APPENDIX E – GEOTECHNICAL INVESTIGATIONS, 2014

SECTION 00 31 32

Geotechnical Data Report

for

San Juan Harbor Construction Dredging - Mitigation
Puerto Rico

Prepared by

Geotechnical Branch

Engineering Division

Jacksonville District Corps of Engineers

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SECTION 00 31 32

Geotechnical Data Report

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Geotechnical Data Report

1.1 SCOPE

The information provided in this section encompasses the geotechnical field investigations available for this project. The investigations consist of borings. The associated boring logs and laboratory data are presented in paragraphs 1.4.6 and 1.4.7, respectively. A character of materials paragraph is included to provide a comprehensive description of the materials utilizing both recent and historical knowledge of the project area. Also included in this section are definitions of terms and boring log notes, which provide additional explanation of the boring logs and drilling techniques.

Items discussed in the character of materials paragraph may not appear explicitly on the boring logs. Based on historic knowledge of the project area, the character of materials paragraph includes items that supplement the data documented by the boring logs. When reviewing the boring logs, use all of the data on the logs, including the materials description, legend, and blow counts. When evaluating the subsurface conditions, use all of the data, including the character of materials paragraph and boring logs.

During the solicitation period, any questions that pertain to the information provided in this section should be addressed to the contract specialist identified in Block 9 of SF1442. After contract award, questions should be addressed to the appointed ACO/COR, which will coordinate with Geotechnical Branch.

1.2 CHARACTER OF MATERIALS

1.2.1 Regional Geology and Local Geology

The study area is located within the shallow marine shelf that surrounds the Commonwealth of Puerto Rico. Sediments of Holocene (0.01 to 0.126 mya) and Pleistocene (0.126 to 2.58 mya) overlie limestone of Tertiary age (2.58 to 65 mya). Periods of fluctuating sea levels occurred during the glacial periods at the close of the Tertiary exposing the limestone allowing for weathering and erosion to occur. Sediments including silt and clay were deposited on the bottom of San Juan Harbor in the final glacial melt. Shallow lagoons formed in depressions along the coast. Silt and clay were transported from upland areas and deposited by streams.

1.2.2 Materials Encountered

Samples were collected from 14 hand borings and five grab samples for the La Esperanza Borrow Area and Condado Lagoon, respectively. Soft sediment probes were conducted in the Condado Lagoon. Most of these areas consist of sand to silty sand, silt and shell. Debris such as ropes, tires, anchors, wood, roots, and other trash may also be encountered.

1.2.2.1 La Esperanza Borrow Area

Sediment borings less than five feet encountered poorly-graded sand that is composed of fine to medium grained sand-sized quartz and shell. Trace to few silt and gravel-sized shell are also present. Below the sand and shell is silt that is not suitable for mitigation material.

1.2.2.2 Condado Lagoon

Grab samples at selected areas of the bottom sediment indicated primarily silt with areas of well-graded sand to silty sand.

1.3 DEFINITIONS

Definitions not explicitly indicated in the sections below are typical industry standard definitions from their respective ASTMs.

1.3.1 Definitions of Basic Terms

Carbonate – Soil component that reacts with HCl of an indeterminate origin (shell, rock, etc.).
Fill – Material that has been placed by man, described with all soil characteristics.
Layer – Rock or soil with a thickness of 6 inches or less.
Lens – A geologic deposit of variable thickness, which disappears laterally in all directions and cannot be correlated to adjacent borings.
Rock – A naturally occurring substance composed of one or more minerals bound together. This geologic term includes a range of engineering properties: strength, hardness, permeability, weathering, and discontinuity. These properties are noted or can be inferred from the boring logs as blow counts, penetration rate, RQD, hardness, etc.
Shell – Material composed of predominantly (>75%) coarse-grained sand to gravel-sized whole or broken shell.

1.3.2 Current Logging Terms

Definition of terms used on boring logs dated since 2000:

Banded - 0.02' (6 mm) to 0.1' (3.0 cm).
Boulder-Sized – Particles greater than 12 inches in diameter.
Cavity - Voids greater than the diameter of the core.
Coarse Grained - Grain diameter greater than 0.079" (2 mm) for sedimentary rocks or 0.197" (5 mm) for igneous or metamorphic rocks.
Coarse Grained Sand-Sized – Less than 10 percent of fine and medium grained sand sizes are present.
Coarse Gravel-Sized – Particles greater than 3/4 of an inch but less than 3 inches in diameter.
Cobble-Sized – Particles greater than 3 inches but less than 12 inches in diameter.
Decomposed – Applicable to saprolitic rock; rock is essentially reduced to a soil with a relic rock texture; can be molded or crumbled by hand.
Dipping (Dip) - 20 to 45 degrees.
Discontinue – Particles were present within the unit above but are no longer present.

Fine Grained - Grain diameter between 0.004" (0.1 mm) and 0.016" (0.4 mm) for sedimentary rocks or 0.039" (1 mm) for igneous or metamorphic rocks.
Fine Grained Sand-Sized - Less than 10 percent of medium and coarse grained sand sizes are present.
Fine Gravel-Sized – Particles greater than No. 4 sieve but less than 3/4 of an inch in diameter.
Flat (Dip) - 0 to 20 degrees.
Fossiliferous – Greater than 40 percent fossils.
Hard (Hardness) - Difficult to scratch with a knife (cannot be pitted with a geology hammer, but can be chipped with moderate blows of the hammer).
Highly Fractured - Spacing 0.3' (9.1 cm) to 1' (30.5 cm).
Highly Weathered - Entire section is discolored; alteration is greater than 50%; some areas of slightly weathered rock are present; some minerals are leached away; retains only a fraction of its original strength (wet strength usually lower than dry strength).
Intact – Spacing greater than 6' (1.8 m).
Intensely Fractured - Spacing less than 0.3' (9.1 cm).
Massive – Over 3' (0.9 m) thick.
Medium-Bedded - 0.3' (9.1 cm) to 1' (30.5 cm) thick.
Medium Grained - Grain diameters between 0.016" (0.4 mm) to 0.079" (2 mm) for sedimentary rocks or 0.039" (1 mm) to 0.197" (5 mm) for igneous or metamorphic rocks.
Medium Grained Sand-Sized - Less than 10 percent of fine and coarse grained sand sizes are present.
Moderately Fractured - Spacing 1' (30.5 cm) to 3' (0.9 m).
Moderately Hard (Hardness) - Can be scratched easily with a knife, but cannot be scratched by a fingernail (can be pitted with moderate blows of a geology hammer).
Moderately Open (Fracture Aperture) - 0.020" (0.5 mm) to 0.098" (2.5 mm).
Moderately Weathered - Discoloration is evident; surface is pitted and altered, with alterations penetrating well below rock surfaces; 10% to 50% of the rock is altered; strength is noticeably less than unweathered rock.
Non-fossiliferous – No observed fossils.
Open (Fracture Aperture) - 0.098" (2.5 mm) to 0.394" (10 mm).
Pitted - Voids 0.039" (1mm) to 0.236" (6mm) in diameter.
Porous - Voids less than 0.039" (1mm) in diameter.
Slightly Fractured - Spacing 3' (0.9 m) to 6' (1.8 m).
Slightly Weathered - Superficial discoloration, alteration and/or discoloration along discontinuities; less than 10% of the rock volume is altered; strength is essentially unaffected.
Soft (Hardness) - Can be scratched with a fingernail (cannot be crumbled between fingers, but can be easily pitted with light blows of a geology hammer).
Solid - Absence of voids.
Sparsely Fossiliferous – Less than 40 percent fossils.
Steeply Dipping (Dip) - 45 to 90 degrees.
Thick-Bedded – 1' (30.5 cm) to 3' (0.9 m) thick.
Thin-Bedded - 0.1' (3.0 cm) to 0.3' (9.1 cm) thick.
Thin Parting - Paper thin to 0.002' (0.6 mm).
Tight (Fracture Aperture) - 0.004" (0.1 mm) to 0.020" (0.5 mm).
Unweathered - No evidence of any mechanical or chemical alteration.
Very Fine Grained - Grain diameter less than 0.004" (0.1 mm); individual grains or crystals are too small to be seen with the naked eye.

Very Hard (Hardness) - Cannot be scratched with a knife (chips can be broken off only with heavy blows of a geology hammer).
Very Soft (Hardness) - Can be deformed by hand (has a rock-like character, but can be easily broken by hand).
Very Tight (Fracture Aperture) - less than 0.004" (0.1 mm).
Very Wide (Fracture Aperture) - 0.394" (10 mm) to 0.984" (25 mm).
Vuggy - Voids 0.236" (6mm) to the diameter of the core.

1.3.3 Previous Logging Terms

Definition of terms used on boring logs dated before 2000:

Dense – Equivalent to SPT N-value of 30 to 50.
Incompetent – Rock that disintegrates while coring; weak.
Indurated – Rock or soil hardened or consolidated by pressure or cementation. Very difficult to break by hand.
Poorly-Indurated – See semi-indurated.
Seam – Rock or soil with average thickness of 2 to 3 inches.
Semi-Indurated – Rock or soil with a lesser degree of hardening or consolidation by pressure or cementation. Crumbles with little effort by hand.

1.3.4 Testing and Procedure Methods

Test/Procedure	Method
Abrasion Resistance of Large-Size Coarse Aggregate, Los Angeles Machine	ASTM C535
Abrasion Resistance of Small-Size Coarse Aggregate, Los Angeles Machine	ASTM C131
Air Content by the Pressure Method	ASTM C231
Air Content by the Volumetric Method	ASTM C173
Air-Entraining Admixtures for Concrete	ASTM C233
Atterberg Limits, wet preparation method, test method a multipoint	ASTM D4318
Bulk Specific Gravity of Bituminous Mixtures	ASTM D2726
Capping Cylindrical Concrete Specimens	ASTM C617
Carbonate Content	ASTM D4373
Compaction: 4" Mold, Modified Proctor	ASTM D1557
Compaction: 4" Mold, Standard Proctor	ASTM D698
Compaction: 6" Mold, Modified Proctor	ASTM D1557
Compaction: 6" Mold, Standard Proctor	ASTM D698
Compressive Strength of Cast in Place Concrete Cylinders	ASTM C873
Compressive Strength of Cylindrical Concrete Specimens (Set of 4)	ASTM C39
Compressive Strength of Lightweight Concrete	ASTM C495
Consolidation, each load of rebound increment with complete time	ASTM D2435
Density and Water Content of Soil by Nuclear Methods (Minimum 4)	ASTM D2922/D3017
Density of Bituminous Concrete in Place by Nuclear Methods (Minimum 4)	ASTM D2950
Density of Soil in Place by the Sand-Cone Method	ASTM D1556

Test/Procedure	Method
Direct Shear	ASTM D3080
Drilled Cores and Sawed Beams of Concrete	ASTM C42
Extraction of Bituminous Paving Mixtures	ASTM D2172
Freezing and Thawing (up to 55 cycles)	ASTM D5312
Grain size sieve Analysis	ASTM D422
Hydrometer Analysis	ASTM D422
Making and Curing Concrete Test Specimens in the Field (Set of 6)	ASTM C31
Making and Curing Concrete Test Specimens in the Lab (Set of 4)	ASTM C192
Marshall Resistance to Plastic Flow (Set of 3)	ASTM D1559
Material Passing No. 200 Sieve	ASTM D1140
Modulus of Elasticity	ASTM D3148
Moisture Content	ASTM D2216
Munsell Color	Munsell Soil Color Charts
Organic Content, Test Method C	ASTM D2974
Organic Impurities in Fine Aggregate	ASTM C40
Permeability: Constant Head Permeability	ASTM D2434
Permeability: Falling Head Permeability	ASTM D5084
Petrographic Examination	ASTM C295
Sampling Aggregate (Minimum 4 hours)	ASTM D75
Sampling Freshly Mixed Concrete	ASTM C172
Sedimentation Rate	No ASTM
Sieve Analysis of Aggregate	ASTM C136
Slump of Hydraulic-Cement Concrete	ASTM C143
Soil Classification (Boring logs)	ASTM D 2488
Specific Gravity and Absorption of Fine Aggregate	ASTM C128
Specific Gravity for Rock	ASTM C127
Specific Gravity for Soil	ASTM D854
SPLITTING TENSILE STRENGTH	ASTM D3967
Splitting Tensile Strength of Concrete Cylinders	ASTM C496
Subsample Preparation ASTM D4220, Group B	ASTM D4220,
Sulfate Soundness	ASTM C88
Total Evaporable Moisture Content	ASTM C566
Triaxial Compression Test for Rock with Strain Gages or LVDTs (per confining pressure)	ASTM D2664
Triaxial compression: Consolidated Undrained (CU) Triaxial Compression Test R Test with Pore Pressure Measurements (per confining pressure)	ASTM D4767
Triaxial compression: Unconsolidated Undrained (UU) Triaxial Compression Test Q Test with Pore Pressure Measurements (per confining pressure)	ASTM D2850
Unbonded Caps for Compressive Strength	ASTM C1231
Unconfined Compressive Strength for Rock Greater than 9,000 psi with Strain	ASTM D2938
Unconfined Compressive Strength for Rock up to 9,000 psi with Strain	ASTM D2938
Unconfined Compressive Strength for Soil	ASTM D2166

Test/Procedure	Method
Unit Weight and Absorption	ASTM C127
Unit Weight of Aggregate	ASTM C29 -
Visual Percent Shell	No ASTM
Wetting and Drying	ASTM D5313

1.4 GEOMECHANICAL DATA

1.4.1 Summary of Field Investigations

The tables below summarize both recent and historical field investigations data set available for this project. Prospective offerors are cautioned to use great care in the evaluation of these borings.

Table 1. Available Boring Data

Designation	State Plane, PR/VI(U.S. Ft.), NAD 83		Project Location
	X	Y	
SJH-LE-1	760,284	881,658	La Esperanza Peninsula
SJH-LE-2	760,715	881,251	
SJH-LE-3	760,255	881,426	
SJH-LE-4	760,464	881,187	
SJH-LE-5	760,245	881,208	
SJH-LE-5A	760,264	881,220	
SJH-LE-6	760,714	880,918	
SJH-LE-7	760,500	880,973	
SJH-LE-8A	760,354	880,945	
SJH-LE-9	760,780	880,730	
SJH-LE-10	760,619	880,645	
SJH-LE-13A	759,927	879,462	
SJH-LE-15A	759,896	879,371	
SJH-LE-17	759,927	879,280	
* Coordinates presented correspond to the project coordinate system and datum			

Table 2. Available Grab Sample Data

Designation	State Plane, PR/VI (U.S. Ft.), NAD 83		Project Location
	X	Y	
SJH-CLG-1	778,836	883,455	Condado Lagoon
SJH-CLG-2	778,675	883,373	
SJH-CLG-3	778,844	883,302	
SJH-CLG-4	883,216	779,026	
SJH-CLG-6	883,199	778,782	
* Coordinates presented correspond to the project coordinate system and datum			

Table 3. Available Probe Data

Designation	State Plane, PR/VI (U.S. Ft.), NAD 83		Project Location
	X	Y	
SJH-CLP-1	778,805	883,437	Condado Lagoon
SJH-CLP-2	778,986	883,286	

Designation	State Plane, PR/VI (U.S. Ft.), NAD 83		Project Location
	X	Y	
SJH-CLP-3	778,618	883,432	
SJH-CLP-4	778,776	883,352	
SJH-CLP-5	778,822	883,323	
SJH-CLP-6	778,880	883,262	
SJH-CLP-7	779,008	883,203	
SJH-CLP-8	779,029	883,172	
SJH-CLP-9	778,672	883,256	
SJH-CLP-10	778,882	883,077	
* Coordinates presented correspond to the project coordinate system and datum. See Section 1.4.6 for more details.			

1.4.2 Summary of Index Testing Data

The table below summarizes the index testing available for this project.

Table 4. Index Testing Available for this Project

Boring Designation	Sample Designation	USCS	LL	PL	PI	Org %	CO_3 %	Munsell Color
SJH-LE-1	1	SP					61	2.5Y 5/2
SJH-LE-1	2	SP						2.5Y 4/2
SJH-LE-1	3	SP						2.5Y 5/1
SJH-LE-1	4	SP-SM						2.5Y 5/2
SJH-LE-1	5	MH	62	32	30			2.5Y 4/1
SJH-LE-10	1	SP						2.5Y 5/2
SJH-LE-10	2	SP					60	2.5Y 5/2
SJH-LE-10	3	SP						2.5Y 4/3
SJH-LE-13A	1	SP						2.5Y 5/2
SJH-LE-15A	1	SP						2.5Y 6/3
SJH-LE-15A	2	SP					69	2.5Y 5/2
SJH-LE-15A	3	SP						2.5Y 5/2
SJH-LE-17	1	SP						2.5Y 6/3
SJH-LE-17	2	SP						2.5Y 5/2
SJH-LE-2	1	SP						10YR 4/2
SJH-LE-2	2	SM						2.5Y 4/1
SJH-LE-2	3	MH	55	32	23			2.5Y 4/1
SJH-LE-3	1	SP						10YR 6/4
SJH-LE-3	2	SP					96	10YR 6/6
SJH-LE-3	3	SP						2.5Y 5/2
SJH-LE-4	1	SP					73	10YR 5/2
SJH-LE-4	2	SP						2.5Y 5/2
SJH-LE-5	1	SP						2.5Y 7/2
SJH-LE-5	2	SP					70	2.5Y 6/4
SJH-LE-5	3	SP						2.5Y 5/2
SJH-LE-5	4	SP						2.5Y 5/2
SJH-LE-5A	1	SP						2.5Y 6/3
SJH-LE-5A	2	SP						2.5Y 6/3
SJH-LE-5A	3	SP				2		2.5Y 5/3
SJH-LE-5A	4	SP						2.5Y 5/3
SJH-LE-5A	5	SP-SM				4		2.5Y 5/2
SJH-LE-5A	6	SP-SM						2.5Y 5/2
SJH-LE-6	1	SP						2.5Y 5/3

Boring Designation	Sample Designation	USCS	LL	PL	PI	Org %	CO_3 %	Munsell Color
SJH-LE-6	2	SP					77	10YR 5/2
SJH-LE-6	3	SP						2.5Y 5/3
SJH-LE-6	4	SP-SM				1		2.5Y 5/2
SJH-LE-6	5	SP-SM						2.5Y 5/2
SJH-LE-7	1	SP					59	2.5Y 7/2
SJH-LE-7	2	SP						2.5Y 6/3
SJH-LE-7	3	SP					62	2.5Y 5/3
SJH-LE-7	4	SW						2.5Y 5/3
SJH-LE-7	5	SP						2.5Y 5/2
SJH-LE-8A	1	SM						2.5Y 4/2
SJH-LE-8A	2	SP-SM					65	2.5Y 5/2
SJH-LE-9	1	SP						2.5Y 5/3
SJH-LE-9	2	SP					68	2.5Y 5/2
SJH-LE-9	3	SP						2.5Y 5/3
SJH-CLG-1	1	SW-SM						5Y 4/2
SJH-CLG-2	1	MH	161	68	93			
SJH-CLG-3	1	MH	167	71	96	30		
SJH-CLG-4	1	MH	130	74	56			
SJH-CLG-6	1	MH	160	67	93	18		

1.4.3 Summary of Additional Laboratory Testing Data

Sedimentation rate curves were obtained for this data set. For testing results, see paragraph 1.4.7.

1.4.4 Boring Log Notes

Borings SJH-LE-1, SJH-LE-2, SJH-LE-3, SJH-LE-4, SJH-LE-5, SJH-LE-5A, SJH-LE-6, SJH-LE-7, SJH-LE-8A, SJH-LE-9, SJH-LE-10, SJH-LE-13A, SJH-LE-15A, and SJH-LE-17 were hand bored using a 5’ long plastic liner, 2.5” in diameter and pushed into the sediment using a 14-lb metal fence post.

Grab samples SJH-CLG-1 thru SJH-CLG-7 were recovered using a 12” stainless steel clamshell bucket.

Sediment probes SJH-CLP-1 thru SJH-CLP-10 were driven using ¾” galvanized pipe with end cap and pushed by hand into the lagoon bottom until refusal was reached.

1.4.5 Recovered Materials

The material recovered from borings SJH-LE-1, SJH-LE-2, SJH-LE-3, SJH-LE-4, SJH-LE-5, SJH-LE-5A, SJH-LE-6, SJH-LE-7, SJH-LE-8A, SJH-LE-9, SJH-LE-10, SJH-LE-13A, SJH-LE-15A, SJH-LE-17, SJH-CLG-1, SJH-CLG-2, SJH-CLG-3, SJH-CLG-4, SJH-CLG-5, SJH-CLG-6, and SJH-CLG-7 is available for inspection by prospective offerors at the Corps of Engineers District warehouse listed below:

Address: 3077 Talleyrand Avenue
Jacksonville, Florida

Hours: 7:00 am to 2:30 pm

The recovered materials will be available for inspection during normal business hours as noted above, except Federal holidays, during the entire bid period. Prospective offerors shall notify the project geologist at 904-232-1137 or Chief, Geology and Explorations Section at 904-232-1617 at least four working days before the visit. The following information will be required to schedule the visit: (1) the project title; (2) the specific borings or entire set which are to be viewed; (3) the date, time, and duration of the visit; the name of the person(s) and company to view the borings; and (5) a point of contact and phone number regarding the visit. Prospective offerors shall record their material examination visit in a record book maintained at the inspection site.

It is strongly suggested that prospective offerors view the samples before submitting their bid.

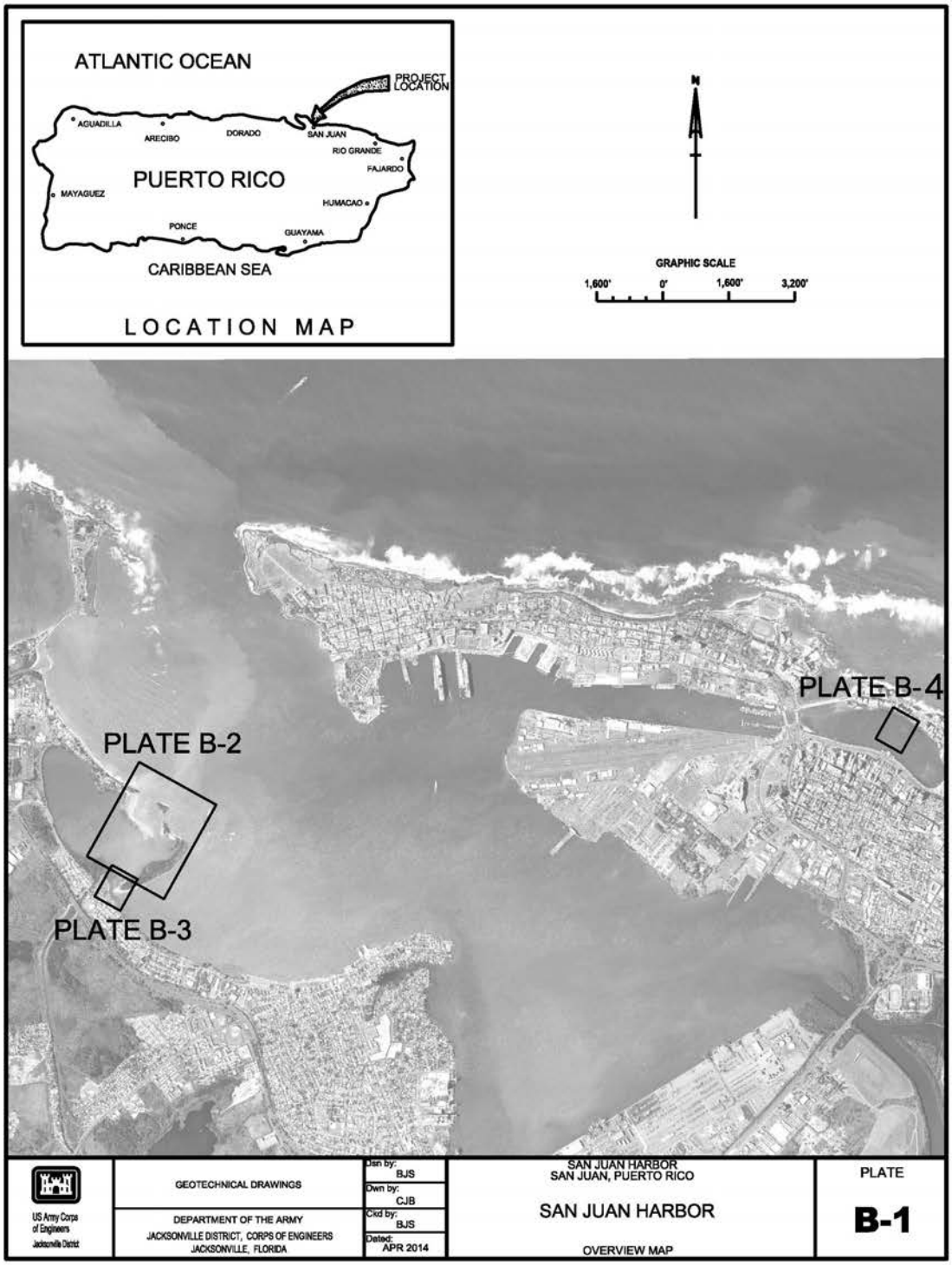

Plate 1. Vicinity Map

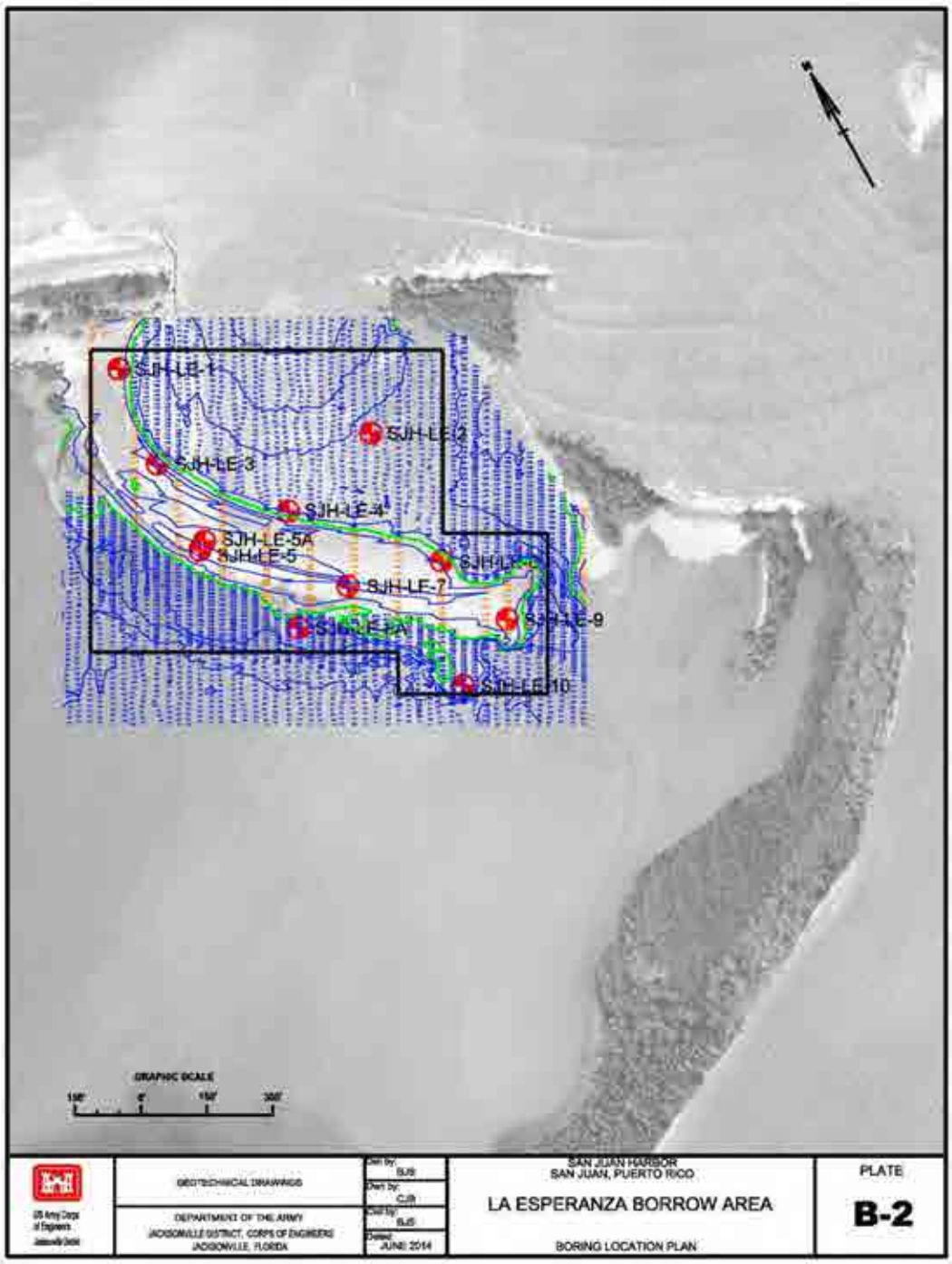

Plate 2. Boring Locations-La Esperanza Borrow Area

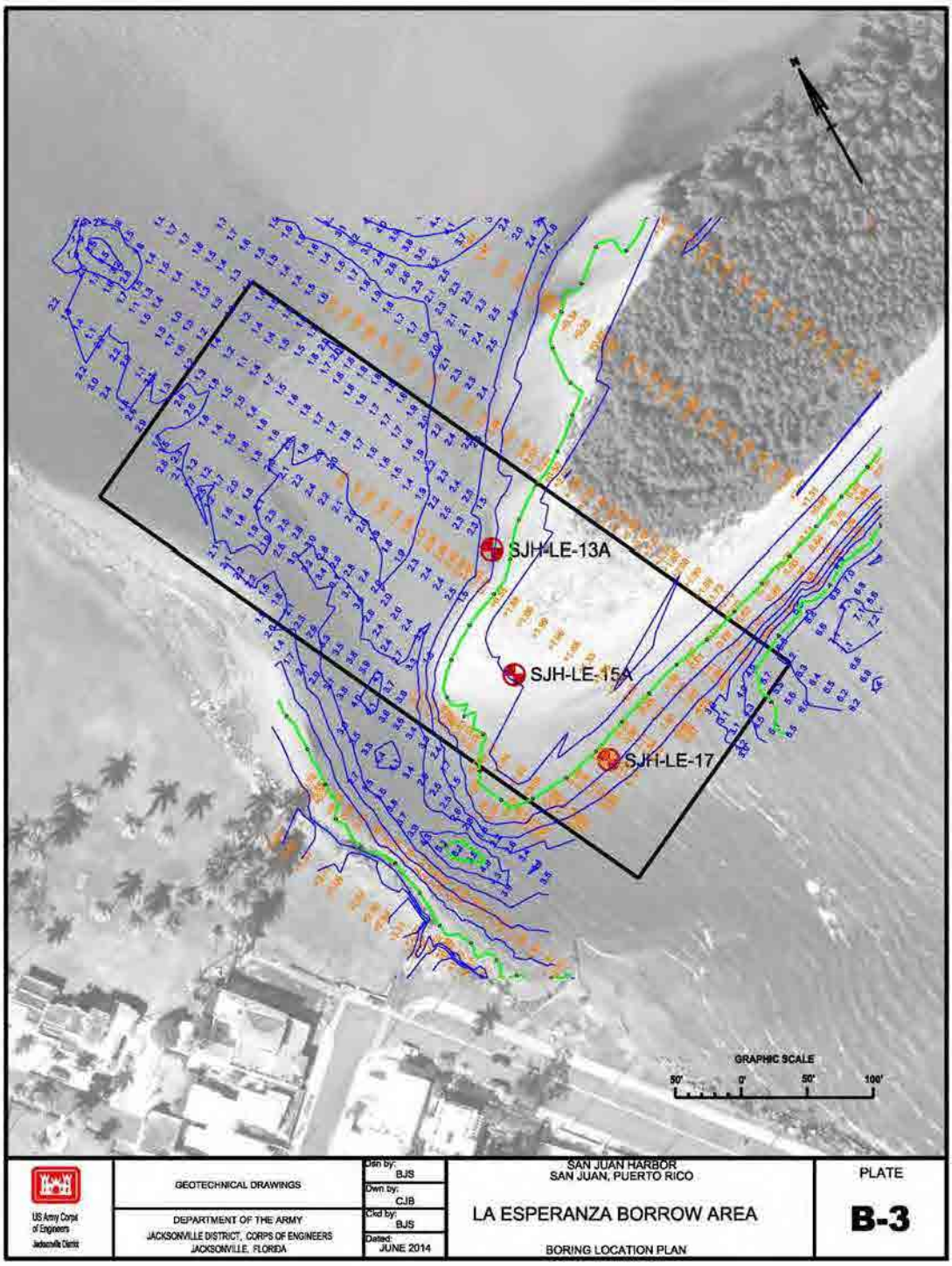

Plate 3. Boring Locations (contd)-La Esperanza Borrow Area

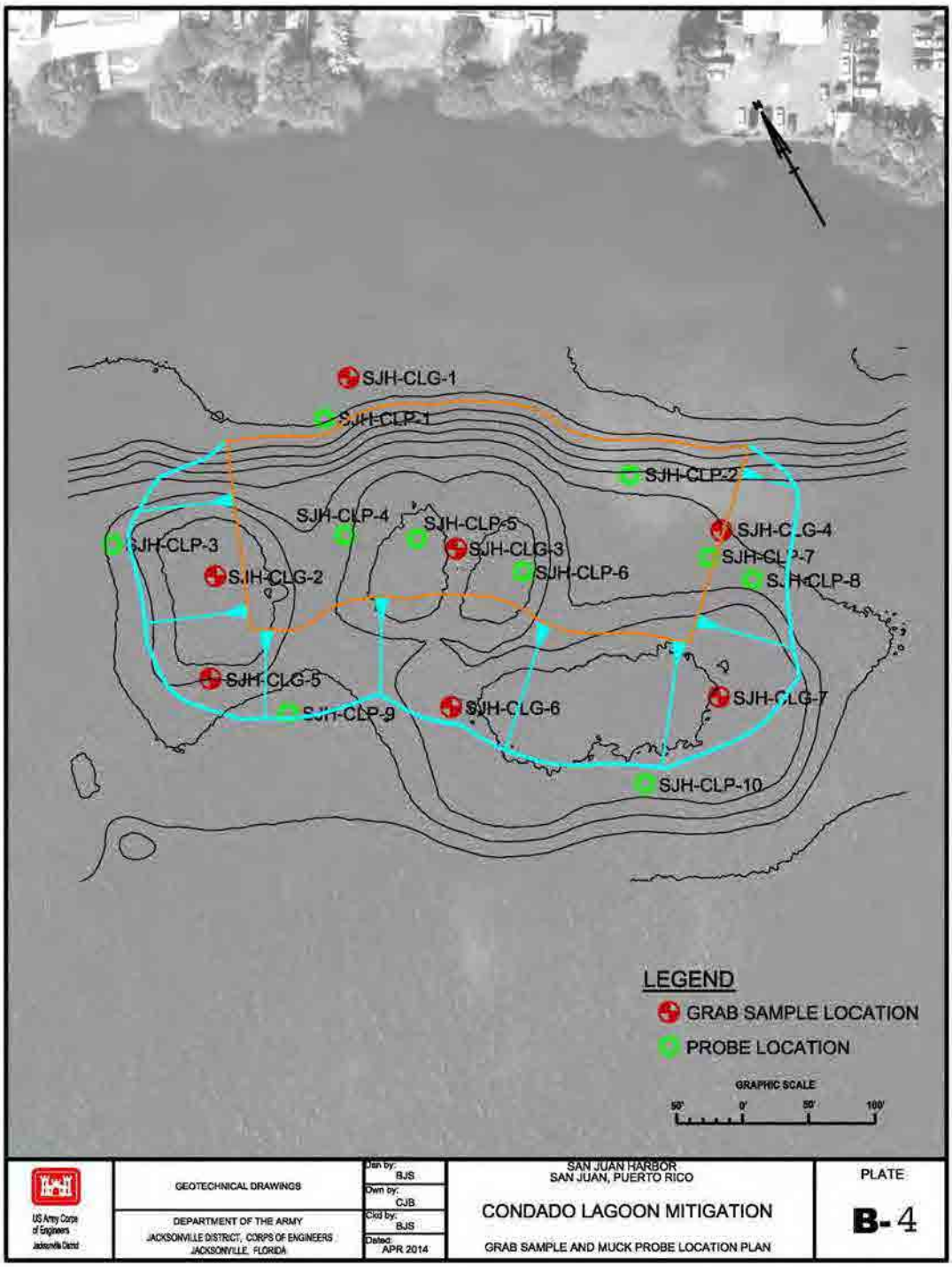

Plate 4. Grab Sample/Probe Locations-Condado Lagoon

1.4.6 Boring Logs

Applicable boring logs and detailed probe data are presented on the following pages.

While the Government’s borings are representative of subsurface conditions at their respective locations and vertical reaches, local variations in the characteristics of the subsurface materials of this region are to be expected. Accordingly, prospective offerors shall form their own conclusions from the examination of the recovered materials prior to submission of their offer.

Boring Designation SJH-LE-1

DRILLING LOG

DIVISION	South Atlantic
INSTALLATION	Jacksonville District
SHEET	1 OF 2 SHEETS
1. PROJECT	San Juan Harbor Condado Lagoon Mitigation
2. BORING DESIGNATION	SJH-LE-1
LOCATION COORDINATES	X = 760,284 Y = 881,658
3. DRILLING AGENCY	Corps of Engineers - CESAJ
CONTRACTOR FILE NO.	
4. NAME OF DRILLER	Bernard J Seifert
5. DIRECTION OF BORING	☒ VERTICAL ☐ INCLINED
DEG. FROM VERTICAL	
BEARING	
6. THICKNESS OF OVERBURDEN	N/A
7. DEPTH DRILLED INTO ROCK	N/A
8. TOTAL DEPTH OF BORING	3.7 Ft.
9. SIZE AND TYPE OF BIT	See Remarks
10. COORDINATE SYSTEM/DATUM	State Plane, PR/VI (U.S. Ft.) / NAD83 / PRVD02
11. MANUFACTURER'S DESIGNATION OF DRILL	☐ AUTO HAMMER ☐ MANUAL HAMMER
12. TOTAL SAMPLES	DISTURBED: 5 UNDISTURBED (UD): 0
13. TOTAL NUMBER CORE BOXES	0
14. ELEVATION GROUND WATER	N/A
15. DATE BORING	STARTED: 04-22-14 COMPLETED: 04-22-14
16. ELEVATION TOP OF BORING	-0.2 Ft.
17. TOTAL RECOVERY FOR BORING	N/A
18. SIGNATURE AND TITLE OF INSPECTOR	Bernard J Seifert, P.G., Geologist

ELEV.	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS	% REC.	BOX OR SAMPLE	RQD OR UD	REMARKS	BLOWS/1 FT.	N-VALUE
-0.2	0.0						-0.2		
			SAND, poorly-graded, mostly quartz, 2.5Y 5/2 grayish brown (SP)		1				
-1.8	1.6						-1.8		
-2.3	2.1		SAND, poorly-graded with silt, 2.5Y 2.5/1 black (SP-SM)		2		-2.3		
			SHELL, mostly medium to coarse-grained sand-sized shell, few fine to medium-grained sand-sized quartz, few silt, from 2.4' to 3.1',		3				
-3.3	3.1						-3.3		
-3.6	3.4		increasing silt content, 2.5Y 4/1 dark gray		4		-3.6		
-3.9	3.7		SAND, silty, mostly angular to subangular fine-grained sand-sized shell, few fine to medium-grained sand-sized coral (SM)		5		-3.9		
			SILT, inorganic-L, low plasticity, soft, mostly silt, no odor, 5Y 4/1 dark gray (ML)				Abbreviations:		

NOTES:

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

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

3. Due to accessibility to the boring locations in shallow-tidal controlled marine zone, the drilling method employed was by pushing a plastic liner 5' long, 2.5" diameter into soil using a 14-lb metal fence post driver.

4. Top of hole elevations were obtained using existing survey monument and tide measurement at time of drilling. Survey monument data:
DESCRIPTION: 14-020-01; NORTHING (ft): 881807.03; EASTING (ft): 760509.76; Elevation (ft): 4.79
*** Horizontal and vertical datum is NAD 83FT - Adjustment 2011 and PRVD02, respectively***

5. Boring sealed with available sediment.

6. Laboratory Testing Results

SAMPLE ID	SAMPLE DEPTH	LABORATORY CLASSIFICATION

0 - 5 - 10 - 15

(Continued)

Boring Designation SJH-LE-1

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

PROJECT	COORDINATE SYSTEM/DATUM	HORIZONTAL	VERTICAL
San Juan Harbor	State Plane, PR/VI (U.S. Ft.)	NAD83	PRVD02

LOCATION COORDINATES	ELEVATION TOP OF BORING
X = 760,284 Y = 881,658	-0.2 Ft.

ELEV.	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS	% REC.	BOX OR SAMPLE	RQD OR UD	REMARKS	BLOWS/ 1 FT.	N-VALUE
			1 0.0/1.5 SP* 2 1.6/2.1 SP* 3 2.1/3.0 SP* 4 3.1/3.3 SP-SM* *Lab visual classification based on gradation curve 7. Additional Laboratory Testing 1 Percent Carbonate 5 Atterberg						

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SAJ FORM 1836-A
JUN 02

Boring Designation SJH-LE-2

DRILLING LOG

DIVISION South Atlantic		**INSTALLATION** Jacksonville District	**SHEET** 1 **OF** 2 **SHEETS**
1. PROJECT San Juan Harbor, Condado Lagoon Mitigation		**9. SIZE AND TYPE OF BIT** See Remarks	
		10. COORDINATE SYSTEM/DATUM State Plane, PR/VI (U.S. Ft.)	**HORIZONTAL** NAD83 / **VERTICAL** PRVD02
2. BORING DESIGNATION SJH-LE-2	**LOCATION COORDINATES** X = 760,715 Y = 881,251	**11. MANUFACTURER'S DESIGNATION OF DRILL**	☐ AUTO HAMMER ☐ MANUAL HAMMER
3. DRILLING AGENCY Corps of Engineers - CESAJ	**CONTRACTOR FILE NO.**	**12. TOTAL SAMPLES**	**DISTURBED** 3 / **UNDISTURBED (UD)** 0
4. NAME OF DRILLER Bernard J Seifert		**13. TOTAL NUMBER CORE BOXES** 0	
5. DIRECTION OF BORING ☒ VERTICAL ☐ INCLINED	**DEG. FROM VERTICAL** / **BEARING**	**14. ELEVATION GROUND WATER** N/A	
		15. DATE BORING	**STARTED** 04-23-14 / **COMPLETED** 04-23-14
6. THICKNESS OF OVERBURDEN N/A		**16. ELEVATION TOP OF BORING** -1.6 Ft.	
7. DEPTH DRILLED INTO ROCK N/A		**17. TOTAL RECOVERY FOR BORING** N/A	
8. TOTAL DEPTH OF BORING 2.3 Ft.		**18. SIGNATURE AND TITLE OF INSPECTOR** Bernard J Seifert, P.G., Geologist	

ELEV.	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS	% REC.	BOX OR SAMPLE	RQD OR UD	REMARKS	BLOWS/1 FT.	N-VALUE
-1.6	0.0						-1.6		
			SAND, poorly-graded with silt, mostly subangular to subrounded fine-grained sand-sized quartz, little fine to medium-grained sand-sized shell, few silt, trace fine gravel-sized coral, 2.5Y 4/2 dark grayish brown (SP-SM)		1				
-2.9	1.3		At El. -2.1 Ft., lensed with silty sand, 2.5Y 2.5/1 black				-2.9		
-3.2	1.7				2		-3.3		
-3.9	2.3		At El. -2.3 Ft., increasing silt content, grades to SM at 1.3'		3		-3.9		
			SHELL, mostly angular to subangular medium-grained sand-sized shell, some silt						
			SILT, inorganic-L, low plasticity, soft, mostly silt, few fine-grained sand-sized shell, 5GY 3/2 grayish olive green (ML)						

Abbreviations:

NOTES:

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3. Due to accessibility to the boring locations in shallow-tidal controlled marine zone, the drilling method employed was by pushing a plastic liner 5' long, 2.5" diameter into soil using a 14-lb metal fence post driver.

4. Top of hole elevations were obtained using existing survey monument and tide measurement at time of drilling. Survey monument data:
DESCRIPTION: 14-020-01; NORTHING (ft): 881807.03; EASTING (ft): 760509.76; Elevation (ft): 4.79
*** Horizontal and vertical datum is NAD 83FT - Adjustment 2011 and PRVD02, respectively***

5. There was 1.6' of water at this location at time of drilling.

6. Boring sealed with available sediment.

7. Laboratory Testing Results

SAMPLE ID	SAMPLE DEPTH	LABORATORY CLASSIFICATION

0 - 5 - 10 - 15

(Continued)

Boring Designation SJH-LE-2

DRILLING LOG (Cont. Sheet)	INSTALLATION		SHEET 2 OF 2 SHEETS
	Jacksonville District		
PROJECT	**COORDINATE SYSTEM/DATUM**	**HORIZONTAL**	**VERTICAL**
San Juan Harbor	State Plane, PR/VI (U.S. Ft.)	NAD83	PRVD02
LOCATION COORDINATES	**ELEVATION TOP OF BORING**		
X = 760,715 Y = 881,251	-1.6 Ft.		

