



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).

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
<b>TOTAL</b>			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
<b>Total Quantity of Geotextile for Soil Stabilization =</b>							<b>3,000</b>	<b>SY</b>
1099500000-E	Shallow Undercut	505 - Aggregate Subgrade	II. B	Contingency	N/A	N/A	1,000	CY
<b>Total Quantity of Shallow Undercut =</b>							<b>1,000</b>	<b>CY</b>
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
<b>Total Quantity of Class IV Subgrade Stabilization =</b>							<b>3,328</b>	<b>TON</b>
1110000000-E	Stabilizer Aggregate	510 - Aggregate Stabilization	II. A	Contingency	N/A	N/A	250	TON
<b>Total Quantity of Stabilizer Aggregate =</b>							<b>250</b>	<b>TON</b>
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
<b>Total Quantity of Geotextile for Pavement Stabilization =</b>							<b>3,038</b>	<b>SY</b>

REFERENCE: C-5621

PROJECT: 50146.3.1

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

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

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11-14	CORE PHOTOS
15-22	LAB SUMMARY

**ROADWAY  
SUBSURFACE INVESTIGATION**

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

**PAVEMENT AND SUBGRADE INVENTORY**

CAUTION NOTICE

THE SUBSURFACE INFORMATION AND THE SUBSURFACE INVESTIGATION ON WHICH IT IS BASED WERE MADE FOR THE PURPOSE OF STUDY, PLANNING AND DESIGN, AND NOT FOR CONSTRUCTION OR PAY PURPOSES. THE VARIOUS FIELD BORING LOGS, ROCK CORES AND SOIL TEST DATA AVAILABLE MAY BE REVIEWED OR INSPECTED IN RALEIGH BY CONTACTING THE N. C. DEPARTMENT OF TRANSPORTATION, GEOTECHNICAL ENGINEERING UNIT AT (919) 707-6850. THE SUBSURFACE PLANS AND REPORTS, FIELD BORING LOGS, ROCK CORES AND SOIL TEST DATA ARE NOT PART OF THE CONTRACT.

GENERAL SOIL AND ROCK STRATA DESCRIPTIONS AND INDICATED BOUNDARIES ARE BASED ON A GEOTECHNICAL INTERPRETATION OF ALL AVAILABLE SUBSURFACE DATA AND MAY NOT NECESSARILY REFLECT THE ACTUAL SUBSURFACE CONDITIONS BETWEEN BORINGS OR BETWEEN SAMPLED STRATA WITHIN THE BOREHOLE. THE LABORATORY SAMPLE DATA AND THE IN SITU (IN-PLACE) TEST DATA CAN BE RELIED ON ONLY TO THE DEGREE OF RELIABILITY INHERENT IN THE STANDARD TEST METHOD. THE OBSERVED WATER LEVELS OR SOIL MOISTURE CONDITIONS INDICATED IN THE SUBSURFACE INVESTIGATIONS ARE AS RECORDED AT THE TIME OF THE INVESTIGATION. THESE WATER LEVELS OR SOIL MOISTURE CONDITIONS MAY VARY CONSIDERABLY WITH TIME ACCORDING TO CLIMATIC CONDITIONS INCLUDING TEMPERATURES, PRECIPITATION AND WIND, AS WELL AS OTHER NON-CLIMATIC FACTORS.

THE BIDDER OR CONTRACTOR IS CAUTIONED THAT DETAILS SHOWN ON THE SUBSURFACE PLANS ARE PRELIMINARY ONLY AND IN MANY CASES THE FINAL DESIGN DETAILS ARE DIFFERENT. FOR BIDDING AND CONSTRUCTION PURPOSES, REFER TO THE CONSTRUCTION PLANS AND DOCUMENTS FOR FINAL DESIGN INFORMATION ON THIS PROJECT. THE DEPARTMENT DOES NOT WARRANT OR GUARANTEE THE SUFFICIENCY OR ACCURACY OF THE INVESTIGATION MADE, NOR THE INTERPRETATIONS MADE, OR OPINION OF THE DEPARTMENT AS TO THE TYPE OF MATERIALS AND CONDITIONS TO BE ENCOUNTERED. THE BIDDER OR CONTRACTOR IS CAUTIONED TO MAKE SUCH INDEPENDENT SUBSURFACE INVESTIGATIONS AS HE DEEMS NECESSARY TO SATISFY HIMSELF AS TO CONDITIONS TO BE ENCOUNTERED ON THE PROJECT. THE CONTRACTOR SHALL HAVE NO CLAIM FOR ADDITIONAL COMPENSATION OR FOR AN EXTENSION OF TIME FOR ANY REASON RESULTING FROM THE ACTUAL CONDITIONS ENCOUNTERED AT THE SITE DIFFERING FROM THOSE INDICATED IN THE SUBSURFACE INFORMATION.

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

PERSONNEL

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INVESTIGATED BY D. STROTHER  
 DRAWN BY J. NELSON  
 CHECKED BY V. MITCHEV  
 SUBMITTED BY V. MITCHEV  
 DATE MARCH 2019

 3201 SPRING FOREST ROAD  
 RALEIGH, NC 27616  
 (919) 872-2660



DocuSigned by:  
Vladimir G. Mitchev 2019  
 BCFD5C... DATE

DOCUMENT NOT CONSIDERED FINAL  
UNLESS ALL SIGNATURES COMPLETED

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

GEOTECHNICAL ENGINEERING UNIT

SUBSURFACE INVESTIGATION

SOIL AND ROCK LEGEND, TERMS, SYMBOLS, AND ABBREVIATIONS

Table with 4 main columns: SOIL DESCRIPTION, GRADATION, ROCK DESCRIPTION, and TERMS AND DEFINITIONS. Contains detailed legends for soil types, gradations, rock types, and various geotechnical terms and symbols.

**PAVEMENT INVESTIGATION DATA SHEET**

Project: 50146.3.1  
TIP: C-5621

County: MECKLENBURG  
Route: INTERSECTION OF SR-5544 (CATAWBA AVE) AND US 21

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

Position (Sta., Lane, Shldr.)	Cut/Fill (Est. of Amount) (ft)	Width		Offset Distance (See Notes) (ft)	Crown "C" or Super "S"	Gross to Top of Soil (in)	Thickness				Pavement Layering	Subgrade				Asphalt Notes	GPS Coordinates					
		Lane(s) (ft)	Shoulder(s) (ft)				Asphalt (in)	Concrete (in)	ABC (in)	Stabilized Soil Subgrade (in)		Description	Sample Number	AASHTO Classification	Soil Moisture		Probe Depth (ft)	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 concrete. 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	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

**PAVEMENT INVESTIGATION DATA SHEET**

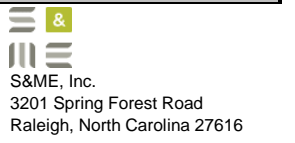
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Route: INTERSECTION OF SR-5544 (CATAWBA AVE) AND US 21

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

Position (Sta., Lane, Shldr.)	Cut/Fill (Est. of Amount)(ft)	Width		Offset Distance (See Notes) (ft)	Crown "C" or Super "S"	Thickness				Pavement Layering	Subgrade					Asphalt Notes	GPS Coordinates						
		Lane(s) (ft)	Shoulder(s) (ft)			Gross to Top of Soil (in)	Asphalt (in)	Concrete (in)	ABC (in)		Stabilized Soil Subgrade (in)	Description	Sample Number	AASHTO Classification	Soil Moisture		Probe Depth (ft)	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



CONE PENETROMETER DATA CODE SHEET				TIP	PROJECT I.D.	ROUTE	
				C-5621	50146.3.1	Catawba Ave And US21 Intersection	
TEST LOCATIONS DESCRIPTION				COUNTY	ENGINEER	TECHNICIANS	
				Mecklenburg	Vlad Mitchev	Darin Strother	
L 13+00 WB OSL				DATE RUN	TEST LOCATIONS DESCRIPTION	DATE RUN	
L 13+25 EB RTLN				2/24 to 2/26/19			2/24 to 2/26/19
DATUM	CUT/FILL	NORTHING	EASTING	DATUM	CUT/FILL	NORTHING	EASTING
ABC	FILL	636258.4	1442433.6	SG	FILL	636202.8	1442473.6
Cumulative Penetration in Centimeters				Cumulative Penetration in Centimeters			
1.4				7.2			
2.3				13.5			
3.2				18.0			
4.1				20.4			
5.0				21.4			
5.9				22.1			
13.9				22.7			
20.2				23.7			
Terminate for Utilities				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	
TEST LOCATIONS DESCRIPTION				COUNTY	ENGINEER	TECHNICIANS	
				Mecklenburg	Vlad Mitchev	Darin Strother	
L 16+00 WB OSL				DATE RUN	TEST LOCATION DESCRIPTION	DATE RUN	
L 16+00 WB OSL				2/24 to 2/26/19			2/24 to 2/26/19
DATUM	CUT/FILL	NORTHING	EASTING	DATUM	CUT/FILL	NORTHING	EASTING
ABC	CUT	636283.3	1442731.4				
Cumulative Penetration in Centimeters				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							

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



CONE PENETROMETER DATA CODE SHEET				TIP	PROJECT I.D.	ROUTE	
				C-5621	50146.3.1	Catawba Ave And US21 Intersection	
TEST LOCATIONS DESCRIPTION				COUNTY	ENGINEER	TECHNICIANS	
				Mecklenburg	Vlad Mitchev	Darin Strother	
L - 16+70 EB OSL				DATE RUN	TEST LOCATIONS DESCRIPTION	DATE RUN	
				2/24 to 2/26/19	L - 19+00 WB OSL	2/24 to 2/26/19	
DATUM	CUT/FILL	NORTHING	EASTING	DATUM	CUT/FILL	NORTHING	EASTING
ABC	FILL	636248.1	1442803.5	SG	CUT	636305.6	1443044.6
Cumulative Penetration in Centimeters				Cumulative Penetration in Centimeters			
1.2	59.2	91.0		3.4	68.2		
1.8	60.3	91.4		5.0	69.9		
2.4	61.2	91.6		5.7	71.7		
3.1	62.0	92.0		6.4	73.0		
3.7	63.1	92.3		7.1	74.7		
4.3	63.2	92.6		7.8	76.3		
5.0	64.3	92.9		8.5	77.8		
5.7	65.8	93.2		9.0	79.7		
6.4	68.5	93.6		9.4	81.1		
7.1	69.5	93.9		9.9	82.8		
7.8	70.4	94.2		10.3	84.5		
8.5	71.2	95.5		10.8	86.0		
9.1	72.3	94.8		11.3	87.3		
9.8	73.2	Terminate		11.8	89.1		
10.4	74.0			12.4	91.0		
11.1	74.8			12.9	92.3		
12.0	75.6			13.4	94.0		
12.9	76.4			14.2	95.6		
14.9	77.6			15.0	97.5		
16.9	78.7			15.7	98.9		
19.2	79.7			16.5	100.7		
21.0	80.9			17.3	102.3		
22.5	81.6			18.5	103.7		
23.4	81.8			19.7	Terminate		
24.6	82.1			21.4			
26.0	82.2			23.1			
27.9	82.5			24.7			
30.6	82.8			26.2			
31.9	83.1			27.5			
33.0	83.5			29.4			
33.7	83.8			31.3			
34.6	84.0			32.8			
35.2	84.4			34.5			
35.8	84.6			36.0			
36.2	85.0			37.8			
36.0	85.4			39.2			
37.5	85.6			40.5			
38.9	86.0			42.3			
40.0	86.3			44.1			
40.9	86.6			45.5			
41.6	87.0			47.1			
42.6	87.2			48.6			
43.5	87.6			50.5			
44.9	87.8			52.0			
47.0	88.2			53.7			
48.6	88.5			55.3			
50.6	88.8			57.1			
52.2	89.1			58.6			
53.6	89.4			60.1			
54.9	89.8			61.8			
56.0	90.1			63.4			
57.0	90.4			64.8			
58.1	90.7			66.8			

CONE PENETROMETER DATA CODE SHEET				TIP	PROJECT I.D.	ROUTE	
				C-5621	50146.3.1	Catawba Ave And US21 Intersection	
TEST LOCATIONS DESCRIPTION				COUNTY	ENGINEER	TECHNICIANS	
				Mecklenburg	Vlad Mitchev	Darin Strother	
L - 19+00 EB OSL (I)				DATE RUN	TEST LOCATION DESCRIPTION	DATE RUN	
				2/24 to 2/26/19	L - 19+00 EB OSL (O)	2/24 to 2/26/19	
DATUM	CUT/FILL	NORTHING	EASTING	DATUM	CUT/FILL	NORTHING	EASTING
SG	CUT	636292.8	1443045.8	SG	CUT	636288.5	1443047.8
Cumulative Penetration in Centimeters				Cumulative Penetration in Centimeters			
1.9				2.5	20.8	89.8	
3.1				4.3	21.1	91.3	
4.0				5.2	21.4	93.2	
4.5				6.0	21.8	Terminate	
4.9				7.1	22.2		
5.20				7.8	22.3		
5.50				8.4	22.4		
5.80				8.8	22.5		
6.00				9.1	22.7		
6.30				9.5	23.0		
6.50				9.8	23.2		
6.60				10.2	23.5		
6.80				10.5	23.7		
6.90				10.7	24.0		
7.05				11.0	24.9		
7.10				11.2	25.9		
7.20				11.5	26.8		
7.30				11.7	27.8		
7.50				12.0	28.7		
7.60				12.2	30.4		
7.70				12.5	32.0		
7.80				12.7	33.8		
7.85				13.0	35.6		
7.90				13.3	37.3		
7.95				13.7	39.9		
8.00				14.0	40.8		
8.10				14.3	42.5		
8.20				14.8	44.2		
8.30				15.3	46.3		
8.35				15.7	47.6		
8.40				16.2	49.8		
8.50				16.7	51.3		
8.55				17.1	53.2		
8.60				17.4	54.7		
8.70				17.8	56.4		
8.80				18.1	58.4		
8.90				18.5	60.1		
8.95				18.6	61.8		
9.00				18.7	63.5		
9.05				18.8	65.4		
9.1				18.9	67.1		
9.2				19.0	68.8		
Terminate for Utilities				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

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		TEST LOCATIONS DESCRIPTION		DATE RUN			
Y1A - 11+00 NB RTL				2/24 to 2/26/19		Y1A - 13+00 NB OSL		2/24 to 2/26/19			
DATUM	CUT/FILL	NORTHING	EASTING	DATUM	CUT/FILL	NORTHING	EASTING	DATUM	CUT/FILL	NORTHING	EASTING
ABC	FILL	636092.7	1442621.1	ABC	FILL	635923.8	1442598.7				
Cumulative Penetration in Centimeters						Cumulative Penetration in Centimeters					
0.6	17.7	97.5		1.1	55.0						
0.9	18.0	98.7		1.4	55.8						
1.3	18.3	99.8		1.7	56.9						
1.7	20.5	101.0		2.1	57.8						
1.8	22.8	Terminate		2.4	59.1						
2.3	27.2			2.7	60.0						
2.5	31.4			2.9	61.2						
2.8	35.8			3.1	62.3						
3.3	39.6			3.2	64.2						
3.5	42.3			3.4	64.5						
3.9	44.8			3.6	65.3						
4.2	47.3			3.8	66.6						
4.5	49.3			4.1	67.3						
4.9	51.8			4.3	68.3						
5.1	54.0			4.6	69.5						
5.5	55.1			4.8	70.7						
5.8	56.3			5.0	71.6						
6.1	57.2			5.2	72.8						
6.5	58.8			5.3	73.7						
6.8	59.7			5.5	74.8						
7.0	60.7			5.7	75.8						
7.3	61.8			6.0	77.0						
7.7	63.0			6.3	78.1						
8.0	64.2			6.7	79.2						
8.4	65.2			7.0	80.1						
8.6	66.4			7.3	81.3						
9.1	67.3			7.8	82.5						
9.4	68.6			8.4	83.6						
9.7	69.6			8.9	84.4						
9.9	70.9			9.5	85.3						
10.4	72.0			10.0	86.5						
10.6	73.2			11.3	87.6						
10.9	74.3			12.6	88.7						
11.3	75.3			14.0	89.9						
11.5	76.3			15.3	90.7						
11.8	77.5			16.6	91.9						
12.2	78.6			20.2	92.6						
12.5	79.8			24.5	93.7						
12.9	80.8			28.0	94.8						
13.1	82.0			31.3	96.1						
13.5	83.2			34.6	97.2						
13.9	84.3			37.3	98.0						
14.1	85.4			39.5	99.2						
14.5	86.5			41.2	100.2						
14.8	87.6			43.4	101.4						
15.2	88.6			45.3	102.2						
15.4	89.8			47.0	103.3						
15.8	90.8			48.5	104.5						
16.0	92.1			50.0	Terminate						
16.3	93.1			51.0							
16.9	94.2			52.2							
17.0	95.6			53.3							
17.2	96.4			54.1							

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		TEST LOCATION DESCRIPTION		DATE RUN			
Y1A - 13+00 SB OSL				2/24 to 2/26/19		Y1A - 13+00 CTL		2/24 to 2/26/19			
DATUM	CUT/FILL	NORTHING	EASTING	DATUM	CUT/FILL	NORTHING	EASTING	DATUM	CUT/FILL	NORTHING	EASTING
ABC	CUT	635920.8	1442574.5	ABC	FILL	635926.0	1442589.1				
Cumulative Penetration in Centimeters						Cumulative Penetration in Centimeters					
0.8	77.1			1.3							
1.3	78.9			2.2							
1.7	79.5			3.6							
2.2	80.2			5.7							
2.6	81.2			8.2							
3.1	81.8			10.1							
3.4	82.5			11.6							
3.8	83.4			14.0							
4.1	84.3			17.1							
4.5	85.1			20.2							
4.8	85.7			23.2							
5.4	86.4			26.0							
5.9	87.2			29.1							
6.5	88.2			31.5							
7.0	88.8			33.4							
7.6	89.5			35.2							
8.6	90.3			36.8							
9.7	91.2			38.6							
10.7	91.9			40.5							
14.3	92.6			42.2							
17.9	93.5			44.2							
19.7	94.3			45.8							
21.4	95.1			47.7							
23.3	95.7			49.3							
25.2	96.6			51.6							
26.8	97.4			53.1							
28.7	98.0			54.8							
30.5	98.9			56.7							
32.2	99.7			58.6							
34.1	100.4			60.2							
35.8	101.2			62.2							
37.7	101.9			64.3							
39.5	102.6			65.8							
41.1	103.5			67.8							
43.0	104.2			69.5							
44.9	105.1			71.2							
46.4	105.8			73.1							
48.2	106.4			74.8							
50.2	107.4			76.7							
52.0	108.1			78.4							
53.8	108.9			80.3							
55.5	109.7			82.1							
57.6	110.4			83.8							
59.2	111.2			85.7							
60.8	Terminate			87.4							
62.7				89.2							
64.4				91.1							
66.3				92.9							
68.1				94.6							
69.8				Terminate							
71.5											
73.3											
75.2											

