

REFERENCE: B-5766

PROJECT: 45722

SEE SHEET 3 FOR PLAN SHEET LAYOUT AT TIME OF INVESTIGATION

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

**ROADWAY
SUBSURFACE INVESTIGATION**

COUNTY STOKES

PROJECT DESCRIPTION BRIDGE NUMBER 82 OVER
DAN RIVER ON SR 1674 (SHEPPARD MILL ROAD)
DANBURY, NORTH CAROLINA

INVENTORY

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	B-5766	1	9

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 T07-6850. 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.

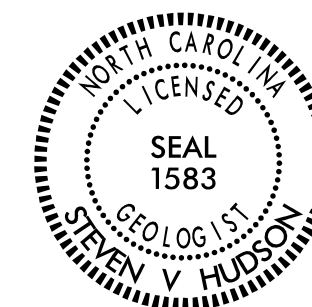
- NOTES:
1. THE INFORMATION CONTAINED HEREIN IS NOT IMPLIED OR GUARANTEED BY THE N. C. DEPARTMENT OF TRANSPORTATION AS ACCURATE NOR IS IT CONSIDERED PART OF THE PLANS, SPECIFICATIONS OR CONTRACT FOR THE PROJECT.
 2. BY HAVING REQUESTED THIS INFORMATION, THE CONTRACTOR SPECIFICALLY WAIVES ANY CLAIMS FOR INCREASED COMPENSATION OR EXTENSION OF TIME BASED ON DIFFERENCES BETWEEN THE CONDITIONS INDICATED HEREIN AND THE ACTUAL CONDITIONS AT THE PROJECT SITE.

PERSONNEL

T. PARK
C. STRATTON
T.J. WHITE, CWC
S. PUGH, CWC

INVESTIGATED BY CATLIN
DRAWN BY S.V. HUDSON, PG
CHECKED BY J. LEE STONE, PG
SUBMITTED BY S.V. HUDSON, PG
DATE JANUARY 2024

