STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION

ROY COOPER
GOVERNOR

JAMES H. TROGDON, III
SECRETARY

May 6, 2019

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

Brenda L. Moore, P.E. CPM
State Roadway Design Engineer

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

DocuSigned by:
John Pilipchuk
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STATE PROJECT: 50146.1.F1 (C-5621) Turnkey

COUNTY: Mecklenburg

DESCRIPTION: Dual Roundabouts North and South of SR 5544 (Catawba Ave.) and US 21 Intersection in Cornelius.

SUBJECT: Geotechnical Recommendations for Pavement Design

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

The proposed work consists of realigning and widening the existing roadways, constructing curb and gutter, sidewalks, concrete directional islands, medians, and roundabouts.

The subgrade beneath the existing roadways consist of roadway embankment and residual soils. Predominant soil types are Silty Clays (A-7) with lesser amounts of Clayey Silt (A-5 and Sandy Clays (A-6).

The project mainline is approximately 45 percent embankment.

Anticipated borrow will likely consist of soil types listed above.

The length of this project is 0.177 miles.

The design soil type is a Silty Clay (A-7).

Mailing Address:
NC DEPARTMENT OF TRANSPORTATION
GEOTECHNICAL ENGINEERING UNIT
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RALEIGH NC 27699-1589

Telephone: 919-707-6850
Fax: 919-250-4237
Customer Service: 1-877-368-4968

Website: www.ncdot.gov

Location:
CENTURY CENTER COMPLEX
ENTRANCE B-2
1020 BIRCH RIDGE DRIVE
RALEIGH NC

ENVIRONMENTAL DESIGN INPUTS						
DESIGN SOIL TYPE(S)	PASSING #200 SIEVE (%)	OPTIMUM MOISTURE CONTENT (%)	MAXIMUM DRY DENSITY (pcf)	LL	PI	CBR (0.2")
Silty Clay (A-7-5)	64.5	23.2	97.5	59	26	5.7, 6.1
Silty Clay (A-7-5)	60.5	20.1	101.3	49	19	3.1, 4.2

AREAS OF SPECIAL GEOTECHNICAL INTEREST

A. Highly Plastic Clays:
Locations of clays with a PI of 26 or greater.

LINE	STATION AND OFFSET	PI
-Y7-	12+40 EB OSL	27
-Y2-	16+00 CTL	32
-L-	13+25 EB RTL	27
-Y1A-	11+00 NB RTL	26
-Y1A-	13+00 CTL	30
-Y1A-	13+00 NB OSL	28
-Y1B-	19+50 SB PS	29
-L-	19+00 WB OSL	31
-Y1A-	16+00 WB OSL	29

B. Trapped Water within Subbase:
Locations where water was observed.

LINE	STATION AND OFFSET	LAYER
-Y2-	16+00 NB OSL	ABC

C. Soils with a High Moisture Content:
Locations of soils that were classified as wet to saturated.

LINE	STATION AND OFFSET	MOISTURE CONTENT
-L-	13+25 EB RT LN	W
-L-	16+70 EB OSL	16.9%
-Y1A-	11+00 NB RTL	W
-Y2-	11+30 NB OSL	23.7%
-Y2-	16+00 NB OSL	W

D. Existing Pavement
Overall the existing pavement was observed to be in fair condition. Surface pavement distress is characterized by low to high severity longitudinal, transverse, fatigue, and block cracking. About half the pavement cores either have full-depth cracks or are delaminated. The worst pavement conditions appear to be on the -Y2- alignment.

DESIGN AND CONSTRUCTION RECOMMENDATIONS

I. Embankment Stability

A. Geotextile for Pavement Stabilization

These areas should be investigated during construction to determine if the Geotextile is required. Notify the Engineer when the roadbed is completed within 2" of subgrade elevation. The Engineer will sample and test subgrade soils for quality to determine if geotextile for pavement stabilization is required at locations shown in the plans and the other locations as directed. For subgrades without stabilization, allow 24 days to determine if geotextile for pavement stabilization is required. For stabilized subgrades with geotextile for pavement stabilization, stabilize subgrade soils to 12" beyond the base course as shown in plans. The following areas may require Geotextile for Pavement Stabilization.

GEOTEXTILE FOR PAVEMENT STABILIZATION					
LINE	BEGIN STATION	END STATION	GEOTEXTILE (SY)	CLASS IV (TONS)	OFFSET
-Y1A-	10+50	17+82	1,871	818	LT
-Y1B-	11+00	12+50	917	401	CL
-Y4-	11+50	11+77	183	80	CL
-Y7-	12+50	13+00	67	29	RT
TOTAL			3,037	1,328	

Recommend 3,037 square yards of Geotextile for Pavement Stabilization.

Recommend 1,328 tons of Class IV Subgrade Stabilization for locations with full-depth asphalt.

II. Subgrade Stability

A. Aggregate Stabilization

Stabilizer Aggregate
Recommend a quantity of 250 tons of Stabilizer Aggregate to be include in the project contract as a contingency item.

B. Aggregate Subgrade (Type 1)

1) Recommend a quantity of 1,000 cubic yards of shallow undercut to be included in the project contract as a contingency item.

2) Geotextile for Soil Stabilization
Recommend 3,000 square yards of Geotextile for Soil Stabilization to be included in the project contract as a contingency item.

3) Class IV Subgrade Stabilization
Recommend 2,000 tons of Class IV Subgrade Stabilization material to be included in the project contract as a contingency item. This material needs to be calculated as waste.

III. Miscellaneous

A. Proof Rolling
It is recommended that proof rolling not be performed on this project.

Note: For additional recommendation and quantities refer to the forthcoming Geotechnical Report-Final Design and Construction Recommendations.

JLP/JBB/PTN

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NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
GEOTECHNICAL ENGINEERING UNIT
Summary of Quantities

WBS Number: 50146.1.F1 | County: Mecklenburg | Project Engineer:
TIP Number: C-5621 | Field Office / PEF: | Project Geologist: P. T. Neumann
Description: Dual Roundabouts North and South of SR 5544 (Catawba Ave.) and US 21 Intersection in Cornelius.

Pay Item No.	Pay Item/ Quantity Adjustment	Spec Book Section No. or Special Provision (SP) Reference	Report Section	Alignment	Begin Station	End Station	Quantity	Units / %
0196000000-E	Geotextile for Soil Stabilization	270 - Geotextile for Soil Stabilization	II. B	Contingency	N/A	N/A	3,000	SY
						Total Quantity of Geotextile for Soil Stabilization =	**3,000**	**SY**
1099500000-E	Shallow Undercut	505 - Aggregate Subgrade	II. B	Contingency	N/A	N/A	1,000	CY
						Total Quantity of Shallow Undercut =	**1,000**	**CY**
1099700000-E	Class IV Subgrade Stabilization	SP - Geotextile for Pavement Stabilization	I. A	-Y1A-	10+50.00	17+82.00	818	TON
1099700000-E	Class IV Subgrade Stabilization	SP - Geotextile for Pavement Stabilization	I. A	-Y1B-	11+00.00	12+50.00	401	TON
1099700000-E	Class IV Subgrade Stabilization	SP - Geotextile for Pavement Stabilization	I. A	-Y4-	11+50.00	11+77.00	80	TON
1099700000-E	Class IV Subgrade Stabilization	SP - Geotextile for Pavement Stabilization	I. A	-Y7-	12+50.00	13+00.00	29	TON
1099700000-E	Class IV Subgrade Stabilization	505 - Aggregate Subgrade	II. B	Contingency	N/A	N/A	2,000	TON
						Total Quantity of Class IV Subgrade Stabilization =	**3,328**	**TON**
1110000000-E	Stabilizer Aggregate	510 - Aggregate Stabilization	II. A	Contingency	N/A	N/A	250	TON
						Total Quantity of Stabilizer Aggregate =	**250**	**TON**
1115000000-E	Geotextile for Pavement Stabilization	SP - Geotextile for Pavement Stabilization	I. A	-Y1A-	10+50.00	17+82.00	1,871	SY
1115000000-E	Geotextile for Pavement Stabilization	SP - Geotextile for Pavement Stabilization	I. A	-Y1B-	11+00.00	12+50.00	917	SY
1115000000-E	Geotextile for Pavement Stabilization	SP - Geotextile for Pavement Stabilization	I. A	-Y4-	11+50.00	11+77.00	183	SY
1115000000-E	Geotextile for Pavement Stabilization	SP - Geotextile for Pavement Stabilization	I. A	-Y7-	12+50.00	13+00.00	67	SY
						Total Quantity of Geotextile for Pavement Stabilization =	**3,038**	**SY**

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	C-5621	1	22

REFERENCE: C-5621

PROJECT: 50146.3.1

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

ROADWAY SUBSURFACE INVESTIGATION

COUNTY *MECKLENBURG*

PROJECT DESCRIPTION *INTERSECTION OF SR 5544 (CATAWBA AVE) AND US 21 IN CORNELIUS*

PAVEMENT AND SUBGRADE INVENTORY

CONTENTS

SHEET NO.	DESCRIPTION
1	TITLE SHEET
2	LEGEND (SOIL & ROCK)
3-4	PAVEMENT DATA
5-10	DCP LOGS
11-14	CORE PHOTOS
15-22	LAB SUMMARY

CAUTION NOTICE

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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

INVESTIGATED BY *D. STROTHER*

DRAWN BY *J. NELSON*

CHECKED BY *V. MITCHEV*

SUBMITTED BY *V. MITCHEV*

DATE *MARCH 2019*

3201 SPRING FOREST ROAD
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(919) 872-2660

NORTH CAROLINA PROFESSIONAL SEAL 031484 ENGINEER VLADIMIR G. MITCHEV

DocuSigned by:
Vladimir G. Mitchev 2019
BCFD... DATE

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

PROJECT REFERENCE NO.	SHEET NO.
C-5621	2

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS
GEOTECHNICAL ENGINEERING UNIT

SUBSURFACE INVESTIGATION

SOIL AND ROCK LEGEND, TERMS, SYMBOLS, AND ABBREVIATIONS

SOIL DESCRIPTION

SOIL IS CONSIDERED UNCONSOLIDATED, SEMI-CONSOLIDATED, OR WEATHERED EARTH MATERIALS THAT CAN BE PENETRATED WITH A CONTINUOUS FLIGHT POWER AUGER AND YIELD LESS THAN 100 BLOWS PER FOOT ACCORDING TO THE STANDARD PENETRATION TEST (AASHTO T 206, ASTM D1586). SOIL CLASSIFICATION IS BASED ON THE AASHTO SYSTEM. BASIC DESCRIPTIONS GENERALLY INCLUDE THE FOLLOWING: CONSISTENCY, COLOR, TEXTURE, MOISTURE, AASHTO CLASSIFICATION, AND OTHER PERTINENT FACTORS SUCH AS MINERALOGICAL COMPOSITION, ANGULARITY, STRUCTURE, PLASTICITY, ETC. FOR EXAMPLE,
VERY STIFF, GRAY, SILTY CLAY, MOIST WITH INTERBEDDED FINE SAND LAYERS, HIGHLY PLASTIC, A-7-6

SOIL LEGEND AND AASHTO CLASSIFICATION

GENERAL CLASS.	GRANULAR MATERIALS (≤ 35% PASSING #200)							SILT-CLAY MATERIALS (> 35% PASSING #200)				ORGANIC MATERIALS		
GROUP CLASS.	A-1		A-3	A-2				A-4	A-5	A-6	A-7	A-1, A-2 A-3	A-4, A-5 A-6, A-7	
	A-1-a	A-1-b		A-2-4	A-2-5	A-2-6	A-2-7				A-7-5, A-7-6			
SYMBOL														
% 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	36 MN	36 MN	36 MN	36 MN	GRANULAR SOILS	SILT-CLAY SOILS	MUCK, PEAT
MATERIAL PASSING #40 LL PI	— 6 MX			— NP	40 MX 10 MX	41 MN 10 MX	40 MX 11 MN	41 MN 11 MN	40 MX 10 MX	41 MN 10 MX	40 MX 11 MN	41 MN 11 MN	SOILS WITH LITTLE OR MODERATE AMOUNTS OF ORGANIC MATTER		HIGHLY ORGANIC SOILS
GROUP INDEX	0		0		0		4 MX		8 MX	12 MX	16 MX	NO MX			
USUAL TYPES OF MAJOR MATERIALS	STONE FRAGS. GRAVEL, AND SAND		FINE SAND		SILTY OR CLAYEY GRAVEL AND SAND				SILTY SOILS		CLAYEY SOILS				
GEN. RATING AS SUBGRADE	EXCELLENT TO GOOD								FAIR TO POOR				FAIR TO POOR	POOR	UNSUITABLE

PI OF A-7-5 SUBGROUP IS ≤ LL - 30 ; PI OF A-7-6 SUBGROUP IS > LL - 30

CONSISTENCY OR DENSENESS

PRIMARY SOIL TYPE	COMPACTNESS OR CONSISTENCY	RANGE OF STANDARD PENETRATION RESISTENCE (N-VALUE)	RANGE OF UNCONFINED COMPRESSIVE STRENGTH ($TONS/FT^2$)
GENERALLY GRANULAR MATERIAL (NON-COHESIVE)	VERY LOOSE LOOSE MEDIUM DENSE DENSE VERY DENSE	< 4 4 TO 10 10 TO 30 30 TO 50 > 50	N/A
GENERALLY SILT-CLAY MATERIAL (COHESIVE)	VERY SOFT SOFT MEDIUM STIFF STIFF VERY STIFF HARD	< 2 2 TO 4 4 TO 8 8 TO 15 15 TO 30 > 30	< 0.25 0.25 TO 0.5 0.5 TO 1.0 1 TO 2 2 TO 4 > 4

TEXTURE OR GRAIN SIZE

U.S. STD. SIEVE SIZE	4	10	40	60	200	270
OPENING (MM)	4.76	2.00	0.42	0.25	0.075	0.053

BOULDER (BLDR.)	COBBLE (COB.)	GRAVEL (GR.)	COARSE SAND (CSE. SD.)	FINE SAND (F SD.)	SILT (SL.)	CLAY (CL.)

GRAIN SIZE	MM	305	75	2.0	0.25	0.05	0.005
	IN.	12	3				

SOIL MOISTURE - CORRELATION OF TERMS

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

PLASTICITY

	PLASTICITY INDEX (PI)	DRY STRENGTH
NON PLASTIC	0-5	VERY LOW
SLIGHTLY PLASTIC	6-15	SLIGHT
MODERATELY PLASTIC	16-25	MEDIUM
HIGHLY PLASTIC	26 OR MORE	HIGH

COLOR

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

GRADATION

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

ANGULARITY OF GRAINS

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

MINERALOGICAL COMPOSITION

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

COMPRESSIBILITY

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

PERCENTAGE OF MATERIAL

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

GROUND WATER

- WATER LEVEL IN BORE HOLE IMMEDIATELY AFTER DRILLING
- STATIC WATER LEVEL AFTER 24 HOURS
- PW — PERCHED WATER, SATURATED ZONE, OR WATER BEARING STRATA
- SPRING OR SEEP

MISCELLANEOUS SYMBOLS

- ROADWAY EMBANKMENT (RE) WITH SOIL DESCRIPTION
- SOIL SYMBOL
- ARTIFICIAL FILL (AF) OTHER THAN ROADWAY EMBANKMENT
- INFERRED SOIL BOUNDARY
- INFERRED ROCK LINE
- ALLUVIAL SOIL BOUNDARY
- 25/025 — DIP & DIP DIRECTION OF ROCK STRUCTURES
- SPT, DPT, DMT, VST PMT — TEST BORING
- AUGER BORING
- CORE BORING
- MW — MONITORING WELL
- PIEZOMETER INSTALLATION
- SLOPE INDICATOR INSTALLATION
- CONE PENETROMETER TEST
- SOUNDING ROD
- TEST BORING WITH CORE
- SPT N-VALUE

RECOMMENDATION SYMBOLS

- UNDERCUT
- SHALLOW UNDERCUT
- UNCLASSIFIED EXCAVATION - UNSUITABLE WASTE
- UNCLASSIFIED EXCAVATION - ACCEPTABLE DEGRADABLE ROCK
- UNCLASSIFIED EXCAVATION - ACCEPTABLE, BUT NOT TO BE USED IN THE TOP 3 FEET OF EMBANKMENT OR BACKFILL

ABBREVIATIONS

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
γ - UNIT WEIGHT
γ_d - DRY UNIT WEIGHT

SAMPLE ABBREVIATIONS

S - BULK
SS - SPLIT SPOON
ST - SHELBY TUBE
RS - ROCK
RT - RECOMPACTED TRIAXIAL
CBR - CALIFORNIA BEARING RATIO

EQUIPMENT USED ON SUBJECT PROJECT

DRILL UNITS:
- [ ] CME-45C
- [X] CME-55
- [ ] CME-550
- [ ] VANE SHEAR TEST
- [ ] PORTABLE HOIST
- [ ] _____
- [ ] _____

ADVANCING TOOLS:
- [ ] CLAY BITS
- [ ] 6" CONTINUOUS FLIGHT AUGER
- [ ] 8" HOLLOW AUGERS
- [ ] HARD FACED FINGER BITS
- [ ] TUNG.-CARBIDE INSERTS
- [ ] CASING [ ] W/ ADVANCER
- [ ] TRICONE _____" STEEL TEETH
- [ ] TRICONE _____" TUNG.-CARB.
- [X] CORE BIT (4.0 inch)
- [X] 3.5 inch auger

HAMMER TYPE:
- [ ] AUTOMATIC [ ] MANUAL

CORE SIZE:
- [ ] -B ____ [ ] -H ____
- [ ] -N ____

HAND TOOLS:
- [ ] POST HOLE DIGGER
- [ ] HAND AUGER
- [ ] SOUNDING ROD
- [ ] VANE SHEAR TEST
- [ ] _____

ROCK DESCRIPTION

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

WEATHERED ROCK (WR)	NON-COASTAL PLAIN MATERIAL THAT WOULD YIELD SPT N VALUES > 100 BLOWS PER FOOT IF TESTED.
CRYSTALLINE ROCK (CR)	FINE TO COARSE GRAIN IGNEOUS AND METAMORPHIC ROCK THAT WOULD YIELD SPT REFUSAL IF TESTED. ROCK TYPE INCLUDES GRANITE, GNEISS, GABBRO, SCHIST, ETC.
NON-CRYSTALLINE ROCK (NCR)	FINE TO COARSE GRAIN METAMORPHIC AND NON-COASTAL PLAIN SEDIMENTARY ROCK THAT WOULD YEILD SPT REFUSAL IF TESTED. ROCK TYPE INCLUDES PHYLLITE, SLATE, SANDSTONE, ETC.
COASTAL PLAIN SEDIMENTARY ROCK (CP)	COASTAL PLAIN SEDIMENTS CEMENTED INTO ROCK, BUT MAY NOT YIELD SPT REFUSAL. ROCK TYPE INCLUDES LIMESTONE, SANDSTONE, CEMENTED SHELL BEDS, ETC.

WEATHERING

FRESH	ROCK FRESH, CRYSTALS BRIGHT, FEW JOINTS MAY SHOW SLIGHT STAINING. ROCK RINGS UNDER HAMMER IF CRYSTALLINE.
VERY SLIGHT (V 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.
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.
MODERATE (MOD.)	SIGNIFICANT PORTIONS OF ROCK SHOW DISCOLORATION AND WEATHERING EFFECTS. IN GRANITOID ROCKS, MOST FELDSPARS ARE DULL AND DISCOLORED, SOME SHOW CLAY. ROCK HAS DULL SOUND UNDER HAMMER BLOWS AND SHOWS SIGNIFICANT LOSS OF STRENGTH AS COMPARED WITH FRESH ROCK.
MODERATELY SEVERE (MOD. SEV.)	ALL ROCK EXCEPT QUARTZ DISCOLORED OR STAINED. IN GRANITOID ROCKS, ALL FELDSPARS DULL AND DISCOLORED AND A MAJORITY SHOW KAOLINIZATION. ROCK SHOWS SEVERE LOSS OF STRENGTH AND CAN BE EXCAVATED WITH A GEOLOGIST'S PICK. ROCK GIVES "CLUNK" SOUND WHEN STRUCK. *IF TESTED, WOULD YIELD SPT REFUSAL*
SEVERE (SEV.)	ALL ROCK EXCEPT QUARTZ DISCOLORED OR STAINED. ROCK FABRIC CLEAR AND EVIDENT BUT REDUCED IN STRENGTH TO STRONG SOIL. IN GRANITOID ROCKS ALL FELDSPARS ARE KAOLINIZED TO SOME EXTENT. SOME FRAGMENTS OF STRONG ROCK USUALLY REMAIN. *IF TESTED, WOULD YIELD SPT N VALUES > 100 BPF*
VERY SEVERE (V SEV.)	ALL ROCK EXCEPT QUARTZ DISCOLORED OR STAINED. ROCK FABRIC ELEMENTS ARE DISCERNIBLE BUT MASS IS EFFECTIVELY REDUCED TO SOIL STATUS, WITH ONLY FRAGMENTS OF STRONG ROCK REMAINING. SAPROLITE IS AN EXAMPLE OF ROCK WEATHERED TO A DEGREE THAT ONLY MINOR VESTIGES OF ORIGINAL ROCK FABRIC REMAIN. *IF TESTED, WOULD YIELD SPT N VALUES < 100 BPF*
COMPLETE	ROCK REDUCED TO SOIL. ROCK FABRIC NOT DISCERNIBLE, OR DISCERNIBLE ONLY IN SMALL AND SCATTERED CONCENTRATIONS. QUARTZ MAY BE PRESENT AS DIKES OR STRINGERS. SAPROLITE IS ALSO AN EXAMPLE.

ROCK HARDNESS

VERY HARD	CANNOT BE SCRATCHED BY KNIFE OR SHARP PICK. BREAKING OF HAND SPECIMENS REQUIRES SEVERAL HARD BLOWS OF THE GEOLOGIST'S PICK.
HARD	CAN BE SCRATCHED BY KNIFE OR PICK ONLY WITH DIFFICULTY. HARD HAMMER BLOWS REQUIRED TO DETACH HAND SPECIMEN.
MODERATELY HARD	CAN BE SCRATCHED BY KNIFE OR PICK. GOUGES OR GROOVES TO 0.25 INCHES DEEP CAN BE EXCAVATED BY HARD BLOW OF A GEOLOGIST'S PICK. HAND SPECIMENS CAN BE DETACHED BY MODERATE BLOWS.
MEDIUM HARD	CAN BE GROOVED OR GOUGED 0.05 INCHES DEEP BY FIRM PRESSURE OF KNIFE OR PICK POINT. CAN BE EXCAVATED IN SMALL CHIPS TO PEICES 1 INCH MAXIMUM SIZE BY HARD BLOWS OF THE POINT OF A GEOLOGIST'S PICK.
SOFT	CAN BE GROVED OR GOUGED READILY BY KNIFE OR PICK. CAN BE EXCAVATED IN FRAGMENTS FROM CHIPS TO SEVERAL INCHES IN SIZE BY MODERATE BLOWS OF A PICK POINT. SMALL, THIN PIECES CAN BE BROKEN BY FINGER PRESSURE.
VERY SOFT	CAN BE CARVED WITH KNIFE. CAN BE EXCAVATED READILY WITH POINT OF PICK. PIECES 1 INCH OR MORE IN THICKNESS CAN BE BROKEN BY FINGER PRESSURE. CAN BE SCRATCHED READILY BY FINGERNAIL.

FRACTURE SPACING

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

BEDDING

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

INDURATION

FOR SEDIMENTARY ROCKS, INDURATION IS THE HARDENING OF MATERIAL BY CEMENTING, HEAT, PRESSURE, ETC.

FRIABLE	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.

TERMS AND DEFINITIONS

ALLUVIUM (ALLUV.) - SOILS THAT HAVE BEEN TRANSPORTED BY WATER.

AQUIFER - A WATER BEARING FORMATION OR STRATA.

ARENACEOUS - APPLIED TO ROCKS THAT HAVE BEEN DERIVED FROM SAND OR THAT CONTAIN SAND.

ARGILLACEOUS - APPLIED TO ALL ROCKS OR SUBSTANCES COMPOSED OF CLAY MINERALS, OR HAVING A NOTABLE PROPORTION OF CLAY IN THEIR COMPOSITION, SUCH AS SHALE, SLATE, ETC.

ARTESIAN - GROUND WATER THAT IS UNDER SUFFICIENT PRESSURE TO RISE ABOVE THE LEVEL AT WHICH IT IS ENCOUNTERED, BUT WHICH DOES NOT NECESSARILY RISE TO OR ABOVE THE GROUND SURFACE.

CALCAREOUS (CALC.) - SOILS THAT CONTAIN APPRECIABLE AMOUNTS OF CALCIUM CARBONATE.

COLLUVIUM - ROCK FRAGMENTS MIXED WITH SOIL DEPOSITED BY GRAVITY ON SLOPE OR AT BOTTOM OF SLOPE.

CORE RECOVERY (REC.) - TOTAL LENGTH OF ALL MATERIAL RECOVERED IN THE CORE BARREL DIVIDED BY TOTAL LENGTH OF CORE RUN AND EXPRESSED AS A PERCENTAGE.

DIKE - A TABULAR BODY OF IGNEOUS ROCK THAT CUTS ACROSS THE STRUCTURE OF ADJACENT ROCKS OR CUTS MASSIVE ROCK.

DIP - THE ANGLE AT WHICH A STRATUM OR ANY PLANAR FEATURE IS INCLINED FROM THE HORIZONTAL.

DIP DIRECTION (DIP AZIMUTH) - THE DIRECTION OR BEARING OF THE HORIZONTAL TRACE OF THE LINE OF DIP, MEASURED CLOCKWISE FROM NORTH.

FAULT - A FRACTURE OR FRACTURE ZONE ALONG WHICH THERE HAS BEEN DISPLACEMENT OF THE SIDES RELATIVE TO ONE ANOTHER PARALLEL TO THE FRACTURE.

FISSILE - A PROPERTY OF SPLITTING ALONG CLOSELY SPACED PARALLEL PLANES.

FLOAT - ROCK FRAGMENTS ON SURFACE NEAR THEIR ORIGINAL POSITION AND DISLODGED FROM PARENT MATERIAL.

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

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

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

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

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

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

PERCHED WATER - WATER MAINTAINED ABOVE THE NORMAL GROUND WATER LEVEL BY THE PRESENCE OF AN INTERVENING IMPERVIOUS STRATUM.

RESIDUAL (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 (SRQD) - 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.

