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NOTE: SEE SHEET 2A FOR PLAN SHEET LAYOUT AT TIME OF INVESTIGATION

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

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	B-3159	1	12
STATE PROJ. NO.	F.A. PROJ. NO.	DESCRIPTION	
38331.1.1	STPNHS-0052(31)	P.E. RW & UTIL.	

CONTENTS

LINE	STATION	PLAN	PROFILE	XSECT
-L-	7+75.00 to 21+00.00	4-5	8	
-Y2-	10+00.00 to 12+36.06	4	8	
-RPA-	10+00.00 to 21+61.41	7,4	9	
-LPA-	10+00.00 to 19+05.77	4	9	
-RPC-	10+00.00 to 20+71.61	6,4	10	
-LPC-	10+00.00 to 17+41.46	4	10	
-Y3-	10+00.00 to 16+09.98	6,4	11	
-Y7-	10+00.00 to 18+53.57	7	11	
SOIL TEST RESULTS		12		

ROADWAY  
SUBSURFACE INVESTIGATION

PROJ. REFERENCE NO. 38331.1.1 (B-3159) F.A. PROJ. STPNHS-0052(31)  
COUNTY DAVIDSON  
PROJECT DESCRIPTION BRIDGE NO. 27 OVER US 29-64-70 /I-85 BUS.  
ON NC 8 /US 52

INVENTORY

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 UN-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.

PERSONNEL

J.K. STICKNEY

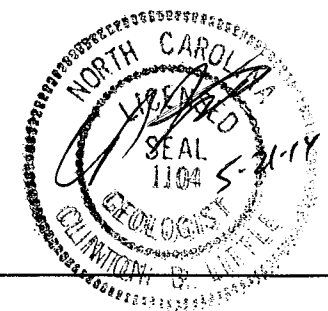
C.L. SMITH

INVESTIGATED BY J.E. BEVERLY

CHECKED BY C.B. LITTLE

SUBMITTED BY C.B. LITTLE

DATE APRIL 2014



ID: B-3159

CONTRACT:

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

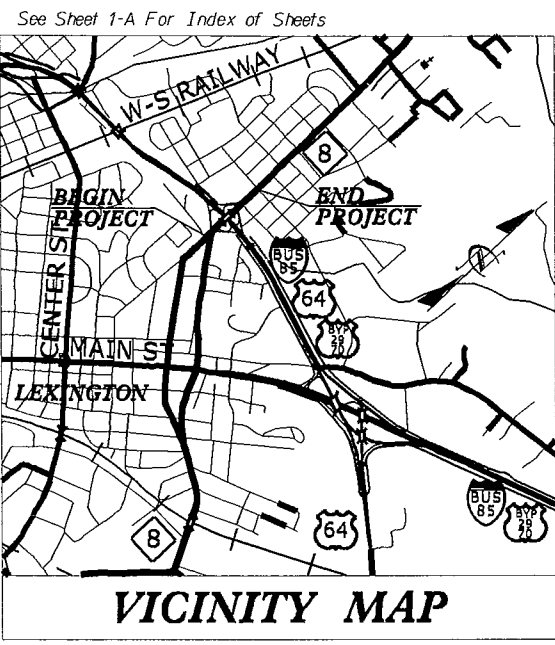
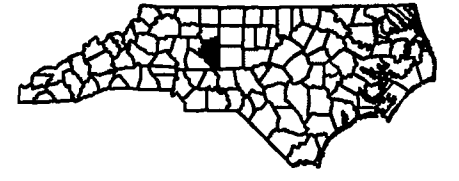
SOIL DESCRIPTION		GRADATION		ROCK DESCRIPTION		TERMS AND DEFINITIONS																																																																																																																																																																																																		
<p>SOIL IS CONSIDERED TO BE THE UNCONSOLIDATED, 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 (ASTM 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 style="text-align: center;"><i>VERY STIFF, GRAY, SILTY CLAY, MOST WITH INTERBEDDED FINE SAND LAYERS, HIGHLY PLASTIC, A-7-6</i></p>		<p><b>WELL GRADED</b> - INDICATES A GOOD REPRESENTATION OF PARTICLE SIZES FROM FINE TO COARSE. <b>UNIFORM</b> - INDICATES THAT SOIL PARTICLES ARE ALL APPROXIMATELY THE SAME SIZE. (ALSO POORLY GRADED)</p> <p><b>GAP-GRADED</b> - INDICATES A MIXTURE OF UNIFORM PARTICLES OF TWO OR MORE SIZES.</p> <p>THE ANGULARITY OR ROUNDNESS OF SOIL GRAINS IS DESIGNATED BY THE TERMS: <b>ANGULAR</b>, <b>SUBANGULAR</b>, <b>SUBROUNDED</b>, OR <b>ROUNDED</b>.</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><b>ALLUVIUM (ALLUV.)</b> - SOILS THAT HAVE BEEN TRANSPORTED BY WATER.</p> <p><b>AQUIFER</b> - A WATER BEARING FORMATION OR STRATA.</p> <p><b>ARENACEOUS</b> - APPLIED TO ROCKS THAT HAVE BEEN DERIVED FROM SAND OR THAT CONTAIN SAND.</p> <p><b>ARGILLACEOUS</b> - 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><b>ARTESIAN</b> - 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><b>CALCAREOUS (CALC.)</b> - SOILS THAT CONTAIN APPRECIABLE AMOUNTS OF CALCIUM CARBONATE.</p> <p><b>COLLUVIUM</b> - ROCK FRAGMENTS MIXED WITH SOIL DEPOSITED BY GRAVITY ON SLOPE OR AT BOTTOM OF SLOPE.</p> <p><b>CORE RECOVERY (REC.)</b> - TOTAL LENGTH OF ALL MATERIAL RECOVERED IN THE CORE BARREL DIVIDED BY TOTAL LENGTH OF CORE RUN AND EXPRESSED AS A PERCENTAGE.</p> <p><b>DIKE</b> - A TABULAR BODY OF IGNEOUS ROCK THAT CUTS ACROSS THE STRUCTURE OF ADJACENT ROCKS OR CUTS MASSIVE ROCK.</p> <p><b>DIP</b> - THE ANGLE AT WHICH A STRATUM OR ANY PLANAR FEATURE IS INCLINED FROM THE HORIZONTAL.</p> <p><b>DIP DIRECTION (DIP AZIMUTH)</b> - THE DIRECTION OR BEARING OF THE HORIZONTAL TRACE OF THE LINE OF DIP, MEASURED CLOCKWISE FROM NORTH.</p> <p><b>FAULT</b> - A FRACTURE OR FRACTURE ZONE ALONG WHICH THERE HAS BEEN DISPLACEMENT OF THE SIDES RELATIVE TO ONE ANOTHER PARALLEL TO THE FRACTURE.</p> <p><b>FISSILE</b> - A PROPERTY OF SPLITTING ALONG CLOSELY SPACED PARALLEL PLANES.</p> <p><b>FLOAT</b> - ROCK FRAGMENTS ON SURFACE NEAR THEIR ORIGINAL POSITION AND DISLODGED FROM PARENT MATERIAL.</p> <p><b>FLOOD PLAIN (FP)</b> - LAND BORDERING A STREAM, BUILT OF SEDIMENTS DEPOSITED BY THE STREAM.</p> <p><b>FORMATION (FM)</b> - A MAPPABLE GEOLOGIC UNIT THAT CAN BE RECOGNIZED AND TRACED IN THE FIELD.</p> <p><b>JOINT</b> - FRACTURE IN ROCK ALONG WHICH NO APPRECIABLE MOVEMENT HAS OCCURRED.</p> <p><b>LEDGE</b> - A SHELF-LIKE RIDGE OR PROJECTION OF ROCK WHOSE THICKNESS IS SMALL COMPARED TO ITS LATERAL EXTENT.</p> <p><b>LENS</b> - A BODY OF SOIL OR ROCK THAT THINS OUT IN ONE OR MORE DIRECTIONS.</p> <p><b>MOTTLED (MOT.)</b> - IRREGULARLY MARKED WITH SPOTS OF DIFFERENT COLORS, MOTTLING IN SOILS USUALLY INDICATES POOR AERATION AND LACK OF GOOD DRAINAGE.</p> <p><b>PERCHED WATER</b> - WATER MAINTAINED ABOVE THE NORMAL GROUND WATER LEVEL BY THE PRESENCE OF AN INTERVENING IMPERVIOUS STRATUM.</p> <p><b>RESIDUAL (RES.) SOIL</b> - SOIL FORMED IN PLACE BY THE WEATHERING OF ROCK.</p> <p><b>ROCK QUALITY DESIGNATION (RQD)</b> - 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><b>SAPROLITE (SAP.)</b> - RESIDUAL SOIL THAT RETAINS THE RELIC STRUCTURE OR FABRIC OF THE PARENT ROCK.</p> <p><b>SILL</b> - 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.</p> <p><b>SLICKENSIDE</b> - POLISHED AND STRIATED SURFACE THAT RESULTS FROM FRICTION ALONG A FAULT OR SLIP PLANE.</p> <p><b>STANDARD PENETRATION TEST (PENETRATION RESISTANCE) (SPT)</b> - NUMBER OF BLOWS IN 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.</p> <p><b>STRATA CORE RECOVERY (SREC.)</b> - TOTAL LENGTH OF STRATA MATERIAL RECOVERED DIVIDED BY TOTAL LENGTH OF STRATUM AND EXPRESSED AS A PERCENTAGE.</p> <p><b>STRATA ROCK QUALITY DESIGNATION (SRQD)</b> - 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.</p> <p><b>TOPSOIL (TS.)</b> - SURFACE SOILS USUALLY CONTAINING ORGANIC MATTER.</p>																																																																																																																																																																																																		
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ARE USED IN DESCRIPTIONS WHENEVER THEY ARE CONSIDERED OF SIGNIFICANCE.</p>		<p><b>WEATHERED ROCK (WR)</b> - NON-COASTAL PLAIN MATERIAL THAT WOULD YIELD SPT N VALUES &gt; 100 BLOWS PER FOOT IF TESTED.</p> <p><b>CRYSTALLINE ROCK (CR)</b> - FINE TO COARSE GRAIN IGNEOUS AND METAMORPHIC ROCK THAT WOULD YIELD SPT REFUSAL IF TESTED. ROCK TYPE INCLUDES GRANITE, GNEISS, GABBRO, SCHIST, ETC.</p> <p><b>NON-CRYSTALLINE ROCK (NCR)</b> - FINE TO COARSE GRAIN METAMORPHIC AND NON-COASTAL PLAIN SEDIMENTARY ROCK THAT WOULD YIELD SPT REFUSAL IF TESTED. ROCK TYPE INCLUDES PHYLLITE, SLATE, SANDSTONE, ETC.</p> <p><b>COASTAL PLAIN SEDIMENTARY ROCK (CP)</b> - COASTAL PLAIN SEDIMENTS CEMENTED INTO ROCK, BUT MAY NOT YIELD SPT REFUSAL. ROCK TYPE INCLUDES LIMESTONE, SANDSTONE, CEMENTED SHELL BEDS, ETC.</p>		<p><b>SLIGHTLY COMPRESSIBLE</b> <b>MODERATELY COMPRESSIBLE</b> <b>HIGHLY COMPRESSIBLE</b></p> <p>LIQUID LIMIT LESS THAN 31 LIQUID LIMIT EQUAL TO 31-50 LIQUID LIMIT GREATER THAN 50</p>		<p><b>PERCENTAGE OF MATERIAL</b></p> <table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <th>ORGANIC MATERIAL</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>&gt;10%</td> <td>&gt;20%</td> <td>HIGHLY</td> </tr> <tr> <td></td> <td></td> <td></td> <td>35% AND ABOVE</td> </tr> </table>		ORGANIC MATERIAL	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				35% AND ABOVE	<p><b>GROUND WATER</b></p> <p>▽ WATER LEVEL IN BORE HOLE IMMEDIATELY AFTER DRILLING</p> <p>▽ STATIC WATER LEVEL AFTER 24 HOURS</p> <p>▽PW PERCHED WATER, SATURATED ZONE, OR WATER BEARING STRATA</p> <p>○ SPRING OR SEEP</p>		<p><b>MISCELLANEOUS SYMBOLS</b></p> <p>ROADWAY EMBANKMENT (RE) WITH SOIL DESCRIPTION</p> <p>SOIL SYMBOL</p> <p>ARTIFICIAL FILL (AF) OTHER THAN ROADWAY EMBANKMENT</p> <p>INFERRED SOIL BOUNDARY</p> <p>INFERRED ROCK LINE</p> <p>ALLUVIAL SOIL BOUNDARY</p> <p>DIP &amp; DIP DIRECTION OF ROCK STRUCTURES</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>CONE PENETROMETER TEST</p> <p>SOUNDING ROD</p>		<p><b>ROCK HARDNESS</b></p> <p><b>VERY HARD</b> - CANNOT BE SCRATCHED BY KNIFE OR SHARP PICK. BREAKING OF HAND SPECIMENS REQUIRES SEVERAL HARD BLOWS OF THE GEOLOGIST'S PICK.</p> <p><b>HARD</b> - CAN BE SCRATCHED BY KNIFE OR PICK ONLY WITH DIFFICULTY. HARD HAMMER BLOWS REQUIRED TO DETACH HAND SPECIMEN.</p> <p><b>MODERATELY HARD</b> - 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.</p> <p><b>MEDIUM HARD</b> - CAN BE GROOVED OR GOUGED 0.05 INCHES DEEP BY FIRM PRESSURE OF KNIFE OR PICK POINT. CAN BE EXCAVATED IN SMALL CHIPS TO PIECES 1 INCH MAXIMUM SIZE BY HARD BLOWS OF THE POINT OF A GEOLOGIST'S PICK.</p> <p><b>SOFT</b> - CAN BE GROOVED OR GOUGED READILY BY KNIFE OR PICK. CAN BE EXCAVATED IN FRAGMENTS FROM CHIPS TO SEVERAL INCHES IN SIZE BY MODERATE BLOWS OF A PICK POINT. SMALL, THIN PIECES CAN BE BROKEN BY FINGER PRESSURE.</p> <p><b>VERY SOFT</b> - CAN BE CARVED WITH KNIFE. CAN BE EXCAVATED READILY WITH POINT OF PICK. PIECES 1 INCH OR MORE IN THICKNESS CAN BE BROKEN BY FINGER PRESSURE. CAN BE SCRATCHED READILY BY FINGER NAIL.</p>	
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STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	B-3159	2A	
STATE PROJ. NO.	F.A. PROJ. NO.	DESCRIPTION	
38331.1.1	STPNHS-0052(31)	PE	

