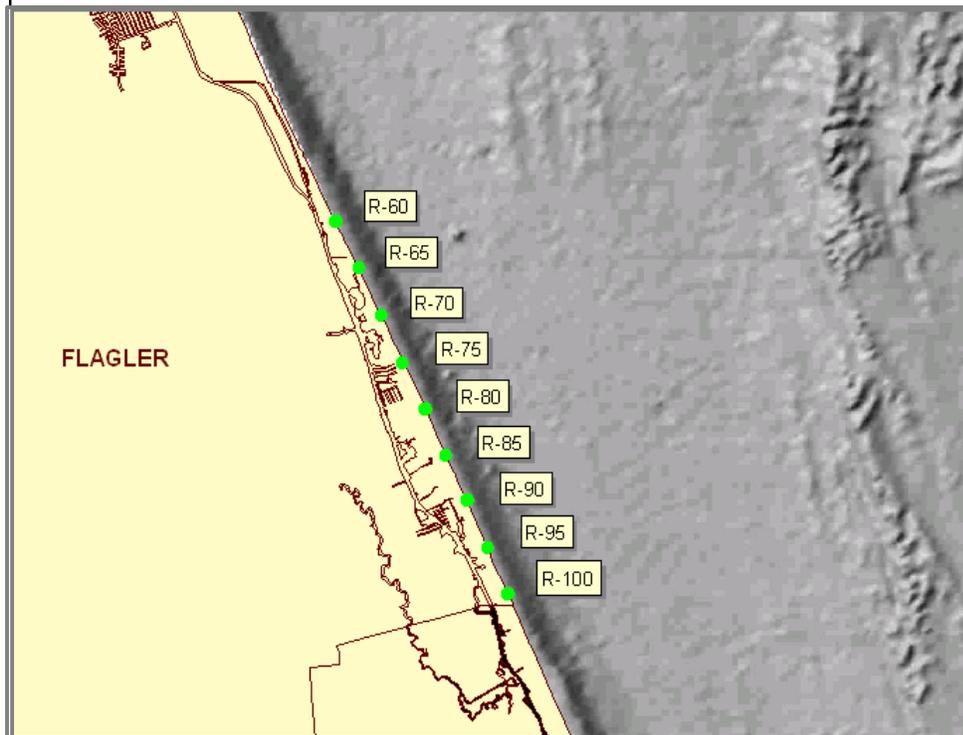


R E P O R T

FLAGLER BEACH RECONNAISSANCE BEACH SAMPLE COLLECTION PHASE II SEDIMENT SAMPLE ANALYSIS REPORT



Prepared for
Florida Department of Environmental Protection
Bureau of Beaches and Coastal Systems
3900 Commonwealth Blvd.
Tallahassee, FL 32399

January 12, 2009



URS Corporation
1625 Summit Lake Dr.
Tallahassee, FL 32317
12804607

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Segments of Beverly Beach (R65.2-R70) and Flagler Beach (R76-R94.8) have been designated as critically eroded by the Florida Department of Environmental Protection (FDEP) and are eligible for beach erosion control funding assistance. Between 26 and 28 March 2008 the Bureau of Beaches and Coastal Systems (BBCS) collected forty-three (43) beach samples between FDEP Range Monuments R60 to R100 during Phase I of this collection effort. These samples were collected to characterize the existing beach in an effort to better understand geologic controls acting on this portion of Flagler County's beaches and the sediment distribution offshore of the critically eroded beaches. Sediment analyses were completed on a sub-set of these (18 samples) for grain size distribution, Munsell color and carbonate content. For Phase II, a second collection effort was undertaken, on August 12 and 13, 2008, by FDEP where 18 beach sand samples were collected from the same locations as the Phase I samples. This report contains the results from this second collection effort.

The study area is located in Flagler County on segments of Beverly Beach and Flagler Beach between Florida Range Monuments R60 and R100 (Figure 1). The samples are labeled with the Range Monument used as the origination of the shore perpendicular transect from which they were taken (Figure 2). Samples were collected 6-12 inches below the surface at the toe of dune, berm, foreshore, top of swash zone and surf zone. For this study, only those samples from the berm and foreshore were analyzed. Samples are designated either berm (b following Range Monument number, i.e., R60b) or foreshore (fs following Range Monument number, i.e., R60fs).

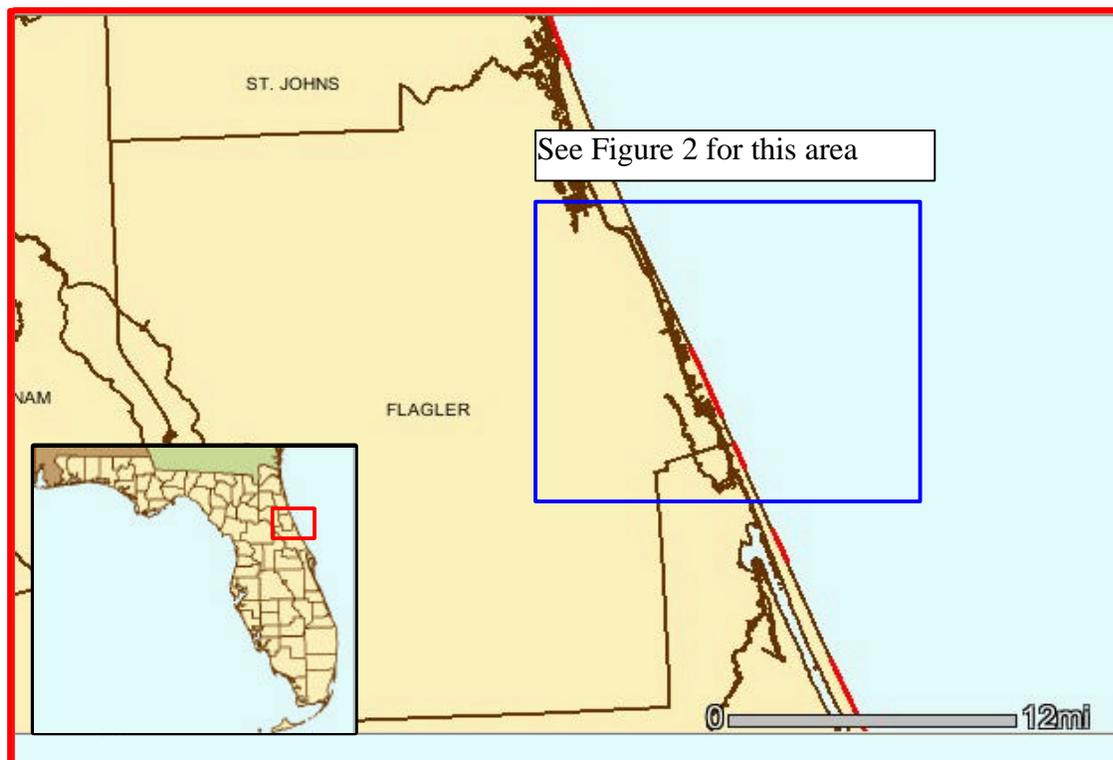


Figure 1: General Location Map of the Study Area

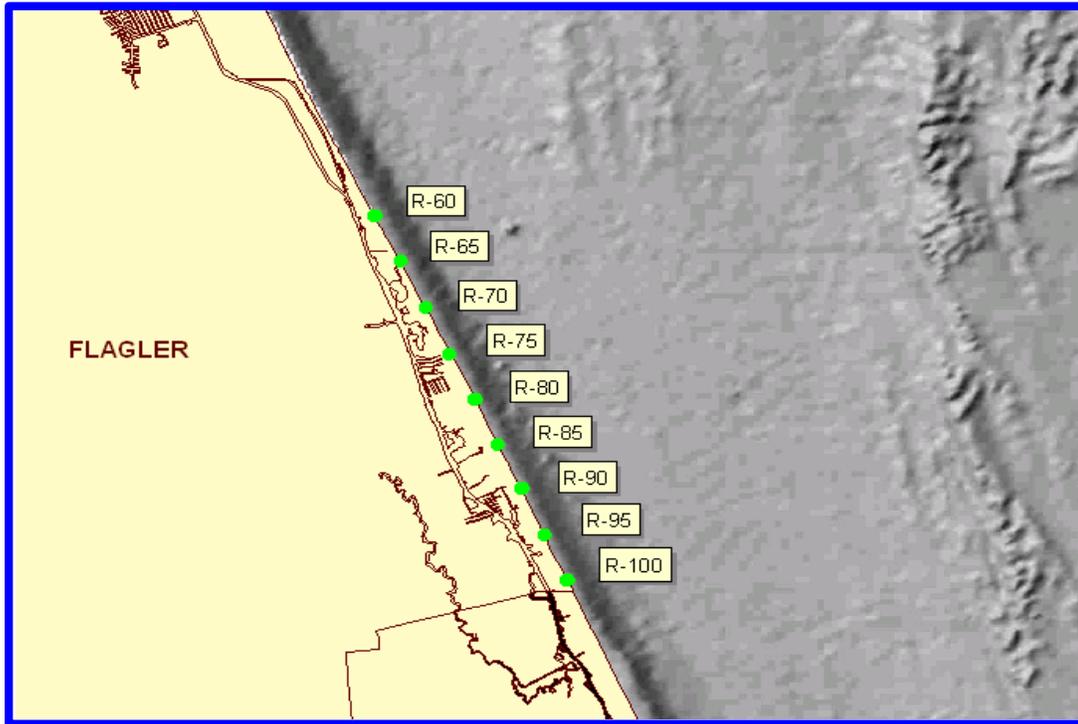


Figure 2: Sediment Sample Locations. Locations based off FDEP Range Monuments

Eighteen (18) sediment samples were analyzed to determine Munsell color and grain size distribution. Prior to sieve analysis, any obvious uncharacteristically large fragments (such as whole shell or large shell fragments) were removed and the description (weight and size) of the material was noted. The wet, dry and washed Munsell colors were noted. Sieve analysis of the sediment samples was performed in accordance with the American Society for Testing and Materials (ASTM) Standard Methods Designation D 422-63 for particle size analysis of soils. This method covers the quantitative determination of the distribution of sand size particles. For sediment finer than the No. 230 sieve (4.0 phi) the ASTM Standard Test Method, Designation D 1140-00 was followed. The sieve stack used for mechanical analysis conformed to the BBCS guidelines provided in Table 1:

Weights retained on each sieve were recorded cumulatively. During sieve analysis the visually estimated percentage of shell retained on the ¾" sieve through the #7 sieves was noted. Grain size results were entered into the gINT® software program, which computes the mean and median grain size, sorting, silt/clay percentages for each sample using the moment method.

Sieve No.	Size (phi)	Size (mm)
3/4	-4.25	19.00
5/8	-4.0	16.00
7/16	-3.5	11.20
5/16	-3.0	8.00
3 ½	-2.5	5.60
4	-2.25	4.75
5	-2.0	4.00
7	-1.5	2.80
10	-1.0	2.00
14	-0.5	1.40
18	0.0	1.00
25	0.5	0.71
35	1.0	0.50
45	1.5	0.36
60	2.0	0.25
80	2.5	0.18
120	3.0	0.13
170	3.5	0.09
200	3.75	0.08
230	4.0	0.06

Table 1. Mesh sizes to be used for granulometric analysis.

Fourteen (14) of the eighteen (18) samples were tested for carbonate content. The four samples not tested for carbonate content are; R65f, R75b, R85f and R95b. Carbonate content was determined by percent weight using the acid leaching methodology described in Twenhofel, W.H. and Tyler, S.A., 1941. Methods of Study of Sediments. New York: McGraw- Hill, 183p.

Following carbonate testing, each of the fourteen (14) samples were resieved following the procedure described above, to determine the control that the carbonate fraction of each sample has on the overall grain size distribution of the sample. These samples are designated by an 'AD' after the sample ID on their respective granulometric reports and grain size distribution curves (Appendix 1). These files are also available on-line from the ROSS website (ROSS.urs-tally.com).

Appendix A
Sample Data Analysis

Granulometric Report

Depths and elevations based on measured values



Coastal Planning & Engineering
 2481 NW Boca Raton Blvd, Boca Raton
 FL 33431
 ph (561) 391-8102
 fax (561) 391-9116

Project Name: Flagler Beach Sample Analysis

Sample Name: R-60 Berm Crest

Analysis Date: 10-29-08

Analyzed By: RC

Easting (ft): -81	Northing (ft): 30	Coordinate System: Geographic (Latitude/Longitude)	Elevation (ft):
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USCS: SP	Munsell: Wet - 10YR-6/6 Dry - 10YR-6/4 Washed - 10YR-6/4	Comments: Collected on 8-13-08
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Dry Weight (g): 98.81	Wash Weight (g): 98.43	Pan Retained (g): 0.00	Sieve Loss (%): 0.04	Fines (%): #200 - 0.42 #230 - 0.42	Organics (%):	Carbonates (%): 57	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	0.00	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	0.50	0.51	0.50	0.51
14	-0.50	1.41	5.29	5.35	5.79	5.86
18	0.00	1.00	16.44	16.64	22.23	22.50
25	0.50	0.71	22.10	22.37	44.33	44.87
35	1.00	0.50	19.56	19.80	63.89	64.67
45	1.50	0.35	16.42	16.62	80.31	81.29
60	2.00	0.25	11.71	11.85	92.02	93.14
80	2.50	0.18	5.08	5.14	97.10	98.28
120	3.00	0.13	1.18	1.19	98.28	99.47
170	3.50	0.09	0.09	0.09	98.37	99.56
200	3.75	0.07	0.02	0.02	98.39	99.58
230	4.00	0.06	0.00	0.00	98.39	99.58

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
2.18	1.61	1.31	0.63	0.06	-0.20	-0.58

Moment Statistics	Mean Phi	Mean mm	Sorting	Skewness	Kurtosis
	0.69	0.62	0.83	0.25	2.47

GRANULOMETRIC REPORT AUGUST 2008 URS FLAGLER BEACH SAMPLES.GPJ_JPBRAZIL.GDT 1/8/09

Granulometric Report

Depths and elevations based on measured values



Coastal Planning & Engineering
2481 NW Boca Raton Blvd, Boca Raton
FL 33431
ph (561) 391-8102
fax (561) 391-9116

Project Name: Flagler Beach Sample Analysis

Sample Name: R-60 Berm Crest AD

Analysis Date: 11-05-08

Analyzed By: MTY

Easting (ft): -81	Northing (ft): 30	Coordinate System: Geographic (Latitude/Longitude)	Elevation (ft):
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USCS: SP	Munsell: Dry - 2.5Y-6/6 Washed - 2.5Y-8/5	Comments: Collected on 8-13-08 AD=After Digestion
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Dry Weight (g): 82.57	Wash Weight (g): 82.05	Pan Retained (g): 0.01	Sieve Loss (%): 0.18	Fines (%): #200 - 0.83 #230 - 0.82	Organics (%):	Carbonates (%):	Shell Hash (%): 0
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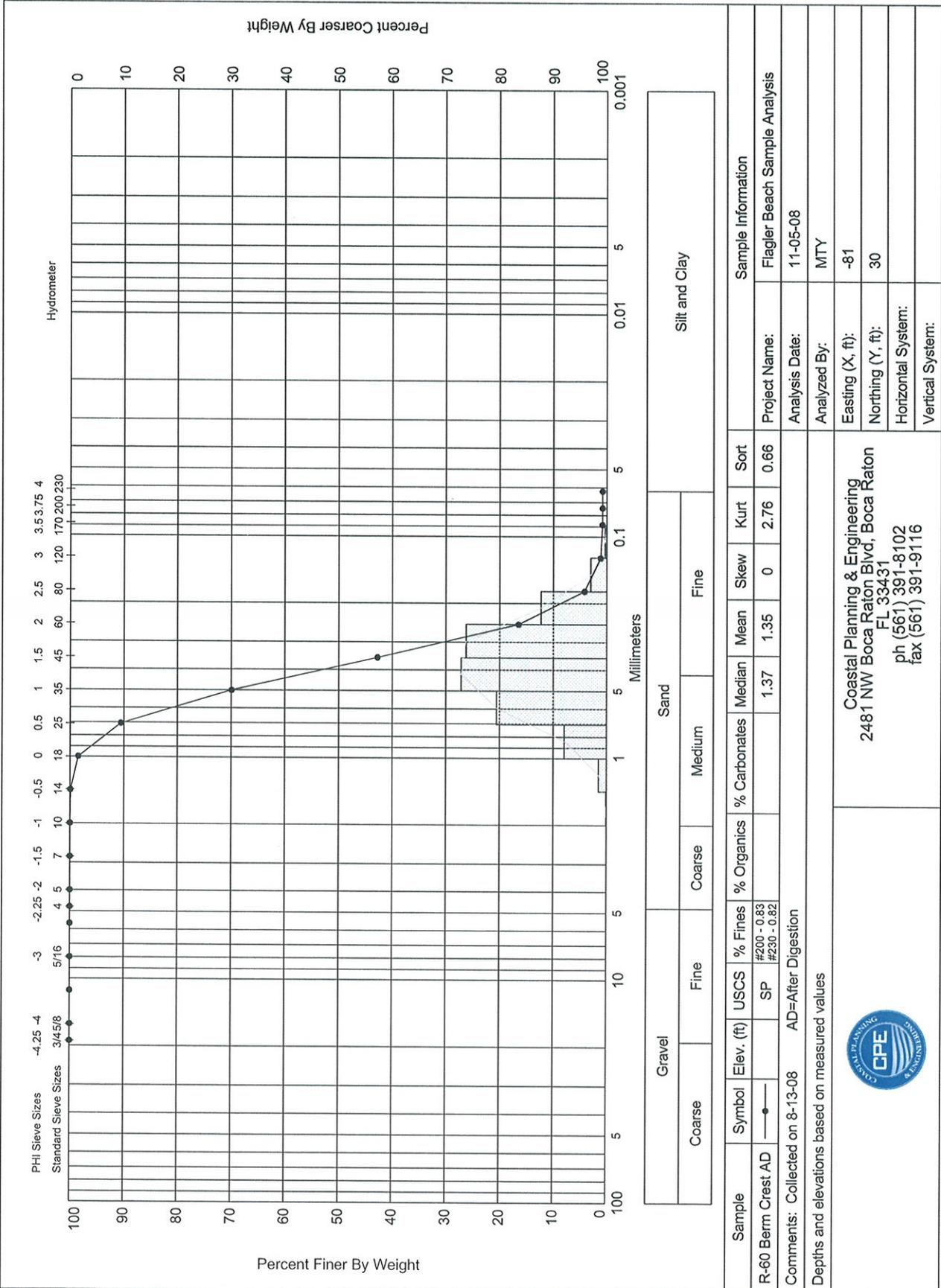
Sieve Number	Sieve Size (Phi)	Sieve Size (Millimeters)	Grams Retained	% Weight Retained	Cum. Grams Retained	C. % Weight Retained
3/4"	-4.25	19.03	0.00	0.00	0.00	0.00
5/8"	-4.00	16.00	0.00	0.00	0.00	0.00
7/16"	-3.50	11.31	0.00	0.00	0.00	0.00
5/16"	-3.00	8.00	0.00	0.00	0.00	0.00
3.5	-2.50	5.66	0.00	0.00	0.00	0.00
4	-2.25	4.76	0.00	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	0.05	0.04	0.05
18	0.00	1.00	1.21	1.47	1.25	1.52
25	0.50	0.71	6.56	7.94	7.81	9.46
35	1.00	0.50	17.00	20.59	24.81	30.05
45	1.50	0.35	22.43	27.16	47.24	57.21
60	2.00	0.25	21.69	26.27	68.93	83.48
80	2.50	0.18	10.20	12.35	79.13	95.83
120	3.00	0.13	2.45	2.97	81.58	98.80
170	3.50	0.09	0.27	0.33	81.85	99.13
200	3.75	0.07	0.03	0.04	81.88	99.17
230	4.00	0.06	0.01	0.01	81.89	99.18

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	2.02	1.84	1.37	0.88	0.66	0.22

Moment Statistics	Mean Phi	Mean mm	Sorting	Skewness	Kurtosis
	1.35	0.39	0.66	0	2.76

GRANULARMETRIC REPORT AUGUST 2008 URS FLAGLER BEACH SAMPLES.GPJ JPBRAZIL.GDT 1/8/09



Gravel		Sand			Silt and Clay						
Sample	Symbol	Elev. (ft)	USCS	% Fines	% Organics	% Carbonates	Median	Mean	Skew	Kurt	Sort
R-60 Berm Crest AD	●		SP	#200 - 0.83 #230 - 0.82			1.37	1.35	0	2.76	0.66
Comments: Collected on 8-13-08 AD=After Digestion											
Depths and elevations based on measured values											
											
Coastal Planning & Engineering 2481 NW Boca Raton Blvd, Boca Raton FL 33431 ph (561) 391-8102 fax (561) 391-9116											
Sample Information								Project Name: Flagler Beach Sample Analysis			
Analysis Date: 11-05-08								Analyzed By: MTY			
Easting (X, ft): -81								Northing (Y, ft): 30			
Horizontal System:								Vertical System:			

Granulometric Report

Depths and elevations based on measured values



Coastal Planning & Engineering
 2481 NW Boca Raton Blvd, Boca Raton
 FL 33431
 ph (561) 391-8102
 fax (561) 391-9116

Project Name: Flagler Beach Sample Analysis

Sample Name: R-60 Foreshore

Analysis Date: 10-30-08

Analyzed By: TD

Easting (ft): -81	Northing (ft): 30	Coordinate System: Geographic (Latitude/Longitude)	Elevation (ft):
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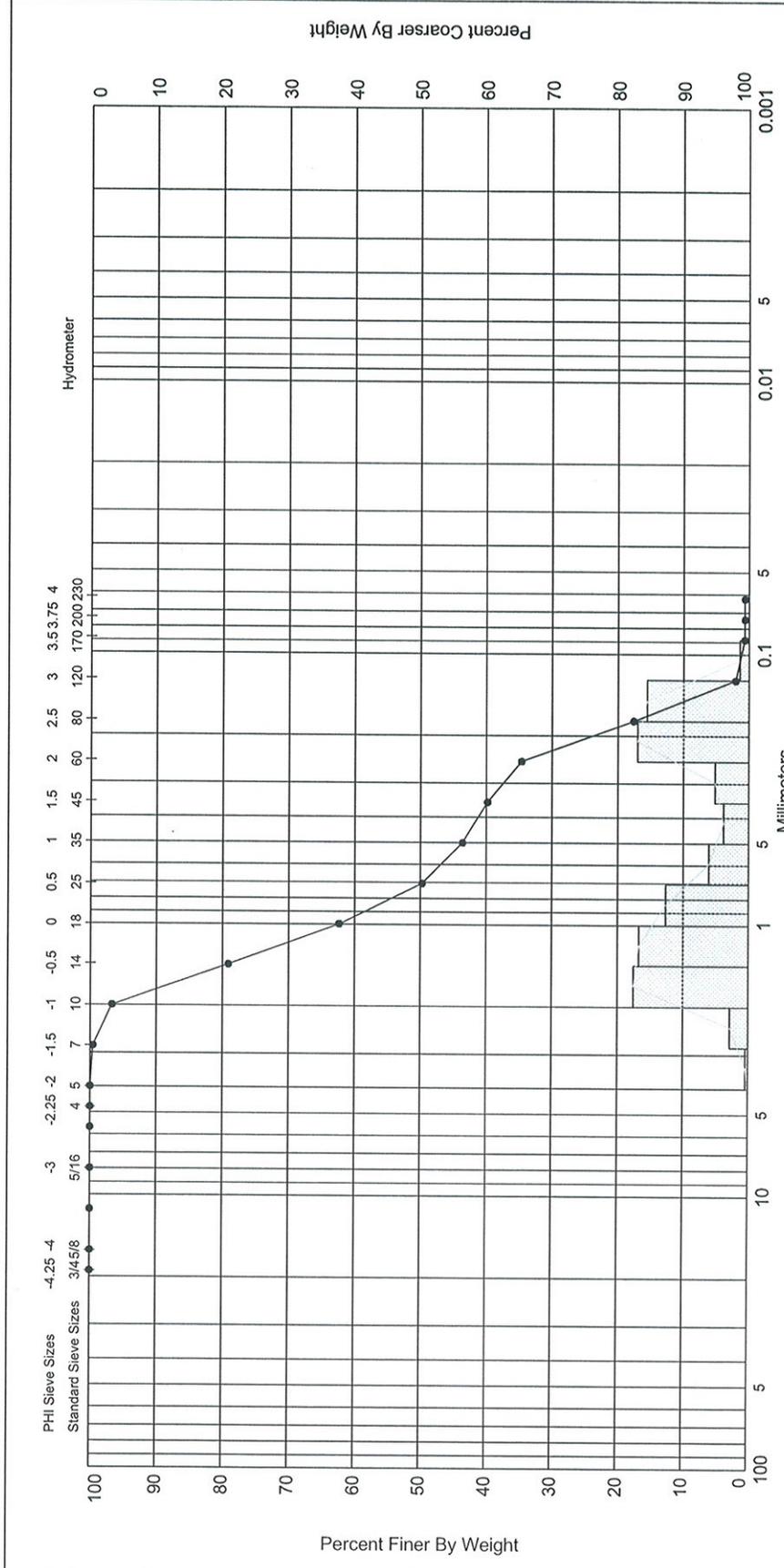
USCS: SW	Munsell: Wet - 10YR-6/4 Dry - 10YR-6/4 Washed - 10YR-6/4	Comments: Collected on 8-13-08
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Dry Weight (g):	Wash Weight (g):	Pan Retained (g):	Sieve Loss (%):	Fines (%): #200 - 0.63 #230 - 0.63	Organics (%):	Carbonates (%):	Shell Hash (%):
98.10	97.62	0.01	0.13			55	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	0.42	0.43	0.42	0.43	
10	-1.00	2.00	2.80	2.85	3.22	3.28	
14	-0.50	1.41	17.26	17.59	20.48	20.87	
18	0.00	1.00	16.45	16.77	36.93	37.64	
25	0.50	0.71	12.41	12.65	49.34	50.29	
35	1.00	0.50	5.99	6.11	55.33	56.40	
45	1.50	0.35	3.73	3.80	59.06	60.20	
60	2.00	0.25	5.08	5.18	64.14	65.38	
80	2.50	0.18	16.67	16.99	80.81	82.37	
120	3.00	0.13	15.25	15.55	96.06	97.92	
170	3.50	0.09	1.39	1.42	97.45	99.34	
200	3.75	0.07	0.03	0.03	97.48	99.37	
230	4.00	0.06	0.00	0.00	97.48	99.37	