ELEV.	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS	% REC.	BOX OR SAMPLE	RQD OR UD	REMARKS	BLOWS/ 1 FT.	N-VALUE
			1 0.0/0.5 SP* 2 1.3/1.6 SM* 3 1.7/2.0 MH *Lab visual classification based on gradation curve 8. Additional Laboratory Testing 3 Atterberg						

15
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SAJ FORM 1836-A
JUN 02

Boring Designation SJH-LE-3

DRILLING LOG

DIVISION	South Atlantic
INSTALLATION	Jacksonville District
SHEET	1 OF 2 SHEETS
1. PROJECT	San Juan Harbor Condado Lagoon Mitigation
2. BORING DESIGNATION	SJH-LE-3
LOCATION COORDINATES	X = 760,255 Y = 881,426
3. DRILLING AGENCY	Corps of Engineers - CESAJ
CONTRACTOR FILE NO.	
4. NAME OF DRILLER	Bernard J Seifert
5. DIRECTION OF BORING	☒ VERTICAL ☐ INCLINED
DEG. FROM VERTICAL	
BEARING	
6. THICKNESS OF OVERBURDEN	N/A
7. DEPTH DRILLED INTO ROCK	N/A
8. TOTAL DEPTH OF BORING	2.5 Ft.
9. SIZE AND TYPE OF BIT	See Remarks
10. COORDINATE SYSTEM/DATUM	State Plane, PR/VI (U.S. Ft.) / NAD83 / PRVD02
11. MANUFACTURER'S DESIGNATION OF DRILL	☐ AUTO HAMMER ☐ MANUAL HAMMER
12. TOTAL SAMPLES	DISTURBED: 3 UNDISTURBED (UD): 0
13. TOTAL NUMBER CORE BOXES	0
14. ELEVATION GROUND WATER	N/A
15. DATE BORING	STARTED: 04-22-14 COMPLETED: 04-22-14
16. ELEVATION TOP OF BORING	-1.1 Ft.
17. TOTAL RECOVERY FOR BORING	N/A
18. SIGNATURE AND TITLE OF INSPECTOR	Bernard J Seifert, P.G., Geologist

ELEV.	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS	% REC.	BOX OR SAMPLE	RQD OR UD	REMARKS	BLOWS/1 FT.	N-VALUE
-1.1	0.0						-1.1		
-1.9	0.8		SHELL, mostly angular to subangular fine to coarse-grained sand-sized shell, few subangular to subrounded fine to medium-grained sand-sized quartz, trace fine to coarse gravel-sized coral, 2.5Y 5/3 light olive brown		1		-1.9		
					2		-2.5		
-3.6	2.5		SHELL, mostly angular to subrounded coarse-grained sand-sized shell, trace silt, SHELL hash layer, 2.5Y 6/8 olive yellow At El. -2.8 Ft., trace fine gravel-sized shell, 2.5Y 4/1 dark gray		3		-3.6		

NOTES:

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3. Due to accessibility to the boring locations in shallow-tidal controlled marine zone, the drilling method employed was by pushing a plastic liner 5' long, 2.5" diameter into soil using a 14-lb metal fence post driver.

4. Top of hole elevations were obtained using existing survey monument and tide measurement at time of drilling. Survey monument data:
DESCRIPTION: 14-020-01; NORTHING (ft): 881807.03; EASTING (ft): 760509.76; Elevation (ft): 4.79
*** Horizontal and vertical datum is NAD 83FT - Adjustment 2011 and PRVD02, respectively***

5. There was 0.6' of water at this location at time of drilling.

6. Boring sealed with available sediment.

7. Laboratory Testing Results

SAMPLE ID	SAMPLE DEPTH	LABORATORY CLASSIFICATION
1	0.0/0.7	SP*
2	0.8/1.1	SP*
3	1.4/2.0	SP*

Abbreviations:

0
5 -
10 -
15

(Continued)

Boring Designation SJH-LE-3

DRILLING LOG (Cont. Sheet)	INSTALLATION		SHEET 2 OF 2 SHEETS
	Jacksonville District		
PROJECT	**COORDINATE SYSTEM/DATUM**	**HORIZONTAL**	**VERTICAL**
San Juan Harbor	State Plane, PR/VI (U.S. Ft.)	NAD83	PRVD02
LOCATION COORDINATES	**ELEVATION TOP OF BORING**		
X = 760,255 Y = 881,426	-1.1 Ft.		

ELEV.	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS	% REC.	BOX OR SAMPLE	RQD OR UD	REMARKS	BLOWS/ 1 FT.	N-VALUE
			*Lab visual classification based on gradation curve 8. Additional Laboratory Testing 2 Percent Carbonate						

15
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25
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SAJ FORM 1836-A
JUN 02

Boring Designation SJH-LE-4

DRILLING LOG

DIVISION South Atlantic	**INSTALLATION** Jacksonville District	**SHEET** 1 **OF** 2 **SHEETS**	
1. PROJECT San Juan Harbor, Condado Lagoon Mitigation	**9. SIZE AND TYPE OF BIT** See Remarks		
	10. COORDINATE SYSTEM/DATUM State Plane, PR/VI (U.S. Ft.)	**HORIZONTAL** NAD83	**VERTICAL** PRVD02
2. BORING DESIGNATION SJH-LE-4	**LOCATION COORDINATES** X = 760,464 Y = 881,187	**11. MANUFACTURER'S DESIGNATION OF DRILL** ☐ AUTO HAMMER ☐ MANUAL HAMMER	
3. DRILLING AGENCY Corps of Engineers - CESAJ	**CONTRACTOR FILE NO.**	**12. TOTAL SAMPLES**	**DISTURBED** 2 / **UNDISTURBED (UD)** 0
4. NAME OF DRILLER Bernard J Seifert		**13. TOTAL NUMBER CORE BOXES** 0	
5. DIRECTION OF BORING ☒ VERTICAL ☐ INCLINED	**DEG. FROM VERTICAL** / **BEARING**	**14. ELEVATION GROUND WATER** N/A	
		15. DATE BORING	**STARTED** 04-22-14 / **COMPLETED** 04-22-14
6. THICKNESS OF OVERBURDEN N/A		**16. ELEVATION TOP OF BORING** -2.2 Ft.	
7. DEPTH DRILLED INTO ROCK N/A		**17. TOTAL RECOVERY FOR BORING** N/A	
8. TOTAL DEPTH OF BORING 1.5 Ft.		**18. SIGNATURE AND TITLE OF INSPECTOR** Bernard J Seifert, P.G., Geologist	

ELEV.	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS	% REC.	BOX OR SAMPLE	RQD OR UD	REMARKS	BLOWS/1 FT.	N-VALUE
-2.2	0.0						-2.2		
-2.4	0.2		SAND, poorly-graded, mostly fine to medium-grained sand-sized quartz (SP)		1		-2.9		
-3.7	1.5		SHELL, mostly sand to gravel-sized flat shell, trace sand to gravel-sized coral, 2.5Y 4/2 dark grayish brown -At El. -2.5 Ft., mostly sand to gravel-sized shell -At El. -2.8 Ft., stratified up to 1/2", shell hash layer -At El. -2.9 Ft., mostly fine-grained sand-sized shell, little silt		2		-3.7		

Abbreviations:

NOTES:

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3. Due to accessibility to the boring locations in shallow-tidal controlled marine zone, the drilling method employed was by pushing a plastic liner 5' long, 2.5" diameter into soil using a 14-lb metal fence post driver.

4. Top of hole elevations were obtained using existing survey monument and tide measurement at time of drilling. Survey monument data:
DESCRIPTION: 14-020-01; NORTHING (ft): 881807.03; EASTING (ft): 760509.76; Elevation (ft): 4.79
*** Horizontal and vertical datum is NAD 83FT - Adjustment 2011 and PRVD02, respectively***

5. There was 1.7' of water at this location at time of drilling.

6. Boring sealed with available sediment.

7. Laboratory Testing Results

SAMPLE ID	SAMPLE DEPTH	LABORATORY CLASSIFICATION
1	0.0/0.6	SP*
2	0.7/1.4	SP*

*Lab visual classification based on gradation

0
5 -
10 -
15

(Continued)

Boring Designation SJH-LE-4

DRILLING LOG (Cont. Sheet)	INSTALLATION		SHEET 2 OF 2 SHEETS
	Jacksonville District		
PROJECT	**COORDINATE SYSTEM/DATUM**	**HORIZONTAL**	**VERTICAL**
San Juan Harbor	State Plane, PR/VI (U.S. Ft.)	NAD83	PRVD02
LOCATION COORDINATES	**ELEVATION TOP OF BORING**		
X = 760,464 Y = 881,187	-2.2 Ft.		

ELEV.	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS	% REC.	BOX OR SAMPLE	RQD OR UD	REMARKS	BLOWS/ 1 FT.	N-VALUE
			curve						
			8. Additional Laboratory Testing						
			1 Percent Carbonate						

15
20
25
30
35

Boring Designation SJH-LE-5

DRILLING LOG	DIVISION	INSTALLATION	SHEET 1 OF 2 SHEETS
	South Atlantic	Jacksonville District	

1. PROJECT: San Juan Harbor, Condado Lagoon Mitigation		9. SIZE AND TYPE OF BIT: See Remarks	
		10. COORDINATE SYSTEM/DATUM: State Plane, PR/VI (U.S. Ft.)	HORIZONTAL: NAD83 / VERTICAL: PRVD02
2. BORING DESIGNATION: SJH-LE-5	LOCATION COORDINATES: X = 760,245 Y = 881,208	11. MANUFACTURER'S DESIGNATION OF DRILL	☐ AUTO HAMMER ☐ MANUAL HAMMER
3. DRILLING AGENCY: Corps of Engineers - CESAJ	CONTRACTOR FILE NO.	12. TOTAL SAMPLES	DISTURBED: 4 / UNDISTURBED (UD): 0
4. NAME OF DRILLER: Bernard J Seifert		13. TOTAL NUMBER CORE BOXES: 0	
5. DIRECTION OF BORING: ☒ VERTICAL ☐ INCLINED	DEG. FROM VERTICAL / BEARING	14. ELEVATION GROUND WATER: 0.0 Ft.	
		15. DATE BORING	STARTED: 04-25-14 / COMPLETED: 04-25-14
6. THICKNESS OF OVERBURDEN: N/A		16. ELEVATION TOP OF BORING: 2.4 Ft.	
7. DEPTH DRILLED INTO ROCK: N/A		17. TOTAL RECOVERY FOR BORING: N/A	
8. TOTAL DEPTH OF BORING: 5.0 Ft.		18. SIGNATURE AND TITLE OF INSPECTOR: Bernard J Seifert, P.G., Geologist	

ELEV.	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS	% REC.	BOX OR SAMPLE	RQD OR UD	REMARKS	BLOWS/1 FT.	N-VALUE
2.4	0.0						2.4		
			SAND, poorly-graded, mostly subangular to subrounded fine-grained sand-sized quartz, some sand to gravel-sized shell, dry, about 35% shell, 2.5Y 6/2 light brownish gray (SP)		1				
1.3	1.2		At El. 1.6 Ft., some medium-grained sand-sized shell, about 40-45% shell				1.2		
			SHELL, mostly sand to gravel-sized shell and coral, some fine to medium-grained sand-sized quartz, trace silt		2				
			From El. 0.1 to 0.0 Ft., stratified with silty sand up to 1-3/8", about 15% silt, organic odor, 5Y 2.5/1 black				-0.1		
-0.7	3.2		At El. 0.0 Ft.		3				
			From El. -0.2 to -0.3 Ft., stratified with shell up to 1-1/4", SHELL HASH layer, 5Y 4/2 olive gray				-0.8		
			At El. -0.3 Ft., trace silt		4				
-2.6	5.0		At El. -0.6 Ft., trace coarse gravel-sized coral				-2.6		
			SHELL, mostly medium-grained sand-sized shell, some fine-grained sand-sized quartz				Abbreviations:		
			At El. -0.9 Ft., mostly fine-grained sand-sized shell, some fine-grained sand-sized quartz, about 30% quartz						
			At El. -1.8 Ft., stratified with shell up to 1/4", SHELL HASH layer, flat, medim to coarse coarse grained sand-sized						

NOTES:

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4. Top of hole elevations were obtained using existing survey monument and tide measurement at time of drilling. Survey monument data:
DESCRIPTION: 14-020-01; NORTHING (ft): 881807.03; EASTING (ft): 760509.76; Elevation (ft): 4.79
*** Horizontal and vertical datum is NAD 83FT - Adjustment 2011 and PRVD02, respectively***

(Continued)

Boring Designation SJH-LE-5

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

PROJECT	COORDINATE SYSTEM/DATUM	HORIZONTAL	VERTICAL
San Juan Harbor	State Plane, PR/VI (U.S. Ft.)	NAD83	PRVD02

LOCATION COORDINATES	ELEVATION TOP OF BORING
X = 760,245 Y = 881,208	2.4 Ft.

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

5. Boring sealed with available sediment.

6. Laboratory Testing Results

SAMPLE ID	SAMPLE DEPTH	LABORATORY CLASSIFICATION
1	0.0/0.8	SP* -
2	1.2/2.0	SP* -
3	2.5/2.8	SP* -
4	3.2/4.5	SP* -

*Lab visual classification based on gradation curve

7. Additional Laboratory Testing

2 Percent Carbonate

15
20
25
30
35

SAJ FORM 1836-A
JUN 02

Boring Designation SJH-LE-5A

DRILLING LOG

DIVISION	South Atlantic
INSTALLATION	Jacksonville District
SHEET	1 OF 2 SHEETS
1. PROJECT	San Juan Harbor Condado Lagoon Mitigation
2. BORING DESIGNATION	SJH-LE-5A
LOCATION COORDINATES	X = 760,264 Y = 881,220
3. DRILLING AGENCY	Corps of Engineers - CESAJ
CONTRACTOR FILE NO.	
4. NAME OF DRILLER	Bernard J Seifert
5. DIRECTION OF BORING	☒ VERTICAL ☐ INCLINED
DEG. FROM VERTICAL	
BEARING	
6. THICKNESS OF OVERBURDEN	N/A
7. DEPTH DRILLED INTO ROCK	N/A
8. TOTAL DEPTH OF BORING	5.0 Ft.
9. SIZE AND TYPE OF BIT	See Remarks
10. COORDINATE SYSTEM/DATUM	State Plane, PR/VI (U.S. Ft.) / HORIZONTAL: NAD83 / VERTICAL: PRVD02
11. MANUFACTURER'S DESIGNATION OF DRILL	☐ AUTO HAMMER ☐ MANUAL HAMMER
12. TOTAL SAMPLES	DISTURBED: 6 / UNDISTURBED (UD): 0
13. TOTAL NUMBER CORE BOXES	0
14. ELEVATION GROUND WATER	0.0 Ft.
15. DATE BORING	STARTED: 04-23-14 / COMPLETED: 04-23-14
16. ELEVATION TOP OF BORING	2.2 Ft.
17. TOTAL RECOVERY FOR BORING	N/A
18. SIGNATURE AND TITLE OF INSPECTOR	Bernard J Seifert, P.G., Geologist

ELEV.	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS	% REC.	BOX OR SAMPLE	RQD OR UD	REMARKS	BLOWS/1 FT.	N-VALUE
2.2	0.0						2.2		
1.3	0.9		SAND, poorly-graded, mostly subangular to subrounded fine to medium-grained sand-sized quartz, some fine to medium-grained sand-sized shell, trace plant debris, dry, 2.5Y 5/2 grayish brown (SP)		1		1.3		
			SHELL, mostly fine to medium-grained sand-sized shell, trace coarse-grained sand-sized flat shell		2		0.0		
			At El. 0.9 Ft., trace coarse gravel-sized shell, trace coarse gravel-sized coral		3		-0.3		
-1.4	3.6		At El. 0.6 Ft., little fine to medium-grained sand-sized quartz		4		-1.4		
-1.8	4.0		At El. 0.3 Ft., trace manufactured debris		5		-1.8		
			From El. 0.0 to -0.4 Ft., little silt, stratified up to 1/4", no odor, 5Y 4/3 olive		6				
-2.8	5.0		From El. -0.3 to -1.2 Ft., mostly fine-grained sand-sized shell, few quartz, 5Y 5/2 olive gray				-2.8		
			SAND, silty, mostly fine to medium-grained sand-sized quartz, some fine to medium-grained sand-sized shell, little silt, 5Y 2.5/1 black (SM)				Abbreviations:		
			SHELL, mostly fine-grained sand-sized shell, 5Y 4/2 olive gray						
			At El. -2.1 Ft., mostly fine to medium-grained sand-sized shell						

NOTES:

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3. Due to accessibility to the boring locations in shallow-tidal controlled marine zone, the drilling method employed was by pushing a plastic liner 5' long, 2.5" diameter into soil using a 14-lb metal fence post driver.

4. Top of hole elevations were obtained using existing survey monument and tide measurement at time of drilling. Survey monument data:
DESCRIPTION: 14-020-01; NORTHING (ft): 881807.03; EASTING (ft): 760509.76; Elevation (ft): 4.79
*** Horizontal and vertical datum is NAD 83FT -

0 - 5 - 10 - 15

(Continued)

Boring Designation SJH-LE-5A

DRILLING LOG (Cont. Sheet)	INSTALLATION		SHEET 2 OF 2 SHEETS
	Jacksonville District		
PROJECT	**COORDINATE SYSTEM/DATUM**	**HORIZONTAL**	**VERTICAL**
San Juan Harbor	State Plane, PR/VI (U.S. Ft.)	NAD83	PRVD02
LOCATION COORDINATES	**ELEVATION TOP OF BORING**		
X = 760,264 Y = 881,220	2.2 Ft.		

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

Adjustment 2011 and PRVD02, respectively***

5. Boring sealed with available sediment.

6. Laboratory Testing Results

SAMPLE ID	SAMPLE DEPTH	LABORATORY CLASSIFICATION
1	0.0/0.9	SP*
2	0.9/1.9	SP*
3	2.2/2.4	SP*
4	2.5/3.5	SP*
5	3.6/3.9	SP-SM*
6	4.0/4.3	SP-SM*

*Lab visual classification based on gradation curve

7. Additional Laboratory Testing

3 Percent Organic
5 Percent Organic

15
20
25
30
35

Boring Designation SJH-LE-6

DRILLING LOG

DIVISION	South Atlantic
INSTALLATION	Jacksonville District
SHEET	1 OF 2 SHEETS
1. PROJECT	San Juan Harbor Condado Lagoon Mitigation
2. BORING DESIGNATION	SJH-LE-6
LOCATION COORDINATES	X = 760,714 Y = 880,918
3. DRILLING AGENCY	Corps of Engineers - CESAJ
CONTRACTOR FILE NO.	
4. NAME OF DRILLER	Bernard J Seifert
5. DIRECTION OF BORING	☒ VERTICAL ☐ INCLINED
DEG. FROM VERTICAL	
BEARING	
6. THICKNESS OF OVERBURDEN	N/A
7. DEPTH DRILLED INTO ROCK	N/A
8. TOTAL DEPTH OF BORING	5.0 Ft.
9. SIZE AND TYPE OF BIT	See Remarks
10. COORDINATE SYSTEM/DATUM	State Plane, PR/VI (U.S. Ft.) / HORIZONTAL NAD83 / VERTICAL PRVD02
11. MANUFACTURER'S DESIGNATION OF DRILL	☐ AUTO HAMMER ☐ MANUAL HAMMER
12. TOTAL SAMPLES	DISTURBED 5 / UNDISTURBED (UD) 0
13. TOTAL NUMBER CORE BOXES	0
14. ELEVATION GROUND WATER	-0.2 Ft.
15. DATE BORING	STARTED 04-23-14 / COMPLETED 04-23-14
16. ELEVATION TOP OF BORING	1.8 Ft.
17. TOTAL RECOVERY FOR BORING	N/A
18. SIGNATURE AND TITLE OF INSPECTOR	Bernard J Seifert, P.G., Geologist

ELEV.	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS	% REC.	BOX OR SAMPLE	RQD OR UD	REMARKS	BLOWS/1 FT.	N-VALUE
1.8	0.0						1.8		
0.6	1.2		SAND, poorly-graded, mostly subangular to subrounded fine to medium-grained sand-sized quartz, little fine to medium-grained sand-sized shell, 2.5Y 5/2 grayish brown (SP)		1				
			SHELL, mostly fine to medium-grained sand-sized shell, about 15% quartz sand From El. 0.0 to -0.7 Ft., few sand to gravel-sized flat shell, trace elongated coral				0.0		
					2		-0.8		
-1.5	3.3		At El. -1.2 Ft., trace plant debris, trace coarse gravel-sized coral, stratified up to 1.5" SHELL HASH, coarse sand to fine gravel-sized		3		-1.5		
-2.0	3.8				4		-2.0		
			SAND, poorly-graded with silt, mostly subangular quartz, about 5-7% silt, about 25% fine sand-sized shell, 5Y 4/1 dark gray (SP-SM) From El. -1.6 to -1.8 Ft., trace wood debris, trace subrounded fine gravel-sized coral, organic odor		5				
-3.2	5.0						-3.2		
			SHELL, mostly medium-grained sand-sized shell, little fine to medium-grained sand-sized quartz, trace fine gravel-sized flat shell, about 25% quartz, 5Y 3/1 very dark gray From El. -2.6 to -2.7 Ft., mostly fine sand-sized shell, about 10% silt, 5Y 4/1 dark gray				Abbreviations:		

NOTES:

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

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

3. Due to accessibility to the boring locations in shallow-tidal controlled marine zone, the drilling method employed was by pushing a plastic liner 5' long, 2.5" diameter into soil using a 14-lb metal fence post driver.

4. Top of hole elevations were obtained using existing survey monument and tide measurement at time of drilling. Survey monument data:
DESCRIPTION: 14-020-01; NORTHING (ft): 881807.03; EASTING (ft): 760509.76; Elevation (ft): 4.79
*** Horizontal and vertical datum is NAD 83FT -

(Continued)

Boring Designation SJH-LE-6

DRILLING LOG (Cont. Sheet)	INSTALLATION		SHEET 2 OF 2 SHEETS
	Jacksonville District		
PROJECT	**COORDINATE SYSTEM/DATUM**	**HORIZONTAL**	**VERTICAL**
San Juan Harbor	State Plane, PR/VI (U.S. Ft.)	NAD83	PRVD02
LOCATION COORDINATES	**ELEVATION TOP OF BORING**		
X = 760,714 Y = 880,918	1.8 Ft.		

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

Adjustment 2011 and PRVD02, respectively***

5. Boring sealed with available sediment.

6. Laboratory Testing Results

SAMPLE ID	SAMPLE DEPTH	LABORATORY CLASSIFICATION
1	0.0/1.1	SP*
2	1.8/2.5	SP*
3	2.6/3.2	SP*
4	3.3/3.6	SP-SM*
5	3.8/4.4	SP-SM*

*Lab visual classification based on gradation curve

7. Additional Laboratory Testing

2 Percent Carbonate
4 Percent Organic -

15
20
25
30
35

SAJ FORM 1836-A
JUN 02

Boring Designation SJH-LE-7

DRILLING LOG

DIVISION	South Atlantic
INSTALLATION	Jacksonville District
SHEET	1 OF 2 SHEETS
1. PROJECT	San Juan Harbor Condado Lagoon Mitigation
2. BORING DESIGNATION	SJH-LE-7
LOCATION COORDINATES	X = 760,500 Y = 880,973
3. DRILLING AGENCY	Corps of Engineers - CESAJ
CONTRACTOR FILE NO.	
4. NAME OF DRILLER	Bernard J Seifert
5. DIRECTION OF BORING	☒ VERTICAL ☐ INCLINED
DEG. FROM VERTICAL	
BEARING	
6. THICKNESS OF OVERBURDEN	N/A
7. DEPTH DRILLED INTO ROCK	N/A
8. TOTAL DEPTH OF BORING	5.0 Ft.
9. SIZE AND TYPE OF BIT	See Remarks
10. COORDINATE SYSTEM/DATUM	State Plane, PR/VI (U.S. Ft.)
HORIZONTAL	NAD83
VERTICAL	PRVD02
11. MANUFACTURER'S DESIGNATION OF DRILL	☐ AUTO HAMMER ☐ MANUAL HAMMER
12. TOTAL SAMPLES	DISTURBED 5 / UNDISTURBED (UD) 0
13. TOTAL NUMBER CORE BOXES	0
14. ELEVATION GROUND WATER	0.2 Ft.
15. DATE BORING	STARTED 04-23-14 / COMPLETED 04-23-14
16. ELEVATION TOP OF BORING	2.2 Ft.
17. TOTAL RECOVERY FOR BORING	N/A
18. SIGNATURE AND TITLE OF INSPECTOR	Bernard J Seifert, P.G., Geologist

ELEV.	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS	% REC.	BOX OR SAMPLE	RQD OR UD	REMARKS	BLOWS/1 FT.	N-VALUE
2.2	0.0						2.2		
1.7	0.5		SAND, poorly-graded, mostly fine to medium-grained sand-sized quartz, little fine-grained sand-sized shell, 2.5Y 6/3 light yellowish brown (SP)		1		1.7		
			SHELL, mostly sand to gravel-sized shell, some sand to gravel-sized coral		2		1.1		
			At El. 1.2 Ft., discontinue fine gravel-sized coral, discontinue fine gravel-sized shell		3		-0.1		
-0.7	2.9		From El. 1.0 to 0.8 Ft., trace fine gravel-sized shell		4		-0.7		
			At El. 0.7 Ft., mostly fine-grained sand-sized shell, about 25% quartz		5				
			At El. 0.1 Ft., trace fine gravel-sized intact coral and flat shell						
-2.8	5.0		From El. -0.1 to -0.6 Ft., mostly sand to gravel-sized shell, trace fine gravel-sized coral				-2.8		
			SAND, poorly-graded, mostly fine-grained sand-sized quartz, about 25% fine to medium sand-sized shell, trace fine gravel-sized coral, 2.5Y 2.5/1 black (SP)				Abbreviations:		
			At El. -2.1 Ft., discontinue coral, 5Y 5/3 olive						

NOTES:

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3. Due to accessibility to the boring locations in shallow-tidal controlled marine zone, the drilling method employed was by pushing a plastic liner 5' long, 2.5" diameter into soil using a 14-lb metal fence post driver.

4. Top of hole elevations were obtained using existing survey monument and tide measurement at time of drilling. Survey monument data:
DESCRIPTION: 14-020-01; NORTHING (ft): 881807.03; EASTING (ft): 760509.76; Elevation (ft): 4.79
*** Horizontal and vertical datum is NAD 83FT - Adjustment 2011 and PRVD02, respectively***

5. Boring sealed with available sediment.

6. Laboratory Testing Results

(Continued)

Boring Designation SJH-LE-7

DRILLING LOG (Cont. Sheet)	INSTALLATION		SHEET 2 OF 2 SHEETS
	Jacksonville District		
PROJECT	**COORDINATE SYSTEM/DATUM**	**HORIZONTAL**	**VERTICAL**
San Juan Harbor	State Plane, PR/VI (U.S. Ft.)	NAD83	PRVD02
LOCATION COORDINATES	**ELEVATION TOP OF BORING**		
X = 760,500 Y = 880,973	2.2 Ft.		

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

SAMPLE ID	SAMPLE DEPTH	LABORATORY CLASSIFICATION
1	0.0/0.4	SP* -
2	0.5/0.9	SP* -
3	1.1/2.1	SP* -
4	2.3/2.8	SW* -
5	2.9/4.4	SP* -

*Lab visual classification based on gradation curve

7. Additional Laboratory Testing

1 Percent Carbonate
3 Percent Carbonate -

15
20
25
30
35

SAJ FORM 1836-A
JUN 02

Boring Designation SJH-LE-8A

DRILLING LOG

DIVISION	South Atlantic
INSTALLATION	Jacksonville District
SHEET	1 OF 1 SHEETS
1. PROJECT	San Juan Harbor Condado Lagoon Mitigation
2. BORING DESIGNATION	SJH-LE-8A
LOCATION COORDINATES	X = 760,354 Y = 880,945
3. DRILLING AGENCY	Corps of Engineers - CESAJ
CONTRACTOR FILE NO.	
4. NAME OF DRILLER	Bernard J Seifert
5. DIRECTION OF BORING	☒ VERTICAL ☐ INCLINED
DEG. FROM VERTICAL	
BEARING	
6. THICKNESS OF OVERBURDEN	N/A
7. DEPTH DRILLED INTO ROCK	N/A
8. TOTAL DEPTH OF BORING	1.5 Ft.
9. SIZE AND TYPE OF BIT	See Remarks
10. COORDINATE SYSTEM/DATUM	State Plane, PR/VI (U.S. Ft.) / NAD83 / PRVD02
11. MANUFACTURER'S DESIGNATION OF DRILL	☐ AUTO HAMMER ☐ MANUAL HAMMER
12. TOTAL SAMPLES	DISTURBED: 2 UNDISTURBED (UD): 0
13. TOTAL NUMBER CORE BOXES	0
14. ELEVATION GROUND WATER	N/A
15. DATE BORING	STARTED: 04-22-14 COMPLETED: 04-22-14
16. ELEVATION TOP OF BORING	-1.8 Ft.
17. TOTAL RECOVERY FOR BORING	N/A
18. SIGNATURE AND TITLE OF INSPECTOR	Bernard J Seifert, P.G., Geologist

ELEV.	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS	% REC.	BOX OR SAMPLE	RQD OR UD	REMARKS	BLOWS/1 FT.	N-VALUE
-1.8	0.0						-1.8		
-2.3	0.5		SAND, silty, mostly angular to subrounded fine - to medium-grained sand-sized shell, some silt, - trace fine gravel-sized elongated coral, - 5Y 2.5/1 black (SM) -		1				
							-2.8		
-3.3	1.5		SHELL, little fine-grained sand-sized quartz, - few coarse gravel-sized shell, 5Y 4/1 dark gray - At El. -2.8 Ft., trace silt, trace coarse - gravel-sized coral, 5Y 5/1 gray -		2		-3.3 -		

Abbreviations: -

NOTES:

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3. Due to accessibility to the boring locations in shallow-tidal controlled marine zone, the drilling method employed was by pushing a plastic liner 5' long, 2.5" diameter into soil using a 14-lb metal fence post driver.

4. Top of hole elevations were obtained using existing survey monument and tide measurement at time of drilling. Survey monument data:
DESCRIPTION: 14-020-01; NORTHING (ft): 881807.03; EASTING (ft): 760509.76; Elevation (ft): 4.79
*** Horizontal and vertical datum is NAD 83FT - Adjustment 2011 and PRVD02, respectively***

5. Boring sealed with available sediment.

6. Laboratory Testing Results

SAMPLE ID	SAMPLE DEPTH	LABORATORY CLASSIFICATION
1	0.0/0.5	SM*
2	1.0/1.4	SP-SM*

*Lab visual classification based on gradation curve

7. Additional Laboratory Testing

2 Percent Carbonate

0 5 10 15

SAJ FORM 1836
JUN 02

Boring Designation SJH-LE-9

DRILLING LOG	DIVISION	INSTALLATION	SHEET 1 OF 2 SHEETS
	South Atlantic	Jacksonville District	

1. PROJECT: San Juan Harbor, Condado Lagoon Mitigation	9. SIZE AND TYPE OF BIT: See Remarks		
	10. COORDINATE SYSTEM/DATUM: State Plane, PR/VI (U.S. Ft.)	HORIZONTAL: NAD83	VERTICAL: PRVD02
2. BORING DESIGNATION: SJH-LE-9	LOCATION COORDINATES: X = 760,780 Y = 880,730	11. MANUFACTURER'S DESIGNATION OF DRILL	☐ AUTO HAMMER ☐ MANUAL HAMMER
3. DRILLING AGENCY: Corps of Engineers - CESAJ	CONTRACTOR FILE NO.	12. TOTAL SAMPLES	DISTURBED: 3 / UNDISTURBED (UD): 0
4. NAME OF DRILLER: Bernard J Seifert		13. TOTAL NUMBER CORE BOXES: 0	
5. DIRECTION OF BORING: ☒ VERTICAL ☐ INCLINED	DEG. FROM VERTICAL	BEARING	14. ELEVATION GROUND WATER: 0.0 Ft.
		15. DATE BORING	STARTED: 04-23-14 / COMPLETED: 04-23-14
6. THICKNESS OF OVERBURDEN: N/A		16. ELEVATION TOP OF BORING: 1.4 Ft.	
7. DEPTH DRILLED INTO ROCK: N/A		17. TOTAL RECOVERY FOR BORING: N/A	
8. TOTAL DEPTH OF BORING: 5.0 Ft.		18. SIGNATURE AND TITLE OF INSPECTOR: Bernard J Seifert, P.G., Geologist	

ELEV.	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS	% REC.	BOX OR SAMPLE	RQD OR UD	REMARKS	BLOWS/1 FT.	N-VALUE
1.4	0.0						1.4		
			SHELL, mostly subangular fine-grained sand-sized shell, some fine-grained sand-sized quartz, stratified, trace algae, 2.5Y 5/3 light olive brown		1				
0.2	1.2		At El. 0.8 Ft., stratified with shell up to 1/2", coarse sand-sized SHELL HASH layer				0.2		
			At El. 0.6 Ft., mostly fine to medium-grained sand-sized shell		2				
-1.2	2.6		At El. 0.3 Ft., stratified with shell up to 1", coarse angular to rounded fine sand-sized to fine gravel-sized SHELL HASH layer				-1.2		
			SAND, poorly-graded, mostly subangular to subrounded fine-grained sand-sized quartz, little fine to medium-grained sand-sized shell, 5Y 5/2 olive gray (SP)		3				
-3.6	5.0		SHELL, mostly fine to coarse-grained sand-sized shell, trace fine to coarse gravel-sized coral				-3.6		
			At El. -2.0 Ft., stratified with shell up to 1/2", coarse sand-sized SHELL HASH layer				Abbreviations:		

NOTES:

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3. Due to accessibility to the boring locations in shallow-tidal controlled marine zone, the drilling method employed was by pushing a plastic liner 5' long, 2.5" diameter into soil using a 14-lb metal fence post driver.

4. Top of hole elevations were obtained using existing survey monument and tide measurement at time of drilling. Survey monument data:
DESCRIPTION: 14-020-01; NORTHING (ft): 881807.03; EASTING (ft): 760509.76; Elevation (ft): 4.79
*** Horizontal and vertical datum is NAD 83FT - Adjustment 2011 and PRVD02, respectively***

5. Boring sealed with available sediment.

6. Laboratory Testing Results

(Continued)

Boring Designation SJH-LE-9

DRILLING LOG (Cont. Sheet)	INSTALLATION		SHEET 2 OF 2 SHEETS
	Jacksonville District		
PROJECT	**COORDINATE SYSTEM/DATUM**	**HORIZONTAL**	**VERTICAL**
San Juan Harbor	State Plane, PR/VI (U.S. Ft.)	NAD83	PRVD02
LOCATION COORDINATES	**ELEVATION TOP OF BORING**		
X = 760,780 Y = 880,730	1.4 Ft.		

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

SAMPLE ID	SAMPLE DEPTH	LABORATORY CLASSIFICATION
1	0.0/1.1	SP* -
2	1.2/2.2	SP* -
3	2.6/3.6	SP* -

*Lab visual classification based on gradation curve

7. Additional Laboratory Testing

2 Percent Carbonate

15 20 25 30 35

SAJ FORM 1836-A
JUN 02

Boring Designation SJH-LE-10

DRILLING LOG

DIVISION	South Atlantic
INSTALLATION	Jacksonville District
SHEET	1 OF 2 SHEETS
1. PROJECT	San Juan Harbor Condado Lagoon Mitigation
2. BORING DESIGNATION	SJH-LE-10
LOCATION COORDINATES	X = 760,619 Y = 880,645
3. DRILLING AGENCY	Corps of Engineers - CESAJ
CONTRACTOR FILE NO.	
4. NAME OF DRILLER	Bernard J Seifert
5. DIRECTION OF BORING	☒ VERTICAL ☐ INCLINED
DEG. FROM VERTICAL	
BEARING	
6. THICKNESS OF OVERBURDEN	N/A
7. DEPTH DRILLED INTO ROCK	N/A
8. TOTAL DEPTH OF BORING	4.0 Ft.
9. SIZE AND TYPE OF BIT	See Remarks
10. COORDINATE SYSTEM/DATUM	State Plane, PR/VI (U.S. Ft.) / HORIZONTAL: NAD83 / VERTICAL: PRVD02
11. MANUFACTURER'S DESIGNATION OF DRILL	☐ AUTO HAMMER ☐ MANUAL HAMMER
12. TOTAL SAMPLES	DISTURBED: 3 / UNDISTURBED (UD): 0
13. TOTAL NUMBER CORE BOXES	0
14. ELEVATION GROUND WATER	N/A
15. DATE BORING	STARTED: 04-23-14 / COMPLETED: 04-23-14
16. ELEVATION TOP OF BORING	1.4 Ft.
17. TOTAL RECOVERY FOR BORING	N/A
18. SIGNATURE AND TITLE OF INSPECTOR	Bernard J Seifert, P.G., Geologist

ELEV.	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS	% REC.	BOX OR SAMPLE	RQD OR UD	REMARKS	BLOWS/1 FT.	N-VALUE
1.4	0.0								
1.3	0.2		SAND, poorly-graded with silt, mostly subangular to subrounded fine to medium-grained sand-sized quartz, little medium-grained sand-sized shell, trace coarse gravel-sized shell, 2.5Y 4/3 olive brown (SP-SM)		1		1.2		
			SAND, poorly-graded, mostly angular to subrounded fine to medium-grained sand-sized quartz, little fine to coarse-grained sand-sized shell, 20-25% shell, 2.5Y 5/2 grayish brown (SP)		2		-0.6		
			At El. -0.6 Ft., little fine gravel-sized flat shell, trace subangular fine gravel-sized coral, trace silt, broken flat shell fragments, 2.5Y 4/1 dark gray		3		-1.5		
-2.6	4.0		At El. -1.0 Ft., trace plant debris At El. -1.4 Ft., discontinue plant debris, discontinue silt, about 35-40% medium to coarse sand-sized shell, 2.5Y 5/2 grayish brown At El. -1.7 Ft., stratified with shell up to 1/2", 1/2" layer of SHELL HASH				-2.6		

NOTES:

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3. Due to accessibility to the boring locations in shallow-tidal controlled marine zone, the drilling method employed was by pushing a plastic liner 5' long, 2.5" diameter into soil using a 14-lb metal fence post driver.

4. Top of hole elevations were obtained using existing survey monument and tide measurement at time of drilling. Survey monument data:
DESCRIPTION: 14-020-01; NORTHING (ft): 881807.03; EASTING (ft): 760509.76; Elevation (ft): 4.79
*** Horizontal and vertical datum is NAD 83FT - Adjustment 2011 and PRVD02, respectively***

5. Boring sealed with available sediment.

6. Laboratory Testing Results

Abbreviations:

0
5 -
10 -
15

(Continued)

Boring Designation SJH-LE-10

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

PROJECT	COORDINATE SYSTEM/DATUM	HORIZONTAL	VERTICAL
San Juan Harbor	State Plane, PR/VI (U.S. Ft.)	NAD83	PRVD02

LOCATION COORDINATES	ELEVATION TOP OF BORING
X = 760,619 Y = 880,645	1.4 Ft.

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

SAMPLE ID	SAMPLE DEPTH	LABORATORY CLASSIFICATION
1	0.2/1.5	SP* -
2	2.0/2.6	SP* -
3	2.9/3.4	SP* -

*Lab visual classification based on gradation curve

7. Additional Laboratory Testing

2 Percent Carbonate

15
20
25
30
35

SAJ FORM 1836-A
JUN 02

Boring Designation SJH-LE-13A

DRILLING LOG

DIVISION	South Atlantic
INSTALLATION	Jacksonville District
SHEET	1 OF 1 SHEETS
1. PROJECT	San Juan Harbor Condado Lagoon Mitigation
2. BORING DESIGNATION	SJH-LE-13A
LOCATION COORDINATES	X = 759,927 Y = 879,462
3. DRILLING AGENCY	Corps of Engineers - CESAJ
CONTRACTOR FILE NO.	
4. NAME OF DRILLER	Bernard J Seifert
5. DIRECTION OF BORING	☒ VERTICAL ☐ INCLINED
DEG. FROM VERTICAL	
BEARING	
6. THICKNESS OF OVERBURDEN	N/A
7. DEPTH DRILLED INTO ROCK	N/A
8. TOTAL DEPTH OF BORING	1.5 Ft.
9. SIZE AND TYPE OF BIT	See Remarks
10. COORDINATE SYSTEM/DATUM	State Plane, PR/VI (U.S. Ft.) / NAD83 / PRVD02
11. MANUFACTURER'S DESIGNATION OF DRILL	☐ AUTO HAMMER ☐ MANUAL HAMMER
12. TOTAL SAMPLES	DISTURBED 1 / UNDISTURBED (UD) 0
13. TOTAL NUMBER CORE BOXES	0
14. ELEVATION GROUND WATER	N/A
15. DATE BORING	STARTED 04-23-14 / COMPLETED 04-23-14
16. ELEVATION TOP OF BORING	-1.4 Ft.
17. TOTAL RECOVERY FOR BORING	N/A
18. SIGNATURE AND TITLE OF INSPECTOR	Bernard J Seifert, P.G., Geologist

ELEV.	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS	% REC.	BOX OR SAMPLE	RQD OR UD	REMARKS	BLOWS/1 FT.	N-VALUE
-1.4	0.0						-1.4		
-2.9	1.5		SHELL, mostly angular to subrounded fine-grained sand-sized shell, few silt, trace coarse gravel-sized coral, trace plant debris, about 10% fines, 2.5Y 2.5/1 black		1		-2.9 -		

NOTES:

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3. Due to accessibility to the boring locations in shallow-tidal controlled marine zone, the drilling method employed was by pushing a plastic liner 5' long, 2.5" diameter into soil using a 14-lb metal fence post driver.

4. Top of hole elevations were obtained using existing survey monument and tide measurement at time of drilling. Survey monument data:
DESCRIPTION: SJH-24; NORTHING (ft): 879246.93; EASTING (ft): 759647.15; Elevation (ft): 3.39
*** Horizontal and vertical datum is NAD 83FT - Adjustment 2011 and PRVD02, respectively***

5. Boring sealed with available sediment.

6. Laboratory Testing Results

SAMPLE ID	SAMPLE DEPTH	LABORATORY CLASSIFICATION
1	0.0/1.0	SP*

*Lab visual classification based on gradation curve

Abbreviations: -

0
5
10
15

SAJ FORM 1836
JUN 02

Boring Designation SJH-LE-15A

DRILLING LOG	DIVISION	INSTALLATION	SHEET 1 OF 2 SHEETS
	South Atlantic	Jacksonville District	

1. PROJECT: San Juan Harbor, Condado Lagoon Mitigation		9. SIZE AND TYPE OF BIT: See Remarks	
		10. COORDINATE SYSTEM/DATUM: State Plane, PR/VI (U.S. Ft.)	HORIZONTAL: NAD83 / VERTICAL: PRVD02
2. BORING DESIGNATION: SJH-LE-15A	LOCATION COORDINATES: X = 759,896 Y = 879,371	11. MANUFACTURER'S DESIGNATION OF DRILL	☐ AUTO HAMMER ☐ MANUAL HAMMER
3. DRILLING AGENCY: Corps of Engineers - CESAJ	CONTRACTOR FILE NO.	12. TOTAL SAMPLES	DISTURBED: 3 / UNDISTURBED (UD): 0
4. NAME OF DRILLER: Bernard J Seifert		13. TOTAL NUMBER CORE BOXES: 0	
5. DIRECTION OF BORING: ☒ VERTICAL ☐ INCLINED	DEG. FROM VERTICAL	BEARING	14. ELEVATION GROUND WATER: 0.3 Ft.
		15. DATE BORING	STARTED: 04-23-14 / COMPLETED: 04-23-14
6. THICKNESS OF OVERBURDEN: N/A		16. ELEVATION TOP OF BORING: 1.0 Ft.	
7. DEPTH DRILLED INTO ROCK: N/A		17. TOTAL RECOVERY FOR BORING: N/A	
8. TOTAL DEPTH OF BORING: 4.0 Ft.		18. SIGNATURE AND TITLE OF INSPECTOR: Bernard J Seifert, P.G., Geologist	

ELEV.	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS	% REC.	BOX OR SAMPLE	RQD OR UD	REMARKS	BLOWS/1 FT.	N-VALUE
1.0	0.0						1.0		
			SHELL, mostly sand to gravel-sized shell, trace plant debris, trace fine to coarse gravel-sized coral, trace silt, about 20% quartz sand, discontinue roots below 0.70', 2.5Y 6/3 light yellowish brown		1		-0.2		
			From El. -0.2 to -0.7 Ft., some fine-grained sand-sized quartz, discontinue coral, about 40% quartz, 2.5Y 6/2 light brownish gray		2		-1.2		
			From El. -1.0 to -1.3 Ft., trace coarse gravel-sized flat shell, discontinue silt						
-3.0	4.0		At El. -1.3 Ft., mostly fine to medium-grained sand-sized shell, about 15% fine to medium sand-sized quartz		3		-3.0		

NOTES:

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4. Top of hole elevations were obtained using existing survey monument and tide measurement at time of drilling. Survey monument data:
DESCRIPTION: SJH-24; NORTHING (ft): 879246.93; EASTING (ft): 759647.15; Elevation (ft): 3.39
*** Horizontal and vertical datum is NAD 83FT - Adjustment 2011 and PRVD02, respectively***

5. Boring sealed with available sediment.

6. Laboratory Testing Results

SAMPLE ID	SAMPLE DEPTH	LABORATORY CLASSIFICATION
1	0.0/1.0	SP* -
2	1.2/2.0	SP* -
3	2.2/3.8	SP* -

Abbreviations:

(Continued)

Boring Designation SJH-LE-15A

DRILLING LOG (Cont. Sheet)	INSTALLATION		SHEET 2 OF 2 SHEETS
	Jacksonville District		
PROJECT	COORDINATE SYSTEM/DATUM	HORIZONTAL	VERTICAL
San Juan Harbor	State Plane, PR/VI (U.S. Ft.)	NAD83	PRVD02
LOCATION COORDINATES	ELEVATION TOP OF BORING		
X = 759,896 Y = 879,371	1.0 Ft.		

