



STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION

ROY COOPER
GOVERNOR

J. ERIC BOYETTE
SECRETARY

August 30, 2022

MEMORANDUM TO: Clark Morrison PhD, P.E.
State Pavement Design Engineer

Tatia L. White, P.E., PLS
State Roadway Design Engineer

FROM: J. L. Pilipchuk, P.E., L.G.
State Geotechnical Engineer

STATE PROJECT: 46892.1.3 (U-5955A)

COUNTY: Mecklenburg

DESCRIPTION: NC 16 (Brookshire Boulevard), Improve I-85 Northbound
Ramp to NC 16

SUBJECT: Pavement and Subgrade Investigation Report

DocuSigned by:

John Pilipchuk

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The Geotechnical Engineering Unit has completed the evaluation of the pavement and subgrade investigation for this project and presents the following.

The proposed work consists of widening and improving the I-85 ramp onto Brookshire Boulevard (NC-16).

The subgrade beneath the existing roadway consists of residual and roadway embankments soils. The predominant soil types consist of sandy clay (A-6) and silty clays (A-7-5, A-7-6).

Anticipated borrow will likely consist of sandy and silty clays.

The length of this project is 0.209 miles.

The existing pavement is in fair condition, with moderate severity block, fatigue, and transverse cracking, and longitudinal cracking along joints.

AREAS OF SPECIAL GEOTECHNICAL INTEREST

A. Highly Plastic Clays:

Locations of clays with a PI of 26 or greater

LINE	STATION AND OFFSET	PI
-RPD-	20+71 LT PS	32
-RPD-	23+08 RT LN	31
-RPD-	23+08 RT PS	27
-RAMPC2-	12+11 OUTSIDE LTL	30
-RAMPC2-	12+11 GORE	28

B. Trapped Water within the Pavement:

Trapped water was not encountered during this investigation.

C. Ground Water

Groundwater was not encountered during this investigation.

D. Soils with a High Moisture Content:

No locations had a moisture content that exceeds the plastic limit.

JLP/JBB/LMH

ATTACHMENT 1:	Pavement and Subgrade Inventory	20
ATTACHMENT 2:	DCP Graphs	15
ATTACHMENT 3:	Pavement Core Evaluation	2



DocuSigned by:

Jeffrey Brian Barfield

08/30/2022

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REFERENCE: U-5955A

PROJECT: 46892

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

**ROADWAY
SUBSURFACE INVESTIGATION**

COUNTY MECKLENBURG
PROJECT DESCRIPTION NC 16 (BROOKSHIRE
BOULEVARD), IMPROVE I-85 NORTHBOUND RAMP
TO NC 16

PAVEMENT AND SUBGRADE INVESTIGATION

CONTENTS

SHEET NO.	DESCRIPTION
1	TITLE SHEET
2, 2A	LEGEND (SOIL & ROCK), ABBREVIATIONS
3	ROADWAY TITLE SHEET
4-5	PLAN SHEETS
6-7	PAVEMENT INVESTIGATION DATA SHEETS
8-11	DUAL MASS DCP DATA SHEETS
12-13	PAVEMENT CORE PHOTOS
14-19	LABORATORY TEST RESULTS

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	U-5955A	1	19

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 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:
- 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.
 - 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.

FIELD PERSONNEL

M. BREWER

D. UNDERWOOD

D. DEMBY

T. WENNER

INVESTIGATED BY CG2

DRAWN BY T. WENNER, P.G.

CHECKED BY M. BREWER, P.E.

SUBMITTED BY CG2

DATE AUGUST 2022

Prepared in the Office of:



**CAROLINAS
GEOTECHNICAL
GROUP**
2400 CROWNPOINT EXECUTIVE DRIVE
SUITE 800
CHARLOTTE, NC 28227
(980) 339-8684



DocuSigned by:

Matt Brewer

09/02/2022

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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 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 (ROD) - 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 (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. STRATA CORE RECOVERY (SREC.) - TOTAL LENGTH OF STRATA MATERIAL RECOVERED DIVIDED BY TOTAL LENGTH OF STRATUM AND EXPRESSED AS A PERCENTAGE. STRATA ROCK QUALITY DESIGNATION (SROD) - A MEASURE OF ROCK QUALITY DESCRIBED BY TOTAL LENGTH OF ROCK SEGMENTS WITHIN A STRATUM EQUAL TO OR GREATER THAN 4 INCHES DIVIDED BY THE TOTAL LENGTH OF STRATA AND EXPRESSED AS A PERCENTAGE. TOPSOIL (TS.) - SURFACE SOILS USUALLY CONTAINING ORGANIC MATTER.</p>																																																																																																																																														
<p style="text-align: center;">SOIL LEGEND AND AASHTO CLASSIFICATION</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <th rowspan="2">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>A-1</th> <th>A-3</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></th> <th></th> <th></th> <th></th> </tr> <tr> <td>GROUP CLASS.</td> <td>A-1-a</td> <td>A-1-b</td> <td>A-2-4</td> <td>A-2-5</td> <td>A-2-6</td> <td>A-2-7</td> <td>A-4</td> <td>A-5</td> <td>A-6</td> <td>A-7</td> <td>A-1, A-2</td> <td>A-3</td> <td>A-4, A-5</td> <td>A-6, A-7</td> <td></td> </tr> <tr> <td>SYMBOL</td> <td colspan="5">[Pattern]</td> <td colspan="5">[Pattern]</td> <td colspan="5">[Pattern]</td> </tr> <tr> <td>% PASSING #10 #40 #200</td> <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>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> <td></td> </tr> <tr> <td>MATERIAL PASSING #40 LL PI</td> <td colspan="5"></td> <td colspan="5"></td> <td colspan="5"></td> </tr> <tr> <td>GROUP INDEX</td> <td colspan="5">0</td> <td colspan="5">4 MX</td> <td colspan="5">8 MX 12 MX 16 MX NO MX</td> </tr> <tr> <td>USUAL TYPES OF MAJOR MATERIALS</td> <td colspan="2">STONE FRAGS. 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ARE USED IN DESCRIPTIONS WHEN THEY ARE CONSIDERED OF SIGNIFICANCE.</p>										<p style="text-align: center;">WEATHERING</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> <p>SLIGHT (SLI.): ROCK GENERALLY FRESH, JOINTS STAINED AND DISCOLORATION EXTENDS INTO ROCK UP TO 1 INCH. OPEN JOINTS MAY CONTAIN CLAY. IN GRANITOID ROCKS SOME OCCASIONAL FELDSPAR CRYSTALS ARE DULL AND DISCOLORED. CRYSTALLINE ROCKS RING UNDER HAMMER BLOWS.</p> <p>MODERATE (MOD.): SIGNIFICANT PORTIONS OF ROCK SHOW DISCOLORATION AND WEATHERING EFFECTS. IN GRANITOID ROCKS, MOST FELDSPARS ARE DULL AND DISCOLORED, SOME SHOW CLAY. ROCK HAS DULL SOUND UNDER HAMMER BLOWS AND SHOWS SIGNIFICANT LOSS OF STRENGTH AS COMPARED WITH FRESH ROCK.</p> <p>MODERATELY SEVERE (MOD. SEV.): ALL ROCK EXCEPT QUARTZ DISCOLORED OR STAINED. IN GRANITOID ROCKS, ALL FELDSPARS DULL AND DISCOLORED AND A MAJORITY SHOW KAOLINIZATION. ROCK SHOWS SEVERE LOSS OF STRENGTH AND CAN BE EXCAVATED WITH A GEOLOGIST'S PICK. ROCK GIVES "CLUNK" SOUND WHEN STRUCK. <i>IF TESTED, WOULD YIELD SPT REFUSAL</i></p> <p>SEVERE (SEV.): ALL ROCK EXCEPT QUARTZ DISCOLORED OR STAINED. ROCK FABRIC CLEAR AND EVIDENT BUT REDUCED IN STRENGTH TO STRONG SOIL. IN GRANITOID ROCKS ALL FELDSPARS ARE KAOLINIZED TO SOME EXTENT. SOME FRAGMENTS OF STRONG ROCK USUALLY REMAIN. <i>IF TESTED, WOULD YIELD SPT N VALUES > 100 BPF</i></p> <p>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></p> <p>COMPLETE: ROCK REDUCED TO SOIL. ROCK FABRIC NOT DISCERNIBLE, OR DISCERNIBLE ONLY IN SMALL AND SCATTERED CONCENTRATIONS. QUARTZ MAY BE PRESENT AS DIKES OR STRINGERS. SAPROLITE IS ALSO AN EXAMPLE.</p>									
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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																																																																																																																																																																									
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Tip No. U-5995A| WBS No. 46892.1.3| Mecklenburg County

ABBREVIATIONS

RT LN = Right Lane

LT LN = Left Lane

OSL = Outside Lane

ISL = Inside Lane

OSML = Outside Mid-Lane

ISML = Inside Mid-Lane

PS = Paved Shoulder

LTL = Left Turn Lane

RTL = Right Turn Lane

MID = Middle Lane

CTL = Center Turn Lane

ISWP = Inside Wheel Path

OSWP = Outside Wheel Path

PS = Paved Shoulder

FW = From White Line

FY = From Yellow Line

RT = Right

LT = Left

(I) = Inside

(O) = Outside

BOC = Back of Curb

C&G = Curb and Gutter

EOP = Edge of Pavement

CR = Crown

S = Super

C = Cut

F = Fill

DCP = Dynamic Cone Penetrometer

M = Moist

W = Wet

N/A = Not Observed

NSR = No Sample Recovered

S- = Soil Grab Sample

Ref- = Soil Reference Sample

SS- = Split Spoon Sample

RE = Roadway Embankment

F. = Fine

Cse. = Coarse

ABC = Aggregate Base Course

STBC = Soil Type Base Course

CSS = Cement Stabilized Soil

SG = Subgrade

See Sheet 1A For Index of Sheets
 See Sheet 1B For Conventional Symbols
 See 1C Sheet Series For Survey Control

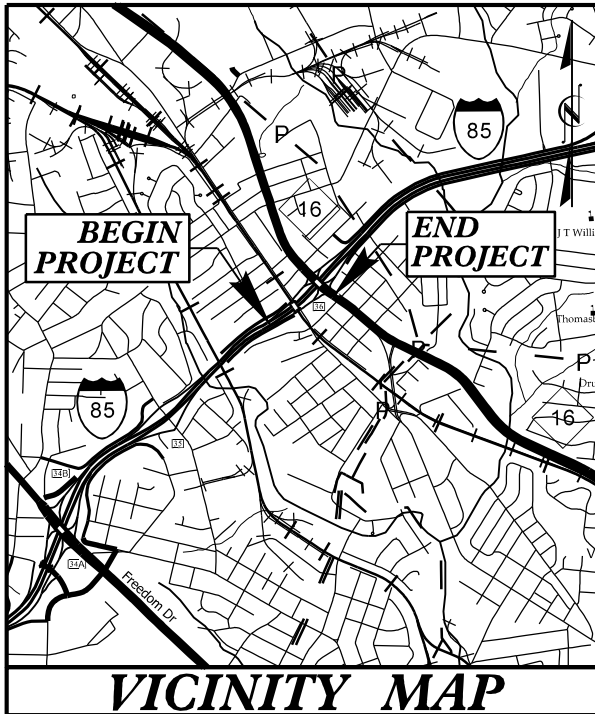
STATE OF NORTH CAROLINA
 DIVISION OF HIGHWAYS

MECKLENBURG COUNTY

LOCATION: NC 16 (BROOKSHIRE BOULEVARD), IMPROVE
 I-85 NORTHBOUND RAMP TO EASTBOUND NC 16

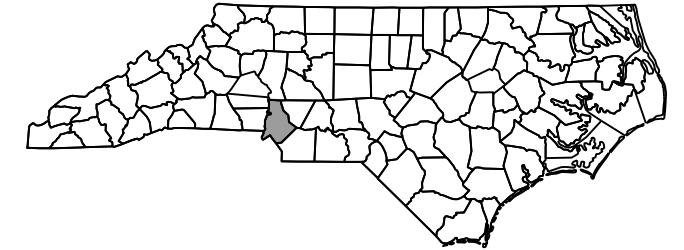
TYPE OF WORK: GRADING, PAVING, DRAINAGE, WIDENING
 & SIGNALS

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	U-5955A	3	19
STATE PROJ. NO.	F.A. PROJ. NO.	DESCRIPTION	
46892.1.3	N/A	P.E.	



NOT TO SCALE

25% PLANS



BEGIN TIP PROJECT U-5955A
 -RPD- STA. 15 + 88.48

END TIP PROJECT U-5955A
 -RPD- STA. 26 + 92.35

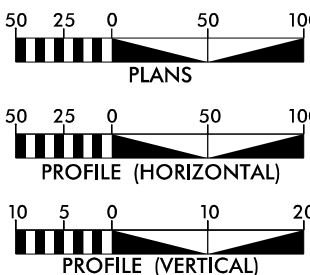
THIS PROJECT IS WITHIN THE MUNICIPAL BOUNDARIES OF CHARLOTTE.

THIS IS A CONTROLLED ACCESS PROJECT WITH ACCESS BEING LIMITED TO INTERCHANGES.

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

- ☆ EXISTING SIGNALS TO BE MODIFIED
- ★ PROPOSED SIGNAL

GRAPHIC SCALES



DESIGN DATA

ADT 2022 = 26,196
 ADT 2042 = 35,677
 K = 8 %
 D = 55 %
 T = 10 % *
 V = 50/30 MPH
 * TTST = 6% DUAL 4%
 FUNC CLASS =
 RAMP
 REGIONAL TIER

PROJECT LENGTH

LENGTH ROADWAY TIP PROJECT U-5955A 0.209 MI
 TOTAL LENGTH OF TIP PROJECT U-5955A 0.209 MI

PLANS PREPARED BY:



FOR DIVISION OF HIGHWAYS

2018 STANDARD SPECIFICATIONS

RIGHT OF WAY DATE: N/A

LETTING DATE: JANUARY 18, 2023

MICHAEL D. HAGE, P.E.
 PROJECT ENGINEER
 NATHAN E. WRIGHT, P.E.
 PROJECT DESIGN ENGINEER

NC DOT CONTACT:
 DUSTIN L. SIMPSON
 DIVISION 10 PROJECT MANAGER

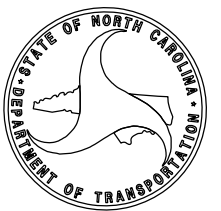
HYDRAULICS ENGINEER

SIGNATURE: _____ P.E.

ROADWAY DESIGN ENGINEER

SIGNATURE: _____ P.E.

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

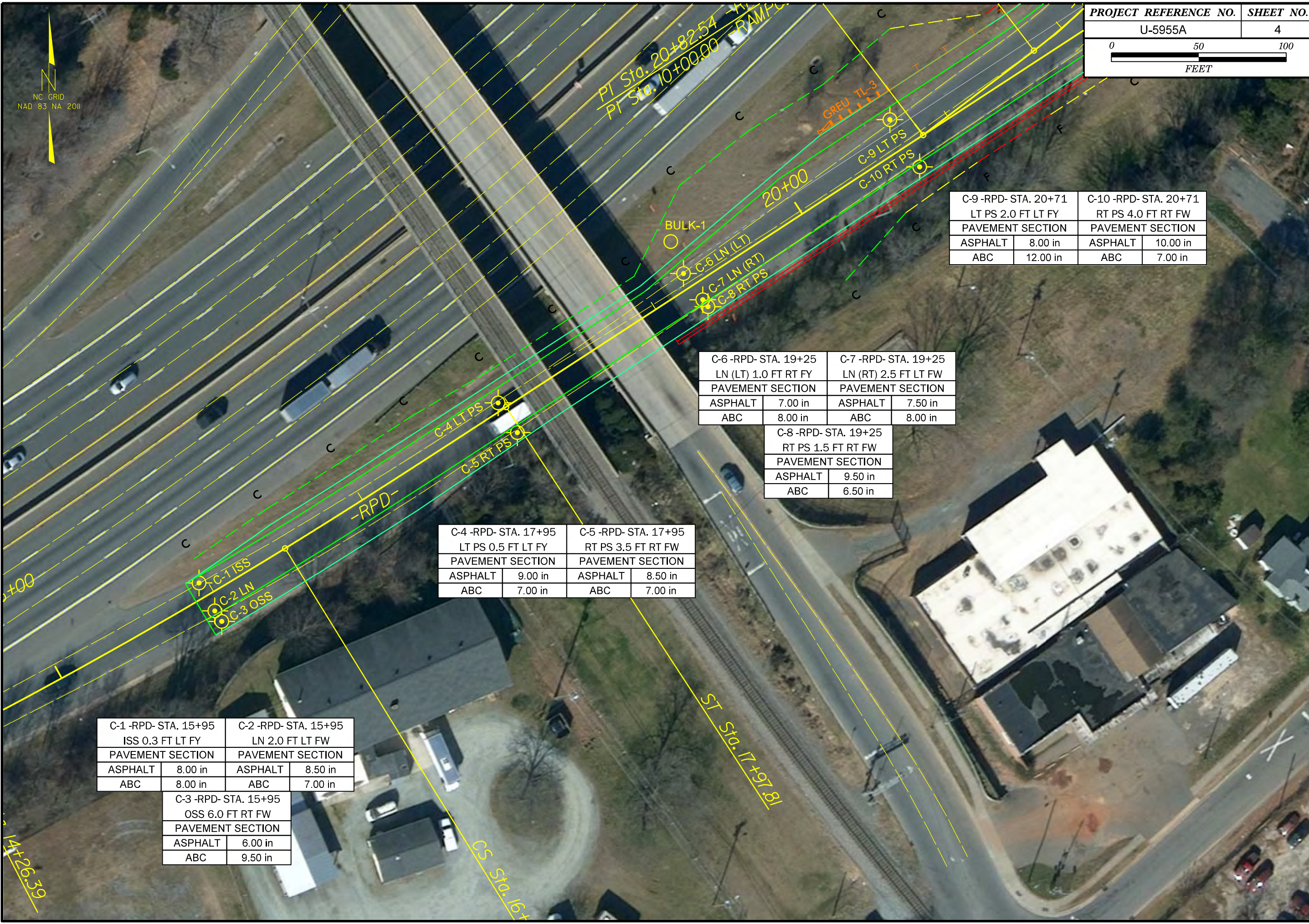
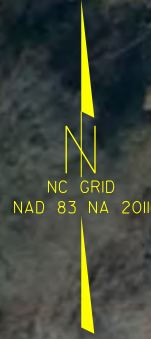


CONTRACT: TIP PROJECT: U-5955A

CONTRACT: TIP PROJECT: U-5955A

05/30/17

\$DATE\$\$\$\$TIME\$\$\$\$
 C:\User\TylerWenner\OneDrive - Carolinas Geotechnical Group, PLLC\Projects\0134 - U-5955A PD\CADD\GEO\TECH\Plan\Prof_U5955A_Rdy_tsh.dgn
 \$\$\$\$\$\$



C-1 -RPD- STA. 15+95 ISS 0.3 FT LT FY		C-2 -RPD- STA. 15+95 LN 2.0 FT LT FW	
PAVEMENT SECTION		PAVEMENT SECTION	
ASPHALT	8.00 in	ASPHALT	8.50 in
ABC	8.00 in	ABC	7.00 in

