



STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION

BEVERLY EAVES PERDUE
GOVERNOR

EUGENE A. CONTI, JR
SECRETARY

July 2, 2010
DRAFT

MEMORANDUM TO: Rodger Rochelle, P.E.
Director of Transportation Program Management

FROM: N. W. Wainaina, P.E.
State Geotechnical Engineer

STATE PROJECT: 34379.1.17 (R-2123CE) – Design Build
F. A. PROJECT: N/A
COUNTY: Mecklenburg
DESCRIPTION: I-485 (Charlotte Eastern Outer Loop) / I-85 Revise Interchange

SUBJECT: Geotechnical Roadway Report - Inventory

The project consists of revising the interchange for I-485 and I-85.

The geotechnical field investigation was conducted June 2010. Kleinfelder Southeast Inc. drill crew was contracted to conduct the pavement and subgrade investigations. A CME-55 truck mounted drill machine was utilized for conducting the subgrade investigation and Dynamic Cone Penetrometer Tests were conducted to evaluate in-situ soil strengths. Representative soil samples were collected for visual classification in the field and selected samples were submitted for laboratory analysis by NCDOT's Materials and Tests Unit.

Based on As-Built Plans for R-2123CB, soil stabilization was used from -L- Sta. 10+00 to approximately -L- Sta. 56+50. The typical sections indicate the mainline pavement, the inside 6 feet of the inside paved shoulder and the inside foot of the outside paved shoulder were stabilized with chemical stabilization. Beyond -L- Sta. 56+50, an ABC design was utilized for the mainline pavement. Currently, the proposed two outside westbound lanes are designated as shoulder. This area is approximately 35 feet wide.

The attachments are as received by consultant:

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

TELEPHONE: 919-250-4088
FAX: 919-250-4237

WEBSITE: WWW.NCDOT.GOV

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

NWW/JBB

ATTACHMENT 1:	Pavement Investigation Data Sheet (F&R)	(3)
ATTACHMENT 2:	Core Photographs (F&R)	(1)
ATTACHMENT 3:	Dynamic Cone Penetrometer Data (F&R)	(15)
ATTACHMENT 4:	Quality and Moisture Results	(5)

PAVEMENT INVESTIGATION DATA SHEET

Project No.: 34379.1.17 TIP No.: R-2123CE County: Mecklenburg Date: 6/8/10-6/9/10 Page 1 of 3
 Project Description: I-485 (Charlotte Eastern Outer Loop)/I-85 Revised Interchange

DRAFT

STA.	LANE/SHOULDER (DESCRIPTION)	CUT "C" OR FILL "F"	LANE/SHOULDER WIDTH (FT.)	OFFSET FROM WHITE LINE (FT.)	CROWN "C" OR SUPER "S"	GROSS DEPTH TO SOIL (IN.)	ASPHALT THICKNESS (IN.)	CONCRETE THICKNESS (IN.)	ABC THICKNESS (IN.)	SAND THICKNESS (IN.)	SAND MOISTURE	SAMPLE NO.	SUBGRADE SOIL DESCRIPTION	AASHTO CLASSIFICATION	SOIL MOISTURE
17+00 -Y-	SB OSS	*N/A	9.6	4.2	C=0.25"	11.0	7.5	-	3.5	-	-	S-9	Residual-Light Brown, Cse. to F. Sdy. SILT (0.9'-3.0')	A-4	M
17+00 -Y-	SB OSL	*N/A	12.0		C=0.25"										
Note: Offset distances measured from left of outside paved shoulder															
No cracking or other pavement distress evident															
*Note: At bridge, could not determine if cut, fill, or grade															
27+00 -Y-	SB OSS	C=3'	11.5	4.2	S=0.25" to Rt.	15.0	6.25	-	8.75	-	-	S-7	ABC Stone (0.5' to 1.3')		
												S-8	Residual-Light Brown, Cse. to F. Sdy. SILT (1.3'-3.0')	A-4	M
27+00 -Y-	SB OSL	C=2'	12.0		S=0.25" to Lt.										
Note: Offset distances measured from left of outside paved shoulder															
No cracking or other pavement distress evident															
32+00 -Y-	SB OSS	C=6'	7.6	4.0	S=0.25" to Rt.	16.5	0.5	16.0	-	-	-	S-6	Residual-Light Brown, Cse. to F. Sdy. SILT (1.3'-3.0')	A-4	M
32+00 -Y-	SB OSL	C=5'	12.5		S=0.25" to Lt.										
Note: Offset distances measured from left of outside paved shoulder															
No cracking or other pavement distress evident															
42+00 -Y-	SB OSS	F=10'	14.4	7.1	S=0.25" to Rt.	8.0	8.0	-	-	-	-	S-4	Fill-Gray, Silty Cse. To F. SAND (0.7'-3.0')	A-2-4	M
42+00 -Y-	SB OSL	F=10'	12.0		S=0.25" to Lt.										
Note: Offset distances measured from Right of left paved shoulder															
No cracking or other pavement distress evident															
55+00 -Y-	SB OSS	C=15'	12.4	4.4	S=0.25" to Rt.	8.0	8.0	-	-	-	-	S-3	Residual-Gray, Silty Cse. To F. SAND (0.7'-3.0')	A-2-4	M
55+00 -Y-	SB OSL	C=14'	12.1		S=0.25" to Lt.										
Note: Offset distances measured from left of outside paved shoulder															
No cracking or other pavement distress evident															
70+00 -Y-	SB OSS	F=20'	12.8 +3.0 C&G	8.1	C=0.25"	7.25	7.25	-	-	-	-	S-2	Fill-Gray, Silty Cse. To F. SAND (0.6'-3.0')	A-2-4	M
70+00 -Y-	SB OSL	F=20'	12.1		C=0.25"										
Note: Offset distances measured from left of outside paved shoulder															
No cracking or other pavement distress evident															
84+00 -Y-	SB OSS	F=15'	12.5+ 3.0 C&G	8.5	C=0.25"	7.75	7.75	-	-	-	-	S-1	Fill-Gray, Silty Cse. To F. SAND (0.6'-3.0')	A-2-4	M
84+00 -Y-	SB OSL	F=13'	12.1		C=0.25"										
Note: Offset distances measured from left of outside paved shoulder															
No cracking or other pavement distress evident															
	OSS of Mallard Ck.Ch. Rp.	C=3'	3.2	2.9	Flat	13.0	13.0	-	-	-	-	S-5	Residual-Brown, Cse. To F. Sandy SILT(1.1'-3.0')	A-4	W
	Ck.Ch. Rp.	C=2'	15.8		C=0.5"										
Note: Offset distances measured from left of outside paved shoulder															
Low Severity Block cracking in outside wheel path															

PAVEMENT INVESTIGATION DATA SHEET

Project No.: 34379.1.17 TIP No.: R-2123CE County: Mecklenburg Date: 6/9/2010 Page 2 of 3
 Project Description: I-485 (Charlotte Eastern Outer Loop)/I-85 Revised Interchange

