

APPENDIX 5
BEACH COMPOSITE GRANULARMETRIC REPORTS
(Digital Copy Only)

Granularmetric Report

Depths and elevations based on measured values



CB&I
Coastal Planning & Engineering, Inc.
2481 NW Boca Raton Blvd.
Boca Raton, FL 33431
ph (561) 391 8102

Project Name: Town of Duck, NC

Sample Name: #06 Composite D-11

Analysis Date: 08-18-15

Analyzed By: TM

Easting (ft):

Northing (ft):

Coordinate System:

Elevation (ft):

North Carolina State Plane

0.0 NAVD 88

USCS:

SW

Munsell:

Comments:

Average Wet Munsell Value is 5, Average Dry Munsell Value is 6

Dry Weight (g): 100.00	Wash Weight (g): 100.00	Pan Retained (g): 0.92	Sieve Loss (%): 0.09	Fines (%): #200 - 1.10 #230 - 1.01	Organics (%):	Carbonates (%): 3	Shell Hash (%):
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Sieve Number	Sieve Size (Phi)	Sieve Size (Millimeters)	Grams Retained	% Weight Retained	Cum. Grams Retained	C. % Weight Retained
3/4"	-4.25	19.03	0.00	0.00	0.00	0.00
5/8"	-4.00	16.00	0.00	0.00	0.00	0.00
7/16"	-3.50	11.31	0.00	0.00	0.00	0.00
5/16"	-3.00	8.00	0.01	0.01	0.01	0.01
3.5	-2.50	5.66	0.01	0.01	0.02	0.02
4	-2.25	4.76	0.05	0.05	0.07	0.07
5	-2.00	4.00	0.19	0.19	0.26	0.26
7	-1.50	2.83	0.63	0.63	0.89	0.89
10	-1.00	2.00	1.23	1.23	2.12	2.12
14	-0.50	1.41	2.36	2.36	4.48	4.48
18	0.00	1.00	3.22	3.22	7.70	7.70
25	0.50	0.71	4.12	4.12	11.82	11.82
35	1.00	0.50	6.43	6.43	18.25	18.25
45	1.50	0.35	12.69	12.69	30.94	30.94
60	2.00	0.25	22.32	22.32	53.26	53.26
80	2.50	0.18	29.15	29.15	82.41	82.41
120	3.00	0.13	14.12	14.12	96.53	96.53
170	3.50	0.09	2.14	2.14	98.67	98.67
200	3.75	0.07	0.23	0.23	98.90	98.90
230	4.00	0.06	0.09	0.09	98.99	98.99

Phi 5	Phi 16	Phi 25	Phi 50	Phi 75	Phi 84	Phi 95
2.95	2.56	2.37	1.93	1.27	0.83	-0.42
Moment	Mean Phi	Mean mm	Sorting	Skewness	Kurtosis	
Statistics	1.69	0.31	0.99	-1.23	4.63	

GRANULARMETRIC REPORT DUCK_2013_BEACH_SAMPLES.GPJ JPBRAZIL.GDT 8/21/15

Granularmetric Report

Depths and elevations based on measured values



CB&I
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2481 NW Boca Raton Blvd.
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Project Name: Town of Duck, NC

Sample Name: #03 Composite D-13

Analysis Date: 12-09-13

Analyzed By: TM

Easting (ft):

Northing (ft):

Coordinate System:

Elevation (ft):

North Carolina State Plane

0.0 NAVD 88

USCS:

SW

Munsell:

Comments:

Average Wet Munsell Value is 5, Average Dry Munsell Value is 6

Dry Weight (g): 100.00	Wash Weight (g): 100.00	Pan Retained (g): 1.14	Sieve Loss (%): 0.01	Fines (%): #200 - 1.25 #230 - 1.15	Organics (%):	Carbonates (%): 3	Shell Hash (%):
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Sieve Number	Sieve Size (Phi)	Sieve Size (Millimeters)	Grams Retained	% Weight Retained	Cum. Grams Retained	C. % Weight Retained
3/4"	-4.25	19.03	0.00	0.00	0.00	0.00
5/8"	-4.00	16.00	0.00	0.00	0.00	0.00
7/16"	-3.50	11.31	0.05	0.05	0.05	0.05
5/16"	-3.00	8.00	0.33	0.33	0.38	0.38
3.5	-2.50	5.66	1.51	1.51	1.89	1.89
4	-2.25	4.76	0.56	0.56	2.45	2.45
5	-2.00	4.00	0.77	0.77	3.22	3.22
7	-1.50	2.83	2.27	2.27	5.49	5.49
10	-1.00	2.00	2.95	2.95	8.44	8.44
14	-0.50	1.41	4.42	4.42	12.86	12.86
18	0.00	1.00	5.09	5.09	17.95	17.95
25	0.50	0.71	6.03	6.03	23.98	23.98
35	1.00	0.50	6.76	6.76	30.74	30.74
45	1.50	0.35	8.27	8.27	39.01	39.01
60	2.00	0.25	13.18	13.18	52.19	52.19
80	2.50	0.18	22.76	22.76	74.95	74.95
120	3.00	0.13	20.07	20.07	95.02	95.02
170	3.50	0.09	3.39	3.39	98.41	98.41
200	3.75	0.07	0.34	0.34	98.75	98.75
230	4.00	0.06	0.10	0.10	98.85	98.85

Phi 5	Phi 16	Phi 25	Phi 50	Phi 75	Phi 84	Phi 95
3.00	2.73	2.50	1.92	0.58	-0.19	-1.61
Moment Statistics	Mean Phi	Mean mm	Sorting	Skewness	Kurtosis	
	1.4	0.38	1.45	-1.07	3.42	

GRANULARMETRIC REPORT DUCK_2013_BEACH_SAMPLES.GPJ JPBRAZIL.GDT 8/21/15

Granularmetric Report

Depths and elevations based on measured values



CB&I
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2481 NW Boca Raton Blvd.
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ph (561) 391 8102

Project Name: Town of Duck, NC

Sample Name: #07 Composite D-15

Analysis Date: 08-18-15

Analyzed By: TM

Easting (ft):

Northing (ft):

Coordinate System:

Elevation (ft):

North Carolina State Plane

0.0 NAVD 88

USCS:

SW

Munsell:

Comments:

Average Wet Munsell Value is 5, Average Dry Munsell Value is 6

Dry Weight (g): 100.00	Wash Weight (g): 100.00	Pan Retained (g): 0.94	Sieve Loss (%): 0.05	Fines (%): #200 - 1.08 #230 - 0.99	Organics (%):	Carbonates (%): 2	Shell Hash (%):
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Sieve Number	Sieve Size (Phi)	Sieve Size (Millimeters)	Grams Retained	% Weight Retained	Cum. Grams Retained	C. % Weight Retained
3/4"	-4.25	19.03	0.00	0.00	0.00	0.00
5/8"	-4.00	16.00	0.00	0.00	0.00	0.00
7/16"	-3.50	11.31	0.00	0.00	0.00	0.00
5/16"	-3.00	8.00	0.14	0.14	0.14	0.14
3.5	-2.50	5.66	0.48	0.48	0.62	0.62
4	-2.25	4.76	0.15	0.15	0.77	0.77
5	-2.00	4.00	0.22	0.22	0.99	0.99
7	-1.50	2.83	0.76	0.76	1.75	1.75
10	-1.00	2.00	1.24	1.24	2.99	2.99
14	-0.50	1.41	2.03	2.03	5.02	5.02
18	0.00	1.00	2.63	2.63	7.65	7.65
25	0.50	0.71	3.75	3.75	11.40	11.40
35	1.00	0.50	6.02	6.02	17.42	17.42
45	1.50	0.35	9.59	9.59	27.01	27.01
60	2.00	0.25	16.46	16.46	43.47	43.47
80	2.50	0.18	29.07	29.07	72.54	72.54
120	3.00	0.13	22.33	22.33	94.87	94.87
170	3.50	0.09	3.67	3.67	98.54	98.54
200	3.75	0.07	0.38	0.38	98.92	98.92
230	4.00	0.06	0.09	0.09	99.01	99.01

Phi 5	Phi 16	Phi 25	Phi 50	Phi 75	Phi 84	Phi 95
3.02	2.76	2.56	2.11	1.40	0.88	-0.50
Moment	Mean Phi	Mean mm	Sorting	Skewness	Kurtosis	
Statistics	1.81	0.29	1.1	-1.55	5.84	

GRANULARMETRIC REPORT DUCK_2013_BEACH_SAMPLES.GPJ JPBRAZIL.GDT 8/21/15

Granularmetric Report

Depths and elevations based on measured values



CB&I
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Project Name: Town of Duck, NC

Sample Name: #08 Composite D-17

Analysis Date: 08-18-15

Analyzed By: TM

Easting (ft):

Northing (ft):

Coordinate System:

Elevation (ft):

North Carolina State Plane

0.0 NAVD 88

USCS: **SW** Munsell: Comments: **Average Wet Munsell Value is 6, Average Dry Munsell Value is 7**

Dry Weight (g): 100.00	Wash Weight (g): 100.00	Pan Retained (g): 0.92	Sieve Loss (%): 0.07	Fines (%): #200 - 1.08 #230 - 0.99	Organics (%):	Carbonates (%): 3	Shell Hash (%):
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Sieve Number	Sieve Size (Phi)	Sieve Size (Millimeters)	Grams Retained	% Weight Retained	Cum. Grams Retained	C. % Weight Retained
3/4"	-4.25	19.03	0.00	0.00	0.00	0.00
5/8"	-4.00	16.00	0.00	0.00	0.00	0.00
7/16"	-3.50	11.31	0.20	0.20	0.20	0.20
5/16"	-3.00	8.00	1.18	1.18	1.38	1.38
3.5	-2.50	5.66	2.97	2.97	4.35	4.35
4	-2.25	4.76	0.65	0.65	5.00	5.00
5	-2.00	4.00	0.96	0.96	5.96	5.96
7	-1.50	2.83	1.60	1.60	7.56	7.56
10	-1.00	2.00	1.66	1.66	9.22	9.22
14	-0.50	1.41	2.50	2.50	11.72	11.72
18	0.00	1.00	2.77	2.77	14.49	14.49
25	0.50	0.71	3.09	3.09	17.58	17.58
35	1.00	0.50	4.74	4.74	22.32	22.32
45	1.50	0.35	8.59	8.59	30.91	30.91
60	2.00	0.25	16.40	16.40	47.31	47.31
80	2.50	0.18	28.29	28.29	75.60	75.60
120	3.00	0.13	19.83	19.83	95.43	95.43
170	3.50	0.09	3.13	3.13	98.56	98.56
200	3.75	0.07	0.36	0.36	98.92	98.92
230	4.00	0.06	0.09	0.09	99.01	99.01

Phi 5	Phi 16	Phi 25	Phi 50	Phi 75	Phi 84	Phi 95
2.99	2.71	2.49	2.05	1.16	0.24	-2.25
Moment	Mean Phi	Mean mm	Sorting	Skewness	Kurtosis	
Statistics	1.51	0.35	1.51	-1.59	4.9	

GRANULARMETRIC REPORT DUCK_2013_BEACH_SAMPLES.GPJ JPBRAZIL.GDT 8/21/15

Granularmetric Report

Depths and elevations based on measured values



CB&I
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2481 NW Boca Raton Blvd.
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Project Name: Town of Duck, NC

Sample Name: #04 Composite D-18

Analysis Date: 12-09-13

Analyzed By: TM

Easting (ft):

Northing (ft):

Coordinate System:

Elevation (ft):

North Carolina State Plane

0.0 NAVD 88

USCS:

SW

Munsell:

Comments:

Average Wet Munsell Value is 5, Average Dry Munsell Value is 6

Dry Weight (g): 100.00	Wash Weight (g): 100.00	Pan Retained (g): 0.87	Sieve Loss (%): 0.02	Fines (%): #200 - 0.99 #230 - 0.89	Organics (%):	Carbonates (%): 5	Shell Hash (%):
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Sieve Number	Sieve Size (Phi)	Sieve Size (Millimeters)	Grams Retained	% Weight Retained	Cum. Grams Retained	C. % Weight Retained
3/4"	-4.25	19.03	0.00	0.00	0.00	0.00
5/8"	-4.00	16.00	0.00	0.00	0.00	0.00
7/16"	-3.50	11.31	0.14	0.14	0.14	0.14
5/16"	-3.00	8.00	0.42	0.42	0.56	0.56
3.5	-2.50	5.66	0.70	0.70	1.26	1.26
4	-2.25	4.76	0.45	0.45	1.71	1.71
5	-2.00	4.00	0.66	0.66	2.37	2.37
7	-1.50	2.83	1.46	1.46	3.83	3.83
10	-1.00	2.00	2.85	2.85	6.68	6.68
14	-0.50	1.41	5.16	5.16	11.84	11.84
18	0.00	1.00	5.50	5.50	17.34	17.34
25	0.50	0.71	5.67	5.67	23.01	23.01
35	1.00	0.50	6.52	6.52	29.53	29.53
45	1.50	0.35	8.89	8.89	38.42	38.42
60	2.00	0.25	13.40	13.40	51.82	51.82
80	2.50	0.18	19.63	19.63	71.45	71.45
120	3.00	0.13	22.88	22.88	94.33	94.33
170	3.50	0.09	4.30	4.30	98.63	98.63
200	3.75	0.07	0.38	0.38	99.01	99.01
230	4.00	0.06	0.10	0.10	99.11	99.11

Phi 5	Phi 16	Phi 25	Phi 50	Phi 75	Phi 84	Phi 95
3.08	2.77	2.58	1.93	0.65	-0.12	-1.29
Moment	Mean Phi	Mean mm	Sorting	Skewness	Kurtosis	
Statistics	1.47	0.36	1.41	-1.05	3.49	

GRANULARMETRIC REPORT DUCK_2013_BEACH_SAMPLES.GPJ JPBRAZIL.GDT 8/21/15

Granularmetric Report

Depths and elevations based on measured values



CB&I
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2481 NW Boca Raton Blvd.
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Project Name: Town of Duck, NC

Sample Name: #09 Dune Composite

Analysis Date: 08-18-15

Analyzed By: TM

Easting (ft):

Northing (ft):

Coordinate System:

Elevation (ft):

North Carolina State Plane

0.0 NAVD 88

USCS:

SW

Munsell:

Wet - 0-6/0
Dry - 0-6/0
Washed - 0-0/0

Comments:

COMPOSITE

Dry Weight (g): 100.00	Wash Weight (g): 100.00	Pan Retained (g): 0.68	Sieve Loss (%): 0.09	Fines (%): #200 - 0.79 #230 - 0.77	Organics (%):	Carbonates (%):	Shell Hash (%):
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Sieve Number	Sieve Size (Phi)	Sieve Size (Millimeters)	Grams Retained	% Weight Retained	Cum. Grams Retained	C. % Weight Retained
3/4"	-4.25	19.03	0.00	0.00	0.00	0.00
5/8"	-4.00	16.00	0.00	0.00	0.00	0.00
7/16"	-3.50	11.31	0.00	0.00	0.00	0.00
5/16"	-3.00	8.00	0.02	0.02	0.02	0.02
3.5	-2.50	5.66	0.09	0.09	0.11	0.11
4	-2.25	4.76	0.16	0.16	0.27	0.27
5	-2.00	4.00	0.13	0.13	0.40	0.40
7	-1.50	2.83	0.47	0.47	0.87	0.87
10	-1.00	2.00	0.92	0.92	1.79	1.79
14	-0.50	1.41	2.00	2.00	3.79	3.79
18	0.00	1.00	3.32	3.32	7.11	7.11
25	0.50	0.71	6.84	6.84	13.95	13.95
35	1.00	0.50	13.39	13.39	27.34	27.34
45	1.50	0.35	21.36	21.36	48.70	48.70
60	2.00	0.25	27.41	27.41	76.11	76.11
80	2.50	0.18	17.65	17.65	93.76	93.76
120	3.00	0.13	4.86	4.86	98.62	98.62
170	3.50	0.09	0.51	0.51	99.13	99.13
200	3.75	0.07	0.08	0.08	99.21	99.21
230	4.00	0.06	0.02	0.02	99.23	99.23

Phi 5	Phi 16	Phi 25	Phi 50	Phi 75	Phi 84	Phi 95
2.63	2.22	1.98	1.52	0.91	0.58	-0.32
Moment	Mean Phi	Mean mm	Sorting	Skewness	Kurtosis	
Statistics	1.37	0.39	0.88	-1	4.75	

GRANULARMETRIC REPORT DUCK_2013_BEACH_SAMPLES.GPJ JPBRAZIL.GDT 8/21/15

Granularmetric Report

Depths and elevations based on measured values



CB&I
Coastal Planning & Engineering, Inc.
2481 NW Boca Raton Blvd.
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Project Name: Town of Duck, NC

Sample Name: #10 TOD Composite

Analysis Date: 08-18-15

Analyzed By: TM

Easting (ft): Northing (ft):

Coordinate System:

Elevation (ft):

North Carolina State Plane

0.0 NAVD 88

USCS: SW	Munsell: Wet - 0-6/0 Dry - 0-7/0 Washed - 0-0/0	Comments: COMPOSITE
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Dry Weight (g): 100.00	Wash Weight (g): 100.00	Pan Retained (g): 0.41	Sieve Loss (%): 0.07	Fines (%): #200 - 0.49 #230 - 0.48	Organics (%):	Carbonates (%):	Shell Hash (%):
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Sieve Number	Sieve Size (Phi)	Sieve Size (Millimeters)	Grams Retained	% Weight Retained	Cum. Grams Retained	C. % Weight Retained
3/4"	-4.25	19.03	0.00	0.00	0.00	0.00
5/8"	-4.00	16.00	0.00	0.00	0.00	0.00
7/16"	-3.50	11.31	0.00	0.00	0.00	0.00
5/16"	-3.00	8.00	0.00	0.00	0.00	0.00
3.5	-2.50	5.66	0.30	0.30	0.30	0.30
4	-2.25	4.76	0.24	0.24	0.54	0.54
5	-2.00	4.00	0.81	0.81	1.35	1.35
7	-1.50	2.83	2.24	2.24	3.59	3.59
10	-1.00	2.00	4.05	4.05	7.64	7.64
14	-0.50	1.41	6.78	6.78	14.42	14.42
18	0.00	1.00	9.67	9.67	24.09	24.09
25	0.50	0.71	12.33	12.33	36.42	36.42
35	1.00	0.50	14.72	14.72	51.14	51.14
45	1.50	0.35	18.65	18.65	69.79	69.79
60	2.00	0.25	18.55	18.55	88.34	88.34
80	2.50	0.18	9.31	9.31	97.65	97.65
120	3.00	0.13	1.68	1.68	99.33	99.33
170	3.50	0.09	0.15	0.15	99.48	99.48
200	3.75	0.07	0.03	0.03	99.51	99.51
230	4.00	0.06	0.01	0.01	99.52	99.52

Phi 5	Phi 16	Phi 25	Phi 50	Phi 75	Phi 84	Phi 95
2.36	1.88	1.64	0.96	0.04	-0.42	-1.33
Moment	Mean Phi	Mean mm	Sorting	Skewness	Kurtosis	
Statistics	0.77	0.59	1.11	-0.58	2.82	

GRANULARMETRIC REPORT DUCK_2013_BEACH_SAMPLES.GPJ JPBRAZIL.GDT 8/21/15

Granularmetric Report

Depths and elevations based on measured values



CB&I
Coastal Planning & Engineering, Inc.
2481 NW Boca Raton Blvd.
Boca Raton, FL 33431
ph (561) 391 8102

Project Name: Town of Duck, NC

Sample Name: #11MidBermComposite

Analysis Date: 08-18-15

Analyzed By: TM

Easting (ft): Northing (ft):

Coordinate System:

Elevation (ft):

