

NOTE: SEE SHEET 1A FOR PLAN SHEET LAYOUT AT TIME OF INVESTIGATION

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LINE	STATION	SHEET NUMBERS		
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-L-	10+00.00 to 42+00.00	4-6	7, 8	

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

ROADWAY
SUBSURFACE INVESTIGATION

PROJ. REFERENCE NO. 33453.1.1 (B-4095) F.A. PROJ. BRSTP-29(19)
COUNTY DAVIDSON
PROJECT DESCRIPTION BRIDGE NO. 128 (NBL) & NO. 130 (SBL) OVER ABBOTTS CREEK ON US 2970 AND I-85 BUSINESS LOOP

INVENTORY

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	B-4095	1	8
STATE PROJ. NO.	F.A. PROJ. NO.	DESCRIPTION	
33453.1.1	BRSTP-29(19)	PE	
33453.2.2	BRSTP-29(19)	R/W & UTILITIES	
33453.3.1	BRSTP-29(19)	CONSTRUCTION	

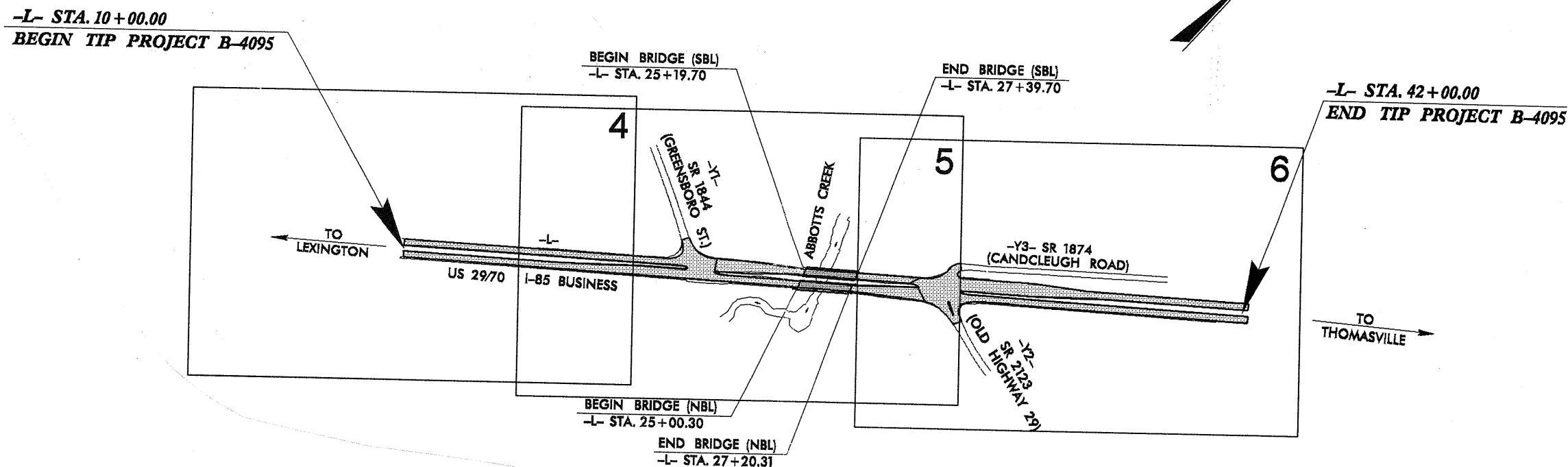
CAUTION NOTICE

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

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-PLACE) TEST DATA CAN BE RELIED ON ONLY TO THE DEGREE OF RELIABILITY INHERENT IN THE STANDARD TEST METHOD. THE OBSERVED WATER LEVELS OR SOIL MOISTURE CONDITIONS INDICATED IN THE SUBSURFACE INVESTIGATIONS ARE AS RECORDED AT THE TIME OF THE INVESTIGATION. THESE WATER LEVELS OR SOIL MOISTURE CONDITIONS MAY VARY CONSIDERABLY WITH TIME ACCORDING TO CLIMATIC CONDITIONS INCLUDING TEMPERATURES, PRECIPITATION, AND WIND, AS WELL AS OTHER NON-CLIMATIC FACTORS.

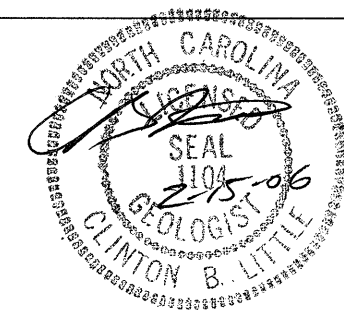
THE BIDDER OR CONTRACTOR IS CAUTIONED THAT DETAILS SHOWN ON THE SUBSURFACE PLANS ARE PRELIMINARY ONLY AND IN MANY CASES THE FINAL DESIGN DETAILS ARE DIFFERENT. FOR BIDDING AND CONSTRUCTION PURPOSES, REFER TO THE CONSTRUCTION PLANS AND DOCUMENTS FOR FINAL DESIGN INFORMATION ON THIS PROJECT. THE DEPARTMENT DOES NOT WARRANT OR GUARANTEE THE SUFFICIENCY OR ACCURACY OF THE INVESTIGATION MADE, NOR THE INTERPRETATIONS MADE, OR OPINION OF THE DEPARTMENT AS TO THE TYPE OF MATERIALS AND CONDITIONS TO BE ENCOUNTERED. THE BIDDER OR CONTRACTOR IS CAUTIONED TO MAKE SUCH INDEPENDENT SUBSURFACE INVESTIGATIONS AS HE DEEMS NECESSARY TO SATISFY HIMSELF AS TO CONDITIONS TO BE ENCOUNTERED ON THIS PROJECT. THE CONTRACTOR SHALL HAVE NO CLAIM FOR ADDITIONAL COMPENSATION OR FOR AN EXTENSION OF TIME FOR ANY REASON RESULTING FROM THE ACTUAL CONDITIONS ENCOUNTERED AT THE SITE DIFFERING FROM THOSE INDICATED IN THE SUBSURFACE INFORMATION.

CONTRACT: C201601 ID: B-4095



- PERSONNEL
- R.W. TODD
 - M.L. SMITH
 - C.E. BURRIS
 - C.C. MURRAY
 - J.E. ESTEP
 - L.N. HARPER

INVESTIGATED BY J.P. ROGERS
CHECKED BY C.B. LITTLE
SUBMITTED BY C.B. LITTLE
DATE JANUARY 2006



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 IS IT CONSIDERED TO BE PART OF THE PLANS, SPECIFICATIONS, OR CONTRACT FOR THE PROJECT.