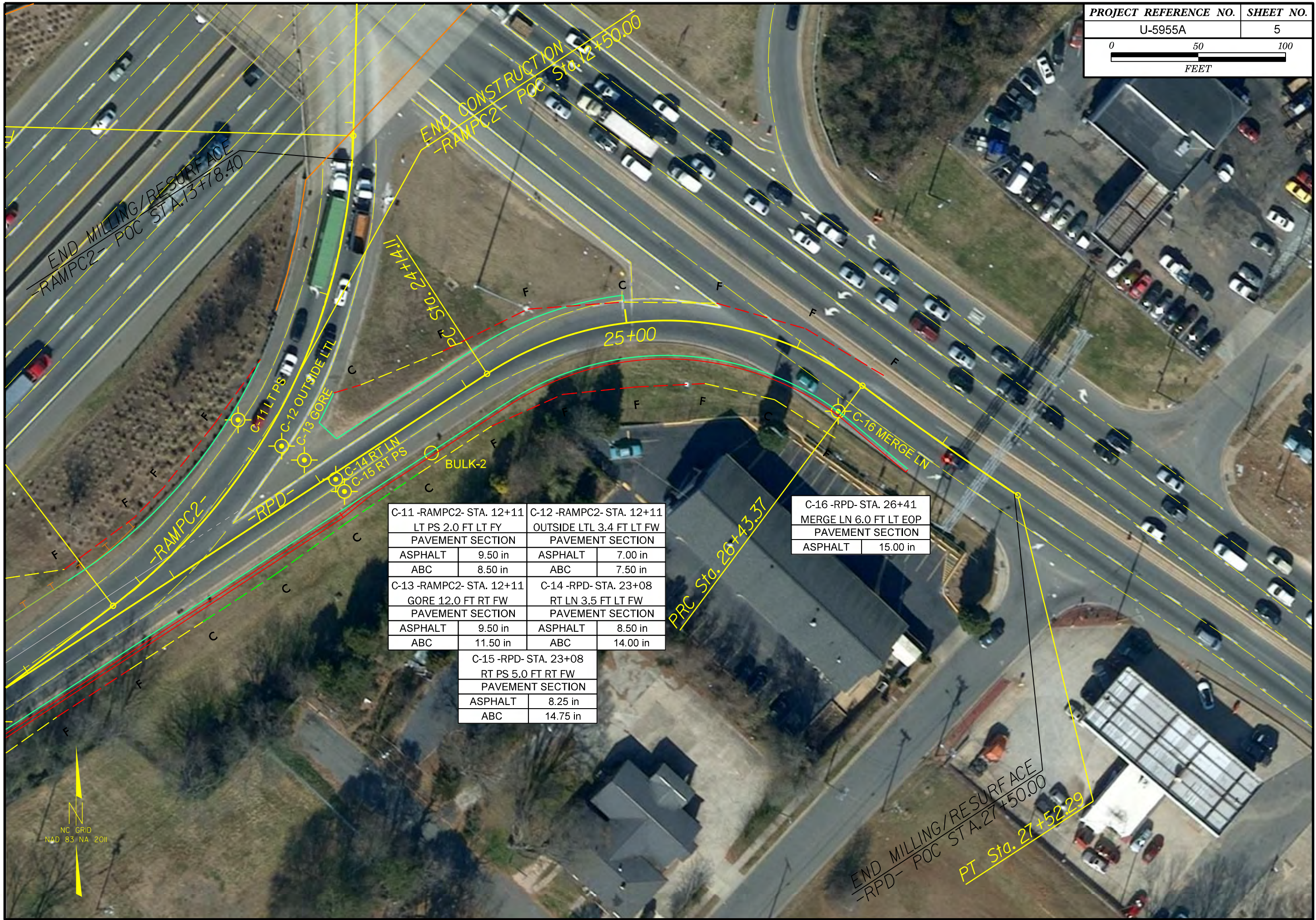
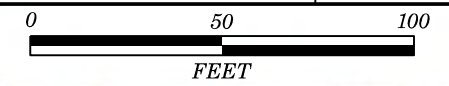
C-3 -RPD- STA. 15+95 OSS 6.0 FT RT FW	
PAVEMENT SECTION	
ASPHALT	6.00 in
ABC	9.50 in

C-4 -RPD- STA. 17+95 LT PS 0.5 FT LT FY		C-5 -RPD- STA. 17+95 RT PS 3.5 FT RT FW	
PAVEMENT SECTION		PAVEMENT SECTION	
ASPHALT	9.00 in	ASPHALT	8.50 in
ABC	7.00 in	ABC	7.00 in

C-6 -RPD- STA. 19+25 LN (LT) 1.0 FT RT FY		C-7 -RPD- STA. 19+25 LN (RT) 2.5 FT LT FW	
PAVEMENT SECTION		PAVEMENT SECTION	
ASPHALT	7.00 in	ASPHALT	7.50 in
ABC	8.00 in	ABC	8.00 in

C-8 -RPD- STA. 19+25 RT PS 1.5 FT RT FW	
PAVEMENT SECTION	
ASPHALT	9.50 in
ABC	6.50 in

C-9 -RPD- STA. 20+71 LT PS 2.0 FT LT FY		C-10 -RPD- STA. 20+71 RT PS 4.0 FT RT FW	
PAVEMENT SECTION		PAVEMENT SECTION	
ASPHALT	8.00 in	ASPHALT	10.00 in
ABC	12.00 in	ABC	7.00 in



C-11 -RAMPC2- STA. 12+11 LT PS 2.0 FT LT FY		C-12 -RAMPC2- STA. 12+11 OUTSIDE LTL 3.4 FT LT FW	
PAVEMENT SECTION		PAVEMENT SECTION	
ASPHALT	9.50 in	ASPHALT	7.00 in
ABC	8.50 in	ABC	7.50 in
C-13 -RAMPC2- STA. 12+11 GORE 12.0 FT RT FW		C-14 -RPD- STA. 23+08 RT LN 3.5 FT LT FW	
PAVEMENT SECTION		PAVEMENT SECTION	
ASPHALT	9.50 in	ASPHALT	8.50 in
ABC	11.50 in	ABC	14.00 in
C-15 -RPD- STA. 23+08 RT PS 5.0 FT RT FW			
PAVEMENT SECTION			
ASPHALT	8.25 in		
ABC	14.75 in		

C-16 -RPD- STA. 26+41 MERGE LN 6.0 FT LT EOP	
PAVEMENT SECTION	
ASPHALT	15.00 in



PAVEMENT INVESTIGATION DATA SHEET

Project:	46892.1.3
TIP:	U-5955A

Route:	NC 16 (Brookshire Boulevard), Improve I-85 Northbound Ramp to NC 16
County:	Mecklenburg

Date Performed:	6/20 and 6/21/22 (1 Night)
Field Personnel:	D. Demby, D. Underwod, T. Wenner, M. Brewer

Test Location	Cut/Fill (Est. of Amount) (ft)	Width (ft)		(ft)	(in)	Thickness (in)					Pavement Layering	Subgrade					Asphalt Notes	GPS Coordinates	
		Lane	Shoulder			Offset Distance (See Notes)	Crown "C" or Super "S"	Gross to Top of Soil	Asphalt	ABC		Stabilized Subgrade	Concrete	Description (Depth - ft)	Soil Sample Number	AASHTO Classification		Soil Moisture	Boring Depth (ft)
C-1 -RPD- Sta. 15+95 ISS	Cut 20.0	16.0	4.0 PS	0.3 LT FY	Cr.	16.00	8.00	8.00			Asphalt ABC SG	1.3-5.0: RES - Tan, Slightly Plastic Fine to Coarse Sandy CLAY	Ref-2	A-6	M	5	Low to Moderate Severity Transverse, Longitudinal, and Block Cracking, Moderate Severity Edge Cracking	554,949	1,438,662
C-2 -RPD- Sta. 15+95 LN	Cut 20.0	16.0	Concrete Exp. Gutter 10.0 PS	2.0 LT FW	Cr.	15.50	8.50	7.00			Asphalt ABC SG	1.3-5.0: RES - Tan, Slightly Plastic Fine to Coarse Sandy CLAY	S-2	A-6	M	5	Low to Moderate Severity Transverse, Longitudinal, and Block Cracking	554,927	1,438,675
C-3 -RPD- Sta. 15+95 OSS	Cut 20.0	16.0	Concrete Exp. Gutter 10.0 PS	6.0 RT FW	Cr.	15.50	6.00	9.50			Asphalt ABC SG	1.3-5.0: RES - Tan, Slightly Plastic Fine to Coarse Sandy CLAY	Ref-2	A-6	M	5	Low to Moderate Severity Transverse, Longitudinal, and Block Cracking, Full Depth Top-Down Crack in Core	554,927	1,438,675
C-4 -RPD- Sta. 17+95 LT PS	Cut 20.0	16.0	4.0 PS	0.5 LT FY	Cr.	16.00	9.00	7.00			Asphalt ABC SG	1.3-5.0: RES - Tan, Slightly Plastic Fine to Coarse Sandy CLAY	S-4	A-6	M	5	Moderate to High Severity Fatigue and Transverse Cracking, High Severity Ravelling, High Severity Edge Cracking, Pavement Resurfaced from Beginning of Ramp to this Area	555,052	1,438,833
C-5 -RPD- Sta. 17+95 RT PS	Cut 20.0	16.0	8.0 PS	3.5 RT FW	Cr.	15.50	8.50	7.00			Asphalt ABC SG	1.3-5.0: RES - Tan-Orange, Slightly Plastic Silty CLAY	S-5	A-7-5	M	5	Low Severity Transverse Cracking	555,035	1,438,844
C-6 -RPD- Sta. 19+25 LN (LT)	Cut 10.0	16.0	4.0 PS	1.0 RT FY	Cr.	15.00	7.00	8.00			Asphalt ABC SG	1.3-5.0: RES - Tan-Orange, Moderately Plastic Silty CLAY	S-6	A-7-5	M	5	Low to Moderate Severity Transverse, Longitudinal, and Block Cracking, Polished	555,126	1,438,939
C-7 -RPD- Sta. 19+25 LN (RT)	Cut 10.0	16.0	Concrete Exp. Gutter 7.0 PS	2.5 LT FW	Cr.	15.50	7.50	8.00			Asphalt ABC SG	1.3-5.0: RES - Tan-Orange, Moderately Plastic Silty CLAY	Ref-6	A-7-5	M	5	High Severity Longitudinal and Transverse Cracking, Polished, Full Depth Top-Down Crack in Core	555,111	1,438,950
C-8 -RPD- Sta. 19+25 RT PS	Cut 10.0	16.0	Concrete Exp. Gutter 7.0 PS	1.5 RT FW	Cr.	16.00	9.50	6.50			Asphalt ABC SG	1.3-5.0: RES - Tan-Orange, Moderately Plastic Silty CLAY	S-8	A-7-6	M	5	High Severity Longitudinal and Transverse Cracking, Polished	555,107	1,438,953
C-9 -RPD- Sta. 20+71 LT PS	Cut 10.0	13.0	3.5 PS	2.0 LT FY	Cr.	20.00	8.00	12.00			Asphalt ABC SG	1.7-5.0: RES - Tan-Orange, Highly Plastic Silty CLAY	S-9	A-7-5	M	5	Low to Moderate Severity Transverse and Longitudinal Cracking	555,214	1,439,057
C-10 -RPD- Sta. 20+71 RT PS	Cut 10.0	13.0	Concrete Exp. Gutter 8.0 PS	4.0 RT FW	Cr.	17.00	10.00	7.00			Asphalt ABC SG	1.4-5.0: RES - Tan-Orange, Highly Plastic Silty CLAY	Ref-9	A-7-5	M	5	Low to Moderate Severity Transverse and Longitudinal Cracking	555,187	1,439,074
C-14 -RPD- Sta. 23+08 RT LN	Fill 5.0	16.0	Concrete Exp. Gutter 8.0 PS	3.5 LT FW	S	22.50	8.50	14.00			Asphalt ABC SG	1.9-5.0: RE - Red-Brown, Highly Plastic Silty CLAY	S-14	A-7-6	M	5	Moderate Severity Longitudinal Cracking, Low to Moderate Severity Transverse Cracking	555,326	1,439,267
C-15 -RPD- Sta. 23+08 RT PS	Fill 5.0	16.0	Concrete Exp. Gutter 8.0 PS	5.0 RT FW	S	23.00	8.25	14.75			Asphalt ABC SG	1.9-5.0: RE - Red-Brown, Highly Plastic Silty CLAY	S-15	A-7-6	M	5	Moderate Severity Longitudinal Cracking, Low to Moderate Severity Transverse Cracking	555,319	1,439,272
C-16 -RPD- Sta. 26+41 MERGE LN	Fill 2.0	12.0	Concrete Exp. Gutter	6.0 LT EOP	Cr.	15.00	15.00				Asphalt SG	1.3-2.3: RE - Red-Brown, Highly Plastic Silty CLAY 2.3-5.0: RES - Tan-Orange-Gray, Slightly Plastic Fine to Coarse Sandy CLAY	Ref-15 S-16	A-7-6 A-6	M M	5	Low Severity Longitudinal and Transverse Cracking	555,365	1,439,555
C-11 -RAMPC2- Sta. 12+11 LT PS	Fill 5.0	15.0	6.0 PS	2.0 LT FY	S	18.00	9.50	8.50			Asphalt ABC SG	1.5-4.6: RE - Gray-Orange, Clayey Fine to Coarse SAND, with trace asphalt fragments Auger Refusal at 4.6 feet	S-11	A-2-6	M	4.6 AR	Low to Moderate Severity Transverse and Longitudinal Cracking, Moderate Severity Ravelling	555,360	1,439,211
C-12 -RAMPC2- Sta. 12+11 OUTSIDE LTL	Fill 5.0	16.0	-	3.4 LT FW	S	14.50	7.00	7.50			Asphalt ABC SG	1.2-5.0: RE - Red-Brown, Highly Plastic Silty CLAY	S-12	A-7-5	M	5	Low to Moderate Severity Transverse and Longitudinal Cracking, Rutting (IS/OSWP)	555,345	1,439,236

Notes:
Offset Distance: Left and Right Relative to the Direction of Travel

Prepared by: CTW
Reviewed by: DMB



DUAL MASS DYNAMIC CONE PENETROMETER DATA SHEET										WBS NO.	PROJECT TIP I.D.	ROUTE
										46892.1.3	U-5955A	NC 16 (Brookshire Boulevard), Improve I-85 Northbound Ramp to NC 16
										COUNTY	FIELD PROFESSIONAL	FIELD CREW
										Mecklenburg	T. Wenner, P.G.	D. Demby, D. Underwood, M. Brewer
Test Location					Test Location					Date Run	Date Run	
C-1 - RPD- Sta. 15+95 ISS 0.3 FT LT FY					C-2 - RPD- Sta. 15+95 LN 2.0 FT LT FW					6/20 to 6/21/22	6/20 to 6/21/22	
Type	Test Interval		Datum		Cut/Fill	Type	Test Interval		Datum		Cut/Fill	
DCP	Cumulative cm per blow		ABC		20.0 ft Cut	DCP	Cumulative cm per blow		ABC		20.0 ft Cut	
0.17	11.21	41.00				0.60	13.90					
0.34	11.38	41.60				1.30	15.60					
0.51	11.55	42.30				1.44	17.10					
0.68	11.72	43.20				1.59	18.20					
0.85	11.89	43.90				1.73	19.70					
1.02	12.06	44.50				1.88	20.70					
1.19	12.23	44.90				2.02	22.00					
1.36	12.40	45.60				2.16	22.50					
1.53	12.57	46.40				2.31	23.50					
1.70	12.74	47.10				2.45	24.00					
1.87	12.91	47.80				2.60	24.80					
2.04	13.08	48.60				2.74	25.50					
2.21	13.25	49.70				2.88	26.50					
2.38	13.42	50.40				3.03	27.50					
2.55	13.58	51.40				3.17	28.00					
2.72	13.75	51.90				3.32	29.00					
2.89	13.92	52.40				3.46	29.70					
3.06	14.09	53.00				3.60	30.50					
3.23	14.26	54.00				3.75	31.70					
3.40	14.43	54.70				3.89	32.90					
3.57	14.60	55.50				4.04	34.30					
3.74	14.77	56.20				4.18	35.50					
3.91	14.94	57.00				4.32	36.50					
4.08	15.11	57.60				4.47	37.80					
4.25	15.28	58.20				4.61	40.00					
4.42	15.45	59.00				4.76	41.30					
4.58	15.62	60.20				4.90	42.80					
4.75	15.79	61.20				5.04	44.80					
4.92	15.96	62.30				5.19	46.10					
5.09	16.13	63.60				5.33	48.30					
5.26	16.30	64.60				5.48	50.80					
5.43	16.47	65.90				5.62	54.00					
5.60	16.64	67.30				5.76	57.90					
5.77	16.81	69.00				5.91	61.50					
5.94	16.98	70.50				6.05	68.10					
6.11	17.15	72.50				6.20	73.00					
6.28	17.32	74.90				6.34	77.00					
6.45	17.49	76.50				6.48	78.10					
6.62	17.66	78.50				6.63	82.30					
6.79	17.83	80.40				6.77	88.70					
6.96	18.00	82.30				6.92	95.30					
7.13	18.30	84.00				7.06	76.62					
7.30	19.00	86.00				7.20						
7.47	19.50	87.90				7.35						
7.64	20.00	91.10				7.49						
7.81	20.40	95.00				7.64						
7.98	20.70	99.60				7.78						
8.15	21.20	105.00				7.92						
8.32	22.00	109.10				8.07						
8.49	22.30	113.40				8.21						
8.66	22.60	117.50				8.36						
8.83	23.40	121.50				8.50						
9.00	24.50	125.50				DCP REF						
9.17	25.40	129.40				AUGER 8.5						
9.34	26.50					TO 33.5 cm						
9.51	27.50					0.00						
9.68	28.80					2.00						
9.85	30.14					2.50						
10.02	33.50					3.50						
10.19	35.00					4.50						
10.36	36.60					5.80						
10.53	37.80					7.80						
10.70	38.70					9.50						
10.87	39.50					10.60						
11.04	40.00					12.50						

DUAL MASS DYNAMIC CONE PENETROMETER DATA SHEET										WBS NO.	PROJECT TIP I.D.	ROUTE
										46892.1.3	U-5955A	NC 16 (Brookshire Boulevard), Improve I-85 Northbound Ramp to NC 16
										COUNTY	FIELD PROFESSIONAL	FIELD CREW
										Mecklenburg	T. Wenner, P.G.	D. Demby, D. Underwood, M. Brewer
Test Location					Test Location					Date Run	Date Run	
C-3 - RPD- Sta. 15+95 OSS 6.0 FT RT FW					C-4 - RPD- Sta. 17+95 LT PS 0.5 FT LT FY					6/20 to 6/21/22	6/20 to 6/21/22	
Type	Test Interval		Datum		Cut/Fill	Type	Test Interval		Datum		Cut/Fill	
DCP	Cumulative cm per blow		ABC		20.0 ft Cut	DCP	Cumulative cm per blow		ABC		20.0 ft Cut	
1.20	25.50	79.15				0.80	21.50	82.30				
1.90	26.90	79.60				1.30	22.30	84.60				
2.40	28.40	80.05				1.60	22.90	87.40				
2.90	30.00	80.50				2.00	24.00	89.70				
3.40	32.00	81.50				2.40	25.00	93.10				
4.00	34.00	82.50				2.80	25.50	97.40				
4.20	35.50	83.50				2.90	26.00	101.00				
4.50	36.50	84.50				3.40	26.60	104.60				
4.81	37.60	85.30				3.70	27.30	108.00				
5.13	38.40	87.10				4.10	27.90	111.00				
5.44	39.00	88.60				4.50	28.40	114.10				
5.75	40.00	90.10				4.60	28.90	116.40				
6.06	40.50	92.30				4.90	29.80	119.00				
6.38	41.50	94.00				5.10	30.30	121.40				
6.69	42.20	95.60				5.60	30.90	123.00				
7.00	43.60	97.10				6.00	31.20					
7.32	44.60	99.20				6.10	31.80					
7.63	45.20	101.00				6.50	32.20					
7.94	46.20	102.00				6.80	33.50					
8.26	47.30	104.00				7.00	35.00					
8.57	48.00	105.60				7.10	36.00					
8.88	49.00	107.10				7.20	36.70					
9.19	50.00	108.50				7.30	37.60					
9.51	51.00	110.20				7.90	38.30					
9.82	53.00	112.00				8.30	38.90					
10.13	54.00	114.60				8.40	39.80					
10.45	55.00	117.00				8.80	40.50					
10.76	55.90	119.40				9.00	41.40					
11.07	56.50	122.00				9.50	42.10					
11.39	57.00	125.00				10.10	42.90					
11.70	58.30	128.00				10.40	43.40					
12.01	59.00	132.00				10.80	44.50					
12.32	59.70					10.90	44.70					
12.64	61.00					11.10	45.40					
12.95	62.00					11.30	46.00					
13.26	63.00					11.50	47.40					
13.58	63.80					11.60	47.70					
13.89	64.60					11.87	48.20					
14.20	65.40					12.13	48.70					
14.51	66.30					12.40	49.30					
14.83	67.10					12.67	50.00					
15.14	67.90					12.93	50.90					
15.45	68.80					13.20	51.10					
15.77	69.25					13.47	51.30					
16.08	69.70					13.73	52.10					
16.39	70.15					14.00	52.30					
16.71	70.60					14.27	52.80					
17.02	71.05					14.53	53.00					
17.33	71.50					14.80	53.40					
17.64	71.95					15.07	54.00					
17.96	72.40					15.33	54.50					
18.27	72.85					15.60	55.70					
18.58	73.30					16.20	56.30					
18.90	73.75					16.50	56.90					
19.21	74.20					16.70	57.50					
19.52	74.65					17.00	58.10					
19.84	75.10					17.40	58.70					
20.15	75.55					17.60	59.80					
20.46	76.00					18.10	61.30					
20.77	76.45					18.40	63.20					
21.09	76.90					18.90	66.00					
21.40	77.35					19.20	69.50					
22.30	77.80					19.90	73.00					
23.50	78.25					20.40	76.30					
24.20	78.70					21.00	79.00					