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



CONE PENETROMETER DATA CODE SHEET				TIP		PROJECT I.D.		ROUTE			
				C-5621		50146.3.1		Catawba Ave And US21 Intersection			
TEST LOCATIONS DESCRIPTION				COUNTY		ENGINEER		TECHNICIANS			
				Mecklenburg		Vlad Mitchev		Darin Strother			
Y1B - 19+50 SB PS				DATE RUN		TEST LOCATIONS DESCRIPTION		DATE RUN			
				2/24 to 2/26/19		Y1B - 19+50 NB OSL		2/24 to 2/26/19			
DATUM	CUT/FILL	NORTHING	EASTING	DATUM	CUT/FILL	NORTHING	EASTING	DATUM	CUT/FILL	NORTHING	EASTING
ABC	CUT	634499.1	1442193.3	ABC	FILL	634491.7	1442212.5				
Cumulative Penetration in Centimeters						Cumulative Penetration in Centimeters					
3.6	53.2	98.6		1.4	19.6	77.7					
4.6	55.3	99.5		2.2	19.9	78.5					
5.0	55.8	100.3		2.8	20.1	79.2					
5.5	56.8	101.2		3.8	20.4	80.3					
5.7	57.6	101.9		4.7	20.6	81.1					
6.3	58.4	102.8		5.8	20.9	81.7					
6.8	59.4	103.6		7.0	21.1	82.6					
7.2	60.2	104.5		7.5	21.4	83.5					
7.6	60.8	105.2		8.0	21.6	84.6					
7.9	61.8	106.3		8.5	21.9	85.3					
8.4	62.3	106.9		9.1	22.1	86.5					
8.8	63.5	107.8		9.3	22.3	87.3					
9.2	64.5	108.6		9.6	22.6	88.1					
9.5	65.3	109.4		9.8	22.8	88.9					
9.8	66.1	110.4		10.1	23.1	89.7					
10.5	66.6	111.2		10.3	24.4	90.5					
10.8	67.8	111.9		10.6	25.8	91.5					
11.3	68.5	112.7		10.8	27.2	92.4					
11.7	69.4	113.6		11.1	29.3	93.3					
12.1	70.2	Terminate		11.3	31.3	94.1					
12.5	71.1			11.6	34.8	94.9					
12.9	71.8			11.8	38.3	95.7					
13.2	72.7			12.1	41.3	96.5					
13.8	73.5			12.3	44.3	97.8					
14.2	74.3			12.5	46.6	98.3					
14.6	75.2			12.8	48.9	99.3					
14.8	76.0			13.0	51.0	100.3					
15.2	76.8			13.3	53.1	100.8					
15.8	77.9			13.5	54.9	101.7					
16.2	78.5			13.8	56.8	102.8					
16.6	79.3			14.0	57.8	103.5					
16.9	80.3			14.3	58.5	104.4					
17.5	81.5			14.5	59.5	105.4					
17.9	81.9			14.7	60.4	106.2					
18.2	82.7			15.0	61.2	107.0					
18.5	83.6			15.2	62.0	Terminate					
19.1	84.3			15.5	62.8						
20.3	85.3			15.7	63.7						
21.8	86.1			16.0	64.5						
23.7	86.9			16.2	65.8						
25.8	87.7			16.5	66.4						
28.1	88.7			16.7	67.1						
30.0	89.4			17.0	68.2						
32.2	90.2			17.2	68.9						
34.3	91.2			17.4	69.7						
36.5	91.9			17.7	70.5						
38.4	92.8			17.9	71.6						
40.4	93.6			18.2	72.3						
42.6	94.6			18.4	73.2						
44.8	95.2			18.7	74.2						
46.7	96.1			18.9	75.1						
48.9	96.8			19.2	75.9						
50.8	97.7			19.4	76.8						

CONE PENETROMETER DATA CODE SHEET				TIP		PROJECT I.D.		ROUTE			
				C-5621		50146.3.1		Catawba Ave And US21 Intersection			
TEST LOCATIONS DESCRIPTION				COUNTY		ENGINEER		TECHNICIANS			
				Mecklenburg		Vlad Mitchev		Darin Strother			
Y1B - 19+50 NB PS				DATE RUN		TEST LOCATION DESCRIPTION		DATE RUN			
				2/24 to 2/26/19							
DATUM	CUT/FILL	NORTHING	EASTING	DATUM	CUT/FILL	NORTHING	EASTING	DATUM	CUT/FILL	NORTHING	EASTING
ABC	FILL	634434.4	1442218.7								
Cumulative Penetration in Centimeters						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											

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		TEST LOCATIONS DESCRIPTION				DATE RUN	
Y2 - 11+30 NB OSL (On Crack)				2/24 to 2/26/19		Y2 - 16+00 NB OSL				2/24 to 2/26/19	
DATUM	CUT/FILL	NORTHING	EASTING	DATUM	CUT/FILL	NORTHING	EASTING	DATUM	CUT/FILL	NORTHING	EASTING
ABC	CUT	637093.3	1442610.1	ABC	CUT	636589.2	1442589.3				
Cumulative Penetration in Centimeters						Cumulative Penetration in Centimeters					
0.7	96.5			1.2	49.6	84.7					
1.2	99.9			1.6	50.5	85.3					
1.7	103.2			2.1	51.6	86.0					
2.1	107.9			2.5	52.4	86.5					
2.4	112.3			2.9	53.3	87.0					
2.8	Terminate			3.4	54.1	87.6					
3.3				3.8	55.1	88.0					
3.8				4.3	55.9	88.7					
4.2				4.7	56.7	89.4					
4.5				5.1	57.5	90.0					
4.8				5.6	58.5	90.5					
5.2				6.0	59.3	91.1					
5.8				6.4	60.1	91.7					
6.2				6.9	60.9	92.4					
6.7				7.3	61.6	92.8					
7.1				7.7	62.4	93.4					
7.4				8.2	63.2	94.0					
7.9				8.6	63.8	94.6					
8.3				9.1	64.4	95.2					
8.6				9.5	64.9	95.7					
9.1				9.9	65.5	96.3					
9.5				10.4	66.1	96.9					
9.9				10.8	66.7	97.4					
10.4				11.2	67.3	98.0					
10.8				11.7	67.8	98.7					
11.2				12.1	68.4	99.2					
11.6				12.6	69.0	99.9					
11.9				13.0	69.6	100.7					
12.5				13.4	70.2	101.3					
12.9				13.9	70.8	101.8					
13.3				14.3	71.3	102.3					
13.5				15.6	71.9	102.8					
15.7				17.0	72.5	103.5					
17.8				18.3	73.1	104.0					
23.2				19.4	73.7	104.5					
28.4				20.7	74.2	105.1					
32.3				21.8	74.8	105.7					
35.9				23.1	75.4	106.2					
40.6				25.6	76.0	106.8					
45.3				27.9	76.5	107.4					
50.7				30.3	77.2	108.1					
56.1				32.3	77.7	108.6					
58.8				34.2	78.3	109.2					
61.8				36.3	79.0	109.7					
67.2				37.9	79.5	Terminate					
72.5				39.6	80.2						
76.2				41.0	80.6						
79.8				42.3	81.2						
83.6				43.6	81.9						
87.5				44.7	82.5						
90.2				45.7	83.0						
92.8				47.0	83.5						
94.9				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		TEST LOCATION DESCRIPTION				DATE RUN	
Y2 - 16+00 CTL (On Crack)				2/24 to 2/26/19		Y2 - 16+20 SB OSL				2/24 to 2/26/19	
DATUM	CUT/FILL	NORTHING	EASTING	DATUM	CUT/FILL	NORTHING	EASTING	DATUM	CUT/FILL	NORTHING	EASTING
ABC	CUT	636579.2	1442567.5	ABC	CUT	636557.7	1442553.1				
Cumulative Penetration in Centimeters						Cumulative Penetration in Centimeters					
0.3	15.5	75.2		1.4	18.9	84.2					
0.6	15.8	77.1		1.7	19.2	86.2					
0.9	16.0	78.9		2.1	19.6	88.1					
1.1	16.4	80.6		2.4	20.0	89.9					
1.5	16.6	82.3		2.7	20.2	91.8					
1.7	16.9	84.2		3.0	20.6	93.6					
2.2	17.0	85.8		3.4	20.9	95.6					
2.3	17.5	87.3		3.7	21.2	97.3					
2.8	17.9	89.2		4.0	21.5	99.2					
3.0	18.1	90.8		4.4	21.9	101.2					
3.2	18.3	92.6		4.7	22.2	103.1					
3.5	18.6	94.4		5.0	22.6	104.8					
3.9	18.9	96.2		5.4	22.8	106.8					
4.1	19.1	97.6		5.7	23.2	108.4					
4.6	19.4	99.6		6.0	23.6	110.6					
4.8	19.8	101.4		6.4	23.8	112.6					
4.9	20.1	103.1		6.7	24.0	114.8					
5.1	20.3	104.8		7.0	24.5	116.1					
5.5	20.5	106.1		7.4	24.9	Terminate					
5.7	20.9	108.2		7.7	25.2						
6.0	21.2	109.8		8.0	25.5						
6.4	21.4	111.6		8.3	25.9						
6.6	21.8	Terminate		8.7	26.3						
6.9	23.5			9.0	28.2						
7.2	25.2			9.3	29.8						
7.5	26.9			9.7	31.7						
7.8	28.7			10.0	33.6						
8.0	30.3			10.3	35.7						
8.4	32.2			10.7	37.5						
8.8	33.8			11.0	39.4						
8.9	35.6			11.3	41.3						
9.1	37.2			11.6	43.2						
9.5	39.1			12.0	44.8						
9.7	40.8			12.3	46.9						
10.1	42.4			12.6	48.8						
10.3	44.3			12.9	50.6						
10.7	45.9			13.3	52.6						
10.9	47.6			13.6	54.5						
11.1	49.5			14.0	56.3						
11.4	51.0			14.3	58.1						
11.8	52.9			14.6	59.8						
12.1	54.5			15.0	61.7						
12.3	56.4			15.3	63.5						
12.7	58.0			15.5	65.5						
12.8	59.8			15.9	67.8						
13.1	61.4			16.2	69.2						
13.4	63.3			16.6	71.2						
13.8	64.8			16.9	73.2						
14.1	66.8			17.3	74.8						
14.3	68.5			17.7	76.8						
14.5	70.2			18.1	78.5						
14.9	71.6			18.3	80.5						
15.1	73.6			18.5	82.3						

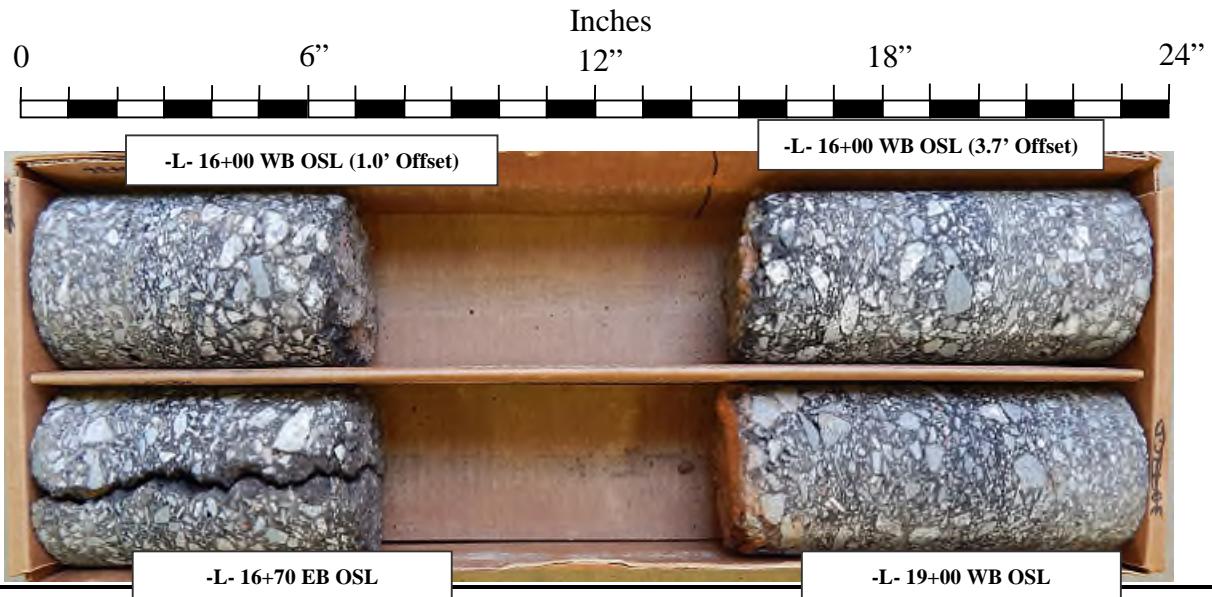
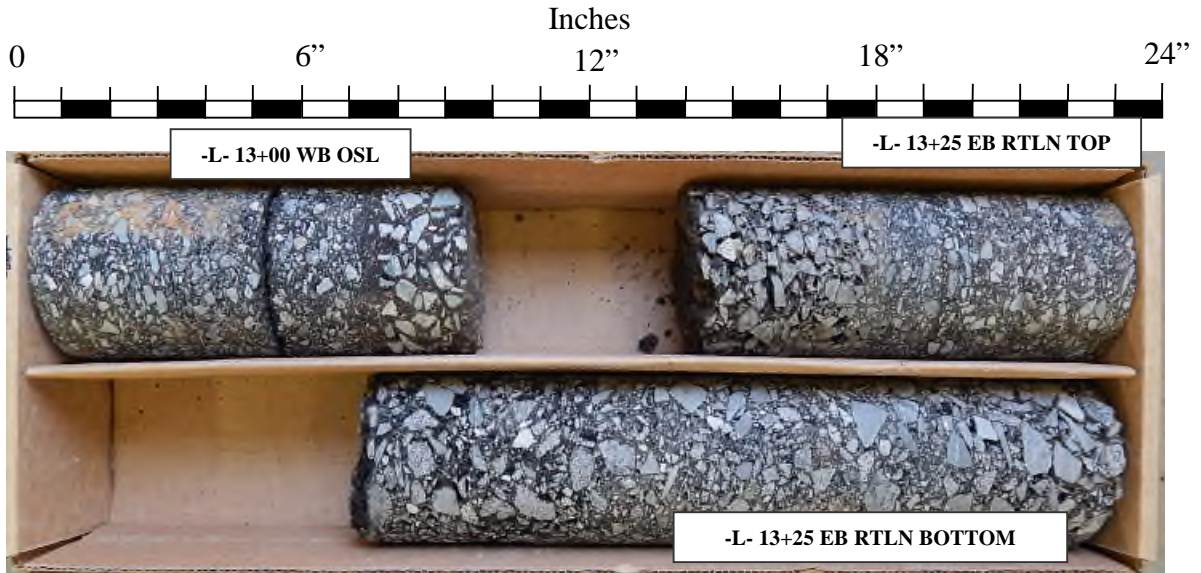
SG = Subgrade  
SS = Stabilized Soil  
CTBC = Cement-Treated Base Course  
ABC = Aggregate Base Course  
ESG = Estimated Subgrade

CONE PENETROMETER DATA CODE SHEET				TIP	PROJECT I.D.	ROUTE			
				C-5621	46451.1.1	Catawba Ave And US21 Intersection			
TEST LOCATIONS DESCRIPTION				COUNTY	ENGINEER	TECHNICIANS			
				Mecklenburg	Vlad Mitchev	Darin Strother			
Y7 - 12+40 EB OSL (ON CRACK)				DATE RUN	TEST LOCATIONS DESCRIPTION				DATE RUN
				2/24 to 2/26/19	Y8 - 11+25 SB OSL (ON CRACK)				2/24 to 2/26/19
DATUM	CUT/ FILL	NORTHING	EASTING	DATUM	CUT/ FILL	NORTHING	EASTING		
ABC	FILL	637276.8	1442857.7	ABC	CUT	637165.7	1443080.1		
Cumulative Penetration in Centimeters				Cumulative Penetration in Centimeters					
1.7	40.6	85.4		1.4	103.9				
2.1	41.3	86.3		1.8	106.7				
2.5	42.2	87.1		2.3	109.5				
2.9	43.0	88.0		2.7	112.6				
3.3	43.9	88.9		3.2	115.5				
3.7	44.7	89.7		3.6	118.9				
4.1	45.6	90.5		4.1	Terminate				
4.6	46.4	91.5		4.6					
5.1	47.3	92.2		5.0					
5.5	48.1	93.0		5.5					
6.0	48.7	93.8		6.0					
6.5	49.8	94.8		6.6					
7.1	50.4	95.6		7.2					
7.7	51.6	96.4		7.7					
8.3	52.6	97.3		8.3					
8.9	53.2	98.2		8.9					
9.5	54.0	99.2		9.9					
10.2	54.7	99.9		11.0					
11.0	55.6	100.8		12.0					
11.7	56.8	101.4		13.1					
12.5	57.5	102.5		14.1					
13.2	58.4	103.3		15.2					
14.1	59.6	104.3		16.3					
14.8	60.2	105.0		17.4					
15.9	60.8	105.9		18.5					
16.7	61.7	106.7		19.6					
17.5	62.6	107.4		22.6					
18.4	63.4	108.4		25.5					
19.5	64.2	109.3		28.4					
20.0	65.3	110.3		31.5					
20.8	65.7	111.0		34.7					
21.6	66.8	111.7		37.7					
22.7	67.6	112.7		40.7					
23.4	68.3	113.5		43.5					
24.3	69.3	114.5		46.8					
25.2	70.3	115.2		49.6					
26.1	71.0	116.5		52.8					
26.8	71.7	116.9		55.8					
27.8	72.5	Terminate		58.5					
28.6	73.6			61.2					
29.6	74.6			64.8					
30.3	75.5			67.6					
31.3	76.1			70.8					
31.9	77.2			73.7					
32.7	77.8			76.7					
33.8	78.8			79.6					
34.5	79.5			82.4					
35.4	80.4			85.6					
36.4	81.2			88.7					
37.2	82.6			91.6					
37.8	82.9			94.3					
38.7	83.7			97.8					
39.8	84.8			100.9					

