

APPENDIX 2  
CPE-NC INDIVIDUAL BEACH GRANULARMETRIC REPORTS

# Granularmetric Report

Depths and elevations based on measured values



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

Project Name: Ocean Isle Beach Terminal Groin

Sample Name: OIB000 001 DUNE

Analysis Date: 04-11-13

Analyzed By: ATP

Easting (ft): <b>2,184,977</b>	Northing (ft): <b>54,878</b>	Coordinate System: <b>North Carolina State Plane</b>	Elevation (ft): <b>9.3 NAVD 88</b>
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USCS: <b>SP</b>	Munsell: <b>Wet - 5Y-7/1 Dry - 5Y-8/1</b>	Comments:
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Dry Weight (g): <b>117.94</b>	Wash Weight (g): <b>117.82</b>	Pan Retained (g): <b>0.00</b>	Sieve Loss (%): <b>0.01</b>	Fines (%): <b>#200 - 0.11 #230 - 0.10</b>	Organics (%):	Carbonates (%):	Shell Hash (%): <b>0</b>
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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 1/2"	-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	0.00	0.00	0.00	0.00
14	-0.50	1.41	0.00	0.00	0.00	0.00
18	0.00	1.00	0.01	0.01	0.01	0.01
25	0.50	0.71	0.01	0.01	0.02	0.02
35	1.00	0.50	0.17	0.14	0.19	0.16
45	1.50	0.35	3.89	3.30	4.08	3.46
60	2.00	0.25	39.86	33.80	43.94	37.26
80	2.50	0.18	57.05	48.37	100.99	85.63
120	3.00	0.13	15.21	12.90	116.20	98.53
170	3.50	0.09	1.52	1.29	117.72	99.82
200	3.75	0.07	0.08	0.07	117.80	99.89
230	4.00	0.06	0.01	0.01	117.81	99.90

Shell Hash calculated from visual estimate of shell <4.75mm and >2.8mm.

Phi 5	Phi 16	Phi 25	Phi 50	Phi 75	Phi 84	Phi 95
2.86	2.48	2.39	2.13	1.82	1.69	1.52
Moment Statistics	Mean Phi	Mean mm	Sorting	Skewness	Kurtosis	
	2.12	0.23	0.39	0.15	3.43	

GRANULARMETRIC REPORT OIB\_NATIVESS\_APRIL2013\_NAVD.GPJ\_JPBRAZIL.GDT 3/18/14

# Granularmetric Report

Depths and elevations based on measured values



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

Project Name: Ocean Isle Beach Terminal Groin

Sample Name: OIB000 002 TOD

Analysis Date: 04-11-13

Analyzed By: ATP

Easting (ft): <b>2,184,983</b>	Northing (ft): <b>54,868</b>	Coordinate System: <b>North Carolina State Plane</b>	Elevation (ft): <b>7.2 NAVD 88</b>
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USCS: <b>SP</b>	Munsell: <b>Wet - 5Y-7/1 Dry - 5Y-7/1</b>	Comments:
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Dry Weight (g): <b>117.53</b>	Wash Weight (g): <b>117.39</b>	Pan Retained (g): <b>0.00</b>	Sieve Loss (%): <b>0.02</b>	Fines (%): <b>#200 - 0.15 #230 - 0.14</b>	Organics (%):	Carbonates (%):	Shell Hash (%): <b>0</b>
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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 1/2"	-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	0.00	0.00	0.00	0.00
14	-0.50	1.41	0.01	0.01	0.01	0.01
18	0.00	1.00	0.12	0.10	0.13	0.11
25	0.50	0.71	0.63	0.54	0.76	0.65
35	1.00	0.50	6.50	5.53	7.26	6.18
45	1.50	0.35	26.31	22.39	33.57	28.57
60	2.00	0.25	48.46	41.23	82.03	69.80
80	2.50	0.18	29.08	24.74	111.11	94.54
120	3.00	0.13	5.35	4.55	116.46	99.09
170	3.50	0.09	0.84	0.71	117.30	99.80
200	3.75	0.07	0.06	0.05	117.36	99.85
230	4.00	0.06	0.01	0.01	117.37	99.86

Shell Hash calculated from visual estimate of shell <4.75mm and >2.8mm.

Phi 5	Phi 16	Phi 25	Phi 50	Phi 75	Phi 84	Phi 95
2.55	2.29	2.11	1.76	1.42	1.22	0.89
Moment Statistics	Mean Phi	Mean mm	Sorting	Skewness	Kurtosis	
	1.75	0.30	0.5	-0.07	3.44	

GRANULARMETRIC REPORT OIB\_NATIVESS\_APRIL2013\_NAVD.GPJ\_JPBRAZIL.GDT 3/18/14

# Granularmetric Report

Depths and elevations based on measured values



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

Project Name: Ocean Isle Beach Terminal Groin

Sample Name: OIB000 003MIDBERM

Analysis Date: 04-11-13

Analyzed By: ATP

Easting (ft): <b>2,184,984</b>	Northing (ft): <b>54,833</b>	Coordinate System: <b>North Carolina State Plane</b>	Elevation (ft): <b>6.6 NAVD 88</b>
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USCS: <b>SP</b>	Munsell: Wet - 5Y-6/1 Dry - 5Y-7/2	Comments: <b>Average wet Munsell Value is 6. Average dry Munsell Value is 7.</b>
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Dry Weight (g): <b>115.91</b>	Wash Weight (g): <b>115.84</b>	Pan Retained (g): <b>0.00</b>	Sieve Loss (%): <b>0.04</b>	Fines (%): #200 - 0.08 #230 - 0.08	Organics (%):	Carbonates (%):	Shell Hash (%): <b>0</b>
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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 1/2"	-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	0.03	0.03	0.06	0.06
14	-0.50	1.41	0.18	0.16	0.24	0.22
18	0.00	1.00	0.94	0.81	1.18	1.03
25	0.50	0.71	9.15	7.89	10.33	8.92
35	1.00	0.50	30.27	26.12	40.60	35.04
45	1.50	0.35	30.56	26.37	71.16	61.41
60	2.00	0.25	26.84	23.16	98.00	84.57
80	2.50	0.18	13.18	11.37	111.18	95.94
120	3.00	0.13	3.96	3.42	115.14	99.36
170	3.50	0.09	0.61	0.53	115.75	99.89
200	3.75	0.07	0.04	0.03	115.79	99.92
230	4.00	0.06	0.00	0.00	115.79	99.92

Shell Hash calculated from visual estimate of shell <4.75mm and >2.8mm.

Phi 5	Phi 16	Phi 25	Phi 50	Phi 75	Phi 84	Phi 95
2.46	1.99	1.79	1.28	0.81	0.64	0.25
Moment Statistics	Mean Phi	Mean mm	Sorting	Skewness	Kurtosis	
	1.32	0.40	0.66	0.19	2.91	

GRANULARMETRIC REPORT OIB\_NATIVES APRIL 2013 NAVD.GPJ JPBRAZIL.GDT 3/18/14

# Granularmetric Report

Depths and elevations based on measured values



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

Project Name: Ocean Isle Beach Terminal Groin

Sample Name: OIB000 004BERMCRST

Analysis Date: 04-11-13

Analyzed By: ATP

Easting (ft):  
2,184,987

Northing (ft):  
54,793

Coordinate System:  
North Carolina State Plane

Elevation (ft):  
7.0 NAVD 88

USCS: SP Munsell: Wet - 5Y-6/1 Dry - 5Y-7/2 Comments: Average wet Munsell Value is 6. Average dry Munsell Value is 7.

Dry Weight (g): 116.18 Wash Weight (g): 116.05 Pan Retained (g): 0.00 Sieve Loss (%): 0.03 Fines (%): #200 - 0.15 #230 - 0.14 Organics (%): Carbonates (%): Shell Hash (%): 0

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 1/2"	-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	0.05	0.04	0.05	0.04
7	-1.50	2.83	0.01	0.01	0.06	0.05
10	-1.00	2.00	0.05	0.04	0.11	0.09
14	-0.50	1.41	0.03	0.03	0.14	0.12
18	0.00	1.00	0.08	0.07	0.22	0.19
25	0.50	0.71	1.07	0.92	1.29	1.11
35	1.00	0.50	18.38	15.82	19.67	16.93
45	1.50	0.35	40.68	35.01	60.35	51.94
60	2.00	0.25	35.63	30.67	95.98	82.61
80	2.50	0.18	15.72	13.53	111.70	96.14
120	3.00	0.13	3.80	3.27	115.50	99.41
170	3.50	0.09	0.48	0.41	115.98	99.82
200	3.75	0.07	0.03	0.03	116.01	99.85
230	4.00	0.06	0.01	0.01	116.02	99.86

Shell Hash calculated from visual estimate of shell <4.75mm and >2.8mm.

Phi 5	Phi 16	Phi 25	Phi 50	Phi 75	Phi 84	Phi 95
2.46	2.05	1.88	1.47	1.12	0.97	0.62
Moment	Mean Phi	Mean mm	Sorting	Skewness	Kurtosis	
Statistics	1.5	0.35	0.55	0.11	4.08	

GRANULARMETRIC REPORT OIB\_NATIVESS\_APRIL2013\_NAVD.GPJ\_JPBRAZIL.GDT 3/18/14

# Granularmetric Report

Depths and elevations based on measured values



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

Project Name: Ocean Isle Beach Terminal Groin

Sample Name: OIB000 005 MHW

Analysis Date: 02-04-14

Analyzed By: TM

Easting (ft): <b>2,184,989</b>	Northing (ft): <b>54,767</b>	Coordinate System: <b>North Carolina State Plane</b>	Elevation (ft): <b>1.3 NAVD 88</b>
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USCS: <b>SP</b>	Munsell: Wet - 5Y-5/1 Dry - 5Y-7/1 Washed - 5Y-7/1	Comments:
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Dry Weight (g): <b>94.24</b>	Wash Weight (g): <b>93.27</b>	Pan Retained (g): <b>0.00</b>	Sieve Loss (%): <b>0.27</b>	Fines (%): #200 - 1.30 #230 - 1.30	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	0.00	0.00	0.00	0.00
14	-0.50	1.41	0.05	0.05	0.05	0.05
18	0.00	1.00	0.12	0.13	0.17	0.18
25	0.50	0.71	0.51	0.54	0.68	0.72
35	1.00	0.50	2.29	2.43	2.97	3.15
45	1.50	0.35	6.97	7.40	9.94	10.55
60	2.00	0.25	30.00	31.83	39.94	42.38
80	2.50	0.18	39.16	41.55	79.10	83.93
120	3.00	0.13	13.06	13.86	92.16	97.79
170	3.50	0.09	0.83	0.88	92.99	98.67
200	3.75	0.07	0.03	0.03	93.02	98.70
230	4.00	0.06	0.00	0.00	93.02	98.70

Shell Hash calculated from visual estimate of shell <4.75mm and >2.8mm.

Phi 5	Phi 16	Phi 25	Phi 50	Phi 75	Phi 84	Phi 95
2.90	2.50	2.39	2.09	1.73	1.59	1.12
Moment Statistics	Mean Phi	Mean mm	Sorting	Skewness	Kurtosis	
	2.04	0.24	0.5	-0.7	4.64	

GRANULARMETRIC REPORT OIB\_NATIVESS\_APRIL2013\_NAVD.GPJ\_JPBRAZIL.GDT 3/18/14

# Granularmetric Report

Depths and elevations based on measured values



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

Project Name: Ocean Isle Beach Terminal Groin

Sample Name: OIB000 006 MTL

Analysis Date: 04-10-13

Analyzed By: ATP

Easting (ft): <b>2,184,995</b>	Northing (ft): <b>54,729</b>	Coordinate System: <b>North Carolina State Plane</b>	Elevation (ft): <b>0.3 NAVD 88</b>
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USCS: <b>SP</b>	Munsell: <b>Wet - 5Y-4/1 Dry - 5Y-7/1</b>	Comments:
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Dry Weight (g): <b>101.08</b>	Wash Weight (g): <b>100.08</b>	Pan Retained (g): <b>0.01</b>	Sieve Loss (%): <b>0.01</b>	Fines (%): <b>#200 - 1.01 #230 - 1.00</b>	Organics (%):	Carbonates (%):	Shell Hash (%): <b>0</b>
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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 1/2"	-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	0.03	0.03	0.03	0.03
14	-0.50	1.41	0.01	0.01	0.04	0.04
18	0.00	1.00	0.06	0.06	0.10	0.10
25	0.50	0.71	0.27	0.27	0.37	0.37
35	1.00	0.50	4.08	4.04	4.45	4.41
45	1.50	0.35	16.76	16.58	21.21	20.99
60	2.00	0.25	24.44	24.18	45.65	45.17
80	2.50	0.18	28.41	28.11	74.06	73.28
120	3.00	0.13	22.98	22.73	97.04	96.01
170	3.50	0.09	2.91	2.88	99.95	98.89
200	3.75	0.07	0.10	0.10	100.05	98.99
230	4.00	0.06	0.01	0.01	100.06	99.00

Shell Hash calculated from visual estimate of shell <4.75mm and >2.8mm.

Phi 5	Phi 16	Phi 25	Phi 50	Phi 75	Phi 84	Phi 95
2.98	2.74	2.54	2.09	1.58	1.35	1.02
Moment Statistics	Mean Phi	Mean mm	Sorting	Skewness	Kurtosis	
	2.04	0.24	0.62	-0.28	2.69	

GRANULARMETRIC REPORT OIB\_NATIVES APRIL2013\_NAVD.GPJ\_JPBRAZIL.GDT 3/18/14

# Granularmetric Report

Depths and elevations based on measured values



Coastal Planning & Engineering  
A CB&I Company  
2481 NW Boca Raton Blvd.  
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ph (561) 391-8102

Project Name: Ocean Isle Beach Terminal Groin

Sample Name: OIB000 007 MLW

Analysis Date: 04-12-13

Analyzed By: ATP

Easting (ft): <b>2,185,017</b>	Northing (ft): <b>54,549</b>	Coordinate System: <b>North Carolina State Plane</b>	Elevation (ft): <b>-3.1 NAVD 88</b>
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USCS: <b>SW</b>	Munsell: <b>Wet - 5Y-5/1 Dry - 5Y-7/1</b>	Comments:
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Dry Weight (g): <b>114.93</b>	Wash Weight (g): <b>113.86</b>	Pan Retained (g): <b>0.00</b>	Sieve Loss (%): <b>0.00</b>	Fines (%): <b>#200 - 0.94 #230 - 0.94</b>	Organics (%):	Carbonates (%):	Shell Hash (%): <b>0</b>
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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	0.39	0.34	0.39	0.34
3.5	-2.50	5.66	0.00	0.00	0.39	0.34
4	-2.25	4.76	0.00	0.00	0.39	0.34
5	-2.00	4.00	0.10	0.09	0.49	0.43
7	-1.50	2.83	0.29	0.25	0.78	0.68
10	-1.00	2.00	0.36	0.31	1.14	0.99
14	-0.50	1.41	0.99	0.86	2.13	1.85
18	0.00	1.00	2.82	2.45	4.95	4.30
25	0.50	0.71	9.59	8.34	14.54	12.64
35	1.00	0.50	28.67	24.95	43.21	37.59
45	1.50	0.35	23.75	20.66	66.96	58.25
60	2.00	0.25	21.41	18.63	88.37	76.88
80	2.50	0.18	16.69	14.52	105.06	91.40
120	3.00	0.13	8.01	6.97	113.07	98.37
170	3.50	0.09	0.77	0.67	113.84	99.04
200	3.75	0.07	0.02	0.02	113.86	99.06
230	4.00	0.06	0.00	0.00	113.86	99.06

Shell Hash calculated from visual estimate of shell <4.75mm and >2.8mm.

Phi 5	Phi 16	Phi 25	Phi 50	Phi 75	Phi 84	Phi 95
2.76	2.25	1.95	1.30	0.75	0.57	0.04
Moment Statistics	Mean Phi	Mean mm	Sorting	Skewness	Kurtosis	
	1.31	0.40	0.86	-0.64	5.4	

GRANULARMETRIC REPORT OIB\_NATIVESS\_APRIL2013\_NAVD.GPJ\_JPBRAZIL.GDT 3/18/14



# Granularmetric Report

Depths and elevations based on measured values



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

Project Name: Ocean Isle Beach Terminal Groin

Sample Name: OIB000 008TROUGH

Analysis Date: 04-12-13

Analyzed By: ATP

Easting (ft): <b>2,185,027</b>	Northing (ft): <b>54,507</b>	Coordinate System: <b>North Carolina State Plane</b>	Elevation (ft): <b>-5.0 NAVD 88</b>
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USCS: <b>SW</b>	Munsell: <b>Wet - 5Y-4/1 Dry - 5Y-7/1</b>	Comments:
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Dry Weight (g): <b>109.65</b>	Wash Weight (g): <b>108.65</b>	Pan Retained (g): <b>0.01</b>	Sieve Loss (%): <b>0.00</b>	Fines (%): <b>#200 - 0.96 #230 - 0.93</b>	Organics (%):	Carbonates (%):	Shell Hash (%): <b>1</b>
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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	0.84	0.77	0.84	0.77
4	-2.25	4.76	0.18	0.16	1.02	0.93
5	-2.00	4.00	0.42	0.38	1.44	1.31
7	-1.50	2.83	0.82	0.75	2.26	2.06
10	-1.00	2.00	0.75	0.68	3.01	2.74
14	-0.50	1.41	1.29	1.18	4.30	3.92
18	0.00	1.00	2.14	1.95	6.44	5.87
25	0.50	0.71	2.75	2.51	9.19	8.38
35	1.00	0.50	6.56	5.98	15.75	14.36
45	1.50	0.35	11.69	10.66	27.44	25.02
60	2.00	0.25	17.97	16.39	45.41	41.41
80	2.50	0.18	25.76	23.49	71.17	64.90
120	3.00	0.13	30.29	27.62	101.46	92.52
170	3.50	0.09	6.92	6.31	108.38	98.83
200	3.75	0.07	0.23	0.21	108.61	99.04
230	4.00	0.06	0.03	0.03	108.64	99.07

Shell Hash calculated from visual estimate of shell <4.75mm and >2.8mm.

Phi 5	Phi 16	Phi 25	Phi 50	Phi 75	Phi 84	Phi 95
3.20	2.85	2.68	2.18	1.50	1.08	-0.22
Moment Statistics	Mean Phi	Mean mm	Sorting	Skewness	Kurtosis	
	1.92	0.26	1.07	-1.71	6.82	

GRANULARMETRIC REPORT OIB\_NATIVESSE\_APRIL2013\_NAVD.GPJ\_JPBRAZIL.GDT 3/18/14

# Granularmetric Report

Depths and elevations based on measured values



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

Project Name: Ocean Isle Beach Terminal Groin

Sample Name: OIB000 009 BARCRST

Analysis Date: 03-17-14

Analyzed By: TM

Easting (ft):

Northing (ft):

Coordinate System:

Elevation (ft):

North Carolina State Plane

-6.5 NAVD 88

USCS:

SP

Munsell:

Wet - 5Y-5/1  
Dry - 5Y-6/1  
Washed - 5Y-7/1

Comments:

Dry Weight (g):

96.90

Wash Weight (g):

95.90

Pan Retained (g):

0.02

Sieve Loss (%):

0.02

Fines (%):

#200 - 1.10  
#230 - 1.08

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	0.09	0.09	0.09	0.09
7	-1.50	2.83	0.09	0.09	0.18	0.18
10	-1.00	2.00	0.15	0.15	0.33	0.33
14	-0.50	1.41	0.21	0.22	0.54	0.55
18	0.00	1.00	0.30	0.31	0.84	0.86
25	0.50	0.71	0.98	1.01	1.82	1.87
35	1.00	0.50	3.23	3.33	5.05	5.20
45	1.50	0.35	7.60	7.84	12.65	13.04
60	2.00	0.25	17.68	18.25	30.33	31.29
80	2.50	0.18	33.61	34.69	63.94	65.98
120	3.00	0.13	28.45	29.36	92.39	95.34
170	3.50	0.09	3.28	3.38	95.67	98.72
200	3.75	0.07	0.17	0.18	95.84	98.90
230	4.00	0.06	0.02	0.02	95.86	98.92

Shell Hash calculated from visual estimate of shell <4.75mm and >2.8mm.

