Paul C. Rizzo Associates, Inc.
ENGINEERS & CONSULTANTS

CALCULATION COVER PAGE

Part 1 – General

Project Number: 09-4179 Project Name: Calvert Cliffs NPP Unit 3
Calculation Title: Unit Weights.
Calculation Number: 09-4179-F13 Revision No.:
Number of Pages in Calculation: 17 pages.
If this is a revision to a calculation, explain reason for revision:

Part 2 – Completed by Originator

1. Does the calculation contain the information required by Section 4.4 of QP-15? ☑ Yes ☐ No
   If Answer is No, explain:
2. Has design or analysis software been used for the calculation? ☐ Yes ☑ No
   If Yes, complete the following:
   Software Name: Version Number:
   V&V Revision Number V&V Date:

Printed Name of Originator: Azekah T. Griffiths.
Signature: A. Griffiths Date: 9/15/2009.

Part 3 – Completed by Checker

1. Were the design inputs correctly selected and appropriately documented? ☑ Yes ☐ No
2. Has the appropriate calculation methodology been used? ☑ Yes ☐ No
3. Are assumptions described and justified? ☑ Yes ☐ No
4. Has the input been correctly selected and incorporated into the calculation? ☑ Yes ☐ No
5. Is information and equations from external sources referenced and appropriate? ☑ Yes ☐ No
6. Are numerical calculations correct and have they been completely documented? ☑ Yes ☐ No
7. Are results reasonable considering the input? ☑ Yes ☐ No

Printed Name of Checker: XIAOSONG XIA
Signature Xiaosong Xia. Date: 9/15/09

Part 4 – Approval (Completed by Project Manager or Principal-in-Charge)

Printed Name: Mel Koleber
Signature ML Koleber Jr.

By: ATG	Date: 7/31/2009	Subject:	Unit Weights	Sheet No. 1	of 4
✓By: XS	Date: 7/31/09		Calvert Cliffs Unit 3	Project. No. 09-4179.01	

ATG – Azekah T. Griffiths A. Griffiths

XS – Xiaosong Xia Xiaosong Xia

TABLE OF CONTENTS

1 Purpose 2

2 Methodology 2

3 Results 2

4 References 4

1 PURPOSE

To determine the unit weight for each soil layer encountered at the Calvert Cliffs NPP Unit 3 Site.

2 METHODOLOGY

Unit weights of soil samples obtained from the CCNPP Unit 3 were summarized in Schnabel (2009) and Mactec (2009) reports. Using 09-4179.01-F9 *"Soil Strata – Thicknesses and Termination Elevations"* (RIZZO 2009), each unit weight was assigned to various soil layers using the boring number and sample depth.

3 RESULTS

The excel file "Unit Weight" contains unit weights obtained from laboratory testing, and the soil layers where each sample was obtained. Tables 3.6 through 3.10 summarize the minimum, maximum, average and standard deviation of unit weights for each layer for the following areas: Entire Site, Unit 3, Construction Layout Area (CLA), Unit 3 & CLA Combined and Intake (includes the intake slope). Attached Tables A.1 through A.5 shows the depth and moist unit weight of all the samples tested.

Table 3.1. Summary of Unit Weights – Entire Site

Stratum	Unit Weight [pcf]			
	Minimum	Maximum	Average	Standard Deviation
Stratum I - Terrace Sand	115	125	121	3
Stratum IIa - Chesapeake Clay/Silt	103	130	116	6
Stratum IIb - Chesapeake Sand				
Layer 1	101	128	120	8
Layer 2	103	126	118	7
Layer 3	115	127	121	4
Stratum IIc - Chesapeake Clay/Silt	86	118	105	9
Stratum III - Nanjemoy Sand	116	132	125	6

Table 3.2. Summary of Unit Weights – Unit 3

Stratum	Unit Weight [pcf]			
	Minimum	Maximum	Average	Standard Deviation
Stratum I - Terrace Sand	120	124	121	2
Stratum IIa - Chesapeake Clay/Silt	103	122	115	5
Stratum IIb - Chesapeake Sand				
Layer 1	117	128	122	5
Layer 2	121	126	123	3
Layer 3	*123			-
Stratum IIc - Chesapeake Clay/Silt	87	117	104	10
Stratum III - Nanjemoy Sand	124	132	127	4

*Based on only one test

Table 3.3. Summary of Unit Weights – CLA

Stratum	Unit Weight [pcf]			
	Minimum	Maximum	Average	Standard Deviation
Stratum I - Terrace Sand	*124			-
Stratum IIa - Chesapeake Clay/Silt	103	123	116	6
Stratum IIb - Chesapeake Sand				
Layer 1	101	125	117	14
Layer 2	116	120	118	2
Layer 3	*115			-
Stratum IIc - Chesapeake Clay/Silt	86	117	103	8
Stratum III - Nanjemoy Sand	*116			-

