

**SEDIMENT SAMPLING AND ANALYSIS REPORT**  
**PILLAR POINT HARBOR**  
**PILOT SURFERS BEACH RESTORATION PROJECT**

**Prepared for:**

**COUNTY OF SAN MATEO  
HARBOR DISTRICT  
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**SAMPLING AND ANALYSIS REPORT**  
**DREDGE MATERIAL INVESTIGATION**  
**PILLAR POINT HARBOR**  
**PILOT SURFERS BEACH RESTORATION PROJECT**

**August 2019**

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## LIST OF ACRONYMS

<b>ASTM</b>	American Society for Testing and Materials	<b>MSD</b>	Matrix Spike Duplicate
<b>BLK</b>	Method or Procedural Blank	<b>MSD</b>	Minimum Significant Difference
<b>BMP</b>	Best Management Practice	<b>ND</b>	Not Detected
<b>BS</b>	Blank Spike	<b>NOAA</b>	National Oceanic and Atmospheric Administration
<b>BSD</b>	Blank Spike Duplicate	<b>OEHA</b>	Office of Environmental Hazard Assessment
<b>Cal/EPA</b>	California Environmental Protection Agency	<b>PAH</b>	Polyaromatic Hydrocarbon
<b>CD</b>	Compact Disc	<b>PCB</b>	Polychlorinated Biphenyl
<b>CDFG</b>	California Department of Fish and Game	<b>PDS</b>	Post Digestion Spike
<b>CESPD</b>	Corps of Engineers South Pacific Division	<b>PDS</b>	Post Digestion Spike Duplicate
<b>CHHSL</b>	California Human Health screening Level	<b>PPB</b>	Parts Per Billion
<b>COC</b>	Chain of Custody	<b>PPM</b>	Parts Per Million
<b>CSLC</b>	California State Lands Commission	<b>PRG</b>	Preliminary Remediation Goals
<b>CV</b>	Coefficient of Variation	<b>PVC</b>	Polyvinyl Chloride
<b>cy</b>	Cubic Yards	<b>RBC</b>	Risk-Based Concentration
<b>CRM</b>	Certified Reference Material	<b>RL</b>	Reporting Limit
<b>DDD</b>	Dichlorodiphenyldichloroethane	<b>RPD</b>	Relative Percent Difference
<b>DDE</b>	Dichlorodiphenyldichloroethylene	<b>RSLs</b>	Regional Screening Levels for Cleanup of Superfund Sites
<b>DDT</b>	Dichlorodiphenyltrichloroethane	<b>SC-DMMT</b>	Southern California Dredge Material Management Team
<b>DGPS</b>	Differential Global Positioning Satellite	<b>SOPs</b>	Standard Operating Procedures
<b>DTSC</b>	Department of Toxic Substances Control	<b>SRM</b>	Standard Reference Material
<b>DUP</b>	Laboratory Replicates	<b>STLC</b>	Title 22 Soluble Threshold Limit Concentration
<b>ERL</b>	NOAA Effects Range Low	<b>SURR</b>	Surrogate Analysis
<b>ERM</b>	NOAA Effects Range Medium	<b>SWQCB</b>	State Water Resources Control Board
<b>GPS</b>	Global Positioning Satellite	<b>TOC</b>	Total Organic Carbon
<b>HHMSSL</b>	Human Health Medium – Specific Screening Levels	<b>TRPH</b>	Total Recoverable Hydrocarbons
<b>HDPE</b>	High-density Polyethylene	<b>TTLC</b>	Title 22 Total Threshold Limit Concentration
<b>ITM</b>	Inland Testing Manual	<b>UCL</b>	Upper Control Limit
<b>LCL</b>	Lower Control Limit	<b>USACE</b>	U.S. Army Corps of Engineers
<b>LCS</b>	Laboratory Control Spike	<b>USEPA</b>	U.S. Environmental Protection Agency
<b>LDPE</b>	Low-density Polyethylene	<b>QA</b>	Quality Assurance
<b>LSD</b>	Least Significant Difference	<b>QC</b>	Quality Control
<b>MDL</b>	Method Detection Limit	<b>QUAL</b>	Qualifier
<b>MLLW</b>	Mean Lower Low Water	<b>USCS</b>	Unified Soil Classification System
<b>MS</b>	Matrix Spike		

**SAMPLING AND ANALYSIS REPORT**  
**Dredge Material Investigation**  
**Pillar Point Harbor**  
**Pilot Surfers Beach Restoration Project**  
**July 2019**

**1.0 INTRODUCTION**

The San Mateo County Harbor District has initiated the Pilot Surfers Beach Restoration Project (project) to protect and restore the shoreline at Surfers Beach. The project will result in relocating clean sand that has accumulated inside the Pillar Point Harbor (PPH) outer breakwater over the past 57 years to the adjacent beach for beneficial re-use.

Surfers Beach has suffered from significant beach and bluff erosion attributed, in large part, to the construction of the PPH outer breakwater, completed in 1961. This rapid erosion of the beach and bluffs extending south of the harbor has been a source of concern over the past several decades. A recent Army Corps of Engineers (USACE) study concluded that the bluffs along Surfers Beach eroded at an average rate of 1.64 feet per year between 1993 and 2012. This erosion rate was determined to be approximately seven times higher than the rate of erosion at a geologically similar stretch of shoreline farther down the coast. Powerful storms during the past two winter seasons have resulted in even more severe erosion, causing major threats to Highway 1, Mirada Road and other coastal infrastructure and leading to emergency repairs by Caltrans and the County of San Mateo.

The project is necessary to reduce the threat of structural damage and recreation loss along Surfers Beach. Specific benefits include: preventing or mitigating beach erosion and sea cliff retreat; improving protection of Highway 1 and other structures; increasing quality and quantity of public access and recreation; reducing the need for hard structures (e.g. seawalls and revetments) and improving beach and wildlife habitat. This project will also address the issues associated with the shoaling that has occurred inside of the Harbor since the outer breakwater was constructed.

The San Mateo County Harbor District Board of Harbor Commissioners recognized the benefits of this proposed project and unanimously approved this pilot project at an October 7, 2015 Board meeting. In February 2016, the District submitted a grant application to Division of Boating and Waterways for \$800,000 to fund the Project implementation (construction and monitoring). The grant request was approved, and the District was notified in July 2017 that there is \$800,000 in the California budget to implement the Project. This includes sediment placement on Surfers Beach of up to 75,000 cubic yards of clean sand excavated/dredged from inside the outer breakwater at Pillar Point Harbor.

The District also successfully applied for funding through the Ocean Protection Council (OPC) for a portion of the necessary planning, engineering and design, environmental studies, and regulatory compliance/permitting. The OPC grant agreement was completed in late June 2017.

## **1.1 Project Summary**

The San Mateo County Harbor District plans to conduct a beach nourishment project at Surfers Beach resulting in the relocation of approximately 75,000 cubic yards of clean sand from inside Pillar Point Harbor to the adjacent beach (Surfers Beach) for beneficial re-use. Please see Figure 1 for a vicinity map of the area. Sampling and testing of sediments to be dredged from Pillar Point Harbor will be completed in order to confirm the suitability of the sediment for beach placement at Surfers Beach, located just east of the Federal Breakwater. This Sampling and Analysis Report (SAR) describes the sample collection, handling, analysis procedures and results for the sampling and testing of material proposed for dredging from Pillar Point Harbor.

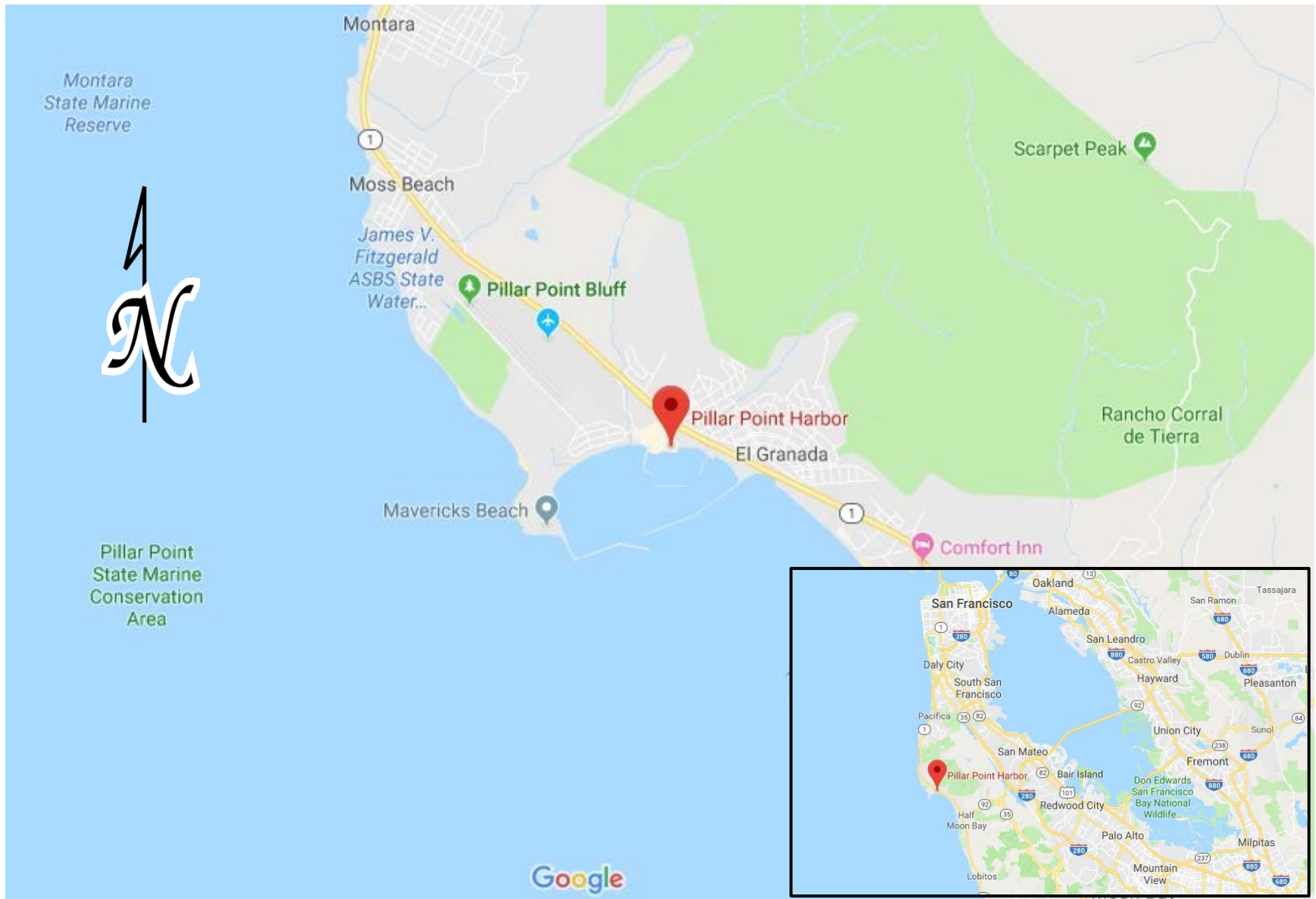


Figure 1. Location of Pillar Point Harbor.



## 1.2 Site Location

Pillar Point Harbor is located in San Mateo County, California (Figure 1). Geographic coordinates (NAD 83) are 37° 29.95' N and 122° 29.15' W for the approximate center inside the federal breakwater.

## 1.3 Roles and Responsibilities

Project responsibilities and key contacts for this sediment characterization program are listed Tables 1 and 2. Kinnetic Laboratories Inc. provided sampling, logging and reporting services. Analytical chemical testing of sediments for this project was primarily carried out by Eurofins Calscience (NELAP No. 03220CA; Cal-ELAP No. 2944). Physical testing was conducted by Leighton Group.

**Table 1. Project Team and Responsibilities.**

Responsibility	Name	Affiliation
Project Planning and Coordination	John Moren Brad Damitz Spencer Johnson	San Mateo Harbor District Independent Consultant Kinnetic Laboratories
Project Design and Engineering	Louis White, PE Bob Battalio, PE	ESA ESA
Sampling and Analysis Plan (SAP) Preparation	Ken Kronschnabl Spencer Johnson	Kinnetic Laboratories Kinnetic Laboratories
Field Sample Collection and Transport	Spencer Johnson Dale Parent	Kinnetic Laboratories Kinnetic Laboratories
Grain Size Analysis, TOC, and Percent Solids	James Ward	Leighton Group
Health and Safety Officer and Site Safety Plan	Greg Cotten	Kinnetic Laboratories
Laboratory Chemical Analyses	Julie Lam Amy Howk	Eurofins Calscience Kinnetic Laboratories
QA/QC Management Analytical Laboratory QA/QC	Danielle Gonsman Amy Howk Julie Lam	Kinnetic Laboratories Kinnetic Laboratories Eurofins Calscience
Technical Review	Ken Kronschnabl Brad Damitz	Kinnetic Laboratories Independent Consultant
Final Report	Ken Kronschnabl Spencer Johnson	Kinnetic Laboratories Kinnetic Laboratories
Agency Coordination	Brad Damitz	Independent Consultant

**Table 2. Key Project Contacts**

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#### **1.4 Data Users**

For project design purposes, the data produced by this sediment sampling and analysis report will be used by the ESA engineering team to refine permitting level dredging and beach nourishment plans for the project.

For environmental review and regulatory purposes, the principal users of the data produced by this project are the following agencies:

1. San Francisco District, U.S. Army Corps of Engineers (USACE);
2. San Francisco Bay Regional Water Quality Control Board (RWQCB)—Region 2;
3. U.S. Environmental Protection Agency (USEPA) - Region IX;
4. Greater Farallones National Marine Sanctuary (GFNMS)
5. California Coastal Commission.

Other users of the data may include the following agencies:

1. California Department of Fish and Wildlife (CDFW);
2. U.S. Fish and Wildlife Service (USFWS);
3. U.S. National Marine Fisheries Service (USNMFS); and
4. California State Lands Commission (CSLC).

## **1.5 Harbor Construction, Site Setting and Potential Sources of Contamination**

The Army Corps of Engineers began work on a breakwater at Pillar Point for a harbor or refuge for the fishing fleet after World War II and finally completed the project in 1961. The Johnson Pier, docks, and the inner breakwater were built during the 1970's and 1980's. Pillar Point remains a major commercial and sport fishing harbor on California's central coast and is host to many public events including the annual Mavericks surfing competition, the July 4th fireworks display, and the Christmas boat decorating contest.

Pillar Point Harbor contains approximately 369 small boat slips. Pleasure craft as well as commercial fishing vessels inhabit the slips. The Harbor and Johnson Pier offer a variety of services and recreational activities. There are several restaurants and small businesses adjacent to the Harbor but there are no industrial facilities in the area. Just outside the inner breakwater to the East is a six-lane small boat launch ramp. Adjacent to the launch ramp are restroom facilities and a fish cleaning station. A beach curves out approximately 1,200 feet South East from the launch ramp to the federal breakwater. A storm drain enters the Harbor near the launch ramp as well as the outfall to Deer Creek, which causes sediment deposition resulting in shoaling at the launch ramps that is a nuisance. The Harbor also receives localized runoff from areas immediately surrounding the Harbor. There are several storm drain outfalls and Denniston Creek drains into the Harbor on the other side. Fecal coliform contamination has been an ongoing issue and has been studied extensively in the recent past.

## **1.6 Previous Testing in the Project Area**

No known sampling and/or testing programs have been conducted in the area of interest, except for the boat launch ramp facility which underwent sampling and testing in 2012 and 2017.

## **2.0 METHODS**

This section describes the dredging design, study design and field and analytical methods for this testing program.

### **2.1 Sampling and Testing Design**

The sampling and testing design for this SAR covers data collection tasks for Pillar Point Harbor sediment collection and testing. Evaluation guidelines are also discussed.

#### **2.1.1 Sampling and Testing Approach**

The main approach was to determine the physical properties (Grain Size, Percent Solids, and Total Organic Carbon) of the sediments at each location and depth interval to determine if the sediments are physically suitable for nourishment of Surfers Beach. In addition, sediments from all locations were composited according to depth intervals and tested for grain size, percent solids, and TOC.

#### **2.1.2 Sample Identification, Composite Areas, Sediment Collection and Testing**

Vibracore sampling, as described in Section 2.2.2 (Vibracore Sampling Methods), was carried out to collect subsurface sediment data at the eight locations within two distinct borrow areas inside the breakwater shown on Figure 2. The sampling location identifiers are “PPIHVC18-01” through “PPIHVC18-08”. Table 3 lists final coordinates, actual depths, and composite IDs for each sample location.

All cores were advanced to nine feet below the existing mudline or to refusal. Cores were sectioned into 36-inch segments as appropriate to create a top, middle, and bottom composite sample for physical analyses (grain size distribution, total organic carbon (TOC), and percent solids) and an archive chemical sample for possible chemical testing. Each segment of each core was subsampled and tested for grain size, and additional archive samples were formed from each core segment.



Figure 2. Pillar Point Harbor Potential Dredge Limits and Sampling Locations.

**Table 3. Actual Sampling Locations, Core Depths, and Composite Identifications, Pillar Point Harbor.**

Composite Area	Sample Designation	Composite IDs	Latitude North	Longitude West	Water Depths (ft., MLLW)	Design Depth (ft., bgs)	Expected Core Length (ft.)	Core Analyses	Composite Analyses
Inside Breakwater	PPIHVC18-1	PPIHVC18- Top,Mid,&Bot	37°30.106'	122°28.619'	-2.0	9	9	Grain Size, Archive	Grain Size Chemical
	PPIHVC18-2		37°30.074'	122°28.657'	-8.7	9	9	Grain Size, Archive	
	PPIHVC18-3		37°30.079'	122°28.599'	-5.7	9	9	Grain Size, Archive	
	PPIHVC18-4		37°30.088'	122°28.552'	-1.4	9	9	Grain Size, Archive	
	PPIHVC18-5		37°30.047'	122°28.594'	-9.6	9	9	Grain Size, Archive	
	PPIHVC18-6	Individual	37°30.944'	122°28.629'	+0.5	9	9	Grain Size, Archive	
	PPIHVC18-7		37°29.913'	122°28.683'	-0.8	9	9	Grain Size, Archive	
	PPIHVC18-8		37°29.872'	122°28.747'	-1.8	9	9	Grain Size, Archive	
Pillar Point Harbor Beach	IHBG-18-1	Individual	37°30.058'	122°28.296'	+2.0	0.5	0.5	Grain Size, Archive	Grain Size
	IHBG-18-2		37°30.025'	122°28.202'	+2.0	0.5	0.5	Grain Size, Archive	
	IHBG-18-3		37°29.985'	122°28.120'	+3.0	0.5	0.5	Grain Size, Archive	
Surfers Beach	SBREF18-1	Individual	37°30.137'	122°28.627'	+3.0	0.5	0.5	Grain Size, Archive	Grain Size
	SBREF18-2		37°30.095'	122°28.530'	+3.0	0.5	0.5	Grain Size, Archive	
	SBREF18-3		37°29.995'	122°28.503'	+3.0	0.5	0.5	Grain Size, Archive	

TBD = To be determined

Archive samples are being stored frozen for at least six months. Grain size, TOC, and Percent Solids samples will not be frozen.

### **2.1.3 Summary of Pillar Point Harbor Outer Breakwater Testing and Evaluation Sequence**

The testing and evaluation conducted for the Pillar Point Harbor samples is described in the next subsection and is outlined as follows:

- 1) Conducted sediment grain analyses on each composite and individual sample including individual reference samples from Surfers Beach and individual samples from Pillar Point Harbor Beach (Figure 2).

## **2.2 Field Sampling Protocols**

This section discusses vibracore sampling, grab sampling, decontamination, sample processing, and documentation procedures carried out for this project.

### **2.2.1 Positioning and Depth Measurements**

Positioning at each sampling location was accomplished using a differential GPS (DGPS) navigation system operating in Wide Area Augmentation System (WAAS) mode with positioning accuracies of 3 to 10 feet. Locations were recorded in geographic coordinates (Latitude and Longitude, NAD 83). A graduated lead line was used to measure water depths that were corrected to mean lower low water (MLLW). Tidal stage was determined using NOAA predicted tide tables checked against a local tide gage or real-time tidal stage data.

All sampling sites were located within dredge limits and within 20 feet of target coordinates. Records were maintained during fieldwork to confirm the accuracy of the DGPS. The DGPS was checked for accuracy at least twice a day and the max error in feet was never greater than 7 feet.

### **2.2.2 Sampling Methods**

Harbor sediment samples were collected using an electric vibracore that can penetrate and obtain samples to the project sample elevation of nine feet bgs or to refusal. The depth of refusal is defined as the depth at which the average rate of penetration is less than 0.1 feet/minute for a two (2) minute period. Refusal was encountered prior to full penetration at sites 1-5 due to formation material. Sites 6-8 were penetrated 10.5 feet. At site 2, where the depth of refusal was reached prior to the sample depth, one additional attempt was made to confirm the presence of formation material.

At the conclusion of a successful vibracore, the core liner was removed and split open for inspection and sampling. None of the core material was extruded from the liner. Processing took place onshore and aboard the sampling vessel.

Vibracore sampling was conducted from a 12 ft x 16 ft pontoon barge, which was positioned with a 17 ft Boston Whaler. The vessels were fully equipped with all necessary navigation, safety, and

lifesaving devices per Coast Guard requirements. The barge secured itself in place in water depths encountered using spuds.

Kinnetic Laboratories' vibracore consists of a 4-inch diameter aluminum coring tube, a stainless steel cutting tip, and a stainless-steel core catcher. The vibrating unit has two counter-rotating motors encased in waterproof aluminum housing. A three-phase, 240-volt generator powers the motors. Inserted into the core tubes were food-grade clean polyethylene liners. The vibracore head and tube were then lowered overboard with a quadrapod and winch. The unit was then vibrated until it reached target sampling depth or until the depth of refusal was reached.

When penetration of the vibracore was complete, power was shut off to the vibra-head, and the vibracore was brought aboard the vessel. The core cutting tip and catcher were then removed. Afterwards, the core liners were removed and sealed on both ends until processed.

Grab sampling beach sediments was conducted with a 4 inch diameter stainless steel hand auger and stainless steel spoon. The auger was advanced 0.5 feet below the sediment surface and samples were placed into sealable plastic bags for grain size analysis.

### **2.2.3 Vibracore Decontamination**

All sample contact surfaces were stainless steel, polyethylene or Teflon<sup>®</sup> coated. Compositing tools were stainless steel. Except for the core liners, all contact surfaces of the sampling devices and the coring tubes were cleaned for each sampling location. The cleaning protocol consisted of a site water rinse, a Micro-90<sup>®</sup> soap wash, and then 3 deionized water rinses. The polyethylene core liners were new and of food grade quality. All rinsate was collected in containers and disposed of properly.

### **2.2.4 Core Processing**

Cores were placed in a PVC core rack that was cleaned between cores. After placement in the rack, core liners were split lengthwise to expose the recovered sediment. Once exposed, sediment that came in contact with the core liner was removed by scraping with a pre-cleaned stainless steel spoon. Each core was photographed, measured, and lithologically logged in accordance with the Unified Soil Classification System (USCS).

Photographs were taken of each core covering a maximum two-foot interval. These pictures are provided in Appendix B.

Following logging, vertical composite subsamples were formed from each core as appropriate. Cores These included samples for grain size analyses, discrete chemical archives, and the composite chemical archive. Vertical composite subsamples were formed by combining and homogenizing a representative sample from each sampling interval, as described in Section 2.1, in a pre-cleaned stainless steel tray. A 0.5-liter portion of this material was placed in a pre-cleaned and certified glass jar with a Teflon<sup>®</sup>-lined lid for archived material. Another portion was placed in sealable plastic bags for grain size analysis. The remaining portion was placed in another pre-



cleaned tray for area compositing with the other primary vertical composite subsamples from the remaining locations and same depth interval.

Sample volumes, containers, and preservation required for the chemistry samples are summarized in Table 4. For the preservation of all sediment samples, filled containers were placed on ice immediately following sampling and then frozen as soon as possible. A small amount of headspace was allowed to prevent container breakage during freezing. The sample containers were sealed to prevent any moisture loss and possible contamination. No samples showed external contamination due to handling or incorrect sampling procedures

### **2.2.5 Detailed Soils Log**

A detailed soils log was prepared for each sampling location as part of the field log. As a minimum, this log included the project name, hole or transect number or designation, date, time, location, water depth, estimated tide, mudline elevation, type and size of sampling device used, depth of penetration, length of recovery, depths below mudline of samples, and a description and condition of the sediment. The description of the sediment was in accordance with ASTM D 2488 (2006), and included as a minimum: grain size, color, estimation of density (sand) or consistency (silts and clays), odor (if present), and description of amount and types of organics and trash present. These logs are provided in Appendix A.

**Table 4. Sample Volumes and Storage Requirements.**

Parameter	Holding Time	Min. Sample Size <sup>a</sup>	Container <sup>b</sup>	Temperature <sup>c</sup>	Archive <sup>d</sup>
Grain Size	NA	2L	1 gallon Ziploc	NA	Yes
Total Solids		50g	1-Liter Glass	2° – 4° C then frozen	Yes
Dioxin (TCDD TEQ), total	30 days pre-extraction, 45 post	50g			
Total Organic Carbon (TOC)	28 days	50g			
Mercury		50g			
Metals (except mercury)	6 months	200g			
Butyltins	14 days pre-extraction 40 days post-extraction (extended by freezing)	200g			
OC Pesticides/ PCBs		300g			
PAHs		200g			

<sup>a</sup> Required sample sizes for one laboratory analysis. Actual volumes collected were increased to provide a margin of error and allow for retests.

<sup>b</sup> Containers were completely filled with minimal head space.

<sup>c</sup> During transport to the laboratory, samples were stored on ice.

<sup>d</sup> For each sampling station, one or more 500 mL glass containers was filled and kept frozen for use as needed for any of the chemical analyses indicated.

## 2.2.6 Documentation and Sample Custody

All samples had their containers physically marked as to sample location, date, time and analyses. All samples were handled under Chain of Custody (COC) protocols beginning at the time of collection. Sampling data was recorded on field data log sheets. A copy of the field data logs is included in this draft report. An inventory(COC form) will be included of all samples taken and delivered.

Samples were considered to be “in custody” if they were (1) in the custodian’s possession or view, (2) in a secured place (locked) with restricted access, or (3) in a secure container. Standard COC procedures were used for all samples collected, transferred, and analyzed as part of this project. COC forms were used to identify the samples, custodians, and dates of transfer. Except for the shipping company, each person who had custody of the samples signed the COC form and ensured samples were stored properly and not left unattended unless properly secured.

The completed COC form was placed in a sealable plastic bag and placed in the cooler with the samples. Copies are located in Appendix E.

A daily field activity log was maintained listing the beginning and ending time for every and all phases of operation, the names and responsibilities of all field personnel present, description and length of any delays, and weather and sea conditions. This log also includes DGPS verification notes. These logs are provided in Appendix D.

## 2.3 Laboratory Testing Methods

Testing of sediments for this project used USEPA and USACE approved methodologies.

### 2.3.1 Geotechnical Testing

A sufficient quantity of sediment was collected from each location so that a representative amount of sediment was included in each geotechnical sample. These samples represented material for each 36-inch or major core interval as appropriate as show in Table 6.

All mechanical grain size tests were run according to ASTM D 6913. In addition to the mechanical grain size, total organic carbon (TOC) and percent solids were also analyzed.

## 3.0 QUALITY CONTROL REQUIREMENTS

Formal QA/QC procedures were followed for this project. The objectives of the QA/QC Program were to fully document the field and laboratory data collected, to maintain data integrity from the time of field collection through storage and archiving, and to produce the highest quality data possible. Quality assurance involves all of the planned and systematic actions necessary to provide confidence that work performed by the project team conforms to contract requirements, laboratory methodologies, state and federal regulation requirements, and corporate Standard Operating Procedures (SOPs). The program is designed to allow the data to be assessed by the following parameters: Precision, Accuracy, Comparability, Representativeness, and Completeness. These parameters are controlled by adhering to documented methods and procedures (SOPs), and by the analysis of quality control (QC) samples on a routine basis.

### 3.1 Field Sampling Quality Management

Field Quality Control procedures are summarized in Table 5 and includes adherence to SOPs and formal sample documentation and tracking.

**Table 5. Quality Control Procedures for Field Sediment Sampling.**

<i>Sediment Sampling Field Activity</i>
<ul style="list-style-type: none"><li>• Vibracore Sampling SOP</li><li>• Grab Sampling SOP</li><li>• Protocol Cleaning/Low Detection Limits</li><li>• Certified Clean Laboratory Containers</li><li>• Horizontal and Vertical Controls</li><li>• Core Logging &amp; Subsampling Protocols</li><li>• Sample Control/ Chain of Custody Procedures</li><li>• Field Logs and Core Logs</li><li>• Sample Preservation &amp; Shipping Procedures</li></ul>

## **4.0 RESULTS**

As summarized in Table 6 below, results of all physical testing of the Pillar Point Harbor and reference beach samples are provided. These tables do not include analytical quality assurance/quality control (QA/QC) data.

### **4.1 Sediment Physical Results**

Grain size analyses were performed on multiple sections of each of the 8 cores collected and each individual beach grab sample. Sieve analysis data for material above project depth for the Pillar Point Harbor cores are provided in Table 6, and the results show that the sediments vary in grain size by location and depth. Locations 6-8 show primarily poorly graded sand with few fines throughout while locations 1,2,3, and 5 show primarily silty sand with siltiness increasing with depth. Location 4 showed poorly graded sand over silty sand. Sieve analysis data for the individual beach grab samples are also provided in Table 6 and show that sediments collected are poorly graded sand with very few fines. Total organic carbon analysis showed inconsequential levels of TOC across all cores. Lab data for the TOC analysis is provided in Appendix F. Individual grain size distribution curves for each individual grain size sample analyzed above are provided in Appendix C.

**Table 6. 2019 Sieve Analysis Data for Pillar Point Harbor Core locations, Inner Beach Grab Locations, and Surfers Beach Reference Locations.**

Location	Sampling Depth (ft, BGS)	Gravel			Coarse Sand	Medium Sand		Fine Sand		Silt/Clay	Classification	
		Sieve No./Sieve Size/% Passing										
		1/2"	3/8"	4	8	16	30	50	100	200		
		12.5 mm	9.5 mm	4.75 mm	2.36 mm	1.18 mm	0.60 mm	0.30 mm	0.150 mm	0.075 mm		
PPIHVC18-Top (1 to 5 Composite)	0.0'-3.0'	100	100	99.7	96.6	90.7	82.3	74.0	46.9	21.3	Silty Sand (SM)	
PPIHVC18-Mid (1 to 5 Composite)	3.0'-6.0'	100	99.4	98.4	93.7	85.7	76.0	67.8	45.9	27.2	Silty Sand (SM)	
PPIHVC18-Bottom (1 to 5 Composite)	6.0'+	100	100	99.8	97.0	90.9	84.3	75.6	53.5	39.3	Silty Clayey Sand (SC-SM)	
Site 1Top	0.0'-3.0'	100	100	99.2	96.5	92.3	82.6	69.3	33.6	13.5	Silty Sand (SM)	
Site 1 Mid	3.0'-4.7'	100	98.8	97.0	91.4	83.2	72.7	62.1	35.0	12.7	Silty Sand (SM)	
Site 2 Top	0.0'-2.0'	100	100	99.8	99.4	99.0	98.8	96.7	87.2	47.7	Silty Sand (SM)	
Site2 Mid	2.0'-3.7'	100	100	99.5	93.8	85.3	77.0	67.2	52.3	41.7	Silty Sand (SM)	
Site 3 Top	0.0'-3.0'	100	100	99.9	99.5	98.6	95.8	91.3	68.7	31.5	Silty Sand (SM)	
Site 3 Mid	3.0'-6.0'	100	98.9	96.6	91.4	84.1	77.0	70.2	42.2	23.5	Silty Sand (SM)	
Site 3 Bottom	6.0'-6.7'	100	100	99.2	94.3	85.9	77.5	67.8	49.0	36.7	Silty Sand (SM)	
Site 4 Top	0.0'-3.0'	100	99.7	99.1	93.5	83.5	72.0	62.0	23.4	4.4	Poorly Graded Sand (SP)	
Site 4 3.0-4.1	3.0'-4.1'	100	100	99.7	97.8	89.3	64.4	49.3	16.8	2.3	Poorly Graded Sand (SP)	
Site 4 4.1-5.8	4.1'-5.8'	100	100	99.8	97.1	87.7	76.6	66.7	56.6	43.2	Silty Sand (SM)	
Site 5 Top	0.0'-3.0'	100	100	99.8	97.7	91.7	84.0	78.7	67.6	43.0	Silty Sand (SM)	
Site 5 Mid	3.0'-6.0'	100	100	99.7	94.9	88.2	82.2	75.9	56.8	36.5	Silty Sand (SM)	
Site 5 Bottom	6.0'-6.5'	100	100	99.6	98.5	95.6	91.4	84.0	57.5	41.8	Silty Sand (SM)	
Site 6 Top	0.0'-3.0'	100	100	100	99.9	99.5	99.3	97.9	48.9	2.7	Poorly Graded Sand (SP)	
Site 6 Mid	3.0'-6.0'	100	100	100	100	100	99.8	97.2	29.6	3.9	Poorly Graded Sand (SP)	
Site 6 Bottom	6.0'-8.5'	100	100	100	100	99.7	98.9	94.4	32.0	5.6	Poorly Graded Sand with Silt (SP-SM)	
Site 7 Top	0.0'-3.0'	100	100	99.9	99.7	99.0	98.5	96.7	47.6	2.8	Poorly Graded Sand (SP)	
Site 7 Mid	3.0'-6.0'	100	100	100	100	100	99.9	98.6	53.9	3.7	Poorly Graded Sand (SP)	
Site 7 Bottom	6.0'-8.5'	100	100	100	100	99.9	99.3	93.8	40.7	4.8	Poorly Graded Sand with Silt (SP-SM))	

**Table 6. 2019 Sieve Analysis Data for Pillar Point Harbor Core locations, Inner Beach Grab Locations, and Surfers Beach Reference Locations.**

Location	Sampling Depth (ft, BGS)	Gravel			Coarse Sand	Medium Sand		Fine Sand		Silt/Clay	Classification	
		Sieve No./Sieve Size/% Passing										
		1/2"	3/8"	4	8	16	30	50	100	200		
		12.5 mm	9.5 mm	4.75 mm	2.36 mm	1.18 mm	0.60 mm	0.30 mm	0.150 mm	0.075 mm		
Site 8 Top	0.0'-3.0'	100	100	100.0	99.9	99.7	99.0	94.5	49.7	3.3	Poorly Graded Sand (SP)	
Site 8 Mid	3.0'-6.0'	100	100	100	100	100	99.8	97.6	55.8	4.7	Poorly Graded Sand (SP)	
Site 8 Bottom	6.0'-7.3'	100	100	100	100	99.7	98.4	88.1	52.2	8.4	Poorly Graded Sand with Silt (SP-SM)	
Inner Harbor Beach Grab 1	0.0'-0.5'	100	100	100	100	100	99.9	98.9	41.7	1.3	Poorly Graded Sand (SP)	
Inner Harbor Beach Grab 2	0.0'-0.5'	100	100	100	100	100	99.9	98.9	53.6	2.0	Poorly Graded Sand (SP)	
Inner Harbor Beach Grab 3	0.0'-0.5'	100	100	100	100	100	100	99.1	47.1	1.9	Poorly Graded Sand (SP)	
Surfer's Beach Reference Grab 1	0.0'-0.5'	100	100	100	100	99.9	99.6	92.3	17.7	1.1	Poorly Graded Sand (SP)	
Surfer's Beach Reference Grab 2	0.0'-0.5'	100	100	100	100	100	99.9	93.4	17.7	1.0	Poorly Graded Sand (SP)	
Surfer's Beach Reference Grab 3	0.0'-0.5'	100	100	100	100	100	99.2	73.0	9.4	1.1	Poorly Graded Sand (SP)	

## **5.0 DISCUSSION**

Subsections that follow describe physical testing results, as summarized in Table 6.

### **5.1 Sediment Observations**

Observed sediment characteristics varied somewhat between cores. According to laboratory analysis, sediments from half of the cores were described as poorly graded sand (SP) or poorly graded sand with silt (SP)(SM) and the other half were described as silty sand. All reference beach samples were described as poorly graded sand (SP).

There were no noxious odors, trash, and other non-organic debris observed in any of the cores. There were also no obvious layers of elevated contamination. Eelgrass was noted in the area between sites 7 and 8.

### **5.2 Sediment Grain Size**

As summarized in Table 6, results indicate that Pillar Point Harbor primary core intervals (mudline to project depth or refusal) varied in sand and silt content by location and depth.

Core locations that showed greater than 80 percent sand were the following:

Site 1 down to 4.7 feet

Site 4 down to 4.1 feet

Site 6 down to 8.5 feet

Site 7 down to 8.5 feet

Site 8 down to 7.3 feet

All beach grabs showed 98 percent sand or greater.

## 6.0 REFERENCES CITED

- ASTM D 2487-06. Classification of Soils for Engineering Purposes (USCS), American Society for Testing and Materials, W. Conshohocken, PA, latest edition.
- ASTM D 2488-06. Standard Practice for Description and Identification of Soils (Visual Manual Procedure), American Society for Testing and Materials, W. Conshohocken, PA, latest edition.
- ASTM D 422-63. Particle-Size Analysis of Soils, American Society for Testing and Materials, W. Conshohocken, PA, latest edition.
- California Department of Toxic Substances and Control (DTSC). 1997. Guidance Document. Selecting Inorganic Constituents as Chemicals of Potential Concern at Risk Assessments at Hazardous Waste Sites and Permitted Facilities. February 1997.
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- San Francisco Regional Water Quality Control Board. Update 2016a. Environmental Screening Levels (ESLs) for Soil.  
([https://www.waterboards.ca.gov/sanfranciscobay/water\\_issues/programs/ESL/ESL%20Workbook\\_ESLs\\_Interim%20Final\\_22Feb16\\_Rev3\\_PDF.pdf](https://www.waterboards.ca.gov/sanfranciscobay/water_issues/programs/ESL/ESL%20Workbook_ESLs_Interim%20Final_22Feb16_Rev3_PDF.pdf))
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- USEPA. 2017a. National Functional Guidelines for Superfund Organic Methods Data Review. EPA540-R-2017-002. January 2017.
- USEPA. 2017b. National Functional Guidelines for Inorganic Superfund Data Review. EPA 540-R-2017-001. January 2017.
- USEPA/USACE (U.S. Environmental Protection Agency and U.S. Army Corps of Engineers). 1998. Evaluation of Dredged Material Proposed For Discharge In Waters Of The U.S. – Testing Manual [Inland Testing Manual (Gold Book)]. EPA-823-B-98-004.
- USEPA. 2018. Regional Screening Levels (RSL) for Chemical Contaminants at Superfund Sites. <http://www.epa.gov/risk/regional-screening-levels-rsls>. Updated May 2018.