Phi 5	Phi 16	Phi 25	Phi 50	Phi 75	Phi 84	Phi 95
2.99	2.81	2.65	2.27	1.83	1.58	0.97
Moment	Mean Phi	Mean mm	Sorting	Skewness	Kurtosis	
Statistics	2.17	0.22	0.66	-1.45	7.49	

GRANULARMETRIC REPORT OIB\_NATIVESS\_APRIL2013\_NAVD.GPJ\_JPBRAZIL.GDT 3/18/14

# Granularmetric Report

Depths and elevations based on measured values



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

Project Name: Ocean Isle Beach Terminal Groin

Sample Name: OIB000 010 (-8.75 ft)

Analysis Date: 06-14-13

Analyzed By: ATP

Easting (ft): <b>2,184,983</b>	Northing (ft): <b>54,082</b>	Coordinate System: <b>North Carolina State Plane</b>	Elevation (ft): <b>-8.8 NAVD 88</b>
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USCS: <b>SP</b>	Munsell: <b>Wet - 5Y-5/1 Dry - 5Y-6/1</b>	Comments:
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Dry Weight (g): <b>139.65</b>	Wash Weight (g): <b>137.62</b>	Pan Retained (g): <b>0.09</b>	Sieve Loss (%): <b>0.00</b>	Fines (%): <b>#200 - 1.76 #230 - 1.51</b>	Organics (%):	Carbonates (%):	Shell Hash (%): <b>0</b>
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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	0.11	0.08	0.11	0.08
10	-1.00	2.00	0.08	0.06	0.19	0.14
14	-0.50	1.41	0.29	0.21	0.48	0.35
18	0.00	1.00	0.56	0.40	1.04	0.75
25	0.50	0.71	1.34	0.96	2.38	1.71
35	1.00	0.50	3.77	2.70	6.15	4.41
45	1.50	0.35	6.96	4.98	13.11	9.39
60	2.00	0.25	12.47	8.93	25.58	18.32
80	2.50	0.18	29.03	20.79	54.61	39.11
120	3.00	0.13	61.01	43.69	115.62	82.80
170	3.50	0.09	20.18	14.45	135.80	97.25
200	3.75	0.07	1.38	0.99	137.18	98.24
230	4.00	0.06	0.35	0.25	137.53	98.49

Shell Hash calculated from visual estimate of shell <4.75mm and >2.8mm.

Phi 5	Phi 16	Phi 25	Phi 50	Phi 75	Phi 84	Phi 95
3.42	3.04	2.91	2.62	2.16	1.87	1.06
Moment Statistics	Mean Phi	Mean mm	Sorting	Skewness	Kurtosis	
	2.46	0.18	0.69	-1.5	6.51	

GRANULARMETRIC REPORT OIB\_NATIVESS\_APRIL2013\_NAVD.GPJ\_JPBRAZIL.GDT 3/18/14

# Granularmetric Report

Depths and elevations based on measured values



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

Project Name: Ocean Isle Beach Terminal Groin

Sample Name: OIB000 011 (-12.5 ft)

Analysis Date: 06-14-13

Analyzed By: ATP

Easting (ft): <b>2,185,004</b>	Northing (ft): <b>53,858</b>	Coordinate System: <b>North Carolina State Plane</b>	Elevation (ft): <b>-12.5 NAVD 88</b>
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USCS: <b>SP</b>	Munsell: <b>Wet - 5Y-5/1 Dry - 5Y-6/1</b>	Comments:
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Dry Weight (g): <b>130.05</b>	Wash Weight (g): <b>127.33</b>	Pan Retained (g): <b>0.15</b>	Sieve Loss (%): <b>0.00</b>	Fines (%): <b>#200 - 2.62 #230 - 2.20</b>	Organics (%):	Carbonates (%):	Shell Hash (%): <b>0</b>
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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	0.02	0.02	0.02	0.02
10	-1.00	2.00	0.03	0.02	0.05	0.04
14	-0.50	1.41	0.11	0.08	0.16	0.12
18	0.00	1.00	0.15	0.12	0.31	0.24
25	0.50	0.71	0.26	0.20	0.57	0.44
35	1.00	0.50	0.71	0.55	1.28	0.99
45	1.50	0.35	1.19	0.92	2.47	1.91
60	2.00	0.25	2.02	1.55	4.49	3.46
80	2.50	0.18	13.51	10.39	18.00	13.85
120	3.00	0.13	75.11	57.75	93.11	71.60
170	3.50	0.09	30.77	23.66	123.88	95.26
200	3.75	0.07	2.76	2.12	126.64	97.38
230	4.00	0.06	0.54	0.42	127.18	97.80

Shell Hash calculated from visual estimate of shell <4.75mm and >2.8mm.

Phi 5	Phi 16	Phi 25	Phi 50	Phi 75	Phi 84	Phi 95
3.49	3.26	3.07	2.81	2.60	2.52	2.07
Moment Statistics	Mean Phi	Mean mm	Sorting	Skewness	Kurtosis	
	2.79	0.14	0.46	-2.2	15.12	

GRANULARMETRIC REPORT OIB\_NATIVESS\_APRIL2013\_NAVD.GPJ\_JPBRAZIL.GDT 3/18/14

# Granularmetric Report

Depths and elevations based on measured values



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

Project Name: Ocean Isle Beach Terminal Groin

Sample Name: OIB000 012 (-16.25 ft)

Analysis Date: 06-14-13

Analyzed By: ATP

Easting (ft): <b>2,185,049</b>	Northing (ft): <b>53,253</b>	Coordinate System: <b>North Carolina State Plane</b>	Elevation (ft): <b>-16.3 NAVD 88</b>
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USCS: <b>SP</b>	Munsell: <b>Wet - 5Y-4/1 Dry - 5Y-6/1</b>	Comments:
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Dry Weight (g): <b>126.01</b>	Wash Weight (g): <b>122.92</b>	Pan Retained (g): <b>0.79</b>	Sieve Loss (%): <b>0.00</b>	Fines (%): <b>#200 - 3.34 #230 - 3.09</b>	Organics (%):	Carbonates (%):	Shell Hash (%): <b>0</b>
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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	0.02	0.04	0.03
14	-0.50	1.41	0.03	0.02	0.07	0.05
18	0.00	1.00	0.05	0.04	0.12	0.09
25	0.50	0.71	0.15	0.12	0.27	0.21
35	1.00	0.50	0.31	0.25	0.58	0.46
45	1.50	0.35	0.57	0.45	1.15	0.91
60	2.00	0.25	2.06	1.63	3.21	2.54
80	2.50	0.18	12.80	10.16	16.01	12.70
120	3.00	0.13	60.43	47.96	76.44	60.66
170	3.50	0.09	41.56	32.98	118.00	93.64
200	3.75	0.07	3.81	3.02	121.81	96.66
230	4.00	0.06	0.32	0.25	122.13	96.91

Shell Hash calculated from visual estimate of shell <4.75mm and >2.8mm.

Phi 5	Phi 16	Phi 25	Phi 50	Phi 75	Phi 84	Phi 95
3.61	3.35	3.22	2.89	2.63	2.53	2.12
Moment Statistics	Mean Phi	Mean mm	Sorting	Skewness	Kurtosis	
	2.86	0.14	0.43	-1.61	11.57	

GRANULARMETRIC REPORT OIB\_NATIVESS\_APRIL2013\_NAVD.GPJ\_JPBRAZIL.GDT 3/18/14

# Granularmetric Report

Depths and elevations based on measured values



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

Project Name: Ocean Isle Beach Terminal Groin

Sample Name: OIB000 013 (-20 ft)

Analysis Date: 06-14-13

Analyzed By: ATP

Easting (ft): <b>2,185,111</b>	Northing (ft): <b>52,713</b>	Coordinate System: <b>North Carolina State Plane</b>	Elevation (ft): <b>-20.0 NAVD 88</b>
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USCS: <b>SW</b>	Munsell: <b>Wet - 5Y-4/1 Dry - 5Y-6/1</b>	Comments:
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Dry Weight (g): <b>149.72</b>	Wash Weight (g): <b>145.45</b>	Pan Retained (g): <b>0.33</b>	Sieve Loss (%): <b>0.00</b>	Fines (%): <b>#200 - 3.87 #230 - 3.08</b>	Organics (%):	Carbonates (%):	Shell Hash (%): <b>0</b>
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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	2.77	1.85	2.77	1.85
5/16"	-3.00	8.00	0.00	0.00	2.77	1.85
3.5	-2.50	5.66	0.46	0.31	3.23	2.16
4	-2.25	4.76	0.04	0.03	3.27	2.19
5	-2.00	4.00	0.24	0.16	3.51	2.35
7	-1.50	2.83	0.47	0.31	3.98	2.66
10	-1.00	2.00	0.39	0.26	4.37	2.92
14	-0.50	1.41	0.30	0.20	4.67	3.12
18	0.00	1.00	0.22	0.15	4.89	3.27
25	0.50	0.71	0.35	0.23	5.24	3.50
35	1.00	0.50	0.80	0.53	6.04	4.03
45	1.50	0.35	1.84	1.23	7.88	5.26
60	2.00	0.25	5.47	3.65	13.35	8.91
80	2.50	0.18	26.21	17.51	39.56	26.42
120	3.00	0.13	62.56	41.78	102.12	68.20
170	3.50	0.09	36.99	24.71	139.11	92.91
200	3.75	0.07	4.82	3.22	143.93	96.13
230	4.00	0.06	1.19	0.79	145.12	96.92

Shell Hash calculated from visual estimate of shell <4.75mm and >2.8mm.

Phi 5	Phi 16	Phi 25	Phi 50	Phi 75	Phi 84	Phi 95
3.66	3.32	3.14	2.78	2.46	2.20	1.39
Moment Statistics	Mean Phi	Mean mm	Sorting	Skewness	Kurtosis	
	2.56	0.17	1.14	-3.99	21.08	

GRANULARMETRIC REPORT OIB\_NATIVESS\_APRIL2013\_NAVD.GPJ\_JPBRAZIL.GDT 3/18/14

# Granularmetric Report

Depths and elevations based on measured values



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

Project Name: Ocean Isle Beach Terminal Groin

Sample Name: OIB010 001 DUNE

Analysis Date: 04-10-13

Analyzed By: ATP

Easting (ft):  
 2,183,878

Northing (ft):  
 54,341

Coordinate System:  
 North Carolina State Plane

Elevation (ft):  
 15.2 NAVD 88

USCS: SP      Munsell: Wet - 5Y-6/1  
 Dry - 5Y-7/1      Comments:

Dry Weight (g): 119.61      Wash Weight (g): 119.37      Pan Retained (g): 0.00      Sieve Loss (%): 0.08  
 Finer (%): #200 - 0.36      Organics (%):      Carbonates (%):      Shell Hash (%): 0  
 #230 - 0.28

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 1/2"	-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	0.00	0.00	0.00	0.00
14	-0.50	1.41	0.00	0.00	0.00	0.00
18	0.00	1.00	0.00	0.00	0.00	0.00
25	0.50	0.71	0.01	0.01	0.01	0.01
35	1.00	0.50	0.17	0.14	0.18	0.15
45	1.50	0.35	7.46	6.24	7.64	6.39
60	2.00	0.25	31.37	26.23	39.01	32.62
80	2.50	0.18	47.88	40.03	86.89	72.65
120	3.00	0.13	27.12	22.67	114.01	95.32
170	3.50	0.09	4.75	3.97	118.76	99.29
200	3.75	0.07	0.42	0.35	119.18	99.64
230	4.00	0.06	0.10	0.08	119.28	99.72

Shell Hash calculated from visual estimate of shell <4.75mm and >2.8mm.

Phi 5	Phi 16	Phi 25	Phi 50	Phi 75	Phi 84	Phi 95
2.99	2.75	2.55	2.22	1.85	1.68	1.39
Moment	Mean Phi	Mean mm	Sorting	Skewness	Kurtosis	
Statistics	2.21	0.22	0.49	0.05	2.85	

GRANULARMETRIC REPORT OIB\_NATIVESS\_APRIL2013\_NAVD.GPJ\_JPBRAZIL.GDT 3/18/14

# Granularmetric Report

Depths and elevations based on measured values



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

Project Name: Ocean Isle Beach Terminal Groin

Sample Name: OIB010 002 TOD

Analysis Date: 04-10-13

Analyzed By: ATP

Easting (ft): <b>2,183,863</b>	Northing (ft): <b>54,318</b>	Coordinate System: <b>North Carolina State Plane</b>	Elevation (ft): <b>5.2 NAVD 88</b>
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USCS: <b>SP</b>	Munsell: <b>Wet - 5Y-6/1 Dry - 5Y-7/1</b>	Comments:
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Dry Weight (g): <b>114.94</b>	Wash Weight (g): <b>114.66</b>	Pan Retained (g): <b>0.01</b>	Sieve Loss (%): <b>0.09</b>	Fines (%): <b>#200 - 0.35 #230 - 0.35</b>	Organics (%):	Carbonates (%):	Shell Hash (%): <b>0</b>
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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	0.00	0.00	0.00	0.00
14	-0.50	1.41	0.02	0.02	0.02	0.02
18	0.00	1.00	0.12	0.10	0.14	0.12
25	0.50	0.71	0.12	0.10	0.26	0.22
35	1.00	0.50	4.63	4.03	4.89	4.25
45	1.50	0.35	30.59	26.61	35.48	30.86
60	2.00	0.25	56.14	48.84	91.62	79.70
80	2.50	0.18	19.77	17.20	111.39	96.90
120	3.00	0.13	2.62	2.28	114.01	99.18
170	3.50	0.09	0.52	0.45	114.53	99.63
200	3.75	0.07	0.02	0.02	114.55	99.65
230	4.00	0.06	0.00	0.00	114.55	99.65

Shell Hash calculated from visual estimate of shell <4.75mm and >2.8mm.

Phi 5	Phi 16	Phi 25	Phi 50	Phi 75	Phi 84	Phi 95
2.44	2.12	1.95	1.70	1.39	1.22	1.01
Moment	Mean Phi	Mean mm	Sorting	Skewness	Kurtosis	
Statistics	1.69	0.31	0.43	0.09	4.03	

GRANULARMETRIC REPORT OIB\_NATIVESS\_APRIL2013\_NAVD.GPJ\_JPBRAZIL.GDT 3/18/14



# Granularmetric Report

Depths and elevations based on measured values



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

Project Name: Ocean Isle Beach Terminal Groin

Sample Name: OIB010 003MidBerm

Analysis Date: 04-10-13

Analyzed By: ATP

Easting (ft): <b>2,183,805</b>	Northing (ft): <b>54,281</b>	Coordinate System: <b>North Carolina State Plane</b>	Elevation (ft): <b>4.7 NAVD 88</b>
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USCS: <b>SP</b>	Munsell: <b>Wet - 5Y-6/1 Dry - 5Y-7/1</b>	Comments:
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Dry Weight (g): <b>120.02</b>	Wash Weight (g): <b>119.75</b>	Pan Retained (g): <b>0.01</b>	Sieve Loss (%): <b>0.01</b>	Fines (%): <b>#200 - 0.23 #230 - 0.23</b>	Organics (%):	Carbonates (%):	Shell Hash (%): <b>0</b>
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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	0.01	0.01	0.01	0.01
14	-0.50	1.41	0.01	0.01	0.02	0.02
18	0.00	1.00	0.02	0.02	0.04	0.04
25	0.50	0.71	0.19	0.16	0.23	0.20
35	1.00	0.50	4.70	3.92	4.93	4.12
45	1.50	0.35	36.80	30.66	41.73	34.78
60	2.00	0.25	59.84	49.86	101.57	84.64
80	2.50	0.18	16.82	14.01	118.39	98.65
120	3.00	0.13	1.19	0.99	119.58	99.64
170	3.50	0.09	0.14	0.12	119.72	99.76
200	3.75	0.07	0.01	0.01	119.73	99.77
230	4.00	0.06	0.00	0.00	119.73	99.77

Shell Hash calculated from visual estimate of shell <4.75mm and >2.8mm.

<b>Phi 5</b>	<b>Phi 16</b>	<b>Phi 25</b>	<b>Phi 50</b>	<b>Phi 75</b>	<b>Phi 84</b>	<b>Phi 95</b>
2.37	1.99	1.90	1.65	1.34	1.19	1.01
<b>Moment</b>	<b>Mean Phi</b>	<b>Mean mm</b>	<b>Sorting</b>	<b>Skewness</b>	<b>Kurtosis</b>	
<b>Statistics</b>	1.64	0.32	0.4	-0.01	3.76	

GRANULARMETRIC REPORT OIB\_NATIVESS\_APRIL2013\_NAVD.GPJ\_JPBRAZIL.GDT 3/18/14

# Granularmetric Report

Depths and elevations based on measured values



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

Project Name: Ocean Isle Beach Terminal Groin

Sample Name: OIB010 004BermCrest

Analysis Date: 04-10-13

Analyzed By: ATP

Easting (ft):

2,183,810

Northing (ft):

54,274

Coordinate System:

North Carolina State Plane

Elevation (ft):

3.5 NAVD 88

USCS:

SP

Munsell:

Wet - 5Y-6/1  
Dry - 5Y-7/1

Comments:

Dry Weight (g):

113.73

Wash Weight (g):

113.51

Pan Retained (g):

0.00

Sieve Loss (%):

0.04

Fines (%):

#200 - 0.23  
#230 - 0.23

Organics (%):

Carbonates (%):

Shell Hash (%):

0

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	0.05	0.04	0.05	0.04
14	-0.50	1.41	0.07	0.06	0.12	0.10
18	0.00	1.00	0.16	0.14	0.28	0.24
25	0.50	0.71	0.94	0.83	1.22	1.07
35	1.00	0.50	10.02	8.81	11.24	9.88
45	1.50	0.35	36.44	32.04	47.68	41.92
60	2.00	0.25	48.57	42.71	96.25	84.63
80	2.50	0.18	15.59	13.71	111.84	98.34
120	3.00	0.13	1.42	1.25	113.26	99.59
170	3.50	0.09	0.19	0.17	113.45	99.76
200	3.75	0.07	0.01	0.01	113.46	99.77
230	4.00	0.06	0.00	0.00	113.46	99.77

Shell Hash calculated from visual estimate of shell <4.75mm and >2.8mm.

