

|   |  |  |  |                     |
|---|--|--|--|---------------------|
| <b>DRILLING LOG</b>   |  | <b>DIVISION:</b> South Atlantic  | <b>INSTALLATION:</b> Jacksonville District | <b>SHEET</b> 1 of 1 |
| 1. PROJECT CAPTIVA ISLAND SAND STUDY                                  |  | 10. SIZE AND TYPE OF BIT 3 5/8"  |  |                     |
| 2. LOCATION (Coordinates or Station)<br>X=540387.69 Y=793026.05       |  | 11. DATUM FOR ELEVATION SHOWN (TBM or MSL)<br>NGVD                     |  |                     |
| 3. DRILLING AGENCY: Alpine Ocean Seismic Survey Inc.                  |  | 12. MANUFACTURER'S DESIGNATION OF DRILL<br>ALPINE PNEUMATIC VIBRACORE  |  |                     |
| 4. HOLE NO. (As shown on drawing title and file number)<br>CIVC-00-18 |  | 13. TOT NO. OF OVERBURDEN SAMPLES TAKEN<br>Disturbed: 0 Undisturbed: 0 |  |                     |
| 5. NAME OF DRILLER MAURIZIO ROSSI                                     |  | 14. TOTAL NO. OF CORE BOXES  |  |                     |
| 6. DIRECTION OF HOLE VERTICAL   |  | 15. ELEVATION GROUND WATER   |  |                     |
| 7. THICKNESS OF BURDEN 0.0 FT   |  | 16. DATE HOLE Started 8/10/00 Completed 15:17                          |  |                     |
| 8. DEPTH DRILLED INTO ROCK N/A  |  | 17. ELEVATION TOP OF HOLE -45.9 FT                                     |  |                     |
| 9. TOTAL DEPTH OF HOLE 18.6 FT  |  | 18. TOTAL CORE RECOVERY FOR BORING 91.4%                               |  |                     |
|   |  | 19. SIGNATURE OF GEOLOGIST SK/ID                                       |  |                     |

| ELEV. | DEPTH | LEGEND | CLASSIFICATION OF MATERIALS<br>(Description)   | CORE<br>REC<br>% | SAMPLE<br>NUMBER | REMARKS   |
|-------|-------|--------|--|------------------|------------------|---|
| -45.9 | 0     |        |  |                  |                  |   |
|       | 1     |        |  |                  |                  |   |
|       | 2     |        | SAND, fine grained, some shell hash/ shell fragments, gray (5Y-5/1), (SP).   |                  | 1                | Sample #1, Depth = 2.0'<br>Mean (mm):0.44, Phi Sorting: 1.07<br>Silt: 2.09% (SP)      |
|       | 3     |        |  |                  |                  |   |
| -50.2 | 4     |        |  |                  |                  |   |
|       | 5     |        | SAND, fine grained, little shell hash/ shell fragments, gray (5Y-6/1), (SP).   |                  | 2                | Sample #2, Depth = 5.2'<br>Mean (mm): 0.34, Phi Sorting: 2.01<br>Silt:9.91% (SW-SM)   |
| -52   | 6     |        |  |                  |                  |   |
|       | 7     |        |  |                  |                  |   |
|       | 8     |        | CARBONATE CLASTS, range from silt/clay size to about 2.5", hard & compact, pale yellow (5Y-7/3), at places light gray (5Y-7/1), (GM-GC).   |                  |                  |   |
|       | 9     |        |  |                  |                  |   |
|       | 10    |        |  |                  |                  |   |
| -57.4 | 11    |        |  |                  |                  |   |
|       | 12    |        | SAND, calcareous, little shell fragments/whole shells, whole shells & coral fragments, gray (5Y-6/1) and at places pale yellow (5Y-7/3), (SP). 1" coral @ 12.0', 1.5" rock fragment @ 14.2'. |                  | 3                | Sample #3, Depth = 12.5'<br>Mean (mm): 0.31, Phi Sorting: 1.71<br>Silt: 9.61% (SW-SM) |
| -60.1 | 13    |        |  |                  |                  |   |
|       | 14    |        |  |                  |                  |   |
|       | 15    |        | SAND, calcareous, little shell fragments/whole shells, whole shells & coral fragments, gray (5Y 6/1) and at places pale yellow (5Y-7/3), (SP). 1.5" shell fragment @ 18.2'.                  |                  | 4                | Sample #4, Depth = 16.0'<br>Mean (mm): 0.34, Phi Sorting: 1.97<br>Silt: 12.59% (SM)   |
| -62.9 | 16    |        |  |                  |                  |   |
|       | 17    |        |  |                  |                  |   |
| -64.5 | 18    |        | No Recovery  |                  |                  |   |
|       | 19    |        | End of Boring  |                  |                  |   |
|       | 20    |        |  |                  |                  |   |
|       | 21    |        | Note:<br>1) Soils are field visually classified in accordance with the Unified Soil Classification System.   |                  |                  | Note:<br>This column contains laboratory data.  |
|       | 22    |        |  |                  |                  |   |
|       | 23    |        |  |                  |                  |   |
|       | 24    |        |  |                  |                  |   |