DRAFT

STA.	LANE/SHOULDER (DESCRIPTION)	CUT "C" OR FILL "F"	LANE/SHOULDER WIDTH (FT.)	OFFSET FROM WHITE LINE (FT.)	CROWN "C" OR SUPER "S"	GROSS DEPTH TO SOIL (IN.)	ASPHALT THICKNESS (IN.)	CONCRETE THICKNESS (IN.)	ABC THICKNESS (IN.)	SAND THICKNESS (IN.)	SAND MOISTURE	SAMPLE NO.	SUBGRADE SOIL DESCRIPTION	AASHTO CLASSIFICATION	SOIL MOISTURE
37+00 -Y-	NB OSS	C=5'	13.8	4.9	C=6.0"	10.0	6.0	-	4.0	-	-	S-10	ABC Stone (0.5'-0.8')		
												S-11	Residual-Gray, Cse. To F. Sandy SILT(0.8'-3.0')	A-4	M
37+00 -Y-	NB OSL	C=5'	10.0		C=3.0"										
Note: Offset distances measured from right of outside paved shoulder															
No cracking or other pavement distress evident															
45+00 -Y-	NB OSS	F=6'	12.0	5.2	C=10.0"	10.5	6.25	-	4.25	-	-	S-12	ABC Stone (0.5'-0.8')		
												S-13	Fill-Gray, Cse. To F. Sandy SILT(0.8'-3.0')	A-4	M
45+00 -Y-	NB OSL	F=6'	11.9		C=6.0"										
Note: Offset distances measured from right of outside paved shoulder															
No cracking or other pavement distress evident															
39+75 -L-	WB OSS	C=25'	33.2	3.4	C=3.0"	15.0	6.0	-	9.0	-	-	S-22	ABC Stone (0.5'-1.3')		
												S-23	Residual-Gray, Cse. to F. Sdy SILT(1.3'-3.0')	A-4	M
39+75 -L-	*WB OSL	C=20'	12.0	35.6	C=0.5"	14.5	6.0	-	8.5	-	-	S-24	ABC Stone (0.5'-1.2')		
												S-25	Residual-Gray, Cse. to F. Sdy SILT(1.2'-3.0')	A-4	M
39+75 -L-	WB ISL	C=16'	12.1		C=0.25"										
39+75 -L-	WB ISS	C=15'	9.9	3.3	Flat	14.0	5.0	-	9.5	-	-	S-33	ABC Stone (0.4'-1.2')		
												S-34	SILT(1.2'-3.0')	A-4	M
Note: Offset distances measured from edge of paved shoulder															
Patched longitudinal cracks in center, inner and outer wheel path of outside lane															
50+00 -L-	WB Outside of OSS	C=25'	35.0	15.9	C=3.0"	14.0	8.0	-	6.0	-	-	S-26	ABC Stone (0.7'-1.2')		
												S-27	Residual-Gray, Silty Cse. to F. SAND(1.2'-3.0')	A-2-4	M
50+00 -L-	WB Inside of OSS	C=24'		28.3		15.0	11.5	-	3.5	-	-	S-28	ABC Stone (1.0'-1.2')		
												S-29	Residual-Gray, Silty Cse. to F. SAND(1.2'-3.0')	A-2-4	M
50+00 -L-	*WB OSL	C=22'	12.0	31.6	C=0.25"	14.0	14.0	-	-	-	-	S-30	SILT(1.2'-3.0')	A-4	M
50+00 -L-	WB ISL	C=15'	11.7		C=0.25"										
50+00 -L-	WB ISS	C=14'	10.0	3.6	C=0.25"	14.5	5.0	-	9.5	-	-	S-35	ABC Stone (0.4'-1.2')		
												S-36	Residual-Gray, Cse. to F. Sdy SILT(1.2'-3.0')	A-4	M
Note: Offset distances measured from edge of paved shoulder															
Patched longitudinal cracks in inner and outer wheel path of outside lane															
57+00 -L-	WB OSS	G	4.4	2	Flat	12.0	5.5	-	6.5	-	-	S-31	ABC Stone (0.5'-1.0')		
57+00 -L-	WB OSL	G	12.1		C=0.5"							S-32	Residual-Gray, Cse. to F. Sdy SILT(1.0'-3.0')	A-4	M
Note: Offset distances measured from right of outside paved shoulder															
Patched longitudinal cracks in inner and outer wheel path of outside lane															

PAVEMENT INVESTIGATION DATA SHEET

Project No.: 34379.1.17 TIP No.: R-2123CE County: Mecklenburg Date: 6/9/2010 Page 3 of 3
 Project Description: I-485 (Charlotte Eastern Outer Loop)/I-85 Revised Interchange

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STA.	LANE/SHOULDER (DESCRIPTION)	CUT "C" OR FILL "F"	LANE/SHOULDER WIDTH (FT.)	OFFSET FROM WHITE LINE (FT.)	CROWN "C" OR SUPER "S"	GROSS DEPTH TO SOIL (IN.)	ASPHALT THICKNESS (IN.)	CONCRETE THICKNESS (IN.)	ABC THICKNESS (IN.)	SAND THICKNESS (IN.)	SAND MOISTURE	SAMPLE NO.	SUBGRADE SOIL DESCRIPTION	AASHTO CLASSIFICATION	SOIL MOISTURE
45+00 -L-	EB OSS	C=20'	10.3	5.3	Flat	14.0	6.5	-	7.5	-	-	S-20	ABC Stone (0.5'-1.2')		
												S-21	Residual-Gray, Cse. to F. Sdy SILT(1.2'-3.0')	A-4	M
45+00 -L-	Outside	C=19'	11.9	15.9	C=0.25"	19.5	11.5	-	8.0	-	-	S-16	ABC Stone (1.0'-1.7')		
												S-17	Residual-Gray, Cse. to F. Sdy SILT(1.7'-3.0')	A-4	M
45+00 -L-	Inside	C=18'	11.9	26.7	C=0.25"	19.0	11.5	-	7.5	-	-	S-18	ABC Stone (1.0'-1.6')		
												S-19	Residual-Gray, Cse. to F. Sdy SILT(1.6'-3.0')	A-4	M
Note: Offset distances measured from left of outside paved shoulder															
Low severity longitudinal cracks in center, inner and outer wheel path of outside lane. Low severity longitudinal cracks in center and outer wheel path of inside lane.															
52+00 -L-	*EB Gore	C=8'	15.0	39.6	Flat	14.5	8.0	-	6.5	-	-	S-14	ABC Stone (0.7'-1.2')		
52+00 -L-	EB OSS	C=10'	8.0		C=0.25"							S-15	Residual-Brown and Gray, Cse. to F. Sdy SILT(1.2'-3.0')	A-4	M
52+00 -L-	EB OSL	C=10'	12.0		C=0.5"										
52+00 -L-	EB ISL	C=9'	11.8		C=0.5"										
Note: Offset distances measured from left of outside paved shoulder															
Low severity longitudinal cracks in inner and outer wheel path of outside lane. Low severity longitudinal cracks in center of inside and outside lanes															

CORE PHOTOGRAPHS

NCDOT Project No. 34379.1.17 TIP No. R-2123CE
I-485 (Charlotte Eastern Outer Loop)/I-85 Revised Interchange
Mecklenburg County, North Carolina



Box 1 of 4



Box 2 of 4



Box 3 of 4



Box 4 of 4



CONE PENETROMETER DATA CODE SHEET DRAFT						PROJECT NUMBER		PROJECT I.D.			ROUTE		
						34379.1.17		R-2123CE			I-485 (Charlotte Eastern Outer Loop)/I-85 Revised Interchange		
						COUNTY		GEOLOGIST			TECHNICIANS		
						Mecklenburg		T. Wells			Toothman/Middleton		
Station (location) information						Date run		Station (location) information			Date run		
-Y- SB 17+00 OSS N580401, E1479752						6/8/2010		-Y- SB 27+00 OSS N581296, E1480023			6/8/2010		
Type	cut or fill	Datum or reference surface				Type	cut or fill	Datum or reference surface					
RAW	-	Subgrade				RAW	Cut	Subgrade					
0.9	23.9	41.98	49.6	59.72	1.0	31.7	36.76	38.76	41.43	47.96			
1.6	24.5	42.02	50.0	59.84	1.4	32.0	36.82	38.79	41.54	48.10			
1.8	25.2	42.06	50.2	59.96	2.4	32.3	36.88	38.82	41.65	48.2			
2.2	26.0	42.10	50.4	60.08	2.6	32.5	36.94	38.85	41.76	48.3			
3.0	26.8	42.16	50.6	60.20	3.2	32.6	37.00	38.88	41.87	48.4			
3.6	27.6	42.22	50.8	60.36	3.9	32.8	37.06	38.91	41.98	48.5			
4.0	28.5	42.28	51.0	60.52	4.1	33.0	37.12	38.94	42.09	48.7			
4.4	29.7	42.34	51.4	60.68	4.8	33.1	37.18	38.97	42.20	48.9			
4.6	30.4	42.40	51.6	60.84	5.2	33.3	37.24	39.00	42.28	49.1			
5.2	30.8	42.45	52.0	61.00	5.5	33.5	37.30	39.03	42.36	49.3			
5.5	31.1	42.50	52.1	61.16	5.6	33.7	37.34	39.06	42.44	49.6			
5.8	31.5	42.55	52.18	61.32	6.3	33.9	37.38	39.09	42.52	49.9			
6.1	31.8	42.60	52.26	61.48	6.7	34.2	37.42	39.12	42.60	50.2			
6.4	32.2	42.65	52.34	61.64	6.8	34.4	37.46	39.15	42.68	50.5			
6.7	32.7	42.70	52.42	61.80	7.5	34.9	37.50	39.18	42.76	50.7			
6.9	33.2	42.75	52.50	61.94	7.6	35.1	37.54	39.21	42.84	50.9			
7.2	33.6	42.80	52.58	62.08	8.4	35.4	37.58	39.24	42.92	51.2			
7.5	34.1	42.85	52.66	62.22	8.7	35.6	37.62	39.27	43.00	51.4			
7.8	34.7	42.90	52.74	62.36	8.9	35.7	37.66	39.30	43.16	51.6			
8.0	35.2	43.02	52.82	62.50	9.7	35.8	37.70	39.33	43.32	52.0			
8.3	35.7	43.14	52.90	62.66	10.1	35.9	37.75	39.36	43.48	52.3			
8.5	36.3	43.26	53.02	62.82	10.6	35.94	37.80	39.39	43.64	52.6			
9.1	36.8	43.38	53.14	62.98	11.0	35.98	37.85	39.42	43.80	52.9			
9.5	37.2	43.50	53.26	63.14	11.2	36.02	37.90	39.45	43.92	53.2			
9.6	37.6	43.62	53.38	63.30	12.0	36.06	37.95	39.48	44.04	53.8			
10.3	38.1	43.74	53.50	63.42	12.6	36.10	38.05	39.51	44.16	54.0			
10.8	38.7	43.86	53.7	63.54	13.1	36.14	38.05	39.54	44.28	54.7			
11.2	39.3	43.98	53.9	63.66	14.2	36.18	38.10	39.57	44.40	54.4			
11.7	39.5	44.10	54.1	63.78	14.8	36.22	38.15	39.60	44.54	54.6			
12.1	39.6	44.33	54.6	63.90	15.4	36.26	38.20	39.65	44.68	54.9			
12.4	39.7	44.56	54.8		16.0	36.30	38.23	39.70	44.82	55.2			
12.9	40.0	44.79	55.0		16.5	36.33	38.26	39.75	44.96	55.3			
13.4	40.1	45.02	55.2		17.1	36.36	38.29	39.80	45.10	55.4			
13.8	40.3	45.25	55.4		17.9	36.39	38.32	39.85	45.32	55.5			
14.2	40.5	45.48	55.6		18.4	36.42	38.35	39.90	45.54	55.6			
14.6	40.62	45.71	56.0		19.1	36.45	38.38	39.95	45.76	56.0			
15.0	40.74	45.94	56.3		19.7	36.48	38.41	40.00	45.98	56.3			
15.4	40.86	46.17	56.6		20.5	36.51	38.44	40.05	46.20	56.5			
15.9	40.98	46.40	56.8		21.1	36.54	38.47	40.10	46.30	56.7			
17.1	41.10	46.6	57.2		21.7	36.57	38.50	40.20	46.40	57.0			
17.3	41.16	46.8	57.5		22.1	36.60	38.52	40.30	46.50	57.7			
18.0	41.22	47.0	57.7		22.6	36.61	38.54	40.40	46.60	58.1			
18.5	41.28	47.2	58.0		22.7	36.62	38.56	40.50	46.70	58.7			
19.1	41.34	47.6	58.3		23.5	36.63	38.58	40.60	46.84	59.3			
19.7	41.40	48.0	58.6		24.4	36.64	38.60	40.70	46.98	59.9			
20.0	41.50	48.3	58.9		25.3	36.65	38.62	40.80	47.12	60.5			
20.9	41.60	48.5	59.1		26.3	36.66	38.64	40.90	47.26	61.3			
21.1	41.70	48.7	59.2		27.1	36.67	38.66	41.00	47.40	62.0			
22.0	41.80	48.9	59.3		28.0	36.68	38.68	41.10	47.54	63.0			
22.5	41.90	49.2	59.5		29.1	36.69	38.70	41.21	47.68	63.7			
23.3	41.94	49.4	59.6		30.5	36.70	38.73	41.32	47.82	64.7			