BENCH MARK:

ELEVATION: FEET

NOTES:

NB - Northbound Lane	RT - Right
SB - Southbound Lane	(I) - Inside
EB - Eastbound Lane	(O) - Outside
WB - Westbound Lane	FW - From White
RT LN - Right LN	FY - From Yellow
OSL - Outside Lane	WP - Wheel Path
CTL - Center Turn Lane	IWP - Inside Wheel Path
RTL - Right Turn Lane	OWP - Outside wheel Path
PS - Paved Shoulder	C&G - Curb and Gutter

DATE: 8-15-14

PAVEMENT INVESTIGATION DATA SHEET

Project:	50146.3.1	County:	MECKLENBURG	Date:	2/24/19 - 2/26/19
TIP:	C-5621	Route:	INTERSECTION OF SR-5544 (CATAWBA AVE) AND US 21	Notes By:	D.Strother

		Width				Thickness						Subgrade						GPS Coordinates	
Position (Sta., Lane, Shldr.)	Cut/Fill (Est. of Amount) (ft)	Lane(s) (ft)	Shoulder(s) (ft)	Offset Distance (See Notes) (ft)	Crown "C" or Super "S"	Gross to Top of Soil (in)	Asphalt (in)	Concrete (in)	ABC (in)	Stabilized Soil Subgrade (in)	Pavement Layering	Description	Sample Number	AASHTO Classification	Soil Moisture	Probe Depth (ft)	Asphalt Notes	Northing	Easting
L - 13+00 WB OSL	8.0 Fill	11.8	C&G	1.2 from C&G	C	15.25	9.25	-	+/- 6.0 DCP	-	ASPHALT ABC	No Auger for Utilities	-	-	-	-	Low Severity Longitudinal Cracking at Lane Joint, Drillers cored approximately 4" into ABC by accident so the DCP values may be off.	636258.39	1442433.59
L - 13+25 EB RTLN	5.0 Fill	12.0	C&G	1.0 from C&G	C	26.0	26.0		-	-	ASPHALT	0.0-5.0' = Roadway Embankment, Orange, Sandy Clay	S-6	A-7-6	W	5.0	Low Severity Longitudinal Cracking at Lane Joint	636202.75	1442473.64
L - 16+00 WB OSL	1.0 Cut	11.8	C&G	1.0 from C&G	C	12.5	6.5		+/- 6.0 DCP	-	ASPHALT ABC	No Auger for Utilities	-	-	-	-	No Visible Cracking	636283.27	1442731.38
L - 16+00 WB OSL	1.0 Cut	11.8	C&G	3.7 from C&G	C	15.0	8.75	-	6.25	-	ASPHALT ABC	0.0-5.0' = Residual Soils, Brown, Orange, Sandy Silty Clay	S-15	A-7-6	M	5.0	No Visible Cracking	636284.27	1442730.21
L - 16+70 EB OSL	5.0 Fill	14.0	C&G	1.0 from C&G	C	18.0	7.0	-	11.0	-	ASPHALT ABC	0.0-5.0' = Roadway Embankment, Grey, Brown, Sandy Clay	S-16	A-6	W	5.0	Moderate Severity Transverse Cracking, Moderate Severity Longitudinal Cracking, High Severity Fatigue Cracking 30' behind core location. Core is Cracked full depth	636248.12	1442803.53
L - 19+00 WB OSL	10.0 Cut	12.0	C&G 1.7' to WL	2.3 from C&G	C	9.0	9.0		-	-	ASPHALT	0.0-5.0' = Residual Soils, Orange, Sandy Silty Clay	S-14	A-7-5	M	5.0	Moderate Severity Transverse Cracking, Moderate Severity Longitudinal Cracking in Both WP and 1.1' from C&G	636305.61	1443044.60
L - 19+00 EB OSL (I)	10.0 Cut	12.0	C&G 1.8' to WL	3.5 from C&G	C	11.25	5.25	6.0	-	-	ASPHALT CONCRETE	During DCP We hit something hard approximately 4" below the concete. We chose not to Auger because may have been sewer line. The material between concrete and hard object was clay and rocks	-	-	-	-	Some Moderate Severity Transverse Cracking, Moderate Severity Longitudinal Cracking in IWP and 1' from C&G	636292.75	1443045.80
L - 19+00 EB OSL (O)	1.0 Cut	-	C&G 1.8' to WL	1.6 from C&G	C	10.0	10	-	-	-	ASPHALT	Auger refusal approximately 3" below bottom of Asphalt. Because DCP did not have refusal, We assumed auger bit hit the edge of the hard object that was in the core location next to it. The material under asphalt was clay	-	-	-	-	Some Moderate Severity Transverse Cracking, Moderate Severity Longitudinal Cracking in IWP and 1' from C&G. Core is cracked in top 4.5"	636288.52	1443047.82
Y1A - 11+00 NB RTL	8.0 Fill	11.0	0.3	3.2 from white	C	18.5	8.5	-	10.0		ASPHALT ABC	0.0-5.0' = Roadway Embankment, Brown, Orange, Sandy Silty Clay	S-7	A-7-6	W	5.0	Low Severity Transverse Cracking, Low Severity Longitudinal Cracking, Moderate Severity Transverse Cracking and Moderate Severity Fatigue Cracking in Other Lanes	636092.65	1442621.05
Y1A - 13+00 NB OSL	8.0 Fill	11.0	-	2.5 from white	C	14.0	6.75	-	7.25	-	ASPHALT ABC	0.0-5.0' = Roadway Embankment, Brown, Orange, Sandy Silty Clay	S-10	A-7-6	M	5.0	Low Severity Transverse Cracking, Low Severity Longitudinal Cracking, Low Severity Fatigue Cracking in OWP, 1/4" Rutting	635923.78	1442598.68
Y1A - 13+00 SB OSL	1.0 Cut	11.4	3.0	2.0 from white	C	13.5	3.5	-	10.0	-	ASPHALT ABC	0.0-5.0' = Residual Soils, Orange, Sandy Silty Clay Cored into ABC Approximately 4.0"	S-8	A-7-5	M	5.0	Low Severity Transverse Cracking, Low Severity Longitudinal Cracking, Moderate Severity Fatigue Cracking in OWP, 1/4" Rutting. Core is cracked full depth	635920.81	1442574.47
Y1A - 13+00 CTL	2.0 Fill	11.5	-	5.0' from RT yellow	C	16.5	7.25	-	9.25	-	ASPHALT ABC	0.0-2.0' = Roadway Embankment, Brown, Orange, Sandy Clay 2.0-5.0' = Residual Soils, Orange, Sandy Silty Clay	S-9 REF S-8	A-7-6 A-7-5	M M	5.0	Low Severity Transverse Cracking, Low Severity Longitudinal Cracking	635925.98	1442589.14
Y1B - 19+50 SB PS	1.0 Cut	-	3.6	1.8 from white	C	12.25	4.25	0.0	8.0	-	ASPHALT ABC	0.0-5.0' = Residual Soils, Brown, Grey, Sandy Clay	S-11	A-7-6	M	5.0	Low Severity Transverse Cracking, Low Severity Longitudinal Cracking	634499.09	1442193.34
Y1B - 19+50 NB OSL	5.0 Fill	10.7	4.0	2.8 from white	C	17.0	7.0	-	10.0	-	ASPHALT ABC	0.0-5.0' = Roadway Embankment, Brown, Orange, Grey, Sandy Silty Clay	Ref S-12	A-7-6	M	5.0	Low Severity Transverse Cracking, Low Severity Longitudinal Cracking, Low Severity Fatigue Cracking in IWP, 1/4" Rutting	634491.74	1442212.54
Y1B - 19+50 NB PS	5.0 Fill	-	4.0	2.0 from white	C	15.0	5.0	0	10.0	-	ASPHALT ABC	0.0-5.0' = Roadway Embankment, Brown, Orange, Grey, Sandy Silty Clay	S-12	A-7-6	M	5.0	Low Severity Transverse Cracking	634489.43	1442218.67

Notes:

OSL = Outside Lane
ISL = Inside Lane
CL = Center Lane
LTL = Left Turn Lane
CTL = Center Turn Lane
RTL = Right Turn Lane
DECEL = Deceleration Lane
ACCEL = Acceleration Lane
OSS = Outside Shoulder
ISS = Inside Shoulder
GM = Grass Median
OGS = Outside Grass Shoulder
PS = Paved Shoulder
RT LN = Right Lane
LT LN = Left Lane
COL = Collector Lane
RT = Right
LT = Left
(I) = Inside
(O) = Outside
NB = Northbound
SB = Southbound
FW = From White
FY = From Yellow
WP = Wheel Path
IWP = Inside Wheel Path
OWP = Outside Wheel Path
C&G = Curb & Gutter

S&ME, Inc.
3201 Spring Forest Road
Raleigh, North Carolina 27616

PAVEMENT INVESTIGATION DATA SHEET

Project:	50146.3.1	County:	MECKLENBURG
TIP:	C-5621	Route:	INTERSECTION OF SR-5544 (CATAWBA AVE) AND US 21

Date:	2/24/19 - 2/26/19
Notes By:	D.Strother

		Width				Thickness						Subgrade						GPS Coordinates	
Position (Sta., Lane, Shldr.)	Cut/Fill (Est. of Amount)(ft)	Lane(s) (ft)	Shoulder(s) (ft)	Offset Distance (See Notes) (ft)	Crown "C" or Super "S"	Gross to Top of Soil (in)	Asphalt (in)	Concrete (in)	ABC (in)	Stabilized Soil Subgrade (in)	Pavement Layering	Description	Sample Number	AASHTO Classification	Soil Moisture	Probe Depth (ft)	Asphalt Notes	Northing	Easting
Y2 - 11+30 NB OSL	1.0 Cut	17.8	C&G	3.1 from C&G	C	12.0	4.75	-	7.25	-	ASPHALT ABC	0.0-5.0' = Residual Soils, Brown, Orange, Sandy Clay	S-3	A-7-6	W	5.0	High Severity Transverse Cracking, Moderate Severity Fatigue Cracking, Block Cracking. Core is cracked full depth	637093.33	1442610.13
Y2 - 16+00 NB OSL	1.0 Cut	10.8	C&G	1.0 from C&G	C	15.5	4.5	-	11.0	-	ASPHALT ABC	0.0-5.0' = Residual Soils, Orange, Sandy Silty Clay	S-5	A-7-5	W	5.0	High Severity Transverse Cracking, High Severity Longitudinal Cracking at Pavement Joints, Water Seeping into ABC	636589.18	1442589.25
Y2 - 16+00 CTL	1.0 Cut	10.8	C&G	26.2 from C&G	C	13.75	3.75	-	10.0	-	ASPHALT ABC	0.0-5.0' = Residual Soils, Orange, Sandy Silty Clay	S-4	A-7-5	M	5.0	High Severity Transverse Cracking, High Severity Longitudinal Cracking at Pavement Joints. Core is cracked full depth	636579.22	1442567.50
Y2 - 16+20 SB OSL	1.0 Cut	11.1	C&G	1.0 from C&G	C	15.75	4.75	-	11.0	-	ASPHALT ABC	0.0-5.0' = Residual Soils, Orange, Sandy Silty Clay	Ref S-4	A-7-5	M	5.0	High Severity Transverse Cracking, High Severity Longitudinal Cracking at Pavement Joints	636557.69	1442553.08
Y7 - 12+40 EB OSL	5.0 Fill	10.5	C&G	6.0 from C&G	C	12.5	4.25	-	8.25	-	ASPHALT ABC	0.0-5.0' = Roadway Embankment, Orange, Sandy Clay Moved Left for Utilities	S-2	A-7-5	M	5.0	Moderate Severity Transverse Cracking, Block Cracking, Moderate Severity Fatigue Cracking in IWP, Bottom of Core Broke Apart, Core is cracked in top 1.75"	637276.79	1442857.73
Y8 - 11+25 SB OSL	2.0 Cut	10.5	C&G	4.0 from C&G	C	11.75	4.0	-	7.75	-	ASPHALT ABC	0.0-5.0' = Residual Soils, Orange, Sandy Silty Clay	S-13	A-7-5	M	5.0	Moderate Severity Transverse Cracking, Low Severity Longitudinal Cracking, Core is cracked full depth	637165.69	1443080.05
Y3A 11+50 SB OSL	1.0 Cut	10.5	C&G	2.0 from C&G	C	8.75	4.25	-	4.5	-	ASPHALT ABC	0.0-5.0' = Residual Soils, Orange, Sandy Clay	S-1	A-7-5	M	5.0	Moderate Severity Transverse Cracking, Low Severity Longitudinal Cracking, Low Severity Fatigue Cracking	636416.00	1442973.20
Bulk-1 Y2 - 16+00 NB	1.0 Cut											1.5'-3.0' = Residual Soils, Orange, Sandy Silty Clay	Bulk-1	A-7-5	M			636592.35	1442597.17
Bulk-2 L - 16+00 EB	5.0 Fill											1.5-3.0' = Roadway Embankment, Grey, Orange, Brown, Sandy Silty Clay	Bulk-2	A-7-5	M			636224.90	1442732.40

Notes:

OSL = Outside Lane	CTL = Center Turn Lane	OSS = Outside Shoulder	PS = Paved Shoulder	RT = Right	NB = Northbound	WP = Wheel Path
ISL = Inside Lane	RTL = Right Turn Lane	ISS = Inside Shoulder	RT LN = Right Lane	LT = Left	SB = Southbound	IWP = Inside Wheel Path
CL = Center Lane	DECEL = Deceleration Lane	GM = Grass Median	LT LN = Left Lane	(I) = Inside	FW = From White	OWP = Outside Wheel Path
LTL = Left Turn Lane	ACCEL = Acceleration Lane	OGS = Outside Grass Shoulder	COL = Collector Lane	(O) = Outside	FY = From Yellow	C&G = Curb & Gutter

S&ME, Inc.
3201 Spring Forest Road
Raleigh, North Carolina 27616

CONE PENETROMETER DATA CODE SHEET

TIP	PROJECT I.D.	ROUTE
C-5621	50146.3.1	Catawba Ave And US21 Intersection
COUNTY	**ENGINEER**	**TECHNICIANS**
Mecklenburg	Vlad Mitchev	Darin Strother

TEST LOCATIONS DESCRIPTION	DATE RUN
L 13+00 WB OSL	2/24 to 2/26/19

DATUM	CUT/ FILL	NORTHING	EASTING
ABC	FILL	636258.4	1442433.6

Cumulative Penetration in Centimeters
1.4
2.3
3.2
4.1
5.0
5.9
13.9
20.2
Terminate for Utilities

TEST LOCATIONS DESCRIPTION	DATE RUN
L 13+25 EB RTLN	2/24 to 2/26/19

DATUM	CUT/ FILL	NORTHING	EASTING
SG	FILL	636202.8	1442473.6

Cumulative Penetration in Centimeters
7.2
13.5
18.0
20.4
21.4
22.1
22.7
23.7
24.6
25.8
26.9
27.6
28.7
30.2
31.4
32.2
33.3
34.2
35.1
36.3
37.3
38.1
39.5
40.2
41.6
42.2
43.6
44.8
45.7
46.3
47.5
48.6
49.8
50.5
51.8
52.9
53.6
54.8
55.9
56.7
57.8
59.0
60.2
61.1
62.2
63.4
64.1
65.3
66.5
67.3
68.4
Terminate

CONE PENETROMETER DATA CODE SHEET

TIP	PROJECT I.D.	ROUTE
C-5621	50146.3.1	Catawba Ave And US21 Intersection
COUNTY	**ENGINEER**	**TECHNICIANS**
Mecklenburg	Vlad Mitchev	Darin Strother

TEST LOCATIONS DESCRIPTION	DATE RUN
L 16+00 WB OSL	2/24 to 2/26/19

DATUM	CUT/ FILL	NORTHING	EASTING
ABC	CUT	636283.3	1442731.4

Cumulative Penetration in Centimeters
2.0
2.6
3.3
3.9
4.6
5.2
5.7
6.3
6.8
7.4
7.9
8.4
8.9
9.4
9.9
10.4
11.5
12.5
13.6
14.6
15.7
19.8
24.7
28.5
33.1
37.9
40.8
43.5
46.1
49.0
50.7
52.5
54.6
56.8
58.7
60.5
62.9
64.4
66.1
68.9
72.5
75.5
78.5
81.5
84.5
87.5
90.2
93.6
97.5
102.1
Terminate

TEST LOCATION DESCRIPTION	DATE RUN

DATUM	CUT/ FILL	NORTHING	EASTING

Cumulative Penetration in Centimeters

SS = Stabilized Soil
CTBC = Cement-Treated Base Course
ABC = Aggregate Base Course
ESG = Estimated Subgrade

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CONE PENETROMETER DATA CODE SHEET

TIP	PROJECT I.D.	ROUTE
C-5621	50146.3.1	Catawba Ave And US21 Intersection
COUNTY	**ENGINEER**	**TECHNICIANS**
Mecklenburg	Vlad Mitchev	Darin Strother

TEST LOCATIONS DESCRIPTION	DATE RUN
L - 16+70 EB OSL	2/24 to 2/26/19

DATUM	CUT/ FILL	NORTHING	EASTING
ABC	FILL	636248.1	1442803.5

Cumulative Penetration in Centimeters

1.2	59.2	91.0
1.8	60.3	91.4
2.4	61.2	91.6
3.1	62.0	92.0
3.7	63.1	92.3
4.3	63.2	92.6
5.0	64.3	92.9
5.7	65.8	93.2
6.4	68.5	93.6
7.1	69.5	93.9
7.8	70.4	94.2
8.5	71.2	95.5
9.1	72.3	94.8
9.8	73.2	Terminate
10.4	74.0	
11.1	74.8	
12.0	75.6	
12.9	76.4	
14.9	77.6	
16.9	78.7	
19.2	79.7	
21.0	80.9	
22.5	81.6	
23.4	81.8	
24.6	82.1	
26.0	82.2	
27.9	82.5	
30.6	82.8	
31.9	83.1	
33.0	83.5	
33.7	83.8	
34.6	84.0	
35.2	84.4	
35.8	84.6	
36.2	85.0	
36.0	85.4	
37.5	85.6	
38.9	86.0	
40.0	86.3	
40.9	86.6	
41.6	87.0	
42.6	87.2	
43.5	87.6	
44.9	87.8	
47.0	88.2	
48.6	88.5	
50.6	88.8	
52.2	89.1	
53.6	89.4	
54.9	89.8	
56.0	90.1	
57.0	90.4	
58.1	90.7	

TIP	PROJECT I.D.	ROUTE
C-5621	50146.3.1	Catawba Ave And US21 Intersection
COUNTY	**ENGINEER**	**TECHNICIANS**
Mecklenburg	Vlad Mitchev	Darin Strother

TEST LOCATIONS DESCRIPTION	DATE RUN
L - 19+00 WB OSL	2/24 to 2/26/19

DATUM	CUT/ FILL	NORTHING	EASTING
SG	CUT	636305.6	1443044.6

Cumulative Penetration in Centimeters

3.4	68.2	
5.0	69.9	
5.7	71.7	
6.4	73.0	
7.1	74.7	
7.8	76.3	
8.5	77.8	
9.0	79.7	
9.4	81.1	
9.9	82.8	
10.3	84.5	
10.8	86.0	
11.3	87.3	
11.8	89.1	
12.4	91.0	
12.9	92.3	
13.4	94.0	
14.2	95.6	
15.0	97.5	
15.7	98.9	
16.5	100.7	
17.3	102.3	
18.5	103.7	
19.7	Terminate	
21.4		
23.1		
24.7		
26.2		
27.5		
29.4		
31.3		
32.8		
34.5		
36.0		
37.8		
39.2		
40.5		
42.3		
44.1		
45.5		
47.1		
48.6		
50.5		
52.0		
53.7		
55.3		
57.1		
58.6		
60.1		
61.8		
63.4		
64.8		
66.8		

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TIP	PROJECT I.D.	ROUTE
C-5621	50146.3.1	Catawba Ave And US21 Intersection
COUNTY	**ENGINEER**	**TECHNICIANS**
Mecklenburg	Vlad Mitchev	Darin Strother

TEST LOCATIONS DESCRIPTION	DATE RUN
L - 19+00 EB OSL (I)	2/24 to 2/26/19

DATUM	CUT/ FILL	NORTHING	EASTING
SG	CUT	636292.8	1443045.8

Cumulative Penetration in Centimeters

1.9		
3.1		
4.0		
4.5		
4.9		
5.20		
5.50		
5.80		
6.00		
6.30		
6.50		
6.60		
6.80		
6.90		
7.05		
7.10		
7.20		
7.30		
7.50		
7.60		
7.70		
7.80		
7.85		
7.90		
7.95		
8.00		
8.10		
8.20		
8.30		
8.35		
8.40		
8.50		
8.55		
8.60		
8.70		
8.80		
8.90		
8.95		
9.00		
9.05		
9.1		
9.2		
Terminate for Utilities		

TEST LOCATION DESCRIPTION	DATE RUN
L - 19+00 EB OSL (O)	2/24 to 2/26/19

DATUM	CUT/ FILL	NORTHING	EASTING
SG	CUT	636288.5	1443047.8

Cumulative Penetration in Centimeters

2.5	20.8	89.8
4.3	21.1	91.3
5.2	21.4	93.2
6.0	21.8	Terminate
7.1	22.2	
7.8	22.3	
8.4	22.4	
8.8	22.5	
9.1	22.7	
9.5	23.0	
9.8	23.2	
10.2	23.5	
10.5	23.7	
10.7	24.0	
11.0	24.9	
11.2	25.9	
11.5	26.8	
11.7	27.8	
12.0	28.7	
12.2	30.4	
12.5	32.0	
12.7	33.8	
13.0	35.6	
13.3	37.3	
13.7	39.9	
14.0	40.8	
14.3	42.5	
14.8	44.2	
15.3	46.3	
15.7	47.6	
16.2	49.8	
16.7	51.3	
17.1	53.2	
17.4	54.7	
17.8	56.4	
18.1	58.4	
18.5	60.1	
18.6	61.8	
18.7	63.5	
18.8	65.4	
18.9	67.1	
19.0	68.8	
19.1	70.3	
19.2	72.2	
19.3	74.1	
19.4	75.7	
19.5	77.6	
19.6	79.2	
19.7	81.2	
19.8	82.7	
19.9	84.6	
20.1	86.3	
20.4	88.0	

SG = Subgrade
SS = Stabilized Soil
CTBC = Cement-Treated Base Course
ABC = Aggregate Base Course
ESG = Estimated Subgrade

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CONE PENETROMETER DATA CODE SHEET

TIP	PROJECT I.D.	ROUTE
C-5621	46451.1.1	Catawba Ave And US21 Intersection
COUNTY	**ENGINEER**	**TECHNICIANS**
Mecklenburg	Vlad Mitchev	Darin Strother

TEST LOCATIONS DESCRIPTION	DATE RUN
Y1A - 11+00 NB RTL	2/24 to 2/26/19

DATUM	CUT/ FILL	NORTHING	EASTING
ABC	FILL	636092.7	1442621.1

Cumulative Penetration in Centimeters

0.6	17.7	97.5				
0.9	18.0	98.7				
1.3	18.3	99.8				
1.7	20.5	101.0				
1.8	22.8	Terminate				
2.3	27.2					
2.5	31.4					
2.8	35.8					
3.3	39.6					
3.5	42.3					
3.9	44.8					
4.2	47.3					
4.5	49.3					
4.9	51.8					
5.1	54.0					
5.5	55.1					
5.8	56.3					
6.1	57.2					
6.5	58.8					
6.8	59.7					
7.0	60.7					
7.3	61.8					
7.7	63.0					
8.0	64.2					
8.4	65.2					
8.6	66.4					
9.1	67.3					
9.4	68.6					
9.7	69.6					
9.9	70.9					
10.4	72.0					
10.6	73.2					
10.9	74.3					
11.3	75.3					
11.5	76.3					
11.8	77.5					
12.2	78.6					
12.5	79.8					
12.9	80.8					
13.1	82.0					
13.5	83.2					
13.9	84.3					
14.1	85.4					
14.5	86.5					
14.8	87.6					
15.2	88.6					
15.4	89.8					
15.8	90.8					
16.0	92.1					
16.3	93.1					
16.9	94.2					
17.0	95.6					
17.2	96.4					

TEST LOCATIONS DESCRIPTION	DATE RUN
Y1A - 13+00 NB OSL	2/24 to 2/26/19

DATUM	CUT/ FILL	NORTHING	EASTING
ABC	FILL	635923.8	1442598.7

Cumulative Penetration in Centimeters

1.1	55.0					
1.4	55.8					
1.7	56.9					
2.1	57.8					
2.4	59.1					
2.7	60.0					
2.9	61.2					
3.1	62.3					
3.2	64.2					
3.4	64.5					
3.6	65.3					
3.8	66.6					
4.1	67.3					
4.3	68.3					
4.6	69.5					
4.8	70.7					
5.0	71.6					
5.2	72.8					
5.3	73.7					
5.5	74.8					
5.7	75.8					
6.0	77.0					
6.3	78.1					
6.7	79.2					
7.0	80.1					
7.3	81.3					
7.8	82.5					
8.4	83.6					
8.9	84.4					
9.5	85.3					
10.0	86.5					
11.3	87.6					
12.6	88.7					
14.0	89.9					
15.3	90.7					
16.6	91.9					
20.2	92.6					
24.5	93.7					
28.0	94.8					
31.3	96.1					
34.6	97.2					
37.3	98.0					
39.5	99.2					
41.2	100.2					
43.4	101.4					
45.3	102.2					
47.0	103.3					
48.5	104.5					
50.0	Terminate					
51.0						
52.2						
53.3						
54.1						

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TIP	PROJECT I.D.	ROUTE
C-5621	50146.3.1	Catawba Ave And US21 Intersection
COUNTY	**ENGINEER**	**TECHNICIANS**
Mecklenburg	Vlad Mitchev	Darin Strother

TEST LOCATIONS DESCRIPTION	DATE RUN
Y1A - 13+00 SB OSL	2/24 to 2/26/19

DATUM	CUT/ FILL	NORTHING	EASTING
ABC	CUT	635920.8	1442574.5

Cumulative Penetration in Centimeters

0.8	77.1					
1.3	78.9					
1.7	79.5					
2.2	80.2					
2.6	81.2					
3.1	81.8					
3.4	82.5					
3.8	83.4					
4.1	84.3					
4.5	85.1					
4.8	85.7					
5.4	86.4					
5.9	87.2					
6.5	88.2					
7.0	88.8					
7.6	89.5					
8.6	90.3					
9.7	91.2					
10.7	91.9					
14.3	92.6					
17.9	93.5					
19.7	94.3					
21.4	95.1					
23.3	95.7					
25.2	96.6					
26.8	97.4					
28.7	98.0					
30.5	98.9					
32.2	99.7					
34.1	100.4					
35.8	101.2					
37.7	101.9					
39.5	102.6					
41.1	103.5					
43.0	104.2					
44.9	105.1					
46.4	105.8					
48.2	106.4					
50.2	107.4					
52.0	108.1					
53.8	108.9					
55.5	109.7					
57.6	110.4					
59.2	111.2					
60.8	Terminate					
62.7						
64.4						
66.3						
68.1						
69.8						
71.5						
73.3						
75.2						

TEST LOCATION DESCRIPTION	DATE RUN
Y1A - 13+00 CTL	2/24 to 2/26/19

DATUM	CUT/ FILL	NORTHING	EASTING
ABC	FILL	635926.0	1442589.1

Cumulative Penetration in Centimeters

1.3						
2.2						
3.6						
5.7						
8.2						
10.1						
11.6						
14.0						
17.1						
20.2						
23.2						
26.0						
29.1						
31.5						
33.4						
35.2						
36.8						
38.6						
40.5						
42.2						
44.2						
45.8						
47.7						
49.3						
51.6						
53.1						
54.8						
56.7						
58.6						
60.2						
62.2						
64.3						
65.8						
67.8						
69.5						
71.2						
73.1						
74.8						
76.7						
78.4						
80.3						
82.1						
83.8						
85.7						
87.4						
89.2						
91.1						
92.9						
94.6						
Terminate						

SG = Subgrade
SS = Stabilized Soil
CTBC = Cement-Treated Base Course
ABC = Aggregate Base Course
ESG = Estimated Subgrade

