Appendix E

Manteo Section 204

Beneficial Use of Dredged Material for Oyster Restoration

Geotechnical Appendix

1.0 Introduction

The Manteo 204 Study area is located within northern Dare County, with its center lying 4.5 nautical miles southwest of Oregon Inlet and 6 nautical miles west of Pea Island (Figure E-1). The 17 mile square mile study area also includes the Old House Channel, Range No. 2. Old House Channel, Range No. 2 is approximately 5 miles long with an authorized depth of -12 feet MLLW with 1V to 3H side slopes (Figures E-2a and E-2b). The channel is dredged on average every two years. The area lies within Manteo-Shallowbag Bay, a back-barrier channel region that experiences diurnal tidal changes and seasonal storm overwash from the Atlantic Ocean. The extent of the Study Area was established based on its practical pumping distance of about 2 miles from the channel reach with a more significant shoaling rate than surrounding reaches.

The Manteo 204 Study goal is to recommend an environmentally sound dredge material disposal option that is both cost effective and will contribute to the State of North Carolina's restoration goals in the northern Pamlico Sound, while addressing with the Corps' dredging and disposal needs for Old House Channel, Range No. 2.

2.0 Geological Framework

The geologic history of the Manteo 204 Study Area and the Outer Banks of North Carolina has largely been influenced by fluctuating sea levels associated with glacial cycles over the past 1.5 million years (Dolan, 1986). Sea-level rise associated with glacial melt resulted in the flooding of paleo-coastal areas and the deposition of finer-grained, deeper-water sediments atop coarser-grained, near shore and land derived sediments. Conversely, sea-level fall associated with glacial freezing resulted in shoreline advancement seaward, and the deposition of coarser-grained sediments atop the finer-grained deep water derived sediments. Geochronologic dating of strata and fossil material indicate that there have been at least six major sea-level fluctuations (Wehmiller, 2006) within region during the Pleistocene Period alone (1.8 million years ago-100,000 years ago). When the last period of glaciation, the Wisconsin, ended 14,000 to 18,000 years ago, sea-level was 300 feet lower than it is today and the North Carolina shoreline was located 50-70 miles seaward of its current position (Dolan, 1986). During this period of sea-level, the shelf area was exposed weathering and erosional processes. Rivers and streams meandered across the exposed continental shelf, incising channels and created river deltas along position of the present-day shelf-break (Riggs, 2000, Buckner and other 2005). As the climate warmed during the Holocene Period (12,000 years ago to Present) and the glaciers melted, the sea-level rose and drowned the Pleistocene shoreline. Freshwater peat deposits, found near Cape Hatteras, are the result of the landward migration of the shoreline and barrier island complexes. Numerous post-glacial sea-level fluctuations driven by oceanographic (salinity, current flow and ocean temperature) and climatic changes (mini-ice ages) have resulted in multiple depositional and erosional events that have extensively modified the morphology of the nearby landforms (Riggs, 2000). The morphology of the nearby landforms, such as Pea-Island, is constrained by four main factors; the inherited rock/sediment types of older Pleistocene strata, the paleotopography from Pleistocene landscape, the physical dynamics of erosion (long shore and cross shore currents, wind-transport and storms), and human modification (Riggs and others, 2001).

3.0 Previous Subsurface Investigations

Subsurface investigations of sediment in the Old House Channel Range 2 are very limited. Some work was published in a research report, titled "A Scoping Study of the Distribution, Composition, and Dynamics of Water-Column and Bottom Sediments: Albemarle-Pamlico Estuarine System". This study was conducted in 1988 by John T. Wells for the University of North Carolina at Chapel Hill. Data for this study was analyzed from 3300 previous grab samples taken from the Albemarle – Pamlico estuarine system between the mid 1950's and the mid 1970's. The study area has not been explored recently; therefore it is unknown if there have been any significant changes from the historical sedimentation conditions that existed 30-years ago to those that exist today. Of the 3300 grab sample taken, 862 were subjected to sieve, pipette, or hydrometer analysis. Bottom sediment is primarily composed of fine sand. Modal grain sizes of the samples, following the Wentworth classification, range from 2ϕ to 4ϕ (0.25 mm - 0.0625 mm), while the percentage of calcium carbonate content (weight of shell fragments) ranges from 4 to 8%. Results of each sample taken in the area of interest were not reported in the study.

4.0 Methodology

For the purpose of this study, a subsurface investigation was performed using the USACE Vessel SNELL. The SNELL is fitted with a 3 7/8-inch diameter, 20-foot long, Alpine vibracore drill machine. The Vibracore drill machine consists of a metal barrel in which a plastic cylinder is inserted. After the plastic tube is inserted, a metal shoe is screwed onto the plastic tube and metal barrel. The shoe provides a cutting edge for the sampler and retains the plastic tube. An air-powered vibrator is mounted at the uppermost end of the vibracore barrel, and the vibrator and the vibracore barrel are mounted to a stand. The stand is lowered to the sediment surface by the SNELL's crane; the vibrator is activated and vibrates the vibracore barrel into the ocean bottom sediment. The disturbed sediment sample is retained in the plastic cylinder. All vibracore borings are drilled to a depth of 10 to 20 feet below the sediment surface, unless vibracore refusal is encountered. Vibracore refusal is defined as a penetration rate of less than 0.1 feet in 10 seconds. The SNELL's HYPACK navigation system is used to determine vibracore boring coordinates. Bottom elevation is determined by measuring water depth from the water line to the sediment surface, with water line datum as 0.0'. The tidal level is subtracted from the water depth to determine actual bottom elevation.

The sediment in the plastic cylinders recovered from vibracore drilling is delivered to the USACE Engineer Yard for sampling. The cylinders are cut open with a power saw and the material inside is visually classified. Samples are taken at 2 foot intervals or at each change of material, whichever is lesser. Vertical datum for a specific coring sample is determined by taking the actual bottom elevation (correlating to the top of the plastic cylinder) and subtracting from that the depth of the sample from the distance to the top of the cylinder. The samples are stored in jars for grain size testing at a USACE certified soils laboratory. Vibracore samples are disturbed samples and cannot be tested for strength properties. All samples are visually and laboratory classified in accordance with the Unified Soils Classification System (USCS) as required in Engineering Manual 1110-1-1804.

A particle-size analysis was conducted on each sample in general accordance with ASTM Standard D 422, "Standard Test Method for Particle-Size Analysis of Soils" using the following U.S. Standard sieve sizes: ¾", 3/8", No. 4, No. 7, No. 10, No. 14, No. 18, No. 25, No. 35, No. 45, No. 60, No. 80, No. 120, No. 170, No. 200 and No. 230 sieve. These samples were classified in accordance with ASTM Standard D 2487, "Classification of Soils for Engineering Purposes (Unified Soil Classification System)".

5.0 Subsurface Investigation Results

A total of 27 vibracore borings were drilled in the study area on 15 and 16 March 2010 (Figure 3). Borings were advanced to elevations between -8.6 to -34.5 feet MLLW (Table 1). The results of the field exploration are summarized in soil boring logs, starting on page E-20 of this appendix. The results of the laboratory testing are presented on the grain size analysis sheets, summarized on the boring logs, and provided in Table E-2. The soil type boundaries presented in the boring logs are approximate and may be more gradual than shown. Figures E-4a - E-4c and Figure E- 6 show various soil cross sections in the Old House Channel, Range 2 and the dredged disposal and reef construction area.

5.1 Old House Channel, Range 2

The materials encountered in the northern portion of Old House Channel, Range 2 (MAN-10-V-23, MAN-10-V-24, MAN-10-V-26, and MAN-10-V-27), generally consist of fine sand (SP) and fine sand with silt (SP-SM). This material is suitable for use in the oyster reef construction because the composite percent silt content is less than 10%. The materials encountered in the southern portion of Old House Channel, Range 2 (MAN-10-V-16, MAN-10-V-17, MAN-10-V-18, MAN-10-V-21, and MAN-10-V-22) generally consists of fine sand (SP), fine sand with silt (SP-SM), silty fine sand (SM), and elastic silt with sand (MH). This material is not suited for use in the study area. See Figure E- 3, A – A' for channel soil profile boring location.

5.2 Dredged Material Disposal and Reef Construction Area

The material encountered in the recommended disposal and reef construction area (MAN-10-V- 01, MAN-10-V-2, MAN-10-V-5, and MAN-10-V-6) generally consists of fine sand (SP). The materials encountered in the unusable placement area (MAN-10-V-04, MAN-10-V-08, MAN-10-V-10, MAN-10-V-13, and MAN-10-V-15) generally consists of fine sand (SP), fine sand with silt (SP-SM), silty fine sand (SM), and elastic silt with sand (MH). Soil profile borings locations in the vicinity of the recommended reef area are shown in Figure E-3, B – B', while soil profile borings locations in the vicinity of the unusable placement area are shown in Figure E-3, C – C'.

6.0 Recommendations

Based on the limited sampling and testing, the composite silt content was used as a determinate in the oyster reef placement (Table E-3). Samples with a composite silt percentage of less than 10% were considered acceptable for placing heavier loads (i.e., rock, riprap, and confined material) at those boring locations. Also, samples with a composite silt percentage of 15% or less were considered acceptable for

use of material placed inside reef containment structures. The oyster reef placement should be located in general proximity to the borings MAN-10-V-1, MAN-10-V-2, MAN-10-V-05, MAN-10-V-06, and MAN-10-V-08 (Figure E-5). Based on Material dredged from Old House Channel, Range 2, and utilized for the oyster reef placement would be limited to boring areas MAN-10-V-18, MAN-10-V-23, MAN-10-V-24, MAN-10-V-26, and MAN-10-V-27. These borings have high sand, low silt content. However, future dredging along Old House Channel (Range 2) is likely to concentrate on shoaling "hot spots" where silt content would be lower. Additional soil sampling is recommended in the Design & Implementation phase to obtain undisturbed samples when a finalized design is presented. Analysis of the undisturbed soil samples will determine quantitative values for compressibility, strength, and settlement.

The soil samples collected for this project are disturbed samples and are used for identifying soil types only. The soil in the study area consists mainly of fine sand with some silt. This type of soil generally performs well under stresses and strains applied by large loads; however, compressibility and strength values cannot be determined from disturbed samples and therefore was not quantified due to insufficient information from the collected soil samples.

If geotubes or riprap is to be used for this project, minor settlement may occur. A settlement analysis was not performed on the tested samples, so some settlement may occur when larger loads are placed on this type of soil. This is not expected to be enough to have a negative impact on the geotubes, riprap, or the confined material placed inside. In order to more accurately determine settlement, additional data is needed to quantify the amount of expected settlement.

Sources Cited:

Buckner, M., Mallinson, D., Riggs, S., Thieler, R., Foster, D., 2005, Quaternary Seismic Stratigraphy of the Southern Albemarle Embayment: The Sequence Stratigraphic Response to Evolving Paleotopography, Geological Society of America, Abstracts with Programs, Volume 37, Issue 2, p. 16.

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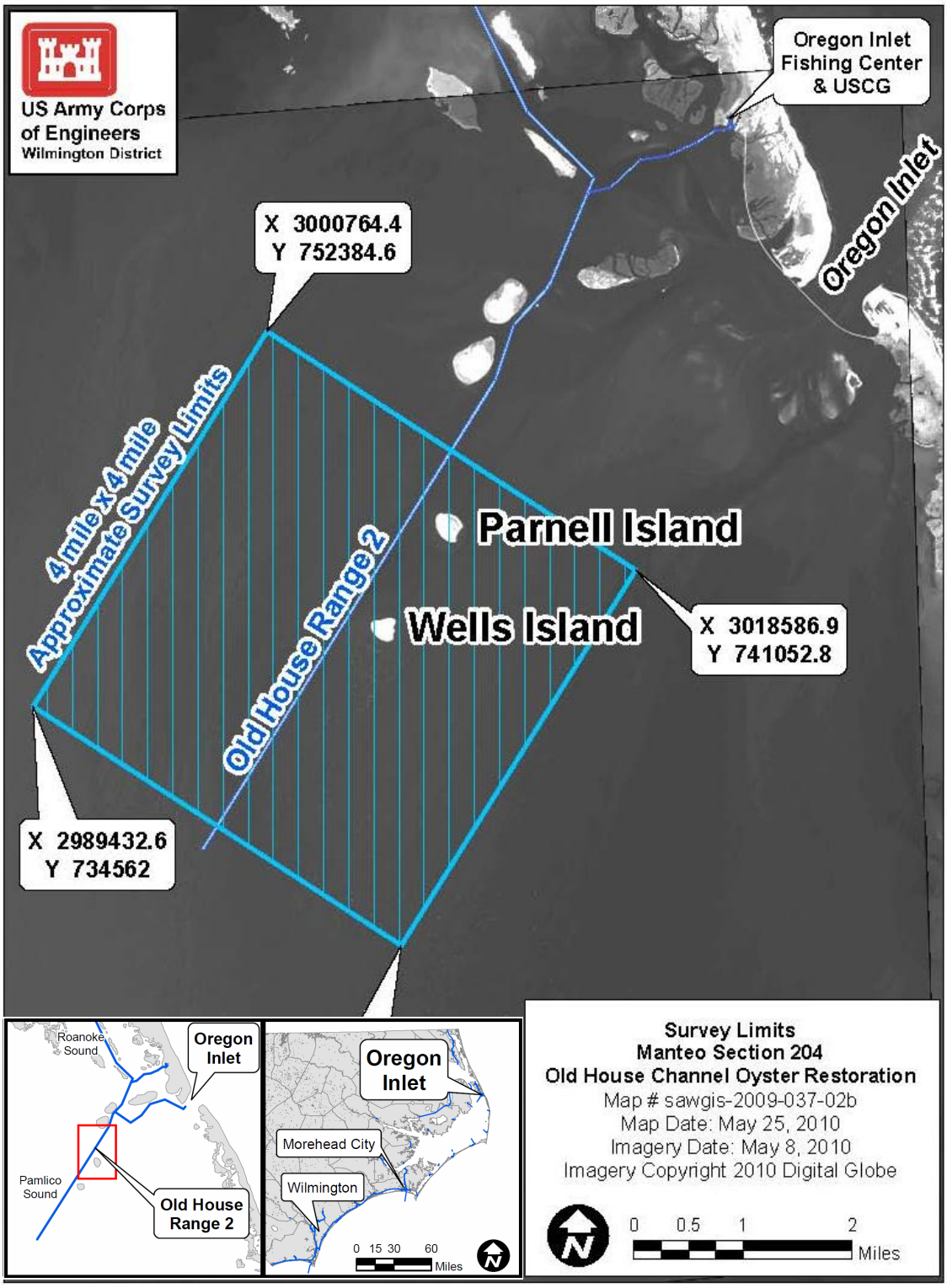


Figure E-1. Manteo 204 Study Area

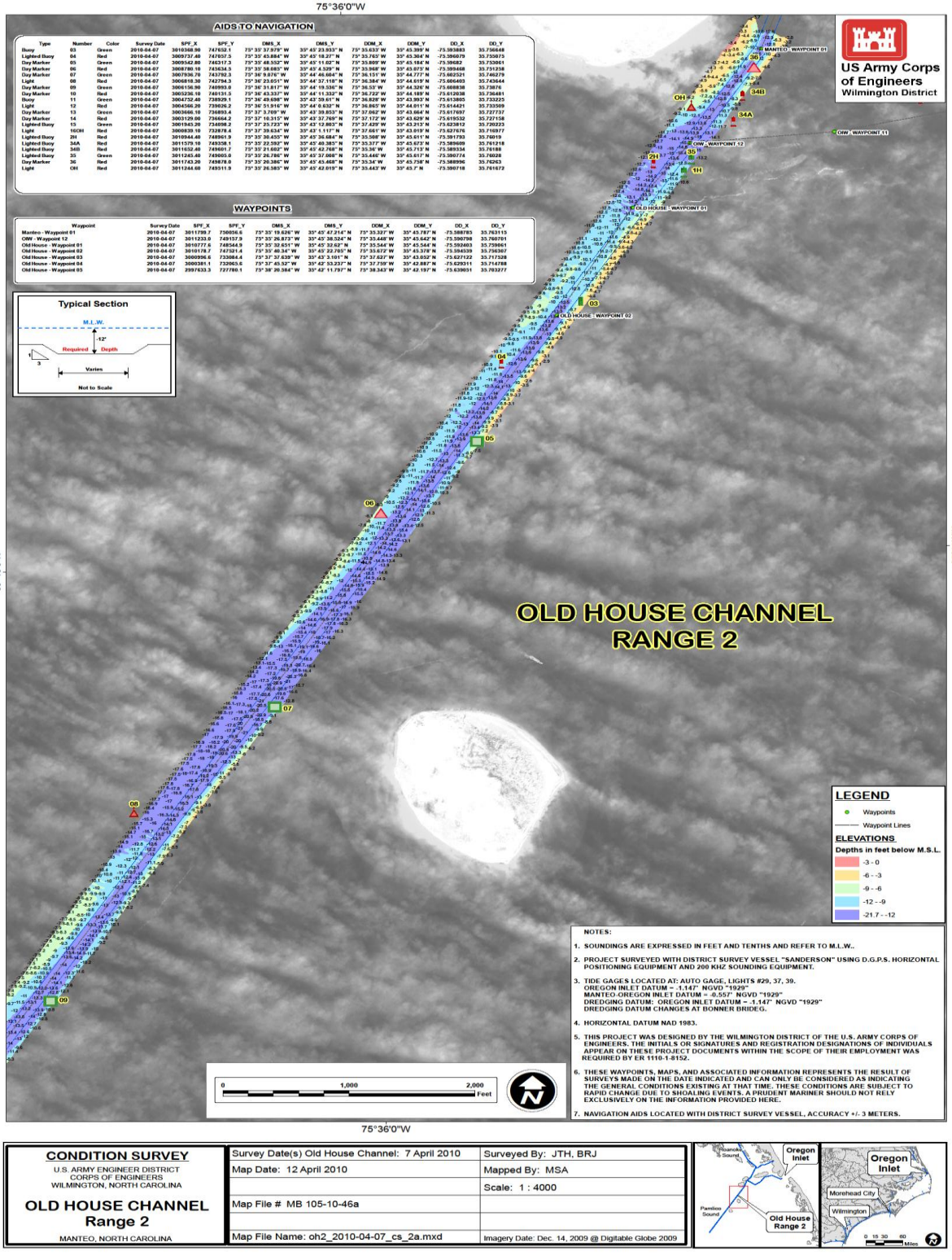


Figure 2a. Old House Channel Range #2 Station 0+00 – 84+00

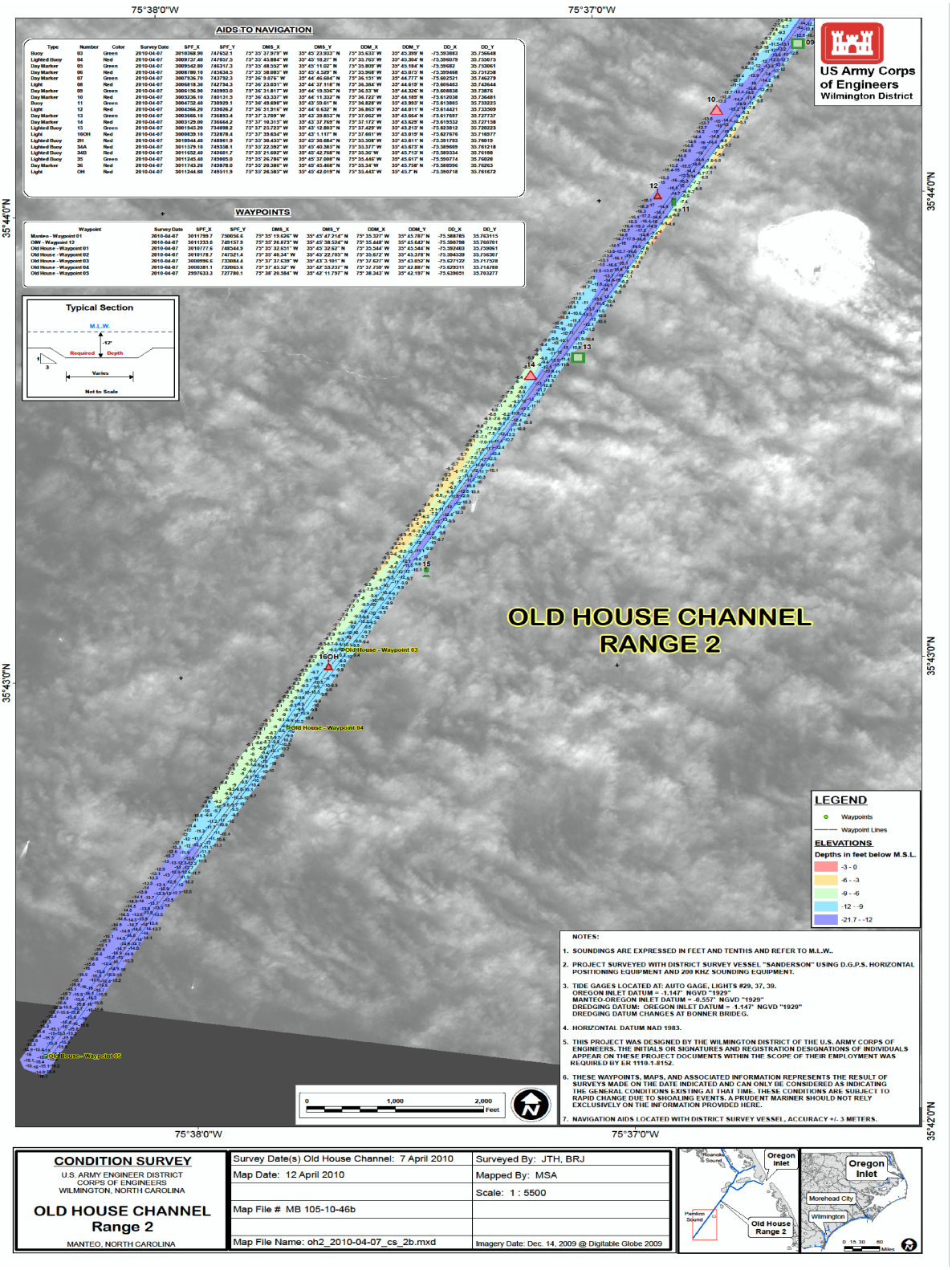


Figure 2b. Old House Channel Range #2 Station 84+00 – 263+99.5

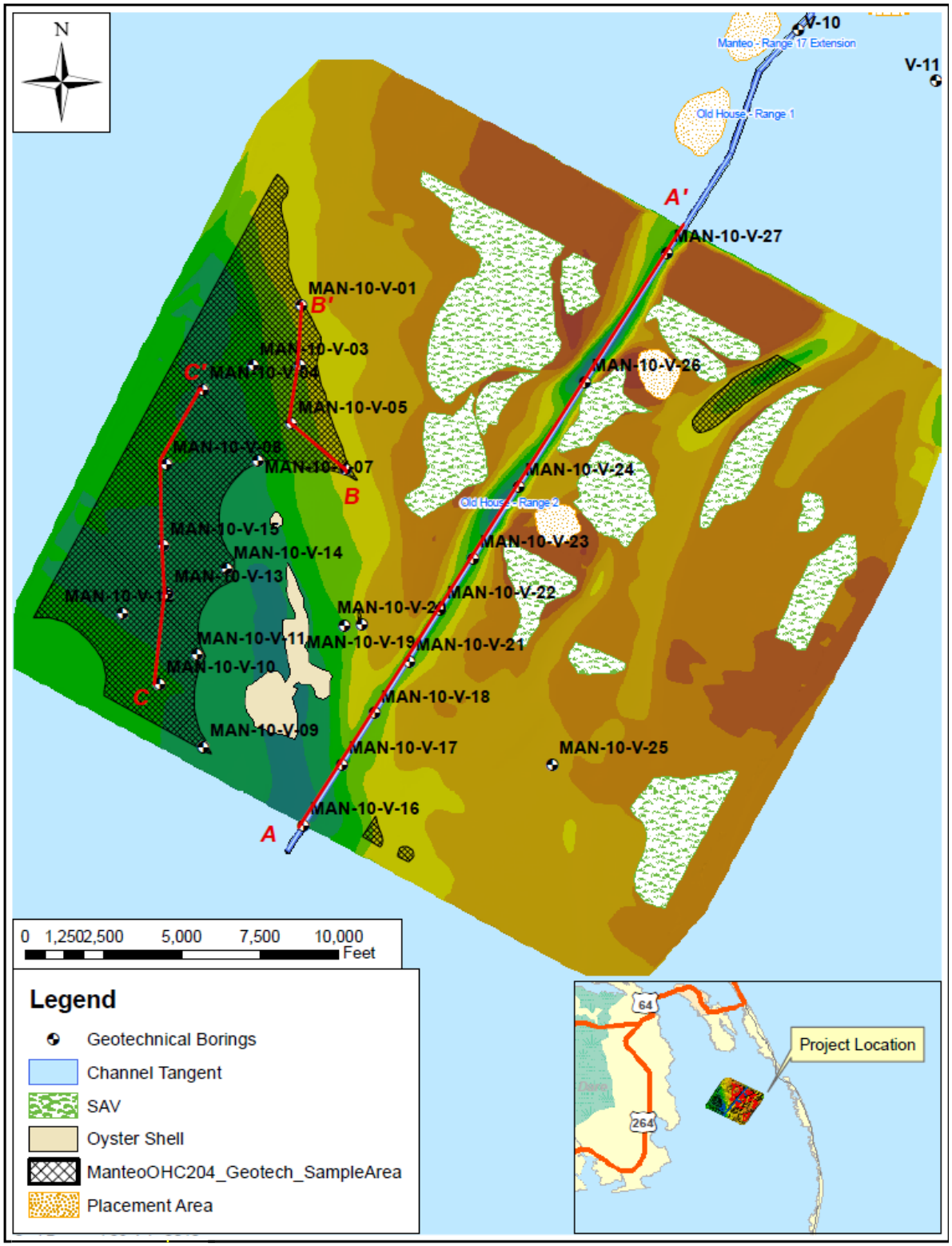


Figure 3. Vibracore Boring Locations

Table E-1. Vibracore Boring Locations and Depths

Boring ID	Date of Boring	Boring Coordinates State Plane NAD 83		Channel Bottom Elevation (feet, MLLW)	Total Depth of Boring Below Channel Bottom (feet)	Bottom of Boring Elevation (feet, MLLW)
		Easting	Northing			
MAN-10-V-01	3/15/2010	2998073	745215	-9.3	10.0	-19.3
MAN-10-V-02	3/15/2010	2998043	743301	-11.0	10.0	-21.0
MAN-10-V-03	3/15/2010	2996535	743299	-14.0	10.0	-24.0
MAN-10-V-04	3/15/2010	2994943	742532	-15.7	10.0	-25.7
MAN-10-V-05	3/15/2010	2997768	741440	-12.2	10.0	-22.2
MAN-10-V-06	3/15/2010	2999495	739963	-10.0	10.0	-20.0
MAN-10-V-07	3/15/2010	2996690	740245	-15.2	10.0	-25.2
MAN-10-V-08	3/15/2010	2993762	740145	-14.8	10.0	-24.8
MAN-10-V-09	3/16/2010	2994952	731109	-14.5	20.0	-34.5
MAN-10-V-10	3/16/2010	2993558	733117	-14.0	16.0	-30.0
MAN-10-V-11	3/16/2010	2994758	734054	-14.0	15.0	-29.0
MAN-10-V-12	3/16/2010	2992362	735375	-13.6	12.0	-25.6
MAN-10-V-13	3/16/2010	2993815	736010	-13.6	12.0	-25.6
MAN-10-V-14	3/16/2010	2995705	736791	-14.8	10.0	-24.8
MAN-10-V-15	3/16/2010	2993679	737545	-14.0	12.0	-26.0
MAN-10-V-16	3/16/2010	2998149	728610	-17.0	10.0	-27.0
MAN-10-V-17	3/16/2010	2999371	730531	-14.3	10.0	-24.3
MAN-10-V-18	3/16/2010	3000416	732183	-11.5	10.0	-21.5
MAN-10-V-19	3/16/2010	2999458	734976	-11.6	10.0	-21.6
MAN-10-V-20	3/16/2010	3000012	735018	-8.6	10.0	-18.6
MAN-10-V-21	3/16/2010	3001522	733832	-12.5	10.0	-22.5
MAN-10-V-22	3/16/2010	3002518	735505	-14.0	10.0	-24.0
MAN-10-V-23	3/16/2010	3003565	737128	-14.8	10.0	-24.8
MAN-10-V-24	3/16/2010	3005010	739424	-16.7	10.0	-26.7
MAN-10-V-25	3/16/2010	3006087	730531	-14.2	10.0	-24.2
MAN-10-V-26	3/16/2010	3007143	742755	-15.3	10.0	-25.3
MAN-10-V-27	3/16/2010	3009755	746877	-14.8	10.0	-24.8

Table E-2. Summary of Sample Depths and Classification

Boring Name	Sample No.	Elevation (ft)	Classification
MAN-10-V-01	1	9.3-9.8	SP
	2	12.0-12.5	SP
	3	15.0-15.5	SP
MAN-10-V-02	1	11.0-11.5	SP
	2	13.5-13.5	SP
	3	15.0-15.5	SP
MAN-10-V-03	1	14.0-14.5	SM
	2	17.0-17.5	MH
	3	19.5-20.0	MH
MAN-10-V-04	1	15.7-16.2	SP
	2	17.5-18.0	SP-SM
	3	19.2-19.7	MH
	4	22.1-22.6	SP-SM
MAN-10-V-05	1	12.2-12.7	SP
	2	14.0-14.5	SP
	3	16.0-16.5	SP-SM
MAN-10-V-06	1	10.0-10.5	SP
	2	12.0-12.5	SP
	3	14.0-14.5	SP
MAN-10-V-07	1	15.2-15.7	SM
	2	18.0-18.5	SM
	3	21.2-21.7	SP-SM
MAN-10-V-08	1	14.8-15.3	SP-SM
	2	17.0-17.5	SP-SM
	3	19.5-20.0	SP
	4	21.5-22.0	SW-SM
MAN-10-V-09	1	14.5-15.0	SP-SM
	2	17.0-17.5	SM
	3	19.0-19.5	SP
	4	21.0-21.5	SP
	5	24.0-24.5	SP
	6	26.5-27.0	SP
MAN-10-V-10	1	14.0-14.5	SP-SM
	2	16.0-16.5	SM
	3	17.0-17.5	SP-SM
	4	18.8-19.3	SP-SM
	5	20.8-21.3	SP-SM
	6	23.0-23.5	SP
MAN-10-V-11	1	14.0-14.5	SP-SM
	2	16.0-16.5	SM
	3	17.3-17.8	SP-SM
	4	18.5-19.0	SP
	5	20.5-21.0	SM
	6	23.0-23.5	SP
MAN-10-V-12	1	13.6-14.1	SP-SM
	2	17.1-17.6	MH
	3	18.1-18.6	SP
	4	20.6-21.1	SP-SM
MAN-10-V-13	1	13.6-14.1	SP-SM
	2	15.6-16.1	MH
	3	16.6-17.1	SP
	4	19.3-19.8	SP
MAN-10-V-14	1	14.8-15.3	SP
	2	16.8-17.3	MH
	3	19.3-19.8	SM
	4	21.6-22.1	SM
MAN-10-V-15	1	14.0-14.5	SM
	2	16.0-16.5	SM
	3	18.4-18.9	SP
	4	20.0-20.5	SP-SM
	5	22.0-22.5	SP
MAN-10-V-16	1	17.0-17.5	MH
	2	20.0-20.5	MH
	3	23.3-23.8	SP
	4	25.0-25.5	SP
MAN-10-V-17	1	14.3-14.8	SM
	2	16.3-16.8	SM
MAN-10-V-18	1	11.5-12.0	SP-SM
	2	13.5-14.0	SP-SM
	3	16.0-16.5	SM
MAN-10-V-19	1	11.6-12.1	SP-SM
	2	13.5-14.0	SP-SM
	3	15.6-16.1	MH
MAN-10-V-20	1	8.6-9.1	SP
	2	11.0-11.5	SP-SM
	3	13.6-14.1	SM
MAN-10-V-21	1	12.5-13.0	SM
	2	14.5-15.0	SM
	3	16.2-16.7	SM
MAN-10-V-22	1	14.0-14.5	MH
	2	15.5-16.0	SM
	3	16.7-17.2	SP-SM
	4	18.3-18.8	SP-SM
MAN-10-V-23	1	14.8-15.3	SP-SM
	2	17.0-17.5	SP-SM
	3	19.5-20.0	SP-SM
	4	21.8-22.3	SM
MAN-10-V-24	1	16.7-17.2	SP-SM
	2	18.7-19.2	SP
	3	21.0-21.5	SP
	4	23.7-24.2	SP-SM
MAN-10-V-25	1	14.2-14.7	SM
	2	16.0-16.5	SP
	3	18.0-18.5	SP
	4	20.0-20.5	SP
MAN-10-V-26	1	15.3-15.8	SP
	2	17.5-18.0	SP
	3	19.0-19.5	SP
MAN-10-V-27	1	14.8-15.3	SP
	2	16.8-17.3	SP
	3	17.6-18.1	SP
	4	19.5-20.0	SP-SM

Figure E-4a. Channel Soil Profile A - A'

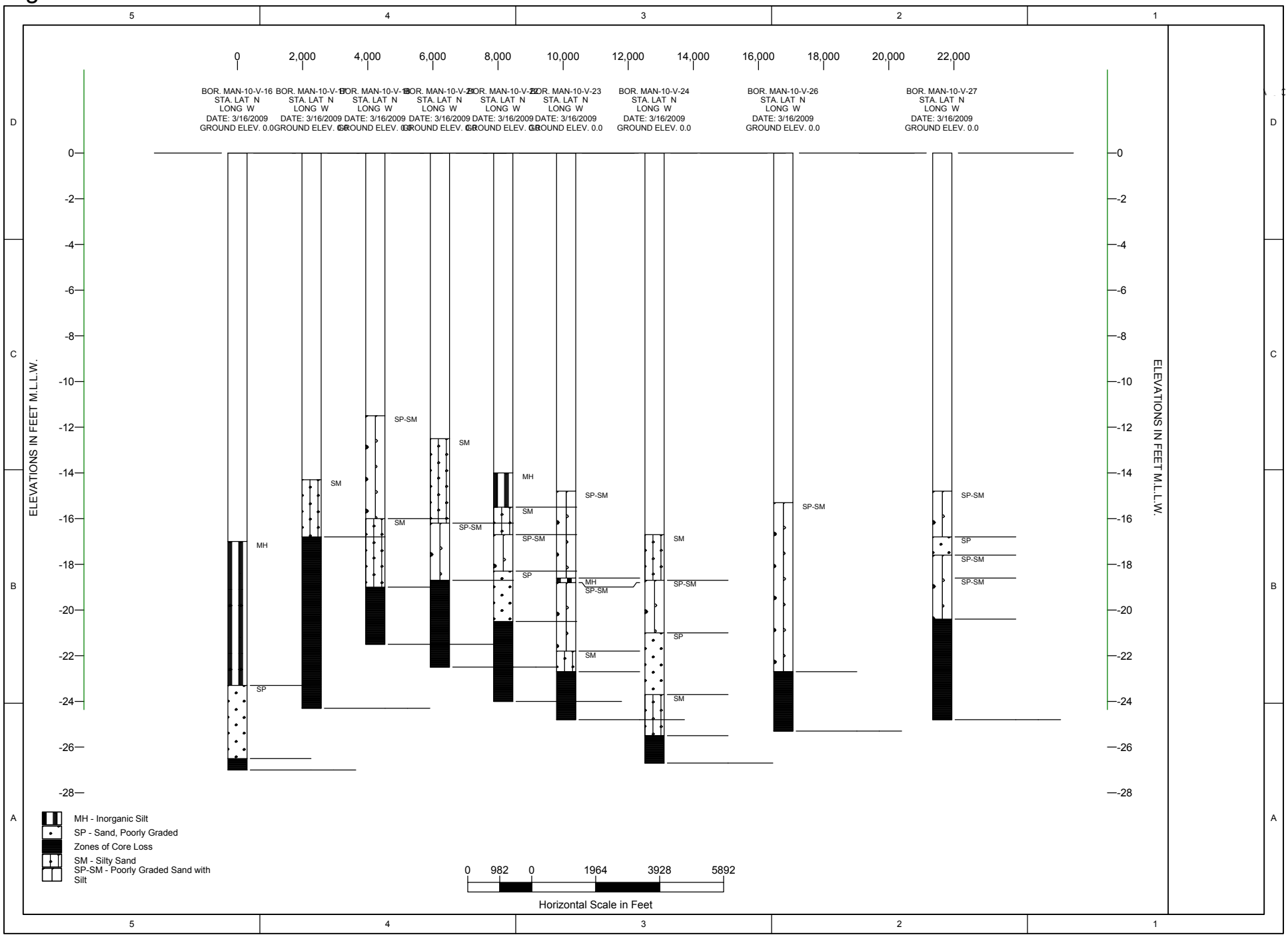


Figure E-4b. Recommended Reef Area Soil Profile B - B'