CONE PENETROMETER DATA CODE SHEET				TIP	PROJECT I.D.	ROUTE			
				C-5621	46451.1.1	Catawba Ave And US21 Intersection			
TEST LOCATIONS DESCRIPTION				COUNTY	ENGINEER	TECHNICIANS			
				Mecklenburg	Vlad Mitchev	Darin Strother			
Y3A 11+50 SB OSL				DATE RUN	TEST LOCATION DESCRIPTION				DATE RUN
				2/24 to 2/26/19					2/24 to 2/26/19
DATUM	CUT/ FILL	NORTHING	EASTING	DATUM	CUT/ FILL	NORTHING	EASTING		
ABC	CUT	636416.0	1442973.2						
Cumulative Penetration in Centimeters				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								

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

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:

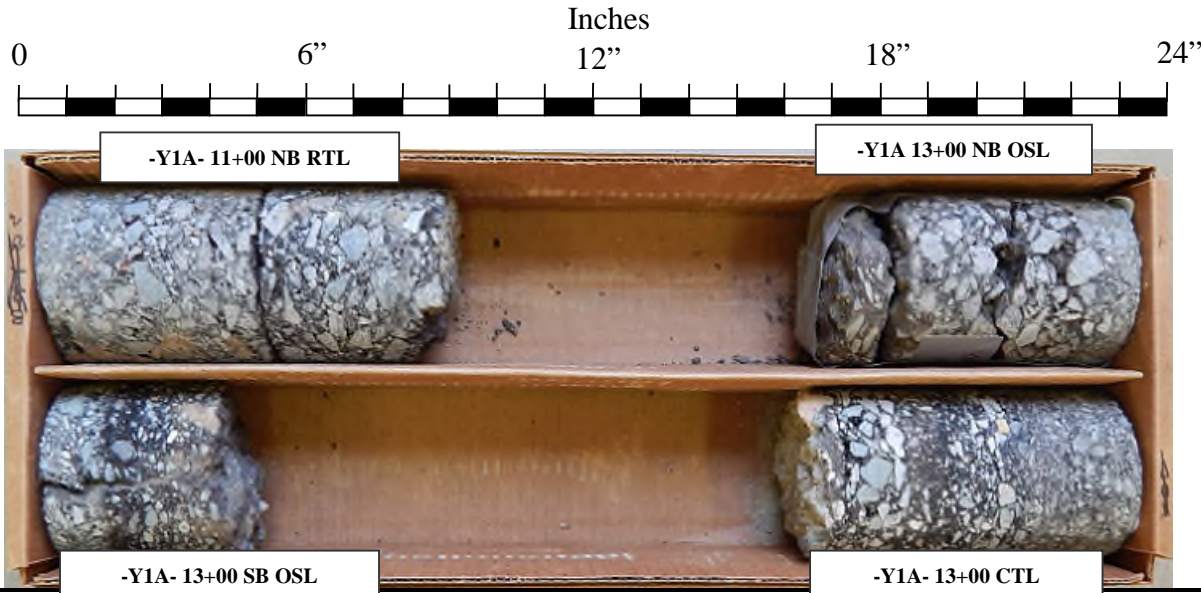
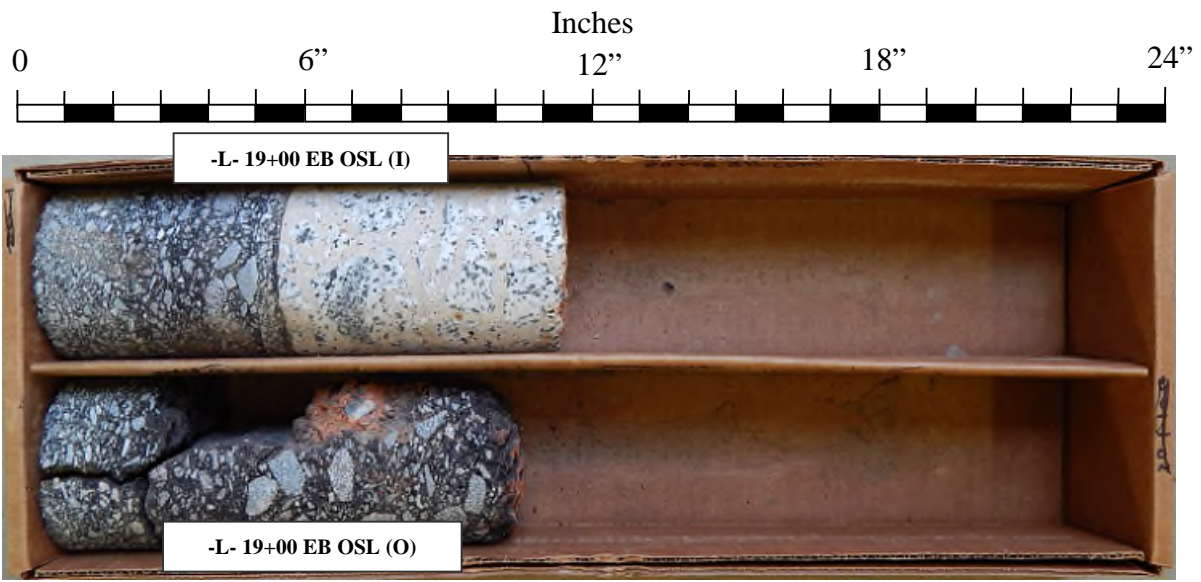
- |                        |                           |              |
|------------------------|---------------------------|--------------|
| OSL = Outside Lane     | ACCEL = Acceleration Lane | MED = Median |
| ISL = Inside Lane      | PS = Paved Shoulder       |              |
| RTL = Right Turn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



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



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



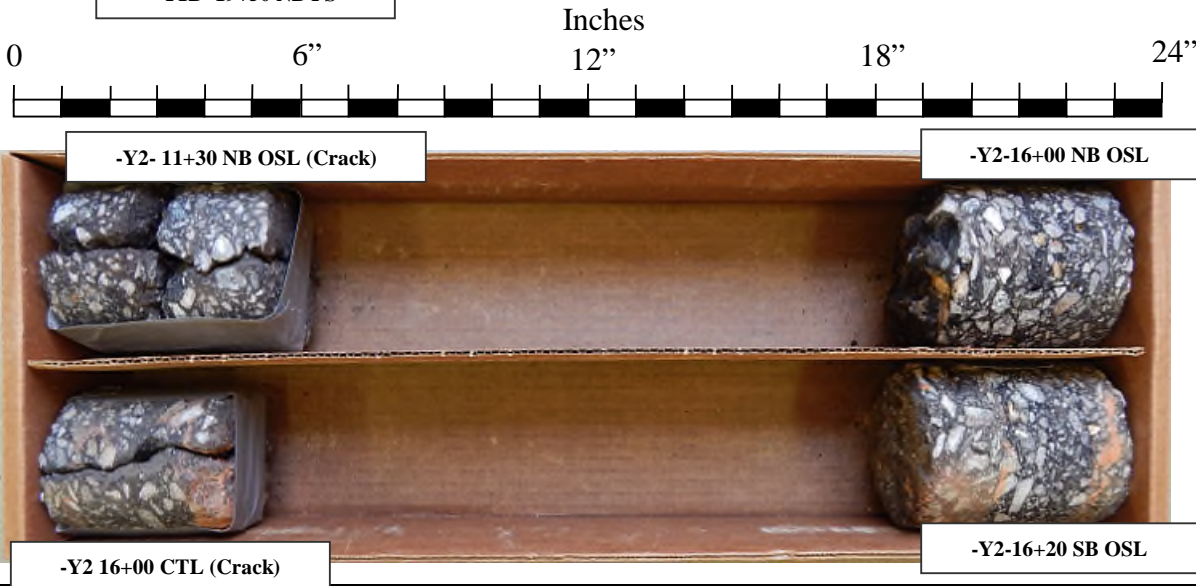
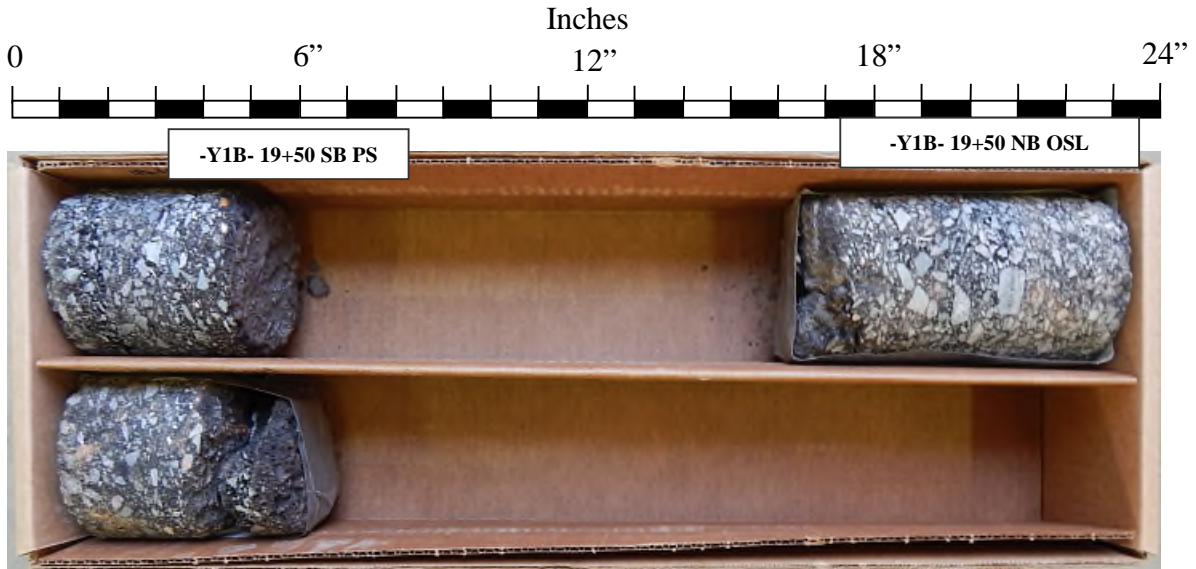
Notes:

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



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			



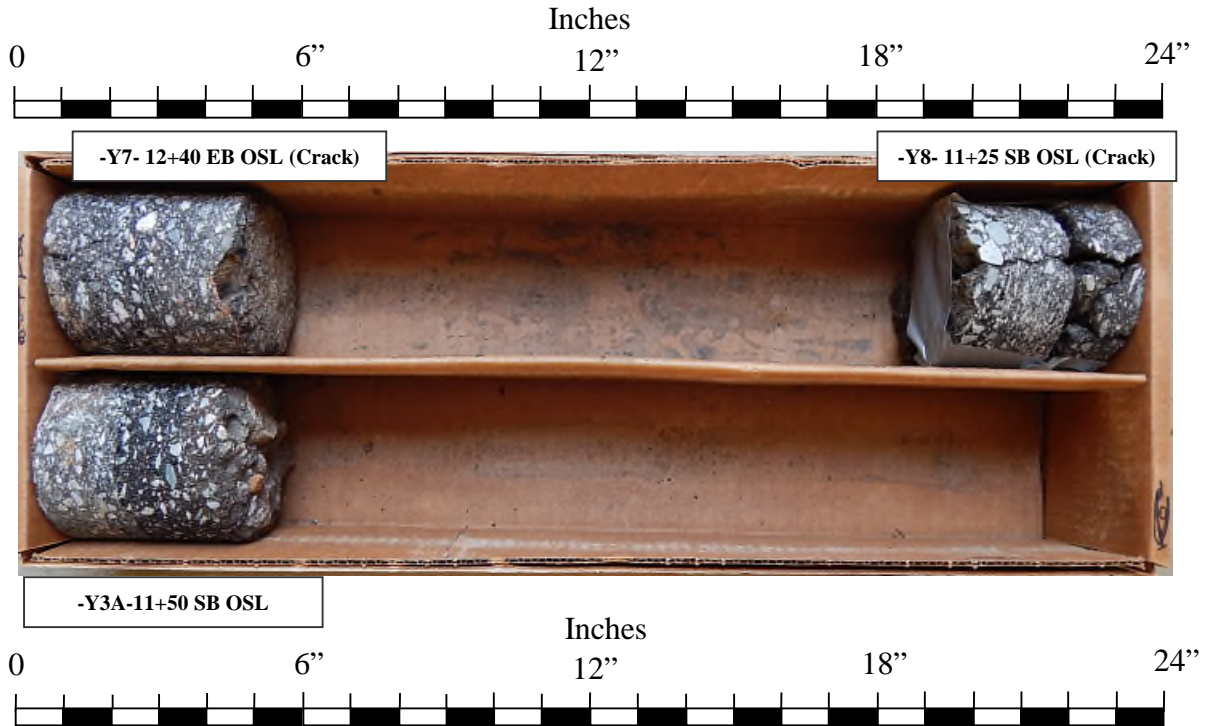
Notes:

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



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

<i>Project No.:</i> 50146.3.1	<i>I.D. No.:</i> C-5621	<i>County:</i> Mecklenburg	<i>Dates:</i> 2/24 to 2/26/19
<i>Site Description:</i> SR-5544 (Catawba Ave) and US-21 Intersection			
<i>Consultant:</i> S&ME, Inc.		<i>Core Size:</i> 4 - inch	<i>Drill Machine:</i> CME-55
<i>Geologist / Engineer:</i> 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	
OSS = Outside Shoulder	ISS = Inside Shoulder	



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
Federal ID No.: NI	TIP No.: C-5621
Project Name: Intersection of US 21 and SR 2697 (Catawba Avenue)	Date Tested: 3/8/19 - 3/19/19
Client Name: NCDOT-Geotech	Client Address: Poole Rd, Raleigh, NC

Sample No.	Station No.	Alignment	Sample Depth (ft)	AASHTO Classification	Total % Passing				Total Mortar Fraction (%)				LL	PL	PI	Organic	Moist. %
					Sieve #				Coarse Sand	Fine Sand	Silt	Clay					
					10	40	60	200									
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
Federal ID No.:	NI	Date Tested	3/8/19 - 3/19/19
Project Name:	Intersection of US 21 and SR 2697 (Catawba Avenue)		
Client Name:	NCDOT-Geotech	TIP No.:	C-5621
Client Address:	Poole Rd, Raleigh, NC		

Sample No.	Station No.	Alignment	Sample Depth (ft)	AASHTO Classification	Total % Passing				Total Mortar Fraction (%)				LL	PL	PI	Organic	Moist. %
					Sieve #				Coarse Sand	Fine Sand	Silt	Clay					
					10	40	60	200									
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 Determined.

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

Technician Name:

\_\_\_\_\_

Signature

NCDOT / 118-06-0305

Certification #

Vlad Mitchev

Technical Responsibility:

Project Manager

Position

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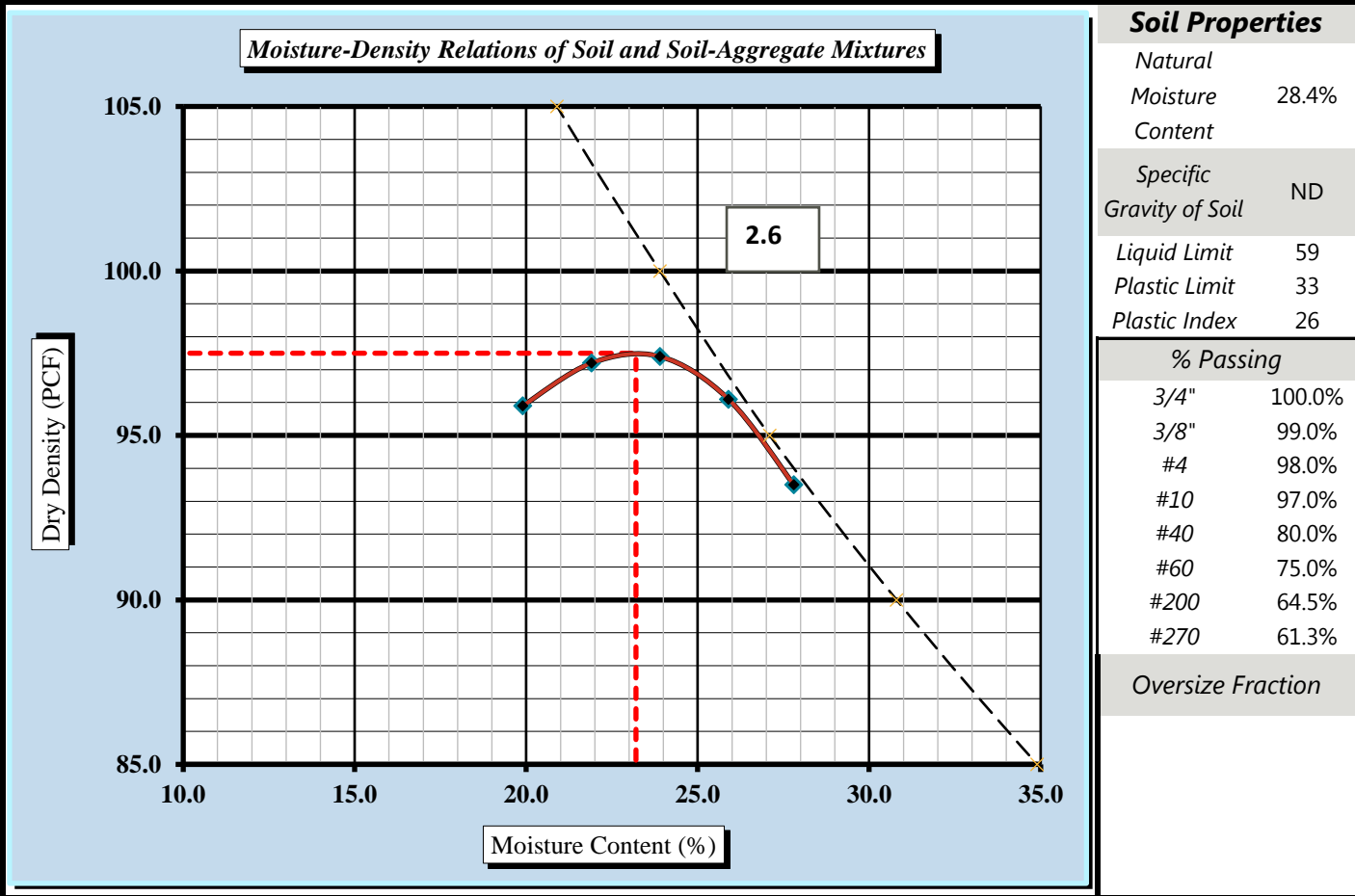
# MOISTURE - DENSITY REPORT