Phi 5	Phi 16	Phi 25	Phi 50	Phi 75	Phi 84	Phi 95
2.38	1.99	1.89	1.59	1.24	1.10	0.72
Moment	Mean Phi	Mean mm	Sorting	Skewness	Kurtosis	
Statistics	1.57	0.34	0.47	-0.27	4.17	

GRANULARMETRIC REPORT OIB\_NATIVESS\_APRIL2013\_NAVD.GPJ\_JPBRAZIL.GDT 3/18/14

# Granularmetric Report

Depths and elevations based on measured values



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

Project Name: Ocean Isle Beach Terminal Groin

Sample Name: OIB010 005 MHW

Analysis Date: 04-10-13

Analyzed By: ATP

Easting (ft): <b>2,183,810</b>	Northing (ft): <b>54,257</b>	Coordinate System: <b>North Carolina State Plane</b>	Elevation (ft): <b>1.6 NAVD 88</b>
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USCS: <b>SP</b>	Munsell: <b>Wet - 5Y-6/1 Dry - 5Y-7/1</b>	Comments:
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Dry Weight (g): <b>111.61</b>	Wash Weight (g): <b>111.14</b>	Pan Retained (g): <b>0.00</b>	Sieve Loss (%): <b>0.03</b>	Fines (%): <b>#200 - 0.45 #230 - 0.45</b>	Organics (%):	Carbonates (%):	Shell Hash (%): <b>0</b>
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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	0.01	0.01	0.01	0.01
14	-0.50	1.41	0.00	0.00	0.01	0.01
18	0.00	1.00	0.05	0.04	0.06	0.05
25	0.50	0.71	0.29	0.26	0.35	0.31
35	1.00	0.50	2.57	2.30	2.92	2.61
45	1.50	0.35	18.49	16.57	21.41	19.18
60	2.00	0.25	50.82	45.53	72.23	64.71
80	2.50	0.18	31.92	28.60	104.15	93.31
120	3.00	0.13	6.62	5.93	110.77	99.24
170	3.50	0.09	0.32	0.29	111.09	99.53
200	3.75	0.07	0.02	0.02	111.11	99.55
230	4.00	0.06	0.00	0.00	111.11	99.55

Shell Hash calculated from visual estimate of shell <4.75mm and >2.8mm.

<b>Phi 5</b>	<b>Phi 16</b>	<b>Phi 25</b>	<b>Phi 50</b>	<b>Phi 75</b>	<b>Phi 84</b>	<b>Phi 95</b>
2.64	2.34	2.18	1.84	1.56	1.40	1.07
<b>Moment</b>	<b>Mean Phi</b>	<b>Mean mm</b>	<b>Sorting</b>	<b>Skewness</b>	<b>Kurtosis</b>	
<b>Statistics</b>	1.85	0.28	0.45	-0.13	3.63	

GRANULARMETRIC REPORT OIB\_NATIVESS\_APRIL2013\_NAVD.GPJ\_JPBRAZIL.GDT 3/18/14

# Granularmetric Report

Depths and elevations based on measured values



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

Project Name: Ocean Isle Beach Terminal Groin

Sample Name: OIB010 006 MTL

Analysis Date: 04-10-13

Analyzed By: ATP

Easting (ft): <b>2,183,812</b>	Northing (ft): <b>54,241</b>	Coordinate System: <b>North Carolina State Plane</b>	Elevation (ft): <b>0.2 NAVD 88</b>
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USCS: <b>SP</b>	Munsell: <b>Wet - 5Y-5/1 Dry - 5Y-7/1</b>	Comments:
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Dry Weight (g): <b>96.06</b>	Wash Weight (g): <b>95.22</b>	Pan Retained (g): <b>0.01</b>	Sieve Loss (%): <b>0.00</b>	Fines (%): <b>#200 - 0.90 #230 - 0.90</b>	Organics (%):	Carbonates (%):	Shell Hash (%): <b>0</b>
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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	0.00	0.00	0.00	0.00
14	-0.50	1.41	0.03	0.03	0.03	0.03
18	0.00	1.00	0.11	0.11	0.14	0.14
25	0.50	0.71	0.47	0.49	0.61	0.63
35	1.00	0.50	5.90	6.14	6.51	6.77
45	1.50	0.35	19.45	20.25	25.96	27.02
60	2.00	0.25	31.92	33.23	57.88	60.25
80	2.50	0.18	26.92	28.02	84.80	88.27
120	3.00	0.13	9.82	10.22	94.62	98.49
170	3.50	0.09	0.58	0.60	95.20	99.09
200	3.75	0.07	0.01	0.01	95.21	99.10
230	4.00	0.06	0.00	0.00	95.21	99.10

Shell Hash calculated from visual estimate of shell <4.75mm and >2.8mm.

Phi 5	Phi 16	Phi 25	Phi 50	Phi 75	Phi 84	Phi 95
2.83	2.42	2.26	1.85	1.45	1.23	0.86
Moment	Mean Phi	Mean mm	Sorting	Skewness	Kurtosis	
Statistics	1.83	0.28	0.56	-0.19	2.89	

GRANULARMETRIC REPORT OIB\_NATIVESSESS\_APRIL2013\_NAVD.GPJ\_JPBRAZIL.GDT 3/18/14

# Granularmetric Report

Depths and elevations based on measured values



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

Project Name: Ocean Isle Beach Terminal Groin

Sample Name: OIB010 007 MLW

Analysis Date: 04-12-13

Analyzed By: ATP

Easting (ft): <b>2,183,837</b>	Northing (ft): <b>54,097</b>	Coordinate System: <b>North Carolina State Plane</b>	Elevation (ft): <b>-3.1 NAVD 88</b>
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USCS: <b>SP</b>	Munsell: <b>Wet - 5Y-5/1 Dry - 5Y-7/2</b>	Comments:
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Dry Weight (g): <b>124.15</b>	Wash Weight (g): <b>122.87</b>	Pan Retained (g): <b>0.00</b>	Sieve Loss (%): <b>0.06</b>	Fines (%): <b>#200 - 1.12 #230 - 1.12</b>	Organics (%):	Carbonates (%):	Shell Hash (%): <b>0</b>
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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	0.09	0.07	0.09	0.07
5	-2.00	4.00	0.00	0.00	0.09	0.07
7	-1.50	2.83	0.04	0.03	0.13	0.10
10	-1.00	2.00	0.08	0.06	0.21	0.16
14	-0.50	1.41	0.44	0.35	0.65	0.51
18	0.00	1.00	2.00	1.61	2.65	2.12
25	0.50	0.71	13.04	10.50	15.69	12.62
35	1.00	0.50	47.43	38.20	63.12	50.82
45	1.50	0.35	24.76	19.94	87.88	70.76
60	2.00	0.25	16.79	13.52	104.67	84.28
80	2.50	0.18	13.01	10.48	117.68	94.76
120	3.00	0.13	4.82	3.88	122.50	98.64
170	3.50	0.09	0.28	0.23	122.78	98.87
200	3.75	0.07	0.01	0.01	122.79	98.88
230	4.00	0.06	0.00	0.00	122.79	98.88

Shell Hash calculated from visual estimate of shell <4.75mm and >2.8mm.

Phi 5	Phi 16	Phi 25	Phi 50	Phi 75	Phi 84	Phi 95
2.53	1.99	1.66	0.99	0.66	0.54	0.14
Moment	Mean Phi	Mean mm	Sorting	Skewness	Kurtosis	
Statistics	1.15	0.45	0.71	0.37	3.31	

GRANULARMETRIC REPORT OIB\_NATIVESS\_APRIL2013\_NAVD.GPJ\_JPBRAZIL.GDT 3/18/14

# Granularmetric Report

Depths and elevations based on measured values



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

Project Name: Ocean Isle Beach Terminal Groin

Sample Name: OIB010 008TROUGH

Analysis Date: 04-12-13

Analyzed By: ATP

Easting (ft): <b>2,183,841</b>	Northing (ft): <b>54,044</b>	Coordinate System: <b>North Carolina State Plane</b>	Elevation (ft): <b>-5.0 NAVD 88</b>
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USCS: <b>SP</b>	Munsell: <b>Wet - 5Y-4/1 Dry - 5Y-7/1</b>	Comments:
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Dry Weight (g): <b>108.99</b>	Wash Weight (g): <b>107.85</b>	Pan Retained (g): <b>0.00</b>	Sieve Loss (%): <b>0.00</b>	Fines (%): <b>#200 - 1.06 #230 - 1.03</b>	Organics (%):	Carbonates (%):	Shell Hash (%): <b>0</b>
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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	0.01	0.01	0.01	0.01
4	-2.25	4.76	0.00	0.00	0.01	0.01
5	-2.00	4.00	0.21	0.19	0.22	0.20
7	-1.50	2.83	0.05	0.05	0.27	0.25
10	-1.00	2.00	0.02	0.02	0.29	0.27
14	-0.50	1.41	0.19	0.17	0.48	0.44
18	0.00	1.00	0.25	0.23	0.73	0.67
25	0.50	0.71	0.50	0.46	1.23	1.13
35	1.00	0.50	1.50	1.38	2.73	2.51
45	1.50	0.35	3.91	3.59	6.64	6.10
60	2.00	0.25	10.94	10.04	17.58	16.14
80	2.50	0.18	40.20	36.88	57.78	53.02
120	3.00	0.13	43.55	39.96	101.33	92.98
170	3.50	0.09	6.32	5.80	107.65	98.78
200	3.75	0.07	0.17	0.16	107.82	98.94
230	4.00	0.06	0.03	0.03	107.85	98.97

Shell Hash calculated from visual estimate of shell <4.75mm and >2.8mm.

Phi 5	Phi 16	Phi 25	Phi 50	Phi 75	Phi 84	Phi 95
3.17	2.89	2.78	2.46	2.12	1.99	1.35
Moment	Mean Phi	Mean mm	Sorting	Skewness	Kurtosis	
Statistics	2.37	0.19	0.58	-2.24	14.06	

GRANULARMETRIC REPORT OIB\_NATIVESS\_APRIL2013\_NAVD.GPJ\_JPBRAZIL.GDT 3/18/14

# Granularmetric Report

Depths and elevations based on measured values



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

Project Name: Ocean Isle Beach Terminal Groin

Sample Name: OIB010 009BarCrest

Analysis Date: 02-04-14

Analyzed By: TM

Easting (ft):

Northing (ft):

Coordinate System:

Elevation (ft):

North Carolina State Plane

-6.5 NAVD 88

USCS:

SP

Munsell:

Wet - 5Y-5/1  
Dry - 5Y-6/1  
Washed - 5Y-7/1

Comments:

Dry Weight (g):

95.05

Wash Weight (g):

94.08

Pan Retained (g):

0.00

Sieve Loss (%):

0.15

Fines (%):

#200 - 1.17  
#230 - 1.17

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	0.00	0.00	0.00	0.00
7	-1.50	2.83	0.00	0.00	0.00	0.00
10	-1.00	2.00	0.03	0.03	0.03	0.03
14	-0.50	1.41	0.06	0.06	0.09	0.09
18	0.00	1.00	0.12	0.13	0.21	0.22
25	0.50	0.71	0.28	0.29	0.49	0.51
35	1.00	0.50	1.74	1.83	2.23	2.34
45	1.50	0.35	7.01	7.38	9.24	9.72
60	2.00	0.25	21.49	22.61	30.73	32.33
80	2.50	0.18	35.49	37.34	66.22	69.67
120	3.00	0.13	25.08	26.39	91.30	96.06
170	3.50	0.09	2.57	2.70	93.87	98.76
200	3.75	0.07	0.07	0.07	93.94	98.83
230	4.00	0.06	0.00	0.00	93.94	98.83

Shell Hash calculated from visual estimate of shell <4.75mm and >2.8mm.

Phi 5	Phi 16	Phi 25	Phi 50	Phi 75	Phi 84	Phi 95
2.98	2.77	2.60	2.24	1.84	1.64	1.18
Moment	Mean Phi	Mean mm	Sorting	Skewness	Kurtosis	
Statistics	2.18	0.22	0.54	-0.74	4.47	

GRANULARMETRIC REPORT OIB\_NATIVESS\_APRIL2013\_NAVD.GPJ\_JPBRAZIL.GDT 3/18/14

# Granularmetric Report

Depths and elevations based on measured values



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

Project Name: Ocean Isle Beach Terminal Groin

Sample Name: OIB010 010 (-8.75 ft)

Analysis Date: 06-14-13

Analyzed By: ATP

Easting (ft): <b>2,183,895</b>	Northing (ft): <b>53,791</b>	Coordinate System: <b>North Carolina State Plane</b>	Elevation (ft): <b>-8.8 NAVD 88</b>
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USCS: <b>SP</b>	Munsell: <b>Wet - 5Y-5/1 Dry - 5Y-6/1</b>	Comments:
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Dry Weight (g): <b>176.51</b>	Wash Weight (g): <b>173.96</b>	Pan Retained (g): <b>0.10</b>	Sieve Loss (%): <b>0.00</b>	Fines (%): <b>#200 - 1.71 #230 - 1.52</b>	Organics (%):	Carbonates (%):	Shell Hash (%): <b>0</b>
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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	0.07	0.04	0.07	0.04
4	-2.25	4.76	0.07	0.04	0.14	0.08
5	-2.00	4.00	0.11	0.06	0.25	0.14
7	-1.50	2.83	0.20	0.11	0.45	0.25
10	-1.00	2.00	0.28	0.16	0.73	0.41
14	-0.50	1.41	0.55	0.31	1.28	0.72
18	0.00	1.00	1.05	0.59	2.33	1.31
25	0.50	0.71	2.64	1.50	4.97	2.81
35	1.00	0.50	7.40	4.19	12.37	7.00
45	1.50	0.35	12.00	6.80	24.37	13.80
60	2.00	0.25	19.44	11.01	43.81	24.81
80	2.50	0.18	48.00	27.19	91.81	52.00
120	3.00	0.13	63.23	35.82	155.04	87.82
170	3.50	0.09	17.10	9.69	172.14	97.51
200	3.75	0.07	1.38	0.78	173.52	98.29
230	4.00	0.06	0.34	0.19	173.86	98.48

Shell Hash calculated from visual estimate of shell <4.75mm and >2.8mm.

Phi 5	Phi 16	Phi 25	Phi 50	Phi 75	Phi 84	Phi 95
3.37	2.95	2.82	2.46	2.00	1.60	0.76
Moment Statistics	Mean Phi	Mean mm	Sorting	Skewness	Kurtosis	
	2.28	0.21	0.77	-1.52	6.97	

GRANULARMETRIC REPORT OIB\_NATIVESS\_APRIL2013\_NAVD.GPJ\_JPBRAZIL.GDT 3/18/14



# Granularmetric Report

Depths and elevations based on measured values



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

Project Name: Ocean Isle Beach Terminal Groin

Sample Name: OIB010 011 (-12.5 ft)

Analysis Date: 06-14-13

Analyzed By: ATP

Easting (ft): <b>2,183,919</b>	Northing (ft): <b>53,540</b>	Coordinate System: <b>North Carolina State Plane</b>	Elevation (ft): <b>-12.5 NAVD 88</b>
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USCS: <b>SP</b>	Munsell: <b>Wet - 5Y-4/1 Dry - 5Y-6/1</b>	Comments:
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Dry Weight (g): <b>125.65</b>	Wash Weight (g): <b>122.65</b>	Pan Retained (g): <b>0.36</b>	Sieve Loss (%): <b>0.00</b>	Fines (%): <b>#200 - 3.80 #230 - 2.66</b>	Organics (%):	Carbonates (%):	Shell Hash (%): <b>0</b>
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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	0.09	0.07	0.10	0.08
10	-1.00	2.00	0.01	0.01	0.11	0.09
14	-0.50	1.41	0.04	0.03	0.15	0.12
18	0.00	1.00	0.06	0.05	0.21	0.17
25	0.50	0.71	0.12	0.10	0.33	0.27
35	1.00	0.50	0.36	0.29	0.69	0.56
45	1.50	0.35	0.79	0.63	1.48	1.19
60	2.00	0.25	1.86	1.48	3.34	2.67
80	2.50	0.18	6.31	5.02	9.65	7.69
120	3.00	0.13	52.43	41.73	62.08	49.42
170	3.50	0.09	52.55	41.82	114.63	91.24
200	3.75	0.07	6.23	4.96	120.86	96.20
230	4.00	0.06	1.43	1.14	122.29	97.34

Shell Hash calculated from visual estimate of shell <4.75mm and >2.8mm.

Phi 5	Phi 16	Phi 25	Phi 50	Phi 75	Phi 84	Phi 95
3.69	3.41	3.31	3.01	2.71	2.60	2.23
Moment	Mean Phi	Mean mm	Sorting	Skewness	Kurtosis	
Statistics	2.96	0.13	0.45	-2.4	18.93	

GRANULARMETRIC REPORT OIB\_NATIVESS\_APRIL2013\_NAVD.GPJ\_JPBRAZIL.GDT 3/18/14

# Granularmetric Report

Depths and elevations based on measured values



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

Project Name: Ocean Isle Beach Terminal Groin

Sample Name: OIB010 012 (-16.25 ft)

Analysis Date: 06-14-13

Analyzed By: ATP

Easting (ft): <b>2,183,968</b>	Northing (ft): <b>53,188</b>	Coordinate System: <b>North Carolina State Plane</b>	Elevation (ft): <b>-16.3 NAVD 88</b>
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USCS: <b>SP</b>	Munsell: <b>Wet - 5Y-4/1 Dry - 5Y-6/2</b>	Comments:
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Dry Weight (g): <b>128.02</b>	Wash Weight (g): <b>124.56</b>	Pan Retained (g): <b>1.66</b>	Sieve Loss (%): <b>0.00</b>	Fines (%): <b>#200 - 4.15 #230 - 4.03</b>	Organics (%):	Carbonates (%):	Shell Hash (%): <b>0</b>
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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	0.04	0.05	0.04
4	-2.25	4.76	0.21	0.16	0.26	0.20
5	-2.00	4.00	0.21	0.16	0.47	0.36
7	-1.50	2.83	0.27	0.21	0.74	0.57
10	-1.00	2.00	0.21	0.16	0.95	0.73
14	-0.50	1.41	0.29	0.23	1.24	0.96
18	0.00	1.00	0.27	0.21	1.51	1.17
25	0.50	0.71	0.51	0.40	2.02	1.57
35	1.00	0.50	1.26	0.98	3.28	2.55
45	1.50	0.35	2.54	1.98	5.82	4.53
60	2.00	0.25	6.06	4.73	11.88	9.26
80	2.50	0.18	12.42	9.70	24.30	18.96
120	3.00	0.13	45.87	35.83	70.17	54.79
170	3.50	0.09	46.19	36.08	116.36	90.87
200	3.75	0.07	6.38	4.98	122.74	95.85
230	4.00	0.06	0.16	0.12	122.90	95.97

Shell Hash calculated from visual estimate of shell <4.75mm and >2.8mm.