# Gradation Analysis Report

Proj Name: Captiva Island  
 Sample: CIVC-00-18#1  
 Date: 1/1/2001  
 By: ID



2841 N. W. Boca Raton Blvd. Boca Raton FL 33428

|            |         |      |           |           |             |      |
|------------|---------|------|-----------|-----------|-------------|------|
| Elevation: | -47.9   | Feet | Easting:  | 540387.69 | State Plane | 1983 |
| Reference: | NGVD 29 |      | Northing: | 793026.05 | FLA West    | Feet |

|           |    |             |        |             |        |
|-----------|----|-------------|--------|-------------|--------|
| USCS:     | SP | Munsel Dry: | 5Y-6/1 | Munsel Wet: | 5Y-6/1 |
| Comments: | 0  |             |        |             |        |

|          |       |               |      |
|----------|-------|---------------|------|
| Dry Wt.  | 61.74 | Percent Silt: | 2.09 |
| Wash Wt. | 60.45 |               |      |

| Sieve Size | PHI Size | mm Size | Grams Retained | % Weight Retained | Cum. Grams Retained | C % Weight Retained |
|------------|----------|---------|----------------|-------------------|---------------------|---------------------|
| 5/8        | -4.000   | 16.000  | 0.000          | 0.000             | 0.000               | 0.000               |
| 5/16       | -3.000   | 8.000   | 0.000          | 0.000             | 0.000               | 0.000               |
| 5          | -2.000   | 4.000   | 0.470          | 0.761             | 0.470               | 0.761               |
| 7          | -1.500   | 2.828   | 0.250          | 0.405             | 0.720               | 1.166               |
| 10         | -1.000   | 2.000   | 0.620          | 1.004             | 1.340               | 2.170               |
| 14         | -0.500   | 1.414   | 1.640          | 2.656             | 2.980               | 4.827               |
| 18         | 0.000    | 1.000   | 3.650          | 5.912             | 6.630               | 10.739              |
| 25         | 0.500    | 0.707   | 6.460          | 10.463            | 13.090              | 21.202              |
| 35         | 1.000    | 0.500   | 7.590          | 12.293            | 20.680              | 33.495              |
| 45         | 1.500    | 0.354   | 9.790          | 15.857            | 30.470              | 49.352              |
| 60         | 2.000    | 0.250   | 21.020         | 34.046            | 51.490              | 83.398              |
| 80         | 2.500    | 0.177   | 7.430          | 12.034            | 58.920              | 95.432              |
| 120        | 3.000    | 0.125   | 1.310          | 2.122             | 60.230              | 97.554              |
| 170        | 3.500    | 0.088   | 0.150          | 0.243             | 60.380              | 97.797              |
| 200        | 3.750    | 0.074   | 0.050          | 0.081             | 60.430              | 97.878              |
| 230        | 4.000    | 0.063   | 0.020          | 0.032             | 60.450              | 97.911              |
| Pan        | Pan      | 0.053   | 1.290          | 2.089             | 61.740              | 100.000             |

|       |        |        |        |        |        |        |
|-------|--------|--------|--------|--------|--------|--------|
| PHI 5 | PHI 16 | PHI 25 | PHI 50 | PHI 75 | PHI 84 | PHI 95 |
| -0.49 | 0.25   | 0.65   | 1.51   | 1.88   | 2.03   | 2.48   |

|             |      |            |      |
|-------------|------|------------|------|
| Median phi: | 1.51 | Median mm: | 0.35 |
|-------------|------|------------|------|

|         | Mean phi | Mean mm | Sorting | Skewness | Kurtosis |
|---------|----------|---------|---------|----------|----------|
| Graphic | 1.16     | 0.45    | 0.89    | -0.55    | 1.00     |
| Moment  | 1.19     | 0.44    | 1.07    | -0.34    | 1.53     |