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

<b>Maximum Dry Density</b>	<b>97.5</b>	<b>PCF.</b>	<b>Optimum Moisture Content</b>	<b>23.2%</b>
<b>AASHTO T99 - - Method A</b>				



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

<u>Vlad Mitchev</u> Technical Responsibility	Signature	<u>Project Manager</u> Position	Date
---	-----------	------------------------------------	------

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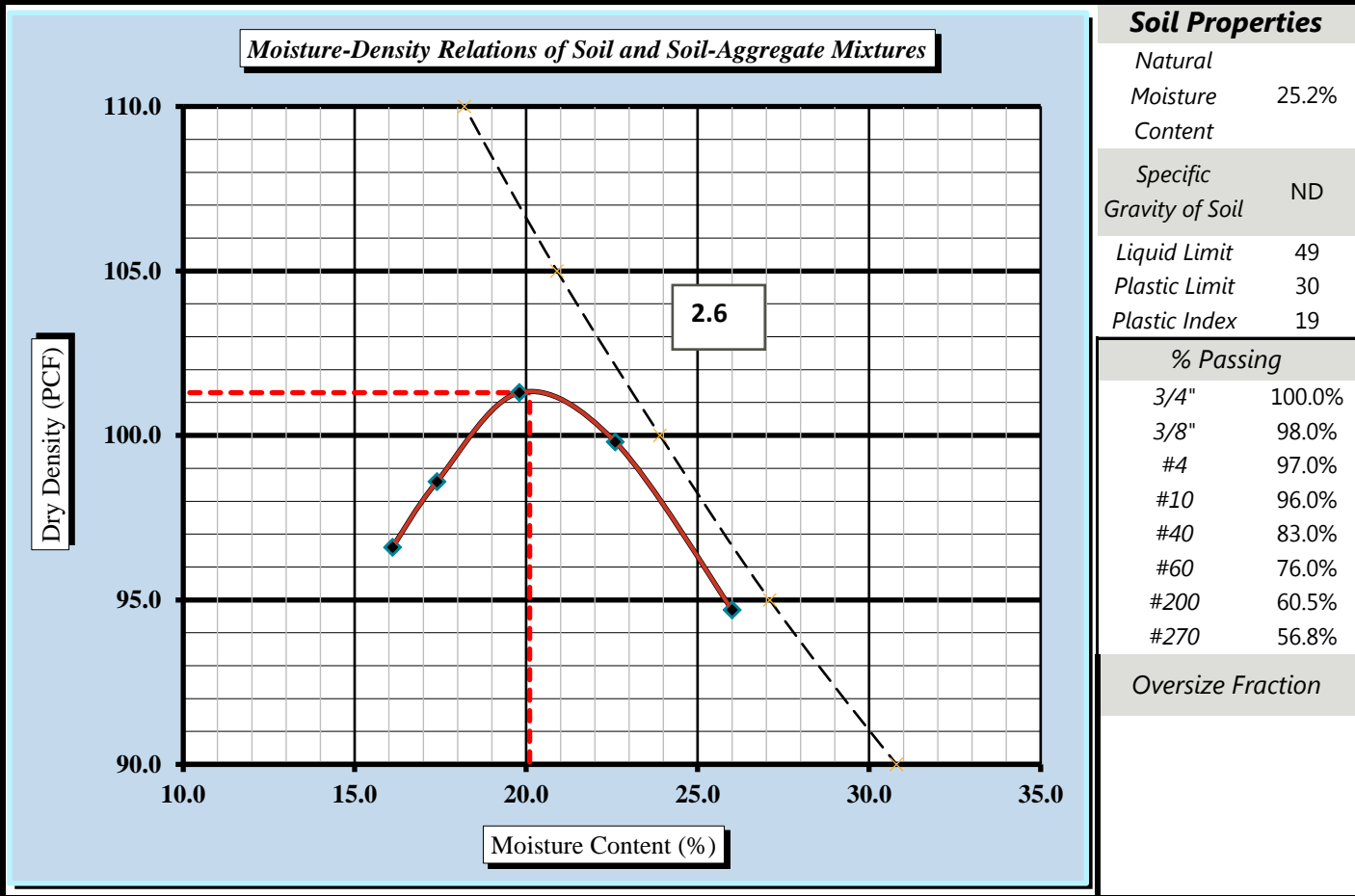
# MOISTURE - DENSITY REPORT



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

<b>Maximum Dry Density</b>	<b>101.3</b>	<b>PCF.</b>	<b>Optimum Moisture Content</b>	<b>20.1%</b>
<b>AASHTO T99 - - Method A</b>				



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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## CBR (CALIFORNIA BEARING RATIO) OF LABORATORY COMPACTED SOIL



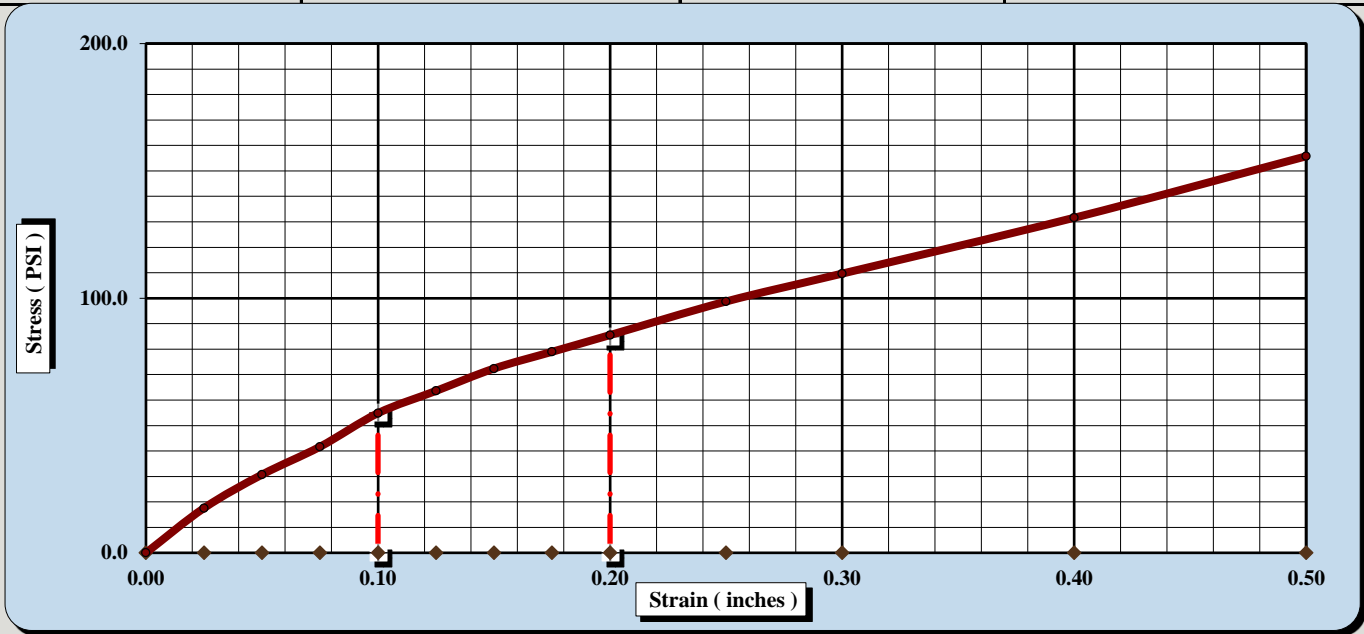
AASHTO T 193

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	Final Dry Density (PCF)	95.1
Initial Dry Density (PCF)	96.7	Moisture Content (top 1" after soaking)	31.5%
Moisture Content of the Compacted Specimen	23.1%	Percent Swell	1.8%
Percent Compaction	99.2%		

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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## CBR (CALIFORNIA BEARING RATIO) OF LABORATORY COMPACTED SOIL



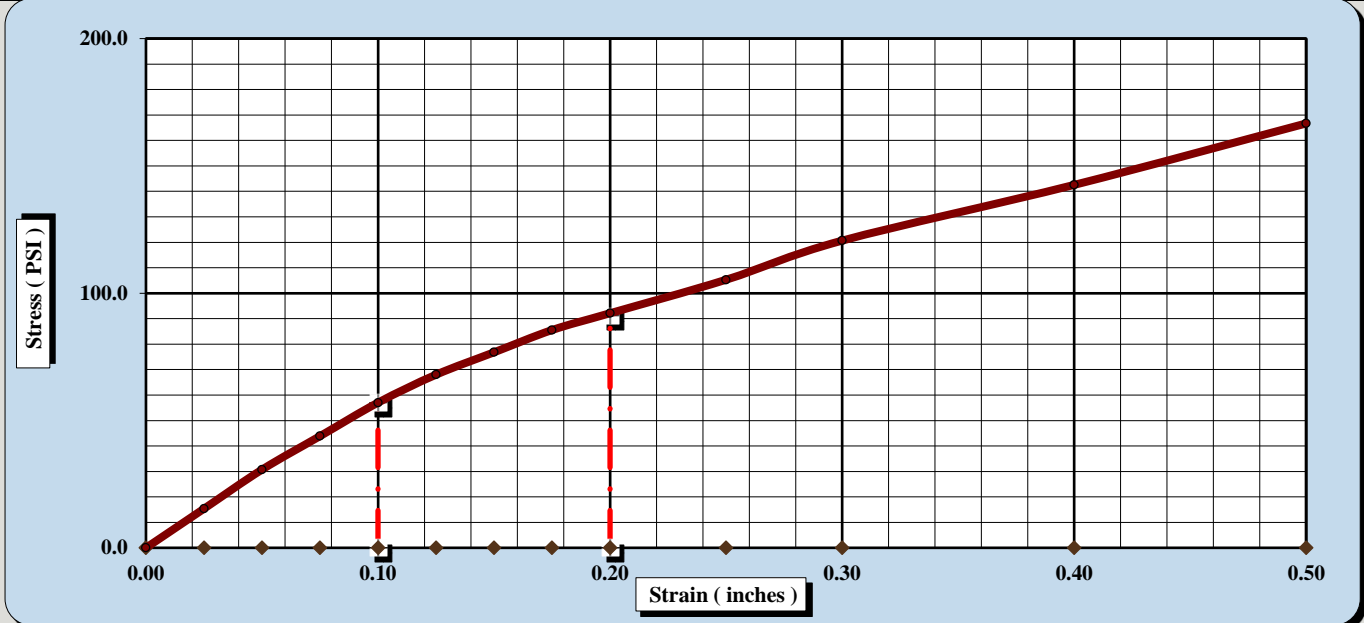
AASHTO T 193

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

<u>Vlad Mitchev</u>	_____	Project Manager	_____
<i>Technical Responsibility</i>	<i>Signature</i>	<i>Position</i>	<i>Date</i>

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## CBR (CALIFORNIA BEARING RATIO) OF LABORATORY COMPACTED SOIL



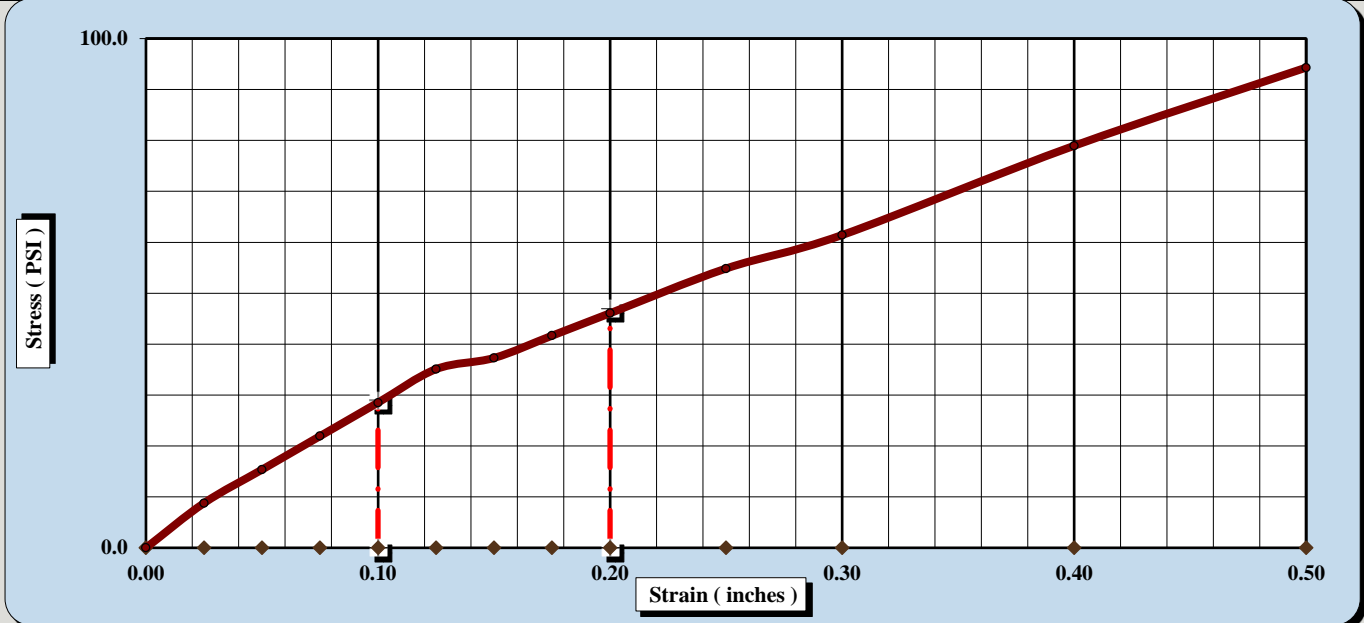
### AASHTO T 193

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	Final Dry Density (PCF)	99.9
Initial Dry Density (PCF)	102.3	Moisture Content (top 1" after soaking)	30.0%
Moisture Content of the Compacted Specimen	19.5%	Percent Swell	2.5%
Percent Compaction	101.0%		

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  
Technical Responsibility

Signature

Project Manager

Position

Date

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## CBR (CALIFORNIA BEARING RATIO) OF LABORATORY COMPACTED SOIL



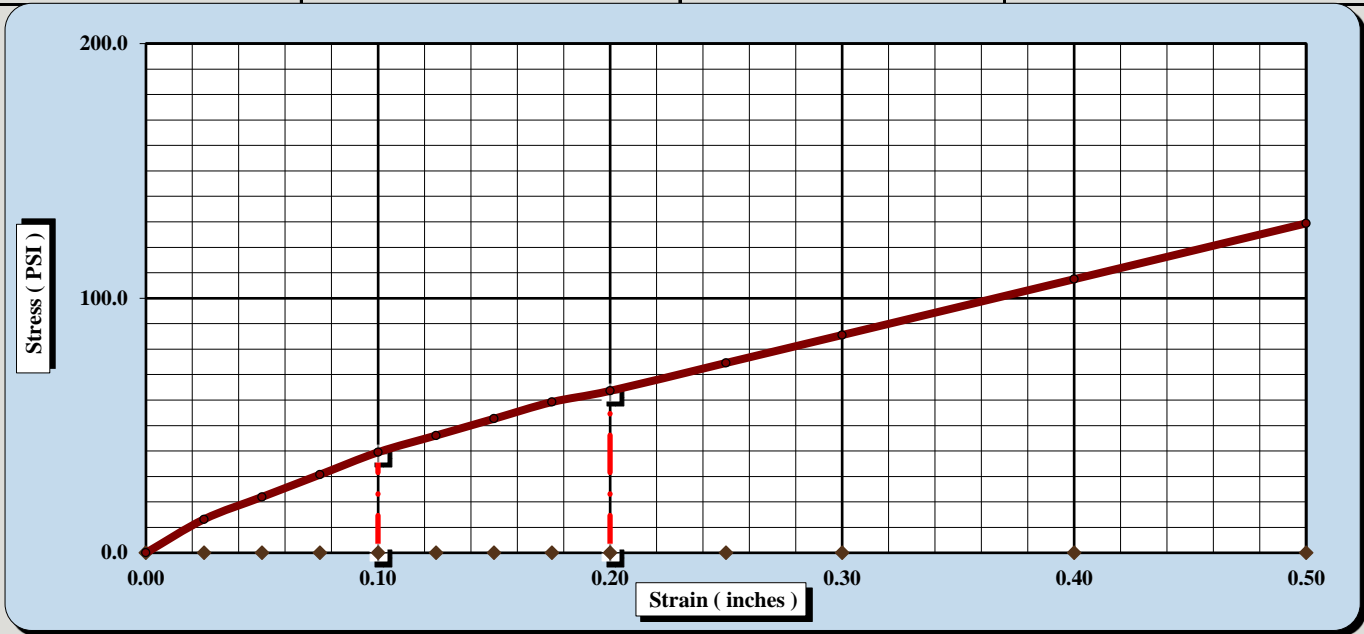
AASHTO T 193

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)
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	Final Dry Density (PCF)	100.9
Initial Dry Density (PCF)	103.7	Moisture Content (top 1" after soaking)	28.2%
Moisture Content of the Compacted Specimen	19.5%	Percent Swell	2.4%
Percent Compaction	102.3%		