CATLIN
Engineers and Scientists



DocuSigned by:
Steve V. Hudson 01/12/2024
01DB23BB746D468 SIGNATURE DATE

**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

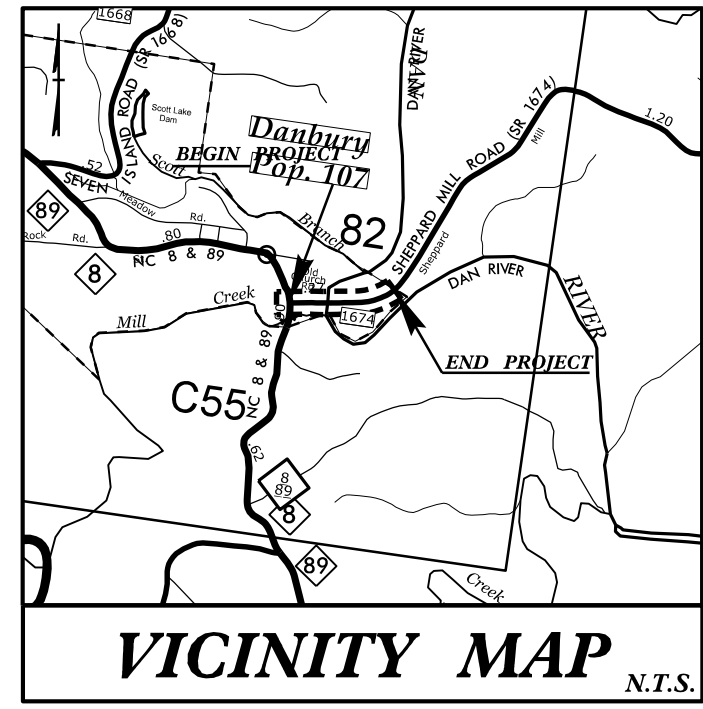
SOIL DESCRIPTION										GRADATION										ROCK DESCRIPTION										TERMS AND DEFINITIONS																																																																									
<p>SOIL IS CONSIDERED UNCONSOLIDATED, SEMI-CONSOLIDATED, OR WEATHERED EARTH MATERIALS THAT CAN BE PENETRATED WITH A CONTINUOUS FLIGHT POWER AUGER AND YIELD LESS THAN 100 BLOWS PER FOOT ACCORDING TO THE STANDARD PENETRATION TEST (AASHTO T 208, 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 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. 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>																																																																									
SOIL LEGEND AND AASHTO CLASSIFICATION										ANGULARITY OF GRAINS										WEATHERED ROCK (WR)										NON-COASTAL PLAIN MATERIAL THAT WOULD YIELD SPT N VALUES > 100 BLOWS PER FOOT IF TESTED.																																																																									
<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <th>GENERAL CLASS.</th> <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-2-4</th> <th>A-2-5</th> <th>A-2-6</th> <th>A-2-7</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> </tr> <tr> <th>SYMBOL</th> <td colspan="5">[Pattern]</td> <td colspan="5">[Pattern]</td> <td colspan="5">[Pattern]</td> </tr> <tr> <th>% PASSING #10 #40 #200</th> <td>50 MX 30 MX 15 MX</td> <td>50 MX 25 MX</td> <td>51 MN 10 MX</td> <td>35 MX 35 MX</td> <td>35 MX 35 MX</td> <td>35 MX 35 MX</td> <td>35 MX 35 MX</td> <td>36 MN 36 MN</td> <td>36 MN 36 MN</td> <td>36 MN 36 MN</td> <td>36 MN 36 MN</td> <td>GRANULAR SOILS</td> <td>SILT-CLAY SOILS</td> <td>MUCK, PEAT</td> <td></td> </tr> </table>										GENERAL CLASS.	GRANULAR MATERIALS (<= 35% PASSING #200)					SILT-CLAY MATERIALS (> 35% PASSING #200)					ORGANIC MATERIALS					GROUP CLASS.	A-1	A-3	A-2	A-2-4	A-2-5	A-2-6	A-2-7	A-4	A-5	A-6	A-7	A-1, A-2	A-3	A-4, A-5	A-6, A-7	SYMBOL	[Pattern]					[Pattern]					[Pattern]					% PASSING #10 #40 #200	50 MX 30 MX 15 MX	50 MX 25 MX	51 MN 10 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	GRANULAR SOILS	SILT-CLAY SOILS	MUCK, PEAT		<p>THE ANGULARITY OR ROUNDNESS OF SOIL GRAINS IS DESIGNATED BY THE TERMS: ANGULAR, SUBANGULAR, SUBROUNDED, OR ROUNDED.</p>										<p>CRISTALLINE 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.</p>										<p>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.</p>									
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<p>MINERAL NAMES SUCH AS QUARTZ, FELDSPAR, MICA, TALC, KAOLIN, ETC. ARE USED IN DESCRIPTIONS WHEN THEY ARE CONSIDERED OF SIGNIFICANCE.</p>										<p>SLIGHTLY COMPRESSIBLE LL < 31 MODERATELY COMPRESSIBLE LL = 31 - 50 HIGHLY COMPRESSIBLE LL > 50</p>										<p>FRESH ROCK FRESH, CRYSTALS BRIGHT, FEW JOINTS MAY SHOW SLIGHT STAINING. ROCK RINGS UNDER HAMMER IF CRYSTALLINE.</p>										<p>VERY SLIGHT (IV SLI) ROCK GENERALLY FRESH, JOINTS STAINED, SOME JOINTS MAY SHOW THIN CLAY COATINGS IF OPEN. CRYSTALS ON A BROKEN SPECIMEN FACE SHINE BRIGHTLY. ROCK RINGS UNDER HAMMER BLOWS IF OF A CRYSTALLINE NATURE.</p>																																																																									
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<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <th>SOIL MOISTURE SCALE (ATTERBERG LIMITS)</th> <th>FIELD MOISTURE DESCRIPTION</th> <th>GUIDE FOR FIELD MOISTURE DESCRIPTION</th> </tr> <tr> <td>LL - LIQUID LIMIT PL - PLASTIC LIMIT OM - OPTIMUM MOISTURE SL - SHRINKAGE LIMIT</td> <td>- SATURATED - (SAT.) - WET - (W) - MOIST - (M) - DRY - (D)</td> <td>USUALLY LIQUID; VERY WET, USUALLY FROM BELOW THE GROUND WATER TABLE SEMISOLID; REQUIRES DRYING TO ATTAIN OPTIMUM MOISTURE SOLID; AT OR NEAR OPTIMUM MOISTURE REQUIRES ADDITIONAL WATER TO ATTAIN OPTIMUM MOISTURE</td> </tr> </table>										SOIL MOISTURE SCALE (ATTERBERG LIMITS)	FIELD MOISTURE DESCRIPTION	GUIDE FOR FIELD MOISTURE DESCRIPTION	LL - LIQUID LIMIT PL - PLASTIC LIMIT OM - OPTIMUM MOISTURE SL - SHRINKAGE LIMIT	- SATURATED - (SAT.) - WET - (W) - MOIST - (M) - DRY - (D)	USUALLY LIQUID; VERY WET, USUALLY FROM BELOW THE GROUND WATER TABLE SEMISOLID; REQUIRES DRYING TO ATTAIN OPTIMUM MOISTURE SOLID; AT OR NEAR OPTIMUM MOISTURE REQUIRES ADDITIONAL WATER TO ATTAIN OPTIMUM MOISTURE	<p>AR - AUGER REFUSAL BT - BORING TERMINATED CL - CLAY CPT - CONE PENETRATION TEST CSE - COARSE DMT - DILATOMETER TEST DPT - DYNAMIC PENETRATION TEST e - VOID RATIO F - FINE FOSS. - FOSSILIFEROUS FRAC. - FRACTURED, FRACTURES FRAGS. - FRAGMENTS HI. - HIGHLY MED. - MEDIUM MICA. - MICACEOUS MOD. - MODERATELY NP - NON PLASTIC ORG. - ORGANIC PMT - PRESSUREMETER TEST SAP. - SAPROLITIC SD. - SAND, SANDY SL. - SILT, SILTY SLI. - SLIGHTLY TCR - TRICONE REFUSAL w - MOISTURE CONTENT V - VERY VST - VANE SHEAR TEST WEA. - WEATHERED W - UNIT WEIGHT W_d - DRY UNIT WEIGHT SAMPLE ABBREVIATIONS S - BULK SS - SPLIT SPOON ST - SHELBY TUBE RS - ROCK RT - RECOMPACTED TRIAXIAL CBR - CALIFORNIA BEARING RATIO</p>										<p>CAN BE GROUDED OR GOUGED 0.25 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>CAN BE GROUDED 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>																																																																			
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PLASTICITY										EQUIPMENT USED ON SUBJECT PROJECT										SOFT										VERY SOFT																																																																									
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<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>										<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	<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	<p>FOR SEDIMENTARY ROCKS, INDURATION IS THE HARDENING OF MATERIAL BY CEMENTING, HEAT, PRESSURE, ETC.</p>										<p>FRAGILE RUBBING WITH FINGER FREES NUMEROUS GRAINS; GENTLE BLOW BY HAMMER DISINTEGRATES SAMPLE. MODERATELY INDURATED GRAINS CAN BE SEPARATED FROM SAMPLE WITH STEEL PROBE; BREAKS EASILY WHEN HIT WITH HAMMER. INDURATED GRAINS ARE DIFFICULT TO SEPARATE WITH STEEL PROBE; DIFFICULT TO BREAK WITH HAMMER. EXTREMELY INDURATED SHARP HAMMER BLOWS REQUIRED TO BREAK SAMPLE; SAMPLE BREAKS ACROSS GRAINS.</p>																																					
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<p>INVESTIGATION COMPLETED ON PRELIMINARY DESIGN FILES PROVIDED BY NCDOT ON MAY 26, 2023</p>										<p>FIAD = FILLED IMMEDIATELY AFTER DRILLING NEM = NOT ENOUGH MATERIAL FOR FULL ANALYSIS</p>										<p>BENCH MARK: BORING LOCATIONS DETERMINED WITH RTK GPS. ELEVATIONS OF STRUCTURE BORINGS OBTAINED WITH RTK GPS; ROADWAY BORINGS OBTAINED FROM 22105.Ls.tIn.tIn. ELEVATION: NGVD 88 US FT.</p>										<p>DATE: 8-15-14</p>																																																																									