# Gradation Analysis Report

Proj Name: Captiva Island  
 Sample: CIVC-00-18#2  
 Date: 1/1/2001  
 By: ID



2841 N. W. Boca Raton Blvd. Boca Raton FL 33428

|            |         |      |           |           |             |      |
|------------|---------|------|-----------|-----------|-------------|------|
| Elevation: | -51.1   | Feet | Easting:  | 540387.69 | State Plane | 1983 |
| Reference: | NGVD 29 |      | Northing: | 793026.05 | FLA West    | Feet |

|           |       |             |        |             |        |
|-----------|-------|-------------|--------|-------------|--------|
| USCS:     | SW-SM | Munsel Dry: | 5Y-6/1 | Munsel Wet: | 5Y-6/1 |
| Comments: | 0     |             |        |             |        |

|          |       |               |      |
|----------|-------|---------------|------|
| Dry Wt.  | 49.47 | Percent Silt: | 9.91 |
| Wash Wt. | 44.63 |               |      |

| Sieve Size | PHI Size | mm Size | Grams Retained | % Weight Retained | Cum. Grams Retained | C % Weight Retained |
|------------|----------|---------|----------------|-------------------|---------------------|---------------------|
| 5/8        | -4.000   | 16.000  | 0.000          | 0.000             | 0.000               | 0.000               |
| 5/16       | -3.000   | 8.000   | 0.000          | 0.000             | 0.000               | 0.000               |
| 5          | -2.000   | 4.000   | 1.400          | 2.830             | 1.400               | 2.830               |
| 7          | -1.500   | 2.828   | 1.480          | 2.992             | 2.880               | 5.822               |
| 10         | -1.000   | 2.000   | 1.400          | 2.830             | 4.280               | 8.652               |
| 14         | -0.500   | 1.414   | 2.250          | 4.548             | 6.530               | 13.200              |
| 18         | 0.000    | 1.000   | 2.520          | 5.094             | 9.050               | 18.294              |
| 25         | 0.500    | 0.707   | 2.340          | 4.730             | 11.390              | 23.024              |
| 35         | 1.000    | 0.500   | 2.370          | 4.791             | 13.760              | 27.815              |
| 45         | 1.500    | 0.354   | 3.250          | 6.570             | 17.010              | 34.384              |
| 60         | 2.000    | 0.250   | 5.680          | 11.482            | 22.690              | 45.866              |
| 80         | 2.500    | 0.177   | 10.150         | 20.517            | 32.840              | 66.384              |
| 120        | 3.000    | 0.125   | 9.360          | 18.921            | 42.200              | 85.304              |
| 170        | 3.500    | 0.088   | 1.870          | 3.780             | 44.070              | 89.084              |
| 200        | 3.750    | 0.074   | 0.340          | 0.687             | 44.410              | 89.772              |
| 230        | 4.000    | 0.063   | 0.140          | 0.283             | 44.550              | 90.055              |
| Pan        | Pan      | 0.053   | 4.900          | 9.905             | 49.450              | 99.960              |

|       |        |        |        |        |        |        |
|-------|--------|--------|--------|--------|--------|--------|
| PHI 5 | PHI 16 | PHI 25 | PHI 50 | PHI 75 | PHI 84 | PHI 95 |
| -1.64 | -0.23  | 0.71   | 2.10   | 2.73   | 2.96   | 4.12   |

|             |      |            |      |
|-------------|------|------------|------|
| Median phi: | 2.10 | Median mm: | 0.23 |
|-------------|------|------------|------|

|         | Mean phi | Mean mm | Sorting | Skewness | Kurtosis |
|---------|----------|---------|---------|----------|----------|
| Graphic | 1.47     | 0.36    | 1.67    | -0.58    | 1.17     |
| Moment  | 1.54     | 0.34    | 2.01    | -0.33    | 1.65     |