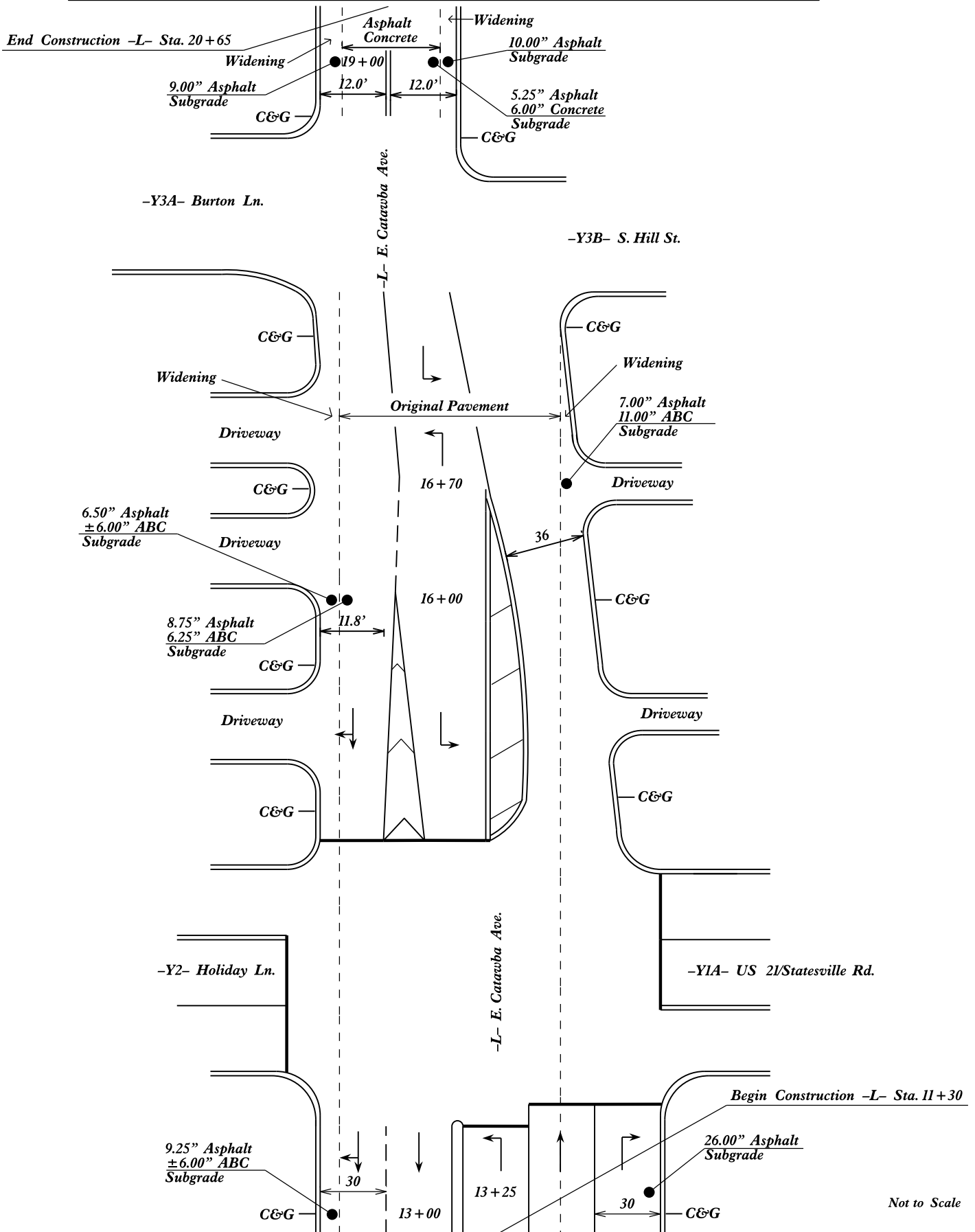
Soak Time:	96 Hrs.	Surcharge Weight	10.0	Surcharge Wt. per sq. Ft.	50.8
Liquid Limit	49	Plastic Index	19	umed Apparent Relative Density	2.600

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

<u>Vlad Mitchev</u>	_____	<u>Project Manager</u>	_____
<i>Technical Responsibility</i>	<i>Signature</i>	<i>Position</i>	<i>Date</i>

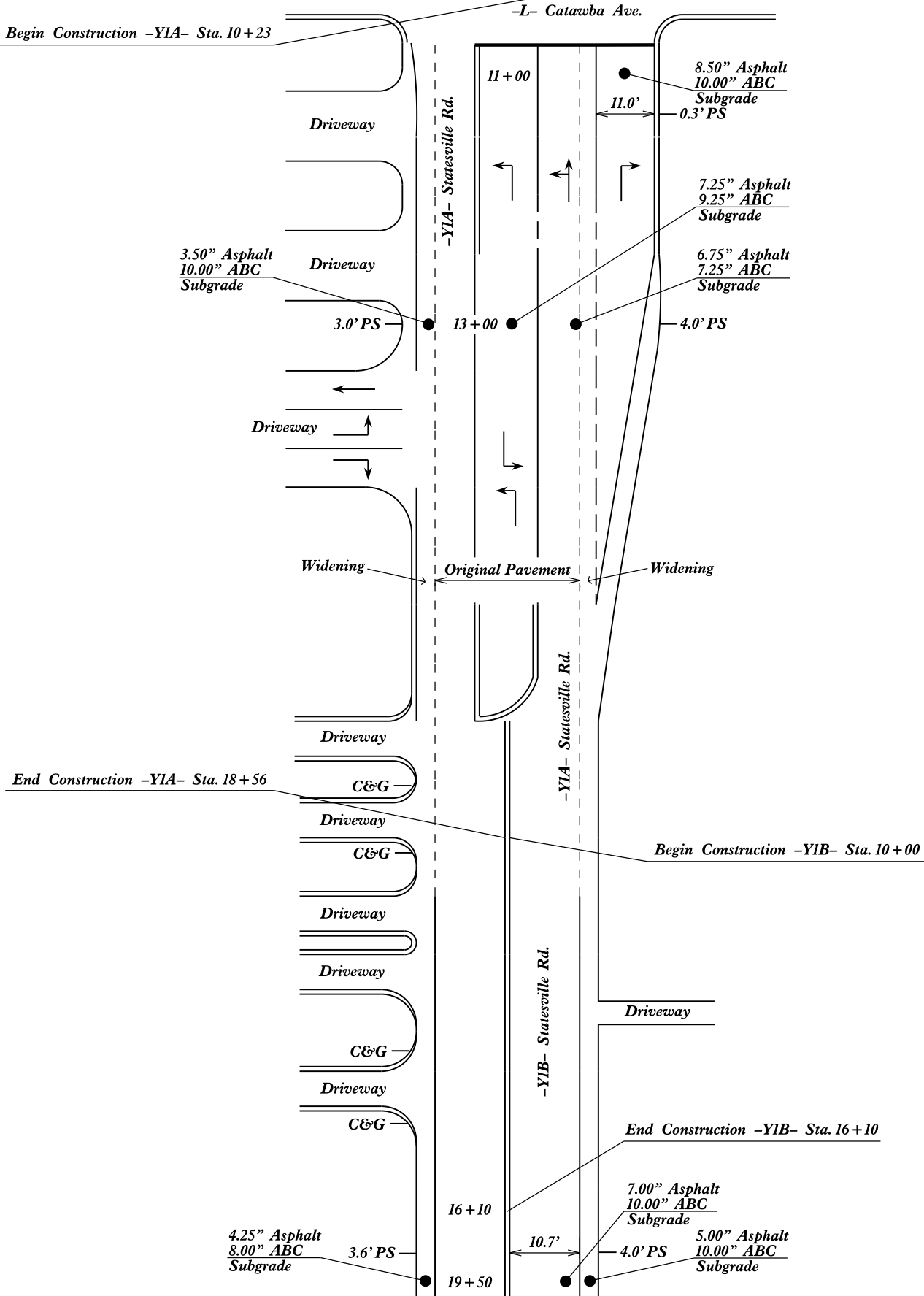
*This report shall not be reproduced, except in full without the written approval of S&ME, Inc.*

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

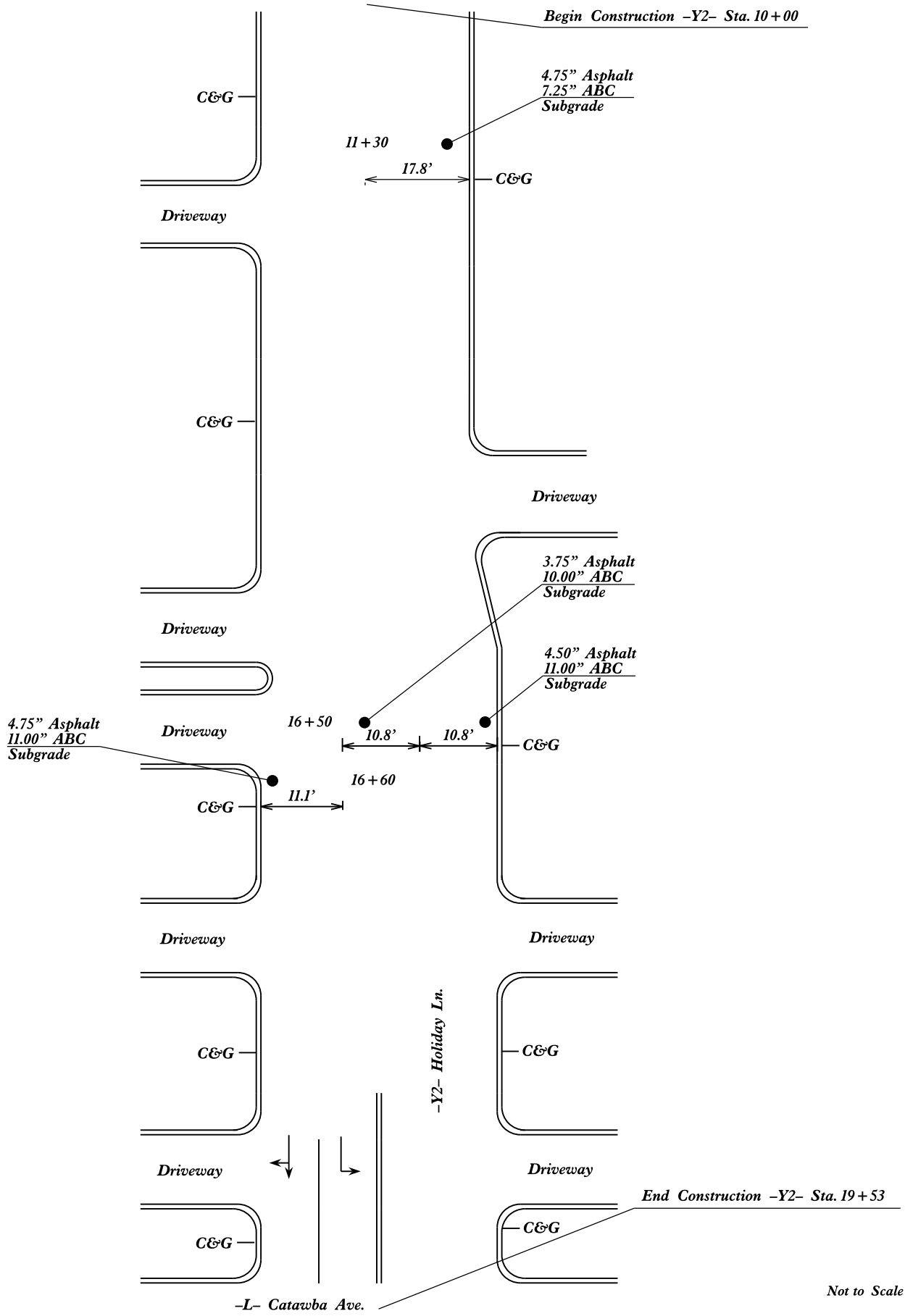


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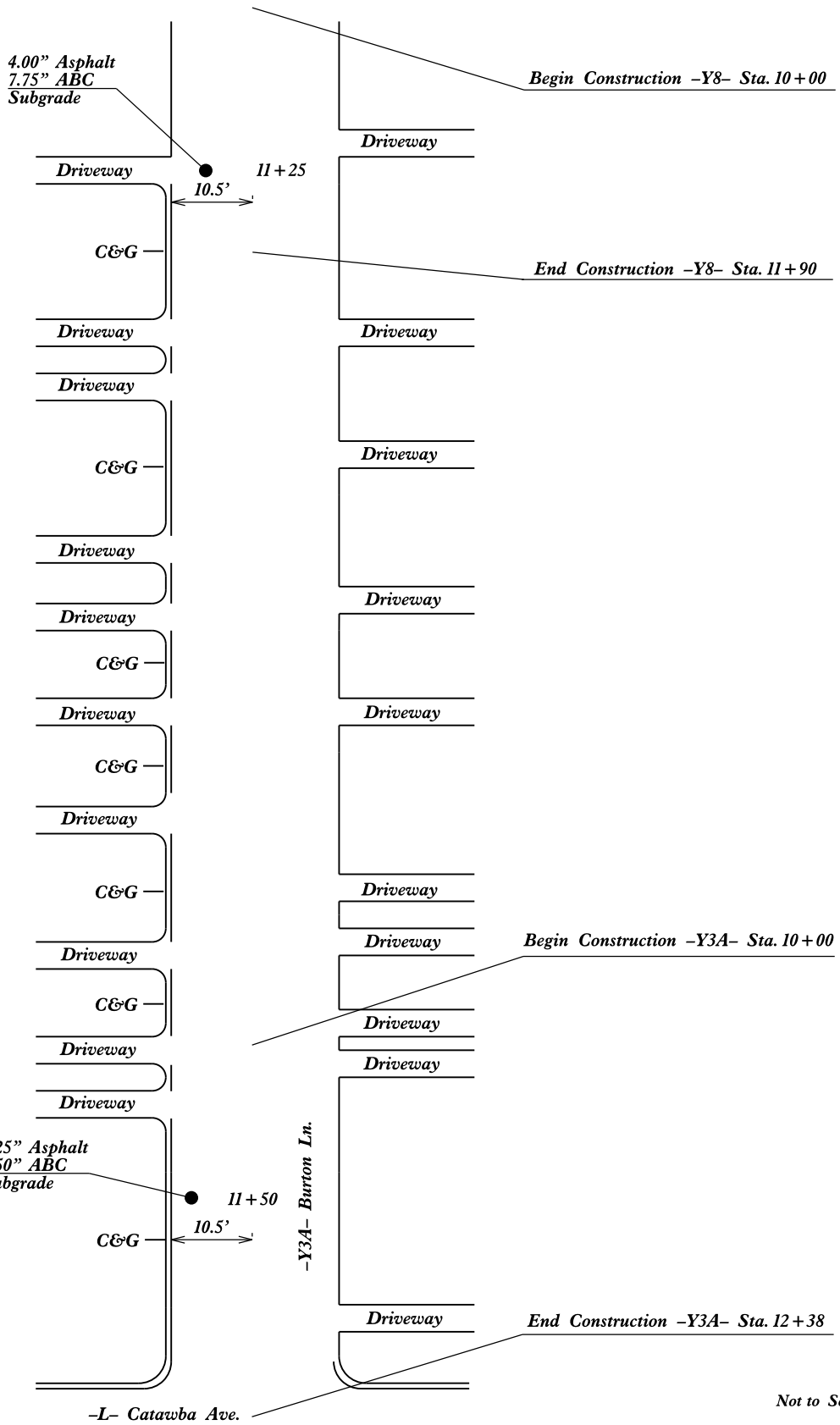


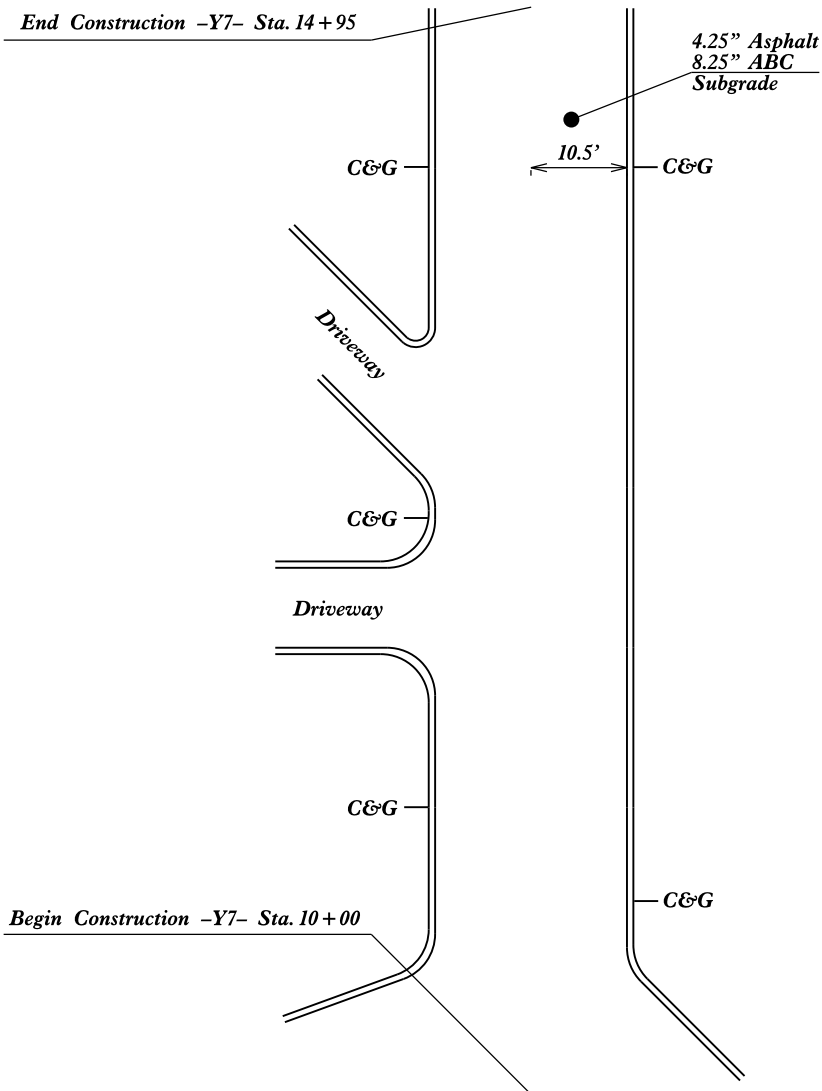


Not to Scale



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

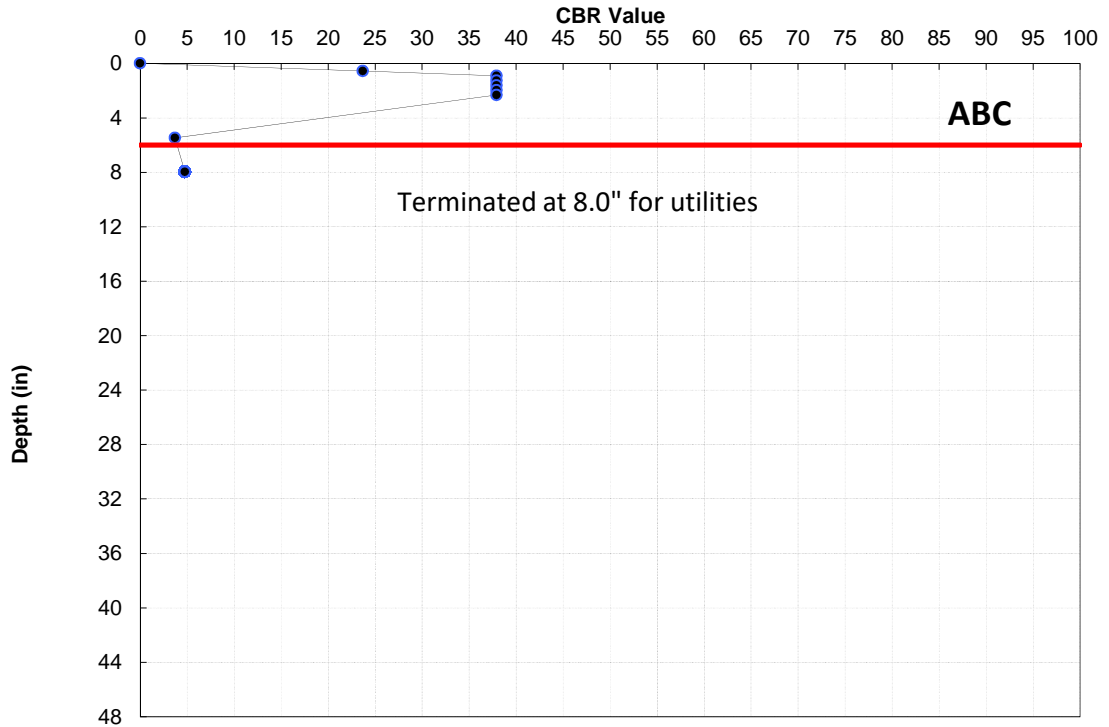
FILE	DCP GRAPHS (1)
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L 13+00 WB OSL