09_08/99

13-NOV-2023 11:59
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TIP PROJECT: B-5766

CONTRACT:

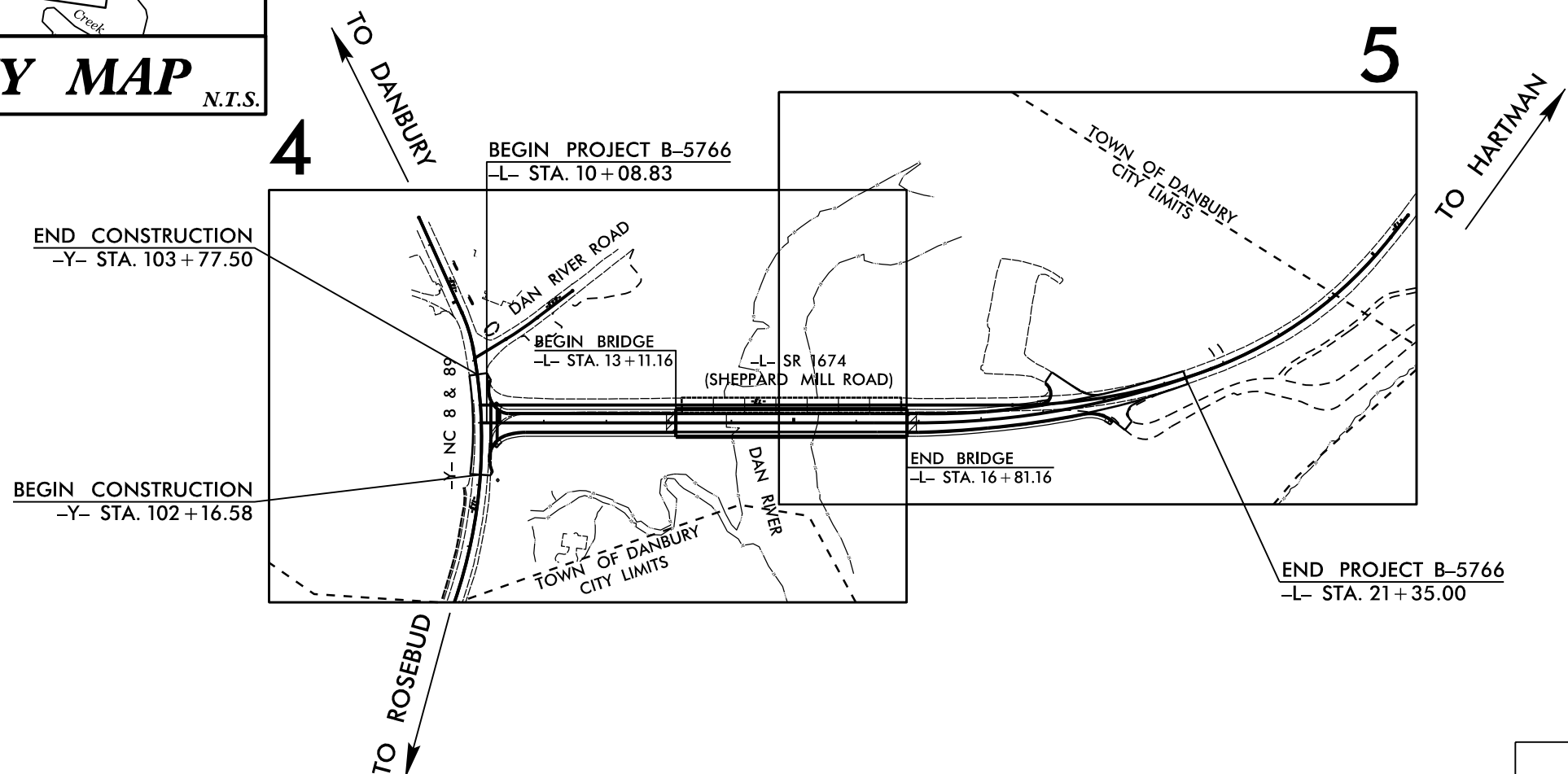


STATE OF NORTH CAROLINA
 DIVISION OF HIGHWAYS
STOKES COUNTY

LOCATION: BRIDGE NO. 82 OVER DAN RIVER ON
 SR 1674 (SHEPPARD MILL ROAD)
 DANBURY, NORTH CAROLINA
TYPE OF WORK: GRADING, PAVING, DRAINAGE, & STRUCTURES

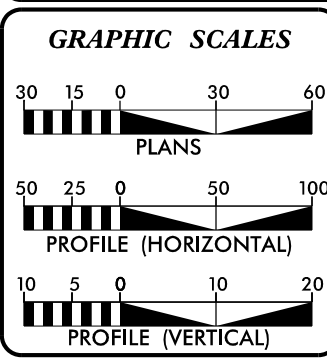
STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	B-5766	3	7
STATE PROJ. NO.	F.A. PROJ. NO.	DESCRIPTION	
45722.1.3	N/A	PE	
45722.2.1	N/A	R/W	
45722.2.2	N/A	UTIL	
45722.3.1	N/A	CONST.	