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

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION

DIVISION OF HIGHWAYS
GEOTECHNICAL ENGINEERING UNIT

SUBSURFACE INVESTIGATION

SOIL AND ROCK LEGEND, TERMS, SYMBOLS, AND ABBREVIATIONS

PROJECT REFERENCE NO. B-4095	SHEET NO. 2
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SOIL DESCRIPTION		GRADATION		ROCK DESCRIPTION		TERMS AND DEFINITIONS																																																																																																																																		
<p>SOIL IS CONSIDERED TO BE THE UNCONSOLIDATED, SEMI-CONSOLIDATED, OR WEATHERED EARTH MATERIALS THAT CAN BE PENETRATED WITH A CONTINUOUS FLIGHT POWER AUGER, AND YIELD LESS THAN 100 BLOWS PER FOOT ACCORDING TO STANDARD PENETRATION TEST (AASHTO T206, ASTM D-1586). SOIL CLASSIFICATION IS BASED ON THE AASHTO SYSTEM. BASIC DESCRIPTIONS GENERALLY SHALL INCLUDE: CONSISTENCY, COLOR, TEXTURE, MOISTURE, AASHTO CLASSIFICATION, AND OTHER PERTINENT FACTORS SUCH AS MINERALOGICAL COMPOSITION, ANGULARITY, STRUCTURE, PLASTICITY, ETC. EXAMPLE:</p> <p>VERY STIFF, GRAY, SILTY CLAY, MOST WITH INTERBEDDED FINE SAND LAYERS, HIGHLY 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) GAP-GRADED - INDICATES A MIXTURE OF UNIFORM PARTICLES OF TWO OR MORE SIZES.</p> <p>ANGULARITY OF GRAINS THE ANGULARITY OR ROUNDNESS OF SOIL GRAINS IS DESIGNATED BY THE TERMS: ANGULAR, SUBANGULAR, SUBROUNDED, OR ROUNDED.</p>		<p>HARD ROCK IS NON-COASTAL PLAIN MATERIAL THAT IF TESTED, WOULD YIELD SPT REFUSAL. AN INFERRED ROCK LINE INDICATES THE LEVEL AT WHICH NON-COASTAL PLAIN MATERIAL WOULD YIELD SPT REFUSAL. SPT REFUSAL IS PENETRATION BY A SPLIT SPOON SAMPLER EQUAL TO OR LESS THAN 0.1 FOOT PER 60 BLOWS. IN NON-COASTAL PLAIN MATERIAL, THE TRANSITION BETWEEN SOIL AND ROCK IS OFTEN REPRESENTED BY A ZONE OF WEATHERED ROCK. ROCK MATERIALS ARE TYPICALLY DIVIDED AS FOLLOWS:</p>		<p>ALLUVIUM (ALLUV.) - SOILS THAT HAVE BEEN TRANSPORTED BY WATER. AQUIFER - A WATER BEARING FORMATION OR STRATA. ARENACEOUS - APPLIED TO ROCKS THAT HAVE BEEN DERIVED FROM SAND OR THAT CONTAIN SAND. ARGILLACEOUS - APPLIED TO ALL ROCKS OR SUBSTANCES COMPOSED OF CLAY MINERALS, OR HAVING A NOTABLE PROPORTION OF CLAY IN THEIR COMPOSITION, AS SHALE, SLATE, ETC. ARTESIAN - GROUND WATER THAT IS UNDER SUFFICIENT PRESSURE TO RISE ABOVE THE LEVEL AT WHICH IT IS ENCOUNTERED, BUT WHICH DOES NOT NECESSARILY RISE TO OR ABOVE THE GROUND SURFACE. CALCAREOUS (CALC.) - SOILS THAT CONTAIN APPRECIABLE AMOUNTS OF CALCIUM CARBONATE. COLLUVIUM - ROCK FRAGMENTS MIXED WITH SOIL DEPOSITED BY GRAVITY ON SLOPE OR AT BOTTOM OF SLOPE. CORE RECOVERY (REC) - TOTAL LENGTH OF ALL MATERIAL RECOVERED IN THE CORE BARREL DIVIDED BY TOTAL LENGTH OF CORE RUN AND EXPRESSED AS A PERCENTAGE. DIKE - A TABULAR BODY OF IGNEOUS ROCK THAT CUTS ACROSS THE STRUCTURE OF ADJACENT ROCKS OR CUTS MASSIVE ROCK. DIP - THE ANGLE AT WHICH A STRATUM OR ANY PLANAR FEATURE IS INCLINED FROM THE HORIZONTAL. DIP DIRECTION (DIP AZIMUTH) - THE DIRECTION OR BEARING OF THE HORIZONTAL TRACE OF THE LINE OF DIP, MEASURED CLOCKWISE FROM NORTH. FAULT - A FRACTURE OR FRACTURE ZONE ALONG WHICH THERE HAS BEEN DISPLACEMENT OF THE SIDES RELATIVE TO ONE ANOTHER PARALLEL TO THE FRACTURE. FISSILE - A PROPERTY OF SPLITTING ALONG CLOSELY SPACED PARALLEL PLANES. FLOAT - ROCK FRAGMENTS ON SURFACE NEAR THEIR ORIGINAL POSITION AND DISLODGED FROM PARENT MATERIAL. FLOOD PLAIN (FP) - LAND BORDERING A STREAM, BUILT OF SEDIMENTS DEPOSITED BY THE STREAM. FORMATION (FM) - A MAPPABLE GEOLOGIC UNIT THAT CAN BE RECOGNIZED AND TRACED IN THE FIELD. JOINT - FRACTURE IN ROCK ALONG WHICH NO APPRECIABLE MOVEMENT HAS OCCURRED. LEDGE - A SHELF-LIKE RIDGE OR PROJECTION OF ROCK WHOSE THICKNESS IS SMALL COMPARED TO ITS LATERAL EXTENT. LENS - A BODY OF SOIL OR ROCK THAT THINS OUT IN ONE OR MORE DIRECTIONS. MOTTLED (MOT) - IRREGULARLY MARKED WITH SPOTS OF DIFFERENT COLORS, MOTTLING IN SOILS USUALLY INDICATES POOR AERATION AND LACK OF GOOD DRAINAGE. PERCHED WATER - WATER MAINTAINED ABOVE THE NORMAL GROUND WATER LEVEL BY THE PRESENCE OF AN INTERVENING IMPERVIOUS STRATUM. RESIDUAL SOIL - SOIL FORMED IN PLACE BY THE WEATHERING OF ROCK. ROCK QUALITY DESIGNATION (RQD) - A MEASURE OF ROCK QUALITY DESCRIBED BY TOTAL LENGTH OF ROCK SEGMENTS EQUAL TO OR GREATER THAN 4 INCHES DIVIDED BY THE TOTAL LENGTH OF CORE RUN AND EXPRESSED AS A PERCENTAGE. SAPROLITE (SAP) - RESIDUAL SOIL THAT RETAINS THE RELIC STRUCTURE OR FABRIC OF THE PARENT ROCK. SILL - AN INTRUSIVE BODY OF IGNEOUS ROCK OF APPROXIMATELY UNIFORM THICKNESS AND RELATIVELY THIN COMPARED WITH ITS LATERAL EXTENT, THAT HAS BEEN EMPLACED PARALLEL TO THE BEDDING OR SCHISTOSITY OF THE INTRUDED ROCKS. SLICKENSIDE - POLISHED AND STRIATED SURFACE THAT RESULTS FROM FRICTION ALONG A FAULT OR SLIP PLANE. STANDARD PENETRATION TEST (PENETRATION RESISTANCE) (SPT) - NUMBER OF BLOWS (N OR BPF) OF A 140 LB. HAMMER FALLING 30 INCHES REQUIRED TO PRODUCE A PENETRATION OF 1 FOOT INTO SOIL WITH A 2 INCH OUTSIDE DIAMETER SPLIT SPOON SAMPLER. SPT REFUSAL IS PENETRATION EQUAL TO OR LESS THAN 0.1 FOOT PER 60 BLOWS. STRATA CORE RECOVERY (SREC) - TOTAL LENGTH OF STRATA MATERIAL RECOVERED DIVIDED BY TOTAL LENGTH OF STRATUM AND EXPRESSED AS A PERCENTAGE. STRATA ROCK QUALITY DESIGNATION (SROD) - A MEASURE OF ROCK QUALITY DESCRIBED BY TOTAL LENGTH OF ROCK SEGMENTS WITHIN A STRATUM EQUAL TO OR GREATER THAN 4 INCHES DIVIDED BY THE TOTAL LENGTH OF STRATA AND EXPRESSED AS A PERCENTAGE. TOPSOIL (TS) - SURFACE SOILS USUALLY CONTAINING ORGANIC MATTER.</p>																																																																																																																																		
<p>SOIL LEGEND AND AASHTO CLASSIFICATION</p> <table border="1"> <tr> <th>GENERAL CLASS.</th> <th colspan="4">GRANULAR MATERIALS (≤ 35% PASSING #200)</th> <th colspan="4">SILT-CLAY MATERIALS (> 35% PASSING #200)</th> <th colspan="4">ORGANIC MATERIALS</th> </tr> <tr> <td>GROUP CLASS.</td> <td>A-1</td> <td>A-3</td> <td>A-2</td> <td>A-4</td> <td>A-5</td> <td>A-6</td> <td>A-7</td> <td>A-1, A-2</td> <td>A-4, A-5</td> <td>A-6, A-7</td> <td></td> <td></td> <td></td> </tr> <tr> <td>SYMBOL</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>% PASSING</td> <td>50 MX 38 MX 40 200</td> <td>50 MX 50 MX 51 MN</td> <td>35 MX 35 MX 35 MX 35 MX</td> <td>36 MN 36 MN 36 MN 36 MN</td> <td>36 MN 36 MN 36 MN 36 MN</td> <td>36 MN 36 MN 36 MN 36 MN</td> <td>36 MN 36 MN 36 MN 36 MN</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>LIQUID LIMIT PLASTIC INDEX</td> <td>6 MX</td> <td>NP</td> <td>40 MX 18 MX</td> <td>41 MN 10 MX</td> <td>41 MN 11 MN</td> <td>41 MN 11 MN</td> <td>41 MN 11 MN</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>GROUP INDEX</td> <td>0</td> <td>0</td> <td>0</td> <td>4 MX</td> <td>8 MX</td> <td>12 MX</td> <td>16 MX</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>USUAL TYPES OF MAJOR MATERIALS</td> <td>STONE FRAGS. 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ARE USED IN DESCRIPTIONS WHENEVER THEY ARE CONSIDERED OF SIGNIFICANCE.</p> <p>COMPRESSIBILITY SLIGHTLY COMPRESSIBLE LIQUID LIMIT LESS THAN 31 MODERATELY COMPRESSIBLE LIQUID LIMIT EQUAL TO 31-50 HIGHLY COMPRESSIBLE LIQUID LIMIT GREATER THAN 50</p> <p>PERCENTAGE OF MATERIAL</p> <table border="1"> <tr> <th></th> <th>GRANULAR SOILS</th> <th>SILT - CLAY SOILS</th> <th>OTHER MATERIAL</th> </tr> <tr> <td>TRACE OF ORGANIC MATTER</td> <td>2 - 3%</td> <td>3 - 5%</td> <td>TRACE</td> </tr> <tr> <td>LITTLE ORGANIC MATTER</td> <td>3 - 5%</td> <td>5 - 12%</td> <td>LITTLE</td> </tr> <tr> <td>MODERATELY ORGANIC</td> <td>5 - 10%</td> <td>12 - 20%</td> <td>SOME</td> </tr> <tr> <td>HIGHLY ORGANIC</td> <td>>10%</td> <td>>20%</td> <td>HIGHLY</td> </tr> </table> <p>GROUND WATER</p> <p> WATER LEVEL IN BORE HOLE IMMEDIATELY AFTER DRILLING</p> <p> STATIC WATER LEVEL AFTER 24 HOURS</p> <p> PERCHED WATER, SATURATED ZONE, OR WATER BEARING STRATA</p> <p> SPRING OR SEEP</p>			GRANULAR SOILS	SILT - CLAY SOILS	OTHER MATERIAL	TRACE OF ORGANIC MATTER	2 - 3%	3 - 5%	TRACE	LITTLE ORGANIC MATTER	3 - 5%	5 - 12%	LITTLE	MODERATELY ORGANIC	5 - 10%	12 - 20%	SOME	HIGHLY ORGANIC	>10%	>20%	HIGHLY	<p>WEATHERING</p> <p>FRESH ROCK FRESH, CRYSTALS BRIGHT, FEW JOINTS MAY SHOW SLIGHT STAINING, ROCK RINGS UNDER HAMMER IF CRYSTALLINE.</p> <p>VERY SLIGHT (V SL.) ROCK GENERALLY FRESH, JOINTS STAINED, SOME JOINTS MAY SHOW THIN CLAY COATINGS IF OPEN, CRYSTALS ON A BROKEN SPECIMEN FACE SHINE BRIGHTLY, ROCK RINGS UNDER HAMMER BLOWS IF OF A CRYSTALLINE NATURE.</p> <p>SLIGHT (SL.) ROCK GENERALLY FRESH, JOINTS STAINED AND DISCOLORATION EXTENDS INTO ROCK UP TO 1 INCH, OPEN JOINTS MAY CONTAIN CLAY. IN GRANITOID ROCKS SOME OCCASIONAL FELDSPAR CRYSTALS ARE DULL AND DISCOLORED, CRYSTALLINE ROCKS RING UNDER HAMMER BLOWS.</p> <p>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.</p> <p>MODERATELY SEVERE (MOD. SEV.) ALL ROCK EXCEPT QUARTZ DISCOLORED OR STAINED, IN GRANITOID ROCKS, ALL FELDSPARS DULL AND DISCOLORED AND A MAJORITY SHOW KAOLINIZATION, ROCK SHOWS SEVERE LOSS OF STRENGTH AND CAN BE EXCAVATED WITH A GEOLOGIST'S PICK. ROCK GIVES 'CLUNK' SOUND WHEN STRUCK. <i>IF TESTED, WOULD YIELD SPT REFUSAL</i></p> <p>SEVERE (SEV.) ALL ROCK EXCEPT QUARTZ DISCOLORED OR STAINED, ROCK FABRIC CLEAR AND EVIDENT BUT REDUCED IN STRENGTH TO STRONG SOIL. IN GRANITOID ROCKS ALL FELDSPARS ARE KAOLINIZED TO SOME EXTENT, SOME FRAGMENTS OF STRONG ROCK USUALLY REMAIN. <i>IF TESTED, YIELDS SPT N VALUES > 100 BPF</i></p> <p>VERY SEVERE (V SEV.) ALL ROCK EXCEPT QUARTZ DISCOLORED OR STAINED, ROCK FABRIC ELEMENTS ARE DISCERNIBLE BUT THE MASS IS EFFECTIVELY REDUCED TO SOIL STATUS, WITH ONLY FRAGMENTS OF STRONG ROCK REMAINING. SAPROLITE IS AN EXAMPLE OF ROCK WEATHERED TO A DEGREE SUCH THAT ONLY MINOR VESTIGES OF THE ORIGINAL ROCK FABRIC REMAIN. <i>IF TESTED, YIELDS SPT N VALUES < 100 BPF</i></p> <p>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.</p>	
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STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	B-4095	2A	8
STATE PROJ. NO.	F.A. PROJ. NO.	DESCRIPTION	
33453.1.1	BRSTP-29(19)	PE	
33453.2.1	BRSTP-29(19)	R / W	