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
2.91	2.55	2.28	0.49	-0.38	-0.64	-0.95
Moment Statistics	Mean Phi	Mean mm	Sorting	Skewness	Kurtosis	
	0.86	0.55	1.38	0.16	1.5	

GRANULOMETRIC REPORT AUGUST 2008 URS FLAGLER BEACH SAMPLES.GPJ_JPBRAZIL.GDT 1/8/09



Sample	Gravel		Sand			Silt and Clay			Sample Information									
	Symbol	Elev. (ft)	USCS	% Fines	% Organics	% Carbonates	Median	Mean	Skew	Kurt	Sort	Project Name:	Analysis Date:	Analyzed By:	Easting (X, ft):	Northing (Y, ft):	Horizontal System:	Vertical System:
R-60 Foreshore	●		SW	#200 - 0.63 #230 - 0.63		55	0.49	0.86	0.16	1.5	1.38	Flagler Beach Sample Analysis	10-30-08	TD	-81	30		
Comments: Collected on 8-13-08 Depths and elevations based on measured values																		
 <p>Coastal Planning & Engineering 2481 NW Boca Raton Blvd, Boca Raton FL 33431 ph (561) 391-8102 fax (561) 391-9116</p>																		

Granulometric Report

Depths and elevations based on measured values



Coastal Planning & Engineering
 2481 NW Boca Raton Blvd, Boca Raton
 FL 33431
 ph (561) 391-8102
 fax (561) 391-9116

Project Name: Flagler Beach Sample Analysis

Sample Name: R-60 Foreshore AD

Analysis Date: 11-03-08

Analyzed By: MTY

Easting (ft): -81	Northing (ft): 30	Coordinate System: Geographic (Latitude/Longitude)	Elevation (ft):
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USCS: SP	Munsell: Dry - 2.5Y-6/6 Washed - 2.5Y-8/4	Comments: Collected on 8-13-08 AD=After Digestion
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Dry Weight (g): 84.69	Wash Weight (g): 83.65	Pan Retained (g): 0.01	Sieve Loss (%): 0.15	Fines (%): #200 - 1.42 #230 - 1.40	Organics (%):	Carbonates (%):	Shell Hash (%): 0
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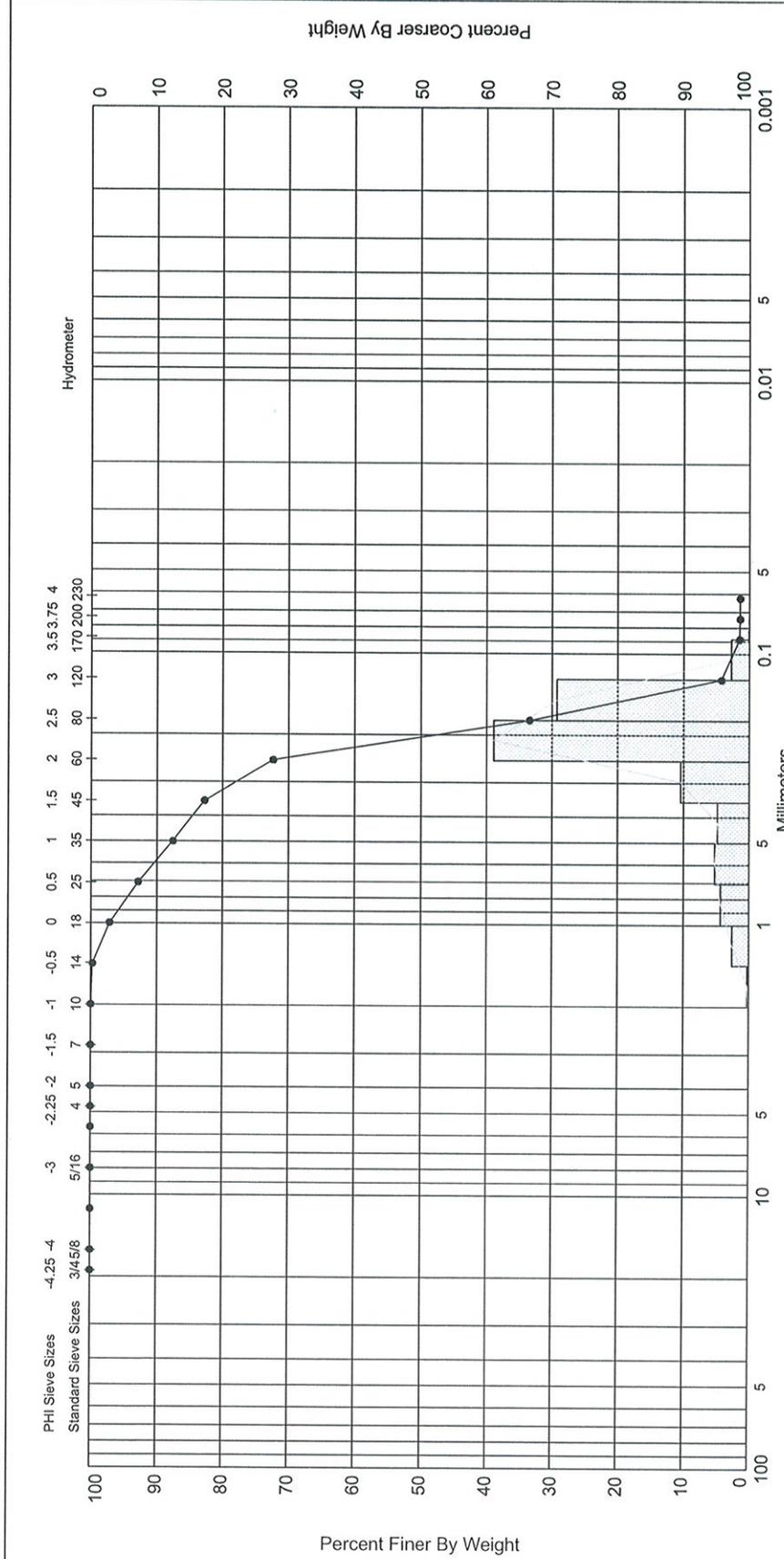
Sieve Number	Sieve Size (Phi)	Sieve Size (Millimeters)	Grams Retained	% Weight Retained	Cum. Grams Retained	C. % Weight Retained
3/4"	-4.25	19.03	0.00	0.00	0.00	0.00
5/8"	-4.00	16.00	0.00	0.00	0.00	0.00
7/16"	-3.50	11.31	0.00	0.00	0.00	0.00
5/16"	-3.00	8.00	0.00	0.00	0.00	0.00
3.5	-2.50	5.66	0.00	0.00	0.00	0.00
4	-2.25	4.76	0.00	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	0.23	0.27	0.23	0.27
18	0.00	1.00	2.17	2.56	2.40	2.83
25	0.50	0.71	3.65	4.31	6.05	7.14
35	1.00	0.50	4.48	5.29	10.53	12.43
45	1.50	0.35	4.08	4.82	14.61	17.25
60	2.00	0.25	8.80	10.39	23.41	27.64
80	2.50	0.18	32.95	38.91	56.36	66.55
120	3.00	0.13	24.74	29.21	81.10	95.76
170	3.50	0.09	2.33	2.75	83.43	98.51
200	3.75	0.07	0.06	0.07	83.49	98.58
230	4.00	0.06	0.02	0.02	83.51	98.60

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
2.99	2.80	2.64	2.29	1.87	1.37	0.25

Moment Statistics	Mean Phi	Mean mm	Sorting	Skewness	Kurtosis
	2.08	0.24	0.8	-1.36	4.36

GRANULARMETRIC REPORT AUGUST 2008 URS FLAGLER BEACH SAMPLES.GPJ JPBRAZIL.GDT 1/8/09



Gravel		Sand			Silt and Clay						
		Coarse	Medium	Fine							
Sample	Symbol	Elev. (ft)	USCS	% Fines	% Organics	% Carbonates	Median	Mean	Skew	Kurt	Sort
R-60 Foreshore AD	●		SP	#200 - 1.42 #230 - 1.40			2.29	2.08	-1.36	4.36	0.8
Comments: Collected on 8-13-08 AD=After Digestion											
Depths and elevations based on measured values											
											
Coastal Planning & Engineering 2481 NW Boca Raton Blvd, Boca Raton FL 33431 ph (561) 391-8102 fax (561) 391-9116											
								Sample Information			
								Project Name: Flagler Beach Sample Analysis			
								Analysis Date: 11-03-08			
								Analyzed By: MTY			
								Easting (X, ft): -81			
								Northing (Y, ft): 30			
								Horizontal System:			
								Vertical System:			

Granulometric Report

Depths and elevations based on measured values



Coastal Planning & Engineering
2481 NW Boca Raton Blvd, Boca Raton
FL 33431
ph (561) 391-8102
fax (561) 391-9116

Project Name: Flagler Beach Sample Analysis

Sample Name: R-65 Berm Crest

Analysis Date: 10-30-08

Analyzed By: PB

Easting (ft): <p style="text-align: center;">-81</p>	Northing (ft): <p style="text-align: center;">30</p>	Coordinate System: <p style="text-align: center;">Geographic (Latitude/Longitude)</p>	Elevation (ft):
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USCS: <p style="text-align: center;">SW</p>	Munsell: Wet - 10YR-5/6 Dry - 10YR-5/6 Washed - 10YR-6/6	Comments: <p style="text-align: center;">Collected on 8-13-08</p>
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Dry Weight (g): <p style="text-align: center;">100.03</p>	Wash Weight (g): <p style="text-align: center;">99.66</p>	Pan Retained (g): <p style="text-align: center;">0.00</p>	Sieve Loss (%): <p style="text-align: center;">0.00</p>	Fines (%): #200 - 0.37 #230 - 0.37	Organics (%):	Carbonates (%): <p style="text-align: center;">72</p>	Shell Hash (%): <p style="text-align: center;">1</p>
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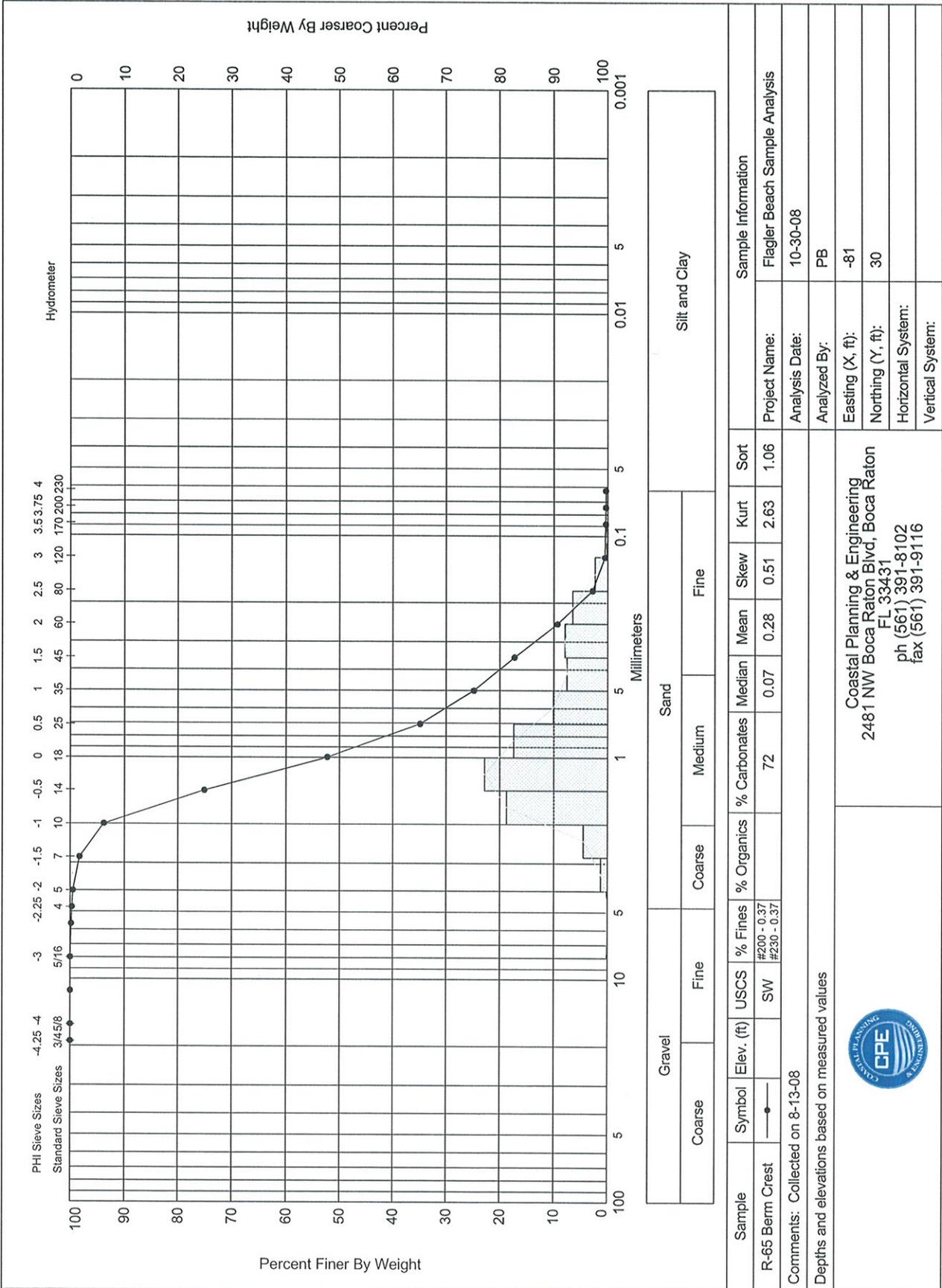
Sieve Number	Sieve Size (Phi)	Sieve Size (Millimeters)	Grams Retained	% Weight Retained	Cum. Grams Retained	C. % Weight Retained
3/4"	-4.25	19.03	0.00	0.00	0.00	0.00
5/8"	-4.00	16.00	0.00	0.00	0.00	0.00
7/16"	-3.50	11.31	0.00	0.00	0.00	0.00
5/16"	-3.00	8.00	0.00	0.00	0.00	0.00
3.5	-2.50	5.66	0.18	0.18	0.18	0.18
4	-2.25	4.76	0.13	0.13	0.31	0.31
5	-2.00	4.00	0.17	0.17	0.48	0.48
7	-1.50	2.83	1.21	1.21	1.69	1.69
10	-1.00	2.00	4.49	4.49	6.18	6.18
14	-0.50	1.41	18.73	18.72	24.91	24.90
18	0.00	1.00	22.81	22.80	47.72	47.70
25	0.50	0.71	17.39	17.38	65.11	65.08
35	1.00	0.50	10.06	10.06	75.17	75.14
45	1.50	0.35	7.57	7.57	82.74	82.71
60	2.00	0.25	7.94	7.94	90.68	90.65
80	2.50	0.18	6.53	6.53	97.21	97.18
120	3.00	0.13	2.31	2.31	99.52	99.49
170	3.50	0.09	0.13	0.13	99.65	99.62
200	3.75	0.07	0.01	0.01	99.66	99.63
230	4.00	0.06	0.00	0.00	99.66	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
2.33	1.58	0.99	0.07	-0.50	-0.74	-1.13

Moment Statistics	Mean Phi	Mean mm	Sorting	Skewness	Kurtosis
	0.28	0.82	1.06	0.51	2.63

GRANULOMETRIC REPORT AUGUST 2008 URS FLAGLER BEACH SAMPLES.GPJ_JPBRAZIL.GDT 1/8/09



Granularmetric Report

Depths and elevations based on measured values



Coastal Planning & Engineering
2481 NW Boca Raton Blvd, Boca Raton
FL 33431
ph (561) 391-8102
fax (561) 391-9116

Project Name: Flagler Beach Sample Analysis

Sample Name: R-65 Berm Crest AD

Analysis Date: 11-03-08

Analyzed By: MTY

Easting (ft): <p style="text-align: center;">-81</p>	Northing (ft): <p style="text-align: center;">30</p>	Coordinate System: <p style="text-align: center;">Geographic (Latitude/Longitude)</p>	Elevation (ft):
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USCS: <p style="text-align: center;">SP</p>	Munsell: Dry - 2.5Y-7/6 Washed - 2.5Y-8/5	Comments: <p style="text-align: center;">Collected on 8-13-08 AD=After Digestion</p>
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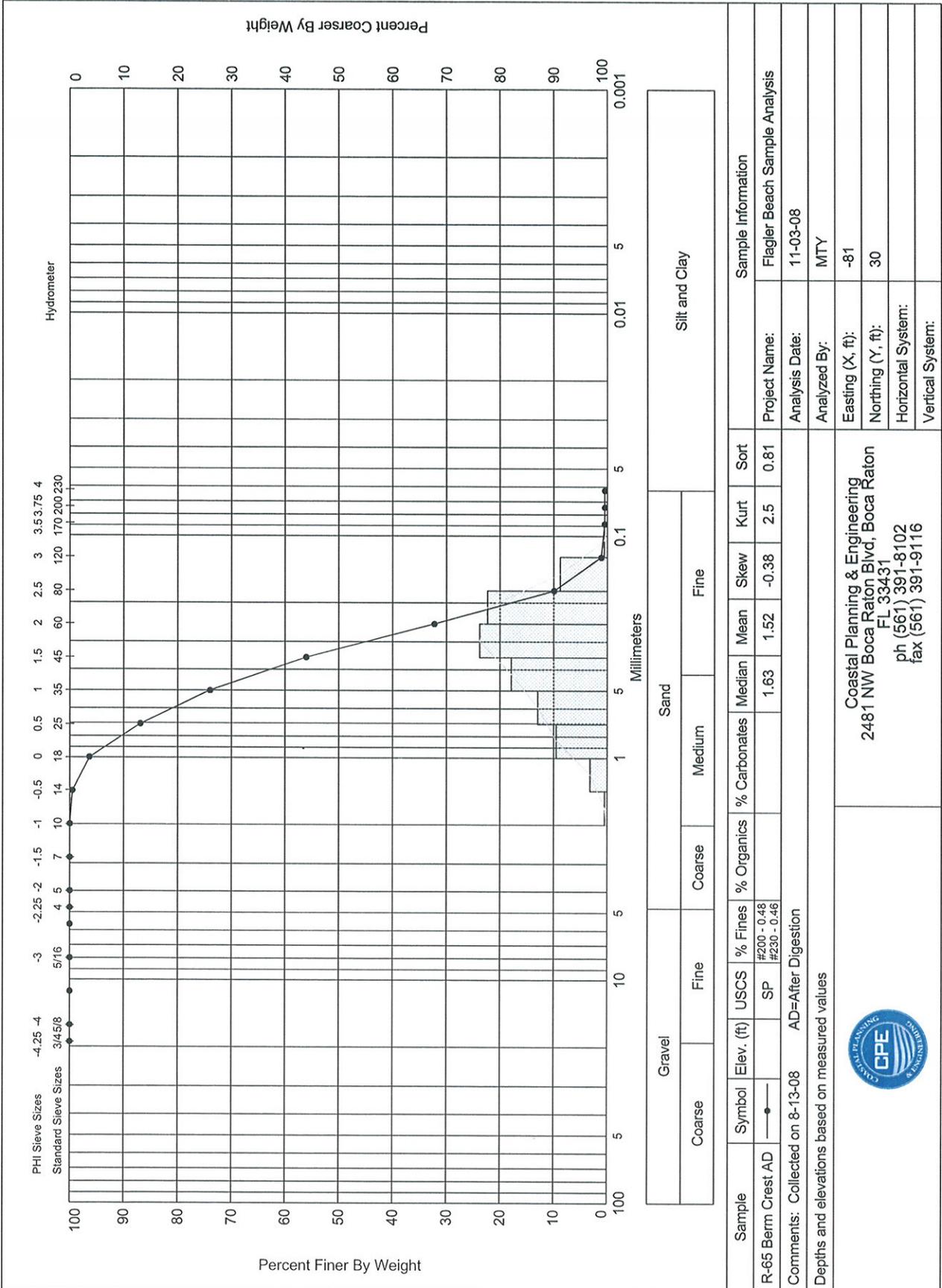
Dry Weight (g): <p style="text-align: center;">56.89</p>	Wash Weight (g): <p style="text-align: center;">56.73</p>	Pan Retained (g): <p style="text-align: center;">0.01</p>	Sieve Loss (%): <p style="text-align: center;">0.16</p>	Fines (%): #200 - 0.48 #230 - 0.46	Organics (%):	Carbonates (%):	Shell Hash (%): <p style="text-align: center;">0</p>
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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	0.27	0.47	0.27	0.47
18	0.00	1.00	1.80	3.16	2.07	3.63
25	0.50	0.71	5.39	9.47	7.46	13.10
35	1.00	0.50	7.35	12.92	14.81	26.02
45	1.50	0.35	10.19	17.91	25.00	43.93
60	2.00	0.25	13.54	23.80	38.54	67.73
80	2.50	0.18	12.71	22.34	51.25	90.07
120	3.00	0.13	5.00	8.79	56.25	98.86
170	3.50	0.09	0.35	0.62	56.60	99.48
200	3.75	0.07	0.02	0.04	56.62	99.52
230	4.00	0.06	0.01	0.02	56.63	99.54

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
2.78	2.36	2.16	1.63	0.96	0.61	0.07
Moment Statistics	Mean Phi	Mean mm	Sorting	Skewness	Kurtosis	
	1.52	0.35	0.81	-0.38	2.5	

GRANULARMETRIC REPORT AUGUST 2008 URS FLAGLER BEACH SAMPLES GPJ_JPBRAZIL.GDT 1/8/09



Coastal Planning & Engineering
 2481 NW Boca Raton Blvd, Boca Raton
 FL 33431
 ph (561) 391-8102
 fax (561) 391-9116

Granulometric Report

Depths and elevations based on measured values



Coastal Planning & Engineering
2481 NW Boca Raton Blvd, Boca Raton
FL 33431
ph (561) 391-8102
fax (561) 391-9116

Project Name: Flagler Beach Sample Analysis

Sample Name: R-65 Foreshore

Analysis Date: 10-29-08

Analyzed By: RC

Easting (ft):

-81

Northing (ft):

30

Coordinate System:

Geographic (Latitude/Longitude)

Elevation (ft):

USCS:

SW

Munsell: Wet - 10YR-6/6
Dry - 10YR-6/4
Washed - 10YR-6/4

Comments:

Collected on 8-13-08

Dry Weight (g):

97.25

Wash Weight (g):

96.92

Pan Retained (g):

0.00

Sieve Loss (%):

0.02

Fines (%):

