# FLAGLER COUNTY, FLORIDA

## HURRICANE AND STORM DAMAGE REDUCTION PROJECT
## FINAL INTEGRATED FEASIBILITY STUDY AND ENVIRONMENTAL ASSESSMENT

# Appendix D

# **Geotechnical**

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# Appendix D
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March 2014

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# 1 BACKGROUND

This report includes a description of the regional and local geology of Flagler County, a sediment characterization of the native beach and a preliminary borrow area design. All boring logs and laboratory testing results are listed in **Table 2** through **Table 5** and depicted in **Plates 1 through Plate 5**. Boring logs and laboratory results are attached in the **Appendix**.

Additional borings in the borrow areas will be needed during the design phase of this project.

## 1.1 REGIONAL GEOLOGY

The Florida Peninsula occupies a portion of the much larger geologic unit called the Florida Plateau. Deep water in the Gulf of Mexico is separated from deep water of the Atlantic Ocean by this partially submerged platform nearly 500 miles long and 450 miles wide. In the last 200 million years, the plateau has been alternately dry land or covered by shallow seas. During that time up to 20,000 feet of carbonate and marine sediments were deposited. There has been a tilting of the Florida Plateau about its longitudinal axis. The west coast is partially submerged, as indicated by the wide estuaries and offshore channels, while the east coast is correspondingly elevated, showing the characteristics of an emergent coastline.

During the last million years, a series of four glacial periods, or ice ages, brought about significant changes in sea level. As a result of these sea level fluctuations, the Florida peninsula was again covered and uncovered by shallow seas. Following the first glacial period, sea level rose 270 ft. above its present level. Dry land on the Florida peninsula was then restricted to a few small islands along the central Florida ridge and in northeast Florida.

About 100,000 years ago, the last glacial period began. Sea level fell to 300 feet below its present level and the Florida Plateau emerged as dry land. Approximately 15,000 years ago, sea level began its most recent rise towards present sea level (Shinn, 1988). Sea level rose at an average rate of 30 feet per 1,000 years. About 7,000 years ago, the rate of sea level rise slowed when the sea level was about 30 feet below its present level. It was at this most recent slowing of sea level rise that the modern barrier islands of southeast peninsular Florida formed.

## 1.2 LOCAL GEOLOGY

Flagler County's approximately 19 Miles of open-ocean shoreline has no embayment or inlets. The barrier island extends over 50 Miles uninterrupted from Matanzas Inlet to the north to Ponce de Leon Inlet in the south. The barrier island is separated from the mainland by the Matanzas River, Smith Creek, and the Intracoastal Waterway.

Beaches along Flagler County are shelly and of a pinkish orange color. This is due the shell material derived from the Anastasia formation which outcrops off-shore of Flagler county and also at Hammock beach in northern Flagler county. The Pleistocene Anastasia Formation is comprised of clay, sand, and shell, and of coquina rock, which is composed of shells and quartz lithified in a calcite matrix. The Anastasia Formation reaches thickness of 20 to 140 feet.

Pliocene/Miocene sediments underlay the Anastasia formation and are comprised of interbedded layers of marine, fine to medium sand, shell and green, calcareous, silty clay. These sediments vary in thickness (20-100 feet) throughout the county.

Underneath the Pliocene/Miocene Sediments follow the deposits of the Hawthorn Group which is of middle Miocene age and consists mainly of dark gray and olive green sandy to silty clay, clay, clayey sand, and thin layers of sandy limestone, and contains moderate to large amounts of black phosphate sand, granules, and pebbles. The Hawthorn Group ranges in thickness from a few feet to 120 feet. The formation varies in thickness from place to place because of both an irregular upper and lower surface. The Hawthorn Group occurs at depths ranging from approximately 30 to 240 feet below land surface.

# 2 NATIVE BEACH

## 2.1 GENERAL

The original study area included the Flagler County shoreline at Marineland, Painters Hill, Beverly Beach and Flagler Beach. Locations are listed by FDEP Reference Monument (R-Monument) ranges in **Table 1** and are depicted on **Plate B-1.** Marineland, Painters Hill, Beverly Beach, and part of Flagler Beach were excluded in the course of the study due to the lack of infrastructure needing protection. Therefore the recommended plan for the project includes only the southern part of Flagler Beach from R-80 to R-94.

**Table 1: Flagler Beaches**

| Beach | FDEP Reference Monument (R-monument) |
|---|---|
| Marineland | R-1 to R-4 |
| Painters Hill | R-50 to R-60 |
| Beverly Beach | R-60 to R-67 |
| Flagler Beach | R-67 to R-101 |

## 2.2 NATIVE BEACH SAMPLING AND ANALYSIS

Beach sediment sampling was performed by the USACE in August 2012 along the following representative beach profile lines: R-81, R-85, R-89, and R-93. Sampling profile line locations are depicted on the attached **Plate B-2**.

Beach sediment samples were collected along the respective profile lines at the following locations as shown in **Figure 1**: Toe of Dune, Berm, Mid-tide, and -3, -5, -10, -15, and -20 below Mean Sea Level.

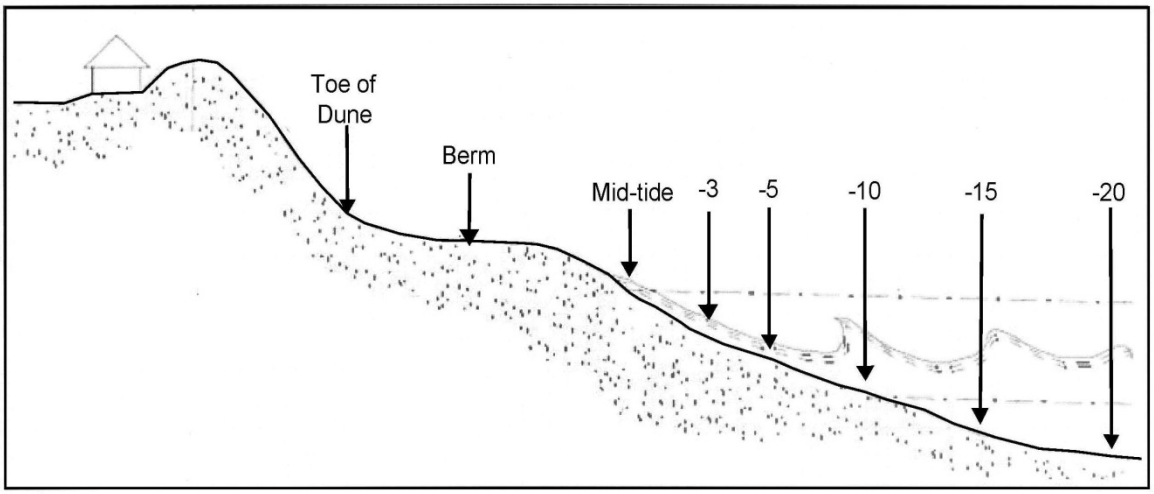



**Figure 1. Beach Transect with Beach Sampling Locations**

Due to the severe erosion, some of the beaches don't show this typical profile. At some locations, the dune is replaced by revetment, and therefore no sample was collected.

All samples were analyzed for grain size, visual shell and Munsell Color. Carbonate analysis was performed on representative samples. The associated gradation curves and granularmetric reports are presented in the Appendix.

An arithmetic composite sample was created from all samples. The granulometric results using the method of moments for each sample and for the composite sample are summarized in **Table 2.**

The test results characterize the sediments at Flagler Beach as poorly-graded, fine-grained quartz sands. The mean grain size ranges between 0.14 mm (2.84 phi) and 0.67 mm (0.58 phi) averaging at 0.28 mm (1.85 phi). The carbonate content ranges from 8% to 64% averaging at 25%. The visual shell averages 23%, and the color of the sand is generally light gray to pinkish gray. Samples collected at the berm and at mid-tide locations have especially high shell contents caused by the deposits from the Anastasia formation, which also causes the typical pinkish grey color of the Flagler County beaches.

## Table 2: Flagler Beach, Beach Sediment Analysis

| Point ID | Number | USCS | Mean (mm) | Mean (phi) | Gravel* (Shell) | Silt ** | Std. Dev. (phi) | Visual Shell % | Carbo-nate % | Munsell Color (wet) |
|---|---|---|---|---|---|---|---|---|---|---|
| R-81 | Toe of Dune | Dune not existent. No sample taken. | | | | | | | | |
| | Berm | SP | 0.43 | 1.22 | 0 | 0.07 | 0.9 | 42.9 | 40.3 | 7.5YR 7/2 |
| | Mid-Tide | SP | 0.41 | 1.29 | 0 | 0.05 | 1 | 42.8 | | 7.5YR 7/2 |
| | -3 | SP | 0.17 | 2.56 | 0 | 0.81 | 0.54 | 2.8 | | 10YR 7/1 |
| | -5 | SP | 0.17 | 2.56 | 0 | 0.64 | 0.47 | 1.9 | | 10YR 7/1 |
| | -10 | SP | 0.17 | 2.56 | 0.18 | 0.87 | 0.79 | 5.7 | 8.3 | 10YR 7/1 |
| | -15 | SP | 0.18 | 2.47 | 0.14 | 1.1 | 0.97 | 8.9 | | 10YR 7/1 |
| | -20 | SP | 0.14 | 2.84 | 0 | 1.21 | 0.51 | 2 | | 10YR 6/1 |
| R-85 | Toe of Dune | Dune not existent. No sample taken. | | | | | | | | |
| | Berm | SP | 0.37 | 1.43 | 0.08 | 0.11 | 0.89 | 31.9 | | 7.5YR 7/2 |
| | Mid-Tide | SP | 0.27 | 1.89 | 0 | 0.32 | 0.82 | 22.6 | | 7.5YR 7/1 |
| | -3 | SP | 0.25 | 2.00 | 0 | 0.84 | 1.02 | 21.5 | | 7.5YR 7/3 |
| | -5 | SP | 0.22 | 2.18 | 0 | 0.81 | 0.88 | 16.1 | | 7.5YR 7/1 |
| | -10 | SP | 0.16 | 2.64 | 0.01 | 1.14 | 0.72 | 7.4 | 8 | 10YR 7/1 |
| | -15 | SP | 0.17 | 2.56 | 0.13 | 1.5 | 0.84 | 8.3 | | 10YR 7/2 |
| | -20 | SP | 0.14 | 2.84 | 0.02 | 1.18 | 0.55 | 3.4 | | 10YR 7/2 |
| R-89 | Toe of Dune | Dune not existent. No sample taken. | | | | | | | | |
| | Berm | SP | 0.4 | 1.32 | 0 | 0.04 | 1 | 41.9 | 39.2 | 7.5YR 7/2 |
| | Mid-Tide | SP | 0.67 | 0.58 | 0 | 0.16 | 1.14 | 65.9 | | 7.5YR 7/3 |
| | -3 | SP | 0.66 | 0.60 | 1.06 | 0.65 | 1.31 | 60.9 | | 7.5YR 7/1 |
| | -5 | SP | 0.17 | 2.56 | 0 | 1.43 | 0.58 | 5.9 | | 10YR 7/1 |
| | -10 | SP | 0.17 | 2.56 | 0.42 | 0.97 | 0.89 | 10.3 | 10.4 | 10YR 7/2 |
| | -15 | SP | 0.17 | 2.56 | 0 | 2.41 | 0.92 | 11.8 | | 10YR 7/2 |
| | -20 | SP | 0.14 | 2.84 | 0.01 | 0.66 | 0.55 | 7.5 | | 10YR 7/2 |
| R-93 | Toe of Dune | SP | 0.59 | 0.76 | 0 | 0.03 | 0.84 | 71.8 | | 7.5YR 7/2 |
| | Berm | SP | 0.64 | 0.64 | 0 | 0.14 | 0.95 | 76.5 | 64.5 | 7.5YR 7/3 |
| | Mid-Tide | SP | 0.32 | 1.64 | 0 | 0.95 | 1.09 | 35.3 | | 7.5YR 7/3 |
| | -3 | SP | 0.21 | 2.25 | 0 | 3.98 | 0.83 | 11.3 | | 10YR 7/1 |
| | -5 | SP | 0.19 | 2.40 | 0 | 0.18 | 0.7 | 28.2 | | 10YR 7/1 |
| | -10 | SP | 0.15 | 2.74 | 0 | 1.79 | 0.68 | 6.8 | 8.4 | 10YR 7/1 |
| | -15 | SP | 0.17 | 2.56 | 0.13 | 1.22 | 1 | 12.7 | | 10YR 6/1 |
| | -20 | SP | 0.15 | 2.74 | 0.2 | 1.59 | 0.65 | 4.8 | | 10YR 6/1 |
| **Flagler Beach Composite** | | **SP** | **0.28** | **1.85** | **0.08** | **0.93** | **0.83** | **23** | **25** | **Light to pinkish gray** |

*Retained in the #4 Sieve, **Passing the #230 Sieve

# 3 BORROW AREAS

## 3.1 SAND SEARCH INVESTIGATIONS

A number of potential borrow areas were identified in the USACE Reconnaissance Report from 2004. Potential borrow areas included the ebb shoal of Matanzas Inlet, the IWW, and three off-shore shoals. The IWW and Matanzas Inlet ebb shoal were ruled out early in the process because of their limited volumes and only the three off-shore borrow areas (Area 1, Area 2, Area 3) were investigated via vibracoring. The Locations are depicted on the attached map **Plate B-1**. In addition to those offshore borrow areas, upland sand sources were also evaluated but were excluded from the study because they could not provide the quality and quantity of sand needed.

Florida Administrative Code 62B-41.007(2) requires that beach fill meets the following requirements:

- Carbonate or quartz with a particle size between 0.062 and 4.76mm
- <5% silt passing the #230 sieve
- <5% gravel sized shell retained on the #4 sieve
- Fill material must be free of foreign matter, debris, toxic material
- Fill material shall be similar in color and grainsize distribution

Halcrow Inc. investigated Area 1, which is part of the Farmton Sand Flat B geomorphologic unit, and is located approximately 2 Miles off-shore of Flagler Beach. All results are presented in the Report "Flagler Beach Shore Protection Project Feasibility Sand Search Report, March 2010 by Halcrow, Inc."

The investigation included sub bottom surveys and approximately 40 vibracores and grain size analysis on selected samples. Most vibracores show a 1 to 3-ft thick beach-compatible top sand layer. Only a few vibracores show a 3 to 5 ft thickness of beach compatible sand. However, sand thicknesses less than 5 feet are not considered dredgeable since state regulations require a 2-ft buffer above the underlying non-beach compatible layers. Therefore, Area 1 does not contain enough beach compatible material to be used as borrow area.

Area 2 and Area 3 were investigated by the USACE, Jacksonville district in 2011. Both areas are located in Federal Waters. Area 2 is part of the Korona Ridge Field geomorphologic unit and is located approximately six to seven miles off-shore of Flagler Beach. Area 3 is part of the Flagler Sand wave geomorphologic unit and is located approximately twelve to fourteen miles off-shore of Flagler Beach. Ten 20-foot vibracores were drilled in Area 2 and thirteen 20-foot vibracores were drilled in Area 3. The recovery of the vibracores is sometimes significantly less than 20 feet due to the underlying rock which could not be penetrated with the vibracore

apparatus. Laboratory testing was performed on selected sediment samples. Boring locations are shown on **Plate B-3**. Boring logs and laboratory test results are attached in the appendix.

## 3.2 PROPOSED BORROW AREAS 2A, 2B, AND 2C

Thicknesses of the beach compatible sand layers vary from 5 to 18 feet in Area 2. Conservative values between 5 and 7 feet below seafloor surface were used as dredging depths for the volume estimates shown in **Table 3**. However, the indicated dredging depths may change with the availability of additional testing results. The estimates indicate that Area 2 contains approximately 5.5 million cubic yards (mcy) of beach compatible sand within three subareas: Areas 2A, 2B, and 2C. Borrow areas 2A and 2B are located offshore Flagler County and are estimated to contain a combined volume of 3 mcy. Borrow area 2C is located off-shore Volusia County and is estimated to contain approximately 2.5 mcy of beach compatible sand. The borrow areas are depicted in **Plate B-3** and details are summarized in **Table 3** below. Water depths are between -50 and -60 feet North Atlantic Vertical Datum (NAVD) 88 as shown on **Plate B-4**.

**Table 3: Proposed Borrow Areas 2A, 2B, 2C**

| Sub-area | Size (ft) | Borrow Area Size (acres) | Sand Thickness Encountered (feet) | Sand Thickness used for Volume Estimate (feet) | Volume Estimate (mcy) | Borings |
|---|---|---|---|---|---|---|
| 2a | 8,500 x 2,400 | 219 | 5 to 8 | 5 | 1.7 | VC-FSP11-14, VC-FSP11-16 |
| 2b | 5,000 x 1,600 | 117 | up to 18 | 7 | 1.3 | VC-FSP11-15 |
| 2c | 8,700 x 2,600 | 332 | 5 to 11 | 5 | 2.5 | VC-FSP11-22, |

Four (4) 20-foot vibracores (VC-FSP11-14 through VC-FSP11-16, and VC-FSP11-22) were collected in February 2011 within the proposed subareas 2A, 2B, and 2C as shown on **Plate B-3** and depicted in **Figure 2**.

### 3.2.1 Borrow Area 2A

An arithmetic composite sample was calculated using all samples within the borrow area 2A design depth. The composite sample indicates that the sediments are poorly-graded, fine grained sands with a mean grain size that ranges from 0.19 mm (2.37 phi) to 0.37 mm (2.42 phi), with an average of 0.26 mm (1.98 phi). Visual shell values average 18%. The amount of fines passing the #230 sieve averages 1.80 %. The wet Munsell color of the sand is 10Y 5/1 (greenish gray) and the dry color is N 7/1 (light gray).

### 3.2.2 Borrow Area 2B

An arithmetic composite sample was calculated using all samples within the borrow area 2B design depth. The composite sample indicates that the sediments are poorly-graded, fine grained sands with a mean grain size that ranges from 0.18 mm (2.51 phi) to 0.65 mm (0.62 phi), with an average of 0.30 mm (1.73 phi). Visual shell values average 23%. The amount of fines passing the #230 sieve averages 3.8 %. The wet Munsell color of the sand is 10Y 4/1 (dark greenish gray) and the dry color is N 7/1 (light gray).

### 3.2.3 Borrow Area 2C

An arithmetic composite sample was calculated using all samples within the borrow area 2C design depth. The composite sample indicates that the sediments are poorly-graded, fine grained sands with a mean grain size that ranges from 0.17 mm (2.53 phi) to 0.20 mm (2.29 phi) with an average of 0.19 mm (2.39 phi). Visual shell values average 12%. The amount of fines passing the #230 sieve averages 1.9 %. The wet Munsell color of the sand is 5GY 5/1 (greenish gray) and the dry color is N 7/1 (light gray).

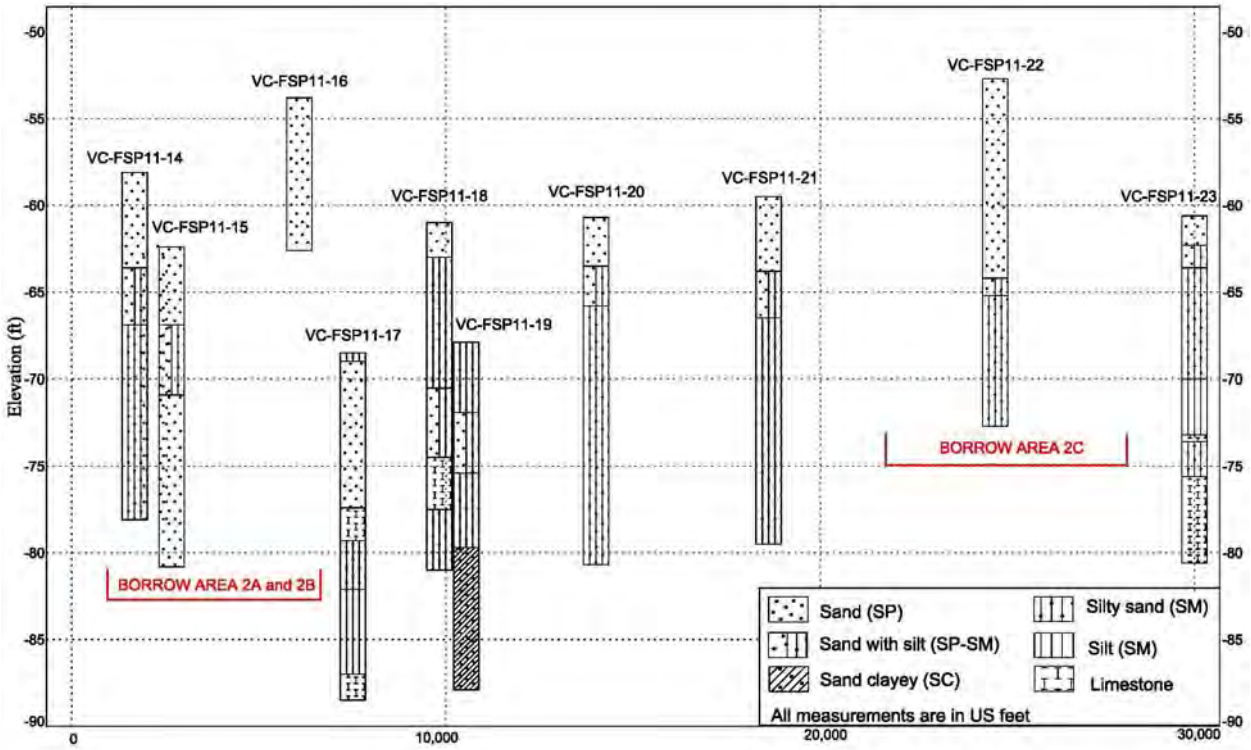



**Figure 2. Borrow Area 2, 2011 Core Borings**

### 3.2.4 Borrow Areas 2 Combined

An arithmetic composite sample for Area 2, including borrow area 2A, 2B, and 2C, was calculated using all samples within the borrow area design depths. The composite sample indicates that the sediments from borrow areas 2A, 2B, and 2C are poorly-graded, fine grained sands with a mean grain size that ranges from 0.17mm (2.53 phi) to 0.65 mm (0.62 phi), with an average of 0.26 mm (1.98 phi). Visual shell values average 19% and carbonate content averages 15 %. The amount of fines passing the #230 sieve averages 2.89 %. The wet Munsell color of the sand is 5Y 5/1 (greenish gray) and the dry color is N 7/1 (light gray).

**Table 4: Sediment Characteristics of Proposed Borrow Areas 2A, 2B, 2C**

| PointID | Number | USCS | Mean (mm) | Mean (phi) | Gravel* (Shell) | Silt** | Std. Dev. (phi) | Visual Shell % | Carbo-nate % | Munsell Color (wet) |
|---|---|---|---|---|---|---|---|---|---|---|
| VC-FSP11-14 | 1 | SP | 0.26 | 1.92 | 1.29 | 0.96 | 1.04 | 16 | | 10Y 5/1 |
| VC-FSP11-14 | 2 | SP | 0.26 | 1.95 | 1.15 | 1.36 | 1.12 | 18 | | 10Y 5/1 |
| VC-FSP11-14 | 3 | SP | 0.23 | 2.10 | 1 | 4.52 | 1.22 | 22 | | 5GY 5/1 |
| VC-FSP11-16 | 1 | SP | 0.19 | 2.37 | 0.19 | 1 | 0.63 | 8 | | 5GY 6/1 |
| VC-FSP11-16 | 2 | SP | 0.20 | 2.32 | 0.31 | 0.91 | 0.72 | 7 | 12 | 5GY 6/1 |
| VC-FSP11-16 | 3 | SP | 0.37 | 1.42 | 6.27 | 2.02 | 1.74 | 37 | | 10Y 5/1 |
| **Borrow Area 2A Composite** | | | **0.25** | **1.98** | **1.70** | **1.80** | **1.08** | **18** | **12** | **gray** |
| VC-FSP11-15 | 1 | SP | 0.29 | 1.80 | 1.17 | 1.46 | 1.15 | 22 | | 10Y 4/1 |
| VC-FSP11-15 | 2 | SP | 0.18 | 2.51 | 0 | 2.74 | 0.57 | 10 | | 10Y 4/1 |
| VC-FSP11-15 | 3 | SP-SM | 0.19 | 2.41 | 0 | 8.55 | 0.86 | 13 | | 10Y 4/1 |
| VC-FSP11-15 | 4 | SP | 0.65 | 0.62 | 13.16 | 3.08 | 2.13 | 49 | | 5GY 4/1 |
| VC-FSP11-15 | 5 | SP | 0.20 | 2.29 | 0.2 | 3.11 | 0.83 | 20 | | 10Y 6/1 |
| **Borrow Area 2B Composite** | | | **0.30** | **1.73** | **2.91** | **3.79** | **1.11** | **23** | **n/a** | **gray** |
| VC-FSP11-22 | 1 | SP | 0.20 | 2.29 | 0.03 | 1.02 | 0.67 | 18 | | 5GY 5/1 |
| VC-FSP11-22 | 4 | SP | 0.18 | 2.46 | 0 | 2.36 | 0.51 | 5 | | 5GY 5/1 |
| VC-FSP11-22 | 7 | SP | 0.20 | 2.29 | 0 | 1.95 | 0.66 | 14 | 17 | 5GY 5/1 |
| VC-FSP11-22 | 10 | SP | 0.17 | 2.53 | 0 | 2.47 | 0.56 | 9 | | 5GY 5/1 |
| **Borrow Area 2C Composite** | | | **0.19** | **2.39** | **0.01** | **1.95** | **0.60** | **12** | **17** | **gray** |
| **Borrow Area 2 Combined Composite** | | | **0.26** | **1.98** | **1.65** | **2.50** | **0.96** | **18** | **15** | **gray** |

* Retained in the #4 Sieve, **Passing the #230 Sieve

## 3.3 PROPOSED BORROW AREA 3A

Beach compatible sand was identified throughout Area 3. However, since Area 3 is approximately 12,000 acres, only a selected portion (Area 3A) of the area is proposed as a borrow area for this project (**Plate B-3).** Area 3A is approximately 2 Miles long and 1 Mile wide and has an estimated 20 mcy of beach-compatible sand. The Thickness of the encountered beach compatible sand layer varies from 7 to 14 feet. A conservative value of 5 feet below seafloor surface was used as a dredging depth for the volume estimate as shown in **Table 5**. However, the indicated dredging depth may change with the availability of additional testing results. Water depths are between -50 and -60 ft NAVD88, as shown on **Plate B-5**.

**Table 5: Proposed Borrow Area 3A**

| Sub-area | Size (ft) | Borrow Area Size (acres) | Sand Thickness Encountered (ft) | Sand Thickness used for Volume Estimate (feet) | Volume (mcy) | Borings |
|---|---|---|---|---|---|---|
| 3A | 13,000 x 8000 | 2300 | 7ft. to 14 | 5 | 20 | VC-FSP11-3, VC-FSP11-4, VC-FSP11-5 VC-FSP11-6 |

Four (4) 20-foot vibracores (VC-FSP11-3 through VC-FSP11-6) were collected in February 2011 within the proposed subarea 3A as shown on **Plate B-3** and depicted in **Figure 3**.

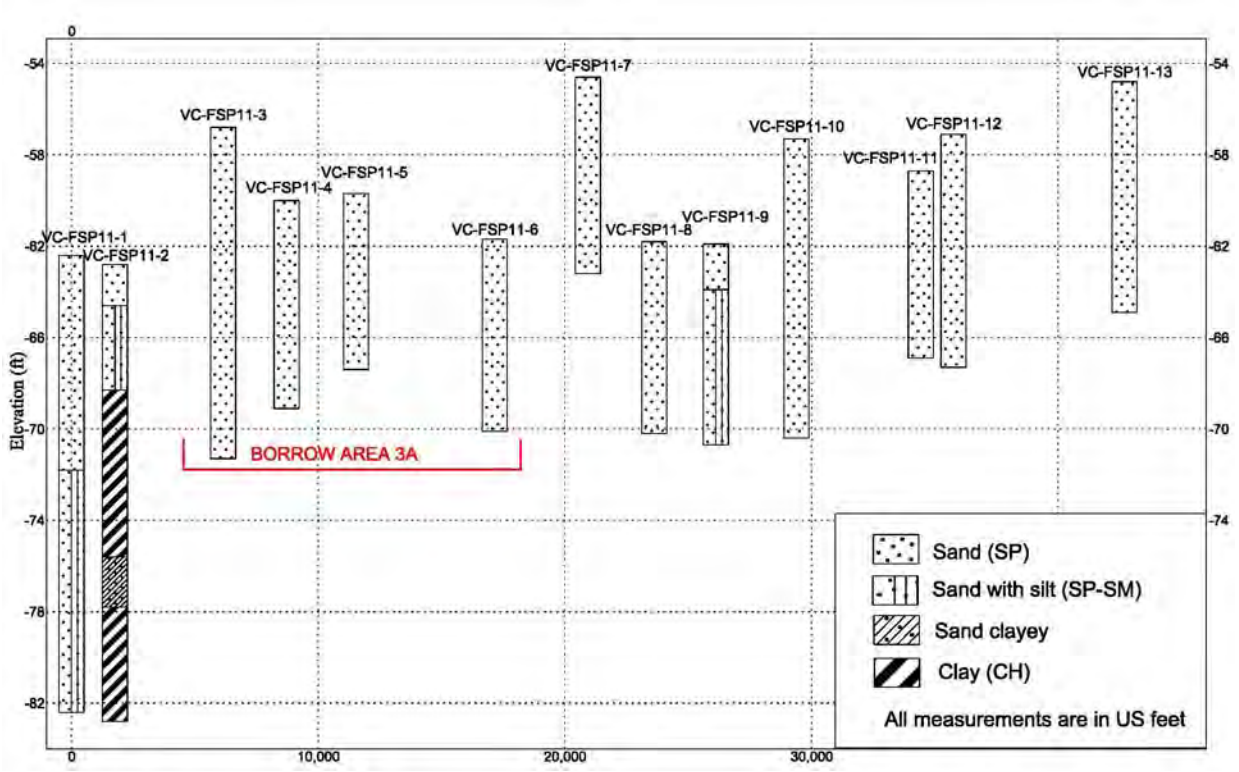



**Figure 3: Borrow Area 3, 2011 Core Borings**

Discrete samples were analyzed for grain-size, visual shell and carbonate content. Laboratory testing results and granulometric statistics, calculated using the method of moments, are summarized in **Table 6**.

An arithmetic composite sample was calculated using all lab samples within the borrow area design depth. The composite sample indicates that the sediments from borrow area 3A are poorly-graded, fine grained sands. The mean grain size ranges from 0.19 mm (2.40 phi) to 0.47 mm (1.09 phi), with an average of 0.29 mm (1.79 phi). Visual shell averages 16% and carbonate content averages 27%. The amount of fines passing the #230 sieve averages 1.7%. The wet Munsell color of the sand is 10Y 5/1 (greenish gray) and the dry color is N 7/1 (light gray).

**Table 6: Sediment Characteristics of Proposed Borrow Area 3A**

| PointID | Number | USCS | Mean (mm) | Mean (phi) | Gravel* (Shell) | Silt ** | Std. Dev. (phi) | Visual Shell % | Carbo -nate % | Munsell Color (wet) |
|---|---|---|---|---|---|---|---|---|---|---|
| VC-FSP11-3 | 1 | SP | 0.32 | 1.64 | 1.1 | 1.24 | 1.15 | 22 | | 10Y 6/1 |
| | 2 | SP | 0.25 | 2.00 | 0 | 0.9 | 0.79 | 14 | | 10Y 6/1 |
| | 3 | SP | 0.28 | 1.84 | 0.53 | 0.96 | 0.97 | 14 | 18 | 10Y 6/1 |
| | 4 | SP | 0.21 | 2.25 | 0.33 | 2.11 | 0.76 | 7 | | 10Y 6/1 |
| | 5 | SP | 0.19 | 2.40 | 0 | 3.12 | 0.73 | 7 | | 10Y 6/1 |
| VC-FSP11-4 | 1 | SP | 0.38 | 1.40 | 0.45 | 1.08 | 1.08 | 27 | | 10GY 5/1 |
| | 2 | SP | 0.47 | 1.09 | 15.67 | 1.82 | 1.44 | 25 | 40 | 10GY 5/1 |
| | 3 | SP | 0.23 | 2.12 | 1.84 | 1.44 | 1.01 | 7 | | 10GY 5/1 |
| VC-FSP11-5 | 1 | SP | 0.31 | 1.69 | 1.21 | 1.9 | 1.11 | 19 | 23 | 5GY 5/1 |
| | 2 | SP | 0.27 | 1.89 | 0.16 | 0.66 | 0.91 | 17 | | 5GY 5/1 |
| | 3 | SP | 0.22 | 2.18 | 0 | 1.49 | 0.65 | 8 | | 5GY 5/1 |
| VC-FSP11-6 | 1 | SP | 0.31 | 1.69 | 0.43 | 0.54 | 0.92 | 14 | | 5GY 5/1 |
| | 2 | SP | 0.29 | 1.79 | 2.19 | 2.22 | 1.29 | 18 | | 5GY 5/1 |
| | 3 | SP | 0.3 | 1.74 | 0 | 1.21 | 1 | 24 | 26 | 5GY 5/1 |
| **Borrow Area3A Composite** | | | **0.29** | **1.84** | **1.7** | **1.5** | **1.0** | **15.9** | **26.8** | **gray** |

*Retained in the #4 Sieve, **Passing the #230 Sieve

# 4 COMPATIBILITY OF THE BORROW AREA WITH THE BEACHES

Grain size distribution, Overfill Factor and Renourishment Factor are used to determine if the proposed borrow areas are compatible with the Flagler beaches.

## 4.1 GRAIN SIZE DISTRIBUTION

Grain size analyses were performed on beach samples from Flagler County's Beaches and on discrete samples of the proposed off-shore borrow areas. Samples were analyzed for grain-size, visual shell and carbonate content. An arithmetic composite sample was calculated from the granulometric results. The composite sample results for the beach, borrow areas 2A, 2B, 2C, borrow areas 2 combined, and borrow area 3A are summarized in **Table 7** and discussed below.

The native beach sediments of Flagler Beach consist of poorly-graded, fine-grained quartz sand with a mean grain size of 0.28 mm (1.85 phi), an average carbonate content of 25%, and an average silt content of 0.9 %. The material from the borrow area 2A, 2B, 2C consists of poorly-graded, fine-grained quartz sand with a mean grain size of 0.25 mm for Area 2A, 0.30 mm for Area 2B, and 0.19 mm for Area 2C. The combined Area 2 average grainsize is 0.26mm (1.94 phi), the average carbonate content of 15%, and an average silt content of 2.89 %. The material from the borrow area 3A consists of poorly-graded, fine-grained quartz sand with a mean grain size of 0.29 mm (1.79 phi), an average carbonate content of 27%, and an average silt content of 1.48 %.

The testing results show that the material from borrow areas 2A, 2B, and 3A are very similar and compatible with the native beach and also meet the requirements of Florida state regulation. The material from borrow area 2C is very fine grained and would have to be mixed with coarser material to be compatible with Flagler County's beaches.

**Table 7: Sediment Analysis Summary**

| Composite Designation | USCS | Mean (mm) | Mean (phi) | Gravel* (Shell) | Silt ** | Std. Dev. (phi) | Visual Shell % | Carbo-nate % | Munsell Color |
|---|---|---|---|---|---|---|---|---|---|
| Borrow Area 2A | SP | 0.25 | 1.98 | 1.70 | 1.80 | 1.08 | 18 | 12 | gray |
| Borrow Area 2B | SP | 0.30 | 1.73 | 2.91 | 3.79 | 1.11 | 23 | n/a | gray |
| Borrow Area 2C | SP | 0.19 | 2.39 | 0.01 | 1.95 | 0.60 | 12 | 17 | gray |
| Borrow Area 2 Combined | SP | 0.25 | 1.98 | 1.65 | 2.50 | 0.96 | 18 | 15 | gray |
| Borrow Area3A | SP | 0.29 | 1.84 | 1.7 | 1.5 | 1.0 | 15.9 | 26.8 | gray |

*Retained in the #4 Sieve, ** Passing the #230 Sieve

## 4.2 OVERFILL AND RENOURISHMENT FACTOR

The Overfill and Renourishment Factors were devised to estimate the predicted performance of borrow materials with respect to the native beach materials, both during initial beach stabilization and over the long term. Thus, they help in choosing the best available borrow material. The factors also are used to calculate fill construction volume and renourishment volumes.

Overfill and Renourishment Factors are calculated using the sediment grainsize and standard deviation of the native beach and the borrow area.

The analysis results for Flagler beach are summarized in **Table 8.**

### 4.2.1 Overfill Factor

The Overfill Factor (RA) is primarily a volume factor which may be used to calculate an intentional overfill to compensate for volume loss during the initial construction. The RA is used to determine which alternative borrow material will provide the lowest placement volume and thus is most compatible with the existing beach. An overfill factor greater than 1.3 is considered unsuitable.

The RA for Flagler Beach was calculated using the USACE software program for each of the borrow areas. The RA for borrow area 2A = 1.21, area 2B = 1.10, area 2C = 14.62, and area 3A = 1.06. Therefore borrow areas 2A, 2B, and 3A are suitable for placement on Flagler County's beaches. The RA for borrow area 2C is very high and characterizes the borrow material as unstable for Flagler County's beaches.

### 4.2.2 Renourishment Factor

The Renourishment Factor (RJ) estimates long term relative erosion rates of borrow materials with respect to native materials. This is done by assuming all grains have a finite residence time in the local littoral system before being transported offshore or alongshore. Larger grains remain longer. The RJ is primarily a measure of relative long-term stability. RJ values greater than one predict the borrow material will erode at a higher rate than the native beach. Conversely, values of less than one predict the borrow material is more stable. A RJ greater than 1.1 is considered unsuitable

The RJ for Flagler Beach was calculated using the USACE software program for each of the borrow areas. The RJ for borrow area 2A = 0.83, area 2B = 0.58, area 2C = 2.43, and area 3A = 0.88. Therefore borrow areas 2A, 2B, and 3A are suitable for placement on Flagler County's beaches. The RJ for borrow area 2C is very high and characterizes the borrow material as unstable for Flagler County's beaches.

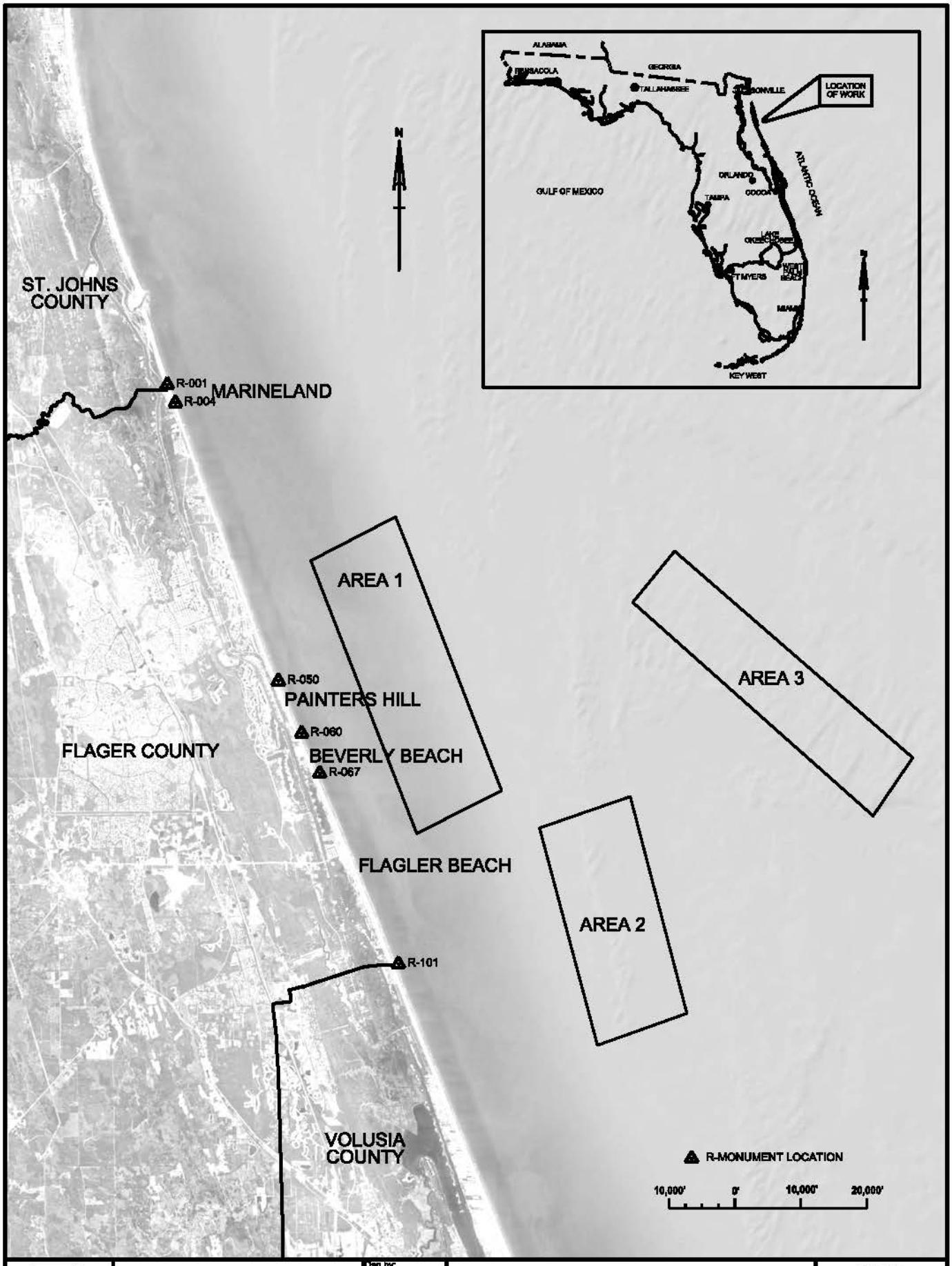
## 4.3 COMPATIBILITY SUMMARY

Grain size distribution, Overfill Factor and Renourishment Factor computations were used to determine if the proposed borrow areas 2A, 2B, 2C and 3A are compatible with the native beach. The compatibility analysis results for Flagler County's beaches are summarized in **Table 8.**

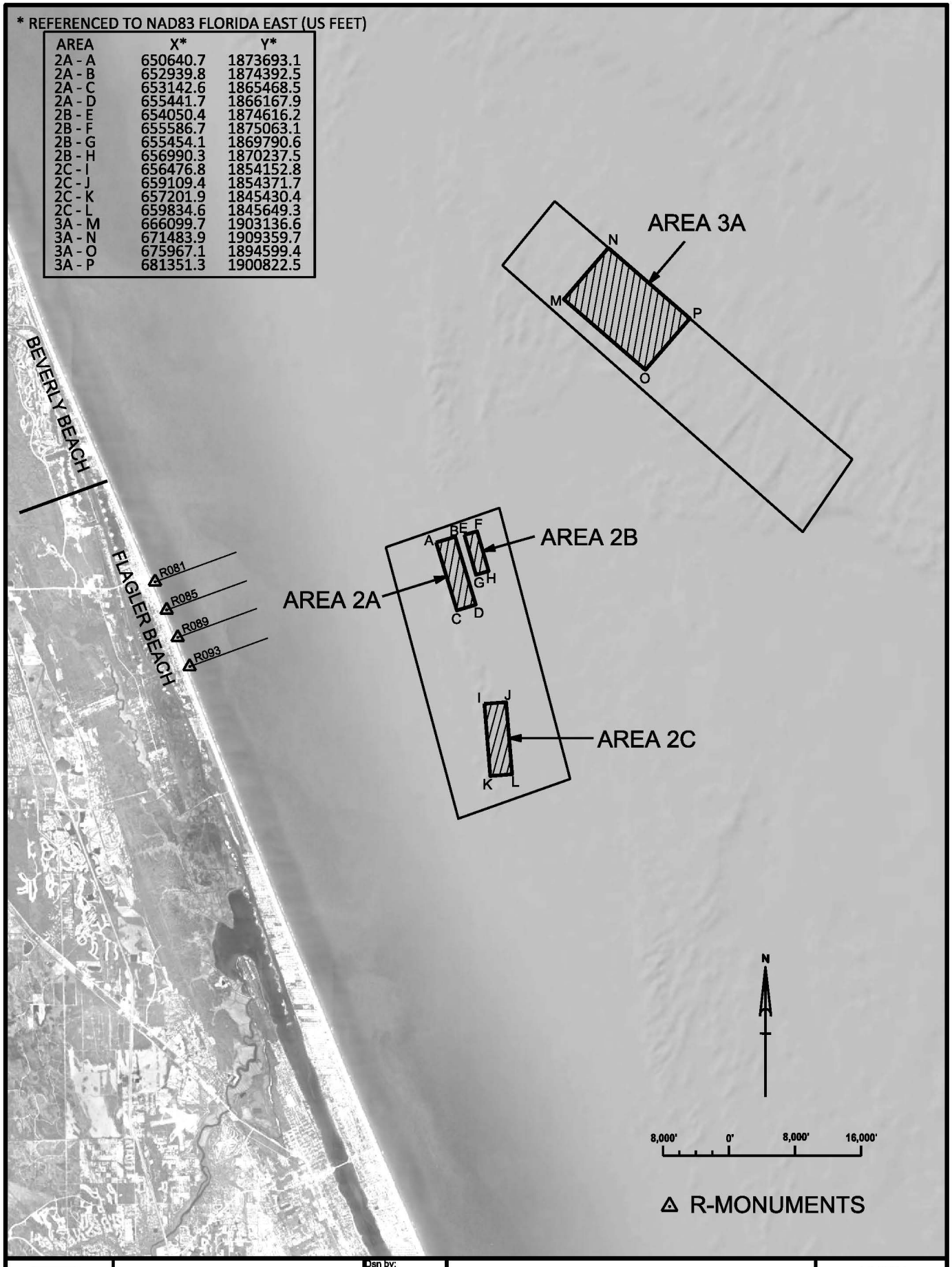
The grain size analysis revealed that the sediments of the borrow areas are composed of fine-grained quartz sand with visual shell values between 12% and 23%. The beach is also composed of fine-grained quartz sand with a visual shell value of 23%. The Overfill and Renourishment Factors for Flagler beach were calculated for each of the borrow areas using the USACE software program. Borrow areas 2A, 2B, and 3A showed Overfill Factors well below 1.3 and Renourishment Factors below 1.1 and are therefore suitable for Flagler County's beaches. The material from borrow area 2C is too fine and too poorly sorted to be compatible with Flagler County's beaches. However it could still be used if mixed with the sediments from the other proposed borrow areas. Also, additional investigation could reveal coarser material in borrow area 2C.

**Table 8: Summary of Sediment Characteristics**

| | Borrow Area 2 | | | | Borrow Area 3A | Native Beach |
|---|---|---|---|---|---|---|
| | Borrow Area 2A | Borrow Area 2B | Borrow Area 2C | Borrow Area 2 Combined | | |
| Mean (mm) | 0.25 | 0.30 | 0.19 | 0.26 | 0.29 | 0.28 |
| Mean (phi) | 1.98 | 1.73 | 2.39 | 1.94 | 1.79 | 1.85 |
| Standard Deviation (phi) | 1.08 | 1.11 | 0.60 | 1.01 | 0.99 | 0.83 |
| Visual Shell % | 18 | 23 | 12 | 19 | 16 | 23 |
| Overfill Factors, RA | 1.21 | 1.10 | 14.62 | 1.15 | 1.06 | n/a |
| Renourishment Factor RJ | 0.83 | 0.58 | 2.43 | 0.88 | 0.75 | n/a |




| | | | | |
|---|---|---|---|---|
| US Army Corps of Engineers, Jacksonville District | GEOTECHNICAL DRAWINGS<br>DEPARTMENT OF THE ARMY<br>JACKSONVILLE DISTRICT, CORPS OF ENGINEERS<br>JACKSONVILLE, FLORIDA | Dsn by: BUN<br>Dwn by: CJB<br>Ckd by: BUN<br>Dated: NOV. 2012 | FLAGLER COUNTY<br>HURRICANE AND STORM DAMAGE REDUCTION FEASABILITY STUDY<br>VICINITY MAP | PLATE<br>B-1 |

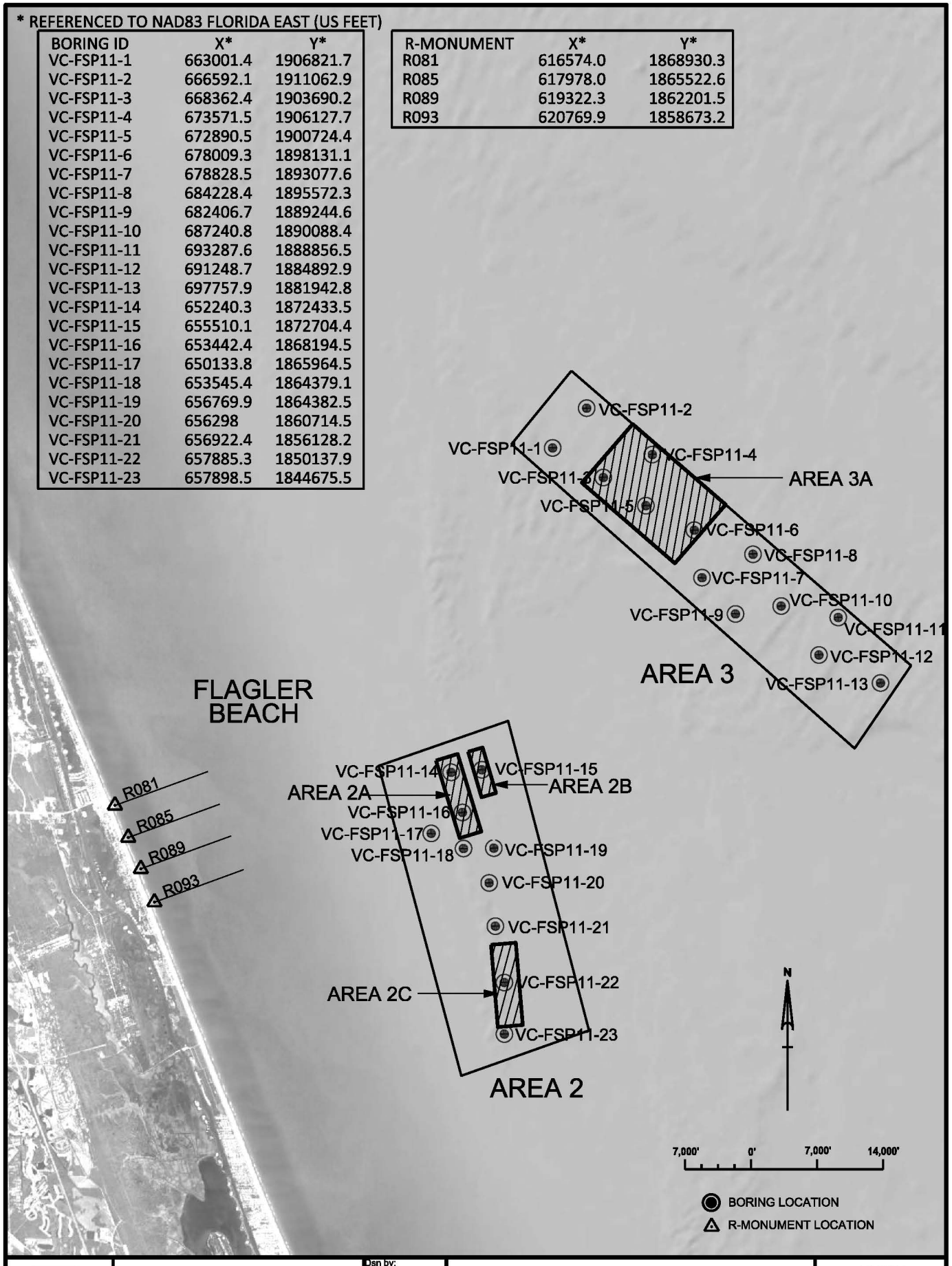



| | | | | |
|---|---|---|---|---|
| US Army Corps of Engineers Jacksonville District | GEOTECHNICAL DRAWINGS | Dsn by: BUN | FLAGLER COUNTY<br>HURRICANE AND STORM DAMAGE REDUCTION FEASABILITY STUDY<br>BORROW AREA MAP | PLATE<br>B-2 |
| | DEPARTMENT OF THE ARMY<br>JACKSONVILLE DISTRICT, CORPS OF ENGINEERS<br>JACKSONVILLE, FLORIDA | Dwn by: CJB<br>Ckd by: BUN<br>Dated: NOV. 2012 | | |

* REFERENCED TO NAD83 FLORIDA EAST (US FEET)

| BORING ID | X* | Y* |
|---|---|---|
| VC-FSP11-1 | 663001.4 | 1906821.7 |
| VC-FSP11-2 | 666592.1 | 1911062.9 |
| VC-FSP11-3 | 668362.4 | 1903690.2 |
| VC-FSP11-4 | 673571.5 | 1906127.7 |
| VC-FSP11-5 | 672890.5 | 1900724.4 |
| VC-FSP11-6 | 678009.3 | 1898131.1 |
| VC-FSP11-7 | 678828.5 | 1893077.6 |
| VC-FSP11-8 | 684228.4 | 1895572.3 |
| VC-FSP11-9 | 682406.7 | 1889244.6 |
| VC-FSP11-10 | 687240.8 | 1890088.4 |
| VC-FSP11-11 | 693287.6 | 1888856.5 |
| VC-FSP11-12 | 691248.7 | 1884892.9 |
| VC-FSP11-13 | 697757.9 | 1881942.8 |
| VC-FSP11-14 | 652240.3 | 1872433.5 |
| VC-FSP11-15 | 655510.1 | 1872704.4 |
| VC-FSP11-16 | 653442.4 | 1868194.5 |
| VC-FSP11-17 | 650133.8 | 1865964.5 |
| VC-FSP11-18 | 653545.4 | 1864379.1 |
| VC-FSP11-19 | 656769.9 | 1864382.5 |
| VC-FSP11-20 | 656298 | 1860714.5 |
| VC-FSP11-21 | 656922.4 | 1856128.2 |
| VC-FSP11-22 | 657885.3 | 1850137.9 |
| VC-FSP11-23 | 657898.5 | 1844675.5 |

| R-MONUMENT | X* | Y* |
|---|---|---|
| R081 | 616574.0 | 1868930.3 |
| R085 | 617978.0 | 1865522.6 |
| R089 | 619322.3 | 1862201.5 |
| R093 | 620769.9 | 1858673.2 |




US Army Corps of Engineers
Jacksonville District

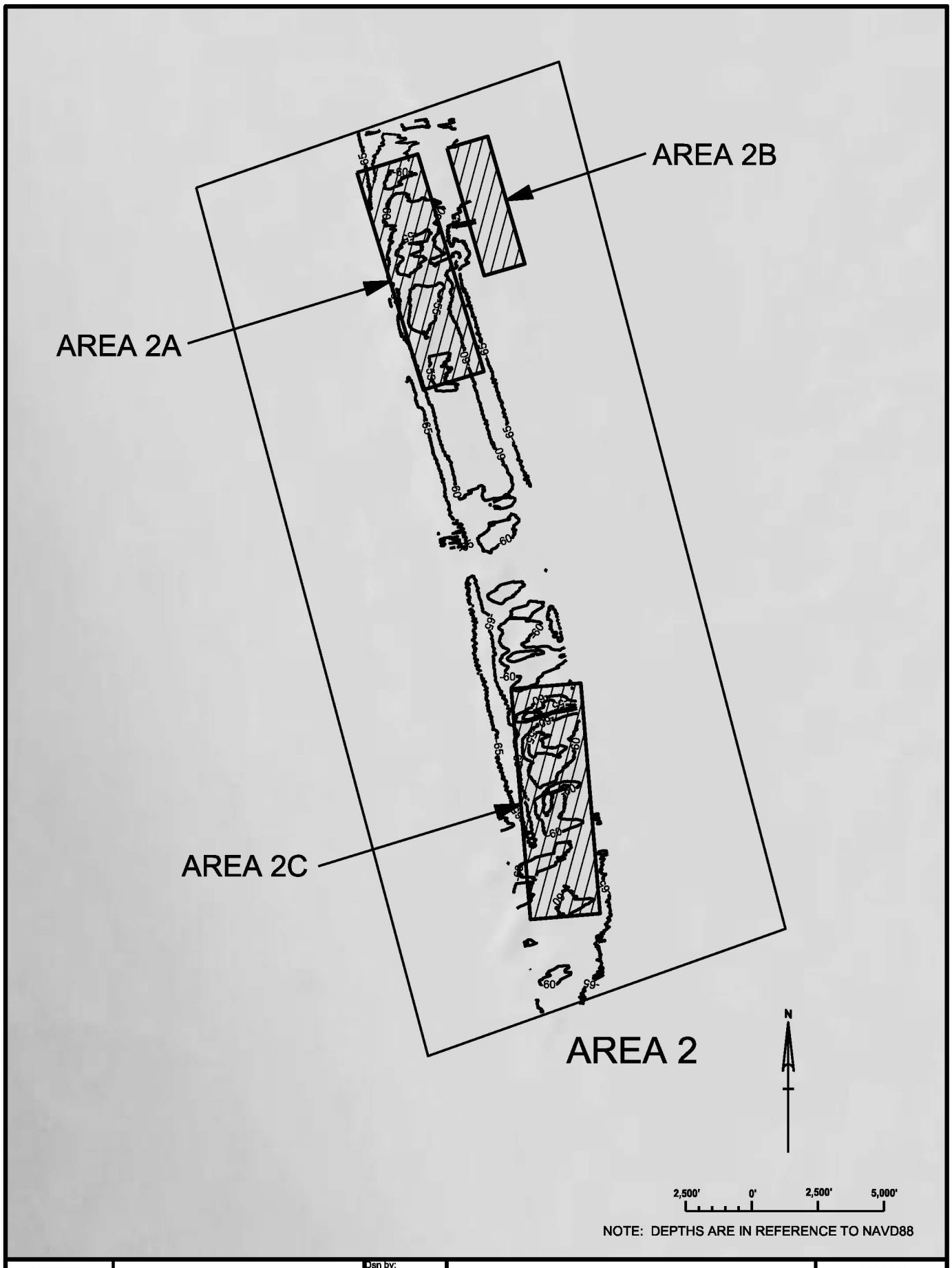
GEOTECHNICAL DRAWINGS

DEPARTMENT OF THE ARMY
JACKSONVILLE DISTRICT, CORPS OF ENGINEERS
JACKSONVILLE, FLORIDA

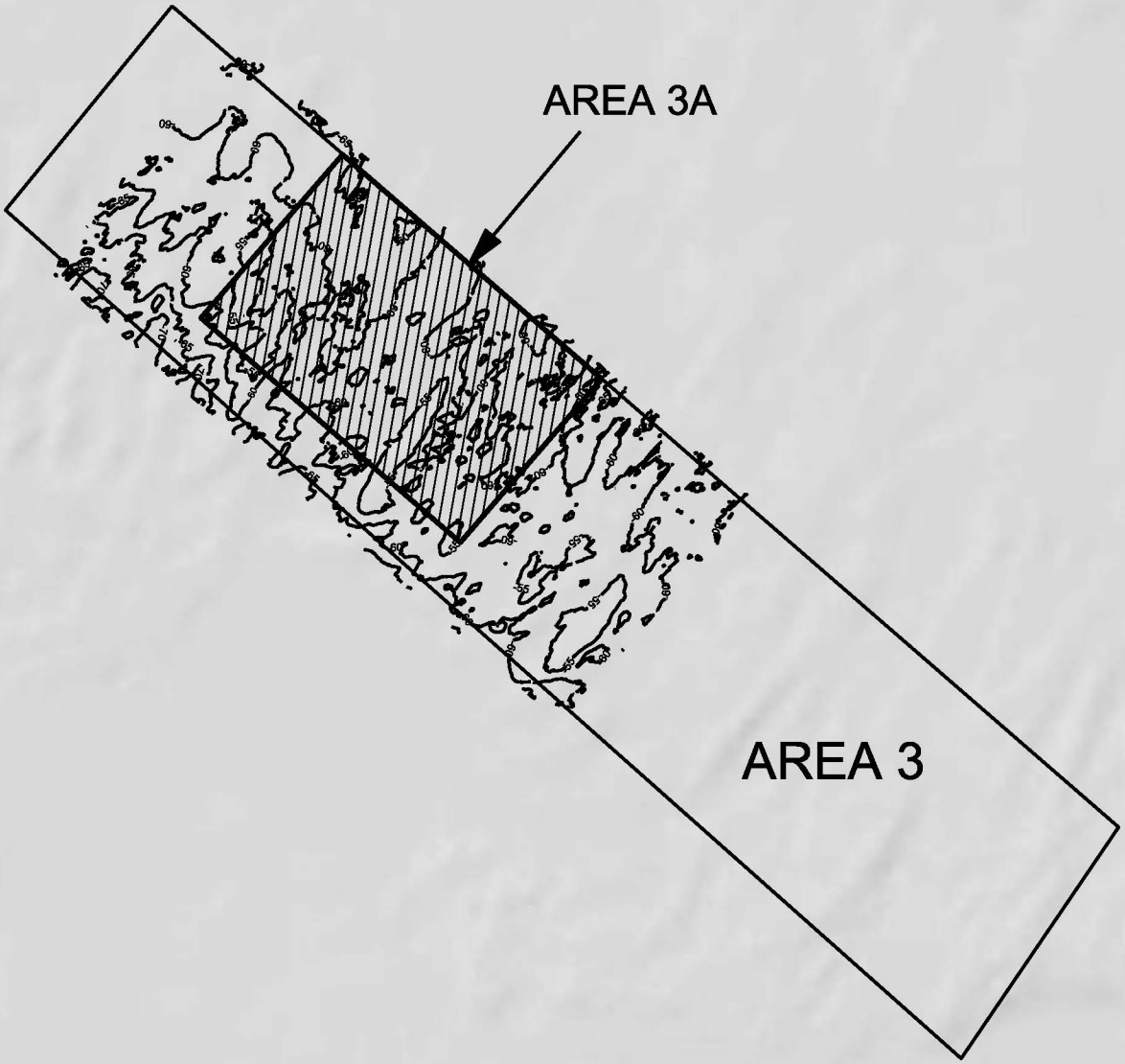
Dsn by: BUN
Dwn by: CJB
Ckd by: BUN
Dated: NOV. 2012

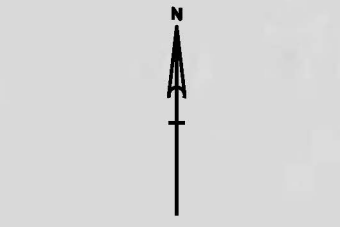
# FLAGLER COUNTY
## HURRICANE AND STORM DAMAGE REDUCTION FEASABILITY STUDY
BORING LOCATION PLAN

PLATE
**B-3**




| | | | | |
|---|---|---|---|---|
| US Army Corps of Engineers Jacksonville District | GEOTECHNICAL DRAWINGS | Dsn by: BUN<br>Dwn by: CJB | FLAGLER COUNTY<br>HURRICANE AND STORM DAMAGE REDUCTION<br>FEASABILITY STUDY | PLATE<br>B-4 |
| | DEPARTMENT OF THE ARMY<br>JACKSONVILLE DISTRICT, CORPS OF ENGINEERS<br>JACKSONVILLE, FLORIDA | Ckd by: BUN<br>Dated: NOV. 2012 | | |




NOTE: DEPTHS ARE IN REFERENCE TO NAVD88

| | | | | |
|---|---|---|---|---|
| US Army Corps of Engineers Jacksonville District | GEOTECHNICAL DRAWINGS | Dsn by: BUN<br>Dwn by: CJB | FLAGLER COUNTY<br>HURRICANE AND STORM DAMAGE REDUCTION<br>FEASABILITY STUDY | PLATE<br>**B-5** |
| | DEPARTMENT OF THE ARMY<br>JACKSONVILLE DISTRICT, CORPS OF ENGINEERS<br>JACKSONVILLE, FLORIDA | Ckd by: BUN<br>Dated: NOV. 2012 | | |

# APPENDIX

# BORROW AREAS:

# BORING LOGS AND LABORATORY TESTING RESULTS

**DRILLING LOG**

| | |
|---|---|
| DIVISION | South Atlantic |
| INSTALLATION | Jacksonville District |
| SHEET | 1 OF 2 SHEETS |
| 1. PROJECT | Off-Shore Borrow Area Investigations<br>Flagler County, Florida |
| 2. BORING DESIGNATION | VC-FSP11-1 |
| LOCATION COORDINATES | X = 663,001 Y = 1,906,822 |
| 3. DRILLING AGENCY | AVS |
| CONTRACTOR FILE NO. | 6734-11-9583 |
| 4. NAME OF DRILLER | Brian McCord |
| 5. DIRECTION OF BORING | ☒ VERTICAL ☐ INCLINED |
| DEG. FROM VERTICAL | |
| BEARING | |
| 6. THICKNESS OF OVERBURDEN | N/A |
| 7. DEPTH DRILLED INTO ROCK | N/A |
| 8. TOTAL DEPTH OF BORING | 20.0 Ft. |
| 9. SIZE AND TYPE OF BIT | See Remarks |
| 10. COORDINATE SYSTEM/DATUM | State Plane, FLE (U.S. Ft.) |
| HORIZONTAL | NAD83 |
| VERTICAL | NAVD88 |
| 11. MANUFACTURER'S DESIGNATION OF DRILL | ☐ AUTO HAMMER ☐ MANUAL HAMMER |
| 12. TOTAL SAMPLES | DISTURBED 6 / UNDISTURBED (UD) 0 |
| 13. TOTAL NUMBER CORE BOXES | 0 |
| 14. ELEVATION GROUND WATER | |
| 15. DATE BORING | STARTED 02-14-11 / COMPLETED 02-14-11 |
| 16. ELEVATION TOP OF BORING | -62.4 Ft. |
| 17. TOTAL RECOVERY FOR BORING | 90 % |
| 18. SIGNATURE AND TITLE OF INSPECTOR | Karishma R. Desai, P.E., Geotechnical Engineer |

| ELEV. | DEPTH | LEGEND | CLASSIFICATION OF MATERIALS | % REC. | BOX OR SAMPLE | RQD OR UD | REMARKS | BLOWS/1 FT. | N-VALUE |
|---|---|---|---|---|---|---|---|---|---|
| -62.4 | 0.0 | | | | | | -62.4 | | |
| | | | SAND, poorly-graded, mostly fine-grained sand-sized quartz, trace fine-grained sand-sized shell, weak reaction with HCl, moist, 10Y 5/1 greenish gray (SP) | NR | | | Vibracore | | |
| | | | From El. -64.5 to -64.9 Ft., few fine to medium-grained sand-sized shell | | | | -64.9 | | |
| | | | | | -Post 1 | | -64.9 | | |
| | | | At El. -66.8 Ft., trace fine gravel-sized shell | | | | | | |
| | | | From El. -67.4 to -68.4 Ft., mostly fine to medium-grained sand-sized quartz, little fine to medium-grained sand-sized shell | | | | -67.9 | | |
| | | | | | 2 | | | | |
| | | | From El. -68.4 to -70.4 Ft., trace silt | | | | -70.4 | | |
| | | | From El. -70.4 to -71.8 Ft., few fine to medium-grained sand-sized shell, trace silt, strong reaction with HCl, 10Y 4/1 dark greenish gray | | 3 | | | | |
| -71.8 | 9.4 | | At El. -71.4 Ft., trace fine to coarse gravel-sized shell | | | | -72.4 | | |
| | | | SAND, poorly-graded with silt, mostly fine-grained sand-sized quartz, few fine to medium-grained sand-sized shell, few silt, strong reaction with HCl, moist, 10Y 4/1 dark greenish gray (SP-SM) | | 4 | | | | |
| | | | From El. -76.1 to -78.9 Ft., few fine to medium-grained sand-sized shell, trace silt nodules | | | | -77.4 | | |

0 5 10 15

(Continued)

SAJ FORM 1836
JUN 02

| DRILLING LOG (Cont. Sheet) | INSTALLATION | SHEET 2 OF 2 SHEETS |
|---|---|---|
| | Jacksonville District | |

| PROJECT | COORDINATE SYSTEM/DATUM | HORIZONTAL | VERTICAL |
|---|---|---|---|
| Off-Shore Borrow Area Investigations | State Plane, FLE (U.S. Ft.) | NAD83 | NAVD88 |

| LOCATION COORDINATES | ELEVATION TOP OF BORING |
|---|---|
| X = 663,001 Y = 1,906,822 | -62.4 Ft. |

| ELEV. | DEPTH | LEGEND | CLASSIFICATION OF MATERIALS | % REC. | BOX OR SAMPLE | RQD OR UD | REMARKS | BLOWS/ 1 FT. | N-VALUE |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | 5 | | | | |
| | | | From El. -78.9 to -80.1 Ft., little fine to coarse-grained sand-sized shell, occasional trace fine-grained sand-sized shell | | | | | | |
| | | | From El. -80.1 to -80.4 Ft., little fine to medium-grained sand-sized shell | | | | | | |
| -82.4 | 20.0 | | | | | | -82.4 | | |

NOTES:

1. USACE Jacksonville is the custodian for these original files.

2. Soils are field visually classified in accordance with the Unified Soils Classification System.

3. 100% recovery attained from 0.0 to 18 feet. Due to varying quantities and size of shell, recovery of sample from 18.0 to 20.0 feet was not achieved. Soil description based on material retained in the shoe.

4. Laboratory Testing Results

| SAMPLE ID | SAMPLE DEPTH | LABORATORY CLASSIFICATION |
|---|---|---|
| 1 | 2.5/3.0 | SP* |
| 1-Post | 2.5/3.0 | SP* |
| 2 | 5.5/6.0 | SP* |
| 3 | 8.0/8.5 | SP* |
| 4 | 10.0/10.5 | SP-SM* |
| 5 | 15.0/15.5 | SP-SM* |

*Lab visual classification based on gradation curve. No Atterberg limits.

Abbreviations:
NR = Not Recorded.

15
20
25
30
35

SAJ FORM 1836-A
JUN 02

# DRILLING LOG

| | |
|---|---|
| DIVISION | South Atlantic |
| INSTALLATION | Jacksonville District |
| SHEET | 1 OF 2 SHEETS |
| 1. PROJECT | Off-Shore Borrow Area Investigations<br>Flagler County, Florida |
| 2. BORING DESIGNATION | VC-FSP11-2 |
| LOCATION COORDINATES | X = 666,592 Y = 1,911,063 |
| 3. DRILLING AGENCY | AVS |
| CONTRACTOR FILE NO. | 6734-11-9583 |
| 4. NAME OF DRILLER | Brian McCord |
| 5. DIRECTION OF BORING | ☒ VERTICAL ☐ INCLINED |
| DEG. FROM VERTICAL | |
| BEARING | |
| 6. THICKNESS OF OVERBURDEN | N/A |
| 7. DEPTH DRILLED INTO ROCK | N/A |
| 8. TOTAL DEPTH OF BORING | 20.0 Ft. |
| 9. SIZE AND TYPE OF BIT | See Remarks |
| 10. COORDINATE SYSTEM/DATUM | State Plane, FLE (U.S. Ft.) / HORIZONTAL NAD83 / VERTICAL NAVD88 |
| 11. MANUFACTURER'S DESIGNATION OF DRILL | ☐ AUTO HAMMER ☐ MANUAL HAMMER |
| 12. TOTAL SAMPLES | DISTURBED 2 / UNDISTURBED (UD) 0 |
| 13. TOTAL NUMBER CORE BOXES | 0 |
| 14. ELEVATION GROUND WATER | |
| 15. DATE BORING | STARTED 02-14-11 / COMPLETED 02-14-11 |
| 16. ELEVATION TOP OF BORING | -62.8 Ft. |
| 17. TOTAL RECOVERY FOR BORING | 100 % |
| 18. SIGNATURE AND TITLE OF INSPECTOR | Karishma R. Desai, P.E., Geotechnical Engineer |

| ELEV. | DEPTH | LEGEND | CLASSIFICATION OF MATERIALS | % REC. | BOX OR SAMPLE | RQD OR UD | REMARKS | BLOWS/1 FT. | N-VALUE |
|---|---|---|---|---|---|---|---|---|---|
| -62.8 | 0.0 | | | | | | -62.8 | | |
| | | | SAND, poorly-graded, mostly fine to medium-grained sand-sized quartz, some fine to coarse-grained sand-sized shell, weak reaction with HCl, moist, 10Y 7/1 light greenish gray (SP) | NR | | | Vibracore | | |
| | | | | | | | -63.8 | | |
| -64.6 | 1.8 | | At El. -64.3 Ft., trace fine gravel-sized shell | | 1 | | | | |
| | | | SAND, poorly-graded with silt, mostly fine-grained sand-sized quartz, few silt, few fine to medium-grained sand-sized shell, strong reaction with HCl, moist, 5GY 5/1 greenish gray (SP-SM) | | | | -66.3 | | |
| | | | At El. -67.0 Ft., trace silt nodule | | 2 | | | | |
| -68.3 | 5.5 | | | | | | | | |
| | | | CLAY, fat, little fine-grained sand-sized quartz, few silt, trace fine-grained sand-sized shell, trace organic matter, weak reaction with HCl, moist, 10Y 2.5/1 greenish black (CH) | | | | | | |
| | | | At El. -68.8 Ft., 1/2" thick sand seam | | | | | | |
| | | | From El. -70.0 to -82.8 Ft., 10Y 4/1 dark greenish gray | | | | | | |
| | | | From El. -71.8 to -73.8 Ft., occasional thin sand layers (approximately 1/16" thick) | | | | | | |
| | | | From El. -72.8 to -75.6 Ft., trace fine-grained sand-sized quartz, discontinue fine-grained sand-sized shell | | | | | | |
| -75.6 | 12.8 | | | | | | | | |
| | | | SAND, clayey, mostly fine-grained sand-sized quartz, some clay, little fine to coarse-grained sand-sized shell, few silt, weak reaction with HCl, moist, 5GY 4/1 dark greenish gray (SC) | | | | | | |
| | | | From El. -77.3 to -77.8 Ft., little silt, trace | | | | | | |
| -77.8 | 15.0 | | | | | | | | |

0 - 5 - 10 - 15

(Continued)

SAJ FORM 1836
JUN 02

| DRILLING LOG (Cont. Sheet) | INSTALLATION | SHEET 2 OF 2 SHEETS |
|---|---|---|
| | Jacksonville District | |

| PROJECT | COORDINATE SYSTEM/DATUM | HORIZONTAL | VERTICAL |
|---|---|---|---|
| Off-Shore Borrow Area Investigations | State Plane, FLE (U.S. Ft.) | NAD83 | NAVD88 |

| LOCATION COORDINATES | ELEVATION TOP OF BORING |
|---|---|
| X = 666,592 Y = 1,911,063 | -62.8 Ft. |

| ELEV. | DEPTH | LEGEND | CLASSIFICATION OF MATERIALS | % REC. | BOX OR SAMPLE | RQD OR UD | REMARKS | BLOWS/ 1 FT. | N-VALUE |
|---|---|---|---|---|---|---|---|---|---|
| | | | fine-grained sand-sized shell<br>CLAY, fat, little silt, trace fine-grained sand-sized quartz, trace fine-grained sand-sized shell, weak reaction with HCl, moist, 5GY 4/1 dark greenish gray (CH)<br><br>From El. -79.9 to -80.4 Ft., few fine-grained sand-sized quartz, few fine to coarse-grained sand-sized shell<br><br>From El. -81.2 to -82.8 Ft., occasional sand layers (approximately 1/16" thick) | | | | | | |
| -82.8 | 20.0 | | | | | | -82.8 | | |

NOTES:

1. USACE Jacksonville is the custodian for these original files.

2. Soils are field visually classified in accordance with the Unified Soils Classification System.

3. Laboratory Testing Results

| SAMPLE ID | SAMPLE DEPTH | LABORATORY CLASSIFICATION |
|---|---|---|
| 1 | 1.0/1.5 | SP* |
| 2 | 3.5/4.0 | SP-SM* |

*Lab visual classification based on gradation curve. No Atterberg limits.

Abbreviations:
NR = Not Recorded.

15 20 25 30 35

**SAJ FORM 1836-A**
**JUN 02**

**DRILLING LOG**

| | | | |
|---|---|---|---|
| **DIVISION** South Atlantic | **INSTALLATION** Jacksonville District | **SHEET** 1 **OF** 2 **SHEETS** | |
| **1. PROJECT** Off-Shore Borrow Area Investigations, Flagler County, Florida | **9. SIZE AND TYPE OF BIT** See Remarks | | |
| | **10. COORDINATE SYSTEM/DATUM** State Plane, FLE (U.S. Ft.) | **HORIZONTAL** NAD83 | **VERTICAL** NAVD88 |
| **2. BORING DESIGNATION** VC-FSP11-3 | **LOCATION COORDINATES** X = 668,362 Y = 1,903,690 | **11. MANUFACTURER'S DESIGNATION OF DRILL** ☐ AUTO HAMMER ☐ MANUAL HAMMER | |
| **3. DRILLING AGENCY** AVS | **CONTRACTOR FILE NO.** 6734-11-9583 | **12. TOTAL SAMPLES** | **DISTURBED** 6 / **UNDISTURBED (UD)** 0 |
| **4. NAME OF DRILLER** Brian McCord | | **13. TOTAL NUMBER CORE BOXES** 0 | |
| **5. DIRECTION OF BORING** ☒ VERTICAL ☐ INCLINED | **DEG. FROM VERTICAL** / **BEARING** | **14. ELEVATION GROUND WATER** | |
| | | **15. DATE BORING** | **STARTED** 02-14-11 / **COMPLETED** 02-14-11 |
| **6. THICKNESS OF OVERBURDEN** N/A | | **16. ELEVATION TOP OF BORING** -56.8 Ft. | |
| **7. DEPTH DRILLED INTO ROCK** N/A | | **17. TOTAL RECOVERY FOR BORING** 98 % | |
| **8. TOTAL DEPTH OF BORING** 14.5 Ft. | | **18. SIGNATURE AND TITLE OF INSPECTOR** Karishma R. Desai, P.E., Geotechnical Engineer | |

| ELEV. | DEPTH | LEGEND | CLASSIFICATION OF MATERIALS | % REC. | BOX OR SAMPLE | RQD OR UD | REMARKS | BLOWS/1 FT. | N-VALUE |
|---|---|---|---|---|---|---|---|---|---|
| -56.8 | 0.0 | | | | | | -56.8 | | |
| | | | SAND, poorly-graded, mostly fine to medium-grained sand-sized quartz, little fine to medium-grained sand-sized shell, trace silt, weak reaction with HCl, moist, 10Y 6/1 greenish gray (SP) | NR | | | Vibracore | | |
| | | | | | | | -57.8 | | |
| | | | | | 1 | | | | |
| | | | From El. -59.8 to -71.3 Ft., mostly fine-grained sand-sized quartz | | | | -60.8 | | |
| | | | | | 2 | | | | |
| | | | From El. -62.5 to -66.3 Ft., little medium-grained sand-sized shell<br>At El. -62.8 Ft., trace coarse gravel-sized shell, (up to 2.5" long and 1-3/4" wide) | | | | -63.8 | | |
| | | | | | 3-Post 3 | | -63.8 | | |
| | | | From El. -66.3 to -71.3 Ft., few fine to medium-grained sand-sized shell, trace fine gravel-sized shell | | | | -66.8 | | |
| | | | | | 4 | | | | |
| | | | | | | | -69.8 | | |
| | | | | | 5 | | | | |
| -71.3 | 14.5 | | | | | | -71.3 | | |
| | | | BORING TERMINATED IN REFUSAL | | | | Abbreviations: | | |

*(Continued)*

**SAJ FORM 1836**
**JUN 02**

| DRILLING LOG (Cont. Sheet) | INSTALLATION | SHEET 2 OF 2 SHEETS |
|---|---|---|
| | Jacksonville District | |

| PROJECT | COORDINATE SYSTEM/DATUM | HORIZONTAL | VERTICAL |
|---|---|---|---|
| Off-Shore Borrow Area Investigations | State Plane, FLE (U.S. Ft.) | NAD83 | NAVD88 |

| LOCATION COORDINATES | ELEVATION TOP OF BORING |
|---|---|
| X = 668,362 Y = 1,903,690 | -56.8 Ft. |

| ELEV. | DEPTH | LEGEND | CLASSIFICATION OF MATERIALS | % REC. | BOX OR SAMPLE | RQD OR UD | REMARKS | BLOWS/ 1 FT. | N-VALUE |
|---|---|---|---|---|---|---|---|---|---|

NOTES:

1. USACE Jacksonville is the custodian for these original files.

2. Soils are field visually classified in accordance with the Unified Soils Classification System.

3. Vibracore penetrated to 14.5 feet. Sample recovery from 13.7 to 14.5 feet was not attained. Soil description based on material retained in the shoe.

4. Laboratory Testing Results

| SAMPLE ID | SAMPLE DEPTH | LABORATORY CLASSIFICATION |
|---|---|---|
| 1 | 1.0/1.5 | SP* - |
| 2 | 4.0/4.5 | SP* - |
| 3 | 7.0/7.5 | SP* - |
| 3-Post | 7.0/7.5 | SP* - |
| 4 | 10.0/10.5 | SP* - |
| 5 | 13.0/13.5 | SP* - |

*Lab visual classification based on gradation curve. No Atterberg limits.

NR = Not Recorded.

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SAJ FORM 1836-A
JUN 02

**DRILLING LOG**

| | | | |
|---|---|---|---|
| **DIVISION** South Atlantic | **INSTALLATION** Jacksonville District | | **SHEET** 1 **OF** 2 **SHEETS** |
| **1. PROJECT** Off-Shore Borrow Area Investigations, Flagler County, Florida | **9. SIZE AND TYPE OF BIT** See Remarks | | |
| | **10. COORDINATE SYSTEM/DATUM** State Plane, FLE (U.S. Ft.) | **HORIZONTAL** NAD83 | **VERTICAL** NAVD88 |
| **2. BORING DESIGNATION** VC-FSP11-4 | **LOCATION COORDINATES** X = 673,572 Y = 1,906,128 | **11. MANUFACTURER'S DESIGNATION OF DRILL** ☐ AUTO HAMMER ☐ MANUAL HAMMER | |
| **3. DRILLING AGENCY** AVS | **CONTRACTOR FILE NO.** 6734-11-9583 | **12. TOTAL SAMPLES** | **DISTURBED** 4 / **UNDISTURBED (UD)** 0 |
| **4. NAME OF DRILLER** Brian McCord | | **13. TOTAL NUMBER CORE BOXES** 0 | |
| **5. DIRECTION OF BORING** ☒ VERTICAL ☐ INCLINED | **DEG. FROM VERTICAL** / **BEARING** | **14. ELEVATION GROUND WATER** | |
| | | **15. DATE BORING** | **STARTED** 02-14-11 / **COMPLETED** 02-14-11 |
| **6. THICKNESS OF OVERBURDEN** N/A | | **16. ELEVATION TOP OF BORING** -60.0 Ft. | |
| **7. DEPTH DRILLED INTO ROCK** N/A | | **17. TOTAL RECOVERY FOR BORING** 86 % | |
| **8. TOTAL DEPTH OF BORING** 9.1 Ft. | | **18. SIGNATURE AND TITLE OF INSPECTOR** Karishma R. Desai, P.E., Geotechnical Engineer | |

| ELEV. | DEPTH | LEGEND | CLASSIFICATION OF MATERIALS | % REC. | BOX OR SAMPLE | RQD OR UD | REMARKS | BLOWS/1 FT. | N-VALUE |
|---|---|---|---|---|---|---|---|---|---|
| -60.0 | 0.0 | | | | | | -60.0 | | |
| | | | SAND, poorly-graded, mostly fine to medium-grained sand-sized quartz, little fine to medium-grained sand-sized shell, weak reaction with HCl, moist, 10GY 5/1 greenish gray (SP) | NR | | | Vibracore | | |
| | | | From El. -61.5 to -62.3 Ft., trace fine to medium-grained sand-sized shell | | | | -61.0 | | |
| | | | From El. -62.3 to -69.1 Ft., mostly fine-grained sand-sized quartz, little medium to coarse-grained sand-sized shell, trace silt | | 1 | | | | |
| | | | At El. -63.6 Ft., little fine to coarse gravel-sized shell | | | | -64.0 | | |
| | | | | | 2-Post 2 | | -64.0 | | |
| | | | | | | | -67.0 | | |
| | | | | | 3 | | | | |
| -69.1 | 9.1 | | | | | | -69.1 | | |
| | | | BORING TERMINATED IN REFUSAL | | | | Abbreviations: NR = Not Recorded. | | |
| | | | NOTES: 1. USACE Jacksonville is the custodian for these original files. 2. Soils are field visually classified in accordance with the Unified Soils Classification System. 3. Vibracore penetrated to 9.1 feet. Sample recovery from 7.3 to 9.1 feet was not attained. Soil description based on material retained in the shoe. 4. Laboratory Testing Results | | | | | | |
| | | | SAMPLE SAMPLE LABORATORY | | | | | | |

*(Continued)*

**SAJ FORM 1836**
**JUN 02**

| DRILLING LOG (Cont. Sheet) | INSTALLATION | SHEET 2 OF 2 SHEETS |
|---|---|---|
| | Jacksonville District | |

| PROJECT | COORDINATE SYSTEM/DATUM | HORIZONTAL | VERTICAL |
|---|---|---|---|
| Off-Shore Borrow Area Investigations | State Plane, FLE (U.S. Ft.) | NAD83 | NAVD88 |

| LOCATION COORDINATES | ELEVATION TOP OF BORING |
|---|---|
| X = 673,572 Y = 1,906,128 | -60.0 Ft. |

| ELEV. | DEPTH | LEGEND | CLASSIFICATION OF MATERIALS | % REC. | BOX OR SAMPLE | RQD OR UD | REMARKS | BLOWS/ 1 FT. | N-VALUE |
|---|---|---|---|---|---|---|---|---|---|

| ID | DEPTH | CLASSIFICATION |
|---|---|---|
| 1 | 1.0/1.5 | SP* - |
| 2 | 4.0/4.5 | SP* - |
| 2-Post | 4.0/4.5 | SP* - |
| 3 | 7.0/7.5 | SP* - |

*Lab visual classification based on gradation curve. No Atterberg limits.

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SAJ FORM 1836-A
JUN 02

# DRILLING LOG

| | |
|---|---|
| DIVISION | South Atlantic |
| INSTALLATION | Jacksonville District |
| SHEET | 1 OF 2 SHEETS |
| 1. PROJECT | Off-Shore Borrow Area Investigations<br>Flagler County, Florida |
| 2. BORING DESIGNATION | VC-FSP11-5 |
| LOCATION COORDINATES | X = 672,891 Y = 1,900,724 |
| 3. DRILLING AGENCY | AVS |
| CONTRACTOR FILE NO. | 6734-11-9583 |
| 4. NAME OF DRILLER | Brian McCord |
| 5. DIRECTION OF BORING | ☒ VERTICAL ☐ INCLINED |
| DEG. FROM VERTICAL | |
| BEARING | |
| 6. THICKNESS OF OVERBURDEN | N/A |
| 7. DEPTH DRILLED INTO ROCK | N/A |
| 8. TOTAL DEPTH OF BORING | 7.7 Ft. |
| 9. SIZE AND TYPE OF BIT | See Remarks |
| 10. COORDINATE SYSTEM/DATUM | State Plane, FLE (U.S. Ft.) / HORIZONTAL NAD83 / VERTICAL NAVD88 |
| 11. MANUFACTURER'S DESIGNATION OF DRILL | ☐ AUTO HAMMER ☐ MANUAL HAMMER |
| 12. TOTAL SAMPLES | DISTURBED 4 / UNDISTURBED (UD) 0 |
| 13. TOTAL NUMBER CORE BOXES | 0 |
| 14. ELEVATION GROUND WATER | |
| 15. DATE BORING | STARTED 02-14-11 / COMPLETED 02-14-11 |
| 16. ELEVATION TOP OF BORING | -59.7 Ft. |
| 17. TOTAL RECOVERY FOR BORING | 88 % |
| 18. SIGNATURE AND TITLE OF INSPECTOR | Karishma R. Desai, P.E., Geotechnical Engineer |

| ELEV. | DEPTH | LEGEND | CLASSIFICATION OF MATERIALS | % REC. | BOX OR SAMPLE | RQD OR UD | REMARKS | BLOWS/1 FT. | N-VALUE |
|---|---|---|---|---|---|---|---|---|---|
| -59.7 | 0.0 | | | | | | -59.7 | | |
| | | | SAND, poorly-graded, mostly fine-grained sand-sized quartz, little fine to medium-grained sand-sized shell, trace silt, weak reaction with HCl, moist, 5GY 5/1 greenish gray (SP) | NR | | | Vibracore<br>-60.7 | | |
| | | | | | -Post 1 | | -60.7 | | |
| | | | | | | | -63.7 | | |
| | | | At El. -64.2 Ft., trace fine gravel-sized coral | | 2 | | | | |
| | | | From El. -65.2 to -67.4 Ft., few medium-grained sand-sized shell, trace fine gravel-sized shell, strong reaction with HCl | | | | -66.2 | | |
| | | | | | 3 | | | | |
| -67.4 | 7.7 | | | | | | -67.4 | | |
| | | | BORING TERMINATED IN REFUSAL | | | | Abbreviations:<br>NR = Not Recorded. | | |

NOTES:

1. USACE Jacksonville is the custodian for these original files.

2. Soils are field visually classified in accordance with the Unified Soils Classification System.

3. Vibracore penetrated to 7.7 feet. Sample recovery from 6.7 to 7.7 feet was not attained. Soil description based on material retained in the shoe.

4. Laboratory Testing Results

| SAMPLE ID | SAMPLE DEPTH | LABORATORY CLASSIFICATION |
|---|---|---|
| 1 | 1.0/1.5 | SP* |
| 1-Post | 1.0/1.5 | SP* |
| 2 | 4.0/4.5 | SP* |

(Continued)

SAJ FORM 1836
JUN 02

| DRILLING LOG (Cont. Sheet) | INSTALLATION | SHEET 2 OF 2 SHEETS |
|---|---|---|
| | Jacksonville District | |

| PROJECT | COORDINATE SYSTEM/DATUM | HORIZONTAL | VERTICAL |
|---|---|---|---|
| Off-Shore Borrow Area Investigations | State Plane, FLE (U.S. Ft.) | NAD83 | NAVD88 |

| LOCATION COORDINATES | ELEVATION TOP OF BORING |
|---|---|
| X = 672,891 Y = 1,900,724 | -59.7 Ft. |

| ELEV. | DEPTH | LEGEND | CLASSIFICATION OF MATERIALS | % REC. | BOX OR SAMPLE | RQD OR UD | REMARKS | BLOWS/ 1 FT. | N-VALUE |
|---|---|---|---|---|---|---|---|---|---|
| | | | 3 6.5/6.7 SP* | | | | | | |
| | | | *Lab visual classification based on gradation curve. No Atterberg limits. | | | | | | |

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SAJ FORM 1836-A
JUN 02

# DRILLING LOG

| | |
|---|---|
| DIVISION | South Atlantic |
| INSTALLATION | Jacksonville District |
| SHEET | 1 OF 2 SHEETS |
| 1. PROJECT | Off-Shore Borrow Area Investigations<br>Flagler County, Florida |
| 2. BORING DESIGNATION | VC-FSP11-6 |
| LOCATION COORDINATES | X = 678,009 Y = 1,898,131 |
| 3. DRILLING AGENCY | AVS |
| CONTRACTOR FILE NO. | 6734-11-9583 |
| 4. NAME OF DRILLER | Brian McCord |
| 5. DIRECTION OF BORING | ☒ VERTICAL ☐ INCLINED |
| DEG. FROM VERTICAL | |
| BEARING | |
| 6. THICKNESS OF OVERBURDEN | N/A |
| 7. DEPTH DRILLED INTO ROCK | N/A |
| 8. TOTAL DEPTH OF BORING | 8.4 Ft. |
| 9. SIZE AND TYPE OF BIT | See Remarks |
| 10. COORDINATE SYSTEM/DATUM | State Plane, FLE (U.S. Ft.) / HORIZONTAL NAD83 / VERTICAL NAVD88 |
| 11. MANUFACTURER'S DESIGNATION OF DRILL | ☐ AUTO HAMMER ☐ MANUAL HAMMER |
| 12. TOTAL SAMPLES | DISTURBED 4 / UNDISTURBED (UD) 0 |
| 13. TOTAL NUMBER CORE BOXES | 0 |
| 14. ELEVATION GROUND WATER | |
| 15. DATE BORING | STARTED 02-14-11 / COMPLETED 02-14-11 |
| 16. ELEVATION TOP OF BORING | -61.7 Ft. |
| 17. TOTAL RECOVERY FOR BORING | 86 % |
| 18. SIGNATURE AND TITLE OF INSPECTOR | Karishma R. Desai, P.E., Geotechnical Engineer |

| ELEV. | DEPTH | LEGEND | CLASSIFICATION OF MATERIALS | % REC. | BOX OR SAMPLE | RQD OR UD | REMARKS | BLOWS/1 FT. | N-VALUE |
|---|---|---|---|---|---|---|---|---|---|
| -61.7 | 0.0 | | | | | | -61.7 | | |
| | | | SAND, poorly-graded, mostly fine-grained sand-sized quartz, little medium-grained sand-sized shell, trace silt, weak reaction with HCl, moist, 5GY 5/1 greenish gray (SP) | NR | | | Vibracore | | |
| | | | | | | | -62.7 | | |
| | | | | | 1 | | | | |
| | | | At El. -63.4 Ft., trace fine gravel-sized shell<br>From El. -63.5 to -64.4 Ft., trace fine-grained sand-sized shell | | | | | | |
| | | | From El. -65.0 to -66.6 Ft., little medium to coarse-grained sand-sized shell | | | | -65.7 | | |
| | | | | | 2 | | | | |
| | | | From El. -67.4 to -68.1 Ft., trace fine gravel-sized shell | | | | | | |
| | | | From El. -68.1 to -70.1 Ft., little medium-grained sand-sized shell | | | | -68.5 | | |
| | | | | | 3-Post 3 | | -68.5 | | |
| -70.1 | 8.4 | | | | | | -70.1 | | |
| | | | BORING TERMINATED IN REFUSAL | | | | Abbreviations:<br>NR = Not Recorded. | | |

NOTES:

1. USACE Jacksonville is the custodian for these original files.

2. Soils are field visually classified in accordance with the Unified Soils Classification System.

3. Vibracore penetrated to 8.4 feet. Sample recovery from 6.9 to 8.4 feet was not attained. Soil description based on material retained in the shoe.

4. Laboratory Testing Results

| SAMPLE ID | SAMPLE DEPTH | LABORATORY CLASSIFICATION |
|---|---|---|
| 1 | 1.0/1.5 | SP* |

(Continued)

SAJ FORM 1836
JUN 02

| DRILLING LOG (Cont. Sheet) | INSTALLATION | SHEET 2 OF 2 SHEETS |
|---|---|---|
| | Jacksonville District | |

| PROJECT | COORDINATE SYSTEM/DATUM | HORIZONTAL | VERTICAL |
|---|---|---|---|
| Off-Shore Borrow Area Investigations | State Plane, FLE (U.S. Ft.) | NAD83 | NAVD88 |

| LOCATION COORDINATES | ELEVATION TOP OF BORING |
|---|---|
| X = 678,009 Y = 1,898,131 | -61.7 Ft. |

| ELEV. | DEPTH | LEGEND | CLASSIFICATION OF MATERIALS | % REC. | BOX OR SAMPLE | RQD OR UD | REMARKS | BLOWS/ 1 FT. | N-VALUE |
|---|---|---|---|---|---|---|---|---|---|
| | | | 2 4.0/4.5 SP*<br>3 6.8/6.9 SP*<br>3-Post 6.8/6.9 SP*<br><br>*Lab visual classification based on gradation curve. No Atterberg limits. | | | | | | |

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SAJ FORM 1836-A
JUN 02

# DRILLING LOG

| | |
|---|---|
| DIVISION | South Atlantic |
| INSTALLATION | Jacksonville District |
| SHEET | 1 OF 2 SHEETS |
| 1. PROJECT | Off-Shore Borrow Area Investigations<br>Flagler County, Florida |
| 2. BORING DESIGNATION | VC-FSP11-7 |
| LOCATION COORDINATES | X = 678,829 Y = 1,893,078 |
| 3. DRILLING AGENCY | AVS |
| CONTRACTOR FILE NO. | 6734-11-9583 |
| 4. NAME OF DRILLER | Brian McCord |
| 5. DIRECTION OF BORING | ☒ VERTICAL ☐ INCLINED |
| DEG. FROM VERTICAL | |
| BEARING | |
| 6. THICKNESS OF OVERBURDEN | N/A |
| 7. DEPTH DRILLED INTO ROCK | N/A |
| 8. TOTAL DEPTH OF BORING | 8.6 Ft. |
| 9. SIZE AND TYPE OF BIT | See Remarks |
| 10. COORDINATE SYSTEM/DATUM | State Plane, FLE (U.S. Ft.) / HORIZONTAL NAD83 / VERTICAL NAVD88 |
| 11. MANUFACTURER'S DESIGNATION OF DRILL | ☐ AUTO HAMMER ☐ MANUAL HAMMER |
| 12. TOTAL SAMPLES | DISTURBED 4 / UNDISTURBED (UD) 0 |
| 13. TOTAL NUMBER CORE BOXES | 0 |
| 14. ELEVATION GROUND WATER | |
| 15. DATE BORING | STARTED 02-14-11 / COMPLETED 02-14-11 |
| 16. ELEVATION TOP OF BORING | -54.6 Ft. |
| 17. TOTAL RECOVERY FOR BORING | 94 % |
| 18. SIGNATURE AND TITLE OF INSPECTOR | Karishma R. Desai, P.E., Geotechnical Engineer |

| ELEV. | DEPTH | LEGEND | CLASSIFICATION OF MATERIALS | % REC. | BOX OR SAMPLE | RQD OR UD | REMARKS | BLOWS/1 FT. | N-VALUE |
|---|---|---|---|---|---|---|---|---|---|
| -54.6 | 0.0 | | | | | | -54.6 | | |
| | | | SAND, poorly-graded, mostly fine-grained sand-sized quartz, little fine to medium-grained sand-sized shell, trace silt, weak reaction with HCl, moist, 10Y 5/1 greenish gray (SP) | NR | | | Vibracore<br>-55.6 | | |
| | | | | | 1 | | -58.6 | | |
| | | | From El. -57.4 to -58.3 Ft., few fine to medium-grained sand-sized shell | | 2-Post 2 | | -58.6 | | |
| | | | From El. -60.6 to -63.2 Ft., few medium-grained sand-sized shell | | | | -61.6 | | |
| | | | | | 3 | | | | |
| -63.2 | 8.6 | | | | | | -63.2 | | |
| | | | BORING TERMINATED IN REFUSAL | | | | Abbreviations:<br>NR = Not Recorded. | | |

NOTES:

1. USACE Jacksonville is the custodian for these original files.

2. Soils are field visually classified in accordance with the Unified Soils Classification System.

3. Vibracore penetrated to 8.6 feet. Sample recovery from 7.8 to 8.6 feet was not attained. Soil description based on material retained in the shoe.

4. Laboratory Testing Results

| SAMPLE ID | SAMPLE DEPTH | LABORATORY CLASSIFICATION |
|---|---|---|

(Continued)

SAJ FORM 1836
JUN 02

| DRILLING LOG (Cont. Sheet) | INSTALLATION | SHEET 2 OF 2 SHEETS |
|---|---|---|
| | Jacksonville District | |

| PROJECT | COORDINATE SYSTEM/DATUM | HORIZONTAL | VERTICAL |
|---|---|---|---|
| Off-Shore Borrow Area Investigations | State Plane, FLE (U.S. Ft.) | NAD83 | NAVD88 |

| LOCATION COORDINATES | ELEVATION TOP OF BORING |
|---|---|
| X = 678,829 Y = 1,893,078 | -54.6 Ft. |

| ELEV. | DEPTH | LEGEND | CLASSIFICATION OF MATERIALS | % REC. | BOX OR SAMPLE | RQD OR UD | REMARKS | BLOWS/ 1 FT. | N-VALUE |
|---|---|---|---|---|---|---|---|---|---|
| | | | 1 1.0/1.5 SP*<br>2 4.0/4.5 SP*<br>2-Post 4.0/4.5 SP*<br>3 7.0/7.5 SP*<br><br>*Lab visual classification based on gradation curve. No Atterberg limits. | | | | | | |

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SAJ FORM 1836-A
JUN 02

**DRILLING LOG**

| | |
|---|---|
| DIVISION | South Atlantic |
| INSTALLATION | Jacksonville District |
| SHEET | 1 OF 2 SHEETS |
| 1. PROJECT | Off-Shore Borrow Area Investigations<br>Flagler County, Florida |
| 2. BORING DESIGNATION | VC-FSP11-8 |
| LOCATION COORDINATES | X = 684,228 Y = 1,895,572 |
| 3. DRILLING AGENCY | AVS |
| CONTRACTOR FILE NO. | 6734-11-9583 |
| 4. NAME OF DRILLER | Brian McCord |
| 5. DIRECTION OF BORING | ☒ VERTICAL ☐ INCLINED |
| DEG. FROM VERTICAL | |
| BEARING | |
| 6. THICKNESS OF OVERBURDEN | N/A |
| 7. DEPTH DRILLED INTO ROCK | N/A |
| 8. TOTAL DEPTH OF BORING | 8.4 Ft. |
| 9. SIZE AND TYPE OF BIT | See Remarks |
| 10. COORDINATE SYSTEM/DATUM | State Plane, FLE (U.S. Ft.) / HORIZONTAL NAD83 / VERTICAL NAVD88 |
| 11. MANUFACTURER'S DESIGNATION OF DRILL | ☐ AUTO HAMMER ☐ MANUAL HAMMER |
| 12. TOTAL SAMPLES | DISTURBED 4 / UNDISTURBED (UD) 0 |
| 13. TOTAL NUMBER CORE BOXES | 0 |
| 14. ELEVATION GROUND WATER | |
| 15. DATE BORING | STARTED 02-14-11 / COMPLETED 02-14-11 |
| 16. ELEVATION TOP OF BORING | -61.8 Ft. |
| 17. TOTAL RECOVERY FOR BORING | 85 % |
| 18. SIGNATURE AND TITLE OF INSPECTOR | Karishma R. Desai, P.E., Geotechnical Engineer |

| ELEV. | DEPTH | LEGEND | CLASSIFICATION OF MATERIALS | % REC. | BOX OR SAMPLE | RQD OR UD | REMARKS | BLOWS/1 FT. | N-VALUE |
|---|---|---|---|---|---|---|---|---|---|
| -61.8 | 0.0 | | | | | | -61.8 | | |
| | | | SAND, poorly-graded, mostly fine-grained sand-sized quartz, few fine to medium-grained sand-sized shell, weak reaction with HCl, moist, 10Y 5/1 greenish gray (SP) | NR | | | Vibracore<br>-62.8 | | |
| | | | | | 1 | | -65.8 | | |
| | | | From El. -63.8 to -64.3 Ft., little fine to coarse-grained sand-sized shell, trace fine gravel-sized shell<br>From El. -65.3 to -70.2 Ft., trace silt<br>From El. -65.4 to -70.2 Ft., little medium to coarse-grained sand-sized shell<br>At El. -66.1 Ft., trace fine gravel-sized shell | | 2-Post 2 | | -65.8<br>-67.8 | | |
| | | | | | 3 | | | | |
| -70.2 | 8.4 | | From El. -68.4 to -70.2 Ft., few fine to coarse-grained sand-sized shell | | | | -70.2 | | |
| | | | BORING TERMINATED IN REFUSAL<br><br>NOTES:<br><br>1. USACE Jacksonville is the custodian for these original files.<br><br>2. Soils are field visually classified in accordance with the Unified Soils Classification System.<br><br>3. Vibracore penetrated to 8.4 feet. Sample recovery from 6.6 to 8.4 feet was not attained. Soil description based on material retained in the shoe.<br><br>4. Laboratory Testing Results<br><br>SAMPLE ID / SAMPLE DEPTH / LABORATORY CLASSIFICATION<br>1 / 1.0/1.5 / SP* | | | | Abbreviations:<br>NR = Not Recorded. | | |

(Continued)

SAJ FORM 1836
JUN 02

| DRILLING LOG (Cont. Sheet) | INSTALLATION | SHEET 2 OF 2 SHEETS |
|---|---|---|
| | Jacksonville District | |

| PROJECT | COORDINATE SYSTEM/DATUM | HORIZONTAL | VERTICAL |
|---|---|---|---|
| Off-Shore Borrow Area Investigations | State Plane, FLE (U.S. Ft.) | NAD83 | NAVD88 |

| LOCATION COORDINATES | ELEVATION TOP OF BORING |
|---|---|
| X = 684,228 Y = 1,895,572 | -61.8 Ft. |

| ELEV. | DEPTH | LEGEND | CLASSIFICATION OF MATERIALS | % REC. | BOX OR SAMPLE | RQD OR UD | REMARKS | BLOWS/ 1 FT. | N-VALUE |
|---|---|---|---|---|---|---|---|---|---|
| | | | 2 4.0/4.5 SP*<br>2-Post 4.0/4.5 SP*<br>3 6.0/6.6 SP*<br><br>*Lab visual classification based on gradation curve. No Atterberg limits. | | | | | | |

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SAJ FORM 1836-A
JUN 02

# DRILLING LOG

| | |
|---|---|
| DIVISION | South Atlantic |
| INSTALLATION | Jacksonville District |
| SHEET | 1 OF 2 SHEETS |
| 1. PROJECT | Off-Shore Borrow Area Investigations<br>Flagler County, Florida |
| 2. BORING DESIGNATION | VC-FSP11-9 |
| LOCATION COORDINATES | X = 682,407 Y = 1,889,245 |
| 3. DRILLING AGENCY | AVS |
| CONTRACTOR FILE NO. | 6734-11-9583 |
| 4. NAME OF DRILLER | Brian McCord |
| 5. DIRECTION OF BORING | ☒ VERTICAL ☐ INCLINED |
| DEG. FROM VERTICAL | |
| BEARING | |
| 6. THICKNESS OF OVERBURDEN | N/A |
| 7. DEPTH DRILLED INTO ROCK | N/A |
| 8. TOTAL DEPTH OF BORING | 8.8 Ft. |
| 9. SIZE AND TYPE OF BIT | See Remarks |
| 10. COORDINATE SYSTEM/DATUM | State Plane, FLE (U.S. Ft.) / HORIZONTAL: NAD83 / VERTICAL: NAVD88 |
| 11. MANUFACTURER'S DESIGNATION OF DRILL | ☐ AUTO HAMMER ☐ MANUAL HAMMER |
| 12. TOTAL SAMPLES | DISTURBED: 4 / UNDISTURBED (UD): 0 |
| 13. TOTAL NUMBER CORE BOXES | 0 |
| 14. ELEVATION GROUND WATER | |
| 15. DATE BORING | STARTED: 02-14-11 / COMPLETED: 02-14-11 |
| 16. ELEVATION TOP OF BORING | -61.9 Ft. |
| 17. TOTAL RECOVERY FOR BORING | 88 % |
| 18. SIGNATURE AND TITLE OF INSPECTOR | Karishma R. Desai, P.E., Geotechnical Engineer |

| ELEV. | DEPTH | LEGEND | CLASSIFICATION OF MATERIALS | % REC. | BOX OR SAMPLE | RQD OR UD | REMARKS | BLOWS/1 FT. N-VALUE |
|---|---|---|---|---|---|---|---|---|
| -61.9 | 0.0 | | | | | | -61.9 | |
| | | | SAND, poorly-graded, mostly fine to medium-grained sand-sized quartz, little fine to coarse-grained sand-sized shell, weak reaction with HCl, moist, 10Y 5/1 greenish gray (SP) | NR | | | Vibracore<br>-62.9 | |
| | | | | | -Post 1 | | -62.9 | |
| -63.9 | 2.0 | | SAND, poorly-graded with silt, mostly fine-grained sand-sized quartz, few silt, trace medium-grained sand-sized shell, weak reaction with HCl, moist, 10Y 5/1 greenish gray (SP-SM) | | | | -65.9 | |
| | | | | | 2 | | | |
| | | | From El. -67.7 to -70.7 Ft., mostly fine to medium-grained sand-sized quartz, little medium to coarse-grained sand-sized shell | | | | -68.9 | |
| | | | At El. -68.9 Ft., trace fine to coarse gravel-sized shell | | 3 | | | |
| -70.7 | 8.8 | | | | | | -70.7 | |
| | | | BORING TERMINATED IN REFUSAL | | | | Abbreviations:<br>NR = Not Recorded. | |

NOTES:

1. USACE Jacksonville is the custodian for these original files.

2. Soils are field visually classified in accordance with the Unified Soils Classification System.

3. Vibracore penetrated to 8.8 feet. Sample recovery from 7.4 to 8.8 feet was not attained. Soil description based on material retained in the shoe.

4. Laboratory Testing Results

| SAMPLE ID | SAMPLE DEPTH | LABORATORY CLASSIFICATION |
|---|---|---|

(Continued)

SAJ FORM 1836
JUN 02

| DRILLING LOG (Cont. Sheet) | INSTALLATION | SHEET 2 OF 2 SHEETS |
|---|---|---|
| | Jacksonville District | |

| PROJECT | COORDINATE SYSTEM/DATUM | HORIZONTAL | VERTICAL |
|---|---|---|---|
| Off-Shore Borrow Area Investigations | State Plane, FLE (U.S. Ft.) | NAD83 | NAVD88 |

| LOCATION COORDINATES | ELEVATION TOP OF BORING |
|---|---|
| X = 682,407 Y = 1,889,245 | -61.9 Ft. |

| ELEV. | DEPTH | LEGEND | CLASSIFICATION OF MATERIALS | % REC. | BOX OR SAMPLE | RQD OR UD | REMARKS | BLOWS/ 1 FT. | N-VALUE |
|---|---|---|---|---|---|---|---|---|---|
| | | | 1 1.0/1.5 SP*<br>1-Post 1.0/1.5 SP* -<br>2 4.0/4.5 SP-SM* -<br>3 7.0/7.5 SP-SM* -<br><br>*Lab visual classification based on gradation curve. No Atterberg limits. | | | | | | |

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SAJ FORM 1836-A
JUN 02

**DRILLING LOG**

| | |
|---|---|
| DIVISION | South Atlantic |
| INSTALLATION | Jacksonville District |
| SHEET | 1 OF 2 SHEETS |
| 1. PROJECT | Off-Shore Borrow Area Investigations<br>Flagler County, Florida |
| 2. BORING DESIGNATION | VC-FSP11-10 |
| LOCATION COORDINATES | X = 687,241 Y = 1,890,088 |
| 3. DRILLING AGENCY | AVS |
| CONTRACTOR FILE NO. | 6734-11-9583 |
| 4. NAME OF DRILLER | Brian McCord |
| 5. DIRECTION OF BORING | ☒ VERTICAL ☐ INCLINED |
| DEG. FROM VERTICAL | |
| BEARING | |
| 6. THICKNESS OF OVERBURDEN | N/A |
| 7. DEPTH DRILLED INTO ROCK | N/A |
| 8. TOTAL DEPTH OF BORING | 13.1 Ft. |
| 9. SIZE AND TYPE OF BIT | See Remarks |
| 10. COORDINATE SYSTEM/DATUM | State Plane, FLE (U.S. Ft.) / HORIZONTAL NAD83 / VERTICAL NAVD88 |
| 11. MANUFACTURER'S DESIGNATION OF DRILL | ☐ AUTO HAMMER ☐ MANUAL HAMMER |
| 12. TOTAL SAMPLES | DISTURBED 6 / UNDISTURBED (UD) 0 |
| 13. TOTAL NUMBER CORE BOXES | 0 |
| 14. ELEVATION GROUND WATER | |
| 15. DATE BORING | STARTED 02-14-11 / COMPLETED 02-14-11 |
| 16. ELEVATION TOP OF BORING | -57.3 Ft. |
| 17. TOTAL RECOVERY FOR BORING | 100 % |
| 18. SIGNATURE AND TITLE OF INSPECTOR | Karishma R. Desai, P.E., Geotechnical Engineer |

| ELEV. | DEPTH | LEGEND | CLASSIFICATION OF MATERIALS | % REC. | BOX OR SAMPLE | RQD OR UD | REMARKS | BLOWS/1 FT. | N-VALUE |
|---|---|---|---|---|---|---|---|---|---|
| -57.3 | 0.0 | | | | | | -57.3 | | |
| | | | SAND, poorly-graded, mostly fine to medium-grained sand-sized quartz, few medium-grained sand-sized shell, weak reaction with HCl, moist, 10Y 5/1 greenish gray (SP) | NR | | | Vibracore | | |
| | | | From El. -58.6 to -70.4 Ft., trace silt | | 1 | | -58.3 | | |
| | | | | | | | -61.3 | | |
| | | | | | 2 | | | | |
| | | | From El. -64.2 to -64.6 Ft., some fine to coarse-grained sand-sized shell | | | | -64.3 | | |
| | | | | | 3 | | | | |
| | | | From El. -66.7 to -67.9 Ft., little fine to medium-grained sand-sized shell | | | | -67.3 | | |
| | | | | | 4-Post 4 | | -67.3 | | |
| | | | From El. -68.3 to -70.4 Ft., strong reaction with HCl | | | | | | |
| | | | From El. -68.6 to -69.8 Ft., little fine to coarse-grained sand-sized shell | | | | -69.3 | | |
| | | | | | 5 | | | | |
| -70.4 | 13.1 | | At El. -69.6 Ft., a shell fragment (1-1/2" long, 3/8" wide) | | | | -70.4 | | |
| | | | BORING TERMINATED IN REFUSAL | | | | Abbreviations:<br>NR = Not Recorded. | | |
| | | | NOTES:<br>1. USACE Jacksonville is the custodian for these original files. | | | | | | |

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JUN 02

| DRILLING LOG (Cont. Sheet) | INSTALLATION | SHEET 2 OF 2 SHEETS |
|---|---|---|
| | Jacksonville District | |

| PROJECT | COORDINATE SYSTEM/DATUM | HORIZONTAL | VERTICAL |
|---|---|---|---|
| Off-Shore Borrow Area Investigations | State Plane, FLE (U.S. Ft.) | NAD83 | NAVD88 |

| LOCATION COORDINATES | ELEVATION TOP OF BORING |
|---|---|
| X = 687,241 Y = 1,890,088 | -57.3 Ft. |

| ELEV. | DEPTH | LEGEND | CLASSIFICATION OF MATERIALS | % REC. | BOX OR SAMPLE | RQD OR UD | REMARKS | BLOWS/ 1 FT. | N-VALUE |
|---|---|---|---|---|---|---|---|---|---|

2. Soils are field visually classified in accordance with the Unified Soils Classification System.

3. Laboratory Testing Results

| SAMPLE ID | SAMPLE DEPTH | LABORATORY CLASSIFICATION |
|---|---|---|
| 1 | 1.0/1.5 | SP* - |
| 2 | 4.0/4.5 | SP* - |
| 3 | 7.0/7.5 | SP* - |
| 4 | 10.0/10.5 | SP* - |
| 4-Post | 10.0/10.5 | SP* - |
| 5 | 12.0/12.5 | SP* - |

*Lab visual classification based on gradation curve. No Atterberg limits.

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SAJ FORM 1836-A
JUN 02

# DRILLING LOG

| | | | |
|---|---|---|---|
| DIVISION: South Atlantic | INSTALLATION: Jacksonville District | SHEET 1 OF 2 SHEETS | |
| 1. PROJECT: Off-Shore Borrow Area Investigations, Flagler County, Florida | 9. SIZE AND TYPE OF BIT: See Remarks | | |
| | 10. COORDINATE SYSTEM/DATUM: State Plane, FLE (U.S. Ft.) | HORIZONTAL: NAD83 | VERTICAL: NAVD88 |
| 2. BORING DESIGNATION: VC-FSP11-11 | LOCATION COORDINATES: X = 693,288 Y = 1,888,857 | 11. MANUFACTURER'S DESIGNATION OF DRILL | ☐ AUTO HAMMER ☐ MANUAL HAMMER |
| 3. DRILLING AGENCY: AVS | CONTRACTOR FILE NO.: 6734-11-9583 | 12. TOTAL SAMPLES | DISTURBED: 4 UNDISTURBED (UD): 0 |
| 4. NAME OF DRILLER: Brian McCord | | 13. TOTAL NUMBER CORE BOXES: 0 | |
| 5. DIRECTION OF BORING: ☒ VERTICAL ☐ INCLINED | DEG. FROM VERTICAL: | BEARING: | 14. ELEVATION GROUND WATER |
| | | 15. DATE BORING | STARTED: 02-14-11 COMPLETED: 02-14-11 |
| 6. THICKNESS OF OVERBURDEN: N/A | | 16. ELEVATION TOP OF BORING: -58.7 Ft. | |
| 7. DEPTH DRILLED INTO ROCK: N/A | | 17. TOTAL RECOVERY FOR BORING: 100 % | |
| 8. TOTAL DEPTH OF BORING: 8.2 Ft. | | 18. SIGNATURE AND TITLE OF INSPECTOR: Karishma R. Desai, P.E., Geotechnical Engineer | |

| ELEV. | DEPTH | LEGEND | CLASSIFICATION OF MATERIALS | % REC. | BOX OR SAMPLE | RQD OR UD | REMARKS | BLOWS/1 FT. | N-VALUE |
|---|---|---|---|---|---|---|---|---|---|
| -58.7 | 0.0 | | | | | | -58.7 | | |
| | | | SAND, poorly-graded, mostly fine to medium-grained sand-sized quartz, little fine to medium-grained sand-sized shell, weak reaction with HCl, moist, 5GY 5/1 greenish gray (SP) | NR | | | Vibracore | | |
| | | | | | | | -59.7 | | |
| | | | | | -Post 1 | | -59.7 | | |
| | | | From El. -61.9 to -66.9 Ft., mostly fine-grained sand-sized quartz | | | | -62.7 | | |
| | | | At El. -63.1 Ft., trace fine gravel-sized coral | | 2 | | | | |
| | | | From El. -63.7 to -64.2 Ft., little fine to coarse-grained sand-sized shell | | | | | | |
| | | | From El. -65.3 to -66.9 Ft., little medium-grained sand-sized shell | | | | -65.7 | | |
| | | | | | 3 | | | | |
| -66.9 | 8.2 | | | | | | -66.9 | | |

BORING TERMINATED IN REFUSAL

NOTES:

1. USACE Jacksonville is the custodian for these original files.

2. Soils are field visually classified in accordance with the Unified Soils Classification System.

3. Laboratory Testing Results

| SAMPLE ID | SAMPLE DEPTH | LABORATORY CLASSIFICATION |
|---|---|---|
| 1 | 1.0/1.5 | SP* |
| 1-Post | 1.0/1.5 | SP* |
| 2 | 4.0/4.5 | SP* |
| 3 | 7.0/7.5 | SP* |

*Lab visual classification based on gradation

Abbreviations:
NR = Not Recorded.

(Continued)

SAJ FORM 1836
JUN 02

| DRILLING LOG (Cont. Sheet) | INSTALLATION | SHEET 2 OF 2 SHEETS |
|---|---|---|
| | Jacksonville District | |

| PROJECT | COORDINATE SYSTEM/DATUM | HORIZONTAL | VERTICAL |
|---|---|---|---|
| Off-Shore Borrow Area Investigations | State Plane, FLE (U.S. Ft.) | NAD83 | NAVD88 |

| LOCATION COORDINATES | ELEVATION TOP OF BORING |
|---|---|
| X = 693,288 Y = 1,888,857 | -58.7 Ft. |

| ELEV. | DEPTH | LEGEND | CLASSIFICATION OF MATERIALS | % REC. | BOX OR SAMPLE | RQD OR UD | REMARKS | BLOWS/ 1 FT. | N-VALUE |
|---|---|---|---|---|---|---|---|---|---|
| | | | curve. No Atterberg limits. | | | | | | |

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SAJ FORM 1836-A
JUN 02

# DRILLING LOG

| | |
|---|---|
| DIVISION | South Atlantic |
| INSTALLATION | Jacksonville District |
| SHEET | 1 OF 2 SHEETS |
| 1. PROJECT | Off-Shore Borrow Area Investigations<br>Flagler County, Florida |
| 2. BORING DESIGNATION | VC-FSP11-12 |
| LOCATION COORDINATES | X = 691,249 Y = 1,884,893 |
| 3. DRILLING AGENCY | AVS |
| CONTRACTOR FILE NO. | 6734-11-9583 |
| 4. NAME OF DRILLER | Brian McCord |
| 5. DIRECTION OF BORING | ☒ VERTICAL ☐ INCLINED |
| DEG. FROM VERTICAL | |
| BEARING | |
| 6. THICKNESS OF OVERBURDEN | N/A |
| 7. DEPTH DRILLED INTO ROCK | N/A |
| 8. TOTAL DEPTH OF BORING | 10.2 Ft. |
| 9. SIZE AND TYPE OF BIT | See Remarks |
| 10. COORDINATE SYSTEM/DATUM | State Plane, FLE (U.S. Ft.) / HORIZONTAL: NAD83 / VERTICAL: NAVD88 |
| 11. MANUFACTURER'S DESIGNATION OF DRILL | ☐ AUTO HAMMER ☐ MANUAL HAMMER |
| 12. TOTAL SAMPLES | DISTURBED: 5 / UNDISTURBED (UD): 0 |
| 13. TOTAL NUMBER CORE BOXES | 0 |
| 14. ELEVATION GROUND WATER | |
| 15. DATE BORING | STARTED: 02-14-11 / COMPLETED: 02-14-11 |
| 16. ELEVATION TOP OF BORING | -57.1 Ft. |
| 17. TOTAL RECOVERY FOR BORING | 85 % |
| 18. SIGNATURE AND TITLE OF INSPECTOR | Karishma R. Desai, P.E., Geotechnical Engineer |

| ELEV. | DEPTH | LEGEND | CLASSIFICATION OF MATERIALS | % REC. | BOX OR SAMPLE | RQD OR UD | REMARKS | BLOWS/1 FT. | N-VALUE |
|---|---|---|---|---|---|---|---|---|---|
| -57.1 | 0.0 | | | | | | -57.1 | | |
| | | | SAND, poorly-graded, mostly fine to medium-grained sand-sized quartz, few fine to medium-grained sand-sized shell, no reaction with HCl, moist, 10Y 5/1 greenish gray (SP) | NR | | | Vibracore | | |
| | | | From El. -57.6 to -62.3 Ft., little fine to medium-grained sand-sized shell | | | | -58.1 | | |
| | | | At El. -59.3 Ft., a large shell (1" long and 3/4" wide) | | 1 | | | | |
| | | | From El. -60.5 to -67.3 Ft., trace silt | | | | -61.1 | | |
| | | | From El. -61.0 to -62.6 Ft., some fine to coarse-grained sand-sized shell, weak reaction with HCl, a coral fragment (1/2" long, 3/8" wide) | | 2-Post 2 | | -61.1 | | |
| | | | From El. -62.6 to -67.3 Ft., little fine to medium-grained sand-sized shell | | | | | | |
| | | | At El. -63.1 Ft., a large shell (1.5" long and 1/4" wide) | | | | -64.1 | | |
| | | | | | 3 | | -66.1 | | |
| | | | | | 4 | | | | |
| -67.3 | 10.2 | | | | | | -67.3 | | |
| | | | BORING TERMINATED IN REFUSAL | | | | Abbreviations:<br>NR = Not Recorded. | | |

NOTES:

1. USACE Jacksonville is the custodian for these original files.

2. Soils are field visually classified in accordance with the Unified Soils Classification System.

3. Vibracore penetrated to 10.2 feet. Sample recovery from 8.5 to 10.2 feet was not attained. Soil description based on material retained in the shoe.