North Carolina State Plane

0.0 NAVD 88

USCS: SW	Munsell: Wet - 0-6/0 Dry - 0-6/0 Washed - 0-0/0	Comments: COMPOSITE
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Dry Weight (g): 100.00	Wash Weight (g): 100.00	Pan Retained (g): 0.36	Sieve Loss (%): 0.07	Fines (%): #200 - 0.43 #230 - 0.43	Organics (%):	Carbonates (%):	Shell Hash (%):
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Sieve Number	Sieve Size (Phi)	Sieve Size (Millimeters)	Grams Retained	% Weight Retained	Cum. Grams Retained	C. % Weight Retained
3/4"	-4.25	19.03	0.00	0.00	0.00	0.00
5/8"	-4.00	16.00	0.00	0.00	0.00	0.00
7/16"	-3.50	11.31	0.00	0.00	0.00	0.00
5/16"	-3.00	8.00	0.23	0.23	0.23	0.23
3.5	-2.50	5.66	0.38	0.38	0.61	0.61
4	-2.25	4.76	0.00	0.00	0.61	0.61
5	-2.00	4.00	0.04	0.04	0.65	0.65
7	-1.50	2.83	0.40	0.40	1.05	1.05
10	-1.00	2.00	1.89	1.89	2.94	2.94
14	-0.50	1.41	7.05	7.05	9.99	9.99
18	0.00	1.00	8.58	8.58	18.57	18.57
25	0.50	0.71	9.25	9.25	27.82	27.82
35	1.00	0.50	12.81	12.81	40.63	40.63
45	1.50	0.35	18.01	18.01	58.64	58.64
60	2.00	0.25	24.16	24.16	82.80	82.80
80	2.50	0.18	14.46	14.46	97.26	97.26
120	3.00	0.13	2.18	2.18	99.44	99.44
170	3.50	0.09	0.11	0.11	99.55	99.55
200	3.75	0.07	0.02	0.02	99.57	99.57
230	4.00	0.06	0.00	0.00	99.57	99.57

Phi 5	Phi 16	Phi 25	Phi 50	Phi 75	Phi 84	Phi 95
2.42	2.04	1.84	1.26	0.35	-0.15	-0.85
Moment	Mean Phi	Mean mm	Sorting	Skewness	Kurtosis	
Statistics	1.04	0.49	1.04	-0.78	3.37	

GRANULARMETRIC REPORT DUCK_2013_BEACH_SAMPLES.GPJ JPBRAZIL.GDT 8/21/15

Granularmetric Report

Depths and elevations based on measured values



CB&I
Coastal Planning & Engineering, Inc.
2481 NW Boca Raton Blvd.
Boca Raton, FL 33431
ph (561) 391 8102

Project Name: Town of Duck, NC

Sample Name: #12BermCrestComposite

Analysis Date: 08-18-15

Analyzed By: TM

Easting (ft): Northing (ft):

Coordinate System: Elevation (ft):

North Carolina State Plane

0.0 NAVD 88

USCS: **SP** Munsell: Wet - 0-6/0 Dry - 0-7/0 Washed - 0-0/0 Comments: **COMPOSITE**

Dry Weight (g): 100.00 Wash Weight (g): 100.00 Pan Retained (g): 0.35 Sieve Loss (%): 0.04 Fines (%): #200 - 0.39 #230 - 0.39 Organics (%): Carbonates (%): Shell Hash (%):

Sieve Number	Sieve Size (Phi)	Sieve Size (Millimeters)	Grams Retained	% Weight Retained	Cum. Grams Retained	C. % Weight Retained
3/4"	-4.25	19.03	0.00	0.00	0.00	0.00
5/8"	-4.00	16.00	0.00	0.00	0.00	0.00
7/16"	-3.50	11.31	0.00	0.00	0.00	0.00
5/16"	-3.00	8.00	0.00	0.00	0.00	0.00
3.5	-2.50	5.66	0.00	0.00	0.00	0.00
4	-2.25	4.76	0.04	0.04	0.04	0.04
5	-2.00	4.00	0.01	0.01	0.05	0.05
7	-1.50	2.83	0.10	0.10	0.15	0.15
10	-1.00	2.00	0.25	0.25	0.40	0.40
14	-0.50	1.41	0.95	0.95	1.35	1.35
18	0.00	1.00	2.93	2.93	4.28	4.28
25	0.50	0.71	5.27	5.27	9.55	9.55
35	1.00	0.50	9.44	9.44	18.99	18.99
45	1.50	0.35	19.25	19.25	38.24	38.24
60	2.00	0.25	33.23	33.23	71.47	71.47
80	2.50	0.18	24.43	24.43	95.90	95.90
120	3.00	0.13	3.55	3.55	99.45	99.45
170	3.50	0.09	0.14	0.14	99.59	99.59
200	3.75	0.07	0.02	0.02	99.61	99.61
230	4.00	0.06	0.00	0.00	99.61	99.61

Moment Statistics	Mean Phi	Mean mm	Sorting	Skewness	Kurtosis
	2.48	2.07	1.68	1.16	0.07
	1.54	0.34	0.74	-1.03	4.42

GRANULARMETRIC REPORT DUCK_2013_BEACH_SAMPLES.GPJ JPBRAZIL.GDT 8/21/15

Granularmetric Report

Depths and elevations based on measured values



CB&I
Coastal Planning & Engineering, Inc.
2481 NW Boca Raton Blvd.
Boca Raton, FL 33431
ph (561) 391 8102

Project Name: Town of Duck, NC

Sample Name: #13 MHW Composite

Analysis Date: 08-18-15

Analyzed By: TM

Easting (ft):

Northing (ft):

Coordinate System:

Elevation (ft):

North Carolina State Plane

0.0 NAVD 88

USCS: SW

Munsell: Wet - 0-5/0
Dry - 0-6/0
Washed - 0-0/0

Comments: COMPOSITE

Dry Weight (g): 100.00	Wash Weight (g): 100.00	Pan Retained (g): 0.75	Sieve Loss (%): 0.04	Fines (%): #200 - 0.79 #230 - 0.79	Organics (%):	Carbonates (%):	Shell Hash (%):
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Sieve Number	Sieve Size (Phi)	Sieve Size (Millimeters)	Grams Retained	% Weight Retained	Cum. Grams Retained	C. % Weight Retained
3/4"	-4.25	19.03	0.00	0.00	0.00	0.00
5/8"	-4.00	16.00	0.00	0.00	0.00	0.00
7/16"	-3.50	11.31	0.14	0.14	0.14	0.14
5/16"	-3.00	8.00	0.21	0.21	0.35	0.35
3.5	-2.50	5.66	0.51	0.51	0.86	0.86
4	-2.25	4.76	0.26	0.26	1.12	1.12
5	-2.00	4.00	0.59	0.59	1.71	1.71
7	-1.50	2.83	2.03	2.03	3.74	3.74
10	-1.00	2.00	3.19	3.19	6.93	6.93
14	-0.50	1.41	6.10	6.10	13.03	13.03
18	0.00	1.00	7.42	7.42	20.45	20.45
25	0.50	0.71	8.04	8.04	28.49	28.49
35	1.00	0.50	9.07	9.07	37.56	37.56
45	1.50	0.35	13.43	13.43	50.99	50.99
60	2.00	0.25	22.89	22.89	73.88	73.88
80	2.50	0.18	21.39	21.39	95.27	95.27
120	3.00	0.13	3.81	3.81	99.08	99.08
170	3.50	0.09	0.11	0.11	99.19	99.19
200	3.75	0.07	0.02	0.02	99.21	99.21
230	4.00	0.06	0.00	0.00	99.21	99.21

Phi 5	Phi 16	Phi 25	Phi 50	Phi 75	Phi 84	Phi 95
2.49	2.24	2.03	1.46	0.28	-0.30	-1.30
Moment	Mean Phi	Mean mm	Sorting	Skewness	Kurtosis	
Statistics	1.07	0.48	1.22	-0.95	3.36	

GRANULARMETRIC REPORT DUCK_2013_BEACH_SAMPLES.GPJ JPBRAZIL.GDT 8/21/15

Granularmetric Report

Depths and elevations based on measured values



CB&I
Coastal Planning & Engineering, Inc.
2481 NW Boca Raton Blvd.
Boca Raton, FL 33431
ph (561) 391 8102

Project Name: Town of Duck, NC

Sample Name: #14 MTL Composite

Analysis Date: 12-09-13

Analyzed By: TM

Easting (ft): Northing (ft):

Coordinate System:

Elevation (ft):

North Carolina State Plane

0.0 NAVD 88

USCS: SW	Munsell: Wet - 0-5/0 Dry - 0-6/0 Washed - 0-0/0	Comments: COMPOSITE
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Dry Weight (g): 100.00	Wash Weight (g): 100.00	Pan Retained (g): 0.76	Sieve Loss (%): 0.04	Fines (%): #200 - 0.81 #230 - 0.80	Organics (%):	Carbonates (%):	Shell Hash (%):
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Sieve Number	Sieve Size (Phi)	Sieve Size (Millimeters)	Grams Retained	% Weight Retained	Cum. Grams Retained	C. % Weight Retained
3/4"	-4.25	19.03	0.00	0.00	0.00	0.00
5/8"	-4.00	16.00	0.00	0.00	0.00	0.00
7/16"	-3.50	11.31	0.00	0.00	0.00	0.00
5/16"	-3.00	8.00	1.71	1.71	1.71	1.71
3.5	-2.50	5.66	5.01	5.01	6.72	6.72
4	-2.25	4.76	1.46	1.46	8.18	8.18
5	-2.00	4.00	2.21	2.21	10.39	10.39
7	-1.50	2.83	4.89	4.89	15.28	15.28
10	-1.00	2.00	6.56	6.56	21.84	21.84
14	-0.50	1.41	8.89	8.89	30.73	30.73
18	0.00	1.00	7.40	7.40	38.13	38.13
25	0.50	0.71	6.54	6.54	44.67	44.67
35	1.00	0.50	5.56	5.56	50.23	50.23
45	1.50	0.35	6.50	6.50	56.73	56.73
60	2.00	0.25	13.18	13.18	69.91	69.91
80	2.50	0.18	22.82	22.82	92.73	92.73
120	3.00	0.13	6.29	6.29	99.02	99.02
170	3.50	0.09	0.16	0.16	99.18	99.18
200	3.75	0.07	0.01	0.01	99.19	99.19
230	4.00	0.06	0.01	0.01	99.20	99.20

Phi 5	Phi 16	Phi 25	Phi 50	Phi 75	Phi 84	Phi 95
2.68	2.31	2.11	0.98	-0.82	-1.45	-2.67
Moment	Mean Phi	Mean mm	Sorting	Skewness	Kurtosis	
Statistics	0.54	0.69	1.72	-0.5	2.02	

GRANULARMETRIC REPORT DUCK_2013_BEACH_SAMPLES.GPJ JPBRAZIL.GDT 8/21/15

Granularmetric Report

Depths and elevations based on measured values



CB&I
Coastal Planning & Engineering, Inc.
2481 NW Boca Raton Blvd.
Boca Raton, FL 33431
ph (561) 391 8102

Project Name: Town of Duck, NC

Sample Name: #15 MLW Composite

Analysis Date: 08-18-15

Analyzed By: TM

Easting (ft): Northing (ft):

Coordinate System: Elevation (ft):

North Carolina State Plane

0.0 NAVD 88

USCS: SW	Munsell: Wet - 0-5/0 Dry - 0-6/0 Washed - 0-0/0	Comments: COMPOSITE
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Dry Weight (g): 100.00	Wash Weight (g): 100.00	Pan Retained (g): 0.58	Sieve Loss (%): 0.06	Fines (%): #200 - 0.64 #230 - 0.64	Organics (%):	Carbonates (%):	Shell Hash (%):
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Sieve Number	Sieve Size (Phi)	Sieve Size (Millimeters)	Grams Retained	% Weight Retained	Cum. Grams Retained	C. % Weight Retained
3/4"	-4.25	19.03	0.00	0.00	0.00	0.00
5/8"	-4.00	16.00	0.00	0.00	0.00	0.00
7/16"	-3.50	11.31	0.88	0.88	0.88	0.88
5/16"	-3.00	8.00	2.98	2.98	3.86	3.86
3.5	-2.50	5.66	8.27	8.27	12.13	12.13
4	-2.25	4.76	2.42	2.42	14.55	14.55
5	-2.00	4.00	3.29	3.29	17.84	17.84
7	-1.50	2.83	6.62	6.62	24.46	24.46
10	-1.00	2.00	7.53	7.53	31.99	31.99
14	-0.50	1.41	8.81	8.81	40.80	40.80
18	0.00	1.00	7.90	7.90	48.70	48.70
25	0.50	0.71	6.89	6.89	55.59	55.59
35	1.00	0.50	5.78	5.78	61.37	61.37
45	1.50	0.35	5.98	5.98	67.35	67.35
60	2.00	0.25	11.03	11.03	78.38	78.38
80	2.50	0.18	16.39	16.39	94.77	94.77
120	3.00	0.13	4.46	4.46	99.23	99.23
170	3.50	0.09	0.11	0.11	99.34	99.34
200	3.75	0.07	0.02	0.02	99.36	99.36
230	4.00	0.06	0.00	0.00	99.36	99.36

Phi 5	Phi 16	Phi 25	Phi 50	Phi 75	Phi 84	Phi 95
2.53	2.17	1.85	0.09	-1.46	-2.14	-2.93
Moment	Mean Phi	Mean mm	Sorting	Skewness	Kurtosis	
Statistics	0.04	0.97	1.84	-0.2	1.78	

GRANULARMETRIC REPORT DUCK_2013_BEACH_SAMPLES.GPJ JPBRAZIL.GDT 8/21/15

Granularmetric Report

Depths and elevations based on measured values



CB&I
Coastal Planning & Engineering, Inc.
2481 NW Boca Raton Blvd.
Boca Raton, FL 33431
ph (561) 391 8102

Project Name: Town of Duck, NC

Sample Name: #16 Trough Composite

Analysis Date: 08-18-15

Analyzed By: TM

Easting (ft): Northing (ft):

Coordinate System: Elevation (ft):

North Carolina State Plane

0.0 NAVD 88

USCS: **SP** Munsell: Wet - 0-5/0 Dry - 0-6/0 Washed - 0-0/0 Comments: **COMPOSITE**

Dry Weight (g): 100.00 Wash Weight (g): 100.00 Pan Retained (g): 1.07 Sieve Loss (%): 0.05 Fines (%): #200 - 1.17 #230 - 1.12 Organics (%): Carbonates (%): Shell Hash (%):

Sieve Number	Sieve Size (Phi)	Sieve Size (Millimeters)	Grams Retained	% Weight Retained	Cum. Grams Retained	C. % Weight Retained
3/4"	-4.25	19.03	0.00	0.00	0.00	0.00
5/8"	-4.00	16.00	0.00	0.00	0.00	0.00
7/16"	-3.50	11.31	0.00	0.00	0.00	0.00
5/16"	-3.00	8.00	0.00	0.00	0.00	0.00
3.5	-2.50	5.66	0.00	0.00	0.00	0.00
4	-2.25	4.76	0.00	0.00	0.00	0.00
5	-2.00	4.00	0.07	0.07	0.07	0.07
7	-1.50	2.83	0.12	0.12	0.19	0.19
10	-1.00	2.00	0.32	0.32	0.51	0.51
14	-0.50	1.41	0.74	0.74	1.25	1.25
18	0.00	1.00	0.95	0.95	2.20	2.20
25	0.50	0.71	1.01	1.01	3.21	3.21
35	1.00	0.50	1.35	1.35	4.56	4.56
45	1.50	0.35	4.07	4.07	8.63	8.63
60	2.00	0.25	14.30	14.30	22.93	22.93
80	2.50	0.18	40.54	40.54	63.47	63.47
120	3.00	0.13	31.77	31.77	95.24	95.24
170	3.50	0.09	3.39	3.39	98.63	98.63
200	3.75	0.07	0.20	0.20	98.83	98.83
230	4.00	0.06	0.05	0.05	98.88	98.88

Moment Statistics	Mean Phi	Mean mm	Sorting	Skewness	Kurtosis
	2.23	0.21	0.68	-2.19	10.6

GRANULARMETRIC REPORT DUCK_2013_BEACH_SAMPLES.GPJ JPBRAZIL.GDT 8/21/15

Granularmetric Report

Depths and elevations based on measured values



CB&I
Coastal Planning & Engineering, Inc.
2481 NW Boca Raton Blvd.
Boca Raton, FL 33431
ph (561) 391 8102

Project Name: Town of Duck, NC

Sample Name: #17BarCrestComposite

Analysis Date: 08-18-15

Analyzed By: TM

Easting (ft): Northing (ft):

Coordinate System:

Elevation (ft):

North Carolina State Plane

0.0 NAVD 88

USCS: **SP** Munsell: **Wet - 0-5/0
Dry - 0-6/0
Washed - 0-0/0** Comments: **COMPOSITE**

Dry Weight (g): **100.00** Wash Weight (g): **100.00** Pan Retained (g): **1.02** Sieve Loss (%): **0.02** Fines (%): **#200 - 1.07
#230 - 1.04** Organics (%): Carbonates (%): Shell Hash (%):

Sieve Number	Sieve Size (Phi)	Sieve Size (Millimeters)	Grams Retained	% Weight Retained	Cum. Grams Retained	C. % Weight Retained
3/4"	-4.25	19.03	0.00	0.00	0.00	0.00
5/8"	-4.00	16.00	0.00	0.00	0.00	0.00
7/16"	-3.50	11.31	0.00	0.00	0.00	0.00
5/16"	-3.00	8.00	0.00	0.00	0.00	0.00
3.5	-2.50	5.66	0.00	0.00	0.00	0.00
4	-2.25	4.76	0.00	0.00	0.00	0.00
5	-2.00	4.00	0.04	0.04	0.04	0.04
7	-1.50	2.83	0.02	0.02	0.06	0.06
10	-1.00	2.00	0.15	0.15	0.21	0.21
14	-0.50	1.41	0.31	0.31	0.52	0.52
18	0.00	1.00	0.48	0.48	1.00	1.00
25	0.50	0.71	0.76	0.76	1.76	1.76
35	1.00	0.50	2.02	2.02	3.78	3.78
45	1.50	0.35	5.80	5.80	9.58	9.58
60	2.00	0.25	17.06	17.06	26.64	26.64
80	2.50	0.18	39.79	39.79	66.43	66.43
120	3.00	0.13	28.56	28.56	94.99	94.99
170	3.50	0.09	3.72	3.72	98.71	98.71
200	3.75	0.07	0.22	0.22	98.93	98.93
230	4.00	0.06	0.03	0.03	98.96	98.96

Moment Statistics	Mean Phi	Mean mm	Sorting	Skewness	Kurtosis
	3.00	2.65	2.29	1.95	1.11
	2.22	0.21	0.62	-1.55	8.17

GRANULARMETRIC REPORT DUCK_2013_BEACH_SAMPLES.GPJ JPBRAZIL.GDT 8/21/15

Granularmetric Report

Depths and elevations based on measured values



CB&I
Coastal Planning & Engineering, Inc.
2481 NW Boca Raton Blvd.
Boca Raton, FL 33431
ph (561) 391 8102

Project Name: Town of Duck, NC

Sample Name: #18 (-12.5) Composite

Analysis Date: 08-18-15

Analyzed By: TM

Easting (ft): Northing (ft):

Coordinate System:

Elevation (ft):