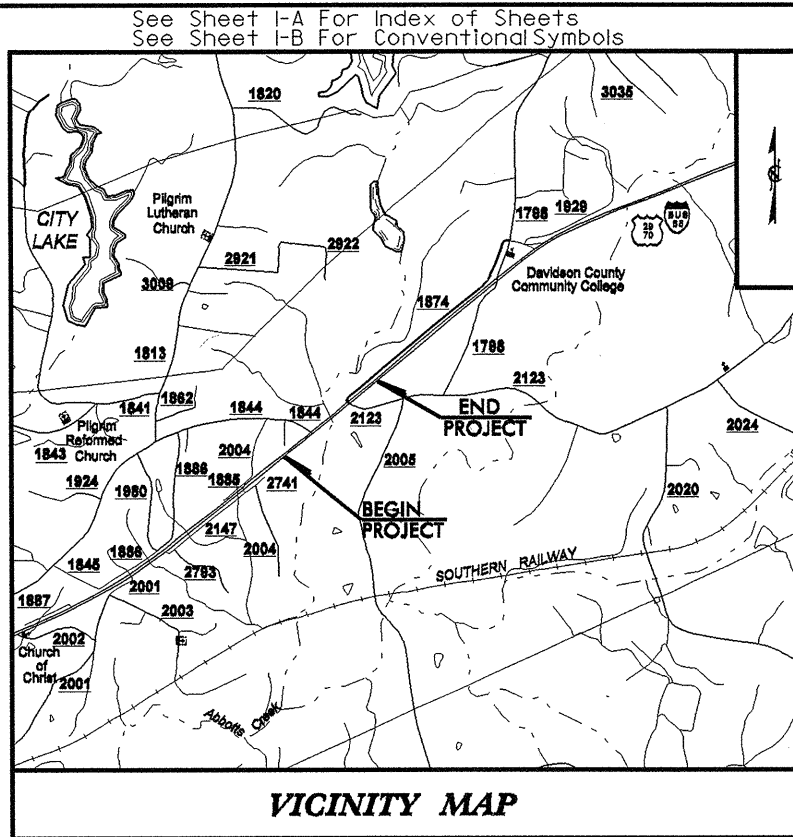
STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

DAVIDSON COUNTY

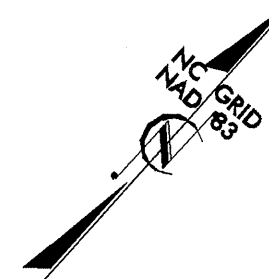
LOCATION: BRIDGE NO. 129 (NBL) & NO. 130 (SBL) OVER ABBOTTS CREEK ON US 29 / 70 AND I-85 BUSINESS LOOP