CONE PENETROMETER DATA CODE SHEET				PROJECT NUMBER				PROJECT I.D.				ROUTE			
				34379.1.17				R-2123CE				I-485 (Charlotte Eastern Outer Loop)/I-85 Revised Interchange			
				COUNTY				GEOLOGIST				TECHNICIANS			
				Mecklenburg				T. Wells				Toothman/Middleton			
DRAFT				Date run				Station (location) information				Date run			
-Y- SB 32+00 OSS N581776, E1480169				6/8/2010				-Y- SB 42+00 OSS N582705, E1480501				6/9/2010			
Type	cut or fill	Datum or reference surface		Type	cut or fill	Datum or reference surface									
RAW	Cut	Subgrade		RAW	Fill	Subgrade									
1.4	8.02			0.8	20.7	46.7	74.2								
2.3	8.08			2.0	21.4	46.9	75.0								
2.6	8.14			2.7	21.9	47.6									
3.0	8.20			3.4	22.3	48.0									
3.2	8.24			3.9	22.7	48.6									
3.4	8.28			4.6	23.1	49.2									
3.5	8.32			5.2	23.6	49.7									
3.7	8.36			5.8	23.9	50.2									
3.9	8.40			6.7	24.3	50.6									
4.3	8.42			7.0	24.7	51.1									
4.5	8.44			7.4	25.1	51.6									
5.2	8.46			7.7	25.5	52.0									
5.5	8.48			8.1	26.0	52.5									
6.0	8.50			8.3	26.4	53.1									
6.2	8.52			8.6	26.8	53.6									
6.28	8.54			8.8	27.3	54.3									
6.36	8.56			9.1	27.8	54.9									
6.44	8.58			9.6	28.2	55.6									
6.52	8.60			9.8	28.7	56.1									
6.60	8.62			10.1	29.2	56.6									
6.64	8.64			10.4	29.6	57.1									
6.68	8.66			10.7	30.1	57.5									
6.72	8.68			11.0	30.6	57.8									
6.76	8.70	Refusal at 8.7cm		11.3	31.0	58.2									
6.80				11.5	31.5	58.7									
6.86				11.8	32.0	59.1									
6.92				12.1	32.4	59.6									
6.98				12.4	32.8	60.0									
7.04				12.7	33.3	60.6									
7.10				13.0	33.6	61.2									
7.14				13.4	34.3	61.5									
7.18				13.7	35.0	62.2									
7.22				14.0	35.6	62.7									
7.26				14.3	36.4	63.2									
7.30				14.6	37.1	63.7									
7.32				15.0	37.9	64.3									
7.34				15.3	38.6	65.0									
7.36				15.6	39.2	65.6									
7.38				16.0	39.8	66.2									
7.40				16.3	40.3	66.8									
7.44				16.7	40.9	67.4									
7.48				17.0	41.4	68.0									
7.52				17.4	41.8	68.4									
7.56				17.9	42.2	68.9									
7.60				18.4	42.9	69.4									
7.66				18.6	43.4	70.0									
7.72				19.0	43.9	70.6									
7.78				19.5	44.5	71.3									
7.84				19.8	45.0	72.0									
7.90				20.2	45.6	72.7									
7.96				20.6	46.1	73.5									