North Carolina State Plane

0.0 NAVD 88

USCS: SP	Munsell: Wet - 0-5/0 Dry - 0-6/0 Washed - 0-0/0	Comments: COMPOSITE
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Dry Weight (g): 100.00	Wash Weight (g): 100.00	Pan Retained (g): 1.20	Sieve Loss (%): 0.06	Fines (%): #200 - 1.40 #230 - 1.26	Organics (%):	Carbonates (%):	Shell Hash (%):
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Sieve Number	Sieve Size (Phi)	Sieve Size (Millimeters)	Grams Retained	% Weight Retained	Cum. Grams Retained	C. % Weight Retained
3/4"	-4.25	19.03	0.00	0.00	0.00	0.00
5/8"	-4.00	16.00	0.00	0.00	0.00	0.00
7/16"	-3.50	11.31	0.00	0.00	0.00	0.00
5/16"	-3.00	8.00	0.00	0.00	0.00	0.00
3.5	-2.50	5.66	0.05	0.05	0.05	0.05
4	-2.25	4.76	0.05	0.05	0.10	0.10
5	-2.00	4.00	0.00	0.00	0.10	0.10
7	-1.50	2.83	0.26	0.26	0.36	0.36
10	-1.00	2.00	0.61	0.61	0.97	0.97
14	-0.50	1.41	0.81	0.81	1.78	1.78
18	0.00	1.00	0.73	0.73	2.51	2.51
25	0.50	0.71	0.65	0.65	3.16	3.16
35	1.00	0.50	1.18	1.18	4.34	4.34
45	1.50	0.35	3.23	3.23	7.57	7.57
60	2.00	0.25	8.85	8.85	16.42	16.42
80	2.50	0.18	33.93	33.93	50.35	50.35
120	3.00	0.13	40.99	40.99	91.34	91.34
170	3.50	0.09	6.72	6.72	98.06	98.06
200	3.75	0.07	0.54	0.54	98.60	98.60
230	4.00	0.06	0.14	0.14	98.74	98.74

Phi 5	Phi 16	Phi 25	Phi 50	Phi 75	Phi 84	Phi 95
3.27	2.91	2.80	2.49	2.13	1.98	1.10
Moment Statistics	Mean Phi	Mean mm	Sorting	Skewness	Kurtosis	
	2.35	0.20	0.74	-2.58	12.74	

GRANULARMETRIC REPORT DUCK_2013_BEACH_SAMPLES.GPJ JPBRAZIL.GDT 8/21/15

Granularmetric Report

Depths and elevations based on measured values



CB&I
Coastal Planning & Engineering, Inc.
2481 NW Boca Raton Blvd.
Boca Raton, FL 33431
ph (561) 391 8102

Project Name: Town of Duck, NC

Sample Name: #19 (-15.0) Composite

Analysis Date: 08-18-15

Analyzed By: TM

Easting (ft): Northing (ft):

Coordinate System:

Elevation (ft):

North Carolina State Plane

0.0 NAVD 88

USCS: SW	Munsell: Wet - 0-5/0 Dry - 0-6/0 Washed - 0-0/0	Comments: COMPOSITE
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Dry Weight (g): 100.00	Wash Weight (g): 100.00	Pan Retained (g): 0.94	Sieve Loss (%): 0.05	Fines (%): #200 - 1.08 #230 - 0.99	Organics (%):	Carbonates (%):	Shell Hash (%):
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Sieve Number	Sieve Size (Phi)	Sieve Size (Millimeters)	Grams Retained	% Weight Retained	Cum. Grams Retained	C. % Weight Retained
3/4"	-4.25	19.03	0.00	0.00	0.00	0.00
5/8"	-4.00	16.00	0.00	0.00	0.00	0.00
7/16"	-3.50	11.31	0.00	0.00	0.00	0.00
5/16"	-3.00	8.00	0.14	0.14	0.14	0.14
3.5	-2.50	5.66	0.48	0.48	0.62	0.62
4	-2.25	4.76	0.15	0.15	0.77	0.77
5	-2.00	4.00	0.22	0.22	0.99	0.99
7	-1.50	2.83	0.76	0.76	1.75	1.75
10	-1.00	2.00	1.24	1.24	2.99	2.99
14	-0.50	1.41	2.03	2.03	5.02	5.02
18	0.00	1.00	2.63	2.63	7.65	7.65
25	0.50	0.71	3.75	3.75	11.40	11.40
35	1.00	0.50	6.02	6.02	17.42	17.42
45	1.50	0.35	9.59	9.59	27.01	27.01
60	2.00	0.25	16.46	16.46	43.47	43.47
80	2.50	0.18	29.07	29.07	72.54	72.54
120	3.00	0.13	22.33	22.33	94.87	94.87
170	3.50	0.09	3.67	3.67	98.54	98.54
200	3.75	0.07	0.38	0.38	98.92	98.92
230	4.00	0.06	0.09	0.09	99.01	99.01

Phi 5	Phi 16	Phi 25	Phi 50	Phi 75	Phi 84	Phi 95
3.02	2.76	2.56	2.11	1.40	0.88	-0.50
Moment	Mean Phi	Mean mm	Sorting	Skewness	Kurtosis	
Statistics	1.81	0.29	1.1	-1.55	5.84	

GRANULARMETRIC REPORT DUCK_2013_BEACH_SAMPLES.GPJ JPBRAZIL.GDT 8/21/15

Granularmetric Report

Depths and elevations based on measured values



CB&I
Coastal Planning & Engineering, Inc.
2481 NW Boca Raton Blvd.
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ph (561) 391 8102

Project Name: Town of Duck, NC

Sample Name: #20 (-17.5) Composite

Analysis Date: 08-18-15

Analyzed By: TM

Easting (ft): Northing (ft):

Coordinate System:

Elevation (ft):

North Carolina State Plane

0.0 NAVD 88

USCS: SW	Munsell: Wet - 0-4/0 Dry - 0-6/0 Washed - 0-0/0	Comments: COMPOSITE
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Dry Weight (g): 100.00	Wash Weight (g): 100.00	Pan Retained (g): 0.92	Sieve Loss (%): 0.07	Fines (%): #200 - 1.08 #230 - 0.99	Organics (%):	Carbonates (%):	Shell Hash (%):
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Sieve Number	Sieve Size (Phi)	Sieve Size (Millimeters)	Grams Retained	% Weight Retained	Cum. Grams Retained	C. % Weight Retained
3/4"	-4.25	19.03	0.00	0.00	0.00	0.00
5/8"	-4.00	16.00	0.00	0.00	0.00	0.00
7/16"	-3.50	11.31	0.20	0.20	0.20	0.20
5/16"	-3.00	8.00	1.18	1.18	1.38	1.38
3.5	-2.50	5.66	2.97	2.97	4.35	4.35
4	-2.25	4.76	0.65	0.65	5.00	5.00
5	-2.00	4.00	0.96	0.96	5.96	5.96
7	-1.50	2.83	1.60	1.60	7.56	7.56
10	-1.00	2.00	1.66	1.66	9.22	9.22
14	-0.50	1.41	2.50	2.50	11.72	11.72
18	0.00	1.00	2.77	2.77	14.49	14.49
25	0.50	0.71	3.09	3.09	17.58	17.58
35	1.00	0.50	4.74	4.74	22.32	22.32
45	1.50	0.35	8.59	8.59	30.91	30.91
60	2.00	0.25	16.40	16.40	47.31	47.31
80	2.50	0.18	28.29	28.29	75.60	75.60
120	3.00	0.13	19.83	19.83	95.43	95.43
170	3.50	0.09	3.13	3.13	98.56	98.56
200	3.75	0.07	0.36	0.36	98.92	98.92
230	4.00	0.06	0.09	0.09	99.01	99.01

Phi 5	Phi 16	Phi 25	Phi 50	Phi 75	Phi 84	Phi 95
2.99	2.71	2.49	2.05	1.16	0.24	-2.25
Moment	Mean Phi	Mean mm	Sorting	Skewness	Kurtosis	
Statistics	1.51	0.35	1.51	-1.59	4.9	

GRANULARMETRIC REPORT DUCK_2013_BEACH_SAMPLES.GPJ JPBRAZIL.GDT 8/21/15

Granularmetric Report

Depths and elevations based on measured values



CB&I
Coastal Planning & Engineering, Inc.
2481 NW Boca Raton Blvd.
Boca Raton, FL 33431
ph (561) 391 8102

Project Name: Town of Duck, NC

Sample Name: #21 (-20.0) Composite

Analysis Date: 08-18-15

Analyzed By: TM

Easting (ft): Northing (ft):

Coordinate System: Elevation (ft):

North Carolina State Plane

0.0 NAVD 88

USCS: SP	Munsell: Wet - 0-4/0 Dry - 0-5/0 Washed - 0-0/0	Comments: COMPOSITE
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Dry Weight (g): 100.00	Wash Weight (g): 100.00	Pan Retained (g): 1.64	Sieve Loss (%): 0.02	Fines (%): #200 - 2.06 #230 - 1.66	Organics (%):	Carbonates (%):	Shell Hash (%):
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Sieve Number	Sieve Size (Phi)	Sieve Size (Millimeters)	Grams Retained	% Weight Retained	Cum. Grams Retained	C. % Weight Retained
3/4"	-4.25	19.03	0.00	0.00	0.00	0.00
5/8"	-4.00	16.00	0.00	0.00	0.00	0.00
7/16"	-3.50	11.31	0.00	0.00	0.00	0.00
5/16"	-3.00	8.00	0.26	0.26	0.26	0.26
3.5	-2.50	5.66	0.11	0.11	0.37	0.37
4	-2.25	4.76	0.15	0.15	0.52	0.52
5	-2.00	4.00	0.07	0.07	0.59	0.59
7	-1.50	2.83	0.15	0.15	0.74	0.74
10	-1.00	2.00	0.09	0.09	0.83	0.83
14	-0.50	1.41	0.05	0.05	0.88	0.88
18	0.00	1.00	0.03	0.03	0.91	0.91
25	0.50	0.71	0.14	0.14	1.05	1.05
35	1.00	0.50	0.23	0.23	1.28	1.28
45	1.50	0.35	0.34	0.34	1.62	1.62
60	2.00	0.25	2.48	2.48	4.10	4.10
80	2.50	0.18	26.54	26.54	30.64	30.64
120	3.00	0.13	52.72	52.72	83.36	83.36
170	3.50	0.09	13.09	13.09	96.45	96.45
200	3.75	0.07	1.49	1.49	97.94	97.94
230	4.00	0.06	0.40	0.40	98.34	98.34

Phi 5	Phi 16	Phi 25	Phi 50	Phi 75	Phi 84	Phi 95
3.44	3.02	2.92	2.68	2.39	2.22	2.02
Moment	Mean Phi	Mean mm	Sorting	Skewness	Kurtosis	
Statistics	2.61	0.16	0.63	-4.87	41.58	

GRANULARMETRIC REPORT DUCK_2013_BEACH_SAMPLES.GPJ JPBRAZIL.GDT 8/21/15

Granularmetric Report

Depths and elevations based on measured values



CB&I
Coastal Planning & Engineering, Inc.
2481 NW Boca Raton Blvd.
Boca Raton, FL 33431
ph (561) 391 8102

Project Name: Town of Duck, NC

Sample Name: #22TotalBeachComposite

Analysis Date: 08-18-15

Analyzed By: TM

Easting (ft):

Northing (ft):

Coordinate System:

Elevation (ft):

North Carolina State Plane

0.0 NAVD 88

USCS:

SW

Munsell:

Comments:

Average Dry Munsell Value is 5, Average Dry Munsell Value is 6

Dry Weight (g): 100.00	Wash Weight (g): 100.00	Pan Retained (g): 0.96	Sieve Loss (%): 0.05	Fines (%): #200 - 1.10 #230 - 1.01	Organics (%):	Carbonates (%): 2	Shell Hash (%)
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Sieve Number	Sieve Size (Phi)	Sieve Size (Millimeters)	Grams Retained	% Weight Retained	Cum. Grams Retained	C. % Weight Retained
3/4"	-4.25	19.03	0.00	0.00	0.00	0.00
5/8"	-4.00	16.00	0.00	0.00	0.00	0.00
7/16"	-3.50	11.31	0.08	0.08	0.08	0.08
5/16"	-3.00	8.00	0.41	0.41	0.49	0.49
3.5	-2.50	5.66	1.14	1.14	1.63	1.63
4	-2.25	4.76	0.37	0.37	2.00	2.00
5	-2.00	4.00	0.56	0.56	2.56	2.56
7	-1.50	2.83	1.34	1.34	3.90	3.90
10	-1.00	2.00	1.99	1.99	5.89	5.89
14	-0.50	1.41	3.30	3.30	9.19	9.19
18	0.00	1.00	3.84	3.84	13.03	13.03
25	0.50	0.71	4.53	4.53	17.56	17.56
35	1.00	0.50	6.09	6.09	23.65	23.65
45	1.50	0.35	9.61	9.61	33.26	33.26
60	2.00	0.25	16.35	16.35	49.61	49.61
80	2.50	0.18	25.78	25.78	75.39	75.39
120	3.00	0.13	19.85	19.85	95.24	95.24
170	3.50	0.09	3.32	3.32	98.56	98.56
200	3.75	0.07	0.34	0.34	98.90	98.90
230	4.00	0.06	0.09	0.09	98.99	98.99

Phi 5	Phi 16	Phi 25	Phi 50	Phi 75	Phi 84	Phi 95
2.99	2.72	2.49	2.01	1.07	0.33	-1.22
Moment	Mean Phi	Mean mm	Sorting	Skewness	Kurtosis	
Statistics	1.58	0.33	1.32	-1.4	4.72	

GRANULARMETRIC REPORT DUCK_2013_BEACH_SAMPLES.GPJ JPBRAZIL.GDT 8/21/15

Granularmetric Report

Depths and elevations based on measured values



CB&I
 Coastal Planning & Engineering, Inc.
 2481 NW Boca Raton Blvd.
 Boca Raton, FL 33431
 ph (561) 391 8102

Project Name: Kitty Hawk, NC

Sample Name: 01 KH0+00Composite

Analysis Date: 08-21-15

Analyzed By: TM

Easting (ft):

Northing (ft):

Coordinate System:

Elevation (ft):

North Carolina State Plane

0.0 NAVD 88

USCS: **SW** Munsell: Comments: **Average Wet Munsell Value is 5, Average Dry Munsell Value is 6**

Dry Weight (g): 100.00	Wash Weight (g): 100.00	Pan Retained (g): 0.87	Sieve Loss (%): 0.06	Fines (%): #200 - 0.96 #230 - 0.93	Organics (%):	Carbonates (%): 2	Shell Hash (%):
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Sieve Number	Sieve Size (Phi)	Sieve Size (Millimeters)	Grams Retained	% Weight Retained	Cum. Grams Retained	C. % Weight Retained
3/4"	-4.25	19.03	0.00	0.00	0.00	0.00
5/8"	-4.00	16.00	0.00	0.00	0.00	0.00
7/16"	-3.50	11.31	0.00	0.00	0.00	0.00
5/16"	-3.00	8.00	0.00	0.00	0.00	0.00
3.5	-2.50	5.66	0.11	0.11	0.11	0.11
4	-2.25	4.76	0.17	0.17	0.28	0.28
5	-2.00	4.00	0.50	0.50	0.78	0.78
7	-1.50	2.83	1.68	1.68	2.46	2.46
10	-1.00	2.00	3.00	3.00	5.46	5.46
14	-0.50	1.41	4.18	4.18	9.64	9.64
18	0.00	1.00	5.63	5.63	15.27	15.27
25	0.50	0.71	9.20	9.20	24.47	24.47
35	1.00	0.50	10.62	10.62	35.09	35.09
45	1.50	0.35	9.19	9.19	44.28	44.28
60	2.00	0.25	13.10	13.10	57.38	57.38
80	2.50	0.18	22.82	22.82	80.20	80.20
120	3.00	0.13	16.77	16.77	96.97	96.97
170	3.50	0.09	1.92	1.92	98.89	98.89
200	3.75	0.07	0.15	0.15	99.04	99.04
230	4.00	0.06	0.03	0.03	99.07	99.07

Phi 5	Phi 16	Phi 25	Phi 50	Phi 75	Phi 84	Phi 95
2.94	2.61	2.39	1.72	0.52	0.04	-1.08
Moment	Mean Phi	Mean mm	Sorting	Skewness	Kurtosis	
Statistics	1.37	0.39	1.25	-0.76	2.79	

GRANULARMETRIC REPORT KH_NATIVESS_2014_NAVD.GPJ_JPBRAZIL.GDT 8/21/15

Granularmetric Report

Depths and elevations based on measured values



CB&I
Coastal Planning & Engineering, Inc.
2481 NW Boca Raton Blvd.
Boca Raton, FL 33431
ph (561) 391 8102

Project Name: Kitty Hawk, NC

Sample Name: 02 KH50+00Composite

Analysis Date: 08-21-15

Analyzed By: TM

Easting (ft):

Northing (ft):

Coordinate System:

Elevation (ft):

North Carolina State Plane

0.0 NAVD 88

USCS:

SW

Munsell:

Comments:

Average Wet Munsell Value is 5, Average Dry Munsell Value is 7

Dry Weight (g): 100.00	Wash Weight (g): 100.00	Pan Retained (g): 0.86	Sieve Loss (%): 0.04	Fines (%): #200 - 0.97 #230 - 0.90	Organics (%):	Carbonates (%): 2	Shell Hash (%):
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Sieve Number	Sieve Size (Phi)	Sieve Size (Millimeters)	Grams Retained	% Weight Retained	Cum. Grams Retained	C. % Weight Retained
3/4"	-4.25	19.03	0.00	0.00	0.00	0.00
5/8"	-4.00	16.00	0.00	0.00	0.00	0.00
7/16"	-3.50	11.31	0.00	0.00	0.00	0.00
5/16"	-3.00	8.00	0.18	0.18	0.18	0.18
3.5	-2.50	5.66	2.40	2.40	2.58	2.58
4	-2.25	4.76	1.03	1.03	3.61	3.61
5	-2.00	4.00	1.74	1.74	5.35	5.35
7	-1.50	2.83	2.63	2.63	7.98	7.98
10	-1.00	2.00	2.69	2.69	10.67	10.67
14	-0.50	1.41	3.76	3.76	14.43	14.43
18	0.00	1.00	4.70	4.70	19.13	19.13
25	0.50	0.71	6.10	6.10	25.23	25.23
35	1.00	0.50	7.04	7.04	32.27	32.27
45	1.50	0.35	6.71	6.71	38.98	38.98
60	2.00	0.25	13.50	13.50	52.48	52.48
80	2.50	0.18	25.90	25.90	78.38	78.38
120	3.00	0.13	18.10	18.10	96.48	96.48
170	3.50	0.09	2.33	2.33	98.81	98.81
200	3.75	0.07	0.22	0.22	99.03	99.03
230	4.00	0.06	0.07	0.07	99.10	99.10

Phi 5	Phi 16	Phi 25	Phi 50	Phi 75	Phi 84	Phi 95
2.96	2.66	2.43	1.91	0.48	-0.33	-2.05
Moment	Mean Phi	Mean mm	Sorting	Skewness	Kurtosis	
Statistics	1.31	0.40	1.52	-1.1	3.3	

GRANULARMETRIC REPORT KH_NATIVESS_2014_NAVD.GPJ_JPBRAZIL.GDT 8/21/15

Granularmetric Report

Depths and elevations based on measured values



CB&I
Coastal Planning & Engineering, Inc.
2481 NW Boca Raton Blvd.
Boca Raton, FL 33431
ph (561) 391 8102

Project Name: Kitty Hawk, NC

Sample Name: 03 KH75+00Composite

Analysis Date: 08-20-15

Analyzed By: TM

Easting (ft):

Northing (ft):

Coordinate System:

Elevation (ft):

North Carolina State Plane

0.0 NAVD 88

USCS:

SW

Munsell:

Comments:

Average Wet Munsell Value is 5, Average Dry Munsell Value is 7

Dry Weight (g): 100.00	Wash Weight (g): 100.00	Pan Retained (g): 0.92	Sieve Loss (%): 0.06	Fines (%): #200 - 1.05 #230 - 0.98	Organics (%):	Carbonates (%): 3	Shell Hash (%):
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Sieve Number	Sieve Size (Phi)	Sieve Size (Millimeters)	Grams Retained	% Weight Retained	Cum. Grams Retained	C. % Weight Retained
3/4"	-4.25	19.03	0.00	0.00	0.00	0.00
5/8"	-4.00	16.00	0.00	0.00	0.00	0.00
7/16"	-3.50	11.31	0.00	0.00	0.00	0.00
5/16"	-3.00	8.00	0.23	0.23	0.23	0.23
3.5	-2.50	5.66	0.95	0.95	1.18	1.18
4	-2.25	4.76	0.81	0.81	1.99	1.99
5	-2.00	4.00	1.65	1.65	3.64	3.64
7	-1.50	2.83	3.47	3.47	7.11	7.11
10	-1.00	2.00	3.60	3.60	10.71	10.71
14	-0.50	1.41	5.35	5.35	16.06	16.06
18	0.00	1.00	7.30	7.30	23.36	23.36
25	0.50	0.71	7.83	7.83	31.19	31.19
35	1.00	0.50	8.62	8.62	39.81	39.81
45	1.50	0.35	5.90	5.90	45.71	45.71
60	2.00	0.25	13.40	13.40	59.11	59.11
80	2.50	0.18	19.34	19.34	78.45	78.45
120	3.00	0.13	17.33	17.33	95.78	95.78
170	3.50	0.09	2.88	2.88	98.66	98.66
200	3.75	0.07	0.29	0.29	98.95	98.95
230	4.00	0.06	0.07	0.07	99.02	99.02