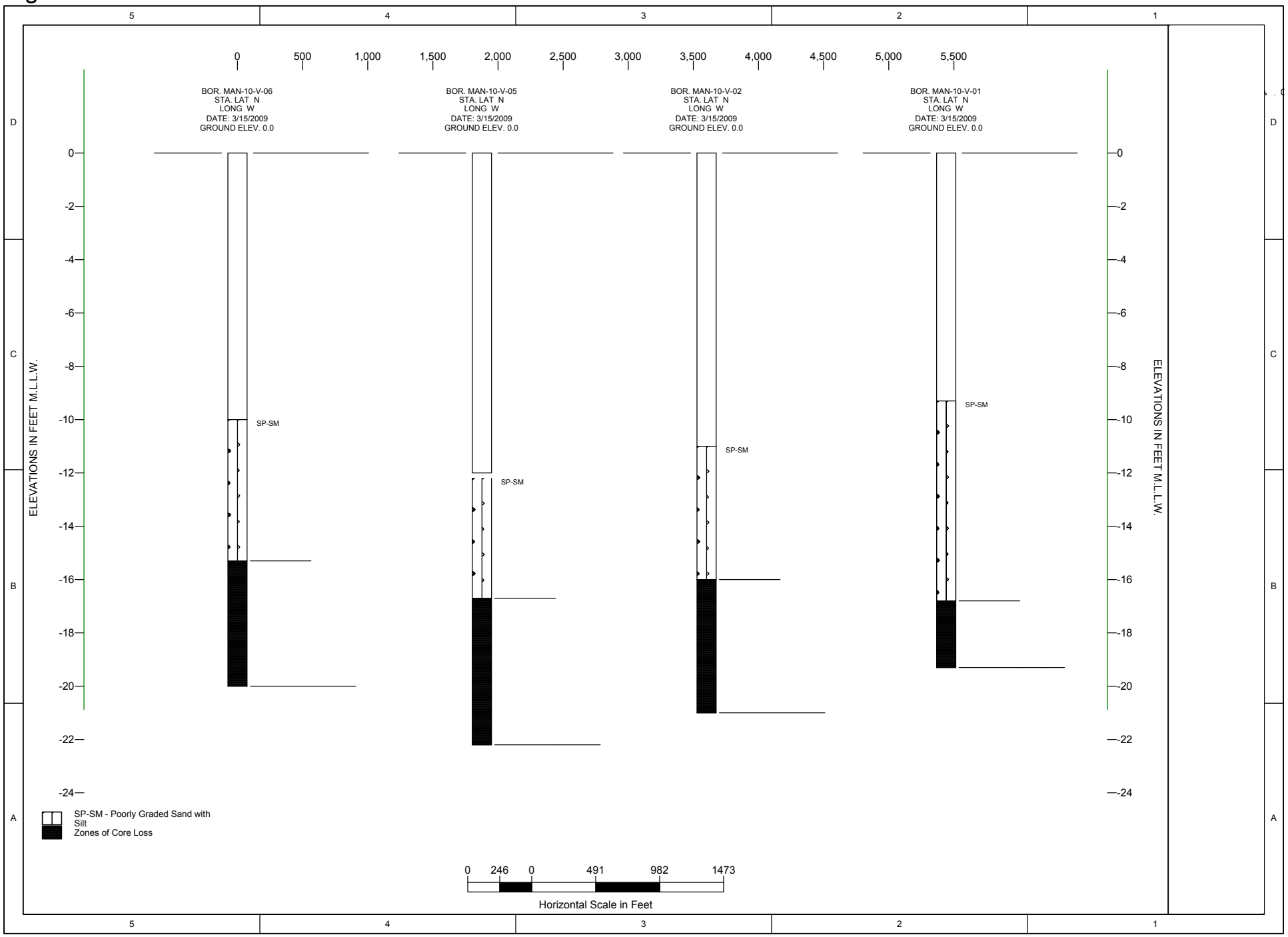
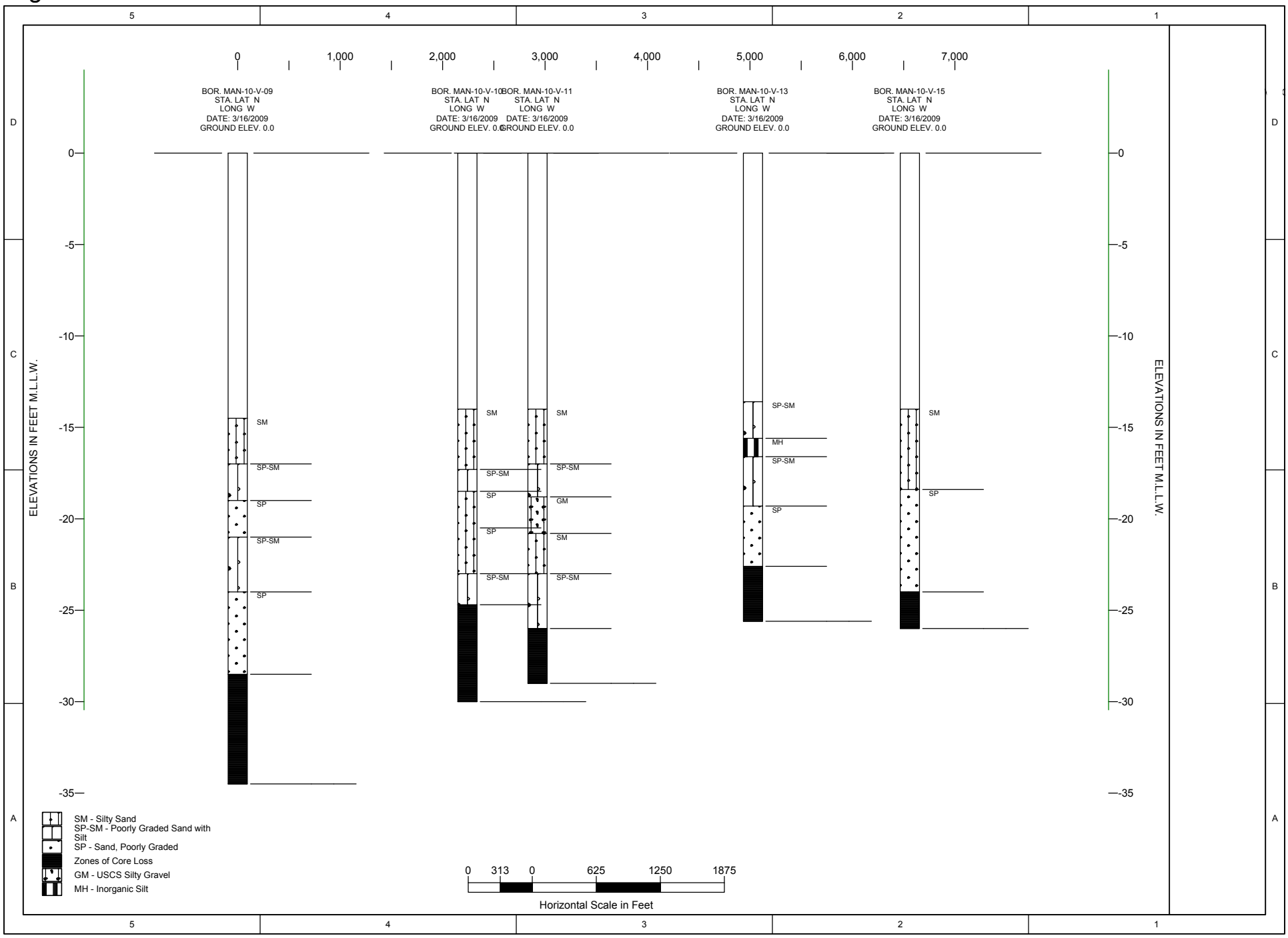


Figure E-4c. Unusable Placement Area Soil Profile C - C'



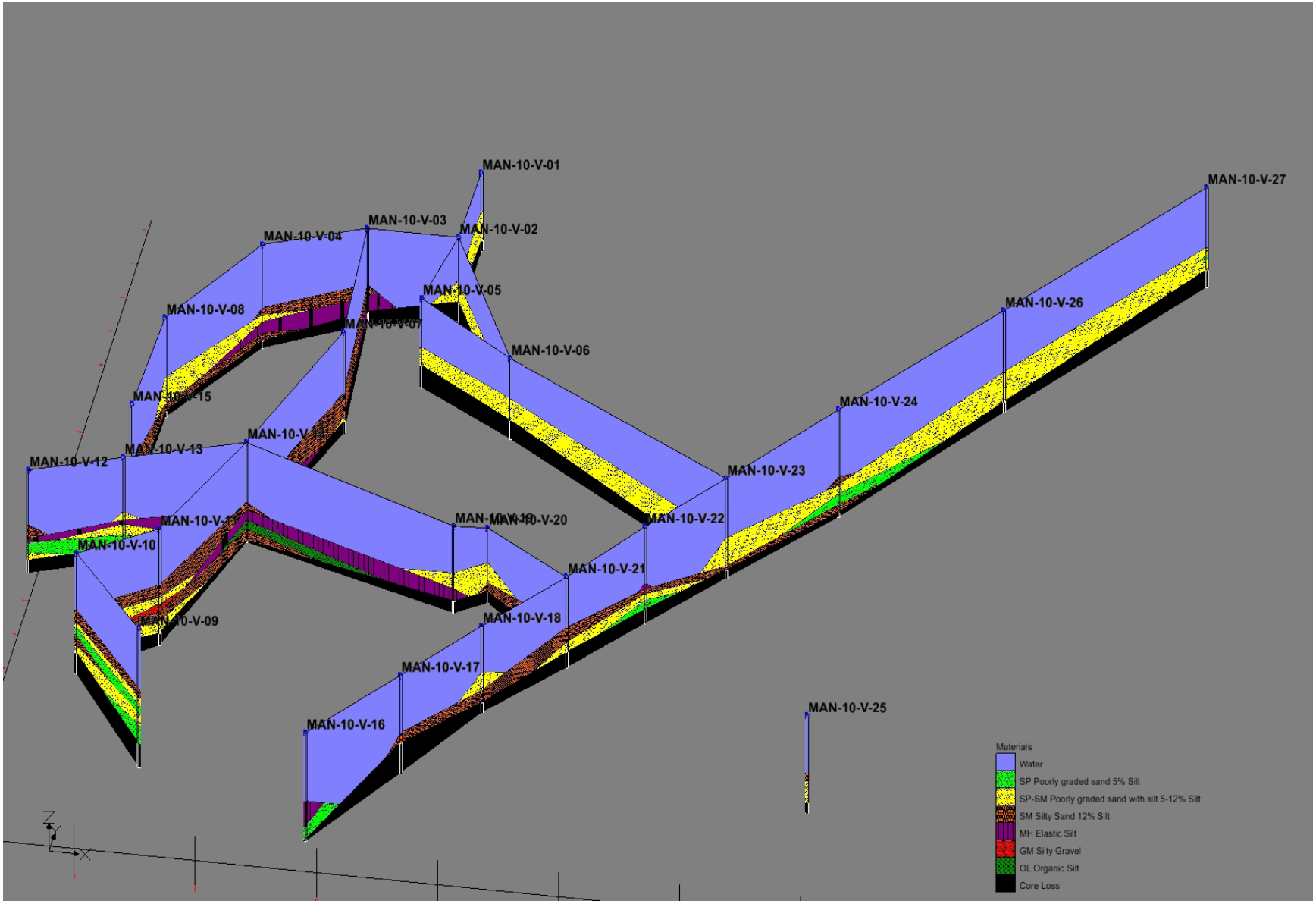


Figure E-6. Fence Diagram of Vibracore Data In Study Area

Table E-3. Composite Silt Content

Boring ID	Geographic Location of Vibracore Boring	Sample 1		Sample 2		Sample 3		Sample 4		Sample 5		Sample 6		Total Composite Silt (%)
		Thickness Represented (ft)	%Silt	Thickness Represented (ft)	%Silt	Thickness Represented (ft)	%Silt	Thickness Represented (ft)	%Silt	Thickness Represented (ft)	%Silt	Thickness Represented (ft)	%Silt	
MAN-10-V-01	Potential Reef Placement Area	2.7	0.9	3.0	0.4	1.8	3.8							1.4
MAN-10-V-02	Potential Reef Placement Area	2.0	1.2	2.0	2.1	1.0	2.7							1.9
MAN-10-V-03	Manteo 204 Study Area	3.0	17.4	2.5	71.2	1.2	90.7							50.6
MAN-10-V-04	Manteo 204 Study Area	2.8	4.1	1.7	10.6	1.9	68.0	2.9	9.7					20.1
MAN-10-V-05	Potential Reef Placement Area	1.8	4.4	2.0	3.0	0.7	9.7							4.6
MAN-10-V-06	Potential Reef Placement Area	2.0	1.9	2.0	2.0	1.3	1.1							1.7
MAN-10-V-07	Manteo 204 Study Area	2.8	37.7	3.2	27.8	1.0	7.3							28.8
MAN-10-V-08	Potential Reef Placement Area	2.2	6.7	2.5	6.4	2.0	4.3	1.8	11.1					7.0
MAN-10-V-09	Manteo 204 Study Area	2.5	7.9	2.0	16.3	2.0	2.3	3.0	2.3	2.5	1.0	2.0	1.6	5.0
MAN-10-V-10	Manteo 204 Study Area	2.0	8.2	1.3	47.2	1.2	5.8	2.0	5.5	2.5	6.2	1.7	2.4	10.8
MAN-10-V-11	Manteo 204 Study Area	2.0	9.1	1.0	35.0	1.8	7.3	2.0	3.4	2.2	23.0	3.0	1.6	10.7
MAN-10-V-12	Manteo 204 Study Area	3.5	11.5	1.0	55.9	2.5	2.5	1.8	6.9					13.0
MAN-10-V-13	Manteo 204 Study Area	2.0	10.6	1.0	52.0	2.7	4.1	3.3	4.0					10.8

Table E-3. Composite Silt Content (cont.)

Boring ID	Geographic Location of Vibracore Boring	Sample 1		Sample 2		Sample 3		Sample 4		Sample 5		Sample 6		Total Composite Silt (%)
		Thickness Represented (ft)	%Silt	Thickness Represented (ft)	%Silt	Thickness Represented (ft)	%Silt	Thickness Represented (ft)	%Silt	Thickness Represented (ft)	%Silt	Thickness Represented (ft)	%Silt	
MAN-10-V-15	Manteo 204 Study Area	2.0	27.8	2.4	49.8	1.6	3.7	2.0	7.7	2.0	4.3			20.5
MAN-10-V-16	Old House Channel Range 2	3.0	58.6	3.3	80.0	1.7	1.4	1.5	2.6					47.0
MAN-10-V-17	Old House Channel Range 2	2.0	38.1	0.5	22.7									35.0
MAN-10-V-18	Old House Channel Range 2	2.0	6.2	2.5	6.2	3.0	35.2							17.8 / 6.2*
MAN-10-V-19	Manteo 204 Study Area	1.9	5.6	2.1	11.2	3.0	81.7							39.9
MAN-10-V-20	Manteo 204 Study Area	2.4	2.6	2.6	6.5	2.2	12.9							7.2
MAN-10-V-21	Old House Channel Range 2	2.0	33.1	1.7	24.8	2.5	12.7							22.6 / 33.1*
MAN-10-V-22	Old House Channel Range 2	1.5	66.4	2.2	13.7	1.6	5.4	2.2	7.7					20.7
MAN-10-V-23	Old House Channel Range 2	2.2	11.5	2.5	5.3	2.3	6.4	0.9	17.9					8.8
MAN-10-V-24	Old House Channel Range 2	2.0	6.7	1.3	2.7	2.7	4.0	1.8	6.7					5.1
MAN-10-V-25	Manteo 204 Study Area	1.8	21.3	2.0	4.0	2.0	2.1	1.6	2.8					7.4
MAN-10-V-26	Old House Channel Range 2	2.2	1.0	1.5	1.5	3.7	2.4							2.7
MAN-10-V-27	Old House Channel Range 2	2.0	3.1	0.8	1.2	1.9	3.5	0.9	9.3					4.0

* Total Composite Silt Content above authorized dredging depth

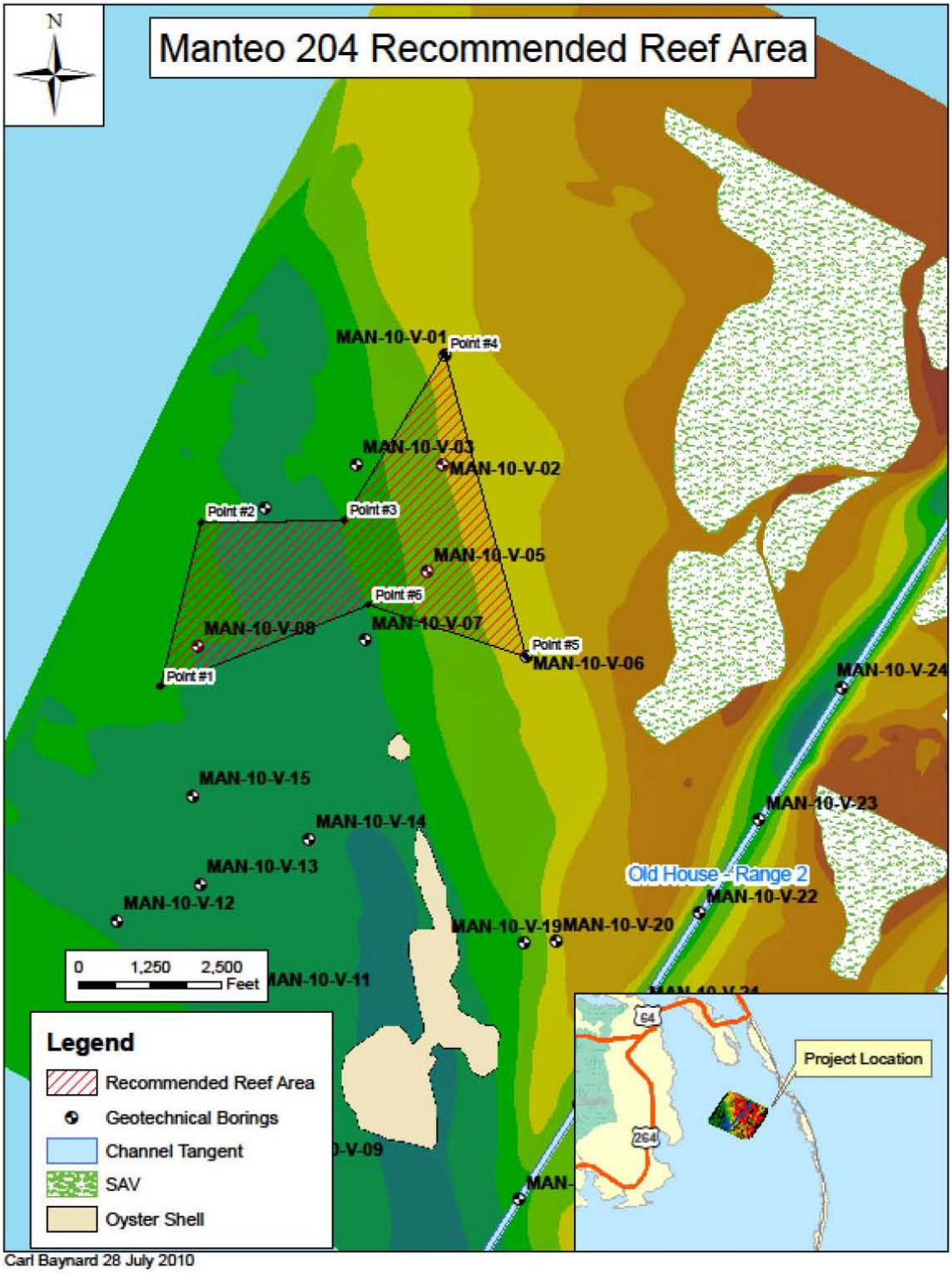


Figure E-5. Recommended Reef Placement Area

Boring Logs

HOLE NO. MAN-10-V-01

DRILLING LOG	DIVISION: SOUTH ATLANTIC	INSTALLATION: WILMINGTON DISTRICT	SHEET 1 OF 1 SHEETS
1. PROJECT: MANTEO 204 PROJECT		10. SIZE AND TYPE OF BIT: 4" Dia. Vibracore	
2. LOCATION (Coordinates or Station): NC COORD N 745215 E 2998073 NAD83		11. DATUM FOR ELEVATION SHOWN (BM or MSL): MLLW	
3. DRILLING AGENCY: WILMINGTON DISTRICT		12. MANUFACTURER'S DESIGNATION OF DRILL: VIBRA CORE SNELL	
4. HOLE NO. (As shown on drawing title and file number): MAN-10-V-01		13. TOTAL NO. OF OVER-BURDEN SAMPLES TAKEN: DISTURBED 3 / UNDISTURBED 0	
5. NAME OF DRILLER: LESTER GAUGHF CRANE OPERATOR		14. TOTAL NUMBER CORE BOXES: N/A	
6. DIRECTION OF HOLE: ☒ VERTICAL ☐ INCLINED _____ DEG. FROM VERT.		15. ELEVATION GROUND WATER: N/A	
7. THICKNESS OF OVERBURDEN: N/A (9.3' of Water)		16. DATE HOLE: STARTED 3/15/2009 / COMPLETED 3/15/2009	
8. DEPTH DRILLED INTO ROCK: 0.0'		17. ELEVATION TOP OF HOLE: 0.0' MLLW	
9. TOTAL DEPTH OF HOLE: 19.3'		18. TOTAL CORE RECOVERY FOR BORING: N/A %	
		19. SIGNATURE OF INSPECTOR: CARL BAYNARD, CIVIL ENGINEER	

ELEVATION MLLW	DEPTH feet	LEGEND	CLASSIFICATION OF MATERIALS (Description)	% CORE RECOVERY	BOX OR SAMPLE NO.	REMARKS (Drilling time, water loss, depth of weathering, etc., if significant)
0.0	0		0.0' TO 9.3' WATER			Time begin vibracoring: 1352 hrs. Soils described by Larry Benjamin, Civil Engr. Tech.
	9.0		OCEAN BOTTOM AT 9.3'		9.3'	
-9.3	9.3		SP-SM Tan, fine, poorly-graded silty sand		1	NOTE: TOP OF HOLE is defined as surface of water and compensation is made for the tide such that top of Hole is 0.0 EL MLLW.
					9.8'	
	11.0					VIBRACORE BORING From 0.0' to 10.0' Ran 10.0' Rec: 7.5'
					12.0'	
					2	
					12.5'	Top of vibracore soil sample is logged as beginning at Ocean Bottom. When Run is greater than Recovery, the difference is depicted as Assumed Not Recovered.
	13.0					
	15.0				15.0'	NOTE: Soils Commercial Lab Classified in Accordance with ASTM-D2487
					3	
					15.5'	
			16.8'			LAB CLASSIFICATION
	17.0		ASSUMED NOT RECOVERED			Jar Number / Classification: 1 SP; 2 SP; 3 SP
	19.0					
-19.3	19.3		BOTTOM OF HOLE AT 19.3' SOILS ARE FIELD VISUALLY CLASSIFIED IN ACCORDANCE WITH THE UNIFIED SOIL CLASSIFICATION SYSTEM			NOTE: HOLE TERMINATED AT PREDETERMINED DEPTH AT 10.0'

HOLE NO. MAN-10-V-02

DRILLING LOG	DIVISION SOUTH ATLANTIC	INSTALLATION WILMINGTON DISTRICT	SHEET 1 OF 1 SHEETS

1. PROJECT MANTEO 204 PROJECT	10. SIZE AND TYPE OF BIT 4" Dia. Vibracore
2. LOCATION (Coordinates or Station) NC COORD N 743301 E 2998043 NAD83	11. DATUM FOR ELEVATION SHOWN (BM or MSL) MLLW
3. DRILLING AGENCY WILMINGTON DISTRICT	12. MANUFACTURER'S DESIGNATION OF DRILL VIBRA CORE SNELL
4. HOLE NO. (As shown on drawing title and file number) MAN-10-V-02	13. TOTAL NO. OF OVER-BURDEN SAMPLES TAKEN: DISTURBED 3 : UNDISTURBED 0
5. NAME OF DRILLER LESTER GAUGHF CRANE OPERATOR	14. TOTAL NUMBER CORE BOXES N/A
6. DIRECTION OF HOLE ☒ VERTICAL ☐ INCLINED _____ DEG. FROM VERT.	15. ELEVATION GROUND WATER N/A
7. THICKNESS OF OVERBURDEN N/A (11.0' of Water)	16. DATE HOLE: STARTED 3/15/2009 : COMPLETED 3/15/2009
8. DEPTH DRILLED INTO ROCK 0.0'	17. ELEVATION TOP OF HOLE 0.0' MLLW
9. TOTAL DEPTH OF HOLE 21.0'	18. TOTAL CORE RECOVERY FOR BORING N/A %
	19. SIGNATURE OF INSPECTOR CARL BAYNARD, CIVIL ENGINEER

ELEVATION MLLW	DEPTH feet	LEGEND	CLASSIFICATION OF MATERIALS (Description)	% CORE RECOVERY	BOX OR SAMPLE NO.	REMARKS (Drilling time, water loss, depth of weathering, etc., if significant)
0.0	0		0.0' TO 11.0' WATER			Time begin vibracoring: 1421 hrs. Soils described by Larry Benjamin, Civil Engr. Tech.
			OCEAN BOTTOM AT 11.0'		11.0'	
-11.0	11.0		SP-SM Grayish-tan, fine, poorly-graded, silty sand		1	NOTE: TOP OF HOLE is defined as surface of water and compensation is made for the tide such that top of Hole is 0.0 EL MLLW.
					11.5'	
	13.0				13.0'	VIBRACORE BORING From 0.0' to 10.0' Ran 10.0' Rec: 5.0'
					2	
					13.5'	
	15.0				15.0'	Top of vibracore soil sample is logged as beginning at Ocean Bottom. When Run is greater than Recovery, the difference is depicted as Assumed Not Recovered.
					3	
			16.0'		15.5'	
			ASSUMED NOT RECOVERED			
	17.0					NOTE: Soils Commercial Lab Classified in Accordance with ASTM-D2487
	19.0					LAB CLASSIFICATION: Jar Number 1 SP; 2 SP; 3 SP
-21.0	21.0		BOTTOM OF HOLE AT 21.0'			NOTE: HOLE TERMINATED AT PREDETERMINED DEPTH AT 10.0'
			SOILS ARE FIELD VISUALLY CLASSIFIED IN ACCORDANCE WITH THE UNIFIED SOIL CLASSIFICATION SYSTEM			

HOLE NO. MAN-10-V-03

DRILLING LOG	DIVISION SOUTH ATLANTIC	INSTALLATION WILMINGTON DISTRICT	SHEET 1 OF 1 SHEETS
1. PROJECT MANTEO 204 PROJECT		10. SIZE AND TYPE OF BIT 4" Dia. Vibracore	
2. LOCATION (Coordinates or Station) NC COORD N 743299 E 2996535 NAD83		11. DATUM FOR ELEVATION SHOWN (BM or MSL) MLLW	
3. DRILLING AGENCY WILMINGTON DISTRICT		12. MANUFACTURER'S DESIGNATION OF DRILL VIBRA CORE SNELL	
4. HOLE NO. (As shown on drawing title and file number) MAN-10-V-03		13. TOTAL NO. OF OVER-BURDEN SAMPLES TAKEN: DISTURBED 3 : UNDISTURBED 0	
5. NAME OF DRILLER LESTER GAUGHF CRANE OPERATOR		14. TOTAL NUMBER CORE BOXES N/A	
6. DIRECTION OF HOLE ☒ VERTICAL ☐ INCLINED _____ DEG. FROM VERT.		15. ELEVATION GROUND WATER N/A	
7. THICKNESS OF OVERBURDEN N/A (14.0' of Water)		16. DATE HOLE: STARTED 3/15/2009 : COMPLETED 3/15/2009	
8. DEPTH DRILLED INTO ROCK 0.0'		17. ELEVATION TOP OF HOLE 0.0' MLLW	
9. TOTAL DEPTH OF HOLE 24.0'		18. TOTAL CORE RECOVERY FOR BORING N/A %	
		19. SIGNATURE OF INSPECTOR CARL BAYNARD, CIVIL ENGINEER	

a ELEVATION MLLW	b DEPTH feet	c LEGEND	d CLASSIFICATION OF MATERIALS (Description)	e % CORE RECOVERY	f BOX OR SAMPLE NO.	g REMARKS (Drilling time, water loss, depth of weathering, etc., if significant)
0.0	0		0.0' TO 14.0' WATER			Time begin vibracoring: 1440 hrs. Soils described by Larry Benjamin, Civil Engr. Tech.
			OCEAN BOTTOM AT 14.0'		14.0'	
-14.0	14.0		SM Dark-gray, fine, silty sand		1	NOTE: TOP OF HOLE is defined as surface of water and compensation is made for the tide such that top of Hole is 0.0 EL MLLW.
					14.5'	
	16.0					VIBRACORE BORING From 0.0' to 10.0' Ran 10.0' Rec: 6.7'
			17.0'		17.0'	
			MH Dark-gray, elastic silt		2	Top of vibracore soil sample is logged as beginning at Ocean Bottom. When Run is greater than Recovery, the difference is depicted as Assumed Not Recovered.
	18.0				17.5'	
					19.5'	
	20.0				3	NOTE: Soils Commercial Lab Classified in Accordance with ASTM-D2487
			20.7'		20.0'	
			ASSUMED NOT RECOVERED			LAB CLASSIFICATION
	22.0					Jar Number / Classification: 1 SM; 2 MH; 3 MH
-24.0	24.0		BOTTOM OF HOLE AT 24.0'			NOTE: HOLE TERMINATED AT PREDETERMINED DEPTH AT 10.0'
			SOILS ARE FIELD VISUALLY CLASSIFIED IN ACCORDANCE WITH THE UNIFIED SOIL CLASSIFICATION SYSTEM			

DRILLING LOG | DIVISION: SOUTH ATLANTIC | INSTALLATION: WILMINGTON DISTRICT | SHEET 1 OF 1 SHEETS

1. PROJECT: MANTEO 204 PROJECT
2. LOCATION (Coordinates or Station): NC COORD N 742532 E 2994943 NAD83
3. DRILLING AGENCY: WILMINGTON DISTRICT
4. HOLE NO. (As shown on drawing title and file number): MAN-10-V-04
5. NAME OF DRILLER: LESTER GAUGHF — CRANE OPERATOR
6. DIRECTION OF HOLE: ☒ VERTICAL ☐ INCLINED _____ DEG. FROM VERT.
7. THICKNESS OF OVERBURDEN: N/A (15.7' of Water)
8. DEPTH DRILLED INTO ROCK: 0.0'
9. TOTAL DEPTH OF HOLE: 25.7'
10. SIZE AND TYPE OF BIT: 4" Dia. Vibracore
11. DATUM FOR ELEVATION SHOWN (BM or MSL): MLLW
12. MANUFACTURER'S DESIGNATION OF DRILL: VIBRA CORE — SNELL
13. TOTAL NO. OF OVER-BURDEN SAMPLES TAKEN: DISTURBED: 4 — UNDISTURBED: 0
14. TOTAL NUMBER CORE BOXES: N/A
15. ELEVATION GROUND WATER: N/A
16. DATE HOLE: STARTED: 3/15/2009 — COMPLETED: 3/15/2009
17. ELEVATION TOP OF HOLE: 0.0' MLLW
18. TOTAL CORE RECOVERY FOR BORING: N/A %
19. SIGNATURE OF INSPECTOR: CARL BAYNARD, CIVIL ENGINEER

ELEVATION MLLW	DEPTH feet	LEGEND	CLASSIFICATION OF MATERIALS (Description)	% CORE RECOVERY	BOX OR SAMPLE NO.	REMARKS (Drilling time, water loss, depth of weathering, etc., if significant)
0.0	0		0.0' TO 15.7' WATER			Time begin vibracoring: 1456 hrs. Soils described by Larry Benjamin, Civil Engr. Tech.
	15.0					NOTE: TOP OF HOLE is defined as surface of water and compensation is made for the tide such that top of Hole is 0.0 EL MLLW.
-15.7	15.7		OCEAN BOTTOM AT 15.7'		15.7'	
			SM Grayish-tan, fine, silty sand with trace shell fragments		1	
	16.0				16.2'	VIBRACORE BORING From 0.0' to 10.0' Ran 10.0' Rec: 8.3'
			17.5'		17.5'	
			SP-SM Tan, fine, poolry-graded silty sand		2	Top of vibracore soil sample is logged as beginning at Ocean Bottom. When Run is greater than Recovery, the difference is depicted as Assumed Not Recovered.
	18.0				18.0'	
			19.2'		19.2'	
			MH Dark-gray, elastic silt		3	
	20.0				19.7'	NOTE: Soils Commercial Lab Classified in Accordance with ASTM-D2487
			22.1'		22.1'	LAB CLASSIFICATION: Jar Number 1 SP; 2 SP-SM; 3 MH; 4 SP-SM
	22.0		SM Dark-gray, fine, silty sand with trace shell fragments		4	
			24.0'		22.6'	
	24.0		ASSUMED NOT RECOVERED			NOTE: HOLE TERMINATED AT PREDETERMINED DEPTH AT 10.0'
-25.7	25.7		BOTTOM OF HOLE AT 25.7'			
			SOILS ARE FIELD VISUALLY CLASSIFIED IN ACCORDANCE WITH THE UNIFIED SOIL CLASSIFICATION SYSTEM			

HOLE NO. MAN-10-V-05

DRILLING LOG	DIVISION: SOUTH ATLANTIC	INSTALLATION: WILMINGTON DISTRICT	SHEET 1 OF 1 SHEETS

1. PROJECT	MANTEO 204 PROJECT
2. LOCATION (Coordinates or Station)	NC COORD N 741440 E 2997768 NAD83
3. DRILLING AGENCY	WILMINGTON DISTRICT
4. HOLE NO. (As shown on drawing title and file number)	MAN-10-V-05
5. NAME OF DRILLER	LESTER GAUGHF CRANE OPERATOR
6. DIRECTION OF HOLE	☒ VERTICAL ☐ INCLINED _____ DEG. FROM VERT.
7. THICKNESS OF OVERBURDEN	N/A (12.2' of Water)
8. DEPTH DRILLED INTO ROCK	0.0'
9. TOTAL DEPTH OF HOLE	22.0'
10. SIZE AND TYPE OF BIT	4" Dia. Vibracore
11. DATUM FOR ELEVATION SHOWN (BM or MSL)	MLLW
12. MANUFACTURER'S DESIGNATION OF DRILL	VIBRA CORE SNELL
13. TOTAL NO. OF OVER-BURDEN SAMPLES TAKEN	DISTURBED: 3 UNDISTURBED: 0
14. TOTAL NUMBER CORE BOXES	N/A
15. ELEVATION GROUND WATER	N/A
16. DATE HOLE	STARTED: 3/15/2009 COMPLETED: 3/15/2009
17. ELEVATION TOP OF HOLE	0.0' MLLW
18. TOTAL CORE RECOVERY FOR BORING	N/A %
19. SIGNATURE OF INSPECTOR	CARL BAYNARD, CIVIL ENGINEER