CONE PENETROMETER DATA CODE SHEET						PROJECT NUMBER		PROJECT I.D.			ROUTE								
						DRAFT						34379.1.17		R-2123CE			I-485 (Charlotte Eastern Outer Loop)/I-85 Revised Interchange		
												COUNTY		GEOLOGIST		TECHNICIANS			
						Mecklenburg		T. Wells		Toothman/Middleton									
Station (location) information						Date run		Station (location) information			Date run								
-Y- SB 55+00 OSS N583833, E1481126						6/9/2010		-Y- SB 70+00 OSS N585017, E1482062			6/9/2010								
Type	cut or fill	Datum or reference surface				Type	cut or fill	Datum or reference surface											
RAW	Cut	Subgrade				RAW	Fill	Subgrade											
1.5	22.3	39.50	48.02	58.6	63.77	0.6	31.7	52.3	72.5	111.7									
2.5	22.6	39.60	48.04	58.9	63.78	0.8	32.3	52.9	73.1										
3.4	22.9	39.70	48.06	59.2	63.79	1.2	32.9	53.4	73.7										
4.4	23.1	39.80	48.08	59.6	63.80	1.5	33.5	54.2	74.2										
5.4	23.3	39.98	48.10	60.0	Refusal	1.8	34.0	55.0	74.8										
6.3	23.6	40.16	48.29	60.3	at 63.8	2.2	34.6	55.7	75.4										
7.3	23.9	40.34	48.48	60.8	cm	2.5	35.1	56.5	76.1										
8.2	24.1	40.52	48.67	61.1		3.0	35.6	57.2	76.8										
8.6	24.3	40.70	48.86	61.4		3.6	35.7	57.8	77.7										
9.0	24.7	40.90	49.05	61.7		3.8	36.2	58.1	78.5										
9.5	25.1	41.10	49.24	62.0		4.3	36.6	58.3	79.4										
9.8	25.4	41.30	49.43	62.2		4.6	37.0	58.4	80.4										
10.3	25.8	41.50	49.62	62.5		5.0	37.2	58.6	81.4										
10.7	26.2	41.70	49.81	62.7		5.5	37.6	58.7	82.4										
11.4	26.5	41.92	50.00	63.1		5.8	38.0	58.9	83.5										
12.3	26.9	42.14	50.20	63.01		6.4	38.4	59.4	84.4										
13.1	27.3	42.36	50.36	63.02		6.8	38.7	59.5	85.2										
13.8	27.8	42.58	50.52	63.03		7.3	39.0	59.7	86.1										
14.3	28.3	42.80	50.68	63.04		7.8	39.3	60.0	86.9										
14.6	28.8	43.12	50.84	63.05		8.2	39.6	61.2	87.7										
14.8	29.3	43.44	51.00	63.06		8.7	39.9	61.3	88.4										
15.0	29.8	43.76	51.22	63.07		9.1	40.2	61.9	89.2										
15.3	30.2	44.08	51.44	63.08		9.3	40.5	61.3	90.1										
15.6	30.7	44.40	51.66	63.09		9.8	40.7	61.5	91.0										
15.9	31.6	44.8	51.88	63.20		10.3	41.2	61.7	91.9										
16.2	32.1	45.1	52.10	63.22		10.7	41.4	61.8	92.9										
16.4	32.7	45.5	52.20	63.24		11.2	41.7	62.0	93.7										
16.6	33.1	45.8	52.30	63.26		11.6	42.2	62.2	94.7										
16.8	33.3	46.1	52.40	63.28		12.0	42.5	62.3	95.7										
17.0	33.5	46.5	52.50	63.30		12.6	42.9	62.5	96.3										
17.2	33.8	46.7	52.60	63.32		13.1	43.2	62.6	97.5										
17.4	34.1	46.9	52.9	63.34		13.7	43.5	62.8	98.3										
17.6	34.3	47.1	53.1	63.36		14.4	43.9	63.1	99.0										
17.8	34.7	47.3	53.3	63.38		15.1	44.3	63.4	99.7										
18.4	35.4	47.4	53.6	63.40		15.7	44.7	63.7	100.4										
18.6	36.1	47.5	53.8	63.43		16.4	45.1	64.1	100.8										
19.0	36.8	47.54	54.1	63.46		17.2	45.4	65.0	101.5										
19.2	37.3	47.58	54.4	63.49		17.9	45.9	65.8	101.8										
19.5	37.5	47.62	54.6	63.52		19.1	46.1	66.3	102.3										
19.7	37.8	47.66	54.8	63.55		20.2	46.4	66.8	102.8										
19.9	38.0	47.70	55.1	63.58		21.3	46.8	67.4	103.3										
20.1	38.1	47.74	55.4	63.61		22.2	47.2	68.0	103.7										
20.3	38.2	47.78	55.7	63.64		22.8	47.7	68.5	104.6										
20.6	38.4	47.82	56.0	63.67		23.6	48.1	68.9	105.4										
20.8	38.6	47.86	56.3	63.70		25.1	48.6	69.3	106.1										
20.9	38.8	47.90	56.7	63.71		26.3	49.1	69.7	106.8										
21.1	39.0	47.92	57.0	63.72		27.3	49.4	70.1	107.6										
21.3	39.1	47.94	57.2	63.73		28.5	49.8	70.5	109.1										
21.5	39.2	47.96	57.5	63.74		29.6	50.4	71.0	109.8										
21.8	39.3	47.98	57.8	63.75		30.5	51.0	71.5	110.5										
22.0	39.40	48.00	58.2	63.76		31.2	51.7	72.0	111.0										



CONE PENETROMETER DATA CODE SHEET					PROJECT NUMBER		PROJECT I.D.		ROUTE	
					34379.1.17		R-2123CE		I-485 (Charlotte Eastern Outer Loop)/I-85 Revised Interchange	
					COUNTY Mecklenburg		GEOLOGIST T. Wells		TECHNICIANS Toothman/Middleton	
DRAFT					Date run		Station (location) information		Date run	
Station (location) information					Date run		Station (location) information		Date run	
-Y- SB 84+00 OSS N586108, E1482960					6/9/2010					
Type	cut or fill	Datum or reference surface			Type	cut or fill	Datum or reference surface			
RAW	Fill	Subgrade			RAW		Subgrade			
0.8	18.2	26.9	29.15	31.04						
1.7	18.4	26.95	29.20	31.06						
2.2	18.6	27.00	29.25	31.08						
2.7	18.8	27.05	29.30	31.10						
3.1	19.0	27.10	29.35	31.12						
3.5	19.1	27.15	29.40	31.14						
3.8	19.2	27.20	29.45	31.16						
4.2	19.5	27.25	29.50	31.18						
4.4	19.7	27.30	29.55	31.20						
4.7	19.84	27.35	29.60	31.21						
5.1	19.98	27.40	29.63	31.22						
5.4	20.12	27.44	29.66	31.23						
5.8	20.26	27.48	29.69	31.24						
6.1	20.40	27.52	29.72	31.25						
6.4	20.54	27.56	29.75	31.26						
6.7	20.68	27.60	29.78	31.27						
7.0	20.82	27.64	29.81	31.28						
7.3	20.96	27.68	29.84	31.29						
7.6	21.10	27.72	29.87	31.30	Refusal					
7.8	21.22	27.76	29.90		at 31.3cm					
8.2	21.34	27.80	29.96							
8.6	21.46	27.83	30.02							
8.9	21.58	27.86	30.08							
9.3	21.70	27.89	30.14							
9.7	21.84	27.92	30.20							
10.0	21.98	27.95	30.26							
10.3	22.12	27.98	30.32							
10.7	22.26	28.10	30.39							
11.1	22.40	28.04	30.44							
11.6	22.52	28.07	30.50							
11.8	22.64	28.10	30.53							
12.1	22.76	28.15	30.56							
12.4	22.88	28.20	30.59							
12.7	23.00	28.25	30.62							
13.0	23.20	28.30	30.65							
13.6	23.40	28.35	30.68							
13.7	23.60	28.40	30.71							
14.0	23.80	28.45	30.74							
14.3	24.00	28.50	30.77							
14.7	24.2	28.55	30.80							
15.1	24.7	28.60	30.82							
15.4	25.0	28.65	30.84							
15.8	25.2	28.70	30.86							
16.1	25.4	28.75	30.88							
16.5	25.6	28.80	30.90							
16.8	25.8	28.85	30.92							
17.1	26.1	28.90	30.94							
17.3	26.3	28.95	30.96							
17.5	26.5	29.00	30.98							
17.7	26.6	29.05	31.00							
18.0	26.8	29.10	31.02							



CONE PENETROMETER DATA CODE SHEET						PROJECT NUMBER		PROJECT I.D.				ROUTE			
						34379.1.17		R-2123CE				I-485 (Charlotte Eastern Outer Loop)/I-85 Revised Interchange			
						COUNTY		GEOLOGIST				TECHNICIANS			
						Mecklenburg		T. Wells				Toothman/Middleton			
DRAFT						Date run		Station (location) information				Date run			
-Y- NB 37+00 OSS N582216, E1480457						6/9/2010		-Y- NB 45+00 OSS N582957, E1480758				6/9/2010			
Type	cut or fill		Datum or reference surface				Type	cut or fill		Datum or reference surface					
RAW	Cut		Subgrade				RAW	Fill		Subgrade					
1.7	18.6	35.6	49.1	60.78	72.6	1.5	32.2	69.6							
2.4	18.9	35.8	49.3	61.04	72.8	2.4	32.8	70.5							
3.1	19.1	36.1	49.6	61.30	73.0	3.3	33.2	71.4							
3.7	19.4	36.3	49.9	61.50	73.2	4.0	33.6	72.3							
4.2	19.6	36.5	50.0	61.70	73.5	4.7	34.0	73.1							
4.6	19.8	36.7	50.2	61.90	73.7	5.3	34.4	73.9							
5.1	20.2	36.8	50.4	62.10	73.8	6.0	34.8	74.8							
5.6	20.5	37.0	50.7	62.30	74.1	6.5	35.3	75.7							
6.0	20.7	37.1	51.0	62.50	74.2	7.3	35.8	76.7							
6.4	21.0	37.3	51.2	62.70	74.5	7.9	36.1	77.5							
6.8	21.3	37.4	51.4	62.90	74.6	8.5	36.4	78.6							
7.2	21.5	37.6	51.6	63.10	74.8	9.0	36.9	79.6							
7.5	21.7	37.8	51.8	63.30	74.9	9.9	37.4								
8.0	21.8	38.3	52.1	63.48	75.0	10.7	37.9								
8.3	22.0	38.5	52.3	63.66	75.1	11.4	38.3								
8.7	22.4	38.8	52.5	63.84	75.3	11.9	38.6								
8.9	23.0	39.1	52.7	64.02	75.4	12.6	38.9								
9.2	23.3	39.4	52.92	64.20		13.4	39.3								
9.5	23.6	39.7	53.14	64.42		14.0	39.8								
9.9	23.8	40.0	53.36	64.64		14.6	40.3								
10.2	24.0	40.3	53.58	64.86		15.2	41.2								
10.5	24.3	40.6	53.80	65.08		15.7	41.8								
10.7	24.5	40.8	54.02	65.30		16.1	42.6								
11.1	24.7	41.2	54.24	65.50		16.6	43.4								
11.5	25.1	41.4	54.46	65.70		17.1	44.1								
11.8	25.7	41.7	54.68	65.90		17.5	44.7								
12.0	26.3	42.1	54.90	66.10		18.0	45.4								
12.3	26.7	42.3	55.2	66.30		18.6	46.0								
12.5	27.0	42.7	55.5	66.6		19.2	46.7								
12.8	27.5	43.1	55.8	66.8		19.6	47.3								
13.1	27.9	43.4	56.1	67.0		20.0	47.9								
13.4	28.4	43.7	56.3	67.2		20.6	48.8								
13.8	28.9	44.1	56.6	67.5		21.1	49.5								
14.1	29.3	44.4	56.8	68.2		21.7	50.2								
14.4	29.7	44.7	57.0	68.5		22.3	51.0								
14.7	30.1	44.9	57.2	68.8		22.9	52.0								
14.9	30.4	45.1	57.4	69.0		23.4	52.9								
15.3	30.8	45.4	57.6	69.2		24.0	53.8								
15.5	31.2	45.7	57.8	69.5		24.6	55.0								
15.8	31.5	46.0	58.0	69.8		25.2	56.0								
16.1	31.8	46.2	58.2	69.9		25.7	57.1								
16.3	32.2	46.4	58.5	70.3		26.2	58.2								
16.5	32.5	46.7	58.7	70.5		26.9	59.5								
16.8	32.8	47.2	58.9	70.7		27.5	60.8								
17.0	33.1	47.5	59.1	71.1		28.2	62.2								
17.2	33.5	47.7	59.5	71.3		28.9	63.7								
17.5	33.9	48.0	59.7	71.5		29.5	64.9								
17.8	34.2	48.2	59.9	71.7		29.9	66.0								
18.0	34.6	48.4	60.0	72.0		30.5	67.0								
18.2	35.0	48.6	60.26	72.2		31.2	67.8								
18.4	35.3	48.9	60.52	72.5		31.7	68.7								