TYPE OF WORK: GRADING, DRAINAGE, STRUCTURES, PAVING, WIDENING AND RESURFACING

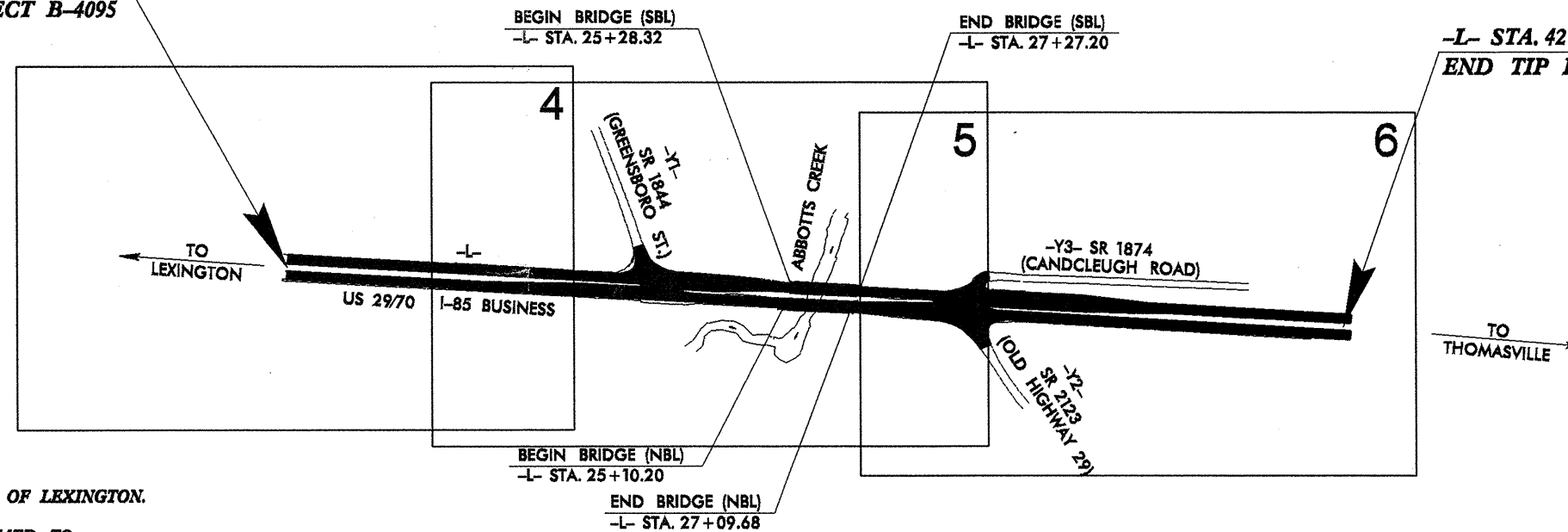
R/W PLANS



VICINITY MAP



-L- STA. 10+00.00
BEGIN TIP PROJECT B-4095



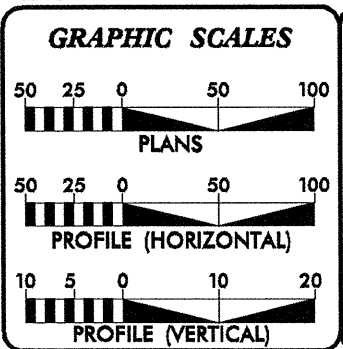
-L- STA. 42+00.00
END TIP PROJECT B-4095

THIS PROJECT IS NOT WITHIN THE CITY LIMITS OF LEXINGTON.

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

NC DOT CONTACT: CATHY S. HOUSER, PE
PROJECT ENGINEER
ROADWAY DESIGN

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION



DESIGN DATA

ADT 2006 =	25,820
ADT 2026 =	39,900
DHV =	10 %
D =	60 %
T =	16 % *
V =	60 MPH
* TTST	6% DUAL 10%
FUNC CLASS =	RURAL MINOR ARTERIAL

PROJECT LENGTH

LENGTH ROADWAY TIP PROJECT B-4095 =	0.568 MILES
LENGTH STRUCTURES TIP PROJECT B-4095 =	0.038 MILES
TOTAL LENGTH OF TIP PROJECT B-4095 =	0.606 MILES

Prepared in the Office of:
PBSJ 1616 EAST MILLBROOK ROAD, SUITE 310
RALEIGH, NORTH CAROLINA 27609
PHONE: (919) 876-6888

2002 STANDARD SPECIFICATIONS

RIGHT OF WAY DATE: NOVEMBER 30, 2005	DAVID W. BASS, PE PROJECT ENGINEER
LETTING DATE: MARCH 20, 2007	RHONDA B. EARLY, PE PROJECT DESIGN ENGINEER

HYDRAULICS ENGINEER

SIGNATURE: _____ P.E.

ROADWAY DESIGN ENGINEER

SIGNATURE: _____ P.E.

**DIVISION OF HIGHWAYS
STATE OF NORTH CAROLINA**

STATE DESIGN ENGINEER

DEPARTMENT OF TRANSPORTATION
FEDERAL HIGHWAY ADMINISTRATION

APPROVED DIVISION ADMINISTRATOR _____ DATE _____

PROJECT: 33453.2.1 TIP PROJECT: B-4095
 25-JAN-2006 15:08:55 GEO. RDWY. DAVIDSON CO. CADD. GEOTECHN.PlanPrjof\B4095.GEO.rmv_tshla.dgn



STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION

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

February 6, 2006

STATE PROJECT: 33453.1.1 (B-4095)
FEDERAL PROJECT: BRSTP-29(19)
COUNTY: Davidson
DESCRIPTION: Bridge No. 129 (NBL) & No. 130 (SBL) over Abbott's Creek
On US 29/70 and I-85 Business Loop.
SUBJECT: Geotechnical Report – Inventory

This project is located in northern Davidson County near the city of Lexington. Total length of lines investigated for this project is 0.66 miles. The scope of this project will entail the widening/upgrading of existing US 29/70 and Bus. I-85 with access improvements to SR 1844, SR 1874, and SR 2123. An upgrade to the dual bridge over Abbott's Creek will also be included in the scope of this project.

The Geotechnical field investigation was conducted primarily during September and November 2005. The bridge borings shown on the attached profile for the proposed structure over Abbott's Creek were performed in January 2006. Due to the overwhelming presence of utilities and homes/business, borings were obtained where feasible. Field data was collected using an all-terrain CME 550-power auger machine equipped with an automatic hammer for Standard Penetration tests.

Geologically, the project corridor is underlain predominantly by Cenozoic Era meta-volcanics with granitic intrusions of the Inner Piedmont Geological Belt. Topography consists of moderately rolling hills with relief of approximately 35' between the upland and lowland portions of the project. Abbott's Creek and its tributaries are the primary drainage outlets for this project.

The following baselines were investigated either by actual soil testing or visual reconnaissance:

Line	Stations
-L-	10+00 to 42+00
-Y1-	12+28 to 13+60
-Y2-	10+00 to 11+47

Items of Special Geotechnical Interest

1. Roadway Fill Soils

Soft to very stiff, silty clay soils (A-7-6, A-7-5, and A-6) were encountered in the borings performed for the proposed structure over Abbott's Creek. A Shelby Tube

(ST-1) was obtained in these soils from the boring performed at proposed EB2-C. Please refer to Sheet 7 of the attached inventory plans.

2. Alluvial Deposits

The largest concentrations of alluvium encountered within the project corridor are at the following locations:

- (a) 17+20 to 19+20, 70' Lt. The alluvium encountered in this interval is approximately four feet deep and consists of soft sandy clay (A-6). A 24-hour, static, groundwater level was not encountered in these materials. Maximum proposed fill heights through the area are approximately 8'.
- (b) 25+50 to 26+80 -L-. The floodplain in this interval is associated with Abbott's Creek. Alluvial soils found in this interval consist of soft to medium stiff sandy clay (A-6) and very loose to medium dense clayey sand (A-2-4, A-1-b) in thickness' ranging between 14' to 17'. At the time of our investigation, groundwater levels were between elevation 645' and 655' throughout this area. Proposed Fill heights in this segment range from 6.0' to 10.0'. These sediments will be bridged by the proposed structure over Abbott's Creek.

Soils Properties

Roadway fill soils encountered in the approaches to the existing bridge over Abbott's creek are approximately 22' – 23' thick. These soils consist primarily of silty clays (A-7-6, A-7-5, A-6) and sandy silts (A-4). In addition, rock fragments were encountered in the Roadway fill on the eastern side of Abbott's Creek.

Residual soils, derived from the weathering of parent rock materials, occur in the uplands as cut materials, in the flanks of hillsides as foundation soils for proposed fills, and underneath alluvial deposits in floodplains. Red and brown clays (A-7-5, A-7-6) cap most of the hills and are approximately five to 10' in thickness. Two borings performed in the project corridor encountered cap clays with a P.I. of 27. Anything above a P.I. of 26 we deem to be highly plastic. In addition to these clays, other saprolitic soils are present. These include sandy silts (A-4, A-5) plus some weathered rock and hard rock in the Abbott's Creek floodplain.

If we can furnish any further information on this project please advise.