ELEV.	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS	% REC.	BOX OR SAMPLE	RQD OR UD	REMARKS	BLOWS/ 1 FT.	N-VALUE
			*Lab visual classification based on gradation curve 7. Additional Laboratory Testing 2 Percent Carbonate						

15
20
25
30
35

SAJ FORM 1836-A
JUN 02

Boring Designation SJH-LE-17

DRILLING LOG	DIVISION	INSTALLATION	SHEET 1 OF 1 SHEETS
	South Atlantic	Jacksonville District	

1. PROJECT: San Juan Harbor, Condado Lagoon Mitigation		9. SIZE AND TYPE OF BIT: See Remarks	
		10. COORDINATE SYSTEM/DATUM: State Plane, PR/VI (U.S. Ft.)	HORIZONTAL: NAD83 / VERTICAL: PRVD02
2. BORING DESIGNATION: SJH-LE-17	LOCATION COORDINATES: X = 759,927 Y = 879,280	11. MANUFACTURER'S DESIGNATION OF DRILL	☐ AUTO HAMMER ☐ MANUAL HAMMER
3. DRILLING AGENCY: Corps of Engineers - CESAJ	CONTRACTOR FILE NO.	12. TOTAL SAMPLES	DISTURBED: 2 / UNDISTURBED (UD): 0
4. NAME OF DRILLER: Bernard J Seifert		13. TOTAL NUMBER CORE BOXES: 0	
5. DIRECTION OF BORING: ☒ VERTICAL ☐ INCLINED	DEG. FROM VERTICAL / BEARING	14. ELEVATION GROUND WATER: N/A	
		15. DATE BORING	STARTED: 04-23-14 / COMPLETED: 04-23-14
6. THICKNESS OF OVERBURDEN: N/A		16. ELEVATION TOP OF BORING: -1.3 Ft.	
7. DEPTH DRILLED INTO ROCK: N/A		17. TOTAL RECOVERY FOR BORING: N/A	
8. TOTAL DEPTH OF BORING: 2.0 Ft.		18. SIGNATURE AND TITLE OF INSPECTOR: Bernard J Seifert, P.G., Geologist	

ELEV.	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS	% REC.	BOX OR SAMPLE	RQD OR UD	REMARKS	BLOWS/1 FT.	N-VALUE
-1.3	0.0						-1.3		
			SHELL, mostly medium to coarse-grained sand-sized shell, few subangular to subrounded fine to medium-grained sand-sized quartz, trace fine gravel-sized coral		1				
			At El. -2.8 Ft., stratified with shell up to 1/2", SHELL HASH layer				-2.9		
-3.3	2.0		At El. -2.9 Ft., mostly fine-grained sand-sized shell, lensed with poorly-graded sand with silt, pockets of black sand with silt (<10% silt)		2		-3.3		
			At El. -3.0 Ft., trace plant debris				Abbreviations:		

NOTES:

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

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

3. Due to accessibility to the boring locations in shallow-tidal controlled marine zone, the drilling method employed was by pushing a plastic liner 5' long, 2.5" diameter into soil using a 14-lb metal fence post driver.

4. Top of hole elevations were obtained using existing survey monument and tide measurement at time of drilling. Survey monument data:
DESCRIPTION: SJH-24; NORTHING (ft): 879246.93; EASTING (ft): 759647.15; Elevation (ft): 3.39
*** Horizontal and vertical datum is NAD 83FT - Adjustment 2011 and PRVD02, respectively***

5. Boring sealed with available sediment.

6. Laboratory Testing Results

SAMPLE ID	SAMPLE DEPTH	LABORATORY CLASSIFICATION
1	0.0/1.0	SP*
2	1.6/1.8	SP*

*Lab visual classification based on gradation curve

0
5 -
10 -
15

SAJ FORM 1836
JUN 02

Boring Designation SJH-CLG-1

DRILLING LOG	DIVISION	INSTALLATION	SHEET 1 OF 1 SHEETS
	South Atlantic	Jacksonville District	

1. PROJECT: San Juan Harbor, Condado Lagoon Mitigation		9. SIZE AND TYPE OF BIT: See Remarks	
		10. COORDINATE SYSTEM/DATUM: State Plane, PR/VI (U.S. Ft.)	HORIZONTAL: NAD83 / VERTICAL: PRVD02
2. BORING DESIGNATION: SJH-CLG-1	LOCATION COORDINATES: X = 778,836 Y = 883,455	11. MANUFACTURER'S DESIGNATION OF DRILL	☐ AUTO HAMMER ☐ MANUAL HAMMER
3. DRILLING AGENCY: Corps of Engineers - CESAJ	CONTRACTOR FILE NO.	12. TOTAL SAMPLES	DISTURBED: 1 / UNDISTURBED (UD): 0
4. NAME OF DRILLER: Mark Whitson		13. TOTAL NUMBER CORE BOXES: 0	
5. DIRECTION OF BORING: ☒ VERTICAL ☐ INCLINED	DEG. FROM VERTICAL	BEARING	14. ELEVATION GROUND WATER: N/A
		15. DATE BORING	STARTED: 05-07-14 / COMPLETED: 05-07-14
6. THICKNESS OF OVERBURDEN: N/A		16. ELEVATION TOP OF BORING: -11.7 Ft.	
7. DEPTH DRILLED INTO ROCK: N/A		17. TOTAL RECOVERY FOR BORING: N/A	
8. TOTAL DEPTH OF BORING: 0.5 Ft.		18. SIGNATURE AND TITLE OF INSPECTOR: Bernard J Seifert, P.G., Geologist	

ELEV.	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS	% REC.	BOX OR SAMPLE	RQD OR UD	REMARKS	BLOWS/1 FT.	N-VALUE
-11.7	0.0						-11.7		
-12.2	0.5		SAND, well-graded with silt, mostly fine to medium-grained sand-sized quartz, some sand to gravel-sized shell, few silt, wet, olive gray, 5Y 4/2 olive gray (SW-SM)		1		-12.2 Clam Shell		

Abbreviations:

NOTES:

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

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

3. Grab sample located under 12.3' of water.

4. Laboratory Testing Results

SAMPLE ID	SAMPLE DEPTH	LABORATORY CLASSIFICATION
1	0.0/0.5	SW-SM*

*Lab visual classification based on gradation curve

0
5
10
15

SAJ FORM 1836
JUN 02

Boring Designation SJH-CLG-2

DRILLING LOG

DIVISION South Atlantic	**INSTALLATION** Jacksonville District		**SHEET** 1 **OF** 1 **SHEETS**
1. PROJECT San Juan Harbor, Condado Lagoon Mitigation	**9. SIZE AND TYPE OF BIT** See Remarks		
	10. COORDINATE SYSTEM/DATUM State Plane, PR/VI (U.S. Ft.)	**HORIZONTAL** NAD83	**VERTICAL** PRVD02
2. BORING DESIGNATION SJH-CLG-2 / **LOCATION COORDINATES** X = 778,674 Y = 883,373	**11. MANUFACTURER'S DESIGNATION OF DRILL**	☐ AUTO HAMMER ☐ MANUAL HAMMER	
3. DRILLING AGENCY Corps of Engineers - CESAJ / **CONTRACTOR FILE NO.**	**12. TOTAL SAMPLES**	**DISTURBED** 1	**UNDISTURBED (UD)** 0
4. NAME OF DRILLER Mark Whitson	**13. TOTAL NUMBER CORE BOXES** 0		
5. DIRECTION OF BORING ☒ VERTICAL ☐ INCLINED / **DEG. FROM VERTICAL** / **BEARING**	**14. ELEVATION GROUND WATER** N/A		
	15. DATE BORING	**STARTED** 05-07-14	**COMPLETED** 05-07-14
6. THICKNESS OF OVERBURDEN N/A	**16. ELEVATION TOP OF BORING** -33.3 Ft.		
7. DEPTH DRILLED INTO ROCK N/A	**17. TOTAL RECOVERY FOR BORING** N/A		
8. TOTAL DEPTH OF BORING 0.5 Ft.	**18. SIGNATURE AND TITLE OF INSPECTOR** Bernard J Seifert, P.G., Geologist		

ELEV.	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS	% REC.	BOX OR SAMPLE	RQD OR UD	REMARKS	BLOWS/ 1 FT.	N-VALUE
-33.3	0.0						-33.3		
-33.8	0.5		SILT, inorganic-H, very soft, wet (MH)		1		-33.8 - Clam Shell		

NOTES:

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

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

3. Grab sample located under 33.5' of water.

4. Additional Laboratory Testing

   1 Atterberg

Abbreviations: -

0
5
10
15

SAJ FORM 1836
JUN 02

Boring Designation SJH-CLG-3

DRILLING LOG

DIVISION	South Atlantic
INSTALLATION	Jacksonville District
SHEET	1 OF 1 SHEETS
1. PROJECT	San Juan Harbor Condado Lagoon Mitigation
2. BORING DESIGNATION	SJH-CLG-3
LOCATION COORDINATES	X = 778,844 Y = 883,302
3. DRILLING AGENCY	Corps of Engineers - CESAJ
CONTRACTOR FILE NO.	
4. NAME OF DRILLER	Mark Whitson
5. DIRECTION OF BORING	☒ VERTICAL ☐ INCLINED
DEG. FROM VERTICAL	
BEARING	
6. THICKNESS OF OVERBURDEN	N/A
7. DEPTH DRILLED INTO ROCK	N/A
8. TOTAL DEPTH OF BORING	0.5 Ft.
9. SIZE AND TYPE OF BIT	See Remarks
10. COORDINATE SYSTEM/DATUM	State Plane, PR/VI (U.S. Ft.)
HORIZONTAL	NAD83
VERTICAL	PRVD02
11. MANUFACTURER'S DESIGNATION OF DRILL	☐ AUTO HAMMER ☐ MANUAL HAMMER
12. TOTAL SAMPLES	DISTURBED 1 / UNDISTURBED (UD) 0
13. TOTAL NUMBER CORE BOXES	0
14. ELEVATION GROUND WATER	N/A
15. DATE BORING	STARTED 05-07-14 / COMPLETED 05-07-14
16. ELEVATION TOP OF BORING	-32.6 Ft.
17. TOTAL RECOVERY FOR BORING	N/A
18. SIGNATURE AND TITLE OF INSPECTOR	Bernard J Seifert, P.G., Geologist

ELEV.	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS	% REC.	BOX OR SAMPLE	RQD OR UD	REMARKS	BLOWS/1 FT.	N-VALUE
-32.6	0.0						-32.6		
-33.1	0.5		SILT, inorganic-H, very soft, wet, 30% organic content (MH) -		1		-33.1 Clam Shell		

NOTES:

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

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

3. Grab sample located under 33.9' of water.

4. Additional Laboratory Testing

   1 Atterberg
   1 Percent Organic

Abbreviations: -

0
5
10
15

SAJ FORM 1836
JUN 02

Boring Designation SJH-CLG-4

DRILLING LOG	DIVISION	INSTALLATION	SHEET 1 OF 1 SHEETS
	South Atlantic	Jacksonville District	

1. PROJECT: San Juan Harbor, Condado Lagoon Mitigation		9. SIZE AND TYPE OF BIT: See Remarks	
		10. COORDINATE SYSTEM/DATUM: State Plane, PR/VI (U.S. Ft.)	HORIZONTAL: NAD83 / VERTICAL: PRVD02
2. BORING DESIGNATION: SJH-CLG-4	LOCATION COORDINATES: X = 883,216 Y = 779,026	11. MANUFACTURER'S DESIGNATION OF DRILL	☐ AUTO HAMMER ☐ MANUAL HAMMER
3. DRILLING AGENCY: Corps of Engineers - CESAJ	CONTRACTOR FILE NO.	12. TOTAL SAMPLES	DISTURBED: 1 / UNDISTURBED (UD): 0
4. NAME OF DRILLER: Mark Whitson		13. TOTAL NUMBER CORE BOXES: 0	
5. DIRECTION OF BORING: ☒ VERTICAL ☐ INCLINED	DEG. FROM VERTICAL / BEARING	14. ELEVATION GROUND WATER: N/A	
		15. DATE BORING	STARTED: 05-07-14 / COMPLETED: 05-07-14
6. THICKNESS OF OVERBURDEN: N/A		16. ELEVATION TOP OF BORING: -24.5 Ft.	
7. DEPTH DRILLED INTO ROCK: N/A		17. TOTAL RECOVERY FOR BORING: N/A	
8. TOTAL DEPTH OF BORING: 0.5 Ft.		18. SIGNATURE AND TITLE OF INSPECTOR: Bernard J Seifert, P.G., Geologist	

ELEV.	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS	% REC.	BOX OR SAMPLE	RQD OR UD	REMARKS	BLOWS/1 FT.	N-VALUE
-24.5	0.0						-24.5		
-25.0	0.5		SILT, inorganic-H, very soft, wet (MH)		1		-25.0 - Clam Shell		

NOTES:

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

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

3. Grab sample located under 26' of water.

4. Additional Laboratory Testing

   1 Atterberg

Abbreviations: -

0
5
10
15

SAJ FORM 1836
JUN 02

Boring Designation SJH-CLG-5

DRILLING LOG

DIVISION	South Atlantic
INSTALLATION	Jacksonville District
SHEET	1 OF 1 SHEETS
1. PROJECT	San Juan Harbor Condado Lagoon Mitigation
2. BORING DESIGNATION	SJH-CLG-5
LOCATION COORDINATES	X = 883,307 Y = 778,634
3. DRILLING AGENCY	Corps of Engineers - CESAJ
CONTRACTOR FILE NO.	
4. NAME OF DRILLER	Mark Whitson
5. DIRECTION OF BORING	☒ VERTICAL ☐ INCLINED
DEG. FROM VERTICAL	
BEARING	
6. THICKNESS OF OVERBURDEN	N/A
7. DEPTH DRILLED INTO ROCK	N/A
8. TOTAL DEPTH OF BORING	0.5 Ft.
9. SIZE AND TYPE OF BIT	See Remarks
10. COORDINATE SYSTEM/DATUM	State Plane, PR/VI (U.S. Ft.) / HORIZONTAL: NAD83 / VERTICAL: PRVD02
11. MANUFACTURER'S DESIGNATION OF DRILL	☐ AUTO HAMMER ☐ MANUAL HAMMER
12. TOTAL SAMPLES	DISTURBED: 1 / UNDISTURBED (UD): 0
13. TOTAL NUMBER CORE BOXES	0
14. ELEVATION GROUND WATER	N/A
15. DATE BORING	STARTED: 05-07-14 / COMPLETED: 05-07-14
16. ELEVATION TOP OF BORING	-29.5 Ft.
17. TOTAL RECOVERY FOR BORING	N/A
18. SIGNATURE AND TITLE OF INSPECTOR	Bernard J Seifert, P.G., Geologist

ELEV.	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS	% REC.	BOX OR SAMPLE	RQD OR UD	REMARKS	BLOWS/1 FT.	N-VALUE
-29.5	0.0						-29.5		
-30.0	0.5		SILT, inorganic-H, very soft, wet (MH)		1		-30.0 - Clam Shell		

NOTES:

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

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

3. Grab sample located under 30.4' of water.

Abbreviations: -

0
5
10
15

SAJ FORM 1836
JUN 02

Boring Designation SJH-CLG-6

DRILLING LOG	DIVISION	INSTALLATION	SHEET 1 OF 1 SHEETS
	South Atlantic	Jacksonville District	

1. PROJECT: San Juan Harbor, Condado Lagoon Mitigation		9. SIZE AND TYPE OF BIT: See Remarks	
		10. COORDINATE SYSTEM/DATUM: State Plane, PR/VI (U.S. Ft.)	HORIZONTAL: NAD83 / VERTICAL: PRVD02
2. BORING DESIGNATION: SJH-CLG-6	LOCATION COORDINATES: X = 883,199 Y = 778,782	11. MANUFACTURER'S DESIGNATION OF DRILL	☐ AUTO HAMMER ☐ MANUAL HAMMER
3. DRILLING AGENCY: Corps of Engineers - CESAJ	CONTRACTOR FILE NO.	12. TOTAL SAMPLES	DISTURBED: 1 / UNDISTURBED (UD): 0
4. NAME OF DRILLER: Mark Whitson		13. TOTAL NUMBER CORE BOXES: 0	
5. DIRECTION OF BORING: ☒ VERTICAL ☐ INCLINED	DEG. FROM VERTICAL	BEARING	14. ELEVATION GROUND WATER: N/A
		15. DATE BORING	STARTED: 05-07-14 / COMPLETED: 05-07-14
6. THICKNESS OF OVERBURDEN: N/A		16. ELEVATION TOP OF BORING: -32.0 Ft.	
7. DEPTH DRILLED INTO ROCK: N/A		17. TOTAL RECOVERY FOR BORING: N/A	
8. TOTAL DEPTH OF BORING: 0.5 Ft.		18. SIGNATURE AND TITLE OF INSPECTOR: Bernard J Seifert, P.G., Geologist	

ELEV.	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS	% REC.	BOX OR SAMPLE	RQD OR UD	REMARKS	BLOWS/1 FT.	N-VALUE
-32.0	0.0						-32.0		
-32.5	0.5		SILT, inorganic-H, very soft, wet, 18% organic content (MH) -		1		-32.5 Clam Shell		

NOTES:

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

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

3. Grab sample located under 30.4' of water.

4. Laboratory Testing Results

SAMPLE ID	SAMPLE DEPTH	LABORATORY CLASSIFICATION
1	0.0/0.5	MH

not on atterberg limits. -

5. Additional Laboratory Testing

1 Atterberg
1 Percent Organic -

Abbreviations: -

0
5
10
15

SAJ FORM 1836
JUN 02

Boring Designation SJH-CLG-7

DRILLING LOG

DIVISION South Atlantic		**INSTALLATION** Jacksonville District	**SHEET** 1 **OF** 1 **SHEETS**
1. PROJECT San Juan Harbor Condado Lagoon Mitigation		**9. SIZE AND TYPE OF BIT** See Remarks	
		10. COORDINATE SYSTEM/DATUM State Plane, PR/VI (U.S. Ft.)	**HORIZONTAL** NAD83 / **VERTICAL** PRVD02
2. BORING DESIGNATION SJH-CLG-7	**LOCATION COORDINATES** X = 883,107 Y = 778,963	**11. MANUFACTURER'S DESIGNATION OF DRILL**	☐ AUTO HAMMER ☐ MANUAL HAMMER
3. DRILLING AGENCY Corps of Engineers - CESAJ	**CONTRACTOR FILE NO.**	**12. TOTAL SAMPLES**	**DISTURBED** 1 / **UNDISTURBED (UD)** 0
4. NAME OF DRILLER Mark Whitson		**13. TOTAL NUMBER CORE BOXES** 0	
5. DIRECTION OF BORING ☒ VERTICAL ☐ INCLINED	**DEG. FROM VERTICAL** / **BEARING**	**14. ELEVATION GROUND WATER** N/A	
		15. DATE BORING	**STARTED** 05-07-14 / **COMPLETED** 05-07-14
6. THICKNESS OF OVERBURDEN N/A		**16. ELEVATION TOP OF BORING** -32.5 Ft.	
7. DEPTH DRILLED INTO ROCK N/A		**17. TOTAL RECOVERY FOR BORING** N/A	
8. TOTAL DEPTH OF BORING 0.5 Ft.		**18. SIGNATURE AND TITLE OF INSPECTOR** Bernard J Seifert, P.G., Geologist	

ELEV.	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS	% REC.	BOX OR SAMPLE	RQD OR UD	REMARKS	BLOWS/ 1 FT.	N-VALUE
-32.5	0.0						-32.5		
-33.0	0.5		SILT, inorganic-H, very soft, wet (MH)		1		-33.0 - Clam Shell		

NOTES:

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

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

3. Grab sample located under 30.4' of water.

Abbreviations: -

0
5
10
15

SAJ FORM 1836
JUN 02

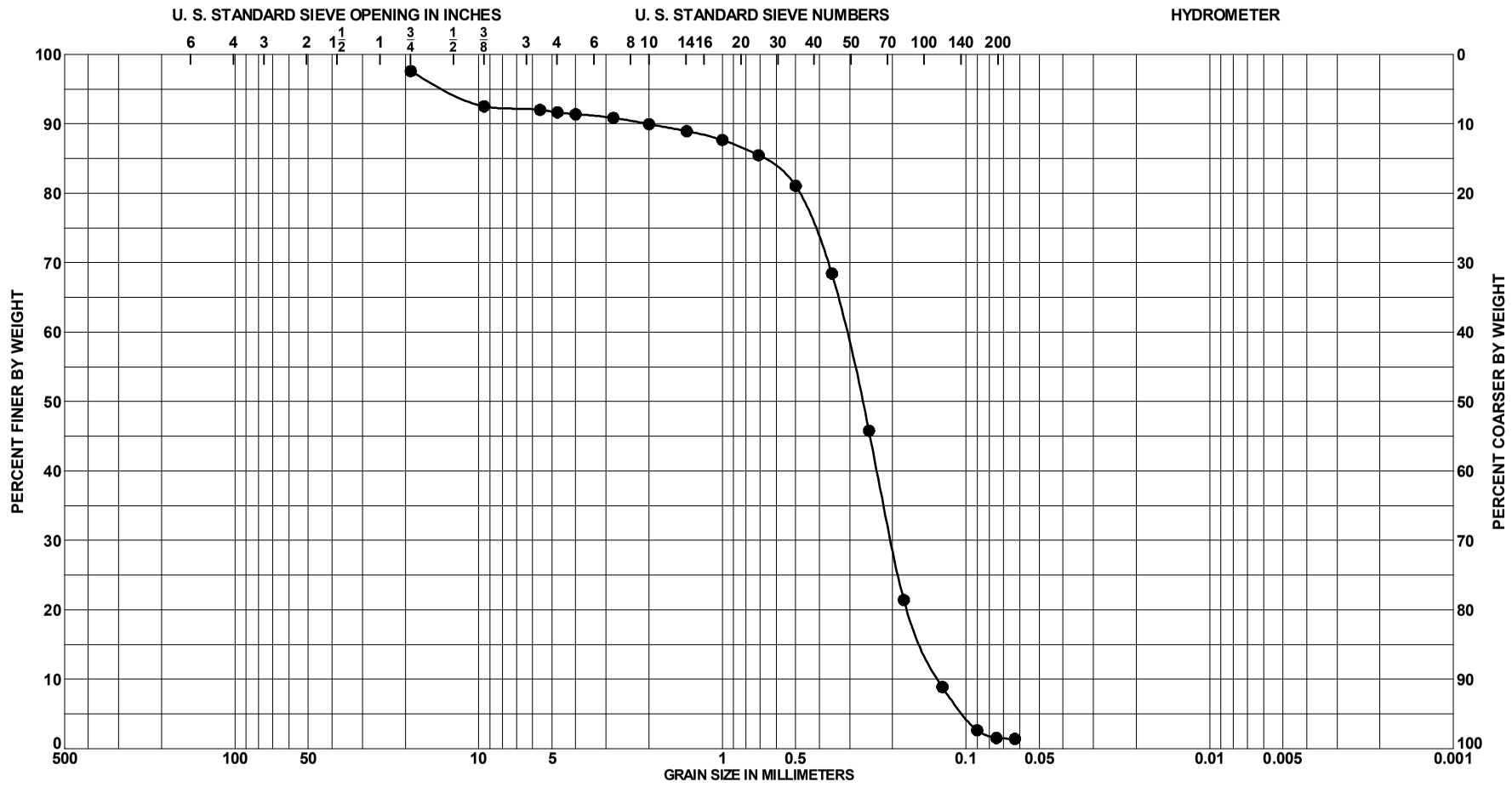
PROBE DATA FOR CONDADO LAGOON

LOCATION	*EASTING*	*NORTHING*	*Water Depth (ft)*	*BOTTOM ELEV.(PRVD02-FT)*	*Probe Depth to Refusal(PRVD02-ft)*	*Soft Sediment Thickness (ft)*
SJH-CLP-1	778,805.1	883,436.6	12.50	-12.25	-16.25	4.00
SJH-CLP-2	778,986.0	883,286.4	18.40	-19.59	-33.49	13.90
SJH-CLP-3	778,617.9	883,431.9	31.20	-27.13	-30.93	3.80
SJH-CLP-4	778,775.5	883,352.0	26.30	-28.98	-29.68	0.70
SJH-CLP-5	778,821.9	883,323.0	32.00	-32.91	-47.91	15.00
SJH-CLP-6	778,879.8	883,262.0	32.20	-33.09	-34.89	1.80
SJH-CLP-7	779,008.1	883,202.5	26.20	-25.74	-35.74	10.00
SJH-CLP-8	779,028.7	883,171.7	26.00	-25.49	-29.69	4.20
SJH-CLP-9	778,672.2	883,255.7	28.00	-26.28	-32.28	6.00
SJH-CLP-10	778,882.4	883,076.7	32.00	-30.74	-30.74	0.00

SURVEY PERFORMED 07-MAY-2014

1.4.7 Laboratory Testing Data

Applicable laboratory testing data are presented on the following pages.



Sample No.	Depth	Classification	Munsell	Visual % Shell (est)	%CO_3	G_s	Org %	w_n	LL	PL	PI
● 1	0.0 to 1.5 Ft.	SAND, poorly-graded, mostly fine-grained sand-sized quartz, some sand to gravel-sized shell, trace silt, grayish brown (SP)	2.5Y 5/2		61						

GRADATION CURVES

PROJECT	San Juan Harbor
	Condado Lagoon Mitigation
BORING NO.	SJH-LE-1
BORING ELEV.	-0.2 Ft., PRVD02
DATE	6/23/2014

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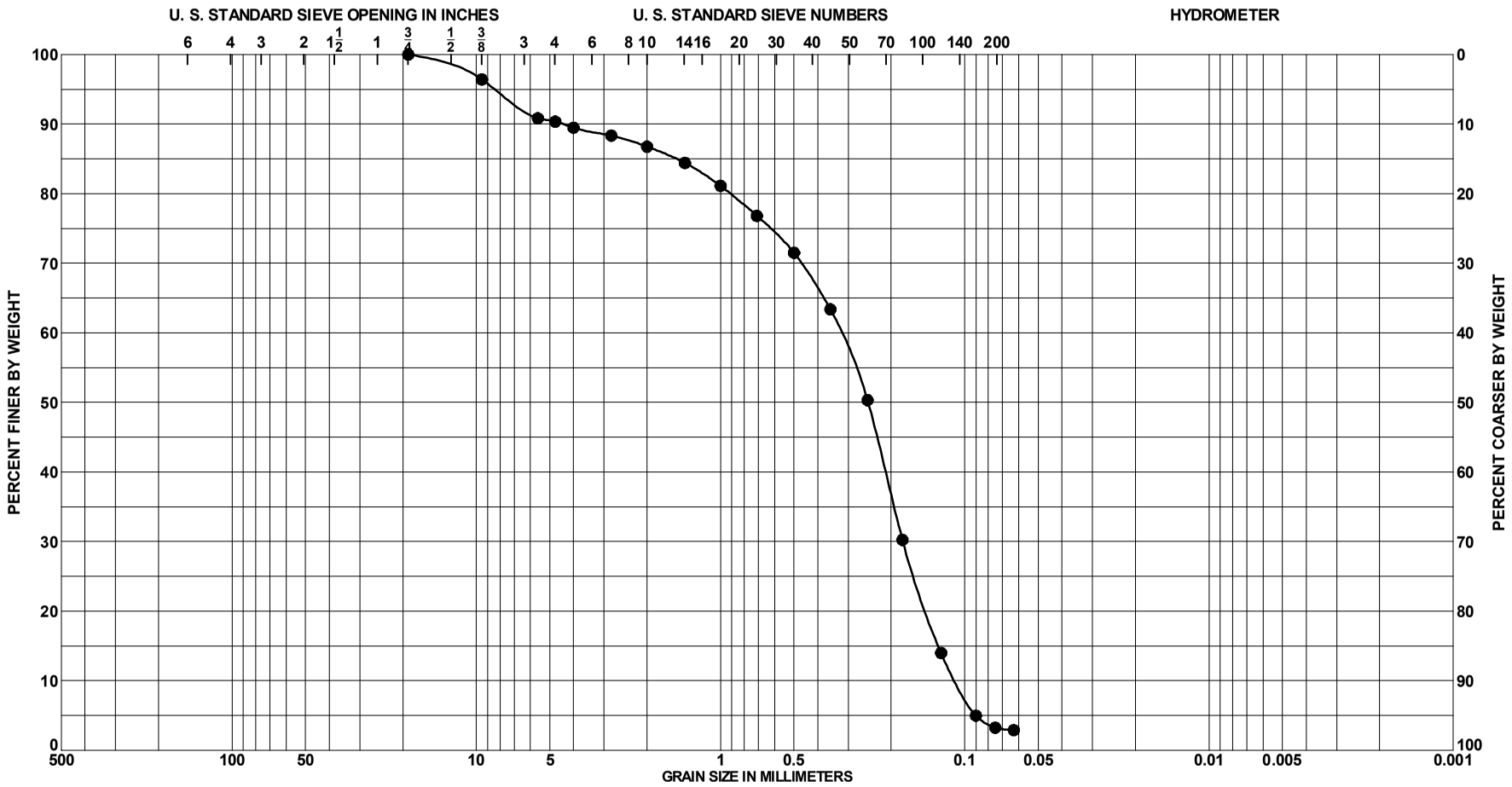
JUN 02



Sample No.	Depth	Classification	Munsell	Visual % Shell (est)	%CO_3	G_s	Org %	w_n	LL	PL	PI
● 2	1.6 to 2.1 Ft.	SAND, poorly-graded, mostly sand to gravel-sized shell, some fine-grained sand-sized quartz, trace silt, dark grayish brown (SP)	2.5Y 4/2								

GRADATION CURVES

PROJECT	San Juan Harbor
	Condado Lagoon Mitigation
BORING NO.	SJH-LE-1
BORING ELEV.	-0.2 Ft., PRVD02
DATE	6/23/2014

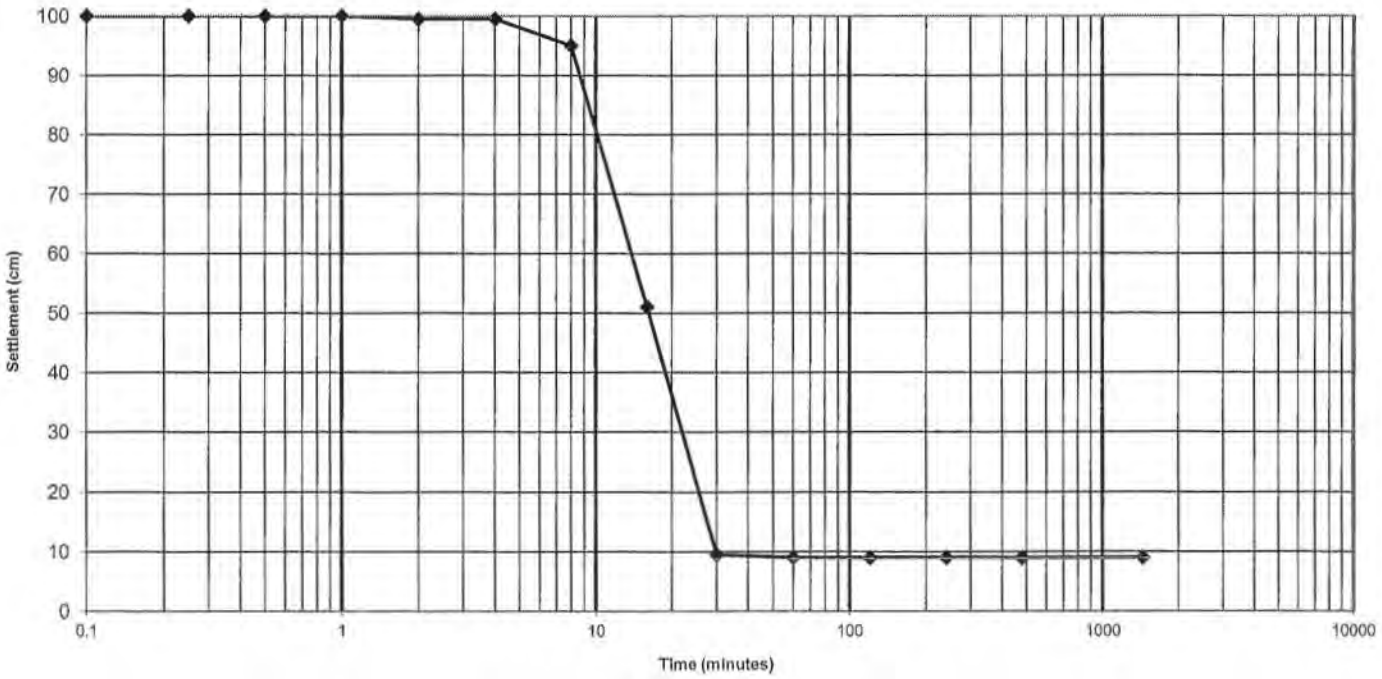
SAJ FORM 2087
JUN 02

amec

REPORT OF SETTLING RATE TESTING

PROJECT NO: 6738-14-5359
PROJECT: San Juan TO 102
CLIENT: USACE

Boring No. SJH-LE-1
Sample No. 3
Depth (ft) 2.1'
CONCENTRATION: 100 g/L



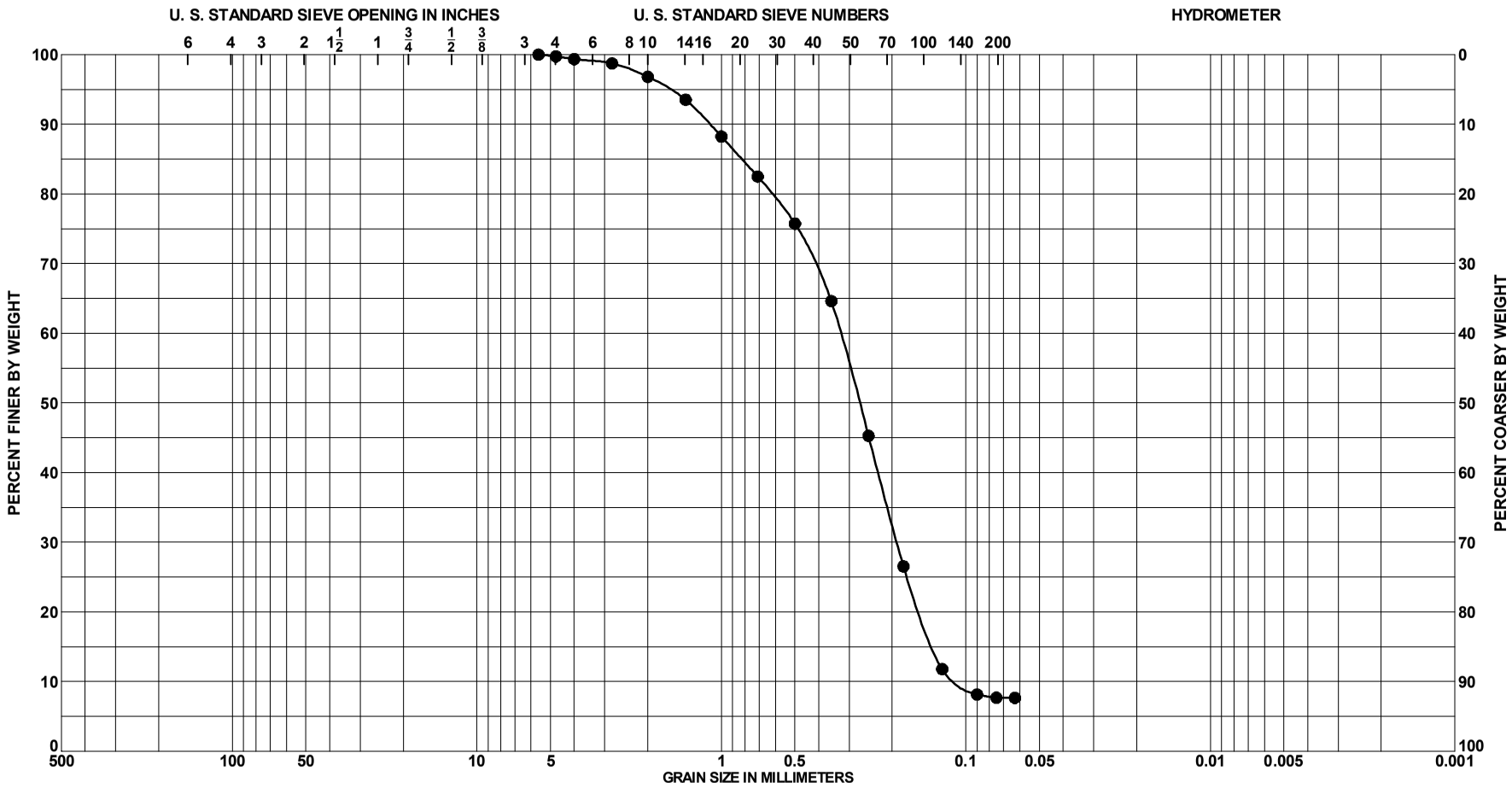
Sedimentation Rate Test COE Method

TIME (min)	INTERFACE (cm)	TIME (min)	INTERFACE (cm)
0.1	100.0	16	51.0
0.25	100.0	30	9.5
0.5	100.0	60	9.0
1	100.0	120	9.0
2	99.5	240	9.0
4	99.5	480	9.0
8	95.0	1440	9.0

Final Concentration: 1111.11 g/L

Respectfully Submitted

Corey T. Chascin, E.I.

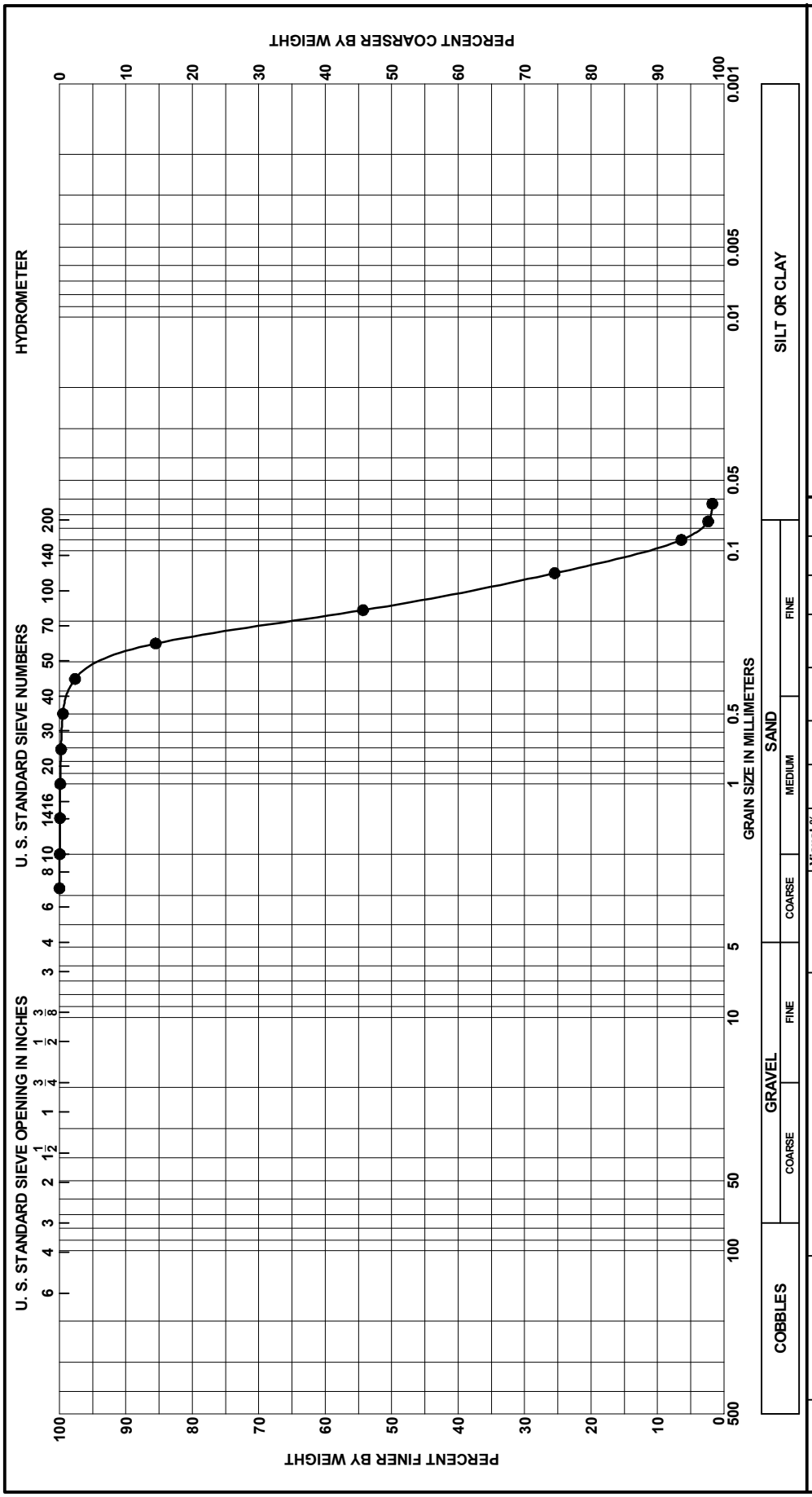


Sample No.	Depth	Classification	Munsell	Visual % Shell (est)	%CO_3	G_s	Org %	w_n	LL	PL	PI
● 4	3.1 to 3.3 Ft.	SAND, poorly-graded with silt, mostly	2.5Y 5/2								
		fine to medium-grained sand-sized									
		shell, some fine-grained sand-sized									
		quartz, few silt, grayish brown									
		(SP-SM)									

GRADATION CURVES

PROJECT	San Juan Harbor
	Condado Lagoon Mitigation
BORING NO.	SJH-LE-1
BORING ELEV.	-0.2 Ft., PRVD02
DATE	6/23/2014

SAJ FORM 2087
JUN 02



Sample No.	Depth	Classification	Munsell	Visual % Shell (est)	%CO_3	G_s	Org %	w_n	LL	PL	PI
● 1	0.0 to 0.5 Ft.	SAND, poorly-graded, mostly fine-grained sand-sized shell, little fine-grained sand-sized quartz, trace silt, dark grayish brown (SP)	10YR 4/2								

PROJECT San Juan Harbor
Condado Lagoon Mitigation
BORING NO. SJH-LE-2
BORING ELEV. -1.6 Ft., PRVD02
DATE 6/23/2014

GRADATION CURVES

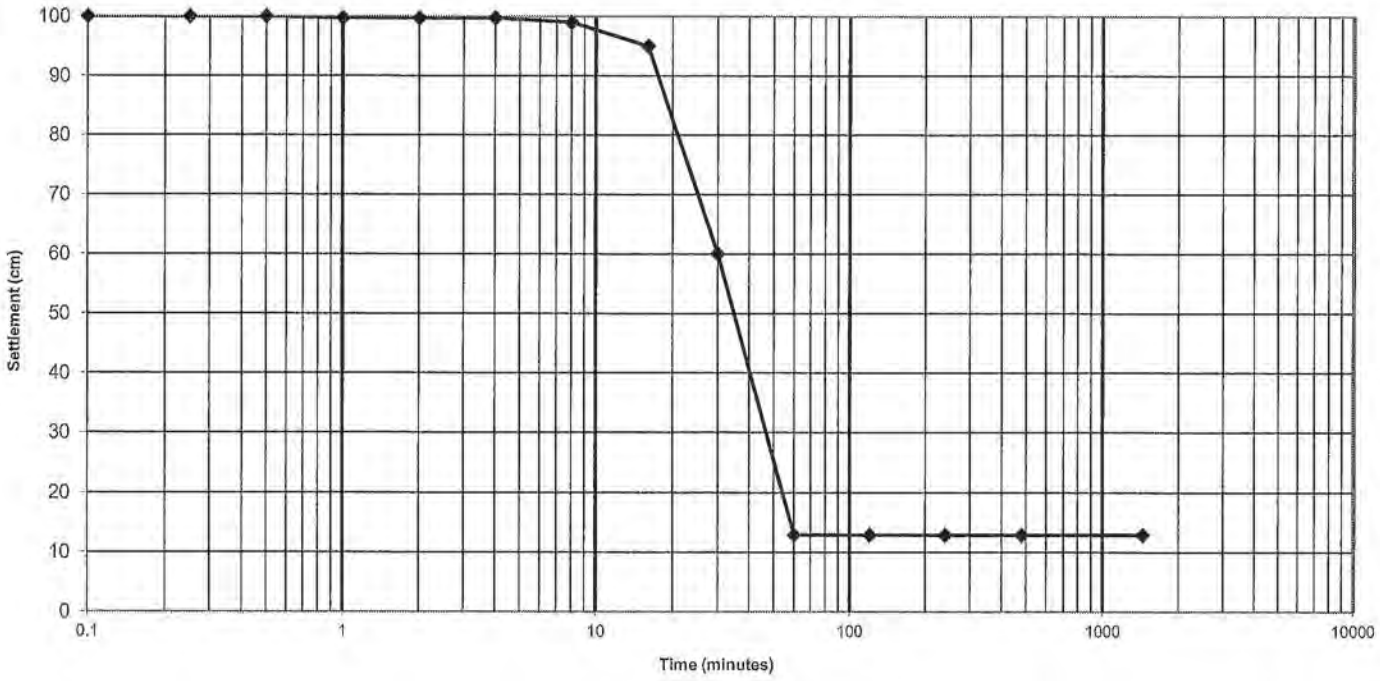
SAJ FORM 2087
JUN 02

amec

REPORT OF SETTLING RATE TESTING

PROJECT NO: 6738-14-5359
PROJECT: San Juan TO 102
CLIENT: USACE

Boring No. SJH-LE-2
Sample No. 2
Depth (ft) 1.3'
CONCENTRATION: 100 g/L



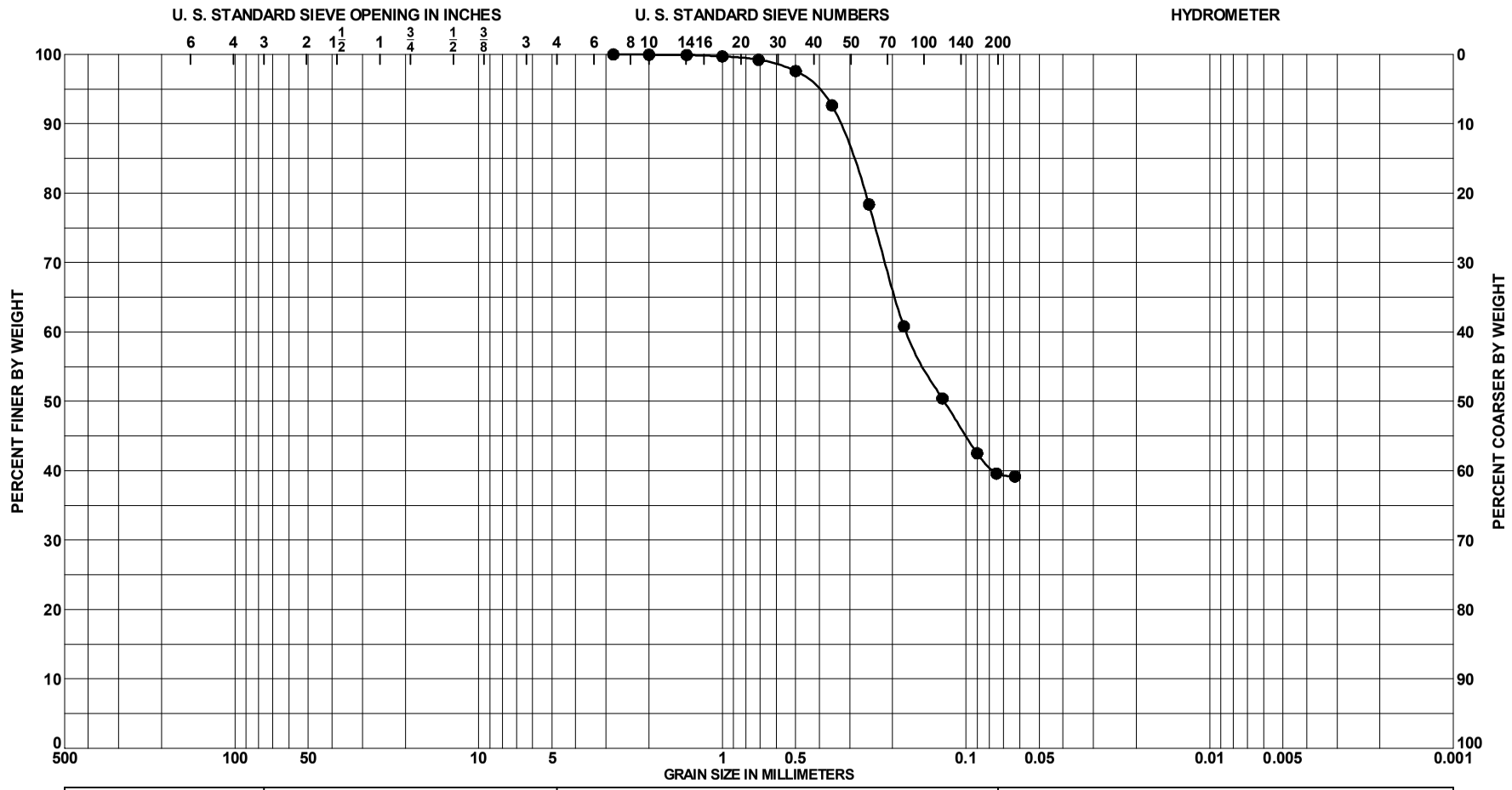
Sedimentation Rate Test COE Method

TIME (min)	INTERFACE (cm)	TIME (min)	INTERFACE (cm)
0.1	100.0	16	95.0
0.25	100.0	30	60.0
0.5	100.0	60	12.9
1	99.7	120	12.9
2	99.7	240	12.9
4	99.7	480	12.9
8	99.0	1440	12.9

Final Concentration: 775.194 g/L

Respectfully Submitted

Corey T. Chascin, E.I.