CONE PENETROMETER DATA CODE SHEET				PROJECT NUMBER				PROJECT I.D.				ROUTE											
				34379.1.17				R-2123CE				I-485 (Charlotte Eastern Outer Loop)/I-85 Revised Interchange											
				COUNTY				GEOLOGIST				TECHNICIANS											
				Mecklenburg				T. Wells				Toothman/Middleton											
DRAFT				Date run				Station (location) information				Date run											
-L- WB 39+75 OSS				N583205, E1485170				6/10/2010				-L- WB 39+75 OSL				N583189, E1485140				6/10/2010			
Type		cut or fill		Datum or reference surface				Type		cut or fill		Datum or reference surface											
RAW		Cut		Subgrade				RAW		Cut		Subgrade											
1.3		13.2		44.4					2.3		17.7		25.32	28.80	31.62								
1.8		13.4		45.8					2.7		17.8		25.40	28.90	31.64								
2.1		13.8		47.5					3.2		18.0		25.48	29.00	31.66								
2.4		14.0		48.9					3.4		18.2		25.56	29.10	31.68								
2.7		14.2		50.2					3.6		18.3		25.64	29.20	31.70								
3.0		14.5		51.4					3.8		18.6		25.72	29.30	31.72								
3.3		14.8		52.5					4.0		18.8		25.80	29.34	31.74								
3.6		15.0		53.5					4.3		19.0		25.86	29.38	31.76								
3.8		15.2		54.5					4.7		19.2		25.92	29.42	31.78								
4.0		15.4		55.5					4.8		19.5		25.98	29.46	31.80	Refusal							
4.4		15.7		56.5					5.0		19.6		26.04	29.50		at 31.8cm							
4.5		15.9		57.4					5.3		19.9		26.10	29.60									
4.6		16.2		58.3					5.5		20.2		26.20	29.70									
5.1		16.6		59.0					5.7		20.4		26.30	29.80									
5.4		17.1		59.4					6.0		20.6		26.40	29.90									
5.6		17.3		59.9					6.3		20.8		26.50	30.00									
5.9		17.6		60.2					6.5		21.0		26.60	30.06									
6.2		17.9		60.7					6.7		21.2		26.64	30.12									
6.5		18.1		61.1					6.8		21.4		26.68	30.18									
6.7		18.4		61.7					7.0		21.5		26.72	30.24									
7.0		18.8		62.5					7.3		21.8		26.76	30.30									
7.2		19.1		63.1					7.6		21.9		26.80	30.34									
7.5		19.4		63.7					7.9		22.1		26.84	30.38									
7.6		19.8		64.4					8.1		22.3		26.88	30.42									
7.7		20.2		65.0					8.3		22.4		26.92	30.46									
7.9		20.5		65.6					8.4		22.6		26.96	30.50									
8.1		20.9		66.2					10.0		22.7		27.00	30.56									
8.26		21.3		66.7					10.7		22.8		27.36	30.62									
8.42		21.6		67.3					11.5		22.9		27.12	30.68									
8.58		22.0		68.0					12.2		23.0		27.18	30.74									
8.74		22.4		68.7					12.9		23.1		27.24	30.80									
8.90		23.0		69.5					13.4		23.2		27.30	30.86									
9.12		23.5		70.1					13.8		23.4		27.38	30.92									
9.34		24.2		70.8					14.0		23.5		27.46	30.98									
9.56		25.0		71.4					14.2		23.7		27.54	31.04									
9.78		25.7		72.2					14.4		24.0		27.62	31.10									
10.00		26.4		73.0					14.7		24.3		27.70	31.14									
10.2		27.3		73.7					15.0		24.5		27.78	31.18									
10.4		28.2		74.6					15.2		24.54		27.86	31.22									
10.6		29.3		75.5					15.5		24.58		27.94	31.26									
10.8		30.3		76.5					15.6		24.62		28.02	31.30									
11.1		31.3		77.4					15.9		24.66		28.10	31.34									
11.4		32.4		78.5					16.1		24.70		28.16	31.38									
11.7		33.7		79.5					16.4		24.76		28.22	31.42									
11.9		34.9		80.5					16.6		24.82		28.28	31.46									
12.2		36.2		81.5					16.8		24.88		28.34	31.50									
12.4		37.7		82.7					16.9		24.94		28.40	31.52									
12.6		39.2							17.1		25.00		28.48	31.54									
12.8		40.6							17.2		25.08		28.56	31.56									
12.9		41.9							17.3		25.16		28.64	31.58									
13.0		43.2							17.5		25.24		28.72	31.60									



