

REFERENCE: BR-0168

PROJECT: 67168

SEE SHEET 3 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.	BR-0168	1	

CONTENTS

<u>LINE</u>	<u>STATION</u>	<u>PLAN</u>	<u>PROFILE</u>
-L-	11+00.00 to 30+25.00	4,5	
-RPC-	13+00.00 to 14+12.53	4	
-LPC-	11+45.00 to 13+79.07	4	
-LPCA-	10+61.69 to 12+68.46	4	
-LPB-	13+00.00 to 14+68.87	5	
-RPB-	13+00.00 to 15+11.52	5	
-Y3-	10+00.00 to 11+35.00	5	

APPENDICES

<u>APPENDIX</u>	<u>TITLE</u>	<u>SHEETS</u>
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ROADWAY
SUBSURFACE INVESTIGATION

COUNTY FORSYTH
PROJECT DESCRIPTION REPLACE BRIDGE 330289 ON
SR-4000 (UNIVERSITY PARKWAY) OVER 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) 707-6850. 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 PERFORM INDEPENDENT SUBSURFACE INVESTIGATIONS AND MAKE INTERPRETATIONS AS NECESSARY TO CONFIRM CONDITIONS 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

- P. BARRERA
- H. AGOPIAN
- C. ALLEN
- M. ULMER
- M. LATTIN
- BRIDGER DRILLING

INVESTIGATED BY ESP Associates, Inc.
DRAWN BY P. BARRERA
CHECKED BY H. AGOPIAN
SUBMITTED BY ESP Associates, Inc.
DATE August 2024

ESP ASSOCIATES, INC.
7011 ALBERT PICK RD
SUITE E
GREENSBORO, NC 27409
WWW.ESPASSOCIATES.COM



Signed by: DATE 09/03/2024

**DOCUMENT NOT CONSIDERED FINAL
UNLESS ALL SIGNATURES COMPLETED**

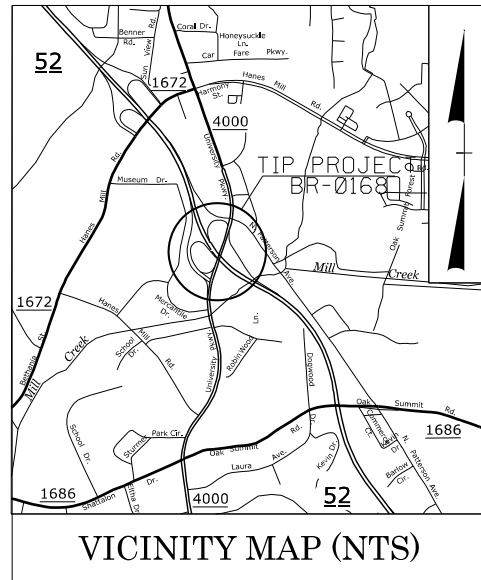
NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS
GEOTECHNICAL ENGINEERING UNIT
SUBSURFACE INVESTIGATION
SOIL AND ROCK LEGEND, TERMS, SYMBOLS, AND ABBREVIATIONS