Respectfully submitted,

J. P. Rogers
Project Engineering Geologist - Geotechnical Engineering Unit
Harrisburg Field Office

cc: Pat Ivey, PE
Division 09 Engineer

EARTHWORK SUMMARIES

PROJECT B-4095

COUNTY Davidson

DATE February 6, 2006

SHEET 3A SHEETS

LINE	STATION	STATION	TOTAL EXCAV. (UNCL.)	ROCK EXCAV.	UNDERCUT EXCAV.	UNSUIT. (UNCL.) EXCAV.	SUITABLE (UNCL.) EXCAV.	TOTAL EMB.	ROCK EMB.	EARTH EMB.	EMB. +20%	BORROW	ROCK WASTE	SUITABLE WASTE	UNSUIT. WASTE	TOTAL WASTE
L (left)	10+00.00	25+19.70	4,609	0	0	0	4,609	764	0	764	917	0	0	3,692	0	3,692
L (left)	27+39.70	42+00.00	1,238	0	0	0	1,238	3	0	3	4	0	0	1,234	0	1,234
SUBTOTAL #1			5,847	0	0	0	5,847	767	0	767	921	0	0	4,927	0	4,927
USE WASTE TO REPLACE BORROW												0		0		0
TOTAL L (left)			5,847	0	0	0	5,847	767	0	767	921	0	0	4,927	0	4,927
L (right)	10+00.00	25+00.30	2,213	0	0	0	2,213	88	0	88	106	0	0	2,107	0	2,107
L (right)	27+20.31	42+00.00	5,380	0	0	0	5,380	0	0	0	0	0	0	5,380	0	5,380
SUBTOTAL #2			7,593	0	0	0	7,593	88	0	88	106	0	0	7,487	0	7,487
USE WASTE TO REPLACE BORROW												0		0		0
TOTAL L (right)			7,593	0	0	0	7,593	88	0	88	106	0	0	7,487	0	7,487
PROJECT TOTAL			13,440	0	0	0	13,440	855	0	855	1,027	0	0	12,414	0	12,414
LOSS DUE TO CLEARING & GRUBB			-2,000				-2,000					2,000				
USE WASTE TO REPLACE BORROW												-2,000		-2,000		-2,000
GRAND TOTAL			11,440	0	0	0	11,440	855	0	855	1,027	0	0	10,414	0	10,414
SAY			12,100	0	0	0	12,100	855	0	855	1,027	0	0	10,500	0	10,500

PAVEMENT STRUCTURE VOLUME 9600 CY
 ESTIMATED UNDERCUT 4100 CY

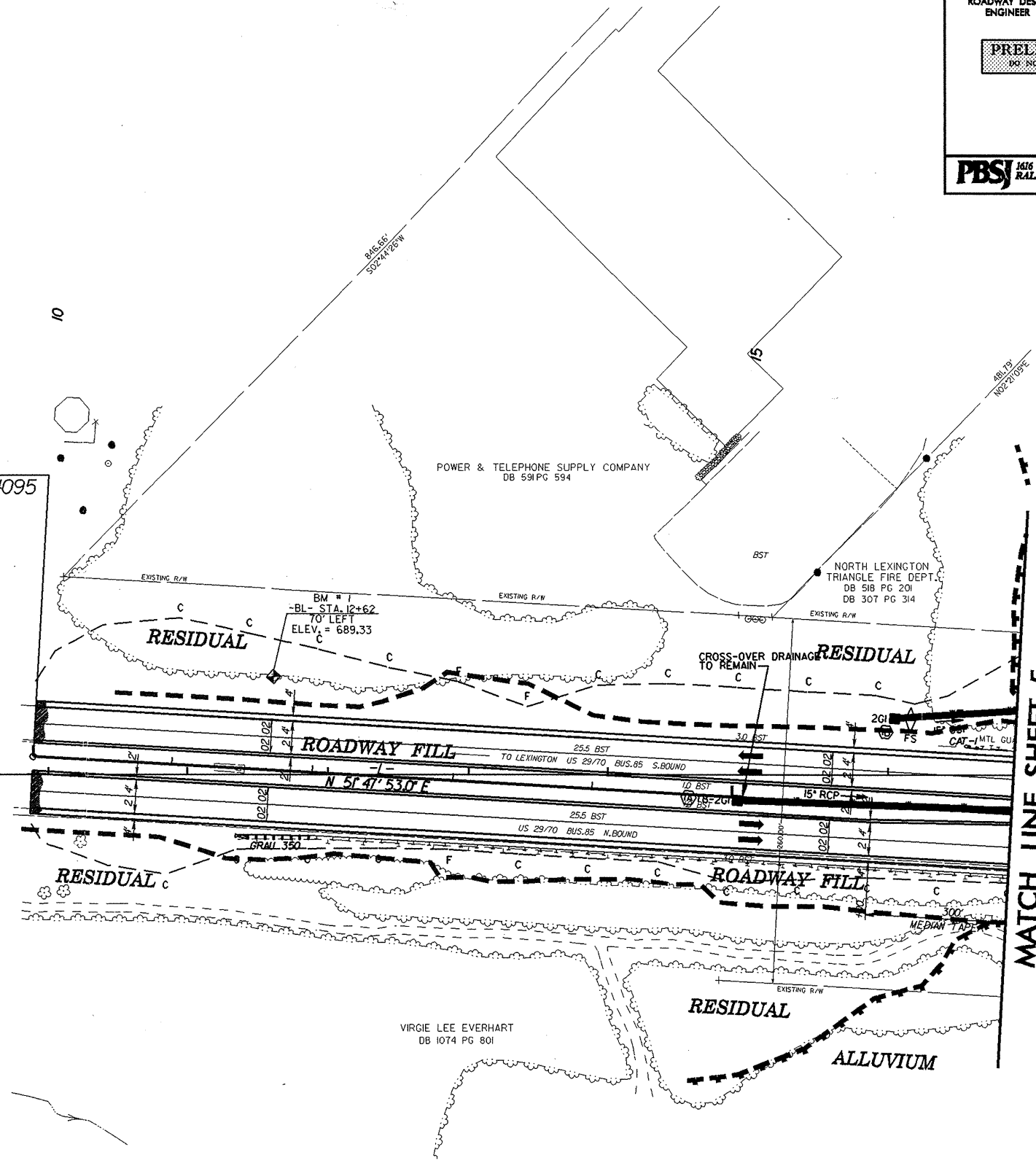
PROJECT REFERENCE NO. B-4095		SHEET NO. 4	
RW SHEET NO.			
ROADWAY DESIGN ENGINEER		HYDRAULICS ENGINEER	
PRELIMINARY PLANS DO NOT USE FOR CONSTRUCTION			
PBS 1416 EAST MILLBROOK ROAD, SUITE 310 RALEIGH, NORTH CAROLINA 27609 PHONE: (919)76-6888			

8/17/99
 REVISIONS
 26-JAN-2006 13:44
 ds-proj\scs\B4095.GEO_ROWY_DAVIDSON COYDADO GEOTECH\PlanPof\B4095.GEO_inv_004_pah04.dgn
 15-SEP-2004 11:10

BL-1(GPS-1)
5+00.00 POT

N 48° 33' 21.5" E

-L- POT STA 10+00.00
BEGIN TIP PROJECT B-4095



MATCH LINE SHEET 5
 -L- STA 17+00

DATUM DESCRIPTION
 THE LOCALIZED COORDINATE SYSTEM DEVELOPED FOR THIS PROJECT IS BASED ON THE STATE PLANE COORDINATES ESTABLISHED BY NCDDOT FOR MONUMENT "B4095-1"
 WITH NAD 83 STATE PLANE GRID COORDINATES OF
 NORTHING: 766347.1100(11) EASTING: 1643604.1380(11)
 THE AVERAGE COMBINED GRID FACTOR USED ON THIS PROJECT (GROUND TO GRID) IS: 0.99989887
 THE N.C. LAMBERT GRID BEARING AND LOCALIZED HORIZONTAL GROUND DISTANCE FROM "B4095-1" TO -L- STATION 10+00.00 IS 589.43 FT AT A BEARING OF 11 47° 19' 38.5" E
 ALL LINEAR DIMENSIONS ARE LOCALIZED HORIZONTAL DISTANCES
 VERTICAL DATUM USED IS NGVD 29

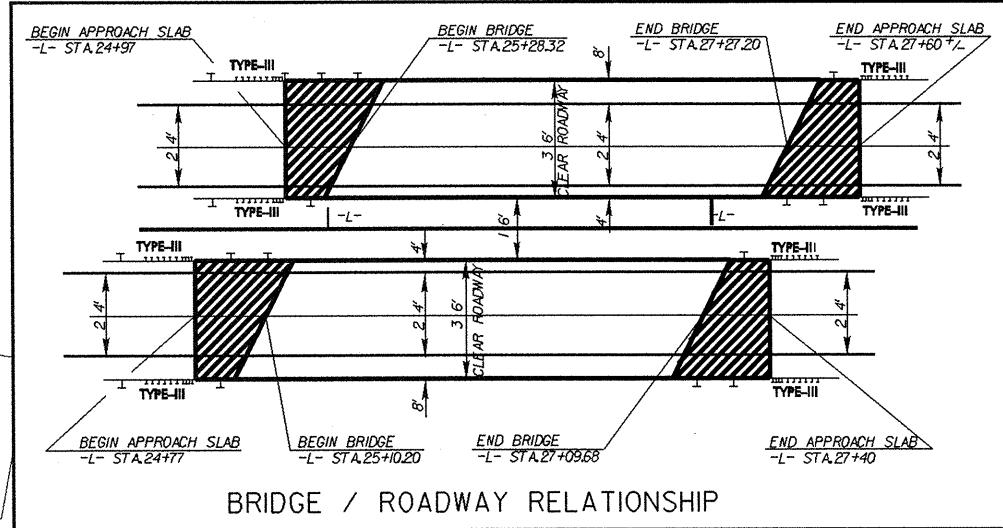
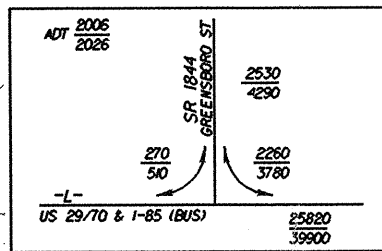
NOTE: SEE SHEET 7 FOR -L- PROFILE.