Phi 5	Phi 16	Phi 25	Phi 50	Phi 75	Phi 84	Phi 95
2.98	2.66	2.41	1.66	0.10	-0.51	-1.80
Moment	Mean Phi	Mean mm	Sorting	Skewness	Kurtosis	
Statistics	1.17	0.44	1.51	-0.73	2.58	

GRANULARMETRIC REPORT KH_NATIVESS_2014_NAVD.GPJ_JPBRAZIL.GDT 8/21/15

Granularmetric Report

Depths and elevations based on measured values



CB&I
Coastal Planning & Engineering, Inc.
2481 NW Boca Raton Blvd.
Boca Raton, FL 33431
ph (561) 391 8102

Project Name: Kitty Hawk, NC

Sample Name: 04 KH110+00Composite

Analysis Date: 08-21-15

Analyzed By: TM

Easting (ft):

Northing (ft):

Coordinate System:

Elevation (ft):

North Carolina State Plane

0.0 NAVD 88

USCS:

SW

Munsell:

Comments:

Average Wet Munsell Value is 5, Average Dry Munsell Value is 7

Dry Weight (g): 100.00	Wash Weight (g): 100.00	Pan Retained (g): 0.84	Sieve Loss (%): 0.04	Fines (%): #200 - 0.93 #230 - 0.88	Organics (%):	Carbonates (%): 2	Shell Hash (%)
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Sieve Number	Sieve Size (Phi)	Sieve Size (Millimeters)	Grams Retained	% Weight Retained	Cum. Grams Retained	C. % Weight Retained
3/4"	-4.25	19.03	0.00	0.00	0.00	0.00
5/8"	-4.00	16.00	0.00	0.00	0.00	0.00
7/16"	-3.50	11.31	0.23	0.23	0.23	0.23
5/16"	-3.00	8.00	0.24	0.24	0.47	0.47
3.5	-2.50	5.66	0.51	0.51	0.98	0.98
4	-2.25	4.76	0.49	0.49	1.47	1.47
5	-2.00	4.00	0.73	0.73	2.20	2.20
7	-1.50	2.83	2.65	2.65	4.85	4.85
10	-1.00	2.00	4.65	4.65	9.50	9.50
14	-0.50	1.41	5.70	5.70	15.20	15.20
18	0.00	1.00	6.00	6.00	21.20	21.20
25	0.50	0.71	4.90	4.90	26.10	26.10
35	1.00	0.50	4.25	4.25	30.35	30.35
45	1.50	0.35	5.31	5.31	35.66	35.66
60	2.00	0.25	13.23	13.23	48.89	48.89
80	2.50	0.18	28.61	28.61	77.50	77.50
120	3.00	0.13	18.64	18.64	96.14	96.14
170	3.50	0.09	2.69	2.69	98.83	98.83
200	3.75	0.07	0.24	0.24	99.07	99.07
230	4.00	0.06	0.05	0.05	99.12	99.12

Phi 5	Phi 16	Phi 25	Phi 50	Phi 75	Phi 84	Phi 95
2.97	2.67	2.46	2.02	0.39	-0.43	-1.48
Moment	Mean Phi	Mean mm	Sorting	Skewness	Kurtosis	
Statistics	1.39	0.38	1.47	-1.03	3.07	

GRANULARMETRIC REPORT KH_NATIVESS_2014_NAVD.GPJ_JPBRAZIL.GDT 8/21/15

Granularmetric Report

Depths and elevations based on measured values



CB&I
Coastal Planning & Engineering, Inc.
2481 NW Boca Raton Blvd.
Boca Raton, FL 33431
ph (561) 391 8102

Project Name: Kitty Hawk, NC

Sample Name: 05 KH160+00Composite

Analysis Date: 08-21-15

Analyzed By: TM

Easting (ft):

Northing (ft):

Coordinate System:

Elevation (ft):

North Carolina State Plane

0.0 NAVD 88

USCS:

SW

Munsell:

Comments:

Average Wet Munsell Value is 5, Average Dry Munsell Value is 7

Dry Weight (g): 100.00	Wash Weight (g): 100.00	Pan Retained (g): 0.96	Sieve Loss (%): 0.04	Fines (%): #200 - 1.14 #230 - 1.00	Organics (%):	Carbonates (%): 2	Shell Hash (%):
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Sieve Number	Sieve Size (Phi)	Sieve Size (Millimeters)	Grams Retained	% Weight Retained	Cum. Grams Retained	C. % Weight Retained
3/4"	-4.25	19.03	0.00	0.00	0.00	0.00
5/8"	-4.00	16.00	0.00	0.00	0.00	0.00
7/16"	-3.50	11.31	0.00	0.00	0.00	0.00
5/16"	-3.00	8.00	0.18	0.18	0.18	0.18
3.5	-2.50	5.66	0.46	0.46	0.64	0.64
4	-2.25	4.76	0.20	0.20	0.84	0.84
5	-2.00	4.00	0.37	0.37	1.21	1.21
7	-1.50	2.83	1.01	1.01	2.22	2.22
10	-1.00	2.00	1.54	1.54	3.76	3.76
14	-0.50	1.41	3.18	3.18	6.94	6.94
18	0.00	1.00	5.18	5.18	12.12	12.12
25	0.50	0.71	6.91	6.91	19.03	19.03
35	1.00	0.50	8.37	8.37	27.40	27.40
45	1.50	0.35	7.25	7.25	34.65	34.65
60	2.00	0.25	9.91	9.91	44.56	44.56
80	2.50	0.18	26.49	26.49	71.05	71.05
120	3.00	0.13	23.68	23.68	94.73	94.73
170	3.50	0.09	3.71	3.71	98.44	98.44
200	3.75	0.07	0.42	0.42	98.86	98.86
230	4.00	0.06	0.14	0.14	99.00	99.00

Phi 5	Phi 16	Phi 25	Phi 50	Phi 75	Phi 84	Phi 95
3.04	2.77	2.58	2.10	0.86	0.28	-0.81
Moment Statistics	Mean Phi	Mean mm	Sorting	Skewness	Kurtosis	
	1.64	0.32	1.25	-1.11	3.79	

GRANULARMETRIC REPORT KH_NATIVESS_2014_NAVD.GPJ_JPBRAZIL.GDT 8/21/15

Granularmetric Report

Depths and elevations based on measured values



CB&I
Coastal Planning & Engineering, Inc.
2481 NW Boca Raton Blvd.
Boca Raton, FL 33431
ph (561) 391 8102

Project Name: Kitty Hawk, NC

Sample Name: 06 DuneComposite

Analysis Date: 08-20-15

Analyzed By: TM

Easting (ft):

Northing (ft):

Coordinate System:

Elevation (ft):

North Carolina State Plane

0.0 NAVD 88

USCS:

SW

Munsell:

Comments:

Average Wet Munsell Value is 6, Average Dry Munsell Value is 7

Dry Weight (g): 100.00	Wash Weight (g): 100.00	Pan Retained (g): 0.30	Sieve Loss (%): 0.11	Fines (%): #200 - 0.42 #230 - 0.41	Organics (%):	Carbonates (%):	Shell Hash (%):
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Sieve Number	Sieve Size (Phi)	Sieve Size (Millimeters)	Grams Retained	% Weight Retained	Cum. Grams Retained	C. % Weight Retained
3/4"	-4.25	19.03	0.00	0.00	0.00	0.00
5/8"	-4.00	16.00	0.00	0.00	0.00	0.00
7/16"	-3.50	11.31	0.00	0.00	0.00	0.00
5/16"	-3.00	8.00	0.00	0.00	0.00	0.00
3.5	-2.50	5.66	0.03	0.03	0.03	0.03
4	-2.25	4.76	0.16	0.16	0.19	0.19
5	-2.00	4.00	0.32	0.32	0.51	0.51
7	-1.50	2.83	2.04	2.04	2.55	2.55
10	-1.00	2.00	4.72	4.72	7.27	7.27
14	-0.50	1.41	7.76	7.76	15.03	15.03
18	0.00	1.00	8.80	8.80	23.83	23.83
25	0.50	0.71	12.00	12.00	35.83	35.83
35	1.00	0.50	18.44	18.44	54.27	54.27
45	1.50	0.35	15.38	15.38	69.65	69.65
60	2.00	0.25	19.74	19.74	89.39	89.39
80	2.50	0.18	8.98	8.98	98.37	98.37
120	3.00	0.13	1.08	1.08	99.45	99.45
170	3.50	0.09	0.11	0.11	99.56	99.56
200	3.75	0.07	0.02	0.02	99.58	99.58
230	4.00	0.06	0.01	0.01	99.59	99.59

Phi 5	Phi 16	Phi 25	Phi 50	Phi 75	Phi 84	Phi 95
2.31	1.86	1.64	0.88	0.05	-0.44	-1.24
Moment	Mean Phi	Mean mm	Sorting	Skewness	Kurtosis	
Statistics	0.76	0.59	1.07	-0.49	2.57	

GRANULARMETRIC REPORT KH_NATIVESS_2014_NAVD.GPJ_JPBRAZIL.GDT 8/21/15

Granularmetric Report

Depths and elevations based on measured values



CB&I
Coastal Planning & Engineering, Inc.
2481 NW Boca Raton Blvd.
Boca Raton, FL 33431
ph (561) 391 8102

Project Name: Kitty Hawk, NC

Sample Name: 07 TODComposite

Analysis Date: 08-21-15

Analyzed By: TM

Easting (ft):

Northing (ft):

Coordinate System:

Elevation (ft):

North Carolina State Plane

0.0 NAVD 88

USCS:

SW

Munsell:

Comments:

Average Wet Munsell Value is 5, Average Dry Munsell Value is 6

Dry Weight (g): 100.00	Wash Weight (g): 100.00	Pan Retained (g): 0.30	Sieve Loss (%): 0.08	Fines (%): #200 - 0.38 #230 - 0.38	Organics (%):	Carbonates (%):	Shell Hash (%):
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Sieve Number	Sieve Size (Phi)	Sieve Size (Millimeters)	Grams Retained	% Weight Retained	Cum. Grams Retained	C. % Weight Retained
3/4"	-4.25	19.03	0.00	0.00	0.00	0.00
5/8"	-4.00	16.00	0.00	0.00	0.00	0.00
7/16"	-3.50	11.31	0.00	0.00	0.00	0.00
5/16"	-3.00	8.00	0.00	0.00	0.00	0.00
3.5	-2.50	5.66	0.11	0.11	0.11	0.11
4	-2.25	4.76	0.03	0.03	0.14	0.14
5	-2.00	4.00	0.28	0.28	0.42	0.42
7	-1.50	2.83	1.67	1.67	2.09	2.09
10	-1.00	2.00	6.90	6.90	8.99	8.99
14	-0.50	1.41	12.90	12.90	21.89	21.89
18	0.00	1.00	15.36	15.36	37.25	37.25
25	0.50	0.71	17.51	17.51	54.76	54.76
35	1.00	0.50	17.72	17.72	72.48	72.48
45	1.50	0.35	13.26	13.26	85.74	85.74
60	2.00	0.25	9.44	9.44	95.18	95.18
80	2.50	0.18	3.67	3.67	98.85	98.85
120	3.00	0.13	0.70	0.70	99.55	99.55
170	3.50	0.09	0.06	0.06	99.61	99.61
200	3.75	0.07	0.01	0.01	99.62	99.62
230	4.00	0.06	0.00	0.00	99.62	99.62

Phi 5	Phi 16	Phi 25	Phi 50	Phi 75	Phi 84	Phi 95
1.99	1.43	1.10	0.36	-0.40	-0.73	-1.29
Moment	Mean Phi	Mean mm	Sorting	Skewness	Kurtosis	
Statistics	0.35	0.78	1	0	2.45	

GRANULARMETRIC REPORT KH_NATIVESS_2014_NAVD.GPJ_JPBRAZIL.GDT 8/21/15

Granularmetric Report

Depths and elevations based on measured values



CB&I
Coastal Planning & Engineering, Inc.
2481 NW Boca Raton Blvd.
Boca Raton, FL 33431
ph (561) 391 8102

Project Name: Kitty Hawk, NC

Sample Name: 08 MidBermComposite

Analysis Date: 08-21-15

Analyzed By: TM

Easting (ft):

Northing (ft):

Coordinate System:

Elevation (ft):

North Carolina State Plane

0.0 NAVD 88

USCS:

SW

Munsell:

Comments:

Average Wet Munsell Value is 7, Average Dry Munsell Value is 7

Dry Weight (g): 100.00	Wash Weight (g): 100.00	Pan Retained (g): 0.43	Sieve Loss (%): 0.04	Fines (%): #200 - 0.47 #230 - 0.47	Organics (%):	Carbonates (%):	Shell Hash (%):
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Sieve Number	Sieve Size (Phi)	Sieve Size (Millimeters)	Grams Retained	% Weight Retained	Cum. Grams Retained	C. % Weight Retained
3/4"	-4.25	19.03	0.00	0.00	0.00	0.00
5/8"	-4.00	16.00	0.00	0.00	0.00	0.00
7/16"	-3.50	11.31	0.00	0.00	0.00	0.00
5/16"	-3.00	8.00	0.00	0.00	0.00	0.00
3.5	-2.50	5.66	0.00	0.00	0.00	0.00
4	-2.25	4.76	0.10	0.10	0.10	0.10
5	-2.00	4.00	0.20	0.20	0.30	0.30
7	-1.50	2.83	1.03	1.03	1.33	1.33
10	-1.00	2.00	2.03	2.03	3.36	3.36
14	-0.50	1.41	5.40	5.40	8.76	8.76
18	0.00	1.00	10.19	10.19	18.95	18.95
25	0.50	0.71	14.93	14.93	33.88	33.88
35	1.00	0.50	15.61	15.61	49.49	49.49
45	1.50	0.35	13.11	13.11	62.60	62.60
60	2.00	0.25	18.42	18.42	81.02	81.02
80	2.50	0.18	14.97	14.97	95.99	95.99
120	3.00	0.13	3.33	3.33	99.32	99.32
170	3.50	0.09	0.19	0.19	99.51	99.51
200	3.75	0.07	0.02	0.02	99.53	99.53
230	4.00	0.06	0.00	0.00	99.53	99.53

Phi 5	Phi 16	Phi 25	Phi 50	Phi 75	Phi 84	Phi 95
2.47	2.10	1.84	1.02	0.20	-0.14	-0.85
Moment	Mean Phi	Mean mm	Sorting	Skewness	Kurtosis	
Statistics	0.96	0.51	1.05	-0.36	2.49	

GRANULARMETRIC REPORT KH_NATIVESS_2014_NAVD.GPJ_JPBRAZIL.GDT 8/21/15

Granularmetric Report

Depths and elevations based on measured values



CB&I
Coastal Planning & Engineering, Inc.
2481 NW Boca Raton Blvd.
Boca Raton, FL 33431
ph (561) 391 8102

Project Name: Kitty Hawk, NC

Sample Name: 09 BermCrestComposite

Analysis Date: 08-21-15

Analyzed By: TM

Easting (ft):

Northing (ft):

Coordinate System:

Elevation (ft):

North Carolina State Plane

0.0 NAVD 88

USCS:

SW

Munsell:

Comments:

Average Wet Munsell Value is 6, Average Dry Munsell Value is 7

Dry Weight (g): 100.00	Wash Weight (g): 100.00	Pan Retained (g): 0.39	Sieve Loss (%): 0.07	Fines (%): #200 - 0.47 #230 - 0.46	Organics (%):	Carbonates (%):	Shell Hash (%):
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Sieve Number	Sieve Size (Phi)	Sieve Size (Millimeters)	Grams Retained	% Weight Retained	Cum. Grams Retained	C. % Weight Retained
3/4"	-4.25	19.03	0.00	0.00	0.00	0.00
5/8"	-4.00	16.00	0.00	0.00	0.00	0.00
7/16"	-3.50	11.31	0.00	0.00	0.00	0.00
5/16"	-3.00	8.00	0.00	0.00	0.00	0.00
3.5	-2.50	5.66	0.00	0.00	0.00	0.00
4	-2.25	4.76	0.00	0.00	0.00	0.00
5	-2.00	4.00	0.08	0.08	0.08	0.08
7	-1.50	2.83	0.23	0.23	0.31	0.31
10	-1.00	2.00	0.56	0.56	0.87	0.87
14	-0.50	1.41	1.84	1.84	2.71	2.71
18	0.00	1.00	5.47	5.47	8.18	8.18
25	0.50	0.71	12.41	12.41	20.59	20.59
35	1.00	0.50	14.26	14.26	34.85	34.85
45	1.50	0.35	13.14	13.14	47.99	47.99
60	2.00	0.25	21.67	21.67	69.66	69.66
80	2.50	0.18	23.61	23.61	93.27	93.27
120	3.00	0.13	6.02	6.02	99.29	99.29
170	3.50	0.09	0.23	0.23	99.52	99.52
200	3.75	0.07	0.01	0.01	99.53	99.53
230	4.00	0.06	0.01	0.01	99.54	99.54

Phi 5	Phi 16	Phi 25	Phi 50	Phi 75	Phi 84	Phi 95
2.64	2.30	2.11	1.55	0.65	0.32	-0.29
Moment	Mean Phi	Mean mm	Sorting	Skewness	Kurtosis	
Statistics	1.35	0.39	0.92	-0.55	2.68	

GRANULARMETRIC REPORT KH_NATIVESS_2014_NAVD.GPJ_JPBRAZIL.GDT 8/21/15

Granularmetric Report

Depths and elevations based on measured values



CB&I
Coastal Planning & Engineering, Inc.
2481 NW Boca Raton Blvd.
Boca Raton, FL 33431
ph (561) 391 8102

Project Name: Kitty Hawk, NC

Sample Name: 10 MHWComposite

Analysis Date: 08-20-15

Analyzed By: TM

Easting (ft):

Northing (ft):

Coordinate System:

Elevation (ft):

North Carolina State Plane

0.0 NAVD 88

USCS:

SW

Munsell:

Comments:

Average Wet Munsell Value is 5, Average Dry Munsell Value is 7

Dry Weight (g): 100.00	Wash Weight (g): 100.00	Pan Retained (g): 0.99	Sieve Loss (%): 0.07	Fines (%): #200 - 1.07 #230 - 1.06	Organics (%):	Carbonates (%):	Shell Hash (%):
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Sieve Number	Sieve Size (Phi)	Sieve Size (Millimeters)	Grams Retained	% Weight Retained	Cum. Grams Retained	C. % Weight Retained
3/4"	-4.25	19.03	0.00	0.00	0.00	0.00
5/8"	-4.00	16.00	0.00	0.00	0.00	0.00
7/16"	-3.50	11.31	0.00	0.00	0.00	0.00
5/16"	-3.00	8.00	0.48	0.48	0.48	0.48
3.5	-2.50	5.66	0.69	0.69	1.17	1.17
4	-2.25	4.76	0.30	0.30	1.47	1.47
5	-2.00	4.00	0.78	0.78	2.25	2.25
7	-1.50	2.83	2.31	2.31	4.56	4.56
10	-1.00	2.00	3.73	3.73	8.29	8.29
14	-0.50	1.41	5.90	5.90	14.19	14.19
18	0.00	1.00	7.64	7.64	21.83	21.83
25	0.50	0.71	6.76	6.76	28.59	28.59
35	1.00	0.50	6.64	6.64	35.23	35.23
45	1.50	0.35	7.00	7.00	42.23	42.23
60	2.00	0.25	21.67	21.67	63.90	63.90
80	2.50	0.18	28.44	28.44	92.34	92.34
120	3.00	0.13	6.20	6.20	98.54	98.54
170	3.50	0.09	0.34	0.34	98.88	98.88
200	3.75	0.07	0.05	0.05	98.93	98.93
230	4.00	0.06	0.01	0.01	98.94	98.94