# Appendix A. Core Logs

PROJECT <b>Pillar Point Harbor</b> <b>Pilot Surfers Beach Restoration Project</b> <b>San Mateo Harbor District</b>	<b>KINNETIC LABORATORIES INC.</b> OCEANOGRAPHIC RESEARCH SANTA CRUZ, CA (831)-457-3950
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### SEDIMENT SAMPLING LOG SHEET

SITE ID: PPIHVC18-1	VESSEL: KLI Barge												
DATE: 18 June, 2019	CREW: SJ, AH, GC												
WEATHER: Overcast	SAMPLING EQUIPMENT: Vibracore,												
WIND/SEAS: 54-61 - surgy	NAVIGATION TYPE: WAAS DGPS, NAD 83												
TIME: 1140-1200	DESCRIPTION OF MATERIAL <small>MUDLINE</small>	DEPTH											
COORDINATES: 37 30.106	<div style="border: 1px solid black; padding: 5px; margin-bottom: 5px;">           dark grey Fine grain sand with fines (SP)         </div> <div style="border: 1px solid black; padding: 5px; margin-bottom: 5px;">           black &amp; grey <sup>gy</sup> inter bedded medium grain sand (SP) + silt fine grain (SW)         </div> <div style="border: 1px solid black; padding: 5px; margin-bottom: 5px;">           light grey med to coarse sand (SW) trace         </div> <div style="border: 1px solid black; padding: 5px; margin-bottom: 5px;"> <del>small piece of cemented sand</del> </div>	0.0											
COORDINATES: 122 28.619		2.5'											
WATER DEPTH: 5.5		4.6											
TIDAL STAGE: +3.5		4.7'											
MUDLINE DEPTH (MLLW): -2.0' MLLW													
TARGET SAMPLING DEPTH: 9 feet BGS													
SAMPLE LENGTH NEEDED: 9 ft													
PENETRATION/RECOVERY: 6.0'													
CORE INTERVAL SAMPLED: 0-3.0 3.0-4.7													
<table border="1" style="width:100%; border-collapse: collapse;"> <thead> <tr> <th style="width:30%;">SAMPLE ID. #</th> <th style="width:30%;">ANALYSIS</th> <th style="width:40%;">QUANTITY</th> </tr> </thead> <tbody> <tr><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td></tr> </tbody> </table>		SAMPLE ID. #	ANALYSIS	QUANTITY									
SAMPLE ID. #	ANALYSIS	QUANTITY											
COMMENTS: refusal @ 6.0' per 2nd Attempt - refusal @ 6' per formation encountered													

PROJECT <b>Pillar Point Harbor</b> <b>Pilot Surfers Beach Restoration Project</b> <b>San Mateo Harbor District</b>	<b>KINNETIC LABORATORIES INC.</b> OCEANOGRAPHIC RESEARCH SANTA CRUZ, CA (831)-457-3950
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**SEDIMENT SAMPLING LOG SHEET**

SITE ID: <b>PPIHVC18-2</b>	VESSEL: KLI Barge
DATE: <b>19 June, 2019</b>	CREW: SJ, AH, GC
WEATHER: <b>overcast</b>	SAMPLING EQUIPMENT: Vibracore,
WIND/SEAS: <b>SSW 6-8/-</b>	NAVIGATION TYPE: WAAS DGPS, NAD 83

	DESCRIPTION OF MATERIAL <small>MUDLINE</small>	DEPTH												
TIME: <b>1110</b>		0.0												
COORDINATES: <b>37 30.074</b>	<div style="border: 1px solid black; padding: 5px;">           dark olive / grey            clayey silt (CL)            trace sand         </div>													
COORDINATES: <b>122 28.657</b>														
WATER DEPTH: <b>11.5'</b>														
TIDAL STAGE: <b>+2.8</b>														
MUDLINE DEPTH (MLLW): <b>-8.7</b>														
TARGET SAMPLING DEPTH: <b>9 feet BGS</b>														
SAMPLE LENGTH NEEDED: <b>9.0'</b>														
PENETRATION/RECOVERY: <b>5.0' / 3.7'</b>		↓	2.0											
CORE INTERVAL SAMPLED: <b>0-2' 2'-3.7'</b>														
<table border="1" style="width:100%; border-collapse: collapse;"> <thead> <tr> <th style="width:25%;">SAMPLE ID. #</th> <th style="width:25%;">ANALYSIS</th> <th style="width:25%;">QUANTITY</th> </tr> </thead> <tbody> <tr><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td></tr> </tbody> </table>		SAMPLE ID. #	ANALYSIS	QUANTITY										<div style="border: 1px solid black; padding: 5px;">             brownish orange              stiff, dry silty              sand (SM)           </div>
SAMPLE ID. #	ANALYSIS	QUANTITY												

COMMENTS: refusal @ 5.0" pen due to formation material

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**SEDIMENT SAMPLING LOG SHEET**

SITE ID: PPIHVC18-3		VESSEL: KLI Barge
DATE: 18 June, 2019		CREW: SJ, AH, GC
WEATHER: overcast		SAMPLING EQUIPMENT: Vibracore,
WIND/SEAS: -   - surge		NAVIGATION TYPE: WAAS DGPS, NAD 83
TIME: 1625	DESCRIPTION OF MATERIAL	
COORDINATES: 37 30.079	MUDLINE	
COORDINATES: 122 28.599	dark grey med to fine grain silty sand (SM)	
WATER DEPTH: 9.0	DEPTH: 0.0	
TIDAL STAGE: +3.3		
MUDLINE DEPTH (MLLW): -5.7		
TARGET SAMPLING DEPTH: 9 feet BGS		
SAMPLE LENGTH NEEDED: 9.0		
PENETRATION/RECOVERY: 7.5/6.7	3.1	
CORE INTERVAL SAMPLED: 0-3.0, 3.0-6.0 6.0-6.7	dark grey med. grain silty sand, traces shell fragments (SM)	
SAMPLE ID. #	ANALYSIS	QUANTITY
		4.5
COMMENTS: Recored @ 7.5' due to formation		brownish orange stiff, dry silty sand (SM)
		6.7

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**SEDIMENT SAMPLING LOG SHEET**

<b>SITE ID:</b> PPIHVC18-4	<b>VESSEL:</b> KLI Barge	
<b>DATE:</b> 19 June, 2019	<b>CREW:</b> SJ, AH, GC	
<b>WEATHER:</b> overcast	<b>SAMPLING EQUIPMENT:</b> Vibracore,	
<b>WIND/SEAS:</b> - / - surge	<b>NAVIGATION TYPE:</b> WAAS DGPS, NAD 83	
<b>TIME:</b> 1535	<b>DESCRIPTION OF MATERIAL</b> <small>MUDLINE</small>	<b>DEPTH</b>
<b>COORDINATES:</b> 37 30.088		0.0
<b>COORDINATES:</b> 122 28.552	black & grey fine to coarse sand (SW) with fines	1.5
<b>WATER DEPTH:</b> 5.0'	grey fine to coarse sand (SW) trace fines	3.0
<b>TIDAL STAGE:</b> +3.6'	grey fine to med grain sand (SP) trace fines	4.1
<b>MUDLINE DEPTH (MLLW):</b> -1.4	brownish orange stiff, dry silty sand (SM)	5.9'
<b>TARGET SAMPLING DEPTH:</b> 9 feet BGS		
<b>SAMPLE LENGTH NEEDED:</b> 9.0'		
<b>PENETRATION/RECOVERY:</b> 7.5' / 9.0'		
<b>CORE INTERVAL SAMPLED:</b> 0-3.0, 3.0-4.1, 4.1-5.9		
<b>SAMPLE ID. #</b>	<b>ANALYSIS</b>	<b>QUANTITY</b>
<b>COMMENTS:</b> refusal @ hard layer 7.5' down from mud line (formation)		

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**SEDIMENT SAMPLING LOG SHEET**

**SITE ID:** PPIHVC18-5  
**DATE:** 19 June, 2019  
**WEATHER:** overcast  
**WIND/SEAS:** 45W 4-6/-  
**TIME:** 1040  
**COORDINATES:** 37 30.047  
**COORDINATES:** 122 28.594  
**WATER DEPTH:** 11.5  
**TIDAL STAGE:** +1.9'  
**MUDLINE DEPTH (MLLW):** -9.6  
**TARGET SAMPLING DEPTH:** 9 feet BGS  
**SAMPLE LENGTH NEEDED:** 9.0'  
**PENETRATION/RECOVERY:** 8.5'/6.5'  
**CORE INTERVAL SAMPLED:** 0-3.0, 3.0-6.0, 6.0-6.5

**VESSEL:** KLI Barge  
**CREW:** SJ, AH, GC  
**SAMPLING EQUIPMENT:** Vibracore,  
**NAVIGATION TYPE:** WAAS DGPS, NAD 83

SAMPLE ID. #	ANALYSIS	QUANTITY

DESCRIPTION OF MATERIAL MUDLINE	DEPTH
	0.0
olive fine grain sand (SP) trace fines	0.8'
dark grey clayey silt (ML)	2.0'
dark grey silty sand (SM)	2.4'
olive fine to medium sand (SP)	2.8'
tan coarse sand (SP)	3.0'
↓	3.2'
olive fine grain sand trace fines (SP)	3.9'
orange / tan stiff, dry silty sand (SM)	6.5'

**COMMENTS:**  
 Refusal @ 8.5' pen due to formation material

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### SEDIMENT SAMPLING LOG SHEET

SITE ID: PPIHVC18-6

VESSEL: KLI Barge

DATE: 18 June, 2019

CREW: SJ, AH, GC

WEATHER: overcast

SAMPLING EQUIPMENT: Vibracore,

WIND/SEAS: WSW 2-4 / - surge

NAVIGATION TYPE: WAAS DGPS, NAD 83

TIME: 1505

COORDINATES: 37 29.944'

COORDINATES: 122 28.629'

WATER DEPTH: 3.5

TIDAL STAGE: +4.0

MUDLINE DEPTH (MLLW): +0.5'

TARGET SAMPLING DEPTH: 9 feet BGS

SAMPLE LENGTH NEEDED: 9.0

PENETRATION/RECOVERY: 10.5' / 9.5'

CORE INTERVAL SAMPLED: 0-3, 3-6, 6-8.5

SAMPLE ID. #	ANALYSIS	QUANTITY

COMMENTS:

No eelgrass observed

DESCRIPTION OF MATERIAL

DEPTH

MUDLINE

tan to olive grey  
med to fine grain  
sand (SP) trace  
fines

0.0

3.0

5.0

dark grey to black  
med. to fine grain sand  
(SP)

5.8

wood debris

6.0

6.7

dark grey med to fine  
grain sand (SP)  
trace fines

8.5

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(831)-457-3950**

**SEDIMENT SAMPLING LOG SHEET**

**SITE ID: PPIHVC18-7**

**VESSEL: KLI Barge**

**DATE: 18 June, 2019**

**CREW: SJ, AH, GC**

**WEATHER: overcast**

**SAMPLING EQUIPMENT: Vibracore,**

**WIND/SEAS: WSW 2-4' - surgy**

**NAVIGATION TYPE: WAAS DGPS, NAD 83**

**TIME: 1429**

**DESCRIPTION OF MATERIAL**

**DEPTH**

**COORDINATES: 37 29.913**

**COORDINATES: 122 28.683**

**WATER DEPTH: 9.0'**

**TIDAL STAGE: +4.2'**

**MUDLINE DEPTH (MLLW): -0.8'**

**TARGET SAMPLING DEPTH: 9 feet BGS**

**SAMPLE LENGTH NEEDED: 9.0'**

**PENETRATION/RECOVERY: 10.5' / 9.5'**

**CORE INTERVAL SAMPLED: 0'-3' 3'-6' 6'-8.5'**

MUDLINE

light tan/grey med.  
to fine grain sand  
(SP) trace fines

3.0

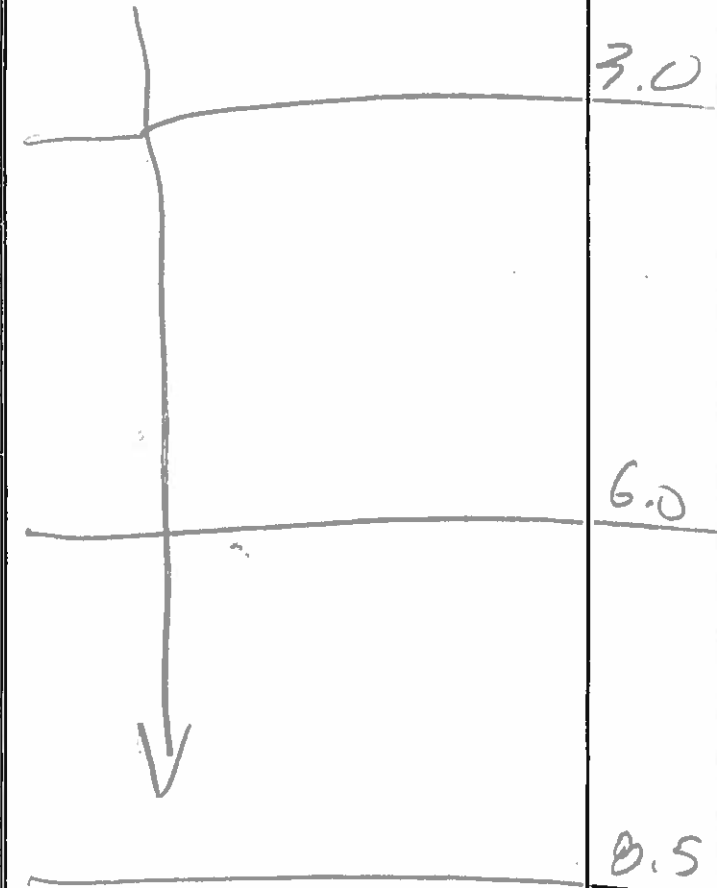
6.0

8.5

SAMPLE ID. #	ANALYSIS	QUANTITY

**COMMENTS:**

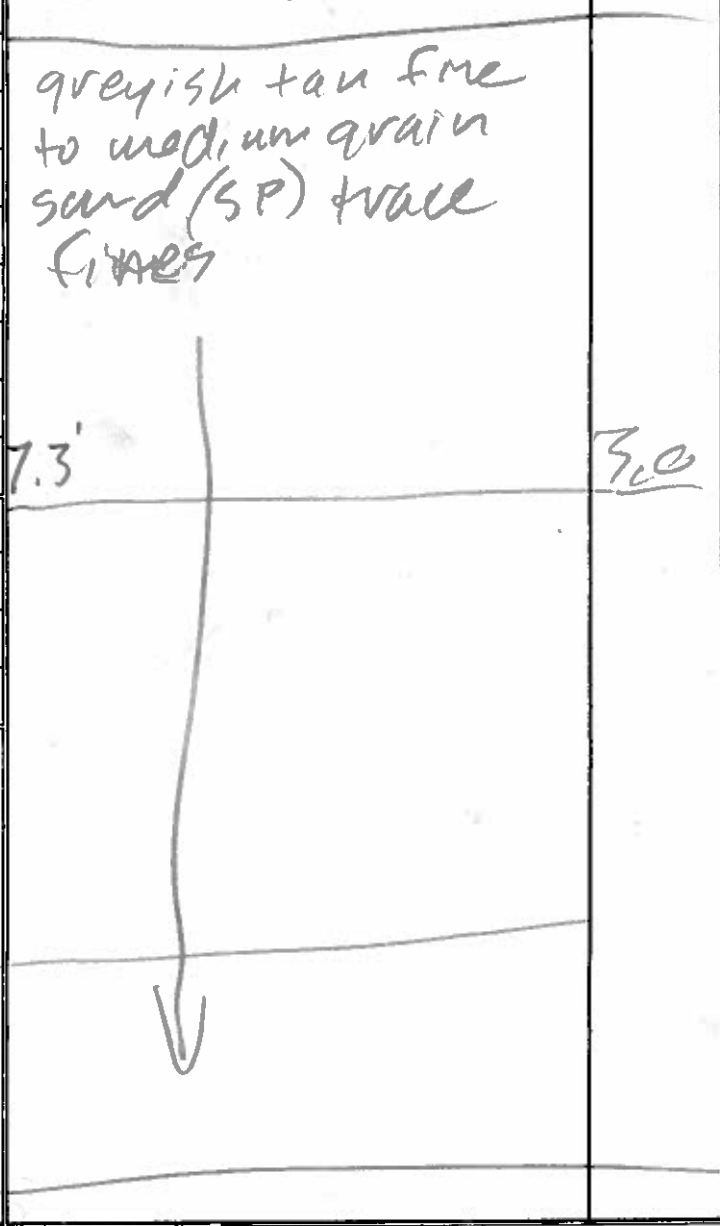
eel grass between this location & site 8



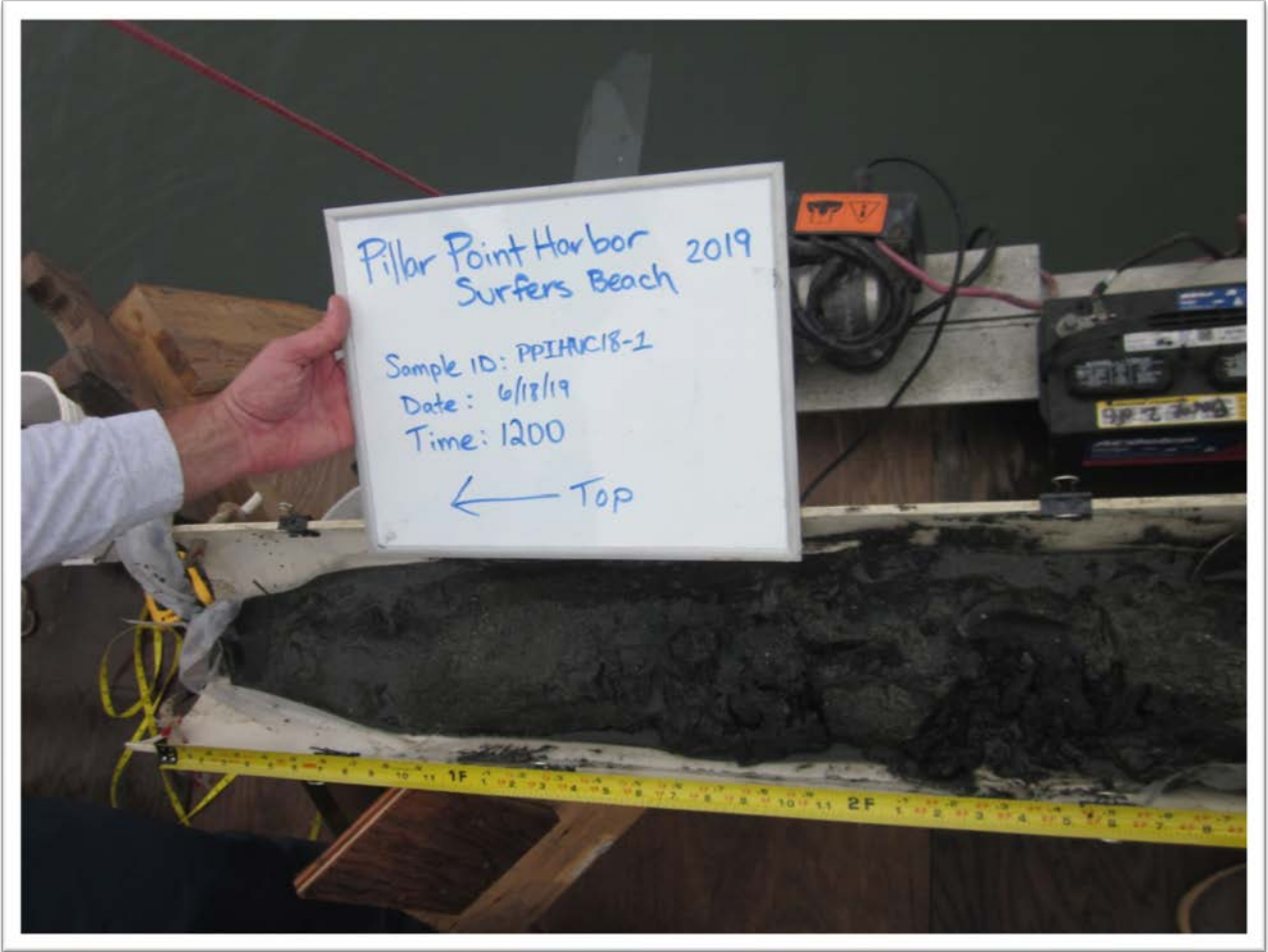


<b>PROJECT</b> <b>Pillar Point Harbor</b> <b>Pilot Surfers Beach Restoration Project</b> <b>San Mateo Harbor District</b>	<b>KINNETIC LABORATORIES INC.</b> <b>OCEANOGRAPHIC RESEARCH</b> <b>SANTA CRUZ, CA</b> <b>(831)-457-3950</b>
--	--

**SEDIMENT SAMPLING LOG SHEET**

<b>SITE ID:</b> PPIHVC18-8	<b>VESSEL:</b> KLI Barge	
<b>DATE:</b> 18 June, 2019	<b>CREW:</b> SJ, AH, GC	
<b>WEATHER:</b> overcast	<b>SAMPLING EQUIPMENT:</b> Vibracore,	
<b>WIND/SEAS:</b> WSW 4/- surge	<b>NAVIGATION TYPE:</b> WAAS DGPS, NAD 83	
<b>TIME:</b> 1355	<b>DESCRIPTION OF MATERIAL</b> <small>MUDLINE</small>	<b>DEPTH</b>
<b>COORDINATES:</b> 37 28.872	greyish tan fine to medium grain sand (SP) trace fines  	
<b>COORDINATES:</b> 122 28.752 747		
<b>WATER DEPTH:</b> 6.1'		
<b>TIDAL STAGE:</b> +4.3		
<b>MUDLINE DEPTH (MLLW):</b> -1.8'		
<b>TARGET SAMPLING DEPTH:</b> 9 feet BGS		
<b>SAMPLE LENGTH NEEDED:</b> 9.0'		
<b>PENETRATION/RECOVERY:</b> 10.9' / 7.3'		
<b>CORE INTERVALS SAMPLED:</b> 0'-3', 3'-6', 6'-7.3'		
<b>SAMPLE ID. #</b>		
<b>COMMENTS:</b>  Site moved due to surge eelgrass between this location & Site 7		