SOIL DESCRIPTION										GRADATION										ROCK DESCRIPTION										TERMS AND DEFINITIONS																																																																																																																																																							
<p>SOIL IS CONSIDERED 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, <i>VERY STIFF, GRAY, SILTY CLAY, MOIST WITH INTERBEDDED FINE SAND LAYERS, HIGHLY PLASTIC, A-7-6</i></p>										<p>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.</p>										<p>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:</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, 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 DISLOADED 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 (RES.) 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>																																																																																																																																																							
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<p>GENERAL CLASS.</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <th colspan="5">GRANULAR MATERIALS (≤ 35% PASSING #200)</th> <th colspan="5">SILT-CLAY MATERIALS (> 35% PASSING #200)</th> <th colspan="5">ORGANIC MATERIALS</th> </tr> <tr> <th>GROUP CLASS.</th> <th>A-1</th> <th>A-3</th> <th>A-2</th> <th>A-2</th> <th>A-4</th> <th>A-5</th> <th>A-6</th> <th>A-7</th> <th>A-1, A-2</th> <th>A-3</th> <th>A-4, A-5</th> <th>A-6, A-7</th> <th colspan="5"></th> </tr> <tr> <th>SYMBOL</th> <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 colspan="5"></td> </tr> <tr> <th>% PASSING #10 #40 #200</th> <td>50 MX 30 MX 15 MX</td> <td>50 MX 25 MX 10 MX</td> <td>51 MN 35 MX 35 MX</td> <td>40 MX 41 MN 40 MX 41 MN 41 MN 41 MN 41 MN 41 MN</td> <td>40 MX 41 MN 40 MX 41 MN 40 MX 41 MN 40 MX 41 MN</td> <td>36 MN 36 MN 36 MN</td> <td>36 MN 36 MN 36 MN</td> <td>36 MN 36 MN 36 MN</td> <td>GRANULAR SOILS</td> <td>SILT-CLAY SOILS</td> <td colspan="5">MUCK, PEAT</td> </tr> <tr> <th>MATERIAL PASSING #40 LL PI</th> <td colspan="2">-</td> <td>NP</td> <td>40 MX 41 MN 40 MX 41 MN 41 MN 41 MN 41 MN 41 MN</td> <td>40 MX 41 MN 40 MX 41 MN 40 MX 41 MN 40 MX 41 MN</td> <td>40 MX 41 MN 40 MX 41 MN 40 MX 41 MN 40 MX 41 MN</td> <td>40 MX 41 MN 40 MX 41 MN 40 MX 41 MN 40 MX 41 MN</td> <td>40 MX 41 MN 40 MX 41 MN 40 MX 41 MN 40 MX 41 MN</td> <td colspan="5">SOILS WITH LITTLE OR MODERATE AMOUNTS OF ORGANIC MATTER</td> <td colspan="5">HIGHLY ORGANIC SOILS</td> </tr> <tr> <th>GROUP INDEX</th> <td colspan="2">0</td> <td>0</td> <td>4 MX</td> <td>8 MX</td> <td>12 MX</td> <td>16 MX</td> <td>NO MX</td> <td colspan="5"></td> <td colspan="5"></td> </tr> <tr> <th>USUAL TYPES OF MAJOR MATERIALS</th> <td colspan="2">STONE FRAGS. 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RATING AS SUBGRADE	EXCELLENT TO GOOD					FAIR TO POOR					FAIR TO POOR	POOR	UNSATURABLE					<p>MINERAL NAMES SUCH AS QUARTZ, FELDSPAR, MICA, TALC, KAOLIN, ETC. ARE USED IN DESCRIPTIONS WHEN THEY ARE CONSIDERED OF SIGNIFICANCE.</p>										<p>FRESH - ROCK FRESH, CRYSTALS BRIGHT, FEW JOINTS MAY SHOW SLIGHT STAINING. ROCK RINGS UNDER HAMMER IF CRYSTALLINE. VERY SLIGHT (IV 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. <i>IF TESTED, WOULD YIELD SPT REFUSAL</i> 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, WOULD YIELD SPT N VALUES > 100 BPF</i> VERY SEVERE (IV 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. <i>IF TESTED, WOULD YIELD SPT N VALUES < 100 BPF</i> 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>										<p>ROCK HARDNESS</p> <p>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 FINGER NAIL.</p>									
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<p>COLOR</p> <p>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.</p>										<p>INDURATION</p> <p>FOR SEDIMENTARY ROCKS, INDURATION IS THE HARDENING OF MATERIAL BY CEMENTING, HEAT, PRESSURE, ETC.</p> <p>FRIABLE - RUBBING WITH FINGER FREES NUMEROUS GRAINS; GENTLE BLOW BY HAMMER DISINTEGRATES SAMPLE.</p> <p>MODERATELY INDURATED - GRAINS CAN BE SEPARATED FROM SAMPLE WITH STEEL PROBE; BREAKS EASILY WHEN HIT WITH HAMMER.</p> <p>INDURATED - GRAINS ARE DIFFICULT TO SEPARATE WITH STEEL PROBE; DIFFICULT TO BREAK WITH HAMMER.</p> <p>EXTREMELY INDURATED - SHARP HAMMER BLOWS REQUIRED TO BREAK SAMPLE; SAMPLE BREAKS ACROSS GRAINS.</p>										<p>EQUIPMENT USED ON SUBJECT PROJECT</p> <p>DRILL UNITS:</p> <p><input type="checkbox"/> CME-45C</p> <p><input checked="" type="checkbox"/> CME-55</p> <p><input type="checkbox"/> CME-550</p> <p><input type="checkbox"/> VANE SHEAR TEST</p> <p><input type="checkbox"/> PORTABLE HOIST</p> <p><input type="checkbox"/></p> <p><input type="checkbox"/></p> <p><input type="checkbox"/></p> <p>ADVANCING TOOLS:</p> <p><input type="checkbox"/> CLAY BITS</p> <p><input type="checkbox"/> 6" CONTINUOUS FLIGHT AUGER</p> <p><input checked="" type="checkbox"/> 8" HOLLOW AUGERS</p> <p><input type="checkbox"/> HARD FACED FINGER BITS</p> <p><input type="checkbox"/> TUNG-CARBIDE INSERTS</p> <p><input checked="" type="checkbox"/> CASING <input type="checkbox"/> W/ ADVANCER</p> <p><input type="checkbox"/> TRICONE * STEEL TEETH</p> <p><input type="checkbox"/> TRICONE * TUNG-CARB.</p> <p><input type="checkbox"/> CORE BIT</p> <p><input type="checkbox"/></p> <p><input type="checkbox"/></p> <p>HAMMER TYPE:</p> <p><input checked="" type="checkbox"/> AUTOMATIC <input type="checkbox"/> MANUAL</p> <p>CORE SIZE:</p> <p><input type="checkbox"/> -B <input type="checkbox"/> -H <input type="checkbox"/> -N</p> <p>HAND TOOLS:</p> <p><input type="checkbox"/> POST HOLE DIGGER</p> <p><input type="checkbox"/> HAND AUGER</p> <p><input type="checkbox"/> SOUNDING ROD</p> <p><input type="checkbox"/> VANE SHEAR TEST</p> <p><input type="checkbox"/></p> <p><input type="checkbox"/></p>										<p>FRACTURE SPACING</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <th>TERM</th> <th>SPACING</th> </tr> <tr> <td>VERY WIDE</td> <td>MORE THAN 10 FEET</td> </tr> <tr> <td>WIDE</td> <td>3 TO 10 FEET</td> </tr> <tr> <td>MODERATELY CLOSE</td> <td>1 TO 3 FEET</td> </tr> <tr> <td>CLOSE</td> <td>0.16 TO 1 FOOT</td> </tr> <tr> <td>VERY CLOSE</td> <td>LESS THAN 0.16 FEET</td> </tr> </table>										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	<p>BEDDING</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <th>TERM</th> <th>THICKNESS</th> </tr> <tr> <td>VERY THICKLY BEDDED</td> <td>4 FEET</td> </tr> <tr> <td>THICKLY BEDDED</td> <td>1.5 - 4 FEET</td> </tr> <tr> <td>THINLY BEDDED</td> <td>0.16 - 1.5 FEET</td> </tr> <tr> <td>VERY THINLY BEDDED</td> <td>0.03 - 0.16 FEET</td> </tr> <tr> <td>THICKLY LAMINATED</td> <td>0.008 - 0.03 FEET</td> </tr> <tr> <td>THINLY LAMINATED</td> <td>< 0.008 FEET</td> </tr> </table>										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																																																																																																										
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09/08/09