(Continued)

SAJ FORM 1836
JUN 02

| DRILLING LOG (Cont. Sheet) | INSTALLATION | SHEET 2 OF 2 SHEETS |
|---|---|---|
| | Jacksonville District | |

| PROJECT | COORDINATE SYSTEM/DATUM | HORIZONTAL | VERTICAL |
|---|---|---|---|
| Off-Shore Borrow Area Investigations | State Plane, FLE (U.S. Ft.) | NAD83 | NAVD88 |

| LOCATION COORDINATES | ELEVATION TOP OF BORING |
|---|---|
| X = 691,249 Y = 1,884,893 | -57.1 Ft. |

| ELEV. | DEPTH | LEGEND | CLASSIFICATION OF MATERIALS | % REC. | BOX OR SAMPLE | RQD OR UD | REMARKS | BLOWS/ 1 FT. | N-VALUE |
|---|---|---|---|---|---|---|---|---|---|

4. Laboratory Testing Results

| SAMPLE ID | SAMPLE DEPTH | LABORATORY CLASSIFICATION |
|---|---|---|
| 1 | 1.0/1.5 | SP* - |
| 2 | 4.0/4.5 | SP* - |
| 2-Post | 4.0/4.5 | SP* - |
| 3 | 7.0/7.5 | SP* - |
| 4 | 9.0/9.5 | SP* - |

*Lab visual classification based on gradation curve. No Atterberg limits.

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SAJ FORM 1836-A
JUN 02

**DRILLING LOG**

| | |
|---|---|
| DIVISION | South Atlantic |
| INSTALLATION | Jacksonville District |
| SHEET | 1 OF 2 SHEETS |
| 1. PROJECT | Off-Shore Borrow Area Investigations<br>Flagler County, Florida |
| 2. BORING DESIGNATION | VC-FSP11-13 |
| LOCATION COORDINATES | X = 697,758 Y = 1,881,943 |
| 3. DRILLING AGENCY | AVS |
| CONTRACTOR FILE NO. | 6734-11-9583 |
| 4. NAME OF DRILLER | Brian McCord |
| 5. DIRECTION OF BORING | ☒ VERTICAL ☐ INCLINED |
| DEG. FROM VERTICAL | |
| BEARING | |
| 6. THICKNESS OF OVERBURDEN | N/A |
| 7. DEPTH DRILLED INTO ROCK | N/A |
| 8. TOTAL DEPTH OF BORING | 10.1 Ft. |
| 9. SIZE AND TYPE OF BIT | See Remarks |
| 10. COORDINATE SYSTEM/DATUM | State Plane, FLE (U.S. Ft.) / HORIZONTAL NAD83 / VERTICAL NAVD88 |
| 11. MANUFACTURER'S DESIGNATION OF DRILL | ☐ AUTO HAMMER ☐ MANUAL HAMMER |
| 12. TOTAL SAMPLES | DISTURBED 5 / UNDISTURBED (UD) 0 |
| 13. TOTAL NUMBER CORE BOXES | 0 |
| 14. ELEVATION GROUND WATER | Not Determined |
| 15. DATE BORING | STARTED 02-15-11 / COMPLETED 02-15-11 |
| 16. ELEVATION TOP OF BORING | -54.8 Ft. |
| 17. TOTAL RECOVERY FOR BORING | 100 % |
| 18. SIGNATURE AND TITLE OF INSPECTOR | Karishma R. Desai, P.E., Geotechnical Engineer |

| ELEV. | DEPTH | LEGEND | CLASSIFICATION OF MATERIALS | % REC. | BOX OR SAMPLE | RQD OR UD | REMARKS | BLOWS/1 FT. | N-VALUE |
|---|---|---|---|---|---|---|---|---|---|
| -54.8 | 0.0 | | | | | | -54.8 | | |
| | | | SAND, poorly-graded, mostly fine to medium-grained sand-sized quartz, few fine to medium-grained sand-sized shell, no reaction with HCl, moist, occasional gravel-sized shell, N 5/ gray (SP) | NR | | | Vibracore<br>-55.8 | | |
| | | | | | 1 | | -58.8 | | |
| | | | From El. -57.1 to -57.5 Ft., little fine to coarse-grained sand-sized shell | | | | | | |
| | | | From El. -58.7 to -59.8 Ft., mostly fine-grained sand-sized quartz, little fine to medium-grained sand-sized shell | | 2-Post 2 | | -58.8 | | |
| | | | From El. -60.2 to -64.9 Ft., little medium-grained sand-sized shell, weak reaction with HCl | | | | -61.8 | | |
| | | | | | 3 | | -63.8 | | |
| | | | From El. -63.5 to -64.9 Ft., mostly fine-grained sand-sized quartz | | 4 | | -64.9 | | |
| -64.9 | 10.1 | | BORING TERMINATED IN REFUSAL | | | | | | |

NOTES:

1. USACE Jacksonville is the custodian for these original files.

2. Soils are field visually classified in accordance with the Unified Soils Classification System.

3. Laboratory Testing Results

| SAMPLE ID | SAMPLE DEPTH | LABORATORY CLASSIFICATION |
|---|---|---|

Abbreviations:
NR = Not Recorded.

(Continued)

**SAJ FORM 1836**
JUN 02

| DRILLING LOG (Cont. Sheet) | INSTALLATION | SHEET 2 OF 2 SHEETS |
|---|---|---|
| | Jacksonville District | |

| PROJECT | COORDINATE SYSTEM/DATUM | HORIZONTAL | VERTICAL |
|---|---|---|---|
| Off-Shore Borrow Area Investigations | State Plane, FLE (U.S. Ft.) | NAD83 | NAVD88 |

| LOCATION COORDINATES | ELEVATION TOP OF BORING |
|---|---|
| X = 697,758 Y = 1,881,943 | -54.8 Ft. |

| ELEV. | DEPTH | LEGEND | CLASSIFICATION OF MATERIALS | % REC. | BOX OR SAMPLE | RQD OR UD | REMARKS | BLOWS/ 1 FT. | N-VALUE |
|---|---|---|---|---|---|---|---|---|---|
| | | | 1 1.0/1.5 SP* -<br>2 4.0/4.5 SP* -<br>2-Post 4.0/4.5 SP* -<br>3 7.0/7.5 SP* -<br>4 9.0/9.5 SP* -<br><br>*Lab visual classification based on gradation curve. No Atterberg limits. | | | | | | |

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SAJ FORM 1836-A
JUN 02

**DRILLING LOG**

| | |
|---|---|
| DIVISION | South Atlantic |
| INSTALLATION | Jacksonville District |
| SHEET | 1 OF 2 SHEETS |
| 1. PROJECT | Off-Shore Borrow Area Investigations<br>Flagler County, Florida |
| 2. BORING DESIGNATION | VC-FSP11-14 |
| LOCATION COORDINATES | X = 652,240 Y = 1,872,434 |
| 3. DRILLING AGENCY | AVS |
| CONTRACTOR FILE NO. | 6734-11-9583 |
| 4. NAME OF DRILLER | Brian McCord |
| 5. DIRECTION OF BORING | ☒ VERTICAL ☐ INCLINED |
| DEG. FROM VERTICAL | |
| BEARING | |
| 6. THICKNESS OF OVERBURDEN | N/A |
| 7. DEPTH DRILLED INTO ROCK | N/A |
| 8. TOTAL DEPTH OF BORING | 20.0 Ft. |
| 9. SIZE AND TYPE OF BIT | See Remarks |
| 10. COORDINATE SYSTEM/DATUM | State Plane, FLE (U.S. Ft.) / HORIZONTAL NAD83 / VERTICAL NAVD88 |
| 11. MANUFACTURER'S DESIGNATION OF DRILL | ☐ AUTO HAMMER ☐ MANUAL HAMMER |
| 12. TOTAL SAMPLES | DISTURBED 4 / UNDISTURBED (UD) 0 |
| 13. TOTAL NUMBER CORE BOXES | 0 |
| 14. ELEVATION GROUND WATER | |
| 15. DATE BORING | STARTED 02-15-11 / COMPLETED 02-15-11 |
| 16. ELEVATION TOP OF BORING | -58.1 Ft. |
| 17. TOTAL RECOVERY FOR BORING | 94 % |
| 18. SIGNATURE AND TITLE OF INSPECTOR | Karishma R. Desai, P.E., Geotechnical Engineer |

| ELEV. | DEPTH | LEGEND | CLASSIFICATION OF MATERIALS | % REC. | BOX OR SAMPLE | RQD OR UD | REMARKS | BLOWS/1 FT. | N-VALUE |
|---|---|---|---|---|---|---|---|---|---|
| -58.1 | 0.0 | | | | | | -58.1 | | |
| | | | SAND, poorly-graded, mostly fine to medium-grained sand-sized quartz, little fine to medium-grained sand-sized shell, trace silt, weak reaction with HCl, moist, 10Y 5/1 greenish gray (SP) | NR | | | Vibracore<br>-59.1 | | |
| | | | From El. -59.7 to -60.4 Ft., few fine to coarse gravel-sized shell | | 1 | | -61.1 | | |
| | | | From El. -61.4 to -63.6 Ft., trace silt, occasional fine to coarse gravel-sized shell, 5GY 5/1 greenish gray | | 2 | | -63.1 | | |
| -63.6 | 5.5 | | | | 3 | | | | |
| | | | SAND, poorly-graded with silt, mostly fine-grained sand-sized quartz, little fine to coarse-grained sand-sized shell, few silt, weak reaction with HCl, moist, 5GY 4/1 dark greenish gray (SP-SM) | | | | -66.1 | | |
| -66.9 | 8.8 | | | | 4 | | | | |
| | | | SAND, silty, mostly fine-grained sand-sized quartz, little silt, little fine to coarse-grained sand-sized shell, weak reaction with HCl, moist, 5GY 4/1 dark greenish gray (SM) | | | | | | |
| | | | At El. -67.8 Ft., trace fine gravel-sized shell | | | | | | |
| | | | From El. -68.3 to -68.9 Ft., some silt | | | | | | |
| | | | From El. -68.9 to -76.9 Ft., some silt, some fine to coarse-grained sand-sized shell, trace fine gravel-sized shell | | | | | | |
| | | | From El. -71.9 to -76.9 Ft., silt content decreasing with depth, shell content increasing with depth | | | | | | |

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(Continued)

SAJ FORM 1836
JUN 02

| DRILLING LOG (Cont. Sheet) | INSTALLATION | SHEET 2 OF 2 SHEETS |
|---|---|---|
| | Jacksonville District | |

| PROJECT | COORDINATE SYSTEM/DATUM | HORIZONTAL | VERTICAL |
|---|---|---|---|
| Off-Shore Borrow Area Investigations | State Plane, FLE (U.S. Ft.) | NAD83 | NAVD88 |

| LOCATION COORDINATES | ELEVATION TOP OF BORING |
|---|---|
| X = 652,240 Y = 1,872,434 | -58.1 Ft. |

| ELEV. | DEPTH | LEGEND | CLASSIFICATION OF MATERIALS | % REC. | BOX OR SAMPLE | RQD OR UD | REMARKS | BLOWS/ 1 FT. | N-VALUE |
|---|---|---|---|---|---|---|---|---|---|
| -78.1 | 20.0 | | At El. -76.3 Ft., trace coarse-grained sand-sized shell<br>At El. -76.9 Ft., trace coarse-grained sand-sized limestone | | | | -78.1 | | |

NOTES:

1. USACE Jacksonville is the custodian for these original files.

2. Soils are field visually classified in accordance with the Unified Soils Classification System.

3. Vibracore penetrated to 20.0 feet. Sample recovery from 18.8 to 20 feet was not attained. Soil description based on material retained in the shoe.

4. Laboratory Testing Results

| SAMPLE ID | SAMPLE DEPTH | LABORATORY CLASSIFICATION |
|---|---|---|
| 1 | 1.0/1.5 | SP* |
| 2 | 3.0/3.5 | SP* |
| 3 | 5.0/5.5 | SP* |
| 4 | 8.0/8.5 | SP-SM* |

*Lab visual classification based on gradation curve. No Atterberg limits.

Abbreviations:
NR = Not Recorded.

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**SAJ FORM 1836-A**
**JUN 02**

**DRILLING LOG**

| | |
|---|---|
| DIVISION | South Atlantic |
| INSTALLATION | Jacksonville District |
| SHEET | 1 OF 2 SHEETS |
| 1. PROJECT | Off-Shore Borrow Area Investigations<br>Flagler County, Florida |
| 2. BORING DESIGNATION | VC-FSP11-15 |
| LOCATION COORDINATES | X = 655,510 Y = 1,872,704 |
| 3. DRILLING AGENCY | AVS |
| CONTRACTOR FILE NO. | 6734-11-9583 |
| 4. NAME OF DRILLER | Brian McCord |
| 5. DIRECTION OF BORING | ☒ VERTICAL ☐ INCLINED |
| DEG. FROM VERTICAL | |
| BEARING | |
| 6. THICKNESS OF OVERBURDEN | N/A |
| 7. DEPTH DRILLED INTO ROCK | N/A |
| 8. TOTAL DEPTH OF BORING | 18.4 Ft. |
| 9. SIZE AND TYPE OF BIT | See Remarks |
| 10. COORDINATE SYSTEM/DATUM | State Plane, FLE (U.S. Ft.) |
| HORIZONTAL | NAD83 |
| VERTICAL | NAVD88 |
| 11. MANUFACTURER'S DESIGNATION OF DRILL | ☐ AUTO HAMMER ☐ MANUAL HAMMER |
| 12. TOTAL SAMPLES | DISTURBED 5 / UNDISTURBED (UD) 0 |
| 13. TOTAL NUMBER CORE BOXES | 0 |
| 14. ELEVATION GROUND WATER | |
| 15. DATE BORING | STARTED 02-15-11 / COMPLETED 02-15-11 |
| 16. ELEVATION TOP OF BORING | -62.4 Ft. |
| 17. TOTAL RECOVERY FOR BORING | 88 % |
| 18. SIGNATURE AND TITLE OF INSPECTOR | Karishma R. Desai, P.E., Geotechnical Engineer |

| ELEV. | DEPTH | LEGEND | CLASSIFICATION OF MATERIALS | % REC. | BOX OR SAMPLE | RQD OR UD | REMARKS | BLOWS/1 FT. | N-VALUE |
|---|---|---|---|---|---|---|---|---|---|
| -62.4 | 0.0 | | | | | | -62.4 | | |
| | | | SAND, poorly-graded, mostly fine-grained sand-sized quartz, little fine to medium-grained sand-sized shell, trace silt, weak reaction with HCl, moist, occasional traces of fine to coarse gravel-sized shell, 10Y 4/1 dark greenish gray (SP) | NR | | | Vibracore<br>-63.4 | | |
| | | | | | 1 | | -66.4 | | |
| -66.9 | 4.5 | | From El. -64.4 to -66.9 Ft., strong reaction with HCl | | 2 | | -68.4 | | |
| | | | SAND, poorly-graded with silt, mostly fine-grained sand-sized quartz, little fine to medium-grained sand-sized shell, few silt, strong reaction with HCl, moist, 10Y 4/1 dark greenish gray (SP-SM) | | 3 | | -71.4 | | |
| -70.9 | 8.5 | | From El. -69.9 to -70.9 Ft., 5GY 4/1 dark greenish gray | | | | | | |
| | | | SAND, poorly-graded, some fine-grained sand-sized quartz, some fine to coarse-grained sand-sized shell, little fine gravel-sized shell, trace silt, weak reaction with HCl, wet, 5GY 4/1 dark greenish gray (SP) | | 4 | | -75.4 | | |
| | | | At El. -73.4 Ft., trace fine gravel-sized shell | | | | | | |
| -74.2 | 11.8 | | SAND, poorly-graded, mostly fine-grained sand-sized quartz, little fine to medium-grained sand-sized shell, weak reaction with HCl, moist, occasional trace of silt nodules, 10Y 6/1 greenish gray (SP) | | 5 | | | | |

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**SAJ FORM 1836**
**JUN 02**

*(Continued)*

| DRILLING LOG (Cont. Sheet) | INSTALLATION | SHEET 2 OF 2 SHEETS |
|---|---|---|
| | Jacksonville District | |

| PROJECT | COORDINATE SYSTEM/DATUM | HORIZONTAL | VERTICAL |
|---|---|---|---|
| Off-Shore Borrow Area Investigations | State Plane, FLE (U.S. Ft.) | NAD83 | NAVD88 |

| LOCATION COORDINATES | ELEVATION TOP OF BORING |
|---|---|
| X = 655,510 Y = 1,872,704 | -62.4 Ft. |

| ELEV. | DEPTH | LEGEND | CLASSIFICATION OF MATERIALS | % REC. | BOX OR SAMPLE | RQD OR UD | REMARKS | BLOWS/ 1 FT. | N-VALUE |
|---|---|---|---|---|---|---|---|---|---|
| -80.8 | 18.4 | | BORING TERMINATED IN REFUSAL | | | | -80.8 | | |

NOTES:

1. USACE Jacksonville is the custodian for these original files.

2. Soils are field visually classified in accordance with the Unified Soils Classification System.

3. Vibracore penetrated to 18.4 feet. Sample recovery from 15.6 to 18.4 feet was not attained. Soil description based on material retained in the shoe.

4. Laboratory Testing Results

| SAMPLE ID | SAMPLE DEPTH | LABORATORY CLASSIFICATION |
|---|---|---|
| 1 | 1.0/1.5 | SP* |
| 2 | 4.0/4.5 | SP* |
| 3 | 6.0/6.5 | SP-SM* |
| 4 | 9.0/9.5 | SP* |
| 5 | 13.0/13.5 | SP* |

*Lab visual classification based on gradation curve. No Atterberg limits.

Abbreviations:
NR = Not Recorded.

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SAJ FORM 1836-A
JUN 02

# DRILLING LOG

| | |
|---|---|
| DIVISION | South Atlantic |
| INSTALLATION | Jacksonville District |
| SHEET | 1 OF 2 SHEETS |
| 1. PROJECT | Off-Shore Borrow Area Investigations<br>Flagler County, Florida |
| 2. BORING DESIGNATION | VC-FSP11-16 |
| LOCATION COORDINATES | X = 653,442 Y = 1,868,195 |
| 3. DRILLING AGENCY | AVS |
| CONTRACTOR FILE NO. | 6734-11-9583 |
| 4. NAME OF DRILLER | Brian McCord |
| 5. DIRECTION OF BORING | ☒ VERTICAL ☐ INCLINED |
| DEG. FROM VERTICAL | |
| BEARING | |
| 6. THICKNESS OF OVERBURDEN | N/A |
| 7. DEPTH DRILLED INTO ROCK | N/A |
| 8. TOTAL DEPTH OF BORING | 8.8 Ft. |
| 9. SIZE AND TYPE OF BIT | See Remarks |
| 10. COORDINATE SYSTEM/DATUM | State Plane, FLE (U.S. Ft.) / HORIZONTAL: NAD83 / VERTICAL: NAVD88 |
| 11. MANUFACTURER'S DESIGNATION OF DRILL | ☐ AUTO HAMMER ☐ MANUAL HAMMER |
| 12. TOTAL SAMPLES | DISTURBED: 4 / UNDISTURBED (UD): 0 |
| 13. TOTAL NUMBER CORE BOXES | 0 |
| 14. ELEVATION GROUND WATER | |
| 15. DATE BORING | STARTED: 02-15-11 / COMPLETED: 02-15-11 |
| 16. ELEVATION TOP OF BORING | -53.8 Ft. |
| 17. TOTAL RECOVERY FOR BORING | 97 % |
| 18. SIGNATURE AND TITLE OF INSPECTOR | Karishma R. Desai, P.E., Geotechnical Engineer |

| ELEV. | DEPTH | LEGEND | CLASSIFICATION OF MATERIALS | % REC. | BOX OR SAMPLE | RQD OR UD | REMARKS | BLOWS/1 FT. | N-VALUE |
|---|---|---|---|---|---|---|---|---|---|
| -53.8 | 0.0 | | | | | | -53.8 | | |
| | | | SAND, poorly-graded, mostly fine-grained sand-sized quartz, few fine to medium-grained sand-sized shell, trace silt, no reaction with HCl, moist, occasional trace of fine gravel-sized shell, 5GY 6/1 greenish gray (SP) | NR | | | Vibracore<br>-54.8 | | |
| | | | | | 1 | | -57.8 | | |
| | | | | | 2-Post 2 | | -57.8 | | |
| | | | From El. -59.4 to -59.6 Ft., some fine to coarse-grained sand-sized shell, trace fine gravel-sized shell<br>From El. -59.5 to -62.3 Ft., 10Y 5/1 greenish gray<br>From El. -60.5 to -62.3 Ft., some fine to coarse-grained sand-sized shell, few fine gravel-sized shell, strong reaction with HCl | | | | -60.8 | | |
| | | | | | 3 | | | | |
| -62.6 | 8.8 | | | | | | -62.6 | | |
| | | | BORING TERMINATED IN REFUSAL<br><br>NOTES:<br><br>1. USACE Jacksonville is the custodian for these original files.<br><br>2. Soils are field visually classified in accordance with the Unified Soils Classification System.<br><br>3. Sanple recovery from 8.5 to 8.8 feet was not attained. Vibracore penetrated to 8.8 feet. Soil description based on material retained in the shoe.<br><br>4. Laboratory Testing Results<br><br>SAMPLE ID / SAMPLE DEPTH / LABORATORY CLASSIFICATION | | | | Abbreviations:<br>NR = Not Recorded. | | |

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(Continued)

SAJ FORM 1836
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| DRILLING LOG (Cont. Sheet) | INSTALLATION | SHEET 2 OF 2 SHEETS |
|---|---|---|
| | Jacksonville District | |

| PROJECT | COORDINATE SYSTEM/DATUM | HORIZONTAL | VERTICAL |
|---|---|---|---|
| Off-Shore Borrow Area Investigations | State Plane, FLE (U.S. Ft.) | NAD83 | NAVD88 |

| LOCATION COORDINATES | ELEVATION TOP OF BORING |
|---|---|
| X = 653,442 Y = 1,868,195 | -53.8 Ft. |

| ELEV. | DEPTH | LEGEND | CLASSIFICATION OF MATERIALS | % REC. | BOX OR SAMPLE | RQD OR UD | REMARKS | BLOWS/ 1 FT. | N-VALUE |
|---|---|---|---|---|---|---|---|---|---|
| | | | 1 1.0/1.5 SP* -<br>2 4.0/4.5 SP* -<br>2-Post 4.0/4.5 SP* -<br>3 7.0/7.5 SP* -<br><br>*Lab visual classification based on gradation curve. No Atterberg limits. | | | | | | |

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SAJ FORM 1836-A
JUN 02

**DRILLING LOG**

| | |
|---|---|
| DIVISION | South Atlantic |
| INSTALLATION | Jacksonville District |
| SHEET | 1 OF 2 SHEETS |
| 1. PROJECT | Off-Shore Borrow Area Investigations<br>Flagler County, Florida |
| 2. BORING DESIGNATION | VC-FSP11-17 |
| LOCATION COORDINATES | X = 650,134 Y = 1,865,965 |
| 3. DRILLING AGENCY | AVS |
| CONTRACTOR FILE NO. | 6734-11-9583 |
| 4. NAME OF DRILLER | Brian McCord |
| 5. DIRECTION OF BORING | ☒ VERTICAL ☐ INCLINED |
| DEG. FROM VERTICAL | |
| BEARING | |
| 6. THICKNESS OF OVERBURDEN | N/A |
| 7. DEPTH DRILLED INTO ROCK | N/A |
| 8. TOTAL DEPTH OF BORING | 20.0 Ft. |
| 9. SIZE AND TYPE OF BIT | See Remarks |
| 10. COORDINATE SYSTEM/DATUM | State Plane, FLE (U.S. Ft.) / HORIZONTAL NAD83 / VERTICAL NAVD88 |
| 11. MANUFACTURER'S DESIGNATION OF DRILL | ☐ AUTO HAMMER ☐ MANUAL HAMMER |
| 12. TOTAL SAMPLES | DISTURBED 3 / UNDISTURBED (UD) 0 |
| 13. TOTAL NUMBER CORE BOXES | 0 |
| 14. ELEVATION GROUND WATER | |
| 15. DATE BORING | STARTED 02-15-11 / COMPLETED 02-15-11 |
| 16. ELEVATION TOP OF BORING | -68.5 Ft. |
| 17. TOTAL RECOVERY FOR BORING | 100 % |
| 18. SIGNATURE AND TITLE OF INSPECTOR | Karishma R. Desai, P.E., Geotechnical Engineer |

| ELEV. | DEPTH | LEGEND | CLASSIFICATION OF MATERIALS | % REC. | BOX OR SAMPLE | RQD OR UD | REMARKS | BLOWS/1 FT. | N-VALUE |
|---|---|---|---|---|---|---|---|---|---|
| -68.5 | 0.0 | | | | | | -68.5 | | |
| -69.0 | 0.5 | | SAND, silty, mostly fine-grained sand-sized quartz, some sand to gravel-sized shell, little silt, strong reaction with HCl, moist, 10GY 4/1 dark greenish gray (SM) | NR | | | -69.0 Vibracore | | |
| | | | | | 1 | | | | |
| | | | SAND, poorly-graded, mostly fine-grained sand-sized quartz, little fine to coarse-grained sand-sized shell, few fine gravel-sized shell, trace silt, weak reaction with HCl, moist, 5B 6/1 bluish gray (SP) | | | | | | |
| | | | From El. -71.5 to -75.5 Ft., little medium-grained sand-sized shell | | | | -72.5 | | |
| | | | | | 2 | | | | |
| | | | | | | | -75.5 | | |
| | | | | | 3 | | | | |
| | | | At El. -76.2 Ft., trace silt nodules<br>From El. -76.4 to -77.4 Ft., 10Y 5/1 greenish gray | | | | | | |
| -77.4 | 8.9 | | | | | | | | |
| | | Mod. Weathered | LIMESTONE, fossiliferous, moderately hard, moderately weathered, fine grained, highly fractured, solid, some silt, little sand to gravel-sized shell, few fine-grained sand-sized quartz, 5GY 5/1 greenish gray | | | | | | |
| -79.3 | 10.8 | | At El. -79.2 Ft., some sand to gravel-sized shell, a large shell (approximately 2" long and 1-3/4" wide) | | | | | | |
| -80.4 | 11.9 | | SAND, silty, mostly fine-grained sand-sized quartz, some silt, trace fine to coarse-grained sand-sized shell, weak reaction with HCl, moist, occasional silt seams (up to 1/4" thick), 5GY 5/1 greenish gray (SM) | | | | | | |
| -82.1 | 13.6 | | SAND, silty, mostly fine to coarse-grained sand-sized shell, little silt, few fine-grained sand-sized quartz, few fine to coarse gravel-sized shell, a cobble-sized limestone (approximately 3.25" in diameter), | | | | | | |

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SAJ FORM 1836
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| DRILLING LOG (Cont. Sheet) | INSTALLATION | SHEET 2 OF 2 SHEETS |
|---|---|---|
| | Jacksonville District | |

| PROJECT | COORDINATE SYSTEM/DATUM | HORIZONTAL | VERTICAL |
|---|---|---|---|
| Off-Shore Borrow Area Investigations | State Plane, FLE (U.S. Ft.) | NAD83 | NAVD88 |

| LOCATION COORDINATES | ELEVATION TOP OF BORING |
|---|---|
| X = 650,134 Y = 1,865,965 | -68.5 Ft. |

| ELEV. | DEPTH | LEGEND | CLASSIFICATION OF MATERIALS | % REC. | BOX OR SAMPLE | RQD OR UD | REMARKS | BLOWS/ 1 FT. | N-VALUE |
|---|---|---|---|---|---|---|---|---|---|
| | | | 10GY 5/1 greenish gray (SM) SILT, inorganic-L, low plasticity, very soft, little clay, little fine-grained sand-sized quartz, few fine to coarse-grained sand-sized shell, weak reaction with HCl, moist, 5G 5/1 greenish gray (ML) | | | | | | |
| -87.0 | 18.5 | | At El. -82.5 Ft., few fine gravel-sized limestone<br>From El. -83.5 to -83.9 Ft., few fine to coarse gravel-sized limestone<br>At El. -84.4 Ft., trace clay nodules<br>From El. -84.7 to -86.7 Ft., clay content increasing with depth, quartz content decreasing with depth, 10GY 3/1 very dark greenish gray | | | | | | |
| -88.5 | 20.0 | Mod. Wea. | LIMESTONE, fossiliferous, moderately hard, moderately weathered, fine grained, intensely fractured, solid, some silt, few clay, few fine-grained sand-sized quartz, 5GY 4/1 dark greenish gray | | | | -88.5 | | |

NOTES:

1. USACE Jacksonville is the custodian for these original files.

2. Soils are field visually classified in accordance with the Unified Soils Classification System.

3. Laboratory Testing Results

| SAMPLE ID | SAMPLE DEPTH | LABORATORY CLASSIFICATION |
|---|---|---|
| 1 | 0.5/1.0 | SP* |
| 2 | 4.0/4.5 | SP* |
| 3 | 7.0/7.5 | SP* |

*Lab visual classification based on gradation curve. No Atterberg limits.

Abbreviations:
NR = Not Recorded.

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SAJ FORM 1836-A
JUN 02

**DRILLING LOG**

| | |
|---|---|
| DIVISION | South Atlantic |
| INSTALLATION | Jacksonville District |
| SHEET | 1 OF 2 SHEETS |
| 1. PROJECT | Off-Shore Borrow Area Investigations<br>Flagler County, Florida |
| 2. BORING DESIGNATION | VC-FSP11-18 |
| LOCATION COORDINATES | X = 653,545 Y = 1,864,379 |
| 3. DRILLING AGENCY | AVS |
| CONTRACTOR FILE NO. | 6734-11-9583 |
| 4. NAME OF DRILLER | Brian McCord |
| 5. DIRECTION OF BORING | ☒ VERTICAL ☐ INCLINED |
| DEG. FROM VERTICAL | |
| BEARING | |
| 6. THICKNESS OF OVERBURDEN | N/A |
| 7. DEPTH DRILLED INTO ROCK | N/A |
| 8. TOTAL DEPTH OF BORING | 20.0 Ft. |
| 9. SIZE AND TYPE OF BIT | See Remarks |
| 10. COORDINATE SYSTEM/DATUM | State Plane, FLE (U.S. Ft.) |
| HORIZONTAL | NAD83 |
| VERTICAL | NAVD88 |
| 11. MANUFACTURER'S DESIGNATION OF DRILL | ☐ AUTO HAMMER ☐ MANUAL HAMMER |
| 12. TOTAL SAMPLES | DISTURBED 2 / UNDISTURBED (UD) 0 |
| 13. TOTAL NUMBER CORE BOXES | 0 |
| 14. ELEVATION GROUND WATER | |
| 15. DATE BORING | STARTED 02-15-11 / COMPLETED 02-15-11 |
| 16. ELEVATION TOP OF BORING | -61.0 Ft. |
| 17. TOTAL RECOVERY FOR BORING | 98 % |
| 18. SIGNATURE AND TITLE OF INSPECTOR | Karishma R. Desai, P.E., Geotechnical Engineer |

| ELEV. | DEPTH | LEGEND | CLASSIFICATION OF MATERIALS | % REC. | BOX OR SAMPLE | RQD OR UD | REMARKS | BLOWS/1 FT. | N-VALUE |
|---|---|---|---|---|---|---|---|---|---|
| -61.0 | 0.0 | | | | | | -61.0 | | |
| | | | SAND, poorly-graded, mostly fine to coarse-grained sand-sized shell, some fine-grained sand-sized quartz, few fine-grained sand-sized shell, weak reaction with HCl, moist, 10Y 4/1 dark greenish gray (SP) | NR | | | Vibracore | | |
| | | | | | | | -62.0 | | |
| -63.0 | 2.0 | | At El. -61.8 Ft., occasional silt nodules, 5GY 4/1 dark greenish gray | | 1 | | | | |
| | | | SAND, silty, mostly fine-grained sand-sized quartz, little silt, few fine to medium-grained sand-sized shell, weak reaction with HCl, moist, 10Y 3/1 very dark greenish gray (SM) | | | | | | |
| | | | From El. -65.5 to -70.5 Ft., 10Y 4/1 dark greenish gray | | | | -66.0 | | |
| | | | | | 2 | | | | |
| | | | From El. -69.1 to -70.5 Ft., little fine to coarse-grained sand-sized shell | | | | | | |
| | | | From El. -69.5 to -70.5 Ft., occasional trace fine gravel-sized shell | | | | | | |
| -70.5 | 9.5 | | | | | | | | |
| | | | SAND, poorly-graded with silt, mostly fine-grained sand-sized quartz, few silt, trace fine to coarse-grained sand-sized shell, weak reaction with HCl, moist, 10Y 5/1 greenish gray (SP-SM) | | | | | | |
| | | | From El. -71.8 to -72.4 Ft., some fine to coarse-grained sand-sized shell, trace fine gravel-sized shell | | | | | | |
| | | | From El. -72.4 to -73.3 Ft., little fine to coarse-grained sand-sized shell | | | | | | |
| | | | From El. -73.5 to -74.0 Ft., few fine to medium-grained sand-sized shell, strong reaction with HCl | | | | | | |
| -74.5 | 13.5 | | | | | | | | |
| | | Mod. Wea. | LIMESTONE, fossiliferous, soft, moderately weathered, fine grained, intensely fractured, little sand to gravel-sized shell, few silt, few fine-grained sand-sized quartz, increasing silt content with depth, 10Y 6/1 greenish gray | | | | | | |

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SAJ FORM 1836
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| DRILLING LOG (Cont. Sheet) | INSTALLATION | SHEET 2 OF 2 SHEETS |
|---|---|---|
| | Jacksonville District | |

| PROJECT | COORDINATE SYSTEM/DATUM | HORIZONTAL | VERTICAL |
|---|---|---|---|
| Off-Shore Borrow Area Investigations | State Plane, FLE (U.S. Ft.) | NAD83 | NAVD88 |

| LOCATION COORDINATES | ELEVATION TOP OF BORING |
|---|---|
| X = 653,545 Y = 1,864,379 | -61.0 Ft. |

| ELEV. | DEPTH | LEGEND | CLASSIFICATION OF MATERIALS | % REC. | BOX OR SAMPLE | RQD OR UD | REMARKS | BLOWS/ 1 FT. | N-VALUE |
|---|---|---|---|---|---|---|---|---|---|
| -77.5 | 16.5 | Mod. Wea. | | | | | | | |
| | | | SAND, silty, mostly fine-grained sand-sized quartz, some silt, no reaction with HCl, moist, trace clay nodules, 5GY 5/1 greenish gray (SM) | | | | | | |
| | | | From El. -79.9 to -80.5 Ft., trace fine-grained sand-sized shell, strong reaction with HCl | | | | | | |
| -81.0 | 20.0 | | | | | | -81.0 | | |

NOTES:

1. USACE Jacksonville is the custodian for these original files.

2. Soils are field visually classified in accordance with the Unified Soils Classification System.

3. Vibracore penetrated to 20 feet. Sample recovery from 19.5 to 20 feet was not attained.

4. Laboratory Testing Results

| SAMPLE ID | SAMPLE DEPTH | LABORATORY CLASSIFICATION |
|---|---|---|
| 1 | 1.0/1.5 | SP* |
| 2 | 5.0/5.5 | SM* |

*Lab visual classification based on gradation curve. No Atterberg limits.

Abbreviations:
NR = Not Recorded.

15 20 25 30 35

**SAJ FORM 1836-A**
**JUN 02**

**DRILLING LOG**

| | |
|---|---|
| DIVISION | South Atlantic |
| INSTALLATION | Jacksonville District |
| SHEET | 1 OF 2 SHEETS |
| 1. PROJECT | Off-Shore Borrow Area Investigations<br>Flagler County, Florida |
| 2. BORING DESIGNATION | VC-FSP11-19 |
| LOCATION COORDINATES | X = 656,770 Y = 1,864,383 |
| 3. DRILLING AGENCY | AVS |
| CONTRACTOR FILE NO. | 6734-11-9583 |
| 4. NAME OF DRILLER | Brian McCord |
| 5. DIRECTION OF BORING | ☒ VERTICAL ☐ INCLINED |
| DEG. FROM VERTICAL | |
| BEARING | |
| 6. THICKNESS OF OVERBURDEN | N/A |
| 7. DEPTH DRILLED INTO ROCK | N/A |
| 8. TOTAL DEPTH OF BORING | 20.0 Ft. |
| 9. SIZE AND TYPE OF BIT | See Remarks |
| 10. COORDINATE SYSTEM/DATUM | State Plane, FLE (U.S. Ft.) |
| HORIZONTAL | NAD83 |
| VERTICAL | NAVD88 |
| 11. MANUFACTURER'S DESIGNATION OF DRILL | ☐ AUTO HAMMER ☐ MANUAL HAMMER |
| 12. TOTAL SAMPLES | DISTURBED 1 / UNDISTURBED (UD) 0 |
| 13. TOTAL NUMBER CORE BOXES | 0 |
| 14. ELEVATION GROUND WATER | |
| 15. DATE BORING | STARTED 02-15-11 / COMPLETED 02-15-11 |
| 16. ELEVATION TOP OF BORING | -67.9 Ft. |
| 17. TOTAL RECOVERY FOR BORING | 97 % |
| 18. SIGNATURE AND TITLE OF INSPECTOR | Karishma R. Desai, P.E., Geotechnical Engineer |

| ELEV. | DEPTH | LEGEND | CLASSIFICATION OF MATERIALS | % REC. | BOX OR SAMPLE | RQD OR UD | REMARKS | BLOWS/1 FT. | N-VALUE |
|---|---|---|---|---|---|---|---|---|---|
| -67.9 | 0.0 | | | | | | -67.9 | | |
| | | | SAND, silty, mostly fine-grained sand-sized quartz, little silt, trace fine to medium-grained sand-sized shell, strong reaction with HCl, moist, 10GY 3/1 very dark greenish gray (SM)<br>From El. -69.2 to -70.7 Ft., few sand to gravel-sized shell | | | | | | |
| | | | From El. -70.7 to -71.3 Ft., few fine to medium-grained sand-sized shell, a large shell (2" long and wide)<br>From El. -71.3 to -73.2 Ft., little fine to coarse-grained sand-sized shell | NR | | | Vibracore | | |
| -71.9 | 4.0 | | SAND, poorly-graded with silt, mostly fine-grained sand-sized quartz, some fine to coarse-grained sand-sized shell, few silt, weak reaction with HCl, moist, 10GY 3/1 very dark greenish gray (SP-SM)<br>From El. -73.2 to -74.1 Ft., little fine to coarse-grained sand-sized shell<br>From El. -74.1 to -75.2 Ft., trace fine to coarse-grained sand-sized shell, occasional silt nodules | | | | -73.9 | | |
| -75.4 | 7.5 | | SAND, silty, mostly fine-grained sand-sized quartz, little silt, trace fine-grained sand-sized shell, strong reaction with HCl, moist, occasional trace of cemented clayey sand nodules, 5GY 6/1 greenish gray (SM)<br>At El. -76.7 Ft., trace fine-grained sand-sized shell<br>From El. -76.8 to -77.3 Ft., occasional clay nodules<br>From El. -78.3 to -79.7 Ft., little clay, 10Y 5/1 greenish gray | | 1 | | | | |
| -79.7 | 11.8 | | SAND, clayey, mostly fine-grained sand-sized quartz, some clay, little silt, strong reaction with HCl, moist, occasional trace of fine-grained sand-sized shell, 10Y 5/1 greenish gray (SC) | | | | | | |

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(Continued)

SAJ FORM 1836
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| DRILLING LOG (Cont. Sheet) | INSTALLATION | | SHEET 2 OF 2 SHEETS |
|---|---|---|---|
| | Jacksonville District | | |
| PROJECT | COORDINATE SYSTEM/DATUM | HORIZONTAL | VERTICAL |
| Off-Shore Borrow Area Investigations | State Plane, FLE (U.S. Ft.) | NAD83 | NAVD88 |
| LOCATION COORDINATES | ELEVATION TOP OF BORING | | |
| X = 656,770 Y = 1,864,383 | -67.9 Ft. | | |

| ELEV. | DEPTH | LEGEND | CLASSIFICATION OF MATERIALS | % REC. | BOX OR SAMPLE | RQD OR UD | REMARKS | BLOWS/ 1 FT. | N-VALUE |
|---|---|---|---|---|---|---|---|---|---|
| -87.9 | 20.0 | | | | | | -87.9 | | |

NOTES:

1. USACE Jacksonville is the custodian for these original files.

2. Soils are field visually classified in accordance with the Unified Soils Classification System.

3. Vibracore penetrated to 20 feet. Sample recovery from 19.4 to 20 feet was not attained.

4. Laboratory Testing Results

| SAMPLE ID | SAMPLE DEPTH | LABORATORY CLASSIFICATION |
|---|---|---|
| 1 | 6.0/6.5 | SP-SM* |

*Lab visual classification based on gradation curve. No Atterberg limits.

Abbreviations:
NR = Not Recorded.

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SAJ FORM 1836-A
JUN 02

**DRILLING LOG**

| | |
|---|---|
| DIVISION | South Atlantic |
| INSTALLATION | Jacksonville District |
| SHEET | 1 OF 2 SHEETS |
| 1. PROJECT | Off-Shore Borrow Area Investigations<br>Flagler County, Florida |
| 2. BORING DESIGNATION | VC-FSP11-20 |
| LOCATION COORDINATES | X = 656,298 Y = 1,860,715 |
| 3. DRILLING AGENCY | AVS |
| CONTRACTOR FILE NO. | 6734-11-9583 |
| 4. NAME OF DRILLER | Brian McCord |
| 5. DIRECTION OF BORING | ☒ VERTICAL ☐ INCLINED |
| DEG. FROM VERTICAL | |
| BEARING | |
| 6. THICKNESS OF OVERBURDEN | N/A |
| 7. DEPTH DRILLED INTO ROCK | N/A |
| 8. TOTAL DEPTH OF BORING | 20.0 Ft. |
| 9. SIZE AND TYPE OF BIT | See Remarks |
| 10. COORDINATE SYSTEM/DATUM | State Plane, FLE (U.S. Ft.) |
| HORIZONTAL | NAD83 |
| VERTICAL | NAVD88 |
| 11. MANUFACTURER'S DESIGNATION OF DRILL | ☐ AUTO HAMMER ☐ MANUAL HAMMER |
| 12. TOTAL SAMPLES | DISTURBED 3 / UNDISTURBED (UD) 0 |
| 13. TOTAL NUMBER CORE BOXES | 0 |
| 14. ELEVATION GROUND WATER | |
| 15. DATE BORING | STARTED 02-15-11 / COMPLETED 02-15-11 |
| 16. ELEVATION TOP OF BORING | -60.7 Ft. |
| 17. TOTAL RECOVERY FOR BORING | 98 % |
| 18. SIGNATURE AND TITLE OF INSPECTOR | Karishma R. Desai, P.E., Geotechnical Engineer |

| ELEV. | DEPTH | LEGEND | CLASSIFICATION OF MATERIALS | % REC. | BOX OR SAMPLE | RQD OR UD | REMARKS | BLOWS/1 FT. | N-VALUE |
|---|---|---|---|---|---|---|---|---|---|
| -60.7 | 0.0 | | | | | | -60.7 | | |
| | | | SAND, poorly-graded, mostly fine-grained sand-sized quartz, few fine to medium-grained sand-sized shell, strong reaction with HCl, moist, 10Y 6/1 greenish gray (SP)<br>From El. -61.1 to -63.5 Ft., some fine to coarse-grained sand-sized shell, few fine gravel-sized shell, trace silt | NR | | | Vibracore<br>-62.2 | | |
| -63.5 | 2.8 | | | | 1 | | | | |
| | | | SAND, poorly-graded with silt, mostly fine-grained sand-sized quartz, little fine to medium-grained sand-sized shell, few silt, weak reaction with HCl, moist, 10GY 4/1 dark greenish gray (SP-SM) | | | | -64.7 | | |
| -65.8 | 5.1 | | | | 2 | | | | |
| | | | SAND, silty, mostly fine-grained sand-sized quartz, little silt, few fine to coarse-grained sand-sized shell, weak reaction with HCl, moist, 10GY 4/1 dark greenish gray (SM)<br>At El. -66.4 Ft., trace fine-grained sand-sized shell<br>From El. -66.7 to -70.3 Ft., silt content increasing with depth<br>From El. -67.7 to -69.4 Ft., some fine to coarse-grained sand-sized shell | | | | | | |
| | | | From El. -69.4 to -70.8 Ft., some silt, little fine to coarse-grained sand-sized shell | | | | -69.7 | | |
| | | | | | 3 | | | | |
| | | | At El. -72.3 Ft., some silt, trace clay nodules | | | | | | |
| | | | At El. -73.7 Ft., trace fine gravel-sized shell | | | | | | |

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(Continued)

SAJ FORM 1836
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| DRILLING LOG (Cont. Sheet) | INSTALLATION | SHEET 2 OF 2 SHEETS |
|---|---|---|
| | Jacksonville District | |

| PROJECT | COORDINATE SYSTEM/DATUM | HORIZONTAL | VERTICAL |
|---|---|---|---|
| Off-Shore Borrow Area Investigations | State Plane, FLE (U.S. Ft.) | NAD83 | NAVD88 |

| LOCATION COORDINATES | ELEVATION TOP OF BORING |
|---|---|
| X = 656,298 Y = 1,860,715 | -60.7 Ft. |

| ELEV. | DEPTH | LEGEND | CLASSIFICATION OF MATERIALS | % REC. | BOX OR SAMPLE | RQD OR UD | REMARKS | BLOWS/1 FT. | N-VALUE |
|---|---|---|---|---|---|---|---|---|---|
| | | | From El. -75.7 to -77.6 Ft., some fine to coarse-grained sand-sized shell, few fine to coarse gravel-sized shell | | | | | | |
| | | | From El. -77.6 to -78.6 Ft., little fine to coarse-grained sand-sized shell, 10Y 7/1 light greenish gray | | | | | | |
| | | | From El. -78.2 to -80.3 Ft., trace clay, occasional fine to coarse-grained sand-sized shell, 10Y 7/1 light greenish gray | | | | | | |
| -80.7 | 20.0 | | | | | | -80.7 | | |

NOTES:

1. USACE Jacksonville is the custodian for these original files.

2. Soils are field visually classified in accordance with the Unified Soils Classification System.

3. Vibracore penetrated to 20 feet. Sample recovery from 19.6 to 20 feet was not attained.

4. Laboratory Testing Results

| SAMPLE ID | SAMPLE DEPTH | LABORATORY CLASSIFICATION |
|---|---|---|
| 1 | 1.5/2.0 | SP* |
| 2 | 4.0/4.5 | SP-SM* |
| 3 | 9.0/9.5 | SM* |

*Lab visual classification based on gradation curve. No Atterberg limits.

Abbreviations:
NR = Not Recorded.

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SAJ FORM 1836-A
JUN 02

**DRILLING LOG**

| | |
|---|---|
| DIVISION | South Atlantic |
| INSTALLATION | Jacksonville District |
| SHEET | 1 OF 2 SHEETS |
| 1. PROJECT | Off-Shore Borrow Area Investigations<br>Flagler County, Florida |
| 2. BORING DESIGNATION | VC-FSP11-21 |
| LOCATION COORDINATES | X = 656,922 Y = 1,856,128 |
| 3. DRILLING AGENCY | AVS |
| CONTRACTOR FILE NO. | 6734-11-9583 |
| 4. NAME OF DRILLER | Brian McCord |
| 5. DIRECTION OF BORING | ☒ VERTICAL ☐ INCLINED |
| DEG. FROM VERTICAL | |
| BEARING | |
| 6. THICKNESS OF OVERBURDEN | N/A |
| 7. DEPTH DRILLED INTO ROCK | N/A |
| 8. TOTAL DEPTH OF BORING | 20.0 Ft. |
| 9. SIZE AND TYPE OF BIT | See Remarks |
| 10. COORDINATE SYSTEM/DATUM | State Plane, FLE (U.S. Ft.) |
| HORIZONTAL | NAD83 |
| VERTICAL | NAVD88 |
| 11. MANUFACTURER'S DESIGNATION OF DRILL | ☐ AUTO HAMMER ☐ MANUAL HAMMER |
| 12. TOTAL SAMPLES | DISTURBED 4 / UNDISTURBED (UD) 0 |
| 13. TOTAL NUMBER CORE BOXES | 0 |
| 14. ELEVATION GROUND WATER | |
| 15. DATE BORING | STARTED 02-15-11 / COMPLETED 02-15-11 |
| 16. ELEVATION TOP OF BORING | -59.5 Ft. |
| 17. TOTAL RECOVERY FOR BORING | 83 % |
| 18. SIGNATURE AND TITLE OF INSPECTOR | Karishma R. Desai, P.E., Geotechnical Engineer |

| ELEV. | DEPTH | LEGEND | CLASSIFICATION OF MATERIALS | % REC. | BOX OR SAMPLE | RQD OR UD | REMARKS | BLOWS/1 FT. | N-VALUE |
|---|---|---|---|---|---|---|---|---|---|
| -59.5 | 0.0 | | | | | | -59.5 | | |
| | | | SAND, poorly-graded, mostly fine-grained sand-sized quartz, few fine-grained sand-sized shell, trace silt, no reaction with HCl, moist, 10Y 6/1 greenish gray (SP) | NR | | | Vibracore<br>-60.5 | | |
| | | | | | 1 | | -63.5 | | |
| | | | From El. -62.5 to -63.8 Ft., little fine to medium-grained sand-sized shell | | | | | | |
| -63.8 | 4.3 | | SAND, poorly-graded with silt, mostly fine-grained sand-sized quartz, little fine to medium-grained sand-sized shell, few silt, strong reaction with HCl, moist, 10Y 4/1 dark greenish gray (SP-SM) | | 2 | | -65.0 | | |
| | | | | | 3 | | -67.5 | | |
| -66.5 | 7.0 | | SAND, silty, mostly fine-grained sand-sized quartz, little silt, few fine to medium-grained sand-sized shell, weak reaction with HCl, moist, 10Y 4/1 dark greenish gray (SM)<br>At El. -67.7 Ft., trace coarse gravel-sized shell<br>From El. -68.1 to -71.1 Ft., some silt | | 4 | | | | |
| | | | From El. -69.6 to -71.1 Ft., little fine to coarse-grained sand-sized shell, trace fine gravel-sized shell<br>At El. -70.5 Ft., some fine to coarse-grained sand-sized shell, trace fine gravel-sized shell<br>From El. -71.1 to -76.1 Ft., occasional trace fine to medium-grained sand-sized shell, occasional silt and clay nodules | | | | | | |

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(Continued)

SAJ FORM 1836
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| DRILLING LOG (Cont. Sheet) | INSTALLATION | SHEET 2 OF 2 SHEETS |
|---|---|---|
| | Jacksonville District | |

| PROJECT | COORDINATE SYSTEM/DATUM | HORIZONTAL | VERTICAL |
|---|---|---|---|
| Off-Shore Borrow Area Investigations | State Plane, FLE (U.S. Ft.) | NAD83 | NAVD88 |

| LOCATION COORDINATES | ELEVATION TOP OF BORING |
|---|---|
| X = 656,922 Y = 1,856,128 | -59.5 Ft. |

| ELEV. | DEPTH | LEGEND | CLASSIFICATION OF MATERIALS | % REC. | BOX OR SAMPLE | RQD OR UD | REMARKS | BLOWS/ 1 FT. | N-VALUE |
|---|---|---|---|---|---|---|---|---|---|
| -79.5 | 20.0 | | | | | | -79.5 | | |

NOTES:

1. USACE Jacksonville is the custodian for these original files.

2. Soils are field visually classified in accordance with the Unified Soils Classification System.

3. Vibracore penetrated to 20 feet. Sample recovery from 16.6 to 20 feet was not attained.

4. Laboratory Testing Results

| SAMPLE ID | SAMPLE DEPTH | LABORATORY CLASSIFICATION |
|---|---|---|
| 1 | 1.0/1.5 | SP* |
| 2 | 4.0/4.5 | SP* |
| 3 | 5.5/6.0 | SP-SM* |
| 4 | 8.0/8.5 | SM* |

*Lab visual classification based on gradation curve. No Atterberg limits.

Abbreviations:
NR = Not Recorded.

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**SAJ FORM 1836-A**
**JUN 02**

**DRILLING LOG**

| | |
|---|---|
| DIVISION | South Atlantic |
| INSTALLATION | Jacksonville District |
| SHEET | 1 OF 2 SHEETS |
| 1. PROJECT | Off-Shore Borrow Area Investigations<br>Flagler County, Florida |
| 2. BORING DESIGNATION | VC-FSP11-22 |
| LOCATION COORDINATES | X = 657,885 Y = 1,850,138 |
| 3. DRILLING AGENCY | AVS |
| CONTRACTOR FILE NO. | 6734-11-9583 |
| 4. NAME OF DRILLER | Brian McCord |
| 5. DIRECTION OF BORING | ☒ VERTICAL ☐ INCLINED |
| DEG. FROM VERTICAL | |
| BEARING | |
| 6. THICKNESS OF OVERBURDEN | N/A |
| 7. DEPTH DRILLED INTO ROCK | N/A |
| 8. TOTAL DEPTH OF BORING | 20.0 Ft. |
| 9. SIZE AND TYPE OF BIT | See Remarks |
| 10. COORDINATE SYSTEM/DATUM | State Plane, FLE (U.S. Ft.) |
| HORIZONTAL | NAD83 |
| VERTICAL | NAVD88 |
| 11. MANUFACTURER'S DESIGNATION OF DRILL | ☐ AUTO HAMMER ☐ MANUAL HAMMER |
| 12. TOTAL SAMPLES | DISTURBED 7 / UNDISTURBED (UD) 0 |
| 13. TOTAL NUMBER CORE BOXES | 0 |
| 14. ELEVATION GROUND WATER | |
| 15. DATE BORING | STARTED 02-15-11 / COMPLETED 02-15-11 |
| 16. ELEVATION TOP OF BORING | -52.7 Ft. |
| 17. TOTAL RECOVERY FOR BORING | 98 % |
| 18. SIGNATURE AND TITLE OF INSPECTOR | Karishma R. Desai, P.E., Geotechnical Engineer |

| ELEV. | DEPTH | LEGEND | CLASSIFICATION OF MATERIALS | % REC. | BOX OR SAMPLE | RQD OR UD | REMARKS | BLOWS/1 FT. | N-VALUE |
|---|---|---|---|---|---|---|---|---|---|
| -52.7 | 0.0 | | | | | | -52.7 | | |
| | | | SAND, poorly-graded, mostly fine-grained sand-sized quartz, little fine to medium-grained sand-sized shell, trace silt, weak reaction with HCl, moist, 5GY 5/1 greenish gray (SP) | NR | | | Vibracore<br>-53.7 | | |
| | | | | | 1 | | | | |
| | | | From El. -55.2 to -57.7 Ft., few fine to medium-grained sand-sized shell | | | | -56.7 | | |
| | | | | | 2 | | | | |
| | | | From El. -59.7 to -61.7 Ft., trace fine gravel-sized shell | | 3-Post 3 | | -59.7 | | |
| | | | From El. -61.7 to -64.2 Ft., little fine to coarse-grained sand-sized shell, few fine-grained sand-sized shell<br>At El. -62.2 Ft., trace silt nodules | | | | -62.7 | | |
| | | | | | 4 | | | | |
| -64.2 | 11.5 | | SAND, poorly-graded with silt, mostly fine-grained sand-sized quartz, few fine-grained sand-sized shell, few silt, weak reaction with HCl, moist, 5GY 4/1 dark greenish gray (SP-SM) | | | | -64.7 | | |
| -65.2 | 12.5 | | SAND, silty, mostly fine-grained sand-sized quartz, little fine to medium-grained sand-sized shell, little silt, weak reaction with HCl, moist, occasional fine to coarse gravel-sized shell, 10GY 3/1 very dark greenish gray (SM) | | 5 | | -66.7 | | |
| | | | | | 6 | | | | |

(Continued)

SAJ FORM 1836
JUN 02

| DRILLING LOG (Cont. Sheet) | INSTALLATION | SHEET 2 OF 2 SHEETS |
|---|---|---|
| | Jacksonville District | |

| PROJECT | COORDINATE SYSTEM/DATUM | HORIZONTAL | VERTICAL |
|---|---|---|---|
| Off-Shore Borrow Area Investigations | State Plane, FLE (U.S. Ft.) | NAD83 | NAVD88 |

| LOCATION COORDINATES | ELEVATION TOP OF BORING |
|---|---|
| X = 657,885 Y = 1,850,138 | -52.7 Ft. |

| ELEV. | DEPTH | LEGEND | CLASSIFICATION OF MATERIALS | % REC. | BOX OR SAMPLE | RQD OR UD | REMARKS | BLOWS/1 FT. | N-VALUE |
|---|---|---|---|---|---|---|---|---|---|
| -72.7 | 20.0 | | At El. -66.4 Ft., wet<br>At El. -67.9 Ft., occasional traces of silt nodules, silt content increasing with depth<br>From El. -69.7 to -71.9 Ft., some fine to coarse-grained sand-sized shell<br>From El. -69.9 to -70.5 Ft., trace gravel to cobble-sized shell, trace coarse gravel-sized oyster shell | | | | -72.7 | | |

NOTES:

1. USACE Jacksonville is the custodian for these original files.

2. Soils are field visually classified in accordance with the Unified Soils Classification System.

3. 100% recovery attained from 0.0 to 19.2 feet. Due to varying quantities and sizes of shell, recovery of sample from 19.2 to 20.0 feet was not achieved. Sample description based on material retained in the shoe.

4. Laboratory Testing Results

| SAMPLE ID | SAMPLE DEPTH | LABORATORY CLASSIFICATION |
|---|---|---|
| 1 | 1.0/1.5 | SP* |
| 2 | 4.0/4.5 | SP* |
| 3 | 7.0/7.5 | SP* |
| 3-Post | 7.0/7.5 | SP* |
| 4 | 10.0/10.5 | SP* |
| 5 | 12.0/12.5 | SP-SM* |
| 6 | 14.0/14.5 | SM* |

*Lab visual classification based on gradation curve. No Atterberg limits.

Abbreviations:
NR = Not Recorded.

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SAJ FORM 1836-A
JUN 02

**DRILLING LOG**

| | |
|---|---|
| DIVISION | South Atlantic |
| INSTALLATION | Jacksonville District |
| SHEET | 1 OF 2 SHEETS |
| 1. PROJECT | Off-Shore Borrow Area Investigations<br>Flagler County, Florida |
| 2. BORING DESIGNATION | VC-FSP11-23 |
| LOCATION COORDINATES | X = 657,899 Y = 1,844,676 |
| 3. DRILLING AGENCY | AVS |
| CONTRACTOR FILE NO. | 6734-11-9583 |
| 4. NAME OF DRILLER | Brian McCord |
| 5. DIRECTION OF BORING | ☒ VERTICAL ☐ INCLINED |
| DEG. FROM VERTICAL | |
| BEARING | |
| 6. THICKNESS OF OVERBURDEN | N/A |
| 7. DEPTH DRILLED INTO ROCK | N/A |
| 8. TOTAL DEPTH OF BORING | 20.0 Ft. |
| 9. SIZE AND TYPE OF BIT | See Remarks |
| 10. COORDINATE SYSTEM/DATUM | State Plane, FLE (U.S. Ft.) / HORIZONTAL NAD83 / VERTICAL NAVD88 |
| 11. MANUFACTURER'S DESIGNATION OF DRILL | ☐ AUTO HAMMER ☐ MANUAL HAMMER |
| 12. TOTAL SAMPLES | DISTURBED 3 / UNDISTURBED (UD) 0 |
| 13. TOTAL NUMBER CORE BOXES | 0 |
| 14. ELEVATION GROUND WATER | |
| 15. DATE BORING | STARTED 02-15-11 / COMPLETED 02-15-11 |
| 16. ELEVATION TOP OF BORING | -60.6 Ft. |
| 17. TOTAL RECOVERY FOR BORING | 87 % |
| 18. SIGNATURE AND TITLE OF INSPECTOR | Karishma R. Desai, P.E., Geotechnical Engineer |

| ELEV. | DEPTH | LEGEND | CLASSIFICATION OF MATERIALS | % REC. | BOX OR SAMPLE | RQD OR UD | REMARKS | BLOWS/1 FT. | N-VALUE |
|---|---|---|---|---|---|---|---|---|---|
| -60.6 | 0.0 | | | | | | -60.6 | | |
| | | | SAND, poorly-graded, mostly fine-grained sand-sized quartz, some fine to medium-grained sand-sized shell, trace silt, weak reaction with HCl, moist, 10Y 4/1 dark greenish gray (SP) | NR | | | Vibracore | | |
| | | | | | | | -61.6 | | |
| | | | | | 1 | | | | |
| -62.3 | 1.7 | | At El. -61.9 Ft., a layer of silt (approximately 1/4" thick) | | | | | | |
| | | | At El. -62.2 Ft., a layer of silt (approximately 1/2" thick) | | | | -63.1 | | |
| -63.6 | 3.0 | | SAND, poorly-graded with silt, mostly fine-grained sand-sized quartz, few silt, few fine to medium-grained sand-sized shell, weak reaction with HCl, moist, 10Y 4/1 dark greenish gray (SP-SM) | | 2 | | | | |
| | | | SAND, silty, mostly fine-grained sand-sized quartz, little silt, few fine to medium-grained sand-sized shell, strong reaction with HCl, moist, occasional fine to coarse gravel-sized shell, 10GY 4/1 dark greenish gray (SM) | | | | -65.6 | | |
| | | | At El. -65.1 Ft., trace clay | | 3 | | | | |
| | | | From El. -66.6 to -67.9 Ft., little fine to coarse-grained sand-sized shell | | | | | | |
| | | | From El. -68.2 to -70.0 Ft., some silt, trace clay, silt content increasing with depth | | | | | | |
| -70.0 | 9.4 | | At El. -69.8 Ft., few fine-grained sand-sized shell | | | | | | |
| | | | SILT, inorganic-L, low plasticity, very soft, little clay, few fine-grained sand-sized quartz, no reaction with HCl, moist, occasional trace fine to medium-grained sand-sized shell, 10GY 4/1 dark greenish gray (ML) | | | | | | |
| -73.2 | 12.6 | | At El. -72.7 Ft., few sand to gravel-sized shell | | | | | | |
| -73.6 | 13.0 | M | LIMESTONE, fossiliferous, moderately hard, moderately weathered, fine grained, highly fractured, solid, some silt, little sand to gravel-sized shell, 10Y 5/1 greenish gray | | | | | | |
| | | | SAND, silty, mostly fine to coarse-grained sand-sized shell, some silt, little fine-grained sand-sized quartz, few fine gravel-sized | | | | | | |
| -75.6 | 15.0 | | | | | | | | |

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**SAJ FORM 1836**
**JUN 02**

| DRILLING LOG (Cont. Sheet) | INSTALLATION | SHEET 2 OF 2 SHEETS |
|---|---|---|
| | Jacksonville District | |

| PROJECT | COORDINATE SYSTEM/DATUM | HORIZONTAL | VERTICAL |
|---|---|---|---|
| Off-Shore Borrow Area Investigations | State Plane, FLE (U.S. Ft.) | NAD83 | NAVD88 |

| LOCATION COORDINATES | ELEVATION TOP OF BORING |
|---|---|
| X = 657,899 Y = 1,844,676 | -60.6 Ft. |

| ELEV. | DEPTH | LEGEND | CLASSIFICATION OF MATERIALS | % REC. | BOX OR SAMPLE | RQD OR UD | REMARKS | BLOWS/ 1 FT. | N-VALUE |
|---|---|---|---|---|---|---|---|---|---|
| -80.6 | 20.0 | Moderately Weathered | shell, no reaction with HCl, moist, - 10Y 5/1 greenish gray (SM) - LIMESTONE, fossiliferous, moderately hard, - moderately weathered, fine grained, highly - fractured, solid, some silt, few clay, - occasional few sand to gravel-sized shell, - 5GY 5/1 greenish gray - | | | | -80.6 | | |

NOTES:

1. USACE Jacksonville is the custodian for these original files.

2. Soils are field visually classified in accordance with the Unified Soils Classification System.

3. 100% recovery attained from 0.0 to 17.3 feet. Due to presence of limestone, sample recovery from 17.3 to 20.0 feet was not achieved.

4. Laboratory Testing Results

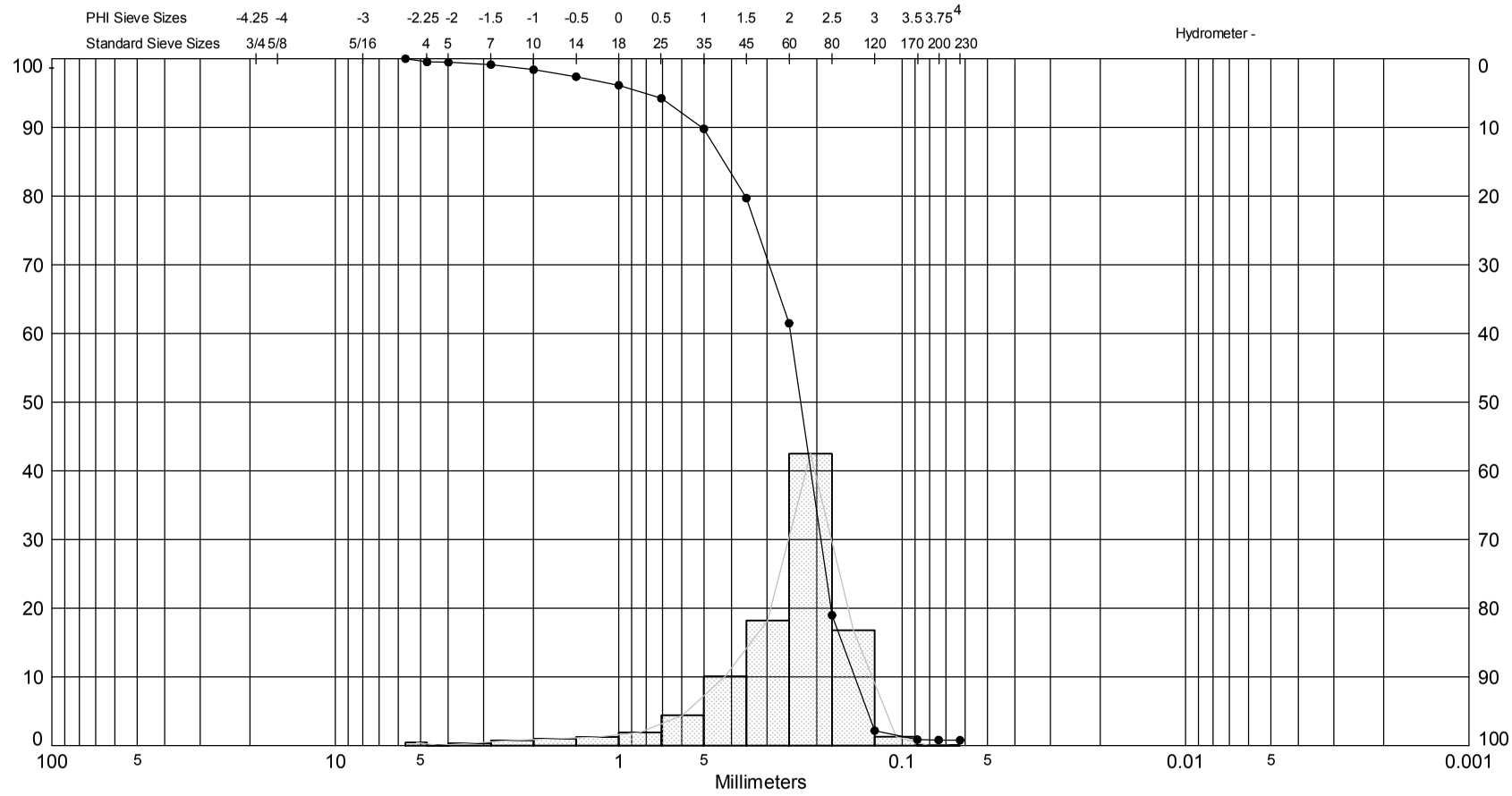
| SAMPLE ID | SAMPLE DEPTH | LABORATORY CLASSIFICATION |
|---|---|---|
| 1 | 1.0/1.5 | SP* |
| 2 | 2.5/3.0 | SP-SM* |
| 3 | 5.0/5.5 | SM* |

*Lab visual classification based on gradation curve. No Atterberg limits.

Abbreviations:
NR = Not Recorded.

15
20
25
30
35

**SAJ FORM 1836-A**
**JUN 02**




SIEVE ANALYSIS FLAGLER_STAT_GINT.GPJ FL DEP ROSS.GDT 11/14/12

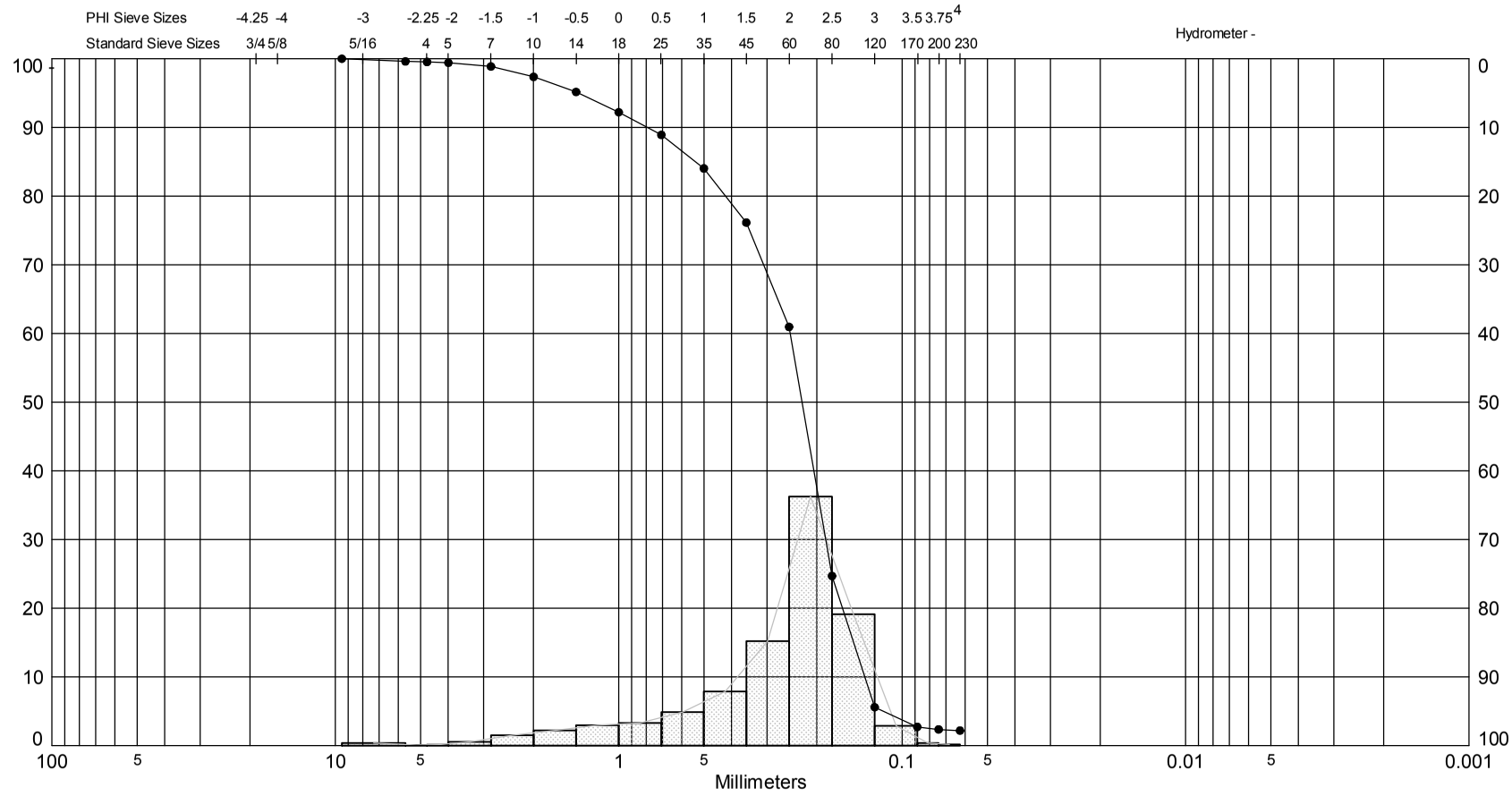
| Sample | Symbol | Elev. (ft) | USCS | % Fines | % Organics | % Carbonates | Median | Mean | Skew | Kurt | Sort |
|---|---|---|---|---|---|---|---|---|---|---|---|
| VC-FSP11-1 #1 | —●— | -64.9 | SP | #230 - 0.78 | | 13.00 | 2.13 | 1.92 | -2.01 | 8.7 | 0.84 |

Comments:

Depths and elevations based on measured values

US Army Corps of Engineers
701 San Marco Blvd
Jacksonville, Florida 32207
phone (904)396-7121

| Sample Information | |
|---|---|
| Project Name: | Flagler County |
| Analysis Date: | 04-01-11 |
| Analyzed By: | |
| Easting (X, ft): | 663,001 |
| Northing (Y, ft): | 1,906,822 |
| Horizontal System: | NAD83 |
| Vertical System: | NAVD88 |




| Sample | Symbol | Elev. (ft) | USCS | % Fines | % Organics | % Carbonates | Median | Mean | Skew | Kurt | Sort |
|---|---|---|---|---|---|---|---|---|---|---|---|
| VC-FSP11-1 #2 | —●— | -67.9 | SW | #230 - 2.18 | | | 2.15 | 1.83 | -1.6 | 5.81 | 1.05 |

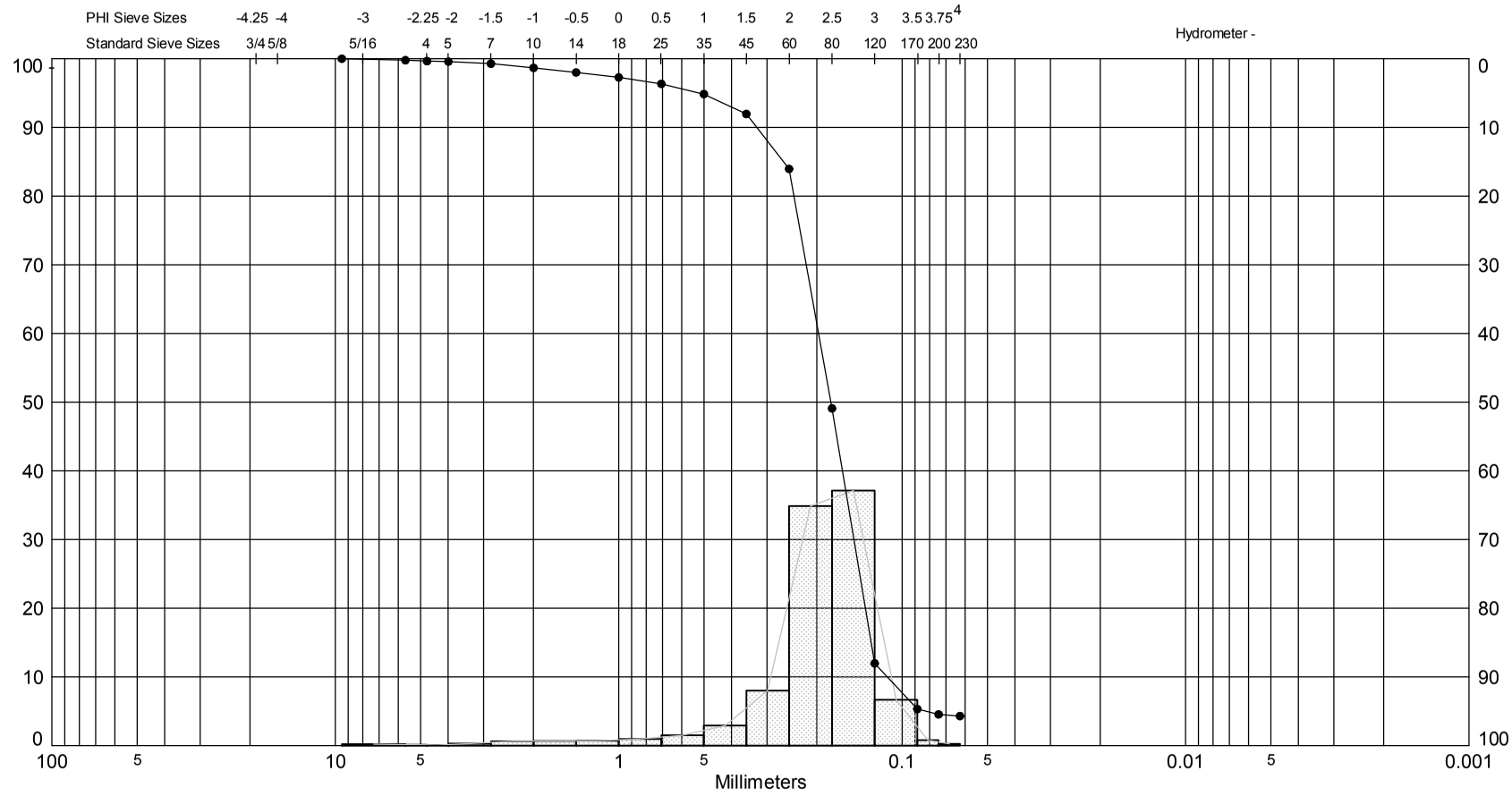
Comments:

Depths and elevations based on measured values

US Army Corps of Engineers
701 San Marco Blvd
Jacksonville, Florida 32207
phone (904)396-7121

| Sample Information | |
|---|---|
| Project Name: | Flagler County |
| Analysis Date: | 04-01-11 |
| Analyzed By: | |
| Easting (X, ft): | 663,001 |
| Northing (Y, ft): | 1,906,822 |
| Horizontal System: | NAD83 |
| Vertical System: | NAVD88 |

SIEVE ANALYSIS FLAGLER_STAT_GINT.GPJ FL DEP ROSS.GDT 11/14/12




| Sample | Symbol | Elev. (ft) | USCS | % Fines | % Organics | % Carbonates | Median | Mean | Skew | Kurt | Sort |
|---|---|---|---|---|---|---|---|---|---|---|---|
| VC-FSP11-1 #3 | —●— | -70.4 | SP | #230 - 4.30 | | | 2.49 | 2.32 | -2.73 | 13.81 | 0.81 |

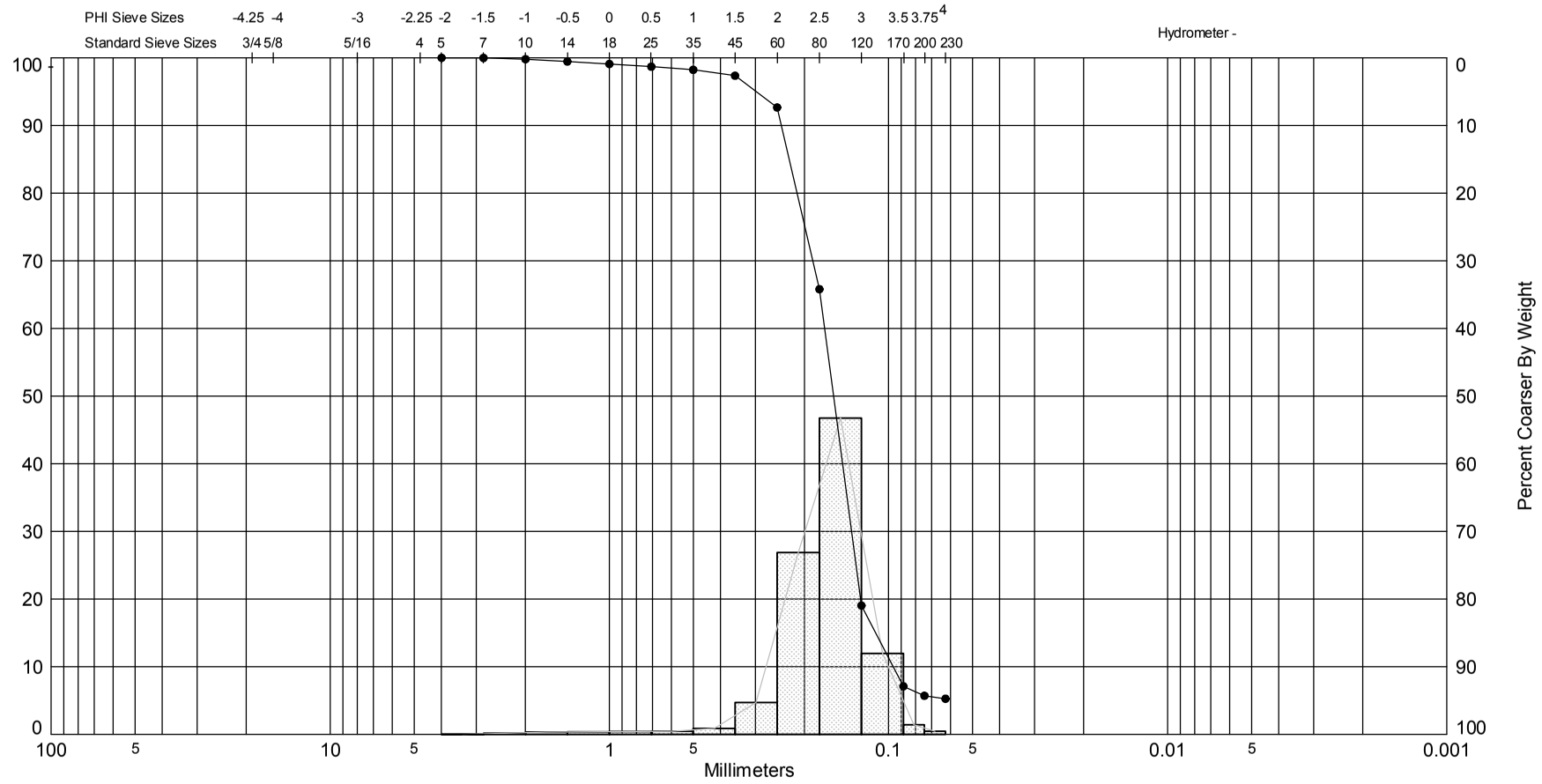
Comments:

Depths and elevations based on measured values

US Army Corps of Engineers
701 San Marco Blvd
Jacksonville, Florida 32207
phone (904)396-7121

| Sample Information | |
|---|---|
| Project Name: | Flagler County |
| Analysis Date: | 04-01-11 |
| Analyzed By: | |
| Easting (X, ft): | 663,001 |
| Northing (Y, ft): | 1,906,822 |
| Horizontal System: | NAD83 |
| Vertical System: | NAVD88 |

SIEVE ANALYSIS FLAGLER_STAT_GINT.GPJ FL DEP ROSS.GDT 11/14/12




| Sample | Symbol | Elev. (ft) | USCS | % Fines | % Organics | % Carbonates | Median | Mean | Skew | Kurt | Sort |
|---|---|---|---|---|---|---|---|---|---|---|---|
| VC-FSP11-1 #4 | —●— | -72.4 | SP-SM | #230 - 5.26 | | | 2.67 | 2.57 | -2.3 | 14.32 | 0.56 |

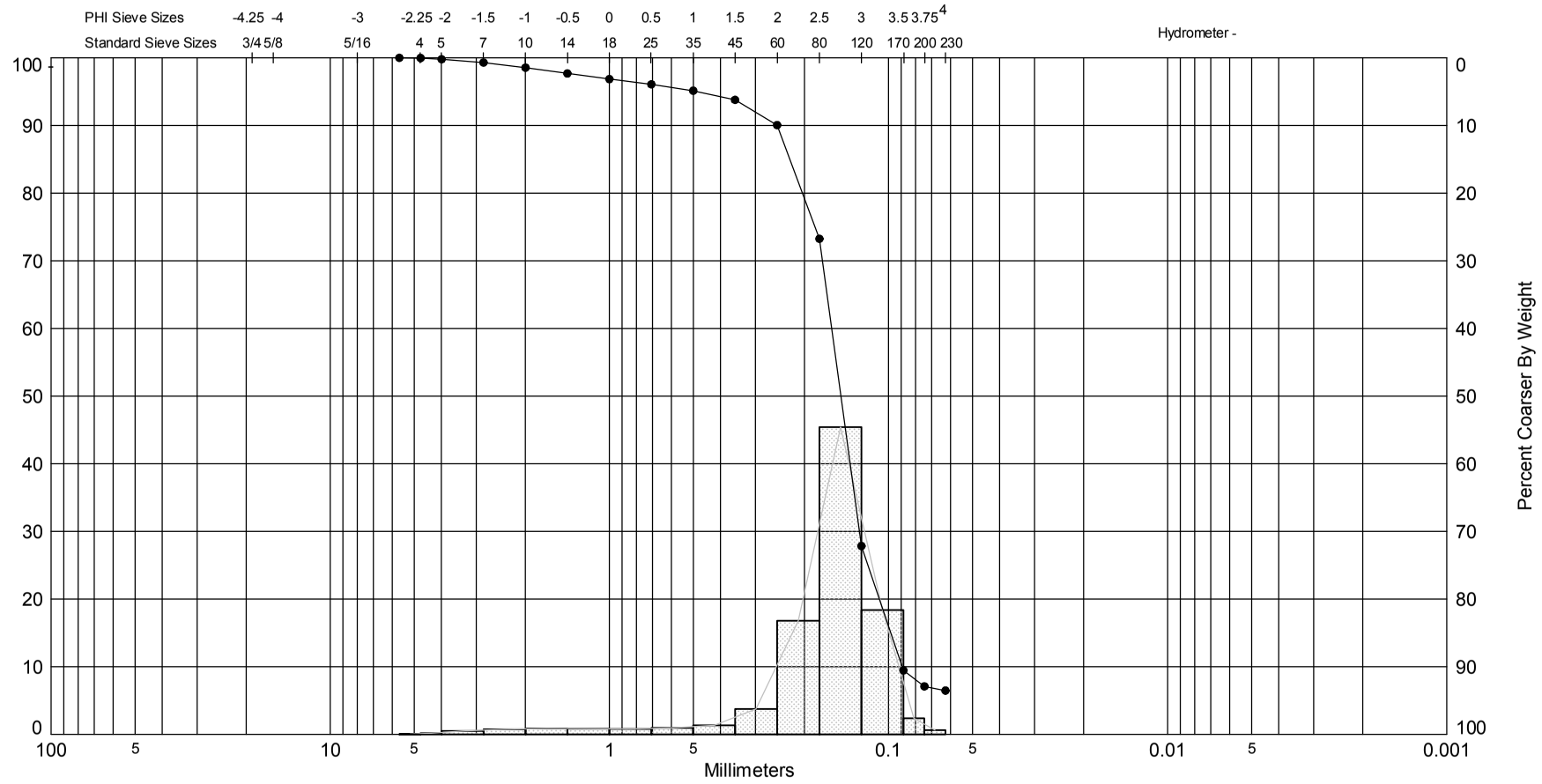
Comments:

Depths and elevations based on measured values

US Army Corps of Engineers
701 San Marco Blvd
Jacksonville, Florida 32207
phone (904)396-7121

| Sample Information | |
|---|---|
| Project Name: | Flagler County |
| Analysis Date: | 04-01-11 |
| Analyzed By: | |
| Easting (X, ft): | 663,001 |
| Northing (Y, ft): | 1,906,822 |
| Horizontal System: | NAD83 |
| Vertical System: | NAVD88 |

SIEVE ANALYSIS FLAGLER_STAT_GINT.GPJ FL DEP ROSS.GDT 11/14/12




| Sample | Symbol | Elev. (ft) | USCS | % Fines | % Organics | % Carbonates | Median | Mean | Skew | Kurt | Sort |
|---|---|---|---|---|---|---|---|---|---|---|---|
| VC-FSP11-1 #5 | —●— | -77.4 | SW-SM | #230 - 6.47 | | | 2.76 | 2.56 | -2.77 | 12.62 | 0.86 |

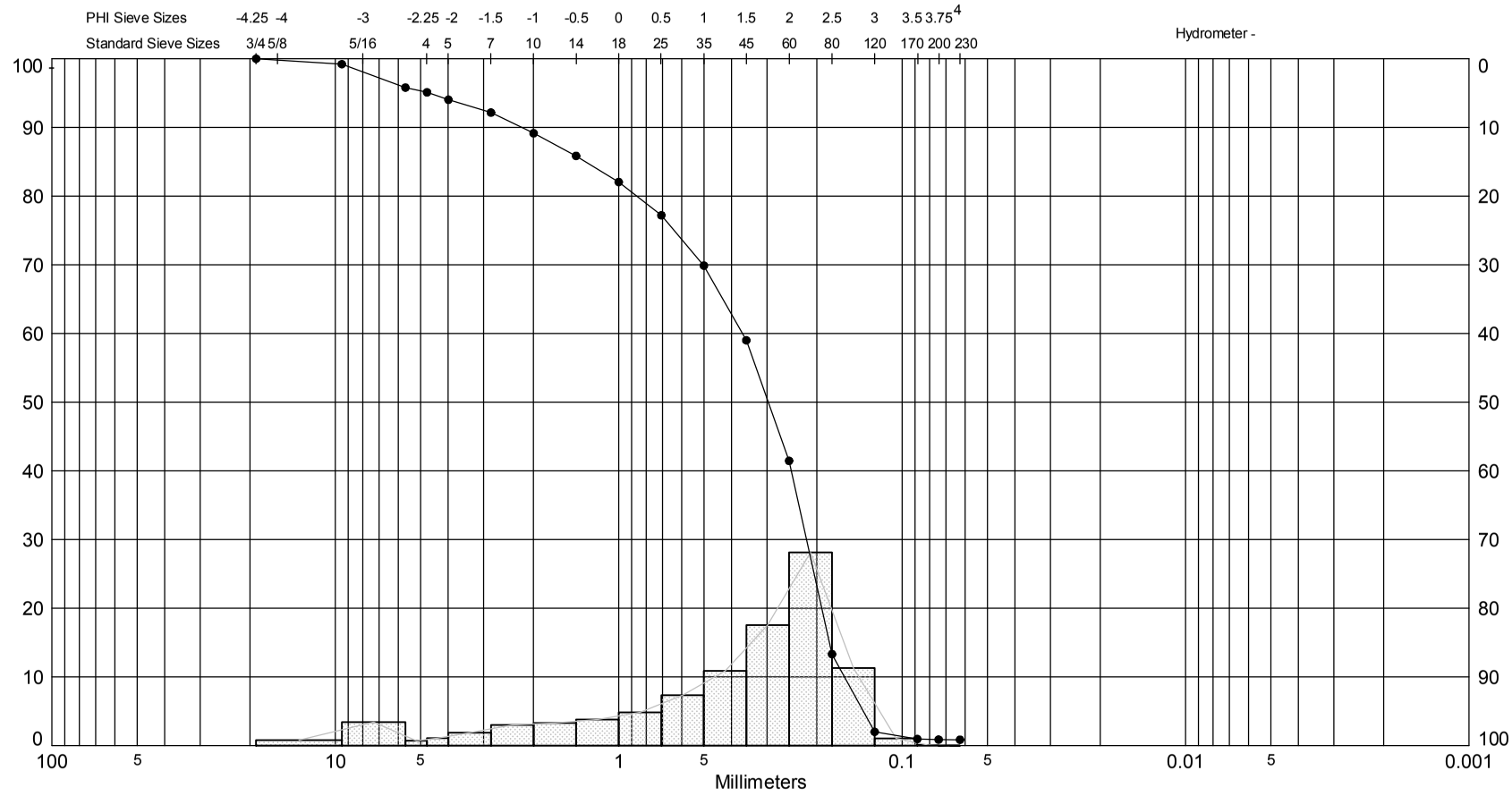
Comments:

Depths and elevations based on measured values

US Army Corps of Engineers
701 San Marco Blvd
Jacksonville, Florida 32207
phone (904)396-7121

| Sample Information | |
|---|---|
| Project Name: | Flagler County |
| Analysis Date: | 04-01-11 |
| Analyzed By: | |
| Easting (X, ft): | 663,001 |
| Northing (Y, ft): | 1,906,822 |
| Horizontal System: | NAD83 |
| Vertical System: | NAVD88 |

SIEVE ANALYSIS FLAGLER_STAT_GINT.GPJ FL DEP ROSS.GDT 11/14/12




| Sample | Symbol | Elev. (ft) | USCS | % Fines | % Organics | % Carbonates | Median | Mean | Skew | Kurt | Sort |
|---|---|---|---|---|---|---|---|---|---|---|---|
| VC-FSP11-2 #1 | —● | -63.8 | SW | #230 - 0.85 | | | 1.75 | 1.23 | -1.36 | 4.19 | 1.51 |

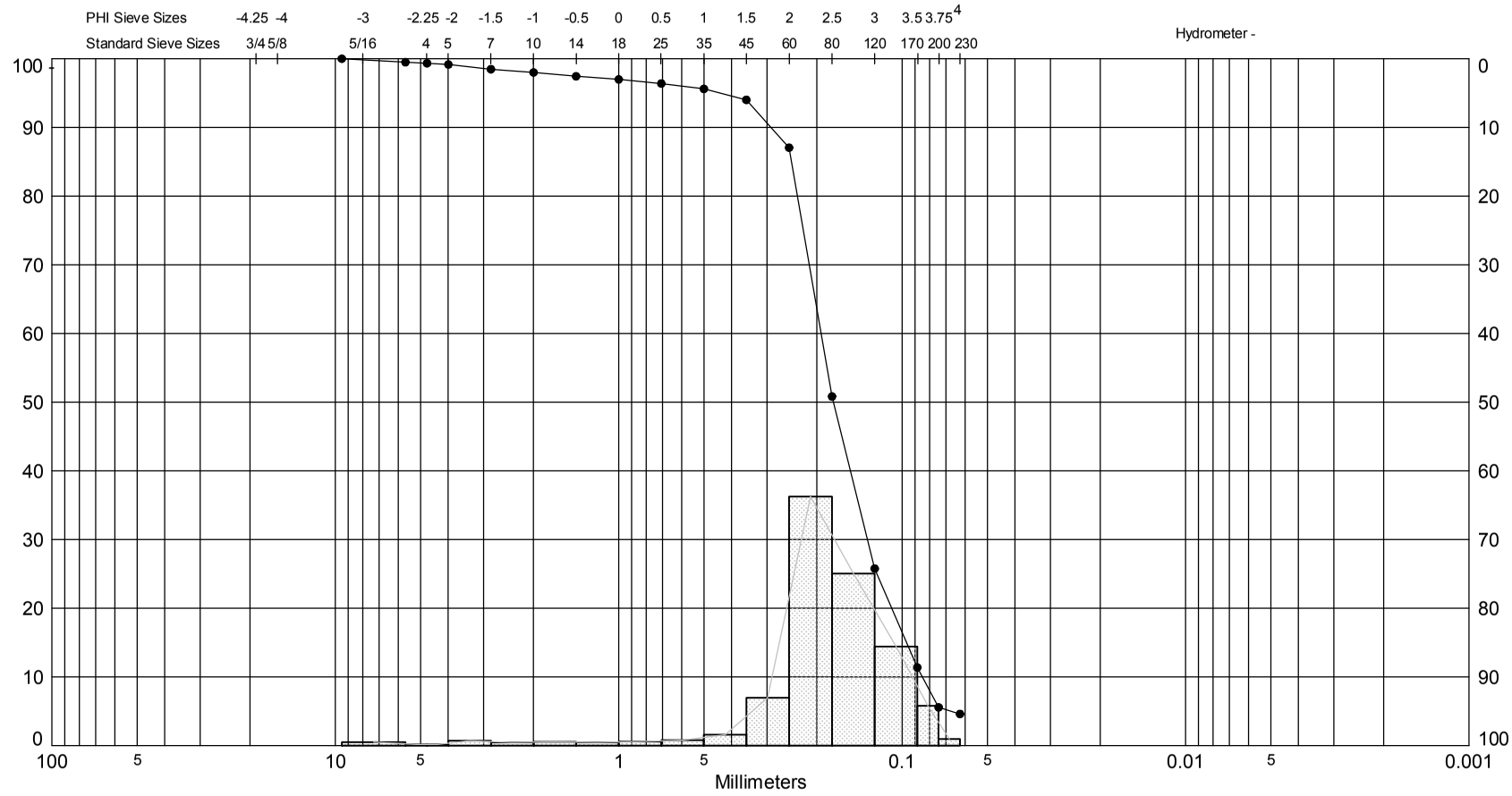
Comments:

Depths and elevations based on measured values

US Army Corps of Engineers
701 San Marco Blvd
Jacksonville, Florida 32207
phone (904)396-7121

| Sample Information | |
|---|---|
| Project Name: | Flagler County |
| Analysis Date: | 04-01-11 |
| Analyzed By: | |
| Easting (X, ft): | 666,592 |
| Northing (Y, ft): | 1,911,063 |
| Horizontal System: | NAD83 |
| Vertical System: | NAVD88 |

SIEVE ANALYSIS FLAGLER_STAT_GINT.GPJ FL DEP ROSS.GDT 11/14/12




SIEVE ANALYSIS FLAGLER_STAT_GINT.GPJ FL DEP ROSS.GDT 11/14/12

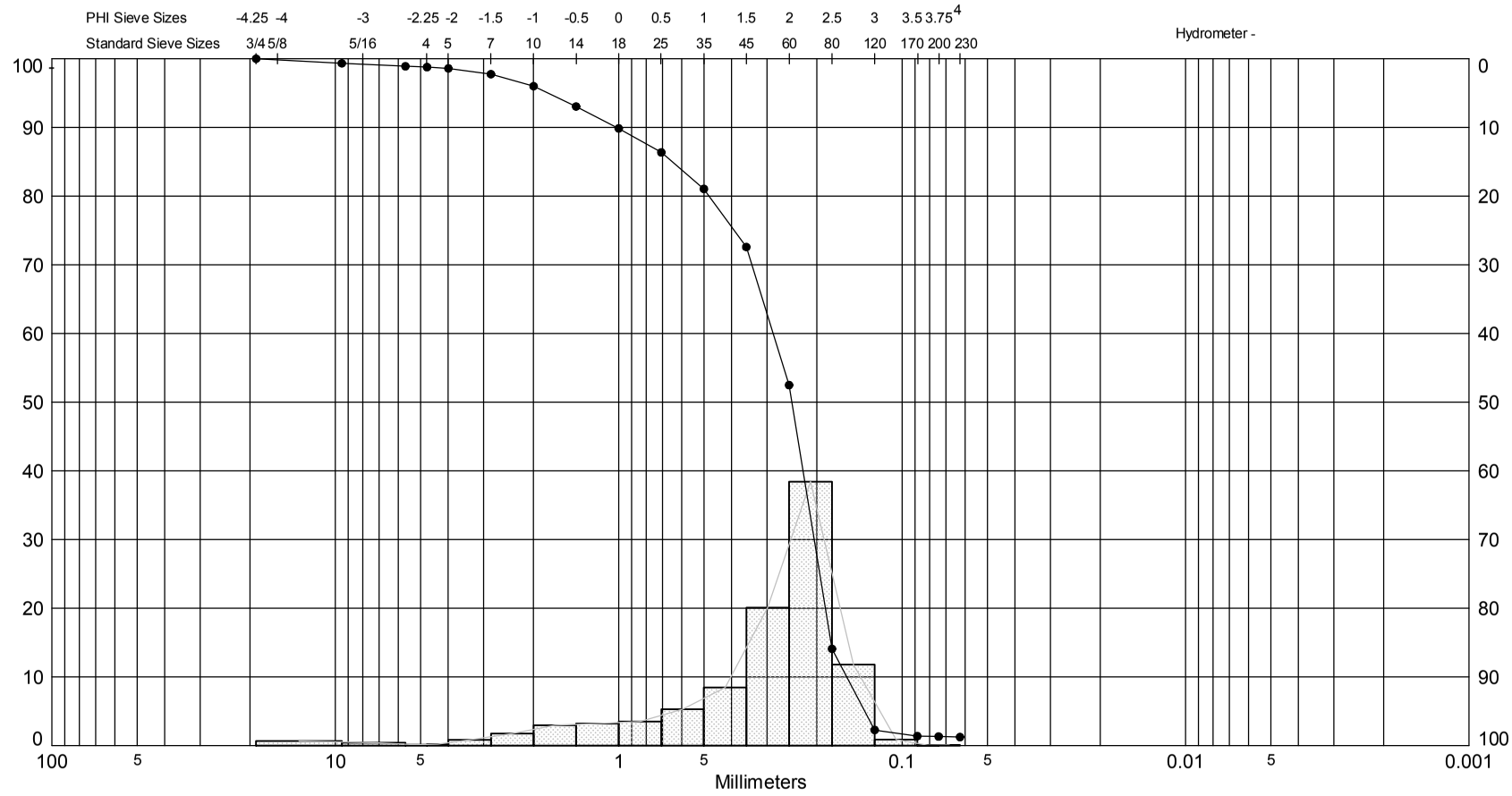
| Sample | Symbol | Elev. (ft) | USCS | % Fines | % Organics | % Carbonates | Median | Mean | Skew | Kurt | Sort |
|---|---|---|---|---|---|---|---|---|---|---|---|
| VC-FSP11-2 #2 | —●— | -66.3 | SW | #230 - 4.60 | | | 2.52 | 2.43 | -2.64 | 13.64 | 0.93 |

Comments:

Depths and elevations based on measured values

US Army Corps of Engineers
701 San Marco Blvd
Jacksonville, Florida 32207
phone (904)396-7121

| Sample Information | |
|---|---|
| Project Name: | Flagler County |
| Analysis Date: | 04-01-11 |
| Analyzed By: | |
| Easting (X, ft): | 666,592 |
| Northing (Y, ft): | 1,911,063 |
| Horizontal System: | NAD83 |
| Vertical System: | NAVD88 |




| Sample | Symbol | Elev. (ft) | USCS | % Fines | % Organics | % Carbonates | Median | Mean | Skew | Kurt | Sort |
|---|---|---|---|---|---|---|---|---|---|---|---|
| VC-FSP11-3 #1 | —●— | -57.8 | SW | #230 - 1.24 | | | 2.03 | 1.64 | -1.9 | 7.22 | 1.15 |

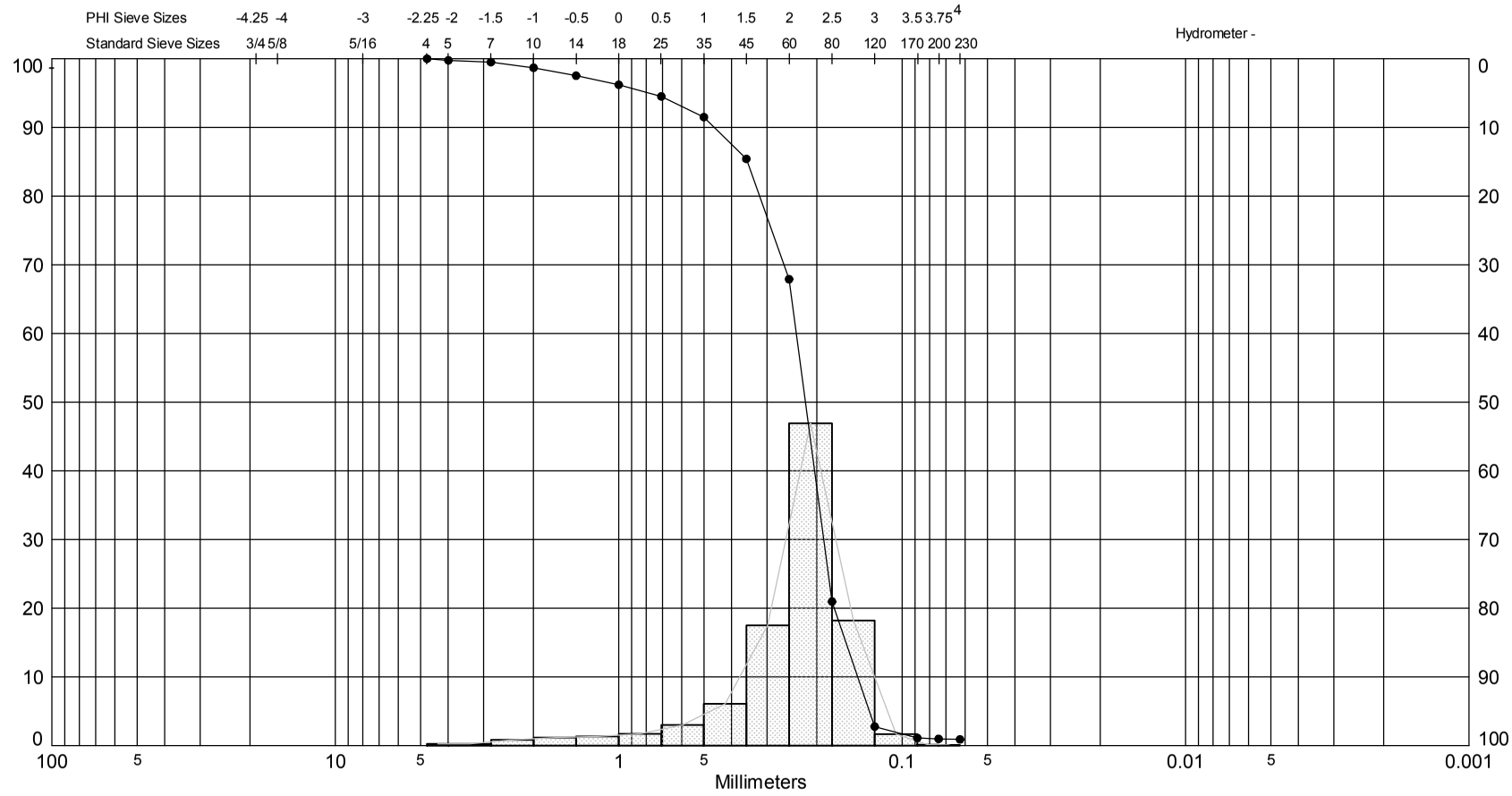
| Sample Information | |
|---|---|
| Project Name: | Flagler County |
| Analysis Date: | 04-01-11 |
| Analyzed By: | |
| Easting (X, ft): | 668,362 |
| Northing (Y, ft): | 1,903,690 |
| Horizontal System: | NAD83 |
| Vertical System: | NAVD88 |

Comments:

Depths and elevations based on measured values

US Army Corps of Engineers
701 San Marco Blvd
Jacksonville, Florida 32207
phone (904)396-7121

SIEVE ANALYSIS FLAGLER_STAT_GINT.GPJ FL DEP ROSS.GDT 11/14/12




| Sample | Symbol | Elev. (ft) | USCS | % Fines | % Organics | % Carbonates | Median | Mean | Skew | Kurt | Sort |
|---|---|---|---|---|---|---|---|---|---|---|---|
| VC-FSP11-3 #2 | —●— | -60.8 | SP | #230 - 0.90 | | | 2.19 | 2.01 | -2.11 | 8.95 | 0.79 |

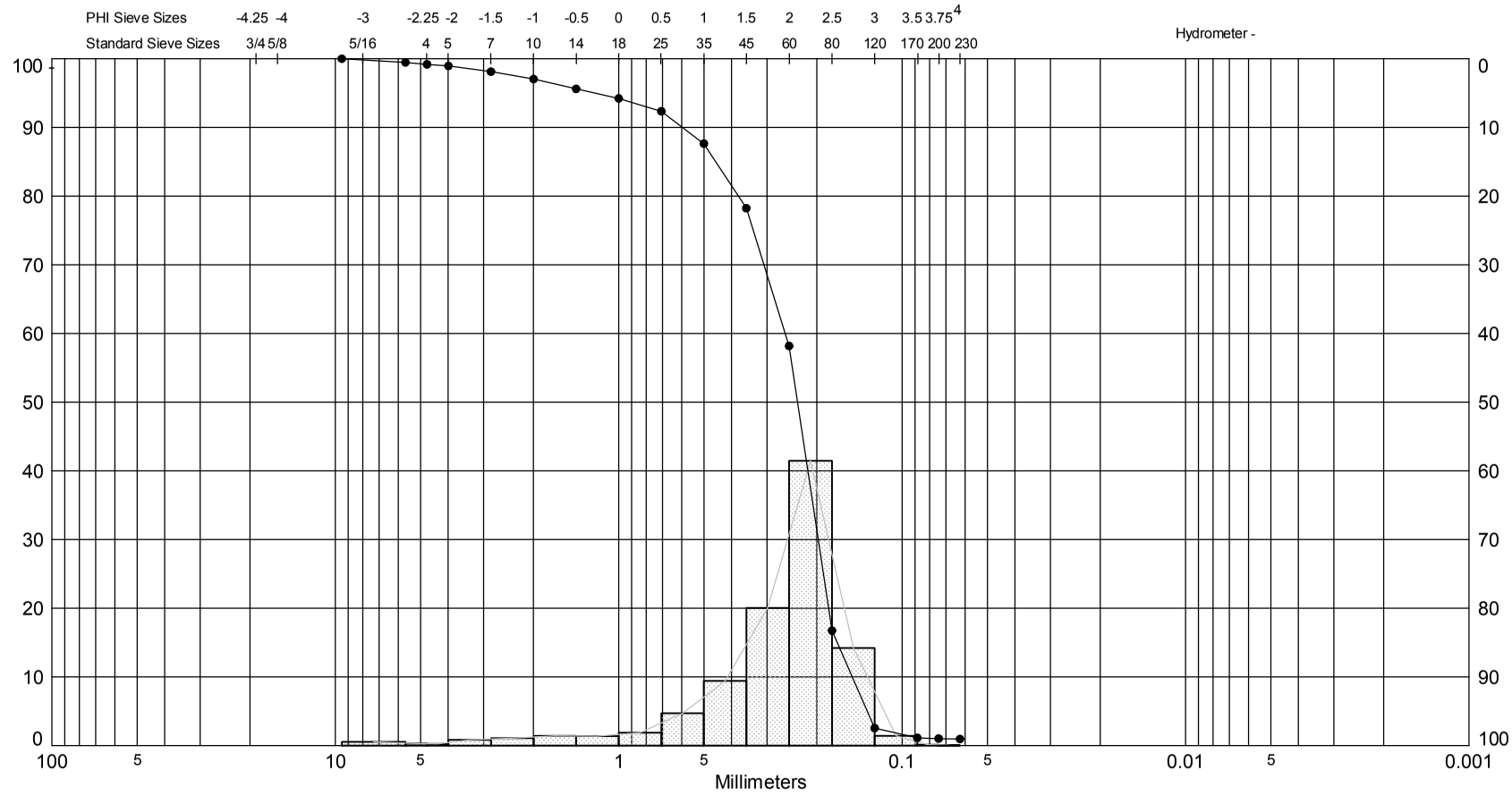
Comments:

Depths and elevations based on measured values

US Army Corps of Engineers
701 San Marco Blvd
Jacksonville, Florida 32207
phone (904)396-7121

| Sample Information | |
|---|---|
| Project Name: | Flagler County |
| Analysis Date: | 04-01-11 |
| Analyzed By: | |
| Easting (X, ft): | 668,362 |
| Northing (Y, ft): | 1,903,690 |
| Horizontal System: | NAD83 |
| Vertical System: | NAVD88 |

SIEVE ANALYSIS FLAGLER_STAT_GINT.GPJ FL DEP ROSS.GDT 11/14/12




| Sample | Symbol | Elev. (ft) | USCS | % Fines | % Organics | % Carbonates | Median | Mean | Skew | Kurt | Sort |
|---|---|---|---|---|---|---|---|---|---|---|---|
| VC-FSP11-3 #3 | —●— | -63.8 | SW | #230 - 0.96 | | 18.00 | 2.1 | 1.83 | -2.14 | 8.77 | 0.97 |

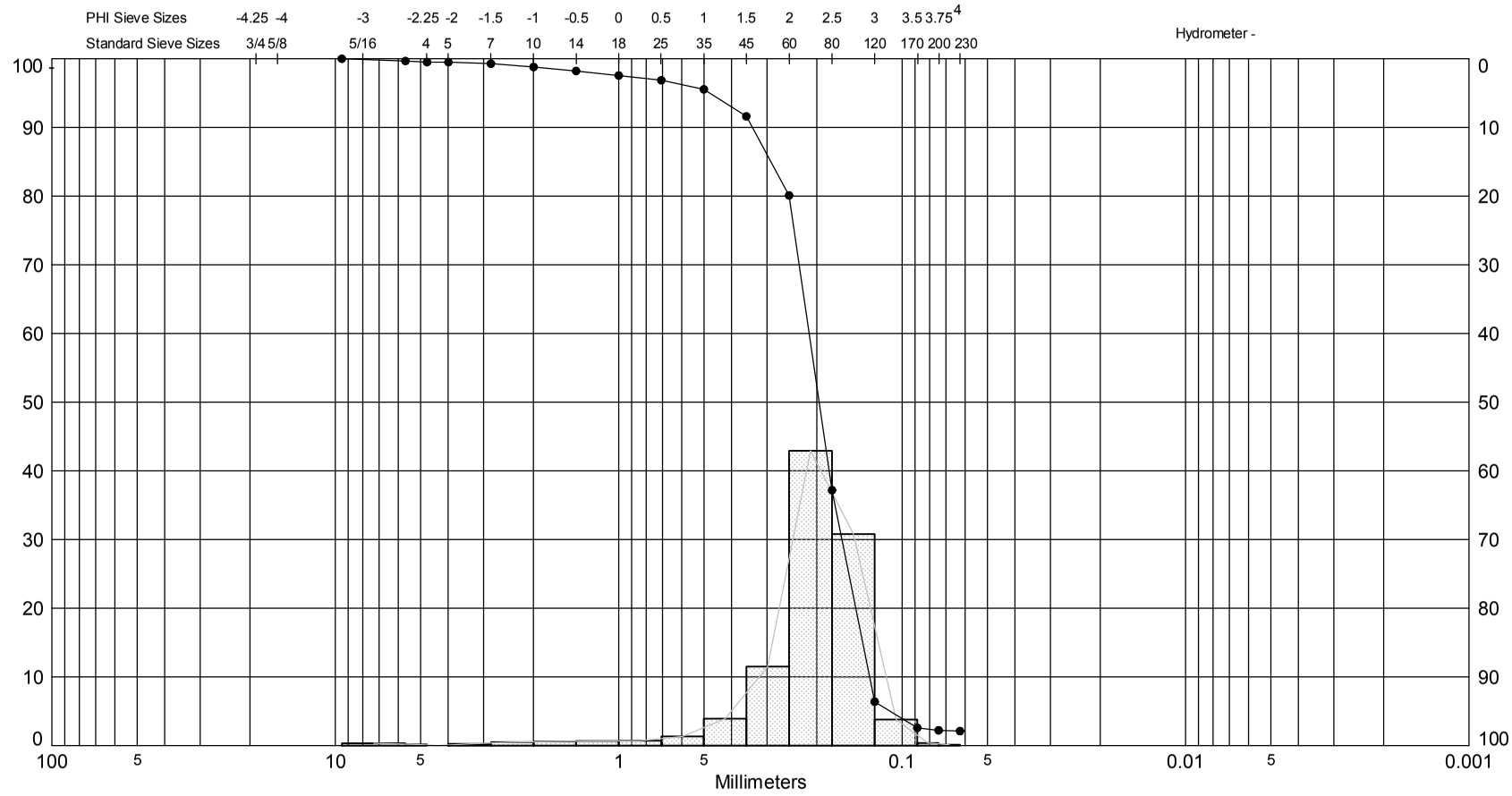
Comments:

Depths and elevations based on measured values

US Army Corps of Engineers
701 San Marco Blvd
Jacksonville, Florida 32207
phone (904)396-7121

| Sample Information | |
|---|---|
| Project Name: | Flagler County |
| Analysis Date: | 04-01-11 |
| Analyzed By: | |
| Easting (X, ft): | 668,362 |
| Northing (Y, ft): | 1,903,690 |
| Horizontal System: | NAD83 |
| Vertical System: | NAVD88 |

SIEVE ANALYSIS FLAGLER_STAT_GINT.GPJ FL DEP ROSS.GDT 11/14/12




| Sample | Symbol | Elev. (ft) | USCS | % Fines | % Organics | % Carbonates | Median | Mean | Skew | Kurt | Sort |
|---|---|---|---|---|---|---|---|---|---|---|---|
| VC-FSP11-3 #4 | —●— | -66.8 | SP | #230 - 2.11 | | | 2.35 | 2.23 | -2.94 | 16.35 | 0.76 |

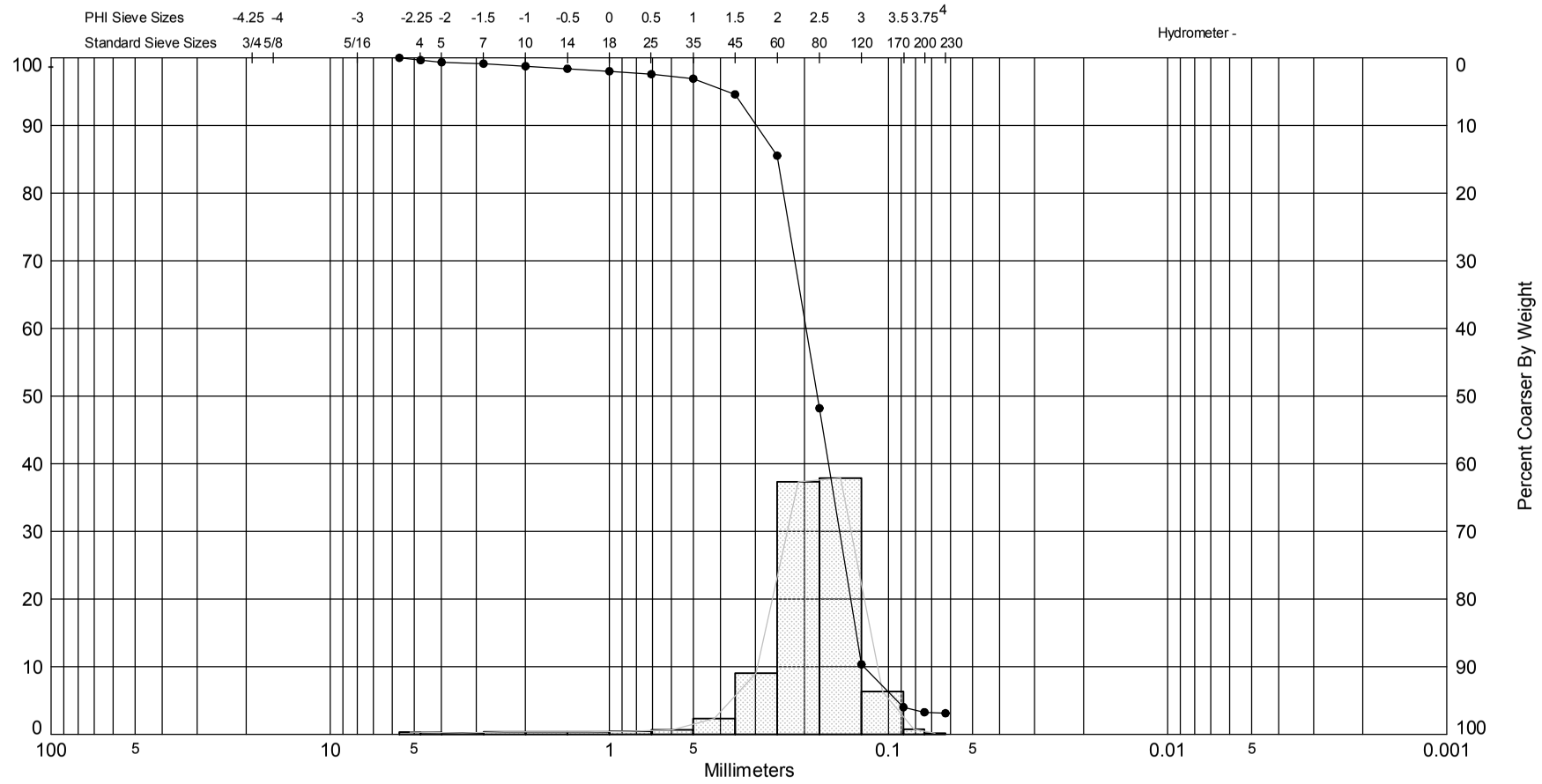
| Sample Information | |
|---|---|
| Project Name: | Flagler County |
| Analysis Date: | 04-01-11 |
| Analyzed By: | |
| Easting (X, ft): | 668,362 |
| Northing (Y, ft): | 1,903,690 |
| Horizontal System: | NAD83 |
| Vertical System: | NAVD88 |

Comments:

Depths and elevations based on measured values

US Army Corps of Engineers
701 San Marco Blvd
Jacksonville, Florida 32207
phone (904)396-7121

SIEVE ANALYSIS FLAGLER_STAT_GINT.GPJ FL DEP ROSS.GDT 11/14/12




SIEVE ANALYSIS FLAGLER_STAT_GINT.GPJ FL DEP ROSS.GDT 11/14/12

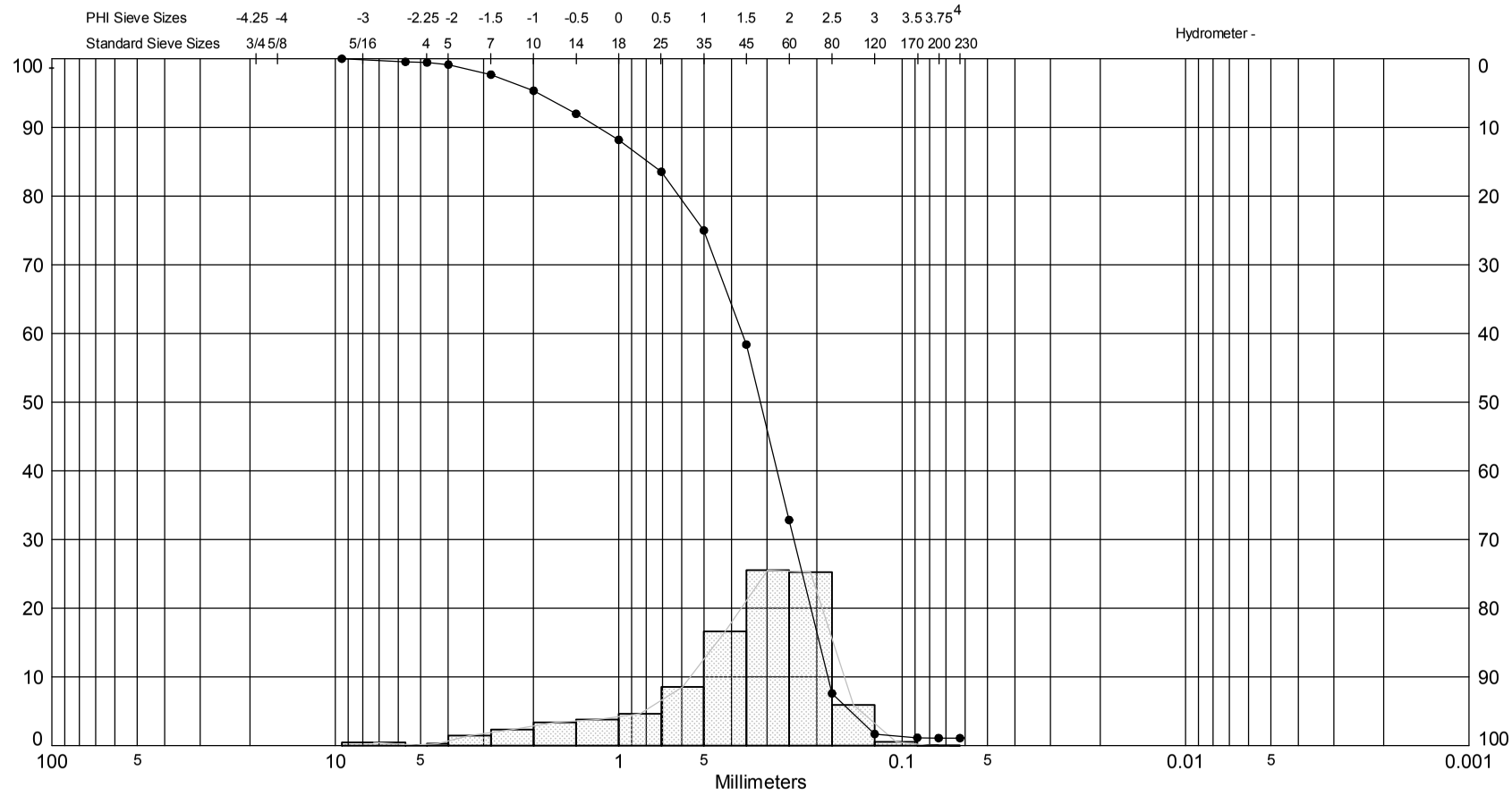
| Sample | Symbol | Elev. (ft) | USCS | % Fines | % Organics | % Carbonates | Median | Mean | Skew | Kurt | Sort |
|---|---|---|---|---|---|---|---|---|---|---|---|
| VC-FSP11-3 #5 | —●— | -69.8 | SP | #230 - 3.12 | | | 2.48 | 2.36 | -3.16 | 18.38 | 0.73 |