## Appendix B. Core Photos



Site 1 Top



Site 1 Bottom



Site 2 Top



Site 2 Bottom





Site 3 Top

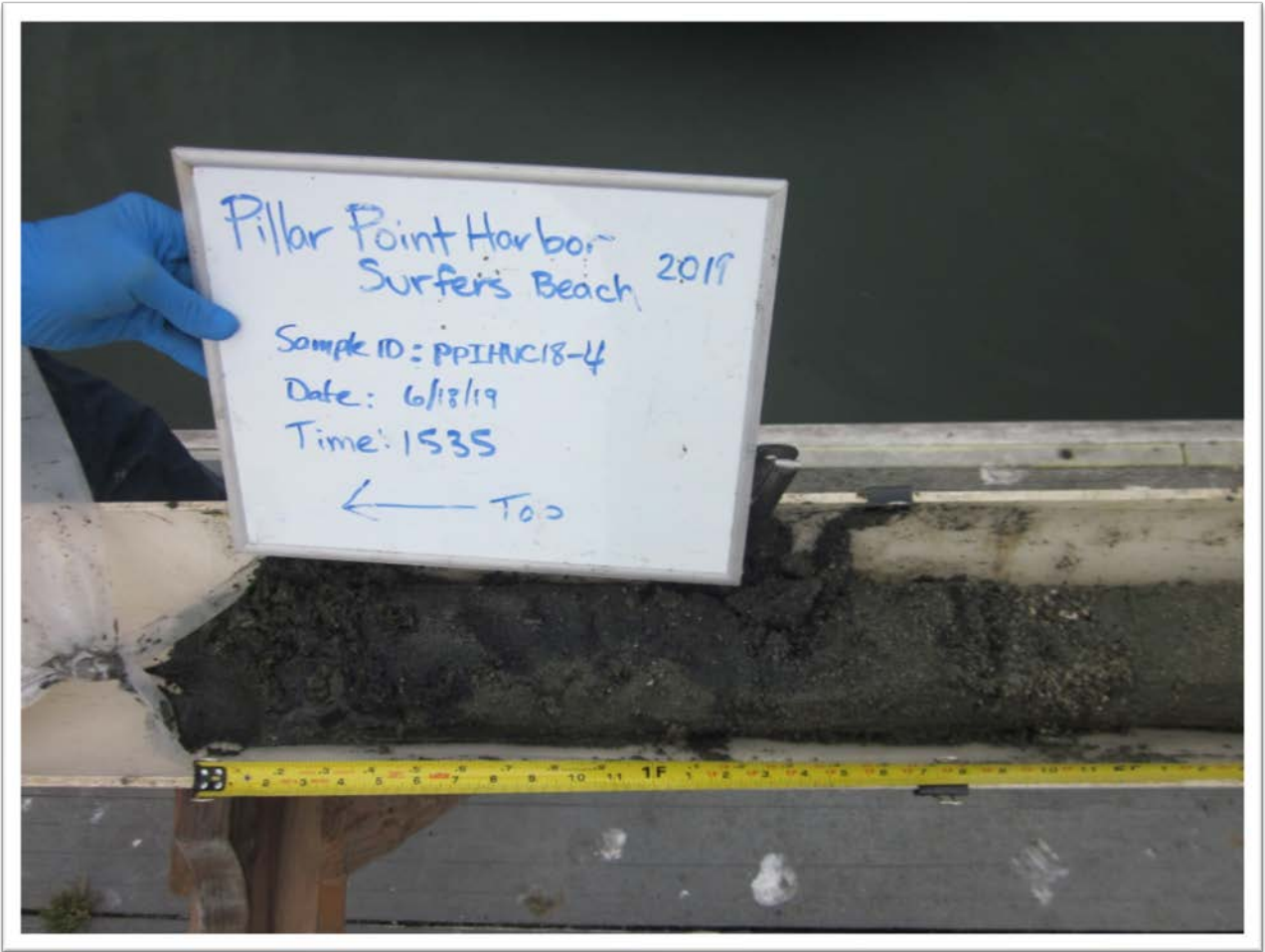


Site 3 Middle





Site 3 Bottom



Site 4 Top



Site 4 Middle



Site 4 Bottom



Site 5 Top

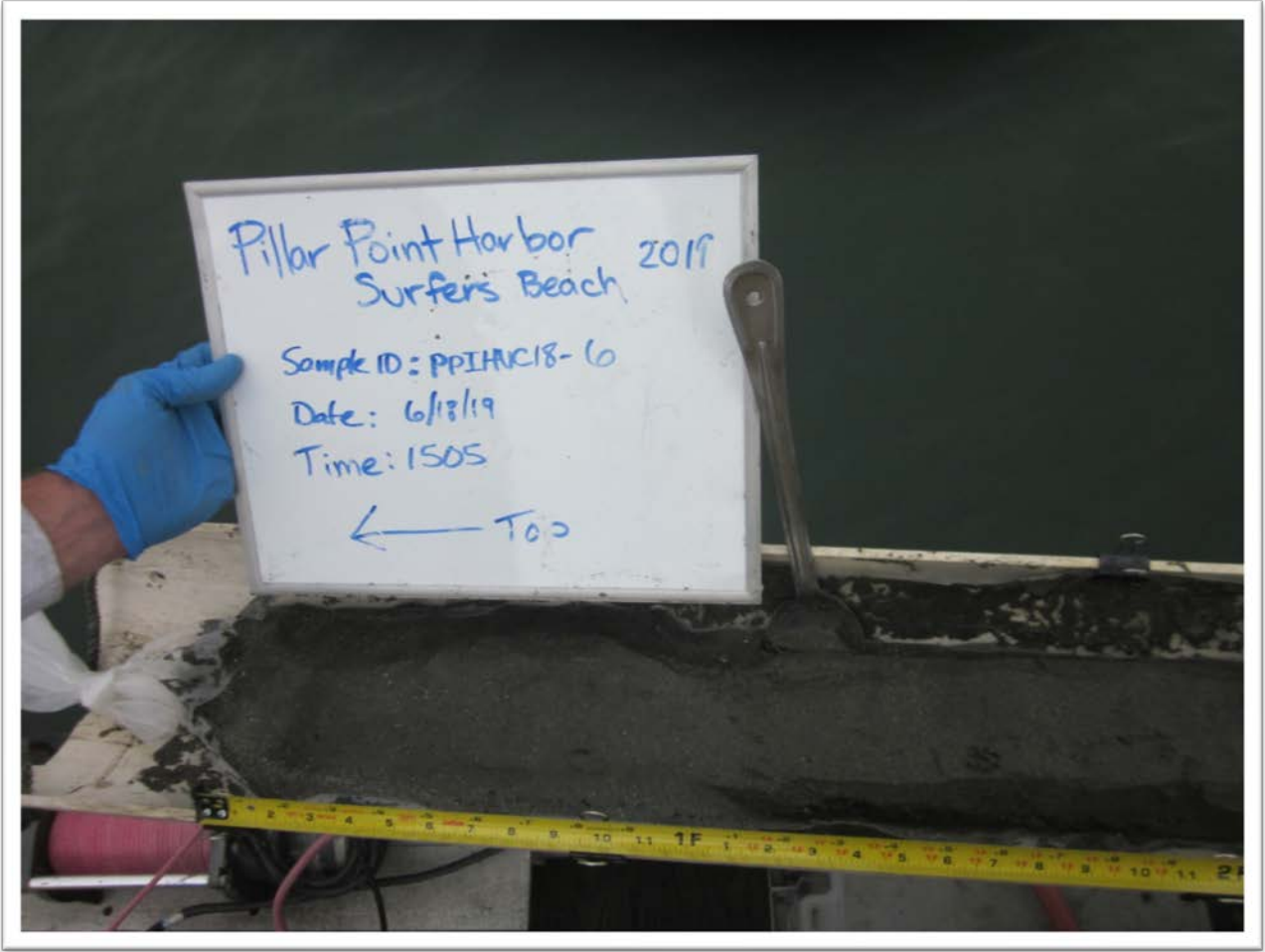




Site 5 Middle

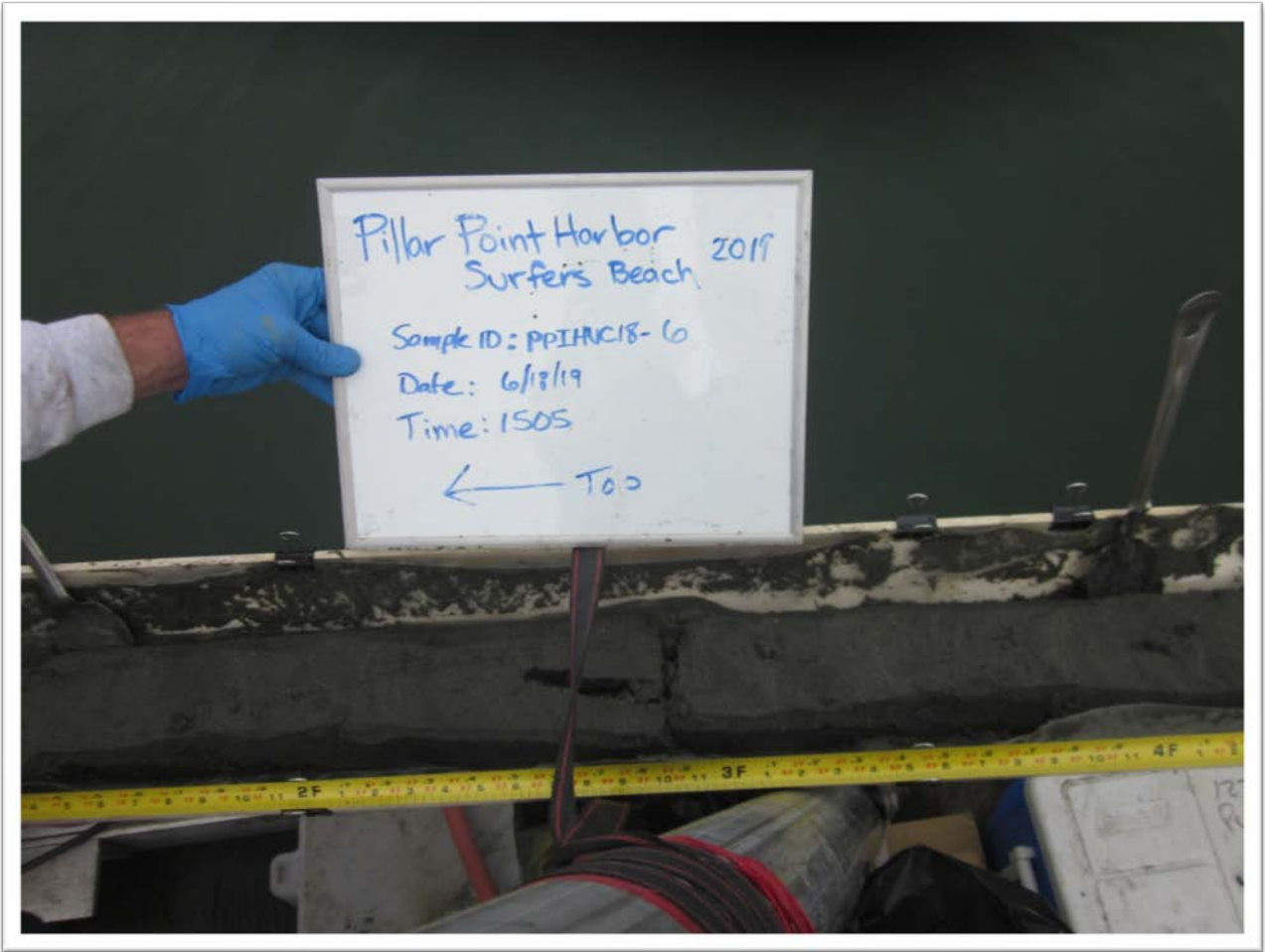


Site 5 Bottom

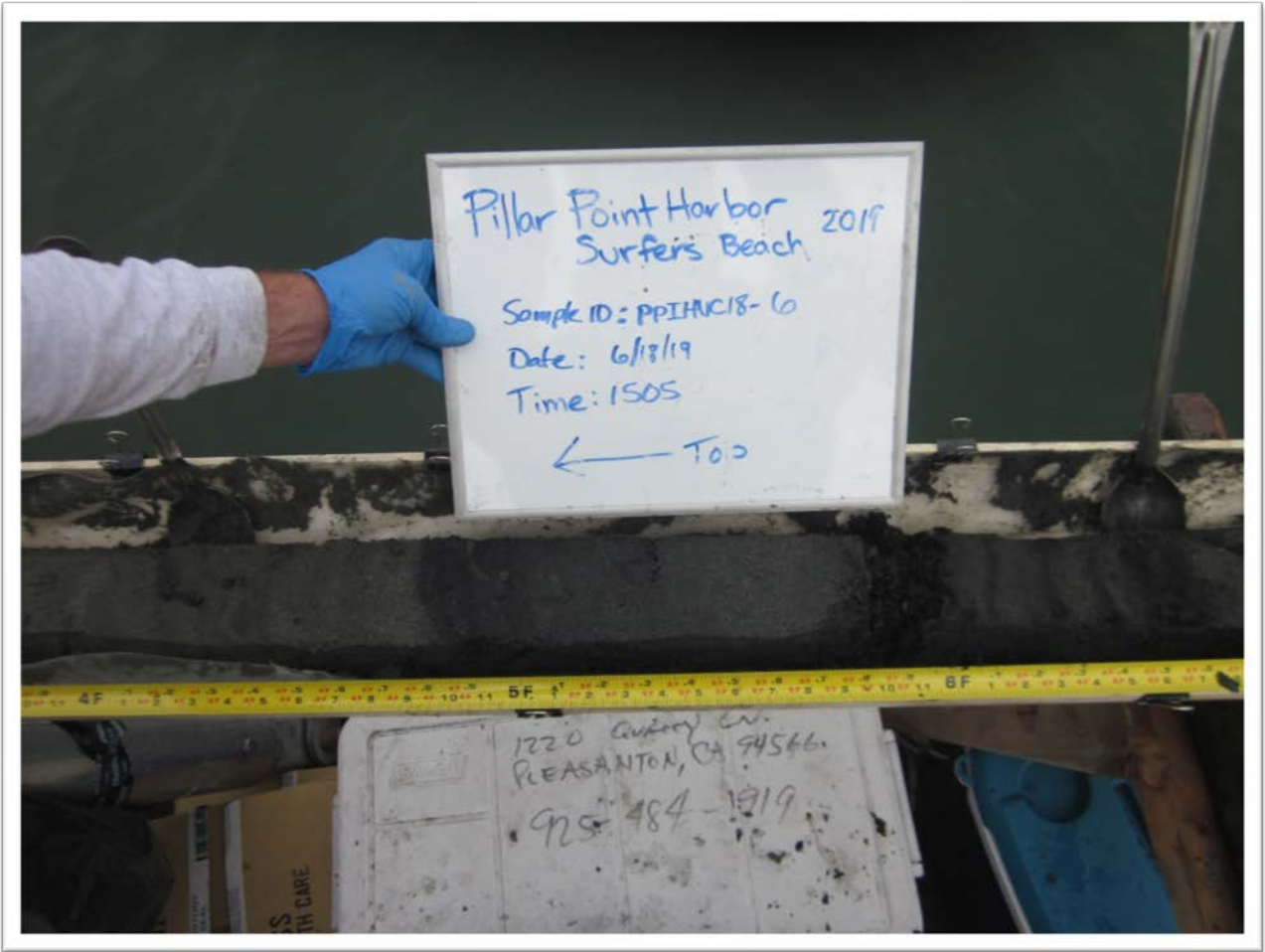


Site 6 Top

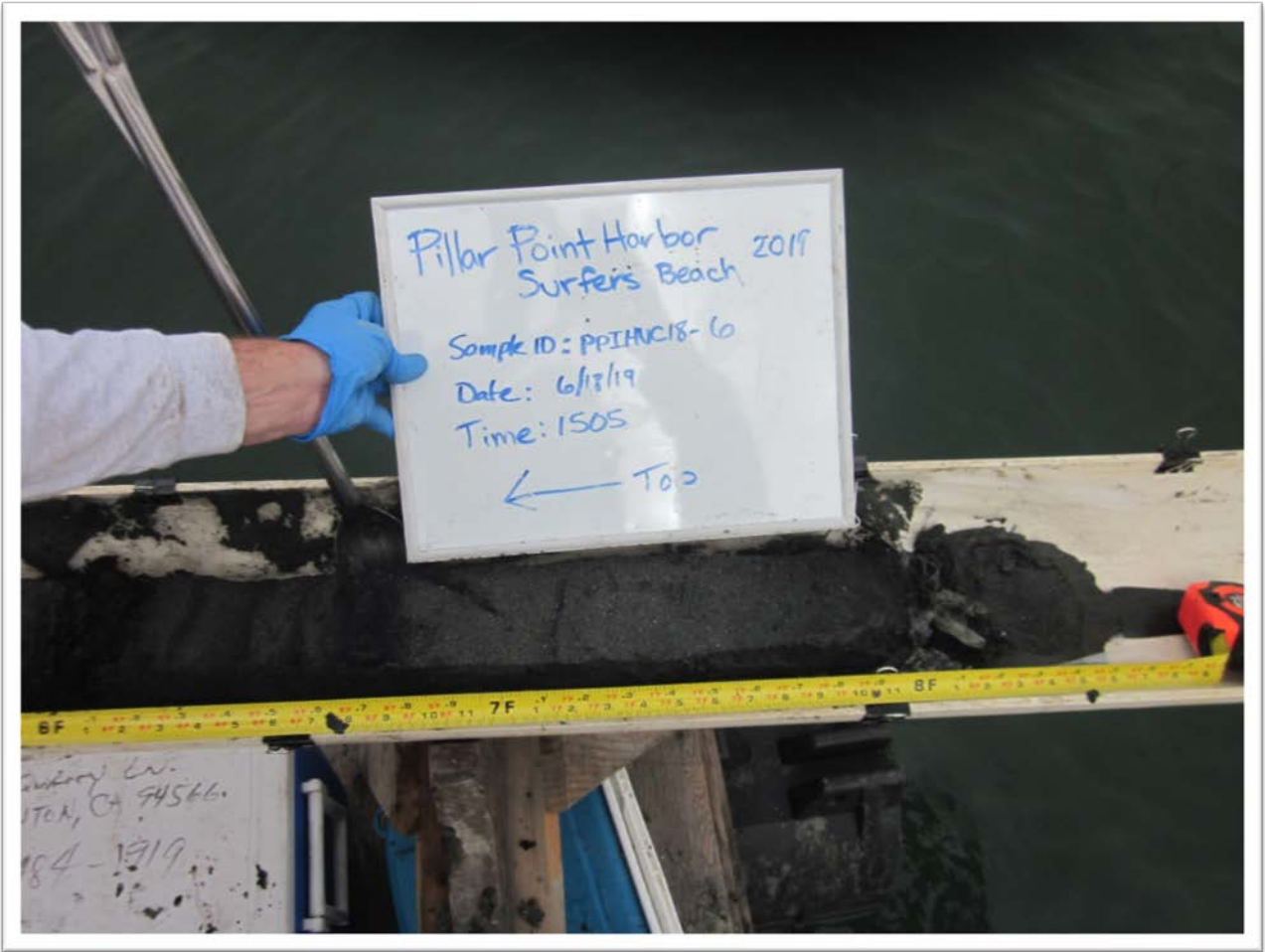




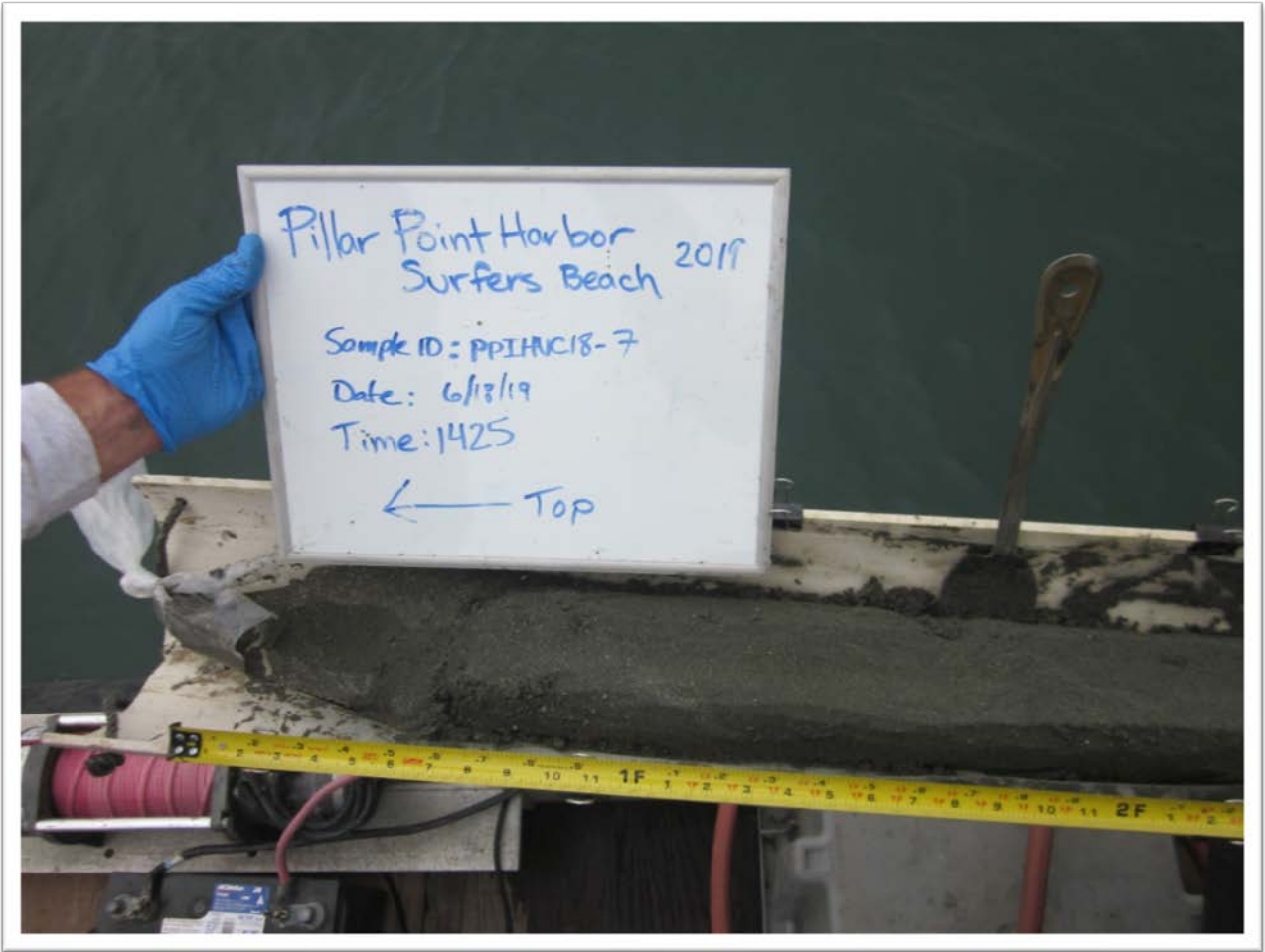
Site 6 Middle A



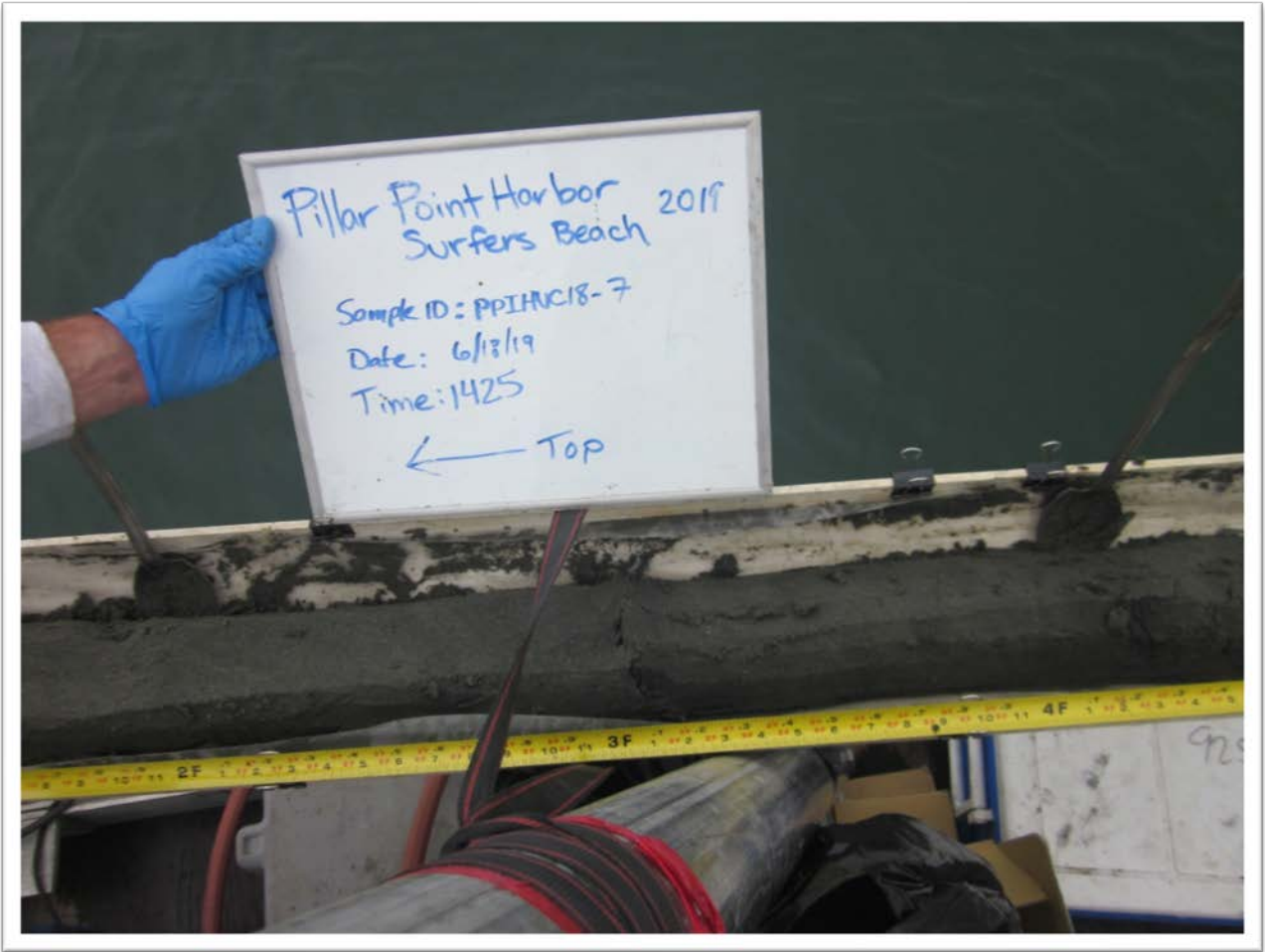
Site 6 Middle B



Site 6 Bottom

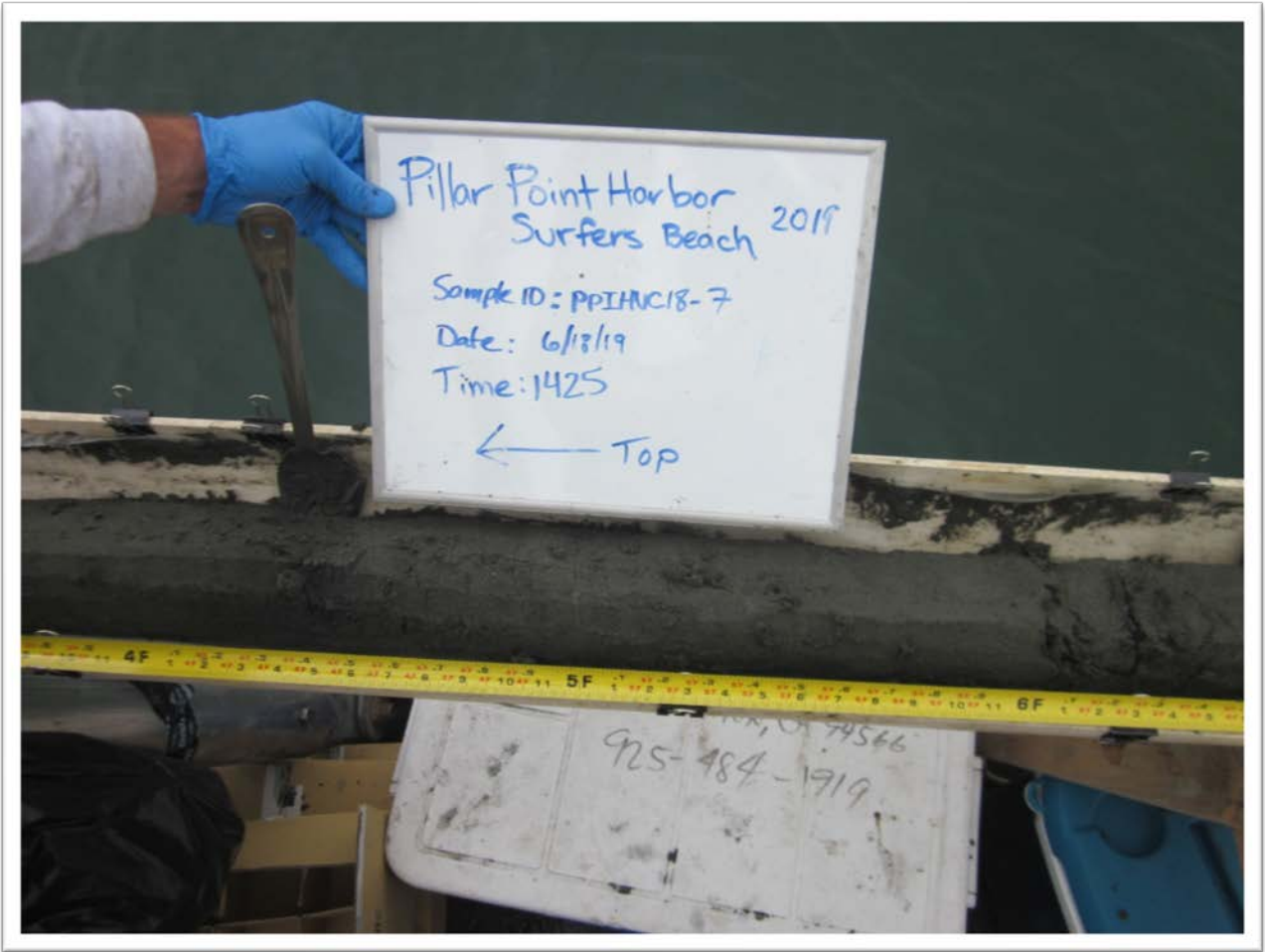


Site 7 Top



Site 7 Middle A





Site 7 Middle B

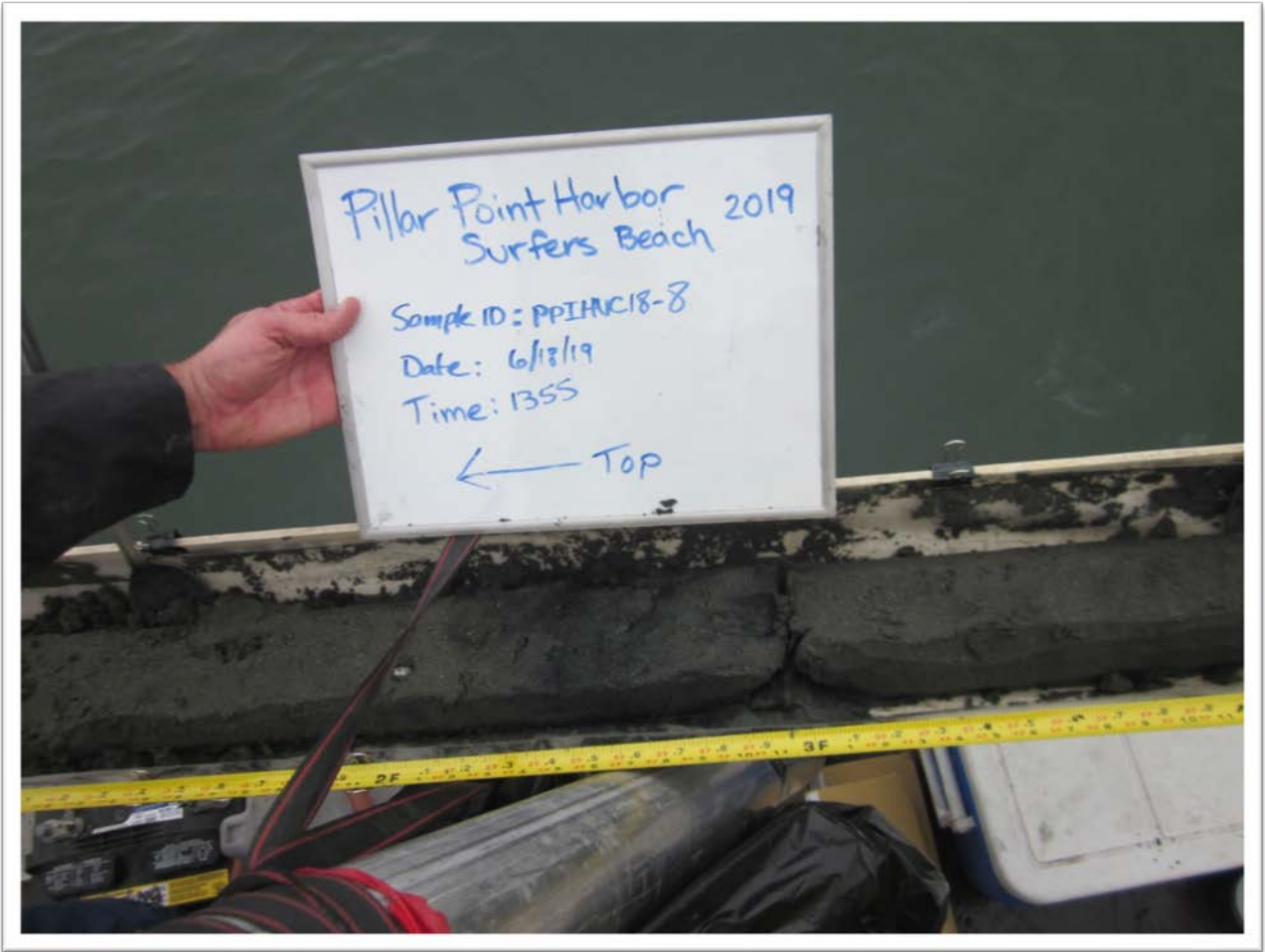


Site 7 Bottom

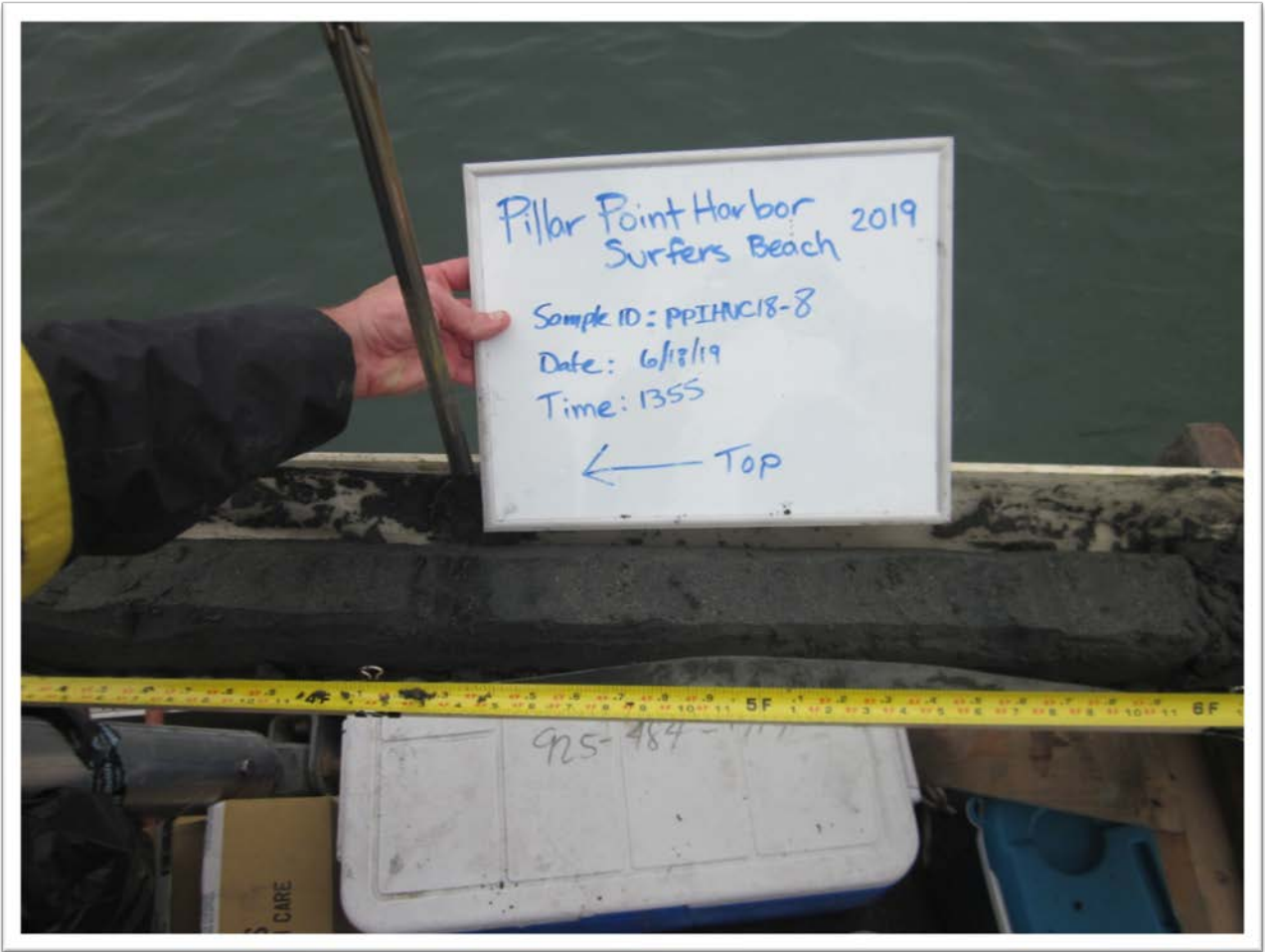


Site 8 Top





Site 8 Middle A



Site 8 Middle B



Site 8 Bottom

## Appendix C. Grain Size Data / Curves



**PARTICLE-SIZE DISTRIBUTION (GRADATION)  
of SOILS USING SIEVE ANALYSIS  
ASTM D 6913**

Project Name: Pillar Point Harbor  
 Project No.: 5720.180  
 Station ID: PP Harbor Beach  
 Sample ID: IHBG18-1  
 Soil Identification: Olive gray poorly-graded sand (SP)

Tested By: ACS/OHF Date: 06/26/19  
 Checked By: J. Ward Date: 07/11/19  
 Date, Time: 06/18/19, 17:02

		Moisture Content of Total Air - Dry Soil	
Container No.:	IP-2	Wt. of Air-Dry Soil + Cont. (g)	0.0
Wt. of Air-Dried Soil + Cont.(g)	687.9	Wt. of Dry Soil + Cont. (g)	0.0
Wt. of Container (g)	96.1	Wt. of Container No._____ (g)	1.0
Dry Wt. of Soil (g)	591.8	Moisture Content (%)	0.0

After Wet Sieve	Container No.	IP-2
	Wt. of Dry Soil + Container (g)	681.8
	Wt. of Container (g)	96.1
	Dry Wt. of Soil Retained on # 200 Sieve (g)	585.7

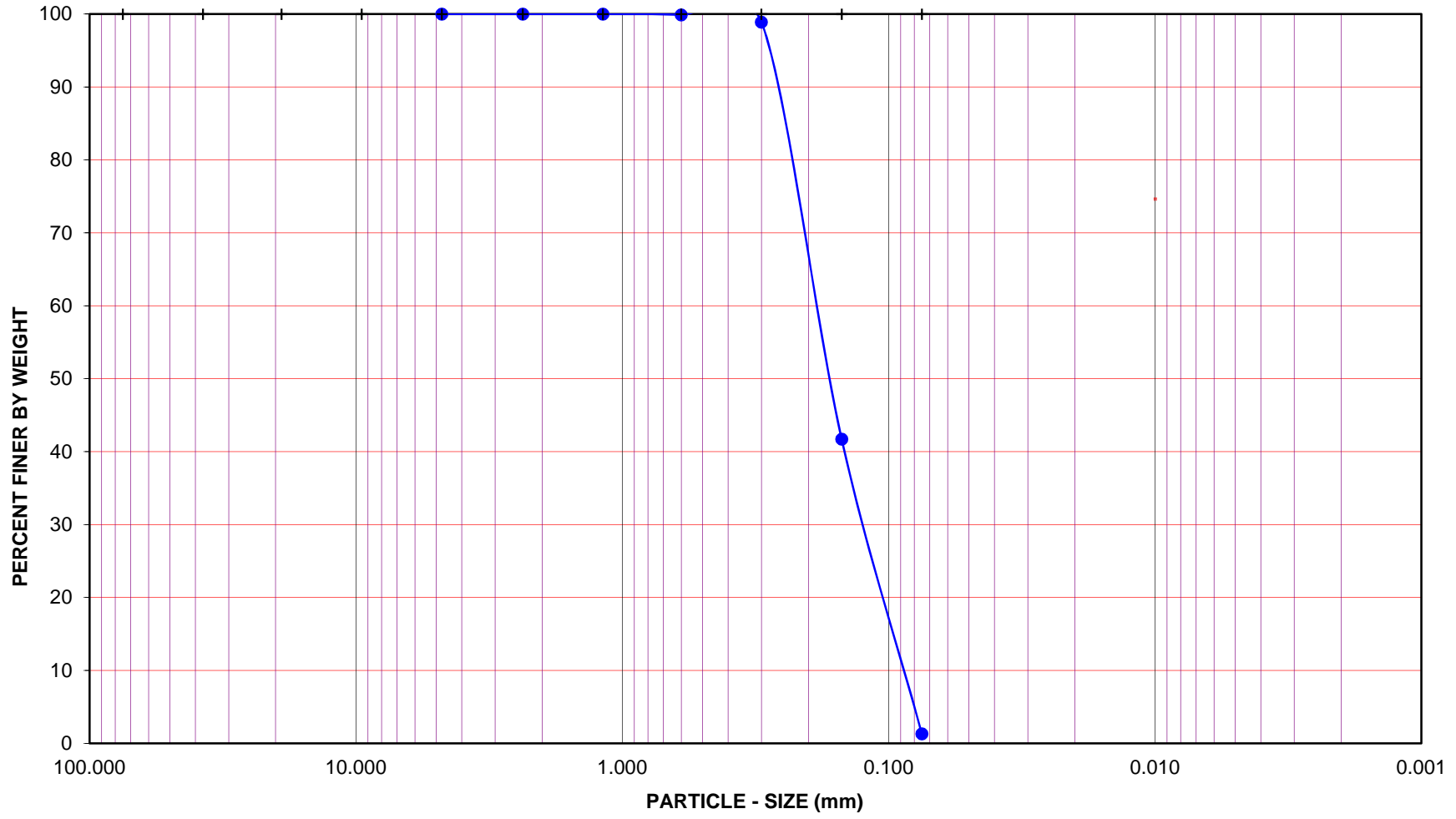
U. S. Sieve Size		Cumulative Weight Dry Soil Retained (g)	Percent Passing (%)
(in.)	(mm.)		
1 1/2"	37.5		
1"	25.0		
3/4"	19.0		
1/2"	12.5		
3/8"	9.5		
#4	4.75	0.0	100.0
#8	2.36	0.2	100.0
#16	1.18	0.2	100.0
#30	0.600	0.4	99.9
#50	0.300	6.5	98.9
#100	0.150	345.0	41.7
#200	0.075	584.3	1.3
PAN			

GRAVEL: 0 %  
 SAND: 99 %  
 FINES: 1 %  
 GROUP SYMBOL: SP

Cu = D60/D10 = 2.02  
 Cc = (D30)<sup>2</sup>/(D60\*D10) = 1.05

Remarks: \_\_\_\_\_

GRAVEL				SAND				FINES				
COARSE		FINE		COARSE	MEDIUM	FINE		SILT		CLAY		
U.S. STANDARD SIEVE OPENING				U.S. STANDARD SIEVE NUMBER				HYDROMETER				
3.0"	1 1/2"	3/4"	3/8"	#4	#8	#16	#30	#50	#100	#200		



Project Name: Pillar Point Harbor  
 Project No.: 5720.180

Station ID: PP Harbor Beach    Sample ID: IHBG18-1  
 Date, Time: 06/18/19, 17:02    Soil Type : SP

Soil Identification: Olive gray poorly-graded sand (SP)

GR:SA:FI : (%)    **0 : 99 : 1**



**PARTICLE - SIZE  
 DISTRIBUTION  
 ASTM D 6913**

Jul-19



**PARTICLE-SIZE DISTRIBUTION (GRADATION)  
of SOILS USING SIEVE ANALYSIS  
ASTM D 6913**

Project Name: [Pillar Point Harbor](#)  
 Project No.: [5720.180](#)  
 Station ID: [PP Harbor Beach](#)  
 Sample ID: [IHBG18-2](#)  
 Soil Identification: [Olive gray poorly-graded sand \(SP\)](#)

Tested By: [O. Figueroa](#) Date: [06/25/19](#)  
 Checked By: [J. Ward](#) Date: [07/11/19](#)  
 Date, Time: [06/18/19, 17:10](#)

		Moisture Content of Total Air - Dry Soil	
Container No.:	<b>G</b>	Wt. of Air-Dry Soil + Cont. (g)	0.0
Wt. of Air-Dried Soil + Cont.(g)	<b>661.3</b>	Wt. of Dry Soil + Cont. (g)	0.0
Wt. of Container (g)	<b>142.1</b>	Wt. of Container No._____ (g)	1.0
Dry Wt. of Soil (g)	519.2	Moisture Content (%)	0.0

After Wet Sieve	Container No.	G
	Wt. of Dry Soil + Container (g)	<b>655.3</b>
	Wt. of Container (g)	142.1
	Dry Wt. of Soil Retained on # 200 Sieve (g)	513.2

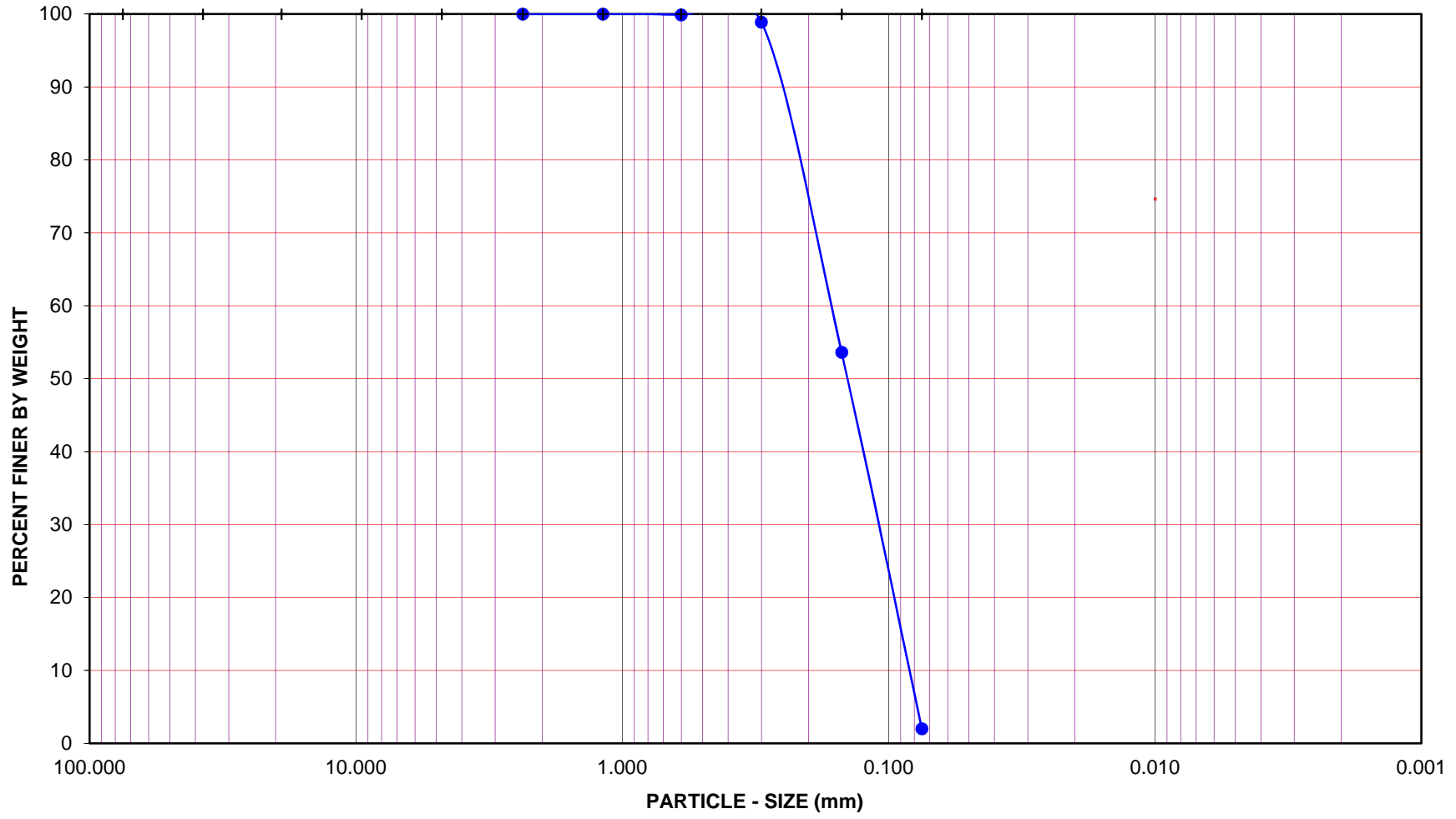
U. S. Sieve Size		Cumulative Weight Dry Soil Retained (g)	Percent Passing (%)
(in.)	(mm.)		
1 1/2"	37.5		
1"	25.0		
3/4"	19.0		
1/2"	12.5		
3/8"	9.5		
#4	4.75		
#8	2.36	<b>0.0</b>	100.0
#16	1.18	<b>0.1</b>	100.0
#30	0.600	<b>0.5</b>	99.9
#50	0.300	<b>5.9</b>	98.9
#100	0.150	<b>241.1</b>	53.6
#200	0.075	<b>508.7</b>	2.0
PAN			

GRAVEL: **0 %**  
 SAND: **98 %**  
 FINES: **2 %**  
 GROUP SYMBOL: **SP**

Cu = D60/D10 = 1.93  
 Cc = (D30)<sup>2</sup>/(D60\*D10) = 0.91

Remarks: \_\_\_\_\_

GRAVEL				SAND				FINES				
COARSE		FINE		COARSE	MEDIUM	FINE		SILT		CLAY		
U.S. STANDARD SIEVE OPENING				U.S. STANDARD SIEVE NUMBER				HYDROMETER				
3.0"	1 1/2"	3/4"	3/8"	#4	#8	#16	#30	#50	#100	#200		



Project Name: Pillar Point Harbor

Project No.: 5720.180

Station ID: PP Harbor Beach      Sample ID: IHBG18-2

Date, Time: 06/18/19, 17:10      Soil Type : SP

Soil Identification: Olive gray poorly-graded sand (SP)

GR:SA:FI : (%)      **0 : 98 : 2**



**PARTICLE - SIZE  
DISTRIBUTION  
ASTM D 6913**

Jul-19





**PARTICLE-SIZE DISTRIBUTION (GRADATION)  
of SOILS USING SIEVE ANALYSIS  
ASTM D 6913**

Project Name: [Pillar Point Harbor](#)  
 Project No.: [5720.180](#)  
 Station ID: [PP Harbor Beach](#)  
 Sample ID: [IHBG18-3](#)  
 Soil Identification: [Olive gray poorly-graded sand \(SP\)](#)

Tested By: [O. Figueroa](#) Date: [06/25/19](#)  
 Checked By: [J. Ward](#) Date: [07/11/19](#)  
 Date, Time: [06/18/19, 17:20](#)

		Moisture Content of Total Air - Dry Soil	
Container No.:	GE	Wt. of Air-Dry Soil + Cont. (g)	0.0
Wt. of Air-Dried Soil + Cont.(g)	851.2	Wt. of Dry Soil + Cont. (g)	0.0
Wt. of Container (g)	250.1	Wt. of Container No._____ (g)	1.0
Dry Wt. of Soil (g)	601.1	Moisture Content (%)	0.0

After Wet Sieve	Container No.	GE
	Wt. of Dry Soil + Container (g)	843.6
	Wt. of Container (g)	250.1
	Dry Wt. of Soil Retained on # 200 Sieve (g)	593.5

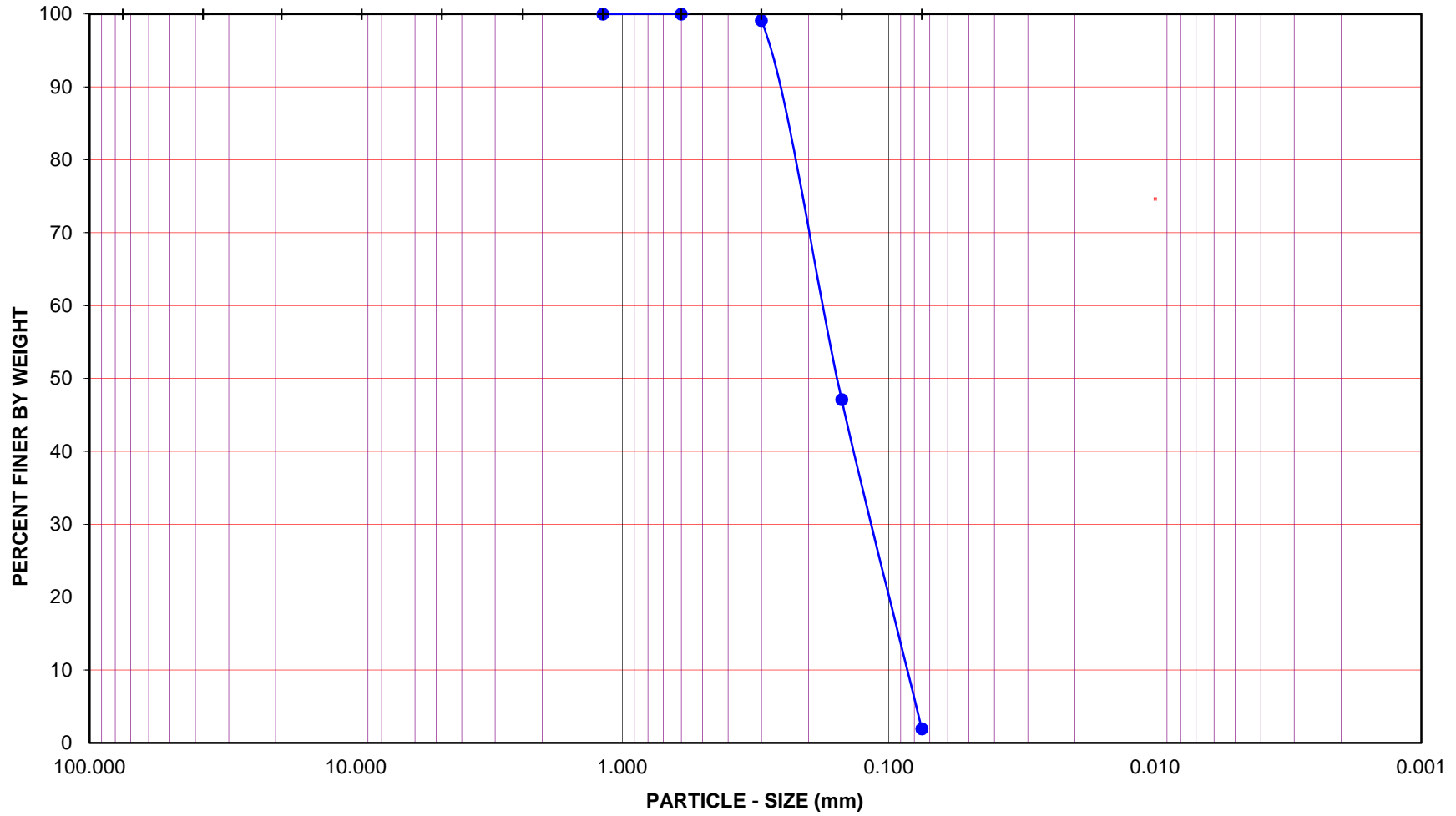
U. S. Sieve Size		Cumulative Weight Dry Soil Retained (g)	Percent Passing (%)
(in.)	(mm.)		
1 1/2"	37.5		
1"	25.0		
3/4"	19.0		
1/2"	12.5		
3/8"	9.5		
#4	4.75		
#8	2.36		
#16	1.18	0.0	100.0
#30	0.600	0.3	100.0
#50	0.300	5.6	99.1
#100	0.150	317.9	47.1
#200	0.075	589.5	1.9
PAN			

GRAVEL: 0 %  
 SAND: 98 %  
 FINES: 2 %  
 GROUP SYMBOL: SP

Cu = D60/D10 = 2.02  
 Cc = (D30)<sup>2</sup>/(D60\*D10) = 1.01

Remarks: \_\_\_\_\_

GRAVEL				SAND				FINES				
COARSE		FINE		COARSE	MEDIUM	FINE		SILT		CLAY		
U.S. STANDARD SIEVE OPENING				U.S. STANDARD SIEVE NUMBER				HYDROMETER				
3.0"	1 1/2"	3/4"	3/8"	#4	#8	#16	#30	#50	#100	#200		



Project Name: Pillar Point Harbor

Project No.: 5720.180

Station ID: PP Harbor Beach

Sample ID: IHBG18-3

Date, Time: 06/18/19, 17:20

Soil Type : SP

Soil Identification: Olive gray poorly-graded sand (SP)

GR:SA:FI : (%)      **0 : 98 : 2**



**PARTICLE - SIZE  
DISTRIBUTION  
ASTM D 6913**

Jul-19



**PARTICLE-SIZE DISTRIBUTION (GRADATION)  
of SOILS USING SIEVE ANALYSIS  
ASTM D 6913**

Project Name: Pillar Point Harbor

Tested By: O. Figueroa Date: 06/26/19

Project No.: 5720.180

Checked By: J. Ward Date: 07/11/19

Station ID: 1 Mid

Date, Time: 06/18/19, 12:00

Sample ID: PPIHVC18-1M

Soil Identification: Dark olive gray silty sand (SM)

		Moisture Content of Total Air - Dry Soil	
Container No.:	DR	Wt. of Air-Dry Soil + Cont. (g)	0.0
Wt. of Air-Dried Soil + Cont.(g)	892.0	Wt. of Dry Soil + Cont. (g)	0.0
Wt. of Container (g)	217.5	Wt. of Container No._____ (g)	1.0
Dry Wt. of Soil (g)	674.5	Moisture Content (%)	0.0

After Wet Sieve	Container No.	DR
	Wt. of Dry Soil + Container (g)	814.2
	Wt. of Container (g)	217.5
	Dry Wt. of Soil Retained on # 200 Sieve (g)	596.7

U. S. Sieve Size		Cumulative Weight Dry Soil Retained (g)	Percent Passing (%)
(in.)	(mm.)		
1 1/2"	37.5		
1"	25.0		
3/4"	19.0		
1/2"	12.5	0.0	100.0
3/8"	9.5	8.2	98.8
#4	4.75	20.0	97.0
#8	2.36	58.0	91.4
#16	1.18	113.6	83.2
#30	0.600	184.4	72.7
#50	0.300	255.3	62.1
#100	0.150	438.3	35.0
#200	0.075	588.8	12.7
PAN			

GRAVEL: 3 %

SAND: 84 %

FINES: 13 %

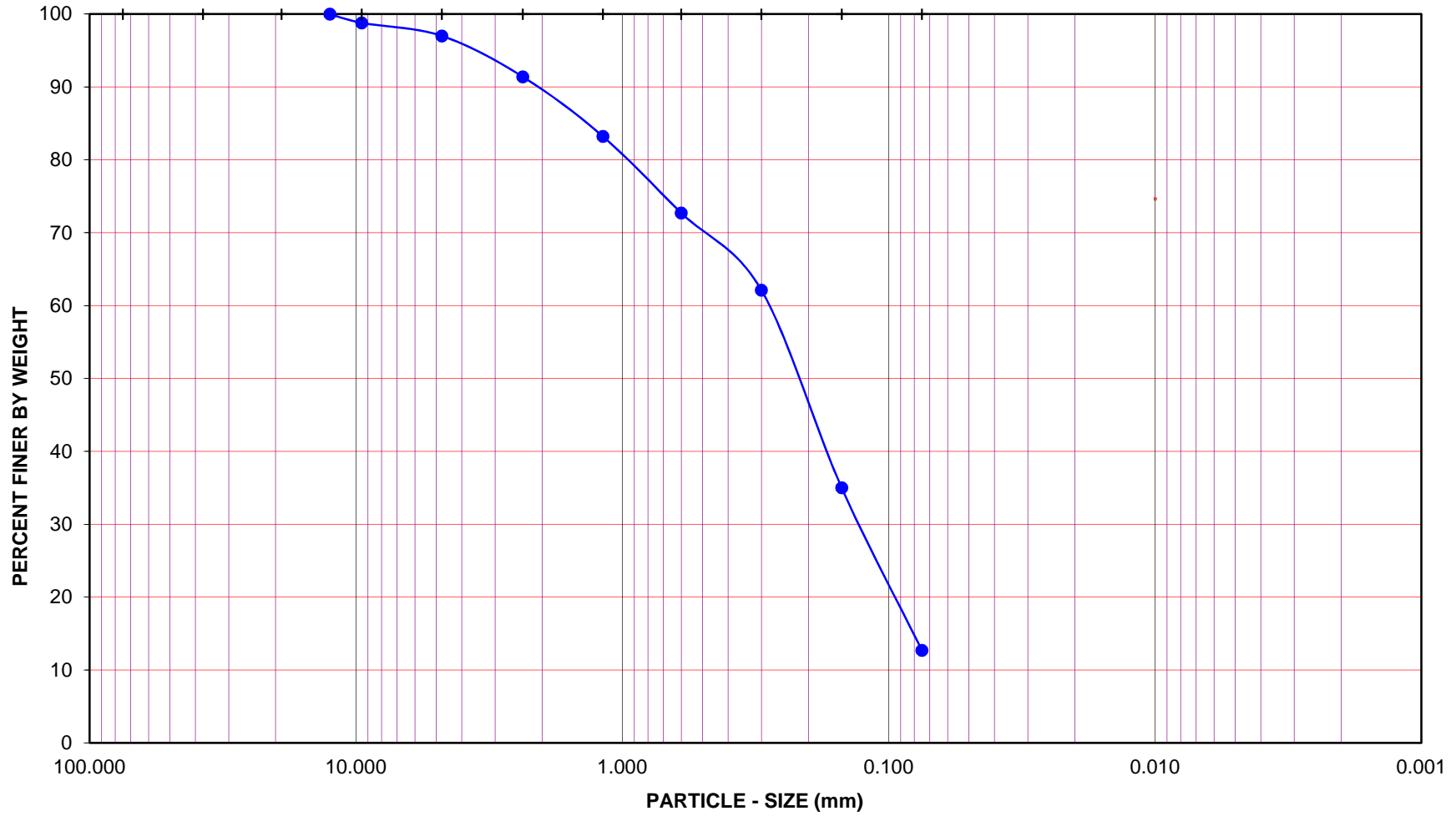
GROUP SYMBOL: SM

Cu = D60/D10 = \_\_\_\_\_

Cc = (D30)<sup>2</sup>/(D60\*D10) = \_\_\_\_\_

Remarks: \_\_\_\_\_

GRAVEL				SAND				FINES				
COARSE		FINE		COARSE	MEDIUM	FINE		SILT		CLAY		
U.S. STANDARD SIEVE OPENING				U.S. STANDARD SIEVE NUMBER				HYDROMETER				
3.0"	1 1/2"	3/4"	3/8"	#4	#8	#16	#30	#50	#100	#200		



Project Name: Pillar Point Harbor

Project No.: 5720.180

Station ID: 1 Mid

Sample ID: PPIHVC18-1M

Date, Time: 06/18/19, 12:00

Soil Type : SM

Soil Identification: Dark olive gray silty sand (SM)

GR:SA:FI : (%) **3 : 84 : 13**



**PARTICLE - SIZE  
DISTRIBUTION  
ASTM D 6913**

Jul-19



**PARTICLE-SIZE DISTRIBUTION (GRADATION)  
of SOILS USING SIEVE ANALYSIS  
ASTM D 6913**

Project Name: Pillar Point Harbor      Tested By: OHF/GEB    Date: 06/26/19  
 Project No.: 5720.180                      Checked By: J. Ward    Date: 07/11/19  
 Station ID: 1 Top                              Date, Time: 06/18/19, 12:00  
 Sample ID: PPIHVC18-1T  
 Soil Identification: Dark olive gray silty sand (SM), shells noted

		Moisture Content of Total Air - Dry Soil	
Container No.:	WR	Wt. of Air-Dry Soil + Cont. (g)	0.0
Wt. of Air-Dried Soil + Cont.(g)	755.8	Wt. of Dry Soil + Cont. (g)	0.0
Wt. of Container (g)	236.9	Wt. of Container No._____ (g)	1.0
Dry Wt. of Soil (g)	518.9	Moisture Content (%)	0.0

After Wet Sieve	Container No.	WR
	Wt. of Dry Soil + Container (g)	691.5
	Wt. of Container (g)	236.9
	Dry Wt. of Soil Retained on # 200 Sieve (g)	454.6

U. S. Sieve Size		Cumulative Weight Dry Soil Retained (g)	Percent Passing (%)
(in.)	(mm.)		
1 1/2"	37.5		
1"	25.0		
3/4"	19.0		
1/2"	12.5		
3/8"	9.5	0.0	100.0
#4	4.75	4.1	99.2
#8	2.36	18.0	96.5
#16	1.18	40.1	92.3
#30	0.600	90.5	82.6
#50	0.300	159.2	69.3
#100	0.150	344.5	33.6
#200	0.075	448.6	13.5
PAN			

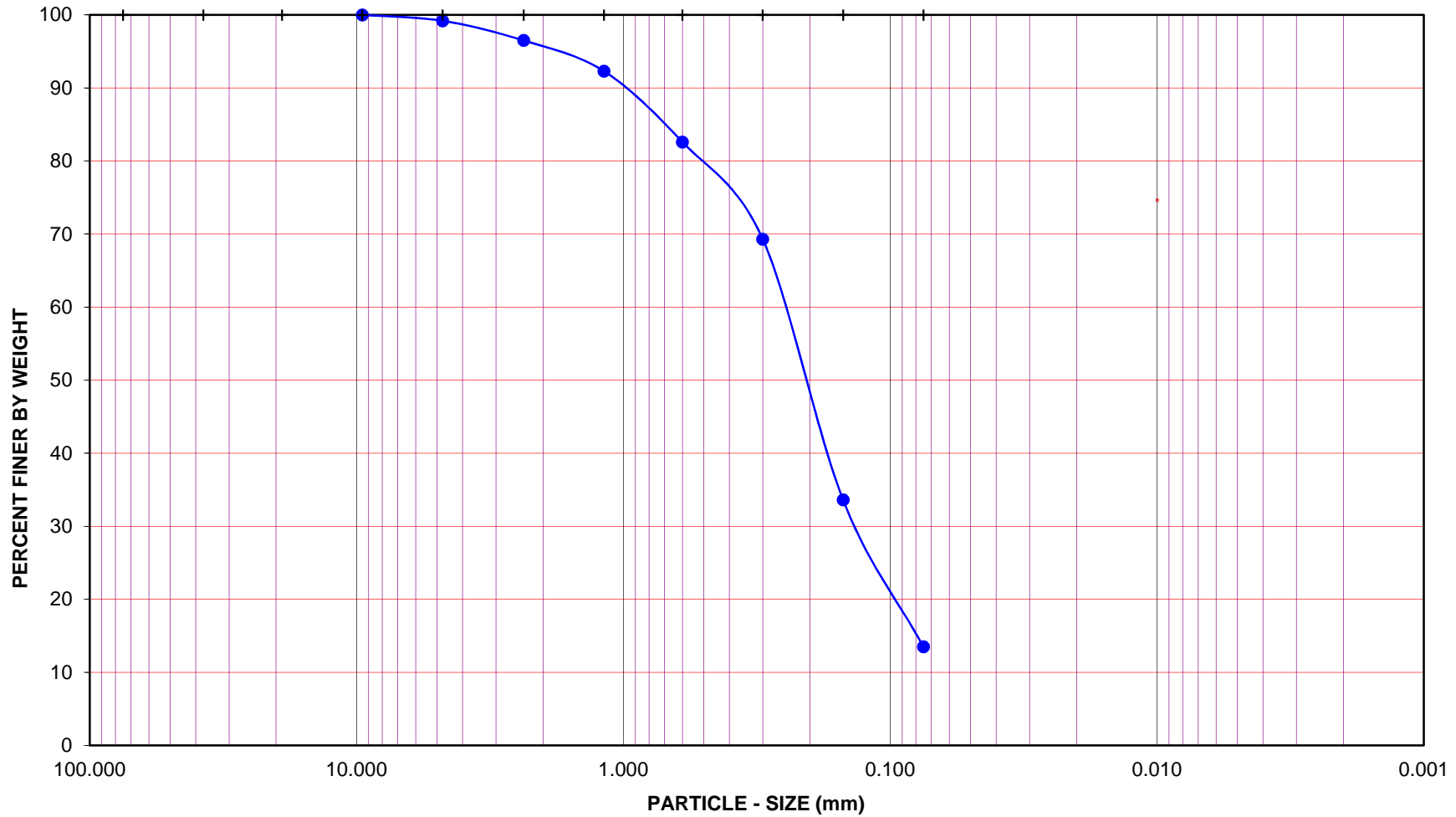
GRAVEL: 1 %  
 SAND: 85 %  
 FINES: 14 %  
 GROUP SYMBOL: SM

Cu = D60/D10 = \_\_\_\_\_

Cc = (D30)<sup>2</sup>/(D60\*D10) = \_\_\_\_\_

Remarks: \_\_\_\_\_

GRAVEL				SAND				FINES				
COARSE		FINE		COARSE	MEDIUM	FINE		SILT		CLAY		
U.S. STANDARD SIEVE OPENING				U.S. STANDARD SIEVE NUMBER				HYDROMETER				
3.0"	1 1/2"	3/4"	3/8"	#4	#8	#16	#30	#50	#100	#200		