Sample No.	Depth	Classification	Munsell	Visual % Shell (est)	%CO_3	G_s	Org %	w_n	LL	PL	PI
● 2	1.3 to 1.6 Ft.	SAND, silty, mostly fine-grained sand-sized quartz, some silt, few fine-grained sand-sized shell, dark gray (SM)	2.5Y 4/1								

GRADATION CURVES

PROJECT	San Juan Harbor
	Condado Lagoon Mitigation
BORING NO.	SJH-LE-2
BORING ELEV.	-1.6 Ft., PRVD02
DATE	6/23/2014

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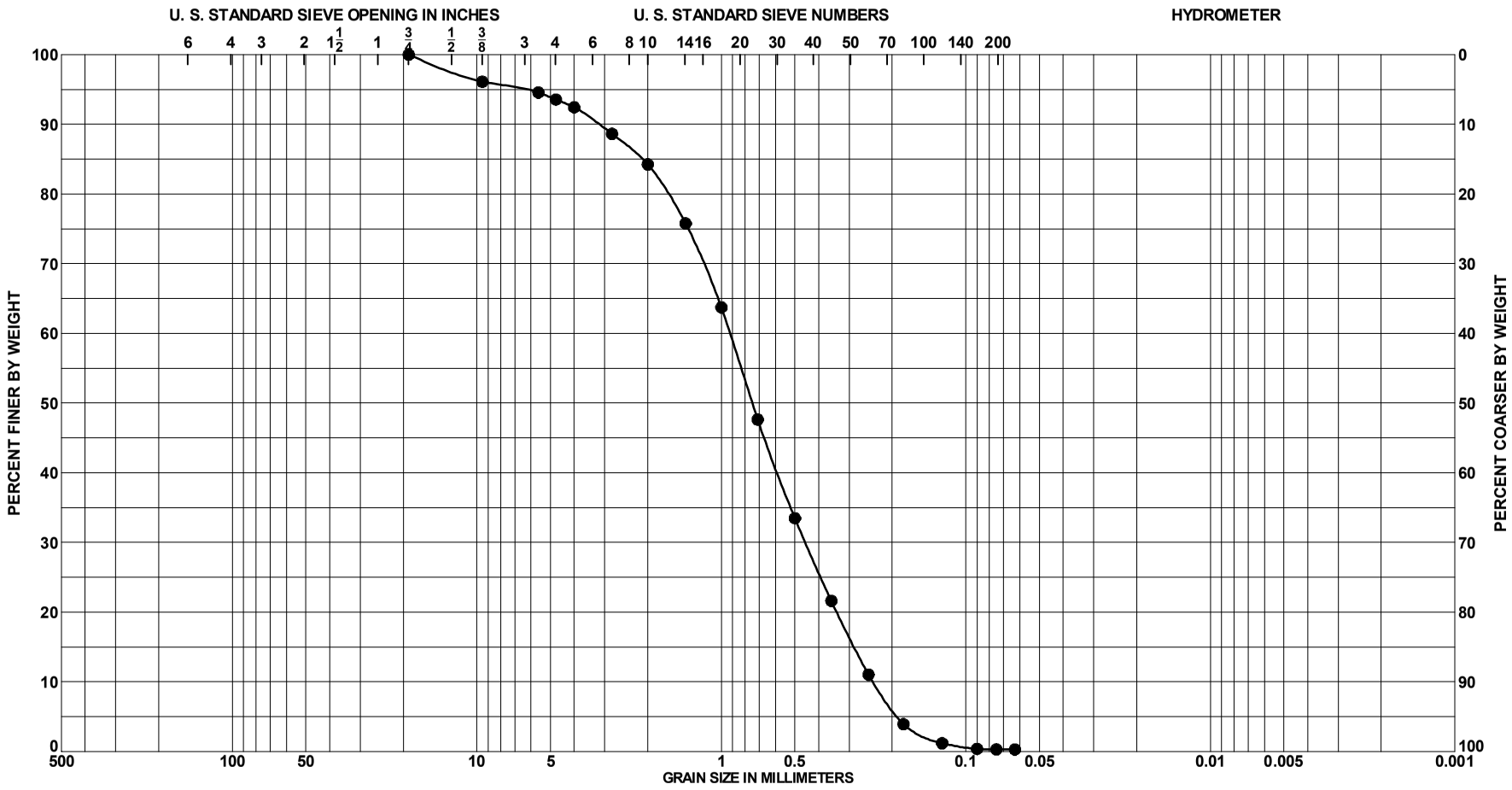

Sample No.	Depth	Classification	Munsell	Visual % Shell (est)	%CO_3	G_s	Org %	w_n	LL	PL	PI
● 1	0.0 to 0.7 Ft.	SAND, poorly-graded, mostly sand to gravel-sized shell, some fine to medium-grained sand-sized quartz, light yellowish brown (SP)	10YR 6/4								

GRADATION CURVES

PROJECT	San Juan Harbor
	Condado Lagoon Mitigation
BORING NO.	SJH-LE-3
BORING ELEV.	-1.1 Ft., PRVD02
DATE	6/23/2014

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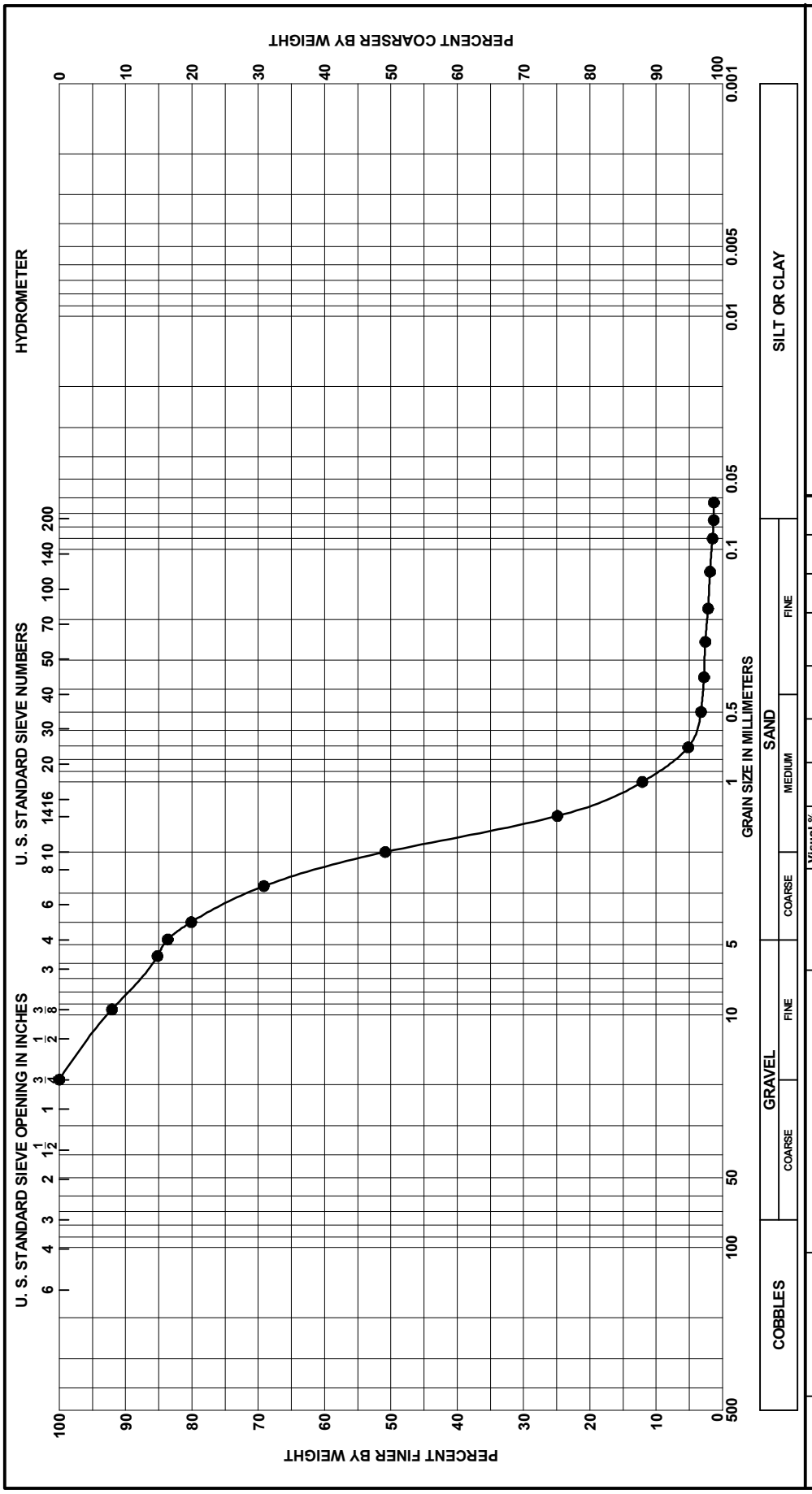
JUN 02



Sample No.	Depth	Classification	Munsell	Visual % Shell (est)	$\%CO_3$	G_s	Org %	w_n	LL	PL	PI
● 2	0.8 to 1.1 Ft.	SAND, poorly-graded, mostly sand to gravel-sized shell, trace silt, brownish yellow (SP)	10YR 6/6		96						

PROJECT San Juan Harbor

Condado Lagoon Mitigation

BORING NO. SJH-LE-3

BORING ELEV. -1.1 Ft., PRVD02

DATE 6/23/2014

GRADATION CURVES

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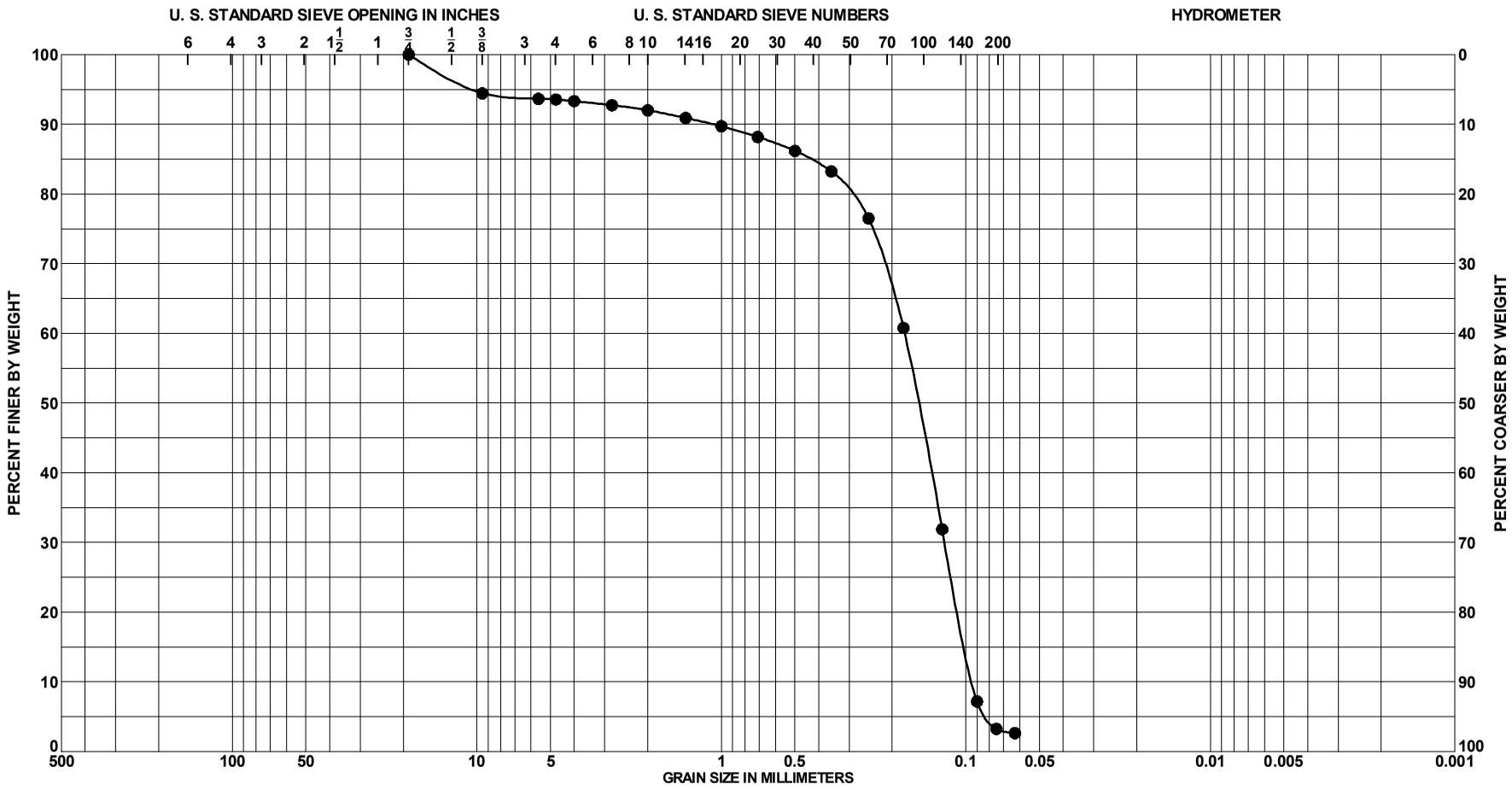

Sample No.	Depth	Classification	Munsell	Visual % Shell (est)	%CO_3	G_s	Org %	w_n	LL	PL	PI
● 3	1.4 to 2.0 Ft.	SAND, poorly-graded, mostly fine-grained sand-sized quartz, some sand to gravel-sized shell, trace silt, grayish brown (SP)	2.5Y 5/2								

GRADATION CURVES

PROJECT	San Juan Harbor
	Condado Lagoon Mitigation
BORING NO.	SJH-LE-3
BORING ELEV.	-1.1 Ft., PRVD02
DATE	6/23/2014

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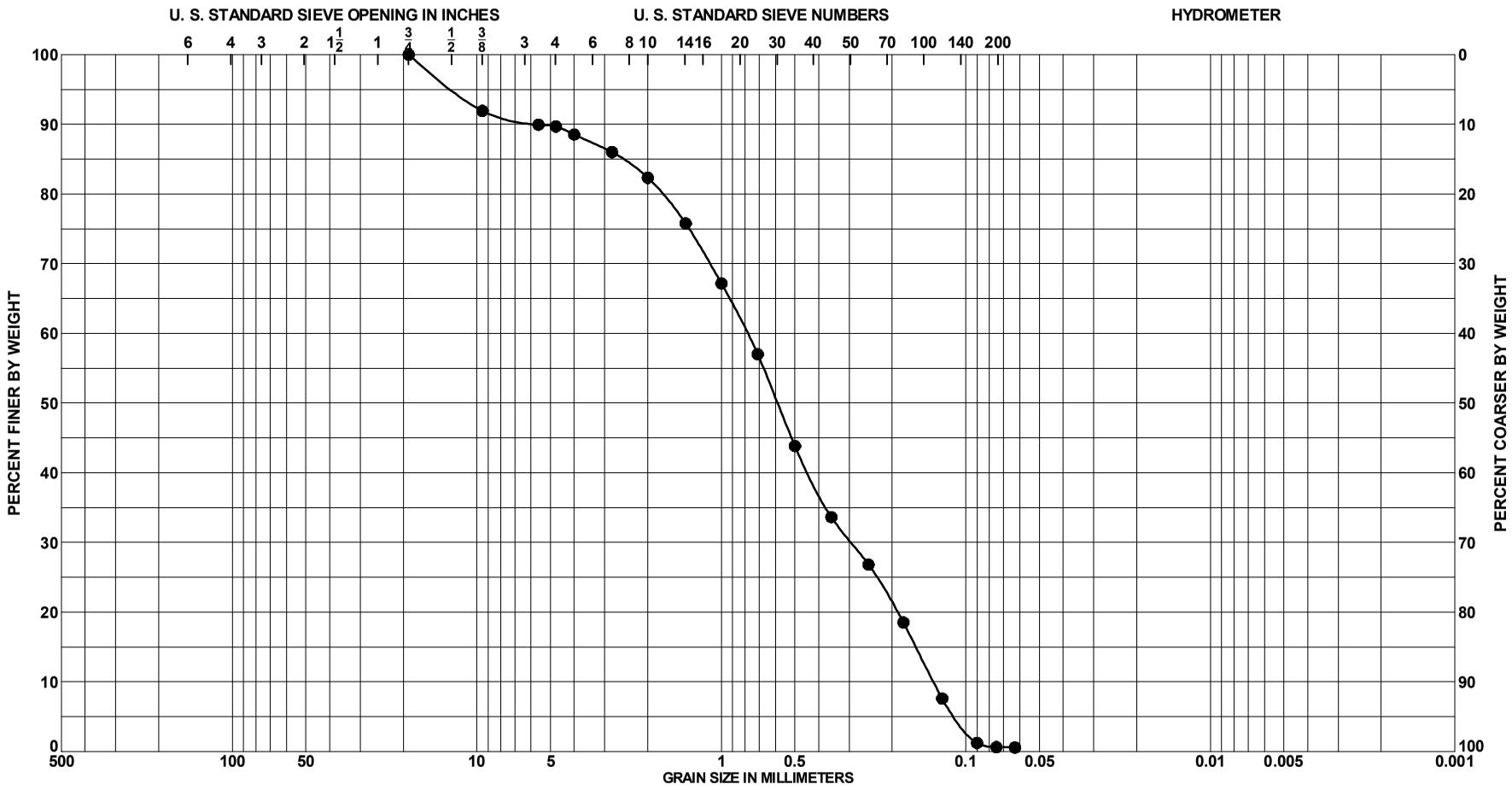
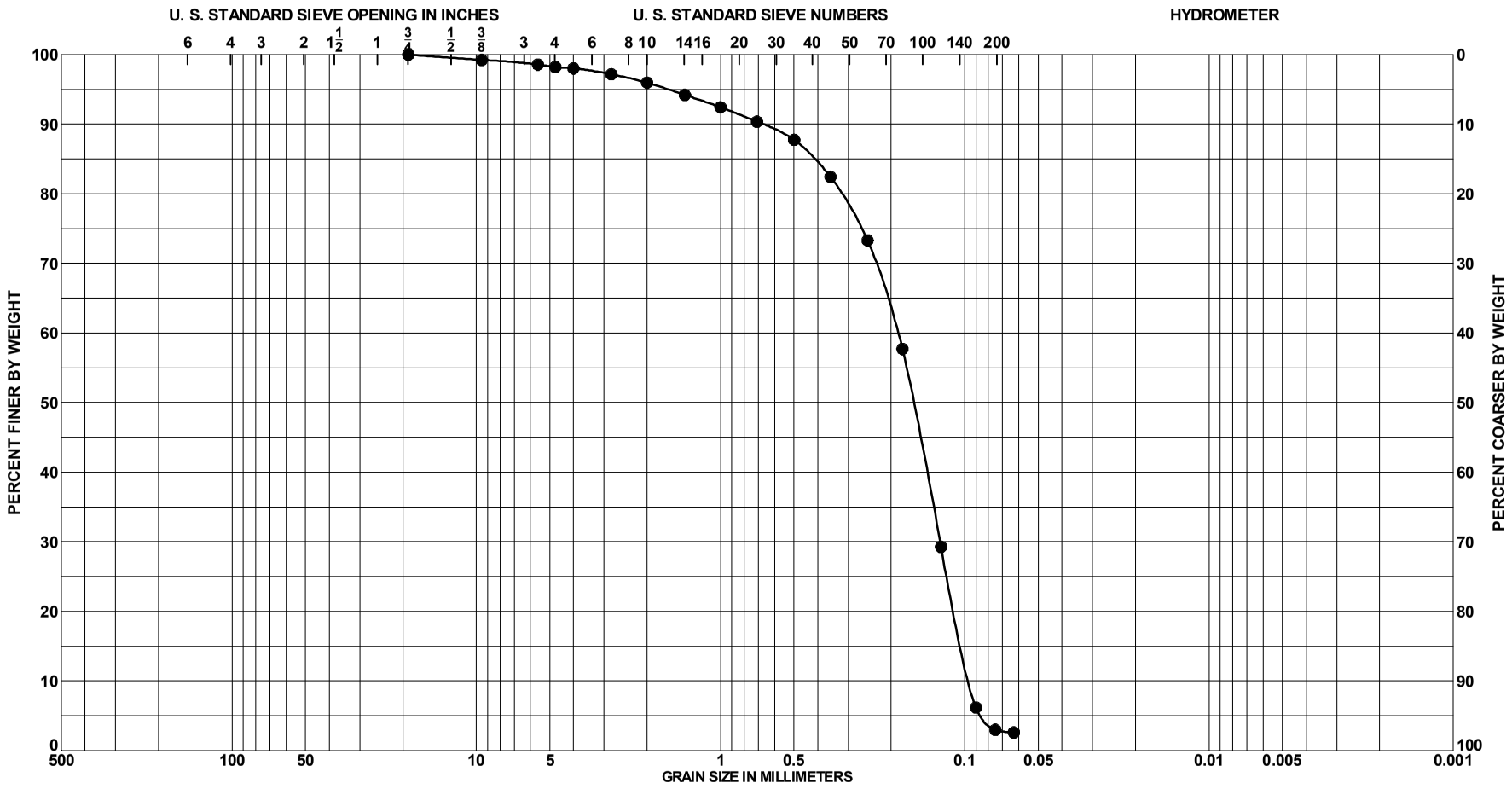


Sample No.	Depth	Classification	Munsell	Visual % Shell (est)	%CO_3	G_s	Org %	w_n	LL	PL	PI
● 1	0.0 to 0.6 Ft.	SAND, poorly-graded, mostly sand to gravel-sized shell, some fine to medium-grained sand-sized quartz, grayish brown (SP)	10YR 5/2		73						

GRADATION CURVES

PROJECT	San Juan Harbor
	Condado Lagoon Mitigation
BORING NO.	SJH-LE-4
BORING ELEV.	-2.2 Ft., PRVD02
DATE	6/23/2014

SAJ FORM 2087
JUN 02

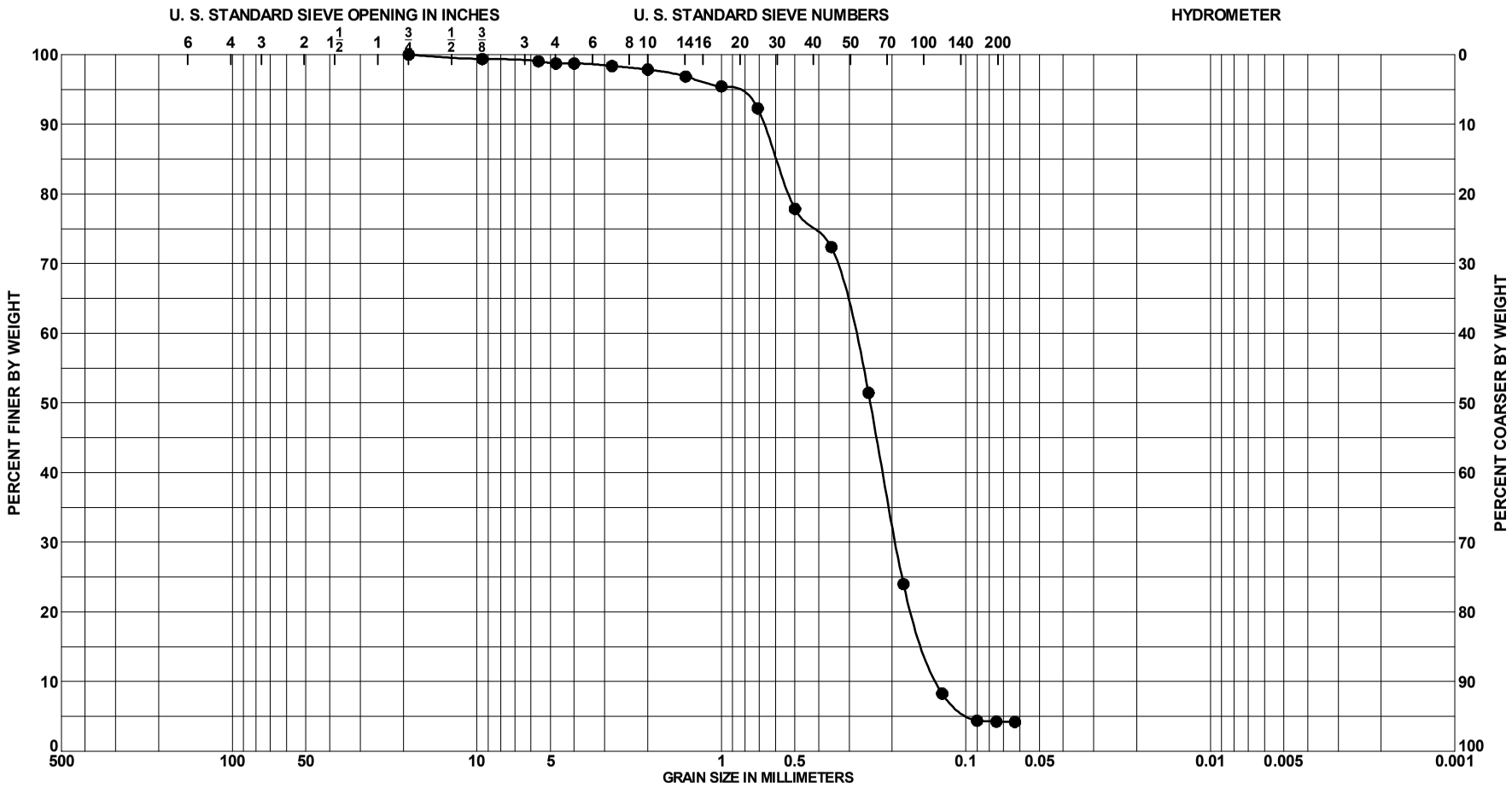


Sample No.	Depth	Classification	Munsell	Visual % Shell (est)	%CO_3	G_s	Org %	w_n	LL	PL	PI
● 2	0.7 to 1.4 Ft.	SAND, poorly-graded, mostly	2.5Y 5/2								
		fine-grained sand-sized quartz, little									
		fine to medium-grained sand-sized									
		shell, trace silt, grayish brown (SP)									

GRADATION CURVES

PROJECT	San Juan Harbor
	Condado Lagoon Mitigation
BORING NO.	SJH-LE-4
BORING ELEV.	-2.2 Ft., PRVD02
DATE	6/23/2014

SAJ FORM 2087
JUN 02



Sample No.	Depth	Classification	Munsell	Visual % Shell (est)	%CO_3	G_s	Org %	w_n	LL	PL	PI
● 1	0.0 to 0.8 Ft.	SAND, poorly-graded, mostly fine to medium-grained sand-sized shell, some fine-grained sand-sized quartz, trace silt, light gray (SP)	2.5Y 7/2								

GRADATION CURVES

PROJECT	San Juan Harbor
	Condado Lagoon Mitigation
BORING NO.	SJH-LE-5
BORING ELEV.	2.4 Ft., PRVD02
DATE	6/23/2014

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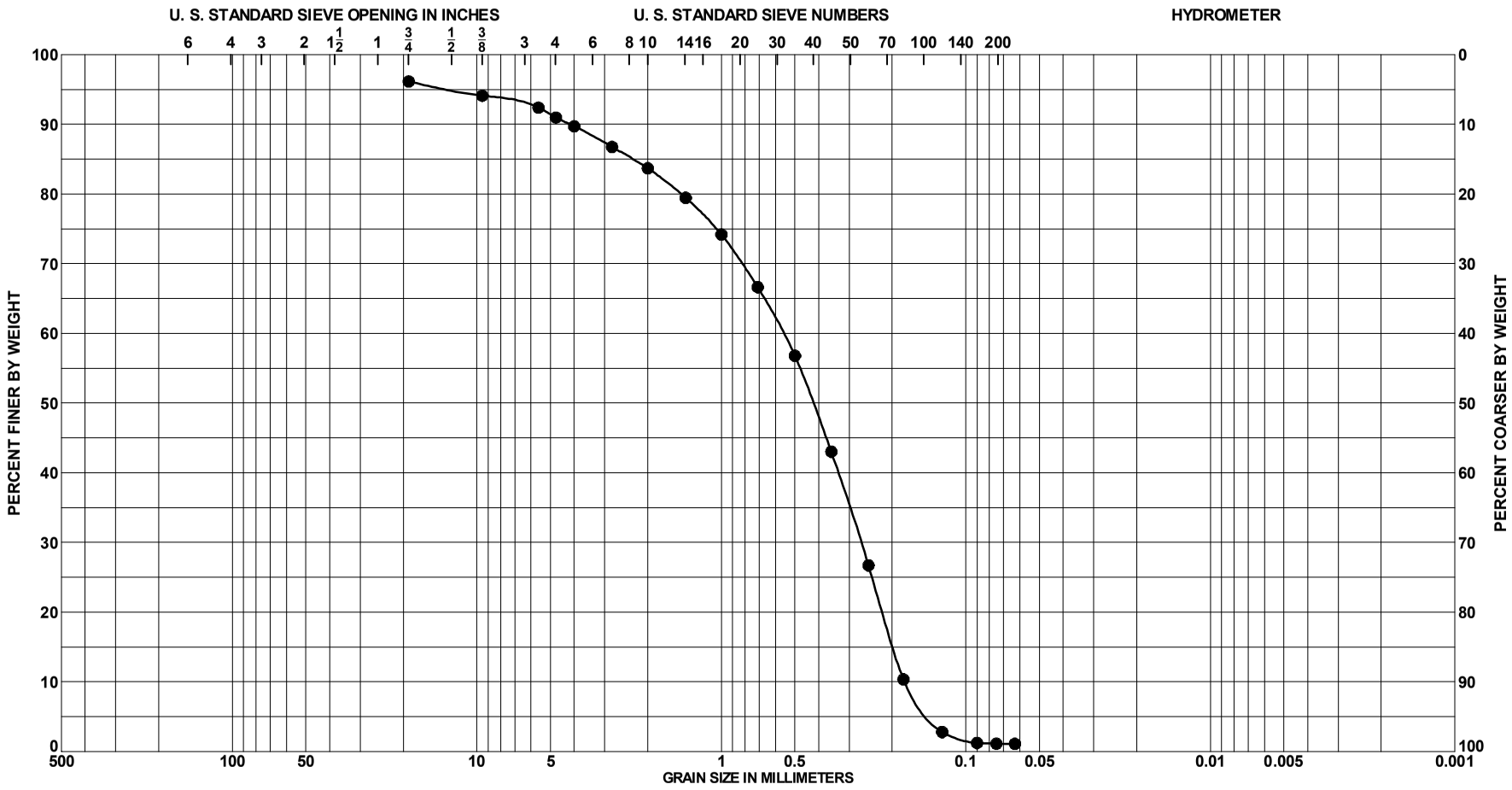
JUN 02



Sample No.	Depth	Classification	Munsell	Visual % Shell (est)	%CO_3	G_s	Org %	w_n	LL	PL	PI
● 2	1.2 to 2.0 Ft.	SAND, poorly-graded, mostly fine to medium-grained sand-sized quartz, some sand to gravel-sized shell, trace silt, light yellowish brown (SP)	2.5Y 6/4		70						

GRADATION CURVES

PROJECT	San Juan Harbor
	Condado Lagoon Mitigation
BORING NO.	SJH-LE-5
BORING ELEV.	2.4 Ft., PRVD02
DATE	6/23/2014

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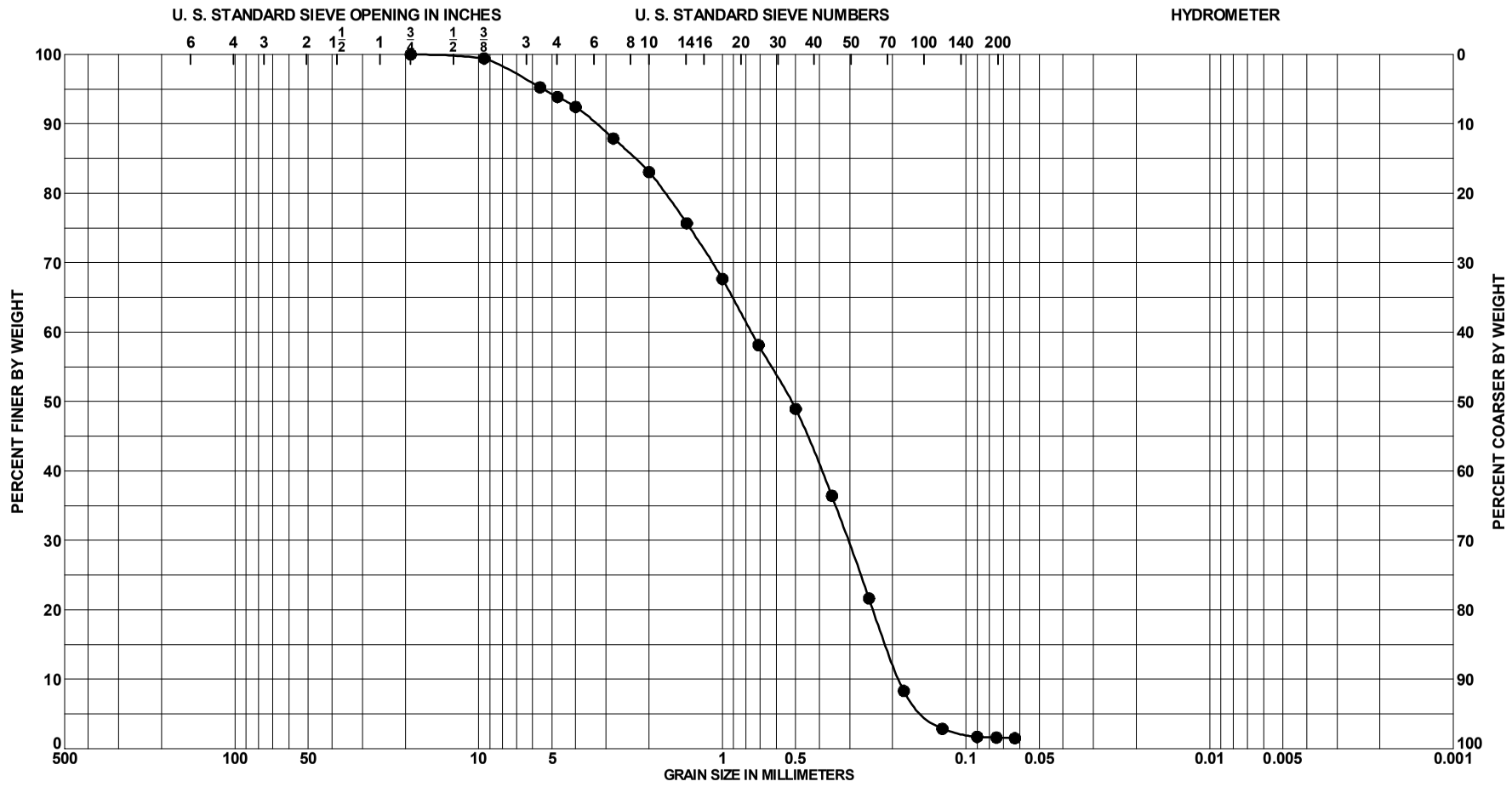
JUN 02



Sample No.	Depth	Classification	Munsell	Visual % Shell (est)	%CO_3	G_s	Org %	w_n	LL	PL	PI
● 3	2.5 to 2.8 Ft.	SAND, poorly-graded, mostly fine to medium-grained sand-sized quartz, some sand to gravel-sized shell, trace silt, grayish brown (SP)	2.5Y 5/2								

GRADATION CURVES

PROJECT	San Juan Harbor
	Condado Lagoon Mitigation
BORING NO.	SJH-LE-5
BORING ELEV.	2.4 Ft., PRVD02
DATE	6/23/2014

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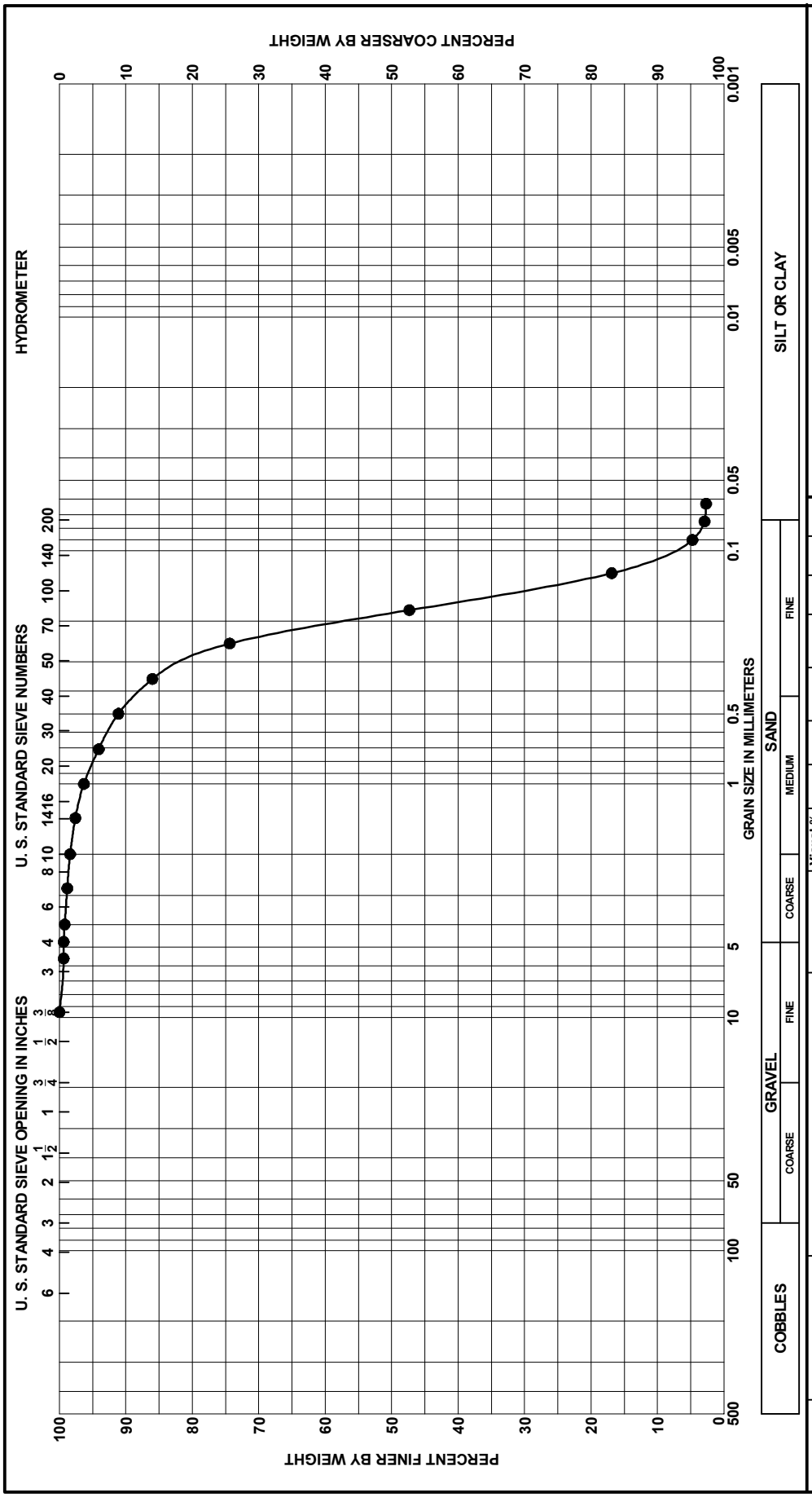

Sample No.	Depth	Classification	Munsell	Visual % Shell (est)	%CO_3	G_s	Org %	w_n	LL	PL	PI
● 4	3.2 to 4.5 Ft.	SAND, poorly-graded, mostly fine-grained sand-sized quartz, little fine to medium-grained sand-sized shell, trace silt, grayish brown (SP)	2.5Y 5/2								

PROJECT San Juan Harbor
Condado Lagoon Mitigation
BORING NO. SJH-LE-5
BORING ELEV. 2.4 Ft., PRVD02
DATE 6/23/2014

GRADATION CURVES

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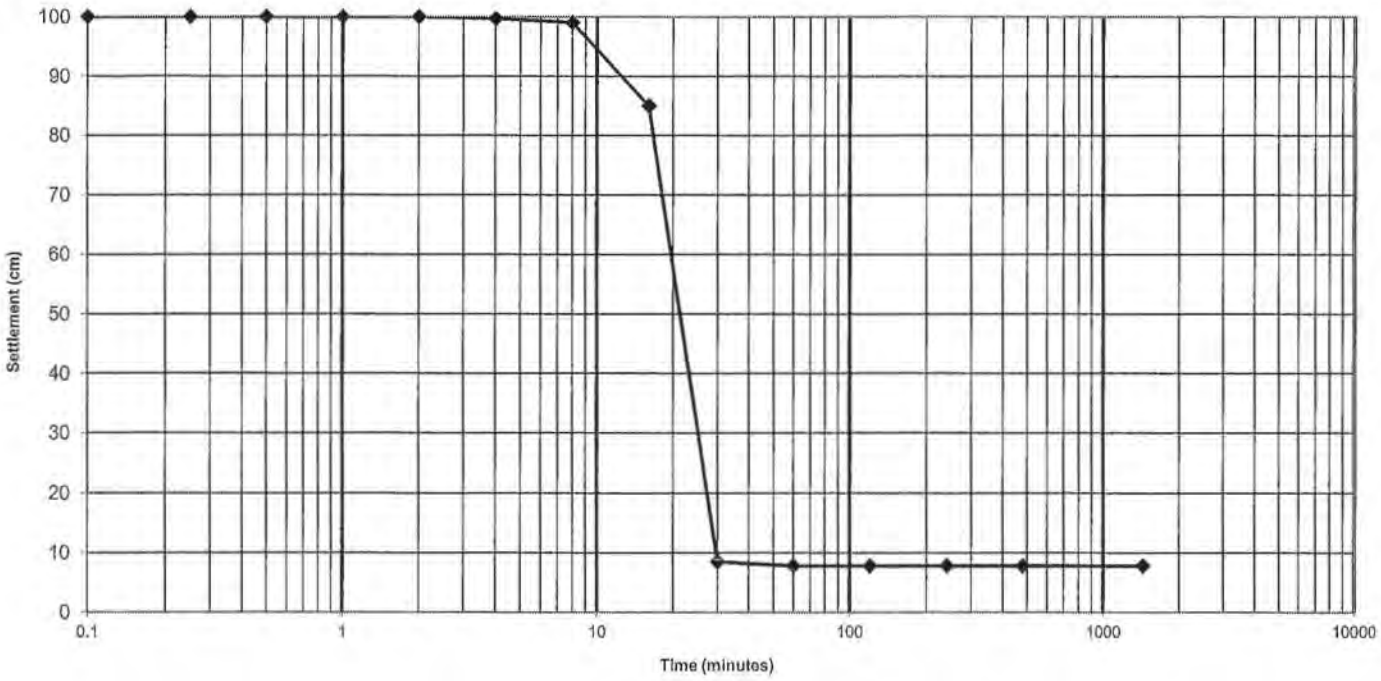
REPORT OF SETTLING RATE TESTING

PROJECT NO: 6738-14-5359
PROJECT: San Juan TO 102
CLIENT: USACE

Boring No. SJH-LE-5
Sample No. 4
Depth (ft) 3.2'
CONCENTRATION: 100 g/L



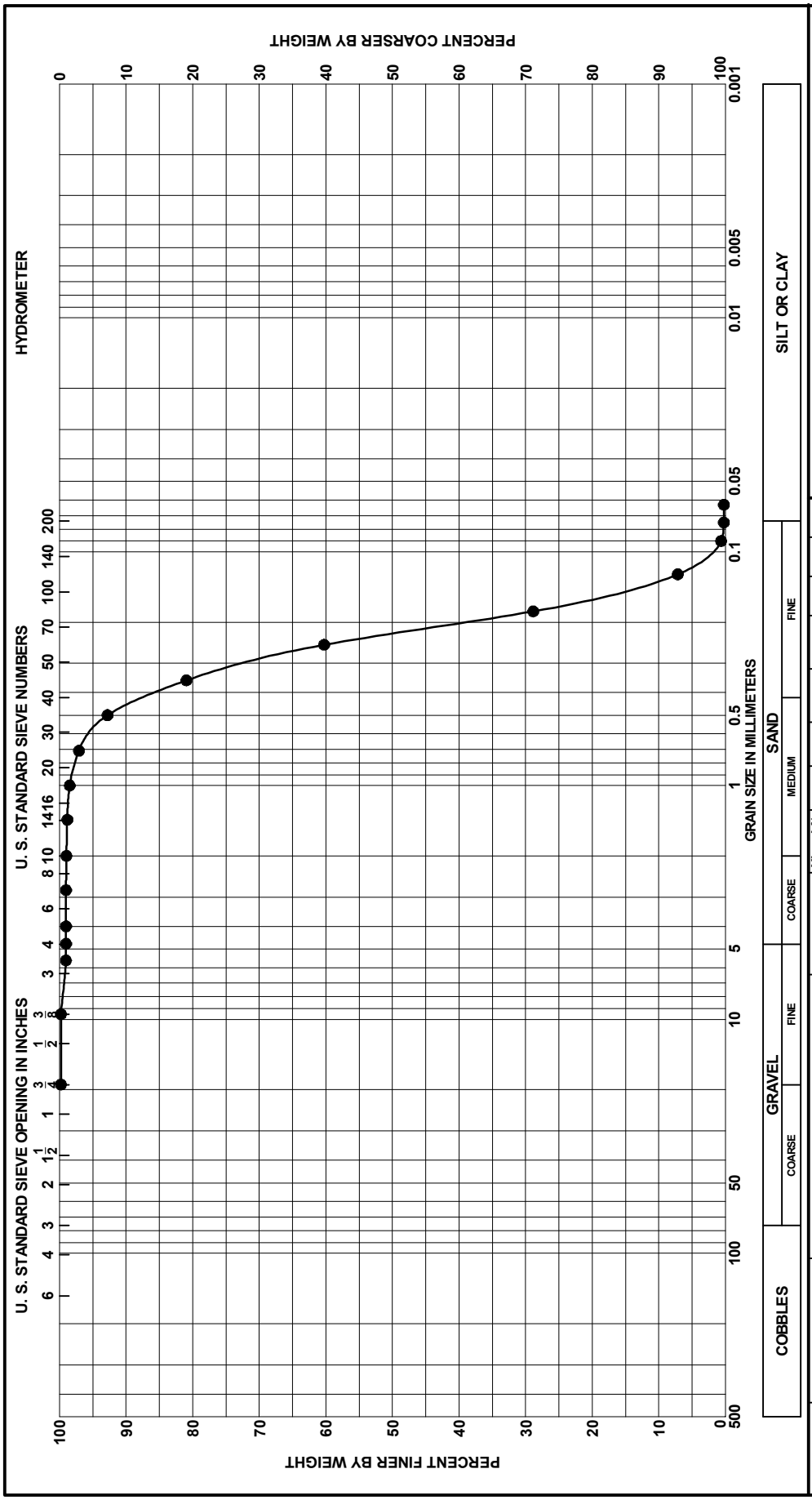
Sedimentation Rate Test COE Method

TIME (min)	INTERFACE (cm)	TIME (min)	INTERFACE (cm)
0.1	100.0	16	85.0
0.25	100.0	30	8.5
0.5	100.0	60	7.8
1	100.0	120	7.8
2	100.0	240	7.8
4	99.7	480	7.8
8	99.0	1440	7.8

Final Concentration: 1282.05 g/L

Respectfully Submitted

Corey T. Chascin, E.I.