DOCUMENT NOT CONSIDERED FINAL
 UNLESS ALL SIGNATURES COMPLETED



THIS PROJECT IS WITHIN THE MUNICIPAL BUANDARIES OF DANBURY.
 CLEARING ON THIS PROJECT SHALL BE PERFORMED TO THE LIMITS ESTABLISHED BY METHOD II

REVISED 25% PLANS
 SUBMITTAL DATE: 05-05-2023



DESIGN DATA

ADT 2040 = 1,600
V = 40 MPH
K = 10%
D = 60%
TTST = 1%
DUALS = 2%
FUNC CLASS = MINOR COLLECTOR
SUB-REGIONAL TIER

PROJECT LENGTH

LENGTH ROADWAY PROJECT B-5766 = 0.160 MILES
LENGTH STRUCTURE PROJECT B-5766 = 0.070 MILES
LENGTH ROADWAY PROJECT B-5766 = 0.230 MILES

NCDOT CONTACT: **RYAN NEWCOMB, PE**
 DIVISION PROJECT ENGINEER
 PH: (336) 747-7800

Prepared In the Office of:
 Infrastructure Consulting Services, Inc.

RKA
 RAMEY KEMP ASSOCIATES
 5008 Furkington Place Raleigh, North Carolina 27609
 Phone: 919.272.5115 | www.rameykemp.com | NC License No. P-1489

2018 STANDARD SPECIFICATIONS

AUGUST 31, 2023
 RIGHT OF WAY DATE:
 FEBRUARY 18, 2025
 LETTING DATE:

KAYLA M. POULOS, PE
 PROJECT ENGINEER

MIKAYLA M. LINDSEY, EI
 PROJECT DESIGNER

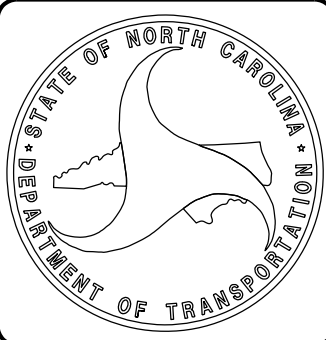
HYDRAULICS ENGINEER

PRELIMINARY PLANS
 DO NOT USE FOR CONSTRUCTION

SIGNATURE:
ROADWAY DESIGN ENGINEER

INCOMPLETE PLANS
 DO NOT USE FOR R/W ACQUISITION

SIGNATURE:



December 2023

WBS Number: 45722.1.1
 TIP Number: B-5766
 Project ID: 42290
 County: STOKES
 Description: Bridge Number 82 over Dan River on SR 1674 (Sheppard Mill Road)
 Danbury, North Carolina

CATLIN Number: 223152

SUBJECT: Roadway Subsurface Inventory Report

Project Description

This project is located on Sheppard Mill Road immediately east of Danbury in Stokes County, North Carolina. Approximately one-half of the project is located within Moratock Park which was added to the National Register of Historic Places in 1974. The proposed project consists of improvement of SR 1674 (Sheppard Mill Road) along with the replacement of existing bridge Number 82 over the Dan River. This geotechnical investigation was conducted by Richard Catlin and Associates (DBE Catlin Engineers and Scientists – (CATLIN)) and was confined to the areas of proposed construction.

Fieldwork was conducted by CATLIN personnel in October 2023. Standard Penetration Test (SPT) borings were completed along the project corridor with an average distance of approximately 150 linear feet between borings. Additional SPT borings advanced during the associated Structure Inventory were utilized to augment the roadway data. Representative soil samples were collected for visual classification in the field and for laboratory analysis.

The following alignment was investigated. Plan sheets and subsurface profiles are included in this report and were generated from files received from NCDOT on May 26, 2023.

<u>Line</u>	<u>Station (±)</u>
-L-	10+00 to 21+35

Areas of Special Geotechnical Interest

1) Seasonal high groundwater was encountered at the following location:

<u>Line</u>	<u>Station (±)</u>
-L-	12+00

2) Cohesive soils that may have the potential to cause embankment/subgrade and or slope stability problems during construction were identified at the following locations:

<u>Line</u>	<u>Station (±)</u>
-L-	11+00 to 13+50
-L-	15+40 to 17+25

Physiography and Geology

This project area is located within the North Carolina Inner Piedmont physiographic province. The North Carolina Piedmont is typically characterized by gently rolling, well-rounded hills with a few hundred feet of relief between the hills and valleys. According to the 1985 North Carolina Geologic Map, the area of investigation lies within the Chauga Belt with the predominant rock type being metagraywacke (biotite gneiss) with muscovite-biotite schist interlayered and gradational throughout. Land use along the project area consists primarily of recreational with some residential housing and small business.

Groundwater

Groundwater data was collected in October 2023. Ground water was encountered from within 2.1 feet to greater than 36 feet from the ground surface along the area of investigation. The project spans the Dan River which as reported in the Bridge Survey & Hydraulic Design Report (BSR) has a normal water surface elevation (NWSEL) of 677.3 feet. Mill Creek crosses highway 89 terminating in the Dan River approximately 100 feet south of the project site.