Project Name: Pillar Point Harbor

Project No.: 5720.180

Station ID: 1 Top

Sample ID: PPIHVC18-1T

Date, Time: 06/18/19, 12:00

Soil Type : SM

Soil Identification: Dark olive gray silty sand (SM), shells noted

GR:SA:FI : (%) **1 : 85 : 14**



**PARTICLE - SIZE  
DISTRIBUTION  
ASTM D 6913**

Jul-19



**PARTICLE-SIZE DISTRIBUTION (GRADATION)  
of SOILS USING SIEVE ANALYSIS  
ASTM D 6913**

Project Name: Pillar Point Harbor

Tested By: OHF/GEB Date: 06/26/19

Project No.: 5720.180

Checked By: J. Ward Date: 07/11/19

Station ID: 2 Mid, 2.0-3.7'

Date, Time: 06/19/19, 11:10

Sample ID: PPIHVC18-2M

Soil Identification: Olive brown silty sand (SM)

		Moisture Content of Total Air - Dry Soil	
Container No.:	DP-1	Wt. of Air-Dry Soil + Cont. (g)	0.0
Wt. of Air-Dried Soil + Cont.(g)	831.7	Wt. of Dry Soil + Cont. (g)	0.0
Wt. of Container (g)	272.4	Wt. of Container No._____ (g)	1.0
Dry Wt. of Soil (g)	559.3	Moisture Content (%)	0.0

After Wet Sieve	Container No.	DP-1
	Wt. of Dry Soil + Container (g)	602.1
	Wt. of Container (g)	272.4
	Dry Wt. of Soil Retained on # 200 Sieve (g)	329.7

U. S. Sieve Size		Cumulative Weight Dry Soil Retained (g)	Percent Passing (%)
(in.)	(mm.)		
1 1/2"	37.5		
1"	25.0		
3/4"	19.0		
1/2"	12.5		
3/8"	9.5	0.0	100.0
#4	4.75	2.8	99.5
#8	2.36	34.4	93.8
#16	1.18	82.0	85.3
#30	0.600	128.6	77.0
#50	0.300	183.3	67.2
#100	0.150	266.9	52.3
#200	0.075	326.0	41.7
PAN			

GRAVEL: **1 %**

SAND: **57 %**

FINES: **42 %**

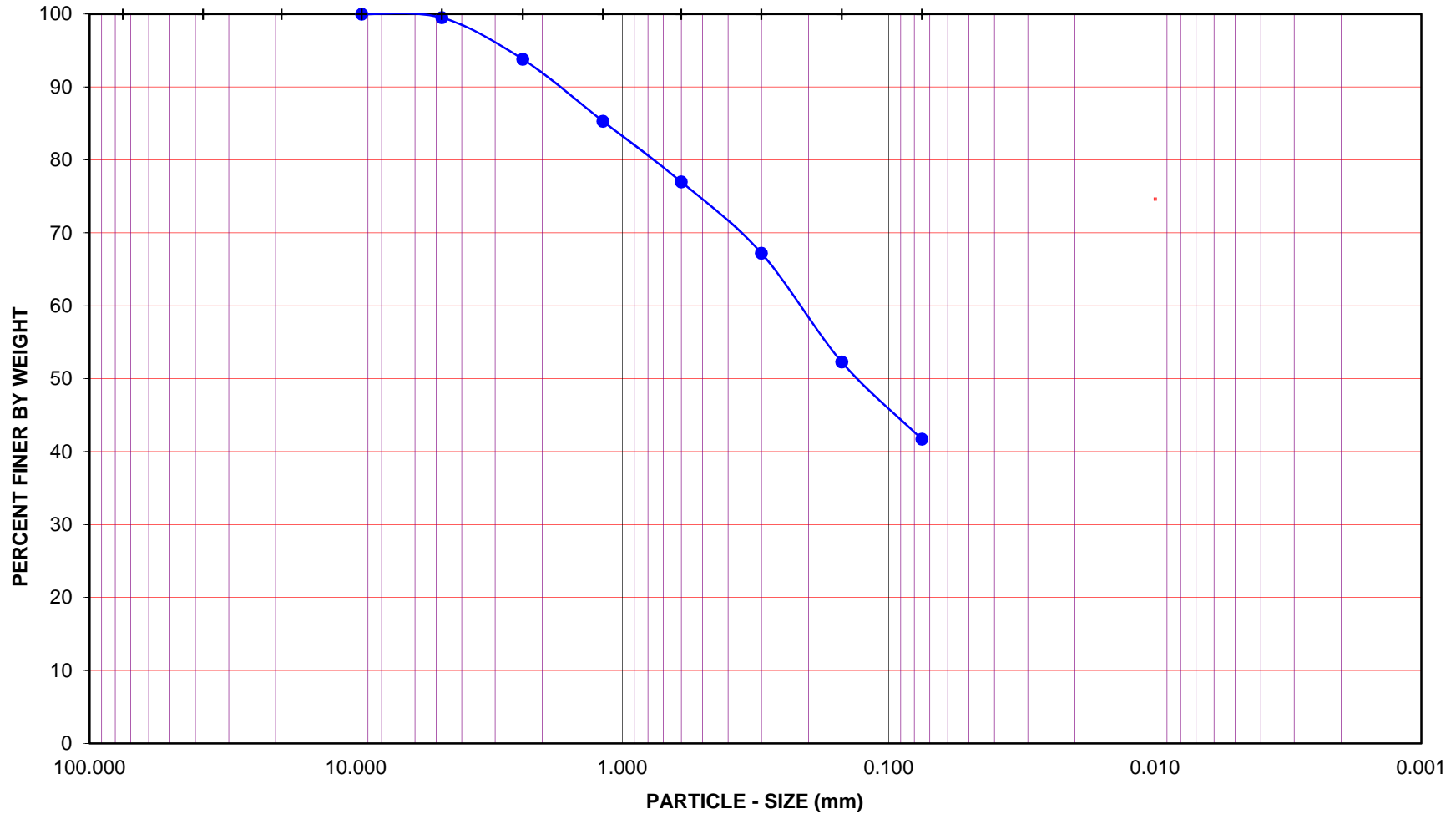
GROUP SYMBOL: **SM**

Cu = D60/D10 = \_\_\_\_\_

Cc = (D30)<sup>2</sup>/(D60\*D10) = \_\_\_\_\_

Remarks: \_\_\_\_\_

GRAVEL				SAND				FINES				
COARSE		FINE		COARSE	MEDIUM	FINE		SILT		CLAY		
U.S. STANDARD SIEVE OPENING				U.S. STANDARD SIEVE NUMBER				HYDROMETER				
3.0"	1 1/2"	3/4"	3/8"	#4	#8	#16	#30	#50	#100	#200		



Project Name: Pillar Point Harbor

Project No.: 5720.180

Station ID: 2 Mid, 2.0-3.7'

Sample ID: PPIHVC18-2M

Date, Time: 06/19/19, 11:10

Soil Type : SM

Soil Identification: Olive brown silty sand (SM)

GR:SA:FI : (%)      **1 : 57 : 42**



Leighton

**PARTICLE - SIZE  
DISTRIBUTION  
ASTM D 6913**

Jul-19





**PARTICLE-SIZE DISTRIBUTION (GRADATION)  
of SOILS USING SIEVE ANALYSIS  
ASTM D 6913**

Project Name: Pillar Point Harbor      Tested By: ACS/OHF    Date: 06/21/19  
 Project No.: 5720.180                              Checked By: J. Ward    Date: 07/11/19  
 Station ID: 2 Top, 0-2.0'                        Date, Time: 06/19/19, 11:10  
 Sample ID: PPIHVC18-2T  
 Soil Identification: Olive gray silty sand (SM), few shells noted

		Moisture Content of Total Air - Dry Soil	
Container No.:	YK	Wt. of Air-Dry Soil + Cont. (g)	0.0
Wt. of Air-Dried Soil + Cont.(g)	683.5	Wt. of Dry Soil + Cont. (g)	0.0
Wt. of Container (g)	251.4	Wt. of Container No. _____ (g)	1.0
Dry Wt. of Soil (g)	432.1	Moisture Content (%)	0.0

After Wet Sieve	Container No.	YK
	Wt. of Dry Soil + Container (g)	485.2
	Wt. of Container (g)	251.4
	Dry Wt. of Soil Retained on # 200 Sieve (g)	233.8

U. S. Sieve Size		Cumulative Weight Dry Soil Retained (g)	Percent Passing (%)
(in.)	(mm.)		
1 1/2"	37.5		
1"	25.0		
3/4"	19.0		
1/2"	12.5		
3/8"	9.5	0.0	100.0
#4	4.75	1.0	99.8
#8	2.36	2.8	99.4
#16	1.18	4.3	99.0
#30	0.600	5.3	98.8
#50	0.300	14.3	96.7
#100	0.150	55.1	87.2
#200	0.075	226.0	47.7
PAN			

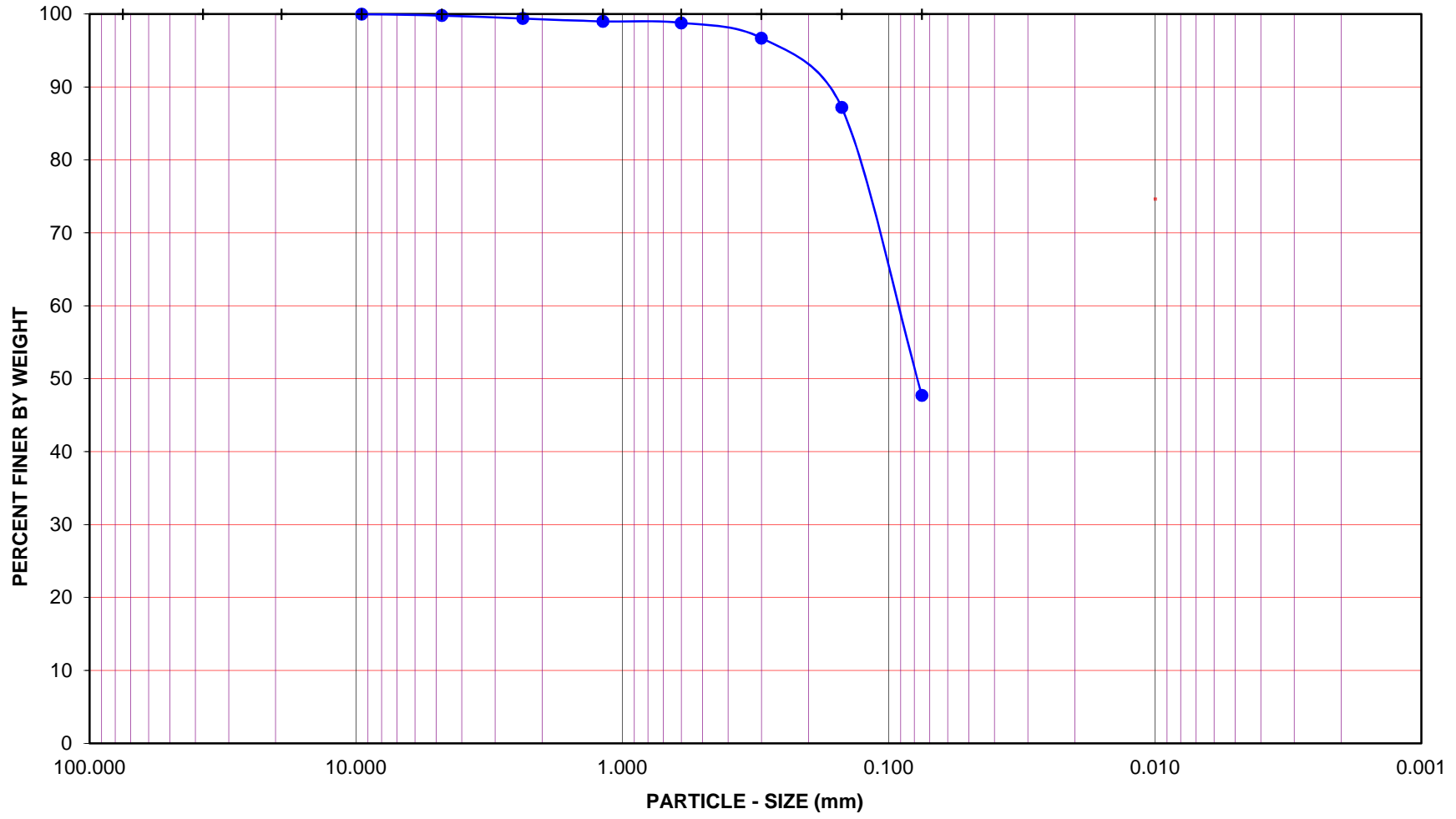
GRAVEL: 0 %  
 SAND: 52 %  
 FINES: 48 %  
 GROUP SYMBOL: SM

Cu = D60/D10 = \_\_\_\_\_

Cc = (D30)<sup>2</sup>/(D60\*D10) = \_\_\_\_\_

Remarks: \_\_\_\_\_

GRAVEL				SAND				FINES				
COARSE		FINE		COARSE	MEDIUM	FINE		SILT		CLAY		
U.S. STANDARD SIEVE OPENING				U.S. STANDARD SIEVE NUMBER				HYDROMETER				
3.0"	1 1/2"	3/4"	3/8"	#4	#8	#16	#30	#50	#100	#200		



Project Name: Pillar Point Harbor

Project No.: 5720.180

Station ID: 2 Top, 0-2.0'

Sample ID: PPIHVC18-2T

Date, Time: 06/19/19, 11:10

Soil Type : SM

Soil Identification: Olive gray silty sand (SM), few shells noted

GR:SA:FI : (%) **0 : 52 : 48**



**PARTICLE - SIZE DISTRIBUTION**  
**ASTM D 6913**

Jul-19



**PARTICLE-SIZE DISTRIBUTION (GRADATION)  
of SOILS USING SIEVE ANALYSIS  
ASTM D 6913**

Project Name: Pillar Point Harbor

Tested By: OHF/ACS Date: 06/26/19

Project No.: 5720.180

Checked By: J. Ward Date: 07/11/19

Station ID: 3 Bottom

Date, Time: 06/18/19, 16:25

Sample ID: PPIHVC18-3B

Soil Identification: Olive brown silty sand (SM)

		Moisture Content of Total Air - Dry Soil	
Container No.:	957	Wt. of Air-Dry Soil + Cont. (g)	0.0
Wt. of Air-Dried Soil + Cont.(g)	748.3	Wt. of Dry Soil + Cont. (g)	0.0
Wt. of Container (g)	108.5	Wt. of Container No._____ (g)	1.0
Dry Wt. of Soil (g)	639.8	Moisture Content (%)	0.0

After Wet Sieve	Container No.	957
	Wt. of Dry Soil + Container (g)	518.2
	Wt. of Container (g)	108.5
	Dry Wt. of Soil Retained on # 200 Sieve (g)	409.7

U. S. Sieve Size		Cumulative Weight Dry Soil Retained (g)	Percent Passing (%)
(in.)	(mm.)		
1 1/2"	37.5		
1"	25.0		
3/4"	19.0		
1/2"	12.5		
3/8"	9.5	0.0	100.0
#4	4.75	4.9	99.2
#8	2.36	36.4	94.3
#16	1.18	90.5	85.9
#30	0.600	144.1	77.5
#50	0.300	206.0	67.8
#100	0.150	326.6	49.0
#200	0.075	405.1	36.7
PAN			

GRAVEL: **1 %**

SAND: **62 %**

FINES: **37 %**

GROUP SYMBOL: **SM**

Cu = D60/D10 = \_\_\_\_\_

Cc = (D30)<sup>2</sup>/(D60\*D10) = \_\_\_\_\_

Remarks: \_\_\_\_\_

GRAVEL				SAND				FINES			
COARSE		FINE		COARSE	MEDIUM	FINE		SILT		CLAY	

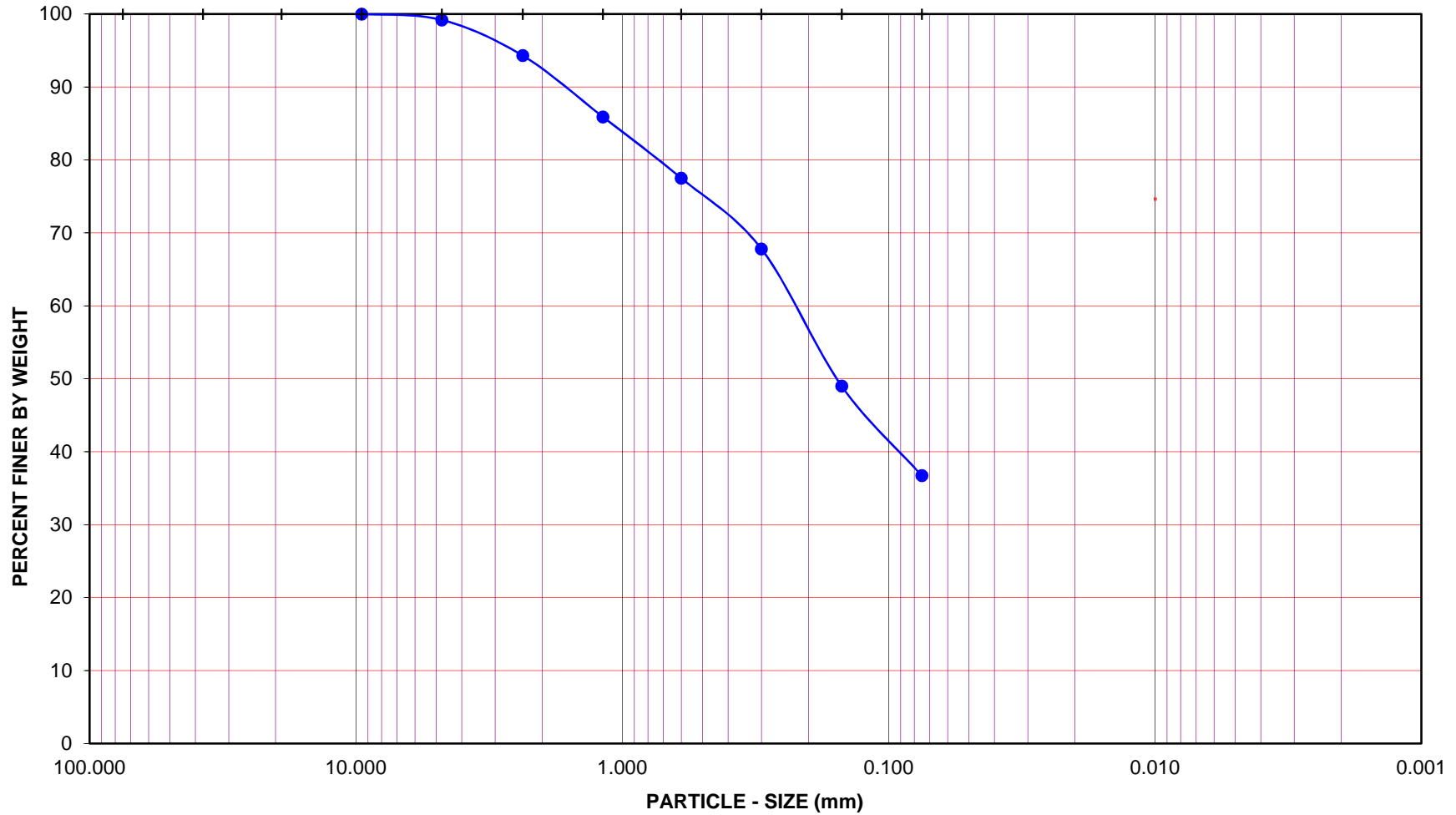
U.S. STANDARD SIEVE OPENING

3.0" 1 1/2" 3/4" 3/8" #4

U.S. STANDARD SIEVE NUMBER

#8 #16 #30 #50 #100 #200

HYDROMETER



Project Name: Pillar Point Harbor

Project No.: 5720.180

Station ID: 3 Bottom

Sample ID: PPIHVC18-3B

Date, Time: 06/18/19, 16:25

Soil Type : SM

Soil Identification: Olive brown silty sand (SM)

GR:SA:FI : (%) **1 : 62 : 37**



Leighton

**PARTICLE - SIZE  
DISTRIBUTION  
ASTM D 6913**

Jul-19



**PARTICLE-SIZE DISTRIBUTION (GRADATION)  
of SOILS USING SIEVE ANALYSIS  
ASTM D 6913**

Project Name: Pillar Point Harbor

Tested By: O. Figueroa Date: 06/26/19

Project No.: 5720.180

Checked By: J. Ward Date: 07/11/19

Station ID: 3 Mid

Date, Time: 06/18/19, 16:25

Sample ID: PPIHVC18-3M

Soil Identification: Olive brown silty sand (SM)

		Moisture Content of Total Air - Dry Soil	
Container No.:	XP	Wt. of Air-Dry Soil + Cont. (g)	0.0
Wt. of Air-Dried Soil + Cont.(g)	955.5	Wt. of Dry Soil + Cont. (g)	0.0
Wt. of Container (g)	201.2	Wt. of Container No._____ (g)	1.0
Dry Wt. of Soil (g)	754.3	Moisture Content (%)	0.0

After Wet Sieve	Container No.	XP
	Wt. of Dry Soil + Container (g)	784.4
	Wt. of Container (g)	201.2
	Dry Wt. of Soil Retained on # 200 Sieve (g)	583.2

U. S. Sieve Size		Cumulative Weight Dry Soil Retained (g)	Percent Passing (%)
(in.)	(mm.)		
1 1/2"	37.5		
1"	25.0		
3/4"	19.0		
1/2"	12.5	0.0	100.0
3/8"	9.5	8.6	98.9
#4	4.75	25.9	96.6
#8	2.36	64.5	91.4
#16	1.18	119.8	84.1
#30	0.600	173.5	77.0
#50	0.300	224.6	70.2
#100	0.150	436.3	42.2
#200	0.075	577.4	23.5
PAN			

GRAVEL: **3 %**

SAND: **73 %**

FINES: **24 %**

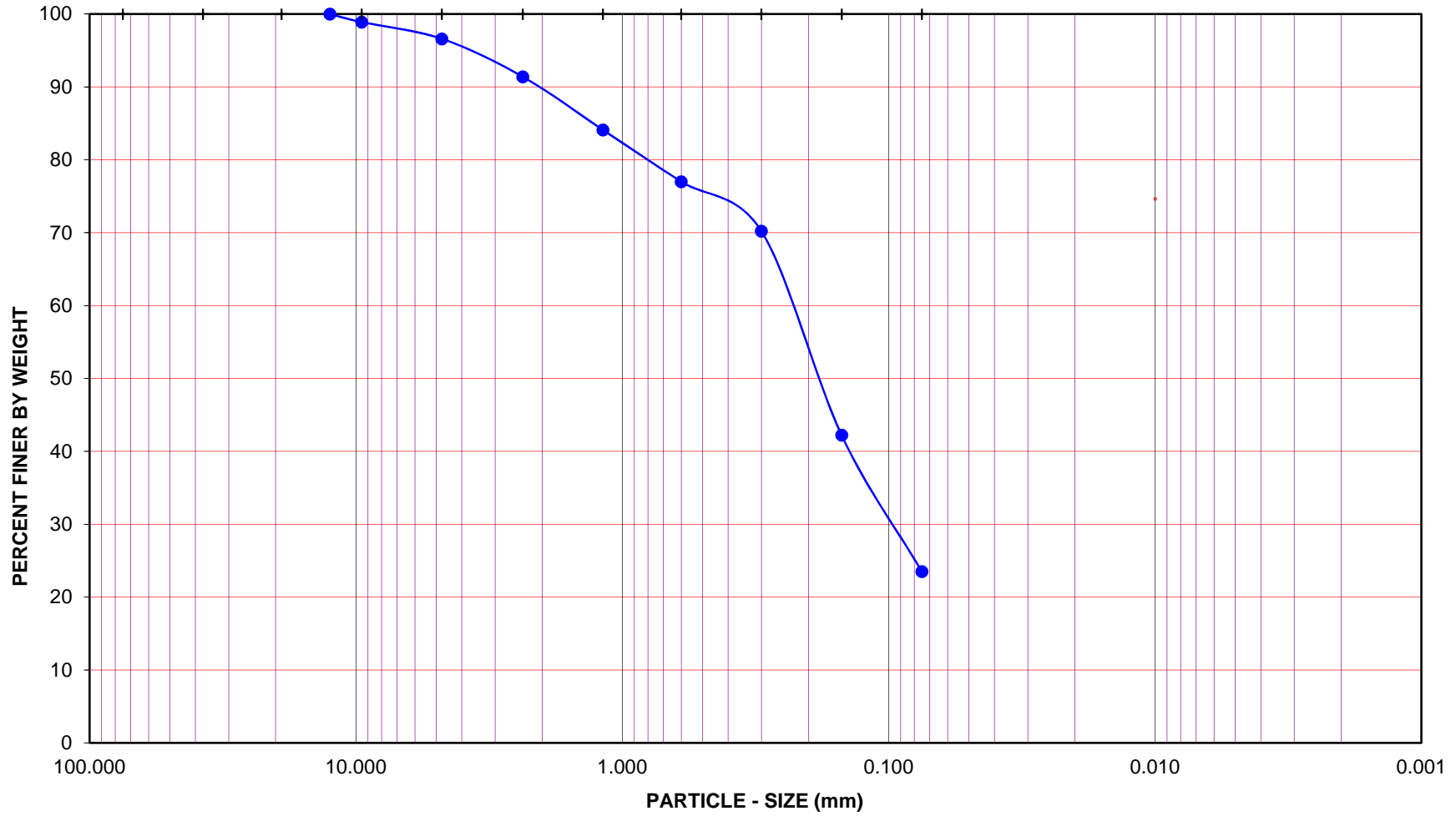
GROUP SYMBOL: **SM**

Cu = D60/D10 = \_\_\_\_\_

Cc = (D30)<sup>2</sup>/(D60\*D10) = \_\_\_\_\_

Remarks: \_\_\_\_\_

GRAVEL				SAND				FINES				
COARSE		FINE		COARSE	MEDIUM	FINE		SILT		CLAY		
U.S. STANDARD SIEVE OPENING				U.S. STANDARD SIEVE NUMBER				HYDROMETER				
3.0"	1 1/2"	3/4"	3/8"	#4	#8	#16	#30	#50	#100	#200		



Project Name: Pillar Point Harbor

Project No.: 5720.180

Station ID: 3 Mid

Sample ID: PPIHVC18-3M

Date, Time: 06/18/19, 16:25

Soil Type : SM

Soil Identification: Olive brown silty sand (SM)

GR:SA:FI : (%) **3 : 73 : 24**



**PARTICLE - SIZE  
DISTRIBUTION  
ASTM D 6913**

Jul-19



**PARTICLE-SIZE DISTRIBUTION (GRADATION)  
of SOILS USING SIEVE ANALYSIS  
ASTM D 6913**

Project Name: Pillar Point Harbor

Tested By: OHF/ACS Date: 06/26/19

Project No.: 5720.180

Checked By: J. Ward Date: 07/11/19

Station ID: 3 Top

Date, Time: 06/18/19, 16:25

Sample ID: PPIHVC18-3T

Soil Identification: Dark olive gray silty sand (SM)

		Moisture Content of Total Air - Dry Soil	
Container No.:	YK	Wt. of Air-Dry Soil + Cont. (g)	0.0
Wt. of Air-Dried Soil + Cont.(g)	659.0	Wt. of Dry Soil + Cont. (g)	0.0
Wt. of Container (g)	251.4	Wt. of Container No._____ (g)	1.0
Dry Wt. of Soil (g)	407.6	Moisture Content (%)	0.0

After Wet Sieve	Container No.	YK
	Wt. of Dry Soil + Container (g)	532.0
	Wt. of Container (g)	251.4
	Dry Wt. of Soil Retained on # 200 Sieve (g)	280.6

U. S. Sieve Size		Cumulative Weight Dry Soil Retained (g)	Percent Passing (%)
(in.)	(mm.)		
1 1/2"	37.5		
1"	25.0		
3/4"	19.0		
1/2"	12.5		
3/8"	9.5	0.0	100.0
#4	4.75	0.5	99.9
#8	2.36	2.2	99.5
#16	1.18	5.9	98.6
#30	0.600	17.3	95.8
#50	0.300	35.4	91.3
#100	0.150	127.7	68.7
#200	0.075	279.2	31.5
PAN			

GRAVEL: **0 %**

SAND: **68 %**

FINES: **32 %**

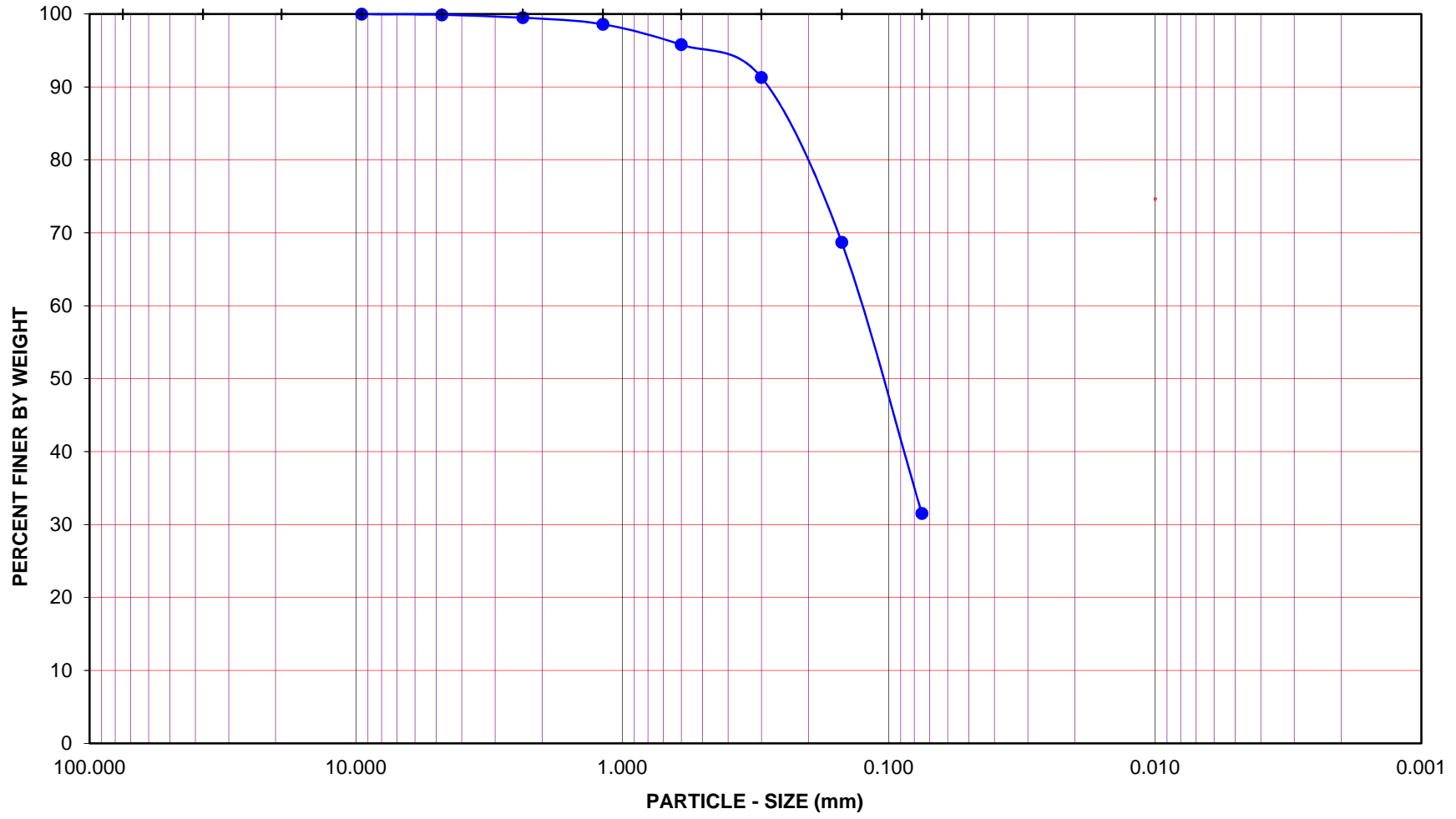
GROUP SYMBOL: **SM**

Cu = D60/D10 = \_\_\_\_\_

Cc = (D30)<sup>2</sup>/(D60\*D10) = \_\_\_\_\_

Remarks: \_\_\_\_\_

GRAVEL				SAND				FINES				
COARSE		FINE		COARSE	MEDIUM	FINE		SILT		CLAY		
U.S. STANDARD SIEVE OPENING				U.S. STANDARD SIEVE NUMBER				HYDROMETER				
3.0"	1 1/2"	3/4"	3/8"	#4	#8	#16	#30	#50	#100	#200		



Project Name: Pillar Point Harbor

Project No.: 5720.180

Station ID: 3 Top

Sample ID: PPIHVC18-3T

Date, Time: 06/18/19, 16:25

Soil Type : SM

Soil Identification: Dark olive gray silty sand (SM)

GR:SA:FI : (%) **0 : 68 : 32**



**PARTICLE - SIZE DISTRIBUTION**  
ASTM D 6913

Jul-19





**PARTICLE-SIZE DISTRIBUTION (GRADATION)  
of SOILS USING SIEVE ANALYSIS  
ASTM D 6913**

Project Name: Pillar Point Harbor      Tested By: ACS/OHF    Date: 06/21/19  
 Project No.: 5720.180                              Checked By: J. Ward    Date: 07/11/19  
 Station ID: 4-3.0-4.1                              Date, Time: 06/18/19, 15:35  
 Sample ID: PPIHVC18-4-3.0-4.1  
 Soil Identification: Olive gray poorly-graded sand (SP)

		Moisture Content of Total Air - Dry Soil	
Container No.:	PH	Wt. of Air-Dry Soil + Cont. (g)	0.0
Wt. of Air-Dried Soil + Cont.(g)	829.9	Wt. of Dry Soil + Cont. (g)	0.0
Wt. of Container (g)	202.6	Wt. of Container No._____ (g)	1.0
Dry Wt. of Soil (g)	627.3	Moisture Content (%)	0.0

After Wet Sieve	Container No.	PH
	Wt. of Dry Soil + Container (g)	816.9
	Wt. of Container (g)	202.6
	Dry Wt. of Soil Retained on # 200 Sieve (g)	614.3

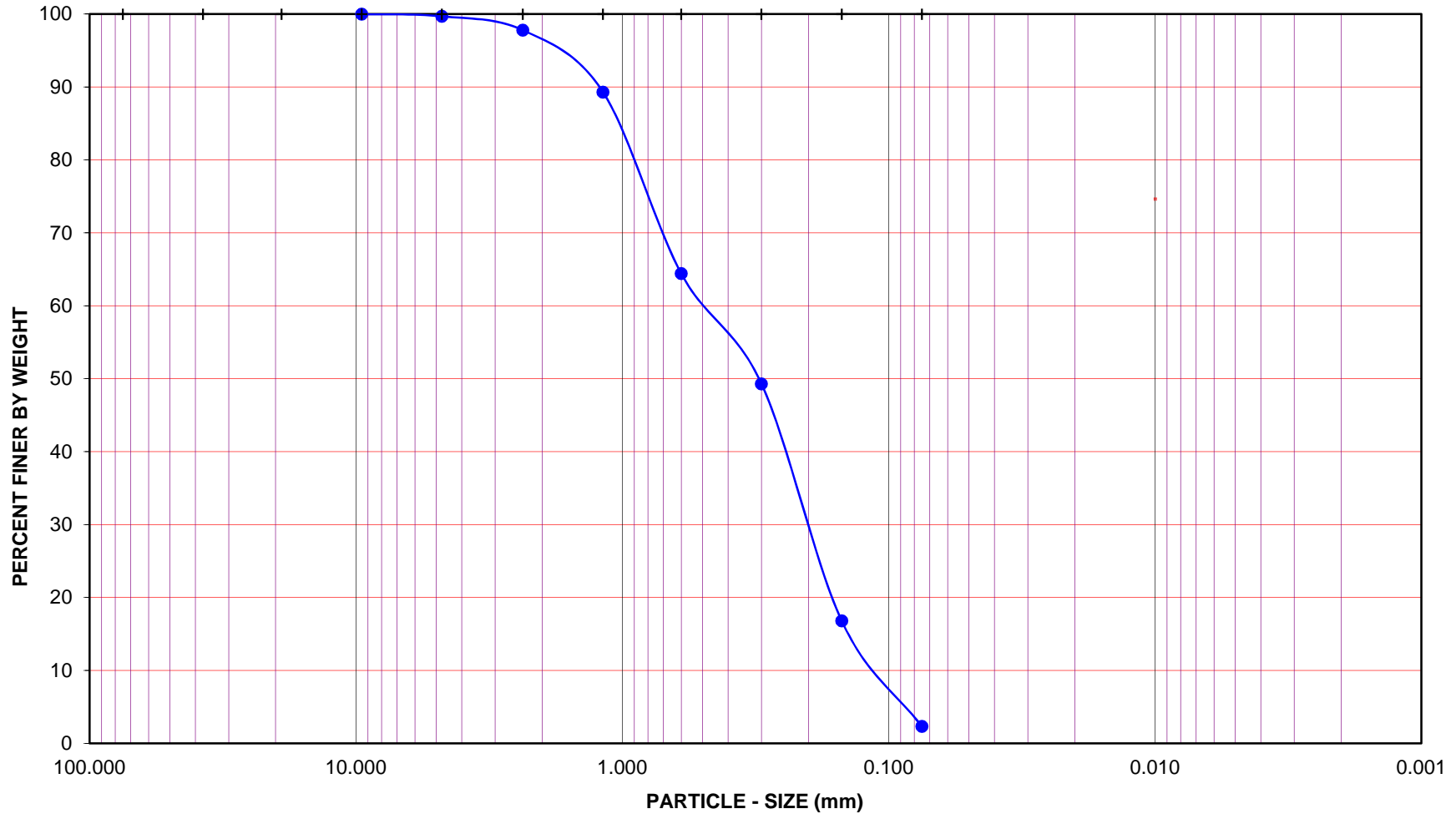
U. S. Sieve Size		Cumulative Weight Dry Soil Retained (g)	Percent Passing (%)
(in.)	(mm.)		
1 1/2"	37.5		
1"	25.0		
3/4"	19.0		
1/2"	12.5		
3/8"	9.5	0.0	100.0
#4	4.75	2.0	99.7
#8	2.36	14.1	97.8
#16	1.18	67.3	89.3
#30	0.600	223.6	64.4
#50	0.300	318.3	49.3
#100	0.150	522.0	16.8
#200	0.075	613.1	2.3
PAN			

GRAVEL:                              **0 %**  
 SAND:                                **98 %**  
 FINES:                                **2 %**  
 GROUP SYMBOL:                **SP**

Cu = D60/D10 = 4.17  
 Cc = (D30)<sup>2</sup>/(D60\*D10) = 0.67

Remarks: \_\_\_\_\_

GRAVEL				SAND				FINES				
COARSE		FINE		COARSE	MEDIUM	FINE		SILT	CLAY			
U.S. STANDARD SIEVE OPENING				U.S. STANDARD SIEVE NUMBER				HYDROMETER				
3.0"	1 1/2"	3/4"	3/8"	#4	#8	#16	#30	#50	#100	#200		



Project Name: Pillar Point Harbor

Project No.: 5720.180

Station ID: 4-3.0-4.1

Sample ID: PPIHVC18-4-3.0-4.1

Date, Time: 06/18/19, 15:35

Soil Type : SP

Soil Identification: Olive gray poorly-graded sand (SP)

GR:SA:FI : (%) **0 : 98 : 2**



**PARTICLE - SIZE  
DISTRIBUTION  
ASTM D 6913**

Jul-19



**PARTICLE-SIZE DISTRIBUTION (GRADATION)  
of SOILS USING SIEVE ANALYSIS  
ASTM D 6913**

Project Name: Pillar Point Harbor                      Tested By: ACS/OHF    Date: 06/21/19  
 Project No.: 5720.180    Checked By: J. Ward    Date: 07/11/19  
 Station ID: 4-4.1-5.8    Date, Time: 06/18/19, 15:35  
 Sample ID: PPIHVC18-4-4.1-5.8  
 Soil Identification: Brown silty sand (SM)

		Moisture Content of Total Air - Dry Soil	
Container No.:	WR	Wt. of Air-Dry Soil + Cont. (g)	0.0
Wt. of Air-Dried Soil + Cont.(g)	780.0	Wt. of Dry Soil + Cont. (g)	0.0
Wt. of Container (g)	236.9	Wt. of Container No._____ (g)	1.0
Dry Wt. of Soil (g)	543.1	Moisture Content (%)	0.0

After Wet Sieve	Container No.	WR
	Wt. of Dry Soil + Container (g)	552.7
	Wt. of Container (g)	236.9
	Dry Wt. of Soil Retained on # 200 Sieve (g)	315.8

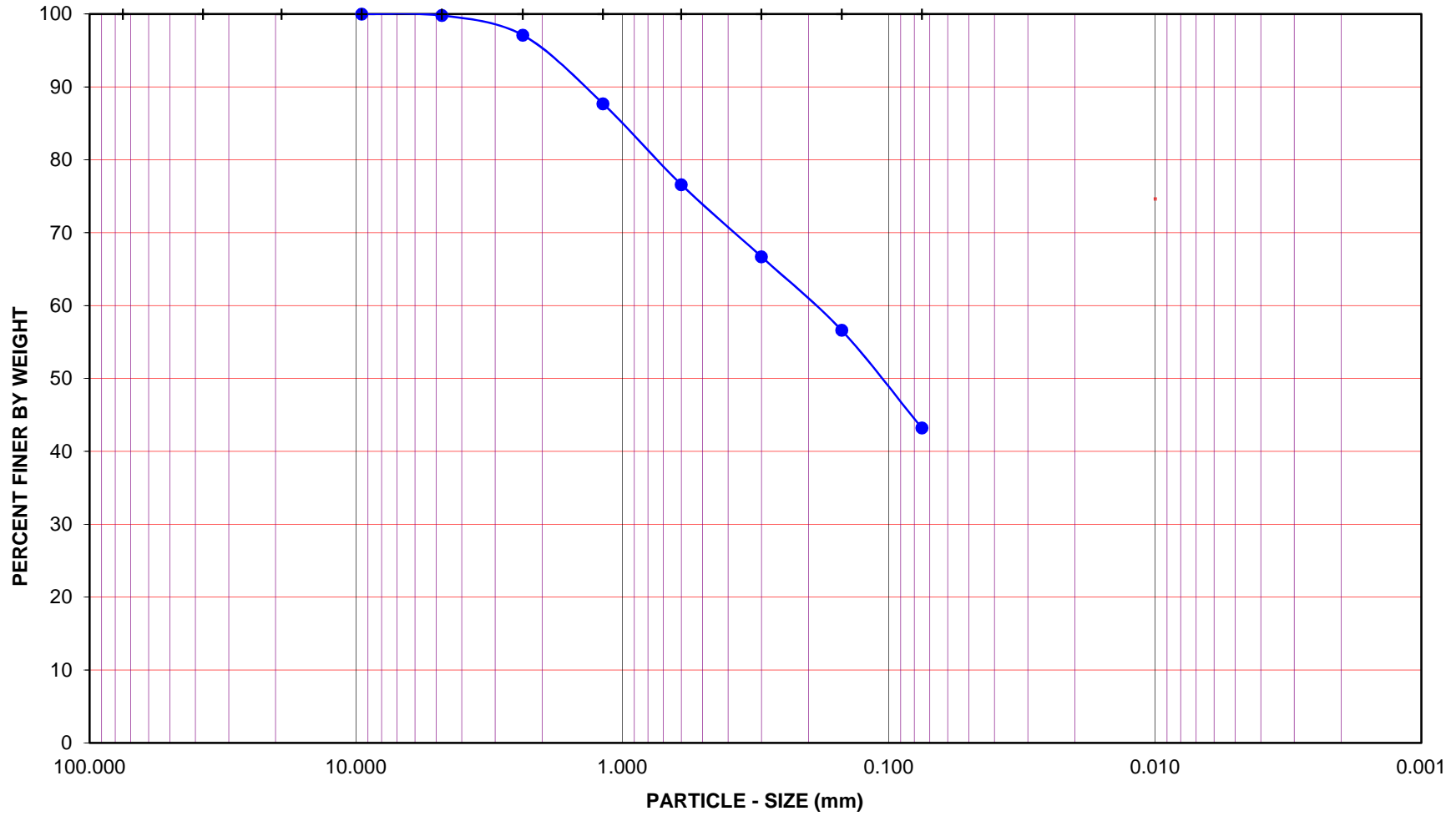
U. S. Sieve Size		Cumulative Weight Dry Soil Retained (g)	Percent Passing (%)
(in.)	(mm.)		
1 1/2"	37.5		
1"	25.0		
3/4"	19.0		
1/2"	12.5		
3/8"	9.5	0.0	100.0
#4	4.75	0.9	99.8
#8	2.36	16.0	97.1
#16	1.18	66.8	87.7
#30	0.600	126.9	76.6
#50	0.300	180.6	66.7
#100	0.150	235.8	56.6
#200	0.075	308.7	43.2
PAN			

