

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	B-4280	1	6
STATE PROJ. NO.	F.A. PROJ. NO.	DESCRIPTION	
33620.1.1	BRSTP-8(2)	PE	
36620.2.2	BRSTP-8(2)	RW & UTL	
33620.3.1	BRSTP-8(6)	CONST.	



CAUTION NOTICE

THE SUBSURFACE INFORMATION AND THE SUBSURFACE INVESTIGATION ON WHICH IT IS BASED WAS 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 UNIT @ (919) 250-4088. NEITHER THE SUBSURFACE PLANS AND REPORTS, NOR THE FIELD BORING LOGS, ROCK CORES, OR SOIL TEST DATA IS PART OF THE CONTRACT.

GENERAL SOIL AND ROCK STRATA DESCRIPTIONS AND INDICATED BOUNDARIES ARE BASED ON A GEOTECHNICAL INTERPRETATION OF ALL AVAILABLE SUBSURFACE DATA AND MAY NOT NECESSARILY REFLECT THE ACTUAL SUBSURFACE CONDITIONS BETWEEN BORINGS OR BETWEEN SAMPLED STRATA WITHIN THE BOREHOLE. THE LABORATORY SAMPLE DATA AND THE IN SITU (IN-PLACED) 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.

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

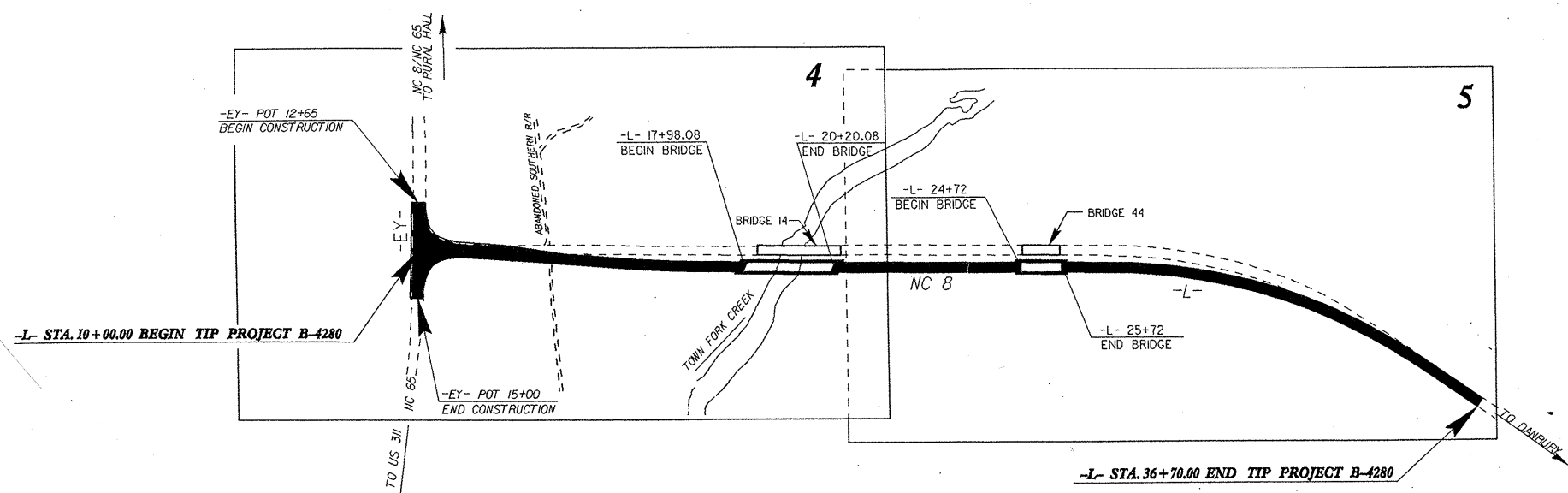
SUBSURFACE INVESTIGATION
INVENTORY

STATE PROJECT 33620.3.1 I.D. NO. B-4280
 F.A. PROJECT _____
 COUNTY STOKES
 DESCRIPTION BRIDGE 14 AND 44 ON
NC 8 OVER TOWN FORK CREEK AND
TOWN FORK CREEK OVERFLOW

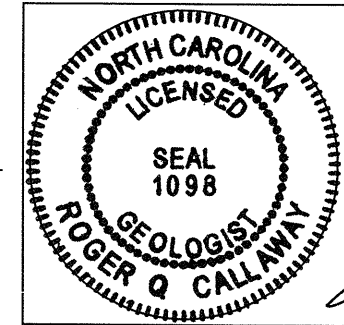
CONTENTS:

LINE	STATION	SHEET NUMBERS	
		PLAN	PROFILE X-SECTS.
-L-	10+00.00 to 36+70.00	4-5	6

"Refer to Sheet 2A for plan sheet layout at the time of investigator"



INVESTIGATED BY R.Q. CALLAWAY PERSONNEL C.C. MURRAY
 CHECKED BY C.B. LITTLE J.E. ESTEP
 SUBMITTED BY C.B. LITTLE D.K. BRATTON
 DATE SEPTEMBER 2003



SEAL
 SIGNATURE *Roger Q. Callaway*

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.