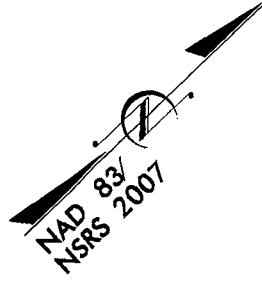
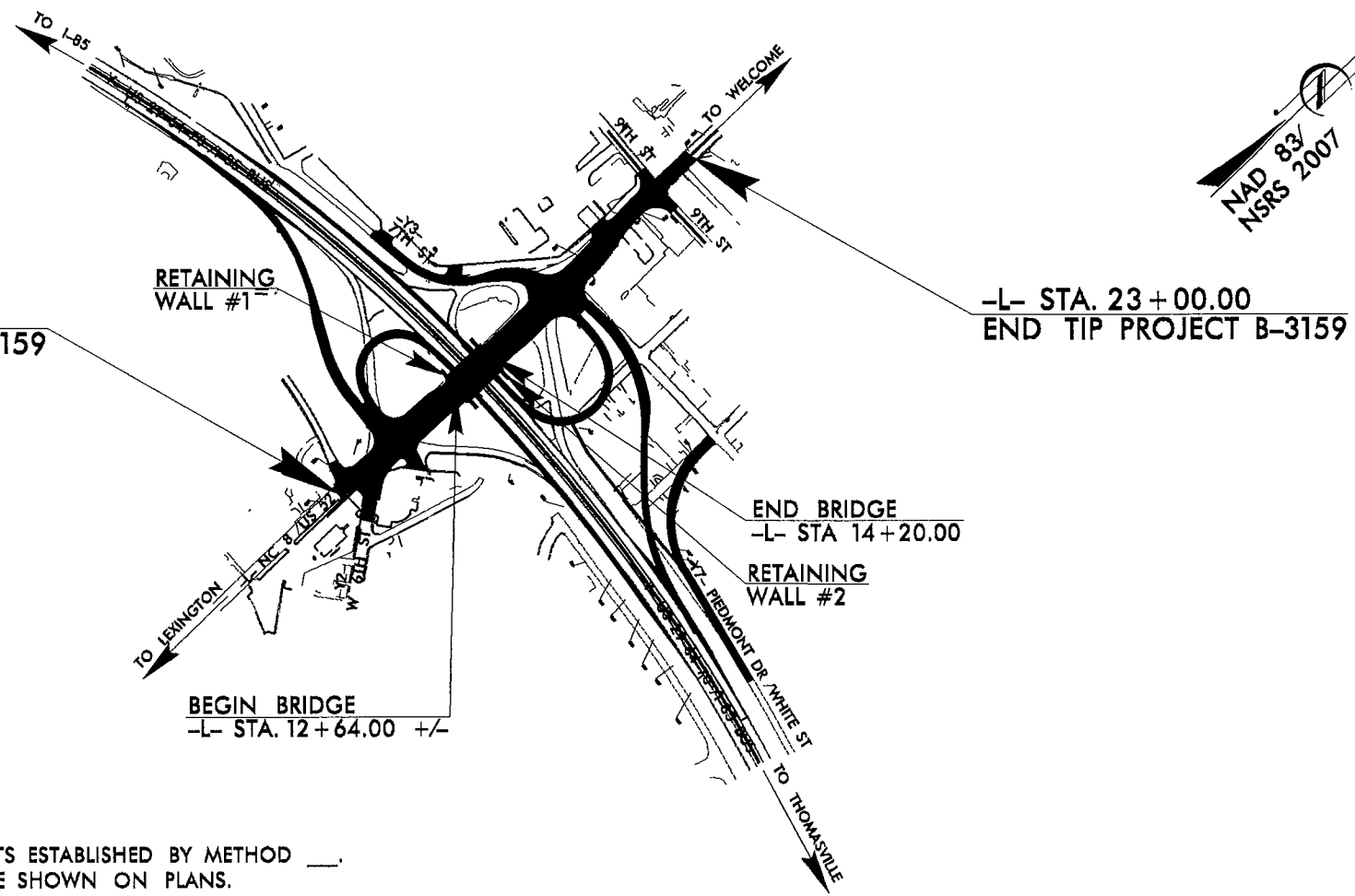
STATE OF NORTH CAROLINA  
DIVISION OF HIGHWAYS

**DAVIDSON COUNTY**

LOCATION: BRIDGE NO. 27 OVER US 29-64-70 / I-85 BUS ON NC 8 / US 52  
TYPE OF WORK: GRADING, DRAINAGE, PAVING, RETAINING WALL,  
& STRUCTURE



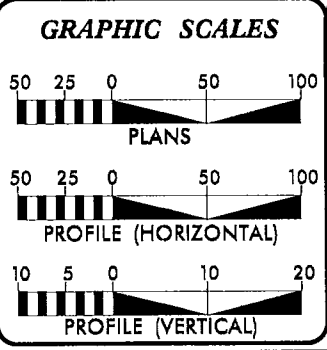
**TIP PROJECT: B-3159**



CLEARING ON THIS PROJECT SHOULD BE PERFORMED TO THE LIMITS ESTABLISHED BY METHOD \_\_\_\_.  
THIS IS A FULL CONTROLLED-ACCESS PROJECT WITH ACCESS TO BE SHOWN ON PLANS.  
THIS PROJECT IS WITHIN THE CITY LIMITS OF LEXINGTON.

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

**CONTRACT:**



**DESIGN DATA**

ADT 2009 =	23,900
ADT 2035 =	28,600
DHV =	10 %
D =	60 %
T =	5 % *
V =	40 MPH
* TTST =	2 DUAL 3
FUNC CLASS =	ARTERIAL
STATEWIDE TIER	

**PROJECT LENGTH**

LENGTH ROADWAY OF TIP PROJECT B-3159 =	0.259 MILES
LENGTH STRUCTURE OF TIP PROJECT B-3159 =	0.030 MILES
TOTAL LENGTH OF TIP PROJECT B-3159 =	0.289 MILES

Prepared In the Office of:  
**DIVISION OF HIGHWAYS**  
1000 Birch Ridge Dr., Raleigh NC, 27610

2012 STANDARD SPECIFICATIONS

RIGHT OF WAY DATE: JUNE 20, 2014

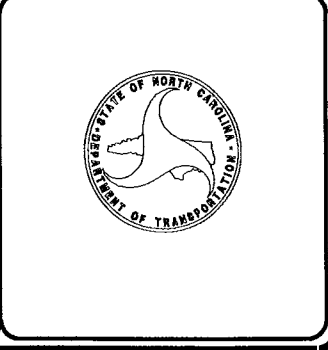
LETTING DATE: JUNE 16, 2015

HYDRAULICS ENGINEER

SIGNATURE: \_\_\_\_\_

ROADWAY DESIGN ENGINEER

SIGNATURE: \_\_\_\_\_



08-APR-2014 11:05 C:\Projects\3159\_CEO\_RDWY-DAVIDSON\ADD\_GEO\TECH\Plan\Prof\B3159\_GEO\_inv\_orig-rdy-tsh\_002A.dgn jimc@ncdot.gov



STATE OF NORTH CAROLINA  
DEPARTMENT OF TRANSPORTATION

PAT MCCRORY  
GOVERNOR

ANTHONY J. TATA  
SECRETARY

April 14, 2014

STATE PROJECT: 38331.1.1 (B-3159)  
F.A. PROJECT: STPNHS-0052(31)  
COUNTY: Davidson  
DESCRIPTION: Bridge No. 27 over US 29-64-70 / I-85 Business on NC 8 / US 52  
SUBJECT: Geotechnical Report – Inventory

This report presents the findings for the proposed interchange surrounding bridge # 27 in Davidson County. The bridge lies at the intersection of NC 8 / US 52 and US 29-64-70 / I-85 Business.

The geotechnical field investigation was conducted in the month of February 2014 with the addition of two PDEA borings from May 2010. An ATV mounted CME 550X drill machine equipped with automatic drop hammer was utilized to perform test borings. The following survey lines are addressed in this report.

Line	Station
-L-	7+75 to 21+00
-Y2-	10+00 to 12+36.06
-RPA-	10+00 to 21+61.41
-LPA-	10+00 to 19+05.77
-RPC-	10+00 to 20+71.61
-LPC-	10+00 to 17+41.46
-Y3-	10+00 to 16+09.98
-Y7-	10+00 to 18+53.57

**Areas of Special Geotechnical Interest:**

1. *Groundwater:*

Groundwater was encountered in several borings during the course of this investigation, however in only 2 instances was groundwater at or above proposed grade. Following is a list of those locations:

Boring Location	Groundwater Elevation
-LPA- 15+35, 25.3' RT	774.1'
-LPC- 11+43, 38' LT	764.5'

2. *Crystalline Rock:*

Rock was not encountered during the course of this investigation.

3. *High PI Soils: (PI's 28 and greater)*

High PI clay soils were only encountered in one instance. An A-7-5 clay with a PI value of 45 was noted at -LPA- station 15+35, 8' RT. Depth range of the soil is 0 – 12 feet which puts it above proposed grade, however it may exist in the proposed side slope cuts around this vicinity.

4. *Alluvial Soils:*

There are no alluvial soils present on the project.

**Physiography / Geology:**

The project area is located in east-central Davidson County within the city limits of Lexington. Topography is predominantly flat with the area surrounded by business structures and traversed by major highways, ramps and loops.

Geologically the site lies in the Carolina Slate Belt with residual soil types originating from metamorphic mafic rock types of Paleozoic Era (PzZm).

**Soil Properties:**

1. *Residual Soils:*

These soils are derived from in place weathering of parent materials. They occur in a variety of consistencies, classifications, and stratigraphic sequences. Residual soils are further subdivided into clays, silts, and sands. In most instances residual soils in this area are micaceous with mica amounts ranging from trace to high.

Clays are common soils within this area. They are found as surface soils and at depth. Boring and sample data indicates they consist of medium stiff to stiff, trace to very micaceous, silty sandy clay. AASHTO classifications were A-7-5 and A-7-6. Clay soils appear well drained with a plasticity index range from 18 to 45. Corresponding liquid limit ranges were between 46 and 85.

Silts are also common and consist of soft to hard, some to very micaceous, clayey sandy silt. AASHTO classifications are A-4, and A-5. Silts were only noted below 7 feet.

MAILING ADDRESS:  
NC DEPARTMENT OF TRANSPORTATION  
DIRECTOR OF PRECONSTRUCTION  
1538 MAIL SERVICE CENTER  
RALEIGH NC 27699-1538

TELEPHONE: 919-707-2540  
FAX: 919-715-5361  
WEBSITE: WWW.NCDOT.GOV

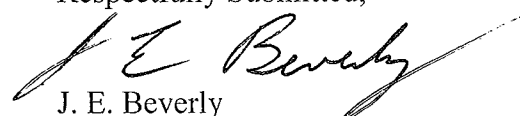
LOCATION:  
TRANSPORTATION BUILDING  
1 SOUTH WILMINGTON STREET  
RALEIGH NC

Sands consist of loose to dense, some mica, clayey silty sand and clayey sand with corresponding AASHTO classifications of A-2-4, and A-2-6. Sands occur at multiple depth ranges.

2. *Fill Soils:*

Roadway embankment fill soils are present beneath the existing roads, loops and ramps associated with the interchange. Roadway fill soils were medium stiff to stiff sandy silty clay with the A-6 AASHTO classification.