Phi 5	Phi 16	Phi 25	Phi 50	Phi 75	Phi 84	Phi 95
3.71	3.40	3.28	2.93	2.58	2.35	1.55
Moment	Mean Phi	Mean mm	Sorting	Skewness	Kurtosis	
Statistics	2.77	0.15	0.74	-3.01	17.19	

GRANULARMETRIC REPORT OIB\_NATIVESS\_APRIL2013\_NAVD.GPJ\_JPBRAZIL.GDT 3/18/14

# Granularmetric Report

Depths and elevations based on measured values



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

Project Name: Ocean Isle Beach Terminal Groin

Sample Name: OIB010 013 (-20 ft)

Analysis Date: 06-14-13

Analyzed By: ATP

Easting (ft): <b>2,183,667</b>	Northing (ft): <b>52,664</b>	Coordinate System: <b>North Carolina State Plane</b>	Elevation (ft): <b>-20.0 NAVD 88</b>
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USCS: <b>SP-SM</b>	Munsell: <b>Wet - 5Y-4/2 Dry - 5Y-6/2</b>	Comments:
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Dry Weight (g): <b>138.09</b>	Wash Weight (g): <b>128.79</b>	Pan Retained (g): <b>0.82</b>	Sieve Loss (%): <b>0.00</b>	Fines (%): <b>#200 - 9.17 #230 - 7.33</b>	Organics (%):	Carbonates (%):	Shell Hash (%): <b>0</b>
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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	0.35	0.25	0.35	0.25
5/16"	-3.00	8.00	0.11	0.08	0.46	0.33
3.5	-2.50	5.66	0.14	0.10	0.60	0.43
4	-2.25	4.76	0.00	0.00	0.60	0.43
5	-2.00	4.00	0.08	0.06	0.68	0.49
7	-1.50	2.83	0.33	0.24	1.01	0.73
10	-1.00	2.00	0.23	0.17	1.24	0.90
14	-0.50	1.41	0.24	0.17	1.48	1.07
18	0.00	1.00	0.22	0.16	1.70	1.23
25	0.50	0.71	0.40	0.29	2.10	1.52
35	1.00	0.50	0.82	0.59	2.92	2.11
45	1.50	0.35	1.30	0.94	4.22	3.05
60	2.00	0.25	3.01	2.18	7.23	5.23
80	2.50	0.18	12.96	9.39	20.19	14.62
120	3.00	0.13	52.24	37.83	72.43	52.45
170	3.50	0.09	44.94	32.54	117.37	84.99
200	3.75	0.07	8.06	5.84	125.43	90.83
230	4.00	0.06	2.54	1.84	127.97	92.67

Shell Hash calculated from visual estimate of shell <4.75mm and >2.8mm.

Phi 5	Phi 16	Phi 25	Phi 50	Phi 75	Phi 84	Phi 95
	3.48	3.35	2.97	2.64	2.52	1.95
Moment	Mean Phi	Mean mm	Sorting	Skewness	Kurtosis	
Statistics	2.83	0.14	0.77	-4.17	29.95	

GRANULARMETRIC REPORT OIB\_NATIVESS\_APRIL2013\_NAVD.GPJ\_JPBRAZIL.GDT 3/18/14

# Granularmetric Report

Depths and elevations based on measured values



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

Project Name: Ocean Isle Beach Terminal Groin

Sample Name: OIB025 001 DUNE

Analysis Date: 04-12-13

Analyzed By: ATP

Easting (ft): <b>2,182,428</b>	Northing (ft): <b>53,833</b>	Coordinate System: <b>North Carolina State Plane</b>	Elevation (ft): <b>9.5 NAVD 88</b>
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USCS: <b>SP</b>	Munsell: <b>Wet - 5Y-6/1 Dry - 5Y-8/1</b>	Comments:
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Dry Weight (g): <b>120.55</b>	Wash Weight (g): <b>118.04</b>	Pan Retained (g): <b>0.00</b>	Sieve Loss (%): <b>0.08</b>	Fines (%): <b>#200 - 2.17 #230 - 2.17</b>	Organics (%):	Carbonates (%):	Shell Hash (%): <b>0</b>
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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	0.00	0.00	0.00	0.00
14	-0.50	1.41	0.00	0.00	0.00	0.00
18	0.00	1.00	0.01	0.01	0.01	0.01
25	0.50	0.71	0.10	0.08	0.11	0.09
35	1.00	0.50	1.93	1.60	2.04	1.69
45	1.50	0.35	18.32	15.20	20.36	16.89
60	2.00	0.25	55.38	45.94	75.74	62.83
80	2.50	0.18	34.33	28.48	110.07	91.31
120	3.00	0.13	7.08	5.87	117.15	97.18
170	3.50	0.09	0.76	0.63	117.91	97.81
200	3.75	0.07	0.03	0.02	117.94	97.83
230	4.00	0.06	0.00	0.00	117.94	97.83

Shell Hash calculated from visual estimate of shell <4.75mm and >2.8mm.

Phi 5	Phi 16	Phi 25	Phi 50	Phi 75	Phi 84	Phi 95
2.81	2.37	2.21	1.86	1.59	1.47	1.11
Moment Statistics	Mean Phi	Mean mm	Sorting	Skewness	Kurtosis	
	1.87	0.27	0.44	0.12	3.4	

GRANULARMETRIC REPORT OIB\_NATIVESS\_APRIL2013\_NAVD.GPJ\_JPBRAZIL.GDT 3/18/14

# Granularmetric Report

Depths and elevations based on measured values



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

Project Name: Ocean Isle Beach Terminal Groin

Sample Name: OIB025 002TOD

Analysis Date: 04-12-13

Analyzed By: ATP

Easting (ft): <b>2,182,434</b>	Northing (ft): <b>53,827</b>	Coordinate System: <b>North Carolina State Plane</b>	Elevation (ft): <b>8.3 NAVD 88</b>
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USCS: <b>SP</b>	Munsell: <b>Wet - 5Y-7/2 Dry - 5Y-7/2</b>	Comments:
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Dry Weight (g): <b>123.95</b>	Wash Weight (g): <b>123.74</b>	Pan Retained (g): <b>0.00</b>	Sieve Loss (%): <b>0.00</b>	Fines (%): <b>#200 - 0.18 #230 - 0.18</b>	Organics (%):	Carbonates (%):	Shell Hash (%): <b>0</b>
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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	0.00	0.00	0.00	0.00
14	-0.50	1.41	0.04	0.03	0.04	0.03
18	0.00	1.00	0.08	0.06	0.12	0.09
25	0.50	0.71	0.29	0.23	0.41	0.32
35	1.00	0.50	5.55	4.48	5.96	4.80
45	1.50	0.35	36.27	29.26	42.23	34.06
60	2.00	0.25	54.75	44.17	96.98	78.23
80	2.50	0.18	22.89	18.47	119.87	96.70
120	3.00	0.13	3.37	2.72	123.24	99.42
170	3.50	0.09	0.47	0.38	123.71	99.80
200	3.75	0.07	0.03	0.02	123.74	99.82
230	4.00	0.06	0.00	0.00	123.74	99.82

Shell Hash calculated from visual estimate of shell <4.75mm and >2.8mm.

Phi 5	Phi 16	Phi 25	Phi 50	Phi 75	Phi 84	Phi 95
2.45	2.16	1.96	1.68	1.35	1.19	1.00
Moment Statistics	Mean Phi	Mean mm	Sorting	Skewness	Kurtosis	
	1.68	0.31	0.45	0.1	3.67	

GRANULARMETRIC REPORT OIB\_NATIVESS\_APRIL2013\_NAVD.GPJ\_JPBRAZIL.GDT 3/18/14

# Granularmetric Report

Depths and elevations based on measured values



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

Project Name: Ocean Isle Beach Terminal Groin

Sample Name: OIB025 003MIDBERM

Analysis Date: 04-12-13

Analyzed By: ATP

Easting (ft): <b>2,182,436</b>	Northing (ft): <b>53,817</b>	Coordinate System: <b>North Carolina State Plane</b>	Elevation (ft): <b>6.2 NAVD 88</b>
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USCS: <b>SP</b>	Munsell: <b>Wet - 5Y-6/1 Dry - 5Y-7/2</b>	Comments:
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Dry Weight (g): <b>116.61</b>	Wash Weight (g): <b>116.25</b>	Pan Retained (g): <b>0.00</b>	Sieve Loss (%): <b>0.00</b>	Fines (%): <b>#200 - 0.31 #230 - 0.31</b>	Organics (%):	Carbonates (%):	Shell Hash (%): <b>0</b>
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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	0.26	0.22	0.26	0.22
10	-1.00	2.00	0.21	0.18	0.47	0.40
14	-0.50	1.41	0.23	0.20	0.70	0.60
18	0.00	1.00	0.53	0.45	1.23	1.05
25	0.50	0.71	1.87	1.60	3.10	2.65
35	1.00	0.50	10.21	8.76	13.31	11.41
45	1.50	0.35	27.86	23.89	41.17	35.30
60	2.00	0.25	42.84	36.74	84.01	72.04
80	2.50	0.18	24.66	21.15	108.67	93.19
120	3.00	0.13	6.52	5.59	115.19	98.78
170	3.50	0.09	1.01	0.87	116.20	99.65
200	3.75	0.07	0.05	0.04	116.25	99.69
230	4.00	0.06	0.00	0.00	116.25	99.69

Shell Hash calculated from visual estimate of shell <4.75mm and >2.8mm.

Phi 5	Phi 16	Phi 25	Phi 50	Phi 75	Phi 84	Phi 95
2.66	2.28	2.07	1.70	1.28	1.10	0.63
Moment Statistics	Mean Phi	Mean mm	Sorting	Skewness	Kurtosis	
	1.67	0.31	0.62	-0.74	5.92	

GRANULARMETRIC REPORT OIB\_NATIVESS\_APRIL2013\_NAVD.GPJ\_JPBRAZIL.GDT 3/18/14

# Granularmetric Report

Depths and elevations based on measured values



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

Project Name: Ocean Isle Beach Terminal Groin

Sample Name: OIB025 004BERMCRST

Analysis Date: 04-12-13

Analyzed By: ATP

Easting (ft):

2,182,437

Northing (ft):

53,798

Coordinate System:

North Carolina State Plane

Elevation (ft):

3.6 NAVD 88

USCS:

SP

Munsell:

Wet - 5Y-6/1  
Dry - 5Y-7/2

Comments:

Dry Weight (g):

120.96

Wash Weight (g):

120.63

Pan Retained (g):

0.00

Sieve Loss (%):

0.08

Fines (%):

#200 - 0.37  
#230 - 0.37

Organics (%):

Carbonates (%):

Shell Hash (%):

0

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	0.02	0.02	0.02	0.02
14	-0.50	1.41	0.01	0.01	0.03	0.03
18	0.00	1.00	0.10	0.08	0.13	0.11
25	0.50	0.71	0.32	0.26	0.45	0.37
35	1.00	0.50	4.82	3.98	5.27	4.35
45	1.50	0.35	31.46	26.01	36.73	30.36
60	2.00	0.25	53.83	44.50	90.56	74.86
80	2.50	0.18	25.85	21.37	116.41	96.23
120	3.00	0.13	3.56	2.94	119.97	99.17
170	3.50	0.09	0.53	0.44	120.50	99.61
200	3.75	0.07	0.03	0.02	120.53	99.63
230	4.00	0.06	0.00	0.00	120.53	99.63

Shell Hash calculated from visual estimate of shell <4.75mm and >2.8mm.

Phi 5	Phi 16	Phi 25	Phi 50	Phi 75	Phi 84	Phi 95
2.47	2.21	2.00	1.72	1.40	1.22	1.01
Moment	Mean Phi	Mean mm	Sorting	Skewness	Kurtosis	
Statistics	1.72	0.30	0.46	0	3.8	

GRANULARMETRIC REPORT OIB\_NATIVESSE\_APRIL2013\_NAVD.GPJ\_JPBRAZIL.GDT 3/18/14

# Granularmetric Report

Depths and elevations based on measured values



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

Project Name: Ocean Isle Beach Terminal Groin

Sample Name: OIB025 005 MHW

Analysis Date: 02-04-14

Analyzed By: TM

Easting (ft):  
2,182,434

Northing (ft):  
53,827

Coordinate System:  
North Carolina State Plane

Elevation (ft):  
1.2 NAVD 88

USCS: SP      Munsell: Wet - 5Y-5/1  
Dry - 5Y-7/1  
Washed - 5Y-7/1      Comments:

Dry Weight (g): 95.27      Wash Weight (g): 94.24      Pan Retained (g): 0.00      Sieve Loss (%): 0.12      Fines (%): #200 - 1.19  
#230 - 1.19      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	0.00	0.00	0.00	0.00
7	-1.50	2.83	0.00	0.00	0.00	0.00
10	-1.00	2.00	0.00	0.00	0.00	0.00
14	-0.50	1.41	0.00	0.00	0.00	0.00
18	0.00	1.00	0.00	0.00	0.00	0.00
25	0.50	0.71	0.08	0.08	0.08	0.08
35	1.00	0.50	0.94	0.99	1.02	1.07
45	1.50	0.35	9.50	9.97	10.52	11.04
60	2.00	0.25	33.78	35.46	44.30	46.50
80	2.50	0.18	38.42	40.33	82.72	86.83
120	3.00	0.13	10.39	10.91	93.11	97.74
170	3.50	0.09	0.97	1.02	94.08	98.76
200	3.75	0.07	0.05	0.05	94.13	98.81
230	4.00	0.06	0.00	0.00	94.13	98.81

Shell Hash calculated from visual estimate of shell <4.75mm and >2.8mm.

Phi 5	Phi 16	Phi 25	Phi 50	Phi 75	Phi 84	Phi 95
2.87	2.46	2.35	2.04	1.70	1.57	1.20
Moment	Mean Phi	Mean mm	Sorting	Skewness	Kurtosis	
Statistics	2.02	0.25	0.45	-0.09	3.21	

GRANULARMETRIC REPORT OIB\_NATIVESS\_APRIL2013\_NAVD.GPJ\_JPBRAZIL.GDT 3/18/14



# Granularmetric Report

Depths and elevations based on measured values



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

Project Name: Ocean Isle Beach Terminal Groin

Sample Name: OIB025 006 MTL

Analysis Date: 04-15-13

Analyzed By: ATP

Easting (ft): <b>2,182,445</b>	Northing (ft): <b>53,759</b>	Coordinate System: <b>North Carolina State Plane</b>	Elevation (ft): <b>0.2 NAVD 88</b>
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USCS: <b>SP</b>	Munsell: <b>Wet - 5Y-5/1 Dry - 5Y-7/1</b>	Comments:
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Dry Weight (g): <b>107.75</b>	Wash Weight (g): <b>106.66</b>	Pan Retained (g): <b>0.00</b>	Sieve Loss (%): <b>0.00</b>	Fines (%): <b>#200 - 0.99 #230 - 0.99</b>	Organics (%):	Carbonates (%):	Shell Hash (%): <b>0</b>
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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	0.11	0.10	0.11	0.10
7	-1.50	2.83	0.00	0.00	0.11	0.10
10	-1.00	2.00	0.02	0.02	0.13	0.12
14	-0.50	1.41	0.02	0.02	0.15	0.14
18	0.00	1.00	0.16	0.15	0.31	0.29
25	0.50	0.71	0.99	0.92	1.30	1.21
35	1.00	0.50	11.74	10.90	13.04	12.11
45	1.50	0.35	20.21	18.76	33.25	30.87
60	2.00	0.25	25.36	23.54	58.61	54.41
80	2.50	0.18	30.77	28.56	89.38	82.97
120	3.00	0.13	16.12	14.96	105.50	97.93
170	3.50	0.09	1.13	1.05	106.63	98.98
200	3.75	0.07	0.03	0.03	106.66	99.01
230	4.00	0.06	0.00	0.00	106.66	99.01

Shell Hash calculated from visual estimate of shell <4.75mm and >2.8mm.

Phi 5	Phi 16	Phi 25	Phi 50	Phi 75	Phi 84	Phi 95
2.90	2.53	2.36	1.91	1.34	1.10	0.67
Moment Statistics	Mean Phi	Mean mm	Sorting	Skewness	Kurtosis	
	1.84	0.28	0.67	-0.45	3.56	

GRANULARMETRIC REPORT OIB\_NATIVESS\_APRIL2013\_NAVD.GPJ\_JPBRAZIL.GDT 3/18/14

# Granularmetric Report

Depths and elevations based on measured values



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

Project Name: Ocean Isle Beach Terminal Groin

Sample Name: OIB025 007 MLW

Analysis Date: 04-15-13

Analyzed By: ATP

Easting (ft):

2,182,460

Northing (ft):

53,620

Coordinate System:

North Carolina State Plane

Elevation (ft):

-3.2 NAVD 88

USCS:

SW

Munsell:

Wet - 5Y-5/1  
Dry - 5Y-7/1

Comments:

Dry Weight (g):

117.12

Wash Weight (g):

116.11

Pan Retained (g):

0.00

Sieve Loss (%):

0.11

Fines (%):

#200 - 0.97  
#230 - 0.97

Organics (%):

Carbonates (%):

Shell Hash (%):

3

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	2.99	2.55	2.99	2.55
5/16"	-3.00	8.00	2.69	2.30	5.68	4.85
3.5	-2.50	5.66	0.86	0.73	6.54	5.58
4	-2.25	4.76	0.64	0.55	7.18	6.13
5	-2.00	4.00	1.15	0.98	8.33	7.11
7	-1.50	2.83	1.81	1.55	10.14	8.66
10	-1.00	2.00	2.40	2.05	12.54	10.71
14	-0.50	1.41	5.45	4.65	17.99	15.36
18	0.00	1.00	9.98	8.52	27.97	23.88
25	0.50	0.71	17.15	14.64	45.12	38.52
35	1.00	0.50	25.48	21.76	70.60	60.28
45	1.50	0.35	19.10	16.31	89.70	76.59
60	2.00	0.25	13.79	11.77	103.49	88.36
80	2.50	0.18	8.92	7.62	112.41	95.98
120	3.00	0.13	3.36	2.87	115.77	98.85
170	3.50	0.09	0.20	0.17	115.97	99.02
200	3.75	0.07	0.01	0.01	115.98	99.03
230	4.00	0.06	0.00	0.00	115.98	99.03

Shell Hash calculated from visual estimate of shell <4.75mm and >2.8mm.

Phi 5	Phi 16	Phi 25	Phi 50	Phi 75	Phi 84	Phi 95
2.44	1.81	1.45	0.76	0.04	-0.46	-2.90
Moment	Mean Phi	Mean mm	Sorting	Skewness	Kurtosis	
Statistics	0.54	0.69	1.39	-1.22	4.71	

GRANULARMETRIC REPORT OIB\_NATIVESS\_APRIL2013\_NAVD.GPJ\_JPBRAZIL.GDT 3/18/14

# Granularmetric Report

Depths and elevations based on measured values



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

Project Name: Ocean Isle Beach Terminal Groin

Sample Name: OIB025 008TROUGH

Analysis Date: 04-15-13

Analyzed By: ATP

Easting (ft):

2,182,467

Northing (ft):

53,590

Coordinate System:

North Carolina State Plane

Elevation (ft):

-5.1 NAVD 88

USCS:

SW

Munsell:

Wet - 5Y-4/1  
 Dry - 5Y-7/1

Comments:

Dry Weight (g):

148.24

Wash Weight (g):

146.05

Pan Retained (g):

0.00

Sieve Loss (%):

0.08

Fines (%):

#200 - 1.60  
 #230 - 1.57

Organics (%):

Carbonates (%):

Shell Hash (%):

0

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	0.69	0.47	0.69	0.47
3.5	-2.50	5.66	0.57	0.38	1.26	0.85
4	-2.25	4.76	0.61	0.41	1.87	1.26
5	-2.00	4.00	0.33	0.22	2.20	1.48
7	-1.50	2.83	0.65	0.44	2.85	1.92
10	-1.00	2.00	0.54	0.36	3.39	2.28
14	-0.50	1.41	0.66	0.45	4.05	2.73
18	0.00	1.00	0.99	0.67	5.04	3.40
25	0.50	0.71	1.16	0.78	6.20	4.18
35	1.00	0.50	3.09	2.08	9.29	6.26
45	1.50	0.35	6.52	4.40	15.81	10.66
60	2.00	0.25	18.52	12.49	34.33	23.15
80	2.50	0.18	61.27	41.33	95.60	64.48
120	3.00	0.13	45.01	30.36	140.61	94.84
170	3.50	0.09	5.09	3.43	145.70	98.27
200	3.75	0.07	0.19	0.13	145.89	98.40
230	4.00	0.06	0.04	0.03	145.93	98.43

Shell Hash calculated from visual estimate of shell <4.75mm and >2.8mm.