ELEVATION MLLW (a)	DEPTH feet (b)	LEGEND (c)	CLASSIFICATION OF MATERIALS (Description) (d)	% CORE RECOVERY (e)	BOX OR SAMPLE NO. (f)	REMARKS (Drilling time, water loss, depth of weathering, etc., if significant) (g)
0.0	0		0.0' TO 12.2' WATER			Time begin vibracoring: 1518 hrs Soils described by Larry Benjamin, Civil Engr. Tech.
-12.2	12.0		OCEAN BOTTOM AT 12.2'		12.2'	
	12.2		SP-SM Tan, fine, poorly-graded silty sand		1 12.7'	NOTE: TOP OF HOLE is defined as surface of water and compensation is made for the tide such that top of Hole is 0.0 EL MLLW.
	14.0				14.0' 2 14.5'	VIBRACORE BORING From 0.0' to 10.0' Ran 10.0' Rec: 4.5' Top of vibracore soil sample is logged as beginning at Ocean Bottom. When Run is greater than Recovery, the difference is depicted as Assumed Not Recovered.
	16.0		16.7'		16.0' 3 16.5'	
			ASSUMED NOT RECOVERED			
	18.0					NOTE: Soils Commercial Lab Classified in Accordance with ASTM-D2487
	20.0					LAB CLASSIFICATION Jar Number / Classification 1 SP 2 SP 3 SP-SM
-22.2	22.0		BOTTOM OF HOLE AT 22.2'			NOTE: HOLE TERMINATED AT PREDETERMINED DEPTH AT 10.0'
	22.2		SOILS ARE FIELD VISUALLY CLASSIFIED IN ACCORDANCE WITH THE UNIFIED SOIL CLASSIFICATION SYSTEM			

DRILLING LOG | DIVISION: SOUTH ATLANTIC | INSTALLATION: WILMINGTON DISTRICT | SHEET 1 OF 1 SHEETS

1. PROJECT: MANTEO 204 PROJECT
2. LOCATION (Coordinates or Station): NC COORD N 739963 E 2999495 NAD83
3. DRILLING AGENCY: WILMINGTON DISTRICT
4. HOLE NO. (As shown on drawing title and file number): MAN-10-V-06
5. NAME OF DRILLER: LESTER GAUGHF — CRANE OPERATOR
6. DIRECTION OF HOLE: ☒ VERTICAL ☐ INCLINED _____ DEG. FROM VERT.
7. THICKNESS OF OVERBURDEN: N/A (10.0' of Water)
8. DEPTH DRILLED INTO ROCK: 0.0'
9. TOTAL DEPTH OF HOLE: 20.0'
10. SIZE AND TYPE OF BIT: 4" Dia. Vibracore
11. DATUM FOR ELEVATION SHOWN (BM or MSL): MLLW
12. MANUFACTURER'S DESIGNATION OF DRILL: VIBRA CORE — SNELL
13. TOTAL NO. OF OVER-BURDEN SAMPLES TAKEN: DISTURBED 3 : UNDISTURBED 0
14. TOTAL NUMBER CORE BOXES: N/A
15. ELEVATION GROUND WATER: N/A
16. DATE HOLE: STARTED 3/15/2009 : COMPLETED 3/15/2009
17. ELEVATION TOP OF HOLE: 0.0' MLLW
18. TOTAL CORE RECOVERY FOR BORING: N/A %
19. SIGNATURE OF INSPECTOR: CARL BAYNARD, CIVIL ENGINEER

ELEVATION MLLW	DEPTH feet	LEGEND	CLASSIFICATION OF MATERIALS (Description)	% CORE RECOVERY	BOX OR SAMPLE NO.	REMARKS (Drilling time, water loss, depth of weathering, etc., if significant)
0.0	0		0.0' TO 10.0' WATER			Time begin vibracoring: 1535 hrs Soils described by Larry Benjamin, Civil Engr. Tech.
			OCEAN BOTTOM AT 10.0'		10.0'	
-10.0	10.0		SP-SM Tan, fine, poorly-graded silty sand		1 10.5'	NOTE: TOP OF HOLE is defined as surface of water and compensation is made for the tide such that top of Hole is 0.0 EL MLLW.
	12.0				12.0' 2 12.5'	VIBRACORE BORING From 0.0' to 10.0' Ran 10.0' Rec: 5.3' Top of vibracore soil sample is logged as beginning at Ocean Bottom. When Run is greater than Recovery, the difference is depicted as Assumed Not Recovered.
	14.0				14.0' 3 14.5'	
			15.3'			
			ASSUMED NOT RECOVERED			
	16.0					NOTE: Soils Commercial Lab Classified in Accordance with ASTM-D2487
	18.0					LAB CLASSIFICATION Jar Number — Classification 1 — SP 2 — SP 3 — SP
-20.0	20.0		BOTTOM OF HOLE AT 20.0'			NOTE: HOLE TERMINATED AT PREDETERMINED DEPTH AT 10.0'
			SOILS ARE FIELD VISUALLY CLASSIFIED IN ACCORDANCE WITH THE UNIFIED SOIL CLASSIFICATION SYSTEM			

DRILLING LOG	DIVISION: SOUTH ATLANTIC	INSTALLATION: WILMINGTON DISTRICT	SHEET 1 OF 1 SHEETS

1. PROJECT: MANTEO 204 PROJECT	10. SIZE AND TYPE OF BIT: 4" Dia. Vibracore
2. LOCATION (Coordinates or Station): NC COORD N 740245 E 2996690 NAD83	11. DATUM FOR ELEVATION SHOWN (TBM or MSL): MLLW
3. DRILLING AGENCY: WILMINGTON DISTRICT	12. MANUFACTURER'S DESIGNATION OF DRILL: VIBRA CORE SNELL
4. HOLE NO. (As shown on drawing title and file number): MAN-10-V-07	13. TOTAL NO. OF OVER-BURDEN SAMPLES TAKEN: DISTURBED 3 UNDISTURBED 0
5. NAME OF DRILLER: LESTER GAUGHF CRANE OPERATOR	14. TOTAL NUMBER CORE BOXES: N/A
6. DIRECTION OF HOLE: ☒ VERTICAL ☐ INCLINED _____ DEG. FROM VERT.	15. ELEVATION GROUND WATER: N/A
7. THICKNESS OF OVERBURDEN: N/A (15.2' of Water)	16. DATE HOLE: STARTED 3/15/2009 COMPLETED 3/15/2009
8. DEPTH DRILLED INTO ROCK: 0.0'	17. ELEVATION TOP OF HOLE: 0.0' MLLW
9. TOTAL DEPTH OF HOLE: 25.2'	18. TOTAL CORE RECOVERY FOR BORING: N/A %
	19. SIGNATURE OF INSPECTOR: CARL BAYNARD, CIVIL ENGINEER

ELEVATION MLLW	DEPTH feet	LEGEND	CLASSIFICATION OF MATERIALS (Description)	% CORE RECOVERY	BOX OR SAMPLE NO.	REMARKS (Drilling time, water loss, depth of weathering, etc., if significant)
0.0	0		0.0' TO 15.2' WATER			Time begin vibracoring: 1553 hrs. Soils described by Larry Benjamin, Civil Engr. Tech.
-15.2	15.0		OCEAN BOTTOM AT 15.2'		15.2'	
	15.2		SM Dark-gray, fine, silty sand with trace shell fragments		1	NOTE: TOP OF HOLE is defined as surface of water and compensation is made for the tide such that top of Hole is 0.0 EL MLLW.
					15.7'	VIBRACORE BORING From 0.0' to 10.0' Ran 10.0' Rec: 7.0'
	17.0					
					18.0'	
					2	Top of vibracore soil sample is logged as beginning at Ocean Bottom. When Run is greater than Recovery, the difference is depicted as Assumed Not Recovered.
	19.0				18.5'	
	21.0		21.2'		21.2'	NOTE: Soils Commercial Lab Classified in Accordance with ASTM-D2487
			SP-SM Gray, fine, poorly-graded, silty sand		3	
			22.2'		21.7'	
			ASSUMED NOT RECOVERED			LAB CLASSIFICATION
	23.0					Jar Number / Classification: 1 SM; 2 SM; 3 SP-SM
	25.0					
-25.2	25.2		BOTTOM OF HOLE AT 25.2'			NOTE: HOLE TERMINATED AT PREDETERMINED DEPTH AT 10.0'
			SOILS ARE FIELD VISUALLY CLASSIFIED IN ACCORDANCE WITH THE UNIFIED SOIL CLASSIFICATION SYSTEM			

DRILLING LOG	DIVISION: SOUTH ATLANTIC	INSTALLATION: WILMINGTON DISTRICT	SHEET 1 OF 1 SHEETS
1. PROJECT: MANTEO 204 PROJECT		10. SIZE AND TYPE OF BIT: 4" Dia. Vibracore	
2. LOCATION (Coordinates or Station): NC COORD N 740145 E 2993762 NAD83		11. DATUM FOR ELEVATION SHOWN (BM or MSL): MLLW	
3. DRILLING AGENCY: WILMINGTON DISTRICT		12. MANUFACTURER'S DESIGNATION OF DRILL: VIBRA CORE SNELL	
4. HOLE NO. (As shown on drawing title and file number): MAN-10-V-08		13. TOTAL NO. OF OVER-BURDEN SAMPLES TAKEN: DISTURBED: 4 UNDISTURBED: 0	
5. NAME OF DRILLER: LESTER GAUGHF CRANE OPERATOR		14. TOTAL NUMBER CORE BOXES: N/A	
6. DIRECTION OF HOLE: ☒ VERTICAL ☐ INCLINED _____ DEG. FROM VERT.		15. ELEVATION GROUND WATER: N/A	
7. THICKNESS OF OVERBURDEN: N/A (14.8' of Water)		16. DATE HOLE: STARTED 3/15/2009 COMPLETED 3/15/2009	
8. DEPTH DRILLED INTO ROCK: 0.0'		17. ELEVATION TOP OF HOLE: 0.0' MLLW	
9. TOTAL DEPTH OF HOLE: 24.8'		18. TOTAL CORE RECOVERY FOR BORING: N/A %	
		19. SIGNATURE OF INSPECTOR: CARL BAYNARD, CIVIL ENGINEER	

ELEVATION MLLW	DEPTH feet	LEGEND	CLASSIFICATION OF MATERIALS (Description)	% CORE RECOVERY	BOX OR SAMPLE NO.	REMARKS (Drilling time, water loss, depth of weathering, etc., if significant)
0.0	0		0.0' TO 14.8' WATER			Time begin vibracoring: 1611 hrs. Soils described by Larry Benjamin, Civil Engr. Tech.
	14.0					NOTE: TOP OF HOLE is defined as surface of water and compensation is made for the tide such that top of Hole is 0.0 EL MLLW.
-14.8	14.8		OCEAN BOTTOM AT 14.8'		14.8'	
			SP-SM Tan, fine, poorly-graded, silty sand		1	
					15.3'	
	16.0					VIBRACORE BORING From 0.0' to 10.0' Ran 10.0' Rec: 8.5'
					17.0'	
					2	
					17.5'	Top of vibracore soil sample is logged as beginning at Ocean Bottom. When Run is greater than Recovery, the difference is depicted as Assumed Not Recovered.
	18.0					
					19.5'	
					3	
	20.0				20.0'	NOTE: Soils Commercial Lab Classified in Accordance with ASTM-D2487
			21.5'		21.5'	LAB CLASSIFICATION
			SM Grayish-tan, fine, silty sand and pea-gravel		4	Jar Number / Classification: 1 SP-SM; 2 SP-SM; 3 SP; 4 SW-SM
	22.0				22.0'	
			23.3'			
			ASSUMED NOT RECOVERED			
	24.0					
-24.8	24.8		BOTTOM OF HOLE AT 24.8'			NOTE: HOLE TERMINATED AT PREDETERMINED DEPTH AT 10.0'
			SOILS ARE FIELD VISUALLY CLASSIFIED IN ACCORDANCE WITH THE UNIFIED SOIL CLASSIFICATION SYSTEM			

DRILLING LOG	DIVISION SOUTH ATLANTIC	INSTALLATION WILMINGTON DISTRICT	SHEET 1 OF 2 SHEETS

1. PROJECT MANTEO 204 PROJECT	10. SIZE AND TYPE OF BIT 4" Dia. Vibracore
2. LOCATION (Coordinates or Station) NC COORD N 731109 E 2994952 NAD83	11. DATUM FOR ELEVATION SHOWN (BM or MSL) MLLW
3. DRILLING AGENCY WILMINGTON DISTRICT	12. MANUFACTURER'S DESIGNATION OF DRILL VIBRA CORE SNELL
4. HOLE NO. (As shown on drawing title and file number) MAN-10-V-09	13. TOTAL NO. OF OVER-BURDEN SAMPLES TAKEN: DISTURBED 6 : UNDISTURBED 0
5. NAME OF DRILLER LESTER GAUGHF CRANE OPERATOR	14. TOTAL NUMBER CORE BOXES N/A
6. DIRECTION OF HOLE ☒ VERTICAL ☐ INCLINED _____ DEG. FROM VERT.	15. ELEVATION GROUND WATER N/A
7. THICKNESS OF OVERBURDEN N/A (14.5' of Water)	16. DATE HOLE: STARTED 3/16/2009 : COMPLETED 3/16/2009
8. DEPTH DRILLED INTO ROCK 0.0'	17. ELEVATION TOP OF HOLE 0.0' MLLW
9. TOTAL DEPTH OF HOLE 34.5'	18. TOTAL CORE RECOVERY FOR BORING N/A %
	19. SIGNATURE OF INSPECTOR CARL BAYNARD, CIVIL ENGINEER

ELEVATION MLLW	DEPTH feet	LEGEND	CLASSIFICATION OF MATERIALS (Description)	% CORE RECOVERY	BOX OR SAMPLE NO.	REMARKS (Drilling time, water loss, depth of weathering, etc., if significant)
0.0	0		0.0' TO 14.8' WATER			Time begin vibracoring: 0856 hrs. Soils described by Larry Benjamin, Civil Engr. Tech.
	14.0		OCEAN BOTTOM AT 14.5'		14.5'	NOTE: TOP OF HOLE is defined as surface of water and compensation is made for the tide such that top of Hole is 0.0 EL MLLW.
-14.5	14.5		SM Gray, fine, silty sand		1	
					15.0'	VIBRACORE BORING From 0.0' to 20.0' Ran 20.0' Rec: 14.0'
	16.0				17.0'	
			SP-SM Tan, fine, poorly-graded, silty sand		2	Top of vibracore soil sample is logged as beginning at Ocean Bottom. When Run is greater than Recovery, the difference is depicted as Assumed Not Recovered.
	18.0				17.5'	
			19.0'		19.0'	
			SP Tan, coarse, poorly-graded, sand with trace shell fragments		3	NOTE: Soils Commercial Lab Classified in Accordance with ASTM-D2487
	20.0				19.5'	
			21.0'		21.0'	
			SP-SM Greenish-tan, fine, poorly -graded, silty sand with trace shell fragments		4	LAB CLASSIFICATION
	22.0				21.5'	Jar Number / Classification: 1 SP-SM; 2 SM; 3 SP; 4 SP; 5 SP; 6 SP
					24.0'	
	24.0		SP Greenish-tan, medium-coarse, poorly-graded, sand		5	
					24.5'	
	26.0		Continued on Sheet 2			

DRILLING LOG (Cont Sheet)	ELEVATION TOP OF HOLE 0.0 MLLW	Hole No. MAN-10-V-09
PROJECT MANTEO 204 PROJECT	INSTALLATION WILMINGTON DISTRICT	SHEET 2__ OF 2__SHEETS

ELEVATION a	DEPTH 26.0	LEGEND c	CLASSIFICATION OF MATERIALS (Description) d	% CORE RECOVERY e	BOX OR SAMPLE NO. f	REMARKS (Drilling time, water loss, depth of weathering, etc., if significant) g
			SP Greenish-tan, medium-coarse, poorly-graded, sand		26.5'	
					6	
					27.0'	
	28.0		28.5'			
			ASSUMED NOT RECOVERED			
	30.0					
	32.0					
	34.0					
-34.5	34.5		BOTTOM OF HOLE AT 34.5'			NOTE: HOLE TERMINATED AT PREDETERMINED DEPTH AT 20.0'

SOILS ARE FIELD VISUALLY CLASSIFIED IN ACCORDANCE WITH THE UNIFIED SOIL CLASSIFICATION SYSTEM

HOLE NO. MAN-10-V-10

DRILLING LOG	DIVISION SOUTH ATLANTIC	INSTALLATION WILMINGTON DISTRICT	SHEET 1 OF 1 SHEETS

1. PROJECT MANTEO 204 PROJECT	10. SIZE AND TYPE OF BIT 4" Dia. Vibracore
2. LOCATION (Coordinates or Station) NC COORD N 733117 E 2993558 NAD83	11. DATUM FOR ELEVATION SHOWN (BM or MSL) MLLW
3. DRILLING AGENCY WILMINGTON DISTRICT	12. MANUFACTURER'S DESIGNATION OF DRILL VIBRA CORE SNELL
4. HOLE NO. (As shown on drawing title and file number) MAN-10-V-10	13. TOTAL NO. OF OVER-BURDEN SAMPLES TAKEN: DISTURBED 6 : UNDISTURBED 0
5. NAME OF DRILLER LESTER GAUGHF CRANE OPERATOR	14. TOTAL NUMBER CORE BOXES N/A
6. DIRECTION OF HOLE ☒ VERTICAL ☐ INCLINED _____ DEG. FROM VERT.	15. ELEVATION GROUND WATER N/A
7. THICKNESS OF OVERBURDEN N/A (14.0' of Water)	16. DATE HOLE STARTED 3/16/2009 : COMPLETED 3/16/2009
8. DEPTH DRILLED INTO ROCK 0.0'	17. ELEVATION TOP OF HOLE 0.0' MLLW
9. TOTAL DEPTH OF HOLE 30.0'	18. TOTAL CORE RECOVERY FOR BORING N/A %
	19. SIGNATURE OF INSPECTOR CARL BAYNARD, CIVIL ENGINEER

a ELEVATION MLLW	b DEPTH feet	b LEGEND c	c CLASSIFICATION OF MATERIALS (Description) d	e % CORE RECOVERY e	f BOX OR SAMPLE NO. f	g REMARKS (Drilling time, water loss, depth of weathering, etc., if significant) g
0.0	0		0.0' TO 14.0' WATER			Time begin vibracoring: 0920 hrs. Soils described by Larry Benjamin, Civil Engr. Tech.
			OCEAN BOTTOM AT 14.0'		14.0'	
-14.0	14.0		SM Gray, fine, silty sand with trace shell fragments		1	NOTE: TOP OF HOLE is defined as surface of water and compensation is made for the tide such that top of Hole is 0.0 EL MLLW.
					14.5'	
	16.0				16.0'	VIBRACORE BORING From 0.0' to 16.0' Ran 16.0' Rec: 10.7'
					2	
					16.5'	
			17.3'		17.3'	
			SP-SM Tan, fine, poorly-graded, silty sand		3	Top of vibracore soil sample is logged as beginning at Ocean Bottom. When Run is greater than Recovery, the difference is depicted as Assumed Not Recovered.
	18.0				17.8'	
			18.5'		18.5'	
			SP Tan, coarse, poorly-graded sand		4	
					19.0'	
	20.0					NOTE: Soils Commercial Lab Classified in Accordance with ASTM-D2487
			20.5'		20.5'	
			SM Gray, fine, silty sand with trace shell fragments		5	
					21.0'	LAB CLASSIFICATION
	22.0					Jar Number / Classification: 1 SP-SM; 2 SM; 3 SP-SM; 4 SP-SM; 5 SP-SM; 6 SP
			23.0'		23.0'	
			SP-SM Tan, fine, poorly-graded, silty sand with trace shell fragments		6	
	24.0				23.5'	
			Continued on Sheet 2			NOTE: HOLE TERMINATED AT REFUSAL DEPTH OF 16.0'

DRILLING LOG (Cont Sheet)	ELEVATION TOP OF HOLE 0.0 MLLW	Hole No. MAN-10-V-10
PROJECT MANTEO 204 PROJECT	INSTALLATION WILMINGTON DISTRICT	SHEET 2 OF 2 SHEETS

ELEVATION	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS (Description)	% CORE RECOVERY	BOX OR SAMPLE NO.	REMARKS (Drilling time, water loss, depth of weathering, etc., if significant)
	24.0		SP-SM Tan, fine, poorly-graded, silty sand w/trace shell fragments 24.7'			
			ASSUMED NOT RECOVERED			
	26.0					
	28.0					
-30.0	30.0		BOTTOM OF HOLE AT 30.0'			NOTE: HOLE TERMINATED AT PREDETERMINED DEPTH AT 16.0'
			SOILS ARE FIELD VISUALLY CLASSIFIED IN ACCORDANCE WITH THE UNIFIED SOIL CLASSIFICATION SYSTEM			

DRILLING LOG	DIVISION: SOUTH ATLANTIC	INSTALLATION: WILMINGTON DISTRICT	SHEET 1 OF 1 SHEETS
1. PROJECT: MANTEO 204 PROJECT		10. SIZE AND TYPE OF BIT: 4" Dia. Vibracore	
2. LOCATION (Coordinates or Station): NC COORD N 734054 E 2994758 NAD83		11. DATUM FOR ELEVATION SHOWN (BM or MSL): MLLW	
3. DRILLING AGENCY: WILMINGTON DISTRICT		12. MANUFACTURER'S DESIGNATION OF DRILL: VIBRA CORE SNELL	
4. HOLE NO. (As shown on drawing title and file number): MAN-10-V-11		13. TOTAL NO. OF OVER-BURDEN SAMPLES TAKEN: DISTURBED: 6 UNDISTURBED: 0	
5. NAME OF DRILLER: LESTER GAUGHF CRANE OPERATOR		14. TOTAL NUMBER CORE BOXES: N/A	
6. DIRECTION OF HOLE: ☒ VERTICAL ☐ INCLINED _____ DEG. FROM VERT.		15. ELEVATION GROUND WATER: N/A	
7. THICKNESS OF OVERBURDEN: N/A (14.0' of Water)		16. DATE HOLE: STARTED: 3/16/2009 COMPLETED: 3/16/2009	
8. DEPTH DRILLED INTO ROCK: 0.0'		17. ELEVATION TOP OF HOLE: 0.0' MLLW	
9. TOTAL DEPTH OF HOLE: 29.0'		18. TOTAL CORE RECOVERY FOR BORING: N/A %	
		19. SIGNATURE OF INSPECTOR: CARL BAYNARD, CIVIL ENGINEER	

ELEVATION MLLW	DEPTH feet	LEGEND	CLASSIFICATION OF MATERIALS (Description)	% CORE RECOVERY	BOX OR SAMPLE NO.	REMARKS (Drilling time, water loss, depth of weathering, etc., if significant)
0.0	0		0.0' TO 14.0' WATER			Time begin vibracoring: 0939 hrs. Soils described by Larry Benjamin, Civil Engr. Tech.
			OCEAN BOTTOM AT 14.0'		14.0'	
-14.0	14.0		SM Gray, fine, silty sand with trace shell fragments		1	NOTE: TOP OF HOLE is defined as surface of water and compensation is made for the tide such that top of Hole is 0.0 EL MLLW.
					14.5'	
	16.0				16.0'	VIBRACORE BORING From 0.0' to 15.0' Ran 15.0' Rec: 12.0'
					2	
					16.5'	
			17.0'		17.0'	
			SP-SM Tan, fine, poorly-graded, silty sand		3	Top of vibracore soil sample is logged as beginning at Ocean Bottom. When Run is greater than Recovery, the difference is depicted as Assumed Not Recovered.
	18.0				17.5'	
			18.8'		18.8'	
			GM Gray, fine, silty gravel		4	NOTE: Soils Commercial Lab Classified in Accordance with ASTM-D2487
					19.3'	
	20.0					
			20.8'		20.8'	
			SM Gray, fine, silty sand with trace shell fragments		5	LAB CLASSIFICATION
					21.3'	Jar Number / Classification: 1 SP-SM; 2 SM; 3 SP-SM; 4 SP; 5 SM; 6 SP
	22.0					
			23.0'		23.0'	
			SP-SM Tan, fine, poorly-graded, silty sand		6	
					23.5'	
	24.0		Continued on Sheet 2			NOTE: HOLE TERMINATED AT REFUSAL DEPTH OF 15.0'

DRILLING LOG (Cont Sheet)	ELEVATION TOP OF HOLE 0.0 MLLW	Hole No. MAN-10-V-11
PROJECT MANTEO 204 PROJECT	INSTALLATION WILMINGTON DISTRICT	SHEET 2 OF 2 SHEETS

ELEVATION	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS (Description)	% CORE RECOVERY	BOX OR SAMPLE NO.	REMARKS (Drilling time, water loss, depth of weathering, etc., if significant)
	24.0		SP-SM Tan, fine, poorly-graded, silty sand			
	26.0		26.0'			
			ASSUMED NOT RECOVERED			
	28.0					
-29.0	29.0		BOTTOM OF HOLE AT 29.0'			NOTE: HOLE TERMINATED AT PREDETERMINED DEPTH AT 15.0'
			SOILS ARE FIELD VISUALLY CLASSIFIED IN ACCORDANCE WITH THE UNIFIED SOIL CLASSIFICATION SYSTEM			

HOLE NO. MAN-10-V-12

DRILLING LOG	DIVISION SOUTH ATLANTIC	INSTALLATION WILMINGTON DISTRICT	SHEET 1 OF 1 SHEETS
1. PROJECT MANTEO 204 PROJECT		10. SIZE AND TYPE OF BIT 4" Dia. Vibracore	
2. LOCATION (Coordinates or Station) NC COORD N 735375 E 2992362 NAD83		11. DATUM FOR ELEVATION SHOWN (BM or MSL) MLLW	
3. DRILLING AGENCY WILMINGTON DISTRICT		12. MANUFACTURER'S DESIGNATION OF DRILL VIBRA CORE SNELL	
4. HOLE NO. (As shown on drawing title and file number) MAN-10-V-12		13. TOTAL NO. OF OVER-BURDEN SAMPLES TAKEN: DISTURBED 4 UNDISTURBED 0	
5. NAME OF DRILLER LESTER GAUGHF CRANE OPERATOR		14. TOTAL NUMBER CORE BOXES N/A	
6. DIRECTION OF HOLE ☒ VERTICAL ☐ INCLINED _____ DEG. FROM VERT.		15. ELEVATION GROUND WATER N/A	
7. THICKNESS OF OVERBURDEN N/A (13.6' of Water)		16. DATE HOLE STARTED 3/16/2009 COMPLETED 3/16/2009	
8. DEPTH DRILLED INTO ROCK 0.0'		17. ELEVATION TOP OF HOLE 0.0' MLLW	
9. TOTAL DEPTH OF HOLE 25.6'		18. TOTAL CORE RECOVERY FOR BORING N/A %	
		19. SIGNATURE OF INSPECTOR CARL BAYNARD, CIVIL ENGINEER	

ELEVATION MLLW	DEPTH feet	LEGEND	CLASSIFICATION OF MATERIALS (Description)	% CORE RECOVERY	BOX OR SAMPLE NO.	REMARKS (Drilling time, water loss, depth of weathering, etc., if significant)
0.0	0		0.0' TO 13.6' WATER			Time begin vibracoring: 1002 hrs. Soils described by Larry Benjamin, Civil Engr. Tech.
	13.0		OCEAN BOTTOM AT 13.6'		13.6'	NOTE: TOP OF HOLE is defined as surface of water and compensation is made for the tide such that top of Hole is 0.0 EL MLLW.
-13.6	13.6		SM Grayish-tan, fine, silty sand with trace shell fragments		1	
			17.1'		14.1'	VIBRACORE BORING From 0.0' to 12.0' Ran 12.0' Rec: 8.8'
	15.0					
	17.0		MH Dark gray elastic silt		17.1'	Top of vibracore soil sample is logged as beginning at Ocean Bottom. When Run is greater than Recovery, the difference is depicted as Assumed Not Recovered.
			18.1'		2 17.6' 18.1'	
			SP Tan, coarse, poorly-graded sand		3	
	19.0				18.6'	NOTE: Soils Commercial Lab Classified in Accordance with ASTM-D2487
			20.6'		20.6'	LAB CLASSIFICATION
	21.0		SP-SM Gray. fine-medium, poorly -graded sand with shell fragments and pea gravel		4	Jar Number / Classification: 1 SP-SM; 2 MH; 3 SP; 4 SP-SM
			22.4'		21.1'	
			ASSUMED NOT RECOVERED			NOTE: HOLE TERMINATED AT REFUSAL DEPTH OF 12.0'
	23.0					
	25.0					
-25.6	25.6		BOTTOM OF HOLE AT 25.6'			
			SOILS ARE FIELD VISUALLY CLASSIFIED IN ACCORDANCE WITH THE UNIFIED SOIL CLASSIFICATION SYSTEM			

HOLE NO. MAN-10-V-13

DRILLING LOG	DIVISION SOUTH ATLANTIC	INSTALLATION WILMINGTON DISTRICT	SHEET 1 OF 1 SHEETS

1. PROJECT MANTEO 204 PROJECT	10. SIZE AND TYPE OF BIT 4" Dia. Vibracore
2. LOCATION (Coordinates or Station) NC COORD N 736010 E 2993815 NAD83	11. DATUM FOR ELEVATION SHOWN (BM or MSL) MLLW
3. DRILLING AGENCY WILMINGTON DISTRICT	12. MANUFACTURER'S DESIGNATION OF DRILL VIBRA CORE SNELL
4. HOLE NO. (As shown on drawing title and file number) MAN-10-V-13	13. TOTAL NO. OF OVER-BURDEN SAMPLES TAKEN: DISTURBED 4 : UNDISTURBED 0
5. NAME OF DRILLER LESTER GAUGHF CRANE OPERATOR	14. TOTAL NUMBER CORE BOXES N/A
6. DIRECTION OF HOLE ☒ VERTICAL ☐ INCLINED _____ DEG. FROM VERT.	15. ELEVATION GROUND WATER N/A
7. THICKNESS OF OVERBURDEN N/A (13.6' of Water)	16. DATE HOLE: STARTED 3/16/2009 : COMPLETED 3/16/2009
8. DEPTH DRILLED INTO ROCK 0.0'	17. ELEVATION TOP OF HOLE 0.0' MLLW
9. TOTAL DEPTH OF HOLE 25.6'	18. TOTAL CORE RECOVERY FOR BORING N/A %
	19. SIGNATURE OF INSPECTOR CARL BAYNARD, CIVIL ENGINEER

ELEVATION a	DEPTH b	LEGEND c	CLASSIFICATION OF MATERIALS (Description) d	% CORE RECOVERY e	BOX OR SAMPLE NO. f	REMARKS (Drilling time, water loss, depth of weathering, etc., if significant) g
0.0	0		0.0' TO 13.6' WATER			Time begin vibracoring: 1018 hrs. Soils described by Larry Benjamin, Civil Engr. Tech.
	13.0		OCEAN BOTTOM AT 13.6'		13.6'	NOTE: TOP OF HOLE is defined as surface of water and compensation is made for the tide such that top of Hole is 0.0 EL MLLW.
-13.6	13.6		SP-SM Gray, fine, poorly-graded silty sand with trace roots		1	
	15.0		15.6'		14.1' 15.6'	VIBRACORE BORING From 0.0' to 12.0' Ran 12.0' Rec: 9.0'
			MH Dark gray elastic silt		2	
			16.6'		16.1' 16.6'	Top of vibracore soil sample is logged as beginning at Ocean Bottom. When Run is greater than Recovery, the difference is depicted as Assumed Not Recovered.
	17.0		SP-SM Gray, fine, poorly-graded silty sand with trace shell fragments		3	
			19.3'		17.1' 19.3'	NOTE: Soils Commercial Lab Classified in Accordance with ASTM-D2487
	19.0		SP Tan, coarse, poorly-graded sand with shell fragments		4	
			21.0' trace shell fragments 21.8' no shell fragments		19.8'	LAB CLASSIFICATION: Jar Number 1 MH; 2 SP; 3 SP; 4 SP
	21.0		22.6'			
	23.0		ASSUMED NOT RECOVERED			NOTE: HOLE TERMINATED AT REFUSAL DEPTH OF 12.0'
	25.0					
-25.6	25.6		BOTTOM OF HOLE AT 25.6' SOILS ARE FIELD VISUALLY CLASSIFIED IN ACCORDANCE WITH THE UNIFIED SOIL CLASSIFICATION SYSTEM			

DRILLING LOG | DIVISION: SOUTH ATLANTIC | INSTALLATION: WILMINGTON DISTRICT | SHEET 1 OF 1 SHEETS

1. PROJECT: MANTEO 204 PROJECT
2. LOCATION (Coordinates or Station): NC COORD N 736791 E 2995705 NAD83
3. DRILLING AGENCY: WILMINGTON DISTRICT
4. HOLE NO. (As shown on drawing title and file number): MAN-10-V-14
5. NAME OF DRILLER: LESTER GAUGHF CRANE OPERATOR
6. DIRECTION OF HOLE: ☒ VERTICAL ☐ INCLINED _____ DEG. FROM VERT.
7. THICKNESS OF OVERBURDEN: N/A (14.8' of Water)
8. DEPTH DRILLED INTO ROCK: 0.0'
9. TOTAL DEPTH OF HOLE: 24.8'
10. SIZE AND TYPE OF BIT: 4" Dia. Vibracore
11. DATUM FOR ELEVATION SHOWN (BM or MSL): MLLW
12. MANUFACTURER'S DESIGNATION OF DRILL: VIBRA CORE SNELL
13. TOTAL NO. OF OVER-BURDEN SAMPLES TAKEN: DISTURBED 4 : UNDISTURBED 0
14. TOTAL NUMBER CORE BOXES: N/A
15. ELEVATION GROUND WATER: N/A
16. DATE HOLE: STARTED 3/16/2009 : COMPLETED 3/16/2009
17. ELEVATION TOP OF HOLE: 0.0' MLLW
18. TOTAL CORE RECOVERY FOR BORING: N/A %
19. SIGNATURE OF INSPECTOR: CARL BAYNARD, CIVIL ENGINEER

ELEVATION MLLW	DEPTH feet	LEGEND	CLASSIFICATION OF MATERIALS (Description)	% CORE RECOVERY	BOX OR SAMPLE NO.	REMARKS (Drilling time, water loss, depth of weathering, etc., if significant)
0.0	0		0.0' TO 14.8' WATER			Time begin vibracoring: 1041 hrs. Soils described by Larry Benjamin, Civil Engr. Tech.
	14.0					NOTE: TOP OF HOLE is defined as surface of water and compensation is made for the tide such that top of Hole is 0.0 EL MLLW.
-14.8	14.8		OCEAN BOTTOM AT 14.8'		14.8'	
			SM Grayish-tan, fine, silty sand with trace shell fragments		1	
	16.0		16.8'		15.3' 16.8'	VIBRACORE BORING From 0.0' to 10.0' Ran 10.0' Rec: 9.5'
			MH Dark gray elastic silt		2	
	18.0		19.3'		17.3' 19.3'	Top of vibracore soil sample is logged as beginning at Ocean Bottom. When Run is greater than Recovery, the difference is depicted as Assumed Not Recovered.
			OL Gray organic soil, slight rust discoloration		3	
	20.0		21.6'		19.8' 21.6'	NOTE: Soils Commercial Lab Classified in Accordance with ASTM-D2487
			SM Gray, fine silty sand with shell fragments		4	LAB CLASSIFICATION: Jar Number 1 SP; 2 MH; 3 SM; 4 SM
	22.0		24.3'		22.1'	
	24.0		ASSUMED NOT RECOVERED			
-24.8	24.8		BOTTOM OF HOLE AT 24.8'			NOTE: HOLE TERMINATED UPON REFUSAL DEPTH 10.0'
			SOILS ARE FIELD VISUALLY CLASSIFIED IN ACCORDANCE WITH THE UNIFIED SOIL CLASSIFICATION SYSTEM			