Sample No.	Depth	Classification	Munsell	Visual % Shell (est)	%CO_3	G_s	Org %	w_n	LL	PL	PI
● 1	0.0 to 0.9 Ft.	SAND, poorly-graded, mostly fine-grained sand-sized quartz, little fine-grained sand-sized shell, light yellowish brown (SP)	2.5Y 6/3								

PROJECT San Juan Harbor
Condado Lagoon Mitigation
BORING NO. SJH-LE-5A
BORING ELEV. 2.2 Ft., PRVD02
DATE 6/23/2014

GRADATION CURVES

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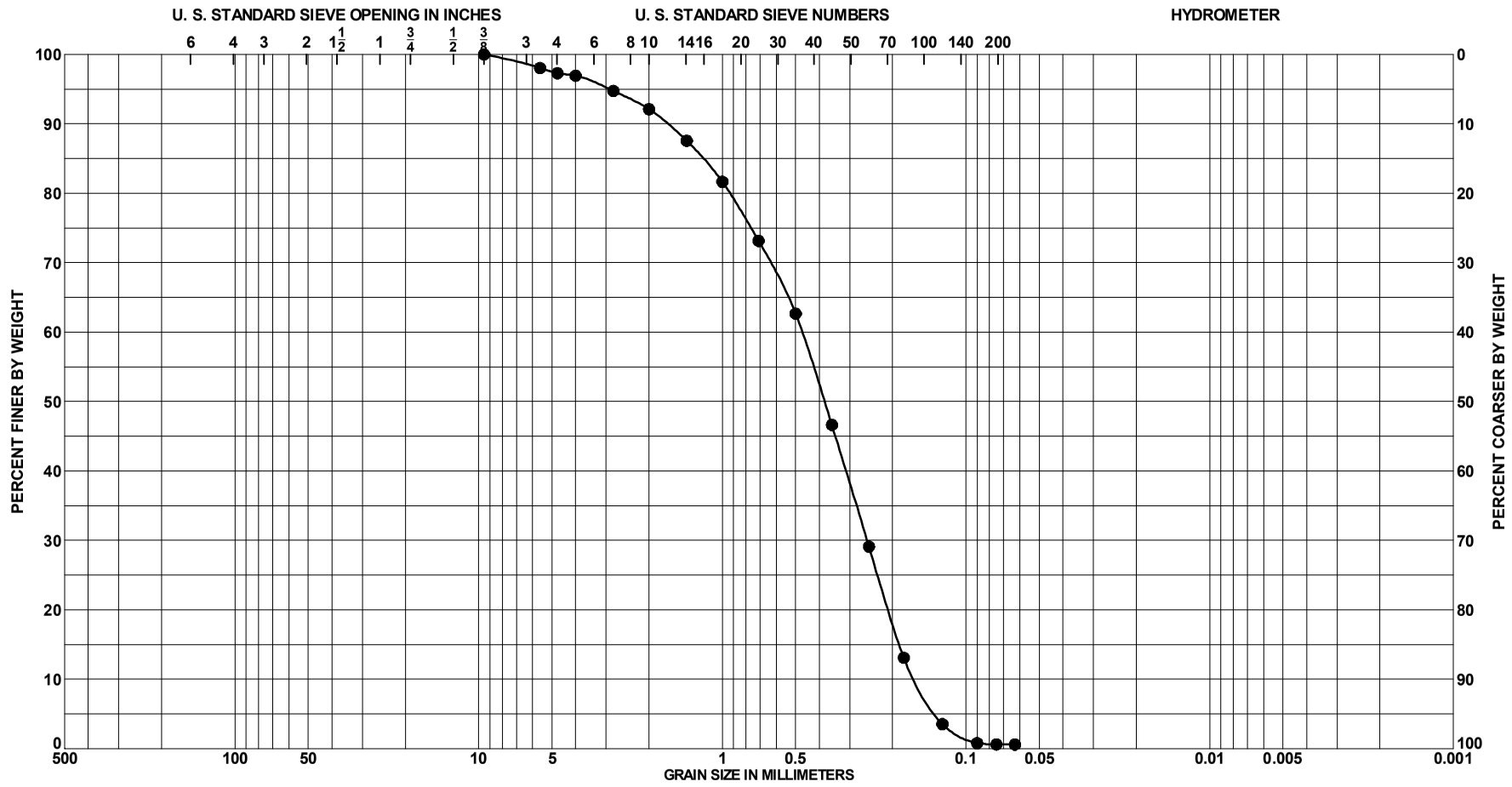

Sample No.	Depth	Classification	Munsell	Visual % Shell (est)	%CO_3	G_s	Org %	w_n	LL	PL	PI
● 2	0.9 to 1.9 Ft.	SAND, poorly-graded, mostly fine to	2.5Y 6/3								
		medium-grained sand-sized quartz,									
		some fine to coarse-grained									
		sand-sized shell, light yellowish brown									
		(SP)									

GRADATION CURVES

PROJECT	San Juan Harbor
	Condado Lagoon Mitigation
BORING NO.	SJH-LE-5A
BORING ELEV.	2.2 Ft., PRVD02
DATE	6/23/2014

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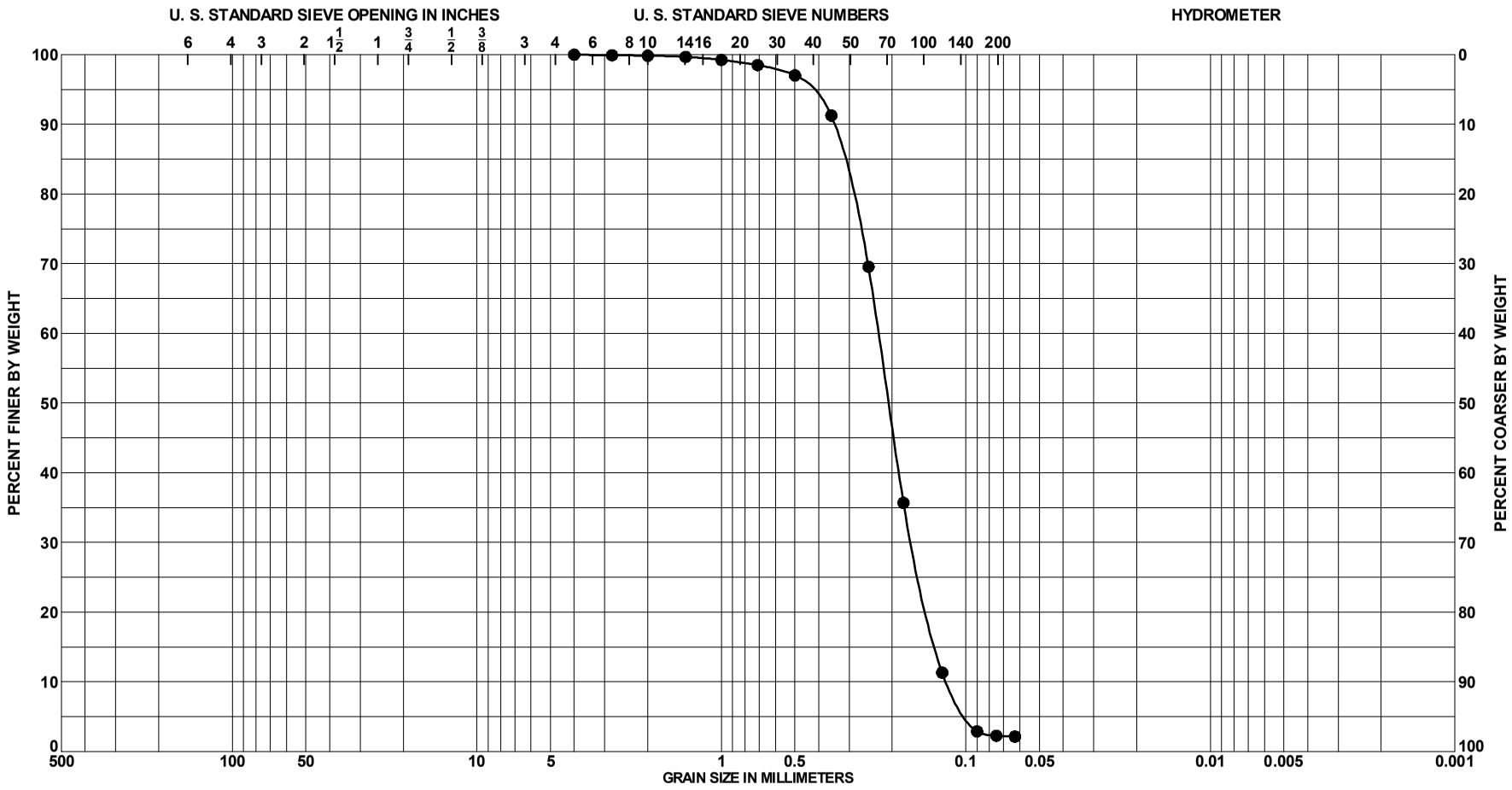
JUN 02



Sample No.	Depth	Classification	Munsell	Visual % Shell (est)	%CO_3	G_s	Org %	w_n	LL	PL	PI
● 3	2.2 to 2.4 Ft.	SAND, poorly-graded, mostly	2.5Y 5/3				2				
		fine-grained sand-sized quartz, little									
		fine-grained sand-sized shell, trace									
		silt, light olive brown (SP)									

GRADATION CURVES

PROJECT	San Juan Harbor
	Condado Lagoon Mitigation
BORING NO.	SJH-LE-5A
BORING ELEV.	2.2 Ft., PRVD02
DATE	6/23/2014

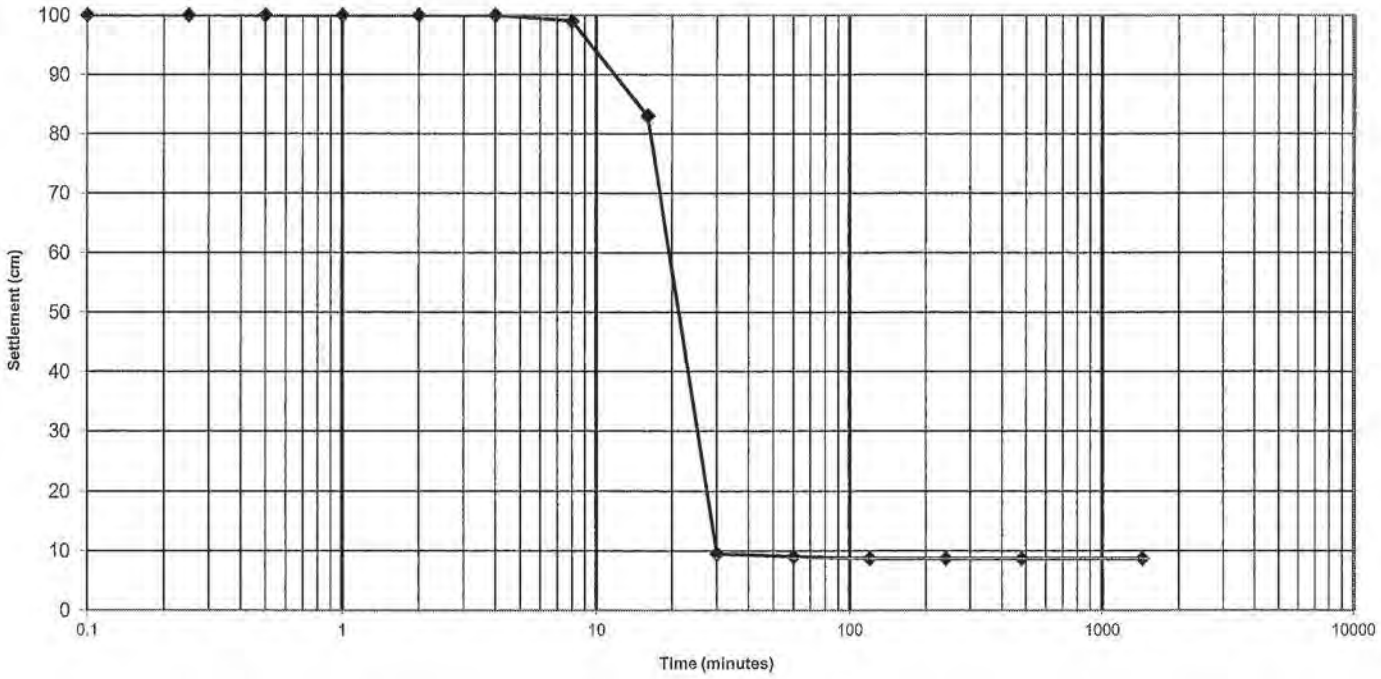
SAJ FORM 2087
JUN 02

amec

REPORT OF SETTLING RATE TESTING

PROJECT NO: 6738-14-5359
PROJECT: San Juan TO 102
CLIENT: USACE

Boring No. SJH-LE-5A
Sample No. 3
Depth (ft) 2.2'
CONCENTRATION: 100 g/L



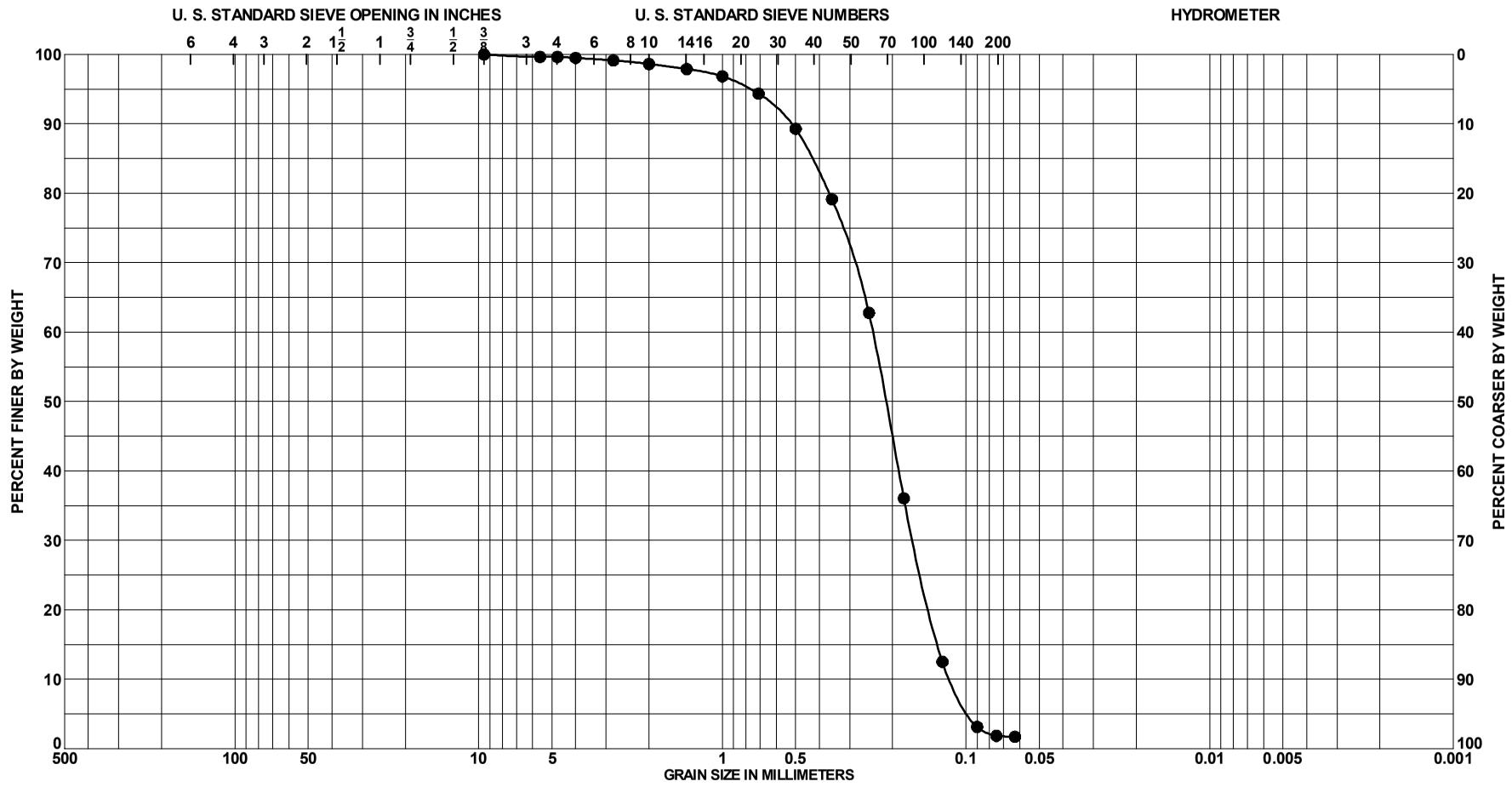
Sedimentation Rate Test COE Method

TIME (min)	INTERFACE (cm)	TIME (min)	INTERFACE (cm)
0.1	100.0	16	83.0
0.25	100.0	30	9.5
0.5	100.0	60	9.0
1	100.0	120	8.7
2	100.0	240	8.7
4	100.0	480	8.7
8	99.0	1440	8.7

Final Concentration: 1149.43 g/L

Respectfully Submitted

Corey T. Chasan, E.I.



Sample No.	Depth	Classification	Munsell	Visual % Shell (est)	%CO_3	G_s	Org %	w_n	LL	PL	PI
● 4	2.5 to 3.5 Ft.	SAND, poorly-graded, mostly	2.5Y 5/3								
		fine-grained sand-sized quartz, little									
		fine to medium-grained sand-sized									
		shell, trace silt, light olive brown (SP)									

GRADATION CURVES

PROJECT	San Juan Harbor
	Condado Lagoon Mitigation
BORING NO.	SJH-LE-5A
BORING ELEV.	2.2 Ft., PRVD02
DATE	6/23/2014

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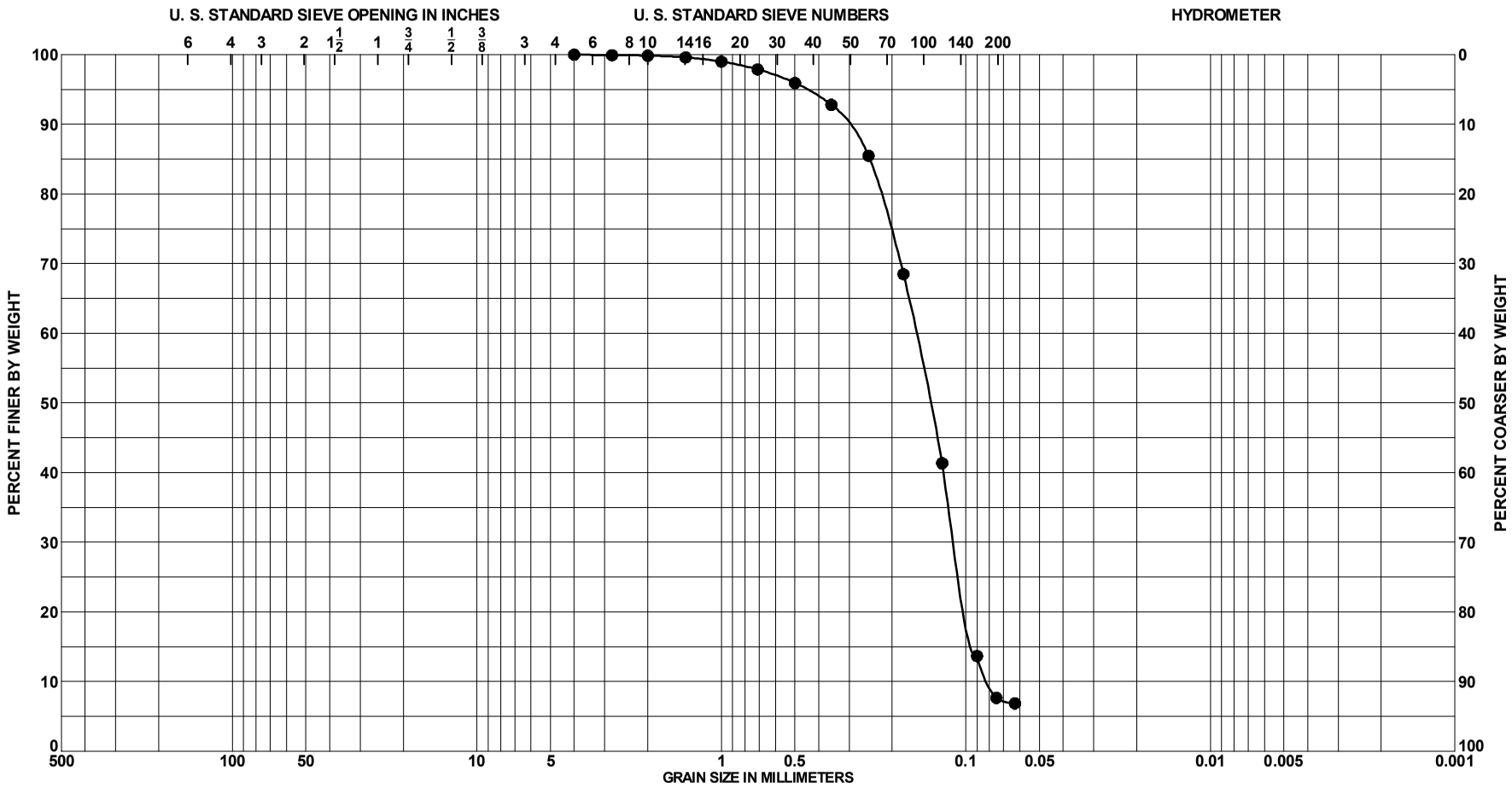

Sample No.	Depth	Classification	Munsell	Visual % Shell (est)	%CO_3	G_s	Org %	w_n	LL	PL	PI
● 5	3.6 to 3.9 Ft.	SAND, poorly-graded with silt, mostly	2.5Y 5/2				4				
		fine-grained sand-sized quartz, little									
		fine-grained sand-sized shell, few silt,									
		grayish brown (SP-SM)									

GRADATION CURVES

PROJECT	San Juan Harbor
	Condado Lagoon Mitigation
BORING NO.	SJH-LE-5A
BORING ELEV.	2.2 Ft., PRVD02
DATE	6/23/2014

SAJ FORM 2087
JUN 02

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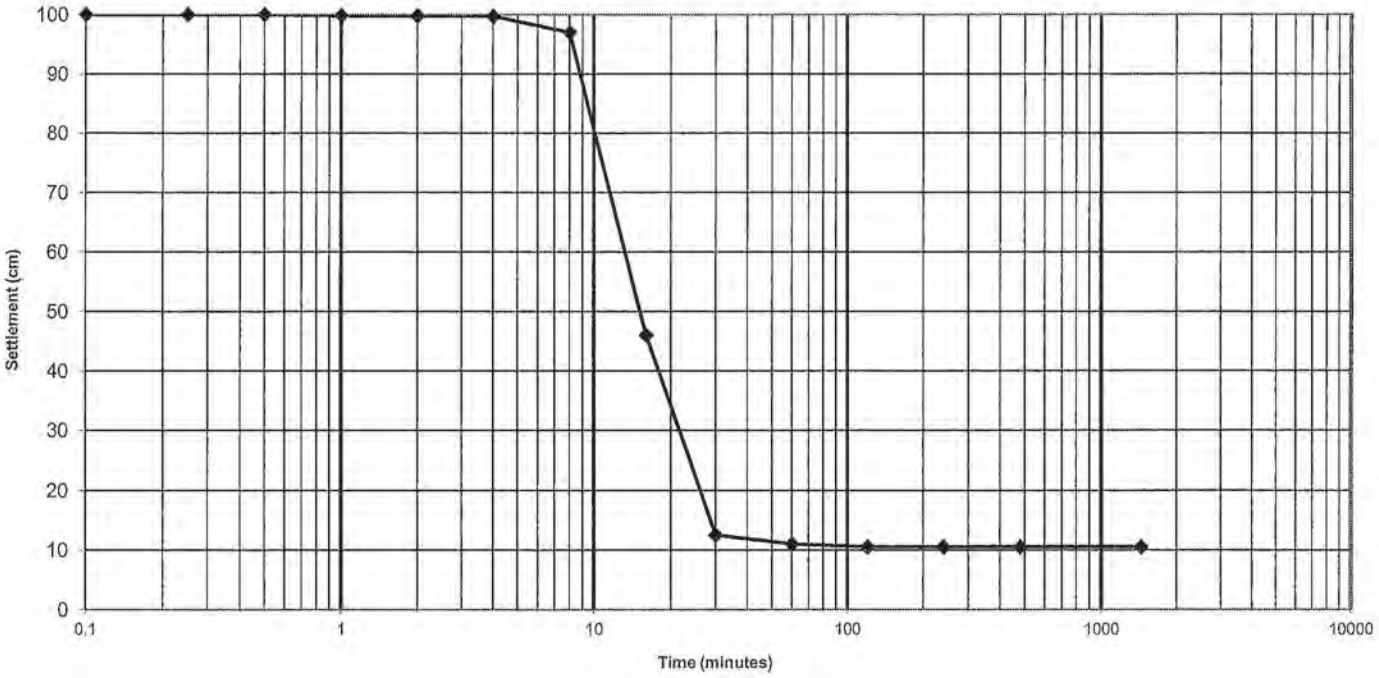
amec

REPORT OF SETTLING RATE TESTING

PROJECT NO: 6738-14-5359
PROJECT: San Juan TO 102
CLIENT: USACE

Boring No. SJH-LE-5A
Sample No. 5
Depth (ft) 3.6'
CONCENTRATION: 100 g/L



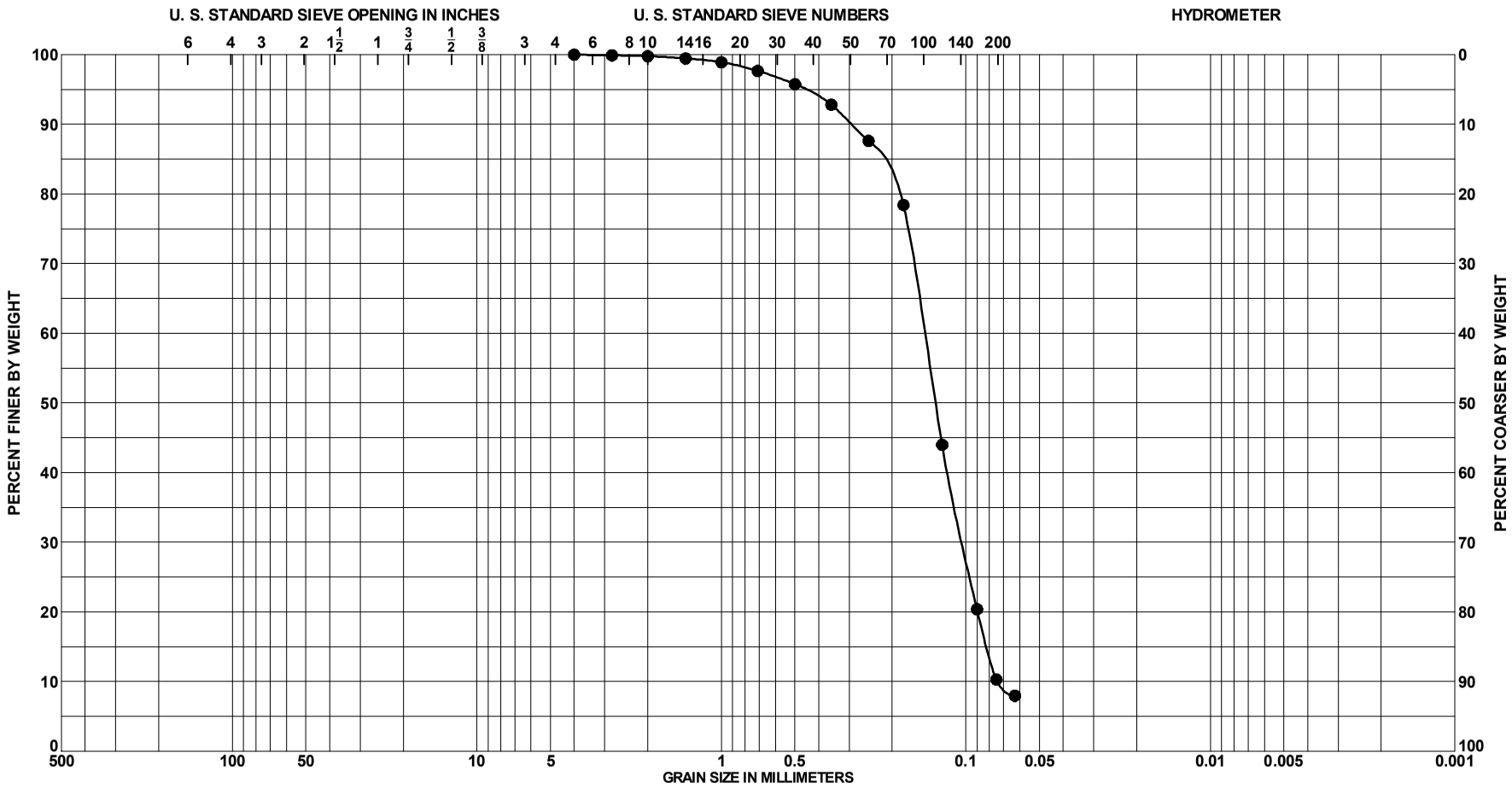
Sedimentation Rate Test COE Method

TIME (min)	INTERFACE (cm)	TIME (min)	INTERFACE (cm)
0.1	100.0	16	46.0
0.25	100.0	30	12.5
0.5	100.0	60	11.0
1	99.8	120	10.5
2	99.8	240	10.5
4	99.7	480	10.5
8	97.0	1440	10.5

Final Concentration: 952.381 g/L

Respectfully Submitted

Corey T. Chasan, E.I.



Sample No.	Depth	Classification	Munsell	Visual % Shell (est)	%CO_3	G_s	Org %	w_n	LL	PL	PI
● 6	4.0 to 4.3 Ft.	SAND, poorly-graded with silt, mostly	2.5Y 5/2								
		fine-grained sand-sized quartz, few									
		silt, few fine-grained sand-sized shell,									
		grayish brown (SP-SM)									

GRADATION CURVES

PROJECT	San Juan Harbor
	Condado Lagoon Mitigation
BORING NO.	SJH-LE-5A
BORING ELEV.	2.2 Ft., PRVD02
DATE	6/23/2014

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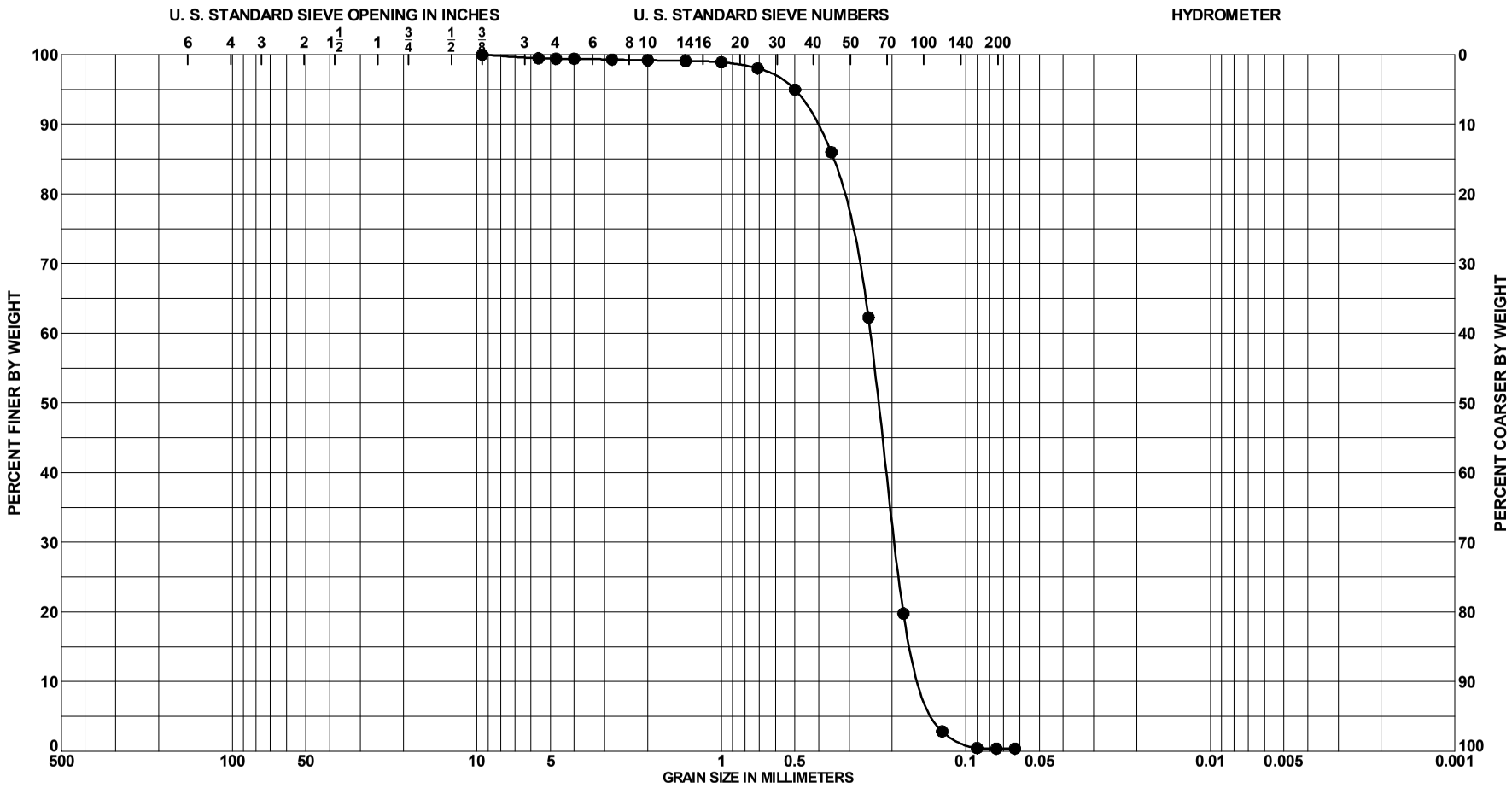

Sample No.	Depth	Classification	Munsell	Visual % Shell (est)	%CO_3	G_s	Org %	w_n	LL	PL	PI
● 1	0.0 to 1.1 Ft.	SAND, poorly-graded, mostly fine-grained sand-sized quartz, few fine-grained sand-sized shell, light olive brown (SP)	2.5Y 5/3								

GRADATION CURVES

PROJECT	San Juan Harbor
	Condado Lagoon Mitigation
BORING NO.	SJH-LE-6
BORING ELEV.	1.8 Ft., PRVD02
DATE	6/23/2014

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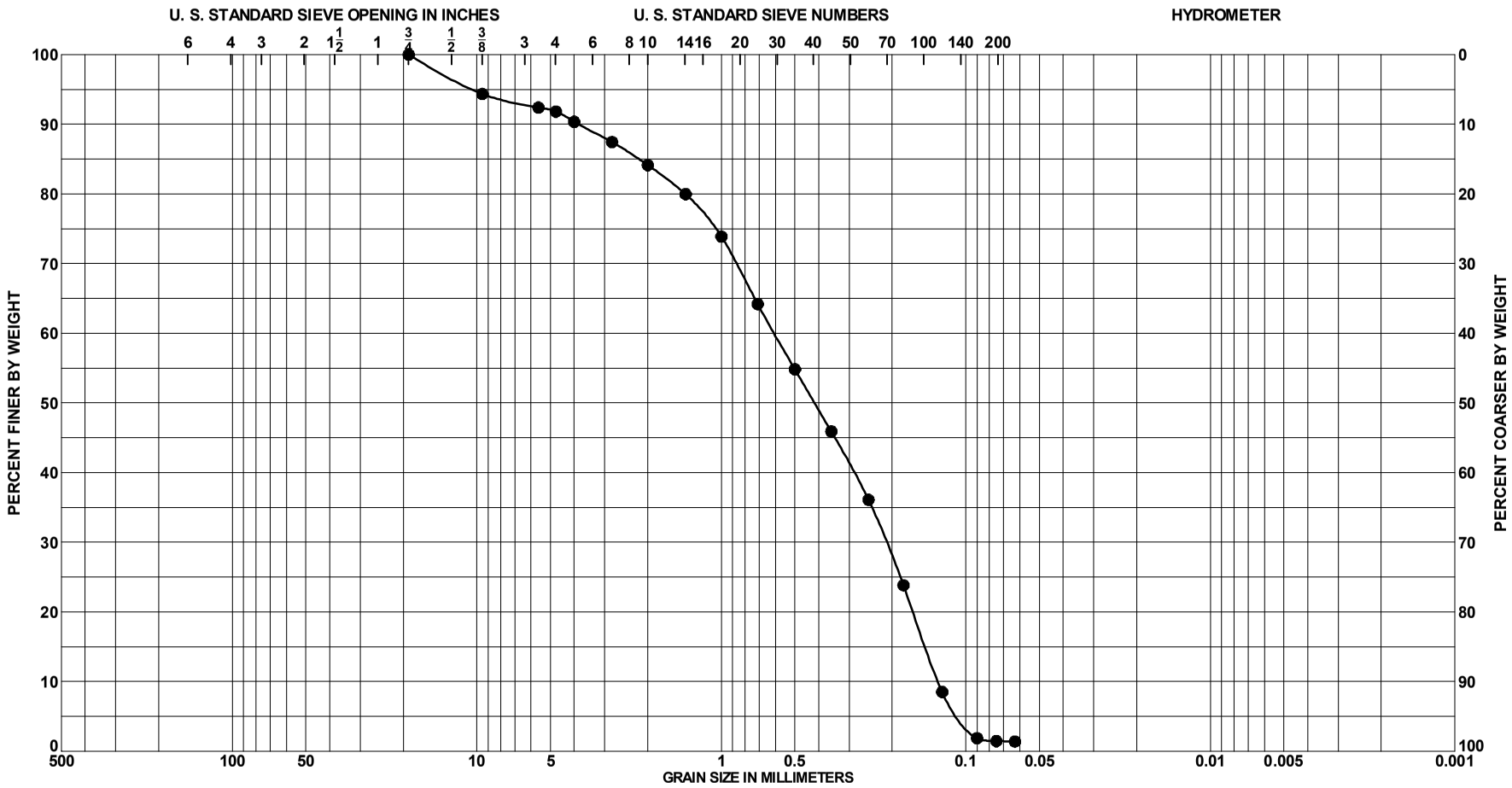
JUN 02

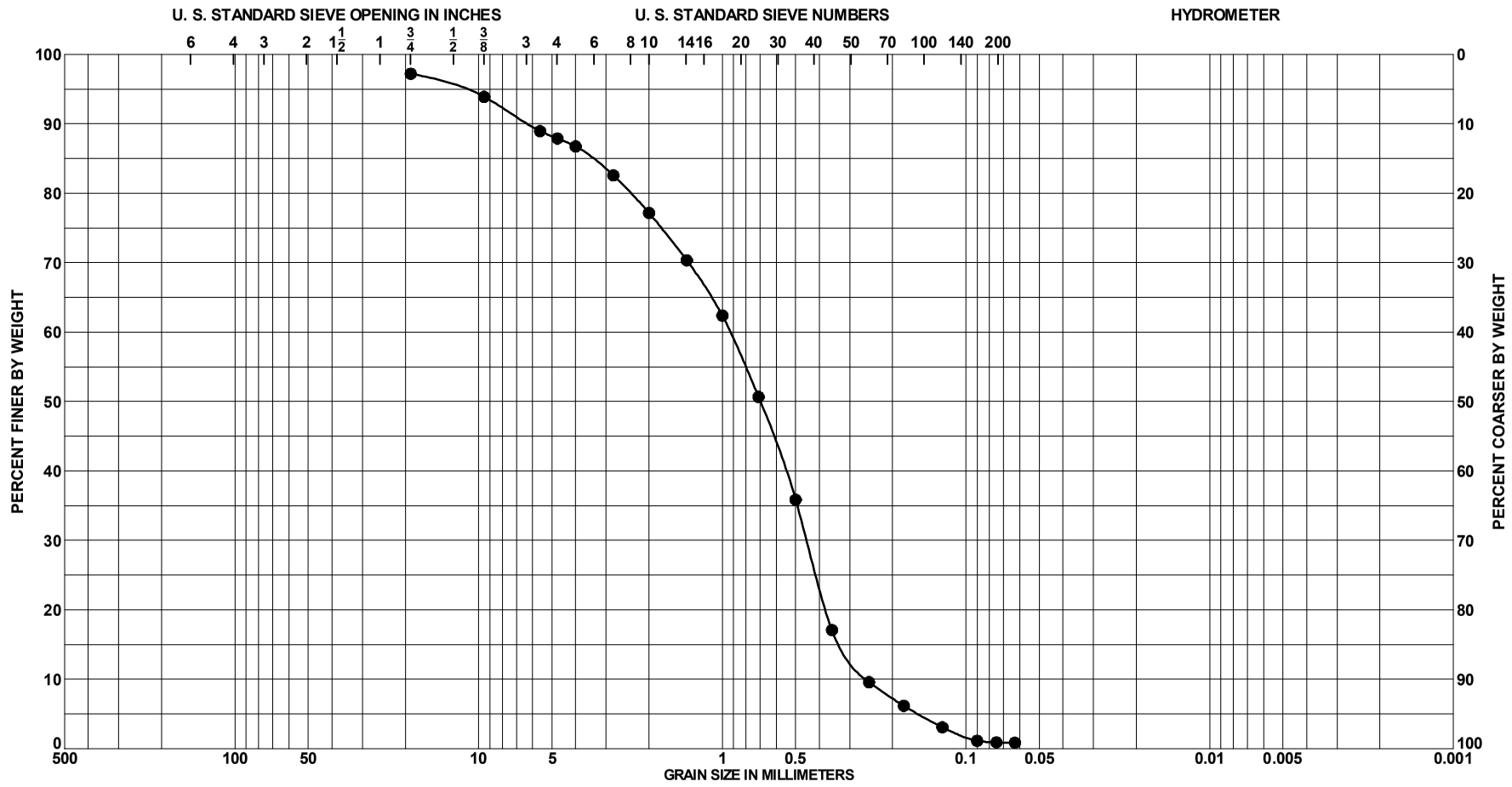


Sample No.	Depth	Classification	Munsell	Visual % Shell (est)	%CO_3	G_s	Org %	w_n	LL	PL	PI
● 2	1.8 to 2.5 Ft.	SAND, poorly-graded, mostly fine to	10YR 5/2		77						
		med-grained sand-si limestone, some									
		sand to gravel-si shell, little									
		fine-grained sand-si quartz, trace silt,									
		grayish brown (SP)									