*Based on only one test

Table 3.4. Summary of Unit Weights – Unit 3 & CLA Combined

Stratum	Unit Weight [pcf]			
	Minimum	Maximum	Average	Standard Deviation
Stratum I - Terrace Sand	120	124	122	2
Stratum IIa - Chesapeake Clay/Silt	103	123	116	6
Stratum IIb - Chesapeake Sand				
Layer 1	101	128	120	9
Layer 2	116	126	120	3
Layer 3	115	123	119	5
Stratum IIc - Chesapeake Clay/Silt	86	117	104	9
Stratum III - Nanjemoy Sand	116	132	125	6

Table 3.5. Summary of Unit Weights – Intake

Stratum	Unit Weight [pcf]			
	Minimum	Maximum	Average	Standard Deviation
Stratum I - Terrace Sand	121	125	122	2
Stratum IIa - Chesapeake Clay/Silt	111	130	117	6
Stratum IIb - Chesapeake Sand				
Layer 1	120	122	121	1
Layer 2	-	-	-	-
Layer 3	118	127	121	3
Stratum IIc - Chesapeake Clay/Silt	94	118	108	8
Stratum III - Nanjemoy Sand	-	-	-	-

4 REFERENCES

Mactec Engineering and Consulting, Inc. (Mactec), (2009). "Laboratory Testing Results" (Revision 2), MACTEC Project Number 6234-08-4783, Charlotte, NC.

Schnabel Engineering North, LLC (Schnabel), (2007). "Geotechnical Subsurface Investigation Data Report" (Revision No. 1), Schnabel Project No. 06120048, December 13, 2007, Gaithersburg, MD.

Paul C. Rizzo Associates, Inc. (RIZZO), (2009). 09-4179.01-F9 "Soil Strata – Thicknesses and Termination Elevations"

Table A.1 - Unit Weight - Entire Site

Area	Boring Number	Depth (ft) From	Depth (ft) To	USCS Classification	Soil Type	Moist Unit Weight (pcf)
Unit 3	B-314	13.5	15.5	SC	Layer 1	119
Unit 3	B-315	23.5	25.5	SC	Layer 1	126
CLA	B-409	35	36.2	SP-SM	Layer 1	124.8
Unit 3	B-305	39.5	41.5	SC	Layer 1	117.2
Unit 3	B-317	48.5	50.5	CL	Layer 1	125.5
Switchyard	B-752	58	60	OH	Layer 1	110
Unit 3	B-301A	60	62	SM	Layer 1	128.4
CLA	B-434	63.5	65.5	SM	Layer 1	100.5
CLA	B-425	75	77	SC	Layer 1	125.36
Unit 3	B-323	83.5	84.8	CL	Layer 1	117
Intake Slope	B-778	81.5	83.5	CL	Layer 1	119.7
Intake Slope	B-778	101.5	103.5	SC	Layer 1	121.7
					Minimum	**101**
					Maximum	**128**
					Average	**120**
					Standard Deviation	**8**
CLA	B-440	51	53	SC	Layer 2	116
CLA	B-404	52	53.5	SP-SM	Layer 2	117.6
Unit 3	B-337	53.5	55.5	SC	Layer 2	126
Unit 3	B-328	63.5	65.5	OH	Layer 2	121
CLA	B-420	63.5	65.5	SC	Layer 2	117
Unit 3	B-321	73.5	75.5	SM	Layer 2	120.5
Cooling Tower Area	B-724	73.5	75.5	OL	Layer 2	103
CLA	B-423	103.5	105.5	SP-SC	Layer 2	120
					Minimum	**103**
					Maximum	**126**
					Average	**118**
					Standard Deviation	**7**
intake	B-774	16.5	18.5	SP-SM	Layer 3	123.4
intake	B-774	21.5	23.5	SC	Layer 3	118.2
intake	B-773A	23	25	SC	Layer 3	119.6
Intake Slope	B-779	81.5	83.4	SC-SM	Layer 3	126.7
CLA	B-404	83.5	84.9	SM	Layer 3	115.4
Intake Slope	B-779	96.5	98.5	SC	Layer 3	121.3
Intake Slope	B-779	100	102	SC	Layer 3	118.6
Unit 3	B-307	123.5	124.7	SC	Layer 3	123
					Minimum	**115**
					Maximum	**127**
					Average	**121**
					Standard Deviation	**4**
Unit 3	B-301A	308	310	SC	Nanjemoy sand	125.6
Unit 3	B-301A	318	320	SC	Nanjemoy sand	132
Unit 3	B-301A	328	330	SC	Nanjemoy sand	126.9