Comments:

Depths and elevations based on measured values

US Army Corps of Engineers
701 San Marco Blvd
Jacksonville, Florida 32207
phone (904)396-7121

| Sample Information | |
|---|---|
| Project Name: | Flagler County |
| Analysis Date: | 04-01-11 |
| Analyzed By: | |
| Easting (X, ft): | 668,362 |
| Northing (Y, ft): | 1,903,690 |
| Horizontal System: | NAD83 |
| Vertical System: | NAVD88 |




| Sample | Symbol | Elev. (ft) | USCS | % Fines | % Organics | % Carbonates | Median | Mean | Skew | Kurt | Sort |
|---|---|---|---|---|---|---|---|---|---|---|---|
| VC-FSP11-4 #1 | —●— | -61.0 | SW | #230 - 1.08 | | | 1.66 | 1.38 | -1.31 | 4.64 | 1.08 |

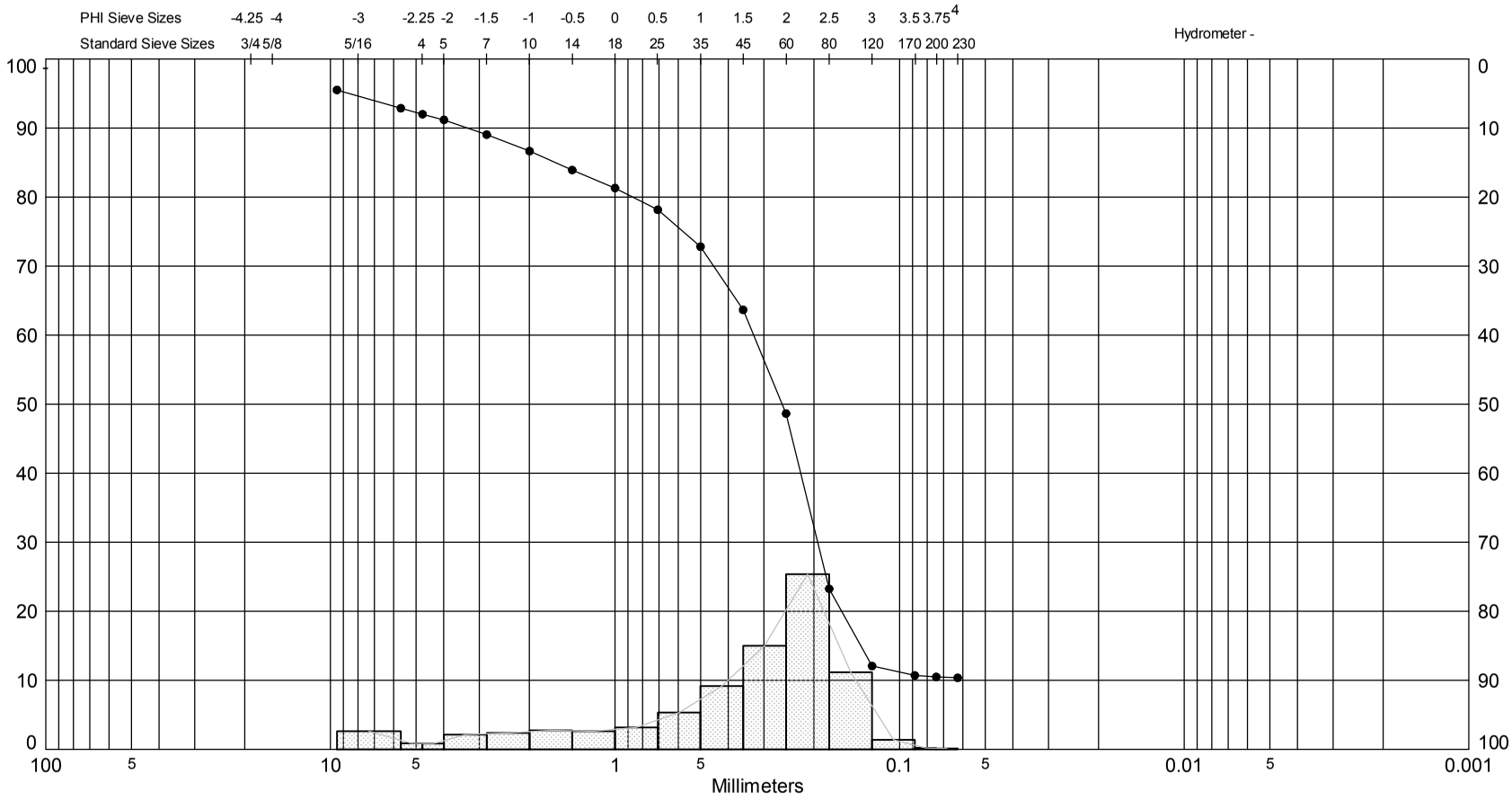
Comments:

Depths and elevations based on measured values

US Army Corps of Engineers
701 San Marco Blvd
Jacksonville, Florida 32207
phone (904)396-7121

| Sample Information | |
|---|---|
| Project Name: | Flagler County |
| Analysis Date: | 04-01-11 |
| Analyzed By: | |
| Easting (X, ft): | 673,572 |
| Northing (Y, ft): | 1,906,128 |
| Horizontal System: | NAD83 |
| Vertical System: | NAVD88 |

SIEVE ANALYSIS FLAGLER_STAT_GINT.GPJ FL DEP ROSS.GDT 11/14/12




| Sample | Symbol | Elev. (ft) | USCS | % Fines | % Organics | % Carbonates | Median | Mean | Skew | Kurt | Sort |
|---|---|---|---|---|---|---|---|---|---|---|---|
| VC-FSP11-4 #2 | —●— | -64.0 | SP | #230 - 10.36 | | 40.00 | 1.95 | 1.1 | -0.83 | 3.35 | 1.44 |

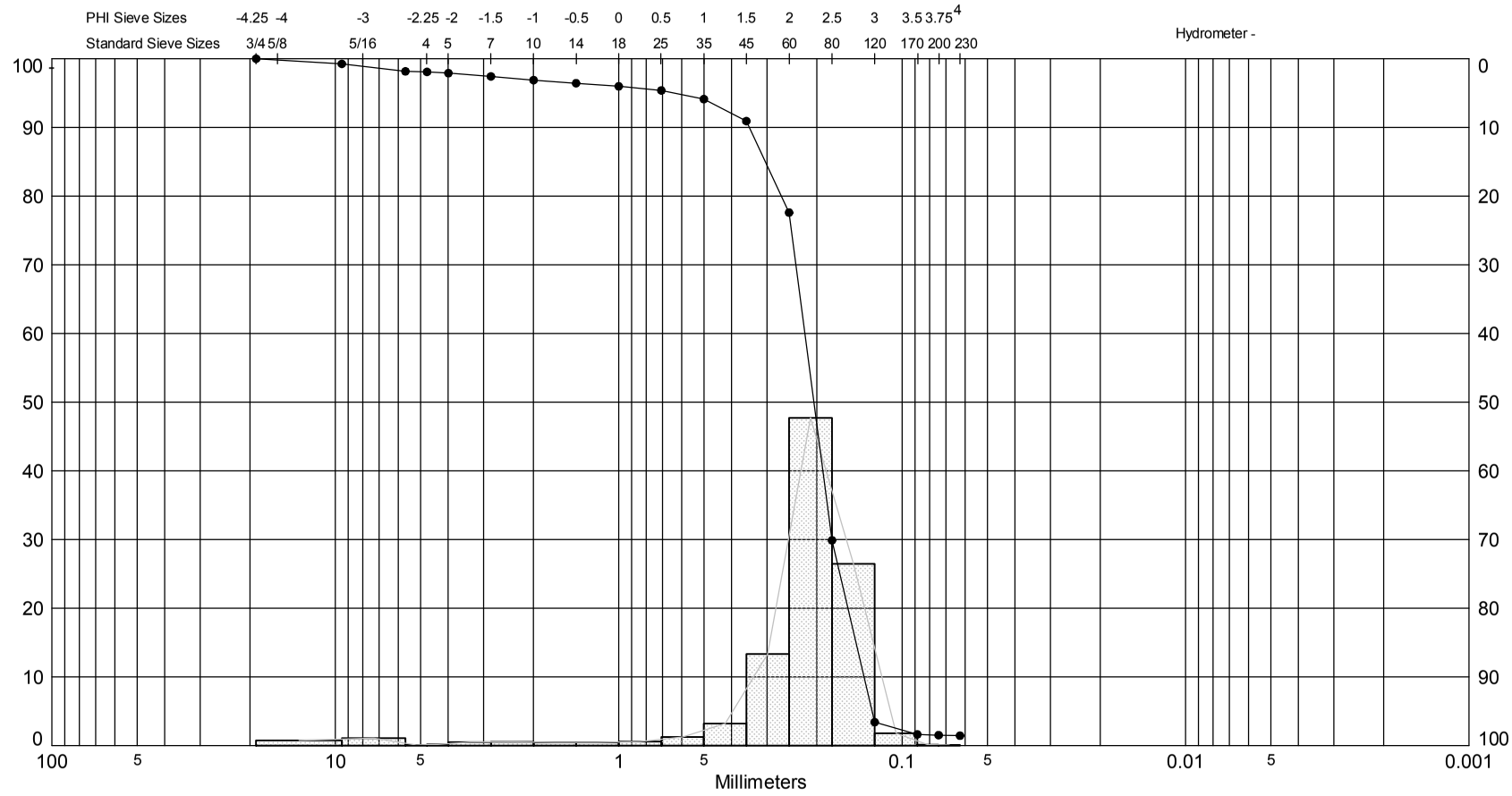
| Sample Information | |
|---|---|
| Project Name: | Flagler County |
| Analysis Date: | 04-01-11 |
| Analyzed By: | |
| Easting (X, ft): | 673,572 |
| Northing (Y, ft): | 1,906,128 |
| Horizontal System: | NAD83 |
| Vertical System: | NAVD88 |

Comments:

Depths and elevations based on measured values

US Army Corps of Engineers
701 San Marco Blvd
Jacksonville, Florida 32207
phone (904)396-7121

SIEVE ANALYSIS FLAGLER_STAT_GINT.GPJ FL DEP ROSS.GDT 11/14/12




| Sample | Symbol | Elev. (ft) | USCS | % Fines | % Organics | % Carbonates | Median | Mean | Skew | Kurt | Sort |
|---|---|---|---|---|---|---|---|---|---|---|---|
| VC-FSP11-4 #3 | —●— | -67.0 | SW | #230 - 1.44 | | | 2.29 | 2.09 | -3.62 | 18.31 | 1.01 |

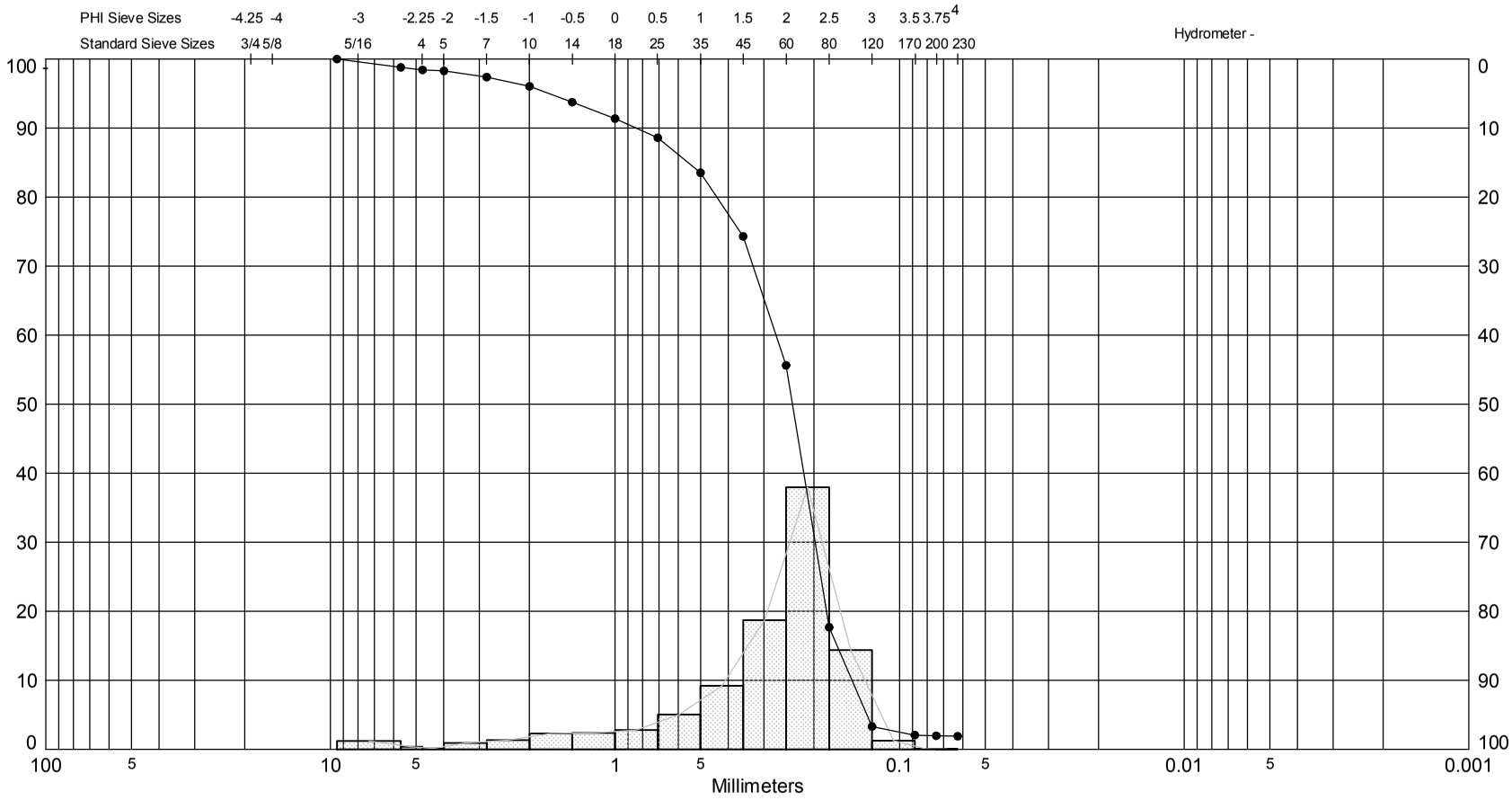
Comments:

Depths and elevations based on measured values

US Army Corps of Engineers
701 San Marco Blvd
Jacksonville, Florida 32207
phone (904)396-7121

| Sample Information | |
|---|---|
| Project Name: | Flagler County |
| Analysis Date: | 04-01-11 |
| Analyzed By: | |
| Easting (X, ft): | 673,572 |
| Northing (Y, ft): | 1,906,128 |
| Horizontal System: | NAD83 |
| Vertical System: | NAVD88 |

SIEVE ANALYSIS FLAGLER_STAT_GINT.GPJ FL DEP ROSS.GDT 11/14/12




| Sample | Symbol | Elev. (ft) | USCS | % Fines | % Organics | % Carbonates | Median | Mean | Skew | Kurt | Sort |
|---|---|---|---|---|---|---|---|---|---|---|---|
| VC-FSP11-5 #1 | —●— | -60.7 | SW | #230 - 1.90 | | 23.00 | 2.07 | 1.71 | -1.91 | 7.04 | 1.11 |

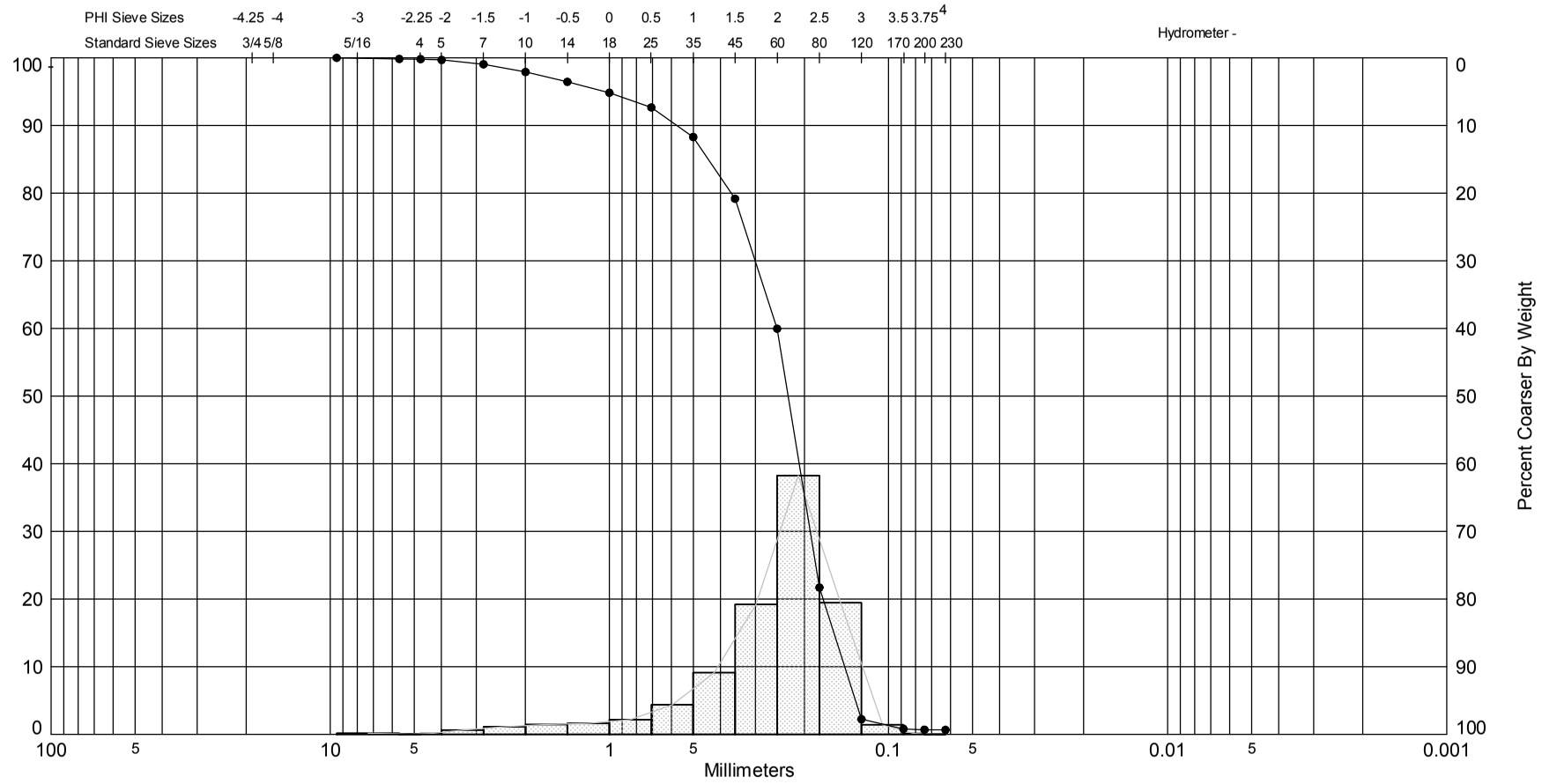
Comments:

Depths and elevations based on measured values

US Army Corps of Engineers
701 San Marco Blvd
Jacksonville, Florida 32207
phone (904)396-7121

| Sample Information | |
|---|---|
| Project Name: | Flagler County |
| Analysis Date: | 04-01-11 |
| Analyzed By: | |
| Easting (X, ft): | 672,891 |
| Northing (Y, ft): | 1,900,724 |
| Horizontal System: | NAD83 |
| Vertical System: | NAVD88 |

SIEVE ANALYSIS FLAGLER_STAT_GINT.GPJ FL DEP ROSS.GDT 11/14/12




| Sample | Symbol | Elev. (ft) | USCS | % Fines | % Organics | % Carbonates | Median | Mean | Skew | Kurt | Sort |
|---|---|---|---|---|---|---|---|---|---|---|---|
| VC-FSP11-5 #2 | —●— | -63.7 | SW | #230 - 0.66 | | | 2.13 | 1.9 | -1.87 | 7.45 | 0.91 |

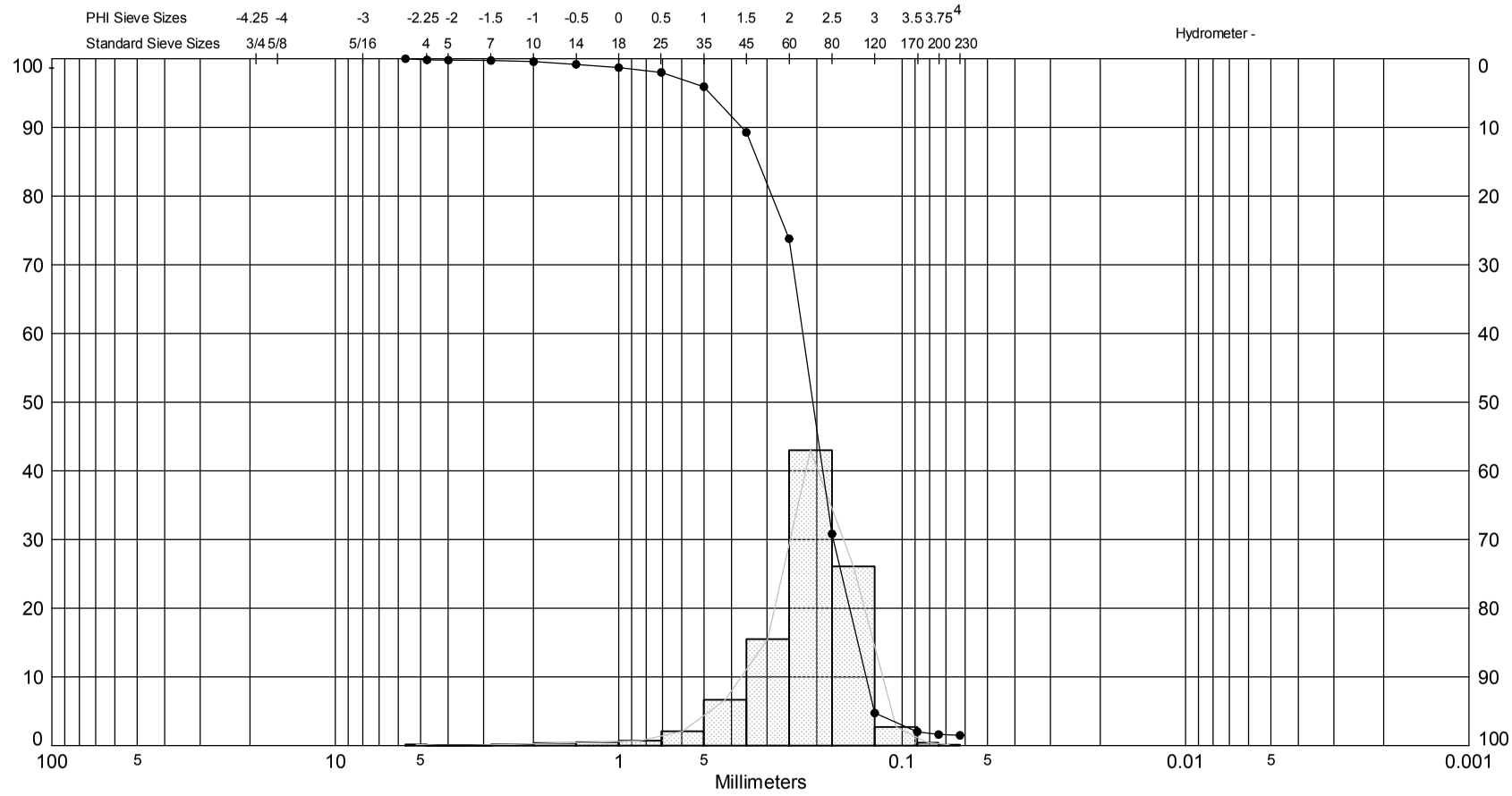
Comments:

Depths and elevations based on measured values

| Sample Information | |
|---|---|
| Project Name: | Flagler County |
| Analysis Date: | 04-01-11 |
| Analyzed By: | |
| Easting (X, ft): | 672,891 |
| Northing (Y, ft): | 1,900,724 |
| Horizontal System: | NAD83 |
| Vertical System: | NAVD88 |

US Army Corps of Engineers
701 San Marco Blvd
Jacksonville, Florida 32207
phone (904)396-7121

SIEVE ANALYSIS FLAGLER_STAT_GINT.GPJ FL DEP ROSS.GDT 11/14/12




| Sample | Symbol | Elev. (ft) | USCS | % Fines | % Organics | % Carbonates | Median | Mean | Skew | Kurt | Sort |
|---|---|---|---|---|---|---|---|---|---|---|---|
| VC-FSP11-5 #3 | —●— | -66.2 | SP | #230 - 1.49 | | | 2.28 | 2.18 | -1.98 | 11.37 | 0.65 |

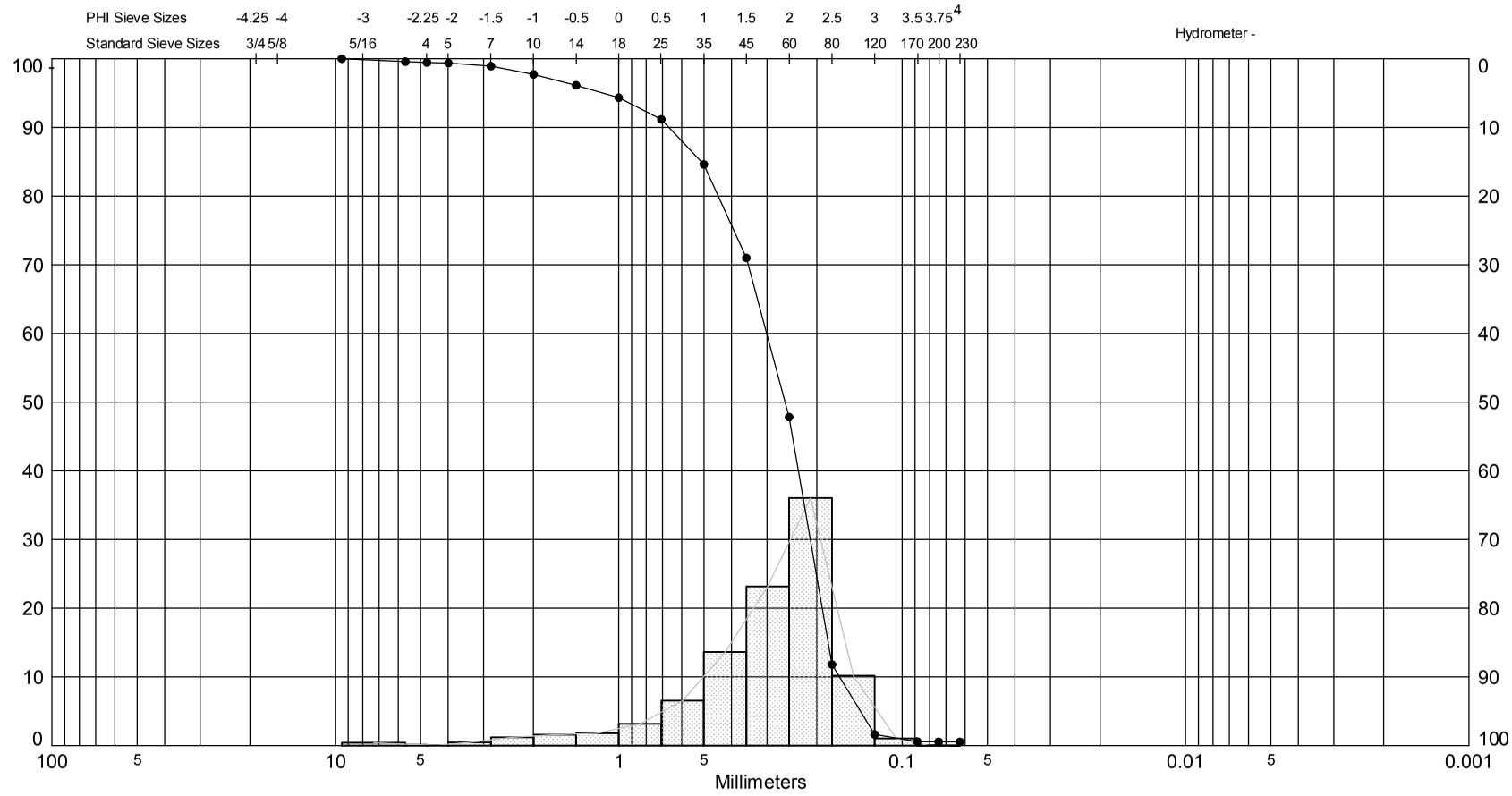
Comments:

Depths and elevations based on measured values

US Army Corps of Engineers
701 San Marco Blvd
Jacksonville, Florida 32207
phone (904)396-7121

| Sample Information | |
|---|---|
| Project Name: | Flagler County |
| Analysis Date: | 04-01-11 |
| Analyzed By: | |
| Easting (X, ft): | 672,891 |
| Northing (Y, ft): | 1,900,724 |
| Horizontal System: | NAD83 |
| Vertical System: | NAVD88 |

SIEVE ANALYSIS FLAGLER_STAT_GINT.GPJ FL DEP ROSS.GDT 11/14/12




| Sample | Symbol | Elev. (ft) | USCS | % Fines | % Organics | % Carbonates | Median | Mean | Skew | Kurt | Sort |
|---|---|---|---|---|---|---|---|---|---|---|---|
| VC-FSP11-6 #1 | —●— | -62.7 | SW | #230 - 0.54 | | | 1.95 | 1.71 | -1.76 | 7.3 | 0.92 |

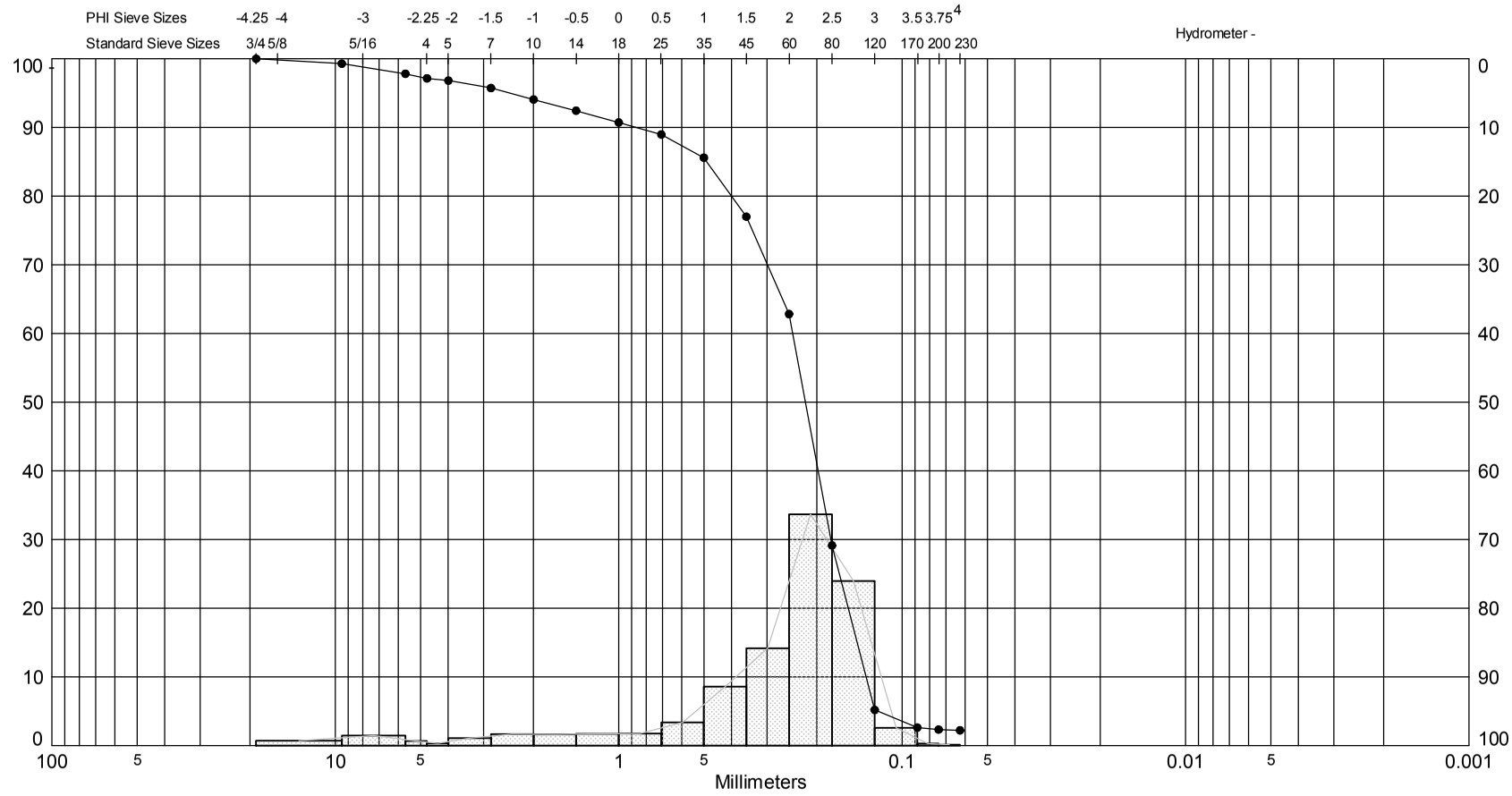
Comments:

Depths and elevations based on measured values

US Army Corps of Engineers
701 San Marco Blvd
Jacksonville, Florida 32207
phone (904)396-7121

| Sample Information | |
|---|---|
| Project Name: | Flagler County |
| Analysis Date: | 04-01-11 |
| Analyzed By: | |
| Easting (X, ft): | 678,009 |
| Northing (Y, ft): | 1,898,131 |
| Horizontal System: | NAD83 |
| Vertical System: | NAVD88 |

SIEVE ANALYSIS FLAGLER_STAT_GINT.GPJ FL DEP ROSS.GDT 11/14/12




| Sample | Symbol | Elev. (ft) | USCS | % Fines | % Organics | % Carbonates | Median | Mean | Skew | Kurt | Sort |
|---|---|---|---|---|---|---|---|---|---|---|---|
| VC-FSP11-6 #2 | —●— | -65.7 | SW | #230 - 2.22 | | | 2.19 | 1.79 | -2.13 | 7.71 | 1.29 |

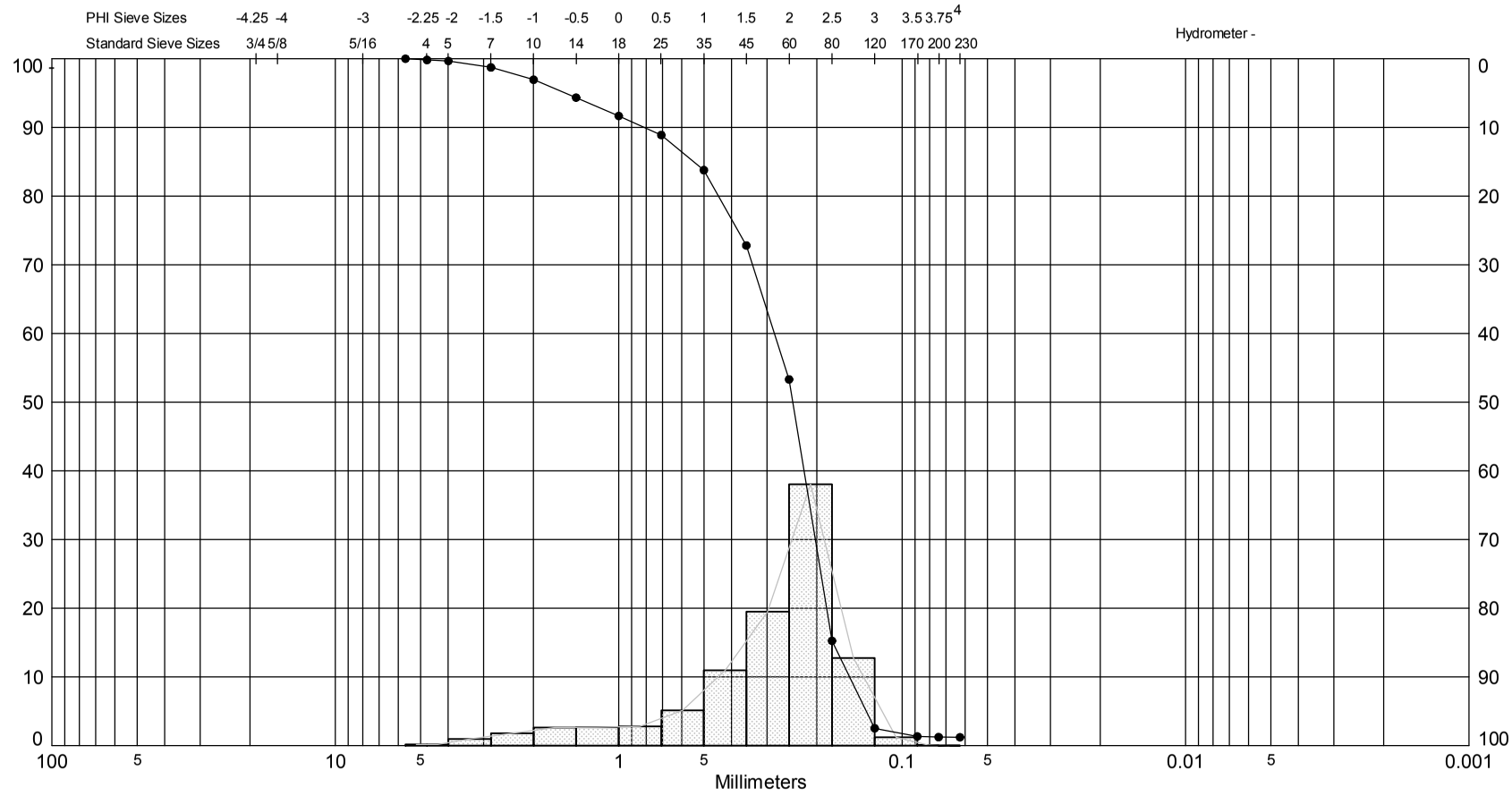
Comments:

Depths and elevations based on measured values

US Army Corps of Engineers
701 San Marco Blvd
Jacksonville, Florida 32207
phone (904)396-7121

| Sample Information | |
|---|---|
| Project Name: | Flagler County |
| Analysis Date: | 04-01-11 |
| Analyzed By: | |
| Easting (X, ft): | 678,009 |
| Northing (Y, ft): | 1,898,131 |
| Horizontal System: | NAD83 |
| Vertical System: | NAVD88 |

SIEVE ANALYSIS FLAGLER_STAT_GINT.GPJ FL DEP ROSS.GDT 11/14/12




| Sample | Symbol | Elev. (ft) | USCS | % Fines | % Organics | % Carbonates | Median | Mean | Skew | Kurt | Sort |
|---|---|---|---|---|---|---|---|---|---|---|---|
| VC-FSP11-6 #3 | —●— | -68.5 | SW | #230 - 1.21 | | 26.00 | 2.04 | 1.72 | -1.57 | 5.41 | 1 |

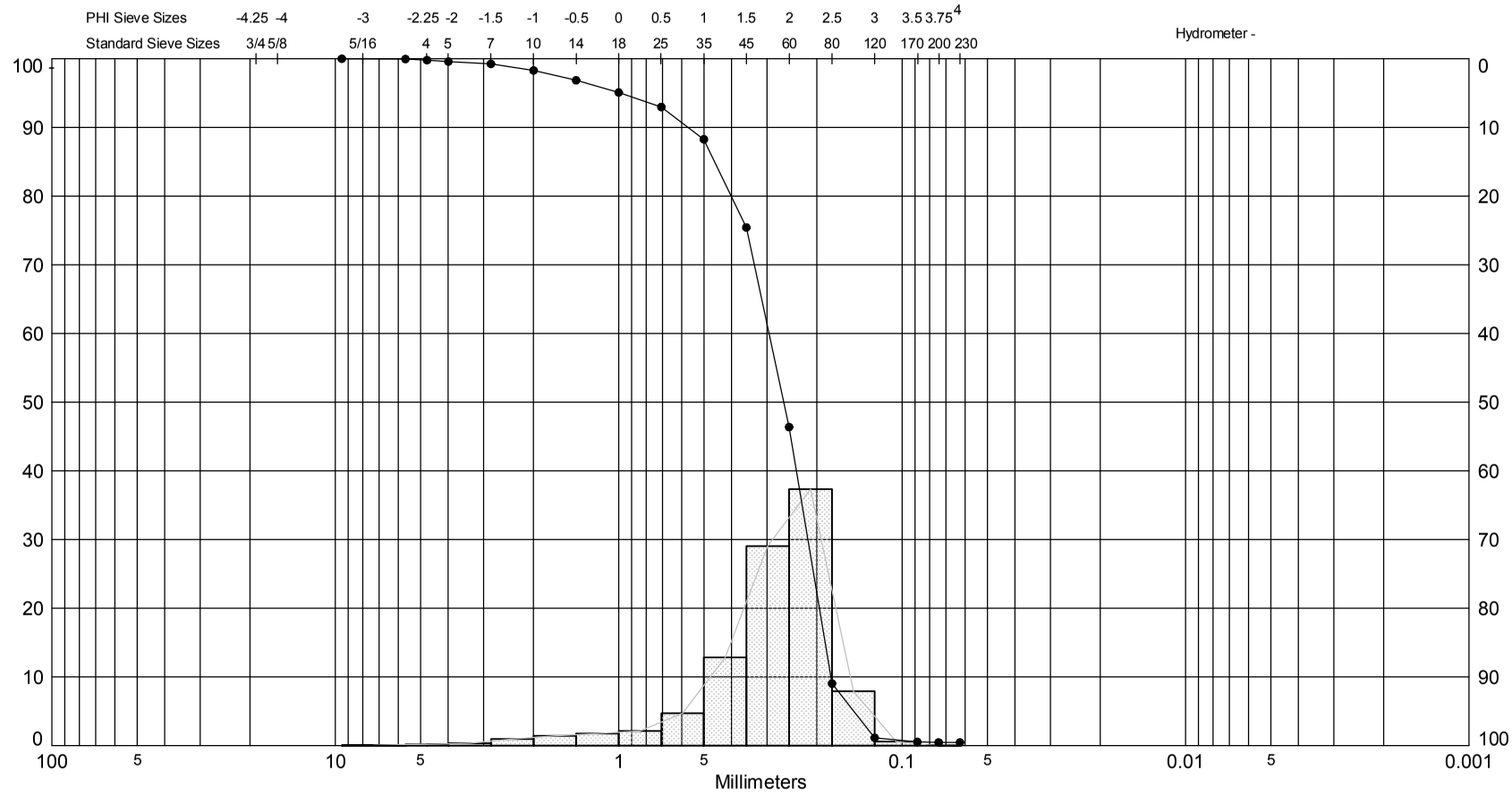
| Sample Information | |
|---|---|
| Project Name: | Flagler County |
| Analysis Date: | 04-01-11 |
| Analyzed By: | |
| Easting (X, ft): | 678,009 |
| Northing (Y, ft): | 1,898,131 |
| Horizontal System: | NAD83 |
| Vertical System: | NAVD88 |

Comments:

Depths and elevations based on measured values

US Army Corps of Engineers
701 San Marco Blvd
Jacksonville, Florida 32207
phone (904)396-7121

SIEVE ANALYSIS FLAGLER_STAT_GINT.GPJ FL DEP ROSS.GDT 11/14/12




SIEVE ANALYSIS FLAGLER_STAT_GINT.GPJ FL DEP ROSS.GDT 11/14/12

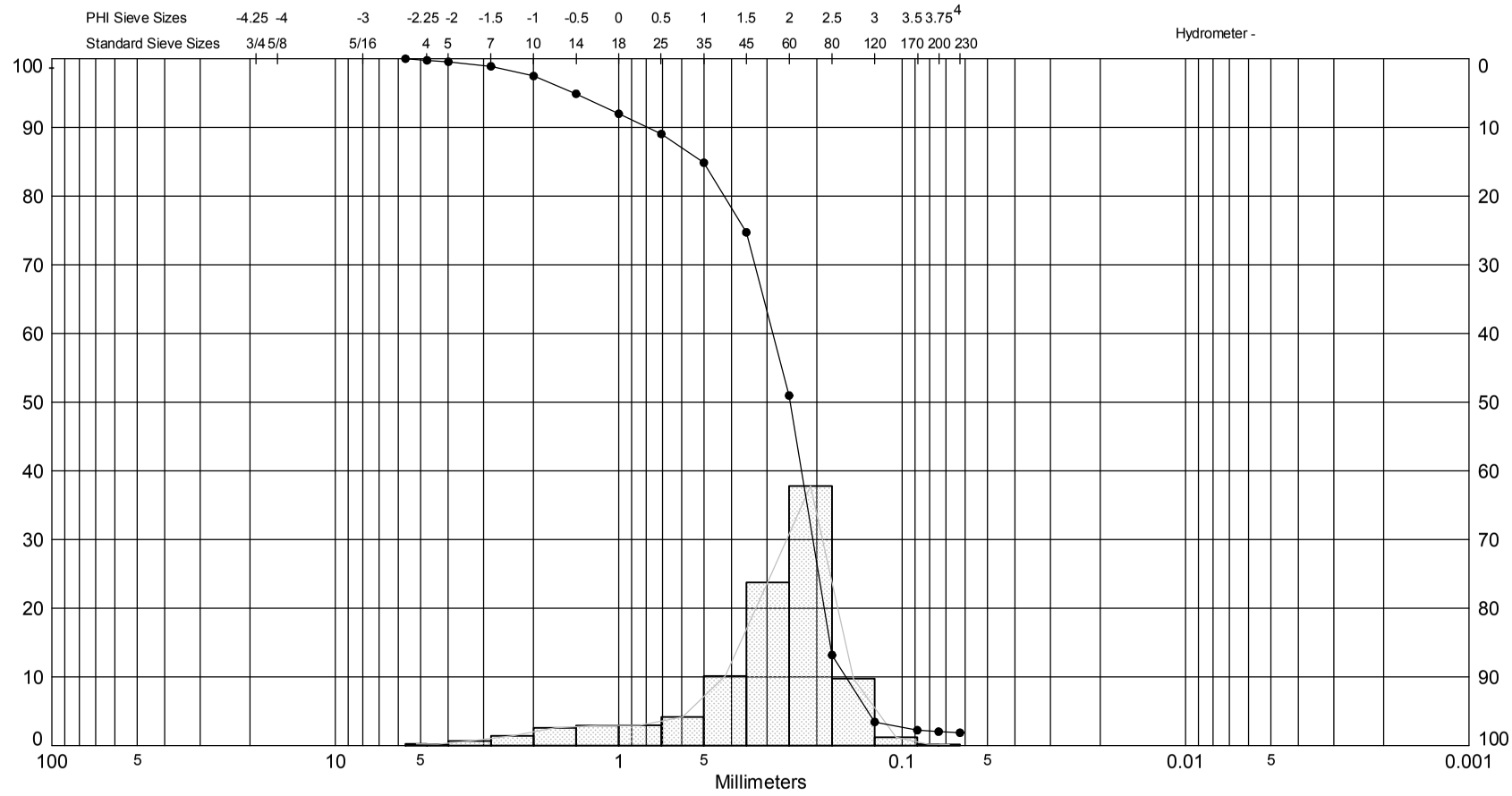
| Sample | Symbol | Elev. (ft) | USCS | % Fines | % Organics | % Carbonates | Median | Mean | Skew | Kurt | Sort |
|---|---|---|---|---|---|---|---|---|---|---|---|
| VC-FSP11-7 #1 | —●— | -55.6 | SP | #230 - 0.45 | | | 1.93 | 1.75 | -1.88 | 7.91 | 0.82 |

Comments:

Depths and elevations based on measured values

US Army Corps of Engineers
701 San Marco Blvd
Jacksonville, Florida 32207
phone (904)396-7121

| Sample Information | |
|---|---|
| Project Name: | Flagler County |
| Analysis Date: | 04-01-11 |
| Analyzed By: | |
| Easting (X, ft): | 678,829 |
| Northing (Y, ft): | 1,893,078 |
| Horizontal System: | NAD83 |
| Vertical System: | NAVD88 |




| Sample | Symbol | Elev. (ft) | USCS | % Fines | % Organics | % Carbonates | Median | Mean | Skew | Kurt | Sort |
|---|---|---|---|---|---|---|---|---|---|---|---|
| VC-FSP11-7 #2 | —●— | -58.6 | SW | #230 - 1.87 | | 25.00 | 2.01 | 1.72 | -1.6 | 5.75 | 0.97 |

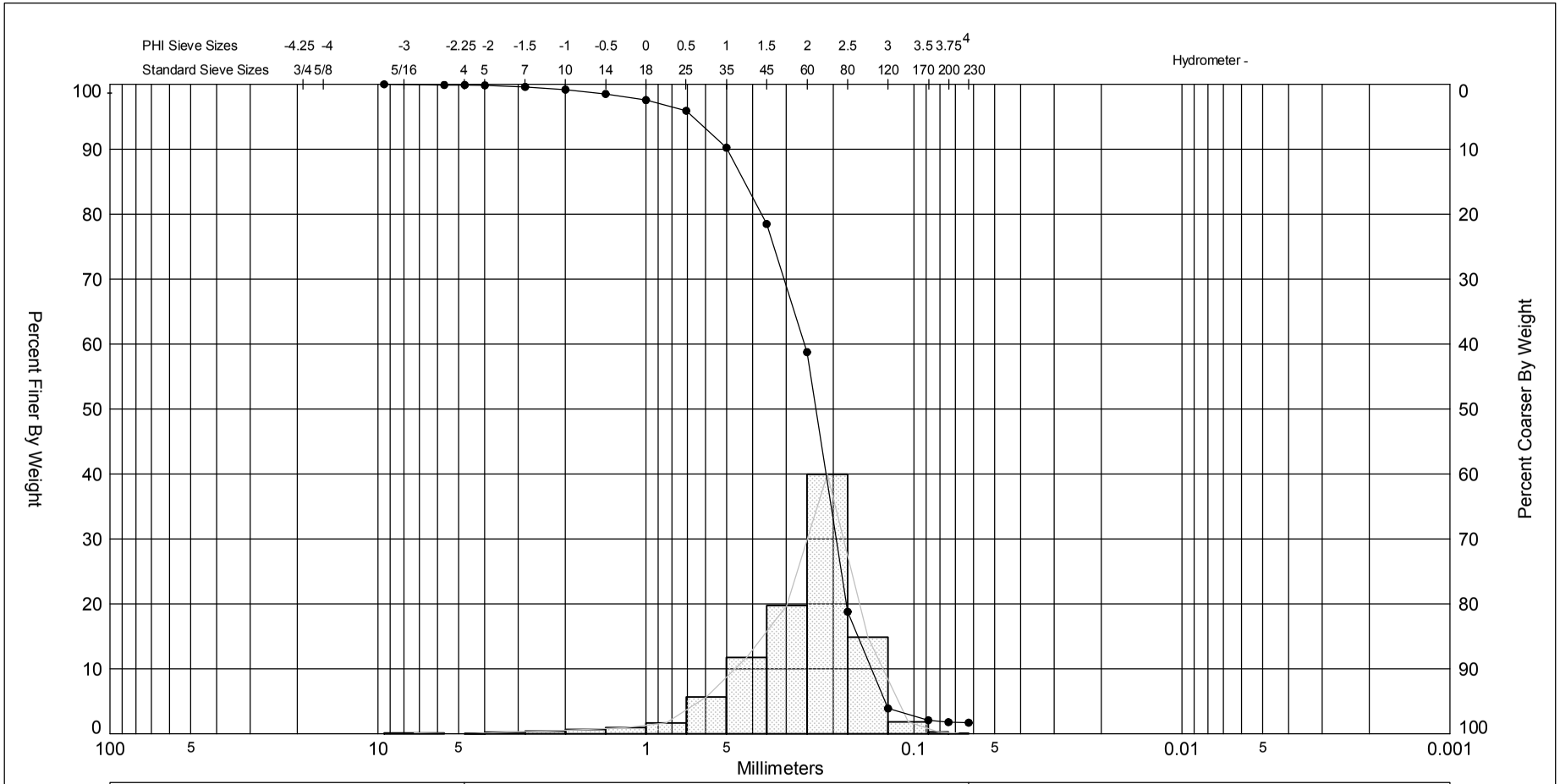
Comments:

Depths and elevations based on measured values

US Army Corps of Engineers
701 San Marco Blvd
Jacksonville, Florida 32207
phone (904)396-7121

| Sample Information | |
|---|---|
| Project Name: | Flagler County |
| Analysis Date: | 04-01-11 |
| Analyzed By: | |
| Easting (X, ft): | 678,829 |
| Northing (Y, ft): | 1,893,078 |
| Horizontal System: | NAD83 |
| Vertical System: | NAVD88 |

SIEVE ANALYSIS FLAGLER_STAT_GINT.GPJ FL DEP ROSS.GDT 11/14/12




| Sample | Symbol | Elev. (ft) | USCS | % Fines | % Organics | % Carbonates | Median | Mean | Skew | Kurt | Sort |
|---|---|---|---|---|---|---|---|---|---|---|---|
| VC-FSP11-7 #3 | —●— | -61.6 | SP | #230 - 1.71 | | | 2.11 | 1.93 | -1.58 | 7.73 | 0.76 |

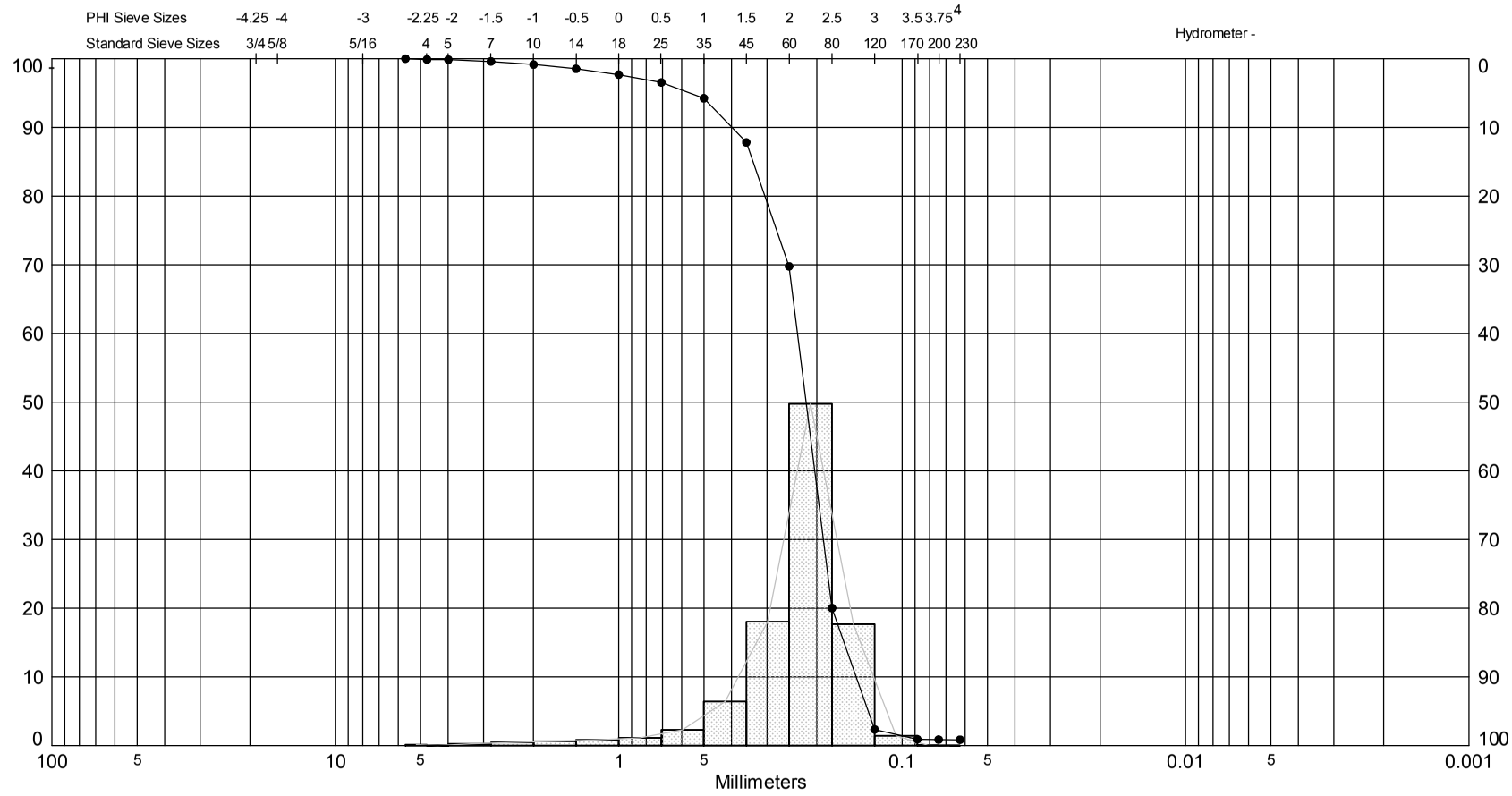
Comments:

Depths and elevations based on measured values

US Army Corps of Engineers
701 San Marco Blvd
Jacksonville, Florida 32207
phone (904)396-7121

| Sample Information | |
|---|---|
| Project Name: | Flagler County |
| Analysis Date: | 04-01-11 |
| Analyzed By: | |
| Easting (X, ft): | 678,829 |
| Northing (Y, ft): | 1,893,078 |
| Horizontal System: | NAD83 |
| Vertical System: | NAVD88 |

SIEVE ANALYSIS FLAGLER_STAT_GINT.GPJ FL DEP ROSS.GDT 11/14/12




| Sample | Symbol | Elev. (ft) | USCS | % Fines | % Organics | % Carbonates | Median | Mean | Skew | Kurt | Sort |
|---|---|---|---|---|---|---|---|---|---|---|---|
| VC-FSP11-8 #1 | —●— | -62.8 | SP | #230 - 0.85 | | | 2.2 | 2.07 | -2.32 | 11.49 | 0.69 |

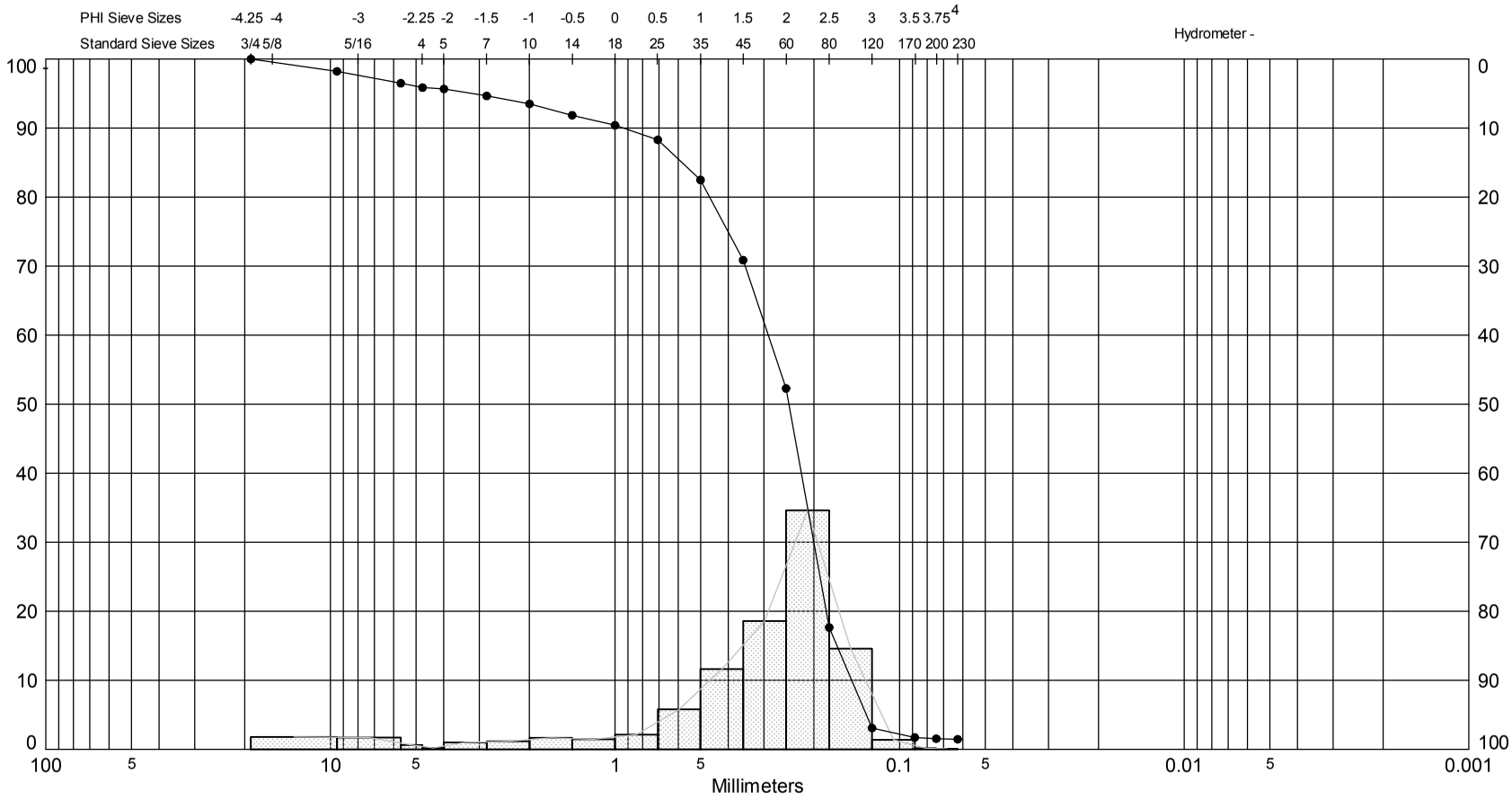
Comments:

Depths and elevations based on measured values

US Army Corps of Engineers
701 San Marco Blvd
Jacksonville, Florida 32207
phone (904)396-7121

| Sample Information | |
|---|---|
| Project Name: | Flagler County |
| Analysis Date: | 04-01-11 |
| Analyzed By: | |
| Easting (X, ft): | 684,228 |
| Northing (Y, ft): | 1,895,572 |
| Horizontal System: | NAD83 |
| Vertical System: | NAVD88 |

SIEVE ANALYSIS FLAGLER_STAT_GINT.GPJ FL DEP ROSS.GDT 11/14/12




| Sample | Symbol | Elev. (ft) | USCS | % Fines | % Organics | % Carbonates | Median | Mean | Skew | Kurt | Sort |
|---|---|---|---|---|---|---|---|---|---|---|---|
| VC-FSP11-8 #2 | —●— | -65.8 | SW | #230 - 1.46 | | 24.00 | 2.03 | 1.59 | -2.18 | 7.93 | 1.36 |

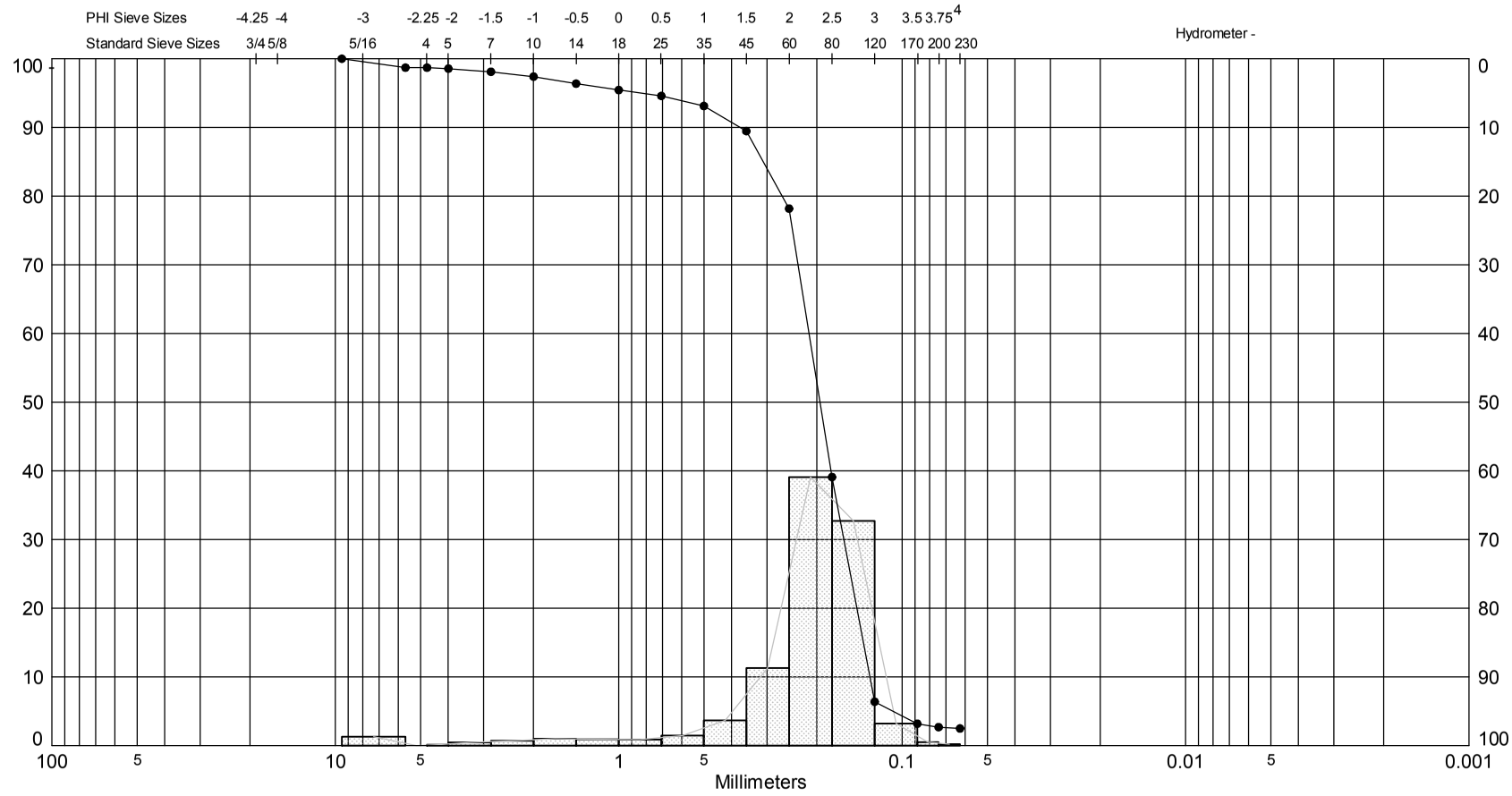
Comments:

Depths and elevations based on measured values

US Army Corps of Engineers
701 San Marco Blvd
Jacksonville, Florida 32207
phone (904)396-7121

| Sample Information | |
|---|---|
| Project Name: | Flagler County |
| Analysis Date: | 04-01-11 |
| Analyzed By: | |
| Easting (X, ft): | 684,228 |
| Northing (Y, ft): | 1,895,572 |
| Horizontal System: | NAD83 |
| Vertical System: | NAVD88 |

SIEVE ANALYSIS FLAGLER_STAT_GINT.GPJ FL DEP ROSS.GDT 11/14/12




| Sample | Symbol | Elev. (ft) | USCS | % Fines | % Organics | % Carbonates | Median | Mean | Skew | Kurt | Sort |
|---|---|---|---|---|---|---|---|---|---|---|---|
| VC-FSP11-8 #3 | —●— | -68.8 | SW | #230 - 2.49 | | | 2.36 | 2.15 | -2.95 | 13.66 | 0.98 |

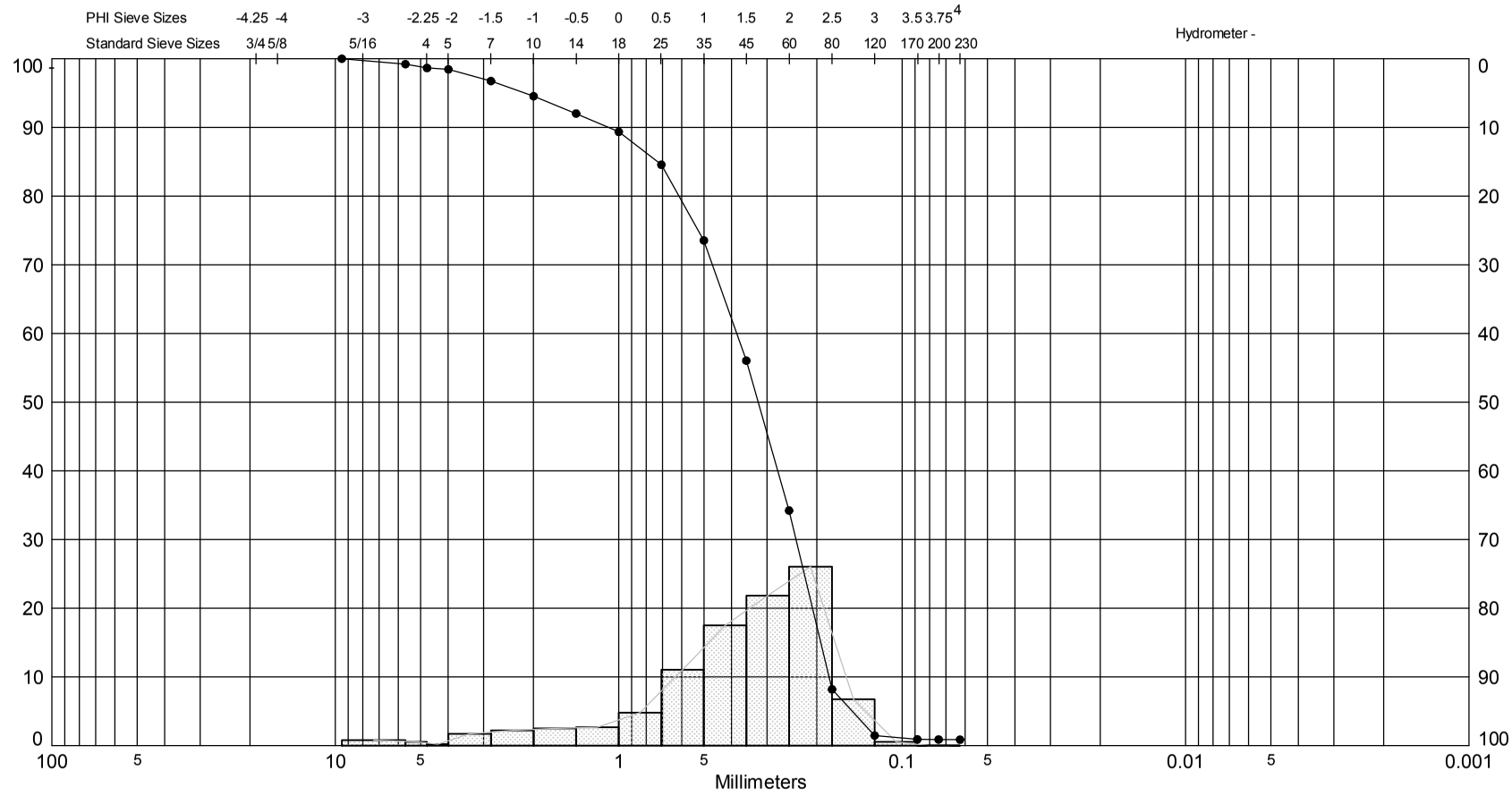
Comments:

Depths and elevations based on measured values

US Army Corps of Engineers
701 San Marco Blvd
Jacksonville, Florida 32207
phone (904)396-7121

| Sample Information | |
|---|---|
| Project Name: | Flagler County |
| Analysis Date: | 04-01-11 |
| Analyzed By: | |
| Easting (X, ft): | 684,228 |
| Northing (Y, ft): | 1,895,572 |
| Horizontal System: | NAD83 |
| Vertical System: | NAVD88 |

SIEVE ANALYSIS FLAGLER_STAT_GINT.GPJ FL DEP ROSS.GDT 11/14/12




| Sample | Symbol | Elev. (ft) | USCS | % Fines | % Organics | % Carbonates | Median | Mean | Skew | Kurt | Sort |
|---|---|---|---|---|---|---|---|---|---|---|---|
| VC-FSP11-9 #1 | —●— | -62.9 | SW | #230 - 0.86 | | 22.00 | 1.63 | 1.37 | -1.41 | 5.15 | 1.11 |

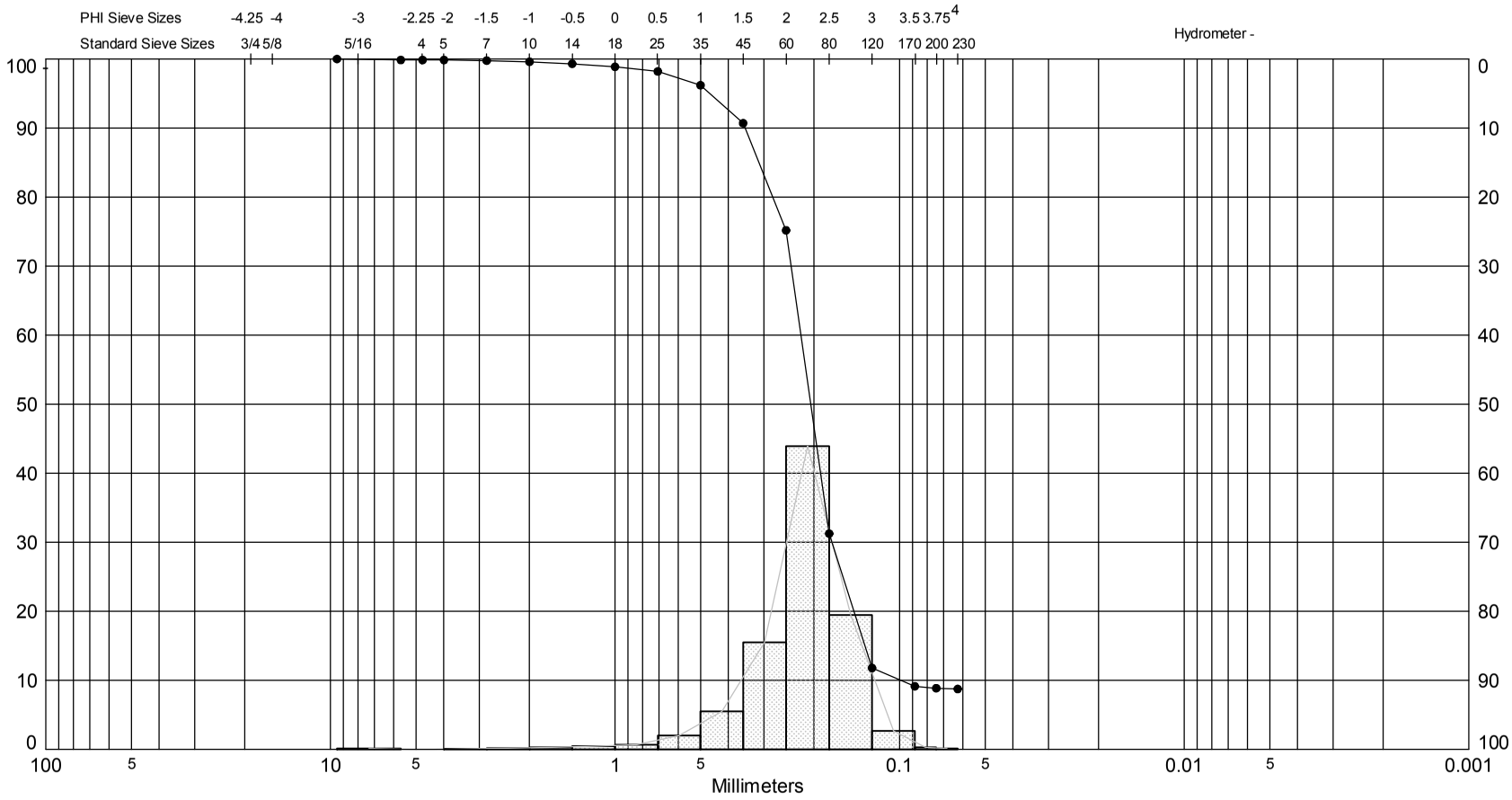
Comments:

Depths and elevations based on measured values

US Army Corps of Engineers
701 San Marco Blvd
Jacksonville, Florida 32207
phone (904)396-7121

| Sample Information | |
|---|---|
| Project Name: | Flagler County |
| Analysis Date: | 04-01-11 |
| Analyzed By: | |
| Easting (X, ft): | 682,407 |
| Northing (Y, ft): | 1,889,245 |
| Horizontal System: | NAD83 |
| Vertical System: | NAVD88 |

SIEVE ANALYSIS FLAGLER_STAT_GINT.GPJ FL DEP ROSS.GDT 11/14/12




| Sample | Symbol | Elev. (ft) | USCS | % Fines | % Organics | % Carbonates | Median | Mean | Skew | Kurt | Sort |
|---|---|---|---|---|---|---|---|---|---|---|---|
| VC-FSP11-9 #2 | —●— | -65.9 | SP-SM | #230 - 8.74 | | | 2.28 | 2.16 | -2.13 | 13.38 | 0.63 |

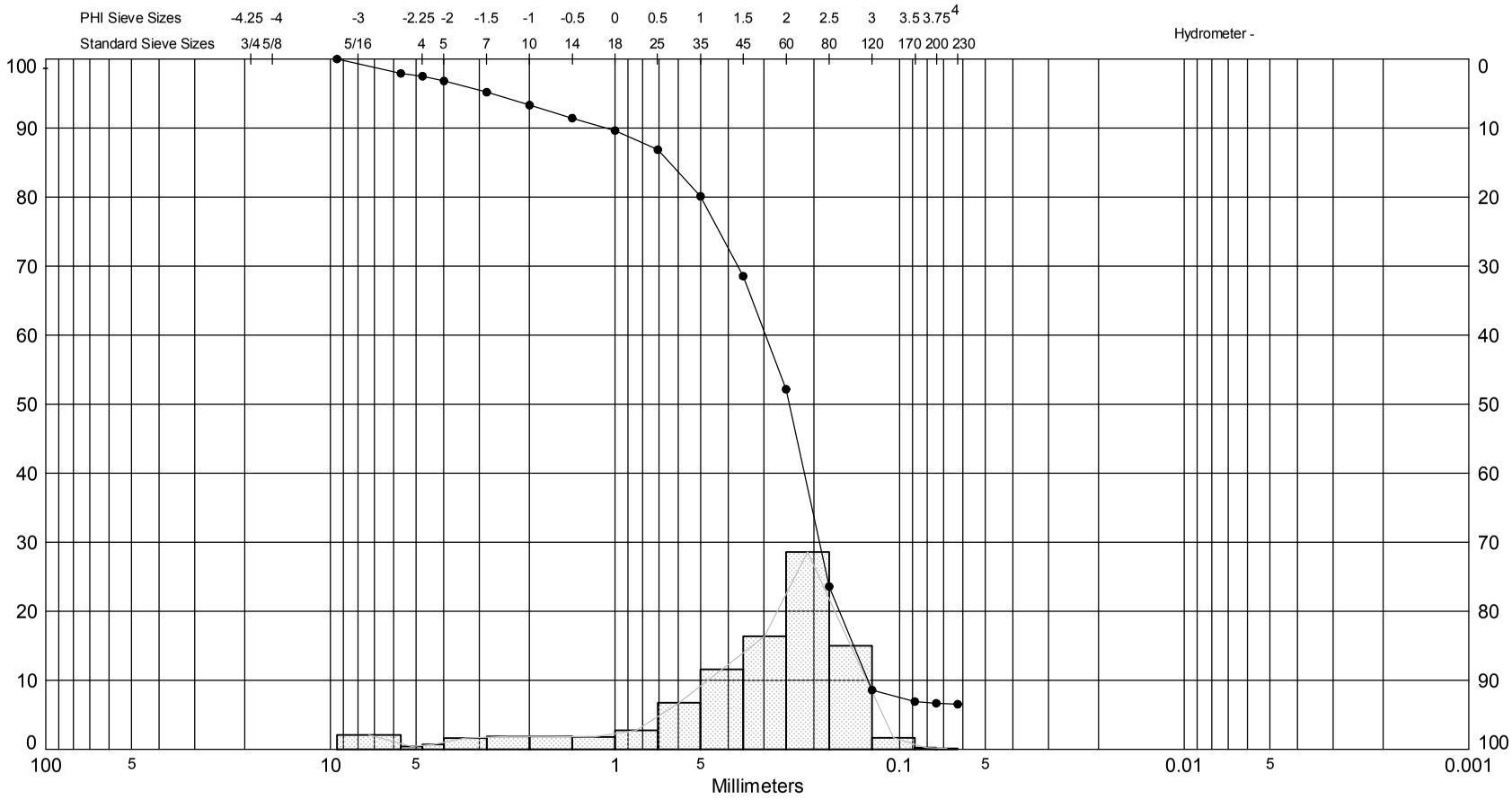
Comments:

Depths and elevations based on measured values

US Army Corps of Engineers
701 San Marco Blvd
Jacksonville, Florida 32207
phone (904)396-7121

| Sample Information | |
|---|---|
| Project Name: | Flagler County |
| Analysis Date: | 04-01-11 |
| Analyzed By: | |
| Easting (X, ft): | 682,407 |
| Northing (Y, ft): | 1,889,245 |
| Horizontal System: | NAD83 |
| Vertical System: | NAVD88 |

SIEVE ANALYSIS FLAGLER_STAT_GINT.GPJ FL DEP ROSS.GDT 11/14/12




| Sample | Symbol | Elev. (ft) | USCS | % Fines | % Organics | % Carbonates | Median | Mean | Skew | Kurt | Sort |
|---|---|---|---|---|---|---|---|---|---|---|---|
| VC-FSP11-9 #3 | —●— | -68.9 | SW-SM | #230 - 6.53 | | | 2.03 | 1.56 | -1.65 | 5.59 | 1.3 |

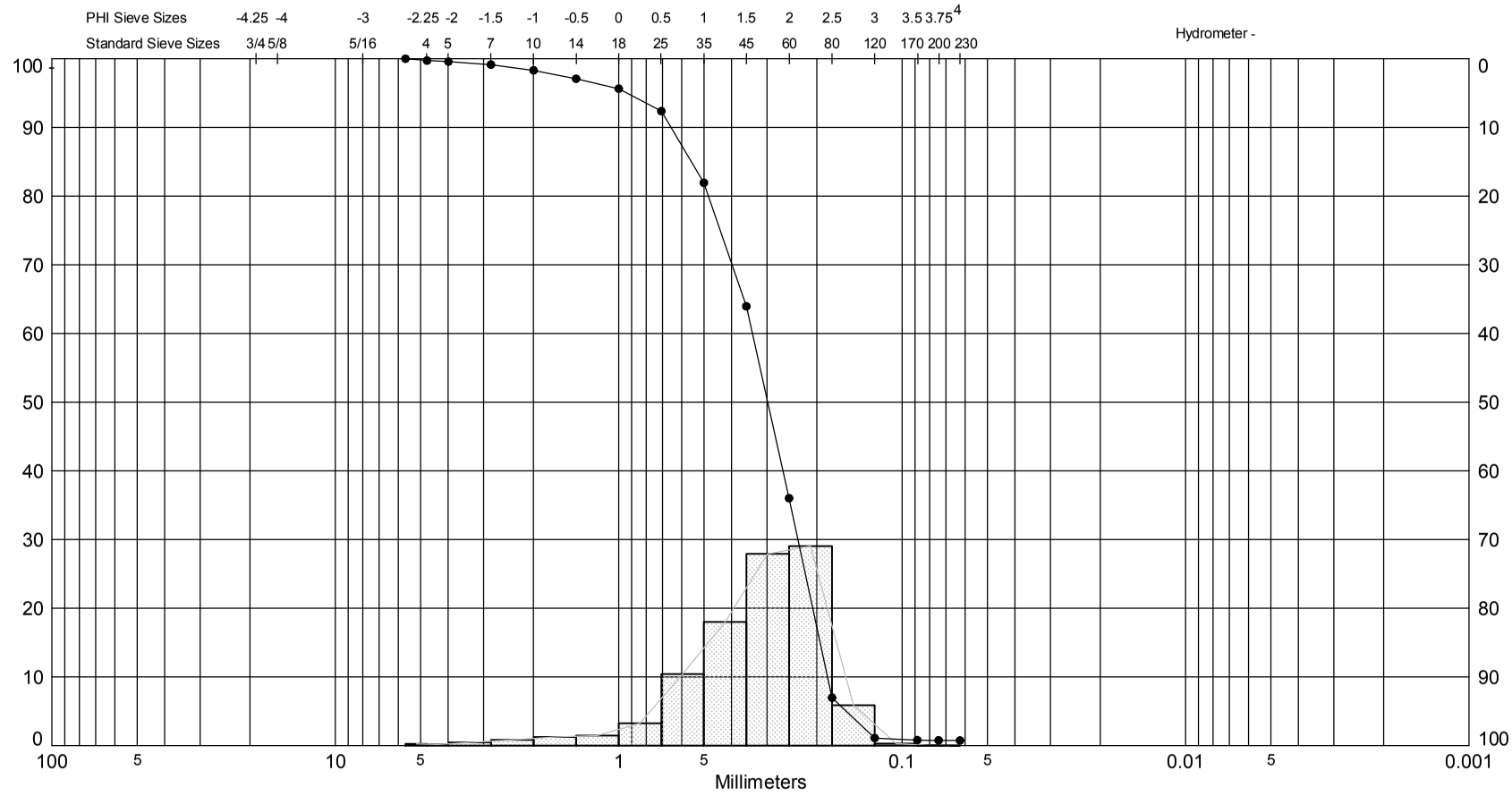
| Sample Information | |
|---|---|
| Project Name: | Flagler County |
| Analysis Date: | 04-01-11 |
| Analyzed By: | |
| Easting (X, ft): | 682,407 |
| Northing (Y, ft): | 1,889,245 |
| Horizontal System: | NAD83 |
| Vertical System: | NAVD88 |

Comments:

Depths and elevations based on measured values

US Army Corps of Engineers
701 San Marco Blvd
Jacksonville, Florida 32207
phone (904)396-7121

SIEVE ANALYSIS FLAGLER_STAT_GINT.GPJ FL DEP ROSS.GDT 11/14/12




| Sample | Symbol | Elev. (ft) | USCS | % Fines | % Organics | % Carbonates | Median | Mean | Skew | Kurt | Sort |
|---|---|---|---|---|---|---|---|---|---|---|---|
| VC-FSP11-10 #1 | —●— | -58.3 | SP | #230 - 0.74 | | | 1.75 | 1.6 | -1.47 | 6.49 | 0.82 |

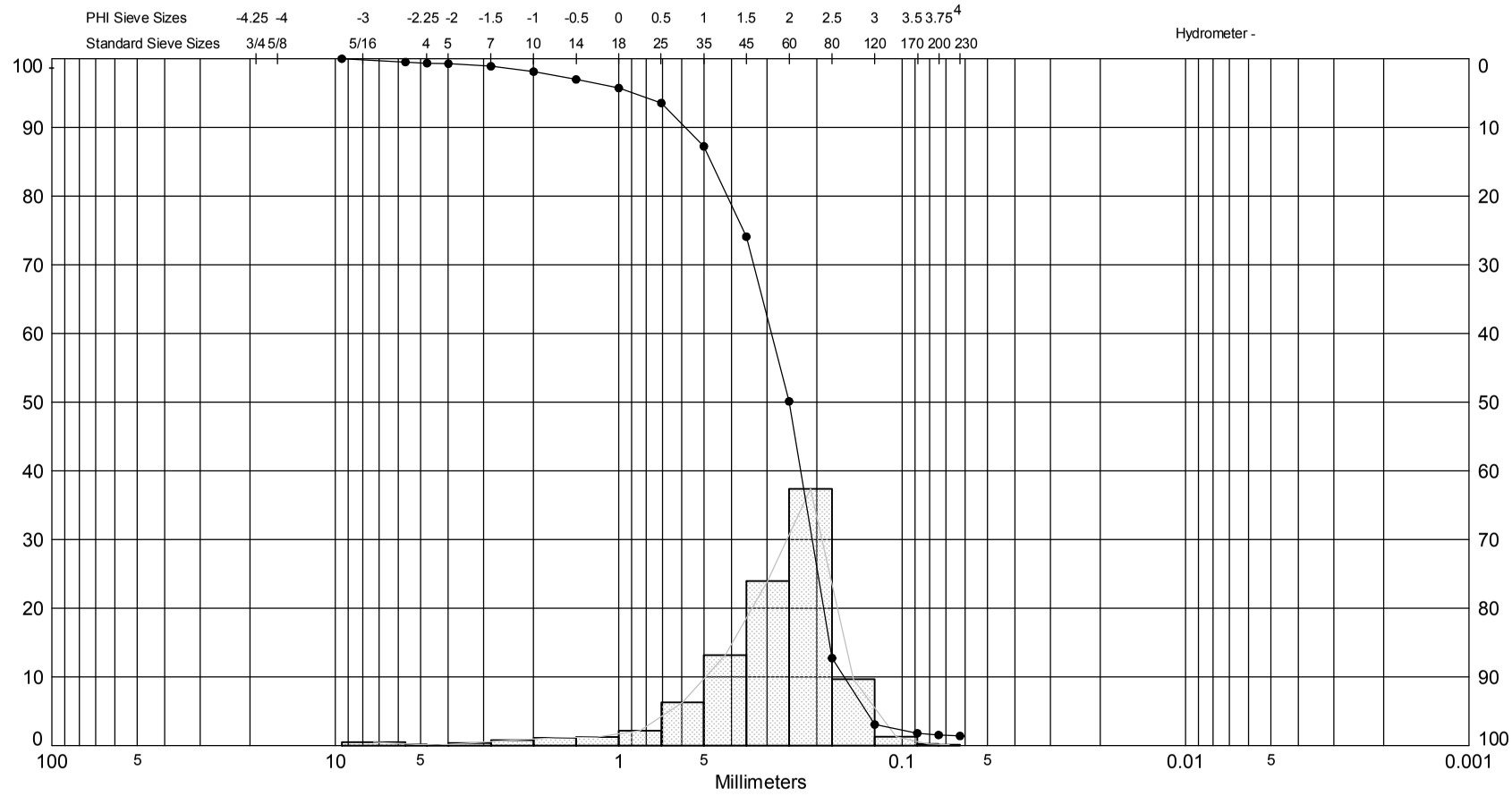
Comments:

Depths and elevations based on measured values

US Army Corps of Engineers
701 San Marco Blvd
Jacksonville, Florida 32207
phone (904)396-7121

| Sample Information | |
|---|---|
| Project Name: | Flagler County |
| Analysis Date: | 04-01-11 |
| Analyzed By: | |
| Easting (X, ft): | 687,241 |
| Northing (Y, ft): | 1,890,088 |
| Horizontal System: | NAD83 |
| Vertical System: | NAVD88 |

SIEVE ANALYSIS FLAGLER_STAT_GINT.GPJ FL DEP ROSS.GDT 11/14/12




| Sample | Symbol | Elev. (ft) | USCS | % Fines | % Organics | % Carbonates | Median | Mean | Skew | Kurt | Sort |
|---|---|---|---|---|---|---|---|---|---|---|---|
| VC-FSP11-10 #2 | —●— | -61.3 | SW | #230 - 1.40 | | | 2 | 1.77 | -1.92 | 8.98 | 0.88 |

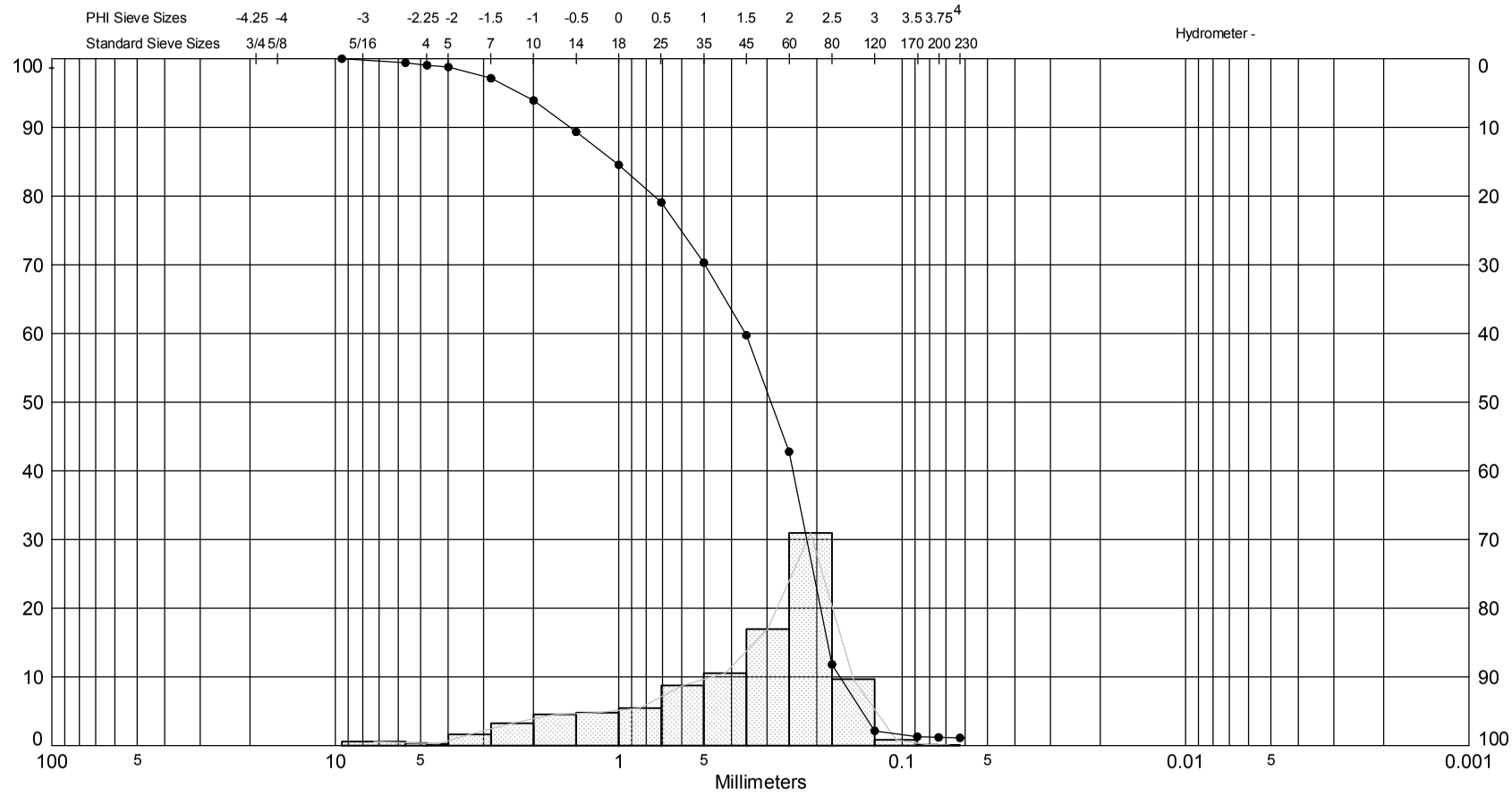
Comments:

Depths and elevations based on measured values

US Army Corps of Engineers
701 San Marco Blvd
Jacksonville, Florida 32207
phone (904)396-7121

| Sample Information | |
|---|---|
| Project Name: | Flagler County |
| Analysis Date: | 04-01-11 |
| Analyzed By: | |
| Easting (X, ft): | 687,241 |
| Northing (Y, ft): | 1,890,088 |
| Horizontal System: | NAD83 |
| Vertical System: | NAVD88 |

SIEVE ANALYSIS FLAGLER_STAT_GINT.GPJ FL DEP ROSS.GDT 11/14/12




SIEVE ANALYSIS FLAGLER_STAT_GINT.GPJ FL DEP ROSS.GDT 11/14/12

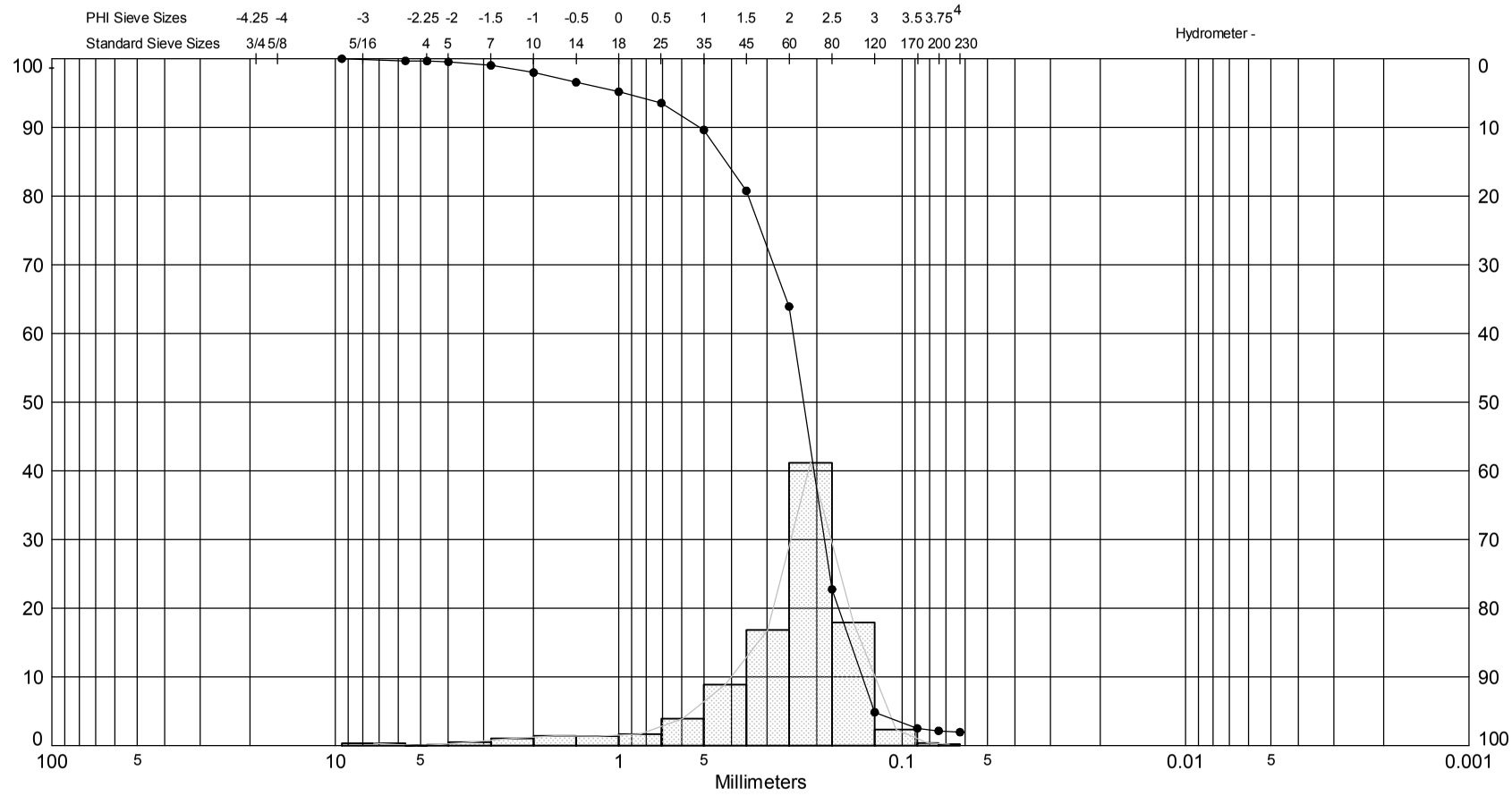
| Sample | Symbol | Elev. (ft) | USCS | % Fines | % Organics | % Carbonates | Median | Mean | Skew | Kurt | Sort |
|---|---|---|---|---|---|---|---|---|---|---|---|
| VC-FSP11-10 #3 | —●— | -64.3 | SW | #230 - 1.12 | | | 1.78 | 1.37 | -1.1 | 3.62 | 1.23 |

Comments:

Depths and elevations based on measured values

US Army Corps of Engineers
701 San Marco Blvd
Jacksonville, Florida 32207
phone (904)396-7121

| Sample Information | |
|---|---|
| Project Name: | Flagler County |
| Analysis Date: | 04-01-11 |
| Analyzed By: | |
| Easting (X, ft): | 687,241 |
| Northing (Y, ft): | 1,890,088 |
| Horizontal System: | NAD83 |
| Vertical System: | NAVD88 |




| Sample | Symbol | Elev. (ft) | USCS | % Fines | % Organics | % Carbonates | Median | Mean | Skew | Kurt | Sort |
|---|---|---|---|---|---|---|---|---|---|---|---|
| VC-FSP11-10 #4 | —●— | -67.3 | SW | #230 - 1.95 | | 20.00 | 2.17 | 1.94 | -1.99 | 8.49 | 0.91 |

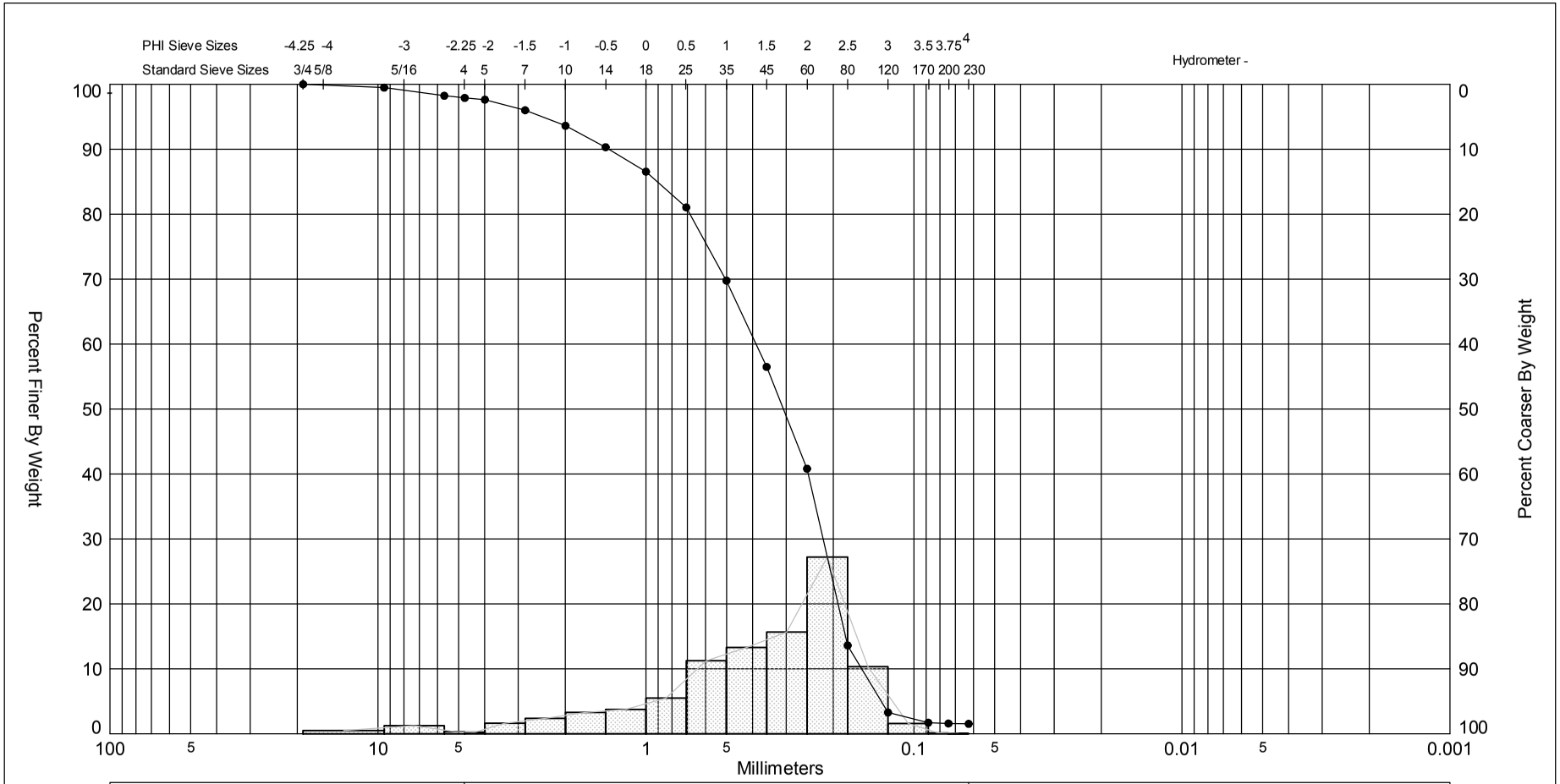
| Sample Information | |
|---|---|
| Project Name: | Flagler County |
| Analysis Date: | 04-01-11 |
| Analyzed By: | |
| Easting (X, ft): | 687,241 |
| Northing (Y, ft): | 1,890,088 |
| Horizontal System: | NAD83 |
| Vertical System: | NAVD88 |

Comments:

Depths and elevations based on measured values

US Army Corps of Engineers
701 San Marco Blvd
Jacksonville, Florida 32207
phone (904)396-7121

SIEVE ANALYSIS FLAGLER_STAT_GINT.GPJ FL DEP ROSS.GDT 11/14/12




| Sample | Symbol | Elev. (ft) | USCS | % Fines | % Organics | % Carbonates | Median | Mean | Skew | Kurt | Sort |
|---|---|---|---|---|---|---|---|---|---|---|---|
| VC-FSP11-10 #5 | —●— | -69.3 | SW | #230 - 1.53 | | | 1.7 | 1.35 | -1.33 | 4.86 | 1.28 |

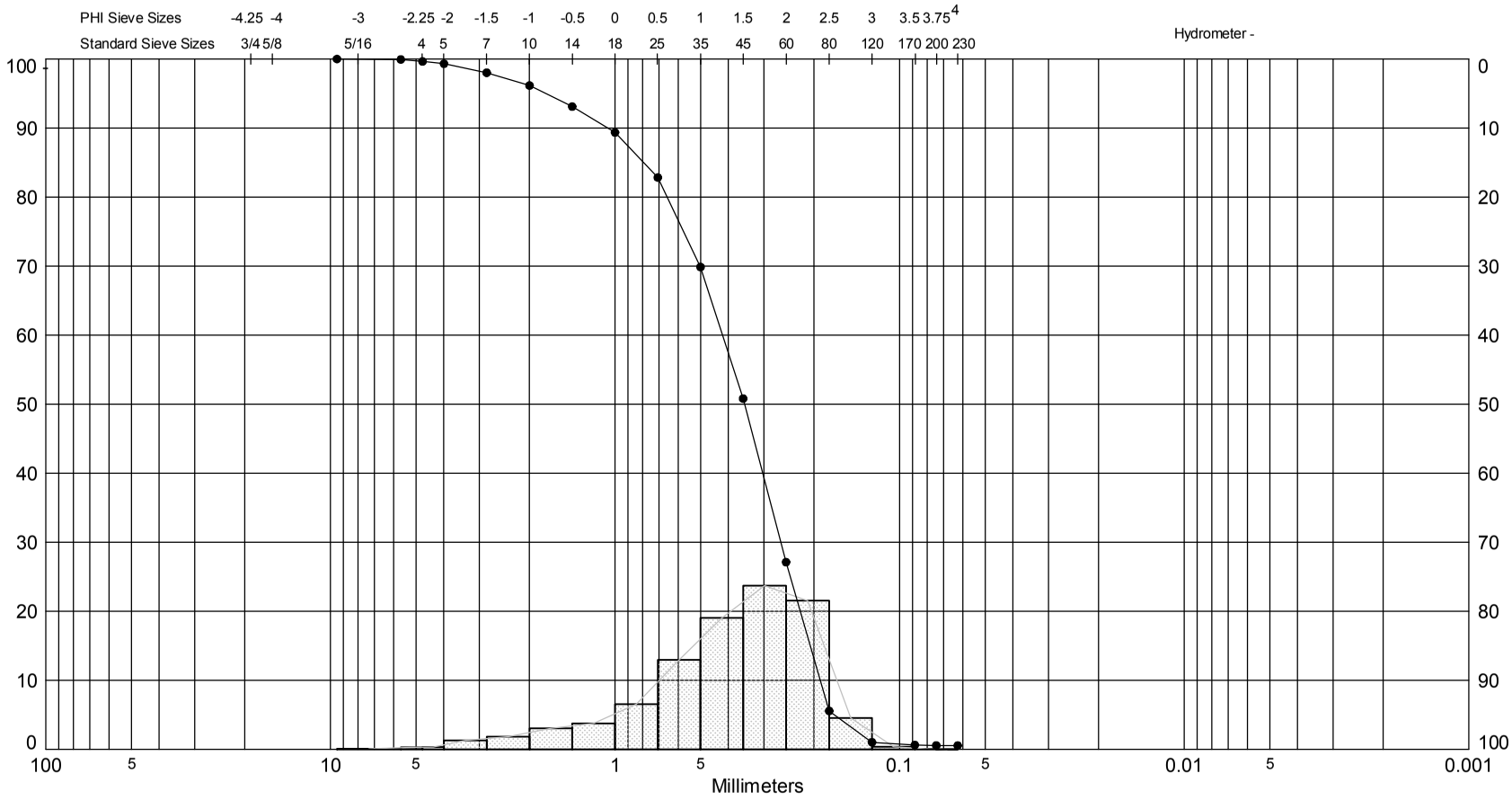
Comments:

Depths and elevations based on measured values

US Army Corps of Engineers
701 San Marco Blvd
Jacksonville, Florida 32207
phone (904)396-7121

| Sample Information | |
|---|---|
| Project Name: | Flagler County |
| Analysis Date: | 04-01-11 |
| Analyzed By: | |
| Easting (X, ft): | 687,241 |
| Northing (Y, ft): | 1,890,088 |
| Horizontal System: | NAD83 |
| Vertical System: | NAVD88 |

SIEVE ANALYSIS FLAGLER_STAT_GINT.GPJ FL DEP ROSS.GDT 11/14/12




| Sample | Symbol | Elev. (ft) | USCS | % Fines | % Organics | % Carbonates | Median | Mean | Skew | Kurt | Sort |
|---|---|---|---|---|---|---|---|---|---|---|---|
| VC-FSP11-11 #1 | —●— | -59.7 | SW | #230 - 0.55 | | 26.00 | 1.51 | 1.3 | -1.09 | 4.25 | 1.01 |

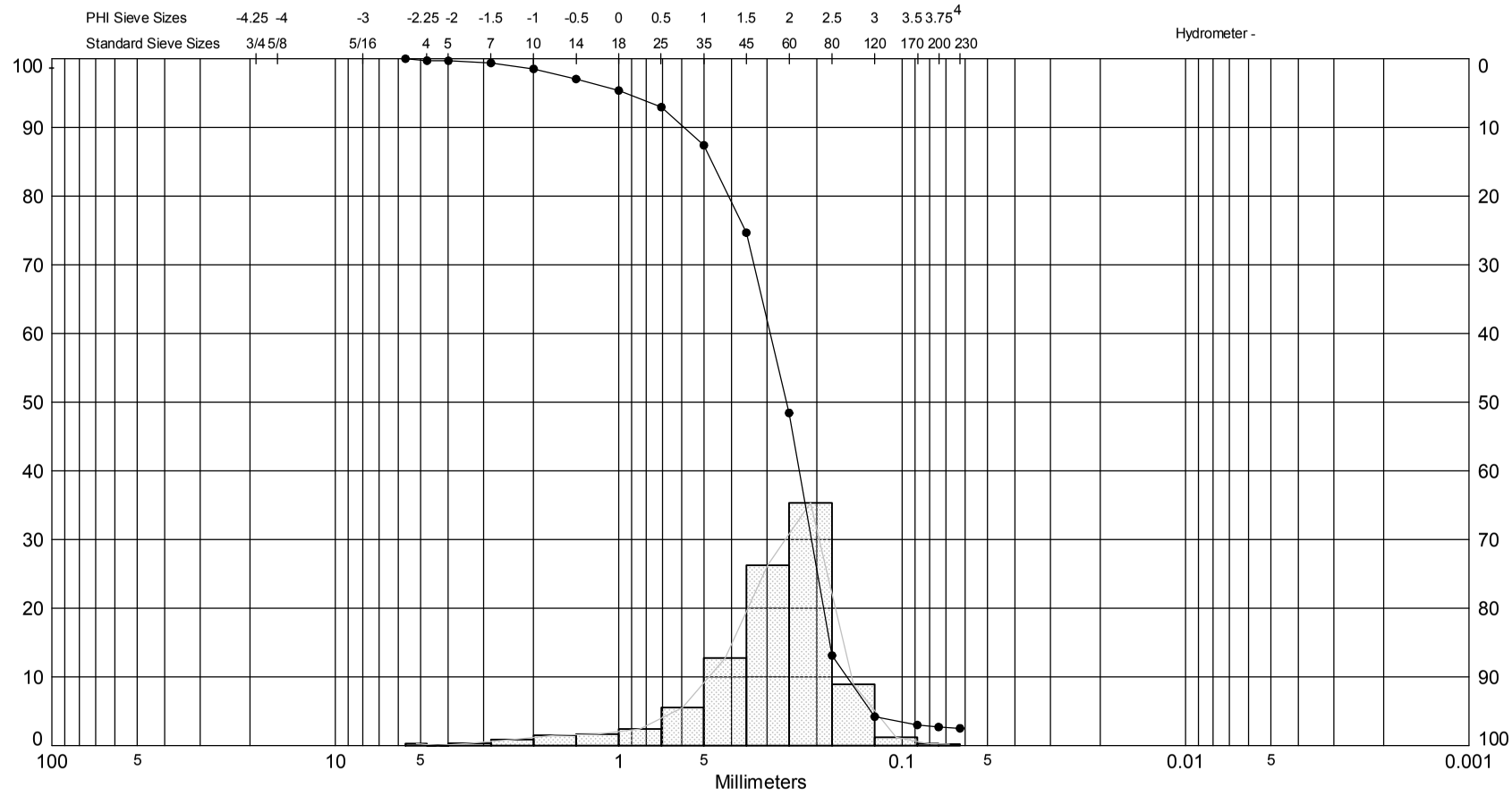
| Sample Information | |
|---|---|
| Project Name: | Flagler County |
| Analysis Date: | 04-01-11 |
| Analyzed By: | |
| Easting (X, ft): | 693,288 |
| Northing (Y, ft): | 1,888,857 |
| Horizontal System: | NAD83 |
| Vertical System: | NAVD88 |

Comments:

Depths and elevations based on measured values

US Army Corps of Engineers
701 San Marco Blvd
Jacksonville, Florida 32207
phone (904)396-7121

SIEVE ANALYSIS FLAGLER_STAT_GINT.GPJ FL DEP ROSS.GDT 11/14/12




| Sample | Symbol | Elev. (ft) | USCS | % Fines | % Organics | % Carbonates | Median | Mean | Skew | Kurt | Sort |
|---|---|---|---|---|---|---|---|---|---|---|---|
| VC-FSP11-11 #2 | —●— | -62.7 | SP | #230 - 2.51 | | | 1.97 | 1.77 | -1.58 | 6.87 | 0.84 |

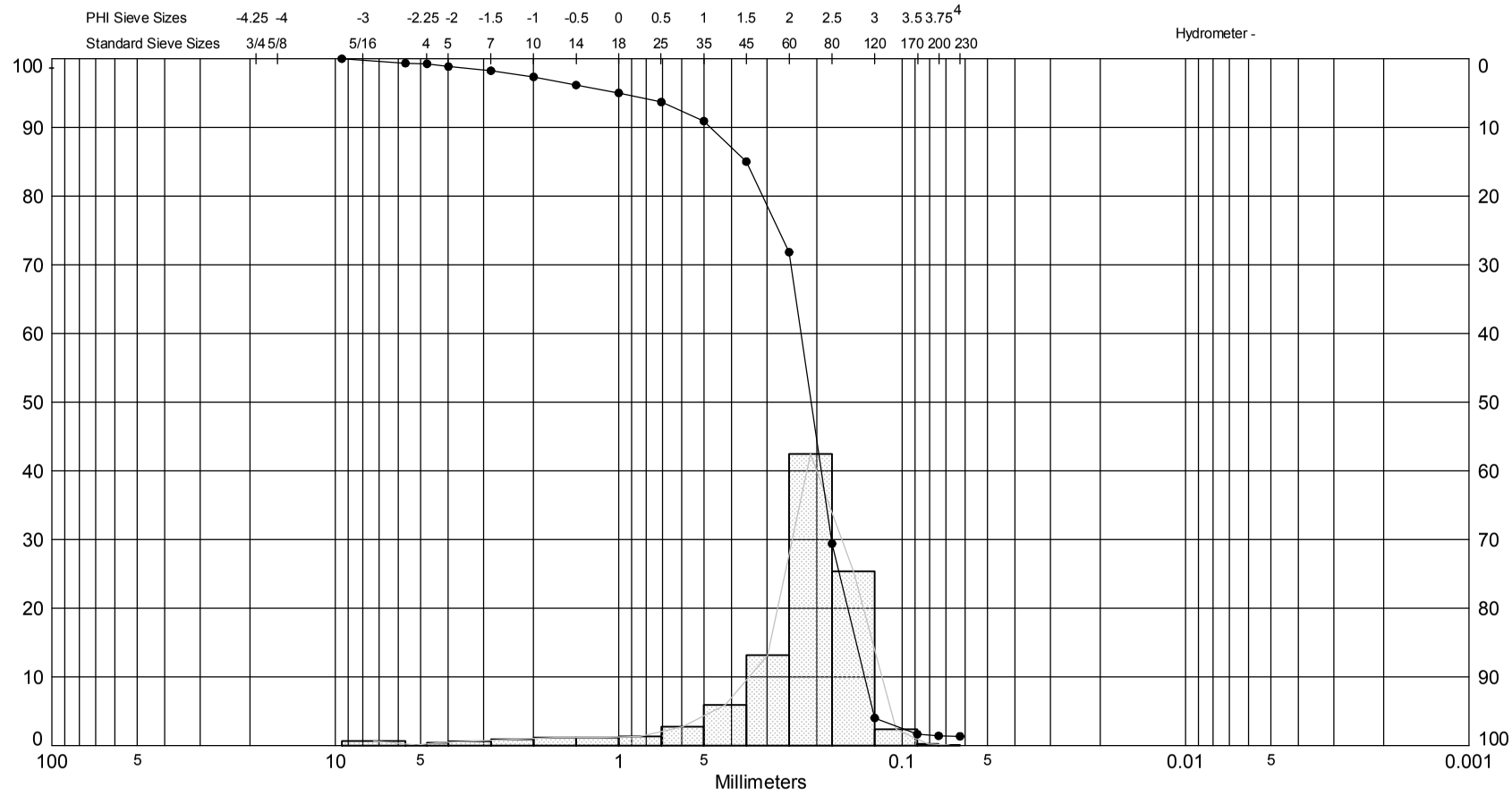
| Sample Information | |
|---|---|
| Project Name: | Flagler County |
| Analysis Date: | 04-01-11 |
| Analyzed By: | |
| Easting (X, ft): | 693,288 |
| Northing (Y, ft): | 1,888,857 |
| Horizontal System: | NAD83 |
| Vertical System: | NAVD88 |

Comments:

Depths and elevations based on measured values

US Army Corps of Engineers
701 San Marco Blvd
Jacksonville, Florida 32207
phone (904)396-7121

SIEVE ANALYSIS FLAGLER_STAT_GINT.GPJ FL DEP ROSS.GDT 11/14/12




| Sample | Symbol | Elev. (ft) | USCS | % Fines | % Organics | % Carbonates | Median | Mean | Skew | Kurt | Sort |
|---|---|---|---|---|---|---|---|---|---|---|---|
| VC-FSP11-11 #3 | —●— | -65.7 | SW | #230 - 1.35 | | | 2.26 | 2.03 | -2.51 | 10.76 | 0.96 |

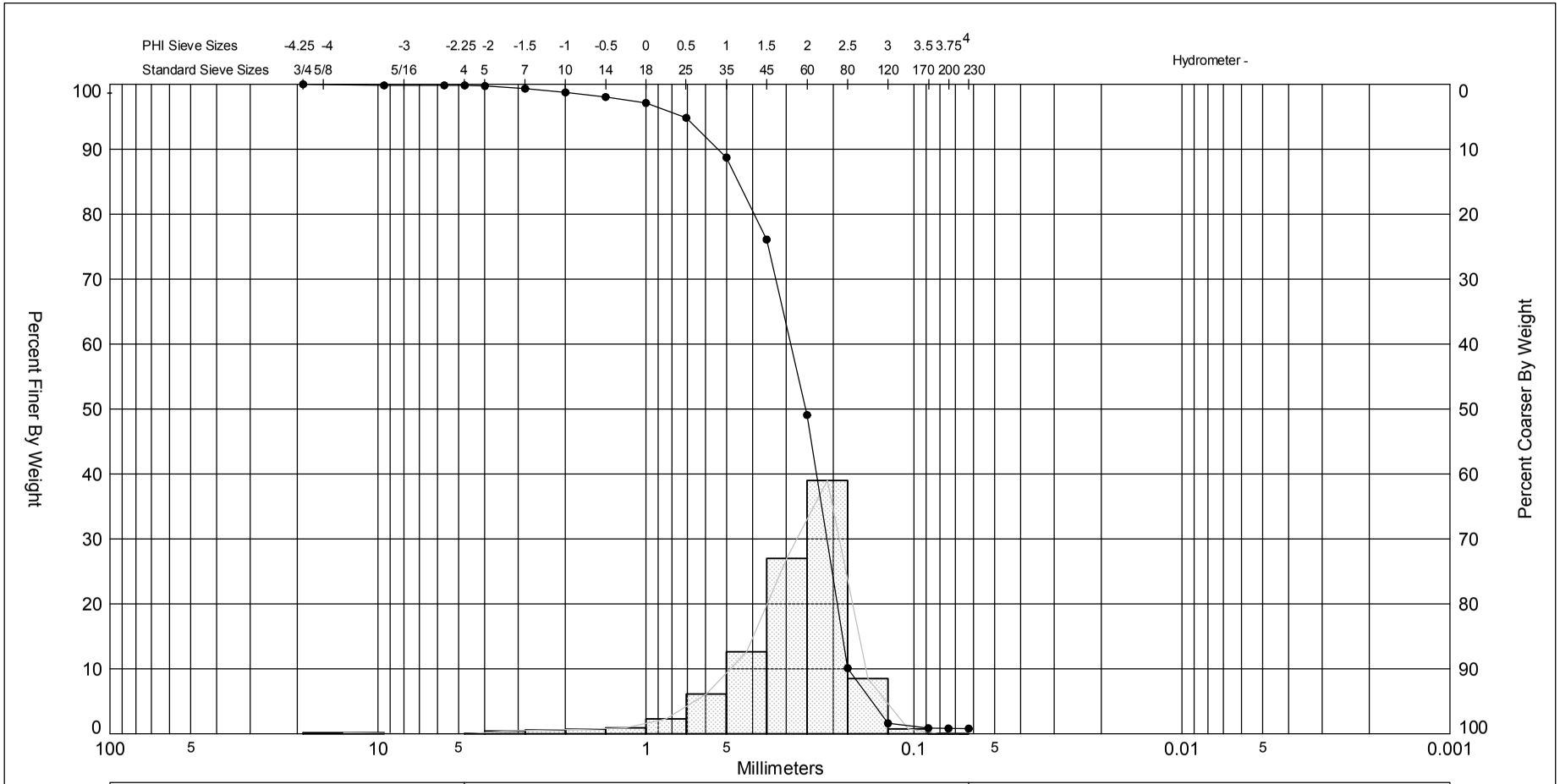
Comments:

Depths and elevations based on measured values

US Army Corps of Engineers
701 San Marco Blvd
Jacksonville, Florida 32207
phone (904)396-7121

| Sample Information | |
|---|---|
| Project Name: | Flagler County |
| Analysis Date: | 04-01-11 |
| Analyzed By: | |
| Easting (X, ft): | 693,288 |
| Northing (Y, ft): | 1,888,857 |
| Horizontal System: | NAD83 |
| Vertical System: | NAVD88 |

SIEVE ANALYSIS FLAGLER_STAT_GINT.GPJ FL DEP ROSS.GDT 11/14/12




| Sample | Symbol | Elev. (ft) | USCS | % Fines | % Organics | % Carbonates | Median | Mean | Skew | Kurt | Sort |
|---|---|---|---|---|---|---|---|---|---|---|---|
| VC-FSP11-12 #1 | —●— | -58.1 | SP | #230 - 0.80 | | | 1.98 | 1.8 | -2.04 | 10.73 | 0.77 |