TIP PROJECT: BR-0168

See Sheet 1A For Index of Sheets
See Sheet 1B For Conventional Symbols



CFI PLAN SET

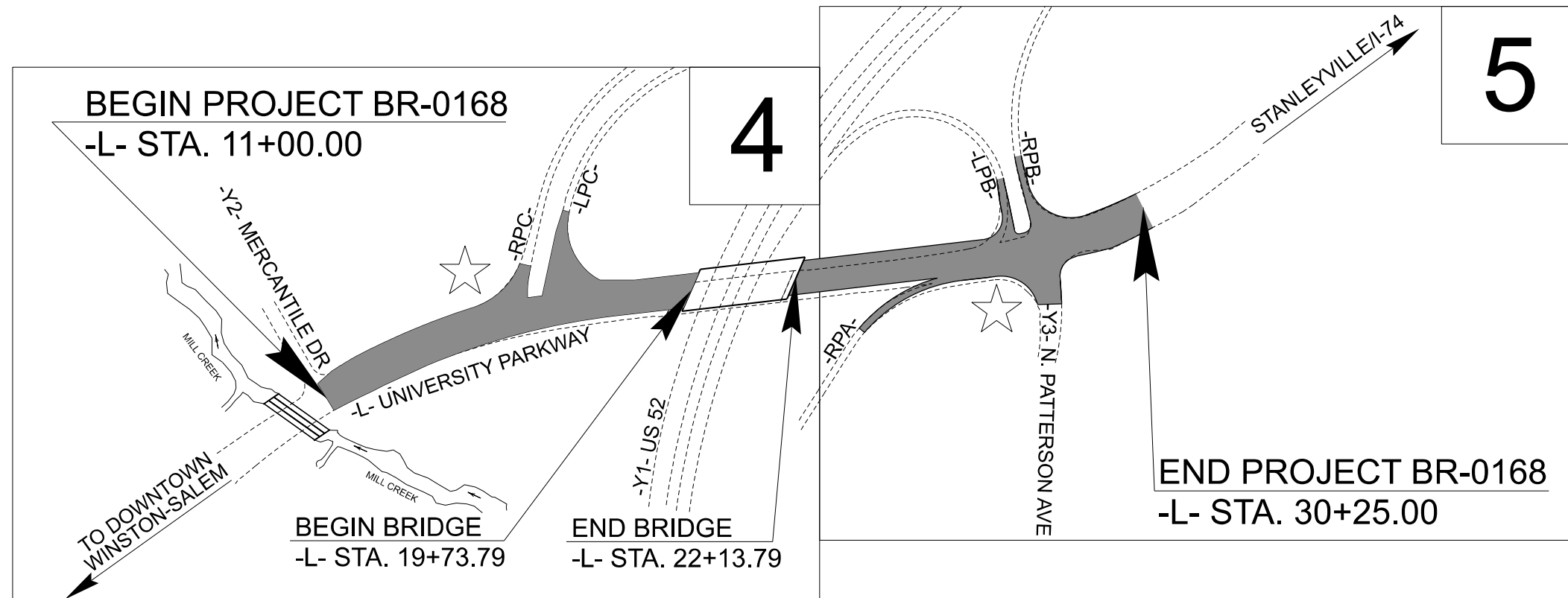
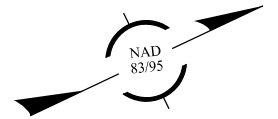
STATE OF NORTH CAROLINA DIVISION OF HIGHWAYS

FORSYTH COUNTY

LOCATION: *REPLACE BRIDGE 330289 ON SR 4000 (UNIVERSITY PARKWAY) OVER US 52*

TYPE OF WORK: *GRADING, PAVING, DRAINAGE, SIGNALS, AND STRUCTURE*

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	BR-0168	3	
STATE PROJ. NO.	F. A. PROJ. NO.	DESCRIPTION	
67168.1.1		P.E.	



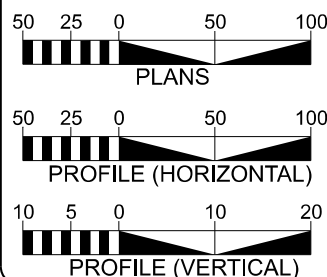
☆ REVISED SIGNAL

THIS PROJECT HAS FULL CONTROLLED ACCESS THROUGH THE INTERCHANGE.
THIS PROJECT IS WITHIN MUNICIPAL BOUNDARIES OF WINSTON-SALEM.
CLEARING ON THIS PROJECT SHALL BE PERFORMED TO THE LIMITS ESTABLISHED BY METHOD ____.

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION
DOCUMENT NOT CONSIDERED FINAL
UNLESS ALL SIGNATURES COMPLETED

CONTRACT:

GRAPHIC SCALES



DESIGN DATA

ADT 2026 = 32800
 ADT 2046 = 31550
 K = 9 %
 D = 65 %
 T = 4 % *
 V = 50 MPH
 * TTST = 1% DUAL 3%
 FUNC CLASS =
 PRINCIPAL ARTERIAL
 REGIONAL TIER

PROJECT LENGTH

LENGTH OF ROADWAY TIP PROJECT BR-0168 = 0.315 MILES
 LENGTH OF STRUCTURE TIP PROJECT BR-0168 = 0.050 MILES
 TOTAL LENGTH OF TIP PROJECT BR-0168 = 0.365 MILES

Prepared in the Office of:

DIVISION OF HIGHWAYS

1000 Birch Ridge Dr., Raleigh NC, 27610

2018 STANDARD SPECIFICATIONS

RIGHT OF WAY DATE:
NOVEMBER 21, 2024

LETTING DATE:
MAY 19, 2026

JOEL P. PERLIN
PROJECT MANAGER

DAVID J. CLODGO, PE
PROJECT ENGINEER

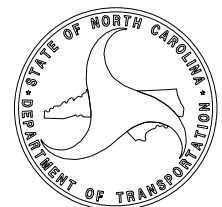
PIOTR J. STOJDA
PROJECT TEAM LEAD

HYDRAULICS ENGINEER

SIGNATURE: P.E.

ROADWAY DESIGN ENGINEER

SIGNATURE: P.E.



August 26, 2024

STATE PROJECT NO.: 67168.1.1
 TIP: BR-0168
 COUNTY: Forsyth
 DESCRIPTION: Replace bridge 330289 on SR-4000 (University Parkway) over US-52
 SUBJECT: Geotechnical Report – Roadway Inventory

Project Description

This proposed project is located approximately 6 miles northwest of Winston-Salem, North Carolina. The project begins at -L- (SR-4000/Mercantile Dr) Station 11+00.00 and continues to -L-Station 30+25.00. The total length of the project is 0.365 miles. The existing -L- alignment within the project corridor is generally a two-lane road in both directions with additional turn lanes at some intersections. The project area is semi-urban with intermittent commercial properties.

The proposed project construction consists of the following:

- Widening -L- (University Parkway) over US-52 to accommodate sidewalk on both sides of the roadway.
- Realignment of the intersection of -L- and -RPC-/-LPC-/-LPCA-/-RPA-/-Y3-/-LPB-/-RPB- and selected widening/reconfiguration to improve vehicular flow and accommodate the bridge.
- Replacement of the existing bridge on the -L- alignment over US-52.

The proposed project construction consists of the realignment of -L- line accommodate two sidewalks on the bridge and improve vehicular traffic within the intersection. The proposed maximum new fill heights are approximately 6 feet and maximum new cut depths of 4 ft. The drainage along the project is generally handled by side ditches. This geotechnical investigation was confined to the areas of proposed construction and the depths reached.

The intersections along the project are as follows:

- -L- and Mercantile Dr
- -L- and US-52 E Exit 115 (-L- and -RPC-/-LPC-/-LPCA-)
- -L-, US-52 W Exit 115A, and Patterson Ave (-L- and -RPA-/-Y3-/-LPB-/-RPB-)

Initial site scoping was performed on April 30, 2024. The field investigation was performed from June 10 to June 21, 2024. Seven (7) Standard Penetration Test borings were advanced with a CME 550X drilling rig equipped with an automatic hammer. Representative soil samples were collected for visual classification in the field and for subsequent laboratory analyses were performed to verify sample classifications.