DUAL MASS DYNAMIC CONE PENETROMETER DATA SHEET				WBS NO.	PROJECT TIP I.D.	ROUTE			
				46892.1.3	U-5955A	NC 16 (Brookshire Boulevard), Improve I-85 Northbound Ramp to NC 16			
				COUNTY	FIELD PROFESSIONAL	FIELD CREW			
Mecklenburg				T. Wenner, P.G.		D. Demby, D. Underwood, M. Brewer			
Test Location				Date Run	Test Location				Date Run
C-5-RPD- Sta. 17+95 RT PS 3.5 FT RT FW				6/20 to 6/21/22	C-6 - RPD- Sta. 19+25 LN (LT) 1.0 FT RT FY				6/20 to 6/21/22
Type	Test Interval		Datum	Cut/Fill	Type	Test Interval		Datum	Cut/Fill
DCP	Cumulative cm per blow		ABC	20.0 ft Cut	DCP	Cumulative cm per blow		ABC	10.0 ft Cut
1.10	35.06	114.30			0.90	6.27	68.00		
1.80	35.72	116.60			1.50	6.33	69.50		
2.10	36.38	119.10			1.60	6.40	71.30		
2.44	37.04	121.30			1.80	6.47	73.00		
2.79	37.70	123.50			2.00	6.54	74.40		
3.13	38.36	125.60			2.20	6.61	75.90		
3.47	39.02	128.00			2.27	6.67	77.50		
3.81	39.68	130.00			2.34	6.74	79.00		
4.16	40.35				2.40	6.81	80.50		
4.50	41.01				2.47	6.88	82.00		
4.84	41.67				2.54	6.94	83.00		
5.18	42.33				2.61	7.01	84.50		
5.53	42.99				2.67	7.08	88.00		
5.87	43.65				2.74	7.15	89.80		
6.21	44.31				2.81	7.22	91.10		
6.55	44.97				2.88	7.28	92.10		
6.90	45.63				2.95	7.35	93.20		
7.24	46.29				3.01	7.42	94.40		
7.58	46.95				3.08	7.49	95.60		
7.92	47.61				3.15	7.55	97.00		
8.27	48.27				3.22	7.62	98.10		
8.61	48.93				3.28	7.69	100.00		
8.95	49.59				3.35	7.76	100.70		
9.29	50.25				3.42	7.83	101.50		
9.64	50.91				3.49	7.89	102.20		
9.98	51.57				3.56	7.96			
10.32	52.23				3.62	8.03			
10.66	52.89				3.69	8.10			
11.01	53.55				3.76	8.16			
11.35	54.21				3.83	8.23			
11.69	54.87				3.89	8.30			
12.03	55.53				3.96	DCP REF			
12.38	56.19				4.03	AUGER 8.3			
12.72	56.85				4.10	TO 25.5 cm			
13.06	57.52				4.17	0.00			
13.40	58.18				4.23	2.00			
13.75	58.84				4.30	4.20			
14.09	59.50				4.37	7.10			
14.43	60.16				4.44	10.00			
14.77	60.82				4.50	13.00			
15.12	61.48				4.57	15.50			
15.46	62.14				4.64	18.10			
15.80	62.80				4.71	21.10			
16.14	63.46				4.78	24.00			
16.49	64.12				4.84	27.50			
16.83	64.78				4.91	30.50			
17.17	65.44				4.98	33.00			
17.51	66.10				5.05	35.30			
17.86	67.20				5.11	37.50			
18.20	68.20				5.18	39.90			
19.00	70.00				5.25	41.90			
20.00	72.00				5.32	44.00			
21.10	76.00				5.39	46.00			
22.20	79.80				5.45	48.20			
23.50	83.80				5.52	49.90			
25.10	86.80				5.59	51.50			
26.80	90.00				5.66	53.40			
28.90	93.00				5.72	55.10			
30.00	96.00				5.79	57.00			
31.10	99.30				5.86	58.50			
31.76	102.30				5.93	60.00			
32.42	104.60				6.00	61.50			
33.08	107.20				6.06	63.10			
33.74	109.60				6.13	64.80			
34.40	111.70				6.20	66.30			

DUAL MASS DYNAMIC CONE PENETROMETER DATA SHEET				WBS NO.	PROJECT TIP I.D.	ROUTE			
				46892.1.3	U-5955A	NC 16 (Brookshire Boulevard), Improve I-85 Northbound Ramp to NC 16			
				COUNTY	FIELD PROFESSIONAL	FIELD CREW			
Mecklenburg				T. Wenner, P.G.		D. Demby, D. Underwood, M. Brewer			
Test Location				Date Run	Test Location				Date Run
C-7 - RPD- Sta. 19+25 LN (RT) 2.5 FT LT FW				6/20 to 6/21/22	C-8 - RPD- Sta. 19+25 RT PS 1.5 FT RT FW				6/20 to 6/21/22
Type	Test Interval		Datum	Cut/Fill	Type	Test Interval		Datum	Cut/Fill
DCP	Cumulative cm per blow		ABC	10.0 ft Cut	DCP	Cumulative cm per blow		ABC	10.0 ft Cut
2.10	4.10				1.10	19.60	51.00		
2.80	6.40				2.00	20.10	52.70		
3.30	8.50				2.50	21.00	54.40		
3.40	10.60				3.00	21.40	55.90		
3.80	12.70				3.40	22.10	58.30		
4.20	14.60				3.60	22.80	60.40		
4.60	16.60				4.00	23.30	62.70		
5.00	19.00				4.30	24.00	64.90		
5.30	21.60				4.50	24.60	68.90		
5.42	24.40				5.80	25.10	69.80		
5.53	26.80				5.90	25.80	71.90		
5.65	28.60				6.09	26.40	72.60		
5.76	30.60				6.27	26.90	74.00		
5.88	32.50				6.46	27.40	76.50		
5.99	34.30				6.65	27.90	78.20		
6.11	35.70				6.83	28.20	79.90		
6.23	37.60				7.02	28.58	81.50		
6.34	39.10				7.21	28.95	83.30		
6.46	40.80				7.39	29.33	84.30		
6.57	42.50				7.58	29.70	86.30		
6.69	44.10				7.77	30.08	87.60		
6.80	45.80				7.95	30.46	89.10		
6.92	47.50				8.14	30.83	90.60		
7.04	49.10				8.33	31.21	92.00		
7.15	50.70				8.51	31.58	93.40		
7.27	52.20				8.70	31.96	95.00		
7.38	53.70				9.00	32.34	96.00		
7.50	55.30				9.20	32.71	97.50		
7.61	56.80				9.60	33.09	98.50		
7.73	58.60				9.80	33.47	100.00		
7.85	59.90				10.00	33.84	101.50		
7.96	61.50				10.20	34.22	102.50		
8.08	63.10				10.40	34.59	105.60		
8.19	64.60				10.60	34.97	106.70		
8.31	66.10				10.80	35.35	107.80		
8.42	67.60				11.00	35.72	111.10		
8.54	69.40				11.20	36.10	111.60		
8.65	70.80				11.40	36.47	112.10		
8.77	72.40				11.60	36.85	114.30		
8.89	73.60				11.80	37.23	115.30		
9.00	75.10				12.00	37.60	116.20		
9.12	76.10				12.20	37.98	117.00		
9.23	77.70				12.40	38.35	118.00		
9.35	79.10				12.60	38.73	118.90		
9.46	80.60				12.80	39.11	120.00		
9.58	83.30				13.00	39.48	120.60		
9.70	85.80				13.20	39.86	121.60		
9.81	87.30				13.40	40.23	122.50		
9.93	88.70				13.60	40.61	123.40		
10.04	90.20				13.80	40.99	124.50		
10.16	91.50				14.20	41.36	125.50		
10.27	92.80				14.60	41.74	126.20		
10.39	94.20				15.00	42.12	127.20		
10.51	95.60				15.20	42.49			
10.62	96.90				15.40	42.87			
10.74	98.30				15.60	43.24			
10.85	99.30				15.80	43.62			
10.97	100.60				16.00	44.00			
11.08	101.40				16.30	44.37			
11.20	102.60				16.90	44.75			
DCP REF	103.80				17.20	45.12			
AUGER 11.2	104.80				17.50	45.50			
TO 20.9 cm	105.70				18.00	46.30			
0.00	106.90				18.30	47.40			
2.00					18.90	49.10			



DUAL MASS DYNAMIC CONE PENETROMETER DATA SHEET										WBS NO.	PROJECT TIP I.D.	ROUTE					
										46892.1.3	U-5955A	NC 16 (Brookshire Boulevard), Improve I-85 Northbound Ramp to NC 16					
										COUNTY	FIELD PROFESSIONAL	FIELD CREW					
										Mecklenburg	T. Wenner, P.G.	D. Demby, D. Underwood, M. Brewer					
Test Location					Test Location					Test Location							
C-9-RPD- Sta. 20+71 LT PS 2.0 FT LT FY					C-10 - RPD- Sta. 20+71 RT PS 4.0 FT RT FW					C-11 - RPD- Sta. 20+71 LT PS 2.0 FT LT FY							
Date Run					Date Run					Date Run							
6/20 to 6/21/22					6/20 to 6/21/22					6/20 to 6/21/22							
Type	Test Interval	Datum			Cut/Fill	Type	Test Interval	Datum			Cut/Fill	Type	Test Interval	Datum			Cut/Fill
DCP	Cumulative cm per blow	ABC			10.0 ft Cut	DCP	Cumulative cm per blow	ABC			10.0 ft Cut	DCP	Cumulative cm per blow	ABC			10.0 ft Cut
0.50	9.43	52.66				0.70	4.95										
1.00	9.55	53.58				1.40	5.50										
1.10	9.66	54.49				1.50	6.05										
1.80	9.78	55.41				1.66	6.60										
2.00	9.90	56.32				1.83	7.15										
2.40	10.01	57.24				1.99	7.70										
2.52	10.13	58.15				2.15	8.25										
2.63	10.25	59.07				2.31	8.80										
2.75	10.37	59.98				2.48	9.35										
2.87	10.48	60.90				2.64	9.90										
2.99	10.60	61.82				2.80	10.45										
3.10	DCP REF	62.73				2.96	11.00										
3.22	AUGER 10.0	63.65				3.13	11.55										
3.34	TO 10.0 cm	64.56				3.29	12.10										
3.45	0.00	65.48				3.45	12.65										
3.57	1.20	66.39				3.62	13.20										
3.69	2.20	67.31				3.78	13.75										
3.81	2.75	68.22				3.94	14.30										
3.92	3.29	69.14				4.10	15.50										
4.04	3.84	70.05				4.27	16.40										
4.16	4.38	70.97				4.43	17.30										
4.27	4.93	71.88				4.59	18.00										
4.39	5.47	72.80				4.75	19.30										
4.51	6.02	73.72				4.92	20.70										
4.63	6.56	74.63				5.08	23.60										
4.74	7.11	75.55				5.24	25.90										
4.86	7.65	76.46				5.41	27.70										
4.98	8.20	77.38				5.57	29.40										
5.09	8.74	78.29				5.73	31.10										
5.21	9.29	79.21				5.89	33.10										
5.33	9.83	80.12				6.06	35.10										
5.45	10.38	81.04				6.22	37.50										
5.56	10.92	81.95				6.38	39.70										
5.68	11.47	82.87				6.55	41.50										
5.80	12.01	83.78				6.71	43.30										
5.91	12.56	84.70				6.87	45.10										
6.03	13.10	85.62				7.03	46.90										
6.15	13.30	86.53				7.20	49.10										
6.27	15.50	87.45				7.36	50.90										
6.38	17.10	88.36				7.52	52.60										
6.50	19.50	89.28				7.68	55.10										
6.62	21.50	90.19				7.85	56.90										
6.73	23.50	91.11				8.01	59.10										
6.85	25.30	92.02				8.17	63.60										
6.97	26.50	92.94				8.34	64.80										
7.09	28.00	93.85				8.50	67.40										
7.20	29.70	94.77				8.66	69.40										
7.32	31.00	95.68				8.82	71.70										
7.44	32.60	96.60				8.99	74.10										
7.55	33.90	97.52				9.15	76.40										
7.67	35.20	98.43				9.31	78.40										
7.79	36.50	99.35				9.47	79.60										
7.91	37.90	100.26				9.64	82.60										
8.02	38.50	101.18				9.80	84.80										
8.14	40.50	102.09				DCP REF	87.10										
8.26	41.50	103.01				AUGER 9.0	89.60										
8.37	43.00	103.92				TO 13.0	92.00										
8.49	44.10	104.84				0.00	94.10										
8.61	45.50	105.75				1.10	96.40										
8.73	46.50	106.67				1.65	97.50										
8.84	47.80	107.58				2.20	99.70										
8.96	49.00	108.50				2.75	104.70										
9.08	49.92					3.30	106.30										
9.19	50.83					3.85	108.30										
9.31	51.75					4.40											

DUAL MASS DYNAMIC CONE PENETROMETER DATA SHEET										WBS NO.	PROJECT TIP I.D.	ROUTE					
										46892.1.3	U-5955A	NC 16 (Brookshire Boulevard), Improve I-85 Northbound Ramp to NC 16					
										COUNTY	FIELD PROFESSIONAL	FIELD CREW					
										Mecklenburg	T. Wenner, P.G.	D. Demby, D. Underwood, M. Brewer					
Test Location					Test Location					Test Location							
C-14 - RPD- Sta. 23+08 RT LN 3.5 FT LT FW					C-15 - RPD- Sta. 23+08 RT PS 5.0 FT RT FW					C-16 - RPD- Sta. 23+08 RT PS 5.0 FT RT FW							
Date Run					Date Run					Date Run							
6/20 to 6/21/22					6/20 to 6/21/22					6/20 to 6/21/22							
Type	Test Interval	Datum			Cut/Fill	Type	Test Interval	Datum			Cut/Fill	Type	Test Interval	Datum			Cut/Fill
DCP	Cumulative cm per blow	ABC			5.0 ft Fill	DCP	Cumulative cm per blow	ABC			5.0 ft Fill	DCP	Cumulative cm per blow	ABC			5.0 ft Fill
0.50	2.49	61.30	99.50			2.00	0.69	33.60	95.80								
1.00	2.81	62.10	101.90			2.50	0.93	35.30	96.60								
1.20	3.14	63.00	103.20			3.00	1.16	36.70	97.30								
2.00	3.47	64.00	103.90			3.50	1.39	38.30	98.00								
2.40	3.80	65.00	104.40			3.80	1.62	39.80	98.80								
2.70	4.13	66.00	105.00			4.10	1.85	41.10	99.40								
2.80	4.46	66.50	105.40			4.70	2.08	42.80	100.00								
2.91	4.79	67.50	106.30			5.20	2.31	44.10	100.80								
3.02	5.11	68.00	107.50			5.39	2.55	45.30	101.60								
3.12	5.44	68.50	108.00			5.59	2.78	45.40	102.30								
3.23	5.77	69.00	108.50			5.78	3.01	48.20	102.80								
3.34	6.10	69.70	109.00			5.98	3.24	49.20	103.80								
3.45	6.43	70.50	109.90			6.17	3.47	50.40	104.30								
3.56	6.76	71.50	110.30			6.36	3.70	51.80	105.10								
3.66	7.09	72.50	110.90			6.56	3.93	52.80	105.80								
3.77	7.41	73.00	111.50			6.75	4.17	53.70	106.80								
3.88	7.74	74.00	111.80			6.95	4.40	55.40	107.60								
3.99	8.07	74.90	112.50			7.14	4.63	56.40									
4.10	8.40	75.50				7.34	4.86	57.40									
4.20	9.00	76.50				7.53	5.09	58.40									
4.31	9.30	77.10				7.72	5.32	59.30									
4.42	9.90	77.90				7.92	5.55	60.20									
4.53	10.10	78.50				8.11	5.79	60.90									
4.64	10.60	79.10				8.31	6.02	61.80									
4.74	11.00	80.00				8.50	6.25	62.50									
4.85	11.50	80.50				8.69	6.48	63.30									
4.96	11.90	81.30				8.89	6.71	64.30									
5.07	12.50	82.00				9.08	6.94	65.00									
5.18	13.40	82.50				9.28	7.17	65.80									
5.28	14.10	83.30				9.47	7.41	66.50									
5.39	15.00	84.00				9.66	7.64	67.50									
5.50	16.40	84.50				9.86	7.87	68.30									
5.61	18.00	85.00				10.05	8.10	69.30									
5.72	20.50	85.70				10.25	8.50	70.00									
5.82	22.50	86.30				10.44	8.76	70.90									
5.93	23.50	87.00				10.64	9.02	71.90									
6.04	26.00	87.50				10.83	9.28	72.80									
6.15	27.00	88.00				11.02	9.54	73.80	</								