GRADATION CURVES

PROJECT	San Juan Harbor
	Condado Lagoon Mitigation
BORING NO.	SJH-LE-6
BORING ELEV.	1.8 Ft., PRVD02
DATE	6/23/2014

SAJ FORM 2087
JUN 02



Sample No.	Depth	Classification	Munsell	Visual % Shell (est)	%CO_3	G_s	Org %	w_n	LL	PL	PI
● 3	2.6 to 3.2 Ft.	SAND, poorly-graded, mostly sand to	2.5Y 5/3								
		gravel-sized shell, little fine-grained									
		sand-sized limestone, little									
		fine-grained sand-sized quartz, light									
		olive brown (SP)									

GRADATION CURVES

PROJECT	San Juan Harbor
	Condado Lagoon Mitigation
BORING NO.	SJH-LE-6
BORING ELEV.	1.8 Ft., PRVD02
DATE	6/23/2014

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JUN 02

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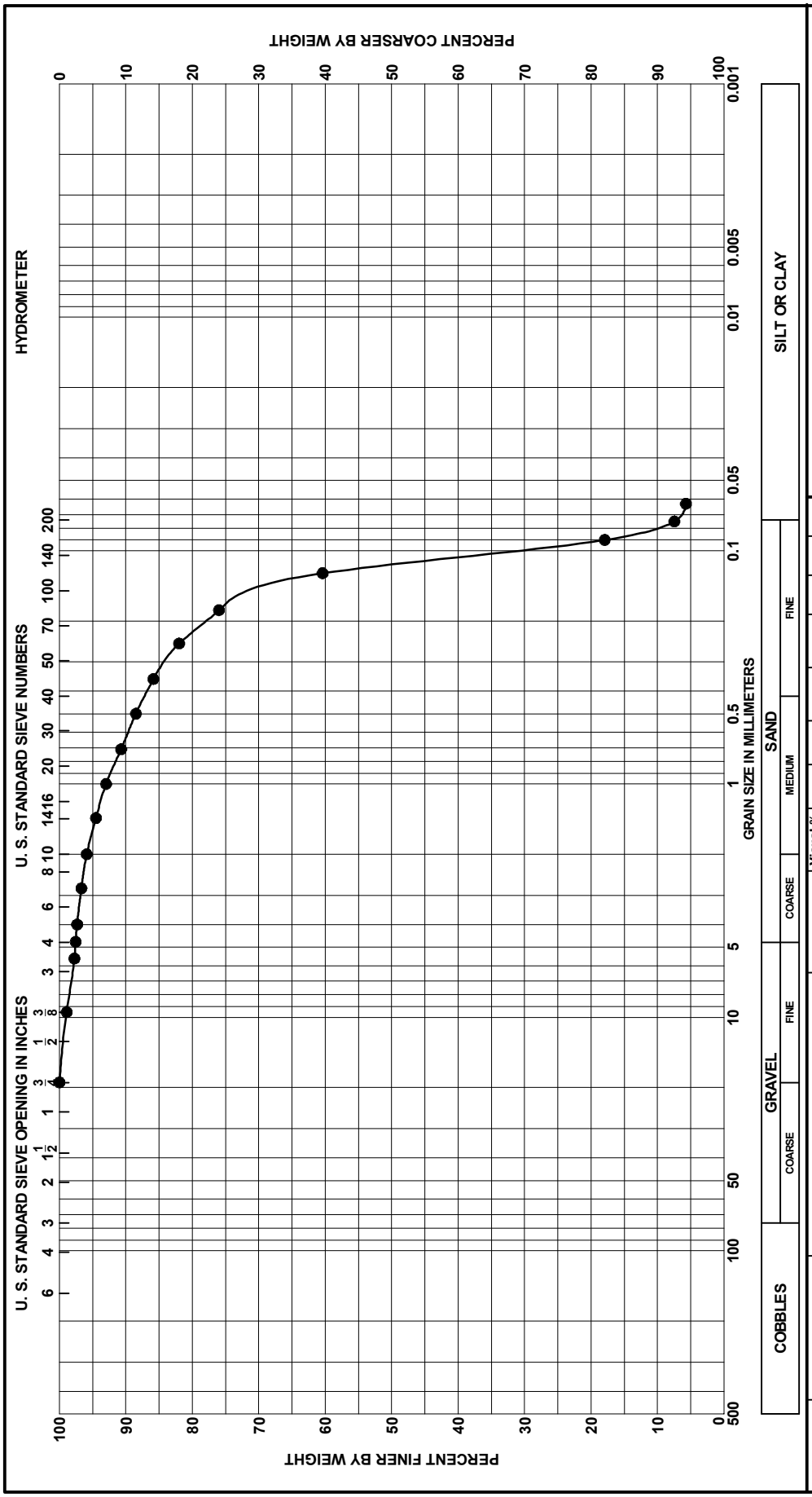


Sample No.	Depth	Classification	Munsell	Visual % Shell (est)	%CO_3	G_s	Org %	w_n	LL	PL	PI
● 4	3.3 to 3.6 Ft.	SAND, poorly-graded with silt, some fine-grained sa-si limestone, some fine-grained sa-si quartz, few medium-grained sa-si shell, few silt, grayish brown (SP-SM)	2.5Y 5/2				1				

PROJECT San Juan Harbor
Condado Lagoon Mitigation
BORING NO. SJH-LE-6
BORING ELEV. 1.8 Ft., PRVD02
DATE 6/23/2014

GRADATION CURVES

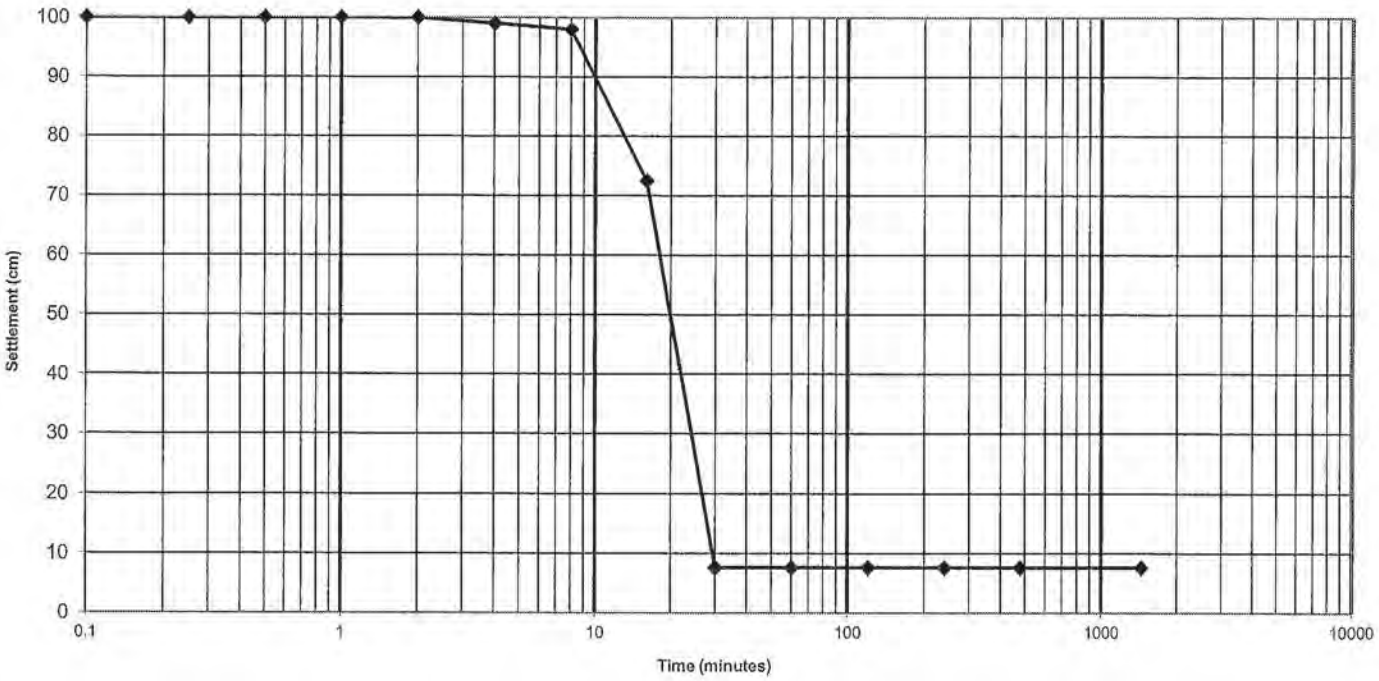
SAJ FORM 2087
JUN 02

amec

REPORT OF SETTLING RATE TESTING

PROJECT NO: 6738-14-5359
PROJECT: San Juan TO 102
CLIENT: USACE

Boring No.	SJH-LE-6
Sample No.	4
Depth (ft)	3.3'
CONCENTRATION:	100 g/L



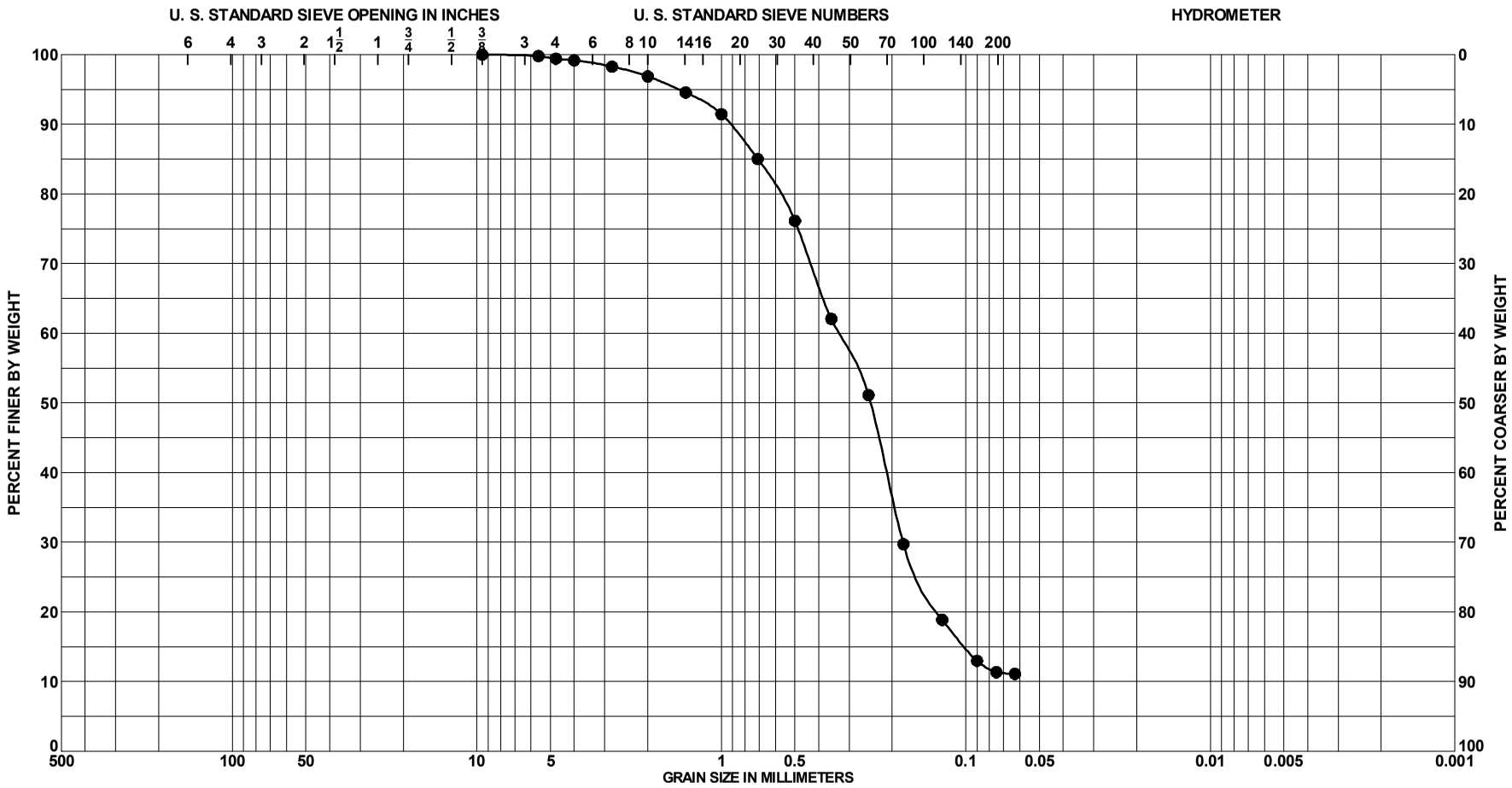
Sedimentation Rate Test COE Method

TIME (min)	INTERFACE (cm)	TIME (min)	INTERFACE (cm)
0.1	100.0	16	72.5
0.25	100.0	30	7.6
0.5	100.0	60	7.6
1	100.0	120	7.6
2	100.0	240	7.6
4	99.0	480	7.6
8	98.0	1440	7.6

Final Concentration: 1315.79 g/L

Respectfully Submitted

Corey T. Chasen, E.I.

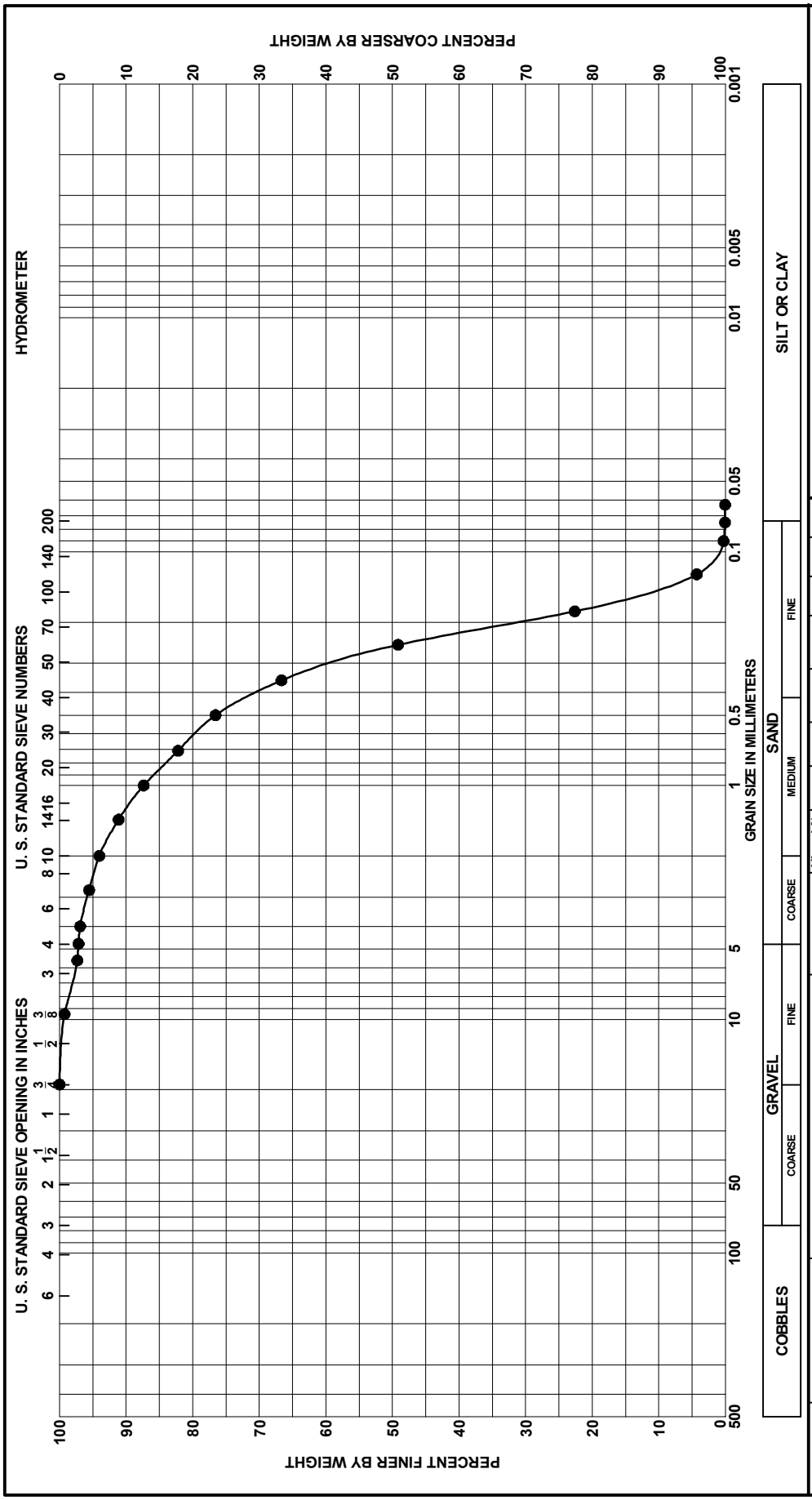


Sample No.	Depth	Classification	Munsell	Visual % Shell (est)	%CO_3	G_s	Org %	w_n	LL	PL	PI
● 5	3.8 to 4.4 Ft.	SAND, poorly-graded with silt, mostly	2.5Y 5/2								
		fine-grained sand-sized limestone,									
		some fine to medium-grained									
		sand-sized shell, few silt, grayish									
		brown (SP-SM)									

GRADATION CURVES

PROJECT	San Juan Harbor
	Condado Lagoon Mitigation
BORING NO.	SJH-LE-6
BORING ELEV.	1.8 Ft., PRVD02
DATE	6/23/2014

SAJ FORM 2087
JUN 02

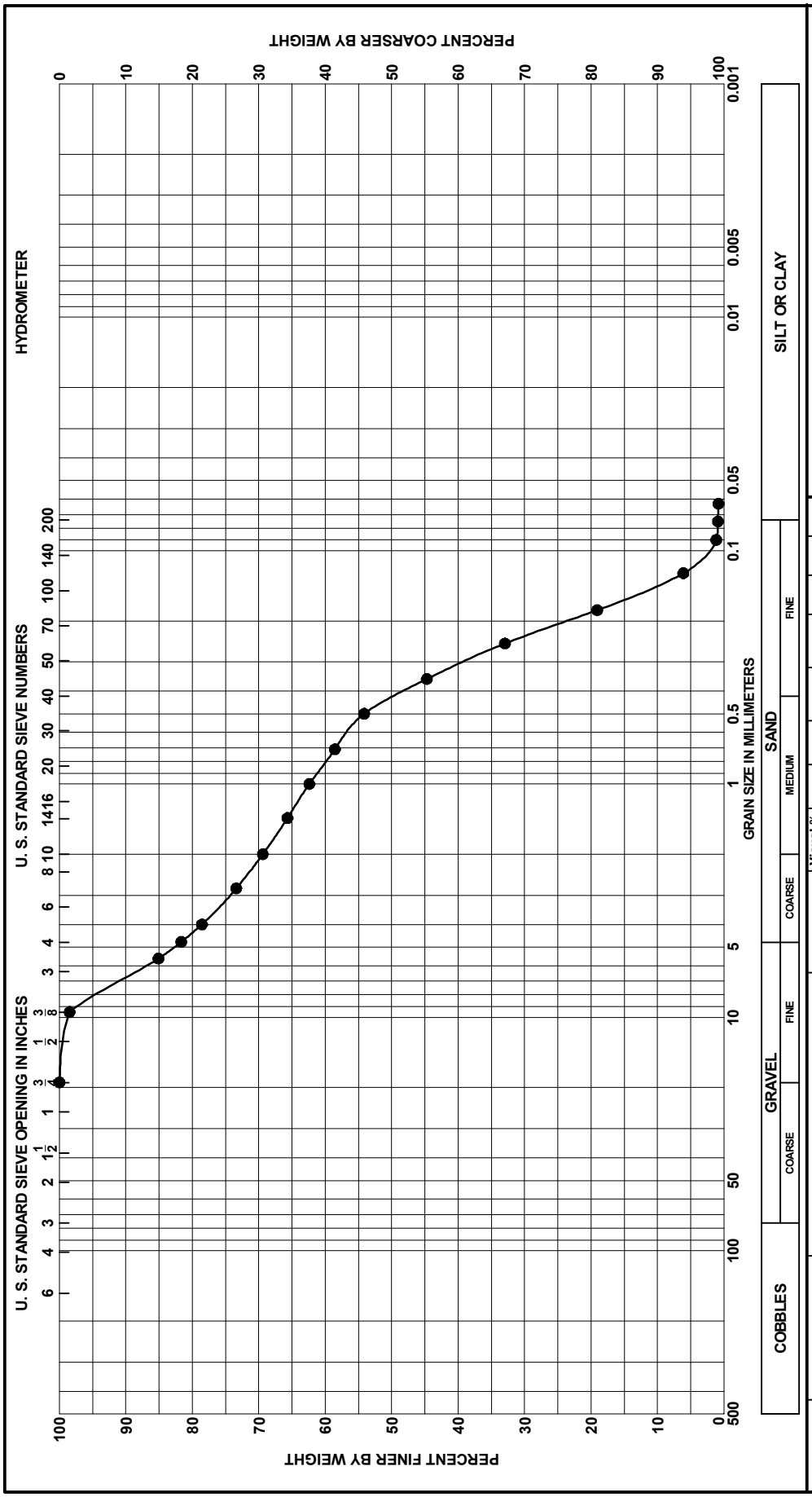


Sample No.	Depth	Classification	Munsell	Visual % Shell (est)	$\%CO_3$	G_s	Org %	w_n	LL	PL	PI
● 1	0.0 to 0.4 Ft.	SAND, poorly-graded, mostly fine-grained sa-si quartz, little fine to coarse-grained sa-si shell, few medium-grained sand-sized limestone, light gray (SP)	2.5Y 7/2		59						

PROJECT San Juan Harbor
Condado Lagoon Mitigation
BORING NO. SJH-LE-7
BORING ELEV. 2.2 Ft., PRVD02
DATE 6/23/2014

GRADATION CURVES

SAJ FORM 2087
JUN 02



Sample No.	Depth	Classification	Munsell	Visual % Shell (est)	%CO_3	G_s	Org %	w_n	LL	PL	PI
● 2	0.5 to 0.9 Ft.	SAND, poorly-graded, some sand to gravel-sized shell, some fine-grained sand-sized quartz, trace limestone, light yellowish brown (SP)	2.5Y 6/3								

PROJECT San Juan Harbor
Condado Lagoon Mitigation
BORING NO. SJH-LE-7
BORING ELEV. 2.2 Ft., PRVD02
DATE 6/23/2014

GRADATION CURVES

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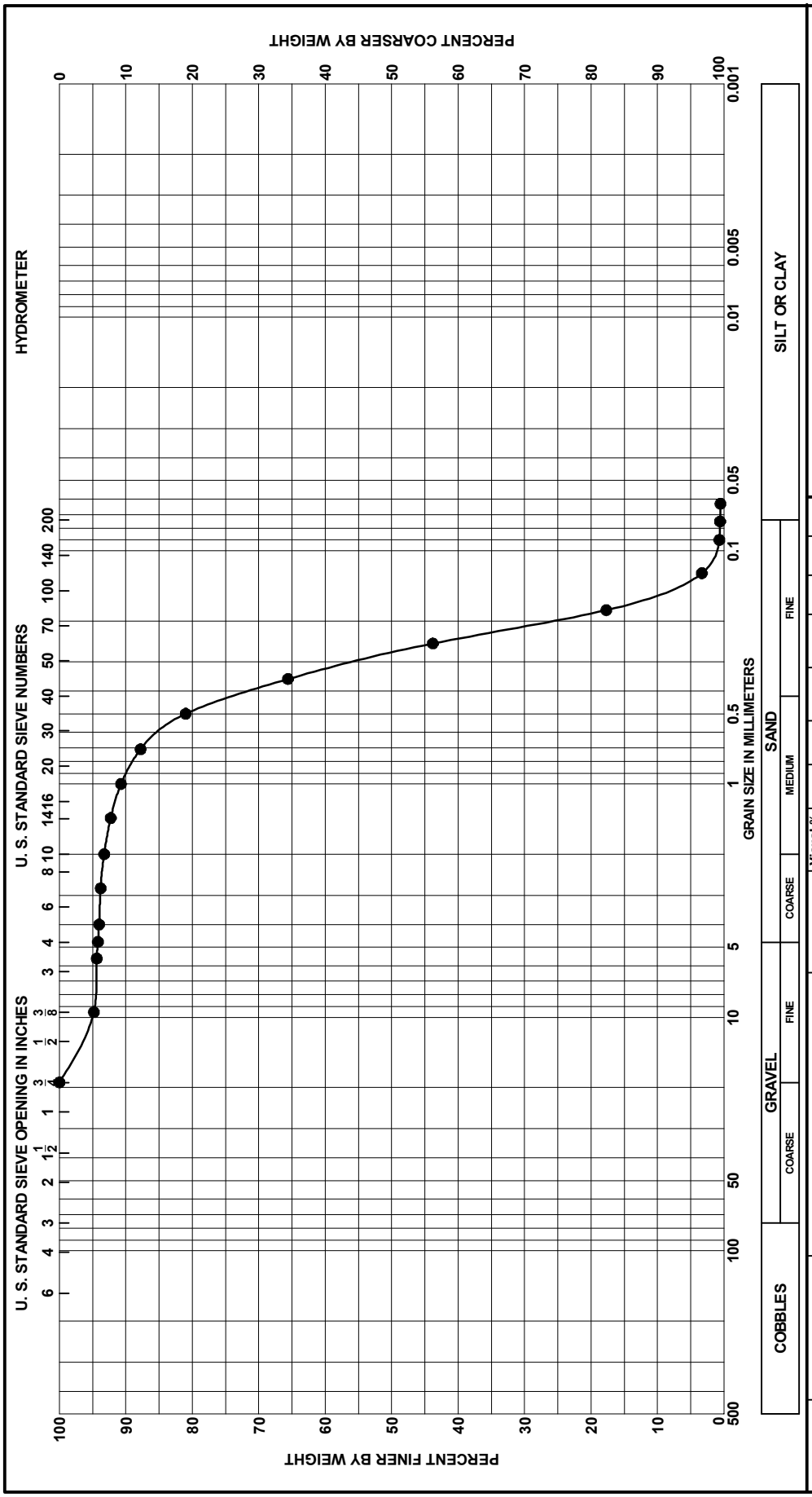
JUN 02

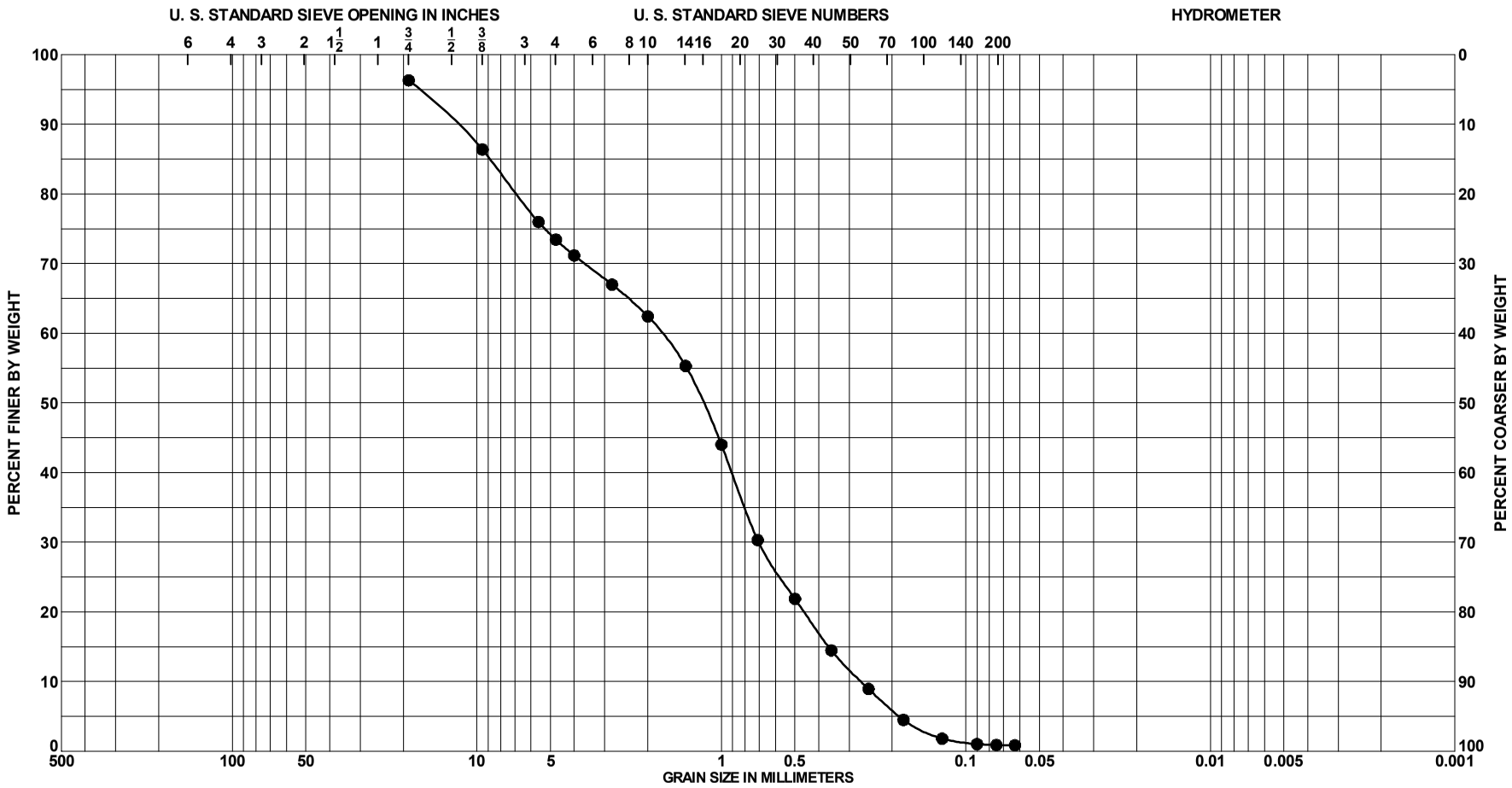


Sample No.	Depth	Classification	Munsell	Visual % Shell (est)	$\%CO_3$	G_s	Org %	w_n	LL	PL	PI
● 3	1.1 to 2.1 Ft.	SAND, poorly-graded, mostly sand to gravel-sized shell, some fine-grained sand-sized quartz, light olive brown (SP)	2.5Y 5/3		62						

GRADATION CURVES

PROJECT	San Juan Harbor
	Condado Lagoon Mitigation
BORING NO.	SJH-LE-7
BORING ELEV.	2.2 Ft., PRVD02
DATE	6/23/2014

SAJ FORM 2087
JUN 02

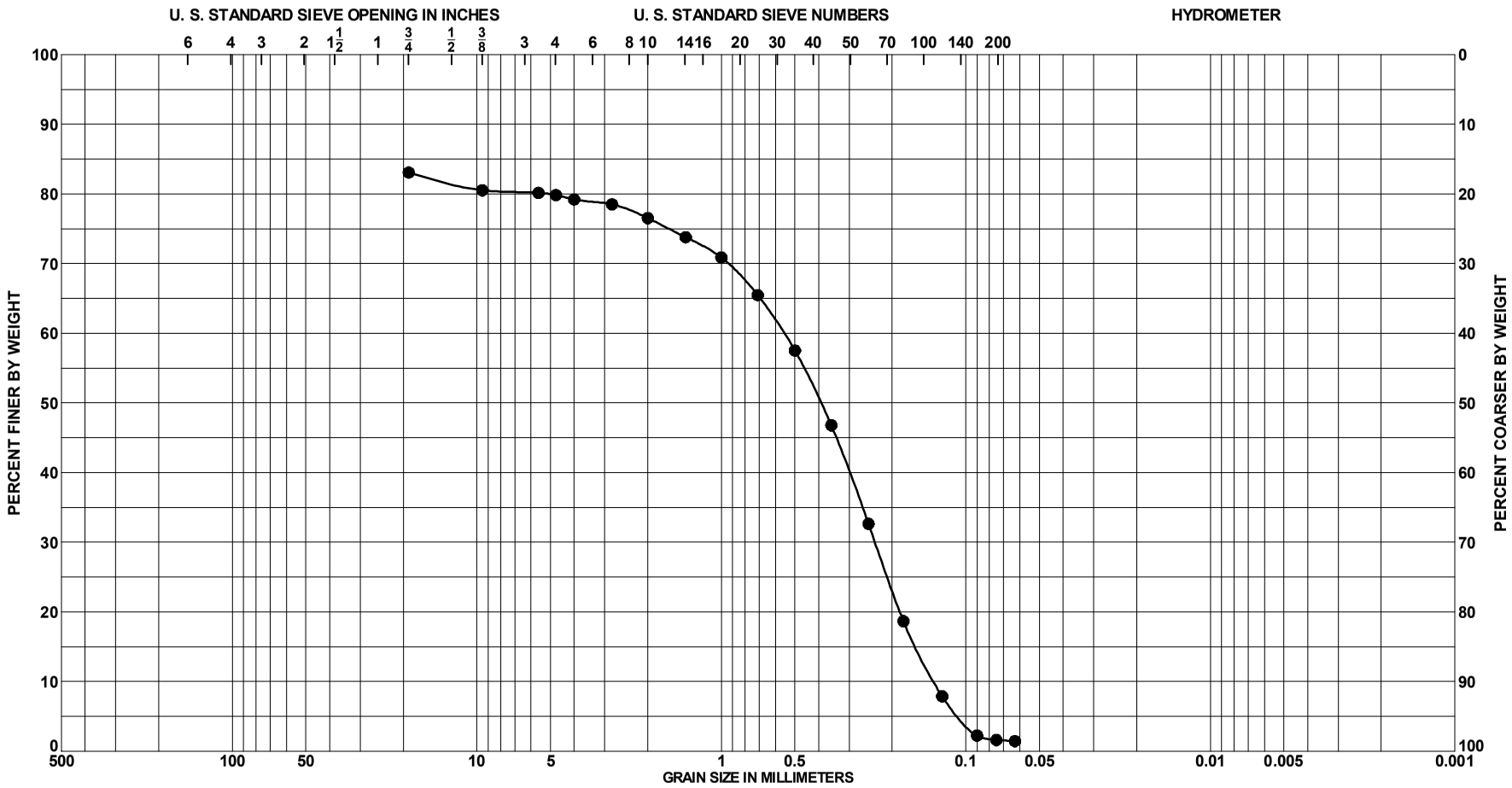


Sample No.	Depth	Classification	Munsell	Visual % Shell (est)	%CO_3	G_s	Org %	w_n	LL	PL	PI
● 4	2.3 to 2.8 Ft.	SAND, well-graded, mostly sand to gravel-sized shell, little fine-grained sand-sized quartz, trace limestone, light olive brown (SW)	2.5Y 5/3								

GRADATION CURVES

PROJECT	San Juan Harbor
	Condado Lagoon Mitigation
BORING NO.	SJH-LE-7
BORING ELEV.	2.2 Ft., PRVD02
DATE	6/23/2014

SAJ FORM 2087
JUN 02

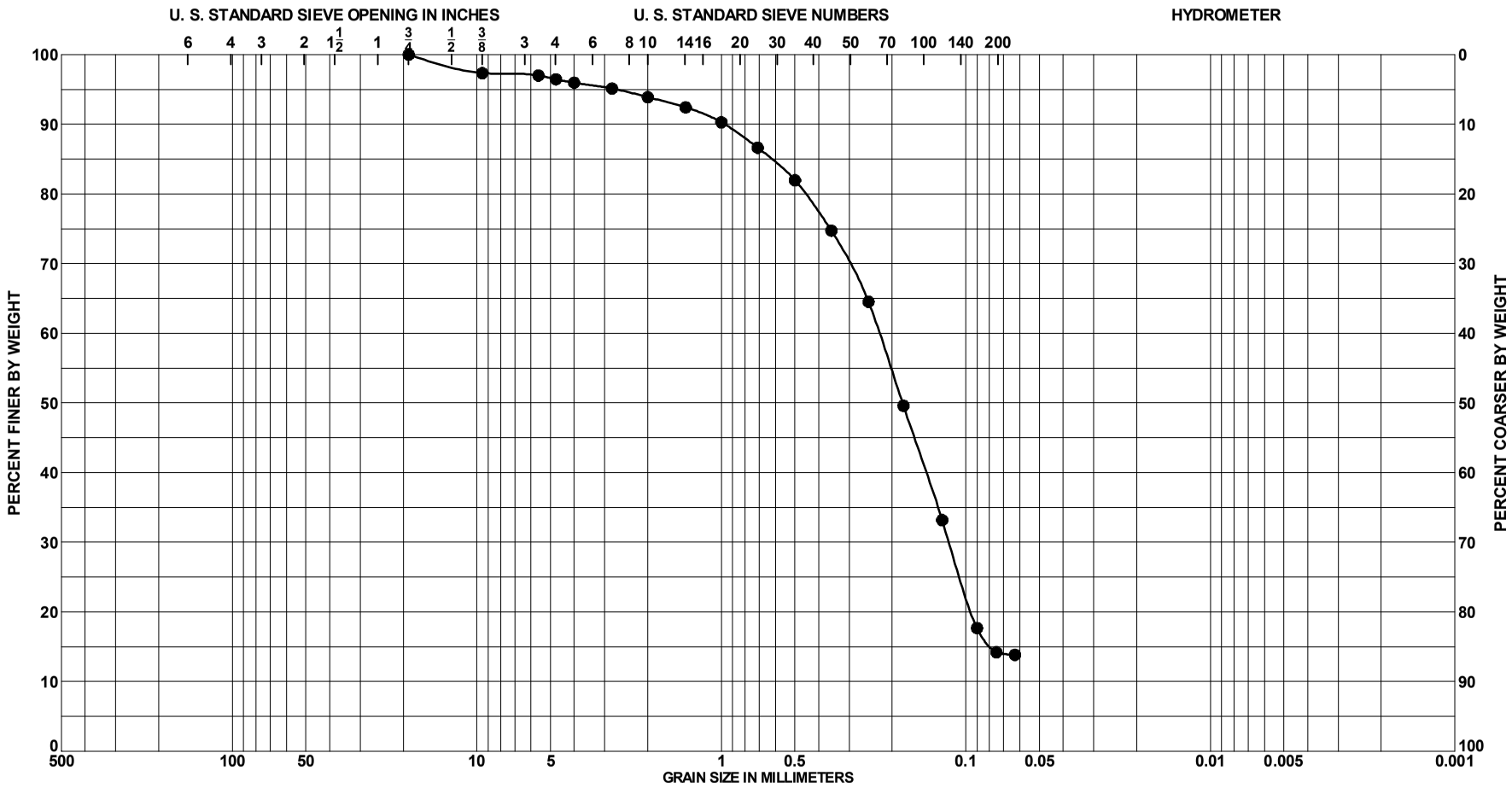


Sample No.	Depth	Classification	Munsell	Visual % Shell (est)	%CO_3	G_s	Org %	w_n	LL	PL	PI
● 5	2.9 to 4.4 Ft.	SAND, poorly-graded, some fine to	2.5Y 5/2								
		medium-grained sand-sized shell,									
		some fine-grained sand-sized quartz,									
		little gravel-sized limestone, trace silt,									
		grayish brown (SP)									

GRADATION CURVES

PROJECT	San Juan Harbor
	Condado Lagoon Mitigation
BORING NO.	SJH-LE-7
BORING ELEV.	2.2 Ft., PRVD02
DATE	6/23/2014

SAJ FORM 2087
JUN 02

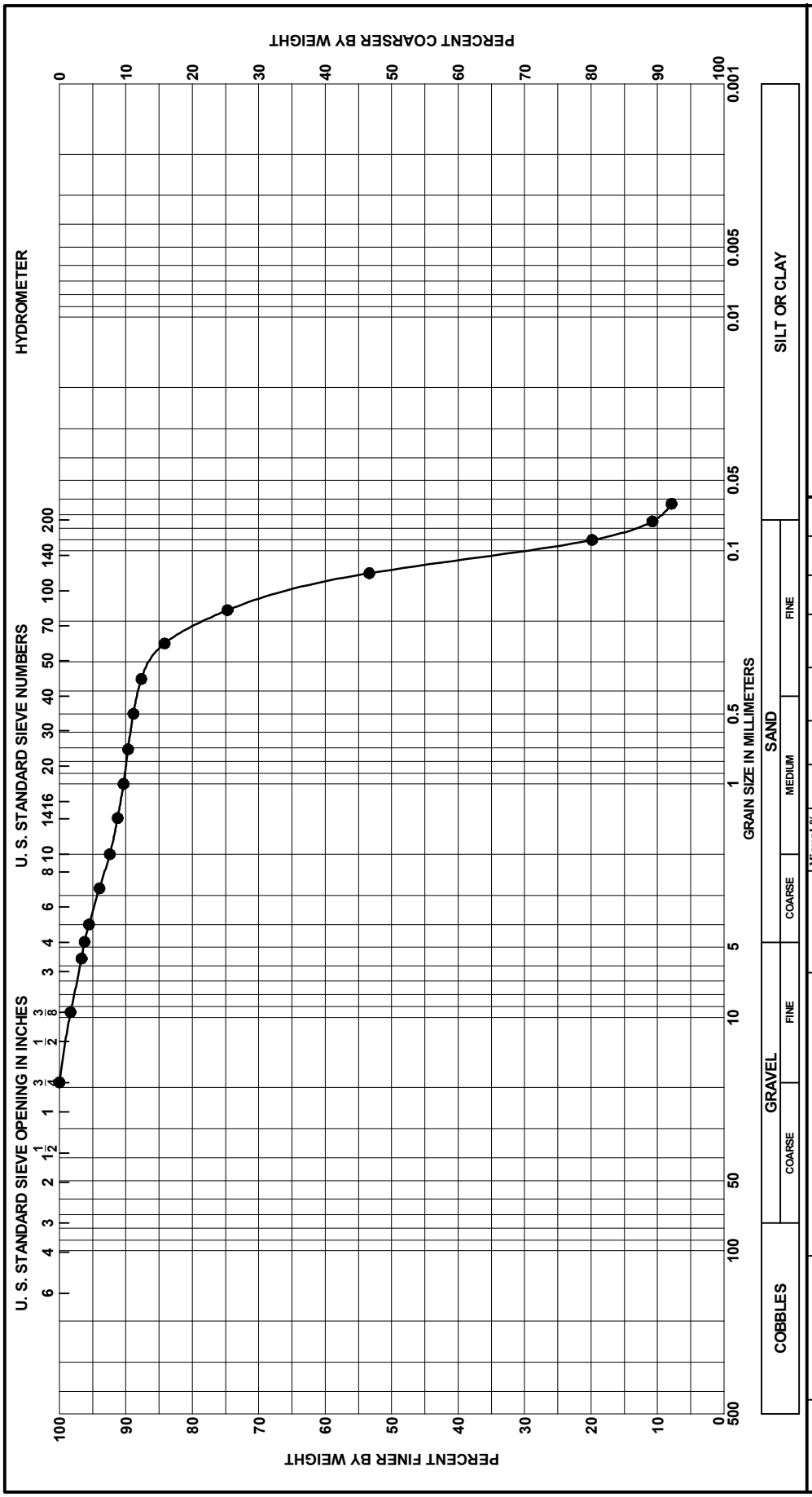


Sample No.	Depth	Classification	Munsell	Visual % Shell (est)	%CO_3	G_s	Org %	w_n	LL	PL	PI
● 1	0.0 to 0.5 Ft.	SAND, silty, mostly fine-grained	2.5Y 4/2								
		sand-sized limestone, little fine to									
		medium-grained sand-sized shell, little									
		silt, dark grayish brown (SM)									

GRADATION CURVES

PROJECT	San Juan Harbor
	Condado Lagoon Mitigation
BORING NO.	SJH-LE-8A
BORING ELEV.	-1.8 Ft., PRVD02
DATE	6/23/2014

SAJ FORM 2087
JUN 02



Sample No.	Depth	Classification	Munsell	Visual % Shell (est)	$\%CO_3$	G_s	Org %	w_n	LL	PL	PI
● 2	1.0 to 1.4 Ft.	SAND, poorly-graded with silt, mostly fine-grained sand-sized limestone, some fine to medium-grained sand-sized shell, few silt, grayish brown (SP-SM)	2.5Y 5/2		65						

PROJECT San Juan Harbor
Condado Lagoon Mitigation
BORING NO. SJH-LE-8A
BORING ELEV. -1.8 Ft., PRVD02
DATE 6/23/2014

GRADATION CURVES

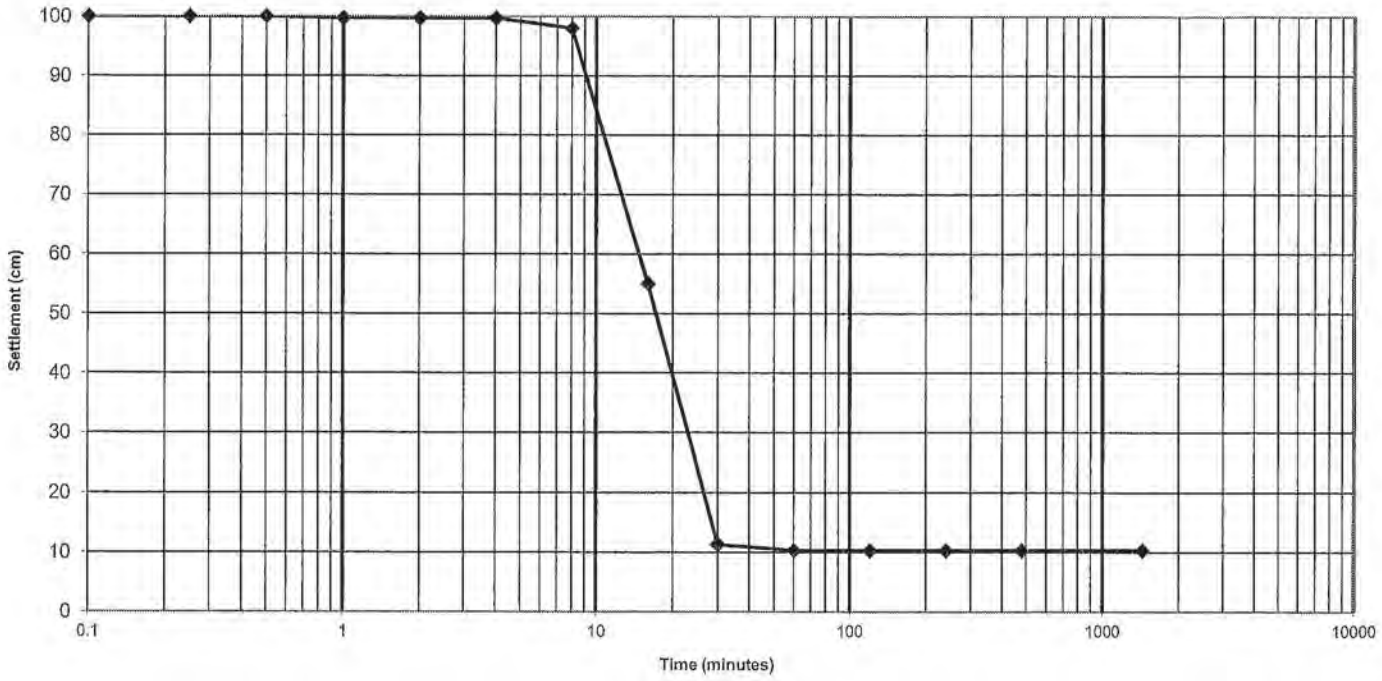
SAJ FORM 2087
JUN 02

amec

REPORT OF SETTLING RATE TESTING

PROJECT NO: 6738-14-5359
PROJECT: San Juan TO 102
CLIENT: USACE

Boring No.	SJH-LE-8A
Sample No.	2
Depth (ft)	1.0'
CONCENTRATION:	100 g/L



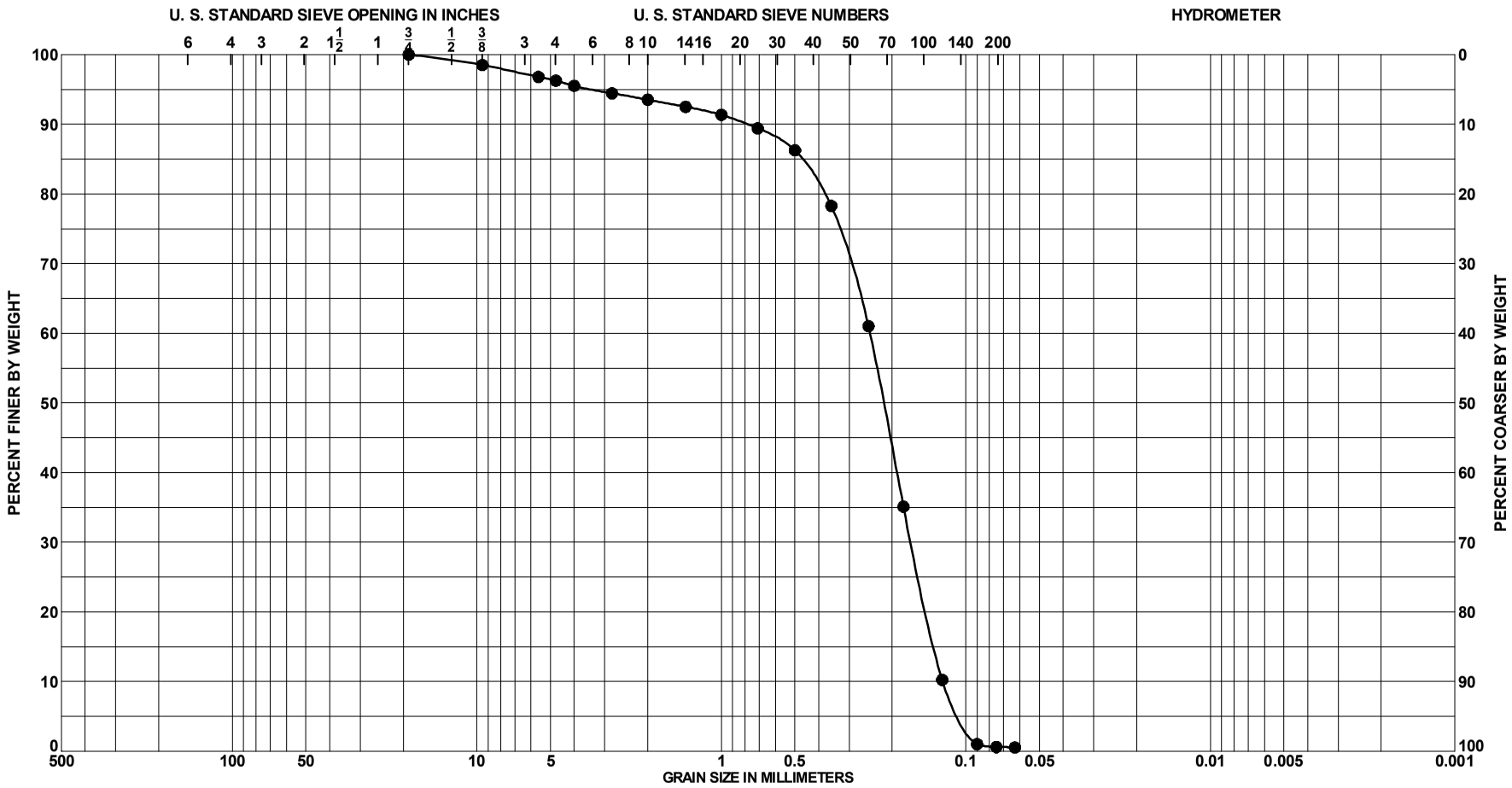
Sedimentation Rate Test COE Method

TIME (min)	INTERFACE (cm)	TIME (min)	INTERFACE (cm)
0.1	100.0	16	55.0
0.25	100.0	30	11.3
0.5	100.0	60	10.3
1	99.7	120	10.3
2	99.7	240	10.3
4	99.7	480	10.3
8	98.0	1440	10.3

Final Concentration: 970.874 g/L

Respectfully Submitted

Corey T. Chasdin, E.I.