The following alignments were investigated in this report:

Alignment	Station (±)
-L-	11+00.00 to 30+25.00
-RPA-	12+50.00 to 15+14.97
-RPB-	13+00.00 to 14+74.02
-LPB-	13+00.00 to 14+31.37
-LPC-	11+45.00 to 13+38.00
-LPCA-	10+61.69 to 11+96.13
-RPC-	13+00.00 to 13+74.94

Physiography and Geography

The project corridor is located in the Inner Piedmont Belt of the Piedmont physiographic region. The Inner Piedmont Belt represents the most profoundly deformed and metamorphosed section of the Piedmont region. The metamorphic rocks within this belt are dated between 500 and 750 million years old. This geologic belt is characterized by refolded nappes composed of migmatized biotite gneiss, sillimanite-quartz-muscovite schist, amphibolite, and orthogneiss (Geology of the Inner Piedmont, Carolina Terrane, and Modoc Zone in Northeast Georgia, Allard & Whitney, 1994). According to the Geologic Map of North Carolina, 1985, the rock underlying the project corridor is “Inequigranular biotite gneiss” which is weakly foliated to massive, and contains plagioclase megacrysts and, rarely, larger megacrysts of quartz and feldspar. This rock primarily consists of creamy-white feldspar and quartz, along with dark minerals, the most abundant being the dark mica biotite. The dark minerals are arranged in streaky bands, giving the rock its characteristic gneissic texture.

The topography along the project corridor generally consists of flat terrain. The roadway along SR-4000 (-L-) generally slopes up towards the bridge and is relatively flat after the bridge from the beginning to the end of the project with start/end elevations of approximately 810 feet (MSL) and approximately 840 feet (MSL), respectively, and the highest bridge elevation at mid-span of approximately 838 feet (MSL).

Soil Properties

Soils encountered within this project area have been divided into two categories: roadway embankment and residual soils.

Roadway embankment is present in the vicinity of the bridge over US 52 and was encountered in every boring except boring LPCA_1100. The thickness of roadway embankment material ranged from approximately 5.5 feet to approximately 17.5 feet. The roadway embankment encountered consists of loose to dense silty fine sands (A-2-4) and sandy silts (A-4), and of medium stiff to stiff clayey silts (A-5), sandy clays (A-6), and silty clays (A-7-5/A-7-6) with trace mica in some of the samples. Plasticities within the cohesive roadway embankment soils are moderately plastic with laboratory plasticity index results ranging from 18 to 25.

Residual soils were encountered in all the borings drilled for this project. The residual soils consist of loose to dense silty fine sands (A-2-4), sandy silts (A-4), and of medium stiff to very stiff clayey silts (A-5), sandy clays (A-6) and silty clays (A-7-5/A-7-6). Plasticities within the cohesive residual soils range from slightly to highly plastic with laboratory plasticity index results ranging from 8 to 28. Mica was encountered in the majority of the soil samples collected with estimated trace mica contents.

Rock Properties

Rock was not encountered within the depths explored and should not affect construction based on the plans provided to ESP.

Groundwater Properties

Groundwater data was collected in June 2024. Groundwater was encountered in borings L_1150 and L_2350 at depths of 27.4 ft and 28.0 ft, respectively. Groundwater was not encountered in the remaining five borings, and groundwater is not expected to be encountered during construction within 10 feet of the proposed grade.

Areas of Special Geotechnical Interest

The borings drilled for this project did not encounter soft cohesive soils, wet to saturated soils, organic soils, highly plastic soils, shallow groundwater or rock within 6 ft of the proposed grade.

Water Wells

No water wells were identified within or adjacent to the proposed right-of-way on the plans provided to ESP or by ESP personnel in the field.

Prepared by,

Handwritten signature of Hratch A. Agopian in black ink.

Hratch A. Agopian, PE
Senior Geotechnical Engineer

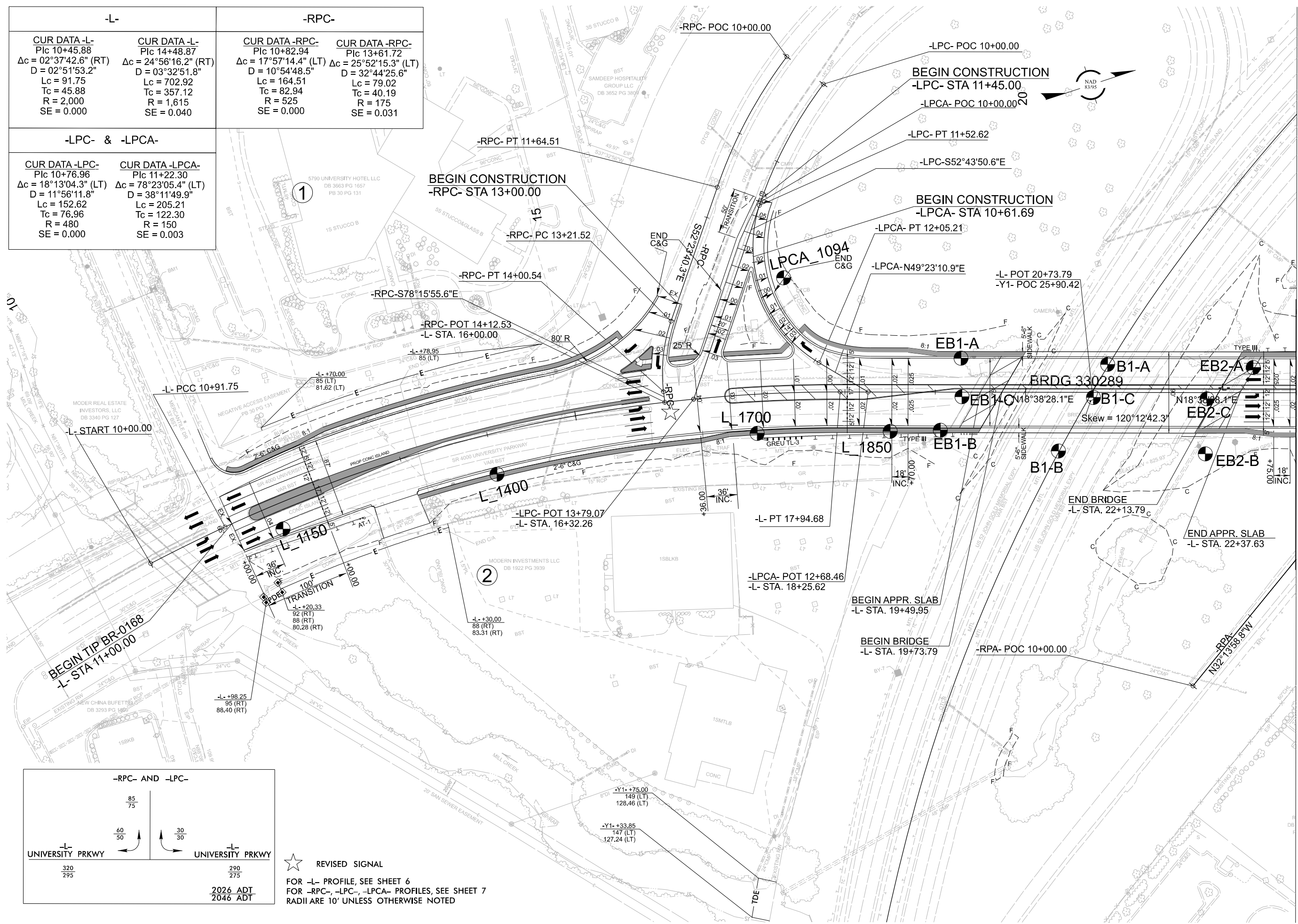
Prepared by,

Handwritten signature of Matthew M. Lattin in blue ink.