Respectfully Submitted,



J. E. Beverly  
Project Engineering Geologist

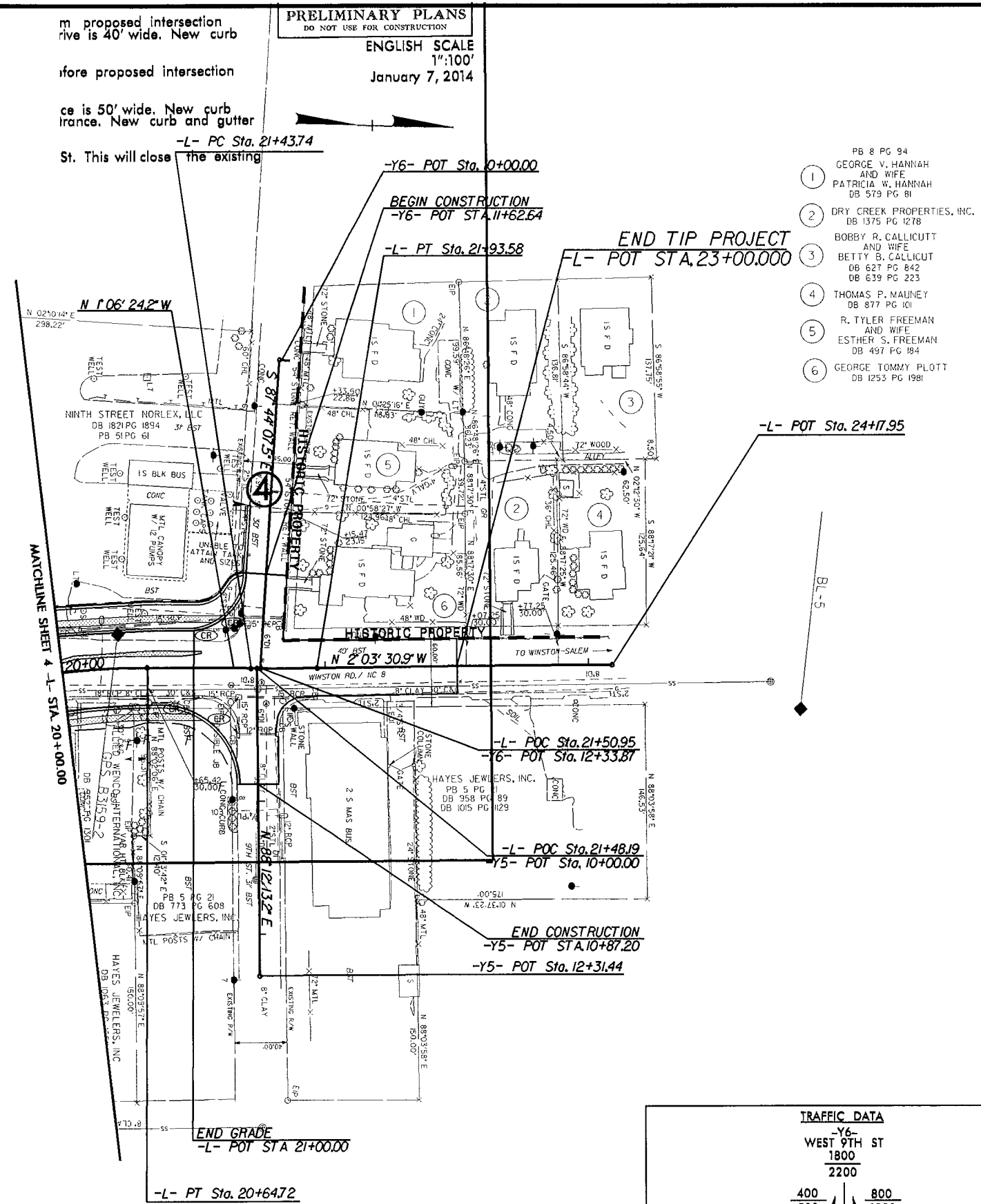
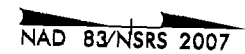


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 08-APP-2014  
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 08-APP-2014  
 C:\projects\83159\83159.dgn

m proposed intersection  
 rive is 40' wide. New curb  
 fore proposed intersection  
 ce is 50' wide. New curb  
 rance. New curb and gutter  
 -L- PC Sta. 21+43.74  
 St. This will close the existing

**PRELIMINARY PLANS**  
 DO NOT USE FOR CONSTRUCTION  
**ENGLISH SCALE**  
 1"=100'  
 January 7, 2014

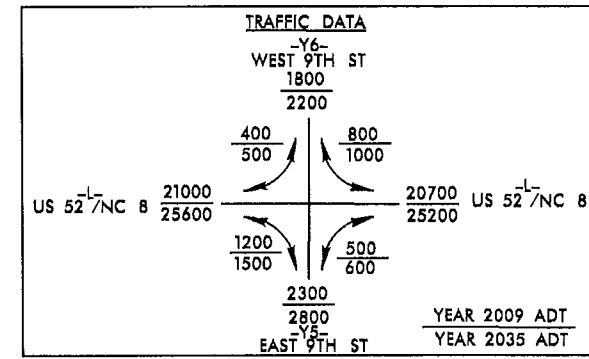
PROJECT REFERENCE NO.	SHEET NO.
B-3159	5
BY SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
<b>INCOMPLETE PLANS</b> DO NOT USE FOR ACQUISITION	
<b>PRELIMINARY PLANS</b> DO NOT USE FOR CONSTRUCTION	



- 1 GEORGE V. HANNAH AND WIFE PATRICIA W. HANNAH DB 579 PG 81
- 2 DRY CREEK PROPERTIES, INC. DB 1375 PG 1278
- 3 BOBBY R. CALLICUTT AND WIFE BETTY B. CALLICUT DB 627 PG 842 DB 639 PG 223
- 4 THOMAS P. MAJNEY DB 877 PG 101
- 5 R. TYLER FREEMAN AND WIFE ESTHER S. FREEMAN DB 497 PG 184
- 6 GEORGE TOMMY PLOTT DB 1253 PG 1981

-L-

PI Sta 19+97.13	PI Sta 21+68.66
$\Delta = 14' 36" 42.4" (RT)$	$\Delta = 0' 57" 06.7" (LT)$
$D = 10' 44" 58.8"$	$D = 1' 54" 35.5"$
$L = 135.93'$	$L = 49.84'$
$T = 68.33'$	$T = 24.92'$
$R = 533.00'$	$R = 3,000.00'$
SE = SEE PLANS	SE = SEE PLANS



SIDEWALK / ISLANDS  
**NOTES:**  
 SEE SHEET 8 FOR -L- PROFILE  
 SEE SHEET 2 FOR INTERSECTION DETAIL



-RPC-			-Y-		
PIs Sta 11+97.82	PI Sta 13+50.37	PIs Sta 15+01.75	PI Sta 25+58.78		
$\Theta_s = 8^\circ 58' 47.7"$	$\Delta = 17^\circ 41' 38.5" (RT)$	$\Theta_s = 8^\circ 58' 47.7"$	$\Delta = 30^\circ 35' 22.0" (RT)$		
$L_s = 184.00'$	$D = 9^\circ 45' 38.8"$	$L_s = 184.00'$	$D = 1^\circ 00' 18.7"$		
$LT = 122.82'$	$L = 181.28'$	$LT = 122.82'$	$L = 3,043.15'$		
$ST = 61.48'$	$T = 91.37'$	$ST = 61.48'$	$T = 1,558.78'$		
	$R = 587.00'$		$R = 5,700.00'$		
	$SE = .08$		$SE = EXIST$		