Table A.1 - Unit Weight - Entire Site

Area	Boring Number	Depth (ft) From	Depth (ft) To	USCS Classification	Soil Type	Moist Unit Weight (pcf)
Unit 3	B-301A	338	340	SC	Nanjemoy sand	123.5
CLA	B-401	348.5	350.5	SM	Nanjemoy sand	116.4
					Minimum	**116**
					Maximum	**132**
					Average	**125**
					Standard Deviation	**6**
Cooling Tower Area	B-737	10.5	12.5	CH	Stratum a	113
Unit 3	B-331	18.5	20.5	CH	Stratum a	111
Utility Corridor	B-703	18.5	20.5	OH	Stratum a	106
Unit 3	B-321	23.5	25.5	CL	Stratum a	117.8
Unit 3	B-334	23.5	25.5	CH	Stratum a	119
CLA	B-411	23.5	25.5	OH	Stratum a	118
Cooling Tower Area	B-726	23.5	25.5	CH	Stratum a	117
Cooling Tower Area	B-733	23.5	25.5	CH	Stratum a	119
Cooling Tower Area	B-735	28	30	CH	Stratum a	119
Unit 3	B-317	28.5	30.5	CL	Stratum a	122.3
Unit 3	B-333	28.5	30.5	CH	Stratum a	114
Cooling Tower Area	B-723	28.5	30.5	CH	Stratum a	120
Unit 3	B-334	33.5	34.8	CL	Stratum a	115
Unit 3	B-333	38.5	40.5	CH	Stratum a	115
CLA	B-433	38.5	40.5	CH	Stratum a	113
Cooling Tower Area	B-723	38.5	40.5	CH	Stratum a	112
Intake Slope	B-779	41.5	43.5	CH	Stratum a	115.7
Unit 3	B-316	43.5	45.5	CL	Stratum a	121
Unit 3	B-319	43.5	45.2	CH	Stratum a	121
Unit 3	B-326	43.5	45.5	OH	Stratum a	111
Unit 3	B-320	48.5	50	CH	Stratum a	114
CLA	B-421	48.5	50.5	CH	Stratum a	122.68
CLA	B-433	48.5	50.5	CH	Stratum a	121
Intake Slope	B-778	51.5	53.5	ML	Stratum a	129.5
Unit 3	B-316	53.5	55.5	CL	Stratum a	103
CLA	B-434	53.5	55.5	CH	Stratum a	118
Intake Slope	B-779	53.5	55.5	SC	Stratum a	118.4
CLA	B-425	57	59	CH	Stratum a	119.69
CLA	B-414	58	60	CH	Stratum a	117.1
CLA	B-421	58.5	60.5	CH	Stratum a	119.44
Switchyard	B-747	58.5	60	CH	Stratum a	108
CLA	B-428	60	62	CH	Stratum a	120
Intake Slope	B-778	61.5	63.5	CH	Stratum a	114.8
Intake Slope	B-779	61.5	63.5	CH	Stratum a	111
CLA	B-406	63.5	65.5	OH	Stratum a	122
CLA	B-427	63.5	65.5	OH	Stratum a	116
CLA	B-425	65	67	CH	Stratum a	114.52

Table A.1 - Unit Weight - Entire Site

Area	Boring Number	Depth (ft) From	Depth (ft) To	USCS Classification	Soil Type	Moist Unit Weight (pcf)
Unit 3	B-306	68	70	CH	Stratum a	115.8
CLA	B-414	68	70	CH	Stratum a	103
Cooling Tower Area	B-729	68.5	70.5	OH	Stratum a	118
Intake Slope	B-778	71.5	73.5	CH	Stratum a	113.5
Intake Slope	B-779	71.5	73.5	CH	Stratum a	115.2
CLA	B-413	73	75	CH	Stratum a	103
					Minimum	**103**
					Maximum	**130**
					Average	**116**
					Standard Deviation	**6**
intake	B-774	41.5	43.5	SC	Stratum c	112
Intake	B-701	43.5	44.9	MH	Stratum c	116
intake	B-771	51.5	53.5	SC	Stratum c	118.2
intake	B-771	61.5	63.5	CH	Stratum c	111.6
intake	B-771	71.5	73.5	SC	Stratum c	114.1
intake	B-771	81.5	83.5	CH/MH	Stratum c	96
intake	B-774	81.5	83.5	CH	Stratum c	94.7
intake	B-773A	83	85	CH	Stratum c	96.8
intake	B-771	91.5	93.5	CH	Stratum c	93.6
intake	B-773A	93	95	CH	Stratum c	109.2
Unit 3	B-313	93.5	94.7	CL	Stratum c	116
CLA	B-409	95	96.5	SM	Stratum c	109.3
Unit 3	B-304	98.5	99.5	SC	Stratum c	113.2
CLA	B-401	98.5	99.8	MH	Stratum c	117
intake	B-774	101.5	103.5	CH	Stratum c	101.5
intake	B-773A	103	105	CH	Stratum c	104.9
intake	B-773A	113	115	SC	Stratum c	118.4
Unit 3	B-327	113.5	115.5	CH	Stratum c	107
intake	B-774	121.5	123.5	SC	Stratum c	113.5
intake	B-773A	123	125	SC	Stratum c	112.5
Unit 3	B-313	123.5	124.3	SC	Stratum c	116
Unit 3	B-328	123.5	125.5	MH	Stratum c	102
CLA	B-401	123.5	124.8	MH	Stratum c	103
CLA	B-420	128.5	130.3	OH	Stratum c	109
Unit 3	B-304	138.5	139.3	SC	Stratum c	113.4
CLA	B-401	138.5	140.5	CH	Stratum c	104.1
intake	B-774	141.5	143.5	CH	Stratum c	103.9
Unit 3	B-301	158.5	159.6	CH	Stratum c	112.2
CLA	B-401	158.5	159.3	MH	Stratum c	105
CLA	B-423	158.5	160	OH	Stratum c	108
Unit 3	B-301	168.5	170.4	CH	Stratum c	97.3
CLA	B-401	173.5	174.4	CH	Stratum c	95
Unit 3	B-307	178.5	180.4	SC	Stratum c	117