DRAWN BY: J.K. McCLURE

CONTRACT: C201500
 TIP PROJECT: B-4280
 30-NOV-2006 10:46
 R:\roadwork\proj\4280_rdy_tsh.rgn
 \$\$\$USERNAME\$\$\$

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS
GEOTECHNICAL UNIT

ID	STATE PROJECT NO.	SHEET NO.	TOTAL SHEETS
B-4280	33620-1	2	6

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. EXAMPLES: <i>VERY STIFF, GRAY SILTY CLAY, MOIST WITH INTERBEDDED FINE SAND LAYERS, HIGHLY PLASTIC, 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. 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) CRYSTALLINE ROCK (CR) NON-CRYSTALLINE ROCK (NCR) COASTAL PLAIN SEDIMENTARY ROCK (CP)		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 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 DISLODGED 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 (IN 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			
GENERAL CLASS.				MINERAL NAMES SUCH AS QUARTZ, FELDSPAR, MICA, TALC, KAOLIN, ETC. ARE USED IN DESCRIPTIONS WHENEVER THEY ARE CONSIDERED OF SIGNIFICANCE.		FRESH VERY SLIGHT (V. S.L.) SLIGHT (S.L.) MODERATE (MOD.) MODERATELY SEVERE (MOD. SEV.) SEVERE (SEV.) VERY SEVERE (V. SEV.) COMPLETE			
GROUP CLASS.				COMPRESSIBILITY		ROCK FRESH, CRYSTALS BRIGHT, FEW JOINTS MAY SHOW SLIGHT STAINING. ROCK RINGS UNDER HAMMER IF CRYSTALLINE.			
SYMBOL				PERCENTAGE OF MATERIAL		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.			
% PASSING				GROUND WATER		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.			
LIQUID LIMIT PLASTIC INDEX				MISCELLANEOUS SYMBOLS		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.			
GROUP INDEX				ROADWAY EMBANKMENT WITH SOIL DESCRIPTION		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>			
USUAL TYPES OF MAJOR MATERIALS				SOIL SYMBOL		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. <i>IF TESTED, YIELDS SPT N VALUES > 100 BPF</i>			
GEN. RATING AS A SUBGRADE				ARTIFICIAL FILL OTHER THAN ROADWAY EMBANKMENTS		VERY SEVERE (V. SEV.) COMPLETE			
P.I. OF A-7-5 ≤ L.L. - 30 ; P.I. OF A-7-6 > L.L. - 30				INFERRED SOIL BOUNDARIES		SEVERE (SEV.)			
CONSISTENCY OR DENSENESS				INFERRED ROCK LINE <th colspan="2">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> <th colspan="2"></th> </th>		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> <th colspan="2"></th>			
PRIMARY SOIL TYPE		COMPACTNESS OR CONSISTENCY		RANGE OF STANDARD PENETRATION RESISTANCE (N-VALUE)		RANGE OF UNCONFINED COMPRESSIVE STRENGTH (TONS/FT ²)			
GENERALLY GRANULAR MATERIAL (NON-COHESIVE)		VERY LOOSE LOOSE MEDIUM DENSE DENSE VERY DENSE		< 4 4 TO 10 10 TO 30 30 TO 50 > 50		N/A			
GENERALLY SILT-CLAY MATERIAL (COHESIVE)		VERY SOFT SOFT MEDIUM STIFF STIFF VERY STIFF HARD		< 2 2 TO 4 4 TO 8 8 TO 15 15 TO 30 > 30		< 0.25 0.25 TO 0.5 0.5 TO 1 1 TO 2 2 TO 4 > 4			
TEXTURE OR GRAIN SIZE				ALLUVIAL SOIL BOUNDARY <th colspan="2">ALL ROCK EXCEPT QUARTZ DISCOLORED OR STAINED. ROCK FABRIC NOT DISCERNIBLE, OR DISCERNIBLE ONLY IN SMALL AND SCATTERED CONCENTRATIONS. FABRIC MAY BE PRESENT AS DIKES OR STRINGERS. SAPROLITE IS ALSO AN EXAMPLE. <th colspan="2"></th> </th>		ALL ROCK EXCEPT QUARTZ DISCOLORED OR STAINED. ROCK FABRIC NOT DISCERNIBLE, OR DISCERNIBLE ONLY IN SMALL AND SCATTERED CONCENTRATIONS. FABRIC MAY BE PRESENT AS DIKES OR STRINGERS. SAPROLITE IS ALSO AN EXAMPLE. <th colspan="2"></th>			
U.S. STD. SIEVE SIZE OPENING (MM)		4 10 40 60 200 270		25/825					
BOULDER (BLDR.)		COBBLE (COB.)		GRAVEL (GR.)		COARSE SAND (CSE. SD.)		FINE SAND (F. SD.)	
GRAIN SIZE MM 3/8"		75 1/4"		2.0 3/16"		0.25 1/8"		0.075 3/250"	
SOIL MOISTURE - CORRELATION OF TERMS				DIP/DIP DIRECTION OF ROCK STRUCTURES		SOUNDING ROD			
SOIL MOISTURE SCALE (ATTERBERG LIMITS)		FIELD MOISTURE DESCRIPTION		GUIDE FOR FIELD MOISTURE DESCRIPTION					
LL - LIQUID LIMIT PL - PLASTIC LIMIT		- SATURATED - (SAT.)		USUALLY LIQUID; VERY WET, USUALLY FROM BELOW THE GROUND WATER TABLE					
		- WET - (W)		SEMISOLID; REQUIRES DRYING TO ATTAIN OPTIMUM MOISTURE					
OM - OPTIMUM MOISTURE SL - SHRINKAGE LIMIT		- MOIST - (M)		SOLID; AT OR NEAR OPTIMUM MOISTURE					
		- DRY - (D)		REQUIRES ADDITIONAL WATER TO ATTAIN OPTIMUM MOISTURE					
PLASTICITY				ABBREVIATIONS		EQUIPMENT USED ON SUBJECT PROJECT		ROCK HARDNESS	
		PLASTICITY INDEX (PI)		DRY STRENGTH		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		VERY HARD HARD MODERATELY HARD MEDIUM HARD SOFT VERY SOFT	
NONPLASTIC		0-5		VERY LOW		FRAC. - FRACTURED FRAGS. - FRAGMENTS HI. - HIGHLY MED. - MEDIUM MICA. - MICACEOUS MOD. - MODERATELY NP - NON PLASTIC PMT - PRESSUREMETER TEST SAP. - SAPROLITIC SD. - SAND, SANDY		CANNOT BE SCRATCHED BY KNIFE OR SHARP PICK. BREAKING OF HAND SPECIMENS REQUIRES SEVERAL HARD BLOWS OF THE GEOLOGIST'S PICK.	
MED. PLASTICITY		6-15		SLIGHT		SL. - SILTY S.L.I. - SLIGHTLY TCR - TRICONE REFUSAL W - MOISTURE CONTENT V. - VERY VST - VANE SHEAR TEST ? - UNIT WEIGHT ? - DRY UNIT WEIGHT		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.	
HIGH PLASTICITY		26 OR MORE		HIGH		SL. - SILTY S.L.I. - SLIGHTLY TCR - TRICONE REFUSAL W - MOISTURE CONTENT V. - VERY VST - VANE SHEAR TEST ? - UNIT WEIGHT ? - DRY UNIT WEIGHT		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.	
COLOR				HAMMER TYPE:		CORE SIZE:		BEDDING	
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.				ADVANCING TOOLS:		HAND TOOLS:		TERM	
				CLAY BITS 6" CONTINUOUS FLIGHT AUGER 8" HOLLOW AUGERS HARD FACED FINGER BITS TUNG.-CARBIDE INSERTS CASING TRICONE * STEEL TEETH TRICONE * TUNG.-CARB. CORE BIT OTHER		POST HOLE DIGGER HAND AUGER SOUNDING ROD VANE SHEAR TEST OTHER		THICKNESS	
				MOBILE B- BK-51 CME-45C CME-550 PORTABLE HOIST OTHER OTHER		<input checked="" type="checkbox"/> AUTOMATIC <input type="checkbox"/> MANUAL <input type="checkbox"/> -B <input type="checkbox"/> -N <input type="checkbox"/> -H		VERY THICKLY BEDDED THICKLY BEDDED MODERATELY BEDDED VERY THINLY BEDDED THICKLY LAMINATED VERY THINLY BEDDED THINLY LAMINATED	
				FOR SEDIMENTARY ROCKS, INDURATION IS THE HARDENING OF THE MATERIAL BY CEMENTING, HEAT, PRESSURE, ETC.		INDURATION		BENCH MARK: ELEVATION: NOTES:	