# Gradation Analysis Report

Proj Name: Captiva Island  
 Sample: CIVC-00-18#3  
 Date: 1/1/2001  
 By: ID



2841 N. W. Boca Raton Blvd. Boca Raton FL 33428

|            |         |      |           |           |             |      |
|------------|---------|------|-----------|-----------|-------------|------|
| Elevation: | -58.4   | Feet | Easting:  | 540387.69 | State Plane | 1983 |
| Reference: | NGVD 29 |      | Northing: | 793026.05 | FLA West    | Feet |

|           |       |             |        |             |        |
|-----------|-------|-------------|--------|-------------|--------|
| USCS:     | SW-SM | Munsel Dry: | 5Y-6/1 | Munsel Wet: | 5Y-6/1 |
| Comments: | 0     |             |        |             |        |

|          |       |               |      |
|----------|-------|---------------|------|
| Dry Wt.  | 62.99 | Percent Silt: | 9.61 |
| Wash Wt. | 56.95 |               |      |

| Sieve Size | PHI Size | mm Size | Grams Retained | % Weight Retained | Cum. Grams Retained | C % Weight Retained |
|------------|----------|---------|----------------|-------------------|---------------------|---------------------|
| 5/8        | -4.000   | 16.000  | 0.000          | 0.000             | 0.000               | 0.000               |
| 5/16       | -3.000   | 8.000   | 0.000          | 0.000             | 0.000               | 0.000               |
| 5          | -2.000   | 4.000   | 0.990          | 1.572             | 0.990               | 1.572               |
| 7          | -1.500   | 2.828   | 1.000          | 1.588             | 1.990               | 3.159               |
| 10         | -1.000   | 2.000   | 1.320          | 2.096             | 3.310               | 5.255               |
| 14         | -0.500   | 1.414   | 1.660          | 2.635             | 4.970               | 7.890               |
| 18         | 0.000    | 1.000   | 2.230          | 3.540             | 7.200               | 11.430              |
| 25         | 0.500    | 0.707   | 3.410          | 5.414             | 10.610              | 16.844              |
| 35         | 1.000    | 0.500   | 4.790          | 7.604             | 15.400              | 24.448              |
| 45         | 1.500    | 0.354   | 6.810          | 10.811            | 22.210              | 35.260              |
| 60         | 2.000    | 0.250   | 12.050         | 19.130            | 34.260              | 54.390              |
| 80         | 2.500    | 0.177   | 13.110         | 20.813            | 47.370              | 75.202              |
| 120        | 3.000    | 0.125   | 7.460          | 11.843            | 54.830              | 87.046              |
| 170        | 3.500    | 0.088   | 1.690          | 2.683             | 56.520              | 89.729              |
| 200        | 3.750    | 0.074   | 0.350          | 0.556             | 56.870              | 90.284              |
| 230        | 4.000    | 0.063   | 0.060          | 0.095             | 56.930              | 90.379              |
| Pan        | Pan      | 0.053   | 6.050          | 9.605             | 62.980              | 99.984              |

|       |        |        |        |        |        |        |
|-------|--------|--------|--------|--------|--------|--------|
| PHI 5 | PHI 16 | PHI 25 | PHI 50 | PHI 75 | PHI 84 | PHI 95 |
| -1.06 | 0.42   | 1.03   | 1.89   | 2.49   | 2.87   | 4.12   |

|             |      |            |      |
|-------------|------|------------|------|
| Median phi: | 1.89 | Median mm: | 0.27 |
|-------------|------|------------|------|

|         | Mean phi | Mean mm | Sorting | Skewness | Kurtosis |
|---------|----------|---------|---------|----------|----------|
| Graphic | 1.65     | 0.32    | 1.40    | -0.30    | 1.44     |
| Moment  | 1.68     | 0.31    | 1.71    | -0.20    | 1.88     |

# Gradation Analysis Report

Proj Name: Captiva Island  
 Sample: CIVC-00-18#4  
 Date: 1/1/2001  
 By: ID



2841 N. W. Boca Raton Blvd. Boca Raton FL 33428

|            |         |      |           |           |             |      |
|------------|---------|------|-----------|-----------|-------------|------|
| Elevation: | -61.9   | Feet | Easting:  | 540387.69 | State Plane | 1983 |
| Reference: | NGVD 29 |      | Northing: | 793026.05 | FLA West    | Feet |

|           |    |             |        |             |        |
|-----------|----|-------------|--------|-------------|--------|
| USCS:     | SM | Munsel Dry: | 5Y-6/1 | Munsel Wet: | 5Y-6/1 |
| Comments: | 0  |             |        |             |        |