CONE PENETROMETER DATA CODE SHEET DRAFT				PROJECT NUMBER		PROJECT I.D.		ROUTE			
				34379.1.17		R-2123CE		I-485 (Charlotte Eastern Outer Loop)/I-85 Revised Interchange			
				COUNTY		GEOLOGIST		TECHNICIANS			
				Mecklenburg		T. Wells		Toothman/Middleton			
Station (location) information				Date run		Station (location) information				Date run	
-L- WB 50+00 IOSS N584078, E1484571				6/10/2010		-L- WB 50+00 OOSS N584086, E1484580				6/10/2010	
Type	cut or fill	Datum or reference surface				Type	cut or fill	Datum or reference surface			
RAW	Cut	Subgrade				RAW	Cut	Subgrade			
0.8	21.70	24.60	25.32			2.3	11.16	13.54	15.52	19.42	39.5
1.4	21.80	24.62	25.34			3.7	11.22	13.56	15.56	19.50	39.9
2.0	21.90	24.64	25.36			4.5	11.28	13.58	15.60	19.66	40.3
2.4	22.00	24.66	25.38			5.1	11.34	13.60	15.65	19.82	41.8
2.9	22.10	24.68	25.40			5.3	11.40	13.62	15.70	19.98	42.4
3.3	22.20	24.70	25.42			5.6	11.46	13.64	15.75	20.14	43.2
3.8	22.30	24.71	25.44			5.9	11.52	13.66	15.80	20.30	43.6
4.3	22.36	24.72	25.46			6.2	11.58	13.68	15.85	20.5	44.2
4.7	22.42	24.73	25.48			6.3	11.64	13.70	15.90	20.8	44.7
5.4	22.48	24.74	25.50			6.5	11.70	13.74	15.95	21.0	45.1
5.9	22.54	24.75	25.52			6.7	11.74	13.78	16.00	21.3	45.7
6.5	22.60	24.76	25.54			7.2	11.78	13.82	16.05	21.6	46.3
7.2	22.68	24.77	25.56			7.4	11.82	13.86	16.10	21.8	46.9
7.9	22.76	24.78	25.58			7.5	11.86	13.90	16.18	22.1	47.4
8.4	22.84	24.79	25.60			7.7	11.90	13.92	16.26	22.4	47.9
9.0	22.92	24.80	25.62			7.8	12.02	13.94	16.34	23.7	48.4
9.7	23.00	24.81	25.64			7.9	12.14	13.96	16.42	24.0	48.5
10.5	23.04	24.82	25.66			8.1	12.26	13.98	16.50	24.3	49.3
11.3	23.08	24.83	25.68			8.2	12.38	14.00	16.54	24.5	49.8
11.6	23.12	24.84	25.70			8.5	12.50	14.06	16.58	25.0	50.3
12.7	23.16	24.85	25.72			8.7	12.54	14.12	16.62	25.3	
13.4	23.20	24.86	25.74			8.80	12.58	14.18	16.66	25.7	
14.2	23.26	24.87	25.76			8.90	12.62	14.24	16.70	26.0	
15.1	23.32	24.88	25.78			9.00	12.66	14.30	16.80	26.4	
16.0	23.38	24.89	25.80	Refusal		9.10	12.70	14.34	16.90	26.8	
16.7	23.44	24.90	at 25.8cm			9.20	12.72	14.38	17.00	27.2	
17.2	23.50	24.91				9.28	12.74	14.42	17.10	27.6	
17.5	23.54	24.92				9.36	12.76	14.46	17.20	28.0	
17.9	23.58	24.93				9.44	12.78	14.50	17.30	28.3	
18.2	23.62	24.94				9.52	12.80	14.54	17.40	28.7	
18.5	23.66	24.95				9.60	12.84	14.58	17.50	29.0	
18.7	23.70	24.96				9.72	12.88	14.62	17.60	29.3	
18.8	23.76	24.97				9.84	12.92	14.66	17.70	29.9	
19.0	23.82	34.98				9.96	12.96	14.70	17.76	30.4	
19.3	23.88	24.99				10.08	13.00	14.75	17.82	31.0	
19.6	23.94	25.00				10.20	13.04	14.80	17.88	31.3	
19.8	24.00	25.02				10.26	13.08	14.85	17.94	31.9	
20.0	24.04	25.04				10.32	13.12	14.90	18.00	32.3	
20.2	24.08	25.06				10.38	13.16	14.95	18.10	32.9	
20.3	24.12	25.08				10.44	13.20	15.00	18.20	33.4	
20.5	24.16	25.10				10.50	13.24	15.05	18.30	33.8	
20.6	24.20	25.12				10.58	13.28	15.10	18.40	34.3	
20.8	24.26	25.14				10.66	13.32	15.15	18.50	34.8	
20.90	24.32	25.16				10.74	13.36	15.20	18.62	35.4	
21.00	24.38	25.18				10.82	13.40	15.24	18.74	35.8	
21.10	24.44	25.20				10.90	13.42	15.28	18.86	36.4	
21.20	24.50	25.22				10.94	13.44	15.32	18.98	37.0	
21.30	24.52	25.24				10.98	13.46	15.36	19.10	37.5	
21.40	24.54	25.26				11.02	13.48	15.40	19.18	38.0	
21.50	54.56	25.28				11.06	13.50	15.44	19.26	38.6	
21.60	24.58	25.30				11.10	13.52	15.48	19.34	39.1	



CONE PENETROMETER DATA CODE SHEET						PROJECT NUMBER		PROJECT I.D.		ROUTE		
						34379.1.17		R-2123CE		I-485 (Charlotte Eastern Outer Loop)/I-85 Revised Interchange		
						COUNTY Mecklenburg		GEOLOGIST T. Wells		TECHNICIANS Toothman/Middleton		
DRAFT						DATE RUN		DATE RUN		DATE RUN		
Station (location) information						Date run		Station (location) information		Date run		
-L- WB 50+00 OSL N584071, E1484563						6/10/2010		-L- WB 50+00 ISS N584059, E1484537				
Type	cut or fill	Datum or reference surface				Type	cut or fill	Datum or reference surface				
RAW	Cut	Subgrade				RAW	Cut	Subgrade				
2.4	11.26	13.54	15.32	18.98	35.8							
3.7	11.32	13.56	15.36	19.10	26.4							
4.6	11.38	13.58	15.40	19.20	37.0							
5.2	11.44	13.60	15.44	19.30	37.5	DCP Equipment Broke, Could Not Perform DCP Test						
5.4	11.50	13.62	15.48	19.40	37.9							
5.7	11.56	13.64	15.52	19.50	38.6							
5.9	11.62	13.66	15.56	19.60	39.1							
6.2	11.68	13.68	15.60	19.76	39.5							
6.4	11.74	13.70	15.66	19.92	39.9							
6.6	11.80	13.72	15.72	20.08	40.3							
6.9	11.84	13.74	15.78	20.24	40.8							
7.2	11.88	13.76	15.84	20.40	41.4							
7.4	11.92	13.78	15.90	20.6	41.9							
7.5	11.96	13.80	15.96	20.8	42.4							
7.7	12.00	13.82	16.02	21.1	43.2							
7.8	12.10	13.84	16.08	21.3	43.5							
8.0	12.20	13.86	16.14	21.6	44.1							
8.1	12.30	13.88	16.20	21.9	44.6							
8.2	12.40	13.90	16.28	22.2	45.1							
8.3	12.50	13.94	16.36	22.5	45.7							
8.7	12.54	13.98	16.44	22.8	46.7							
8.82	12.58	14.02	16.52	23.1	46.8							
8.94	12.62	14.06	16.60	23.4	47.3							
9.06	12.66	14.10	16.66	23.7	48.4							
9.18	12.70	14.16	16.72	24.1	48.9							
9.30	12.72	14.22	16.78	24.7	49.3							
9.38	12.74	14.28	16.84	25.0	49.8							
9.46	12.76	14.34	16.90	25.4	50.3							
9.54	12.78	14.40	16.96	25.8								
9.62	12.80	14.45	17.02	26.0								
9.70	12.82	14.50	17.08	26.4								
9.80	12.84	14.55	17.14	26.9								
9.90	12.86	14.60	17.20	27.2								
10.00	12.88	14.65	17.30	27.6								
10.10	13.00	14.70	17.40	28.0								
10.20	13.04	14.75	17.50	28.4								
10.28	13.08	14.80	17.60	28.6								
10.36	13.12	14.85	17.70	28.7								
10.44	13.16	14.90	17.78	29.0								
10.52	13.20	14.93	17.86	29.3								
10.60	13.24	14.96	17.94	30.0								
10.68	13.28	14.99	18.02	30.4								
10.76	13.32	15.02	18.10	31.0								
10.84	13.36	15.05	18.18	31.3								
10.92	13.40	15.08	18.26	32.0								
11.00	13.42	15.11	18.34	32.3								
11.04	13.44	15.14	18.42	32.9								
11.08	13.46	15.17	18.50	33.4								
11.12	13.48	15.20	18.62	33.8								
11.16	13.50	15.24	18.74	34.7								
11.20	13.52	15.28	18.86	35.4								



CONE PENETROMETER DATA CODE SHEET						PROJECT NUMBER		PROJECT I.D.		ROUTE	
						34379.1.17		R-2123CE		I-485 (Charlotte Eastern Outer Loop)/I-85 Revised Interchange	
						COUNTY Mecklenburg		GEOLOGIST T. Wells		TECHNICIANS Toothman/Middleton	
DRAFT						Date run		Station (location) information		Date run	
Station (location) information						Date run		Station (location) information		Date run	
-L- EB 45+00 OSS N583705, E1484620						6/9/2010					
Type	cut or fill		Datum or reference surface			Type	cut or fill		Datum or reference surface		
RAW	Cut		Subgrade			RAW			Subgrade		
0.8	13.5		30.1		52.1						
1.3	13.7		30.7		52.3						
1.5	13.8		31.5		52.6						
1.8	14.0		32.2		52.8						
2.0	14.3		32.8		53.1						
2.3	14.5		33.3		53.3						
2.5	14.7		33.7		53.7						
2.8	15.0		34.3		54.0						
3.2	15.3		34.8		54.2						
3.6	15.4		35.4		54.5						
3.9	15.6		35.8		54.6						
4.2	15.8		36.3		54.8						
4.6	16.0		37.0		55.0						
4.8	16.2		37.6		55.2						
5.1	16.5		38.1		55.3						
5.4	16.8		38.6		55.4						
5.7	17.0		39.2		55.5						
5.9	17.2		39.6		55.7						
6.1	17.4		40.3		55.9						
6.4	17.6		40.7		56.1						
6.6	18.0		41.3		56.3						
6.9	18.3		41.7		56.4						
7.0	18.6		42.2		56.5						
7.2	18.8		42.9		56.6						
7.4	19.1		43.4		56.8						
7.5	19.3		44.1		57.0						
7.7	19.7		44.6		57.1						
7.8	19.9		45.3		57.3						
8.2	20.1		46.0		57.4						
8.6	20.3		46.5		57.5						
8.8	20.5		46.9		57.7						
9.0	20.8		47.1		57.8						
9.2	21.0		47.4		58.0						
9.4	21.3		47.5		58.2						
9.6	21.6		47.6		58.4						
9.8	22.0		47.7		58.6						
10.0	22.3		48.1		58.7						
10.2	22.6		48.34		58.8						
10.4	23.0		48.58		58.86						
10.6	23.4		48.82		58.92						
10.8	23.8		49.06		58.98						
11.1	24.2		49.30		59.04						
11.4	24.7		49.7		59.10						
11.6	25.3		50.0		59.22						
11.8	25.8		50.3		59.34						
12.1	26.4		50.6		59.46						
12.3	27.0		50.8		59.58						
12.6	27.5		51.0		59.70						
12.8	28.2		51.2		59.84						
13.0	28.8		51.5		59.98						
13.3	29.5		51.8		60.12						