See Sheet 1-A For Index of Sheets

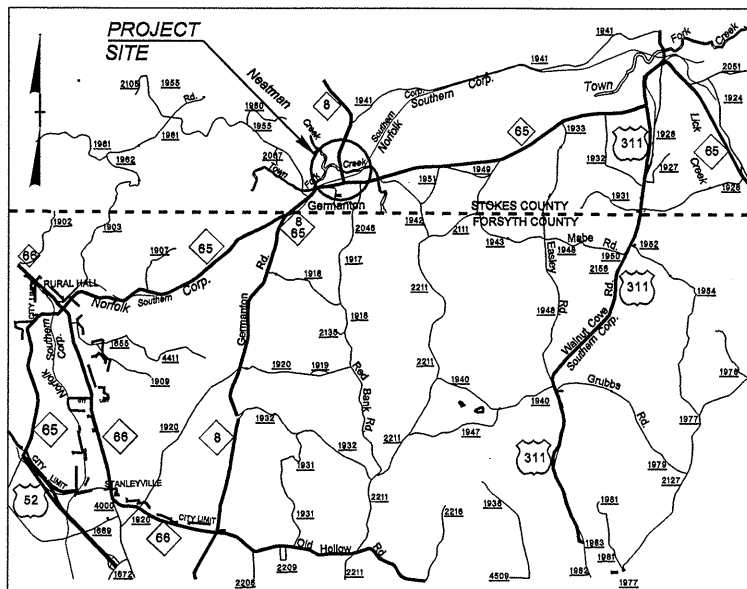
STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

STOKES COUNTY

LOCATION: BRIDGE 14 AND BRIDGE 44 ON NC 8 OVER TOWN FORK CREEK AND TOWN FORK CREEK OVERFLOW

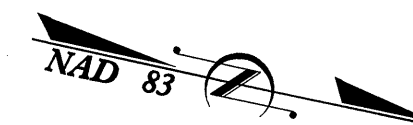
TYPE OF WORK: GRADING, DRAINAGE, PAVING AND STRUCTURES

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	B-4280	2A	6
STATE PROJ. NO.	F.A. PROJ. NO.	DESCRIPTION	
33620.1.1	BRSTP-8(2)	PE	