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



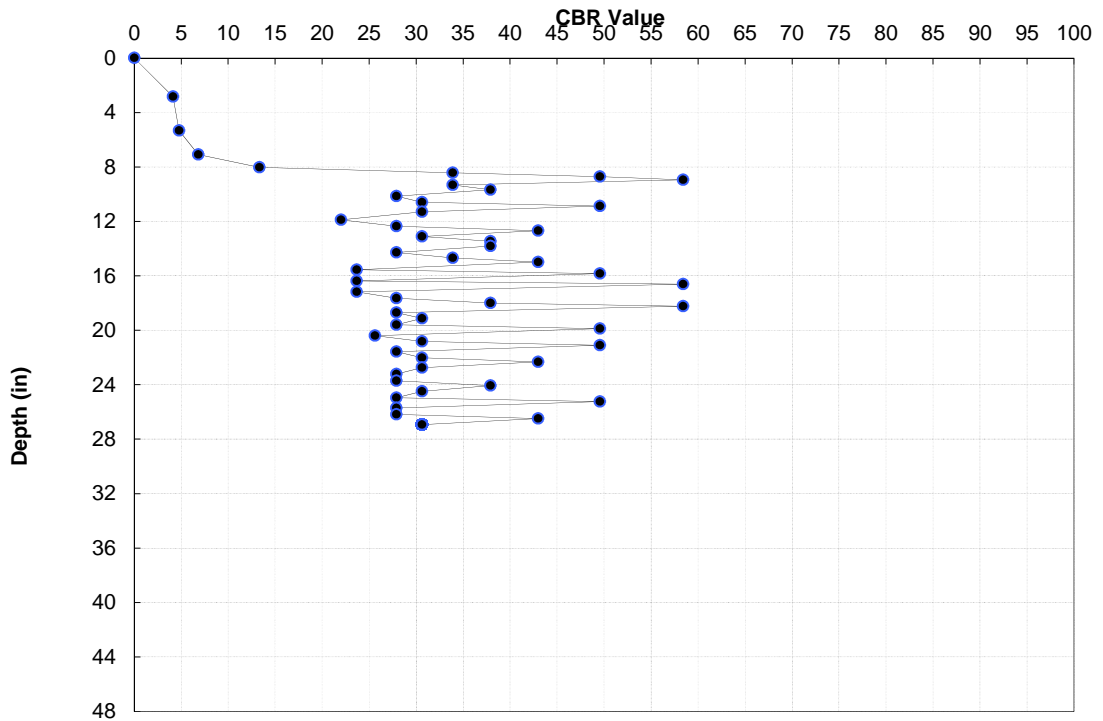
1

L 13+25 EB RT LN

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



2

**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

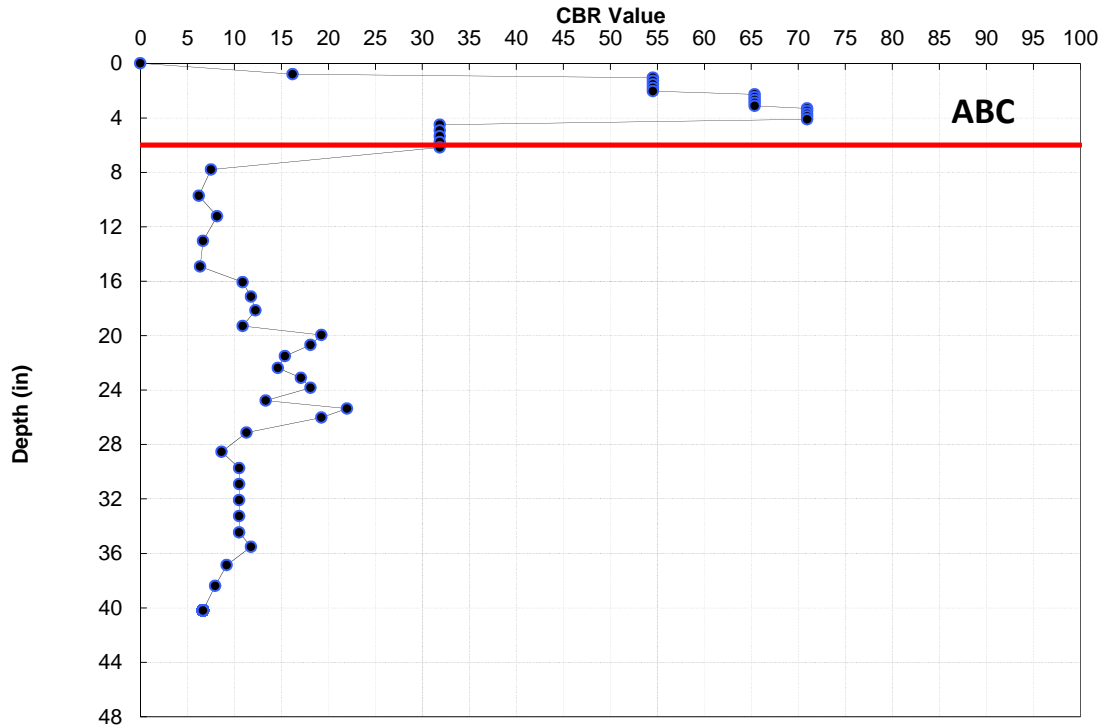
FILE	DCP GRAPHS (1)
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L 16+00 WB OSL

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



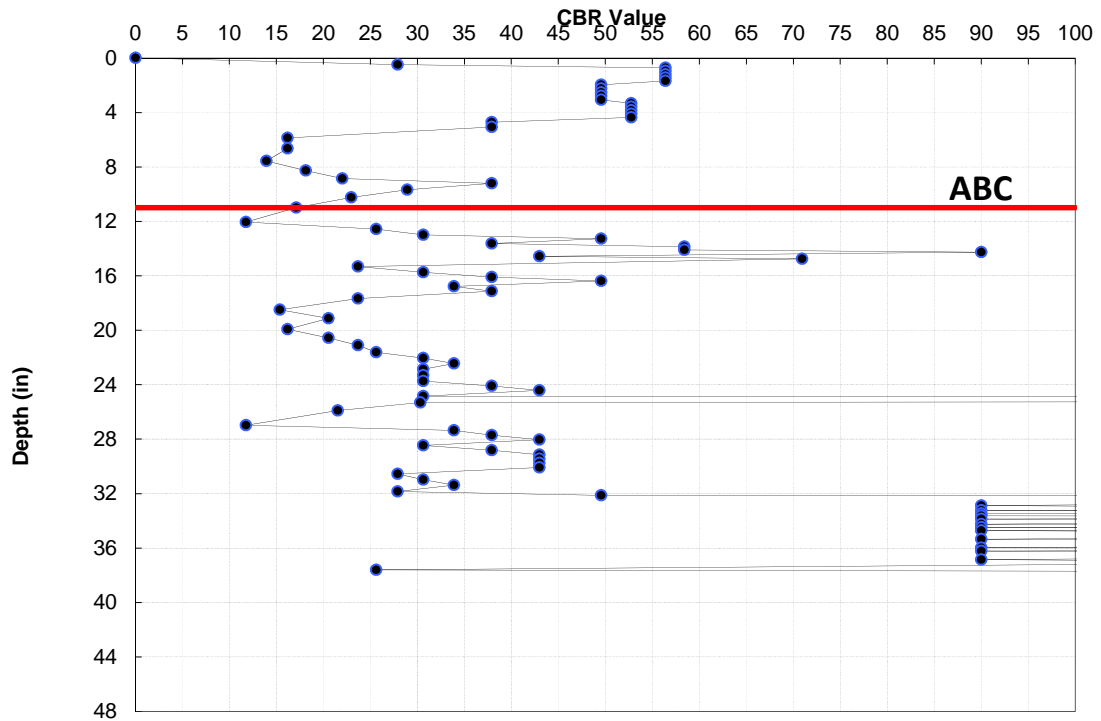
3

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



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

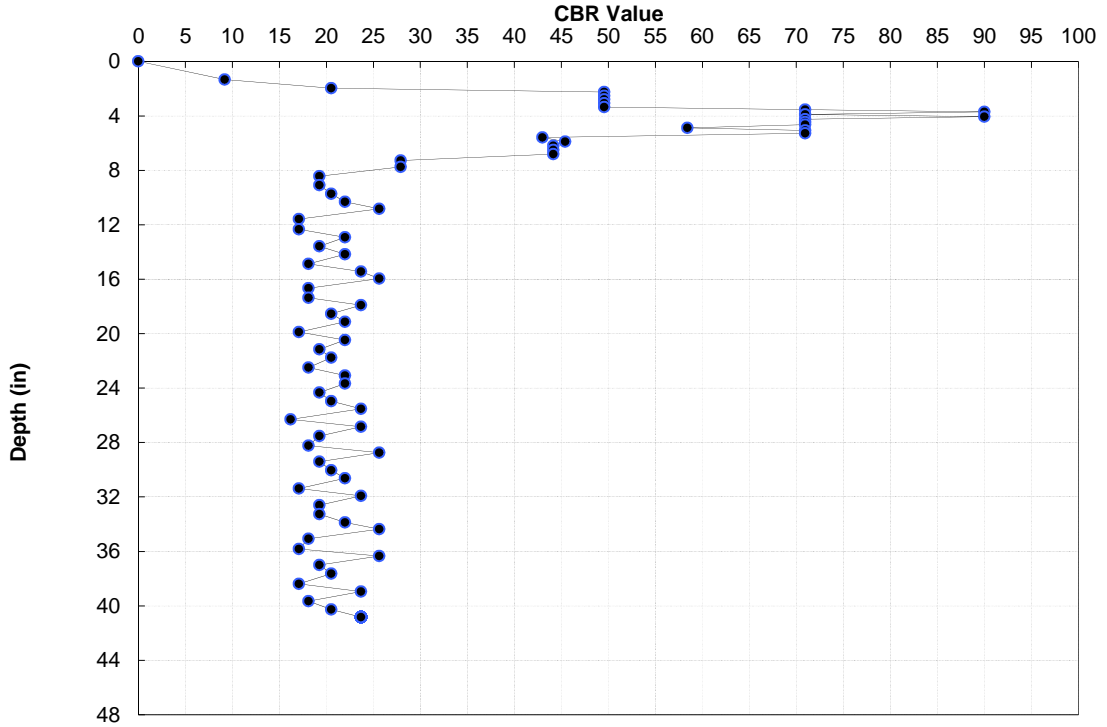
FILE	DCP GRAPHS (1)
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**L - 19+00 WB OSL**

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

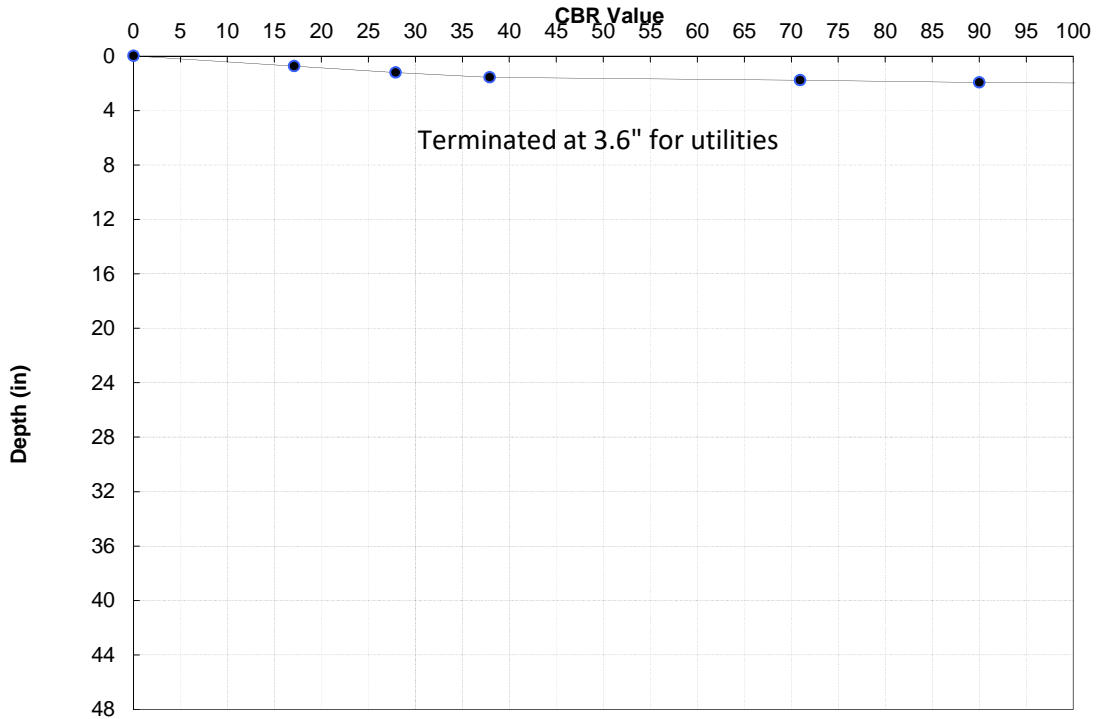


**L - 19+00 EB OSL (I)**

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

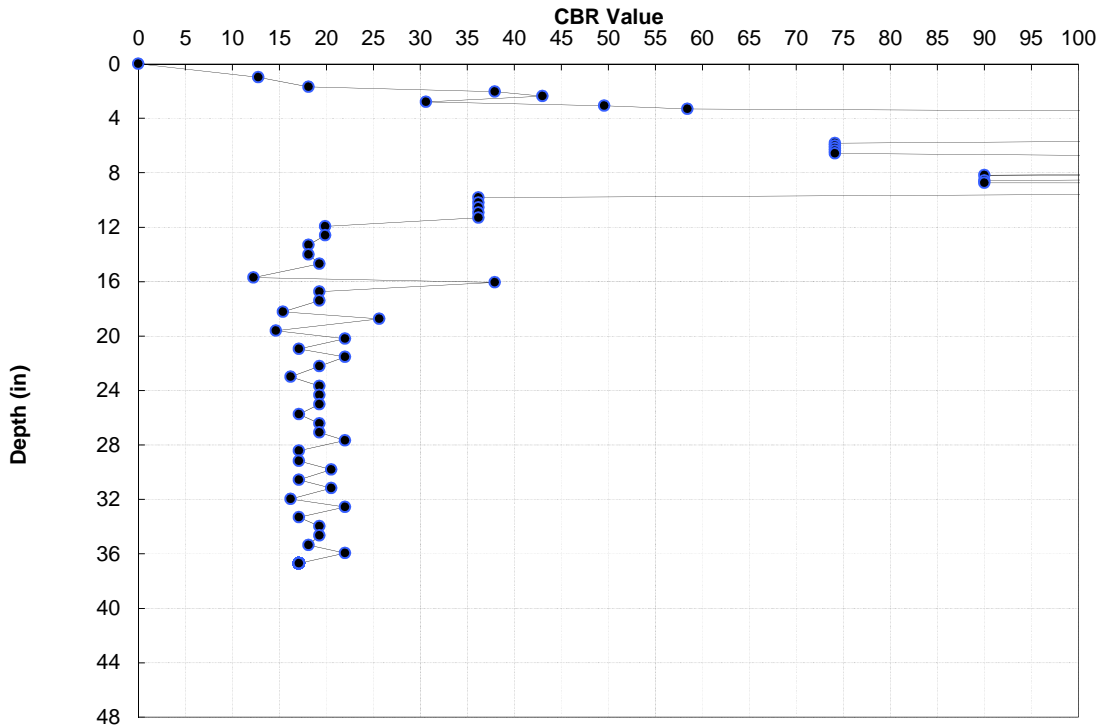
FILE	DCP GRAPHS (1)
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L - 19+00 EB OSL (O)

