



STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION

PAT MCCRORY
GOVERNOR

ANTHONY J. TATA
SECRETARY

May 7, 2015

MEMORANDUM TO: Judith Corley-Lay, P.E., Ph.D.
State Pavement Management Engineer

Glen W. Mumford, P.E.
State Roadway Design Engineer

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

STATE PROJECT: 42263.1.1 (B-5121) – Turnkey
46031.1.1 (B-5317) – Turnkey

F. A. PROJECT: BRNHS-0070(119)
BRNHS-0070(149)

COUNTY: Wake

DESCRIPTION: Bridge No. 277 on US 70/US 401/NC 50 (Capital Boulevard) over
Peace Street and Bridge No. 213 on US 70/NC 50 (Wade Avenue)
over US 401 (Capital Boulevard)

SUBJECT: Geotechnical Recommendations for Pavement Design

DS
MAM

DocuSigned by:
John Pilipchuk
52C44B94B8BE444...

The proposed work consists of replacing bridge No. 277 and No. 213 and reconstruction of the existing concrete roadway to construct a four to seven lane highway with curb and gutter.

Soil Type: The predominant soils encountered beneath the existing roadway consist of residual and embankment soils, silty sand (A-2-4), sandy silt (A-4) and sandy/silty clay (A-6, A-7).

The project mainline is approximately 70 percent embankment. Anticipated borrow will likely consist of residual soils that consist of sandy silt, sandy clay and silty clay. The design soil type is silty clay (A-7).

The length of this project is 0.812 miles.

MAILING ADDRESS:
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GEOTECHNICAL ENGINEERING UNIT
1589 MAIL SERVICE CENTER
RALEIGH NC 27699-1589

TELEPHONE: 919-707-6850
Fax: 919-250-4237
connect.ncdot.gov/resources/Geological

LOCATION:
CENTURY CENTER COMPLEX
ENTRANCE B-2
1020 BIRCH RIDGE DRIVE
RALEIGH NC 27610

Pavement Design Inputs: The following values are recommended to be used with the Design soil type:

TYPE	¹ PASSING #200 SIEVE (%)	¹ OPTIMUM MOISTURE CONTENT (%)	¹ MAXIMUM DRY DENSITY (pcf)	¹ D ₆₀ (in)	^{1&3} PLASTICITY INDEX (PI)	¹ SPECIFIC GRAVITY (G _s)
Silty Clay	48	16.3	111.4	0.03531	23	2.74

*Note: Optimum moisture, maximum dry density D₆₀ and specific gravity where taken from county soil results.

Areas of Special Geotechnical Interest

1) Highly Plastic Clays:

<u>Line</u>	<u>STATION AND OFFSET</u>	<u>PI</u>
-L-	45+00 NB OSS	31
-L-	45+00 NB OSL	38
-L-	45+00 NB CL	34
-L-	45+00 NB ISL	26
-L-	45+00 SB ISL	27

2) Ground Water or Trapped Water within the Pavement:

Ground water or trapped water was not encountered at any of the test locations during this investigation but it is common to have trapped water beneath old concrete pavements. If trapped water is encountered, drainage should be provided to allow water to drain from beneath the existing roadway. It may require additional time and effort to dry the subgrade soils.

3) Existing Pavement

There was approximately 1 inch of settlement in the area of the core taken at station 42+50 in the southbound outside lane. The settlement extended approximately 120 feet.

DESIGN AND CONSTRUCTION RECOMMENDATIONS

I. Embankment Stability

A. The following areas may require Geotextile for Pavement Stabilization. These areas should be investigated during construction to determine if the Geotextile is required.

LINE	STATION	STATION	SY	OFFSET
-L-	19+25	21+39	1,236	SB Lanes
-L-	23+25	30+00	3,375	SB Lanes
-Flyover-	18+25	19+39	570	CL
-Flyover	21+69	23+25	780	CL
TOTAL			5,961	

II. Subgrade Stability

A. Aggregate Stabilization

Stabilizer Aggregate

Recommend a quantity of 500 tons of Stabilizer Aggregate to be included in the project contract as a contingency item.

B. Aggregate Subgrade

Recommend a quantity of 5,000 cubic yards of shallow undercut to be included in the project contract as a contingency item.

Geotextile for Soil Stabilization

Recommend 15,000 square yards of Geotextile for Soil Stabilization to be included in the project contract as a contingency item.

Class IV Subgrade Stabilization

Recommend 9,800 tons of Class IV Subgrade Stabilization material to be included in the project contract as a contingency item.

C. Scarify Existing Drainage Layers

Upon removal of the existing concrete pavement the Geotechnical Engineering Unit recommends incorporating the existing drainage layers of sand and ABC into the underling soils. It is recommended that the materials be scarified into the proposed subgrade to a minimum depth of 12 inches. Some areas may be wet and may require additional time to dry before the blended materials can be compacted.

See Attached Special Provision.

III. Miscellaneous

A. Proof Rolling

It is recommended that proof rolling be performed on this project and should conform to Standard Specifications, Article 260.

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

JLP/MAM/JBB/CWJ

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NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
GEOTECHNICAL ENGINEERING UNIT

Summary of Quantities

WBS Number: 42263.1.1/46031.1.1

County: Wake

Project Engineer: _____

TIP Number: B-5121/B-5317

Field Office: Central

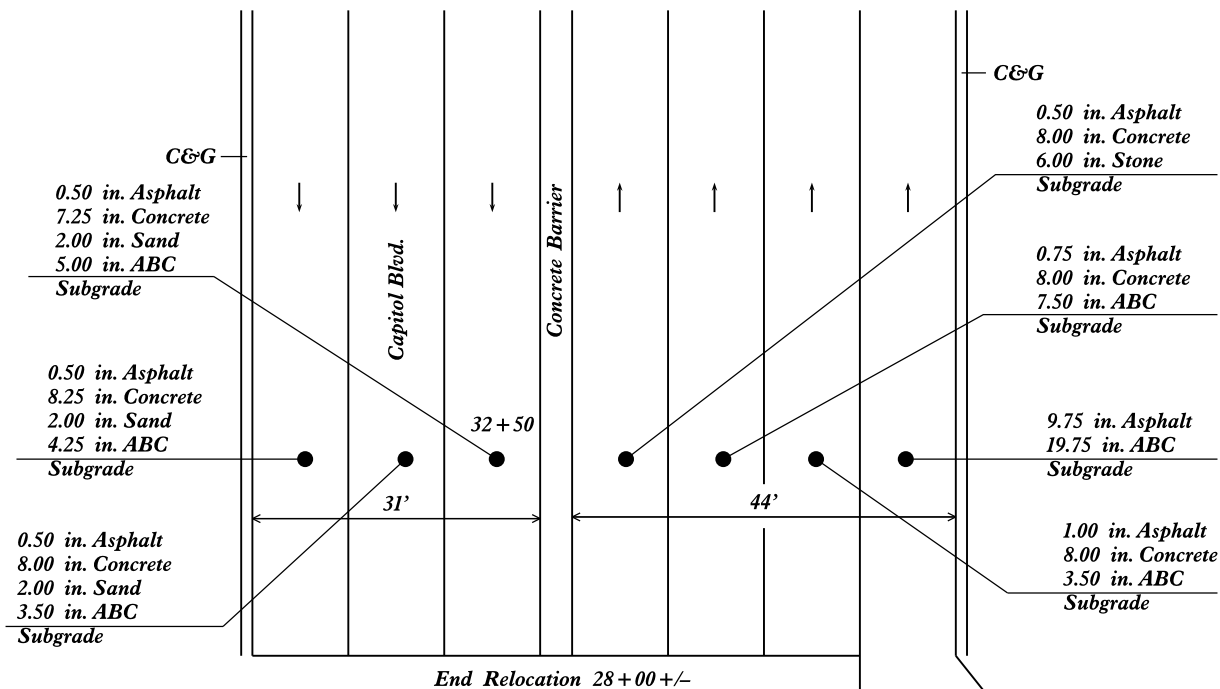
Project Geologist: J.B. Barfield

Description: Bridge No. 277 on US 70/US 401/NC 50 (Capitol Blvd.) over Peace St. Bridge No. 213 on US 70/NC 50 (Wade Ave.) over US 401 (Capitol Blvd.)

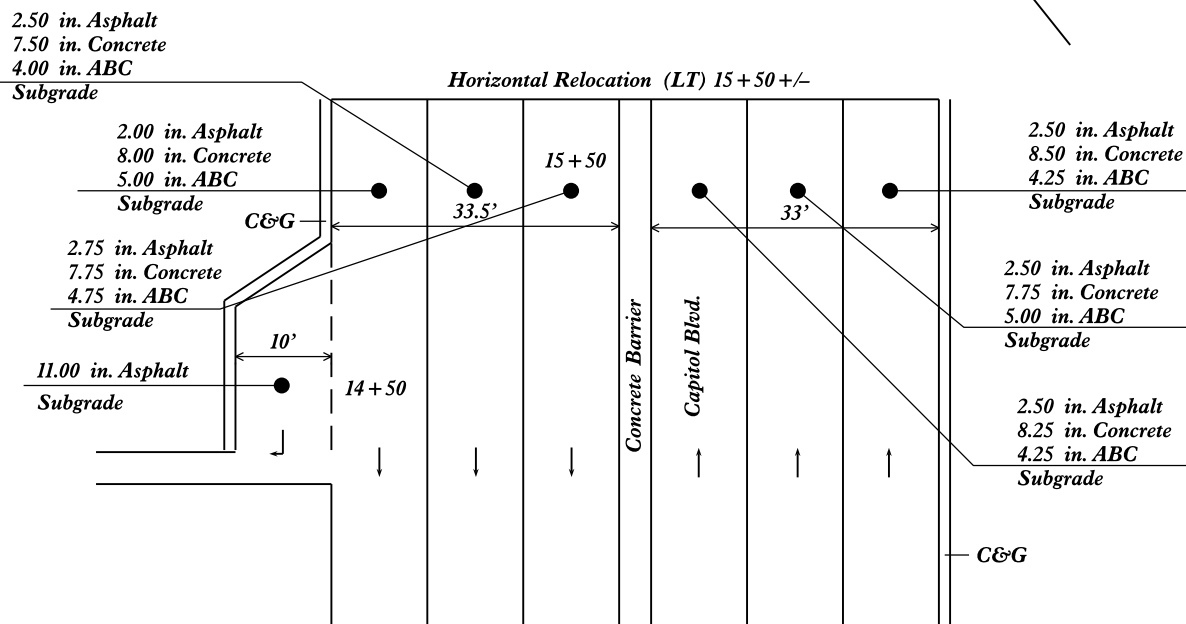
Pay Item No.	Pay Item/ Quantity Adjustment	Spec Book Section No. or Special Provision (SP) Reference	Report Section	Alignment	Begin Station	End Station	Quantity	Units / %
0196000000-E	Geotextile for Soil Stabilization	270 - Geotextile for Soil Stabilization	II. B	Contingency	N/A	N/A	15,000	SY
Total Quantity of Geotextile for Soil Stabilization =							15,000	SY
1099500000-E	Shallow Undercut	505 - Aggregate Subgrade	II. B	Contingency	N/A	N/A	5,000	CY
Total Quantity of Shallow Undercut =							5,000	CY
1099700000-E	Class IV Subgrade Stabilization	505 - Aggregate Subgrade	II. B	Contingency	N/A	N/A	9,800	TON
Total Quantity of Class IV Subgrade Stabilization =							9,800	TON
1110000000-E	Stabilizer Aggregate	510 - Aggregate Stabilization	II. A	Contingency	N/A	N/A	500	TON
Total Quantity of Stabilizer Aggregate =							500	TON
1115000000-E	Geotextile for Pavement Stabilization	SP - Geotextile for Pavement Stabilization	I. A	Varies	N/A	N/A	5,961	SY
Total Quantity of Geotextile for Pavement Stabilization =							5,961	SY

State Project No.: 42263.1/46031.1.1 (B-5121/B-5317) Wake County

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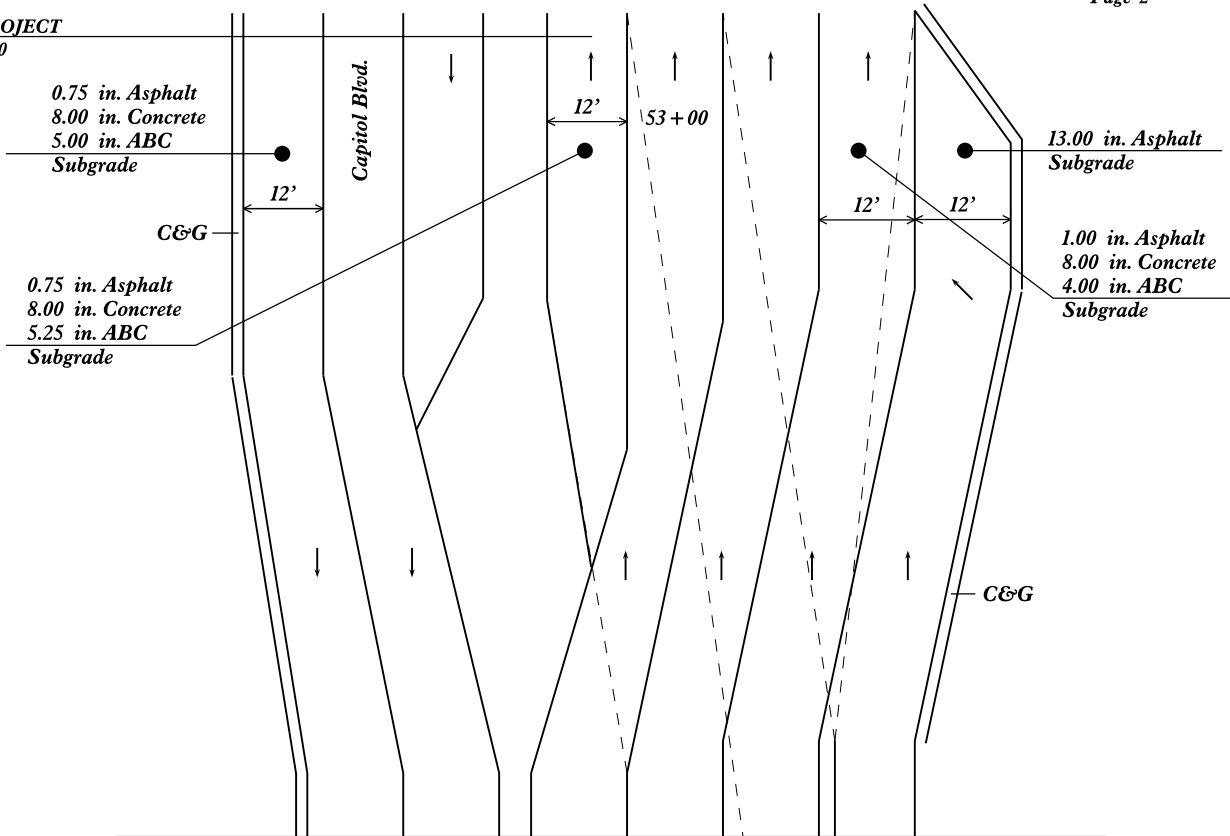
Relocation of Peace Street Bridge



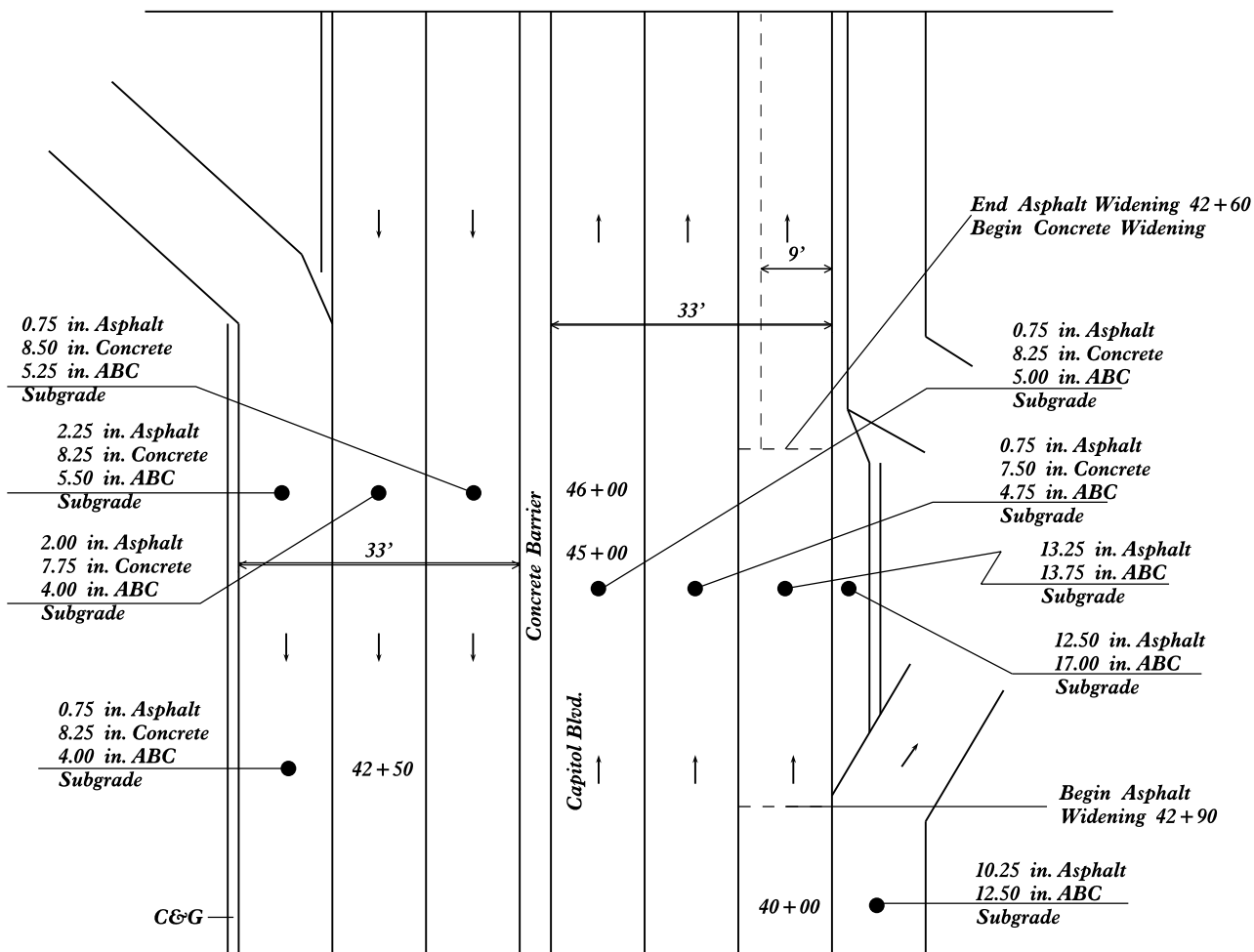
BEGIN STATE PROJECT
-L- STA. 10 + 21.00

Not to Scale

END STATE PROJECT
-L- STA. 53+06.00



Wade Avenue



PAVEMENT CORES FOR
42263.1.1/46031.1.1, B-5121/B-5317, Wake County

LINE	STATION	ABC (IN)	LAYER THICKNESS (in)	LAYERS	REMARKS
-L-	14+50 SB DECEL 11" Asphalt	-	3	S	2 lifts, lift 1 is 1 1/2" Nova Chip with moderate severity stripping, full-depth crack and 2" bottom-up crack
			8	B	2 lifts, low severity stripping, low weathering in crack, missing few agg.
-L-	15+50 NB OSL 2 1/2" Asphalt 8 1/2" Concrete	4 1/4	2 1/2	S	2 lifts, lift 1 is 3/4" Nova Chip with moderate severity stripping, machine break bottom of lift 2
			8 1/2	C	1 lift, few small voids
-L-	15+50 NB CL 2 1/2" Asphalt 7 3/4" Concrete	5	2 1/2	S	2 lifts, lift 1 is 1" Nova Chip with moderate severity stripping
			7 3/4	C	1 lift, few small voids
-L-	15+50 NB ISL 2 1/2" Asphalt 8 1/4" Concrete	4 1/4	2 1/2	S	2 lifts, lift 1 is 1" Nova Chip with moderate severity stripping, machine break bottom of lift 2
			8 1/4	C	1 lift, few small voids
-L-	15+50 SB OSL 2" Asphalt 8 1/2" Concrete	5	2	S	2 lifts, lift 1 is 1" Nova Chip with moderate severity stripping, bottom of lift 2 is delaminated from concrete
			8 1/2	C	1 lift, btm 1" is broken with few missing aggregate
-L-	15+50 SB CL 2 1/2" Asphalt 7 1/2" Concrete	4	2 1/2	S	2 lifts, lift 1 is 1" Nova Chip with moderate severity stripping, lift 2 has low severity bleeding
			7 1/2	C	1 lift, few small voids
-L-	15+50 SB ISL 2 3/4" Asphalt 7 3/4" Concrete	5	2 3/4	S	2 lifts, lift 1 is 1" Nova Chip with moderate severity stripping, bottom of lift 2 is delaminated from concrete
			7 3/4	C	1 lift, core has evidence of grout mixture, grouting in vicinity of core location
-L-	32+50 NB OSL 9 3/4" Asphalt	19 3/4	4 1/2	S	3 lifts, lift 1 is 1" Nova Chip with moderate severity stripping, lift 2 has low severity stripping
			2	I	1 lift, low severity stripping
			3 1/4	B	1 lift, top is delaminated from intermediate lift
-L-	32+50 NB CL (O) 1" Asphalt 8" Concrete	3 1/2	1	S	1 lift, Nova Chip with moderate to high severity stripping, missing few aggregate
			8	C	1 lift, few small voids
-L-	32+50 NB CL (I) 3/4" Asphalt 8" Concrete	7 1/2	3/4	S	1 lift, Nova Chip with moderate severity stripping
			8	C	1 lift, few small voids
-L-	32+50 NB ISL 1/2" Asphalt 8" Concrete	6	1/2	S	1 lift, Nova Chip with moderate severity stripping
			8	C	1 lift, few small voids
-L-	32+50 SB OSL 1/2" Asphalt 8 1/4" Concrete	2 Sand 4 1/4	1/2	S	1 lift, Nova Chip with moderate severity stripping
			8 1/4	C	1 lift, few small voids
-L-	32+50 SB CL 1/2" Asphalt 8" Concrete	2 Sand 3 1/2	1/2	S	1 lift, Nova Chip with moderate severity stripping
			8	C	1 lift, few small voids