Soils

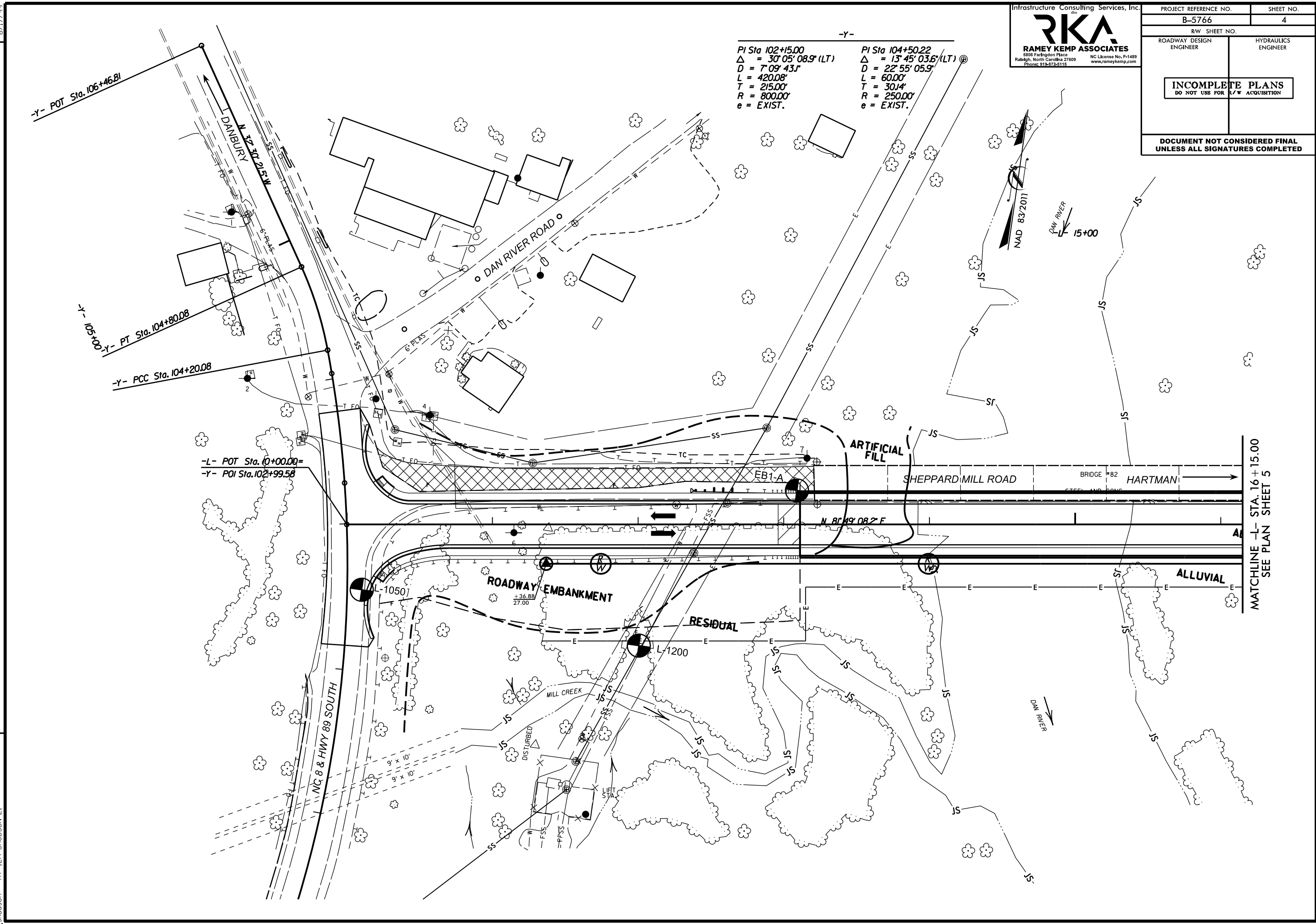
Soils encountered along the project site include Roadway Embankment, Artificial Fill, Alluvial, Residual, Weathered Rock, and Crystalline Rock.

- Roadway Embankment soils exist beneath and adjacent to existing -L- (Sheppard Mill Road) and consist of approximately three (3) to 20 feet of material. The embankment soils are comprised of soft to stiff, fine grained sandy clay and sandy silt (A-4, A-6) and very loose to loose, fine grained silty sands (A-2-4).
- Artificial Fill was identified and inferred along the project corridor adjacent to the Dan River and under the Moratock Park access roads. Although not sampled, the materials under the access roads are expected to be comprised of materials similar to those used for Roadway Embankment.
- Alluvial soils were identified across the flood plain to the east of the Dan River and south of Sheppard Mill Road at thickness ranging from six (6) to 12 feet. The soils were predominantly described as very loose to loose, fine grained sands and silty, fine grained sands (A-3, A-2-4) with some well-rounded gravels at the base of the stratum. Medium stiff, clay and fine grained sandy clay (A-6) was encountered along the eastern bank of the Dan River.
- Residual materials consisting of very soft to hard, fine sandy and clayey silt and fine sandy and silty clay (A-6, A-7, A-4) were encountered beneath the Roadway Embankment on the west side of the Dan River at thicknesses of up to approximately 23 feet. A small amount of loose to very dense sand and clayey sand (A-2-4, A-2-6) was identified beneath the fine material adjacent to the Dan River. Residual materials on the east side of the Dan River were comprised primarily of loose to dense, silty, fine and coarse sand (A-2-4, A-3) with some clay and weathered rock fragments at thickness up to 15 feet.
- Weathered Rock (Gneiss) was identified beneath the Residual soils at elevations ranging from 682 feet 673 feet west of the Dan River and from elevations ranging from approximately 665 feet to 685 feet east of the Dan River.
- Crystalline Rock (Gneiss) was identified beneath the Weathered Gneiss at elevations ranging from a high of 682 feet near the west side of the Dan River to a low of 668 feet on the east side of the Dan River. No rock core was collected during the Roadway Investigation.