DRILLING LOG | DIVISION: SOUTH ATLANTIC | INSTALLATION: WILMINGTON DISTRICT | SHEET 1 OF 1 SHEETS

1. PROJECT: MANTEO 204 PROJECT
2. LOCATION (Coordinates or Station): NC COORD N 737545 E 2993679 NAD83
3. DRILLING AGENCY: WILMINGTON DISTRICT
4. HOLE NO. (As shown on drawing title and file number): MAN-10-V-15
5. NAME OF DRILLER: LESTER GAUGHF CRANE OPERATOR
6. DIRECTION OF HOLE: ☒ VERTICAL ☐ INCLINED _____ DEG. FROM VERT.
7. THICKNESS OF OVERBURDEN: N/A (14.0' of Water)
8. DEPTH DRILLED INTO ROCK: 0.0'
9. TOTAL DEPTH OF HOLE: 26.0'
10. SIZE AND TYPE OF BIT: 4" Dia. Vibracore
11. DATUM FOR ELEVATION SHOWN (BM or MSL): MLLW
12. MANUFACTURER'S DESIGNATION OF DRILL: VIBRA CORE SNELL
13. TOTAL NO. OF OVER-BURDEN SAMPLES TAKEN: DISTURBED 4 | UNDISTURBED 0
14. TOTAL NUMBER CORE BOXES: N/A
15. ELEVATION GROUND WATER: N/A
16. DATE HOLE: STARTED 3/16/2009 | COMPLETED 3/16/2009
17. ELEVATION TOP OF HOLE: 0.0' MLLW
18. TOTAL CORE RECOVERY FOR BORING: N/A %
19. SIGNATURE OF INSPECTOR: CARL BAYNARD, CIVIL ENGINEER

ELEVATION MLLW	DEPTH feet	LEGEND	CLASSIFICATION OF MATERIALS (Description)	% CORE RECOVERY	BOX OR SAMPLE NO.	REMARKS (Drilling time, water loss, depth of weathering, etc., if significant)
0.0	0		0.0' TO 14.0' WATER			Time begin vibracoring: 1101 hrs. Soils described by Larry Benjamin, Civil Engr. Tech.
			OCEAN BOTTOM AT 14.0'		14.0'	
-14.0	14.0		SM Tan, fine, silty sand		1	NOTE: TOP OF HOLE is defined as surface of water and compensation is made for the tide such that top of Hole is 0.0 EL MLLW.
					14.5'	
	16.0					VIBRACORE BORING From 0.0' to 12.0' Ran 12.0' Rec: 10.0'
					16.0'	
					2	Top of vibracore soil sample is logged as beginning at Ocean Bottom. When Run is greater than Recovery, the difference is depicted as Assumed Not Recovered.
	18.0		18.4'		16.5'	
					18.4'	
			SP Tan, coarse, poorly -graded sand		3	
					18.9'	
					20.0'	NOTE: Soils Commercial Lab Classified in Accordance with ASTM-D2487
	20.0				4	
					20.5'	
						LAB CLASSIFICATION: Jar Number 1 SM; 2 SM; 3 SP; 4 SP-SM; 5 SP
	22.0				22.0'	
					5	
					22.5'	
	24.0		24.0'			
			ASSUMED NOT RECOVERED			
-26.0	26.0		BOTTOM OF HOLE AT 26.0'			NOTE: HOLE TERMINATED UPON REFUSAL DEPTH 12.0'
			SOILS ARE FIELD VISUALLY CLASSIFIED IN ACCORDANCE WITH THE UNIFIED SOIL CLASSIFICATION SYSTEM			

HOLE NO. MAN-10-V-16

DRILLING LOG	DIVISION: SOUTH ATLANTIC	INSTALLATION: WILMINGTON DISTRICT	SHEET 1 OF 1 SHEETS

1. PROJECT: MANTEO 204 PROJECT	10. SIZE AND TYPE OF BIT: 4" Dia. Vibracore
2. LOCATION (Coordinates or Station): NC COORD N 728610 E 2998149 NAD83	11. DATUM FOR ELEVATION SHOWN (BM or MSL): MLLW
3. DRILLING AGENCY: WILMINGTON DISTRICT	12. MANUFACTURER'S DESIGNATION OF DRILL: VIBRA CORE SNELL
4. HOLE NO. (As shown on drawing title and file number): MAN-10-V-16	13. TOTAL NO. OF OVER-BURDEN SAMPLES TAKEN: DISTURBED 4 / UNDISTURBED 0
5. NAME OF DRILLER: LESTER GAUGHF CRANE OPERATOR	14. TOTAL NUMBER CORE BOXES: N/A
6. DIRECTION OF HOLE: ☒ VERTICAL ☐ INCLINED _____ DEG. FROM VERT.	15. ELEVATION GROUND WATER: N/A
7. THICKNESS OF OVERBURDEN: N/A (17.0' of Water)	16. DATE HOLE: STARTED 3/16/2009 / COMPLETED 3/16/2009
8. DEPTH DRILLED INTO ROCK: 0.0'	17. ELEVATION TOP OF HOLE: 0.0' MLLW
9. TOTAL DEPTH OF HOLE: 27.0'	18. TOTAL CORE RECOVERY FOR BORING: N/A %
	19. SIGNATURE OF INSPECTOR: CARL BAYNARD, CIVIL ENGINEER

ELEVATION MLLW	DEPTH feet	LEGEND	CLASSIFICATION OF MATERIALS (Description)	% CORE RECOVERY	BOX OR SAMPLE NO.	REMARKS (Drilling time, water loss, depth of weathering, etc., if significant)
0.0	0		0.0' TO 17.0' WATER			Time begin vibracoring: 1154 hrs. Soils described by Larry Benjamin, Civil Engr. Tech.
			OCEAN BOTTOM AT 17.0'		17.0'	
-17.0	17.0		MH Dark gray elastic silt		1	NOTE: TOP OF HOLE is defined as surface of water and compensation is made for the tide such that top of Hole is 0.0 EL MLLW.
					17.5'	
	19.0					VIBRACORE BORING From 0.0' to 10.0' Ran 10.0' Rec: 9.5'
					20.0'	
					2	
	21.0				20.5'	Top of vibracore soil sample is logged as beginning at Ocean Bottom. When Run is greater than Recovery, the difference is depicted as Assumed Not Recovered.
	23.0		23.3'		23.3'	NOTE: Soils Commercial Lab Classified in Accordance with ASTM-D2487
			SP Grayish-tan, medium-coarse, poorly-graded sand with shell fragments		3	
					23.8'	
	25.0				25.0'	LAB CLASSIFICATION
					4	Jar Number / Classification: 1 MH; 2 MH; 3 SP; 4 SP
					25.5'	
			26.5'			
			ASSUMED NOT RECOVERED			
-27.0	27.0		BOTTOM OF HOLE AT 27.0'			NOTE: HOLE TERMINATED AT PREDETERMINED DEPTH AT 10.0'
			SOILS ARE FIELD VISUALLY CLASSIFIED IN ACCORDANCE WITH THE UNIFIED SOIL CLASSIFICATION SYSTEM			

HOLE NO. MAN-10-V-17

DRILLING LOG	DIVISION: SOUTH ATLANTIC	INSTALLATION: WILMINGTON DISTRICT	SHEET 1 OF 1 SHEETS

1. PROJECT: MANTEO 204 PROJECT	10. SIZE AND TYPE OF BIT: 4" Dia. Vibracore
2. LOCATION (Coordinates or Station): NC COORD N 730531 E 2999371 NAD83	11. DATUM FOR ELEVATION SHOWN (BM or MSL): MLLW
3. DRILLING AGENCY: WILMINGTON DISTRICT	12. MANUFACTURER'S DESIGNATION OF DRILL: VIBRA CORE SNELL
4. HOLE NO. (As shown on drawing title and file number): MAN-10-V-17	13. TOTAL NO. OF OVER-BURDEN SAMPLES TAKEN: DISTURBED 2 / UNDISTURBED 0
5. NAME OF DRILLER: LESTER GAUGHF CRANE OPERATOR	14. TOTAL NUMBER CORE BOXES: N/A
6. DIRECTION OF HOLE: ☒ VERTICAL ☐ INCLINED _____ DEG. FROM VERT.	15. ELEVATION GROUND WATER: N/A
7. THICKNESS OF OVERBURDEN: N/A (14.8' of Water)	16. DATE HOLE: STARTED 3/16/2009 / COMPLETED 3/16/2009
8. DEPTH DRILLED INTO ROCK: 0.0'	17. ELEVATION TOP OF HOLE: 0.0' MLLW
9. TOTAL DEPTH OF HOLE: 24.3'	18. TOTAL CORE RECOVERY FOR BORING: N/A %
	19. SIGNATURE OF INSPECTOR: CARL BAYNARD, CIVIL ENGINEER

ELEVATION MLLW	DEPTH feet	LEGEND	CLASSIFICATION OF MATERIALS (Description)	% CORE RECOVERY	BOX OR SAMPLE NO.	REMARKS (Drilling time, water loss, depth of weathering, etc., if significant)
0.0	0		0.0' TO 14.3' WATER			Time begin vibracoring: 1216 hrs. Soils described by Larry Benjamin, Civil Engr. Tech.
	14.0					
-14.3	14.3		OCEAN BOTTOM AT 14.3'		14.3'	NOTE: TOP OF HOLE is defined as surface of water and compensation is made for the tide such that top of Hole is 0.0 EL MLLW.
			SM Blackish-gray, fine silty sand		1	
					14.8'	
	16.0				16.3'	VIBRACORE BORING From 0.0' to 10.0' Ran 10.0' Rec: 2.5'
			16.8'		2	
			ASSUMED NOT RECOVERED		16.8'	Top of vibracore soil sample is logged as beginning at Ocean Bottom. When Run is greater than Recovery, the difference is depicted as Assumed Not Recovered.
	18.0					
	20.0					NOTE: Soils Commercial Lab Classified in Accordance with ASTM-D2487
	22.0					LAB CLASSIFICATION: Jar Number 1 — SM; Jar Number 2 — SM
	24.0					
-24.3	24.3		BOTTOM OF HOLE AT 24.3' SOILS ARE FIELD VISUALLY CLASSIFIED IN ACCORDANCE WITH THE UNIFIED SOIL CLASSIFICATION SYSTEM			NOTE: HOLE TERMINATED AT PREDETERMINED DEPTH AT 10.0'

DRILLING LOG | DIVISION: SOUTH ATLANTIC | INSTALLATION: WILMINGTON DISTRICT | SHEET 1 OF 1 SHEETS

1. PROJECT: MANTEO 204 PROJECT
2. LOCATION (Coordinates or Station): NC COORD N 732183 E 3000416 NAD83
3. DRILLING AGENCY: WILMINGTON DISTRICT
4. HOLE NO. (As shown on drawing title and file number): MAN-10-V-18
5. NAME OF DRILLER: LESTER GAUGHF — CRANE OPERATOR
6. DIRECTION OF HOLE: ☒ VERTICAL ☐ INCLINED _____ DEG. FROM VERT.
7. THICKNESS OF OVERBURDEN: N/A (11.5' of Water)
8. DEPTH DRILLED INTO ROCK: 0.0'
9. TOTAL DEPTH OF HOLE: 21.5'
10. SIZE AND TYPE OF BIT: 4" Dia. Vibracore
11. DATUM FOR ELEVATION SHOWN (BM or MSL): MLLW
12. MANUFACTURER'S DESIGNATION OF DRILL: VIBRA CORE — SNELL
13. TOTAL NO. OF OVER-BURDEN SAMPLES TAKEN: DISTURBED: 3 — UNDISTURBED: 0
14. TOTAL NUMBER CORE BOXES: N/A
15. ELEVATION GROUND WATER: N/A
16. DATE HOLE: STARTED: 3/16/2009 — COMPLETED: 3/16/2009
17. ELEVATION TOP OF HOLE: 0.0' MLLW
18. TOTAL CORE RECOVERY FOR BORING: N/A %
19. SIGNATURE OF INSPECTOR: CARL BAYNARD, CIVIL ENGINEER

ELEVATION MLLW	DEPTH feet	LEGEND	CLASSIFICATION OF MATERIALS (Description)	% CORE RECOVERY	BOX OR SAMPLE NO.	REMARKS (Drilling time, water loss, depth of weathering, etc., if significant)
0.0	0		0.0' TO 11.5' WATER			Time begin vibracoring: 1235 hrs. Soils described by Larry Benjamin, Civil Engr. Tech.
	11.0		OCEAN BOTTOM AT 11.5'		11.5'	NOTE: TOP OF HOLE is defined as surface of water and compensation is made for the tide such that top of Hole is 0.0 EL MLLW.
-11.5	11.5		SP-SM Grayish-tan, fine, poorly -graded silty sand		1	
					12.0'	VIBRACORE BORING From 0.0' to 10.0' Ran 10.0' Rec: 7.5'
	13.0				13.5'	
					2	
					14.0'	Top of vibracore soil sample is logged as beginning at Ocean Bottom. When Run is greater than Recovery, the difference is depicted as Assumed Not Recovered.
	15.0		16.0'		16.0'	
			SM Gray, fine silty sand		3	
	17.0		17.5' grayish-tan color		16.5'	NOTE: Soils Commercial Lab Classified in Accordance with ASTM-D2487
			19.0'			LAB CLASSIFICATION: Jar Number 1 — SP-SM; 2 — SP-SM; 3 — SM
	19.0		ASSUMED NOT RECOVERED			
	21.0					
-21.5	21.5		BOTTOM OF HOLE AT 21.5' SOILS ARE FIELD VISUALLY CLASSIFIED IN ACCORDANCE WITH THE UNIFIED SOIL CLASSIFICATION SYSTEM			NOTE: HOLE TERMINATED AT PREDETERMINED DEPTH AT 10.0'

DRILLING LOG	DIVISION: SOUTH ATLANTIC	INSTALLATION: WILMINGTON DISTRICT	SHEET 1 OF 1 SHEETS

1. PROJECT: MANTEO 204 PROJECT	10. SIZE AND TYPE OF BIT: 4" Dia. Vibracore
2. LOCATION (Coordinates or Station): NC COORD N 734976 E 2999458 NAD83	11. DATUM FOR ELEVATION SHOWN (BM or MSL): MLLW
3. DRILLING AGENCY: WILMINGTON DISTRICT	12. MANUFACTURER'S DESIGNATION OF DRILL: VIBRA CORE SNELL
4. HOLE NO. (As shown on drawing title and file number): MAN-10-V-19	13. TOTAL NO. OF OVER-BURDEN SAMPLES TAKEN: DISTURBED 3 / UNDISTURBED 0
5. NAME OF DRILLER: LESTER GAUGHF CRANE OPERATOR	14. TOTAL NUMBER CORE BOXES: N/A
6. DIRECTION OF HOLE: ☒ VERTICAL ☐ INCLINED _____ DEG. FROM VERT.	15. ELEVATION GROUND WATER: N/A
7. THICKNESS OF OVERBURDEN: N/A (11.6' of Water)	16. DATE HOLE: STARTED 3/16/2009 / COMPLETED 3/16/2009
8. DEPTH DRILLED INTO ROCK: 0.0'	17. ELEVATION TOP OF HOLE: 0.0' MLLW
9. TOTAL DEPTH OF HOLE: 21.6'	18. TOTAL CORE RECOVERY FOR BORING: N/A %
	19. SIGNATURE OF INSPECTOR: CARL BAYNARD, CIVIL ENGINEER

ELEVATION MLLW	DEPTH feet	LEGEND	CLASSIFICATION OF MATERIALS (Description)	% CORE RECOVERY	BOX OR SAMPLE NO.	REMARKS (Drilling time, water loss, depth of weathering, etc., if significant)
0.0	0		0.0' TO 11.6' WATER			Time begin vibracoring: 1256 hrs. Soils described by Larry Benjamin, Civil Engr. Tech.
	11.0		OCEAN BOTTOM AT 11.6'		11.6'	NOTE: TOP OF HOLE is defined as surface of water and compensation is made for the tide such that top of Hole is 0.0 EL MLLW.
-11.6	11.6		SP-SM Tan, fine, poorly-graded silty sand		1	
					12.1'	VIBRACORE BORING From 0.0' to 10.0' Ran 10.0' Rec: 7.0'
	13.0				13.5'	
					2	
					14.0'	Top of vibracore soil sample is logged as beginning at Ocean Bottom. When Run is greater than Recovery, the difference is depicted as Assumed Not Recovered.
	15.0				15.6'	
			MH Dark gray elastic silt with large shell fragments		3	
			16.0'		16.1'	
	17.0		no shell fragments			NOTE: Soils Commercial Lab Classified in Accordance with ASTM-D2487
			18.6'			LAB CLASSIFICATION
	19.0		ASSUMED NOT RECOVERED			Jar Number / Classification: 1 SP-SM; 2 SP-SM; 3 MH
	21.0					
-21.6	21.6		BOTTOM OF HOLE AT 21.6'			NOTE: HOLE TERMINATED AT PREDETERMINED DEPTH AT 10.0'
			SOILS ARE FIELD VISUALLY CLASSIFIED IN ACCORDANCE WITH THE UNIFIED SOIL CLASSIFICATION SYSTEM			

DRILLING LOG	DIVISION SOUTH ATLANTIC	INSTALLATION WILMINGTON DISTRICT	SHEET 1 OF 1 SHEETS
1. PROJECT MANTEO 204 PROJECT		10. SIZE AND TYPE OF BIT 4" Dia. Vibracore	
2. LOCATION (Coordinates or Station) NC COORD N 735018 E 3000012 NAD83		11. DATUM FOR ELEVATION SHOWN (BM or MSL) MLLW	
3. DRILLING AGENCY WILMINGTON DISTRICT		12. MANUFACTURER'S DESIGNATION OF DRILL VIBRA CORE SNELL	
4. HOLE NO. (As shown on drawing title and file number) MAN-10-V-20		13. TOTAL NO. OF OVER-BURDEN SAMPLES TAKEN: DISTURBED 3 : UNDISTURBED 0	
5. NAME OF DRILLER LESTER GAUGHF CRANE OPERATOR		14. TOTAL NUMBER CORE BOXES N/A	
6. DIRECTION OF HOLE ☒ VERTICAL ☐ INCLINED _____ DEG. FROM VERT.		15. ELEVATION GROUND WATER N/A	
		16. DATE HOLE STARTED 3/16/2009 : COMPLETED 3/16/2009	
7. THICKNESS OF OVERBURDEN N/A (8.6' of Water)		17. ELEVATION TOP OF HOLE 0.0' MLLW	
8. DEPTH DRILLED INTO ROCK 0.0'		18. TOTAL CORE RECOVERY FOR BORING N/A %	
9. TOTAL DEPTH OF HOLE 18.6'		19. SIGNATURE OF INSPECTOR CARL BAYNARD, CIVIL ENGINEER	

ELEVATION MLLW	DEPTH feet	LEGEND	CLASSIFICATION OF MATERIALS (Description)	% CORE RECOVERY	BOX OR SAMPLE NO.	REMARKS (Drilling time, water loss, depth of weathering, etc., if significant)
0.0	0		0.0' TO 8.6' WATER			Time begin vibracoring: 1315 hrs Soils described by Larry Benjamin, Civil Engr. Tech.
	8.0		OCEAN BOTTOM AT 8.6'		8.6'	NOTE: TOP OF HOLE is defined as surface of water and compensation is made for the tide such that top of Hole is 0.0 EL MLLW.
-8.6	8.6		SP-SM Tan, fine, poorly-graded silty sand		1 9.1'	VIBRACORE BORING From 0.0' to 10.0' Ran 10.0' Rec: 7.2'
	10.0				11.0'	
					2 11.5'	Top of vibracore soil sample is logged as beginning at Ocean Bottom. When Run is greater than Recovery, the difference is depicted as Assumed Not Recovered.
	12.0		13.6'		13.6'	
	14.0		SM Gray, fine silty sand		3 14.1'	NOTE: Soils Commercial Lab Classified in Accordance with ASTM-D2487
			15.8'			LAB CLASSIFICATION Jar Number / Classification 1 SP 2 SP-SM 3 SM
	16.0		ASSUMED NOT RECOVERED			
	18.0					
-18.6	18.6		BOTTOM OF HOLE AT 18.6'			NOTE: HOLE TERMINATED AT PREDETERMINED DEPTH AT 10.0'
			SOILS ARE FIELD VISUALLY CLASSIFIED IN ACCORDANCE WITH THE UNIFIED SOIL CLASSIFICATION SYSTEM			

HOLE NO. MAN-10-V-21

DRILLING LOG	DIVISION SOUTH ATLANTIC	INSTALLATION WILMINGTON DISTRICT	SHEET 1 OF 1 SHEETS

1. PROJECT MANTEO 204 PROJECT	10. SIZE AND TYPE OF BIT 4" Dia. Vibracore
2. LOCATION (Coordinates or Station) NC COORD N 733832 E 3001522 NAD83	11. DATUM FOR ELEVATION SHOWN (BM or MSL) MLLW
3. DRILLING AGENCY WILMINGTON DISTRICT	12. MANUFACTURER'S DESIGNATION OF DRILL VIBRA CORE SNELL
4. HOLE NO. (As shown on drawing title and file number) MAN-10-V-21	13. TOTAL NO. OF OVER-BURDEN SAMPLES TAKEN: DISTURBED 3 : UNDISTURBED 0
5. NAME OF DRILLER LESTER GAUGHF CRANE OPERATOR	14. TOTAL NUMBER CORE BOXES N/A
6. DIRECTION OF HOLE ☒ VERTICAL ☐ INCLINED _____ DEG. FROM VERT.	15. ELEVATION GROUND WATER N/A
7. THICKNESS OF OVERBURDEN N/A (12.5' of Water)	16. DATE HOLE STARTED 3/16/2009 : COMPLETED 3/16/2009
8. DEPTH DRILLED INTO ROCK 0.0'	17. ELEVATION TOP OF HOLE 0.0' MLLW
9. TOTAL DEPTH OF HOLE 24.8'	18. TOTAL CORE RECOVERY FOR BORING N/A %
	19. SIGNATURE OF INSPECTOR CARL BAYNARD, CIVIL ENGINEER

ELEVATION MLLW	DEPTH feet	LEGEND	CLASSIFICATION OF MATERIALS (Description)	% CORE RECOVERY	BOX OR SAMPLE NO.	REMARKS (Drilling time, water loss, depth of weathering, etc., if significant)
0.0	0		0.0' TO 12.5' WATER			Time begin vibracoring: 1337 hrs. Soils described by Larry Benjamin, Civil Engr. Tech.
	12.0					
-12.5	12.5		OCEAN BOTTOM AT 12.5'		12.5'	NOTE: TOP OF HOLE is defined as surface of water and compensation is made for the tide such that top of Hole is 0.0 EL MLLW.
			SM Dark gray, fine silty sand		1	
	14.0				13.0'	
					14.5'	VIBRACORE BORING From 0.0' to 10.0' Ran 10.0' Rec: 6.2'
					2	
					15.0'	Top of vibracore soil sample is logged as beginning at Ocean Bottom. When Run is greater than Recovery, the difference is depicted as Assumed Not Recovered.
	16.0				16.2'	
			SP-SM Tan, fine, poorly-graded silty sand		3	
	18.0		18.7'		16.7'	NOTE: Soils Commercial Lab Classified in Accordance with ASTM-D2487
			ASSUMED NOT RECOVERED			LAB CLASSIFICATION
	20.0					Jar Number / Classification: 1 SM; 2 SM; 3 SM
	22.0					
-22.5	22.5		BOTTOM OF HOLE AT 22.5'			NOTE: HOLE TERMINATED UPON REFUSAL DEPTH 10.0'
			SOILS ARE FIELD VISUALLY CLASSIFIED IN ACCORDANCE WITH THE UNIFIED SOIL CLASSIFICATION SYSTEM			

HOLE NO. MAN-10-V-22

DRILLING LOG	DIVISION: SOUTH ATLANTIC	INSTALLATION: WILMINGTON DISTRICT	SHEET 1 OF 1 SHEETS

1. PROJECT: MANTEO 204 PROJECT	10. SIZE AND TYPE OF BIT: 4" Dia. Vibracore
2. LOCATION (Coordinates or Station): NC COORD N 735505 E 3002518 NAD83	11. DATUM FOR ELEVATION SHOWN (BM or MSL): MLLW
3. DRILLING AGENCY: WILMINGTON DISTRICT	12. MANUFACTURER'S DESIGNATION OF DRILL: VIBRA CORE SNELL
4. HOLE NO. (As shown on drawing title and file number): MAN-10-V-22	13. TOTAL NO. OF OVER-BURDEN SAMPLES TAKEN: DISTURBED 4 / UNDISTURBED 0
5. NAME OF DRILLER: LESTER GAUGHF CRANE OPERATOR	14. TOTAL NUMBER CORE BOXES: N/A
6. DIRECTION OF HOLE: ☒ VERTICAL ☐ INCLINED _____ DEG. FROM VERT.	15. ELEVATION GROUND WATER: N/A
7. THICKNESS OF OVERBURDEN: N/A (14.0' of Water)	16. DATE HOLE: STARTED 3/16/2009 / COMPLETED 3/16/2009
8. DEPTH DRILLED INTO ROCK: 0.0'	17. ELEVATION TOP OF HOLE: 0.0' MLLW
9. TOTAL DEPTH OF HOLE: 24.0'	18. TOTAL CORE RECOVERY FOR BORING: N/A %
	19. SIGNATURE OF INSPECTOR: CARL BAYNARD, CIVIL ENGINEER

a ELEVATION MLLW	a DEPTH feet	b LEGEND c	c CLASSIFICATION OF MATERIALS (Description) d	e % CORE RECOVERY	f BOX OR SAMPLE NO.	g REMARKS (Drilling time, water loss, depth of weathering, etc., if significant)
0.0	0		0.0' TO 14.0' WATER			Time begin vibracoring: 1353 hrs. Soils described by Larry Benjamin, Civil Engr. Tech.
			OCEAN BOTTOM AT 14.0'		14.0'	
-14.0	14.0		MH Dark gray elastic silt		1	NOTE: TOP OF HOLE is defined as surface of water and compensation is made for the tide such that top of Hole is 0.0 EL MLLW.
			15.5'		14.5' 15.5'	
			SM Grayish-tan, fine silty sand		2	VIBRACORE BORING From 0.0' to 10.0' Ran 10.0' Rec: 6.5'
	16.0		16.7'		16.0' 16.7'	
			SP-SM Tan, fine, poorly-graded silty sand		3	Top of vibracore soil sample is logged as beginning at Ocean Bottom. When Run is greater than Recovery, the difference is depicted as Assumed Not Recovered.
	18.0		18.3'		17.2' 18.3'	
			SP Tan, coarse, poorly-graded sand		4	
			20.0' trace shell and pea-gravel 20.5'		18.8'	NOTE: Soils Commercial Lab Classified in Accordance with ASTM-D2487
	20.0		ASSUMED NOT RECOVERED			LAB CLASSIFICATION
	22.0					Jar Number / Classification: 1 MH; 2 SM; 3 SP-SM; 4 SP-SM
-24.0	24.0		BOTTOM OF HOLE AT 24.0' SOILS ARE FIELD VISUALLY CLASSIFIED IN ACCORDANCE WITH THE UNIFIED SOIL CLASSIFICATION SYSTEM			NOTE: HOLE TERMINATED UPON REFUSAL DEPTH 10.0'

HOLE NO. MAN-10-V-23

DRILLING LOG	DIVISION SOUTH ATLANTIC	INSTALLATION WILMINGTON DISTRICT	SHEET 1 OF 1 SHEETS

1. PROJECT: MANTEO 204 PROJECT
2. LOCATION (Coordinates or Station): NC COORD N 737128 E 3003565 NAD83
3. DRILLING AGENCY: WILMINGTON DISTRICT
4. HOLE NO. (As shown on drawing title and file number): MAN-10-V-23
5. NAME OF DRILLER: LESTER GAUGHF CRANE OPERATOR
6. DIRECTION OF HOLE: ☒ VERTICAL ☐ INCLINED _____ DEG. FROM VERT.
7. THICKNESS OF OVERBURDEN: N/A (14.8' of Water)
8. DEPTH DRILLED INTO ROCK: 0.0'
9. TOTAL DEPTH OF HOLE: 24.8'
10. SIZE AND TYPE OF BIT: 4" Dia. Vibracore
11. DATUM FOR ELEVATION SHOWN (BM or MSL): MLLW
12. MANUFACTURER'S DESIGNATION OF DRILL: VIBRA CORE SNELL
13. TOTAL NO. OF OVER-BURDEN SAMPLES TAKEN: DISTURBED 4 : UNDISTURBED 0
14. TOTAL NUMBER CORE BOXES: N/A
15. ELEVATION GROUND WATER: N/A
16. DATE HOLE: STARTED 3/16/2009 : COMPLETED 3/16/2009
17. ELEVATION TOP OF HOLE: 0.0' MLLW
18. TOTAL CORE RECOVERY FOR BORING: N/A %
19. SIGNATURE OF INSPECTOR: CARL BAYNARD, CIVIL ENGINEER

ELEVATION MLLW	DEPTH feet	LEGEND	CLASSIFICATION OF MATERIALS (Description)	% CORE RECOVERY	BOX OR SAMPLE NO.	REMARKS (Drilling time, water loss, depth of weathering, etc., if significant)
0.0	0		0.0' TO 14.8' WATER			Time begin vibracoring: 1410 hrs. Soils described by Larry Benjamin, Civil Engr. Tech.
	14.0					NOTE: TOP OF HOLE is defined as surface of water and compensation is made for the tide such that top of Hole is 0.0 EL MLLW.
-14.8	14.8		OCEAN BOTTOM AT 14.8'		14.8'	
			SP-SM Tan, fine, poorly-graded silty sand		1	
					15.3'	VIBRACORE BORING From 0.0' to 10.0' Ran 10.0' Rec: 7.9
	16.0				17.0'	
					2	Top of vibracore soil sample is logged as beginning at Ocean Bottom. When Run is greater than Recovery, the difference is depicted as Assumed Not Recovered.
					17.5'	
	18.0		18.6' MH interlayer			
					19.5'	
					3	NOTE: Soils Commercial Lab Classified in Accordance with ASTM-D2487
	20.0				20.0'	
			21.8'		21.8'	LAB CLASSIFICATION: Jar Number 1 SP-SM; 2 SP-SM; 3 SP-SM; 4 SM
	22.0		SM Gray, fine silty sand with shell fragments		4	
			22.7'		22.3'	
			ASSUMED NOT RECOVERED			
	24.0					
-24.8	24.8		BOTTOM OF HOLE AT 24.8' SOILS ARE FIELD VISUALLY CLASSIFIED IN ACCORDANCE WITH THE UNIFIED SOIL CLASSIFICATION SYSTEM			NOTE: HOLE TERMINATED UPON REFUSAL DEPTH 10.0'

DRILLING LOG	DIVISION: SOUTH ATLANTIC	INSTALLATION: WILMINGTON DISTRICT	SHEET 1 OF 1 SHEETS

1. PROJECT: MANTEO 204 PROJECT	10. SIZE AND TYPE OF BIT: 4" Dia. Vibracore
2. LOCATION (Coordinates or Station): NC COORD N 739424 E 3005010 NAD83	11. DATUM FOR ELEVATION SHOWN (BW or MSL): MLLW
3. DRILLING AGENCY: WILMINGTON DISTRICT	12. MANUFACTURER'S DESIGNATION OF DRILL: VIBRA CORE SNELL
4. HOLE NO. (As shown on drawing title and file number): MAN-10-V-24	13. TOTAL NO. OF OVER-BURDEN SAMPLES TAKEN: DISTURBED 4 UNDISTURBED 0
5. NAME OF DRILLER: LESTER GAUGHF CRANE OPERATOR	14. TOTAL NUMBER CORE BOXES: N/A
6. DIRECTION OF HOLE: ☒ VERTICAL ☐ INCLINED _____ DEG. FROM VERT.	15. ELEVATION GROUND WATER: N/A
7. THICKNESS OF OVERBURDEN: N/A (16.7' of Water)	16. DATE HOLE: STARTED 3/16/2009 COMPLETED 3/16/2009
8. DEPTH DRILLED INTO ROCK: 0.0'	17. ELEVATION TOP OF HOLE: 0.0' MLLW
9. TOTAL DEPTH OF HOLE: 26.7'	18. TOTAL CORE RECOVERY FOR BORING: N/A %
	19. SIGNATURE OF INSPECTOR: CARL BAYNARD, CIVIL ENGINEER

ELEVATION MLLW	DEPTH feet	LEGEND	CLASSIFICATION OF MATERIALS (Description)	% CORE RECOVERY	BOX OR SAMPLE NO.	REMARKS (Drilling time, water loss, depth of weathering, etc., if significant)
0.0	0		0.0' TO 16.7' WATER			Time begin vibracoring: 1430 hrs. Soils described by Larry Benjamin, Civil Engr. Tech.
	16.0					NOTE: TOP OF HOLE is defined as surface of water and compensation is made for the tide such that top of Hole is 0.0 EL MLLW.
-16.7	16.7		OCEAN BOTTOM AT 16.7'		16.7'	
			SM Gray, fine, silty sand		1	
					17.2'	
	18.0					VIBRACORE BORING From 0.0' to 10.0' Ran 10.0' Rec: 7.9
					18.7'	
			SP-SM Tan, fine-medium, poorly-graded silty sand with trace shell fragments		2	
					19.2'	Top of vibracore soil sample is logged as beginning at Ocean Bottom. When Run is greater than Recovery, the difference is depicted as Assumed Not Recovered.
	20.0		21.0'		21.0'	
			SP Tan, coarse, poorly-graded sand with trace shell fragments		3	
					21.5'	NOTE: Soils Commercial Lab Classified in Accordance with ASTM-D2487
	22.0					
			23.7'		23.7'	LAB CLASSIFICATION
	24.0		SM Grayish-tan, fine, silty sand with shell fragments		4	Jar Number / Classification: 1 SP; 2 SP; 3 SP-SM; 4 SM
					24.2'	
			25.5'			
	26.0		ASSUMED NOT RECOVERED			
-26.7	26.7		BOTTOM OF HOLE AT 26.7'			NOTE: HOLE TERMINATED UPON REFUSAL DEPTH 10.0'
			SOILS ARE FIELD VISUALLY CLASSIFIED IN ACCORDANCE WITH THE UNIFIED SOIL CLASSIFICATION SYSTEM			

HOLE NO. MAN-10-V-25

DRILLING LOG	DIVISION SOUTH ATLANTIC	INSTALLATION WILMINGTON DISTRICT	SHEET 1 OF 1 SHEETS

1. PROJECT: MANTEO 204 PROJECT
2. LOCATION (Coordinates or Station): NC COORD N 730531 E 3006087 NAD83
3. DRILLING AGENCY: WILMINGTON DISTRICT
4. HOLE NO. (As shown on drawing title and file number): MAN-10-V-25
5. NAME OF DRILLER: LESTER GAUGHF CRANE OPERATOR
6. DIRECTION OF HOLE: ☒ VERTICAL ☐ INCLINED _____ DEG. FROM VERT.
7. THICKNESS OF OVERBURDEN: N/A (14.2' of Water)
8. DEPTH DRILLED INTO ROCK: 0.0'
9. TOTAL DEPTH OF HOLE: 24.2'
10. SIZE AND TYPE OF BIT: 4" Dia. Vibracore
11. DATUM FOR ELEVATION SHOWN (BM or MSL): MLLW
12. MANUFACTURER'S DESIGNATION OF DRILL: VIBRA CORE SNELL
13. TOTAL NO. OF OVER-BURDEN SAMPLES TAKEN: DISTURBED 4 UNDISTURBED 0
14. TOTAL NUMBER CORE BOXES: N/A
15. ELEVATION GROUND WATER: N/A
16. DATE HOLE: STARTED 3/16/2009 COMPLETED 3/16/2009
17. ELEVATION TOP OF HOLE: 0.0' MLLW
18. TOTAL CORE RECOVERY FOR BORING: N/A %
19. SIGNATURE OF INSPECTOR: CARL BAYNARD, CIVIL ENGINEER

ELEVATION MLLW	DEPTH feet	LEGEND	CLASSIFICATION OF MATERIALS (Description)	% CORE RECOVERY	BOX OR SAMPLE NO.	REMARKS (Drilling time, water loss, depth of weathering, etc., if significant)
0.0	0		0.0' TO 14.2' WATER			Time begin vibracoring: 1447 hrs. Soils described by Larry Benjamin, Civil Engr. Tech.
-14.2	14.0 / 14.2		OCEAN BOTTOM AT 14.2'		14.2'	
			SM Dark gray, fine, silty sand		1	NOTE: TOP OF HOLE is defined as surface of water and compensation is made for the tide such that top of Hole is 0.0 EL MLLW.
	16.0		16.0'		14.7' / 16.0'	
			SP-SM Tan, fine, poorly-graded silty sand		2	VIBRACORE BORING From 0.0' to 10.0' Ran 10.0' Rec: 7.4'
	18.0				16.5' / 18.0'	Top of vibracore soil sample is logged as beginning at Ocean Bottom. When Run is greater than Recovery, the difference is depicted as Assumed Not Recovered.
			21.0'		3	
	20.0		21.0' with shell fragments		18.5' / 20.0'	NOTE: Soils Commercial Lab Classified in Accordance with ASTM-D2487
			21.6'		4	
	22.0		ASSUMED NOT RECOVERED		20.5'	LAB CLASSIFICATION: Jar Number 1 SM; 2 SP; 3 SP; 4 SP
-24.2	24.0 / 24.2		BOTTOM OF HOLE AT 24.2' SOILS ARE FIELD VISUALLY CLASSIFIED IN ACCORDANCE WITH THE UNIFIED SOIL CLASSIFICATION SYSTEM			NOTE: HOLE TERMINATED UPON REFUSAL DEPTH 10.0'