Phi 5	Phi 16	Phi 25	Phi 50	Phi 75	Phi 84	Phi 95
2.71	2.35	2.20	1.68	0.23	-0.38	-1.44
Moment	Mean Phi	Mean mm	Sorting	Skewness	Kurtosis	
Statistics	1.16	0.45	1.33	-0.99	3.14	

GRANULARMETRIC REPORT KH_NATIVESS_2014_NAVD.GPJ_JPBRAZIL.GDT 8/21/15

Granularmetric Report

Depths and elevations based on measured values



CB&I
Coastal Planning & Engineering, Inc.
2481 NW Boca Raton Blvd.
Boca Raton, FL 33431
ph (561) 391 8102

Project Name: Kitty Hawk, NC

Sample Name: 11 MTLComposite

Analysis Date: 08-21-15

Analyzed By: TM

Easting (ft):

Northing (ft):

Coordinate System:

Elevation (ft):

North Carolina State Plane

0.0 NAVD 88

USCS:

SW

Munsell:

Comments:

Average Wet Munsell Value is 5, Average Dry Munsell Value is 7

Dry Weight (g): 100.00	Wash Weight (g): 100.00	Pan Retained (g): 0.91	Sieve Loss (%): 0.08	Fines (%): #200 - 0.99 #230 - 0.99	Organics (%):	Carbonates (%):	Shell Hash (%):
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Sieve Number	Sieve Size (Phi)	Sieve Size (Millimeters)	Grams Retained	% Weight Retained	Cum. Grams Retained	C. % Weight Retained
3/4"	-4.25	19.03	0.00	0.00	0.00	0.00
5/8"	-4.00	16.00	0.00	0.00	0.00	0.00
7/16"	-3.50	11.31	0.00	0.00	0.00	0.00
5/16"	-3.00	8.00	0.22	0.22	0.22	0.22
3.5	-2.50	5.66	1.12	1.12	1.34	1.34
4	-2.25	4.76	0.52	0.52	1.86	1.86
5	-2.00	4.00	1.39	1.39	3.25	3.25
7	-1.50	2.83	4.92	4.92	8.17	8.17
10	-1.00	2.00	6.65	6.65	14.82	14.82
14	-0.50	1.41	6.66	6.66	21.48	21.48
18	0.00	1.00	6.89	6.89	28.37	28.37
25	0.50	0.71	8.36	8.36	36.73	36.73
35	1.00	0.50	10.83	10.83	47.56	47.56
45	1.50	0.35	8.68	8.68	56.24	56.24
60	2.00	0.25	14.65	14.65	70.89	70.89
80	2.50	0.18	21.49	21.49	92.38	92.38
120	3.00	0.13	6.36	6.36	98.74	98.74
170	3.50	0.09	0.25	0.25	98.99	98.99
200	3.75	0.07	0.02	0.02	99.01	99.01
230	4.00	0.06	0.00	0.00	99.01	99.01

Phi 5	Phi 16	Phi 25	Phi 50	Phi 75	Phi 84	Phi 95
2.71	2.31	2.10	1.14	-0.24	-0.91	-1.82
Moment	Mean Phi	Mean mm	Sorting	Skewness	Kurtosis	
Statistics	0.83	0.56	1.45	-0.59	2.29	

GRANULARMETRIC REPORT KH_NATIVESS_2014_NAVD.GPJ_JPBRAZIL.GDT 8/21/15

Granularmetric Report

Depths and elevations based on measured values



CB&I
Coastal Planning & Engineering, Inc.
2481 NW Boca Raton Blvd.
Boca Raton, FL 33431
ph (561) 391 8102

Project Name: Kitty Hawk, NC

Sample Name: 12 MLWComposite

Analysis Date: 08-21-15

Analyzed By: TM

Easting (ft):

Northing (ft):

Coordinate System:

Elevation (ft):

North Carolina State Plane

0.0 NAVD 88

USCS:

SW

Munsell:

Comments:

Average Wet Munsell Value is 6, Average Dry Munsell Value is 7

Dry Weight (g): 100.00	Wash Weight (g): 100.00	Pan Retained (g): 0.71	Sieve Loss (%): 0.05	Fines (%): #200 - 0.76 #230 - 0.76	Organics (%):	Carbonates (%):	Shell Hash (%):
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Sieve Number	Sieve Size (Phi)	Sieve Size (Millimeters)	Grams Retained	% Weight Retained	Cum. Grams Retained	C. % Weight Retained
3/4"	-4.25	19.03	0.00	0.00	0.00	0.00
5/8"	-4.00	16.00	0.00	0.00	0.00	0.00
7/16"	-3.50	11.31	0.60	0.60	0.60	0.60
5/16"	-3.00	8.00	0.67	0.67	1.27	1.27
3.5	-2.50	5.66	5.99	5.99	7.26	7.26
4	-2.25	4.76	3.64	3.64	10.90	10.90
5	-2.00	4.00	6.67	6.67	17.57	17.57
7	-1.50	2.83	10.50	10.50	28.07	28.07
10	-1.00	2.00	9.67	9.67	37.74	37.74
14	-0.50	1.41	11.70	11.70	49.44	49.44
18	0.00	1.00	15.75	15.75	65.19	65.19
25	0.50	0.71	13.16	13.16	78.35	78.35
35	1.00	0.50	6.69	6.69	85.04	85.04
45	1.50	0.35	1.98	1.98	87.02	87.02
60	2.00	0.25	4.23	4.23	91.25	91.25
80	2.50	0.18	6.00	6.00	97.25	97.25
120	3.00	0.13	1.92	1.92	99.17	99.17
170	3.50	0.09	0.06	0.06	99.23	99.23
200	3.75	0.07	0.01	0.01	99.24	99.24
230	4.00	0.06	0.00	0.00	99.24	99.24

Phi 5	Phi 16	Phi 25	Phi 50	Phi 75	Phi 84	Phi 95
2.31	0.92	0.37	-0.48	-1.65	-2.06	-2.69
Moment	Mean Phi	Mean mm	Sorting	Skewness	Kurtosis	
Statistics	-0.5	1.41	1.45	0.31	2.53	

GRANULARMETRIC REPORT KH_NATIVESS_2014_NAVD.GPJ_JPBRAZIL.GDT 8/21/15

Granularmetric Report

Depths and elevations based on measured values



CB&I
Coastal Planning & Engineering, Inc.
2481 NW Boca Raton Blvd.
Boca Raton, FL 33431
ph (561) 391 8102

Project Name: Kitty Hawk, NC

Sample Name: 13 Trough Composite

Analysis Date: 08-20-15

Analyzed By: TM

Easting (ft):

Northing (ft):

Coordinate System:

Elevation (ft):

North Carolina State Plane

0.0 NAVD 88

USCS:

SW

Munsell:

Comments:

Average Wet Munsell Value is 5, Average Dry Munsell Value is 7

Dry Weight (g): 100.00	Wash Weight (g): 100.00	Pan Retained (g): 0.97	Sieve Loss (%): 0.03	Fines (%): #200 - 1.00 #230 - 1.00	Organics (%):	Carbonates (%):	Shell Hash (%):
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Sieve Number	Sieve Size (Phi)	Sieve Size (Millimeters)	Grams Retained	% Weight Retained	Cum. Grams Retained	C. % Weight Retained
3/4"	-4.25	19.03	0.00	0.00	0.00	0.00
5/8"	-4.00	16.00	0.00	0.00	0.00	0.00
7/16"	-3.50	11.31	0.00	0.00	0.00	0.00
5/16"	-3.00	8.00	0.80	0.80	0.80	0.80
3.5	-2.50	5.66	3.30	3.30	4.10	4.10
4	-2.25	4.76	2.27	2.27	6.37	6.37
5	-2.00	4.00	3.21	3.21	9.58	9.58
7	-1.50	2.83	6.87	6.87	16.45	16.45
10	-1.00	2.00	5.61	5.61	22.06	22.06
14	-0.50	1.41	5.10	5.10	27.16	27.16
18	0.00	1.00	4.05	4.05	31.21	31.21
25	0.50	0.71	3.77	3.77	34.98	34.98
35	1.00	0.50	5.70	5.70	40.68	40.68
45	1.50	0.35	7.73	7.73	48.41	48.41
60	2.00	0.25	14.82	14.82	63.23	63.23
80	2.50	0.18	24.40	24.40	87.63	87.63
120	3.00	0.13	10.61	10.61	98.24	98.24
170	3.50	0.09	0.72	0.72	98.96	98.96
200	3.75	0.07	0.04	0.04	99.00	99.00
230	4.00	0.06	0.00	0.00	99.00	99.00

Phi 5	Phi 16	Phi 25	Phi 50	Phi 75	Phi 84	Phi 95
2.85	2.43	2.24	1.55	-0.71	-1.53	-2.40
Moment	Mean Phi	Mean mm	Sorting	Skewness	Kurtosis	
Statistics	0.8	0.57	1.75	-0.69	2.1	

GRANULARMETRIC REPORT KH_NATIVESS_2014_NAVD.GPJ_JPBRAZIL.GDT 8/21/15

Granularmetric Report

Depths and elevations based on measured values



CB&I
Coastal Planning & Engineering, Inc.
2481 NW Boca Raton Blvd.
Boca Raton, FL 33431
ph (561) 391 8102

Project Name: Kitty Hawk, NC

Sample Name: 14 BarCrest Composite

Analysis Date: 08-20-15

Analyzed By: TM

Easting (ft):

Northing (ft):

Coordinate System:

Elevation (ft):

North Carolina State Plane

0.0 NAVD 88

USCS:

SP

Munsell:

Comments:

Average Wet Munsell Value is 5, Average Dry Munsell Value is 7

Dry Weight (g): 100.00	Wash Weight (g): 100.00	Pan Retained (g): 1.23	Sieve Loss (%): 0.02	Fines (%): #200 - 1.34 #230 - 1.25	Organics (%):	Carbonates (%):	Shell Hash (%):
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Sieve Number	Sieve Size (Phi)	Sieve Size (Millimeters)	Grams Retained	% Weight Retained	Cum. Grams Retained	C. % Weight Retained
3/4"	-4.25	19.03	0.00	0.00	0.00	0.00
5/8"	-4.00	16.00	0.00	0.00	0.00	0.00
7/16"	-3.50	11.31	0.00	0.00	0.00	0.00
5/16"	-3.00	8.00	0.00	0.00	0.00	0.00
3.5	-2.50	5.66	0.21	0.21	0.21	0.21
4	-2.25	4.76	0.00	0.00	0.21	0.21
5	-2.00	4.00	0.00	0.00	0.21	0.21
7	-1.50	2.83	0.05	0.05	0.26	0.26
10	-1.00	2.00	0.08	0.08	0.34	0.34
14	-0.50	1.41	0.12	0.12	0.46	0.46
18	0.00	1.00	0.28	0.28	0.74	0.74
25	0.50	0.71	0.63	0.63	1.37	1.37
35	1.00	0.50	1.61	1.61	2.98	2.98
45	1.50	0.35	2.35	2.35	5.33	5.33
60	2.00	0.25	13.38	13.38	18.71	18.71
80	2.50	0.18	44.27	44.27	62.98	62.98
120	3.00	0.13	31.02	31.02	94.00	94.00
170	3.50	0.09	4.30	4.30	98.30	98.30
200	3.75	0.07	0.36	0.36	98.66	98.66
230	4.00	0.06	0.09	0.09	98.75	98.75

Phi 5	Phi 16	Phi 25	Phi 50	Phi 75	Phi 84	Phi 95
3.12	2.84	2.69	2.35	2.07	1.90	1.43
Moment Statistics	Mean Phi	Mean mm	Sorting	Skewness	Kurtosis	
	2.3	0.20	0.59	-2.51	18.05	

GRANULARMETRIC REPORT KH_NATIVESS_2014_NAVD.GPJ_JPBRAZIL.GDT 8/21/15

Granularmetric Report

Depths and elevations based on measured values



CB&I
Coastal Planning & Engineering, Inc.
2481 NW Boca Raton Blvd.
Boca Raton, FL 33431
ph (561) 391 8102

Project Name: Kitty Hawk, NC

Sample Name: 15 (-12.5) Composite

Analysis Date: 08-20-15

Analyzed By: TM

Easting (ft):

Northing (ft):

Coordinate System:

Elevation (ft):

North Carolina State Plane

0.0 NAVD 88

USCS:

SP

Munsell:

Comments:

Average Wet Munsell Value is 5, Average Dry Munsell Value is 7

Dry Weight (g): 100.00	Wash Weight (g): 100.00	Pan Retained (g): 1.19	Sieve Loss (%): 0.03	Fines (%): #200 - 1.34 #230 - 1.22	Organics (%):	Carbonates (%):	Shell Hash (%):
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Sieve Number	Sieve Size (Phi)	Sieve Size (Millimeters)	Grams Retained	% Weight Retained	Cum. Grams Retained	C. % Weight Retained
3/4"	-4.25	19.03	0.00	0.00	0.00	0.00
5/8"	-4.00	16.00	0.00	0.00	0.00	0.00
7/16"	-3.50	11.31	0.00	0.00	0.00	0.00
5/16"	-3.00	8.00	0.00	0.00	0.00	0.00
3.5	-2.50	5.66	0.00	0.00	0.00	0.00
4	-2.25	4.76	0.00	0.00	0.00	0.00
5	-2.00	4.00	0.00	0.00	0.00	0.00
7	-1.50	2.83	0.00	0.00	0.00	0.00
10	-1.00	2.00	0.13	0.13	0.13	0.13
14	-0.50	1.41	0.05	0.05	0.18	0.18
18	0.00	1.00	0.11	0.11	0.29	0.29
25	0.50	0.71	0.44	0.44	0.73	0.73
35	1.00	0.50	1.57	1.57	2.30	2.30
45	1.50	0.35	3.53	3.53	5.83	5.83
60	2.00	0.25	12.30	12.30	18.13	18.13
80	2.50	0.18	44.26	44.26	62.39	62.39
120	3.00	0.13	32.14	32.14	94.53	94.53
170	3.50	0.09	3.72	3.72	98.25	98.25
200	3.75	0.07	0.41	0.41	98.66	98.66
230	4.00	0.06	0.12	0.12	98.78	98.78

Phi 5	Phi 16	Phi 25	Phi 50	Phi 75	Phi 84	Phi 95
3.06	2.84	2.70	2.36	2.08	1.91	1.38
Moment	Mean Phi	Mean mm	Sorting	Skewness	Kurtosis	
Statistics	2.32	0.20	0.52	-1.33	8.06	

GRANULARMETRIC REPORT KH_NATIVESS_2014_NAVD.GPJ_JPBRAZIL.GDT 8/21/15

Granularmetric Report

Depths and elevations based on measured values



CB&I
Coastal Planning & Engineering, Inc.
2481 NW Boca Raton Blvd.
Boca Raton, FL 33431
ph (561) 391 8102

Project Name: Kitty Hawk, NC

Sample Name: 16 (-15) Composite

Analysis Date: 08-21-15

Analyzed By: TM

Easting (ft):

Northing (ft):

Coordinate System:

Elevation (ft):

North Carolina State Plane

0.0 NAVD 88

USCS:

SP

Munsell:

Comments:

Average Wet Munsell Value is 5, Average Dry Munsell Value is 7

Dry Weight (g): 100.00	Wash Weight (g): 100.00	Pan Retained (g): 1.21	Sieve Loss (%): 0.02	Fines (%): #200 - 1.35 #230 - 1.23	Organics (%):	Carbonates (%):	Shell Hash (%):
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Sieve Number	Sieve Size (Phi)	Sieve Size (Millimeters)	Grams Retained	% Weight Retained	Cum. Grams Retained	C. % Weight Retained
3/4"	-4.25	19.03	0.00	0.00	0.00	0.00
5/8"	-4.00	16.00	0.00	0.00	0.00	0.00
7/16"	-3.50	11.31	0.00	0.00	0.00	0.00
5/16"	-3.00	8.00	0.00	0.00	0.00	0.00
3.5	-2.50	5.66	0.00	0.00	0.00	0.00
4	-2.25	4.76	0.00	0.00	0.00	0.00
5	-2.00	4.00	0.00	0.00	0.00	0.00
7	-1.50	2.83	0.01	0.01	0.01	0.01
10	-1.00	2.00	0.03	0.03	0.04	0.04
14	-0.50	1.41	0.03	0.03	0.07	0.07
18	0.00	1.00	0.11	0.11	0.18	0.18
25	0.50	0.71	0.36	0.36	0.54	0.54
35	1.00	0.50	1.29	1.29	1.83	1.83
45	1.50	0.35	2.06	2.06	3.89	3.89
60	2.00	0.25	8.11	8.11	12.00	12.00
80	2.50	0.18	40.06	40.06	52.06	52.06
120	3.00	0.13	40.12	40.12	92.18	92.18
170	3.50	0.09	5.90	5.90	98.08	98.08
200	3.75	0.07	0.57	0.57	98.65	98.65
230	4.00	0.06	0.12	0.12	98.77	98.77

Phi 5	Phi 16	Phi 25	Phi 50	Phi 75	Phi 84	Phi 95
3.24	2.90	2.79	2.47	2.16	2.05	1.57
Moment	Mean Phi	Mean mm	Sorting	Skewness	Kurtosis	
Statistics	2.43	0.19	0.49	-1.29	7.86	

GRANULARMETRIC REPORT KH_NATIVESS_2014_NAVD.GPJ_JPBRAZIL.GDT 8/21/15

Granularmetric Report

Depths and elevations based on measured values



CB&I
Coastal Planning & Engineering, Inc.
2481 NW Boca Raton Blvd.
Boca Raton, FL 33431
ph (561) 391 8102

Project Name: Kitty Hawk, NC

Sample Name: 17 (-17.5) Composite

Analysis Date: 08-20-15

Analyzed By: TM

Easting (ft):

Northing (ft):

Coordinate System:

Elevation (ft):

North Carolina State Plane

0.0 NAVD 88

USCS:

SP

Munsell:

Comments:

Average Wet Munsell Value is 4, Average Dry Munsell Value is 6

Dry Weight (g): 100.00	Wash Weight (g): 100.00	Pan Retained (g): 1.33	Sieve Loss (%): 0.02	Fines (%): #200 - 1.54 #230 - 1.35	Organics (%):	Carbonates (%):	Shell Hash (%):
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Sieve Number	Sieve Size (Phi)	Sieve Size (Millimeters)	Grams Retained	% Weight Retained	Cum. Grams Retained	C. % Weight Retained
3/4"	-4.25	19.03	0.00	0.00	0.00	0.00
5/8"	-4.00	16.00	0.00	0.00	0.00	0.00
7/16"	-3.50	11.31	0.00	0.00	0.00	0.00
5/16"	-3.00	8.00	0.00	0.00	0.00	0.00
3.5	-2.50	5.66	0.00	0.00	0.00	0.00
4	-2.25	4.76	0.00	0.00	0.00	0.00
5	-2.00	4.00	0.00	0.00	0.00	0.00
7	-1.50	2.83	0.03	0.03	0.03	0.03
10	-1.00	2.00	0.06	0.06	0.09	0.09
14	-0.50	1.41	0.11	0.11	0.20	0.20
18	0.00	1.00	0.19	0.19	0.39	0.39
25	0.50	0.71	0.35	0.35	0.74	0.74
35	1.00	0.50	0.59	0.59	1.33	1.33
45	1.50	0.35	0.88	0.88	2.21	2.21
60	2.00	0.25	3.89	3.89	6.10	6.10
80	2.50	0.18	31.38	31.38	37.48	37.48
120	3.00	0.13	51.98	51.98	89.46	89.46
170	3.50	0.09	8.22	8.22	97.68	97.68
200	3.75	0.07	0.78	0.78	98.46	98.46
230	4.00	0.06	0.19	0.19	98.65	98.65