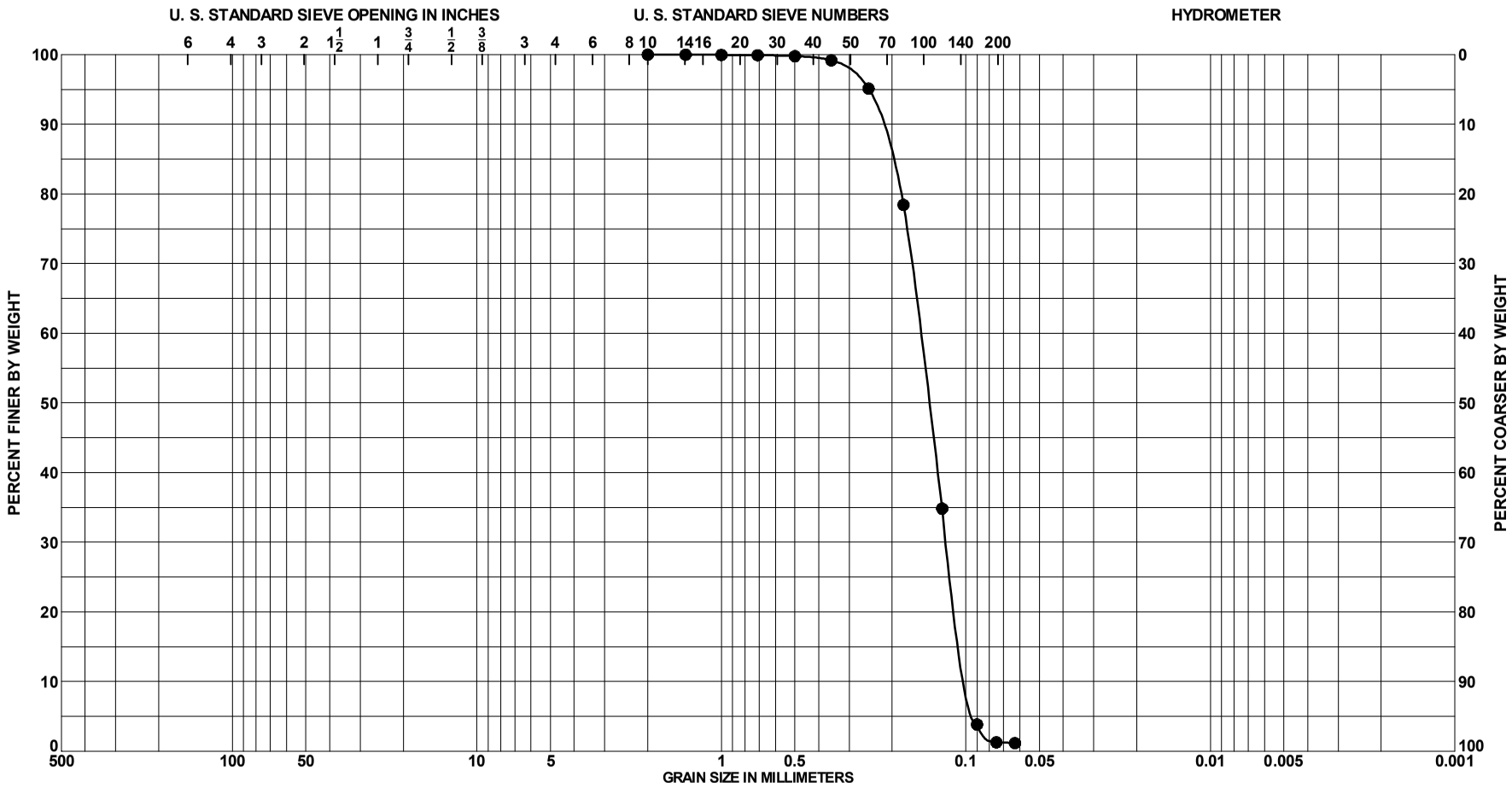


Sample No.	Depth	Classification	Munsell	Visual % Shell (est)	%CO_3	G_s	Org %	w_n	LL	PL	PI
● 1	0.0 to 1.1 Ft.	SAND, poorly-graded, mostly	2.5Y 5/3								
		fine-grained sa-si quartz, little fine to									
		med-grained sand-sized shell, few									
		med-grained sand-sized limestone,									
		light olive brown (SP)									

GRADATION CURVES

PROJECT	San Juan Harbor
	Condado Lagoon Mitigation
BORING NO.	SJH-LE-9
BORING ELEV.	1.4 Ft., PRVD02
DATE	6/23/2014

SAJ FORM 2087
JUN 02

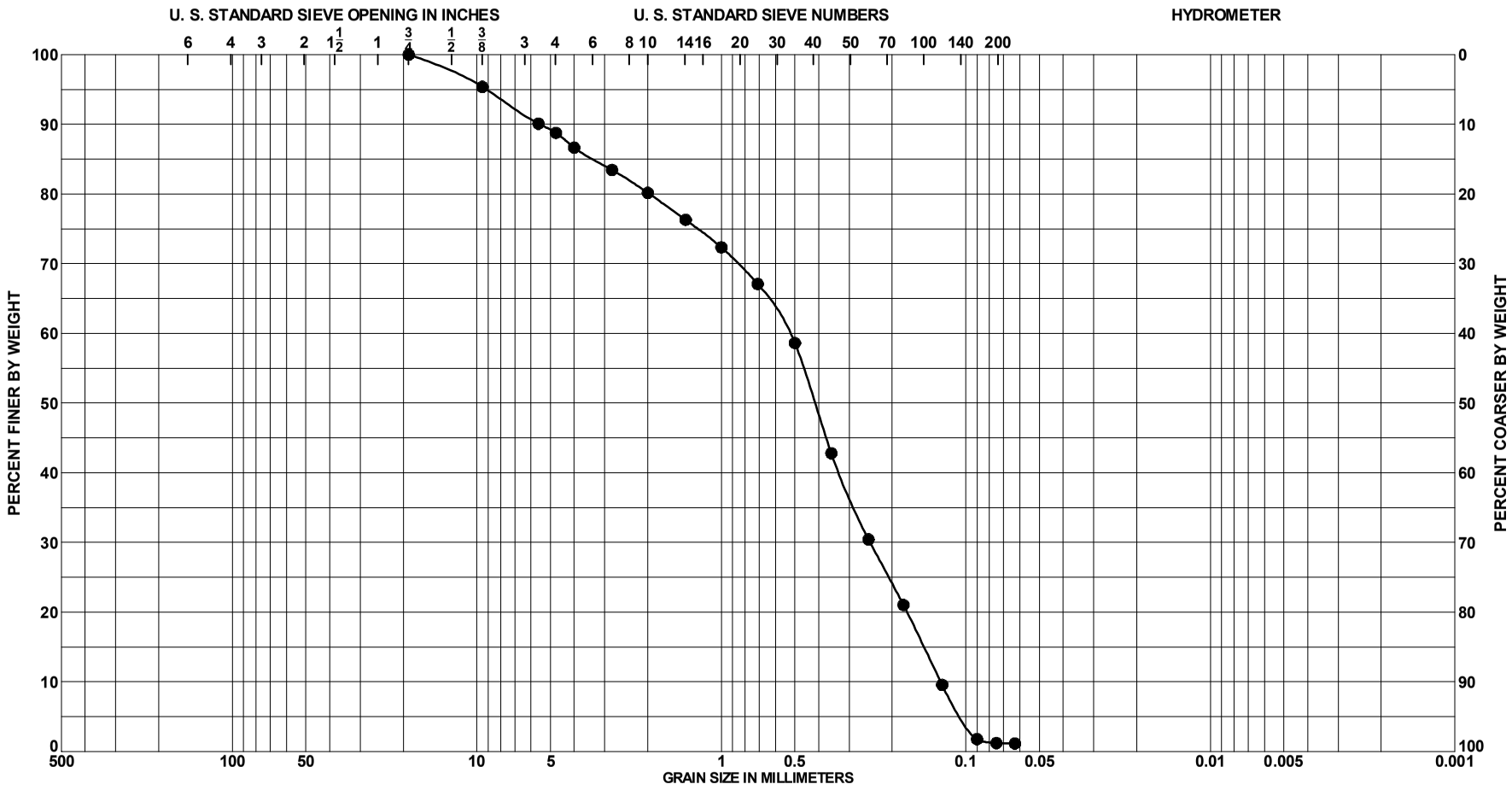


Sample No.	Depth	Classification	Munsell	Visual % Shell (est)	%CO_3	G_s	Org %	w_n	LL	PL	PI
● 2	1.2 to 2.2 Ft.	SAND, poorly-graded, mostly fine-grained sand-sized quartz, trace shell, trace silt, grayish brown (SP)	2.5Y 5/2		68						

GRADATION CURVES

PROJECT	San Juan Harbor
	Condado Lagoon Mitigation
BORING NO.	SJH-LE-9
BORING ELEV.	1.4 Ft., PRVD02
DATE	6/23/2014

SAJ FORM 2087
JUN 02

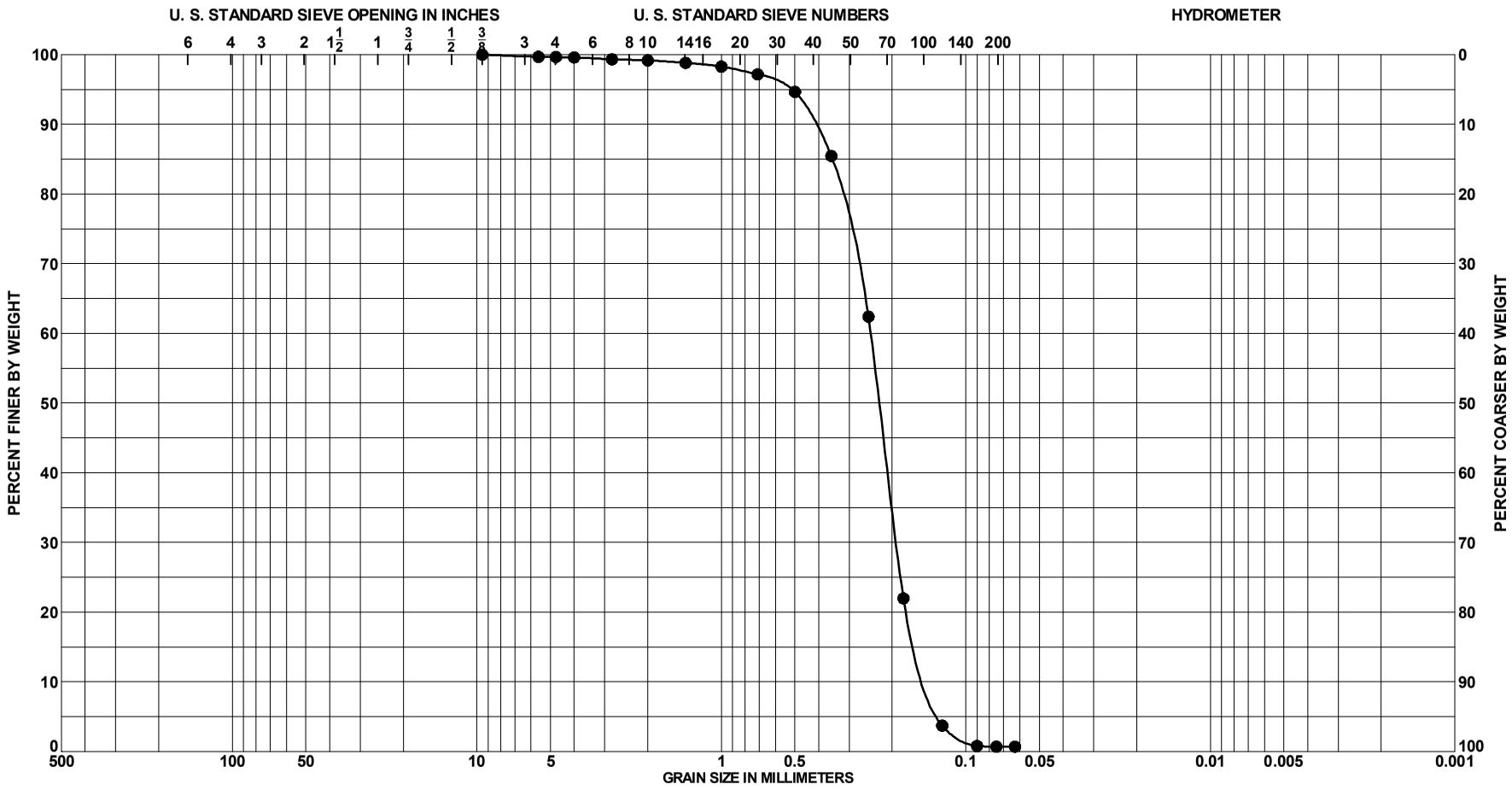


Sample No.	Depth	Classification	Munsell	Visual % Shell (est)	%CO_3	G_s	Org %	w_n	LL	PL	PI
● 3	2.6 to 3.6 Ft.	SAND, poorly-graded, mostly sand to gravel-sized shell, some fine-grained sand-sized quartz, trace silt, light olive brown (SP)	2.5Y 5/3								

GRADATION CURVES

PROJECT	San Juan Harbor
	Condado Lagoon Mitigation
BORING NO.	SJH-LE-9
BORING ELEV.	1.4 Ft., PRVD02
DATE	6/23/2014

SAJ FORM 2087
JUN 02



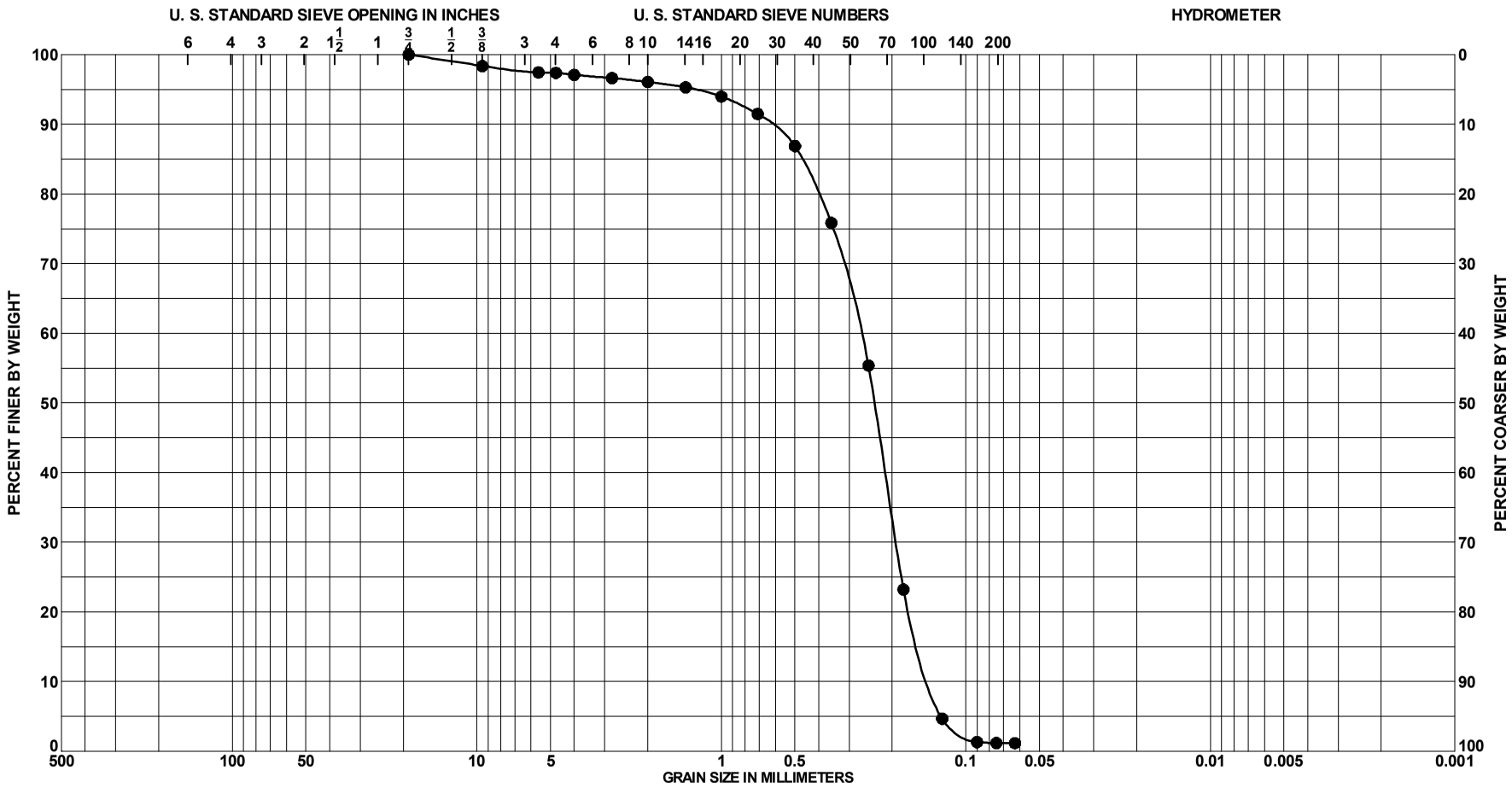
Sample No.	Depth	Classification	Munsell	Visual % Shell (est)	%CO_3	G_s	Org %	w_n	LL	PL	PI
● 1	0.2 to 1.5 Ft.	SAND, poorly-graded, mostly	2.5Y 5/2								
		fine-grained sand-sized quartz, little									
		fine to medium-grained sand-sized									
		shell, grayish brown (SP)									

GRADATION CURVES

PROJECT	San Juan Harbor
	Condado Lagoon Mitigation
BORING NO.	SJH-LE-10
BORING ELEV.	1.4 Ft., PRVD02
DATE	6/23/2014

SAJ FORM 2087
JUN 02

00 31 32-93



Sample No.	Depth	Classification	Munsell	Visual % Shell (est)	%CO_3	G_s	Org %	w_n	LL	PL	PI
● 2	2.0 to 2.6 Ft.	SAND, poorly-graded, mostly	2.5Y 5/2		60						
		fine-grained sand-sized quartz, some									
		fine to medium-grained sand-sized									
		shell, trace silt, grayish brown (SP)									

GRADATION CURVES

PROJECT	San Juan Harbor
	Condado Lagoon Mitigation
BORING NO.	SJH-LE-10
BORING ELEV.	1.4 Ft., PRVD02
DATE	6/23/2014

SAJ FORM 2087
JUN 02

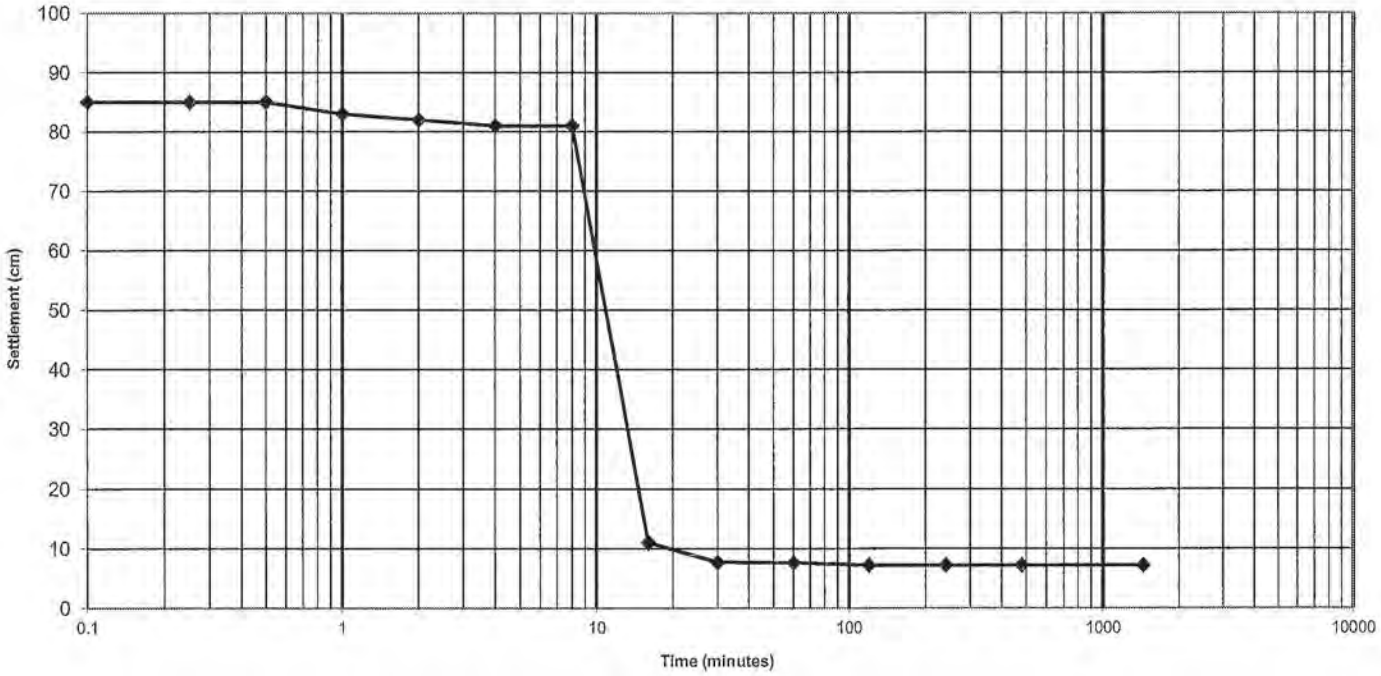
00 31 32-94

amec

REPORT OF SETTLING RATE TESTING

PROJECT NO: 6738-14-5359
PROJECT: San Juan TO 102
CLIENT: USACE

Boring No. SJH-LE-10
Sample No. 2
Depth (ft) 2.0'
CONCENTRATION: 100 g/L



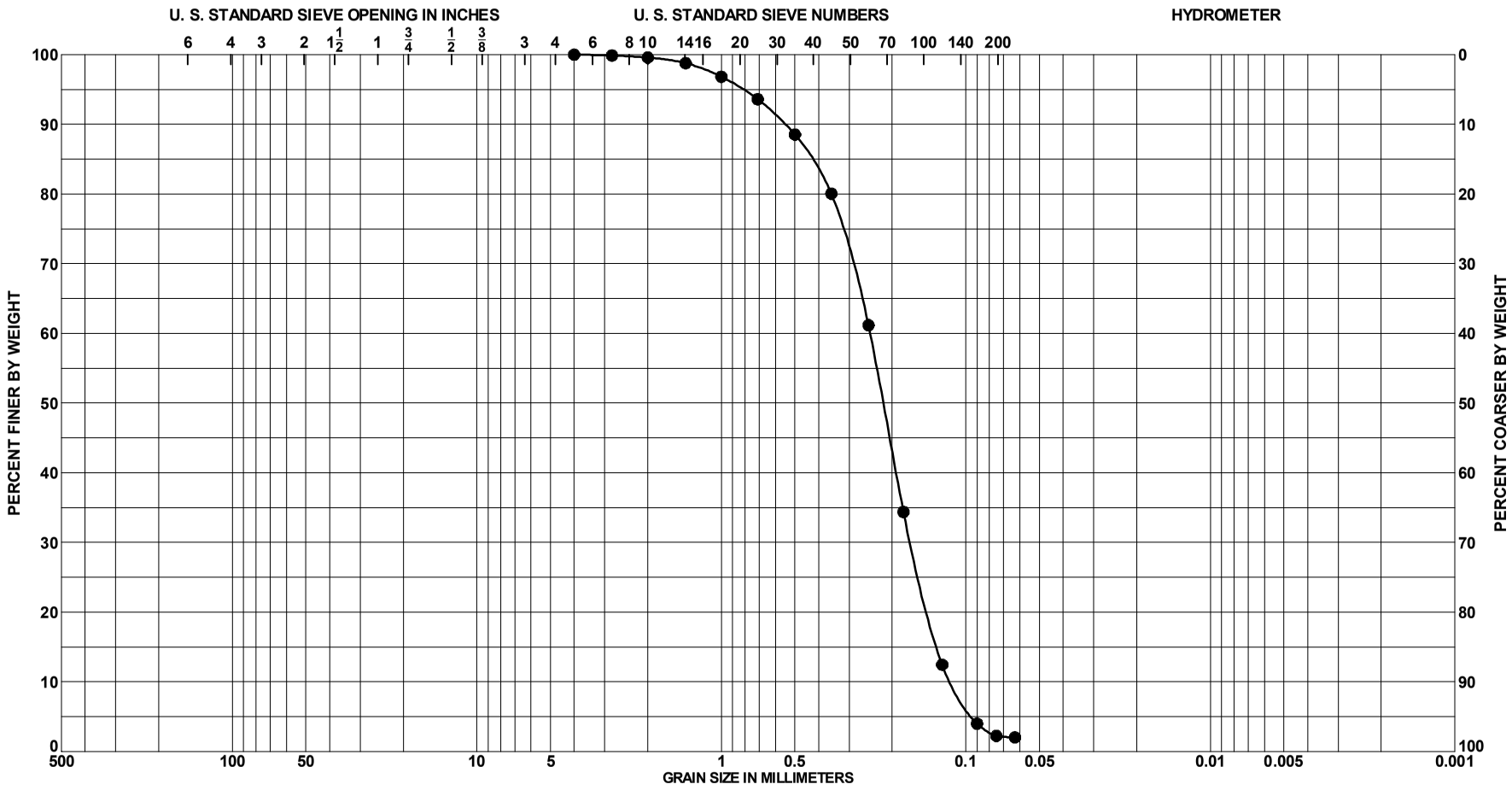
Sedimentation Rate Test COE Method

TIME (min)	INTERFACE (cm)	TIME (min)	INTERFACE (cm)
0.1	85.0	16	11.0
0.25	85.0	30	7.7
0.5	85.0	60	7.6
1	83.0	120	7.2
2	82.0	240	7.2
4	81.0	480	7.2
8	81.0	1440	7.2

Final Concentration: 1388.89 g/L

Respectfully Submitted

Corey T. Chason, E.I.

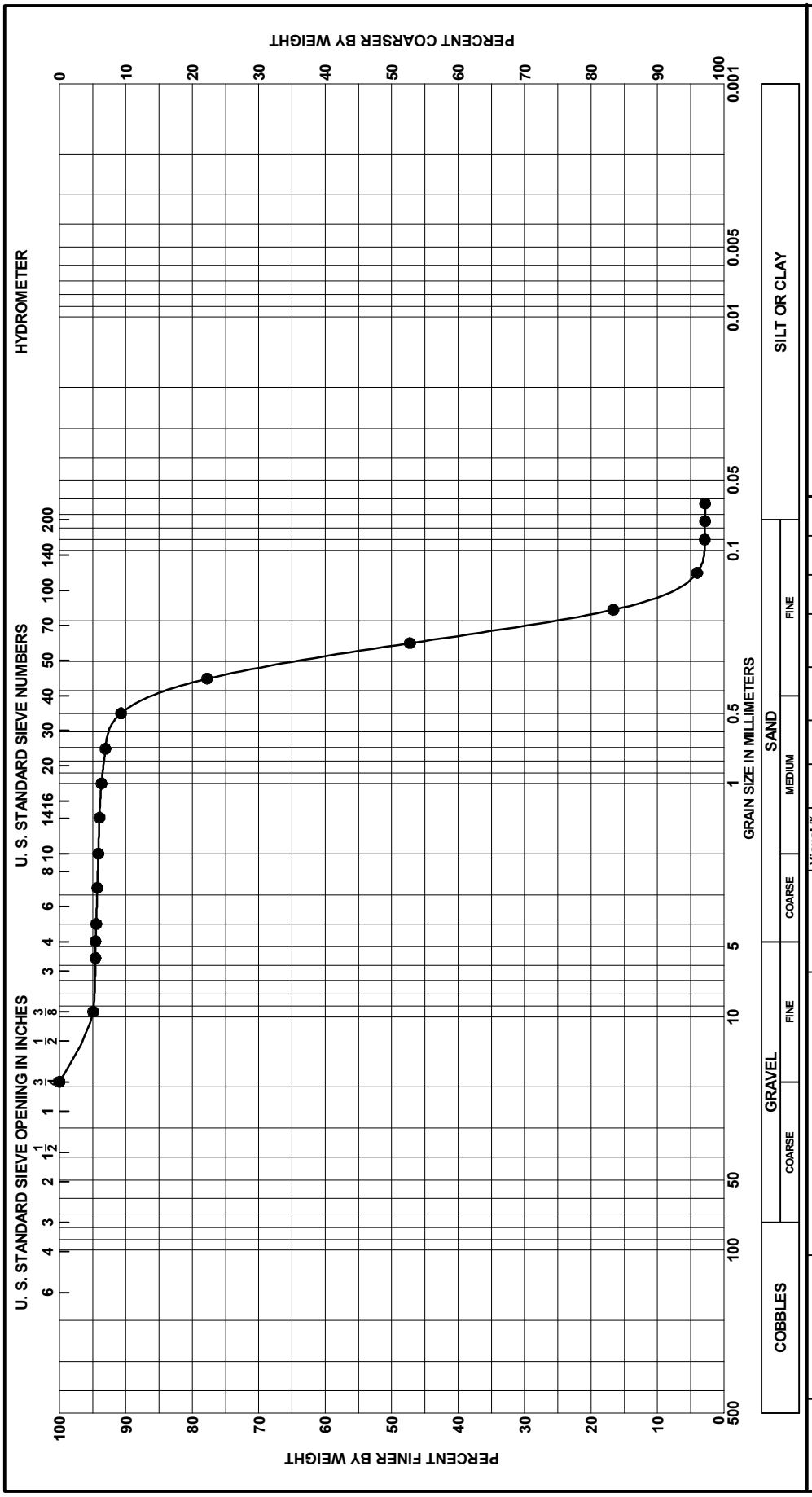


Sample No.	Depth	Classification	Munsell	Visual % Shell (est)	%CO_3	G_s	Org %	w_n	LL	PL	PI
● 3	2.9 to 3.4 Ft.	SAND, poorly-graded, mostly fine to medium-grained sand-sized shell, some fine-grained sand-sized quartz, trace silt, olive brown (SP)	2.5Y 4/3								

GRADATION CURVES

PROJECT	San Juan Harbor
	Condado Lagoon Mitigation
BORING NO.	SJH-LE-10
BORING ELEV.	1.4 Ft., PRVD02
DATE	6/23/2014

SAJ FORM 2087
JUN 02



Sample No.	Depth	Classification	Munsell	Visual % Shell (est)	%CO_3	G_s	Org %	w_n	LL	PL	PI
● 1	0.0 to 1.0 Ft.	SAND, poorly-graded, some sand to gravel-sized shell, some fine-grained sand-sized quartz, trace silt, grayish brown (SP)	2.5Y 5/2								

PROJECT San Juan Harbor
Condado Lagoon Mitigation
BORING NO. SJH-LE-13A
BORING ELEV. -1.4 Ft., PRVD02
DATE 6/23/2014

GRADATION CURVES

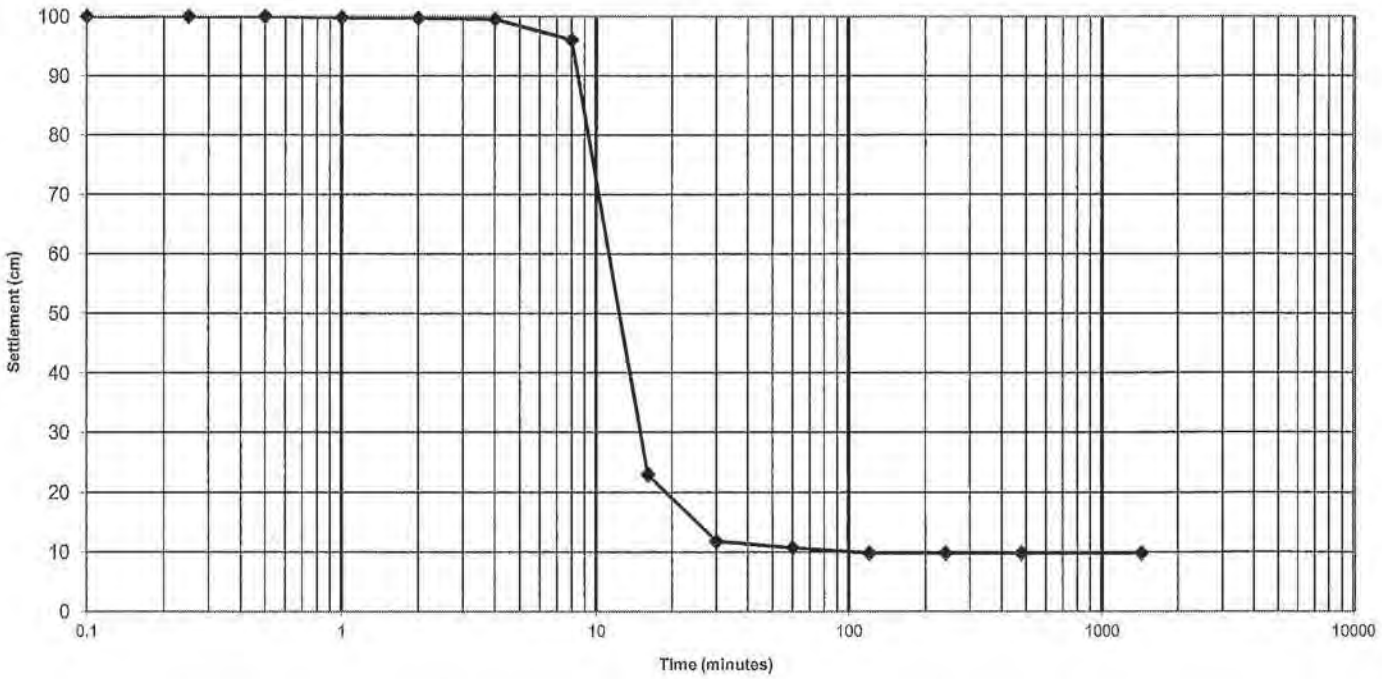
SAJ FORM 2087
JUN 02

amec

REPORT OF SETTLING RATE TESTING

PROJECT NO: 6738-14-5359
PROJECT: San Juan TO 102
CLIENT: USACE

Boring No. SJH-LE-13A
Sample No. 1
Depth (ft) 0.0'
CONCENTRATION: 100 g/L



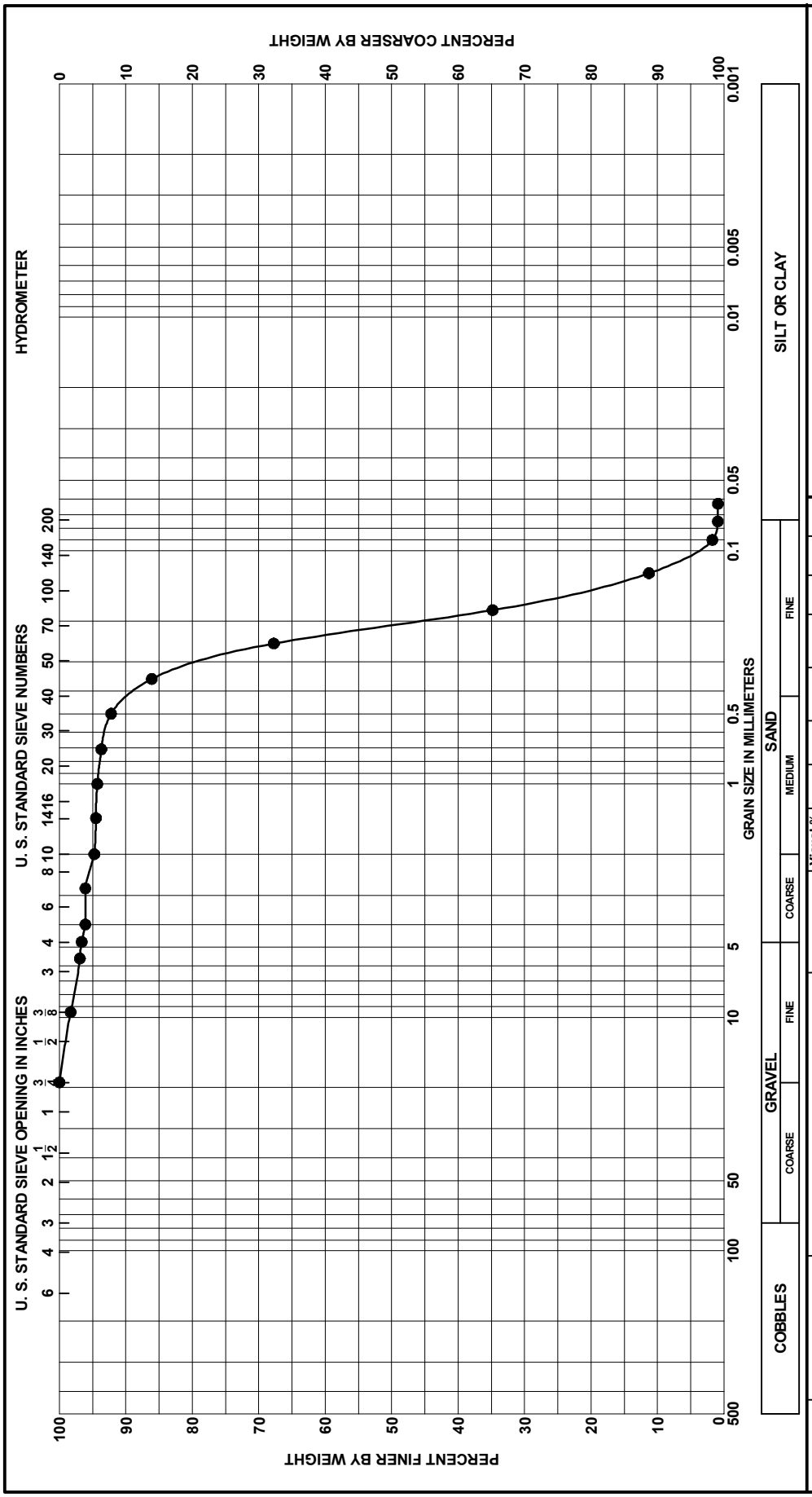
Sedimentation Rate Test COE Method

TIME (min)	INTERFACE (cm)	TIME (min)	INTERFACE (cm)
0.1	100.0	16	23.0
0.25	100.0	30	11.8
0.5	100.0	60	10.7
1	99.8	120	9.8
2	99.7	240	9.8
4	99.5	480	9.8
8	96.0	1440	9.8

Final Concentration: 1020.41 g/L

Respectfully Submitted

Corey T. Chaskin, E.I.