#200 - 0.39
#230 - 0.38

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

0.14

0.14

0.14

0.14

7

-1.50

2.83

0.00

0.00

0.14

0.14

10

-1.00

2.00

0.13

0.13

0.27

0.27

14

-0.50

1.41

3.69

3.79

3.96

4.06

18

0.00

1.00

16.09

16.54

20.05

20.60

25

0.50

0.71

20.38

20.96

40.43

41.56

35

1.00

0.50

12.54

12.89

52.97

54.45

45

1.50

0.35

7.43

7.64

60.40

62.09

60

2.00

0.25

9.39

9.66

69.79

71.75

80

2.50

0.18

16.24

16.70

86.03

88.45

120

3.00

0.13

9.66

9.93

95.69

98.38

170

3.50

0.09

1.17

1.20

96.86

99.58

200

3.75

0.07

0.03

0.03

96.89

99.61

230

4.00

0.06

0.01

0.01

96.90

99.62

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

2.37

2.10

0.83

0.10

-0.14

-0.47

Moment

Mean Phi

Mean mm

Sorting

Skewness

Kurtosis

Statistics

1.03

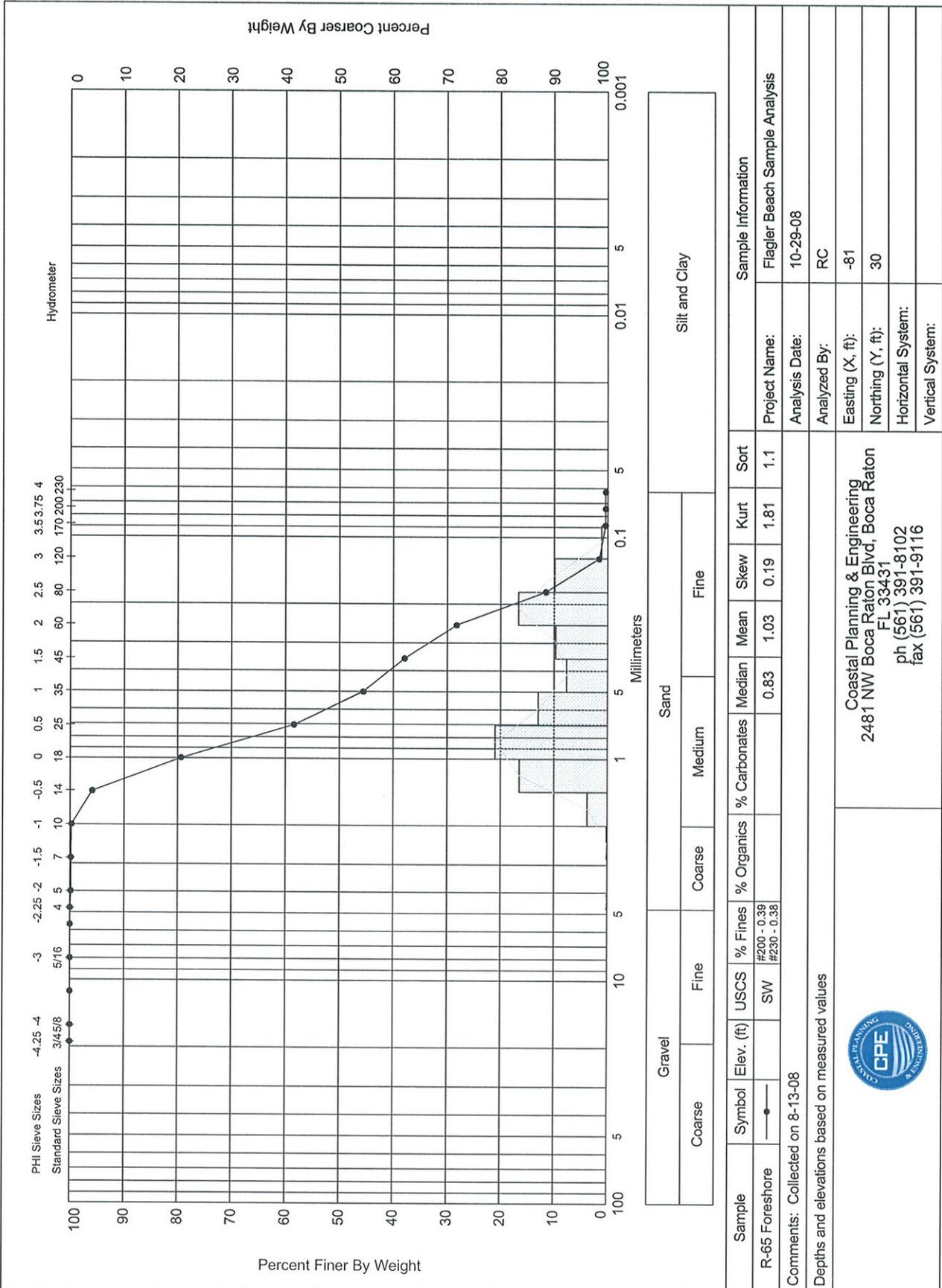
0.49

1.1

0.19

1.81

GRANULOMETRIC REPORT AUGUST 2008 URS FLAGLER BEACH SAMPLES.GPJ_JPBRAZIL.GDT 1/8/09



Gravel		Sand		Silt and Clay	
Coarse	Fine	Coarse	Medium	Fine	

Sample	Symbol	Elev. (ft)	USCS	% Fines	% Organics	% Carbonates	Median	Mean	Skew	Kurt	Sort
R-65	Foreshore	—●—	SW	#200 - 0.39 #230 - 0.38			0.83	1.03	0.19	1.81	1.1

Comments: Collected on 8-13-08
 Depths and elevations based on measured values

Project Name: Flagler Beach Sample Analysis
 Analysis Date: 10-29-08
 Analyzed By: RC
 Easting (X, ft): -81
 Northing (Y, ft): 30
 Horizontal System:
 Vertical System:

Coastal Planning & Engineering
 2481 NW Boca Raton Blvd, Boca Raton
 FL 33431
 ph (561) 391-8102
 fax (561) 391-9116



Granulometric Report

Depths and elevations based on measured values



Coastal Planning & Engineering
 2481 NW Boca Raton Blvd, Boca Raton
 FL 33431
 ph (561) 391-8102
 fax (561) 391-9116

Project Name: Flagler Beach Sample Analysis

Sample Name: R-70 Berm Crest

Analysis Date: 10-29-08

Analyzed By: RC

Easting (ft): -81	Northing (ft): 30	Coordinate System: Geographic (Latitude/Longitude)	Elevation (ft):
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USCS: SW	Munsell: Wet - 10YR-6/6 Dry - 10YR-6/6 Washed - 10YR-6/6	Comments: Collected on 8-13-08
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Dry Weight (g): 98.33	Wash Weight (g): 97.94	Pan Retained (g): 0.00	Sieve Loss (%): 0.07	Fines (%): #200 - 0.45 #230 - 0.45	Organics (%):	Carbonates (%): 61	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	0.00	0.00	0.00	0.00
5	-2.00	4.00	0.00	0.00	0.00	0.00
7	-1.50	2.83	0.33	0.34	0.33	0.34
10	-1.00	2.00	1.36	1.38	1.69	1.72
14	-0.50	1.41	12.56	12.77	14.25	14.49
18	0.00	1.00	24.59	25.01	38.84	39.50
25	0.50	0.71	18.64	18.96	57.48	58.46
35	1.00	0.50	8.14	8.28	65.62	66.74
45	1.50	0.35	5.08	5.17	70.70	71.91
60	2.00	0.25	6.95	7.07	77.65	78.98
80	2.50	0.18	12.83	13.05	90.48	92.03
120	3.00	0.13	6.87	6.99	97.35	99.02
170	3.50	0.09	0.49	0.50	97.84	99.52
200	3.75	0.07	0.03	0.03	97.87	99.55
230	4.00	0.06	0.00	0.00	97.87	99.55

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	2.19	1.72	0.28	-0.29	-0.47	-0.87

Moment Statistics	Mean Phi	Mean mm	Sorting	Skewness	Kurtosis
	0.62	0.65	1.16	0.52	2.02

GRANULARMETRIC REPORT AUGUST 2008 URS FLAGLER BEACH SAMPLES.GPJ_JPBRAZIL.GDT 1/8/09

Granulometric Report

Depths and elevations based on measured values



Coastal Planning & Engineering
2481 NW Boca Raton Blvd, Boca Raton
FL 33431
ph (561) 391-8102
fax (561) 391-9116

Project Name: Flagler Beach Sample Analysis

Sample Name: R-70 Berm Crest AD

Analysis Date: 11-03-08

Analyzed By: MTY

Easting (ft): <p style="text-align: center;">-81</p>	Northing (ft): <p style="text-align: center;">30</p>	Coordinate System: <p style="text-align: center;">Geographic (Latitude/Longitude)</p>	Elevation (ft):
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USCS: <p style="text-align: center;">SP</p>	Munsell: Dry - 2.5Y-7/4 Washed - 2.5Y-8/4	Comments: <p style="text-align: center;">Collected on 8-13-08 AD=After Digestion</p>
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Dry Weight (g): <p style="text-align: center;">63.11</p>	Wash Weight (g): <p style="text-align: center;">62.64</p>	Pan Retained (g): <p style="text-align: center;">0.02</p>	Sieve Loss (%): <p style="text-align: center;">0.08</p>	Fines (%): #200 - 0.91 #230 - 0.85	Organics (%):	Carbonates (%):	Shell Hash (%): <p style="text-align: center;">0</p>
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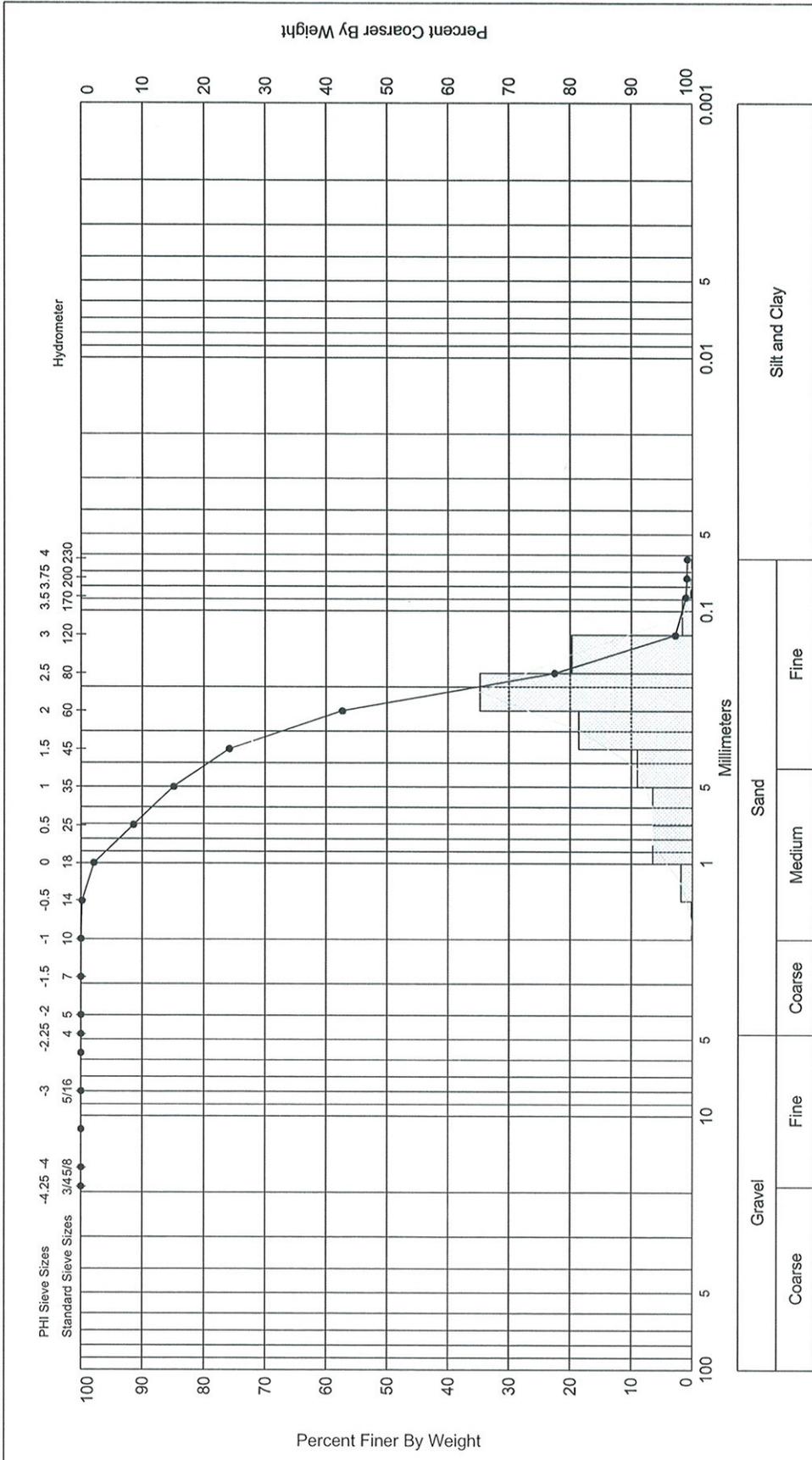
Sieve Number	Sieve Size (Phi)	Sieve Size (Millimeters)	Grams Retained	% Weight Retained	Cum. Grams Retained	C. % Weight Retained
3/4"	-4.25	19.03	0.00	0.00	0.00	0.00
5/8"	-4.00	16.00	0.00	0.00	0.00	0.00
7/16"	-3.50	11.31	0.00	0.00	0.00	0.00
5/16"	-3.00	8.00	0.00	0.00	0.00	0.00
3.5	-2.50	5.66	0.00	0.00	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	0.12	0.19	0.12	0.19
18	0.00	1.00	1.19	1.89	1.31	2.08
25	0.50	0.71	4.10	6.50	5.41	8.58
35	1.00	0.50	4.12	6.53	9.53	15.11
45	1.50	0.35	5.70	9.03	15.23	24.14
60	2.00	0.25	11.71	18.55	26.94	42.69
80	2.50	0.18	21.94	34.76	48.88	77.45
120	3.00	0.13	12.45	19.73	61.33	97.18
170	3.50	0.09	1.07	1.70	62.40	98.88
200	3.75	0.07	0.13	0.21	62.53	99.09
230	4.00	0.06	0.04	0.06	62.57	99.15

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
2.94	2.67	2.46	2.11	1.52	1.05	0.22

Moment Statistics	Mean Phi	Mean mm	Sorting	Skewness	Kurtosis
	1.9	0.27	0.8	-0.9	3.25

GRANULOMETRIC REPORT AUGUST 2008 URS FLAGLER BEACH SAMPLES.GPJ_JPBRAZIL.GDT 1/8/09



Sample		Symbol		Elev. (ft)		USCS		% Fines		% Organics		% Carbonates		Median		Mean		Skew		Kurt		Sort	
R-70 Berm Crest AD		●		—		SP		#200 - 0.91 #230 - 0.85						2.11		1.9		-0.9		3.25		0.8	
Comments: Collected on 8-13-08 AD=After Digestion																							
Depths and elevations based on measured values																							
Gravel												Sand						Silt and Clay					
Coarse						Fine			Coarse			Medium			Fine								
Sample Information												Flagler Beach Sample Analysis											
Project Name:												11-03-08											
Analysis Date:												MTY											
Analyzed By:												-81											
Easting (X, ft):												30											
Northing (Y, ft):																							
Horizontal System:																							
Vertical System:																							
Coastal Planning & Engineering 2481 NW Boca Raton Blvd, Boca Raton FL 33431 ph (561) 391-8102 fax (561) 391-9116																							



Granulometric Report

Depths and elevations based on measured values



Coastal Planning & Engineering
2481 NW Boca Raton Blvd, Boca Raton
FL 33431
ph (561) 391-8102
fax (561) 391-9116

Project Name: Flagler Beach Sample Analysis

Sample Name: R-70 Foreshore

Analysis Date: 10-29-08

Analyzed By: RC

Easting (ft): -81	Northing (ft): 30	Coordinate System: Geographic (Latitude/Longitude)	Elevation (ft):
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USCS: SW	Munsell: Wet - 10YR-6/4 Dry - 10YR-6/4 Washed - 10YR-7/4	Comments: Collected on 8-13-08
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Dry Weight (g): 97.54	Wash Weight (g): 97.08	Pan Retained (g): 0.00	Sieve Loss (%): 0.00	Fines (%): #200 - 0.49 #230 - 0.48	Organics (%):	Carbonates (%): 45	Shell Hash (%): 0
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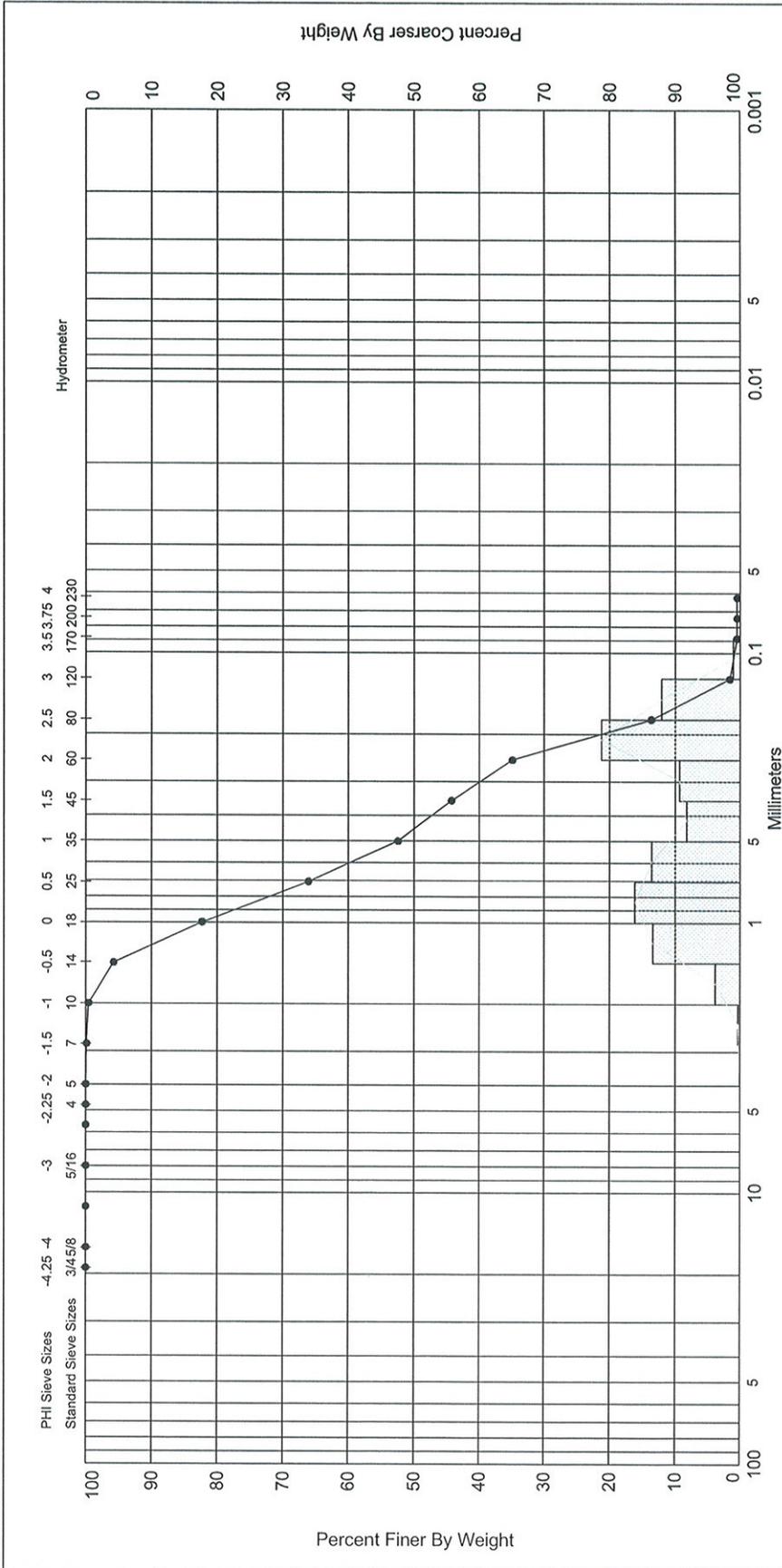
Sieve Number	Sieve Size (Phi)	Sieve Size (Millimeters)	Grams Retained	% Weight Retained	Cum. Grams Retained	C. % Weight Retained
3/4"	-4.25	19.03	0.00	0.00	0.00	0.00
5/8"	-4.00	16.00	0.00	0.00	0.00	0.00
7/16"	-3.50	11.31	0.00	0.00	0.00	0.00
5/16"	-3.00	8.00	0.00	0.00	0.00	0.00
3.5	-2.50	5.66	0.00	0.00	0.00	0.00
4	-2.25	4.76	0.00	0.00	0.00	0.00
5	-2.00	4.00	0.00	0.00	0.00	0.00
7	-1.50	2.83	0.12	0.12	0.12	0.12
10	-1.00	2.00	0.29	0.30	0.41	0.42
14	-0.50	1.41	3.76	3.85	4.17	4.27
18	0.00	1.00	13.11	13.44	17.28	17.71
25	0.50	0.71	15.79	16.19	33.07	33.90
35	1.00	0.50	13.28	13.61	46.35	47.51
45	1.50	0.35	8.06	8.26	54.41	55.77
60	2.00	0.25	9.08	9.31	63.49	65.08
80	2.50	0.18	20.73	21.25	84.22	86.33
120	3.00	0.13	11.75	12.05	95.97	98.38
170	3.50	0.09	1.07	1.10	97.04	99.48
200	3.75	0.07	0.03	0.03	97.07	99.51
230	4.00	0.06	0.01	0.01	97.08	99.52

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	2.45	2.23	1.15	0.23	-0.06	-0.47

Moment Statistics	Mean Phi	Mean mm	Sorting	Skewness	Kurtosis
	1.19	0.44	1.11	-0.06	1.74

GRANULOMETRIC REPORT AUGUST 2008 URS FLAGLER BEACH SAMPLES.GPJ JPBRAZIL.GDT 1/8/09



Gravel		Sand			Silt and Clay							
Sample	Symbol	Elev. (ft)	USCS	% Fines	% Organics	% Carbonates	Median	Mean	Skew	Kurt	Sort	
R-70 Foreshore	—●—		SW	#200 - 0.49 #230 - 0.48		45	1.15	1.19	-0.06	1.74	1.11	
Comments: Collected on 8-13-08												
Depths and elevations based on measured values												
												
Coastal Planning & Engineering 2481 NW Boca Raton Blvd, Boca Raton FL 33431 ph (561) 391-8102 fax (561) 391-9116												
Sample Information								Project Name:				Flagler Beach Sample Analysis
								Analysis Date:				10-29-08
								Analyzed By:				RC
								Easting (X, ft):				-81
								Northing (Y, ft):				30
								Horizontal System:				
								Vertical System:				

Granulometric Report

Depths and elevations based on measured values



Coastal Planning & Engineering
2481 NW Boca Raton Blvd, Boca Raton
FL 33431
ph (561) 391-8102
fax (561) 391-9116

Project Name: Flagler Beach Sample Analysis

Sample Name: R-70 Foreshore AD

Analysis Date: 11-04-08

Analyzed By: RC

Easting (ft): <p style="text-align: center;">-81</p>	Northing (ft): <p style="text-align: center;">30</p>	Coordinate System: <p style="text-align: center;">Geographic (Latitude/Longitude)</p>	Elevation (ft):
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USCS: <p style="text-align: center;">SP</p>	Munsell: Dry - 2.5Y-8/4 Washed - 2.5Y-8/4	Comments: <p style="text-align: center;">Collected on 8-13-08 AD=After Digestion</p>
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Dry Weight (g): <p style="text-align: center;">97.18</p>	Wash Weight (g): <p style="text-align: center;">96.87</p>	Pan Retained (g): <p style="text-align: center;">0.01</p>	Sieve Loss (%): <p style="text-align: center;">0.06</p>	Fines (%): #200 - 0.42 #230 - 0.40	Organics (%):	Carbonates (%):	Shell Hash (%): <p style="text-align: center;">0</p>
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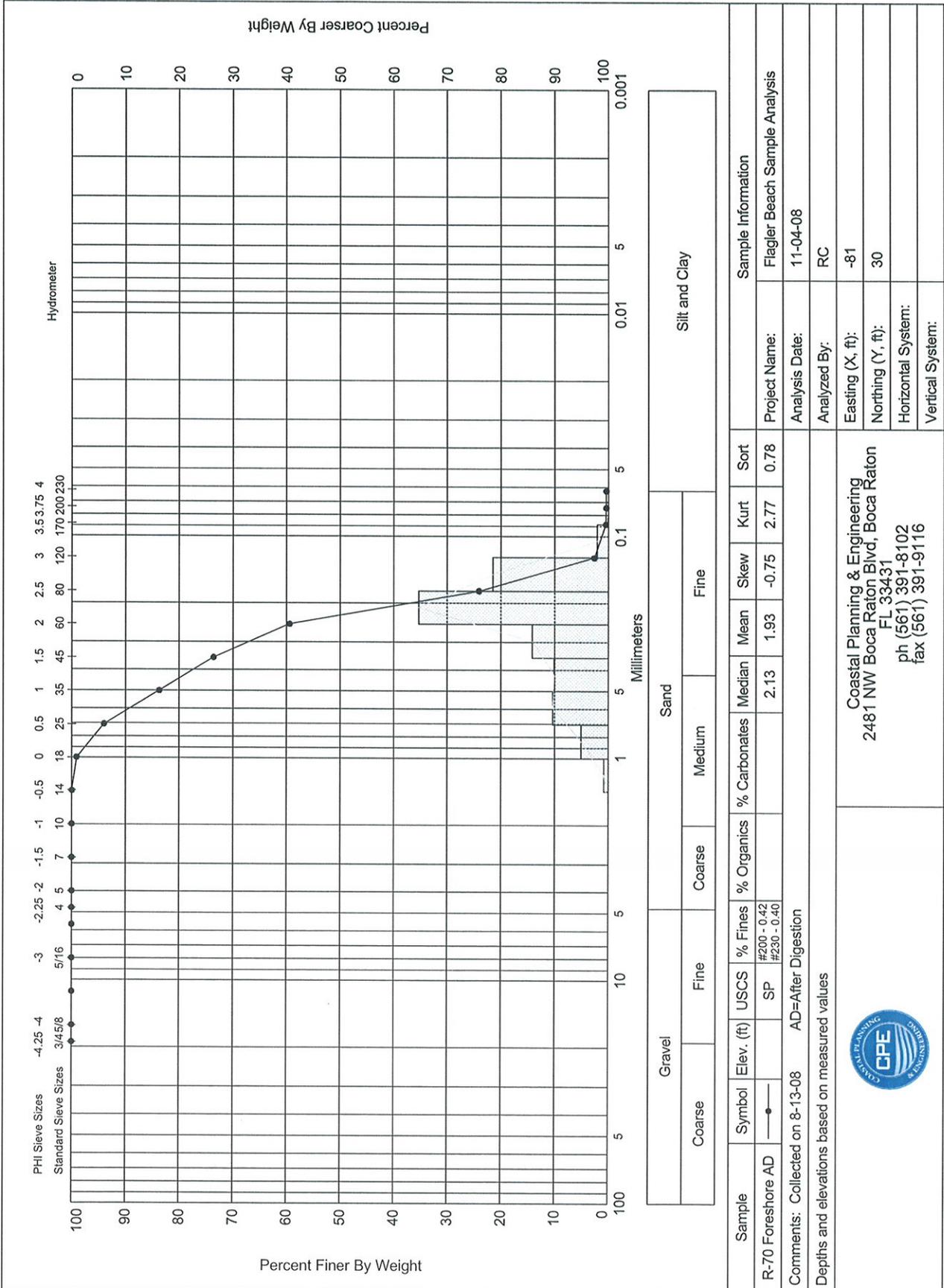
Sieve Number	Sieve Size (Phi)	Sieve Size (Millimeters)	Grams Retained	% Weight Retained	Cum. Grams Retained	C. % Weight Retained
3/4"	-4.25	19.03	0.00	0.00	0.00	0.00
5/8"	-4.00	16.00	0.00	0.00	0.00	0.00
7/16"	-3.50	11.31	0.00	0.00	0.00	0.00
5/16"	-3.00	8.00	0.00	0.00	0.00	0.00
3.5	-2.50	5.66	0.00	0.00	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	0.84	0.86	0.87	0.89
25	0.50	0.71	4.95	5.09	5.82	5.98
35	1.00	0.50	10.04	10.33	15.86	16.31
45	1.50	0.35	9.78	10.06	25.64	26.37
60	2.00	0.25	13.79	14.19	39.43	40.56
80	2.50	0.18	34.32	35.32	73.75	75.88
120	3.00	0.13	20.90	21.51	94.65	97.39
170	3.50	0.09	2.06	2.12	96.71	99.51
200	3.75	0.07	0.07	0.07	96.78	99.58
230	4.00	0.06	0.02	0.02	96.80	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
2.94	2.69	2.49	2.13	1.43	0.98	0.40