8/17/99

26 - JAN - 2006 13:50
20 - PROJ - 0305 - AT - PREP - 1410
25 - PROJ - 0305 - GEO. ROWY - DAVIDSON CONCADO GEOTECH.PlanPr of .B4095_GEO_rvw_005_psh05.dgn

-YI-

PI Sta 11+98.79
 $\Delta = 3' 31" 01.7" (RT)$
 $D = 1' 42' 37.2"$
 $L = 205.64'$
 $T = 102.85'$
 $R = 3,350.00'$
 $Se = EXISTING$
 $DS = 55 MPH$



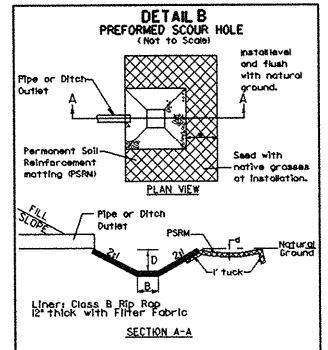
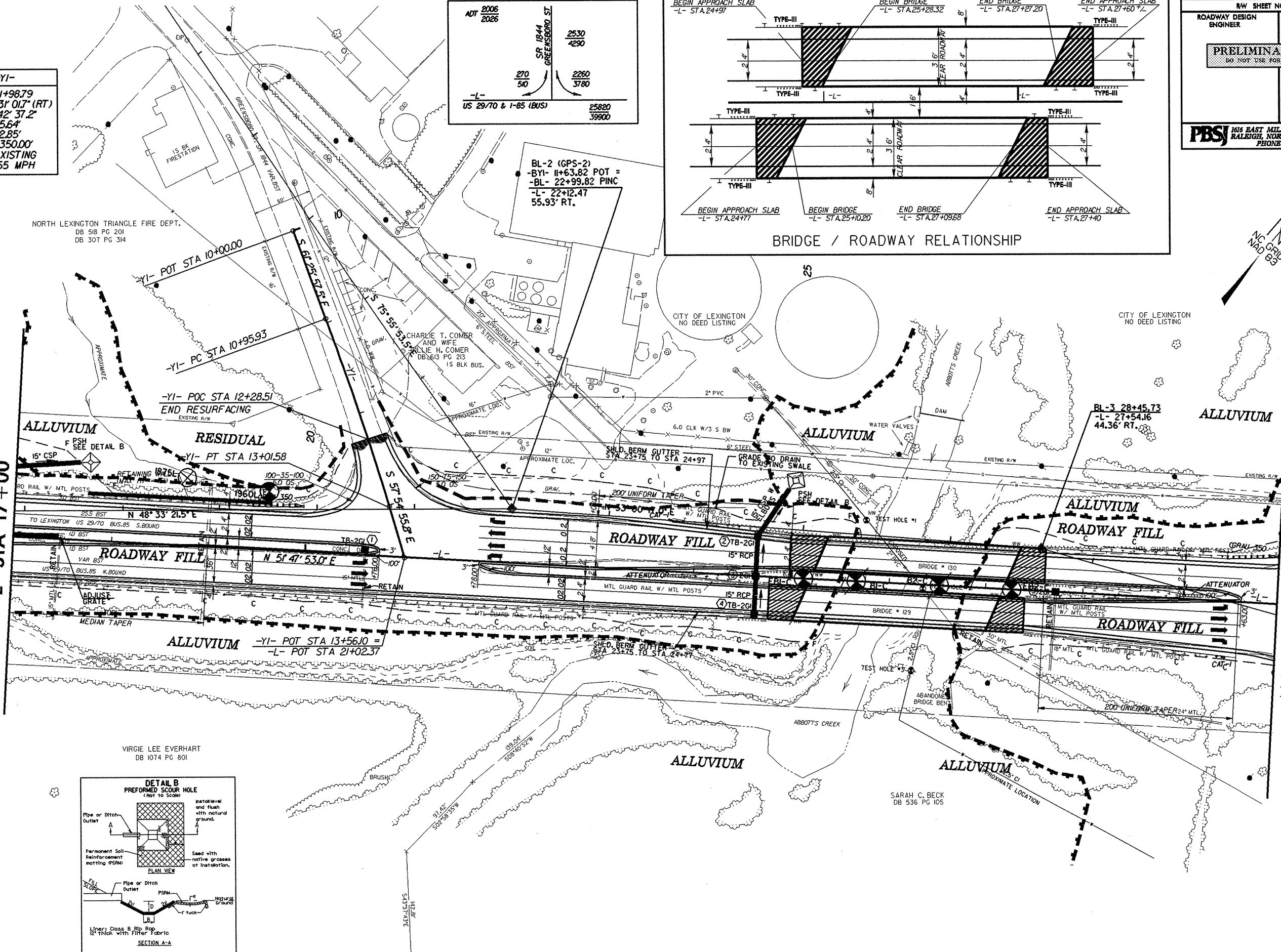
PROJECT REFERENCE NO. B-4095	SHEET NO. 5
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
PRELIMINARY PLANS <small>DO NOT USE FOR CONSTRUCTION</small>	
PBS 1616 EAST MILLBROOK ROAD, SUITE 310 RALEIGH, NORTH CAROLINA 27609 PHONE: (919)476-8888	

BL-2 (GPS-2)
 -BYI- 11+63.82 POT =
 -BL- 22+99.82 PINC
 -L- 22+12.47
 55.93' RT.

NORTH LEXINGTON TRIANGLE FIRE DEPT.
 DB 518 PG 201
 DB 307 PG 314

MATCH LINE SHEET 4
-L- STA 17+00

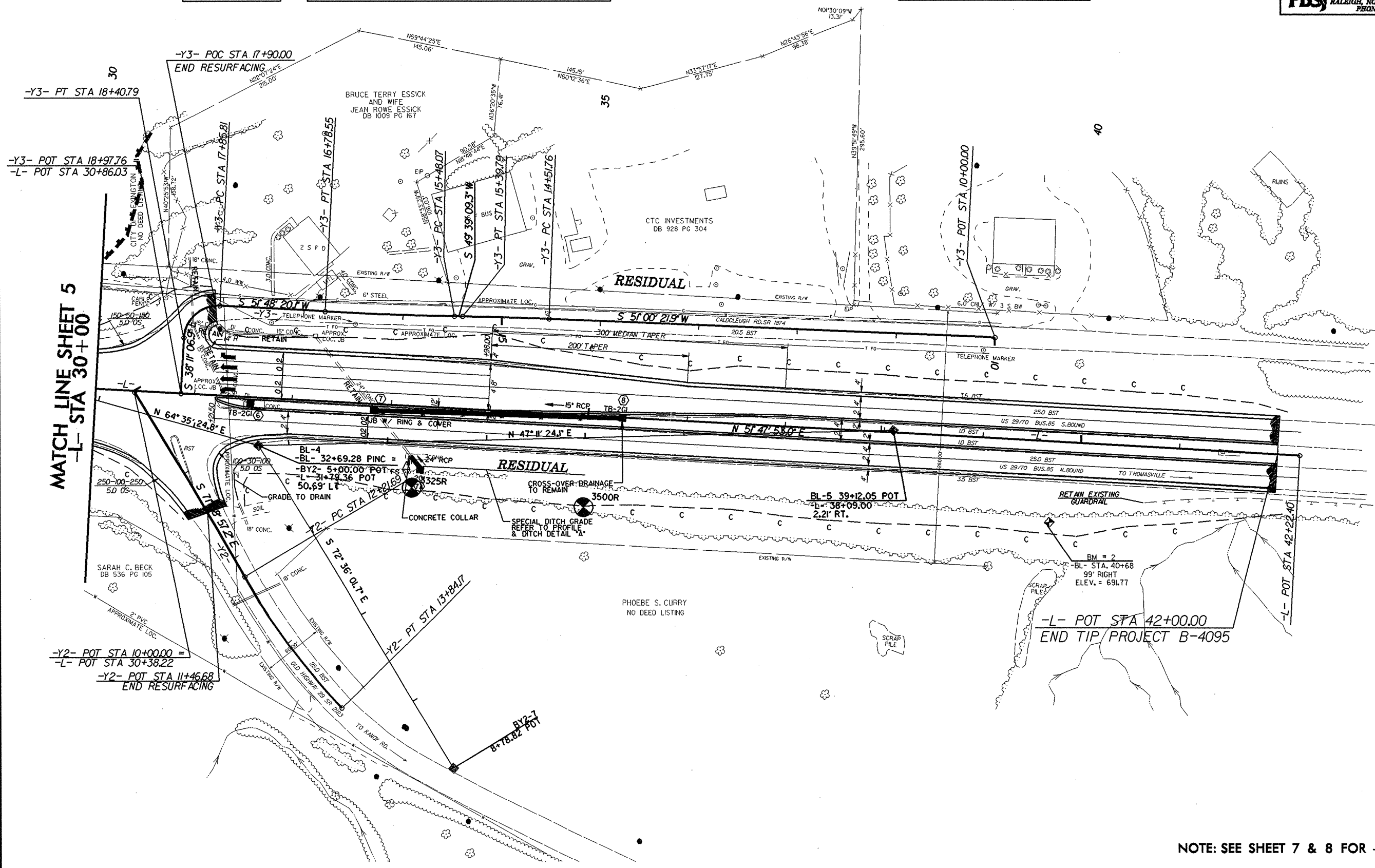
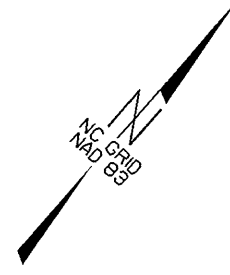
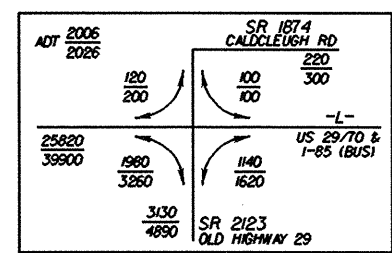
MATCH LINE SHEET 6
-L- STA 30+00