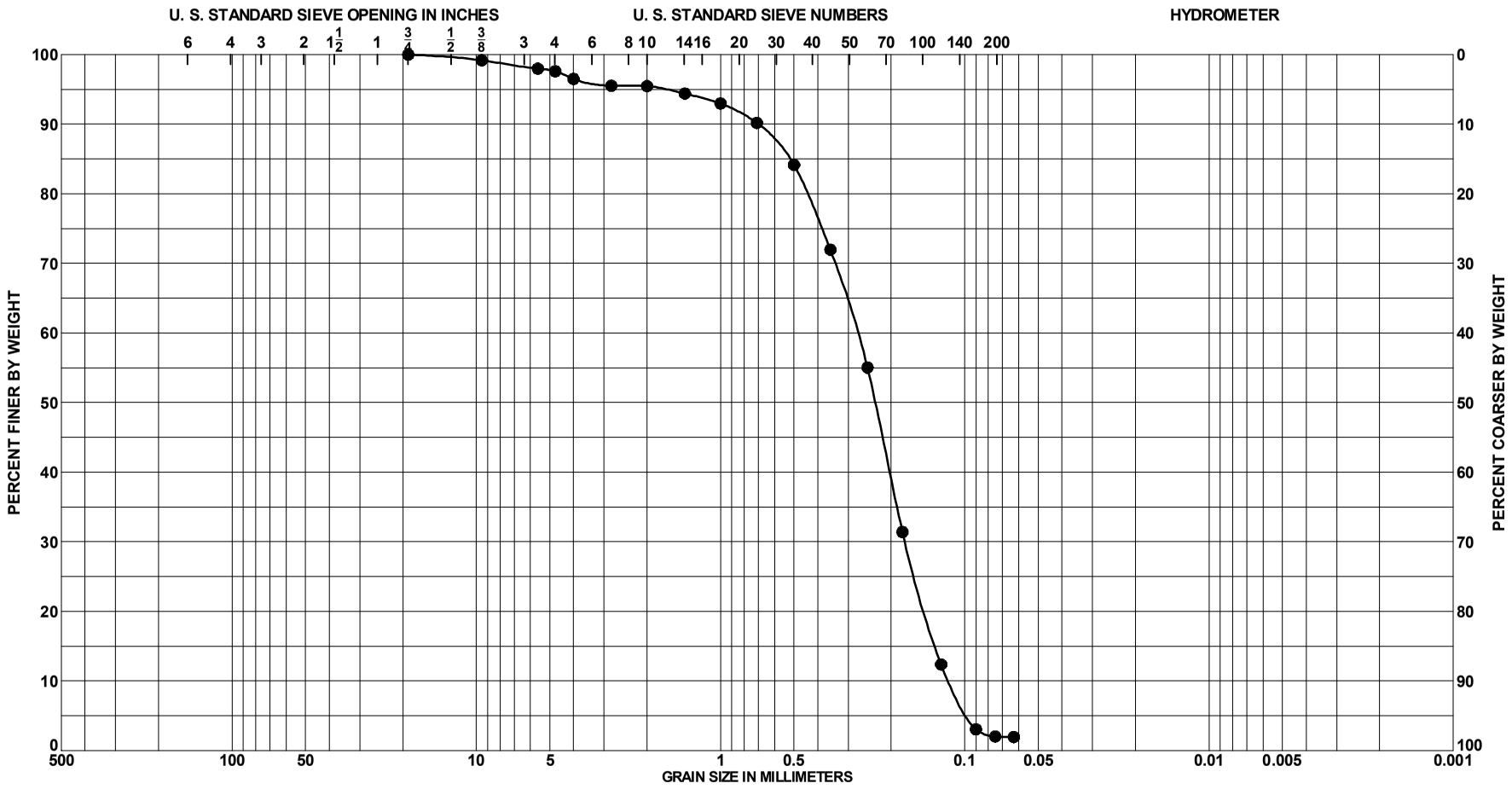


Sample No.	Depth	Classification	Munsell	Visual % Shell (est)	%CO_3	G_s	Org %	w_n	LL	PL	PI
● 1	0.0 to 1.0 Ft.	SAND, poorly-graded, mostly fine-grained sand-sized quartz, little fine to medium-grained sand-sized shell, light yellowish brown (SP)	2.5Y 6/3								

PROJECT	San Juan Harbor Condado Lagoon Mitigation
BORING NO.	SJH-LE-15A
BORING ELEV.	1.0 Ft., PRVD02
DATE	6/23/2014

GRADATION CURVES

SAJ FORM 2087
JUN 02

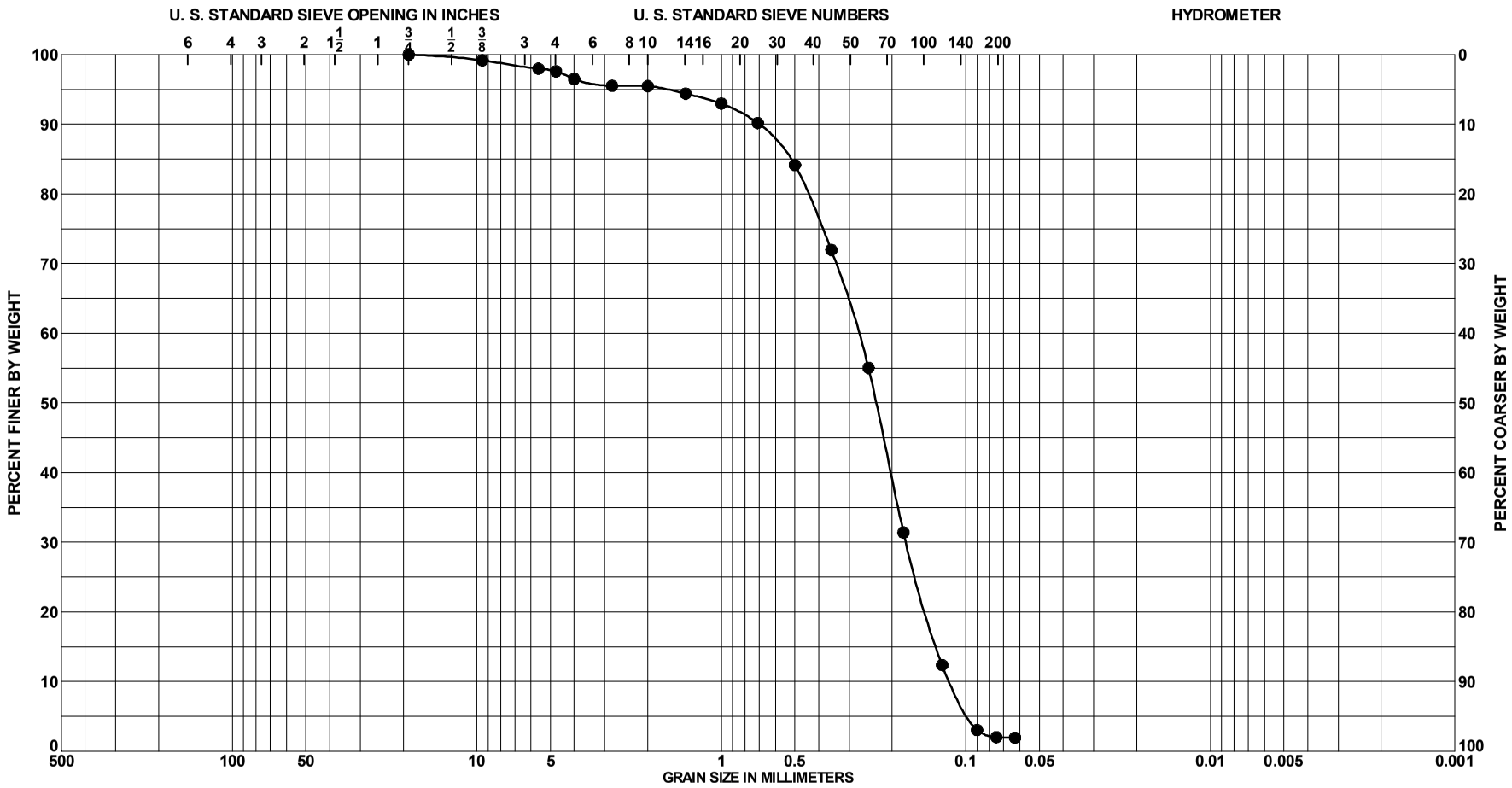


Sample No.	Depth	Classification	Munsell	Visual % Shell (est)	%CO_3	G_s	Org %	w_n	LL	PL	PI
● 2	1.2 to 2.0 Ft.	SAND, poorly-graded, mostly	2.5Y 5/2		69						
		fine-grained sand-sized quartz, some									
		fine to medium-grained sand-sized									
		shell, trace silt, grayish brown (SP)									

GRADATION CURVES

PROJECT	San Juan Harbor
	Condado Lagoon Mitigation
BORING NO.	SJH-LE-15A
BORING ELEV.	1.0 Ft., PRVD02
DATE	6/23/2014

SAJ FORM 2087
JUN 02

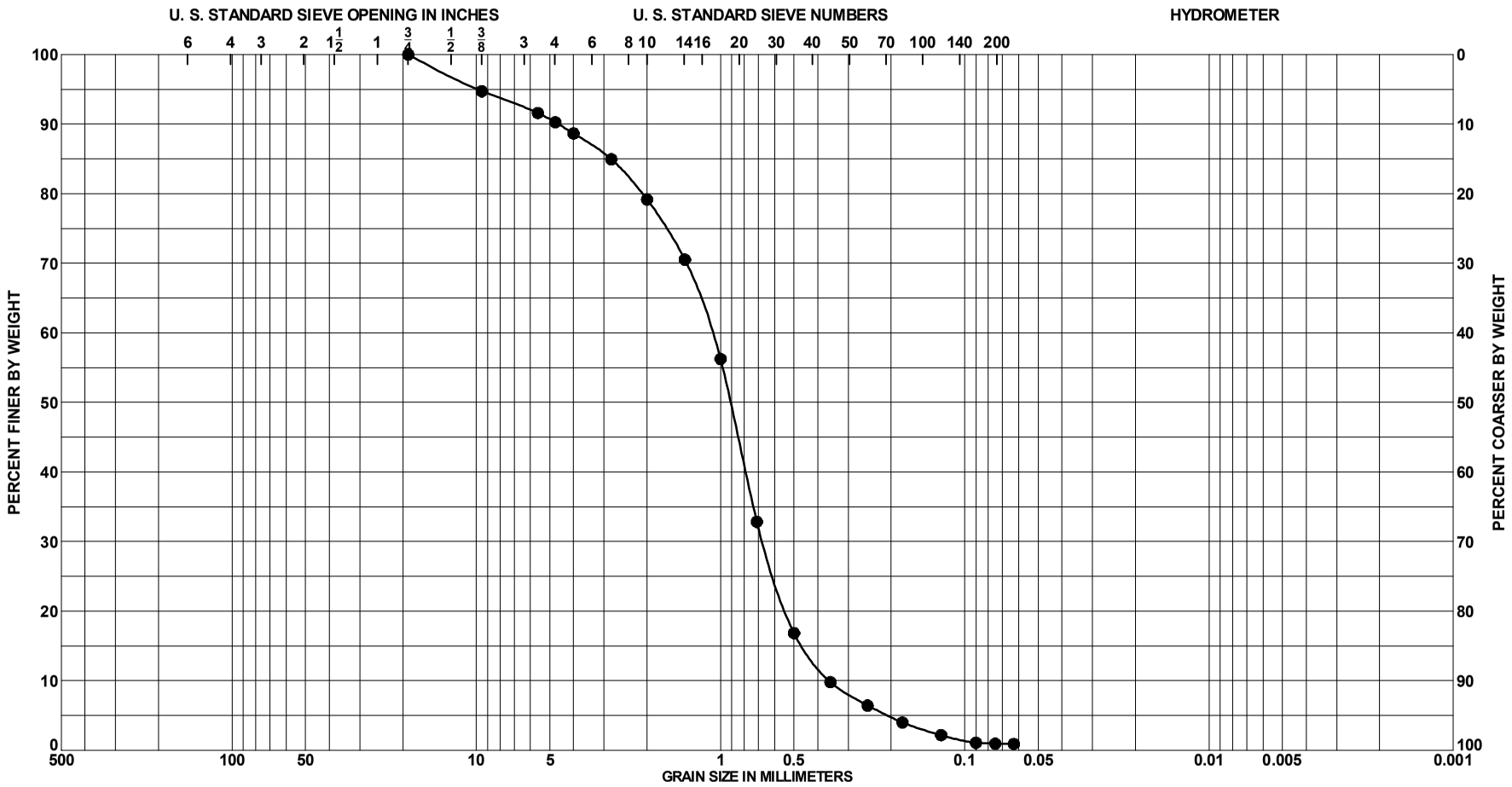


Sample No.	Depth	Classification	Munsell	Visual % Shell (est)	%CO_3	G_s	Org %	w_n	LL	PL	PI
● 3	2.2 to 3.8 Ft.	SAND, poorly-graded, mostly	2.5Y 5/2								
		fine-grained sand-sized quartz, some									
		fine to medium-grained sand-sized									
		shell, trace silt, grayish brown (SP)									

GRADATION CURVES

PROJECT	San Juan Harbor
	Condado Lagoon Mitigation
BORING NO.	SJH-LE-15A
BORING ELEV.	1.0 Ft., PRVD02
DATE	6/23/2014

SAJ FORM 2087
JUN 02



Sample No.	Depth	Classification	Munsell	Visual % Shell (est)	%CO_3	G_s	Org %	w_n	LL	PL	PI
● 1	0.0 to 1.0 Ft.	SAND, poorly-graded, mostly sand to	2.5Y 6/3								
		gravel-sized shell, few fine-grained									
		sand-sized quartz, light yellowish									
		brown (SP)									

GRADATION CURVES

PROJECT	San Juan Harbor
	Condado Lagoon Mitigation
BORING NO.	SJH-LE-17
BORING ELEV.	-1.3 Ft., PRVD02
DATE	6/23/2014

SAJ FORM 2087
JUN 02

amec

REPORT OF SETTLING RATE TESTING

PROJECT NO: 6738-14-5359
PROJECT: San Juan TO 102
CLIENT: USACE

Boring No. SJH-LE-17
Sample No. 1
Depth (ft) 0.0'
CONCENTRATION: 100 g/L

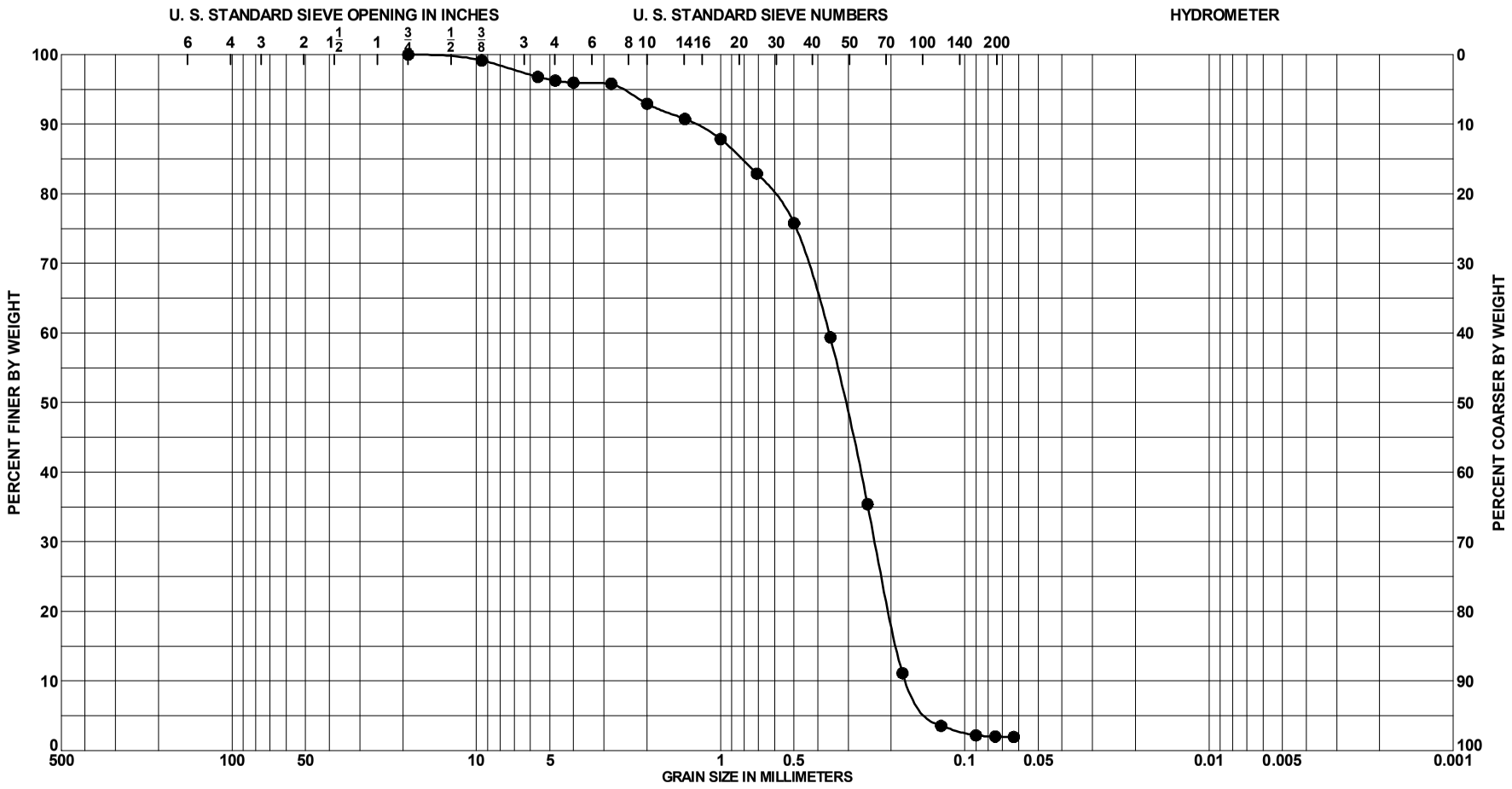
Sedimentation Rate Test COE Method

TIME (min)	INTERFACE (cm)	TIME (min)	INTERFACE (cm)
0.1	100.0	16	10.0
0.25	100.0	30	9.0
0.5	99.7	60	8.6
1	99.2	120	8.2
2	99.0	240	8.2
4	91.0	480	8.2
8	78.0	1440	8.2

Final Concentration: 1219.51 g/L

Respectfully Submitted

Corey T. Chaucin, E.I.

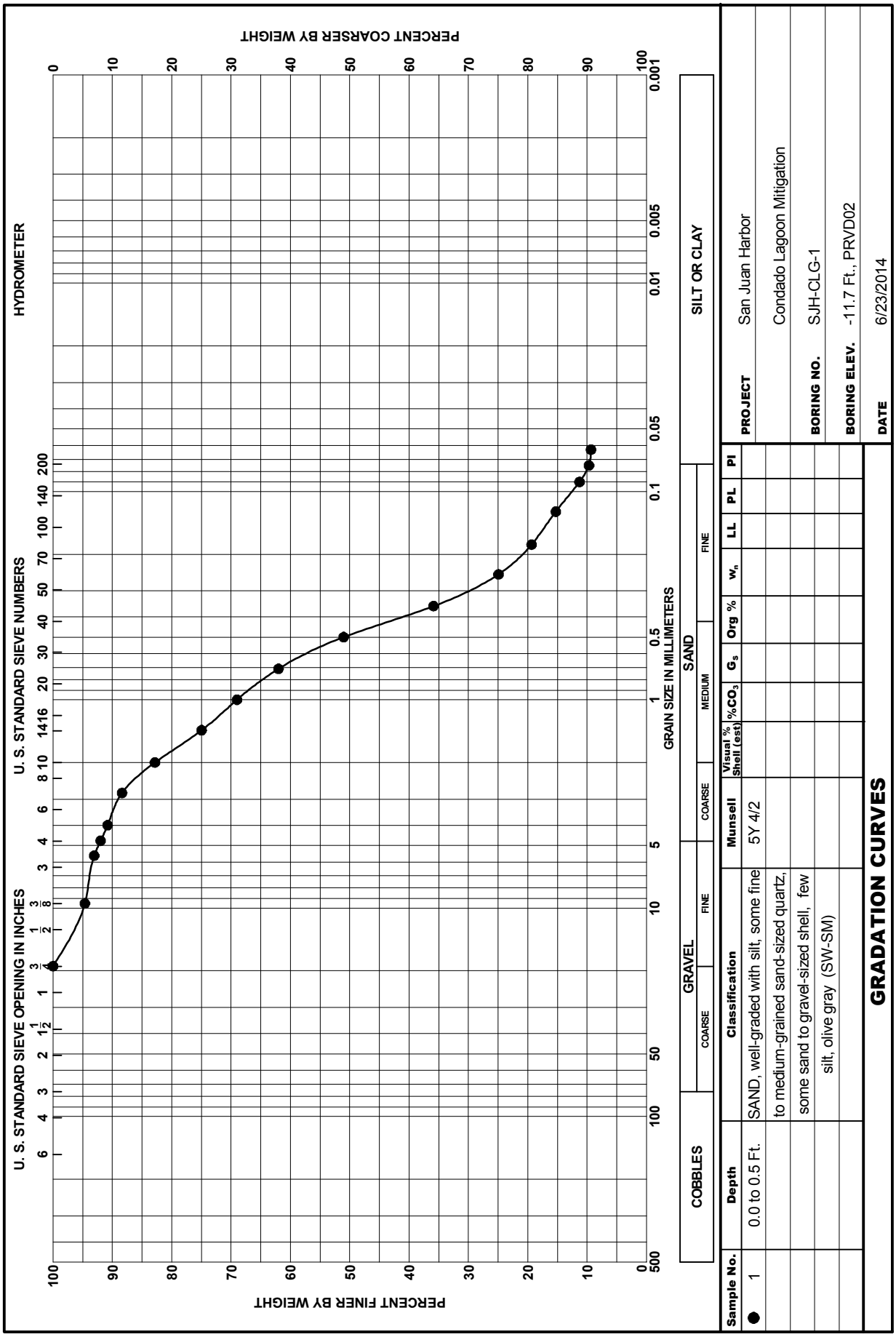


Sample No.	Depth	Classification	Munsell	Visual % Shell (est)	%CO_3	G_s	Org %	w_n	LL	PL	PI
● 2	1.6 to 1.8 Ft.	SAND, poorly-graded, mostly	2.5Y 5/2								
		fine-grained sand-sized quartz, some									
		fine to coarse-grained sand-sized									
		shell, trace silt, grayish brown (SP)									

GRADATION CURVES

PROJECT	San Juan Harbor
	Condado Lagoon Mitigation
BORING NO.	SJH-LE-17
BORING ELEV.	-1.3 Ft., PRVD02
DATE	6/23/2014

SAJ FORM 2087
JUN 02

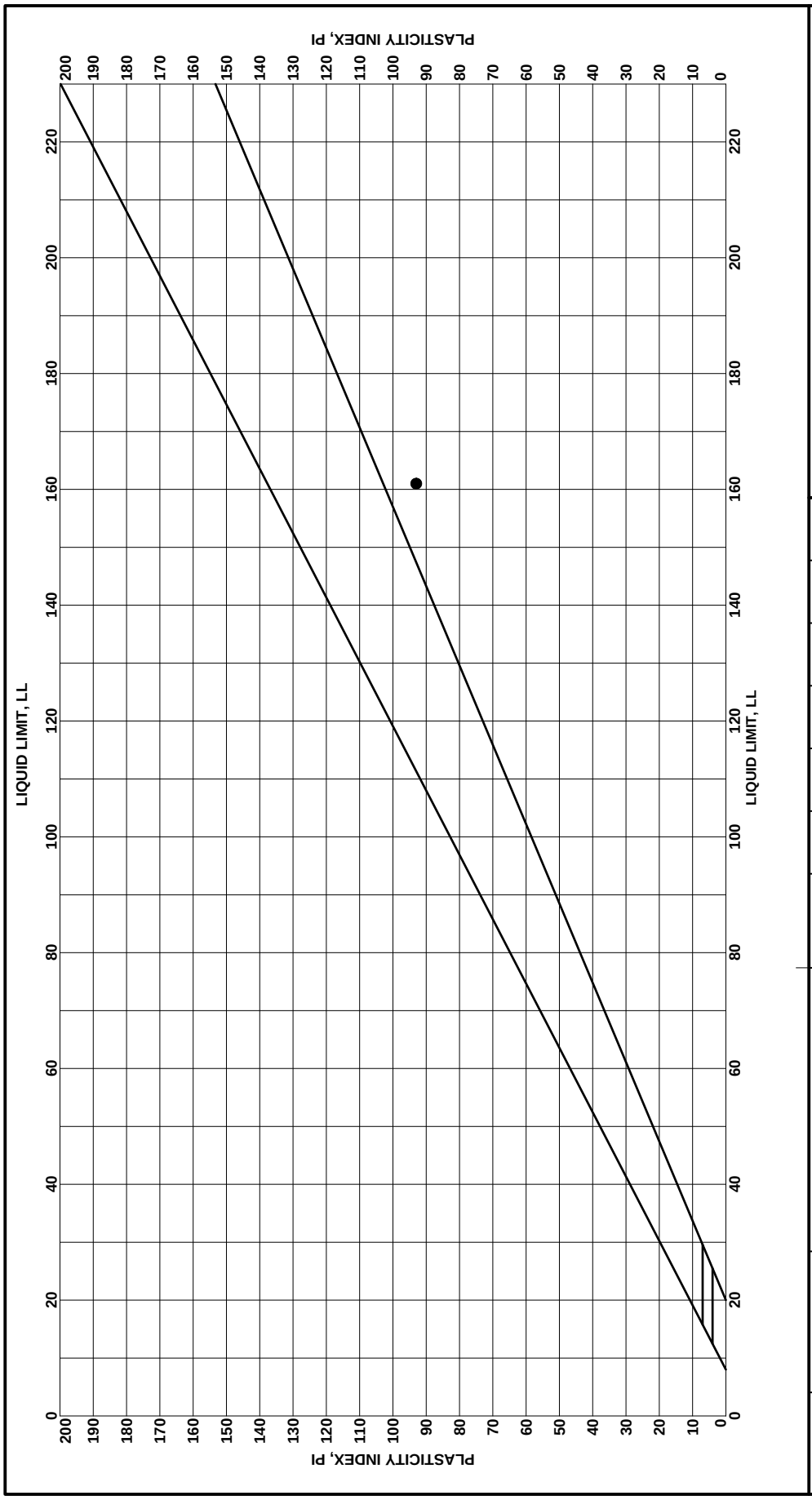


Sample No.	Depth	Classification	Munsell	Visual % Shell (est)	%CO_3	G_s	Org %	w_n	LL	PL	PI
● 1	0.0 to 0.5 Ft.	SAND, well-graded with silt, some fine to medium-grained sand-sized quartz, some sand to gravel-sized shell, few silt, olive gray (SW-SM)	5Y 4/2								

PROJECT San Juan Harbor
Condado Lagoon Mitigation
BORING NO. SJH-CLG-1
BORING ELEV. -11.7 Ft., PRVD02
DATE 6/23/2014

GRADATION CURVES

SAJ FORM 2087
JUN 02



Sample No.	Depth	Classification	CO_3 %	G_s	Org %	w_n	LL	PL	PI
● 1	0.0 to 0.5 Ft.	(MH)					161	68	93

PROJECT: San Juan Harbor
Condado Lagoon Mitigation
BORING NO.: SJH-CLG-2
BORING ELEV.: -33.26 Ft., PRVD02
DATE: 6/23/2014

PLASTICITY CHART

SAJ FORM 4334
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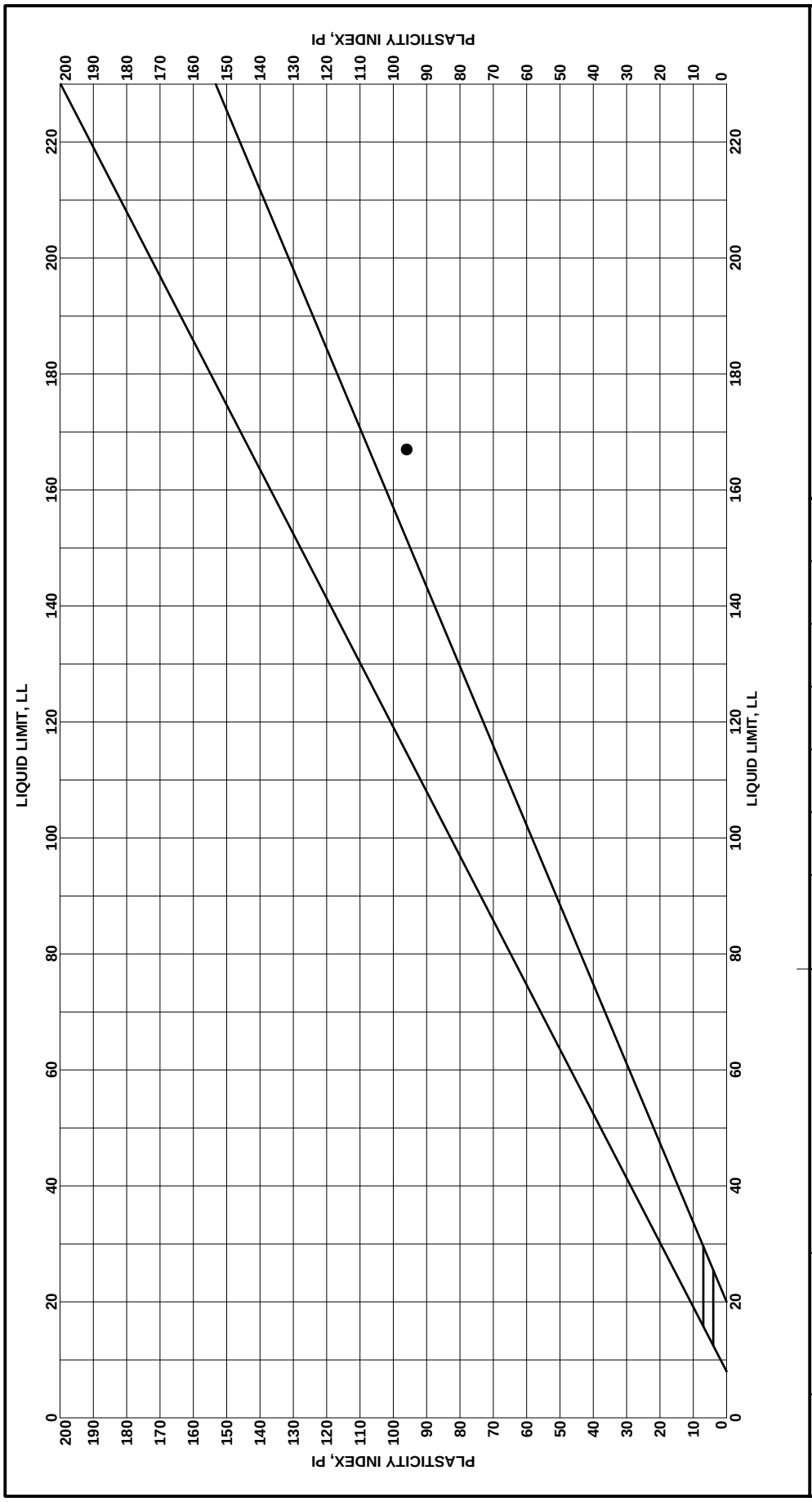


Sample No.	Depth	Classification	CO_3 %	G_s	Org %	w_n	LL	PL	PI
● 1	0.0 to 0.5 Ft.	(MH)			30		167	71	96

PLASTICITY CHART

PROJECT San Juan Harbor
Condado Lagoon Mitigation
BORING NO. SJH-CLG-3
BORING ELEV. -32.56 Ft., PRVD02
DATE 6/23/2014

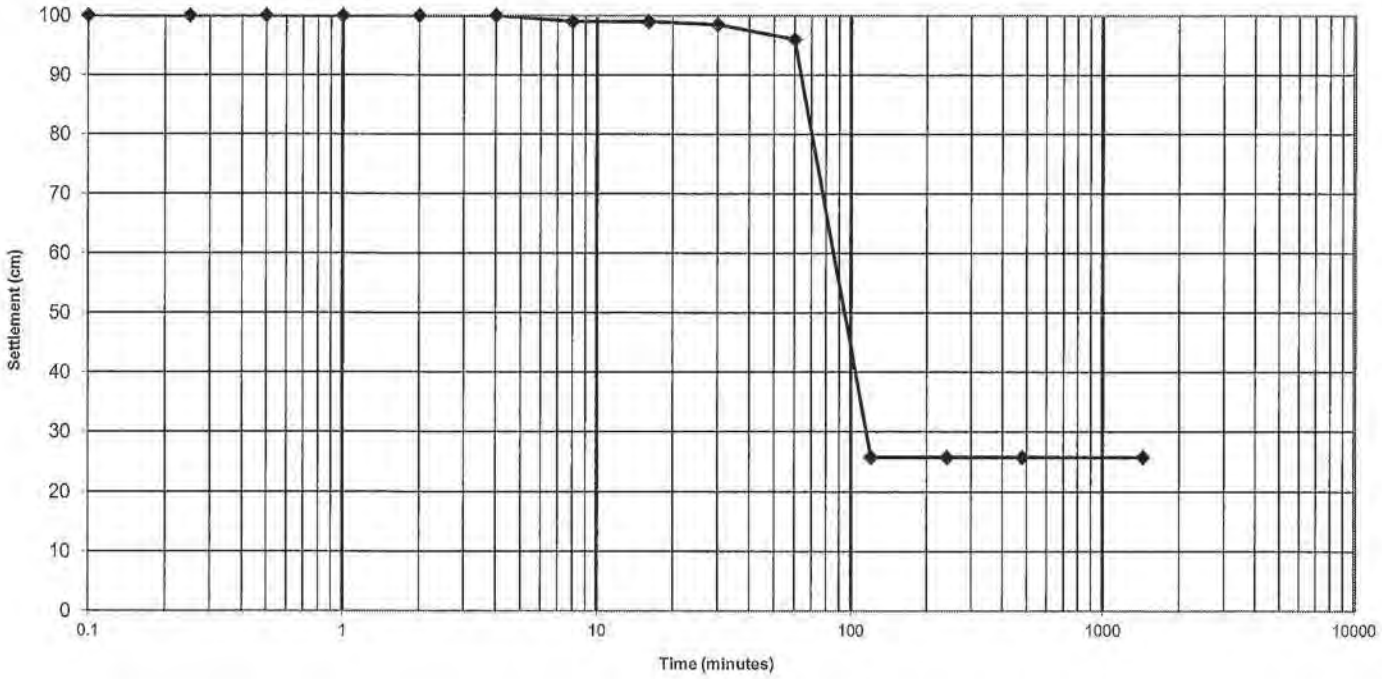
SAJ FORM 4334
JUN 02

amec

REPORT OF SETTLING RATE TESTING

PROJECT NO: 6738-14-5359
PROJECT: San Juan TO 102
CLIENT: USACE

Boring No.	SJH-CLG-3
Sample No.	1
Depth (ft)	33.9'
CONCENTRATION:	100 g/L



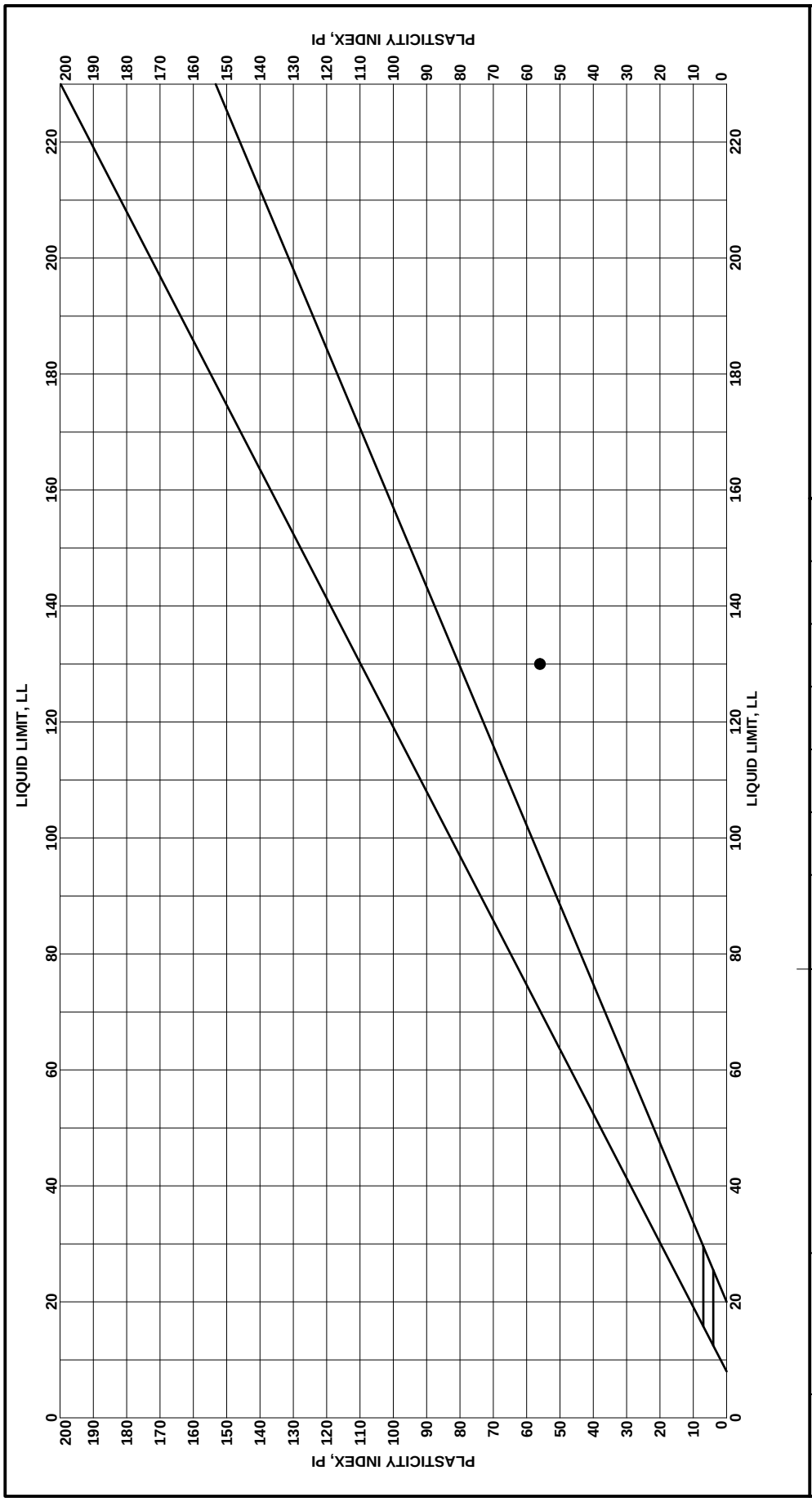
Sedimentation Rate Test COE Method

TIME (min)	INTERFACE (cm)	TIME (min)	INTERFACE (cm)
0.1	100.0	16	99.0
0.25	100.0	30	98.5
0.5	100.0	60	96.0
1	100.0	120	25.7
2	100.0	240	25.7
4	100.0	480	25.7
8	99.0	1440	25.7

Final Concentration: 389.105 g/L

Respectfully Submitted

Corey T. Chaplin, E.I.

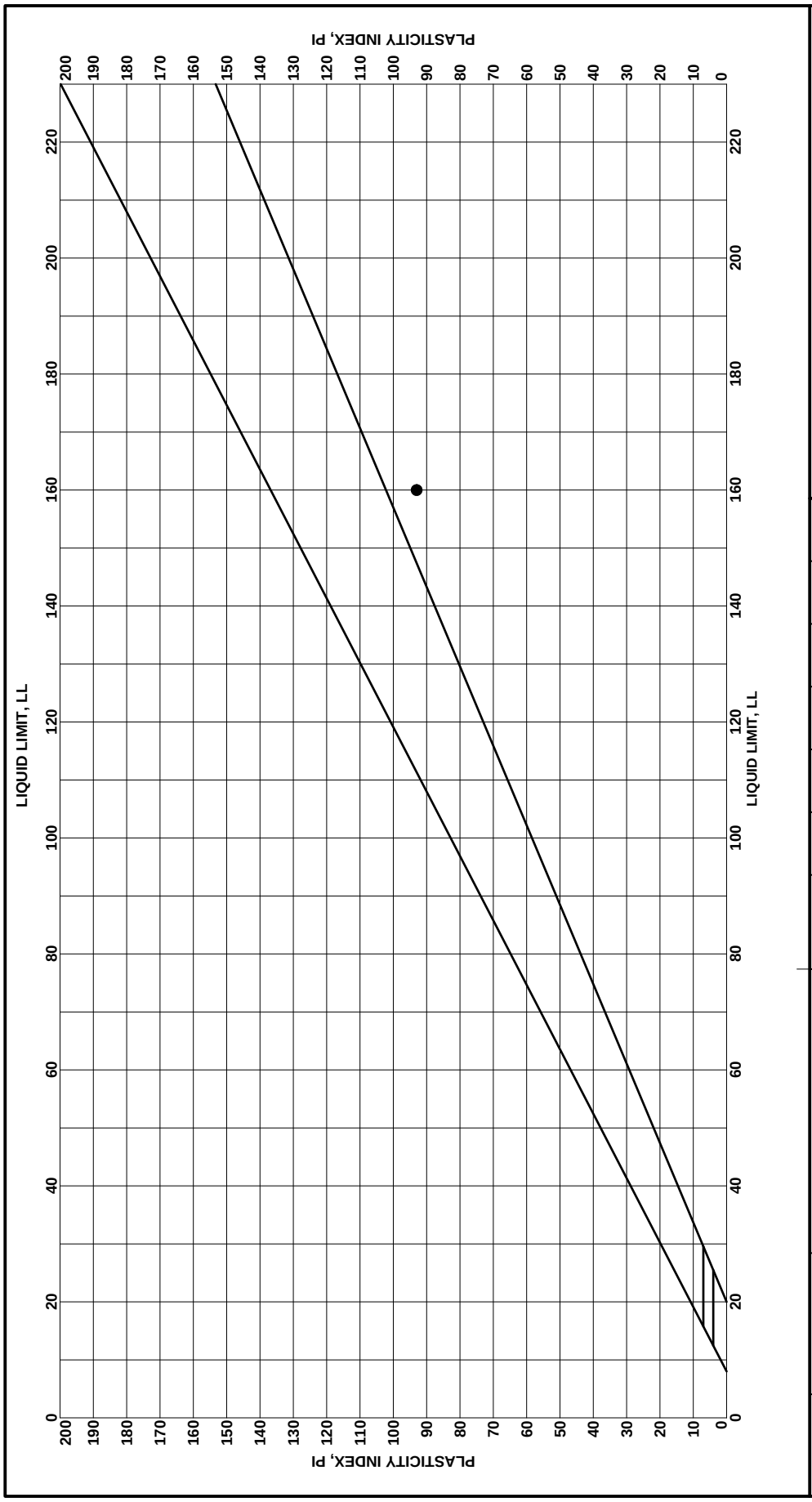


Sample No.	Depth	Classification	CO_3 %	G_s	Org %	w_n	LL	PL	PI
● 1	0.0 to 0.5 Ft.	(MH)					130	74	56

PLASTICITY CHART

PROJECT San Juan Harbor
Condado Lagoon Mitigation
BORING NO. SJH-CLG-4
BORING ELEV. -24.48 Ft., PRVD02
DATE 6/23/2014

SAJ FORM 4334
JUN 02



Sample No.	Depth	Classification	CO_3 %	G_s	Org %	w_n	LL	PL	PI
● 1	0.0 to 0.5 Ft.	(MH)			18		160	67	93

PLASTICITY CHART

PROJECT San Juan Harbor
Condado Lagoon Mitigation
BORING NO. SJH-CLG-6
BORING ELEV. -32 Ft., PRVD02
DATE 6/23/2014

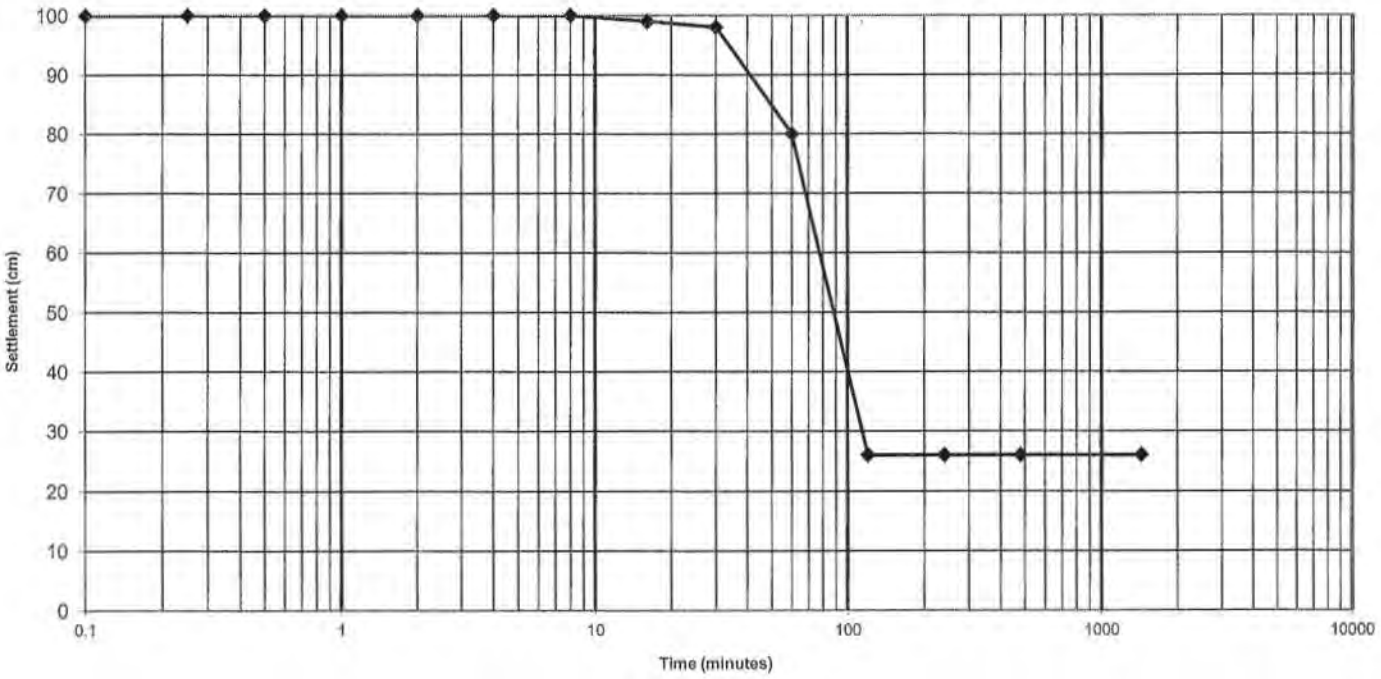
SAJ FORM 4334
JUN 02

amec

REPORT OF SETTLING RATE TESTING

PROJECT NO: 6738-14-5359
PROJECT: San Juan TO 102
CLIENT: USACE

Boring No. SJH-CLG-6
Sample No. 1
Depth (ft) 30.4'
CONCENTRATION: 100 g/L



Sedimentation Rate Test COE Method

TIME (min)	INTERFACE (cm)	TIME (min)	INTERFACE (cm)
0.1	100.0	16	99.0
0.25	100.0	30	98.0
0.5	100.0	60	80.0
1	100.0	120	26.0
2	100.0	240	26.0
4	100.0	480	26.0
8	100.0	1440	26.0

Final Concentration: 384.615 g/L

Respectfully Submitted

Corey T. Chaszin, E.I.