CONE PENETROMETER DATA CODE SHEET					PROJECT NUMBER		PROJECT I.D.			ROUTE		
					34379.1.17		R-2123CE			I-485 (Charlotte Eastern Outer Loop)/I-85 Revised Interchange		
					COUNTY		GEOLOGIST			TECHNICIANS		
					Mecklenburg		T. Wells			Toothman/Middleton		
DRAFT					Date run		Station (location) information			Date run		
-L- EB 45+00 Accel Ln. Inside N583716, E1484637					6/9/2010		-L- EB 45+00 Accel Ln. Outside N583705, E1484634			6/9/2010		
Type	cut or fill	Datum or reference surface			Type	cut or fill	Datum or reference surface					
RAW	Cut	Subgrade			RAW	Cut	Subgrade					
1.0	15.6	21.32	24.00	25.48	0.9	16.06	17.58	18.90				
1.8	15.9	21.38	24.05	25.50	1.5	16.08	17.60	18.92				
2.4	16.0	21.44	24.10	25.52	2.1	16.10	17.62	18.94				
2.9	16.2	21.50	24.13	25.54	2.7	16.12	17.64	18.96				
3.2	16.3	21.55	24.16	25.56	3.1	16.14	17.66	18.98				
3.6	16.7	21.60	24.19	25.58	3.6	16.16	17.68	19.00	Refusal			
3.9	16.9	21.65	24.22	25.60	4.1	16.18	17.70		at 19.0cm			
4.5	17.1	21.70	24.25	25.62	4.5	16.20	17.73					
4.7	17.2	21.75	24.28	25.64	4.9	16.22	17.76					
5.0	17.3	21.80	24.31	25.66	5.3	16.24	17.79					
5.4	17.5	21.85	24.34	25.68	5.7	16.26	17.82					
5.6	17.7	21.90	24.37	25.70	6.2	16.28	17.85					
5.8	17.8	21.95	24.40	25.73	6.6	16.30	17.88					
6.2	18.0	22.00	24.44	25.76	7.0	16.32	17.91					
6.5	18.1	22.07	24.48	25.79	7.4	16.34	17.94					
6.7	18.20	22.14	24.52	25.82	7.8	16.36	17.97					
7.0	18.30	22.21	24.56	25.85	8.2	16.38	18.00					
7.2	18.40	22.28	24.60	25.88	8.7	16.40	18.03					
7.5	18.50	22.35	24.64	25.91	9.2	16.47	18.06					
7.7	18.60	22.42	24.68	25.94	9.8	16.54	18.09					
8.1	18.74	22.49	24.72	25.97	10.5	16.61	18.12					
8.3	18.88	22.56	24.76	26.00	11.0	16.68	18.15					
8.5	19.02	22.63	24.80		11.6	16.75	18.18					
8.8	19.16	22.70	24.83		12.1	16.82	18.21					
9.0	19.30	22.74	24.86		12.6	16.89	18.24					
9.1	19.36	22.78	24.89		13.0	16.96	18.27					
9.4	19.42	22.82	24.92		13.4	17.03	18.30					
9.7	19.48	22.86	24.95		13.7	17.10	18.33					
9.9	19.54	22.90	24.98		14.3	17.12	18.36					
10.2	19.60	22.94	25.01		14.5	17.14	18.39					
10.4	19.72	22.98	25.04		14.7	17.16	18.42					
10.6	19.84	23.02	25.07		14.9	17.18	18.45					
10.9	19.96	23.06	25.10		15.1	17.20	18.48					
11.1	20.08	23.10	25.12		15.3	17.22	18.51					
11.3	20.20	23.15	25.14		15.36	17.24	18.54					
11.6	20.26	23.20	25.16		15.42	17.26	18.57					
11.9	20.32	23.25	25.18		15.48	17.28	18.60					
12.2	20.38	23.30	25.20		15.54	17.30	18.62					
12.3	20.44	23.35	25.22		15.60	17.32	18.64					
12.7	20.50	23.40	25.24		15.64	17.34	18.66					
12.9	20.58	23.45	25.26		15.68	17.36	18.68					
13.2	20.66	23.50	25.28		15.72	17.38	18.70					
13.3	20.74	23.55	25.30		15.76	17.40	18.72					
13.6	20.82	23.60	25.32		15.80	17.42	18.74					
13.9	20.90	23.65	25.34		15.84	17.44	18.76					
14.1	20.96	23.70	25.36		15.88	17.46	18.78					
14.3	21.02	23.75	25.38		15.92	17.48	18.80					
14.6	21.08	23.80	25.40		15.96	17.50	18.82					
14.8	21.14	23.85	25.42		16.00	17.52	18.84					
15.1	21.20	23.90	25.44		16.02	17.54	18.86					
15.3	21.26	23.95	25.46		16.04	17.56	18.88					



CONE PENETROMETER DATA CODE SHEET						PROJECT NUMBER		PROJECT I.D.		ROUTE	
						34379.1.17		R-2123CE		I-485 (Charlotte Eastern Outer Loop)/I-85 Revised Interchange	
						COUNTY		GEOLOGIST		TECHNICIANS	
						Mecklenburg		T. Wells		Toothman/Middleton	
DRAFT						Date run		Station (location) information		Date run	
Station (location) information						Date run		Station (location) information		Date run	
-L- EB 52+00 GORE N584203, E1484318						6/9/2010		-L- EB 52+00 GORE (continued)			
Type	cut or fill	Datum or reference surface				Type	cut or fill	Datum or reference surface			
RAW	Cut	Subgrade				RAW		Subgrade			
0.6	13.3	22.16	26.32	29.75	34.22	59.3					
1.0	13.6	22.28	26.40	29.82	34.34	60.0					
1.4	13.7	22.40	26.48	29.89	34.46	60.6					
1.7	13.9	22.50	26.56	29.96	34.58	61.2					
1.9	14.2	22.60	26.64	30.03	34.70	62.0					
2.3	14.5	22.70	26.72	30.10	34.90	62.5					
2.7	14.8	22.80	26.80	30.17	35.10	63.1					
3.0	15.1	22.90	26.90	30.24	35.30	63.7					
3.3	15.3	23.00	27.00	30.31	35.50	64.2					
3.6	15.4	23.10	27.10	30.38	35.70	64.8					
3.8	15.6	23.20	27.20	30.45	35.9	65.3					
4.0	16.5	23.30	27.30	30.52	36.2	65.8					
4.3	17.3	23.40	27.38	30.59	36.4	66.3					
4.5	17.7	23.46	27.46	30.66	36.7	66.7					
4.7	17.9	23.52	27.54	30.73	36.9	67.1					
4.8	18.1	23.58	27.62	30.80	37.3	67.6					
5.4	18.3	23.64	27.70	30.88	37.6	67.8					
5.5	18.5	23.70	27.78	30.96	37.8	68.3					
5.7	18.7	23.80	27.86	31.04	38.2	68.8					
6.0	18.9	23.90	27.94	31.12	38.6	69.3					
6.2	19.0	24.00	28.02	31.20	38.9	69.7					
6.3	19.1	24.10	28.10	31.30	39.3	70.2					
6.5	19.2	24.20	28.14	31.40	39.7	70.7					
6.7	19.3	24.26	28.18	31.50	40.2	71.3					
6.8	19.38	24.32	28.22	31.60	40.6	71.8					
7.1	19.46	24.38	28.26	31.70	41.1	72.4					
7.2	19.54	24.44	28.30	31.80	41.6	73.0					
7.5	19.62	24.50	28.36	31.90	42.1						
7.7	19.70	24.58	28.42	32.00	42.7						
8.1	19.80	24.66	28.48	32.10	43.3						
8.3	19.90	24.74	28.54	32.20	43.8						
8.5	20.00	24.82	28.60	32.28	44.4						
8.7	20.10	24.90	28.66	32.36	45.2						
8.9	20.20	25.02	28.72	32.44	45.9						
9.1	20.32	25.14	28.78	32.52	46.6						
9.3	20.44	25.26	28.84	32.60	47.3						
9.5	20.56	25.38	28.90	32.70	48.0						
9.7	20.68	25.50	28.95	32.80	48.8						
9.9	20.80	25.56	29.00	32.90	49.6						
10.2	20.90	25.62	29.05	33.00	50.4						
10.6	21.00	25.68	29.10	33.10	51.2						
11.1	21.10	25.74	29.15	33.20	51.8						
11.4	21.20	25.80	29.20	33.30	52.3						
11.7	21.30	25.82	29.25	33.40	53.0						
11.9	21.40	25.84	29.30	33.50	53.7						
12.2	21.50	25.86	29.35	33.60	54.5						
12.5	21.60	25.88	29.40	33.70	55.8						
12.7	21.70	26.00	29.47	33.80	56.5						
12.8	21.80	26.08	29.54	33.90	57.2						
13.0	21.92	26.16	29.61	34.00	57.9						
13.1	22.04	26.24	29.68	34.10	58.6						