Phi 5	Phi 16	Phi 25	Phi 50	Phi 75	Phi 84	Phi 95
3.34	2.95	2.86	2.62	2.30	2.16	1.86
Moment	Mean Phi	Mean mm	Sorting	Skewness	Kurtosis	
Statistics	2.55	0.17	0.47	-2.11	14.64	

GRANULARMETRIC REPORT KH_NATIVESS_2014_NAVD.GPJ_JPBRAZIL.GDT 8/21/15

Granularmetric Report

Depths and elevations based on measured values



CB&I
Coastal Planning & Engineering, Inc.
2481 NW Boca Raton Blvd.
Boca Raton, FL 33431
ph (561) 391 8102

Project Name: Kitty Hawk, NC

Sample Name: 18 (-20) Composite

Analysis Date: 08-21-15

Analyzed By: TM

Easting (ft):

Northing (ft):

Coordinate System:

Elevation (ft):

North Carolina State Plane

0.0 NAVD 88

USCS:

SP

Munsell:

Comments:

Average Wet Munsell Value is 4, Average Dry Munsell Value is 5

Dry Weight (g): 100.00	Wash Weight (g): 100.00	Pan Retained (g): 1.61	Sieve Loss (%): 0.02	Fines (%): #200 - 2.02 #230 - 1.63	Organics (%):	Carbonates (%):	Shell Hash (%):
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Sieve Number	Sieve Size (Phi)	Sieve Size (Millimeters)	Grams Retained	% Weight Retained	Cum. Grams Retained	C. % Weight Retained
3/4"	-4.25	19.03	0.00	0.00	0.00	0.00
5/8"	-4.00	16.00	0.00	0.00	0.00	0.00
7/16"	-3.50	11.31	0.00	0.00	0.00	0.00
5/16"	-3.00	8.00	0.00	0.00	0.00	0.00
3.5	-2.50	5.66	0.04	0.04	0.04	0.04
4	-2.25	4.76	0.01	0.01	0.05	0.05
5	-2.00	4.00	0.05	0.05	0.10	0.10
7	-1.50	2.83	0.04	0.04	0.14	0.14
10	-1.00	2.00	0.10	0.10	0.24	0.24
14	-0.50	1.41	0.09	0.09	0.33	0.33
18	0.00	1.00	0.09	0.09	0.42	0.42
25	0.50	0.71	0.13	0.13	0.55	0.55
35	1.00	0.50	0.20	0.20	0.75	0.75
45	1.50	0.35	0.27	0.27	1.02	1.02
60	2.00	0.25	1.83	1.83	2.85	2.85
80	2.50	0.18	28.68	28.68	31.53	31.53
120	3.00	0.13	54.26	54.26	85.79	85.79
170	3.50	0.09	11.09	11.09	96.88	96.88
200	3.75	0.07	1.10	1.10	97.98	97.98
230	4.00	0.06	0.39	0.39	98.37	98.37

Phi 5	Phi 16	Phi 25	Phi 50	Phi 75	Phi 84	Phi 95
3.42	2.98	2.90	2.67	2.39	2.23	2.04
Moment Statistics	Mean Phi	Mean mm	Sorting	Skewness	Kurtosis	
	2.63	0.16	0.46	-3.08	30.22	

GRANULARMETRIC REPORT KH_NATIVESS_2014_NAVD.GPJ_JPBRAZIL.GDT 8/21/15

Granularmetric Report

Depths and elevations based on measured values



CB&I
Coastal Planning & Engineering, Inc.
2481 NW Boca Raton Blvd.
Boca Raton, FL 33431
ph (561) 391 8102

Project Name: Kitty Hawk, NC

Sample Name: 19 TotalBeachComposite

Analysis Date: 08-21-15

Analyzed By: TM

Easting (ft):

Northing (ft):

Coordinate System:

Elevation (ft):

North Carolina State Plane

0.0 NAVD 88

USCS:

SW

Munsell:

Comments:

Average Wet Munsell Value is 5, Average Dry Munsell Value is 7

Dry Weight (g): 100.00	Wash Weight (g): 100.00	Pan Retained (g): 0.89	Sieve Loss (%): 0.05	Fines (%): #200 - 1.01 #230 - 0.94	Organics (%):	Carbonates (%): 2	Shell Hash (%):
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Sieve Number	Sieve Size (Phi)	Sieve Size (Millimeters)	Grams Retained	% Weight Retained	Cum. Grams Retained	C. % Weight Retained
3/4"	-4.25	19.03	0.00	0.00	0.00	0.00
5/8"	-4.00	16.00	0.00	0.00	0.00	0.00
7/16"	-3.50	11.31	0.05	0.05	0.05	0.05
5/16"	-3.00	8.00	0.16	0.16	0.21	0.21
3.5	-2.50	5.66	0.89	0.89	1.10	1.10
4	-2.25	4.76	0.54	0.54	1.64	1.64
5	-2.00	4.00	1.00	1.00	2.64	2.64
7	-1.50	2.83	2.28	2.28	4.92	4.92
10	-1.00	2.00	3.10	3.10	8.02	8.02
14	-0.50	1.41	4.43	4.43	12.45	12.45
18	0.00	1.00	5.77	5.77	18.22	18.22
25	0.50	0.71	6.98	6.98	25.20	25.20
35	1.00	0.50	7.78	7.78	32.98	32.98
45	1.50	0.35	6.88	6.88	39.86	39.86
60	2.00	0.25	12.62	12.62	52.48	52.48
80	2.50	0.18	24.64	24.64	77.12	77.12
120	3.00	0.13	18.90	18.90	96.02	96.02
170	3.50	0.09	2.71	2.71	98.73	98.73
200	3.75	0.07	0.26	0.26	98.99	98.99
230	4.00	0.06	0.07	0.07	99.06	99.06

Phi 5	Phi 16	Phi 25	Phi 50	Phi 75	Phi 84	Phi 95
2.97	2.68	2.46	1.90	0.49	-0.19	-1.49
Moment	Mean Phi	Mean mm	Sorting	Skewness	Kurtosis	
Statistics	1.38	0.38	1.41	-0.98	3.17	

GRANULARMETRIC REPORT KH_NATIVESS_2014_NAVD.GPJ_JPBRAZIL.GDT 8/21/15

Granularmetric Report

Depths and elevations based on measured values



CB&I
Coastal Planning & Engineering, Inc.
2481 NW Boca Raton Blvd.
Boca Raton, FL 33431
ph (561) 391 8102

Project Name: Kill Devil Hills, NC

Sample Name: 02 KDH210Composite

Analysis Date: 08-21-15

Analyzed By: TM

Easting (ft):

Northing (ft):

Coordinate System:

Elevation (ft):

North Carolina State Plane

0.0 NAVD 88

USCS:
SW

Munsell:

Comments:
Average Wet Munsell Value is 5, Average Dry Munsell Value is 7

Dry Weight (g): 100.00	Wash Weight (g): 100.00	Pan Retained (g): 0.88	Sieve Loss (%): 0.08	Fines (%): #200 - 1.04 #230 - 0.96	Organics (%):	Carbonates (%): 2	Shell Hash (%):
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Sieve Number	Sieve Size (Phi)	Sieve Size (Millimeters)	Grams Retained	% Weight Retained	Cum. Grams Retained	C. % Weight Retained
3/4"	-4.25	19.03	0.00	0.00	0.00	0.00
5/8"	-4.00	16.00	0.00	0.00	0.00	0.00
7/16"	-3.50	11.31	0.00	0.00	0.00	0.00
5/16"	-3.00	8.00	0.00	0.00	0.00	0.00
3.5	-2.50	5.66	0.20	0.20	0.20	0.20
4	-2.25	4.76	0.19	0.19	0.39	0.39
5	-2.00	4.00	0.30	0.30	0.69	0.69
7	-1.50	2.83	0.93	0.93	1.62	1.62
10	-1.00	2.00	1.27	1.27	2.89	2.89
14	-0.50	1.41	2.45	2.45	5.34	5.34
18	0.00	1.00	4.21	4.21	9.55	9.55
25	0.50	0.71	7.25	7.25	16.80	16.80
35	1.00	0.50	10.52	10.52	27.32	27.32
45	1.50	0.35	9.55	9.55	36.87	36.87
60	2.00	0.25	13.40	13.40	50.27	50.27
80	2.50	0.18	19.68	19.68	69.95	69.95
120	3.00	0.13	22.21	22.21	92.16	92.16
170	3.50	0.09	6.32	6.32	98.48	98.48
200	3.75	0.07	0.48	0.48	98.96	98.96
230	4.00	0.06	0.08	0.08	99.04	99.04

Phi 5	Phi 16	Phi 25	Phi 50	Phi 75	Phi 84	Phi 95
3.22	2.82	2.61	1.99	0.89	0.44	-0.57
Moment	Mean Phi	Mean mm	Sorting	Skewness	Kurtosis	
Statistics	1.67	0.31	1.18	-0.9	3.44	

GRANULARMETRIC REPORT KDH_NATIVES_2013_NAVD.GPJ JPBRAZIL.GDT 8/26/15

Granularmetric Report

Depths and elevations based on measured values



CB&I
Coastal Planning & Engineering, Inc.
2481 NW Boca Raton Blvd.
Boca Raton, FL 33431
ph (561) 391 8102

Project Name: Kill Devil Hills, NC

Sample Name: 03 KDH235Composite

Analysis Date: 08-21-15

Analyzed By: TM

Easting (ft):

Northing (ft):

Coordinate System:

Elevation (ft):

North Carolina State Plane

0.0 NAVD 88

USCS:

SW

Munsell:

Comments:

Average Wet Munsell Value is 5, Average Dry Munsell Value is 7

Dry Weight (g): 100.00	Wash Weight (g): 100.00	Pan Retained (g): 0.88	Sieve Loss (%): 0.04	Fines (%): #200 - 1.00 #230 - 0.92	Organics (%):	Carbonates (%): 2	Shell Hash (%):
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Sieve Number	Sieve Size (Phi)	Sieve Size (Millimeters)	Grams Retained	% Weight Retained	Cum. Grams Retained	C. % Weight Retained
3/4"	-4.25	19.03	0.00	0.00	0.00	0.00
5/8"	-4.00	16.00	0.00	0.00	0.00	0.00
7/16"	-3.50	11.31	0.00	0.00	0.00	0.00
5/16"	-3.00	8.00	0.08	0.08	0.08	0.08
3.5	-2.50	5.66	0.59	0.59	0.67	0.67
4	-2.25	4.76	0.40	0.40	1.07	1.07
5	-2.00	4.00	0.81	0.81	1.88	1.88
7	-1.50	2.83	1.66	1.66	3.54	3.54
10	-1.00	2.00	2.02	2.02	5.56	5.56
14	-0.50	1.41	3.11	3.11	8.67	8.67
18	0.00	1.00	3.25	3.25	11.92	11.92
25	0.50	0.71	3.47	3.47	15.39	15.39
35	1.00	0.50	4.82	4.82	20.21	20.21
45	1.50	0.35	7.29	7.29	27.50	27.50
60	2.00	0.25	13.49	13.49	40.99	40.99
80	2.50	0.18	25.70	25.70	66.69	66.69
120	3.00	0.13	26.71	26.71	93.40	93.40
170	3.50	0.09	5.24	5.24	98.64	98.64
200	3.75	0.07	0.36	0.36	99.00	99.00
230	4.00	0.06	0.08	0.08	99.08	99.08

Phi 5	Phi 16	Phi 25	Phi 50	Phi 75	Phi 84	Phi 95
3.15	2.82	2.66	2.18	1.33	0.56	-1.14
Moment	Mean Phi	Mean mm	Sorting	Skewness	Kurtosis	
Statistics	1.76	0.30	1.29	-1.45	4.62	

GRANULARMETRIC REPORT KDH_NATIVES_2013_NAVD.GPJ_JPBRAZIL.GDT_8/26/15

Granularmetric Report

Depths and elevations based on measured values



CB&I
Coastal Planning & Engineering, Inc.
2481 NW Boca Raton Blvd.
Boca Raton, FL 33431
ph (561) 391 8102

Project Name: Kill Devil Hills, NC

Sample Name: 04 KDH260Composite

Analysis Date: 08-21-15

Analyzed By: TM

Easting (ft):

Northing (ft):

Coordinate System:

Elevation (ft):

North Carolina State Plane

0.0 NAVD 88

USCS:

SW

Munsell:

Comments:

Average Wet Munsell Value is 5, Average Dry Munsell Value is 7

Dry Weight (g): 100.00	Wash Weight (g): 100.00	Pan Retained (g): 0.80	Sieve Loss (%): 0.04	Fines (%): #200 - 0.87 #230 - 0.84	Organics (%):	Carbonates (%): 2	Shell Hash (%):
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Sieve Number	Sieve Size (Phi)	Sieve Size (Millimeters)	Grams Retained	% Weight Retained	Cum. Grams Retained	C. % Weight Retained
3/4"	-4.25	19.03	0.00	0.00	0.00	0.00
5/8"	-4.00	16.00	0.00	0.00	0.00	0.00
7/16"	-3.50	11.31	0.39	0.39	0.39	0.39
5/16"	-3.00	8.00	0.08	0.08	0.47	0.47
3.5	-2.50	5.66	0.27	0.27	0.74	0.74
4	-2.25	4.76	0.25	0.25	0.99	0.99
5	-2.00	4.00	0.50	0.50	1.49	1.49
7	-1.50	2.83	1.12	1.12	2.61	2.61
10	-1.00	2.00	1.49	1.49	4.10	4.10
14	-0.50	1.41	2.91	2.91	7.01	7.01
18	0.00	1.00	4.50	4.50	11.51	11.51
25	0.50	0.71	6.37	6.37	17.88	17.88
35	1.00	0.50	10.95	10.95	28.83	28.83
45	1.50	0.35	11.05	11.05	39.88	39.88
60	2.00	0.25	13.51	13.51	53.39	53.39
80	2.50	0.18	23.82	23.82	77.21	77.21
120	3.00	0.13	19.69	19.69	96.90	96.90
170	3.50	0.09	2.09	2.09	98.99	98.99
200	3.75	0.07	0.14	0.14	99.13	99.13
230	4.00	0.06	0.03	0.03	99.16	99.16

Phi 5	Phi 16	Phi 25	Phi 50	Phi 75	Phi 84	Phi 95
2.95	2.67	2.45	1.87	0.83	0.35	-0.85
Moment	Mean Phi	Mean mm	Sorting	Skewness	Kurtosis	
Statistics	1.52	0.35	1.22	-1.2	4.57	

GRANULARMETRIC REPORT KDH_NATIVES_2013_NAVD.GPJ_JPBRAZIL.GDT 8/26/15

Granularmetric Report

Depths and elevations based on measured values



CB&I
Coastal Planning & Engineering, Inc.
2481 NW Boca Raton Blvd.
Boca Raton, FL 33431
ph (561) 391 8102

Project Name: Kill Devil Hills, NC

Sample Name: 05 KDH290Composite

Analysis Date: 08-20-15

Analyzed By: TM

Easting (ft):

Northing (ft):

Coordinate System:

Elevation (ft):

North Carolina State Plane

0.0 NAVD 88

USCS:

SW

Munsell:

Comments:

Average Wet Munsell Value is 6, Average Dry Munsell Value is 6

Dry Weight (g): 100.00	Wash Weight (g): 100.00	Pan Retained (g): 0.75	Sieve Loss (%): 0.12	Fines (%): #200 - 0.91 #230 - 0.87	Organics (%):	Carbonates (%): 2	Shell Hash (%):
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Sieve Number	Sieve Size (Phi)	Sieve Size (Millimeters)	Grams Retained	% Weight Retained	Cum. Grams Retained	C. % Weight Retained
3/4"	-4.25	19.03	0.00	0.00	0.00	0.00
5/8"	-4.00	16.00	0.00	0.00	0.00	0.00
7/16"	-3.50	11.31	0.14	0.14	0.14	0.14
5/16"	-3.00	8.00	0.23	0.23	0.37	0.37
3.5	-2.50	5.66	1.37	1.37	1.74	1.74
4	-2.25	4.76	0.75	0.75	2.49	2.49
5	-2.00	4.00	1.17	1.17	3.66	3.66
7	-1.50	2.83	3.36	3.36	7.02	7.02
10	-1.00	2.00	4.65	4.65	11.67	11.67
14	-0.50	1.41	5.15	5.15	16.82	16.82
18	0.00	1.00	4.65	4.65	21.47	21.47
25	0.50	0.71	5.69	5.69	27.16	27.16
35	1.00	0.50	8.62	8.62	35.78	35.78
45	1.50	0.35	7.57	7.57	43.35	43.35
60	2.00	0.25	12.29	12.29	55.64	55.64
80	2.50	0.18	22.72	22.72	78.36	78.36
120	3.00	0.13	17.85	17.85	96.21	96.21
170	3.50	0.09	2.70	2.70	98.91	98.91
200	3.75	0.07	0.18	0.18	99.09	99.09
230	4.00	0.06	0.04	0.04	99.13	99.13

Phi 5	Phi 16	Phi 25	Phi 50	Phi 75	Phi 84	Phi 95
2.97	2.66	2.43	1.77	0.31	-0.58	-1.80
Moment	Mean Phi	Mean mm	Sorting	Skewness	Kurtosis	
Statistics	1.24	0.42	1.52	-0.9	2.88	

GRANULARMETRIC REPORT KDH_NATIVES_2013_NAVD.GPJ_JPBRAZIL.GDT_8/26/15

Granularmetric Report

Depths and elevations based on measured values



CB&I
Coastal Planning & Engineering, Inc.
2481 NW Boca Raton Blvd.
Boca Raton, FL 33431
ph (561) 391 8102

Project Name: Kill Devil Hills, NC

Sample Name: 06 KDH320Composite

Analysis Date: 08-21-15

Analyzed By: TM

Easting (ft):

Northing (ft):

Coordinate System:

Elevation (ft):

North Carolina State Plane

0.0 NAVD 88

USCS:

SW

Munsell:

Comments:

Average Wet Munsell Value is 5, Average Dry Munsell Value is 7

Dry Weight (g): 100.00	Wash Weight (g): 100.00	Pan Retained (g): 0.84	Sieve Loss (%): 0.06	Fines (%): #200 - 0.97 #230 - 0.90	Organics (%):	Carbonates (%): 2	Shell Hash (%):
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Sieve Number	Sieve Size (Phi)	Sieve Size (Millimeters)	Grams Retained	% Weight Retained	Cum. Grams Retained	C. % Weight Retained
3/4"	-4.25	19.03	0.00	0.00	0.00	0.00
5/8"	-4.00	16.00	0.00	0.00	0.00	0.00
7/16"	-3.50	11.31	0.31	0.31	0.31	0.31
5/16"	-3.00	8.00	0.80	0.80	1.11	1.11
3.5	-2.50	5.66	1.22	1.22	2.33	2.33
4	-2.25	4.76	0.83	0.83	3.16	3.16
5	-2.00	4.00	1.50	1.50	4.66	4.66
7	-1.50	2.83	2.32	2.32	6.98	6.98
10	-1.00	2.00	2.62	2.62	9.60	9.60
14	-0.50	1.41	4.23	4.23	13.83	13.83
18	0.00	1.00	6.73	6.73	20.56	20.56
25	0.50	0.71	8.47	8.47	29.03	29.03
35	1.00	0.50	11.89	11.89	40.92	40.92
45	1.50	0.35	9.75	9.75	50.67	50.67
60	2.00	0.25	9.75	9.75	60.42	60.42
80	2.50	0.18	18.55	18.55	78.97	78.97
120	3.00	0.13	17.33	17.33	96.30	96.30
170	3.50	0.09	2.48	2.48	98.78	98.78
200	3.75	0.07	0.25	0.25	99.03	99.03
230	4.00	0.06	0.07	0.07	99.10	99.10