Phi 5	Phi 16	Phi 25	Phi 50	Phi 75	Phi 84	Phi 95
3.02	2.82	2.67	2.32	2.02	1.71	0.70
Moment Statistics	Mean Phi	Mean mm	Sorting	Skewness	Kurtosis	
	2.15	0.23	0.91	-3.17	16.05	

GRANULARMETRIC REPORT OIB\_NATIVESS\_APRIL2013\_NAVD.GPJ\_JPBRAZIL.GDT 3/18/14

# Granularmetric Report

Depths and elevations based on measured values



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

Project Name: Ocean Isle Beach Terminal Groin

Sample Name: OIB025 009BarCrest

Analysis Date: 03-17-14

Analyzed By: TM

Easting (ft):

Northing (ft):

Coordinate System:

Elevation (ft):

North Carolina State Plane

-6.5 NAVD 88

USCS:

SW

Munsell:

Wet - 5Y-5/1  
Dry - 5Y-6/1  
Washed - 5Y-7/1

Comments:

Dry Weight (g):

95.35

Wash Weight (g):

94.35

Pan Retained (g):

0.00

Sieve Loss (%):

0.08

Fines (%):

#200 - 1.13  
#230 - 1.13

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

0.08

0.08

0.08

0.08

5

-2.00

4.00

0.26

0.27

0.34

0.35

7

-1.50

2.83

1.03

1.08

1.37

1.43

10

-1.00

2.00

0.97

1.02

2.34

2.45

14

-0.50

1.41

1.22

1.28

3.56

3.73

18

0.00

1.00

2.14

2.24

5.70

5.97

25

0.50

0.71

4.85

5.09

10.55

11.06

35

1.00

0.50

16.58

17.39

27.13

28.45

45

1.50

0.35

23.56

24.71

50.69

53.16

60

2.00

0.25

19.31

20.25

70.00

73.41

80

2.50

0.18

15.52

16.28

85.52

89.69

120

3.00

0.13

8.02

8.41

93.54

98.10

170

3.50

0.09

0.72

0.76

94.26

98.86

200

3.75

0.07

0.01

0.01

94.27

98.87

230

4.00

0.06

0.00

0.00

94.27

98.87

Shell Hash calculated from visual estimate of shell <4.75mm and >2.8mm.

Phi 5

Phi 16

Phi 25

Phi 50

Phi 75

Phi 84

Phi 95

2.82

2.33

2.05

1.44

0.90

0.64

-0.22

Moment

Mean Phi

Mean mm

Sorting

Skewness

Kurtosis

Statistics

1.39

0.38

0.91

-0.89

4.71

GRANULARMETRIC REPORT OIB\_NATIVESS\_APRIL2013\_NAVD.GPJ\_JPBRAZIL.GDT 3/18/14

# Granularmetric Report

Depths and elevations based on measured values



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

Project Name: Ocean Isle Beach Terminal Groin

Sample Name: OIB025 010 (-8.75 ft)

Analysis Date: 06-14-13

Analyzed By: ATP

Easting (ft): <b>2,182,420</b>	Northing (ft): <b>53,308</b>	Coordinate System: <b>North Carolina State Plane</b>	Elevation (ft): <b>-8.8 NAVD 88</b>
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USCS: <b>SW</b>	Munsell: <b>Wet - 5Y-4/1 Dry - 5Y-6/1</b>	Comments:
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Dry Weight (g): <b>168.28</b>	Wash Weight (g): <b>165.60</b>	Pan Retained (g): <b>0.24</b>	Sieve Loss (%): <b>0.01</b>	Fines (%): <b>#200 - 2.13 #230 - 1.74</b>	Organics (%):	Carbonates (%):	Shell Hash (%): <b>0</b>
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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	0.72	0.43	0.72	0.43
5/16"	-3.00	8.00	0.00	0.00	0.72	0.43
3.5	-2.50	5.66	0.23	0.14	0.95	0.57
4	-2.25	4.76	0.23	0.14	1.18	0.71
5	-2.00	4.00	0.10	0.06	1.28	0.77
7	-1.50	2.83	0.59	0.35	1.87	1.12
10	-1.00	2.00	0.60	0.36	2.47	1.48
14	-0.50	1.41	1.06	0.63	3.53	2.11
18	0.00	1.00	1.42	0.84	4.95	2.95
25	0.50	0.71	2.34	1.39	7.29	4.34
35	1.00	0.50	4.56	2.71	11.85	7.05
45	1.50	0.35	5.81	3.45	17.66	10.50
60	2.00	0.25	8.28	4.92	25.94	15.42
80	2.50	0.18	22.44	13.33	48.38	28.75
120	3.00	0.13	80.78	48.00	129.16	76.75
170	3.50	0.09	32.94	19.57	162.10	96.32
200	3.75	0.07	2.60	1.55	164.70	97.87
230	4.00	0.06	0.65	0.39	165.35	98.26

Shell Hash calculated from visual estimate of shell <4.75mm and >2.8mm.

Phi 5	Phi 16	Phi 25	Phi 50	Phi 75	Phi 84	Phi 95
3.47	3.19	2.98	2.72	2.36	2.02	0.62
Moment Statistics	Mean Phi	Mean mm	Sorting	Skewness	Kurtosis	
	2.48	0.18	0.96	-2.92	14.76	

GRANULARMETRIC REPORT OIB\_NATIVESS\_APRIL2013\_NAVD.GPJ\_JPBRAZIL.GDT 3/18/14

# Granularmetric Report

Depths and elevations based on measured values



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

Project Name: Ocean Isle Beach Terminal Groin

Sample Name: OIB025 011 (-12.5 ft)

Analysis Date: 06-14-13

Analyzed By: ATP

Easting (ft): <b>2,182,471</b>	Northing (ft): <b>53,111</b>	Coordinate System: <b>North Carolina State Plane</b>	Elevation (ft): <b>-12.5 NAVD 88</b>
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USCS: <b>SP</b>	Munsell: <b>Wet - 5Y-4/2 Dry - 5Y-6/2</b>	Comments:
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Dry Weight (g): <b>173.10</b>	Wash Weight (g): <b>169.74</b>	Pan Retained (g): <b>0.43</b>	Sieve Loss (%): <b>0.00</b>	Fines (%): <b>#200 - 3.32 #230 - 2.18</b>	Organics (%):	Carbonates (%):	Shell Hash (%): <b>0</b>
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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	0.05	0.03	0.05	0.03
7	-1.50	2.83	0.15	0.09	0.20	0.12
10	-1.00	2.00	0.12	0.07	0.32	0.19
14	-0.50	1.41	0.10	0.06	0.42	0.25
18	0.00	1.00	0.08	0.05	0.50	0.30
25	0.50	0.71	0.17	0.10	0.67	0.40
35	1.00	0.50	0.59	0.34	1.26	0.74
45	1.50	0.35	1.15	0.66	2.41	1.40
60	2.00	0.25	2.19	1.27	4.60	2.67
80	2.50	0.18	9.02	5.21	13.62	7.88
120	3.00	0.13	75.46	43.59	89.08	51.47
170	3.50	0.09	68.53	39.59	157.61	91.06
200	3.75	0.07	9.73	5.62	167.34	96.68
230	4.00	0.06	1.97	1.14	169.31	97.82

Shell Hash calculated from visual estimate of shell <4.75mm and >2.8mm.

Phi 5	Phi 16	Phi 25	Phi 50	Phi 75	Phi 84	Phi 95
3.68	3.41	3.30	2.98	2.70	2.59	2.22
Moment Statistics	Mean Phi	Mean mm	Sorting	Skewness	Kurtosis	
	2.94	0.13	0.48	-2.89	23.47	

GRANULARMETRIC REPORT OIB\_NATIVESS\_APRIL2013\_NAVD.GPJ\_JPBRAZIL.GDT 3/18/14

# Granularmetric Report

Depths and elevations based on measured values



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

Project Name: Ocean Isle Beach Terminal Groin

Sample Name: OIB025 012 (-16.25 ft)

Analysis Date: 06-14-13

Analyzed By: ATP

Easting (ft): <b>2,182,508</b>	Northing (ft): <b>52,882</b>	Coordinate System: <b>North Carolina State Plane</b>	Elevation (ft): <b>-16.3 NAVD 88</b>
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USCS: <b>SP-SM</b>	Munsell: <b>Wet - 5Y-4/2 Dry - 5Y-6/2</b>	Comments:
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Dry Weight (g): <b>185.51</b>	Wash Weight (g): <b>179.97</b>	Pan Retained (g): <b>3.25</b>	Sieve Loss (%): <b>0.21</b>	Fines (%): <b>#200 - 5.76 #230 - 4.93</b>	Organics (%):	Carbonates (%):	Shell Hash (%): <b>0</b>
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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	0.11	0.21	0.11
3.5	-2.50	5.66	0.00	0.00	0.21	0.11
4	-2.25	4.76	0.03	0.02	0.24	0.13
5	-2.00	4.00	0.11	0.06	0.35	0.19
7	-1.50	2.83	0.35	0.19	0.70	0.38
10	-1.00	2.00	0.33	0.18	1.03	0.56
14	-0.50	1.41	0.42	0.23	1.45	0.79
18	0.00	1.00	0.39	0.21	1.84	1.00
25	0.50	0.71	0.81	0.44	2.65	1.44
35	1.00	0.50	3.30	1.78	5.95	3.22
45	1.50	0.35	4.37	2.36	10.32	5.58
60	2.00	0.25	5.94	3.20	16.26	8.78
80	2.50	0.18	14.35	7.74	30.61	16.52
120	3.00	0.13	63.54	34.25	94.15	50.77
170	3.50	0.09	69.67	37.56	163.82	88.33
200	3.75	0.07	10.97	5.91	174.79	94.24
230	4.00	0.06	1.54	0.83	176.33	95.07

Shell Hash calculated from visual estimate of shell <4.75mm and >2.8mm.

Phi 5	Phi 16	Phi 25	Phi 50	Phi 75	Phi 84	Phi 95
3.98	3.44	3.32	2.99	2.62	2.47	1.38
Moment Statistics	Mean Phi	Mean mm	Sorting	Skewness	Kurtosis	
	2.81	0.14	0.74	-2.85	16.01	

GRANULARMETRIC REPORT OIB\_NATIVESS\_APRIL2013\_NAVD.GPJ\_JPBRAZIL.GDT 3/18/14

# Granularmetric Report

Depths and elevations based on measured values



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

Project Name: Ocean Isle Beach Terminal Groin

Sample Name: OIB025 013 (-20 ft)

Analysis Date: 06-17-13

Analyzed By: ATP

Easting (ft): 2,182,578	Northing (ft): 52,461	Coordinate System: North Carolina State Plane	Elevation (ft): -20.0 NAVD 88
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USCS: SW-SM	Munsell: Wet - 5Y-4/2 Dry - 5Y-6/2	Comments:
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Dry Weight (g): 207.90	Wash Weight (g): 195.93	Pan Retained (g): 2.71	Sieve Loss (%): 0.00	Fines (%): #200 - 9.93 #230 - 7.06	Organics (%):	Carbonates (%):	Shell Hash (%): 1
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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	0.97	0.47	0.97	0.47
5/16"	-3.00	8.00	0.00	0.00	0.97	0.47
3.5	-2.50	5.66	0.89	0.43	1.86	0.90
4	-2.25	4.76	0.25	0.12	2.11	1.02
5	-2.00	4.00	0.49	0.24	2.60	1.26
7	-1.50	2.83	0.91	0.44	3.51	1.70
10	-1.00	2.00	1.42	0.68	4.93	2.38
14	-0.50	1.41	1.53	0.74	6.46	3.12
18	0.00	1.00	1.21	0.58	7.67	3.70
25	0.50	0.71	1.96	0.94	9.63	4.64
35	1.00	0.50	7.49	3.60	17.12	8.24
45	1.50	0.35	8.06	3.88	25.18	12.12
60	2.00	0.25	8.69	4.18	33.87	16.30
80	2.50	0.18	22.83	10.98	56.70	27.28
120	3.00	0.13	56.93	27.38	113.63	54.66
170	3.50	0.09	60.05	28.88	173.68	83.54
200	3.75	0.07	13.57	6.53	187.25	90.07
230	4.00	0.06	5.97	2.87	193.22	92.94

Shell Hash calculated from visual estimate of shell <4.75mm and >2.8mm.

Phi 5	Phi 16	Phi 25	Phi 50	Phi 75	Phi 84	Phi 95
	3.52	3.35	2.91	2.40	1.96	0.55
Moment	Mean Phi	Mean mm	Sorting	Skewness	Kurtosis	
Statistics	2.56	0.17	1.15	-2.46	10.81	

GRANULARMETRIC REPORT OIB\_NATIVESS\_APRIL2013\_NAVD.GPJ\_JPBRAZIL.GDT 3/18/14



# Granularmetric Report

Depths and elevations based on measured values



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

Project Name: Ocean Isle Beach Terminal Groin

Sample Name: OIB040 001 DUNE

Analysis Date: 03-17-14

Analyzed By: TM

Easting (ft):

Northing (ft):

Coordinate System:

Elevation (ft):

North Carolina State Plane

-0.5 NAVD 88

USCS:

SP

Munsell:

Wet - 5Y-7/1  
Dry - 5Y-8/1  
Washed - 5Y-7/1

Comments:

Dry Weight (g):

116.99

Wash Weight (g):

116.83

Pan Retained (g):

0.00

Sieve Loss (%):

0.06

Fines (%):

#200 - 0.19  
#230 - 0.18

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

0.00

0.00

0.00

0.00

7

-1.50

2.83

0.00

0.00

0.00

0.00

10

-1.00

2.00

0.00

0.00

0.00

0.00

14

-0.50

1.41

0.00

0.00

0.00

0.00

18

0.00

1.00

0.02

0.02

0.02

0.02

25

0.50

0.71

0.16

0.14

0.18

0.16

35

1.00

0.50

2.54

2.17

2.72

2.33

45

1.50

0.35

16.62

14.21

19.34

16.54

60

2.00

0.25

48.79

41.70

68.13

58.24

80

2.50

0.18

37.62

32.16

105.75

90.40

120

3.00

0.13

9.94

8.50

115.69

98.90

170

3.50

0.09

0.99

0.85

116.68

99.75

200

3.75

0.07

0.07

0.06

116.75

99.81

230

4.00

0.06

0.01

0.01

116.76

99.82

Shell Hash calculated from visual estimate of shell <4.75mm and >2.8mm.

Phi 5

Phi 16

Phi 25

Phi 50

Phi 75

Phi 84

Phi 95

2.77

2.40

2.26

1.90

1.60

1.48

1.09

Moment

Mean Phi

Mean mm

Sorting

Skewness

Kurtosis

Statistics

1.91

0.27

0.47

-0.01

3.3

GRANULARMETRIC REPORT OIB\_NATIVES APRIL2013\_NAVD.GPJ\_JPBRAZIL.GDT 3/18/14

# Granularmetric Report

Depths and elevations based on measured values



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

Project Name: Ocean Isle Beach Terminal Groin

Sample Name: OIB060 001 DUNE

Analysis Date: 04-12-13

Analyzed By: ATP

Easting (ft): <b>2,179,202</b>	Northing (ft): <b>52,836</b>	Coordinate System: <b>North Carolina State Plane</b>	Elevation (ft): <b>12.2 NAVD 88</b>
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USCS: <b>SP</b>	Munsell: <b>Wet - 5Y-6/1 Dry - 5Y-7/1</b>	Comments:
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Dry Weight (g): <b>114.78</b>	Wash Weight (g): <b>114.53</b>	Pan Retained (g): <b>0.02</b>	Sieve Loss (%): <b>0.00</b>	Fines (%): <b>#200 - 0.24 #230 - 0.23</b>	Organics (%):	Carbonates (%):	Shell Hash (%): <b>0</b>
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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	0.00	0.00	0.00	0.00
14	-0.50	1.41	0.00	0.00	0.00	0.00
18	0.00	1.00	0.01	0.01	0.01	0.01
25	0.50	0.71	0.03	0.03	0.04	0.04
35	1.00	0.50	0.51	0.44	0.55	0.48
45	1.50	0.35	3.47	3.02	4.02	3.50
60	2.00	0.25	18.95	16.51	22.97	20.01
80	2.50	0.18	56.51	49.23	79.48	69.24
120	3.00	0.13	31.61	27.54	111.09	96.78
170	3.50	0.09	3.22	2.81	114.31	99.59
200	3.75	0.07	0.19	0.17	114.50	99.76
230	4.00	0.06	0.01	0.01	114.51	99.77

Shell Hash calculated from visual estimate of shell <4.75mm and >2.8mm.

Phi 5	Phi 16	Phi 25	Phi 50	Phi 75	Phi 84	Phi 95
2.97	2.77	2.60	2.30	2.05	1.88	1.55
Moment Statistics	Mean Phi	Mean mm	Sorting	Skewness	Kurtosis	
	2.3	0.20	0.43	-0.37	3.82	

GRANULARMETRIC REPORT OIB\_NATIVESS\_APRIL2013\_NAVD.GPJ\_JPBRAZIL.GDT 3/18/14

# Granularmetric Report

Depths and elevations based on measured values



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

Project Name: Ocean Isle Beach Terminal Groin

Sample Name: OIB060 002 TOD

Analysis Date: 04-15-13

Analyzed By: ATP

Easting (ft):  
2,179,206

Northing (ft):  
52,825

Coordinate System:  
North Carolina State Plane

Elevation (ft):  
9.0 NAVD 88

USCS: SP      Munsell: Wet - 5Y-6/1  
Dry - 5Y-8/1      Comments:

Dry Weight (g): 118.45      Wash Weight (g): 118.15      Pan Retained (g): 0.00      Sieve Loss (%): 0.00  
Fines (%): #200 - 0.29      Organics (%):      Carbonates (%):      Shell Hash (%): 0  
#230 - 0.26

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	0.05	0.04	0.05	0.04
14	-0.50	1.41	0.13	0.11	0.18	0.15
18	0.00	1.00	0.69	0.58	0.87	0.73
25	0.50	0.71	4.78	4.04	5.65	4.77
35	1.00	0.50	15.69	13.25	21.34	18.02
45	1.50	0.35	18.40	15.53	39.74	33.55
60	2.00	0.25	36.41	30.74	76.15	64.29
80	2.50	0.18	31.88	26.91	108.03	91.20
120	3.00	0.13	8.79	7.42	116.82	98.62
170	3.50	0.09	1.19	1.00	118.01	99.62
200	3.75	0.07	0.11	0.09	118.12	99.71
230	4.00	0.06	0.03	0.03	118.15	99.74

Shell Hash calculated from visual estimate of shell <4.75mm and >2.8mm.