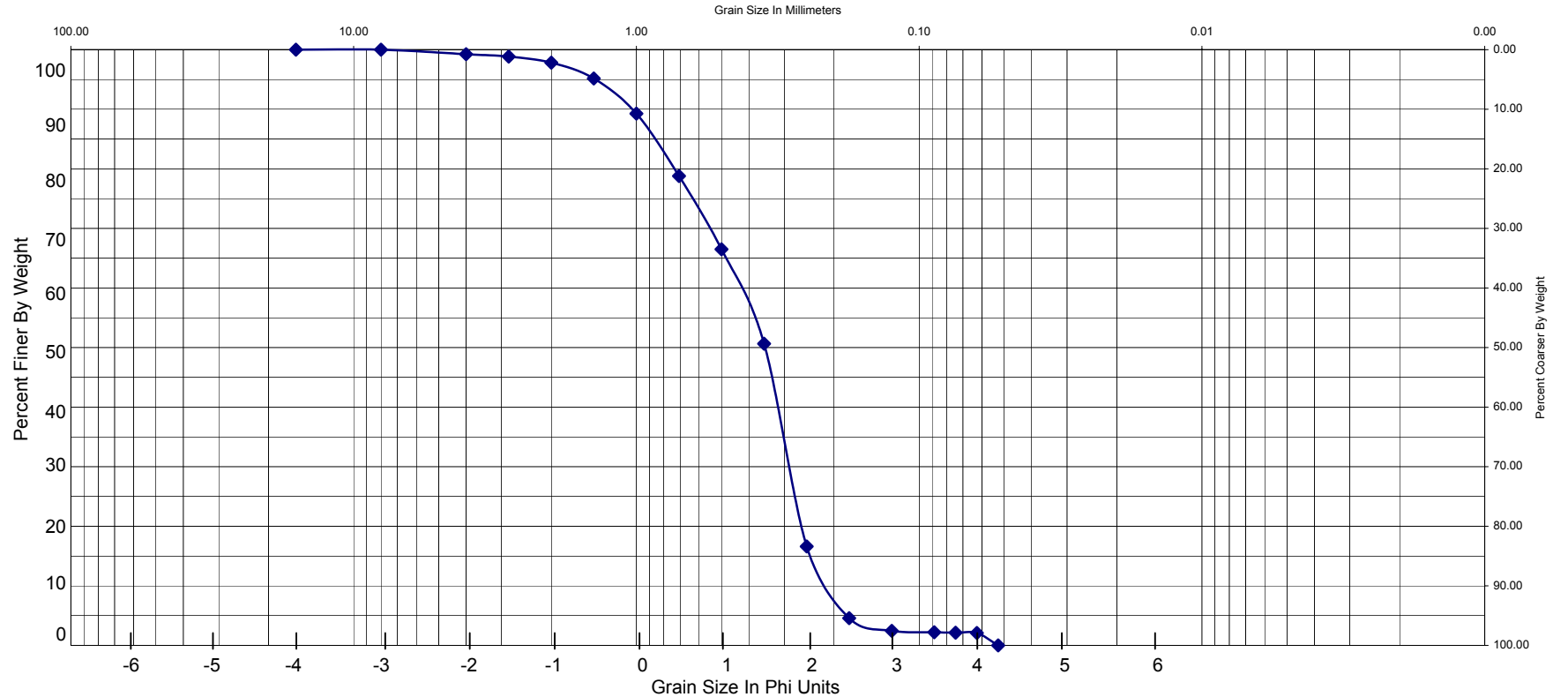
|          |       |               |       |
|----------|-------|---------------|-------|
| Dry Wt.  | 63.18 | Percent Silt: | 12.59 |
| Wash Wt. | 55.24 |               |       |

| Sieve Size | PHI Size | mm Size | Grams Retained | % Weight Retained | Cum. Grams Retained | C % Weight Retained |
|------------|----------|---------|----------------|-------------------|---------------------|---------------------|
| 5/8        | -4.000   | 16.000  | 0.000          | 0.000             | 0.000               | 0.000               |
| 5/16       | -3.000   | 8.000   | 0.000          | 0.000             | 0.000               | 0.000               |
| 5          | -2.000   | 4.000   | 1.740          | 2.754             | 1.740               | 2.754               |
| 7          | -1.500   | 2.828   | 1.810          | 2.865             | 3.550               | 5.619               |
| 10         | -1.000   | 2.000   | 2.090          | 3.308             | 5.640               | 8.927               |
| 14         | -0.500   | 1.414   | 2.460          | 3.894             | 8.100               | 12.821              |
| 18         | 0.000    | 1.000   | 2.530          | 4.004             | 10.630              | 16.825              |
| 25         | 0.500    | 0.707   | 2.840          | 4.495             | 13.470              | 21.320              |
| 35         | 1.000    | 0.500   | 3.820          | 6.046             | 17.290              | 27.366              |
| 45         | 1.500    | 0.354   | 5.840          | 9.243             | 23.130              | 36.610              |
| 60         | 2.000    | 0.250   | 9.300          | 14.720            | 32.430              | 51.330              |
| 80         | 2.500    | 0.177   | 12.990         | 20.560            | 45.420              | 71.890              |
| 120        | 3.000    | 0.125   | 8.110          | 12.836            | 53.530              | 84.726              |
| 170        | 3.500    | 0.088   | 1.430          | 2.263             | 54.960              | 86.990              |
| 200        | 3.750    | 0.074   | 0.190          | 0.301             | 55.150              | 87.290              |
| 230        | 4.000    | 0.063   | 0.070          | 0.111             | 55.220              | 87.401              |
| Pan        | Pan      | 0.053   | 7.950          | 12.583            | 63.170              | 99.984              |