PAVEMENT CORES FOR
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LINE	STATION	ABC (IN)	LAYER THICKNESS (IN)	LAYERS	REMARKS
-L-	32+50 SB ISL 1/2" Asphalt 7 3/4" Concrete	6 1/4	1/2	S	1 lift, Nova Chip with moderate severity stripping
			7 3/4	C	1 lift, few small voids, full-depth wood peg of unknown origin
-L-	40+00 NB OSL 10 1/4" Asphalt	12 1/2	5 3/4	S	4 lifts, lift 1 is Nova Chip with moderate severity stripping, mechanical break in lift 3, lifts 2-4 have low severity stripping
			4 1/2	B	1 lift, very low severity stripping
-L-	42+50 SB OSL 3/4" Asphalt 8 1/4" Concrete	4	3/4	S	1 lift, Nova Chip with moderate severity stripping
			8 1/4	C	1 lift, few small voids
-L-	45+00 NB OSS 12 1/2" Asphalt	17	3 3/4	S	3 lifts, lift 1 is 1" Nova Chop with moderate severity stripping, white line top of lift 2, lifts 2 and 3 have low severity stripping and bleeding
			3	I	1 lift, low to moderate severity stripping
			5 3/4	B	1 lift, low severity stripping last 2 inches
-L-	45+00 NB OSL 13 1/4" Asphalt	13 3/4	3 3/4	S	3 lifts, lift 1 is Nova Chip, lifts 1 and 3 have moderate severity stripping, few agg missing lift 2
			4	I	1 lift, low severity stripping
			5 1/2	B	1 lift, very low severity stripping
-L-	45+00 NB CL 3/4" Asphalt 7 1/2" Concrete	4 3/4	3/4	S	1 lift, Nova Chip, moderate severity stripping
			7 1/2	C	1 lift, few small voids
-L-	45+00 NB ISL 3/4" Asphalt 8 1/4" Concrete	5	3/4	S	1 lift, Nova Chip with moderate severity stripping
			8 1/4	C	1 lift, few small voids
-L-	46+00 SB ISL 3/4" Asphalt 8 1/2" Concrete	5 1/4	3/4	S	1 lift, Nova Chip, low severity stripping and bleeding
			8 1/2	C	1 lift, few voids
-L-	46+00 SB CL 2" Asphalt 7 3/4" Asphalt	4	2	S	2 lifts, lift 1 is Nova Chip with moderate severity stripping, lift 2 has low severity bleeding and is delaminated from concrete
			7 3/4	C	1 lift, few small voids
-L-	46+00 SB OSL 2 1/4" Asphalt 8 1/4" Concrete	5 1/2	2 1/4	S	2 lifts, lift 1 is Nova Chip with moderate severity stripping
			8 1/4	C	1 lift, few small voids
-L-	53+00 NB ACCEL 13" Asphalt	-	5 1/2	S	4 lifts, lift 1 is Nova Chip with moderate severity stripping
			3	I	1 lift, bottom 1" has moderate severity stripping and low severity bleeding
			4 1/2	B	1 lift, bottom 2" moderate severity stripping and low severity bleeding, missing few aggregate
-L-	53+00 NB OSL 1" Asphalt 8" Concrete	4	1	S	1 lift, Nova Chip with moderate to high severity stripping, missing few aggregate
			8	C	1 lift, very few small voids

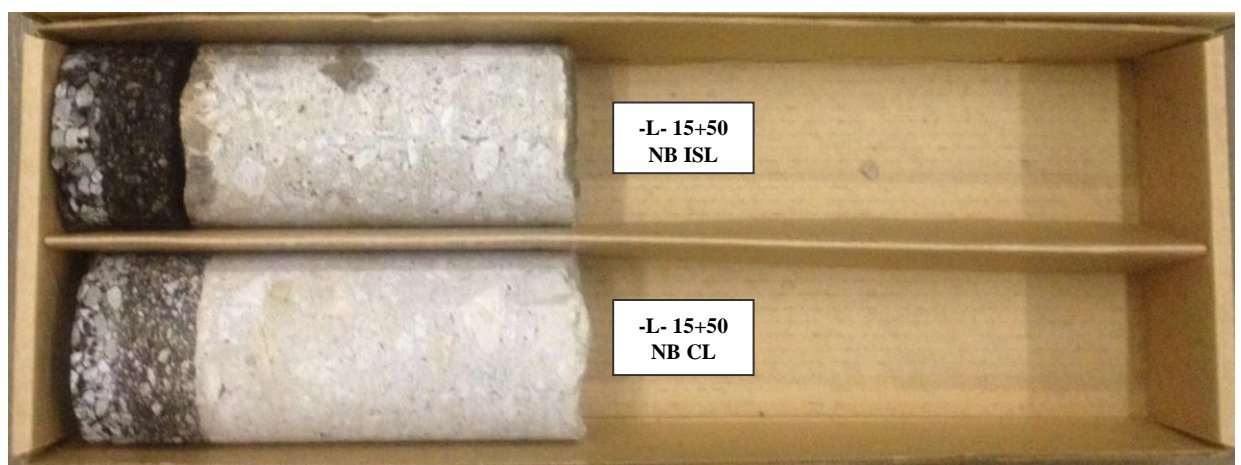
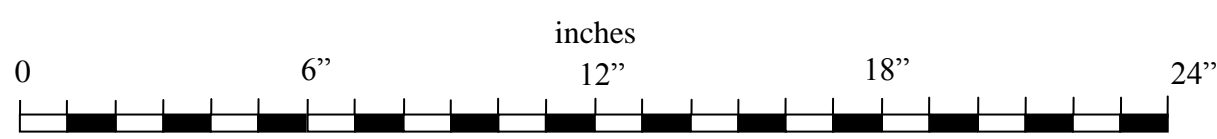
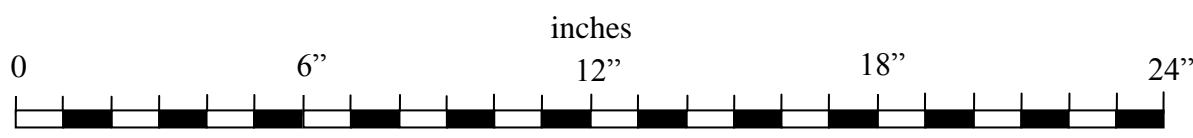
PAVEMENT CORES FOR
42263.1.1/46031.1.1, B-5121/B-5317, Wake County

ATTACHMENT 2

LINE	STATION	ABC (IN)	LAYER THICKNESS (IN)	LAYERS	REMARKS
-L-	53+00 NB ISL 3/4" Asphalt 8" Concrete	5 1/4	3/4	S	1 lift, Nova Chip with low severity stripping
			8	C	1 lift, few voids less than 1 inch
-L-	53+000 SB OSL 3/4" Asphalt 8" Concrete	5	3/4	S	1 lift, Nova Chip with moderate to high severity stripping, missing few aggregate
			8	C	1 lift, few small voids

North Carolina Department of Transportation
 Geotechnical Engineering Unit
 Asphalt Core Photo

Project No.: 42263.1.1/46031.1.1	I.D. No.: B-5121/B-5317	County: Wake	Date: 2/2 - 2/4/2015
Site Description: Bridge No. 227 on US 70/US 401/NC 50 (Capital Boulevard) over Peace Street and Bridge No. 213 on US 70/NC 50 (Wade Avenue) over US 401 (Capital Boulevard)			
Driller: J. R. Turnage and D. T. Koerner	Core Size: 4 - inch	Drill Machine: Hilti DD 200 / CME-75	
Geologist / Engineer: M. J. Alexander			



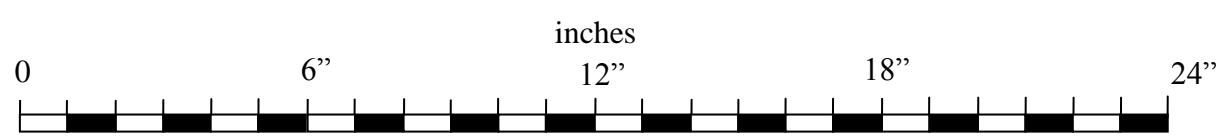
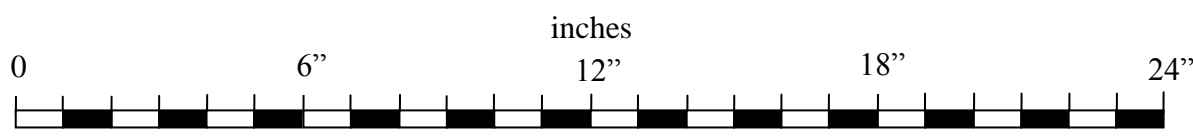
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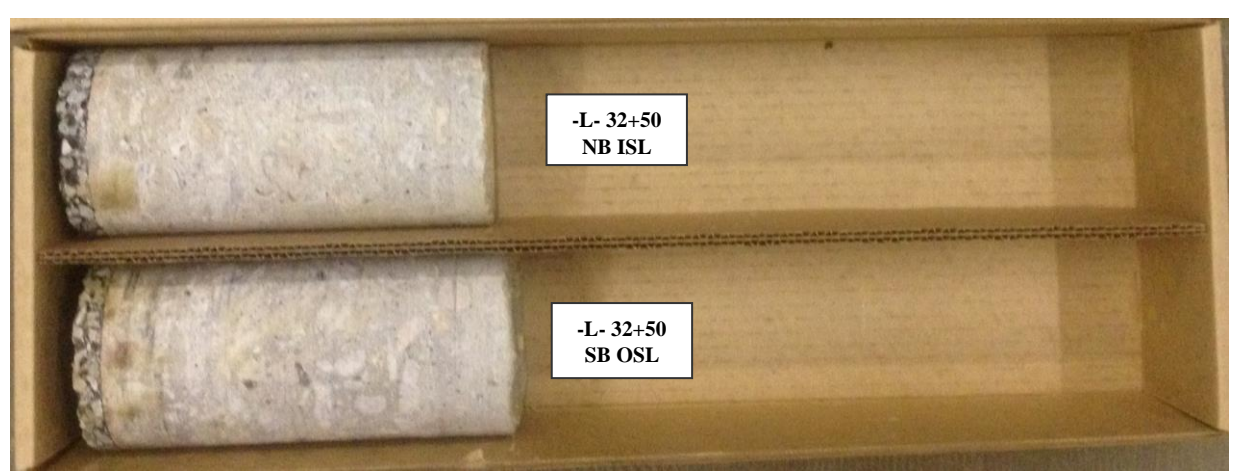
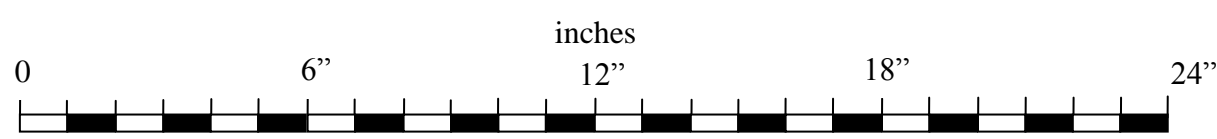
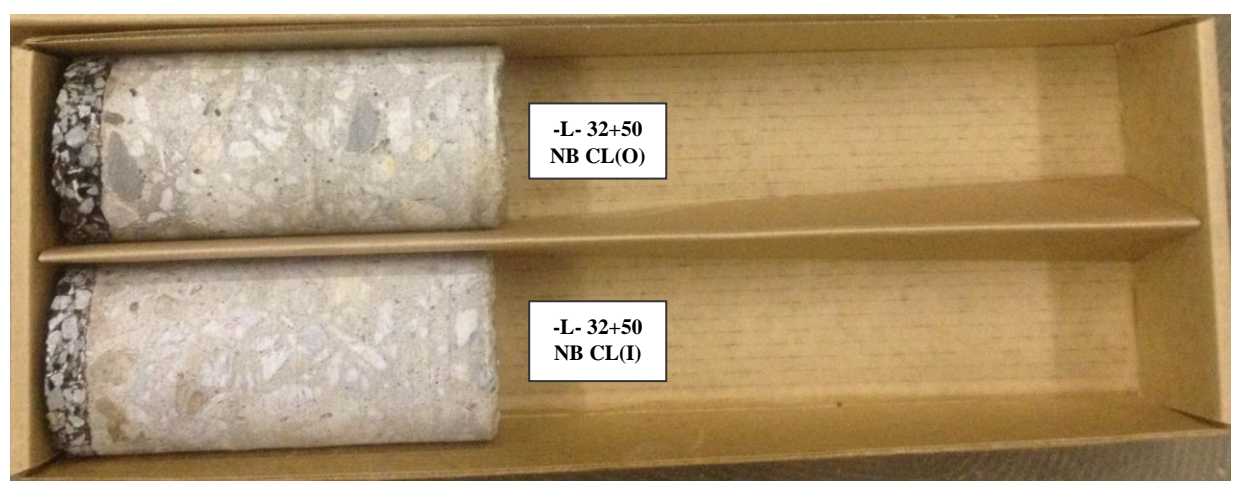
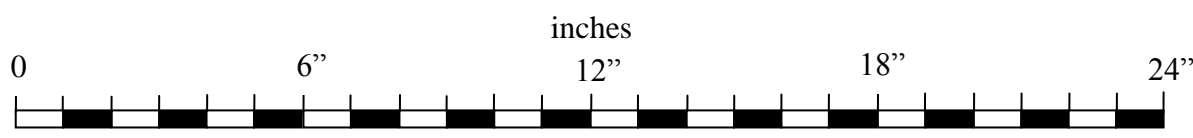
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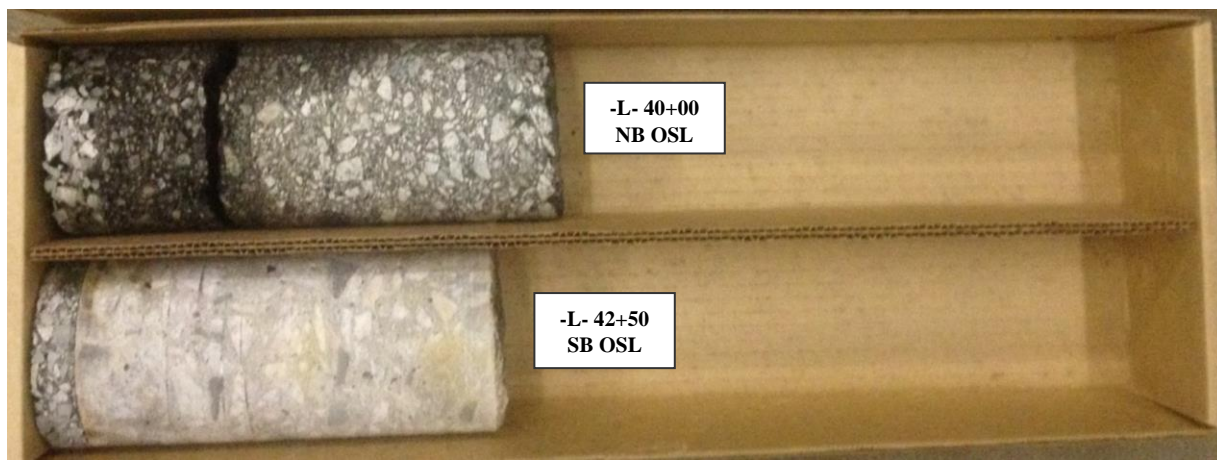
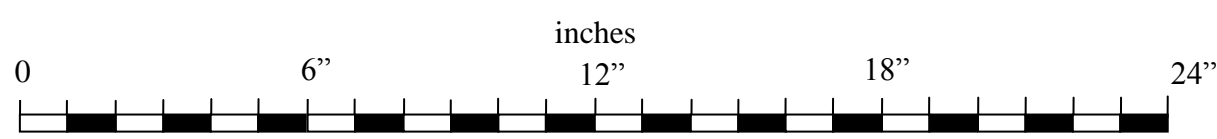
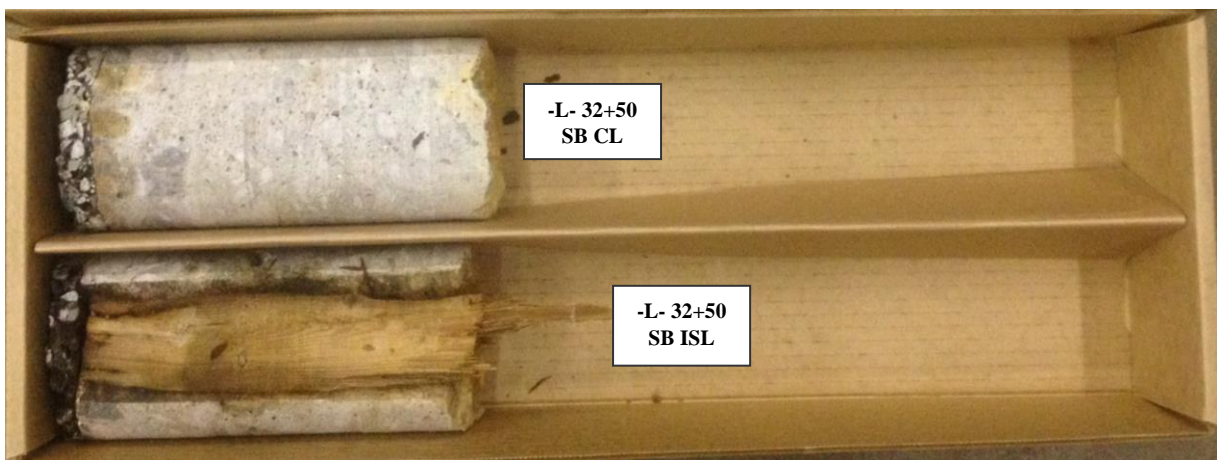
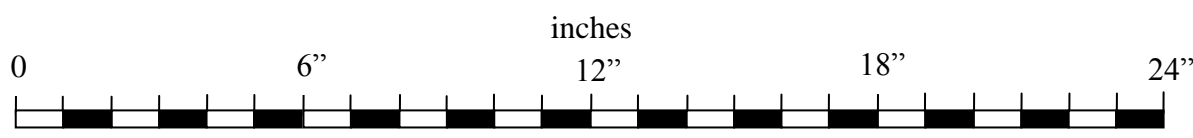
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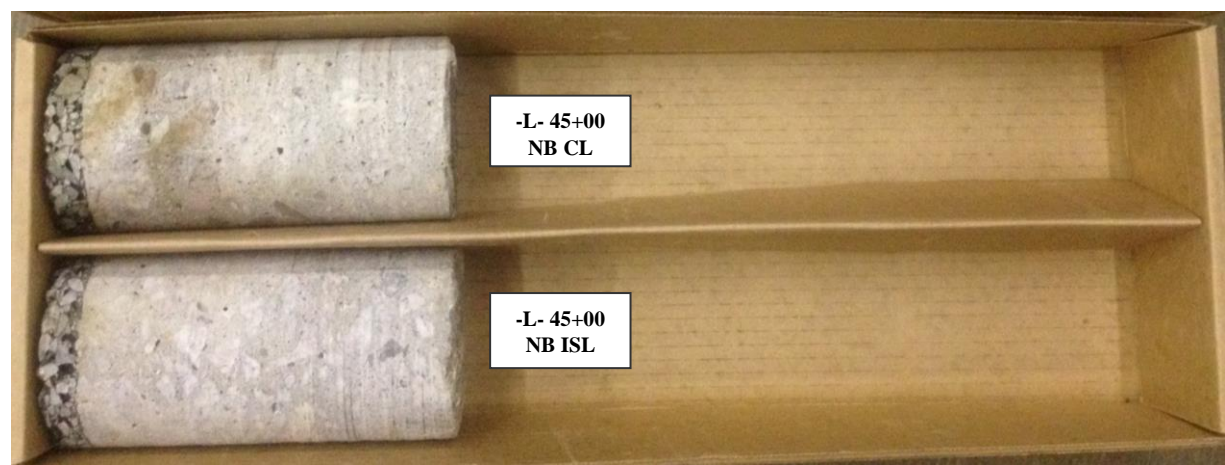
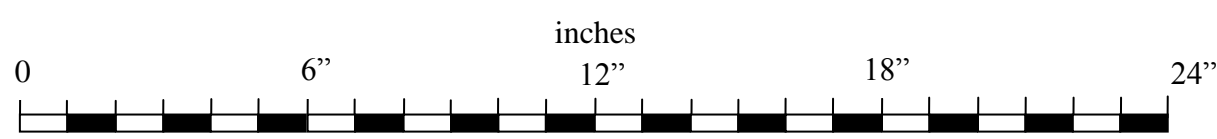
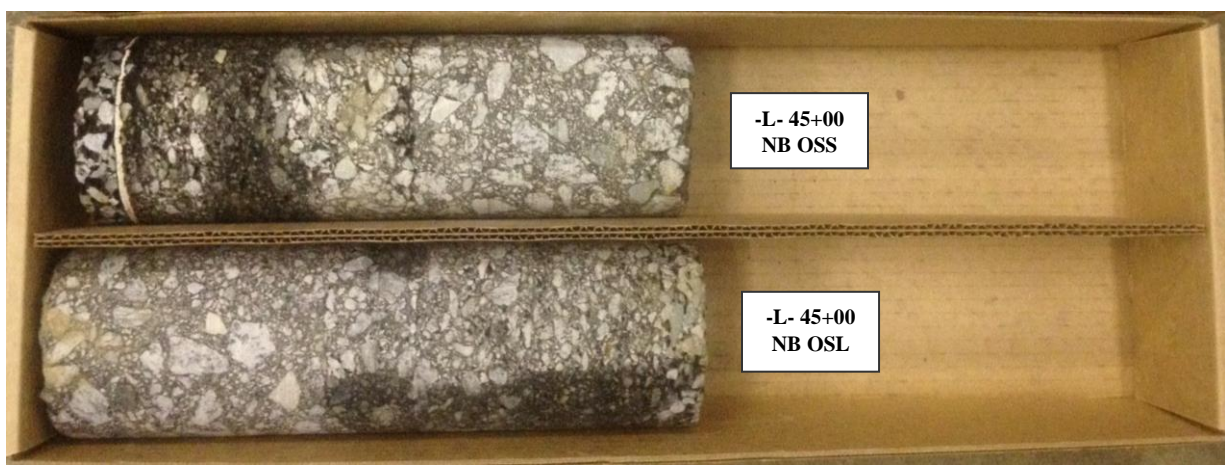
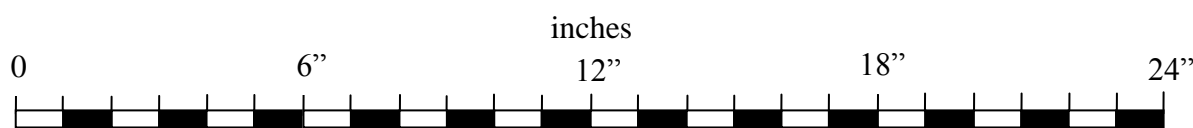
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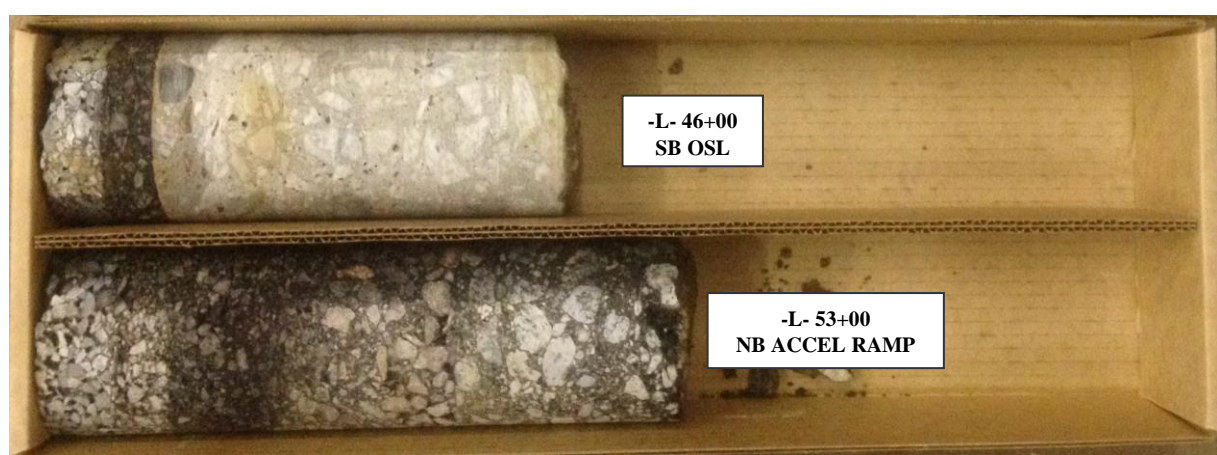
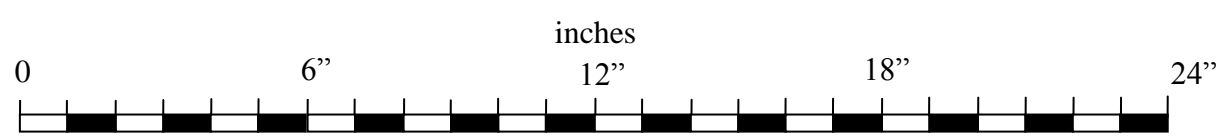
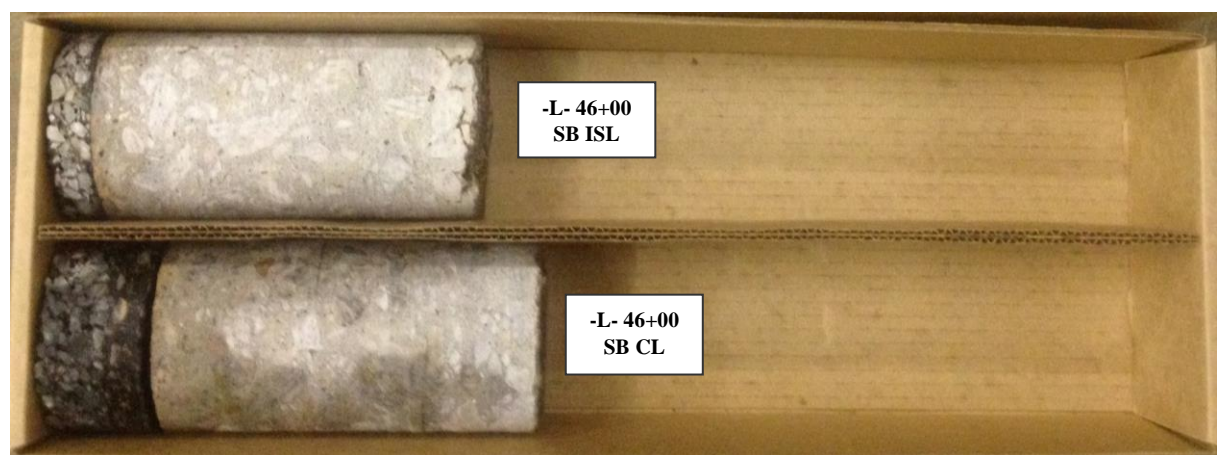
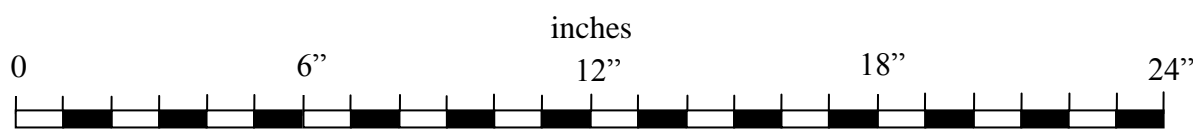
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North Carolina Department of Transportation
 Geotechnical Engineering Unit
 Asphalt Core Photo