DRILLING LOG	DIVISION SOUTH ATLANTIC	INSTALLATION WILMINGTON DISTRICT	SHEET 1 OF 1 SHEETS
1. PROJECT MANTEO 204 PROJECT		10. SIZE AND TYPE OF BIT 4" Dia. Vibracore	
2. LOCATION (Coordinates or Station) NC COORD N 742755 E 3007143 NAD83		11. DATUM FOR ELEVATION SHOWN (BM or MSL) MLLW	
3. DRILLING AGENCY WILMINGTON DISTRICT		12. MANUFACTURER'S DESIGNATION OF DRILL VIBRA CORE SNELL	
4. HOLE NO. (As shown on drawing title and file number) MAN-10-V-26		13. TOTAL NO. OF OVER-BURDEN SAMPLES TAKEN DISTURBED 3 UNDISTURBED 0	
5. NAME OF DRILLER LESTER GAUGHF CRANE OPERATOR		14. TOTAL NUMBER CORE BOXES N/A	
6. DIRECTION OF HOLE ☒ VERTICAL ☐ INCLINED _____ DEG. FROM VERT.		15. ELEVATION GROUND WATER N/A	
7. THICKNESS OF OVERBURDEN N/A (15.3' of Water)		16. DATE HOLE STARTED 3/16/2009 COMPLETED 3/16/2009	
8. DEPTH DRILLED INTO ROCK 0.0'		17. ELEVATION TOP OF HOLE 0.0' MLLW	
9. TOTAL DEPTH OF HOLE 25.3'		18. TOTAL CORE RECOVERY FOR BORING N/A %	
		19. SIGNATURE OF INSPECTOR CARL BAYNARD, CIVIL ENGINEER	

ELEVATION MLLW	DEPTH feet	LEGEND	CLASSIFICATION OF MATERIALS (Description)	% CORE RECOVERY	BOX OR SAMPLE NO.	REMARKS (Drilling time, water loss, depth of weathering, etc., if significant)
0.0	0		0.0' TO 15.3' WATER			Time begin vibracoring: 1505 hrs. Soils described by Larry Benjamin, Civil Engr. Tech.
	15.0		OCEAN BOTTOM AT 15.3'		15.3'	
-15.3	15.3		SP-SM Tan, fine-medium, poorly -graded silty sand		1	NOTE: TOP OF HOLE is defined as surface of water and compensation is made for the tide such that top of Hole is 0.0 EL MLLW.
					15.8'	
	17.0		17.5' fine-grained sand		17.5'	VIBRACORE BORING From 0.0' to 10.0' Ran 10.0' Rec: 7.4'
					2	
					18.0'	
	19.0				19.0'	Top of vibracore soil sample is logged as beginning at Ocean Bottom. When Run is greater than Recovery, the difference is depicted as Assumed Not Recovered.
					3	
					19.5'	
	21.0		22.7'			NOTE: Soils Commercial Lab Classified in Accordance with ASTM-D2487
	23.0		ASSUMED NOT RECOVERED			LAB CLASSIFICATION Jar Number / Classification: 1 SP; 2 SP; 3 SP
	25.0					
-25.3	25.3		BOTTOM OF HOLE AT 25.3' SOILS ARE FIELD VISUALLY CLASSIFIED IN ACCORDANCE WITH THE UNIFIED SOIL CLASSIFICATION SYSTEM			NOTE: HOLE TERMINATED UPON REFUSAL DEPTH 10.0'

HOLE NO. MAN-10-V-27

DRILLING LOG	DIVISION: SOUTH ATLANTIC	INSTALLATION: WILMINGTON DISTRICT	SHEET 1 OF 1 SHEETS
1. PROJECT: MANTEO 204 PROJECT		10. SIZE AND TYPE OF BIT: 4" Dia. Vibracore	
2. LOCATION (Coordinates or Station): NC COORD N 746877 E 3009755 NAD83		11. DATUM FOR ELEVATION SHOWN (BM or MSL): MLLW	
3. DRILLING AGENCY: WILMINGTON DISTRICT		12. MANUFACTURER'S DESIGNATION OF DRILL: VIBRA CORE SNELL	
4. HOLE NO. (As shown on drawing title and file number): MAN-10-V-27		13. TOTAL NO. OF OVER-BURDEN SAMPLES TAKEN: DISTURBED 4 UNDISTURBED 0	
5. NAME OF DRILLER: LESTER GAUGHF CRANE OPERATOR		14. TOTAL NUMBER CORE BOXES: N/A	
6. DIRECTION OF HOLE: ☒ VERTICAL ☐ INCLINED _____ DEG. FROM VERT.		15. ELEVATION GROUND WATER: N/A	
7. THICKNESS OF OVERBURDEN: N/A (14.8' of Water)		16. DATE HOLE: STARTED 3/16/2009 COMPLETED 3/16/2009	
8. DEPTH DRILLED INTO ROCK: 0.0'		17. ELEVATION TOP OF HOLE: 0.0' MLLW	
9. TOTAL DEPTH OF HOLE: 24.8'		18. TOTAL CORE RECOVERY FOR BORING: N/A %	
		19. SIGNATURE OF INSPECTOR: CARL BAYNARD, CIVIL ENGINEER	

ELEVATION MLLW	DEPTH feet	LEGEND	CLASSIFICATION OF MATERIALS (Description)	% CORE RECOVERY	BOX OR SAMPLE NO.	REMARKS (Drilling time, water loss, depth of weathering, etc., if significant)
0.0	0		0.0' TO 14.8' WATER			Time begin vibracoring: 1528 hrs Soils described by Larry Benjamin, Civil Engr. Tech.
	14.0					NOTE: TOP OF HOLE is defined as surface of water and compensation is made for the tide such that top of Hole is 0.0 EL MLLW.
-14.8	14.8		OCEAN BOTTOM AT 14.8'		14.8'	
			SP-SM Grayish-tan, fine, poorly-graded silty sand		1	
	16.0				15.3'	
					16.8'	VIBRACORE BORING From 0.0' to 10.0' Ran 10.0' Rec: 5.6'
			SP Tan, coarse, poorly-graded sand 17.6'		2 17.3' 17.6'	
	18.0		SP-SM Tan, fine-medium, poorly-graded silty sand 18.6' fine-grained sand		3 18.1'	Top of vibracore soil sample is logged as beginning at Ocean Bottom. When Run is greater than Recovery, the difference is depicted as Assumed Not Recovered.
					19.5'	
	20.0		20.4'		4 20.0'	NOTE: Soils Commercial Lab Classified in Accordance with ASTM-D2487
			ASSUMED NOT RECOVERED			LAB CLASSIFICATION Jar Number / Classification 1 SP 2 SP 3 SP 4 SP-SM
	22.0					
	24.0					
-24.8	24.8		BOTTOM OF HOLE AT 24.8' SOILS ARE FIELD VISUALLY CLASSIFIED IN ACCORDANCE WITH THE UNIFIED SOIL CLASSIFICATION SYSTEM			NOTE: HOLE TERMINATED UPON REFUSAL DEPTH 10.0'

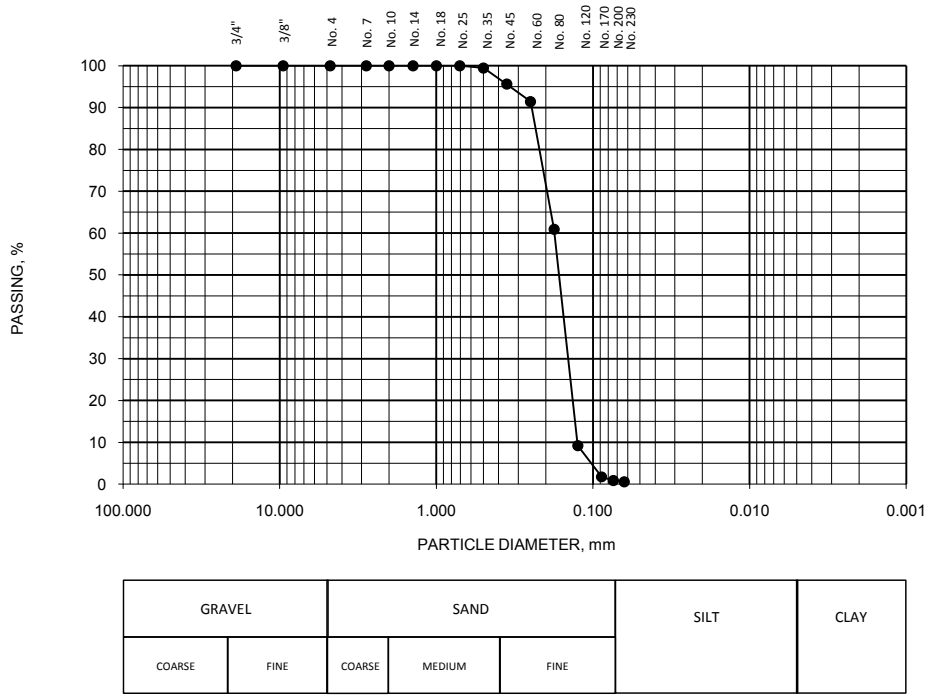
Laboratory Data

PROJECT NAME	Manteo (Old House Channel) 204 Study Area		
CLIENT	US Army Corps of Engineers	**BORING #**	MAN-10-V-01
PROJECT NO.	70105034	**SAMPLE #**	1
DATE SAMPLE RECEIVED	5/20/2010	**DEPTH, ft**	9.3-9.8
DATE TESTED	5/24/2010	**DESCRIPTION**	Poorly Graded Sand, SP
DATE REPORTED	5/25/2010		

TEST PROCEDURES

ASTM STANDARD D 422 - Particle Size Analysis of Soils	WEIGHT OF DRY SOLIDS (grams) 492.8

VISUALLY ESTIMATED SHELL CONTENT (%) #N/A



PERCENT FINER (dry weight basis)

GRAVEL			COARSE SAND		MEDIUM SAND				FINE SAND						SILT / CLAY
3/4"	3/8"	No. 4	No. 7	No. 10	No. 14	No. 18	No. 25	No. 35	No. 45	No. 60	No. 80	No. 120	No. 170	No. 200	No. 230
100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	99.5	95.6	91.4	60.9	9.2	1.7	0.9	0.6

VISUALLY ESTIMATED SHELL CONTENT (percent)

#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	Shell Content <5% (Amount not visually estimated)

TESTED BY: S.E. Hardison CHECKED BY: S.E. Hardison APPROVED BY: R.L. Denton, II, PE

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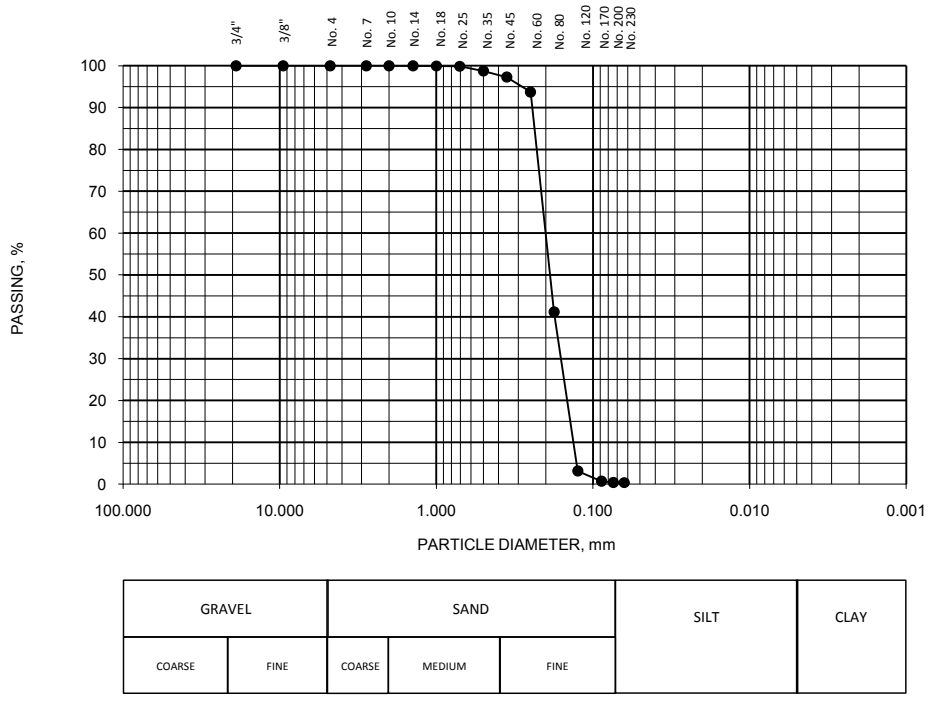
PROJECT NAME	Manteo (Old House Channel) 204 Study Area		
CLIENT	US Army Corps of Engineers	**BORING #**	MAN-10-V-01
PROJECT NO.	70105034	**SAMPLE #**	2
DATE SAMPLE RECEIVED	5/20/2010	**DEPTH, ft**	12.0-12.5
DATE TESTED	5/24/2010	**DESCRIPTION**	Poorly Graded Sand, SP
DATE REPORTED	5/25/2010		

TEST PROCEDURES

ASTM STANDARD D 422 - Particle Size Analysis of Soils	WEIGHT OF DRY SOLIDS (grams) 483.0

VISUALLY ESTIMATED SHELL CONTENT (%) #N/A



PERCENT FINER (dry weight basis)

GRAVEL			COARSE SAND		MEDIUM SAND				FINE SAND						SILT / CLAY
3/4"	3/8"	No. 4	No. 7	No. 10	No. 14	No. 18	No. 25	No. 35	No. 45	No. 60	No. 80	No. 120	No. 170	No. 200	No. 230
100.0	100.0	100.0	100.0	100.0	100.0	99.9	99.9	98.7	97.3	93.7	41.1	3.1	0.7	0.4	0.4

VISUALLY ESTIMATED SHELL CONTENT (percent)

#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	Shell Content <5% (Amount not visually estimated)

TESTED BY: S.E. Hardison CHECKED BY: S.E. Hardison APPROVED BY: R.L. Denton, II, PE

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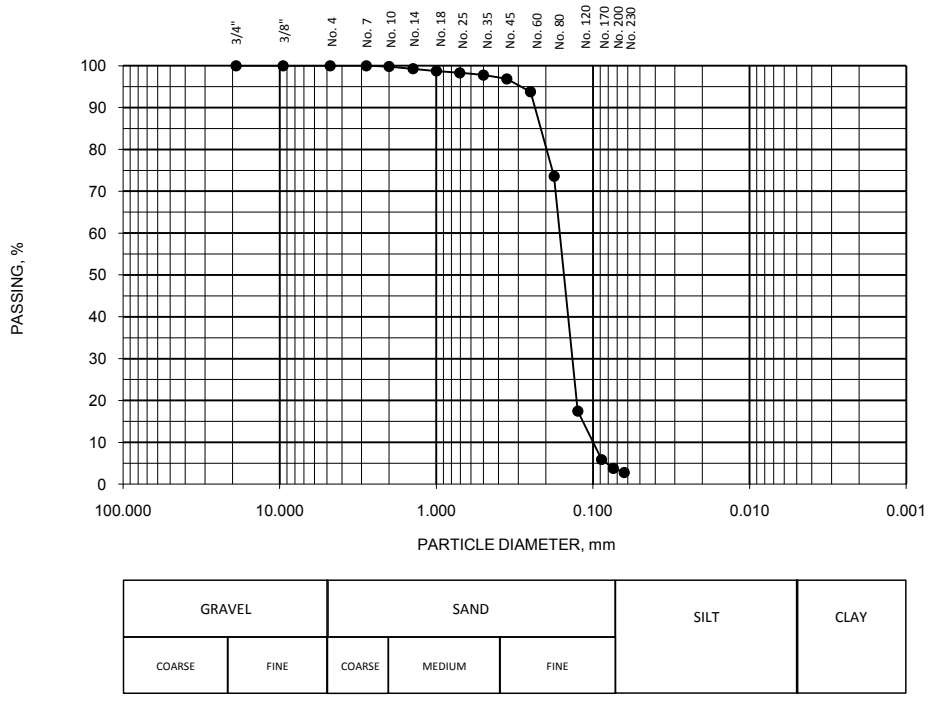
PROJECT NAME	Manteo (Old House Channel) 204 Study Area		
CLIENT	US Army Corps of Engineers	**BORING #**	MAN-10-V-01
PROJECT NO.	70105034	**SAMPLE #**	3
DATE SAMPLE RECEIVED	5/20/2010	**DEPTH, ft**	15.0-15.5
DATE TESTED	5/24/2010	**DESCRIPTION**	Poorly Graded Sand, SP
DATE REPORTED	5/25/2010		

TEST PROCEDURES

ASTM STANDARD D 422 - Particle Size Analysis of Soils	WEIGHT OF DRY SOLIDS (grams) 508.3

VISUALLY ESTIMATED SHELL CONTENT (%) #N/A



PERCENT FINER (dry weight basis)

GRAVEL			COARSE SAND		MEDIUM SAND				FINE SAND						SILT / CLAY
3/4"	3/8"	No. 4	No. 7	No. 10	No. 14	No. 18	No. 25	No. 35	No. 45	No. 60	No. 80	No. 120	No. 170	No. 200	No. 230
100.0	100.0	100.0	100.0	99.8	99.3	98.7	98.3	97.8	96.9	93.8	73.6	17.5	5.9	3.8	2.8

VISUALLY ESTIMATED SHELL CONTENT (percent)

#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	Shell Content <5% (Amount not visually estimated)

TESTED BY: S.E. Hardison CHECKED BY: S.E. Hardison APPROVED BY: R.L. Denton, II, PE

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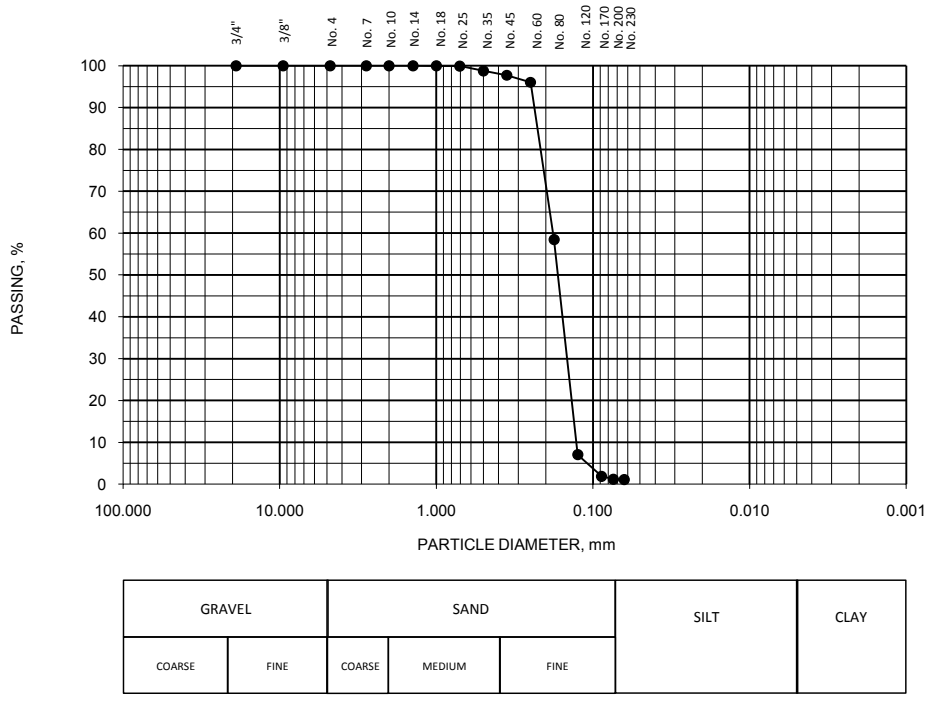
PROJECT NAME	Manteo (Old House Channel) 204 Study Area		
CLIENT	US Army Corps of Engineers	**BORING #**	MAN-10-V-02
PROJECT NO.	70105034	**SAMPLE #**	1
DATE SAMPLE RECEIVED	5/20/2010	**DEPTH, ft**	11.0-11.5
DATE TESTED	5/24/2010	**DESCRIPTION**	Poorly Graded Sand, SP
DATE REPORTED	5/25/2010		

TEST PROCEDURES

ASTM STANDARD D 422 - Particle Size Analysis of Soils	WEIGHT OF DRY SOLIDS (grams) 441.7

VISUALLY ESTIMATED SHELL CONTENT (%) #N/A



PERCENT FINER (dry weight basis)

GRAVEL			COARSE SAND		MEDIUM SAND				FINE SAND						SILT / CLAY
3/4"	3/8"	No. 4	No. 7	No. 10	No. 14	No. 18	No. 25	No. 35	No. 45	No. 60	No. 80	No. 120	No. 170	No. 200	No. 230
100.0	100.0	100.0	100.0	100.0	100.0	100.0	99.9	98.8	97.7	96.0	58.4	7.0	1.9	1.2	1.1

VISUALLY ESTIMATED SHELL CONTENT (percent)

#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	Shell Content <5% (Amount not visually estimated)

TESTED BY: S.E. Hardison CHECKED BY: S.E. Hardison APPROVED BY: R.L. Denton, II, PE

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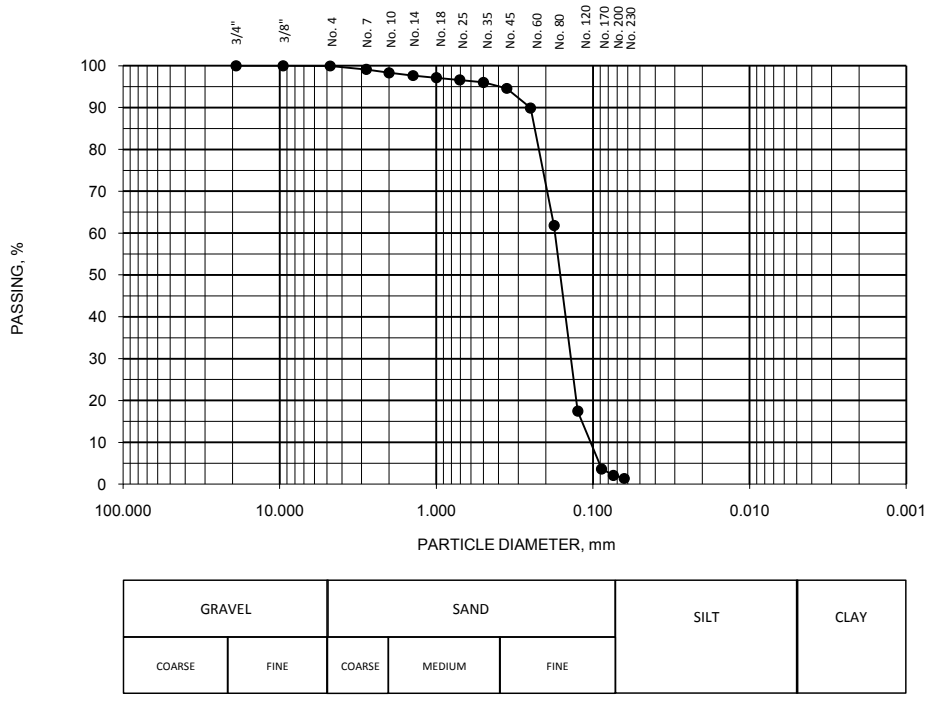
PROJECT NAME	Manteo (Old House Channel) 204 Study Area		
CLIENT	US Army Corps of Engineers	**BORING #**	MAN-10-V-02
PROJECT NO.	70105034	**SAMPLE #**	2
DATE SAMPLE RECEIVED	5/20/2010	**DEPTH, ft**	13.0-13.5
DATE TESTED	5/24/2010	**DESCRIPTION**	Poorly Graded Sand, SP
DATE REPORTED	5/25/2010		

TEST PROCEDURES

ASTM STANDARD D 422 - Particle Size Analysis of Soils	WEIGHT OF DRY SOLIDS (grams) 492.2

VISUALLY ESTIMATED SHELL CONTENT (%) #N/A



PERCENT FINER (dry weight basis)

GRAVEL			COARSE SAND		MEDIUM SAND				FINE SAND						SILT / CLAY
3/4"	3/8"	No. 4	No. 7	No. 10	No. 14	No. 18	No. 25	No. 35	No. 45	No. 60	No. 80	No. 120	No. 170	No. 200	No. 230
100.0	100.0	99.9	99.1	98.3	97.6	97.1	96.6	96.0	94.6	89.9	61.8	17.4	3.6	2.1	1.4

VISUALLY ESTIMATED SHELL CONTENT (percent)

#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	Shell Content <5% (Amount not visually estimated)

TESTED BY: S.E. Hardison CHECKED BY: S.E. Hardison APPROVED BY: R.L. Denton, II, PE

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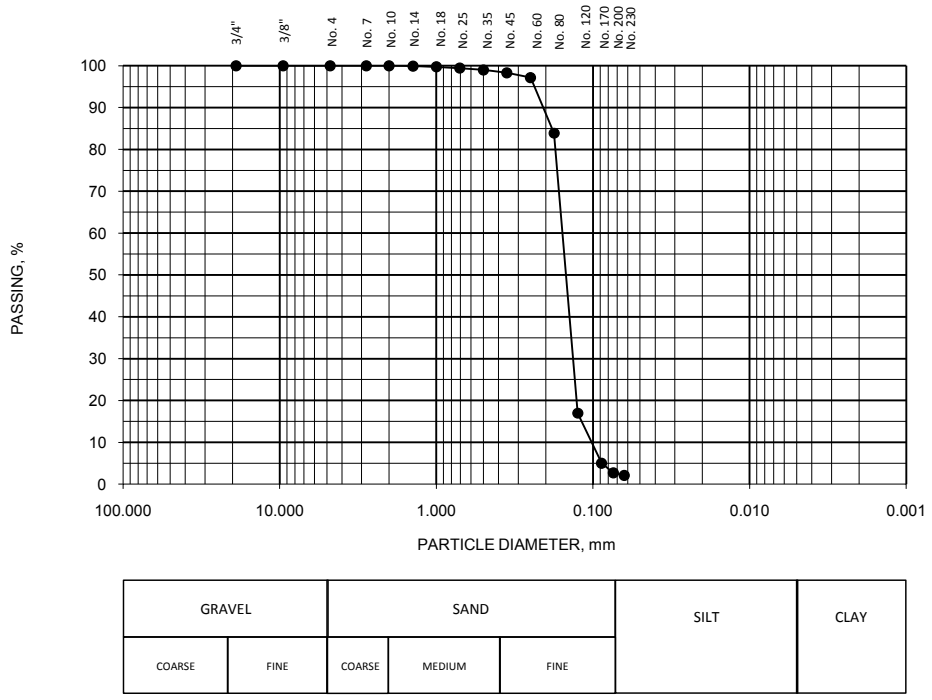
PROJECT NAME	Manteo (Old House Channel) 204 Study Area		
CLIENT	US Army Corps of Engineers	**BORING #**	MAN-10-V-02
PROJECT NO.	70105034	**SAMPLE #**	3
DATE SAMPLE RECEIVED	5/20/2010	**DEPTH, ft**	15.0-15.5
DATE TESTED	5/24/2010	**DESCRIPTION**	Poorly Graded Sand, SP
DATE REPORTED	5/25/2010		

TEST PROCEDURES

ASTM STANDARD D 422 - Particle Size Analysis of Soils	WEIGHT OF DRY SOLIDS (grams) 504.1

VISUALLY ESTIMATED SHELL CONTENT (%) #N/A



PERCENT FINER (dry weight basis)

GRAVEL			COARSE SAND		MEDIUM SAND				FINE SAND						SILT / CLAY
3/4"	3/8"	No. 4	No. 7	No. 10	No. 14	No. 18	No. 25	No. 35	No. 45	No. 60	No. 80	No. 120	No. 170	No. 200	No. 230
100.0	100.0	100.0	100.0	100.0	99.9	99.7	99.4	99.0	98.3	97.2	83.9	17.0	5.0	2.7	2.1

VISUALLY ESTIMATED SHELL CONTENT (percent)

#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	Shell Content <5% (Amount not visually estimated)

TESTED BY: S.E. Hardison CHECKED BY: S.E. Hardison APPROVED BY: R.L. Denton, II, PE

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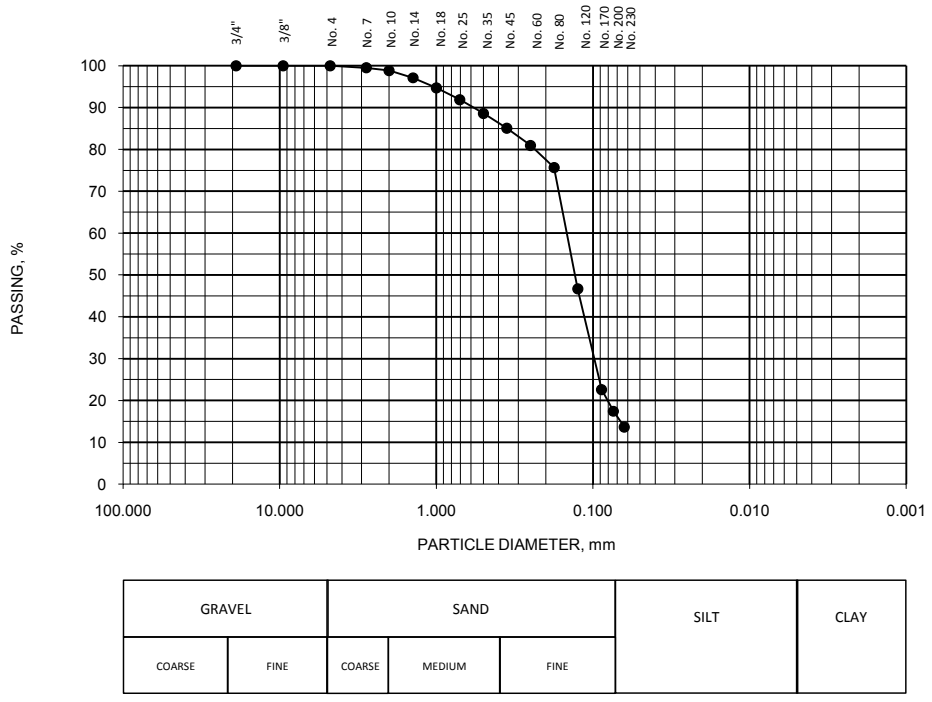
PROJECT NAME	Manteo (Old House Channel) 204 Study Area		
CLIENT	US Army Corps of Engineers	**BORING #**	MAN-10-V-03
PROJECT NO.	70105034	**SAMPLE #**	1
DATE SAMPLE RECEIVED	5/20/2010	**DEPTH, ft**	14.0-14.5
DATE TESTED	5/24/2010	**DESCRIPTION**	Silty Sand, SM
DATE REPORTED	5/25/2010		

TEST PROCEDURES

ASTM STANDARD D 422 - Particle Size Analysis of Soils	WEIGHT OF DRY SOLIDS (grams) 283.5

VISUALLY ESTIMATED SHELL CONTENT (%) #N/A



PERCENT FINER (dry weight basis)

GRAVEL			COARSE SAND		MEDIUM SAND				FINE SAND						SILT / CLAY
3/4"	3/8"	No. 4	No. 7	No. 10	No. 14	No. 18	No. 25	No. 35	No. 45	No. 60	No. 80	No. 120	No. 170	No. 200	No. 230
100.0	100.0	100.0	99.5	98.8	97.1	94.7	91.9	88.6	85.1	81.0	75.7	46.7	22.6	17.4	13.7

VISUALLY ESTIMATED SHELL CONTENT (percent)

#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	Shell Content <5% (Amount not visually estimated)

TESTED BY: S.E. Hardison CHECKED BY: S.E. Hardison APPROVED BY: R.L. Denton, II, PE

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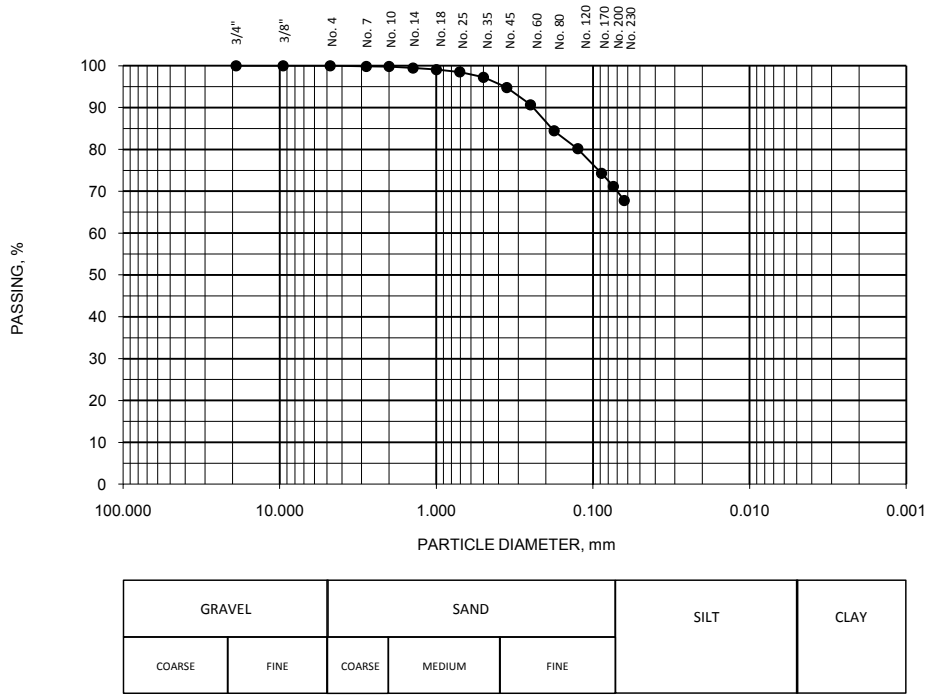
PROJECT NAME	Manteo (Old House Channel) 204 Study Area		
CLIENT	US Army Corps of Engineers	**BORING #**	MAN-10-V-03
PROJECT NO.	70105034	**SAMPLE #**	2
DATE SAMPLE RECEIVED	5/20/2010	**DEPTH, ft**	17.0-17.5
DATE TESTED	5/27/2010	**DESCRIPTION**	Silt with Sand, MH
DATE REPORTED	5/29/2010		

TEST PROCEDURES

ASTM STANDARD D 422 - Particle Size Analysis of Soils	WEIGHT OF DRY SOLIDS (grams) 259.0

VISUALLY ESTIMATED SHELL CONTENT (%) #N/A



PERCENT FINER (dry weight basis)

GRAVEL			COARSE SAND		MEDIUM SAND				FINE SAND						SILT / CLAY
3/4"	3/8"	No. 4	No. 7	No. 10	No. 14	No. 18	No. 25	No. 35	No. 45	No. 60	No. 80	No. 120	No. 170	No. 200	No. 230
100.0	100.0	100.0	99.8	99.8	99.5	99.1	98.5	97.2	94.8	90.7	84.4	80.2	74.2	71.2	67.8

VISUALLY ESTIMATED SHELL CONTENT (percent)

#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	Shell Content <5% (Amount not visually estimated)

TESTED BY: S.E. Hardison CHECKED BY: S.E. Hardison APPROVED BY: R.L. Denton, II, PE