GRAVEL:    **0 %**  
 SAND:    **57 %**  
 FINES:    **43 %**  
 GROUP SYMBOL:                                **SM**

Cu = D60/D10 = \_\_\_\_\_  
 Cc = (D30)<sup>2</sup>/(D60\*D10) = \_\_\_\_\_

Remarks: \_\_\_\_\_

GRAVEL				SAND				FINES				
COARSE		FINE		COARSE	MEDIUM	FINE		SILT		CLAY		
U.S. STANDARD SIEVE OPENING				U.S. STANDARD SIEVE NUMBER				HYDROMETER				
3.0"	1 1/2"	3/4"	3/8"	#4	#8	#16	#30	#50	#100	#200		



Project Name: Pillar Point Harbor

Project No.: 5720.180

Station ID: 4-4.1-5.8

Sample ID: PPIHVC18-4-4.1-5.8

Date, Time: 06/18/19, 15:35

Soil Type : SM

Soil Identification: Brown silty sand (SM)

GR:SA:FI : (%)      0 : 57 : 43



**PARTICLE - SIZE  
DISTRIBUTION  
ASTM D 6913**

Jul-19



**PARTICLE-SIZE DISTRIBUTION (GRADATION)  
of SOILS USING SIEVE ANALYSIS  
ASTM D 6913**

Project Name: Pillar Point Harbor

Tested By: OHF/ACS Date: 06/21/19

Project No.: 5720.180

Checked By: J. Ward Date: 07/11/19

Station ID: 4 Mid

Date, Time: 06/18/19, 15:35

Sample ID: PPIHVC18-4M

Soil Identification: Brown silty sand (SM)

		Moisture Content of Total Air - Dry Soil	
Container No.:	SP	Wt. of Air-Dry Soil + Cont. (g)	0.0
Wt. of Air-Dried Soil + Cont.(g)	802.4	Wt. of Dry Soil + Cont. (g)	0.0
Wt. of Container (g)	220.5	Wt. of Container No._____ (g)	1.0
Dry Wt. of Soil (g)	581.9	Moisture Content (%)	0.0

After Wet Sieve	Container No.	SP
	Wt. of Dry Soil + Container (g)	662.4
	Wt. of Container (g)	220.5
	Dry Wt. of Soil Retained on # 200 Sieve (g)	441.9

U. S. Sieve Size		Cumulative Weight Dry Soil Retained (g)	Percent Passing (%)
(in.)	(mm.)		
1 1/2"	37.5		
1"	25.0		
3/4"	19.0		
1/2"	12.5		
3/8"	9.5	0.0	100.0
#4	4.75	0.8	99.9
#8	2.36	14.0	97.6
#16	1.18	64.5	88.9
#30	0.600	168.7	71.0
#50	0.300	241.3	58.5
#100	0.150	354.0	39.2
#200	0.075	436.3	25.0
PAN			

GRAVEL: 0 %

SAND: 75 %

FINES: 25 %

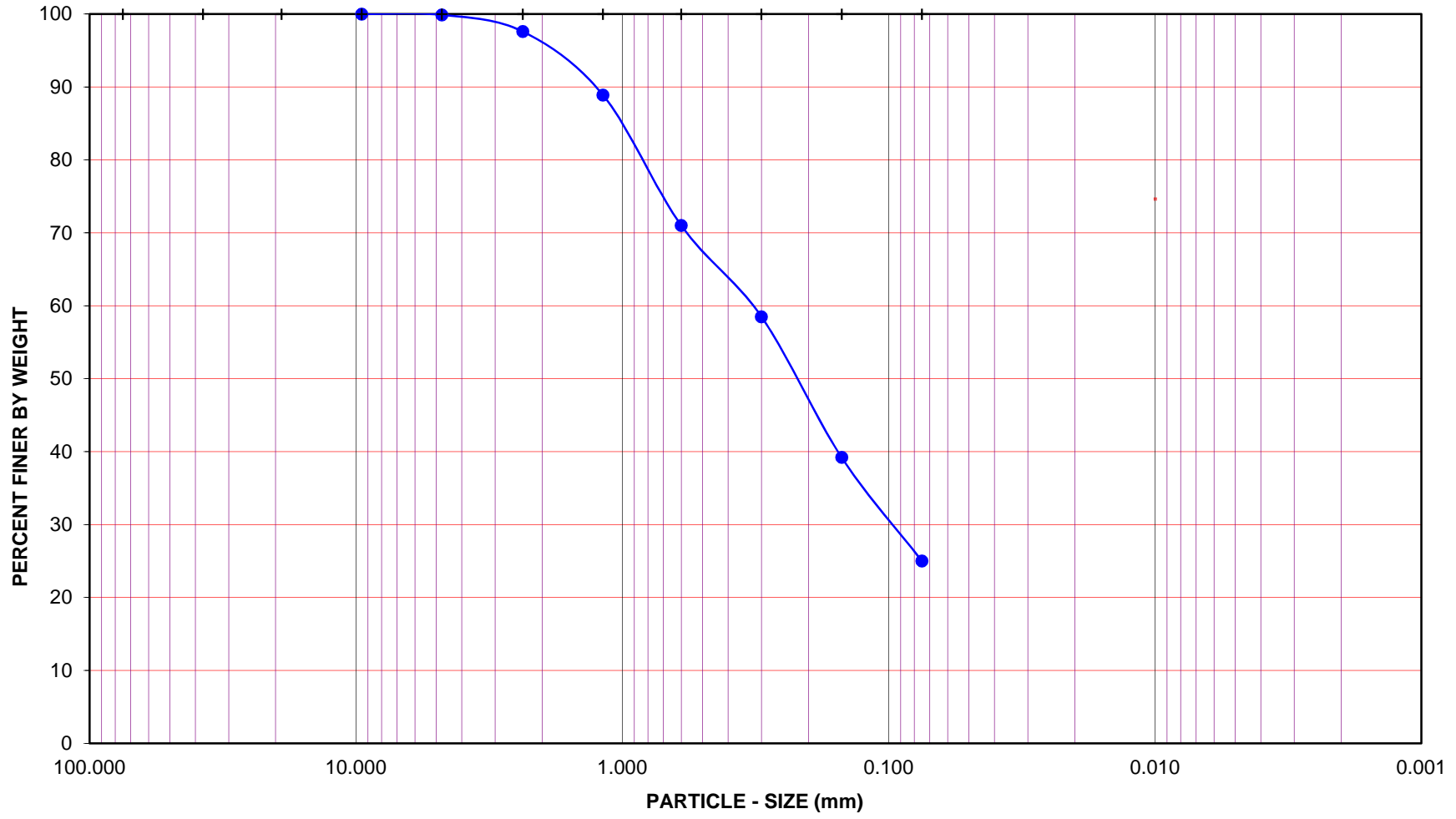
GROUP SYMBOL: SM

Cu = D60/D10 = \_\_\_\_\_

Cc = (D30)<sup>2</sup>/(D60\*D10) = \_\_\_\_\_

Remarks: \_\_\_\_\_

GRAVEL				SAND				FINES				
COARSE		FINE		COARSE	MEDIUM	FINE		SILT		CLAY		
U.S. STANDARD SIEVE OPENING				U.S. STANDARD SIEVE NUMBER				HYDROMETER				
3.0"	1 1/2"	3/4"	3/8"	#4	#8	#16	#30	#50	#100	#200		



Project Name: Pillar Point Harbor

Project No.: 5720.180

Station ID: 4 Mid

Sample ID: PPIHVC18-4M

Date, Time: 06/18/19, 15:35

Soil Type : SM

Soil Identification: Brown silty sand (SM)

GR:SA:FI : (%) **0 : 75 : 25**



**PARTICLE - SIZE DISTRIBUTION**  
**ASTM D 6913**

Jul-19



**PARTICLE-SIZE DISTRIBUTION (GRADATION)  
of SOILS USING SIEVE ANALYSIS  
ASTM D 6913**

Project Name: Pillar Point Harbor

Tested By: OHF/ACS Date: 06/26/19

Project No.: 5720.180

Checked By: J. Ward Date: 07/11/19

Station ID: 4 Top

Date, Time: 06/18/19, 15:35

Sample ID: PPIHVC18-4T

Soil Identification: Dark olive gray poorly-graded sand (SP)

		Moisture Content of Total Air - Dry Soil	
Container No.:	PH	Wt. of Air-Dry Soil + Cont. (g)	0.0
Wt. of Air-Dried Soil + Cont.(g)	761.1	Wt. of Dry Soil + Cont. (g)	0.0
Wt. of Container (g)	202.6	Wt. of Container No._____ (g)	1.0
Dry Wt. of Soil (g)	558.5	Moisture Content (%)	0.0

After Wet Sieve	Container No.	PH
	Wt. of Dry Soil + Container (g)	739.7
	Wt. of Container (g)	202.6
	Dry Wt. of Soil Retained on # 200 Sieve (g)	537.1

U. S. Sieve Size		Cumulative Weight Dry Soil Retained (g)	Percent Passing (%)
(in.)	(mm.)		
1 1/2"	37.5		
1"	25.0		
3/4"	19.0		
1/2"	12.5	0.0	100.0
3/8"	9.5	1.8	99.7
#4	4.75	5.1	99.1
#8	2.36	36.2	93.5
#16	1.18	92.3	83.5
#30	0.600	156.2	72.0
#50	0.300	212.3	62.0
#100	0.150	427.7	23.4
#200	0.075	533.8	4.4
PAN			

GRAVEL: 1 %

SAND: 95 %

FINES: 4 %

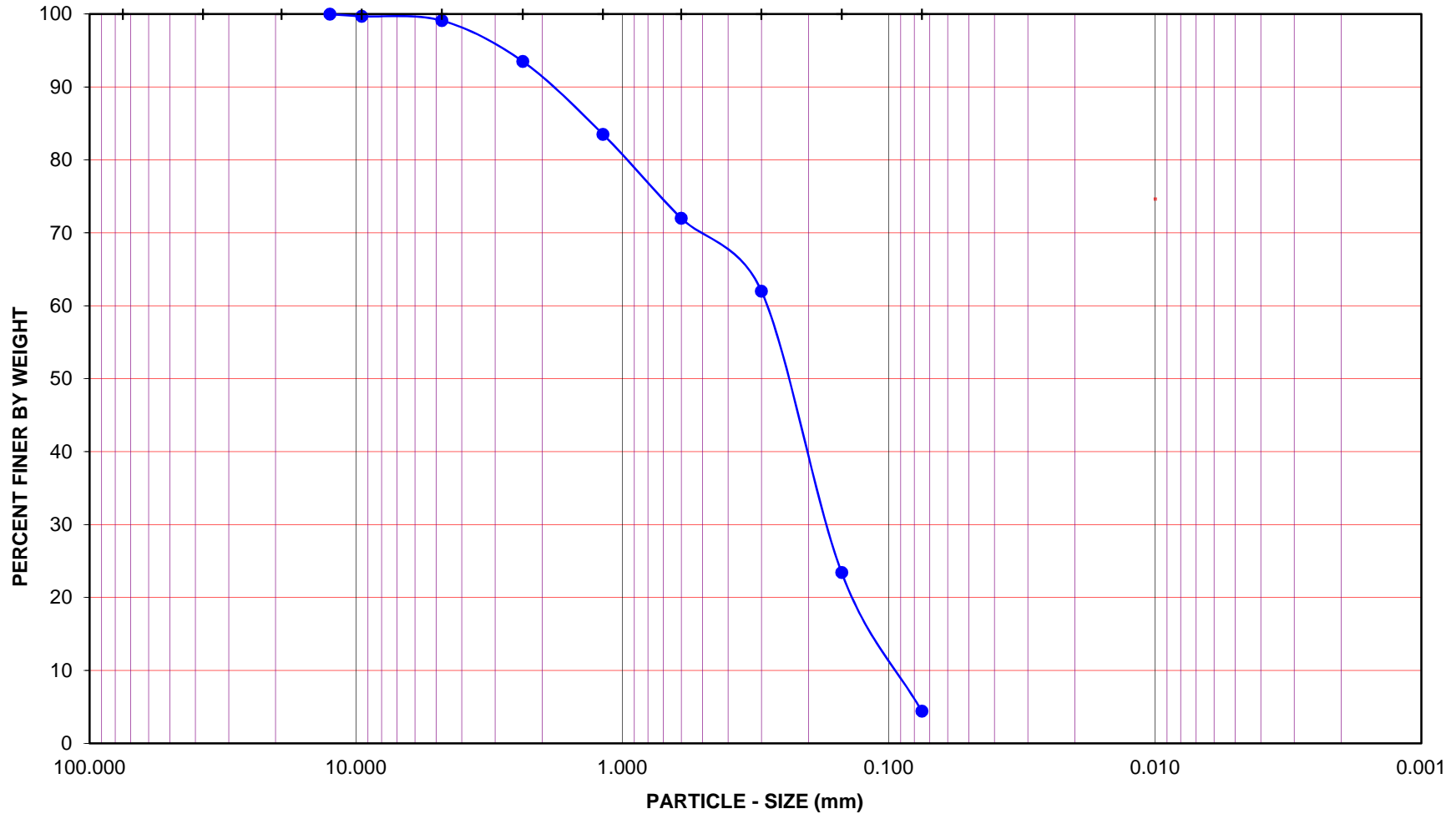
GROUP SYMBOL: SP

Cu = D60/D10 = 2.98

Cc = (D30)<sup>2</sup>/(D60\*D10) = 1.10

Remarks: \_\_\_\_\_

GRAVEL				SAND				FINES				
COARSE		FINE		COARSE	MEDIUM	FINE		SILT		CLAY		
U.S. STANDARD SIEVE OPENING				U.S. STANDARD SIEVE NUMBER				HYDROMETER				
3.0"	1 1/2"	3/4"	3/8"	#4	#8	#16	#30	#50	#100	#200		



Project Name: Pillar Point Harbor

Project No.: 5720.180

Station ID: 4 Top

Sample ID: PPIHVC18-4T

Date, Time: 06/18/19, 15:35

Soil Type : SP

Soil Identification: Dark olive gray poorly-graded sand (SP)

GR:SA:FI : (%)      **1 : 95 : 4**



**PARTICLE - SIZE  
DISTRIBUTION  
ASTM D 6913**

Jul-19





**PARTICLE-SIZE DISTRIBUTION (GRADATION)  
of SOILS USING SIEVE ANALYSIS  
ASTM D 6913**

Project Name: [Pillar Point Harbor](#)

Tested By: [O. Figueroa](#) Date: [06/25/19](#)

Project No.: [5720.180](#)

Checked By: [J. Ward](#) Date: [07/11/19](#)

Station ID: [5 Bottom](#)

Date, Time: [06/19/19, 10:40](#)

Sample ID: [PPIHVC18-5B](#)

Soil Identification: [Yellowish brown silty sand \(SM\)](#)

		Moisture Content of Total Air - Dry Soil	
Container No.:	<a href="#">XP</a>	Wt. of Air-Dry Soil + Cont. (g)	0.0
Wt. of Air-Dried Soil + Cont.(g)	<a href="#">736.7</a>	Wt. of Dry Soil + Cont. (g)	0.0
Wt. of Container (g)	<a href="#">201.2</a>	Wt. of Container No._____ (g)	1.0
Dry Wt. of Soil (g)	535.5	Moisture Content (%)	0.0

After Wet Sieve	Container No.	XP
	Wt. of Dry Soil + Container (g)	<a href="#">516.5</a>
	Wt. of Container (g)	201.2
	Dry Wt. of Soil Retained on # 200 Sieve (g)	315.3

U. S. Sieve Size		Cumulative Weight Dry Soil Retained (g)	Percent Passing (%)
(in.)	(mm.)		
1 1/2"	37.5		
1"	25.0		
3/4"	19.0		
1/2"	12.5		
3/8"	9.5	<a href="#">0.0</a>	100.0
#4	4.75	<a href="#">1.9</a>	99.6
#8	2.36	<a href="#">8.0</a>	98.5
#16	1.18	<a href="#">23.3</a>	95.6
#30	0.600	<a href="#">46.1</a>	91.4
#50	0.300	<a href="#">85.6</a>	84.0
#100	0.150	<a href="#">227.5</a>	57.5
#200	0.075	<a href="#">311.5</a>	41.8
PAN			

GRAVEL: 0 %

SAND: 58 %

FINES: 42 %

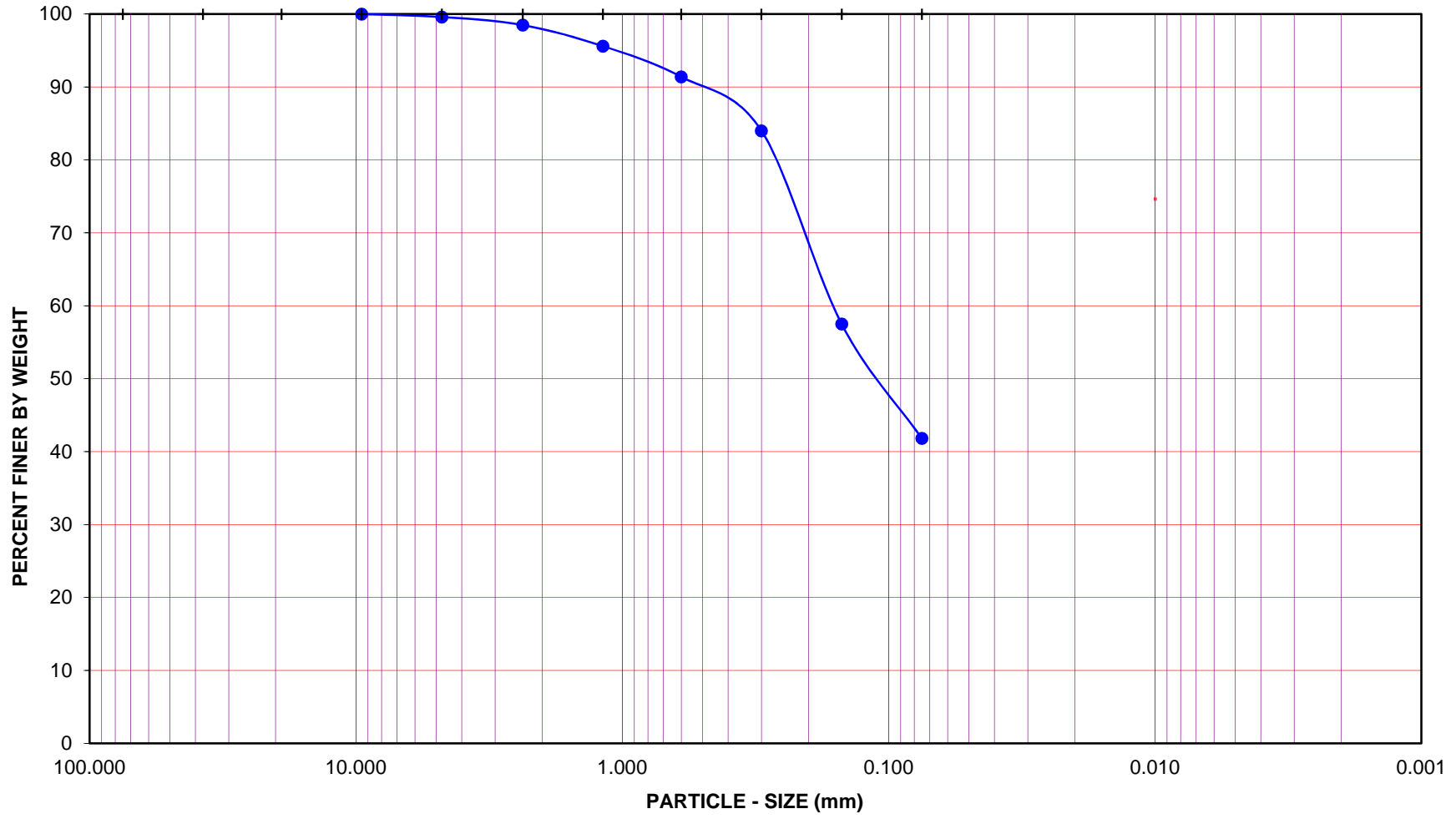
GROUP SYMBOL: SM

Cu = D60/D10 = \_\_\_\_\_

Cc = (D30)<sup>2</sup>/(D60\*D10) = \_\_\_\_\_

Remarks: \_\_\_\_\_

GRAVEL				SAND				FINES				
COARSE		FINE		COARSE	MEDIUM	FINE		SILT		CLAY		
U.S. STANDARD SIEVE OPENING				U.S. STANDARD SIEVE NUMBER				HYDROMETER				
3.0"	1 1/2"	3/4"	3/8"	#4	#8	#16	#30	#50	#100	#200		



Project Name: Pillar Point Harbor

Project No.: 5720.180

Station ID: 5 Bottom

Sample ID: PPIHVC18-5B

Date, Time: 06/19/19, 10:40

Soil Type : SM

Soil Identification: Yellowish brown silty sand (SM)

GR:SA:FI : (%)      0 : 58 : 42



**PARTICLE - SIZE  
DISTRIBUTION  
ASTM D 6913**

Jul-19



**PARTICLE-SIZE DISTRIBUTION (GRADATION)  
of SOILS USING SIEVE ANALYSIS  
ASTM D 6913**

Project Name: Pillar Point Harbor

Tested By: OHF/GEB Date: 06/25/19

Project No.: 5720.180

Checked By: J. Ward Date: 07/11/19

Station ID: 5 Mid

Date, Time: 06/19/19, 10:40

Sample ID: PPIHVC18-5M

Soil Identification: Yellowish brown silty sand (SM)

		Moisture Content of Total Air - Dry Soil	
Container No.:	934	Wt. of Air-Dry Soil + Cont. (g)	0.0
Wt. of Air-Dried Soil + Cont.(g)	663.1	Wt. of Dry Soil + Cont. (g)	0.0
Wt. of Container (g)	108.1	Wt. of Container No._____ (g)	1.0
Dry Wt. of Soil (g)	555.0	Moisture Content (%)	0.0

After Wet Sieve	Container No.	934
	Wt. of Dry Soil + Container (g)	467.1
	Wt. of Container (g)	108.1
	Dry Wt. of Soil Retained on # 200 Sieve (g)	359.0

U. S. Sieve Size		Cumulative Weight Dry Soil Retained (g)	Percent Passing (%)
(in.)	(mm.)		
1 1/2"	37.5		
1"	25.0		
3/4"	19.0		
1/2"	12.5		
3/8"	9.5	0.0	100.0
#4	4.75	1.6	99.7
#8	2.36	28.3	94.9
#16	1.18	65.7	88.2
#30	0.600	98.6	82.2
#50	0.300	133.6	75.9
#100	0.150	239.9	56.8
#200	0.075	352.2	36.5
PAN			

GRAVEL: 0 %

SAND: 63 %

FINES: 37 %

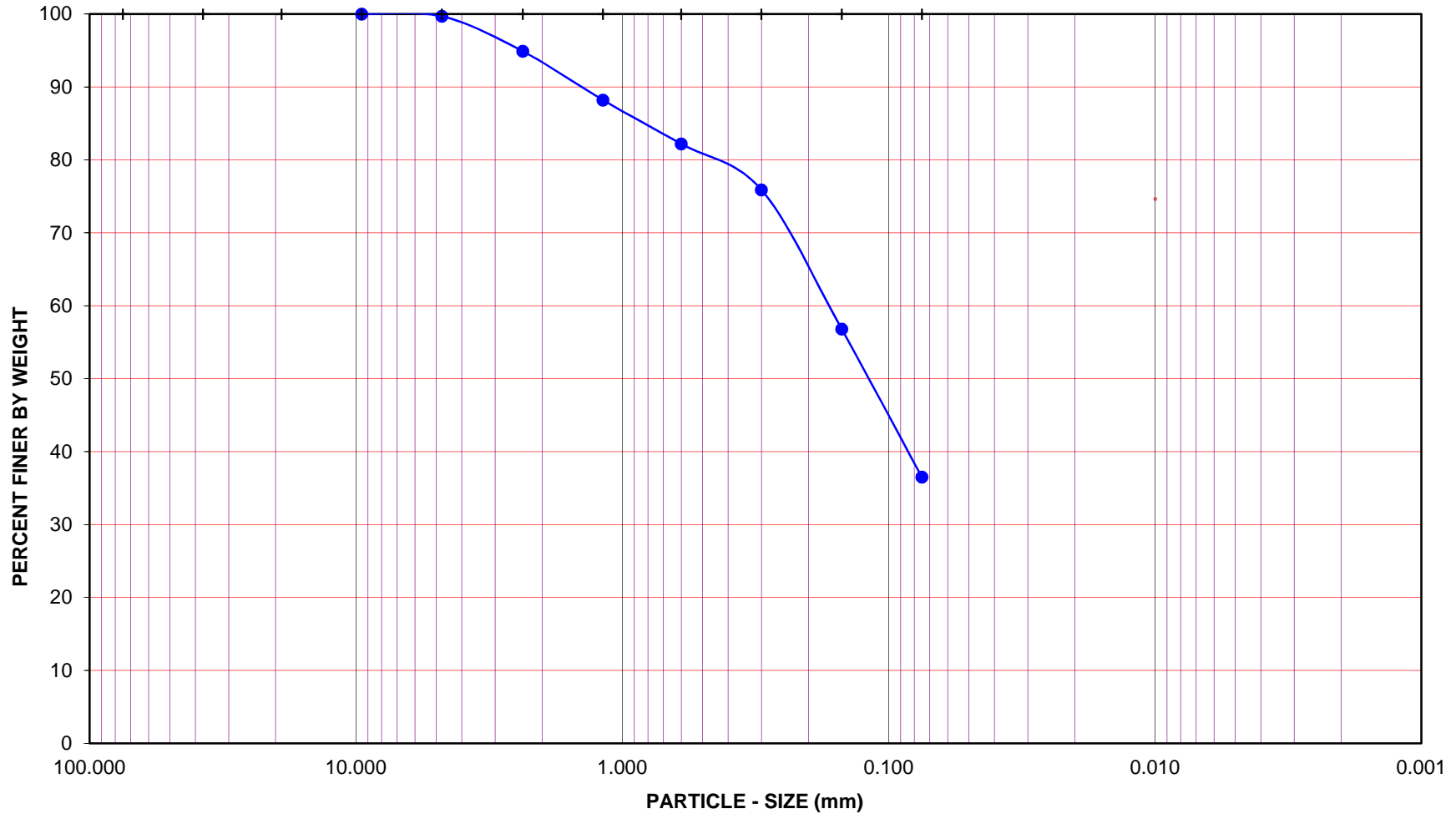
GROUP SYMBOL: SM

Cu = D60/D10 = \_\_\_\_\_

Cc = (D30)<sup>2</sup>/(D60\*D10) = \_\_\_\_\_

Remarks: \_\_\_\_\_

GRAVEL				SAND				FINES				
COARSE		FINE		COARSE	MEDIUM	FINE		SILT		CLAY		
U.S. STANDARD SIEVE OPENING				U.S. STANDARD SIEVE NUMBER				HYDROMETER				
3.0"	1 1/2"	3/4"	3/8"	#4	#8	#16	#30	#50	#100	#200		



Project Name: Pillar Point Harbor

Project No.: 5720.180

Station ID: 5 Mid

Sample ID: PPIHVC18-5M

Date, Time: 06/19/19, 10:40

Soil Type : SM

Soil Identification: Yellowish brown silty sand (SM)

GR:SA:FI : (%) **0 : 63 : 37**



**PARTICLE - SIZE  
DISTRIBUTION  
ASTM D 6913**

Jul-19



**PARTICLE-SIZE DISTRIBUTION (GRADATION)  
of SOILS USING SIEVE ANALYSIS  
ASTM D 6913**

Project Name: Pillar Point Harbor

Tested By: OHF/ACS Date: 06/21/19

Project No.: 5720.180

Checked By: J. Ward Date: 07/11/19

Station ID: 5 Top

Date, Time: 06/19/19, 10:40

Sample ID: PPIHVC18-5T

Soil Identification: Olive gray silty sand (SM)

		Moisture Content of Total Air - Dry Soil	
Container No.:	DR	Wt. of Air-Dry Soil + Cont. (g)	0.0
Wt. of Air-Dried Soil + Cont.(g)	745.2	Wt. of Dry Soil + Cont. (g)	0.0
Wt. of Container (g)	217.5	Wt. of Container No._____ (g)	1.0
Dry Wt. of Soil (g)	527.7	Moisture Content (%)	0.0

After Wet Sieve	Container No.	DR
	Wt. of Dry Soil + Container (g)	525.3
	Wt. of Container (g)	217.5
	Dry Wt. of Soil Retained on # 200 Sieve (g)	307.8

U. S. Sieve Size		Cumulative Weight Dry Soil Retained (g)	Percent Passing (%)
(in.)	(mm.)		
1 1/2"	37.5		
1"	25.0		
3/4"	19.0		
1/2"	12.5		
3/8"	9.5	0.0	100.0
#4	4.75	0.8	99.8
#8	2.36	12.1	97.7
#16	1.18	43.8	91.7
#30	0.600	84.6	84.0
#50	0.300	112.2	78.7
#100	0.150	171.1	67.6
#200	0.075	300.9	43.0
PAN			

GRAVEL: 0 %

SAND: 57 %

FINES: 43 %

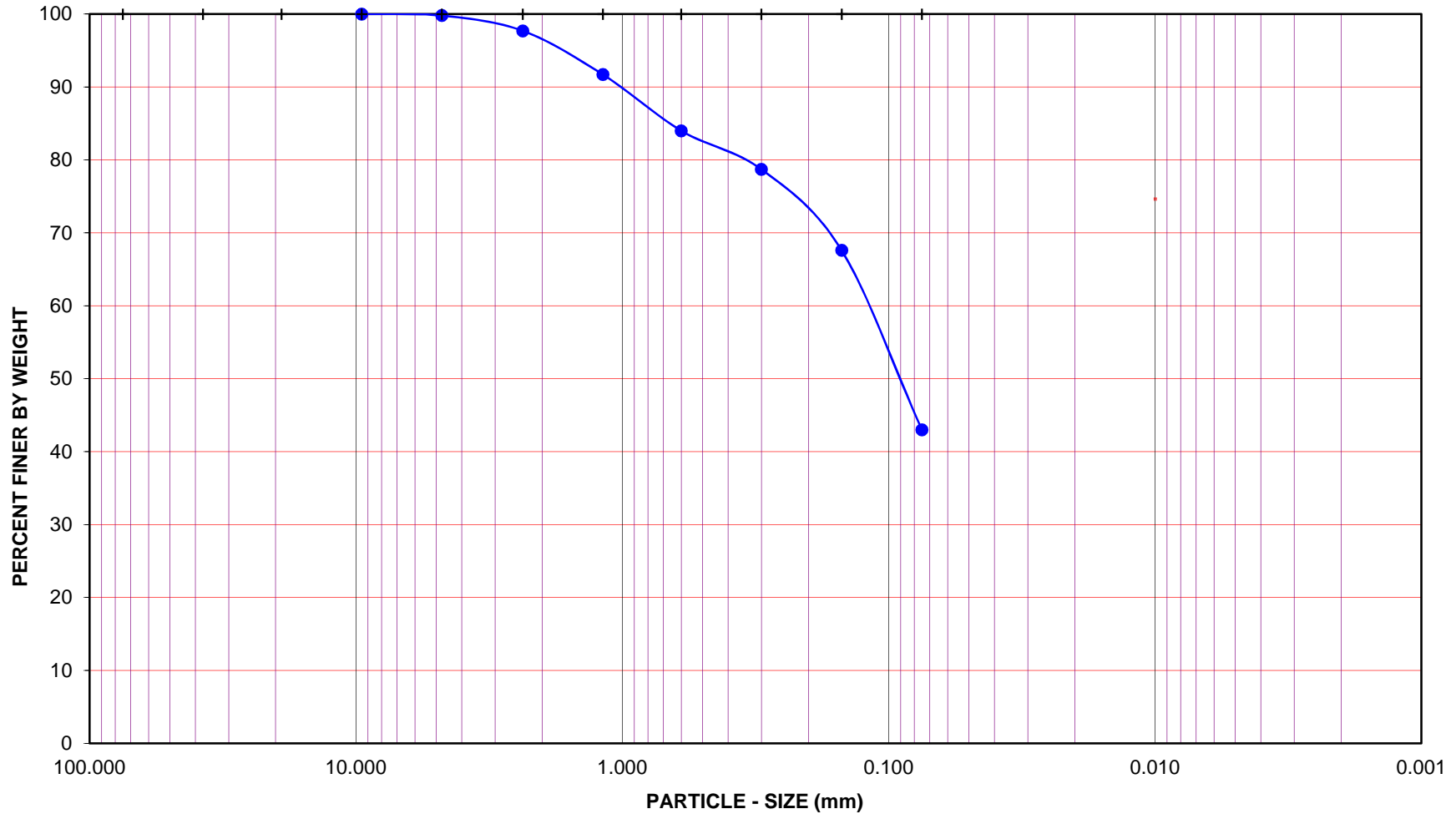
GROUP SYMBOL: SM

Cu = D60/D10 = \_\_\_\_\_

Cc = (D30)<sup>2</sup>/(D60\*D10) = \_\_\_\_\_

Remarks: \_\_\_\_\_

GRAVEL				SAND				FINES				
COARSE		FINE		COARSE	MEDIUM	FINE		SILT		CLAY		
U.S. STANDARD SIEVE OPENING				U.S. STANDARD SIEVE NUMBER				HYDROMETER				
3.0"	1 1/2"	3/4"	3/8"	#4	#8	#16	#30	#50	#100	#200		



Project Name: Pillar Point Harbor

Project No.: 5720.180

Station ID: 5 Top

Sample ID: PPIHVC18-5T

Date, Time: 06/19/19, 10:40

Soil Type : SM

Soil Identification: Olive gray silty sand (SM)

GR:SA:FI : (%) **0 : 57 : 43**



**PARTICLE - SIZE  
DISTRIBUTION  
ASTM D 6913**

Jul-19



**PARTICLE-SIZE DISTRIBUTION (GRADATION)  
of SOILS USING SIEVE ANALYSIS  
ASTM D 6913**

Project Name: Pillar Point Harbor      Tested By: OHF/GEB    Date: 06/25/19  
 Project No.: 5720.180                              Checked By: J. Ward    Date: 07/11/19  
 Station ID: 6 Bottom                              Date, Time: 06/18/19, 15:05  
 Sample ID: PPIHVC18-6B  
 Soil Identification: Olive gray poorly-graded sand with silt (SP-SM), shells noted

		Moisture Content of Total Air - Dry Soil	
Container No.:	935	Wt. of Air-Dry Soil + Cont. (g)	0.0
Wt. of Air-Dried Soil + Cont.(g)	613.0	Wt. of Dry Soil + Cont. (g)	0.0
Wt. of Container (g)	108.6	Wt. of Container No._____ (g)	1.0
Dry Wt. of Soil (g)	504.4	Moisture Content (%)	0.0

After Wet Sieve	Container No.	935
	Wt. of Dry Soil + Container (g)	587.2
	Wt. of Container (g)	108.6
	Dry Wt. of Soil Retained on # 200 Sieve (g)	478.6

U. S. Sieve Size		Cumulative Weight Dry Soil Retained (g)	Percent Passing (%)
(in.)	(mm.)		
1 1/2"	37.5		
1"	25.0		
3/4"	19.0		
1/2"	12.5		
3/8"	9.5		
#4	4.75	0.0	100.0
#8	2.36	0.1	100.0
#16	1.18	1.4	99.7
#30	0.600	5.5	98.9
#50	0.300	28.3	94.4
#100	0.150	343.1	32.0
#200	0.075	476.0	5.6
PAN			

GRAVEL: 0 %  
 SAND: 94 %  
 FINES: 6 %  
 GROUP SYMBOL: SP-SM

Cu = D60/D10 = 2.35  
 Cc = (D30)<sup>2</sup>/(D60\*D10) = 1.15

Remarks: \_\_\_\_\_

GRAVEL				SAND				FINES			
COARSE		FINE		COARSE	MEDIUM	FINE		SILT		CLAY	

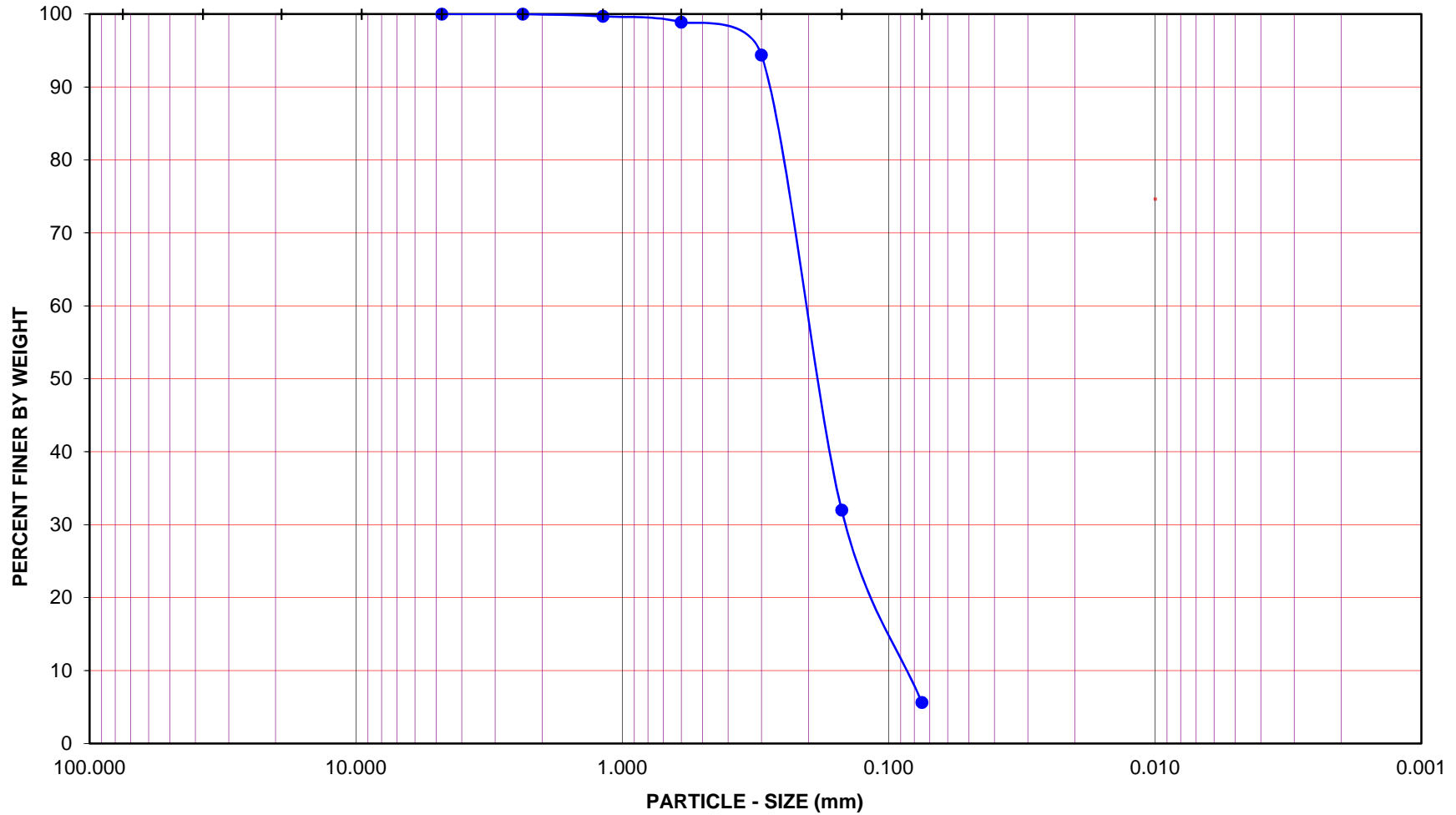
U.S. STANDARD SIEVE OPENING

3.0" 1 1/2" 3/4" 3/8"

U.S. STANDARD SIEVE NUMBER

#4 #8 #16 #30 #50 #100 #200

HYDROMETER



Project Name: Pillar Point Harbor

Project No.: 5720.180

Station ID: 6 Bottom

Sample ID: PPIHVC18-6B

Date, Time: 06/18/19, 15:05

Soil Type : SP-SM

Soil Identification: Olive gray poorly-graded sand with silt (SP-SM), shells noted

GR:SA:FI : (%) **0 : 94 : 6**

Jul-19



Leighton

**PARTICLE - SIZE  
DISTRIBUTION  
ASTM D 6913**





**PARTICLE-SIZE DISTRIBUTION (GRADATION)  
of SOILS USING SIEVE ANALYSIS  
ASTM D 6913**

Project Name: [Pillar Point Harbor](#)

Tested By: [OHF/GEB](#) Date: [06/25/19](#)

Project No.: [5720.180](#)

Checked By: [J. Ward](#) Date: [07/11/19](#)

Station ID: [6 Mid](#)

Date, Time: [06/18/19, 15:05](#)

Sample ID: [PPIHVC18-6M](#)

Soil Identification: [Olive gray poorly-graded sand \(SP\)](#)

		Moisture Content of Total Air - Dry Soil	
Container No.:	929	Wt. of Air-Dry Soil + Cont. (g)	0.0
Wt. of Air-Dried Soil + Cont.(g)	714.8	Wt. of Dry Soil + Cont. (g)	0.0
Wt. of Container (g)	108.0	Wt. of Container No._____ (g)	1.0
Dry Wt. of Soil (g)	606.8	Moisture Content (%)	0.0

After Wet Sieve	Container No.	929
	Wt. of Dry Soil + Container (g)	694.6
	Wt. of Container (g)	108.0
	Dry Wt. of Soil Retained on # 200 Sieve (g)	586.6

U. S. Sieve Size		Cumulative Weight Dry Soil Retained (g)	Percent Passing (%)
(in.)	(mm.)		
1 1/2"	37.5		
1"	25.0		
3/4"	19.0		
1/2"	12.5		
3/8"	9.5		
#4	4.75		
#8	2.36	0.0	100.0
#16	1.18	0.2	100.0
#30	0.600	1.4	99.8
#50	0.300	17.2	97.2
#100	0.150	427.0	29.6
#200	0.075	583.3	3.9
PAN			