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TIP	PROJECT I.D.	ROUTE
C-5621	50146.3.1	Catawba Ave And US21 Intersection
COUNTY	**ENGINEER**	**TECHNICIANS**
Mecklenburg	Vlad Mitchev	Darin Strother

TEST LOCATIONS DESCRIPTION	DATE RUN
Y1B - 19+50 SB PS	2/24 to 2/26/19

DATUM	CUT/ FILL	NORTHING	EASTING
ABC	CUT	634499.1	1442193.3

Cumulative Penetration in Centimeters		
3.6	53.2	98.6
4.6	55.3	99.5
5.0	55.8	100.3
5.5	56.8	101.2
5.7	57.6	101.9
6.3	58.4	102.8
6.8	59.4	103.6
7.2	60.2	104.5
7.6	60.8	105.2
7.9	61.8	106.3
8.4	62.3	106.9
8.8	63.5	107.8
9.2	64.5	108.6
9.5	65.3	109.4
9.8	66.1	110.4
10.5	66.6	111.2
10.8	67.8	111.9
11.3	68.5	112.7
11.7	69.4	113.6
12.1	70.2	Terminate
12.5	71.1	
12.9	71.8	
13.2	72.7	
13.8	73.5	
14.2	74.3	
14.6	75.2	
14.8	76.0	
15.2	76.8	
15.8	77.9	
16.2	78.5	
16.6	79.3	
16.9	80.3	
17.5	81.5	
17.9	81.9	
18.2	82.7	
18.5	83.6	
19.1	84.3	
20.3	85.3	
21.8	86.1	
23.7	86.9	
25.8	87.7	
28.1	88.7	
30.0	89.4	
32.2	90.2	
34.3	91.2	
36.5	91.9	
38.4	92.8	
40.4	93.6	
42.6	94.6	
44.8	95.2	
46.7	96.1	
48.9	96.8	
50.8	97.7	

TEST LOCATIONS DESCRIPTION	DATE RUN
Y1B - 19+50 NB OSL	2/24 to 2/26/19

DATUM	CUT/ FILL	NORTHING	EASTING
ABC	FILL	634491.7	1442212.5

Cumulative Penetration in Centimeters		
1.4	19.6	77.7
2.2	19.9	78.5
2.8	20.1	79.2
3.8	20.4	80.3
4.7	20.6	81.1
5.8	20.9	81.7
7.0	21.1	82.6
7.5	21.4	83.5
8.0	21.6	84.6
8.5	21.9	85.3
9.1	22.1	86.5
9.3	22.3	87.3
9.6	22.6	88.1
9.8	22.8	88.9
10.1	23.1	89.7
10.3	24.4	90.5
10.6	25.8	91.5
10.8	27.2	92.4
11.1	29.3	93.3
11.3	31.3	94.1
11.6	34.8	94.9
11.8	38.3	95.7
12.1	41.3	96.5
12.3	44.3	97.8
12.5	46.6	98.3
12.8	48.9	99.3
13.0	51.0	100.3
13.3	53.1	100.8
13.5	54.9	101.7
13.8	56.8	102.8
14.0	57.8	103.5
14.3	58.5	104.4
14.5	59.5	105.4
14.7	60.4	106.2
15.0	61.2	107.0
15.2	62.0	Terminate
15.5	62.8	
15.7	63.7	
16.0	64.5	
16.2	65.8	
16.5	66.4	
16.7	67.1	
17.0	68.2	
17.2	68.9	
17.4	69.7	
17.7	70.5	
17.9	71.6	
18.2	72.3	
18.4	73.2	
18.7	74.2	
18.9	75.1	
19.2	75.9	
19.4	76.8	

CONE PENETROMETER DATA CODE SHEET

TIP	PROJECT I.D.	ROUTE
C-5621	50146.3.1	Catawba Ave And US21 Intersection
COUNTY	**ENGINEER**	**TECHNICIANS**
Mecklenburg	Vlad Mitchev	Darin Strother

TEST LOCATIONS DESCRIPTION	DATE RUN
Y1B - 19+50 NB PS	2/24 to 2/26/19

DATUM	CUT/ FILL	NORTHING	EASTING
ABC	FILL	634434.4	1442218.7

Cumulative Penetration in Centimeters		
1.7	68.3	
2.1	69.4	
2.5	70.4	
2.8	71.3	
3.2	72.5	
3.6	73.6	
3.9	74.3	
4.2	75.4	
4.6	76.5	
4.9	77.6	
5.2	78.3	
5.6	79.6	
6.0	80.4	
6.3	81.5	
6.7	82.7	
7.1	83.6	
7.6	84.5	
8.1	85.7	
8.7	86.9	
9.2	87.8	
9.7	88.6	
10.3	89.5	
11.0	90.7	
11.6	91.8	
12.3	92.9	
12.9	93.6	
14.1	94.7	
15.4	95.3	
16.6	96.8	
18.9	97.8	
21.2	98.6	
23.3	100.0	
25.6	101.2	
27.8	102.1	
29.8	103.3	
32.2	104.1	
34.3	105.2	
36.6	106.1	
38.9	Terminate	
40.9		
43.2		
45.4		
47.6		
49.8		
51.8		
54.2		
56.5		
58.8		
60.9		
63.2		
65.3		
66.6		
67.3		

TEST LOCATION DESCRIPTION	DATE RUN

DATUM	CUT/ FILL	NORTHING	EASTING

Cumulative Penetration in Centimeters

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CONE PENETROMETER DATA CODE SHEET

TIP	PROJECT I.D.	ROUTE
C-5621	50146.3.1	Catawba Ave And US21 Intersection
COUNTY	**ENGINEER**	**TECHNICIANS**
Mecklenburg	Vlad Mitchev	Darin Strother

TEST LOCATIONS DESCRIPTION	DATE RUN
Y2 - 11+30 NB OSL (On Crack)	2/24 to 2/26/19

DATUM	CUT/ FILL	NORTHING	EASTING
ABC	CUT	637093.3	1442610.1

Cumulative Penetration in Centimeters

0.7	96.5								
1.2	99.9								
1.7	103.2								
2.1	107.9								
2.4	112.3								
2.8	Terminate								
3.3									
3.8									
4.2									
4.5									
4.8									
5.2									
5.8									
6.2									
6.7									
7.1									
7.4									
7.9									
8.3									
8.6									
9.1									
9.5									
9.9									
10.4									
10.8									
11.2									
11.6									
11.9									
12.5									
12.9									
13.3									
13.5									
15.7									
17.8									
23.2									
28.4									
32.3									
35.9									
40.6									
45.3									
50.7									
56.1									
58.8									
61.8									
67.2									
72.5									
76.2									
79.8									
83.6									
87.5									
90.2									
92.8									
94.9									

TEST LOCATIONS DESCRIPTION	DATE RUN
Y2 - 16+00 NB OSL	2/24 to 2/26/19

DATUM	CUT/ FILL	NORTHING	EASTING
ABC	CUT	636589.2	1442589.3

Cumulative Penetration in Centimeters

1.2	49.6	84.7							
1.6	50.5	85.3							
2.1	51.6	86.0							
2.5	52.4	86.5							
2.9	53.3	87.0							
3.4	54.1	87.6							
3.8	55.1	88.0							
4.3	55.9	88.7							
4.7	56.7	89.4							
5.1	57.5	90.0							
5.6	58.5	90.5							
6.0	59.3	91.1							
6.4	60.1	91.7							
6.9	60.9	92.4							
7.3	61.6	92.8							
7.7	62.4	93.4							
8.2	63.2	94.0							
8.6	63.8	94.6							
9.1	64.4	95.2							
9.5	64.9	95.7							
9.9	65.5	96.3							
10.4	66.1	96.9							
10.8	66.7	97.4							
11.2	67.3	98.0							
11.7	67.8	98.7							
12.1	68.4	99.2							
12.6	69.0	99.9							
13.0	69.6	100.7							
13.4	70.2	101.3							
13.9	70.8	101.8							
14.3	71.3	102.3							
15.6	71.9	102.8							
17.0	72.5	103.5							
18.3	73.1	104.0							
19.4	73.7	104.5							
20.7	74.2	105.1							
21.8	74.8	105.7							
23.1	75.4	106.2							
25.6	76.0	106.8							
27.9	76.5	107.4							
30.3	77.2	108.1							
32.3	77.7	108.6							
34.2	78.3	109.2							
36.3	79.0	109.7							
37.9	79.5	Terminate							
39.6	80.2								
41.0	80.6								
42.3	81.2								
43.6	81.9								
44.7	82.5								
45.7	83.0								
47.0	83.5								
48.4	84.2								

CONE PENETROMETER DATA CODE SHEET

TIP	PROJECT I.D.	ROUTE
C-5621	50146.3.1	Catawba Ave And US21 Intersection
COUNTY	**ENGINEER**	**TECHNICIANS**
Mecklenburg	Vlad Mitchev	Darin Strother

TEST LOCATIONS DESCRIPTION	DATE RUN
Y2 - 16+00 CTL (On Crack)	2/24 to 2/26/19

DATUM	CUT/ FILL	NORTHING	EASTING
ABC	CUT	636579.2	1442567.5

Cumulative Penetration in Centimeters

0.3	15.5	75.2							
0.6	15.8	77.1							
0.9	16.0	78.9							
1.1	16.4	80.6							
1.5	16.6	82.3							
1.7	16.9	84.2							
2.2	17.0	85.8							
2.3	17.5	87.3							
2.8	17.9	89.2							
3.0	18.1	90.8							
3.2	18.3	92.6							
3.5	18.6	94.4							
3.9	18.9	96.2							
4.1	19.1	97.6							
4.6	19.4	99.6							
4.8	19.8	101.4							
4.9	20.1	103.1							
5.1	20.3	104.8							
5.5	20.5	106.1							
5.7	20.9	108.2							
6.0	21.2	109.8							
6.4	21.4	111.6							
6.6	21.8	Terminate							
6.9	23.5								
7.2	25.2								
7.5	26.9								
7.8	28.7								
8.0	30.3								
8.4	32.2								
8.8	33.8								
8.9	35.6								
9.1	37.2								
9.5	39.1								
9.7	40.8								
10.1	42.4								
10.3	44.3								
10.7	45.9								
10.9	47.6								
11.1	49.5								
11.4	51.0								
11.8	52.9								
12.1	54.5								
12.3	56.4								
12.7	58.0								
12.8	59.8								
13.1	61.4								
13.4	63.3								
13.8	64.8								
14.1	66.8								
14.3	68.5								
14.5	70.2								
14.9	71.6								
15.1	73.6								

TEST LOCATION DESCRIPTION	DATE RUN
Y2 - 16+20 SB OSL	2/24 to 2/26/19

DATUM	CUT/ FILL	NORTHING	EASTING
ABC	CUT	636557.7	1442553.1

Cumulative Penetration in Centimeters

1.4	18.9	84.2							
1.7	19.2	86.2							
2.1	19.6	88.1							
2.4	20.0	89.9							
2.7	20.2	91.8							
3.0	20.6	93.6							
3.4	20.9	95.6							
3.7	21.2	97.3							
4.0	21.5	99.2							
4.4	21.9	101.2							
4.7	22.2	103.1							
5.0	22.6	104.8							
5.4	22.8	106.8							
5.7	23.2	108.4							
6.0	23.6	110.6							
6.4	23.8	112.6							
6.7	24.0	114.8							
7.0	24.5	116.1							
7.4	24.9	Terminate							
7.7	25.2								
8.0	25.5								
8.3	25.9								
8.7	26.3								
9.0	28.2								
9.3	29.8								
9.7	31.7								
10.0	33.6								
10.3	35.7								
10.7	37.5								
11.0	39.4								
11.3	41.3								
11.6	43.2								
12.0	44.8								
12.3	46.9								
12.6	48.8								
12.9	50.6								
13.3	52.6								
13.6	54.5								
14.0	56.3								
14.3	58.1								
14.6	59.8								
15.0	61.7								
15.3	63.5								
15.5	65.5								
15.9	67.8								
16.2	69.2								
16.6	71.2								
16.9	73.2								
17.3	74.8								
17.7	76.8								
18.1	78.5								
18.3	80.5								
18.5	82.3								

SG = Subgrade
SS = Stabilized Soil
CTBC = Cement-Treated Base Course
ABC = Aggregate Base Course
ESG = Estimated Subgrade

S&ME, Inc.
3201 Spring Forest Road
Raleigh, North Carolina 27616

CONE PENETROMETER DATA CODE SHEET

TIP	PROJECT I.D.	ROUTE
C-5621	46451.1.1	Catawba Ave And US21 Intersection
COUNTY	**ENGINEER**	**TECHNICIANS**
Mecklenburg	Vlad Mitchev	Darin Strother

TEST LOCATIONS DESCRIPTION	DATE RUN
Y7 - 12+40 EB OSL (ON CRACK)	2/24 to 2/26/19

DATUM	CUT/ FILL	NORTHING	EASTING
ABC	FILL	637276.8	1442857.7

Cumulative Penetration in Centimeters

1.7	40.6	85.4							
2.1	41.3	86.3							
2.5	42.2	87.1							
2.9	43.0	88.0							
3.3	43.9	88.9							
3.7	44.7	89.7							
4.1	45.6	90.5							
4.6	46.4	91.5							
5.1	47.3	92.2							
5.5	48.1	93.0							
6.0	48.7	93.8							
6.5	49.8	94.8							
7.1	50.4	95.6							
7.7	51.6	96.4							
8.3	52.6	97.3							
8.9	53.2	98.2							
9.5	54.0	99.2							
10.2	54.7	99.9							
11.0	55.6	100.8							
11.7	56.8	101.4							
12.5	57.5	102.5							
13.2	58.4	103.3							
14.1	59.6	104.3							
14.8	60.2	105.0							
15.9	60.8	105.9							
16.7	61.7	106.7							
17.5	62.6	107.4							
18.4	63.4	108.4							
19.5	64.2	109.3							
20.0	65.3	110.3							
20.8	65.7	111.0							
21.6	66.8	111.7							
22.7	67.6	112.7							
23.4	68.3	113.5							
24.3	69.3	114.5							
25.2	70.3	115.2							
26.1	71.0	116.5							
26.8	71.7	116.9							
27.8	72.5	Terminate							
28.6	73.6								
29.6	74.6								
30.3	75.5								
31.3	76.1								
31.9	77.2								
32.7	77.8								
33.8	78.8								
34.5	79.5								
35.4	80.4								
36.4	81.2								
37.2	82.6								
37.8	82.9								
38.7	83.7								
39.8	84.8								

TIP	PROJECT I.D.	ROUTE
C-5621	46451.1.1	Catawba Ave And US21 Intersection
COUNTY	**ENGINEER**	**TECHNICIANS**
Mecklenburg	Vlad Mitchev	Darin Strother

TEST LOCATIONS DESCRIPTION	DATE RUN
Y8 - 11+25 SB OSL (ON CRACK)	2/24 to 2/26/19

DATUM	CUT/ FILL	NORTHING	EASTING
ABC	CUT	637165.7	1443080.1

Cumulative Penetration in Centimeters

1.4	103.9								
1.8	106.7								
2.3	109.5								
2.7	112.6								
3.2	115.5								
3.6	118.9								
4.1	Terminate								
4.6									
5.0									
5.5									
6.0									
6.6									
7.2									
7.7									
8.3									
8.9									
9.9									
11.0									
12.0									
13.1									
14.1									
15.2									
16.3									
17.4									
18.5									
19.6									
22.6									
25.5									
28.4									
31.5									
34.7									
37.7									
40.7									
43.5									
46.8									
49.6									
52.8									
55.8									
58.5									
61.2									
64.8									
67.6									
70.8									
73.7									
76.7									
79.6									
82.4									
85.6									
88.7									
91.6									
94.3									
97.8									
100.9									

CONE PENETROMETER DATA CODE SHEET

TIP	PROJECT I.D.	ROUTE
C-5621	46451.1.1	Catawba Ave And US21 Intersection
COUNTY	**ENGINEER**	**TECHNICIANS**
Mecklenburg	Vlad Mitchev	Darin Strother

TEST LOCATIONS DESCRIPTION	DATE RUN
Y3A 11+50 SB OSL	2/24 to 2/26/19

DATUM	CUT/ FILL	NORTHING	EASTING
ABC	CUT	636416.0	1442973.2

Cumulative Penetration in Centimeters

0.6	44.0	99.1							
1.0	45.0	100.0							
1.4	46.1	101.3							
1.9	47.2	102.4							
2.3	48.0	103.3							
2.7	49.2	104.5							
3.1	50.3	105.3							
3.5	51.4	106.5							
3.9	52.3	107.4							
4.3	53.6	108.6							
4.7	54.5	109.6							
5.1	55.5	110.3							
5.5	56.6	111.6							
5.9	57.8	112.4							
6.3	58.6	113.8							
6.7	59.7	114.7							
7.7	60.6	Terminate							
8.7	61.6								
9.6	62.7								
10.6	63.4								
11.6	64.8								
13.3	65.9								
14.6	66.9								
15.2	67.6								
15.8	69.0								
16.4	70.1								
16.9	71.0								
17.5	72.3								
18.2	73.1								
19.0	74.1								
19.7	75.4								
20.4	76.3								
21.6	77.2								
22.9	78.3								
24.1	79.4								
25.3	80.3								
26.3	81.4								
27.5	82.6								
28.4	83.5								
29.0	84.7								
29.6	85.6								
31.5	86.5								
32.7	87.7								
33.6	88.9								
34.8	89.6								
35.7	90.5								
36.4	91.8								
37.9	92.5								
38.6	93.9								
39.9	94.6								
40.8	96.2								
42.0	97.1								
43.2	98.2								

TEST LOCATION DESCRIPTION	DATE RUN

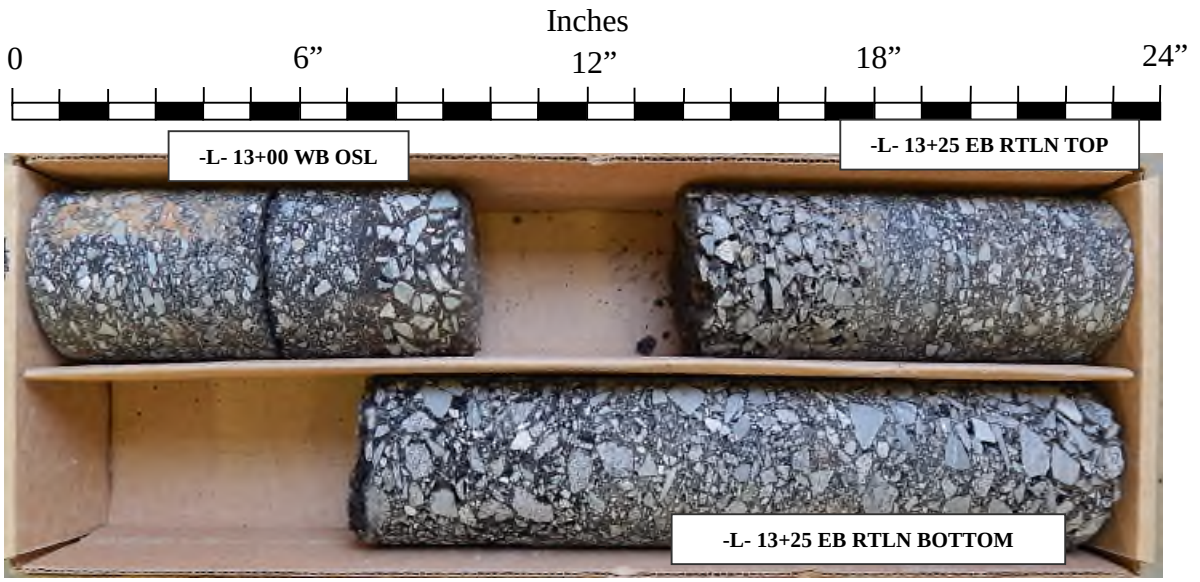
DATUM	CUT/ FILL	NORTHING	EASTING

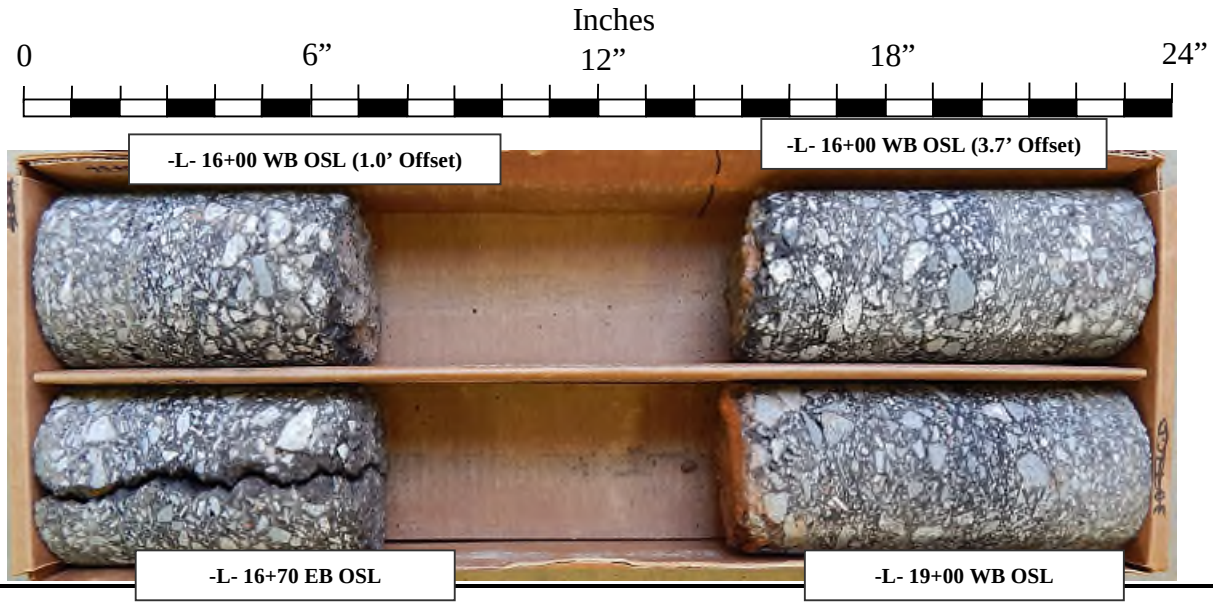
Cumulative Penetration in Centimeters

SG = Subgrade
SS = Stabilized Soil
CTBC = Cement-Treated Base Course
ABC = Aggregate Base Course
ESG = Estimated Subgrade

S&ME, Inc.
3201 Spring Forest Road
Raleigh, North Carolina 27616

Project No.: 50146.3.1	*I.D. No.*: C-5621	*County*: Mecklenburg	*Dates:2/24 to 2/26/19*
Site Description: SR-5544 (Catawba Ave) and US-21 Intersection			
Consultant: S&ME, Inc.	*Core Size*: 4 - inch	*Drill Machine:* CME-55	
Geologist / Engineer: Darin Strother			



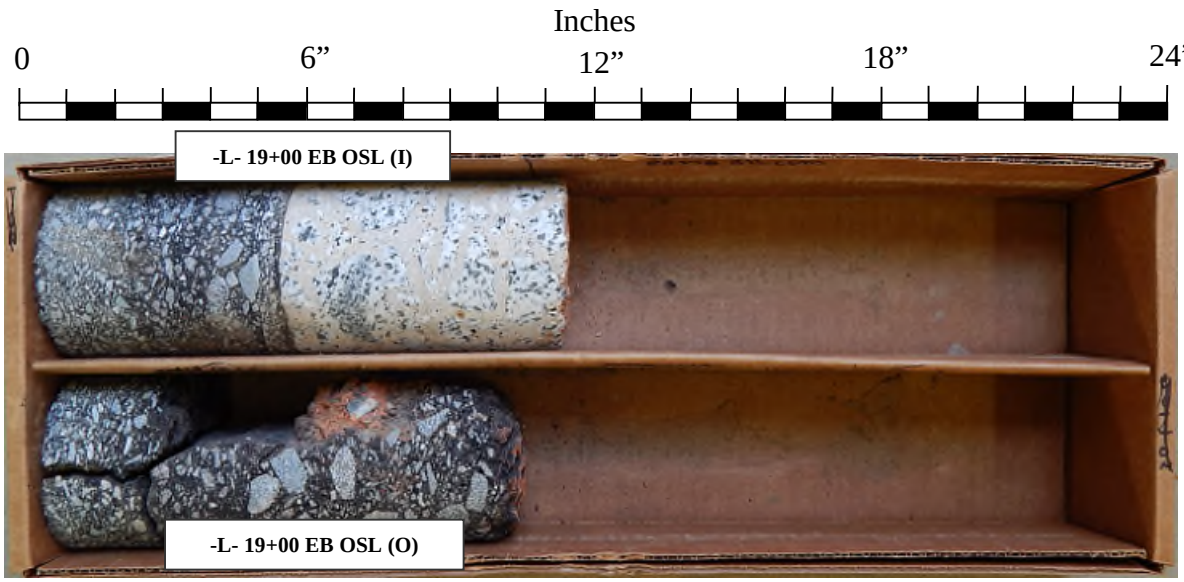


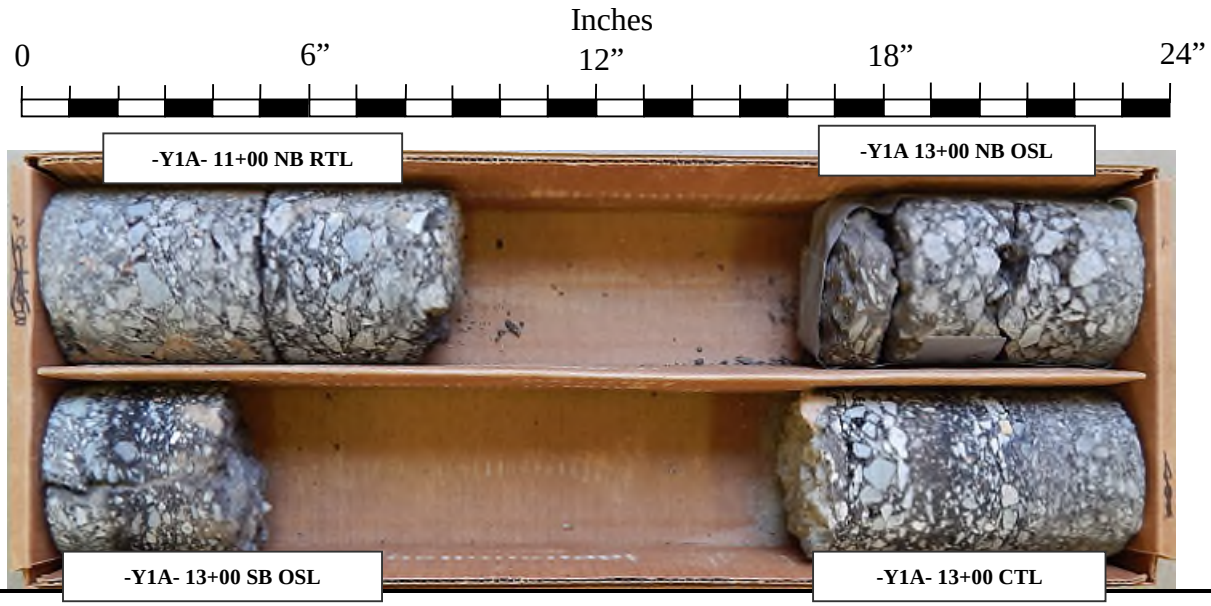
Notes:

OSL = Outside Lane
ISL = Inside Lane
RTL = Right Turn Lane
OSS = Outside Shoulder
ACCEL = Acceleration Lane
PS = Paved Shoulder
LTL = Left Turn Lane
ISS = Inside Shoulder
MED = Median

S&ME, Inc.
3201 Spring Forest Road
Raleigh, North Carolina 27616

Project No.: 50146.3.1	*I.D. No.*: C-5621	*County*: Mecklenburg	*Dates:2/24 to 2/26/19*
Site Description: SR-5544 (Catawba Ave) and US-21 Intersection			
Consultant: S&ME, Inc.	*Core Size*: 4 - inch	*Drill Machine:* CME-55	
Geologist / Engineer: Darin Strother			





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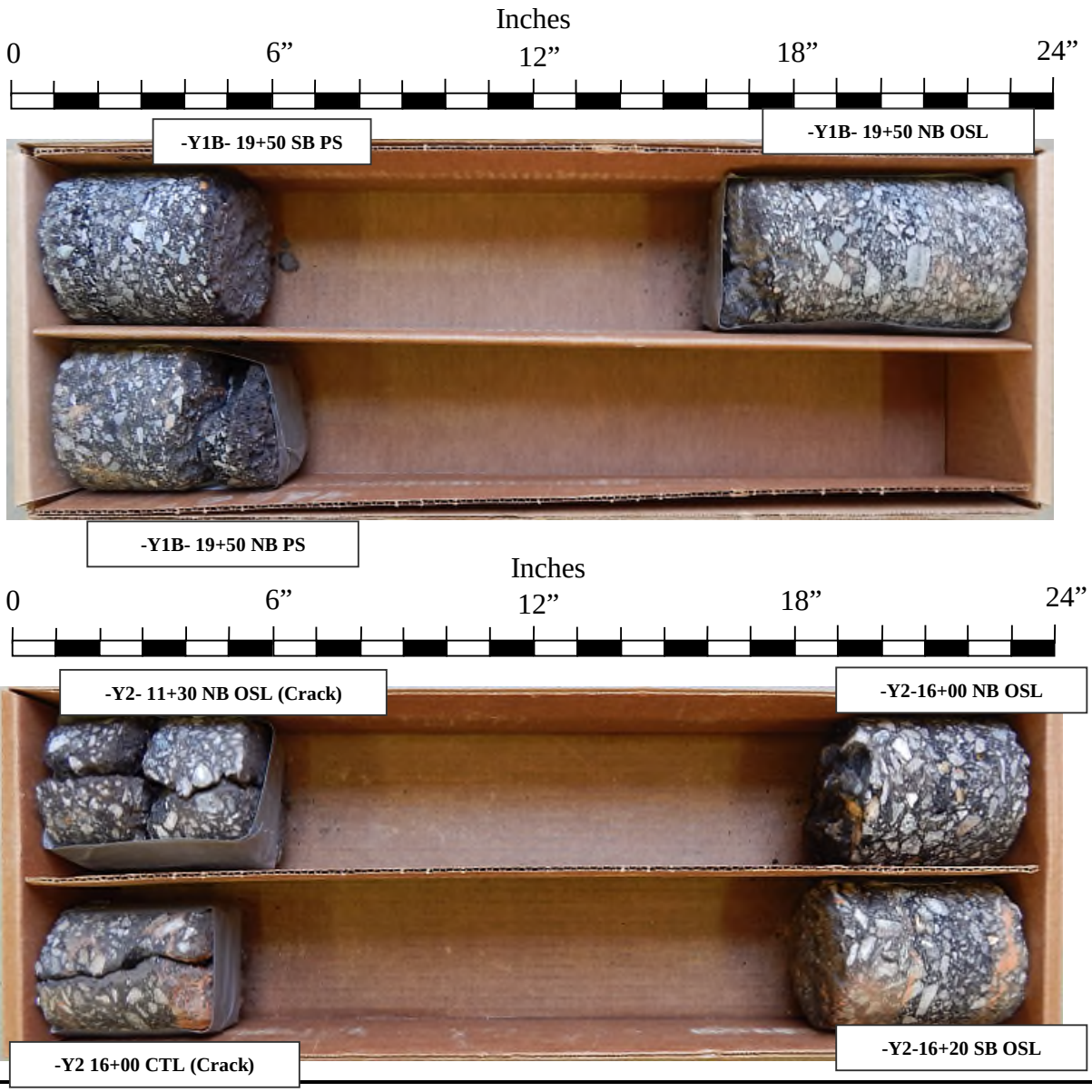
S&ME, Inc.
3201 Spring Forest Road
Raleigh, North Carolina 27616

Project No.: 50146.3.1	*I.D. No.*: C-5621	*County*: Mecklenburg	*Dates:2/24 to 2/26/19*
Site Description: SR-5544 (Catawba Ave) and US-21 Intersection			
Consultant: S&ME, Inc.	*Core Size*: 4 - inch	*Drill Machine:* CME-55	
Geologist / Engineer: Darin Strother			



Notes:

OSL = Outside Lane	ACCEL = Acceleration Lane	MED = Median
ISL = Inside Lane	PS = Paved Shoulder	
RTL = Right Turn Lane	LTL = Left Turn Lane	
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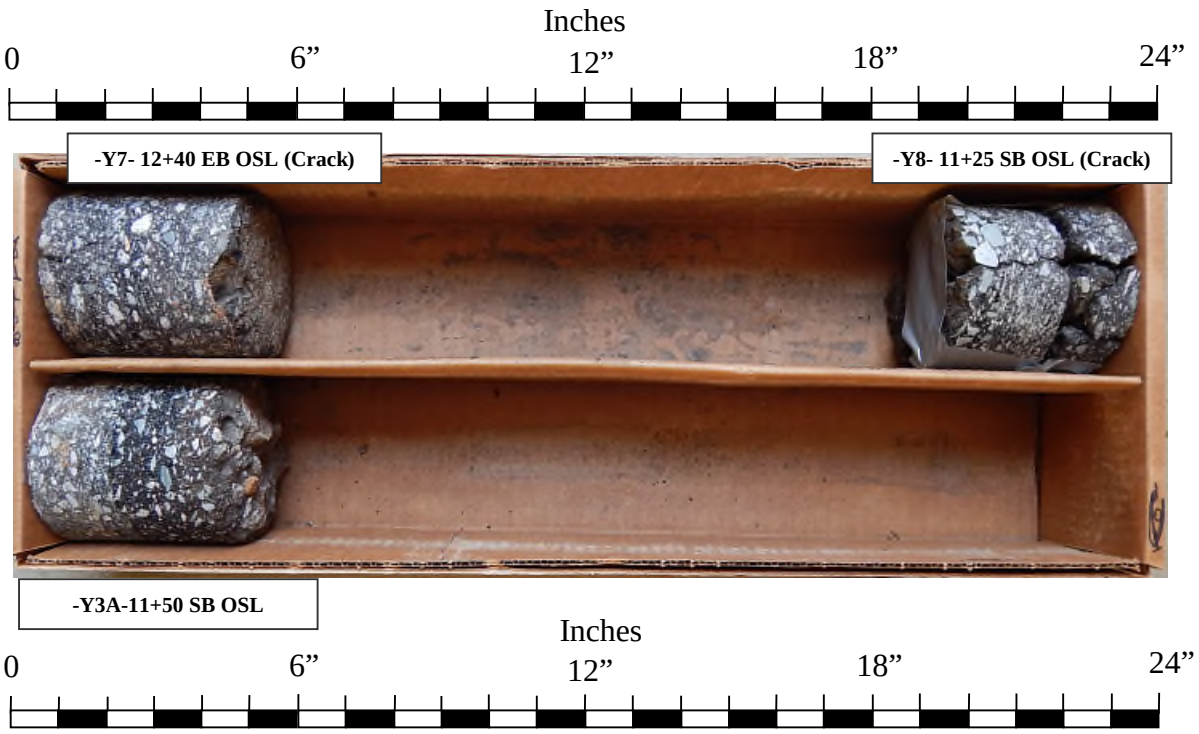
S&ME, Inc.
3201 Spring Forest Road
Raleigh, North Carolina 27616

Project No.: 50146.3.1	*I.D. No.*: C-5621	*County*: Mecklenburg	*Dates:2/24 to 2/26/19*
Site Description: SR-5544 (Catawba Ave) and US-21 Intersection			
Consultant: S&ME, Inc.	*Core Size*: 4 - inch	*Drill Machine:* CME-55	
Geologist / Engineer: Darin Strother			



Notes:

OSL = Outside Lane	ACCEL = Acceleration Lane	MED = Median
ISL = Inside Lane	PS = Paved Shoulder	
RTL = Right Turn Lane	LTL = Left Turn Lane	
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S&ME, Inc.
3201 Spring Forest Road
Raleigh, North Carolina 27616

SUMMARY OF LABORATORY TEST DATA

Soil Classification and Gradation

S&ME, Inc. Raleigh, 3201 Spring Forest Road, Raleigh, North Carolina 27616

S&ME Project #:	6205-19-004			Date Report	3/19/2019
State Project No.:	50146.3.1	County:	Mecklenburg	Date Tested	3/8/19 - 3/19/19
Federal ID No.:	NI	TIP No.:	C-5621		
Project Name:	Intersection of US 21 and SR 2697 (Catawba Avenue)				
Client Name:	NCDOT-Geotech	Client Address:	Poole Rd, Raleigh, NC		

Sample No.	Station No.	Alignment	Sample Depth (ft)	AASHTO Classification		Total % Passing Sieve #				Total Mortar Fraction (%)				LL	PL	PI	Organic	Moist. %
						10	40	60	200	Coarse Sand	Fine Sand	Silt	Clay					
S-1	11+50 SB OSL	-Y3A-	0 - 5.0'	A-7-5	(22)	100	93	90	77.5	10	16	23	51	64	40	24	ND	34.3
S-2	12+40 EB OSL	-Y7-	0 - 5.0'	A-7-5	(17)	100	82	75	64.0	25	15	20	41	58	31	27	ND	27.3
S-3	11+30 NB OSL	-Y2-	0 - 5.0'	A-7-6	(9)	96	75	69	53.9	28	22	21	29	43	21	22	ND	23.7
S-4	16+00 CTL	-Y2-	0 - 5.0'	A-7-5	(23)	99	83	78	68.5	21	12	21	46	68	36	32	ND	26.7
S-5	16+00 NB OSL	-Y2-	0 - 5.0'	A-7-5	(17)	98	81	77	65.8	22	14	24	40	62	38	24	ND	30.6
S-6	13+25 EB RTL	-L-	0 - 5.0'	A-7-6	(16)	97	84	77	63.8	21	17	32	30	50	23	27	ND	33.0
S-7	11+00 NB RTL	-Y1A-	0 - 5.0'	A-7-6	(13)	99	82	75	59.4	25	19	20	36	52	26	26	ND	22.2
S-8	13+00 SB OSL	-Y1A-	0 - 5.0'	A-7-5	(14)	99	84	78	64.2	21	18	23	38	53	31	22	ND	27.3
S-9	13+00 CTL	-Y1A-	0 - 2.0'	A-7-6	(14)	99	82	74	57.4	25	20	18	36	53	23	30	ND	22.0
S-10	13+00 NB OSL	-Y1A-	0 - 5.0'	A-7-6	(14)	96	79	72	58.4	25	19	21	36	5	28	28	ND	24.8
S-11	19+50 SB PS	-Y1B-	0 - 5.0'	A-7-6	(12)	99	77	69	53.1	30	20	18	32	50	21	29	ND	19.0
S-12	19+50 NB PS	-Y1B-	0 - 5.0'	A-7-6	(10)	99	80	71	53.8	28	22	18	32	47	23	24	ND	20.4
S-13	11+25 SB OSL	-Y8-	0 - 5.0'	A-7-5	(10)	94	77	71	57.4	25	17	25	33	55	35	20	ND	26.1
S-14	19+00 WB OSL	-L-	0 - 5.0'	A-7-5	(22)	100	84	78	66.6	22	14	17	47	73	42	31	ND	28.1
S-15	16+00 WB OSL	-L-	0 - 5.0'	A-7-6	(18)	98	85	78	64.4	21	17	21	41	56	27	29	ND	20.0
S-16	16+70 EB OSL	-L-	0 - 5.0'	A-6	(1)	82	63	55	36.4	33	27	18	22	30	16	14	ND	16.9

SUMMARY OF LABORATORY TEST DATA

Soil Classification and Gradation

S&ME, Inc. Raleigh, 3201 Spring Forest Road, Raleigh, North Carolina 27616

S&ME Project #:	6205-19-004			Date Report	3/19/2019
State Project No.:	50146.3.1	County:	Mecklenburg	Date Tested	3/8/19 - 3/19/19
Federal ID No.:	NI	TIP No.:	C-5621		
Project Name:	Intersection of US 21 and SR 2697 (Catawba Avenue)				
Client Name:	NCDOT-Geotech	Client Address:	Poole Rd, Raleigh, NC		

Sample No.	Station No.	Alignment	Sample Depth (ft)	AASHTO Classification		Total % Passing Sieve #				Total Mortar Fraction (%)				LL	PL	PI	Organic	Moist. %
						10	40	60	200	Coarse Sand	Fine Sand	Silt	Clay					
Bulk-1	16+00 NB	-Y2-	1.5' - 3.0'	A-7-5	(17)	97	80	75	64.5	23	14	23	40	59	33	26	ND	28.4
Bulk-2	16+00 EB	-L-	1.5' - 3.0'	A-7-5	(10)	96	83	76	60.5	21	20	22	37	49	30	19	ND	25.2

References / Comments / Deviations: ND=Not Detemined.

AASHTO T88: Particle Size Analysis of Soils as Modified by the NCDOT

AASHTO T89: Determining the Liquid Limit of Soils

AASHTO T90: Determining the Plastic Limit & Plasticity Index of Soils

AASHTO T265: Laboratory Determination of Moisture Content of Soils

AASHTO M145: The Classification of Soils and Soil Aggregate Mixtures for Highway Construction Purposes

Karen Warner		NCDOT / 118-06-0305	Vlad Mitchev	Project Manager
Technician Name:	Signature	Certification #	Technical Responsibility:	Position

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Form No. TR-D698-2
Revision No. : 1
Revision Date: 07/25/17

MOISTURE - DENSITY REPORT

Quality Assurance

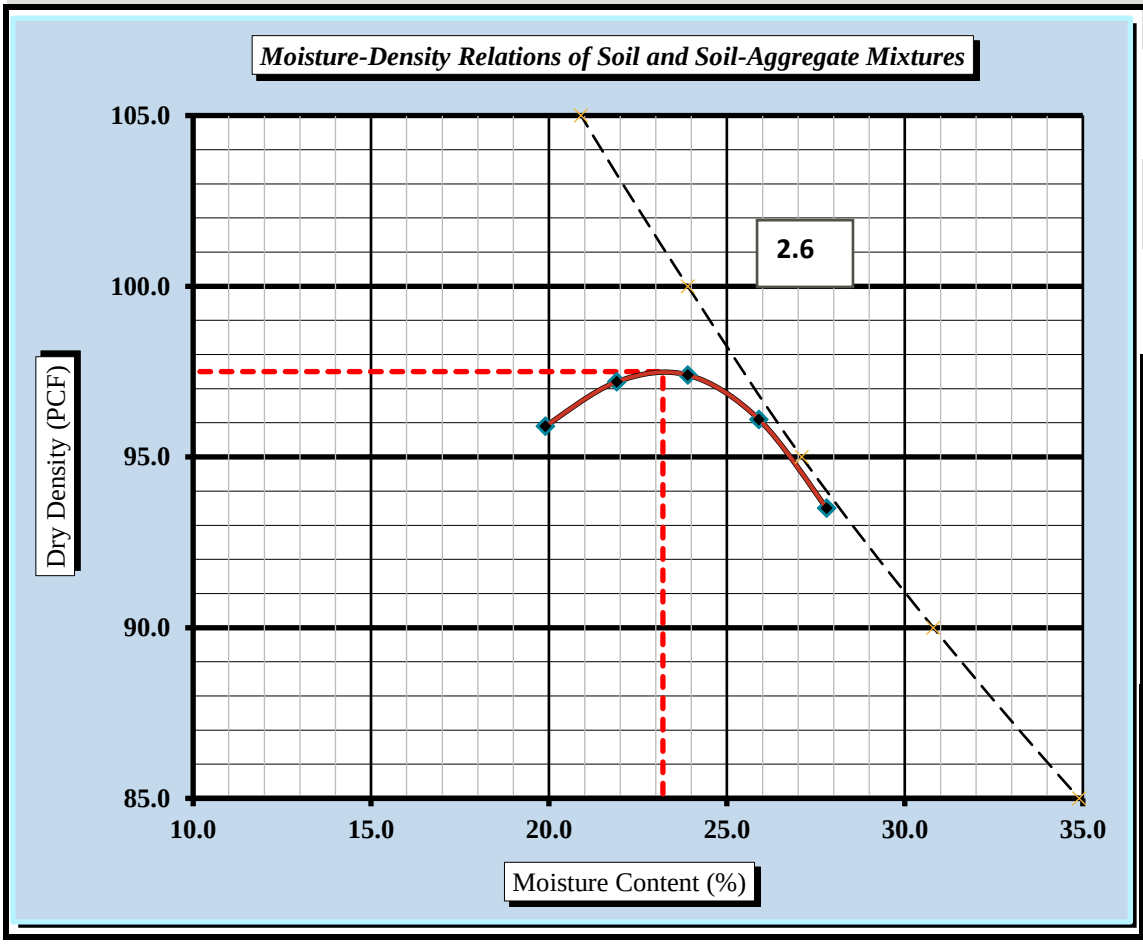
S&ME, Inc. Charlotte: 9751 Southern Pine Boulevard, Charlotte, NC 28273

S&ME Project #:	6205-19-004	Report Date:	3/18/19
Project Name:	C-5621	Test Date(s):	3/4-18/19
Client Name:	NCDOT-Geotech		
Client Address:	Poole Rd., Raleigh, NC		

Boring #:	C-17	Sample #:	Bulk-1	Sample Date:	2/24-26/19
Location:	Roadway	Offset:	NI	Depth:	1.5-3.0
Sample Description:	A-7-5 (17)				

Maximum Dry Density **97.5** **PCF.** **Optimum Moisture Content** **23.2%**

AASHTO T99 - - Method A



Soil Properties	
Natural Moisture Content	28.4%
Specific Gravity of Soil	ND
Liquid Limit	59
Plastic Limit	33
Plastic Index	26

% Passing	
3/4"	100.0%
3/8"	99.0%
#4	98.0%
#10	97.0%
#40	80.0%
#60	75.0%
#200	64.5%
#270	61.3%

Oversize Fraction

Moisture-Density Curve Displayed: Fine Fraction ☒ Corrected for Oversize Fraction (ASTM D 4718) ☐

Sieve Size used to separate the Oversize Fraction: #4 Sieve ☒ 3/8 inch Sieve ☐ 3/4 inch Sieve ☐

Mechanical Rammer ☒ Manual Rammer ☐ Moist Preparation ☐ Dry Preparation ☒

References / Comments / Deviations: ND: Not Determined NI: No Information Provided

AASHTO T 99: Moisture-Density Relations of Soil Using a 5.5 Lb. Rammer and a 12" Drop

Vlad Mitchev — *Technical Responsibility* — *Signature*

Project Manager — *Position* — *Date*

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Form No. TR-D698-2
Revision No. : 1
Revision Date: 07/25/17

MOISTURE - DENSITY REPORT

Quality Assurance

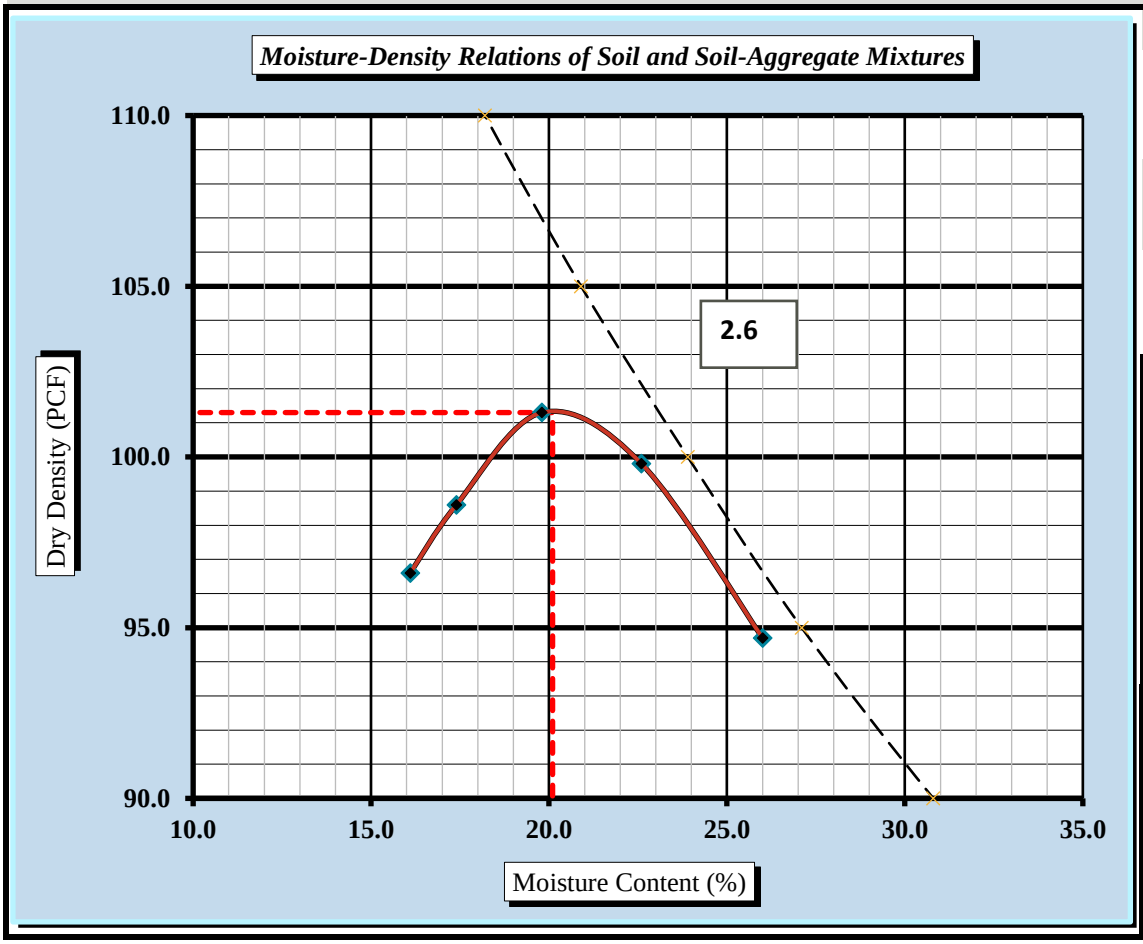
S&ME, Inc. Charlotte: 9751 Southern Pine Boulevard, Charlotte, NC 28273

S&ME Project #:	6205-19-004	Report Date:	3/18/19
Project Name:	C-521	Test Date(s):	3/4-18/19
Client Name:	NCDOT-Geotech		
Client Address:	Poole Rd., Raleigh, NC		

Boring #:	C-11	Sample #:	Bulk-2	Sample Date:	2/24-26/19
Location:	Roadway	Offset:	NI	Depth:	1.5-3.0
Sample Description:	A-7-5 (10)				

Maximum Dry Density **101.3** **PCF.** **Optimum Moisture Content** **20.1%**

AASHTO T99 - - Method A



Soil Properties

Natural Moisture Content	25.2%
Specific Gravity of Soil	ND
Liquid Limit	49
Plastic Limit	30
Plastic Index	19

% Passing	
3/4"	100.0%
3/8"	98.0%
#4	97.0%
#10	96.0%
#40	83.0%
#60	76.0%
#200	60.5%
#270	56.8%

Oversize Fraction

Moisture-Density Curve Displayed: Fine Fraction ☒ Corrected for Oversize Fraction (ASTM D 4718) ☐

Sieve Size used to separate the Oversize Fraction: #4 Sieve ☒ 3/8 inch Sieve ☐ 3/4 inch Sieve ☐

Mechanical Rammer ☒ Manual Rammer ☐ Moist Preparation ☐ Dry Preparation ☒

References / Comments / Deviations: ND: Not Determined NI: No Information Provided

AASHTO T 99: Moisture-Density Relations of Soil Using a 5.5 Lb. Rammer and a 12" Drop

Vlav Mitchev — *Technical Responsibility* — *Signature*

Project Manager — *Position* — *Date*

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Form No. TR-D1883-T193-3
Revision No. 2
Revision Date: 08/11/17

CBR (CALIFORNIA BEARING RATIO) OF LABORATORY COMPACTED SOIL

AASHTO T 193

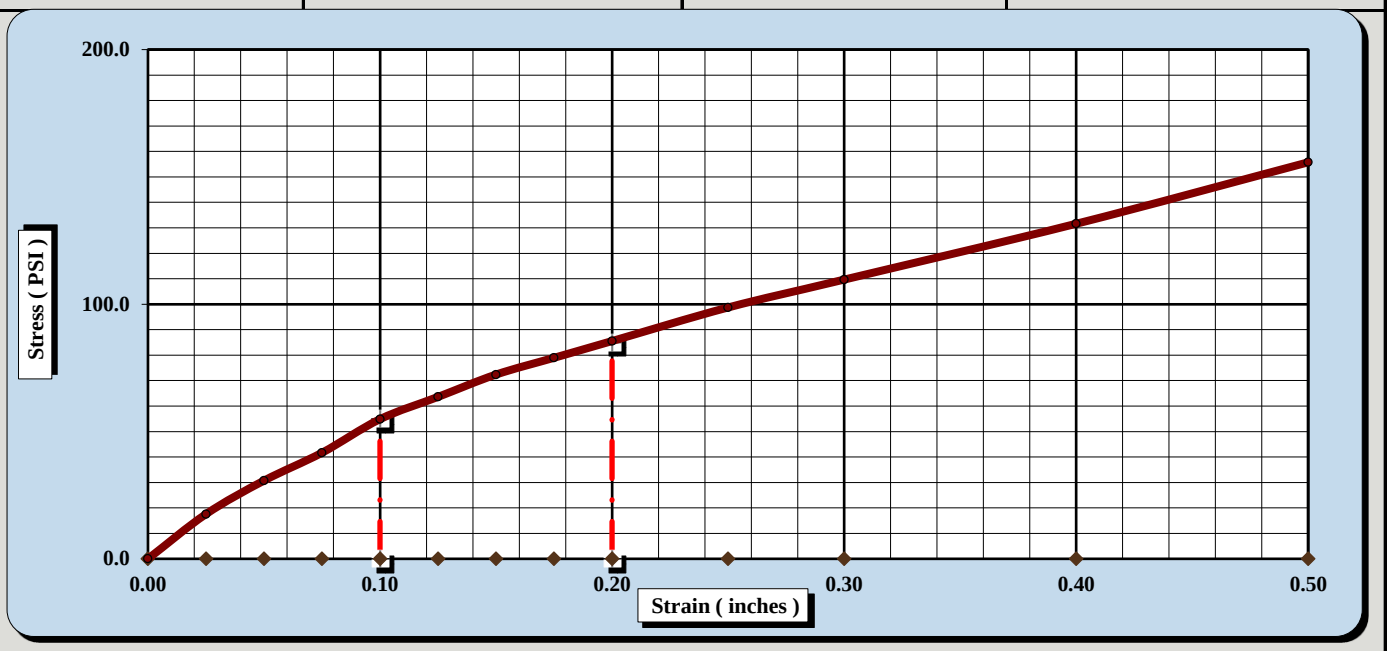
S&ME, Inc. Charlotte: 9751 Southern Pine Boulevard, Charlotte, NC 28273