Phi 5	Phi 16	Phi 25	Phi 50	Phi 75	Phi 84	Phi 95
2.76	2.37	2.20	1.77	1.22	0.92	0.51
Moment	Mean Phi	Mean mm	Sorting	Skewness	Kurtosis	
Statistics	1.69	0.31	0.68	-0.41	2.98	

GRANULARMETRIC REPORT OIB\_NATIVESS\_APRIL2013\_NAVD.GPJ\_JPBRAZIL.GDT 3/18/14

# Granularmetric Report

Depths and elevations based on measured values



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

Project Name: Ocean Isle Beach Terminal Groin

Sample Name: OIB060 003MIDBERM

Analysis Date: 04-15-13

Analyzed By: ATP

Easting (ft): <b>2,179,212</b>	Northing (ft): <b>52,796</b>	Coordinate System: <b>North Carolina State Plane</b>	Elevation (ft): <b>7.7 NAVD 88</b>
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USCS: <b>SP</b>	Munsell: <b>Wet - 5Y-6/1 Dry - 5Y-8/1</b>	Comments:
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Dry Weight (g): <b>117.96</b>	Wash Weight (g): <b>117.62</b>	Pan Retained (g): <b>0.00</b>	Sieve Loss (%): <b>0.00</b>	Fines (%): <b>#200 - 0.31 #230 - 0.29</b>	Organics (%):	Carbonates (%):	Shell Hash (%): <b>0</b>
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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	0.00	0.00	0.00	0.00
14	-0.50	1.41	0.04	0.03	0.04	0.03
18	0.00	1.00	0.03	0.03	0.07	0.06
25	0.50	0.71	0.09	0.08	0.16	0.14
35	1.00	0.50	3.00	2.54	3.16	2.68
45	1.50	0.35	26.47	22.44	29.63	25.12
60	2.00	0.25	49.73	42.16	79.36	67.28
80	2.50	0.18	29.81	25.27	109.17	92.55
120	3.00	0.13	6.94	5.88	116.11	98.43
170	3.50	0.09	1.35	1.14	117.46	99.57
200	3.75	0.07	0.14	0.12	117.60	99.69
230	4.00	0.06	0.02	0.02	117.62	99.71

Shell Hash calculated from visual estimate of shell <4.75mm and >2.8mm.

Phi 5	Phi 16	Phi 25	Phi 50	Phi 75	Phi 84	Phi 95
2.71	2.33	2.15	1.80	1.50	1.30	1.05
Moment	Mean Phi	Mean mm	Sorting	Skewness	Kurtosis	
Statistics	1.81	0.29	0.49	0.25	3.58	

GRANULARMETRIC REPORT OIB\_NATIVESS\_APRIL2013\_NAVD.GPJ\_JPBRAZIL.GDT 3/18/14

# Granularmetric Report

Depths and elevations based on measured values



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

Project Name: Ocean Isle Beach Terminal Groin

Sample Name: OIB060 004BERMCRST

Analysis Date: 04-15-13

Analyzed By: ATP

Easting (ft): <b>2,179,228</b>	Northing (ft): <b>52,745</b>	Coordinate System: <b>North Carolina State Plane</b>	Elevation (ft): <b>3.5 NAVD 88</b>
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USCS: <b>SP</b>	Munsell: <b>Wet - 5Y-7/2 Dry - 5Y-7/1</b>	Comments:
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Dry Weight (g): <b>116.26</b>	Wash Weight (g): <b>115.81</b>	Pan Retained (g): <b>0.00</b>	Sieve Loss (%): <b>0.11</b>	Fines (%): <b>#200 - 0.52 #230 - 0.52</b>	Organics (%):	Carbonates (%):	Shell Hash (%): <b>0</b>
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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	0.00	0.00	0.00	0.00
14	-0.50	1.41	0.00	0.00	0.00	0.00
18	0.00	1.00	0.00	0.00	0.00	0.00
25	0.50	0.71	0.04	0.03	0.04	0.03
35	1.00	0.50	0.41	0.35	0.45	0.38
45	1.50	0.35	5.92	5.09	6.37	5.47
60	2.00	0.25	51.48	44.28	57.85	49.75
80	2.50	0.18	50.05	43.05	107.90	92.80
120	3.00	0.13	7.19	6.18	115.09	98.98
170	3.50	0.09	0.54	0.46	115.63	99.44
200	3.75	0.07	0.05	0.04	115.68	99.48
230	4.00	0.06	0.00	0.00	115.68	99.48

Shell Hash calculated from visual estimate of shell <4.75mm and >2.8mm.

Phi 5	Phi 16	Phi 25	Phi 50	Phi 75	Phi 84	Phi 95
2.68	2.40	2.29	2.00	1.72	1.62	1.45
Moment Statistics	Mean Phi	Mean mm	Sorting	Skewness	Kurtosis	
	2.01	0.25	0.37	0.08	3.67	

GRANULARMETRIC REPORT OIB\_NATIVESS\_APRIL2013\_NAVD.GPJ\_JPBRAZIL.GDT 3/18/14

# Granularmetric Report

Depths and elevations based on measured values



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

Project Name: Ocean Isle Beach Terminal Groin

Sample Name: OIB060 005 MHW

Analysis Date: 02-04-14

Analyzed By: TM

Easting (ft): <b>2,179,244</b>	Northing (ft): <b>52,732</b>	Coordinate System: <b>North Carolina State Plane</b>	Elevation (ft): <b>1.3 NAVD 88</b>
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USCS: <b>SP</b>	Munsell: <b>Wet - 5Y-5/1 Dry - 5Y-6/1 Washed - 5Y-7/1</b>	Comments:
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Dry Weight (g): <b>93.77</b>	Wash Weight (g): <b>92.76</b>	Pan Retained (g): <b>0.01</b>	Sieve Loss (%): <b>0.11</b>	Fines (%): <b>#200 - 1.19 #230 - 1.18</b>	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	0.08	0.09	0.08	0.09
4	-2.25	4.76	0.00	0.00	0.08	0.09
5	-2.00	4.00	0.18	0.19	0.26	0.28
7	-1.50	2.83	0.38	0.41	0.64	0.69
10	-1.00	2.00	0.28	0.30	0.92	0.99
14	-0.50	1.41	0.53	0.57	1.45	1.56
18	0.00	1.00	0.85	0.91	2.30	2.47
25	0.50	0.71	1.86	1.98	4.16	4.45
35	1.00	0.50	7.48	7.98	11.64	12.43
45	1.50	0.35	19.12	20.39	30.76	32.82
60	2.00	0.25	29.15	31.09	59.91	63.91
80	2.50	0.18	23.07	24.60	82.98	88.51
120	3.00	0.13	8.81	9.40	91.79	97.91
170	3.50	0.09	0.81	0.86	92.60	98.77
200	3.75	0.07	0.04	0.04	92.64	98.81
230	4.00	0.06	0.01	0.01	92.65	98.82

Shell Hash calculated from visual estimate of shell <4.75mm and >2.8mm.

Phi 5	Phi 16	Phi 25	Phi 50	Phi 75	Phi 84	Phi 95
2.85	2.41	2.23	1.78	1.31	1.09	0.53
Moment Statistics	Mean Phi	Mean mm	Sorting	Skewness	Kurtosis	
	1.7	0.31	0.74	-1.34	7.48	

GRANULARMETRIC REPORT OIB\_NATIVESS\_APRIL2013\_NAVD.GPJ\_JPBRAZIL.GDT 3/18/14

# Granularmetric Report

Depths and elevations based on measured values



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

Project Name: Ocean Isle Beach Terminal Groin

Sample Name: OIB060 006 MTL

Analysis Date: 04-16-13

Analyzed By: ATP

Easting (ft): <b>2,179,248</b>	Northing (ft): <b>52,691</b>	Coordinate System: <b>North Carolina State Plane</b>	Elevation (ft): <b>0.0 NAVD 88</b>
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USCS: <b>SP</b>	Munsell: <b>Wet - 5Y-5/1 Dry - 5Y-7/1</b>	Comments:
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Dry Weight (g): <b>106.12</b>	Wash Weight (g): <b>105.04</b>	Pan Retained (g): <b>0.00</b>	Sieve Loss (%): <b>0.00</b>	Fines (%): <b>#200 - 1.02 #230 - 1.01</b>	Organics (%):	Carbonates (%):	Shell Hash (%): <b>0</b>
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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	0.09	0.10	0.09
5	-2.00	4.00	0.00	0.00	0.10	0.09
7	-1.50	2.83	0.07	0.07	0.17	0.16
10	-1.00	2.00	0.07	0.07	0.24	0.23
14	-0.50	1.41	0.23	0.22	0.47	0.45
18	0.00	1.00	0.52	0.49	0.99	0.94
25	0.50	0.71	1.04	0.98	2.03	1.92
35	1.00	0.50	3.57	3.36	5.60	5.28
45	1.50	0.35	10.28	9.69	15.88	14.97
60	2.00	0.25	25.46	23.99	41.34	38.96
80	2.50	0.18	39.35	37.08	80.69	76.04
120	3.00	0.13	22.27	20.99	102.96	97.03
170	3.50	0.09	2.01	1.89	104.97	98.92
200	3.75	0.07	0.06	0.06	105.03	98.98
230	4.00	0.06	0.01	0.01	105.04	98.99

Shell Hash calculated from visual estimate of shell <4.75mm and >2.8mm.

Phi 5	Phi 16	Phi 25	Phi 50	Phi 75	Phi 84	Phi 95
2.95	2.69	2.49	2.15	1.71	1.52	0.96
Moment Statistics	Mean Phi	Mean mm	Sorting	Skewness	Kurtosis	
	2.06	0.24	0.63	-1.33	7.5	

GRANULARMETRIC REPORT OIB\_NATIVESSE\_APRIL2013\_NAVD.GPJ\_JPBRAZIL.GDT 3/18/14

# Granularmetric Report

Depths and elevations based on measured values



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

Project Name: Ocean Isle Beach Terminal Groin

Sample Name: OIB060 007 MLW

Analysis Date: 04-16-13

Analyzed By: ATP

Easting (ft): <b>2,179,287</b>	Northing (ft): <b>52,524</b>	Coordinate System: <b>North Carolina State Plane</b>	Elevation (ft): <b>-3.0 NAVD 88</b>
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USCS: <b>SW</b>	Munsell: <b>Wet - 5Y-5/1 Dry - 5Y-7/1</b>	Comments:
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Dry Weight (g): <b>112.48</b>	Wash Weight (g): <b>111.51</b>	Pan Retained (g): <b>0.00</b>	Sieve Loss (%): <b>0.08</b>	Fines (%): <b>#200 - 0.93 #230 - 0.93</b>	Organics (%):	Carbonates (%):	Shell Hash (%): <b>2</b>
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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	0.74	0.66	0.74	0.66
3.5	-2.50	5.66	0.81	0.72	1.55	1.38
4	-2.25	4.76	0.45	0.40	2.00	1.78
5	-2.00	4.00	1.34	1.19	3.34	2.97
7	-1.50	2.83	1.36	1.21	4.70	4.18
10	-1.00	2.00	1.89	1.68	6.59	5.86
14	-0.50	1.41	3.76	3.34	10.35	9.20
18	0.00	1.00	6.51	5.79	16.86	14.99
25	0.50	0.71	13.11	11.66	29.97	26.65
35	1.00	0.50	22.08	19.63	52.05	46.28
45	1.50	0.35	19.18	17.05	71.23	63.33
60	2.00	0.25	19.73	17.54	90.96	80.87
80	2.50	0.18	14.00	12.45	104.96	93.32
120	3.00	0.13	5.99	5.33	110.95	98.65
170	3.50	0.09	0.45	0.40	111.40	99.05
200	3.75	0.07	0.02	0.02	111.42	99.07
230	4.00	0.06	0.00	0.00	111.42	99.07

Shell Hash calculated from visual estimate of shell <4.75mm and >2.8mm.

Phi 5	Phi 16	Phi 25	Phi 50	Phi 75	Phi 84	Phi 95
2.66	2.13	1.83	1.11	0.43	0.04	-1.26
Moment Statistics	Mean Phi	Mean mm	Sorting	Skewness	Kurtosis	
	0.99	0.50	1.15	-0.98	4.42	

GRANULARMETRIC REPORT OIB\_NATIVESS\_APRIL2013\_NAVD.GPJ\_JPBRAZIL.GDT 3/18/14



# Granularmetric Report

Depths and elevations based on measured values



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

Project Name: Ocean Isle Beach Terminal Groin

Sample Name: OIB060 008TROUGH

Analysis Date: 04-16-13

Analyzed By: ATP

Easting (ft): 2,179,299	Northing (ft): 52,478	Coordinate System: North Carolina State Plane	Elevation (ft): -5.1 NAVD 88
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USCS: SP	Munsell: Wet - 5Y-4/1 Dry - 5Y-7/1	Comments:
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Dry Weight (g): 109.94	Wash Weight (g): 108.77	Pan Retained (g): 0.00	Sieve Loss (%): 0.00	Fines (%): #200 - 1.06 #230 - 1.05	Organics (%):	Carbonates (%):	Shell Hash (%): 0
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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	0.13	0.12	0.13	0.12
4	-2.25	4.76	0.05	0.05	0.18	0.17
5	-2.00	4.00	0.00	0.00	0.18	0.17
7	-1.50	2.83	0.04	0.04	0.22	0.21
10	-1.00	2.00	0.05	0.05	0.27	0.26
14	-0.50	1.41	0.09	0.08	0.36	0.34
18	0.00	1.00	0.21	0.19	0.57	0.53
25	0.50	0.71	0.41	0.37	0.98	0.90
35	1.00	0.50	1.85	1.68	2.83	2.58
45	1.50	0.35	7.09	6.45	9.92	9.03
60	2.00	0.25	22.40	20.37	32.32	29.40
80	2.50	0.18	48.14	43.79	80.46	73.19
120	3.00	0.13	26.13	23.77	106.59	96.96
170	3.50	0.09	2.12	1.93	108.71	98.89
200	3.75	0.07	0.05	0.05	108.76	98.94
230	4.00	0.06	0.01	0.01	108.77	98.95

Shell Hash calculated from visual estimate of shell <4.75mm and >2.8mm.

Phi 5	Phi 16	Phi 25	Phi 50	Phi 75	Phi 84	Phi 95
2.96	2.73	2.54	2.24	1.89	1.67	1.19
Moment	Mean Phi	Mean mm	Sorting	Skewness	Kurtosis	
Statistics	2.17	0.22	0.56	-1.94	14.13	

GRANULARMETRIC REPORT OIB\_NATIVESS\_APRIL2013\_NAVD.GPJ\_JPBRAZIL.GDT 3/18/14

# Granularmetric Report

Depths and elevations based on measured values



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

Project Name: Ocean Isle Beach Terminal Groin

Sample Name: OIB060 009BarCrest

Analysis Date: 02-04-14

Analyzed By: TM

Easting (ft):	Northing (ft):	Coordinate System: <b>North Carolina State Plane</b>	Elevation (ft): <b>-6.5 NAVD 88</b>
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USCS: <b>SP</b>	Munsell: Wet - 5Y-5/1 Dry - 5Y-6/1 Washed - 5Y-7/1	Comments:
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Dry Weight (g): <b>93.86</b>	Wash Weight (g): <b>92.81</b>	Pan Retained (g): <b>0.00</b>	Sieve Loss (%): <b>0.16</b>	Fines (%): #200 - 1.29 #230 - 1.28	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	0.58	0.62	0.58	0.62
4	-2.25	4.76	0.00	0.00	0.58	0.62
5	-2.00	4.00	0.04	0.04	0.62	0.66
7	-1.50	2.83	0.30	0.32	0.92	0.98
10	-1.00	2.00	0.35	0.37	1.27	1.35
14	-0.50	1.41	0.44	0.47	1.71	1.82
18	0.00	1.00	1.14	1.21	2.85	3.03
25	0.50	0.71	3.26	3.47	6.11	6.50
35	1.00	0.50	14.59	15.54	20.70	22.04
45	1.50	0.35	24.86	26.49	45.56	48.53
60	2.00	0.25	23.94	25.51	69.50	74.04
80	2.50	0.18	14.34	15.28	83.84	89.32
120	3.00	0.13	7.76	8.27	91.60	97.59
170	3.50	0.09	1.03	1.10	92.63	98.69
200	3.75	0.07	0.02	0.02	92.65	98.71
230	4.00	0.06	0.01	0.01	92.66	98.72

Shell Hash calculated from visual estimate of shell <4.75mm and >2.8mm.

Phi 5	Phi 16	Phi 25	Phi 50	Phi 75	Phi 84	Phi 95
2.84	2.33	2.03	1.53	1.06	0.81	0.28
Moment	Mean Phi	Mean mm	Sorting	Skewness	Kurtosis	
Statistics	1.5	0.35	0.82	-1.17	7.55	

GRANULARMETRIC REPORT OIB\_NATIVESS\_APRIL2013\_NAVD.GPJ\_JPBRAZIL.GDT 3/18/14

# Granularmetric Report

Depths and elevations based on measured values



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

Project Name: Ocean Isle Beach Terminal Groin

Sample Name: OIB060 010 -8.75 ft

Analysis Date: 06-17-13

Analyzed By: ATP

Easting (ft): 2,179,361	Northing (ft): 52,216	Coordinate System: North Carolina State Plane	Elevation (ft): -8.8 NAVD 88
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USCS: SP	Munsell: Wet - 5Y-4/1 Dry - 5Y-6/1	Comments:
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Dry Weight (g): 185.76	Wash Weight (g): 182.91	Pan Retained (g): 0.29	Sieve Loss (%): 0.00	Fines (%): #200 - 2.00 #230 - 1.69	Organics (%):	Carbonates (%):	Shell Hash (%): 0
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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	0.18	0.10	0.19	0.11
7	-1.50	2.83	0.37	0.20	0.56	0.31
10	-1.00	2.00	0.25	0.13	0.81	0.44
14	-0.50	1.41	0.60	0.32	1.41	0.76
18	0.00	1.00	0.63	0.34	2.04	1.10
25	0.50	0.71	1.12	0.60	3.16	1.70
35	1.00	0.50	2.35	1.27	5.51	2.97
45	1.50	0.35	3.24	1.74	8.75	4.71
60	2.00	0.25	6.04	3.25	14.79	7.96
80	2.50	0.18	25.38	13.66	40.17	21.62
120	3.00	0.13	102.07	54.95	142.24	76.57
170	3.50	0.09	37.04	19.94	179.28	96.51
200	3.75	0.07	2.76	1.49	182.04	98.00
230	4.00	0.06	0.58	0.31	182.62	98.31

Shell Hash calculated from visual estimate of shell <4.75mm and >2.8mm.

Phi 5	Phi 16	Phi 25	Phi 50	Phi 75	Phi 84	Phi 95
3.46	3.19	2.99	2.76	2.53	2.29	1.54
Moment	Mean Phi	Mean mm	Sorting	Skewness	Kurtosis	
Statistics	2.66	0.16	0.64	-2.93	16.55	

GRANULARMETRIC REPORT OIB\_NATIVESS\_APRIL2013\_NAVD.GPJ\_JPBRAZIL.GDT 3/18/14

# Granularmetric Report

Depths and elevations based on measured values



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

Project Name: Ocean Isle Beach Terminal Groin

Sample Name: OIB060 011 -12.5 ft

Analysis Date: 06-17-13

Analyzed By: ATP

Easting (ft): <b>2,179,376</b>	Northing (ft): <b>52,149</b>	Coordinate System: <b>North Carolina State Plane</b>	Elevation (ft): <b>-12.5 NAVD 88</b>
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USCS: <b>SW</b>	Munsell: <b>Wet - 5Y-4/2 Dry - 5Y-6/1</b>	Comments:
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Dry Weight (g): <b>136.56</b>	Wash Weight (g): <b>134.15</b>	Pan Retained (g): <b>0.16</b>	Sieve Loss (%): <b>0.00</b>	Fines (%): <b>#200 - 2.41 #230 - 1.88</b>	Organics (%):	Carbonates (%):	Shell Hash (%): <b>0</b>
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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	1.56	1.14	1.56	1.14
5/16"	-3.00	8.00	0.00	0.00	1.56	1.14
3.5	-2.50	5.66	0.00	0.00	1.56	1.14
4	-2.25	4.76	0.00	0.00	1.56	1.14
5	-2.00	4.00	0.15	0.11	1.71	1.25
7	-1.50	2.83	0.19	0.14	1.90	1.39
10	-1.00	2.00	0.28	0.21	2.18	1.60
14	-0.50	1.41	0.24	0.18	2.42	1.78
18	0.00	1.00	0.20	0.15	2.62	1.93
25	0.50	0.71	0.28	0.21	2.90	2.14
35	1.00	0.50	0.40	0.29	3.30	2.43
45	1.50	0.35	0.58	0.42	3.88	2.85
60	2.00	0.25	1.13	0.83	5.01	3.68
80	2.50	0.18	8.50	6.22	13.51	9.90
120	3.00	0.13	76.82	56.25	90.33	66.15
170	3.50	0.09	39.40	28.85	129.73	95.00
200	3.75	0.07	3.54	2.59	133.27	97.59
230	4.00	0.06	0.72	0.53	133.99	98.12

Shell Hash calculated from visual estimate of shell <4.75mm and >2.8mm.