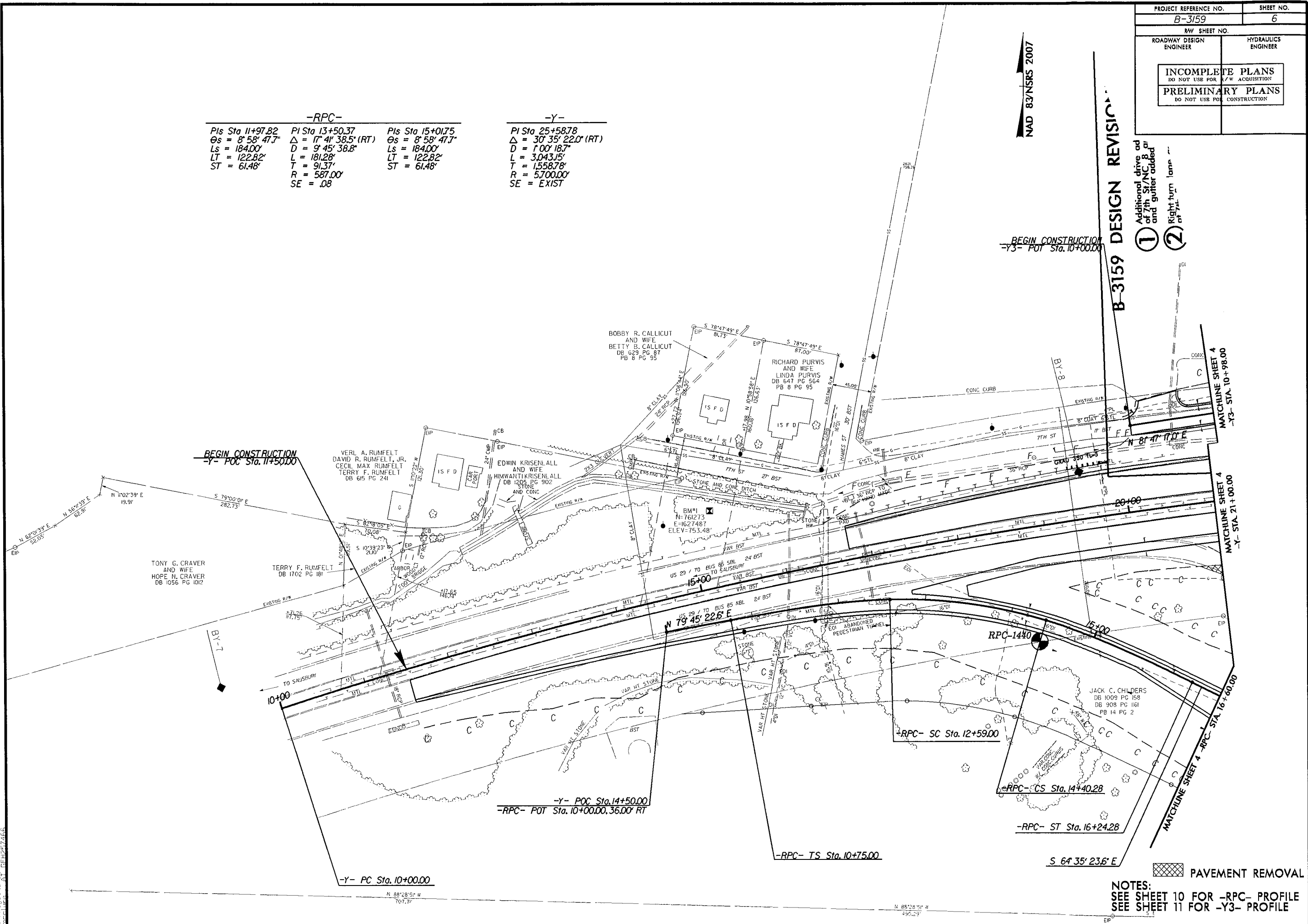
NAD 83/NSRS 2007

**B-3159 DESIGN REVISION**

- ① Additional drive and of 7th St/NCB and gutter added
- ② Right turn lane

BEGIN CONSTRUCTION  
-Y3- POT Sta. 10+00.00

BEGIN CONSTRUCTION  
-Y- POC Sta. 11+50.00

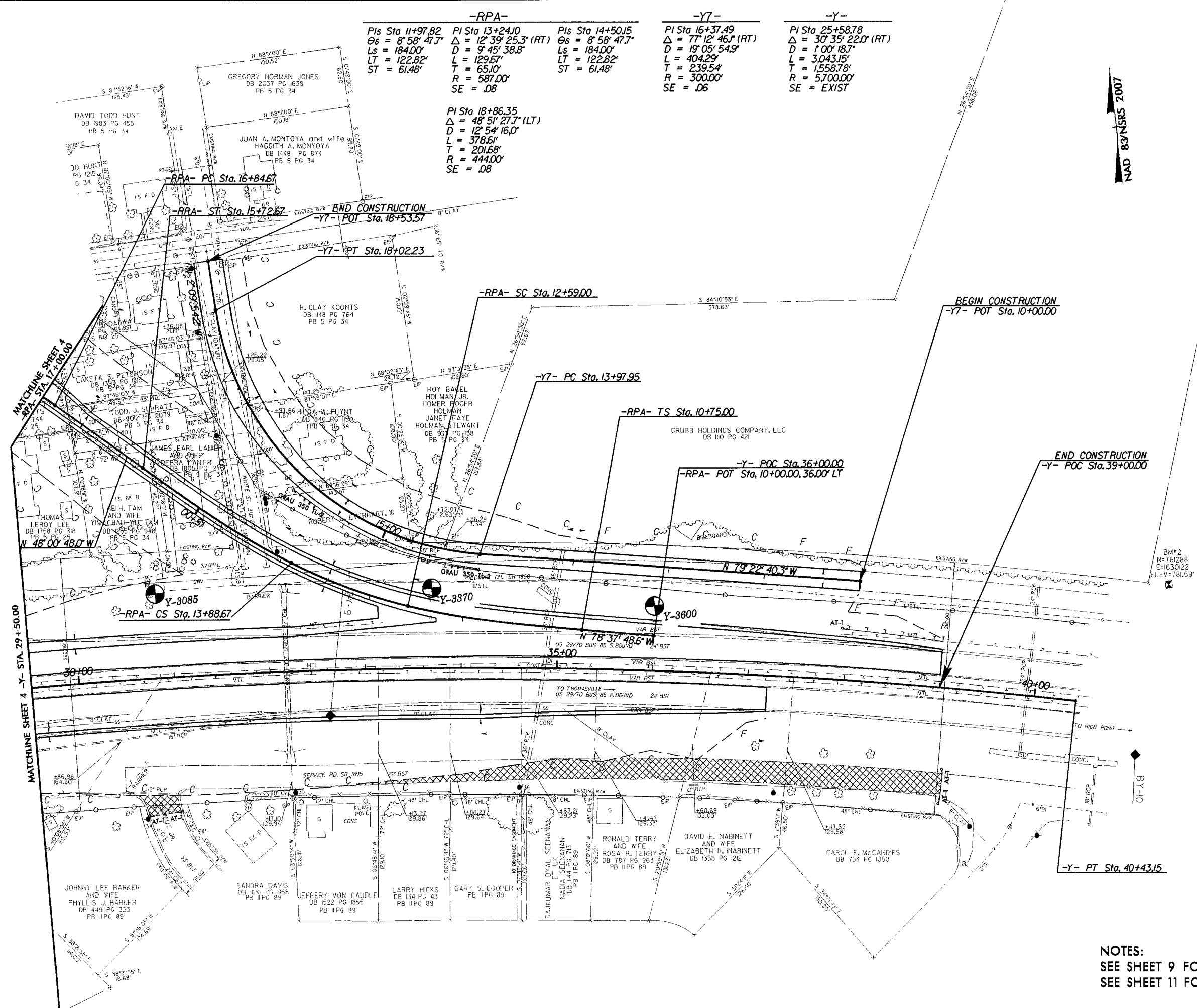


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 8/17/99

PAVEMENT REMOVAL  
 NOTES:  
 SEE SHEET 10 FOR -RPC- PROFILE  
 SEE SHEET 11 FOR -Y3- PROFILE

-RPA-	-Y7-	-Y-
PI Sta 11+97.82 Os = 8' 58' 47.7" Ls = 184.00' LT = 122.82' ST = 61.48'	PI Sta 13+24.10 Δ = 12' 39' 25.3" (RT) D = 9' 45' 38.8" L = 129.67' T = 65.10' R = 587.00' SE = .08	PI Sta 14+50.15 Os = 8' 58' 47.7" Ls = 184.00' LT = 122.82' ST = 61.48'
	PI Sta 16+37.49 Δ = 77' 12' 46.1" (RT) D = 19' 05' 54.9" L = 404.29' T = 239.54' R = 300.00' SE = .06	PI Sta 25+58.78 Δ = 30' 35' 22.0" (RT) D = 1' 00' 18.7" L = 3,043.15' T = 1,558.78' R = 5,700.00' SE = EXIST
	PI Sta 18+86.35 Δ = 48' 51' 27.7" (LT) D = 12' 54' 16.0" L = 378.61' T = 201.68' R = 444.00' SE = .08	

NAD 83/NSRS 2007



REVISIONS

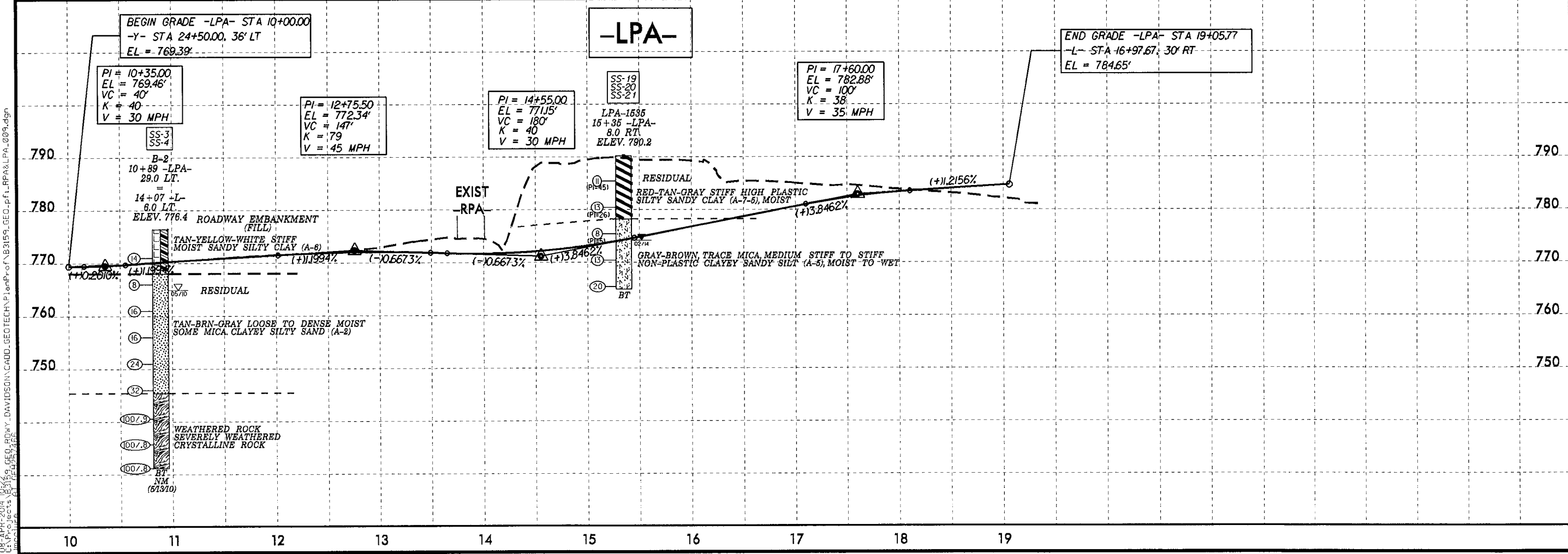
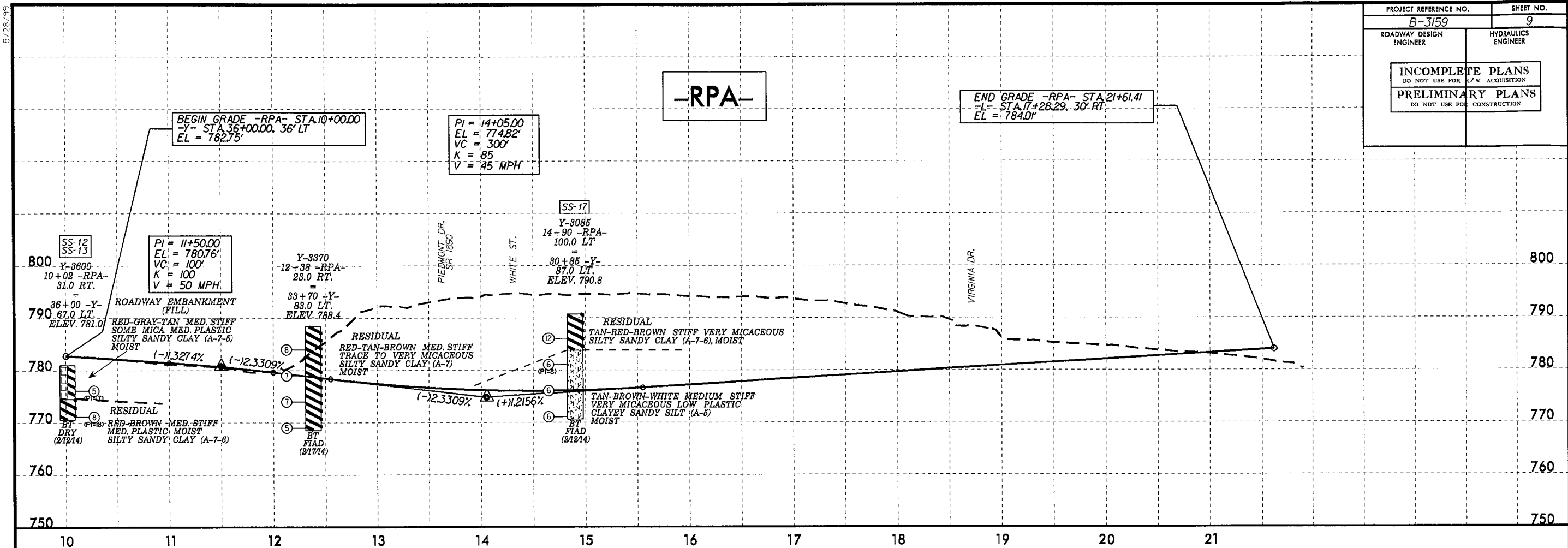
1/20/13 (AEV) DESIGN REVISION - REMOVED RETAINING WALL #3 FROM ALONG -Y-

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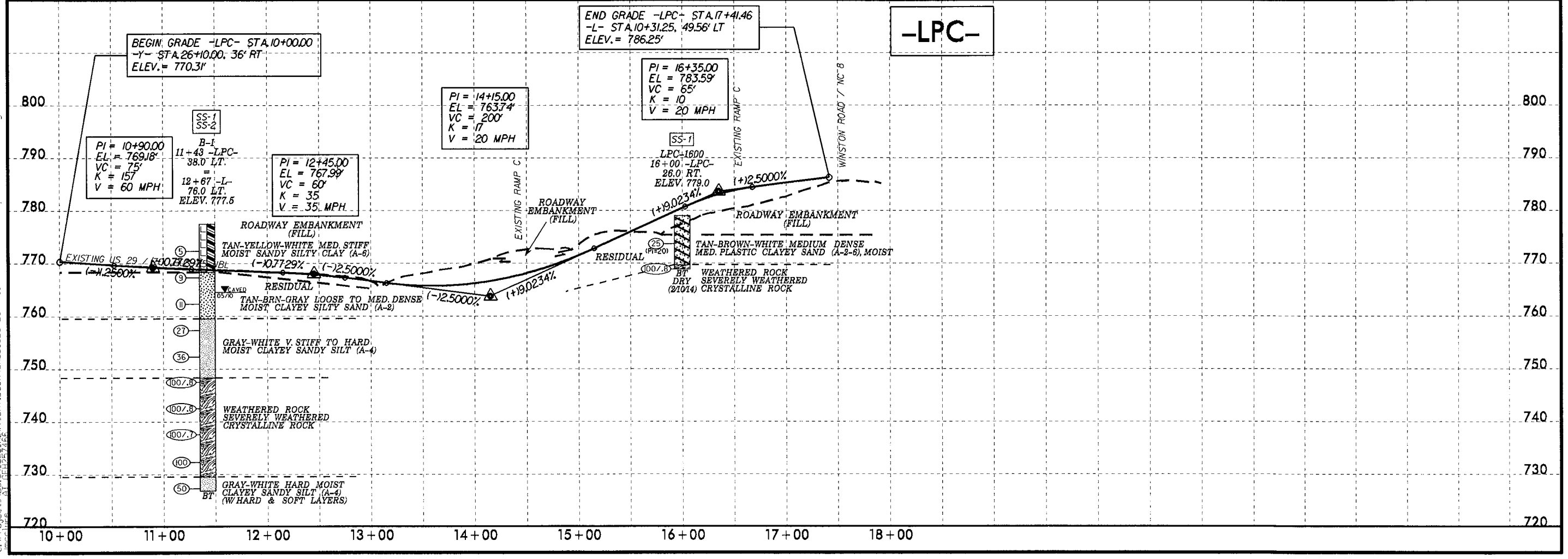
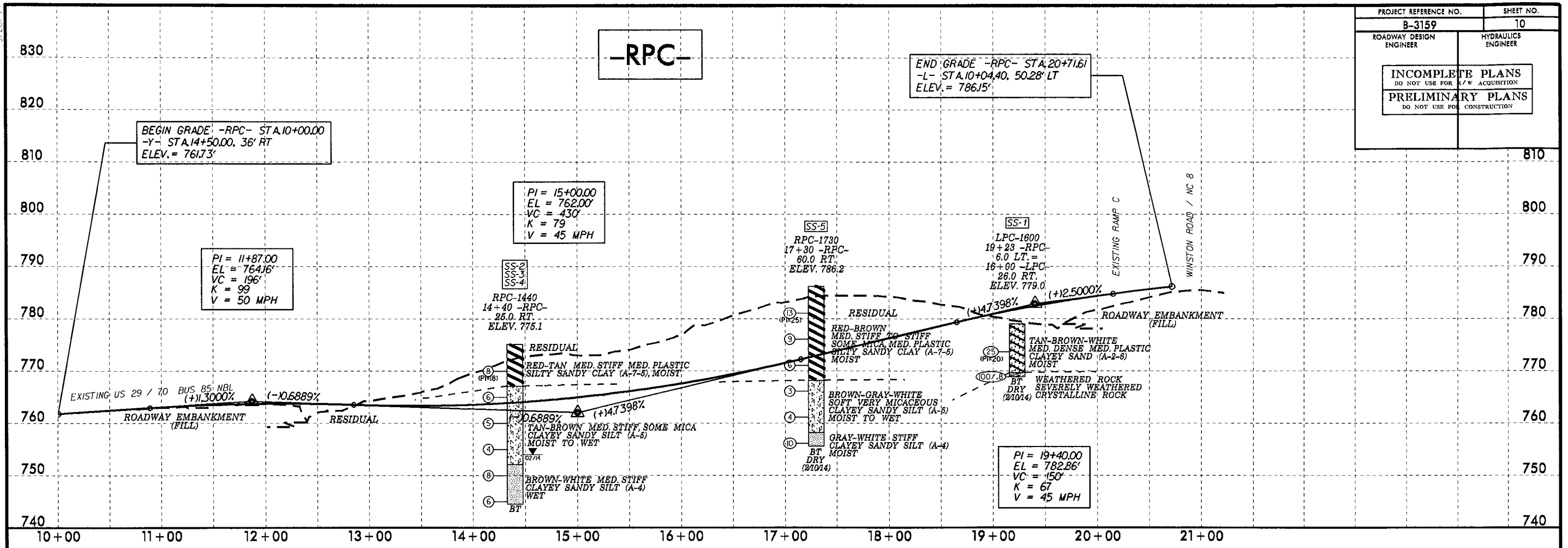
**NOTES:**  
 SEE SHEET 9 FOR -RPA- PROFILE.  
 SEE SHEET 11 FOR -Y7- PROFILE.