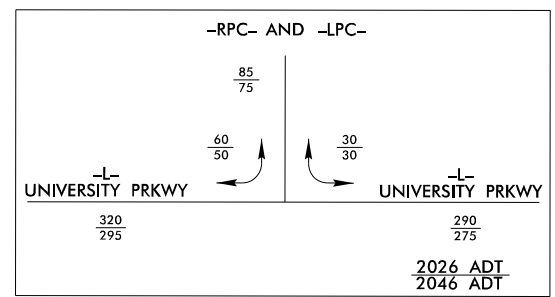
Matthew M. Lattin, PE
Senior Geotechnical Engineer

-L-		-RPC-	
CUR DATA -L- Plc 10+45.88 Δc = 02°37'42.6" (RT) D = 02°51'53.2" Lc = 91.75 Tc = 45.88 R = 2,000 SE = 0.000	CUR DATA -L- Plc 14+48.87 Δc = 24°56'16.2" (RT) D = 03°32'51.8" Lc = 702.92 Tc = 357.12 R = 1,615 SE = 0.040	CUR DATA -RPC- Plc 10+82.94 Δc = 17°57'14.4" (LT) D = 10°54'48.5" Lc = 164.51 Tc = 82.94 R = 525 SE = 0.000	CUR DATA -RPC- Plc 13+61.72 Δc = 25°52'15.3" (RT) D = 32°44'25.6" Lc = 79.02 Tc = 40.19 R = 175 SE = 0.031

-LPC- & -LPCA-	
CUR DATA -LPC- Plc 10+76.96 Δc = 18°13'04.3" (LT) D = 11°56'11.8" Lc = 152.62 Tc = 76.96 R = 480 SE = 0.000	CUR DATA -LPCA- Plc 11+22.30 Δc = 78°23'05.4" (LT) D = 38°11'49.9" Lc = 205.21 Tc = 122.30 R = 150 SE = 0.003