Moment	Mean Phi	Mean mm	Sorting	Skewness	Kurtosis
Statistics	1.93	0.26	0.78	-0.75	2.77

GRANULOMETRIC REPORT AUGUST 2008 URS FLAGLER BEACH SAMPLES.GPJ JPBRAZIL.GDT 1/8/09



Sample		USCS				Statistics				Sample Information			
Symbol	Elev. (ft)	% Fines	% Organics	% Carbonates	Median	Mean	Skew	Kurt	Sort	Project Name:	Analysis Date:	Analyzed By:	Easting (X, ft):
R-70 Foreshore AD	—●—	#200 - 0.42 #230 - 0.40			2.13	1.93	-0.75	2.77	0.78	Flagler Beach Sample Analysis	11-04-08	RC	-81
Comments: Collected on 8-13-08 AD=After Digestion										Northing (Y, ft):	30		
Depths and elevations based on measured values										Horizontal System:			
										Vertical System:			



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 FL 33431
 ph (561) 391-8102
 fax (561) 391-9116

Granulometric Report

Depths and elevations based on measured values



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Project Name: Flagler Beach Sample Analysis

Sample Name: R-75 Berm Crest

Analysis Date: 10-29-08

Analyzed By: RC

Easting (ft): -81	Northing (ft): 29	Coordinate System: Geographic (Latitude/Longitude)	Elevation (ft):
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USCS: SP	Munsell: Wet - 10YR-6/4 Dry - 10YR-6/4 Washed - 10YR-6/4	Comments: Collected on 8-13-08
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Dry Weight (g): 97.87	Wash Weight (g): 97.56	Pan Retained (g): 0.00	Sieve Loss (%): 0.02	Fines (%): #200 - 0.35 #230 - 0.34	Organics (%):	Carbonates (%):	Shell Hash (%): 0
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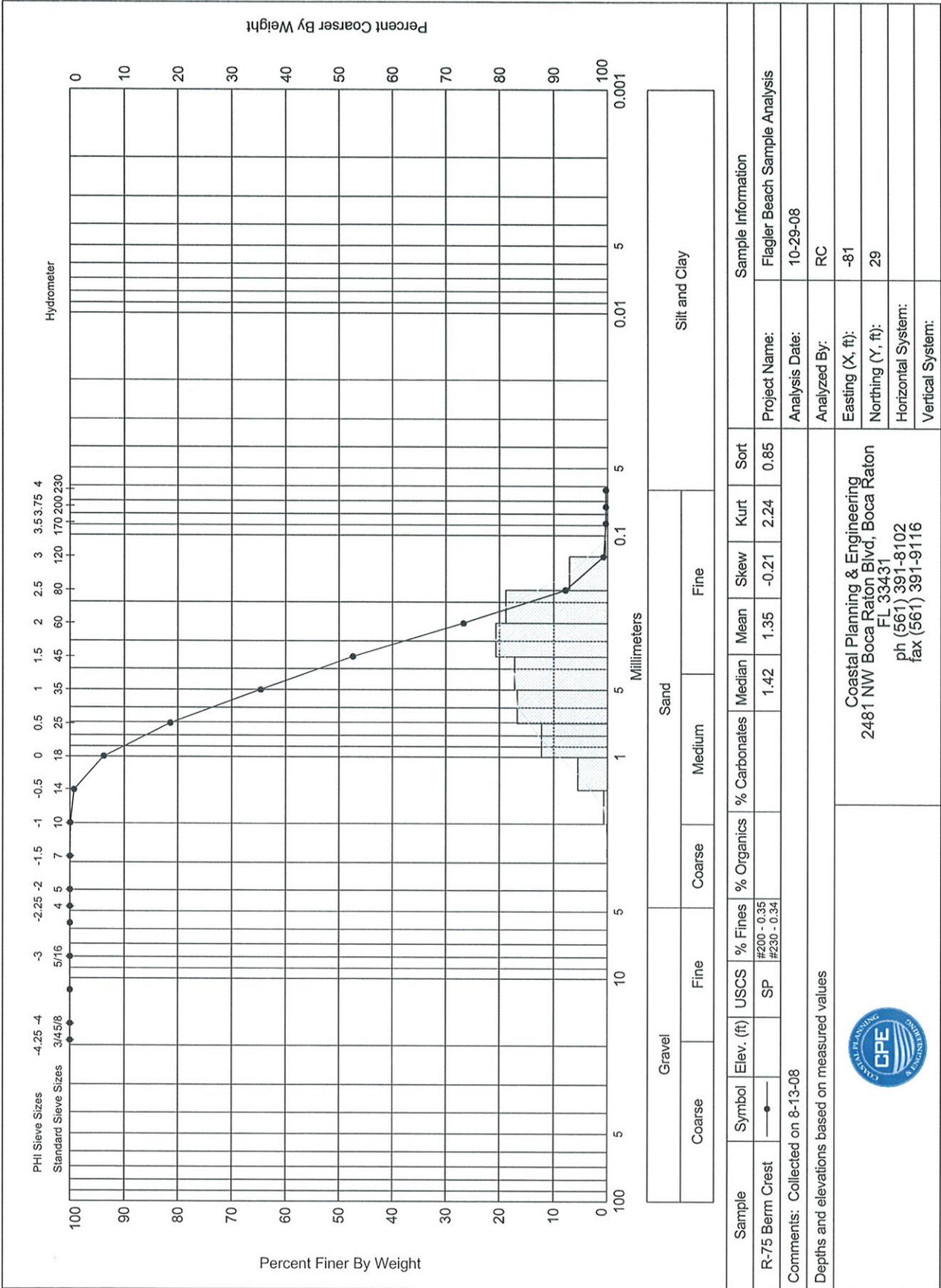
Sieve Number	Sieve Size (Phi)	Sieve Size (Millimeters)	Grams Retained	% Weight Retained	Cum. Grams Retained	C. % Weight Retained
3/4"	-4.25	19.03	0.00	0.00	0.00	0.00
5/8"	-4.00	16.00	0.00	0.00	0.00	0.00
7/16"	-3.50	11.31	0.00	0.00	0.00	0.00
5/16"	-3.00	8.00	0.00	0.00	0.00	0.00
3.5	-2.50	5.66	0.00	0.00	0.00	0.00
4	-2.25	4.76	0.00	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	0.05	0.05	0.05
14	-0.50	1.41	0.67	0.68	0.72	0.73
18	0.00	1.00	5.42	5.54	6.14	6.27
25	0.50	0.71	12.03	12.29	18.17	18.56
35	1.00	0.50	16.42	16.78	34.59	35.34
45	1.50	0.35	16.89	17.26	51.48	52.60
60	2.00	0.25	20.25	20.69	71.73	73.29
80	2.50	0.18	18.47	18.87	90.20	92.16
120	3.00	0.13	6.90	7.05	97.10	99.21
170	3.50	0.09	0.41	0.42	97.51	99.63
200	3.75	0.07	0.02	0.02	97.53	99.65
230	4.00	0.06	0.01	0.01	97.54	99.66

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
2.70	2.28	2.05	1.42	0.69	0.40	-0.11

Moment Statistics	Mean Phi	Mean mm	Sorting	Skewness	Kurtosis
	1.35	0.39	0.85	-0.21	2.24

GRANULARMETRIC REPORT AUGUST 2008 URS FLAGLER BEACH SAMPLES.GPJ JPBRAZIL.GDT 1/8/09



Gravel		Sand			Silt and Clay						
Coarse	Fine	Coarse	Medium	Fine							
Sample	Symbol	Elev. (ft)	USCS	% Fines	% Organics	% Carbonates	Median	Mean	Skew	Kurt	Sort
R-75 Berm Crest	●		SP	#200 - 0.35 #230 - 0.34			1.42	1.35	-0.21	2.24	0.85
Comments: Collected on 8-13-08											
Depths and elevations based on measured values											

Sample Information	
Project Name:	Flagler Beach Sample Analysis
Analysis Date:	10-29-08
Analyzed By:	RC
Easting (X, ft):	-81
Northing (Y, ft):	29
Horizontal System:	
Vertical System:	

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 FL 33431
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Granulometric Report

Depths and elevations based on measured values



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 ph (561) 391-8102
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Project Name: Flagler Beach Sample Analysis

Sample Name: R-75 Foreshore

Analysis Date: 10-29-08

Analyzed By: RC

Easting (ft): -81	Northing (ft): 29	Coordinate System: Geographic (Latitude/Longitude)	Elevation (ft):
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USCS: SP	Munsell: Wet - 2.5Y-7/2 Dry - 10YR-8/1 Washed - 10YR-8/1	Comments: Collected on 8-13-08
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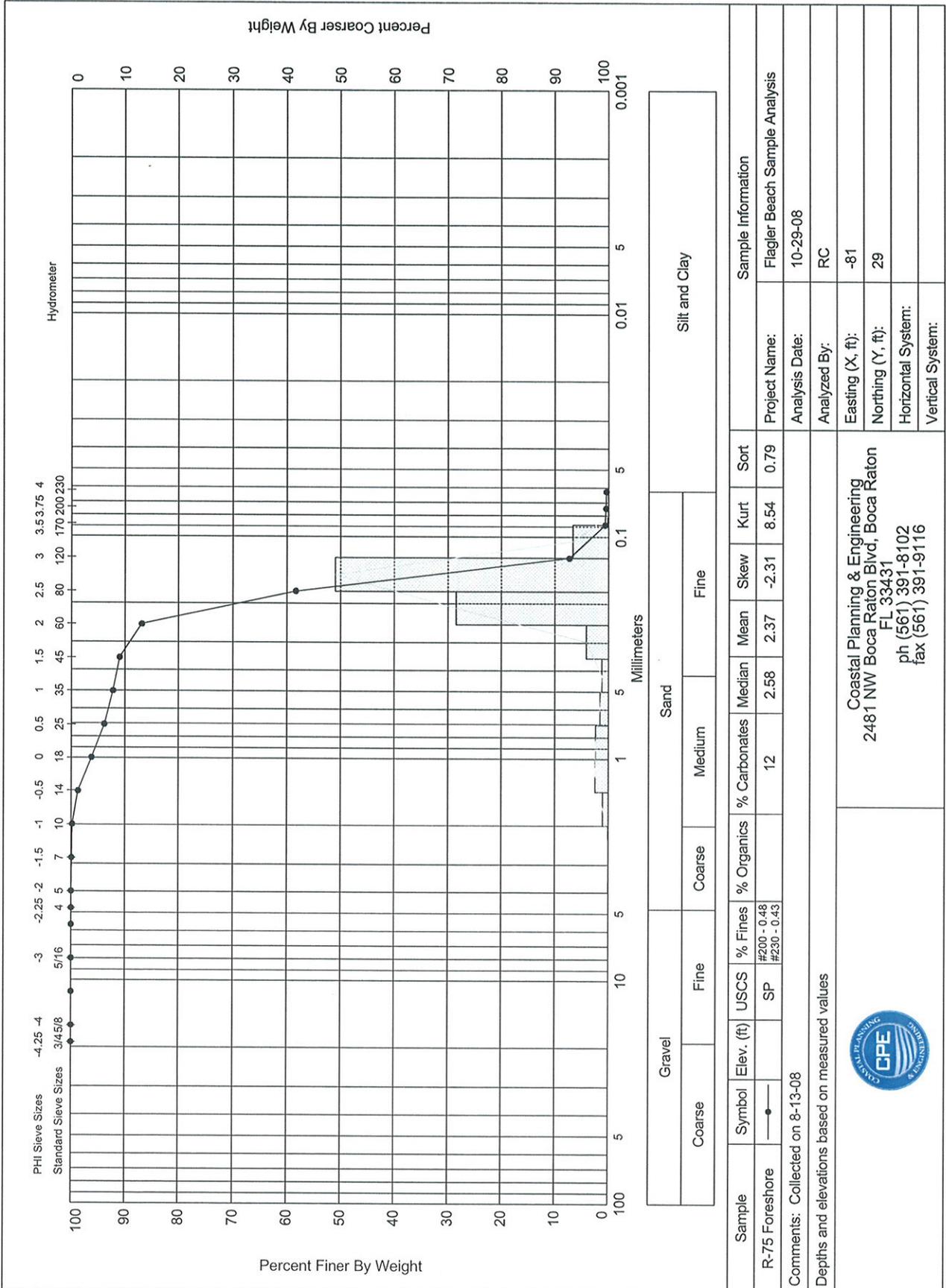
Dry Weight (g): 93.97	Wash Weight (g): 93.58	Pan Retained (g): 0.00	Sieve Loss (%): 0.01	Fines (%): #200 - 0.48 #230 - 0.43	Organics (%):	Carbonates (%): 12	Shell Hash (%): 0
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Sieve Number	Sieve Size (Phi)	Sieve Size (Millimeters)	Grams Retained	% Weight 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	0.00	0.00	0.00	0.00
5	-2.00	4.00	0.00	0.00	0.00	0.00
7	-1.50	2.83	0.07	0.07	0.07	0.07
10	-1.00	2.00	0.11	0.12	0.18	0.19
14	-0.50	1.41	1.01	1.07	1.19	1.26
18	0.00	1.00	2.35	2.50	3.54	3.76
25	0.50	0.71	2.24	2.38	5.78	6.14
35	1.00	0.50	1.50	1.60	7.28	7.74
45	1.50	0.35	1.18	1.26	8.46	9.00
60	2.00	0.25	3.91	4.16	12.37	13.16
80	2.50	0.18	26.76	28.48	39.13	41.64
120	3.00	0.13	47.94	51.02	87.07	92.66
170	3.50	0.09	6.29	6.69	93.36	99.35
200	3.75	0.07	0.16	0.17	93.52	99.52
230	4.00	0.06	0.05	0.05	93.57	99.57

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	2.92	2.83	2.58	2.21	2.05	0.26
Moment	Mean Phi	Mean mm	Sorting	Skewness	Kurtosis	
Statistics	2.37	0.19	0.79	-2.31	8.54	

GRANULOMETRIC REPORT AUGUST 2008 URS FLAGLER BEACH SAMPLES.GPJ_JPBRAZIL.GDT 1/8/09



Gravel		Sand			Silt and Clay	
Coarse	Fine	Coarse	Medium	Fine		
Sample	Symbol	Elev. (ft)	USCS	% Fines	% Organics	% Carbonates
R-75	Foreshore	—●—	SP	#200 - 0.48 #230 - 0.43	12	
Mean	Skew	Kurt	Sort			
2.37	-2.31	8.54	0.79			
Median	2.58	2.37	8.54			

Sample Information	
Project Name:	Flagler Beach Sample Analysis
Analysis Date:	10-29-08
Analyzed By:	RC
Easting (X, ft):	-81
Northing (Y, ft):	29
Horizontal System:	
Vertical System:	

Comments: Collected on 8-13-08
 Depths and elevations based on measured values


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 2481 NW Boca Raton Blvd, Boca Raton
 FL 33431
 ph (561) 391-8102
 fax (561) 391-9116

Granulometric Report

Depths and elevations based on measured values



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FL 33431
ph (561) 391-8102
fax (561) 391-9116

Project Name: Flagler Beach Sample Analysis

Sample Name: R-75 Foreshore AD

Analysis Date: 11-04-08

Analyzed By: RC

Easting (ft): <p style="text-align: center;">-81</p>	Northing (ft): <p style="text-align: center;">29</p>	Coordinate System: <p style="text-align: center;">Geographic (Latitude/Longitude)</p>	Elevation (ft):
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USCS: <p style="text-align: center;">SP</p>	Munsell: Dry - 2.5Y-8/2 Washed - 2.5Y-8/2	Comments: <p style="text-align: center;">Collected on 8-13-08 AD=After Digestion</p>
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Dry Weight (g): <p style="text-align: center;">147.23</p>	Wash Weight (g): <p style="text-align: center;">146.62</p>	Pan Retained (g): <p style="text-align: center;">0.02</p>	Sieve Loss (%): <p style="text-align: center;">0.02</p>	Fines (%): #200 - 0.50 #230 - 0.45	Organics (%):	Carbonates (%):	Shell Hash (%): <p style="text-align: center;">0</p>
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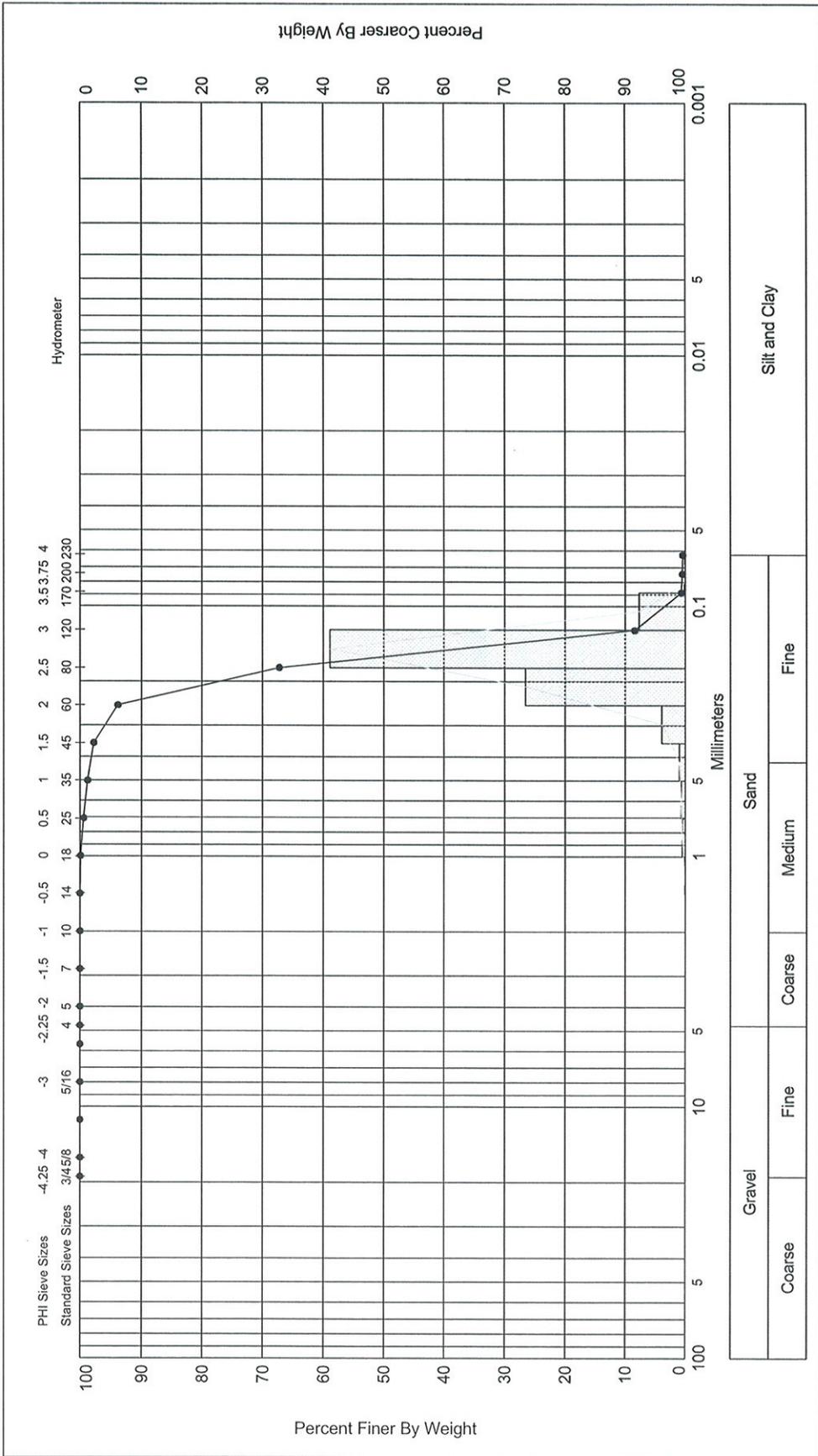
Sieve Number	Sieve Size (Phi)	Sieve Size (Millimeters)	Grams Retained	% Weight Retained	Cum. Grams Retained	C. % Weight Retained
3/4"	-4.25	19.03	0.00	0.00	0.00	0.00
5/8"	-4.00	16.00	0.00	0.00	0.00	0.00
7/16"	-3.50	11.31	0.00	0.00	0.00	0.00
5/16"	-3.00	8.00	0.00	0.00	0.00	0.00
3.5	-2.50	5.66	0.00	0.00	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	0.13	0.09	0.13	0.09
25	0.50	0.71	0.78	0.53	0.91	0.62
35	1.00	0.50	0.93	0.63	1.84	1.25
45	1.50	0.35	1.49	1.01	3.33	2.26
60	2.00	0.25	5.75	3.91	9.08	6.17
80	2.50	0.18	39.09	26.55	48.17	32.72
120	3.00	0.13	86.71	58.89	134.88	91.61
170	3.50	0.09	11.34	7.70	146.22	99.31
200	3.75	0.07	0.28	0.19	146.50	99.50
230	4.00	0.06	0.07	0.05	146.57	99.55

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
3.22	2.94	2.86	2.65	2.35	2.19	1.85

Moment	Mean Phi	Mean mm	Sorting	Skewness	Kurtosis
Statistics	2.57	0.17	0.43	-1.87	10.26

GRANULOMETRIC REPORT AUGUST 2008 URS FLAGLER BEACH SAMPLES.GPJ_JPBRAZIL.GDT 1/8/09



Granulometric Report

Depths and elevations based on measured values



Coastal Planning & Engineering
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Project Name: Flagler Beach Sample Analysis