Phi 5	Phi 16	Phi 25	Phi 50	Phi 75	Phi 84	Phi 95
3.50	3.31	3.15	2.86	2.63	2.55	2.11
Moment Statistics	Mean Phi	Mean mm	Sorting	Skewness	Kurtosis	
	2.76	0.15	0.88	-5.51	38.75	

GRANULARMETRIC REPORT OIB\_NATIVESS\_APRIL2013\_NAVD.GPJ\_JPBRAZIL.GDT 3/18/14

# Granularmetric Report

Depths and elevations based on measured values



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

Project Name: Ocean Isle Beach Terminal Groin

Sample Name: OIB060 012 -16.25 ft

Analysis Date: 06-18-13

Analyzed By: ATP

Easting (ft): <b>2,179,421</b>	Northing (ft): <b>51,924</b>	Coordinate System: <b>North Carolina State Plane</b>	Elevation (ft): <b>-16.3 NAVD 88</b>
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USCS: <b>SW</b>	Munsell: <b>Wet - 5Y-4/2 Dry - 5Y-6/1</b>	Comments:
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Dry Weight (g): <b>148.88</b>	Wash Weight (g): <b>146.47</b>	Pan Retained (g): <b>0.07</b>	Sieve Loss (%): <b>0.05</b>	Fines (%): <b>#200 - 1.82 #230 - 1.71</b>	Organics (%):	Carbonates (%):	Shell Hash (%): <b>1</b>
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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	0.24	0.16	0.24	0.16
4	-2.25	4.76	0.16	0.11	0.40	0.27
5	-2.00	4.00	0.27	0.18	0.67	0.45
7	-1.50	2.83	1.16	0.78	1.83	1.23
10	-1.00	2.00	2.56	1.72	4.39	2.95
14	-0.50	1.41	3.53	2.37	7.92	5.32
18	0.00	1.00	4.87	3.27	12.79	8.59
25	0.50	0.71	15.63	10.50	28.42	19.09
35	1.00	0.50	47.16	31.68	75.58	50.77
45	1.50	0.35	38.95	26.16	114.53	76.93
60	2.00	0.25	18.80	12.63	133.33	89.56
80	2.50	0.18	4.02	2.70	137.35	92.26
120	3.00	0.13	4.38	2.94	141.73	95.20
170	3.50	0.09	3.81	2.56	145.54	97.76
200	3.75	0.07	0.63	0.42	146.17	98.18
230	4.00	0.06	0.16	0.11	146.33	98.29

Shell Hash calculated from visual estimate of shell <4.75mm and >2.8mm.

Phi 5	Phi 16	Phi 25	Phi 50	Phi 75	Phi 84	Phi 95
2.97	1.78	1.46	0.99	0.59	0.35	-0.57
Moment Statistics	Mean Phi	Mean mm	Sorting	Skewness	Kurtosis	
	1	0.50	0.9	-0.17	5.01	

GRANULARMETRIC REPORT OIB\_NATIVESS\_APRIL2013\_NAVD.GPJ\_JPBRAZIL.GDT 3/18/14

# Granularmetric Report

Depths and elevations based on measured values



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

Project Name: Ocean Isle Beach Terminal Groin

Sample Name: OIB060 013 -20 ft

Analysis Date: 06-18-13

Analyzed By: ATP

Easting (ft): <b>2,179,464</b>	Northing (ft): <b>51,631</b>	Coordinate System: <b>North Carolina State Plane</b>	Elevation (ft): <b>-20.0 NAVD 88</b>
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USCS: <b>SW</b>	Munsell: <b>Wet - 5Y-4/1 Dry - 5Y-6/1</b>	Comments:
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Dry Weight (g): <b>150.34</b>	Wash Weight (g): <b>146.85</b>	Pan Retained (g): <b>0.30</b>	Sieve Loss (%): <b>0.01</b>	Fines (%): <b>#200 - 3.55 #230 - 2.53</b>	Organics (%):	Carbonates (%):	Shell Hash (%): <b>0</b>
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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	0.03	0.04	0.03
4	-2.25	4.76	0.15	0.10	0.19	0.13
5	-2.00	4.00	0.12	0.08	0.31	0.21
7	-1.50	2.83	0.28	0.19	0.59	0.40
10	-1.00	2.00	0.77	0.51	1.36	0.91
14	-0.50	1.41	0.87	0.58	2.23	1.49
18	0.00	1.00	0.75	0.50	2.98	1.99
25	0.50	0.71	1.69	1.12	4.67	3.11
35	1.00	0.50	6.63	4.41	11.30	7.52
45	1.50	0.35	15.29	10.17	26.59	17.69
60	2.00	0.25	24.96	16.60	51.55	34.29
80	2.50	0.18	23.66	15.74	75.21	50.03
120	3.00	0.13	36.99	24.60	112.20	74.63
170	3.50	0.09	27.74	18.45	139.94	93.08
200	3.75	0.07	5.07	3.37	145.01	96.45
230	4.00	0.06	1.53	1.02	146.54	97.47

Shell Hash calculated from visual estimate of shell <4.75mm and >2.8mm.

Phi 5	Phi 16	Phi 25	Phi 50	Phi 75	Phi 84	Phi 95
3.64	3.25	3.01	2.50	1.72	1.42	0.71
Moment Statistics	Mean Phi	Mean mm	Sorting	Skewness	Kurtosis	
	2.28	0.21	0.93	-1.11	5.28	

GRANULARMETRIC REPORT OIB\_NATIVESS\_APRIL2013\_NAVD.GPJ\_JPBRAZIL.GDT 3/18/14

# Granularmetric Report

Depths and elevations based on measured values



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

Project Name: Ocean Isle Beach Terminal Groin

Sample Name: USACE OIB040 #001

Analysis Date: 07-14-13

Analyzed By: ATP

Easting (ft): <b>2,181,062</b>	Northing (ft): <b>53,511</b>	Coordinate System: <b>North Carolina State Plane</b>	Elevation (ft): <b>7.0 NAVD 88</b>
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USCS: <b>SP</b>	Munsell:	Comments:
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Dry Weight (g): <b>100.00</b>	Wash Weight (g): <b>100.00</b>	Pan Retained (g): <b>0.95</b>	Sieve Loss (%): <b>0.00</b>	Fines (%): #200 - 1.92 #230 - 0.95	Organics (%):	Carbonates (%): <b>4</b>	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	0.04	0.04	0.04	0.04
5	-2.00	4.00	0.04	0.04	0.08	0.08
7	-1.50	2.83	0.06	0.06	0.14	0.14
10	-1.00	2.00	0.05	0.05	0.19	0.19
14	-0.50	1.41	0.02	0.02	0.21	0.21
18	0.00	1.00	0.08	0.08	0.29	0.29
25	0.50	0.71	0.19	0.19	0.48	0.48
35	1.00	0.50	0.47	0.47	0.95	0.95
45	1.50	0.35	0.46	0.46	1.41	1.41
60	2.00	0.25	6.72	6.72	8.13	8.13
80	2.50	0.18	23.67	23.67	31.80	31.80
120	3.00	0.13	23.66	23.66	55.46	55.46
170	3.50	0.09	21.32	21.32	76.78	76.78
200	3.75	0.07	21.30	21.30	98.08	98.08
230	4.00	0.06	0.97	0.97	99.05	99.05

Shell Hash calculated from visual estimate of shell <4.75mm and >2.8mm.

Phi 5	Phi 16	Phi 25	Phi 50	Phi 75	Phi 84	Phi 95
3.71	3.58	3.46	2.88	2.36	2.17	1.77
Moment Statistics	Mean Phi	Mean mm	Sorting	Skewness	Kurtosis	
	2.84	0.14	0.67	-1.12	7.59	

GRANULARMETRIC REPORT OIB\_NATIVESSE\_APRIL2013\_NAVD.GPJ\_JPBRAZIL.GDT 3/18/14

# Granularmetric Report

Depths and elevations based on measured values



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

Project Name: Ocean Isle Beach Terminal Groin

Sample Name: USACE OIB040 #002

Analysis Date: 07-14-13

Analyzed By: ATP

Easting (ft): <b>2,181,064</b>	Northing (ft): <b>53,496</b>	Coordinate System: <b>North Carolina State Plane</b>	Elevation (ft): <b>5.0 NAVD 88</b>
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USCS: <b>SP</b>	Munsell:	Comments:
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Dry Weight (g): <b>100.00</b>	Wash Weight (g): <b>100.00</b>	Pan Retained (g): <b>0.39</b>	Sieve Loss (%): <b>0.00</b>	Fines (%): <b>#200 - 0.78</b> <b>#230 - 0.39</b>	Organics (%):	Carbonates (%): <b>1</b>	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	0.00	0.00	0.01	0.01
14	-0.50	1.41	0.00	0.00	0.01	0.01
18	0.00	1.00	0.01	0.01	0.02	0.02
25	0.50	0.71	0.02	0.02	0.04	0.04
35	1.00	0.50	0.14	0.14	0.18	0.18
45	1.50	0.35	0.14	0.14	0.32	0.32
60	2.00	0.25	12.34	12.34	12.66	12.66
80	2.50	0.18	32.59	32.59	45.25	45.25
120	3.00	0.13	32.59	32.59	77.84	77.84
170	3.50	0.09	10.69	10.69	88.53	88.53
200	3.75	0.07	10.69	10.69	99.22	99.22
230	4.00	0.06	0.39	0.39	99.61	99.61

Shell Hash calculated from visual estimate of shell <4.75mm and >2.8mm.

Phi 5	Phi 16	Phi 25	Phi 50	Phi 75	Phi 84	Phi 95
3.65	3.29	2.96	2.57	2.19	2.05	1.69
Moment Statistics	Mean Phi	Mean mm	Sorting	Skewness	Kurtosis	
	2.61	0.16	0.56	0.18	2.93	

GRANULARMETRIC REPORT OIB\_NATIVESS\_APRIL2013\_NAVD.GPJ\_JPBRAZIL.GDT 3/18/14



# Granularmetric Report

Depths and elevations based on measured values



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

Project Name: Ocean Isle Beach Terminal Groin

Sample Name: USACE OIB040 #003

Analysis Date: 07-14-03

Analyzed By: ATP

Easting (ft):

2,181,075

Northing (ft):

53,428

Coordinate System:

North Carolina State Plane

Elevation (ft):

3.0 NAVD 88

USCS:

SP

Munsell:

Comments:

Dry Weight (g):

100.00

Wash Weight (g):

100.00

Pan Retained (g):

0.11

Sieve Loss (%):

0.00

Fines (%):

#200 - 0.22  
#230 - 0.11

Organics (%):

1

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

0.00

0.00

0.00

0.00

7

-1.50

2.83

0.00

0.00

0.00

0.00

10

-1.00

2.00

0.00

0.00

0.00

0.00

14

-0.50

1.41

0.00

0.00

0.00

0.00

18

0.00

1.00

0.00

0.00

0.00

0.00

25

0.50

0.71

0.00

0.00

0.00

0.00

35

1.00

0.50

0.01

0.01

0.01

0.01

45

1.50

0.35

0.01

0.01

0.02

0.02

60

2.00

0.25

5.97

5.97

5.99

5.99

80

2.50

0.18

39.91

39.91

45.90

45.90

120

3.00

0.13

39.90

39.90

85.80

85.80

170

3.50

0.09

6.99

6.99

92.79

92.79

200

3.75

0.07

6.99

6.99

99.78

99.78

230

4.00

0.06

0.11

0.11

99.89

99.89

Shell Hash calculated from visual estimate of shell <4.75mm and >2.8mm.

Phi 5

Phi 16

Phi 25

Phi 50

Phi 75

Phi 84

Phi 95

3.58

2.98

2.86

2.55

2.24

2.13

1.92

Moment

Mean Phi

Mean mm

Sorting

Skewness

Kurtosis

Statistics

2.59

0.17

0.45

0.55

3.14

GRANULARMETRIC REPORT OIB\_NATIVES APRIL2013\_NAVD.GPJ\_JPBRAZIL.GDT 3/18/14

# Granularmetric Report

Depths and elevations based on measured values



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

Project Name: Ocean Isle Beach Terminal Groin

Sample Name: USACE OIB040 #004

Analysis Date: 07-14-13

Analyzed By: ATP

Easting (ft): <b>2,181,078</b>	Northing (ft): <b>53,407</b>	Coordinate System: <b>North Carolina State Plane</b>	Elevation (ft): <b>1.0 NAVD 88</b>
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USCS: <b>SP</b>	Munsell:	Comments:
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Dry Weight (g): <b>100.00</b>	Wash Weight (g): <b>100.00</b>	Pan Retained (g): <b>0.37</b>	Sieve Loss (%): <b>0.00</b>	Fines (%): #200 - 0.75 #230 - 0.37	Organics (%):	Carbonates (%): <b>1</b>	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	0.00	0.00	0.00	0.00
14	-0.50	1.41	0.00	0.00	0.00	0.00
18	0.00	1.00	0.00	0.00	0.00	0.00
25	0.50	0.71	0.01	0.01	0.01	0.01
35	1.00	0.50	2.35	2.35	2.36	2.36
45	1.50	0.35	2.35	2.35	4.71	4.71
60	2.00	0.25	34.93	34.93	39.64	39.64
80	2.50	0.18	24.75	24.75	64.39	64.39
120	3.00	0.13	24.75	24.75	89.14	89.14
170	3.50	0.09	5.06	5.06	94.20	94.20
200	3.75	0.07	5.05	5.05	99.25	99.25
230	4.00	0.06	0.38	0.38	99.63	99.63

Shell Hash calculated from visual estimate of shell <4.75mm and >2.8mm.

Phi 5	Phi 16	Phi 25	Phi 50	Phi 75	Phi 84	Phi 95
3.54	2.90	2.71	2.21	1.79	1.66	1.50
Moment	Mean Phi	Mean mm	Sorting	Skewness	Kurtosis	
Statistics	2.27	0.21	0.62	0.27	2.97	

GRANULARMETRIC REPORT OIB\_NATIVESS\_APRIL2013\_NAVD.GPJ\_JPBRAZIL.GDT 3/18/14

# Granularmetric Report

Depths and elevations based on measured values



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

Project Name: Ocean Isle Beach Terminal Groin

Sample Name: USACE OIB040 #005

Analysis Date: 07-14-13

Analyzed By: ATP

Easting (ft): 2,181,084	Northing (ft): 53,369	Coordinate System: North Carolina State Plane	Elevation (ft): -1.0 NAVD 88
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USCS: SP	Munsell:	Comments:
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Dry Weight (g): 100.00	Wash Weight (g): 100.00	Pan Retained (g): 0.57	Sieve Loss (%): 0.00	Fines (%): #200 - 1.14 #230 - 0.57	Organics (%):	Carbonates (%): 1	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	0.17	0.17	0.17	0.17
5	-2.00	4.00	0.00	0.00	0.17	0.17
7	-1.50	2.83	0.00	0.00	0.17	0.17
10	-1.00	2.00	0.00	0.00	0.17	0.17
14	-0.50	1.41	0.03	0.03	0.20	0.20
18	0.00	1.00	0.06	0.06	0.26	0.26
25	0.50	0.71	0.24	0.24	0.50	0.50
35	1.00	0.50	8.54	8.54	9.04	9.04
45	1.50	0.35	8.54	8.54	17.58	17.58
60	2.00	0.25	30.97	30.97	48.55	48.55
80	2.50	0.18	19.42	19.42	67.97	67.97
120	3.00	0.13	19.42	19.42	87.39	87.39
170	3.50	0.09	5.74	5.74	93.13	93.13
200	3.75	0.07	5.73	5.73	98.86	98.86
230	4.00	0.06	0.57	0.57	99.43	99.43

Shell Hash calculated from visual estimate of shell <4.75mm and >2.8mm.

Phi 5	Phi 16	Phi 25	Phi 50	Phi 75	Phi 84	Phi 95
3.58	2.91	2.68	2.04	1.62	1.41	0.76
Moment	Mean Phi	Mean mm	Sorting	Skewness	Kurtosis	
Statistics	2.11	0.23	0.79	-0.2	4.14	

GRANULARMETRIC REPORT OIB\_NATIVESS\_APRIL2013\_NAVD.GPJ\_JPBRAZIL.GDT 3/18/14

# Granularmetric Report

Depths and elevations based on measured values



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

Project Name: Ocean Isle Beach Terminal Groin

Sample Name: USACE OIB040 #006

Analysis Date: 07-14-13

Analyzed By: ATP

Easting (ft): 2,181,092	Northing (ft): 53,315	Coordinate System: North Carolina State Plane	Elevation (ft): -3.0 NAVD 88
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USCS: SW	Munsell:	Comments:
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Dry Weight (g): 100.00	Wash Weight (g): 100.00	Pan Retained (g): 0.57	Sieve Loss (%): 0.00	Fines (%): #200 - 1.15 #230 - 0.57	Organics (%):	Carbonates (%): 8	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	0.88	0.88	0.88	0.88
4	-2.25	4.76	0.20	0.20	1.08	1.08
5	-2.00	4.00	0.00	0.00	1.08	1.08
7	-1.50	2.83	0.04	0.04	1.12	1.12
10	-1.00	2.00	0.03	0.03	1.15	1.15
14	-0.50	1.41	0.01	0.01	1.16	1.16
18	0.00	1.00	0.06	0.06	1.22	1.22
25	0.50	0.71	0.30	0.30	1.52	1.52
35	1.00	0.50	3.58	3.58	5.10	5.10
45	1.50	0.35	3.58	3.58	8.68	8.68
60	2.00	0.25	26.74	26.74	35.42	35.42
80	2.50	0.18	23.67	23.67	59.09	59.09
120	3.00	0.13	23.67	23.67	82.76	82.76
170	3.50	0.09	8.05	8.05	90.81	90.81
200	3.75	0.07	8.04	8.04	98.85	98.85
230	4.00	0.06	0.58	0.58	99.43	99.43

Shell Hash calculated from visual estimate of shell <4.75mm and >2.8mm.