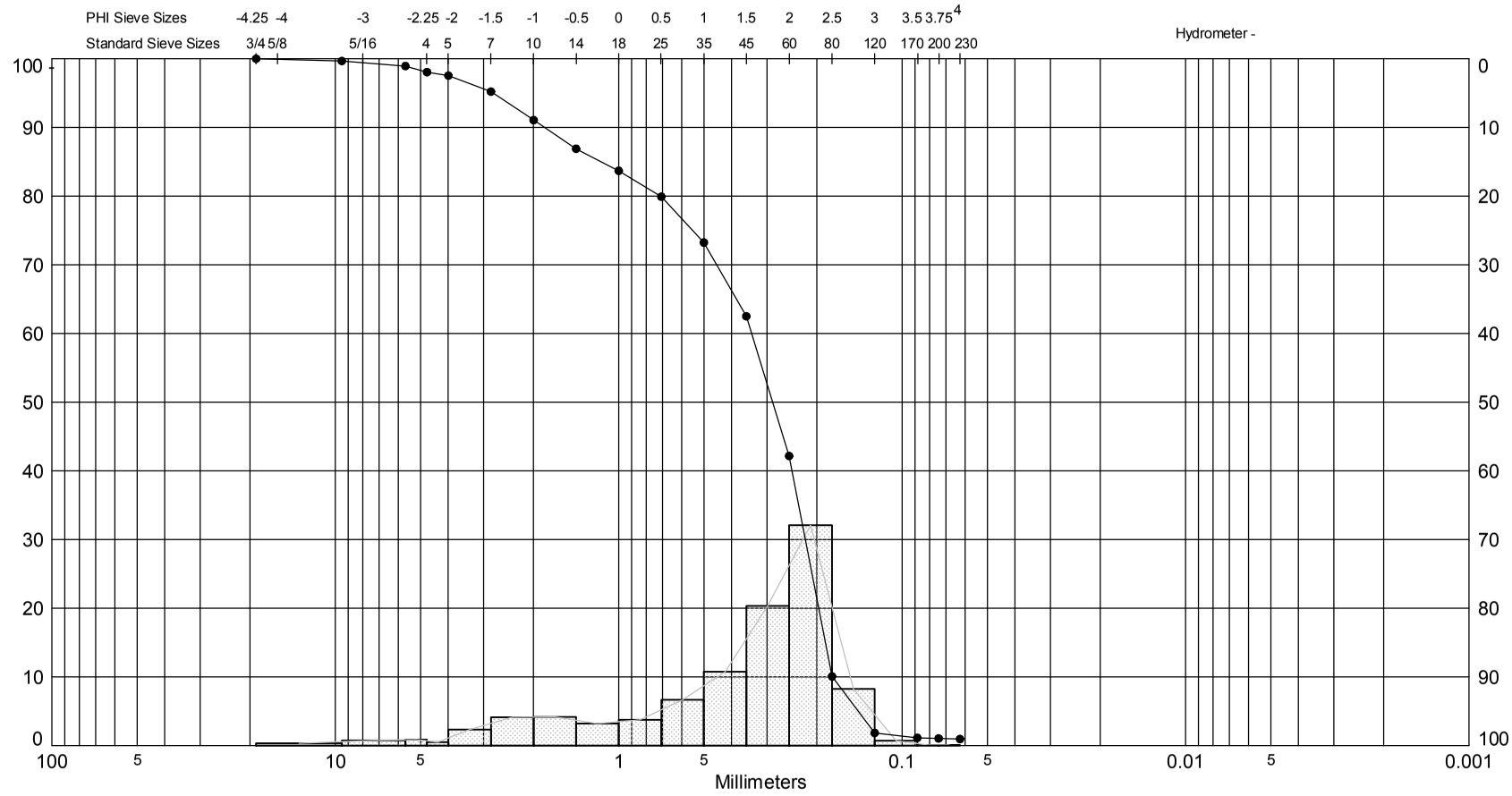
| Sample Information | |
|---|---|
| Project Name: | Flagler County |
| Analysis Date: | 04-01-11 |
| Analyzed By: | |
| Easting (X, ft): | 691,249 |
| Northing (Y, ft): | 1,884,893 |
| Horizontal System: | NAD83 |
| Vertical System: | NAVD88 |

Comments:

Depths and elevations based on measured values

US Army Corps of Engineers
701 San Marco Blvd
Jacksonville, Florida 32207
phone (904)396-7121

SIEVE ANALYSIS FLAGLER_STAT_GINT.GPJ FL DEP ROSS.GDT 11/14/12




| Sample | Symbol | Elev. (ft) | USCS | % Fines | % Organics | % Carbonates | Median | Mean | Skew | Kurt | Sort |
|---|---|---|---|---|---|---|---|---|---|---|---|
| VC-FSP11-12 #2 | —●— | -61.1 | SW | #230 - 0.95 | | 32.00 | 1.8 | 1.34 | -1.35 | 4.21 | 1.32 |

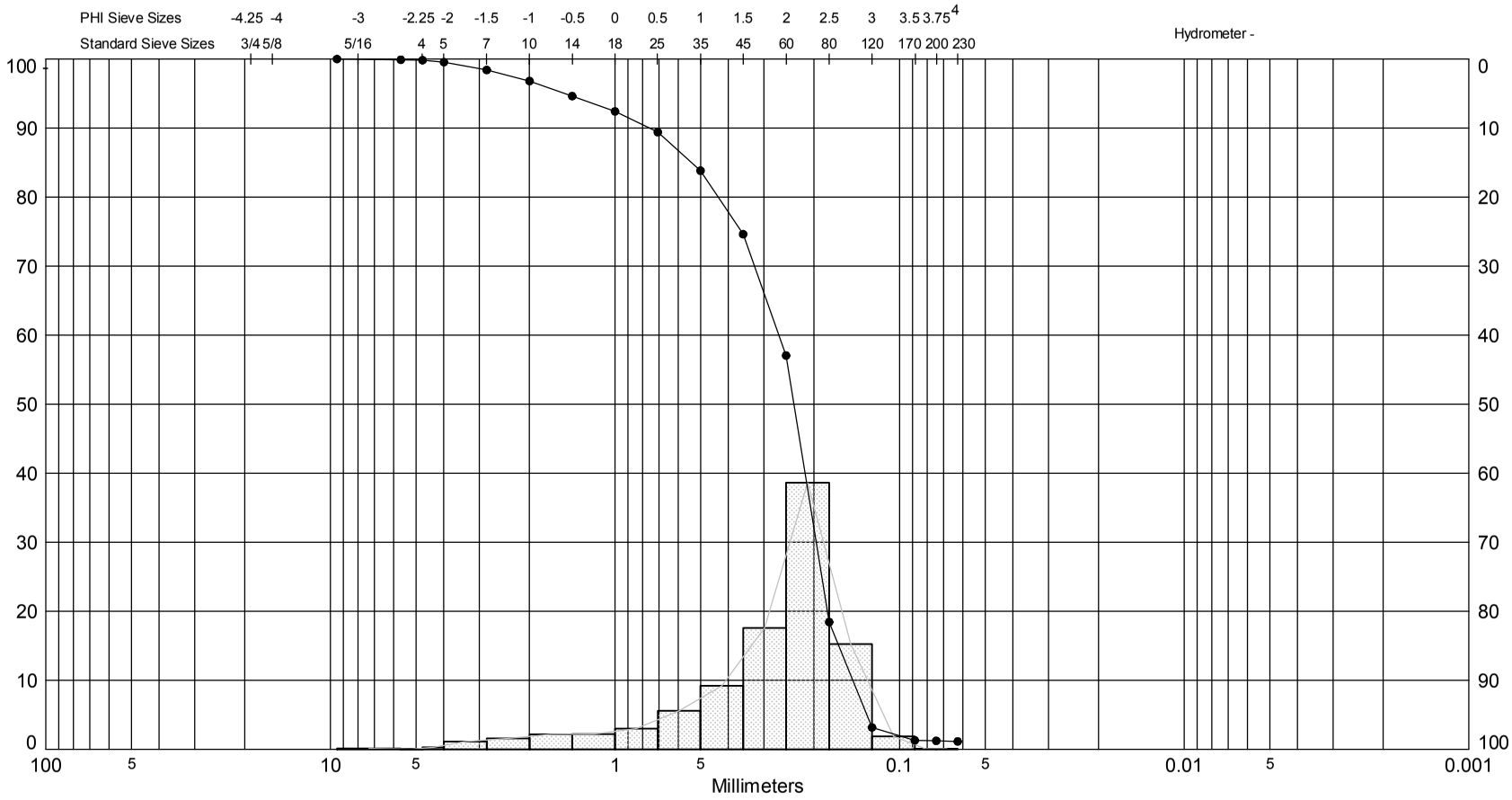
| Sample Information | |
|---|---|
| Project Name: | Flagler County |
| Analysis Date: | 04-01-11 |
| Analyzed By: | |
| Easting (X, ft): | 691,249 |
| Northing (Y, ft): | 1,884,893 |
| Horizontal System: | NAD83 |
| Vertical System: | NAVD88 |

Comments:

Depths and elevations based on measured values

US Army Corps of Engineers
701 San Marco Blvd
Jacksonville, Florida 32207
phone (904)396-7121

SIEVE ANALYSIS FLAGLER_STAT_GINT.GPJ FL DEP ROSS.GDT 11/14/12




| Sample | Symbol | Elev. (ft) | USCS | % Fines | % Organics | % Carbonates | Median | Mean | Skew | Kurt | Sort |
|---|---|---|---|---|---|---|---|---|---|---|---|
| VC-FSP11-12 #3 | —●— | -64.1 | SW | #230 - 1.14 | | | 2.09 | 1.77 | -1.64 | 5.79 | 1.02 |

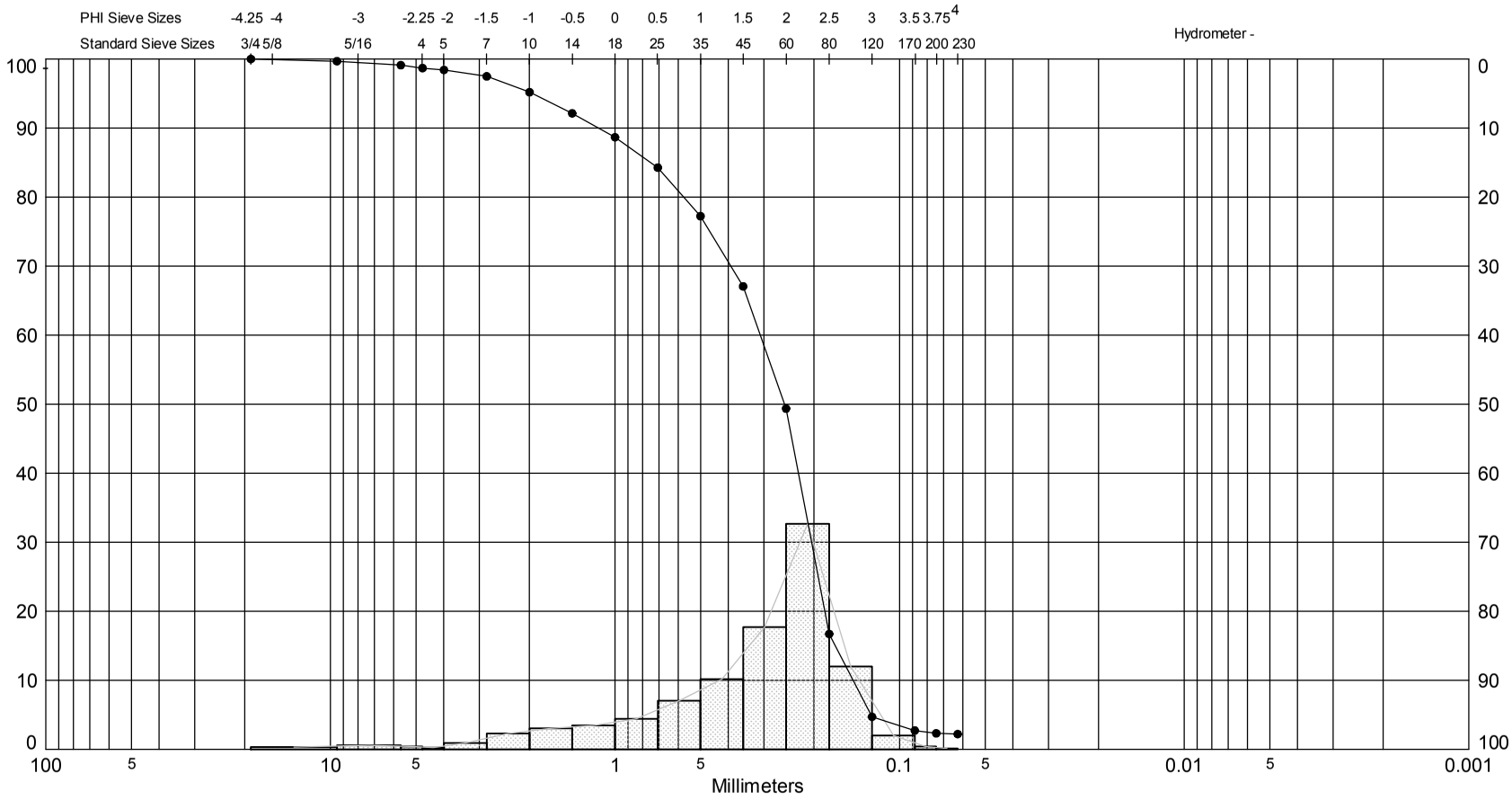
Comments:

Depths and elevations based on measured values

US Army Corps of Engineers
701 San Marco Blvd
Jacksonville, Florida 32207
phone (904)396-7121

| Sample Information | |
|---|---|
| Project Name: | Flagler County |
| Analysis Date: | 04-01-11 |
| Analyzed By: | |
| Easting (X, ft): | 691,249 |
| Northing (Y, ft): | 1,884,893 |
| Horizontal System: | NAD83 |
| Vertical System: | NAVD88 |

SIEVE ANALYSIS FLAGLER_STAT_GINT.GPJ FL DEP ROSS.GDT 11/14/12




| Sample | Symbol | Elev. (ft) | USCS | % Fines | % Organics | % Carbonates | Median | Mean | Skew | Kurt | Sort |
|---|---|---|---|---|---|---|---|---|---|---|---|
| VC-FSP11-12 #4 | —●— | -66.1 | SW | #230 - 2.21 | | | 1.98 | 1.56 | -1.47 | 5.33 | 1.2 |

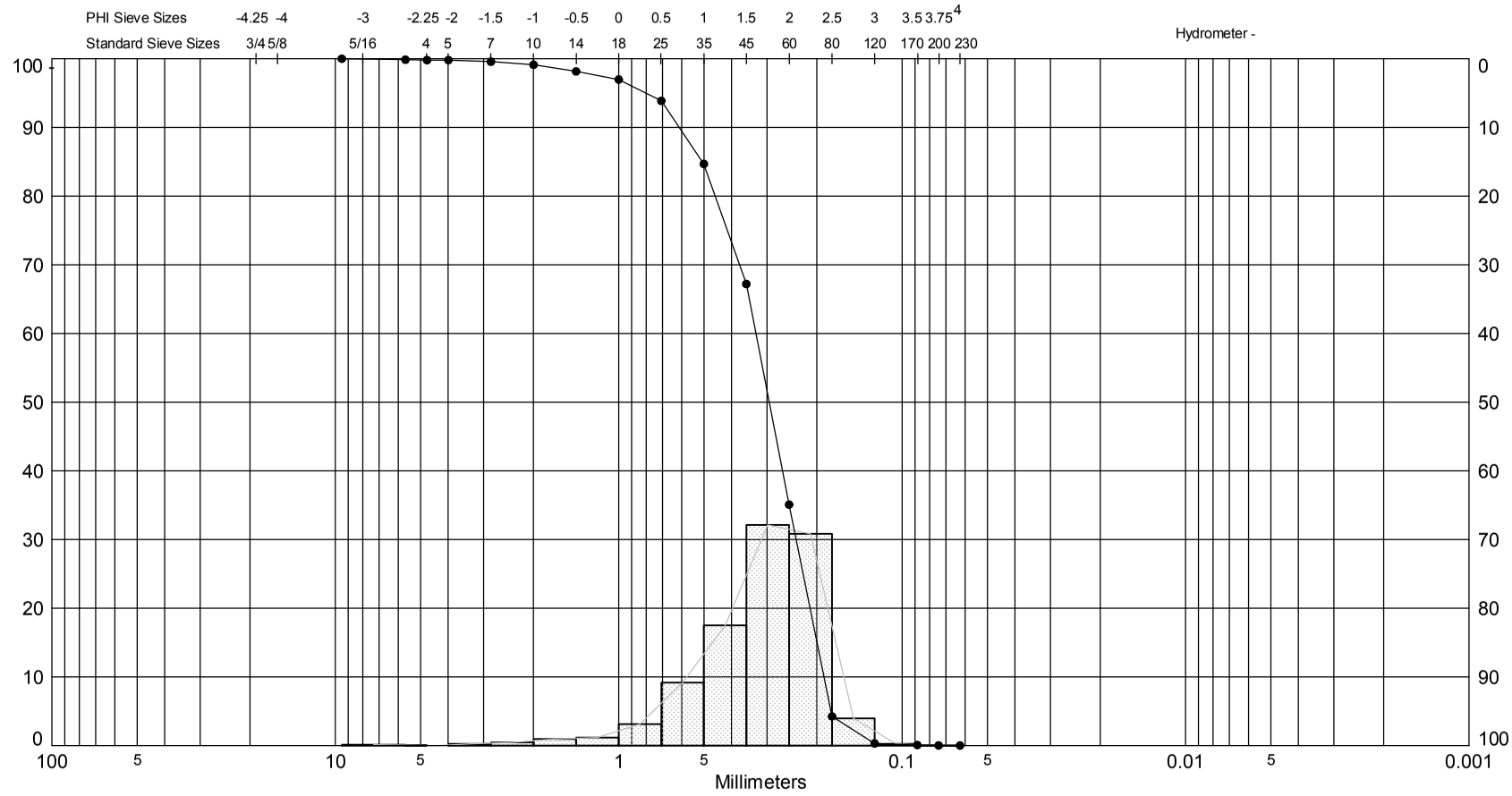
| Sample Information | |
|---|---|
| Project Name: | Flagler County |
| Analysis Date: | 04-01-11 |
| Analyzed By: | |
| Easting (X, ft): | 691,249 |
| Northing (Y, ft): | 1,884,893 |
| Horizontal System: | NAD83 |
| Vertical System: | NAVD88 |

Comments:

Depths and elevations based on measured values

US Army Corps of Engineers
701 San Marco Blvd
Jacksonville, Florida 32207
phone (904)396-7121

SIEVE ANALYSIS FLAGLER_STAT_GINT.GPJ FL DEP ROSS.GDT 11/14/12




| Sample | Symbol | Elev. (ft) | USCS | % Fines | % Organics | % Carbonates | Median | Mean | Skew | Kurt | Sort |
|---|---|---|---|---|---|---|---|---|---|---|---|
| VC-FSP11-13 #1 | —●— | -55.8 | SP | #230 - 0.01 | | | 1.76 | 1.64 | -1.53 | 7.45 | 0.73 |

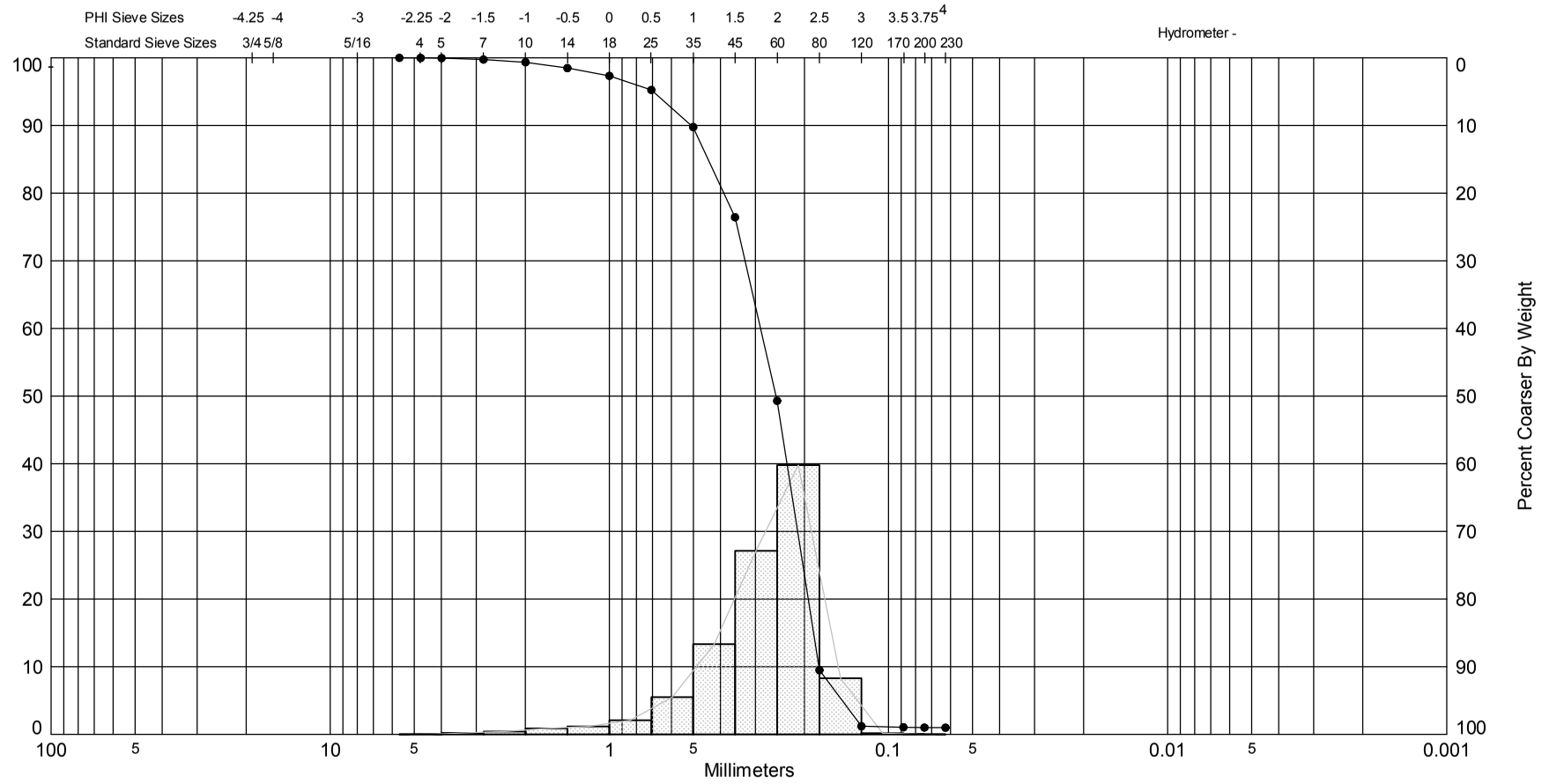
Comments:

Depths and elevations based on measured values

US Army Corps of Engineers
701 San Marco Blvd
Jacksonville, Florida 32207
phone (904)396-7121

| Sample Information | |
|---|---|
| Project Name: | Flagler County |
| Analysis Date: | 04-01-11 |
| Analyzed By: | |
| Easting (X, ft): | 697,758 |
| Northing (Y, ft): | 1,881,943 |
| Horizontal System: | NAD83 |
| Vertical System: | NAVD88 |

SIEVE ANALYSIS FLAGLER_STAT_GINT.GPJ FL DEP ROSS.GDT 11/14/12




| Sample | Symbol | Elev. (ft) | USCS | % Fines | % Organics | % Carbonates | Median | Mean | Skew | Kurt | Sort |
|---|---|---|---|---|---|---|---|---|---|---|---|
| VC-FSP11-13 #2 | —●— | -58.8 | SP | #230 - 0.98 | | 19.00 | 1.98 | 1.82 | -1.6 | 7.04 | 0.7 |

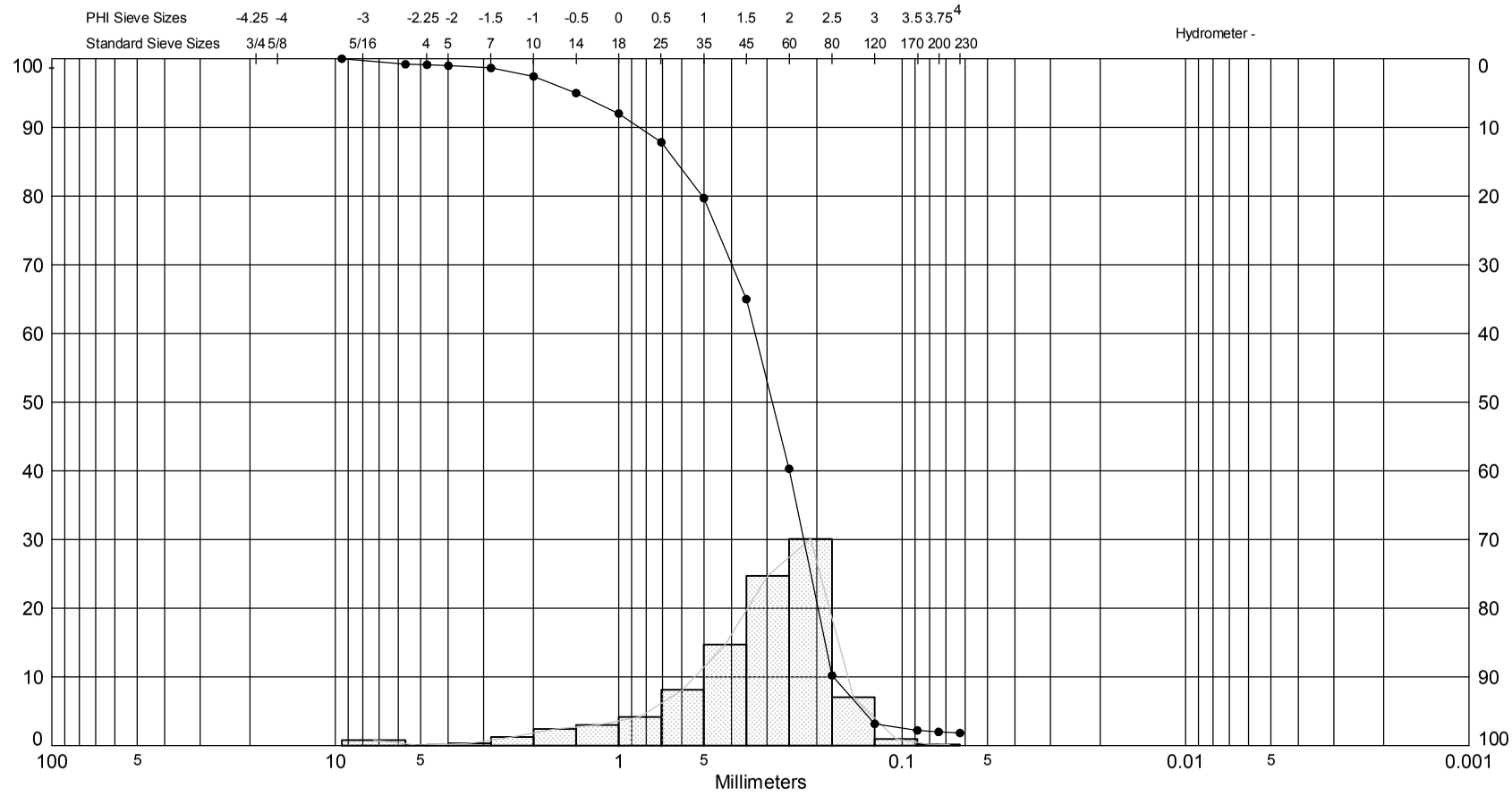
| Sample Information | |
|---|---|
| Project Name: | Flagler County |
| Analysis Date: | 04-01-11 |
| Analyzed By: | |
| Easting (X, ft): | 697,758 |
| Northing (Y, ft): | 1,881,943 |
| Horizontal System: | NAD83 |
| Vertical System: | NAVD88 |

Comments:

Depths and elevations based on measured values

US Army Corps of Engineers
701 San Marco Blvd
Jacksonville, Florida 32207
phone (904)396-7121

SIEVE ANALYSIS FLAGLER_STAT_GINT.GPJ FL DEP ROSS.GDT 11/14/12




SIEVE ANALYSIS FLAGLER_STAT_GINT.GPJ FL DEP ROSS.GDT 11/14/12

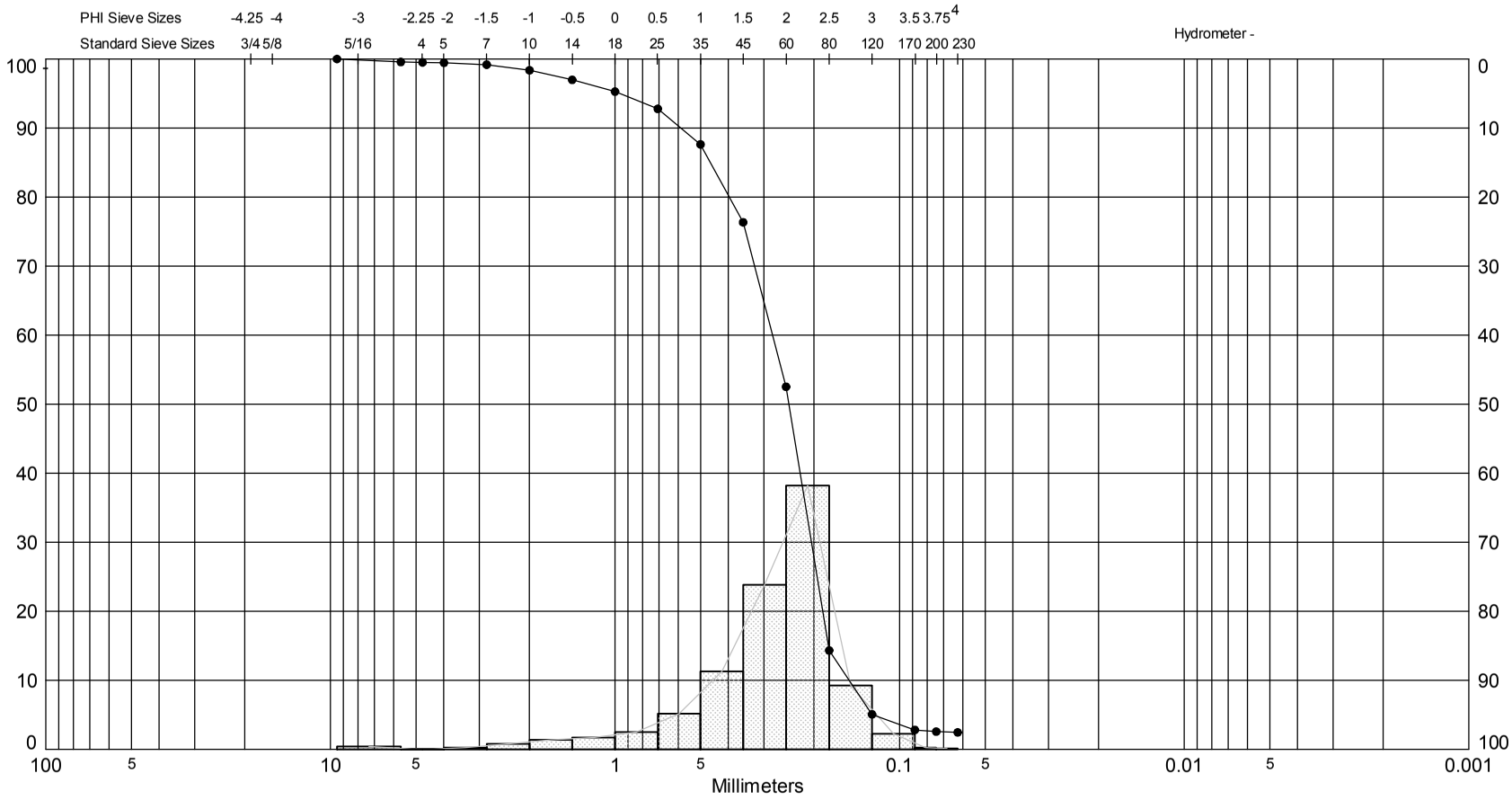
| Sample | Symbol | Elev. (ft) | USCS | % Fines | % Organics | % Carbonates | Median | Mean | Skew | Kurt | Sort |
|---|---|---|---|---|---|---|---|---|---|---|---|
| VC-FSP11-13 #3 | —●— | -61.8 | SW | #230 - 1.83 | | | 1.8 | 1.56 | -1.53 | 6.3 | 1 |

Comments:

Depths and elevations based on measured values

US Army Corps of Engineers
701 San Marco Blvd
Jacksonville, Florida 32207
phone (904)396-7121

| Sample Information | |
|---|---|
| Project Name: | Flagler County |
| Analysis Date: | 04-01-11 |
| Analyzed By: | |
| Easting (X, ft): | 697,758 |
| Northing (Y, ft): | 1,881,943 |
| Horizontal System: | NAD83 |
| Vertical System: | NAVD88 |




| Sample | Symbol | Elev. (ft) | USCS | % Fines | % Organics | % Carbonates | Median | Mean | Skew | Kurt | Sort |
|---|---|---|---|---|---|---|---|---|---|---|---|
| VC-FSP11-13 #4 | —●— | -63.8 | SW | #230 - 2.45 | | | 2.03 | 1.8 | -1.81 | 8.24 | 0.88 |

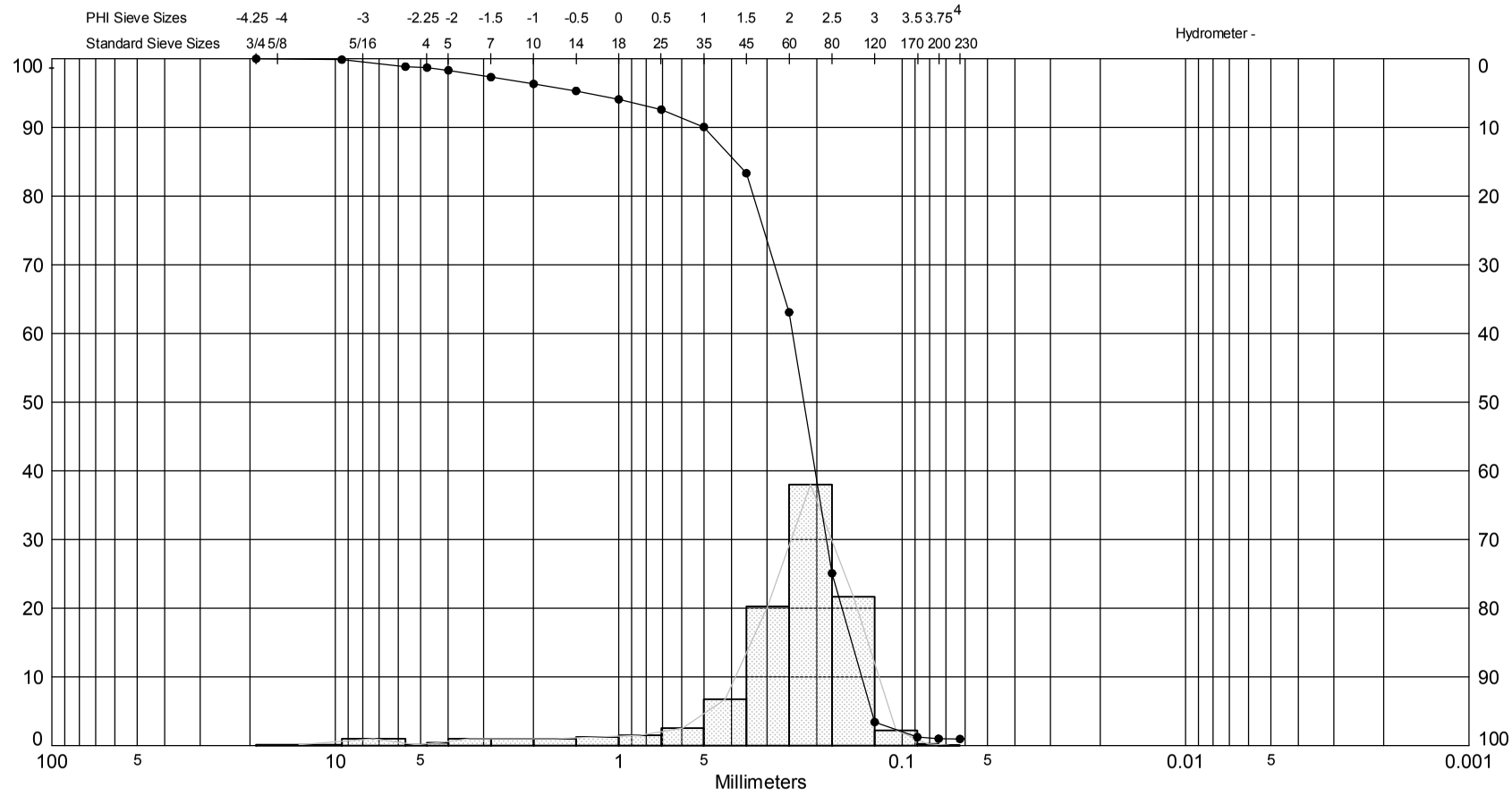
Comments:

Depths and elevations based on measured values

US Army Corps of Engineers
701 San Marco Blvd
Jacksonville, Florida 32207
phone (904)396-7121

| Sample Information | |
|---|---|
| Project Name: | Flagler County |
| Analysis Date: | 04-01-11 |
| Analyzed By: | |
| Easting (X, ft): | 697,758 |
| Northing (Y, ft): | 1,881,943 |
| Horizontal System: | NAD83 |
| Vertical System: | NAVD88 |

SIEVE ANALYSIS FLAGLER_STAT_GINT.GPJ FL DEP ROSS.GDT 11/14/12




| Sample | Symbol | Elev. (ft) | USCS | % Fines | % Organics | % Carbonates | Median | Mean | Skew | Kurt | Sort |
|---|---|---|---|---|---|---|---|---|---|---|---|
| VC-FSP11-14 #1 | —●— | -59.1 | SW | #230 - 0.96 | | | 2.17 | 1.92 | -2.48 | 10.4 | 1.04 |

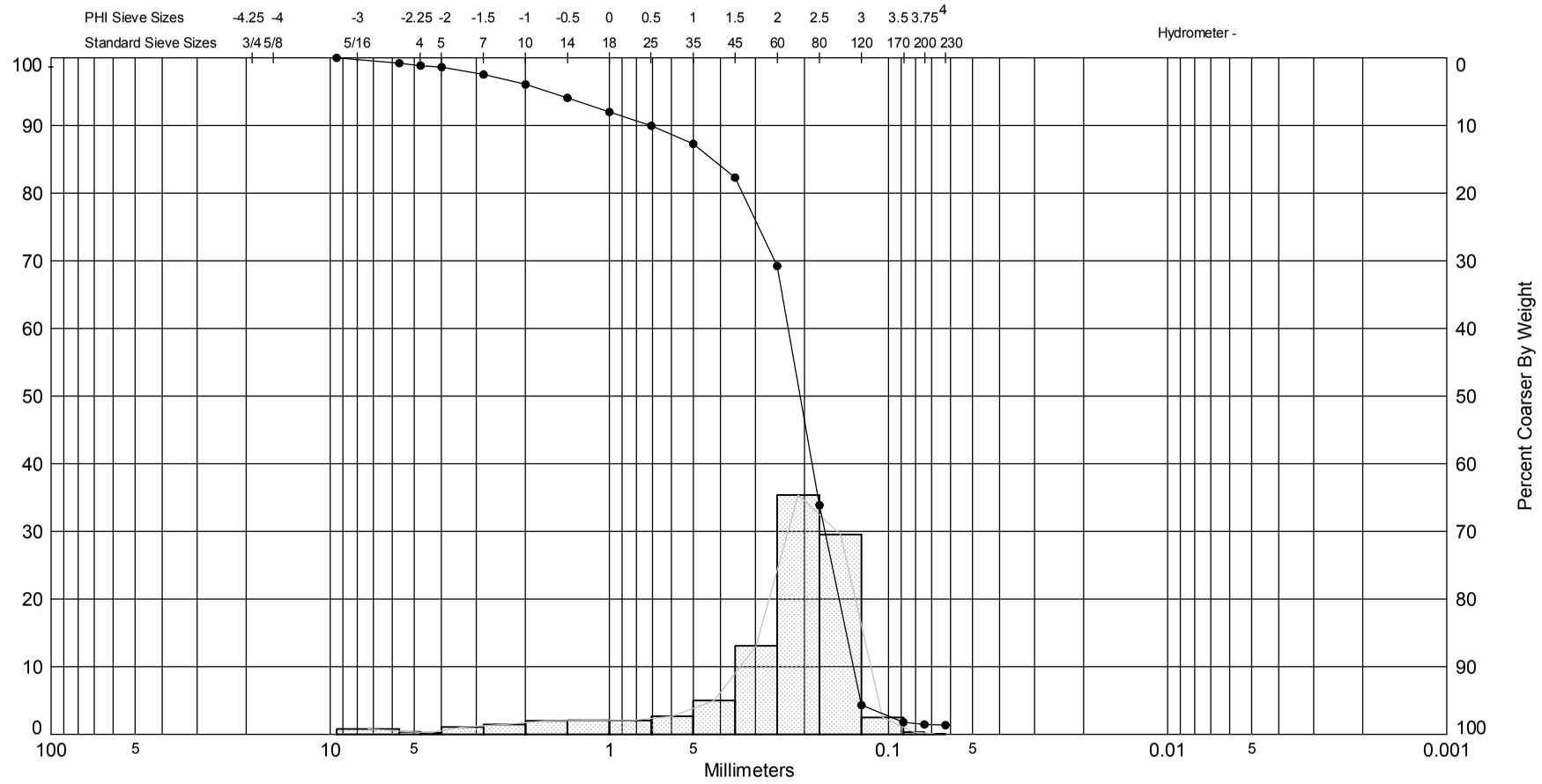
| Sample Information | |
|---|---|
| Project Name: | Flagler County |
| Analysis Date: | 04-01-11 |
| Analyzed By: | |
| Easting (X, ft): | 652,240 |
| Northing (Y, ft): | 1,872,434 |
| Horizontal System: | NAD83 |
| Vertical System: | NAVD88 |

Comments:

Depths and elevations based on measured values

US Army Corps of Engineers
701 San Marco Blvd
Jacksonville, Florida 32207
phone (904)396-7121

SIEVE ANALYSIS FLAGLER_STAT_GINT.GPJ FL DEP ROSS.GDT 11/14/12




| Sample | Symbol | Elev. (ft) | USCS | % Fines | % Organics | % Carbonates | Median | Mean | Skew | Kurt | Sort |
|---|---|---|---|---|---|---|---|---|---|---|---|
| VC-FSP11-14 #2 | —●— | -61.1 | SW | #230 - 1.36 | | | 2.27 | 1.95 | -2.1 | 7.6 | 1.12 |

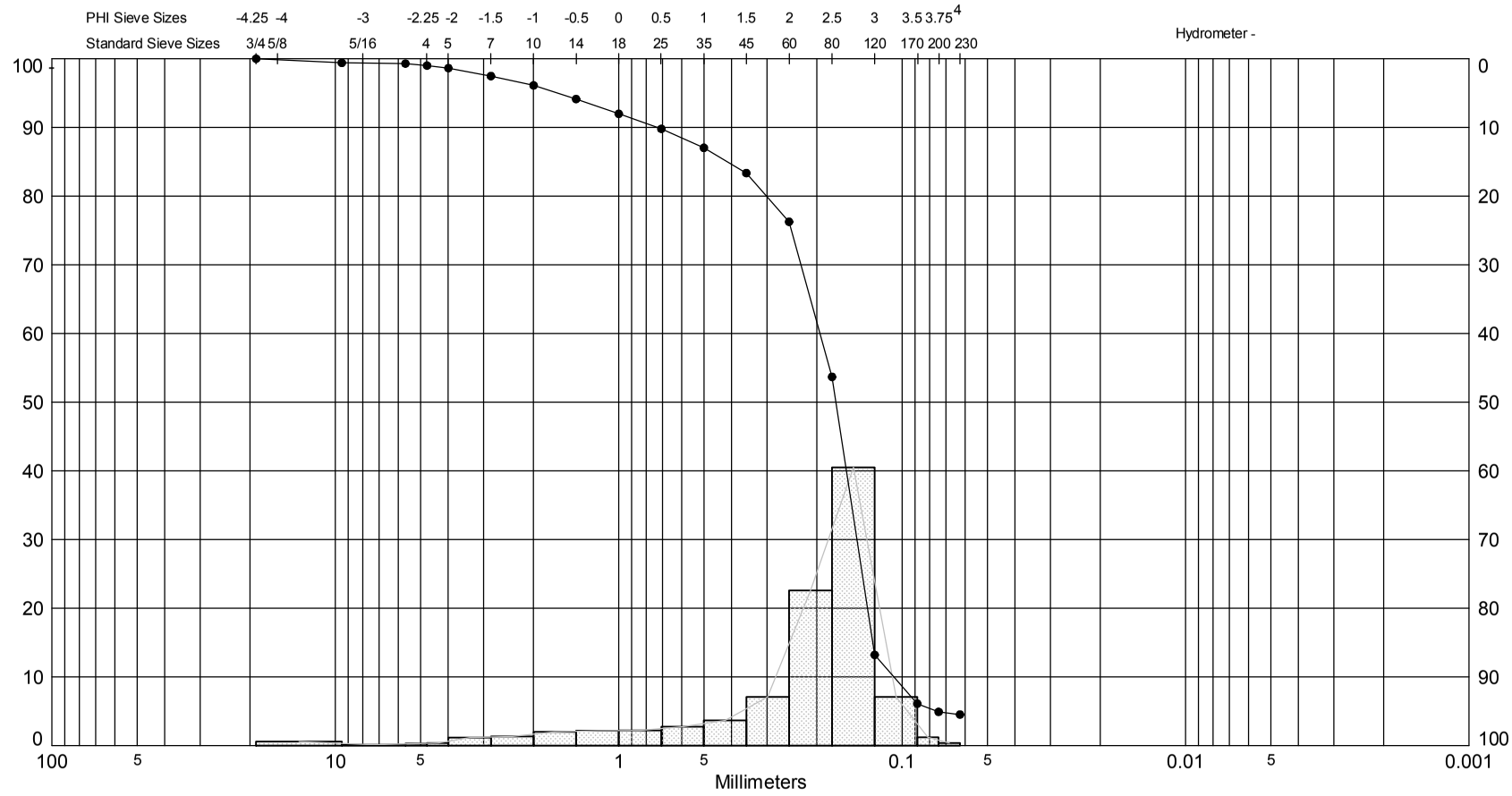
| Sample Information | |
|---|---|
| Project Name: | Flagler County |
| Analysis Date: | 04-01-11 |
| Analyzed By: | |
| Easting (X, ft): | 652,240 |
| Northing (Y, ft): | 1,872,434 |
| Horizontal System: | NAD83 |
| Vertical System: | NAVD88 |

Comments:

Depths and elevations based on measured values

US Army Corps of Engineers
701 San Marco Blvd
Jacksonville, Florida 32207
phone (904)396-7121

SIEVE ANALYSIS FLAGLER_STAT_GINT.GPJ FL DEP ROSS.GDT 11/14/12




SIEVE ANALYSIS FLAGLER_STAT_GINT.GPJ FL DEP ROSS.GDT 11/14/12

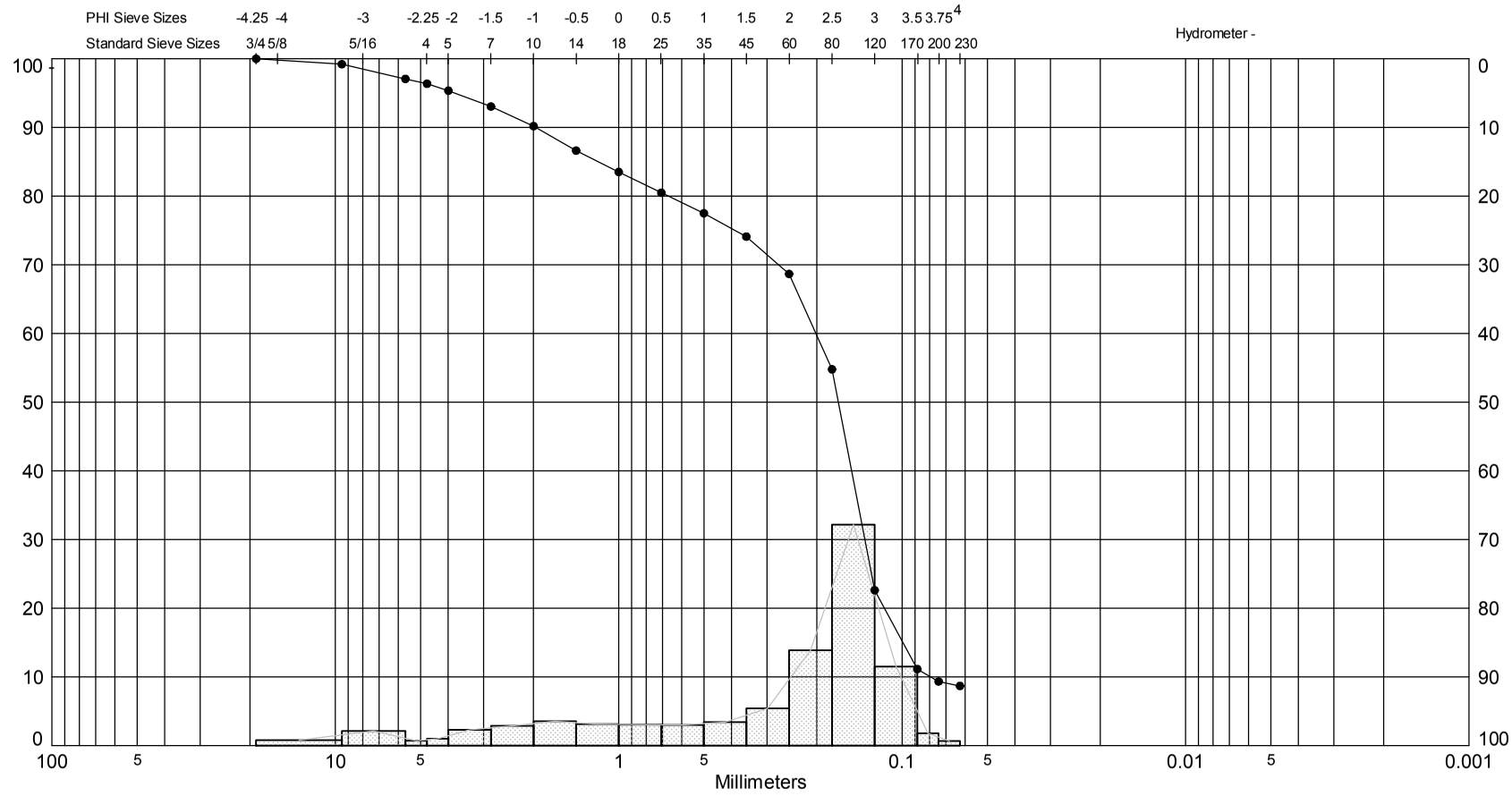
| Sample | Symbol | Elev. (ft) | USCS | % Fines | % Organics | % Carbonates | Median | Mean | Skew | Kurt | Sort |
|---|---|---|---|---|---|---|---|---|---|---|---|
| VC-FSP11-14 #3 | —●— | -63.1 | SW | #230 - 4.52 | | | 2.55 | 2.1 | -2.14 | 7.9 | 1.22 |

Comments:

Depths and elevations based on measured values

US Army Corps of Engineers
701 San Marco Blvd
Jacksonville, Florida 32207
phone (904)396-7121

| Sample Information | |
|---|---|
| Project Name: | Flagler County |
| Analysis Date: | 04-01-11 |
| Analyzed By: | |
| Easting (X, ft): | 652,240 |
| Northing (Y, ft): | 1,872,434 |
| Horizontal System: | NAD83 |
| Vertical System: | NAVD88 |




| Sample | Symbol | Elev. (ft) | USCS | % Fines | % Organics | % Carbonates | Median | Mean | Skew | Kurt | Sort |
|---|---|---|---|---|---|---|---|---|---|---|---|
| VC-FSP11-14 #4 | —●— | -66.1 | SP-SM | #230 - 8.68 | | | 2.57 | 1.74 | -1.36 | 3.87 | 1.71 |

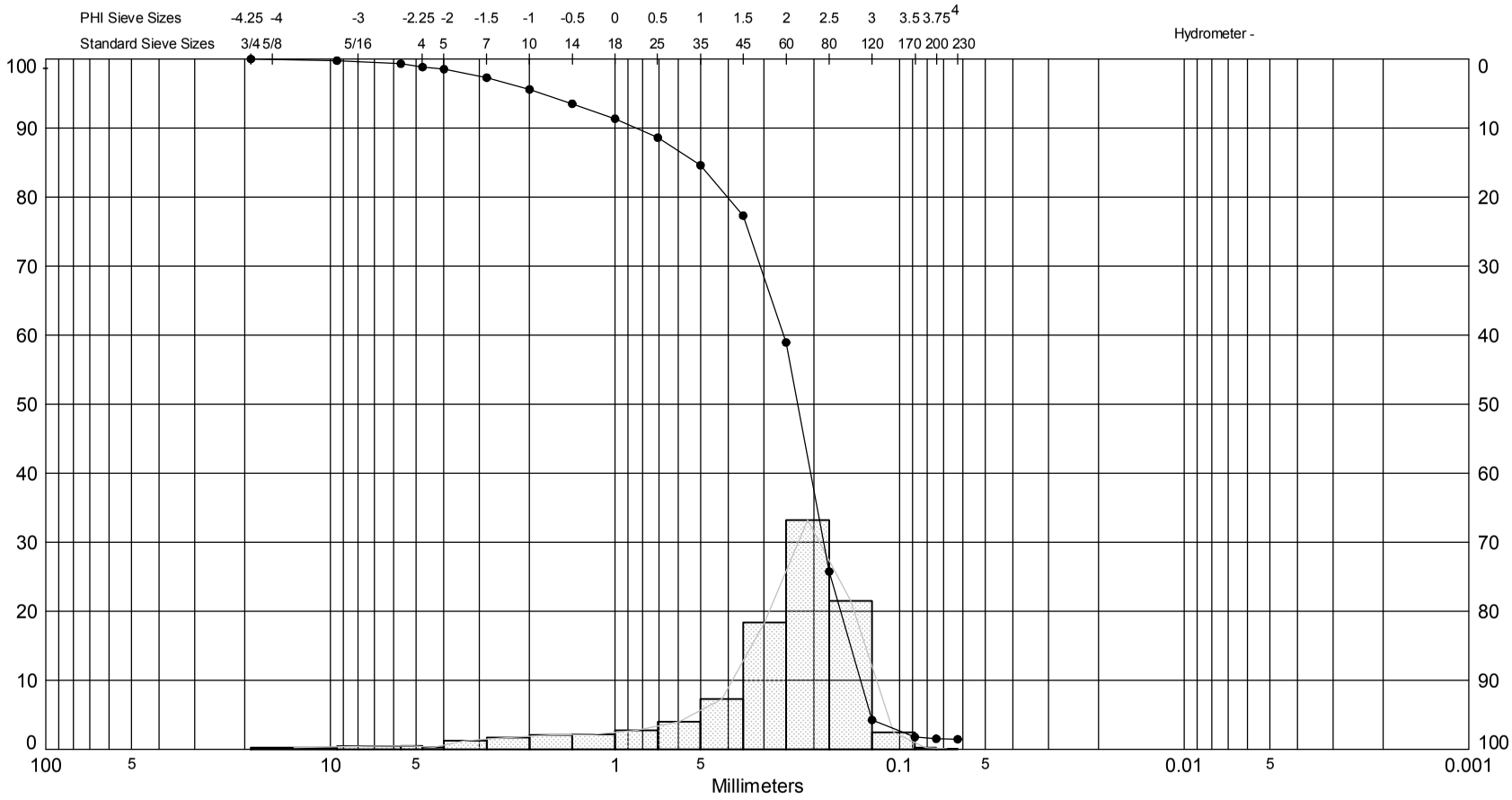
Comments:

Depths and elevations based on measured values

US Army Corps of Engineers
701 San Marco Blvd
Jacksonville, Florida 32207
phone (904)396-7121

| Sample Information | |
|---|---|
| Project Name: | Flagler County |
| Analysis Date: | 04-01-11 |
| Analyzed By: | |
| Easting (X, ft): | 652,240 |
| Northing (Y, ft): | 1,872,434 |
| Horizontal System: | NAD83 |
| Vertical System: | NAVD88 |

SIEVE ANALYSIS FLAGLER_STAT_GINT.GPJ FL DEP ROSS.GDT 11/14/12




| Sample | Symbol | Elev. (ft) | USCS | % Fines | % Organics | % Carbonates | Median | Mean | Skew | Kurt | Sort |
|---|---|---|---|---|---|---|---|---|---|---|---|
| VC-FSP11-15 #1 | —●— | -63.4 | SW | #230 - 1.46 | | | 2.13 | 1.8 | -1.89 | 6.89 | 1.15 |

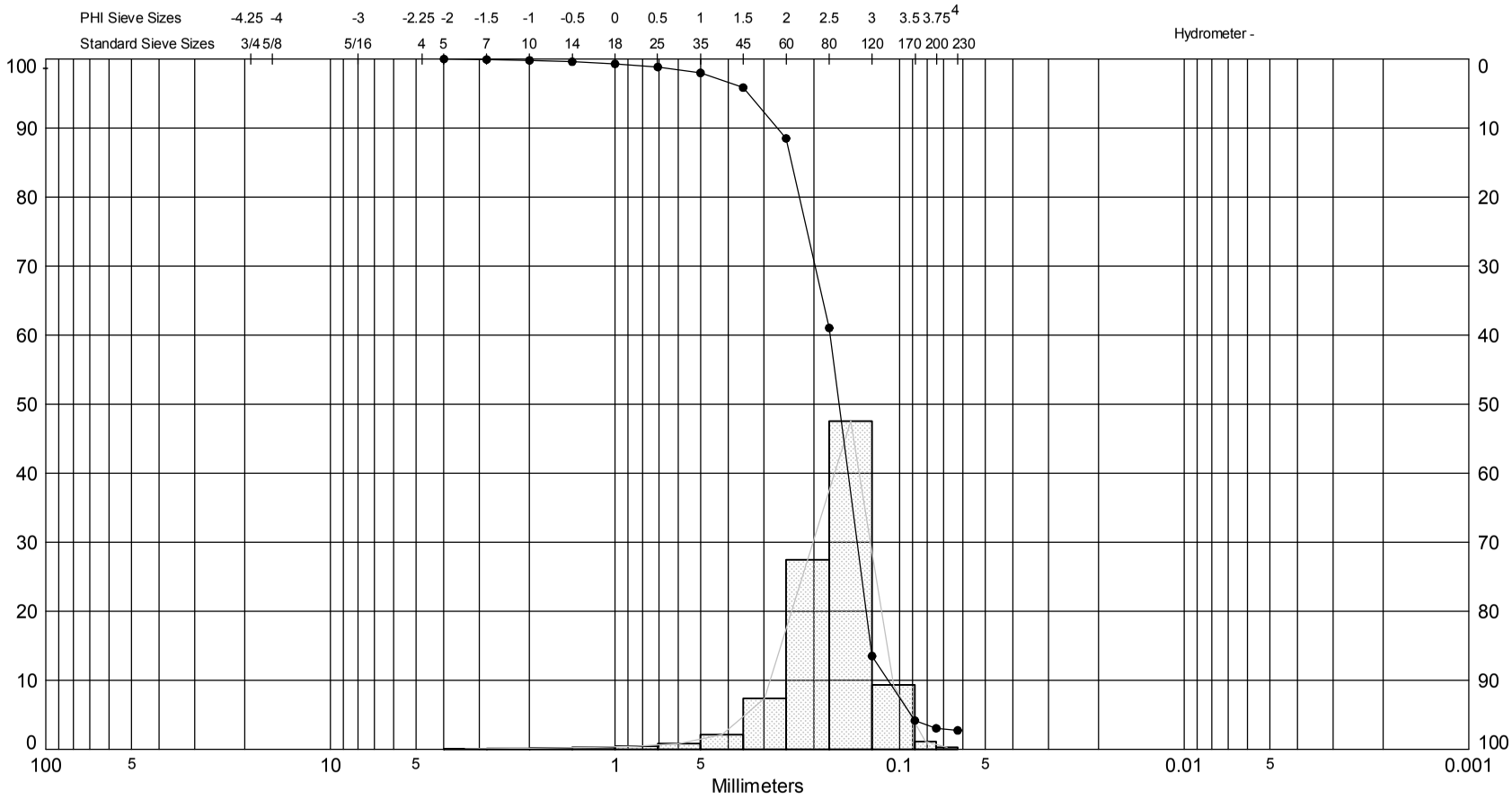
Comments:

Depths and elevations based on measured values

US Army Corps of Engineers
701 San Marco Blvd
Jacksonville, Florida 32207
phone (904)396-7121

| Sample Information | |
|---|---|
| Project Name: | Flagler County |
| Analysis Date: | 04-01-11 |
| Analyzed By: | |
| Easting (X, ft): | 655,510 |
| Northing (Y, ft): | 1,872,704 |
| Horizontal System: | NAD83 |
| Vertical System: | NAVD88 |

SIEVE ANALYSIS FLAGLER_STAT_GINT.GPJ FL DEP ROSS.GDT 11/14/12




| Sample | Symbol | Elev. (ft) | USCS | % Fines | % Organics | % Carbonates | Median | Mean | Skew | Kurt | Sort |
|---|---|---|---|---|---|---|---|---|---|---|---|
| VC-FSP11-15 #2 | —●— | -66.4 | SP | #230 - 2.74 | | | 2.62 | 2.51 | -2 | 11.77 | 0.57 |

Comments:

Depths and elevations based on measured values

| Sample Information | |
|---|---|
| Project Name: | Flagler County |
| Analysis Date: | 04-01-11 |
| Analyzed By: | |
| Easting (X, ft): | 655,510 |
| Northing (Y, ft): | 1,872,704 |
| Horizontal System: | NAD83 |
| Vertical System: | NAVD88 |

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701 San Marco Blvd
Jacksonville, Florida 32207
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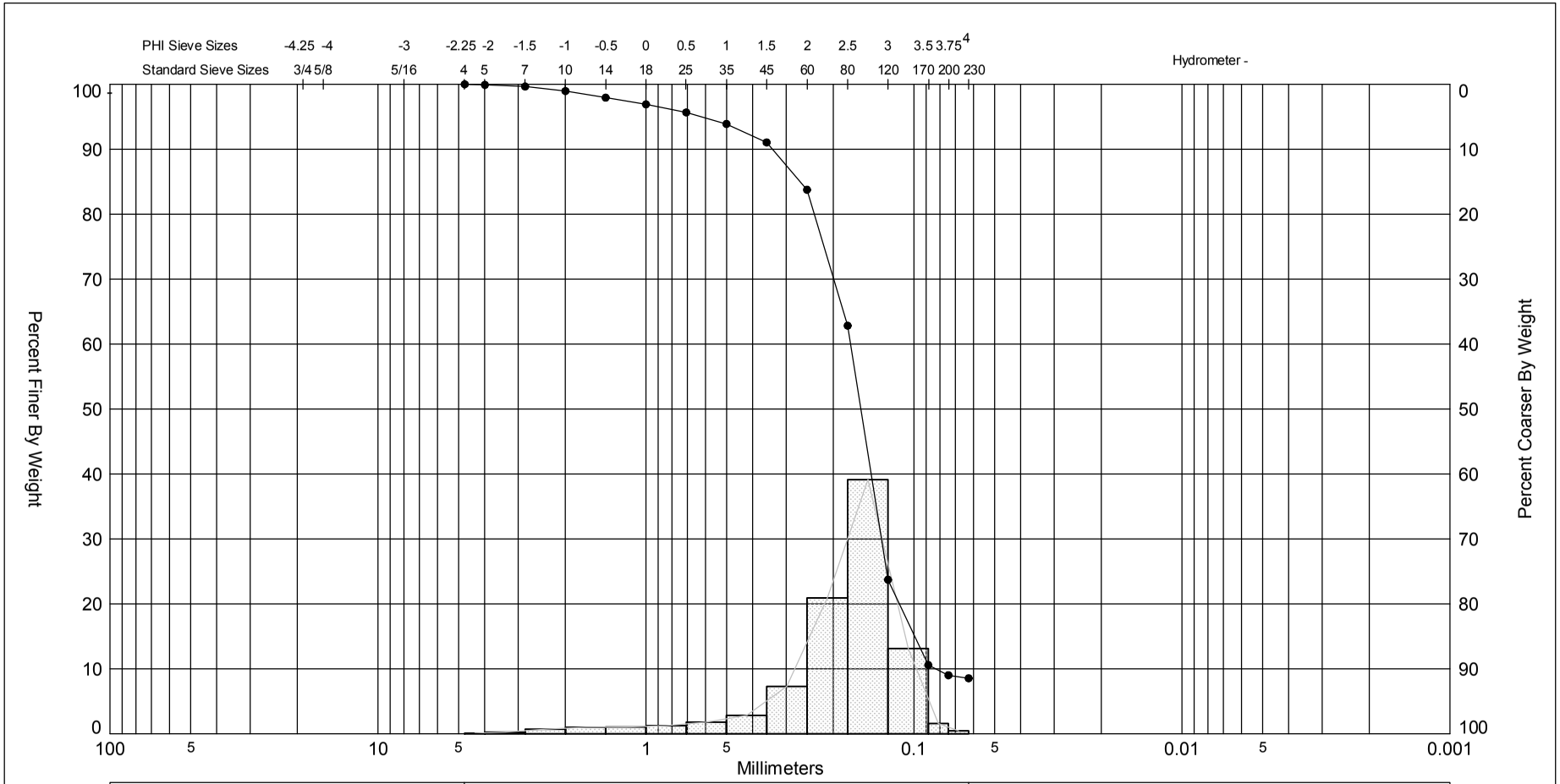
SIEVE ANALYSIS FLAGLER_STAT_GINT.GPJ FL DEP ROSS.GDT 11/14/12




| Sample | Symbol | Elev. (ft) | USCS | % Fines | % Organics | % Carbonates | Median | Mean | Skew | Kurt | Sort |
|---|---|---|---|---|---|---|---|---|---|---|---|
| VC-FSP11-15 #3 | —●— | -68.4 | SP-SM | #230 - 8.55 | | | 2.66 | 2.41 | -2.12 | 8.79 | 0.86 |

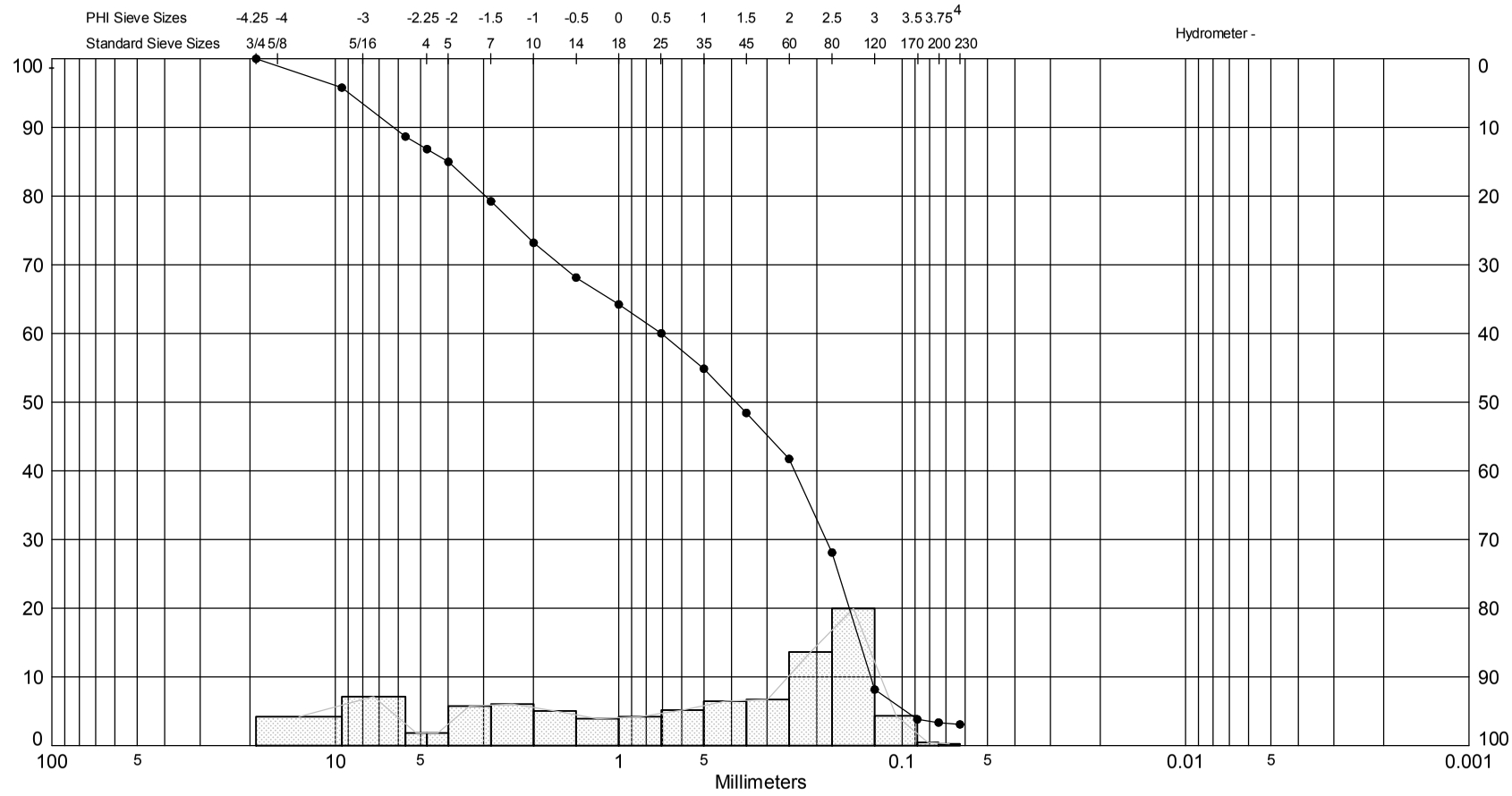
| Sample Information | |
|---|---|
| Project Name: | Flagler County |
| Analysis Date: | 04-01-11 |
| Analyzed By: | |
| Easting (X, ft): | 655,510 |
| Northing (Y, ft): | 1,872,704 |
| Horizontal System: | NAD83 |
| Vertical System: | NAVD88 |

Comments:

Depths and elevations based on measured values

US Army Corps of Engineers
701 San Marco Blvd
Jacksonville, Florida 32207
phone (904)396-7121

SIEVE ANALYSIS FLAGLER_STAT_GINT.GPJ FL DEP ROSS.GDT 11/14/12




| Sample | Symbol | Elev. (ft) | USCS | % Fines | % Organics | % Carbonates | Median | Mean | Skew | Kurt | Sort |
|---|---|---|---|---|---|---|---|---|---|---|---|
| VC-FSP11-15 #4 | —●— | -71.4 | SW | #230 - 3.08 | | | 1.37 | 0.62 | -0.55 | 1.97 | 2.13 |

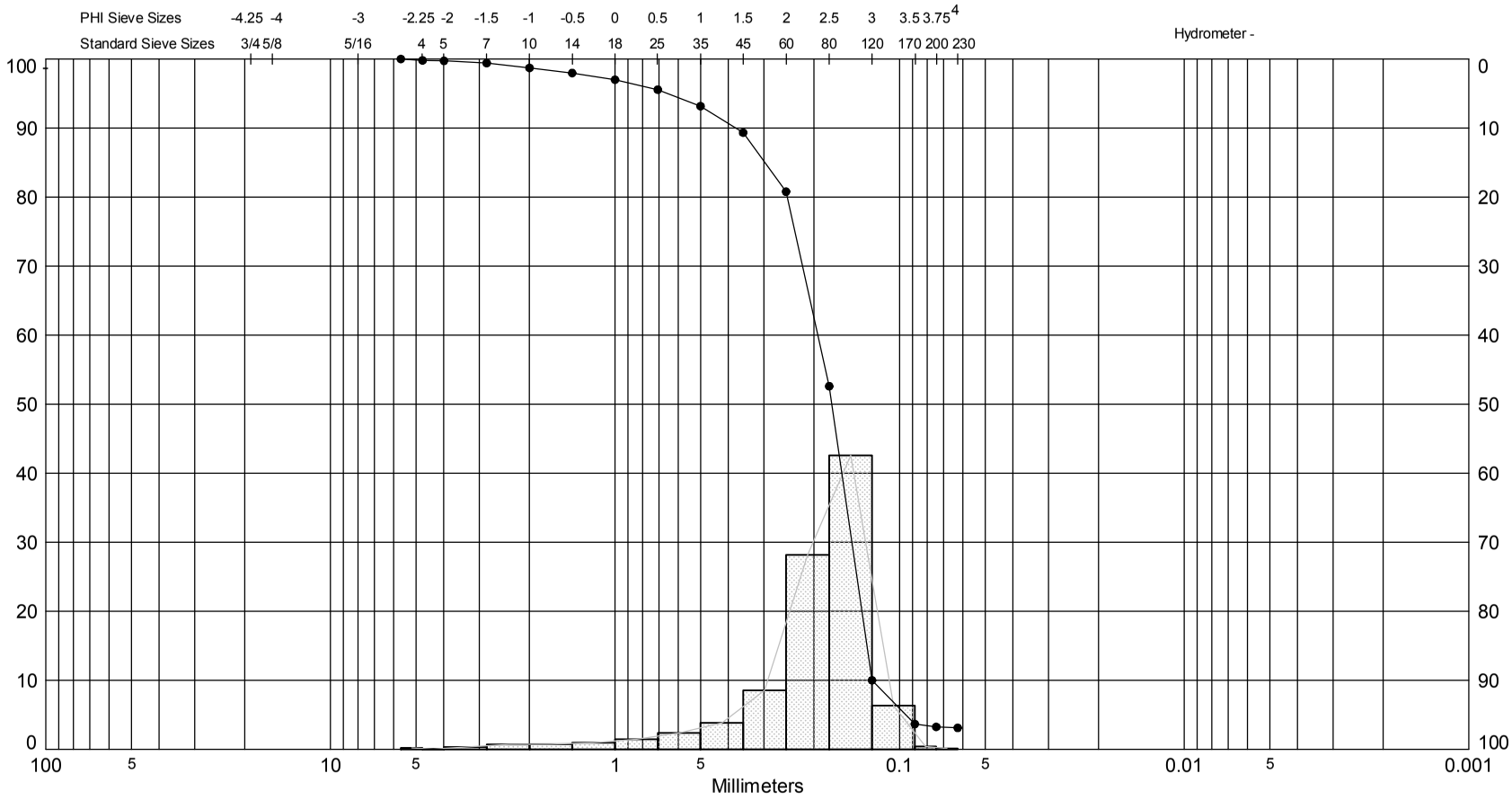
| Sample Information | |
|---|---|
| Project Name: | Flagler County |
| Analysis Date: | 04-01-11 |
| Analyzed By: | |
| Easting (X, ft): | 655,510 |
| Northing (Y, ft): | 1,872,704 |
| Horizontal System: | NAD83 |
| Vertical System: | NAVD88 |

Comments:

Depths and elevations based on measured values

US Army Corps of Engineers
701 San Marco Blvd
Jacksonville, Florida 32207
phone (904)396-7121

SIEVE ANALYSIS FLAGLER_STAT_GINT.GPJ FL DEP ROSS.GDT 11/14/12




| Sample | Symbol | Elev. (ft) | USCS | % Fines | % Organics | % Carbonates | Median | Mean | Skew | Kurt | Sort |
|---|---|---|---|---|---|---|---|---|---|---|---|
| VC-FSP11-15 #5 | —● | -75.4 | SP | #230 - 3.11 | | | 2.53 | 2.29 | -2.34 | 10.17 | 0.83 |

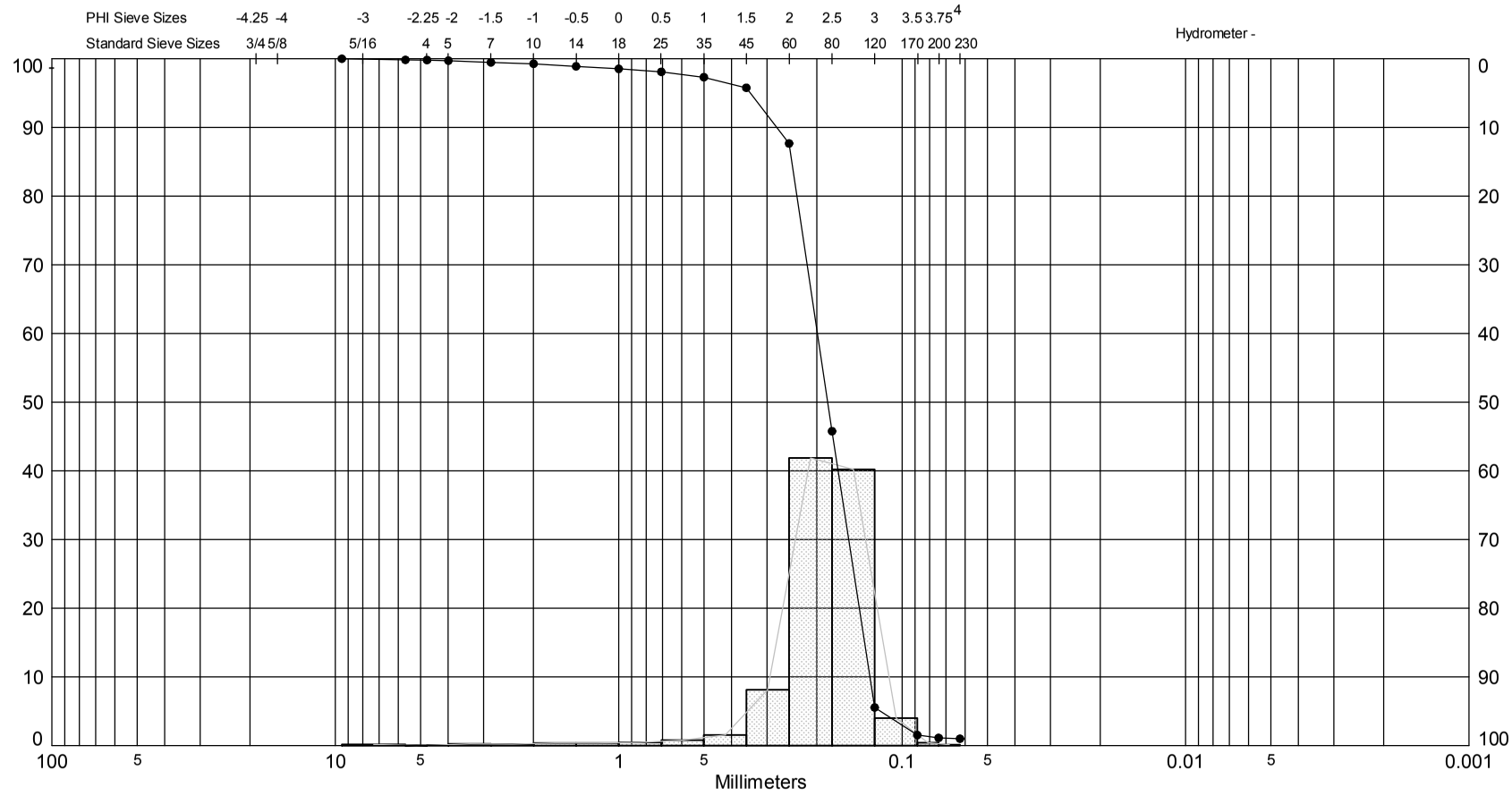
Comments:

Depths and elevations based on measured values

US Army Corps of Engineers
701 San Marco Blvd
Jacksonville, Florida 32207
phone (904)396-7121

| Sample Information | |
|---|---|
| Project Name: | Flagler County |
| Analysis Date: | 04-01-11 |
| Analyzed By: | |
| Easting (X, ft): | 655,510 |
| Northing (Y, ft): | 1,872,704 |
| Horizontal System: | NAD83 |
| Vertical System: | NAVD88 |

SIEVE ANALYSIS FLAGLER_STAT_GINT.GPJ FL DEP ROSS.GDT 11/14/12




| Sample | Symbol | Elev. (ft) | USCS | % Fines | % Organics | % Carbonates | Median | Mean | Skew | Kurt | Sort |
|---|---|---|---|---|---|---|---|---|---|---|---|
| VC-FSP11-16 #1 | —●— | -54.8 | SP | #230 - 1.00 | | | 2.45 | 2.37 | -3.42 | 22.63 | 0.63 |

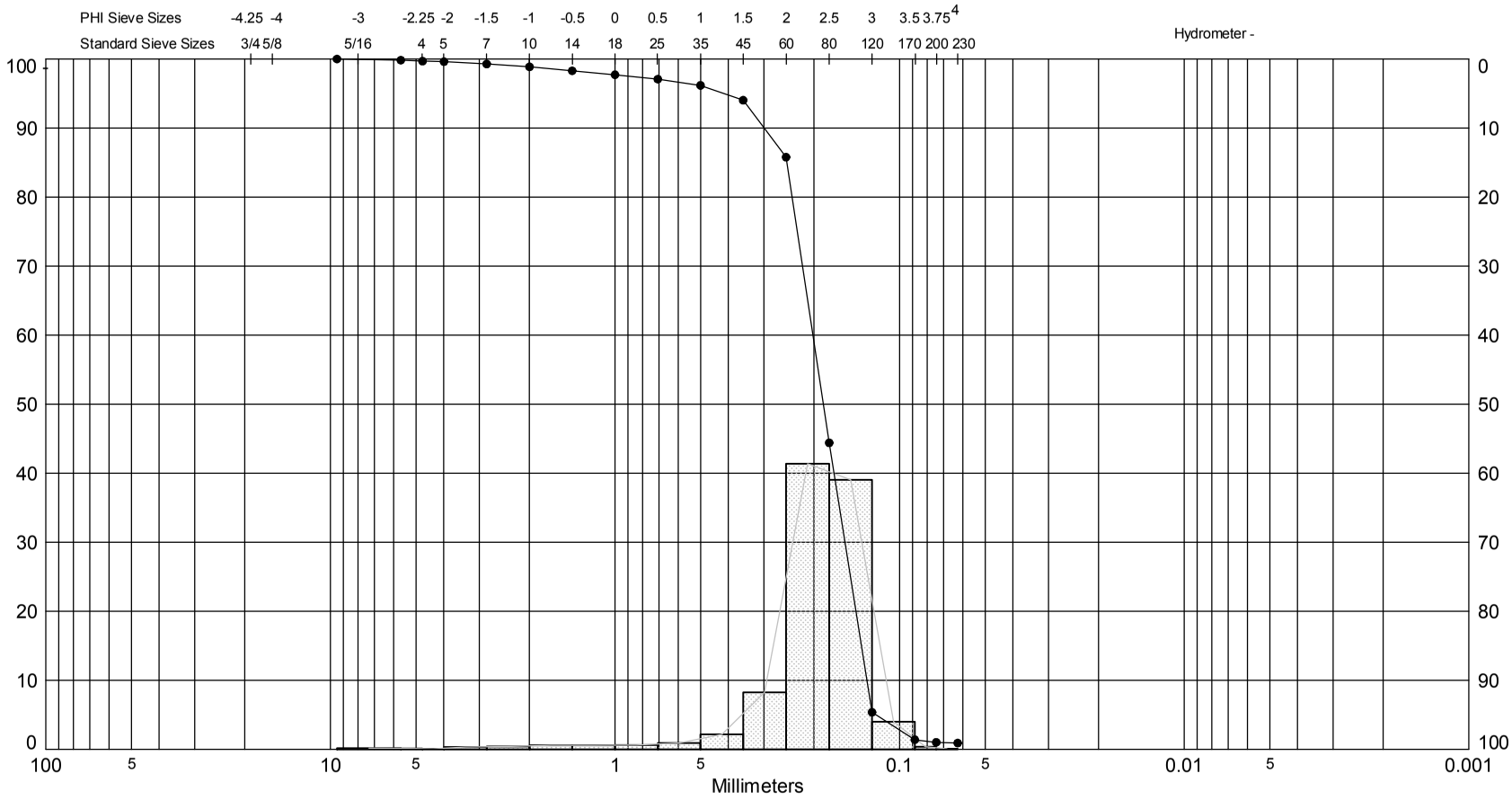
Comments:

Depths and elevations based on measured values

US Army Corps of Engineers
701 San Marco Blvd
Jacksonville, Florida 32207
phone (904)396-7121

| Sample Information | |
|---|---|
| Project Name: | Flagler County |
| Analysis Date: | 04-01-11 |
| Analyzed By: | |
| Easting (X, ft): | 653,442 |
| Northing (Y, ft): | 1,868,195 |
| Horizontal System: | NAD83 |
| Vertical System: | NAVD88 |

SIEVE ANALYSIS FLAGLER_STAT_GINT.GPJ FL DEP ROSS.GDT 11/14/12




| Sample | Symbol | Elev. (ft) | USCS | % Fines | % Organics | % Carbonates | Median | Mean | Skew | Kurt | Sort |
|---|---|---|---|---|---|---|---|---|---|---|---|
| VC-FSP11-16 #2 | —●— | -57.8 | SP | #230 - 0.91 | | 12.00 | 2.43 | 2.32 | -3.25 | 18.4 | 0.72 |

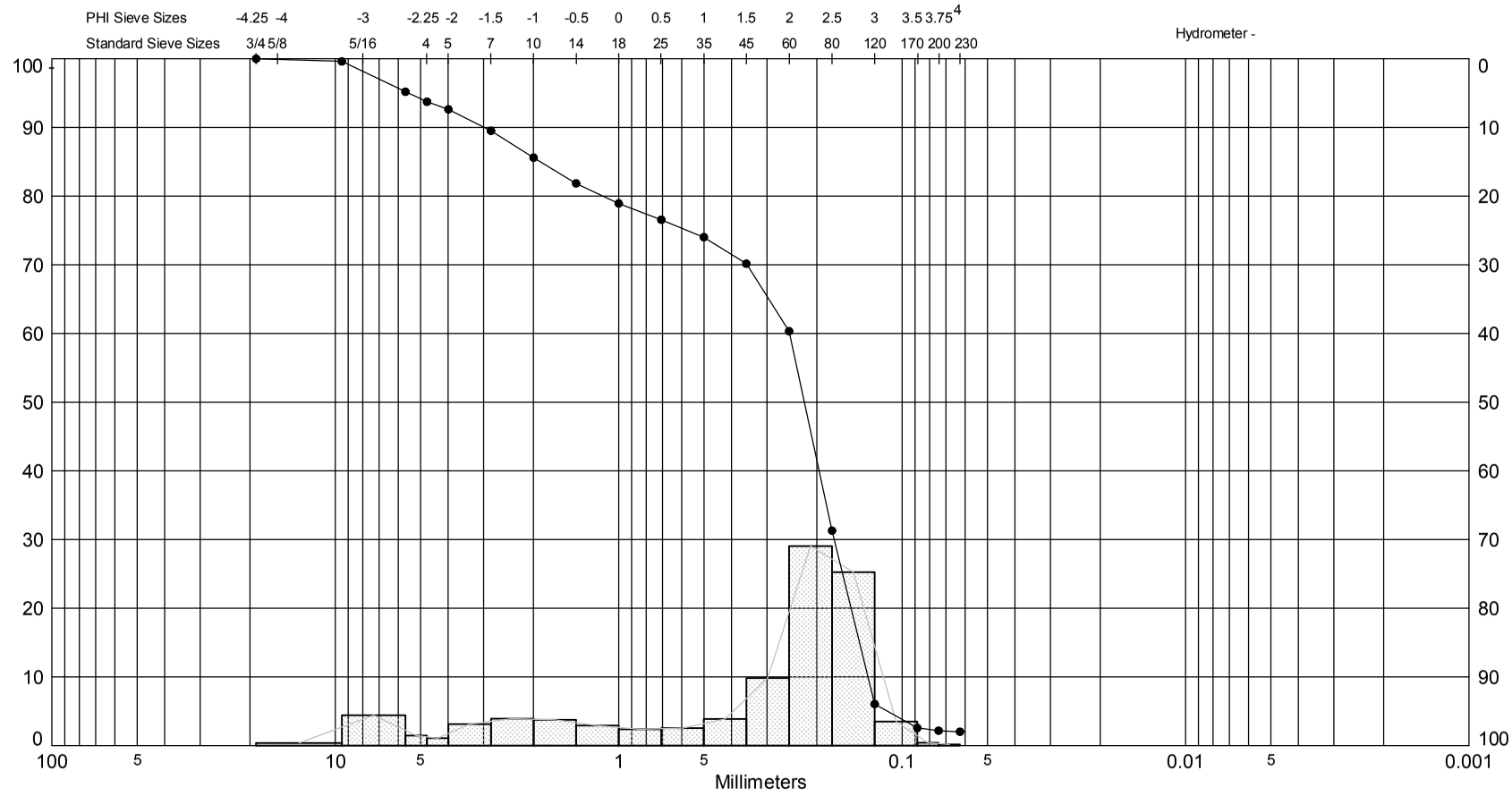
| Sample Information | |
|---|---|
| Project Name: | Flagler County |
| Analysis Date: | 04-01-11 |
| Analyzed By: | |
| Easting (X, ft): | 653,442 |
| Northing (Y, ft): | 1,868,195 |
| Horizontal System: | NAD83 |
| Vertical System: | NAVD88 |

Comments:

Depths and elevations based on measured values

US Army Corps of Engineers
701 San Marco Blvd
Jacksonville, Florida 32207
phone (904)396-7121

SIEVE ANALYSIS FLAGLER_STAT_GINT.GPJ FL DEP ROSS.GDT 11/14/12




| Sample | Symbol | Elev. (ft) | USCS | % Fines | % Organics | % Carbonates | Median | Mean | Skew | Kurt | Sort |
|---|---|---|---|---|---|---|---|---|---|---|---|
| VC-FSP11-16 #3 | —●— | -60.8 | SW | #230 - 2.02 | | | 2.18 | 1.42 | -1.27 | 3.36 | 1.74 |

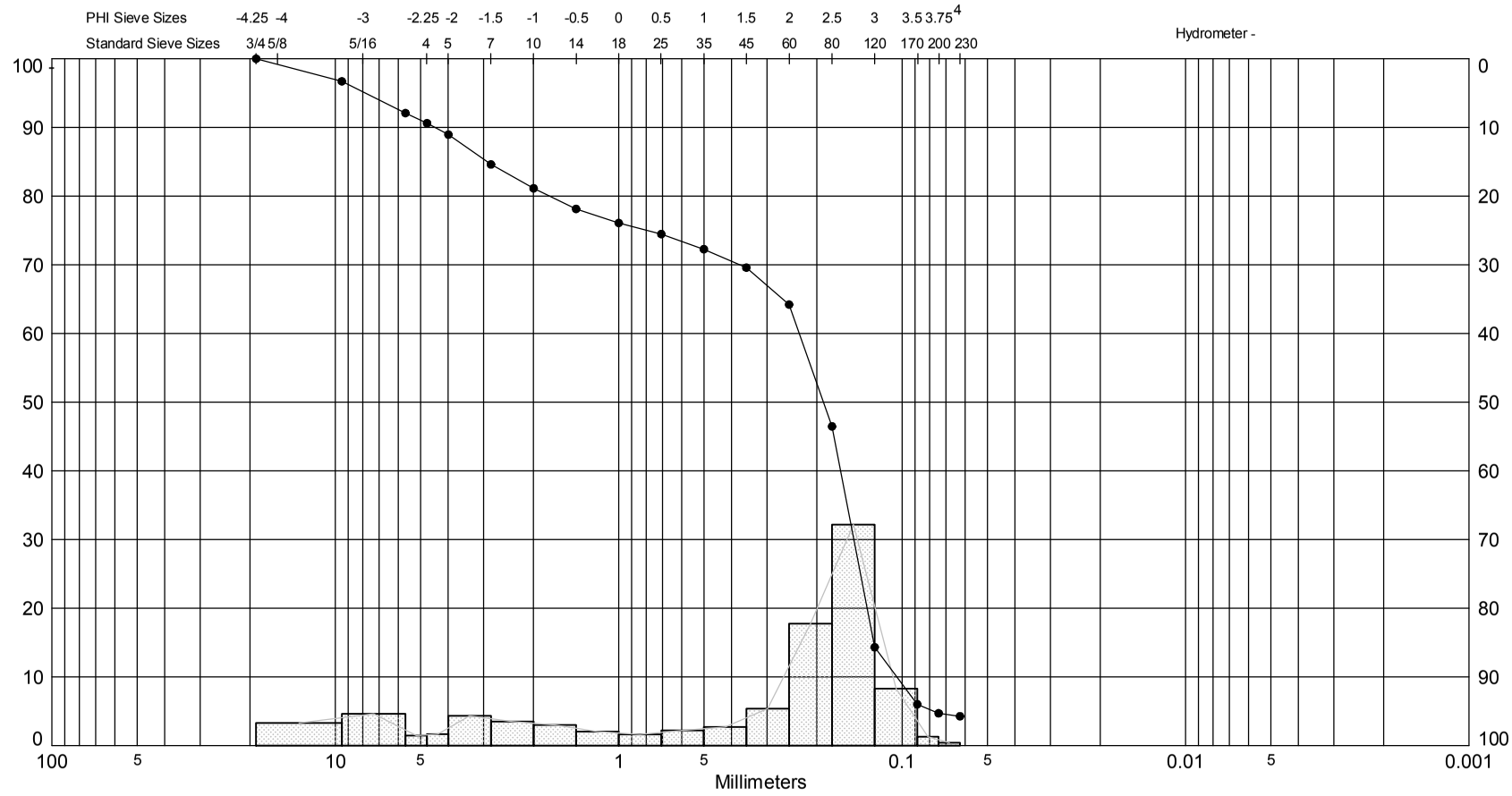
Comments:

Depths and elevations based on measured values

US Army Corps of Engineers
701 San Marco Blvd
Jacksonville, Florida 32207
phone (904)396-7121

| Sample Information | |
|---|---|
| Project Name: | Flagler County |
| Analysis Date: | 04-01-11 |
| Analyzed By: | |
| Easting (X, ft): | 653,442 |
| Northing (Y, ft): | 1,868,195 |
| Horizontal System: | NAD83 |
| Vertical System: | NAVD88 |

SIEVE ANALYSIS FLAGLER_STAT_GINT.GPJ FL DEP ROSS.GDT 11/14/12




| Sample | Symbol | Elev. (ft) | USCS | % Fines | % Organics | % Carbonates | Median | Mean | Skew | Kurt | Sort |
|---|---|---|---|---|---|---|---|---|---|---|---|
| VC-FSP11-17 #1 | —●— | -69.0 | SW | #230 - 4.27 | | | 2.4 | 1.35 | -1.14 | 2.89 | 2.08 |

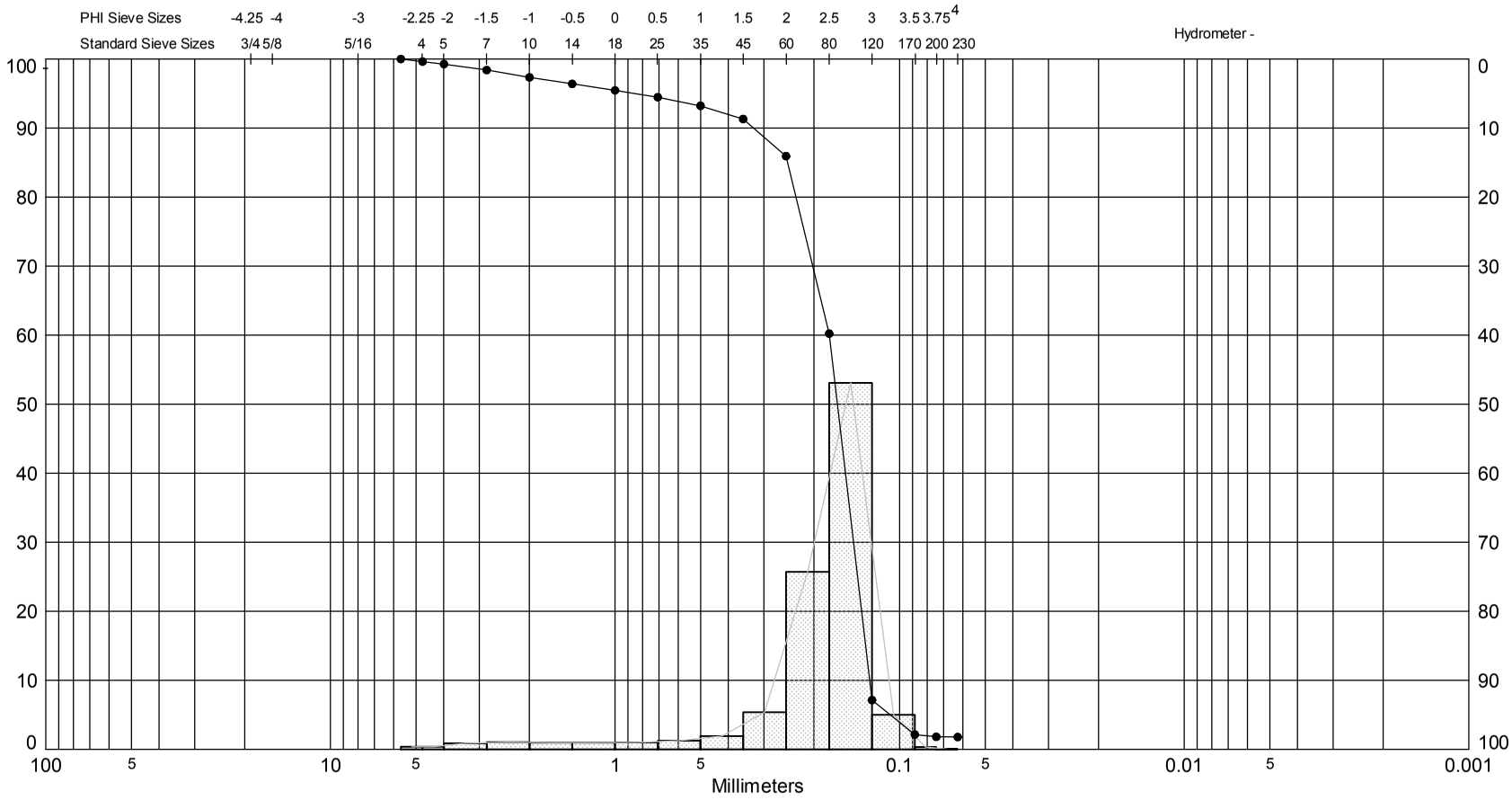
Comments:

Depths and elevations based on measured values

US Army Corps of Engineers
701 San Marco Blvd
Jacksonville, Florida 32207
phone (904)396-7121

| Sample Information | |
|---|---|
| Project Name: | Flagler County |
| Analysis Date: | 04-01-11 |
| Analyzed By: | |
| Easting (X, ft): | 650,134 |
| Northing (Y, ft): | 1,865,965 |
| Horizontal System: | NAD83 |
| Vertical System: | NAVD88 |

SIEVE ANALYSIS FLAGLER_STAT_GINT.GPJ FL DEP ROSS.GDT 11/14/12




| Sample | Symbol | Elev. (ft) | USCS | % Fines | % Organics | % Carbonates | Median | Mean | Skew | Kurt | Sort |
|---|---|---|---|---|---|---|---|---|---|---|---|
| VC-FSP11-17 #2 | —●— | -72.5 | SW | #230 - 1.78 | | | 2.6 | 2.33 | -2.94 | 12.4 | 0.93 |

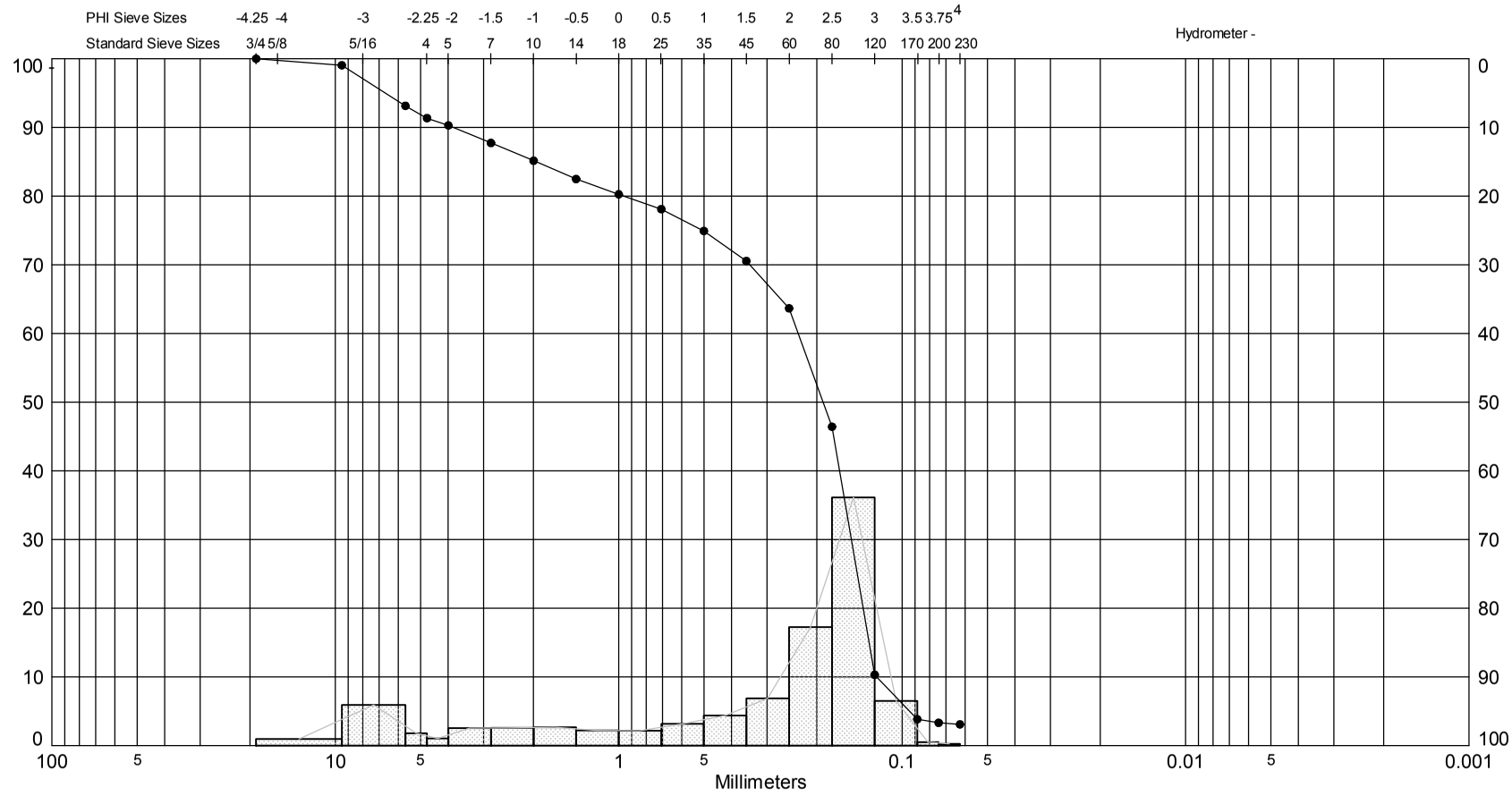
Comments:

Depths and elevations based on measured values

US Army Corps of Engineers
701 San Marco Blvd
Jacksonville, Florida 32207
phone (904)396-7121

| Sample Information | |
|---|---|
| Project Name: | Flagler County |
| Analysis Date: | 04-01-11 |
| Analyzed By: | |
| Easting (X, ft): | 650,134 |
| Northing (Y, ft): | 1,865,965 |
| Horizontal System: | NAD83 |
| Vertical System: | NAVD88 |

SIEVE ANALYSIS FLAGLER_STAT_GINT.GPJ FL DEP ROSS.GDT 11/14/12




| Sample | Symbol | Elev. (ft) | USCS | % Fines | % Organics | % Carbonates | Median | Mean | Skew | Kurt | Sort |
|---|---|---|---|---|---|---|---|---|---|---|---|
| VC-FSP11-17 #3 | —●— | -75.5 | SW | #230 - 3.09 | | | 2.4 | 1.5 | -1.32 | 3.44 | 1.88 |

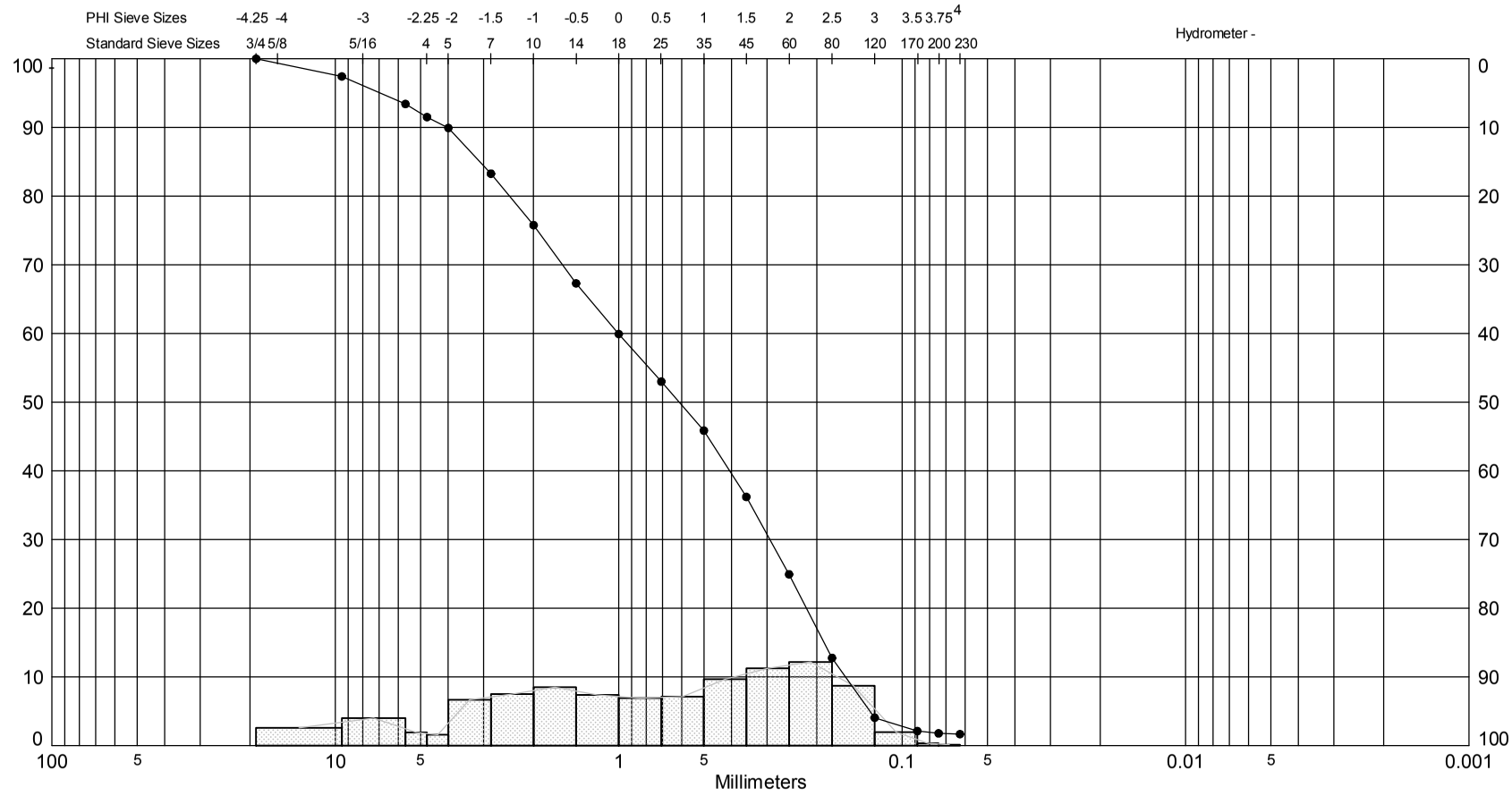
Comments:

Depths and elevations based on measured values

US Army Corps of Engineers
701 San Marco Blvd
Jacksonville, Florida 32207
phone (904)396-7121

| Sample Information | |
|---|---|
| Project Name: | Flagler County |
| Analysis Date: | 04-01-11 |
| Analyzed By: | |
| Easting (X, ft): | 650,134 |
| Northing (Y, ft): | 1,865,965 |
| Horizontal System: | NAD83 |
| Vertical System: | NAVD88 |

SIEVE ANALYSIS FLAGLER_STAT_GINT.GPJ FL DEP ROSS.GDT 11/14/12




| Sample | Symbol | Elev. (ft) | USCS | % Fines | % Organics | % Carbonates | Median | Mean | Skew | Kurt | Sort |
|---|---|---|---|---|---|---|---|---|---|---|---|
| VC-FSP11-18 #1 | —●— | -62.0 | SW | #230 - 1.67 | | | 0.71 | 0.4 | -0.4 | 2.21 | 1.79 |

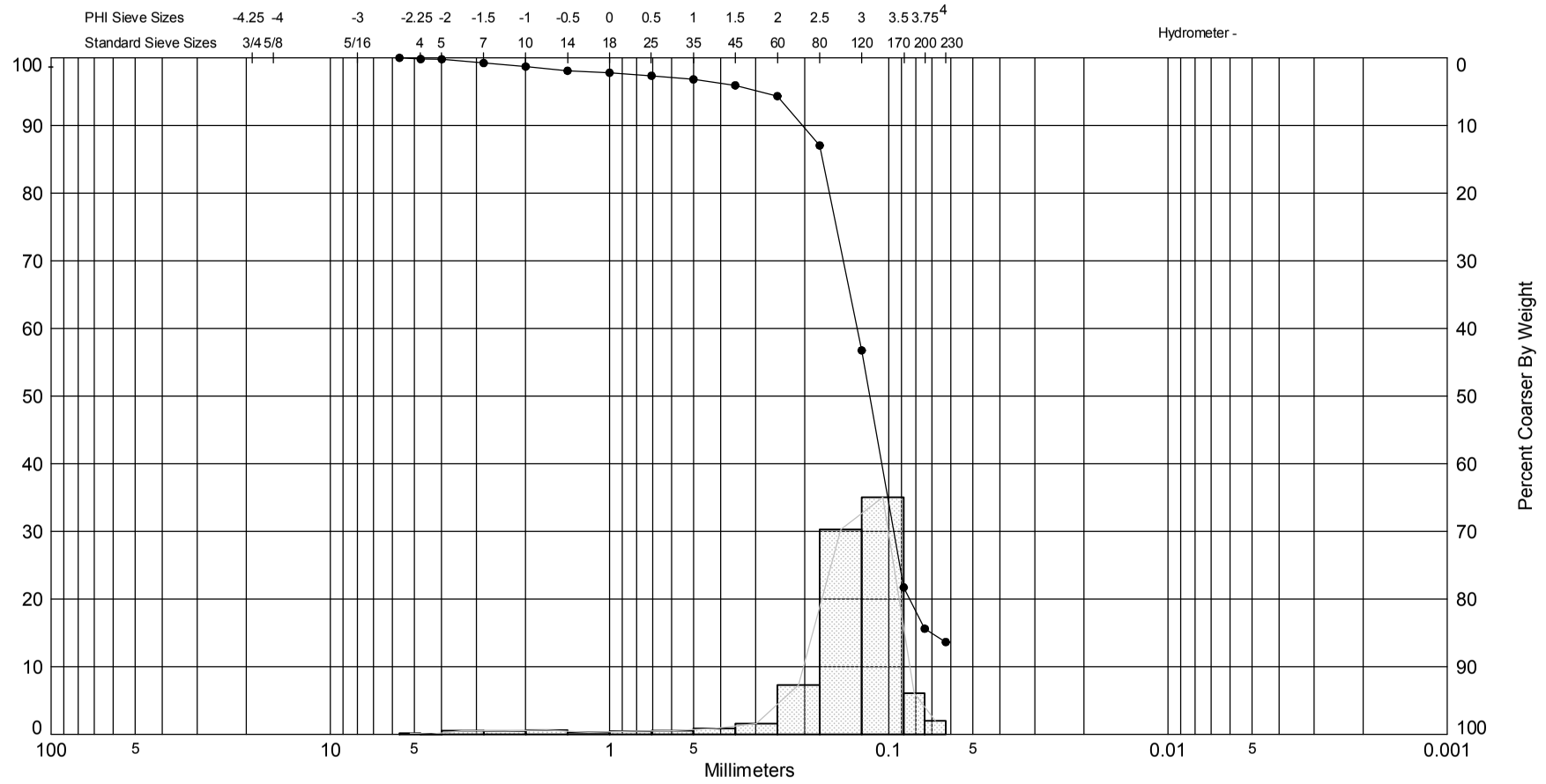
Comments:

Depths and elevations based on measured values

US Army Corps of Engineers
701 San Marco Blvd
Jacksonville, Florida 32207
phone (904)396-7121

| Sample Information | |
|---|---|
| Project Name: | Flagler County |
| Analysis Date: | 04-01-11 |
| Analyzed By: | |
| Easting (X, ft): | 653,545 |
| Northing (Y, ft): | 1,864,379 |
| Horizontal System: | NAD83 |
| Vertical System: | NAVD88 |

SIEVE ANALYSIS FLAGLER_STAT_GINT.GPJ FL DEP ROSS.GDT 11/14/12




| Sample | Symbol | Elev. (ft) | USCS | % Fines | % Organics | % Carbonates | Median | Mean | Skew | Kurt | Sort |
|---|---|---|---|---|---|---|---|---|---|---|---|
| VC-FSP11-18 #2 | —●— | -66.0 | SM | #230 - 13.64 | | | 3.1 | 2.84 | -3.28 | 16.69 | 0.84 |

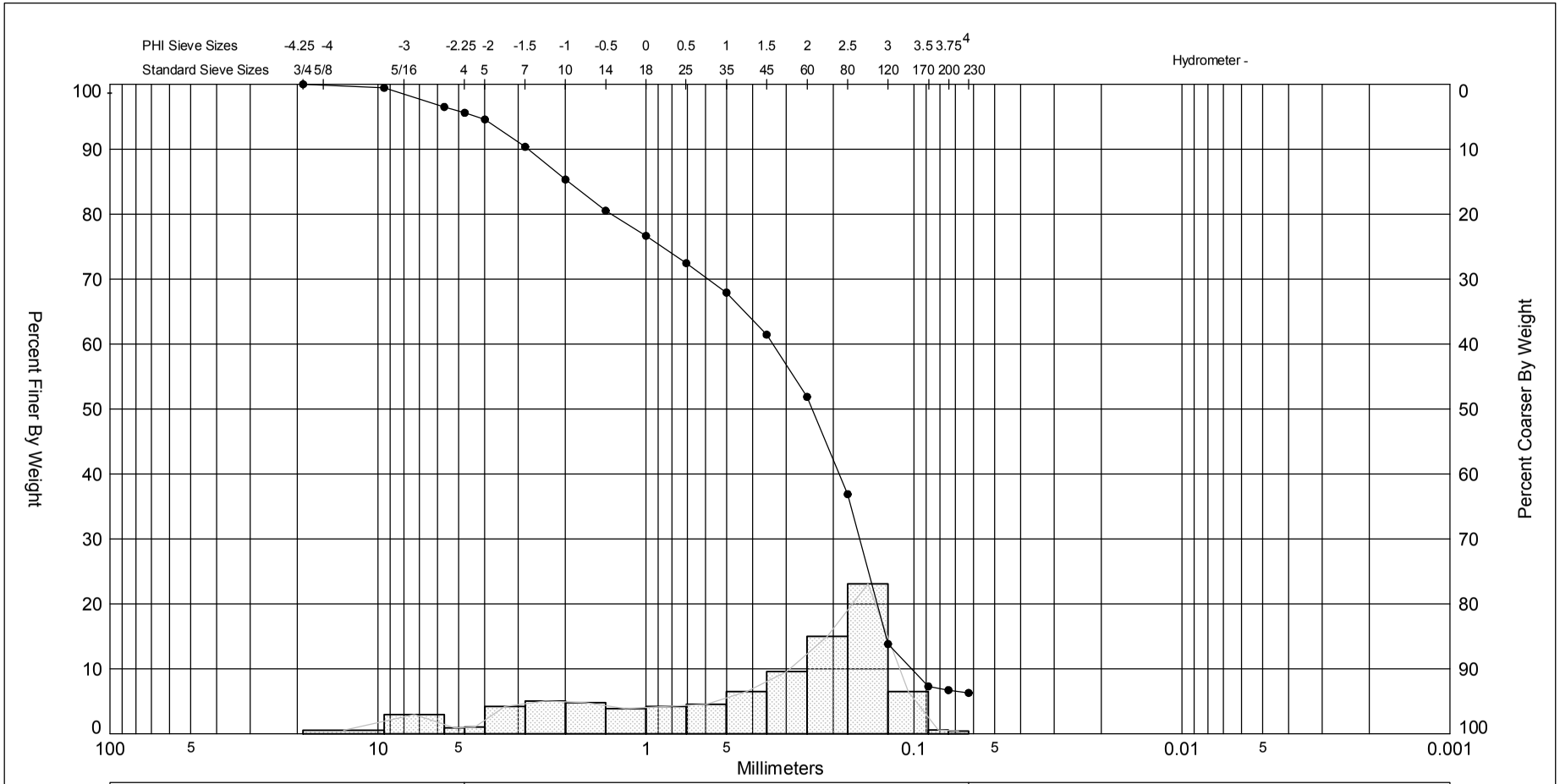
Comments:

Depths and elevations based on measured values

US Army Corps of Engineers
701 San Marco Blvd
Jacksonville, Florida 32207
phone (904)396-7121

| Sample Information | |
|---|---|
| Project Name: | Flagler County |
| Analysis Date: | 04-01-11 |
| Analyzed By: | |
| Easting (X, ft): | 653,545 |
| Northing (Y, ft): | 1,864,379 |
| Horizontal System: | NAD83 |
| Vertical System: | NAVD88 |

SIEVE ANALYSIS FLAGLER_STAT_GINT.GPJ FL DEP ROSS.GDT 11/14/12




| Sample | Symbol | Elev. (ft) | USCS | % Fines | % Organics | % Carbonates | Median | Mean | Skew | Kurt | Sort |
|---|---|---|---|---|---|---|---|---|---|---|---|
| VC-FSP11-19 #1 | —●— | -73.9 | SP-SM | #230 - 6.29 | | | 2.06 | 1.26 | -0.88 | 2.67 | 1.76 |

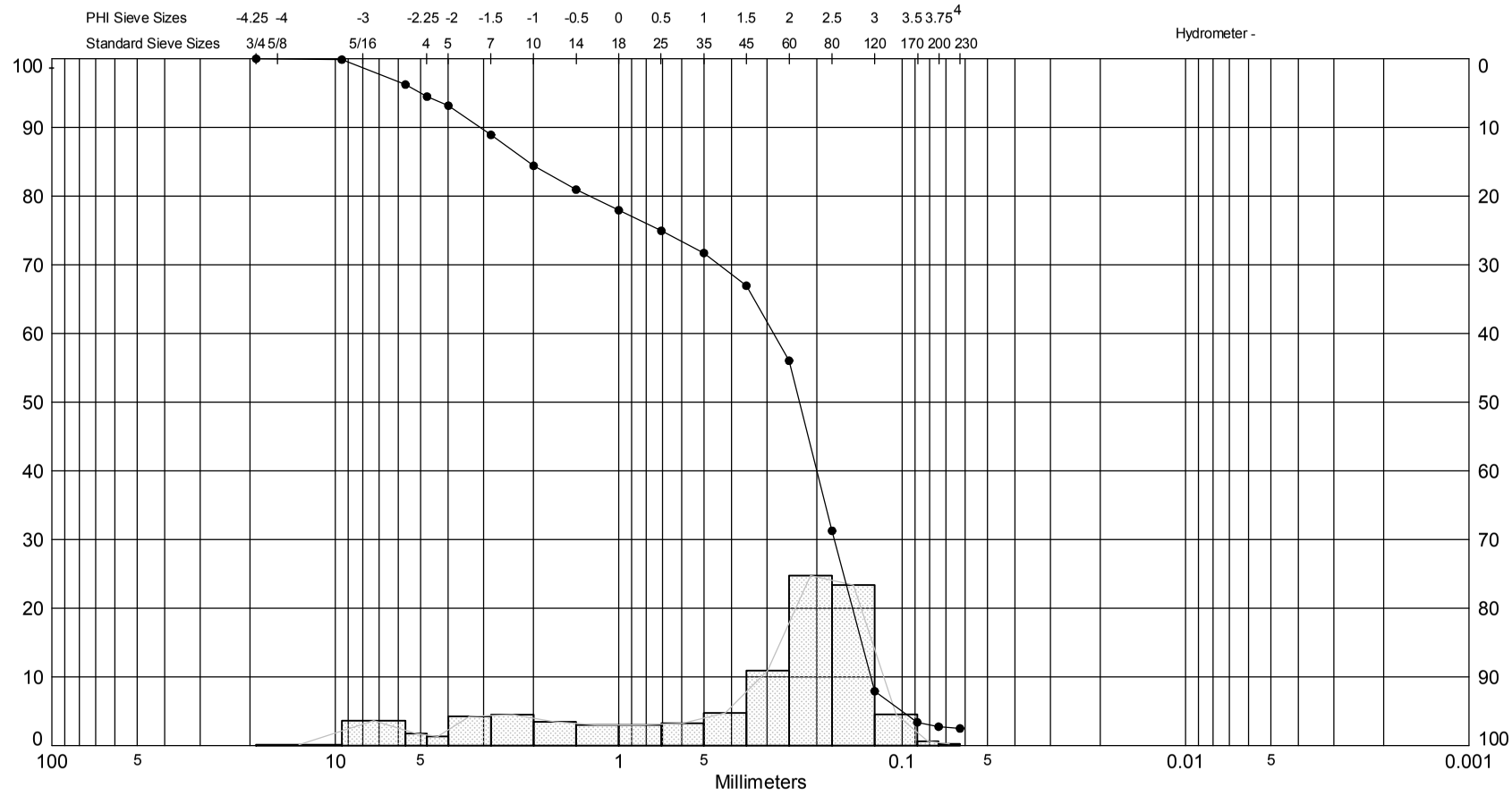
Comments:

Depths and elevations based on measured values

US Army Corps of Engineers
701 San Marco Blvd
Jacksonville, Florida 32207
phone (904)396-7121

| Sample Information | |
|---|---|
| Project Name: | Flagler County |
| Analysis Date: | 04-01-11 |
| Analyzed By: | |
| Easting (X, ft): | 656,770 |
| Northing (Y, ft): | 1,864,383 |
| Horizontal System: | NAD83 |
| Vertical System: | NAVD88 |

SIEVE ANALYSIS FLAGLER_STAT_GINT.GPJ FL DEP ROSS.GDT 11/14/12




| Sample | Symbol | Elev. (ft) | USCS | % Fines | % Organics | % Carbonates | Median | Mean | Skew | Kurt | Sort |
|---|---|---|---|---|---|---|---|---|---|---|---|
| VC-FSP11-20 #1 | —●— | -62.2 | SW | #230 - 2.49 | | | 2.12 | 1.35 | -1.1 | 2.95 | 1.74 |

