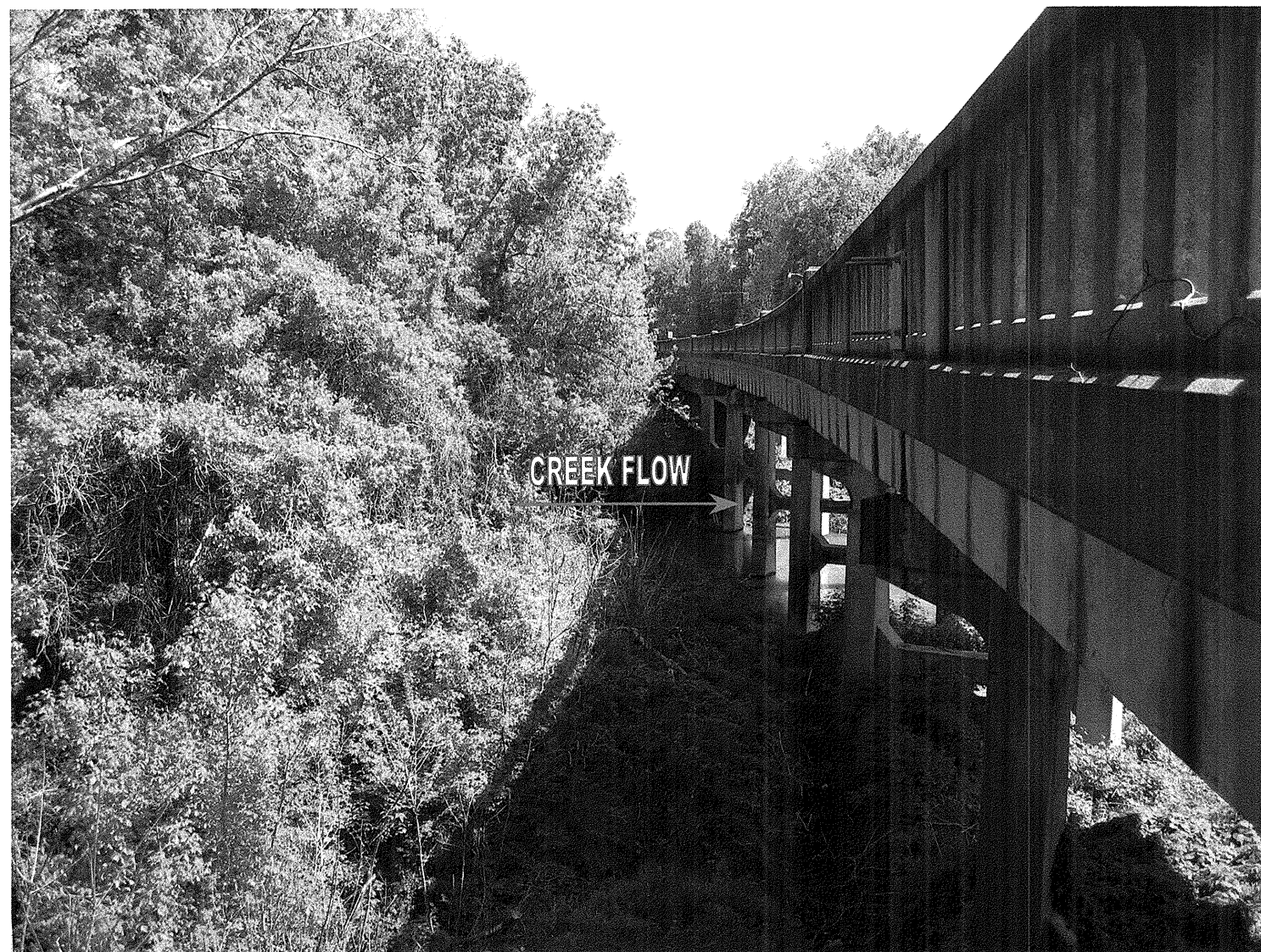


PHOTO TAKEN FROM THE LEFT SIDE OF EXISTING END BENT ONE LOOKING TOWARDS THE SOUTH YADKIN RIVER. PROPOSED END BENT ONE (-L-) IS LOCATED APPROXIMATELY 40' LEFT OF THIS POSITION.