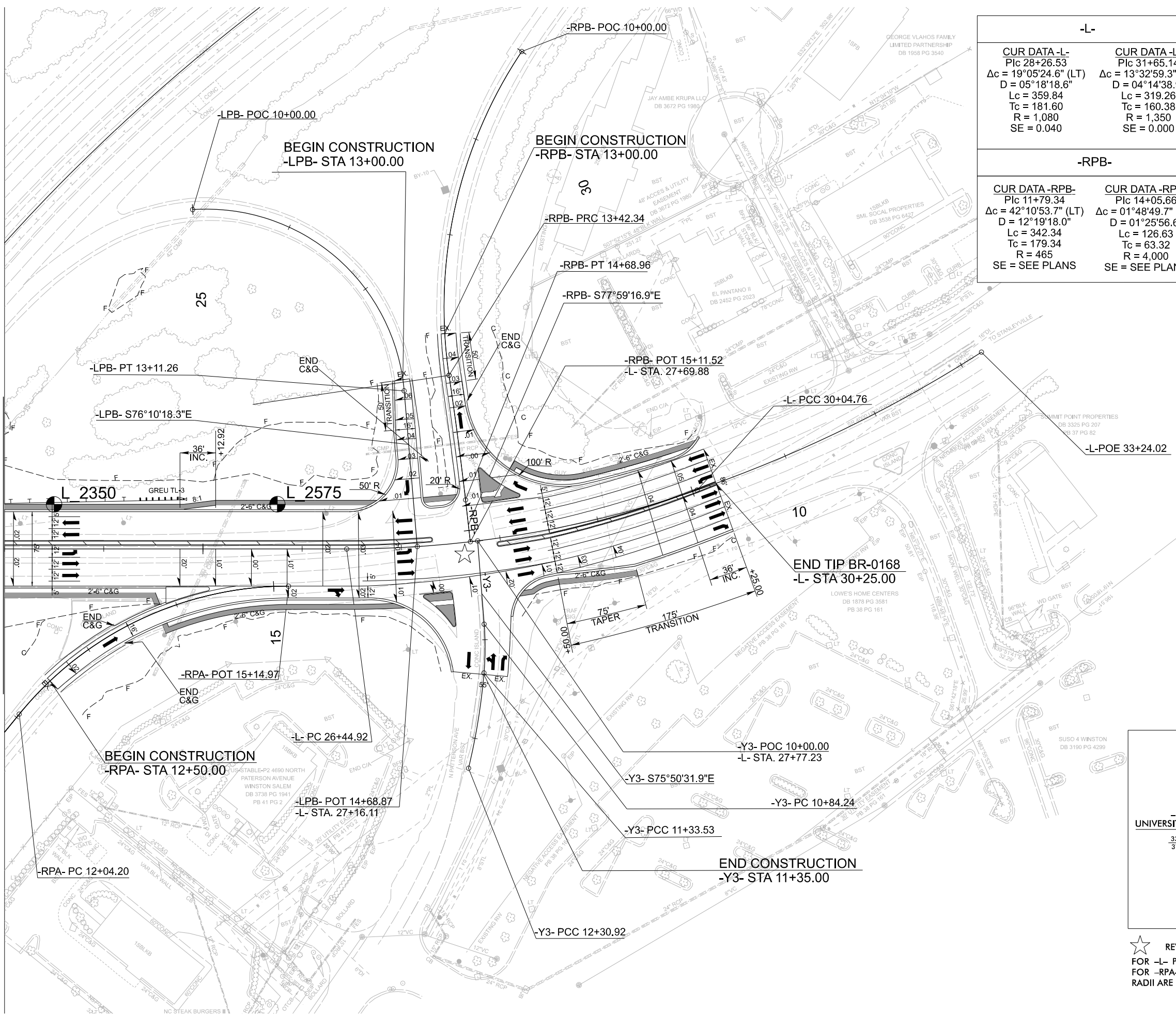
MATCHLINE -L- STA 23+00.00 SEE SHEET 5



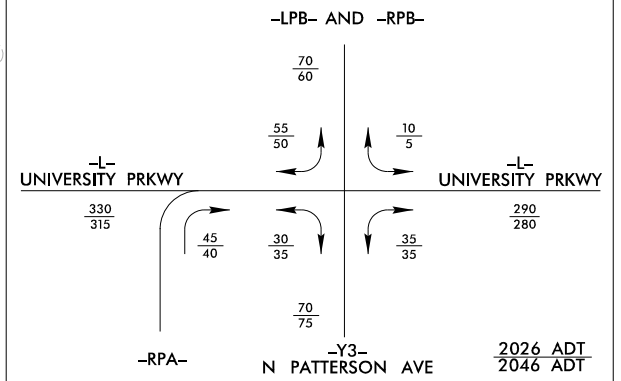
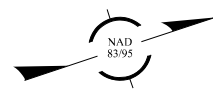
★ REVISED SIGNAL
 FOR -L- PROFILE, SEE SHEET 6
 FOR -RPC-, -LPC-, -LPCA- PROFILES, SEE SHEET 7
 RADII ARE 10' UNLESS OTHERWISE NOTED

REVISIONS

MATCHLINE -L- STA 23+00.00 SEE SHEET 4



-L-		-LPB-	-RPA-
CUR DATA -L- Plc 28+26.53 $\Delta c = 19^{\circ}05'24.6''$ (LT) $D = 05^{\circ}18'18.6''$ $Lc = 359.84$ $Tc = 181.60$ $R = 1,080$ $SE = 0.040$	CUR DATA -L- Plc 31+65.14 $\Delta c = 13^{\circ}32'59.3''$ (LT) $D = 04^{\circ}14'38.9''$ $Lc = 319.26$ $Tc = 160.38$ $R = 1,350$ $SE = 0.000$	CUR DATA -LPB- Plc 11+97.13 $\Delta c = 89^{\circ}10'13.6''$ (RT) $D = 28^{\circ}38'52.4''$ $Lc = 311.26$ $Tc = 197.13$ $R = 200$ $SE = \text{SEE PLANS}$	CUR DATA -RPA- Plc 13+70.67 $\Delta c = 50^{\circ}52'26.9''$ (RT) $D = 16^{\circ}22'12.8''$ $Lc = 310.77$ $Tc = 166.47$ $R = 350$ $SE = \text{SEE PLANS}$
-RPB-		-Y3-	
CUR DATA -RPB- Plc 11+79.34 $\Delta c = 42^{\circ}10'53.7''$ (LT) $D = 12^{\circ}19'18.0''$ $Lc = 342.34$ $Tc = 179.34$ $R = 465$ $SE = \text{SEE PLANS}$	CUR DATA -RPB- Plc 14+05.66 $\Delta c = 01^{\circ}48'49.7''$ (RT) $D = 01^{\circ}25'56.6''$ $Lc = 126.63$ $Tc = 63.32$ $R = 4,000$ $SE = \text{SEE PLANS}$	CUR DATA -Y3- Plc 11+08.94 $\Delta c = 09^{\circ}24'43.8''$ (RT) $D = 19^{\circ}05'54.9''$ $Lc = 49.28$ $Tc = 24.70$ $R = 300$ $SE = \text{SEE PLANS}$	CUR DATA -Y3- Plc 11+82.31 $\Delta c = 08^{\circ}35'04.7''$ (RT) $D = 08^{\circ}48'53.0''$ $Lc = 97.39$ $Tc = 48.79$ $R = 650$ $SE = \text{SEE PLANS}$



★ REVISED SIGNAL
 FOR -L- PROFILE, SEE SHEET 6
 FOR -RPA-, -LPB-, -RPB-, -Y3- PROFILES, SEE SHEET 7
 RADII ARE 10' UNLESS OTHERWISE NOTED

CFI 5
 NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 FORESTH COUNTY

ROADWAY DESIGN UNIT
 ROADWAY ENGINEER

HYDRAULICS
 ENGINEER

INCOMPLETE PLANS
DO NOT USE FOR CONSTRUCTION
 DOCUMENT NOT CONSIDERED FINAL
 UNLESS ALL SIGNATURES COMPLETED

REVISIONS

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS
GEOTECHNICAL ENGINEERING UNIT
SUBSURFACE INVESTIGATION
APPENDIX A
SOIL TEST BORING LOGS

REFERENCE: BR-0168

PROJECT: 67168

GEOTECHNICAL BORING REPORT

BORE LOG

WBS 67168.1.1		TIP BR-0168		COUNTY FORSYTH		GEOLOGIST P. Barrera											
SITE DESCRIPTION Replace bridge 330289 on SR-4000 (University Parkway) over US-52.							GROUND WTR (ft)										
BORING NO. L_1150		STATION 11+50		OFFSET 28 ft RT		ALIGNMENT -L-											
COLLAR ELEV. 809.5 ft		TOTAL DEPTH 30.0 ft		NORTHING 886,383		EASTING 1,623,434											
DRILL RIG/HAMMER EFF./DATE BRI3895 CME-55 91% 03/14/2024			DRILL METHOD H.S. Augers		HAMMER TYPE Automatic												
DRILLER K. Campbell		START DATE 06/16/24		COMP. DATE 06/16/24		SURFACE WATER DEPTH N/A											
ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT			BLOWS PER FOOT					SAMP. NO.	LOG MOI	LOG G	SOIL AND ROCK DESCRIPTION	DEPTH (ft)		
			0.5ft	0.5ft	0.5ft	0	25	50	75	100							
810															809.5	GROUND SURFACE	0.0
	808.2	1.3	12	20	14											ROADWAY EMBANKMENT	
	806.0	3.5													806.2	Gray and Brown, Silty SAND with gravel	3.3
805			3	4	4											Gray, Orange and Brown, Sandy SILT, trace Mica	
	803.5	6.0	3	3	5												
	801.0	8.5	3	3	5												
800																	
	796.0	13.5	2	2	3										796.5	RESIDUAL	13.0
795																Brown and Gray, Silty CLAY, high plasticity	
	791.0	18.5	2	3	3										791.0	Brown and Gray, Silty SAND with silty clay lenses	18.5
790																	
	786.0	23.5	1	1	3										787.5	Brown and Gray, Sandy SILT	22.0
785																	
	781.0	28.5	4	4	8										780.5	Brown and Orange, Silty SAND	29.0
780															779.5	Boring Terminated at Elevation 779.5 ft in Residual: Silty SAND	30.0