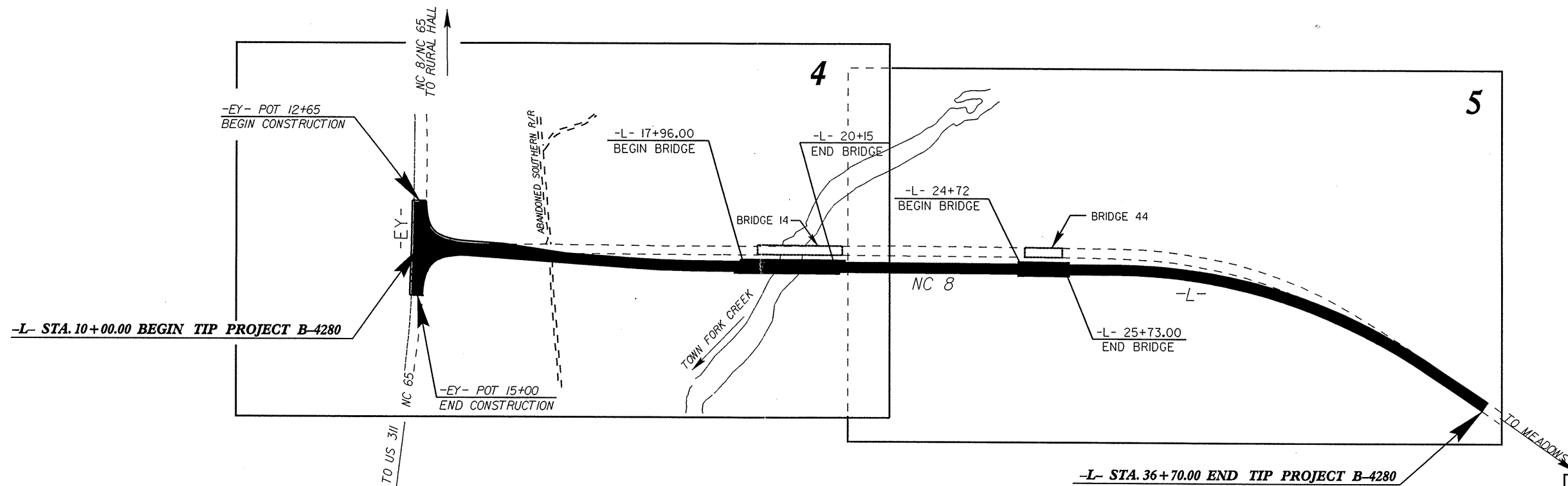


VICINITY MAP

THIS PROJECT IS NOT WITHIN ANY MUNICIPAL BOUNDARIES

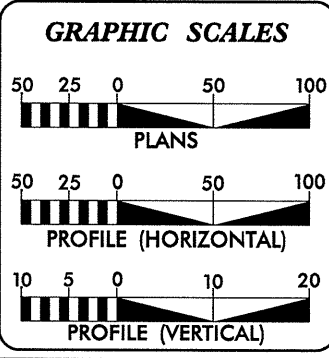


TIP PROJECT: B-4280



CLEARING ON THIS PROJECT SHALL BE PERFORMED TO THE LIMITS ESTABLISHED BY METHOD ??

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION
PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION



DESIGN DATA

ADT 2002 =	6,600
ADT 2025 =	12,200
DHV =	13 %
D =	60 %
*T =	6 %
V =	60 MPH
*TTST	1 % DUAL 5 %
FUNCTIONAL CLASSIFICATION	RURAL MAJOR COLLECTOR

PROJECT LENGTH

LENGTH ROADWAY TIP PROJECT B-4280 =	0.445 Miles
LENGTH STRUCTURE TIP PROJECT B-4280 =	0.061 Miles
TOTAL LENGTH OF TIP PROJECT B-4280 =	0.506 Miles

Prepared In the Office of:

DIVISION OF HIGHWAYS
1000 Birch Ridge Dr., NC, 27610

2002 STANDARD SPECIFICATIONS	
RIGHT OF WAY DATE:	JUNE 18, 2004
LETTING DATE:	JUNE 21, 2005
	G. E. BREW, PE PROJECT ENGINEER
	I. T. YOUNIS PROJECT DESIGN ENGINEER

HYDRAULICS ENGINEER

SIGNATURE: _____ P.E.

ROADWAY DESIGN ENGINEER

SIGNATURE: _____ P.E.

DIVISION OF HIGHWAYS
STATE OF NORTH CAROLINA

SIGNATURE: _____ P.E.

STATE DESIGN ENGINEER

DEPARTMENT OF TRANSPORTATION
FEDERAL HIGHWAY ADMINISTRATION

APPROVED DIVISION ADMINISTRATOR DATE

12-SEP-2003 10:00
D:\Projects\B-4280\B4280_rdy_tsh.dgn
geo AT

CONTRACT:

PROJECT: NO. : B-4280		COUNTY: STOKES				DONE BY: JBT		DATE: 11/6/2007		CHKD BY: IY		DATE: 11/7/2007	
LOCATION	EXCAVATION (CUBIC YARDS)					EMBANKMENT (CUBIC YARDS)				BORROW	WASTE (CUBIC YARDS)		
	TOTAL UNCLASS.	ROCK	UNDERCUT	UNSUITABLE UNCLASS.	SUITABLE UNCLASS.	TOTAL EMBANKMENT	ROCK EMBANKMENT	EARTH EMBANKMENT	EMBANKMENT PLUS 20%		ROCK	SUITABLE	UNSUITABLE
SUMMARY NO. 1													
PHASE 1													
-L- 16+40 TO 18+27.34 LT TEMP	6				6	6		6	7	1			
-L- 20+42.43 TO 24+77.43 LT TEMP	19				19	5		5	6			13	13
10+00 TO 17+98.08 -L- RT	495				495	8,702		8,702	10,442	9,947			
20+20.08 TO 24+72 -L- RT						8,941		8,941	10,729	10,729			
PHASE 2													
10+00 TO 17+98.08 -L- LT	769				769	12		12	14			755	755
20+20.08 TO 24+72 -L- LT	550				550							550	550
SUMMARY NO. 1 TOTALS	1,839				1,839	17,666		17,666	21,199	20,678		1,318	1,318
SUMMARY NO. 2													
PHASE 1													
-L- 25+67.81 TO 27+20 LT TEMP	7				7							7	7
25+72 TO 36+70 -L- RT	174				174	7,349		7,349	8,819	8,645			
PHASE 2													
25+72 TO 36+70 -L- RT	1,363				1,363	464		464	557			806	806
SUMMARY NO. 2 TOTALS	1,544				1,544	7,813		7,813	9,376	8,645		813	813
	3,383				3,383	25,479		25,479	30,575	29,323		2,131	2,131
WASTE IN LIEU OF BORROW										-959		-959	-959
LOSS DUE TO C&G	-169									-169			
EST. SHOULDER MATERIAL								1,169	1,403	1,403			
EST. 5% TO REPLACE TOPSOIL AT BORROW PIT										1,497			
PROJECT TOTAL	3,214									31,432		1,172	1,172
SAY	3,220									31,500			
NOTE : Earthwork quantities are calculated by the Roadway Design Unit.													
These earthwork quantites are based in part on subsurface data													
provided by the Geotechnical Engineering Unit.													
ESTIMATED DDE= 291 CY													
ESTIMATED UNDERCUT= 750 CY													



STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
P.O. BOX 25201, RALEIGH, N.C. 27611-5201

MICHAEL F. EASLEY
GOVERNOR

LYNDO TIPPETT
SECRETARY

September 10, 2003

State Project: 33620.1.1 (B-4280)
Federal Project: BRSTP-8(2)
County: Stokes
Description: Bridge 14 and Bridge 44 on NC 8 Over Town Fork Creek and Town Fork Creek Overflow.
Subject: Geotechnical Report – Inventory

Project Description

This is the report of an English-units geotechnical investigation for a roadway relocation project of a section of NC-8 in Stokes County, just east of Germanton. The project begins at the west end, at the intersection with NC-65. It continues to the east for about a half a mile. The project is on residual soil at the beginning and the end. In the middle, a wide place in the Town Creek floodplain is crossed on an embankment.