PROJECT REFERENCE NO. B-5766	SHEET NO. 4
RW SHEET NO. ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
INCOMPLETE PLANS DO NOT USE FOR R/W ACQUISITION	
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED	

-Y-

PI Sta 102+15.00 Δ = 30° 05' 08.9" (LT) D = 7° 09' 43.1" L = 420.08' T = 215.00' R = 800.00' e = EXIST.	PI Sta 104+50.22 Δ = 13° 45' 03.6" (LT) D = 22° 55' 05.9" L = 60.00' T = 30.14' R = 250.00' e = EXIST.
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-L- POT Sta. 10+00.00=
-Y- POI Sta. 102+99.58

-Y- POT Sta. 106+46.81

-Y- 105+00
-Y- PT Sta. 104+80.08
-Y- PCC Sta. 104+20.08

MATCHLINE -L- STA. 16+15.00
SEE PLAN SHEET 5

REVISIONS

28-NOV-2023 12:25
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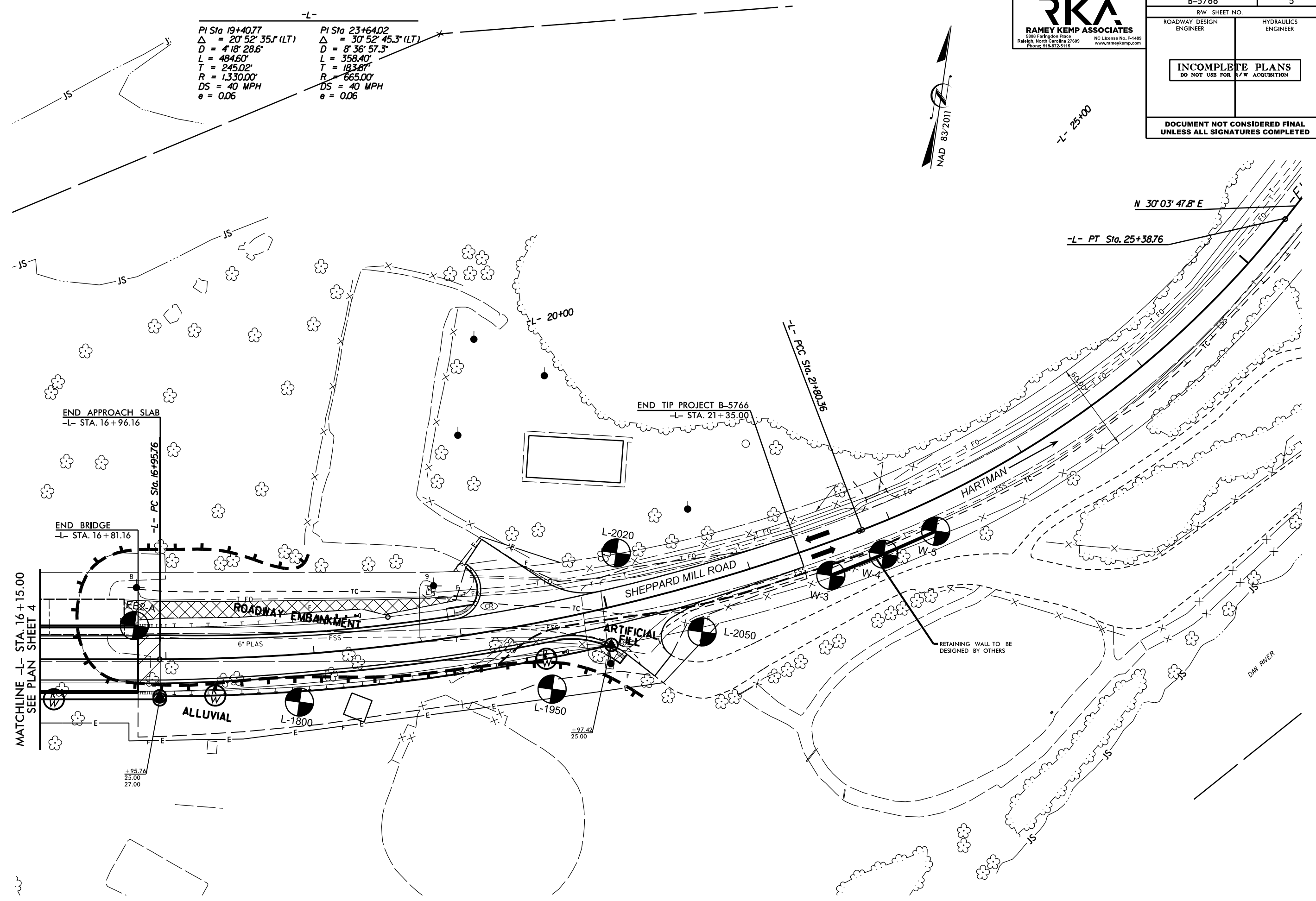
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 Shudson