Project No.: 42263.1.1/46031.1.1	I.D. No.: B-5121/B-5317	County: Wake	Date: 2/2 - 2/4/2015
Site Description: Bridge No. 227 on US 70/US 401/NC 50 (Capital Boulevard) over Peace Street and Bridge No. 213 on US 70/NC 50 (Wade Avenue) over US 401 (Capital Boulevard)			
Driller: J. R. Turnage and D. T. Koerner		Core Size: 4 - inch	Drill Machine: Hilti DD 200 / CME-75
Geologist / Engineer: M. J. Alexander			



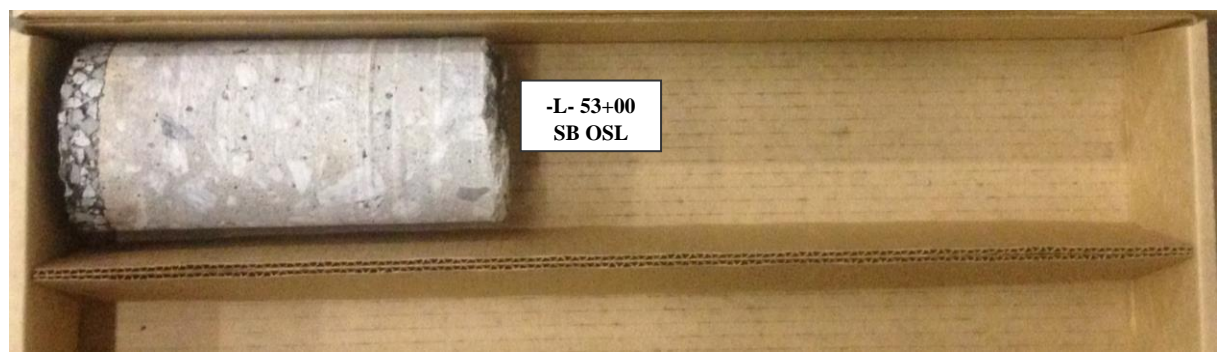
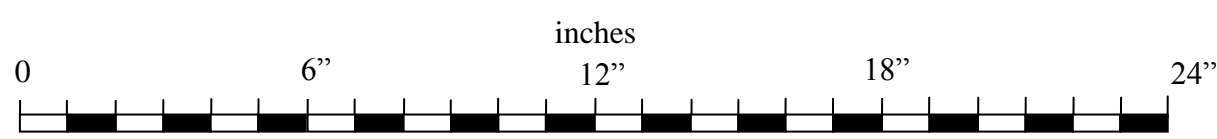
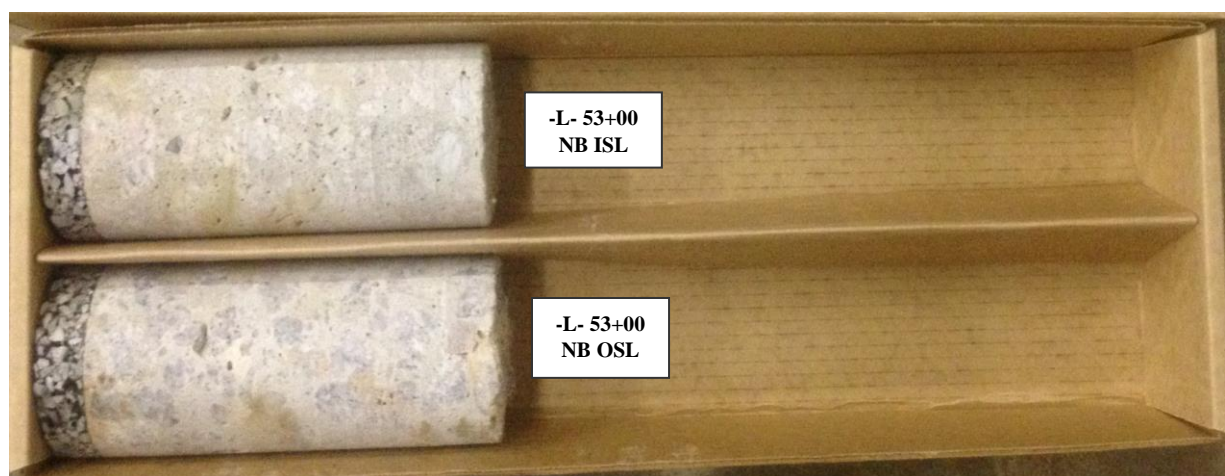
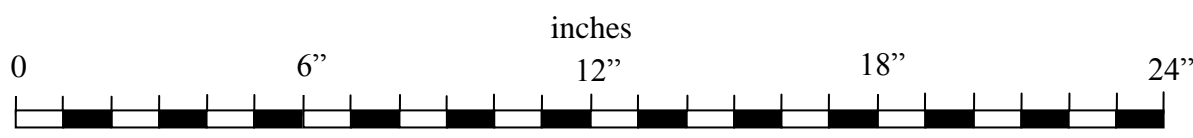
Notes:

- | | | |
|---------------------------|---------------------------|----------------------|
| OSL - Outside Lane | ISL - Inside Lane | CL - Center Lane |
| OSS - Outside Shoulder | ISS - Inside Shoulder | PS - Paved Shoulder |
| ACCEL - Acceleration Lane | DECEL - Deceleration Lane | COL - Collector Lane |
| LTL - Left Turn Lane | RTL - Right Turn Lane | |
| RT LN - Right Lane | LT LN - Left Lane | |
| NB - Northbound | SB - Southbound | |
| (I) - Inside | (O) - Outside | |



North Carolina Department of Transportation
 Geotechnical Engineering Unit
 Asphalt Core Photo

<i>Project No.:</i> 42263.1.1/46031.1.1	<i>I.D. No.:</i> B-5121/B-5317	<i>County:</i> Wake	<i>Date:</i> 2/2 - 2/4/2015
<i>Site Description:</i> Bridge No. 227 on US 70/US 401/NC 50 (Capital Boulevard) over Peace Street and Bridge No. 213 on US 70/NC 50 (Wade Avenue) over US 401 (Capital Boulevard)			
<i>Driller:</i> J. R. Turnage and D. T. Koerner	<i>Core Size:</i> 4 - inch	<i>Drill Machine:</i> Hilti DD 200 / CME-75	
<i>Geologist / Engineer:</i> M. J. Alexander			



Notes:

- | | | |
|---------------------------|---------------------------|----------------------|
| OSL - Outside Lane | ISL - Inside Lane | CL - Center Lane |
| OSS - Outside Shoulder | ISS - Inside Shoulder | PS - Paved Shoulder |
| ACCEL - Acceleration Lane | DECEL - Deceleration Lane | COL - Collector Lane |
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| RT LN - Right Lane | LT LN - Left Lane | |
| NB - Northbound | SB - Southbound | |
| (I) - Inside | (O) - Outside | |

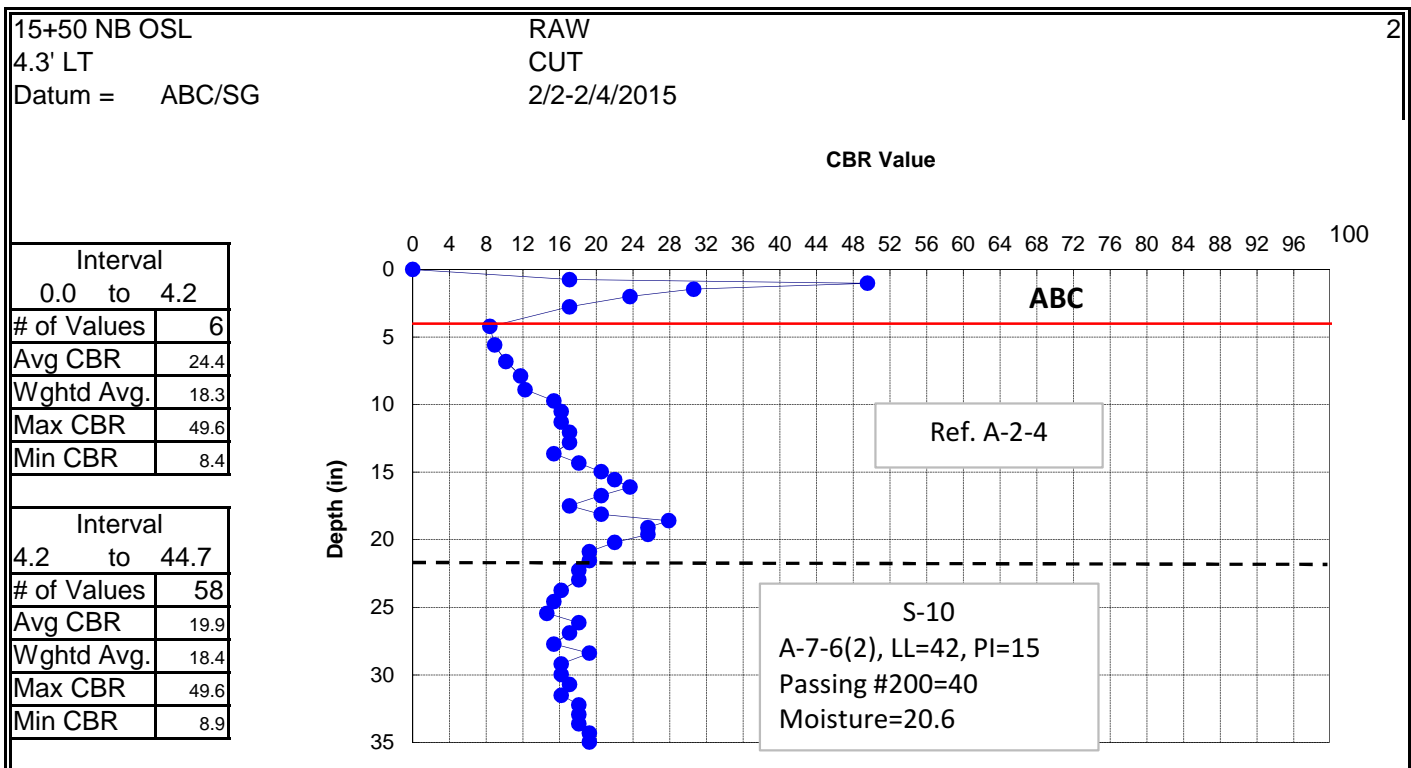
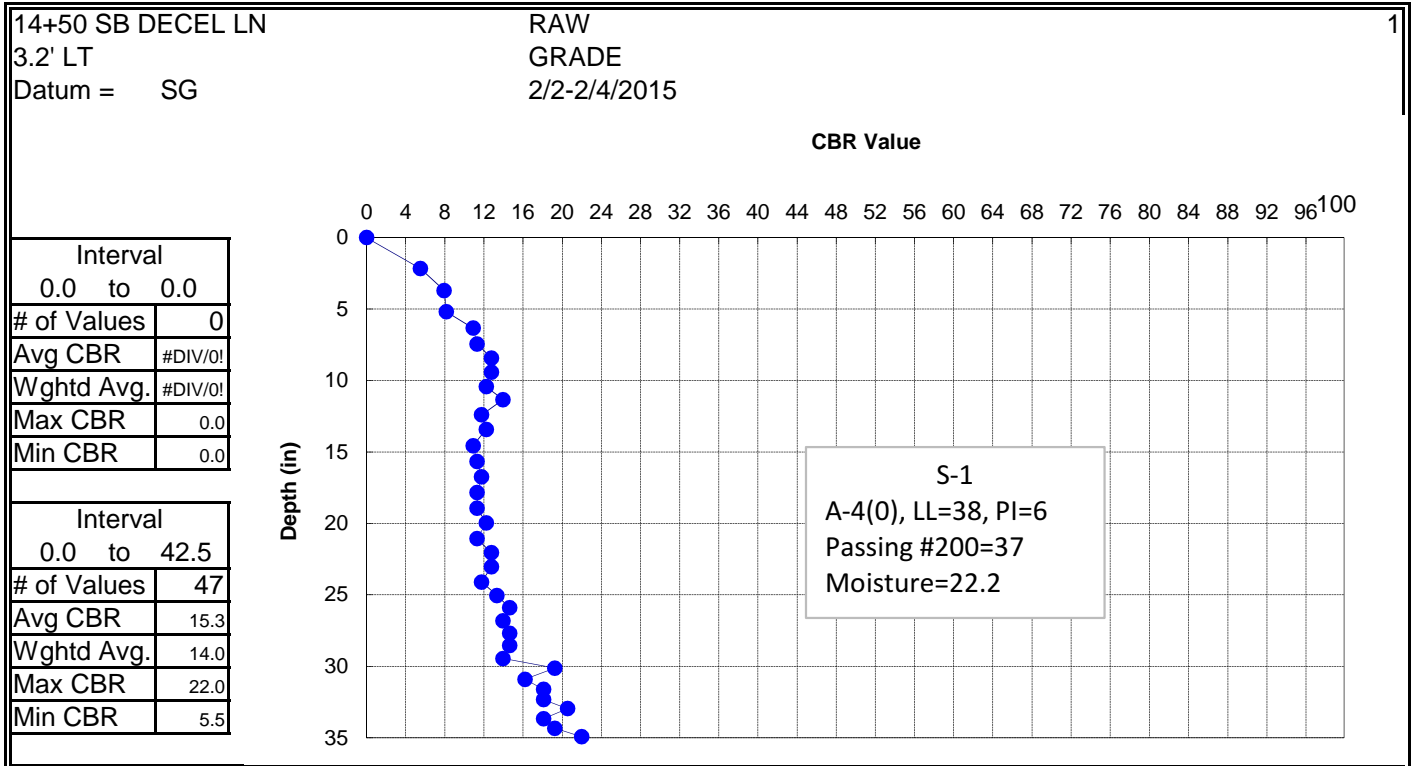