GRAVEL: 0 %

SAND: 96 %

FINES: 4 %

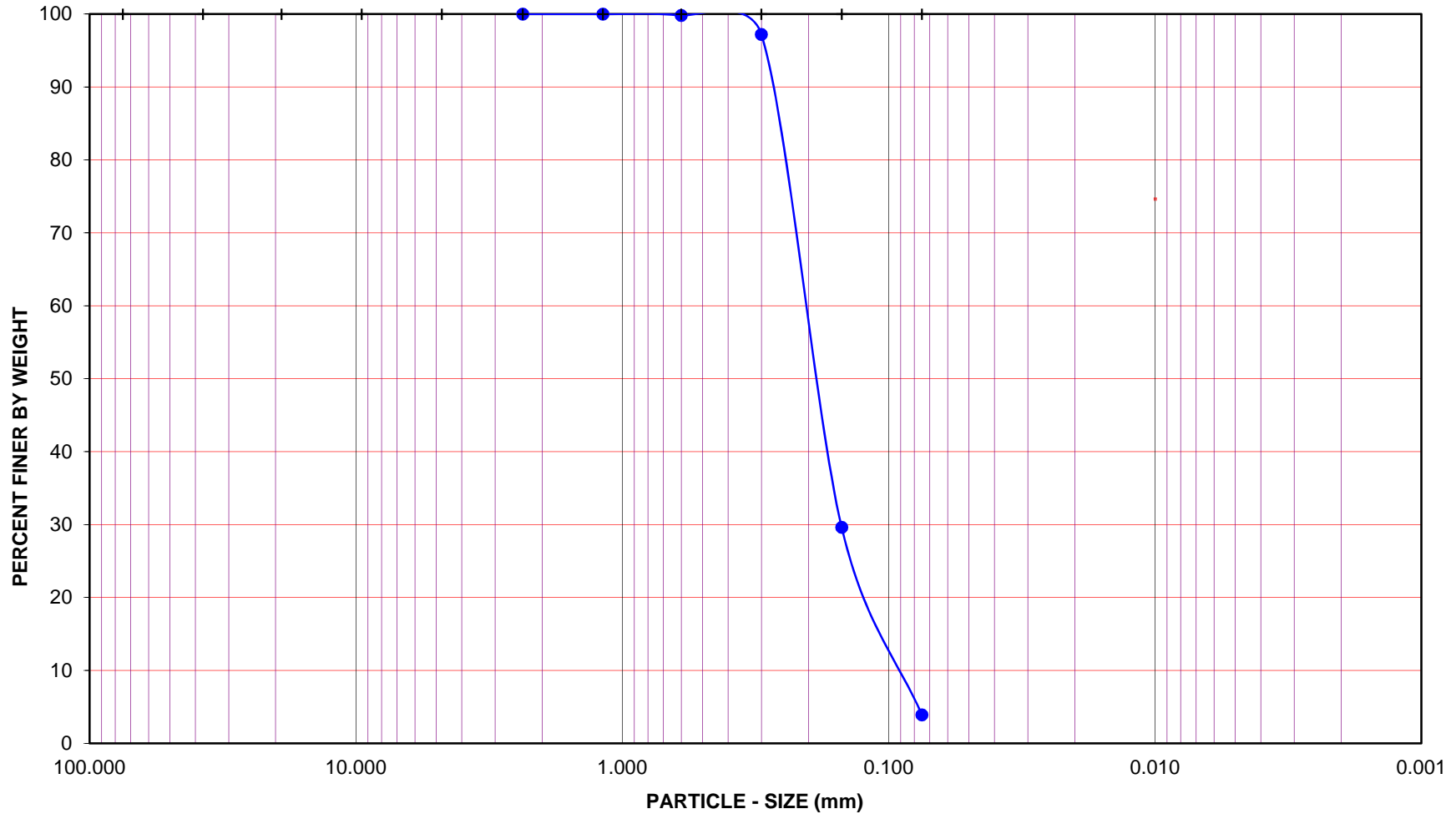
GROUP SYMBOL: SP

$$Cu = D_{60}/D_{10} = \underline{2.22}$$

$$Cc = (D_{30})^2/(D_{60} \cdot D_{10}) = \underline{1.42}$$

Remarks: \_\_\_\_\_

GRAVEL				SAND				FINES				
COARSE		FINE		COARSE	MEDIUM	FINE		SILT		CLAY		
U.S. STANDARD SIEVE OPENING				U.S. STANDARD SIEVE NUMBER				HYDROMETER				
3.0"	1 1/2"	3/4"	3/8"	#4	#8	#16	#30	#50	#100	#200		



Project Name: Pillar Point Harbor  
 Project No.: 5720.180

Station ID: 6 Mid      Sample ID: PPIHVC18-6M  
 Date, Time: 06/18/19, 15:05      Soil Type : SP  
 Soil Identification: Olive gray poorly-graded sand (SP)

**PARTICLE - SIZE  
DISTRIBUTION  
ASTM D 6913**

GR:SA:FI : (%)      **0 : 96 : 4**

Jul-19



**PARTICLE-SIZE DISTRIBUTION (GRADATION)  
of SOILS USING SIEVE ANALYSIS  
ASTM D 6913**

Project Name: [Pillar Point Harbor](#)

Tested By: [O. Figueroa](#) Date: [06/25/19](#)

Project No.: [5720.180](#)

Checked By: [J. Ward](#) Date: [07/11/19](#)

Station ID: [6 Top](#)

Date, Time: [06/18/19, 15:05](#)

Sample ID: [PPIHVC18-6T](#)

Soil Identification: [Olive gray poorly-graded sand \(SP\)](#)

		Moisture Content of Total Air - Dry Soil	
Container No.:	957	Wt. of Air-Dry Soil + Cont. (g)	0.0
Wt. of Air-Dried Soil + Cont.(g)	647.9	Wt. of Dry Soil + Cont. (g)	0.0
Wt. of Container (g)	108.5	Wt. of Container No._____ (g)	1.0
Dry Wt. of Soil (g)	539.4	Moisture Content (%)	0.0

After Wet Sieve	Container No.	957
	Wt. of Dry Soil + Container (g)	635.5
	Wt. of Container (g)	108.5
	Dry Wt. of Soil Retained on # 200 Sieve (g)	527.0

U. S. Sieve Size		Cumulative Weight Dry Soil Retained (g)	Percent Passing (%)
(in.)	(mm.)		
1 1/2"	37.5		
1"	25.0		
3/4"	19.0		
1/2"	12.5		
3/8"	9.5		
#4	4.75	0.0	100.0
#8	2.36	0.6	99.9
#16	1.18	2.5	99.5
#30	0.600	3.9	99.3
#50	0.300	11.5	97.9
#100	0.150	275.6	48.9
#200	0.075	525.1	2.7
PAN			

GRAVEL: **0 %**

SAND: **97 %**

FINES: **3 %**

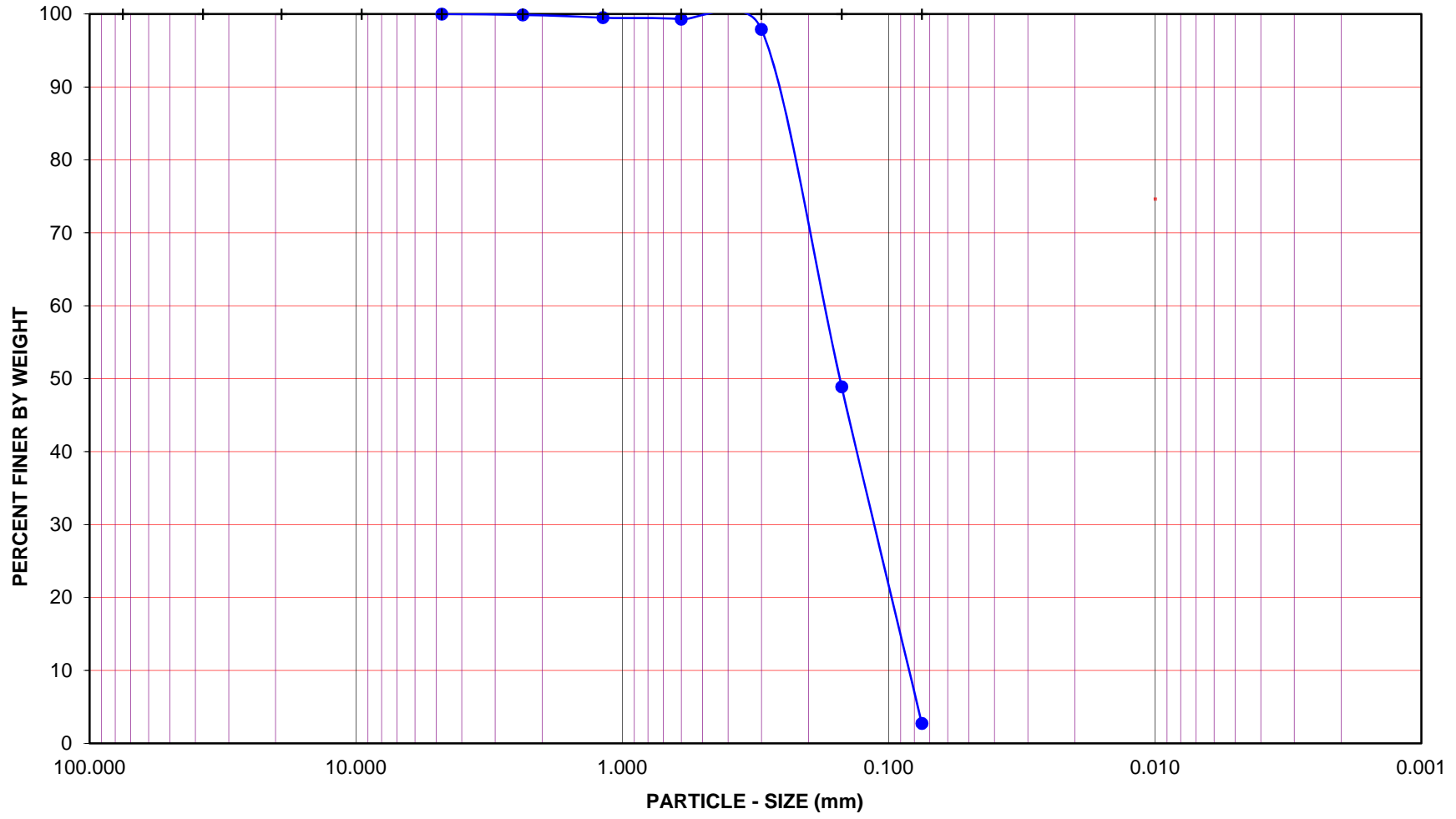
GROUP SYMBOL: **SP**

Cu = D60/D10 = 2.05

Cc = (D30)<sup>2</sup>/(D60\*D10) = 1.02

Remarks: \_\_\_\_\_

GRAVEL				SAND				FINES				
COARSE		FINE		COARSE	MEDIUM	FINE		SILT		CLAY		
U.S. STANDARD SIEVE OPENING				U.S. STANDARD SIEVE NUMBER				HYDROMETER				
3.0"	1 1/2"	3/4"	3/8"	#4	#8	#16	#30	#50	#100	#200		



Project Name: Pillar Point Harbor  
 Project No.: 5720.180

Station ID: 6 Top      Sample ID: PPIHVC18-6T  
 Date, Time: 06/18/19, 15:05      Soil Type : SP  
 Soil Identification: Olive gray poorly-graded sand (SP)



**PARTICLE - SIZE  
 DISTRIBUTION  
 ASTM D 6913**

**GR:SA:FI : (%)      0 : 97 : 3**

Jul-19



**PARTICLE-SIZE DISTRIBUTION (GRADATION)  
of SOILS USING SIEVE ANALYSIS  
ASTM D 6913**

Project Name: Pillar Point Harbor      Tested By: OHF/GEB    Date: 06/25/19  
 Project No.: 5720.180                      Checked By: J. Ward    Date: 07/11/19  
 Station ID: 7 Bottom                      Date, Time: 06/18/19, 14:25  
 Sample ID: PPIHVC18-7B  
 Soil Identification: Olive gray poorly-graded sand with silt (SP-SM)

		Moisture Content of Total Air - Dry Soil	
Container No.:	IMC-1	Wt. of Air-Dry Soil + Cont. (g)	0.0
Wt. of Air-Dried Soil + Cont.(g)	767.5	Wt. of Dry Soil + Cont. (g)	0.0
Wt. of Container (g)	300.2	Wt. of Container No._____ (g)	1.0
Dry Wt. of Soil (g)	467.3	Moisture Content (%)	0.0

After Wet Sieve	Container No.	IMC-1
	Wt. of Dry Soil + Container (g)	748.6
	Wt. of Container (g)	300.2
	Dry Wt. of Soil Retained on # 200 Sieve (g)	448.4

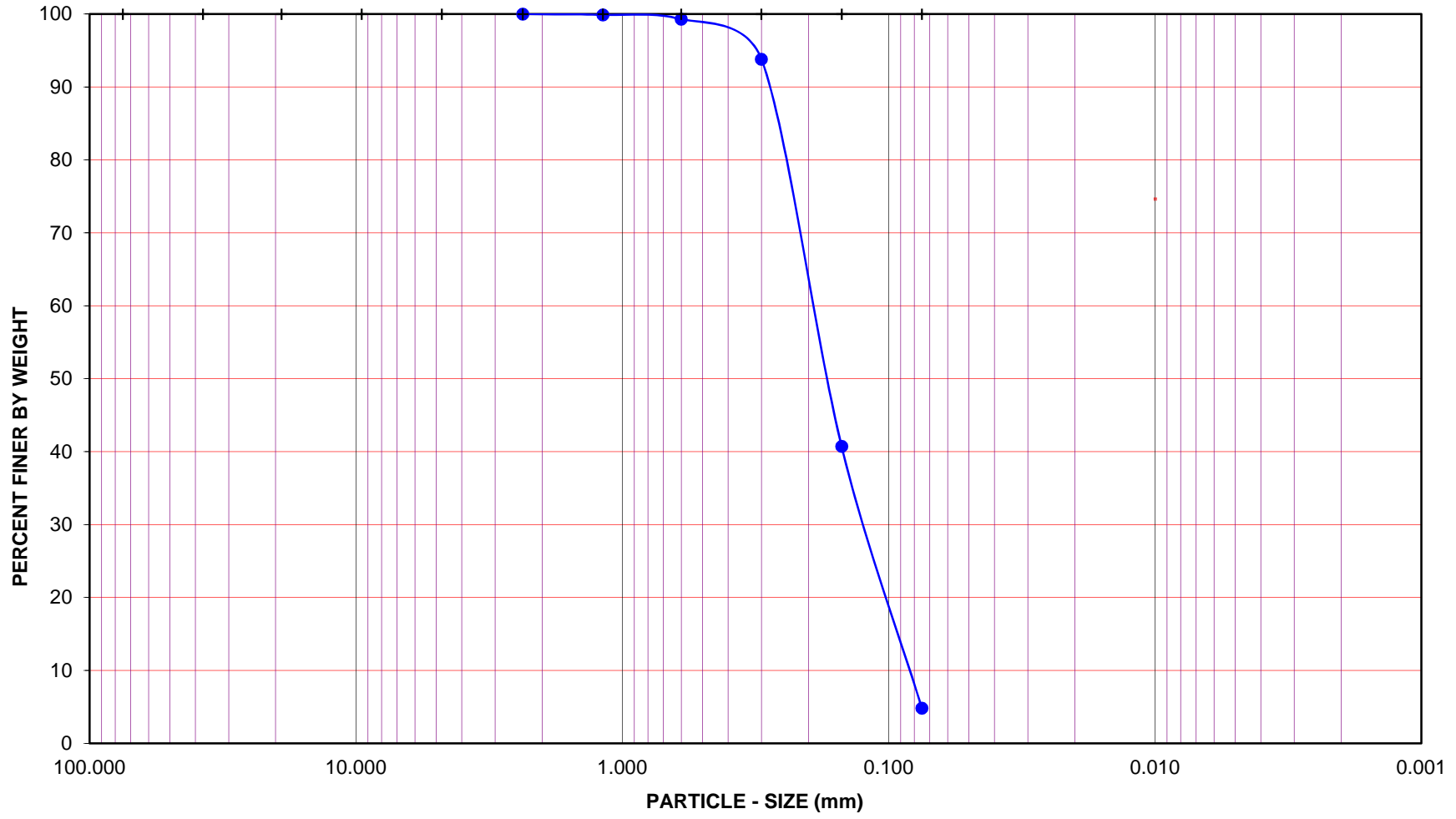
U. S. Sieve Size		Cumulative Weight Dry Soil Retained (g)	Percent Passing (%)
(in.)	(mm.)		
1 1/2"	37.5		
1"	25.0		
3/4"	19.0		
1/2"	12.5		
3/8"	9.5		
#4	4.75		
#8	2.36	0.0	100.0
#16	1.18	0.4	99.9
#30	0.600	3.3	99.3
#50	0.300	29.2	93.8
#100	0.150	277.2	40.7
#200	0.075	444.8	4.8
PAN			

GRAVEL: 0 %  
 SAND: 95 %  
 FINES: 5 %  
 GROUP SYMBOL: SP-SM

Cu = D60/D10 = 2.29  
 Cc = (D30)<sup>2</sup>/(D60\*D10) = 1.07

Remarks: \_\_\_\_\_

GRAVEL				SAND				FINES				
COARSE		FINE		COARSE	MEDIUM	FINE		SILT		CLAY		
U.S. STANDARD SIEVE OPENING				U.S. STANDARD SIEVE NUMBER				HYDROMETER				
3.0"	1 1/2"	3/4"	3/8"	#4	#8	#16	#30	#50	#100	#200		



Project Name: Pillar Point Harbor

Project No.: 5720.180

Station ID: 7 Bottom

Sample ID: PPIHVC18-7B

Date, Time: 06/18/19, 14:25

Soil Type: SP-SM

Soil Identification: Olive gray poorly-graded sand with silt (SP-SM)

GR:SA:FI : (%) **0 : 95 : 5**



**PARTICLE - SIZE  
DISTRIBUTION  
ASTM D 6913**

Jul-19



**PARTICLE-SIZE DISTRIBUTION (GRADATION)  
of SOILS USING SIEVE ANALYSIS  
ASTM D 6913**

Project Name: Pillar Point Harbor

Tested By: ACS/OHF Date: 06/21/19

Project No.: 5720.180

Checked By: J. Ward Date: 07/11/19

Station ID: 7 Mid

Date, Time: 06/18/19, 14:25

Sample ID: PPIHVC18-7M

Soil Identification: Olive gray poorly-graded sand (SP)

		Moisture Content of Total Air - Dry Soil	
Container No.:	CT	Wt. of Air-Dry Soil + Cont. (g)	0.0
Wt. of Air-Dried Soil + Cont.(g)	643.4	Wt. of Dry Soil + Cont. (g)	0.0
Wt. of Container (g)	244.0	Wt. of Container No._____ (g)	1.0
Dry Wt. of Soil (g)	399.4	Moisture Content (%)	0.0

After Wet Sieve	Container No.	CT
	Wt. of Dry Soil + Container (g)	630.0
	Wt. of Container (g)	244.0
	Dry Wt. of Soil Retained on # 200 Sieve (g)	386.0

U. S. Sieve Size		Cumulative Weight Dry Soil Retained (g)	Percent Passing (%)
(in.)	(mm.)		
1 1/2"	37.5		
1"	25.0		
3/4"	19.0		
1/2"	12.5		
3/8"	9.5		
#4	4.75		
#8	2.36		
#16	1.18	0.0	100.0
#30	0.600	0.4	99.9
#50	0.300	5.4	98.6
#100	0.150	184.3	53.9
#200	0.075	384.6	3.7
PAN			

GRAVEL: 0 %

SAND: 96 %

FINES: 4 %

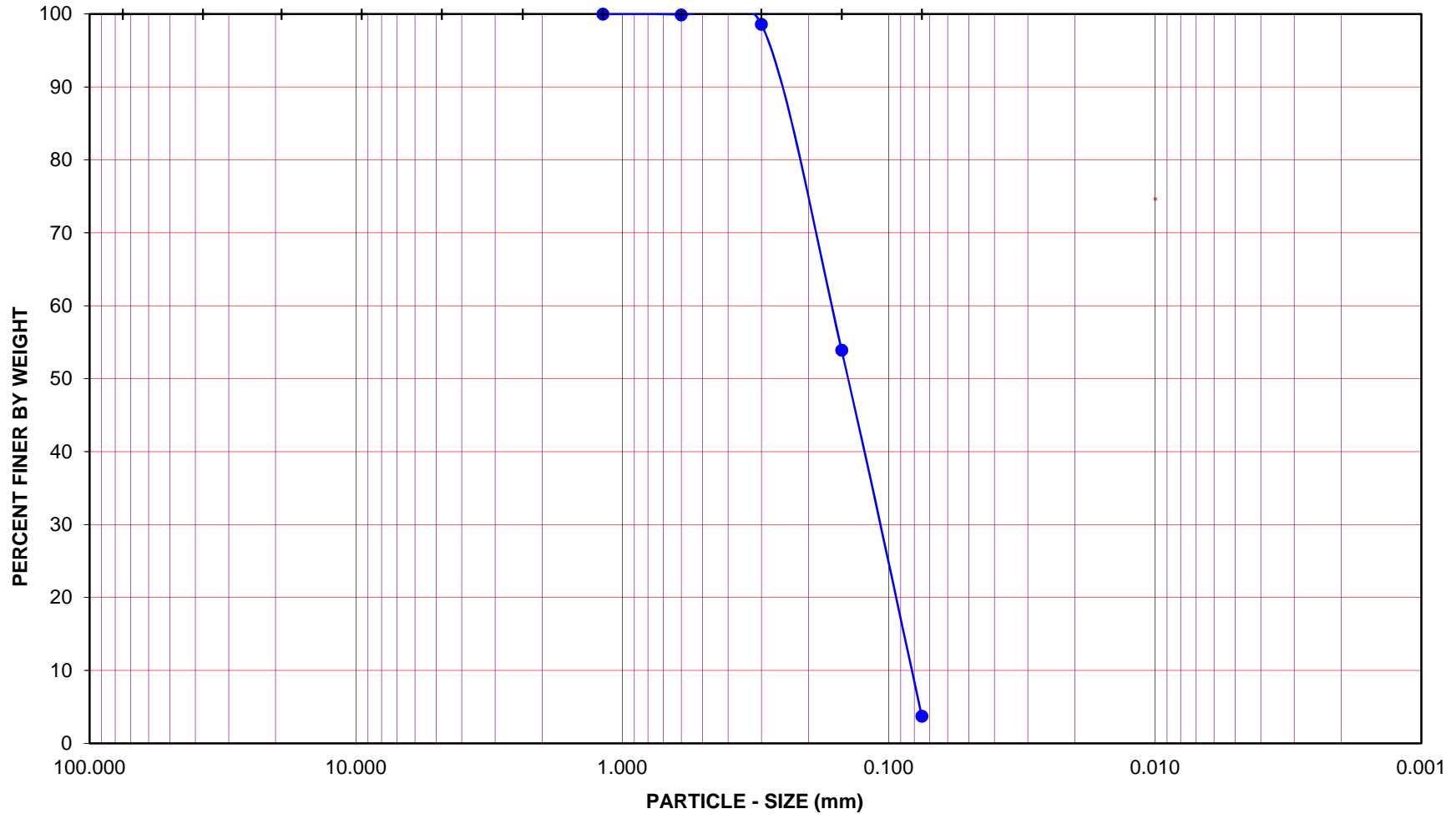
GROUP SYMBOL: SP

Cu = D60/D10 = 1.98

Cc = (D30)<sup>2</sup>/(D60\*D10) = 0.93

Remarks: \_\_\_\_\_

GRAVEL				SAND				FINES				
COARSE		FINE		COARSE	MEDIUM	FINE		SILT		CLAY		
U.S. STANDARD SIEVE OPENING				U.S. STANDARD SIEVE NUMBER				HYDROMETER				
3.0"	1 1/2"	3/4"	3/8"	#4	#8	#16	#30	#50	#100	#200		



Project Name: Pillar Point Harbor

Project No.: 5720.180

Station ID: 7 Mid

Sample ID: PPIHVC18-7M

Date, Time: 06/18/19, 14:25

Soil Type : SP

Soil Identification: Olive gray poorly-graded sand (SP)

GR:SA:FI : (%) **0 : 96 : 4**



Leighton

**PARTICLE - SIZE  
DISTRIBUTION  
ASTM D 6913**

Jul-19





**PARTICLE-SIZE DISTRIBUTION (GRADATION)  
of SOILS USING SIEVE ANALYSIS  
ASTM D 6913**

Project Name: Pillar Point Harbor

Tested By: O. Figueroa Date: 06/25/19

Project No.: 5720.180

Checked By: J. Ward Date: 07/11/19

Station ID: 7 Top

Date, Time: 06/18/19, 14:25

Sample ID: PPIHVC18-7I

Soil Identification: Grayish brown poorly-graded sand (SP)

		Moisture Content of Total Air - Dry Soil	
Container No.:	<u>D7</u>	Wt. of Air-Dry Soil + Cont. (g)	0.0
Wt. of Air-Dried Soil + Cont.(g)	<u>787.7</u>	Wt. of Dry Soil + Cont. (g)	0.0
Wt. of Container (g)	<u>206.2</u>	Wt. of Container No._____ (g)	1.0
Dry Wt. of Soil (g)	581.5	Moisture Content (%)	0.0

After Wet Sieve	Container No.	D7
	Wt. of Dry Soil + Container (g)	<u>774.4</u>
	Wt. of Container (g)	206.2
	Dry Wt. of Soil Retained on # 200 Sieve (g)	568.2

U. S. Sieve Size		Cumulative Weight Dry Soil Retained (g)	Percent Passing (%)
(in.)	(mm.)		
1 1/2"	37.5		
1"	25.0		
3/4"	19.0		
1/2"	12.5		
3/8"	9.5	0.0	100.0
#4	4.75	0.3	99.9
#8	2.36	1.5	99.7
#16	1.18	5.8	99.0
#30	0.600	8.7	98.5
#50	0.300	19.0	96.7
#100	0.150	304.5	47.6
#200	0.075	565.2	2.8
PAN			

GRAVEL: **0 %**

SAND: **97 %**

FINES: **3 %**

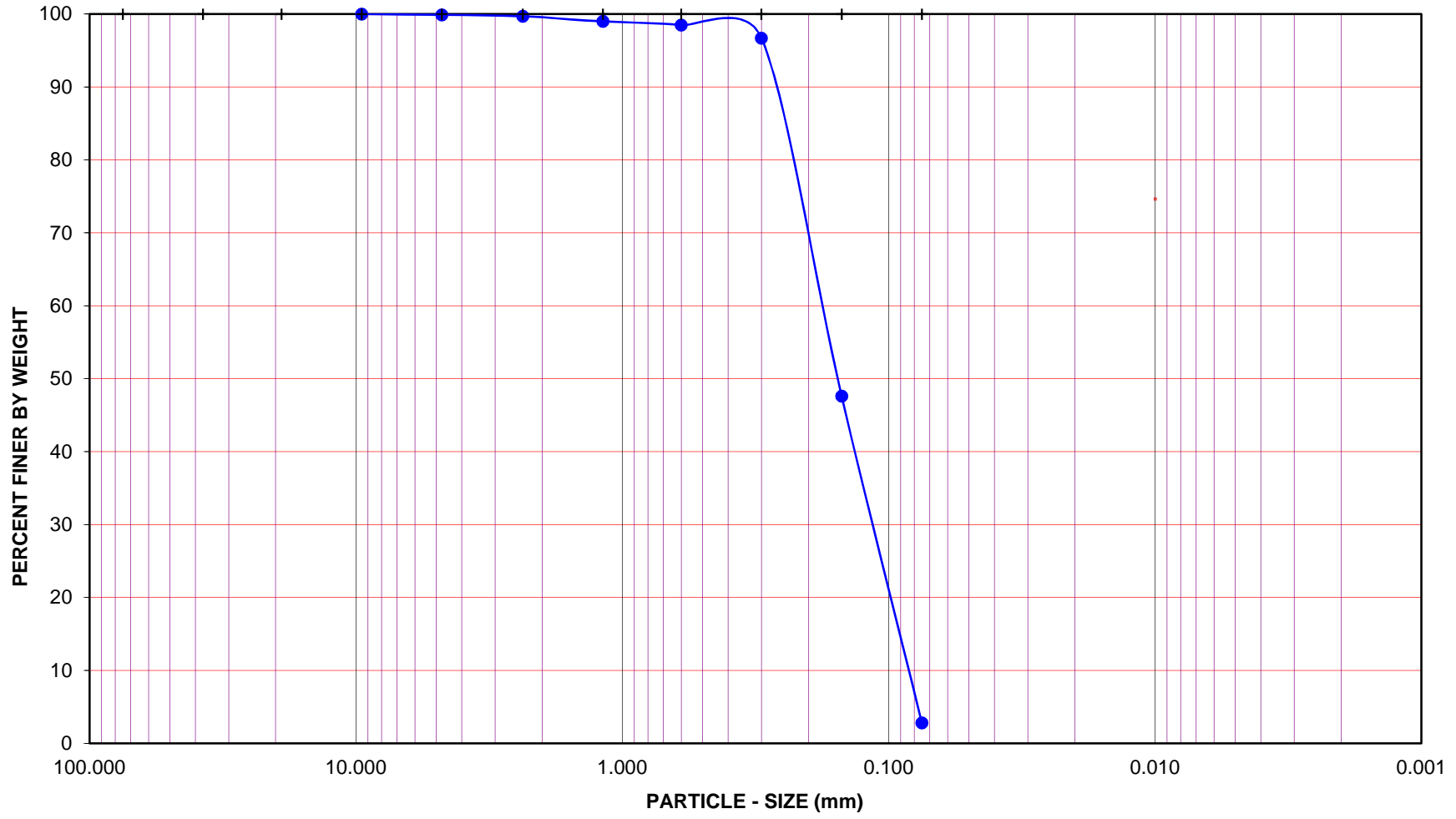
GROUP SYMBOL: **SP**

$$Cu = D_{60}/D_{10} = \underline{2.05}$$

$$Cc = (D_{30})^2/(D_{60} \cdot D_{10}) = \underline{1.02}$$

Remarks: \_\_\_\_\_

GRAVEL				SAND				FINES				
COARSE		FINE		COARSE	MEDIUM	FINE		SILT		CLAY		
U.S. STANDARD SIEVE OPENING				U.S. STANDARD SIEVE NUMBER				HYDROMETER				
3.0"	1 1/2"	3/4"	3/8"	#4	#8	#16	#30	#50	#100	#200		



Project Name: Pillar Point Harbor

Project No.: 5720.180

Station ID: 7 Top

Sample ID: PPIHVC18-7T

Date, Time: 06/18/19, 14:25

Soil Type : SP

Soil Identification: Grayish brown poorly-graded sand (SP)

GR:SA:FI : (%) **0 : 97 : 3**



**PARTICLE - SIZE  
DISTRIBUTION  
ASTM D 6913**

Jul-19



**PARTICLE-SIZE DISTRIBUTION (GRADATION)  
of SOILS USING SIEVE ANALYSIS  
ASTM D 6913**

Project Name: [Pillar Point Harbor](#)  
 Project No.: [5720.180](#)  
 Station ID: [8 Bottom](#)  
 Sample ID: [PPIHVC18-8B](#)  
 Soil Identification: [Olive gray poorly-graded sand with silt \(SP-SM\)](#)

Tested By: [ACS/OHF](#) Date: [06/21/19](#)  
 Checked By: [J. Ward](#) Date: [07/11/19](#)  
 Date, Time: [06/18/19, 13:55](#)

		Moisture Content of Total Air - Dry Soil	
Container No.:	PHD	Wt. of Air-Dry Soil + Cont. (g)	0.0
Wt. of Air-Dried Soil + Cont.(g)	678.4	Wt. of Dry Soil + Cont. (g)	0.0
Wt. of Container (g)	214.9	Wt. of Container No. _____ (g)	1.0
Dry Wt. of Soil (g)	463.5	Moisture Content (%)	0.0

After Wet Sieve	Container No.	PHD
	Wt. of Dry Soil + Container (g)	643.5
	Wt. of Container (g)	214.9
	Dry Wt. of Soil Retained on # 200 Sieve (g)	428.6

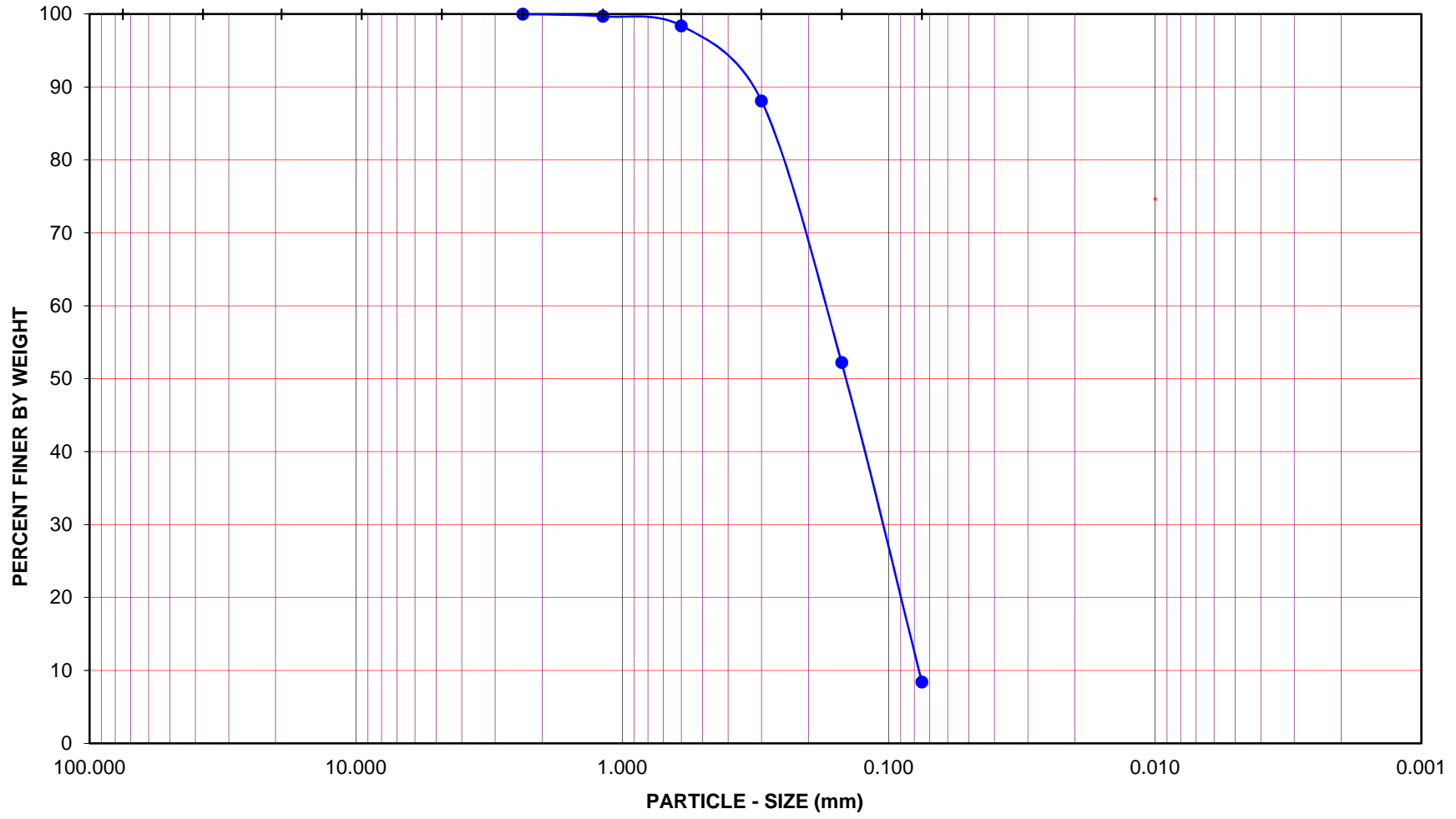
U. S. Sieve Size		Cumulative Weight Dry Soil Retained (g)	Percent Passing (%)
(in.)	(mm.)		
1 1/2"	37.5		
1"	25.0		
3/4"	19.0		
1/2"	12.5		
3/8"	9.5		
#4	4.75		
#8	2.36	0.0	100.0
#16	1.18	1.3	99.7
#30	0.600	7.6	98.4
#50	0.300	55.1	88.1
#100	0.150	221.4	52.2
#200	0.075	424.4	8.4
PAN			

GRAVEL: **0 %**  
 SAND: **92 %**  
 FINES: **8 %**  
 GROUP SYMBOL: **SP-SM**

Cu = D60/D10 = 2.18  
 Cc = (D30)<sup>2</sup>/(D60\*D10) = 0.91

Remarks: \_\_\_\_\_

GRAVEL				SAND				FINES				
COARSE		FINE		COARSE	MEDIUM	FINE		SILT		CLAY		
U.S. STANDARD SIEVE OPENING				U.S. STANDARD SIEVE NUMBER				HYDROMETER				
3.0"	1 1/2"	3/4"	3/8"	#4	#8	#16	#30	#50	#100	#200		



Project Name: Pillar Point Harbor  
 Project No.: 5720.180

Station ID: 8 Bottom      Sample ID: PPIHVC18-8B  
 Date, Time: 06/18/19, 13:55      Soil Type : SP-SM

Soil Identification: Olive gray poorly-graded sand with silt (SP-SM)

GR:SA:FI : (%)      0 : 92 : 8



**PARTICLE - SIZE  
 DISTRIBUTION  
 ASTM D 6913**

Jul-19



**PARTICLE-SIZE DISTRIBUTION (GRADATION)  
of SOILS USING SIEVE ANALYSIS  
ASTM D 6913**

Project Name: Pillar Point Harbor      Tested By: O. Figueroa    Date: 06/25/19  
 Project No.: 5720.180                      Checked By: J. Ward      Date: 07/11/19  
 Station ID: 8 Mid                              Date, Time: 06/18/19, 13:55  
 Sample ID: PPIHVC18-8M  
 Soil Identification: Grayish brown poorly-graded sand with silt (SP-SM)

		Moisture Content of Total Air - Dry Soil	
Container No.:	VIP	Wt. of Air-Dry Soil + Cont. (g)	0.0
Wt. of Air-Dried Soil + Cont.(g)	750.4	Wt. of Dry Soil + Cont. (g)	0.0
Wt. of Container (g)	219.5	Wt. of Container No._____ (g)	1.0
Dry Wt. of Soil (g)	530.9	Moisture Content (%)	0.0

After Wet Sieve	Container No.	VIP
	Wt. of Dry Soil + Container (g)	729.0
	Wt. of Container (g)	219.5
	Dry Wt. of Soil Retained on # 200 Sieve (g)	509.5

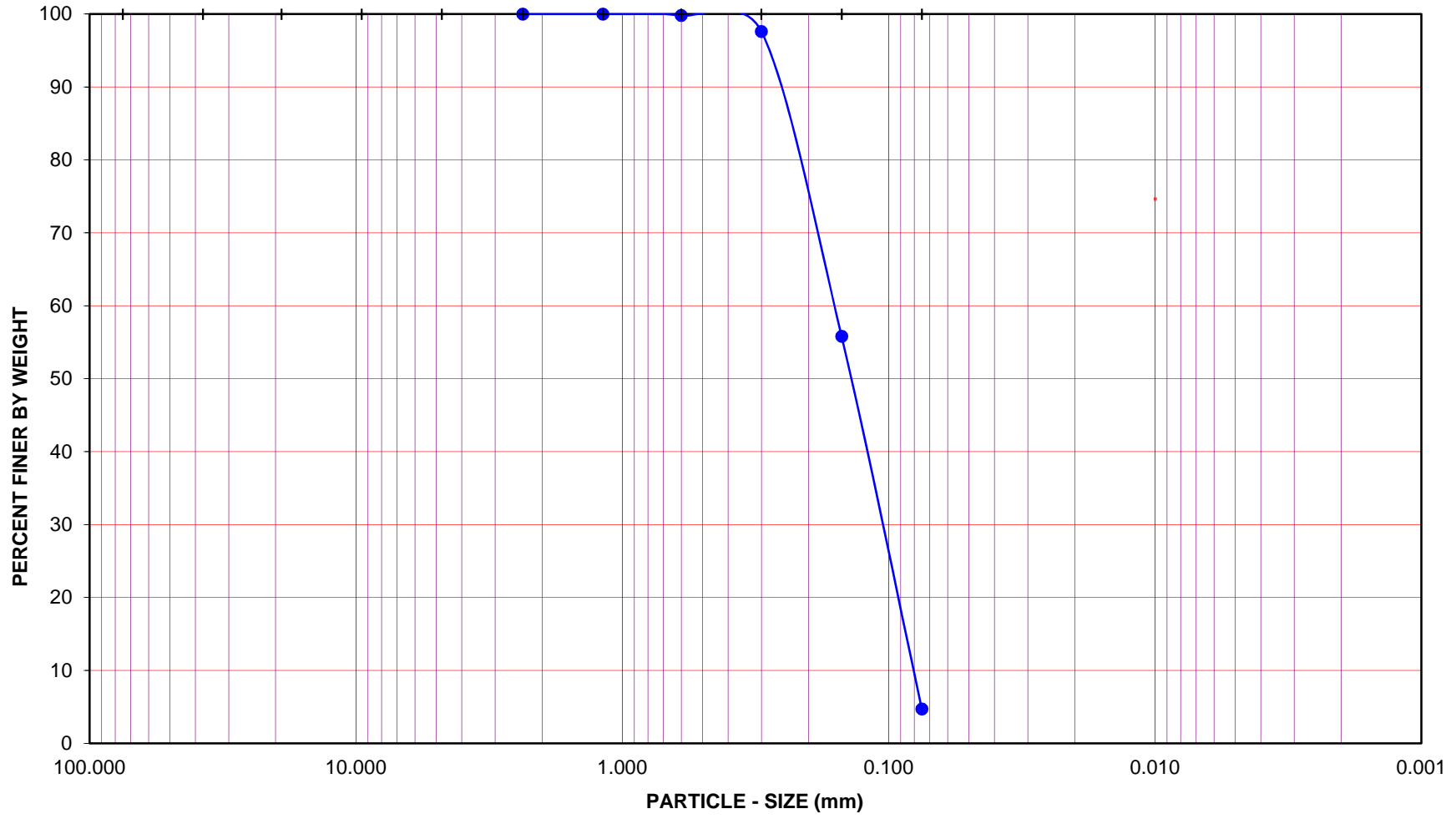
U. S. Sieve Size		Cumulative Weight Dry Soil Retained (g)	Percent Passing (%)
(in.)	(mm.)		
1 1/2"	37.5		
1"	25.0		
3/4"	19.0		
1/2"	12.5		
3/8"	9.5		
#4	4.75		
#8	2.36	0.0	100.0
#16	1.18	0.2	100.0
#30	0.600	1.3	99.8
#50	0.300	12.8	97.6
#100	0.150	234.6	55.8
#200	0.075	506.2	4.7
PAN			

GRAVEL:                      **0 %**  
 SAND:                        **95 %**  
 FINES:                       **5 %**  
 GROUP SYMBOL:        **SP-SM**

Cu = D60/D10 = 2.00  
 Cc = (D30)<sup>2</sup>/(D60\*D10) = 0.95

Remarks: \_\_\_\_\_

GRAVEL				SAND				FINES				
COARSE		FINE		COARSE	MEDIUM	FINE		SILT		CLAY		
U.S. STANDARD SIEVE OPENING				U.S. STANDARD SIEVE NUMBER				HYDROMETER				
3.0"	1 1/2"	3/4"	3/8"	#4	#8	#16	#30	#50	#100	#200		



Project Name: Pillar Point Harbor

Project No.: 5720.180

Station ID: 8 Mid

Sample ID: PPIHVC18-8M

Date, Time: 06/18/19, 13:55

Soil Type : SP-SM

Soil Identification: Grayish brown poorly-graded sand with silt (SP-SM)

GR:SA:FI : (%) **0 : 95 : 5**



**PARTICLE - SIZE  
DISTRIBUTION  
ASTM D 6913**

Jul-19



**PARTICLE-SIZE DISTRIBUTION (GRADATION)  
of SOILS USING SIEVE ANALYSIS  
ASTM D 6913**

Project Name: [Pillar Point Harbor](#)

Tested By: [O. Figueroa](#) Date: [06/25/19](#)

Project No.: [5720.180](#)

Checked By: [J. Ward](#) Date: [07/11/19](#)

Station ID: [8 Top](#)

Date, Time: [06/18/19, 13:55](#)

Sample ID: [PPIHVC18-8T](#)

Soil Identification: [Olive gray poorly-graded sand \(SP\)](#)

		Moisture Content of Total Air - Dry Soil	
Container No.:	H	Wt. of Air-Dry Soil + Cont. (g)	0.0
Wt. of Air-Dried Soil + Cont.(g)	650.7	Wt. of Dry Soil + Cont. (g)	0.0
Wt. of Container (g)	145.0	Wt. of Container No._____ (g)	1.0
Dry Wt. of Soil (g)	505.7	Moisture Content (%)	0.0

After Wet Sieve	Container No.	H
	Wt. of Dry Soil + Container (g)	636.9
	Wt. of Container (g)	145.0
	Dry Wt. of Soil Retained on # 200 Sieve (g)	491.9