REVISIONS

PI Sta 19+40.77 $\Delta = 20^\circ 52' 35.1" (LT)$ $D = 4' 18" 28.6"$ $L = 484.60'$ $T = 245.02'$ $R = 1,330.00'$ $DS = 40 MPH$ $e = 0.06$	PI Sta 23+64.02 $\Delta = 30^\circ 52' 45.3" (LT)$ $D = 8' 36" 57.3"$ $L = 358.40'$ $T = 183.87'$ $R = 665.00'$ $DS = 40 MPH$ $e = 0.06$
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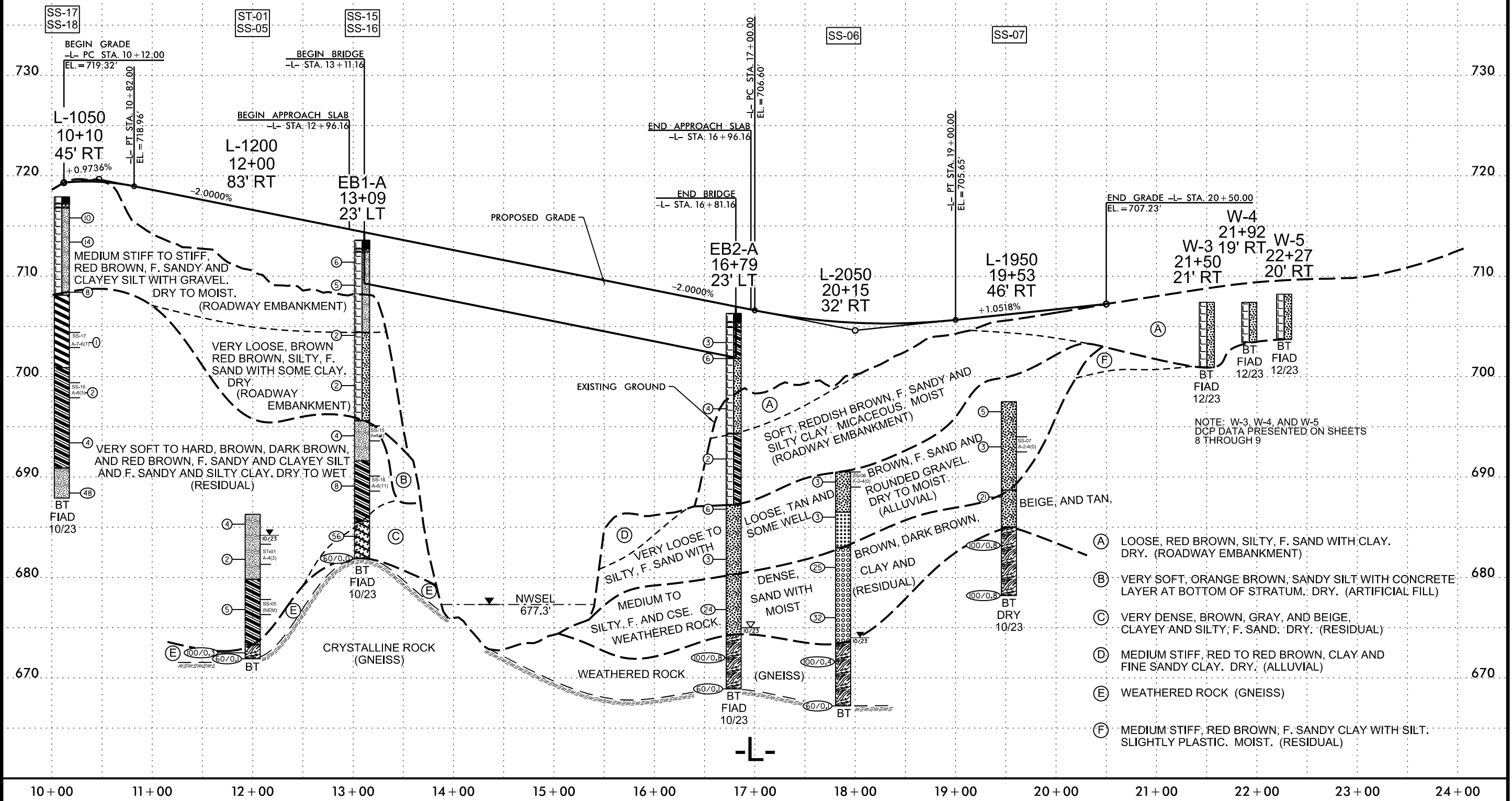
Infrastructure Consulting Services, Inc.
RKA
RAMEY KEMP ASSOCIATES
 5808 Farlington Place
 Raleigh, North Carolina 27608
 Phone: 919-872-5115
 NC License No. F-1489
 www.rameykemp.com

PROJECT REFERENCE NO. B-5766	SHEET NO. 5
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
INCOMPLETE PLANS DO NOT USE FOR R/W ACQUISITION	
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED	



-L- SR 1674 (SHEPPARD MILL ROAD)

SAMPLE NUMBER	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P. I.	% BY WEIGHT				% PASSING SIEVES			% MOISTURE	% ORGANIC
							C. SAND	F. SAND	SILT	CLAY	10	40	200		
SS-17	45 ft RT	10+10	13.5- 15.0	A-7-6(7)	41	16	15.2	34.1	18.5	32.2	99.3	93	56	26	-
SS-18	45 ft RT	10+10	18.5- 20.0	A-6(5)	35	14	10.2	42.0	18.4	29.4	90.9	88	50	19	-
ST-01	83 ft RT	12+00	3.5- 5.0	A-4(3)	32	7	6.0	41.9	29.5	22.6	100	96	65	16	-
SS-05	83 ft RT	12+00	8.5- 10.0	NEM	32	6	NEM	NEM	NEM	NEM	91.2	NEM	NEM	38	-
SS-15	23 ft LT	13+09	18.5- 20.0	A-4(4)	32	9	3.5	32.9	40.1	23.5	96.3	95	62	25	-
SS-16	23 ft LT	13+09	23.5- 25.0	A-6(11)	39	16	3.9	32.3	25.2	38.6	99.9	99	71	24	-
SS-06	32 ft RT	17+88	0.0- 1.5	A-2-4(0)	NP	NP	35.1	47.5	11.0	6.5	94.6	83	21	16	-
SS-07	46 ft RT	19+53	3.5- 5.0	A-2-4(0)	NP	NP	14.9	54.7	21.6	8.8	99.7	96	33	13	-