**CONE PENETROMETER RESULTS
NC - DOT, GEOTECHNICAL ENGINEERING UNIT**

PROJECT NO.	42263.1.1/46031.1.1
PROJECT ID	B-5121/B-5317
ROUTE	US 70/401/NC 50 (Capital Blvd.)
COUNTY	WAKE

GEOLOGIST	J.B. BARFIELD
GEOTECHS	TERRACON

FILE	DRAFT
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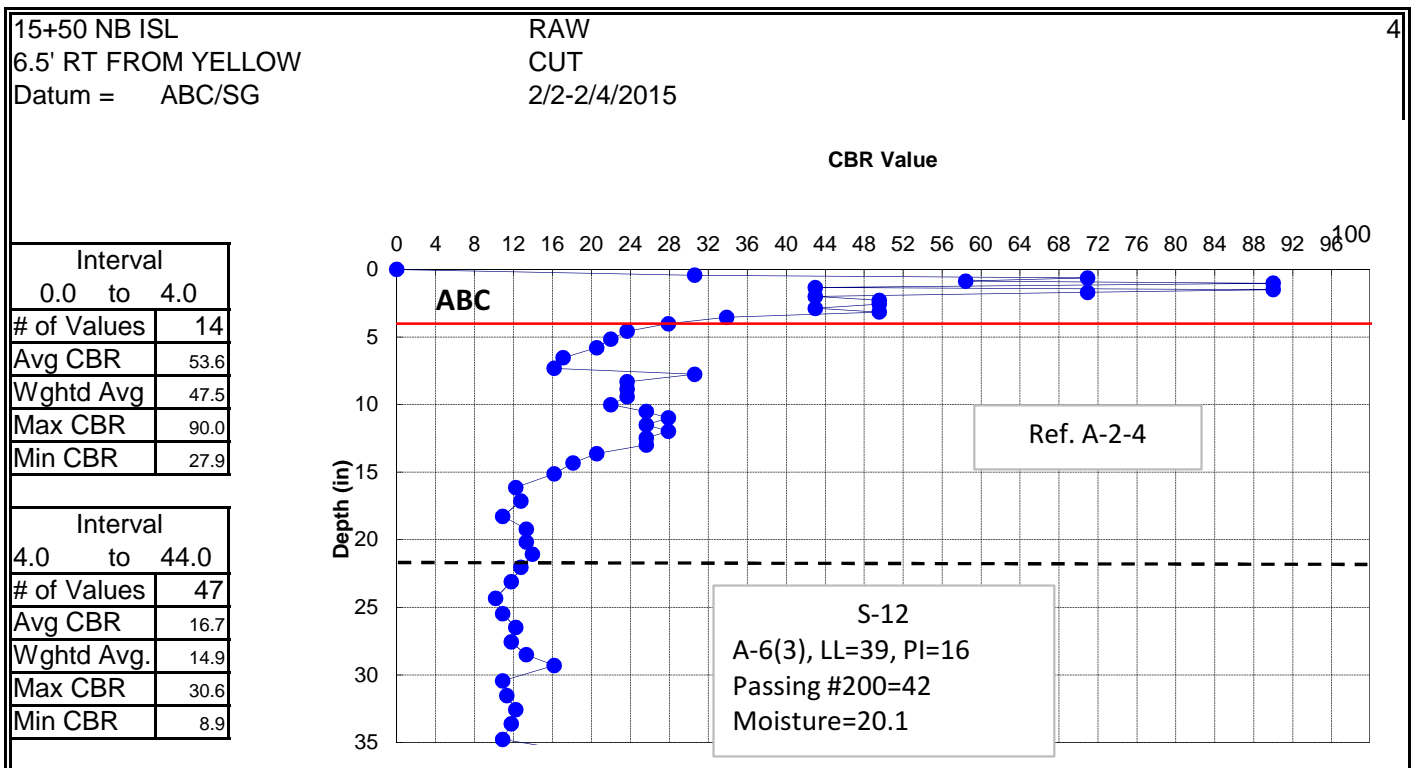
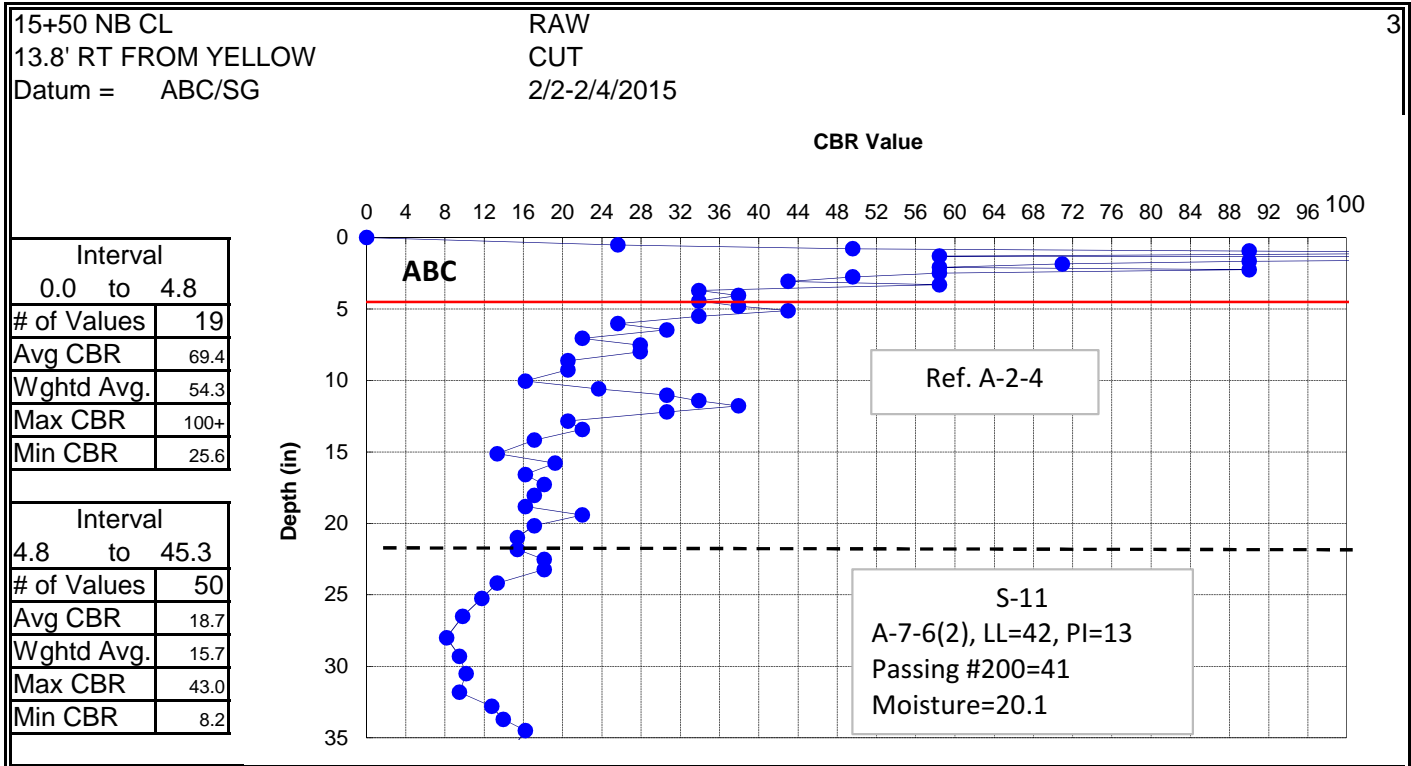


**CONE PENETROMETER RESULTS
NC - DOT, GEOTECHNICAL ENGINEERING UNIT**

PROJECT NO.	42263.1.1/46031.1.1
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COUNTY	WAKE

GEOLOGIST	J.B. BARFIELD
GEOTECHS	TERRACON

FILE	DRAFT
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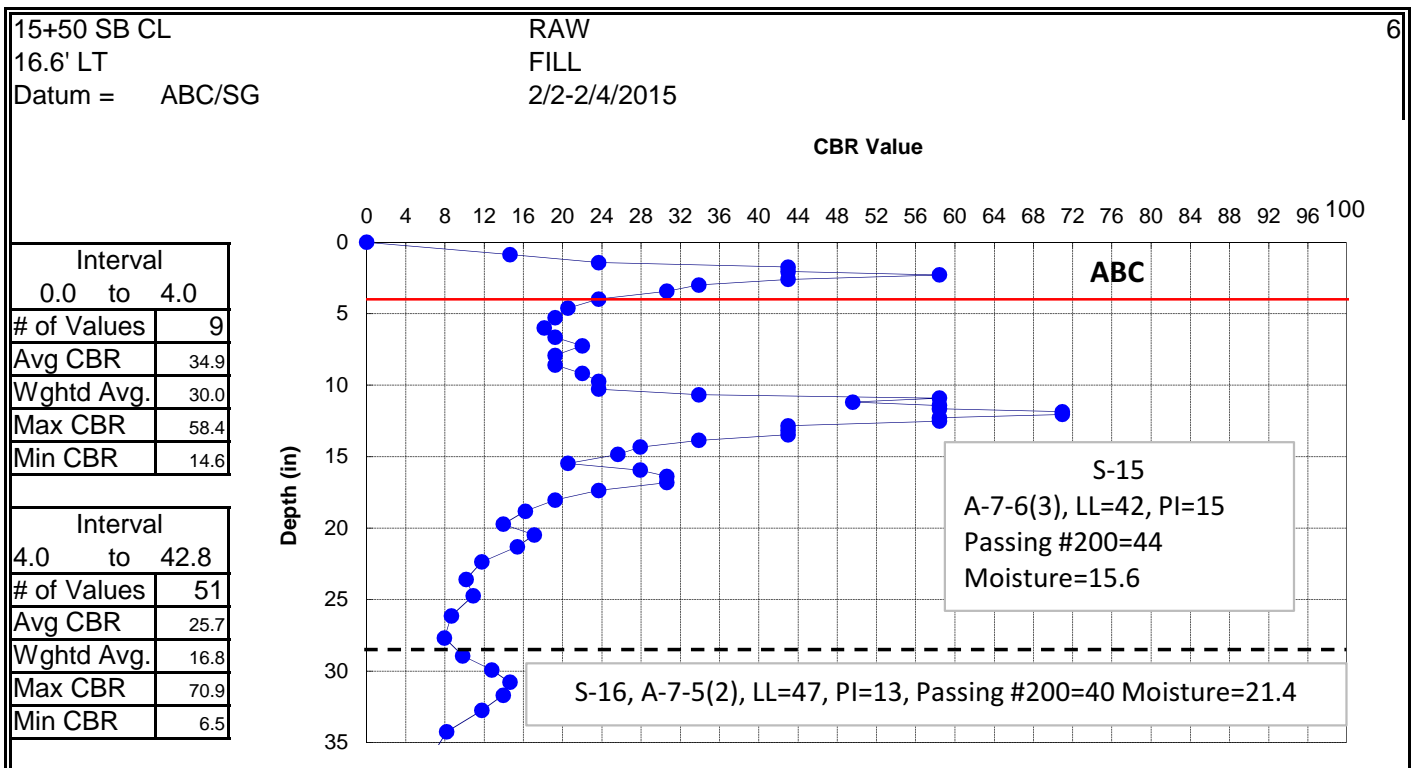
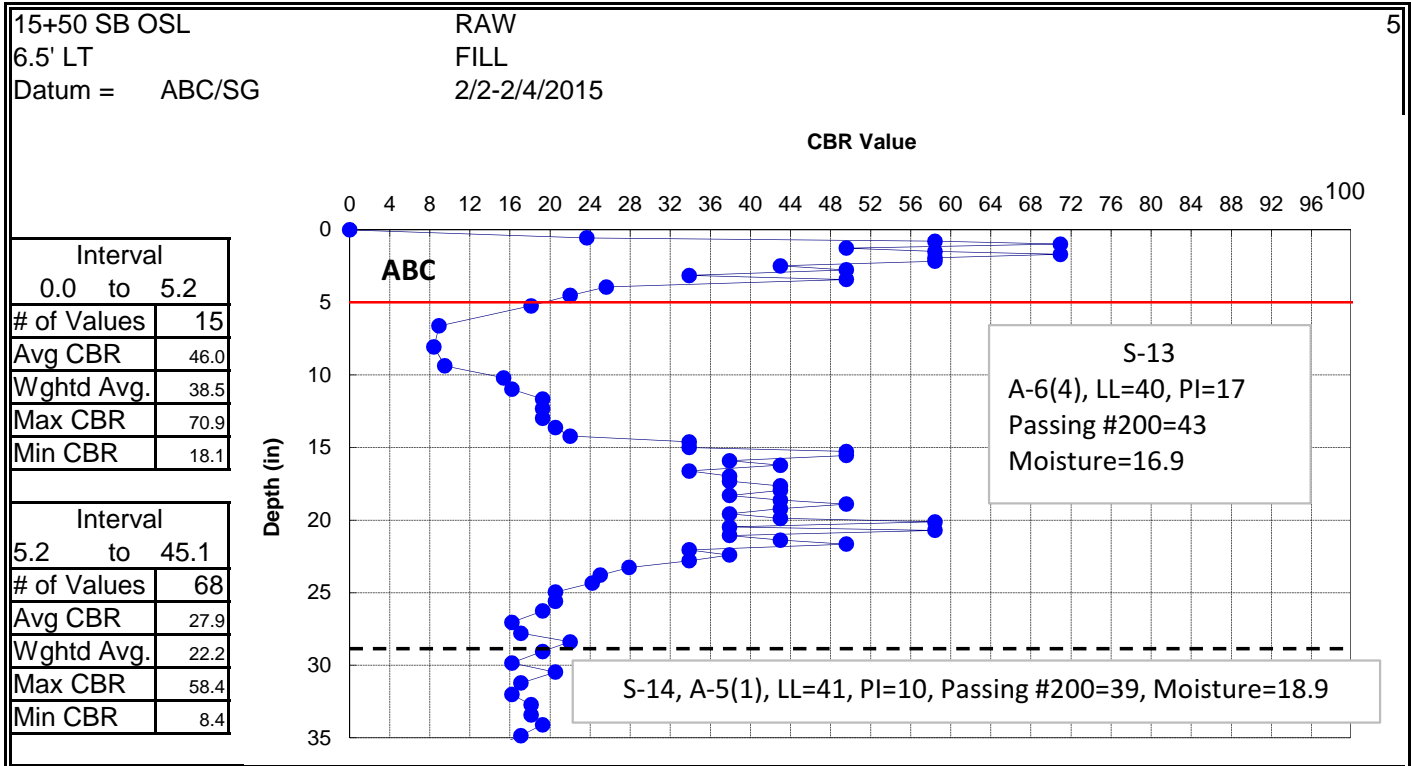


**CONE PENETROMETER RESULTS
NC - DOT, GEOTECHNICAL ENGINEERING UNIT**

PROJECT NO.	42263.1.1/46031.1.1
PROJECT ID	B-5121/B-5317
ROUTE	US 70/401/NC 50 (Capital Blvd.)
COUNTY	WAKE

GEOLOGIST	J.B. BARFIELD
GEOTECHS	TERRACON

FILE	DRAFT
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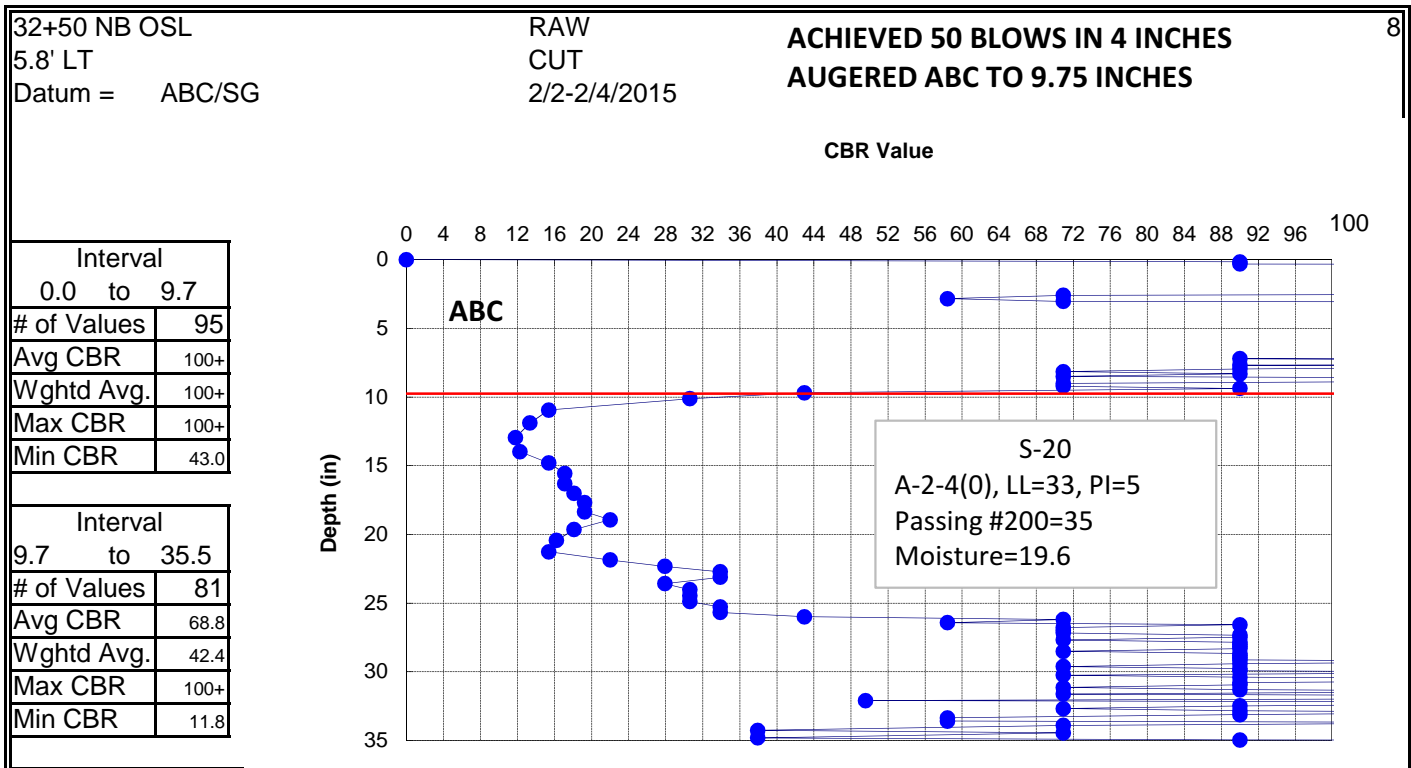
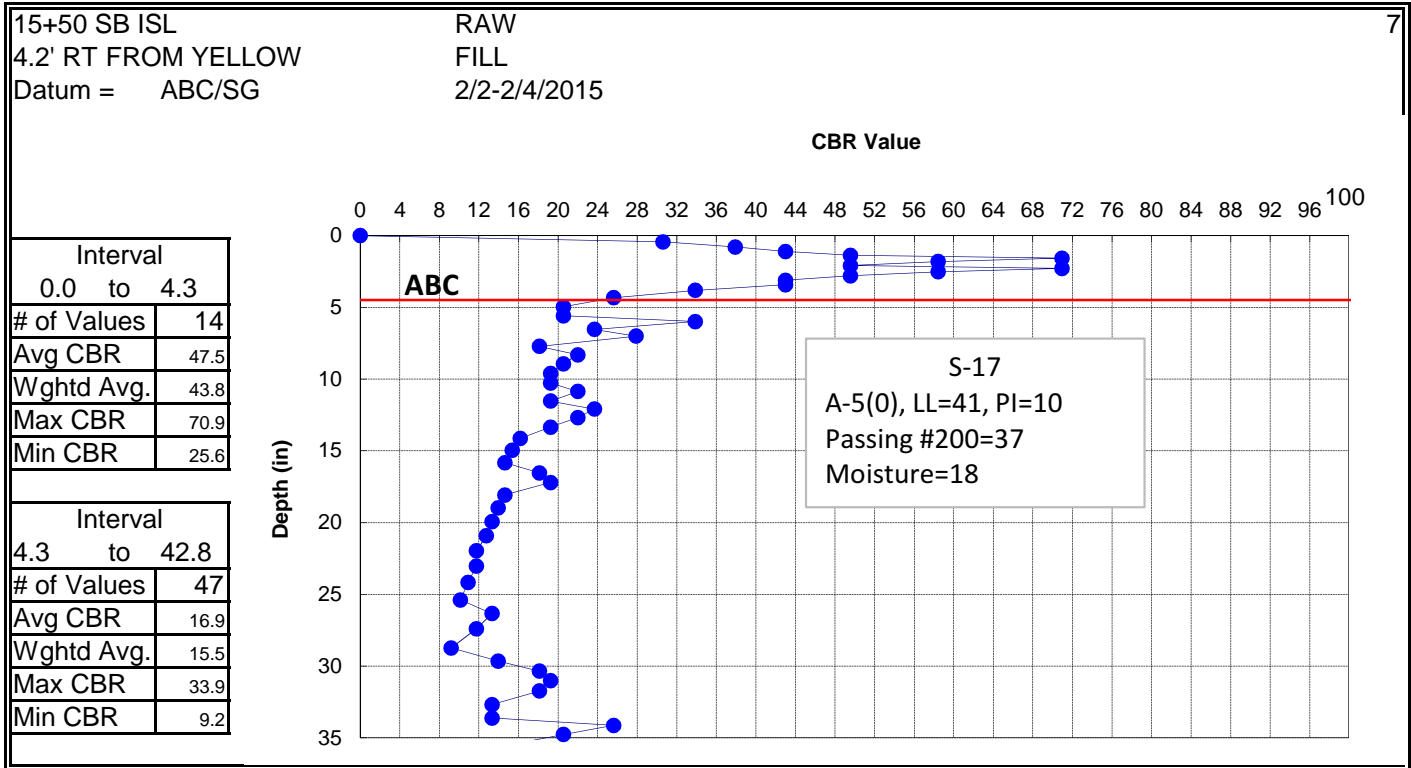