U. S. Sieve Size		Cumulative Weight Dry Soil Retained (g)	Percent Passing (%)
(in.)	(mm.)		
1 1/2"	37.5		
1"	25.0		
3/4"	19.0		
1/2"	12.5		
3/8"	9.5		
#4	4.75	0.0	100.0
#8	2.36	0.3	99.9
#16	1.18	1.3	99.7
#30	0.600	5.3	99.0
#50	0.300	28.0	94.5
#100	0.150	254.3	49.7
#200	0.075	489.2	3.3
PAN			

GRAVEL: **0 %**

SAND: **97 %**

FINES: **3 %**

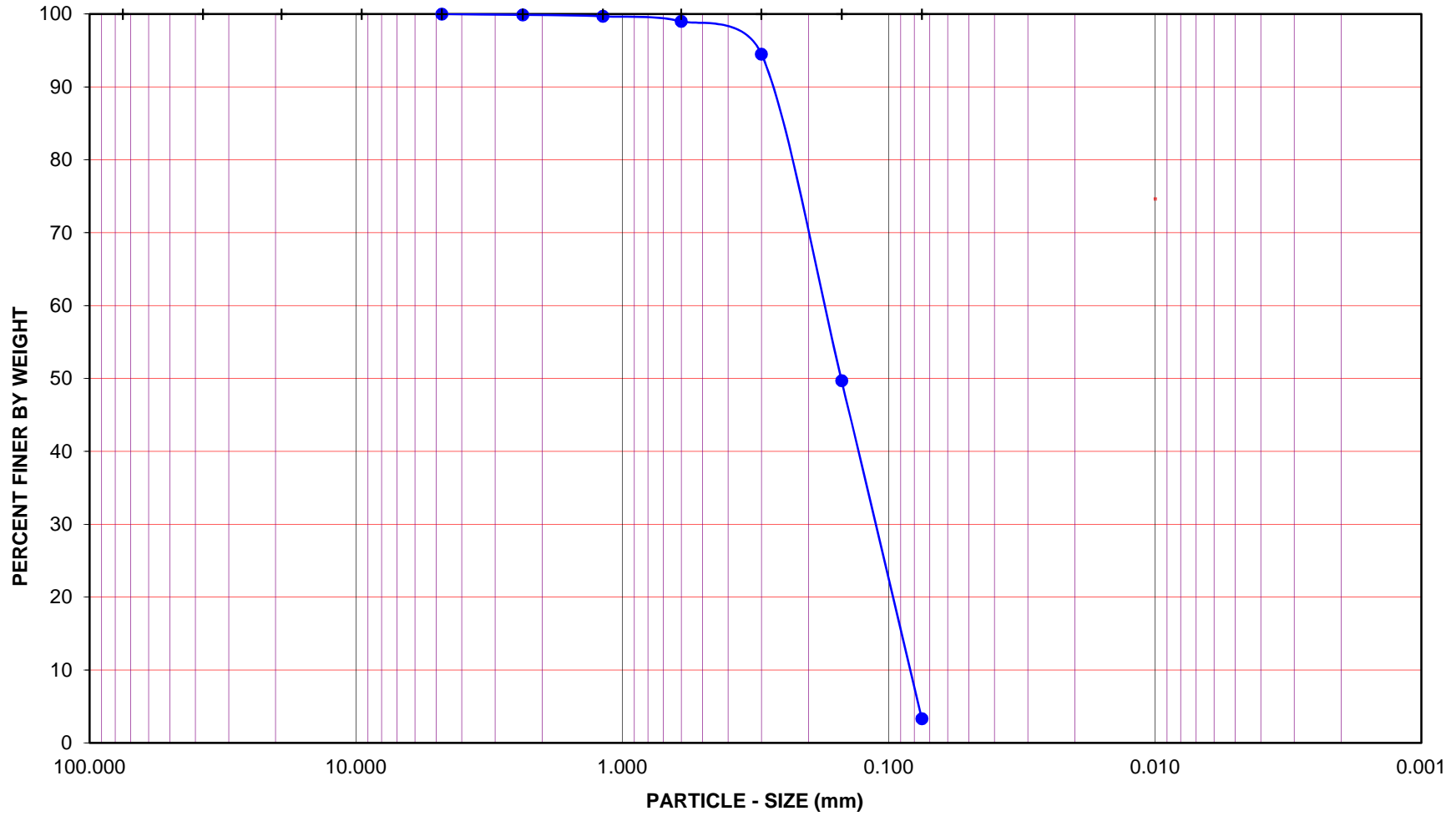
GROUP SYMBOL: **SP**

Cu = D60/D10 = 2.05

Cc = (D30)<sup>2</sup>/(D60\*D10) = 1.02

Remarks: \_\_\_\_\_

GRAVEL				SAND				FINES				
COARSE		FINE		COARSE	MEDIUM	FINE		SILT		CLAY		
U.S. STANDARD SIEVE OPENING				U.S. STANDARD SIEVE NUMBER				HYDROMETER				
3.0"	1 1/2"	3/4"	3/8"	#4	#8	#16	#30	#50	#100	#200		



Project Name: Pillar Point Harbor

Project No.: 5720.180

Station ID: 8 Top

Sample ID: PPIHVC18-8T

Date, Time: 06/18/19, 13:55

Soil Type : SP

Soil Identification: Olive gray poorly-graded sand (SP)

GR:SA:FI : (%) **0 : 97 : 3**



**PARTICLE - SIZE  
DISTRIBUTION  
ASTM D 6913**

Jul-19





**PARTICLE-SIZE DISTRIBUTION (GRADATION)  
of SOILS USING SIEVE ANALYSIS  
ASTM D 6913**

Project Name: Pillar Point Harbor

Tested By: ACS/OHF Date: 06/26/19

Project No.: 5720.180

Checked By: J. Ward Date: 07/11/19

Station ID: Bottom Comp

Date, Time: 06/19/19, 10:40

Sample ID: PPIHVC18-Bot

Soil Identification: Yellowish brown silty, clayey sand (SC-SM)

		Moisture Content of Total Air - Dry Soil	
Container No.:	CT	Wt. of Air-Dry Soil + Cont. (g)	0.0
Wt. of Air-Dried Soil + Cont.(g)	727.4	Wt. of Dry Soil + Cont. (g)	0.0
Wt. of Container (g)	244.0	Wt. of Container No._____ (g)	1.0
Dry Wt. of Soil (g)	483.4	Moisture Content (%)	0.0

After Wet Sieve	Container No.	CT
	Wt. of Dry Soil + Container (g)	540.7
	Wt. of Container (g)	244.0
	Dry Wt. of Soil Retained on # 200 Sieve (g)	296.7

U. S. Sieve Size		Cumulative Weight Dry Soil Retained (g)	Percent Passing (%)
(in.)	(mm.)		
1 1/2"	37.5		
1"	25.0		
3/4"	19.0		
1/2"	12.5		
3/8"	9.5	0.0	100.0
#4	4.75	0.8	99.8
#8	2.36	14.4	97.0
#16	1.18	44.0	90.9
#30	0.600	76.0	84.3
#50	0.300	118.1	75.6
#100	0.150	225.0	53.5
#200	0.075	293.2	39.3
PAN			

GRAVEL: 0 %

SAND: 61 %

FINES: 39 %

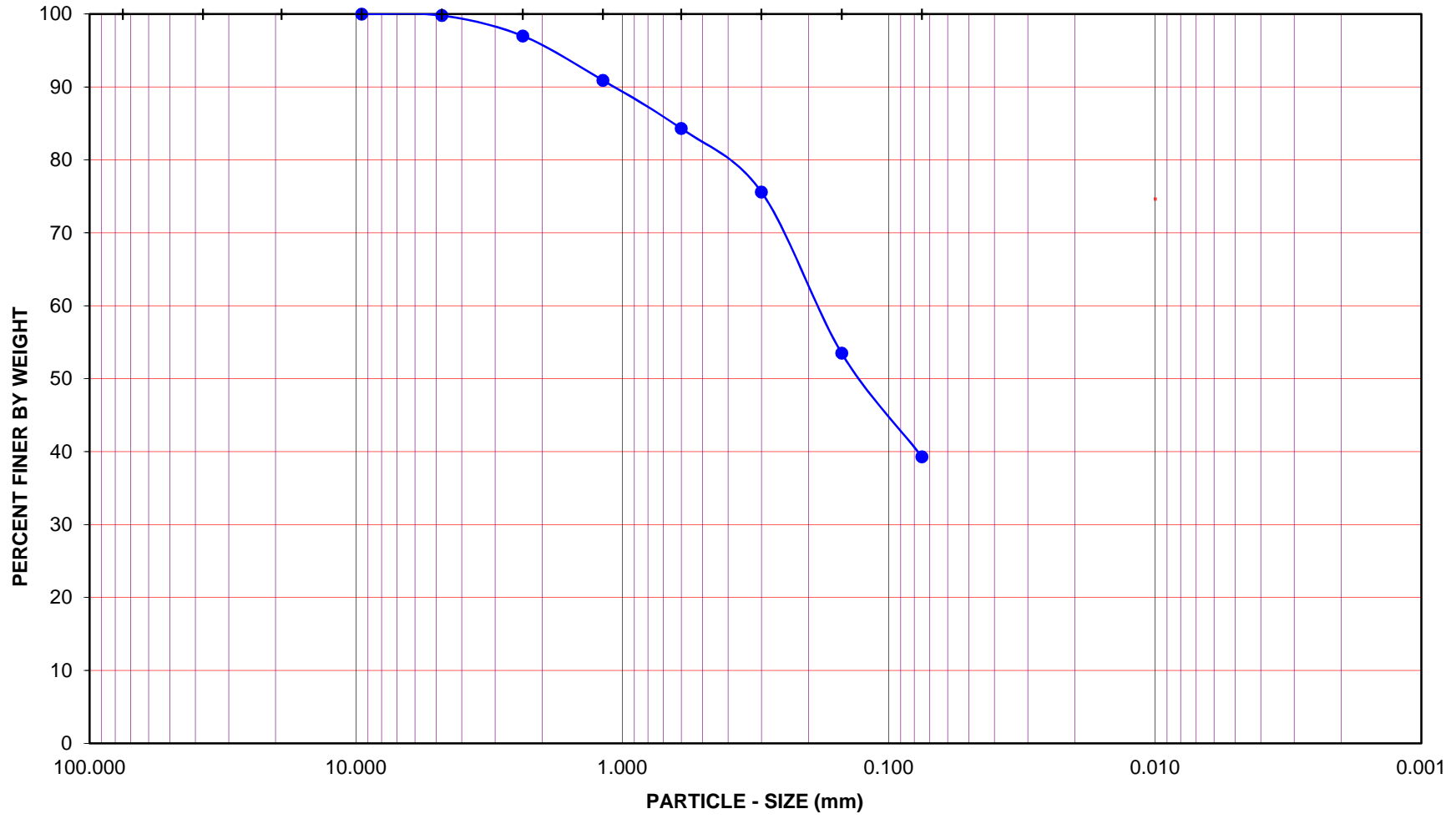
GROUP SYMBOL: SC-SM

Cu = D60/D10 = \_\_\_\_\_

Cc = (D30)<sup>2</sup>/(D60\*D10) = \_\_\_\_\_

Remarks: \_\_\_\_\_

GRAVEL				SAND				FINES				
COARSE		FINE		COARSE	MEDIUM	FINE		SILT		CLAY		
U.S. STANDARD SIEVE OPENING				U.S. STANDARD SIEVE NUMBER				HYDROMETER				
3.0"	1 1/2"	3/4"	3/8"	#4	#8	#16	#30	#50	#100	#200		



Project Name: Pillar Point Harbor  
 Project No.: 5720.180

Station ID: Bottom Comp      Sample ID: PPIHVC18-Bot  
 Date, Time: 06/19/19, 10:40      Soil Type : SC-SM

Soil Identification: Yellowish brown silty, clayey sand (SC-SM)

GR:SA:FI : (%)      **0 : 61 : 39**



**PARTICLE - SIZE DISTRIBUTION**  
**ASTM D 6913**

Jul-19



**PARTICLE-SIZE DISTRIBUTION (GRADATION)  
of SOILS USING SIEVE ANALYSIS  
ASTM D 6913**

Project Name: Pillar Point Harbor      Tested By: ACS/OHF    Date: 06/26/19  
 Project No.: 5720.180                      Checked By: J. Ward    Date: 07/11/19  
 Station ID: Mid Comp                      Date, Time: 06/19/19, 10:40  
 Sample ID: PPIHVC18-Mid  
 Soil Identification: Olive brown silty sand (SM)

		Moisture Content of Total Air - Dry Soil	
Container No.:	PHD	Wt. of Air-Dry Soil + Cont. (g)	0.0
Wt. of Air-Dried Soil + Cont.(g)	822.4	Wt. of Dry Soil + Cont. (g)	0.0
Wt. of Container (g)	214.9	Wt. of Container No._____ (g)	1.0
Dry Wt. of Soil (g)	607.5	Moisture Content (%)	0.0

After Wet Sieve	Container No.	PHD
	Wt. of Dry Soil + Container (g)	659.8
	Wt. of Container (g)	214.9
	Dry Wt. of Soil Retained on # 200 Sieve (g)	444.9

U. S. Sieve Size		Cumulative Weight Dry Soil Retained (g)	Percent Passing (%)
(in.)	(mm.)		
1 1/2"	37.5		
1"	25.0		
3/4"	19.0		
1/2"	12.5	0.0	100.0
3/8"	9.5	3.5	99.4
#4	4.75	9.9	98.4
#8	2.36	38.3	93.7
#16	1.18	87.0	85.7
#30	0.600	145.7	76.0
#50	0.300	195.8	67.8
#100	0.150	328.5	45.9
#200	0.075	442.3	27.2
PAN			

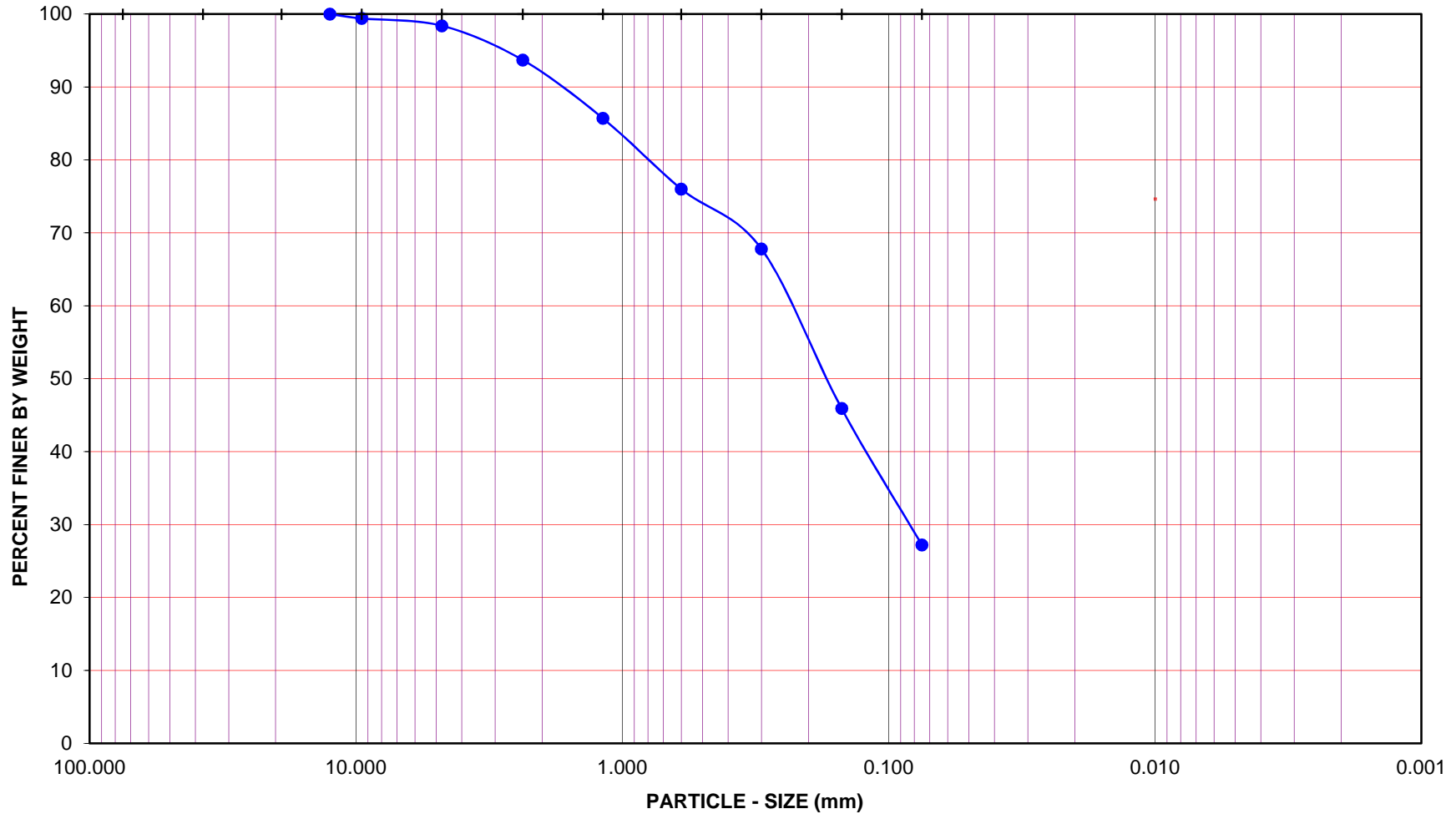
GRAVEL: 2 %  
 SAND: 71 %  
 FINES: 27 %  
 GROUP SYMBOL: SM

Cu = D60/D10 = \_\_\_\_\_

Cc = (D30)<sup>2</sup>/(D60\*D10) = \_\_\_\_\_

Remarks: \_\_\_\_\_

GRAVEL				SAND				FINES				
COARSE		FINE		COARSE	MEDIUM	FINE		SILT		CLAY		
U.S. STANDARD SIEVE OPENING				U.S. STANDARD SIEVE NUMBER				HYDROMETER				
3.0"	1 1/2"	3/4"	3/8"	#4	#8	#16	#30	#50	#100	#200		



Project Name: Pillar Point Harbor

Project No.: 5720.180

Station ID: Mid Comp

Sample ID: PPIHVC18-Mid

Date, Time: 06/19/19, 10:40

Soil Type : SM

Soil Identification: Olive brown silty sand (SM)

GR:SA:FI : (%)      **2 : 71 : 27**



**PARTICLE - SIZE  
DISTRIBUTION  
ASTM D 6913**

Jul-19



**PARTICLE-SIZE DISTRIBUTION (GRADATION)  
of SOILS USING SIEVE ANALYSIS  
ASTM D 6913**

Project Name: Pillar Point Harbor

Tested By: ACS/OHF Date: 06/21/19

Project No.: 5720.180

Checked By: J. Ward Date: 07/10/19

Station ID: Top Comp

Date, Time: 06/19/19, 10:40

Sample ID: PPIHVC18-Top

Soil Identification: Olive gray silty sand (SM)

		Moisture Content of Total Air - Dry Soil	
Container No.:	VO	Wt. of Air-Dry Soil + Cont. (g)	0.0
Wt. of Air-Dried Soil + Cont.(g)	752.7	Wt. of Dry Soil + Cont. (g)	0.0
Wt. of Container (g)	234.7	Wt. of Container No._____ (g)	1.0
Dry Wt. of Soil (g)	518.0	Moisture Content (%)	0.0

After Wet Sieve	Container No.	VO
	Wt. of Dry Soil + Container (g)	647.7
	Wt. of Container (g)	234.7
	Dry Wt. of Soil Retained on # 200 Sieve (g)	413.0

U. S. Sieve Size		Cumulative Weight Dry Soil Retained (g)	Percent Passing (%)
(in.)	(mm.)		
1 1/2"	37.5		
1"	25.0		
3/4"	19.0		
1/2"	12.5		
3/8"	9.5	0.0	100.0
#4	4.75	1.6	99.7
#8	2.36	17.4	96.6
#16	1.18	48.4	90.7
#30	0.600	91.8	82.3
#50	0.300	134.8	74.0
#100	0.150	275.3	46.9
#200	0.075	407.6	21.3
PAN			

GRAVEL: **0 %**

SAND: **79 %**

FINES: **21 %**

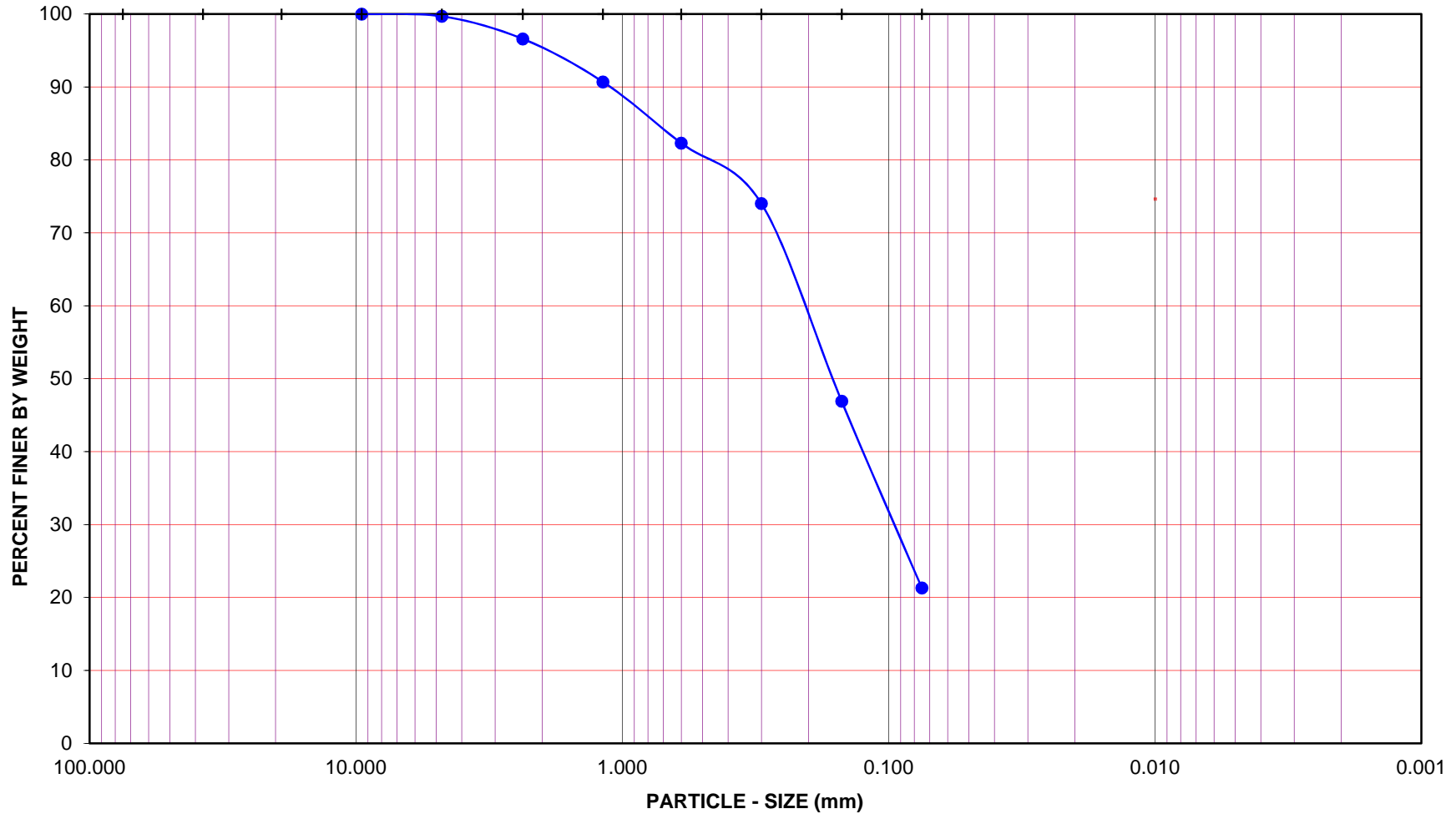
GROUP SYMBOL: **SM**

Cu = D60/D10 = \_\_\_\_\_

Cc = (D30)<sup>2</sup>/(D60\*D10) = \_\_\_\_\_

Remarks: \_\_\_\_\_

GRAVEL				SAND				FINES				
COARSE		FINE		COARSE	MEDIUM	FINE		SILT		CLAY		
U.S. STANDARD SIEVE OPENING				U.S. STANDARD SIEVE NUMBER				HYDROMETER				
3.0"	1 1/2"	3/4"	3/8"	#4	#8	#16	#30	#50	#100	#200		



Project Name: Pillar Point Harbor

Project No.: 5720.180

Station ID: Top Comp

Sample ID: PPIHVC18-Top

Date, Time: 06/19/19, 10:40

Soil Type : SM

Soil Identification: Olive gray silty sand (SM)

GR:SA:FI : (%)      0 : 79 : 21



**PARTICLE - SIZE  
DISTRIBUTION  
ASTM D 6913**

Jul-19



**PARTICLE-SIZE DISTRIBUTION (GRADATION)  
of SOILS USING SIEVE ANALYSIS  
ASTM D 6913**

Project Name: [Pillar Point Harbor](#)

Tested By: [OHF/ACS](#) Date: [06/26/19](#)

Project No.: [5720.180](#)

Checked By: [J. Ward](#) Date: [07/11/19](#)

Station ID: [Surfers Beach](#)

Date, Time: [06/19/19, 9:40](#)

Sample ID: [SBREF18-1](#)

Soil Identification: [Olive gray poorly-graded sand \(SP\)](#)

		Moisture Content of Total Air - Dry Soil	
Container No.:	F	Wt. of Air-Dry Soil + Cont. (g)	0.0
Wt. of Air-Dried Soil + Cont.(g)	696.0	Wt. of Dry Soil + Cont. (g)	0.0
Wt. of Container (g)	137.7	Wt. of Container No._____ (g)	1.0
Dry Wt. of Soil (g)	558.3	Moisture Content (%)	0.0

After Wet Sieve	Container No.	F
	Wt. of Dry Soil + Container (g)	690.5
	Wt. of Container (g)	137.7
	Dry Wt. of Soil Retained on # 200 Sieve (g)	552.8

U. S. Sieve Size		Cumulative Weight Dry Soil Retained (g)	Percent Passing (%)
(in.)	(mm.)		
1 1/2"	37.5		
1"	25.0		
3/4"	19.0		
1/2"	12.5		
3/8"	9.5		
#4	4.75		
#8	2.36	0.0	100.0
#16	1.18	0.3	99.9
#30	0.600	2.2	99.6
#50	0.300	43.2	92.3
#100	0.150	459.7	17.7
#200	0.075	552.4	1.1
PAN			

GRAVEL: **0 %**

SAND: **99 %**

FINES: **1 %**

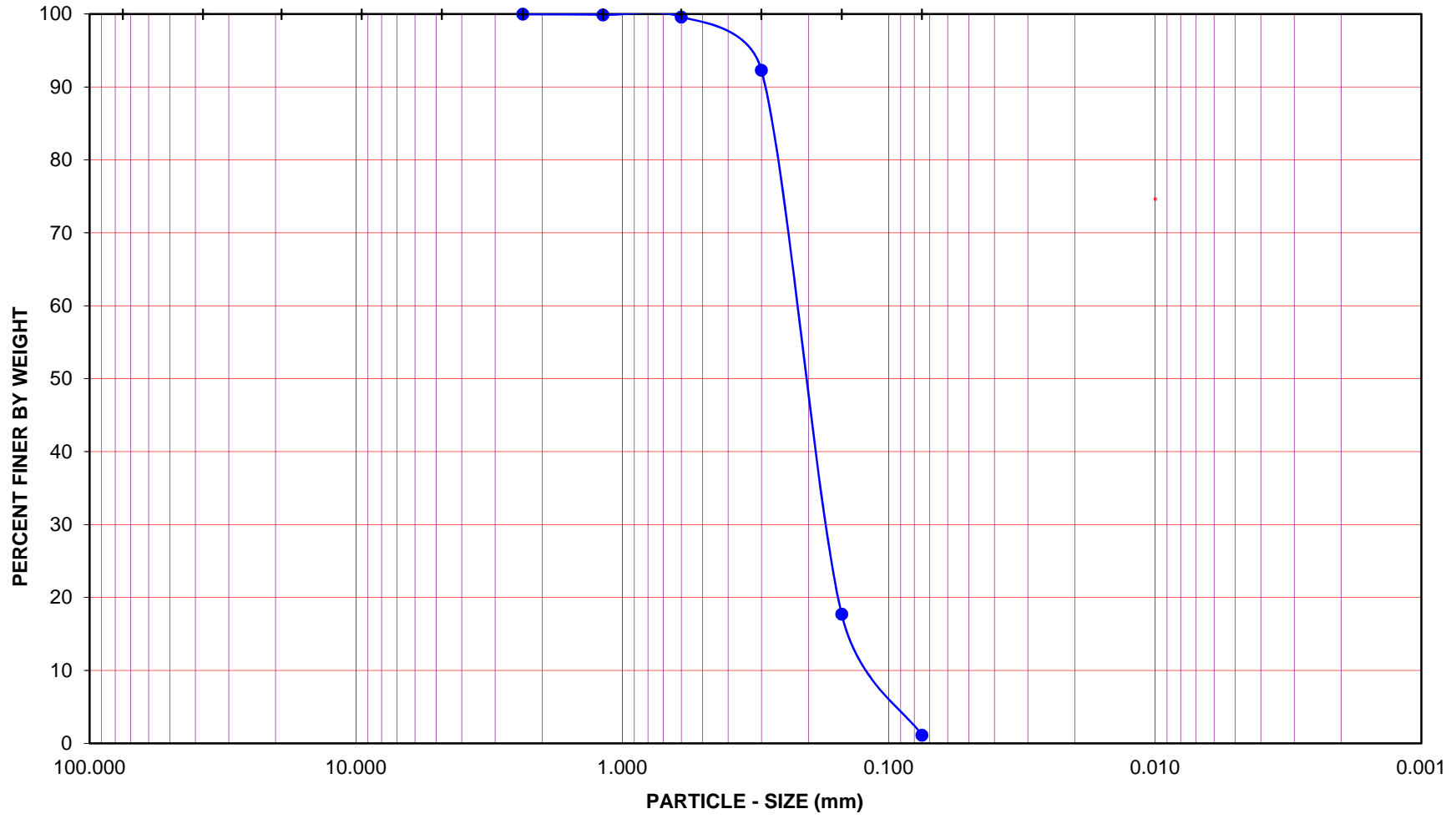
GROUP SYMBOL: **SP**

$$Cu = D_{60}/D_{10} = \underline{1.69}$$

$$Cc = (D_{30})^2/(D_{60} \cdot D_{10}) = \underline{0.90}$$

Remarks: \_\_\_\_\_

GRAVEL				SAND				FINES				
COARSE		FINE		COARSE	MEDIUM	FINE		SILT		CLAY		
U.S. STANDARD SIEVE OPENING				U.S. STANDARD SIEVE NUMBER				HYDROMETER				
3.0"	1 1/2"	3/4"	3/8"	#4	#8	#16	#30	#50	#100	#200		



Project Name: Pillar Point Harbor

Project No.: 5720.180

Station ID: Surfers Beach

Sample ID: SBREF18-1

Date, Time: 06/19/19, 9:40

Soil Type : SP

Soil Identification: Olive gray poorly-graded sand (SP)

GR:SA:FI : (%)      0 : 99 : 1



**PARTICLE - SIZE  
DISTRIBUTION  
ASTM D 6913**

Jul-19





**PARTICLE-SIZE DISTRIBUTION (GRADATION)  
of SOILS USING SIEVE ANALYSIS  
ASTM D 6913**

Project Name: Pillar Point Harbor

Tested By: OHF/ACS Date: 06/26/19

Project No.: 5720.180

Checked By: J. Ward Date: 07/11/19

Station ID: Surfers Beach

Date, Time: 06/19/19, 9:32

Sample ID: SBREF18-2

Soil Identification: Olive gray poorly-graded sand (SP)

		Moisture Content of Total Air - Dry Soil	
Container No.:	VIP	Wt. of Air-Dry Soil + Cont. (g)	0.0
Wt. of Air-Dried Soil + Cont.(g)	706.2	Wt. of Dry Soil + Cont. (g)	0.0
Wt. of Container (g)	219.5	Wt. of Container No._____ (g)	1.0
Dry Wt. of Soil (g)	486.7	Moisture Content (%)	0.0

After Wet Sieve	Container No.	VIP
	Wt. of Dry Soil + Container (g)	701.9
	Wt. of Container (g)	219.5
	Dry Wt. of Soil Retained on # 200 Sieve (g)	482.4

U. S. Sieve Size		Cumulative Weight Dry Soil Retained (g)	Percent Passing (%)
(in.)	(mm.)		
1 1/2"	37.5		
1"	25.0		
3/4"	19.0		
1/2"	12.5		
3/8"	9.5		
#4	4.75		
#8	2.36		
#16	1.18	0.0	100.0
#30	0.600	0.5	99.9
#50	0.300	31.9	93.4
#100	0.150	400.6	17.7
#200	0.075	481.9	1.0
PAN			

GRAVEL: **0 %**

SAND: **99 %**

FINES: **1 %**

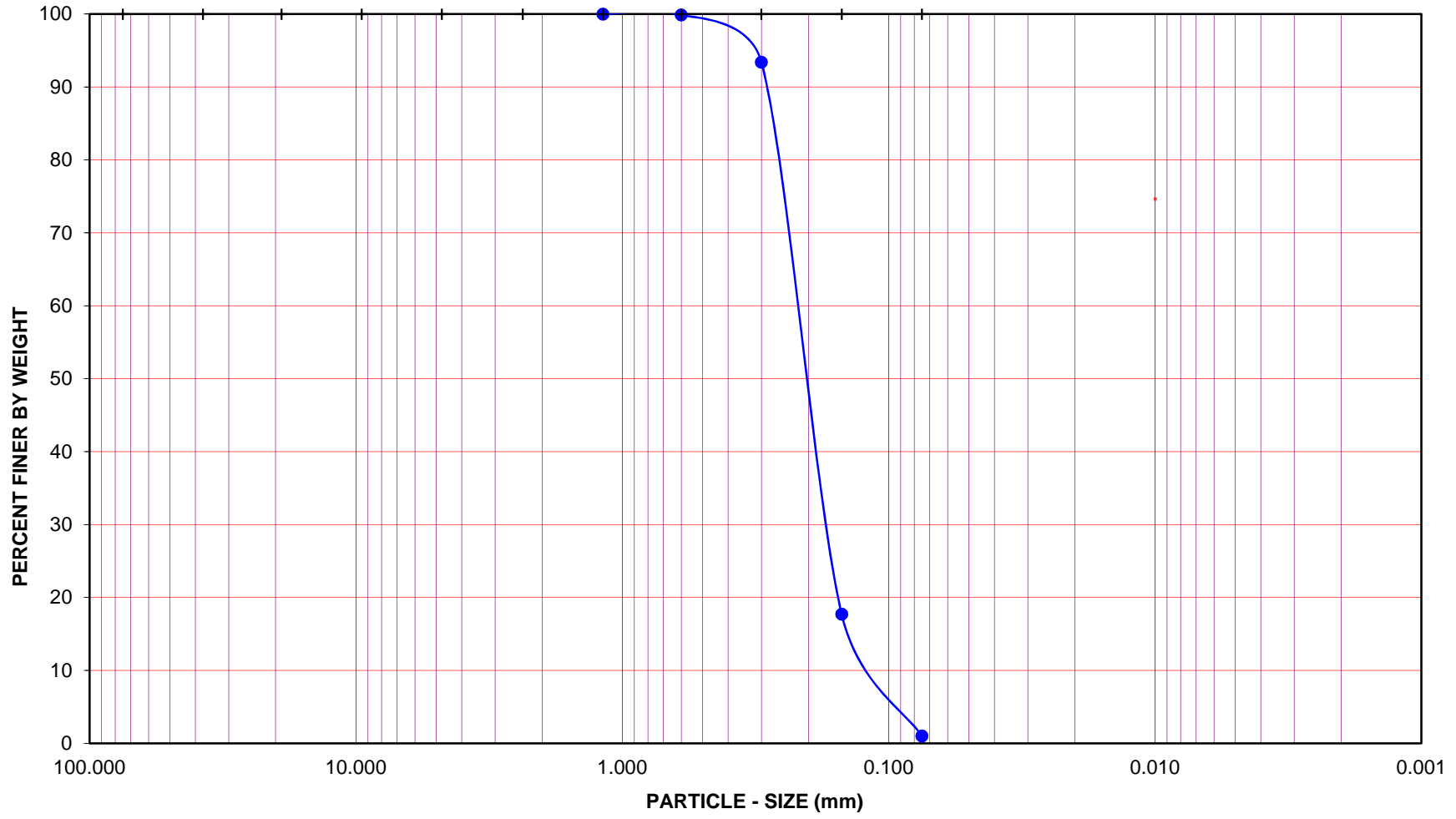
GROUP SYMBOL: **SP**

$$Cu = D_{60}/D_{10} = \underline{1.69}$$

$$Cc = (D_{30})^2/(D_{60} \cdot D_{10}) = \underline{0.90}$$

Remarks: \_\_\_\_\_

GRAVEL				SAND				FINES				
COARSE		FINE		COARSE	MEDIUM	FINE		SILT		CLAY		
U.S. STANDARD SIEVE OPENING				U.S. STANDARD SIEVE NUMBER				HYDROMETER				
3.0"	1 1/2"	3/4"	3/8"	#4	#8	#16	#30	#50	#100	#200		



Project Name: Pillar Point Harbor

Project No.: 5720.180

Station ID: Surfers Beach

Sample ID: SBREF18-2

Date, Time: 06/19/19, 9:32

Soil Type : SP

Soil Identification: Olive gray poorly-graded sand (SP)

GR:SA:FI : (%) **0 : 99 : 1**



**PARTICLE - SIZE  
DISTRIBUTION  
ASTM D 6913**

Jul-19



**PARTICLE-SIZE DISTRIBUTION (GRADATION)  
of SOILS USING SIEVE ANALYSIS  
ASTM D 6913**

Project Name: Pillar Point Harbor

Tested By: OHF/ACS Date: 06/26/19

Project No.: 5720.180

Checked By: J. Ward Date: 07/11/19

Station ID: Surfers Beach

Date, Time: 06/19/19, 9:26

Sample ID: SBREF18-3

Soil Identification: Olive gray poorly-graded sand (SP)

		Moisture Content of Total Air - Dry Soil	
Container No.:	GE	Wt. of Air-Dry Soil + Cont. (g)	0.0
Wt. of Air-Dried Soil + Cont.(g)	776.5	Wt. of Dry Soil + Cont. (g)	0.0
Wt. of Container (g)	250.3	Wt. of Container No._____ (g)	1.0
Dry Wt. of Soil (g)	526.2	Moisture Content (%)	0.0

After Wet Sieve	Container No.	GE
	Wt. of Dry Soil + Container (g)	771.5
	Wt. of Container (g)	250.3
	Dry Wt. of Soil Retained on # 200 Sieve (g)	521.2

U. S. Sieve Size		Cumulative Weight Dry Soil Retained (g)	Percent Passing (%)
(in.)	(mm.)		
1 1/2"	37.5		
1"	25.0		
3/4"	19.0		
1/2"	12.5		
3/8"	9.5		
#4	4.75		
#8	2.36		
#16	1.18	0.0	100.0
#30	0.600	4.3	99.2
#50	0.300	142.0	73.0
#100	0.150	476.6	9.4
#200	0.075	520.6	1.1
PAN			

GRAVEL: 0 %

SAND: 99 %

FINES: 1 %

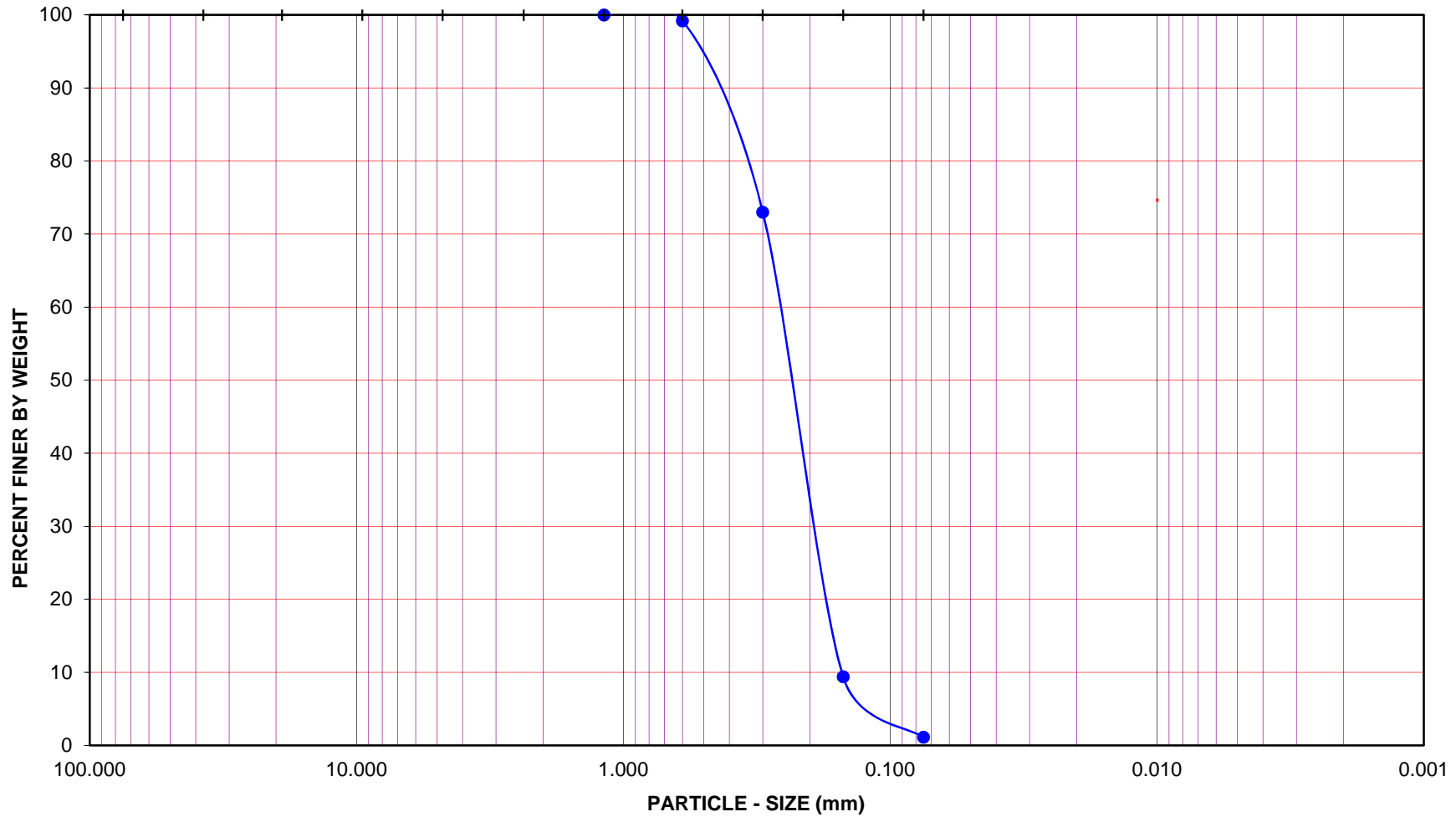
GROUP SYMBOL: SP

$$Cu = D_{60}/D_{10} = \underline{1.67}$$

$$Cc = (D_{30})^2/(D_{60} \cdot D_{10}) = \underline{1.07}$$

Remarks: \_\_\_\_\_

GRAVEL				SAND				FINES				
COARSE		FINE		COARSE	MEDIUM	FINE		SILT		CLAY		
U.S. STANDARD SIEVE OPENING				U.S. STANDARD SIEVE NUMBER				HYDROMETER				
3.0"	1 1/2"	3/4"	3/8"	#4	#8	#16	#30	#50	#100	#200		



Project Name: Pillar Point Harbor

Project No.: 5720.180

Station ID: Surfers Beach

Sample ID: SBREF18-3

Date, Time: 06/19/19, 9:26

Soil Type : SP

Soil Identification: Olive gray poorly-graded sand (SP)

GR:SA:FI : (%) **0 : 99 : 1**



**PARTICLE - SIZE  
DISTRIBUTION  
ASTM D 6913**

Jul-19

## Appendix D. Daily Logs / GPS Notes

KLI Daily Log Pillar Point Harbor / Surfers Beach Sampling

18 June 2019

GPS Start 0.47' accuracy

GPS End 0.47' accuracy

0830 Setup Barge

1140 Begin coring ops site 1

1355 core site 8

1425 core site 7

1505 core site 6

1535 core site 4

1625 core site 3

1645 shut down vibrocoring, start beach grabs on foot

1702 collect inner harbor site 1

1710 collect inner harbor site 2

1720 collect inner harbor site 3

1800 Report

KLI Daily Log Pillar Point Harbor / Surfers Beach Sampling

19 June 2019

GPS Start 6.47 Accuracy

GPS End 6.47 Accuracy

0900 Arrive Pillar Point Harbor

0926 Collect Surfers Beach Ref site 3

0932 " " " " 2

0940 " " " " 1

1030 Abandon barge

1040 core site 5

1110 core site 2

1140 shutdown vibrating ops, process samples

1500 Demobe barge

1700 Depart

## Appendix E. Chain of Custody Forms



# Chain of Custody Record



**To:**  
Eurofins Calscience, Inc.  
7440 Lincoln Way  
Garden Grove, CA 92841  
Phone: (714) 895-5494

**Date Received:**  
**Lab #:**

**From:**  
Kinnetic Laboratories, Inc  
307 Washington St.  
Santa Cruz, CA 95060  
(831) 457-3950  
Contact: Amy Howk

**Project:** Pillar Point Harbor **Matrix:** Sediment **Project #:** 5720.180

SampleID	StationID	Sample Date	Sample Time	Sample Type	Analysis	Container	Pres	No. of Bottles	LabID	Condition Upon Receipt
PPIHVC18-Top	Top Comp	6/19/19	1040	Comp	% Solids, TOC	500 ml WMGJ	4° C	1		
PPIHVC18-Mid	Mid Comp	↓	↓	Comp	% Solids, TOC	500 ml WMGJ	4° C	1		
PPIHVC18-Bot	Bottom Comp	↓	↓	Comp	% Solids, TOC	500 ml WMGJ	4° C	1		
PPIHVC18-6&7-Top	6&7 Top*	6/18/19	1505	Comp	% Solids, TOC	500 ml WMGJ	4° C	1		
PPIHVC18-6&7-Mid	6&7 Mid*	↓	↓	Comp	% Solids, TOC	500 ml WMGJ	4° C	1		
PPIHVC18-6&7-Bot	6&7 Bottom*	↓	↓	Comp	% Solids, TOC	500 ml WMGJ	4° C	1		
PPIHVC18-8T	8 Top*	6/18/19	1355	Grab	% Solids, TOC	500 ml WMGJ	4° C	1		
PPIHVC18-8M	8 Mid*	↓	↓	Grab	% Solids, TOC	500 ml WMGJ	4° C	1		
PPIHVC18-8B	8 Bottom*	↓	↓	Grab	% Solids, TOC	500 ml WMGJ	4° C	1		

**Data Report MUST include the following:** Sample ID, Analytical Method, Detection Limit, Date of Extraction if applicable, Date of Analysis, Analytical Results and Signature of QA Reviewer. All times on this sheet are military time. Email PDF and EDD reports to [edd@kinneticlabs.net](mailto:edd@kinneticlabs.net).