Phi 5	Phi 16	Phi 25	Phi 50	Phi 75	Phi 84	Phi 95
2.96	2.65	2.39	1.47	0.26	-0.34	-1.93
Moment	Mean Phi	Mean mm	Sorting	Skewness	Kurtosis	
Statistics	1.15	0.45	1.5	-0.87	3.2	

GRANULARMETRIC REPORT KDH_NATIVES_2013_NAVD.GPJ JPBRAZIL.GDT 8/26/15

Granularmetric Report

Depths and elevations based on measured values



CB&I
Coastal Planning & Engineering, Inc.
2481 NW Boca Raton Blvd.
Boca Raton, FL 33431
ph (561) 391 8102

Project Name: Kill Devil Hills, NC

Sample Name: 07 DuneComposite

Analysis Date: 08-20-15

Analyzed By: TM

Easting (ft):

Northing (ft):

Coordinate System:

Elevation (ft):

North Carolina State Plane

0.0 NAVD 88

USCS:

SP

Munsell:

Comments:

Average Wet Munsell Value is 5, Average Dry Munsell Value is 7

Dry Weight (g):

100.00

Wash Weight (g):

100.00

Pan Retained (g):

0.22

Sieve Loss (%):

0.10

Fines (%):

#200 - 0.34
#230 - 0.32

Organics (%):

Carbonates (%):

Shell Hash (%):

Sieve Number

Sieve Size (Phi)

Sieve Size (Millimeters)

Grams Retained

% Weight Retained

Cum. Grams Retained

C. % Weight Retained

3/4"

-4.25

19.03

0.00

0.00

0.00

0.00

5/8"

-4.00

16.00

0.00

0.00

0.00

0.00

7/16"

-3.50

11.31

0.00

0.00

0.00

0.00

5/16"

-3.00

8.00

0.00

0.00

0.00

0.00

3.5

-2.50

5.66

0.00

0.00

0.00

0.00

4

-2.25

4.76

0.00

0.00

0.00

0.00

5

-2.00

4.00

0.01

0.01

0.01

0.01

7

-1.50

2.83

0.05

0.05

0.06

0.06

10

-1.00

2.00

0.13

0.13

0.19

0.19

14

-0.50

1.41

0.79

0.79

0.98

0.98

18

0.00

1.00

3.62

3.62

4.60

4.60

25

0.50

0.71

8.67

8.67

13.27

13.27

35

1.00

0.50

20.83

20.83

34.10

34.10

45

1.50

0.35

23.76

23.76

57.86

57.86

60

2.00

0.25

25.88

25.88

83.74

83.74

80

2.50

0.18

13.66

13.66

97.40

97.40

120

3.00

0.13

2.03

2.03

99.43

99.43

170

3.50

0.09

0.21

0.21

99.64

99.64

200

3.75

0.07

0.02

0.02

99.66

99.66

230

4.00

0.06

0.02

0.02

99.68

99.68

Phi 5

Phi 16

Phi 25

Phi 50

Phi 75

Phi 84

Phi 95

2.41

2.01

1.83

1.33

0.78

0.57

0.02

Moment

Mean Phi

Mean mm

Sorting

Skewness

Kurtosis

Statistics

1.29

0.41

0.72

-0.35

3.05

GRANULARMETRIC REPORT_KDH_NATIVES_2013_NAVD.GPJ_JPBRAZIL.GDT_8/26/15

Granularmetric Report

Depths and elevations based on measured values



CB&I
Coastal Planning & Engineering, Inc.
2481 NW Boca Raton Blvd.
Boca Raton, FL 33431
ph (561) 391 8102

Project Name: Kill Devil Hills, NC

Sample Name: 08 TODComposite

Analysis Date: 08-21-15

Analyzed By: TM

Easting (ft):

Northing (ft):

Coordinate System:

Elevation (ft):

North Carolina State Plane

0.0 NAVD 88

USCS:

SW

Munsell:

Comments:

Average Wet Munsell Value is 5, Average Dry Munsell Value is 7

Dry Weight (g): 100.00	Wash Weight (g): 100.00	Pan Retained (g): 0.32	Sieve Loss (%): 0.13	Fines (%): #200 - 0.46 #230 - 0.45	Organics (%):	Carbonates (%):	Shell Hash (%):
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Sieve Number	Sieve Size (Phi)	Sieve Size (Millimeters)	Grams Retained	% Weight Retained	Cum. Grams Retained	C. % Weight Retained
3/4"	-4.25	19.03	0.00	0.00	0.00	0.00
5/8"	-4.00	16.00	0.00	0.00	0.00	0.00
7/16"	-3.50	11.31	0.00	0.00	0.00	0.00
5/16"	-3.00	8.00	0.00	0.00	0.00	0.00
3.5	-2.50	5.66	0.00	0.00	0.00	0.00
4	-2.25	4.76	0.32	0.32	0.32	0.32
5	-2.00	4.00	0.36	0.36	0.68	0.68
7	-1.50	2.83	1.66	1.66	2.34	2.34
10	-1.00	2.00	2.37	2.37	4.71	4.71
14	-0.50	1.41	5.25	5.25	9.96	9.96
18	0.00	1.00	7.03	7.03	16.99	16.99
25	0.50	0.71	11.95	11.95	28.94	28.94
35	1.00	0.50	23.67	23.67	52.61	52.61
45	1.50	0.35	21.83	21.83	74.44	74.44
60	2.00	0.25	15.25	15.25	89.69	89.69
80	2.50	0.18	7.89	7.89	97.58	97.58
120	3.00	0.13	1.75	1.75	99.33	99.33
170	3.50	0.09	0.19	0.19	99.52	99.52
200	3.75	0.07	0.02	0.02	99.54	99.54
230	4.00	0.06	0.01	0.01	99.55	99.55

Phi 5	Phi 16	Phi 25	Phi 50	Phi 75	Phi 84	Phi 95
2.34	1.81	1.52	0.94	0.34	-0.07	-0.97
Moment	Mean Phi	Mean mm	Sorting	Skewness	Kurtosis	
Statistics	0.85	0.55	0.97	-0.62	3.45	

GRANULARMETRIC REPORT_KDH_NATIVES_2013_NAVD.GPJ_JPBRAZIL.GDT_8/26/15

Granularmetric Report

Depths and elevations based on measured values



CB&I
 Coastal Planning & Engineering, Inc.
 2481 NW Boca Raton Blvd.
 Boca Raton, FL 33431
 ph (561) 391 8102

Project Name: Kill Devil Hills, NC

Sample Name: 09 MidBermComposite

Analysis Date: 08-21-15

Analyzed By: TM

Easting (ft):

Northing (ft):

Coordinate System:

Elevation (ft):

North Carolina State Plane

0.0 NAVD 88

USCS:

SW

Munsell:

Comments:

Average Wet Munsell Value is 5, Average Dry Munsell Value is 7

Dry Weight (g): 100.00	Wash Weight (g): 100.00	Pan Retained (g): 0.43	Sieve Loss (%): 0.05	Fines (%): #200 - 0.49 #230 - 0.48	Organics (%):	Carbonates (%):	Shell Hash (%):
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Sieve Number	Sieve Size (Phi)	Sieve Size (Millimeters)	Grams Retained	% Weight Retained	Cum. Grams Retained	C. % Weight Retained
3/4"	-4.25	19.03	0.00	0.00	0.00	0.00
5/8"	-4.00	16.00	0.00	0.00	0.00	0.00
7/16"	-3.50	11.31	0.00	0.00	0.00	0.00
5/16"	-3.00	8.00	0.00	0.00	0.00	0.00
3.5	-2.50	5.66	0.00	0.00	0.00	0.00
4	-2.25	4.76	0.01	0.01	0.01	0.01
5	-2.00	4.00	0.06	0.06	0.07	0.07
7	-1.50	2.83	0.41	0.41	0.48	0.48
10	-1.00	2.00	3.64	3.64	4.12	4.12
14	-0.50	1.41	6.13	6.13	10.25	10.25
18	0.00	1.00	9.32	9.32	19.57	19.57
25	0.50	0.71	17.74	17.74	37.31	37.31
35	1.00	0.50	25.28	25.28	62.59	62.59
45	1.50	0.35	14.22	14.22	76.81	76.81
60	2.00	0.25	10.60	10.60	87.41	87.41
80	2.50	0.18	9.15	9.15	96.56	96.56
120	3.00	0.13	2.77	2.77	99.33	99.33
170	3.50	0.09	0.17	0.17	99.50	99.50
200	3.75	0.07	0.01	0.01	99.51	99.51
230	4.00	0.06	0.01	0.01	99.52	99.52

Phi 5	Phi 16	Phi 25	Phi 50	Phi 75	Phi 84	Phi 95
2.41	1.84	1.44	0.75	0.15	-0.19	-0.93
Moment	Mean Phi	Mean mm	Sorting	Skewness	Kurtosis	
Statistics	0.77	0.59	0.96	-0.06	2.7	

GRANULARMETRIC REPORT_KDH_NATIVES_2013_NAVD.GPJ_JPBRAZIL.GDT_8/26/15

Granularmetric Report

Depths and elevations based on measured values



CB&I
Coastal Planning & Engineering, Inc.
2481 NW Boca Raton Blvd.
Boca Raton, FL 33431
ph (561) 391 8102

Project Name: Kill Devil Hills, NC

Sample Name: 10 BermCrestComposite

Analysis Date: 08-21-15

Analyzed By: TM

Easting (ft):

Northing (ft):

Coordinate System:

Elevation (ft):

North Carolina State Plane

0.0 NAVD 88

USCS:

SP

Munsell:

Comments:

Average Wet Munsell Value is 5, Average Dry Munsell Value is 7

Dry Weight (g): 100.00	Wash Weight (g): 100.00	Pan Retained (g): 0.34	Sieve Loss (%): 0.05	Fines (%): #200 - 0.39 #230 - 0.39	Organics (%):	Carbonates (%):	Shell Hash (%):
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Sieve Number	Sieve Size (Phi)	Sieve Size (Millimeters)	Grams Retained	% Weight Retained	Cum. Grams Retained	C. % Weight Retained
3/4"	-4.25	19.03	0.00	0.00	0.00	0.00
5/8"	-4.00	16.00	0.00	0.00	0.00	0.00
7/16"	-3.50	11.31	0.00	0.00	0.00	0.00
5/16"	-3.00	8.00	0.00	0.00	0.00	0.00
3.5	-2.50	5.66	0.00	0.00	0.00	0.00
4	-2.25	4.76	0.00	0.00	0.00	0.00
5	-2.00	4.00	0.13	0.13	0.13	0.13
7	-1.50	2.83	0.47	0.47	0.60	0.60
10	-1.00	2.00	0.70	0.70	1.30	1.30
14	-0.50	1.41	1.14	1.14	2.44	2.44
18	0.00	1.00	2.78	2.78	5.22	5.22
25	0.50	0.71	7.36	7.36	12.58	12.58
35	1.00	0.50	15.70	15.70	28.28	28.28
45	1.50	0.35	20.23	20.23	48.51	48.51
60	2.00	0.25	25.79	25.79	74.30	74.30
80	2.50	0.18	20.26	20.26	94.56	94.56
120	3.00	0.13	4.70	4.70	99.26	99.26
170	3.50	0.09	0.30	0.30	99.56	99.56
200	3.75	0.07	0.05	0.05	99.61	99.61
230	4.00	0.06	0.00	0.00	99.61	99.61

Phi 5	Phi 16	Phi 25	Phi 50	Phi 75	Phi 84	Phi 95
2.55	2.24	2.02	1.53	0.90	0.61	-0.04
Moment	Mean Phi	Mean mm	Sorting	Skewness	Kurtosis	
Statistics	1.41	0.38	0.83	-0.82	4.12	

GRANULARMETRIC REPORT_KDH_NATIVESS_2013_NAVD.GPJ_JPBRAZIL.GDT_8/26/15

Granularmetric Report

Depths and elevations based on measured values



CB&I
Coastal Planning & Engineering, Inc.
2481 NW Boca Raton Blvd.
Boca Raton, FL 33431
ph (561) 391 8102

Project Name: Kill Devil Hills, NC

Sample Name: 11 MHWComposite

Analysis Date: 08-21-15

Analyzed By: TM

Easting (ft):

Northing (ft):

Coordinate System:

Elevation (ft):

North Carolina State Plane

0.0 NAVD 88

USCS:

SW

Munsell:

Comments:

Average Wet Munsell Value is 6, Average Dry Munsell Value is 7

Dry Weight (g): 100.00	Wash Weight (g): 100.00	Pan Retained (g): 0.46	Sieve Loss (%): 0.11	Fines (%): #200 - 0.57 #230 - 0.57	Organics (%):	Carbonates (%):	Shell Hash (%):
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Sieve Number	Sieve Size (Phi)	Sieve Size (Millimeters)	Grams Retained	% Weight Retained	Cum. Grams Retained	C. % Weight Retained
3/4"	-4.25	19.03	0.00	0.00	0.00	0.00
5/8"	-4.00	16.00	0.00	0.00	0.00	0.00
7/16"	-3.50	11.31	0.00	0.00	0.00	0.00
5/16"	-3.00	8.00	0.48	0.48	0.48	0.48
3.5	-2.50	5.66	1.14	1.14	1.62	1.62
4	-2.25	4.76	0.46	0.46	2.08	2.08
5	-2.00	4.00	1.29	1.29	3.37	3.37
7	-1.50	2.83	2.80	2.80	6.17	6.17
10	-1.00	2.00	5.61	5.61	11.78	11.78
14	-0.50	1.41	11.93	11.93	23.71	23.71
18	0.00	1.00	16.21	16.21	39.92	39.92
25	0.50	0.71	14.81	14.81	54.73	54.73
35	1.00	0.50	11.13	11.13	65.86	65.86
45	1.50	0.35	7.42	7.42	73.28	73.28
60	2.00	0.25	10.47	10.47	83.75	83.75
80	2.50	0.18	11.85	11.85	95.60	95.60
120	3.00	0.13	3.63	3.63	99.23	99.23
170	3.50	0.09	0.18	0.18	99.41	99.41
200	3.75	0.07	0.02	0.02	99.43	99.43
230	4.00	0.06	0.00	0.00	99.43	99.43

Phi 5	Phi 16	Phi 25	Phi 50	Phi 75	Phi 84	Phi 95
2.47	2.01	1.58	0.34	-0.46	-0.82	-1.71
Moment	Mean Phi	Mean mm	Sorting	Skewness	Kurtosis	
Statistics	0.44	0.74	1.3	-0.12	2.47	

GRANULARMETRIC REPORT_KDH_NATIVES_2013_NAVD.GPJ_JPBRAZIL.GDT_8/26/15

Granularmetric Report

Depths and elevations based on measured values



CB&I
Coastal Planning & Engineering, Inc.
2481 NW Boca Raton Blvd.
Boca Raton, FL 33431
ph (561) 391 8102

Project Name: Kill Devil Hills, NC

Sample Name: 12 MTLComposite

Analysis Date: 08-21-15

Analyzed By: TM

Easting (ft):

Northing (ft):

Coordinate System:

Elevation (ft):

North Carolina State Plane

0.0 NAVD 88

USCS:

SW

Munsell:

Comments:

Average Wet Munsell Value is 6, Average Dry Munsell Value is 7

Dry Weight (g): 100.00	Wash Weight (g): 100.00	Pan Retained (g): 0.78	Sieve Loss (%): 0.07	Fines (%): #200 - 0.85 #230 - 0.85	Organics (%):	Carbonates (%):	Shell Hash (%):
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Sieve Number	Sieve Size (Phi)	Sieve Size (Millimeters)	Grams Retained	% Weight Retained	Cum. Grams Retained	C. % Weight Retained
3/4"	-4.25	19.03	0.00	0.00	0.00	0.00
5/8"	-4.00	16.00	0.00	0.00	0.00	0.00
7/16"	-3.50	11.31	0.81	0.81	0.81	0.81
5/16"	-3.00	8.00	1.60	1.60	2.41	2.41
3.5	-2.50	5.66	5.15	5.15	7.56	7.56
4	-2.25	4.76	2.40	2.40	9.96	9.96
5	-2.00	4.00	3.81	3.81	13.77	13.77
7	-1.50	2.83	6.82	6.82	20.59	20.59
10	-1.00	2.00	5.26	5.26	25.85	25.85
14	-0.50	1.41	5.95	5.95	31.80	31.80
18	0.00	1.00	5.78	5.78	37.58	37.58
25	0.50	0.71	4.97	4.97	42.55	42.55
35	1.00	0.50	6.30	6.30	48.85	48.85
45	1.50	0.35	8.54	8.54	57.39	57.39
60	2.00	0.25	15.95	15.95	73.34	73.34
80	2.50	0.18	18.81	18.81	92.15	92.15
120	3.00	0.13	6.71	6.71	98.86	98.86
170	3.50	0.09	0.27	0.27	99.13	99.13
200	3.75	0.07	0.02	0.02	99.15	99.15
230	4.00	0.06	0.00	0.00	99.15	99.15

Phi 5	Phi 16	Phi 25	Phi 50	Phi 75	Phi 84	Phi 95
2.71	2.28	2.04	1.07	-1.08	-1.84	-2.75
Moment	Mean Phi	Mean mm	Sorting	Skewness	Kurtosis	
Statistics	0.46	0.73	1.81	-0.53	1.97	

GRANULARMETRIC REPORT_KDH_NATIVES_2013_NAVD.GPJ_JPBRAZIL.GDT_8/26/15

Granularmetric Report

Depths and elevations based on measured values



CB&I
Coastal Planning & Engineering, Inc.
2481 NW Boca Raton Blvd.
Boca Raton, FL 33431
ph (561) 391 8102

Project Name: Kill Devil Hills, NC

Sample Name: 13 MLWComposite

Analysis Date: 08-21-15

Analyzed By: TM

Easting (ft):

Northing (ft):

Coordinate System:

Elevation (ft):

North Carolina State Plane

0.0 NAVD 88

USCS:

SW

Munsell:

Comments:

Average Wet Munsell Value is 5, Average Dry Munsell Value is 7

Dry Weight (g): 100.00	Wash Weight (g): 100.00	Pan Retained (g): 0.65	Sieve Loss (%): 0.03	Fines (%): #200 - 0.68 #230 - 0.68	Organics (%):	Carbonates (%):	Shell Hash (%):
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Sieve Number	Sieve Size (Phi)	Sieve Size (Millimeters)	Grams Retained	% Weight Retained	Cum. Grams Retained	C. % Weight Retained
3/4"	-4.25	19.03	0.00	0.00	0.00	0.00
5/8"	-4.00	16.00	0.00	0.00	0.00	0.00
7/16"	-3.50	11.31	1.36	1.36	1.36	1.36
5/16"	-3.00	8.00	0.56	0.56	1.92	1.92
3.5	-2.50	5.66	2.52	2.52	4.44	4.44
4	-2.25	4.76	2.16	2.16	6.60	6.60
5	-2.00	4.00	4.42	4.42	11.02	11.02
7	-1.50	2.83	9.44	9.44	20.46	20.46
10	-1.00	2.00	10.06	10.06	30.52	30.52
14	-0.50	1.41	10.42	10.42	40.94	40.94
18	0.00	1.00	8.86	8.86	49.80	49.80
25	0.50	0.71	6.44	6.44	56.24	56.24
35	1.00	0.50	6.15	6.15	62.39	62.39
45	1.50	0.35	5.87	5.87	68.26	68.26
60	2.00	0.25	9.80	9.80	78.06	78.06
80	2.50	0.18	15.93	15.93	93.99	93.99
120	3.00	0.13	5.10	5.10	99.09	99.09
170	3.50	0.09	0.21	0.21	99.30	99.30
200	3.75	0.07	0.02	0.02	99.32	99.32
230	4.00	0.06	0.00	0.00	99.32	99.32

Phi 5	Phi 16	Phi 25	Phi 50	Phi 75	Phi 84	Phi 95
2.60	2.19	1.84	0.02	-1.27	-1.74	-2.44
Moment	Mean Phi	Mean mm	Sorting	Skewness	Kurtosis	
Statistics	0.14	0.91	1.71	-0.1	1.86	