|       |        |        |        |        |        |        |
|-------|--------|--------|--------|--------|--------|--------|
| PHI 5 | PHI 16 | PHI 25 | PHI 50 | PHI 75 | PHI 84 | PHI 95 |
| -1.61 | -0.10  | 0.80   | 1.95   | 2.62   | 2.97   | 4.15   |

|             |      |            |      |
|-------------|------|------------|------|
| Median phi: | 1.95 | Median mm: | 0.26 |
|-------------|------|------------|------|

|         | Mean phi | Mean mm | Sorting | Skewness | Kurtosis |
|---------|----------|---------|---------|----------|----------|
| Graphic | 1.47     | 0.36    | 1.64    | -0.48    | 1.30     |
| Moment  | 1.54     | 0.34    | 1.97    | -0.31    | 1.74     |



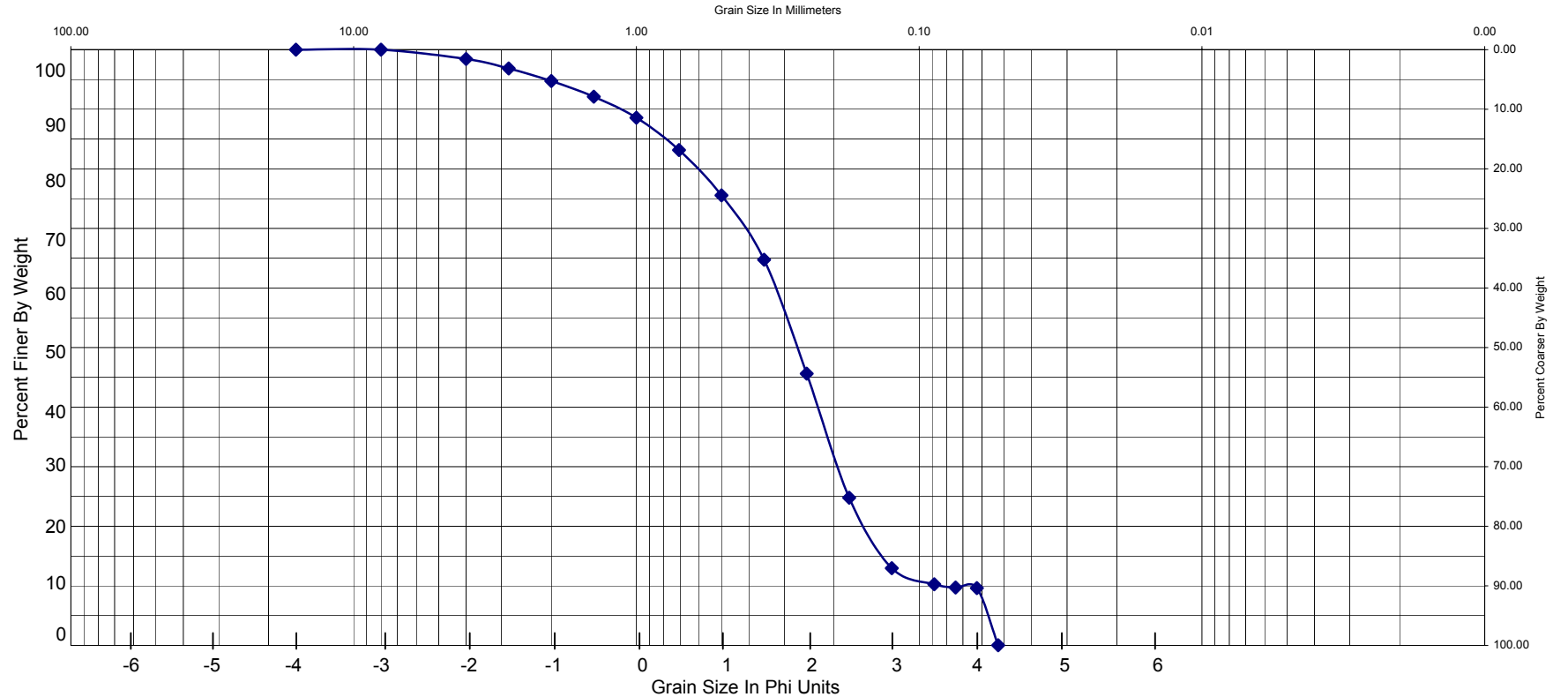
| Gravel |      | Sand   |        |      | Silt or Clay |
|--------|------|--------|--------|------|--------------|
| Coarse | Fine | Coarse | Medium | Fine |              |