PROJECT REFERENCE NO. B-3159	SHEET NO. 9
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
<b>INCOMPLETE PLANS</b> DO NOT USE FOR ACQUISITION <b>PRELIMINARY PLANS</b> DO NOT USE FOR CONSTRUCTION	



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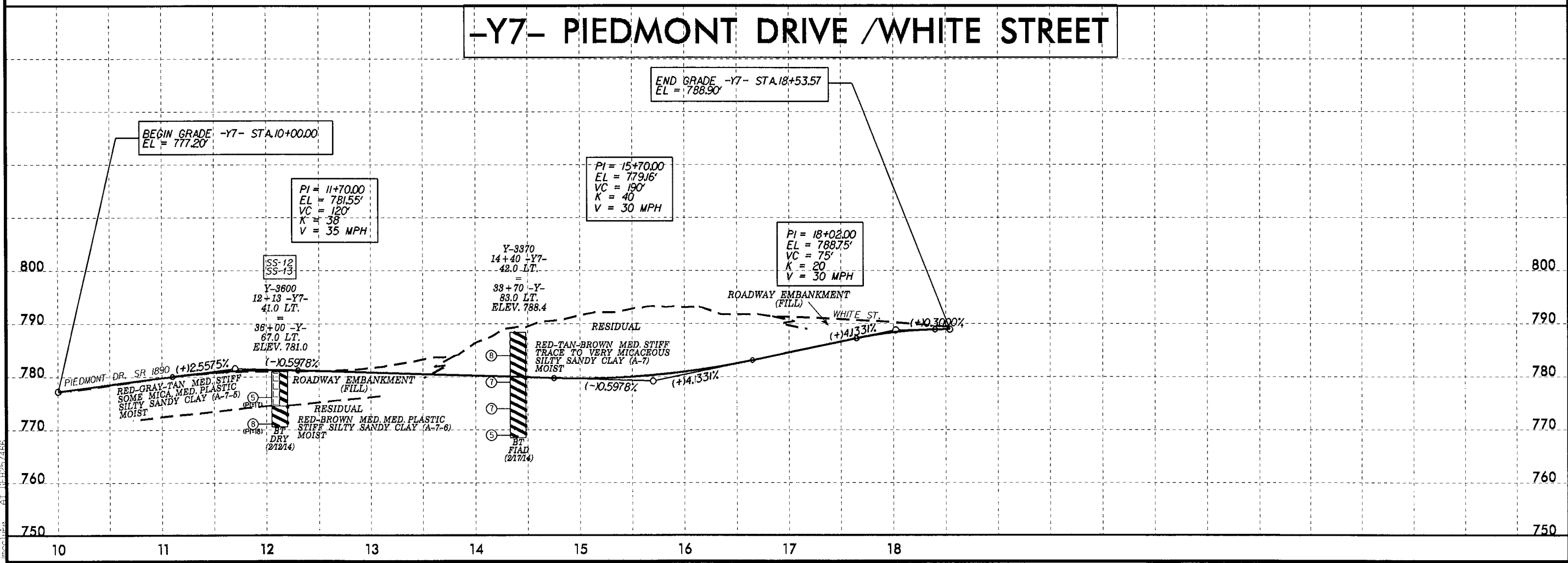
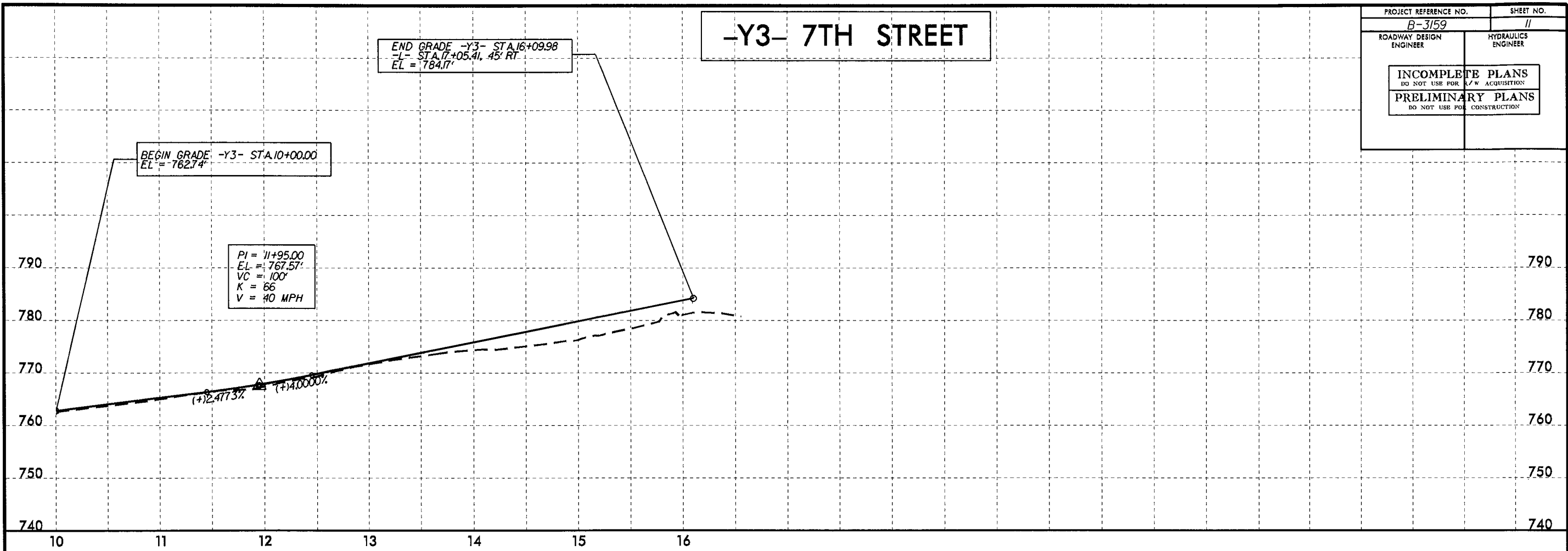


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5/28/99

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PROJECT REFERENCE NO. B-3159	SHEET NO. 11
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
<b>INCOMPLETE PLANS</b> DO NOT USE FOR ACQUISITION <b>PRELIMINARY PLANS</b> DO NOT USE FOR CONSTRUCTION	



## SOIL TEST RESULTS

SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT				% PASSING (SIEVES)			% MOISTURE	% ORGANIC	Line or Boring ID
							C.SAND	F.SAND	SILT	CLAY	10	40	200			
SS-1	26 RT	16+00	4.8-5.8	A-2-6(1)	37	20	55.5	14.1	8.2	22.1	73	39	24	-	-	LPC
SS-2	25 RT	14+40	4.6-5.6	A-7-5(10)	65	18	15.9	35.0	20.9	28.2	100	92	55	-	-	RPC
SS-3	25 RT	14+40	9.6-10.6	A-5(0)	42	NP	21.1	41.6	23.1	14.1	100	89	44	-	-	RPC
SS-4	25 RT	14+40	24.6-25.6	A-4(0)	31	NP	19.5	45.3	23.1	12.1	100	92	44	-	-	RPC
SS-5	60 RT	17+30	4.6-5.6	A-7-5(19)	67	25	12.7	23.3	25.8	38.2	100	95	69	-	-	RPC
SS-12	67 LT	36+00	4.4-5.4	A-7-5(14)	57	17	10.3	25.6	30.0	34.2	100	95	71	-	-	Y
SS-13	67 LT	36+00	9.4-10.4	A-7-6(13)	46	18	10.9	20.1	26.8	42.3	100	95	73	-	-	Y
SS-17	87 LT	30+85	9.2-10.2	A-5(3)	49	8	21.9	32.6	27.4	18.1	94	80	48	-	-	Y
SS-19	8 RT	15+35	4.3-5.3	A-7-5(40)	85	45	11.1	13.5	11.1	64.4	100	94	78	-	-	LPA
SS-20	8 RT	15+35	9.3-10.3	A-7-6(16)	46	26	11.9	25.4	14.5	48.3	100	96	68	-	-	LPA
SS-21	8 RT	15+35	14.3-15.3	A-5(3)	45	5	4.2	49.3	32.4	14.1	100	99	57	-	-	LPA
THE FOLLOWING SAMPLES ARE FROM PROJECT 38331.1.1 (B-3159) PDEA																
SS-1	76 LT	12+67	9.7-10.7	A-2-4(0)	39	3	30.2	44.3	19.4	6.1	98	82	33	-	-	B-1 (-L-)
SS-2	76 LT	12+67	19.7-20.7	A-2-4(0)	25	NP	18.6	62.7	16.7	2.0	100	92	32	-	-	B-1 (-L-)
SS-3	6 LT	14+07	4.9-5.9	A-6(7)	39	21	18.6	35.5	19.4	26.5	99	91	52	-	-	B-2 (-L-)
SS-4	6 LT	14+07	9.9-10.9	A-2-4(0)	37	3	25.7	48.0	18.2	8.2	100	88	34	-	-	B-2 (-L-)

PROJECT: 38331.1.1 REFERENCE: B-3159

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

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	B-3159	1	11

**CONTENTS**

<u>SHEET NO.</u>	<u>DESCRIPTION</u>
1	TITLE SHEET
2	LEGEND
3	SITE PLAN
4	PROFILE(S)
5-II	BORE LOG(S)

# STRUCTURE SUBSURFACE INVESTIGATION

COUNTY DAVIDSON  
 PROJECT DESCRIPTION REPLACE BRIDGE 27 OVER  
US 29-64-70/1-85 BUSINESS LOOP ON US 52/NC 8  
 SITE DESCRIPTION NOISE WALL ON SERVICE RD.  
(SR 1895) (-NW- STA. 10+00 TO 22+45)

**CAUTION NOTICE**

THE SUBSURFACE INFORMATION AND THE SUBSURFACE INVESTIGATION ON WHICH IT IS BASED WERE MADE FOR THE PURPOSE OF STUDY, PLANNING AND DESIGN, AND NOT FOR CONSTRUCTION OR PAY PURPOSES. THE VARIOUS FIELD BORING LOGS, ROCK CORES AND SOIL TEST DATA AVAILABLE MAY BE REVIEWED OR INSPECTED IN RALEIGH BY CONTACTING THE N. C. DEPARTMENT OF TRANSPORTATION, GEOTECHNICAL ENGINEERING UNIT AT 1919 TOT-6850. THE SUBSURFACE PLANS AND REPORTS, FIELD BORING LOGS, ROCK CORES AND SOIL TEST DATA ARE NOT 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.

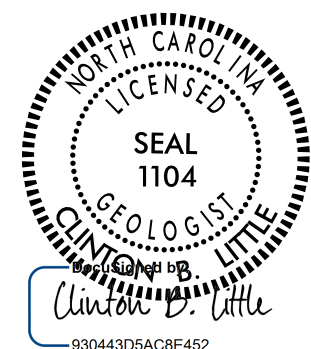
THE BIDDER OR CONTRACTOR IS CAUTIONED THAT DETAILS SHOWN ON THE SUBSURFACE PLANS ARE PRELIMINARY ONLY AND IN MANY CASES THE FINAL DESIGN DETAILS ARE DIFFERENT. FOR BIDDING AND CONSTRUCTION PURPOSES, REFER TO THE CONSTRUCTION PLANS AND DOCUMENTS FOR FINAL DESIGN INFORMATION ON THIS PROJECT. THE DEPARTMENT 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 THE 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.

- NOTES:
1. THE INFORMATION CONTAINED HEREIN IS NOT IMPLIED OR GUARANTEED BY THE N. C. DEPARTMENT OF TRANSPORTATION AS ACCURATE NOR IS IT CONSIDERED PART OF THE PLANS, SPECIFICATIONS OR CONTRACT FOR THE PROJECT.
  2. 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.