Table A.1 - Unit Weight - Entire Site

Area	Boring Number	Depth (ft) From	Depth (ft) To	USCS Classification	Soil Type	Moist Unit Weight (pcf)
CLA	B-423	178.5	179.5	SM	Stratum c	112
Unit 3	B-344	181.5	183.5	SC	Stratum c	116.8
CLA	B-423	188.5	180	MH	Stratum c	96
Unit 3	B-301A	198	200	CH	Stratum c	100.9
CLA	B-401	198.5	200.3	SM	Stratum c	101.2
Unit 3	B-344	204	206	CH	Stratum c	105.8
Unit 3	B-301A	218	220	SC	Stratum c	109.3
Unit 3	B-344	221.5	223.5	CH	Stratum c	96.5
CLA	B-401	228.5	229.6	MH	Stratum c	98.2
Unit 3	B-301A	238	240	CH	Stratum c	104.7
Unit 3	B-344	241.5	243.5	CH	Stratum c	86.8
CLA	B-401	243.5	244.4	MH	Stratum c	86
Unit 3	B-301A	258	260	CH	Stratum c	98.5
Unit 3	B-301A	268	270	CH	Stratum c	88.3
Unit 3	B-301A	278	280	CH	Stratum c	86.5
Unit 3	B-301A	288	290	CH	Stratum c	99.8
Unit 3	B-301A	298	300	CH	Stratum c	92.9
					Minimum	**86**
					Maximum	**118**
					Average	**105**
					Standard Deviation	**9**
CLA	B-437	13.5	15.5	SP-SM	Terrace Sand	124.1
SITE	B-746	13.5	15.5	SC-SM	Terrace Sand	121
Cooling Tower Area	B-732	15	17	SC	Terrace Sand	124
Intake Slope	B-779	21.5	23.5	SM	Terrace Sand	120.8
Cooling Tower Area	B-743	23.5	25.5	CL	Terrace Sand	115
Intake Slope	B-779	31.5	33.5	SC	Terrace Sand	121.4
Unit 3	B-319	33.5	35.5	CL	Terrace Sand	120
Unit 3	B-326	33.5	35.5	CL	Terrace Sand	120
Cooling Tower Area	B-722	33.5	35.5	SM	Terrace Sand	120
Intake Slope	B-778	33.5	35.5	SM	Terrace Sand	124.6
Cooling Tower Area	B-738	35	37	SC-SM	Terrace Sand	118
Unit 3	B-320	38.5	40.5	SC	Terrace Sand	124
Intake Slope	B-778	41.5	43.5	SC	Terrace Sand	120.7
					Minimum	**115**
					Maximum	**125**
					Average	**121**
					Standard Deviation	**3**