**Special Instructions/Comments:** Please report in dry weight using the DMMO format. \*Samples from Areas 6&7 and Area 8 need to be fully homogenized prior to analysis

Sampled and Relinquished By:	Date/Time:	Transporter	Received By:	Date/Time:
Amy Howk	6/20/19 1600	FedEx		
		Transporter		

Chain of Custody Record



**To:**  
Leighton  
17781 Cowan  
Irvine, CA 92614  
Phone: (949)-681-4249

**Date Received:**  
**Lab #:**

**From:**  
Kinnetic Laboratories, Inc  
307 Washington St.  
Santa Cruz, CA 95060  
(831) 457-3950  
Contact: Amy Howk

Project #: 5720.180

Matrix: Sediment

Project: Pillar Point Harbor

Complete by: 10 Day TAT

SampleID	StationID	Sample Date	Sample Time	Sample Type	Analysis	Container	Pres	No. of Bottles	LabID	Condition Upon Receipt
PPIHVC18-Top	Top Comp	6/19/19	1040	Comp	Grain Size	1 Qt Ziploc Bag	4° C	1		
PPIHVC18-Mid	Mid Comp	↓	↓	Comp	Grain Size	1 Qt Ziploc Bag	4° C	1		
PPIHVC18-Bot	Bottom Comp	↓	↓	Comp	Grain Size	1 Qt Ziploc Bag	4° C	1		
PPIHVC18-4-3.0-4.1	4-3.0-4.1	6/18/19	1535	Grab	Grain Size	↓	↓	1		
PPIHVC18-4-4.1-5.7	4-4.1-5.7	↓	↓	Grab	Grain Size	↓	↓	1		

Data Report MUST include the following: Sample ID, Analytical Method, Detection Limit, Date of Extraction if applicable, Date of Analysis, Analytical Results and Signature of QA Reviewer. All times on this sheet are military time. Email PDF and EDD reports to edd@kinneticlabs.net.

Special Instructions/Comments:

Sampled and Relinquished By:	Date/Time:	Transporter	Received By:	Date/Time:
Amy Howk	6/20/19 1600	FedEx		

# Chain of Custody Record



**To:**  
 Leighton  
 17781 Cowan  
 Irvine, CA 92614  
 Phone: (949)-681-4249

**Date Received:**  
**Lab #:**

**From:**  
 Kinnetic Laboratories, Inc  
 307 Washington SL  
 Santa Cruz, CA 95060  
 (831) 457-3950  
 Contact: Amy Howk

**Project:** Pillar Point Harbor **Matrix:** Sediment **Project #:** 5720.180  
**Complete by:** 10 Day TAT

Sample ID	Station ID	Sample Date	Sample Time	Sample Type	Analysis	Container	Pres	No. of Bottles	Lab ID	Condition Upon Receipt
PPIHVC18-1T	1 Top	6/18/19	1200	Grab	Grain Size	1 Qt Ziploc Bag	4° C	1		
PPIHVC18-1M	1 Mid		↓	Grab	Grain Size	1 Qt Ziploc Bag	4° C	1		
<del>PPIHVC18-1B</del>	<del>1 Bottom</del>			Grab	Grain Size	<del>1 Qt Ziploc Bag</del>	<del>4° C</del>	<del>1</del>	<del>(AH)</del>	
PPIHVC18-2T	0-20' 2 Top	6/19/19	1110	Grab	Grain Size	1 Qt Ziploc Bag	4° C	1		
PPIHVC18-2M	20'-3.7' 2 Mid	↓	↓	Grab	Grain Size	1 Qt Ziploc Bag	4° C	1		
<del>PPIHVC18-2B</del>	<del>2 Bottom</del>			Grab	Grain Size	<del>1 Qt Ziploc Bag</del>	<del>4° C</del>	<del>1</del>	<del>(AH)</del>	
PPIHVC18-3T	3 Top	6/18/19	1625	Grab	Grain Size	1 Qt Ziploc Bag	4° C	1		
PPIHVC18-3M	3 Mid	↓	↓	Grab	Grain Size	1 Qt Ziploc Bag	4° C	1		
PPIHVC18-3B	3 Bottom	↓	↓	Grab	Grain Size	1 Qt Ziploc Bag	4° C	1		
PPIHVC18-4T	4 Top	6/18/19	1535	Grab	Grain Size	1 Qt Ziploc Bag	4° C	1		
PPIHVC18-4M	4 Mid	↓	↓	Grab	Grain Size	1 Qt Ziploc Bag	4° C	1		
<del>PPIHVC18-4B</del>	<del>4 Bottom</del>			Grab	Grain Size	<del>1 Qt Ziploc Bag</del>	<del>4° C</del>	<del>1</del>	<del>(AH)</del>	

Data Report MUST include the following: Sample ID, Analytical Method, Detection Limit, Date of Extraction if applicable, Date of Analysis, Analytical Results and Signature of QA Reviewer.  
 All times on this sheet are military time. Email PDF and EDD reports to edd@kinneticlabs.net.

**Special Instructions/Comments:**

Sampled and Relinquished By:	Transporter	Received By:	Date/Time:
Amy Howk	FedEx		
Relinquished By:	Transporter	Received By:	Date/Time:

# Chain of Custody Record

**To:**  
Leighton  
17781 Cowan  
Irvine, CA 92614  
Phone: (949)-681-4249

**Date Received:**  
**Lab #:**

**From:**  
Kinnetic Laboratories, Inc  
307 Washington St.  
Santa Cruz, CA 95060  
(831) 457-3950  
(831) 426-0405 Fax  
Contact: Amy Howk



**Project:** Pillar Point Harbor  
**Complete by:** 10 Day TAT

**Matrix:** Sediment  
**Project #:** 5720.180

SampleID	StationID	Sample Date	Sample Time	Sample Type	Analysis	Container	Pres	No. of Bottles	LabID	Condition Upon Receipt
PPIHVC18-5T	5 Top	6/19/19	1040	Grab	Grain Size	1 Qt Ziploc Bag	4° C	1		
PPIHVC18-5M	5 Mid	↓	↓	Grab	Grain Size	1 Qt Ziploc Bag	4° C	1		
PPIHVC18-5B	5 Bottom	↓	↓	Grab	Grain Size	1 Qt Ziploc Bag	4° C	1		
PPIHVC18-6T	6 Top	6/18/19	1505	Grab	Grain Size	1 Qt Ziploc Bag	4° C	1		
PPIHVC18-6M	6 Mid	↓	↓	Grab	Grain Size	1 Qt Ziploc Bag	4° C	1		
PPIHVC18-6B	6 Bottom	↓	↓	Grab	Grain Size	1 Qt Ziploc Bag	4° C	1		
PPIHVC18-7T	7 Top	6/18/19	1425	Grab	Grain Size	1 Qt Ziploc Bag	4° C	1		
PPIHVC18-7M	7 Mid	↓	↓	Grab	Grain Size	1 Qt Ziploc Bag	4° C	1		
PPIHVC18-7B	7 Bottom	↓	↓	Grab	Grain Size	1 Qt Ziploc Bag	4° C	1		
PPIHVC18-8T	8 Top	6/18/19	1355	Grab	Grain Size	1 Qt Ziploc Bag	4° C	1		
PPIHVC18-8M	8 Mid	↓	↓	Grab	Grain Size	1 Qt Ziploc Bag	4° C	1		
PPIHVC18-8B	8 Bottom	↓	↓	Grab	Grain Size	1 Qt Ziploc Bag	4° C	1		

**Data Report MUST include the following:** Sample ID, Analytical Method, Detection Limit, Date of Extraction if applicable, Date of Analysis, Analytical Results and Signature of QA Reviewer.  
All times on this sheet are military time. Email PDF and EDD reports to edd@kinneticlabs.net.

**Special Instructions/Comments:**

<b>Sampled and Relinquished By:</b> Amy Hank	<b>Date/Time:</b> 6/20/19 1600	<b>Received By:</b> FedEx	<b>Date/Time:</b>
<b>Relinquished By:</b> J	<b>Date/Time:</b>	<b>Received By:</b>	<b>Date/Time:</b>

# Chain of Custody Record



**From:**  
 Kinnetic Laboratories, Inc  
 307 Washington St.  
 Santa Cruz, CA 95060  
 (831) 457-3950  
 (831) 426-0405 Fax  
 Contact: Amy Howk

**Date Received:**  
**Lab #:**

**Project:** Pillar Point Harbor  
**Matrix:** Sediment  
**Project #:** 5720.180

**Complete by:** 10 Day TAT

SampleID	StationID	Sample Date	Sample Time	Sample Type	Analysis	Container	Pres	No. of Bottles	LabID	Condition Upon Receipt
IHBG18-1	PP Harbor Beach	6/18/19	1702	Grab	Grain Size	1 Qt Ziploc Bag	4°C	1		
IHBG18-2	PP Harbor Beach	↓	1710	Grab	Grain Size	1 Qt Ziploc Bag	4°C	1		
IHBG18-3	PP Harbor Beach	↓	1720	Grab	Grain Size	1 Qt Ziploc Bag	4°C	1		
SBREF18-1	Surfers Beach	6/19/19	0940	Grab	Grain Size	1 Qt Ziploc Bag	4°C	1		
SBREF18-2	Surfers Beach	↓	0932	Grab	Grain Size	1 Qt Ziploc Bag	4°C	1		
SBREF18-3	Surfers Beach	↓	0926	Grab	Grain Size	1 Qt Ziploc Bag	4°C	1		

Data Report MUST include the following: Sample ID, Analytical Method, Detection Limit, Date of Extraction if applicable, Date of Analysis, Analytical Results and Signature of QA Reviewer.  
 All times on this sheet are military time. Email PDF and EDD reports to edd@kinneticlabs.net.

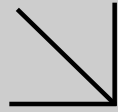
**Special Instructions/Comments:**

<b>Sampled and Relinquished By:</b> Amy Howk	<b>Date/Time:</b> 6/20/19 1600	<b>Transporter:</b> FedEx	<b>Received By:</b>	<b>Date/Time:</b>
<b>Relinquished By:</b>	<b>Date/Time:</b>	<b>Transporter:</b>	<b>Received By:</b>	<b>Date/Time:</b>

## Appendix F. Lab Chemistry Report



Calscience



**WORK ORDER NUMBER: 19-06-1455**

*The difference is service*



AIR | SOIL | WATER | MARINE CHEMISTRY

**Analytical Report For**

**Client:** Kinnetic Laboratories, Inc.

**Client Project Name:** Pillar Point Harbor

**Attention:** Amy Howk  
307 Washington Street  
Santa Cruz, CA 95060-4928

Approved for release on 07/05/2019 by:  
Lori Thompson  
Project Manager

ResultLink ▶

Email your PM ▶

Eurofins Calscience (Calscience) certifies that the test results provided in this report meet all NELAC Institute requirements for parameters for which accreditation is required or available. Any exceptions to NELAC Institute requirements are noted in the case narrative. The original report of subcontracted analyses, if any, is attached to this report. The results in this report are limited to the sample(s) tested and any reproduction thereof must be made in its entirety. The client or recipient of this report is specifically prohibited from making material changes to said report and, to the extent that such changes are made, Calscience is not responsible, legally or otherwise. The client or recipient agrees to indemnify Calscience for any defense to any litigation which may arise.



# Contents

Client Project Name: Pillar Point Harbor  
Work Order Number: 19-06-1455

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5	Glossary of Terms and Qualifiers. . . . .	12
6	Chain-of-Custody/Sample Receipt Form. . . . .	13



**Condition Upon Receipt:**

Samples were received under Chain-of-Custody (COC) on 06/21/19. They were assigned to Work Order 19-06-1455.

Unless otherwise noted on the Sample Receiving forms all samples were received in good condition and within the recommended EPA temperature criteria for the methods noted on the COC. The COC and Sample Receiving Documents are integral elements of the analytical report and are presented at the back of the report.

**Holding Times:**

All samples were analyzed within prescribed holding times (HT) and/or in accordance with the Calscience Sample Acceptance Policy unless otherwise noted in the analytical report and/or comprehensive case narrative, if required.

Any parameter identified in 40CFR Part 136.3 Table II that is designated as "analyze immediately" with a holding time of  $\leq 15$  minutes (40CFR-136.3 Table II, footnote 4), is considered a "field" test and the reported results will be qualified as being received outside of the stated holding time unless received at the laboratory within 15 minutes of the collection time.

**Quality Control:**

All quality control parameters (QC) were within established control limits except where noted in the QC summary forms or described further within this report.

**Subcontractor Information:**

Unless otherwise noted below (or on the subcontract form), no samples were subcontracted.

**Additional Comments:**

Air - Sorbent-extracted air methods (EPA TO-4A, EPA TO-13A): Analytical results are converted from mass/sample basis to mass/volume basis using client-supplied air volumes.

Solid - Unless otherwise indicated, solid sample data is reported on a wet weight basis, not corrected for % moisture. All QC results are always reported on a wet weight basis.



Calscience

## Sample Summary

Client: Kinnetic Laboratories, Inc.	Work Order: 19-06-1455
307 Washington Street	Project Name: Pillar Point Harbor
Santa Cruz, CA 95060-4928	PO Number:
	Date/Time Received: 06/21/19 10:00
	Number of Containers: 9

Attn: Amy Howk

Sample Identification	Lab Number	Collection Date and Time	Number of Containers	Matrix
PPIHVC18-Top	19-06-1455-1	06/19/19 10:40	1	Sediment
PPIHVC18-Mid	19-06-1455-2	06/19/19 10:40	1	Sediment
PPIHVC18-Bot	19-06-1455-3	06/19/19 10:40	1	Sediment
PPIHVC18-6&7-Top	19-06-1455-4	06/18/19 15:05	1	Sediment
PPIHVC18-6&7-Mid	19-06-1455-5	06/18/19 15:05	1	Sediment
PPIHVC18-6&7-Bot	19-06-1455-6	06/18/19 15:05	1	Sediment
PPIHVC18-8T	19-06-1455-7	06/18/19 13:55	1	Sediment
PPIHVC18-8M	19-06-1455-8	06/18/19 13:55	1	Sediment
PPIHVC18-8B	19-06-1455-9	06/18/19 13:55	1	Sediment



Calscience

## Analytical Report

Kinnetic Laboratories, Inc.  
307 Washington Street  
Santa Cruz, CA 95060-4928

Date Received: 06/21/19  
Work Order: 19-06-1455  
Preparation: N/A  
Method: EPA 9060A  
Units: %

Project: Pillar Point Harbor

Page 1 of 2

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
PPIHVC18-Top	19-06-1455-1-AA	06/19/19 10:40	Sediment	TOC 10	06/23/19	06/24/19 17:39	J0623TOCL1

Comment(s): - Results are reported on a dry weight basis.  
- Results were evaluated to the MDL (DL), concentrations  $\geq$  to the MDL (DL) but  $<$  RL (LOQ), if found, are qualified with a "J" flag.

Parameter	Result	RL	MDL	DF	Qualifiers
Carbon, Total Organic	0.33	0.068	0.024	1.00	

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
PPIHVC18-Mid	19-06-1455-2-AA	06/19/19 10:40	Sediment	TOC 10	06/23/19	06/24/19 17:39	J0623TOCL1

Comment(s): - Results are reported on a dry weight basis.  
- Results were evaluated to the MDL (DL), concentrations  $\geq$  to the MDL (DL) but  $<$  RL (LOQ), if found, are qualified with a "J" flag.

Parameter	Result	RL	MDL	DF	Qualifiers
Carbon, Total Organic	0.12	0.061	0.021	1.00	

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
PPIHVC18-Bot	19-06-1455-3-AA	06/19/19 10:40	Sediment	TOC 10	06/23/19	06/24/19 17:39	J0623TOCL1

Comment(s): - Results are reported on a dry weight basis.  
- Results were evaluated to the MDL (DL), concentrations  $\geq$  to the MDL (DL) but  $<$  RL (LOQ), if found, are qualified with a "J" flag.

Parameter	Result	RL	MDL	DF	Qualifiers
Carbon, Total Organic	0.028	0.058	0.020	1.00	J

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
PPIHVC18-6&7-Top	19-06-1455-4-AA	06/18/19 15:05	Sediment	TOC 10	06/23/19	06/24/19 17:39	J0623TOCL1

Comment(s): - Results are reported on a dry weight basis.  
- Results were evaluated to the MDL (DL), concentrations  $\geq$  to the MDL (DL) but  $<$  RL (LOQ), if found, are qualified with a "J" flag.

Parameter	Result	RL	MDL	DF	Qualifiers
Carbon, Total Organic	0.095	0.064	0.022	1.00	

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
PPIHVC18-6&7-Mid	19-06-1455-5-AA	06/18/19 15:05	Sediment	TOC 10	06/23/19	06/24/19 17:39	J0623TOCL1

Comment(s): - Results are reported on a dry weight basis.  
- Results were evaluated to the MDL (DL), concentrations  $\geq$  to the MDL (DL) but  $<$  RL (LOQ), if found, are qualified with a "J" flag.

Parameter	Result	RL	MDL	DF	Qualifiers
Carbon, Total Organic	0.23	0.063	0.022	1.00	

RL: Reporting Limit. DF: Dilution Factor. MDL: Method Detection Limit.



Calscience

## Analytical Report

Kinnetic Laboratories, Inc.  
307 Washington Street  
Santa Cruz, CA 95060-4928

Date Received: 06/21/19  
Work Order: 19-06-1455  
Preparation: N/A  
Method: EPA 9060A  
Units: %

Project: Pillar Point Harbor

Page 2 of 2

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
PPIHVC18-6&7-Bot	19-06-1455-6-AA	06/18/19 15:05	Sediment	TOC 10	06/23/19	06/24/19 17:39	J0623TOCL1

Comment(s): - Results are reported on a dry weight basis.  
- Results were evaluated to the MDL (DL), concentrations  $\geq$  to the MDL (DL) but  $<$  RL (LOQ), if found, are qualified with a "J" flag.

Parameter	Result	RL	MDL	DF	Qualifiers
Carbon, Total Organic	1.2	0.068	0.024	1.00	

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
PPIHVC18-8T	19-06-1455-7-AA	06/18/19 13:55	Sediment	TOC 10	06/23/19	06/24/19 17:39	J0623TOCL1

Comment(s): - Results are reported on a dry weight basis.  
- Results were evaluated to the MDL (DL), concentrations  $\geq$  to the MDL (DL) but  $<$  RL (LOQ), if found, are qualified with a "J" flag.

Parameter	Result	RL	MDL	DF	Qualifiers
Carbon, Total Organic	0.32	0.070	0.024	1.00	

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
PPIHVC18-8M	19-06-1455-8-AA	06/18/19 13:55	Sediment	TOC 10	06/23/19	06/24/19 17:39	J0623TOCL1

Comment(s): - Results are reported on a dry weight basis.  
- Results were evaluated to the MDL (DL), concentrations  $\geq$  to the MDL (DL) but  $<$  RL (LOQ), if found, are qualified with a "J" flag.

Parameter	Result	RL	MDL	DF	Qualifiers
Carbon, Total Organic	0.33	0.064	0.022	1.00	

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
PPIHVC18-8B	19-06-1455-9-AA	06/18/19 13:55	Sediment	TOC 10	06/23/19	06/24/19 17:39	J0623TOCL1

Comment(s): - Results are reported on a dry weight basis.  
- Results were evaluated to the MDL (DL), concentrations  $\geq$  to the MDL (DL) but  $<$  RL (LOQ), if found, are qualified with a "J" flag.

Parameter	Result	RL	MDL	DF	Qualifiers
Carbon, Total Organic	1.3	0.073	0.025	1.00	

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
Method Blank	099-06-013-1965	N/A	Solid	TOC 10	06/23/19	06/24/19 17:39	J0623TOCL1

Comment(s): - Results were evaluated to the MDL (DL), concentrations  $\geq$  to the MDL (DL) but  $<$  RL (LOQ), if found, are qualified with a "J" flag.

Parameter	Result	RL	MDL	DF	Qualifiers
Carbon, Total Organic	ND	0.050	0.017	1.00	

RL: Reporting Limit. DF: Dilution Factor. MDL: Method Detection Limit.



Calscience

## Analytical Report

Kinnetic Laboratories, Inc.  
307 Washington Street  
Santa Cruz, CA 95060-4928

Date Received: 06/21/19  
Work Order: 19-06-1455  
Preparation: N/A  
Method: SM 2540 B (M)  
Units: %

Project: Pillar Point Harbor

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Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
PPIHVC18-Top	19-06-1455-1-AA	06/19/19 10:40	Sediment	N/A	06/22/19	06/22/19 15:30	J0622TSB1

Comment(s): - Results were evaluated to the MDL (DL), concentrations  $\geq$  to the MDL (DL) but  $<$  RL (LOQ), if found, are qualified with a "J" flag.

Parameter	Result	RL	MDL	DF	Qualifiers
Solids, Total	73.7	0.100	0.100	1.00	

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
PPIHVC18-Mid	19-06-1455-2-AA	06/19/19 10:40	Sediment	N/A	06/22/19	06/22/19 15:30	J0622TSB1

Comment(s): - Results were evaluated to the MDL (DL), concentrations  $\geq$  to the MDL (DL) but  $<$  RL (LOQ), if found, are qualified with a "J" flag.

Parameter	Result	RL	MDL	DF	Qualifiers
Solids, Total	82.4	0.100	0.100	1.00	

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
PPIHVC18-Bot	19-06-1455-3-AA	06/19/19 10:40	Sediment	N/A	06/22/19	06/22/19 15:30	J0622TSB1

Comment(s): - Results were evaluated to the MDL (DL), concentrations  $\geq$  to the MDL (DL) but  $<$  RL (LOQ), if found, are qualified with a "J" flag.

Parameter	Result	RL	MDL	DF	Qualifiers
Solids, Total	86.0	0.100	0.100	1.00	

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
PPIHVC18-6&7-Top	19-06-1455-4-AA	06/18/19 15:05	Sediment	N/A	06/22/19	06/22/19 15:30	J0622TSB1

Comment(s): - Results were evaluated to the MDL (DL), concentrations  $\geq$  to the MDL (DL) but  $<$  RL (LOQ), if found, are qualified with a "J" flag.

Parameter	Result	RL	MDL	DF	Qualifiers
Solids, Total	78.3	0.100	0.100	1.00	

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
PPIHVC18-6&7-Mid	19-06-1455-5-AA	06/18/19 15:05	Sediment	N/A	06/22/19	06/22/19 15:30	J0622TSB1

Comment(s): - Results were evaluated to the MDL (DL), concentrations  $\geq$  to the MDL (DL) but  $<$  RL (LOQ), if found, are qualified with a "J" flag.

Parameter	Result	RL	MDL	DF	Qualifiers
Solids, Total	78.8	0.100	0.100	1.00	

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
PPIHVC18-6&7-Bot	19-06-1455-6-AA	06/18/19 15:05	Sediment	N/A	06/22/19	06/22/19 15:30	J0622TSB1

Comment(s): - Results were evaluated to the MDL (DL), concentrations  $\geq$  to the MDL (DL) but  $<$  RL (LOQ), if found, are qualified with a "J" flag.

Parameter	Result	RL	MDL	DF	Qualifiers
Solids, Total	73.6	0.100	0.100	1.00	

RL: Reporting Limit. DF: Dilution Factor. MDL: Method Detection Limit.



Calscience

## Analytical Report

Kinnetic Laboratories, Inc.  
307 Washington Street  
Santa Cruz, CA 95060-4928

Date Received: 06/21/19  
Work Order: 19-06-1455  
Preparation: N/A  
Method: SM 2540 B (M)  
Units: %

Project: Pillar Point Harbor

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Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
PPIHVC18-8T	19-06-1455-7-AA	06/18/19 13:55	Sediment	N/A	06/22/19	06/22/19 15:30	J0622TSB1

Comment(s): - Results were evaluated to the MDL (DL), concentrations  $\geq$  to the MDL (DL) but  $<$  RL (LOQ), if found, are qualified with a "J" flag.

Parameter	Result	RL	MDL	DF	Qualifiers
Solids, Total	71.5	0.100	0.100	1.00	

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
PPIHVC18-8M	19-06-1455-8-AA	06/18/19 13:55	Sediment	N/A	06/22/19	06/22/19 15:30	J0622TSB1

Comment(s): - Results were evaluated to the MDL (DL), concentrations  $\geq$  to the MDL (DL) but  $<$  RL (LOQ), if found, are qualified with a "J" flag.

Parameter	Result	RL	MDL	DF	Qualifiers
Solids, Total	78.6	0.100	0.100	1.00	

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
PPIHVC18-8B	19-06-1455-9-AA	06/18/19 13:55	Sediment	N/A	06/22/19	06/22/19 15:30	J0622TSB1

Comment(s): - Results were evaluated to the MDL (DL), concentrations  $\geq$  to the MDL (DL) but  $<$  RL (LOQ), if found, are qualified with a "J" flag.

Parameter	Result	RL	MDL	DF	Qualifiers
Solids, Total	68.8	0.100	0.100	1.00	

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
Method Blank	099-05-019-4503	N/A	Solid	N/A	06/22/19	06/22/19 15:30	J0622TSB1

Comment(s): - Results were evaluated to the MDL (DL), concentrations  $\geq$  to the MDL (DL) but  $<$  RL (LOQ), if found, are qualified with a "J" flag.

Parameter	Result	RL	MDL	DF	Qualifiers
Solids, Total	ND	0.100	0.100	1.00	

RL: Reporting Limit. DF: Dilution Factor. MDL: Method Detection Limit.



Calscience

## Quality Control - Spike/Spike Duplicate

Kinnetic Laboratories, Inc.  
307 Washington Street  
Santa Cruz, CA 95060-4928

Date Received: 06/21/19  
Work Order: 19-06-1455  
Preparation: N/A  
Method: EPA 9060A

Project: Pillar Point Harbor

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Quality Control Sample ID	Type	Matrix	Instrument	Date Prepared	Date Analyzed	MS/MSD Batch Number
19-06-1332-1	Sample	Solid	TOC 10	06/23/19	06/24/19 17:39	J0623TOCS1
19-06-1332-1	Matrix Spike	Solid	TOC 10	06/23/19	06/24/19 17:39	J0623TOCS1
19-06-1332-1	Matrix Spike Duplicate	Solid	TOC 10	06/23/19	06/24/19 17:39	J0623TOCS1

Parameter	Sample Conc.	Spike Added	MS Conc.	MS %Rec.	MSD Conc.	MSD %Rec.	%Rec. CL	RPD	RPD CL	Qualifiers
Carbon, Total Organic	0.2630	3.000	2.663	80	2.011	58	75-125	28	0-25	3,4

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RPD: Relative Percent Difference. CL: Control Limits



Calscience

## Quality Control - Sample Duplicate

Kinnetic Laboratories, Inc.  
307 Washington Street  
Santa Cruz, CA 95060-4928

Date Received: 06/21/19  
Work Order: 19-06-1455  
Preparation: N/A  
Method: SM 2540 B (M)

Project: Pillar Point Harbor

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Quality Control Sample ID	Type	Matrix	Instrument	Date Prepared	Date Analyzed	Duplicate Batch Number
<b>PPIHVC18-Top</b>	<b>Sample</b>	<b>Sediment</b>	<b>N/A</b>	<b>06/22/19 00:00</b>	<b>06/22/19 15:30</b>	<b>J0622TSD1</b>
<b>PPIHVC18-Top</b>	<b>Sample Duplicate</b>	<b>Sediment</b>	<b>N/A</b>	<b>06/22/19 00:00</b>	<b>06/22/19 15:30</b>	<b>J0622TSD1</b>
<u>Parameter</u>		<u>Sample Conc.</u>	<u>DUP Conc.</u>	<u>RPD</u>	<u>RPD CL</u>	<u>Qualifiers</u>
Solids, Total		73.70	73.60	0	0-10	

  
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RPD: Relative Percent Difference. CL: Control Limits





Calscience

## Quality Control - LCS/LCSD

Kinnetic Laboratories, Inc.  
307 Washington Street  
Santa Cruz, CA 95060-4928

Date Received: 06/21/19  
Work Order: 19-06-1455  
Preparation: N/A  
Method: EPA 9060A

Project: Pillar Point Harbor

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Quality Control Sample ID	Type	Matrix	Instrument	Date Prepared	Date Analyzed	LCS/LCSD Batch Number			
099-06-013-1965	LCS	Solid	TOC 10	06/23/19	06/24/19 17:39	J0623TOCL1			
099-06-013-1965	LCSD	Solid	TOC 10	06/23/19	06/24/19 17:39	J0623TOCL1			
Parameter	Spike Added	LCS Conc.	LCS %Rec.	LCSD Conc.	LCSD %Rec.	%Rec. CL	RPD	RPD CL	Qualifiers
Carbon, Total Organic	0.6000	0.6078	101	0.6248	104	80-120	3	0-20	

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RPD: Relative Percent Difference. CL: Control Limits

## Glossary of Terms and Qualifiers

Work Order: 19-06-1455

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<u>Qualifiers</u>	<u>Definition</u>
*	See applicable analysis comment.
<	Less than the indicated value.
>	Greater than the indicated value.
1	Surrogate compound recovery was out of control due to a required sample dilution. Therefore, the sample data was reported without further clarification.
2	Surrogate compound recovery was out of control due to matrix interference. The associated method blank surrogate spike compound was in control and, therefore, the sample data was reported without further clarification.
3	Recovery of the Matrix Spike (MS) or Matrix Spike Duplicate (MSD) compound was out of control due to suspected matrix interference. The associated LCS recovery was in control.
4	The MS/MSD RPD was out of control due to suspected matrix interference.
5	The PDS/PDSD or PES/PESD associated with this batch of samples was out of control due to suspected matrix interference.
6	Surrogate recovery below the acceptance limit.
7	Surrogate recovery above the acceptance limit.
B	Analyte was present in the associated method blank.
BU	Sample analyzed after holding time expired.
BV	Sample received after holding time expired.
CI	See case narrative.
E	Concentration exceeds the calibration range.
ET	Sample was extracted past end of recommended max. holding time.
HD	The chromatographic pattern was inconsistent with the profile of the reference fuel standard.
HDH	The sample chromatographic pattern for TPH matches the chromatographic pattern of the specified standard but heavier hydrocarbons were also present (or detected).
HDL	The sample chromatographic pattern for TPH matches the chromatographic pattern of the specified standard but lighter hydrocarbons were also present (or detected).
J	Analyte was detected at a concentration below the reporting limit and above the laboratory method detection limit. Reported value is estimated.
JA	Analyte positively identified but quantitation is an estimate.
ME	LCS Recovery Percentage is within Marginal Exceedance (ME) Control Limit range (+/- 4 SD from the mean).
ND	Parameter not detected at the indicated reporting limit.
Q	Spike recovery and RPD control limits do not apply resulting from the parameter concentration in the sample exceeding the spike concentration by a factor of four or greater.
SG	The sample extract was subjected to Silica Gel treatment prior to analysis.
X	% Recovery and/or RPD out-of-range.
Z	Analyte presence was not confirmed by second column or GC/MS analysis.
	Solid - Unless otherwise indicated, solid sample data is reported on a wet weight basis, not corrected for % moisture. All QC results are reported on a wet weight basis.
	Any parameter identified in 40CFR Part 136.3 Table II that is designated as "analyze immediately" with a holding time of <= 15 minutes (40CFR-136.3 Table II, footnote 4), is considered a "field" test and the reported results will be qualified as being received outside of the stated holding time unless received at the laboratory within 15 minutes of the collection time.
	A calculated total result (Example: Total Pesticides) is the summation of each component concentration and/or, if "J" flags are reported, estimated concentration. Component concentrations showing not detected (ND) are summed into the calculated total result as zero concentrations.

Chain of Custody Record

**To:**  
Eurofins Calscience, Inc.  
7440 Lincoln Way  
Garden Grove, CA 92841  
Phone: (714) 895-5494  
Contact: Julie Lam

**From:**  
Kinnetic Laboratories, Inc  
307 Washington St.  
Santa Cruz, CA 95060  
(831) 457-3950  
(831) 426-0405 Fax  
Contact: Amy Howk

**Date Received:**  
**Lab #:**



**19-06-1455**

Project #: 5720.180

Matrix: Sediment

Project: Pillar Point Harbor

Complete by: 10 Day TAT

SampleID	StationID	Sample Date	Sample Time	Sample Type	Analysis	Container	Pres	No. of Bottles	LabID	Condition Upon Receipt
PPIHVC18-Top	Top Comp	6/19/19	1040	Comp	% Solids, TOC	500 ml WMGJ	4° C	1	1	
PPIHVC18-Mid	Mid Comp	↓	↓	Comp	% Solids, TOC	500 ml WMGJ	4° C	1	2	
PPIHVC18-Bot	Bottom Comp	↓	↓	Comp	% Solids, TOC	500 ml WMGJ	4° C	1	3	
PPIHVC18-6&7-Top	6&7 Top*	6/18/19	1505	Comp	% Solids, TOC	500 ml WMGJ	4° C	1	4	
PPIHVC18-6&7-Mid	6&7 Mid*	↓	↓	Comp	% Solids, TOC	500 ml WMGJ	4° C	1	5	
PPIHVC18-6&7-Bot	6&7 Bottom*	↓	↓	Comp	% Solids, TOC	500 ml WMGJ	4° C	1	6	
PPIHVC18-8T	8 Top*	6/18/19	1355	Grab	% Solids, TOC	500 ml WMGJ	4° C	1	7	
PPIHVC18-8M	8 Mid*	↓	↓	Grab	% Solids, TOC	500 ml WMGJ	4° C	1	8	
PPIHVC18-8B	8 Bottom*	↓	↓	Grab	% Solids, TOC	500 ml WMGJ	4° C	1	9	

Data Report MUST include the following: Sample ID, Analytical Method, Detection Limit, Date of Extraction if applicable, Date of Analysis, Analytical Results and Signature of QA Reviewer. All times on this sheet are military time. Email PDF and EDD reports to edd@kinneticlabs.net.

Special Instructions/Comments: Please report in dry weight using the DMMO format. \*Samples from Areas 6&7 and Area 8 need to be fully homogenized prior to analysis.

Sampled and Relinquished By:	Date/Time:	Transporter	Received By:	Date/Time:
Amy Hawk	6/20/19 1600	FedEx	Amy	6/21/19 10:00
Relinquished By:	Date/Time:	Transporter	Received By:	Date/Time:

(Fedex)

1455

ORIGIN ID:SRUA (831) 457-3950  
AMY HOWK  
KINETIC LABORATORIES, INC  
307 WASHINGTON STREET

SHIP DATE: 20JUN19  
ACTWGT: 35.00 LB  
CAD: 113675965/NET4100

SANTA CRUZ, CA 95060  
UNITED STATES US

BILL SENDER

TO **JULIE LAM, KATHY BURNEY**  
**EUROFINS CALSCIENCE**  
**7440 LINCOLN WAY**

**GARDEN GROVE CA 92841**

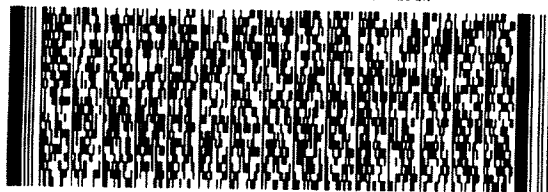
(714) 895-5494

REF: 5720.180

INV:

PO:

DEPT:



**FedEx**  
Express



565J1D210/23AD

**FedEx**

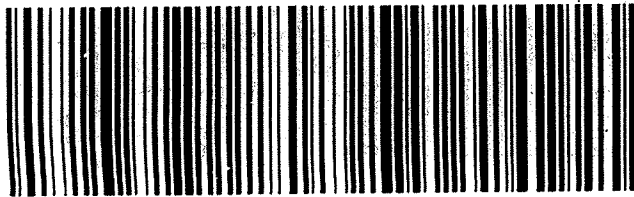
TRK#  
0201

**7755 3015 9248**

**FRI - 21 JUN AA**  
**STANDARD OVERNIGHT**

**92 APVA**

**92841**  
**CA-US SNA**



#2634586 06/20 565J1/0210/23AD

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**SAMPLE RECEIPT CHECKLIST**

COOLER 1 OF 1

CLIENT: Kinnetic Labs., Inc.

DATE: 06/21/2019

**TEMPERATURE:** (Criteria: 0.0°C – 6.0°C, not frozen except sediment/tissue)

Thermometer ID: SC6 (CF: -0.2°C); Temperature (w/o CF): 2.6 °C (w/ CF): 2.4 °C;  Blank  Sample

Sample(s) outside temperature criteria (PM/APM contacted by: \_\_\_\_\_)

Sample(s) outside temperature criteria but received on ice/chilled on same day of sampling

Sample(s) received at ambient temperature; placed on ice for transport by courier

Ambient Temperature:  Air  Filter

Checked by: SM

**CUSTODY SEAL:**

Cooler  Present and Intact  Present but Not Intact  Not Present  N/A Checked by: SM

Sample(s)  Present and Intact  Present but Not Intact  Not Present  N/A Checked by: SM

**SAMPLE CONDITION:**

	Yes	No	N/A
Chain-of-Custody (COC) document(s) received with samples .....	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
COC document(s) received complete .....	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/> Sampling date <input type="checkbox"/> Sampling time <input type="checkbox"/> Matrix <input type="checkbox"/> Number of containers			
<input type="checkbox"/> No analysis requested <input type="checkbox"/> Not relinquished <input type="checkbox"/> No relinquished date <input type="checkbox"/> No relinquished time			
Sampler's name indicated on COC .....	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Sample container label(s) consistent with COC .....	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Sample container(s) intact and in good condition .....	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Proper containers for analyses requested .....	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Sufficient volume/mass for analyses requested .....	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Samples received within holding time .....	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Aqueous samples for certain analyses received within 15-minute holding time			
<input type="checkbox"/> pH <input type="checkbox"/> Residual Chlorine <input type="checkbox"/> Dissolved Sulfide <input type="checkbox"/> Dissolved Oxygen .....	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Proper preservation chemical(s) noted on COC and/or sample container .....	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Unpreserved aqueous sample(s) received for certain analyses			
<input type="checkbox"/> Volatile Organics <input type="checkbox"/> Total Metals <input type="checkbox"/> Dissolved Metals			
Acid/base preserved samples - pH within acceptable range .....	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Container(s) for certain analysis free of headspace.....	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
<input type="checkbox"/> Volatile Organics <input type="checkbox"/> Dissolved Gases (RSK-175) <input type="checkbox"/> Dissolved Oxygen (SM 4500)			
<input type="checkbox"/> Carbon Dioxide (SM 4500) <input type="checkbox"/> Ferrous Iron (SM 3500) <input type="checkbox"/> Hydrogen Sulfide (Hach)			
Tedlar™ bag(s) free of condensation .....	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

**CONTAINER TYPE:**

(Trip Blank Lot Number: \_\_\_\_\_)

**Aqueous:**  VOA  VOA<sub>h</sub>  VOAn<sub>2</sub>  100PJ  100PJn<sub>2</sub>  125AGB  125AGB<sub>h</sub>  125AGB<sub>p</sub>  125PB  125PBz<sub>nna</sub> (pH\_\_9)  
 250AGB  250CGB  250CGBs (pH\_\_2)  250PB  250PBn (pH\_\_2)  500AGB  500AGJ  500AGJs (pH\_\_2)  500PB  
 1AGB  1AGBn<sub>2</sub>  1AGBs (pH\_\_2)  1AGBs (O&G)  1PB  1PBna (pH\_\_12)  \_\_\_\_\_  \_\_\_\_\_

**Solid:**  4ozCGJ  8ozCGJ  16ozCGJ  Sleeve (\_\_\_\_)  EnCores® (\_\_\_\_)  TerraCores® (\_\_\_\_)  \_\_\_\_\_  \_\_\_\_\_

**Air:**  Tedlar™  Canister  Sorbent Tube  PUF  \_\_\_\_\_ Other Matrix (Sediment):  16 oz CGJ  \_\_\_\_\_  \_\_\_\_\_

Container: **A** = Amber, **B** = Bottle, **C** = Clear, **E** = Envelope, **G** = Glass, **J** = Jar, **P** = Plastic, and **Z** = Ziploc/Resealable Bag

Preservative: **b** = buffered, **f** = filtered, **h** = HCl, **n** = HNO<sub>3</sub>, **na** = NaOH, **na<sub>2</sub>** = Na<sub>2</sub>S<sub>2</sub>O<sub>3</sub>, **p** = H<sub>3</sub>PO<sub>4</sub>, Labeled/Checked by: SM

**s** = H<sub>2</sub>SO<sub>4</sub>, **u** = ultra-pure, **x** = Na<sub>2</sub>SO<sub>3</sub>+NaHSO<sub>4</sub>.H<sub>2</sub>O, **z<sub>nna</sub>** = Zn (CH<sub>3</sub>CO<sub>2</sub>)<sub>2</sub> + NaOH Reviewed by: 778

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