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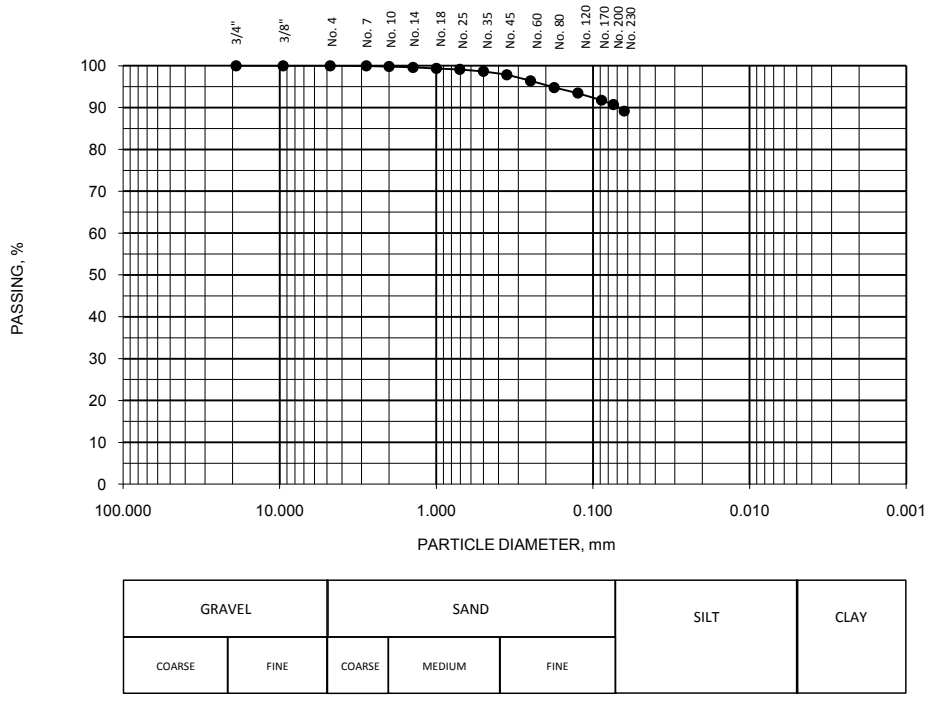
PROJECT NAME	Manteo (Old House Channel) 204 Study Area		
CLIENT	US Army Corps of Engineers	**BORING #**	MAN-10-V-03
PROJECT NO.	70105034	**SAMPLE #**	3
DATE SAMPLE RECEIVED	5/20/2010	**DEPTH, ft**	19.5-20.0
DATE TESTED	5/27/2010	**DESCRIPTION**	Silt, MH
DATE REPORTED	5/29/2010		

TEST PROCEDURES

ASTM STANDARD D 422 - Particle Size Analysis of Soils	WEIGHT OF DRY SOLIDS (grams) 200.0

VISUALLY ESTIMATED SHELL CONTENT (%) #N/A



PERCENT FINER (dry weight basis)

GRAVEL			COARSE SAND		MEDIUM SAND				FINE SAND						SILT / CLAY
3/4"	3/8"	No. 4	No. 7	No. 10	No. 14	No. 18	No. 25	No. 35	No. 45	No. 60	No. 80	No. 120	No. 170	No. 200	No. 230
100.0	100.0	100.0	100.0	99.8	99.6	99.4	99.1	98.7	97.9	96.4	94.8	93.5	91.8	90.7	89.2

VISUALLY ESTIMATED SHELL CONTENT (percent)

#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	Shell Content <5% (Amount not visually estimated)

TESTED BY: S.E. Hardison CHECKED BY: S.E. Hardison APPROVED BY: R.L. Denton, II, PE

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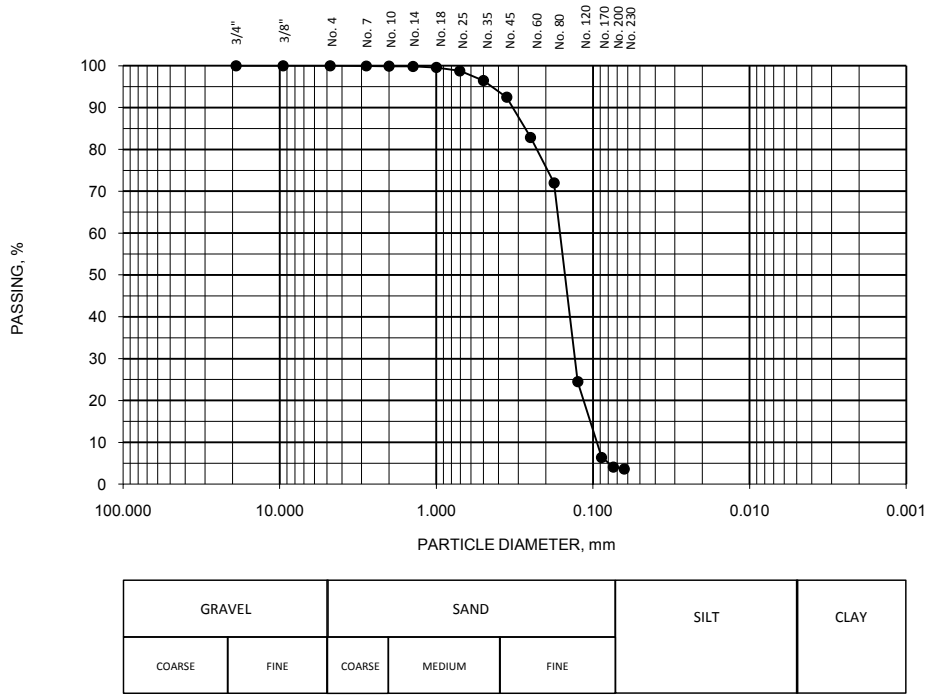
PROJECT NAME	Manteo (Old House Channel) 204 Study Area		
CLIENT	US Army Corps of Engineers	**BORING #**	MAN-10-V-04
PROJECT NO.	70105034	**SAMPLE #**	1
DATE SAMPLE RECEIVED	5/20/2010	**DEPTH, ft**	15.7-16.2
DATE TESTED	5/24/2010	**DESCRIPTION**	Poorly Graded Sand, SP
DATE REPORTED	5/25/2010		

TEST PROCEDURES

ASTM STANDARD D 422 - Particle Size Analysis of Soils	WEIGHT OF DRY SOLIDS (grams) 461.2

VISUALLY ESTIMATED SHELL CONTENT (%) #N/A



PERCENT FINER (dry weight basis)

GRAVEL			COARSE SAND		MEDIUM SAND				FINE SAND						SILT / CLAY
3/4"	3/8"	No. 4	No. 7	No. 10	No. 14	No. 18	No. 25	No. 35	No. 45	No. 60	No. 80	No. 120	No. 170	No. 200	No. 230
100.0	100.0	100.0	99.9	99.9	99.8	99.6	98.8	96.4	92.5	82.9	72.0	24.5	6.4	4.1	3.6

VISUALLY ESTIMATED SHELL CONTENT (percent)

#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	Shell Content <5% (Amount not visually estimated)

TESTED BY: S.E. Hardison CHECKED BY: S.E. Hardison APPROVED BY: R.L. Denton, II, PE

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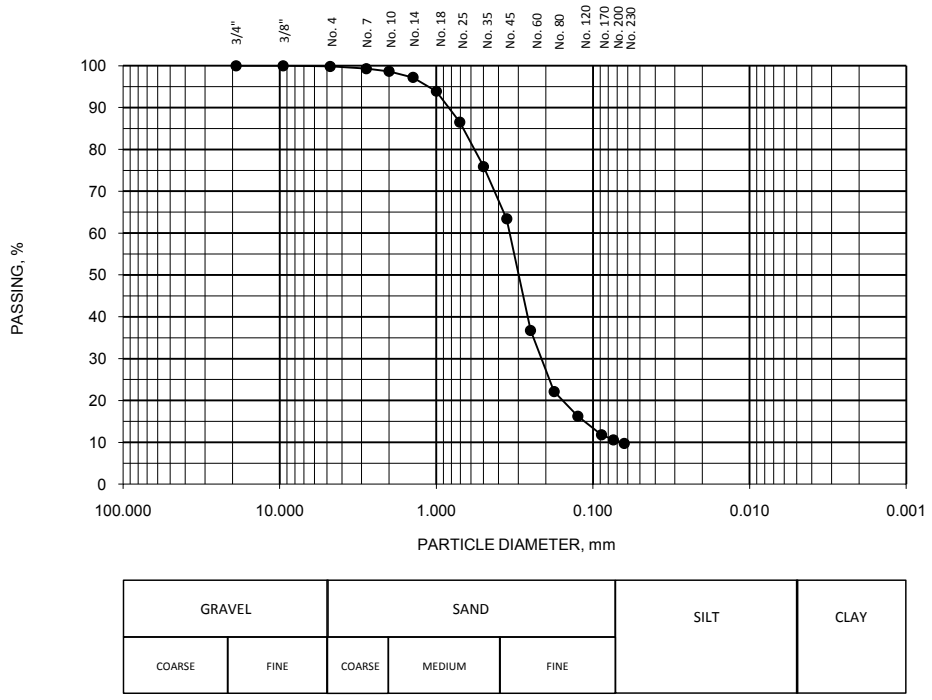
PROJECT NAME	Manteo (Old House Channel) 204 Study Area		
CLIENT	US Army Corps of Engineers	**BORING #**	MAN-10-V-04
PROJECT NO.	70105034	**SAMPLE #**	2
DATE SAMPLE RECEIVED	5/20/2010	**DEPTH, ft**	17.5-18.0
DATE TESTED	5/24/2010	**DESCRIPTION**	Poorly Graded Sand with Silt, SP-SM
DATE REPORTED	5/25/2010		

TEST PROCEDURES

ASTM STANDARD D 422 - Particle Size Analysis of Soils	WEIGHT OF DRY SOLIDS (grams) 581.0

VISUALLY ESTIMATED SHELL CONTENT (%) #N/A



PERCENT FINER (dry weight basis)

GRAVEL			COARSE SAND		MEDIUM SAND				FINE SAND						SILT / CLAY
3/4"	3/8"	No. 4	No. 7	No. 10	No. 14	No. 18	No. 25	No. 35	No. 45	No. 60	No. 80	No. 120	No. 170	No. 200	No. 230
100.0	100.0	99.8	99.3	98.6	97.2	93.9	86.5	75.9	63.4	36.7	22.1	16.3	11.8	10.6	9.7

VISUALLY ESTIMATED SHELL CONTENT (percent)

#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	Shell Content <5% (Amount not visually estimated)

TESTED BY: S.E. Hardison CHECKED BY: S.E. Hardison APPROVED BY: R.L. Denton, II, PE

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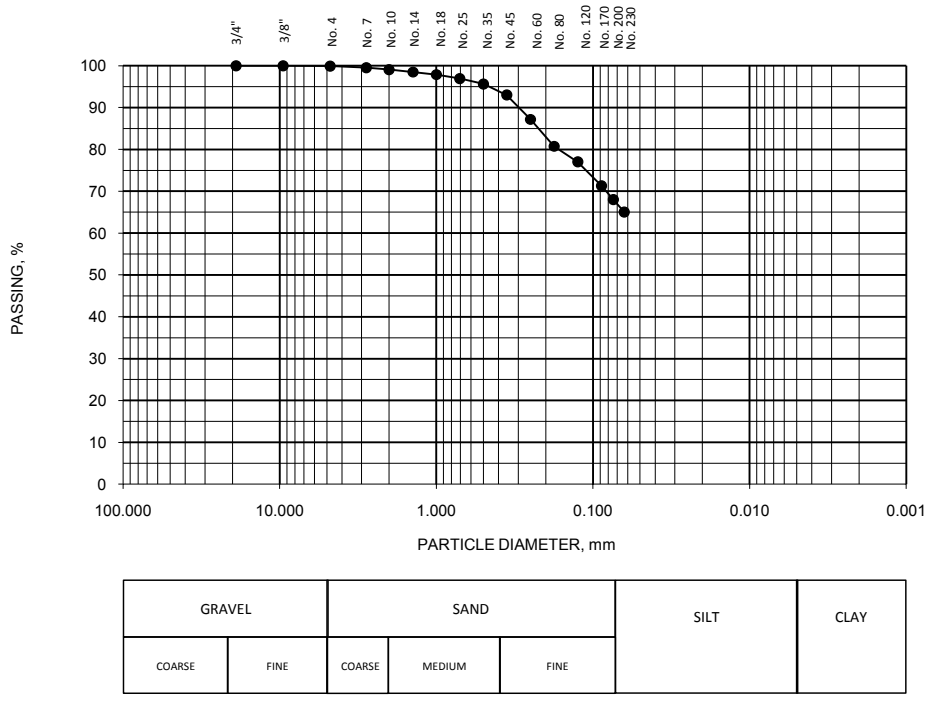
PROJECT NAME	Manteo (Old House Channel) 204 Study Area		
CLIENT	US Army Corps of Engineers	**BORING #**	MAN-10-V-04
PROJECT NO.	70105034	**SAMPLE #**	3
DATE SAMPLE RECEIVED	5/20/2010	**DEPTH, ft**	19.2-19.7
DATE TESTED	5/26/2010	**DESCRIPTION**	Sandy Silt, MH
DATE REPORTED	5/26/2010		

TEST PROCEDURES

ASTM STANDARD D 422 - Particle Size Analysis of Soils	WEIGHT OF DRY SOLIDS (grams) 376.4

VISUALLY ESTIMATED SHELL CONTENT (%) #N/A



PERCENT FINER (dry weight basis)

GRAVEL			COARSE SAND		MEDIUM SAND				FINE SAND						SILT / CLAY
3/4"	3/8"	No. 4	No. 7	No. 10	No. 14	No. 18	No. 25	No. 35	No. 45	No. 60	No. 80	No. 120	No. 170	No. 200	No. 230
100.0	100.0	99.9	99.5	99.1	98.5	97.9	96.9	95.6	93.0	87.2	80.7	77.0	71.3	68.0	65.0

VISUALLY ESTIMATED SHELL CONTENT (percent)

#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	Shell Content <5% (Amount not visually estimated)

TESTED BY: S.E. Hardison CHECKED BY: S.E. Hardison APPROVED BY: R.L. Denton, II, PE

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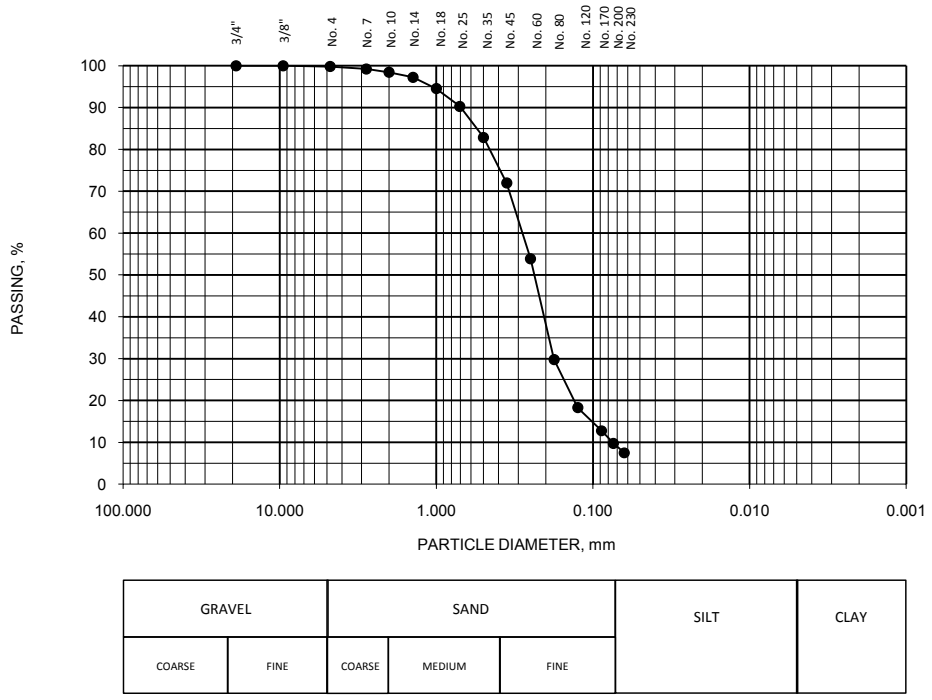
PROJECT NAME	Manteo (Old House Channel) 204 Study Area		
CLIENT	US Army Corps of Engineers	**BORING #**	MAN-10-V-04
PROJECT NO.	70105034	**SAMPLE #**	4
DATE SAMPLE RECEIVED	5/20/2010	**DEPTH, ft**	22.1-22.6
DATE TESTED	5/24/2010	**DESCRIPTION**	Poorly Graded Sand with Silt, SP-SM
DATE REPORTED	5/25/2010		

TEST PROCEDURES

ASTM STANDARD D 422 - Particle Size Analysis of Soils	WEIGHT OF DRY SOLIDS (grams) 482.1

VISUALLY ESTIMATED SHELL CONTENT (%) #N/A



PERCENT FINER (dry weight basis)

GRAVEL			COARSE SAND		MEDIUM SAND				FINE SAND						SILT / CLAY
3/4"	3/8"	No. 4	No. 7	No. 10	No. 14	No. 18	No. 25	No. 35	No. 45	No. 60	No. 80	No. 120	No. 170	No. 200	No. 230
100.0	100.0	99.8	99.2	98.4	97.2	94.5	90.3	82.8	72.0	53.8	29.8	18.3	12.8	9.7	7.5

VISUALLY ESTIMATED SHELL CONTENT (percent)

#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	Shell Content <5% (Amount not visually estimated)

TESTED BY: S.E. Hardison CHECKED BY: S.E. Hardison APPROVED BY: R.L. Denton, II, PE

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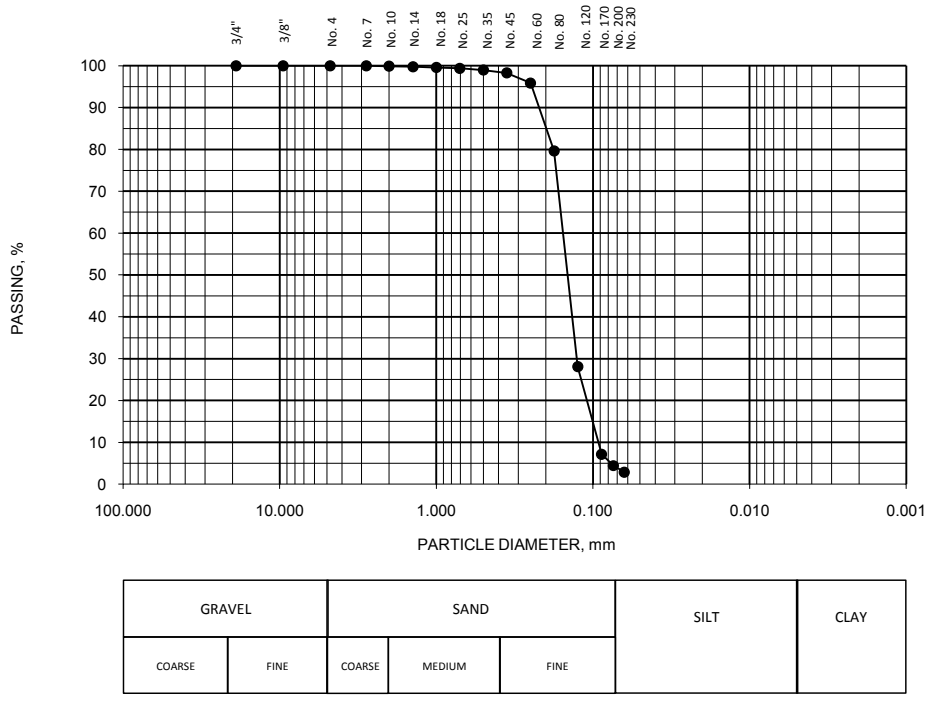
PROJECT NAME	Manteo (Old House Channel) 204 Study Area		
CLIENT	US Army Corps of Engineers	**BORING #**	MAN-10-V-05
PROJECT NO.	70105034	**SAMPLE #**	1
DATE SAMPLE RECEIVED	5/20/2010	**DEPTH, ft**	12.2-12.7
DATE TESTED	5/24/2010	**DESCRIPTION**	Poorly Graded Sand, SP
DATE REPORTED	5/25/2010		

TEST PROCEDURES

ASTM STANDARD D 422 - Particle Size Analysis of Soils	WEIGHT OF DRY SOLIDS (grams) 474.5

VISUALLY ESTIMATED SHELL CONTENT (%) #N/A



PERCENT FINER (dry weight basis)

GRAVEL			COARSE SAND		MEDIUM SAND				FINE SAND						SILT / CLAY
3/4"	3/8"	No. 4	No. 7	No. 10	No. 14	No. 18	No. 25	No. 35	No. 45	No. 60	No. 80	No. 120	No. 170	No. 200	No. 230
100.0	100.0	100.0	100.0	99.9	99.7	99.6	99.4	99.0	98.3	95.8	79.6	28.1	7.2	4.4	2.9

VISUALLY ESTIMATED SHELL CONTENT (percent)

#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	Shell Content <5% (Amount not visually estimated)

TESTED BY: S.E. Hardison CHECKED BY: S.E. Hardison APPROVED BY: R.L. Denton, II, PE

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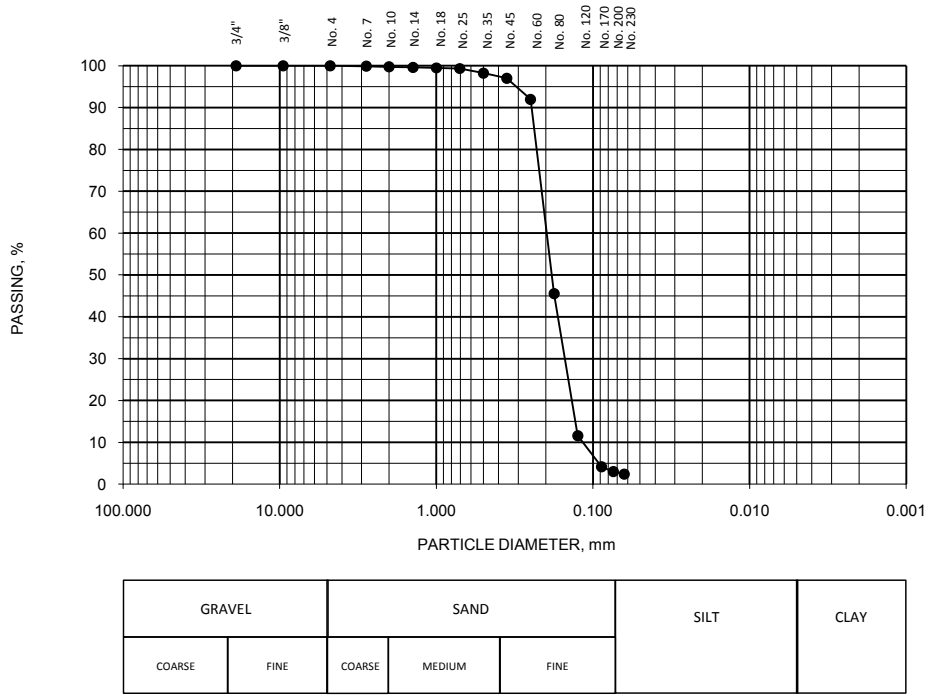
PROJECT NAME	Manteo (Old House Channel) 204 Study Area		
CLIENT	US Army Corps of Engineers	**BORING #**	MAN-10-V-05
PROJECT NO.	70105034	**SAMPLE #**	2
DATE SAMPLE RECEIVED	5/20/2010	**DEPTH, ft**	14.0-14.5
DATE TESTED	5/24/2010	**DESCRIPTION**	Poorly Graded Sand, SP
DATE REPORTED	5/25/2010		

TEST PROCEDURES

ASTM STANDARD D 422 - Particle Size Analysis of Soils	WEIGHT OF DRY SOLIDS (grams) 489.4

VISUALLY ESTIMATED SHELL CONTENT (%) #N/A



PERCENT FINER (dry weight basis)

GRAVEL			COARSE SAND		MEDIUM SAND				FINE SAND						SILT / CLAY
3/4"	3/8"	No. 4	No. 7	No. 10	No. 14	No. 18	No. 25	No. 35	No. 45	No. 60	No. 80	No. 120	No. 170	No. 200	No. 230
100.0	100.0	100.0	99.9	99.7	99.6	99.5	99.3	98.2	97.0	91.9	45.5	11.6	4.1	3.0	2.4

VISUALLY ESTIMATED SHELL CONTENT (percent)

#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	Shell Content <5% (Amount not visually estimated)

TESTED BY: S.E. Hardison CHECKED BY: S.E. Hardison APPROVED BY: R.L. Denton, II, PE

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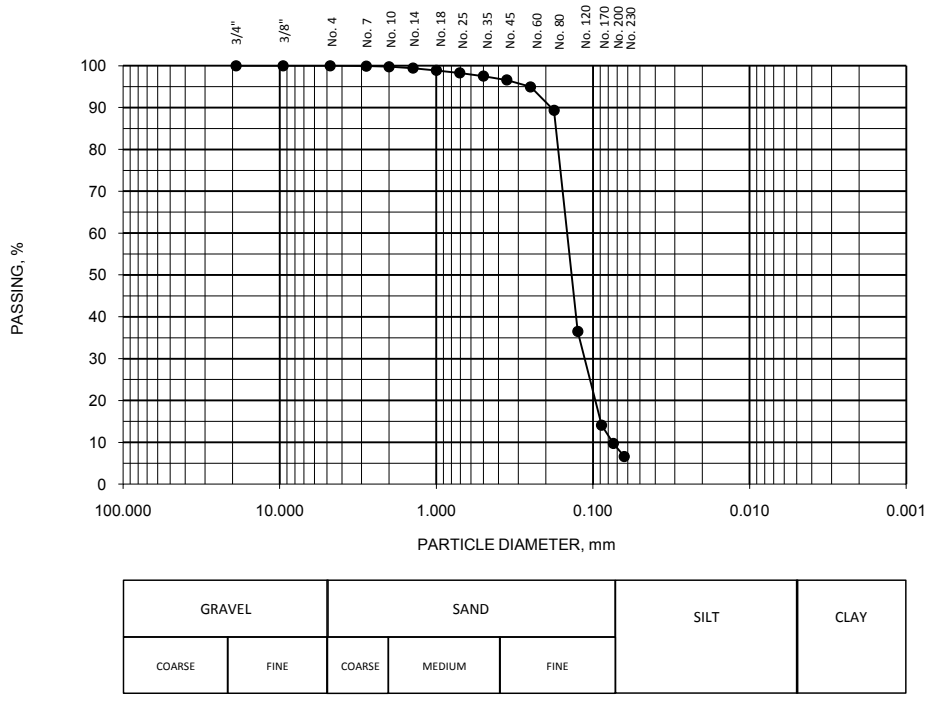
PROJECT NAME	Manteo (Old House Channel) 204 Study Area		
CLIENT	US Army Corps of Engineers	**BORING #**	MAN-10-V-05
PROJECT NO.	70105034	**SAMPLE #**	3
DATE SAMPLE RECEIVED	5/20/2010	**DEPTH, ft**	16.0-16.5
DATE TESTED	5/24/2010	**DESCRIPTION**	Poorly Graded Sand with Silt, SP-SM
DATE REPORTED	5/25/2010		

TEST PROCEDURES

ASTM STANDARD D 422 - Particle Size Analysis of Soils	WEIGHT OF DRY SOLIDS (grams) 447.7

VISUALLY ESTIMATED SHELL CONTENT (%) #N/A



PERCENT FINER (dry weight basis)

GRAVEL			COARSE SAND		MEDIUM SAND				FINE SAND						SILT / CLAY
3/4"	3/8"	No. 4	No. 7	No. 10	No. 14	No. 18	No. 25	No. 35	No. 45	No. 60	No. 80	No. 120	No. 170	No. 200	No. 230
100.0	100.0	100.0	99.9	99.8	99.4	98.9	98.3	97.5	96.6	94.9	89.3	36.5	14.1	9.7	6.6

VISUALLY ESTIMATED SHELL CONTENT (percent)

#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	Shell Content <5% (Amount not visually estimated)

TESTED BY: S.E. Hardison CHECKED BY: S.E. Hardison APPROVED BY: R.L. Denton, II, PE

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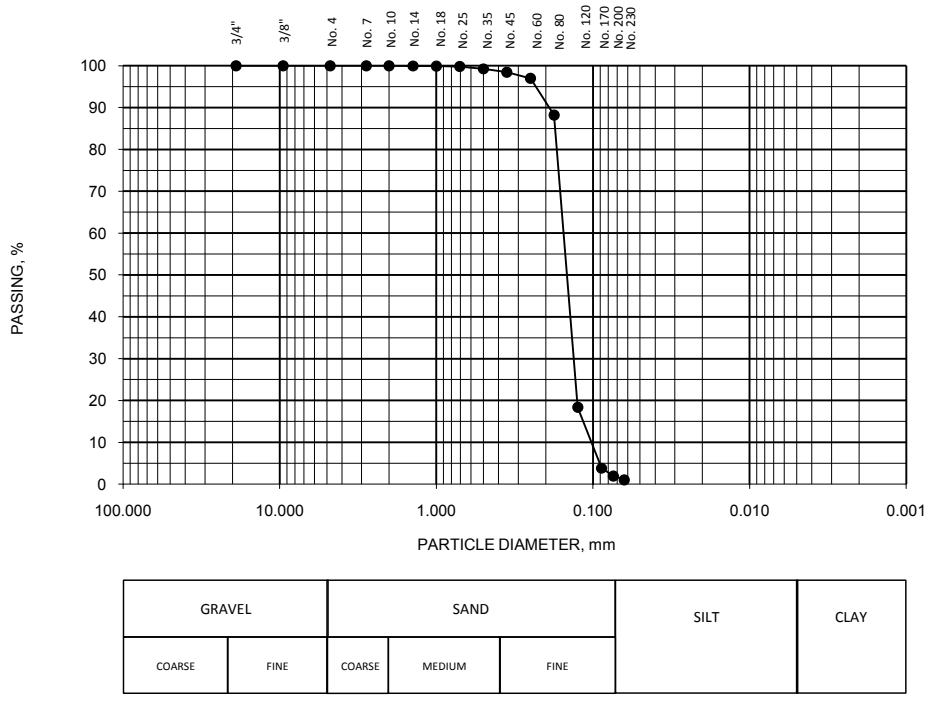
PROJECT NAME	Manteo (Old House Channel) 204 Study Area		
CLIENT	US Army Corps of Engineers	**BORING #**	MAN-10-V-06
PROJECT NO.	70105034	**SAMPLE #**	1
DATE SAMPLE RECEIVED	5/20/2010	**DEPTH, ft**	10.0-10.5
DATE TESTED	5/24/2010	**DESCRIPTION**	Poorly Graded Sand, SP
DATE REPORTED	5/25/2010		

TEST PROCEDURES

ASTM STANDARD D 422 - Particle Size Analysis of Soils	WEIGHT OF DRY SOLIDS (grams) 448.4

VISUALLY ESTIMATED SHELL CONTENT (%) #N/A



PERCENT FINER (dry weight basis)

GRAVEL			COARSE SAND		MEDIUM SAND				FINE SAND						SILT / CLAY
3/4"	3/8"	No. 4	No. 7	No. 10	No. 14	No. 18	No. 25	No. 35	No. 45	No. 60	No. 80	No. 120	No. 170	No. 200	No. 230
100.0	100.0	100.0	100.0	100.0	99.9	99.9	99.8	99.2	98.5	97.0	88.2	18.4	3.8	1.9	1.0

VISUALLY ESTIMATED SHELL CONTENT (percent)

#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	Shell Content <5% (Amount not visually estimated)

TESTED BY: S.E. Hardison / B.S. Junker CHECKED BY: S.E. Hardison APPROVED BY: R.L. Denton, II, PE

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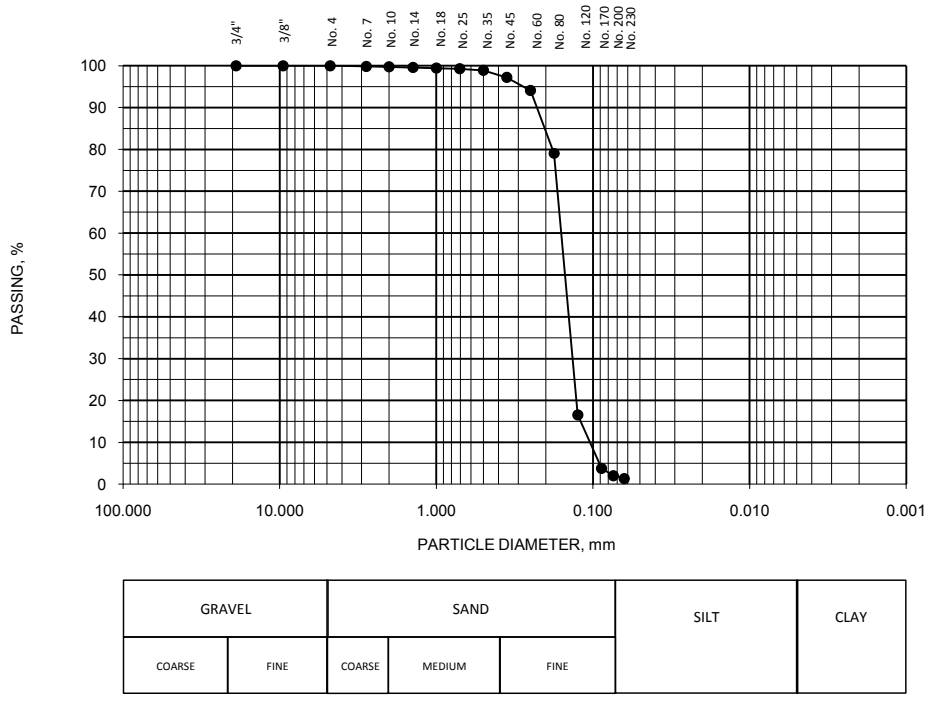
PROJECT NAME	Manteo (Old House Channel) 204 Study Area		
CLIENT	US Army Corps of Engineers	**BORING #**	MAN-10-V-06
PROJECT NO.	70105034	**SAMPLE #**	2
DATE SAMPLE RECEIVED	5/20/2010	**DEPTH, ft**	12.0-12.5
DATE TESTED	5/24/2010	**DESCRIPTION**	Poorly Graded Sand, SP
DATE REPORTED	5/25/2010		

TEST PROCEDURES

ASTM STANDARD D 422 - Particle Size Analysis of Soils	WEIGHT OF DRY SOLIDS (grams) 452.8

VISUALLY ESTIMATED SHELL CONTENT (%) #N/A



PERCENT FINER (dry weight basis)

GRAVEL			COARSE SAND		MEDIUM SAND				FINE SAND						SILT / CLAY
3/4"	3/8"	No. 4	No. 7	No. 10	No. 14	No. 18	No. 25	No. 35	No. 45	No. 60	No. 80	No. 120	No. 170	No. 200	No. 230
100.0	100.0	100.0	99.8	99.7	99.6	99.4	99.3	98.9	97.2	94.1	79.1	16.6	3.8	2.0	1.3

VISUALLY ESTIMATED SHELL CONTENT (percent)

#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	Shell Content <5% (Amount not visually estimated)

TESTED BY: S.E. Hardison / B.S. Junker CHECKED BY: S.E. Hardison APPROVED BY: R.L. Denton, II, PE