Table A.2 - Unit Weight - Unit 3

Area	Boring Number	Depth (ft) To	Depth (ft) From	USCS Classification	Soil Type	Moist Unit Weight (pcf)
Unit 3	B-301A	60	62	SM	Layer 1	128.4
Unit 3	B-305	39.5	41.5	SC	Layer 1	117.2
Unit 3	B-314	13.5	15.5	SC	Layer 1	119
Unit 3	B-315	23.5	25.5	SC	Layer 1	126
Unit 3	B-317	48.5	50.5	CL	Layer 1	125.5
Unit 3	B-323	83.5	84.8	CL	Layer 1	117
					Minimum	**117**
					Maximum	**128**
					Average	**122**
					Standard deviation	**5**
Unit 3	B-321	73.5	75.5	SM	Layer 2	120.5
Unit 3	B-328	63.5	65.5	OH	Layer 2	121
Unit 3	B-337	53.5	55.5	SC	Layer 2	126
					Minimum	**121**
					Maximum	**126**
					Average	**123**
					Standard deviation	**3**
Unit 3	B-307	123.5	124.7	SC	Layer 3	123
					Minimum	**123**
					Maximum	**123**
					Average	**123**
					Standard deviation	**-**
Unit 3	B-301A	308	310	SC	Nanjemoy sand	125.6
Unit 3	B-301A	318	320	SC	Nanjemoy sand	132
Unit 3	B-301A	328	330	SC	Nanjemoy sand	126.9
Unit 3	B-301A	338	340	SC	Nanjemoy sand	123.5
					Minimum	**124**
					Maximum	**132**
					Average	**127**
					Standard deviation	**4**
Unit 3	B-306	68	70	CH	Stratum a	115.8
Unit 3	B-316	43.5	45.5	CL	Stratum a	121
Unit 3	B-316	53.5	55.5	CL	Stratum a	103
Unit 3	B-317	28.5	30.5	CL	Stratum a	122.3
Unit 3	B-319	43.5	45.2	CH	Stratum a	121
Unit 3	B-320	48.5	50	CH	Stratum a	114
Unit 3	B-321	23.5	25.5	CL	Stratum a	117.8
Unit 3	B-326	43.5	45.5	OH	Stratum a	111
Unit 3	B-331	18.5	20.5	CH	Stratum a	111
Unit 3	B-333	28.5	30.5	CH	Stratum a	114
Unit 3	B-333	38.5	40.5	CH	Stratum a	115
Unit 3	B-334	23.5	25.5	CH	Stratum a	119
Unit 3	B-334	33.5	34.8	CL	Stratum a	115

Table A.2 - Unit Weight - Unit 3

Area	Boring Number	Depth (ft) To	Depth (ft) From	USCS Classification	Soil Type	Moist Unit Weight (pcf)
					Minimum	**103**
					Maximum	**122**
					Average	**115**
					Standard deviation	**5**
Unit 3	B-301	158.5	159.6	CH	Stratum c	112.2
Unit 3	B-301	168.5	170.4	CH	Stratum c	97.3
Unit 3	B-301A	198	200	CH	Stratum c	100.9
Unit 3	B-301A	218	220	SC	Stratum c	109.3
Unit 3	B-301A	238	240	CH	Stratum c	104.7
Unit 3	B-301A	258	260	CH	Stratum c	98.5
Unit 3	B-301A	268	270	CH	Stratum c	88.3
Unit 3	B-301A	278	280	CH	Stratum c	86.5
Unit 3	B-301A	288	290	CH	Stratum c	99.8
Unit 3	B-301A	298	300	CH	Stratum c	92.9
Unit 3	B-304	98.5	99.5	SC	Stratum c	113.2
Unit 3	B-304	138.5	139.3	SC	Stratum c	113.4
Unit 3	B-307	178.5	180.4	SC	Stratum c	117
Unit 3	B-313	93.5	94.7	CL	Stratum c	116
Unit 3	B-313	123.5	124.3	SC	Stratum c	116
Unit 3	B-327	113.5	115.5	CH	Stratum c	107
Unit 3	B-328	123.5	125.5	MH	Stratum c	102
Unit 3	B-344	181.5	183.5	SC	Stratum c	116.8
Unit 3	B-344	204	206	CH	Stratum c	105.8
Unit 3	B-344	221.5	223.5	CH	Stratum c	96.5
Unit 3	B-344	241.5	243.5	CH	Stratum c	86.8
					Minimum	**87**
					Maximum	**117**
					Average	**104**
					Standard deviation	**10**
Unit 3	B-319	33.5	35.5	CL	Terrace Sand	120
Unit 3	B-320	38.5	40.5	SC	Terrace Sand	124
Unit 3	B-326	33.5	35.5	CL	Terrace Sand	120
					Minimum	**120**
					Maximum	**124**
					Average	**121**
					Standard deviation	**2**