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

T. I. P. No. R-2123

REPORT ON SAMPLES OF SOILS FOR MOISTURE

Project 34379.1.17 County MECK/CAB Owner _____
 Date: Sampled 6/8/10 Received 6/25/10 Reported Y
 Sampled from Y By J B BARFIELD
 Submitted by N WAINAINA 1995 Standard Specifications

764320 TO 764323
7/6/10

TEST RESULTS

Proj. Sample No.	S-3	S-5	S-23	S-36		
Lab. Sample No.	764320	764321	764322	764323		
Retained #4 Sieve %	-	-	-	-		
Passing #10 Sieve %						
Passing #40 Sieve %						
Passing #200 Sieve %						

MINUS NO. 10 FRACTION

SOIL MORTAR - 100%						
Coarse Sand Ret - #60 %						
Fine Sand Ret - #270 %						
Silt 0.05 - 0.005 mm %						
Clay < 0.005 mm %						
Passing #40 Sieve %	-	-	-	-		
Passing #200 Sieve %	-	-	-	-		

L. L.						
P. I.						
AASHTO Classification						
Station	55+00		39+75	50+00		
OFFSET	SB OSS	OSS	WB OSS	WB ISS		
Hole No.						
Depth (Ft)	0.70	1.10	1.30	1.20		
to	3.00	3.00	3.00	3.00		
%MOISTURE	19.1	22.6	16.9	36.2		

cc: J B BARFIELD
Soils File

Soils Engineer

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

ATTACHMENT 4

T. I. P. No. R-2123

REPORT ON SAMPLES OF SOILS FOR QUALITY

Project 34379.1.17 **County** MECK/CAB **Owner** _____
Date: Sampled 6/9/10 **Received** 6/23/10 **Reported** 6/25/10
Sampled from Y **By** J B BARFIELD
Submitted by N WAINAINA 1995 Standard Specifications

764286 TO 764307

7/6/10

TEST RESULTS

Proj. Sample No.		S-1	S-2	S-3	S-4	S-5	S-6
Lab. Sample No.		764286	764287	764288	764289	764290	764291
Retained #4 Sieve	%	3	5	18	1	-	-
Passing #10 Sieve	%	84	90	70	91	97	93
Passing #40 Sieve	%	64	77	56	76	84	84
Passing #200 Sieve	%	40	57	38	60	68	72

MINUS NO. 10 FRACTION

SOIL MORTAR - 100%							
Coarse Sand Ret - #60	%	32.9	20.2	27.3	20.8	18.6	13.5
Fine Sand Ret - #270	%	26.3	22.8	23.0	18.8	17.8	12.3
Silt 0.05 - 0.005 mm	%	26.7	32.7	27.5	36.2	37.4	53.9
Clay < 0.005 mm	%	14.1	24.2	22.2	24.2	26.3	20.2
Passing #40 Sieve	%	-	-	-	-	-	-
Passing #200 Sieve	%	-	-	-	-	-	-

L. L.	32	30	30	31	35	27
P. I.	6	11	13	13	15	9
AASHTO Classification	A-4(0)	A-6(4)	A-6(1)	A-6(5)	A-6(8)	A-4(4)
Station	84+00	70+00	55+00	42+00		
OFFSET	SB OSS	SB OSS	SB OSS	SB OSS	OSS	SB OSS
Hole No.						
Depth (Ft)	0.60	0.60	0.70	0.70	1.10	1.30
to	3.00	3.00	3.00	3.00	3.00	3.00

cc: J B BARFIELD

Soils File

Soils Engineer

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764286 TO 764307

7/6/10

TEST RESULTS

Proj. Sample No.		S-8	S-9	S-11	S-13	S-15	S-17
Lab. Sample No.		764292	764293	764294	764295	764296	764297
Retained #4 Sieve	%	7	3	-	3	4	-
Passing #10 Sieve	%	85	88	99	90	84	94
Passing #40 Sieve	%	77	78	94	78	66	83
Passing #200 Sieve	%	65	60	79	59	46	66

MINUS NO. 10 FRACTION

SOIL MORTAR - 100%							
Coarse Sand Ret - #60	%	12.9	16.0	8.7	18.6	29.5	17.6
Fine Sand Ret - #270	%	16.4	23.2	17.0	22.2	19.8	19.2
Silt 0.05 - 0.005 mm	%	40.4	42.6	44.0	34.9	30.5	45.1
Clay < 0.005 mm	%	30.3	18.2	30.3	24.2	20.2	18.2
Passing #40 Sieve	%	-	-	-	-	-	-
Passing #200 Sieve	%	-	-	-	-	-	-

L. L.	36	24	30	33	33	27
P. I.	13	6	12	14	14	8
AASHTO Classification	A-6(7)	A-4(1)	A-6(8)	A-6(6)	A-6(3)	A-4(3)
Station	27+00	17+00	37+00	45+00	52+00	45+00
OFFSET	SB OSS	SB OSS	NB OSS	NB OSS	EB GORE	OSL
Hole No.						
Depth (Ft)	1.30	0.90	0.80	0.80	1.20	1.70
to	3.00	3.00	3.00	3.00	3.00	3.00

Soils Engineer

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764286 TO 764307

7/6/10

TEST RESULTS

Proj. Sample No.		S-19	S-21	S-23	S-25	S-27	S-29
Lab. Sample No.		764298	764299	764300	764301	764302	764303
Retained #4 Sieve	%	4	-	2	1	-	-
Passing #10 Sieve	%	89	95	86	89	99	98
Passing #40 Sieve	%	79	84	72	68	86	83
Passing #200 Sieve	%	66	68	55	48	53	53

MINUS NO. 10 FRACTION

SOIL MORTAR - 100%							
Coarse Sand Ret - #60	%	15.2	16.6	22.2	31.1	25.3	26.5
Fine Sand Ret - #270	%	17.0	17.0	18.8	19.4	25.3	23.8
Silt 0.05 - 0.005 mm	%	47.7	42.2	30.7	27.3	27.3	27.5
Clay < 0.005 mm	%	20.2	24.2	28.3	22.2	22.2	22.2
Passing #40 Sieve	%	-	-	-	-	-	-
Passing #200 Sieve	%	-	-	-	-	-	-

L. L.	25	26	37	31	36	33
P. I.	7	11	15	14	14	13
AASHTO Classification	A-4(2)	A-6(5)	A-6(6)	A-6(3)	A-6(5)	A-6(4)
Station	45+00	45+00	39+75	39+75	50+00	50+00
OFFSET	MID	EB OSS	WB OSS	WB OSL	WB OSS	WB OSS
Hole No.						
Depth (Ft)	1.60	1.20	1.30	1.20	1.20	1.20
to	3.00	3.00	3.00	3.00	3.00	3.00

Soils Engineer

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764286 TO 764307

7/6/10

TEST RESULTS

Proj. Sample No.		S-30	S-32	S-34	S-36		
Lab. Sample No.		764304	764305	764306	764307		
Retained #4 Sieve	%	-	3	3	-		
Passing #10 Sieve	%	98	86	86	99		
Passing #40 Sieve	%	92	74	67	96		
Passing #200 Sieve	%	81	59	48	89		

MINUS NO. 10 FRACTION

SOIL MORTAR - 100%							
Coarse Sand Ret - #60	%	9.9	19.0	29.7	4.4		
Fine Sand Ret - #270	%	10.9	16.8	19.0	12.7		
Silt 0.05 - 0.005 mm	%	46.9	36.0	29.1	54.5		
Clay < 0.005 mm	%	32.3	28.3	22.2	28.3		
Passing #40 Sieve	%	-	-	-	-		
Passing #200 Sieve	%	-	-	-	-		

L. L.	44	34	29	49		
P. I.	21	16	12	21		
AASHTO Classification	A-7-6(17)	A-6(7)	A-6(3)	A-7-6(21)		
Station	50+00	57+00	39+75	50+00		
OFFSET	WB OSL	WB OSL	WB JSS	WB ISS		
Hole No.						
Depth (Ft)	1.20	1.00	1.20	1.20		
to	3.00	3.00	3.00	3.00		

Soils Engineer