Phi 5	Phi 16	Phi 25	Phi 50	Phi 75	Phi 84	Phi 95
3.63	3.08	2.84	2.31	1.81	1.64	0.99
Moment	Mean Phi	Mean mm	Sorting	Skewness	Kurtosis	
Statistics	2.28	0.21	0.88	-1.88	12.23	

GRANULARMETRIC REPORT OIB\_NATIVESS\_APRIL2013\_NAVD.GPJ\_JPBRAZIL.GDT 3/18/14

# Granularmetric Report

Depths and elevations based on measured values



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

Project Name: Ocean Isle Beach Terminal Groin

Sample Name: USACE OIB040 #007

Analysis Date: 07-14-13

Analyzed By: ATP

Easting (ft): <b>2,181,097</b>	Northing (ft): <b>53,282</b>	Coordinate System: <b>North Carolina State Plane</b>	Elevation (ft): <b>-5.0 NAVD 88</b>
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USCS: <b>SW</b>	Munsell:	Comments:
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Dry Weight (g): <b>100.00</b>	Wash Weight (g): <b>100.00</b>	Pan Retained (g): <b>0.48</b>	Sieve Loss (%): <b>0.01</b>	Fines (%): #200 - 0.98 #230 - 0.49	Organics (%):	Carbonates (%): <b>14</b>	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	5.43	5.43	5.43	5.43
5/16"	-3.00	8.00	0.00	0.00	5.43	5.43
3.5	-2.50	5.66	0.00	0.00	5.43	5.43
4	-2.25	4.76	0.00	0.00	5.43	5.43
5	-2.00	4.00	0.00	0.00	5.43	5.43
7	-1.50	2.83	0.04	0.04	5.47	5.47
10	-1.00	2.00	0.04	0.04	5.51	5.51
14	-0.50	1.41	0.04	0.04	5.55	5.55
18	0.00	1.00	0.10	0.10	5.65	5.65
25	0.50	0.71	0.31	0.31	5.96	5.96
35	1.00	0.50	6.02	6.02	11.98	11.98
45	1.50	0.35	6.01	6.01	17.99	17.99
60	2.00	0.25	42.95	42.95	60.94	60.94
80	2.50	0.18	16.72	16.72	77.66	77.66
120	3.00	0.13	16.72	16.72	94.38	94.38
170	3.50	0.09	2.32	2.32	96.70	96.70
200	3.75	0.07	2.32	2.32	99.02	99.02
230	4.00	0.06	0.49	0.49	99.51	99.51

Shell Hash calculated from visual estimate of shell <4.75mm and >2.8mm.

Phi 5	Phi 16	Phi 25	Phi 50	Phi 75	Phi 84	Phi 95
3.13	2.69	2.42	1.87	1.58	1.33	-2.18
Moment Statistics	Mean Phi	Mean mm	Sorting	Skewness	Kurtosis	
	1.69	0.31	1.45	-2.72	10.94	

GRANULARMETRIC REPORT OIB\_NATIVESS\_APRIL2013\_NAVD.GPJ\_JPBRAZIL.GDT 3/18/14

# Granularmetric Report

Depths and elevations based on measured values



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

Project Name: Ocean Isle Beach Terminal Groin

Sample Name: USACE OIB040 #008

Analysis Date: 07-14-13

Analyzed By: ATP

Easting (ft): <b>2,181,127</b>	Northing (ft): <b>53,089</b>	Coordinate System: <b>North Carolina State Plane</b>	Elevation (ft): <b>-7.0 NAVD 88</b>
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USCS: <b>SP</b>	Munsell:	Comments:
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Dry Weight (g): <b>100.00</b>	Wash Weight (g): <b>100.00</b>	Pan Retained (g): <b>0.51</b>	Sieve Loss (%): <b>0.00</b>	Fines (%): <b>#200 - 1.03</b> <b>#230 - 0.51</b>	Organics (%):	Carbonates (%): <b>5</b>	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	0.45	0.45	0.45	0.45
5	-2.00	4.00	0.00	0.00	0.45	0.45
7	-1.50	2.83	0.15	0.15	0.60	0.60
10	-1.00	2.00	0.15	0.15	0.75	0.75
14	-0.50	1.41	0.28	0.28	1.03	1.03
18	0.00	1.00	0.43	0.43	1.46	1.46
25	0.50	0.71	0.61	0.61	2.07	2.07
35	1.00	0.50	5.67	5.67	7.74	7.74
45	1.50	0.35	4.66	4.66	12.40	12.40
60	2.00	0.25	31.29	31.29	43.69	43.69
80	2.50	0.18	21.72	21.72	65.41	65.41
120	3.00	0.13	21.71	21.71	87.12	87.12
170	3.50	0.09	5.93	5.93	93.05	93.05
200	3.75	0.07	5.92	5.92	98.97	98.97
230	4.00	0.06	0.52	0.52	99.49	99.49

Shell Hash calculated from visual estimate of shell <4.75mm and >2.8mm.

Phi 5	Phi 16	Phi 25	Phi 50	Phi 75	Phi 84	Phi 95
3.58	2.93	2.72	2.15	1.70	1.56	0.76
Moment Statistics	Mean Phi	Mean mm	Sorting	Skewness	Kurtosis	
	2.16	0.22	0.84	-1.05	7.28	

GRANULARMETRIC REPORT OIB\_NATIVESS\_APRIL2013\_NAVD.GPJ\_JPBRAZIL.GDT 3/18/14

# Granularmetric Report

Depths and elevations based on measured values



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

Project Name: Ocean Isle Beach Terminal Groin

Sample Name: USACE OIB040 #009

Analysis Date: 07-15-13

Analyzed By: ATP

Easting (ft): <b>2,181,137</b>	Northing (ft): <b>53,027</b>	Coordinate System: <b>North Carolina State Plane</b>	Elevation (ft): <b>-9.0 NAVD 88</b>
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USCS: <b>SP</b>	Munsell:	Comments:
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Dry Weight (g): <b>100.00</b>	Wash Weight (g): <b>100.00</b>	Pan Retained (g): <b>0.39</b>	Sieve Loss (%): <b>0.01</b>	Fines (%): <b>#200 - 0.80</b> <b>#230 - 0.40</b>	Organics (%):	Carbonates (%): <b>1</b>	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	0.00	0.00	0.01	0.01
14	-0.50	1.41	0.05	0.05	0.06	0.06
18	0.00	1.00	0.07	0.07	0.13	0.13
25	0.50	0.71	0.17	0.17	0.30	0.30
35	1.00	0.50	2.24	2.24	2.54	2.54
45	1.50	0.35	2.24	2.24	4.78	4.78
60	2.00	0.25	14.74	14.74	19.52	19.52
80	2.50	0.18	25.62	25.62	45.14	45.14
120	3.00	0.13	25.62	25.62	70.76	70.76
170	3.50	0.09	14.22	14.22	84.98	84.98
200	3.75	0.07	14.22	14.22	99.20	99.20
230	4.00	0.06	0.40	0.40	99.60	99.60

Shell Hash calculated from visual estimate of shell <4.75mm and >2.8mm.

Phi 5	Phi 16	Phi 25	Phi 50	Phi 75	Phi 84	Phi 95
3.68	3.47	3.15	2.59	2.11	1.88	1.51
Moment	Mean Phi	Mean mm	Sorting	Skewness	Kurtosis	
Statistics	2.59	0.17	0.71	-0.4	3.19	

GRANULARMETRIC REPORT OIB\_NATIVESS\_APRIL2013\_NAVD.GPJ\_JPBRAZIL.GDT 3/18/14

# Granularmetric Report

Depths and elevations based on measured values



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

Project Name: Ocean Isle Beach Terminal Groin

Sample Name: USACE OIB040 #010

Analysis Date: 07-14-13

Analyzed By: ATP

Easting (ft): <b>2,181,149</b>	Northing (ft): <b>52,951</b>	Coordinate System: <b>North Carolina State Plane</b>	Elevation (ft): <b>-11.0 NAVD 88</b>
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USCS: <b>SP</b>	Munsell:	Comments:
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Dry Weight (g): <b>100.00</b>	Wash Weight (g): <b>100.00</b>	Pan Retained (g): <b>0.53</b>	Sieve Loss (%): <b>0.00</b>	Fines (%): #200 - 1.07 #230 - 0.53	Organics (%):	Carbonates (%): <b>1</b>	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	0.04	0.04	0.04	0.04
14	-0.50	1.41	0.04	0.04	0.08	0.08
18	0.00	1.00	0.07	0.07	0.15	0.15
25	0.50	0.71	0.12	0.12	0.27	0.27
35	1.00	0.50	0.26	0.26	0.53	0.53
45	1.50	0.35	1.68	1.68	2.21	2.21
60	2.00	0.25	11.65	11.65	13.86	13.86
80	2.50	0.18	23.44	23.44	37.30	37.30
120	3.00	0.13	23.43	23.43	60.73	60.73
170	3.50	0.09	19.10	19.10	79.83	79.83
200	3.75	0.07	19.10	19.10	98.93	98.93
230	4.00	0.06	0.54	0.54	99.47	99.47

Shell Hash calculated from visual estimate of shell <4.75mm and >2.8mm.

Phi 5	Phi 16	Phi 25	Phi 50	Phi 75	Phi 84	Phi 95
3.70	3.55	3.37	2.77	2.24	2.05	1.62
Moment Statistics	Mean Phi	Mean mm	Sorting	Skewness	Kurtosis	
	2.75	0.15	0.67	-0.46	3.23	

GRANULARMETRIC REPORT OIB\_NATIVESS\_APRIL2013\_NAVD.GPJ\_JPBRAZIL.GDT 3/18/14



# Granularmetric Report

Depths and elevations based on measured values



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

Project Name: Ocean Isle Beach Terminal Groin

Sample Name: USACE OIB040 #011

Analysis Date: 08-05-13

Analyzed By: ATP

Easting (ft): 2,181,202	Northing (ft): 52,603	Coordinate System: North Carolina State Plane	Elevation (ft): -13.0 NAVD 88
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USCS: SP	Munsell:	Comments:
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Dry Weight (g): 100.00	Wash Weight (g): 100.00	Pan Retained (g): 0.73	Sieve Loss (%): 0.00	Fines (%): #200 - 1.46 #230 - 0.73	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	0.08	0.08	0.08	0.08
5	-2.00	4.00	0.00	0.00	0.08	0.08
7	-1.50	2.83	0.06	0.06	0.14	0.14
10	-1.00	2.00	0.06	0.06	0.20	0.20
14	-0.50	1.41	0.09	0.09	0.29	0.29
18	0.00	1.00	0.12	0.12	0.41	0.41
25	0.50	0.71	0.22	0.22	0.63	0.63
35	1.00	0.50	0.95	0.95	1.58	1.58
45	1.50	0.35	0.95	0.95	2.53	2.53
60	2.00	0.25	3.83	3.83	6.36	6.36
80	2.50	0.18	18.54	18.54	24.90	24.90
120	3.00	0.13	18.54	18.54	43.44	43.44
170	3.50	0.09	27.55	27.55	70.99	70.99
200	3.75	0.07	27.55	27.55	98.54	98.54
230	4.00	0.06	0.73	0.73	99.27	99.27

Shell Hash calculated from visual estimate of shell <4.75mm and >2.8mm.

Phi 5	Phi 16	Phi 25	Phi 50	Phi 75	Phi 84	Phi 95
3.72	3.62	3.54	3.12	2.50	2.26	1.82
Moment	Mean Phi	Mean mm	Sorting	Skewness	Kurtosis	
Statistics	2.95	0.13	0.69	-1.67	9.11	

GRANULARMETRIC REPORT OIB\_NATIVESS\_APRIL2013\_NAVD.GPJ\_JPBRAZIL.GDT 3/18/14

# Granularmetric Report

Depths and elevations based on measured values



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

Project Name: Ocean Isle Beach Terminal Groin

Sample Name: USACE OIB040 #012

Analysis Date: 07-14-13

Analyzed By: ATP

Easting (ft): <b>2,181,222</b>	Northing (ft): <b>52,475</b>	Coordinate System: <b>North Carolina State Plane</b>	Elevation (ft): <b>-15.0 NAVD 88</b>
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USCS: <b>SP</b>	Munsell:	Comments:
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Dry Weight (g): <b>100.00</b>	Wash Weight (g): <b>100.00</b>	Pan Retained (g): <b>0.92</b>	Sieve Loss (%): <b>0.00</b>	Fines (%): <b>#200 - 1.85</b> <b>#230 - 0.92</b>	Organics (%):	Carbonates (%): <b>1</b>	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	0.04	0.04	0.04	0.04
5	-2.00	4.00	0.00	0.00	0.04	0.04
7	-1.50	2.83	0.06	0.06	0.10	0.10
10	-1.00	2.00	0.06	0.06	0.16	0.16
14	-0.50	1.41	0.17	0.17	0.33	0.33
18	0.00	1.00	0.22	0.22	0.55	0.55
25	0.50	0.71	0.40	0.40	0.95	0.95
35	1.00	0.50	0.92	0.92	1.87	1.87
45	1.50	0.35	0.92	0.92	2.79	2.79
60	2.00	0.25	2.91	2.91	5.70	5.70
80	2.50	0.18	15.43	15.43	21.13	21.13
120	3.00	0.13	15.42	15.42	36.55	36.55
170	3.50	0.09	30.80	30.80	67.35	67.35
200	3.75	0.07	30.80	30.80	98.15	98.15
230	4.00	0.06	0.93	0.93	99.08	99.08

Shell Hash calculated from visual estimate of shell <4.75mm and >2.8mm.

Phi 5	Phi 16	Phi 25	Phi 50	Phi 75	Phi 84	Phi 95
3.72	3.64	3.56	3.22	2.63	2.33	1.88
Moment Statistics	Mean Phi	Mean mm	Sorting	Skewness	Kurtosis	
	3.02	0.12	0.69	-1.94	9.55	

GRANULARMETRIC REPORT OIB\_NATIVESS\_APRIL2013\_NAVD.GPJ\_JPBRAZIL.GDT 3/18/14

# Granularmetric Report

Depths and elevations based on measured values



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

Project Name: Ocean Isle Beach Terminal Groin

Sample Name: USACE OIB040 #013

Analysis Date: 08-05-13

Analyzed By: ATP

Easting (ft): <b>2,181,244</b>	Northing (ft): <b>52,332</b>	Coordinate System: <b>North Carolina State Plane</b>	Elevation (ft): <b>-17.0 NAVD 88</b>
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USCS: <b>SP</b>	Munsell:	Comments:
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Dry Weight (g): <b>100.00</b>	Wash Weight (g): <b>100.00</b>	Pan Retained (g): <b>1.85</b>	Sieve Loss (%): <b>0.00</b>	Fines (%): <b>#200 - 3.70</b> <b>#230 - 1.85</b>	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	0.02	0.02	0.02	0.02
10	-1.00	2.00	0.01	0.01	0.03	0.03
14	-0.50	1.41	0.02	0.02	0.05	0.05
18	0.00	1.00	0.03	0.03	0.08	0.08
25	0.50	0.71	0.06	0.06	0.14	0.14
35	1.00	0.50	0.21	0.21	0.35	0.35
45	1.50	0.35	0.20	0.20	0.55	0.55
60	2.00	0.25	1.05	1.05	1.60	1.60
80	2.50	0.18	13.51	13.51	15.11	15.11
120	3.00	0.13	13.51	13.51	28.62	28.62
170	3.50	0.09	33.84	33.84	62.46	62.46
200	3.75	0.07	33.84	33.84	96.30	96.30
230	4.00	0.06	1.85	1.85	98.15	98.15

Shell Hash calculated from visual estimate of shell <4.75mm and >2.8mm.

Phi 5	Phi 16	Phi 25	Phi 50	Phi 75	Phi 84	Phi 95
3.74	3.66	3.59	3.32	2.87	2.53	2.13
Moment Statistics	Mean Phi	Mean mm	Sorting	Skewness	Kurtosis	
	3.15	0.11	0.53	-1.41	6.77	

GRANULARMETRIC REPORT OIB\_NATIVESSE\_APRIL2013\_NAVD.GPJ\_JPBRAZIL.GDT 3/18/14

# Granularmetric Report

Depths and elevations based on measured values



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

Project Name: Ocean Isle Beach Terminal Groin

Sample Name: USACE OIB040 #014

Analysis Date: 07-14-13

Analyzed By: ATP

Easting (ft): 2,181,265	Northing (ft): 52,201	Coordinate System: North Carolina State Plane	Elevation (ft): -19.0 NAVD 88
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USCS:	Munsell:	Comments:
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Dry Weight (g): 100.00	Wash Weight (g): 100.00	Pan Retained (g): 3.07	Sieve Loss (%): 0.00	Fines (%): #200 - 6.14 #230 - 3.07	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	0.00	0.00	0.00	0.00
4	-2.25	4.76	0.05	0.05	0.05	0.05
5	-2.00	4.00	0.00	0.00	0.05	0.05
7	-1.50	2.83	0.03	0.03	0.08	0.08
10	-1.00	2.00	0.02	0.02	0.10	0.10
14	-0.50	1.41	0.06	0.06	0.16	0.16
18	0.00	1.00	0.07	0.07	0.23	0.23
25	0.50	0.71	0.16	0.16	0.39	0.39
35	1.00	0.50	0.53	0.53	0.92	0.92
45	1.50	0.35	0.52	0.52	1.44	1.44
60	2.00	0.25	2.16	2.16	3.60	3.60
80	2.50	0.18	8.88	8.88	12.48	12.48
120	3.00	0.13	8.88	8.88	21.36	21.36
170	3.50	0.09	36.25	36.25	57.61	57.61
200	3.75	0.07	36.25	36.25	93.86	93.86
230	4.00	0.06	3.07	3.07	96.93	96.93

Shell Hash calculated from visual estimate of shell <4.75mm and >2.8mm.

Phi 5	Phi 16	Phi 25	Phi 50	Phi 75	Phi 84	Phi 95
3.84	3.68	3.62	3.40	3.05	2.70	2.08
Moment	Mean Phi	Mean mm	Sorting	Skewness	Kurtosis	
Statistics	3.2	0.11	0.59	-2.43	13.58	

GRANULARMETRIC REPORT OIB\_NATIVESS\_APRIL2013\_NAVD.GPJ\_JPBRAZIL.GDT 3/18/14

# Granularmetric Report

Depths and elevations based on measured values



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

Project Name: Ocean Isle Beach Terminal Groin

Sample Name: USACE OIB040 #015

Analysis Date: 07-14-13

Analyzed By: ATP

Easting (ft): <b>2,181,290</b>	Northing (ft): <b>52,037</b>	Coordinate System: <b>North Carolina State Plane</b>	Elevation (ft): <b>-21.0 NAVD 88</b>
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USCS:	Munsell:	Comments:
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Dry Weight (g): <b>100.00</b>	Wash Weight (g): <b>100.00</b>	Pan Retained (g): <b>3.25</b>	Sieve Loss (%): <b>0.00</b>	Fines (%): <b>#200 - 6.50</b> <b>#230 - 3.25</b>	Organics (%):	Carbonates (%): <b>2</b>	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	0.08	0.08	0.08	0.08
5	-2.00	4.00	0.00	0.00	0.08	0.08
7	-1.50	2.83	0.17	0.17	0.25	0.25
10	-1.00	2.00	0.16	0.16	0.41	0.41
14	-0.50	1.41	0.29	0.29	0.70	0.70
18	0.00	1.00	0.23	0.23	0.93	0.93
25	0.50	0.71	0.39	0.39	1.32	1.32
35	1.00	0.50	1.61	1.61	2.93	2.93
45	1.50	0.35	1.61	1.61	4.54	4.54
60	2.00	0.25	6.06	6.06	10.60	10.60
80	2.50	0.18	13.19	13.19	23.79	23.79
120	3.00	0.13	13.19	13.19	36.98	36.98
170	3.50	0.09	28.26	28.26	65.24	65.24
200	3.75	0.07	28.26	28.26	93.50	93.50
230	4.00	0.06	3.25	3.25	96.75	96.75

Shell Hash calculated from visual estimate of shell <4.75mm and >2.8mm.

Phi 5	Phi 16	Phi 25	Phi 50	Phi 75	Phi 84	Phi 95
3.87	3.67	3.59	3.23	2.55	2.20	1.54
Moment Statistics	Mean Phi	Mean mm	Sorting	Skewness	Kurtosis	
	2.95	0.13	0.82	-1.91	8.71	

GRANULARMETRIC REPORT OIB\_NATIVESS\_APRIL2013\_NAVD.GPJ\_JPBRAZIL.GDT 3/18/14