GRANULARMETRIC REPORT_KDH_NATIVES_2013_NAVD.GPJ_JPBRAZIL.GDT_8/26/15

Granularmetric Report

Depths and elevations based on measured values



CB&I
Coastal Planning & Engineering, Inc.
2481 NW Boca Raton Blvd.
Boca Raton, FL 33431
ph (561) 391 8102

Project Name: Kill Devil Hills, NC

Sample Name: 14 Trough Composite

Analysis Date: 08-20-15

Analyzed By: TM

Easting (ft):

Northing (ft):

Coordinate System:

Elevation (ft):

North Carolina State Plane

0.0 NAVD 88

USCS:

SW

Munsell:

Comments:

Average Wet Munsell Value is 5, Average Dry Munsell Value is 7

Dry Weight (g): 100.00	Wash Weight (g): 100.00	Pan Retained (g): 0.95	Sieve Loss (%): 0.07	Fines (%): #200 - 1.07 #230 - 1.02	Organics (%):	Carbonates (%):	Shell Hash (%):
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Sieve Number	Sieve Size (Phi)	Sieve Size (Millimeters)	Grams Retained	% Weight Retained	Cum. Grams Retained	C. % Weight Retained
3/4"	-4.25	19.03	0.00	0.00	0.00	0.00
5/8"	-4.00	16.00	0.00	0.00	0.00	0.00
7/16"	-3.50	11.31	0.00	0.00	0.00	0.00
5/16"	-3.00	8.00	0.00	0.00	0.00	0.00
3.5	-2.50	5.66	0.14	0.14	0.14	0.14
4	-2.25	4.76	0.03	0.03	0.17	0.17
5	-2.00	4.00	0.09	0.09	0.26	0.26
7	-1.50	2.83	0.48	0.48	0.74	0.74
10	-1.00	2.00	0.89	0.89	1.63	1.63
14	-0.50	1.41	1.53	1.53	3.16	3.16
18	0.00	1.00	2.28	2.28	5.44	5.44
25	0.50	0.71	2.40	2.40	7.84	7.84
35	1.00	0.50	3.07	3.07	10.91	10.91
45	1.50	0.35	3.41	3.41	14.32	14.32
60	2.00	0.25	13.16	13.16	27.48	27.48
80	2.50	0.18	38.63	38.63	66.11	66.11
120	3.00	0.13	29.51	29.51	95.62	95.62
170	3.50	0.09	3.18	3.18	98.80	98.80
200	3.75	0.07	0.13	0.13	98.93	98.93
230	4.00	0.06	0.05	0.05	98.98	98.98

Phi 5	Phi 16	Phi 25	Phi 50	Phi 75	Phi 84	Phi 95
2.99	2.80	2.65	2.29	1.91	1.56	-0.10
Moment	Mean Phi	Mean mm	Sorting	Skewness	Kurtosis	
Statistics	2.07	0.24	0.92	-2.03	7.68	

GRANULARMETRIC REPORT_KDH_NATIVES_2013_NAVD.GPJ_JPBRAZIL.GDT_8/26/15

Granularmetric Report

Depths and elevations based on measured values



CB&I
Coastal Planning & Engineering, Inc.
2481 NW Boca Raton Blvd.
Boca Raton, FL 33431
ph (561) 391 8102

Project Name: Kill Devil Hills, NC

Sample Name: 15 BarCrest Composite

Analysis Date: 08-21-15

Analyzed By: TM

Easting (ft):

Northing (ft):

Coordinate System:

Elevation (ft):

North Carolina State Plane

0.0 NAVD 88

USCS:

SW

Munsell:

Comments:

Average Wet Munsell Value is 5, Average Dry Munsell Value is 7

Dry Weight (g): 100.00	Wash Weight (g): 100.00	Pan Retained (g): 1.12	Sieve Loss (%): 0.11	Fines (%): #200 - 1.28 #230 - 1.23	Organics (%):	Carbonates (%):	Shell Hash (%):
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Sieve Number	Sieve Size (Phi)	Sieve Size (Millimeters)	Grams Retained	% Weight Retained	Cum. Grams Retained	C. % Weight Retained
3/4"	-4.25	19.03	0.00	0.00	0.00	0.00
5/8"	-4.00	16.00	0.00	0.00	0.00	0.00
7/16"	-3.50	11.31	0.00	0.00	0.00	0.00
5/16"	-3.00	8.00	0.25	0.25	0.25	0.25
3.5	-2.50	5.66	0.21	0.21	0.46	0.46
4	-2.25	4.76	0.61	0.61	1.07	1.07
5	-2.00	4.00	0.63	0.63	1.70	1.70
7	-1.50	2.83	1.91	1.91	3.61	3.61
10	-1.00	2.00	2.28	2.28	5.89	5.89
14	-0.50	1.41	2.85	2.85	8.74	8.74
18	0.00	1.00	4.02	4.02	12.76	12.76
25	0.50	0.71	5.19	5.19	17.95	17.95
35	1.00	0.50	4.92	4.92	22.87	22.87
45	1.50	0.35	4.05	4.05	26.92	26.92
60	2.00	0.25	8.66	8.66	35.58	35.58
80	2.50	0.18	25.99	25.99	61.57	61.57
120	3.00	0.13	31.25	31.25	92.82	92.82
170	3.50	0.09	5.57	5.57	98.39	98.39
200	3.75	0.07	0.33	0.33	98.72	98.72
230	4.00	0.06	0.05	0.05	98.77	98.77

Phi 5	Phi 16	Phi 25	Phi 50	Phi 75	Phi 84	Phi 95
3.20	2.86	2.71	2.28	1.26	0.31	-1.20
Moment Statistics	Mean Phi	Mean mm	Sorting	Skewness	Kurtosis	
	1.78	0.29	1.34	-1.4	4.21	

GRANULARMETRIC REPORT_KDH_NATIVES_2013_NAVD.GPJ_JPBRAZIL.GDT_8/26/15

Granularmetric Report

Depths and elevations based on measured values



CB&I
Coastal Planning & Engineering, Inc.
2481 NW Boca Raton Blvd.
Boca Raton, FL 33431
ph (561) 391 8102

Project Name: Kill Devil Hills, NC

Sample Name: 16 (-12.5) Composite

Analysis Date: 08-21-15

Analyzed By: TM

Easting (ft):

Northing (ft):

Coordinate System:

Elevation (ft):

North Carolina State Plane

0.0 NAVD 88

USCS:

SP

Munsell:

Comments:

Average Wet Munsell Value is 4, Average Dry Munsell Value is 7

Dry Weight (g): 100.00	Wash Weight (g): 100.00	Pan Retained (g): 1.33	Sieve Loss (%): 0.04	Fines (%): #200 - 1.47 #230 - 1.37	Organics (%):	Carbonates (%):	Shell Hash (%):
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Sieve Number	Sieve Size (Phi)	Sieve Size (Millimeters)	Grams Retained	% Weight Retained	Cum. Grams Retained	C. % Weight Retained
3/4"	-4.25	19.03	0.00	0.00	0.00	0.00
5/8"	-4.00	16.00	0.00	0.00	0.00	0.00
7/16"	-3.50	11.31	0.00	0.00	0.00	0.00
5/16"	-3.00	8.00	0.00	0.00	0.00	0.00
3.5	-2.50	5.66	0.00	0.00	0.00	0.00
4	-2.25	4.76	0.00	0.00	0.00	0.00
5	-2.00	4.00	0.01	0.01	0.01	0.01
7	-1.50	2.83	0.00	0.00	0.01	0.01
10	-1.00	2.00	0.01	0.01	0.02	0.02
14	-0.50	1.41	0.05	0.05	0.07	0.07
18	0.00	1.00	0.09	0.09	0.16	0.16
25	0.50	0.71	0.30	0.30	0.46	0.46
35	1.00	0.50	1.40	1.40	1.86	1.86
45	1.50	0.35	2.68	2.68	4.54	4.54
60	2.00	0.25	9.71	9.71	14.25	14.25
80	2.50	0.18	35.21	35.21	49.46	49.46
120	3.00	0.13	41.43	41.43	90.89	90.89
170	3.50	0.09	7.18	7.18	98.07	98.07
200	3.75	0.07	0.46	0.46	98.53	98.53
230	4.00	0.06	0.10	0.10	98.63	98.63

Phi 5	Phi 16	Phi 25	Phi 50	Phi 75	Phi 84	Phi 95
3.29	2.92	2.81	2.51	2.15	2.02	1.52
Moment	Mean Phi	Mean mm	Sorting	Skewness	Kurtosis	
Statistics	2.43	0.19	0.52	-1.19	6.67	

GRANULARMETRIC REPORT_KDH_NATIVES_2013_NAVD.GPJ_JPBRAZIL.GDT_8/26/15

Granularmetric Report

Depths and elevations based on measured values



CB&I
Coastal Planning & Engineering, Inc.
2481 NW Boca Raton Blvd.
Boca Raton, FL 33431
ph (561) 391 8102

Project Name: Kill Devil Hills, NC

Sample Name: 17 (-15) Composite

Analysis Date: 08-20-15

Analyzed By: TM

Easting (ft):

Northing (ft):

Coordinate System:

Elevation (ft):

North Carolina State Plane

0.0 NAVD 88

USCS:

SP

Munsell:

Comments:

Average Wet Munsell Value is 5, Average Dry Munsell Value is 7

Dry Weight (g): 100.00	Wash Weight (g): 100.00	Pan Retained (g): 1.33	Sieve Loss (%): 0.05	Fines (%): #200 - 1.55 #230 - 1.38	Organics (%):	Carbonates (%):	Shell Hash (%):
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Sieve Number	Sieve Size (Phi)	Sieve Size (Millimeters)	Grams Retained	% Weight Retained	Cum. Grams Retained	C. % Weight Retained
3/4"	-4.25	19.03	0.00	0.00	0.00	0.00
5/8"	-4.00	16.00	0.00	0.00	0.00	0.00
7/16"	-3.50	11.31	0.00	0.00	0.00	0.00
5/16"	-3.00	8.00	0.00	0.00	0.00	0.00
3.5	-2.50	5.66	0.02	0.02	0.02	0.02
4	-2.25	4.76	0.00	0.00	0.02	0.02
5	-2.00	4.00	0.07	0.07	0.09	0.09
7	-1.50	2.83	0.09	0.09	0.18	0.18
10	-1.00	2.00	0.07	0.07	0.25	0.25
14	-0.50	1.41	0.10	0.10	0.35	0.35
18	0.00	1.00	0.27	0.27	0.62	0.62
25	0.50	0.71	0.80	0.80	1.42	1.42
35	1.00	0.50	1.85	1.85	3.27	3.27
45	1.50	0.35	2.95	2.95	6.22	6.22
60	2.00	0.25	7.51	7.51	13.73	13.73
80	2.50	0.18	30.94	30.94	44.67	44.67
120	3.00	0.13	44.41	44.41	89.08	89.08
170	3.50	0.09	8.69	8.69	97.77	97.77
200	3.75	0.07	0.68	0.68	98.45	98.45
230	4.00	0.06	0.17	0.17	98.62	98.62

Phi 5	Phi 16	Phi 25	Phi 50	Phi 75	Phi 84	Phi 95
3.34	2.94	2.84	2.56	2.18	2.04	1.29
Moment	Mean Phi	Mean mm	Sorting	Skewness	Kurtosis	
Statistics	2.44	0.18	0.61	-2.04	11.53	

GRANULARMETRIC REPORT_KDH_NATIVES_2013_NAVD.GPJ_JPBRAZIL.GDT_8/26/15

Granularmetric Report

Depths and elevations based on measured values



CB&I
Coastal Planning & Engineering, Inc.
2481 NW Boca Raton Blvd.
Boca Raton, FL 33431
ph (561) 391 8102

Project Name: Kill Devil Hills, NC

Sample Name: 18 (-17.5) Composite

Analysis Date: 08-21-15

Analyzed By: TM

Easting (ft):

Northing (ft):

Coordinate System:

Elevation (ft):

North Carolina State Plane

0.0 NAVD 88

USCS:

SP

Munsell:

Comments:

Average Wet Munsell Value is 4, Average Dry Munsell Value is 6

Dry Weight (g): 100.00	Wash Weight (g): 100.00	Pan Retained (g): 1.42	Sieve Loss (%): 0.01	Fines (%): #200 - 1.61 #230 - 1.43	Organics (%):	Carbonates (%):	Shell Hash (%):
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Sieve Number	Sieve Size (Phi)	Sieve Size (Millimeters)	Grams Retained	% Weight Retained	Cum. Grams Retained	C. % Weight Retained
3/4"	-4.25	19.03	0.00	0.00	0.00	0.00
5/8"	-4.00	16.00	0.00	0.00	0.00	0.00
7/16"	-3.50	11.31	0.00	0.00	0.00	0.00
5/16"	-3.00	8.00	0.21	0.21	0.21	0.21
3.5	-2.50	5.66	0.35	0.35	0.56	0.56
4	-2.25	4.76	0.25	0.25	0.81	0.81
5	-2.00	4.00	0.25	0.25	1.06	1.06
7	-1.50	2.83	0.31	0.31	1.37	1.37
10	-1.00	2.00	0.19	0.19	1.56	1.56
14	-0.50	1.41	0.20	0.20	1.76	1.76
18	0.00	1.00	0.20	0.20	1.96	1.96
25	0.50	0.71	0.35	0.35	2.31	2.31
35	1.00	0.50	0.97	0.97	3.28	3.28
45	1.50	0.35	2.02	2.02	5.30	5.30
60	2.00	0.25	6.71	6.71	12.01	12.01
80	2.50	0.18	32.00	32.00	44.01	44.01
120	3.00	0.13	42.96	42.96	86.97	86.97
170	3.50	0.09	10.58	10.58	97.55	97.55
200	3.75	0.07	0.84	0.84	98.39	98.39
230	4.00	0.06	0.18	0.18	98.57	98.57

Phi 5	Phi 16	Phi 25	Phi 50	Phi 75	Phi 84	Phi 95
3.38	2.97	2.86	2.57	2.20	2.06	1.43
Moment	Mean Phi	Mean mm	Sorting	Skewness	Kurtosis	
Statistics	2.43	0.19	0.8	-3.68	22.37	

GRANULARMETRIC REPORT_KDH_NATIVES_2013_NAVD.GPJ_JPBRAZIL.GDT_8/26/15

Granularmetric Report

Depths and elevations based on measured values



CB&I
Coastal Planning & Engineering, Inc.
2481 NW Boca Raton Blvd.
Boca Raton, FL 33431
ph (561) 391 8102

Project Name: Kill Devil Hills, NC

Sample Name: 19 (-20) Composite

Analysis Date: 08-21-15

Analyzed By: TM

Easting (ft):

Northing (ft):

Coordinate System:

Elevation (ft):

North Carolina State Plane

0.0 NAVD 88

USCS:

SP

Munsell:

Comments:

Average Wet Munsell Value is 4, Average Dry Munsell Value is 7

Dry Weight (g): 100.00	Wash Weight (g): 100.00	Pan Retained (g): 1.47	Sieve Loss (%): 0.02	Fines (%): #200 - 1.73 #230 - 1.49	Organics (%):	Carbonates (%):	Shell Hash (%):
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Sieve Number	Sieve Size (Phi)	Sieve Size (Millimeters)	Grams Retained	% Weight Retained	Cum. Grams Retained	C. % Weight Retained
3/4"	-4.25	19.03	0.00	0.00	0.00	0.00
5/8"	-4.00	16.00	0.00	0.00	0.00	0.00
7/16"	-3.50	11.31	0.00	0.00	0.00	0.00
5/16"	-3.00	8.00	0.00	0.00	0.00	0.00
3.5	-2.50	5.66	0.00	0.00	0.00	0.00
4	-2.25	4.76	0.00	0.00	0.00	0.00
5	-2.00	4.00	0.01	0.01	0.01	0.01
7	-1.50	2.83	0.02	0.02	0.03	0.03
10	-1.00	2.00	0.09	0.09	0.12	0.12
14	-0.50	1.41	0.08	0.08	0.20	0.20
18	0.00	1.00	0.20	0.20	0.40	0.40
25	0.50	0.71	0.29	0.29	0.69	0.69
35	1.00	0.50	0.37	0.37	1.06	1.06
45	1.50	0.35	0.57	0.57	1.63	1.63
60	2.00	0.25	2.91	2.91	4.54	4.54
80	2.50	0.18	26.87	26.87	31.41	31.41
120	3.00	0.13	53.60	53.60	85.01	85.01
170	3.50	0.09	12.20	12.20	97.21	97.21
200	3.75	0.07	1.06	1.06	98.27	98.27
230	4.00	0.06	0.24	0.24	98.51	98.51

Phi 5	Phi 16	Phi 25	Phi 50	Phi 75	Phi 84	Phi 95
3.41	2.99	2.91	2.67	2.38	2.21	2.01
Moment Statistics	Mean Phi	Mean mm	Sorting	Skewness	Kurtosis	
	2.62	0.16	0.47	-2.19	16.49	

GRANULARMETRIC REPORT_KDH_NATIVES_2013_NAVD.GPJ_JPBRAZIL.GDT_8/26/15

Granularmetric Report

Depths and elevations based on measured values



CB&I
Coastal Planning & Engineering, Inc.
2481 NW Boca Raton Blvd.
Boca Raton, FL 33431
ph (561) 391 8102

Project Name: Kill Devil Hills, NC

Sample Name: 20 TotalBeachComposite

Analysis Date: 08-21-15

Analyzed By: TM

Easting (ft):

Northing (ft):

Coordinate System:

Elevation (ft):

North Carolina State Plane

0.0 NAVD 88

USCS:

SW

Munsell:

Comments:

Average Wet Munsell Value is 5, Average Dry Munsell Value is 7

Dry Weight (g): 100.00	Wash Weight (g): 100.00	Pan Retained (g): 0.83	Sieve Loss (%): 0.07	Fines (%): #200 - 0.96 #230 - 0.90	Organics (%):	Carbonates (%): 2	Shell Hash (%):
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Sieve Number	Sieve Size (Phi)	Sieve Size (Millimeters)	Grams Retained	% Weight Retained	Cum. Grams Retained	C. % Weight Retained
3/4"	-4.25	19.03	0.00	0.00	0.00	0.00
5/8"	-4.00	16.00	0.00	0.00	0.00	0.00
7/16"	-3.50	11.31	0.17	0.17	0.17	0.17
5/16"	-3.00	8.00	0.24	0.24	0.41	0.41
3.5	-2.50	5.66	0.73	0.73	1.14	1.14
4	-2.25	4.76	0.48	0.48	1.62	1.62
5	-2.00	4.00	0.86	0.86	2.48	2.48
7	-1.50	2.83	1.88	1.88	4.36	4.36
10	-1.00	2.00	2.41	2.41	6.77	6.77
14	-0.50	1.41	3.57	3.57	10.34	10.34
18	0.00	1.00	4.66	4.66	15.00	15.00
25	0.50	0.71	6.25	6.25	21.25	21.25
35	1.00	0.50	9.36	9.36	30.61	30.61
45	1.50	0.35	9.04	9.04	39.65	39.65
60	2.00	0.25	12.49	12.49	52.14	52.14
80	2.50	0.18	22.10	22.10	74.24	74.24
120	3.00	0.13	20.75	20.75	94.99	94.99
170	3.50	0.09	3.77	3.77	98.76	98.76
200	3.75	0.07	0.28	0.28	99.04	99.04
230	4.00	0.06	0.06	0.06	99.10	99.10

Phi 5	Phi 16	Phi 25	Phi 50	Phi 75	Phi 84	Phi 95
3.00	2.74	2.52	1.91	0.70	0.08	-1.37
Moment	Mean Phi	Mean mm	Sorting	Skewness	Kurtosis	
Statistics	1.47	0.36	1.37	-1.1	3.74	

GRANULARMETRIC REPORT_KDH_NATIVES_2013_NAVD.GPJ_JPBRAZIL.GDT_8/26/15