Project #:	6205-19-004	Report Date:	3/14/19
Project Name:	C-5621	Test Date(s)	3/4-14/19
Client Name:	NCDOT-Geotech		
Client Address:	Poole Rd, Raleigh, NC		
Boring #:	C-17	Sample #: Bulk-1 (A)	Sample Date: 2/24-2/26/19
Location:	Roadway	Offset: NI	Elevation: 1.5-3.0'
Sample Description:	A-7-5 (17)		

AASHTO T99 *Method A* Maximum Dry Density: 97.5 PCF Optimum Moisture Content: 23.2%

% Retained on the 3/4" sieve: 0.0%

Uncorrected CBR Values		Corrected CBR Values	
CBR at 0.1 in. 5.5	CBR at 0.2 in. 5.7	CBR at 0.1 in. 5.5	CBR at 0.2 in. 5.7



CBR Sample Preparation:

The replacement method was used and compacted in a 6" CBR mold in accordance with

Before Soaking		*After Soaking*	
Compactive Effort (Blows per Layer)	56		
Initial Dry Density (PCF)	96.7	Final Dry Density (PCF)	95.1
Moisture Content of the Compacted Specimen	23.1%	Moisture Content (top 1" after soaking)	31.5%
Percent Compaction	99.2%	Percent Swell	1.8%

Soak Time:	96 Hrs.	Surcharge Weight	10.0	Surcharge Wt. per sq. Ft.	50.8
Liquid Limit	59	Plastic Index	26	Assumed Apparent Relative Density	2.600

Notes/Deviations/References: Test Performed As Modified By NCDOT

Vlad Mitchev		Project Manager	
Technical Responsibility	*Signature*	*Position*	*Date*

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Form No. TR-D1883-T193-3
Revision No. 2
Revision Date: 08/11/17

CBR (CALIFORNIA BEARING RATIO) OF LABORATORY COMPACTED SOIL

AASHTO T 193

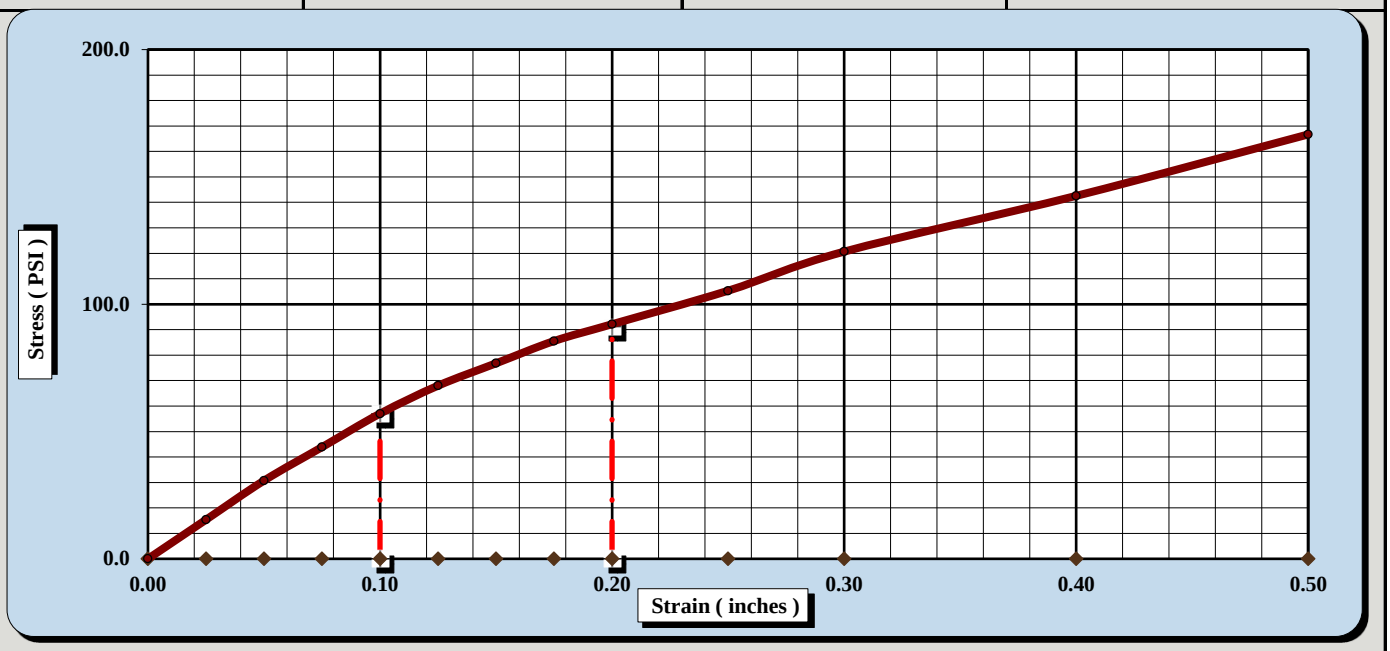
S&ME, Inc. Charlotte: 9751 Southern Pine Boulevard, Charlotte, NC 28273

Project #:	6205-19-004	Report Date:	3/14/19
Project Name:	C-5621	Test Date(s)	3/4-14/19
Client Name:	NCDOT-Geotech		
Client Address:	Poole Rd, Raleigh, NC		
Boring #:	C-17	Sample #: Bulk-1 (B)	Sample Date: 2/24-2/26/19
Location:	Roadway	Offset: NI	Elevation: 1.5-3.0'
Sample Description:	A-7-5 (17)		

AASHTO T99 *Method A* Maximum Dry Density: 97.5 PCF Optimum Moisture Content: 23.2%

% Retained on the 3/4" sieve: 0.0%

Uncorrected CBR Values		Corrected CBR Values	
CBR at 0.1 in. 5.7	CBR at 0.2 in. 6.1	CBR at 0.1 in. 5.7	CBR at 0.2 in. 6.1



CBR Sample Preparation:

The replacement method was used and compacted in a 6" CBR mold in accordance with

Before Soaking		*After Soaking*	
Compactive Effort (Blows per Layer)	56		
Initial Dry Density (PCF)	96.9	Final Dry Density (PCF)	94.8
Moisture Content of the Compacted Specimen	22.9%	Moisture Content (top 1" after soaking)	31.6%
Percent Compaction	99.4%	Percent Swell	1.8%

Soak Time:	96 Hrs.	Surcharge Weight	10.0	Surcharge Wt. per sq. Ft.	50.8
Liquid Limit	59	Plastic Index	26	Assumed Apparent Relative Density	2.600

Notes/Deviations/References: Test Performed As Modified By NCDOT

Vlad Mitchev — *Technical Responsibility*
_____ — *Signature*
Project Manager — *Position*
_____ — *Date*

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Form No. TR-D1883-T193-3
Revision No. 2
Revision Date: 08/11/17

CBR (CALIFORNIA BEARING RATIO) OF LABORATORY COMPACTED SOIL

AASHTO T 193

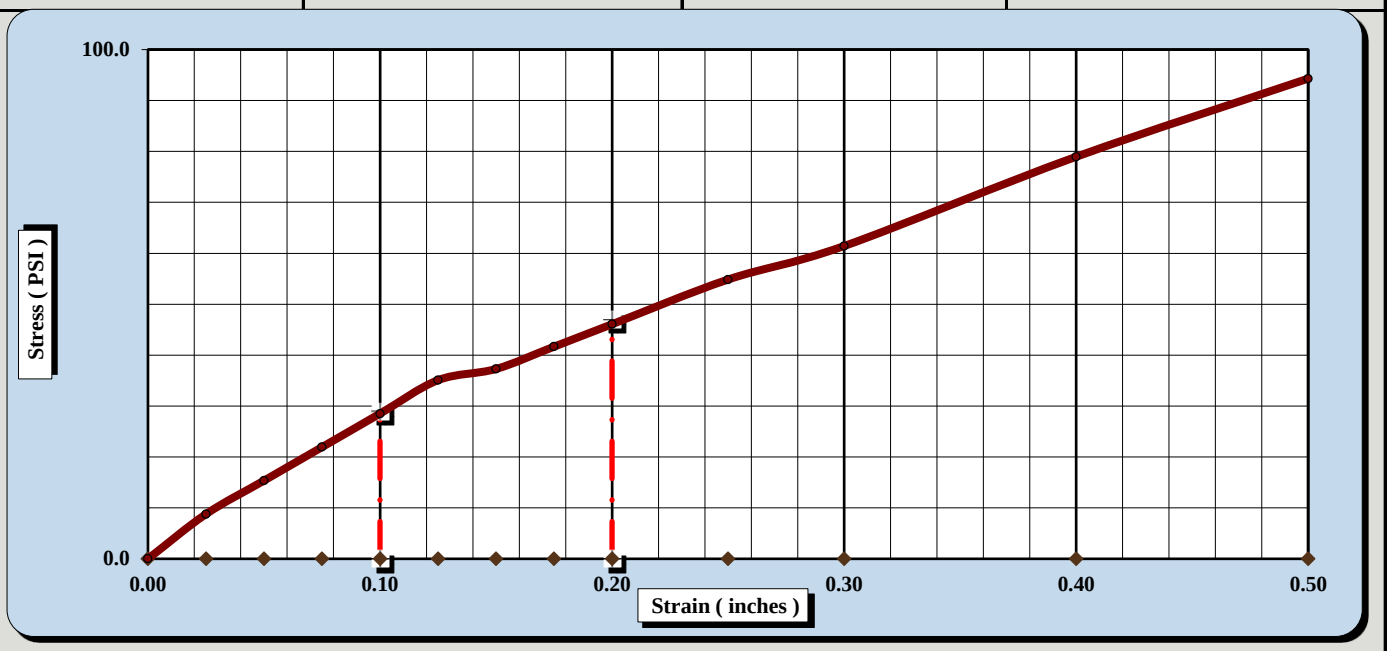
S&ME, Inc. Charlotte: 9751 Southern Pine Boulevard, Charlotte, NC 28273

Project #:	6205-19-004	Report Date:	3/18/19
Project Name:	C-5621	Test Date(s)	3/4-18/19
Client Name:	NCDOT-Geotech		
Client Address:	Poole Rd., Raleigh, NC		
Boring #:	C-11	Sample #: Bulk-2 (A)	Sample Date: 2/24-26/19
Location:	Roadway	Offset: NI	Elevation: 1.5-3.0'
Sample Description:	A-7-5 (10)		

AASHTO T99 *Method A* Maximum Dry Density: 101.3 PCF Optimum Moisture Content: 20.1%

% Retained on the 3/4" sieve: 0.0%

Uncorrected CBR Values		Corrected CBR Values	
CBR at 0.1 in. 2.9	CBR at 0.2 in. 3.1	CBR at 0.1 in. 2.9	CBR at 0.2 in. 3.1



CBR Sample Preparation:

The entire gradation was used and compacted in a 6" CBR mold in accordance with

Before Soaking		*After Soaking*	
Compactive Effort (Blows per Layer)	56		
Initial Dry Density (PCF)	102.3	Final Dry Density (PCF)	99.9
Moisture Content of the Compacted Specimen	19.5%	Moisture Content (top 1" after soaking)	30.0%
Percent Compaction	101.0%	Percent Swell	2.5%

Soak Time:	96 Hrs.	Surcharge Weight	10.0	Surcharge Wt. per sq. Ft.	50.8
Liquid Limit	49	Plastic Index	19	Assumed Apparent Relative Density	2.600

Notes/Deviations/References: Test Performed As Modified By NCDOT

Vlad Mitchev		Project Manager	
Technical Responsibility	*Signature*	*Position*	*Date*

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Form No. TR-D1883-T193-3
Revision No. 2
Revision Date: 08/11/17

CBR (CALIFORNIA BEARING RATIO) OF LABORATORY COMPACTED SOIL

AASHTO T 193

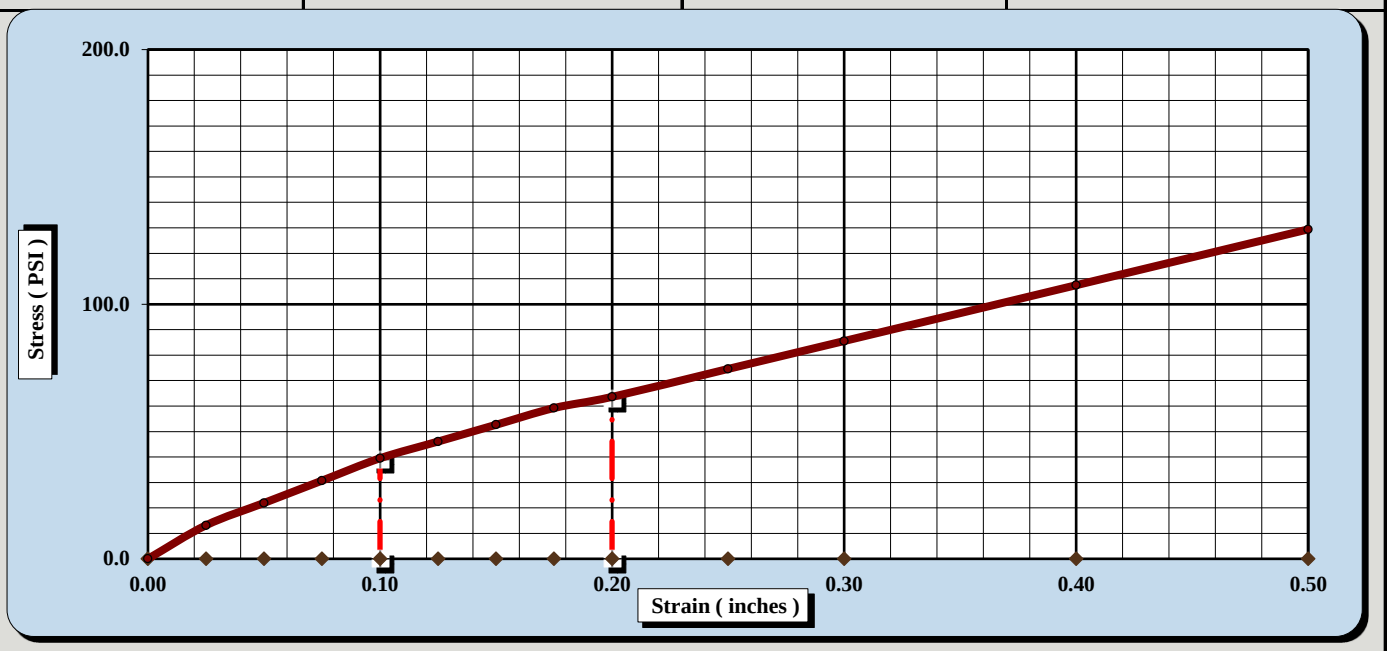
S&ME, Inc. Charlotte: 9751 Southern Pine Boulevard, Charlotte, NC 28273

Project #:	6205-19-004	Report Date:	3/18/19
Project Name:	C-5621	Test Date(s)	3/4-18/19
Client Name:	NCDOT-Geotech		
Client Address:	Poole Rd., Raleigh, NC		
Boring #:	C-11	Sample #: Bulk-2 (B)	Sample Date: 2/24-26/19
Location:	Roadway	Offset: NI	Elevation: 1.5-3.0'
Sample Description:	A-7-5 (10)		

AASHTO T99 *Method A* Maximum Dry Density: 101.3 PCF Optimum Moisture Content: 20.1%

% Retained on the 3/4" sieve: 0.0%

Uncorrected CBR Values		Corrected CBR Values	
CBR at 0.1 in. 3.9	CBR at 0.2 in. 4.2	CBR at 0.1 in. 3.9	CBR at 0.2 in. 4.2



CBR Sample Preparation:

The entire gradation was used and compacted in a 6" CBR mold in accordance with

Before Soaking		*After Soaking*	
Compactive Effort (Blows per Layer)	56		
Initial Dry Density (PCF)	103.7	Final Dry Density (PCF)	100.9
Moisture Content of the Compacted Specimen	19.5%	Moisture Content (top 1" after soaking)	28.2%
Percent Compaction	102.3%	Percent Swell	2.4%

Soak Time:	96 Hrs.	Surcharge Weight	10.0	Surcharge Wt. per sq. Ft.	50.8
Liquid Limit	49	Plastic Index	19	umed Apparent Relative Density	2.600

Notes/Deviations/References: Test Performed As Modified By NCDOT

Vlad Mitchev		Project Manager	
Technical Responsibility	*Signature*	*Position*	*Date*

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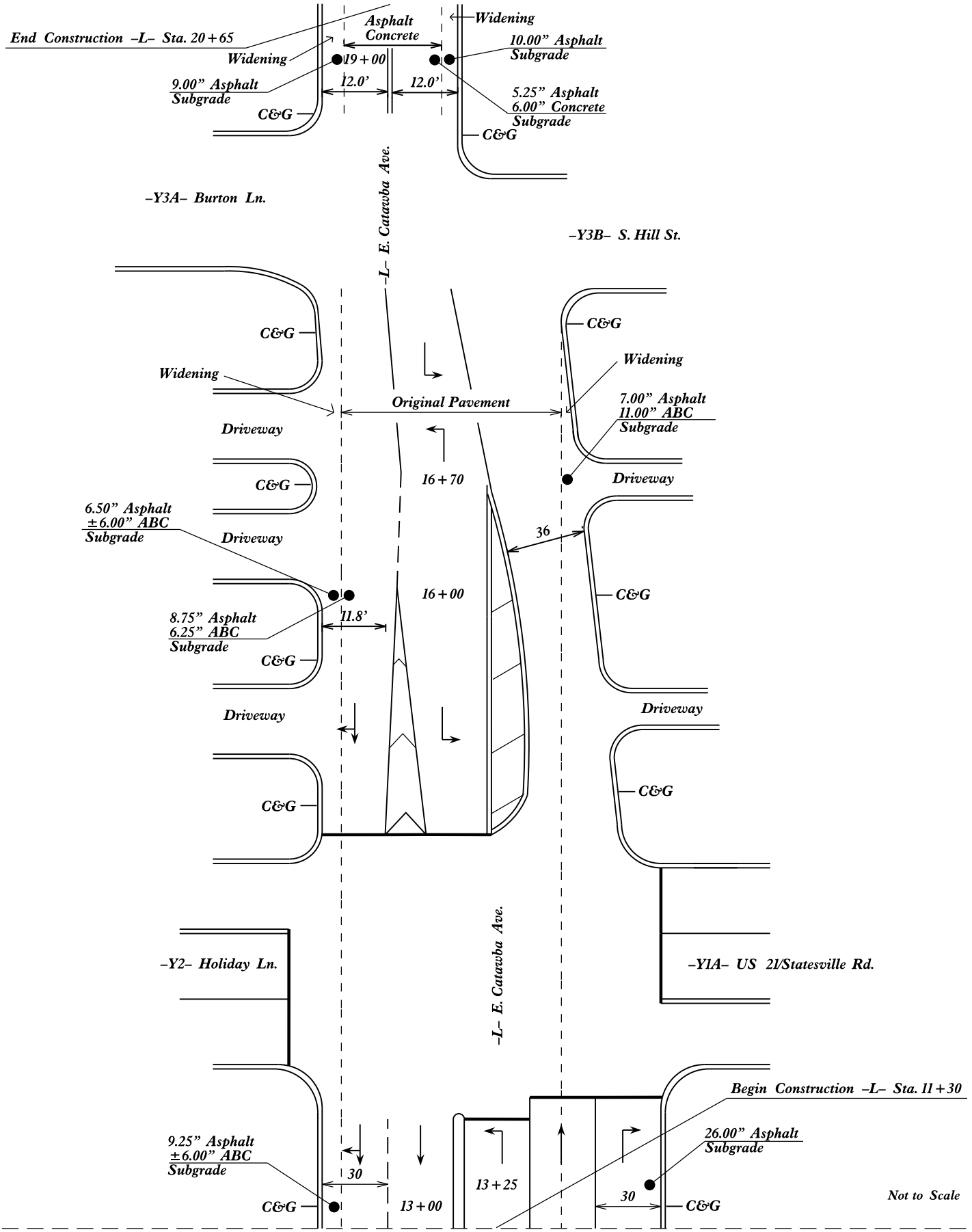
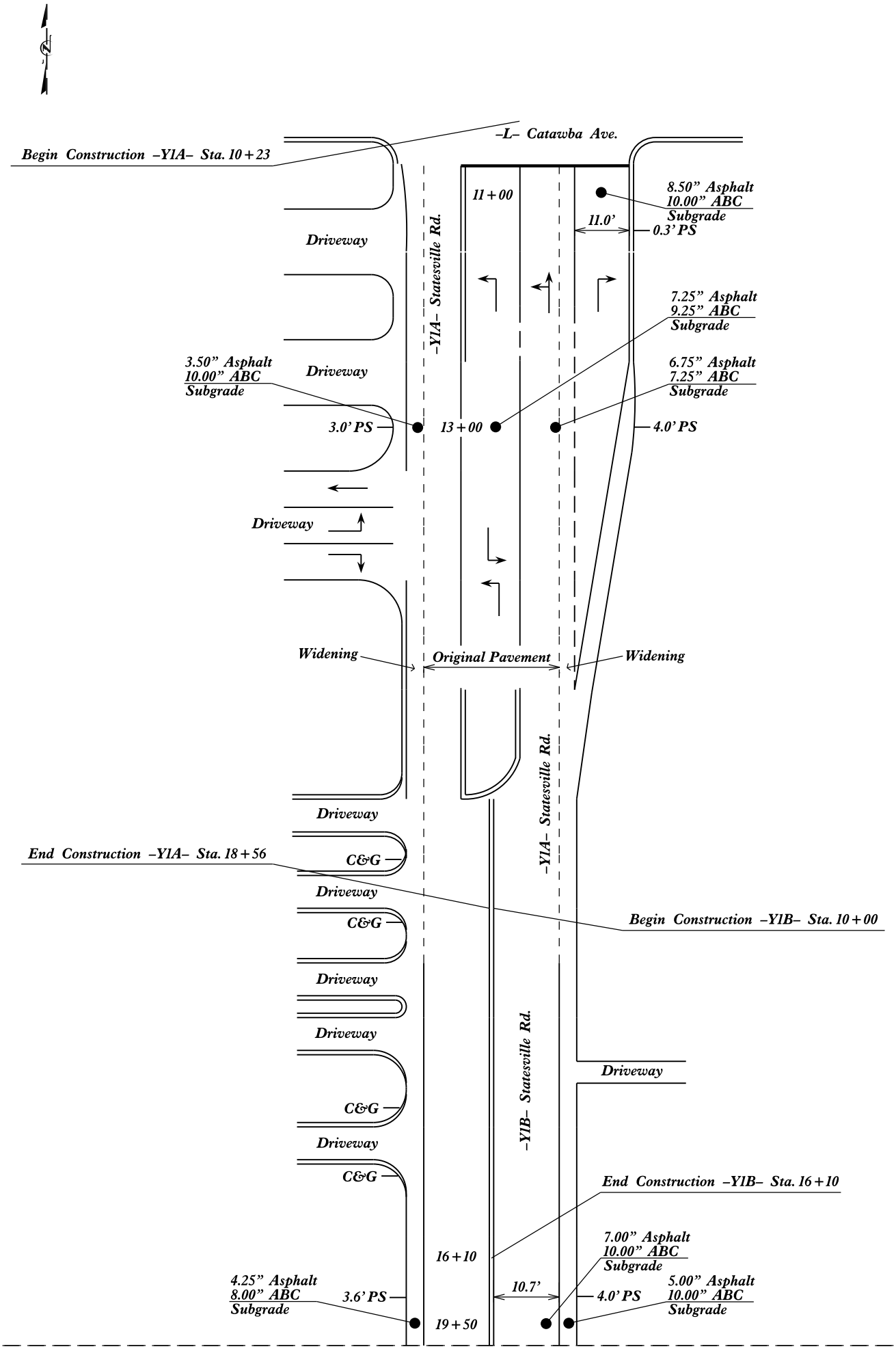
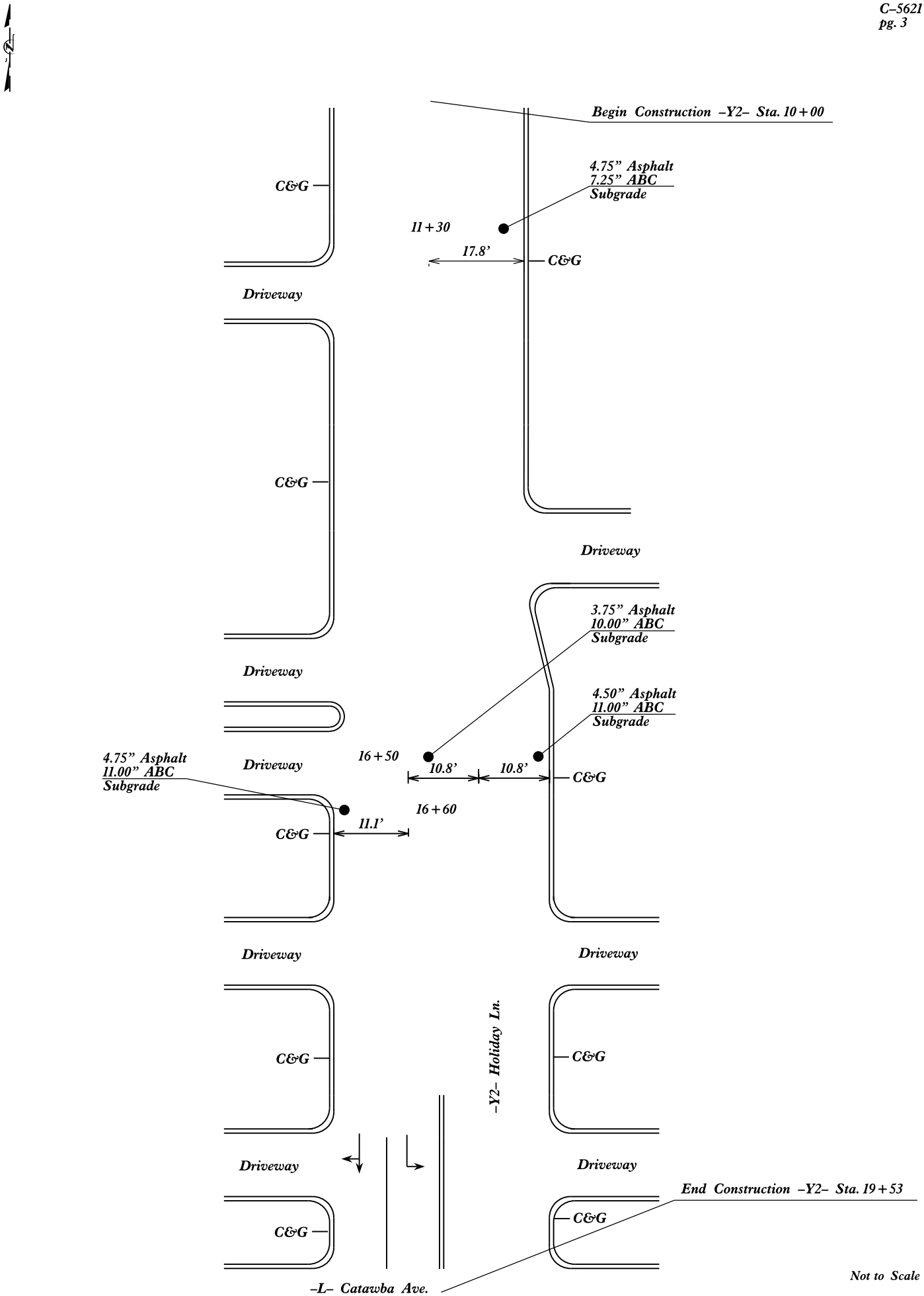
State Project No.: 50146.1.F1 (C–5621) Mecklenburg County