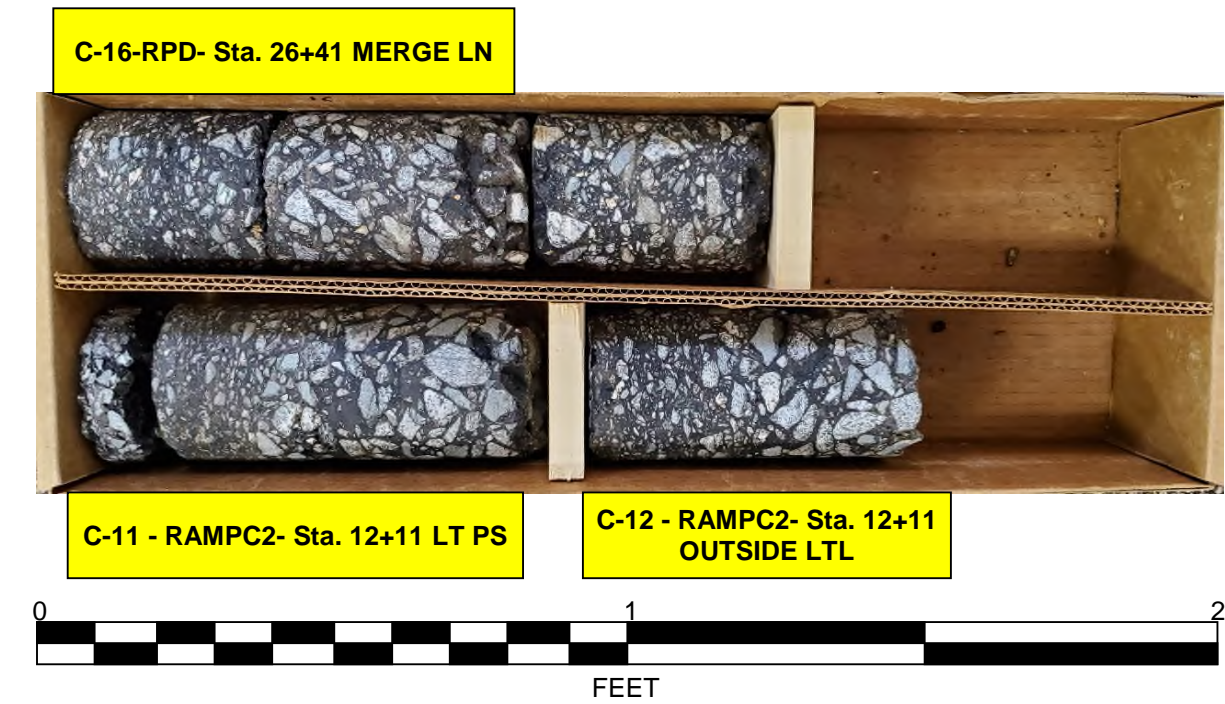
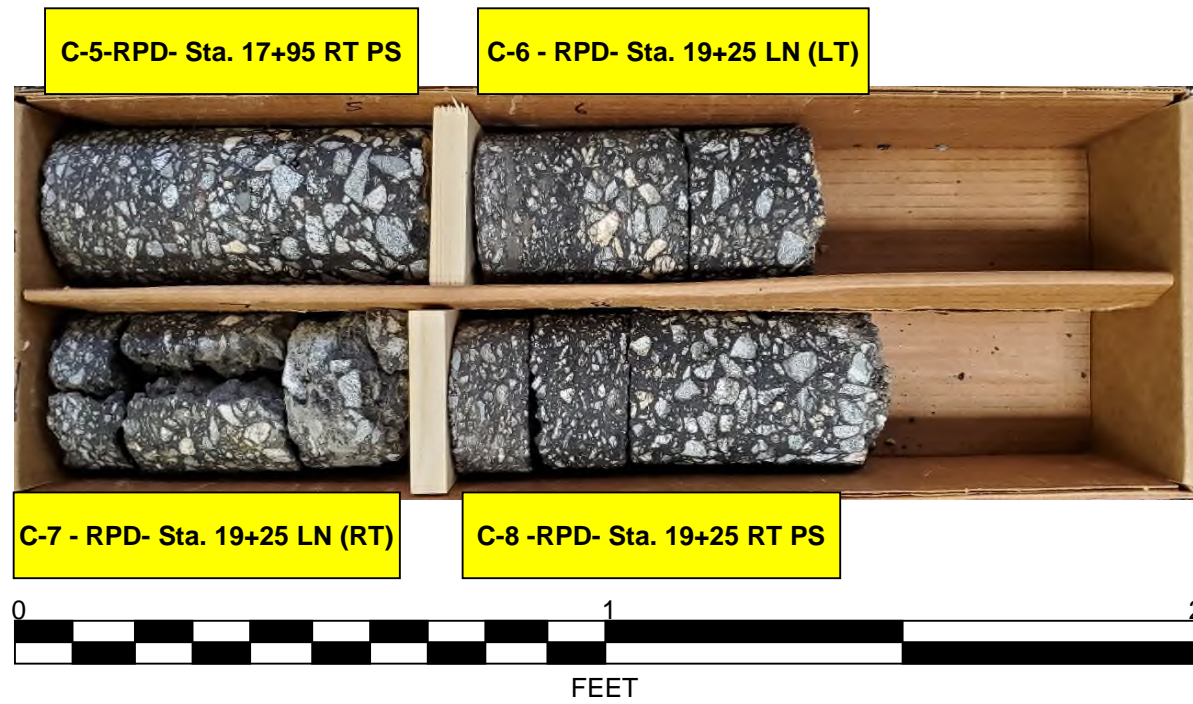
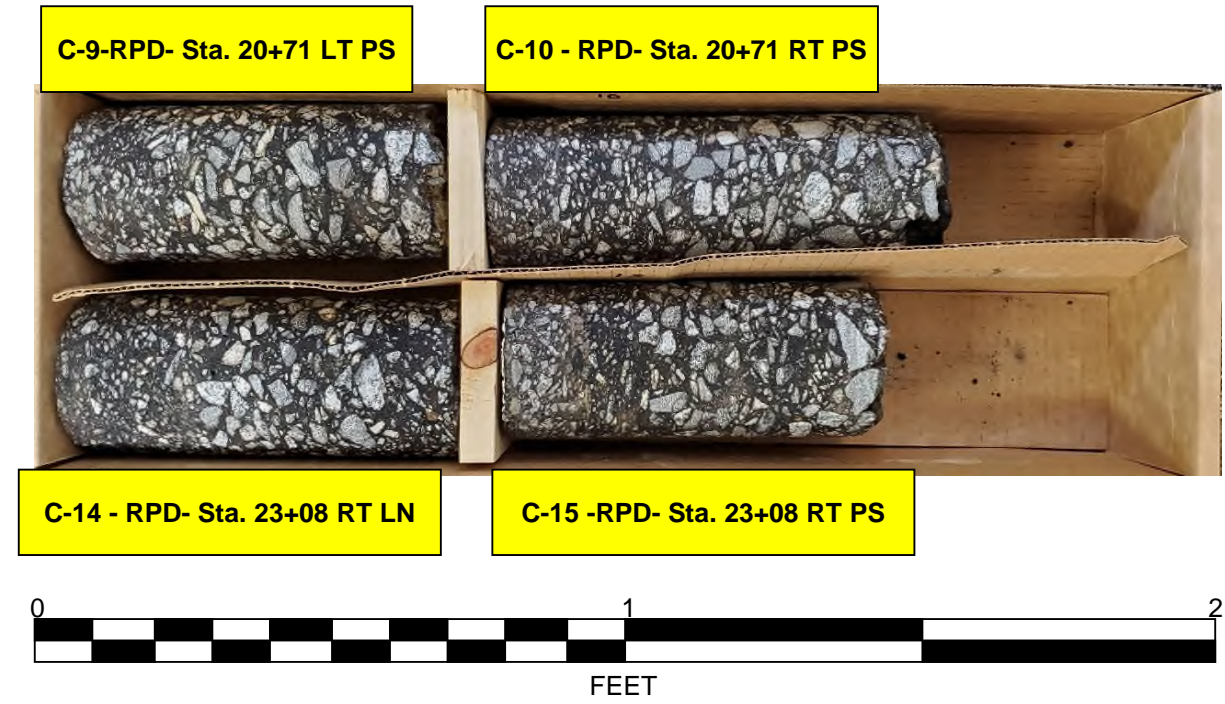
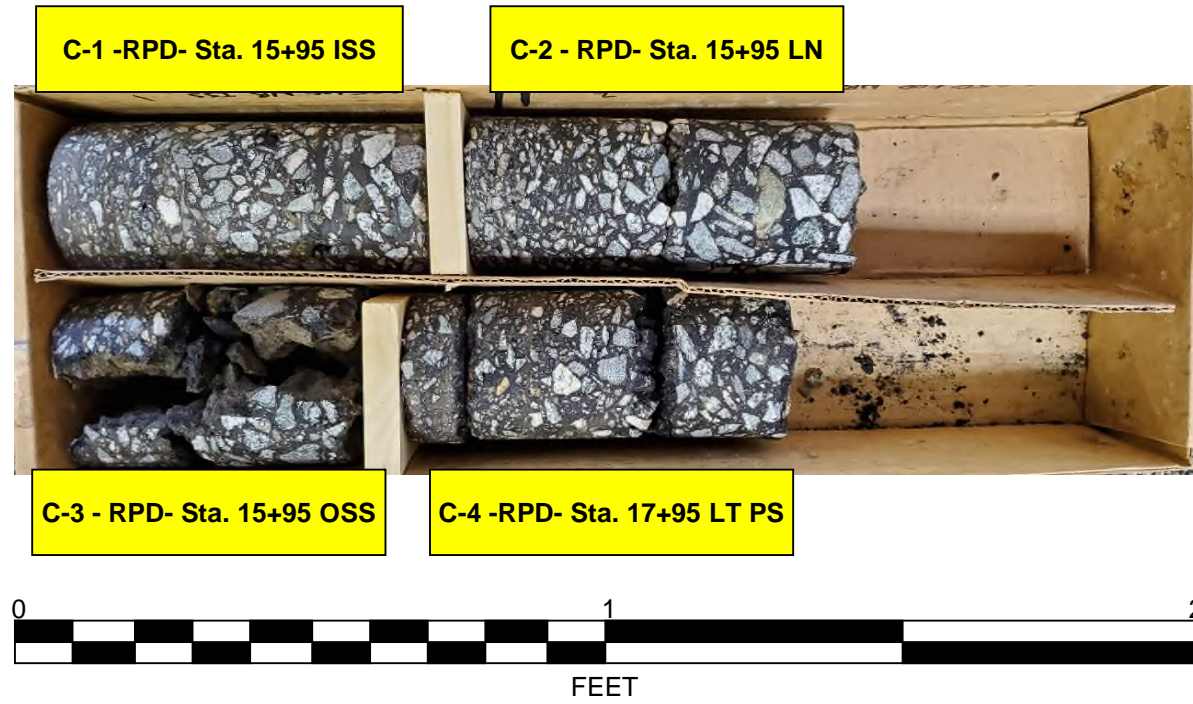
DUAL MASS DYNAMIC CONE PENETROMETER DATA SHEET				WBS NO.	PROJECT TIP I.D.	ROUTE					
				46892.1.3	U-5955A	NC 16 (Brookshire Boulevard), Improve I-85 Northbound Ramp to NC 16					
				COUNTY	FIELD PROFESSIONAL	FIELD CREW					
Mecklenburg				T. Wenner, P.G.		D. Demby, D. Underwood, M. Brewer					
Test Location				Date Run	Test Location				Date Run		
C-16-RPD- Sta. 26+41 MERGE LN 6.0 FT LT EOP				6/20 to 6/21/22	C-11 - RAMPC2- Sta. 12+11 LT PS 2.0 FT LT FY				6/20 to 6/21/22		
Type	Test Interval	Datum	Cut/Fill	Type	Test Interval	Datum	Cut/Fill	Type	Test Interval	Datum	Cut/Fill
DCP	Cumulative cm per blow	SG (A-7)	2.0 ft Fill	DCP	Cumulative cm per blow	ABC	5.0 ft Fill				
3.20	111.50			0.90	83.11						
6.80				1.50	83.23						
11.00				2.30	83.36						
15.90				2.70	83.48						
17.60				4.40	83.60						
19.00				6.00	83.73						
20.60				6.50	83.85						
22.00				7.60	83.97						
23.40				8.50	84.10						
24.80				9.00	84.22						
26.40				9.80	84.34						
27.80				10.50	84.47						
29.20				11.60	84.59						
31.40				12.60	84.71						
35.00				14.00	84.84						
39.30				15.50	84.96						
42.30				16.80	85.08						
44.40				18.00	85.21						
46.40				19.00	85.33						
48.20				20.50	85.45						
50.30				22.00	85.58						
52.00				24.40	85.70						
53.60				27.50	85.75						
55.30				31.00	85.80						
57.10				35.50	85.85						
58.80				39.50	85.90						
60.50				42.80	85.95						
62.50				45.30	86.00						
64.00				48.20	86.05						
66.40				51.40	86.10						
67.70				53.50	86.15						
69.50				55.90	86.20						
71.00				57.30	86.32						
72.50				58.80	86.44						
73.90				60.40	86.57						
75.50				61.60	86.69						
77.00				62.90	86.81						
78.70				63.00	86.93						
79.70				64.60	87.06						
80.70				65.60	87.18						
81.50				66.00	87.30						
82.50				66.70	DCP REF						
83.60				68.00	80/2"						
84.70				68.50							
86.00				69.30							
87.00				70.50							
88.00				71.60							
89.00				73.20							
90.00				74.40							
91.00				75.50							
92.20				76.50							
93.20				77.50							
94.40				78.50							
96.00				79.80							
97.00				80.60							
98.50				81.40							
100.00				82.00							
101.00				82.12							
102.20				82.25							
103.50				82.37							
104.60				82.49							
105.80				82.62							
107.10				82.74							
108.60				82.86							
110.10				82.99							

DUAL MASS DYNAMIC CONE PENETROMETER DATA SHEET				WBS NO.	PROJECT TIP I.D.	ROUTE					
				46892.1.3	U-5955A	NC 16 (Brookshire Boulevard), Improve I-85 Northbound Ramp to NC 16					
				COUNTY	FIELD PROFESSIONAL	FIELD CREW					
Mecklenburg				T. Wenner, P.G.		D. Demby, D. Underwood, M. Brewer					
Test Location				Date Run	Test Location				Date Run		
C-12 - RAMPC2- Sta. 12+11 OUTSIDE LTL 3.4 FT LT FW				6/20 to 6/21/22	C-13 -RAMPC2- Sta. 12+11 GORE 12.0 FT RT FW				6/20 to 6/21/22		
Type	Test Interval	Datum	Cut/Fill	Type	Test Interval	Datum	Cut/Fill	Type	Test Interval	Datum	Cut/Fill
DCP	Cumulative cm per blow	ABC	5.0 ft Fill	DCP	Cumulative cm per blow	ABC	5.0 ft Fill				
1.00	103.40			3.50	75.10	115.68					
1.50	105.00			4.20	75.30	116.29					
2.00	106.00			5.10	76.80	116.91					
2.60	107.00			5.40	77.42	117.53					
2.80	109.50			5.50	78.03	118.15					
3.30	110.50			5.90	78.65	118.76					
3.90	111.50			6.40	79.27	119.38					
4.20	112.50			6.60	79.89	120.00					
4.50	113.40			6.80	80.50	120.61					
4.90	114.20			7.00	81.12	121.23					
5.10	114.70			8.00	81.74	121.85					
5.50	115.70			9.00	82.35	122.47					
5.90	116.30			9.50	82.97	123.08					
6.30	117.00			10.70	83.59	123.70					
7.00	117.70			11.90	84.21						
7.50	118.20			13.40	84.82						
8.00	119.20			14.90	85.44						
8.30	120.00			16.50	86.06						
8.70	120.90			17.00	86.67						
9.00	121.50			17.30	87.29						
9.30	122.00			17.90	87.91						
9.90	122.80			18.30	88.53						
10.50	123.30			18.40	89.14						
11.00	124.10			19.00	89.76						
12.00	125.00			19.70	90.38						
13.00	125.50			20.20	90.99						
14.00				21.00	91.61						
16.50				21.50	92.23						
19.10				21.70	92.84						
22.00				22.30	93.46						
25.80				23.00	94.08						
29.00				23.70	94.70						
32.50				24.60	95.31						
34.80				25.60	95.93						
38.00				26.70	96.55						
40.50				28.40	97.16						
44.50				30.90	97.78						
49.50				33.30	98.40						
53.00				35.90	99.02						
54.70				37.80	99.63						
55.20				40.00	100.25						
59.00				41.50	100.87						
63.00				43.50	101.48						
66.20				46.10	102.10						
68.80				48.60	102.72						
71.50				50.80	103.34						
74.60				52.40	103.95						
77.40				54.00	104.57						
80.70				55.00	105.19						
83.10				56.80	105.80						
85.10				57.90	106.42						
87.10				59.10	107.04						
88.90				60.50	107.66						
90.00				62.00	108.27						
91.00				63.10	108.89						
92.00				65.00	109.51						
93.30				65.50	110.12						
94.20				66.40	110.74						
95.30				67.50	111.36						
96.70				68.40	111.98						
97.70				69.30	112.59						
98.60				70.50	113.21						
100.00				71.30	113.83						
101.40				72.50	114.44						
102.60				73.50	115.06						



NC 16 (Brookshire Boulevard), Improve I-85 Northbound Ramp to NC 16

Pavement Core Photographs

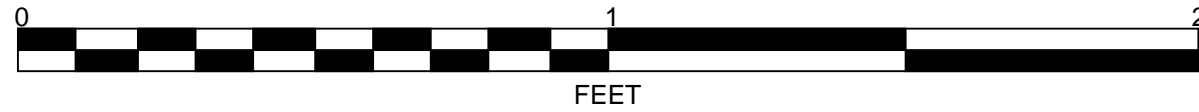




NC 16 (Brookshire Boulevard), Improve I-85 Northbound Ramp to NC 16

Pavement Core Photographs

C-13 -RAMPC2- Sta. 12+11 GORE



F&ME CONSULTANTS, INC.
3112 DEVINE STREET, COLUMBIA SC 29205
(CERT No.: 130-0212)

Project NC 16 (Brookshire Boulevard), Improve I-85
Northbound Ramp to NC 16 T.I.P. No. U-5955A County Mecklenburg F&ME Job No. C8806 - Task 00014
Date Received 6/23/2022 Date Reported 7/11/2022 Tested By J. Hiers CERT No.: 130-04-0212

SOIL TEST RESULTS

SAMPLE NO.	LANE	STATION	DEPTH INTERVAL (ft.)	AASHTO CLASS	L.L.	P.I.	% BY WEIGHT				% PASSING (SIEVES)			% MOISTURE	% ORGANIC
							C. SAND	F. SAND	SILT	CLAY	10	40	200		
S-2	LN	-RPD- Sta. 15+95	1.3-5.0	A-6(2)	35	12	27.6%	23.9%	34.1%	14.3%	80.1%	65.8%	43.2%	12.7%	ND
S-4	LT PS	-RPD- Sta. 17+95	1.3-5.0	A-6(4)	36	15	28.4%	22.8%	34.5%	14.3%	87.3%	69.7%	47.2%	8.6%	ND
S-5	RT PS	-RPD- Sta. 17+95	1.3-5.0	A-7-5(9)	45	14	11.8%	21.2%	44.7%	22.3%	92.1%	85.1%	67.3%	22.6%	ND
S-6	LN (LT)	-RPD- Sta. 19+25	1.3-5.0	A-7-5(17)	54	18	8.4%	13.2%	39.9%	38.5%	93.8%	88.7%	77.6%	28.4%	ND
S-8	RT PS	-RPD- Sta. 19+25	1.3-5.0	A-7-6(9)	44	20	20.3%	19.0%	38.2%	22.5%	85.3%	73.4%	56.0%	5.8%	ND
S-9	LT PS	-RPD- Sta. 20+71	1.7-5.0	A-7-5(20)	75	32	1.5%	5.6%	40.0%	52.9%	96.8%	95.8%	92.2%	36.8%	ND
S-14	RT LN	-RPD- Sta. 23+08	1.9-5.0	A-7-6(20)	55	31	16.9%	10.9%	21.8%	50.5%	96.4%	85.3%	71.8%	21.9%	ND
S-15	RT PS	-RPD- Sta. 23+08	1.9-5.0	A-7-6(20)	55	27	12.2%	10.1%	23.2%	54.5%	95.0%	87.6%	76.0%	23.4%	ND
S-16	MERGE LN	-RPD- Sta. 26+41	2.3-5.0	A-6(6)	36	15	24.7%	16.6%	34.4%	24.3%	95.3%	79.5%	58.7%	17.0%	ND
S-11	LT PS	-RAMPC2- Sta. 12+11	1.5-4.6	A-2-6(0)	32	14	48.8%	16.0%	23.2%	12.1%	52.4%	32.4%	19.8%	7.6%	ND
S-12	OUTSIDE LTL	-RAMPC2- Sta. 12+11	1.2-5.0	A-7-5(18)	60	30	19.9%	13.0%	22.5%	44.6%	90.8%	79.1%	63.0%	29.3%	ND
S-13	GORE	-RAMPC2- Sta. 12+11	1.8-5.0	A-7-6(16)	54	28	21.6%	13.8%	22.2%	42.4%	92.4%	79.0%	62.3%	22.2%	ND