PERSONNEL

C.C. MURRAY  
J.E. ESTEP  
W.R. MOORE

INVESTIGATED BY J.E. BEVERLY  
 DRAWN BY J.K. McCLURE  
 CHECKED BY C.B. LITTLE  
 SUBMITTED BY C.B. LITTLE  
 DATE APRIL 2015



4/27/2015

SIGNATURE DATE



NORTH CAROLINA DEPARTMENT OF TRANSPORTATION  
DIVISION OF HIGHWAYS  
GEOTECHNICAL ENGINEERING UNIT  
**SUBSURFACE INVESTIGATION**  
SOIL AND ROCK LEGEND, TERMS, SYMBOLS, AND ABBREVIATIONS

**SOIL DESCRIPTION**

SOIL IS CONSIDERED 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 THE STANDARD PENETRATION TEST (AASHTO T 206, ASTM D1586). SOIL CLASSIFICATION IS BASED ON THE AASHTO SYSTEM. BASIC DESCRIPTIONS GENERALLY INCLUDE THE FOLLOWING: CONSISTENCY, COLOR, TEXTURE, MOISTURE, AASHTO CLASSIFICATION, AND OTHER PERTINENT FACTORS SUCH AS MINERALOGICAL COMPOSITION, ANGULARITY, STRUCTURE, PLASTICITY, ETC. FOR EXAMPLE, VERY STIFF, GRAY, SILTY CLAY, MOIST WITH INTERBEDDED FINE SAND LAYERS, HIGHLY PLASTIC, A-7-6

**SOIL LEGEND AND AASHTO CLASSIFICATION**

GENERAL CLASS.	GRANULAR MATERIALS (≤ 35% PASSING #200)						SILT-CLAY MATERIALS (> 35% PASSING #200)						ORGANIC MATERIALS						
	A-1	A-3	A-2	A-4	A-5	A-7	A-1, A-2	A-4, A-5	A-6	A-7	A-1, A-2	A-4, A-5	A-6	A-7	A-1, A-2	A-4, A-5	A-6	A-7	
GROUP CLASS.	A-1-a	A-1-b	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-4, A-5	A-6	A-7	A-1, A-2	A-4, A-5	A-6	A-7	
SYMBOL																			
% PASSING #10 #40 #200	50 MX 30 MX 15 MX	50 MX 25 MX 10 MX	51 MN 35 MX 35 MX	35 MX 35 MX 35 MX	35 MX 35 MX 35 MX	35 MX 35 MX 35 MX	36 MN 36 MN 36 MN	36 MN 36 MN 36 MN	36 MN 36 MN 36 MN	36 MN 36 MN 36 MN	36 MN 36 MN 36 MN	36 MN 36 MN 36 MN	36 MN 36 MN 36 MN	36 MN 36 MN 36 MN	36 MN 36 MN 36 MN	36 MN 36 MN 36 MN	36 MN 36 MN 36 MN	36 MN 36 MN 36 MN	36 MN 36 MN 36 MN
MATERIAL PASSING #40 LL PI	-	6 MX	NP	40 MX 10 MX	41 MN 10 MX	40 MX 11 MN	40 MX 11 MN	40 MX 11 MN	40 MX 11 MN	40 MX 11 MN	40 MX 11 MN	40 MX 11 MN	40 MX 11 MN	40 MX 11 MN	40 MX 11 MN	40 MX 11 MN	40 MX 11 MN	40 MX 11 MN	40 MX 11 MN
GROUP INDEX	0	0	0	4 MX	8 MX	12 MX	16 MX	NO MX	NO MX	NO MX	NO MX	NO MX	NO MX	NO MX	NO MX	NO MX	NO MX	NO MX	NO MX
USUAL TYPES OF MAJOR MATERIALS	STONE FRAGS. GRAVEL, AND SAND	FINE SAND	SILTY OR CLAYEY GRAVEL AND SAND	SILTY SOILS	CLAYEY SOILS	CLAYEY SOILS	CLAYEY SOILS	CLAYEY SOILS	CLAYEY SOILS	CLAYEY SOILS	CLAYEY SOILS	CLAYEY SOILS	CLAYEY SOILS	CLAYEY SOILS	CLAYEY SOILS	CLAYEY SOILS	CLAYEY SOILS	CLAYEY SOILS	CLAYEY SOILS
GEN. RATING AS SUBGRADE	EXCELLENT TO GOOD						FAIR TO POOR						FAIR TO POOR	POOR	UNSATURABLE				
PI OF A-7-5 SUBGROUP IS ≤ LL - 30 ; PI OF A-7-6 SUBGROUP IS > LL - 30																			

**CONSISTENCY OR DENSENESS**

PRIMARY SOIL TYPE	COMPACTNESS OR CONSISTENCY	RANGE OF STANDARD PENETRATION RESISTANCE (N-VALUE)	RANGE OF UNCONFINED COMPRESSIVE STRENGTH (TONS/FT <sup>2</sup> )
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 1.0 1 TO 2 2 TO 4 > 4

**TEXTURE OR GRAIN SIZE**

U.S. STD. SIEVE SIZE OPENING (MM)	4	10	40	60	200	270
	4.76	2.00	0.42	0.25	0.075	0.053
BOULDER (BLDR.)						
COBBLE (COB.)						
GRAVEL (GR.)						
COARSE SAND (CS, SD.)						
FINE SAND (F SD.)						
SILT (SL.)						
CLAY (CL.)						
GRAIN SIZE	305	75	2.0	0.25	0.05	0.005
MM						
IN.	12	3				

**SOIL MOISTURE - CORRELATION OF TERMS**

SOIL MOISTURE SCALE (ATTERBERG LIMITS)	FIELD MOISTURE DESCRIPTION	GUIDE FOR FIELD MOISTURE DESCRIPTION
LL	LIQUID LIMIT	
PL	PLASTIC LIMIT	
OM	OPTIMUM MOISTURE SHRINKAGE LIMIT	
	- SATURATED - (SAT.)	USUALLY LIQUID; VERY WET, USUALLY FROM BELOW THE GROUND WATER TABLE
	- WET - (W)	SEMISOLID; REQUIRES DRYING TO ATTAIN OPTIMUM MOISTURE
	- MOIST - (M)	SOLID; AT OR NEAR OPTIMUM MOISTURE
	- DRY - (D)	REQUIRES ADDITIONAL WATER TO ATTAIN OPTIMUM MOISTURE

**PLASTICITY**

NON PLASTIC	SLIGHTLY PLASTIC	MODERATELY PLASTIC	HIGHLY PLASTIC
0-5	6-15	16-25	26 OR MORE
VERY LOW	SLIGHT	MEDIUM	HIGH

**COLOR**

DESCRIPTIONS MAY INCLUDE COLOR OR COLOR COMBINATIONS (TAN, RED, YELLOW-BROWN, BLUE-GRAY). MODIFIERS SUCH AS LIGHT, DARK, STREAKED, ETC. ARE USED TO DESCRIBE APPEARANCE.

**GRADATION**

**WELL GRADED** - INDICATES A GOOD REPRESENTATION OF PARTICLE SIZES FROM FINE TO COARSE.  
**UNIFORMLY GRADED** - INDICATES THAT SOIL PARTICLES ARE ALL APPROXIMATELY THE SAME SIZE.  
**GAP-GRADED** - INDICATES A MIXTURE OF UNIFORM PARTICLE SIZES OF TWO OR MORE SIZES.

**ANGULARITY OF GRAINS**

THE ANGULARITY OR ROUNDNESS OF SOIL GRAINS IS DESIGNATED BY THE TERMS: ANGULAR, SUBANGULAR, SUBROUNDED, OR ROUNDED.

**MINERALOGICAL COMPOSITION**

MINERAL NAMES SUCH AS QUARTZ, FELDSPAR, MICA, TALC, KAOLIN, ETC. ARE USED IN DESCRIPTIONS WHEN THEY ARE CONSIDERED OF SIGNIFICANCE.

**COMPRESSIBILITY**

SLIGHTLY COMPRESSIBLE LL < 31  
MODERATELY COMPRESSIBLE LL = 31 - 50  
HIGHLY COMPRESSIBLE LL > 50

**PERCENTAGE OF MATERIAL**

ORGANIC MATERIAL	GRANULAR SOILS	SILT - CLAY SOILS	OTHER MATERIAL
TRACE OF ORGANIC MATTER	2 - 3%	3 - 5%	TRACE 1 - 10%
LITTLE ORGANIC MATTER	3 - 5%	5 - 12%	LITTLE 10 - 20%
MODERATELY ORGANIC	5 - 10%	12 - 20%	SOME 20 - 35%
HIGHLY ORGANIC	> 10%	> 20%	HIGHLY 35% AND ABOVE

**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 SEEP

**MISCELLANEOUS SYMBOLS**

	ROADWAY EMBANKMENT (RE) WITH SOIL DESCRIPTION		SPT DMT TEST BORING		SLOPE INDICATOR INSTALLATION
	SOIL SYMBOL		AUGER BORING		CONE PENETROMETER TEST
	ARTIFICIAL FILL (AF) OTHER THAN ROADWAY EMBANKMENT		CORE BORING		SOUNDING ROD
	INFERRED SOIL BOUNDARY		MONITORING WELL		TEST BORING WITH CORE
	INFERRED ROCK LINE		PIEZOMETER INSTALLATION		SPT N-VALUE
	ALLUVIAL SOIL BOUNDARY				

**RECOMMENDATION SYMBOLS**

	UNDERCUT EXCAVATION		UNCLASSIFIED EXCAVATION - UNSUITABLE WASTE		UNCLASSIFIED EXCAVATION - ACCEPTABLE DEGRADED ROCK
	SHALLOW UNDERCUT				

**ABBREVIATIONS**

AR - AUGER REFUSAL	MED. - MEDIUM	VST - VANE SHEAR TEST
BT - BORING TERMINATED	MICA - MICACEOUS	WEA. - WEATHERED
CL - CLAY	MOD. - MODERATELY	W - UNIT WEIGHT
CPT - COPE PENETRATION TEST	NP - NON PLASTIC	W <sub>d</sub> - DRY UNIT WEIGHT
CSE - COARSE	ORG. - ORGANIC	
DMT - DILATOMETER TEST	PMT - PRESSUREMETER TEST	
DPT - DYNAMIC PENETRATION TEST	SAP. - SAPROLITIC	
e - VOID RATIO	SD. - SAND, SANDY	
F - FINE	SL. - SILTY, SILTY	
FOSS. - FOSSILIFEROUS	SLI. - SLIGHTLY	
FRAC. - FRACTURED, FRACTURES	TCR - TRICONE REFUSAL	
FRAGS. - FRAGMENTS	w - MOISTURE CONTENT	
HI. - HIGHLY	V - VERY	

**EQUIPMENT USED ON SUBJECT PROJECT**

<input type="checkbox"/> CME-45C	<input type="checkbox"/> CLAY BITS	<input checked="" type="checkbox"/> AUTOMATIC	<input type="checkbox"/> MANUAL
<input type="checkbox"/> CME-55	<input type="checkbox"/> 6" CONTINUOUS FLIGHT AUGER	<input type="checkbox"/> CORE SIZE:	<input type="checkbox"/> -B
<input checked="" type="checkbox"/> CME-550	<input checked="" type="checkbox"/> 8" HOLLOW AUGERS	<input type="checkbox"/> -N	<input type="checkbox"/> -H
<input type="checkbox"/> VANE SHEAR TEST	<input type="checkbox"/> HARD FACED FINGER BITS	<input type="checkbox"/> HAND TOOLS:	<input type="checkbox"/> POST HOLE DIGGER
<input type="checkbox"/> PORTABLE HOIST	<input checked="" type="checkbox"/> TUNG-CARBIDE INSERTS	<input type="checkbox"/> HAND AUGER	<input type="checkbox"/> SOUNDING ROD
<input type="checkbox"/>	<input type="checkbox"/> CASING <input type="checkbox"/> W/ ADVANCER	<input type="checkbox"/> VANE SHEAR TEST	<input type="checkbox"/>
<input type="checkbox"/>	<input type="checkbox"/> TRICONE <input type="checkbox"/> STEEL TEETH		
<input type="checkbox"/>	<input type="checkbox"/> TRICONE <input type="checkbox"/> TUNG-CARB.		
<input type="checkbox"/>	<input type="checkbox"/> CORE BIT		

**ROCK DESCRIPTION**

HARD ROCK IS NON-COASTAL PLAIN MATERIAL THAT WOULD YIELD SPT REFUSAL IF TESTED. AN INFERRED ROCK LINE INDICATES THE LEVEL AT WHICH NON-COASTAL PLAIN MATERIAL WOULD YIELD SPT REFUSAL. SPT REFUSAL IS PENETRATION BY A SPLIT SPOON SAMPLER EQUAL TO OR LESS THAN 0.1 FOOT PER 60 BLOWS IN NON-COASTAL PLAIN MATERIAL. THE TRANSITION BETWEEN SOIL AND ROCK IS OFTEN REPRESENTED BY A ZONE OF WEATHERED ROCK. ROCK MATERIALS ARE TYPICALLY DIVIDED AS FOLLOWS:

**WEATHERED ROCK (WR)** - NON-COASTAL PLAIN MATERIAL THAT WOULD YIELD SPT N VALUES > 100 BLOWS PER FOOT IF TESTED.

**CRYSTALLINE ROCK (CR)** - FINE TO COARSE GRAIN IGNEOUS AND METAMORPHIC ROCK THAT WOULD YIELD SPT REFUSAL IF TESTED. ROCK TYPE INCLUDES GRANITE, GNEISS, GABBRO, SCHIST, ETC.

**NON-CRYSTALLINE ROCK (NCR)** - FINE TO COARSE GRAIN METAMORPHIC AND NON-COASTAL PLAIN SEDIMENTARY ROCK THAT WOULD YIELD SPT REFUSAL IF TESTED. ROCK TYPE INCLUDES PHYLLITE, SLATE, SANDSTONE, ETC.

**COASTAL PLAIN SEDIMENTARY ROCK (CP)** - COASTAL PLAIN SEDIMENTS CEMENTED INTO ROCK, BUT MAY NOT YIELD SPT REFUSAL. ROCK TYPE INCLUDES LIMESTONE, SANDSTONE, CEMENTED SHELL BEDS, ETC.

**WEATHERING**

**FRESH** - ROCK FRESH, CRYSTALS BRIGHT, FEW JOINTS MAY SHOW SLIGHT STAINING. ROCK RINGS UNDER HAMMER IF CRYSTALLINE.

**VERY SLIGHT (V SL.)** - ROCK GENERALLY FRESH, JOINTS STAINED, SOME JOINTS MAY SHOW THIN CLAY COATINGS IF OPEN. CRYSTALS ON A BROKEN SPECIMEN FACE SHINE BRIGHTLY. ROCK RINGS UNDER HAMMER BLOWS IF OF A CRYSTALLINE NATURE.