Table A.3 - Unit Weight - CLA

Area	Boring Number	Depth (ft) From	Depth (ft) To	USCS Classification	Soil Type	Moist Unit Weight (pcf)
CLA	B-409	35	36.2	SP-SM	Layer 1	124.8
CLA	B-425	75	77	SC	Layer 1	125.36
CLA	B-434	63.5	65.5	SM	Layer 1	100.5
					Minimum	**101**
					Maximum	**125**
					Average	**117**
					Standard deviation	**14**
CLA	B-404	52	53.5	SP-SM	Layer 2	117.6
CLA	B-420	63.5	65.5	SC	Layer 2	117
CLA	B-423	103.5	105.5	SP-SC	Layer 2	120
CLA	B-440	51	53	SC	Layer 2	116
					Minimum	**116**
					Maximum	**120**
					Average	**118**
					Standard deviation	**2**
CLA	B-404	83.5	84.9	SM	Layer 3	115.4
					Minimum	**115**
					Maximum	**115**
					Average	**115**
					Standard deviation	**-**
CLA	B-401	348.5	350.5	SM	Nanjemoy sand	116.4
					Minimum	**116**
					Maximum	**116**
					Average	**116**
					Standard deviation	**-**
CLA	B-406	63.5	65.5	OH	Stratum a	122
CLA	B-411	23.5	25.5	OH	Stratum a	118
CLA	B-413	73	75	CH	Stratum a	103
CLA	B-414	58	60	CH	Stratum a	117.1
CLA	B-414	68	70	CH	Stratum a	103
CLA	B-421	48.5	50.5	CH	Stratum a	122.68
CLA	B-421	58.5	60.5	CH	Stratum a	119.44
CLA	B-425	57	59	CH	Stratum a	119.69
CLA	B-425	65	67	CH	Stratum a	114.52
CLA	B-427	63.5	65.5	OH	Stratum a	116
CLA	B-428	60	62	CH	Stratum a	120
CLA	B-433	38.5	40.5	CH	Stratum a	113
CLA	B-433	48.5	50.5	CH	Stratum a	121
CLA	B-434	53.5	55.5	CH	Stratum a	118
					Minimum	**103**
					Maximum	**123**
					Average	**116**
					Standard deviation	**6**

Table A.3 - Unit Weight - CLA

Area	Boring Number	Depth (ft) From	Depth (ft) To	USCS Classification	Soil Type	Moist Unit Weight (pcf)
CLA	B-401	98.5	99.8	MH	Stratum c	117
CLA	B-401	123.5	124.8	MH	Stratum c	103
CLA	B-401	138.5	140.5	CH	Stratum c	104.1
CLA	B-401	158.5	159.3	MH	Stratum c	105
CLA	B-401	173.5	174.4	CH	Stratum c	95
CLA	B-401	198.5	200.3	SM	Stratum c	101.2
CLA	B-401	228.5	229.6	MH	Stratum c	98.2
CLA	B-401	243.5	244.4	MH	Stratum c	86
CLA	B-409	95	96.5	SM	Stratum c	109.3
CLA	B-420	128.5	130.3	OH	Stratum c	109
CLA	B-423	158.5	160	OH	Stratum c	108
CLA	B-423	178.5	179.5	SM	Stratum c	112
CLA	B-423	188.5	180	MH	Stratum c	96
					Minimum	**86**
					Maximum	**117**
					Average	**103**
					Standard deviation	**8**
CLA	B-437	13.5	15.5	SP-SM	Terrace Sand	124.1
					Minimum	**124**
					Maximum	**124**
					Average	**124**
					Standard deviation	**-**

Table A.4 - Unit Weight - Unit 3 & CLA Combined

Area	Boring Number	Depth (ft) From	Depth (ft) To	USCS Classification	Soil Type	Moist Unit Weight (pcf)
Unit 3	B-301A	60	62	SM	Layer 1	128.4
Unit 3	B-305	39.5	41.5	SC	Layer 1	117.2
Unit 3	B-314	13.5	15.5	SC	Layer 1	119
Unit 3	B-315	23.5	25.5	SC	Layer 1	126
Unit 3	B-317	48.5	50.5	CL	Layer 1	125.5
Unit 3	B-323	83.5	84.8	CL	Layer 1	117
CLA	B-409	35	36.2	SP-SM	Layer 1	124.8
CLA	B-425	75	77	SC	Layer 1	125.36
CLA	B-434	63.5	65.5	SM	Layer 1	100.5
					Minimum	**101**
					Maximum	**128**
					Average	**120**
					Standard deviation	**9**
Unit 3	B-321	73.5	75.5	SM	Layer 2	120.5
Unit 3	B-328	63.5	65.5	OH	Layer 2	121
Unit 3	B-337	53.5	55.5	SC	Layer 2	126
CLA	B-404	52	53.5	SP-SM	Layer 2	117.6
CLA	B-420	63.5	65.5	SC	Layer 2	117
CLA	B-423	103.5	105.5	SP-SC	Layer 2	120
CLA	B-440	51	53	SC	Layer 2	116
					Minimum	**116**
					Maximum	**126**
					Average	**120**
					Standard deviation	**3**
Unit 3	B-307	123.5	124.7	SC	Layer 3	123
CLA	B-404	83.5	84.9	SM	Layer 3	115.4
					Minimum	**115**
					Maximum	**123**
					Average	**119**
					Standard deviation	**5**
Unit 3	B-301A	308	310	SC	Nanjemoy sand	125.6
Unit 3	B-301A	318	320	SC	Nanjemoy sand	132
Unit 3	B-301A	328	330	SC	Nanjemoy sand	126.9
Unit 3	B-301A	338	340	SC	Nanjemoy sand	123.5
CLA	B-401	348.5	350.5	SM	Nanjemoy sand	116.4
					Minimum	**116**
					Maximum	**132**
					Average	**125**
					Standard deviation	**6**
Unit 3	B-306	68	70	CH	Stratum a	115.8
Unit 3	B-316	43.5	45.5	CL	Stratum a	121
Unit 3	B-316	53.5	55.5	CL	Stratum a	103
Unit 3	B-317	28.5	30.5	CL	Stratum a	122.3