-L- Line: 10+00 to 36+70 2670ft
-EY- Line: 12+50 to 15+00 250ft

Areas of Special Geotechnical Interest

Extensive Floodplain Deposits

The bridge approaches are on fill over alluvium. Our investigation found this alluvium to be 12' to 15' thick, primarily sand, gravel and silt with minor relatively high PI clay.

Groundwater

Ground water elevation was measured in nearly all of the borings and found in the alluvium, slightly above the river surface elevation.

Wells and Springs

There is a seep at -L-34+50, right side as indicated on the plans, located at the toe of a gravel deposit over residual Triassic red-bed siltstone.

Preliminary Bridge Borings

The preliminary bridge borings found rock within 15' of ground surface. Based on the very limited sample return, the rock was identified as Triassic red-bed siltstone. Bearing capacity will be achieved somewhere in this lithology. The unconsolidated sand and gravel may well be eliminated from consideration via the scour calculation.

High Plasticity Soil

Residual soil at grade from Triassic sediment, near the end of the project, yielded PI values of 21 and 25. This is borderline High Plasticity particularly in soils from Triassic redbeds.

Physiography and Geology

The project is within the Piedmont physiographic province at the contact between the Sauratown

Mountain litho-tectonic belt and the Dan River Triassic Basin. It is underlain by alluvial soil up to 10' thick on red siltstone, (probably Triassic redbeds).

Topographic Setting

The ground surface of the project is at about 620 feet elevation. The land rises to the north and south reaching a divide 4 miles to the north at an elevation of 840' and a similar divide 6 miles to the south at elevation 880.

Surface Drainage and Geomorphology

The project is within the Dan River Valley, and crosses Town Creek, a northeast flowing river that roughly doubles the flow of the northeast flowing Dan River. The streams form a lattice network of north-northwest streams and east-northeast streams.

Geology

The project area is at the southwest end of the northeast –southwest elongate Dan River Triassic Basin. Town Fork Creek flows through a floodplain from ¼ to over a mile wide developed within the Triassic redbed outcrop area.

Soils Properties

Most of the soil affecting the project is alluvial soil, though the road is on grade on residual soil at the beginning and end. A general description follows immediately below, and a detailed description of the subsurface may be found under the segment descriptions in the *Geotechnical Descriptive Analysis* section, farther along in the report.

Residual Soil

Clayey Soil

At the end of the project, the road is at grade on residual stiff, wet, silty clay soil, (A-7-6), produced from Triassic red-beds. The PI values of 25 and 21 are borderline high plasticity soil.

Silt Soil

Non-plastic, soft to hard residual silt was found at 10' depth, below the residual clay at the end of the project.

Alluvial Soil

Where we drilled the Town Fork Creek floodplain, an alluvial soil “blanket”, 12 to 15 feet thick, covers a rock substrate. Silt sand and gravel intervals were the most common. One interval of A-6 soil was found at the edge of the floodplain, and one interval was found on the floodplain.

Gravelly Soil

Where gravelly soil was found it was at the base of the alluvial section.

Sandy Soil

Sandy soil was the most common gradation. West of the active creek, the majority of material was sand. East of the creek, sand probably accounts for half of the samples.

Silty Soil

Silt is second only to sand in occurrence. The silt samples return A-4 classifications with most of the PI values less than 5. There is the possibility that the silt is filling abandoned meander channels cut into sand.

Clayey Soil

The two clayey samples were soft A-6 clays, one interval in the overflow channel, and one against the residual soil bank on the east side. This basal alluvial deposit against the bank may be a sort of alluvial fan coming off the Triassic residual soil rather than fluvial from the creek. The “alluvial fan” samples register 19 and 21 PI values.

Fill Soil

The current road is built on an embankment 10 to 12 feet high. No evidence of failure was noted. One interval of fill soil was found adjacent to the existing road, and will be reworked during construction endeavors.

Rock Properties

Rock manifested as auger refusal or SPT refusal in most of the floodplain borings. The drill cuttings that were recovered were consistent with the Triassic stratigraphy shown for this area, on the Geologic Map of North Carolina. In other places, some intervals of Triassic rock slake or disintegrate upon exposure to water.

Groundwater Properties

The groundwater in the floodplain borings is in sand and gravel beds. This water is connected with and influenced by the stream. In the floodplain, the blow counts in the sand and silt beds are somewhat low, (N=4). There may be some slight weakening from groundwater discharge into the base of the alluvium, (conveyed by bedrock cracks and fractures from the high ground to the north and south).

CLOSING STATEMENT

If any significant changes are made in the design or location of the proposed roadway, the subsurface information and interpretations will have to be reviewed and modified as necessary.

Respectfully Submitted,



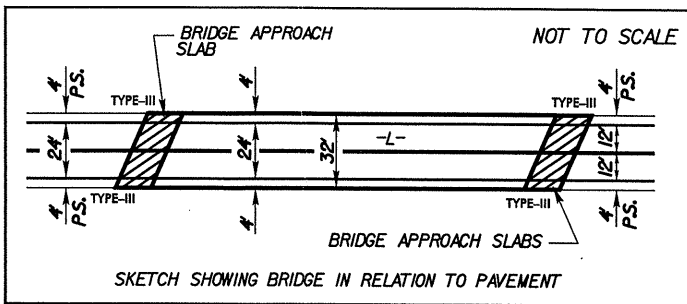
R.Q. Callaway, L.G.