STATION	B	D	d	W	STONE	FF
25+05 LT	6.0'	2.5'	0.5'	4.0'	H TONS	31 SY
17+75 LT	3.8'	2.7'	0.5'	4.0'	KTONS	24 SY

NOTE: SEE SHEET 7 FOR -L- PROFILE.

-Y2-	-Y3-		
PI Sta 13+03.30	PI Sta 14+95.78	PI Sta 16+13.32	PI Sta 18+20.81
$\Delta = 13^{\circ}17'58.7"$ (LT)	$\Delta = 1^{\circ}21'12.7"$ (LT)	$\Delta = 2^{\circ}09'10.8"$ (RT)	$\Delta = 89^{\circ}59'27.0"$ (LT)
D = 8'11"06.4"	D = 1'32"15.0"	D = 1'39"00.0"	D = 163'42"08.0"
L = 162.49'	L = 88.03'	L = 130.48'	L = 54.97'
T = 81.61'	T = 44.02'	T = 65.25'	T = 34.99'
R = 700.00'	R = 3,726.55'	R = 3,472.47'	R = 35.00'
Se = EXISTING	Se = EXISTING	Se = EXISTING	Se = EXISTING
DS = 45 MPH	DS = 55 MPH	DS = 55 MPH	DS = 15 MPH

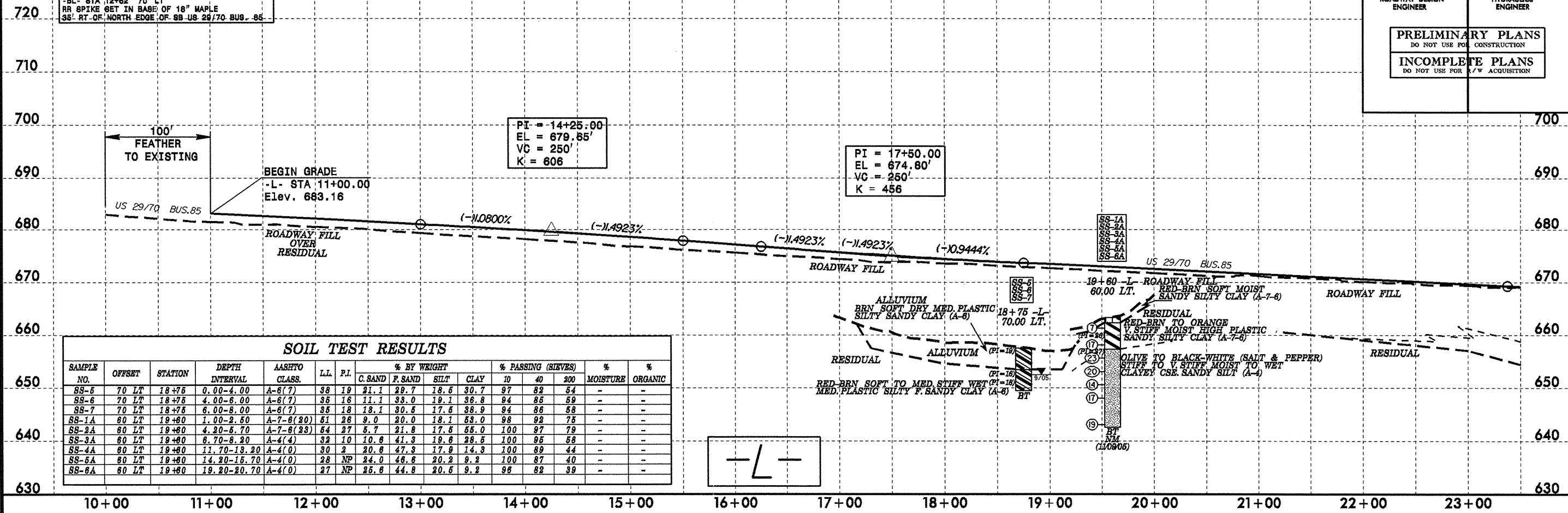


MATCH LINE SHEET 5
 -L- STA 30+00

NOTE: SEE SHEET 7 & 8 FOR -L- PROFILE.

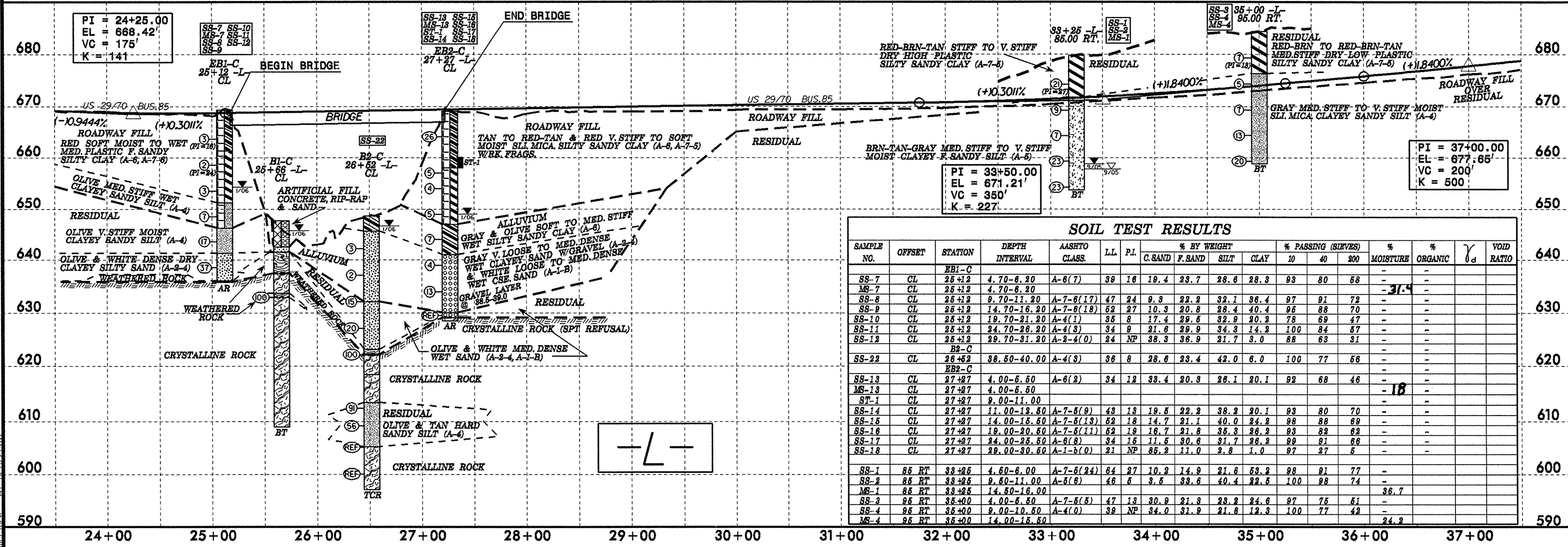
8/17/99
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 21:30:00
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 26-JAN-2006 14:44
 21:30:00
 GEOTECH.P1.enPr-01.B4995_GED.rvw_006-psb06.cadgn