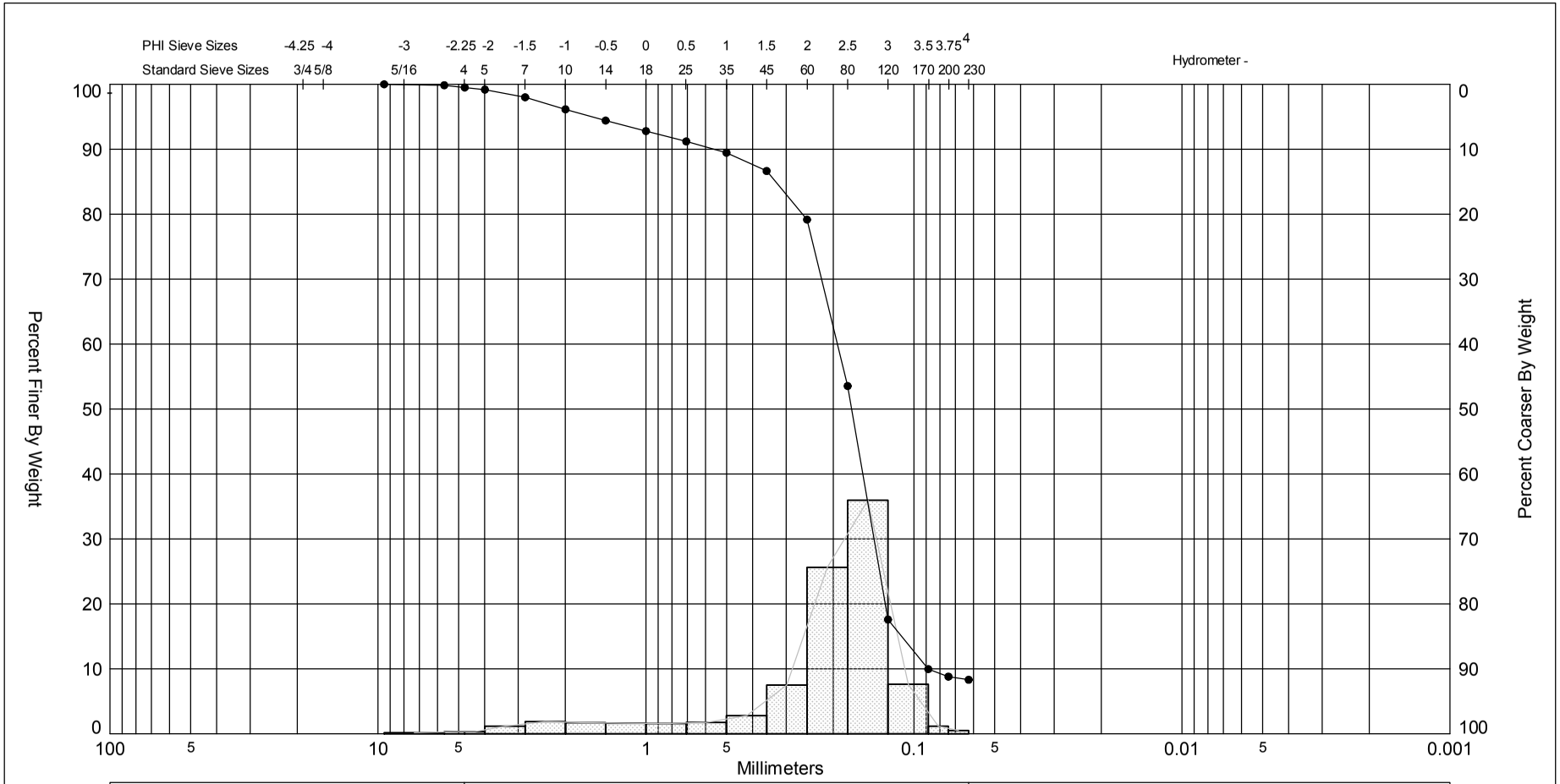
Comments:

Depths and elevations based on measured values

US Army Corps of Engineers
701 San Marco Blvd
Jacksonville, Florida 32207
phone (904)396-7121

| Sample Information | |
|---|---|
| Project Name: | Flagler County |
| Analysis Date: | 04-01-11 |
| Analyzed By: | |
| Easting (X, ft): | 656,298 |
| Northing (Y, ft): | 1,860,715 |
| Horizontal System: | NAD83 |
| Vertical System: | NAVD88 |

SIEVE ANALYSIS FLAGLER_STAT_GINT.GPJ FL DEP ROSS.GDT 11/14/12




| Sample | Symbol | Elev. (ft) | USCS | % Fines | % Organics | % Carbonates | Median | Mean | Skew | Kurt | Sort |
|---|---|---|---|---|---|---|---|---|---|---|---|
| VC-FSP11-20 #2 | —●— | -64.7 | SP-SM | #230 - 8.32 | | | 2.55 | 2.16 | -2.06 | 7.14 | 1.14 |

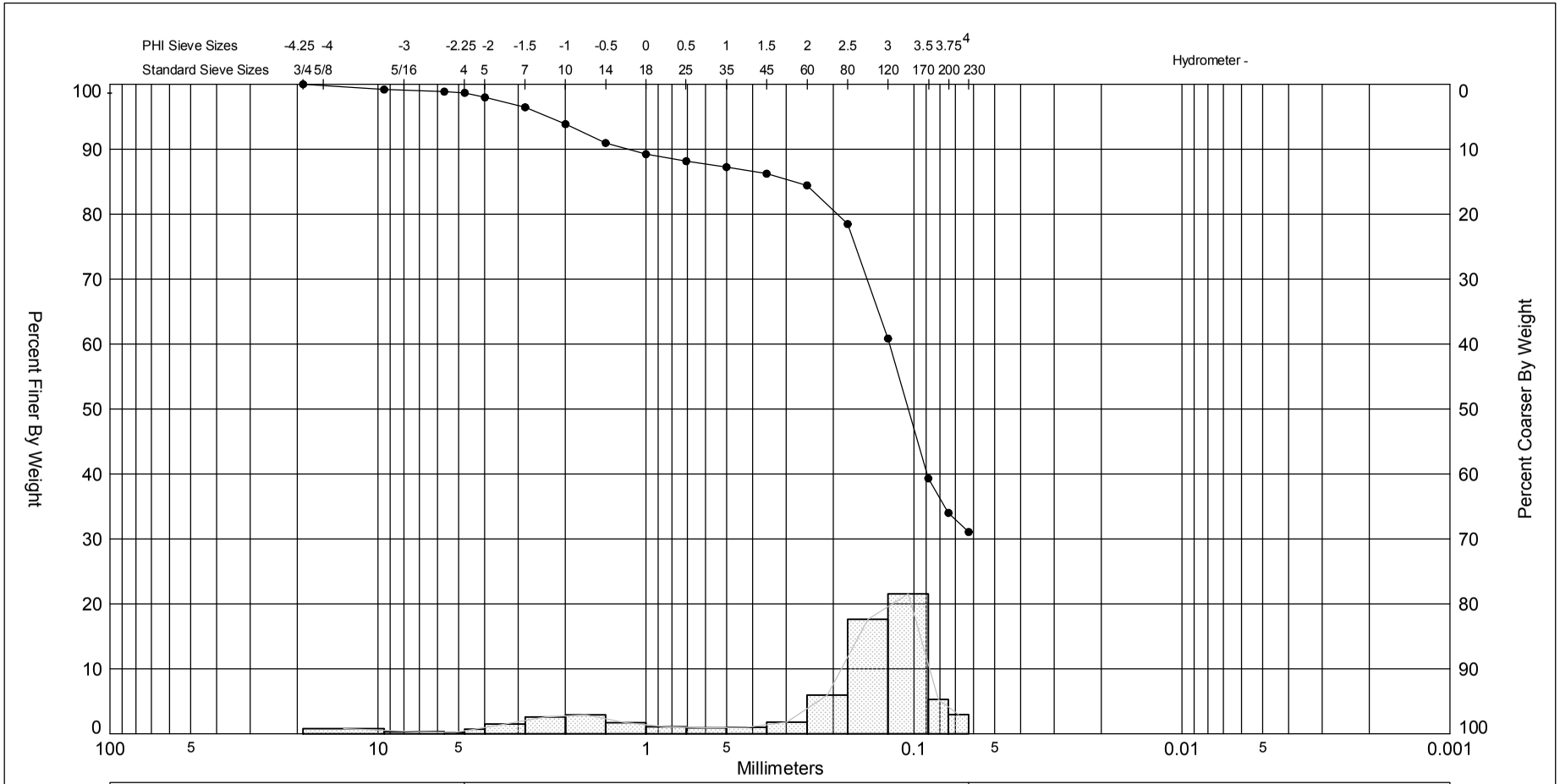
Comments:

Depths and elevations based on measured values

US Army Corps of Engineers
701 San Marco Blvd
Jacksonville, Florida 32207
phone (904)396-7121

| Sample Information | |
|---|---|
| Project Name: | Flagler County |
| Analysis Date: | 04-01-11 |
| Analyzed By: | |
| Easting (X, ft): | 656,298 |
| Northing (Y, ft): | 1,860,715 |
| Horizontal System: | NAD83 |
| Vertical System: | NAVD88 |

SIEVE ANALYSIS FLAGLER_STAT_GINT.GPJ FL DEP ROSS.GDT 11/14/12




| Sample | Symbol | Elev. (ft) | USCS | % Fines | % Organics | % Carbonates | Median | Mean | Skew | Kurt | Sort |
|---|---|---|---|---|---|---|---|---|---|---|---|
| VC-FSP11-20 #3 | —●— | -69.7 | SM | #230 - 31.07 | | | 3.25 | 2.23 | -1.64 | 4.72 | 1.7 |

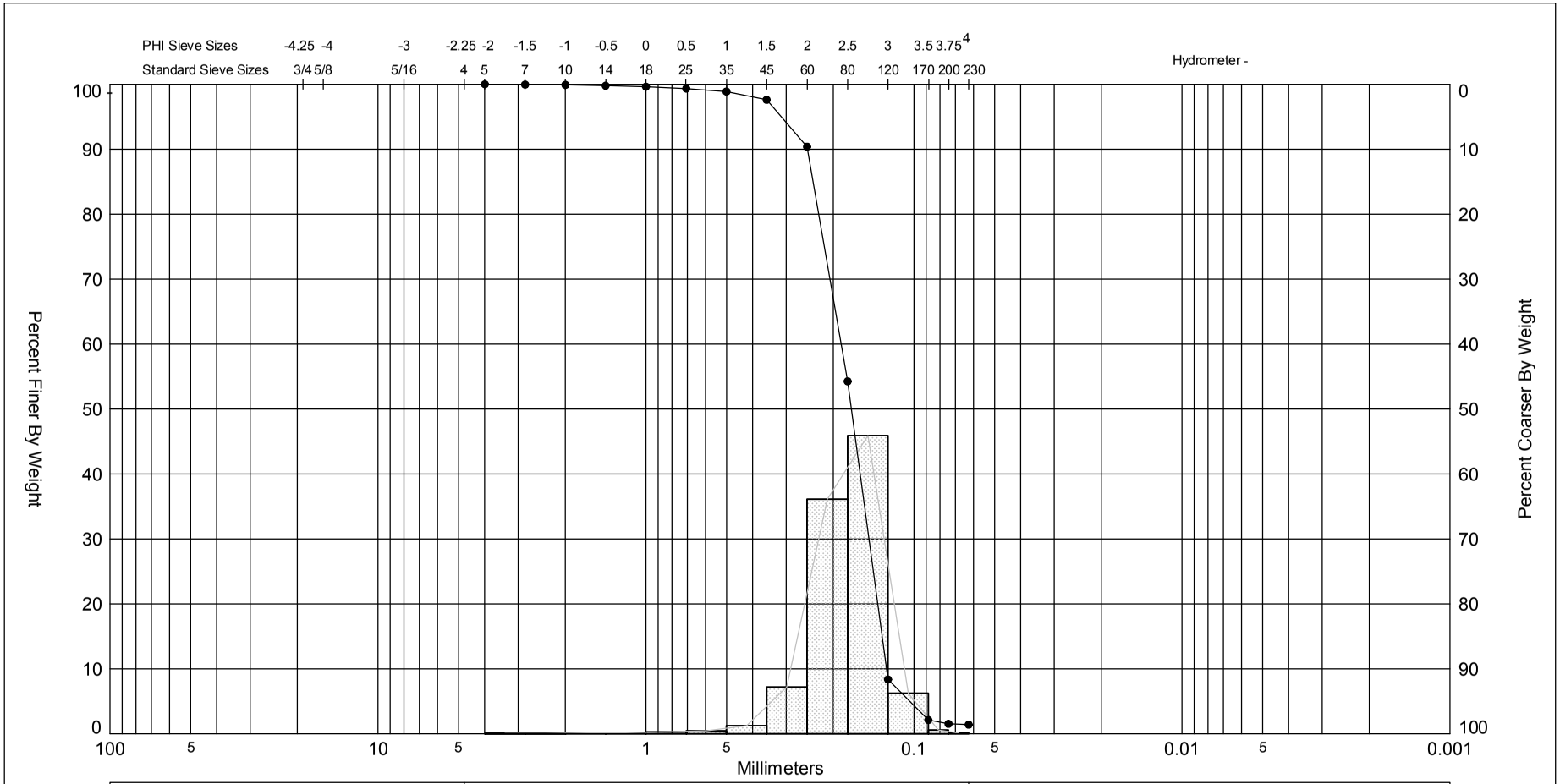
| Sample Information | |
|---|---|
| Project Name: | Flagler County |
| Analysis Date: | 04-01-11 |
| Analyzed By: | |
| Easting (X, ft): | 656,298 |
| Northing (Y, ft): | 1,860,715 |
| Horizontal System: | NAD83 |
| Vertical System: | NAVD88 |

Comments:

Depths and elevations based on measured values

US Army Corps of Engineers
701 San Marco Blvd
Jacksonville, Florida 32207
phone (904)396-7121

SIEVE ANALYSIS FLAGLER_STAT_GINT.GPJ FL DEP ROSS.GDT 11/14/12




| Sample | Symbol | Elev. (ft) | USCS | % Fines | % Organics | % Carbonates | Median | Mean | Skew | Kurt | Sort |
|---|---|---|---|---|---|---|---|---|---|---|---|
| VC-FSP11-21 #1 | —●— | -60.5 | SP | #230 - 1.40 | | | 2.55 | 2.48 | -1.82 | 12.9 | 0.48 |

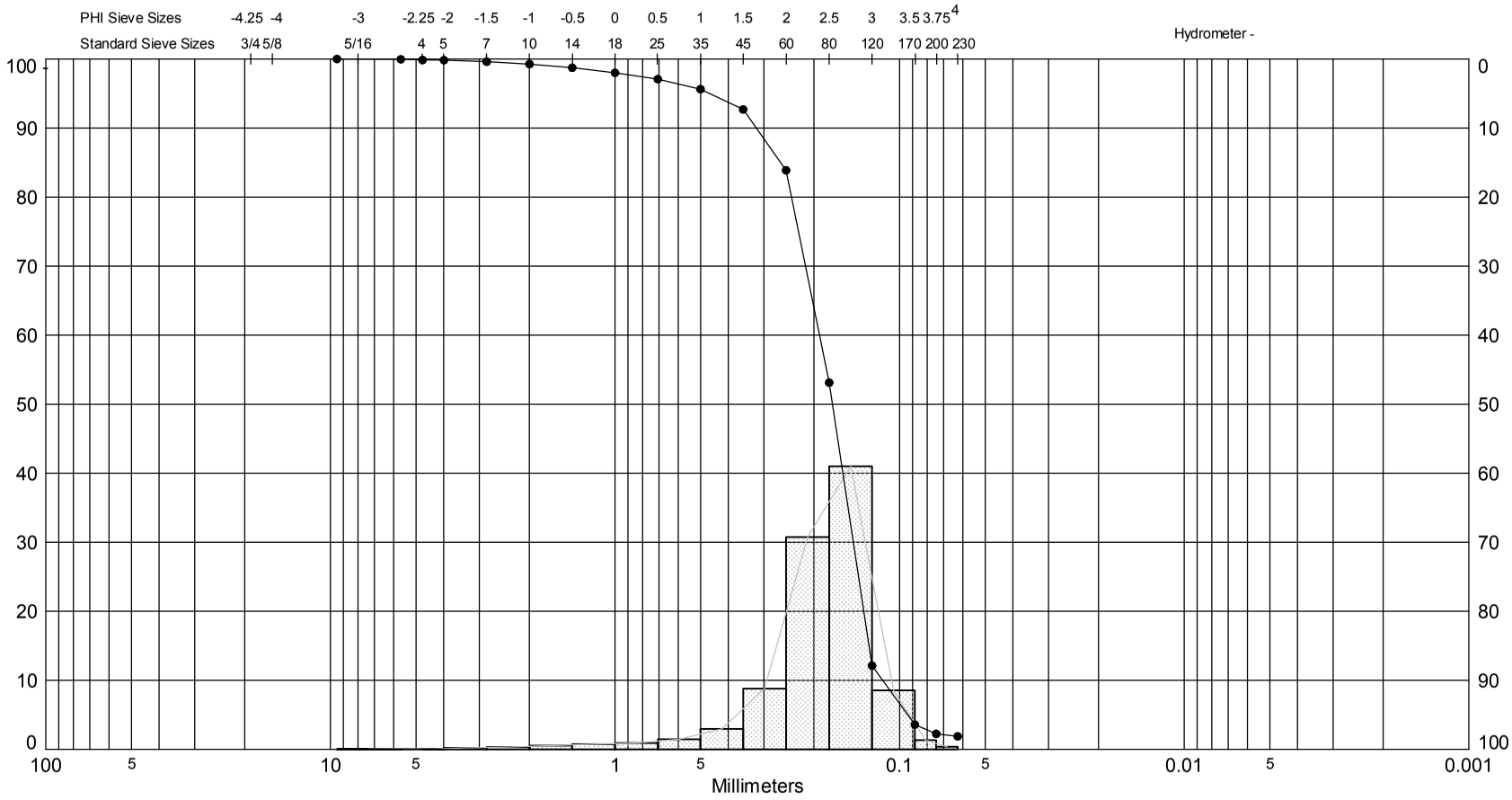
Comments:

Depths and elevations based on measured values

US Army Corps of Engineers
701 San Marco Blvd
Jacksonville, Florida 32207
phone (904)396-7121

| Sample Information | |
|---|---|
| Project Name: | Flagler County |
| Analysis Date: | 04-01-11 |
| Analyzed By: | |
| Easting (X, ft): | 656,922 |
| Northing (Y, ft): | 1,856,128 |
| Horizontal System: | NAD83 |
| Vertical System: | NAVD88 |

SIEVE ANALYSIS FLAGLER_STAT_GINT.GPJ FL DEP ROSS.GDT 11/14/12




| Sample | Symbol | Elev. (ft) | USCS | % Fines | % Organics | % Carbonates | Median | Mean | Skew | Kurt | Sort |
|---|---|---|---|---|---|---|---|---|---|---|---|
| VC-FSP11-21 #2 | —●— | -63.5 | SP | #230 - 1.88 | | | 2.54 | 2.39 | -2.35 | 12.14 | 0.74 |

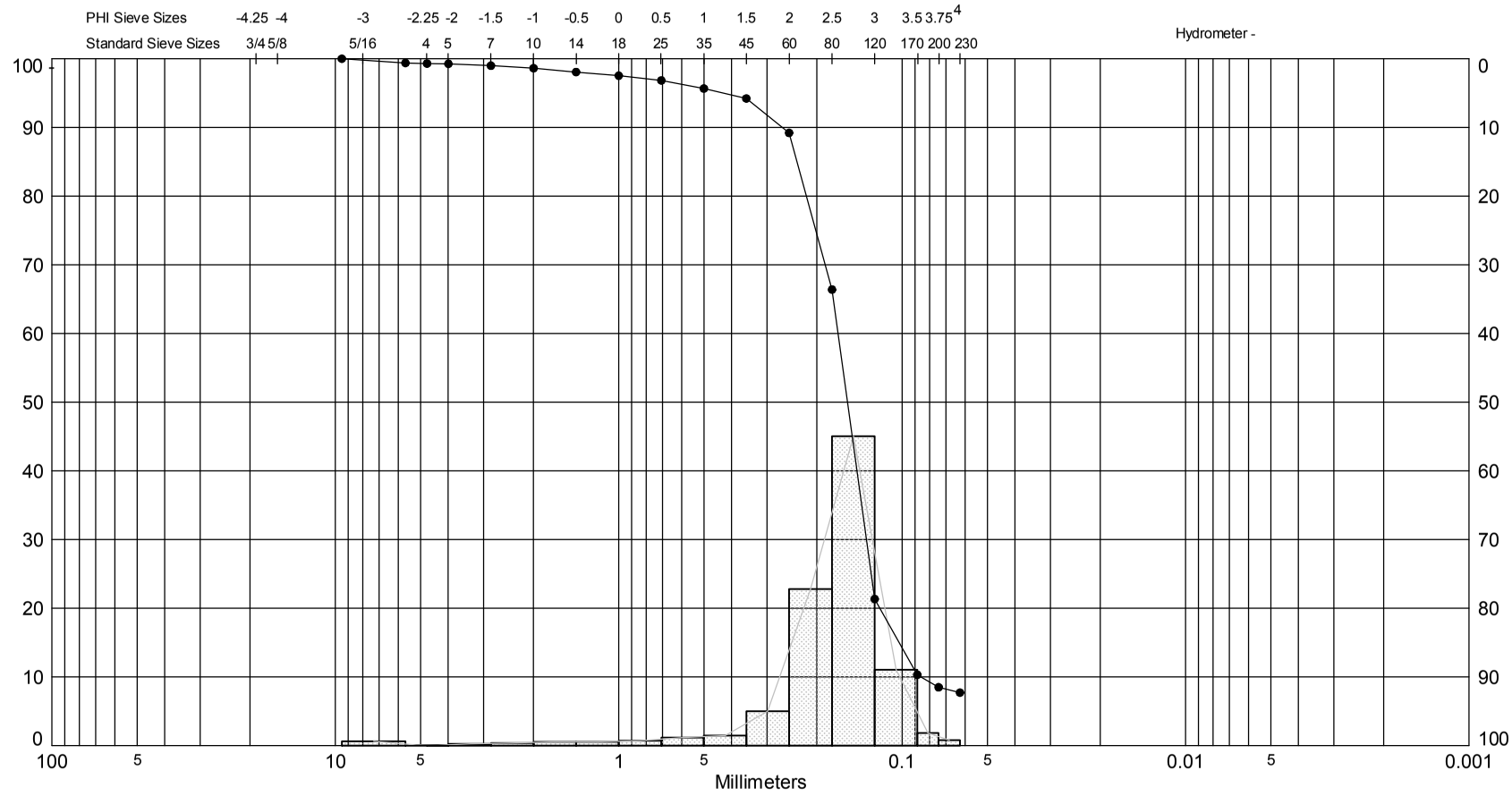
Comments:

Depths and elevations based on measured values

US Army Corps of Engineers
701 San Marco Blvd
Jacksonville, Florida 32207
phone (904)396-7121

| Sample Information | |
|---|---|
| Project Name: | Flagler County |
| Analysis Date: | 04-01-11 |
| Analyzed By: | |
| Easting (X, ft): | 656,922 |
| Northing (Y, ft): | 1,856,128 |
| Horizontal System: | NAD83 |
| Vertical System: | NAVD88 |

SIEVE ANALYSIS FLAGLER_STAT_GINT.GPJ FL DEP ROSS.GDT 11/14/12




| Sample | Symbol | Elev. (ft) | USCS | % Fines | % Organics | % Carbonates | Median | Mean | Skew | Kurt | Sort |
|---|---|---|---|---|---|---|---|---|---|---|---|
| VC-FSP11-21 #3 | —●— | -65.0 | SP-SM | #230 - 7.71 | | | 2.68 | 2.48 | -3.23 | 17.65 | 0.85 |

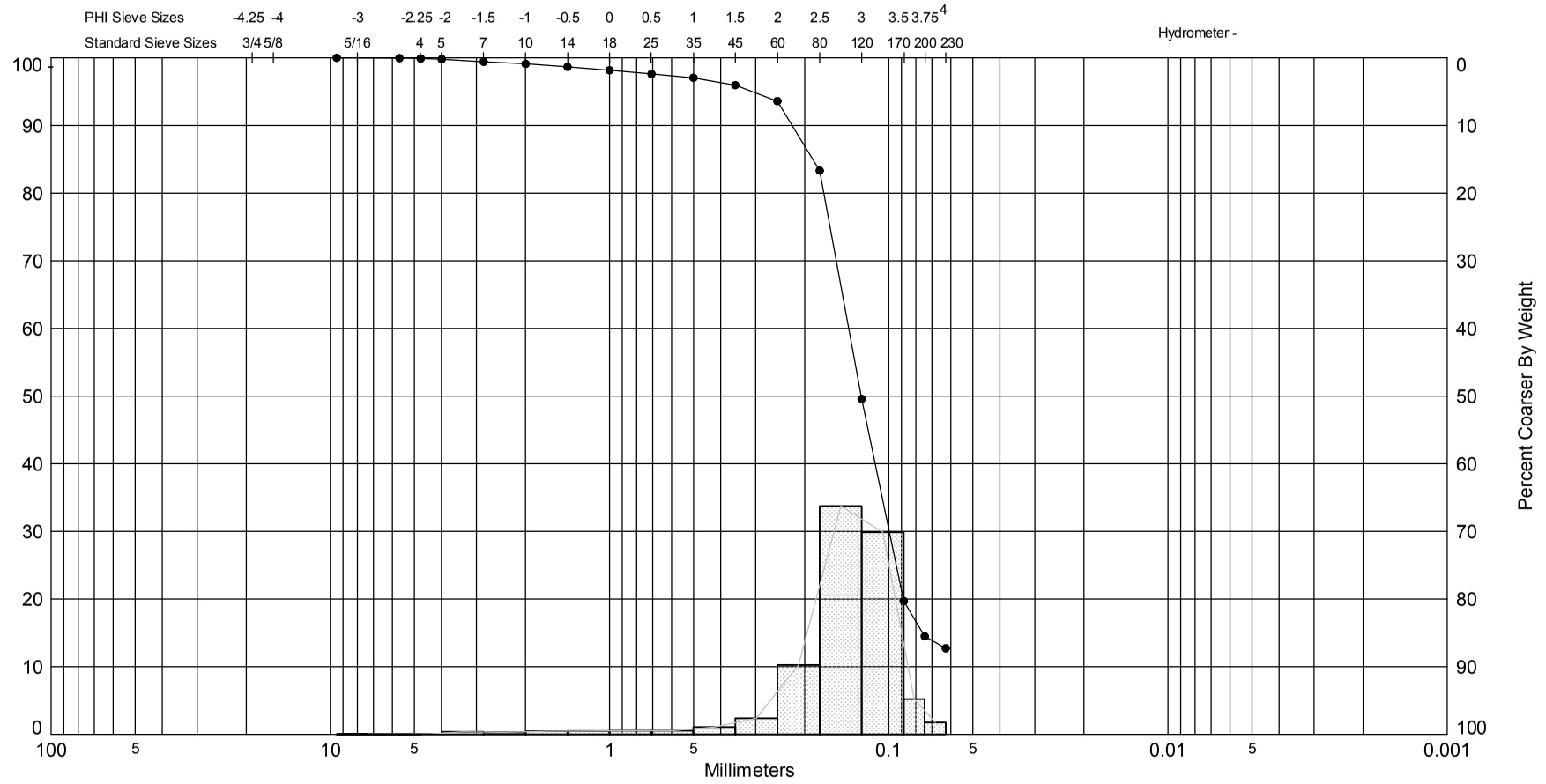
Comments:

Depths and elevations based on measured values

US Army Corps of Engineers
701 San Marco Blvd
Jacksonville, Florida 32207
phone (904)396-7121

| Sample Information | |
|---|---|
| Project Name: | Flagler County |
| Analysis Date: | 04-01-11 |
| Analyzed By: | |
| Easting (X, ft): | 656,922 |
| Northing (Y, ft): | 1,856,128 |
| Horizontal System: | NAD83 |
| Vertical System: | NAVD88 |

SIEVE ANALYSIS FLAGLER_STAT_GINT.GPJ FL DEP ROSS.GDT 11/14/12




SIEVE ANALYSIS FLAGLER_STAT_GINT.GPJ FL DEP ROSS.GDT 11/14/12

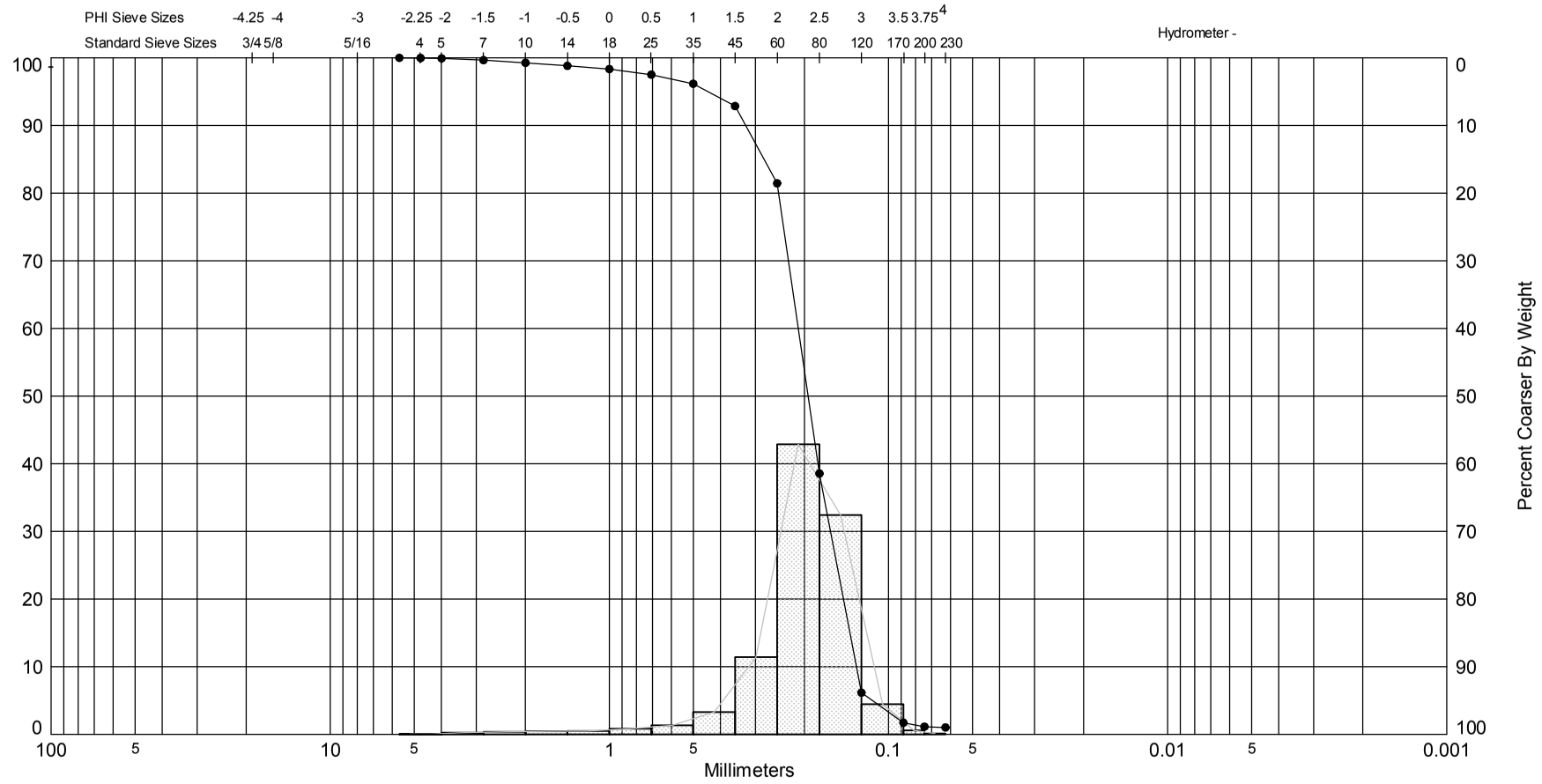
| Sample | Symbol | Elev. (ft) | USCS | % Fines | % Organics | % Carbonates | Median | Mean | Skew | Kurt | Sort |
|---|---|---|---|---|---|---|---|---|---|---|---|
| VC-FSP11-21 #4 | —●— | -67.5 | SM | #230 - 12.72 | | | 2.99 | 2.78 | -3.01 | 15.98 | 0.79 |

Comments:

Depths and elevations based on measured values

US Army Corps of Engineers
701 San Marco Blvd
Jacksonville, Florida 32207
phone (904)396-7121

| Sample Information | |
|---|---|
| Project Name: | Flagler County |
| Analysis Date: | 04-01-11 |
| Analyzed By: | |
| Easting (X, ft): | 656,922 |
| Northing (Y, ft): | 1,856,128 |
| Horizontal System: | NAD83 |
| Vertical System: | NAVD88 |




SIEVE ANALYSIS FLAGLER_STAT_GINT.GPJ FL DEP ROSS.GDT 11/14/12

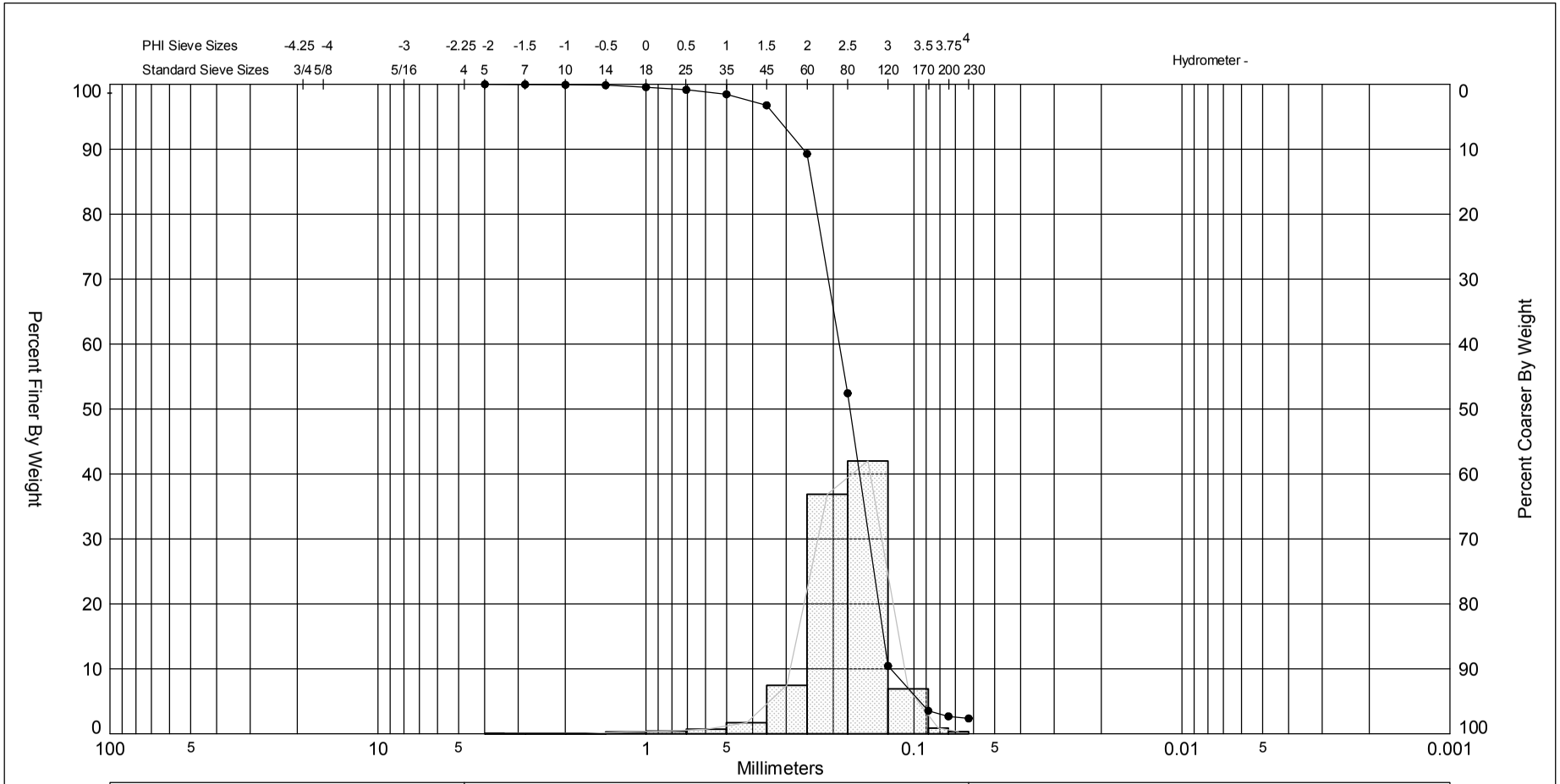
| Sample | Symbol | Elev. (ft) | USCS | % Fines | % Organics | % Carbonates | Median | Mean | Skew | Kurt | Sort |
|---|---|---|---|---|---|---|---|---|---|---|---|
| VC-FSP11-22 #1 | —●— | -53.7 | SP | #230 - 1.02 | | | 2.37 | 2.29 | -2.4 | 13.07 | 0.67 |

Comments:

Depths and elevations based on measured values

US Army Corps of Engineers
701 San Marco Blvd
Jacksonville, Florida 32207
phone (904)396-7121

| Sample Information | |
|---|---|
| Project Name: | Flagler County |
| Analysis Date: | 04-01-11 |
| Analyzed By: | |
| Easting (X, ft): | 657,885 |
| Northing (Y, ft): | 1,850,138 |
| Horizontal System: | NAD83 |
| Vertical System: | NAVD88 |




| Sample | Symbol | Elev. (ft) | USCS | % Fines | % Organics | % Carbonates | Median | Mean | Skew | Kurt | Sort |
|---|---|---|---|---|---|---|---|---|---|---|---|
| VC-FSP11-22 #2 | —●— | -56.7 | SP | #230 - 2.36 | | | 2.53 | 2.46 | -1.55 | 10.23 | 0.51 |

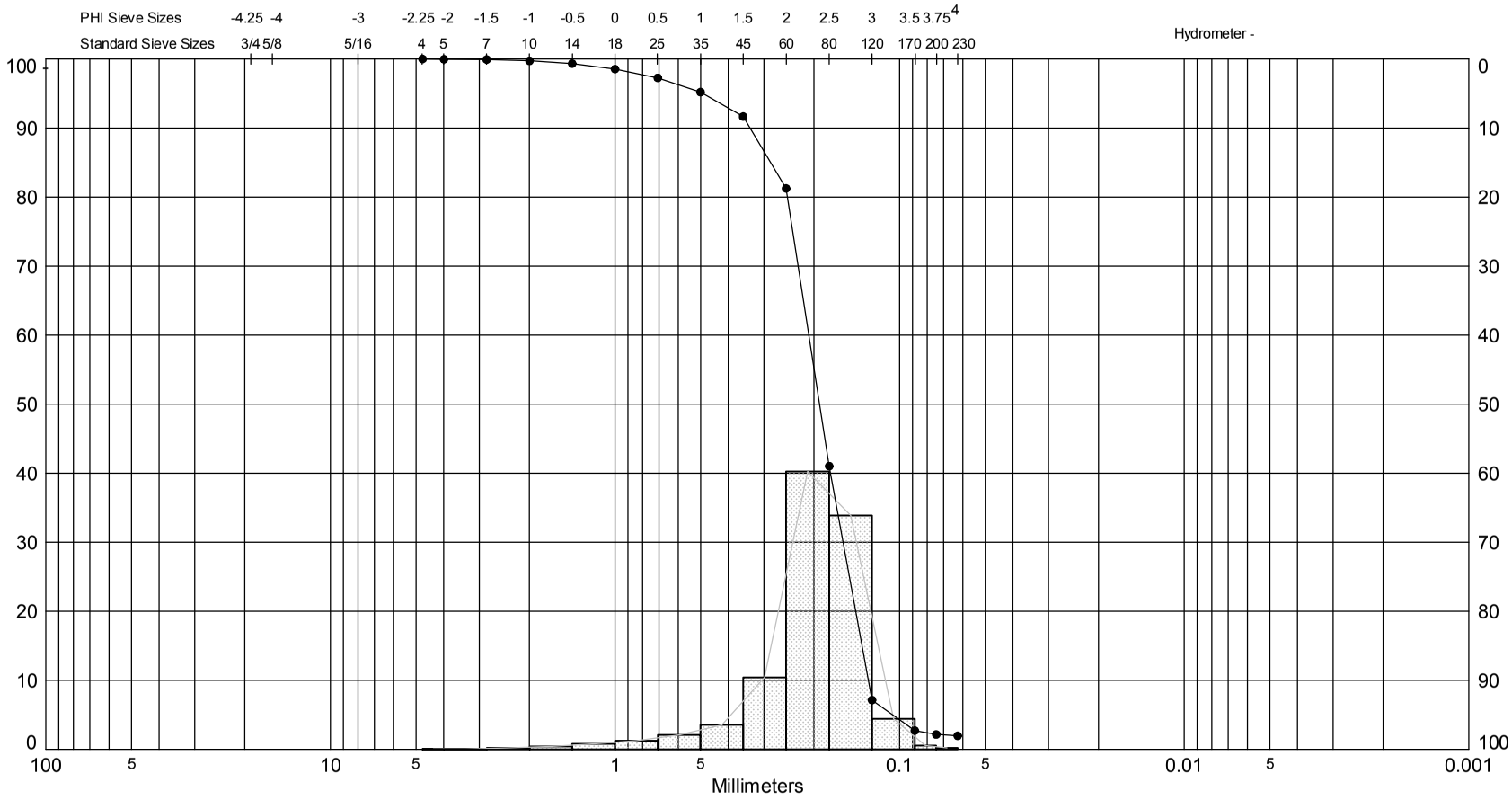
Comments:

Depths and elevations based on measured values

| Sample Information | |
|---|---|
| Project Name: | Flagler County |
| Analysis Date: | 04-01-11 |
| Analyzed By: | |
| Easting (X, ft): | 657,885 |
| Northing (Y, ft): | 1,850,138 |
| Horizontal System: | NAD83 |
| Vertical System: | NAVD88 |

US Army Corps of Engineers
701 San Marco Blvd
Jacksonville, Florida 32207
phone (904)396-7121

SIEVE ANALYSIS FLAGLER_STAT_GINT.GPJ FL DEP ROSS.GDT 11/14/12




| Sample | Symbol | Elev. (ft) | USCS | % Fines | % Organics | % Carbonates | Median | Mean | Skew | Kurt | Sort |
|---|---|---|---|---|---|---|---|---|---|---|---|
| VC-FSP11-22 #3 | —●— | -59.7 | SP | #230 - 1.95 | | 17.00 | 2.39 | 2.29 | -1.9 | 9.17 | 0.66 |

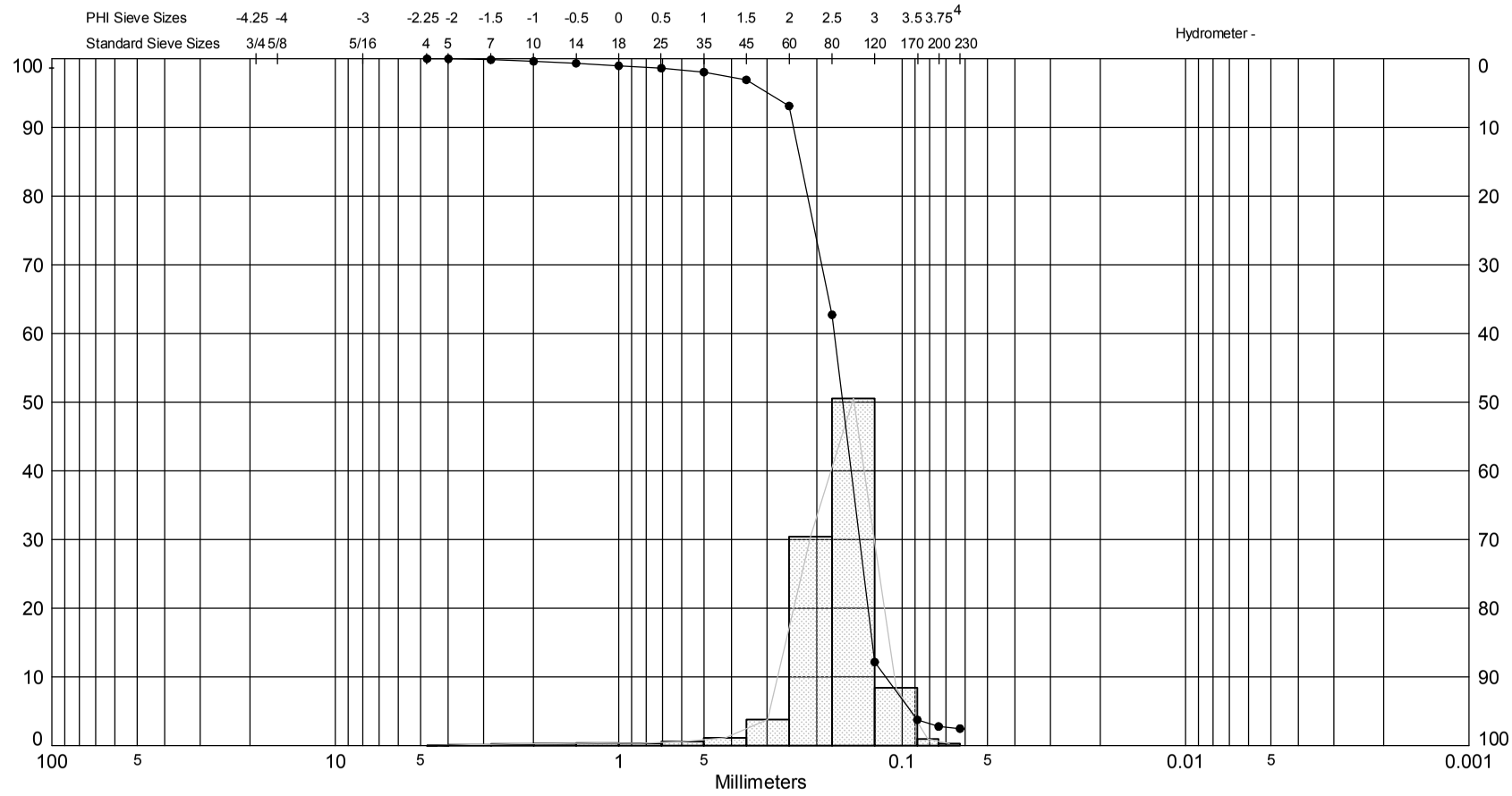
| Sample Information | |
|---|---|
| Project Name: | Flagler County |
| Analysis Date: | 04-01-11 |
| Analyzed By: | |
| Easting (X, ft): | 657,885 |
| Northing (Y, ft): | 1,850,138 |
| Horizontal System: | NAD83 |
| Vertical System: | NAVD88 |

Comments:

Depths and elevations based on measured values

US Army Corps of Engineers
701 San Marco Blvd
Jacksonville, Florida 32207
phone (904)396-7121

SIEVE ANALYSIS FLAGLER_STAT_GINT.GPJ FL DEP ROSS.GDT 11/14/12




| Sample | Symbol | Elev. (ft) | USCS | % Fines | % Organics | % Carbonates | Median | Mean | Skew | Kurt | Sort |
|---|---|---|---|---|---|---|---|---|---|---|---|
| VC-FSP11-22 #4 | —●— | -62.7 | SP | #230 - 2.47 | | | 2.63 | 2.53 | -2.85 | 18.39 | 0.56 |

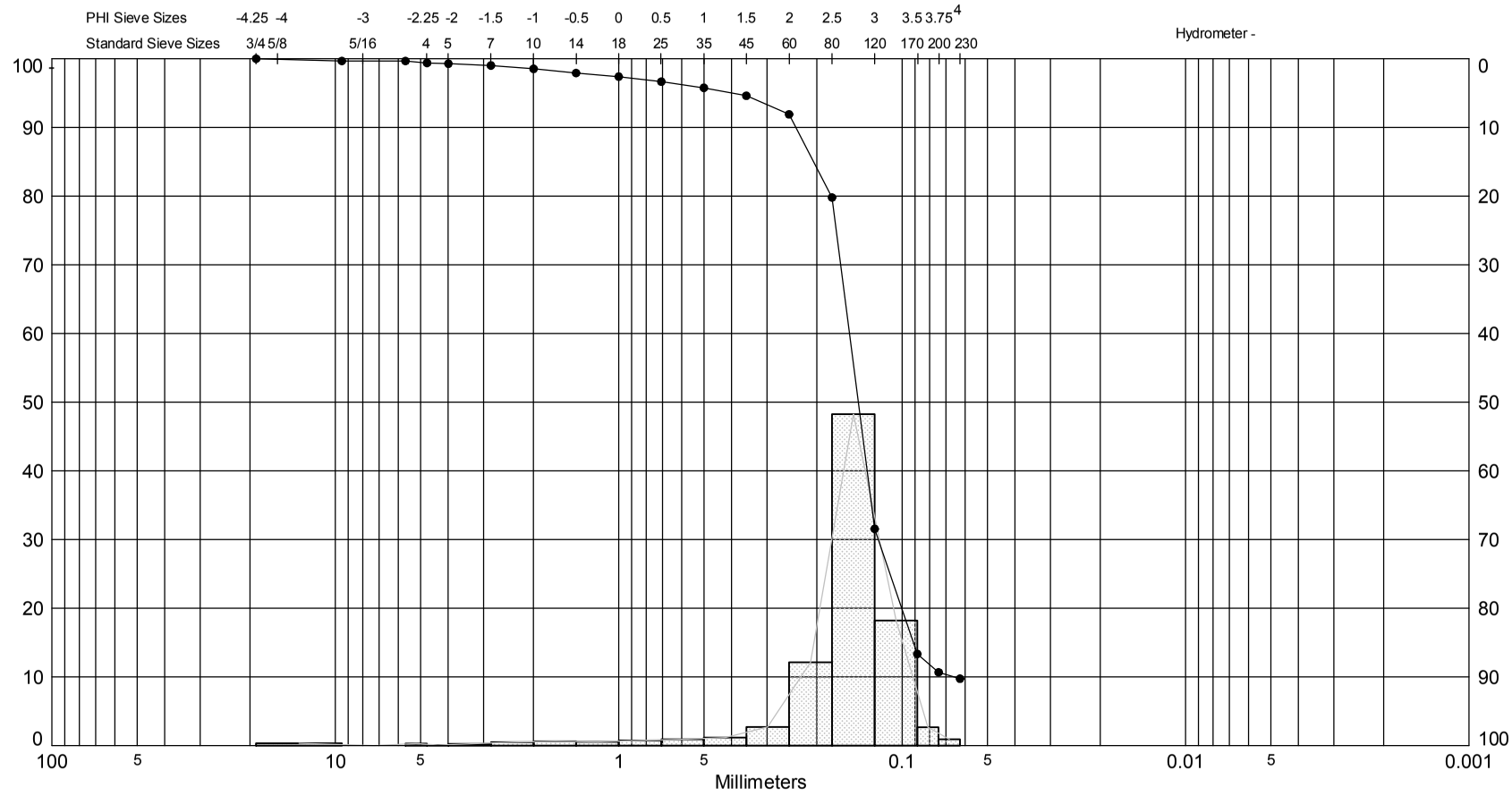
Comments:

Depths and elevations based on measured values

US Army Corps of Engineers
701 San Marco Blvd
Jacksonville, Florida 32207
phone (904)396-7121

| Sample Information | |
|---|---|
| Project Name: | Flagler County |
| Analysis Date: | 04-01-11 |
| Analyzed By: | |
| Easting (X, ft): | 657,885 |
| Northing (Y, ft): | 1,850,138 |
| Horizontal System: | NAD83 |
| Vertical System: | NAVD88 |

SIEVE ANALYSIS FLAGLER_STAT_GINT.GPJ FL DEP ROSS.GDT 11/14/12




| Sample | Symbol | Elev. (ft) | USCS | % Fines | % Organics | % Carbonates | Median | Mean | Skew | Kurt | Sort |
|---|---|---|---|---|---|---|---|---|---|---|---|
| VC-FSP11-22 #5 | —●— | -64.7 | SP-SM | #230 - 9.74 | | | 2.81 | 2.61 | -3.55 | 19.8 | 0.89 |

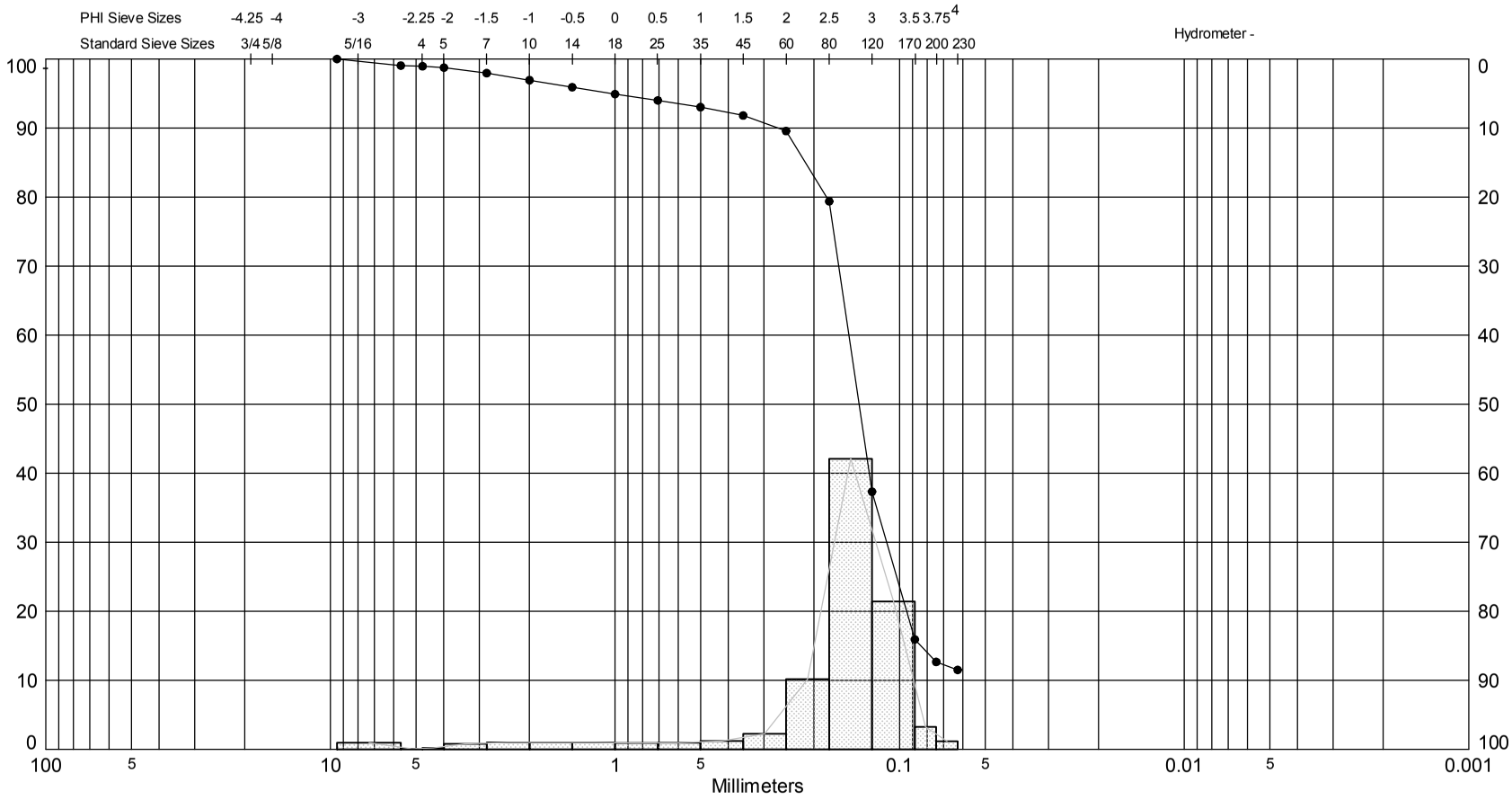
Comments:

Depths and elevations based on measured values

US Army Corps of Engineers
701 San Marco Blvd
Jacksonville, Florida 32207
phone (904)396-7121

| Sample Information | |
|---|---|
| Project Name: | Flagler County |
| Analysis Date: | 04-01-11 |
| Analyzed By: | |
| Easting (X, ft): | 657,885 |
| Northing (Y, ft): | 1,850,138 |
| Horizontal System: | NAD83 |
| Vertical System: | NAVD88 |

SIEVE ANALYSIS FLAGLER_STAT_GINT.GPJ FL DEP ROSS.GDT 11/14/12




| Sample | Symbol | Elev. (ft) | USCS | % Fines | % Organics | % Carbonates | Median | Mean | Skew | Kurt | Sort |
|---|---|---|---|---|---|---|---|---|---|---|---|
| VC-FSP11-22 #6 | —●— | -66.7 | SM | #230 - 11.50 | | | 2.85 | 2.53 | -2.81 | 11.44 | 1.13 |

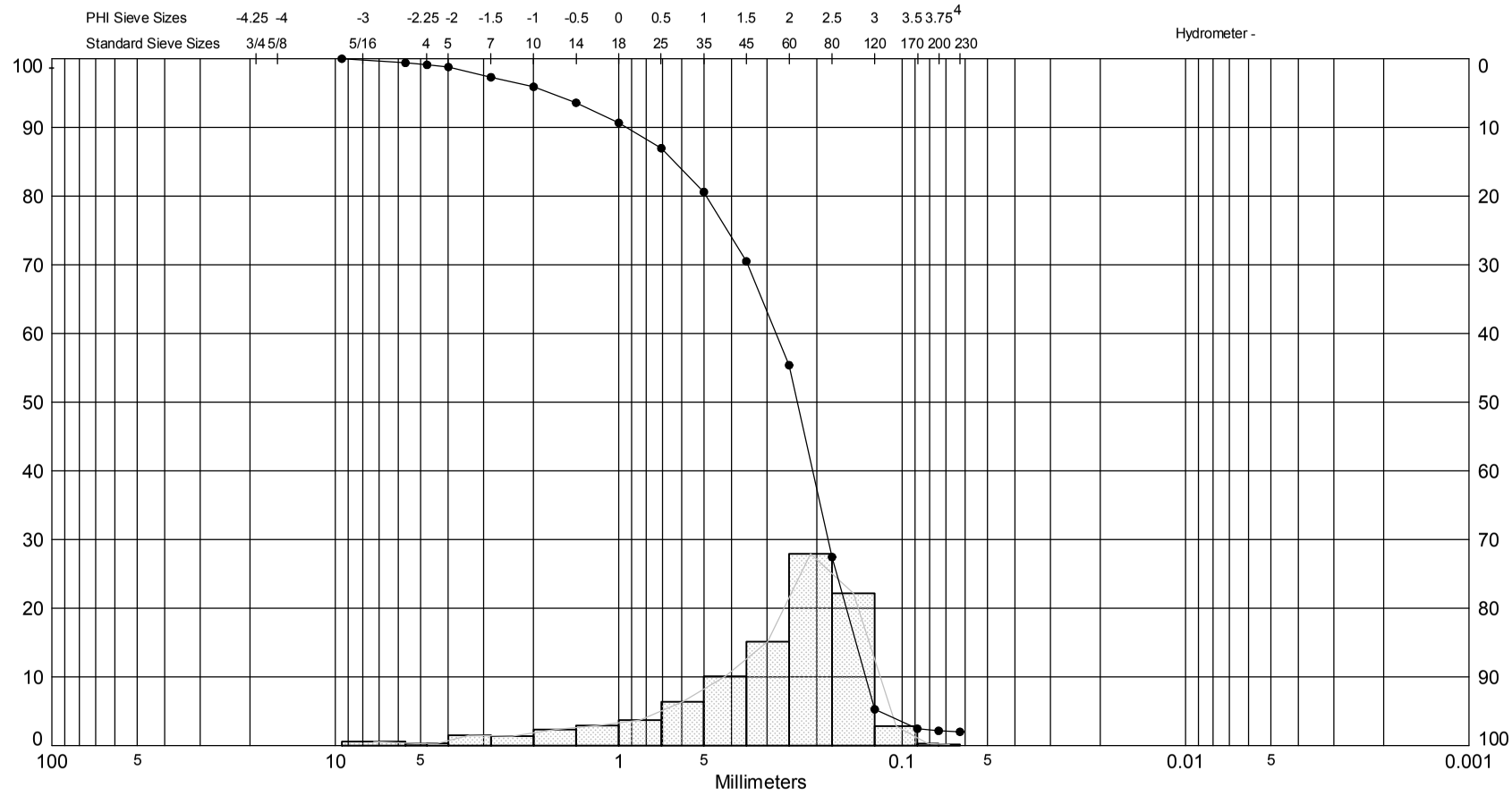
Comments:

Depths and elevations based on measured values

US Army Corps of Engineers
701 San Marco Blvd
Jacksonville, Florida 32207
phone (904)396-7121

| Sample Information | |
|---|---|
| Project Name: | Flagler County |
| Analysis Date: | 04-01-11 |
| Analyzed By: | |
| Easting (X, ft): | 657,885 |
| Northing (Y, ft): | 1,850,138 |
| Horizontal System: | NAD83 |
| Vertical System: | NAVD88 |

SIEVE ANALYSIS FLAGLER_STAT_GINT.GPJ FL DEP ROSS.GDT 11/14/12




| Sample | Symbol | Elev. (ft) | USCS | % Fines | % Organics | % Carbonates | Median | Mean | Skew | Kurt | Sort |
|---|---|---|---|---|---|---|---|---|---|---|---|
| VC-FSP11-23 #1 | —● | -61.6 | SW | #230 - 2.00 | | | 2.09 | 1.73 | -1.48 | 5.21 | 1.17 |

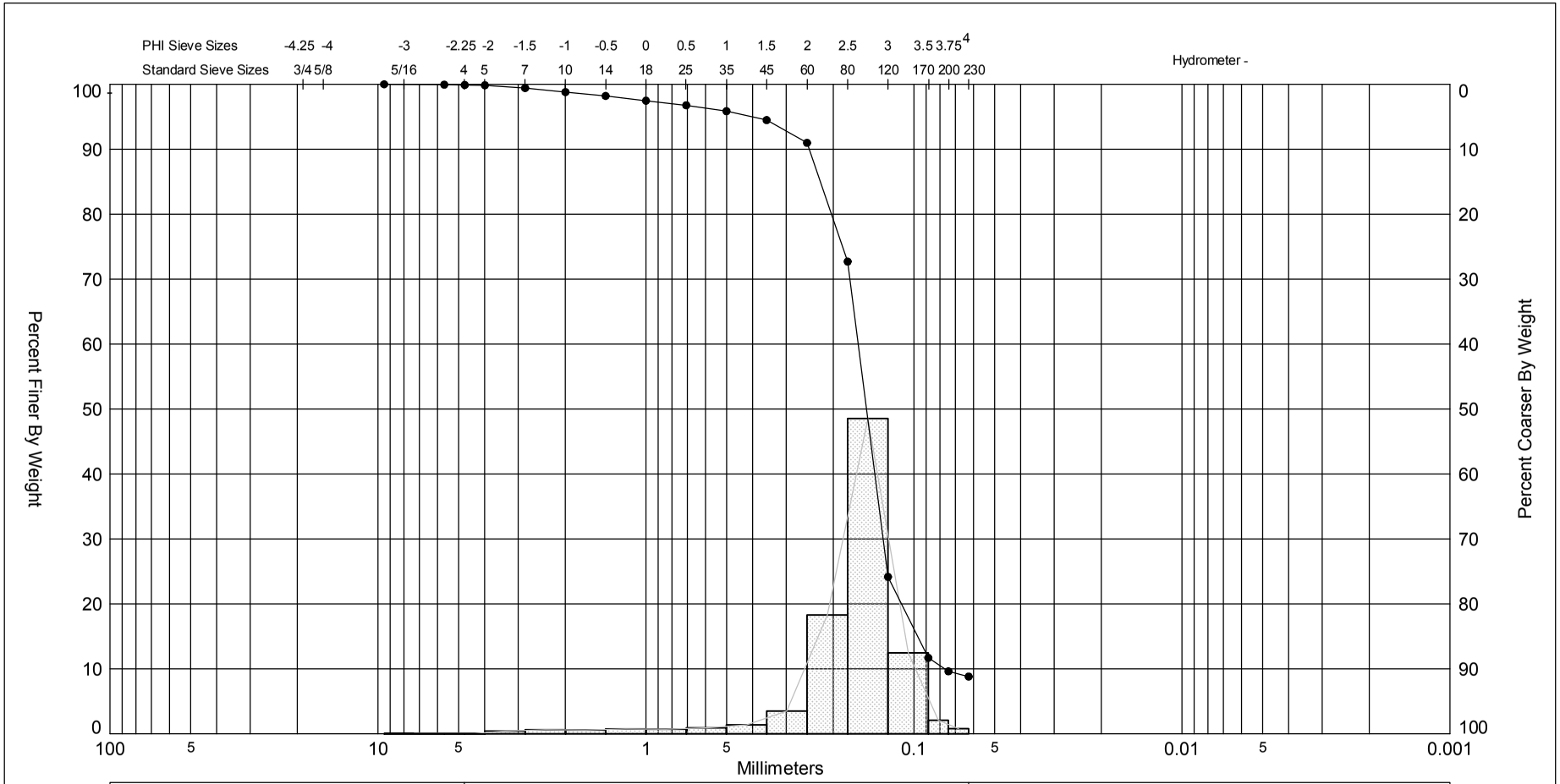
Comments:

Depths and elevations based on measured values

US Army Corps of Engineers
701 San Marco Blvd
Jacksonville, Florida 32207
phone (904)396-7121

| Sample Information | |
|---|---|
| Project Name: | Flagler County |
| Analysis Date: | 04-01-11 |
| Analyzed By: | |
| Easting (X, ft): | 657,899 |
| Northing (Y, ft): | 1,844,676 |
| Horizontal System: | NAD83 |
| Vertical System: | NAVD88 |

SIEVE ANALYSIS FLAGLER_STAT_GINT.GPJ FL DEP ROSS.GDT 11/14/12




SIEVE ANALYSIS FLAGLER_STAT_GINT.GPJ FL DEP ROSS.GDT 11/14/12

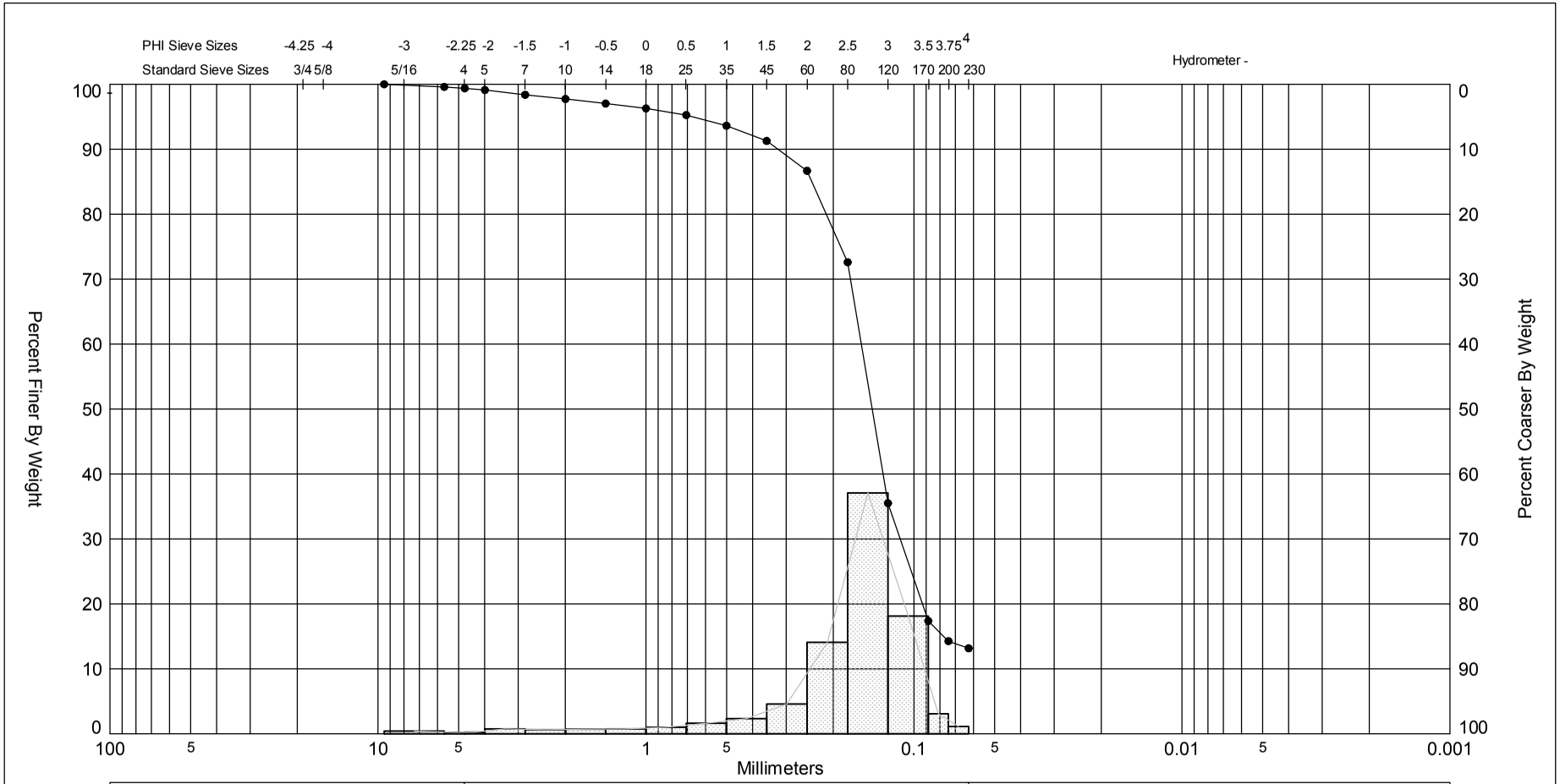
| Sample | Symbol | Elev. (ft) | USCS | % Fines | % Organics | % Carbonates | Median | Mean | Skew | Kurt | Sort |
|---|---|---|---|---|---|---|---|---|---|---|---|
| VC-FSP11-23 #2 | —●— | -63.1 | SP-SM | #230 - 8.81 | | | 2.73 | 2.54 | -2.92 | 14.52 | 0.8 |

Comments:

Depths and elevations based on measured values

US Army Corps of Engineers
701 San Marco Blvd
Jacksonville, Florida 32207
phone (904)396-7121

| Sample Information | |
|---|---|
| Project Name: | Flagler County |
| Analysis Date: | 04-01-11 |
| Analyzed By: | |
| Easting (X, ft): | 657,899 |
| Northing (Y, ft): | 1,844,676 |
| Horizontal System: | NAD83 |
| Vertical System: | NAVD88 |




| Sample | Symbol | Elev. (ft) | USCS | % Fines | % Organics | % Carbonates | Median | Mean | Skew | Kurt | Sort |
|---|---|---|---|---|---|---|---|---|---|---|---|
| VC-FSP11-23 #3 | —●— | -65.6 | SM | #230 - 13.16 | | | 2.8 | 2.48 | -2.57 | 10.98 | 1.04 |

Comments:

Depths and elevations based on measured values

US Army Corps of Engineers
701 San Marco Blvd
Jacksonville, Florida 32207
phone (904)396-7121

| Sample Information | |
|---|---|
| Project Name: | Flagler County |
| Analysis Date: | 04-01-11 |
| Analyzed By: | |
| Easting (X, ft): | 657,899 |
| Northing (Y, ft): | 1,844,676 |
| Horizontal System: | NAD83 |
| Vertical System: | NAVD88 |

SIEVE ANALYSIS FLAGLER_STAT_GINT.GPJ FL DEP ROSS.GDT 11/14/12

# Granularmetric Report

Depths and elevations based on measured values

Project Name: Flagler County

Sample Name: VC-FSP11-1 #1

Analysis Date: 04-01-11

Analyzed By:

US Army Corps of Engineers
701 San Marco Blvd
Jacksonville, Florida 32207
phone (904)396-7121

| Easting (ft): | Northing (ft): | Coordinate System: | Elevation (ft): |
|---|---|---|---|
| 663,001 | 1,906,822 | | -64.9 NAVD88 |

| USCS | Munsell: | Comments: |
|---|---|---|
| SP | Moist - 10Y 5/1 | |

| Fines (%): | Organics (%): | Carbonates (%): | Shells (%): |
|---|---|---|---|
| #230 - 0.78 | | 13.00 | 11.00 |

| Sieve Number | Sieve Size (Phi) | Sieve Size (Millimeters) | % Weight Retained | C. % Weight Retained |
|---|---|---|---|---|
| #3.5 | -2.50 | 5.66 | 0.00 | 0.00 |
| #4 | -2.25 | 4.75 | 0.47 | 0.47 |
| #5 | -2.00 | 3.99 | 0.05 | 0.52 |
| #7 | -1.50 | 2.82 | 0.34 | 0.86 |
| #10 | -1.00 | 2.00 | 0.74 | 1.60 |
| #14 | -0.50 | 1.41 | 1.02 | 2.62 |
| #18 | 0.00 | 1.00 | 1.24 | 3.86 |
| #25 | 0.50 | 0.71 | 1.91 | 5.77 |
| #35 | 1.00 | 0.50 | 4.43 | 10.20 |
| #45 | 1.50 | 0.35 | 10.10 | 20.30 |
| #60 | 2.00 | 0.25 | 18.22 | 38.52 |
| #80 | 2.50 | 0.18 | 42.50 | 81.02 |
| #120 | 3.00 | 0.13 | 16.81 | 97.83 |
| #170 | 3.50 | 0.09 | 1.30 | 99.13 |
| #200 | 3.75 | 0.07 | 0.06 | 99.19 |
| #230 | 4.00 | 0.06 | 0.03 | 99.22 |

| Phi 5 | Phi 16 | Phi 25 | Phi 50 | Phi 75 | Phi 84 | Phi 95 |
|---|---|---|---|---|---|---|
| 2.92 | 2.59 | 2.43 | 2.13 | 1.62 | 1.28 | 0.30 |

| Moment | Mean Phi | Mean mm | Sorting | Skewness | Kurtosis |
|---|---|---|---|---|---|
| Statistics | 1.92 | 0.26 | 0.84 | -2.01 | 8.7 |

USACE GRANULARMETRIC REPORT FLAGLER_STAT_GINT.GPJ FL DEP ROSS.GDT 11/14/12

# Granularmetric Report

Depths and elevations based on measured values

Project Name: Flagler County

Sample Name: VC-FSP11-1 #2

Analysis Date: 04-01-11

Analyzed By:

US Army Corps of Engineers
701 San Marco Blvd
Jacksonville, Florida 32207
phone (904)396-7121

| Easting (ft): | Northing (ft): | Coordinate System: | Elevation (ft): |
|---|---|---|---|
| 663,001 | 1,906,822 | | -67.9 NAVD88 |

| USCS | Munsell: | Comments: |
|---|---|---|
| SW | Moist - 10Y 5/1 | |

| | | | Fines (%): | Organics (%): | Carbonates (%): | Shells (%): |
|---|---|---|---|---|---|---|
| | | | #230 - 2.18 | | | 18.00 |

| Sieve Number | Sieve Size (Phi) | Sieve Size (Millimeters) | % Weight Retained | C. % Weight Retained |
|---|---|---|---|---|
| 3/8 | -3.25 | 9.48 | 0.00 | 0.00 |
| #3.5 | -2.50 | 5.66 | 0.39 | 0.39 |
| #4 | -2.25 | 4.75 | 0.08 | 0.47 |
| #5 | -2.00 | 3.99 | 0.12 | 0.59 |
| #7 | -1.50 | 2.82 | 0.54 | 1.13 |
| #10 | -1.00 | 2.00 | 1.51 | 2.64 |
| #14 | -0.50 | 1.41 | 2.20 | 4.84 |
| #18 | 0.00 | 1.00 | 2.95 | 7.79 |
| #25 | 0.50 | 0.71 | 3.30 | 11.09 |
| #35 | 1.00 | 0.50 | 4.88 | 15.97 |
| #45 | 1.50 | 0.35 | 7.89 | 23.86 |
| #60 | 2.00 | 0.25 | 15.19 | 39.05 |
| #80 | 2.50 | 0.18 | 36.26 | 75.31 |
| #120 | 3.00 | 0.13 | 19.11 | 94.42 |
| #170 | 3.50 | 0.09 | 2.86 | 97.28 |
| #200 | 3.75 | 0.07 | 0.37 | 97.65 |
| #230 | 4.00 | 0.06 | 0.17 | 97.82 |

| Phi 5 | Phi 16 | Phi 25 | Phi 50 | Phi 75 | Phi 84 | Phi 95 |
|---|---|---|---|---|---|---|
| 3.10 | 2.73 | 2.50 | 2.15 | 1.53 | 1.00 | -0.47 |

| Moment | Mean Phi | Mean mm | Sorting | Skewness | Kurtosis |
|---|---|---|---|---|---|
| Statistics | 1.83 | 0.28 | 1.05 | -1.6 | 5.81 |

USACE GRANULARMETRIC REPORT FLAGLER_STAT_GINT.GPJ FL DEP ROSS.GDT 11/14/12

# Granularmetric Report

Depths and elevations based on measured values

Project Name: Flagler County

Sample Name: VC-FSP11-1 #3

Analysis Date: 04-01-11

Analyzed By:

US Army Corps of Engineers
701 San Marco Blvd
Jacksonville, Florida 32207
phone (904)396-7121

| Easting (ft): | Northing (ft): | Coordinate System: | Elevation (ft): |
|---|---|---|---|
| 663,001 | 1,906,822 | | -70.4 NAVD88 |

| USCS | Munsell: | Comments: |
|---|---|---|
| SP | Moist - 10Y 4/1 | |

| Fines (%): | Organics (%): | Carbonates (%): | Shells (%): |
|---|---|---|---|
| #230 - 4.30 | | | 12.00 |

| Sieve Number | Sieve Size (Phi) | Sieve Size (Millimeters) | % Weight Retained | C. % Weight Retained |
|---|---|---|---|---|
| 3/8 | -3.25 | 9.48 | 0.00 | 0.00 |
| #3.5 | -2.50 | 5.66 | 0.22 | 0.22 |
| #4 | -2.25 | 4.75 | 0.13 | 0.35 |
| #5 | -2.00 | 3.99 | 0.07 | 0.42 |
| #7 | -1.50 | 2.82 | 0.30 | 0.72 |
| #10 | -1.00 | 2.00 | 0.61 | 1.33 |
| #14 | -0.50 | 1.41 | 0.67 | 2.00 |
| #18 | 0.00 | 1.00 | 0.72 | 2.72 |
| #25 | 0.50 | 0.71 | 0.94 | 3.66 |
| #35 | 1.00 | 0.50 | 1.49 | 5.15 |
| #45 | 1.50 | 0.35 | 2.90 | 8.05 |
| #60 | 2.00 | 0.25 | 7.99 | 16.04 |
| #80 | 2.50 | 0.18 | 34.87 | 50.91 |
| #120 | 3.00 | 0.13 | 37.12 | 88.03 |
| #170 | 3.50 | 0.09 | 6.65 | 94.68 |
| #200 | 3.75 | 0.07 | 0.78 | 95.46 |
| #230 | 4.00 | 0.06 | 0.24 | 95.70 |

| Phi 5 | Phi 16 | Phi 25 | Phi 50 | Phi 75 | Phi 84 | Phi 95 |
|---|---|---|---|---|---|---|
| 3.60 | 2.95 | 2.82 | 2.49 | 2.13 | 1.99 | 0.95 |

| Moment | Mean Phi | Mean mm | Sorting | Skewness | Kurtosis |
|---|---|---|---|---|---|
| Statistics | 2.32 | 0.20 | 0.81 | -2.73 | 13.81 |

USACE GRANULARMETRIC REPORT FLAGLER_STAT_GINT.GPJ FL DEP ROSS.GDT 11/14/12

# Granularmetric Report

Depths and elevations based on measured values

Project Name: Flagler County

Sample Name: VC-FSP11-1 #4

Analysis Date: 04-01-11

Analyzed By:

US Army Corps of Engineers
701 San Marco Blvd
Jacksonville, Florida 32207
phone (904)396-7121

| Easting (ft): | Northing (ft): | Coordinate System: | Elevation (ft): |
|---|---|---|---|
| 663,001 | 1,906,822 | | -72.4 NAVD88 |

| USCS | Munsell: | Comments: |
|---|---|---|
| SP-SM | Moist - 10Y 4/1 | |

| Fines (%): | Organics (%): | Carbonates (%): | Shells (%): |
|---|---|---|---|
| #230 - 5.26 | | | 6.00 |

| Sieve Number | Sieve Size (Phi) | Sieve Size (Millimeters) | % Weight Retained | C. % Weight Retained |
|---|---|---|---|---|
| #5 | -2.00 | 3.99 | 0.00 | 0.00 |
| #7 | -1.50 | 2.82 | 0.02 | 0.02 |
| #10 | -1.00 | 2.00 | 0.18 | 0.20 |
| #14 | -0.50 | 1.41 | 0.35 | 0.55 |
| #18 | 0.00 | 1.00 | 0.36 | 0.91 |
| #25 | 0.50 | 0.71 | 0.40 | 1.31 |
| #35 | 1.00 | 0.50 | 0.46 | 1.77 |
| #45 | 1.50 | 0.35 | 0.87 | 2.64 |
| #60 | 2.00 | 0.25 | 4.70 | 7.34 |
| #80 | 2.50 | 0.18 | 26.86 | 34.20 |
| #120 | 3.00 | 0.13 | 46.76 | 80.96 |
| #170 | 3.50 | 0.09 | 11.94 | 92.90 |
| #200 | 3.75 | 0.07 | 1.40 | 94.30 |
| #230 | 4.00 | 0.06 | 0.44 | 94.74 |

| Phi 5 | Phi 16 | Phi 25 | Phi 50 | Phi 75 | Phi 84 | Phi 95 |
|---|---|---|---|---|---|---|
| | 3.13 | 2.94 | 2.67 | 2.33 | 2.16 | 1.75 |

| Moment | Mean Phi | Mean mm | Sorting | Skewness | Kurtosis |
|---|---|---|---|---|---|
| Statistics | 2.57 | 0.17 | 0.56 | -2.3 | 14.32 |

USACE GRANULARMETRIC REPORT FLAGLER_STAT_GINT.GPJ FL DEP ROSS.GDT 11/14/12

# Granularmetric Report

Depths and elevations based on measured values

Project Name: Flagler County

Sample Name: VC-FSP11-1 #5

Analysis Date: 04-01-11

Analyzed By:

US Army Corps of Engineers
701 San Marco Blvd
Jacksonville, Florida 32207
phone (904)396-7121

| Easting (ft): | Northing (ft): | Coordinate System: | Elevation (ft): |
|---|---|---|---|
| 663,001 | 1,906,822 | | -77.4 NAVD88 |

| USCS | Munsell: | Comments: |
|---|---|---|
| SW-SM | Moist - 10Y 4/1 | |

| Fines (%): | Organics (%): | Carbonates (%): | Shells (%): |
|---|---|---|---|
| #230 - 6.47 | | | 8.00 |

| Sieve Number | Sieve Size (Phi) | Sieve Size (Millimeters) | % Weight Retained | C. % Weight Retained |
|---|---|---|---|---|
| #3.5 | -2.50 | 5.66 | 0.00 | 0.00 |
| #4 | -2.25 | 4.75 | 0.03 | 0.03 |
| #5 | -2.00 | 3.99 | 0.18 | 0.21 |
| #7 | -1.50 | 2.82 | 0.48 | 0.69 |
| #10 | -1.00 | 2.00 | 0.76 | 1.45 |
| #14 | -0.50 | 1.41 | 0.86 | 2.31 |
| #18 | 0.00 | 1.00 | 0.83 | 3.14 |
| #25 | 0.50 | 0.71 | 0.78 | 3.92 |
| #35 | 1.00 | 0.50 | 0.94 | 4.86 |
| #45 | 1.50 | 0.35 | 1.35 | 6.21 |
| #60 | 2.00 | 0.25 | 3.73 | 9.94 |
| #80 | 2.50 | 0.18 | 16.81 | 26.75 |
| #120 | 3.00 | 0.13 | 45.41 | 72.16 |
| #170 | 3.50 | 0.09 | 18.39 | 90.55 |
| #200 | 3.75 | 0.07 | 2.36 | 92.91 |
| #230 | 4.00 | 0.06 | 0.62 | 93.53 |

| Phi 5 | Phi 16 | Phi 25 | Phi 50 | Phi 75 | Phi 84 | Phi 95 |
|---|---|---|---|---|---|---|
| | 3.32 | 3.08 | 2.76 | 2.45 | 2.18 | 1.05 |

| Moment | Mean Phi | Mean mm | Sorting | Skewness | Kurtosis |
|---|---|---|---|---|---|
| Statistics | 2.56 | 0.17 | 0.86 | -2.77 | 12.62 |

USACE GRANULARMETRIC REPORT FLAGLER_STAT_GINT.GPJ FL DEP ROSS.GDT 11/14/12

# Granularmetric Report

Depths and elevations based on measured values

Project Name: Flagler County

Sample Name: VC-FSP11-2 #1

Analysis Date: 04-01-11

Analyzed By:

US Army Corps of Engineers
701 San Marco Blvd
Jacksonville, Florida 32207
phone (904)396-7121

| Easting (ft): | Northing (ft): | Coordinate System: | Elevation (ft): |
|---|---|---|---|
| 666,592 | 1,911,063 | | -63.8 NAVD88 |

| USCS | Munsell: | Comments: |
|---|---|---|
| SW | Moist - 10Y 7/1 | |

| | | | Fines (%): | Organics (%): | Carbonates (%): | Shells (%): |
|---|---|---|---|---|---|---|
| | | | #230 - 0.85 | | | 30.00 |

| Sieve Number | Sieve Size (Phi) | Sieve Size (Millimeters) | % Weight Retained | C. % Weight Retained |
|---|---|---|---|---|
| 3/4 | -4.25 | 19.03 | 0.00 | 0.00 |
| 3/8 | -3.25 | 9.48 | 0.79 | 0.79 |
| #3.5 | -2.50 | 5.66 | 3.41 | 4.20 |
| #4 | -2.25 | 4.75 | 0.69 | 4.89 |
| #5 | -2.00 | 3.99 | 1.08 | 5.97 |
| #7 | -1.50 | 2.82 | 1.87 | 7.84 |
| #10 | -1.00 | 2.00 | 3.01 | 10.85 |
| #14 | -0.50 | 1.41 | 3.30 | 14.15 |
| #18 | 0.00 | 1.00 | 3.80 | 17.95 |
| #25 | 0.50 | 0.71 | 4.85 | 22.80 |
| #35 | 1.00 | 0.50 | 7.32 | 30.12 |
| #45 | 1.50 | 0.35 | 10.88 | 41.00 |
| #60 | 2.00 | 0.25 | 17.55 | 58.55 |
| #80 | 2.50 | 0.18 | 28.14 | 86.69 |
| #120 | 3.00 | 0.13 | 11.31 | 98.00 |
| #170 | 3.50 | 0.09 | 1.04 | 99.04 |
| #200 | 3.75 | 0.07 | 0.09 | 99.13 |
| #230 | 4.00 | 0.06 | 0.02 | 99.15 |

| Phi 5 | Phi 16 | Phi 25 | Phi 50 | Phi 75 | Phi 84 | Phi 95 |
|---|---|---|---|---|---|---|
| 2.87 | 2.45 | 2.29 | 1.75 | 0.65 | -0.26 | -2.22 |

| Moment | Mean Phi | Mean mm | Sorting | Skewness | Kurtosis |
|---|---|---|---|---|---|
| Statistics | 1.23 | 0.43 | 1.51 | -1.36 | 4.19 |

USACE GRANULARMETRIC REPORT FLAGLER_STAT_GINT.GPJ FL DEP ROSS.GDT 11/14/12

# Granularmetric Report

Depths and elevations based on measured values

Project Name: Flagler County

Sample Name: VC-FSP11-2 #2

Analysis Date: 04-01-11

Analyzed By:

US Army Corps of Engineers
701 San Marco Blvd
Jacksonville, Florida 32207
phone (904)396-7121

| Easting (ft): | Northing (ft): | Coordinate System: | Elevation (ft): |
|---|---|---|---|
| 666,592 | 1,911,063 | | -66.3 NAVD88 |

| USCS | Munsell: | Comments: |
|---|---|---|
| SW | Moist - 5GY 5/1 | |

| Fines (%): | Organics (%): | Carbonates (%): | Shells (%): |
|---|---|---|---|
| #230 - 4.60 | | | 6.00 |

| Sieve Number | Sieve Size (Phi) | Sieve Size (Millimeters) | % Weight Retained | C. % Weight Retained |
|---|---|---|---|---|
| 3/8 | -3.25 | 9.48 | 0.00 | 0.00 |
| #3.5 | -2.50 | 5.66 | 0.51 | 0.51 |
| #4 | -2.25 | 4.75 | 0.15 | 0.66 |
| #5 | -2.00 | 3.99 | 0.18 | 0.84 |
| #7 | -1.50 | 2.82 | 0.69 | 1.53 |
| #10 | -1.00 | 2.00 | 0.47 | 2.00 |
| #14 | -0.50 | 1.41 | 0.56 | 2.56 |
| #18 | 0.00 | 1.00 | 0.45 | 3.01 |
| #25 | 0.50 | 0.71 | 0.60 | 3.61 |
| #35 | 1.00 | 0.50 | 0.78 | 4.39 |
| #45 | 1.50 | 0.35 | 1.60 | 5.99 |
| #60 | 2.00 | 0.25 | 6.96 | 12.95 |
| #80 | 2.50 | 0.18 | 36.23 | 49.18 |
| #120 | 3.00 | 0.13 | 25.05 | 74.23 |
| #170 | 3.50 | 0.09 | 14.40 | 88.63 |
| #200 | 3.75 | 0.07 | 5.80 | 94.43 |
| #230 | 4.00 | 0.06 | 0.97 | 95.40 |

| Phi 5 | Phi 16 | Phi 25 | Phi 50 | Phi 75 | Phi 84 | Phi 95 |
|---|---|---|---|---|---|---|
| 3.90 | 3.34 | 3.03 | 2.52 | 2.16 | 2.04 | 1.19 |

| Moment | Mean Phi | Mean mm | Sorting | Skewness | Kurtosis |
|---|---|---|---|---|---|
| Statistics | 2.43 | 0.19 | 0.93 | -2.64 | 13.64 |

USACE GRANULARMETRIC REPORT FLAGLER_STAT_GINT.GPJ FL DEP ROSS.GDT 11/14/12

# Granularmetric Report

Depths and elevations based on measured values

Project Name: Flagler County

Sample Name: VC-FSP11-3 #1

Analysis Date: 04-01-11

Analyzed By:

US Army Corps of Engineers
701 San Marco Blvd
Jacksonville, Florida 32207
phone (904)396-7121

| Easting (ft): | Northing (ft): | Coordinate System: | Elevation (ft): |
|---|---|---|---|
| 668,362 | 1,903,690 | | -57.8 NAVD88 |

| USCS | Munsell: | Comments: |
|---|---|---|
| SW | Moist - 10Y 6/1 | |

| Fines (%): | Organics (%): | Carbonates (%): | Shells (%): |
|---|---|---|---|
| #230 - 1.24 | | | 22.00 |

| Sieve Number | Sieve Size (Phi) | Sieve Size (Millimeters) | % Weight Retained | C. % Weight Retained |
|---|---|---|---|---|
| 3/4 | -4.25 | 19.03 | 0.00 | 0.00 |
| 3/8 | -3.25 | 9.48 | 0.67 | 0.67 |
| #3.5 | -2.50 | 5.66 | 0.43 | 1.10 |
| #4 | -2.25 | 4.75 | 0.12 | 1.22 |
| #5 | -2.00 | 3.99 | 0.19 | 1.41 |
| #7 | -1.50 | 2.82 | 0.84 | 2.25 |
| #10 | -1.00 | 2.00 | 1.75 | 4.00 |
| #14 | -0.50 | 1.41 | 2.96 | 6.96 |
| #18 | 0.00 | 1.00 | 3.19 | 10.15 |
| #25 | 0.50 | 0.71 | 3.49 | 13.64 |
| #35 | 1.00 | 0.50 | 5.31 | 18.95 |
| #45 | 1.50 | 0.35 | 8.47 | 27.42 |
| #60 | 2.00 | 0.25 | 20.10 | 47.52 |
| #80 | 2.50 | 0.18 | 38.40 | 85.92 |
| #120 | 3.00 | 0.13 | 11.81 | 97.73 |
| #170 | 3.50 | 0.09 | 0.89 | 98.62 |
| #200 | 3.75 | 0.07 | 0.06 | 98.68 |
| #230 | 4.00 | 0.06 | 0.08 | 98.76 |

| Phi 5 | Phi 16 | Phi 25 | Phi 50 | Phi 75 | Phi 84 | Phi 95 |
|---|---|---|---|---|---|---|
| 2.88 | 2.47 | 2.36 | 2.03 | 1.35 | 0.72 | -0.83 |

| Moment | Mean Phi | Mean mm | Sorting | Skewness | Kurtosis |
|---|---|---|---|---|---|
| Statistics | 1.64 | 0.32 | 1.15 | -1.9 | 7.22 |

USACE GRANULARMETRIC REPORT FLAGLER_STAT_GINT.GPJ FL DEP ROSS.GDT 11/14/12

# Granularmetric Report

Depths and elevations based on measured values

Project Name: Flagler County

Sample Name: VC-FSP11-3 #2

Analysis Date: 04-01-11

Analyzed By:

US Army Corps of Engineers
701 San Marco Blvd
Jacksonville, Florida 32207
phone (904)396-7121

| Easting (ft): | Northing (ft): | Coordinate System: | Elevation (ft): |
|---|---|---|---|
| 668,362 | 1,903,690 | | -60.8 NAVD88 |

| USCS | Munsell: | Comments: |
|---|---|---|
| SP | Moist - 10Y 6/1 | |

| Fines (%): | Organics (%): | Carbonates (%): | Shells (%): |
|---|---|---|---|
| #230 - 0.90 | | | 14.00 |

| Sieve Number | Sieve Size (Phi) | Sieve Size (Millimeters) | % Weight Retained | C. % Weight Retained |
|---|---|---|---|---|
| #4 | -2.25 | 4.75 | 0.00 | 0.00 |
| #5 | -2.00 | 3.99 | 0.24 | 0.24 |
| #7 | -1.50 | 2.82 | 0.26 | 0.50 |
| #10 | -1.00 | 2.00 | 0.82 | 1.32 |
| #14 | -0.50 | 1.41 | 1.15 | 2.47 |
| #18 | 0.00 | 1.00 | 1.32 | 3.79 |
| #25 | 0.50 | 0.71 | 1.70 | 5.49 |
| #35 | 1.00 | 0.50 | 3.01 | 8.50 |
| #45 | 1.50 | 0.35 | 6.08 | 14.58 |
| #60 | 2.00 | 0.25 | 17.52 | 32.10 |
| #80 | 2.50 | 0.18 | 46.93 | 79.03 |
| #120 | 3.00 | 0.13 | 18.21 | 97.24 |
| #170 | 3.50 | 0.09 | 1.65 | 98.89 |
| #200 | 3.75 | 0.07 | 0.14 | 99.03 |
| #230 | 4.00 | 0.06 | 0.07 | 99.10 |

| Phi 5 | Phi 16 | Phi 25 | Phi 50 | Phi 75 | Phi 84 | Phi 95 |
|---|---|---|---|---|---|---|
| 2.94 | 2.64 | 2.46 | 2.19 | 1.79 | 1.54 | 0.36 |

| Moment | Mean Phi | Mean mm | Sorting | Skewness | Kurtosis |
|---|---|---|---|---|---|
| Statistics | 2.01 | 0.25 | 0.79 | -2.11 | 8.95 |

USACE GRANULARMETRIC REPORT FLAGLER_STAT_GINT.GPJ FL DEP ROSS.GDT 11/14/12

# Granularmetric Report

Depths and elevations based on measured values

Project Name: Flagler County

Sample Name: VC-FSP11-3 #3

Analysis Date: 04-01-11

Analyzed By:

US Army Corps of Engineers
701 San Marco Blvd
Jacksonville, Florida 32207
phone (904)396-7121

| Easting (ft): | Northing (ft): | Coordinate System: | Elevation (ft): |
|---|---|---|---|
| 668,362 | 1,903,690 | | -63.8 NAVD88 |

| USCS | Munsell: | Comments: |
|---|---|---|
| SW | Moist - 10Y 6/1 | |

| Fines (%): | Organics (%): | Carbonates (%): | Shells (%): |
|---|---|---|---|
| #230 - 0.96 | | 18.00 | 14.00 |

| Sieve Number | Sieve Size (Phi) | Sieve Size (Millimeters) | % Weight Retained | C. % Weight Retained |
|---|---|---|---|---|
| 3/8 | -3.25 | 9.48 | 0.00 | 0.00 |
| #3.5 | -2.50 | 5.66 | 0.53 | 0.53 |
| #4 | -2.25 | 4.75 | 0.29 | 0.82 |
| #5 | -2.00 | 3.99 | 0.23 | 1.05 |
| #7 | -1.50 | 2.82 | 0.83 | 1.88 |
| #10 | -1.00 | 2.00 | 1.08 | 2.96 |
| #14 | -0.50 | 1.41 | 1.43 | 4.39 |
| #18 | 0.00 | 1.00 | 1.39 | 5.78 |
| #25 | 0.50 | 0.71 | 1.87 | 7.65 |
| #35 | 1.00 | 0.50 | 4.71 | 12.36 |
| #45 | 1.50 | 0.35 | 9.41 | 21.77 |
| #60 | 2.00 | 0.25 | 20.05 | 41.82 |
| #80 | 2.50 | 0.18 | 41.44 | 83.26 |
| #120 | 3.00 | 0.13 | 14.19 | 97.45 |
| #170 | 3.50 | 0.09 | 1.42 | 98.87 |
| #200 | 3.75 | 0.07 | 0.11 | 98.98 |
| #230 | 4.00 | 0.06 | 0.06 | 99.04 |

| Phi 5 | Phi 16 | Phi 25 | Phi 50 | Phi 75 | Phi 84 | Phi 95 |
|---|---|---|---|---|---|---|
| 2.91 | 2.53 | 2.40 | 2.10 | 1.58 | 1.19 | -0.28 |

| Moment | Mean Phi | Mean mm | Sorting | Skewness | Kurtosis |
|---|---|---|---|---|---|
| Statistics | 1.83 | 0.28 | 0.97 | -2.14 | 8.77 |

USACE GRANULARMETRIC REPORT FLAGLER_STAT_GINT.GPJ FL DEP ROSS.GDT 11/14/12

# Granularmetric Report

Depths and elevations based on measured values

Project Name: Flagler County

Sample Name: VC-FSP11-3 #4

Analysis Date: 04-01-11

Analyzed By:

US Army Corps of Engineers
701 San Marco Blvd
Jacksonville, Florida 32207
phone (904)396-7121

| Easting (ft): | Northing (ft): | Coordinate System: | Elevation (ft): |
|---|---|---|---|
| 668,362 | 1,903,690 | | -66.8 NAVD88 |

| USCS | Munsell: | Comments: |
|---|---|---|
| SP | Moist - 10Y 6/1 | |

| Fines (%): | Organics (%): | Carbonates (%): | Shells (%): |
|---|---|---|---|
| #230 - 2.11 | | | 7.00 |

| Sieve Number | Sieve Size (Phi) | Sieve Size (Millimeters) | % Weight Retained | C. % Weight Retained |
|---|---|---|---|---|
| 3/8 | -3.25 | 9.48 | 0.00 | 0.00 |
| #3.5 | -2.50 | 5.66 | 0.33 | 0.33 |
| #4 | -2.25 | 4.75 | 0.16 | 0.49 |
| #5 | -2.00 | 3.99 | 0.00 | 0.49 |
| #7 | -1.50 | 2.82 | 0.23 | 0.72 |
| #10 | -1.00 | 2.00 | 0.48 | 1.20 |
| #14 | -0.50 | 1.41 | 0.58 | 1.78 |
| #18 | 0.00 | 1.00 | 0.66 | 2.44 |
| #25 | 0.50 | 0.71 | 0.70 | 3.14 |
| #35 | 1.00 | 0.50 | 1.32 | 4.46 |
| #45 | 1.50 | 0.35 | 3.93 | 8.39 |
| #60 | 2.00 | 0.25 | 11.51 | 19.90 |
| #80 | 2.50 | 0.18 | 42.92 | 62.82 |
| #120 | 3.00 | 0.13 | 30.79 | 93.61 |
| #170 | 3.50 | 0.09 | 3.81 | 97.42 |
| #200 | 3.75 | 0.07 | 0.36 | 97.78 |
| #230 | 4.00 | 0.06 | 0.11 | 97.89 |

| Phi 5 | Phi 16 | Phi 25 | Phi 50 | Phi 75 | Phi 84 | Phi 95 |
|---|---|---|---|---|---|---|
| 3.18 | 2.84 | 2.70 | 2.35 | 2.06 | 1.83 | 1.07 |

| Moment | Mean Phi | Mean mm | Sorting | Skewness | Kurtosis |
|---|---|---|---|---|---|
| Statistics | 2.23 | 0.21 | 0.76 | -2.94 | 16.35 |

USACE GRANULARMETRIC REPORT FLAGLER_STAT_GINT.GPJ FL DEP ROSS.GDT 11/14/12

# Granularmetric Report

Depths and elevations based on measured values

Project Name: Flagler County

Sample Name: VC-FSP11-3 #5

Analysis Date: 04-01-11

Analyzed By:

US Army Corps of Engineers
701 San Marco Blvd
Jacksonville, Florida 32207
phone (904)396-7121

| Easting (ft): | Northing (ft): | Coordinate System: | Elevation (ft): |
|---|---|---|---|
| 668,362 | 1,903,690 | | -69.8 NAVD88 |

| USCS | Munsell: | Comments: |
|---|---|---|
| SP | Moist - 10Y 6/1 | |

| Fines (%): | Organics (%): | Carbonates (%): | Shells (%): |
|---|---|---|---|
| #230 - 3.12 | | | 7.00 |

| Sieve Number | Sieve Size (Phi) | Sieve Size (Millimeters) | % Weight Retained | C. % Weight Retained |
|---|---|---|---|---|
| #3.5 | -2.50 | 5.66 | 0.00 | 0.00 |
| #4 | -2.25 | 4.75 | 0.34 | 0.34 |
| #5 | -2.00 | 3.99 | 0.31 | 0.65 |
| #7 | -1.50 | 2.82 | 0.21 | 0.86 |
| #10 | -1.00 | 2.00 | 0.38 | 1.24 |
| #14 | -0.50 | 1.41 | 0.37 | 1.61 |
| #18 | 0.00 | 1.00 | 0.37 | 1.98 |
| #25 | 0.50 | 0.71 | 0.44 | 2.42 |
| #35 | 1.00 | 0.50 | 0.66 | 3.08 |
| #45 | 1.50 | 0.35 | 2.32 | 5.40 |
| #60 | 2.00 | 0.25 | 9.06 | 14.46 |
| #80 | 2.50 | 0.18 | 37.34 | 51.80 |
| #120 | 3.00 | 0.13 | 37.86 | 89.66 |
| #170 | 3.50 | 0.09 | 6.33 | 95.99 |
| #200 | 3.75 | 0.07 | 0.74 | 96.73 |
| #230 | 4.00 | 0.06 | 0.15 | 96.88 |

| Phi 5 | Phi 16 | Phi 25 | Phi 50 | Phi 75 | Phi 84 | Phi 95 |
|---|---|---|---|---|---|---|
| 3.42 | 2.93 | 2.81 | 2.48 | 2.14 | 2.02 | 1.41 |

| Moment | Mean Phi | Mean mm | Sorting | Skewness | Kurtosis |
|---|---|---|---|---|---|
| Statistics | 2.36 | 0.19 | 0.73 | -3.16 | 18.38 |

USACE GRANULARMETRIC REPORT FLAGLER_STAT_GINT.GPJ FL DEP ROSS.GDT 11/14/12

# Granularmetric Report

Depths and elevations based on measured values

Project Name: Flagler County

Sample Name: VC-FSP11-4 #1

Analysis Date: 04-01-11

Analyzed By:

US Army Corps of Engineers
701 San Marco Blvd
Jacksonville, Florida 32207
phone (904)396-7121

| Easting (ft): | Northing (ft): | Coordinate System: | Elevation (ft): |
|---|---|---|---|
| 673,572 | 1,906,128 | | -61.0 NAVD88 |

| USCS | Munsell: | Comments: |
|---|---|---|
| SW | Moist - 10GY 5/1 | |

| Fines (%): | Organics (%): | Carbonates (%): | Shells (%): |
|---|---|---|---|
| #230 - 1.08 | | | 27.00 |

| Sieve Number | Sieve Size (Phi) | Sieve Size (Millimeters) | % Weight Retained | C. % Weight Retained |
|---|---|---|---|---|
| 3/8 | -3.25 | 9.48 | 0.00 | 0.00 |
| #3.5 | -2.50 | 5.66 | 0.45 | 0.45 |
| #4 | -2.25 | 4.75 | 0.10 | 0.55 |
| #5 | -2.00 | 3.99 | 0.31 | 0.86 |
| #7 | -1.50 | 2.82 | 1.46 | 2.32 |
| #10 | -1.00 | 2.00 | 2.34 | 4.66 |
| #14 | -0.50 | 1.41 | 3.36 | 8.02 |
| #18 | 0.00 | 1.00 | 3.80 | 11.82 |
| #25 | 0.50 | 0.71 | 4.64 | 16.46 |
| #35 | 1.00 | 0.50 | 8.54 | 25.00 |
| #45 | 1.50 | 0.35 | 16.62 | 41.62 |
| #60 | 2.00 | 0.25 | 25.54 | 67.16 |
| #80 | 2.50 | 0.18 | 25.25 | 92.41 |
| #120 | 3.00 | 0.13 | 5.91 | 98.32 |
| #170 | 3.50 | 0.09 | 0.54 | 98.86 |
| #200 | 3.75 | 0.07 | 0.05 | 98.91 |
| #230 | 4.00 | 0.06 | 0.01 | 98.92 |

| Phi 5 | Phi 16 | Phi 25 | Phi 50 | Phi 75 | Phi 84 | Phi 95 |
|---|---|---|---|---|---|---|
| 2.72 | 2.33 | 2.15 | 1.66 | 1.00 | 0.45 | -0.95 |

| Moment | Mean Phi | Mean mm | Sorting | Skewness | Kurtosis |
|---|---|---|---|---|---|
| Statistics | 1.38 | 0.38 | 1.08 | -1.31 | 4.64 |

USACE GRANULARMETRIC REPORT FLAGLER_STAT_GINT.GPJ FL DEP ROSS.GDT 11/14/12

# Granularmetric Report

Depths and elevations based on measured values

Project Name: Flagler County

Sample Name: VC-FSP11-4 #2

Analysis Date: 04-01-11

Analyzed By:

US Army Corps of Engineers
701 San Marco Blvd
Jacksonville, Florida 32207
phone (904)396-7121

| Easting (ft): | Northing (ft): | Coordinate System: | Elevation (ft): |
|---|---|---|---|
| 673,572 | 1,906,128 | | -64.0 NAVD88 |

| USCS | Munsell: | Comments: |
|---|---|---|
| SP | Moist - 10GY 5/1 | |

| Fines (%): | Organics (%): | Carbonates (%): | Shells (%): |
|---|---|---|---|
| #230 - 10.36 | | 40.00 | 25.00 |

| Sieve Number | Sieve Size (Phi) | Sieve Size (Millimeters) | % Weight Retained | C. % Weight Retained |
|---|---|---|---|---|
| 3/8 | -3.25 | 9.48 | 4.49 | 4.49 |
| #3.5 | -2.50 | 5.66 | 2.64 | 7.13 |
| #4 | -2.25 | 4.75 | 0.87 | 8.00 |
| #5 | -2.00 | 3.99 | 0.82 | 8.82 |
| #7 | -1.50 | 2.82 | 2.13 | 10.95 |
| #10 | -1.00 | 2.00 | 2.39 | 13.34 |
| #14 | -0.50 | 1.41 | 2.74 | 16.08 |
| #18 | 0.00 | 1.00 | 2.61 | 18.69 |
| #25 | 0.50 | 0.71 | 3.15 | 21.84 |
| #35 | 1.00 | 0.50 | 5.34 | 27.18 |
| #45 | 1.50 | 0.35 | 9.16 | 36.34 |
| #60 | 2.00 | 0.25 | 15.02 | 51.36 |
| #80 | 2.50 | 0.18 | 25.39 | 76.75 |
| #120 | 3.00 | 0.13 | 11.18 | 87.93 |
| #170 | 3.50 | 0.09 | 1.37 | 89.30 |
| #200 | 3.75 | 0.07 | 0.21 | 89.51 |
| #230 | 4.00 | 0.06 | 0.13 | 89.64 |

| Phi 5 | Phi 16 | Phi 25 | Phi 50 | Phi 75 | Phi 84 | Phi 95 |
|---|---|---|---|---|---|---|
| | 2.82 | 2.47 | 1.95 | 0.79 | -0.51 | -3.10 |

| Moment | Mean Phi | Mean mm | Sorting | Skewness | Kurtosis |
|---|---|---|---|---|---|
| Statistics | 1.1 | 0.47 | 1.44 | -0.83 | 3.35 |

USACE GRANULARMETRIC REPORT FLAGLER_STAT_GINT.GPJ FL DEP ROSS.GDT 11/14/12

# Granularmetric Report

Depths and elevations based on measured values

Project Name: Flagler County

Sample Name: VC-FSP11-4 #3

Analysis Date: 04-01-11

Analyzed By:

US Army Corps of Engineers
701 San Marco Blvd
Jacksonville, Florida 32207
phone (904)396-7121

| Easting (ft): | Northing (ft): | Coordinate System: | Elevation (ft): |
|---|---|---|---|
| 673,572 | 1,906,128 | | -67.0 NAVD88 |

| USCS | Munsell: | Comments: |
|---|---|---|
| SW | Moist - 10GY 5/1 | |

| Fines (%): | Organics (%): | Carbonates (%): | Shells (%): |
|---|---|---|---|
| #230 - 1.44 | | | 7.00 |

| Sieve Number | Sieve Size (Phi) | Sieve Size (Millimeters) | % Weight Retained | C. % Weight Retained |
|---|---|---|---|---|
| 3/4 | -4.25 | 19.03 | 0.00 | 0.00 |
| 3/8 | -3.25 | 9.48 | 0.75 | 0.75 |
| #3.5 | -2.50 | 5.66 | 1.09 | 1.84 |
| #4 | -2.25 | 4.75 | 0.08 | 1.92 |
| #5 | -2.00 | 3.99 | 0.18 | 2.10 |
| #7 | -1.50 | 2.82 | 0.48 | 2.58 |
| #10 | -1.00 | 2.00 | 0.54 | 3.12 |
| #14 | -0.50 | 1.41 | 0.45 | 3.57 |
| #18 | 0.00 | 1.00 | 0.45 | 4.02 |
| #25 | 0.50 | 0.71 | 0.60 | 4.62 |
| #35 | 1.00 | 0.50 | 1.26 | 5.88 |
| #45 | 1.50 | 0.35 | 3.20 | 9.08 |
| #60 | 2.00 | 0.25 | 13.32 | 22.40 |
| #80 | 2.50 | 0.18 | 47.72 | 70.12 |
| #120 | 3.00 | 0.13 | 26.47 | 96.59 |
| #170 | 3.50 | 0.09 | 1.78 | 98.37 |
| #200 | 3.75 | 0.07 | 0.11 | 98.48 |
| #230 | 4.00 | 0.06 | 0.08 | 98.56 |

| Phi 5 | Phi 16 | Phi 25 | Phi 50 | Phi 75 | Phi 84 | Phi 95 |
|---|---|---|---|---|---|---|
| 2.97 | 2.76 | 2.59 | 2.29 | 2.02 | 1.76 | 0.65 |

| Moment | Mean Phi | Mean mm | Sorting | Skewness | Kurtosis |
|---|---|---|---|---|---|
| Statistics | 2.09 | 0.23 | 1.01 | -3.62 | 18.31 |

USACE GRANULARMETRIC REPORT FLAGLER_STAT_GINT.GPJ FL DEP ROSS.GDT 11/14/12

# Granularmetric Report

Depths and elevations based on measured values

Project Name: Flagler County

Sample Name: VC-FSP11-5 #1

Analysis Date: 04-01-11

Analyzed By:

US Army Corps of Engineers
701 San Marco Blvd
Jacksonville, Florida 32207
phone (904)396-7121

| Easting (ft): | Northing (ft): | Coordinate System: | Elevation (ft): |
|---|---|---|---|
| 672,891 | 1,900,724 | | -60.7 NAVD88 |

| USCS | Munsell: | Comments: |
|---|---|---|
| SW | Moist - 5GY 5/1 | |

| Fines (%): | Organics (%): | Carbonates (%): | Shells (%): |
|---|---|---|---|
| #230 - 1.90 | | 23.00 | 19.00 |

| Sieve Number | Sieve Size (Phi) | Sieve Size (Millimeters) | % Weight Retained | C. % Weight Retained |
|---|---|---|---|---|
| 3/8 | -3.25 | 9.48 | 0.00 | 0.00 |
| #3.5 | -2.50 | 5.66 | 1.21 | 1.21 |
| #4 | -2.25 | 4.75 | 0.37 | 1.58 |
| #5 | -2.00 | 3.99 | 0.14 | 1.72 |
| #7 | -1.50 | 2.82 | 0.90 | 2.62 |
| #10 | -1.00 | 2.00 | 1.34 | 3.96 |
| #14 | -0.50 | 1.41 | 2.29 | 6.25 |
| #18 | 0.00 | 1.00 | 2.38 | 8.63 |
| #25 | 0.50 | 0.71 | 2.78 | 11.41 |
| #35 | 1.00 | 0.50 | 5.06 | 16.47 |
| #45 | 1.50 | 0.35 | 9.22 | 25.69 |
| #60 | 2.00 | 0.25 | 18.69 | 44.38 |
| #80 | 2.50 | 0.18 | 37.94 | 82.32 |
| #120 | 3.00 | 0.13 | 14.37 | 96.69 |
| #170 | 3.50 | 0.09 | 1.25 | 97.94 |
| #200 | 3.75 | 0.07 | 0.10 | 98.04 |
| #230 | 4.00 | 0.06 | 0.06 | 98.10 |

| Phi 5 | Phi 16 | Phi 25 | Phi 50 | Phi 75 | Phi 84 | Phi 95 |
|---|---|---|---|---|---|---|
| 2.94 | 2.56 | 2.40 | 2.07 | 1.46 | 0.95 | -0.77 |

| Moment | Mean Phi | Mean mm | Sorting | Skewness | Kurtosis |
|---|---|---|---|---|---|
| Statistics | 1.71 | 0.31 | 1.11 | -1.91 | 7.04 |

USACE GRANULARMETRIC REPORT FLAGLER_STAT_GINT.GPJ FL DEP ROSS.GDT 11/14/12

# Granularmetric Report

Depths and elevations based on measured values

Project Name: Flagler County

Sample Name: VC-FSP11-5 #2

Analysis Date: 04-01-11

Analyzed By:

US Army Corps of Engineers
701 San Marco Blvd
Jacksonville, Florida 32207
phone (904)396-7121

| Easting (ft): | Northing (ft): | Coordinate System: | Elevation (ft): |
|---|---|---|---|
| 672,891 | 1,900,724 | | -63.7 NAVD88 |

| USCS | Munsell: | Comments: |
|---|---|---|
| SW | Moist - 5GY 5/1 | |

| Fines (%): | Organics (%): | Carbonates (%): | Shells (%): |
|---|---|---|---|
| #230 - 0.66 | | | 17.00 |

| Sieve Number | Sieve Size (Phi) | Sieve Size (Millimeters) | % Weight Retained | C. % Weight Retained |
|---|---|---|---|---|
| 3/8 | -3.25 | 9.48 | 0.00 | 0.00 |
| #3.5 | -2.50 | 5.66 | 0.16 | 0.16 |
| #4 | -2.25 | 4.75 | 0.03 | 0.19 |
| #5 | -2.00 | 3.99 | 0.12 | 0.31 |
| #7 | -1.50 | 2.82 | 0.64 | 0.95 |
| #10 | -1.00 | 2.00 | 1.14 | 2.09 |
| #14 | -0.50 | 1.41 | 1.46 | 3.55 |
| #18 | 0.00 | 1.00 | 1.61 | 5.16 |
| #25 | 0.50 | 0.71 | 2.17 | 7.33 |
| #35 | 1.00 | 0.50 | 4.37 | 11.70 |
| #45 | 1.50 | 0.35 | 9.13 | 20.83 |
| #60 | 2.00 | 0.25 | 19.21 | 40.04 |
| #80 | 2.50 | 0.18 | 38.26 | 78.30 |
| #120 | 3.00 | 0.13 | 19.46 | 97.76 |
| #170 | 3.50 | 0.09 | 1.43 | 99.19 |
| #200 | 3.75 | 0.07 | 0.13 | 99.32 |
| #230 | 4.00 | 0.06 | 0.02 | 99.34 |

| Phi 5 | Phi 16 | Phi 25 | Phi 50 | Phi 75 | Phi 84 | Phi 95 |
|---|---|---|---|---|---|---|
| 2.93 | 2.65 | 2.46 | 2.13 | 1.60 | 1.23 | -0.05 |

| Moment | Mean Phi | Mean mm | Sorting | Skewness | Kurtosis |
|---|---|---|---|---|---|
| Statistics | 1.9 | 0.27 | 0.91 | -1.87 | 7.45 |

USACE GRANULARMETRIC REPORT FLAGLER_STAT_GINT.GPJ FL DEP ROSS.GDT 11/14/12

# Granularmetric Report

Depths and elevations based on measured values

Project Name: Flagler County

Sample Name: VC-FSP11-5 #3

Analysis Date: 04-01-11

Analyzed By:

US Army Corps of Engineers
701 San Marco Blvd
Jacksonville, Florida 32207
phone (904)396-7121

| Easting (ft): | Northing (ft): | Coordinate System: | Elevation (ft): |
|---|---|---|---|
| 672,891 | 1,900,724 | | -66.2 NAVD88 |

| USCS | Munsell: | Comments: |
|---|---|---|
| SP | Moist - 5GY 5/1 | |

| Fines (%): | Organics (%): | Carbonates (%): | Shells (%): |
|---|---|---|---|
| #230 - 1.49 | | | 8.00 |

| Sieve Number | Sieve Size (Phi) | Sieve Size (Millimeters) | % Weight Retained | C. % Weight Retained |
|---|---|---|---|---|
| #3.5 | -2.50 | 5.66 | 0.00 | 0.00 |
| #4 | -2.25 | 4.75 | 0.17 | 0.17 |
| #5 | -2.00 | 3.99 | 0.04 | 0.21 |
| #7 | -1.50 | 2.82 | 0.05 | 0.26 |
| #10 | -1.00 | 2.00 | 0.17 | 0.43 |
| #14 | -0.50 | 1.41 | 0.39 | 0.82 |
| #18 | 0.00 | 1.00 | 0.48 | 1.30 |
| #25 | 0.50 | 0.71 | 0.69 | 1.99 |
| #35 | 1.00 | 0.50 | 2.08 | 4.07 |
| #45 | 1.50 | 0.35 | 6.65 | 10.72 |
| #60 | 2.00 | 0.25 | 15.48 | 26.20 |
| #80 | 2.50 | 0.18 | 42.99 | 69.19 |
| #120 | 3.00 | 0.13 | 26.07 | 95.26 |
| #170 | 3.50 | 0.09 | 2.72 | 97.98 |
| #200 | 3.75 | 0.07 | 0.41 | 98.39 |
| #230 | 4.00 | 0.06 | 0.12 | 98.51 |

| Phi 5 | Phi 16 | Phi 25 | Phi 50 | Phi 75 | Phi 84 | Phi 95 |
|---|---|---|---|---|---|---|
| 3.00 | 2.78 | 2.61 | 2.28 | 1.96 | 1.67 | 1.07 |

| Moment | Mean Phi | Mean mm | Sorting | Skewness | Kurtosis |
|---|---|---|---|---|---|
| Statistics | 2.18 | 0.22 | 0.65 | -1.98 | 11.37 |

USACE GRANULARMETRIC REPORT FLAGLER_STAT_GINT.GPJ FL DEP ROSS.GDT 11/14/12

# Granularmetric Report

Depths and elevations based on measured values

Project Name: Flagler County

Sample Name: VC-FSP11-6 #1

Analysis Date: 04-01-11

Analyzed By:

US Army Corps of Engineers
701 San Marco Blvd
Jacksonville, Florida 32207
phone (904)396-7121

| Easting (ft): | Northing (ft): | Coordinate System: | Elevation (ft): |
|---|---|---|---|
| 678,009 | 1,898,131 | | -62.7 NAVD88 |

| USCS | Munsell: | Comments: |
|---|---|---|
| SW | Moist - 5GY 5/1 | |

| | | | Fines (%): | Organics (%): | Carbonates (%): | Shells (%): |
|---|---|---|---|---|---|---|
| | | | #230 - 0.54 | | | 14.00 |

| Sieve Number | Sieve Size (Phi) | Sieve Size (Millimeters) | % Weight Retained | C. % Weight Retained |
|---|---|---|---|---|
| 3/8 | -3.25 | 9.48 | 0.00 | 0.00 |
| #3.5 | -2.50 | 5.66 | 0.43 | 0.43 |
| #4 | -2.25 | 4.75 | 0.13 | 0.56 |
| #5 | -2.00 | 3.99 | 0.07 | 0.63 |
| #7 | -1.50 | 2.82 | 0.46 | 1.09 |
| #10 | -1.00 | 2.00 | 1.19 | 2.28 |
| #14 | -0.50 | 1.41 | 1.59 | 3.87 |
| #18 | 0.00 | 1.00 | 1.81 | 5.68 |
| #25 | 0.50 | 0.71 | 3.15 | 8.83 |
| #35 | 1.00 | 0.50 | 6.56 | 15.39 |
| #45 | 1.50 | 0.35 | 13.61 | 29.00 |
| #60 | 2.00 | 0.25 | 23.18 | 52.18 |
| #80 | 2.50 | 0.18 | 36.03 | 88.21 |
| #120 | 3.00 | 0.13 | 10.17 | 98.38 |
| #170 | 3.50 | 0.09 | 1.03 | 99.41 |
| #200 | 3.75 | 0.07 | 0.04 | 99.45 |
| #230 | 4.00 | 0.06 | 0.01 | 99.46 |

| Phi 5 | Phi 16 | Phi 25 | Phi 50 | Phi 75 | Phi 84 | Phi 95 |
|---|---|---|---|---|---|---|
| 2.83 | 2.44 | 2.32 | 1.95 | 1.35 | 1.02 | -0.19 |

| Moment | Mean Phi | Mean mm | Sorting | Skewness | Kurtosis |
|---|---|---|---|---|---|
| Statistics | 1.71 | 0.31 | 0.92 | -1.76 | 7.3 |

USACE GRANULARMETRIC REPORT FLAGLER_STAT_GINT.GPJ FL DEP ROSS.GDT 11/14/12

# Granularmetric Report

Depths and elevations based on measured values

Project Name: Flagler County

Sample Name: VC-FSP11-6 #2

Analysis Date: 04-01-11

Analyzed By:

US Army Corps of Engineers
701 San Marco Blvd
Jacksonville, Florida 32207
phone (904)396-7121

| Easting (ft): | Northing (ft): | Coordinate System: | Elevation (ft): |
|---|---|---|---|
| 678,009 | 1,898,131 | | -65.7 NAVD88 |

| USCS | Munsell: | Comments: |
|---|---|---|
| SW | Moist - 5GY 5/1 | |

| Fines (%): | Organics (%): | Carbonates (%): | Shells (%): |
|---|---|---|---|
| #230 - 2.22 | | | 18.00 |

| Sieve Number | Sieve Size (Phi) | Sieve Size (Millimeters) | % Weight Retained | C. % Weight Retained |
|---|---|---|---|---|
| 3/4 | -4.25 | 19.03 | 0.00 | 0.00 |
| 3/8 | -3.25 | 9.48 | 0.72 | 0.72 |
| #3.5 | -2.50 | 5.66 | 1.47 | 2.19 |
| #4 | -2.25 | 4.75 | 0.67 | 2.86 |
| #5 | -2.00 | 3.99 | 0.32 | 3.18 |
| #7 | -1.50 | 2.82 | 1.09 | 4.27 |
| #10 | -1.00 | 2.00 | 1.67 | 5.94 |
| #14 | -0.50 | 1.41 | 1.63 | 7.57 |
| #18 | 0.00 | 1.00 | 1.71 | 9.28 |
| #25 | 0.50 | 0.71 | 1.75 | 11.03 |
| #35 | 1.00 | 0.50 | 3.38 | 14.41 |
| #45 | 1.50 | 0.35 | 8.59 | 23.00 |
| #60 | 2.00 | 0.25 | 14.18 | 37.18 |
| #80 | 2.50 | 0.18 | 33.68 | 70.86 |
| #120 | 3.00 | 0.13 | 23.95 | 94.81 |
| #170 | 3.50 | 0.09 | 2.57 | 97.38 |
| #200 | 3.75 | 0.07 | 0.29 | 97.67 |
| #230 | 4.00 | 0.06 | 0.11 | 97.78 |

| Phi 5 | Phi 16 | Phi 25 | Phi 50 | Phi 75 | Phi 84 | Phi 95 |
|---|---|---|---|---|---|---|
| 3.04 | 2.77 | 2.59 | 2.19 | 1.57 | 1.09 | -1.28 |

| Moment | Mean Phi | Mean mm | Sorting | Skewness | Kurtosis |
|---|---|---|---|---|---|
| Statistics | 1.79 | 0.29 | 1.29 | -2.13 | 7.71 |