**SLIGHT (SL.)** - ROCK GENERALLY FRESH, JOINTS STAINED AND DISCOLORATION EXTENDS INTO ROCK UP TO 1 INCH. OPEN JOINTS MAY CONTAIN CLAY. IN GRANITOID ROCKS SOME OCCASIONAL FELDSPAR CRYSTALS ARE DULL AND DISCOLORED. CRYSTALLINE ROCKS RING UNDER HAMMER BLOWS.

**MODERATE (MOD.)** - SIGNIFICANT PORTIONS OF ROCK SHOW DISCOLORATION AND WEATHERING EFFECTS. IN GRANITOID ROCKS, MOST FELDSPARS ARE DULL AND DISCOLORED, SOME SHOW CLAY. ROCK HAS DULL SOUND UNDER HAMMER BLOWS AND SHOWS SIGNIFICANT LOSS OF STRENGTH AS COMPARED WITH FRESH ROCK.

**MODERATELY SEVERE (MOD. SEV.)** - ALL ROCK EXCEPT QUARTZ DISCOLORED OR STAINED. IN GRANITOID ROCKS, ALL FELDSPARS DULL AND DISCOLORED AND A MAJORITY SHOW KAOLINIZATION. ROCK SHOWS SEVERE LOSS OF STRENGTH AND CAN BE EXCAVATED WITH A GEOLOGIST'S PICK. ROCK GIVES "CLUNK" SOUND WHEN STRUCK. IF TESTED, WOULD YIELD SPT REFUSAL.

**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. IF TESTED, WOULD YIELD SPT N VALUES > 100 BPF.

**VERY SEVERE (V SEV.)** - ALL ROCK EXCEPT QUARTZ DISCOLORED OR STAINED. ROCK FABRIC ELEMENTS ARE DISCERNIBLE BUT MASS IS EFFECTIVELY REDUCED TO SOIL STATUS, WITH ONLY FRAGMENTS OF STRONG ROCK REMAINING. SAPROLITE IS AN EXAMPLE OF ROCK WEATHERED TO A DEGREE THAT ONLY MINOR VESTIGES OF ORIGINAL ROCK FABRIC REMAIN. IF TESTED, WOULD YIELD SPT N VALUES < 100 BPF.

**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.

**ROCK HARDNESS**

**VERY HARD** - CANNOT BE SCRATCHED BY KNIFE OR SHARP PICK. BREAKING OF HAND SPECIMENS REQUIRES SEVERAL HARD BLOWS OF THE GEOLOGIST'S PICK.

**HARD** - CAN BE SCRATCHED BY KNIFE OR PICK ONLY WITH DIFFICULTY. HARD HAMMER BLOWS REQUIRED TO DETACH HAND SPECIMEN.

**MODERATELY HARD** - CAN BE SCRATCHED BY KNIFE OR PICK. GOUGES OR GROOVES TO 0.25 INCHES DEEP CAN BE EXCAVATED BY HARD BLOW OF A GEOLOGIST'S PICK. HAND SPECIMENS CAN BE DETACHED BY MODERATE BLOWS.

**MEDIUM HARD** - CAN BE GROOVED OR GOUGED 0.05 INCHES DEEP BY FIRM PRESSURE OF KNIFE OR PICK POINT. CAN BE EXCAVATED IN SMALL CHIPS TO PIECES 1 INCH MAXIMUM SIZE BY HARD BLOWS OF THE POINT OF A GEOLOGIST'S PICK.

**SOFT** - CAN BE GROOVED OR GOUGED READILY BY KNIFE OR PICK. CAN BE EXCAVATED IN FRAGMENTS FROM CHIPS TO SEVERAL INCHES IN SIZE BY MODERATE BLOWS OF A PICK POINT. SMALL, THIN PIECES CAN BE BROKEN BY FINGER PRESSURE.

**VERY SOFT** - CAN BE CARVED WITH KNIFE. CAN BE EXCAVATED READILY WITH POINT OF PICK. PIECES 1 INCH OR MORE IN THICKNESS CAN BE BROKEN BY FINGER PRESSURE. CAN BE SCRATCHED READILY BY FINGERNAIL.

**FRACTURE SPACING**

TERM	SPACING
VERY WIDE	MORE THAN 10 FEET
WIDE	3 TO 10 FEET
MODERATELY CLOSE	1 TO 3 FEET
CLOSE	0.16 TO 1 FOOT
VERY CLOSE	LESS THAN 0.16 FEET

**BEDDING**

TERM	THICKNESS
VERY THICKLY BEDDED	4 FEET
THICKLY BEDDED	1.5 - 4 FEET
THINLY BEDDED	0.16 - 1.5 FEET
VERY THINLY BEDDED	0.03 - 0.16 FEET
THICKLY LAMINATED	0.008 - 0.03 FEET
THINLY LAMINATED	< 0.008 FEET

**INDURATION**

<b>FRIABLE</b>	RUBBING WITH FINGER FREES NUMEROUS GRAINS; GENTLE BLOW BY HAMMER DISINTEGRATES SAMPLE.
<b>MODERATELY INDURATED</b>	GRAINS CAN BE SEPARATED FROM SAMPLE WITH STEEL PROBE; BREAKS EASILY WHEN HIT WITH HAMMER.
<b>INDURATED</b>	GRAINS ARE DIFFICULT TO SEPARATE WITH STEEL PROBE; DIFFICULT TO BREAK WITH HAMMER.
<b>EXTREMELY INDURATED</b>	SHARP HAMMER BLOWS REQUIRED TO BREAK SAMPLE; SAMPLE BREAKS ACROSS GRAINS.

**TERMS AND DEFINITIONS**

**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, SUCH 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 DISLOGGED FROM PARENT MATERIAL.

**FLOOD PLAIN (FP)** - LAND BORDERING A STREAM, BUILT OF SEDIMENTS DEPOSITED BY THE STREAM.

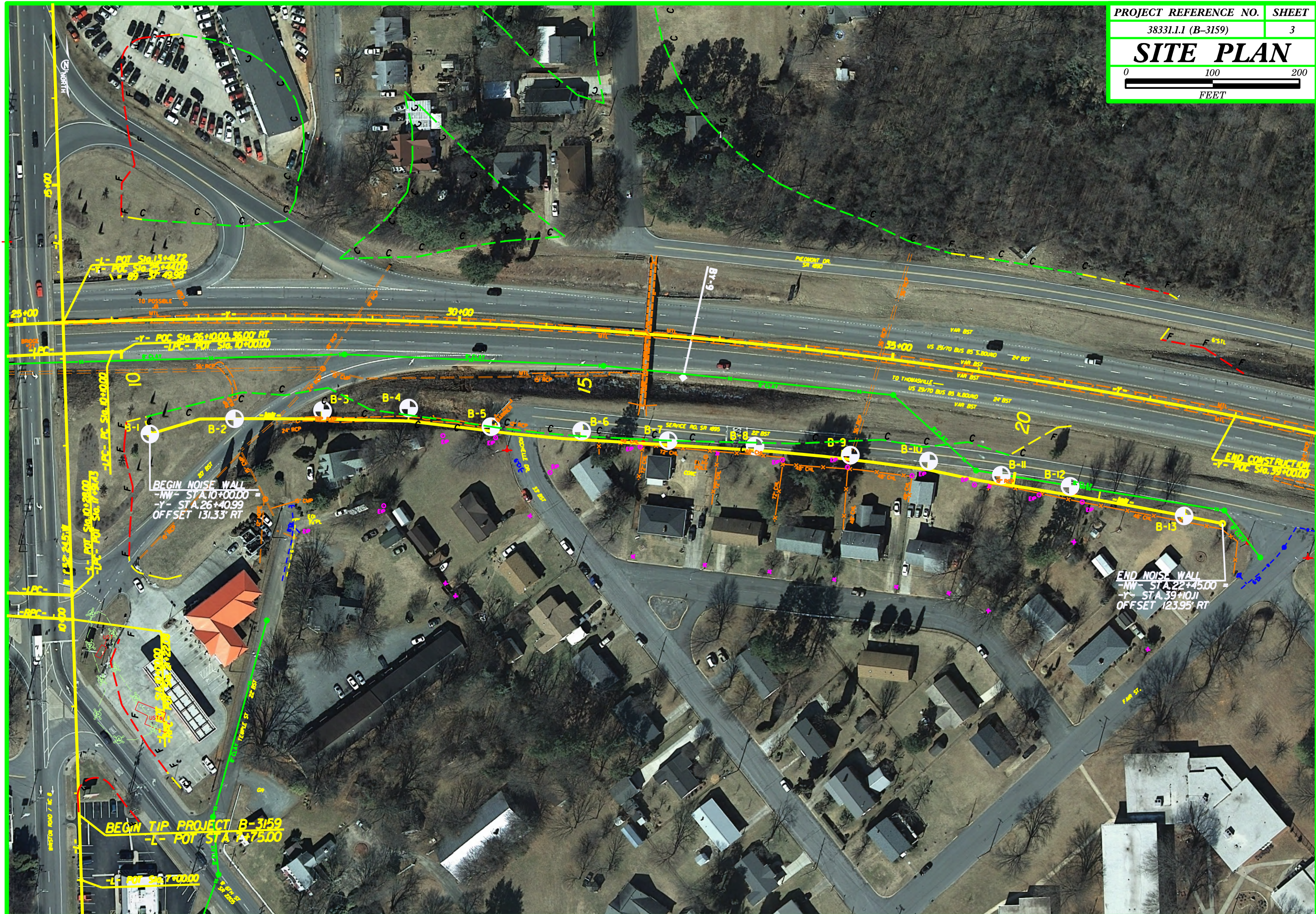
**FORMATION (FM)** - A MAPPABLE GEOLOGIC UNIT THAT CAN BE RECOGNIZED AND TRACED IN THE FIELD.

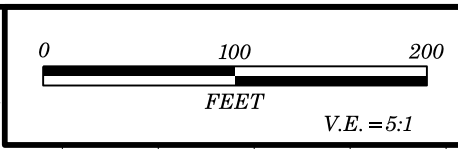
**JOINT** - FRACTURE IN ROCK ALONG WHICH NO APPRECIABLE MOVEMENT HAS OCCURRED.

**LEDGE** - A SHELF-LIKE RIDGE OR PROJECTION OF ROCK WHOSE THICKNESS IS SMALL COMPARED TO ITS LATERAL EXTENT.

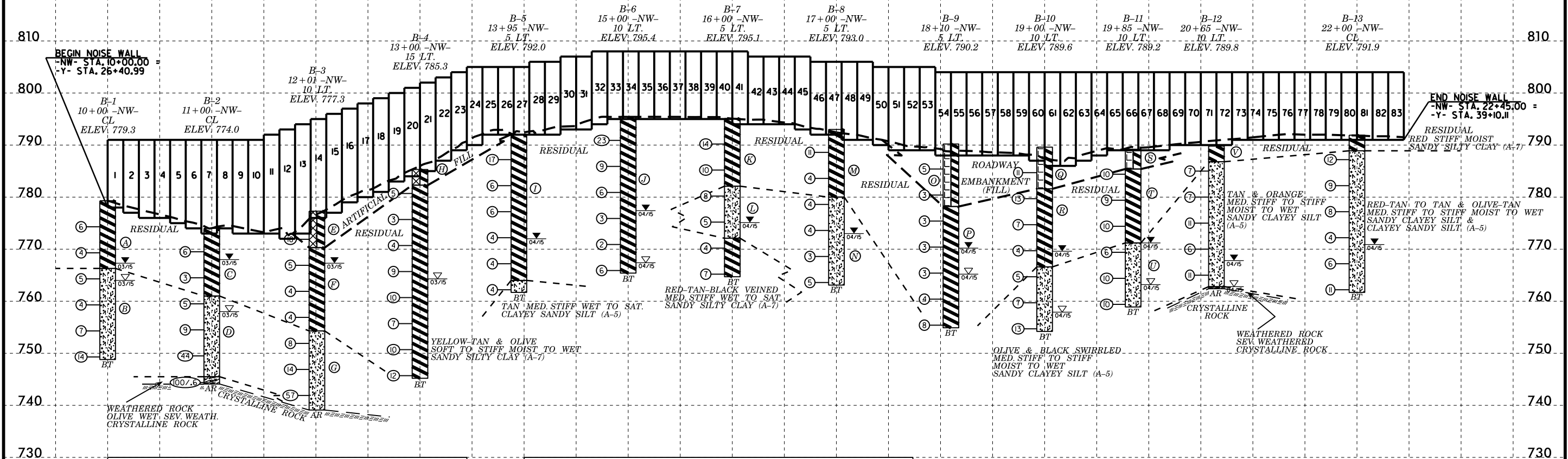
**LENS** - A BODY OF SOIL OR ROCK THAT THINS OUT IN ONE OR MORE DIRECTIONS.

**MOTTLED (MOT.)** - IRREGULARLY MARKED WITH SPOTS OF DIFFERENT COLORS. MOTTLING IN SOILS USUALLY INDICATES POOR AERATION AND LACK OF GOOD DRAINAGE.