| Sample No.     | Depth | Description | USCS | % Silt | Median | Mean | Skew  | Kurt | Sort | PL | LL | PI | Sample Information                       |
|----------------|-------|-------------|------|--------|--------|------|-------|------|------|----|----|----|--|
| ◆ CIVC-00-18#1 | 2.0   |             | SP   | 2.09   | 0.35   | 0.44 | -0.34 | 1.53 | 1.07 | NA | NA | NA | Project Name: Captiva Island             |
|                |       |             |      |        |        |      |       |      |      |    |    |    | Sample Type: Vibracores                  |
|                |       |             |      |        |        |      |       |      |      |    |    |    | Collection Date: 1/1/2001                |
|                |       |             |      |        |        |      |       |      |      |    |    |    | Analysis By: ID                          |
|                |       |             |      |        |        |      |       |      |      |    |    |    | Easting (X): 540387.69 Feet              |
|                |       |             |      |        |        |      |       |      |      |    |    |    | Northing (Y): 793026.05 Feet             |
|                |       |             |      |        |        |      |       |      |      |    |    |    | Sample Elevation: -47.9 NGVD 29          |
|                |       |             |      |        |        |      |       |      |      |    |    |    | Coord. System: State Plane 1983 FLA West |



**COASTAL PLANNING & ENGINEERING, INC.**  
**2481 N. W. BOCA RATON BLVD.**  
**BOCA RATON, FLORIDA 33431**





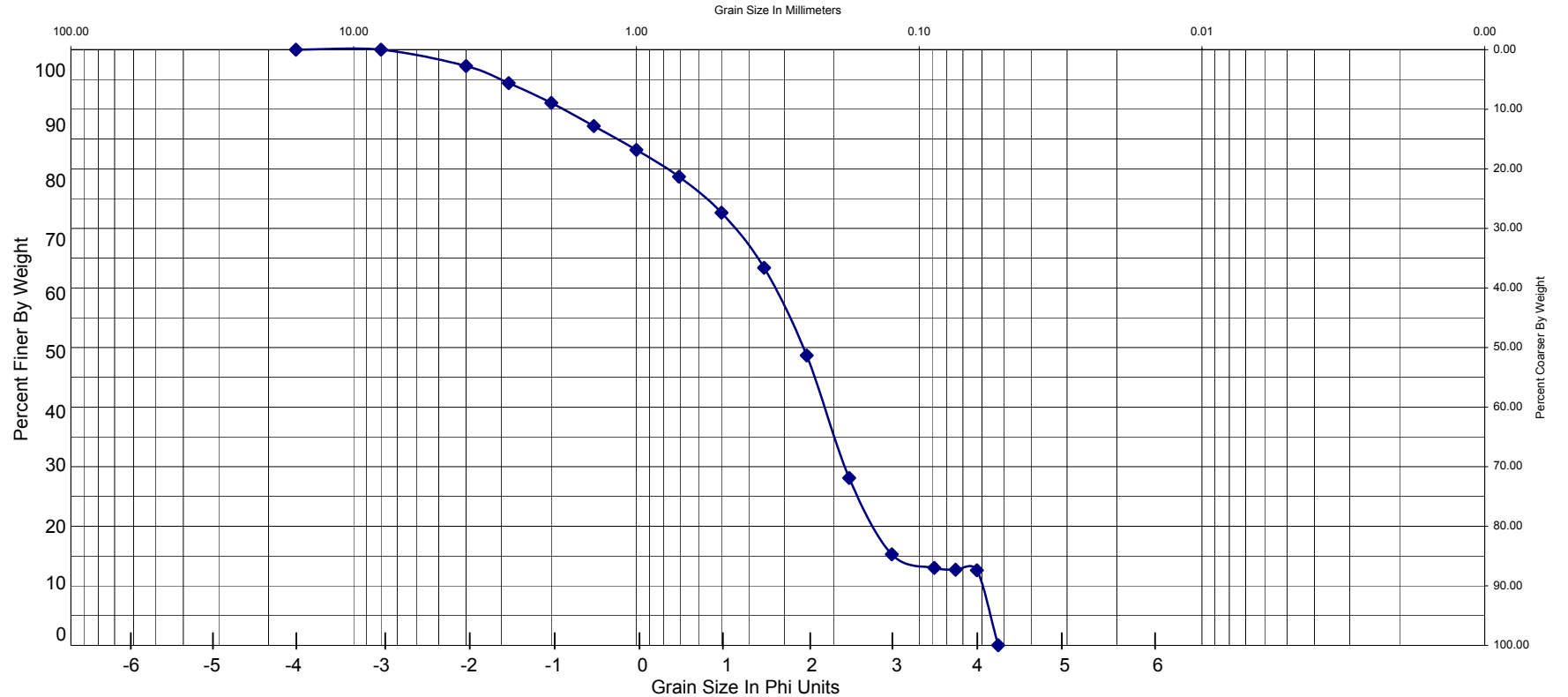
| Gravel |      | Sand   |        |      | Silt or Clay |
|--------|------|--------|--------|------|--------------|
| Coarse | Fine | Coarse | Medium | Fine |              |