USACE GRANULARMETRIC REPORT FLAGLER_STAT_GINT.GPJ FL DEP ROSS.GDT 11/14/12

# Granularmetric Report

Depths and elevations based on measured values

Project Name: Flagler County

Sample Name: VC-FSP11-6 #3

Analysis Date: 04-01-11

Analyzed By:

US Army Corps of Engineers
701 San Marco Blvd
Jacksonville, Florida 32207
phone (904)396-7121

| Easting (ft): | Northing (ft): | Coordinate System: | Elevation (ft): |
|---|---|---|---|
| 678,009 | 1,898,131 | | -68.5 NAVD88 |

| USCS | Munsell: | Comments: |
|---|---|---|
| SW | Moist - 5GY 5/1 | |

| Fines (%): | Organics (%): | Carbonates (%): | Shells (%): |
|---|---|---|---|
| #230 - 1.21 | | 26.00 | 24.00 |

| Sieve Number | Sieve Size (Phi) | Sieve Size (Millimeters) | % Weight Retained | C. % Weight Retained |
|---|---|---|---|---|
| #3.5 | -2.50 | 5.66 | 0.00 | 0.00 |
| #4 | -2.25 | 4.75 | 0.18 | 0.18 |
| #5 | -2.00 | 3.99 | 0.15 | 0.33 |
| #7 | -1.50 | 2.82 | 0.94 | 1.27 |
| #10 | -1.00 | 2.00 | 1.79 | 3.06 |
| #14 | -0.50 | 1.41 | 2.61 | 5.67 |
| #18 | 0.00 | 1.00 | 2.66 | 8.33 |
| #25 | 0.50 | 0.71 | 2.78 | 11.11 |
| #35 | 1.00 | 0.50 | 5.11 | 16.22 |
| #45 | 1.50 | 0.35 | 10.97 | 27.19 |
| #60 | 2.00 | 0.25 | 19.50 | 46.69 |
| #80 | 2.50 | 0.18 | 38.06 | 84.75 |
| #120 | 3.00 | 0.13 | 12.73 | 97.48 |
| #170 | 3.50 | 0.09 | 1.19 | 98.67 |
| #200 | 3.75 | 0.07 | 0.10 | 98.77 |
| #230 | 4.00 | 0.06 | 0.02 | 98.79 |

| Phi 5 | Phi 16 | Phi 25 | Phi 50 | Phi 75 | Phi 84 | Phi 95 |
|---|---|---|---|---|---|---|
| 2.90 | 2.49 | 2.37 | 2.04 | 1.40 | 0.98 | -0.63 |

| Moment | Mean Phi | Mean mm | Sorting | Skewness | Kurtosis |
|---|---|---|---|---|---|
| Statistics | 1.72 | 0.30 | 1 | -1.57 | 5.41 |

USACE GRANULARMETRIC REPORT FLAGLER_STAT_GINT.GPJ FL DEP ROSS.GDT 11/14/12

# Granularmetric Report

Depths and elevations based on measured values

Project Name: Flagler County

Sample Name: VC-FSP11-7 #1

Analysis Date: 04-01-11

Analyzed By:

US Army Corps of Engineers
701 San Marco Blvd
Jacksonville, Florida 32207
phone (904)396-7121

| Easting (ft): | Northing (ft): | Coordinate System: | Elevation (ft): |
|---|---|---|---|
| 678,829 | 1,893,078 | | -55.6 NAVD88 |

| USCS | Munsell: | Comments: |
|---|---|---|
| SP | Moist - 10Y 5/1 | |

| Fines (%): | Organics (%): | Carbonates (%): | Shells (%): |
|---|---|---|---|
| #230 - 0.45 | | | 14.00 |

| Sieve Number | Sieve Size (Phi) | Sieve Size (Millimeters) | % Weight Retained | C. % Weight Retained |
|---|---|---|---|---|
| 3/8 | -3.25 | 9.48 | 0.00 | 0.00 |
| #3.5 | -2.50 | 5.66 | 0.05 | 0.05 |
| #4 | -2.25 | 4.75 | 0.16 | 0.21 |
| #5 | -2.00 | 3.99 | 0.20 | 0.41 |
| #7 | -1.50 | 2.82 | 0.34 | 0.75 |
| #10 | -1.00 | 2.00 | 0.96 | 1.71 |
| #14 | -0.50 | 1.41 | 1.43 | 3.14 |
| #18 | 0.00 | 1.00 | 1.77 | 4.91 |
| #25 | 0.50 | 0.71 | 2.12 | 7.03 |
| #35 | 1.00 | 0.50 | 4.70 | 11.73 |
| #45 | 1.50 | 0.35 | 12.84 | 24.57 |
| #60 | 2.00 | 0.25 | 29.06 | 53.63 |
| #80 | 2.50 | 0.18 | 37.34 | 90.97 |
| #120 | 3.00 | 0.13 | 7.90 | 98.87 |
| #170 | 3.50 | 0.09 | 0.60 | 99.47 |
| #200 | 3.75 | 0.07 | 0.07 | 99.54 |
| #230 | 4.00 | 0.06 | 0.01 | 99.55 |

| Phi 5 | Phi 16 | Phi 25 | Phi 50 | Phi 75 | Phi 84 | Phi 95 |
|---|---|---|---|---|---|---|
| 2.76 | 2.41 | 2.28 | 1.93 | 1.50 | 1.16 | 0.02 |

| Moment | Mean Phi | Mean mm | Sorting | Skewness | Kurtosis |
|---|---|---|---|---|---|
| Statistics | 1.75 | 0.30 | 0.82 | -1.88 | 7.91 |

USACE GRANULARMETRIC REPORT FLAGLER_STAT_GINT.GPJ FL DEP ROSS.GDT 11/14/12

# Granularmetric Report

Depths and elevations based on measured values

Project Name: Flagler County

Sample Name: VC-FSP11-7 #2

Analysis Date: 04-01-11

Analyzed By:

US Army Corps of Engineers
701 San Marco Blvd
Jacksonville, Florida 32207
phone (904)396-7121

| Easting (ft): | Northing (ft): | Coordinate System: | Elevation (ft): |
|---|---|---|---|
| 678,829 | 1,893,078 | | -58.6 NAVD88 |

| USCS | Munsell: | Comments: |
|---|---|---|
| SW | Moist - 10Y 5/1 | |

| Fines (%): | Organics (%): | Carbonates (%): | Shells (%): |
|---|---|---|---|
| #230 - 1.87 | | 25.00 | 20.00 |

| Sieve Number | Sieve Size (Phi) | Sieve Size (Millimeters) | % Weight Retained | C. % Weight Retained |
|---|---|---|---|---|
| #3.5 | -2.50 | 5.66 | 0.00 | 0.00 |
| #4 | -2.25 | 4.75 | 0.23 | 0.23 |
| #5 | -2.00 | 3.99 | 0.21 | 0.44 |
| #7 | -1.50 | 2.82 | 0.67 | 1.11 |
| #10 | -1.00 | 2.00 | 1.41 | 2.52 |
| #14 | -0.50 | 1.41 | 2.59 | 5.11 |
| #18 | 0.00 | 1.00 | 2.90 | 8.01 |
| #25 | 0.50 | 0.71 | 2.95 | 10.96 |
| #35 | 1.00 | 0.50 | 4.18 | 15.14 |
| #45 | 1.50 | 0.35 | 10.14 | 25.28 |
| #60 | 2.00 | 0.25 | 23.75 | 49.03 |
| #80 | 2.50 | 0.18 | 37.79 | 86.82 |
| #120 | 3.00 | 0.13 | 9.75 | 96.57 |
| #170 | 3.50 | 0.09 | 1.19 | 97.76 |
| #200 | 3.75 | 0.07 | 0.21 | 97.97 |
| #230 | 4.00 | 0.06 | 0.16 | 98.13 |

| Phi 5 | Phi 16 | Phi 25 | Phi 50 | Phi 75 | Phi 84 | Phi 95 |
|---|---|---|---|---|---|---|
| 2.92 | 2.46 | 2.34 | 2.01 | 1.48 | 1.04 | -0.52 |

| Moment | Mean Phi | Mean mm | Sorting | Skewness | Kurtosis |
|---|---|---|---|---|---|
| Statistics | 1.72 | 0.30 | 0.97 | -1.6 | 5.75 |

USACE GRANULARMETRIC REPORT FLAGLER_STAT_GINT.GPJ FL DEP ROSS.GDT 11/14/12

# Granularmetric Report

Depths and elevations based on measured values

Project Name: Flagler County

Sample Name: VC-FSP11-7 #3

Analysis Date: 04-01-11

Analyzed By:

US Army Corps of Engineers
701 San Marco Blvd
Jacksonville, Florida 32207
phone (904)396-7121

| Easting (ft): | Northing (ft): | Coordinate System: | Elevation (ft): |
|---|---|---|---|
| 678,829 | 1,893,078 | | -61.6 NAVD88 |

| USCS | Munsell: | Comments: |
|---|---|---|
| SP | Moist - 10Y 5/1 | |

| Fines (%): | Organics (%): | Carbonates (%): | Shells (%): |
|---|---|---|---|
| #230 - 1.71 | | | 10.00 |

| Sieve Number | Sieve Size (Phi) | Sieve Size (Millimeters) | % Weight Retained | C. % Weight Retained |
|---|---|---|---|---|
| 3/8 | -3.25 | 9.48 | 0.00 | 0.00 |
| #3.5 | -2.50 | 5.66 | 0.11 | 0.11 |
| #4 | -2.25 | 4.75 | 0.00 | 0.11 |
| #5 | -2.00 | 3.99 | 0.05 | 0.16 |
| #7 | -1.50 | 2.82 | 0.24 | 0.40 |
| #10 | -1.00 | 2.00 | 0.42 | 0.82 |
| #14 | -0.50 | 1.41 | 0.67 | 1.49 |
| #18 | 0.00 | 1.00 | 0.94 | 2.43 |
| #25 | 0.50 | 0.71 | 1.65 | 4.08 |
| #35 | 1.00 | 0.50 | 5.68 | 9.76 |
| #45 | 1.50 | 0.35 | 11.75 | 21.51 |
| #60 | 2.00 | 0.25 | 19.73 | 41.24 |
| #80 | 2.50 | 0.18 | 39.97 | 81.21 |
| #120 | 3.00 | 0.13 | 14.89 | 96.10 |
| #170 | 3.50 | 0.09 | 1.82 | 97.92 |
| #200 | 3.75 | 0.07 | 0.29 | 98.21 |
| #230 | 4.00 | 0.06 | 0.08 | 98.29 |

| Phi 5 | Phi 16 | Phi 25 | Phi 50 | Phi 75 | Phi 84 | Phi 95 |
|---|---|---|---|---|---|---|
| 2.96 | 2.59 | 2.42 | 2.11 | 1.58 | 1.26 | 0.58 |

| Moment | Mean Phi | Mean mm | Sorting | Skewness | Kurtosis |
|---|---|---|---|---|---|
| Statistics | 1.93 | 0.26 | 0.76 | -1.58 | 7.73 |

USACE GRANULARMETRIC REPORT FLAGLER_STAT_GINT.GPJ FL DEP ROSS.GDT 11/14/12

# Granularmetric Report

Depths and elevations based on measured values

Project Name: Flagler County

Sample Name: VC-FSP11-8 #1

Analysis Date: 04-01-11

Analyzed By:

US Army Corps of Engineers
701 San Marco Blvd
Jacksonville, Florida 32207
phone (904)396-7121

| Easting (ft): | Northing (ft): | Coordinate System: | Elevation (ft): |
|---|---|---|---|
| 684,228 | 1,895,572 | | -62.8 NAVD88 |

| USCS | Munsell: | Comments: |
|---|---|---|
| SP | Moist - 10Y 5/1 | |

| Fines (%): | Organics (%): | Carbonates (%): | Shells (%): |
|---|---|---|---|
| #230 - 0.85 | | | 10.00 |

| Sieve Number | Sieve Size (Phi) | Sieve Size (Millimeters) | % Weight Retained | C. % Weight Retained |
|---|---|---|---|---|
| #3.5 | -2.50 | 5.66 | 0.00 | 0.00 |
| #4 | -2.25 | 4.75 | 0.12 | 0.12 |
| #5 | -2.00 | 3.99 | 0.02 | 0.14 |
| #7 | -1.50 | 2.82 | 0.26 | 0.40 |
| #10 | -1.00 | 2.00 | 0.45 | 0.85 |
| #14 | -0.50 | 1.41 | 0.62 | 1.47 |
| #18 | 0.00 | 1.00 | 0.85 | 2.32 |
| #25 | 0.50 | 0.71 | 1.14 | 3.46 |
| #35 | 1.00 | 0.50 | 2.30 | 5.76 |
| #45 | 1.50 | 0.35 | 6.42 | 12.18 |
| #60 | 2.00 | 0.25 | 18.05 | 30.23 |
| #80 | 2.50 | 0.18 | 49.75 | 79.98 |
| #120 | 3.00 | 0.13 | 17.68 | 97.66 |
| #170 | 3.50 | 0.09 | 1.42 | 99.08 |
| #200 | 3.75 | 0.07 | 0.05 | 99.13 |
| #230 | 4.00 | 0.06 | 0.02 | 99.15 |

| Phi 5 | Phi 16 | Phi 25 | Phi 50 | Phi 75 | Phi 84 | Phi 95 |
|---|---|---|---|---|---|---|
| 2.92 | 2.61 | 2.45 | 2.20 | 1.85 | 1.60 | 0.83 |

| Moment | Mean Phi | Mean mm | Sorting | Skewness | Kurtosis |
|---|---|---|---|---|---|
| Statistics | 2.07 | 0.24 | 0.69 | -2.32 | 11.49 |

USACE GRANULARMETRIC REPORT FLAGLER_STAT_GINT.GPJ FL DEP ROSS.GDT 11/14/12

# Granularmetric Report

Depths and elevations based on measured values

Project Name: Flagler County

Sample Name: VC-FSP11-8 #2

Analysis Date: 04-01-11

Analyzed By:

US Army Corps of Engineers
701 San Marco Blvd
Jacksonville, Florida 32207
phone (904)396-7121

| Easting (ft): | Northing (ft): | Coordinate System: | Elevation (ft): |
|---|---|---|---|
| 684,228 | 1,895,572 | | -65.8 NAVD88 |

| USCS | Munsell: | Comments: |
|---|---|---|
| SW | Moist - 10Y 5/1 | |

| Fines (%): | Organics (%): | Carbonates (%): | Shells (%): |
|---|---|---|---|
| #230 - 1.46 | | 24.00 | 19.00 |

| Sieve Number | Sieve Size (Phi) | Sieve Size (Millimeters) | % Weight Retained | C. % Weight Retained |
|---|---|---|---|---|
| 3/4 | -4.25 | 19.03 | 0.00 | 0.00 |
| 3/8 | -3.25 | 9.48 | 1.79 | 1.79 |
| #3.5 | -2.50 | 5.66 | 1.72 | 3.51 |
| #4 | -2.25 | 4.75 | 0.63 | 4.14 |
| #5 | -2.00 | 3.99 | 0.20 | 4.34 |
| #7 | -1.50 | 2.82 | 1.01 | 5.35 |
| #10 | -1.00 | 2.00 | 1.15 | 6.50 |
| #14 | -0.50 | 1.41 | 1.65 | 8.15 |
| #18 | 0.00 | 1.00 | 1.45 | 9.60 |
| #25 | 0.50 | 0.71 | 2.11 | 11.71 |
| #35 | 1.00 | 0.50 | 5.81 | 17.52 |
| #45 | 1.50 | 0.35 | 11.62 | 29.14 |
| #60 | 2.00 | 0.25 | 18.58 | 47.72 |
| #80 | 2.50 | 0.18 | 34.63 | 82.35 |
| #120 | 3.00 | 0.13 | 14.57 | 96.92 |
| #170 | 3.50 | 0.09 | 1.36 | 98.28 |
| #200 | 3.75 | 0.07 | 0.18 | 98.46 |
| #230 | 4.00 | 0.06 | 0.08 | 98.54 |

| Phi 5 | Phi 16 | Phi 25 | Phi 50 | Phi 75 | Phi 84 | Phi 95 |
|---|---|---|---|---|---|---|
| 2.93 | 2.56 | 2.39 | 2.03 | 1.32 | 0.87 | -1.67 |

| Moment | Mean Phi | Mean mm | Sorting | Skewness | Kurtosis |
|---|---|---|---|---|---|
| Statistics | 1.59 | 0.33 | 1.36 | -2.18 | 7.93 |

USACE GRANULARMETRIC REPORT FLAGLER_STAT_GINT.GPJ FL DEP ROSS.GDT 11/14/12

# Granularmetric Report

Depths and elevations based on measured values

Project Name: Flagler County

Sample Name: VC-FSP11-8 #3

Analysis Date: 04-01-11

Analyzed By:

US Army Corps of Engineers
701 San Marco Blvd
Jacksonville, Florida 32207
phone (904)396-7121

| Easting (ft): | Northing (ft): | Coordinate System: | Elevation (ft): |
|---|---|---|---|
| 684,228 | 1,895,572 | | -68.8 NAVD88 |

| USCS | Munsell: | Comments: |
|---|---|---|
| SW | Moist - 10Y 5/1 | |

| Fines (%): | Organics (%): | Carbonates (%): | Shells (%): |
|---|---|---|---|
| #230 - 2.49 | | | 9.00 |

| Sieve Number | Sieve Size (Phi) | Sieve Size (Millimeters) | % Weight Retained | C. % Weight Retained |
|---|---|---|---|---|
| 3/8 | -3.25 | 9.48 | 0.00 | 0.00 |
| #3.5 | -2.50 | 5.66 | 1.30 | 1.30 |
| #4 | -2.25 | 4.75 | 0.00 | 1.30 |
| #5 | -2.00 | 3.99 | 0.14 | 1.44 |
| #7 | -1.50 | 2.82 | 0.46 | 1.90 |
| #10 | -1.00 | 2.00 | 0.71 | 2.61 |
| #14 | -0.50 | 1.41 | 1.02 | 3.63 |
| #18 | 0.00 | 1.00 | 0.93 | 4.56 |
| #25 | 0.50 | 0.71 | 0.86 | 5.42 |
| #35 | 1.00 | 0.50 | 1.46 | 6.88 |
| #45 | 1.50 | 0.35 | 3.66 | 10.54 |
| #60 | 2.00 | 0.25 | 11.28 | 21.82 |
| #80 | 2.50 | 0.18 | 39.09 | 60.91 |
| #120 | 3.00 | 0.13 | 32.71 | 93.62 |
| #170 | 3.50 | 0.09 | 3.20 | 96.82 |
| #200 | 3.75 | 0.07 | 0.50 | 97.32 |
| #230 | 4.00 | 0.06 | 0.19 | 97.51 |

| Phi 5 | Phi 16 | Phi 25 | Phi 50 | Phi 75 | Phi 84 | Phi 95 |
|---|---|---|---|---|---|---|
| 3.22 | 2.85 | 2.72 | 2.36 | 2.04 | 1.74 | 0.26 |

| Moment | Mean Phi | Mean mm | Sorting | Skewness | Kurtosis |
|---|---|---|---|---|---|
| Statistics | 2.15 | 0.23 | 0.98 | -2.95 | 13.66 |

USACE GRANULARMETRIC REPORT FLAGLER_STAT_GINT.GPJ FL DEP ROSS.GDT 11/14/12

# Granularmetric Report

Depths and elevations based on measured values

Project Name: Flagler County

Sample Name: VC-FSP11-9 #1

Analysis Date: 04-01-11

Analyzed By:

US Army Corps of Engineers
701 San Marco Blvd
Jacksonville, Florida 32207
phone (904)396-7121

| Easting (ft): | Northing (ft): | Coordinate System: | Elevation (ft): |
|---|---|---|---|
| 682,407 | 1,889,245 | | -62.9 NAVD88 |

| USCS | Munsell: | Comments: |
|---|---|---|
| SW | Moist - 10Y 5/1 | |

| Fines (%): | Organics (%): | Carbonates (%): | Shells (%): |
|---|---|---|---|
| #230 - 0.86 | | 22.00 | 20.00 |

| Sieve Number | Sieve Size (Phi) | Sieve Size (Millimeters) | % Weight Retained | C. % Weight Retained |
|---|---|---|---|---|
| 3/8 | -3.25 | 9.48 | 0.00 | 0.00 |
| #3.5 | -2.50 | 5.66 | 0.79 | 0.79 |
| #4 | -2.25 | 4.75 | 0.56 | 1.35 |
| #5 | -2.00 | 3.99 | 0.20 | 1.55 |
| #7 | -1.50 | 2.82 | 1.70 | 3.25 |
| #10 | -1.00 | 2.00 | 2.21 | 5.46 |
| #14 | -0.50 | 1.41 | 2.52 | 7.98 |
| #18 | 0.00 | 1.00 | 2.66 | 10.64 |
| #25 | 0.50 | 0.71 | 4.79 | 15.43 |
| #35 | 1.00 | 0.50 | 11.03 | 26.46 |
| #45 | 1.50 | 0.35 | 17.50 | 43.96 |
| #60 | 2.00 | 0.25 | 21.82 | 65.78 |
| #80 | 2.50 | 0.18 | 26.03 | 91.81 |
| #120 | 3.00 | 0.13 | 6.73 | 98.54 |
| #170 | 3.50 | 0.09 | 0.56 | 99.10 |
| #200 | 3.75 | 0.07 | 0.02 | 99.12 |
| #230 | 4.00 | 0.06 | 0.02 | 99.14 |

| Phi 5 | Phi 16 | Phi 25 | Phi 50 | Phi 75 | Phi 84 | Phi 95 |
|---|---|---|---|---|---|---|
| 2.74 | 2.35 | 2.17 | 1.63 | 0.93 | 0.53 | -1.10 |

| Moment | Mean Phi | Mean mm | Sorting | Skewness | Kurtosis |
|---|---|---|---|---|---|
| Statistics | 1.37 | 0.39 | 1.11 | -1.41 | 5.15 |

USACE GRANULARMETRIC REPORT FLAGLER_STAT_GINT.GPJ FL DEP ROSS.GDT 11/14/12

# Granularmetric Report

Depths and elevations based on measured values

Project Name: Flagler County

Sample Name: VC-FSP11-9 #2

Analysis Date: 04-01-11

Analyzed By:

US Army Corps of Engineers
701 San Marco Blvd
Jacksonville, Florida 32207
phone (904)396-7121

| Easting (ft): | Northing (ft): | Coordinate System: | Elevation (ft): |
|---|---|---|---|
| 682,407 | 1,889,245 | | -65.9 NAVD88 |

| USCS | Munsell: | Comments: |
|---|---|---|
| SP-SM | Moist - 10Y 5/1 | |

| Fines (%): | Organics (%): | Carbonates (%): | Shells (%): |
|---|---|---|---|
| #230 - 8.74 | | | 3.00 |

| Sieve Number | Sieve Size (Phi) | Sieve Size (Millimeters) | % Weight Retained | C. % Weight Retained |
|---|---|---|---|---|
| 3/8 | -3.25 | 9.48 | 0.00 | 0.00 |
| #3.5 | -2.50 | 5.66 | 0.14 | 0.14 |
| #4 | -2.25 | 4.75 | 0.00 | 0.14 |
| #5 | -2.00 | 3.99 | 0.00 | 0.14 |
| #7 | -1.50 | 2.82 | 0.09 | 0.23 |
| #10 | -1.00 | 2.00 | 0.17 | 0.40 |
| #14 | -0.50 | 1.41 | 0.29 | 0.69 |
| #18 | 0.00 | 1.00 | 0.44 | 1.13 |
| #25 | 0.50 | 0.71 | 0.67 | 1.80 |
| #35 | 1.00 | 0.50 | 2.00 | 3.80 |
| #45 | 1.50 | 0.35 | 5.50 | 9.30 |
| #60 | 2.00 | 0.25 | 15.52 | 24.82 |
| #80 | 2.50 | 0.18 | 43.93 | 68.75 |
| #120 | 3.00 | 0.13 | 19.47 | 88.22 |
| #170 | 3.50 | 0.09 | 2.65 | 90.87 |
| #200 | 3.75 | 0.07 | 0.28 | 91.15 |
| #230 | 4.00 | 0.06 | 0.11 | 91.26 |

| Phi 5 | Phi 16 | Phi 25 | Phi 50 | Phi 75 | Phi 84 | Phi 95 |
|---|---|---|---|---|---|---|
| | 2.89 | 2.66 | 2.28 | 2.00 | 1.71 | 1.11 |

| Moment | Mean Phi | Mean mm | Sorting | Skewness | Kurtosis |
|---|---|---|---|---|---|
| Statistics | 2.16 | 0.22 | 0.63 | -2.13 | 13.38 |

USACE GRANULARMETRIC REPORT FLAGLER_STAT_GINT.GPJ FL DEP ROSS.GDT 11/14/12

# Granularmetric Report

Depths and elevations based on measured values

Project Name: Flagler County

Sample Name: VC-FSP11-9 #3

Analysis Date: 04-01-11

Analyzed By:

US Army Corps of Engineers
701 San Marco Blvd
Jacksonville, Florida 32207
phone (904)396-7121

| Easting (ft): | Northing (ft): | Coordinate System: | Elevation (ft): |
|---|---|---|---|
| 682,407 | 1,889,245 | | -68.9 NAVD88 |

| USCS | Munsell: | Comments: |
|---|---|---|
| SW-SM | Moist - 10Y 5/1 | |

| | | | Fines (%): | Organics (%): | Carbonates (%): | Shells (%): |
|---|---|---|---|---|---|---|
| | | | #230 - 6.53 | | | 16.00 |

| Sieve Number | Sieve Size (Phi) | Sieve Size (Millimeters) | % Weight Retained | C. % Weight Retained |
|---|---|---|---|---|
| 3/8 | -3.25 | 9.48 | 0.00 | 0.00 |
| #3.5 | -2.50 | 5.66 | 2.08 | 2.08 |
| #4 | -2.25 | 4.75 | 0.41 | 2.49 |
| #5 | -2.00 | 3.99 | 0.69 | 3.18 |
| #7 | -1.50 | 2.82 | 1.63 | 4.81 |
| #10 | -1.00 | 2.00 | 1.87 | 6.68 |
| #14 | -0.50 | 1.41 | 1.89 | 8.57 |
| #18 | 0.00 | 1.00 | 1.80 | 10.37 |
| #25 | 0.50 | 0.71 | 2.77 | 13.14 |
| #35 | 1.00 | 0.50 | 6.75 | 19.89 |
| #45 | 1.50 | 0.35 | 11.57 | 31.46 |
| #60 | 2.00 | 0.25 | 16.38 | 47.84 |
| #80 | 2.50 | 0.18 | 28.58 | 76.42 |
| #120 | 3.00 | 0.13 | 14.99 | 91.41 |
| #170 | 3.50 | 0.09 | 1.68 | 93.09 |
| #200 | 3.75 | 0.07 | 0.24 | 93.33 |
| #230 | 4.00 | 0.06 | 0.14 | 93.47 |

| Phi 5 | Phi 16 | Phi 25 | Phi 50 | Phi 75 | Phi 84 | Phi 95 |
|---|---|---|---|---|---|---|
| | 2.75 | 2.47 | 2.03 | 1.22 | 0.71 | -1.45 |

| Moment | Mean Phi | Mean mm | Sorting | Skewness | Kurtosis |
|---|---|---|---|---|---|
| Statistics | 1.56 | 0.34 | 1.3 | -1.65 | 5.59 |

USACE GRANULARMETRIC REPORT FLAGLER_STAT_GINT.GPJ FL DEP ROSS.GDT 11/14/12

# Granularmetric Report

Depths and elevations based on measured values

Project Name: Flagler County

Sample Name: VC-FSP11-10 #1

Analysis Date: 04-01-11

Analyzed By:

US Army Corps of Engineers
701 San Marco Blvd
Jacksonville, Florida 32207
phone (904)396-7121

| Easting (ft): | Northing (ft): | Coordinate System: | Elevation (ft): |
|---|---|---|---|
| 687,241 | 1,890,088 | | -58.3 NAVD88 |

| USCS | Munsell: | Comments: |
|---|---|---|
| SP | Moist - 10Y 5/1 | |

| Fines (%): | Organics (%): | Carbonates (%): | Shells (%): |
|---|---|---|---|
| #230 - 0.74 | | | 8.00 |

| Sieve Number | Sieve Size (Phi) | Sieve Size (Millimeters) | % Weight Retained | C. % Weight Retained |
|---|---|---|---|---|
| #3.5 | -2.50 | 5.66 | 0.00 | 0.00 |
| #4 | -2.25 | 4.75 | 0.27 | 0.27 |
| #5 | -2.00 | 3.99 | 0.15 | 0.42 |
| #7 | -1.50 | 2.82 | 0.44 | 0.86 |
| #10 | -1.00 | 2.00 | 0.83 | 1.69 |
| #14 | -0.50 | 1.41 | 1.23 | 2.92 |
| #18 | 0.00 | 1.00 | 1.44 | 4.36 |
| #25 | 0.50 | 0.71 | 3.27 | 7.63 |
| #35 | 1.00 | 0.50 | 10.43 | 18.06 |
| #45 | 1.50 | 0.35 | 17.99 | 36.05 |
| #60 | 2.00 | 0.25 | 27.93 | 63.98 |
| #80 | 2.50 | 0.18 | 29.05 | 93.03 |
| #120 | 3.00 | 0.13 | 5.87 | 98.90 |
| #170 | 3.50 | 0.09 | 0.31 | 99.21 |
| #200 | 3.75 | 0.07 | 0.03 | 99.24 |
| #230 | 4.00 | 0.06 | 0.02 | 99.26 |

| Phi 5 | Phi 16 | Phi 25 | Phi 50 | Phi 75 | Phi 84 | Phi 95 |
|---|---|---|---|---|---|---|
| 2.67 | 2.34 | 2.19 | 1.75 | 1.19 | 0.90 | 0.10 |

| Moment | Mean Phi | Mean mm | Sorting | Skewness | Kurtosis |
|---|---|---|---|---|---|
| Statistics | 1.6 | 0.33 | 0.82 | -1.47 | 6.49 |

USACE GRANULARMETRIC REPORT FLAGLER_STAT_GINT.GPJ FL DEP ROSS.GDT 11/14/12

# Granularmetric Report

Depths and elevations based on measured values

Project Name: Flagler County

Sample Name: VC-FSP11-10 #2

Analysis Date: 04-01-11

Analyzed By:

US Army Corps of Engineers
701 San Marco Blvd
Jacksonville, Florida 32207
phone (904)396-7121

| Easting (ft): | Northing (ft): | Coordinate System: | Elevation (ft): |
|---|---|---|---|
| 687,241 | 1,890,088 | | -61.3 NAVD88 |

| USCS | Munsell: | Comments: |
|---|---|---|
| SW | Moist - 10Y 5/1 | |

| Fines (%): | Organics (%): | Carbonates (%): | Shells (%): |
|---|---|---|---|
| #230 - 1.40 | | | 8.00 |

| Sieve Number | Sieve Size (Phi) | Sieve Size (Millimeters) | % Weight Retained | C. % Weight Retained |
|---|---|---|---|---|
| 3/8 | -3.25 | 9.48 | 0.00 | 0.00 |
| #3.5 | -2.50 | 5.66 | 0.48 | 0.48 |
| #4 | -2.25 | 4.75 | 0.17 | 0.65 |
| #5 | -2.00 | 3.99 | 0.07 | 0.72 |
| #7 | -1.50 | 2.82 | 0.38 | 1.10 |
| #10 | -1.00 | 2.00 | 0.78 | 1.88 |
| #14 | -0.50 | 1.41 | 1.14 | 3.02 |
| #18 | 0.00 | 1.00 | 1.25 | 4.27 |
| #25 | 0.50 | 0.71 | 2.18 | 6.45 |
| #35 | 1.00 | 0.50 | 6.31 | 12.76 |
| #45 | 1.50 | 0.35 | 13.15 | 25.91 |
| #60 | 2.00 | 0.25 | 23.97 | 49.88 |
| #80 | 2.50 | 0.18 | 37.39 | 87.27 |
| #120 | 3.00 | 0.13 | 9.66 | 96.93 |
| #170 | 3.50 | 0.09 | 1.28 | 98.21 |
| #200 | 3.75 | 0.07 | 0.25 | 98.46 |
| #230 | 4.00 | 0.06 | 0.14 | 98.60 |

| Phi 5 | Phi 16 | Phi 25 | Phi 50 | Phi 75 | Phi 84 | Phi 95 |
|---|---|---|---|---|---|---|
| 2.90 | 2.46 | 2.33 | 2.00 | 1.46 | 1.12 | 0.17 |

| Moment | Mean Phi | Mean mm | Sorting | Skewness | Kurtosis |
|---|---|---|---|---|---|
| Statistics | 1.77 | 0.29 | 0.88 | -1.92 | 8.98 |

USACE GRANULARMETRIC REPORT FLAGLER_STAT_GINT.GPJ FL DEP ROSS.GDT 11/14/12

# Granularmetric Report

Depths and elevations based on measured values

Project Name: Flagler County

Sample Name: VC-FSP11-10 #3

Analysis Date: 04-01-11

Analyzed By:

US Army Corps of Engineers
701 San Marco Blvd
Jacksonville, Florida 32207
phone (904)396-7121

| Easting (ft): | Northing (ft): | Coordinate System: | Elevation (ft): |
|---|---|---|---|
| 687,241 | 1,890,088 | | -64.3 NAVD88 |

| USCS | Munsell: | Comments: |
|---|---|---|
| SW | Moist - 10Y 5/1 | |

| Fines (%): | Organics (%): | Carbonates (%): | Shells (%): |
|---|---|---|---|
| #230 - 1.12 | | | 29.00 |

| Sieve Number | Sieve Size (Phi) | Sieve Size (Millimeters) | % Weight Retained | C. % Weight Retained |
|---|---|---|---|---|
| 3/8 | -3.25 | 9.48 | 0.00 | 0.00 |
| #3.5 | -2.50 | 5.66 | 0.59 | 0.59 |
| #4 | -2.25 | 4.75 | 0.36 | 0.95 |
| #5 | -2.00 | 3.99 | 0.26 | 1.21 |
| #7 | -1.50 | 2.82 | 1.64 | 2.85 |
| #10 | -1.00 | 2.00 | 3.23 | 6.08 |
| #14 | -0.50 | 1.41 | 4.56 | 10.64 |
| #18 | 0.00 | 1.00 | 4.81 | 15.45 |
| #25 | 0.50 | 0.71 | 5.47 | 20.92 |
| #35 | 1.00 | 0.50 | 8.77 | 29.69 |
| #45 | 1.50 | 0.35 | 10.56 | 40.25 |
| #60 | 2.00 | 0.25 | 16.97 | 57.22 |
| #80 | 2.50 | 0.18 | 30.97 | 88.19 |
| #120 | 3.00 | 0.13 | 9.67 | 97.86 |
| #170 | 3.50 | 0.09 | 0.84 | 98.70 |
| #200 | 3.75 | 0.07 | 0.11 | 98.81 |
| #230 | 4.00 | 0.06 | 0.07 | 98.88 |

| Phi 5 | Phi 16 | Phi 25 | Phi 50 | Phi 75 | Phi 84 | Phi 95 |
|---|---|---|---|---|---|---|
| 2.85 | 2.43 | 2.29 | 1.78 | 0.73 | 0.05 | -1.17 |

| Moment | Mean Phi | Mean mm | Sorting | Skewness | Kurtosis |
|---|---|---|---|---|---|
| Statistics | 1.37 | 0.39 | 1.23 | -1.1 | 3.62 |

USACE GRANULARMETRIC REPORT FLAGLER_STAT_GINT.GPJ FL DEP ROSS.GDT 11/14/12

# Granularmetric Report

Depths and elevations based on measured values

Project Name: Flagler County

Sample Name: VC-FSP11-10 #4

Analysis Date: 04-01-11

Analyzed By:

US Army Corps of Engineers
701 San Marco Blvd
Jacksonville, Florida 32207
phone (904)396-7121

| Easting (ft): | Northing (ft): | Coordinate System: | Elevation (ft): |
|---|---|---|---|
| 687,241 | 1,890,088 | | -67.3 NAVD88 |

| USCS | Munsell: | Comments: |
|---|---|---|
| SW | Moist - 10Y 5/1 | |

| Fines (%): | Organics (%): | Carbonates (%): | Shells (%): |
|---|---|---|---|
| #230 - 1.95 | | 20.00 | 15.00 |

| Sieve Number | Sieve Size (Phi) | Sieve Size (Millimeters) | % Weight Retained | C. % Weight Retained |
|---|---|---|---|---|
| 3/8 | -3.25 | 9.48 | 0.00 | 0.00 |
| #3.5 | -2.50 | 5.66 | 0.32 | 0.32 |
| #4 | -2.25 | 4.75 | 0.02 | 0.34 |
| #5 | -2.00 | 3.99 | 0.12 | 0.46 |
| #7 | -1.50 | 2.82 | 0.51 | 0.97 |
| #10 | -1.00 | 2.00 | 1.04 | 2.01 |
| #14 | -0.50 | 1.41 | 1.42 | 3.43 |
| #18 | 0.00 | 1.00 | 1.38 | 4.81 |
| #25 | 0.50 | 0.71 | 1.65 | 6.46 |
| #35 | 1.00 | 0.50 | 3.91 | 10.37 |
| #45 | 1.50 | 0.35 | 8.87 | 19.24 |
| #60 | 2.00 | 0.25 | 16.84 | 36.08 |
| #80 | 2.50 | 0.18 | 41.17 | 77.25 |
| #120 | 3.00 | 0.13 | 17.90 | 95.15 |
| #170 | 3.50 | 0.09 | 2.35 | 97.50 |
| #200 | 3.75 | 0.07 | 0.36 | 97.86 |
| #230 | 4.00 | 0.06 | 0.19 | 98.05 |

| Phi 5 | Phi 16 | Phi 25 | Phi 50 | Phi 75 | Phi 84 | Phi 95 |
|---|---|---|---|---|---|---|
| 3.00 | 2.69 | 2.47 | 2.17 | 1.67 | 1.31 | 0.06 |

| Moment | Mean Phi | Mean mm | Sorting | Skewness | Kurtosis |
|---|---|---|---|---|---|
| Statistics | 1.94 | 0.26 | 0.91 | -1.99 | 8.49 |

USACE GRANULARMETRIC REPORT FLAGLER_STAT_GINT.GPJ FL DEP ROSS.GDT 11/14/12

# Granularmetric Report

Depths and elevations based on measured values

Project Name: Flagler County

Sample Name: VC-FSP11-10 #5

Analysis Date: 04-01-11

Analyzed By:

US Army Corps of Engineers
701 San Marco Blvd
Jacksonville, Florida 32207
phone (904)396-7121

| Easting (ft): | Northing (ft): | Coordinate System: | Elevation (ft): |
|---|---|---|---|
| 687,241 | 1,890,088 | | -69.3 NAVD88 |

| USCS | Munsell: | Comments: |
|---|---|---|
| SW | Moist - 10Y 5/1 | |

| Fines (%): | Organics (%): | Carbonates (%): | Shells (%): |
|---|---|---|---|
| #230 - 1.53 | | | 24.00 |

| Sieve Number | Sieve Size (Phi) | Sieve Size (Millimeters) | % Weight Retained | C. % Weight Retained |
|---|---|---|---|---|
| 3/4 | -4.25 | 19.03 | 0.00 | 0.00 |
| 3/8 | -3.25 | 9.48 | 0.52 | 0.52 |
| #3.5 | -2.50 | 5.66 | 1.25 | 1.77 |
| #4 | -2.25 | 4.75 | 0.33 | 2.10 |
| #5 | -2.00 | 3.99 | 0.27 | 2.37 |
| #7 | -1.50 | 2.82 | 1.63 | 4.00 |
| #10 | -1.00 | 2.00 | 2.39 | 6.39 |
| #14 | -0.50 | 1.41 | 3.30 | 9.69 |
| #18 | 0.00 | 1.00 | 3.76 | 13.45 |
| #25 | 0.50 | 0.71 | 5.51 | 18.96 |
| #35 | 1.00 | 0.50 | 11.27 | 30.23 |
| #45 | 1.50 | 0.35 | 13.29 | 43.52 |
| #60 | 2.00 | 0.25 | 15.67 | 59.19 |
| #80 | 2.50 | 0.18 | 27.21 | 86.40 |
| #120 | 3.00 | 0.13 | 10.32 | 96.72 |
| #170 | 3.50 | 0.09 | 1.58 | 98.30 |
| #200 | 3.75 | 0.07 | 0.12 | 98.42 |
| #230 | 4.00 | 0.06 | 0.05 | 98.47 |

| Phi 5 | Phi 16 | Phi 25 | Phi 50 | Phi 75 | Phi 84 | Phi 95 |
|---|---|---|---|---|---|---|
| 2.92 | 2.46 | 2.29 | 1.70 | 0.77 | 0.23 | -1.29 |

| Moment | Mean Phi | Mean mm | Sorting | Skewness | Kurtosis |
|---|---|---|---|---|---|
| Statistics | 1.35 | 0.39 | 1.28 | -1.33 | 4.86 |

USACE GRANULARMETRIC REPORT FLAGLER_STAT_GINT.GPJ FL DEP ROSS.GDT 11/14/12

# Granularmetric Report

Depths and elevations based on measured values

Project Name: Flagler County

Sample Name: VC-FSP11-11 #1

Analysis Date: 04-01-11

Analyzed By:

US Army Corps of Engineers
701 San Marco Blvd
Jacksonville, Florida 32207
phone (904)396-7121

| Easting (ft): | Northing (ft): | Coordinate System: | Elevation (ft): |
|---|---|---|---|
| 693,288 | 1,888,857 | | -59.7 NAVD88 |

| USCS | Munsell: | Comments: |
|---|---|---|
| SW | Moist - 5GY 5/1 | |

| Fines (%): | Organics (%): | Carbonates (%): | Shells (%): |
|---|---|---|---|
| #230 - 0.55 | | 26.00 | 29.00 |

| Sieve Number | Sieve Size (Phi) | Sieve Size (Millimeters) | % Weight Retained | C. % Weight Retained |
|---|---|---|---|---|
| 3/8 | -3.25 | 9.48 | 0.00 | 0.00 |
| #3.5 | -2.50 | 5.66 | 0.07 | 0.07 |
| #4 | -2.25 | 4.75 | 0.28 | 0.35 |
| #5 | -2.00 | 3.99 | 0.33 | 0.68 |
| #7 | -1.50 | 2.82 | 1.31 | 1.99 |
| #10 | -1.00 | 2.00 | 1.85 | 3.84 |
| #14 | -0.50 | 1.41 | 3.05 | 6.89 |
| #18 | 0.00 | 1.00 | 3.75 | 10.64 |
| #25 | 0.50 | 0.71 | 6.53 | 17.17 |
| #35 | 1.00 | 0.50 | 12.96 | 30.13 |
| #45 | 1.50 | 0.35 | 19.06 | 49.19 |
| #60 | 2.00 | 0.25 | 23.70 | 72.89 |
| #80 | 2.50 | 0.18 | 21.55 | 94.44 |
| #120 | 3.00 | 0.13 | 4.54 | 98.98 |
| #170 | 3.50 | 0.09 | 0.39 | 99.37 |
| #200 | 3.75 | 0.07 | 0.07 | 99.44 |
| #230 | 4.00 | 0.06 | 0.01 | 99.45 |

| Phi 5 | Phi 16 | Phi 25 | Phi 50 | Phi 75 | Phi 84 | Phi 95 |
|---|---|---|---|---|---|---|
| 2.56 | 2.26 | 2.05 | 1.51 | 0.80 | 0.41 | -0.81 |

| Moment | Mean Phi | Mean mm | Sorting | Skewness | Kurtosis |
|---|---|---|---|---|---|
| Statistics | 1.3 | 0.41 | 1.01 | -1.09 | 4.25 |

USACE GRANULARMETRIC REPORT FLAGLER_STAT_GINT.GPJ FL DEP ROSS.GDT 11/14/12

# Granularmetric Report

Depths and elevations based on measured values

Project Name: Flagler County

Sample Name: VC-FSP11-11 #2

Analysis Date: 04-01-11

Analyzed By:

US Army Corps of Engineers
701 San Marco Blvd
Jacksonville, Florida 32207
phone (904)396-7121

| Easting (ft): | Northing (ft): | Coordinate System: | Elevation (ft): |
|---|---|---|---|
| 693,288 | 1,888,857 | | -62.7 NAVD88 |

| USCS | Munsell: | Comments: |
|---|---|---|
| SP | Moist - 5GY 5/1 | |

| Fines (%): | Organics (%): | Carbonates (%): | Shells (%): |
|---|---|---|---|
| #230 - 2.51 | | | 17.00 |

| Sieve Number | Sieve Size (Phi) | Sieve Size (Millimeters) | % Weight Retained | C. % Weight Retained |
|---|---|---|---|---|
| #3.5 | -2.50 | 5.66 | 0.00 | 0.00 |
| #4 | -2.25 | 4.75 | 0.28 | 0.28 |
| #5 | -2.00 | 3.99 | 0.02 | 0.30 |
| #7 | -1.50 | 2.82 | 0.32 | 0.62 |
| #10 | -1.00 | 2.00 | 0.86 | 1.48 |
| #14 | -0.50 | 1.41 | 1.48 | 2.96 |
| #18 | 0.00 | 1.00 | 1.67 | 4.63 |
| #25 | 0.50 | 0.71 | 2.42 | 7.05 |
| #35 | 1.00 | 0.50 | 5.55 | 12.60 |
| #45 | 1.50 | 0.35 | 12.73 | 25.33 |
| #60 | 2.00 | 0.25 | 26.24 | 51.57 |
| #80 | 2.50 | 0.18 | 35.32 | 86.89 |
| #120 | 3.00 | 0.13 | 8.91 | 95.80 |
| #170 | 3.50 | 0.09 | 1.20 | 97.00 |
| #200 | 3.75 | 0.07 | 0.30 | 97.30 |
| #230 | 4.00 | 0.06 | 0.19 | 97.49 |

| Phi 5 | Phi 16 | Phi 25 | Phi 50 | Phi 75 | Phi 84 | Phi 95 |
|---|---|---|---|---|---|---|
| 2.96 | 2.46 | 2.33 | 1.97 | 1.48 | 1.13 | 0.08 |

| Moment | Mean Phi | Mean mm | Sorting | Skewness | Kurtosis |
|---|---|---|---|---|---|
| Statistics | 1.77 | 0.29 | 0.84 | -1.58 | 6.87 |

USACE GRANULARMETRIC REPORT FLAGLER_STAT_GINT.GPJ FL DEP ROSS.GDT 11/14/12

# Granularmetric Report

Depths and elevations based on measured values

Project Name: Flagler County

Sample Name: VC-FSP11-11 #3

Analysis Date: 04-01-11

Analyzed By:

US Army Corps of Engineers
701 San Marco Blvd
Jacksonville, Florida 32207
phone (904)396-7121

| Easting (ft): | Northing (ft): | Coordinate System: | Elevation (ft): |
|---|---|---|---|
| 693,288 | 1,888,857 | | -65.7 NAVD88 |

| USCS | Munsell: | Comments: |
|---|---|---|
| SW | Moist - 5GY 5/1 | |

| Fines (%): | Organics (%): | Carbonates (%): | Shells (%): |
|---|---|---|---|
| #230 - 1.35 | | | 12.00 |

| Sieve Number | Sieve Size (Phi) | Sieve Size (Millimeters) | % Weight Retained | C. % Weight Retained |
|---|---|---|---|---|
| 3/8 | -3.25 | 9.48 | 0.00 | 0.00 |
| #3.5 | -2.50 | 5.66 | 0.65 | 0.65 |
| #4 | -2.25 | 4.75 | 0.09 | 0.74 |
| #5 | -2.00 | 3.99 | 0.40 | 1.14 |
| #7 | -1.50 | 2.82 | 0.61 | 1.75 |
| #10 | -1.00 | 2.00 | 0.90 | 2.65 |
| #14 | -0.50 | 1.41 | 1.18 | 3.83 |
| #18 | 0.00 | 1.00 | 1.15 | 4.98 |
| #25 | 0.50 | 0.71 | 1.33 | 6.31 |
| #35 | 1.00 | 0.50 | 2.77 | 9.08 |
| #45 | 1.50 | 0.35 | 5.90 | 14.98 |
| #60 | 2.00 | 0.25 | 13.18 | 28.16 |
| #80 | 2.50 | 0.18 | 42.44 | 70.60 |
| #120 | 3.00 | 0.13 | 25.38 | 95.98 |
| #170 | 3.50 | 0.09 | 2.36 | 98.34 |
| #200 | 3.75 | 0.07 | 0.24 | 98.58 |
| #230 | 4.00 | 0.06 | 0.07 | 98.65 |

| Phi 5 | Phi 16 | Phi 25 | Phi 50 | Phi 75 | Phi 84 | Phi 95 |
|---|---|---|---|---|---|---|
| 2.98 | 2.76 | 2.59 | 2.26 | 1.88 | 1.53 | 0.01 |

| Moment | Mean Phi | Mean mm | Sorting | Skewness | Kurtosis |
|---|---|---|---|---|---|
| Statistics | 2.03 | 0.24 | 0.96 | -2.51 | 10.76 |

USACE GRANULARMETRIC REPORT FLAGLER_STAT_GINT.GPJ FL DEP ROSS.GDT 11/14/12

# Granularmetric Report

Depths and elevations based on measured values

Project Name: Flagler County

Sample Name: VC-FSP11-12 #1

Analysis Date: 04-01-11

Analyzed By:

US Army Corps of Engineers
701 San Marco Blvd
Jacksonville, Florida 32207
phone (904)396-7121

| Easting (ft): | Northing (ft): | Coordinate System: | Elevation (ft): |
|---|---|---|---|
| 691,249 | 1,884,893 | | -58.1 NAVD88 |

| USCS | Munsell: | Comments: |
|---|---|---|
| SP | Moist - 10Y 5/1 | |

| | | | Fines (%): | Organics (%): | Carbonates (%): | Shells (%): |
|---|---|---|---|---|---|---|
| | | | #230 - 0.80 | | | 10.00 |

| Sieve Number | Sieve Size (Phi) | Sieve Size (Millimeters) | % Weight Retained | C. % Weight Retained |
|---|---|---|---|---|
| 3/4 | -4.25 | 19.03 | 0.00 | 0.00 |
| 3/8 | -3.25 | 9.48 | 0.17 | 0.17 |
| #3.5 | -2.50 | 5.66 | 0.00 | 0.17 |
| #4 | -2.25 | 4.75 | 0.00 | 0.17 |
| #5 | -2.00 | 3.99 | 0.09 | 0.26 |
| #7 | -1.50 | 2.82 | 0.41 | 0.67 |
| #10 | -1.00 | 2.00 | 0.58 | 1.25 |
| #14 | -0.50 | 1.41 | 0.71 | 1.96 |
| #18 | 0.00 | 1.00 | 0.92 | 2.88 |
| #25 | 0.50 | 0.71 | 2.29 | 5.17 |
| #35 | 1.00 | 0.50 | 6.11 | 11.28 |
| #45 | 1.50 | 0.35 | 12.63 | 23.91 |
| #60 | 2.00 | 0.25 | 27.01 | 50.92 |
| #80 | 2.50 | 0.18 | 38.98 | 89.90 |
| #120 | 3.00 | 0.13 | 8.49 | 98.39 |
| #170 | 3.50 | 0.09 | 0.75 | 99.14 |
| #200 | 3.75 | 0.07 | 0.04 | 99.18 |
| #230 | 4.00 | 0.06 | 0.02 | 99.20 |

| Phi 5 | Phi 16 | Phi 25 | Phi 50 | Phi 75 | Phi 84 | Phi 95 |
|---|---|---|---|---|---|---|
| 2.80 | 2.42 | 2.31 | 1.98 | 1.52 | 1.18 | 0.46 |

| Moment | Mean Phi | Mean mm | Sorting | Skewness | Kurtosis |
|---|---|---|---|---|---|
| Statistics | 1.8 | 0.29 | 0.77 | -2.04 | 10.73 |

USACE GRANULARMETRIC REPORT FLAGLER_STAT_GINT.GPJ FL DEP ROSS.GDT 11/14/12

# Granularmetric Report

Depths and elevations based on measured values

Project Name: Flagler County

Sample Name: VC-FSP11-12 #2

Analysis Date: 04-01-11

Analyzed By:

US Army Corps of Engineers
701 San Marco Blvd
Jacksonville, Florida 32207
phone (904)396-7121

| Easting (ft): | Northing (ft): | Coordinate System: | Elevation (ft): |
|---|---|---|---|
| 691,249 | 1,884,893 | | -61.1 NAVD88 |

| USCS | Munsell: | Comments: |
|---|---|---|
| SW | Moist - 10Y 5/1 | |

| | | | Fines (%): | Organics (%): | Carbonates (%): | Shells (%): |
|---|---|---|---|---|---|---|
| | | | #230 - 0.95 | | 32.00 | 32.00 |

| Sieve Number | Sieve Size (Phi) | Sieve Size (Millimeters) | % Weight Retained | C. % Weight Retained |
|---|---|---|---|---|
| 3/4 | -4.25 | 19.03 | 0.00 | 0.00 |
| 3/8 | -3.25 | 9.48 | 0.33 | 0.33 |
| #3.5 | -2.50 | 5.66 | 0.74 | 1.07 |
| #4 | -2.25 | 4.75 | 0.88 | 1.95 |
| #5 | -2.00 | 3.99 | 0.51 | 2.46 |
| #7 | -1.50 | 2.82 | 2.33 | 4.79 |
| #10 | -1.00 | 2.00 | 4.14 | 8.93 |
| #14 | -0.50 | 1.41 | 4.18 | 13.11 |
| #18 | 0.00 | 1.00 | 3.21 | 16.32 |
| #25 | 0.50 | 0.71 | 3.77 | 20.09 |
| #35 | 1.00 | 0.50 | 6.67 | 26.76 |
| #45 | 1.50 | 0.35 | 10.74 | 37.50 |
| #60 | 2.00 | 0.25 | 20.33 | 57.83 |
| #80 | 2.50 | 0.18 | 32.10 | 89.93 |
| #120 | 3.00 | 0.13 | 8.23 | 98.16 |
| #170 | 3.50 | 0.09 | 0.71 | 98.87 |
| #200 | 3.75 | 0.07 | 0.09 | 98.96 |
| #230 | 4.00 | 0.06 | 0.09 | 99.05 |

| Phi 5 | Phi 16 | Phi 25 | Phi 50 | Phi 75 | Phi 84 | Phi 95 |
|---|---|---|---|---|---|---|
| 2.81 | 2.41 | 2.27 | 1.80 | 0.87 | -0.05 | -1.47 |

| Moment | Mean Phi | Mean mm | Sorting | Skewness | Kurtosis |
|---|---|---|---|---|---|
| Statistics | 1.34 | 0.40 | 1.32 | -1.35 | 4.21 |

USACE GRANULARMETRIC REPORT FLAGLER_STAT_GINT.GPJ FL DEP ROSS.GDT 11/14/12

# Granularmetric Report

Depths and elevations based on measured values

Project Name: Flagler County

Sample Name: VC-FSP11-12 #3

Analysis Date: 04-01-11

Analyzed By:

US Army Corps of Engineers
701 San Marco Blvd
Jacksonville, Florida 32207
phone (904)396-7121

| Easting (ft): | Northing (ft): | Coordinate System: | Elevation (ft): |
|---|---|---|---|
| 691,249 | 1,884,893 | | -64.1 NAVD88 |

| USCS | Munsell: | Comments: |
|---|---|---|
| SW | Moist - 10Y 5/1 | |

| Fines (%): | Organics (%): | Carbonates (%): | Shells (%): |
|---|---|---|---|
| #230 - 1.14 | | | 21.00 |

| Sieve Number | Sieve Size (Phi) | Sieve Size (Millimeters) | % Weight Retained | C. % Weight Retained |
|---|---|---|---|---|
| 3/8 | -3.25 | 9.48 | 0.00 | 0.00 |
| #3.5 | -2.50 | 5.66 | 0.11 | 0.11 |
| #4 | -2.25 | 4.75 | 0.06 | 0.17 |
| #5 | -2.00 | 3.99 | 0.28 | 0.45 |
| #7 | -1.50 | 2.82 | 1.14 | 1.59 |
| #10 | -1.00 | 2.00 | 1.60 | 3.19 |
| #14 | -0.50 | 1.41 | 2.18 | 5.37 |
| #18 | 0.00 | 1.00 | 2.22 | 7.59 |
| #25 | 0.50 | 0.71 | 3.01 | 10.60 |
| #35 | 1.00 | 0.50 | 5.58 | 16.18 |
| #45 | 1.50 | 0.35 | 9.20 | 25.38 |
| #60 | 2.00 | 0.25 | 17.57 | 42.95 |
| #80 | 2.50 | 0.18 | 38.62 | 81.57 |
| #120 | 3.00 | 0.13 | 15.26 | 96.83 |
| #170 | 3.50 | 0.09 | 1.87 | 98.70 |
| #200 | 3.75 | 0.07 | 0.07 | 98.77 |
| #230 | 4.00 | 0.06 | 0.09 | 98.86 |

| Phi 5 | Phi 16 | Phi 25 | Phi 50 | Phi 75 | Phi 84 | Phi 95 |
|---|---|---|---|---|---|---|
| 2.94 | 2.58 | 2.41 | 2.09 | 1.47 | 0.98 | -0.58 |

| Moment | Mean Phi | Mean mm | Sorting | Skewness | Kurtosis |
|---|---|---|---|---|---|
| Statistics | 1.77 | 0.29 | 1.02 | -1.64 | 5.79 |

USACE GRANULARMETRIC REPORT FLAGLER_STAT_GINT.GPJ FL DEP ROSS.GDT 11/14/12

# Granularmetric Report

Depths and elevations based on measured values

Project Name: Flagler County

Sample Name: VC-FSP11-12 #4

Analysis Date: 04-01-11

Analyzed By:

US Army Corps of Engineers
701 San Marco Blvd
Jacksonville, Florida 32207
phone (904)396-7121

| Easting (ft): | Northing (ft): | Coordinate System: | Elevation (ft): |
|---|---|---|---|
| 691,249 | 1,884,893 | | -66.1 NAVD88 |

| USCS | Munsell: | Comments: |
|---|---|---|
| SW | Moist - 10Y 5/1 | |

| Fines (%): | Organics (%): | Carbonates (%): | Shells (%): |
|---|---|---|---|
| #230 - 2.21 | | | 26.00 |

| Sieve Number | Sieve Size (Phi) | Sieve Size (Millimeters) | % Weight Retained | C. % Weight Retained |
|---|---|---|---|---|
| 3/4 | -4.25 | 19.03 | 0.00 | 0.00 |
| 3/8 | -3.25 | 9.48 | 0.32 | 0.32 |
| #3.5 | -2.50 | 5.66 | 0.57 | 0.89 |
| #4 | -2.25 | 4.75 | 0.43 | 1.32 |
| #5 | -2.00 | 3.99 | 0.26 | 1.58 |
| #7 | -1.50 | 2.82 | 0.93 | 2.51 |
| #10 | -1.00 | 2.00 | 2.30 | 4.81 |
| #14 | -0.50 | 1.41 | 3.06 | 7.87 |
| #18 | 0.00 | 1.00 | 3.46 | 11.33 |
| #25 | 0.50 | 0.71 | 4.40 | 15.73 |
| #35 | 1.00 | 0.50 | 7.04 | 22.77 |
| #45 | 1.50 | 0.35 | 10.17 | 32.94 |
| #60 | 2.00 | 0.25 | 17.70 | 50.64 |
| #80 | 2.50 | 0.18 | 32.65 | 83.29 |
| #120 | 3.00 | 0.13 | 12.00 | 95.29 |
| #170 | 3.50 | 0.09 | 1.99 | 97.28 |
| #200 | 3.75 | 0.07 | 0.40 | 97.68 |
| #230 | 4.00 | 0.06 | 0.11 | 97.79 |

| Phi 5 | Phi 16 | Phi 25 | Phi 50 | Phi 75 | Phi 84 | Phi 95 |
|---|---|---|---|---|---|---|
| 2.99 | 2.53 | 2.37 | 1.98 | 1.11 | 0.52 | -0.97 |

| Moment | Mean Phi | Mean mm | Sorting | Skewness | Kurtosis |
|---|---|---|---|---|---|
| Statistics | 1.56 | 0.34 | 1.2 | -1.47 | 5.33 |

USACE GRANULARMETRIC REPORT FLAGLER_STAT_GINT.GPJ FL DEP ROSS.GDT 11/14/12

# Granularmetric Report

Depths and elevations based on measured values

Project Name: Flagler County

Sample Name: VC-FSP11-13 #1

Analysis Date: 04-01-11

Analyzed By:

US Army Corps of Engineers
701 San Marco Blvd
Jacksonville, Florida 32207
phone (904)396-7121

| Easting (ft): | Northing (ft): | Coordinate System: | Elevation (ft): |
|---|---|---|---|
| 697,758 | 1,881,943 | | -55.8 NAVD88 |

| USCS | Munsell: | Comments: |
|---|---|---|
| SP | Moist - N 5/ | |

| Fines (%): | Organics (%): | Carbonates (%): | Shells (%): |
|---|---|---|---|
| #230 - 0.01 | | | 9.00 |

| Sieve Number | Sieve Size (Phi) | Sieve Size (Millimeters) | % Weight Retained | C. % Weight Retained |
|---|---|---|---|---|
| 3/8 | -3.25 | 9.48 | 0.00 | 0.00 |
| #3.5 | -2.50 | 5.66 | 0.14 | 0.14 |
| #4 | -2.25 | 4.75 | 0.06 | 0.20 |
| #5 | -2.00 | 3.99 | 0.00 | 0.20 |
| #7 | -1.50 | 2.82 | 0.23 | 0.43 |
| #10 | -1.00 | 2.00 | 0.45 | 0.88 |
| #14 | -0.50 | 1.41 | 0.97 | 1.85 |
| #18 | 0.00 | 1.00 | 1.18 | 3.03 |
| #25 | 0.50 | 0.71 | 3.11 | 6.14 |
| #35 | 1.00 | 0.50 | 9.18 | 15.32 |
| #45 | 1.50 | 0.35 | 17.48 | 32.80 |
| #60 | 2.00 | 0.25 | 32.12 | 64.92 |
| #80 | 2.50 | 0.18 | 30.83 | 95.75 |
| #120 | 3.00 | 0.13 | 3.94 | 99.69 |
| #170 | 3.50 | 0.09 | 0.23 | 99.92 |
| #200 | 3.75 | 0.07 | 0.06 | 99.98 |
| #230 | 4.00 | 0.06 | 0.01 | 99.99 |

| Phi 5 | Phi 16 | Phi 25 | Phi 50 | Phi 75 | Phi 84 | Phi 95 |
|---|---|---|---|---|---|---|
| 2.49 | 2.31 | 2.16 | 1.76 | 1.27 | 1.02 | 0.32 |

| Moment | Mean Phi | Mean mm | Sorting | Skewness | Kurtosis |
|---|---|---|---|---|---|
| Statistics | 1.64 | 0.32 | 0.73 | -1.53 | 7.45 |

USACE GRANULARMETRIC REPORT FLAGLER_STAT_GINT.GPJ FL DEP ROSS.GDT 11/14/12

# Granularmetric Report

Depths and elevations based on measured values

Project Name: Flagler County

Sample Name: VC-FSP11-13 #2

Analysis Date: 04-01-11

Analyzed By:

US Army Corps of Engineers
701 San Marco Blvd
Jacksonville, Florida 32207
phone (904)396-7121

| Easting (ft): | Northing (ft): | Coordinate System: | Elevation (ft): |
|---|---|---|---|
| 697,758 | 1,881,943 | | -58.8 NAVD88 |

| USCS | Munsell: | Comments: |
|---|---|---|
| SP | Moist - N 5/ | |

| Fines (%): | Organics (%): | Carbonates (%): | Shells (%): |
|---|---|---|---|
| #230 - 0.98 | | 19.00 | 10.00 |

| Sieve Number | Sieve Size (Phi) | Sieve Size (Millimeters) | % Weight Retained | C. % Weight Retained |
|---|---|---|---|---|
| #3.5 | -2.50 | 5.66 | 0.00 | 0.00 |
| #4 | -2.25 | 4.75 | 0.02 | 0.02 |
| #5 | -2.00 | 3.99 | 0.02 | 0.04 |
| #7 | -1.50 | 2.82 | 0.21 | 0.25 |
| #10 | -1.00 | 2.00 | 0.40 | 0.65 |
| #14 | -0.50 | 1.41 | 0.87 | 1.52 |
| #18 | 0.00 | 1.00 | 1.15 | 2.67 |
| #25 | 0.50 | 0.71 | 2.08 | 4.75 |
| #35 | 1.00 | 0.50 | 5.48 | 10.23 |
| #45 | 1.50 | 0.35 | 13.34 | 23.57 |
| #60 | 2.00 | 0.25 | 27.13 | 50.70 |
| #80 | 2.50 | 0.18 | 39.81 | 90.51 |
| #120 | 3.00 | 0.13 | 8.29 | 98.80 |
| #170 | 3.50 | 0.09 | 0.15 | 98.95 |
| #200 | 3.75 | 0.07 | 0.05 | 99.00 |
| #230 | 4.00 | 0.06 | 0.02 | 99.02 |

| Phi 5 | Phi 16 | Phi 25 | Phi 50 | Phi 75 | Phi 84 | Phi 95 |
|---|---|---|---|---|---|---|
| 2.77 | 2.42 | 2.30 | 1.98 | 1.52 | 1.21 | 0.52 |

| Moment | Mean Phi | Mean mm | Sorting | Skewness | Kurtosis |
|---|---|---|---|---|---|
| Statistics | 1.82 | 0.28 | 0.7 | -1.6 | 7.04 |

USACE GRANULARMETRIC REPORT FLAGLER_STAT_GINT.GPJ FL DEP ROSS.GDT 11/14/12

# Granularmetric Report

Depths and elevations based on measured values

Project Name: Flagler County

Sample Name: VC-FSP11-13 #3

Analysis Date: 04-01-11

Analyzed By:

US Army Corps of Engineers
701 San Marco Blvd
Jacksonville, Florida 32207
phone (904)396-7121

| Easting (ft): | Northing (ft): | Coordinate System: | Elevation (ft): |
|---|---|---|---|
| 697,758 | 1,881,943 | | -61.8 NAVD88 |

| USCS | Munsell: | Comments: |
|---|---|---|
| SW | Moist - N 5/ | |

| Fines (%): | Organics (%): | Carbonates (%): | Shells (%): |
|---|---|---|---|
| #230 - 1.83 | | | 14.00 |

| Sieve Number | Sieve Size (Phi) | Sieve Size (Millimeters) | % Weight Retained | C. % Weight Retained |
|---|---|---|---|---|
| 3/8 | -3.25 | 9.48 | 0.00 | 0.00 |
| #3.5 | -2.50 | 5.66 | 0.81 | 0.81 |
| #4 | -2.25 | 4.75 | 0.07 | 0.88 |
| #5 | -2.00 | 3.99 | 0.14 | 1.02 |
| #7 | -1.50 | 2.82 | 0.33 | 1.35 |
| #10 | -1.00 | 2.00 | 1.23 | 2.58 |
| #14 | -0.50 | 1.41 | 2.42 | 5.00 |
| #18 | 0.00 | 1.00 | 2.98 | 7.98 |
| #25 | 0.50 | 0.71 | 4.18 | 12.16 |
| #35 | 1.00 | 0.50 | 8.14 | 20.30 |
| #45 | 1.50 | 0.35 | 14.71 | 35.01 |
| #60 | 2.00 | 0.25 | 24.69 | 59.70 |
| #80 | 2.50 | 0.18 | 30.09 | 89.79 |
| #120 | 3.00 | 0.13 | 7.05 | 96.84 |
| #170 | 3.50 | 0.09 | 0.96 | 97.80 |
| #200 | 3.75 | 0.07 | 0.21 | 98.01 |
| #230 | 4.00 | 0.06 | 0.16 | 98.17 |

| Phi 5 | Phi 16 | Phi 25 | Phi 50 | Phi 75 | Phi 84 | Phi 95 |
|---|---|---|---|---|---|---|
| 2.87 | 2.40 | 2.25 | 1.80 | 1.16 | 0.73 | -0.50 |

| Moment | Mean Phi | Mean mm | Sorting | Skewness | Kurtosis |
|---|---|---|---|---|---|
| Statistics | 1.56 | 0.34 | 1 | -1.53 | 6.3 |

USACE GRANULARMETRIC REPORT FLAGLER_STAT_GINT.GPJ FL DEP ROSS.GDT 11/14/12

# Granularmetric Report

Depths and elevations based on measured values

Project Name: Flagler County

Sample Name: VC-FSP11-13 #4

Analysis Date: 04-01-11

Analyzed By:

US Army Corps of Engineers
701 San Marco Blvd
Jacksonville, Florida 32207
phone (904)396-7121

| Easting (ft): | Northing (ft): | Coordinate System: | Elevation (ft): |
|---|---|---|---|
| 697,758 | 1,881,943 | | -63.8 NAVD88 |

| USCS | Munsell: | Comments: |
|---|---|---|
| SW | Moist - N 5/ | |

| | | | Fines (%): | Organics (%): | Carbonates (%): | Shells (%): |
|---|---|---|---|---|---|---|
| | | | #230 - 2.45 | | | 12.00 |

| Sieve Number | Sieve Size (Phi) | Sieve Size (Millimeters) | % Weight Retained | C. % Weight Retained |
|---|---|---|---|---|
| 3/8 | -3.25 | 9.48 | 0.00 | 0.00 |
| #3.5 | -2.50 | 5.66 | 0.43 | 0.43 |
| #4 | -2.25 | 4.75 | 0.06 | 0.49 |
| #5 | -2.00 | 3.99 | 0.06 | 0.55 |
| #7 | -1.50 | 2.82 | 0.27 | 0.82 |
| #10 | -1.00 | 2.00 | 0.81 | 1.63 |
| #14 | -0.50 | 1.41 | 1.39 | 3.02 |
| #18 | 0.00 | 1.00 | 1.70 | 4.72 |
| #25 | 0.50 | 0.71 | 2.50 | 7.22 |
| #35 | 1.00 | 0.50 | 5.15 | 12.37 |
| #45 | 1.50 | 0.35 | 11.29 | 23.66 |
| #60 | 2.00 | 0.25 | 23.82 | 47.48 |
| #80 | 2.50 | 0.18 | 38.20 | 85.68 |
| #120 | 3.00 | 0.13 | 9.26 | 94.94 |
| #170 | 3.50 | 0.09 | 2.25 | 97.19 |
| #200 | 3.75 | 0.07 | 0.24 | 97.43 |
| #230 | 4.00 | 0.06 | 0.12 | 97.55 |

| Phi 5 | Phi 16 | Phi 25 | Phi 50 | Phi 75 | Phi 84 | Phi 95 |
|---|---|---|---|---|---|---|
| 3.01 | 2.48 | 2.36 | 2.03 | 1.52 | 1.16 | 0.06 |

| Moment | Mean Phi | Mean mm | Sorting | Skewness | Kurtosis |
|---|---|---|---|---|---|
| Statistics | 1.8 | 0.29 | 0.88 | -1.81 | 8.24 |

USACE GRANULARMETRIC REPORT FLAGLER_STAT_GINT.GPJ FL DEP ROSS.GDT 11/14/12

# Granularmetric Report

Depths and elevations based on measured values

Project Name: Flagler County

Sample Name: VC-FSP11-14 #1

Analysis Date: 04-01-11

Analyzed By:

US Army Corps of Engineers
701 San Marco Blvd
Jacksonville, Florida 32207
phone (904)396-7121

| Easting (ft): | Northing (ft): | Coordinate System: | Elevation (ft): |
|---|---|---|---|
| 652,240 | 1,872,434 | | -59.1 NAVD88 |

| USCS | Munsell: | Comments: |
|---|---|---|
| SW | Moist - 10Y 5/1 | |

| | | | Fines (%): | Organics (%): | Carbonates (%): | Shells (%): |
|---|---|---|---|---|---|---|
| | | | #230 - 0.96 | | | 16.00 |

| Sieve Number | Sieve Size (Phi) | Sieve Size (Millimeters) | % Weight Retained | C. % Weight Retained |
|---|---|---|---|---|
| 3/4 | -4.25 | 19.03 | 0.00 | 0.00 |
| 3/8 | -3.25 | 9.48 | 0.13 | 0.13 |
| #3.5 | -2.50 | 5.66 | 1.02 | 1.15 |
| #4 | -2.25 | 4.75 | 0.14 | 1.29 |
| #5 | -2.00 | 3.99 | 0.40 | 1.69 |
| #7 | -1.50 | 2.82 | 0.99 | 2.68 |
| #10 | -1.00 | 2.00 | 0.99 | 3.67 |
| #14 | -0.50 | 1.41 | 1.02 | 4.69 |
| #18 | 0.00 | 1.00 | 1.23 | 5.92 |
| #25 | 0.50 | 0.71 | 1.49 | 7.41 |
| #35 | 1.00 | 0.50 | 2.53 | 9.94 |
| #45 | 1.50 | 0.35 | 6.73 | 16.67 |
| #60 | 2.00 | 0.25 | 20.25 | 36.92 |
| #80 | 2.50 | 0.18 | 38.00 | 74.92 |
| #120 | 3.00 | 0.13 | 21.66 | 96.58 |
| #170 | 3.50 | 0.09 | 2.19 | 98.77 |
| #200 | 3.75 | 0.07 | 0.23 | 99.00 |
| #230 | 4.00 | 0.06 | 0.04 | 99.04 |

| Phi 5 | Phi 16 | Phi 25 | Phi 50 | Phi 75 | Phi 84 | Phi 95 |
|---|---|---|---|---|---|---|
| 2.96 | 2.71 | 2.50 | 2.17 | 1.70 | 1.45 | -0.37 |

| Moment | Mean Phi | Mean mm | Sorting | Skewness | Kurtosis |
|---|---|---|---|---|---|
| Statistics | 1.92 | 0.26 | 1.04 | -2.48 | 10.4 |

USACE GRANULARMETRIC REPORT FLAGLER_STAT_GINT.GPJ FL DEP ROSS.GDT 11/14/12

# Granularmetric Report

Depths and elevations based on measured values

Project Name: Flagler County

Sample Name: VC-FSP11-14 #2

Analysis Date: 04-01-11

Analyzed By:

US Army Corps of Engineers
701 San Marco Blvd
Jacksonville, Florida 32207
phone (904)396-7121

| Easting (ft): | Northing (ft): | Coordinate System: | Elevation (ft): |
|---|---|---|---|
| 652,240 | 1,872,434 | | -61.1 NAVD88 |

| USCS | Munsell: | Comments: |
|---|---|---|
| SW | Moist - 10Y 5/1 | |

| | | | Fines (%): | Organics (%): | Carbonates (%): | Shells (%): |
|---|---|---|---|---|---|---|
| | | | #230 - 1.36 | | | 18.00 |

| Sieve Number | Sieve Size (Phi) | Sieve Size (Millimeters) | % Weight Retained | C. % Weight Retained |
|---|---|---|---|---|
| 3/8 | -3.25 | 9.48 | 0.00 | 0.00 |
| #3.5 | -2.50 | 5.66 | 0.79 | 0.79 |
| #4 | -2.25 | 4.75 | 0.36 | 1.15 |
| #5 | -2.00 | 3.99 | 0.23 | 1.38 |
| #7 | -1.50 | 2.82 | 1.09 | 2.47 |
| #10 | -1.00 | 2.00 | 1.46 | 3.93 |
| #14 | -0.50 | 1.41 | 1.98 | 5.91 |
| #18 | 0.00 | 1.00 | 2.09 | 8.00 |
| #25 | 0.50 | 0.71 | 2.04 | 10.04 |
| #35 | 1.00 | 0.50 | 2.68 | 12.72 |
| #45 | 1.50 | 0.35 | 4.98 | 17.70 |
| #60 | 2.00 | 0.25 | 13.07 | 30.77 |
| #80 | 2.50 | 0.18 | 35.37 | 66.14 |
| #120 | 3.00 | 0.13 | 29.54 | 95.68 |
| #170 | 3.50 | 0.09 | 2.52 | 98.20 |
| #200 | 3.75 | 0.07 | 0.34 | 98.54 |
| #230 | 4.00 | 0.06 | 0.10 | 98.64 |

| Phi 5 | Phi 16 | Phi 25 | Phi 50 | Phi 75 | Phi 84 | Phi 95 |
|---|---|---|---|---|---|---|
| 2.99 | 2.80 | 2.65 | 2.27 | 1.78 | 1.33 | -0.73 |

| Moment | Mean Phi | Mean mm | Sorting | Skewness | Kurtosis |
|---|---|---|---|---|---|
| Statistics | 1.95 | 0.26 | 1.12 | -2.1 | 7.6 |

USACE GRANULARMETRIC REPORT FLAGLER_STAT_GINT.GPJ FL DEP ROSS.GDT 11/14/12

# Granularmetric Report

Depths and elevations based on measured values

Project Name: Flagler County

Sample Name: VC-FSP11-14 #3

Analysis Date: 04-01-11

Analyzed By:

US Army Corps of Engineers
701 San Marco Blvd
Jacksonville, Florida 32207
phone (904)396-7121

| Easting (ft): | Northing (ft): | Coordinate System: | Elevation (ft): |
|---|---|---|---|
| 652,240 | 1,872,434 | | -63.1 NAVD88 |

| USCS | Munsell: | Comments: |
|---|---|---|
| SW | Moist - 5GY 5/1 | |

| Fines (%): | Organics (%): | Carbonates (%): | Shells (%): |
|---|---|---|---|
| #230 - 4.52 | | | 22.00 |

| Sieve Number | Sieve Size (Phi) | Sieve Size (Millimeters) | % Weight Retained | C. % Weight Retained |
|---|---|---|---|---|
| 3/4 | -4.25 | 19.03 | 0.00 | 0.00 |
| 3/8 | -3.25 | 9.48 | 0.60 | 0.60 |
| #3.5 | -2.50 | 5.66 | 0.11 | 0.71 |
| #4 | -2.25 | 4.75 | 0.29 | 1.00 |
| #5 | -2.00 | 3.99 | 0.37 | 1.37 |
| #7 | -1.50 | 2.82 | 1.16 | 2.53 |
| #10 | -1.00 | 2.00 | 1.35 | 3.88 |
| #14 | -0.50 | 1.41 | 1.99 | 5.87 |
| #18 | 0.00 | 1.00 | 2.15 | 8.02 |
| #25 | 0.50 | 0.71 | 2.19 | 10.21 |
| #35 | 1.00 | 0.50 | 2.76 | 12.97 |
| #45 | 1.50 | 0.35 | 3.68 | 16.65 |
| #60 | 2.00 | 0.25 | 7.09 | 23.74 |
| #80 | 2.50 | 0.18 | 22.58 | 46.32 |
| #120 | 3.00 | 0.13 | 40.48 | 86.80 |
| #170 | 3.50 | 0.09 | 7.10 | 93.90 |
| #200 | 3.75 | 0.07 | 1.19 | 95.09 |
| #230 | 4.00 | 0.06 | 0.39 | 95.48 |

| Phi 5 | Phi 16 | Phi 25 | Phi 50 | Phi 75 | Phi 84 | Phi 95 |
|---|---|---|---|---|---|---|
| 3.73 | 2.97 | 2.85 | 2.55 | 2.02 | 1.41 | -0.72 |

| Moment | Mean Phi | Mean mm | Sorting | Skewness | Kurtosis |
|---|---|---|---|---|---|
| Statistics | 2.1 | 0.23 | 1.22 | -2.14 | 7.9 |

USACE GRANULARMETRIC REPORT FLAGLER_STAT_GINT.GPJ FL DEP ROSS.GDT 11/14/12

# Granularmetric Report

Depths and elevations based on measured values

Project Name: Flagler County

Sample Name: VC-FSP11-14 #4

Analysis Date: 04-01-11

Analyzed By:

US Army Corps of Engineers
701 San Marco Blvd
Jacksonville, Florida 32207
phone (904)396-7121

| Easting (ft): | Northing (ft): | Coordinate System: | Elevation (ft): |
|---|---|---|---|
| 652,240 | 1,872,434 | | -66.1 NAVD88 |

| USCS | Munsell: | Comments: |
|---|---|---|
| SP-SM | Moist - 5GY 4/1 | |

| Fines (%): | Organics (%): | Carbonates (%): | Shells (%): |
|---|---|---|---|
| #230 - 8.68 | | | 28.00 |

| Sieve Number | Sieve Size (Phi) | Sieve Size (Millimeters) | % Weight Retained | C. % Weight Retained |
|---|---|---|---|---|
| 3/4 | -4.25 | 19.03 | 0.00 | 0.00 |
| 3/8 | -3.25 | 9.48 | 0.80 | 0.80 |
| #3.5 | -2.50 | 5.66 | 2.14 | 2.94 |
| #4 | -2.25 | 4.75 | 0.70 | 3.64 |
| #5 | -2.00 | 3.99 | 1.01 | 4.65 |
| #7 | -1.50 | 2.82 | 2.31 | 6.96 |
| #10 | -1.00 | 2.00 | 2.86 | 9.82 |
| #14 | -0.50 | 1.41 | 3.56 | 13.38 |
| #18 | 0.00 | 1.00 | 3.11 | 16.49 |
| #25 | 0.50 | 0.71 | 3.03 | 19.52 |
| #35 | 1.00 | 0.50 | 2.98 | 22.50 |
| #45 | 1.50 | 0.35 | 3.40 | 25.90 |
| #60 | 2.00 | 0.25 | 5.43 | 31.33 |
| #80 | 2.50 | 0.18 | 13.89 | 45.22 |
| #120 | 3.00 | 0.13 | 32.16 | 77.38 |
| #170 | 3.50 | 0.09 | 11.48 | 88.86 |
| #200 | 3.75 | 0.07 | 1.81 | 90.67 |
| #230 | 4.00 | 0.06 | 0.65 | 91.32 |

| Phi 5 | Phi 16 | Phi 25 | Phi 50 | Phi 75 | Phi 84 | Phi 95 |
|---|---|---|---|---|---|---|
| | 3.29 | 2.96 | 2.57 | 1.36 | -0.08 | -1.92 |

| Moment | Mean Phi | Mean mm | Sorting | Skewness | Kurtosis |
|---|---|---|---|---|---|
| Statistics | 1.74 | 0.30 | 1.71 | -1.36 | 3.87 |

USACE GRANULARMETRIC REPORT FLAGLER_STAT_GINT.GPJ FL DEP ROSS.GDT 11/14/12

# Granularmetric Report

Depths and elevations based on measured values

Project Name: Flagler County

Sample Name: VC-FSP11-15 #1

Analysis Date: 04-01-11

Analyzed By:

US Army Corps of Engineers
701 San Marco Blvd
Jacksonville, Florida 32207
phone (904)396-7121

| Easting (ft): | Northing (ft): | Coordinate System: | Elevation (ft): |
|---|---|---|---|
| 655,510 | 1,872,704 | | -63.4 NAVD88 |

| USCS | Munsell: | Comments: |
|---|---|---|
| SW | Moist - 10Y 4/1 | |

| Fines (%): | Organics (%): | Carbonates (%): | Shells (%): |
|---|---|---|---|
| #230 - 1.46 | | | 22.00 |

| Sieve Number | Sieve Size (Phi) | Sieve Size (Millimeters) | % Weight Retained | C. % Weight Retained |
|---|---|---|---|---|
| 3/4 | -4.25 | 19.03 | 0.00 | 0.00 |
| 3/8 | -3.25 | 9.48 | 0.23 | 0.23 |
| #3.5 | -2.50 | 5.66 | 0.45 | 0.68 |
| #4 | -2.25 | 4.75 | 0.49 | 1.17 |
| #5 | -2.00 | 3.99 | 0.30 | 1.47 |
| #7 | -1.50 | 2.82 | 1.23 | 2.70 |
| #10 | -1.00 | 2.00 | 1.71 | 4.41 |
| #14 | -0.50 | 1.41 | 2.07 | 6.48 |
| #18 | 0.00 | 1.00 | 2.17 | 8.65 |
| #25 | 0.50 | 0.71 | 2.74 | 11.39 |
| #35 | 1.00 | 0.50 | 4.00 | 15.39 |
| #45 | 1.50 | 0.35 | 7.30 | 22.69 |
| #60 | 2.00 | 0.25 | 18.37 | 41.06 |
| #80 | 2.50 | 0.18 | 33.19 | 74.25 |
| #120 | 3.00 | 0.13 | 21.50 | 95.75 |
| #170 | 3.50 | 0.09 | 2.47 | 98.22 |
| #200 | 3.75 | 0.07 | 0.25 | 98.47 |
| #230 | 4.00 | 0.06 | 0.07 | 98.54 |

| Phi 5 | Phi 16 | Phi 25 | Phi 50 | Phi 75 | Phi 84 | Phi 95 |
|---|---|---|---|---|---|---|
| 2.98 | 2.73 | 2.52 | 2.13 | 1.56 | 1.04 | -0.86 |

| Moment | Mean Phi | Mean mm | Sorting | Skewness | Kurtosis |
|---|---|---|---|---|---|
| Statistics | 1.8 | 0.29 | 1.15 | -1.89 | 6.89 |

USACE GRANULARMETRIC REPORT FLAGLER_STAT_GINT.GPJ FL DEP ROSS.GDT 11/14/12

# Granularmetric Report

Depths and elevations based on measured values

Project Name: Flagler County

Sample Name: VC-FSP11-15 #2

Analysis Date: 04-01-11

Analyzed By:

US Army Corps of Engineers
701 San Marco Blvd
Jacksonville, Florida 32207
phone (904)396-7121

| Easting (ft): | Northing (ft): | Coordinate System: | Elevation (ft): |
|---|---|---|---|
| 655,510 | 1,872,704 | | -66.4 NAVD88 |

| USCS | Munsell: | Comments: |
|---|---|---|
| SP | Moist - 10Y 4/1 | |

| | | | Fines (%): | Organics (%): | Carbonates (%): | Shells (%): |
|---|---|---|---|---|---|---|
| | | | #230 - 2.74 | | | 10.00 |

| Sieve Number | Sieve Size (Phi) | Sieve Size (Millimeters) | % Weight Retained | C. % Weight Retained |
|---|---|---|---|---|
| #5 | -2.00 | 3.99 | 0.00 | 0.00 |
| #7 | -1.50 | 2.82 | 0.08 | 0.08 |
| #10 | -1.00 | 2.00 | 0.12 | 0.20 |
| #14 | -0.50 | 1.41 | 0.19 | 0.39 |
| #18 | 0.00 | 1.00 | 0.31 | 0.70 |
| #25 | 0.50 | 0.71 | 0.46 | 1.16 |
| #35 | 1.00 | 0.50 | 0.85 | 2.01 |
| #45 | 1.50 | 0.35 | 2.13 | 4.14 |
| #60 | 2.00 | 0.25 | 7.36 | 11.50 |
| #80 | 2.50 | 0.18 | 27.46 | 38.96 |
| #120 | 3.00 | 0.13 | 47.53 | 86.49 |
| #170 | 3.50 | 0.09 | 9.34 | 95.83 |
| #200 | 3.75 | 0.07 | 1.13 | 96.96 |
| #230 | 4.00 | 0.06 | 0.30 | 97.26 |

| Phi 5 | Phi 16 | Phi 25 | Phi 50 | Phi 75 | Phi 84 | Phi 95 |
|---|---|---|---|---|---|---|
| 3.46 | 2.97 | 2.88 | 2.62 | 2.24 | 2.08 | 1.55 |

| Moment | Mean Phi | Mean mm | Sorting | Skewness | Kurtosis |
|---|---|---|---|---|---|
| Statistics | 2.51 | 0.18 | 0.57 | -2 | 11.77 |

USACE GRANULARMETRIC REPORT FLAGLER_STAT_GINT.GPJ FL DEP ROSS.GDT 11/14/12

# Granularmetric Report

Depths and elevations based on measured values

Project Name: Flagler County

Sample Name: VC-FSP11-15 #3

Analysis Date: 04-01-11

Analyzed By:

US Army Corps of Engineers
701 San Marco Blvd
Jacksonville, Florida 32207
phone (904)396-7121

| Easting (ft): | Northing (ft): | Coordinate System: | Elevation (ft): |
|---|---|---|---|
| 655,510 | 1,872,704 | | -68.4 NAVD88 |

| USCS | Munsell: | Comments: |
|---|---|---|
| SP-SM | Moist - 10Y 4/1 | |

| Fines (%): | Organics (%): | Carbonates (%): | Shells (%): |
|---|---|---|---|
| #230 - 8.55 | | | 13.00 |

| Sieve Number | Sieve Size (Phi) | Sieve Size (Millimeters) | % Weight Retained | C. % Weight Retained |
|---|---|---|---|---|
| #4 | -2.25 | 4.75 | 0.00 | 0.00 |
| #5 | -2.00 | 3.99 | 0.09 | 0.09 |
| #7 | -1.50 | 2.82 | 0.25 | 0.34 |
| #10 | -1.00 | 2.00 | 0.70 | 1.04 |
| #14 | -0.50 | 1.41 | 1.02 | 2.06 |
| #18 | 0.00 | 1.00 | 1.03 | 3.09 |
| #25 | 0.50 | 0.71 | 1.24 | 4.33 |
| #35 | 1.00 | 0.50 | 1.78 | 6.11 |
| #45 | 1.50 | 0.35 | 2.84 | 8.95 |
| #60 | 2.00 | 0.25 | 7.29 | 16.24 |
| #80 | 2.50 | 0.18 | 20.93 | 37.17 |
| #120 | 3.00 | 0.13 | 39.11 | 76.28 |
| #170 | 3.50 | 0.09 | 13.13 | 89.41 |
| #200 | 3.75 | 0.07 | 1.58 | 90.99 |
| #230 | 4.00 | 0.06 | 0.46 | 91.45 |

| Phi 5 | Phi 16 | Phi 25 | Phi 50 | Phi 75 | Phi 84 | Phi 95 |
|---|---|---|---|---|---|---|
| | 3.29 | 2.98 | 2.66 | 2.21 | 1.98 | 0.69 |

| Moment | Mean Phi | Mean mm | Sorting | Skewness | Kurtosis |
|---|---|---|---|---|---|
| Statistics | 2.41 | 0.19 | 0.86 | -2.12 | 8.79 |

USACE GRANULARMETRIC REPORT FLAGLER_STAT_GINT.GPJ FL DEP ROSS.GDT 11/14/12

# Granularmetric Report

Depths and elevations based on measured values

Project Name: Flagler County

Sample Name: VC-FSP11-15 #4

Analysis Date: 04-01-11

Analyzed By:

US Army Corps of Engineers
701 San Marco Blvd
Jacksonville, Florida 32207
phone (904)396-7121

| Easting (ft): | Northing (ft): | Coordinate System: | Elevation (ft): |
|---|---|---|---|
| 655,510 | 1,872,704 | | -71.4 NAVD88 |

| USCS | Munsell: | Comments: |
|---|---|---|
| SW | Moist - 5GY 4/1 | |

| | | | Fines (%): | Organics (%): | Carbonates (%): | Shells (%): |
|---|---|---|---|---|---|---|
| | | | #230 - 3.08 | | | 49.00 |

| Sieve Number | Sieve Size (Phi) | Sieve Size (Millimeters) | % Weight Retained | C. % Weight Retained |
|---|---|---|---|---|
| 3/4 | -4.25 | 19.03 | 0.00 | 0.00 |
| 3/8 | -3.25 | 9.48 | 4.21 | 4.21 |
| #3.5 | -2.50 | 5.66 | 7.12 | 11.33 |
| #4 | -2.25 | 4.75 | 1.83 | 13.16 |
| #5 | -2.00 | 3.99 | 1.85 | 15.01 |
| #7 | -1.50 | 2.82 | 5.75 | 20.76 |
| #10 | -1.00 | 2.00 | 6.04 | 26.80 |
| #14 | -0.50 | 1.41 | 5.06 | 31.86 |
| #18 | 0.00 | 1.00 | 3.91 | 35.77 |
| #25 | 0.50 | 0.71 | 4.21 | 39.98 |
| #35 | 1.00 | 0.50 | 5.15 | 45.13 |
| #45 | 1.50 | 0.35 | 6.44 | 51.57 |
| #60 | 2.00 | 0.25 | 6.69 | 58.26 |
| #80 | 2.50 | 0.18 | 13.64 | 71.90 |
| #120 | 3.00 | 0.13 | 19.94 | 91.84 |
| #170 | 3.50 | 0.09 | 4.34 | 96.18 |
| #200 | 3.75 | 0.07 | 0.47 | 96.65 |
| #230 | 4.00 | 0.06 | 0.27 | 96.92 |

| Phi 5 | Phi 16 | Phi 25 | Phi 50 | Phi 75 | Phi 84 | Phi 95 |
|---|---|---|---|---|---|---|
| 3.36 | 2.80 | 2.58 | 1.37 | -1.15 | -1.91 | -3.16 |

| Moment | Mean Phi | Mean mm | Sorting | Skewness | Kurtosis |
|---|---|---|---|---|---|
| Statistics | 0.62 | 0.65 | 2.13 | -0.55 | 1.97 |

USACE GRANULARMETRIC REPORT FLAGLER_STAT_GINT.GPJ FL DEP ROSS.GDT 11/14/12

# Granularmetric Report

Depths and elevations based on measured values

Project Name: Flagler County

Sample Name: VC-FSP11-15 #5

Analysis Date: 04-01-11

Analyzed By:

US Army Corps of Engineers
701 San Marco Blvd
Jacksonville, Florida 32207
phone (904)396-7121

| Easting (ft): | Northing (ft): | Coordinate System: | Elevation (ft): |
|---|---|---|---|
| 655,510 | 1,872,704 | | -75.4 NAVD88 |

| USCS | Munsell: | Comments: |
|---|---|---|
| SP | Moist - 10Y 6/1 | |

| | | | Fines (%): | Organics (%): | Carbonates (%): | Shells (%): |
|---|---|---|---|---|---|---|
| | | | #230 - 3.11 | | | 20.00 |

| Sieve Number | Sieve Size (Phi) | Sieve Size (Millimeters) | % Weight Retained | C. % Weight Retained |
|---|---|---|---|---|
| #3.5 | -2.50 | 5.66 | 0.00 | 0.00 |
| #4 | -2.25 | 4.75 | 0.20 | 0.20 |
| #5 | -2.00 | 3.99 | 0.06 | 0.26 |
| #7 | -1.50 | 2.82 | 0.33 | 0.59 |
| #10 | -1.00 | 2.00 | 0.70 | 1.29 |
| #14 | -0.50 | 1.41 | 0.74 | 2.03 |
| #18 | 0.00 | 1.00 | 0.97 | 3.00 |
| #25 | 0.50 | 0.71 | 1.44 | 4.44 |
| #35 | 1.00 | 0.50 | 2.39 | 6.83 |
| #45 | 1.50 | 0.35 | 3.84 | 10.67 |
| #60 | 2.00 | 0.25 | 8.55 | 19.22 |
| #80 | 2.50 | 0.18 | 28.18 | 47.40 |
| #120 | 3.00 | 0.13 | 42.60 | 90.00 |
| #170 | 3.50 | 0.09 | 6.34 | 96.34 |
| #200 | 3.75 | 0.07 | 0.41 | 96.75 |
| #230 | 4.00 | 0.06 | 0.14 | 96.89 |

| Phi 5 | Phi 16 | Phi 25 | Phi 50 | Phi 75 | Phi 84 | Phi 95 |
|---|---|---|---|---|---|---|
| 3.39 | 2.93 | 2.82 | 2.53 | 2.10 | 1.81 | 0.62 |

| Moment | Mean Phi | Mean mm | Sorting | Skewness | Kurtosis |
|---|---|---|---|---|---|
| Statistics | 2.29 | 0.20 | 0.83 | -2.34 | 10.17 |

USACE GRANULARMETRIC REPORT FLAGLER_STAT_GINT.GPJ FL DEP ROSS.GDT 11/14/12

# Granularmetric Report

Depths and elevations based on measured values

Project Name: Flagler County

Sample Name: VC-FSP11-16 #1

Analysis Date: 04-01-11

Analyzed By:

US Army Corps of Engineers
701 San Marco Blvd
Jacksonville, Florida 32207
phone (904)396-7121

| Easting (ft): | Northing (ft): | Coordinate System: | Elevation (ft): |
|---|---|---|---|
| 653,442 | 1,868,195 | | -54.8 NAVD88 |

| USCS | Munsell: | Comments: |
|---|---|---|
| SP | Moist - 5GY 6/1 | |

| Fines (%): | Organics (%): | Carbonates (%): | Shells (%): |
|---|---|---|---|
| #230 - 1.00 | | | 8.00 |

| Sieve Number | Sieve Size (Phi) | Sieve Size (Millimeters) | % Weight Retained | C. % Weight Retained |
|---|---|---|---|---|
| 3/8 | -3.25 | 9.48 | 0.00 | 0.00 |
| #3.5 | -2.50 | 5.66 | 0.17 | 0.17 |
| #4 | -2.25 | 4.75 | 0.02 | 0.19 |
| #5 | -2.00 | 3.99 | 0.09 | 0.28 |
| #7 | -1.50 | 2.82 | 0.25 | 0.53 |
| #10 | -1.00 | 2.00 | 0.20 | 0.73 |
| #14 | -0.50 | 1.41 | 0.38 | 1.11 |
| #18 | 0.00 | 1.00 | 0.36 | 1.47 |
| #25 | 0.50 | 0.71 | 0.44 | 1.91 |
| #35 | 1.00 | 0.50 | 0.78 | 2.69 |
| #45 | 1.50 | 0.35 | 1.54 | 4.23 |
| #60 | 2.00 | 0.25 | 8.11 | 12.34 |
| #80 | 2.50 | 0.18 | 41.89 | 54.23 |
| #120 | 3.00 | 0.13 | 40.22 | 94.45 |
| #170 | 3.50 | 0.09 | 4.02 | 98.47 |
| #200 | 3.75 | 0.07 | 0.41 | 98.88 |
| #230 | 4.00 | 0.06 | 0.12 | 99.00 |

| Phi 5 | Phi 16 | Phi 25 | Phi 50 | Phi 75 | Phi 84 | Phi 95 |
|---|---|---|---|---|---|---|
| 3.07 | 2.87 | 2.76 | 2.45 | 2.15 | 2.04 | 1.54 |

| Moment | Mean Phi | Mean mm | Sorting | Skewness | Kurtosis |
|---|---|---|---|---|---|
| Statistics | 2.37 | 0.19 | 0.63 | -3.42 | 22.63 |

USACE GRANULARMETRIC REPORT FLAGLER_STAT_GINT.GPJ FL DEP ROSS.GDT 11/14/12

# Granularmetric Report

Depths and elevations based on measured values

Project Name: Flagler County

Sample Name: VC-FSP11-16 #2

Analysis Date: 04-01-11

Analyzed By:

US Army Corps of Engineers
701 San Marco Blvd
Jacksonville, Florida 32207
phone (904)396-7121

| Easting (ft): | Northing (ft): | Coordinate System: | Elevation (ft): |
|---|---|---|---|
| 653,442 | 1,868,195 | | -57.8 NAVD88 |

| USCS | Munsell: | Comments: |
|---|---|---|
| SP | Moist - 5GY 6/1 | |

| Fines (%): | Organics (%): | Carbonates (%): | Shells (%): |
|---|---|---|---|
| #230 - 0.91 | | 12.00 | 7.00 |

| Sieve Number | Sieve Size (Phi) | Sieve Size (Millimeters) | % Weight Retained | C. % Weight Retained |
|---|---|---|---|---|
| 3/8 | -3.25 | 9.48 | 0.00 | 0.00 |
| #3.5 | -2.50 | 5.66 | 0.17 | 0.17 |
| #4 | -2.25 | 4.75 | 0.14 | 0.31 |
| #5 | -2.00 | 3.99 | 0.07 | 0.38 |
| #7 | -1.50 | 2.82 | 0.34 | 0.72 |
| #10 | -1.00 | 2.00 | 0.41 | 1.13 |
| #14 | -0.50 | 1.41 | 0.58 | 1.71 |
| #18 | 0.00 | 1.00 | 0.57 | 2.28 |
| #25 | 0.50 | 0.71 | 0.64 | 2.92 |
| #35 | 1.00 | 0.50 | 0.90 | 3.82 |
| #45 | 1.50 | 0.35 | 2.15 | 5.97 |
| #60 | 2.00 | 0.25 | 8.25 | 14.22 |
| #80 | 2.50 | 0.18 | 41.38 | 55.60 |
| #120 | 3.00 | 0.13 | 39.03 | 94.63 |
| #170 | 3.50 | 0.09 | 3.98 | 98.61 |
| #200 | 3.75 | 0.07 | 0.38 | 98.99 |
| #230 | 4.00 | 0.06 | 0.10 | 99.09 |

| Phi 5 | Phi 16 | Phi 25 | Phi 50 | Phi 75 | Phi 84 | Phi 95 |
|---|---|---|---|---|---|---|
| 3.05 | 2.86 | 2.75 | 2.43 | 2.13 | 2.02 | 1.27 |

| Moment | Mean Phi | Mean mm | Sorting | Skewness | Kurtosis |
|---|---|---|---|---|---|
| Statistics | 2.32 | 0.20 | 0.72 | -3.25 | 18.4 |

USACE GRANULARMETRIC REPORT FLAGLER_STAT_GINT.GPJ FL DEP ROSS.GDT 11/14/12

# Granularmetric Report

Depths and elevations based on measured values

Project Name: Flagler County

Sample Name: VC-FSP11-16 #3

Analysis Date: 04-01-11

Analyzed By:

US Army Corps of Engineers
701 San Marco Blvd
Jacksonville, Florida 32207
phone (904)396-7121

| Easting (ft): | Northing (ft): | Coordinate System: | Elevation (ft): |
|---|---|---|---|
| 653,442 | 1,868,195 | | -60.8 NAVD88 |

| USCS | Munsell: | Comments: |
|---|---|---|
| SW | Moist - 10Y 5/1 | |

| | | | Fines (%): | Organics (%): | Carbonates (%): | Shells (%): |
|---|---|---|---|---|---|---|
| | | | #230 - 2.02 | | | 37.00 |

| Sieve Number | Sieve Size (Phi) | Sieve Size (Millimeters) | % Weight Retained | C. % Weight Retained |
|---|---|---|---|---|
| 3/4 | -4.25 | 19.03 | 0.00 | 0.00 |
| 3/8 | -3.25 | 9.48 | 0.39 | 0.39 |
| #3.5 | -2.50 | 5.66 | 4.42 | 4.81 |
| #4 | -2.25 | 4.75 | 1.46 | 6.27 |
| #5 | -2.00 | 3.99 | 1.10 | 7.37 |
| #7 | -1.50 | 2.82 | 3.12 | 10.49 |
| #10 | -1.00 | 2.00 | 3.91 | 14.40 |
| #14 | -0.50 | 1.41 | 3.75 | 18.15 |
| #18 | 0.00 | 1.00 | 2.92 | 21.07 |
| #25 | 0.50 | 0.71 | 2.37 | 23.44 |
| #35 | 1.00 | 0.50 | 2.54 | 25.98 |
| #45 | 1.50 | 0.35 | 3.86 | 29.84 |
| #60 | 2.00 | 0.25 | 9.82 | 39.66 |
| #80 | 2.50 | 0.18 | 29.05 | 68.71 |
| #120 | 3.00 | 0.13 | 25.24 | 93.95 |
| #170 | 3.50 | 0.09 | 3.48 | 97.43 |
| #200 | 3.75 | 0.07 | 0.40 | 97.83 |
| #230 | 4.00 | 0.06 | 0.15 | 97.98 |

| Phi 5 | Phi 16 | Phi 25 | Phi 50 | Phi 75 | Phi 84 | Phi 95 |
|---|---|---|---|---|---|---|
| 3.15 | 2.80 | 2.62 | 2.18 | 0.81 | -0.79 | -2.47 |

| Moment | Mean Phi | Mean mm | Sorting | Skewness | Kurtosis |
|---|---|---|---|---|---|
| Statistics | 1.42 | 0.37 | 1.74 | -1.27 | 3.36 |

USACE GRANULARMETRIC REPORT FLAGLER_STAT_GINT.GPJ FL DEP ROSS.GDT 11/14/12

# Granularmetric Report

Depths and elevations based on measured values

Project Name: Flagler County

Sample Name: VC-FSP11-17 #1

Analysis Date: 04-01-11

Analyzed By:

US Army Corps of Engineers
701 San Marco Blvd
Jacksonville, Florida 32207
phone (904)396-7121

| Easting (ft): | Northing (ft): | Coordinate System: | Elevation (ft): |
|---|---|---|---|
| 650,134 | 1,865,965 | | -69.0 NAVD88 |

| USCS | Munsell: | Comments: |
|---|---|---|
| SW | Moist - 10GY 4/1 | |

| Fines (%): | Organics (%): | Carbonates (%): | Shells (%): |
|---|---|---|---|
| #230 - 4.27 | | | 33.00 |

| Sieve Number | Sieve Size (Phi) | Sieve Size (Millimeters) | % Weight Retained | C. % Weight Retained |
|---|---|---|---|---|
| 3/4 | -4.25 | 19.03 | 0.00 | 0.00 |
| 3/8 | -3.25 | 9.48 | 3.29 | 3.29 |
| #3.5 | -2.50 | 5.66 | 4.63 | 7.92 |
| #4 | -2.25 | 4.75 | 1.47 | 9.39 |
| #5 | -2.00 | 3.99 | 1.66 | 11.05 |
| #7 | -1.50 | 2.82 | 4.34 | 15.39 |
| #10 | -1.00 | 2.00 | 3.48 | 18.87 |
| #14 | -0.50 | 1.41 | 3.00 | 21.87 |
| #18 | 0.00 | 1.00 | 2.05 | 23.92 |
| #25 | 0.50 | 0.71 | 1.61 | 25.53 |
| #35 | 1.00 | 0.50 | 2.20 | 27.73 |
| #45 | 1.50 | 0.35 | 2.69 | 30.42 |
| #60 | 2.00 | 0.25 | 5.37 | 35.79 |
| #80 | 2.50 | 0.18 | 17.74 | 53.53 |
| #120 | 3.00 | 0.13 | 32.15 | 85.68 |
| #170 | 3.50 | 0.09 | 8.31 | 93.99 |
| #200 | 3.75 | 0.07 | 1.31 | 95.30 |
| #230 | 4.00 | 0.06 | 0.43 | 95.73 |

| Phi 5 | Phi 16 | Phi 25 | Phi 50 | Phi 75 | Phi 84 | Phi 95 |
|---|---|---|---|---|---|---|
| 3.69 | 2.97 | 2.83 | 2.40 | 0.33 | -1.41 | -2.97 |

| Moment | Mean Phi | Mean mm | Sorting | Skewness | Kurtosis |
|---|---|---|---|---|---|
| Statistics | 1.35 | 0.39 | 2.08 | -1.14 | 2.89 |

USACE GRANULARMETRIC REPORT FLAGLER_STAT_GINT.GPJ FL DEP ROSS.GDT 11/14/12

# Granularmetric Report

Depths and elevations based on measured values

Project Name: Flagler County

Sample Name: VC-FSP11-17 #2

Analysis Date: 04-01-11

Analyzed By:

US Army Corps of Engineers
701 San Marco Blvd
Jacksonville, Florida 32207
phone (904)396-7121

| Easting (ft): | Northing (ft): | Coordinate System: | Elevation (ft): |
|---|---|---|---|
| 650,134 | 1,865,965 | | -72.5 NAVD88 |

| USCS | Munsell: | Comments: |
|---|---|---|
| SW | Moist - 5B 6/1 | |

| Fines (%): | Organics (%): | Carbonates (%): | Shells (%): |
|---|---|---|---|
| #230 - 1.78 | | | 9.00 |

| Sieve Number | Sieve Size (Phi) | Sieve Size (Millimeters) | % Weight Retained | C. % Weight Retained |
|---|---|---|---|---|
| #3.5 | -2.50 | 5.66 | 0.00 | 0.00 |
| #4 | -2.25 | 4.75 | 0.37 | 0.37 |
| #5 | -2.00 | 3.99 | 0.37 | 0.74 |
| #7 | -1.50 | 2.82 | 0.86 | 1.60 |
| #10 | -1.00 | 2.00 | 1.06 | 2.66 |
| #14 | -0.50 | 1.41 | 0.94 | 3.60 |
| #18 | 0.00 | 1.00 | 0.94 | 4.54 |
| #25 | 0.50 | 0.71 | 0.99 | 5.53 |
| #35 | 1.00 | 0.50 | 1.25 | 6.78 |
| #45 | 1.50 | 0.35 | 1.91 | 8.69 |
| #60 | 2.00 | 0.25 | 5.38 | 14.07 |
| #80 | 2.50 | 0.18 | 25.71 | 39.78 |
| #120 | 3.00 | 0.13 | 53.09 | 92.87 |
| #170 | 3.50 | 0.09 | 4.99 | 97.86 |
| #200 | 3.75 | 0.07 | 0.32 | 98.18 |
| #230 | 4.00 | 0.06 | 0.04 | 98.22 |

| Phi 5 | Phi 16 | Phi 25 | Phi 50 | Phi 75 | Phi 84 | Phi 95 |
|---|---|---|---|---|---|---|
| 3.21 | 2.92 | 2.83 | 2.60 | 2.21 | 2.03 | 0.23 |

| Moment | Mean Phi | Mean mm | Sorting | Skewness | Kurtosis |
|---|---|---|---|---|---|
| Statistics | 2.33 | 0.20 | 0.93 | -2.94 | 12.4 |

USACE GRANULARMETRIC REPORT FLAGLER_STAT_GINT.GPJ FL DEP ROSS.GDT 11/14/12

# Granularmetric Report

Depths and elevations based on measured values

Project Name: Flagler County

Sample Name: VC-FSP11-17 #3

Analysis Date: 04-01-11

Analyzed By:

US Army Corps of Engineers
701 San Marco Blvd
Jacksonville, Florida 32207
phone (904)396-7121

| Easting (ft): | Northing (ft): | Coordinate System: | Elevation (ft): |
|---|---|---|---|
| 650,134 | 1,865,965 | | -75.5 NAVD88 |

| USCS | Munsell: | Comments: |
|---|---|---|
| SW | Moist - 5B 6/1 | |

| Fines (%): | Organics (%): | Carbonates (%): | Shells (%): |
|---|---|---|---|
| #230 - 3.09 | | | 32.00 |

| Sieve Number | Sieve Size (Phi) | Sieve Size (Millimeters) | % Weight Retained | C. % Weight Retained |
|---|---|---|---|---|
| 3/4 | -4.25 | 19.03 | 0.00 | 0.00 |
| 3/8 | -3.25 | 9.48 | 0.95 | 0.95 |
| #3.5 | -2.50 | 5.66 | 5.91 | 6.86 |
| #4 | -2.25 | 4.75 | 1.79 | 8.65 |
| #5 | -2.00 | 3.99 | 1.06 | 9.71 |
| #7 | -1.50 | 2.82 | 2.55 | 12.26 |
| #10 | -1.00 | 2.00 | 2.59 | 14.85 |
| #14 | -0.50 | 1.41 | 2.67 | 17.52 |
| #18 | 0.00 | 1.00 | 2.22 | 19.74 |
| #25 | 0.50 | 0.71 | 2.16 | 21.90 |
| #35 | 1.00 | 0.50 | 3.18 | 25.08 |
| #45 | 1.50 | 0.35 | 4.37 | 29.45 |
| #60 | 2.00 | 0.25 | 6.89 | 36.34 |
| #80 | 2.50 | 0.18 | 17.24 | 53.58 |
| #120 | 3.00 | 0.13 | 36.11 | 89.69 |
| #170 | 3.50 | 0.09 | 6.48 | 96.17 |
| #200 | 3.75 | 0.07 | 0.51 | 96.68 |
| #230 | 4.00 | 0.06 | 0.23 | 96.91 |

| Phi 5 | Phi 16 | Phi 25 | Phi 50 | Phi 75 | Phi 84 | Phi 95 |
|---|---|---|---|---|---|---|
| 3.41 | 2.92 | 2.80 | 2.40 | 0.99 | -0.78 | -2.73 |

| Moment | Mean Phi | Mean mm | Sorting | Skewness | Kurtosis |
|---|---|---|---|---|---|
| Statistics | 1.5 | 0.35 | 1.88 | -1.32 | 3.44 |

USACE GRANULARMETRIC REPORT FLAGLER_STAT_GINT.GPJ FL DEP ROSS.GDT 11/14/12

# Granularmetric Report

Depths and elevations based on measured values

Project Name: Flagler County

Sample Name: VC-FSP11-18 #1

Analysis Date: 04-01-11

Analyzed By:

US Army Corps of Engineers
701 San Marco Blvd
Jacksonville, Florida 32207
phone (904)396-7121

| Easting (ft): | Northing (ft): | Coordinate System: | Elevation (ft): |
|---|---|---|---|
| 653,545 | 1,864,379 | | -62.0 NAVD88 |

| USCS | Munsell: | Comments: |
|---|---|---|
| SW | Moist - 5GY 4/1 | |

| Fines (%): | Organics (%): | Carbonates (%): | Shells (%): |
|---|---|---|---|
| #230 - 1.67 | | | 65.00 |

| Sieve Number | Sieve Size (Phi) | Sieve Size (Millimeters) | % Weight Retained | C. % Weight Retained |
|---|---|---|---|---|
| 3/4 | -4.25 | 19.03 | 0.00 | 0.00 |
| 3/8 | -3.25 | 9.48 | 2.58 | 2.58 |
| #3.5 | -2.50 | 5.66 | 4.01 | 6.59 |
| #4 | -2.25 | 4.75 | 1.91 | 8.50 |
| #5 | -2.00 | 3.99 | 1.59 | 10.09 |
| #7 | -1.50 | 2.82 | 6.65 | 16.74 |
| #10 | -1.00 | 2.00 | 7.49 | 24.23 |
| #14 | -0.50 | 1.41 | 8.48 | 32.71 |
| #18 | 0.00 | 1.00 | 7.37 | 40.08 |
| #25 | 0.50 | 0.71 | 6.93 | 47.01 |
| #35 | 1.00 | 0.50 | 7.13 | 54.14 |
| #45 | 1.50 | 0.35 | 9.66 | 63.80 |
| #60 | 2.00 | 0.25 | 11.27 | 75.07 |
| #80 | 2.50 | 0.18 | 12.17 | 87.24 |
| #120 | 3.00 | 0.13 | 8.70 | 95.94 |
| #170 | 3.50 | 0.09 | 1.95 | 97.89 |
| #200 | 3.75 | 0.07 | 0.33 | 98.22 |
| #230 | 4.00 | 0.06 | 0.11 | 98.33 |

| Phi 5 | Phi 16 | Phi 25 | Phi 50 | Phi 75 | Phi 84 | Phi 95 |
|---|---|---|---|---|---|---|
| 2.95 | 2.37 | 1.99 | 0.71 | -0.95 | -1.55 | -2.80 |

| Moment | Mean Phi | Mean mm | Sorting | Skewness | Kurtosis |
|---|---|---|---|---|---|
| Statistics | 0.4 | 0.76 | 1.79 | -0.4 | 2.21 |

USACE GRANULARMETRIC REPORT FLAGLER_STAT_GINT.GPJ FL DEP ROSS.GDT 11/14/12

# Granularmetric Report

Depths and elevations based on measured values

Project Name: Flagler County

Sample Name: VC-FSP11-18 #2

Analysis Date: 04-01-11

Analyzed By:

US Army Corps of Engineers
701 San Marco Blvd
Jacksonville, Florida 32207
phone (904)396-7121

| Easting (ft): | Northing (ft): | Coordinate System: | Elevation (ft): |
|---|---|---|---|
| 653,545 | 1,864,379 | | -66.0 NAVD88 |

| USCS | Munsell: | Comments: |
|---|---|---|
| SM | Moist - 10Y 4/1 | |

| | | | Fines (%): | Organics (%): | Carbonates (%): | Shells (%): |
|---|---|---|---|---|---|---|
| | | | #230 - 13.64 | | | 10.00 |

| Sieve Number | Sieve Size (Phi) | Sieve Size (Millimeters) | % Weight Retained | C. % Weight Retained |
|---|---|---|---|---|
| #3.5 | -2.50 | 5.66 | 0.00 | 0.00 |
| #4 | -2.25 | 4.75 | 0.18 | 0.18 |
| #5 | -2.00 | 3.99 | 0.03 | 0.21 |
| #7 | -1.50 | 2.82 | 0.56 | 0.77 |
| #10 | -1.00 | 2.00 | 0.52 | 1.29 |
| #14 | -0.50 | 1.41 | 0.62 | 1.91 |
| #18 | 0.00 | 1.00 | 0.29 | 2.20 |
| #25 | 0.50 | 0.71 | 0.45 | 2.65 |
| #35 | 1.00 | 0.50 | 0.53 | 3.18 |
| #45 | 1.50 | 0.35 | 0.89 | 4.07 |
| #60 | 2.00 | 0.25 | 1.59 | 5.66 |
| #80 | 2.50 | 0.18 | 7.29 | 12.95 |
| #120 | 3.00 | 0.13 | 30.30 | 43.25 |
| #170 | 3.50 | 0.09 | 35.03 | 78.28 |
| #200 | 3.75 | 0.07 | 6.10 | 84.38 |
| #230 | 4.00 | 0.06 | 1.98 | 86.36 |

| Phi 5 | Phi 16 | Phi 25 | Phi 50 | Phi 75 | Phi 84 | Phi 95 |
|---|---|---|---|---|---|---|
| | 3.73 | 3.45 | 3.10 | 2.70 | 2.55 | 1.79 |

| Moment | Mean Phi | Mean mm | Sorting | Skewness | Kurtosis |
|---|---|---|---|---|---|
| Statistics | 2.84 | 0.14 | 0.84 | -3.28 | 16.69 |

USACE GRANULARMETRIC REPORT FLAGLER_STAT_GINT.GPJ FL DEP ROSS.GDT 11/14/12

# Granularmetric Report

Depths and elevations based on measured values

Project Name: Flagler County

Sample Name: VC-FSP11-19 #1

Analysis Date: 04-01-11

Analyzed By:

US Army Corps of Engineers
701 San Marco Blvd
Jacksonville, Florida 32207
phone (904)396-7121

| Easting (ft): | Northing (ft): | Coordinate System: | Elevation (ft): |
|---|---|---|---|
| 656,770 | 1,864,383 | | -73.9 NAVD88 |

| USCS | Munsell: | Comments: |
|---|---|---|
| SP-SM | Moist - 10GY 3/1 | |

| Fines (%): | Organics (%): | Carbonates (%): | Shells (%): |
|---|---|---|---|
| #230 - 6.29 | | | 40.00 |

| Sieve Number | Sieve Size (Phi) | Sieve Size (Millimeters) | % Weight Retained | C. % Weight Retained |
|---|---|---|---|---|
| 3/4 | -4.25 | 19.03 | 0.00 | 0.00 |
| 3/8 | -3.25 | 9.48 | 0.55 | 0.55 |
| #3.5 | -2.50 | 5.66 | 2.94 | 3.49 |
| #4 | -2.25 | 4.75 | 0.90 | 4.39 |
| #5 | -2.00 | 3.99 | 1.03 | 5.42 |
| #7 | -1.50 | 2.82 | 4.21 | 9.63 |
| #10 | -1.00 | 2.00 | 5.04 | 14.67 |
| #14 | -0.50 | 1.41 | 4.80 | 19.47 |
| #18 | 0.00 | 1.00 | 3.86 | 23.33 |
| #25 | 0.50 | 0.71 | 4.21 | 27.54 |
| #35 | 1.00 | 0.50 | 4.53 | 32.07 |
| #45 | 1.50 | 0.35 | 6.48 | 38.55 |
| #60 | 2.00 | 0.25 | 9.58 | 48.13 |
| #80 | 2.50 | 0.18 | 14.98 | 63.11 |
| #120 | 3.00 | 0.13 | 23.07 | 86.18 |
| #170 | 3.50 | 0.09 | 6.52 | 92.70 |
| #200 | 3.75 | 0.07 | 0.58 | 93.28 |
| #230 | 4.00 | 0.06 | 0.43 | 93.71 |

| Phi 5 | Phi 16 | Phi 25 | Phi 50 | Phi 75 | Phi 84 | Phi 95 |
|---|---|---|---|---|---|---|
| | 2.95 | 2.76 | 2.06 | 0.20 | -0.86 | -2.10 |

| Moment | Mean Phi | Mean mm | Sorting | Skewness | Kurtosis |
|---|---|---|---|---|---|
| Statistics | 1.26 | 0.42 | 1.76 | -0.88 | 2.67 |

USACE GRANULARMETRIC REPORT FLAGLER_STAT_GINT.GPJ FL DEP ROSS.GDT 11/14/12

# Granularmetric Report

Depths and elevations based on measured values

Project Name: Flagler County

Sample Name: VC-FSP11-20 #1

Analysis Date: 04-01-11

Analyzed By:

US Army Corps of Engineers
701 San Marco Blvd
Jacksonville, Florida 32207
phone (904)396-7121

| Easting (ft): | Northing (ft): | Coordinate System: | Elevation (ft): |
|---|---|---|---|
| 656,298 | 1,860,715 | | -62.2 NAVD88 |

| USCS | Munsell: | Comments: |
|---|---|---|
| SW | Moist - 10Y 6/1 | |

| Fines (%): | Organics (%): | Carbonates (%): | Shells (%): |
|---|---|---|---|
| #230 - 2.49 | | | 41.00 |

| Sieve Number | Sieve Size (Phi) | Sieve Size (Millimeters) | % Weight Retained | C. % Weight Retained |
|---|---|---|---|---|
| 3/4 | -4.25 | 19.03 | 0.00 | 0.00 |
| 3/8 | -3.25 | 9.48 | 0.13 | 0.13 |
| #3.5 | -2.50 | 5.66 | 3.63 | 3.76 |
| #4 | -2.25 | 4.75 | 1.76 | 5.52 |
| #5 | -2.00 | 3.99 | 1.32 | 6.84 |
| #7 | -1.50 | 2.82 | 4.25 | 11.09 |
| #10 | -1.00 | 2.00 | 4.50 | 15.59 |
| #14 | -0.50 | 1.41 | 3.47 | 19.06 |
| #18 | 0.00 | 1.00 | 3.00 | 22.06 |
| #25 | 0.50 | 0.71 | 3.00 | 25.06 |
| #35 | 1.00 | 0.50 | 3.23 | 28.29 |
| #45 | 1.50 | 0.35 | 4.76 | 33.05 |
| #60 | 2.00 | 0.25 | 10.92 | 43.97 |
| #80 | 2.50 | 0.18 | 24.76 | 68.73 |
| #120 | 3.00 | 0.13 | 23.36 | 92.09 |
| #170 | 3.50 | 0.09 | 4.53 | 96.62 |
| #200 | 3.75 | 0.07 | 0.63 | 97.25 |
| #230 | 4.00 | 0.06 | 0.26 | 97.51 |

| Phi 5 | Phi 16 | Phi 25 | Phi 50 | Phi 75 | Phi 84 | Phi 95 |
|---|---|---|---|---|---|---|
| 3.32 | 2.83 | 2.63 | 2.12 | 0.49 | -0.94 | -2.32 |

| Moment | Mean Phi | Mean mm | Sorting | Skewness | Kurtosis |
|---|---|---|---|---|---|
| Statistics | 1.35 | 0.39 | 1.74 | -1.1 | 2.95 |