Project Geologist

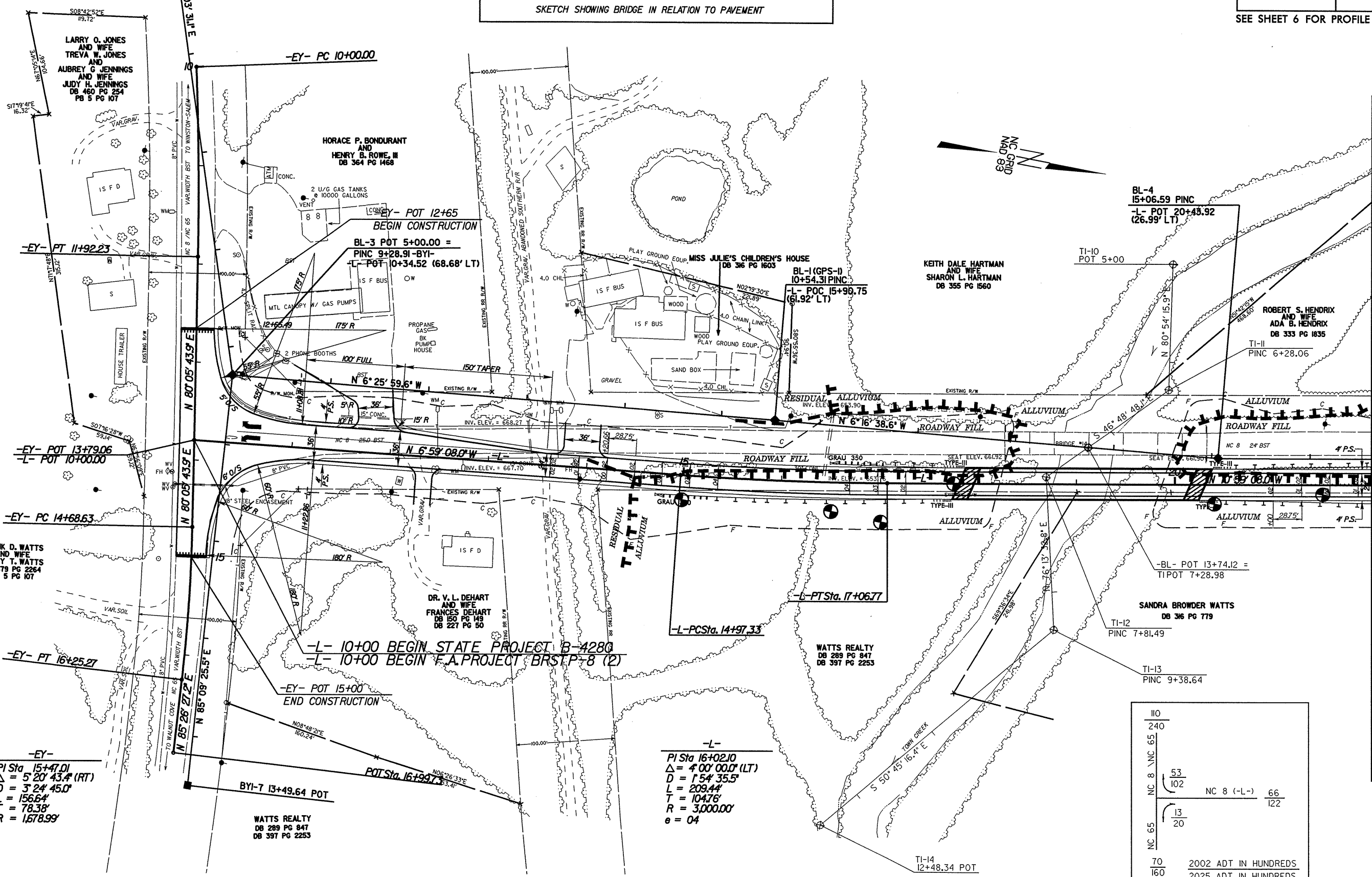
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PROJECT REFERENCE NO. B-4280	SHEET NO. 4
RW SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
INCOMPLETE PLANS DO NOT USE FOR R/W ACQUISITION PRELIMINARY PLANS DO NOT USE FOR CONSTRUCTION	

SEE SHEET 6 FOR PROFILE



-EY-
 PI Sta 10+96.14
 $\Delta = 3' 17' 34.5''$ (RT)
 $D = 1' 42' 47.0''$
 $L = 192.23'$
 $T = 96.14'$
 $R = 3,344.66'$



-L-
 PI Sta 16+02.10
 $\Delta = 4' 00' 00.0''$ (LT)
 $D = 1' 54' 35.5''$
 $L = 209.44'$
 $T = 104.76'$
 $R = 3,000.00'$
 $e = 04$

110		
240		
NC 8 \ NC 65	53	
	102	
NC 8 (-L-)	66	122
	13	
NC 65	20	
70		
160		

2002 ADT IN HUNDREDS
2025 ADT IN HUNDREDS

REVISIONS

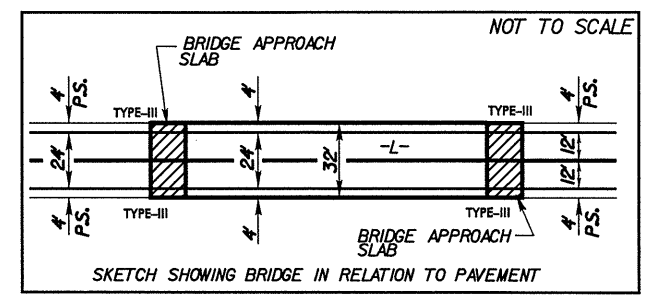
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 geo