Table A.4 - Unit Weight - Unit 3 & CLA Combined

Area	Boring Number	Depth (ft) From	Depth (ft) To	USCS Classification	Soil Type	Moist Unit Weight (pcf)
Unit 3	B-319	43.5	45.2	CH	Stratum a	121
Unit 3	B-320	48.5	50	CH	Stratum a	114
Unit 3	B-321	23.5	25.5	CL	Stratum a	117.8
Unit 3	B-326	43.5	45.5	OH	Stratum a	111
Unit 3	B-331	18.5	20.5	CH	Stratum a	111
Unit 3	B-333	28.5	30.5	CH	Stratum a	114
Unit 3	B-333	38.5	40.5	CH	Stratum a	115
Unit 3	B-334	23.5	25.5	CH	Stratum a	119
Unit 3	B-334	33.5	34.8	CL	Stratum a	115
CLA	B-406	63.5	65.5	OH	Stratum a	122
CLA	B-411	23.5	25.5	OH	Stratum a	118
CLA	B-413	73	75	CH	Stratum a	103
CLA	B-414	58	60	CH	Stratum a	117.1
CLA	B-414	68	70	CH	Stratum a	103
CLA	B-421	48.5	50.5	CH	Stratum a	122.68
CLA	B-421	58.5	60.5	CH	Stratum a	119.44
CLA	B-425	57	59	CH	Stratum a	119.69
CLA	B-425	65	67	CH	Stratum a	114.52
CLA	B-427	63.5	65.5	OH	Stratum a	116
CLA	B-428	60	62	CH	Stratum a	120
CLA	B-433	38.5	40.5	CH	Stratum a	113
CLA	B-433	48.5	50.5	CH	Stratum a	121
CLA	B-434	53.5	55.5	CH	Stratum a	118
					Minimum	**103**
					Maximum	**123**
					Average	**116**
					Standard deviation	**6**
Unit 3	B-301	158.5	159.6	CH	Stratum c	112.2
Unit 3	B-301	168.5	170.4	CH	Stratum c	97.3
Unit 3	B-301A	198	200	CH	Stratum c	100.9
Unit 3	B-301A	218	220	SC	Stratum c	109.3
Unit 3	B-301A	238	240	CH	Stratum c	104.7
Unit 3	B-301A	258	260	CH	Stratum c	98.5
Unit 3	B-301A	268	270	CH	Stratum c	88.3
Unit 3	B-301A	278	280	CH	Stratum c	86.5
Unit 3	B-301A	288	290	CH	Stratum c	99.8
Unit 3	B-301A	298	300	CH	Stratum c	92.9
Unit 3	B-304	98.5	99.5	SC	Stratum c	113.2
Unit 3	B-304	138.5	139.3	SC	Stratum c	113.4
Unit 3	B-307	178.5	180.4	SC	Stratum c	117
Unit 3	B-313	93.5	94.7	CL	Stratum c	116
Unit 3	B-313	123.5	124.3	SC	Stratum c	116
Unit 3	B-327	113.5	115.5	CH	Stratum c	107