NOTE: W-3, W-4, AND W-5 DCP DATA PRESENTED ON SHEETS 8 THROUGH 9

- (A) LOOSE, RED BROWN, SILTY, F. SAND WITH CLAY. DRY. (ROADWAY EMBANKMENT)
- (B) VERY SOFT, ORANGE BROWN, SANDY SILT WITH CONCRETE LAYER AT BOTTOM OF STRATUM. DRY. (ARTIFICIAL FILL)
- (C) VERY DENSE, BROWN, GRAY, AND BEIGE, CLAYEY AND SILTY, F. SAND. DRY. (RESIDUAL)
- (D) MEDIUM STIFF, RED TO RED BROWN, CLAY AND FINE SANDY CLAY. DRY. (ALLUVIAL)
- (E) WEATHERED ROCK (GNEISS)
- (F) MEDIUM STIFF, RED BROWN, F. SANDY CLAY WITH SILT. SLIGHTLY PLASTIC. MOIST. (RESIDUAL)

5/14/99
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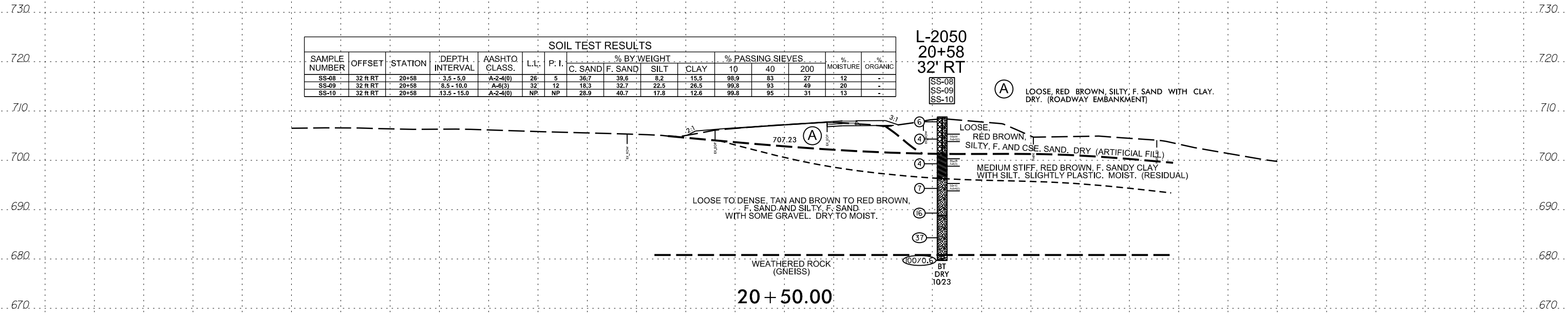
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SAMPLE NUMBER	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P. I.	% BY WEIGHT				% PASSING SIEVES			MOISTURE	% ORGANIC
							C. SAND	F. SAND	SILT	CLAY	10	40	200		
SS-08	32 ft RT	20+58	3.5 - 5.0	A-2-4(0)	26	5	36.7	39.6	8.2	15.5	98.9	83	27	12	-
SS-09	32 ft RT	20+58	8.5 - 10.0	A-6(3)	32	12	18.3	32.7	22.5	26.5	99.8	93	49	20	-
SS-10	32 ft RT	20+58	13.5 - 15.0	A-2-4(0)	NP	NP	28.9	40.7	17.8	12.6	99.8	95	31	13	-

L-2050
20+58
32' RT

SS-08
SS-09
SS-10

(A) LOOSE, RED BROWN, SILTY, F. SAND WITH CLAY. DRY. (ROADWAY EMBANKMENT)

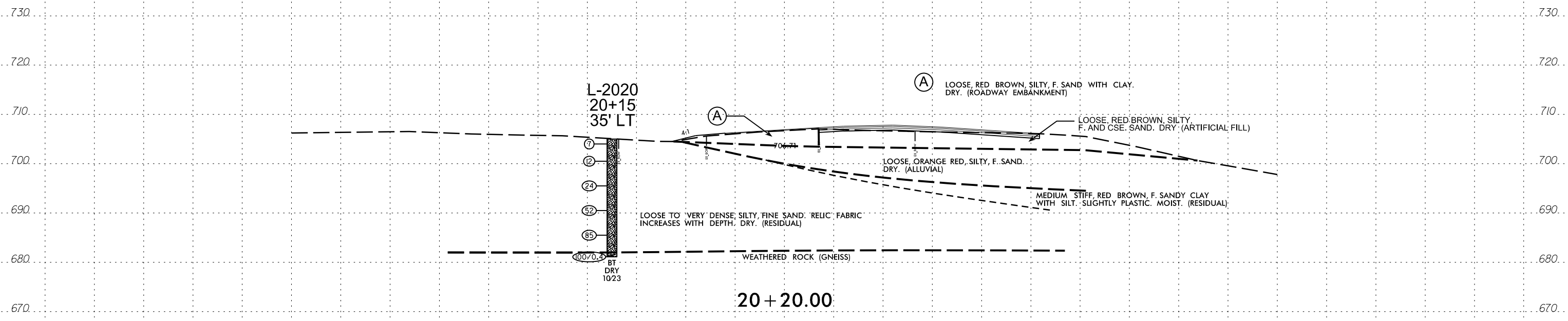


20 + 50.00

L-2020
20+15
35' LT

(7)
(12)
(24)
(52)
(85)
BT
DRY
1023

(A) LOOSE, RED BROWN, SILTY, F. SAND WITH CLAY. DRY. (ROADWAY EMBANKMENT)



20 + 20.00