USACE GRANULARMETRIC REPORT FLAGLER_STAT_GINT.GPJ FL DEP ROSS.GDT 11/14/12

# Granularmetric Report

Depths and elevations based on measured values

Project Name: Flagler County

Sample Name: VC-FSP11-20 #2

Analysis Date: 04-01-11

Analyzed By:

US Army Corps of Engineers
701 San Marco Blvd
Jacksonville, Florida 32207
phone (904)396-7121

| Easting (ft): | Northing (ft): | Coordinate System: | Elevation (ft): |
|---|---|---|---|
| 656,298 | 1,860,715 | | -64.7 NAVD88 |

| USCS | Munsell: | Comments: |
|---|---|---|
| SP-SM | Moist - 10Y 4/1 | |

| Fines (%): | Organics (%): | Carbonates (%): | Shells (%): |
|---|---|---|---|
| #230 - 8.32 | | | 20.00 |

| Sieve Number | Sieve Size (Phi) | Sieve Size (Millimeters) | % Weight Retained | C. % Weight Retained |
|---|---|---|---|---|
| 3/8 | -3.25 | 9.48 | 0.00 | 0.00 |
| #3.5 | -2.50 | 5.66 | 0.15 | 0.15 |
| #4 | -2.25 | 4.75 | 0.34 | 0.49 |
| #5 | -2.00 | 3.99 | 0.33 | 0.82 |
| #7 | -1.50 | 2.82 | 1.18 | 2.00 |
| #10 | -1.00 | 2.00 | 1.86 | 3.86 |
| #14 | -0.50 | 1.41 | 1.72 | 5.58 |
| #18 | 0.00 | 1.00 | 1.63 | 7.21 |
| #25 | 0.50 | 0.71 | 1.59 | 8.80 |
| #35 | 1.00 | 0.50 | 1.74 | 10.54 |
| #45 | 1.50 | 0.35 | 2.81 | 13.35 |
| #60 | 2.00 | 0.25 | 7.48 | 20.83 |
| #80 | 2.50 | 0.18 | 25.63 | 46.46 |
| #120 | 3.00 | 0.13 | 35.95 | 82.41 |
| #170 | 3.50 | 0.09 | 7.63 | 90.04 |
| #200 | 3.75 | 0.07 | 1.16 | 91.20 |
| #230 | 4.00 | 0.06 | 0.48 | 91.68 |

| Phi 5 | Phi 16 | Phi 25 | Phi 50 | Phi 75 | Phi 84 | Phi 95 |
|---|---|---|---|---|---|---|
| | 3.10 | 2.90 | 2.55 | 2.08 | 1.67 | -0.67 |

| Moment | Mean Phi | Mean mm | Sorting | Skewness | Kurtosis |
|---|---|---|---|---|---|
| Statistics | 2.16 | 0.22 | 1.14 | -2.06 | 7.14 |

USACE GRANULARMETRIC REPORT FLAGLER_STAT_GINT.GPJ FL DEP ROSS.GDT 11/14/12

# Granularmetric Report

Depths and elevations based on measured values

Project Name: Flagler County

Sample Name: VC-FSP11-20 #3

Analysis Date: 04-01-11

Analyzed By:

US Army Corps of Engineers
701 San Marco Blvd
Jacksonville, Florida 32207
phone (904)396-7121

| Easting (ft): | Northing (ft): | Coordinate System: | Elevation (ft): |
|---|---|---|---|
| 656,298 | 1,860,715 | | -69.7 NAVD88 |

| USCS | Munsell: | Comments: |
|---|---|---|
| SM | Moist - 10Y 4/1 | |

| Fines (%): | Organics (%): | Carbonates (%): | Shells (%): |
|---|---|---|---|
| #230 - 31.07 | | | 19.00 |

| Sieve Number | Sieve Size (Phi) | Sieve Size (Millimeters) | % Weight Retained | C. % Weight Retained |
|---|---|---|---|---|
| 3/4 | -4.25 | 19.03 | 0.00 | 0.00 |
| 3/8 | -3.25 | 9.48 | 0.81 | 0.81 |
| #3.5 | -2.50 | 5.66 | 0.32 | 1.13 |
| #4 | -2.25 | 4.75 | 0.19 | 1.32 |
| #5 | -2.00 | 3.99 | 0.70 | 2.02 |
| #7 | -1.50 | 2.82 | 1.52 | 3.54 |
| #10 | -1.00 | 2.00 | 2.59 | 6.13 |
| #14 | -0.50 | 1.41 | 2.91 | 9.04 |
| #18 | 0.00 | 1.00 | 1.72 | 10.76 |
| #25 | 0.50 | 0.71 | 1.08 | 11.84 |
| #35 | 1.00 | 0.50 | 0.91 | 12.75 |
| #45 | 1.50 | 0.35 | 1.02 | 13.77 |
| #60 | 2.00 | 0.25 | 1.80 | 15.57 |
| #80 | 2.50 | 0.18 | 5.95 | 21.52 |
| #120 | 3.00 | 0.13 | 17.63 | 39.15 |
| #170 | 3.50 | 0.09 | 21.53 | 60.68 |
| #200 | 3.75 | 0.07 | 5.31 | 65.99 |
| #230 | 4.00 | 0.06 | 2.94 | 68.93 |

| Phi 5 | Phi 16 | Phi 25 | Phi 50 | Phi 75 | Phi 84 | Phi 95 |
|---|---|---|---|---|---|---|
| | | | 3.25 | 2.60 | 2.03 | -1.22 |

| Moment | Mean Phi | Mean mm | Sorting | Skewness | Kurtosis |
|---|---|---|---|---|---|
| Statistics | 2.23 | 0.21 | 1.7 | -1.64 | 4.72 |

USACE GRANULARMETRIC REPORT FLAGLER_STAT_GINT.GPJ FL DEP ROSS.GDT 11/14/12

# Granularmetric Report

Depths and elevations based on measured values

Project Name: Flagler County

Sample Name: VC-FSP11-21 #1

Analysis Date: 04-01-11

Analyzed By:

US Army Corps of Engineers
701 San Marco Blvd
Jacksonville, Florida 32207
phone (904)396-7121

| Easting (ft): | Northing (ft): | Coordinate System: | Elevation (ft): |
|---|---|---|---|
| 656,922 | 1,856,128 | | -60.5 NAVD88 |

| USCS | Munsell: | Comments: |
|---|---|---|
| SP | Moist - 10Y 6/1 | |

| | | | Fines (%): | Organics (%): | Carbonates (%): | Shells (%): |
|---|---|---|---|---|---|---|
| | | | #230 - 1.40 | | | 6.00 |

| Sieve Number | Sieve Size (Phi) | Sieve Size (Millimeters) | % Weight Retained | C. % Weight Retained |
|---|---|---|---|---|
| #5 | -2.00 | 3.99 | 0.00 | 0.00 |
| #7 | -1.50 | 2.82 | 0.05 | 0.05 |
| #10 | -1.00 | 2.00 | 0.04 | 0.09 |
| #14 | -0.50 | 1.41 | 0.13 | 0.22 |
| #18 | 0.00 | 1.00 | 0.15 | 0.37 |
| #25 | 0.50 | 0.71 | 0.29 | 0.66 |
| #35 | 1.00 | 0.50 | 0.46 | 1.12 |
| #45 | 1.50 | 0.35 | 1.27 | 2.39 |
| #60 | 2.00 | 0.25 | 7.22 | 9.61 |
| #80 | 2.50 | 0.18 | 36.12 | 45.73 |
| #120 | 3.00 | 0.13 | 45.91 | 91.64 |
| #170 | 3.50 | 0.09 | 6.24 | 97.88 |
| #200 | 3.75 | 0.07 | 0.59 | 98.47 |
| #230 | 4.00 | 0.06 | 0.13 | 98.60 |

| Phi 5 | Phi 16 | Phi 25 | Phi 50 | Phi 75 | Phi 84 | Phi 95 |
|---|---|---|---|---|---|---|
| 3.27 | 2.92 | 2.82 | 2.55 | 2.21 | 2.09 | 1.68 |

| Moment | Mean Phi | Mean mm | Sorting | Skewness | Kurtosis |
|---|---|---|---|---|---|
| Statistics | 2.48 | 0.18 | 0.48 | -1.82 | 12.9 |

USACE GRANULARMETRIC REPORT FLAGLER_STAT_GINT.GPJ FL DEP ROSS.GDT 11/14/12

# Granularmetric Report

Depths and elevations based on measured values

Project Name: Flagler County

Sample Name: VC-FSP11-21 #2

Analysis Date: 04-01-11

Analyzed By:

US Army Corps of Engineers
701 San Marco Blvd
Jacksonville, Florida 32207
phone (904)396-7121

| Easting (ft): | Northing (ft): | Coordinate System: | Elevation (ft): |
|---|---|---|---|
| 656,922 | 1,856,128 | | -63.5 NAVD88 |

| USCS | Munsell: | Comments: |
|---|---|---|
| SP | Moist - 10Y 6/1 | |

| | | | Fines (%): | Organics (%): | Carbonates (%): | Shells (%): |
|---|---|---|---|---|---|---|
| | | | #230 - 1.88 | | | 15.00 |

| Sieve Number | Sieve Size (Phi) | Sieve Size (Millimeters) | % Weight Retained | C. % Weight Retained |
|---|---|---|---|---|
| 3/8 | -3.25 | 9.48 | 0.00 | 0.00 |
| #3.5 | -2.50 | 5.66 | 0.04 | 0.04 |
| #4 | -2.25 | 4.75 | 0.10 | 0.14 |
| #5 | -2.00 | 3.99 | 0.03 | 0.17 |
| #7 | -1.50 | 2.82 | 0.21 | 0.38 |
| #10 | -1.00 | 2.00 | 0.35 | 0.73 |
| #14 | -0.50 | 1.41 | 0.54 | 1.27 |
| #18 | 0.00 | 1.00 | 0.73 | 2.00 |
| #25 | 0.50 | 0.71 | 0.92 | 2.92 |
| #35 | 1.00 | 0.50 | 1.45 | 4.37 |
| #45 | 1.50 | 0.35 | 2.94 | 7.31 |
| #60 | 2.00 | 0.25 | 8.81 | 16.12 |
| #80 | 2.50 | 0.18 | 30.76 | 46.88 |
| #120 | 3.00 | 0.13 | 41.00 | 87.88 |
| #170 | 3.50 | 0.09 | 8.54 | 96.42 |
| #200 | 3.75 | 0.07 | 1.34 | 97.76 |
| #230 | 4.00 | 0.06 | 0.36 | 98.12 |

| Phi 5 | Phi 16 | Phi 25 | Phi 50 | Phi 75 | Phi 84 | Phi 95 |
|---|---|---|---|---|---|---|
| 3.42 | 2.95 | 2.84 | 2.54 | 2.14 | 1.99 | 1.10 |

| Moment | Mean Phi | Mean mm | Sorting | Skewness | Kurtosis |
|---|---|---|---|---|---|
| Statistics | 2.39 | 0.19 | 0.74 | -2.35 | 12.14 |

USACE GRANULARMETRIC REPORT FLAGLER_STAT_GINT.GPJ FL DEP ROSS.GDT 11/14/12

# Granularmetric Report

Depths and elevations based on measured values

Project Name: Flagler County

Sample Name: VC-FSP11-21 #3

Analysis Date: 04-01-11

Analyzed By:

US Army Corps of Engineers
701 San Marco Blvd
Jacksonville, Florida 32207
phone (904)396-7121

| Easting (ft): | Northing (ft): | Coordinate System: | Elevation (ft): |
|---|---|---|---|
| 656,922 | 1,856,128 | | -65.0 NAVD88 |

| USCS | Munsell: | Comments: |
|---|---|---|
| SP-SM | Moist - 10Y 4/1 | |

| Fines (%): | Organics (%): | Carbonates (%): | Shells (%): |
|---|---|---|---|
| #230 - 7.71 | | | 13.00 |

| Sieve Number | Sieve Size (Phi) | Sieve Size (Millimeters) | % Weight Retained | C. % Weight Retained |
|---|---|---|---|---|
| 3/8 | -3.25 | 9.48 | 0.00 | 0.00 |
| #3.5 | -2.50 | 5.66 | 0.62 | 0.62 |
| #4 | -2.25 | 4.75 | 0.08 | 0.70 |
| #5 | -2.00 | 3.99 | 0.04 | 0.74 |
| #7 | -1.50 | 2.82 | 0.27 | 1.01 |
| #10 | -1.00 | 2.00 | 0.37 | 1.38 |
| #14 | -0.50 | 1.41 | 0.56 | 1.94 |
| #18 | 0.00 | 1.00 | 0.53 | 2.47 |
| #25 | 0.50 | 0.71 | 0.69 | 3.16 |
| #35 | 1.00 | 0.50 | 1.18 | 4.34 |
| #45 | 1.50 | 0.35 | 1.45 | 5.79 |
| #60 | 2.00 | 0.25 | 5.01 | 10.80 |
| #80 | 2.50 | 0.18 | 22.81 | 33.61 |
| #120 | 3.00 | 0.13 | 45.05 | 78.66 |
| #170 | 3.50 | 0.09 | 11.03 | 89.69 |
| #200 | 3.75 | 0.07 | 1.82 | 91.51 |
| #230 | 4.00 | 0.06 | 0.78 | 92.29 |

| Phi 5 | Phi 16 | Phi 25 | Phi 50 | Phi 75 | Phi 84 | Phi 95 |
|---|---|---|---|---|---|---|
| | 3.24 | 2.96 | 2.68 | 2.31 | 2.11 | 1.22 |

| Moment | Mean Phi | Mean mm | Sorting | Skewness | Kurtosis |
|---|---|---|---|---|---|
| Statistics | 2.48 | 0.18 | 0.85 | -3.23 | 17.65 |

USACE GRANULARMETRIC REPORT FLAGLER_STAT_GINT.GPJ FL DEP ROSS.GDT 11/14/12

# Granularmetric Report

Depths and elevations based on measured values

Project Name: Flagler County

Sample Name: VC-FSP11-21 #4

Analysis Date: 04-01-11

Analyzed By:

US Army Corps of Engineers
701 San Marco Blvd
Jacksonville, Florida 32207
phone (904)396-7121

| Easting (ft): | Northing (ft): | Coordinate System: | Elevation (ft): |
|---|---|---|---|
| 656,922 | 1,856,128 | | -67.5 NAVD88 |

| USCS | Munsell: | Comments: |
|---|---|---|
| SM | Moist - 10Y 4/1 | |

| Fines (%): | Organics (%): | Carbonates (%): | Shells (%): |
|---|---|---|---|
| #230 - 12.72 | | | 10.00 |

| Sieve Number | Sieve Size (Phi) | Sieve Size (Millimeters) | % Weight Retained | C. % Weight Retained |
|---|---|---|---|---|
| 3/8 | -3.25 | 9.48 | 0.00 | 0.00 |
| #3.5 | -2.50 | 5.66 | 0.05 | 0.05 |
| #4 | -2.25 | 4.75 | 0.05 | 0.10 |
| #5 | -2.00 | 3.99 | 0.10 | 0.20 |
| #7 | -1.50 | 2.82 | 0.38 | 0.58 |
| #10 | -1.00 | 2.00 | 0.31 | 0.89 |
| #14 | -0.50 | 1.41 | 0.44 | 1.33 |
| #18 | 0.00 | 1.00 | 0.50 | 1.83 |
| #25 | 0.50 | 0.71 | 0.56 | 2.39 |
| #35 | 1.00 | 0.50 | 0.56 | 2.95 |
| #45 | 1.50 | 0.35 | 1.09 | 4.04 |
| #60 | 2.00 | 0.25 | 2.36 | 6.40 |
| #80 | 2.50 | 0.18 | 10.27 | 16.67 |
| #120 | 3.00 | 0.13 | 33.75 | 50.42 |
| #170 | 3.50 | 0.09 | 29.87 | 80.29 |
| #200 | 3.75 | 0.07 | 5.22 | 85.51 |
| #230 | 4.00 | 0.06 | 1.77 | 87.28 |

| Phi 5 | Phi 16 | Phi 25 | Phi 50 | Phi 75 | Phi 84 | Phi 95 |
|---|---|---|---|---|---|---|
| | 3.68 | 3.41 | 2.99 | 2.62 | 2.47 | 1.70 |

| Moment | Mean Phi | Mean mm | Sorting | Skewness | Kurtosis |
|---|---|---|---|---|---|
| Statistics | 2.78 | 0.15 | 0.79 | -3.01 | 15.98 |

USACE GRANULARMETRIC REPORT FLAGLER_STAT_GINT.GPJ FL DEP ROSS.GDT 11/14/12

# Granularmetric Report

Depths and elevations based on measured values

Project Name: Flagler County

Sample Name: VC-FSP11-22 #1

Analysis Date: 04-01-11

Analyzed By:

US Army Corps of Engineers
701 San Marco Blvd
Jacksonville, Florida 32207
phone (904)396-7121

| Easting (ft): | Northing (ft): | Coordinate System: | Elevation (ft): |
|---|---|---|---|
| 657,885 | 1,850,138 | | -53.7 NAVD88 |

| USCS | Munsell: | Comments: |
|---|---|---|
| SP | Moist - 5GY 5/1 | |

| | | | Fines (%): | Organics (%): | Carbonates (%): | Shells (%): |
|---|---|---|---|---|---|---|
| | | | #230 - 1.02 | | | 18.00 |

| Sieve Number | Sieve Size (Phi) | Sieve Size (Millimeters) | % Weight Retained | C. % Weight Retained |
|---|---|---|---|---|
| #3.5 | -2.50 | 5.66 | 0.00 | 0.00 |
| #4 | -2.25 | 4.75 | 0.03 | 0.03 |
| #5 | -2.00 | 3.99 | 0.05 | 0.08 |
| #7 | -1.50 | 2.82 | 0.26 | 0.34 |
| #10 | -1.00 | 2.00 | 0.39 | 0.73 |
| #14 | -0.50 | 1.41 | 0.45 | 1.18 |
| #18 | 0.00 | 1.00 | 0.48 | 1.66 |
| #25 | 0.50 | 0.71 | 0.82 | 2.48 |
| #35 | 1.00 | 0.50 | 1.35 | 3.83 |
| #45 | 1.50 | 0.35 | 3.30 | 7.13 |
| #60 | 2.00 | 0.25 | 11.42 | 18.55 |
| #80 | 2.50 | 0.18 | 42.89 | 61.44 |
| #120 | 3.00 | 0.13 | 32.40 | 93.84 |
| #170 | 3.50 | 0.09 | 4.44 | 98.28 |
| #200 | 3.75 | 0.07 | 0.59 | 98.87 |
| #230 | 4.00 | 0.06 | 0.11 | 98.98 |

| Phi 5 | Phi 16 | Phi 25 | Phi 50 | Phi 75 | Phi 84 | Phi 95 |
|---|---|---|---|---|---|---|
| 3.13 | 2.85 | 2.71 | 2.37 | 2.07 | 1.88 | 1.17 |

| Moment | Mean Phi | Mean mm | Sorting | Skewness | Kurtosis |
|---|---|---|---|---|---|
| Statistics | 2.29 | 0.20 | 0.67 | -2.4 | 13.07 |

USACE GRANULARMETRIC REPORT FLAGLER_STAT_GINT.GPJ FL DEP ROSS.GDT 11/14/12

# Granularmetric Report

Depths and elevations based on measured values

Project Name: Flagler County

Sample Name: VC-FSP11-22 #2

Analysis Date: 04-01-11

Analyzed By:

US Army Corps of Engineers
701 San Marco Blvd
Jacksonville, Florida 32207
phone (904)396-7121

| Easting (ft): | Northing (ft): | Coordinate System: | Elevation (ft): |
|---|---|---|---|
| 657,885 | 1,850,138 | | -56.7 NAVD88 |

| USCS | Munsell: | Comments: |
|---|---|---|
| SP | Moist - 5GY 5/1 | |

| Fines (%): | Organics (%): | Carbonates (%): | Shells (%): |
|---|---|---|---|
| #230 - 2.36 | | | 5.00 |

| Sieve Number | Sieve Size (Phi) | Sieve Size (Millimeters) | % Weight Retained | C. % Weight Retained |
|---|---|---|---|---|
| #5 | -2.00 | 3.99 | 0.00 | 0.00 |
| #7 | -1.50 | 2.82 | 0.03 | 0.03 |
| #10 | -1.00 | 2.00 | 0.05 | 0.08 |
| #14 | -0.50 | 1.41 | 0.06 | 0.14 |
| #18 | 0.00 | 1.00 | 0.30 | 0.44 |
| #25 | 0.50 | 0.71 | 0.41 | 0.85 |
| #35 | 1.00 | 0.50 | 0.69 | 1.54 |
| #45 | 1.50 | 0.35 | 1.70 | 3.24 |
| #60 | 2.00 | 0.25 | 7.46 | 10.70 |
| #80 | 2.50 | 0.18 | 36.87 | 47.57 |
| #120 | 3.00 | 0.13 | 41.99 | 89.56 |
| #170 | 3.50 | 0.09 | 6.90 | 96.46 |
| #200 | 3.75 | 0.07 | 0.86 | 97.32 |
| #230 | 4.00 | 0.06 | 0.32 | 97.64 |

| Phi 5 | Phi 16 | Phi 25 | Phi 50 | Phi 75 | Phi 84 | Phi 95 |
|---|---|---|---|---|---|---|
| 3.39 | 2.93 | 2.83 | 2.53 | 2.19 | 2.07 | 1.61 |

| Moment | Mean Phi | Mean mm | Sorting | Skewness | Kurtosis |
|---|---|---|---|---|---|
| Statistics | 2.46 | 0.18 | 0.51 | -1.55 | 10.23 |

USACE GRANULARMETRIC REPORT FLAGLER_STAT_GINT.GPJ FL DEP ROSS.GDT 11/14/12

# Granularmetric Report

Depths and elevations based on measured values

Project Name: Flagler County

Sample Name: VC-FSP11-22 #3

Analysis Date: 04-01-11

Analyzed By:

US Army Corps of Engineers
701 San Marco Blvd
Jacksonville, Florida 32207
phone (904)396-7121

| Easting (ft): | Northing (ft): | Coordinate System: | Elevation (ft): |
|---|---|---|---|
| 657,885 | 1,850,138 | | -59.7 NAVD88 |

| USCS | Munsell: | Comments: |
|---|---|---|
| SP | Moist - 5GY 5/1 | |

| | | | Fines (%): | Organics (%): | Carbonates (%): | Shells (%): |
|---|---|---|---|---|---|---|
| | | | #230 - 1.95 | | 17.00 | 14.00 |

| Sieve Number | Sieve Size (Phi) | Sieve Size (Millimeters) | % Weight Retained | C. % Weight Retained |
|---|---|---|---|---|
| #4 | -2.25 | 4.75 | 0.00 | 0.00 |
| #5 | -2.00 | 3.99 | 0.04 | 0.04 |
| #7 | -1.50 | 2.82 | 0.04 | 0.08 |
| #10 | -1.00 | 2.00 | 0.19 | 0.27 |
| #14 | -0.50 | 1.41 | 0.40 | 0.67 |
| #18 | 0.00 | 1.00 | 0.79 | 1.46 |
| #25 | 0.50 | 0.71 | 1.27 | 2.73 |
| #35 | 1.00 | 0.50 | 2.07 | 4.80 |
| #45 | 1.50 | 0.35 | 3.54 | 8.34 |
| #60 | 2.00 | 0.25 | 10.41 | 18.75 |
| #80 | 2.50 | 0.18 | 40.23 | 58.98 |
| #120 | 3.00 | 0.13 | 33.89 | 92.87 |
| #170 | 3.50 | 0.09 | 4.42 | 97.29 |
| #200 | 3.75 | 0.07 | 0.56 | 97.85 |
| #230 | 4.00 | 0.06 | 0.20 | 98.05 |

| Phi 5 | Phi 16 | Phi 25 | Phi 50 | Phi 75 | Phi 84 | Phi 95 |
|---|---|---|---|---|---|---|
| 3.24 | 2.87 | 2.74 | 2.39 | 2.07 | 1.86 | 1.03 |

| Moment | Mean Phi | Mean mm | Sorting | Skewness | Kurtosis |
|---|---|---|---|---|---|
| Statistics | 2.29 | 0.20 | 0.66 | -1.9 | 9.17 |

USACE GRANULARMETRIC REPORT FLAGLER_STAT_GINT.GPJ FL DEP ROSS.GDT 11/14/12

# Granularmetric Report

Depths and elevations based on measured values

Project Name: Flagler County

Sample Name: VC-FSP11-22 #4

Analysis Date: 04-01-11

Analyzed By:

US Army Corps of Engineers
701 San Marco Blvd
Jacksonville, Florida 32207
phone (904)396-7121

| Easting (ft): | Northing (ft): | Coordinate System: | Elevation (ft): |
|---|---|---|---|
| 657,885 | 1,850,138 | | -62.7 NAVD88 |

| USCS | Munsell: | Comments: |
|---|---|---|
| SP | Moist - 5GY 5/1 | |

| Fines (%): | Organics (%): | Carbonates (%): | Shells (%): |
|---|---|---|---|
| #230 - 2.47 | | | 9.00 |

| Sieve Number | Sieve Size (Phi) | Sieve Size (Millimeters) | % Weight Retained | C. % Weight Retained |
|---|---|---|---|---|
| #4 | -2.25 | 4.75 | 0.00 | 0.00 |
| #5 | -2.00 | 3.99 | 0.01 | 0.01 |
| #7 | -1.50 | 2.82 | 0.13 | 0.14 |
| #10 | -1.00 | 2.00 | 0.24 | 0.38 |
| #14 | -0.50 | 1.41 | 0.29 | 0.67 |
| #18 | 0.00 | 1.00 | 0.36 | 1.03 |
| #25 | 0.50 | 0.71 | 0.35 | 1.38 |
| #35 | 1.00 | 0.50 | 0.57 | 1.95 |
| #45 | 1.50 | 0.35 | 1.13 | 3.08 |
| #60 | 2.00 | 0.25 | 3.80 | 6.88 |
| #80 | 2.50 | 0.18 | 30.40 | 37.28 |
| #120 | 3.00 | 0.13 | 50.56 | 87.84 |
| #170 | 3.50 | 0.09 | 8.41 | 96.25 |
| #200 | 3.75 | 0.07 | 0.97 | 97.22 |
| #230 | 4.00 | 0.06 | 0.31 | 97.53 |

| Phi 5 | Phi 16 | Phi 25 | Phi 50 | Phi 75 | Phi 84 | Phi 95 |
|---|---|---|---|---|---|---|
| 3.43 | 2.96 | 2.87 | 2.63 | 2.30 | 2.15 | 1.75 |

| Moment | Mean Phi | Mean mm | Sorting | Skewness | Kurtosis |
|---|---|---|---|---|---|
| Statistics | 2.53 | 0.17 | 0.56 | -2.85 | 18.39 |

USACE GRANULARMETRIC REPORT FLAGLER_STAT_GINT.GPJ FL DEP ROSS.GDT 11/14/12

# Granularmetric Report

Depths and elevations based on measured values

Project Name: Flagler County

Sample Name: VC-FSP11-22 #5

Analysis Date: 04-01-11

Analyzed By:

US Army Corps of Engineers
701 San Marco Blvd
Jacksonville, Florida 32207
phone (904)396-7121

| Easting (ft): | Northing (ft): | Coordinate System: | Elevation (ft): |
|---|---|---|---|
| 657,885 | 1,850,138 | | -64.7 NAVD88 |

| USCS | Munsell: | Comments: |
|---|---|---|
| SP-SM | Moist - 5GY 4/1 | |

| Fines (%): | Organics (%): | Carbonates (%): | Shells (%): |
|---|---|---|---|
| #230 - 9.74 | | | 9.00 |

| Sieve Number | Sieve Size (Phi) | Sieve Size (Millimeters) | % Weight Retained | C. % Weight Retained |
|---|---|---|---|---|
| 3/4 | -4.25 | 19.03 | 0.00 | 0.00 |
| 3/8 | -3.25 | 9.48 | 0.33 | 0.33 |
| #3.5 | -2.50 | 5.66 | 0.00 | 0.33 |
| #4 | -2.25 | 4.75 | 0.29 | 0.62 |
| #5 | -2.00 | 3.99 | 0.10 | 0.72 |
| #7 | -1.50 | 2.82 | 0.27 | 0.99 |
| #10 | -1.00 | 2.00 | 0.48 | 1.47 |
| #14 | -0.50 | 1.41 | 0.61 | 2.08 |
| #18 | 0.00 | 1.00 | 0.53 | 2.61 |
| #25 | 0.50 | 0.71 | 0.73 | 3.34 |
| #35 | 1.00 | 0.50 | 0.90 | 4.24 |
| #45 | 1.50 | 0.35 | 1.15 | 5.39 |
| #60 | 2.00 | 0.25 | 2.71 | 8.10 |
| #80 | 2.50 | 0.18 | 12.11 | 20.21 |
| #120 | 3.00 | 0.13 | 48.24 | 68.45 |
| #170 | 3.50 | 0.09 | 18.21 | 86.66 |
| #200 | 3.75 | 0.07 | 2.67 | 89.33 |
| #230 | 4.00 | 0.06 | 0.93 | 90.26 |

| Phi 5 | Phi 16 | Phi 25 | Phi 50 | Phi 75 | Phi 84 | Phi 95 |
|---|---|---|---|---|---|---|
| | 3.43 | 3.18 | 2.81 | 2.55 | 2.32 | 1.33 |

| Moment | Mean Phi | Mean mm | Sorting | Skewness | Kurtosis |
|---|---|---|---|---|---|
| Statistics | 2.61 | 0.16 | 0.89 | -3.55 | 19.8 |

USACE GRANULARMETRIC REPORT FLAGLER_STAT_GINT.GPJ FL DEP ROSS.GDT 11/14/12

# Granularmetric Report

Depths and elevations based on measured values

Project Name: Flagler County

Sample Name: VC-FSP11-22 #6

Analysis Date: 04-01-11

Analyzed By:

US Army Corps of Engineers
701 San Marco Blvd
Jacksonville, Florida 32207
phone (904)396-7121

| Easting (ft): | Northing (ft): | Coordinate System: | Elevation (ft): |
|---|---|---|---|
| 657,885 | 1,850,138 | | -66.7 NAVD88 |

| USCS | Munsell: | Comments: |
|---|---|---|
| SM | Moist - 10GY 3/1 | |

| Fines (%): | Organics (%): | Carbonates (%): | Shells (%): |
|---|---|---|---|
| #230 - 11.50 | | | 15.00 |

| Sieve Number | Sieve Size (Phi) | Sieve Size (Millimeters) | % Weight Retained | C. % Weight Retained |
|---|---|---|---|---|
| 3/8 | -3.25 | 9.48 | 0.00 | 0.00 |
| #3.5 | -2.50 | 5.66 | 0.95 | 0.95 |
| #4 | -2.25 | 4.75 | 0.10 | 1.05 |
| #5 | -2.00 | 3.99 | 0.20 | 1.25 |
| #7 | -1.50 | 2.82 | 0.80 | 2.05 |
| #10 | -1.00 | 2.00 | 1.02 | 3.07 |
| #14 | -0.50 | 1.41 | 1.02 | 4.09 |
| #18 | 0.00 | 1.00 | 0.99 | 5.08 |
| #25 | 0.50 | 0.71 | 0.92 | 6.00 |
| #35 | 1.00 | 0.50 | 0.97 | 6.97 |
| #45 | 1.50 | 0.35 | 1.21 | 8.18 |
| #60 | 2.00 | 0.25 | 2.25 | 10.43 |
| #80 | 2.50 | 0.18 | 10.18 | 20.61 |
| #120 | 3.00 | 0.13 | 42.07 | 62.68 |
| #170 | 3.50 | 0.09 | 21.40 | 84.08 |
| #200 | 3.75 | 0.07 | 3.26 | 87.34 |
| #230 | 4.00 | 0.06 | 1.16 | 88.50 |

| Phi 5 | Phi 16 | Phi 25 | Phi 50 | Phi 75 | Phi 84 | Phi 95 |
|---|---|---|---|---|---|---|
| | 3.50 | 3.29 | 2.85 | 2.55 | 2.27 | -0.04 |

| Moment | Mean Phi | Mean mm | Sorting | Skewness | Kurtosis |
|---|---|---|---|---|---|
| Statistics | 2.53 | 0.17 | 1.13 | -2.81 | 11.44 |

USACE GRANULARMETRIC REPORT FLAGLER_STAT_GINT.GPJ FL DEP ROSS.GDT 11/14/12

# Granularmetric Report

Depths and elevations based on measured values

Project Name: Flagler County

Sample Name: VC-FSP11-23 #1

Analysis Date: 04-01-11

Analyzed By:

US Army Corps of Engineers
701 San Marco Blvd
Jacksonville, Florida 32207
phone (904)396-7121

| Easting (ft): | Northing (ft): | Coordinate System: | Elevation (ft): |
|---|---|---|---|
| 657,899 | 1,844,676 | | -61.6 NAVD88 |

| USCS | Munsell: | Comments: |
|---|---|---|
| SW | Moist - 10Y 4/1 | |

| | | | Fines (%): | Organics (%): | Carbonates (%): | Shells (%): |
|---|---|---|---|---|---|---|
| | | | #230 - 2.00 | | | 37.00 |

| Sieve Number | Sieve Size (Phi) | Sieve Size (Millimeters) | % Weight Retained | C. % Weight Retained |
|---|---|---|---|---|
| 3/8 | -3.25 | 9.48 | 0.00 | 0.00 |
| #3.5 | -2.50 | 5.66 | 0.60 | 0.60 |
| #4 | -2.25 | 4.75 | 0.29 | 0.89 |
| #5 | -2.00 | 3.99 | 0.32 | 1.21 |
| #7 | -1.50 | 2.82 | 1.49 | 2.70 |
| #10 | -1.00 | 2.00 | 1.39 | 4.09 |
| #14 | -0.50 | 1.41 | 2.33 | 6.42 |
| #18 | 0.00 | 1.00 | 2.92 | 9.34 |
| #25 | 0.50 | 0.71 | 3.69 | 13.03 |
| #35 | 1.00 | 0.50 | 6.37 | 19.40 |
| #45 | 1.50 | 0.35 | 10.10 | 29.50 |
| #60 | 2.00 | 0.25 | 15.12 | 44.62 |
| #80 | 2.50 | 0.18 | 27.93 | 72.55 |
| #120 | 3.00 | 0.13 | 22.17 | 94.72 |
| #170 | 3.50 | 0.09 | 2.83 | 97.55 |
| #200 | 3.75 | 0.07 | 0.30 | 97.85 |
| #230 | 4.00 | 0.06 | 0.15 | 98.00 |

| Phi 5 | Phi 16 | Phi 25 | Phi 50 | Phi 75 | Phi 84 | Phi 95 |
|---|---|---|---|---|---|---|
| 3.05 | 2.76 | 2.56 | 2.09 | 1.27 | 0.73 | -0.80 |

| Moment | Mean Phi | Mean mm | Sorting | Skewness | Kurtosis |
|---|---|---|---|---|---|
| Statistics | 1.73 | 0.30 | 1.17 | -1.48 | 5.21 |

USACE GRANULARMETRIC REPORT FLAGLER_STAT_GINT.GPJ FL DEP ROSS.GDT 11/14/12

# Granularmetric Report

Depths and elevations based on measured values

Project Name: Flagler County

Sample Name: VC-FSP11-23 #2

Analysis Date: 04-01-11

Analyzed By:

US Army Corps of Engineers
701 San Marco Blvd
Jacksonville, Florida 32207
phone (904)396-7121

| Easting (ft): | Northing (ft): | Coordinate System: | Elevation (ft): |
|---|---|---|---|
| 657,899 | 1,844,676 | | -63.1 NAVD88 |

| USCS | Munsell: | Comments: |
|---|---|---|
| SP-SM | Moist - 10Y 4/1 | |

| Fines (%): | Organics (%): | Carbonates (%): | Shells (%): |
|---|---|---|---|
| #230 - 8.81 | | | 10.00 |

| Sieve Number | Sieve Size (Phi) | Sieve Size (Millimeters) | % Weight Retained | C. % Weight Retained |
|---|---|---|---|---|
| 3/8 | -3.25 | 9.48 | 0.00 | 0.00 |
| #3.5 | -2.50 | 5.66 | 0.06 | 0.06 |
| #4 | -2.25 | 4.75 | 0.05 | 0.11 |
| #5 | -2.00 | 3.99 | 0.04 | 0.15 |
| #7 | -1.50 | 2.82 | 0.43 | 0.58 |
| #10 | -1.00 | 2.00 | 0.62 | 1.20 |
| #14 | -0.50 | 1.41 | 0.59 | 1.79 |
| #18 | 0.00 | 1.00 | 0.74 | 2.53 |
| #25 | 0.50 | 0.71 | 0.70 | 3.23 |
| #35 | 1.00 | 0.50 | 0.91 | 4.14 |
| #45 | 1.50 | 0.35 | 1.37 | 5.51 |
| #60 | 2.00 | 0.25 | 3.51 | 9.02 |
| #80 | 2.50 | 0.18 | 18.28 | 27.30 |
| #120 | 3.00 | 0.13 | 48.54 | 75.84 |
| #170 | 3.50 | 0.09 | 12.47 | 88.31 |
| #200 | 3.75 | 0.07 | 2.07 | 90.38 |
| #230 | 4.00 | 0.06 | 0.81 | 91.19 |

| Phi 5 | Phi 16 | Phi 25 | Phi 50 | Phi 75 | Phi 84 | Phi 95 |
|---|---|---|---|---|---|---|
| | 3.33 | 2.99 | 2.73 | 2.44 | 2.19 | 1.31 |

| Moment | Mean Phi | Mean mm | Sorting | Skewness | Kurtosis |
|---|---|---|---|---|---|
| Statistics | 2.54 | 0.17 | 0.8 | -2.92 | 14.52 |

USACE GRANULARMETRIC REPORT FLAGLER_STAT_GINT.GPJ FL DEP ROSS.GDT 11/14/12

# Granularmetric Report

Depths and elevations based on measured values

Project Name: Flagler County

Sample Name: VC-FSP11-23 #3

Analysis Date: 04-01-11

Analyzed By:

US Army Corps of Engineers
701 San Marco Blvd
Jacksonville, Florida 32207
phone (904)396-7121

| Easting (ft): | Northing (ft): | Coordinate System: | Elevation (ft): |
|---|---|---|---|
| 657,899 | 1,844,676 | | -65.6 NAVD88 |

| USCS | Munsell: | Comments: |
|---|---|---|
| SM | Moist - 10GY 4/1 | |

| Fines (%): | Organics (%): | Carbonates (%): | Shells (%): |
|---|---|---|---|
| #230 - 13.16 | | | 11.00 |

| Sieve Number | Sieve Size (Phi) | Sieve Size (Millimeters) | % Weight Retained | C. % Weight Retained |
|---|---|---|---|---|
| 3/8 | -3.25 | 9.48 | 0.00 | 0.00 |
| #3.5 | -2.50 | 5.66 | 0.40 | 0.40 |
| #4 | -2.25 | 4.75 | 0.22 | 0.62 |
| #5 | -2.00 | 3.99 | 0.26 | 0.88 |
| #7 | -1.50 | 2.82 | 0.74 | 1.62 |
| #10 | -1.00 | 2.00 | 0.64 | 2.26 |
| #14 | -0.50 | 1.41 | 0.71 | 2.97 |
| #18 | 0.00 | 1.00 | 0.75 | 3.72 |
| #25 | 0.50 | 0.71 | 1.02 | 4.74 |
| #35 | 1.00 | 0.50 | 1.64 | 6.38 |
| #45 | 1.50 | 0.35 | 2.34 | 8.72 |
| #60 | 2.00 | 0.25 | 4.60 | 13.32 |
| #80 | 2.50 | 0.18 | 14.08 | 27.40 |
| #120 | 3.00 | 0.13 | 37.10 | 64.50 |
| #170 | 3.50 | 0.09 | 18.13 | 82.63 |
| #200 | 3.75 | 0.07 | 3.10 | 85.73 |
| #230 | 4.00 | 0.06 | 1.11 | 86.84 |

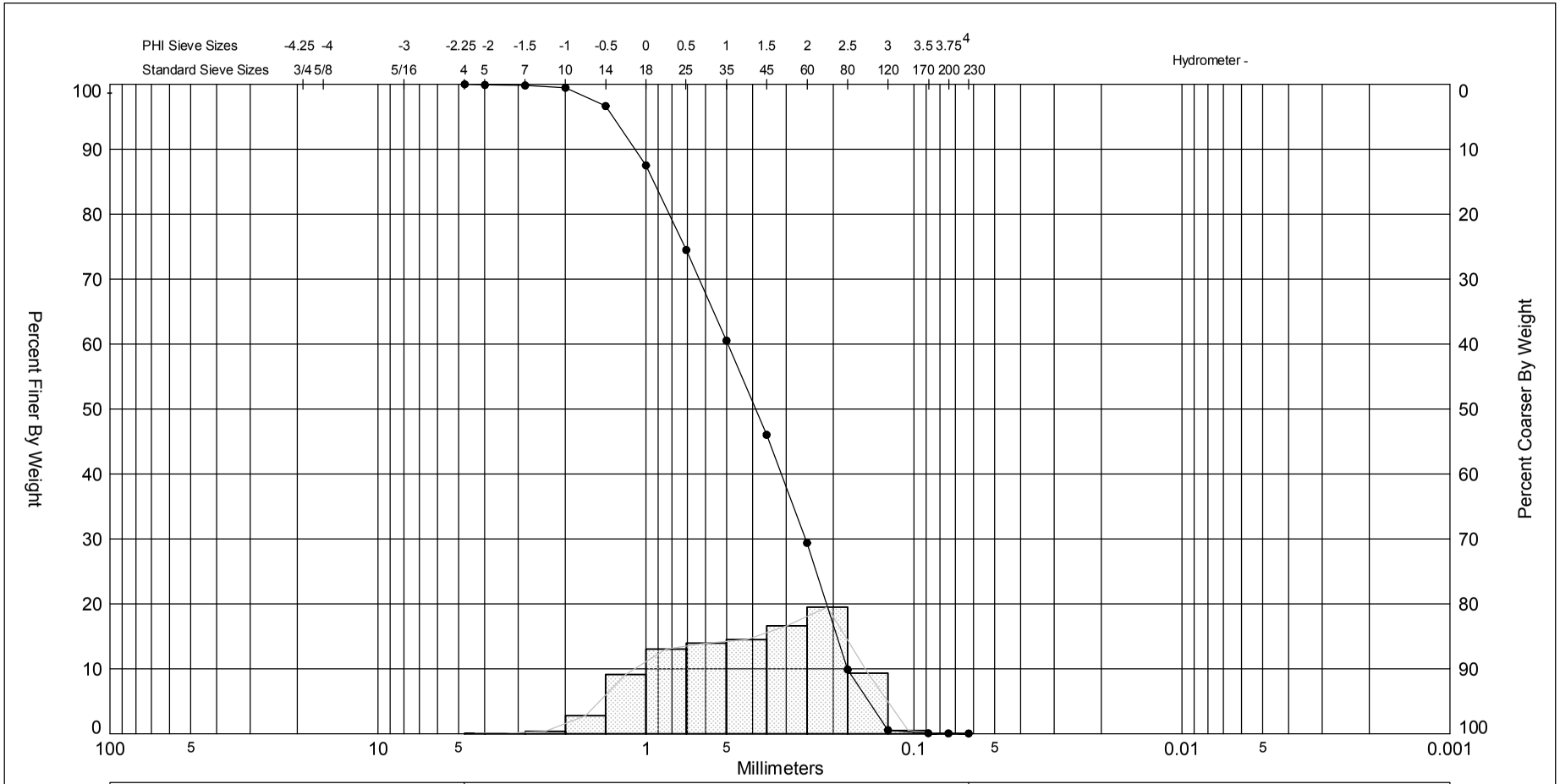
| Phi 5 | Phi 16 | Phi 25 | Phi 50 | Phi 75 | Phi 84 | Phi 95 |
|---|---|---|---|---|---|---|
| | 3.61 | 3.29 | 2.80 | 2.41 | 2.09 | 0.58 |

| Moment | Mean Phi | Mean mm | Sorting | Skewness | Kurtosis |
|---|---|---|---|---|---|
| Statistics | 2.48 | 0.18 | 1.04 | -2.57 | 10.98 |

USACE GRANULARMETRIC REPORT FLAGLER_STAT_GINT.GPJ FL DEP ROSS.GDT 11/14/12

# NATIVE BEACH:

# LABORATORY TESTING RESULTS




| Sample | Symbol | Elev. (ft) | USCS | % Fines | % Organics | % Carbonates | Median | Mean | Skew | Kurt | Sort |
|---|---|---|---|---|---|---|---|---|---|---|---|
| R-81 #Mid-Tide | —●— | 0.0 | SW | #230 - 0.05 | | | 1.36 | 1.27 | -0.28 | 2.21 | 1 |

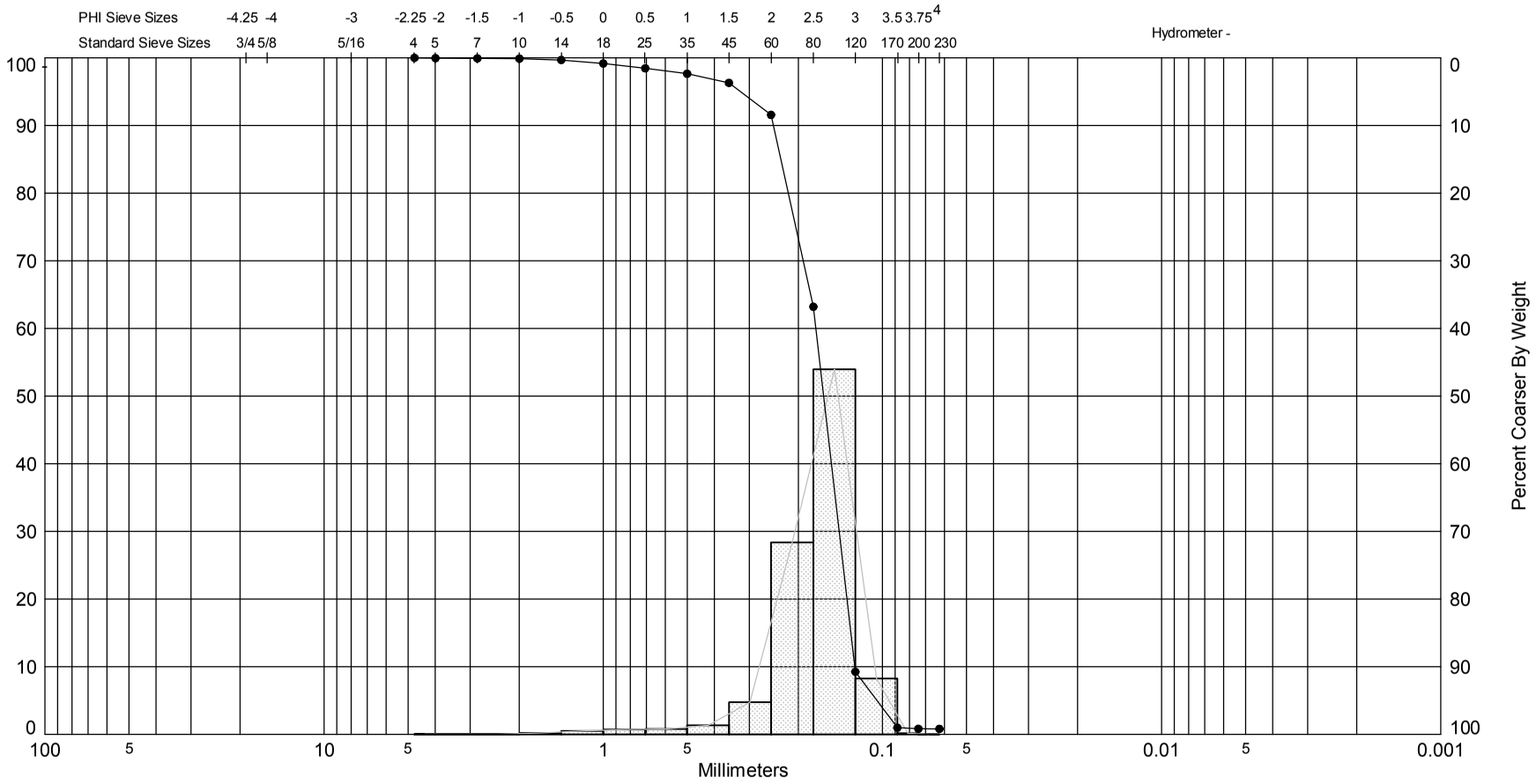
Comments:

Depths and elevations based on measured values

| Sample Information | |
|---|---|
| Project Name: | Flagler County |
| Analysis Date: | 09-04-12 |
| Analyzed By: | |
| Easting (X, ft): | 616,574 |
| Northing (Y, ft): | 1,868,930 |
| Horizontal System: | NAD83 |
| Vertical System: | MLLW |

US Army Corps of Engineers
701 San Marco Blvd
Jacksonville, Florida 32207
phone (904)396-7121

SIEVE ANALYSIS FDEP_GINT_IMPORT_FLAGLER.GPJ FL DEP ROSS.GDT 11/14/12




| Sample | Symbol | Elev. (ft) | USCS | % Fines | % Organics | % Carbonates | Median | Mean | Skew | Kurt | Sort |
|---|---|---|---|---|---|---|---|---|---|---|---|
| R-81 #-3 | —● | 0.0 | SP | #230 - 0.81 | | | 2.62 | 2.52 | -2.64 | 15.18 | 0.54 |

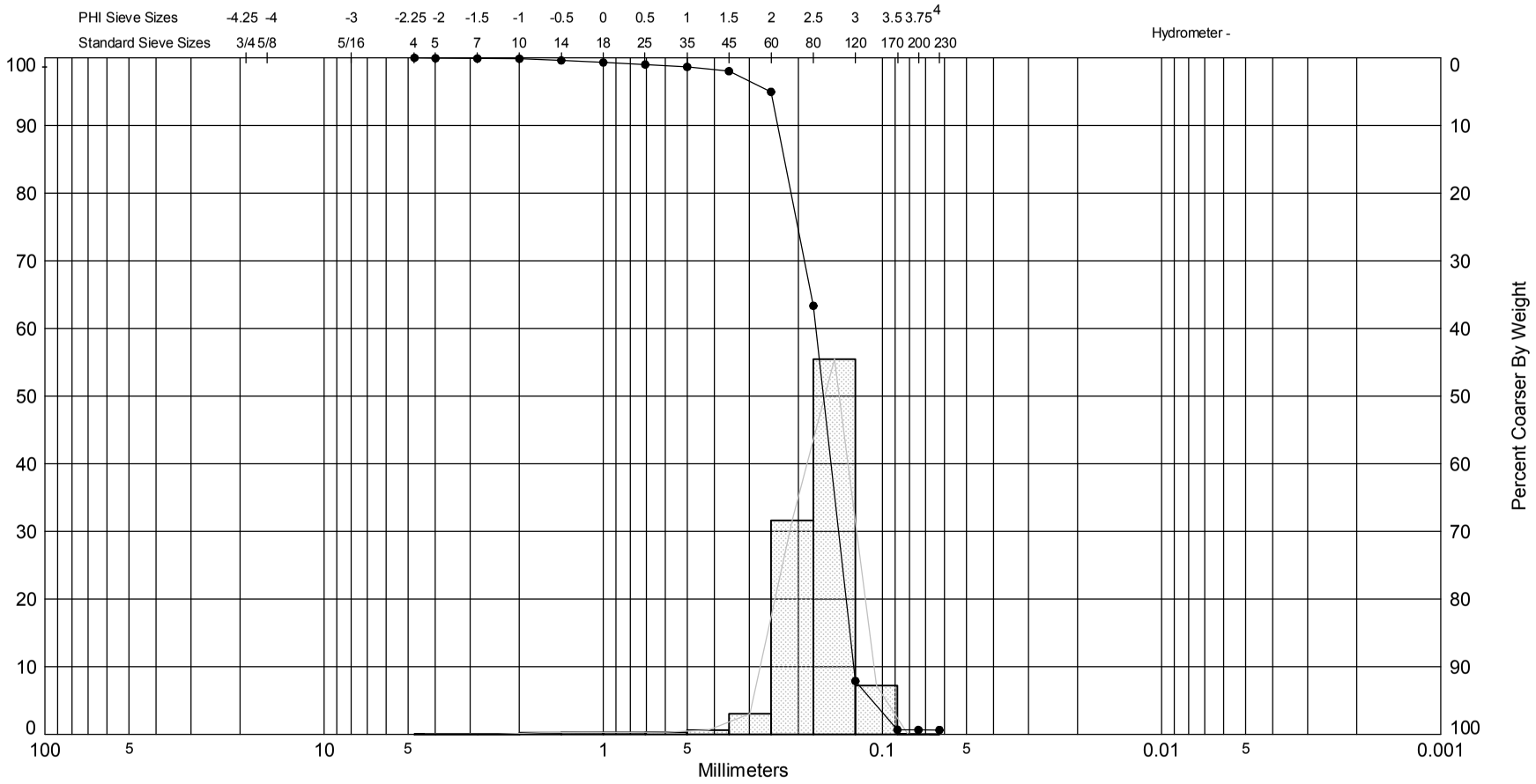
Comments:

Depths and elevations based on measured values

US Army Corps of Engineers
701 San Marco Blvd
Jacksonville, Florida 32207
phone (904)396-7121

| Sample Information | |
|---|---|
| Project Name: | Flagler County |
| Analysis Date: | 09-04-12 |
| Analyzed By: | |
| Easting (X, ft): | 616,574 |
| Northing (Y, ft): | 1,868,930 |
| Horizontal System: | NAD83 |
| Vertical System: | MLLW |

SIEVE ANALYSIS FDEP_GINT_IMPORT_FLAGLER.GPJ FL DEP ROSS.GDT 11/14/12




| Sample | Symbol | Elev. (ft) | USCS | % Fines | % Organics | % Carbonates | Median | Mean | Skew | Kurt | Sort |
|---|---|---|---|---|---|---|---|---|---|---|---|
| R-81 #-5 | —●— | -0.1 | SP | #230 - 0.64 | | | 2.62 | 2.55 | -3.18 | 23.24 | 0.47 |

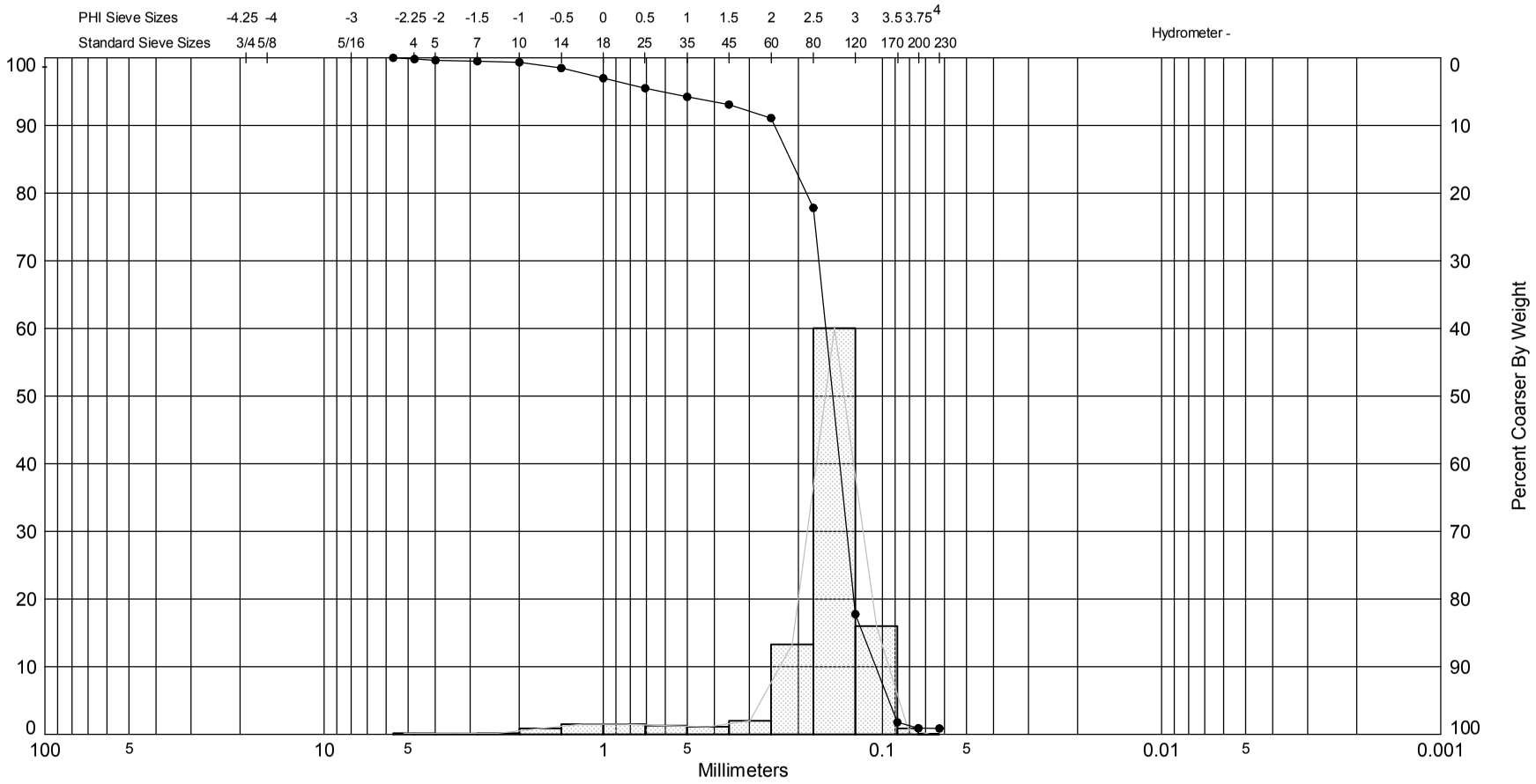
Comments:

Depths and elevations based on measured values

US Army Corps of Engineers
701 San Marco Blvd
Jacksonville, Florida 32207
phone (904)396-7121

| Sample Information | |
|---|---|
| Project Name: | Flagler County |
| Analysis Date: | 09-04-12 |
| Analyzed By: | |
| Easting (X, ft): | 616,574 |
| Northing (Y, ft): | 1,868,930 |
| Horizontal System: | NAD83 |
| Vertical System: | MLLW |

SIEVE ANALYSIS FDEP_GINT_IMPORT_FLAGLER.GPJ FL DEP ROSS.GDT 11/14/12




| Sample | Symbol | Elev. (ft) | USCS | % Fines | % Organics | % Carbonates | Median | Mean | Skew | Kurt | Sort |
|---|---|---|---|---|---|---|---|---|---|---|---|
| R-81 #-10 | —●— | -0.1 | SP | #230 - 0.87 | | 8.30 | 2.73 | 2.56 | -3.03 | 13.91 | 0.79 |

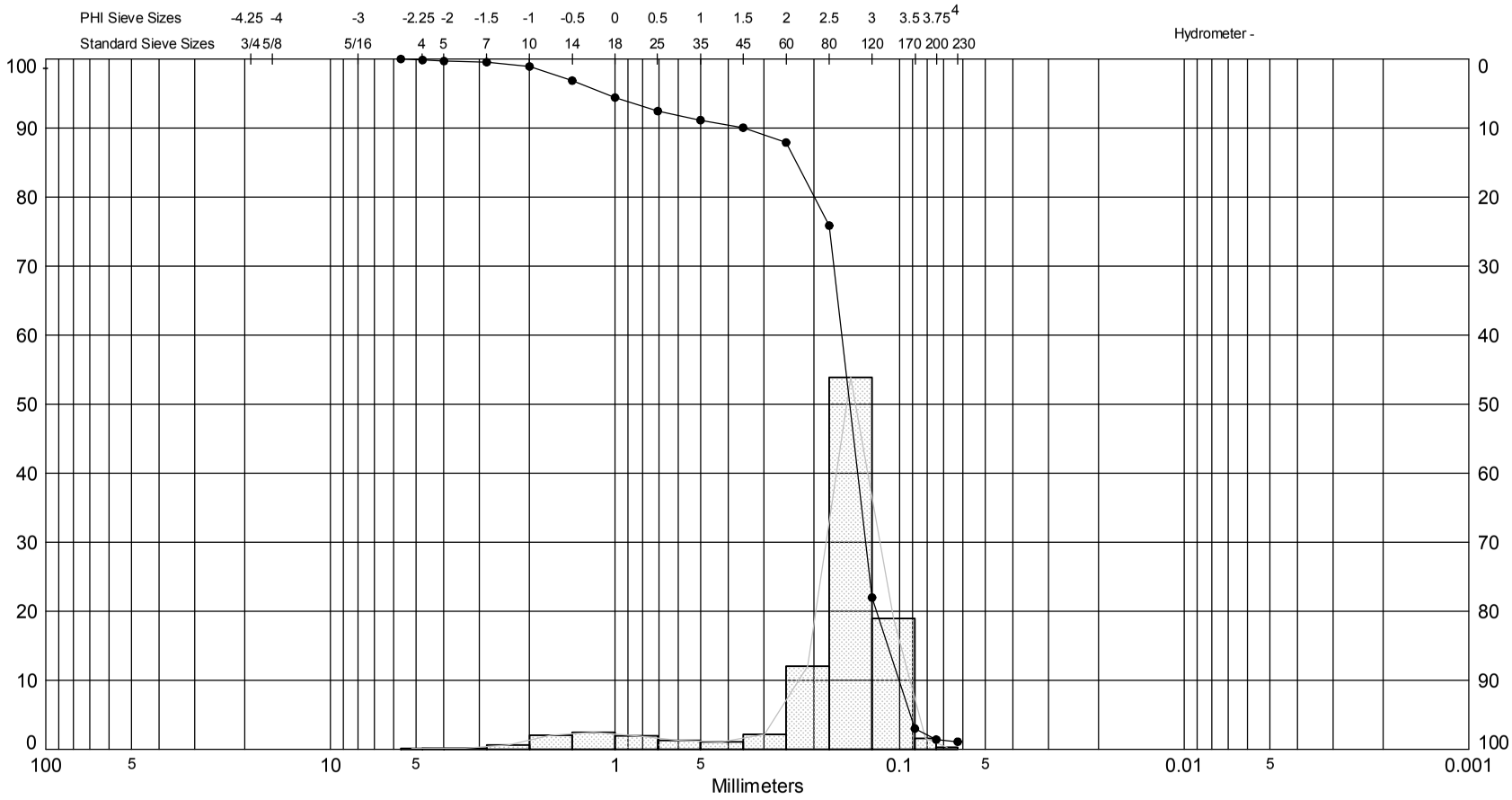
Comments:

Depths and elevations based on measured values

US Army Corps of Engineers
701 San Marco Blvd
Jacksonville, Florida 32207
phone (904)396-7121

| Sample Information | |
|---|---|
| Project Name: | Flagler County |
| Analysis Date: | 09-04-12 |
| Analyzed By: | |
| Easting (X, ft): | 616,574 |
| Northing (Y, ft): | 1,868,930 |
| Horizontal System: | NAD83 |
| Vertical System: | MLLW |

SIEVE ANALYSIS FDEP_GINT_IMPORT_FLAGLER.GPJ FL DEP ROSS.GDT 11/14/12




| Sample | Symbol | Elev. (ft) | USCS | % Fines | % Organics | % Carbonates | Median | Mean | Skew | Kurt | Sort |
|---|---|---|---|---|---|---|---|---|---|---|---|
| R-81 #-15 | —●— | -0.1 | SW | #230 - 1.10 | | | 2.74 | 2.49 | -2.41 | 8.78 | 0.97 |

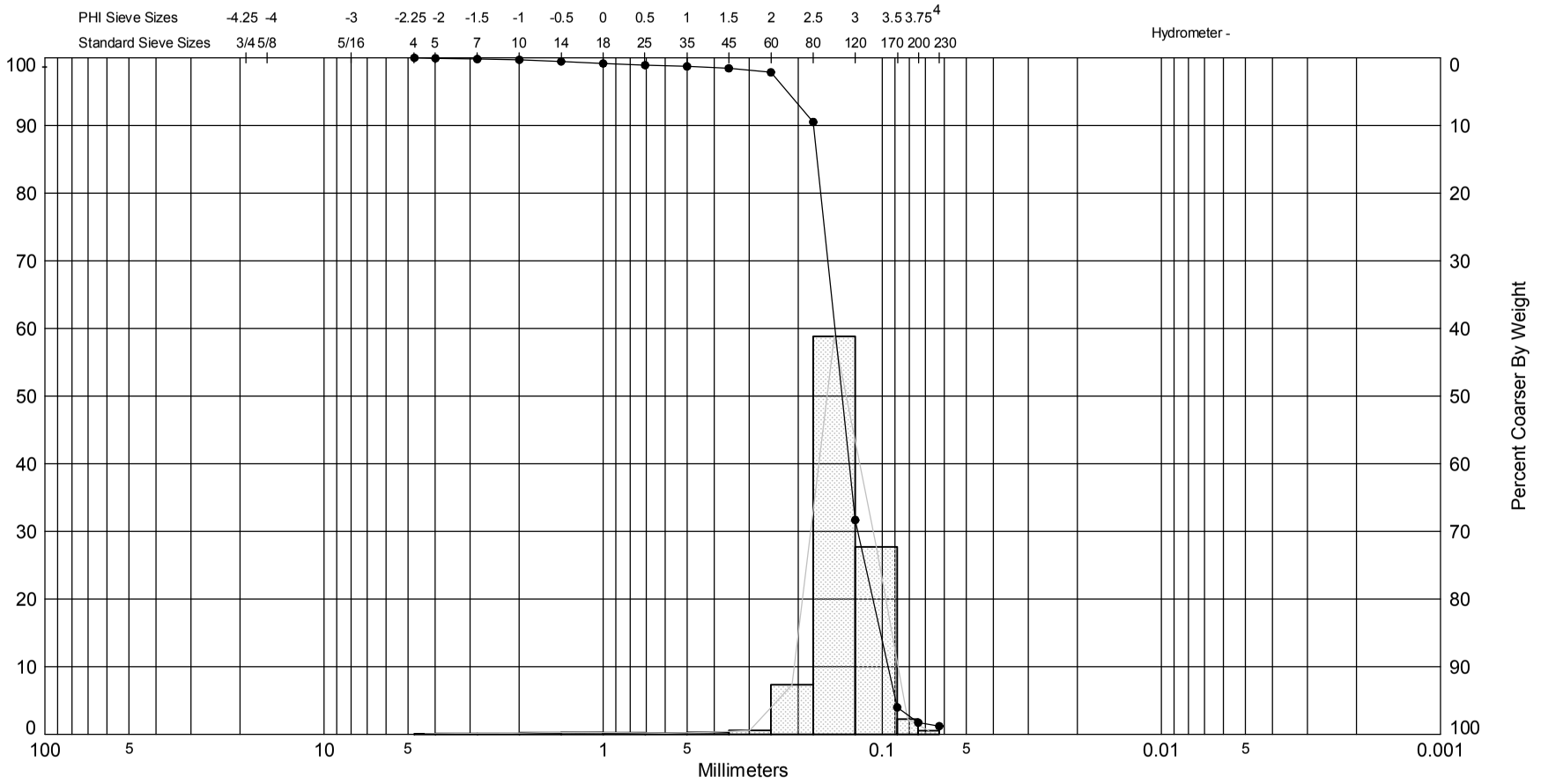
Comments:

Depths and elevations based on measured values

US Army Corps of Engineers
701 San Marco Blvd
Jacksonville, Florida 32207
phone (904)396-7121

| Sample Information | |
|---|---|
| Project Name: | Flagler County |
| Analysis Date: | 09-04-12 |
| Analyzed By: | |
| Easting (X, ft): | 616,574 |
| Northing (Y, ft): | 1,868,930 |
| Horizontal System: | NAD83 |
| Vertical System: | MLLW |

SIEVE ANALYSIS FDEP_GINT_IMPORT_FLAGLER.GPJ FL DEP ROSS.GDT 11/14/12




| Sample | Symbol | Elev. (ft) | USCS | % Fines | % Organics | % Carbonates | Median | Mean | Skew | Kurt | Sort |
|---|---|---|---|---|---|---|---|---|---|---|---|
| R-81 #-20 | —●— | -0.1 | SP | #230 - 1.21 | | | 2.84 | 2.83 | -4.01 | 31.76 | 0.51 |

Comments:

Depths and elevations based on measured values

US Army Corps of Engineers
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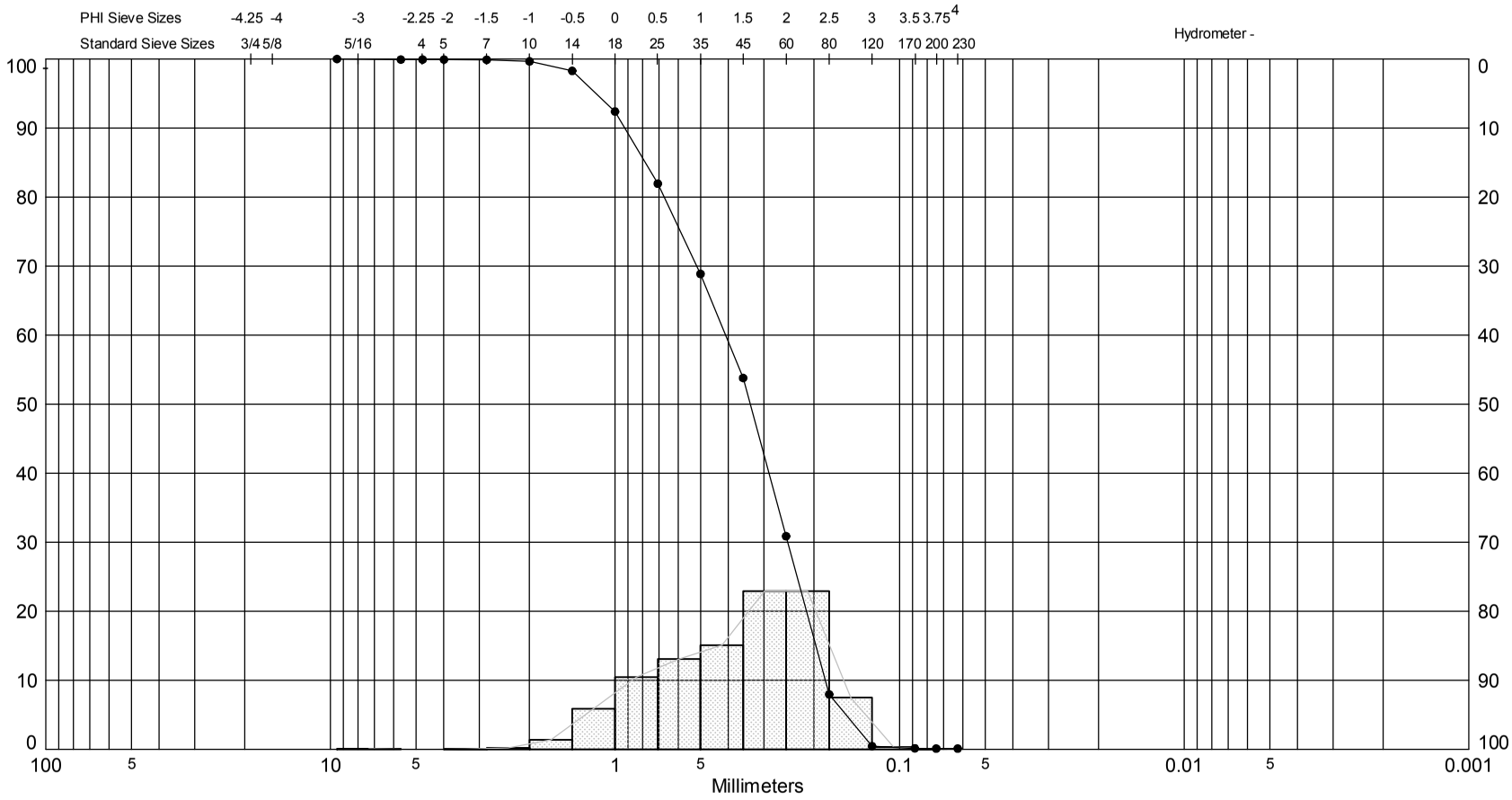
Jacksonville, Florida 32207
phone (904)396-7121

| Sample Information | |
|---|---|
| Project Name: | Flagler County |
| Analysis Date: | 09-04-12 |
| Analyzed By: | |
| Easting (X, ft): | 616,574 |
| Northing (Y, ft): | 1,868,930 |
| Horizontal System: | NAD83 |
| Vertical System: | MLLW |

SIEVE ANALYSIS FDEP_GINT_IMPORT_FLAGLER.GPJ FL DEP ROSS.GDT 11/14/12




| Sample | Symbol | Elev. (ft) | USCS | % Fines | % Organics | % Carbonates | Median | Mean | Skew | Kurt | Sort |
|---|---|---|---|---|---|---|---|---|---|---|---|
| R-85 #Berm | —●— | 0.0 | SW | #230 - 0.11 | | | 1.58 | 1.42 | -0.55 | 2.82 | 0.89 |

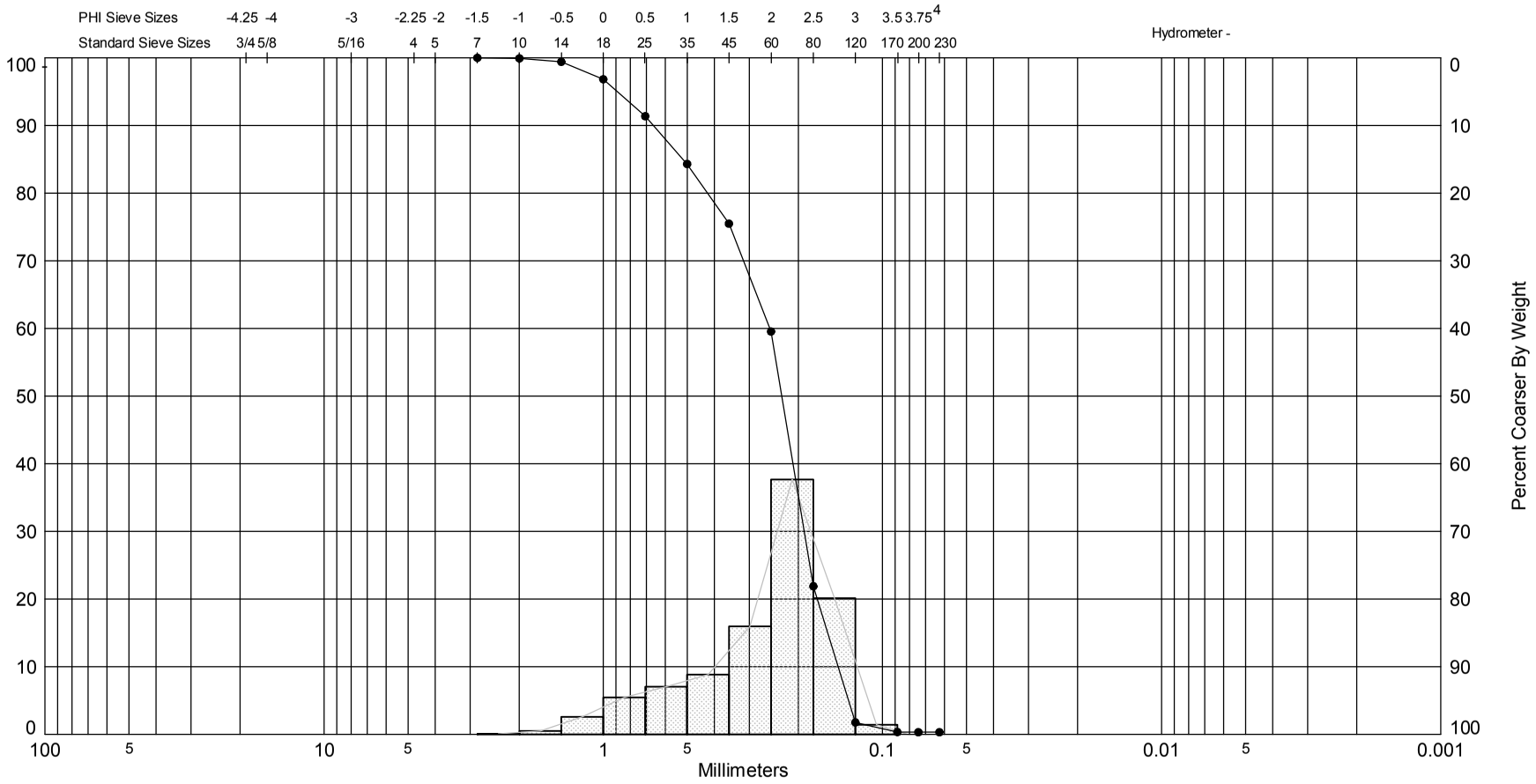
Comments:

Depths and elevations based on measured values

US Army Corps of Engineers
701 San Marco Blvd
Jacksonville, Florida 32207
phone (904)396-7121

| Sample Information | |
|---|---|
| Project Name: | Flagler County |
| Analysis Date: | 09-04-12 |
| Analyzed By: | |
| Easting (X, ft): | 617,978 |
| Northing (Y, ft): | 1,865,523 |
| Horizontal System: | NAD83 |
| Vertical System: | MLLW |

SIEVE ANALYSIS FDEP_GINT_IMPORT_FLAGLER.GPJ FL DEP ROSS.GDT 11/14/12




| Sample | Symbol | Elev. (ft) | USCS | % Fines | % Organics | % Carbonates | Median | Mean | Skew | Kurt | Sort |
|---|---|---|---|---|---|---|---|---|---|---|---|
| R-85 #Mid-Tide | —●— | 0.0 | SP | #230 - 0.32 | | | 2.12 | 1.9 | -1.06 | 3.56 | 0.82 |

Comments:

Depths and elevations based on measured values

US Army Corps of Engineers
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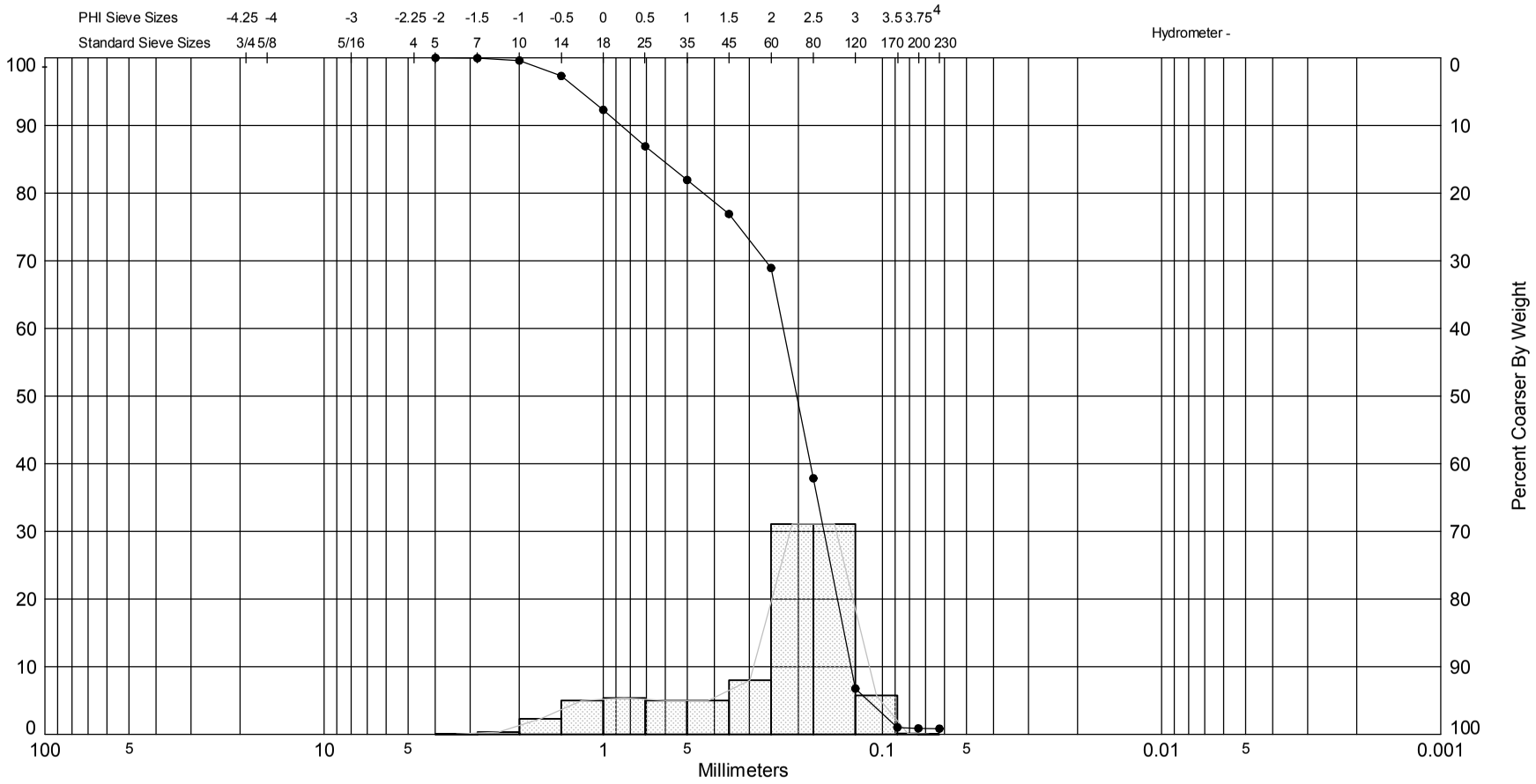
Jacksonville, Florida 32207
phone (904)396-7121

| Sample Information | |
|---|---|
| Project Name: | Flagler County |
| Analysis Date: | 09-04-12 |
| Analyzed By: | |
| Easting (X, ft): | 617,978 |
| Northing (Y, ft): | 1,865,523 |
| Horizontal System: | NAD83 |
| Vertical System: | MLLW |

SIEVE ANALYSIS FDEP_GINT_IMPORT_FLAGLER.GPJ FL DEP ROSS.GDT 11/14/12




| Sample | Symbol | Elev. (ft) | USCS | % Fines | % Organics | % Carbonates | Median | Mean | Skew | Kurt | Sort |
|---|---|---|---|---|---|---|---|---|---|---|---|
| R-85 #-3 | —●— | 0.0 | SW | #230 - 0.84 | | | 2.3 | 1.98 | -1.22 | 3.59 | 1.02 |

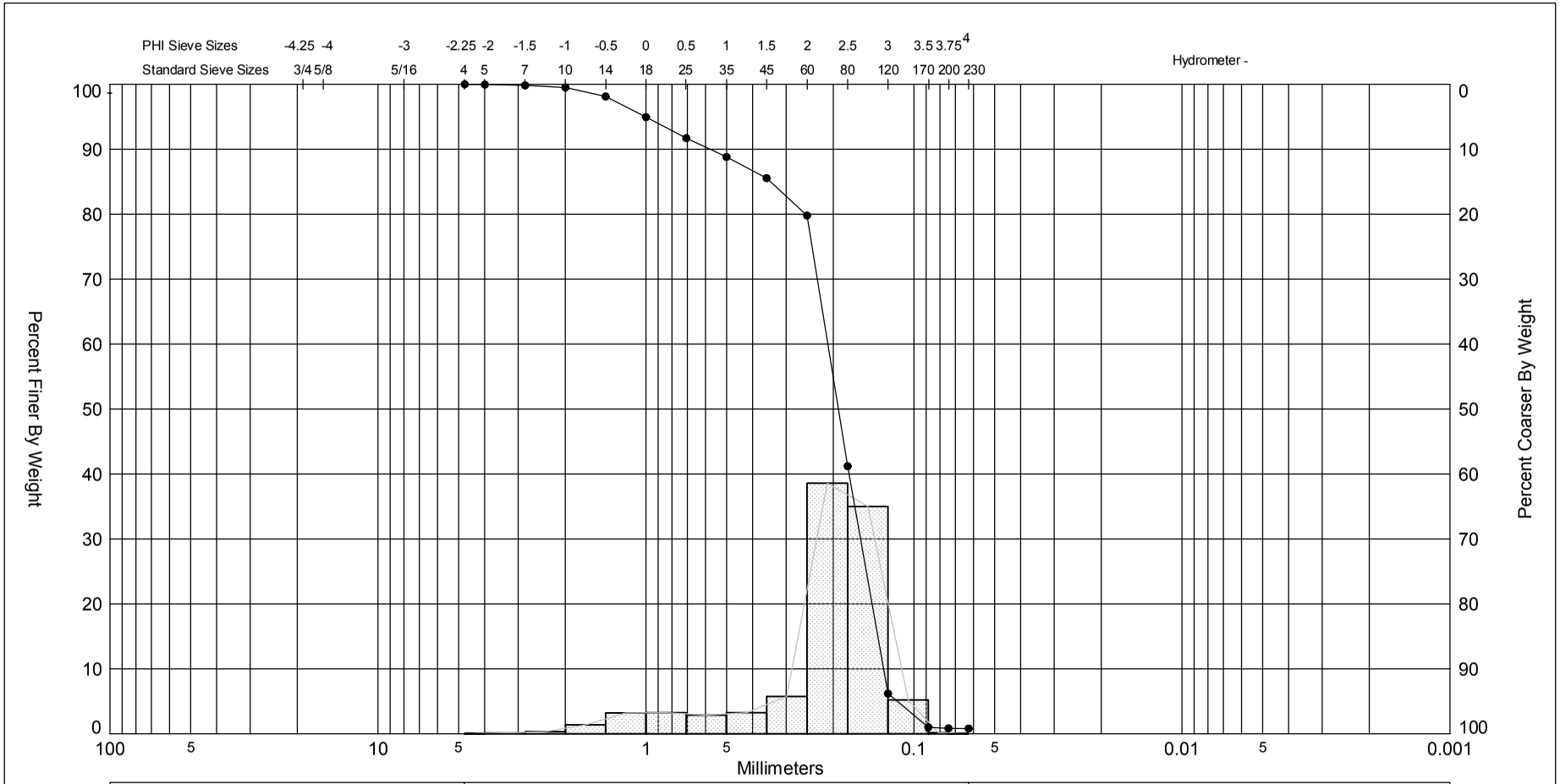
Comments:

Depths and elevations based on measured values

US Army Corps of Engineers
701 San Marco Blvd
Jacksonville, Florida 32207
phone (904)396-7121

| Sample Information | |
|---|---|
| Project Name: | Flagler County |
| Analysis Date: | 09-04-12 |
| Analyzed By: | |
| Easting (X, ft): | 617,978 |
| Northing (Y, ft): | 1,865,523 |
| Horizontal System: | NAD83 |
| Vertical System: | MLLW |

SIEVE ANALYSIS FDEP_GINT_IMPORT_FLAGLER.GPJ FL DEP ROSS.GDT 11/14/12




| Sample | Symbol | Elev. (ft) | USCS | % Fines | % Organics | % Carbonates | Median | Mean | Skew | Kurt | Sort |
|---|---|---|---|---|---|---|---|---|---|---|---|
| R-85 #-5 | —●— | -0.1 | SW | #230 - 0.81 | | | 2.39 | 2.17 | -1.82 | 6.16 | 0.88 |

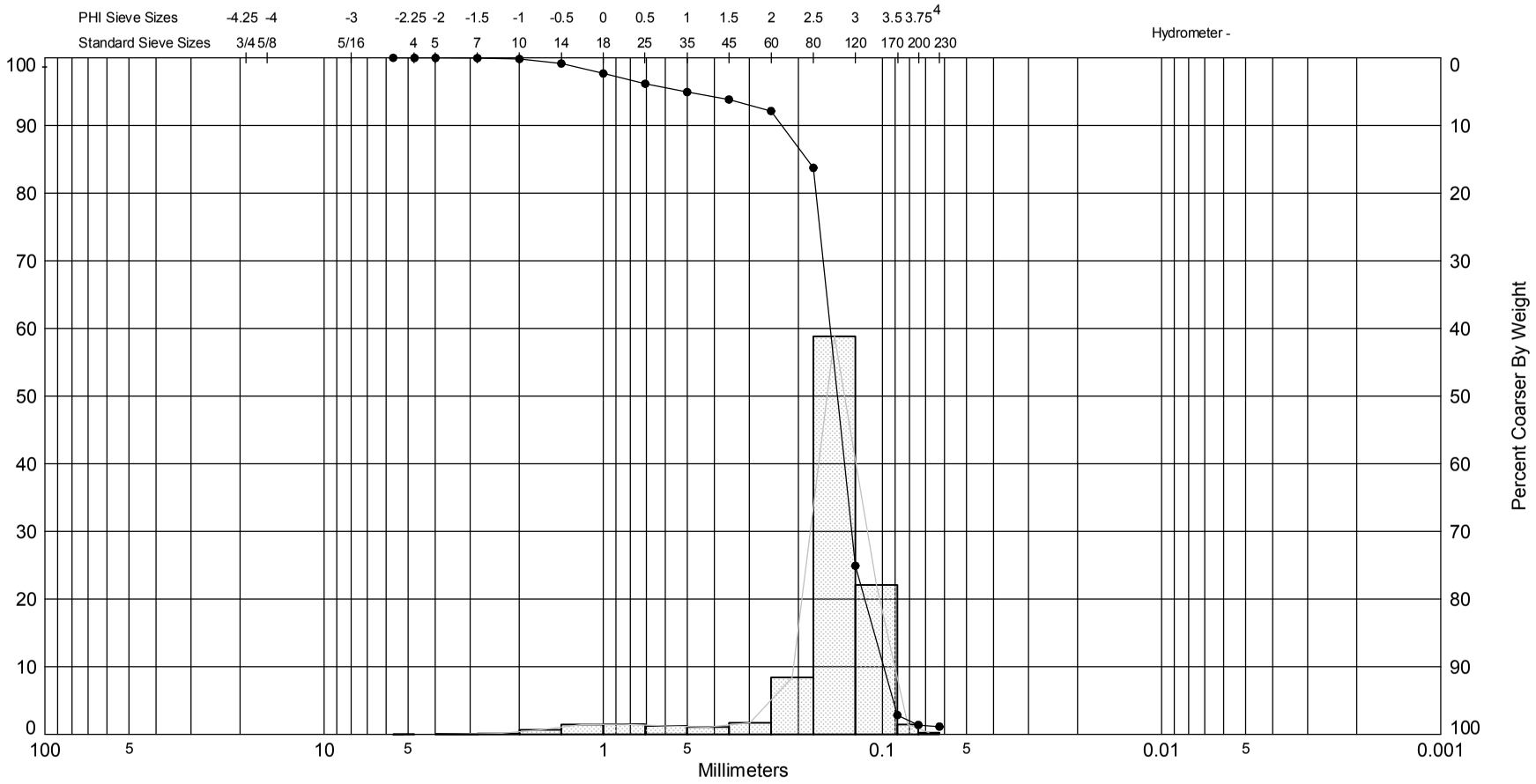
Comments:

Depths and elevations based on measured values

US Army Corps of Engineers
701 San Marco Blvd
Jacksonville, Florida 32207
phone (904)396-7121

| Sample Information | |
|---|---|
| Project Name: | Flagler County |
| Analysis Date: | 09-04-12 |
| Analyzed By: | |
| Easting (X, ft): | 617,978 |
| Northing (Y, ft): | 1,865,523 |
| Horizontal System: | NAD83 |
| Vertical System: | MLLW |

SIEVE ANALYSIS FDEP_GINT_IMPORT_FLAGLER.GPJ FL DEP ROSS.GDT 11/14/12




| Sample | Symbol | Elev. (ft) | USCS | % Fines | % Organics | % Carbonates | Median | Mean | Skew | Kurt | Sort |
|---|---|---|---|---|---|---|---|---|---|---|---|
| R-85 #-10 | —●— | -0.1 | SP | #230 - 1.14 | | 8.00 | 2.79 | 2.66 | -2.79 | 12.12 | 0.72 |

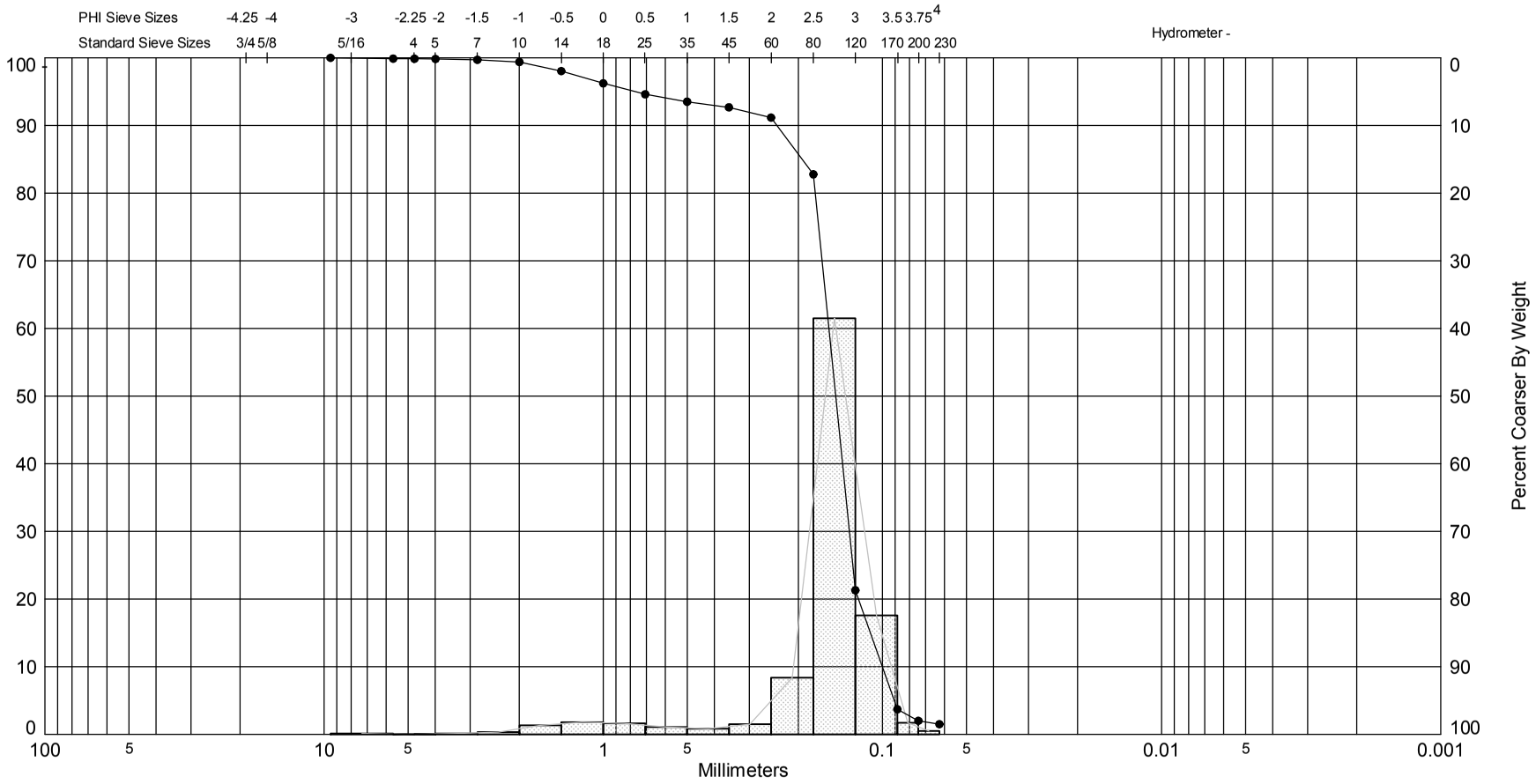
Comments:

Depths and elevations based on measured values

US Army Corps of Engineers
701 San Marco Blvd
Jacksonville, Florida 32207
phone (904)396-7121

| Sample Information | |
|---|---|
| Project Name: | Flagler County |
| Analysis Date: | 09-04-12 |
| Analyzed By: | |
| Easting (X, ft): | 617,978 |
| Northing (Y, ft): | 1,865,523 |
| Horizontal System: | NAD83 |
| Vertical System: | MLLW |

SIEVE ANALYSIS FDEP_GINT_IMPORT_FLAGLER.GPJ FL DEP ROSS.GDT 11/14/12




| Sample | Symbol | Elev. (ft) | USCS | % Fines | % Organics | % Carbonates | Median | Mean | Skew | Kurt | Sort |
|---|---|---|---|---|---|---|---|---|---|---|---|
| R-85 #-15 | —●— | -0.1 | SP | #230 - 1.50 | | | 2.77 | 2.59 | -2.89 | 12.38 | 0.84 |

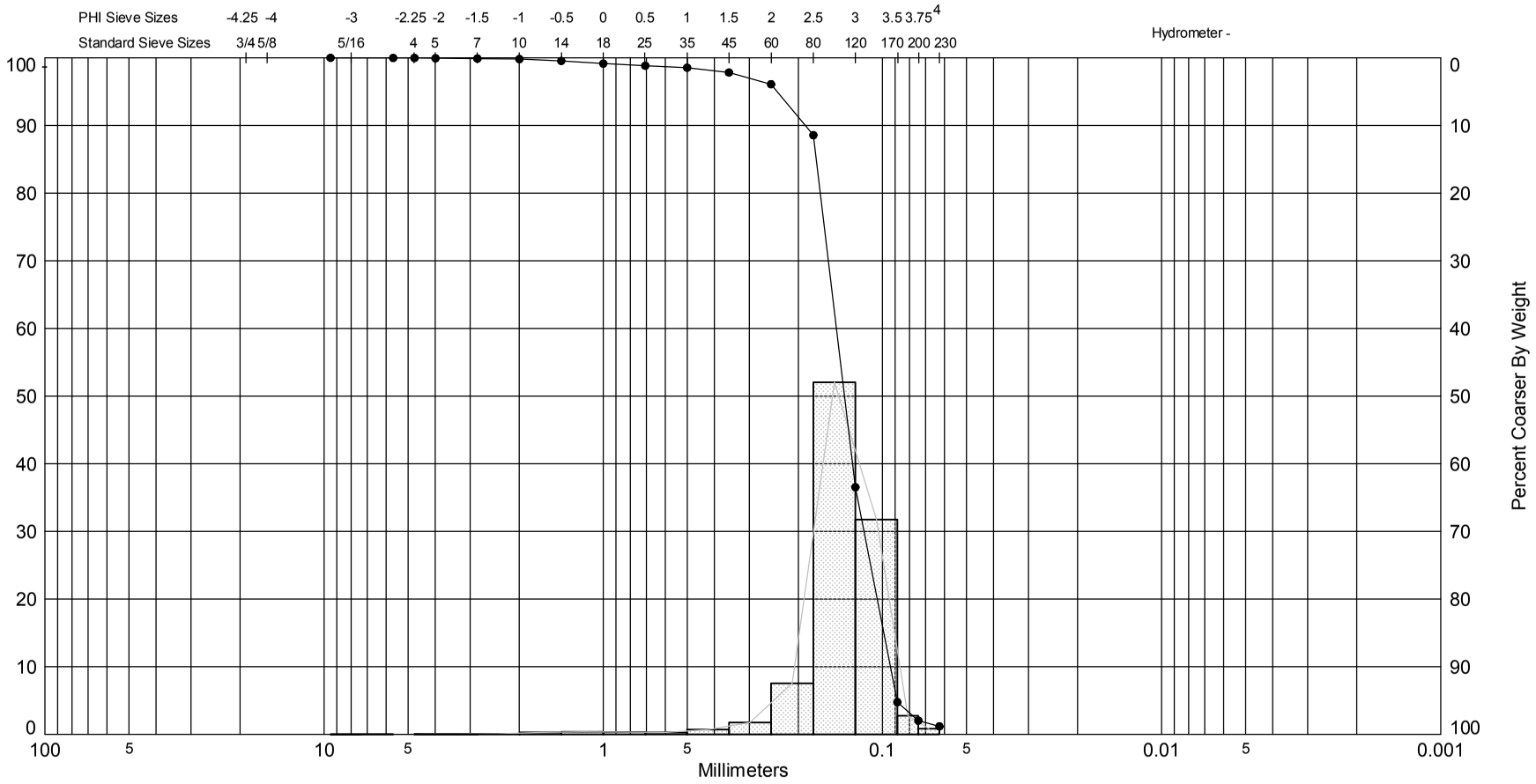
Comments:

Depths and elevations based on measured values

US Army Corps of Engineers
701 San Marco Blvd
Jacksonville, Florida 32207
phone (904)396-7121

| Sample Information | |
|---|---|
| Project Name: | Flagler County |
| Analysis Date: | 09-04-12 |
| Analyzed By: | |
| Easting (X, ft): | 617,978 |
| Northing (Y, ft): | 1,865,523 |
| Horizontal System: | NAD83 |
| Vertical System: | MLLW |

SIEVE ANALYSIS FDEP_GINT_IMPORT_FLAGLER.GPJ FL DEP ROSS.GDT 11/14/12




| Sample | Symbol | Elev. (ft) | USCS | % Fines | % Organics | % Carbonates | Median | Mean | Skew | Kurt | Sort |
|---|---|---|---|---|---|---|---|---|---|---|---|
| R-85 #-20 | —●— | -0.1 | SP | #230 - 1.18 | | | 2.87 | 2.83 | -3.27 | 22.63 | 0.55 |

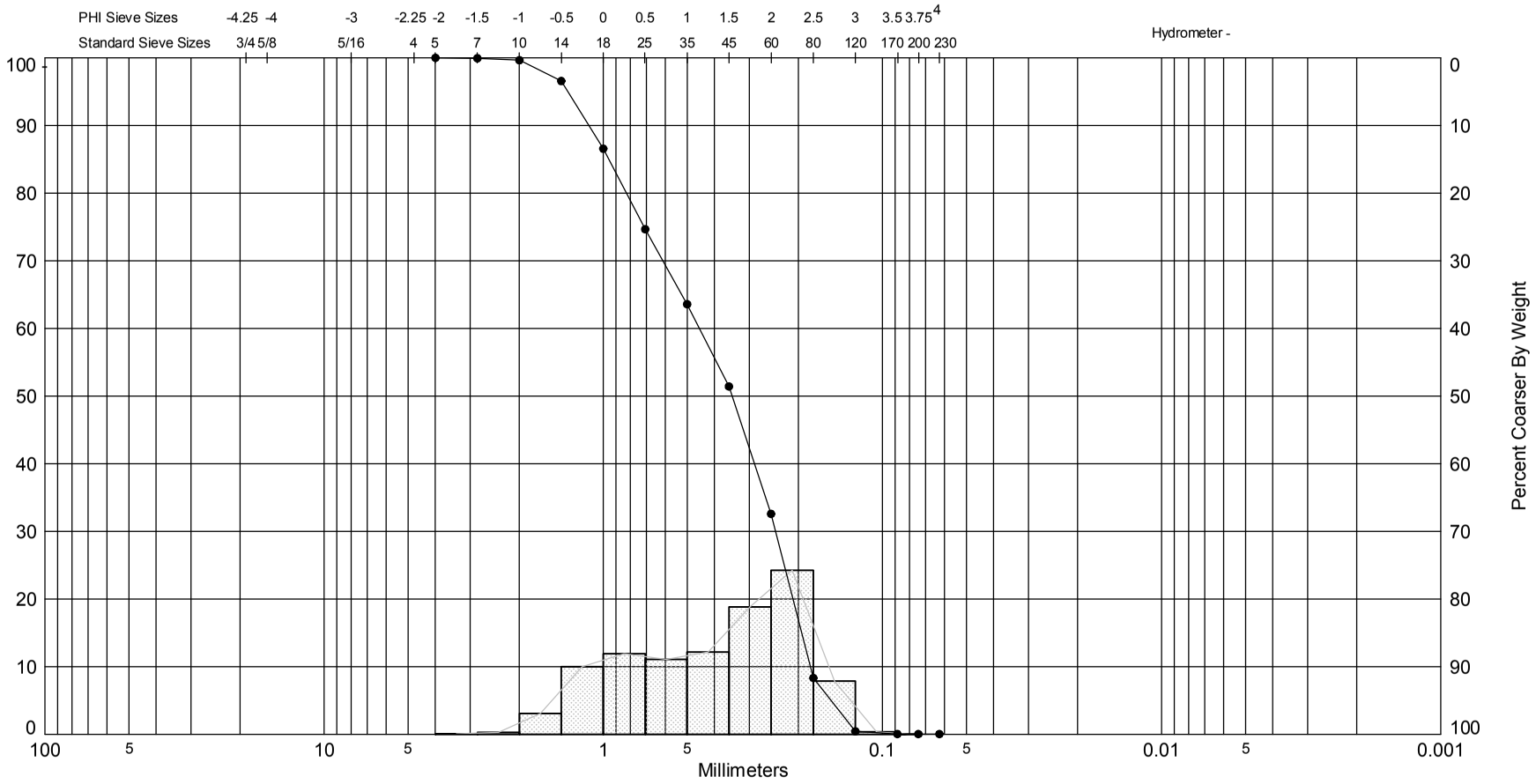
Comments:

Depths and elevations based on measured values

US Army Corps of Engineers
701 San Marco Blvd
Jacksonville, Florida 32207
phone (904)396-7121

| Sample Information | |
|---|---|
| Project Name: | Flagler County |
| Analysis Date: | 09-04-12 |
| Analyzed By: | |
| Easting (X, ft): | 617,978 |
| Northing (Y, ft): | 1,865,523 |
| Horizontal System: | NAD83 |
| Vertical System: | MLLW |

SIEVE ANALYSIS FDEP_GINT_IMPORT_FLAGLER.GPJ FL DEP ROSS.GDT 11/14/12




| Sample | Symbol | Elev. (ft) | USCS | % Fines | % Organics | % Carbonates | Median | Mean | Skew | Kurt | Sort |
|---|---|---|---|---|---|---|---|---|---|---|---|
| R-89 #Berm | —●— | 0.0 | SW | #230 - 0.04 | | 39.20 | 1.53 | 1.32 | -0.42 | 2.11 | 1 |

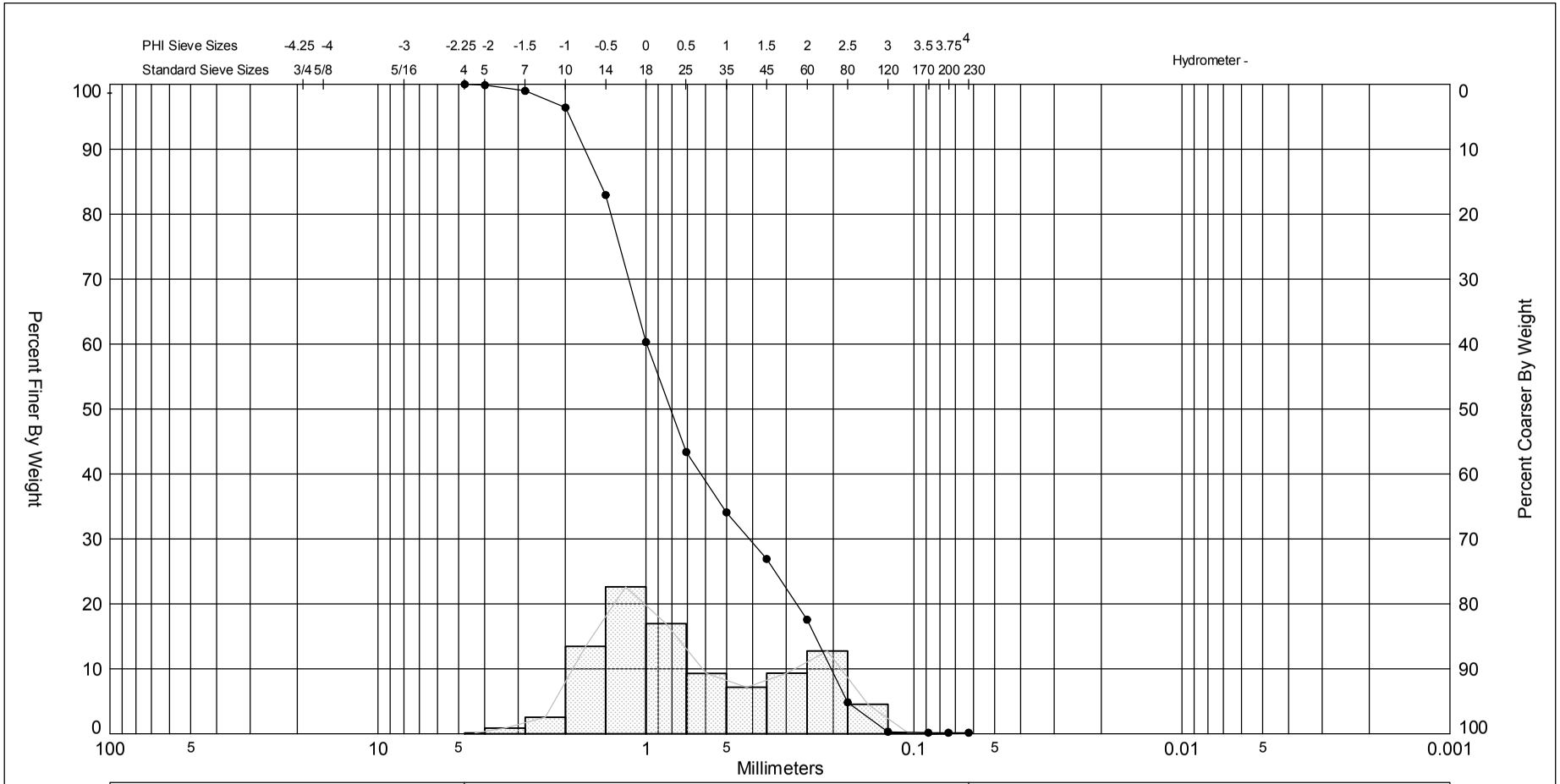
Comments:

Depths and elevations based on measured values

US Army Corps of Engineers
701 San Marco Blvd
Jacksonville, Florida 32207
phone (904)396-7121

| Sample Information | |
|---|---|
| Project Name: | Flagler County |
| Analysis Date: | 09-05-12 |
| Analyzed By: | |
| Easting (X, ft): | 619,322 |
| Northing (Y, ft): | 1,862,202 |
| Horizontal System: | NAD83 |
| Vertical System: | MLLW |

SIEVE ANALYSIS FDEP_GINT_IMPORT_FLAGLER.GPJ FL DEP ROSS.GDT 11/14/12




| Sample | Symbol | Elev. (ft) | USCS | % Fines | % Organics | % Carbonates | Median | Mean | Skew | Kurt | Sort |
|---|---|---|---|---|---|---|---|---|---|---|---|
| R-89 #Mid-Tide | —●— | 0.0 | SW | #230 - 0.16 | | | 0.3 | 0.57 | 0.36 | 2.03 | 1.14 |

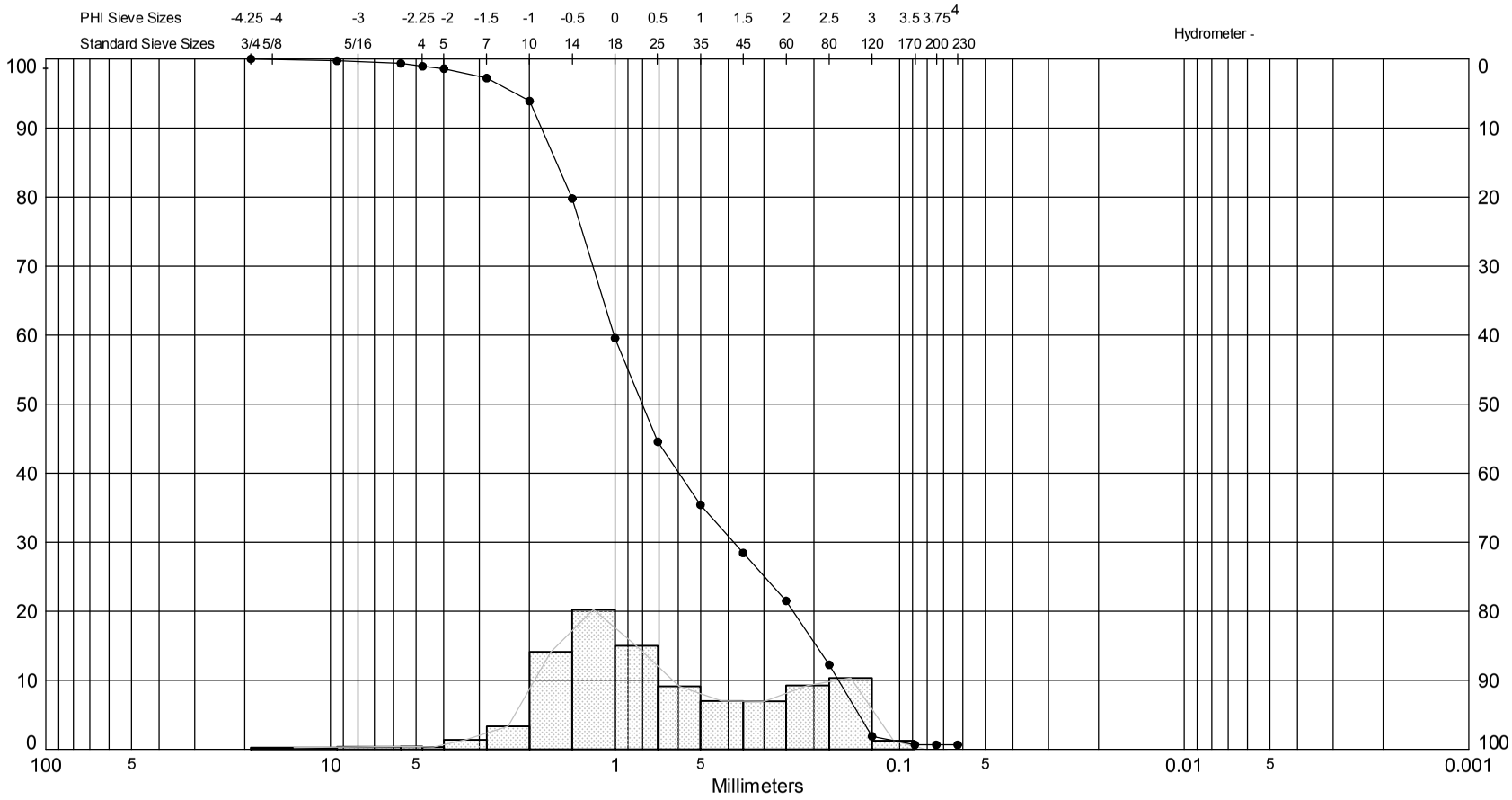
Comments:

Depths and elevations based on measured values

US Army Corps of Engineers
701 San Marco Blvd
Jacksonville, Florida 32207
phone (904)396-7121

| Sample Information | |
|---|---|
| Project Name: | Flagler County |
| Analysis Date: | 09-05-12 |
| Analyzed By: | |
| Easting (X, ft): | 619,322 |
| Northing (Y, ft): | 1,862,202 |
| Horizontal System: | NAD83 |
| Vertical System: | MLLW |

SIEVE ANALYSIS FDEP_GINT_IMPORT_FLAGLER.GPJ FL DEP ROSS.GDT 11/14/12




| Sample | Symbol | Elev. (ft) | USCS | % Fines | % Organics | % Carbonates | Median | Mean | Skew | Kurt | Sort |
|---|---|---|---|---|---|---|---|---|---|---|---|
| R-89 #-3 | —●— | 0.0 | SW | #230 - 0.65 | | | 0.32 | 0.59 | 0.19 | 2.4 | 1.31 |

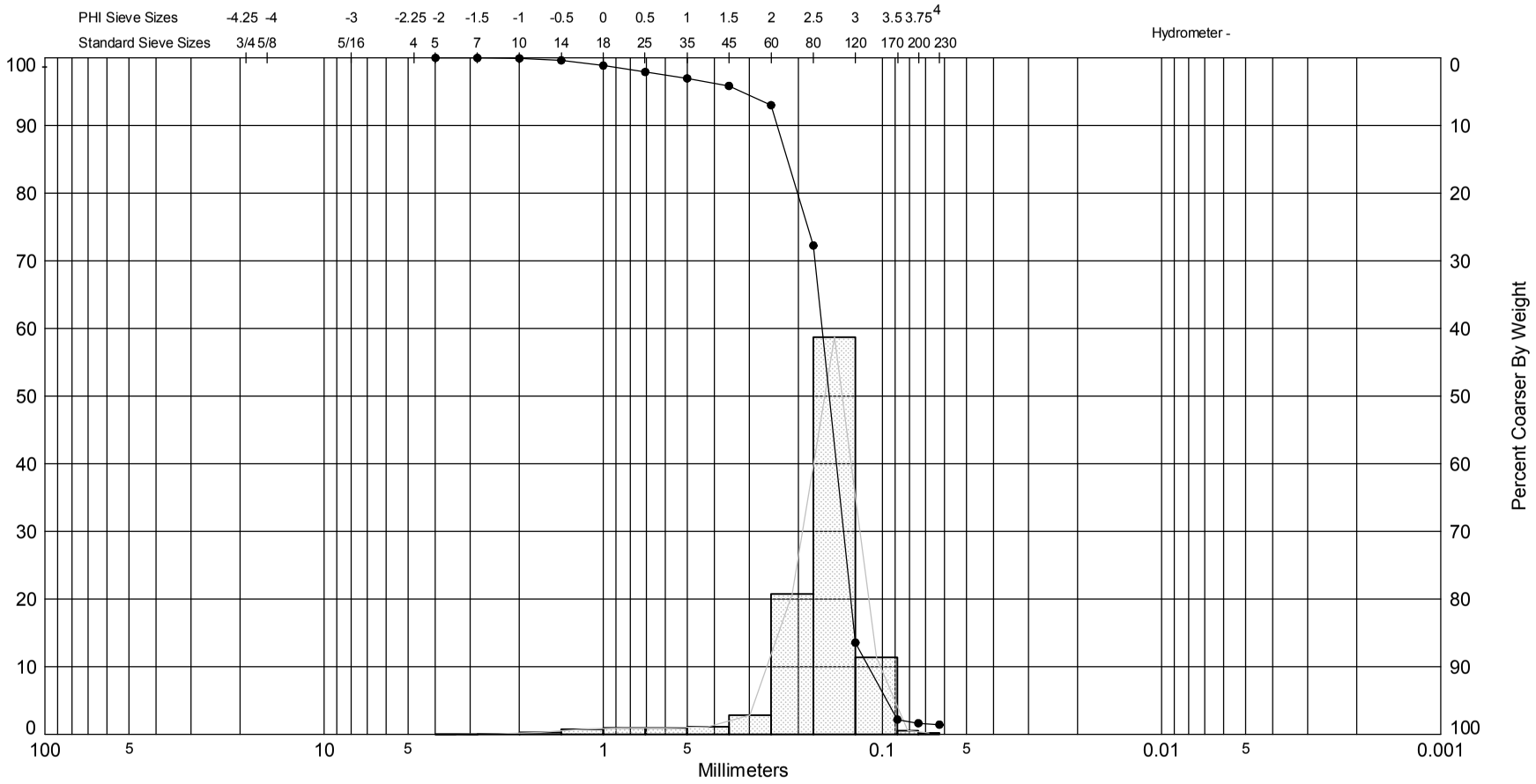
Comments:

Depths and elevations based on measured values

US Army Corps of Engineers
701 San Marco Blvd
Jacksonville, Florida 32207
phone (904)396-7121

| Sample Information | |
|---|---|
| Project Name: | Flagler County |
| Analysis Date: | 09-05-12 |
| Analyzed By: | |
| Easting (X, ft): | 619,322 |
| Northing (Y, ft): | 1,862,202 |
| Horizontal System: | NAD83 |
| Vertical System: | MLLW |

SIEVE ANALYSIS FDEP_GINT_IMPORT_FLAGLER.GPJ FL DEP ROSS.GDT 11/14/12




| Sample | Symbol | Elev. (ft) | USCS | % Fines | % Organics | % Carbonates | Median | Mean | Skew | Kurt | Sort |
|---|---|---|---|---|---|---|---|---|---|---|---|
| R-89 #-5 | —●— | -0.1 | SP | #230 - 1.43 | | | 2.69 | 2.58 | -2.7 | 13.78 | 0.58 |

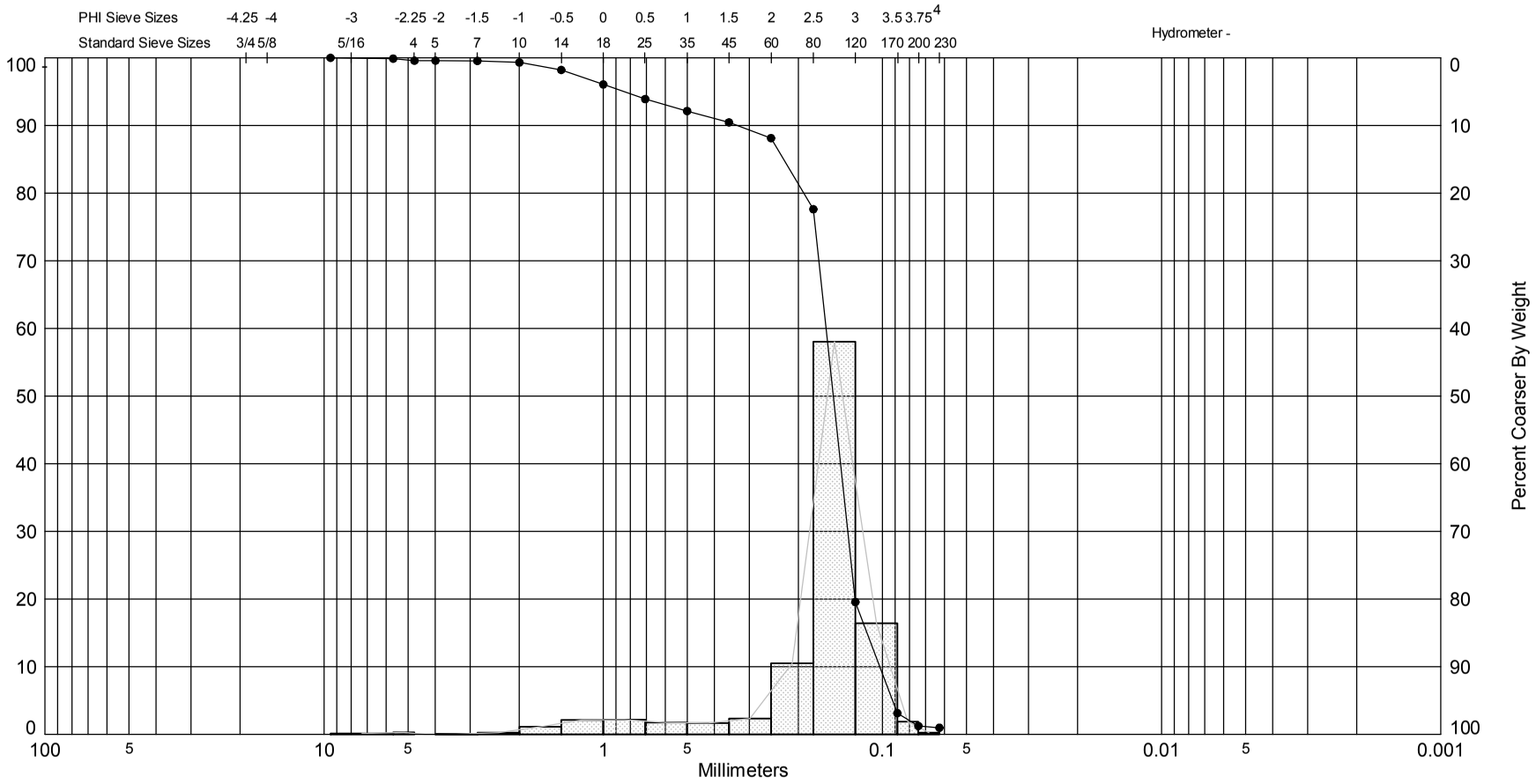
Comments:

Depths and elevations based on measured values

US Army Corps of Engineers
701 San Marco Blvd
Jacksonville, Florida 32207
phone (904)396-7121

| Sample Information | |
|---|---|
| Project Name: | Flagler County |
| Analysis Date: | 09-05-12 |
| Analyzed By: | |
| Easting (X, ft): | 619,322 |
| Northing (Y, ft): | 1,862,202 |
| Horizontal System: | NAD83 |
| Vertical System: | MLLW |