Prepared in the Office of:

F&ME CONSULTANTS, INC.
COLUMBIA, SOUTH CAROLINA
NCDOT LAB CERT. NO. 130-0212

U-5955A

15

F&ME CONSULTANTS, INC.
3112 DEVINE STREET, COLUMBIA SC 29205
(CERT No.: 130-0212)

Project NC 16 (Brookshire Boulevard), Improve I-85
Northbound Ramp to NC 16 **T.I.P. No.** U-5955A **County** Mecklenburg **F&ME Job No.** C8806 - Task 00014
Date Received 6/14/2022 **Date Reported** 7/11/2022 **Tested By** J. Hiers **CERT No.:** 130-04-0212

SOIL TEST RESULTS

SAMPLE NO.	ALIGNMENT	STATION	DEPTH INTERVAL (ft.)	AASHTO CLASS	L.L.	P.I.	% BY WEIGHT				% PASSING (SIEVES)			% MOISTURE	% ORGANIC
							C. SAND	F. SAND	SILT	CLAY	10	40	200		
Bulk-1	-RPD-	19+27	1.0 - 3.0	A-7-6(6)	43	17	30.3%	17.5%	27.7%	24.5%	93.7%	73.5%	52.1%	16.2%	ND
Bulk-2	-RPD-	23+62	1.0 - 3.0	A-7-6(11)	49	22	19.8%	16.3%	35.2%	28.7%	87.9%	76.2%	59.1%	28.8%	ND

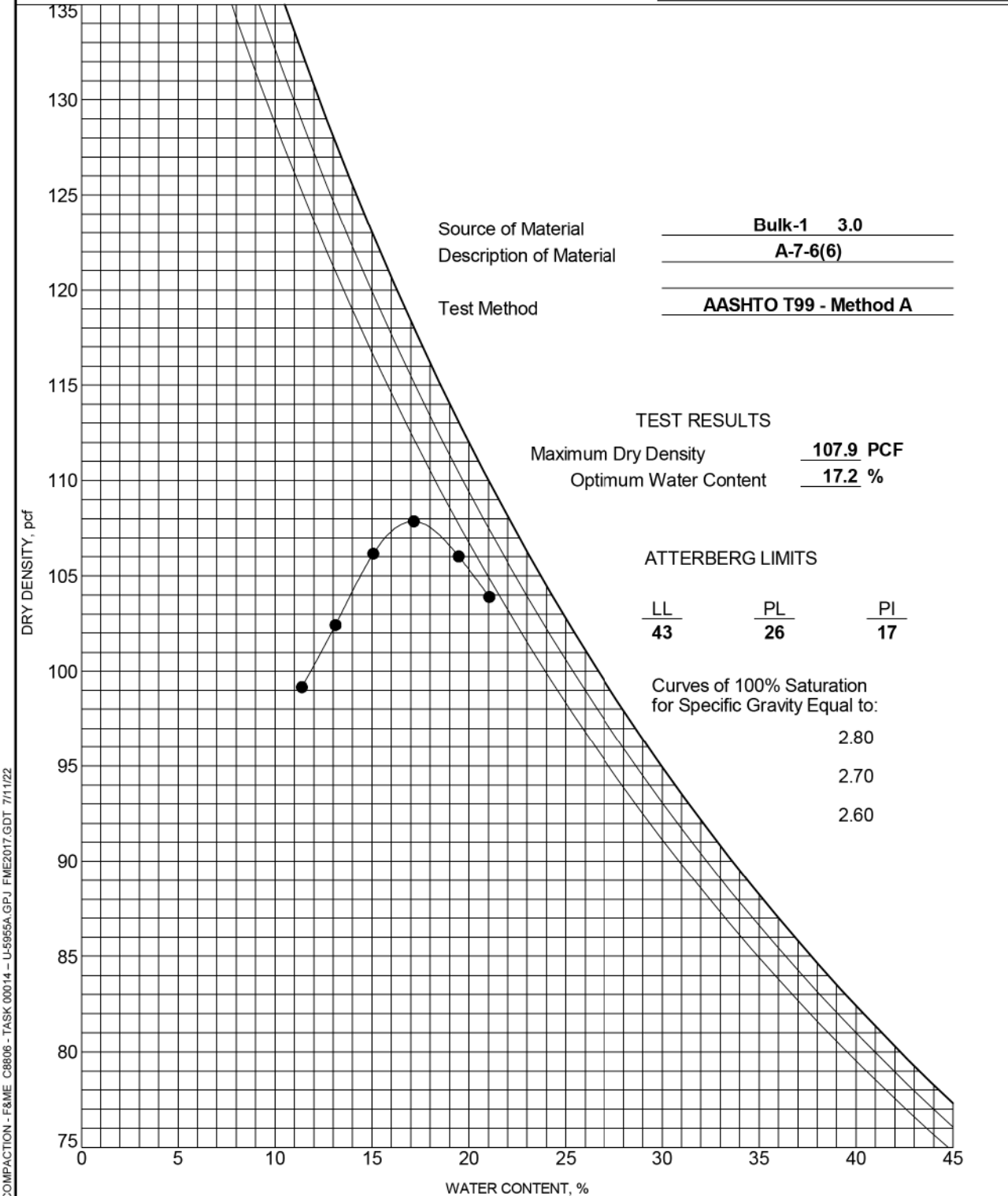


MOISTURE-DENSITY RELATIONSHIP

PROJECT ID U-5955A

PROJECT NAME NC 16, Improve I-85 Northbound Ramp to NC 16

PROJECT LOCATION Mecklenburg County, North Carolina



COMPACTION - F&ME CB806 - TASK 00014 - U-5955A.GPJ FME2017.GDT 7/11/22

REV 08/2021

**CALIFORNIA BEARING RATIO (CBR)
AASHTO T193**

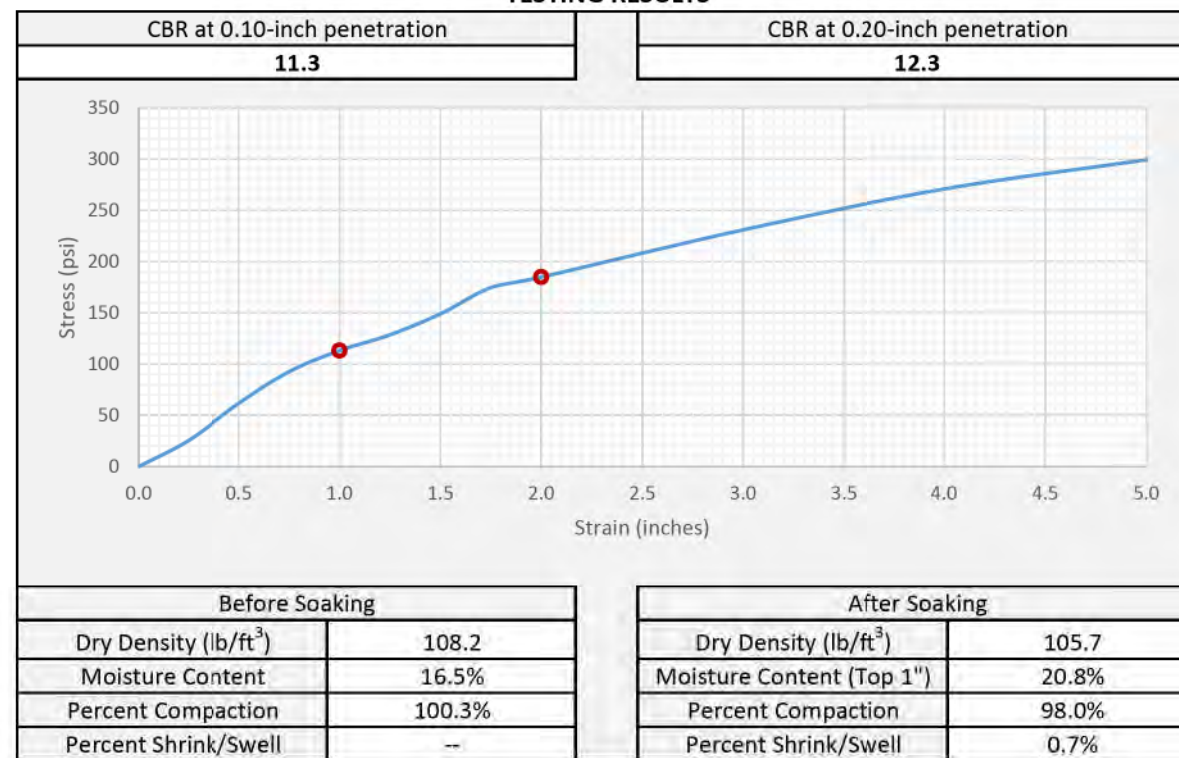
SAMPLE INFORMATION

Project Name	NC 16, Improve I-85 NB Ramp to NC 16		Project No.	U-5955A	
Sample Location	Bulk-1 (Specimen A)		FME Lab ID	22-1788	
Soil Description	A-7-6(6)		Depth/Elev.	1.0 - 3.0	
Date Sampled	--	Sampled By:	CG2	Date Received	6/14/22
Date Test Began	6/20/22	Date Completed	6/24/22	Tested By	JJW

MOLDING CHARACTERISTICS

Method	AASHTO T99 - Method A	% Retained on 3/4" Sieve	0%
Max Dry Density (lb/ft ³)	107.9	Optimum Moisture Content (%)	17.2
Soak Time (hr)	96	Surcharge Weight (lb)	10.0

TESTING RESULTS



ADDITIONAL COMMENTS

Desired Percent Compaction = 100%

	F&ME Consultants, Inc. 3112 Devine Street, Columbia, SC 29205		7/11/22 Date
	Reviewed By		Date

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REV 08/2021

**CALIFORNIA BEARING RATIO (CBR)
AASHTO T193**

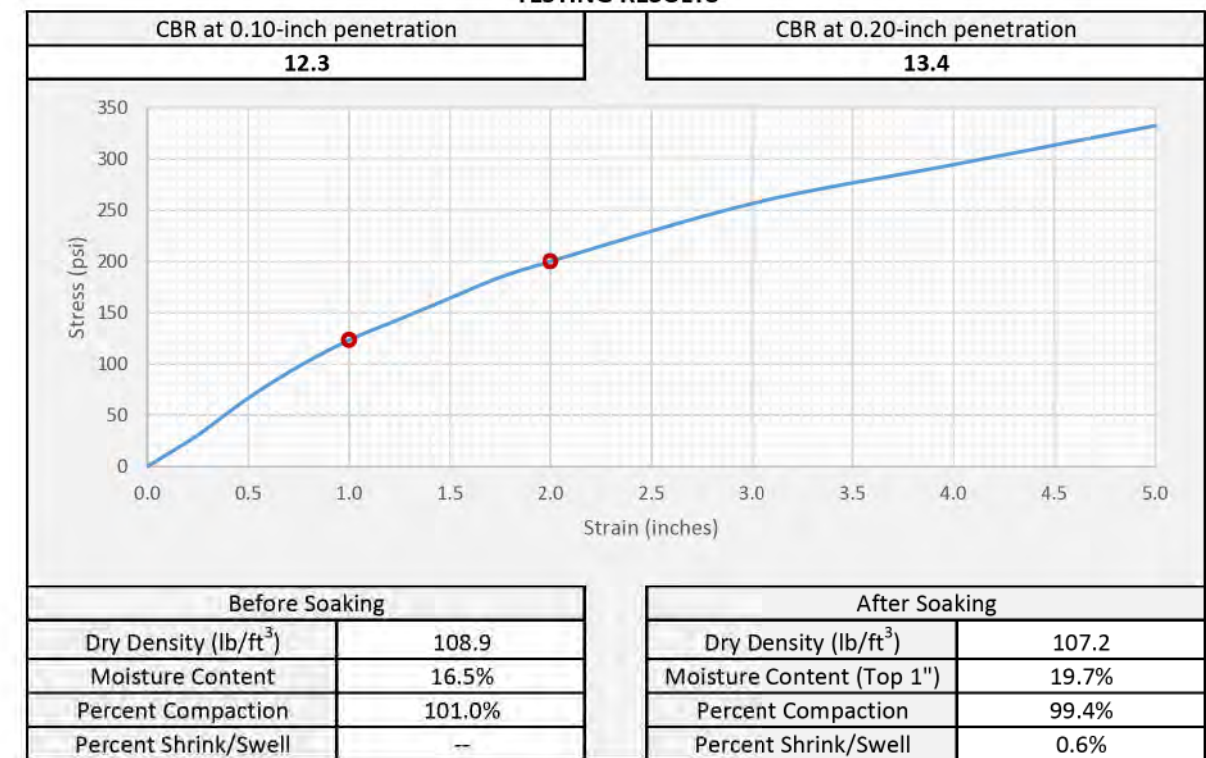
SAMPLE INFORMATION

Project Name	NC 16, Improve I-85 NB Ramp to NC 16		Project No.	U-5955A	
Sample Location	Bulk-1 (Specimen B)		FME Lab ID	22-1788	
Soil Description	A-7-6(6)		Depth/Elev.	1.0 - 3.0	
Date Sampled	--	Sampled By:	CG2	Date Received	6/14/22
Date Test Began	6/20/22	Date Completed	6/24/22	Tested By	JJW

MOLDING CHARACTERISTICS

Method	AASHTO T99 - Method A	% Retained on 3/4" Sieve	0%
Max Dry Density (lb/ft ³)	107.9	Optimum Moisture Content (%)	17.2
Soak Time (hr)	96	Surcharge Weight (lb)	10.0

TESTING RESULTS



ADDITIONAL COMMENTS

Desired Percent Compaction = 100%

	F&ME Consultants, Inc. 3112 Devine Street, Columbia, SC 29205		7/11/22 Date
	Reviewed By		Date

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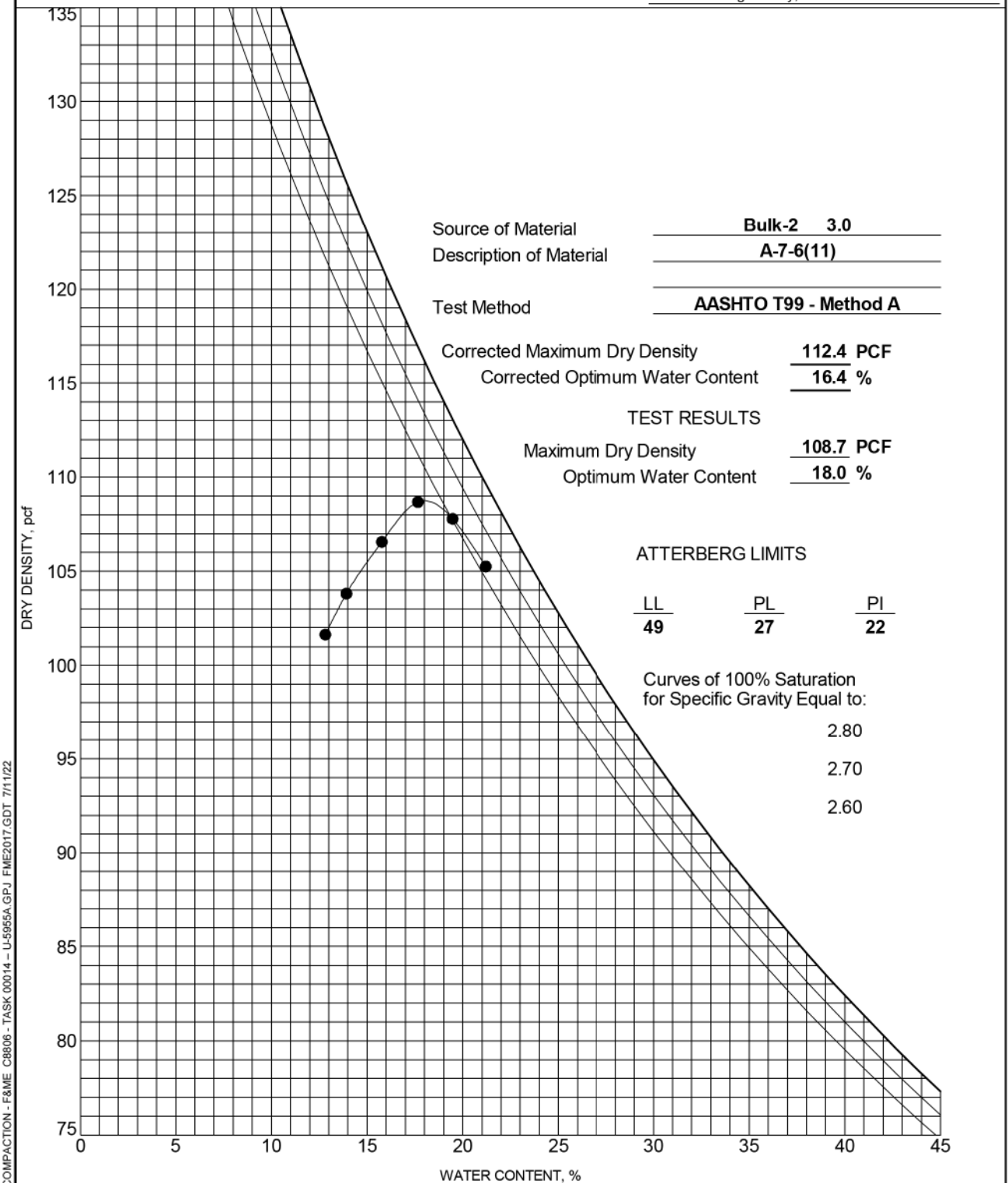