Sample Name: R-80 Berm Crest

Analysis Date: 10-30-08

Analyzed By: TD

Easting (ft): -81	Northing (ft): 29	Coordinate System: Geographic (Latitude/Longitude)	Elevation (ft):
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USCS: SW	Munsell: Wet - 10YR-7/2 Dry - 10YR-7/2 Washed - 10YR-7/2	Comments: Collected on 8-12-08
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Dry Weight (g): 94.65	Wash Weight (g): 94.35	Pan Retained (g): 0.01	Sieve Loss (%): 0.15	Fines (%): #200 - 0.51 #230 - 0.49	Organics (%):	Carbonates (%): 20	Shell Hash (%): 0
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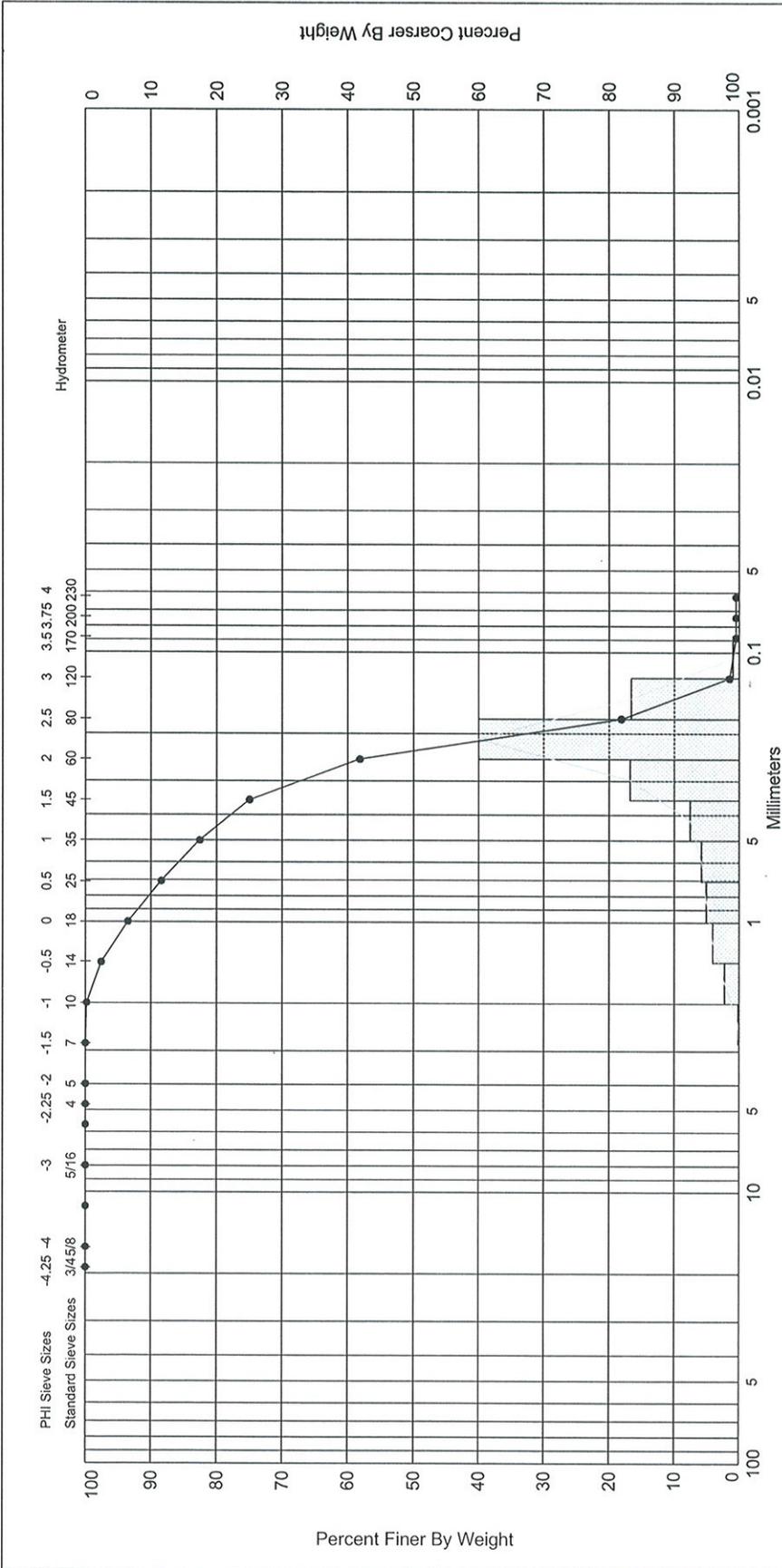
Sieve Number	Sieve Size (Phi)	Sieve Size (Millimeters)	Grams Retained	% Weight Retained	Cum. Grams Retained	C. % Weight Retained
3/4"	-4.25	19.03	0.00	0.00	0.00	0.00
5/8"	-4.00	16.00	0.00	0.00	0.00	0.00
7/16"	-3.50	11.31	0.00	0.00	0.00	0.00
5/16"	-3.00	8.00	0.00	0.00	0.00	0.00
3.5	-2.50	5.66	0.00	0.00	0.00	0.00
4	-2.25	4.76	0.00	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	0.18	0.19	0.18	0.19
14	-0.50	1.41	2.10	2.22	2.28	2.41
18	0.00	1.00	3.87	4.09	6.15	6.50
25	0.50	0.71	4.85	5.12	11.00	11.62
35	1.00	0.50	5.52	5.83	16.52	17.45
45	1.50	0.35	7.16	7.56	23.68	25.01
60	2.00	0.25	15.94	16.84	39.62	41.85
80	2.50	0.18	37.85	39.99	77.47	81.84
120	3.00	0.13	15.74	16.63	93.21	98.47
170	3.50	0.09	0.94	0.99	94.15	99.46
200	3.75	0.07	0.03	0.03	94.18	99.49
230	4.00	0.06	0.02	0.02	94.20	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
2.90	2.56	2.41	2.10	1.50	0.88	-0.18

Moment	Mean Phi	Mean mm	Sorting	Skewness	Kurtosis
Statistics	1.82	0.28	0.9	-1.22	3.84

GRANULOMETRIC REPORT AUGUST 2008 URS FLAGLER BEACH SAMPLES.GPJ_JPBRAZIL.GDT 1/8/09



Gravel		Sand			Silt and Clay						
Sample	Symbol	Elev. (ft)	USCS	% Fines	% Organics	% Carbonates	Median	Mean	Skew	Kurt	Sort
R-80 Berm Crest	●	—	SW	#200 - 0.51 #230 - 0.49		20	2.1	1.82	-1.22	3.84	0.9
Comments: Collected on 8-12-08											
Depths and elevations based on measured values											
								Coastal Planning & Engineering 2481 NW Boca Raton Blvd, Boca Raton FL 33431 ph (561) 391-8102 fax (561) 391-9116			
Sample Information								Project Name: Flagler Beach Sample Analysis			
Analysis Date: 10-30-08								Analyzed By: TD			
Easting (X, ft): -81								Northing (Y, ft): 29			
Horizontal System:								Vertical System:			

Granulometric Report
 Depths and elevations based on measured values



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Project Name: Flagler Beach Sample Analysis
 Sample Name: R-80 Berm Crest AD
 Analysis Date: 11-04-08
 Analyzed By: RC

Easting (ft): -81 Northing (ft): 29 Coordinate System: Geographic (Latitude/Longitude) Elevation (ft):

USCS: SP Munsell: Dry - 2.5Y-8/2 Washed - 2.5Y-8/2 Comments: Collected on 8-12-08 AD=After Digestion

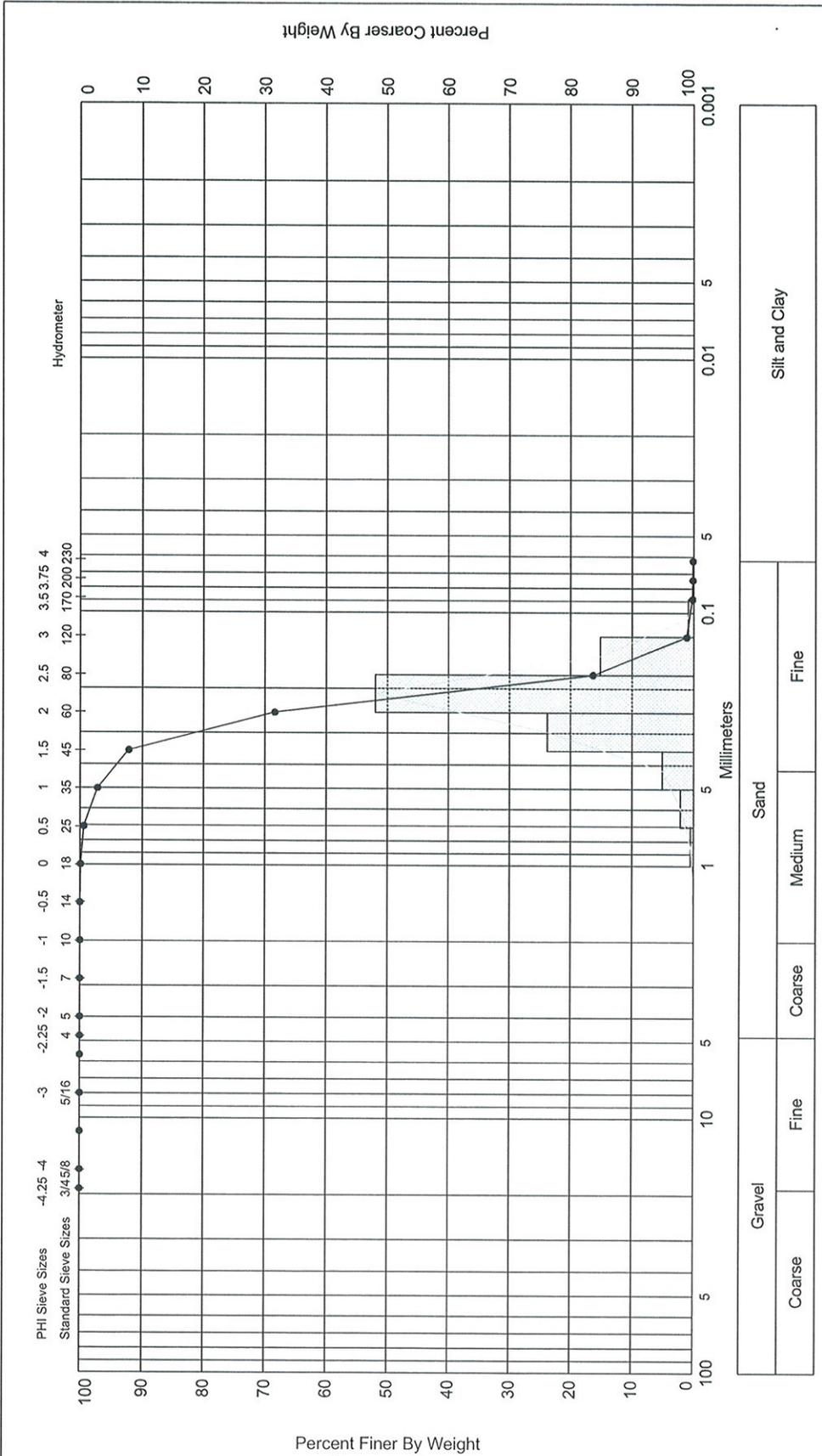
Dry Weight (g): 113.18 Wash Weight (g): 113.06 Pan Retained (g): 0.01 Sieve Loss (%): 0.02 Fines (%): #200 - 0.15 #230 - 0.13 Organics (%): Carbonates (%): Shell Hash (%): 0

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	0.00	0.00	0.00	0.00
14	-0.50	1.41	0.00	0.00	0.00	0.00
18	0.00	1.00	0.10	0.09	0.10	0.09
25	0.50	0.71	0.59	0.52	0.69	0.61
35	1.00	0.50	2.41	2.13	3.10	2.74
45	1.50	0.35	5.71	5.05	8.81	7.79
60	2.00	0.25	26.95	23.81	35.76	31.60
80	2.50	0.18	58.89	52.03	94.65	83.63
120	3.00	0.13	17.20	15.20	111.85	98.83
170	3.50	0.09	1.08	0.95	112.93	99.78
200	3.75	0.07	0.08	0.07	113.01	99.85
230	4.00	0.06	0.02	0.02	113.03	99.87

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
2.87	2.51	2.42	2.18	1.86	1.67	1.22
Moment Statistics	Mean Phi	Mean mm	Sorting	Skewness	Kurtosis	
	2.12	0.23	0.47	-0.9	5.2	

GRANULARMETRIC REPORT AUGUST 2008 URS FLAGLER BEACH SAMPLES.GPJ_JPBRAZIL.GDT 1/8/09



Gravel		Sand			Silt and Clay						
Sample	Symbol	Elev. (ft)	USCS	% Fines	% Organics	% Carbonates	Median	Mean	Skew	Kurt	Sort
R-80 Berm Crest AD	●		SP	#200 - 0.15 #230 - 0.13			2.18	2.12	-0.9	5.2	0.47
Comments: Collected on 8-12-08 AD=After Digestion											
Depths and elevations based on measured values											
								Sample Information			
								Project Name:		Flagler Beach Sample Analysis	
								Analysis Date:		11-04-08	
								Analyzed By:		RC	
								Easting (X, ft):		-81	
								Northing (Y, ft):		29	
								Horizontal System:			
								Vertical System:			
								Coastal Planning & Engineering 2481 NW Boca Raton Blvd, Boca Raton FL 33431 ph (561) 391-8102 fax (561) 391-9116			



Granulometric Report

Depths and elevations based on measured values



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 FL 33431
 ph (561) 391-8102
 fax (561) 391-9116

Project Name: Flagler Beach Sample Analysis

Sample Name: R-80 Foreshore

Analysis Date: 10-30-08

Analyzed By: MTY

Easting (ft): -81	Northing (ft): 29	Coordinate System: Geographic (Latitude/Longitude)	Elevation (ft):
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USCS: SP	Munsell: Wet - 2.5Y-7/2 Dry - 2.5Y-8/1 Washed - 2.5Y-8/1	Comments: Collected on 8-12-08
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Dry Weight (g): 93.52	Wash Weight (g): 93.23	Pan Retained (g): 0.01	Sieve Loss (%): 0.00	Fines (%): #200 - 0.36 #230 - 0.32	Organics (%):	Carbonates (%): 6	Shell Hash (%): 0
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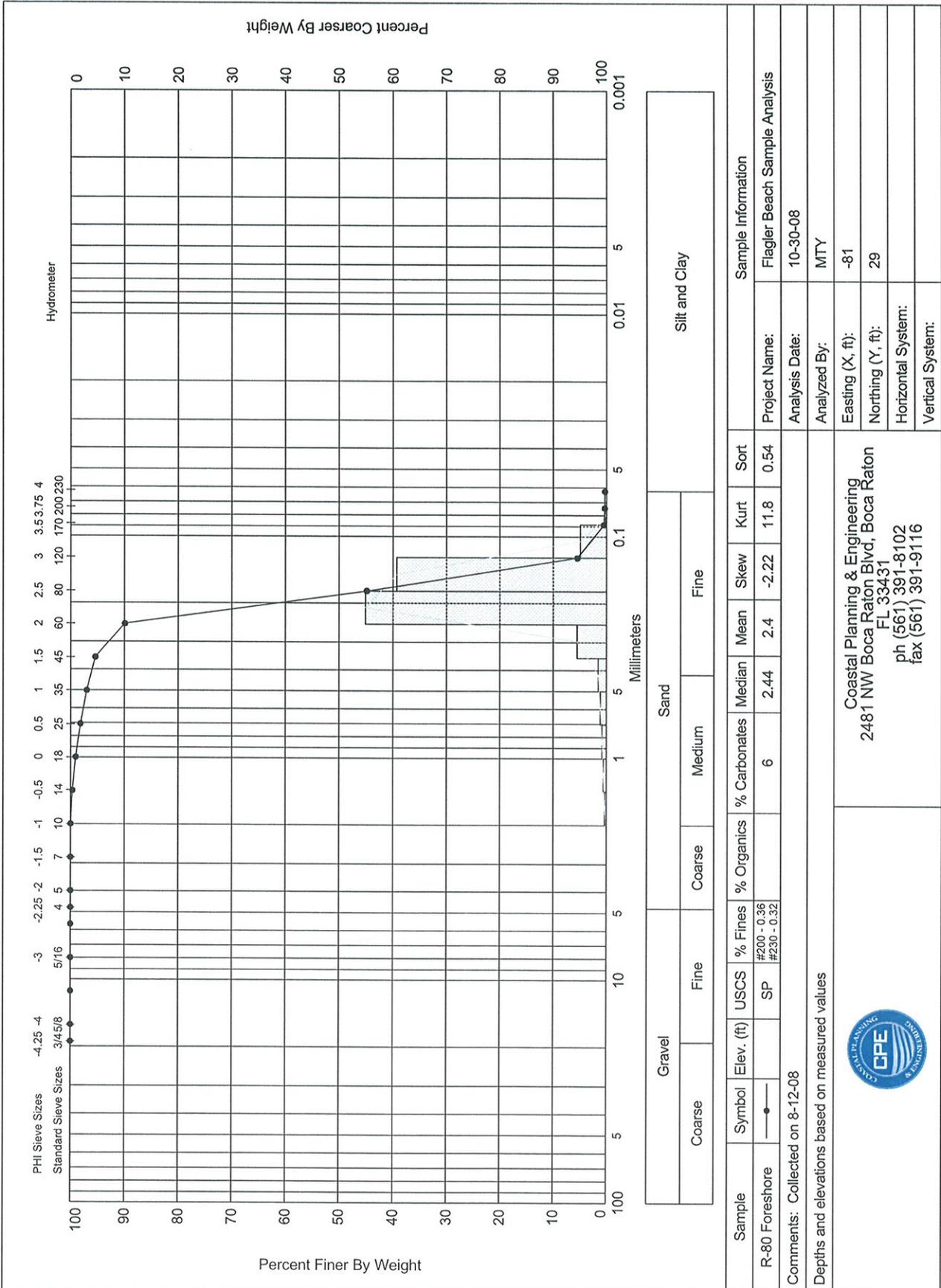
Sieve Number	Sieve Size (Phi)	Sieve Size (Millimeters)	Grams Retained	% Weight Retained	Cum. Grams Retained	C. % Weight Retained
3/4"	-4.25	19.03	0.00	0.00	0.00	0.00
5/8"	-4.00	16.00	0.00	0.00	0.00	0.00
7/16"	-3.50	11.31	0.00	0.00	0.00	0.00
5/16"	-3.00	8.00	0.00	0.00	0.00	0.00
3.5	-2.50	5.66	0.00	0.00	0.00	0.00
4	-2.25	4.76	0.00	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	0.33	0.35	0.35	0.37
18	0.00	1.00	0.54	0.58	0.89	0.95
25	0.50	0.71	0.81	0.87	1.70	1.82
35	1.00	0.50	1.09	1.17	2.79	2.99
45	1.50	0.35	1.50	1.60	4.29	4.59
60	2.00	0.25	5.16	5.52	9.45	10.11
80	2.50	0.18	42.14	45.06	51.59	55.17
120	3.00	0.13	36.80	39.35	88.39	94.52
170	3.50	0.09	4.63	4.95	93.02	99.47
200	3.75	0.07	0.16	0.17	93.18	99.64
230	4.00	0.06	0.04	0.04	93.22	99.68

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
3.05	2.87	2.75	2.44	2.17	2.07	1.54

Moment Statistics	Mean Phi	Mean mm	Sorting	Skewness	Kurtosis
	2.4	0.19	0.54	-2.22	11.8

GRANULARMETRIC REPORT AUGUST 2008 URS FLAGLER BEACH SAMPLES.GPJ_JPBRAZIL.GDT 1/8/09



Gravel		Sand		Silt and Clay	
Coarse	Fine	Coarse	Medium	Fine	

Sample	Symbol	Elev. (ft)	USCS	% Fines	% Organics	% Carbonates	Median	Mean	Skew	Kurt	Sort
R-80 Foreshore	●		SP	#200 - 0.36 #230 - 0.32		6	2.44	2.4	-2.22	11.8	0.54

Sample Information	
Project Name:	Flagler Beach Sample Analysis
Analysis Date:	10-30-08
Analyzed By:	MTY
Easting (X, ft):	-81
Northing (Y, ft):	29
Horizontal System:	
Vertical System:	

Comments: Collected on 8-12-08
 Depths and elevations based on measured values



Coastal Planning & Engineering
 2481 NW Boca Raton Blvd, Boca Raton
 FL 33431
 ph (561) 391-8102
 fax (561) 391-9116

Granulometric Report

Depths and elevations based on measured values



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2481 NW Boca Raton Blvd, Boca Raton
FL 33431
ph (561) 391-8102
fax (561) 391-9116

Project Name: Flagler Beach Sample Analysis

Sample Name: R-80 Foreshore AD

Analysis Date: 11-05-08

Analyzed By: RC

Easting (ft): <p style="text-align: center;">-81</p>	Northing (ft): <p style="text-align: center;">29</p>	Coordinate System: <p style="text-align: center;">Geographic (Latitude/Longitude)</p>	Elevation (ft):
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USCS: <p style="text-align: center;">SP</p>	Munsell: Dry - 2.5Y-8/2 Washed - 2.5Y-8/2	Comments: <p style="text-align: center;">Collected on 8-12-08 AD=After Digestion</p>
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Dry Weight (g): <p style="text-align: center;">123.19</p>	Wash Weight (g): <p style="text-align: center;">122.71</p>	Pan Retained (g): <p style="text-align: center;">0.02</p>	Sieve Loss (%): <p style="text-align: center;">0.01</p>	Fines (%): #200 - 0.47 #230 - 0.41	Organics (%):	Carbonates (%):	Shell Hash (%): <p style="text-align: center;">0</p>
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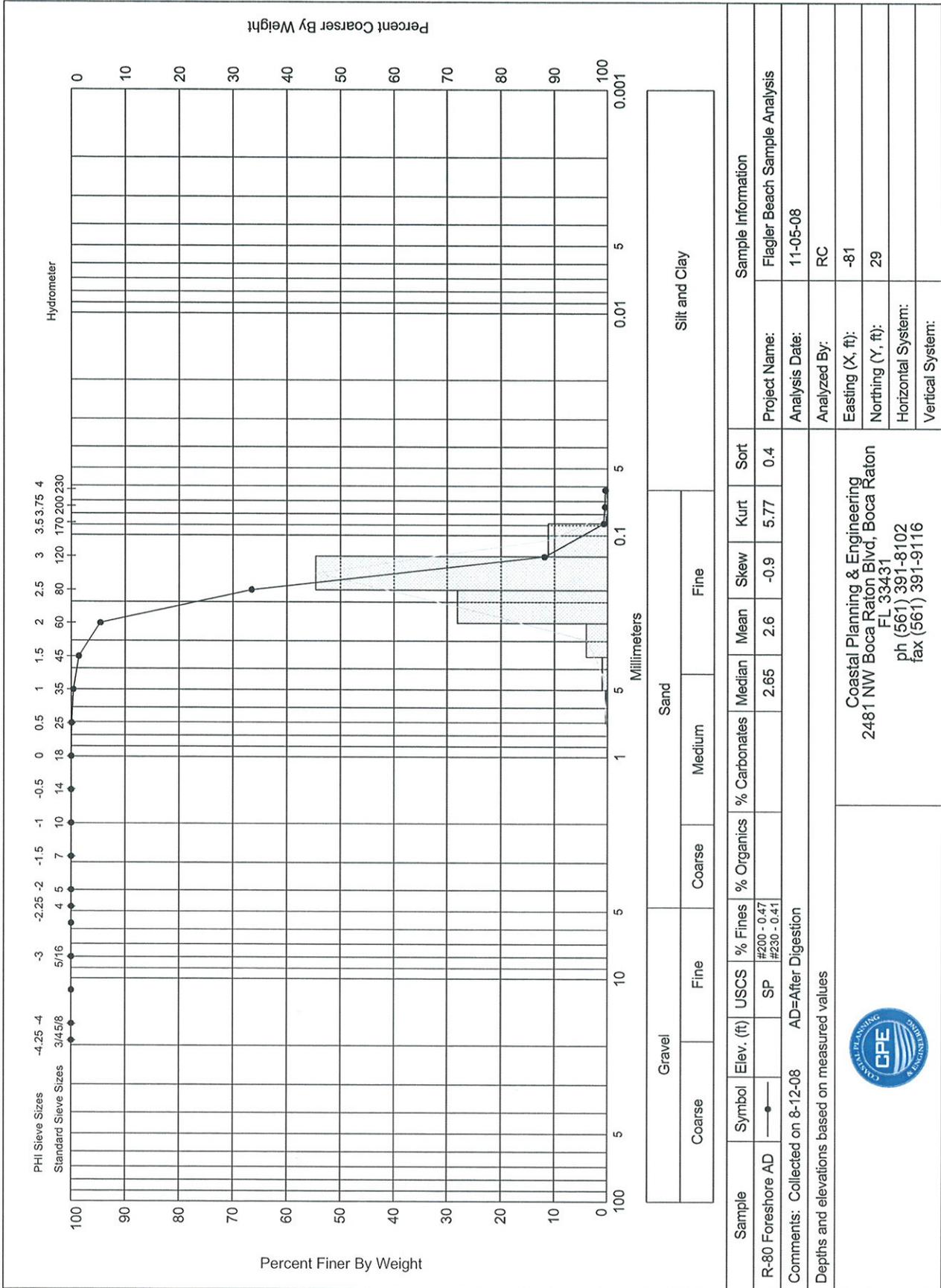
Sieve Number	Sieve Size (Phi)	Sieve Size (Millimeters)	Grams Retained	% Weight Retained	Cum. Grams Retained	C. % Weight Retained
3/4"	-4.25	19.03	0.00	0.00	0.00	0.00
5/8"	-4.00	16.00	0.00	0.00	0.00	0.00
7/16"	-3.50	11.31	0.00	0.00	0.00	0.00
5/16"	-3.00	8.00	0.00	0.00	0.00	0.00
3.5	-2.50	5.66	0.00	0.00	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	0.02	0.02	0.02	0.02
25	0.50	0.71	0.07	0.06	0.09	0.08
35	1.00	0.50	0.37	0.30	0.46	0.38
45	1.50	0.35	1.25	1.01	1.71	1.39
60	2.00	0.25	4.96	4.03	6.67	5.42
80	2.50	0.18	34.55	28.05	41.22	33.47
120	3.00	0.13	67.35	54.67	108.57	88.14
170	3.50	0.09	13.74	11.15	122.31	99.29
200	3.75	0.07	0.30	0.24	122.61	99.53
230	4.00	0.06	0.07	0.06	122.68	99.59

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
3.31	2.96	2.88	2.65	2.35	2.19	1.95

Moment	Mean Phi	Mean mm	Sorting	Skewness	Kurtosis
Statistics	2.6	0.16	0.4	-0.9	5.77

GRANULOMETRIC REPORT AUGUST 2008 URS FLAGLER BEACH SAMPLES.GPJ JPBRAZIL.GDT 1/8/09



Sample	Symbol	Elev. (ft)	USCS	% Fines	% Organics	% Carbonates	Sand			Silt and Clay			Sort	Sample Information				
							Coarse	Medium	Fine	Coarse	Medium	Fine		Project Name:	Analysis Date:			
R-80 Foreshore AD	—●—		SP	#200 - 0.47 #230 - 0.41			2.65	2.6	-0.9	5.77	0.4	Flagler Beach Sample Analysis	11-05-08	RC	-81	29		
Comments: Collected on 8-12-08 AD=After Digestion																		
Depths and elevations based on measured values																		
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Granulometric Report

Depths and elevations based on measured values



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 2481 NW Boca Raton Blvd, Boca Raton
 FL 33431
 ph (561) 391-8102
 fax (561) 391-9116