**CONE PENETROMETER RESULTS
NC - DOT, GEOTECHNICAL ENGINEERING UNIT**

PROJECT NO.	42263.1.1/46031.1.1
PROJECT ID	B-5121/B-5317
ROUTE	US 70/401/NC 50 (Capital Blvd.)
COUNTY	WAKE

GEOLOGIST	J.B. BARFIELD
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FILE	DRAFT
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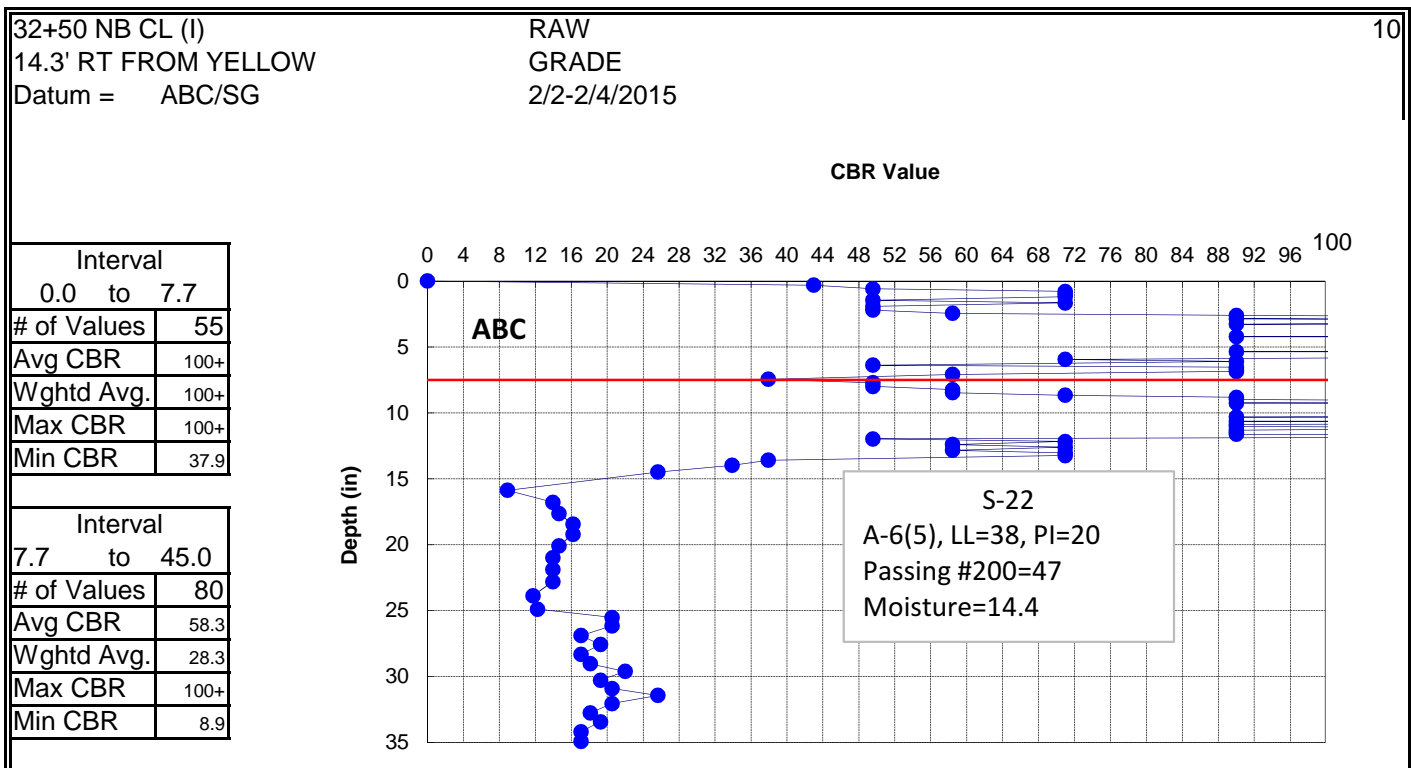
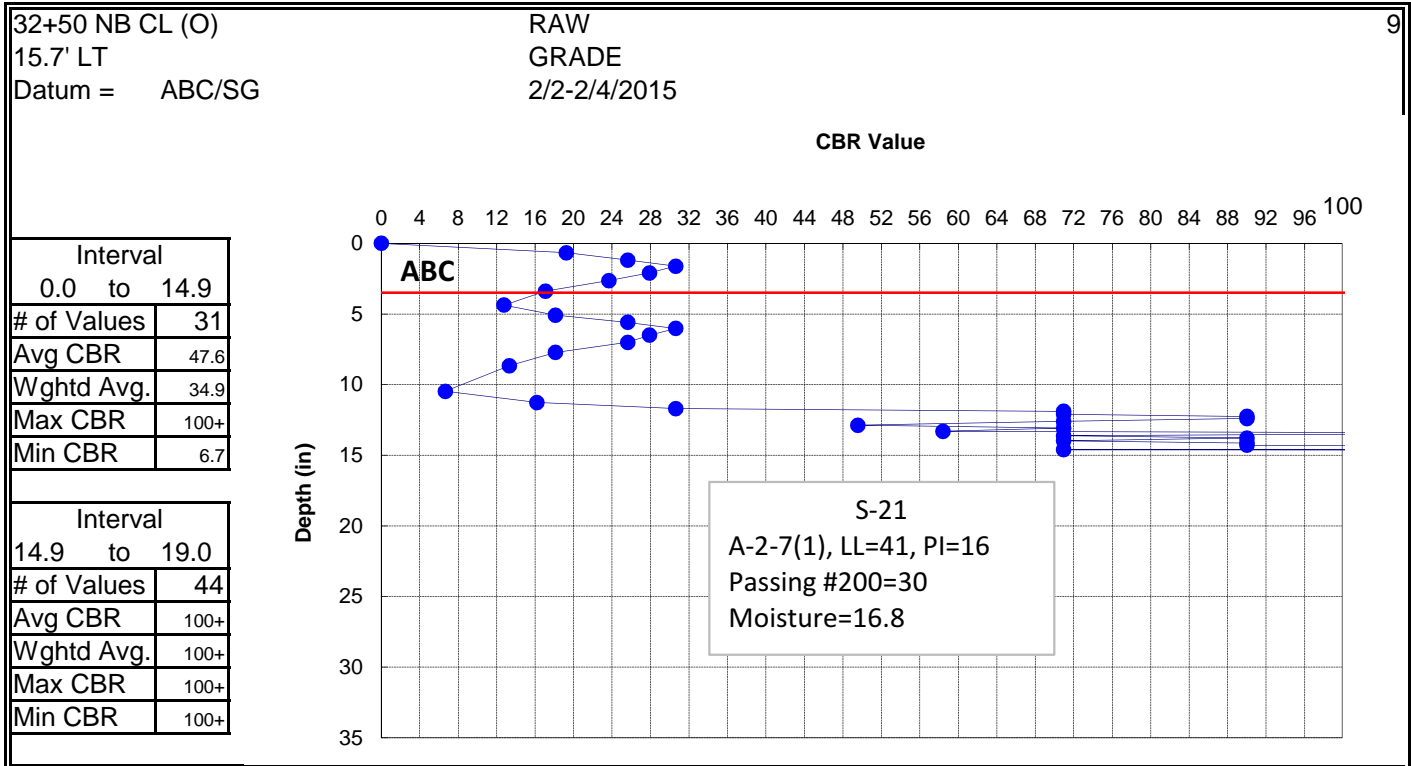


**CONE PENETROMETER RESULTS
NC - DOT, GEOTECHNICAL ENGINEERING UNIT**

PROJECT NO.	42263.1.1/46031.1.1
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COUNTY	WAKE

GEOLOGIST	J.B. BARFIELD
GEOTECHS	TERRACON

FILE	DRAFT
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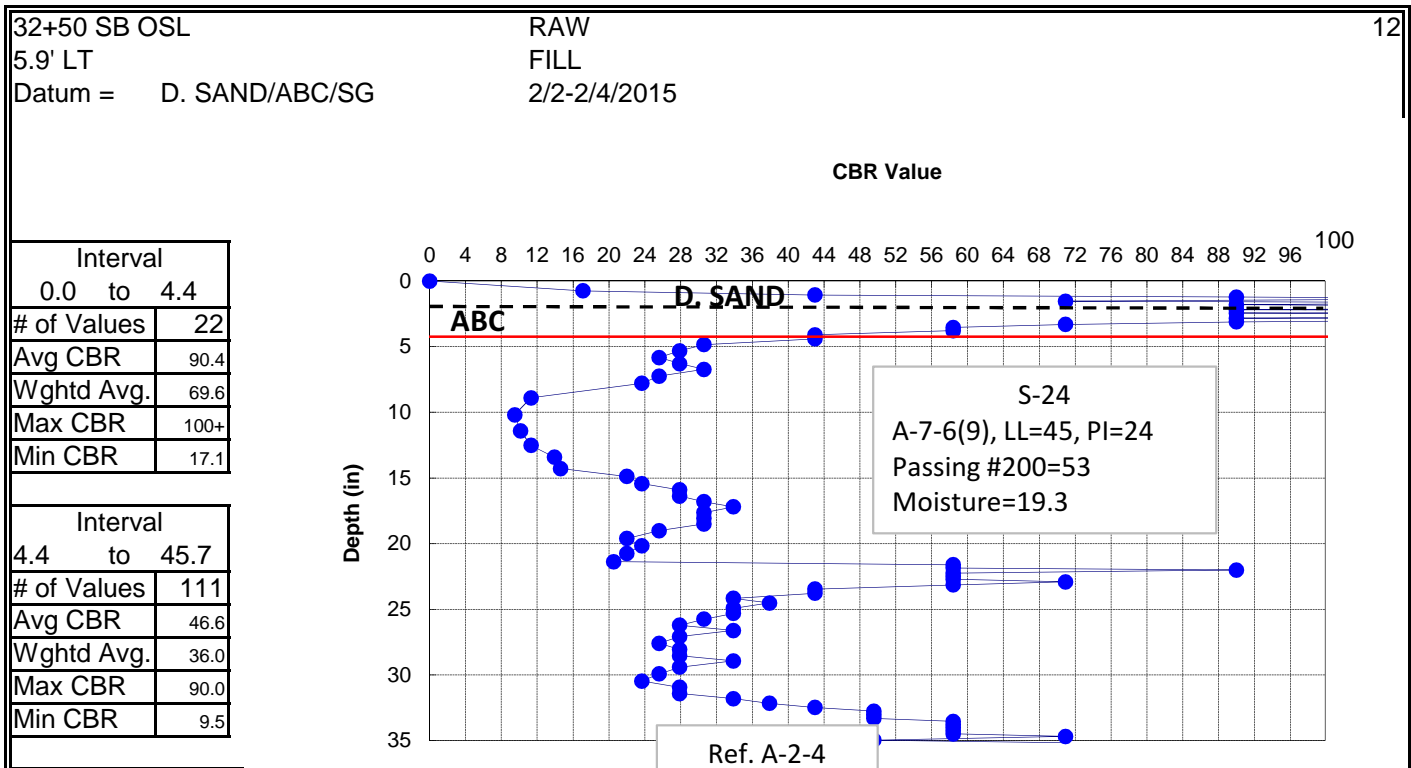
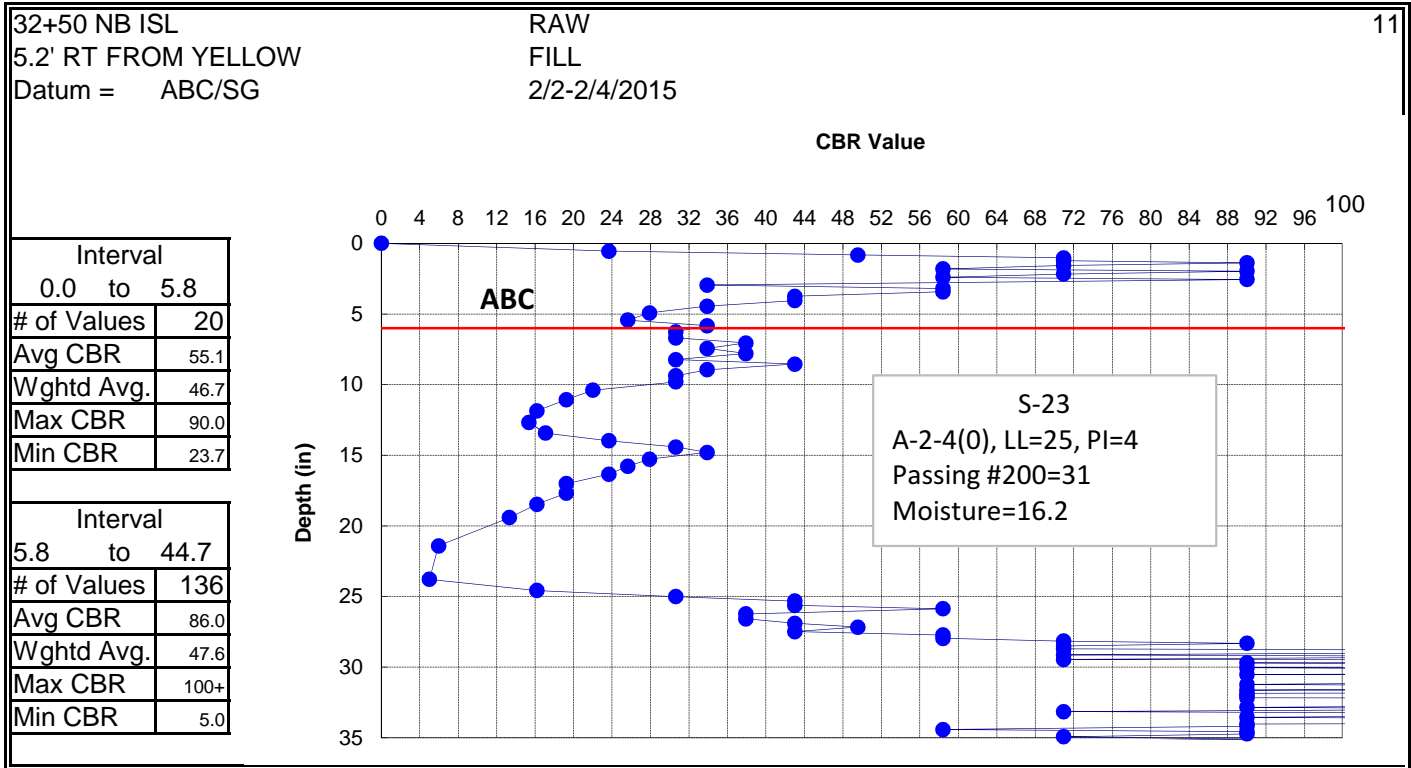


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NC - DOT, GEOTECHNICAL ENGINEERING UNIT**