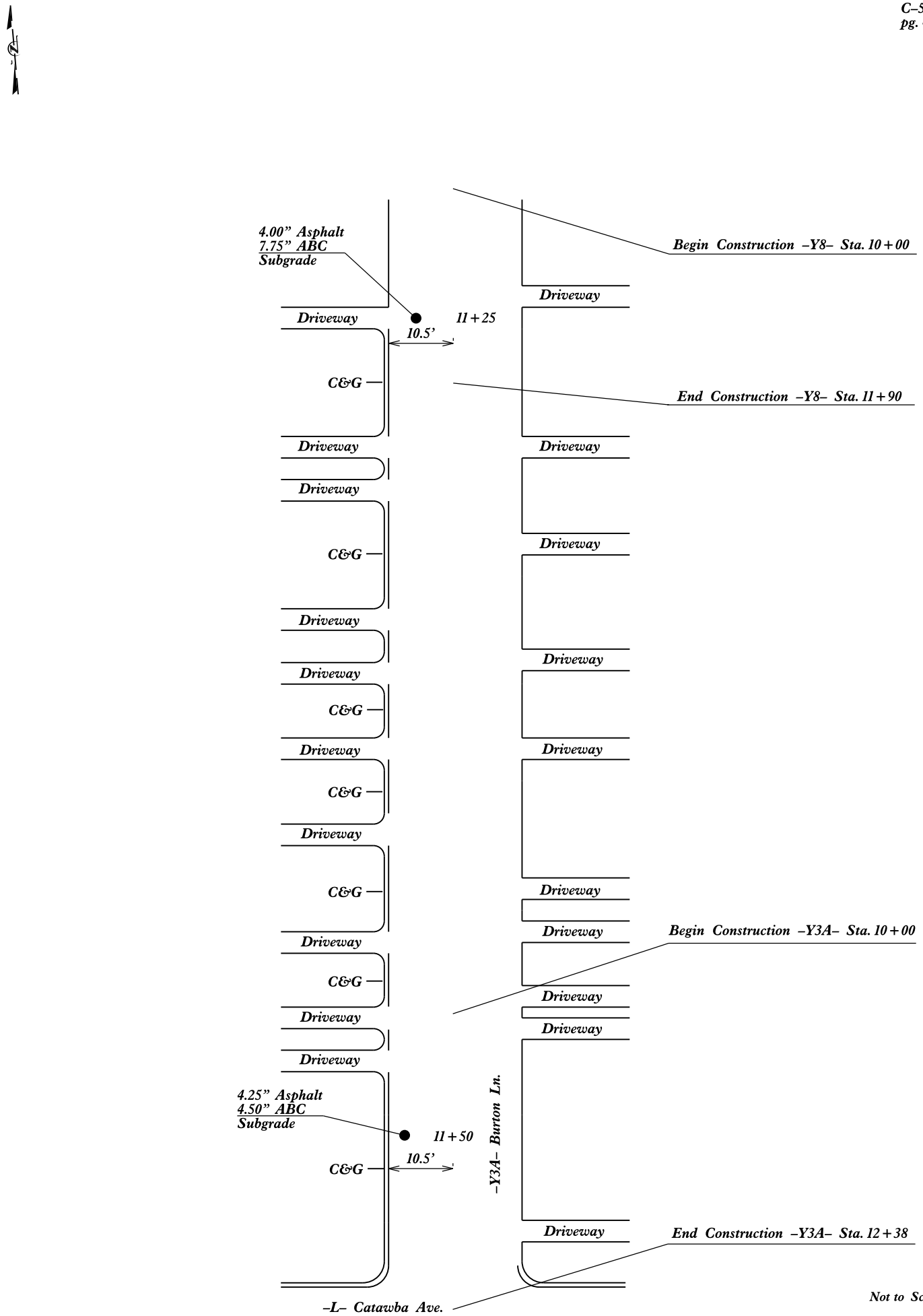
Description: Dual Roundabouts North and South of SR 5544 (Catawba Ave.) and US 21 Intersection in Cornelius

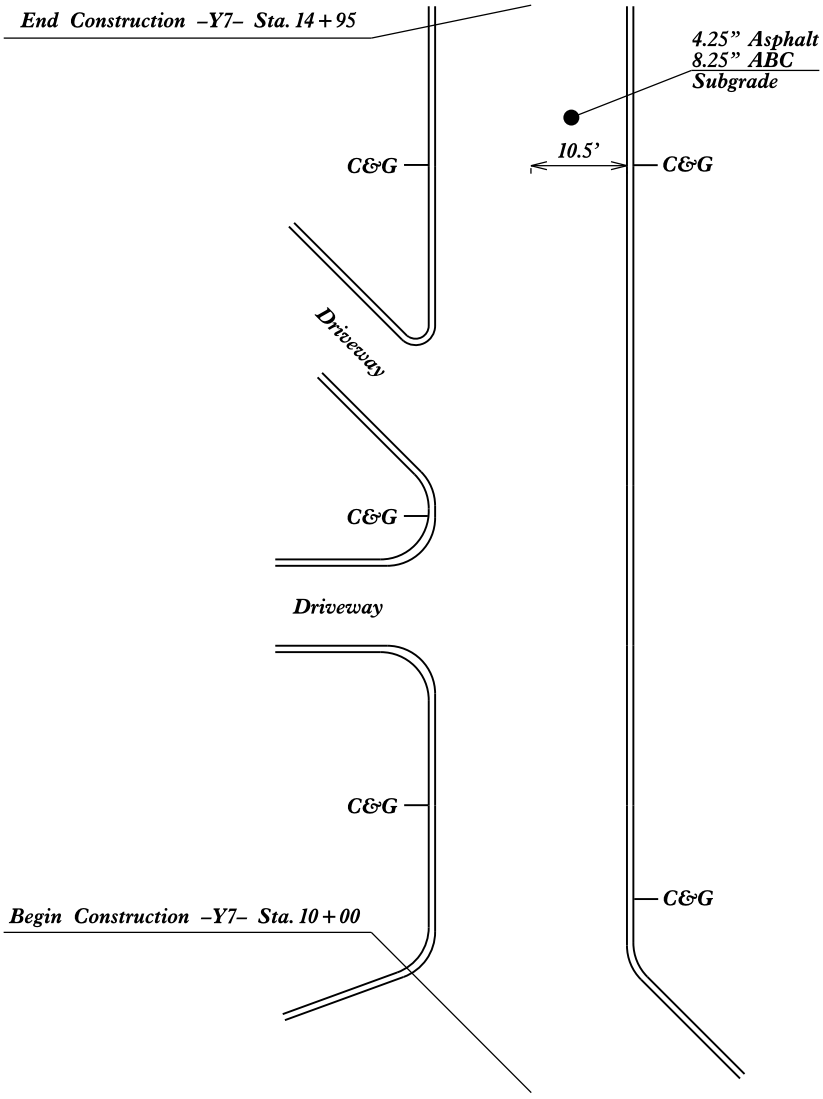



–L– Catawba Ave.
Begin Construction –Y1A– Sta. 10+23
11+00
8.50" Asphalt
10.00" ABC
Subgrade
11.0'
0.3' PS
Driveway
–Y1A– Statesville Rd.
7.25" Asphalt
9.25" ABC
Subgrade
3.50" Asphalt
10.00" ABC
Subgrade
Driveway
6.75" Asphalt
7.25" ABC
Subgrade
3.0' PS
13+00
4.0' PS
Driveway
Widening
Original Pavement
Widening
Driveway
–Y1A– Statesville Rd.
End Construction –Y1A– Sta. 18+56
C&G
Driveway
Begin Construction –Y1B– Sta. 10+00
C&G
Driveway
Driveway
Driveway
C&G
–Y1B– Statesville Rd.
Driveway
Driveway
C&G
End Construction –Y1B– Sta. 16+10
16+10
7.00" Asphalt
10.00" ABC
Subgrade
4.25" Asphalt
8.00" ABC
Subgrade
3.6' PS
10.7'
4.0' PS
5.00" Asphalt
10.00" ABC
Subgrade
19+50
Not to Scale


Begin Construction –Y2– Sta. 10 + 00
4.75" Asphalt
7.25" ABC
Subgrade
11 + 30
17.8'
C&G
C&G
Driveway
C&G
Driveway
3.75" Asphalt
10.00" ABC
Subgrade
4.50" Asphalt
11.00" ABC
Subgrade
Driveway
16 + 50
10.8'
10.8'
C&G
4.75" Asphalt
11.00" ABC
Subgrade
16 + 60
11.1'
C&G
Driveway
Driveway
C&G
–Y2– Holiday Ln.
C&G
Driveway
Driveway
End Construction –Y2– Sta. 19 + 53
C&G
C&G
–L– Catawba Ave.

Not to Scale


4.00" Asphalt
7.75" ABC
Subgrade
Begin Construction –Y8– Sta. 10+00
Driveway
Driveway
11+25
10.5'
C&G
End Construction –Y8– Sta. 11+90
Driveway
Driveway
Driveway
Driveway
C&G
Driveway
Driveway
Driveway
C&G
Driveway
Driveway
C&G
Driveway
Driveway
C&G
Driveway
Driveway
Driveway
Begin Construction –Y3A– Sta. 10+00
Driveway
Driveway
Driveway
4.25" Asphalt
4.50" ABC
Subgrade
11+50
10.5'
C&G
–Y3A– Burton Ln.
Driveway
End Construction –Y3A– Sta. 12+38
–L– Catawba Ave.
Not to Scale


End Construction –Y7– Sta. 14 + 95
4.25" Asphalt
8.25" ABC
Subgrade
10.5'
C&G
C&G
Driveway
C&G
Driveway
C&G
C&G
Begin Construction –Y7– Sta. 10 + 00

Not to Scale

CONE PENETROMETER RESULTS
NCDOT, GEOTECHNICAL ENGINEERING UNIT

PROJECT NO.	50146.3.1
PROJECT ID	C-5621
ROUTE	CATAWBA AVE. AND US 21 INTERSECT.
COUNTY	MECKLENBURG

GEOLOGIST	P. T. NEUMANN
GEOTECHS	S&ME

FILE	DCP GRAPHS (1)

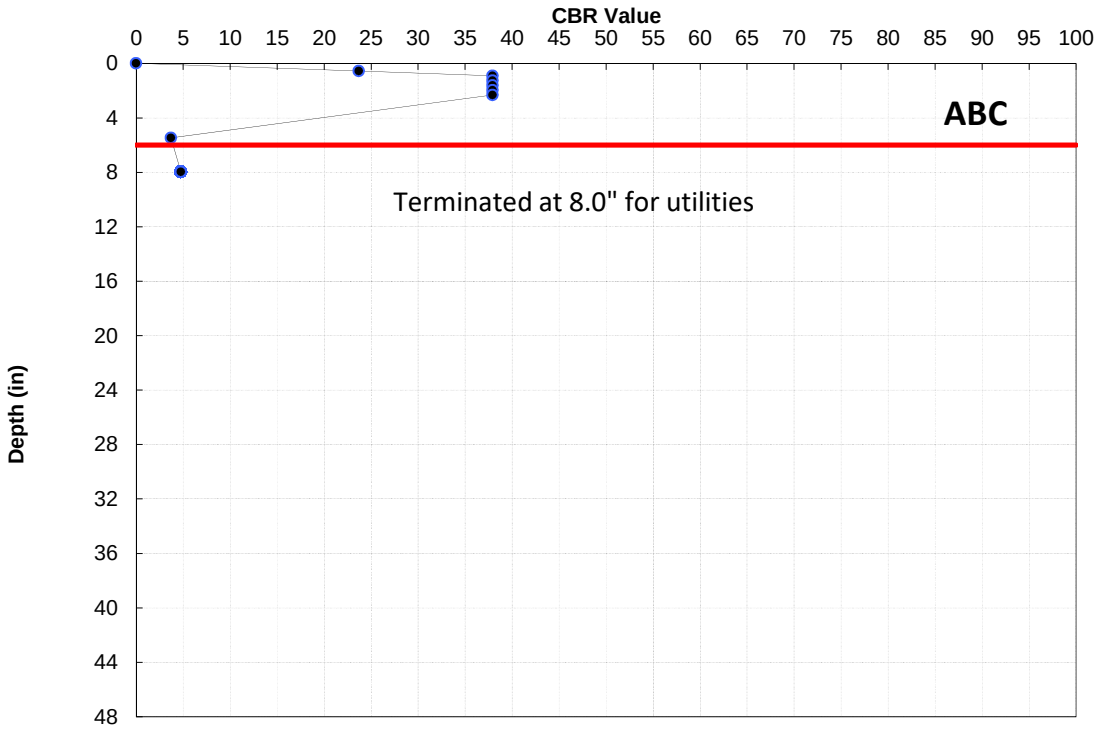
L 13+00 WB OSL

1

Datum = ABC
RAW
FILL
2/24 to 2/26/19

Interval 0.0 to 5.5	
# of Values	7
Avg CBR	31.0
Wghtd Avg.	16.3
Max CBR	37.9
Min CBR	3.7

Interval 5.5 to 8.0	
# of Values	1
Avg CBR	4.8
Wghtd Avg.	4.8
Max CBR	4.8
Min CBR	4.8



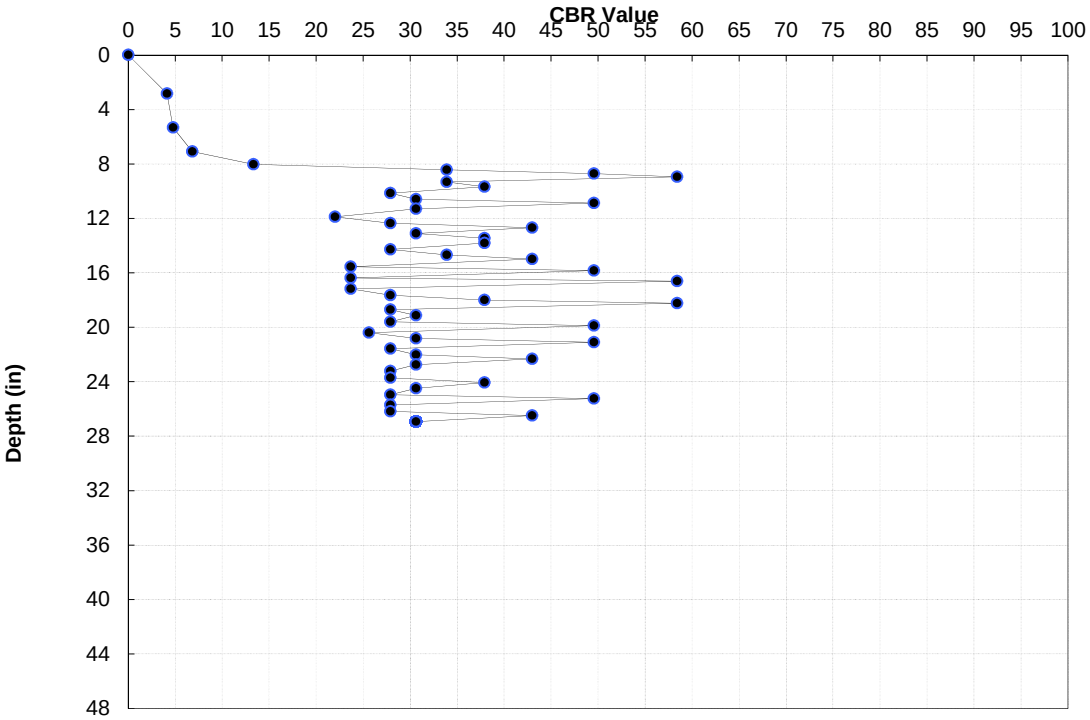
L 13+25 EB RT LN

2

Datum = SG
RAW
FILL
2/24 to 2/26/19

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 26.9	
# of Values	51
Avg CBR	33.2
Wghtd Avg.	24.8
Max CBR	58.4
Min CBR	4.1



CONE PENETROMETER RESULTS
NCDOT, GEOTECHNICAL ENGINEERING UNIT

PROJECT NO.	50146.3.1
PROJECT ID	C-5621
ROUTE	CATAWBA AVE. AND US 21 INTERSECT.
COUNTY	MECKLENBURG

GEOLOGIST	P. T. NEUMANN
GEOTECHS	S&ME

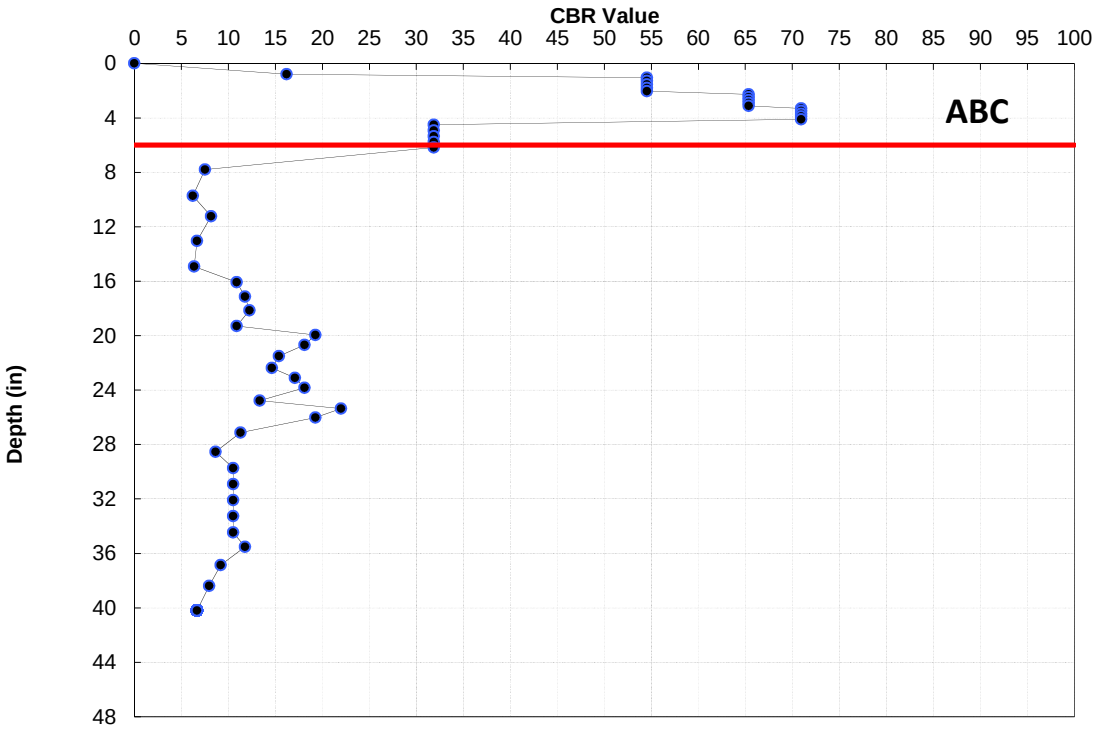
FILE	DCP GRAPHS (1)

L 16+00 WB OSL

Datum = ABC
RAW
CUT
2/24 to 2/26/19

Interval 0.0 to 5.8	
# of Values	20
Avg CBR	54.9
Wghtd Avg.	47.3
Max CBR	70.9
Min CBR	16.2

Interval 5.8 to 40.2	
# of Values	30
Avg CBR	12.6
Wghtd Avg.	10.8
Max CBR	31.8
Min CBR	6.2

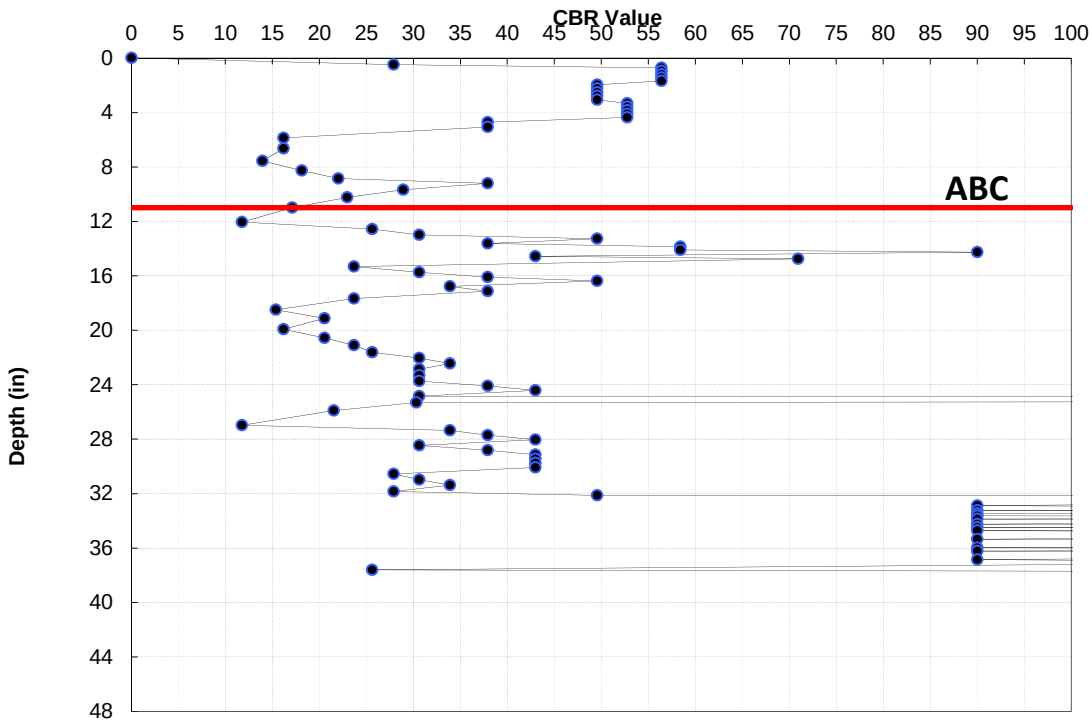


L 16+70 EB OSL

Datum = ABC
RAW
FILL
2/24 to 2/26/19

Interval 0.0 to 11.0	
# of Values	27
Avg CBR	40.4
Wghtd Avg.	32.7
Max CBR	56.4
Min CBR	13.9

Interval 11.0 to 37.7	
# of Values	92
Avg CBR	85.7
Wghtd Avg.	46.8
Max CBR	100+
Min CBR	11.8



CONE PENETROMETER RESULTS
NCDOT, GEOTECHNICAL ENGINEERING UNIT

PROJECT NO.	50146.3.1
PROJECT ID	C-5621
ROUTE	CATAWBA AVE. AND US 21 INTERSECT.
COUNTY	MECKLENBURG

GEOLOGIST	P. T. NEUMANN
GEOTECHS	S&ME

FILE	DCP GRAPHS (1)

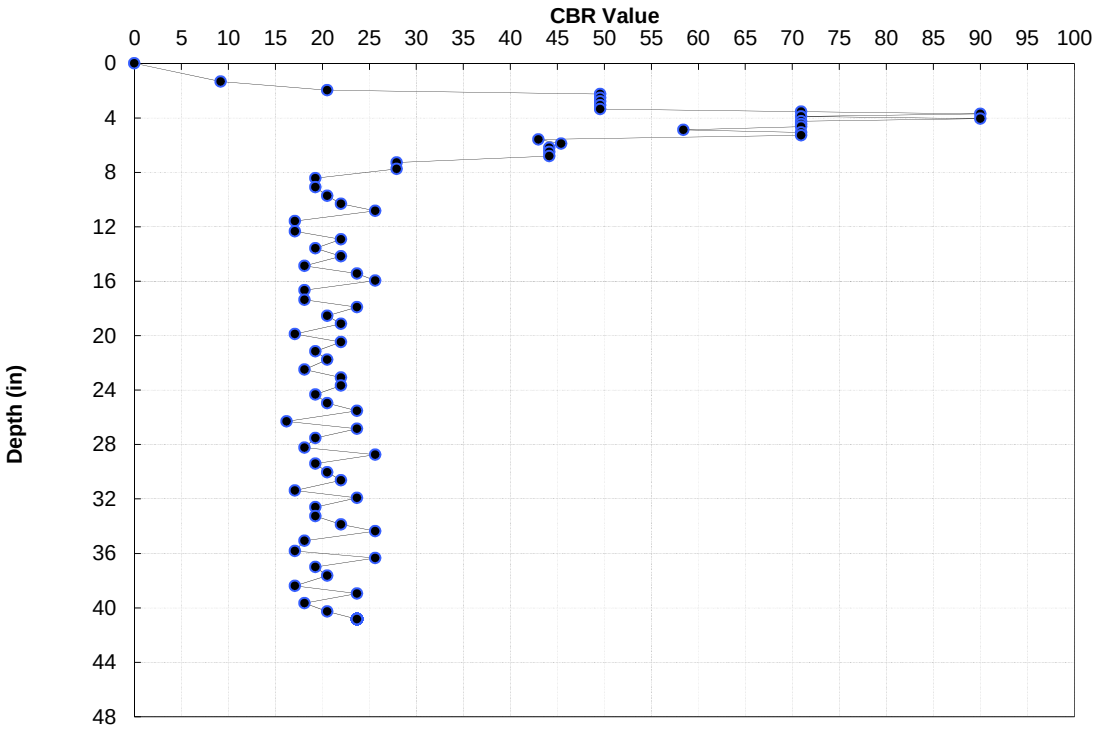
L - 19+00 WB OSL

5

Datum = SG
RAW
CUT
2/24 to 2/26/19

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 40.8	
# of Values	76
Avg CBR	31.1
Wghtd Avg.	24.3
Max CBR	90.0
Min CBR	9.2



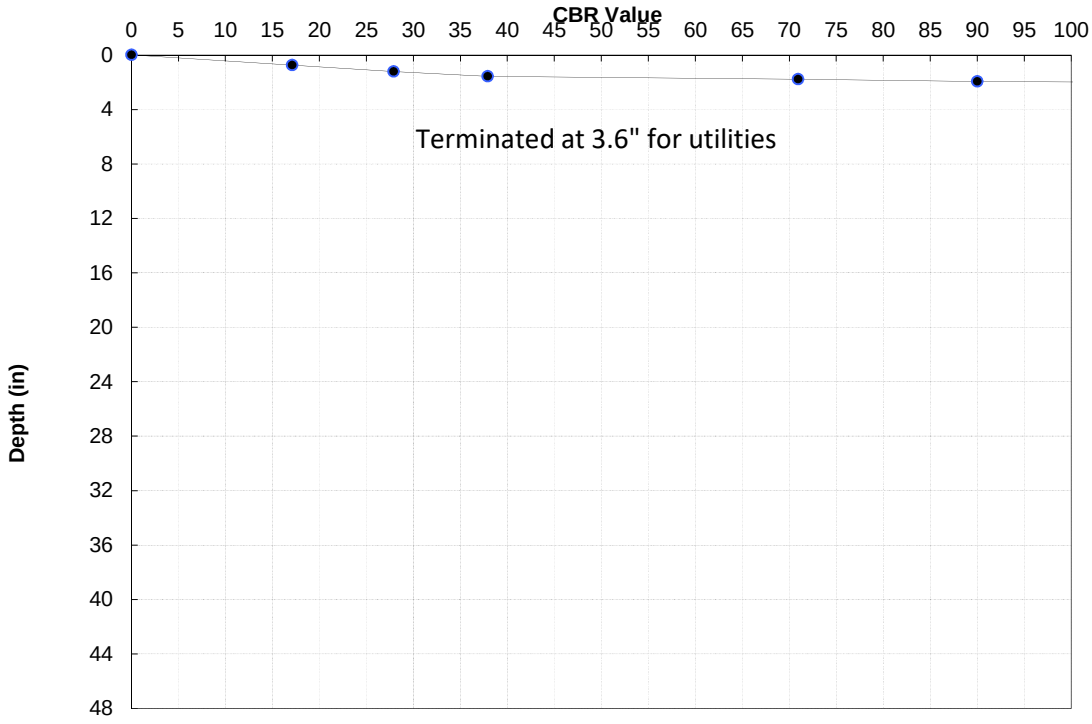
L - 19+00 EB OSL (I)