SIEVE ANALYSIS FDEP_GINT_IMPORT_FLAGLER.GPJ FL DEP ROSS.GDT 11/14/12




| Sample | Symbol | Elev. (ft) | USCS | % Fines | % Organics | % Carbonates | Median | Mean | Skew | Kurt | Sort |
|---|---|---|---|---|---|---|---|---|---|---|---|
| R-89 #-10 | —●— | -0.1 | SW | #230 - 0.97 | | 10.40 | 2.74 | 2.52 | -2.6 | 10.68 | 0.89 |

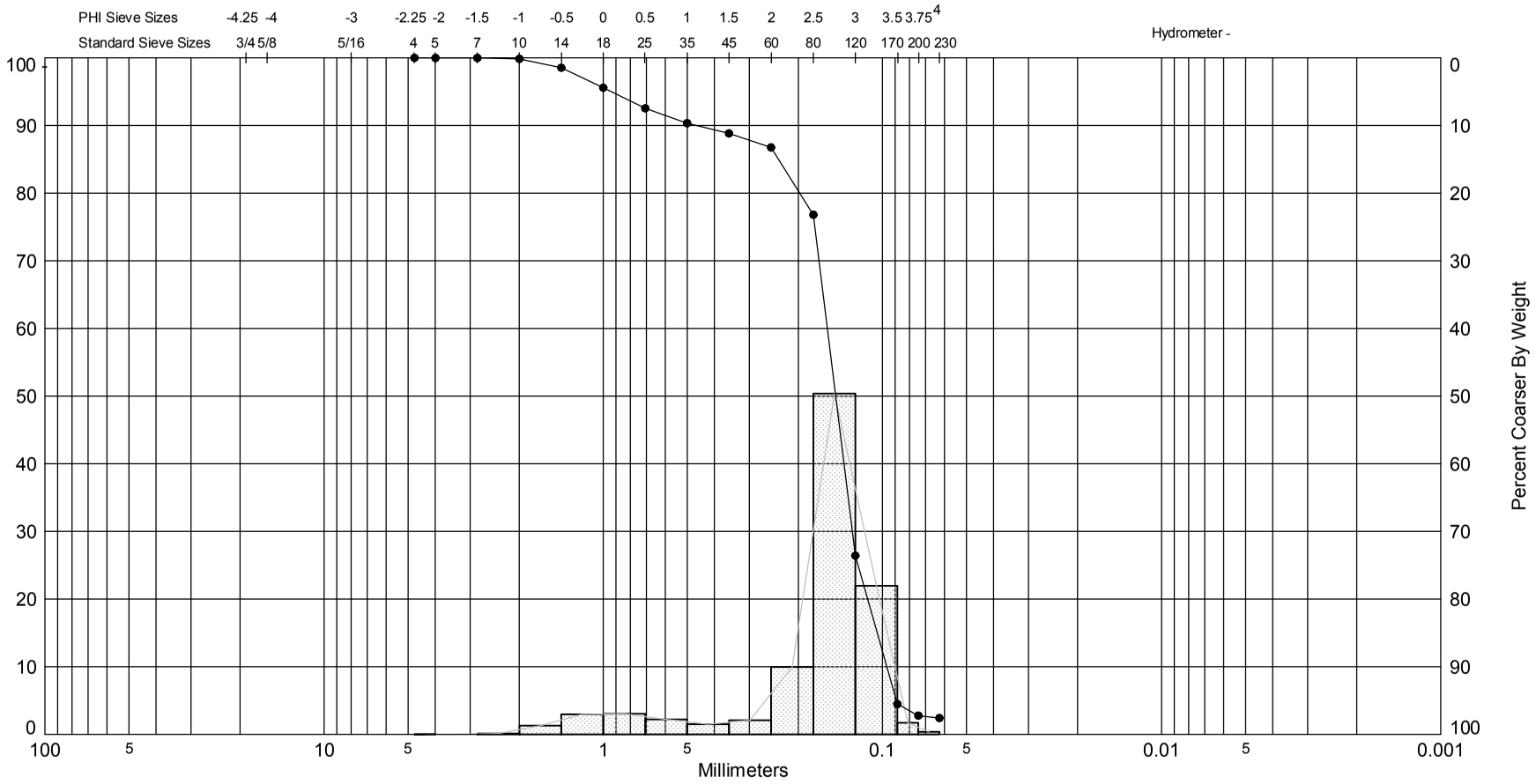
Comments:

Depths and elevations based on measured values

US Army Corps of Engineers
701 San Marco Blvd
Jacksonville, Florida 32207
phone (904)396-7121

| Sample Information | |
|---|---|
| Project Name: | Flagler County |
| Analysis Date: | 09-05-12 |
| Analyzed By: | |
| Easting (X, ft): | 619,322 |
| Northing (Y, ft): | 1,862,202 |
| Horizontal System: | NAD83 |
| Vertical System: | MLLW |

SIEVE ANALYSIS FDEP_GINT_IMPORT_FLAGLER.GPJ FL DEP ROSS.GDT 11/14/12




| Sample | Symbol | Elev. (ft) | USCS | % Fines | % Organics | % Carbonates | Median | Mean | Skew | Kurt | Sort |
|---|---|---|---|---|---|---|---|---|---|---|---|
| R-89 #-15 | —●— | -0.1 | SW | #230 - 2.41 | | | 2.77 | 2.52 | -2.05 | 6.73 | 0.92 |

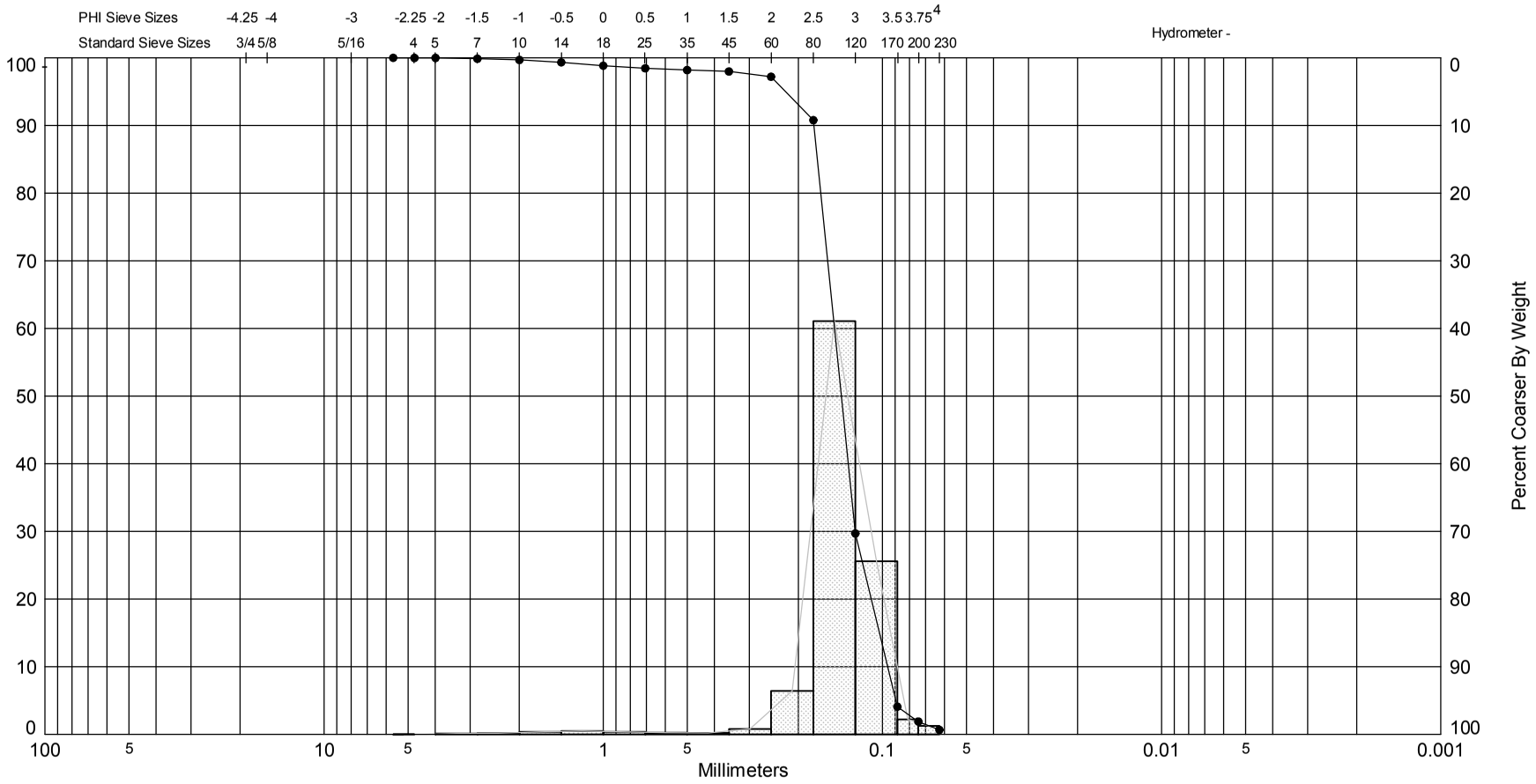
Comments:

Depths and elevations based on measured values

US Army Corps of Engineers
701 San Marco Blvd
Jacksonville, Florida 32207
phone (904)396-7121

| Sample Information | |
|---|---|
| Project Name: | Flagler County |
| Analysis Date: | 09-05-12 |
| Analyzed By: | |
| Easting (X, ft): | 619,322 |
| Northing (Y, ft): | 1,862,202 |
| Horizontal System: | NAD83 |
| Vertical System: | MLLW |

SIEVE ANALYSIS FDEP_GINT_IMPORT_FLAGLER.GPJ FL DEP ROSS.GDT 11/14/12




| Sample | Symbol | Elev. (ft) | USCS | % Fines | % Organics | % Carbonates | Median | Mean | Skew | Kurt | Sort |
|---|---|---|---|---|---|---|---|---|---|---|---|
| R-89 #-20 | —●— | -0.1 | SP | #230 - 0.66 | | | 2.83 | 2.81 | -3.78 | 26.19 | 0.55 |

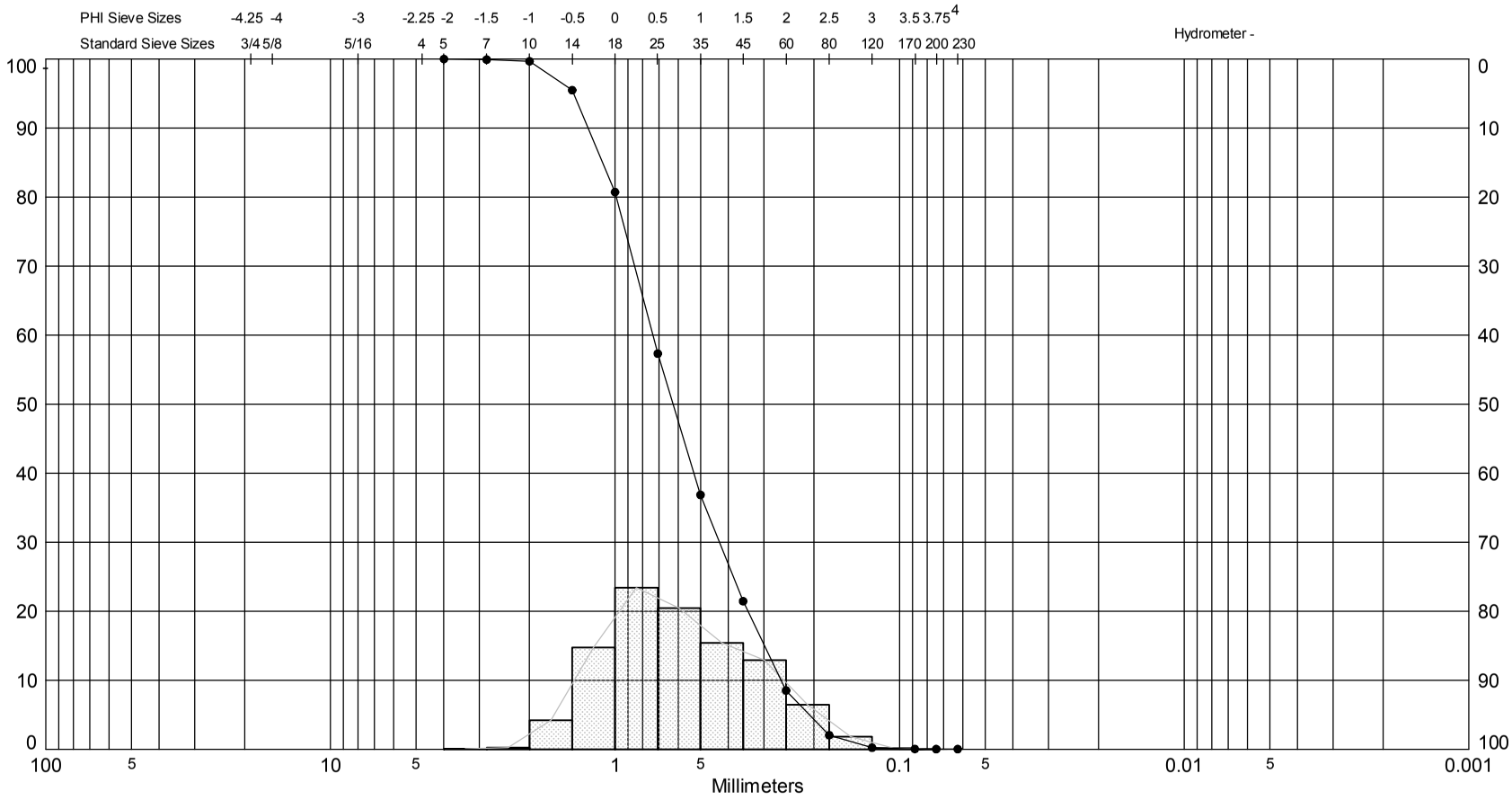
Comments:

Depths and elevations based on measured values

US Army Corps of Engineers
701 San Marco Blvd
Jacksonville, Florida 32207
phone (904)396-7121

| Sample Information | |
|---|---|
| Project Name: | Flagler County |
| Analysis Date: | 09-05-12 |
| Analyzed By: | |
| Easting (X, ft): | 619,322 |
| Northing (Y, ft): | 1,862,202 |
| Horizontal System: | NAD83 |
| Vertical System: | MLLW |

SIEVE ANALYSIS FDEP_GINT_IMPORT_FLAGLER.GPJ FL DEP ROSS.GDT 11/14/12




| Sample | Symbol | Elev. (ft) | USCS | % Fines | % Organics | % Carbonates | Median | Mean | Skew | Kurt | Sort |
|---|---|---|---|---|---|---|---|---|---|---|---|
| R-93 #Dune | —●— | 0.0 | SP | #230 - 0.03 | | | 0.68 | 0.76 | 0.29 | 2.52 | 0.84 |

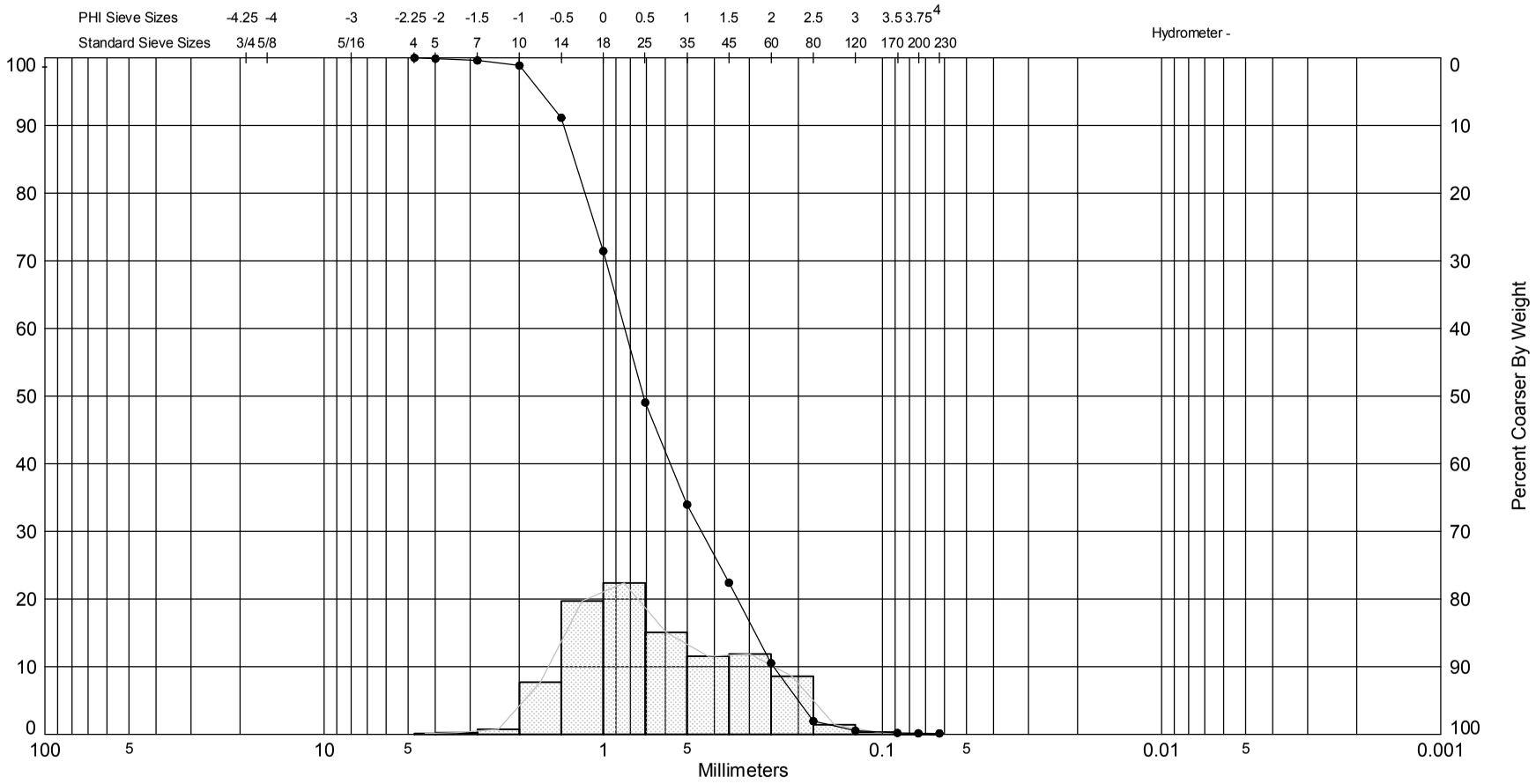
Comments:

Depths and elevations based on measured values

US Army Corps of Engineers
701 San Marco Blvd
Jacksonville, Florida 32207
phone (904)396-7121

| Sample Information | |
|---|---|
| Project Name: | Flagler County |
| Analysis Date: | 09-05-12 |
| Analyzed By: | |
| Easting (X, ft): | 620,770 |
| Northing (Y, ft): | 1,858,673 |
| Horizontal System: | NAD83 |
| Vertical System: | MLLW |

SIEVE ANALYSIS FDEP_GINT_IMPORT_FLAGLER.GPJ FL DEP ROSS.GDT 11/14/12




| Sample | Symbol | Elev. (ft) | USCS | % Fines | % Organics | % Carbonates | Median | Mean | Skew | Kurt | Sort |
|---|---|---|---|---|---|---|---|---|---|---|---|
| R-93 #Berm | —●— | 0.0 | SW | #230 - 0.14 | | 64.50 | 0.48 | 0.64 | 0.33 | 2.41 | 0.95 |

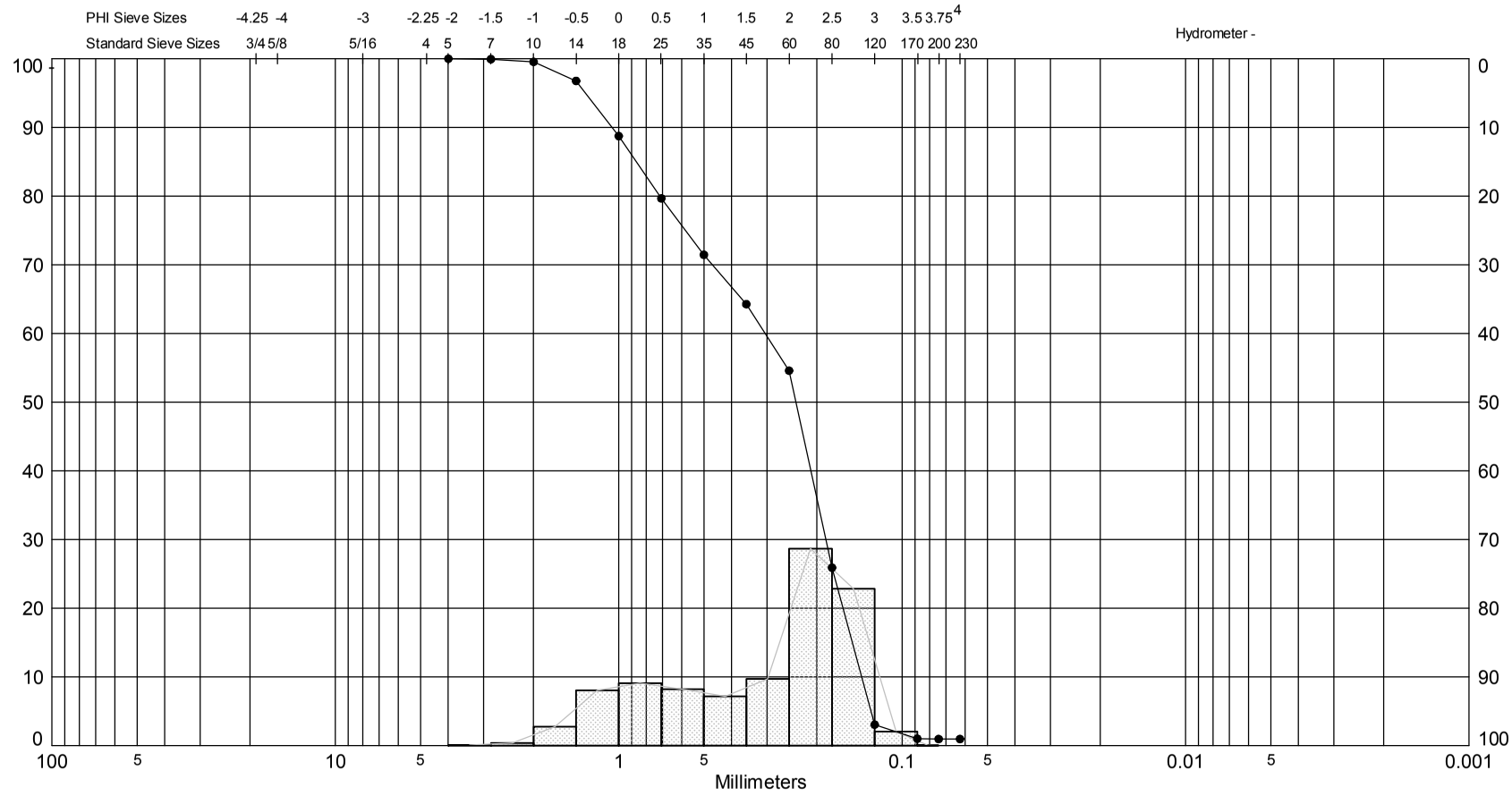
Comments:

Depths and elevations based on measured values

US Army Corps of Engineers
701 San Marco Blvd
Jacksonville, Florida 32207
phone (904)396-7121

| Sample Information | |
|---|---|
| Project Name: | Flagler County |
| Analysis Date: | 09-05-12 |
| Analyzed By: | |
| Easting (X, ft): | 620,770 |
| Northing (Y, ft): | 1,858,673 |
| Horizontal System: | NAD83 |
| Vertical System: | MLLW |

SIEVE ANALYSIS FDEP_GINT_IMPORT_FLAGLER.GPJ FL DEP ROSS.GDT 11/14/12




| Sample | Symbol | Elev. (ft) | USCS | % Fines | % Organics | % Carbonates | Median | Mean | Skew | Kurt | Sort |
|---|---|---|---|---|---|---|---|---|---|---|---|
| R-93 #Mid-Tide | —● | 0.0 | SW | #230 - 0.95 | | | 2.08 | 1.65 | -0.72 | 2.32 | 1.09 |

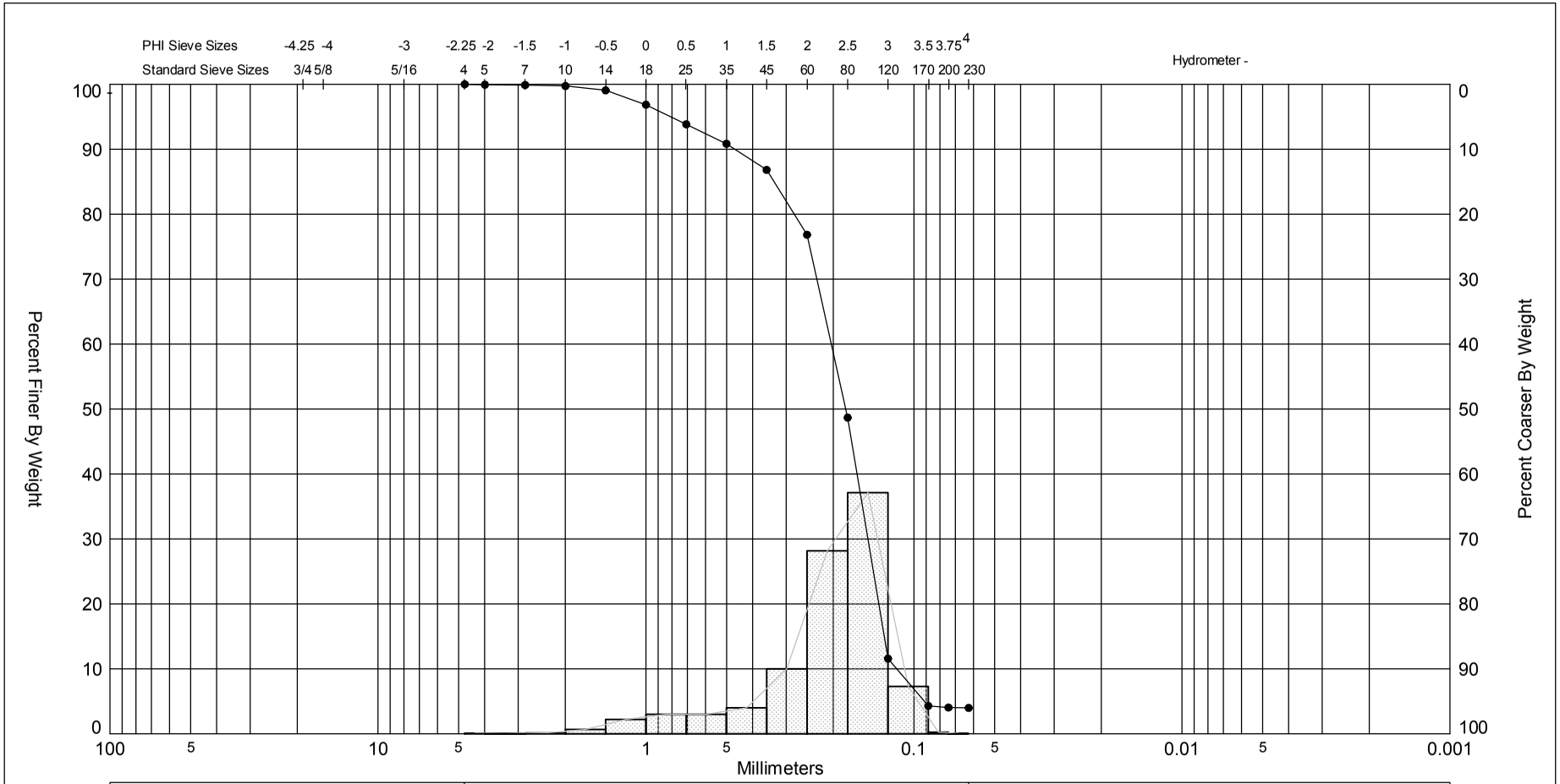
Comments:

Depths and elevations based on measured values

US Army Corps of Engineers
701 San Marco Blvd
Jacksonville, Florida 32207
phone (904)396-7121

| Sample Information | |
|---|---|
| Project Name: | Flagler County |
| Analysis Date: | 09-05-12 |
| Analyzed By: | |
| Easting (X, ft): | 620,770 |
| Northing (Y, ft): | 1,858,673 |
| Horizontal System: | NAD83 |
| Vertical System: | MLLW |

SIEVE ANALYSIS FDEP_GINT_IMPORT_FLAGLER.GPJ FL DEP ROSS.GDT 11/14/12




| Sample | Symbol | Elev. (ft) | USCS | % Fines | % Organics | % Carbonates | Median | Mean | Skew | Kurt | Sort |
|---|---|---|---|---|---|---|---|---|---|---|---|
| R-93 #-3 | —●— | 0.0 | SP | #230 - 3.98 | | | 2.48 | 2.23 | -1.64 | 5.94 | 0.83 |

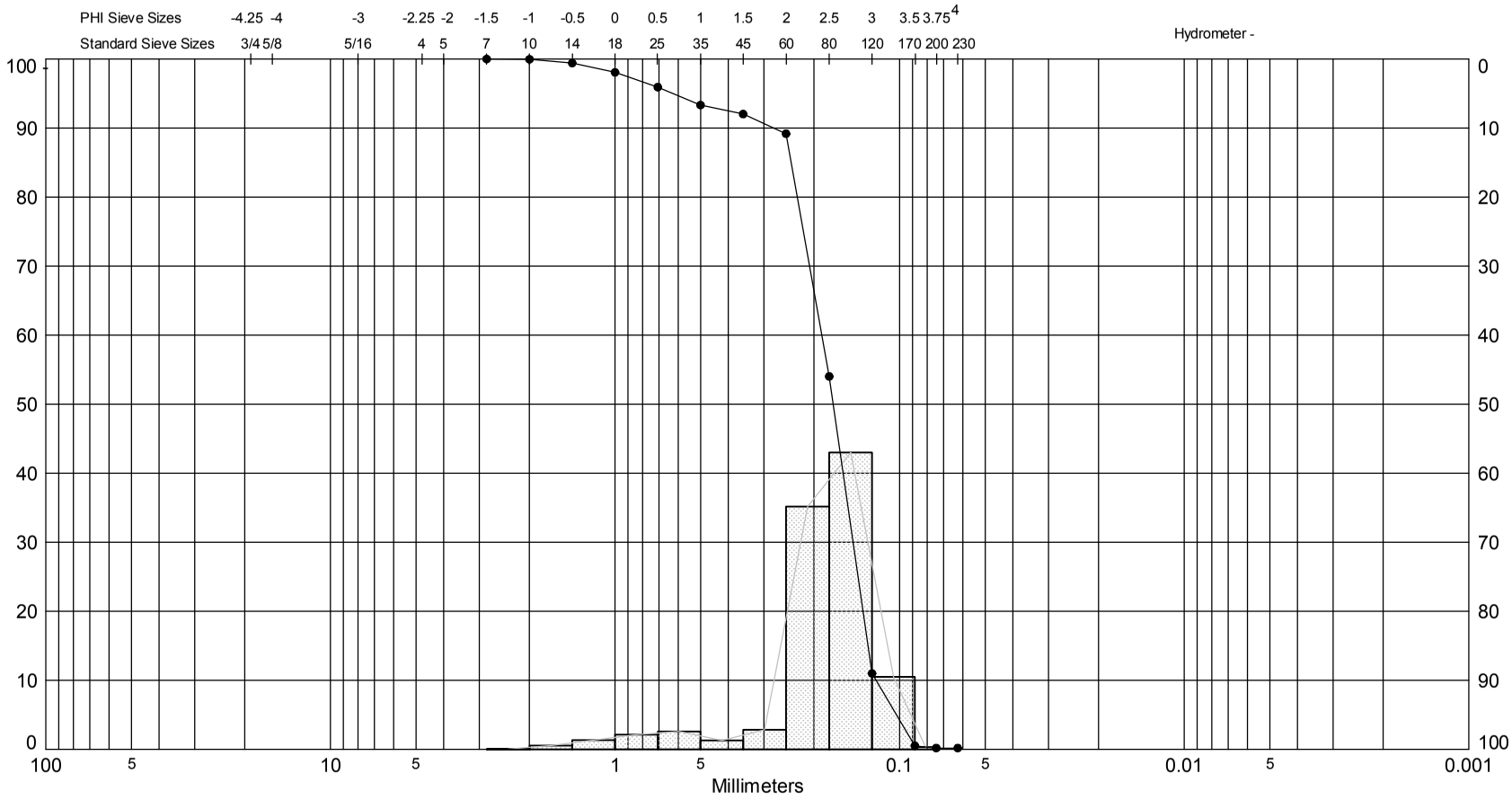
Comments:

Depths and elevations based on measured values

US Army Corps of Engineers
701 San Marco Blvd
Jacksonville, Florida 32207
phone (904)396-7121

| Sample Information | |
|---|---|
| Project Name: | Flagler County |
| Analysis Date: | 09-05-12 |
| Analyzed By: | |
| Easting (X, ft): | 620,770 |
| Northing (Y, ft): | 1,858,673 |
| Horizontal System: | NAD83 |
| Vertical System: | MLLW |

SIEVE ANALYSIS FDEP_GINT_IMPORT_FLAGLER.GPJ FL DEP ROSS.GDT 11/14/12




| Sample | Symbol | Elev. (ft) | USCS | % Fines | % Organics | % Carbonates | Median | Mean | Skew | Kurt | Sort |
|---|---|---|---|---|---|---|---|---|---|---|---|
| R-93 #-5 | —●— | -0.1 | SP | #230 - 0.18 | | | 2.55 | 2.41 | -2.1 | 8.4 | 0.7 |

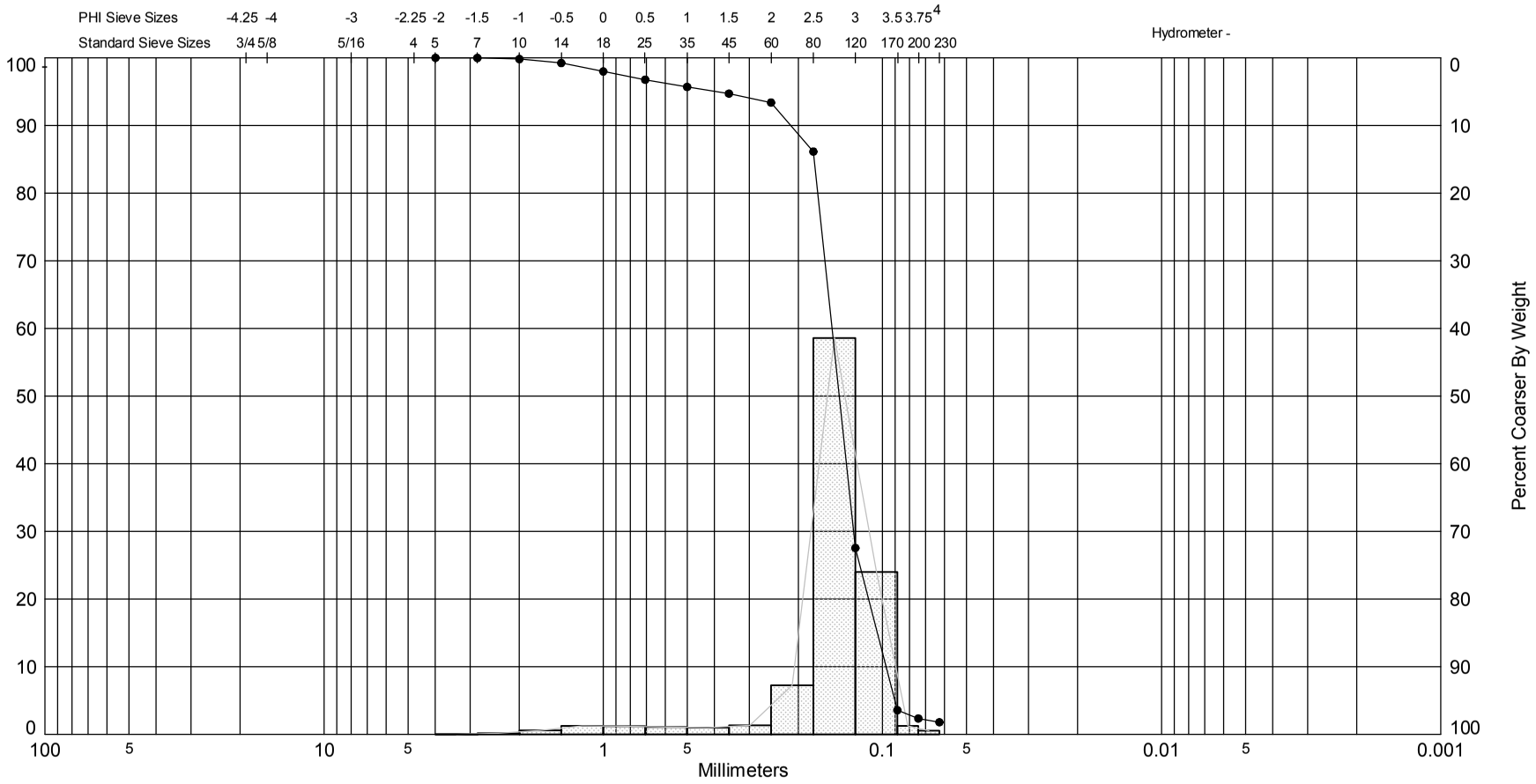
Comments:

Depths and elevations based on measured values

US Army Corps of Engineers
701 San Marco Blvd
Jacksonville, Florida 32207
phone (904)396-7121

| Sample Information | |
|---|---|
| Project Name: | Flagler County |
| Analysis Date: | 09-05-12 |
| Analyzed By: | |
| Easting (X, ft): | 620,770 |
| Northing (Y, ft): | 1,858,673 |
| Horizontal System: | NAD83 |
| Vertical System: | MLLW |

SIEVE ANALYSIS FDEP_GINT_IMPORT_FLAGLER.GPJ FL DEP ROSS.GDT 11/14/12




| Sample | Symbol | Elev. (ft) | USCS | % Fines | % Organics | % Carbonates | Median | Mean | Skew | Kurt | Sort |
|---|---|---|---|---|---|---|---|---|---|---|---|
| R-93 #-10 | —●— | -0.1 | SP | #230 - 1.79 | | 8.40 | 2.81 | 2.7 | -2.95 | 13.65 | 0.68 |

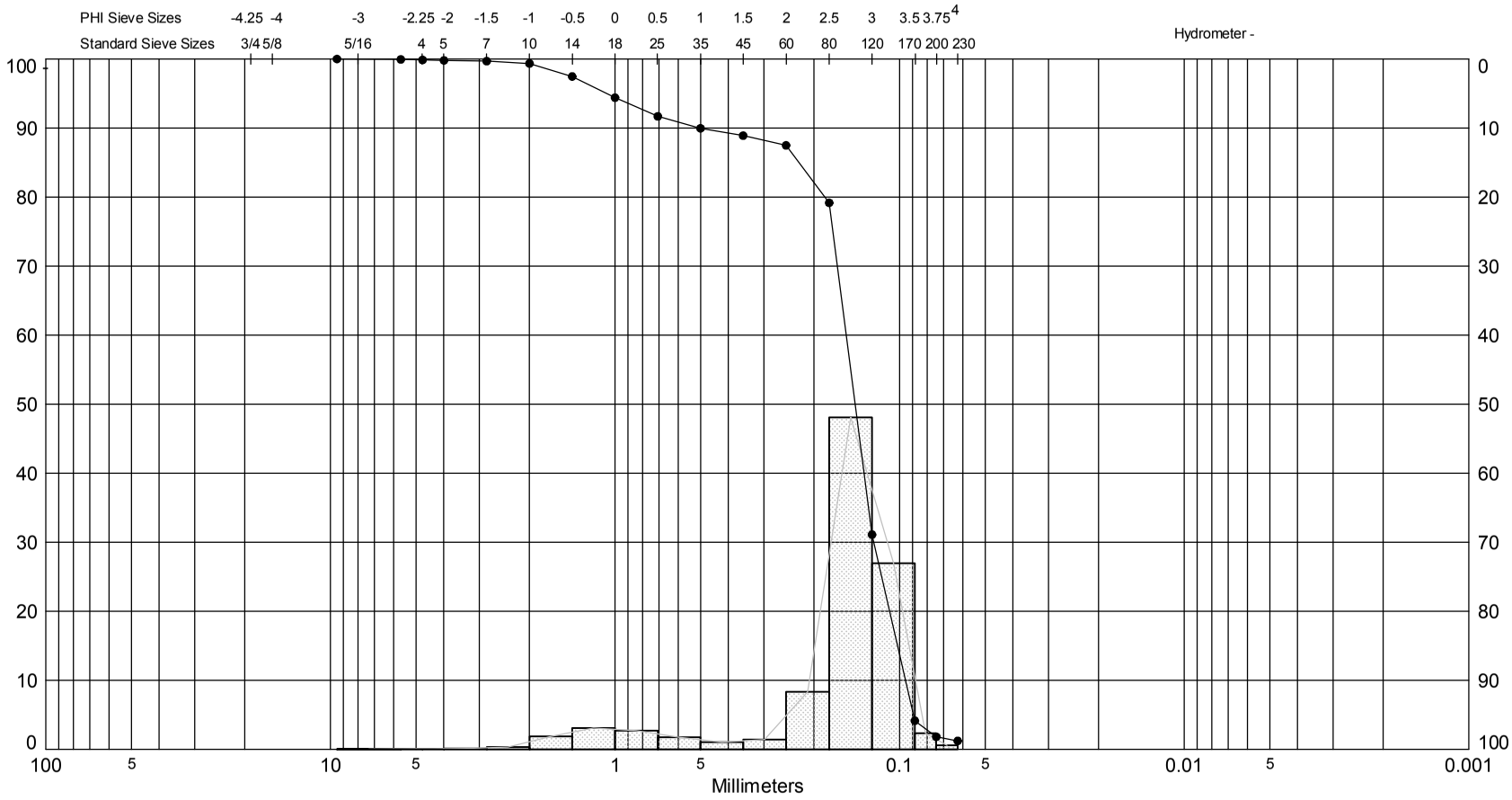
Comments:

Depths and elevations based on measured values

US Army Corps of Engineers
701 San Marco Blvd
Jacksonville, Florida 32207
phone (904)396-7121

| Sample Information | |
|---|---|
| Project Name: | Flagler County |
| Analysis Date: | 09-05-12 |
| Analyzed By: | |
| Easting (X, ft): | 620,770 |
| Northing (Y, ft): | 1,858,673 |
| Horizontal System: | NAD83 |
| Vertical System: | MLLW |

SIEVE ANALYSIS FDEP_GINT_IMPORT_FLAGLER.GPJ FL DEP ROSS.GDT 11/14/12




| Sample | Symbol | Elev. (ft) | USCS | % Fines | % Organics | % Carbonates | Median | Mean | Skew | Kurt | Sort |
|---|---|---|---|---|---|---|---|---|---|---|---|
| R-93 #-15 | —●— | -0.1 | SW | #230 - 1.22 | | | 2.8 | 2.55 | -2.22 | 7.64 | 1 |

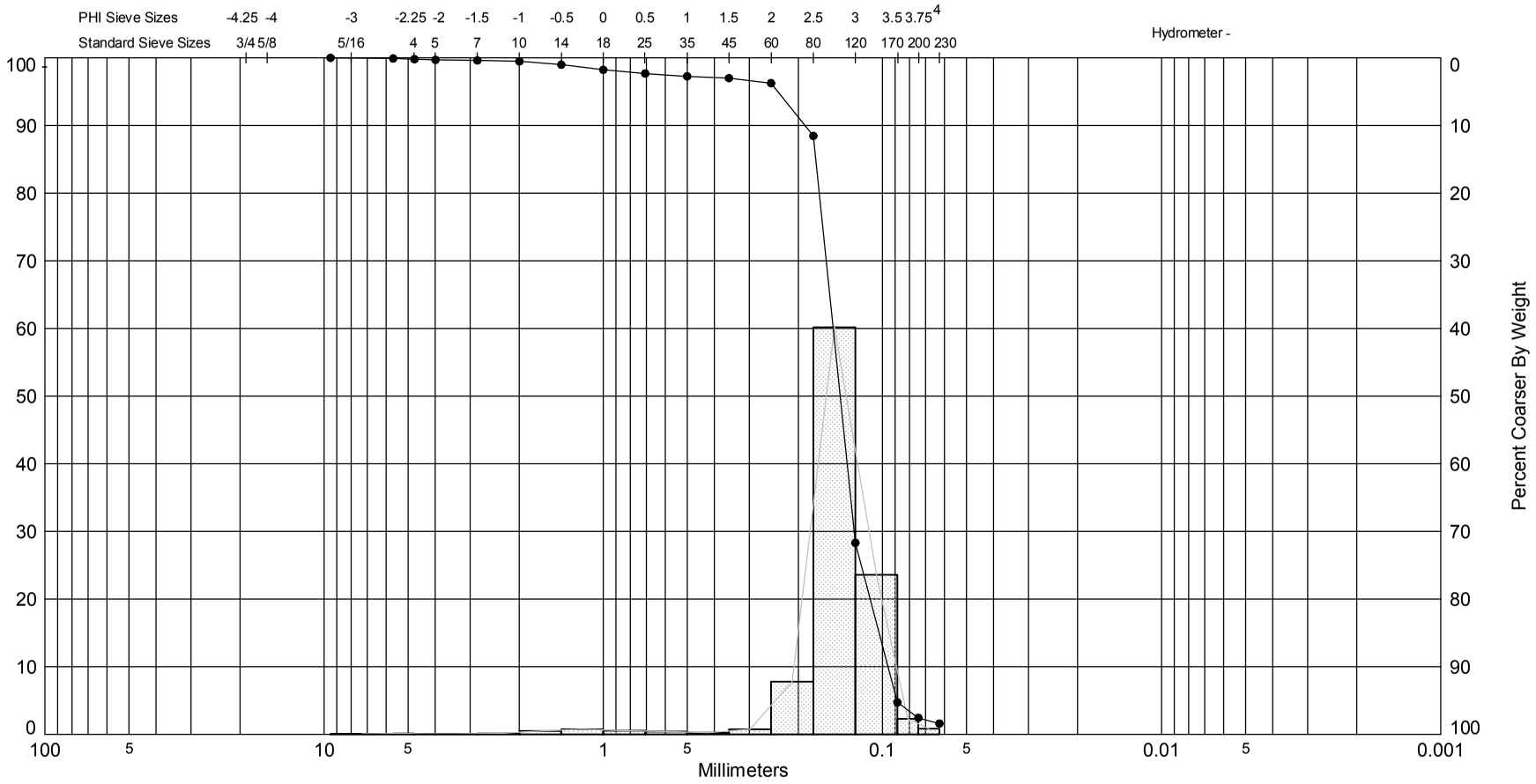
Comments:

Depths and elevations based on measured values

US Army Corps of Engineers
701 San Marco Blvd
Jacksonville, Florida 32207
phone (904)396-7121

| Sample Information | |
|---|---|
| Project Name: | Flagler County |
| Analysis Date: | 09-05-12 |
| Analyzed By: | |
| Easting (X, ft): | 620,770 |
| Northing (Y, ft): | 1,858,673 |
| Horizontal System: | NAD83 |
| Vertical System: | MLLW |

SIEVE ANALYSIS FDEP_GINT_IMPORT_FLAGLER.GPJ FL DEP ROSS.GDT 11/14/12




| Sample | Symbol | Elev. (ft) | USCS | % Fines | % Organics | % Carbonates | Median | Mean | Skew | Kurt | Sort |
|---|---|---|---|---|---|---|---|---|---|---|---|
| R-93 #-20 | —●— | -0.1 | SP | #230 - 1.59 | | | 2.82 | 2.76 | -4.03 | 26.05 | 0.65 |

Comments:

Depths and elevations based on measured values

US Army Corps of Engineers
701 San Marco Blvd
Jacksonville, Florida 32207
phone (904)396-7121

| Sample Information | |
|---|---|
| Project Name: | Flagler County |
| Analysis Date: | 09-05-12 |
| Analyzed By: | |
| Easting (X, ft): | 620,770 |
| Northing (Y, ft): | 1,858,673 |
| Horizontal System: | NAD83 |
| Vertical System: | MLLW |

SIEVE ANALYSIS FDEP_GINT_IMPORT_FLAGLER.GPJ FL DEP ROSS.GDT 11/14/12

# Granularmetric Report

Depths and elevations based on measured values

Project Name: Flagler County

Sample Name: R-81 #Berm

Analysis Date: 09-04-12

Analyzed By:

US Army Corps of Engineers
701 San Marco Blvd
Jacksonville, Florida 32207
phone (904)396-7121

| Easting (ft): | Northing (ft): | Coordinate System: | Elevation (ft): |
|---|---|---|---|
| 616,574 | 1,868,930 | | 0.0 MLLW |

| USCS | Munsell: | Comments: |
|---|---|---|
| SW | Moist - 7.5YR 7/2 | |

| Fines (%): | Organics (%): | Carbonates (%): | Shells (%): |
|---|---|---|---|
| #230 - 0.07 | | 40.30 | 42.90 |

| Sieve Number | Sieve Size (Phi) | Sieve Size (Millimeters) | % Weight Retained | C. % Weight Retained |
|---|---|---|---|---|
| #4 | -2.25 | 4.75 | 0.00 | 0.00 |
| #5 | -2.00 | 3.99 | 0.13 | 0.13 |
| #7 | -1.50 | 2.82 | 0.13 | 0.26 |
| #10 | -1.00 | 2.00 | 0.46 | 0.72 |
| #14 | -0.50 | 1.41 | 2.76 | 3.48 |
| #18 | 0.00 | 1.00 | 8.34 | 11.82 |
| #25 | 0.50 | 0.71 | 11.03 | 22.85 |
| #35 | 1.00 | 0.50 | 13.77 | 36.62 |
| #45 | 1.50 | 0.35 | 18.71 | 55.33 |
| #60 | 2.00 | 0.25 | 24.03 | 79.36 |
| #80 | 2.50 | 0.18 | 16.99 | 96.35 |
| #120 | 3.00 | 0.13 | 3.10 | 99.45 |
| #170 | 3.50 | 0.09 | 0.46 | 99.91 |
| #200 | 3.75 | 0.07 | 0.01 | 99.92 |
| #230 | 4.00 | 0.06 | 0.01 | 99.93 |

| Phi 5 | Phi 16 | Phi 25 | Phi 50 | Phi 75 | Phi 84 | Phi 95 |
|---|---|---|---|---|---|---|
| 2.46 | 2.13 | 1.91 | 1.35 | 0.58 | 0.19 | -0.41 |

| Moment | Mean Phi | Mean mm | Sorting | Skewness | Kurtosis |
|---|---|---|---|---|---|
| Statistics | 1.21 | 0.43 | 0.9 | -0.49 | 2.71 |

USACE GRANULARMETRIC REPORT FDEP_GINT_IMPORT_FLAGLER.GPJ FL DEP ROSS.GDT 11/14/12

# Granularmetric Report

Depths and elevations based on measured values

Project Name: Flagler County

Sample Name: R-81 #Mid-Tide

Analysis Date: 09-04-12

Analyzed By:

US Army Corps of Engineers
701 San Marco Blvd
Jacksonville, Florida 32207
phone (904)396-7121

| Easting (ft): | Northing (ft): | Coordinate System: | Elevation (ft): |
|---|---|---|---|
| 616,574 | 1,868,930 | | 0.0 MLLW |

| USCS | Munsell: | Comments: |
|---|---|---|
| SW | Moist - 7.5YR 7/2 | |

| Fines (%): | Organics (%): | Carbonates (%): | Shells (%): |
|---|---|---|---|
| #230 - 0.05 | | | 42.80 |

| Sieve Number | Sieve Size (Phi) | Sieve Size (Millimeters) | % Weight Retained | C. % Weight Retained |
|---|---|---|---|---|
| #4 | -2.25 | 4.75 | 0.00 | 0.00 |
| #5 | -2.00 | 3.99 | 0.10 | 0.10 |
| #7 | -1.50 | 2.82 | 0.08 | 0.18 |
| #10 | -1.00 | 2.00 | 0.36 | 0.54 |
| #14 | -0.50 | 1.41 | 2.81 | 3.35 |
| #18 | 0.00 | 1.00 | 9.14 | 12.49 |
| #25 | 0.50 | 0.71 | 13.03 | 25.52 |
| #35 | 1.00 | 0.50 | 13.94 | 39.46 |
| #45 | 1.50 | 0.35 | 14.51 | 53.97 |
| #60 | 2.00 | 0.25 | 16.64 | 70.61 |
| #80 | 2.50 | 0.18 | 19.50 | 90.11 |
| #120 | 3.00 | 0.13 | 9.33 | 99.44 |
| #170 | 3.50 | 0.09 | 0.48 | 99.92 |
| #200 | 3.75 | 0.07 | 0.01 | 99.93 |
| #230 | 4.00 | 0.06 | 0.02 | 99.95 |

| Phi 5 | Phi 16 | Phi 25 | Phi 50 | Phi 75 | Phi 84 | Phi 95 |
|---|---|---|---|---|---|---|
| 2.76 | 2.34 | 2.11 | 1.36 | 0.48 | 0.13 | -0.41 |

| Moment | Mean Phi | Mean mm | Sorting | Skewness | Kurtosis |
|---|---|---|---|---|---|
| Statistics | 1.27 | 0.41 | 1 | -0.28 | 2.21 |

USACE GRANULARMETRIC REPORT FDEP_GINT_IMPORT_FLAGLER.GPJ FL DEP ROSS.GDT 11/14/12

# Granularmetric Report

Depths and elevations based on measured values

Project Name: Flagler County

Sample Name: R-81 #-3

Analysis Date: 09-04-12

Analyzed By:

US Army Corps of Engineers
701 San Marco Blvd
Jacksonville, Florida 32207
phone (904)396-7121

| Easting (ft): | Northing (ft): | Coordinate System: | Elevation (ft): |
|---|---|---|---|
| 616,574 | 1,868,930 | | 0.0 MLLW |

| USCS | Munsell: | Comments: |
|---|---|---|
| SP | Moist - 10YR 7/1 | |

| Fines (%): | Organics (%): | Carbonates (%): | Shells (%): |
|---|---|---|---|
| #230 - 0.81 | | | 2.80 |

| Sieve Number | Sieve Size (Phi) | Sieve Size (Millimeters) | % Weight Retained | C. % Weight Retained |
|---|---|---|---|---|
| #4 | -2.25 | 4.75 | 0.00 | 0.00 |
| #5 | -2.00 | 3.99 | 0.05 | 0.05 |
| #7 | -1.50 | 2.82 | 0.03 | 0.08 |
| #10 | -1.00 | 2.00 | 0.04 | 0.12 |
| #14 | -0.50 | 1.41 | 0.20 | 0.32 |
| #18 | 0.00 | 1.00 | 0.52 | 0.84 |
| #25 | 0.50 | 0.71 | 0.71 | 1.55 |
| #35 | 1.00 | 0.50 | 0.80 | 2.35 |
| #45 | 1.50 | 0.35 | 1.35 | 3.70 |
| #60 | 2.00 | 0.25 | 4.73 | 8.43 |
| #80 | 2.50 | 0.18 | 28.37 | 36.80 |
| #120 | 3.00 | 0.13 | 53.95 | 90.75 |
| #170 | 3.50 | 0.09 | 8.27 | 99.02 |
| #200 | 3.75 | 0.07 | 0.16 | 99.18 |
| #230 | 4.00 | 0.06 | 0.01 | 99.19 |

| Phi 5 | Phi 16 | Phi 25 | Phi 50 | Phi 75 | Phi 84 | Phi 95 |
|---|---|---|---|---|---|---|
| 3.26 | 2.94 | 2.85 | 2.62 | 2.29 | 2.13 | 1.63 |

| Moment | Mean Phi | Mean mm | Sorting | Skewness | Kurtosis |
|---|---|---|---|---|---|
| Statistics | 2.52 | 0.17 | 0.54 | -2.64 | 15.18 |

USACE GRANULARMETRIC REPORT FDEP_GINT_IMPORT_FLAGLER.GPJ FL DEP ROSS.GDT 11/14/12

# Granularmetric Report

Depths and elevations based on measured values

Project Name: Flagler County

Sample Name: R-81 #-5

Analysis Date: 09-04-12

Analyzed By:

US Army Corps of Engineers
701 San Marco Blvd
Jacksonville, Florida 32207
phone (904)396-7121

| Easting (ft): | Northing (ft): | Coordinate System: | Elevation (ft): |
|---|---|---|---|
| 616,574 | 1,868,930 | | -0.1 MLLW |

| USCS | Munsell: | Comments: |
|---|---|---|
| SP | Moist - 10YR 7/1 | |

| Fines (%): | Organics (%): | Carbonates (%): | Shells (%): |
|---|---|---|---|
| #230 - 0.64 | | | 1.90 |

| Sieve Number | Sieve Size (Phi) | Sieve Size (Millimeters) | % Weight Retained | C. % Weight Retained |
|---|---|---|---|---|
| #4 | -2.25 | 4.75 | 0.00 | 0.00 |
| #5 | -2.00 | 3.99 | 0.06 | 0.06 |
| #7 | -1.50 | 2.82 | 0.04 | 0.10 |
| #10 | -1.00 | 2.00 | 0.03 | 0.13 |
| #14 | -0.50 | 1.41 | 0.25 | 0.38 |
| #18 | 0.00 | 1.00 | 0.30 | 0.68 |
| #25 | 0.50 | 0.71 | 0.31 | 0.99 |
| #35 | 1.00 | 0.50 | 0.35 | 1.34 |
| #45 | 1.50 | 0.35 | 0.63 | 1.97 |
| #60 | 2.00 | 0.25 | 3.06 | 5.03 |
| #80 | 2.50 | 0.18 | 31.63 | 36.66 |
| #120 | 3.00 | 0.13 | 55.46 | 92.12 |
| #170 | 3.50 | 0.09 | 7.20 | 99.32 |
| #200 | 3.75 | 0.07 | 0.03 | 99.35 |
| #230 | 4.00 | 0.06 | 0.01 | 99.36 |

| Phi 5 | Phi 16 | Phi 25 | Phi 50 | Phi 75 | Phi 84 | Phi 95 |
|---|---|---|---|---|---|---|
| 3.20 | 2.93 | 2.85 | 2.62 | 2.31 | 2.17 | 1.99 |

| Moment | Mean Phi | Mean mm | Sorting | Skewness | Kurtosis |
|---|---|---|---|---|---|
| Statistics | 2.55 | 0.17 | 0.47 | -3.18 | 23.24 |

USACE GRANULARMETRIC REPORT FDEP_GINT_IMPORT_FLAGLER.GPJ FL DEP ROSS.GDT 11/14/12

# Granularmetric Report

Depths and elevations based on measured values

Project Name: Flagler County

Sample Name: R-81 #-10

Analysis Date: 09-04-12

Analyzed By:

US Army Corps of Engineers
701 San Marco Blvd
Jacksonville, Florida 32207
phone (904)396-7121

| Easting (ft): | Northing (ft): | Coordinate System: | Elevation (ft): |
|---|---|---|---|
| 616,574 | 1,868,930 | | -0.1 MLLW |

| USCS | Munsell: | Comments: |
|---|---|---|
| SP | Moist - 10YR 7/1 | |

| Fines (%): | Organics (%): | Carbonates (%): | Shells (%): |
|---|---|---|---|
| #230 - 0.87 | | 8.30 | 5.70 |

| Sieve Number | Sieve Size (Phi) | Sieve Size (Millimeters) | % Weight Retained | C. % Weight Retained |
|---|---|---|---|---|
| #3.5 | -2.50 | 5.66 | 0.00 | 0.00 |
| #4 | -2.25 | 4.75 | 0.18 | 0.18 |
| #5 | -2.00 | 3.99 | 0.18 | 0.36 |
| #7 | -1.50 | 2.82 | 0.13 | 0.49 |
| #10 | -1.00 | 2.00 | 0.17 | 0.66 |
| #14 | -0.50 | 1.41 | 0.86 | 1.52 |
| #18 | 0.00 | 1.00 | 1.49 | 3.01 |
| #25 | 0.50 | 0.71 | 1.48 | 4.49 |
| #35 | 1.00 | 0.50 | 1.28 | 5.77 |
| #45 | 1.50 | 0.35 | 1.14 | 6.91 |
| #60 | 2.00 | 0.25 | 1.99 | 8.90 |
| #80 | 2.50 | 0.18 | 13.28 | 22.18 |
| #120 | 3.00 | 0.13 | 60.06 | 82.24 |
| #170 | 3.50 | 0.09 | 15.98 | 98.22 |
| #200 | 3.75 | 0.07 | 0.87 | 99.09 |
| #230 | 4.00 | 0.06 | 0.04 | 99.13 |

| Phi 5 | Phi 16 | Phi 25 | Phi 50 | Phi 75 | Phi 84 | Phi 95 |
|---|---|---|---|---|---|---|
| 3.40 | 3.06 | 2.94 | 2.73 | 2.52 | 2.27 | 0.70 |

| Moment | Mean Phi | Mean mm | Sorting | Skewness | Kurtosis |
|---|---|---|---|---|---|
| Statistics | 2.56 | 0.17 | 0.79 | -3.03 | 13.91 |

USACE GRANULARMETRIC REPORT FDEP_GINT_IMPORT_FLAGLER.GPJ FL_DEP ROSS.GDT 11/14/12

# Granularmetric Report

Depths and elevations based on measured values

Project Name: Flagler County

Sample Name: R-81 #-15

Analysis Date: 09-04-12

Analyzed By:

US Army Corps of Engineers
701 San Marco Blvd
Jacksonville, Florida 32207
phone (904)396-7121

| Easting (ft): | Northing (ft): | Coordinate System: | Elevation (ft): |
|---|---|---|---|
| 616,574 | 1,868,930 | | -0.1 MLLW |

| USCS | Munsell: | Comments: |
|---|---|---|
| SW | Moist - 10YR 7/1 | |

| Fines (%): | Organics (%): | Carbonates (%): | Shells (%): |
|---|---|---|---|
| #230 - 1.10 | | | 8.90 |

| Sieve Number | Sieve Size (Phi) | Sieve Size (Millimeters) | % Weight Retained | C. % Weight Retained |
|---|---|---|---|---|
| #3.5 | -2.50 | 5.66 | 0.00 | 0.00 |
| #4 | -2.25 | 4.75 | 0.14 | 0.14 |
| #5 | -2.00 | 3.99 | 0.16 | 0.30 |
| #7 | -1.50 | 2.82 | 0.16 | 0.46 |
| #10 | -1.00 | 2.00 | 0.62 | 1.08 |
| #14 | -0.50 | 1.41 | 2.05 | 3.13 |
| #18 | 0.00 | 1.00 | 2.45 | 5.58 |
| #25 | 0.50 | 0.71 | 1.97 | 7.55 |
| #35 | 1.00 | 0.50 | 1.31 | 8.86 |
| #45 | 1.50 | 0.35 | 1.09 | 9.95 |
| #60 | 2.00 | 0.25 | 2.15 | 12.10 |
| #80 | 2.50 | 0.18 | 12.03 | 24.13 |
| #120 | 3.00 | 0.13 | 53.89 | 78.02 |
| #170 | 3.50 | 0.09 | 18.97 | 96.99 |
| #200 | 3.75 | 0.07 | 1.60 | 98.59 |
| #230 | 4.00 | 0.06 | 0.31 | 98.90 |

| Phi 5 | Phi 16 | Phi 25 | Phi 50 | Phi 75 | Phi 84 | Phi 95 |
|---|---|---|---|---|---|---|
| 3.45 | 3.16 | 2.97 | 2.74 | 2.51 | 2.16 | -0.12 |

| Moment | Mean Phi | Mean mm | Sorting | Skewness | Kurtosis |
|---|---|---|---|---|---|
| Statistics | 2.49 | 0.18 | 0.97 | -2.41 | 8.78 |

USACE GRANULARMETRIC REPORT FDEP_GINT_IMPORT_FLAGLER.GPJ FL_DEP ROSS.GDT 11/14/12

# Granularmetric Report

Depths and elevations based on measured values

Project Name: Flagler County

Sample Name: R-81 #-20

Analysis Date: 09-04-12

Analyzed By:

US Army Corps of Engineers
701 San Marco Blvd
Jacksonville, Florida 32207
phone (904)396-7121

| Easting (ft): | Northing (ft): | Coordinate System: | Elevation (ft): |
|---|---|---|---|
| 616,574 | 1,868,930 | | -0.1 MLLW |

| USCS | Munsell: | Comments: |
|---|---|---|
| SP | Moist - 10YR 6/1 | |

| Fines (%): | Organics (%): | Carbonates (%): | Shells (%): |
|---|---|---|---|
| #230 - 1.21 | | | 2.00 |

| Sieve Number | Sieve Size (Phi) | Sieve Size (Millimeters) | % Weight Retained | C. % Weight Retained |
|---|---|---|---|---|
| #4 | -2.25 | 4.75 | 0.00 | 0.00 |
| #5 | -2.00 | 3.99 | 0.07 | 0.07 |
| #7 | -1.50 | 2.82 | 0.11 | 0.18 |
| #10 | -1.00 | 2.00 | 0.11 | 0.29 |
| #14 | -0.50 | 1.41 | 0.24 | 0.53 |
| #18 | 0.00 | 1.00 | 0.30 | 0.83 |
| #25 | 0.50 | 0.71 | 0.25 | 1.08 |
| #35 | 1.00 | 0.50 | 0.18 | 1.26 |
| #45 | 1.50 | 0.35 | 0.29 | 1.55 |
| #60 | 2.00 | 0.25 | 0.59 | 2.14 |
| #80 | 2.50 | 0.18 | 7.34 | 9.48 |
| #120 | 3.00 | 0.13 | 58.84 | 68.32 |
| #170 | 3.50 | 0.09 | 27.69 | 96.01 |
| #200 | 3.75 | 0.07 | 2.25 | 98.26 |
| #230 | 4.00 | 0.06 | 0.53 | 98.79 |

| Phi 5 | Phi 16 | Phi 25 | Phi 50 | Phi 75 | Phi 84 | Phi 95 |
|---|---|---|---|---|---|---|
| 3.48 | 3.28 | 3.12 | 2.84 | 2.63 | 2.56 | 2.19 |

| Moment | Mean Phi | Mean mm | Sorting | Skewness | Kurtosis |
|---|---|---|---|---|---|
| Statistics | 2.83 | 0.14 | 0.51 | -4.01 | 31.76 |

USACE GRANULARMETRIC REPORT FDEP_GINT_IMPORT_FLAGLER.GPJ FL DEP ROSS.GDT 11/14/12

# Granularmetric Report

Depths and elevations based on measured values

Project Name: Flagler County

Sample Name: R-85 #Berm

Analysis Date: 09-04-12

Analyzed By:

US Army Corps of Engineers
701 San Marco Blvd
Jacksonville, Florida 32207
phone (904)396-7121

| Easting (ft): | Northing (ft): | Coordinate System: | Elevation (ft): |
|---|---|---|---|
| 617,978 | 1,865,523 | | 0.0 MLLW |

| USCS | Munsell: | Comments: |
|---|---|---|
| SW | Moist - 7.5YR 7/2 | |

| Fines (%): | Organics (%): | Carbonates (%): | Shells (%): |
|---|---|---|---|
| #230 - 0.11 | | | 31.90 |

| Sieve Number | Sieve Size (Phi) | Sieve Size (Millimeters) | % Weight Retained | C. % Weight Retained |
|---|---|---|---|---|
| 3/8" | -3.25 | 9.48 | 0.00 | 0.00 |
| #3.5 | -2.50 | 5.66 | 0.08 | 0.08 |
| #4 | -2.25 | 4.75 | 0.00 | 0.08 |
| #5 | -2.00 | 3.99 | 0.00 | 0.08 |
| #7 | -1.50 | 2.82 | 0.04 | 0.12 |
| #10 | -1.00 | 2.00 | 0.22 | 0.34 |
| #14 | -0.50 | 1.41 | 1.38 | 1.72 |
| #18 | 0.00 | 1.00 | 5.89 | 7.61 |
| #25 | 0.50 | 0.71 | 10.45 | 18.06 |
| #35 | 1.00 | 0.50 | 13.07 | 31.13 |
| #45 | 1.50 | 0.35 | 15.08 | 46.21 |
| #60 | 2.00 | 0.25 | 22.92 | 69.13 |
| #80 | 2.50 | 0.18 | 22.92 | 92.05 |
| #120 | 3.00 | 0.13 | 7.49 | 99.54 |
| #170 | 3.50 | 0.09 | 0.32 | 99.86 |
| #200 | 3.75 | 0.07 | 0.03 | 99.89 |
| #230 | 4.00 | 0.06 | 0.00 | 99.89 |

| Phi 5 | Phi 16 | Phi 25 | Phi 50 | Phi 75 | Phi 84 | Phi 95 |
|---|---|---|---|---|---|---|
| 2.70 | 2.32 | 2.13 | 1.58 | 0.76 | 0.40 | -0.22 |

| Moment | Mean Phi | Mean mm | Sorting | Skewness | Kurtosis |
|---|---|---|---|---|---|
| Statistics | 1.42 | 0.37 | 0.89 | -0.55 | 2.82 |

USACE GRANULARMETRIC REPORT FDEP_GINT_IMPORT_FLAGLER.GPJ FL_DEP ROSS.GDT 11/14/12

# Granularmetric Report

Depths and elevations based on measured values

Project Name: Flagler County

Sample Name: R-85 #Mid-Tide

Analysis Date: 09-04-12

Analyzed By:

US Army Corps of Engineers
701 San Marco Blvd
Jacksonville, Florida 32207
phone (904)396-7121

| Easting (ft): | Northing (ft): | Coordinate System: | Elevation (ft): |
|---|---|---|---|
| 617,978 | 1,865,523 | | 0.0 MLLW |

| USCS | Munsell: | Comments: |
|---|---|---|
| SP | Moist - 7.5YR 7/1 | |

| Fines (%): | Organics (%): | Carbonates (%): | Shells (%): |
|---|---|---|---|
| #230 - 0.32 | | | 22.60 |

| Sieve Number | Sieve Size (Phi) | Sieve Size (Millimeters) | % Weight Retained | C. % Weight Retained |
|---|---|---|---|---|
| #7 | -1.50 | 2.82 | 0.00 | 0.00 |
| #10 | -1.00 | 2.00 | 0.08 | 0.08 |
| #14 | -0.50 | 1.41 | 0.51 | 0.59 |
| #18 | 0.00 | 1.00 | 2.58 | 3.17 |
| #25 | 0.50 | 0.71 | 5.46 | 8.63 |
| #35 | 1.00 | 0.50 | 7.06 | 15.69 |
| #45 | 1.50 | 0.35 | 8.83 | 24.52 |
| #60 | 2.00 | 0.25 | 15.94 | 40.46 |
| #80 | 2.50 | 0.18 | 37.65 | 78.11 |
| #120 | 3.00 | 0.13 | 20.13 | 98.24 |
| #170 | 3.50 | 0.09 | 1.42 | 99.66 |
| #200 | 3.75 | 0.07 | 0.02 | 99.68 |
| #230 | 4.00 | 0.06 | 0.00 | 99.68 |

| Phi 5 | Phi 16 | Phi 25 | Phi 50 | Phi 75 | Phi 84 | Phi 95 |
|---|---|---|---|---|---|---|
| 2.92 | 2.65 | 2.46 | 2.12 | 1.51 | 1.02 | 0.17 |

| Moment | Mean Phi | Mean mm | Sorting | Skewness | Kurtosis |
|---|---|---|---|---|---|
| Statistics | 1.9 | 0.27 | 0.82 | -1.06 | 3.56 |

USACE GRANULARMETRIC REPORT FDEP_GINT_IMPORT_FLAGLER.GPJ FL_DEP ROSS.GDT 11/14/12

# Granularmetric Report

Depths and elevations based on measured values

Project Name: Flagler County

Sample Name: R-85 #-3

Analysis Date: 09-04-12

Analyzed By:

US Army Corps of Engineers
701 San Marco Blvd
Jacksonville, Florida 32207
phone (904)396-7121

| Easting (ft): | Northing (ft): | Coordinate System: | Elevation (ft): |
|---|---|---|---|
| 617,978 | 1,865,523 | | 0.0 MLLW |

| USCS | Munsell: | Comments: |
|---|---|---|
| SW | Moist - 7.5YR 7/3 | |

| Fines (%): | Organics (%): | Carbonates (%): | Shells (%): |
|---|---|---|---|
| #230 - 0.84 | | | 21.50 |

| Sieve Number | Sieve Size (Phi) | Sieve Size (Millimeters) | % Weight Retained | C. % Weight Retained |
|---|---|---|---|---|
| #5 | -2.00 | 3.99 | 0.00 | 0.00 |
| #7 | -1.50 | 2.82 | 0.05 | 0.05 |
| #10 | -1.00 | 2.00 | 0.35 | 0.40 |
| #14 | -0.50 | 1.41 | 2.28 | 2.68 |
| #18 | 0.00 | 1.00 | 5.01 | 7.69 |
| #25 | 0.50 | 0.71 | 5.39 | 13.08 |
| #35 | 1.00 | 0.50 | 4.98 | 18.06 |
| #45 | 1.50 | 0.35 | 5.02 | 23.08 |
| #60 | 2.00 | 0.25 | 7.98 | 31.06 |
| #80 | 2.50 | 0.18 | 31.09 | 62.15 |
| #120 | 3.00 | 0.13 | 31.08 | 93.23 |
| #170 | 3.50 | 0.09 | 5.75 | 98.98 |
| #200 | 3.75 | 0.07 | 0.14 | 99.12 |
| #230 | 4.00 | 0.06 | 0.04 | 99.16 |

| Phi 5 | Phi 16 | Phi 25 | Phi 50 | Phi 75 | Phi 84 | Phi 95 |
|---|---|---|---|---|---|---|
| 3.15 | 2.85 | 2.71 | 2.30 | 1.62 | 0.79 | -0.27 |

| Moment | Mean Phi | Mean mm | Sorting | Skewness | Kurtosis |
|---|---|---|---|---|---|
| Statistics | 1.98 | 0.25 | 1.02 | -1.22 | 3.59 |

USACE GRANULARMETRIC REPORT FDEP_GINT_IMPORT_FLAGLER.GPJ FL_DEP ROSS.GDT 11/14/12

# Granularmetric Report

Depths and elevations based on measured values

Project Name: Flagler County

Sample Name: R-85 #-5

Analysis Date: 09-04-12

Analyzed By:

US Army Corps of Engineers
701 San Marco Blvd
Jacksonville, Florida 32207
phone (904)396-7121

| Easting (ft): | Northing (ft): | Coordinate System: | Elevation (ft): |
|---|---|---|---|
| 617,978 | 1,865,523 | | -0.1 MLLW |

| USCS | Munsell: | Comments: |
|---|---|---|
| SW | Moist - 7.5YR 7/1 | |

| Fines (%): | Organics (%): | Carbonates (%): | Shells (%): |
|---|---|---|---|
| #230 - 0.81 | | | 16.10 |

| Sieve Number | Sieve Size (Phi) | Sieve Size (Millimeters) | % Weight Retained | C. % Weight Retained |
|---|---|---|---|---|
| #4 | -2.25 | 4.75 | 0.00 | 0.00 |
| #5 | -2.00 | 3.99 | 0.05 | 0.05 |
| #7 | -1.50 | 2.82 | 0.12 | 0.17 |
| #10 | -1.00 | 2.00 | 0.32 | 0.49 |
| #14 | -0.50 | 1.41 | 1.38 | 1.87 |
| #18 | 0.00 | 1.00 | 3.19 | 5.06 |
| #25 | 0.50 | 0.71 | 3.23 | 8.29 |
| #35 | 1.00 | 0.50 | 2.89 | 11.18 |
| #45 | 1.50 | 0.35 | 3.27 | 14.45 |
| #60 | 2.00 | 0.25 | 5.76 | 20.21 |
| #80 | 2.50 | 0.18 | 38.59 | 58.80 |
| #120 | 3.00 | 0.13 | 35.01 | 93.81 |
| #170 | 3.50 | 0.09 | 5.20 | 99.01 |
| #200 | 3.75 | 0.07 | 0.15 | 99.16 |
| #230 | 4.00 | 0.06 | 0.03 | 99.19 |

| Phi 5 | Phi 16 | Phi 25 | Phi 50 | Phi 75 | Phi 84 | Phi 95 |
|---|---|---|---|---|---|---|
| 3.11 | 2.86 | 2.73 | 2.39 | 2.06 | 1.63 | -0.01 |

| Moment | Mean Phi | Mean mm | Sorting | Skewness | Kurtosis |
|---|---|---|---|---|---|
| Statistics | 2.17 | 0.22 | 0.88 | -1.82 | 6.16 |

USACE GRANULARMETRIC REPORT FDEP_GINT_IMPORT_FLAGLER.GPJ FL DEP ROSS.GDT 11/14/12

# Granularmetric Report

Depths and elevations based on measured values

Project Name: Flagler County

Sample Name: R-85 #-10

Analysis Date: 09-04-12

Analyzed By:

US Army Corps of Engineers
701 San Marco Blvd
Jacksonville, Florida 32207
phone (904)396-7121

| Easting (ft): | Northing (ft): | Coordinate System: | Elevation (ft): |
|---|---|---|---|
| 617,978 | 1,865,523 | | -0.1 MLLW |

| USCS | Munsell: | Comments: |
|---|---|---|
| SP | Moist - 10YR 7/1 | |

| Fines (%): | Organics (%): | Carbonates (%): | Shells (%): |
|---|---|---|---|
| #230 - 1.14 | | 8.00 | 7.40 |

| Sieve Number | Sieve Size (Phi) | Sieve Size (Millimeters) | % Weight Retained | C. % Weight Retained |
|---|---|---|---|---|
| #3.5 | -2.50 | 5.66 | 0.00 | 0.00 |
| #4 | -2.25 | 4.75 | 0.01 | 0.01 |
| #5 | -2.00 | 3.99 | 0.00 | 0.01 |
| #7 | -1.50 | 2.82 | 0.03 | 0.04 |
| #10 | -1.00 | 2.00 | 0.13 | 0.17 |
| #14 | -0.50 | 1.41 | 0.67 | 0.84 |
| #18 | 0.00 | 1.00 | 1.47 | 2.31 |
| #25 | 0.50 | 0.71 | 1.52 | 3.83 |
| #35 | 1.00 | 0.50 | 1.23 | 5.06 |
| #45 | 1.50 | 0.35 | 1.10 | 6.16 |
| #60 | 2.00 | 0.25 | 1.70 | 7.86 |
| #80 | 2.50 | 0.18 | 8.40 | 16.26 |
| #120 | 3.00 | 0.13 | 58.82 | 75.08 |
| #170 | 3.50 | 0.09 | 22.07 | 97.15 |
| #200 | 3.75 | 0.07 | 1.46 | 98.61 |
| #230 | 4.00 | 0.06 | 0.25 | 98.86 |

| Phi 5 | Phi 16 | Phi 25 | Phi 50 | Phi 75 | Phi 84 | Phi 95 |
|---|---|---|---|---|---|---|
| 3.45 | 3.20 | 3.00 | 2.79 | 2.57 | 2.48 | 0.97 |

| Moment | Mean Phi | Mean mm | Sorting | Skewness | Kurtosis |
|---|---|---|---|---|---|
| Statistics | 2.66 | 0.16 | 0.72 | -2.79 | 12.12 |

USACE GRANULARMETRIC REPORT FDEP_GINT_IMPORT_FLAGLER.GPJ FL DEP ROSS.GDT 11/14/12

# Granularmetric Report

Depths and elevations based on measured values

Project Name: Flagler County

Sample Name: R-85 #-15

Analysis Date: 09-04-12

Analyzed By:

US Army Corps of Engineers
701 San Marco Blvd
Jacksonville, Florida 32207
phone (904)396-7121

| Easting (ft): | Northing (ft): | Coordinate System: | Elevation (ft): |
|---|---|---|---|
| 617,978 | 1,865,523 | | -0.1 MLLW |

| USCS | Munsell: | Comments: |
|---|---|---|
| SP | Moist - 10YR 7/2 | |

| Fines (%): | Organics (%): | Carbonates (%): | Shells (%): |
|---|---|---|---|
| #230 - 1.50 | | | 8.30 |

| Sieve Number | Sieve Size (Phi) | Sieve Size (Millimeters) | % Weight Retained | C. % Weight Retained |
|---|---|---|---|---|
| 3/8" | -3.25 | 9.48 | 0.00 | 0.00 |
| #3.5 | -2.50 | 5.66 | 0.12 | 0.12 |
| #4 | -2.25 | 4.75 | 0.01 | 0.13 |
| #5 | -2.00 | 3.99 | 0.04 | 0.17 |
| #7 | -1.50 | 2.82 | 0.12 | 0.29 |
| #10 | -1.00 | 2.00 | 0.32 | 0.61 |
| #14 | -0.50 | 1.41 | 1.35 | 1.96 |
| #18 | 0.00 | 1.00 | 1.81 | 3.77 |
| #25 | 0.50 | 0.71 | 1.62 | 5.39 |
| #35 | 1.00 | 0.50 | 1.10 | 6.49 |
| #45 | 1.50 | 0.35 | 0.83 | 7.32 |
| #60 | 2.00 | 0.25 | 1.51 | 8.83 |
| #80 | 2.50 | 0.18 | 8.39 | 17.22 |
| #120 | 3.00 | 0.13 | 61.48 | 78.70 |
| #170 | 3.50 | 0.09 | 17.60 | 96.30 |
| #200 | 3.75 | 0.07 | 1.70 | 98.00 |
| #230 | 4.00 | 0.06 | 0.50 | 98.50 |

| Phi 5 | Phi 16 | Phi 25 | Phi 50 | Phi 75 | Phi 84 | Phi 95 |
|---|---|---|---|---|---|---|
| 3.46 | 3.15 | 2.97 | 2.77 | 2.56 | 2.43 | 0.38 |

| Moment | Mean Phi | Mean mm | Sorting | Skewness | Kurtosis |
|---|---|---|---|---|---|
| Statistics | 2.59 | 0.17 | 0.84 | -2.89 | 12.38 |

USACE GRANULARMETRIC REPORT FDEP_GINT_IMPORT_FLAGLER.GPJ FL_DEP ROSS.GDT 11/14/12

# Granularmetric Report

Depths and elevations based on measured values

Project Name: Flagler County

Sample Name: R-85 #-20

Analysis Date: 09-04-12

Analyzed By:

US Army Corps of Engineers
701 San Marco Blvd
Jacksonville, Florida 32207
phone (904)396-7121

| Easting (ft): | Northing (ft): | Coordinate System: | Elevation (ft): |
|---|---|---|---|
| 617,978 | 1,865,523 | | -0.1 MLLW |

| USCS | Munsell: | Comments: |
|---|---|---|
| SP | Moist - 10YR 7/2 | |

| Fines (%): | Organics (%): | Carbonates (%): | Shells (%): |
|---|---|---|---|
| #230 - 1.18 | | | 3.40 |

| Sieve Number | Sieve Size (Phi) | Sieve Size (Millimeters) | % Weight Retained | C. % Weight Retained |
|---|---|---|---|---|
| 3/8" | -3.25 | 9.48 | 0.00 | 0.00 |
| #3.5 | -2.50 | 5.66 | 0.02 | 0.02 |
| #4 | -2.25 | 4.75 | 0.00 | 0.02 |
| #5 | -2.00 | 3.99 | 0.04 | 0.06 |
| #7 | -1.50 | 2.82 | 0.05 | 0.11 |
| #10 | -1.00 | 2.00 | 0.07 | 0.18 |
| #14 | -0.50 | 1.41 | 0.28 | 0.46 |
| #18 | 0.00 | 1.00 | 0.39 | 0.85 |
| #25 | 0.50 | 0.71 | 0.32 | 1.17 |
| #35 | 1.00 | 0.50 | 0.29 | 1.46 |
| #45 | 1.50 | 0.35 | 0.71 | 2.17 |
| #60 | 2.00 | 0.25 | 1.73 | 3.90 |
| #80 | 2.50 | 0.18 | 7.53 | 11.43 |
| #120 | 3.00 | 0.13 | 52.04 | 63.47 |
| #170 | 3.50 | 0.09 | 31.77 | 95.24 |
| #200 | 3.75 | 0.07 | 2.73 | 97.97 |
| #230 | 4.00 | 0.06 | 0.85 | 98.82 |

| Phi 5 | Phi 16 | Phi 25 | Phi 50 | Phi 75 | Phi 84 | Phi 95 |
|---|---|---|---|---|---|---|
| 3.50 | 3.32 | 3.18 | 2.87 | 2.63 | 2.54 | 2.07 |

| Moment | Mean Phi | Mean mm | Sorting | Skewness | Kurtosis |
|---|---|---|---|---|---|
| Statistics | 2.83 | 0.14 | 0.55 | -3.27 | 22.63 |

USACE GRANULARMETRIC REPORT FDEP_GINT_IMPORT_FLAGLER.GPJ FL DEP ROSS.GDT 11/14/12

# Granularmetric Report

Depths and elevations based on measured values

Project Name: Flagler County

Sample Name: R-89 #Berm

Analysis Date: 09-05-12

Analyzed By:

US Army Corps of Engineers
701 San Marco Blvd
Jacksonville, Florida 32207
phone (904)396-7121

| Easting (ft): | Northing (ft): | Coordinate System: | Elevation (ft): |
|---|---|---|---|
| 619,322 | 1,862,202 | | 0.0 MLLW |

| USCS | Munsell: | Comments: |
|---|---|---|
| SW | Moist - 7.5YR 7/2 | |

| | | | Fines (%): | Organics (%): | Carbonates (%): | Shells (%): |
|---|---|---|---|---|---|---|
| | | | #230 - 0.04 | | 39.20 | 41.90 |

| Sieve Number | Sieve Size (Phi) | Sieve Size (Millimeters) | % Weight Retained | C. % Weight Retained |
|---|---|---|---|---|
| #5 | -2.00 | 3.99 | 0.00 | 0.00 |
| #7 | -1.50 | 2.82 | 0.07 | 0.07 |
| #10 | -1.00 | 2.00 | 0.28 | 0.35 |
| #14 | -0.50 | 1.41 | 3.08 | 3.43 |
| #18 | 0.00 | 1.00 | 10.00 | 13.43 |
| #25 | 0.50 | 0.71 | 11.91 | 25.34 |
| #35 | 1.00 | 0.50 | 11.08 | 36.42 |
| #45 | 1.50 | 0.35 | 12.16 | 48.58 |
| #60 | 2.00 | 0.25 | 18.83 | 67.41 |
| #80 | 2.50 | 0.18 | 24.26 | 91.67 |
| #120 | 3.00 | 0.13 | 7.89 | 99.56 |
| #170 | 3.50 | 0.09 | 0.39 | 99.95 |
| #200 | 3.75 | 0.07 | 0.01 | 99.96 |
| #230 | 4.00 | 0.06 | 0.00 | 99.96 |

| Phi 5 | Phi 16 | Phi 25 | Phi 50 | Phi 75 | Phi 84 | Phi 95 |
|---|---|---|---|---|---|---|
| 2.71 | 2.34 | 2.15 | 1.53 | 0.49 | 0.11 | -0.42 |

| Moment | Mean Phi | Mean mm | Sorting | Skewness | Kurtosis |
|---|---|---|---|---|---|
| Statistics | 1.32 | 0.40 | 1 | -0.42 | 2.11 |

USACE GRANULARMETRIC REPORT FDEP_GINT_IMPORT_FLAGLER.GPJ FL DEP ROSS.GDT 11/14/12

# Granularmetric Report

Depths and elevations based on measured values

Project Name: Flagler County

Sample Name: R-89 #Mid-Tide

Analysis Date: 09-05-12

Analyzed By:

US Army Corps of Engineers
701 San Marco Blvd
Jacksonville, Florida 32207
phone (904)396-7121

| Easting (ft): | Northing (ft): | Coordinate System: | Elevation (ft): |
|---|---|---|---|
| 619,322 | 1,862,202 | | 0.0 MLLW |

| USCS | Munsell: | Comments: |
|---|---|---|
| SW | Moist - 7.5YR 7/3 | |

| Fines (%): | Organics (%): | Carbonates (%): | Shells (%): |
|---|---|---|---|
| #230 - 0.16 | | | 65.90 |

| Sieve Number | Sieve Size (Phi) | Sieve Size (Millimeters) | % Weight Retained | C. % Weight Retained |
|---|---|---|---|---|
| #4 | -2.25 | 4.75 | 0.00 | 0.00 |
| #5 | -2.00 | 3.99 | 0.13 | 0.13 |
| #7 | -1.50 | 2.82 | 0.89 | 1.02 |
| #10 | -1.00 | 2.00 | 2.56 | 3.58 |
| #14 | -0.50 | 1.41 | 13.47 | 17.05 |
| #18 | 0.00 | 1.00 | 22.63 | 39.68 |
| #25 | 0.50 | 0.71 | 16.94 | 56.62 |
| #35 | 1.00 | 0.50 | 9.29 | 65.91 |
| #45 | 1.50 | 0.35 | 7.17 | 73.08 |
| #60 | 2.00 | 0.25 | 9.35 | 82.43 |
| #80 | 2.50 | 0.18 | 12.73 | 95.16 |
| #120 | 3.00 | 0.13 | 4.53 | 99.69 |
| #170 | 3.50 | 0.09 | 0.14 | 99.83 |
| #200 | 3.75 | 0.07 | 0.01 | 99.84 |
| #230 | 4.00 | 0.06 | 0.00 | 99.84 |

| Phi 5 | Phi 16 | Phi 25 | Phi 50 | Phi 75 | Phi 84 | Phi 95 |
|---|---|---|---|---|---|---|
| 2.49 | 2.06 | 1.60 | 0.30 | -0.32 | -0.54 | -0.95 |

| Moment | Mean Phi | Mean mm | Sorting | Skewness | Kurtosis |
|---|---|---|---|---|---|
| Statistics | 0.57 | 0.67 | 1.14 | 0.36 | 2.03 |

USACE GRANULARMETRIC REPORT FDEP_GINT_IMPORT_FLAGLER.GPJ FL DEP ROSS.GDT 11/14/12

# Granularmetric Report

Depths and elevations based on measured values

Project Name: Flagler County

Sample Name: R-89 #-3

Analysis Date: 09-05-12

Analyzed By:

US Army Corps of Engineers
701 San Marco Blvd
Jacksonville, Florida 32207
phone (904)396-7121

| Easting (ft): | Northing (ft): | Coordinate System: | Elevation (ft): |
|---|---|---|---|
| 619,322 | 1,862,202 | | 0.0 MLLW |

| USCS | Munsell: | Comments: |
|---|---|---|
| SW | Moist - 7.5YR 7/1 | |

| Fines (%): | Organics (%): | Carbonates (%): | Shells (%): |
|---|---|---|---|
| #230 - 0.65 | | | 60.90 |

| Sieve Number | Sieve Size (Phi) | Sieve Size (Millimeters) | % Weight Retained | C. % Weight Retained |
|---|---|---|---|---|
| 3/4" | -4.25 | 19.03 | 0.00 | 0.00 |
| 3/8" | -3.25 | 9.48 | 0.26 | 0.26 |
| #3.5 | -2.50 | 5.66 | 0.38 | 0.64 |
| #4 | -2.25 | 4.75 | 0.42 | 1.06 |
| #5 | -2.00 | 3.99 | 0.34 | 1.40 |
| #7 | -1.50 | 2.82 | 1.36 | 2.76 |
| #10 | -1.00 | 2.00 | 3.34 | 6.10 |
| #14 | -0.50 | 1.41 | 14.11 | 20.21 |
| #18 | 0.00 | 1.00 | 20.23 | 40.44 |
| #25 | 0.50 | 0.71 | 15.01 | 55.45 |
| #35 | 1.00 | 0.50 | 9.13 | 64.58 |
| #45 | 1.50 | 0.35 | 6.98 | 71.56 |
| #60 | 2.00 | 0.25 | 6.94 | 78.50 |
| #80 | 2.50 | 0.18 | 9.26 | 87.76 |
| #120 | 3.00 | 0.13 | 10.35 | 98.11 |
| #170 | 3.50 | 0.09 | 1.24 | 99.35 |
| #200 | 3.75 | 0.07 | 0.00 | 99.35 |
| #230 | 4.00 | 0.06 | 0.00 | 99.35 |

| Phi 5 | Phi 16 | Phi 25 | Phi 50 | Phi 75 | Phi 84 | Phi 95 |
|---|---|---|---|---|---|---|
| 2.85 | 2.30 | 1.74 | 0.32 | -0.38 | -0.65 | -1.16 |

| Moment | Mean Phi | Mean mm | Sorting | Skewness | Kurtosis |
|---|---|---|---|---|---|
| Statistics | 0.59 | 0.66 | 1.31 | 0.19 | 2.4 |

USACE GRANULARMETRIC REPORT FDEP_GINT_IMPORT_FLAGLER.GPJ FL_DEP ROSS.GDT 11/14/12

# Granularmetric Report

Depths and elevations based on measured values

Project Name: Flagler County

Sample Name: R-89 #-5

Analysis Date: 09-05-12

Analyzed By:

US Army Corps of Engineers
701 San Marco Blvd
Jacksonville, Florida 32207
phone (904)396-7121

| Easting (ft): | Northing (ft): | Coordinate System: | Elevation (ft): |
|---|---|---|---|
| 619,322 | 1,862,202 | | -0.1 MLLW |

| USCS | Munsell: | Comments: |
|---|---|---|
| SP | Moist - 10YR 7/1 | |

| Fines (%): | Organics (%): | Carbonates (%): | Shells (%): |
|---|---|---|---|
| #230 - 1.43 | | | 5.90 |

| Sieve Number | Sieve Size (Phi) | Sieve Size (Millimeters) | % Weight Retained | C. % Weight Retained |
|---|---|---|---|---|
| #5 | -2.00 | 3.99 | 0.00 | 0.00 |
| #7 | -1.50 | 2.82 | 0.01 | 0.01 |
| #10 | -1.00 | 2.00 | 0.07 | 0.08 |
| #14 | -0.50 | 1.41 | 0.29 | 0.37 |
| #18 | 0.00 | 1.00 | 0.77 | 1.14 |
| #25 | 0.50 | 0.71 | 0.95 | 2.09 |
| #35 | 1.00 | 0.50 | 0.95 | 3.04 |
| #45 | 1.50 | 0.35 | 1.11 | 4.15 |
| #60 | 2.00 | 0.25 | 2.85 | 7.00 |
| #80 | 2.50 | 0.18 | 20.74 | 27.74 |
| #120 | 3.00 | 0.13 | 58.70 | 86.44 |
| #170 | 3.50 | 0.09 | 11.38 | 97.82 |
| #200 | 3.75 | 0.07 | 0.54 | 98.36 |
| #230 | 4.00 | 0.06 | 0.21 | 98.57 |

| Phi 5 | Phi 16 | Phi 25 | Phi 50 | Phi 75 | Phi 84 | Phi 95 |
|---|---|---|---|---|---|---|
| 3.38 | 2.98 | 2.90 | 2.69 | 2.43 | 2.21 | 1.64 |

| Moment | Mean Phi | Mean mm | Sorting | Skewness | Kurtosis |
|---|---|---|---|---|---|
| Statistics | 2.58 | 0.17 | 0.58 | -2.7 | 13.78 |

USACE GRANULARMETRIC REPORT FDEP_GINT_IMPORT_FLAGLER.GPJ FL_DEP ROSS.GDT 11/14/12

# Granularmetric Report

Depths and elevations based on measured values

Project Name: Flagler County

Sample Name: R-89 #-10

Analysis Date: 09-05-12

Analyzed By:

US Army Corps of Engineers
701 San Marco Blvd
Jacksonville, Florida 32207
phone (904)396-7121

| Easting (ft): | Northing (ft): | Coordinate System: | Elevation (ft): |
|---|---|---|---|
| 619,322 | 1,862,202 | | -0.1 MLLW |

| USCS | Munsell: | Comments: |
|---|---|---|
| SW | Moist - 10YR 7/2 | |

| Fines (%): | Organics (%): | Carbonates (%): | Shells (%): |
|---|---|---|---|
| #230 - 0.97 | | 10.40 | 10.30 |

| Sieve Number | Sieve Size (Phi) | Sieve Size (Millimeters) | % Weight Retained | C. % Weight Retained |
|---|---|---|---|---|
| 3/8" | -3.25 | 9.48 | 0.00 | 0.00 |
| #3.5 | -2.50 | 5.66 | 0.12 | 0.12 |
| #4 | -2.25 | 4.75 | 0.30 | 0.42 |
| #5 | -2.00 | 3.99 | 0.00 | 0.42 |
| #7 | -1.50 | 2.82 | 0.03 | 0.45 |
| #10 | -1.00 | 2.00 | 0.23 | 0.68 |
| #14 | -0.50 | 1.41 | 1.11 | 1.79 |
| #18 | 0.00 | 1.00 | 2.14 | 3.93 |
| #25 | 0.50 | 0.71 | 2.17 | 6.10 |
| #35 | 1.00 | 0.50 | 1.77 | 7.87 |
| #45 | 1.50 | 0.35 | 1.67 | 9.54 |
| #60 | 2.00 | 0.25 | 2.33 | 11.87 |
| #80 | 2.50 | 0.18 | 10.51 | 22.38 |
| #120 | 3.00 | 0.13 | 58.06 | 80.44 |
| #170 | 3.50 | 0.09 | 16.43 | 96.87 |
| #200 | 3.75 | 0.07 | 1.89 | 98.76 |
| #230 | 4.00 | 0.06 | 0.27 | 99.03 |

| Phi 5 | Phi 16 | Phi 25 | Phi 50 | Phi 75 | Phi 84 | Phi 95 |
|---|---|---|---|---|---|---|
| 3.44 | 3.11 | 2.95 | 2.74 | 2.52 | 2.19 | 0.25 |

| Moment | Mean Phi | Mean mm | Sorting | Skewness | Kurtosis |
|---|---|---|---|---|---|
| Statistics | 2.52 | 0.17 | 0.89 | -2.6 | 10.68 |

USACE GRANULARMETRIC REPORT FDEP_GINT_IMPORT_FLAGLER.GPJ FL_DEP ROSS.GDT 11/14/12

# Granularmetric Report

Depths and elevations based on measured values

Project Name: Flagler County

Sample Name: R-89 #-15

Analysis Date: 09-05-12

Analyzed By:

US Army Corps of Engineers
701 San Marco Blvd
Jacksonville, Florida 32207
phone (904)396-7121

| Easting (ft): | Northing (ft): | Coordinate System: | Elevation (ft): |
|---|---|---|---|
| 619,322 | 1,862,202 | | -0.1 MLLW |

| USCS | Munsell: | Comments: |
|---|---|---|
| SW | Moist - 10YR 7/2 | |

| Fines (%): | Organics (%): | Carbonates (%): | Shells (%): |
|---|---|---|---|
| #230 - 2.41 | | | 11.80 |

| Sieve Number | Sieve Size (Phi) | Sieve Size (Millimeters) | % Weight Retained | C. % Weight Retained |
|---|---|---|---|---|
| #4 | -2.25 | 4.75 | 0.00 | 0.00 |
| #5 | -2.00 | 3.99 | 0.02 | 0.02 |
| #7 | -1.50 | 2.82 | 0.00 | 0.02 |
| #10 | -1.00 | 2.00 | 0.13 | 0.15 |
| #14 | -0.50 | 1.41 | 1.31 | 1.46 |
| #18 | 0.00 | 1.00 | 2.96 | 4.42 |
| #25 | 0.50 | 0.71 | 3.04 | 7.46 |
| #35 | 1.00 | 0.50 | 2.20 | 9.66 |
| #45 | 1.50 | 0.35 | 1.51 | 11.17 |
| #60 | 2.00 | 0.25 | 2.07 | 13.24 |
| #80 | 2.50 | 0.18 | 9.95 | 23.19 |
| #120 | 3.00 | 0.13 | 50.39 | 73.58 |
| #170 | 3.50 | 0.09 | 21.94 | 95.52 |
| #200 | 3.75 | 0.07 | 1.71 | 97.23 |
| #230 | 4.00 | 0.06 | 0.36 | 97.59 |

| Phi 5 | Phi 16 | Phi 25 | Phi 50 | Phi 75 | Phi 84 | Phi 95 |
|---|---|---|---|---|---|---|
| 3.49 | 3.24 | 3.03 | 2.77 | 2.52 | 2.14 | 0.10 |

| Moment | Mean Phi | Mean mm | Sorting | Skewness | Kurtosis |
|---|---|---|---|---|---|
| Statistics | 2.52 | 0.17 | 0.92 | -2.05 | 6.73 |

USACE GRANULARMETRIC REPORT FDEP_GINT_IMPORT_FLAGLER.GPJ FL DEP ROSS.GDT 11/14/12

# Granularmetric Report

Depths and elevations based on measured values

Project Name: Flagler County

Sample Name: R-89 #-20

Analysis Date: 09-05-12

Analyzed By:

US Army Corps of Engineers
701 San Marco Blvd
Jacksonville, Florida 32207
phone (904)396-7121

| Easting (ft): | Northing (ft): | Coordinate System: | Elevation (ft): |
|---|---|---|---|
| 619,322 | 1,862,202 | | -0.1 MLLW |

| USCS | Munsell: | Comments: |
|---|---|---|
| SP | Moist - 10YR 7/2 | |

| Fines (%): | Organics (%): | Carbonates (%): | Shells (%): |
|---|---|---|---|
| #230 - 0.66 | | | 7.50 |

| Sieve Number | Sieve Size (Phi) | Sieve Size (Millimeters) | % Weight Retained | C. % Weight Retained |
|---|---|---|---|---|
| #3.5 | -2.50 | 5.66 | 0.00 | 0.00 |
| #4 | -2.25 | 4.75 | 0.01 | 0.01 |
| #5 | -2.00 | 3.99 | 0.00 | 0.01 |
| #7 | -1.50 | 2.82 | 0.12 | 0.13 |
| #10 | -1.00 | 2.00 | 0.18 | 0.31 |
| #14 | -0.50 | 1.41 | 0.36 | 0.67 |
| #18 | 0.00 | 1.00 | 0.50 | 1.17 |
| #25 | 0.50 | 0.71 | 0.38 | 1.55 |
| #35 | 1.00 | 0.50 | 0.26 | 1.81 |
| #45 | 1.50 | 0.35 | 0.21 | 2.02 |
| #60 | 2.00 | 0.25 | 0.78 | 2.80 |
| #80 | 2.50 | 0.18 | 6.42 | 9.22 |
| #120 | 3.00 | 0.13 | 61.09 | 70.31 |
| #170 | 3.50 | 0.09 | 25.60 | 95.91 |
| #200 | 3.75 | 0.07 | 2.20 | 98.11 |
| #230 | 4.00 | 0.06 | 1.23 | 99.34 |

| Phi 5 | Phi 16 | Phi 25 | Phi 50 | Phi 75 | Phi 84 | Phi 95 |
|---|---|---|---|---|---|---|
| 3.48 | 3.27 | 3.09 | 2.83 | 2.63 | 2.56 | 2.17 |

| Moment | Mean Phi | Mean mm | Sorting | Skewness | Kurtosis |
|---|---|---|---|---|---|
| Statistics | 2.81 | 0.14 | 0.55 | -3.78 | 26.19 |

USACE GRANULARMETRIC REPORT FDEP_GINT_IMPORT_FLAGLER.GPJ FL_DEP ROSS.GDT 11/14/12

# Granularmetric Report

Depths and elevations based on measured values

Project Name: Flagler County

Sample Name: R-93 #Dune

Analysis Date: 09-05-12

Analyzed By:

US Army Corps of Engineers
701 San Marco Blvd
Jacksonville, Florida 32207
phone (904)396-7121

| Easting (ft): | Northing (ft): | Coordinate System: | Elevation (ft): |
|---|---|---|---|
| 620,770 | 1,858,673 | | 0.0 MLLW |

| USCS | Munsell: | Comments: |
|---|---|---|
| SP | Moist - 7.5YR 7/2 | |

| Fines (%): | Organics (%): | Carbonates (%): | Shells (%): |
|---|---|---|---|
| #230 - 0.03 | | | 71.80 |

| Sieve Number | Sieve Size (Phi) | Sieve Size (Millimeters) | % Weight Retained | C. % Weight Retained |
|---|---|---|---|---|
| #5 | -2.00 | 3.99 | 0.00 | 0.00 |
| #7 | -1.50 | 2.82 | 0.09 | 0.09 |
| #10 | -1.00 | 2.00 | 0.24 | 0.33 |
| #14 | -0.50 | 1.41 | 4.19 | 4.52 |
| #18 | 0.00 | 1.00 | 14.76 | 19.28 |
| #25 | 0.50 | 0.71 | 23.40 | 42.68 |
| #35 | 1.00 | 0.50 | 20.46 | 63.14 |
| #45 | 1.50 | 0.35 | 15.41 | 78.55 |
| #60 | 2.00 | 0.25 | 12.93 | 91.48 |
| #80 | 2.50 | 0.18 | 6.47 | 97.95 |
| #120 | 3.00 | 0.13 | 1.82 | 99.77 |
| #170 | 3.50 | 0.09 | 0.18 | 99.95 |
| #200 | 3.75 | 0.07 | 0.02 | 99.97 |
| #230 | 4.00 | 0.06 | 0.00 | 99.97 |

| Phi 5 | Phi 16 | Phi 25 | Phi 50 | Phi 75 | Phi 84 | Phi 95 |
|---|---|---|---|---|---|---|
| 2.27 | 1.71 | 1.38 | 0.68 | 0.12 | -0.11 | -0.48 |

| Moment | Mean Phi | Mean mm | Sorting | Skewness | Kurtosis |
|---|---|---|---|---|---|
| Statistics | 0.76 | 0.59 | 0.84 | 0.29 | 2.52 |

USACE GRANULARMETRIC REPORT FDEP_GINT_IMPORT_FLAGLER.GPJ FL_DEP ROSS.GDT 11/14/12

# Granularmetric Report

Depths and elevations based on measured values

Project Name: Flagler County

Sample Name: R-93 #Berm

Analysis Date: 09-05-12

Analyzed By:

US Army Corps of Engineers
701 San Marco Blvd
Jacksonville, Florida 32207
phone (904)396-7121

| Easting (ft): | Northing (ft): | Coordinate System: | Elevation (ft): |
|---|---|---|---|
| 620,770 | 1,858,673 | | 0.0 MLLW |

| USCS | Munsell: | Comments: |
|---|---|---|
| SW | Moist - 7.5YR 7/3 | |

| Fines (%): | Organics (%): | Carbonates (%): | Shells (%): |
|---|---|---|---|
| #230 - 0.14 | | 64.50 | 76.50 |

| Sieve Number | Sieve Size (Phi) | Sieve Size (Millimeters) | % Weight Retained | C. % Weight Retained |
|---|---|---|---|---|
| #4 | -2.25 | 4.75 | 0.00 | 0.00 |
| #5 | -2.00 | 3.99 | 0.12 | 0.12 |
| #7 | -1.50 | 2.82 | 0.26 | 0.38 |
| #10 | -1.00 | 2.00 | 0.76 | 1.14 |
| #14 | -0.50 | 1.41 | 7.72 | 8.86 |
| #18 | 0.00 | 1.00 | 19.71 | 28.57 |
| #25 | 0.50 | 0.71 | 22.38 | 50.95 |
| #35 | 1.00 | 0.50 | 15.09 | 66.04 |
| #45 | 1.50 | 0.35 | 11.55 | 77.59 |
| #60 | 2.00 | 0.25 | 11.89 | 89.48 |
| #80 | 2.50 | 0.18 | 8.57 | 98.05 |
| #120 | 3.00 | 0.13 | 1.41 | 99.46 |
| #170 | 3.50 | 0.09 | 0.33 | 99.79 |
| #200 | 3.75 | 0.07 | 0.06 | 99.85 |
| #230 | 4.00 | 0.06 | 0.01 | 99.86 |

| Phi 5 | Phi 16 | Phi 25 | Phi 50 | Phi 75 | Phi 84 | Phi 95 |
|---|---|---|---|---|---|---|
| 2.32 | 1.77 | 1.38 | 0.48 | -0.09 | -0.32 | -0.75 |

| Moment | Mean Phi | Mean mm | Sorting | Skewness | Kurtosis |
|---|---|---|---|---|---|
| Statistics | 0.64 | 0.64 | 0.95 | 0.33 | 2.41 |

USACE GRANULARMETRIC REPORT FDEP_GINT_IMPORT_FLAGLER.GPJ FL DEP ROSS.GDT 11/14/12

# Granularmetric Report

Depths and elevations based on measured values

Project Name: Flagler County

Sample Name: R-93 #Mid-Tide

Analysis Date: 09-05-12

Analyzed By:

US Army Corps of Engineers
701 San Marco Blvd
Jacksonville, Florida 32207
phone (904)396-7121

| Easting (ft): | Northing (ft): | Coordinate System: | Elevation (ft): |
|---|---|---|---|
| 620,770 | 1,858,673 | | 0.0 MLLW |

| USCS | Munsell: | Comments: |
|---|---|---|
| SW | Moist - 7.5YR 7/3 | |

| Fines (%): | Organics (%): | Carbonates (%): | Shells (%): |
|---|---|---|---|
| #230 - 0.95 | | | 35.30 |

| Sieve Number | Sieve Size (Phi) | Sieve Size (Millimeters) | % Weight Retained | C. % Weight Retained |
|---|---|---|---|---|
| #5 | -2.00 | 3.99 | 0.00 | 0.00 |
| #7 | -1.50 | 2.82 | 0.07 | 0.07 |
| #10 | -1.00 | 2.00 | 0.39 | 0.46 |
| #14 | -0.50 | 1.41 | 2.77 | 3.23 |
| #18 | 0.00 | 1.00 | 8.03 | 11.26 |
| #25 | 0.50 | 0.71 | 9.08 | 20.34 |
| #35 | 1.00 | 0.50 | 8.21 | 28.55 |
| #45 | 1.50 | 0.35 | 7.18 | 35.73 |
| #60 | 2.00 | 0.25 | 9.69 | 45.42 |
| #80 | 2.50 | 0.18 | 28.68 | 74.10 |
| #120 | 3.00 | 0.13 | 22.85 | 96.95 |
| #170 | 3.50 | 0.09 | 2.05 | 99.00 |
| #200 | 3.75 | 0.07 | 0.05 | 99.05 |
| #230 | 4.00 | 0.06 | 0.00 | 99.05 |

| Phi 5 | Phi 16 | Phi 25 | Phi 50 | Phi 75 | Phi 84 | Phi 95 |
|---|---|---|---|---|---|---|
| 2.96 | 2.72 | 2.52 | 2.08 | 0.78 | 0.26 | -0.39 |

| Moment | Mean Phi | Mean mm | Sorting | Skewness | Kurtosis |
|---|---|---|---|---|---|
| Statistics | 1.65 | 0.32 | 1.09 | -0.72 | 2.32 |

USACE GRANULARMETRIC REPORT FDEP_GINT_IMPORT_FLAGLER.GPJ FL_DEP ROSS.GDT 11/14/12

# Granularmetric Report

Depths and elevations based on measured values

Project Name: Flagler County

Sample Name: R-93 #-3

Analysis Date: 09-05-12

Analyzed By:

US Army Corps of Engineers
701 San Marco Blvd
Jacksonville, Florida 32207
phone (904)396-7121

| Easting (ft): | Northing (ft): | Coordinate System: | Elevation (ft): |
|---|---|---|---|
| 620,770 | 1,858,673 | | 0.0 MLLW |

| USCS | Munsell: | Comments: |
|---|---|---|
| SP | Moist - 10YR 7/1 | |

| Fines (%): | Organics (%): | Carbonates (%): | Shells (%): |
|---|---|---|---|
| #230 - 3.98 | | | 11.30 |

| Sieve Number | Sieve Size (Phi) | Sieve Size (Millimeters) | % Weight Retained | C. % Weight Retained |
|---|---|---|---|---|
| #4 | -2.25 | 4.75 | 0.00 | 0.00 |
| #5 | -2.00 | 3.99 | 0.07 | 0.07 |
| #7 | -1.50 | 2.82 | 0.05 | 0.12 |
| #10 | -1.00 | 2.00 | 0.14 | 0.26 |
| #14 | -0.50 | 1.41 | 0.67 | 0.93 |
| #18 | 0.00 | 1.00 | 2.22 | 3.15 |
| #25 | 0.50 | 0.71 | 3.01 | 6.16 |
| #35 | 1.00 | 0.50 | 3.00 | 9.16 |
| #45 | 1.50 | 0.35 | 4.02 | 13.18 |
| #60 | 2.00 | 0.25 | 9.99 | 23.17 |
| #80 | 2.50 | 0.18 | 28.15 | 51.32 |
| #120 | 3.00 | 0.13 | 37.11 | 88.43 |
| #170 | 3.50 | 0.09 | 7.28 | 95.71 |
| #200 | 3.75 | 0.07 | 0.25 | 95.96 |
| #230 | 4.00 | 0.06 | 0.06 | 96.02 |

| Phi 5 | Phi 16 | Phi 25 | Phi 50 | Phi 75 | Phi 84 | Phi 95 |
|---|---|---|---|---|---|---|
| 3.45 | 2.94 | 2.82 | 2.48 | 2.03 | 1.64 | 0.31 |

| Moment | Mean Phi | Mean mm | Sorting | Skewness | Kurtosis |
|---|---|---|---|---|---|
| Statistics | 2.23 | 0.21 | 0.83 | -1.64 | 5.94 |

USACE GRANULARMETRIC REPORT FDEP_GINT_IMPORT_FLAGLER.GPJ FL DEP ROSS.GDT 11/14/12

# Granularmetric Report

Depths and elevations based on measured values

Project Name: Flagler County

Sample Name: R-93 #-5

Analysis Date: 09-05-12

Analyzed By:

US Army Corps of Engineers
701 San Marco Blvd
Jacksonville, Florida 32207
phone (904)396-7121

| Easting (ft): | Northing (ft): | Coordinate System: | Elevation (ft): |
|---|---|---|---|
| 620,770 | 1,858,673 | | -0.1 MLLW |

| USCS | Munsell: | Comments: |
|---|---|---|
| SP | Moist - 10YR 7/1 | |

| Fines (%): | Organics (%): | Carbonates (%): | Shells (%): |
|---|---|---|---|
| #230 - 0.18 | | | 28.20 |

| Sieve Number | Sieve Size (Phi) | Sieve Size (Millimeters) | % Weight Retained | C. % Weight Retained |
|---|---|---|---|---|
| #7 | -1.50 | 2.82 | 0.00 | 0.00 |
| #10 | -1.00 | 2.00 | 0.04 | 0.04 |
| #14 | -0.50 | 1.41 | 0.55 | 0.59 |
| #18 | 0.00 | 1.00 | 1.34 | 1.93 |
| #25 | 0.50 | 0.71 | 2.14 | 4.07 |
| #35 | 1.00 | 0.50 | 2.60 | 6.67 |
| #45 | 1.50 | 0.35 | 1.30 | 7.97 |
| #60 | 2.00 | 0.25 | 2.85 | 10.82 |
| #80 | 2.50 | 0.18 | 35.16 | 45.98 |
| #120 | 3.00 | 0.13 | 43.02 | 89.00 |
| #170 | 3.50 | 0.09 | 10.48 | 99.48 |
| #200 | 3.75 | 0.07 | 0.34 | 99.82 |
| #230 | 4.00 | 0.06 | 0.00 | 99.82 |

| Phi 5 | Phi 16 | Phi 25 | Phi 50 | Phi 75 | Phi 84 | Phi 95 |
|---|---|---|---|---|---|---|
| 3.29 | 2.94 | 2.84 | 2.55 | 2.20 | 2.07 | 0.68 |

| Moment | Mean Phi | Mean mm | Sorting | Skewness | Kurtosis |
|---|---|---|---|---|---|
| Statistics | 2.41 | 0.19 | 0.7 | -2.1 | 8.4 |

USACE GRANULARMETRIC REPORT FDEP_GINT_IMPORT_FLAGLER.GPJ FL_DEP ROSS.GDT 11/14/12

# Granularmetric Report

Depths and elevations based on measured values

Project Name: Flagler County

Sample Name: R-93 #-10

Analysis Date: 09-05-12

Analyzed By:

US Army Corps of Engineers
701 San Marco Blvd
Jacksonville, Florida 32207
phone (904)396-7121

| Easting (ft): | Northing (ft): | Coordinate System: | Elevation (ft): |
|---|---|---|---|
| 620,770 | 1,858,673 | | -0.1 MLLW |

| USCS | Munsell: | Comments: |
|---|---|---|
| SP | Moist - 10YR 7/1 | |

| Fines (%): | Organics (%): | Carbonates (%): | Shells (%): |
|---|---|---|---|
| #230 - 1.79 | | 8.40 | 6.80 |

| Sieve Number | Sieve Size (Phi) | Sieve Size (Millimeters) | % Weight Retained | C. % Weight Retained |
|---|---|---|---|---|
| #5 | -2.00 | 3.99 | 0.00 | 0.00 |
| #7 | -1.50 | 2.82 | 0.02 | 0.02 |
| #10 | -1.00 | 2.00 | 0.16 | 0.18 |
| #14 | -0.50 | 1.41 | 0.59 | 0.77 |
| #18 | 0.00 | 1.00 | 1.24 | 2.01 |
| #25 | 0.50 | 0.71 | 1.22 | 3.23 |
| #35 | 1.00 | 0.50 | 1.07 | 4.30 |
| #45 | 1.50 | 0.35 | 0.99 | 5.29 |
| #60 | 2.00 | 0.25 | 1.32 | 6.61 |
| #80 | 2.50 | 0.18 | 7.25 | 13.86 |
| #120 | 3.00 | 0.13 | 58.59 | 72.45 |
| #170 | 3.50 | 0.09 | 23.98 | 96.43 |
| #200 | 3.75 | 0.07 | 1.23 | 97.66 |
| #230 | 4.00 | 0.06 | 0.55 | 98.21 |

| Phi 5 | Phi 16 | Phi 25 | Phi 50 | Phi 75 | Phi 84 | Phi 95 |
|---|---|---|---|---|---|---|
| 3.47 | 3.24 | 3.05 | 2.81 | 2.60 | 2.52 | 1.35 |

| Moment | Mean Phi | Mean mm | Sorting | Skewness | Kurtosis |
|---|---|---|---|---|---|
| Statistics | 2.7 | 0.15 | 0.68 | -2.95 | 13.65 |

USACE GRANULARMETRIC REPORT FDEP_GINT_IMPORT_FLAGLER.GPJ FL_DEP ROSS.GDT 11/14/12

# Granularmetric Report

Depths and elevations based on measured values

Project Name: Flagler County

Sample Name: R-93 #-15

Analysis Date: 09-05-12

Analyzed By:

US Army Corps of Engineers
701 San Marco Blvd
Jacksonville, Florida 32207
phone (904)396-7121

| Easting (ft): | Northing (ft): | Coordinate System: | Elevation (ft): |
|---|---|---|---|
| 620,770 | 1,858,673 | | -0.1 MLLW |

| USCS | Munsell: | Comments: |
|---|---|---|
| SW | Moist - 10YR 6/1 | |

| Fines (%): | Organics (%): | Carbonates (%): | Shells (%): |
|---|---|---|---|
| #230 - 1.22 | | | 12.70 |

| Sieve Number | Sieve Size (Phi) | Sieve Size (Millimeters) | % Weight Retained | C. % Weight Retained |
|---|---|---|---|---|
| 3/8" | -3.25 | 9.48 | 0.00 | 0.00 |
| #3.5 | -2.50 | 5.66 | 0.06 | 0.06 |
| #4 | -2.25 | 4.75 | 0.07 | 0.13 |
| #5 | -2.00 | 3.99 | 0.07 | 0.20 |
| #7 | -1.50 | 2.82 | 0.11 | 0.31 |
| #10 | -1.00 | 2.00 | 0.34 | 0.65 |
| #14 | -0.50 | 1.41 | 1.88 | 2.53 |
| #18 | 0.00 | 1.00 | 3.07 | 5.60 |
| #25 | 0.50 | 0.71 | 2.71 | 8.31 |
| #35 | 1.00 | 0.50 | 1.73 | 10.04 |
| #45 | 1.50 | 0.35 | 1.06 | 11.10 |
| #60 | 2.00 | 0.25 | 1.41 | 12.51 |
| #80 | 2.50 | 0.18 | 8.32 | 20.83 |
| #120 | 3.00 | 0.13 | 48.07 | 68.90 |
| #170 | 3.50 | 0.09 | 26.96 | 95.86 |
| #200 | 3.75 | 0.07 | 2.32 | 98.18 |
| #230 | 4.00 | 0.06 | 0.60 | 98.78 |

| Phi 5 | Phi 16 | Phi 25 | Phi 50 | Phi 75 | Phi 84 | Phi 95 |
|---|---|---|---|---|---|---|
| 3.48 | 3.28 | 3.11 | 2.80 | 2.54 | 2.21 | -0.10 |

| Moment | Mean Phi | Mean mm | Sorting | Skewness | Kurtosis |
|---|---|---|---|---|---|
| Statistics | 2.55 | 0.17 | 1 | -2.22 | 7.64 |

USACE GRANULARMETRIC REPORT FDEP_GINT_IMPORT_FLAGLER.GPJ FL DEP ROSS.GDT 11/14/12

# Granularmetric Report

Depths and elevations based on measured values

Project Name: Flagler County

Sample Name: R-93 #-20

Analysis Date: 09-05-12

Analyzed By:

US Army Corps of Engineers
701 San Marco Blvd
Jacksonville, Florida 32207
phone (904)396-7121

| Easting (ft): | Northing (ft): | Coordinate System: | Elevation (ft): |
|---|---|---|---|
| 620,770 | 1,858,673 | | -0.1 MLLW |

| USCS | Munsell: | Comments: |
|---|---|---|
| SP | Moist - 10YR 6/1 | |

| Fines (%): | Organics (%): | Carbonates (%): | Shells (%): |
|---|---|---|---|
| #230 - 1.59 | | | 4.80 |

| Sieve Number | Sieve Size (Phi) | Sieve Size (Millimeters) | % Weight Retained | C. % Weight Retained |
|---|---|---|---|---|
| 3/8" | -3.25 | 9.48 | 0.00 | 0.00 |
| #3.5 | -2.50 | 5.66 | 0.09 | 0.09 |
| #4 | -2.25 | 4.75 | 0.11 | 0.20 |
| #5 | -2.00 | 3.99 | 0.10 | 0.30 |
| #7 | -1.50 | 2.82 | 0.08 | 0.38 |
| #10 | -1.00 | 2.00 | 0.14 | 0.52 |
| #14 | -0.50 | 1.41 | 0.49 | 1.01 |
| #18 | 0.00 | 1.00 | 0.76 | 1.77 |
| #25 | 0.50 | 0.71 | 0.55 | 2.32 |
| #35 | 1.00 | 0.50 | 0.41 | 2.73 |
| #45 | 1.50 | 0.35 | 0.27 | 3.00 |
| #60 | 2.00 | 0.25 | 0.74 | 3.74 |
| #80 | 2.50 | 0.18 | 7.80 | 11.54 |
| #120 | 3.00 | 0.13 | 60.15 | 71.69 |
| #170 | 3.50 | 0.09 | 23.58 | 95.27 |
| #200 | 3.75 | 0.07 | 2.30 | 97.57 |
| #230 | 4.00 | 0.06 | 0.84 | 98.41 |

| Phi 5 | Phi 16 | Phi 25 | Phi 50 | Phi 75 | Phi 84 | Phi 95 |
|---|---|---|---|---|---|---|
| 3.49 | 3.26 | 3.07 | 2.82 | 2.61 | 2.54 | 2.08 |

| Moment | Mean Phi | Mean mm | Sorting | Skewness | Kurtosis |
|---|---|---|---|---|---|
| Statistics | 2.76 | 0.15 | 0.65 | -4.03 | 26.05 |

USACE GRANULARMETRIC REPORT FDEP_GINT_IMPORT_FLAGLER.GPJ FL DEP ROSS.GDT 11/14/12