| Sample No.     | Depth | Description | USCS  | % Silt | Median | Mean | Skew | Kurt | Sort | PL | LL | PI | Sample Information                       |
|----------------|-------|-------------|-------|--------|--------|------|------|------|------|----|----|----|--|
| ◆ CIVC-00-18#3 | 12.5  |             | SW-SM | 9.61   | 0.27   | 0.31 | -0.2 | 1.88 | 1.71 | NA | NA | NA | Project Name: Captiva Island             |
|                |       |             |       |        |        |      |      |      |      |    |    |    | Sample Type: Vibracores                  |
|                |       |             |       |        |        |      |      |      |      |    |    |    | Collection Date: 1/1/2001                |
|                |       |             |       |        |        |      |      |      |      |    |    |    | Analysis By: ID                          |
|                |       |             |       |        |        |      |      |      |      |    |    |    | Easting (X): 540387.69 Feet              |
|                |       |             |       |        |        |      |      |      |      |    |    |    | Northing (Y): 793026.05 Feet             |
|                |       |             |       |        |        |      |      |      |      |    |    |    | Sample Elevation: -58.4 NGVD 29          |
|                |       |             |       |        |        |      |      |      |      |    |    |    | Coord. System: State Plane 1983 FLA West |



**COASTAL PLANNING & ENGINEERING, INC.**  
**2481 N. W. BOCA RATON BLVD.**  
**BOCA RATON, FLORIDA 33431**





| Gravel |      | Sand   |        |      | Silt or Clay |
|--------|------|--------|--------|------|--------------|
| Coarse | Fine | Coarse | Medium | Fine |              |

| Sample No.     | Depth | Description | USCS | % Silt | Median | Mean | Skew  | Kurt | Sort | PL | LL | PI | Sample Information                       |
|----------------|-------|-------------|------|--------|--------|------|-------|------|------|----|----|----|--|
| ◆ CIVC-00-18#4 | 16.0  |             | SM   | 12.59  | 0.26   | 0.34 | -0.31 | 1.74 | 1.97 | NA | NA | NA | Project Name: Captiva Island             |
|                |       |             |      |        |        |      |       |      |      |    |    |    | Sample Type: Vibracores                  |
|                |       |             |      |        |        |      |       |      |      |    |    |    | Collection Date: 1/1/2001                |
|                |       |             |      |        |        |      |       |      |      |    |    |    | Analysis By: ID                          |
|                |       |             |      |        |        |      |       |      |      |    |    |    | Easting (X): 540387.69 Feet              |
|                |       |             |      |        |        |      |       |      |      |    |    |    | Northing (Y): 793026.05 Feet             |
|                |       |             |      |        |        |      |       |      |      |    |    |    | Sample Elevation:-61.9 NGVD 29           |
|                |       |             |      |        |        |      |       |      |      |    |    |    | Coord. System: State Plane 1983 FLA West |



**COASTAL PLANNING & ENGINEERING, INC.**  
**2481 N. W. BOCA RATON BLVD.**  
**BOCA RATON, FLORIDA 33431**