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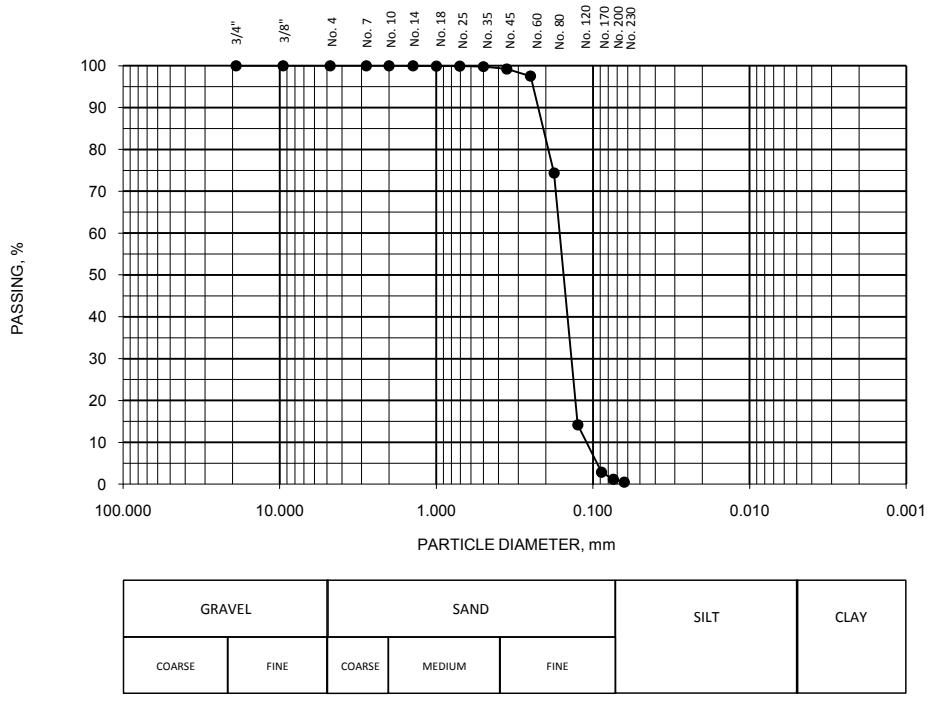
PROJECT NAME	Manteo (Old House Channel) 204 Study Area		
CLIENT	US Army Corps of Engineers	**BORING #**	MAN-10-V-06
PROJECT NO.	70105034	**SAMPLE #**	3
DATE SAMPLE RECEIVED	5/20/2010	**DEPTH, ft**	14.0-14.5
DATE TESTED	5/24/2010	**DESCRIPTION**	Poorly Graded Sand, SP
DATE REPORTED	5/25/2010		

TEST PROCEDURES

ASTM STANDARD D 422 - Particle Size Analysis of Soils	WEIGHT OF DRY SOLIDS (grams) 401.8

VISUALLY ESTIMATED SHELL CONTENT (%) #N/A



PERCENT FINER (dry weight basis)

GRAVEL			COARSE SAND		MEDIUM SAND				FINE SAND						SILT / CLAY
3/4"	3/8"	No. 4	No. 7	No. 10	No. 14	No. 18	No. 25	No. 35	No. 45	No. 60	No. 80	No. 120	No. 170	No. 200	No. 230
100.0	100.0	100.0	100.0	100.0	100.0	99.9	99.9	99.8	99.2	97.5	74.4	14.2	2.8	1.1	0.5

VISUALLY ESTIMATED SHELL CONTENT (percent)

#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	Shell Content <5% (Amount not visually estimated)

TESTED BY: S.E. Hardison / B.S. Junker CHECKED BY: S.E. Hardison APPROVED BY: R.L. Denton, II, PE

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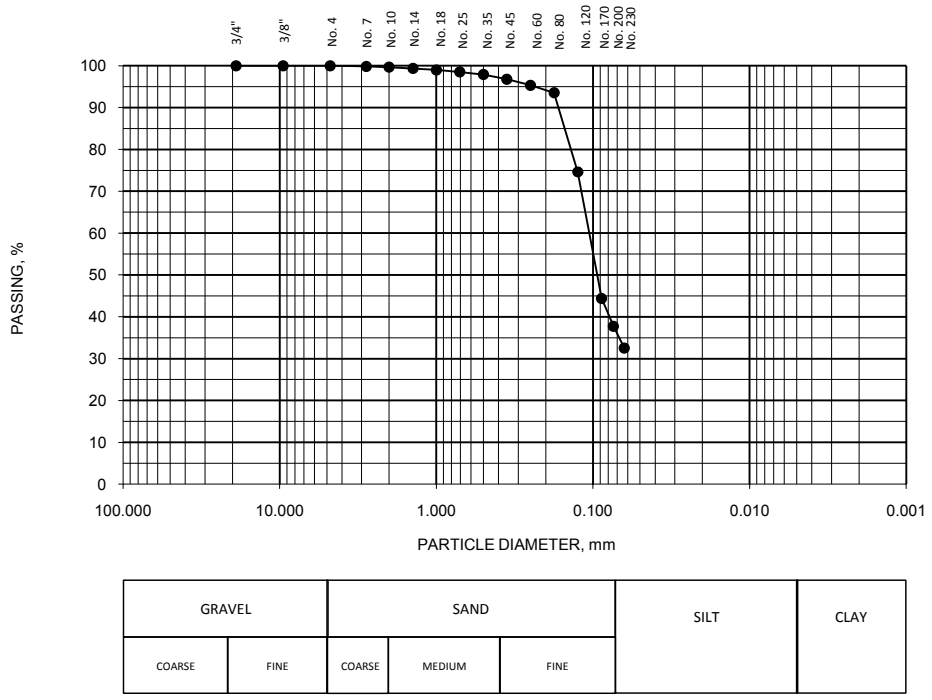
PROJECT NAME	Manteo (Old House Channel) 204 Study Area		
CLIENT	US Army Corps of Engineers	**BORING #**	MAN-10-V-07
PROJECT NO.	70105034	**SAMPLE #**	1
DATE SAMPLE RECEIVED	5/20/2010	**DEPTH, ft**	15.2-15.7
DATE TESTED	5/26/2010	**DESCRIPTION**	Silty Sand, SM
DATE REPORTED	5/26/2010		

TEST PROCEDURES

ASTM STANDARD D 422 - Particle Size Analysis of Soils	WEIGHT OF DRY SOLIDS (grams) 286.1

VISUALLY ESTIMATED SHELL CONTENT (%) #N/A



PERCENT FINER (dry weight basis)

GRAVEL			COARSE SAND		MEDIUM SAND				FINE SAND						SILT / CLAY
3/4"	3/8"	No. 4	No. 7	No. 10	No. 14	No. 18	No. 25	No. 35	No. 45	No. 60	No. 80	No. 120	No. 170	No. 200	No. 230
100.0	100.0	100.0	99.8	99.7	99.3	99.0	98.5	97.9	96.8	95.3	93.5	74.6	44.4	37.7	32.5

VISUALLY ESTIMATED SHELL CONTENT (percent)

#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	Shell Content <5% (Amount not visually estimated)

TESTED BY: S.E. Hardison / B.S. Junker CHECKED BY: S.E. Hardison APPROVED BY: R.L. Denton, II, PE

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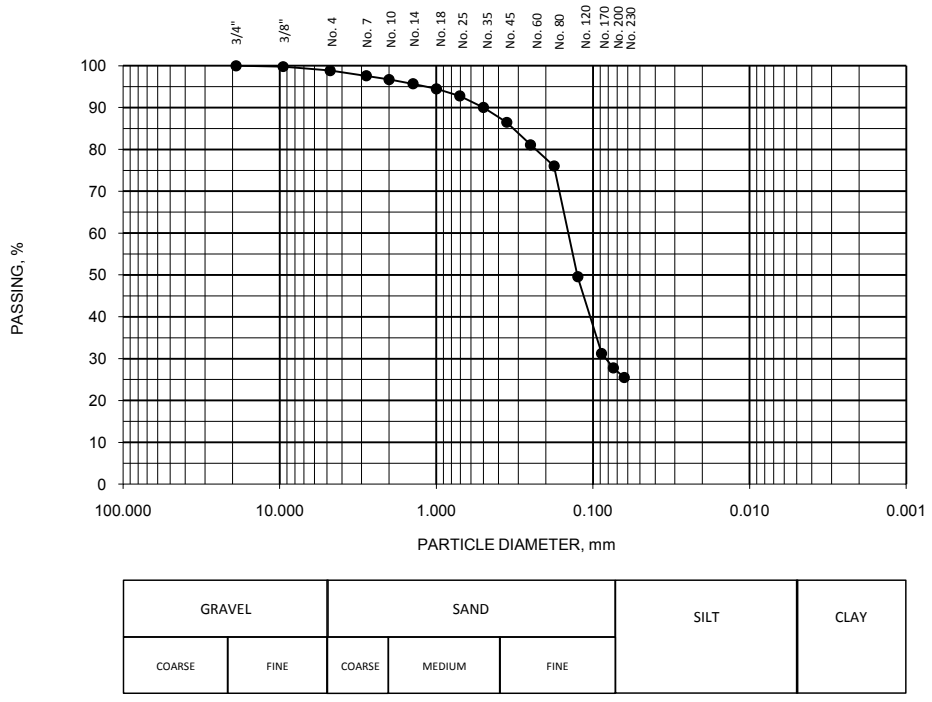
PROJECT NAME	Manteo (Old House Channel) 204 Study Area		
CLIENT	US Army Corps of Engineers	**BORING #**	MAN-10-V-07
PROJECT NO.	70105034	**SAMPLE #**	2
DATE SAMPLE RECEIVED	5/20/2010	**DEPTH, ft**	18.0-18.5
DATE TESTED	5/26/2010	**DESCRIPTION**	Silty Sand, SM
DATE REPORTED	5/26/2010		

TEST PROCEDURES

ASTM STANDARD D 422 - Particle Size Analysis of Soils	WEIGHT OF DRY SOLIDS (grams) 363.6

VISUALLY ESTIMATED SHELL CONTENT (%) #N/A



PERCENT FINER (dry weight basis)

GRAVEL			COARSE SAND		MEDIUM SAND				FINE SAND						SILT / CLAY
3/4"	3/8"	No. 4	No. 7	No. 10	No. 14	No. 18	No. 25	No. 35	No. 45	No. 60	No. 80	No. 120	No. 170	No. 200	No. 230
100.0	99.8	98.8	97.6	96.7	95.7	94.5	92.8	90.0	86.5	81.1	76.0	49.6	31.2	27.8	25.5

VISUALLY ESTIMATED SHELL CONTENT (percent)

#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	Shell Content <5% (Amount not visually estimated)

TESTED BY: S.E. Hardison / B.S. Junker CHECKED BY: S.E. Hardison APPROVED BY: R.L. Denton, II, PE

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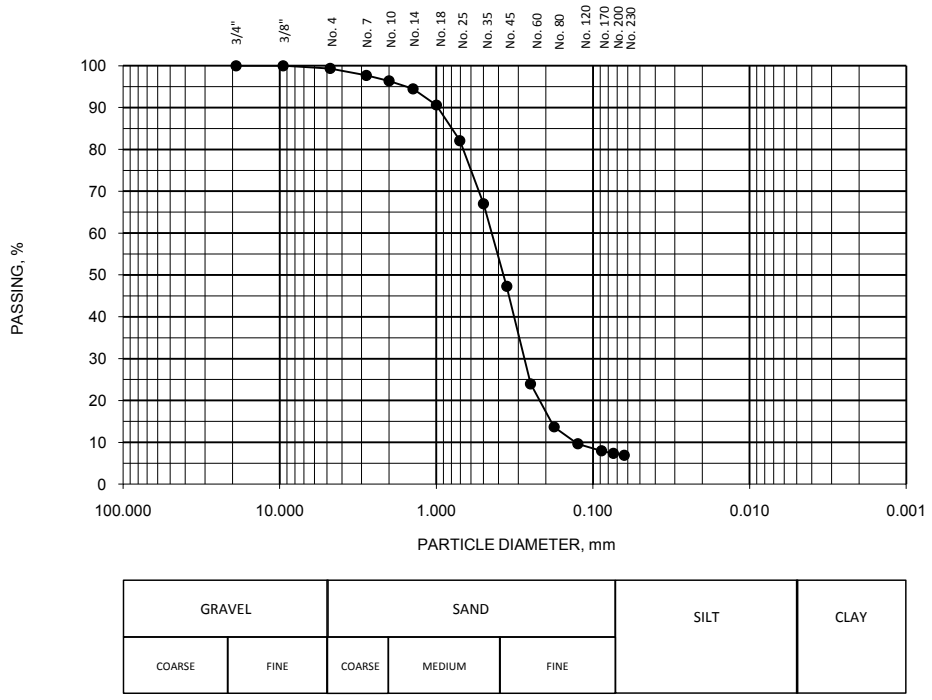
PROJECT NAME	Manteo (Old House Channel) 204 Study Area		
CLIENT	US Army Corps of Engineers	**BORING #**	MAN-10-V-07
PROJECT NO.	70105034	**SAMPLE #**	3
DATE SAMPLE RECEIVED	5/20/2010	**DEPTH, ft**	21.2-21.7
DATE TESTED	5/24/2010	**DESCRIPTION**	Poorly Graded Sand with Silt, SP-SM
DATE REPORTED	5/25/2010		

TEST PROCEDURES

ASTM STANDARD D 422 - Particle Size Analysis of Soils	WEIGHT OF DRY SOLIDS (grams) 520.4

VISUALLY ESTIMATED SHELL CONTENT (%) #N/A



PERCENT FINER (dry weight basis)

GRAVEL			COARSE SAND		MEDIUM SAND				FINE SAND						SILT / CLAY
3/4"	3/8"	No. 4	No. 7	No. 10	No. 14	No. 18	No. 25	No. 35	No. 45	No. 60	No. 80	No. 120	No. 170	No. 200	No. 230
100.0	100.0	99.3	97.7	96.3	94.5	90.6	82.1	67.0	47.3	24.0	13.7	9.6	8.0	7.3	6.9

VISUALLY ESTIMATED SHELL CONTENT (percent)

#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	Shell Content <5% (Amount not visually estimated)

TESTED BY: S.E. Hardison / B.S. Junker CHECKED BY: S.E. Hardison APPROVED BY: R.L. Denton, II, PE

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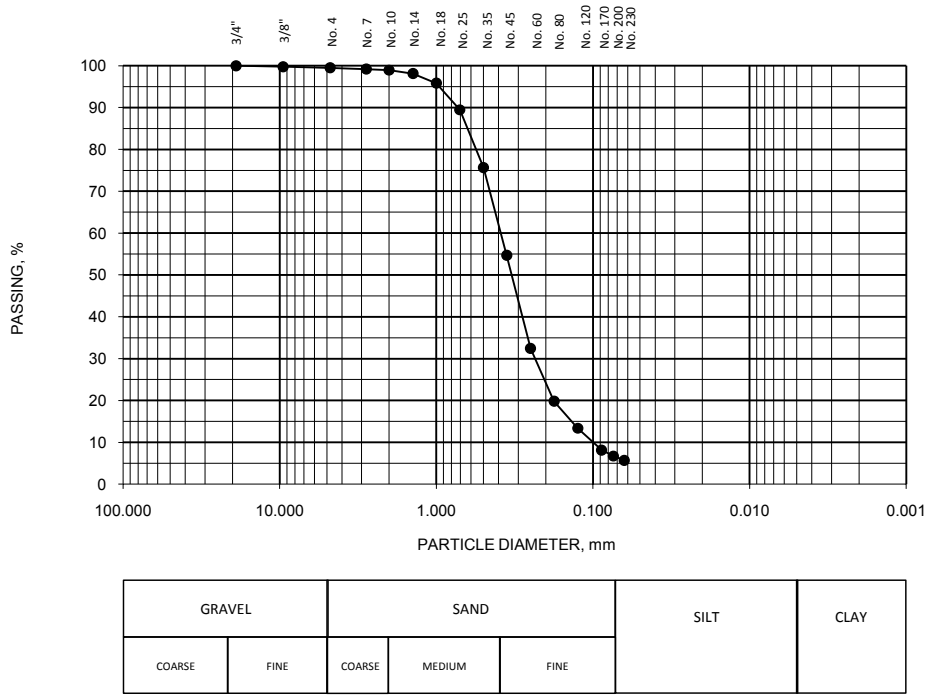
PROJECT NAME	Manteo (Old House Channel) 204 Study Area		
CLIENT	US Army Corps of Engineers	**BORING #**	MAN-10-V-08
PROJECT NO.	70105034	**SAMPLE #**	1
DATE SAMPLE RECEIVED	5/20/2010	**DEPTH, ft**	14.8-15.3
DATE TESTED	5/24/2010	**DESCRIPTION**	Poorly Graded Sand with Silt, SP-SM
DATE REPORTED	5/25/2010		

TEST PROCEDURES

ASTM STANDARD D 422 - Particle Size Analysis of Soils	WEIGHT OF DRY SOLIDS (grams) 526.7

VISUALLY ESTIMATED SHELL CONTENT (%) #N/A



PERCENT FINER (dry weight basis)

GRAVEL			COARSE SAND		MEDIUM SAND				FINE SAND						SILT / CLAY
3/4"	3/8"	No. 4	No. 7	No. 10	No. 14	No. 18	No. 25	No. 35	No. 45	No. 60	No. 80	No. 120	No. 170	No. 200	No. 230
100.0	99.8	99.5	99.2	98.9	98.1	95.8	89.5	75.6	54.7	32.4	19.8	13.4	8.1	6.7	5.7

VISUALLY ESTIMATED SHELL CONTENT (percent)

#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	Shell Content <5% (Amount not visually estimated)

TESTED BY: S.E. Hardison / B.S. Junker CHECKED BY: S.E. Hardison APPROVED BY: R.L. Denton, II, PE

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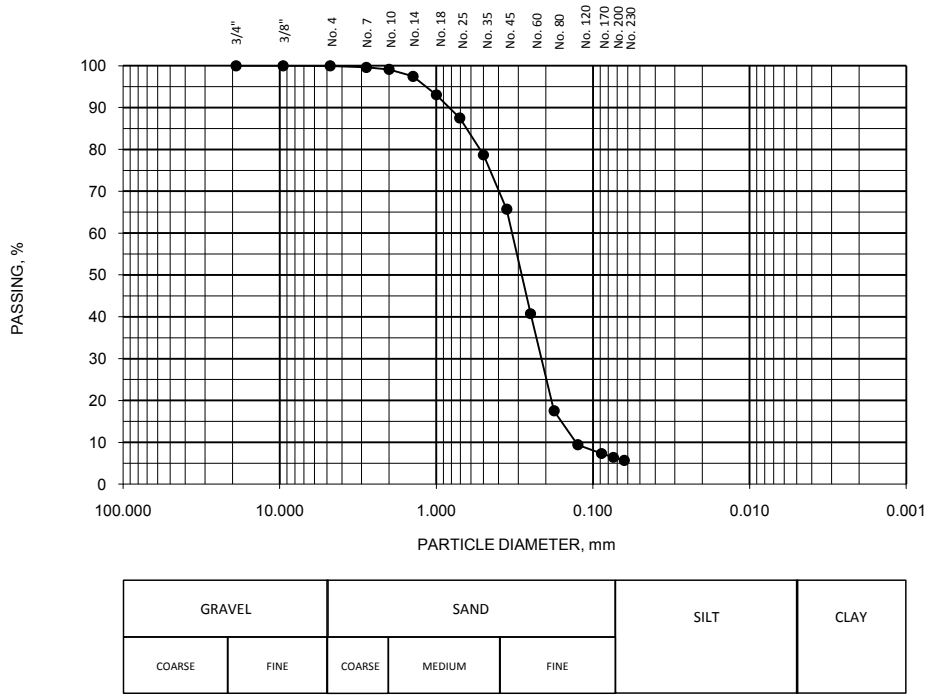
PROJECT NAME	Manteo (Old House Channel) 204 Study Area		
CLIENT	US Army Corps of Engineers	**BORING #**	MAN-10-V-08
PROJECT NO.	70105034	**SAMPLE #**	2
DATE SAMPLE RECEIVED	5/20/2010	**DEPTH, ft**	17.0-17.5
DATE TESTED	5/24/2010	**DESCRIPTION**	Poorly Graded Sand with Silt, SP-SM
DATE REPORTED	5/25/2010		

TEST PROCEDURES

ASTM STANDARD D 422 - Particle Size Analysis of Soils	WEIGHT OF DRY SOLIDS (grams) 547.1

VISUALLY ESTIMATED SHELL CONTENT (%) #N/A



PERCENT FINER (dry weight basis)

GRAVEL			COARSE SAND		MEDIUM SAND				FINE SAND						SILT / CLAY
3/4"	3/8"	No. 4	No. 7	No. 10	No. 14	No. 18	No. 25	No. 35	No. 45	No. 60	No. 80	No. 120	No. 170	No. 200	No. 230
100.0	100.0	99.9	99.6	99.1	97.5	93.1	87.5	78.7	65.7	40.7	17.5	9.4	7.3	6.4	5.7

VISUALLY ESTIMATED SHELL CONTENT (percent)

#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	Shell Content <5% (Amount not visually estimated)

TESTED BY: S.E. Hardison / B.S. Junker CHECKED BY: S.E. Hardison APPROVED BY: R.L. Denton, II, PE

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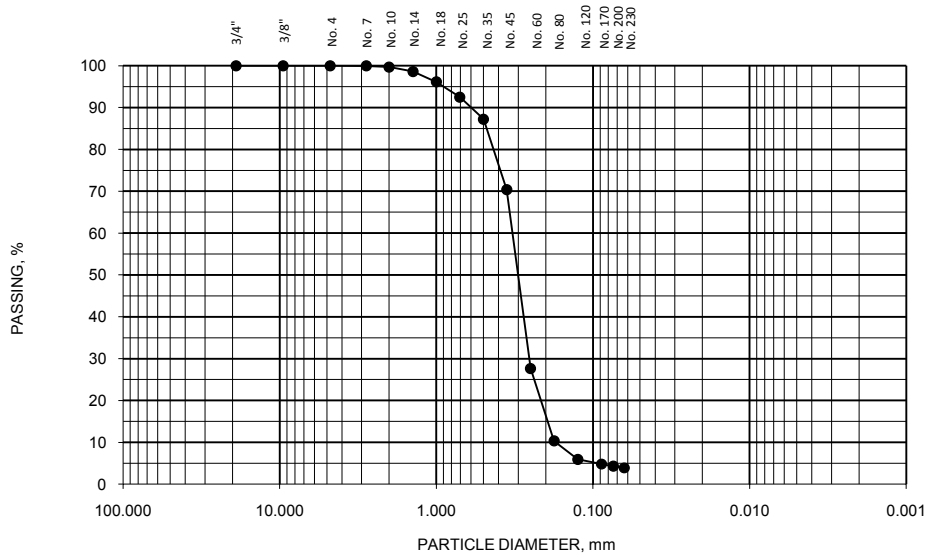
PROJECT NAME	Manteo (Old House Channel) 204 Study Area		
CLIENT	US Army Corps of Engineers	**BORING #**	MAN-10-V-08
PROJECT NO.	70105034	**SAMPLE #**	3
DATE SAMPLE RECEIVED	5/20/2010	**DEPTH, ft**	19.5-20.0
DATE TESTED	5/24/2010	**DESCRIPTION**	Poorly Graded Sand, SP
DATE REPORTED	5/25/2010		

TEST PROCEDURES

ASTM STANDARD D 422 - Particle Size Analysis of Soils	WEIGHT OF DRY SOLIDS (grams) 631.0

VISUALLY ESTIMATED SHELL CONTENT (%) #N/A



PERCENT FINER (dry weight basis)

GRAVEL			COARSE SAND		MEDIUM SAND				FINE SAND						SILT / CLAY
3/4"	3/8"	No. 4	No. 7	No. 10	No. 14	No. 18	No. 25	No. 35	No. 45	No. 60	No. 80	No. 120	No. 170	No. 200	No. 230
100.0	100.0	100.0	100.0	99.7	98.6	96.1	92.5	87.2	70.4	27.7	10.3	5.9	4.8	4.3	3.9

VISUALLY ESTIMATED SHELL CONTENT (percent)

#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	Shell Content <5% (Amount not visually estimated)

TESTED BY: S.E. Hardison / B.S. Junker CHECKED BY: S.E. Hardison APPROVED BY: R.L. Denton, II, PE

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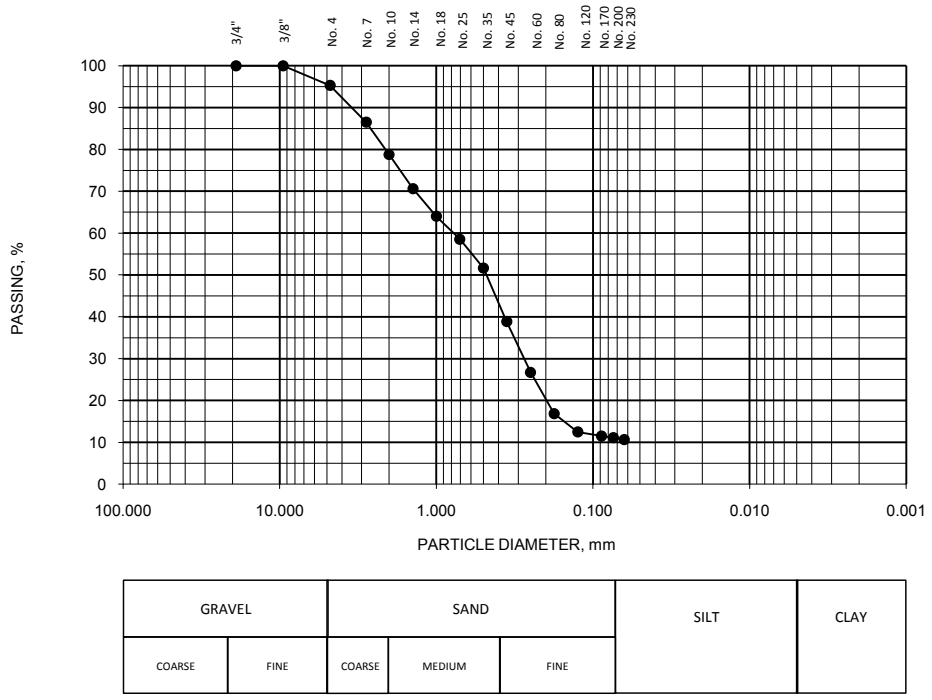
PROJECT NAME	Manteo (Old House Channel) 204 Study Area		
CLIENT	US Army Corps of Engineers	**BORING #**	MAN-10-V-08
PROJECT NO.	70105034	**SAMPLE #**	4
DATE SAMPLE RECEIVED	5/20/2010	**DEPTH, ft**	21.5-22.0
DATE TESTED	5/26/2010	**DESCRIPTION**	Well Graded Sand with Silt, SW-SM
DATE REPORTED	5/26/2010		

TEST PROCEDURES

ASTM STANDARD D 422 - Particle Size Analysis of Soils	WEIGHT OF DRY SOLIDS (grams) 642.5

VISUALLY ESTIMATED SHELL CONTENT (%) #N/A



PERCENT FINER (dry weight basis)

GRAVEL			COARSE SAND		MEDIUM SAND				FINE SAND						SILT / CLAY
3/4"	3/8"	No. 4	No. 7	No. 10	No. 14	No. 18	No. 25	No. 35	No. 45	No. 60	No. 80	No. 120	No. 170	No. 200	No. 230
100.0	100.0	95.3	86.5	78.8	70.6	64.0	58.6	51.6	38.8	26.7	16.9	12.5	11.5	11.1	10.6

VISUALLY ESTIMATED SHELL CONTENT (percent)

#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	Shell Content <5% (Amount not visually estimated)

TESTED BY: S.E. Hardison / B.S. Junker CHECKED BY: S.E. Hardison APPROVED BY: R.L. Denton, II, PE

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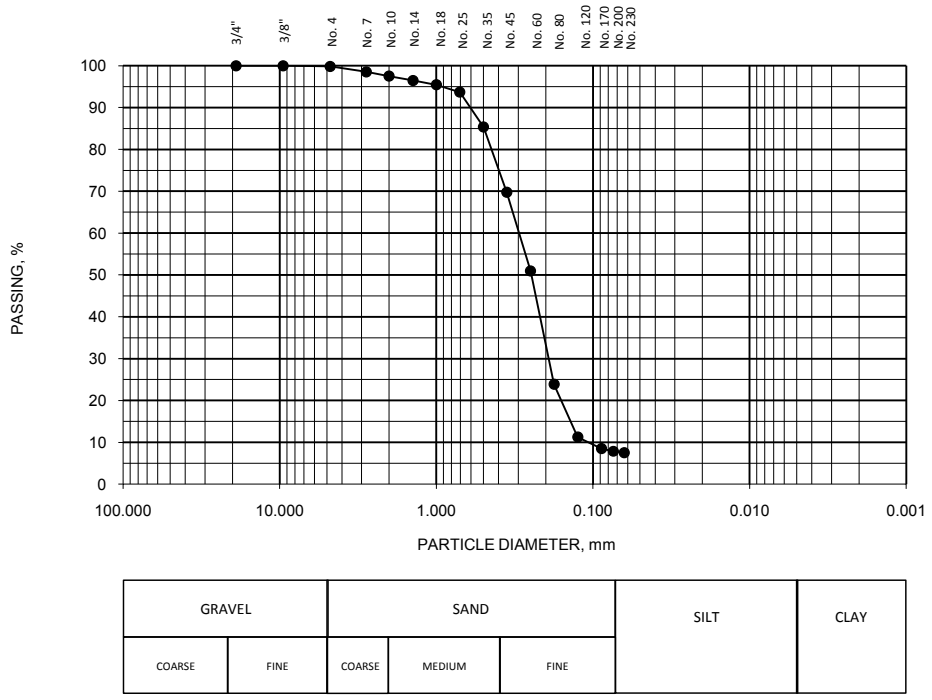
PROJECT NAME	Manteo (Old House Channel) 204 Study Area		
CLIENT	US Army Corps of Engineers	**BORING #**	MAN-10-V-09
PROJECT NO.	70105034	**SAMPLE #**	1
DATE SAMPLE RECEIVED	5/20/2010	**DEPTH, ft**	14.5-15.0
DATE TESTED	5/26/2010	**DESCRIPTION**	Poorly Graded Sand with Silt, SP-SM
DATE REPORTED	5/26/2010		

TEST PROCEDURES

ASTM STANDARD D 422 - Particle Size Analysis of Soils	WEIGHT OF DRY SOLIDS (grams) 436.1

VISUALLY ESTIMATED SHELL CONTENT (%) #N/A



PERCENT FINER (dry weight basis)

GRAVEL			COARSE SAND		MEDIUM SAND				FINE SAND						SILT / CLAY
3/4"	3/8"	No. 4	No. 7	No. 10	No. 14	No. 18	No. 25	No. 35	No. 45	No. 60	No. 80	No. 120	No. 170	No. 200	No. 230
100.0	100.0	99.8	98.5	97.5	96.5	95.4	93.7	85.3	69.8	50.9	23.9	11.3	8.5	7.9	7.5

VISUALLY ESTIMATED SHELL CONTENT (percent)

#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	Shell Content <5% (Amount not visually estimated)

TESTED BY: S.E. Hardison / B.S. Junker CHECKED BY: S.E. Hardison APPROVED BY: R.L. Denton, II, PE

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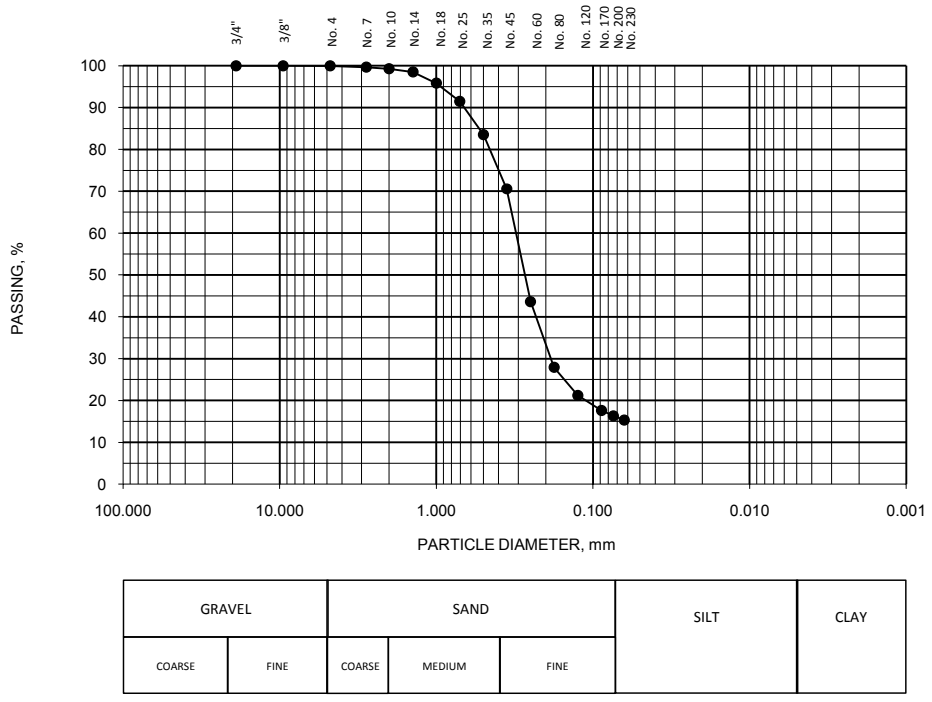
PROJECT NAME	Manteo (Old House Channel) 204 Study Area		
CLIENT	US Army Corps of Engineers	**BORING #**	MAN-10-V-09
PROJECT NO.	70105034	**SAMPLE #**	2
DATE SAMPLE RECEIVED	5/20/2010	**DEPTH, ft**	17.0-17.5
DATE TESTED	5/24/2010	**DESCRIPTION**	Silty Sand, SM
DATE REPORTED	5/25/2010		

TEST PROCEDURES

ASTM STANDARD D 422 - Particle Size Analysis of Soils	WEIGHT OF DRY SOLIDS (grams) 524.3

VISUALLY ESTIMATED SHELL CONTENT (%) #N/A



PERCENT FINER (dry weight basis)

GRAVEL			COARSE SAND		MEDIUM SAND				FINE SAND						SILT / CLAY
3/4"	3/8"	No. 4	No. 7	No. 10	No. 14	No. 18	No. 25	No. 35	No. 45	No. 60	No. 80	No. 120	No. 170	No. 200	No. 230
100.0	100.0	99.9	99.6	99.3	98.5	95.8	91.5	83.5	70.6	43.6	27.9	21.2	17.6	16.3	15.3

VISUALLY ESTIMATED SHELL CONTENT (percent)

#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	Shell Content <5% (Amount not visually estimated)

TESTED BY: S.E. Hardison / B.S. Junker CHECKED BY: S.E. Hardison APPROVED BY: R.L. Denton, II, PE

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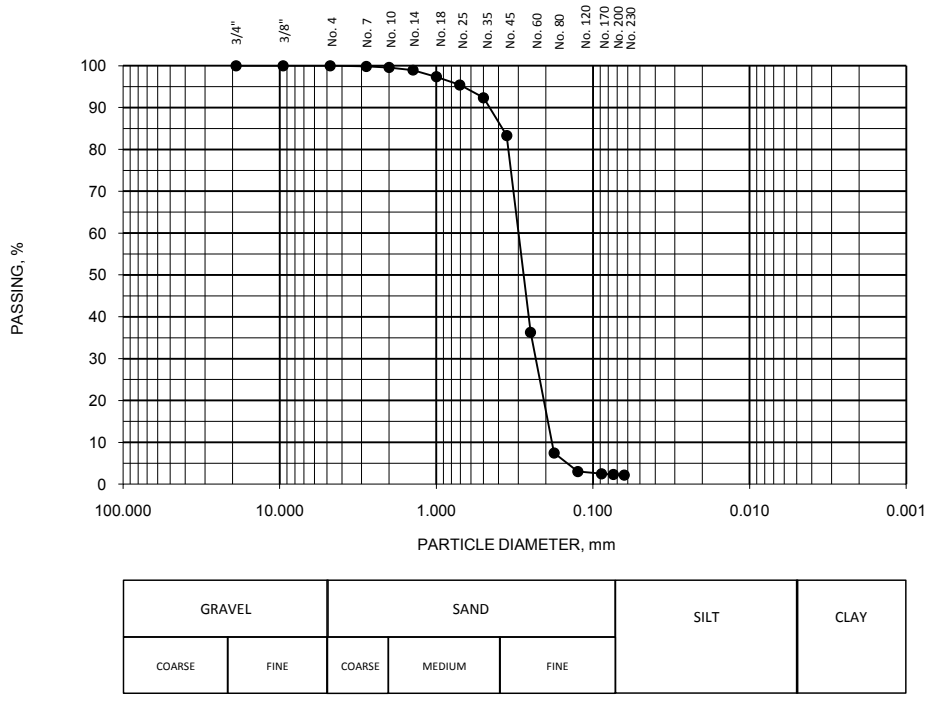
PROJECT NAME	Manteo (Old House Channel) 204 Study Area		
CLIENT	US Army Corps of Engineers	**BORING #**	MAN-10-V-09
PROJECT NO.	70105034	**SAMPLE #**	3
DATE SAMPLE RECEIVED	5/20/2010	**DEPTH, ft**	19.0-19.5
DATE TESTED	5/24/2010	**DESCRIPTION**	Poorly Graded Sand, SP
DATE REPORTED	5/25/2010		