MOISTURE-DENSITY RELATIONSHIP

PROJECT ID U-5955A

PROJECT NAME NC 16, Improve I-85 Northbound Ramp to NC 16

PROJECT LOCATION Mecklenburg County, North Carolina



COMPACTION - F&ME CB806 - TASK 00014 - U-5955A.GPJ FME2017.GDT 7/11/22

REV 08/2021

**CALIFORNIA BEARING RATIO (CBR)
AASHTO T193**

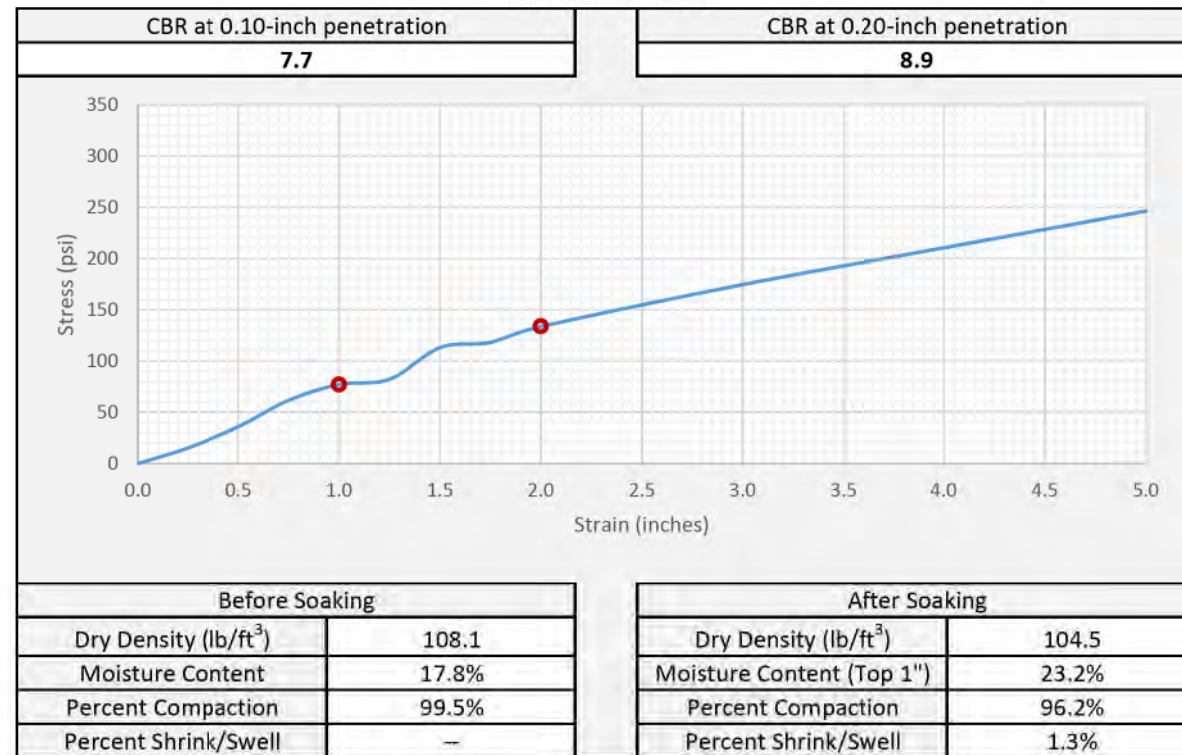
SAMPLE INFORMATION

Project Name	NC 16, Improve I-85 NB Ramp to NC 16			Project No.	U-5955A
Sample Location	Bulk-2 (Specimen A)			FME Lab ID	22-1789
Soil Description	A-7-6(11)			Depth/Elev.	1.0 - 3.0
Date Sampled	--	Sampled By:	CG2	Date Received	6/14/22
Date Test Began	6/20/22	Date Completed	6/24/22	Tested By	JJW

MOLDING CHARACTERISTICS

Method	AASHTO T99 - Method A	% Retained on 3/4" Sieve	0%
Max Dry Density (lb/ft ³)	108.7	Optimum Moisture Content (%)	18.0
Soak Time (hr)	96	Surcharge Weight (lb)	10.0

TESTING RESULTS



ADDITIONAL COMMENTS

Desired Percent Compaction = 100%

	F&ME Consultants, Inc. 3112 Devine Street, Columbia, SC 29205		7/11/22 Date
	Reviewed By		Date

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REV 08/2021

**CALIFORNIA BEARING RATIO (CBR)
AASHTO T193**

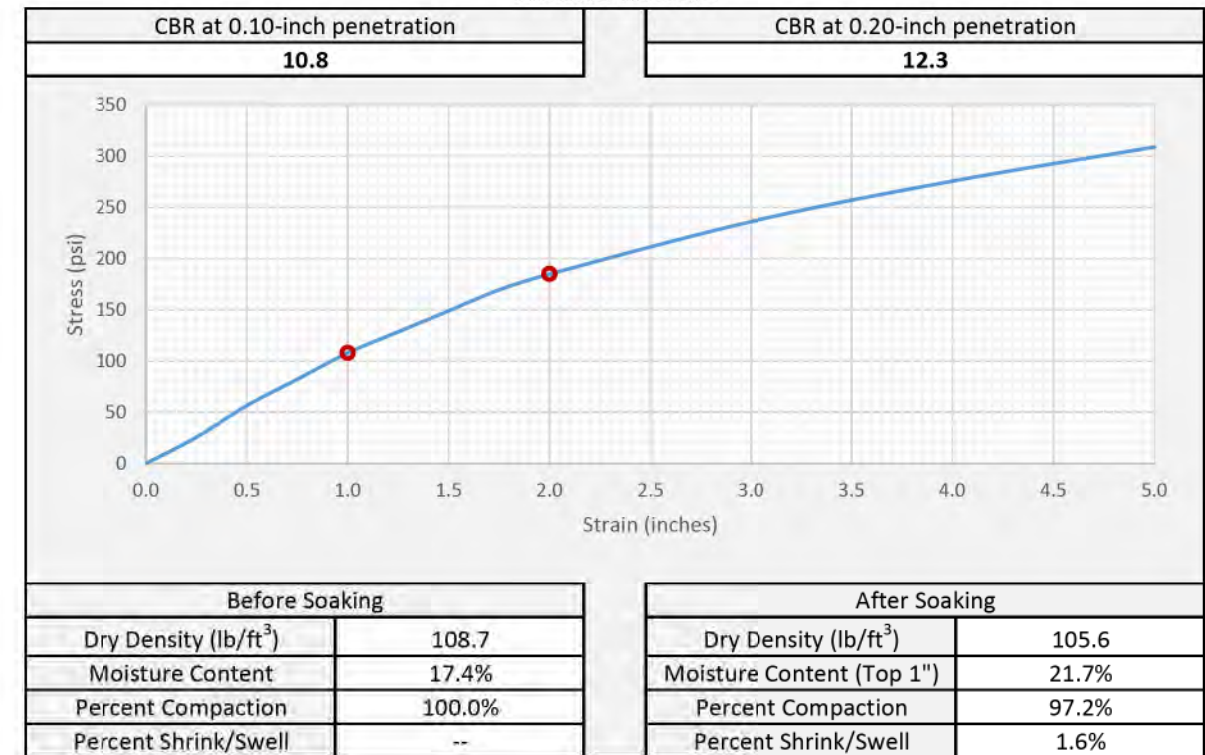
SAMPLE INFORMATION

Project Name	NC 16, Improve I-85 NB Ramp to NC 16			Project No.	U-5955A
Sample Location	Bulk-2 (Specimen B)			FME Lab ID	22-1789
Soil Description	A-7-6(11)			Depth/Elev.	1.0 - 3.0
Date Sampled	--	Sampled By:	CG2	Date Received	6/14/22
Date Test Began	6/20/22	Date Completed	6/24/22	Tested By	JJW

MOLDING CHARACTERISTICS

Method	AASHTO T99 - Method A	% Retained on 3/4" Sieve	0%
Max Dry Density (lb/ft ³)	108.7	Optimum Moisture Content (%)	18.0
Soak Time (hr)	96	Surcharge Weight (lb)	10.0

TESTING RESULTS



ADDITIONAL COMMENTS

Desired Percent Compaction = 100%

	F&ME Consultants, Inc. 3112 Devine Street, Columbia, SC 29205		7/11/22 Date
	Reviewed By		Date

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**CONE PENETROMETER RESULTS
NCDOT, GEOTECHNICAL ENGINEERING UNIT**

PROJECT NO.	46892.1.3
PROJECT ID	U-5955A
ROUTE	NC 16/ I-85
COUNTY	Meckenburg

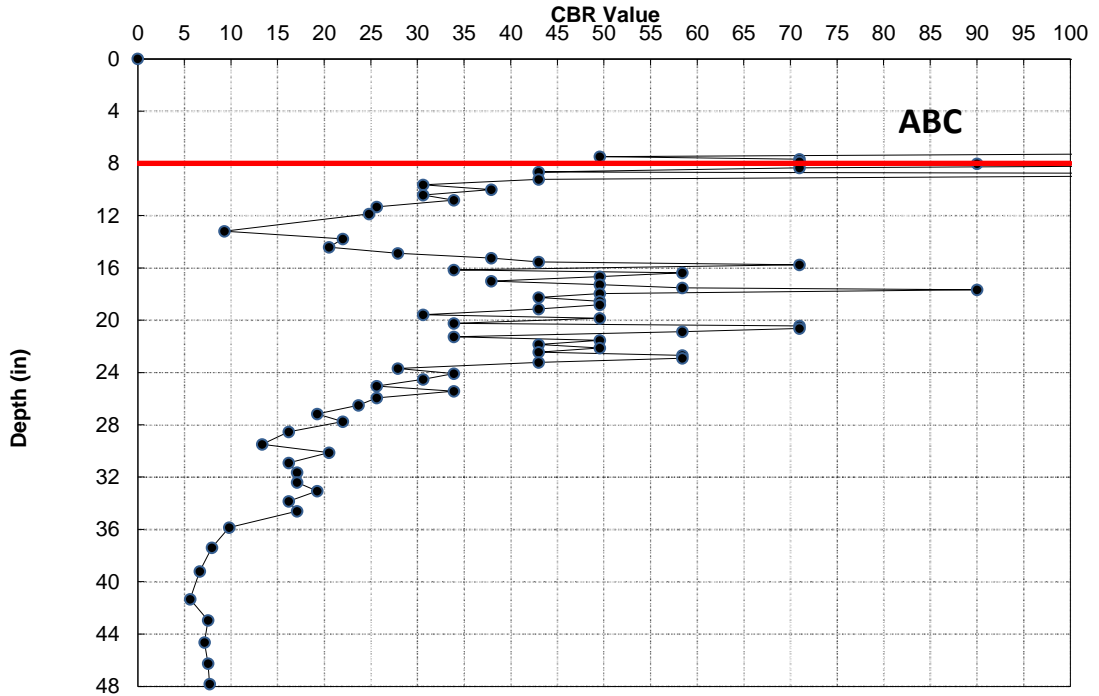
GEOLOGIST	LM Howard
GEOTECHS	CG2

FILE	U5955A_DCP Graphs
------	-------------------

C-1 -RPD- Sta. 15+95 ISS
0.3 FT LT FY
Datum = ABC
RAW
CUT
06/20/22

Interval	
0.0	to 8.0
# of Values	111
Avg CBR	100+
Wghtd Avg.	100+
Max CBR	100+
Min CBR	49.6

Interval	
8.0	to 50.9
# of Values	73
Avg CBR	37.2
Wghtd Avg.	22.1
Max CBR	100+
Min CBR	5.6

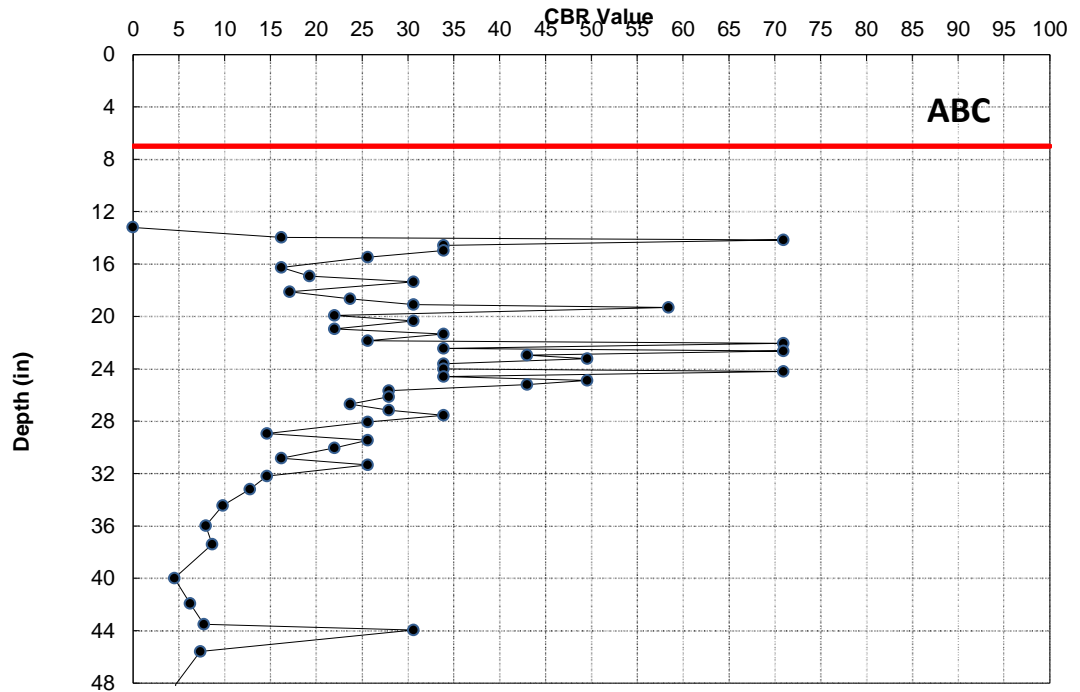


1

C-2 - RPD- Sta. 15+95 LN
2.0 FT LT FW
Datum = ABC
RAW
CUT
06/20/22

Interval	
0.0	to 0.0
# of Values	0
Avg CBR	#DIV/0!
Wghtd Avg.	#DIV/0!
Max CBR	0.0
Min CBR	0.0

Interval	
13.2	to 51.2
# of Values	52
Avg CBR	28.1
Wghtd Avg.	17.5
Max CBR	70.9
Min CBR	4.5



2

**CONE PENETROMETER RESULTS
NCDOT, GEOTECHNICAL ENGINEERING UNIT**

PROJECT NO.	46892.1.3
PROJECT ID	U-5955A
ROUTE	NC 16/ I-85
COUNTY	Meckenburg

GEOLOGIST	LM Howard
GEOTECHS	CG2

FILE	U5955A_DCP Graphs
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C-3 - RPD- Sta. 15+95 OSS

3

6.0 FT RT FW

Datum = ABC

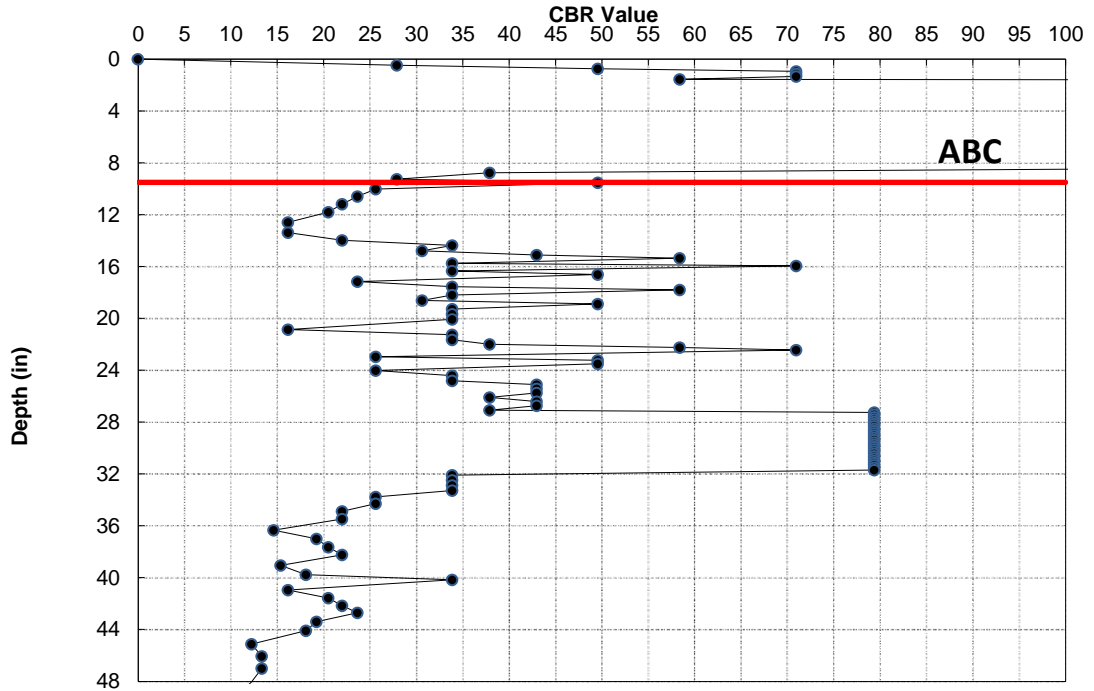
RAW

CUT

06/20/22

Interval	
0.0	to 9.5
# of Values	65
Avg CBR	100+
Wghtd Avg.	97.1
Max CBR	100+
Min CBR	27.9

Interval	
9.5	to 52.0
# of Values	97
Avg CBR	43.6
Wghtd Avg.	30.3
Max CBR	79.4
Min CBR	7.7



C-4 -RPD- Sta. 17+95 LT PS

4

0.5 FT LT FY

Datum = ABC

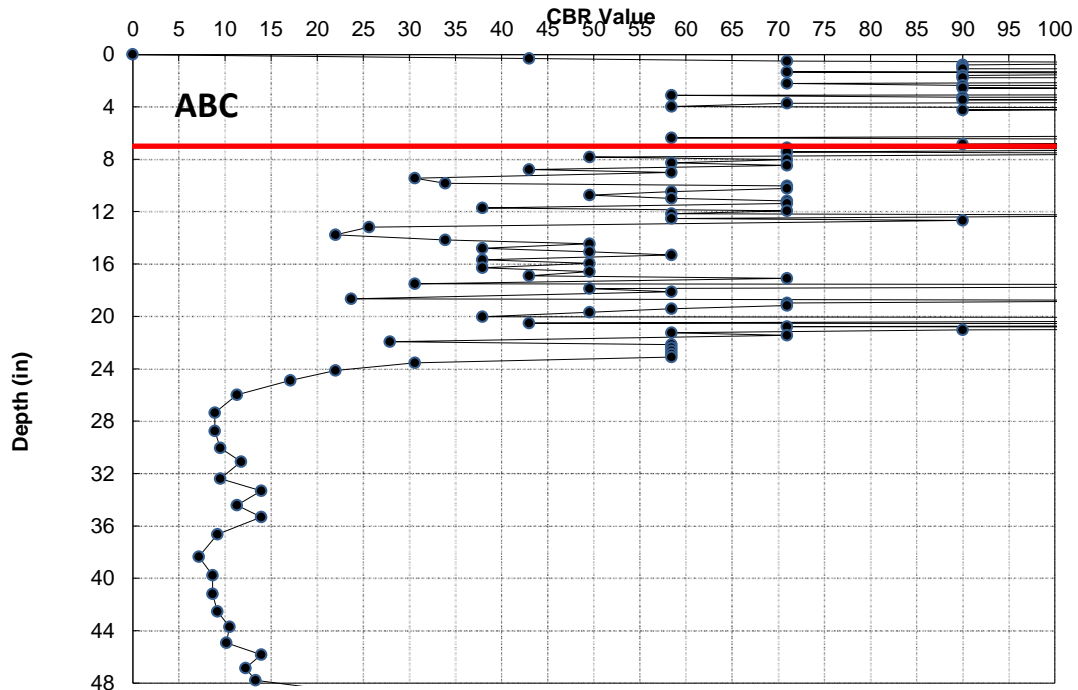
RAW

CUT

06/20/22

Interval	
0.0	to 7.1
# of Values	59
Avg CBR	100+
Wghtd Avg.	100+
Max CBR	100+
Min CBR	43.0

Interval	
7.1	to 48.4
# of Values	86
Avg CBR	54.0
Wghtd Avg.	27.4
Max CBR	100+
Min CBR	7.2



**CONE PENETROMETER RESULTS
NCDOT, GEOTECHNICAL ENGINEERING UNIT**

PROJECT NO.	46892.1.3
PROJECT ID	U-5955A
ROUTE	NC 16/ I-85
COUNTY	Meckenburg

GEOLOGIST	LM Howard
GEOTECHS	CG2

FILE	U5955A_DCP Graphs
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C-5-RPD- Sta. 17+95 RT PS