Table A.4 - Unit Weight - Unit 3 & CLA Combined

Area	Boring Number	Depth (ft) From	Depth (ft) To	USCS Classification	Soil Type	Moist Unit Weight (pcf)
Unit 3	B-328	123.5	125.5	MH	Stratum c	102
Unit 3	B-344	181.5	183.5	SC	Stratum c	116.8
Unit 3	B-344	204	206	CH	Stratum c	105.8
Unit 3	B-344	221.5	223.5	CH	Stratum c	96.5
Unit 3	B-344	241.5	243.5	CH	Stratum c	86.8
CLA	B-401	98.5	99.8	MH	Stratum c	117
CLA	B-401	123.5	124.8	MH	Stratum c	103
CLA	B-401	138.5	140.5	CH	Stratum c	104.1
CLA	B-401	158.5	159.3	MH	Stratum c	105
CLA	B-401	173.5	174.4	CH	Stratum c	95
CLA	B-401	198.5	200.3	SM	Stratum c	101.2
CLA	B-401	228.5	229.6	MH	Stratum c	98.2
CLA	B-401	243.5	244.4	MH	Stratum c	86
CLA	B-409	95	96.5	SM	Stratum c	109.3
CLA	B-420	128.5	130.3	OH	Stratum c	109
CLA	B-423	158.5	160	OH	Stratum c	108
CLA	B-423	178.5	179.5	SM	Stratum c	112
CLA	B-423	188.5	180	MH	Stratum c	96
					Minimum	**86**
					Maximum	**117**
					Average	**104**
					Standard deviation	**9**
Unit 3	B-319	33.5	35.5	CL	Terrace Sand	120
Unit 3	B-320	38.5	40.5	SC	Terrace Sand	124
Unit 3	B-326	33.5	35.5	CL	Terrace Sand	120
CLA	B-437	13.5	15.5	SP-SM	Terrace Sand	124.1
					Minimum	**120**
					Maximum	**124**
					Average	**122**
					Standard deviation	**2**

Table A.5 - Unit Weight - Intake

Area	Boring Number	Depth (ft) From	Depth (ft) To	USCS Classification	Soil Type	Moist Unit Weight (pcf)
Intake Slope	B-778	81.5	83.5	CL	Layer 1	119.7
Intake Slope	B-778	101.5	103.5	SC	Layer 1	121.7
					Minimum	**120**
					Maximum	**122**
					Average	**121**
					Standard deviation	**1**
intake	B-773A	23	25	SC	Layer 3	119.6
intake	B-774	16.5	18.5	SP-SM	Layer 3	123.4
intake	B-774	21.5	23.5	SC	Layer 3	118.2
Intake Slope	B-779	81.5	83.4	SC-SM	Layer 3	126.7
Intake Slope	B-779	96.5	98.5	SC	Layer 3	121.3
Intake Slope	B-779	100	102	SC	Layer 3	118.6
					Minimum	**118**
					Maximum	**127**
					Average	**121**
					Standard deviation	**3**
Intake Slope	B-778	71.5	73.5	CH	Stratum a	113.5
Intake Slope	B-779	71.5	73.5	CH	Stratum a	115.2
Intake Slope	B-779	41.5	43.5	CH	Stratum a	115.7
Intake Slope	B-778	51.5	53.5	ML	Stratum a	129.5
Intake Slope	B-779	53.5	55.5	SC	Stratum a	118.4
Intake Slope	B-778	61.5	63.5	CH	Stratum a	114.8
Intake Slope	B-779	61.5	63.5	CH	Stratum a	111
					Minimum	**111**
					Maximum	**130**
					Average	**117**
					Standard deviation	**6**
Intake	B-701	43.5	44.9	MH	Stratum c	116
intake	B-771	31.5	33.5	SC	Stratum c	111.8
intake	B-771	41.5	43.5	SC	Stratum c	110.9
intake	B-771	51.5	53.5	SC	Stratum c	118.2
intake	B-771	61.5	63.5	CH	Stratum c	111.6
intake	B-771	71.5	73.5	SC	Stratum c	114.1
intake	B-771	81.5	83.5	CH/MH	Stratum c	96
intake	B-771	91.5	93.5	CH	Stratum c	93.6
intake	B-773A	83	85	CH	Stratum c	96.8
intake	B-773A	93	95	CH	Stratum c	109.2
intake	B-773A	103	105	CH	Stratum c	104.9
intake	B-773A	113	115	SC	Stratum c	118.4
intake	B-773A	123	125	SC	Stratum c	112.5
intake	B-774	31.5	33.5	SC	Stratum c	116
intake	B-774	41.5	43.5	SC	Stratum c	112
intake	B-774	81.5	83.5	CH	Stratum c	94.7

Table A.5 - Unit Weight - Intake

Area	Boring Number	Depth (ft) From	Depth (ft) To	USCS Classification	Soil Type	Moist Unit Weight (pcf)
intake	B-774	101.5	103.5	CH	Stratum c	101.5
intake	B-774	121.5	123.5	SC	Stratum c	113.5
intake	B-774	141.5	143.5	CH	Stratum c	103.9
					Minimum	**94**
					Maximum	**118**
					Average	**108**
					Standard deviation	**8**
Intake Slope	B-779	21.5	23.5	SM	Terrace Sand	120.8
Intake Slope	B-779	31.5	33.5	SC	Terrace Sand	121.4
Intake Slope	B-778	33.5	35.5	SM	Terrace Sand	124.6
Intake Slope	B-778	41.5	43.5	SC	Terrace Sand	120.7
					Minimum	**121**
					Maximum	**125**
					Average	**122**
					Standard deviation	**2**