6

Datum = SG
RAW
CUT
2/24 to 2/26/19

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 3.6	
# of Values	42
Avg CBR	100+
Wghtd Avg.	100+
Max CBR	100+
Min CBR	17.1



CONE PENETROMETER RESULTS
NCDOT, GEOTECHNICAL ENGINEERING UNIT

PROJECT NO.	50146.3.1
PROJECT ID	C-5621
ROUTE	CATAWBA AVE. AND US 21 INTERSECT.
COUNTY	MECKLENBURG

GEOLOGIST	P. T. NEUMANN
GEOTECHS	S&ME

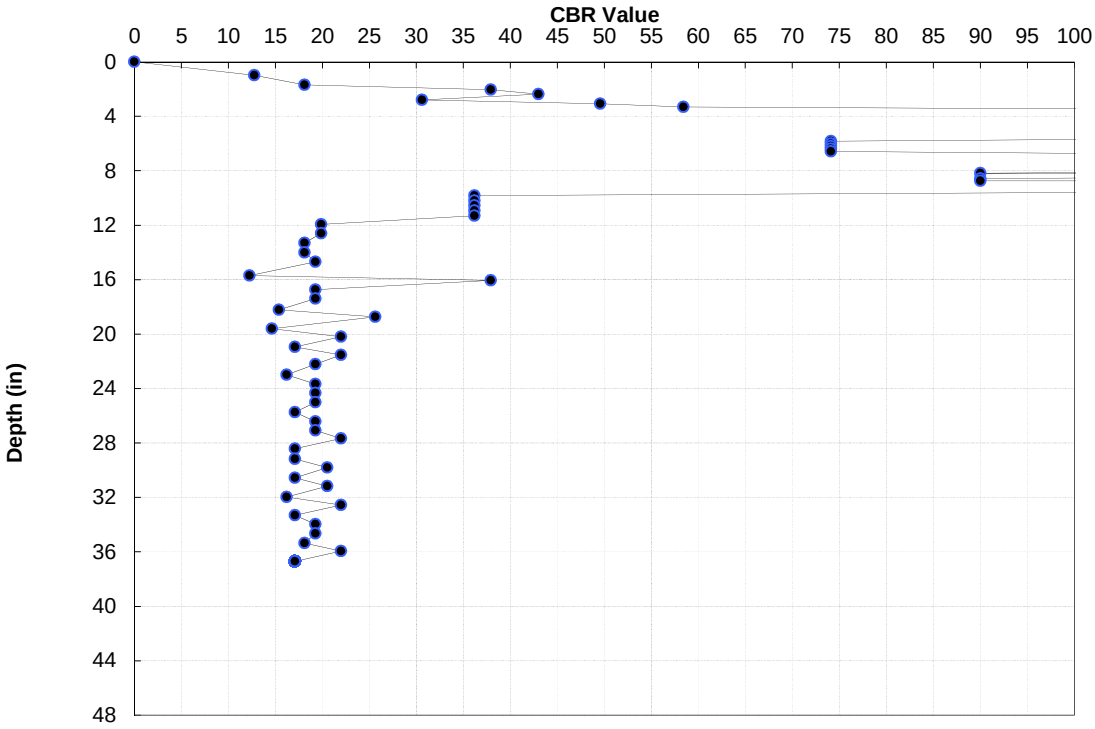
FILE	DCP GRAPHS (1)

L - 19+00 EB OSL (O) 7

Datum = SG
RAW
CUT
2/24 to 2/26/19

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 36.7	
# of Values	109
Avg CBR	100+
Wghtd Avg.	40.0
Max CBR	100+
Min CBR	12.2

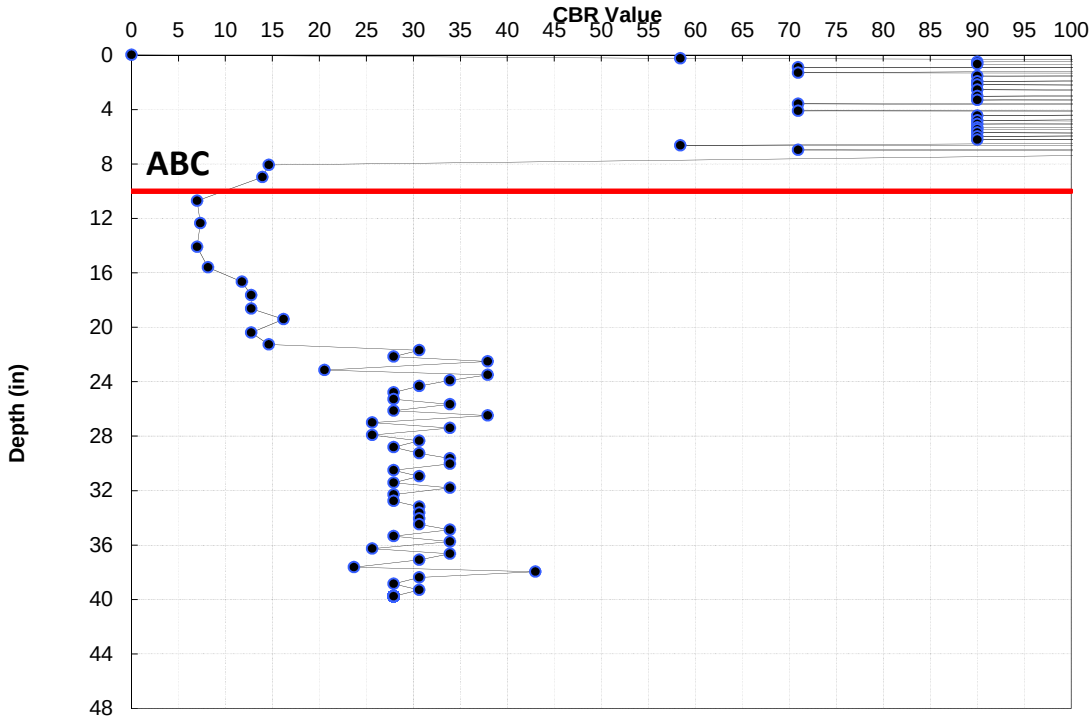


Y1A - 11+00 NB RTL 8

Datum = ABC
RAW
FILL
2/24 to 2/26/19

Interval 0.0 to 10.7	
# of Values	59
Avg CBR	#DIV/0!
Wghtd Avg.	#DIV/0!
Max CBR	0.0
Min CBR	0.0

Interval 10.7 to 39.8	
# of Values	51
Avg CBR	27.2
Wghtd Avg.	22.9
Max CBR	43.0
Min CBR	7.0



CONE PENETROMETER RESULTS
NCDOT, GEOTECHNICAL ENGINEERING UNIT

PROJECT NO.	50146.3.1
PROJECT ID	C-5621
ROUTE	CATAWBA AVE. AND US 21 INTERSECT.
COUNTY	MECKLENBURG

GEOLOGIST	P. T. NEUMANN
GEOTECHS	S&ME

FILE	DCP GRAPHS (1)

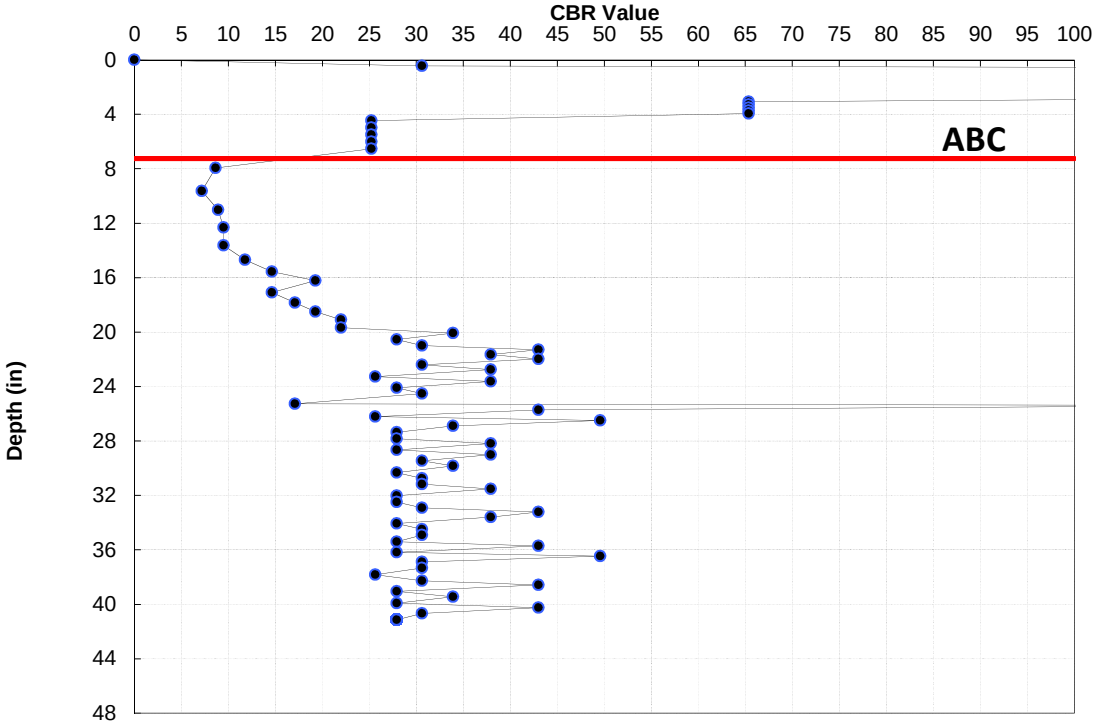
9

Y1A - 13+00 NB OSL

Datum = ABC
RAW
FILL
2/24 to 2/26/19

Interval 0.0 to 8.0	
# of Values	37
Avg CBR	100+
Wghtd Avg.	64.6
Max CBR	100+
Min CBR	8.6

Interval 8.0 to 41.1	
# of Values	64
Avg CBR	31.0
Wghtd Avg.	25.3
Max CBR	100+
Min CBR	7.2



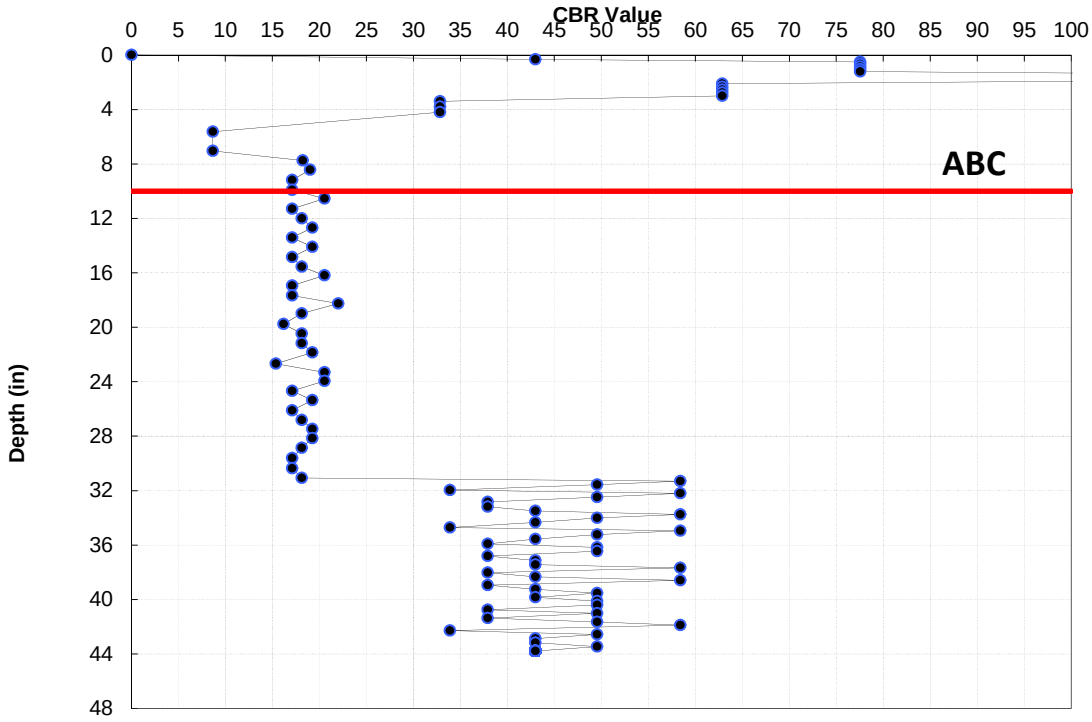
10

Y1A - 13+00 SB OSL

Datum = ABC
RAW
CUT
2/24 to 2/26/19

Interval 0.0 to 9.9	
# of Values	25
Avg CBR	58.7
Wghtd Avg.	33.6
Max CBR	100+
Min CBR	8.6

Interval 9.9 to 43.8	
# of Values	72
Avg CBR	34.5
Wghtd Avg.	28.0
Max CBR	58.4
Min CBR	15.4



CONE PENETROMETER RESULTS
NCDOT, GEOTECHNICAL ENGINEERING UNIT

PROJECT NO.	50146.3.1
PROJECT ID	C-5621
ROUTE	CATAWBA AVE. AND US 21 INTERSECT.
COUNTY	MECKLENBURG

GEOLOGIST	P. T. NEUMANN
GEOTECHS	S&ME

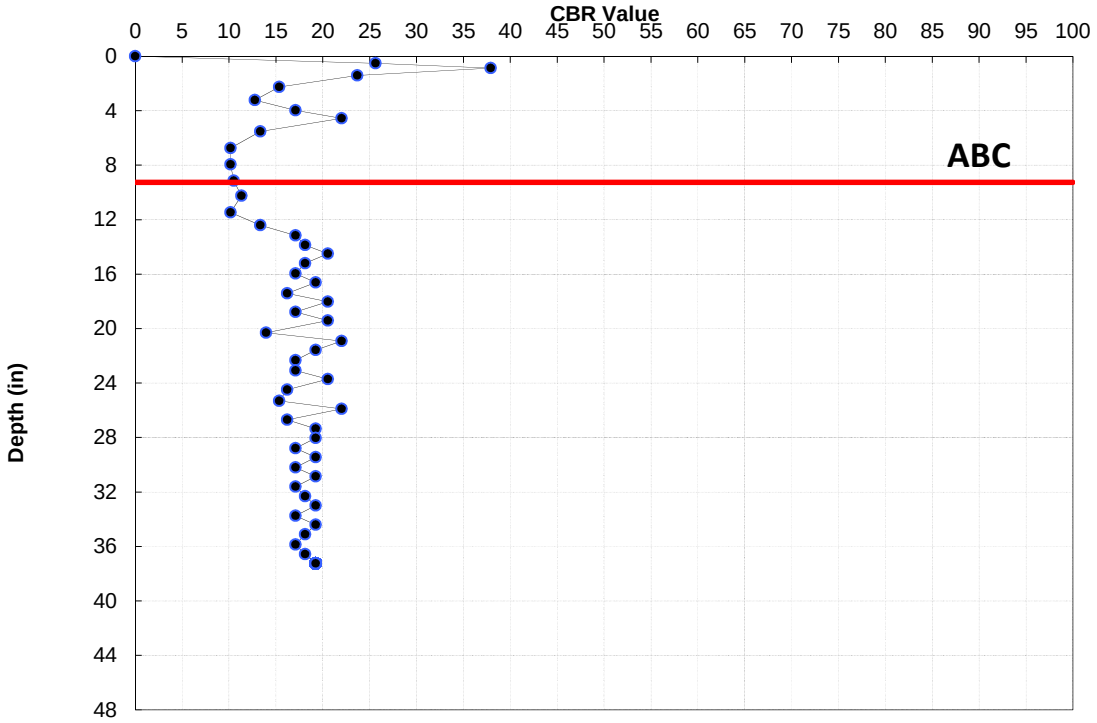
FILE	DCP GRAPHS (1)

Y1A - 13+00 CTL

Datum = ABC
RAW
FILL
2/24 to 2/26/19

Interval 0.0 to 9.1	
# of Values	11
Avg CBR	18.0
Wghtd Avg.	15.3
Max CBR	37.9
Min CBR	10.1

Interval 9.1 to 37.2	
# of Values	38
Avg CBR	17.7
Wghtd Avg.	17.3
Max CBR	22.0
Min CBR	10.1

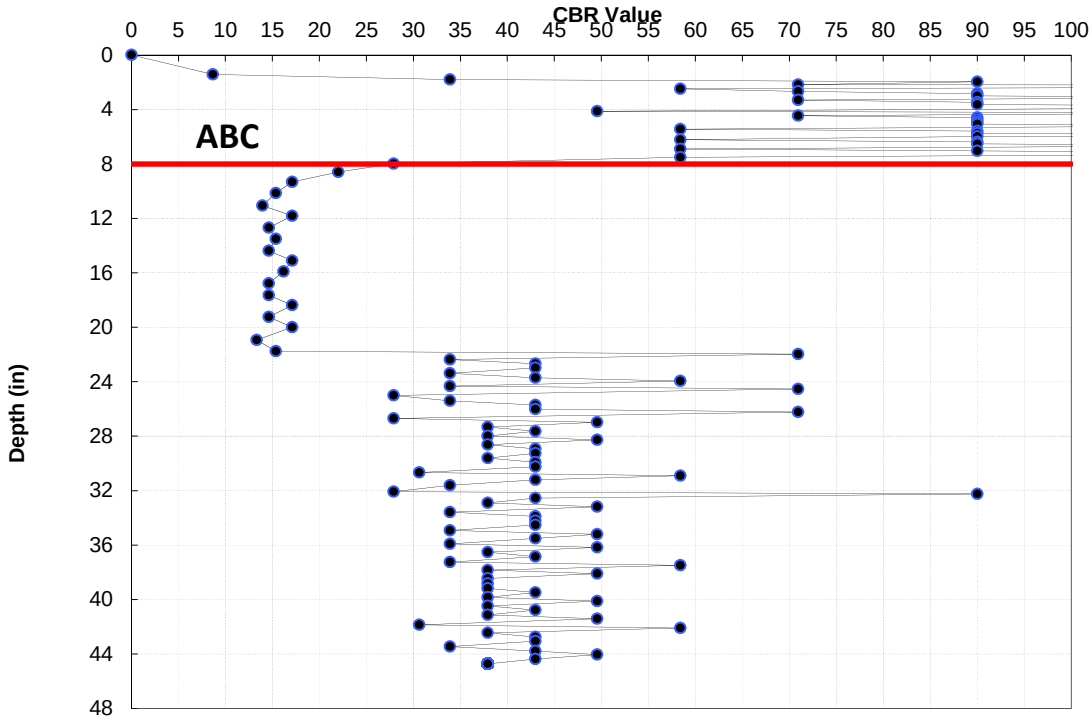


Y1B 19+50 SB PS

Datum = ABC
RAW
CUT
2/24 to 2/26/19

Interval 0.0 to 8.0	
# of Values	38
Avg CBR	89.5
Wghtd Avg.	66.1
Max CBR	100+
Min CBR	8.6

Interval 8.0 to 44.7	
# of Values	87
Avg CBR	37.9
Wghtd Avg.	31.5
Max CBR	90.0
Min CBR	13.3



CONE PENETROMETER RESULTS
NCDOT, GEOTECHNICAL ENGINEERING UNIT

PROJECT NO.	50146.3.1
PROJECT ID	C-5621
ROUTE	CATAWBA AVE. AND US 21 INTERSECT.
COUNTY	MECKLENBURG

GEOLOGIST	P. T. NEUMANN
GEOTECHS	S&ME

FILE	DCP GRAPHS (1)

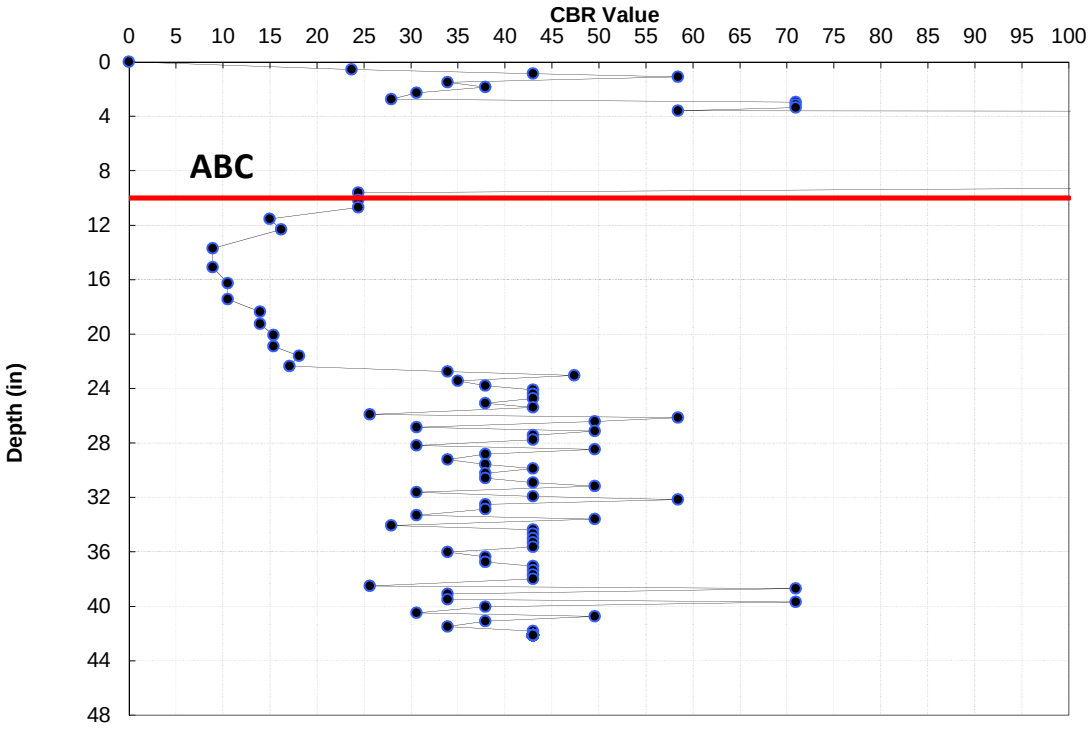
13

Y1B - 19+50 NB OSL

Datum = ABC
RAW
FILL
2/24 to 2/26/19

Interval 0.0 to 10.2	
# of Values	70
Avg CBR	100+
Wghtd Avg.	98.2
Max CBR	100+
Min CBR	23.7

Interval 10.2 to 42.1	
# of Values	71
Avg CBR	36.3
Wghtd Avg.	29.4
Max CBR	70.9
Min CBR	8.9



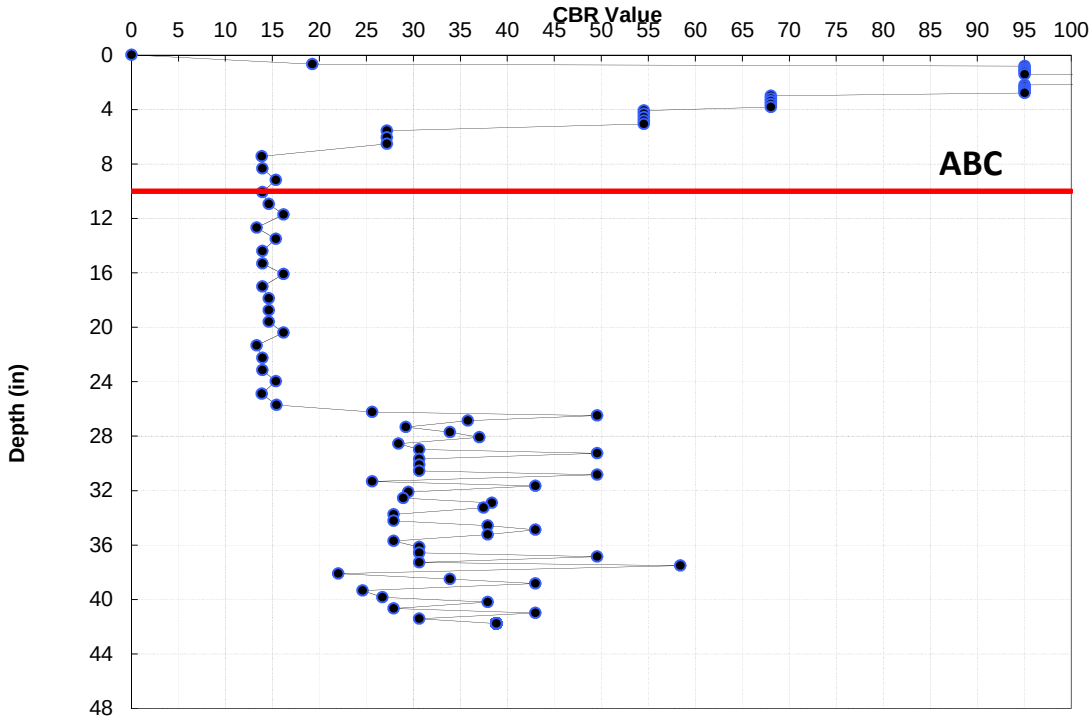
14

Y1B - 19+50 NB PS

Datum = ABC
RAW
FILL
2/24 to 2/26/19

Interval 0.0 to 10.1	
# of Values	33
Avg CBR	69.5
Wghtd Avg.	44.4
Max CBR	100+
Min CBR	13.9

Interval 10.1 to 41.8	
# of Values	58
Avg CBR	28.6
Wghtd Avg.	23.9
Max CBR	58.4
Min CBR	13.3



CONE PENETROMETER RESULTS
NCDOT, GEOTECHNICAL ENGINEERING UNIT

PROJECT NO.	50146.3.1
PROJECT ID	C-5621
ROUTE	CATAWBA AVE. AND US 21 INTERSECT.
COUNTY	MECKLENBURG

GEOLOGIST	P. T. NEUMANN
GEOTECHS	S&ME

FILE	DCP GRAPHS (1)