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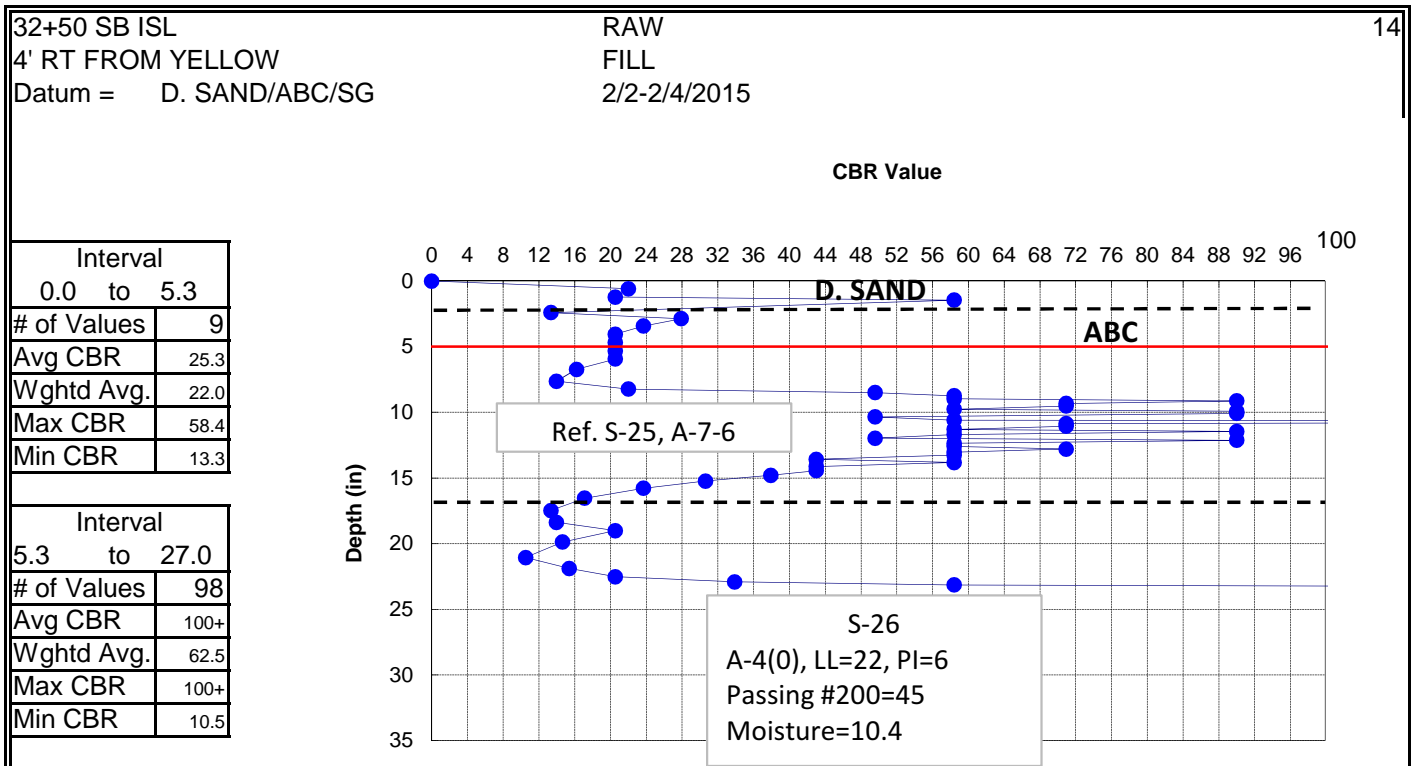
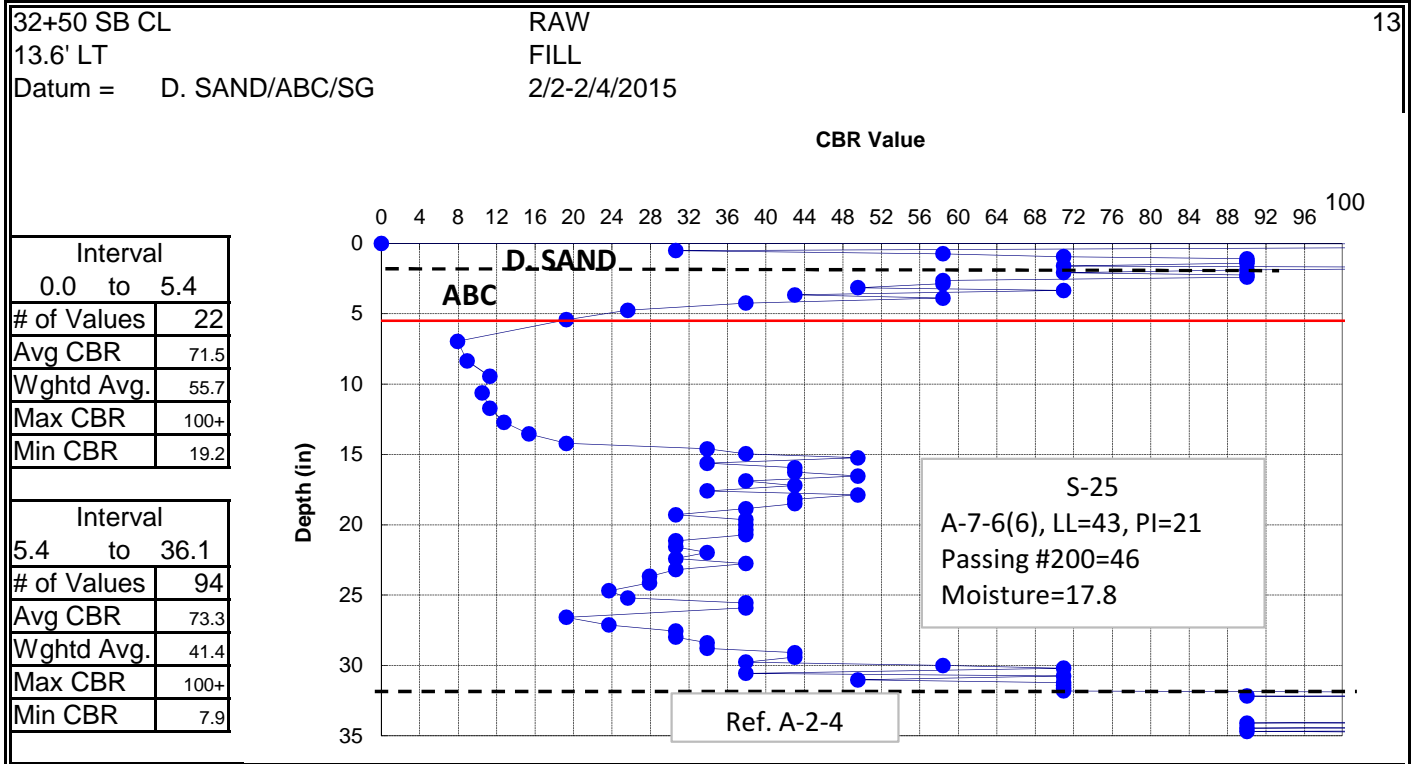


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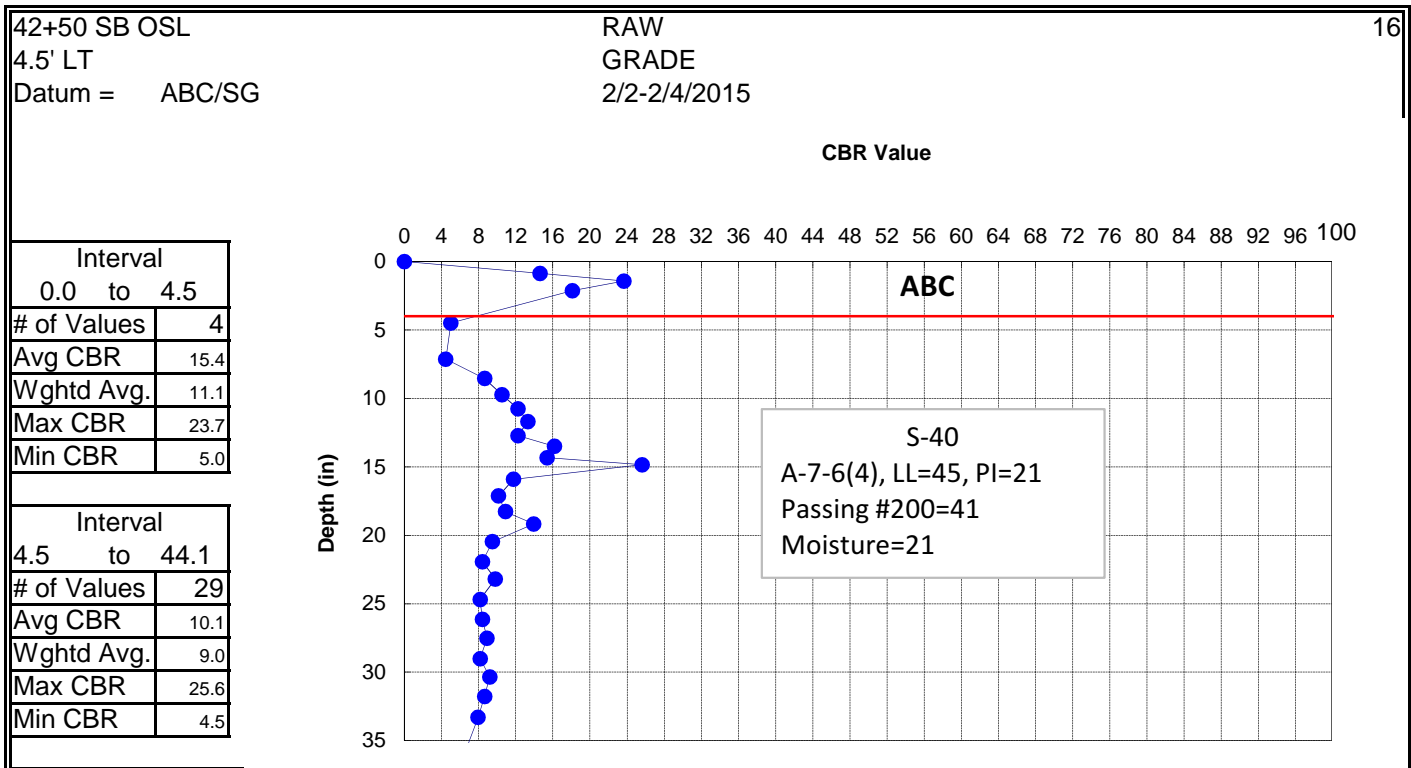
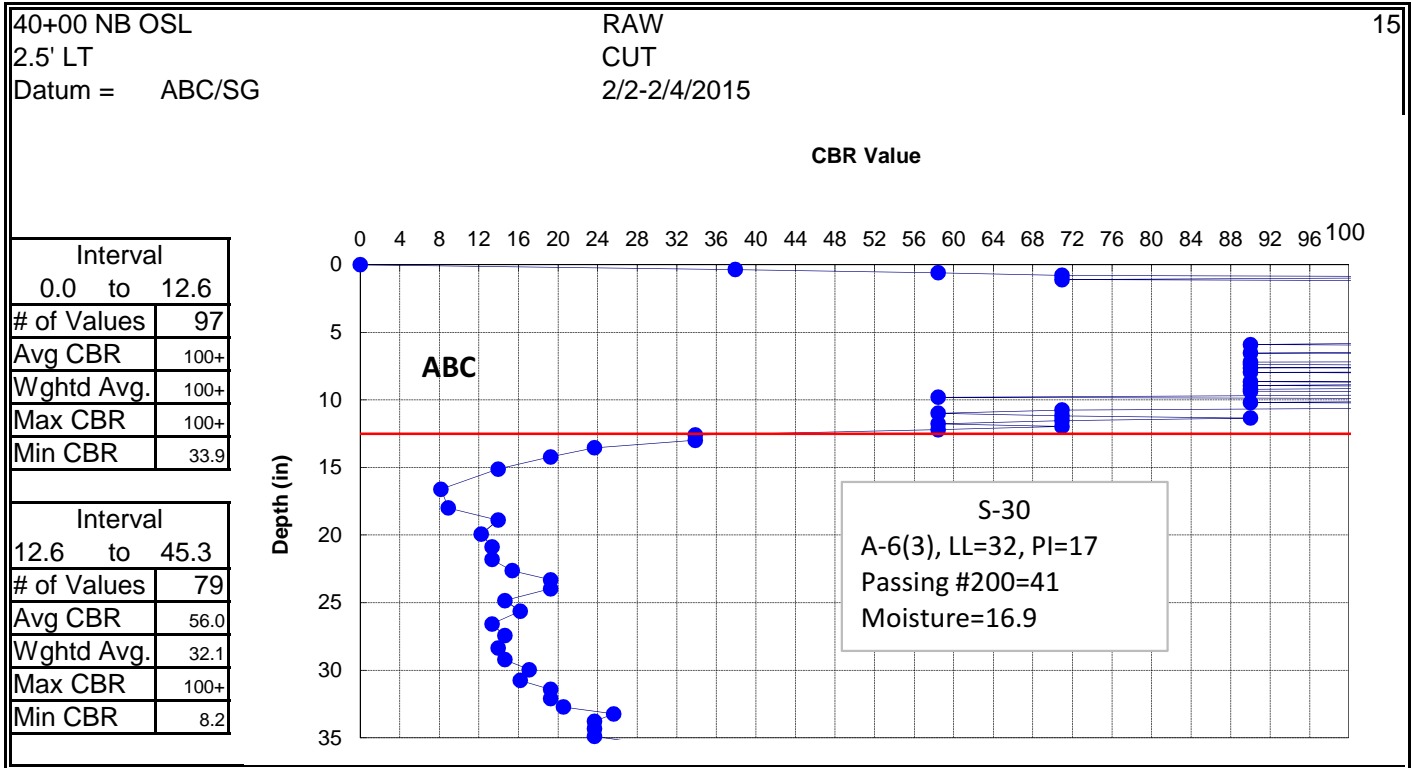


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NC - DOT, GEOTECHNICAL ENGINEERING UNIT**

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FILE	DRAFT
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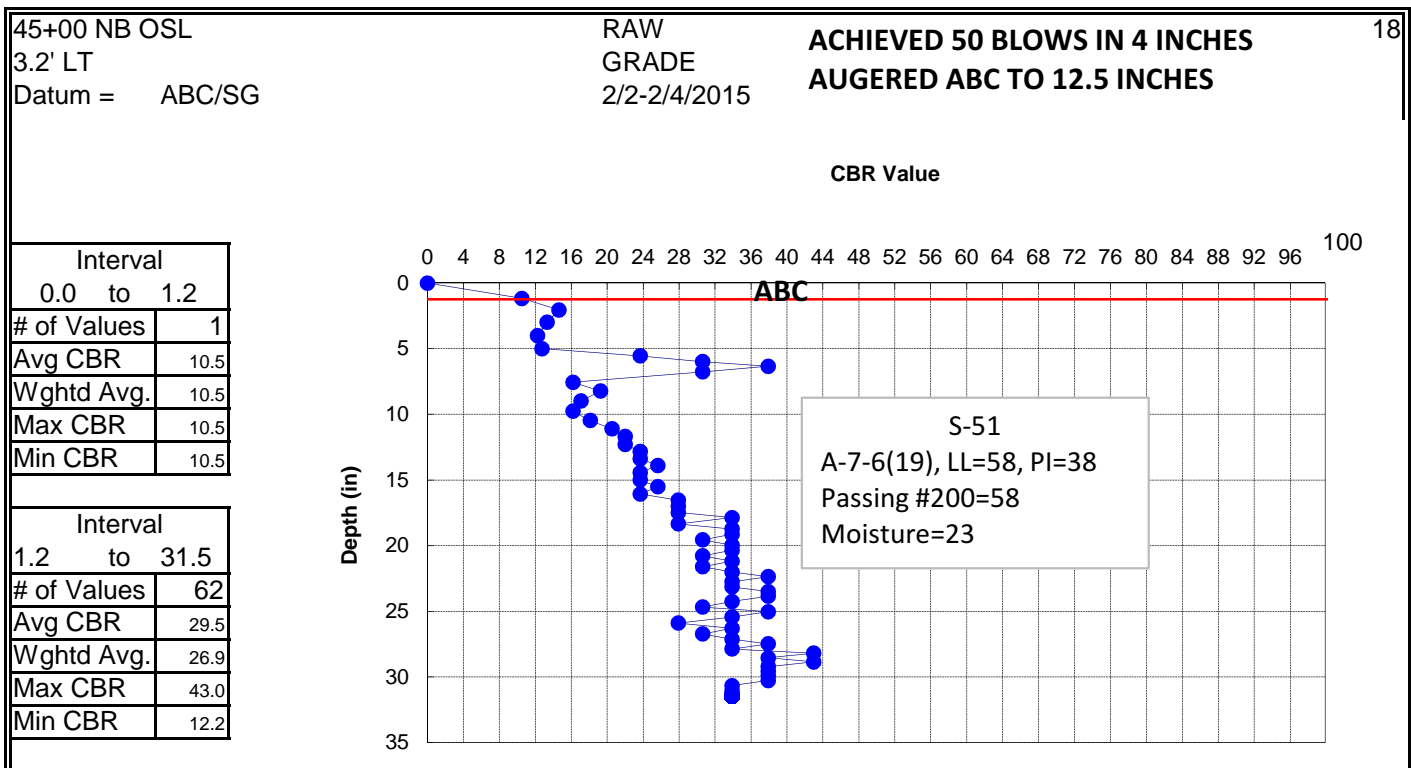
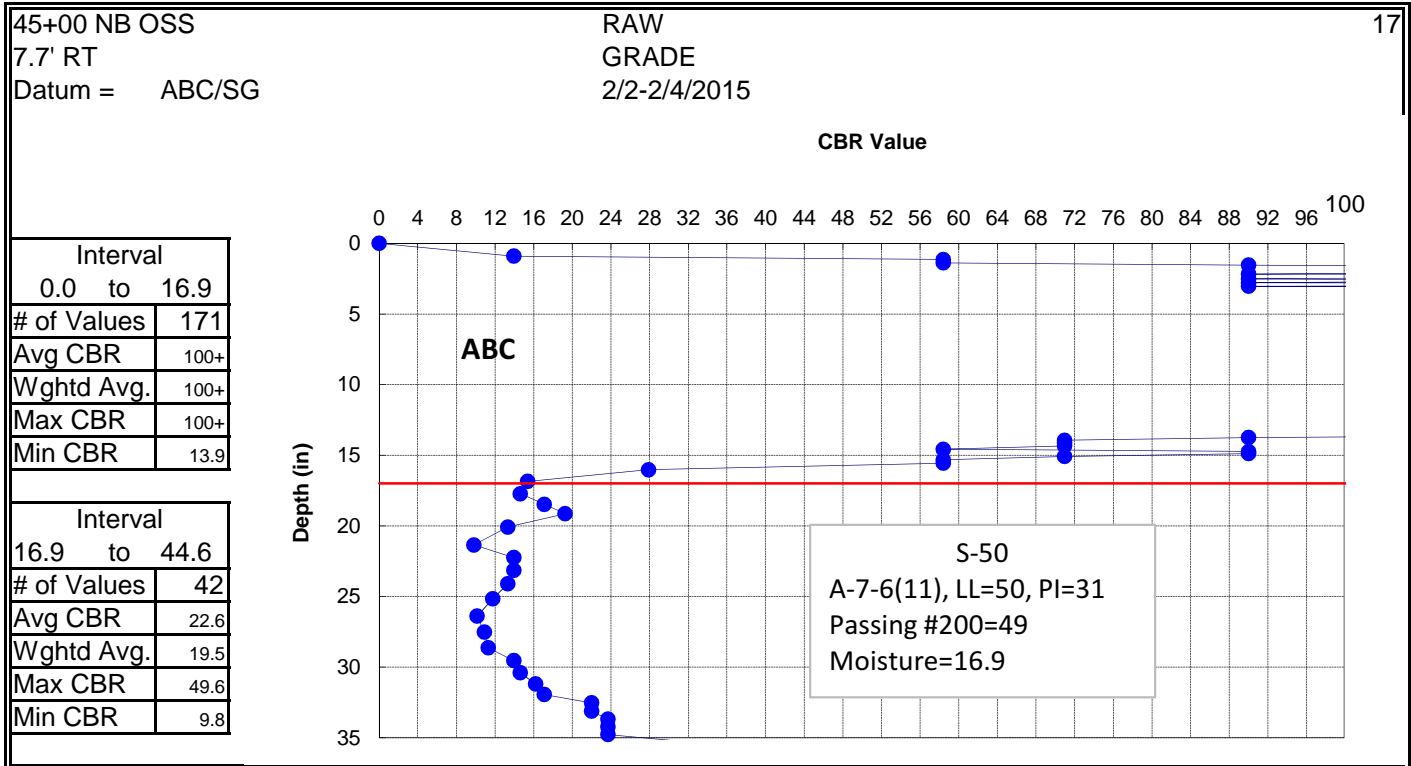