3.5 FT RT FW

Datum = ABC

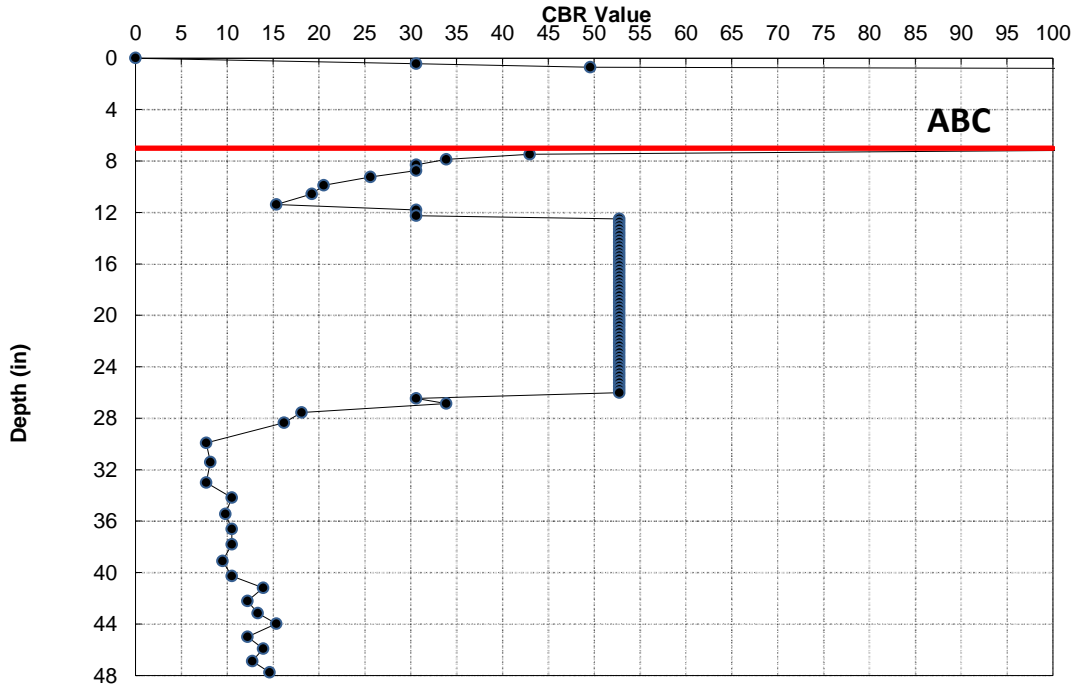
RAW

CUT

06/20/22

Interval	
0.0	to 7.0
# of Values	49
Avg CBR	100+
Wghtd Avg.	99.4
Max CBR	100+
Min CBR	30.6

Interval	
7.0	to 51.2
# of Values	89
Avg CBR	39.7
Wghtd Avg.	26.5
Max CBR	100+
Min CBR	7.7



C-6 - RPD- Sta. 19+25 LN (LT)

1.0 FT RT FY

Datum = ABC

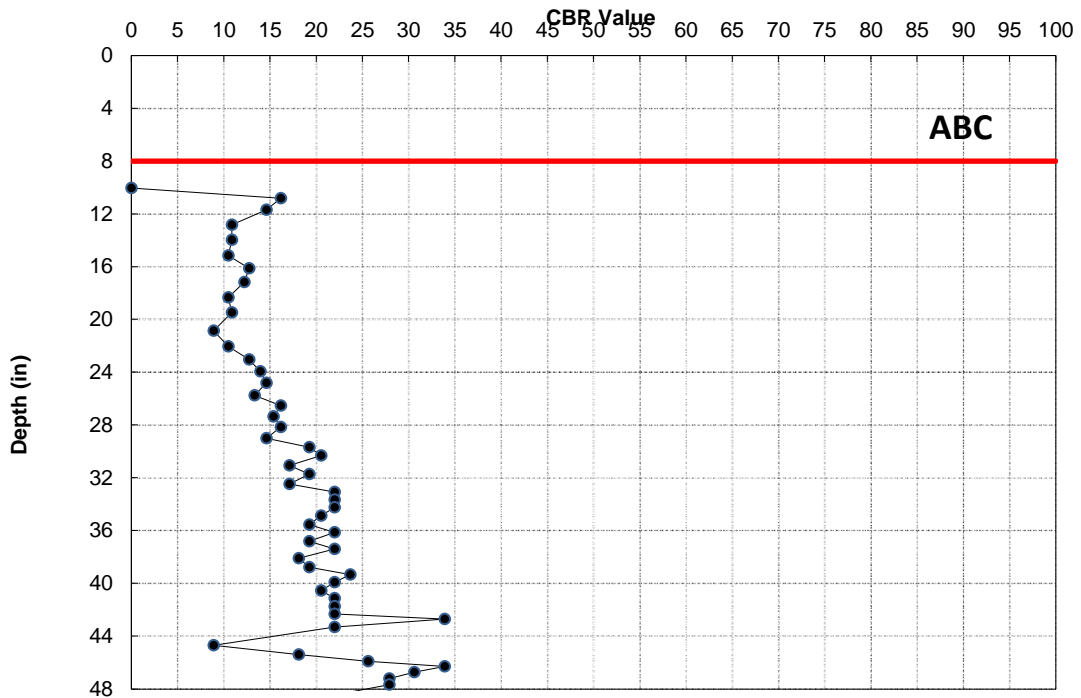
RAW

CUT

06/20/22

Interval	
0.0	to 0.0
# of Values	0
Avg CBR	#DIV/0!
Wghtd Avg.	#DIV/0!
Max CBR	0.0
Min CBR	0.0

Interval	
10.0	to 50.3
# of Values	55
Avg CBR	20.4
Wghtd Avg.	17.5
Max CBR	49.6
Min CBR	8.9



**CONE PENETROMETER RESULTS
NCDOT, GEOTECHNICAL ENGINEERING UNIT**

PROJECT NO.	46892.1.3
PROJECT ID	U-5955A
ROUTE	NC 16/ I-85
COUNTY	Mecklenburg

GEOLOGIST	LM Howard
GEOTECHS	CG2

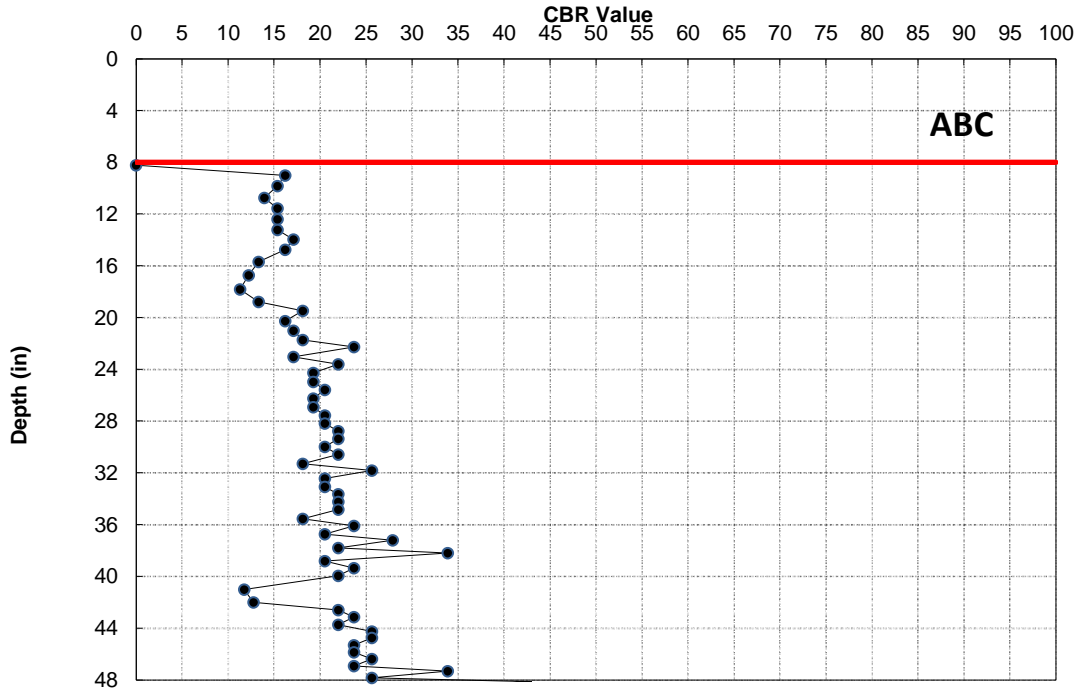
FILE	U5955A_DCP Graphs
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C-7 - RPD- Sta. 19+25 LN (RT)

2.5 FT LT FW
Datum = ABC
RAW
CUT
06/20/22

Interval	
0.0	to 0.0
# of Values	0
Avg CBR	#DIV/0!
Wghtd Avg.	#DIV/0!
Max CBR	0.0
Min CBR	0.0

Interval	
8.2	to 50.3
# of Values	65
Avg CBR	21.4
Wghtd Avg.	19.9
Max CBR	43.0
Min CBR	11.3

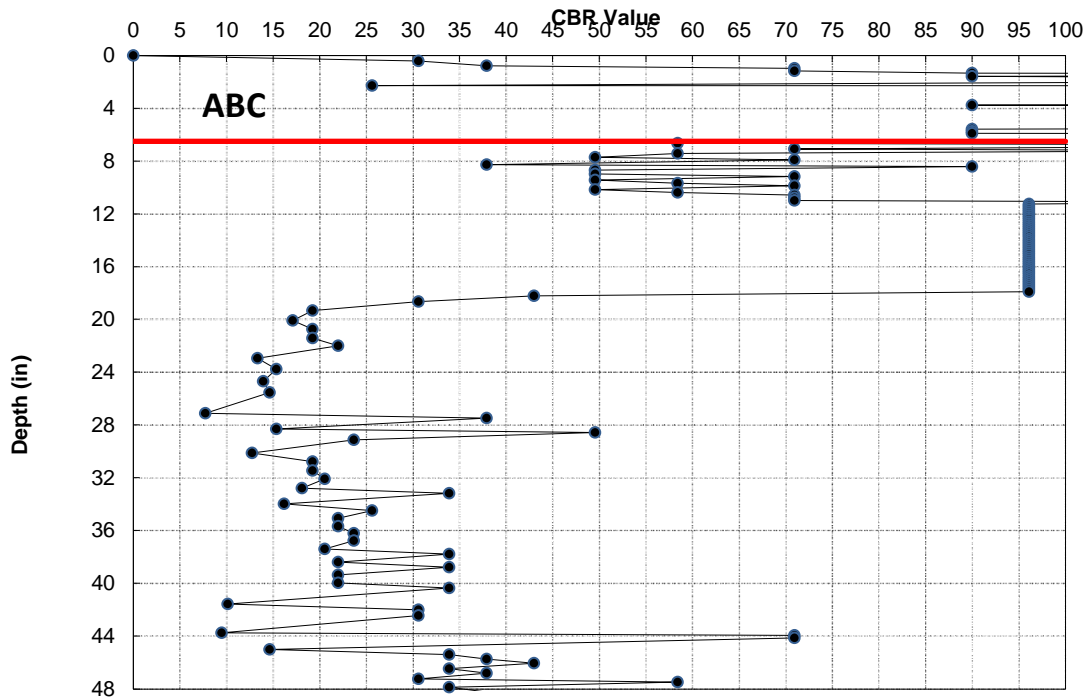


C-8 -RPD- Sta. 19+25 RT PS

1.5 FT RT FW
Datum = ABC
RAW
CUT
06/20/22

Interval	
0.0	to 6.4
# of Values	59
Avg CBR	#DIV/0!
Wghtd Avg.	#DIV/0!
Max CBR	0.0
Min CBR	0.0

Interval	
6.4	to 50.1
# of Values	124
Avg CBR	61.2
Wghtd Avg.	38.2
Max CBR	100+
Min CBR	7.7



**CONE PENETROMETER RESULTS
NCDOT, GEOTECHNICAL ENGINEERING UNIT**

PROJECT NO.	46892.1.3
PROJECT ID	U-5955A
ROUTE	NC 16/ I-85
COUNTY	Meckenburg

GEOLOGIST	LM Howard
GEOTECHS	CG2

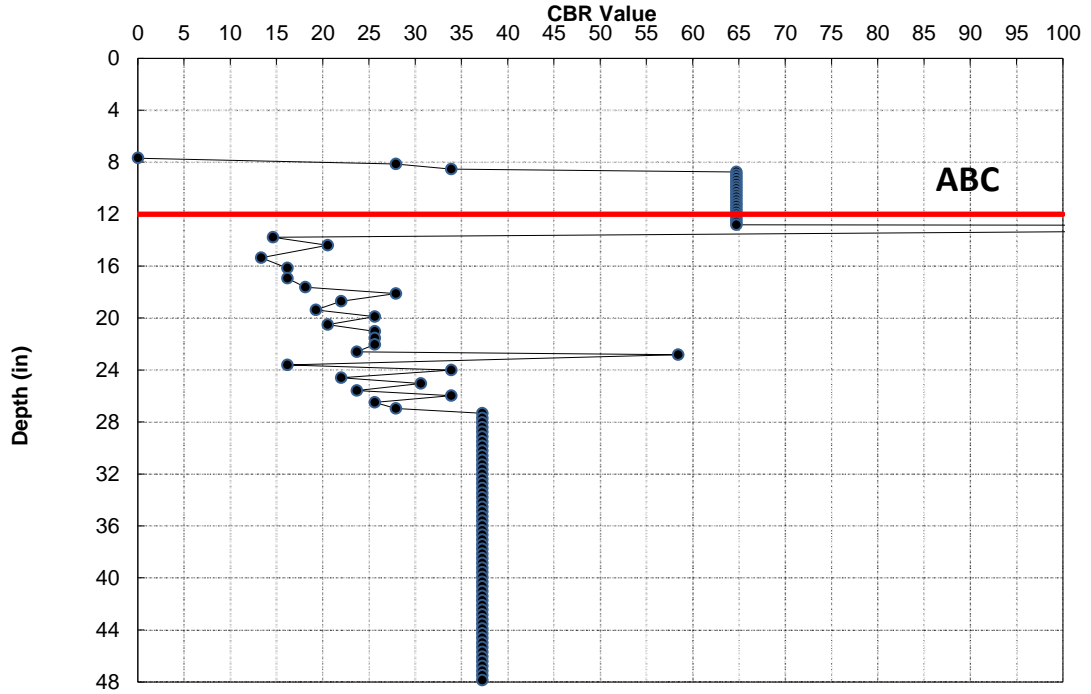
FILE	U5955A_DCP Graphs
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C-9-RPD- Sta. 20+71 LT PS

2.0 FT LT FY
Datum = ABC
RAW
CUT
06/20/22

Interval	
7.7	to 12.0
# of Values	18
Avg CBR	61.0
Wghtd Avg.	57.7
Max CBR	64.7
Min CBR	27.9

Interval	
12.0	to 50.4
# of Values	94
Avg CBR	36.7
Wghtd Avg.	32.6
Max CBR	100+
Min CBR	13.3

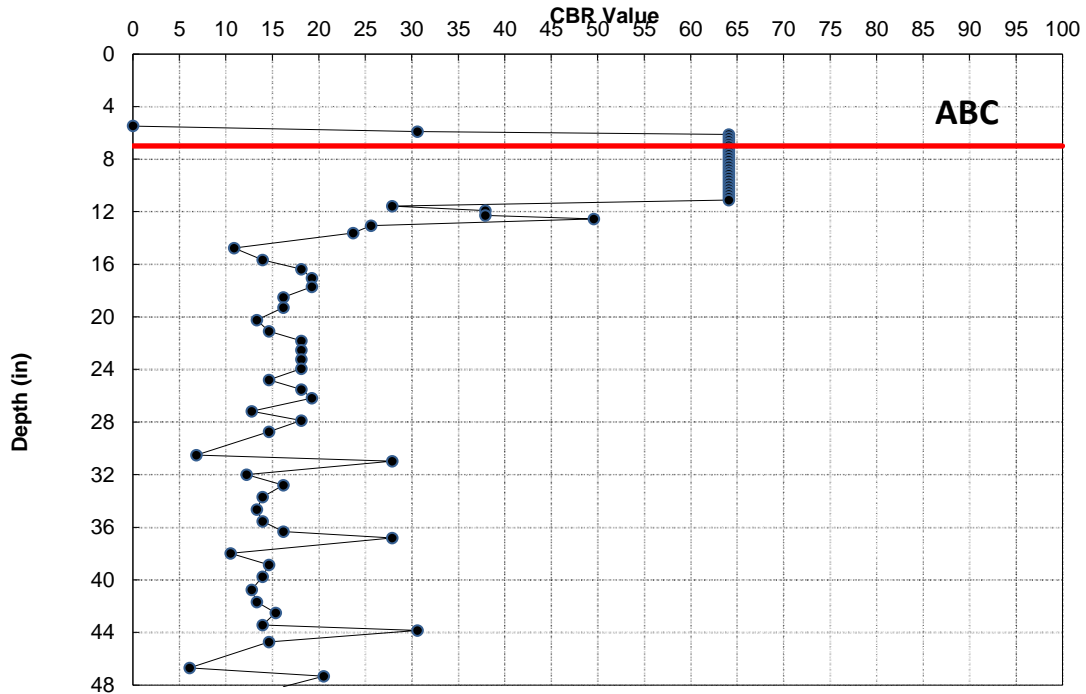


C-10 - RPD- Sta. 20+71 RT PS

4.0 FT RT FW
Datum = ABC
RAW
CUT
6/20/2022

Interval	
5.5	to 7.0
# of Values	6
Avg CBR	58.5
Wghtd Avg.	54.4
Max CBR	64.1
Min CBR	30.6

Interval	
7.0	to 48.1
# of Values	65
Avg CBR	31.7
Wghtd Avg.	20.4
Max CBR	64.1
Min CBR	6.1



**CONE PENETROMETER RESULTS
NCDOT, GEOTECHNICAL ENGINEERING UNIT**

PROJECT NO.	46892.1.3
PROJECT ID	U-5955A
ROUTE	NC 16/ I-85
COUNTY	Meckenburg

GEOLOGIST	LM Howard
GEOTECHS	CG2

FILE	U5955A_DCP Graphs
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C-14 - RPD- Sta. 23+08 RT LN

3.5 FT LT FW

Datum = ABC

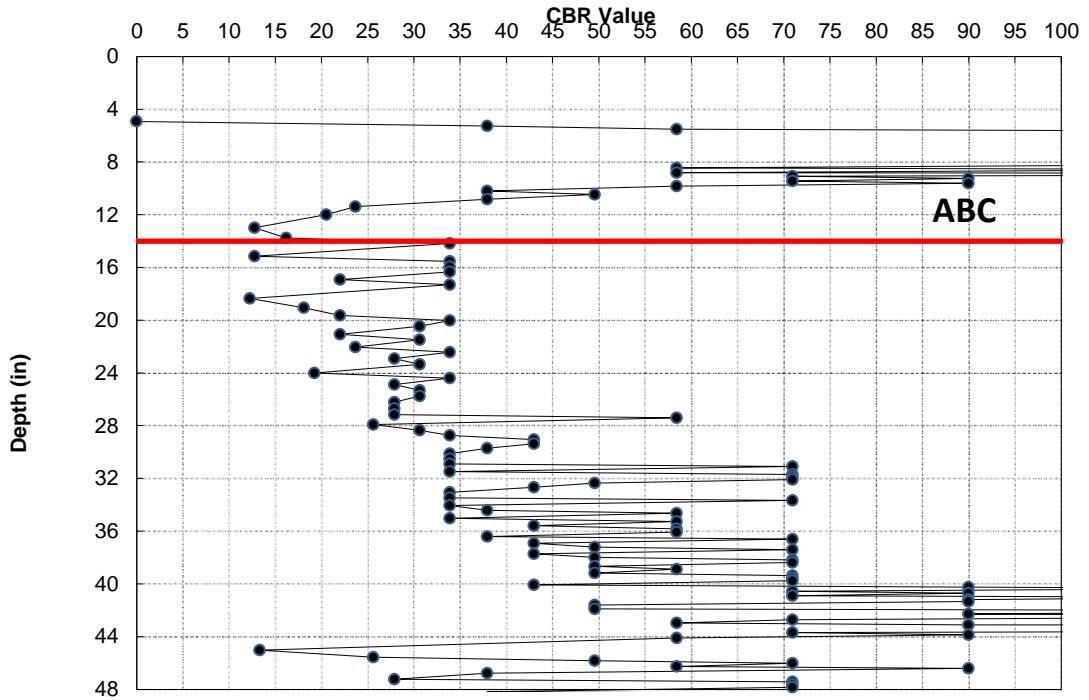
RAW

FILL

06/20/22

Interval 4.9 to 14.2	
# of Values	40
Avg CBR	86.7
Wghtd Avg.	59.7
Max CBR	100+
Min CBR	12.8