BM#1 ELEVATION = 689.33
 N = 768904 E = 1844129
 -BL- STA 12+82 70' LT
 RR SPIKE SET IN BASE OF 18" MAPLE
 36" RT OF NORTH EDGE OF 88 US 29/70 BUS. 85



SOIL TEST RESULTS

SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	LL	PI	% BY WEIGHT				% PASSING (SIEVES)			% MOISTURE	% ORGANIC
							C. SAND	F. SAND	SILT	CLAY	10	40	200		
SS-5	70 LT	18+75	0.00-4.00	A-6(7)	38	19	21.1	29.7	18.5	30.7	97	82	54	-	-
SS-6	70 LT	18+75	4.00-6.00	A-6(7)	35	16	11.1	33.0	19.1	36.8	94	85	59	-	-
SS-7	70 LT	18+75	6.00-8.00	A-6(7)	35	18	13.1	30.5	17.5	38.9	94	86	58	-	-
SS-1A	80 LT	19+60	1.00-2.50	A-7-6(20)	51	26	9.0	20.0	18.1	53.0	98	92	75	-	-
SS-2A	80 LT	19+60	4.20-5.70	A-7-6(23)	54	27	5.7	21.8	17.5	55.0	100	97	79	-	-
SS-3A	80 LT	19+60	6.70-8.20	A-4(4)	32	10	10.6	41.3	19.6	28.5	100	95	68	-	-
SS-4A	80 LT	19+60	11.70-13.20	A-4(0)	30	2	20.6	47.3	17.9	14.3	100	89	44	-	-
SS-5A	80 LT	19+60	14.20-15.70	A-4(0)	28	NP	24.0	46.6	20.2	9.2	100	87	40	-	-
SS-6A	80 LT	19+60	19.20-20.70	A-4(0)	27	NP	25.6	44.8	20.5	9.2	98	82	39	-	-



SOIL TEST RESULTS

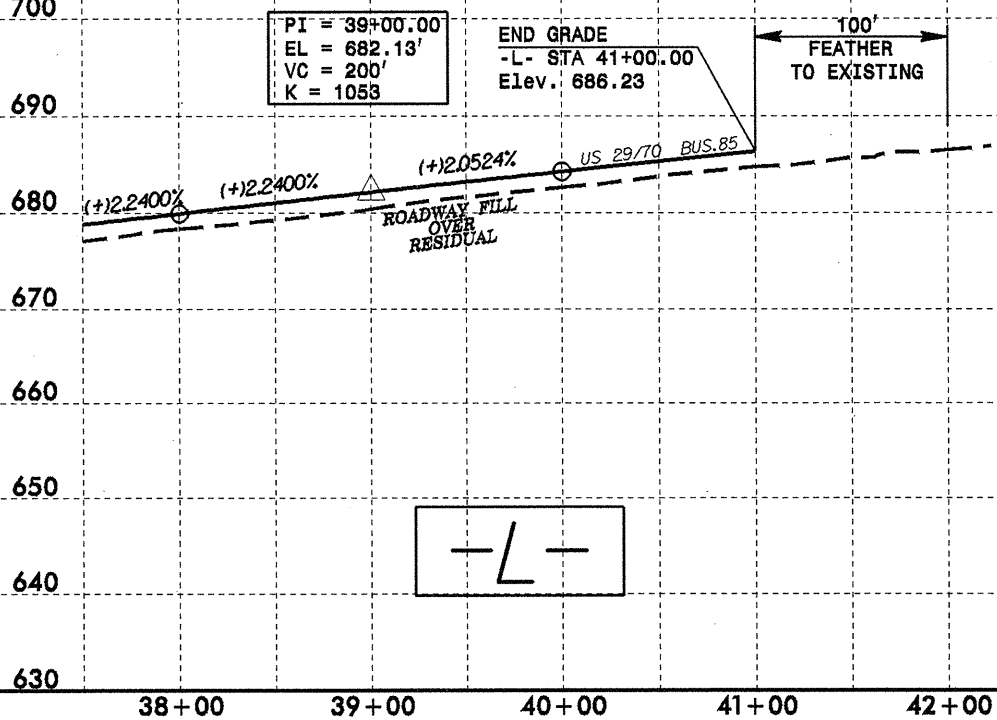
SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	LL	PI	% BY WEIGHT				% PASSING (SIEVES)			% MOISTURE	% ORGANIC	γ _d	VOID RATIO
							C. SAND	F. SAND	SILT	CLAY	10	40	200				
SS-7	CL	EB1-C	4.70-6.20	A-6(7)	38	16	18.4	23.7	28.6	28.3	93	80	58	-	-	-	-
MS-7	CL	EB1-C	4.70-6.20	A-6(7)	38	16	18.4	23.7	28.6	28.3	93	80	58	-	-	-	-
SS-8	CL	EB1-C	9.70-11.20	A-7-6(17)	47	24	9.3	22.2	32.1	38.4	97	91	72	-	-	-	-
SS-9	CL	EB1-C	14.70-16.20	A-7-6(18)	52	27	10.3	20.8	28.4	40.4	95	88	70	-	-	-	-
SS-10	CL	EB1-C	19.70-21.20	A-4(1)	35	8	17.4	29.5	32.9	20.2	78	69	47	-	-	-	-
SS-11	CL	EB1-C	24.70-26.20	A-4(3)	34	9	21.6	29.9	34.3	14.2	100	84	57	-	-	-	-
SS-12	CL	EB1-C	29.70-31.20	A-2-4(0)	24	NP	38.3	36.9	21.7	3.0	88	63	31	-	-	-	-
SS-22	CL	EB2-C	38.50-40.00	A-4(3)	36	8	28.6	23.4	42.0	6.0	100	77	56	-	-	-	-
SS-13	CL	EB2-C	4.00-5.50	A-6(2)	34	12	33.4	20.3	26.1	20.1	92	68	46	-	-	-	-
MS-13	CL	EB2-C	4.00-5.50	A-6(2)	34	12	33.4	20.3	26.1	20.1	92	68	46	-	-	-	-
ST-1	CL	EB2-C	9.00-11.00	A-6(2)	34	12	33.4	20.3	26.1	20.1	92	68	46	-	-	-	-
SS-14	CL	EB2-C	11.00-12.50	A-7-6(9)	43	18	19.5	22.2	38.2	30.1	93	80	70	-	-	-	-
SS-15	CL	EB2-C	14.00-15.50	A-7-6(13)	52	18	14.7	21.1	40.0	24.2	98	88	69	-	-	-	-
SS-16	CL	EB2-C	19.00-20.50	A-7-6(11)	52	19	16.7	21.8	35.3	28.2	93	82	62	-	-	-	-
SS-17	CL	EB2-C	24.00-25.50	A-6(8)	34	16	11.5	30.6	31.7	28.2	99	91	66	-	-	-	-
SS-18	CL	EB2-C	29.00-30.50	A-1-3(0)	21	NP	85.2	11.0	2.8	1.0	97	27	5	-	-	-	-
SS-1	85 RT	33+25	4.50-6.00	A-7-6(24)	64	27	10.2	14.9	21.6	53.2	98	91	77	-	-	-	-
SS-2	85 RT	33+25	9.50-11.00	A-5(6)	46	5	3.5	33.6	40.4	22.5	100	98	74	-	-	-	-
MS-1	85 RT	33+25	14.50-16.00	A-5(6)	46	5	3.5	33.6	40.4	22.5	100	98	74	-	-	-	-
SS-3	95 RT	35+00	4.00-5.50	A-7-6(5)	47	13	30.9	21.3	23.2	24.6	97	75	51	-	-	-	-
SS-4	95 RT	35+00	9.00-10.50	A-4(0)	39	NP	34.0	31.9	21.8	12.3	100	77	42	-	-	-	-
MS-4	95 RT	35+00	14.00-15.50	A-4(0)	39	NP	34.0	31.9	21.8	12.3	100	77	42	-	-	-	-

03-FEB-2006 15:43
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 5/28/99

5/28/99

BM#2 ELEVATION = 691.77
N = 788518 E = 1646425
-BL- STA 40+88 99' RT
RR SPIKE SET IN BASE OF 30" FORKED BERCH.
40' RT OF SOUTH EDGE OF NB US 29/70 BUS. 85'

PROJECT REFERENCE NO.	SHEET NO.
B-4095	8
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
PRELIMINARY PLANS DO NOT USE FOR CONSTRUCTION	
INCOMPLETE PLANS DO NOT USE FOR R/W ACQUISITION	



26-JAN-2006 14:58
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imc@imc