**CONE PENETROMETER RESULTS
NC - DOT, GEOTECHNICAL ENGINEERING UNIT**

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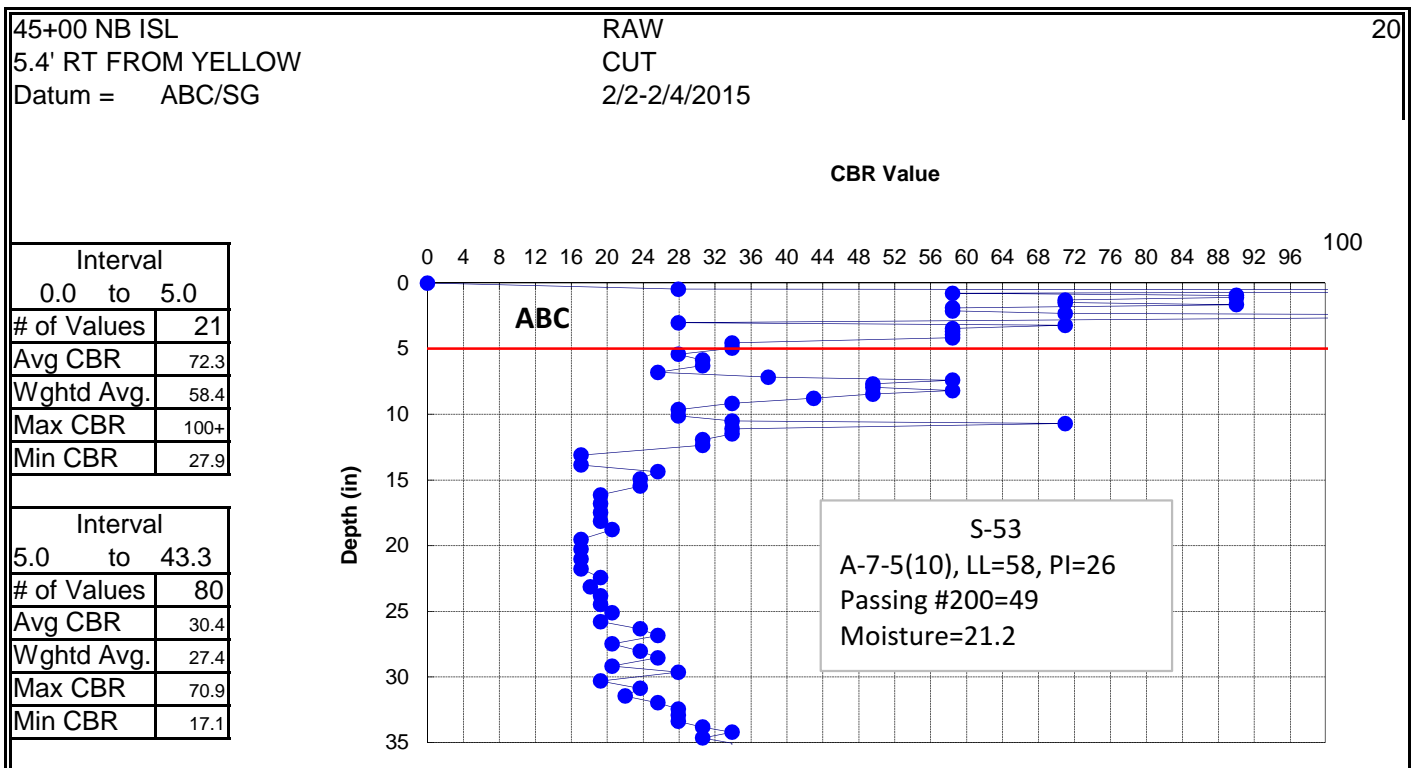
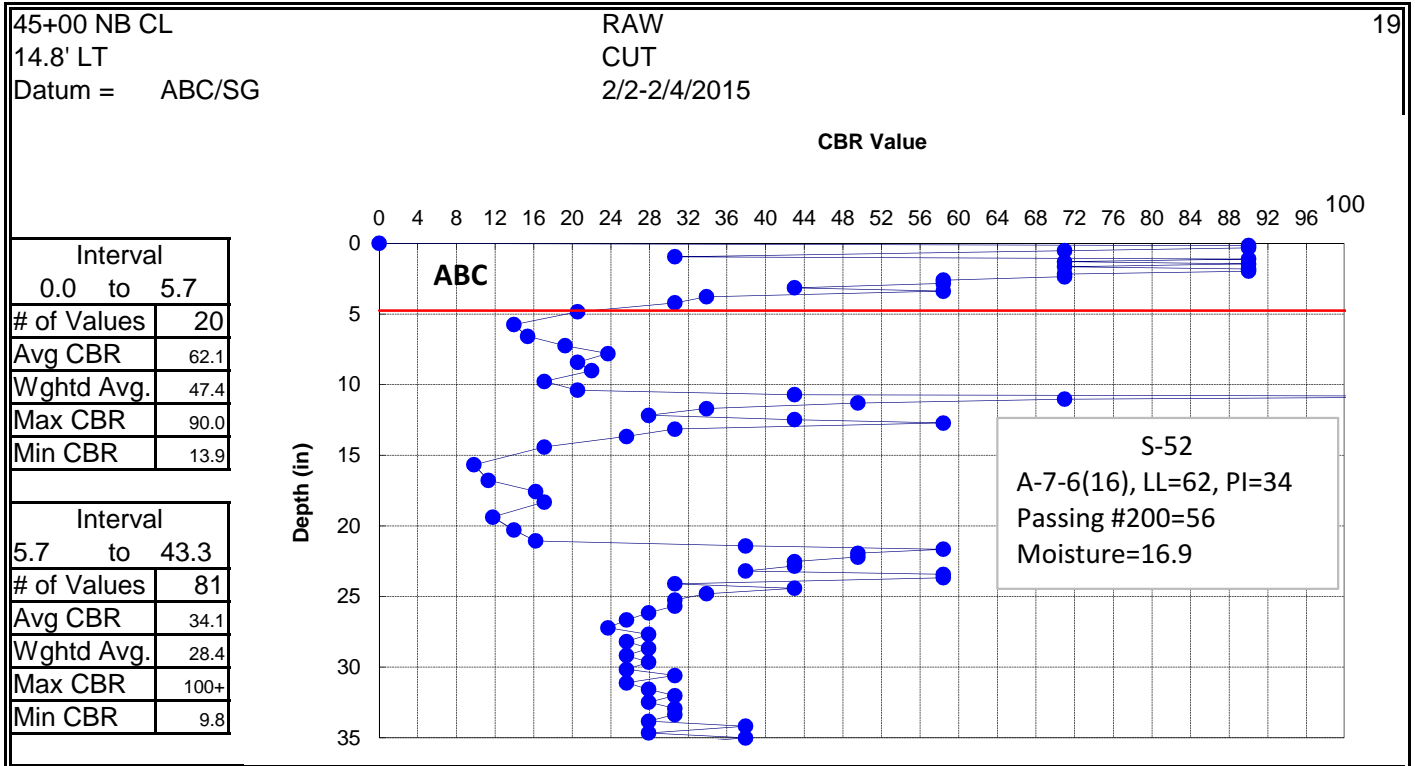


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NC - DOT, GEOTECHNICAL ENGINEERING UNIT**

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GEOTECHS	TERRACON

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**CONE PENETROMETER RESULTS
NC - DOT, GEOTECHNICAL ENGINEERING UNIT**

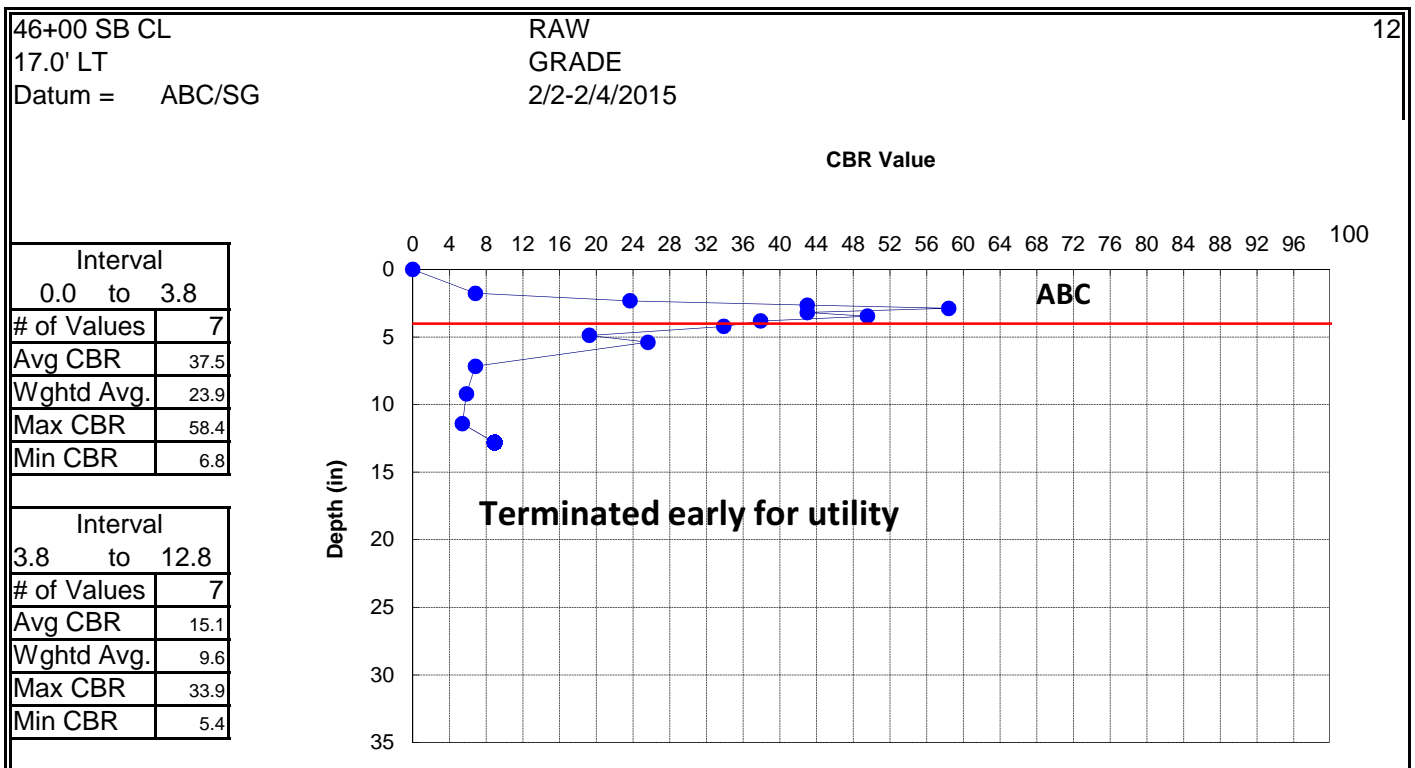
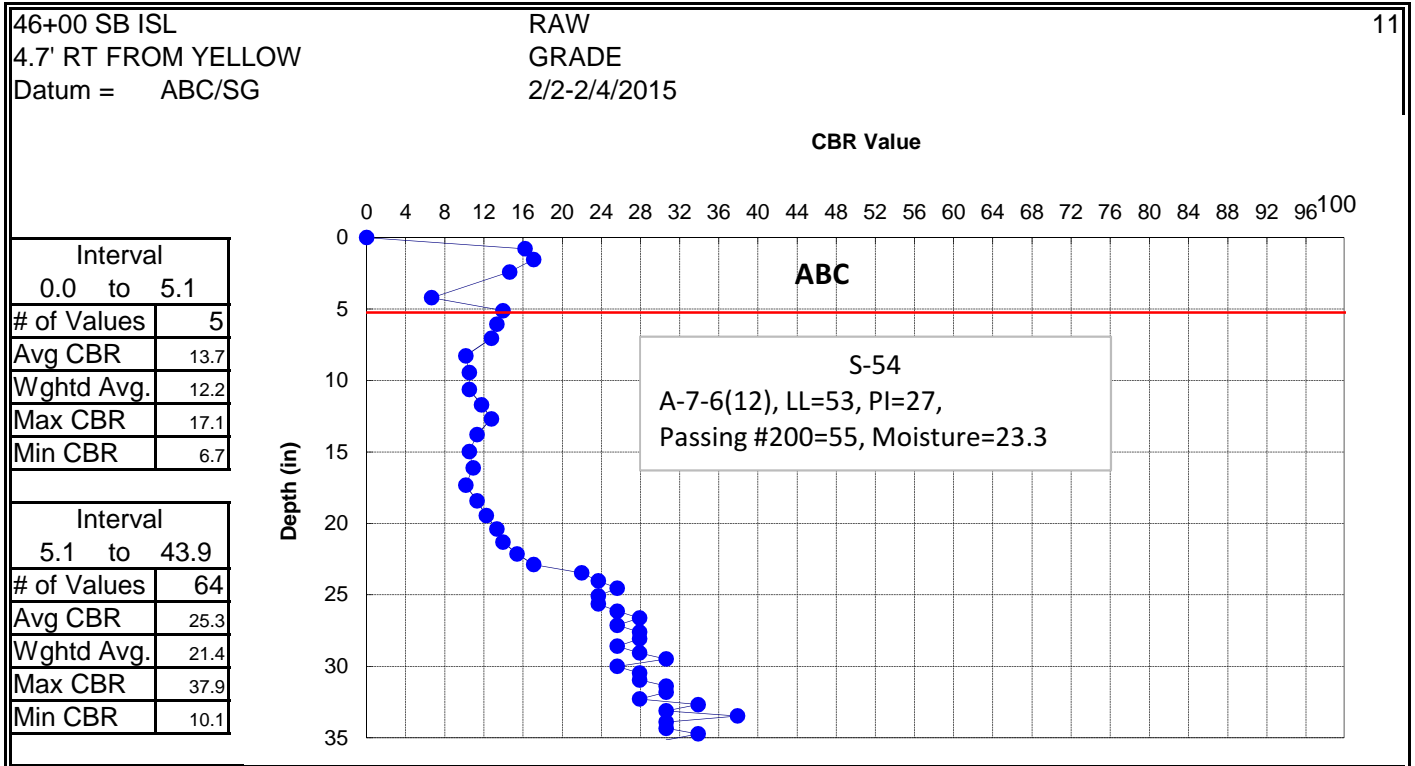
ATTACHMENT 4

Page 11

PROJECT NO.	42263.1.1/46031.1.1
PROJECT ID	B-5121_B-5317
ROUTE	US 70/401/NC 50 (Capital Blvd.)
COUNTY	WAKE

GEOLOGIST	J.B. BARFIELD
GEOTECHS	TERRACON

FILE	DRAFT
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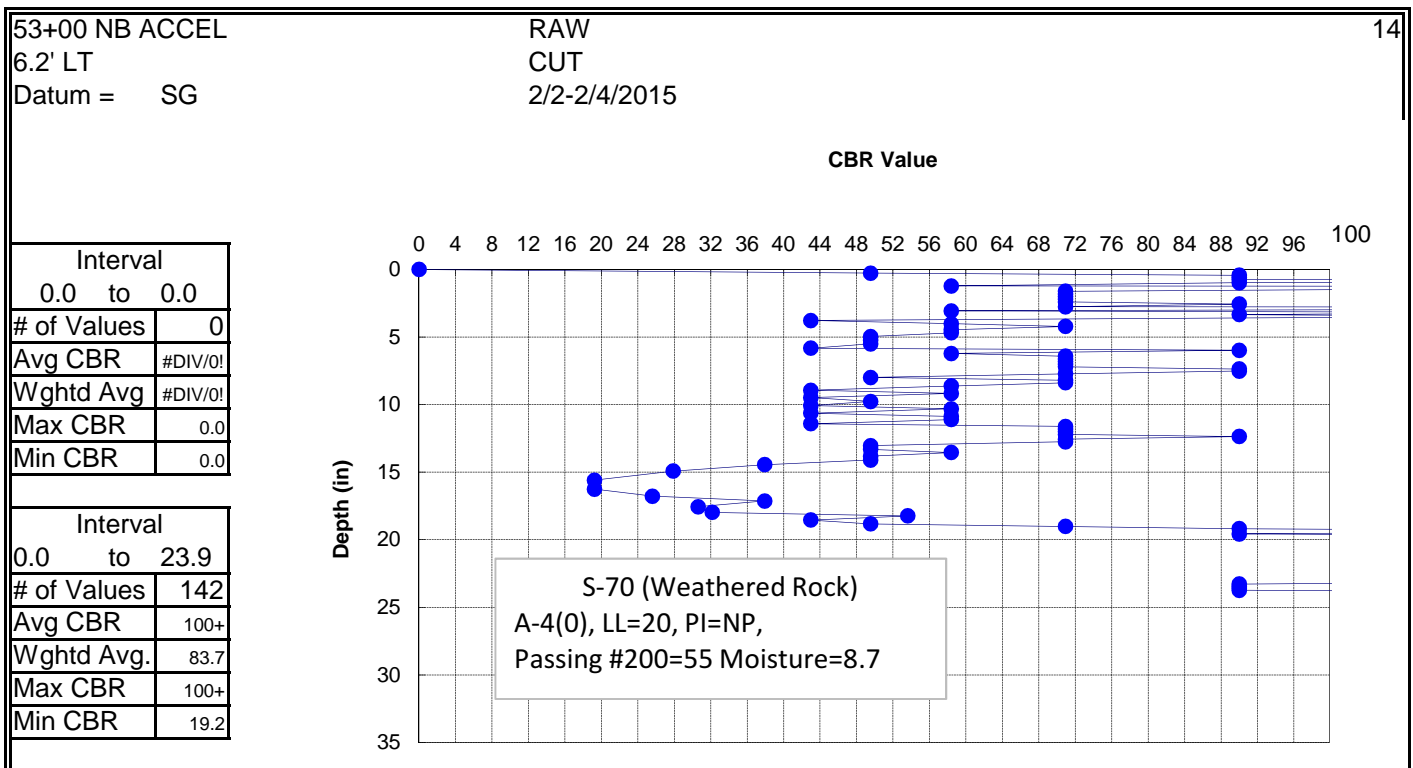
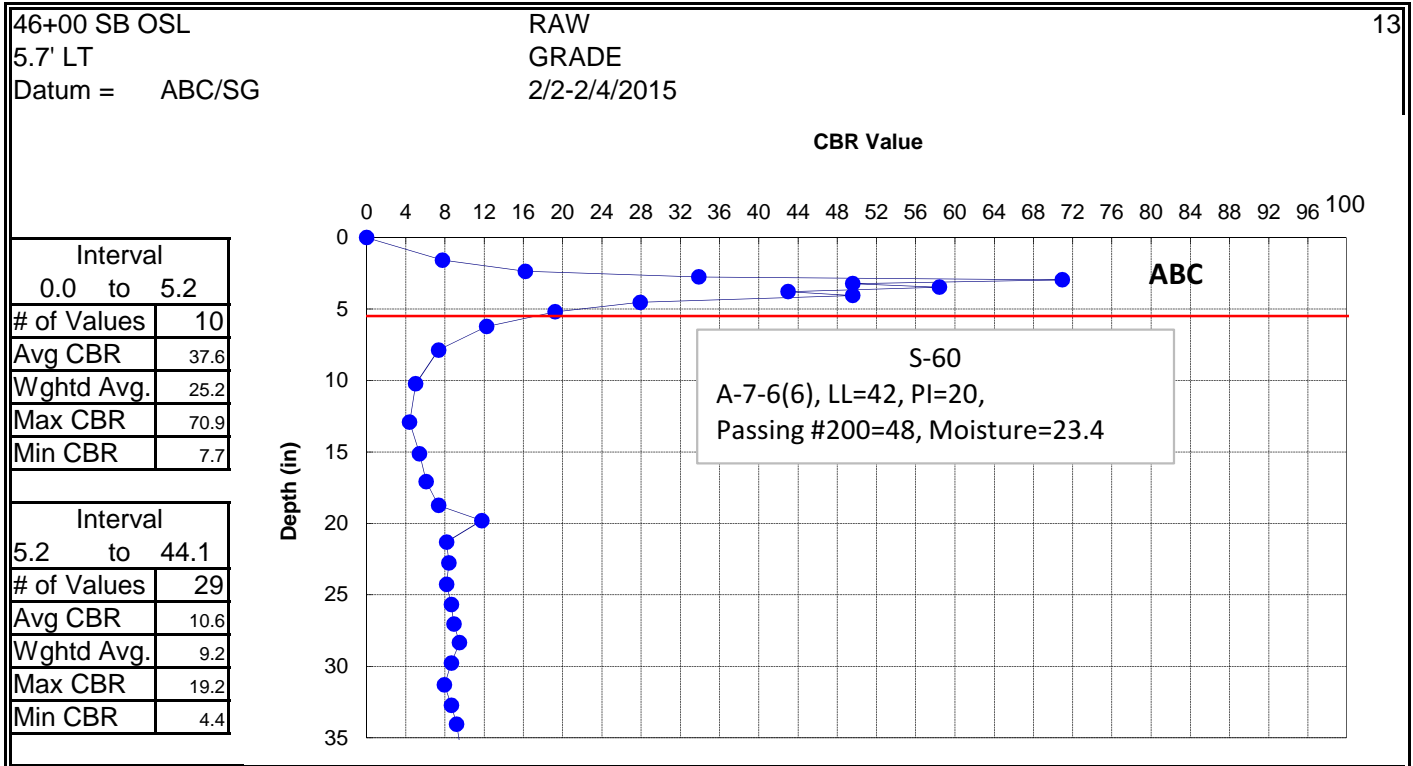


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NC - DOT, GEOTECHNICAL ENGINEERING UNIT**