-NW- DESIGN DATA																						
PANEL	1-10	11	12	13	14	15	16	17	18	19	20	21	22	23	24-27	28-29	30-31	32-41	42-45	46-49	50-53	54-83
TOP ELEV. (FT)	791	792	793	794	795	796	797	798	799	800	801	802	803	804	805	806	807	808	807	806	805	804
LENGTH (FT)	150	15	15	15	15	15	15	15	15	15	15	15	15	15	60	30	30	150	60	60	60	450



BORING DESCRIPTIONS	
(A)	TAN-OLIVE MED. STIFF MOIST TO WET SANDY SILTY CLAY (A-7) (RESIDUAL)
(B)	OLIVE-TAN & OLIVE TO GREEN-WHITE SPECKLED MED. STIFF TO STIFF WET SANDY CLAYEY SILT (A-5) (RESIDUAL)
(C)	TAN-OLIVE & TAN-ORANGE MED. STIFF TO SOFT MOIST SANDY SILTY CLAY (A-7) (RESIDUAL)
(D)	OLIVE-TAN & OLIVE-MED. STIFF TO HARD MOIST TO WET SANDY CLAYEY SILT (A-5) (RESIDUAL)
(E)	RED V. STIFF MOIST SANDY SILTY CLAY (A-7) W/ RIP-RAP & ASPHALT (ARTIFICIAL FILL)
(F)	TAN MED. STIFF MOIST TO WET SANDY SILTY CLAY (A-7) (RESIDUAL)
(G)	OLIVE-TAN-WHITE MED. STIFF TO HARD MOIST TO WET TRACE MICA SANDY CLAYEY SILT (A-5) (RESIDUAL)
(H)	RED MED. STIFF MOIST SANDY SILTY CLAY (A-7) W/ GRAVEL (ARTIFICIAL FILL)
(I)	RED-TAN & TAN V. STIFF TO MED. STIFF MOIST TO WET SANDY SILTY CLAY (A-7) W/ TRACE MICA @ 18.8 (RESIDUAL)
(J)	RED-TAN & TAN W/ BLK STREAKS V. STIFF TO SOFT MOIST TO SAT. SANDY SILTY CLAY (A-7) (RESIDUAL)
(K)	RED-TAN & TAN-RED STIFF MOIST TO WET SANDY SILTY CLAY (A-7) (RESIDUAL)

BORING DESCRIPTIONS	
(L)	TAN-WHITE MED. STIFF MOIST TO WET SANDY CLAYEY SILT (A-5) (RESIDUAL)
(M)	RED-STIFF TO MED-STIFF MOIST SANDY SILTY CLAY (A-7) (RESIDUAL)
(N)	RED-TAN & BLACK VEINED SOFT TO MED. STIFF MOIST TO WET TRACE MICA SANDY CLAYEY SILT (A-5) (RESIDUAL)
(O)	RED-TAN MED. STIFF TO SOFT MOIST TO WET SANDY SILTY CLAY (A-7) W/ ASPHALT & BASE 0.0-1.0 (ROADWAY EMBANKMENT)
(P)	TAN & RED-TAN SOFT TO STIFF WET SANDY SILTY CLAY (A-7) (RESIDUAL)
(Q)	BRN-TAN STIFF MOIST SANDY SILTY CLAY (A-7) W/ ASPHALT & BASE 0.0-1.0 (ROADWAY EMBANKMENT)
(R)	RED & TAN STIFF TO MED. STIFF MOIST TO WET SANDY SILTY CLAY (A-7) (RESIDUAL)
(S)	RED-TAN STIFF MOIST SANDY SILTY CLAY (A-7) W/ GRAVEL (ROADWAY EMBANKMENT)
(T)	RED-TAN & OLIVE-TAN STIFF MOIST SANDY SILTY CLAY (A-7) (RESIDUAL)
(U)	OLIVE-TAN & OLIVE-WHITE MED. STIFF TO STIFF MOIST TO WET SANDY CLAYEY SILT (A-5) (RESIDUAL)
(V)	TAN-RED MED. STIFF MOIST SANDY SILTY CLAY (A-7) (RESIDUAL)



**NCDOT GEOTECHNICAL ENGINEERING UNIT**  
**BORELOG REPORT**

WBS 38331.1.1	TIP B-3159	COUNTY DAVIDSON	GEOLOGIST Murray, C. C.
SITE DESCRIPTION NOISE WALL ON SERVICE RD. (SR 1895) (STA. 10+00 TO 22+45)			GROUND WTR (ft)
BORING NO. B-3	STATION 12+01	OFFSET 10 ft LT	ALIGNMENT -NW-
COLLAR ELEV. 777.3 ft	TOTAL DEPTH 38.2 ft	NORTHING 761,216	EASTING 1,628,810
DRILL RIG/HAMMER EFF./DATE HFO0066 CME-550 81% 03/19/2014		DRILL METHOD H.S. Augers	HAMMER TYPE Automatic
DRILLER Estep, J. E.	START DATE 03/26/15	COMP. DATE 03/26/15	SURFACE WATER DEPTH N/A

ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT			BLOWS PER FOOT					SAMP. NO.	LOG	SOIL AND ROCK DESCRIPTION	DEPTH (ft)	
			0.5ft	0.5ft	0.5ft	0	25	50	75	100					
780														777.3	0.0
775	772.9	4.4	4	9	9							M	ARTIFICIAL FILL RED V. STIFF MOIST SANDY SILTY CLAY (A-7) W/ RIP-RAP & ASPHALT		
770	767.9	9.4	3	2	3							W	RESIDUAL TAN MED. STIFF MOIST TO WET SANDY SILTY CLAY (A-7)	770.3	
765	762.9	14.4	2	1	3							MW			
760	757.9	19.4	2	2	2							MW			
755	752.9	24.4	2	3	5							MW	RESIDUAL OLIVE-TAN-WHITE MED. STIFF TO HARD MOIST TO WET TRACE MICA SANDY CLAYEY SILT (A-5)	754.3	
750	747.9	29.4	2	5	9							MW			
745	742.9	34.4	9	20	37							MW			
740														739.1	38.2

Boring Terminated BY AUGER REFUSAL at Elevation 739.1 ft ON CRYSTALLINE ROCK

WBS 38331.1.1	TIP B-3159	COUNTY DAVIDSON	GEOLOGIST Murray, C. C.
SITE DESCRIPTION NOISE WALL ON SERVICE RD. (SR 1895) (STA. 10+00 TO 22+45)			GROUND WTR (ft)
BORING NO. B-4	STATION 13+00	OFFSET 15 ft LT	ALIGNMENT -NW-
COLLAR ELEV. 785.3 ft	TOTAL DEPTH 40.1 ft	NORTHING 761,219	EASTING 1,628,909
DRILL RIG/HAMMER EFF./DATE HFO0066 CME-550 81% 03/19/2014		DRILL METHOD H.S. Augers	HAMMER TYPE Automatic
DRILLER Estep, J. E.	START DATE 03/25/15	COMP. DATE 03/25/15	SURFACE WATER DEPTH N/A

ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT			BLOWS PER FOOT					SAMP. NO.	LOG	SOIL AND ROCK DESCRIPTION	DEPTH (ft)	
			0.5ft	0.5ft	0.5ft	0	25	50	75	100					
790														785.3	0.0
785	781.7	3.6	2	2	3							M	ARTIFICIAL FILL RED MED. STIFF MOIST SANDY SILTY CLAY (A-7) W/ GRAVEL	782.3	
780	776.7	8.6	2	1	2							MW	RESIDUAL YELLOW-TAN & OLIVE SOFT TO STIFF MOIST TO WET SANDY SILTY CLAY (A-7)		
775	771.7	13.6	2	2	2							MW			
770	766.7	18.6	3	4	5							W			
765	761.7	23.6	4	4	6							W			
760	756.7	28.6	2	2	5							W			
755	751.7	33.6	2	3	7							W			
750	746.7	38.6	4	5	7							W			

Boring Terminated at Elevation 745.2 ft IN STIFF WET SANDY SILTY CLAY (A-7)

NCDOT BORE DOUBLE B3159\_GEO\_BH\_NWAL.GPJ NC\_DOT\_GDT\_4/17/15





**NCDOT GEOTECHNICAL ENGINEERING UNIT**  
**BORELOG REPORT**

WBS 38331.1.1	TIP B-3159	COUNTY DAVIDSON	GEOLOGIST Murray, C. C.
SITE DESCRIPTION NOISE WALL ON SERVICE RD. (SR 1895) (STA. 10+00 TO 22+45)			GROUND WTR (ft)
BORING NO. B-9	STATION 18+10	OFFSET 5 ft LT	ALIGNMENT -NW-
COLLAR ELEV. 790.2 ft	TOTAL DEPTH 35.3 ft	NORTHING 761,165	EASTING 1,629,417
DRILL RIG/HAMMER EFF./DATE HFO0066 CME-550 81% 03/19/2014		DRILL METHOD H.S. Augers	HAMMER TYPE Automatic
DRILLER Estep, J. E.	START DATE 04/08/15	COMP. DATE 04/08/15	SURFACE WATER DEPTH N/A

ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT			BLOWS PER FOOT					SAMP. NO.	LOG	SOIL AND ROCK DESCRIPTION	DEPTH (ft)
			0.5ft	0.5ft	0.5ft	0	25	50	75	100				
795														
790													GROUND SURFACE 0.0	
785	786.4	3.8	3	2	3							M	ROADWAY EMBANKMENT RED-TAN MED. STIFF TO SOFT MOIST TO WET SANDY SILTY CLAY (A-7) W/ ASPHALT & BASE 0.0-1.0	
780	781.4	8.8	1	1	2							MW		
775	776.4	13.8	1	1	2							W	RESIDUAL TAN & RED-TAN SOFT TO STIFF WET SANDY SILTY CLAY (A-7)	12.0
770	771.4	18.8	1	1	2							W		
765	766.4	23.8	1	1	2							W		
760	761.4	28.8	1	1	3							W		
755	756.4	33.8	3	3	5							W	Boring Terminated at Elevation 754.9 ft IN STIFF WET SANDY SILTY CLAY (A-7)	35.3

WBS 38331.1.1	TIP B-3159	COUNTY DAVIDSON	GEOLOGIST Murray, C. C.
SITE DESCRIPTION NOISE WALL ON SERVICE RD. (SR 1895) (STA. 10+00 TO 22+45)			GROUND WTR (ft)
BORING NO. B-10	STATION 19+00	OFFSET 10 ft LT	ALIGNMENT -NW-
COLLAR ELEV. 789.6 ft	TOTAL DEPTH 35.4 ft	NORTHING 761,158	EASTING 1,629,507
DRILL RIG/HAMMER EFF./DATE HFO0066 CME-550 81% 03/19/2014		DRILL METHOD H.S. Augers	HAMMER TYPE Automatic
DRILLER Estep, J. E.	START DATE 04/08/15	COMP. DATE 04/08/15	SURFACE WATER DEPTH N/A

ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT			BLOWS PER FOOT					SAMP. NO.	LOG	SOIL AND ROCK DESCRIPTION	DEPTH (ft)
			0.5ft	0.5ft	0.5ft	0	25	50	75	100				
790													GROUND SURFACE 0.0	
785	785.7	3.9	5	5	6							M	ROADWAY EMBANKMENT BRN-TAN STIFF MOIST SANDY SILTY CLAY (A-7) W/ ASPHALT & BASE 0.0-1.0	
780	780.7	8.9	4	5	8							MW	RESIDUAL RED & TAN STIFF TO MED. STIFF MOIST TO WET SANDY SILTY CLAY (A-7)	8.0
775	775.7	13.9	3	3	4							MW		
770	770.7	18.9	1	2	2							W		
765	765.7	23.9	1	2	3							MW	RESIDUAL OLIVE & BLACK SWIRLED MED. STIFF TO STIFF MOIST TO WET SANDY CLAYEY SILT (A-5)	23.0
760	760.7	28.9	2	2	5							W		
755	755.7	33.9	4	6	7							W	Boring Terminated at Elevation 754.2 ft IN STIFF WET SANDY CLAYEY SILT (A-5)	35.4

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# NCDOT GEOTECHNICAL ENGINEERING UNIT

## BORELOG REPORT

WBS 38331.1.1	TIP B-3159	COUNTY DAVIDSON	GEOLOGIST Murray, C. C.
SITE DESCRIPTION NOISE WALL ON SERVICE RD. (SR 1895) (STA. 10+00 TO 22+45)			GROUND WTR (ft)
BORING NO. B-13	STATION 22+00	OFFSET CL	ALIGNMENT -NW- 0 HR. Dry
COLLAR ELEV. 791.9 ft	TOTAL DEPTH 30.2 ft	NORTHING 761,095	EASTING 1,629,801 24 HR. 21.0
DRILL RIG/HAMMER EFF./DATE HFO0066 CME-550 81% 03/19/2014		DRILL METHOD H.S. Augers	HAMMER TYPE Automatic
DRILLER Estep, J. E.	START DATE 04/09/15	COMP. DATE 04/09/15	SURFACE WATER DEPTH N/A

ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT			BLOWS PER FOOT					SAMP. NO.	LOG	SOIL AND ROCK DESCRIPTION	DEPTH (ft)	
			0.5ft	0.5ft	0.5ft	0	25	50	75	100					
795															
790														791.9	0.0
														788.9	3.0
785	788.2	3.7	3	6	6	12						M	RESIDUAL RED STIFF MOIST SANDY SILTY CLAY (A-7)		
780	783.2	8.7	3	4	5	9						M	RESIDUAL RED-TAN TO TAN & OLIVE-TAN MED. STIFF TO STIFF MOIST TO WET SANDY CLAYEY SILT & CLAYEY SANDY SILT (A-5)		
775	778.2	13.7	4	3	5	8						M			
770	773.2	18.7	2	2	2	4						MW			
765	768.2	23.7	3	3	3	6						MW			
	763.2	28.7	3	6	5	11						MW			
														761.7	30.2

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