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



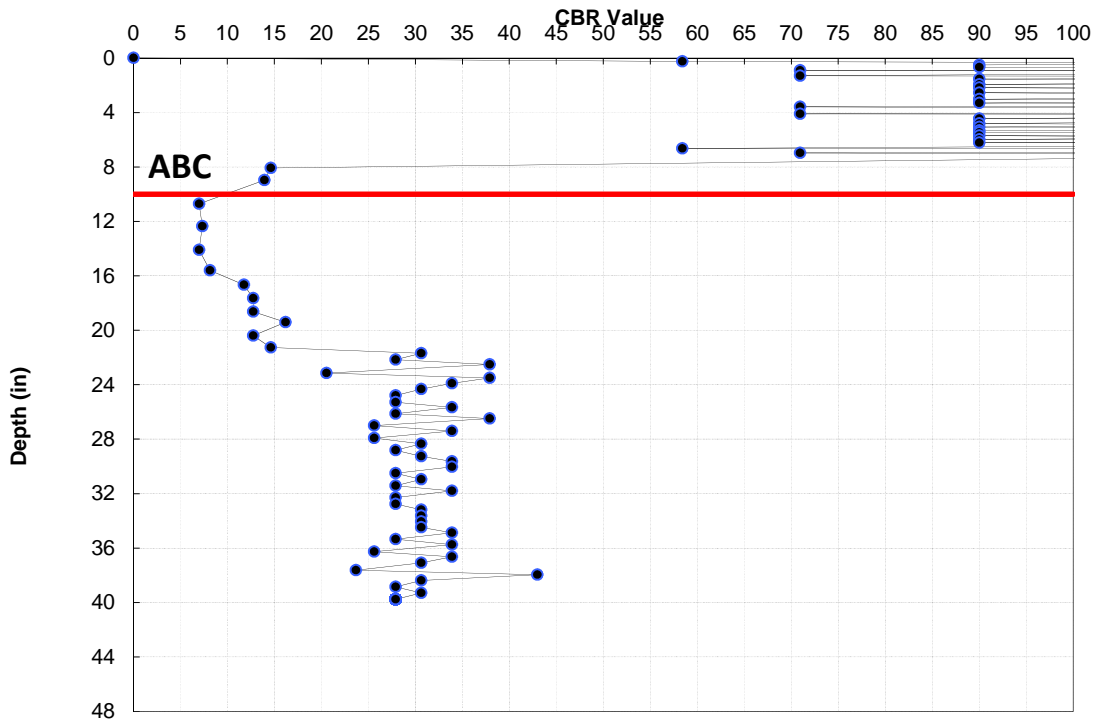
7

Y1A - 11+00 NB RTL

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



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

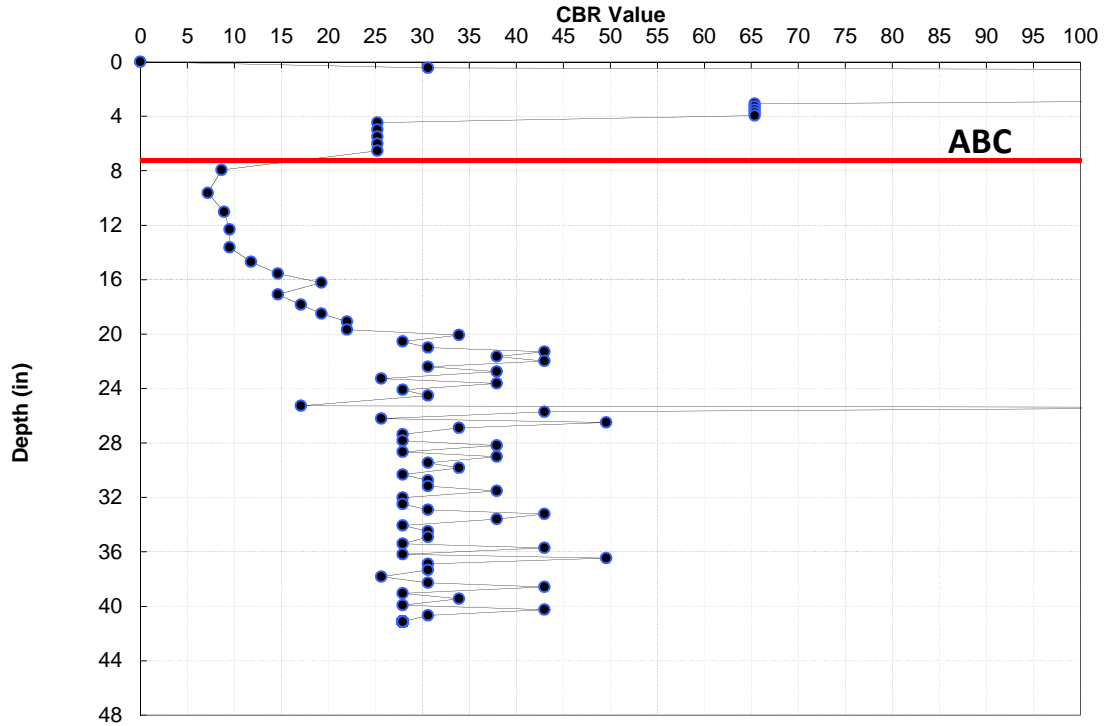
FILE	DCP GRAPHS (1)
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**Y1A - 13+00 NB OSL**

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

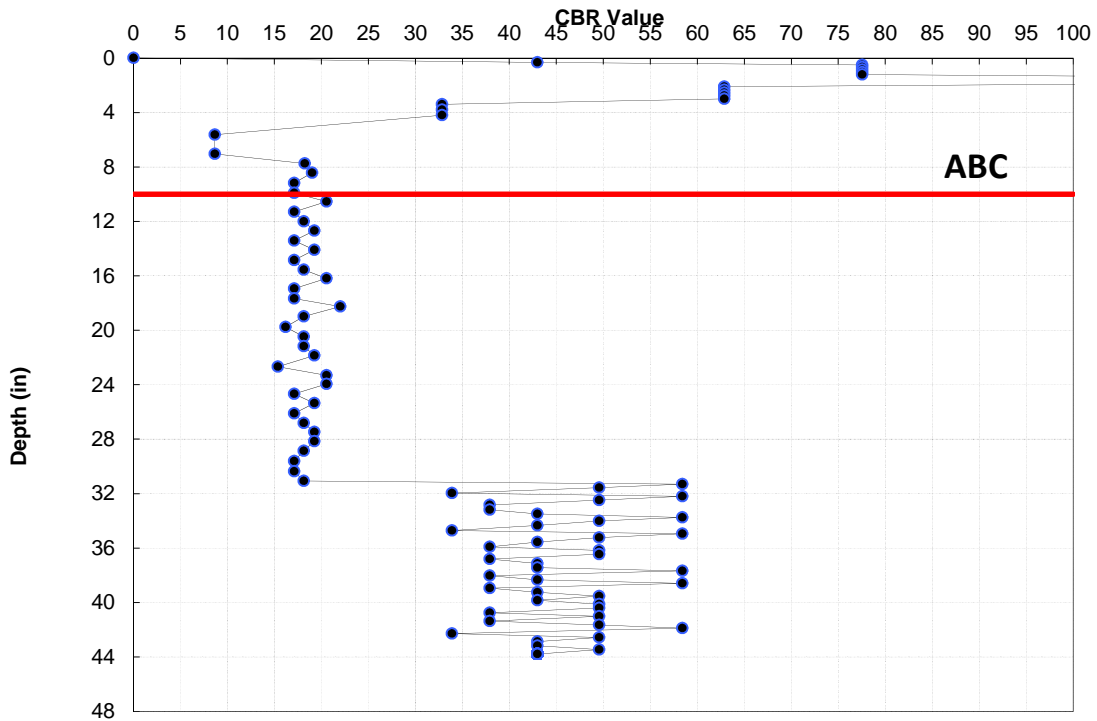


**Y1A - 13+00 SB OSL**

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

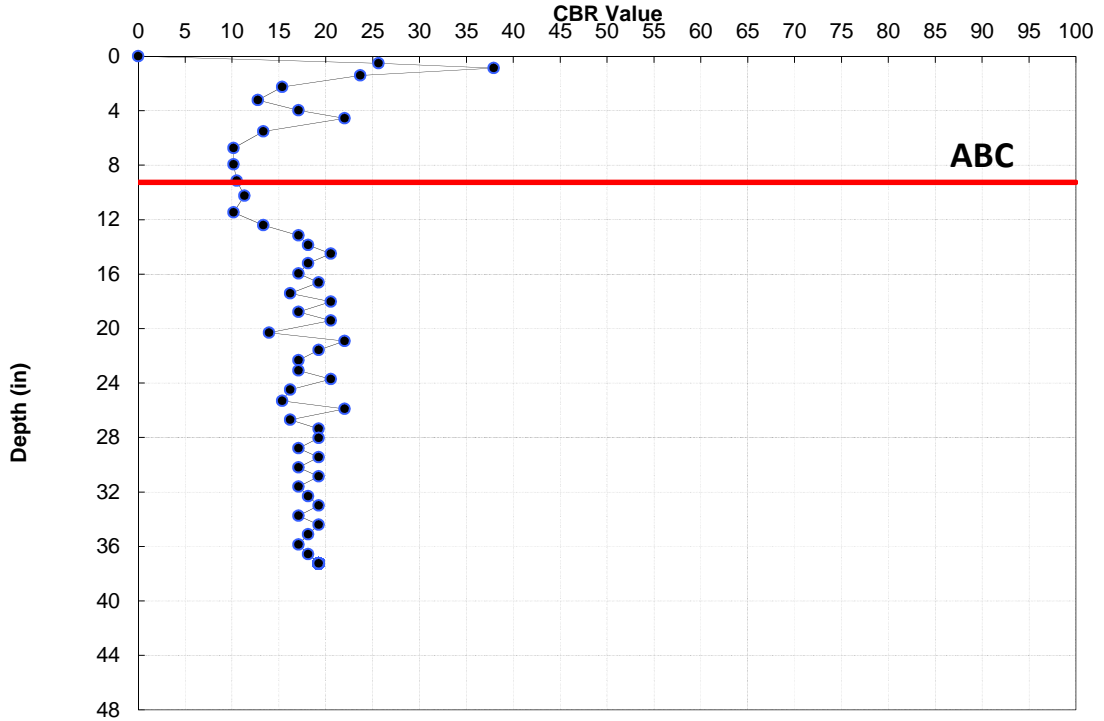
FILE	DCP GRAPHS (1)
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**Y1A - 13+00 CTL**

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

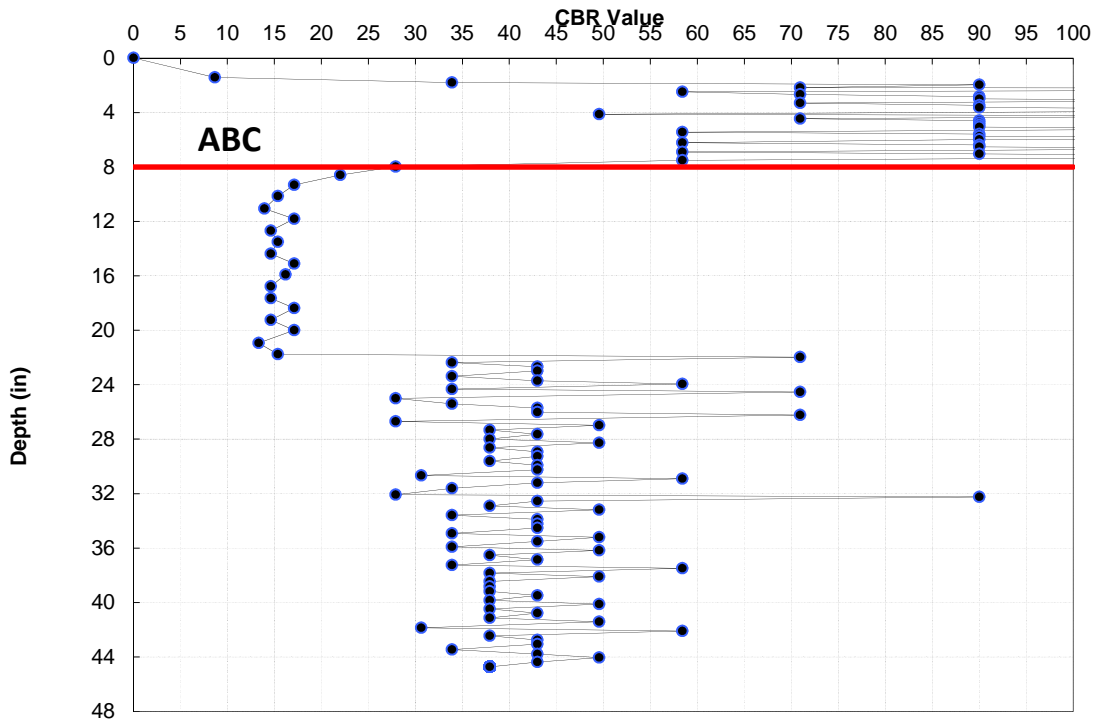


**Y1B 19+50 SB PS**

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

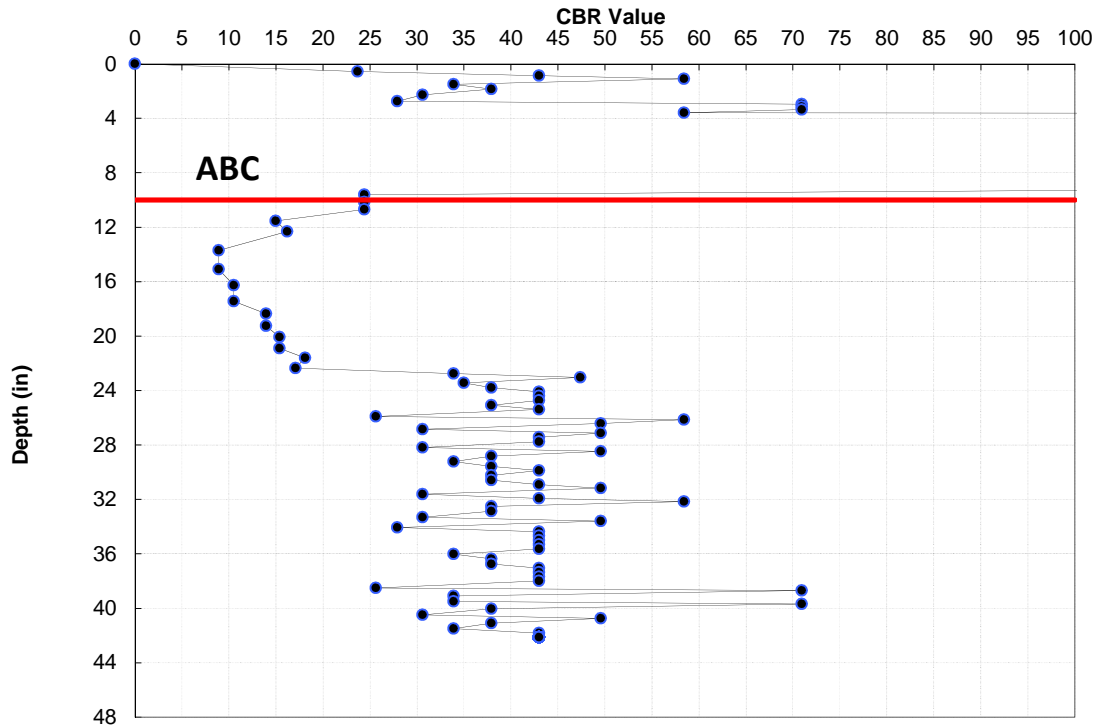
FILE	DCP GRAPHS (1)
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**Y1B - 19+50 NB OSL**

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

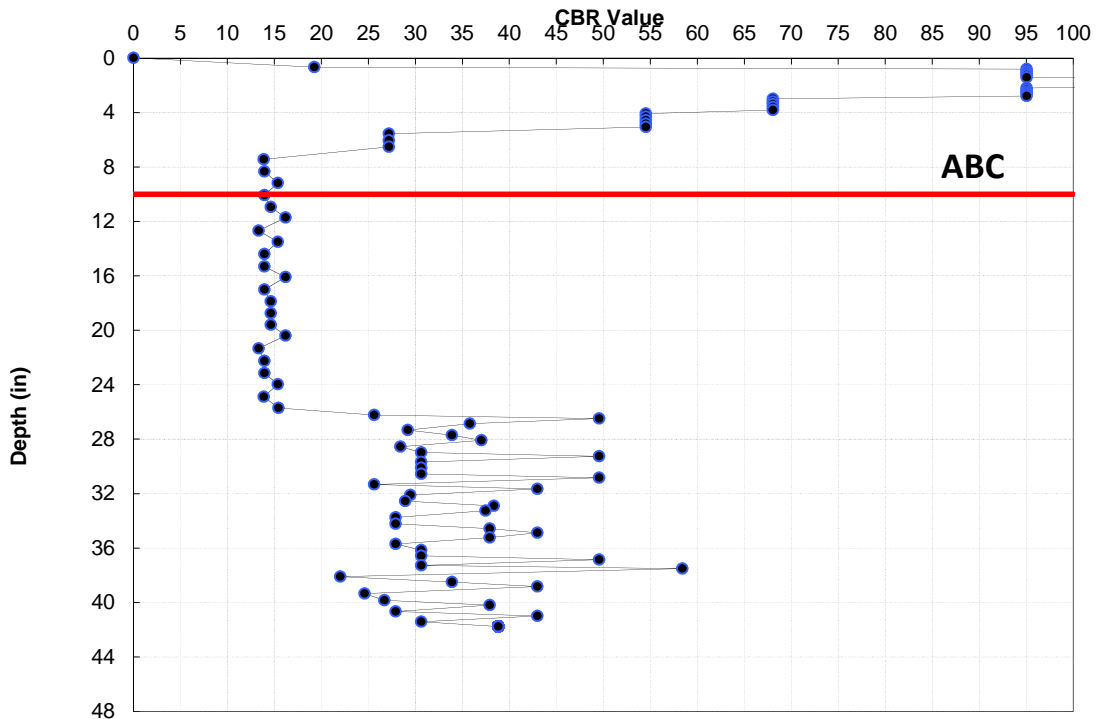


**Y1B - 19+50 NB PS**

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  
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PROJECT NO.	50146.3.1
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ROUTE	CATAWBA AVE. AND US 21 INTERSECT.
COUNTY	MECKLENBURG