MATCH LINE -L- STA 22+00.00 SEE SHEET 5

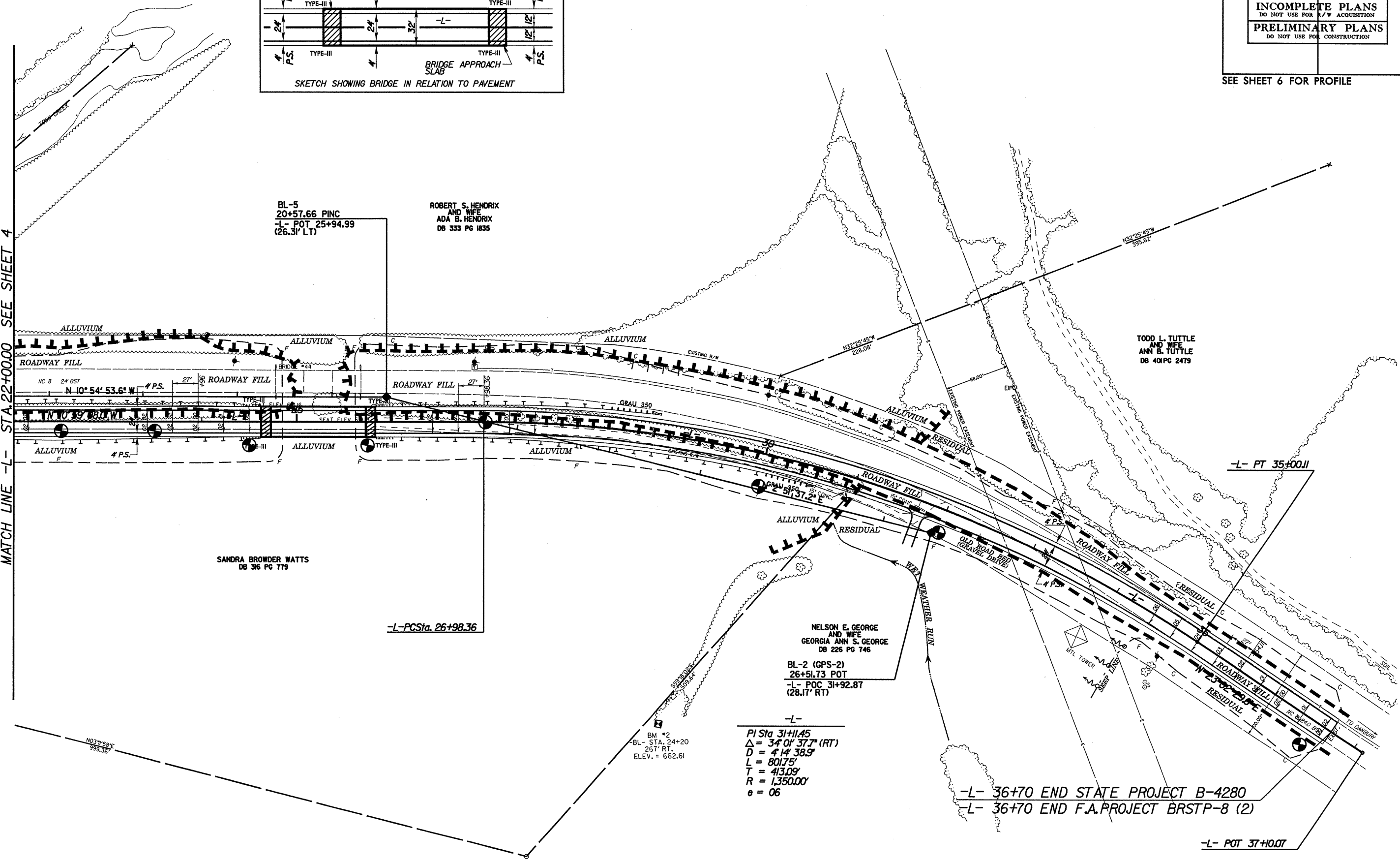
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PROJECT REFERENCE NO. B-4280	SHEET NO. 5
RW SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
INCOMPLETE PLANS DO NOT USE FOR R/W ACQUISITION PRELIMINARY PLANS DO NOT USE FOR CONSTRUCTION	
SEE SHEET 6 FOR PROFILE	



REVISIONS
MATCH LINE -L- STA. 22+00.00 SEE SHEET 4



BL-5
20+57.66 PINC
-L- POT 25+94.99
(26.31' LT)

ROBERT S. HENDRIX
AND WIFE
ADA B. HENDRIX
DB 333 PG 1835

SANDRA BROWDER WATTS
DB 316 PG 779

-L- PCSta. 26+98.36

NELSON E. GEORGE
AND WIFE
GEORGIA ANN S. GEORGE
DB 226 PG 746

BL-2 (GPS-2)
26+51.73 POT
-L- POC 31+92.87
(28.17' RT)

-L-
PI Sta 31+11.45
Δ = 34° 01' 37.7\"/>

TODD L. TUTTLE
AND WIFE
ANN B. TUTTLE
DB 401 PG 2479

-L- 36+70 END STATE PROJECT B-4280
-L- 36+70 END F.A. PROJECT BRSTP-8 (2)

-L- POT 37+10.07

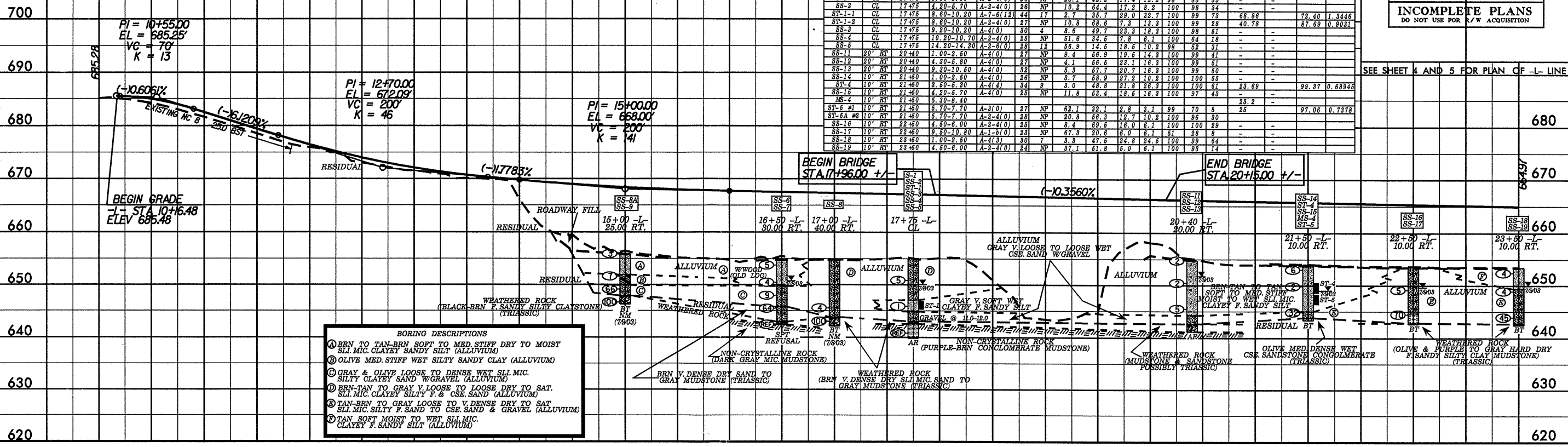
BM#1 - CHISEL SQUARE IN SOUTHERN MOST CORNER OF LIGHT POLE W/ CONC BASE
-L- STA 11+02.77 604.74' RIGHT EL 679.60
N 917930 E 1540337