Project Name: Flagler Beach Sample Analysis

Sample Name: R-85 Berm Crest

Analysis Date: 10-30-08

Analyzed By: PB

Easting (ft): -81	Northing (ft): 29	Coordinate System: Geographic (Latitude/Longitude)	Elevation (ft):
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USCS: SP	Munsell: Wet - 10YR-7/2 Dry - 10YR-7/2 Washed - 10YR-7/2	Comments: Collected on 8-12-08
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Dry Weight (g): 96.58	Wash Weight (g): 96.18	Pan Retained (g): 0.00	Sieve Loss (%): 0.00	Fines (%): #200 - 0.43 #230 - 0.41	Organics (%):	Carbonates (%): 15	Shell Hash (%): 0
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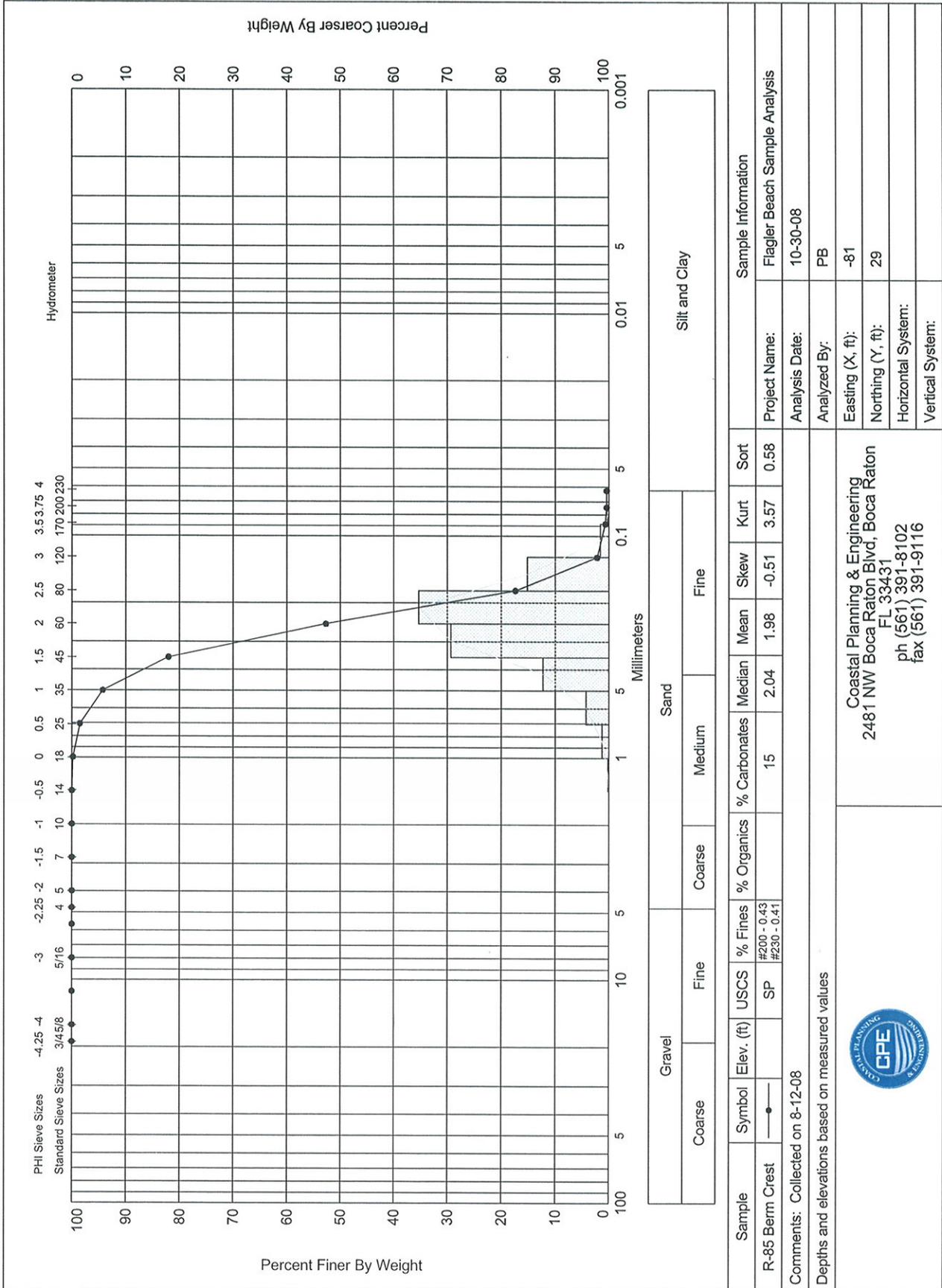
Sieve Number	Sieve Size (Phi)	Sieve Size (Millimeters)	Grams Retained	% Weight Retained	Cum. Grams Retained	C. % Weight Retained
3/4"	-4.25	19.03	0.00	0.00	0.00	0.00
5/8"	-4.00	16.00	0.00	0.00	0.00	0.00
7/16"	-3.50	11.31	0.00	0.00	0.00	0.00
5/16"	-3.00	8.00	0.00	0.00	0.00	0.00
3.5	-2.50	5.66	0.00	0.00	0.00	0.00
4	-2.25	4.76	0.00	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	0.17	0.18	0.19	0.20
25	0.50	0.71	1.22	1.26	1.41	1.46
35	1.00	0.50	4.10	4.25	5.51	5.71
45	1.50	0.35	11.81	12.23	17.32	17.94
60	2.00	0.25	28.34	29.34	45.66	47.28
80	2.50	0.18	34.13	35.34	79.79	82.62
120	3.00	0.13	14.67	15.19	94.46	97.81
170	3.50	0.09	1.50	1.55	95.96	99.36
200	3.75	0.07	0.20	0.21	96.16	99.57
230	4.00	0.06	0.02	0.02	96.18	99.59

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
2.91	2.55	2.39	2.04	1.62	1.42	0.92

Moment Statistics	Mean Phi	Mean mm	Sorting	Skewness	Kurtosis
	1.98	0.25	0.58	-0.51	3.57

GRANULARMETRIC REPORT AUGUST 2008 URS FLAGLER BEACH SAMPLES.GPJ_JPBRAZIL.GDT 1/8/09



Gravel		Sand			Silt and Clay	
Coarse	Fine	Coarse	Medium	Fine		
Sample	Symbol	Elev. (ft)	USCS	% Fines	% Organics	% Carbonates
R-85 Berm Crest	—●—		SP	#200 - 0.43 #230 - 0.41		15
Mean	Median	Skew	Kurt	Sort	Sample Information	
1.98	2.04	-0.51	3.57	0.58	Project Name:	Flagler Beach Sample Analysis
Comments: Collected on 8-12-08				Analysis Date:	10-30-08	
Depths and elevations based on measured values				Analyzed By:	PB	
				Easting (X, ft):	-81	
				Northing (Y, ft):	29	
				Horizontal System:		
				Vertical System:		



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 2481 NW Boca Raton Blvd, Boca Raton
 FL 33431
 ph (561) 391-8102
 fax (561) 391-9116

Granulometric Report
 Depths and elevations based on measured values



Coastal Planning & Engineering
 2481 NW Boca Raton Blvd, Boca Raton
 FL 33431
 ph (561) 391-8102
 fax (561) 391-9116

Project Name: Flagler Beach Sample Analysis
 Sample Name: R-85 Berm Crest AD
 Analysis Date: 11-05-08
 Analyzed By: RC

Easting (ft): -81 Northing (ft): 29 Coordinate System: Geographic (Latitude/Longitude) Elevation (ft):

USCS: SP Munsell: Dry - 2.5Y-8/3, Washed - 2.5Y-8/3 Comments: Collected on 8-12-08 AD=After Digestion

Dry Weight (g): 130.07 Wash Weight (g): 129.86 Pan Retained (g): 0.01 Sieve Loss (%): 0.00 Fines (%): #200 - 0.21, #230 - 0.17 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	0.00	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	0.06	0.08	0.06
35	1.00	0.50	1.41	1.08	1.49	1.14
45	1.50	0.35	11.15	8.57	12.64	9.71
60	2.00	0.25	38.58	29.66	51.22	39.37
80	2.50	0.18	57.78	44.42	109.00	83.79
120	3.00	0.13	18.23	14.02	127.23	97.81
170	3.50	0.09	2.31	1.78	129.54	99.59
200	3.75	0.07	0.26	0.20	129.80	99.79
230	4.00	0.06	0.05	0.04	129.85	99.83

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
2.90	2.51	2.40	2.12	1.76	1.61	1.23

Moment Statistics	Mean Phi	Mean mm	Sorting	Skewness	Kurtosis
	2.09	0.23	0.47	-0.12	3.4

GRANULARMETRIC REPORT AUGUST 2008 URS FLAGLER BEACH SAMPLES.GPJ JPBRAZIL.GDT 1/8/09

Granulometric Report

Depths and elevations based on measured values



Coastal Planning & Engineering
2481 NW Boca Raton Blvd, Boca Raton
FL 33431
ph (561) 391-8102
fax (561) 391-9116

Project Name: Flagler Beach Sample Analysis

Sample Name: R-85 Foreshore

Analysis Date: 10-30-08

Analyzed By: PB

Easting (ft): <p style="text-align: center;">-81</p>	Northing (ft): <p style="text-align: center;">29</p>	Coordinate System: <p style="text-align: center;">Geographic (Latitude/Longitude)</p>	Elevation (ft):
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USCS: <p style="text-align: center;">SP</p>	Munsell: Wet - 2.5Y-7/2 Dry - 2.5Y-8/1 Washed - 2.5Y-8/1	Comments: <p style="text-align: center;">Collected on 8-12-08</p>
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Dry Weight (g): <p style="text-align: center;">95.22</p>	Wash Weight (g): <p style="text-align: center;">94.72</p>	Pan Retained (g): <p style="text-align: center;">0.01</p>	Sieve Loss (%): <p style="text-align: center;">0.01</p>	Fines (%): #200 - 0.60 #230 - 0.56	Organics (%):	Carbonates (%):	Shell Hash (%): <p style="text-align: center;">0</p>
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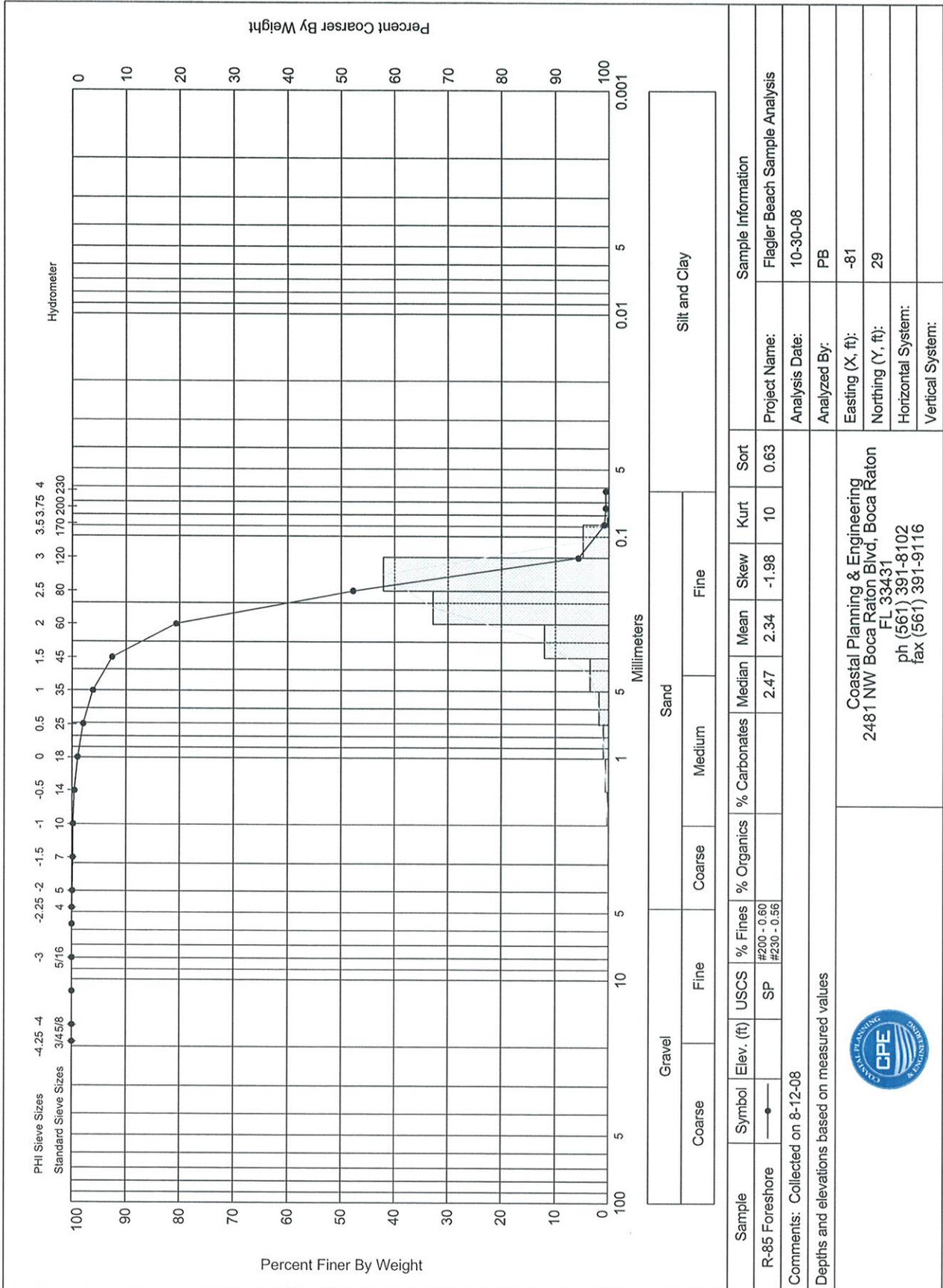
Sieve Number	Sieve Size (Phi)	Sieve Size (Millimeters)	Grams Retained	% Weight Retained	Cum. Grams Retained	C. % Weight Retained
3/4"	-4.25	19.03	0.00	0.00	0.00	0.00
5/8"	-4.00	16.00	0.00	0.00	0.00	0.00
7/16"	-3.50	11.31	0.00	0.00	0.00	0.00
5/16"	-3.00	8.00	0.00	0.00	0.00	0.00
3.5	-2.50	5.66	0.00	0.00	0.00	0.00
4	-2.25	4.76	0.00	0.00	0.00	0.00
5	-2.00	4.00	0.08	0.08	0.08	0.08
7	-1.50	2.83	0.07	0.07	0.15	0.15
10	-1.00	2.00	0.04	0.04	0.19	0.19
14	-0.50	1.41	0.24	0.25	0.43	0.44
18	0.00	1.00	0.52	0.55	0.95	0.99
25	0.50	0.71	0.99	1.04	1.94	2.03
35	1.00	0.50	1.72	1.81	3.66	3.84
45	1.50	0.35	3.37	3.54	7.03	7.38
60	2.00	0.25	11.42	11.99	18.45	19.37
80	2.50	0.18	31.27	32.84	49.72	52.21
120	3.00	0.13	40.07	42.08	89.79	94.29
170	3.50	0.09	4.63	4.86	94.42	99.15
200	3.75	0.07	0.24	0.25	94.66	99.40
230	4.00	0.06	0.04	0.04	94.70	99.44

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
3.07	2.88	2.77	2.47	2.09	1.86	1.16

Moment	Mean Phi	Mean mm	Sorting	Skewness	Kurtosis
Statistics	2.34	0.20	0.63	-1.98	10

GRANULOMETRIC REPORT AUGUST 2008 URS FLAGLER BEACH SAMPLES.GPJ_JPBRAZIL.GDT 1/8/09



Granulometric Report

Depths and elevations based on measured values



Coastal Planning & Engineering
 2481 NW Boca Raton Blvd, Boca Raton
 FL 33431
 ph (561) 391-8102
 fax (561) 391-9116

Project Name: Flagler Beach Sample Analysis

Sample Name: R-90 Berm Crest

Analysis Date: 10-30-08

Analyzed By: PB

Easting (ft): -81	Northing (ft): 29	Coordinate System: Geographic (Latitude/Longitude)	Elevation (ft):
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USCS: SP	Munsell: Wet - 10YR-7/2 Dry - 10YR-7/2 Washed - 10YR-8/2	Comments: Collected on 8-12-08
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Dry Weight (g): 100.22	Wash Weight (g): 99.98	Pan Retained (g): 0.01	Sieve Loss (%): 0.02	Fines (%): #200 - 0.27 #230 - 0.26	Organics (%):	Carbonates (%): 13	Shell Hash (%): 0
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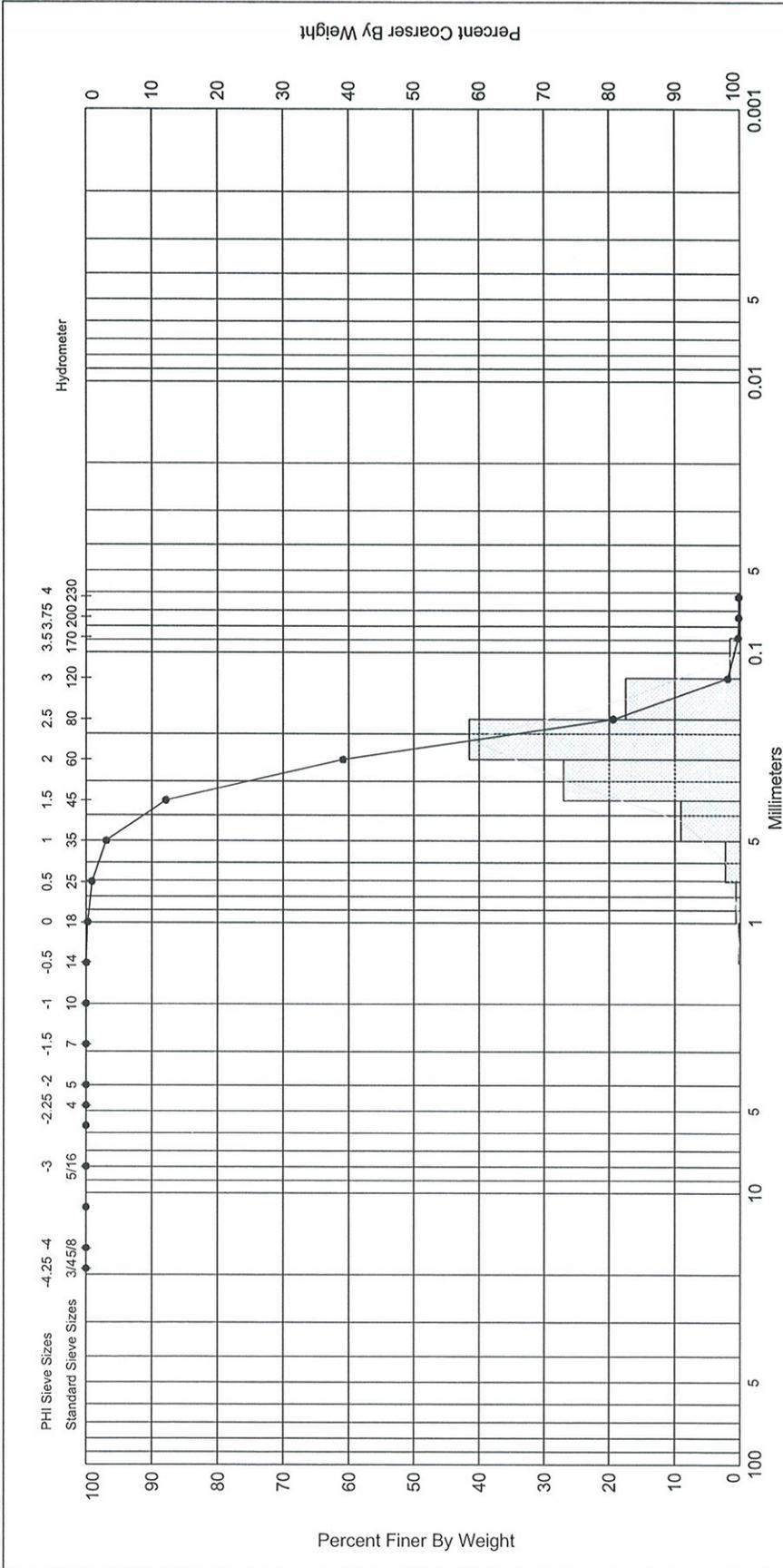
Sieve Number	Sieve Size (Phi)	Sieve Size (Millimeters)	Grams Retained	% Weight Retained	Cum. Grams Retained	C. % Weight Retained
3/4"	-4.25	19.03	0.00	0.00	0.00	0.00
5/8"	-4.00	16.00	0.00	0.00	0.00	0.00
7/16"	-3.50	11.31	0.00	0.00	0.00	0.00
5/16"	-3.00	8.00	0.00	0.00	0.00	0.00
3.5	-2.50	5.66	0.00	0.00	0.00	0.00
4	-2.25	4.76	0.00	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	0.22	0.22	0.25	0.25
25	0.50	0.71	0.63	0.63	0.88	0.88
35	1.00	0.50	2.21	2.21	3.09	3.09
45	1.50	0.35	9.08	9.06	12.17	12.15
60	2.00	0.25	27.04	26.98	39.21	39.13
80	2.50	0.18	41.55	41.46	80.76	80.59
120	3.00	0.13	17.52	17.48	98.28	98.07
170	3.50	0.09	1.58	1.58	99.86	99.65
200	3.75	0.07	0.08	0.08	99.94	99.73
230	4.00	0.06	0.01	0.01	99.95	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
2.91	2.60	2.43	2.13	1.74	1.57	1.11

Moment Statistics	Mean Phi	Mean mm	Sorting	Skewness	Kurtosis
	2.08	0.24	0.53	-0.67	4.3

GRANULOMETRIC REPORT AUGUST 2008 URS FLAGLER BEACH SAMPLES.GPJ JPBRAZIL.GDT 1/8/09



Gravel		Sand			Silt and Clay						
Sample	Symbol	Elev. (ft)	USCS	% Fines	% Organics	% Carbonates	Median	Mean	Skew	Kurt	Sort
R-90 Berm Crest	●		SP	#200 - 0.27 #230 - 0.26		13	2.13	2.08	-0.67	4.3	0.53
Comments: Collected on 8-12-08 Depths and elevations based on measured values											
											
Coastal Planning & Engineering 2481 NW Boca Raton Blvd, Boca Raton FL 33431 ph (561) 391-8102 fax (561) 391-9116											
Sample Information				Flagler Beach Sample Analysis							
Project Name:				10-30-08							
Analysis Date:				PB							
Analyzed By:				-81							
Easting (X, ft):				29							
Northing (Y, ft):											
Horizontal System:											
Vertical System:											

Granulometric Report

Depths and elevations based on measured values



Coastal Planning & Engineering
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 FL 33431
 ph (561) 391-8102
 fax (561) 391-9116

Project Name: Flagler Beach Sample Analysis

Sample Name: R-90 Berm Crest AD

Analysis Date: 11-05-08

Analyzed By: MTY

Easting (ft): -81	Northing (ft): 29	Coordinate System: Geographic (Latitude/Longitude)	Elevation (ft):
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USCS: SP	Munsell: Dry - 2.5Y-8/2 Washed - 2.5Y-8/2	Comments: Collected on 8-12-08 AD=After Digestion
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Dry Weight (g): 124.19	Wash Weight (g): 124.04	Pan Retained (g): 0.01	Sieve Loss (%): 0.09	Fines (%): #200 - 0.24 #230 - 0.22	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	0.00	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	0.04	0.03	0.05	0.04
35	1.00	0.50	0.51	0.41	0.56	0.45
45	1.50	0.35	7.30	5.88	7.86	6.33
60	2.00	0.25	35.91	28.92	43.77	35.25
80	2.50	0.18	53.78	43.30	97.55	78.55
120	3.00	0.13	24.48	19.71	122.03	98.26
170	3.50	0.09	1.75	1.41	123.78	99.67
200	3.75	0.07	0.11	0.09	123.89	99.76
230	4.00	0.06	0.03	0.02	123.92	99.78

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
2.92	2.64	2.46	2.17	1.82	1.67	1.39

Moment Statistics	Mean Phi	Mean mm	Sorting	Skewness	Kurtosis
	2.15	0.23	0.45	-0.14	3.07

GRANULARMETRIC REPORT AUGUST 2008 URS FLAGLER BEACH SAMPLES.GPJ_JPBRAZIL.GDT_11/8/09

Granulometric Report

Depths and elevations based on measured values



Coastal Planning & Engineering
2481 NW Boca Raton Blvd, Boca Raton
FL 33431
ph (561) 391-8102
fax (561) 391-9116

Project Name: Flagler Beach Sample Analysis

Sample Name: R-90 Foreshore

Analysis Date: 10-30-08

Analyzed By: MTY

Easting (ft): <p style="text-align: center;">-81</p>	Northing (ft): <p style="text-align: center;">29</p>	Coordinate System: <p style="text-align: center;">Geographic (Latitude/Longitude)</p>	Elevation (ft):
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USCS: <p style="text-align: center;">SP</p>	Munsell: Wet - 2.5Y-7/2 Dry - 2.5Y-8/1 Washed - 2.5Y-8/1	Comments: <p style="text-align: center;">Collected on 8-12-08</p>
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Dry Weight (g): <p style="text-align: center;">95.95</p>	Wash Weight (g): <p style="text-align: center;">95.55</p>	Pan Retained (g): <p style="text-align: center;">0.01</p>	Sieve Loss (%): <p style="text-align: center;">0.04</p>	Fines (%): #200 - 0.55 #230 - 0.47	Organics (%):	Carbonates (%): <p style="text-align: center;">6</p>	Shell Hash (%): <p style="text-align: center;">0</p>
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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	0.15	0.16	0.15	0.16
18	0.00	1.00	0.62	0.65	0.77	0.81
25	0.50	0.71	1.24	1.29	2.01	2.10
35	1.00	0.50	1.63	1.70	3.64	3.80
45	1.50	0.35	1.72	1.79	5.36	5.59
60	2.00	0.25	5.49	5.72	10.85	11.31
80	2.50	0.18	33.72	35.14	44.57	46.45
120	3.00	0.13	44.15	46.01	88.72	92.46
170	3.50	0.09	6.53	6.81	95.25	99.27
200	3.75	0.07	0.17	0.18	95.42	99.45
230	4.00	0.06	0.08	0.08	95.50	99.53