WBS 67168.1.1		TIP BR-0168		COUNTY FORSYTH		GEOLOGIST P. Barrera											
SITE DESCRIPTION Replace bridge 330289 on SR-4000 (University Parkway) over US-52.							GROUND WTR (ft)										
BORING NO. L_1400		STATION 14+00		OFFSET 45 ft RT		ALIGNMENT -L-											
COLLAR ELEV. 816.6 ft		TOTAL DEPTH 10.0 ft		NORTHING 886,627		EASTING 1,623,452											
DRILL RIG/HAMMER EFF./DATE BRI3895 CME-55 91% 03/14/2024			DRILL METHOD H.S. Augers		HAMMER TYPE Automatic												
DRILLER K. Campbell		START DATE 06/10/24		COMP. DATE 06/10/24		SURFACE WATER DEPTH N/A											
ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT			BLOWS PER FOOT					SAMP. NO.	LOG MOI	LOG G	SOIL AND ROCK DESCRIPTION	DEPTH (ft)		
			0.5ft	0.5ft	0.5ft	0	25	50	75	100							
820															816.6	GROUND SURFACE	0.0
	815.6	1.0	1	2	1											ROADWAY EMBANKMENT	
815															813.1	Brown, Orange, and Red, Sandy SILT, Trace Mica	3.5
	813.1	3.5	1	2	2											RESIDUAL	
	810.6	6.0	3	9	11										811.1	Orange and Brown, Coarse to Fine Sandy SILT, Trace Mica	5.5
810															808.6	Orange to Red, Silty CLAY, Trace Mica	8.0
	808.1	8.5	2	6	7										806.6	Brown to Orange, Sandy CLAY	10.0
																Boring Terminated at Elevation 806.6 ft in Residual: Sandy CLAY	

NCDOT BORE DOUBLE BR-0168_GEO_RDWY_GINT.GPJ NC_DOT.GDT 8/14/24

GEOTECHNICAL BORING REPORT

BORE LOG

WBS 67168.1.1		TIP BR-0168		COUNTY FORSYTH		GEOLOGIST P. Barrera										
SITE DESCRIPTION Replace bridge 330289 on SR-4000 (University Parkway) over US-52.							GROUND WTR (ft)									
BORING NO. L_1700		STATION 17+00		OFFSET 43 ft RT		ALIGNMENT -L-										
COLLAR ELEV. 826.0 ft		TOTAL DEPTH 20.0 ft		NORTHING 886,915		EASTING 1,623,501										
DRILL RIG/HAMMER EFF./DATE BRI3895 CME-55 91% 03/14/2024			DRILL METHOD H.S. Augers		HAMMER TYPE Automatic											
DRILLER K. Campbell		START DATE 06/16/24		COMP. DATE 06/16/24		SURFACE WATER DEPTH N/A										
ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT			BLOWS PER FOOT					SAMP. NO.	MOI	LOG	SOIL AND ROCK DESCRIPTION		
			0.5ft	0.5ft	0.5ft	0	25	50	75	100				ELEV. (ft)	DEPTH (ft)	
830																
															826.0	GROUND SURFACE 0.0
825	825.0	1.0	13	11	4								M		823.2	ROADWAY EMBANKMENT Grey and Brown, Silty SAND with gravel Red and Orange, Silty CLAY, trace Mica 2.8
	822.5	3.5	2	5	6								M			
820	820.0	6.0	2	5	10								M			
	817.5	8.5	4	5	6								M		818.0	RESIDUAL Orange and Brown, Silty CLAY, medium plasticity, trace Mica, trace Quartz 8.0
815												SS-75	23%			
	812.5	13.5	3	3	3								M			
810													M			
	807.5	18.5	3	6	6								M		806.0	Boring Terminated at Elevation 806.0 ft in Residual: Silty CLAY 20.0

WBS 67168.1.1		TIP BR-0168		COUNTY FORSYTH		GEOLOGIST P. Barrera										
SITE DESCRIPTION Replace bridge 330289 on SR-4000 (University Parkway) over US-52.							GROUND WTR (ft)									
BORING NO. L_1850		STATION 18+50		OFFSET 44 ft RT		ALIGNMENT -L-										
COLLAR ELEV. 828.8 ft		TOTAL DEPTH 30.0 ft		NORTHING 887,055		EASTING 1,623,545										
DRILL RIG/HAMMER EFF./DATE BRI3895 CME-55 91% 03/14/2024			DRILL METHOD H.S. Augers		HAMMER TYPE Automatic											
DRILLER K. Campbell		START DATE 06/16/24		COMP. DATE 06/17/24		SURFACE WATER DEPTH N/A										
ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT			BLOWS PER FOOT					SAMP. NO.	MOI	LOG	SOIL AND ROCK DESCRIPTION		
			0.5ft	0.5ft	0.5ft	0	25	50	75	100				ELEV. (ft)	DEPTH (ft)	
830																
	827.8	1.0	9	5	5								M		828.8	GROUND SURFACE 0.0
825	825.3	3.5	1	2	3								SS-79		825.8	ROADWAY EMBANKMENT Brown and Orange, Sandy SILT, trace Mica 3.0
	822.8	6.0	2	4	6								M			Red and Orange, Silty CLAY, medium plasticity
820	820.3	8.5	4	5	7								M			
													M			
815	815.3	13.5	3	5	7								M			
													M		811.3	RESIDUAL Orange and yellowish-Brown, Clayey SILT, trace Mica 17.5
810	810.3	18.5	3	11	13								M		806.8	RESIDUAL Orange and yellowish-Brown, Clayey SILT, trace Mica 22.0
													M			Brown and Orange, Sandy SILT, trace Mica
805	805.3	23.5	3	5	5								M			
													M			
800	800.3	28.5	3	9	12								M		798.8	Boring Terminated at Elevation 798.8 ft in Residual: Sandy SILT 30.0