Interval 14.2 to 49.2	
# of Values	112
Avg CBR	62.5
Wghtd Avg.	43.3
Max CBR	100+
Min CBR	12.2



C-15 -RPD- Sta. 23+08 RT PS

5.0 FT RT FW

Datum = ABC

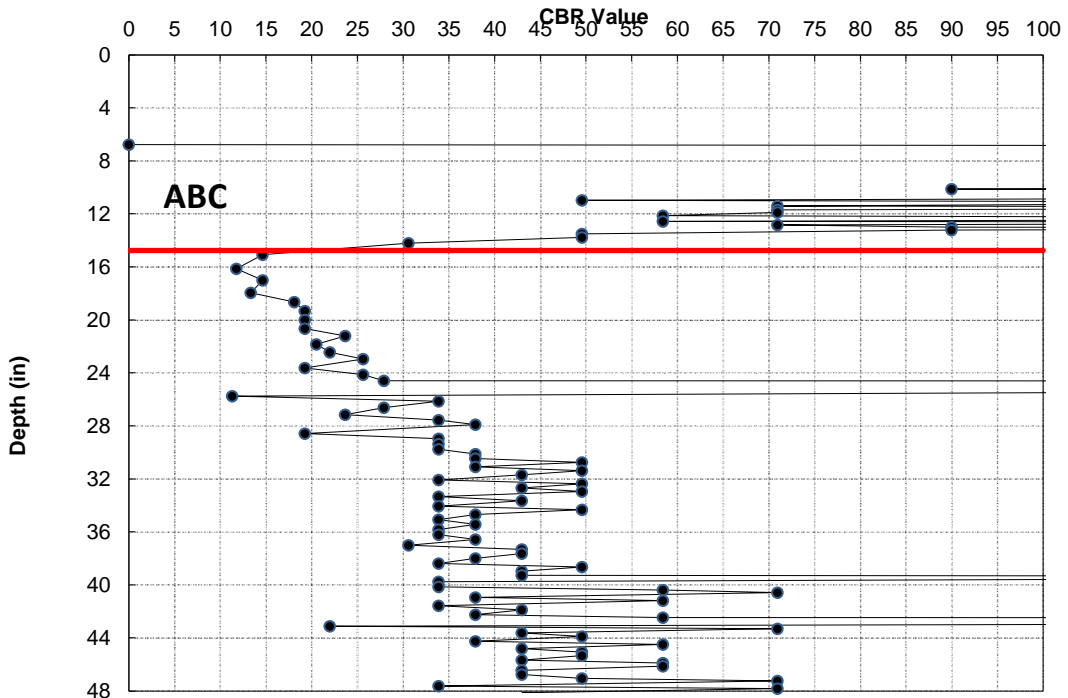
RAW

FILL

06/20/22

Interval 6.8 to 14.2	
# of Values	61
Avg CBR	100+
Wghtd Avg.	100+
Max CBR	100+
Min CBR	30.6

Interval 14.2 to 49.1	
# of Values	88
Avg CBR	48.0
Wghtd Avg.	33.6
Max CBR	100+
Min CBR	11.3



**CONE PENETROMETER RESULTS
NCDOT, GEOTECHNICAL ENGINEERING UNIT**

PROJECT NO.	46892.1.3
PROJECT ID	U-5955A
ROUTE	NC 16/ I-85
COUNTY	Meckenburg

GEOLOGIST	LM Howard
GEOTECHS	CG2

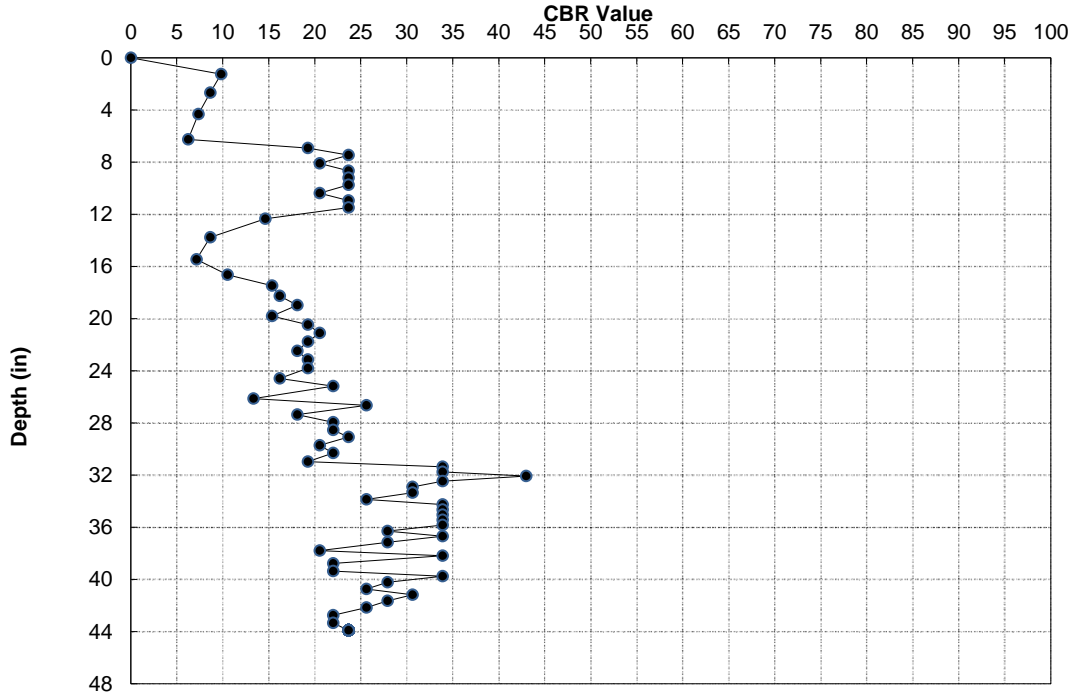
FILE	U5955A_DCP Graphs
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C-16-RPD- Sta. 26+41 MERGE LN

6.0 FT LT EOP
Datum = SG (A-7)
RAW
FILL
06/20/22

Interval	
0.0	to 0.0
# of Values	0
Avg CBR	#DIV/0!
Wghtd Avg.	#DIV/0!
Max CBR	0.0
Min CBR	0.0

Interval	
0.0	to 43.9
# of Values	66
Avg CBR	22.9
Wghtd Avg.	19.4
Max CBR	43.0
Min CBR	6.2

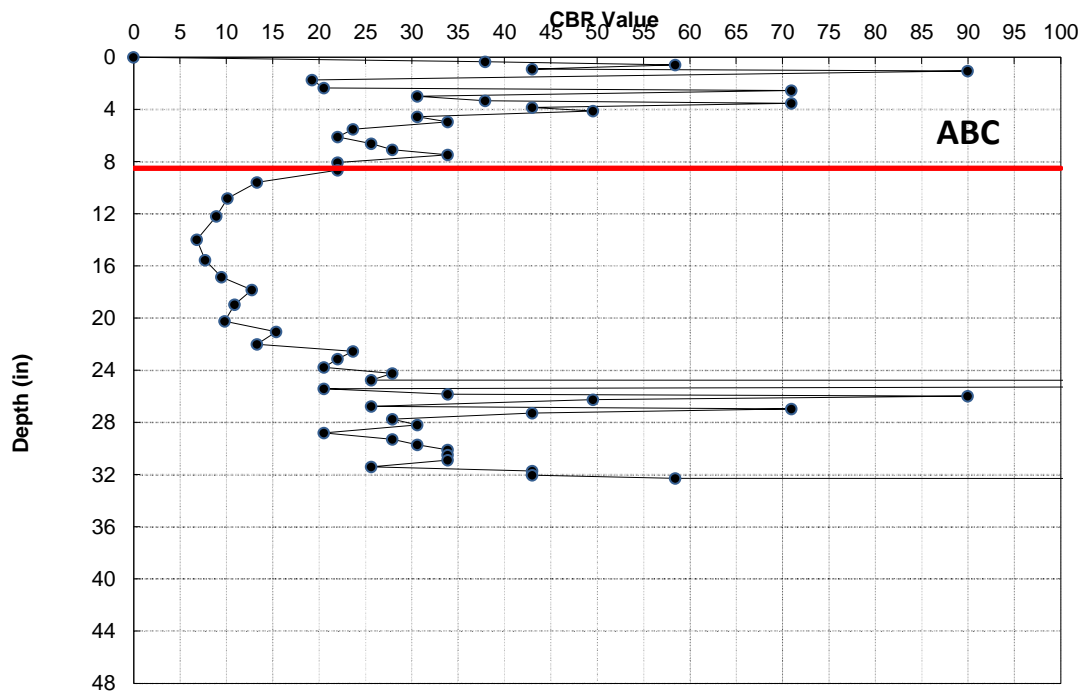


C-11 - RAMPC2- Sta. 12+11 LT PS

2.0 FT LT FY
Datum = ABC
RAW
FLL
06/20/22

Interval	
0.0	to 8.7
# of Values	21
Avg CBR	38.7
Wghtd Avg.	32.2
Max CBR	90.0
Min CBR	19.2

Interval	
8.7	to 34.4
# of Values	85
Avg CBR	100+
Wghtd Avg.	44.9
Max CBR	100+
Min CBR	6.8



**CONE PENETROMETER RESULTS
NCDOT, GEOTECHNICAL ENGINEERING UNIT**

PROJECT NO.	46892.1.3
PROJECT ID	U-5955A
ROUTE	NC 16/ I-85
COUNTY	Meckenburg

GEOLOGIST	LM Howard
GEOTECHS	CG2

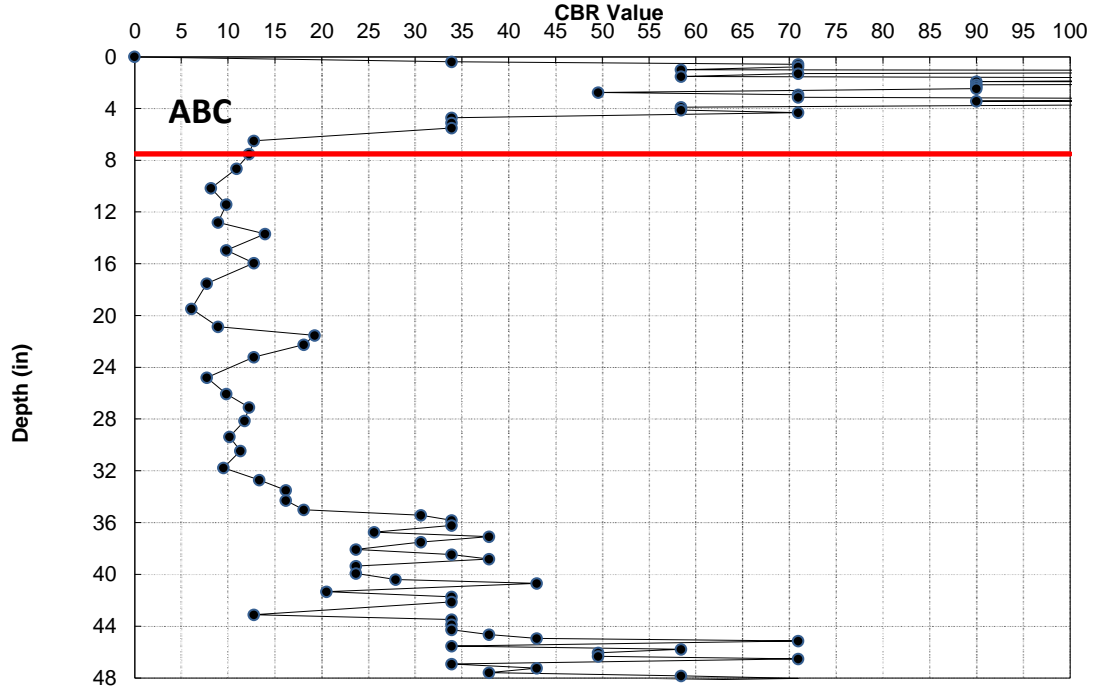
FILE	U5955A_DCP Graphs
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C-12 - RAMPC2- Sta. 12+11 OUTSIDE LTL

3.4 FT LT FW
Datum = ABC
RAW
CUT
06/20/22

Interval	
0.0	to 7.5
# of Values	29
Avg CBR	79.6
Wghtd Avg.	52.9
Max CBR	100+
Min CBR	12.2

Interval	
7.5	to 49.4
# of Values	62
Avg CBR	29.3
Wghtd Avg.	19.1
Max CBR	70.9
Min CBR	6.1

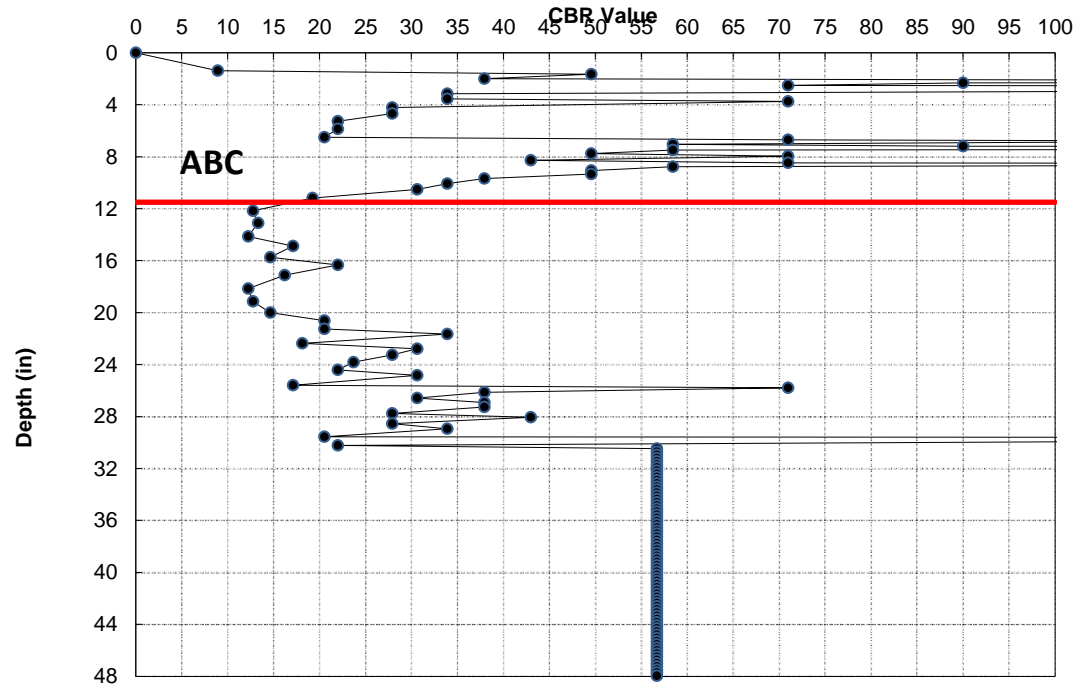


C-13 -RAMPC2- Sta. 12+11 GORE

12.0 FT RT FW
Datum = ABC
RAW
FILL
06/20/22

Interval	
0.0	to 11.2
# of Values	36
Avg CBR	86.0
Wghtd Avg.	43.6
Max CBR	100+
Min CBR	8.9

Interval	
11.2	to 48.7
# of Values	108
Avg CBR	48.9
Wghtd Avg.	38.7
Max CBR	100+
Min CBR	12.2



PAVEMENT CORE EVALUATION
46892.1.3 (U-5955A) Mecklenburg

LINE	STATION	ABC (in)	LAYER THICKNESS (in)	LAYER	LIFT(S)	REMARKS
-RPD-	15+95 ISS	8.00	2.25	S	2	low oxidation
	8" Asphalt		5.75	B	2	moderate stripping, oxidation, and bleeding, lift 1 might be intermediate
-RPD-	15+95 LN	7.00	2.75	S	2	moderate oxidation and bleeding
	8.5" Asphalt		2.00	I	1	moderate oxidation and bleeding
			3.75	B	1	moderate oxidation and bleeding, delaminated
-RPD-	15+95 OSS	9.50	-	S	2+	full-depth crack, high oxidation and stripping, turning to rubble
	6" Asphalt		-	B	1+	
-RPD-	17+95 LT PS	7.00	3.00	S	2	lift 1 delaminated, moderate oxidation
	9" Asphalt		2.75	I	1	moderate oxidation
			3.25	B	1	moderate oxidation, delaminated, moderate bleeding
-RPD-	17+95 RT PS	7.00	3.00	S	2	low to moderate oxidation
	8.5" Asphalt		3.00	I	1	low to moderate oxidation
			2.50	B	1	moderate oxidation and bleeding, initial signs of delamination
-RPD-	19+25 LN (LT)	8.00	2.50	S	2	moderate oxidation
	7" Asphalt		4.50	B	2	moderate oxidation, lift 2 delaminated, low severity bleeding
-RPD-	19+25 LN (RT)	8.00	2.50	S	2	top-down crack through all but last lift of base, moderate to high oxidation and stripping
	7.5" Asphalt		5.00	B	2	moderate to high oxidation and stripping, lift 1 maybe intermediate
-RPD-	19+25 RT PS	6.50	3.75	S	2	lifts 1 and 2 delaminated, high oxidation and moderate stripping
	9.5" Asphalt		5.75	B	1	high oxidation and moderate stripping, lifts indistinguishable
-RPD-	20+71 LT PS	12.00	2.25	S	2	low oxidation
	8" Asphalt		2.75	I	1	low oxidation
			3.00	B	1	low oxidation
-RPD-	20+71 RT PS	7.00	3.50	S	2	low oxidation
	10" Asphalt		2.50	I	1	low oxidation
			4.00	B	1	low oxidation
-RPD-	23+08 RT LN	14.00	2.75	S	2	moderate oxidation, lifts indistinguishable
	8.5" Asphalt		3.00	I	1	moderate oxidation
			2.75	B	1	moderate oxidation, partially delaminated
-RPD-	23+08 RT PS	14.75	2.50	S	2	moderate oxidation, low stripping
	8.25" Asphalt		3.00	I	1	moderate oxidation, low stripping
			2.75	B	1	moderate oxidation, low stripping
-RPD-	26+41 MERGE LN	-	2.50	S	2	moderate to high oxidation and stripping
	15" Asphalt		1.25	I	1	moderate to high oxidation and stripping, delaminated from lower lift
			11.25	B	2	moderate to high oxidation and stripping, lift 2 delaminated
-RAMP C2-	12+11 LT PS	8.50	3.00	S	2	lift 1 delaminated, high oxidation in lift 1, lift 2 moderate oxidation
	9.5" Asphalt		2.00	I	1	moderate oxidation, high oxidation at boundary with base
			4.50	B	1	moderate oxidation

PAVEMENT CORE EVALUATION
46892.1.3 (U-5955A) Mecklenburg

LINE	STATION	ABC (in)	LAYER THICKNESS (in)	LAYER	LIFT(S)	REMARKS
-RAMP C2-	12+11 LT PS	7.50	1.75	S	1-2	lifts indistinguishable, moderate oxidation
	7" Asphalt		2.25	I	1	moderate oxidation
			3.00	B	1	high severity stripping, moderate oxidation
-RAMP C2-	12+11 GORE	11.50	2.50	S	2	lift 1 delaminated, low severity bleeding, low severity oxidation
	9.5" Asphalt		4.00	I	1	low oxidation
			3.00	B	1	low oxidation, delaminated