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
3.19	2.91	2.81	2.54	2.19	2.07	1.34

Moment	Mean Phi	Mean mm	Sorting	Skewness	Kurtosis
Statistics	2.43	0.19	0.58	-2.01	9.21

GRANULOMETRIC REPORT AUGUST 2008 URS FLAGLER BEACH SAMPLES.GPJ JPBRAZIL.GDT 11/8/09

Granulometric Report

Depths and elevations based on measured values



Coastal Planning & Engineering
 2481 NW Boca Raton Blvd, Boca Raton
 FL 33431
 ph (561) 391-8102
 fax (561) 391-9116

Project Name: Flagler Beach Sample Analysis

Sample Name: R-90 Foreshore AD

Analysis Date: 11-05-08

Analyzed By: RC

Easting (ft): -81	Northing (ft): 29	Coordinate System: Geographic (Latitude/Longitude)	Elevation (ft):
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USCS: SP	Munsell: Dry - 2.5Y-8/1 Washed - 2.5Y-8/1	Comments: Collected on 8-12-08 AD=After Digestion
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Dry Weight (g): 126.78	Wash Weight (g): 126.71	Pan Retained (g): 0.01	Sieve Loss (%): 0.02	Fines (%): #200 - 0.15 #230 - 0.08	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	0.00	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	0.03	0.02	0.03	0.02
25	0.50	0.71	0.11	0.09	0.14	0.11
35	1.00	0.50	0.72	0.57	0.86	0.68
45	1.50	0.35	1.80	1.42	2.66	2.10
60	2.00	0.25	5.89	4.65	8.55	6.75
80	2.50	0.18	46.07	36.34	54.62	43.09
120	3.00	0.13	62.25	49.10	116.87	92.19
170	3.50	0.09	9.45	7.45	126.32	99.64
200	3.75	0.07	0.26	0.21	126.58	99.85
230	4.00	0.06	0.09	0.07	126.67	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
3.19	2.92	2.82	2.57	2.25	2.13	1.81

Moment Statistics	Mean Phi	Mean mm	Sorting	Skewness	Kurtosis
	2.53	0.17	0.41	-0.96	6.1

GRANULOMETRIC REPORT AUGUST 2008 URS FLAGLER BEACH SAMPLES.GPJ JPBRAZIL.GDT 11/8/09

Granulometric Report

Depths and elevations based on measured values



Coastal Planning & Engineering
2481 NW Boca Raton Blvd, Boca Raton
FL 33431
ph (561) 391-8102
fax (561) 391-9116

Project Name: Flagler Beach Sample Analysis

Sample Name: R-95 Berm Crest

Analysis Date: 10-31-08

Analyzed By: MTY

Easting (ft): <p style="text-align: center;">-81</p>	Northing (ft): <p style="text-align: center;">29</p>	Coordinate System: <p style="text-align: center;">Geographic (Latitude/Longitude)</p>	Elevation (ft):
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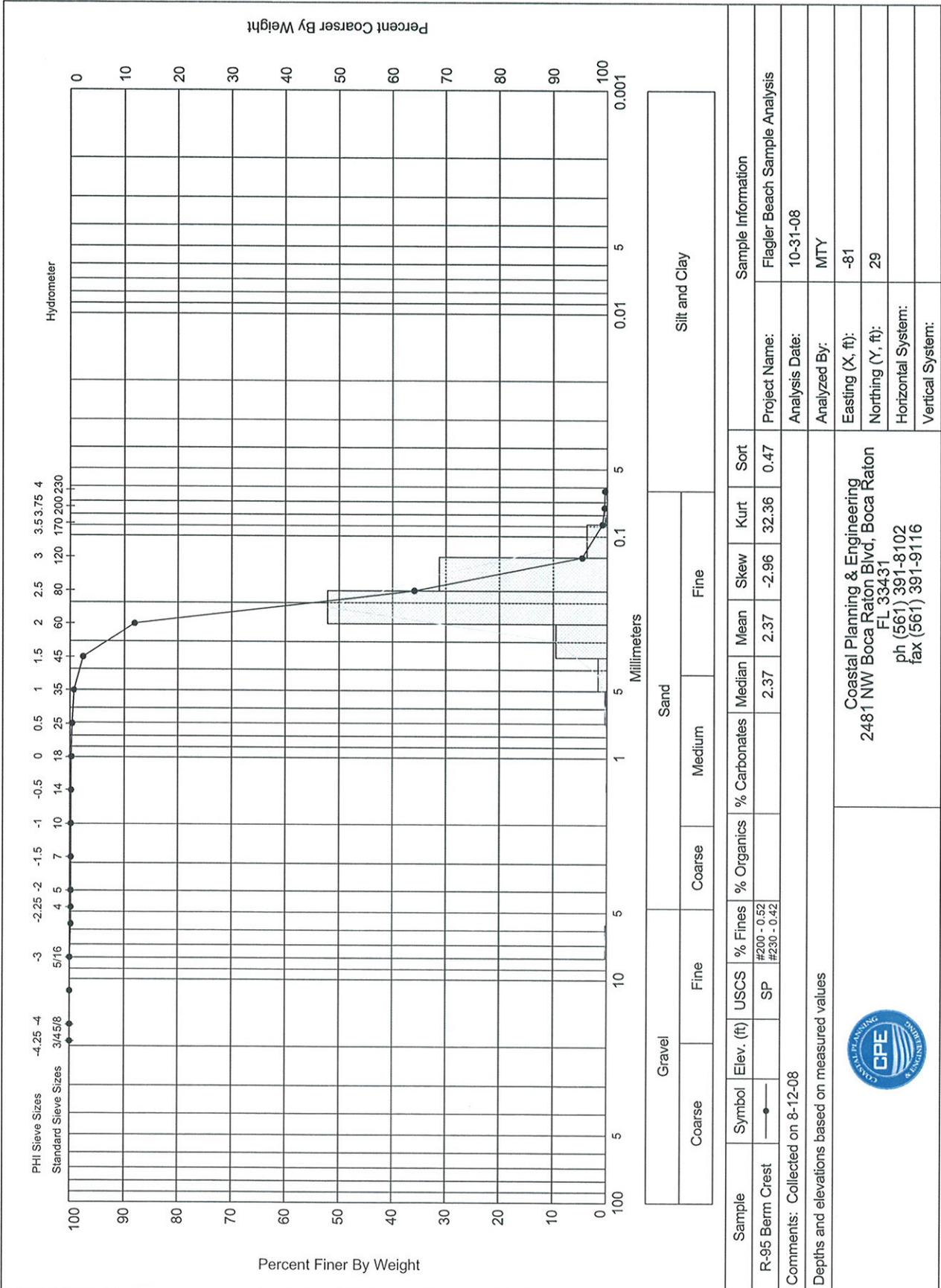
USCS: <p style="text-align: center;">SP</p>	Munsell: Wet - 2.5Y-7/2 Dry - 2.5Y-8/1 Washed - 2.5Y-8/1	Comments: <p style="text-align: center;">Collected on 8-12-08</p>
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Dry Weight (g):	Wash Weight (g):	Pan Retained (g):	Sieve Loss (%):	Fines (%): #200 - 0.52 #230 - 0.42	Organics (%):	Carbonates (%):	Shell Hash (%):
97.50	97.15	0.01	0.04				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	0.20	0.21	0.20	0.21	
4	-2.25	4.76	0.00	0.00	0.20	0.21	
5	-2.00	4.00	0.00	0.00	0.20	0.21	
7	-1.50	2.83	0.00	0.00	0.20	0.21	
10	-1.00	2.00	0.00	0.00	0.20	0.21	
14	-0.50	1.41	0.02	0.02	0.22	0.23	
18	0.00	1.00	0.05	0.05	0.27	0.28	
25	0.50	0.71	0.11	0.11	0.38	0.39	
35	1.00	0.50	0.31	0.32	0.69	0.71	
45	1.50	0.35	1.66	1.70	2.35	2.41	
60	2.00	0.25	9.25	9.49	11.60	11.90	
80	2.50	0.18	50.88	52.18	62.48	64.08	
120	3.00	0.13	30.49	31.27	92.97	95.35	
170	3.50	0.09	3.67	3.76	96.64	99.11	
200	3.75	0.07	0.36	0.37	97.00	99.48	
230	4.00	0.06	0.10	0.10	97.10	99.58	

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	2.82	2.67	2.37	2.13	2.04	1.64
Moment Statistics	Mean Phi	Mean mm	Sorting	Skewness	Kurtosis	
	2.37	0.19	0.47	-2.96	32.36	

GRANULOMETRIC REPORT AUGUST 2008 URS FLAGLER BEACH SAMPLES.GPJ_JPBRAZIL.GDT 1/8/09



Granulometric Report

Depths and elevations based on measured values



Coastal Planning & Engineering
 2481 NW Boca Raton Blvd, Boca Raton
 FL 33431
 ph (561) 391-8102
 fax (561) 391-9116

Project Name: Flagler Beach Sample Analysis

Sample Name: R-95 Foreshore

Analysis Date: 10-31-08

Analyzed By: MTY

Easting (ft): -81	Northing (ft): 29	Coordinate System: Geographic (Latitude/Longitude)	Elevation (ft):
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USCS: SW	Munsell: Wet - 10YR-6/3 Dry - 10YR-7/3 Washed - 10YR-7/3	Comments: Collected on 8-12-08
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Dry Weight (g): 97.64	Wash Weight (g): 97.05	Pan Retained (g): 0.00	Sieve Loss (%): 0.11	Fines (%): #200 - 0.73 #230 - 0.72	Organics (%):	Carbonates (%): 34	Shell Hash (%): 0
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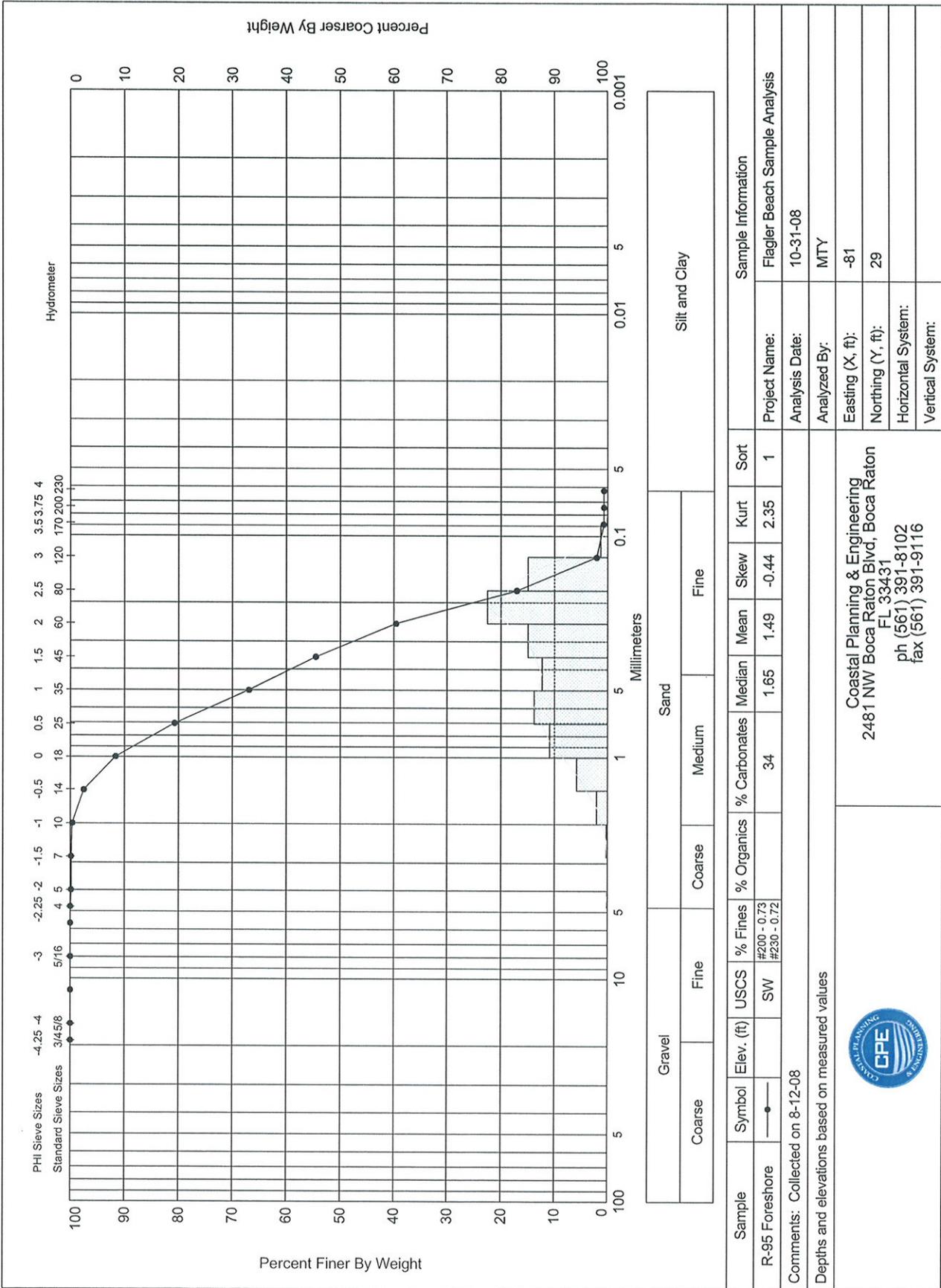
Sieve Number	Sieve Size (Phi)	Sieve Size (Millimeters)	Grams Retained	% Weight Retained	Cum. Grams Retained	C. % Weight Retained
3/4"	-4.25	19.03	0.00	0.00	0.00	0.00
5/8"	-4.00	16.00	0.00	0.00	0.00	0.00
7/16"	-3.50	11.31	0.00	0.00	0.00	0.00
5/16"	-3.00	8.00	0.00	0.00	0.00	0.00
3.5	-2.50	5.66	0.00	0.00	0.00	0.00
4	-2.25	4.76	0.00	0.00	0.00	0.00
5	-2.00	4.00	0.14	0.14	0.14	0.14
7	-1.50	2.83	0.00	0.00	0.14	0.14
10	-1.00	2.00	0.22	0.23	0.36	0.37
14	-0.50	1.41	2.07	2.12	2.43	2.49
18	0.00	1.00	5.71	5.85	8.14	8.34
25	0.50	0.71	10.67	10.93	18.81	19.27
35	1.00	0.50	13.50	13.83	32.31	33.10
45	1.50	0.35	12.03	12.32	44.34	45.42
60	2.00	0.25	14.63	14.98	58.97	60.40
80	2.50	0.18	21.99	22.52	80.96	82.92
120	3.00	0.13	14.65	15.00	95.61	97.92
170	3.50	0.09	1.27	1.30	96.88	99.22
200	3.75	0.07	0.05	0.05	96.93	99.27
230	4.00	0.06	0.01	0.01	96.94	99.28

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	2.54	2.32	1.65	0.71	0.35	-0.29

Moment Statistics	Mean Phi	Mean mm	Sorting	Skewness	Kurtosis
	1.49	0.36	1	-0.44	2.35

GRANULOMETRIC REPORT AUGUST 2008 URS FLAGLER BEACH SAMPLES.GPJ JPBRAZIL.GDT 1/8/09



Gravel		Sand		Silt and Clay	
Coarse	Fine	Coarse	Medium	Fine	

Sample	Symbol	Elev. (ft)	USCS	% Fines	% Organics	% Carbonates	Median	Mean	Skew	Kurt	Sort
R-95 Foreshore	●	—	SW	#200 - 0.75 #230 - 0.72		34	1.65	1.49	-0.44	2.35	1

Comments: Collected on 8-12-08
 Depths and elevations based on measured values

Project Name: Flagler Beach Sample Analysis
 Analysis Date: 10-31-08
 Analyzed By: MTY
 Easting (X, ft): -81
 Northing (Y, ft): 29
 Horizontal System:
 Vertical System:

Coastal Planning & Engineering
 2481 NW Boca Raton Blvd, Boca Raton
 FL 33431
 ph (561) 391-8102
 fax (561) 391-9116



Granularmetric Report

Depths and elevations based on measured values



Coastal Planning & Engineering
 2481 NW Boca Raton Blvd, Boca Raton
 FL 33431
 ph (561) 391-8102
 fax (561) 391-9116

Project Name: Flagler Beach Sample Analysis

Sample Name: R-95 Foreshore AD

Analysis Date: 11-05-08

Analyzed By: MTY

Easting (ft): -81	Northing (ft): 29	Coordinate System: Geographic (Latitude/Longitude)	Elevation (ft):
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USCS: SP	Munsell: Dry - 2.5Y-8/4 Washed - 2.5Y-8/4	Comments: Collected on 8-12-08 AD=After Digestion
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Dry Weight (g): 102.15	Wash Weight (g): 102.03	Pan Retained (g): 0.03	Sieve Loss (%): 0.11	Fines (%): #200 - 0.27 #230 - 0.25	Organics (%):	Carbonates (%):	Shell Hash (%): 0
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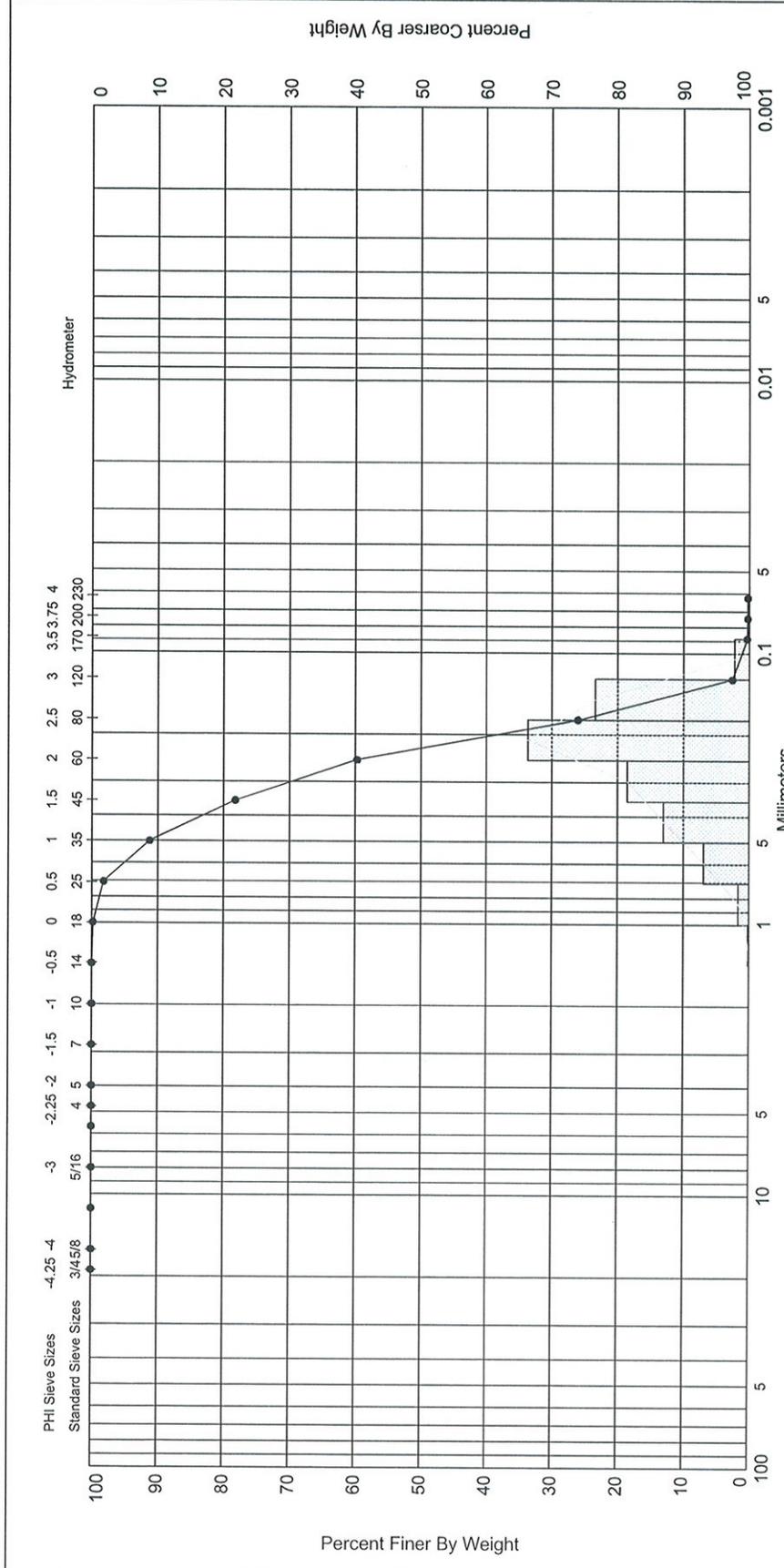
Sieve Number	Sieve Size (Phi)	Sieve Size (Millimeters)	Grams Retained	% Weight Retained	Cum. Grams Retained	C. % Weight Retained
3/4"	-4.25	19.03	0.00	0.00	0.00	0.00
5/8"	-4.00	16.00	0.00	0.00	0.00	0.00
7/16"	-3.50	11.31	0.00	0.00	0.00	0.00
5/16"	-3.00	8.00	0.00	0.00	0.00	0.00
3.5	-2.50	5.66	0.00	0.00	0.00	0.00
4	-2.25	4.76	0.00	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	0.15	0.15	0.15	0.15
25	0.50	0.71	1.68	1.64	1.83	1.79
35	1.00	0.50	7.10	6.95	8.93	8.74
45	1.50	0.35	13.30	13.02	22.23	21.76
60	2.00	0.25	18.92	18.52	41.15	40.28
80	2.50	0.18	34.41	33.69	75.56	73.97
120	3.00	0.13	23.93	23.43	99.49	97.40
170	3.50	0.09	2.29	2.24	101.78	99.64
200	3.75	0.07	0.09	0.09	101.87	99.73
230	4.00	0.06	0.02	0.02	101.89	99.75

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
2.95	2.71	2.52	2.14	1.59	1.28	0.73

Moment Statistics	Mean Phi	Mean mm	Sorting	Skewness	Kurtosis
	2.03	0.24	0.67	-0.62	2.87

GRANULARMETRIC REPORT AUGUST 2008 URS FLAGLER BEACH SAMPLES.GPJ JPBRAZIL.GDT 1/8/09



Gravel		Sand			Silt and Clay						
Sample	Symbol	Elev. (ft)	USCS	% Fines	% Organics	% Carbonates	Median	Mean	Skew	Kurt	Sort
R-95 Foreshore AD	●		SP	#200 - 0.27 #230 - 0.25			2.14	2.03	-0.62	2.87	0.67
Comments: Collected on 8-12-08 AD=After Digestion											
Depths and elevations based on measured values											
								Coastal Planning & Engineering 2481 NW Boca Raton Blvd, Boca Raton FL 33431 ph (561) 391-8102 fax (561) 391-9116			
Project Name:								Flagler Beach Sample Analysis			
Analysis Date:								11-05-08			
Analyzed By:								MTY			
Easting (X, ft):								-81			
Northing (Y, ft):								29			
Horizontal System:											
Vertical System:											

Granulometric Report

Depths and elevations based on measured values



Coastal Planning & Engineering
2481 NW Boca Raton Blvd, Boca Raton
FL 33431
ph (561) 391-8102
fax (561) 391-9116