SOIL TEST RESULTS

Table with columns: SAMPLE NO., OFFSET, STATION, DEPTH INTERVAL, AASHTO CLASS., L.L., P.L.I., % BY WEIGHT (C. SAND, F. SAND, SILT, CLAY), % PASSING SIEVES (10, 40, 200), MOISTURE, ORGANIC, UNIT WT.(g), VOID RATIO.

PROJECT REFERENCE NO. B-4280 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 SHEET 4 AND 5 FOR PLAN OF -L- LINE

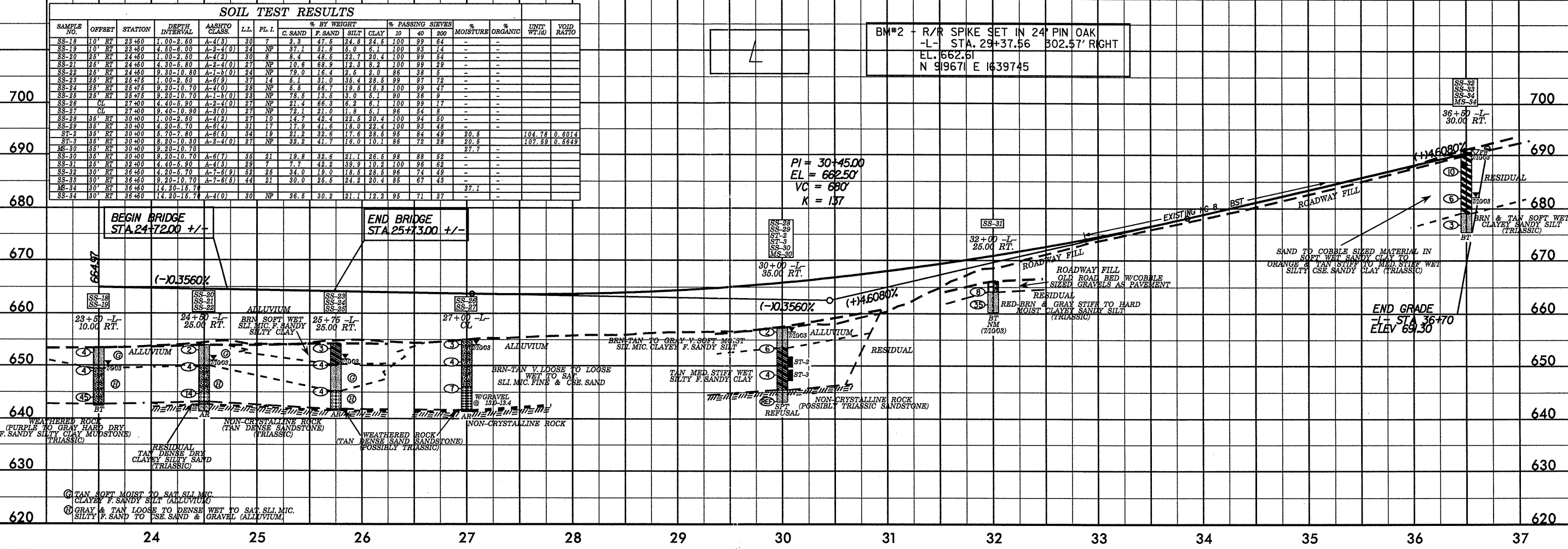


- BORING DESCRIPTIONS
(1) BRN TO TAN-BRN SOFT TO MED. STIFF DRY TO MOIST SILT. MIC. CLAYEY SANDY SILT (ALLUVIUM)
(2) OLIVE MED. STIFF WET SILTY SANDY CLAY (ALLUVIUM)
(3) GRAY & OLIVE LOOSE TO DENSE WET SILT. MIC. SILTY CLAYEY SAND W/ GRAVEL (ALLUVIUM)
(4) BRN-TAN TO GRAY V. LOOSE TO LOOSE DRY TO SAT. SILT. MIC. CLAYEY SILTY F. & CSE. SAND (ALLUVIUM)
(5) TAN-BRN TO GRAY LOOSE TO V. DENSE DRY TO SAT. SILT. MIC. SILTY F. SAND TO CSE. SAND & GRAVEL (ALLUVIUM)
(6) TAN SOFT MOIST TO WET SILT. MIC. CLAYEY F. SANDY SILT (ALLUVIUM)

SOIL TEST RESULTS table for the lower section, including columns for sample no., station, depth, and soil properties.

BM#2 - R/R SPKE SET IN 24" PIN OAK
-L- STA. 29+37.56 302.57' RIGHT
EL. 662.51
N 919671 E 1639745

PI = 30+45.00
EL = 662.50'
VC = 680'
K = 137



- (1) TAN SOFT MOIST TO SAT. SILT. MIC. CLAYEY F. SANDY SILT (ALLUVIUM)
(2) GRAY & TAN LOOSE TO DENSE WET TO SAT. SILT. MIC. SILTY F. SAND TO CSE. SAND & GRAVEL (ALLUVIUM)