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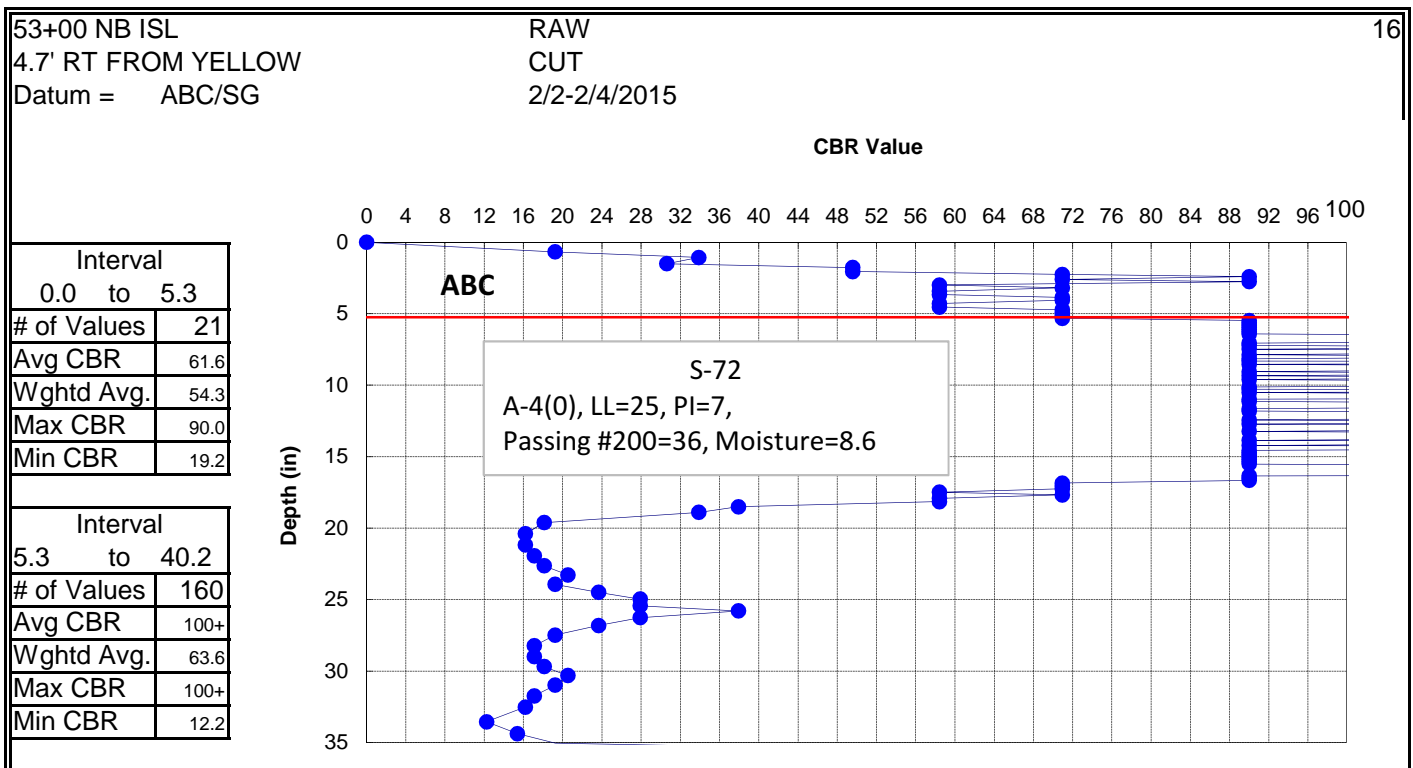
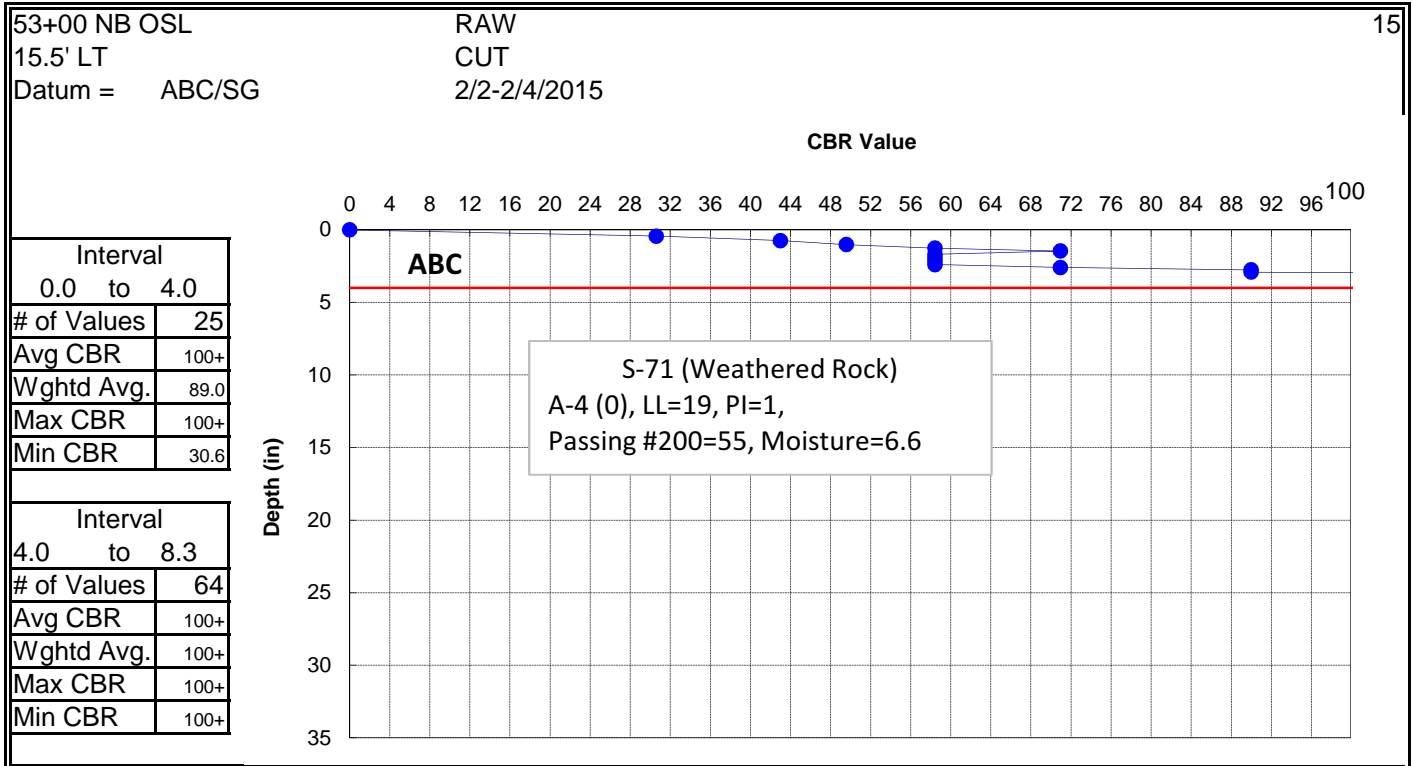


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NC - DOT, GEOTECHNICAL ENGINEERING UNIT**

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ROUTE	US 70/401/NC 50 (Capital Blvd.)
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FILE	DRAFT
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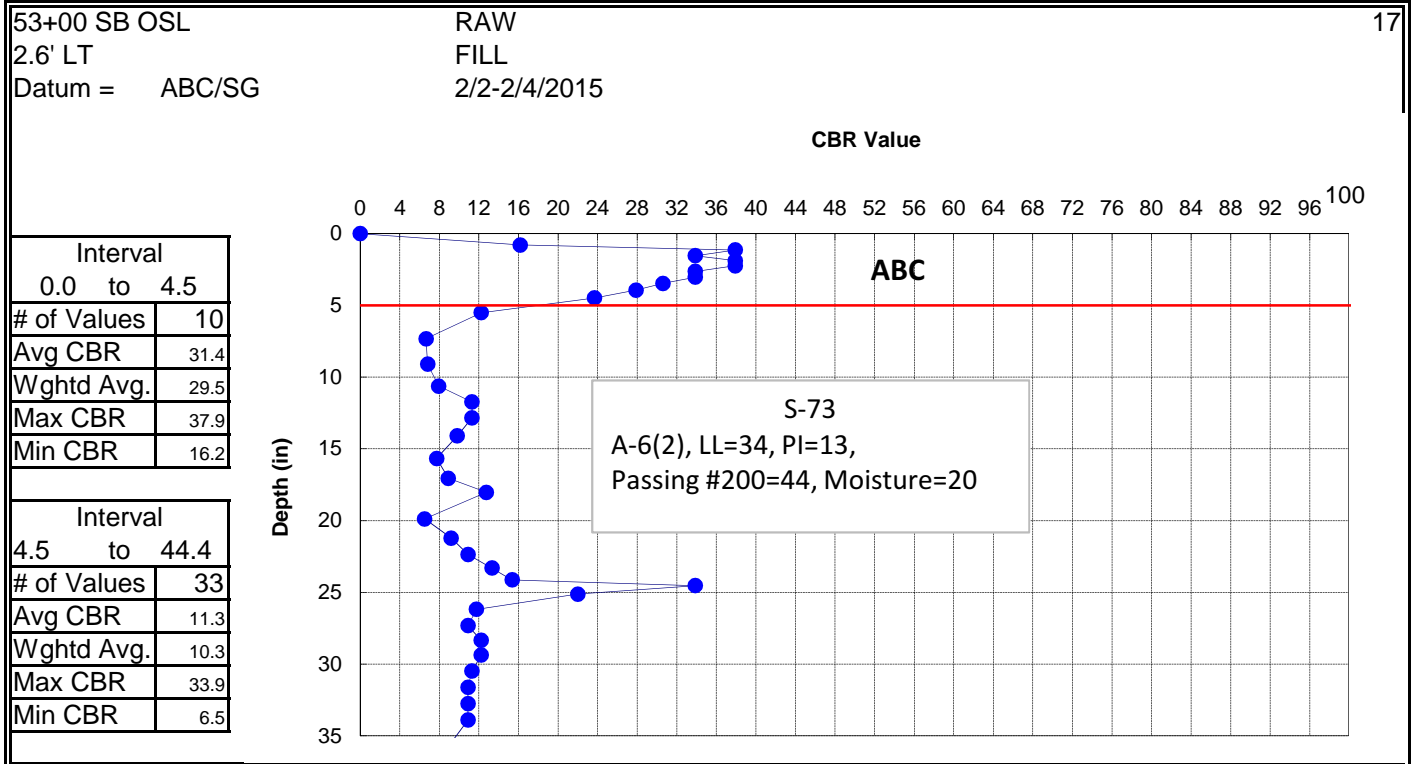


**CONE PENETROMETER RESULTS
NC - DOT, GEOTECHNICAL ENGINEERING UNIT**

PROJECT NO.	42263.1.1/46031.1.1
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ROUTE	US 70/401/NC 50 (Capital Blvd.)
COUNTY	WAKE

GEOLOGIST	J.B. BARFIELD
GEOTECHS	TERRACON

FILE	DRAFT
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NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAY
MATERIALS & TESTS UNIT
SOILS LABORATORY

T. I. P. No. B-5121/B-5317REPORT ON SAMPLES OF SOILS FOR QUALITY

Project 42263.1.1/46031.1.1 County WAKE Owner
 Date: Sampled 2/3/15 Received 2/24/15 Reported 2/25/15
 Sampled from ROADWAY By J.B BARFIELD
 Submitted by _____ 2012 Standard Specifications

795496 TO 795523
 5/7/15

TEST RESULTS

Proj. Sample No.	S-1	S-10	S-11	S-12	S-13	S-14
Lab. Sample No.	795496	795497	795498	795499	795500	795501
Retained #4 Sieve %	-	-	1	-	1	-
Passing #10 Sieve %	100	95	94	96	94	100
Passing #40 Sieve %	93	77	75	74	76	85
Passing #200 Sieve %	37	40	41	42	43	39

MINUS NO. 10 FRACTION

SOIL MORTAR - 100%						
Coarse Sand Ret - #60 %	26.3	33.3	33.3	35.0	32.7	32.1
Fine Sand Ret - #270 %	43.1	28.8	27.3	25.0	25.6	34.1
Silt 0.05 - 0.005 mm %	16.6	11.8	13.2	9.9	11.6	13.7
Clay < 0.005 mm %	14.1	26.1	26.1	30.2	30.2	20.1
T-#						
Sample						

L. L.	38	42	42	39	40	41
P. I.	6	15	13	16	17	10
AASHTO Classification	A-4(0)	A-7-6(2)	A-7-6(2)	A-6(3)	A-6(4)	A-5(1)
Station						
Offset	SB DECEL	NB OSL	NB OSL	NB ISL	SB OSL	SB OSL
Alignment	-L-	-L-	-L-	-L-	-L-	-L-
Location	14+50	15+50	15+50	15+50	15+50	15+50
Depth (Ft)	0.00	1.50	1.50	1.50	0.00	2.50
to	4.00	4.50	4.50	4.50	2.50	4.00
Moisture %	22.2	20.6	20.1	20.1	16.9	18.9

cc: J.B BARFIELD

 Soils Engineer

**NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAY
MATERIALS & TESTS UNIT
SOILS LABORATORY**

T. I. P. No. **B-5121/B-5317**

REPORT ON SAMPLES OF **SOILS FOR QUALITY**

Project 42263.1.1/46031.1.1 **County** WAKE **Owner** _____
Date: Sampled 2/3/15 **Received** 2/24/15 **Reported** 2/25/15
Sampled from ROADWAY **By** J.B BARFIELD
Submitted by _____ 2012 Standard Specifications

795496 TO 795523
5/7/15

TEST RESULTS

Proj. Sample No.	S-15	S-16	S-17	S-20	S-21	S-22
Lab. Sample No.	795502	795503	795504	795505	795506	795507
Retained #4 Sieve %	-	1	-	-	9	1
Passing #10 Sieve %	92	97	97	98	75	94
Passing #40 Sieve %	75	80	82	84	55	81
Passing #200 Sieve %	44	40	37	35	30	47

MINUS NO. 10 FRACTION

SOIL MORTAR - 100%						
Coarse Sand Ret - #60 %	30.9	33.6	33.5	31.6	37.6	26.3
Fine Sand Ret - #270 %	25.3	30.0	32.7	38.7	26.0	28.0
Silt 0.05 - 0.005 mm %	15.7	14.3	15.6	11.6	12.2	9.5
Clay < 0.005 mm %	28.1	22.1	18.1	18.1	24.1	36.2
T-#						
Sample						

L. L.	42	47	41	33	41	38
P. I.	15	13	10	5	16	20
AASHTO Classification	A-7-6(3)	A-7-5(2)	A-5(0)	A-2-4(0)	A-2-7(1)	A-6(5)
Station						
Offset	SB OL	SB OL	SB ISL	NB OSL	NB CL	NB CL
Alignment	-L-	-L-	-L-	-L-	-L-	-L-
Location	15+50	15+50	15+50	32+50	32+50	32+50
Depth (Ft)	0.00	2.00	0.00	0.00	0.00	0.00
to	2.00	4.00	4.00	3.00	3.50	4.00
Moisture %	15.6	21.4	18	19.6	16.8	14.4

cc: J.B BARFIELD

Soils Engineer

**NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAY
MATERIALS & TESTS UNIT
SOILS LABORATORY**

T. I. P. No. **B-5121/B-5317**

REPORT ON SAMPLES OF **SOILS FOR QUALITY**

Project **42263.1.1/46031.1.1** County **WAKE** Owner
 Date: Sampled **2/3/15** Received **2/24/15** Reported **2/25/15**
 Sampled from **ROADWAY** By **J.B BARFIELD**
 Submitted by _____ **2012** Standard Specifications

795496 TO 795523
5/7/15

TEST RESULTS

Proj. Sample No.	S-23	S-24	S-25	S-26	S-30	S-40
Lab. Sample No.	795508	795509	795510	795511	795512	795513
Retained #4 Sieve %	3	1	1	-	1	1
Passing #10 Sieve %	88	93	92	91	93	89
Passing #40 Sieve %	69	78	74	76	76	72
Passing #200 Sieve %	31	53	46	45	41	41

MINUS NO. 10 FRACTION

SOIL MORTAR - 100%						
Coarse Sand Ret - #60 %	36.6	25.7	31.1	27.2	33.5	32.6
Fine Sand Ret - #270 %	33.6	20.9	23.1	28.9	26.3	24.3
Silt 0.05 - 0.005 mm %	15.7	13.2	11.7	21.8	8.0	10.9
Clay < 0.005 mm %	14.1	40.2	34.2	22.1	32.2	32.2
T-#						
Sample						

L. L.	25	45	43	22	32	45
P. I.	4	24	21	6	17	21
AASHTO Classification	A-2-4(0)	A-7-6(9)	A-7-6(6)	A-4(0)	A-6(3)	A-7-6(4)
Station						
Offset	NB ISL	SB OSL	SB CL	SB ISL	NB OSL	SB OSL
Alignment	-L-	-L-	-L-	-L-	-L-	-L-
Location	32+50	32+50	32+50	32+50	40+00	42+50
Depth (Ft)	0.00	0.00	0.00	1.00	0.00	0.00
to	3.00	3.00	3.00	4.00	4.50	4.50
Moisture %	16.2	19.3	17.8	10.4	16.9	21

cc: J.B BARFIELD

Soils Engineer

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAY
MATERIALS & TESTS UNIT
SOILS LABORATORY

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Project 42263.1.1/46031.1.1 County WAKE Owner
 Date: Sampled 2/3/15 Received 2/24/15 Reported 2/25/15
 Sampled from ROADWAY By J.B BARFIELD
 Submitted by _____ 2012 Standard Specifications

795496 TO 795523
 5/7/15

TEST RESULTS

Proj. Sample No.	S-50	S-51	S-52	S-53	S-54	S-60
Lab. Sample No.	795514	795515	795516	795517	795518	795519
Retained #4 Sieve %	2	-	-	1	1	1
Passing #10 Sieve %	88	96	93	92	94	93
Passing #40 Sieve %	72	82	79	77	82	78
Passing #200 Sieve %	49	58	56	49	55	48

MINUS NO. 10 FRACTION

SOIL MORTAR - 100%						
Coarse Sand Ret - #60 %	27.6	22.9	24.9	26.9	22.2	33.5
Fine Sand Ret - #270 %	19.8	19.3	18.7	24.3	24.0	16.0
Silt 0.05 - 0.005 mm %	10.3	9.5	10.2	12.7	15.7	14.3
Clay < 0.005 mm %	42.2	48.2	46.2	36.2	38.2	36.2
T-#						
Sample						

L. L.	50	58	62	58	53	42
P. I.	31	38	34	26	27	20
AASHTO Classification	A-7-6(11)	A-7-6(19)	A-7-6(16)	A-7-5(10)	A-7-6(12)	A-7-6(6)
Station						
Offset	NB OSS	NB OSL	NB CL	NB ISL	SB ISL	SB OSL
Alignment	-L-	-L-	-L-	-L-	-L-	-L-
Location	45+00	45+00	45+00	45+00	46+00	46+00
Depth (Ft)	0.00	0.00	0.00	0.00	0.00	0.00
to	3.00	3.00	4.00	4.00	4.00	4.00
Moisture %	16.9	23	16.9	21.2	23.3	23.4

cc: J.B BARFIELD

 Soils Engineer

**NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAY
MATERIALS & TESTS UNIT
SOILS LABORATORY**

T. I. P. No. B-5121/B-5317

REPORT ON SAMPLES OF SOILS FOR QUALITY

Project 42263.1.1/46031.1.1 County WAKE Owner
 Date: Sampled 2/3/15 Received 2/24/15 Reported 2/25/15
 Sampled from ROADWAY By J.B BARFIELD
 Submitted by _____ 2012 Standard Specifications

795496 TO 795523
5/7/15

TEST RESULTS

Proj. Sample No.	S-70	S-71	S-72	S-73		
Lab. Sample No.	795520	795521	795522	795523		
Retained #4 Sieve %	-	-	2	1		
Passing #10 Sieve %	100	100	89	92		
Passing #40 Sieve %	82	88	69	75		
Passing #200 Sieve %	36	55	36	44		

MINUS NO. 10 FRACTION

SOIL MORTAR - 100%						
Coarse Sand Ret - #60 %	33.9	22.2	35.4	31.0		
Fine Sand Ret - #270 %	36.0	29.3	29.1	25.2		
Silt 0.05 - 0.005 mm %	14.0	28.4	17.4	15.6		
Clay < 0.005 mm %	16.1	20.1	18.1	28.1		
T-#						
Sample						

L. L.	20	19	25	34		
P. I.	NP	1	7	13		
AASHTO Classification	A-4(0)	A-4(0)	A-4(0)	A-6(2)		
Station						
Offset	NB ACC RI	NB OSL	NB ISL	SB OSL		
Alignment	-L-	-L-	-L-	-L-		
Location	53+00	53+00	53+00	53+00		
Depth (Ft)	0.00	0.00	0.00	2.00		
to	4.00	4.00	4.00	4.00		
Moisture %	8.7	6.6	8.6	20		

cc: J.B BARFIELD

Soils Engineer

SCARIFY/MIX EXISTING DRAINAGE LAYERS

(SPECIAL)

1.0 GENERAL

Upon removal of the existing concrete pavement, incorporate the existing drainage layers of sand and ABC into the underlying soils to a minimum depth of 12 inches. The existing drainage materials should be scarified into the proposed subgrade to a minimum depth of 12 inches. Scarification will require a minimum of 3 passes over the same area. Some areas may be wet and may require additional time to dry before the blended materials can be compacted.

2.0 MEASUREMENT AND PAYMENT

Work is incidental to fine grading and payment will be made in accordance with Article, 500-5 of the Standard Specifications.