NCDOT BORE DOUBLE BR-0168_GEO_RDWY_GINT.GPJ NC_DOT.GDT 8/14/24

GEOTECHNICAL BORING REPORT

BORE LOG

WBS 67168.1.1		TIP BR-0168		COUNTY FORSYTH		GEOLOGIST P. Barrera										
SITE DESCRIPTION Replace bridge 330289 on SR-4000 (University Parkway) over US-52.							GROUND WTR (ft)									
BORING NO. L_2350		STATION 23+50		OFFSET 45 ft LT		ALIGNMENT -L-										
COLLAR ELEV. 829.0 ft		TOTAL DEPTH 35.0 ft		NORTHING 887,557		EASTING 1,623,622										
DRILL RIG/HAMMER EFF./DATE BRI3895 CME-55 91% 03/14/2024			DRILL METHOD H.S. Augers		HAMMER TYPE Automatic											
DRILLER K. Campbell		START DATE 06/10/24		COMP. DATE 06/10/24		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						
830														829.0	GROUND SURFACE	0.0
	828.0	1.0	2	4	5							M		826.0	ROADWAY EMBANKMENT Orange, and Brown, Sandy SILT	3.0
825	825.5	3.5	2	2	3							M			Red, Orange, and Brown, Clayey SILT	
	823.0	6.0	2	4	6							M				
820	820.5	8.5	2	3	4							M		821.0	Brown to orange Brown, Silty CLAY, medium plasticity	8.0
											SS-26	24%				
815	815.5	13.5	3	3	4							M		815.0	RESIDUAL Brown, Orange, and White, Silty SAND	14.0
												M				
810	810.5	18.5	3	4	7							M		811.0	orange Brown, Sandy SILT	18.0
												M				
805	805.5	23.5	3	6	13							M		806.0	Brown and Orange, Silty SAND, little Mica	23.0
												M				
800	800.5	28.5	6	10	19							M				
												M				
795	795.5	33.5	10	18	26							M		794.0	Boring Terminated at Elevation 794.0 ft in Residual: Silty SAND	35.0

WBS 67168.1.1		TIP BR-0168		COUNTY FORSYTH		GEOLOGIST P. Barrera										
SITE DESCRIPTION Replace bridge 330289 on SR-4000 (University Parkway) over US-52.							GROUND WTR (ft)									
BORING NO. L_2575		STATION 25+75		OFFSET 45 ft LT		ALIGNMENT -L-										
COLLAR ELEV. 829.1 ft		TOTAL DEPTH 15.0 ft		NORTHING 887,770		EASTING 1,623,693										
DRILL RIG/HAMMER EFF./DATE BRI3895 CME-55 91% 03/14/2024			DRILL METHOD H.S. Augers		HAMMER TYPE Automatic											
DRILLER K. Campbell		START DATE 06/10/24		COMP. DATE 06/10/24		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						
830														829.1	GROUND SURFACE	0.0
	828.1	1.0	2	5	7							M				
825	825.6	3.5	2	3	4							M				
	823.1	6.0	1	2	4							M		823.3	Brown and Orange to Red, Sandy CLAY	5.8
820	820.6	8.5	1	2	4							M		821.1	RESIDUAL Grey, and Brown with Orange and Grey, Sandy SILT, little to trace Mica	8.0
												M				
815	815.6	13.5	1	4	6							M		814.1	Boring Terminated at Elevation 814.1 ft in Residual: Sandy SILT	15.0

NCDOT BORE DOUBLE BR-0168_GEO_RDWY_GINT.GPJ NC_DOT.GDT 8/14/24

GEOTECHNICAL BORING REPORT

BORE LOG

WBS 67168.1.1		TIP BR-0168		COUNTY FORSYTH		GEOLOGIST P. Barrera & C. Allen												
SITE DESCRIPTION Replace bridge 330289 on SR-4000 (University Parkway) over US-52.							GROUND WTR (ft)											
BORING NO. LPCA_1094		STATION 10+94		OFFSET 28 ft LT		ALIGNMENT -LPCA-												
COLLAR ELEV. 825.0 ft		TOTAL DEPTH 15.0 ft		NORTHING 886,997		EASTING 1,623,347												
DRILL RIG/HAMMER EFF./DATE BRI3895 CME-55 91% 03/14/2024				DRILL METHOD H.S. Augers		HAMMER TYPE Automatic												
DRILLER K. Campbell		START DATE 06/11/24		COMP. DATE 06/11/24		SURFACE WATER DEPTH N/A												
ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT			BLOWS PER FOOT					SAMP. NO.	MOI	LOG	SOIL AND ROCK DESCRIPTION				
			0.5ft	0.5ft	0.5ft	0	25	50	75	100				ELEV. (ft)	DEPTH (ft)			
825															825.0	0.0	GROUND SURFACE	
	824.0	1.0	2	4	3							M					RESIDUAL Brown with Black, Clayey SILT, low plasticity, trace Mica	
820	821.5	3.5	4	5	6						SS-60	20%						
	819.0	6.0	4	6	7							M						Brown and White with Black, Silty SAND, little Mica
815	816.5	8.5	4	6	6							M						
	811.5	13.5	4	6	7							M						
810															810.0	15.0	Boring Terminated at Elevation 810.0 ft in Residual: Silty SAND	

NCDOT BORE DOUBLE BR-0168_GEO_RDWY_GINT.GPJ NC_DOT.GDT 8/14/24

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS
GEOTECHNICAL ENGINEERING UNIT
SUBSURFACE INVESTIGATION
APPENDIX B
LABORATORY TEST RESULTS SUMMARY

REFERENCE: BR-0168

PROJECT: 67168

SOILS LABORATORY TESTS RESULTS

WBS NO.: 67168.1.1

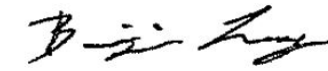
TIP NO.: BR-0168

COUNTY: Forsyth

SITE DESCRIPTION: Replace bridge 330289 on SR-4000 (University Parkway) over US-52

BORING NO.	SAMPLE NO.	BORING LOCATION	DEPTH INTERVAL (FT)	AASHTO CLASS	N	L.L	P.I.	% BY WEIGHT				% PASSING SIEVES			% MOISTURE	% ORGANIC
								CSE. SAND	F. SAND	SILT	CLAY	10	40	200		
LPCA-1094	SS-60	-LPCA- STA. 10+94, 28' LT	3.5-5.0	A-5 (5)	7	43	8	9.8	40.6	35.9	13.8	99.3	95.0	61.7	19.6	-
L-1150	SS-68	-L- STA. 11+50, 28' RT	13.5-15.0	A-7-6 (18)	5	49	28	9.7	24.9	18.7	46.7	97.1	92.4	68.7	23.8	-
L-1700	SS-75	-L- STA. 17+00, 43' RT	8.5-10.0	A-7-5 (15)	11	53	20	8.0	26.8	27.9	37.3	96.2	92.2	71.0	23.1	-
L-1850	SS-79	-L- STA.18+50, 44' RT	3.5-5.0	A-7-6 (15)	5	43	24	9.2	24.8	14.4	51.6	96.5	92.3	69.0	n.d.*	-
L-2350	SS-26	-L- STA. 23+50, 45' LT	8.5-10.0	A-7-5 (14)	7	55	25	16.4	29.3	11.2	43.1	99.6	91.0	59.8	23.8	-
L-2575	SS-18	-L- STA. 25+75, 45' LT	1.0-2.5	A-7-6 (10)	12	45	18	14.6	27.5	23.4	34.4	99.1	91.5	63.3	20.2	-

* - No Data



Certification No. 144-02-0718