GEOLOGIST	P. T. NEUMANN
GEOTECHS	S&ME

FILE	DCP GRAPHS (1)
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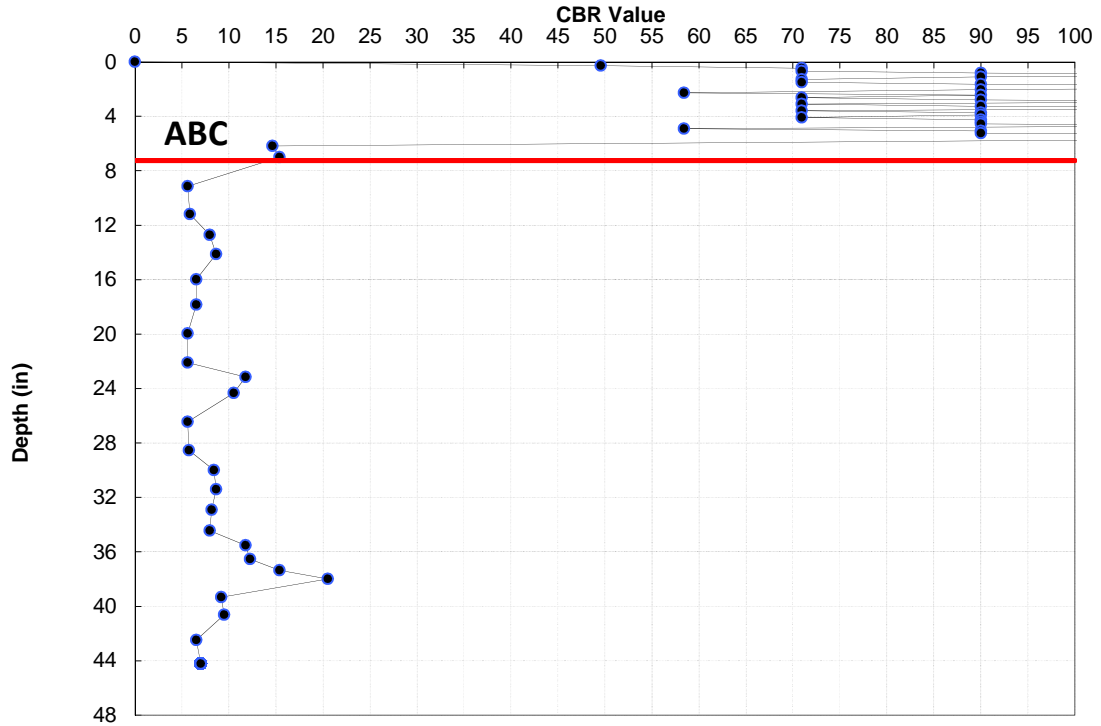
Y2 11+30 NB OSL

15

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



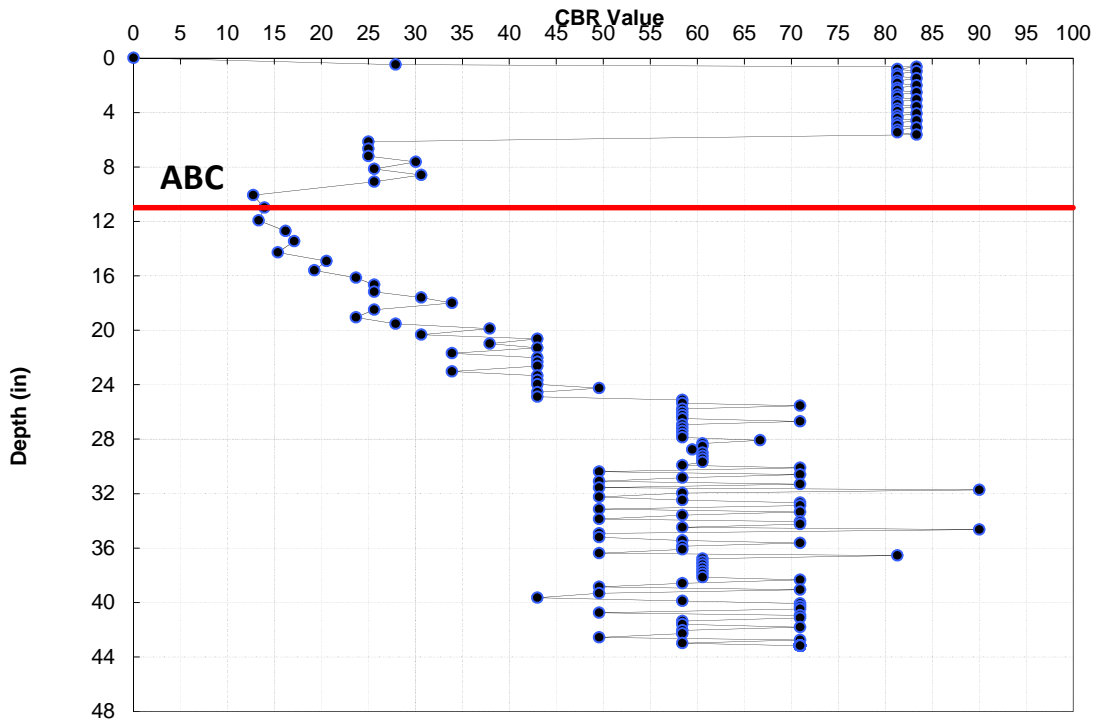
Y2 - 16+00 NB OSL

16

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)
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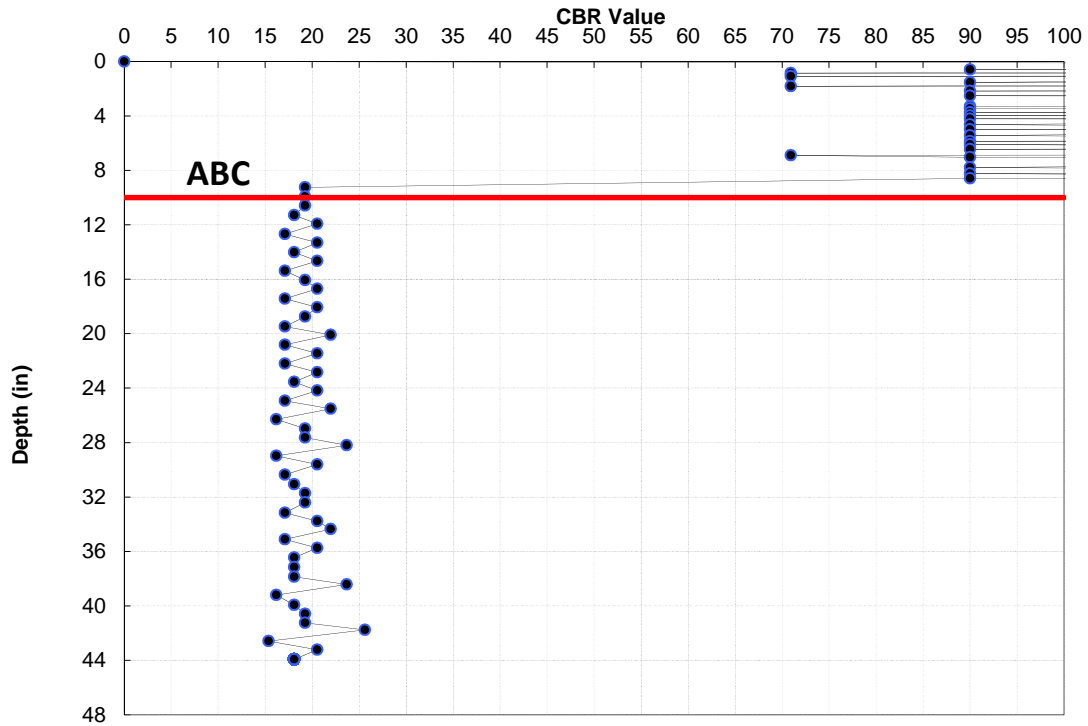
Y2 - 16+00 CTL

17

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



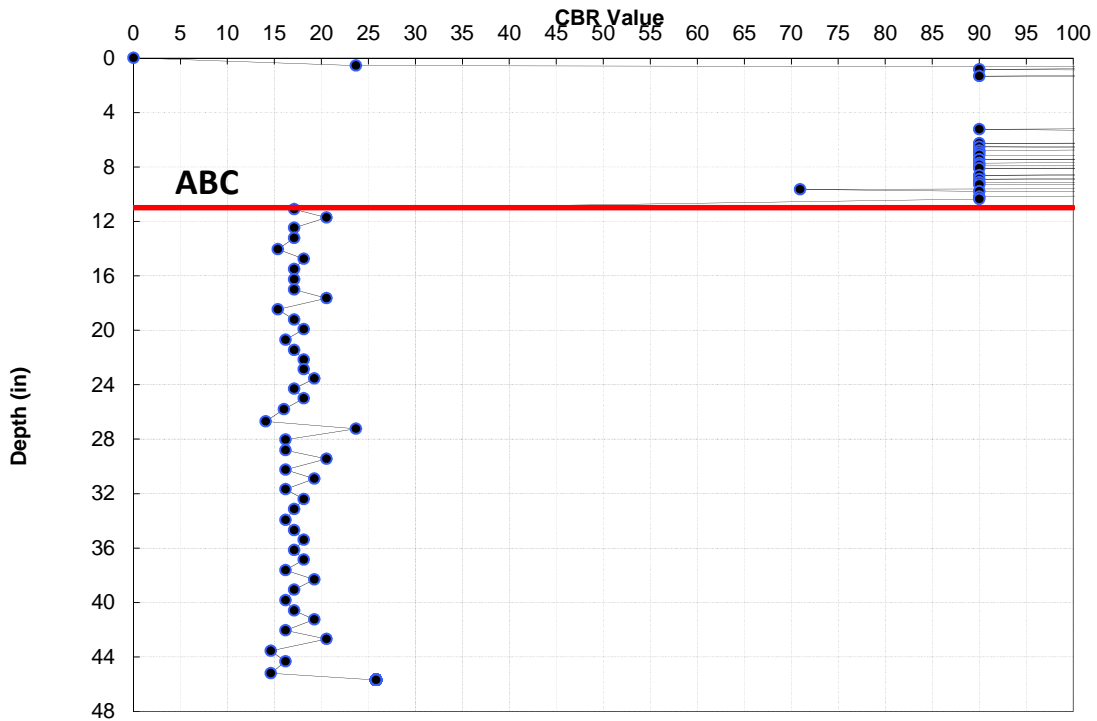
Y2 - 16+20 SB OSL

18

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
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ROUTE	CATAWBA AVE. AND US 21 INTERSECT.
COUNTY	MECKLENBURG

GEOLOGIST	P. T. NEUMANN
GEOTECHS	S&ME

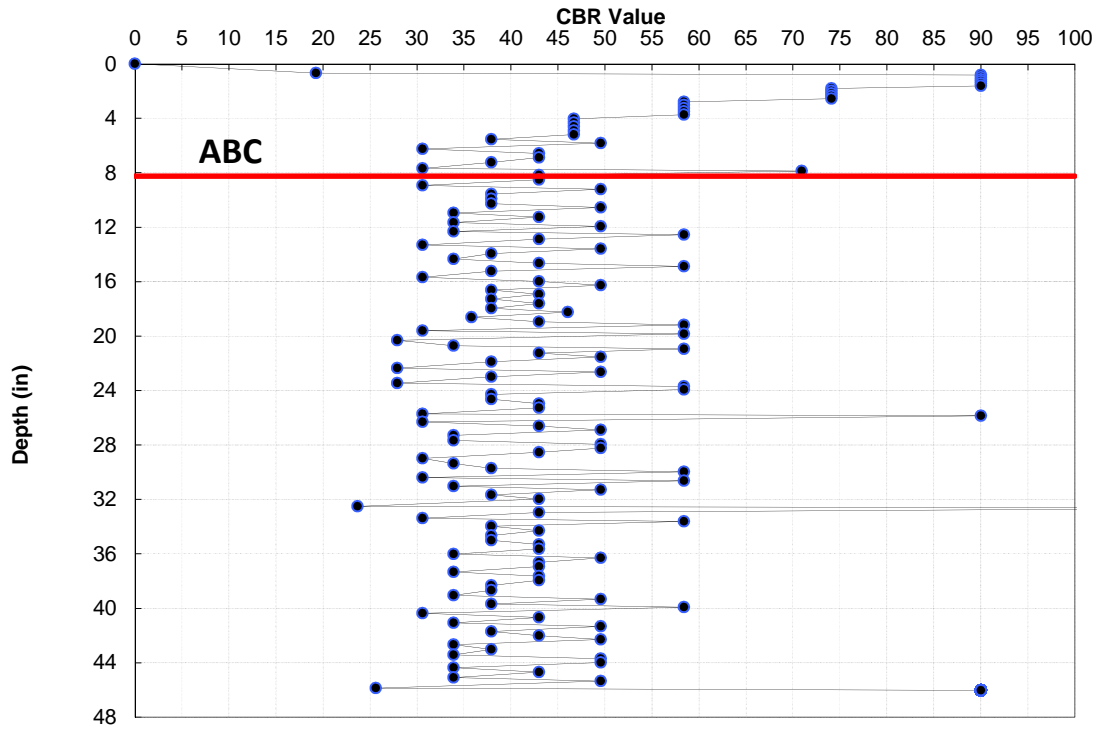
FILE	DCP GRAPHS (1)
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**Y7 - 12+40 EB OSL**

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

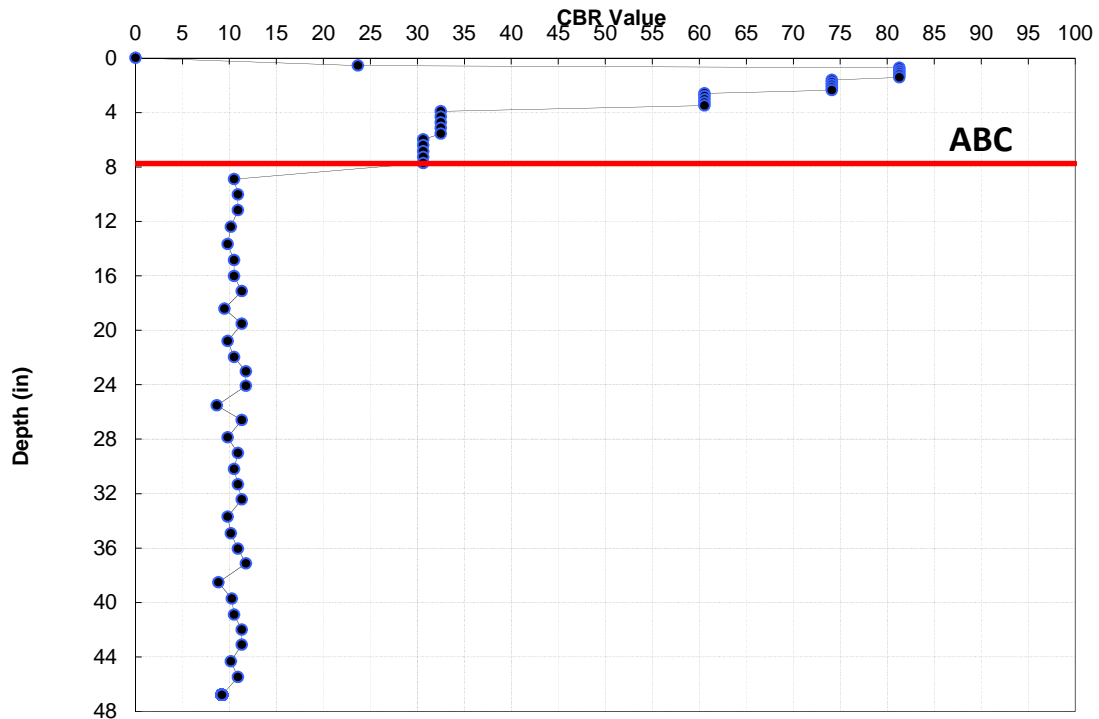


**Y8 - 11+25 SB OSL**

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

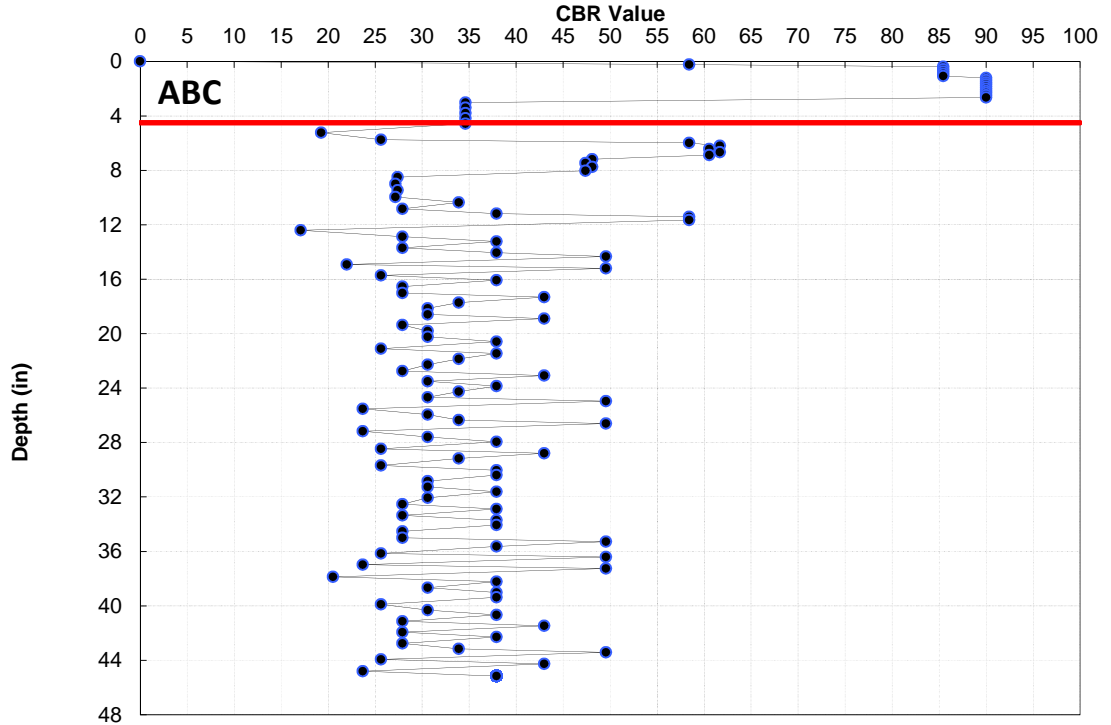
FILE	DCP GRAPHS (2)
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Y3A 11+50 SB OSL

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