Project Name: Flagler Beach Sample Analysis

Sample Name: R-100 Berm Crest

Analysis Date: 10-29-08

Analyzed By: RC

Easting (ft): <p style="text-align: center;">-81</p>	Northing (ft): <p style="text-align: center;">29</p>	Coordinate System: <p style="text-align: center;">Geographic (Latitude/Longitude)</p>	Elevation (ft):
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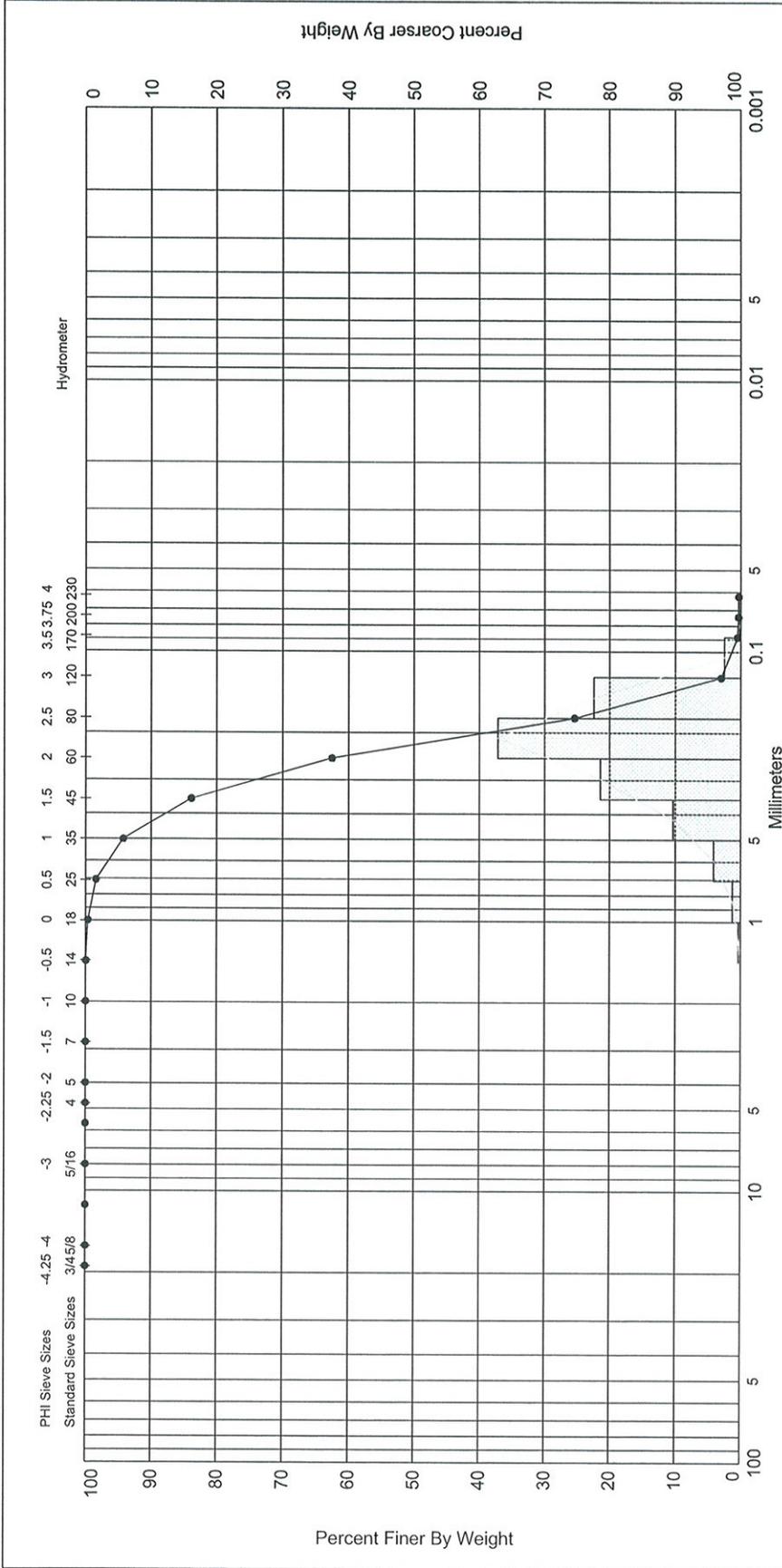
USCS: <p style="text-align: center;">SP</p>	Munsell: Wet - 10YR-7/2 Dry - 10YR-7/2 Washed - 10YR-7/2	Comments: <p style="text-align: center;">Collected on 8-12-08</p>
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Dry Weight (g):	Wash Weight (g):	Pan Retained (g):	Sieve Loss (%):	Fines (%): #200 - 0.36 #230 - 0.32	Organics (%):	Carbonates (%):	Shell Hash (%):
100.12	99.79	0.00	0.00			12	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	0.01	0.01	0.01	0.01	
10	-1.00	2.00	0.01	0.01	0.02	0.02	
14	-0.50	1.41	0.02	0.02	0.04	0.04	
18	0.00	1.00	0.31	0.31	0.35	0.35	
25	0.50	0.71	1.21	1.21	1.56	1.56	
35	1.00	0.50	4.17	4.17	5.73	5.73	
45	1.50	0.35	10.36	10.35	16.09	16.08	
60	2.00	0.25	21.41	21.38	37.50	37.46	
80	2.50	0.18	37.19	37.15	74.69	74.61	
120	3.00	0.13	22.43	22.40	97.12	97.01	
170	3.50	0.09	2.49	2.49	99.61	99.50	
200	3.75	0.07	0.14	0.14	99.75	99.64	
230	4.00	0.06	0.04	0.04	99.79	99.68	

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	2.71	2.51	2.17	1.71	1.50	0.91
Moment Statistics	Mean Phi	Mean mm	Sorting	Skewness	Kurtosis	
	2.08	0.24	0.62	-0.76	3.88	

GRANULARMETRIC REPORT AUGUST 2008 URS FLAGLER BEACH SAMPLES.GPJ_JPBRAZIL.GDT 1/8/09



Gravel		Sand			Silt and Clay		
Coarse	Fine	Coarse	Medium	Fine			

Sample	Symbol	Elev. (ft)	USCS	% Fines	% Organics	% Carbonates	Median	Mean	Skew	Kurt	Sort	Sample Information													
R-100 Berm Crest	●		SP	#200 - 0.36 #230 - 0.32		12	2.17	2.08	-0.76	3.88	0.62	Project Name:	Flagler Beach Sample Analysis	Analysis Date:	10-29-08	Analyzed By:	RC	Easting (X, ft):	-81	Northing (Y, ft):	29	Horizontal System:		Vertical System:	
Comments: Collected on 8-12-08												Depths and elevations based on measured values													
												Coastal Planning & Engineering 2481 NW Boca Raton Blvd, Boca Raton FL 33431 ph (561) 391-8102 fax (561) 391-9116													

Granularmetric Report

Depths and elevations based on measured values



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FL 33431
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fax (561) 391-9116

Project Name: Flagler Beach Sample Analysis

Sample Name: R-100 Berm Crest AD

Analysis Date: 11-04-08

Analyzed By: RC

Easting (ft): <p style="text-align: center;">-81</p>	Northing (ft): <p style="text-align: center;">29</p>	Coordinate System: <p style="text-align: center;">Geographic (Latitude/Longitude)</p>	Elevation (ft):
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USCS: <p style="text-align: center;">SP</p>	Munsell: Dry - 2.5Y-8/2 Washed - 2.5Y-8/2	Comments: <p style="text-align: center;">Collected on 8-12-08 AD=After Digestion</p>
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Dry Weight (g): <p style="text-align: center;">138.69</p>	Wash Weight (g): <p style="text-align: center;">138.49</p>	Pan Retained (g): <p style="text-align: center;">0.01</p>	Sieve Loss (%): <p style="text-align: center;">0.02</p>	Fines (%): #200 - 0.23 #230 - 0.17	Organics (%):	Carbonates (%):	Shell Hash (%): <p style="text-align: center;">0</p>
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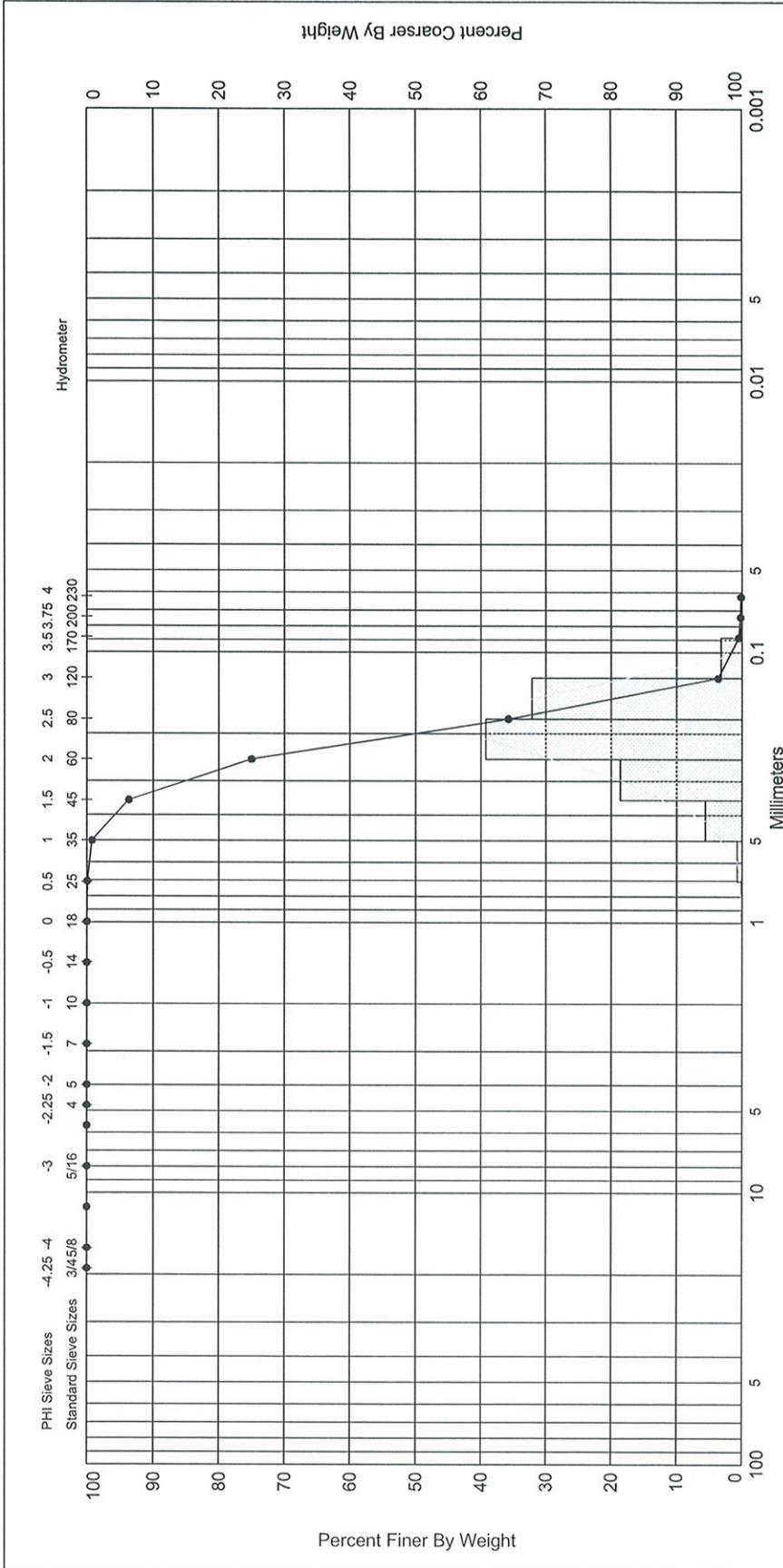
Sieve Number	Sieve Size (Phi)	Sieve Size (Millimeters)	Grams Retained	% Weight Retained	Cum. Grams Retained	C. % Weight Retained
3/4"	-4.25	19.03	0.00	0.00	0.00	0.00
5/8"	-4.00	16.00	0.00	0.00	0.00	0.00
7/16"	-3.50	11.31	0.00	0.00	0.00	0.00
5/16"	-3.00	8.00	0.00	0.00	0.00	0.00
3.5	-2.50	5.66	0.00	0.00	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	0.08	0.06	0.09	0.07
35	1.00	0.50	1.00	0.72	1.09	0.79
45	1.50	0.35	7.74	5.58	8.83	6.37
60	2.00	0.25	25.80	18.60	34.63	24.97
80	2.50	0.18	54.43	39.25	89.06	64.22
120	3.00	0.13	44.56	32.13	133.62	96.35
170	3.50	0.09	4.37	3.15	137.99	99.50
200	3.75	0.07	0.37	0.27	138.36	99.77
230	4.00	0.06	0.09	0.06	138.45	99.83

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	2.81	2.67	2.32	2.00	1.76	1.38

Moment	Mean Phi	Mean mm	Sorting	Skewness	Kurtosis
Statistics	2.29	0.20	0.49	-0.46	3.29

GRANULARMETRIC REPORT AUGUST 2008 URS FLAGLER BEACH SAMPLES.GPJ JPBRAZIL.GDT 1/8/09



Gravel		Sand		Silt and Clay	
Coarse	Fine	Coarse	Medium	Fine	

Sample	Symbol	Elev. (ft)	USCS	% Fines	% Organics	% Carbonates	Median	Mean	Skew	Kurt	Sort	Sample Information			
R-100 Berm Crest AD	—●—		SP	#200 - 0.23 #230 - 0.17			2.32	2.29	-0.46	3.29	0.49	Project Name:	Flagler Beach Sample Analysis		
Comments: Collected on 8-12-08												Analysis Date:	11-04-08		
AD=After Digestion												Analyzed By:	RC		
Depths and elevations based on measured values												Easting (X, ft):	-81		
												Northing (Y, ft):	29		
												Horizontal System:			
												Vertical System:			


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 FL 33431
 ph (561) 391-8102
 fax (561) 391-9116

Granularmetric Report

Depths and elevations based on measured values



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 FL 33431
 ph (561) 391-8102
 fax (561) 391-9116

Project Name: Flagler Beach Sample Analysis

Sample Name: R-100 Foreshore

Analysis Date: 10-30-08

Analyzed By: PB

Easting (ft): -81	Northing (ft): 29	Coordinate System: Geographic (Latitude/Longitude)	Elevation (ft):
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USCS: SW	Munsell: Wet - 10YR-7/4 Dry - 10YR-7/3 Washed - 10YR-7/3	Comments: Collected on 8-12-08
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Dry Weight (g): 96.82	Wash Weight (g): 96.31	Pan Retained (g): 0.01	Sieve Loss (%): 0.00	Fines (%): #200 - 0.54 #230 - 0.52	Organics (%):	Carbonates (%): 42	Shell Hash (%): 0
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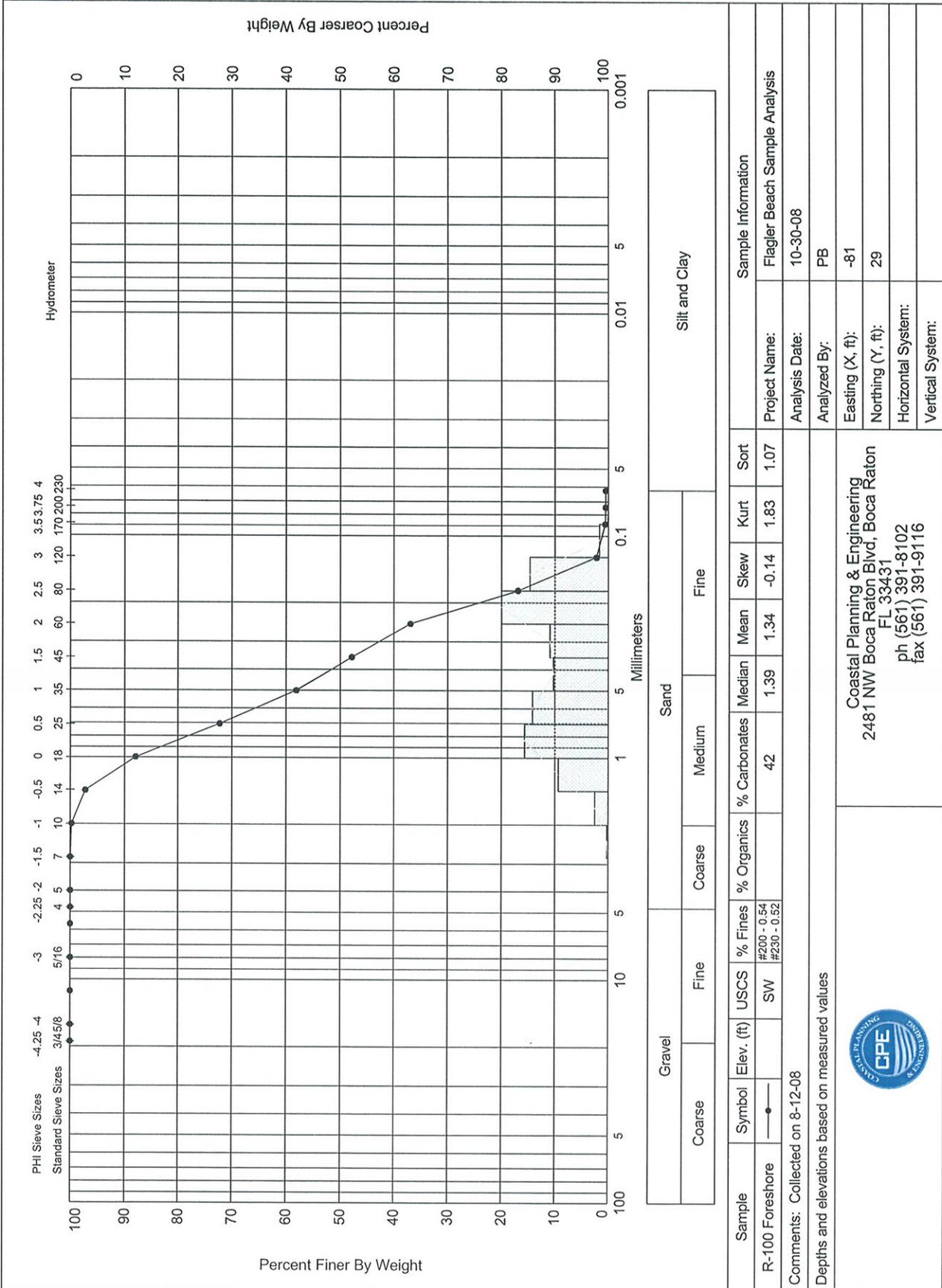
Sieve Number	Sieve Size (Phi)	Sieve Size (Millimeters)	Grams Retained	% Weight Retained	Cum. Grams Retained	C. % Weight Retained
3/4"	-4.25	19.03	0.00	0.00	0.00	0.00
5/8"	-4.00	16.00	0.00	0.00	0.00	0.00
7/16"	-3.50	11.31	0.00	0.00	0.00	0.00
5/16"	-3.00	8.00	0.00	0.00	0.00	0.00
3.5	-2.50	5.66	0.00	0.00	0.00	0.00
4	-2.25	4.76	0.00	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	0.22	0.23	0.22	0.23
14	-0.50	1.41	2.45	2.53	2.67	2.76
18	0.00	1.00	9.01	9.31	11.68	12.07
25	0.50	0.71	15.19	15.69	26.87	27.76
35	1.00	0.50	13.68	14.13	40.55	41.89
45	1.50	0.35	9.94	10.27	50.49	52.16
60	2.00	0.25	10.56	10.91	61.05	63.07
80	2.50	0.18	19.38	20.02	80.43	83.09
120	3.00	0.13	14.22	14.69	94.65	97.78
170	3.50	0.09	1.58	1.63	96.23	99.41
200	3.75	0.07	0.05	0.05	96.28	99.46
230	4.00	0.06	0.02	0.02	96.30	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
2.91	2.53	2.30	1.39	0.41	0.13	-0.38

Moment Statistics	Mean Phi	Mean mm	Sorting	Skewness	Kurtosis
	1.34	0.40	1.07	-0.14	1.83

GRANULARMETRIC REPORT AUGUST 2008 URS FLAGLER BEACH SAMPLES.GPJ JPBRAZIL.GDT 1/8/09



Gravel		Sand		Silt and Clay	
Coarse	Fine	Coarse	Medium	Fine	

Sample	Symbol	Elev. (ft)	USCS	% Fines	% Organics	% Carbonates	Median	Mean	Skew	Kurt	Sort
R-100 Foresho	●		SW	#200 - 0.54 #230 - 0.52		42	1.39	1.34	-0.14	1.83	1.07

Comments: Collected on 8-12-08
 Depths and elevations based on measured values

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 fax (561) 391-9116



Sample Information	
Project Name:	Flagler Beach Sample Analysis
Analysis Date:	10-30-08
Analyzed By:	PB
Easting (X, ft):	-81
Northing (Y, ft):	29
Horizontal System:	
Vertical System:	

Granularmetric Report

Depths and elevations based on measured values



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 FL 33431
 ph (561) 391-8102
 fax (561) 391-9116

Project Name: Flagler Beach Sample Analysis

Sample Name: R-100 Foreshore AD

Analysis Date: 11-05-08

Analyzed By: RC

Easting (ft): -81	Northing (ft): 29	Coordinate System: Geographic (Latitude/Longitude)	Elevation (ft):
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USCS: SP	Munsell: Dry - 2.5Y-8/2 Washed - 2.5Y-8/2	Comments: Collected on 8-12-08 AD=After Digestion
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Dry Weight (g): 97.48	Wash Weight (g): 97.44	Pan Retained (g): 0.01	Sieve Loss (%): 0.08	Fines (%): #200 - 0.19 #230 - 0.14	Organics (%):	Carbonates (%):	Shell Hash (%): 0
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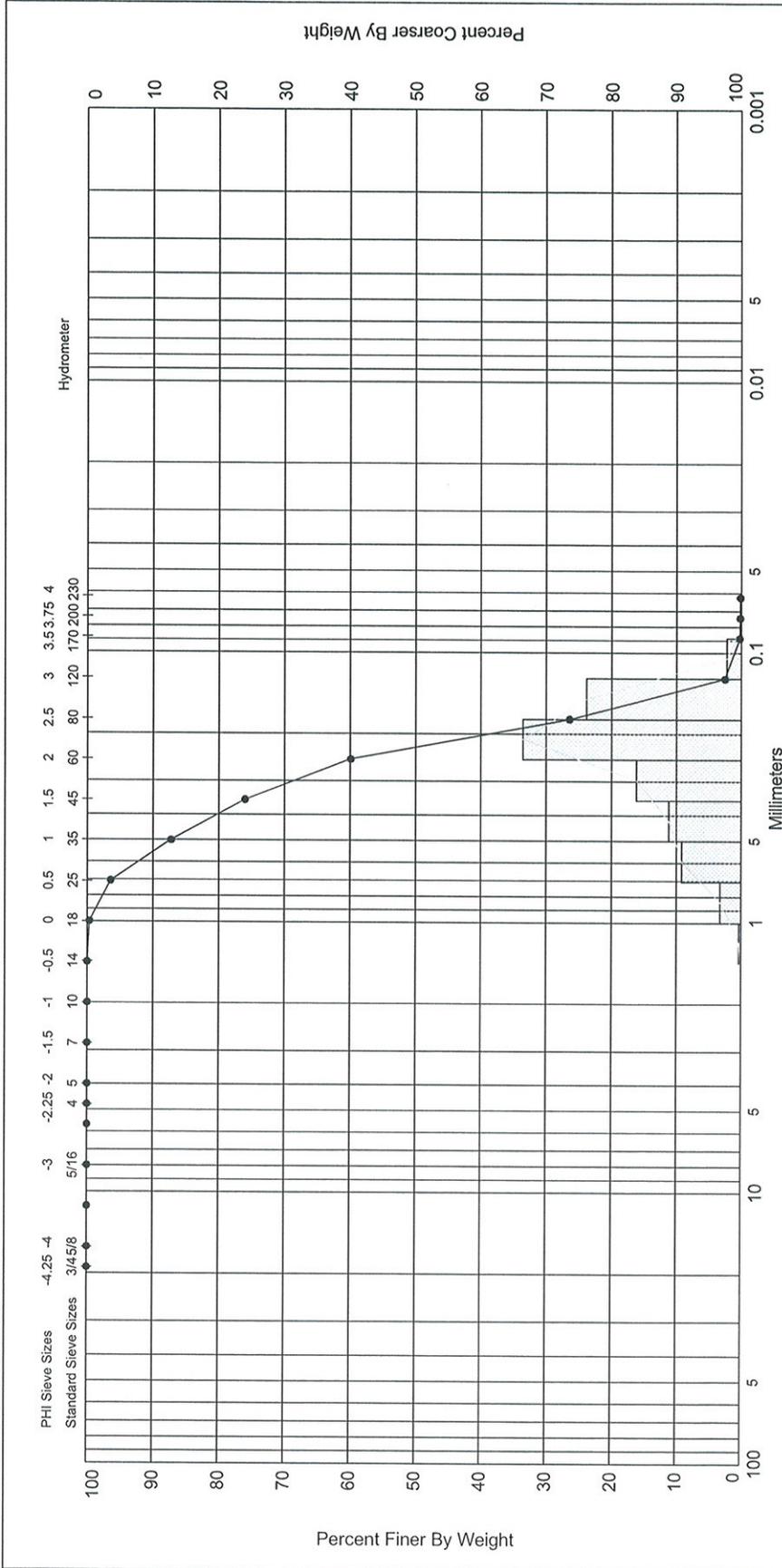
Sieve Number	Sieve Size (Phi)	Sieve Size (Millimeters)	Grams Retained	% Weight Retained	Cum. Grams Retained	C. % Weight Retained
3/4"	-4.25	19.03	0.00	0.00	0.00	0.00
5/8"	-4.00	16.00	0.00	0.00	0.00	0.00
7/16"	-3.50	11.31	0.00	0.00	0.00	0.00
5/16"	-3.00	8.00	0.00	0.00	0.00	0.00
3.5	-2.50	5.66	0.00	0.00	0.00	0.00
4	-2.25	4.76	0.00	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	0.33	0.34	0.33	0.34
25	0.50	0.71	3.14	3.22	3.47	3.56
35	1.00	0.50	8.96	9.19	12.43	12.75
45	1.50	0.35	10.90	11.18	23.33	23.93
60	2.00	0.25	15.74	16.15	39.07	40.08
80	2.50	0.18	32.68	33.52	71.75	73.60
120	3.00	0.13	23.25	23.85	95.00	97.45
170	3.50	0.09	2.22	2.28	97.22	99.73
200	3.75	0.07	0.08	0.08	97.30	99.81
230	4.00	0.06	0.05	0.05	97.35	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
2.95	2.72	2.53	2.15	1.53	1.15	0.58

Moment Statistics	Mean Phi	Mean mm	Sorting	Skewness	Kurtosis
	1.99	0.25	0.73	-0.7	2.82

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Gravel		Sand			Silt and Clay						
Coarse	Fine	Coarse	Medium	Fine	Coarse	Medium	Fine				
Sample	Symbol	Elev. (ft)	USCS	% Fines	% Organics	% Carbonates	Median	Mean	Skew	Kurt	Sort
R-100 Foreshoare AD	—●—		SP	#200 - 0.19 #230 - 0.14			2.15	1.99	-0.7	2.82	0.73
Comments: Collected on 8-12-08 AD=After Digestion											
Depths and elevations based on measured values											
Sample Information						Sample Information					
Project Name:						Flagler Beach Sample Analysis					
Analysis Date:						11-05-08					
Analyzed By:						RC					
Easting (X, ft):						-81					
Northing (Y, ft):						29					
Horizontal System:											
Vertical System:											
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