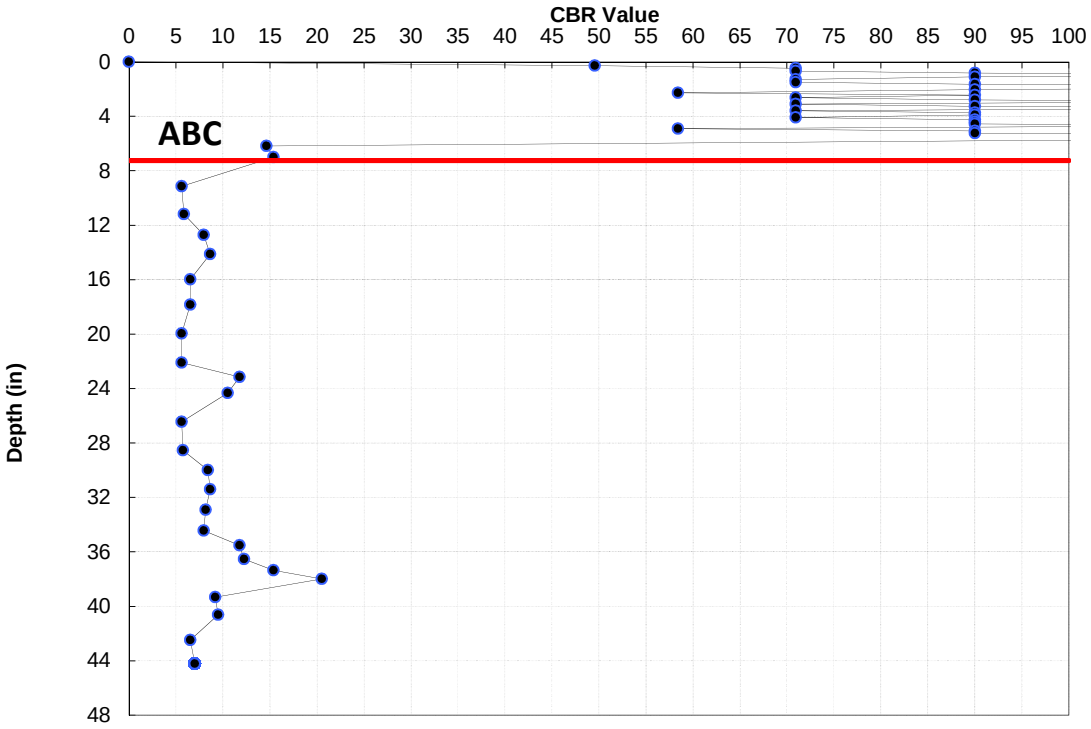
15

Y2 11+30 NB OSL

Datum = ABC
RAW
CUT
2/24 to 2/26/19

Interval 0.0 to 7.0	
# of Values	34
Avg CBR	86.6
Wghtd Avg.	67.5
Max CBR	100+
Min CBR	14.6

Interval 7.0 to 44.2	
# of Values	24
Avg CBR	8.8
Wghtd Avg.	7.9
Max CBR	20.5
Min CBR	5.6



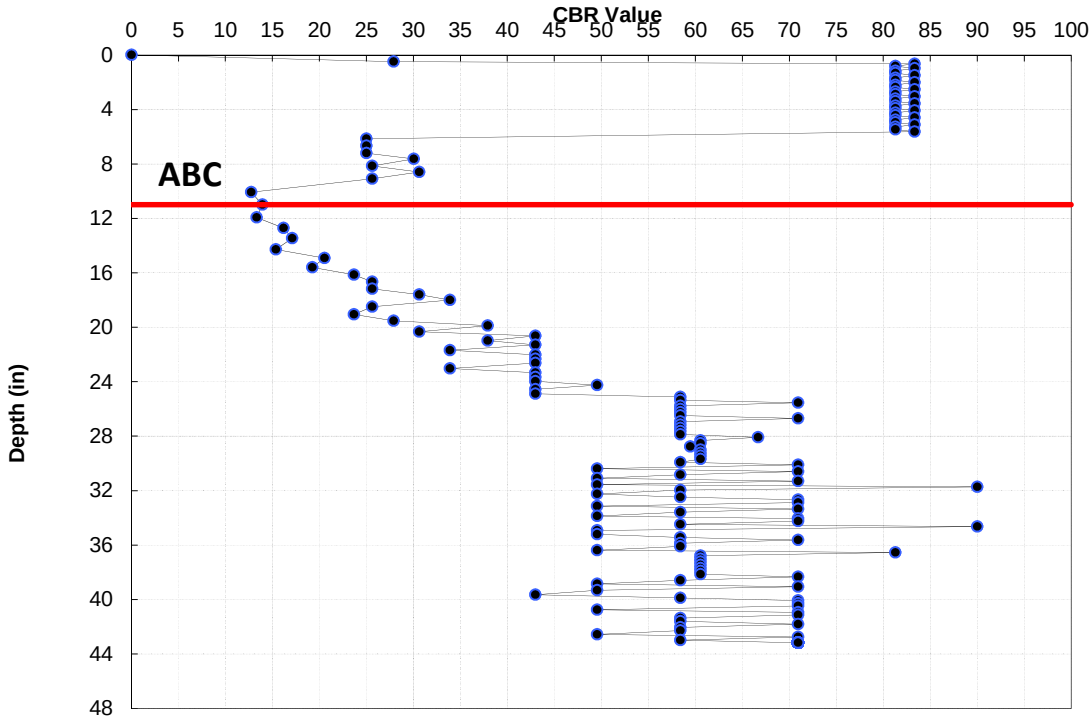
16

Y2 - 16+00 NB OSL

Datum = ABC
RAW
CUT
2/24 to 2/26/19

Interval 0.0 to 11.0	
# of Values	40
Avg CBR	67.6
Wghtd Avg.	49.7
Max CBR	83.3
Min CBR	12.8

Interval 11.0 to 43.2	
# of Values	110
Avg CBR	53.6
Wghtd Avg.	46.5
Max CBR	90.0
Min CBR	13.3



CONE PENETROMETER RESULTS
NCDOT, GEOTECHNICAL ENGINEERING UNIT

PROJECT NO.	50146.3.1
PROJECT ID	C-5621
ROUTE	CATAWBA AVE. AND US 21 INTERSECT.
COUNTY	MECKLENBURG

GEOLOGIST	P. T. NEUMANN
GEOTECHS	S&ME

FILE	DCP GRAPHS (1)

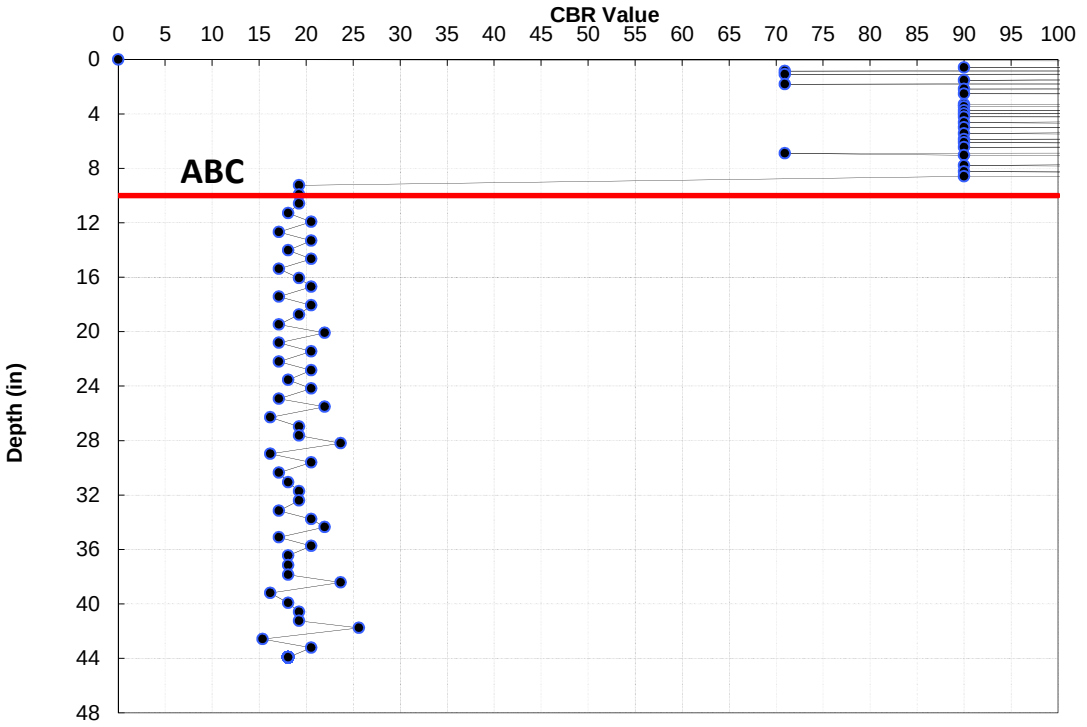
17

Y2 - 16+00 CTL

Datum = ABC
RAW
CUT
2/24 to 2/26/19

Interval 0.0 to 9.9	
# of Values	78
Avg CBR	100+
Wghtd Avg.	100+
Max CBR	100+
Min CBR	19.2

Interval 9.9 to 43.9	
# of Values	50
Avg CBR	19.1
Wghtd Avg.	18.9
Max CBR	25.6
Min CBR	15.4



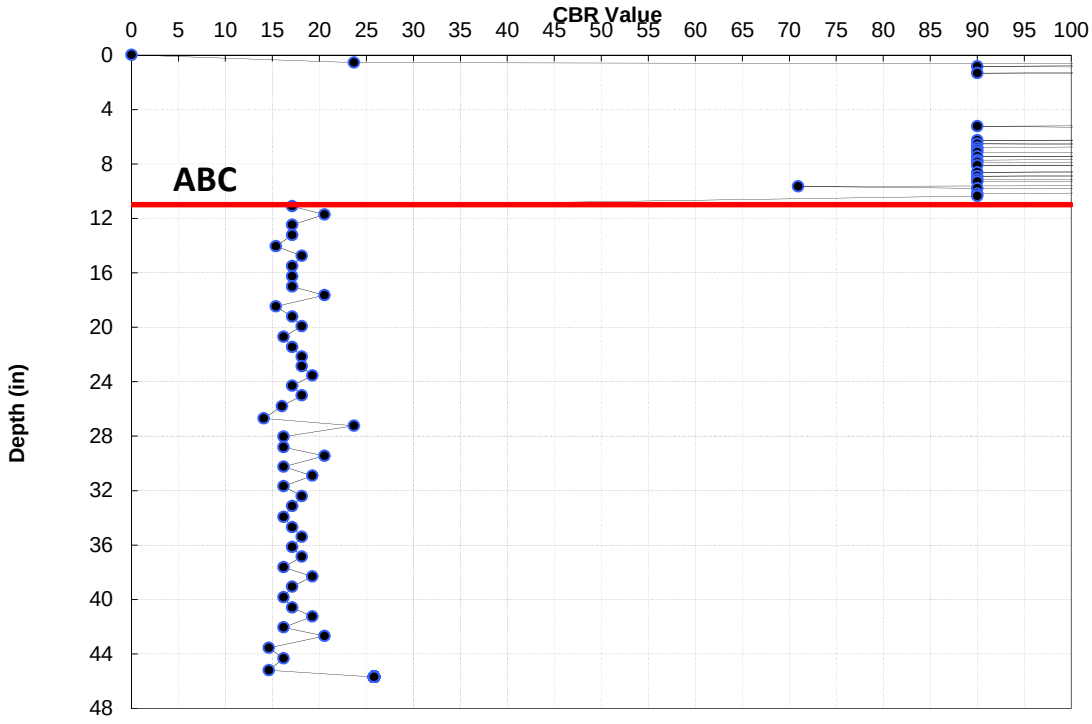
18

Y2 - 16+20 SB OSL

Datum = ABC
RAW
CUT
2/24 to 2/26/19

Interval 0.0 to 11.1	
# of Values	77
Avg CBR	100+
Wghtd Avg.	98.9
Max CBR	100+
Min CBR	17.1

Interval 11.1 to 45.7	
# of Values	47
Avg CBR	17.6
Wghtd Avg.	17.4
Max CBR	25.8
Min CBR	14.1



CONE PENETROMETER RESULTS
NCDOT, GEOTECHNICAL ENGINEERING UNIT

PROJECT NO.	50146.3.1
PROJECT ID	C-5621
ROUTE	CATAWBA AVE. AND US 21 INTERSECT.
COUNTY	MECKLENBURG

GEOLOGIST	P. T. NEUMANN
GEOTECHS	S&ME

FILE	DCP GRAPHS (1)

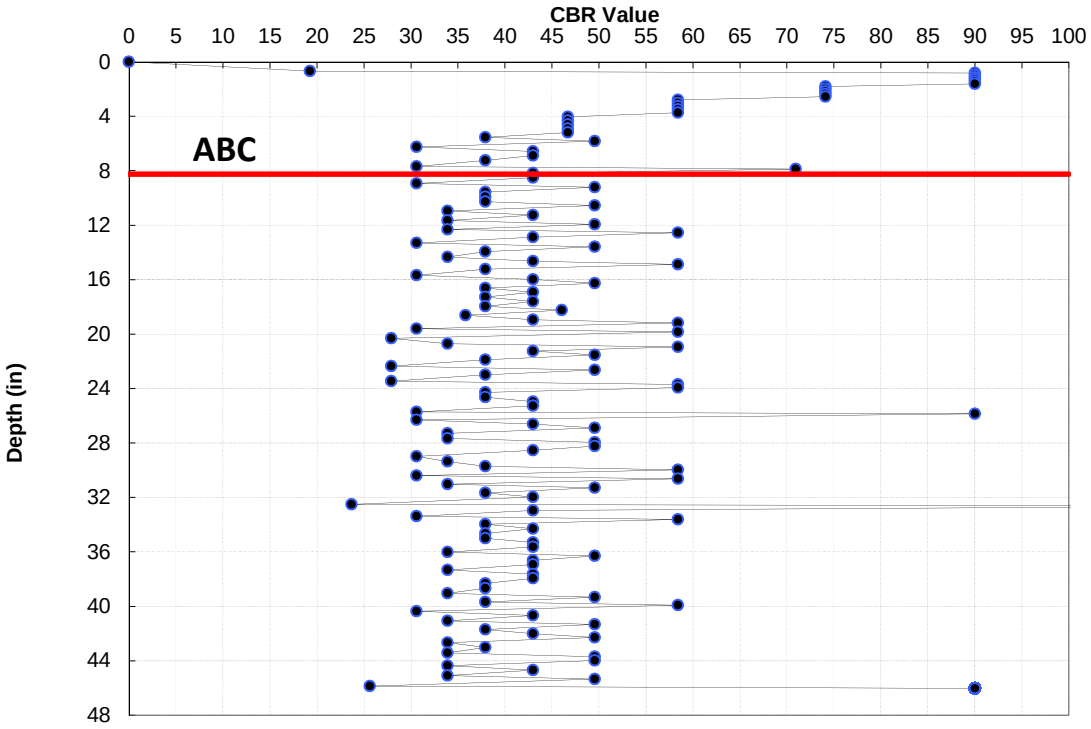
19

Y7 - 12+40 EB OSL

Datum = ABC
RAW
FILL
2/24 to 2/26/19

Interval 0.0 to 8.2	
# of Values	31
Avg CBR	59.4
Wghtd Avg.	51.8
Max CBR	90.0
Min CBR	19.2

Interval 8.2 to 46.0	
# of Values	113
Avg CBR	42.9
Wghtd Avg.	40.3
Max CBR	100+
Min CBR	23.7



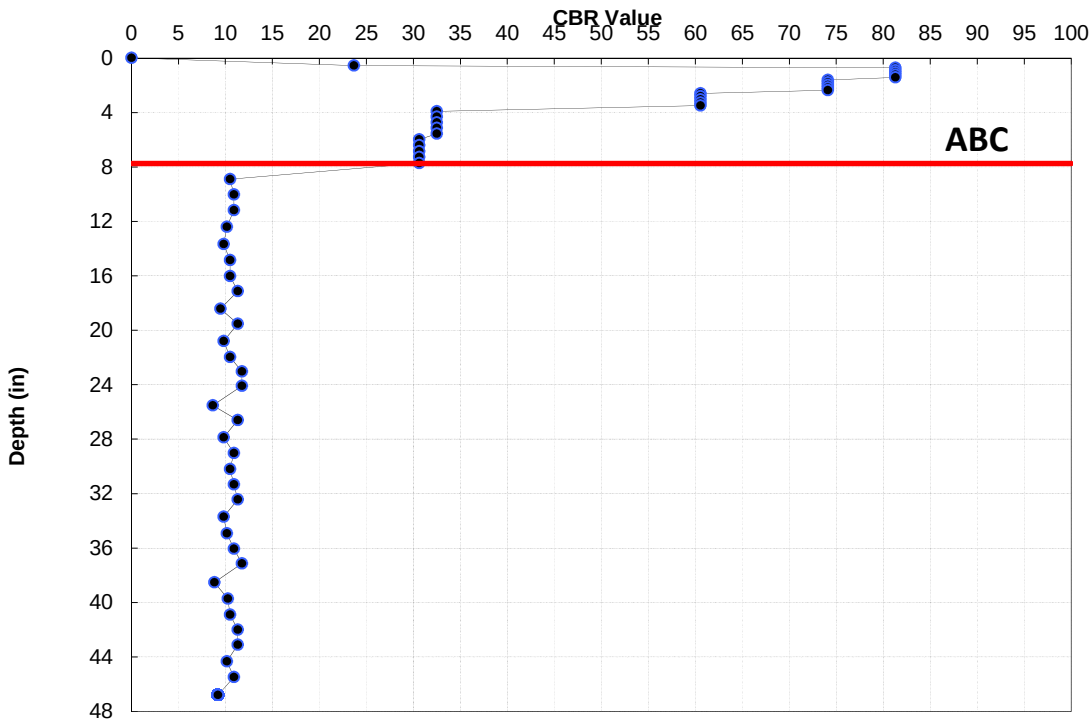
20

Y8 - 11+25 SB OSL

Datum = ABC
RAW
CUT
2/24 to 2/26/19

Interval 0.0 to 7.7	
# of Values	26
Avg CBR	54.6
Wghtd Avg.	100+
Max CBR	81.3
Min CBR	23.7

Interval 7.7 to 46.8	
# of Values	33
Avg CBR	10.5
Wghtd Avg.	10.5
Max CBR	11.8
Min CBR	8.6



CONE PENETROMETER RESULTS
NCDOT, GEOTECHNICAL ENGINEERING UNIT

PROJECT NO.	50146.3.1
PROJECT ID	C-5621
ROUTE	CATAWBA AVE. AND US 21 INTERSECT.
COUNTY	MECKLENBURG

GEOLOGIST	P. T. NEUMANN
GEOTECHS	S&ME

FILE	DCP GRAPHS (2)

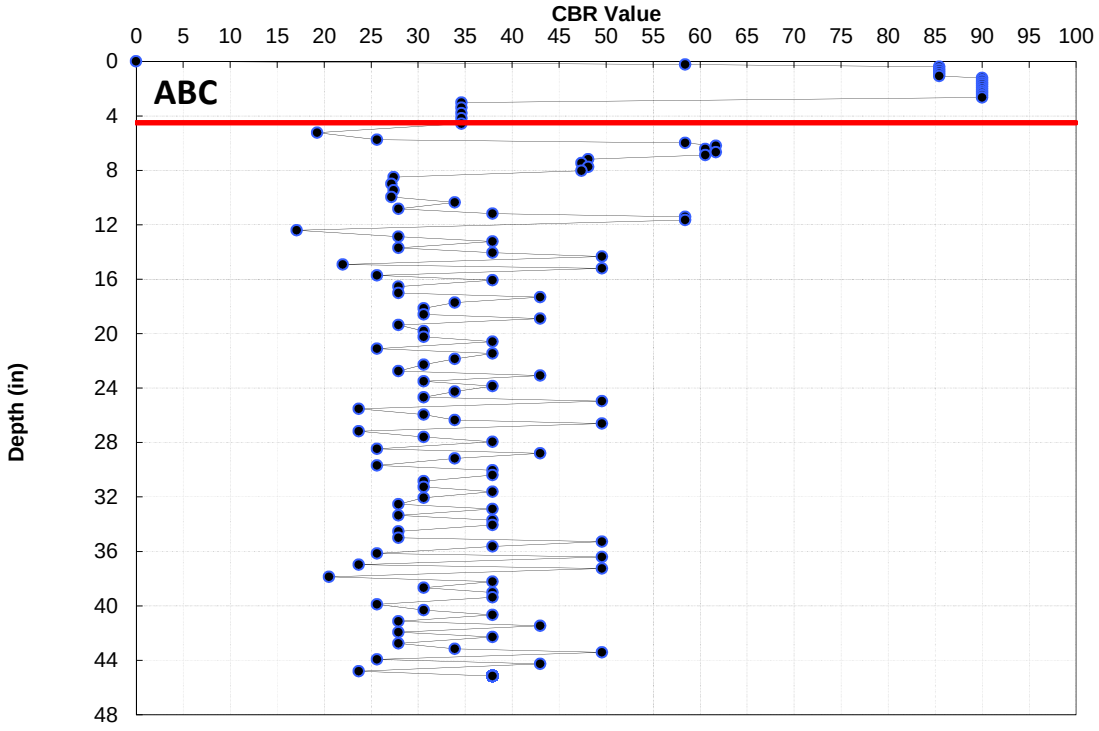
21

Y3A 11+50 SB OSL

Datum = ABC
RAW
CUT
2/24 to 2/26/19

Interval 0.0 to 1.7	
# of Values	10
Avg CBR	84.6
Wghtd Avg.	83.3
Max CBR	90.0
Min CBR	58.4

Interval 1.7 to 45.2	
# of Values	112
Avg CBR	38.6
Wghtd Avg.	34.4
Max CBR	90.0
Min CBR	17.1



PAVEMENT CORES FOR
50146.1.F1 (C-5621) MECKLENBURG COUNTY

LINE	STATION	ABC (in)	LAYER THICKNESS (in)	LAYER	LIFT(S)	REMARKS
-L-	13+00 WB OSL	~ 6	7.00	S	3	Flat and elongated aggregate (FEA), mechanical break between 2nd and 3rd lifts, numerous small voids in 2nd lift, some bleeding in 3rd lift.
	9.25" Asphalt		2.25	I	1	Low to moderate severity stripping with some material missing.
-L-	13+25 EB RT LN	-	6.00	S	4	FEA
	26.00" Asphalt		3.75	I	1	Mechanical break with lower contact, mod. severity stripping/oxidation with numerous voids, FEA.
			17.00	B	1	Top 3.25" - Mechanical break with upper contact, mod. sev. stripping/oxid. with numerous small voids, FEA. Middle 7.75" - Low sev. stripping/oxid. with numerous small voids. Bottom 6.00" - Mod. sev. stripping/oxid. with numerous voids, FEA.
-L-	16+00 WB OSL	~ 6	3.25	S	2	FEA
	6.50" Asphalt		3.00	I	1	FEA and rounded quartz aggregate.
-L-	16+00 WB OSL	6.25	3.50	S	2	FEA
	8.75" Asphalt		5.25	I	1	Low severity stripping/oxidation near base with some voids, FEA, rounded quartz aggregate.
-L-	16+70 EB OSL	11.00	2.50	S	2	Full-depth crack, FEA.
	7.00" Asphalt		4.25	I	1	Full-depth crack, low severity stripping/oxidation with some voids, FEA.
-L-	19+00 WB OSL	-	2.00	S	1	FEA
	9.00" Asphalt		2.75	I	1	FEA
			4.25	B	1	Low to mod. sev. stripping/oxid. in the bottom 3" with numerous voids and material missing, FEA.
-L-	19+00 EB OSL (I)	-	3.25	S	2	FEA
	5.25" Asphalt		1.50	I	1	FEA, rounded quartz aggregate, some bleeding.
	6.00" Concrete		0.50	S	1	Thin layer of dense aggregate.
			6.00	C	1	Very large rounded quartz aggregate, some voids.
-L-	19+00 EB OSL (O)	-	2.25	S	2	Bottom-up crack, FEA, delaminated at lower contact, 2nd lift has low sev. stripping/oxid. w/voids.
	10.00" Asphalt		2.00	I	1	Cored on edge, some bleeding and FEA.
			5.75	B	1	Cored on edge, low severity stripping/oxidation with numerous small voids, some bleeding, FEA.
-Y1A-	11+00 NB RTL	10.00	1.50	S	1	1.5" top-down crack, FEA.
	8.50" Asphalt		7.00	I	2	Mechanical break between lifts, low to moderate severity stripping/oxidation with numerous voids and material missing near base, abundant FEA.
-Y1A-	13+00 NB OSL	7.25	1.00	S	1	FEA
	6.75" Asphalt		6.00	I	2	Lift 1: Delaminated 1.25" from top, low to high sev. strip./oxid. w/numerous voids and material missing, FEA. Lift 2: Low to high sev. strip./oxid. w/material missing 1.5" from base, FEA.
-Y1A-	13+00 SB OSL	10.00	4.00	S	3	Full-depth crack. Lift 1: Abundant FEA. Lift 2: Numerous small voids, bleeding. Lift 3: Numerous small voids, FEA.
	3.50" Asphalt					
-Y1A-	13+00 CTL	9.25	5.25	S	4	Numerous small voids in 1st, 3rd, & 4th lifts. Abundant FEA in 1st & 3rd lift. FEA in 2nd & 4th lifts.
	7.25" Asphalt		2.00	I	1	Some voids, abundant FEA.
-Y1B-	19+50 SB PS	8.00	4.00	S	3	FEA, numerous small voids in 1st and 3rd lifts, some bleeding in 1st lift.
	4.25" Asphalt					
-Y1B-	19+50 NB OSL	10.00	7.00	S	3	1.5" bottom-up crack, FEA, numerous small voids in 2nd and 3rd lifts, some bleeding in 2nd lift. Low severity stripping/oxidation with material missing in 3rd lift.
	7.00" Asphalt					

PAVEMENT CORES FOR
50146.1.F1 (C-5621) MECKLENBURG COUNTY

LINE	STATION	ABC (in)	LAYER THICKNESS (in)	LAYER	LIFT(S)	REMARKS
-Y1B-	19+50 NB PS	10.00	5.00	S	3	Lifts 1-3: FEA. Lifts 2-3: Delaminated between lifts, low to moderate severity stripping/oxidation with numerous small voids and material missing.
	5.00" Asphalt					
-Y2-	11+30 NB OSL	7.25	2.50	S	1	Full-depth crack, low to moderate severity stripping/oxidation with material missing, FEA.
	4.75" Asphalt		2.25	I	1	Full-depth crack, low to moderate severity stripping/oxidation with material missing, FEA.
-Y2-	16+00 NB OSL	11.00	2.25	S	2	FEA, numerous small voids and bleeding in the 2nd lift.
	4.50" Asphalt		2.00	I	1	FEA and rounded quartz aggregate.
-Y2-	16+00 CTL	10.00	2.25	S	2	Full-depth crack with material mising, FEA, bleeding in the 2nd lift.
	3.75" Asphalt		1.50	I	1	Full-depth crack with material mising, rounded quartz aggregate, some FEA.
-Y2-	16+20 SB OSL	11.00	2.00	S	2	FEA, some voids in 2nd lift.
	4.75" Asphalt		2.50	I	1	FEA and rounded quartz aggregate with some voids.
-Y7-	12+40 EB OSL	8.25	2.75	S	2	Full-depth crack, mechanical break between lifts. Lift 1: Mult. pieces. Lift 2: Abundant FEA.
	4.25" Asphalt		1.00	I	1	Full-depth crack, low severity stripping/oxidation with numerous voids, FEA.
-Y8-	11+25 SB OSL	7.75	4.00	S	2	1.5" top-down crack. Lift 1: Numerous small voids, rounded quartz aggregate and some FEA. Lift 2: Rounded quartz aggregate, some FEA.
	4.00" Asphalt					
-Y3A-	11+50 SB OSL	4.50	4.25	S	3	Lifts 1-3: FEA. Lifts 2-3: Numerous small voids. Lift 2: Bleeding.
	4.25" Asphalt					