TEST PROCEDURES

ASTM STANDARD D 422 - Particle Size Analysis of Soils	WEIGHT OF DRY SOLIDS (grams) 557.9

VISUALLY ESTIMATED SHELL CONTENT (%) #N/A



PERCENT FINER (dry weight basis)

GRAVEL			COARSE SAND		MEDIUM SAND				FINE SAND						SILT / CLAY
3/4"	3/8"	No. 4	No. 7	No. 10	No. 14	No. 18	No. 25	No. 35	No. 45	No. 60	No. 80	No. 120	No. 170	No. 200	No. 230
100.0	100.0	100.0	99.8	99.6	98.9	97.3	95.4	92.3	83.3	36.3	7.5	3.0	2.5	2.3	2.2

VISUALLY ESTIMATED SHELL CONTENT (percent)

#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	Shell Content <5% (Amount not visually estimated)

TESTED BY: S.E. Hardison / B.S. Junker CHECKED BY: S.E. Hardison APPROVED BY: R.L. Denton, II, PE

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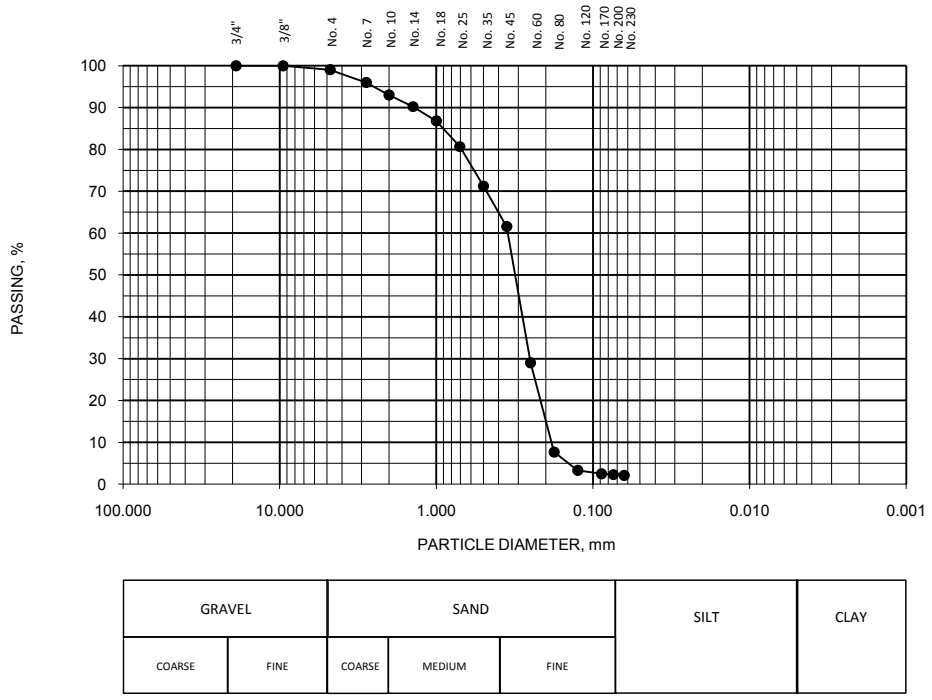
PROJECT NAME	Manteo (Old House Channel) 204 Study Area		
CLIENT	US Army Corps of Engineers	**BORING #**	MAN-10-V-09
PROJECT NO.	70105034	**SAMPLE #**	4
DATE SAMPLE RECEIVED	5/20/2010	**DEPTH, ft**	21.0-21.5
DATE TESTED	5/24/2010	**DESCRIPTION**	Poorly Graded Sand, SP
DATE REPORTED	5/25/2010		

TEST PROCEDURES

ASTM STANDARD D 422 - Particle Size Analysis of Soils	WEIGHT OF DRY SOLIDS (grams) 544.4

VISUALLY ESTIMATED SHELL CONTENT (%) #N/A



PERCENT FINER (dry weight basis)

GRAVEL			COARSE SAND		MEDIUM SAND				FINE SAND						SILT / CLAY
3/4"	3/8"	No. 4	No. 7	No. 10	No. 14	No. 18	No. 25	No. 35	No. 45	No. 60	No. 80	No. 120	No. 170	No. 200	No. 230
100.0	100.0	99.0	96.0	93.0	90.2	86.8	80.7	71.2	61.6	29.0	7.7	3.3	2.5	2.3	2.1

VISUALLY ESTIMATED SHELL CONTENT (percent)

#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	Shell Content <5% (Amount not visually estimated)

TESTED BY: S.E. Hardison / B.S. Junker CHECKED BY: S.E. Hardison APPROVED BY: R.L. Denton, II, PE

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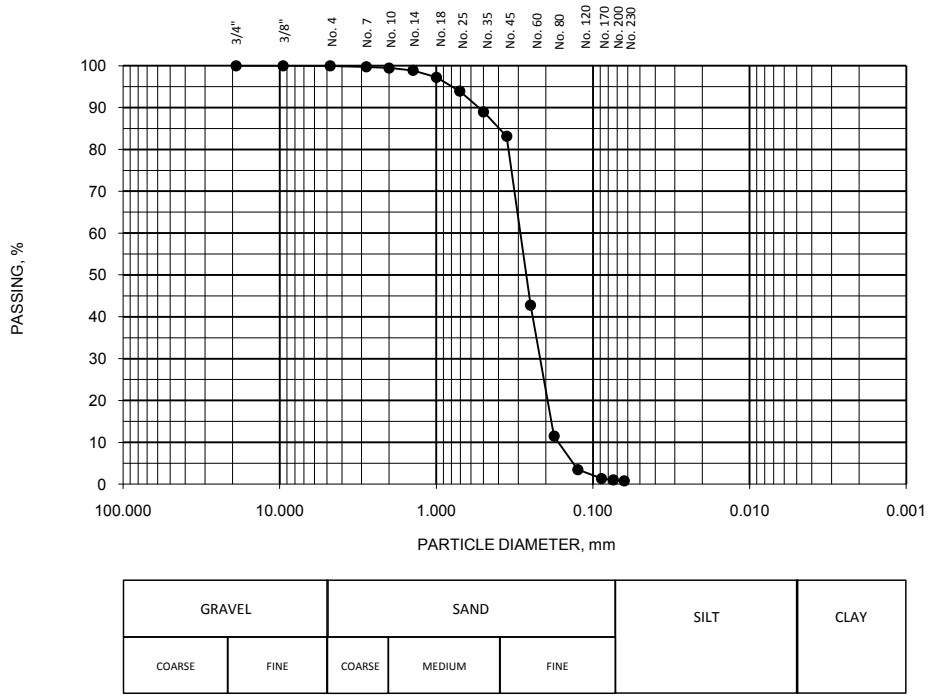
PROJECT NAME	Manteo (Old House Channel) 204 Study Area		
CLIENT	US Army Corps of Engineers	**BORING #**	MAN-10-V-09
PROJECT NO.	70105034	**SAMPLE #**	5
DATE SAMPLE RECEIVED	5/20/2010	**DEPTH, ft**	24.0-24.5
DATE TESTED	5/24/2010	**DESCRIPTION**	Poorly Graded Sand, SP
DATE REPORTED	5/25/2010		

TEST PROCEDURES

ASTM STANDARD D 422 - Particle Size Analysis of Soils	WEIGHT OF DRY SOLIDS (grams) 594.4

VISUALLY ESTIMATED SHELL CONTENT (%) #N/A



PERCENT FINER (dry weight basis)

GRAVEL			COARSE SAND		MEDIUM SAND				FINE SAND						SILT / CLAY
3/4"	3/8"	No. 4	No. 7	No. 10	No. 14	No. 18	No. 25	No. 35	No. 45	No. 60	No. 80	No. 120	No. 170	No. 200	No. 230
100.0	100.0	99.9	99.7	99.4	98.9	97.2	93.9	89.0	83.1	42.7	11.5	3.5	1.3	1.0	0.8

VISUALLY ESTIMATED SHELL CONTENT (percent)

#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	Shell Content <5% (Amount not visually estimated)

TESTED BY: S.E. Hardison / B.S. Junker CHECKED BY: S.E. Hardison APPROVED BY: R.L. Denton, II, PE

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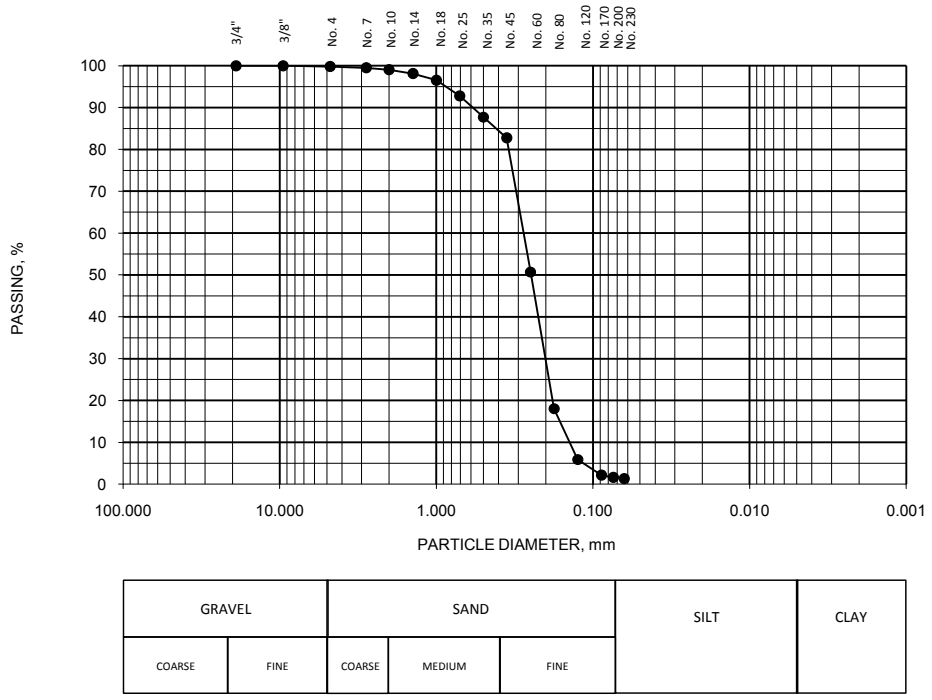
PROJECT NAME	Manteo (Old House Channel) 204 Study Area		
CLIENT	US Army Corps of Engineers	**BORING #**	MAN-10-V-09
PROJECT NO.	70105034	**SAMPLE #**	6
DATE SAMPLE RECEIVED	5/20/2010	**DEPTH, ft**	26.5-27.0
DATE TESTED	5/24/2010	**DESCRIPTION**	Poorly Graded Sand, SP
DATE REPORTED	5/25/2010		

TEST PROCEDURES

ASTM STANDARD D 422 - Particle Size Analysis of Soils	WEIGHT OF DRY SOLIDS (grams) 527.7

VISUALLY ESTIMATED SHELL CONTENT (%) #N/A



PERCENT FINER (dry weight basis)

GRAVEL			COARSE SAND		MEDIUM SAND				FINE SAND						SILT / CLAY
3/4"	3/8"	No. 4	No. 7	No. 10	No. 14	No. 18	No. 25	No. 35	No. 45	No. 60	No. 80	No. 120	No. 170	No. 200	No. 230
100.0	100.0	99.8	99.5	99.1	98.1	96.5	92.8	87.7	82.8	50.7	18.0	5.9	2.1	1.6	1.3

VISUALLY ESTIMATED SHELL CONTENT (percent)

#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	Shell Content <5% (Amount not visually estimated)

TESTED BY: S.E. Hardison / B.S. Junker CHECKED BY: S.E. Hardison APPROVED BY: R.L. Denton, II, PE

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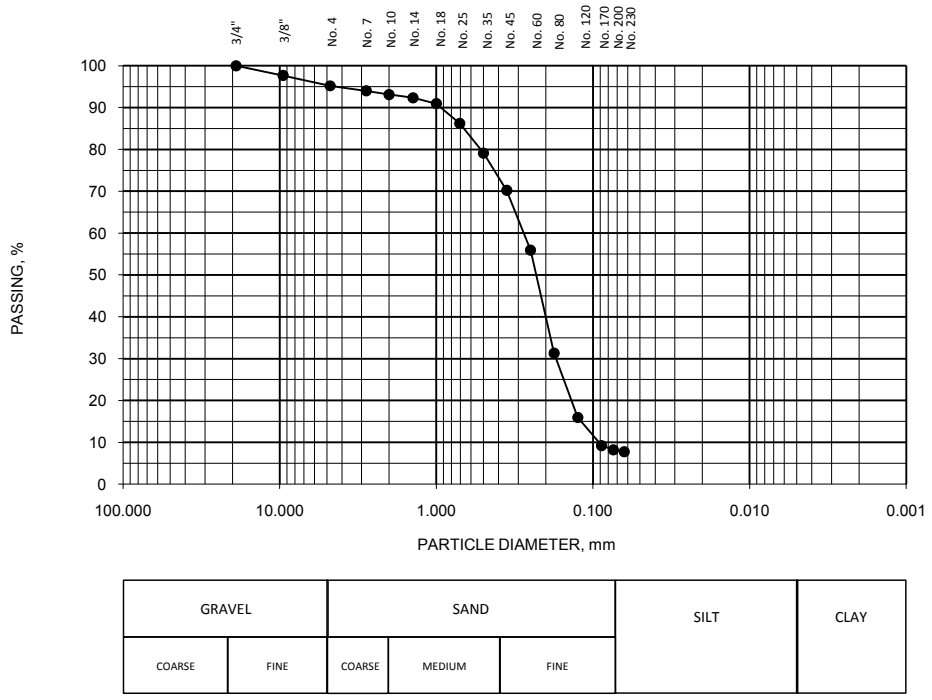
PROJECT NAME	Manteo (Old House Channel) 204 Study Area		
CLIENT	US Army Corps of Engineers	**BORING #**	MAN-10-V-10
PROJECT NO.	70105034	**SAMPLE #**	1
DATE SAMPLE RECEIVED	5/20/2010	**DEPTH, ft**	14.0-14.5
DATE TESTED	5/26/2010	**DESCRIPTION**	Poorly Graded Sand with Silt, SP-SM
DATE REPORTED	5/26/2010		

TEST PROCEDURES

ASTM STANDARD D 422 - Particle Size Analysis of Soils	WEIGHT OF DRY SOLIDS (grams) 405.4

VISUALLY ESTIMATED SHELL CONTENT (%) #N/A



PERCENT FINER (dry weight basis)

GRAVEL			COARSE SAND		MEDIUM SAND				FINE SAND						SILT / CLAY
3/4"	3/8"	No. 4	No. 7	No. 10	No. 14	No. 18	No. 25	No. 35	No. 45	No. 60	No. 80	No. 120	No. 170	No. 200	No. 230
100.0	97.7	95.2	94.0	93.1	92.4	90.9	86.2	79.1	70.2	55.9	31.3	16.0	9.2	8.2	7.8

VISUALLY ESTIMATED SHELL CONTENT (percent)

#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	Shell Content <5% (Amount not visually estimated)

TESTED BY: S.E. Hardison / B.S. Junker CHECKED BY: S.E. Hardison APPROVED BY: R.L. Denton, II, PE

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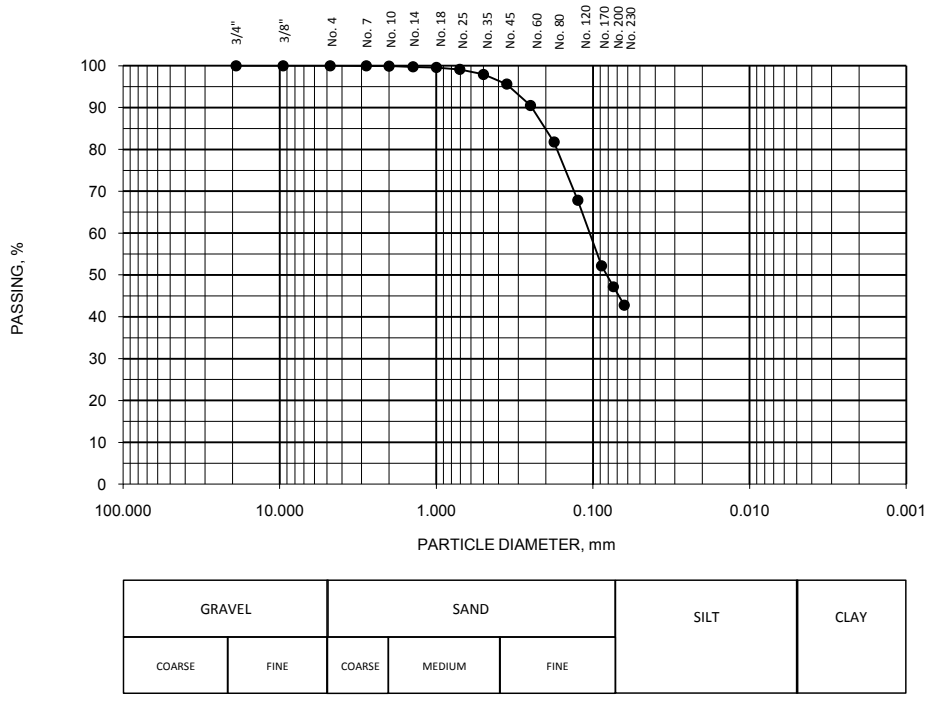
PROJECT NAME	Manteo (Old House Channel) 204 Study Area		
CLIENT	US Army Corps of Engineers	**BORING #**	MAN-10-V-10
PROJECT NO.	70105034	**SAMPLE #**	2
DATE SAMPLE RECEIVED	5/20/2010	**DEPTH, ft**	16.0-16.5
DATE TESTED	5/26/2010	**DESCRIPTION**	Silty Sand, SM
DATE REPORTED	5/26/2010		

TEST PROCEDURES

ASTM STANDARD D 422 - Particle Size Analysis of Soils	WEIGHT OF DRY SOLIDS (grams) 443.7

VISUALLY ESTIMATED SHELL CONTENT (%) #N/A



PERCENT FINER (dry weight basis)

GRAVEL			COARSE SAND		MEDIUM SAND				FINE SAND						SILT / CLAY
3/4"	3/8"	No. 4	No. 7	No. 10	No. 14	No. 18	No. 25	No. 35	No. 45	No. 60	No. 80	No. 120	No. 170	No. 200	No. 230
100.0	100.0	100.0	100.0	99.9	99.7	99.6	99.1	97.9	95.6	90.5	81.7	67.9	52.2	47.2	42.8

VISUALLY ESTIMATED SHELL CONTENT (percent)

#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	Shell Content <5% (Amount not visually estimated)

TESTED BY: S.E. Hardison / B.S. Junker CHECKED BY: S.E. Hardison APPROVED BY: R.L. Denton, II, PE

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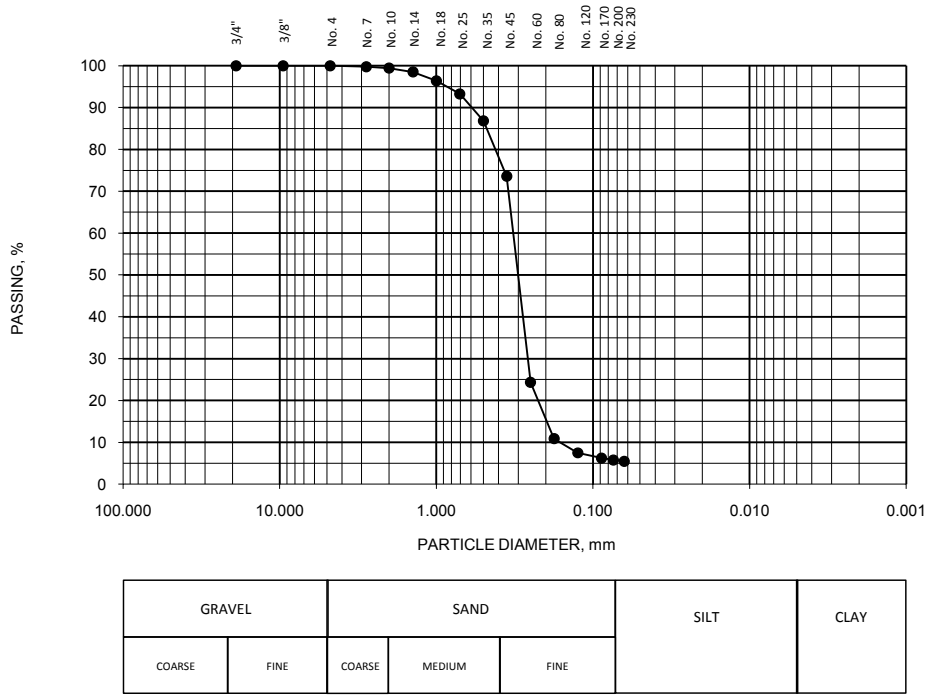
PROJECT NAME	Manteo (Old House Channel) 204 Study Area		
CLIENT	US Army Corps of Engineers	**BORING #**	MAN-10-V-10
PROJECT NO.	70105034	**SAMPLE #**	3
DATE SAMPLE RECEIVED	5/20/2010	**DEPTH, ft**	17.0-17.5
DATE TESTED	5/24/2010	**DESCRIPTION**	Poorly Graded Sand with Silt, SP-SM
DATE REPORTED	5/25/2010		

TEST PROCEDURES

ASTM STANDARD D 422 - Particle Size Analysis of Soils	WEIGHT OF DRY SOLIDS (grams) 571.6

VISUALLY ESTIMATED SHELL CONTENT (%) #N/A



PERCENT FINER (dry weight basis)

GRAVEL			COARSE SAND		MEDIUM SAND				FINE SAND						SILT / CLAY
3/4"	3/8"	No. 4	No. 7	No. 10	No. 14	No. 18	No. 25	No. 35	No. 45	No. 60	No. 80	No. 120	No. 170	No. 200	No. 230
100.0	100.0	100.0	99.8	99.4	98.5	96.4	93.2	86.8	73.6	24.3	10.9	7.5	6.2	5.8	5.5

VISUALLY ESTIMATED SHELL CONTENT (percent)

#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	Shell Content <5% (Amount not visually estimated)

TESTED BY: S.E. Hardison / B.S. Junker CHECKED BY: S.E. Hardison APPROVED BY: R.L. Denton, II, PE

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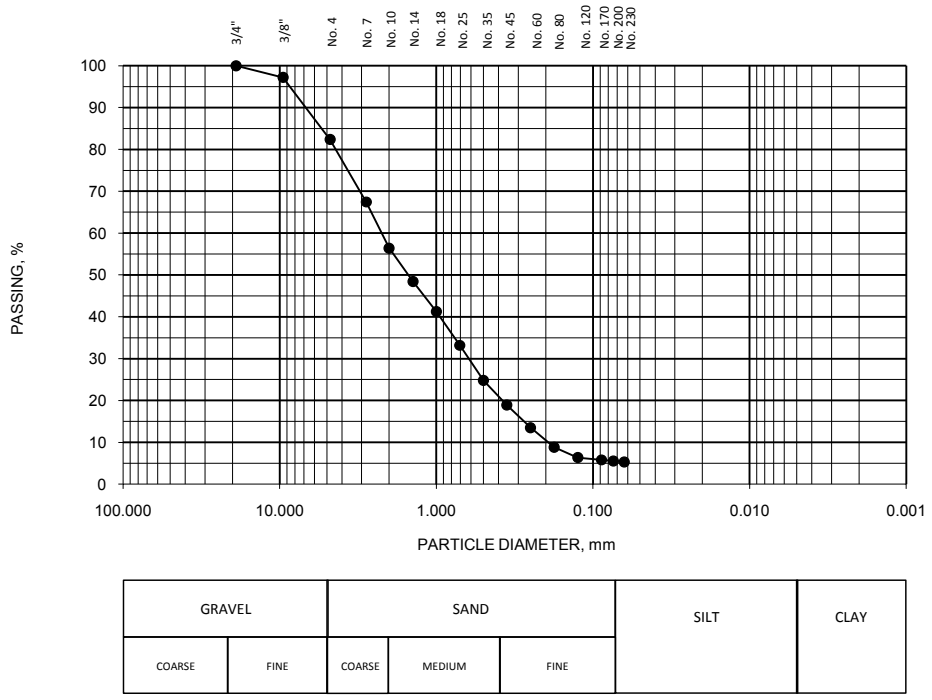
PROJECT NAME	Manteo (Old House Channel) 204 Study Area		
CLIENT	US Army Corps of Engineers	**BORING #**	MAN-10-V-10
PROJECT NO.	70105034	**SAMPLE #**	4
DATE SAMPLE RECEIVED	5/20/2010	**DEPTH, ft**	18.8-19.3
DATE TESTED	5/26/2010	**DESCRIPTION**	Poorly Graded Sand with Silt & Gravel, SP-SM
DATE REPORTED	5/26/2010		

TEST PROCEDURES

ASTM STANDARD D 422 - Particle Size Analysis of Soils	WEIGHT OF DRY SOLIDS (grams) 510.1

VISUALLY ESTIMATED SHELL CONTENT (%) #N/A



PERCENT FINER (dry weight basis)

GRAVEL			COARSE SAND		MEDIUM SAND				FINE SAND						SILT / CLAY
3/4"	3/8"	No. 4	No. 7	No. 10	No. 14	No. 18	No. 25	No. 35	No. 45	No. 60	No. 80	No. 120	No. 170	No. 200	No. 230
100.0	97.2	82.4	67.4	56.4	48.4	41.3	33.2	24.8	18.9	13.5	8.8	6.4	5.8	5.5	5.3

VISUALLY ESTIMATED SHELL CONTENT (percent)

#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	Shell Content <5% (Amount not visually estimated)

TESTED BY: S.E. Hardison / B.S. Junker CHECKED BY: S.E. Hardison APPROVED BY: R.L. Denton, II, PE

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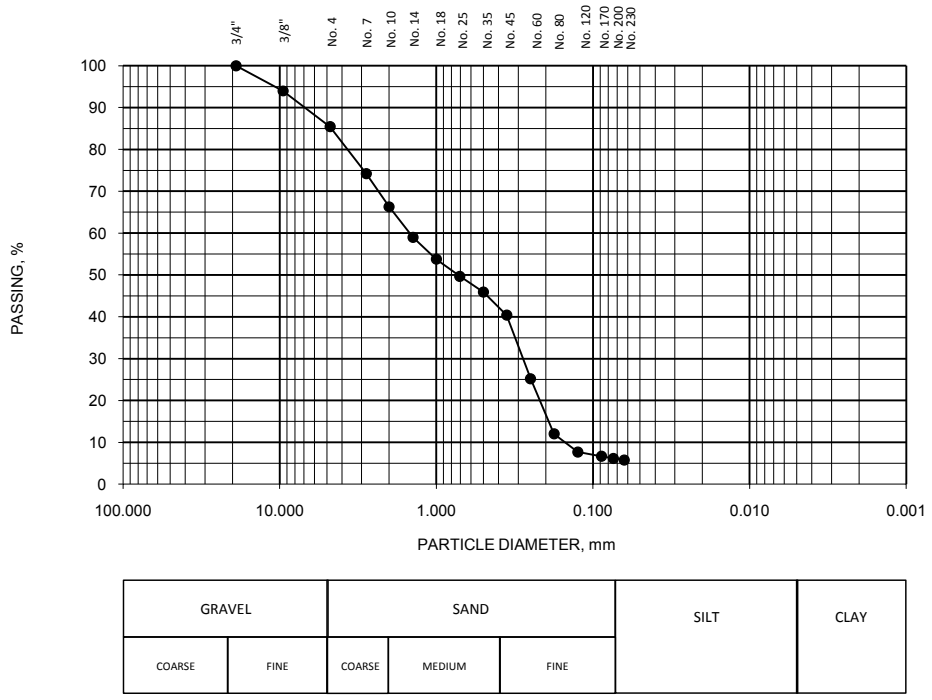
PROJECT NAME	Manteo (Old House Channel) 204 Study Area		
CLIENT	US Army Corps of Engineers	**BORING #**	MAN-10-V-10
PROJECT NO.	70105034	**SAMPLE #**	5
DATE SAMPLE RECEIVED	5/20/2010	**DEPTH, ft**	20.8-21.3
DATE TESTED	5/24/2010	**DESCRIPTION**	Poorly Graded Sand with Silt, SP-SM
DATE REPORTED	5/25/2010		

TEST PROCEDURES

ASTM STANDARD D 422 - Particle Size Analysis of Soils	WEIGHT OF DRY SOLIDS (grams) 492.4

VISUALLY ESTIMATED SHELL CONTENT (%) #N/A



PERCENT FINER (dry weight basis)

GRAVEL			COARSE SAND		MEDIUM SAND				FINE SAND						SILT / CLAY
3/4"	3/8"	No. 4	No. 7	No. 10	No. 14	No. 18	No. 25	No. 35	No. 45	No. 60	No. 80	No. 120	No. 170	No. 200	No. 230
100.0	94.0	85.4	74.2	66.3	59.0	53.8	49.7	45.9	40.4	25.2	12.0	7.7	6.7	6.2	5.8

VISUALLY ESTIMATED SHELL CONTENT (percent)

#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	Shell Content <5% (Amount not visually estimated)

TESTED BY: S.E. Hardison / B.S. Junker CHECKED BY: S.E. Hardison APPROVED BY: R.L. Denton, II, PE

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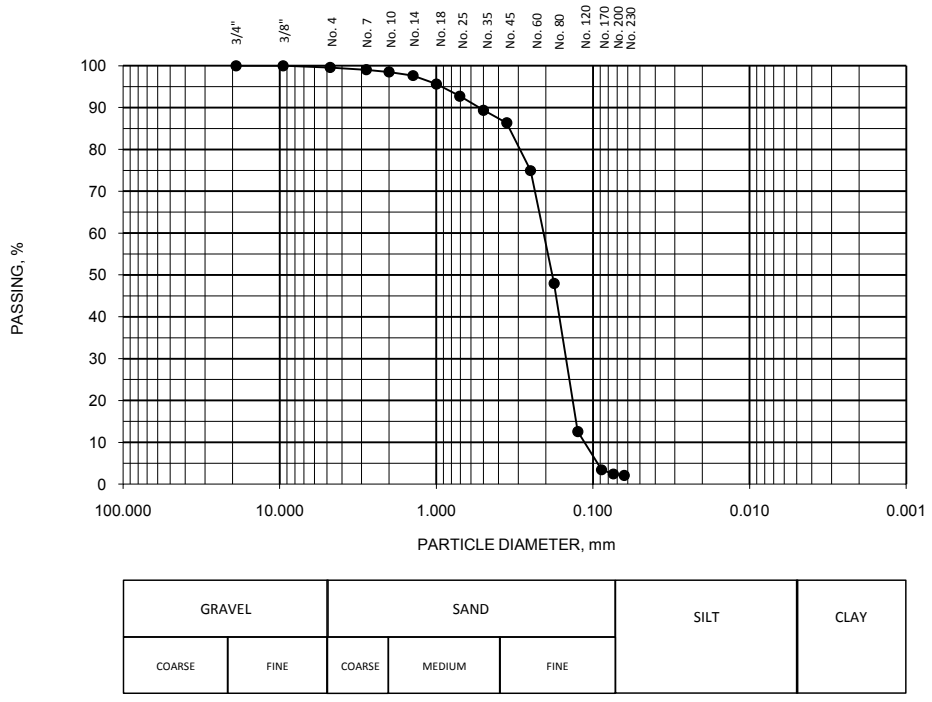
PROJECT NAME	Manteo (Old House Channel) 204 Study Area		
CLIENT	US Army Corps of Engineers	**BORING #**	MAN-10-V-10
PROJECT NO.	70105034	**SAMPLE #**	6
DATE SAMPLE RECEIVED	5/20/2010	**DEPTH, ft**	23.0-23.5
DATE TESTED	5/25/2010	**DESCRIPTION**	Poorly Graded Sand, SP
DATE REPORTED	6/1/2010		

TEST PROCEDURES

ASTM STANDARD D 422 - Particle Size Analysis of Soils	WEIGHT OF DRY SOLIDS (grams) 481.7

VISUALLY ESTIMATED SHELL CONTENT (%) #N/A



PERCENT FINER (dry weight basis)

GRAVEL			COARSE SAND		MEDIUM SAND				FINE SAND						SILT / CLAY
3/4"	3/8"	No. 4	No. 7	No. 10	No. 14	No. 18	No. 25	No. 35	No. 45	No. 60	No. 80	No. 120	No. 170	No. 200	No. 230
100.0	100.0	99.6	99.0	98.5	97.6	95.6	92.7	89.4	86.3	74.9	48.0	12.6	3.4	2.4	2.1

VISUALLY ESTIMATED SHELL CONTENT (percent)

#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	Shell Content <5% (Amount not visually estimated)

TESTED BY: S.E. Hardison / B.S. Junker CHECKED BY: S.E. Hardison APPROVED BY: R.L. Denton, II, PE

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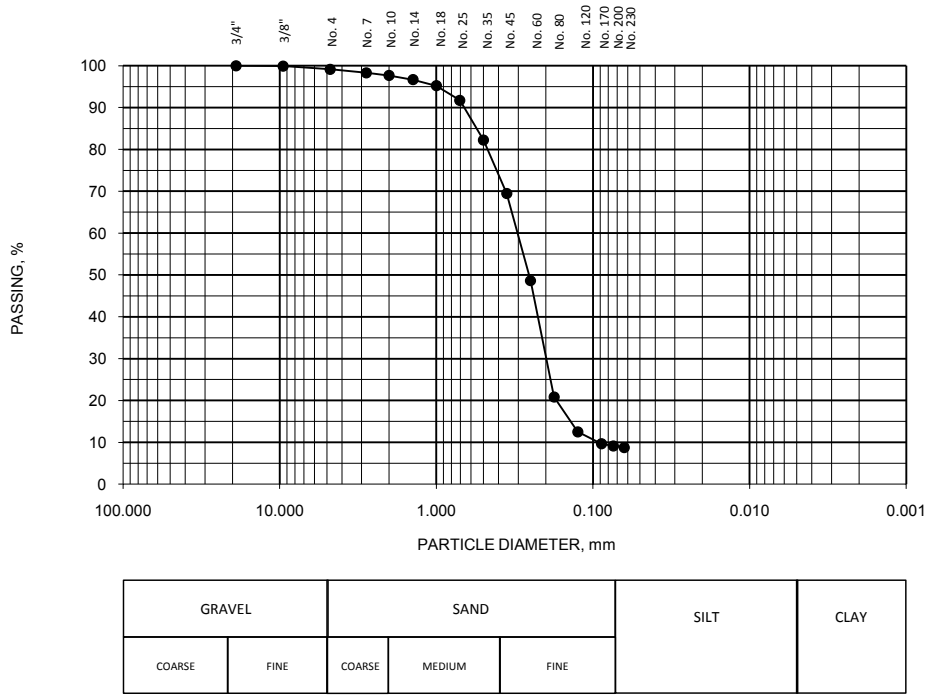
PROJECT NAME	Manteo (Old House Channel) 204 Study Area		
CLIENT	US Army Corps of Engineers	**BORING #**	MAN-10-V-11
PROJECT NO.	70105034	**SAMPLE #**	1
DATE SAMPLE RECEIVED	5/20/2010	**DEPTH, ft**	14.0-14.5
DATE TESTED	5/26/2010	**DESCRIPTION**	Poorly Graded Sand with Silt, SP-SM
DATE REPORTED	5/26/2010		

TEST PROCEDURES

ASTM STANDARD D 422 - Particle Size Analysis of Soils	WEIGHT OF DRY SOLIDS (grams) 425.1

VISUALLY ESTIMATED SHELL CONTENT (%) #N/A



PERCENT FINER (dry weight basis)

GRAVEL			COARSE SAND		MEDIUM SAND				FINE SAND						SILT / CLAY
3/4"	3/8"	No. 4	No. 7	No. 10	No. 14	No. 18	No. 25	No. 35	No. 45	No. 60	No. 80	No. 120	No. 170	No. 200	No. 230
100.0	99.9	99.2	98.3	97.6	96.7	95.2	91.7	82.2	69.5	48.6	20.8	12.5	9.6	9.1	8.8

VISUALLY ESTIMATED SHELL CONTENT (percent)

#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	Shell Content <5% (Amount not visually estimated)

TESTED BY: S.E. Hardison / B.S. Junker CHECKED BY: S.E. Hardison APPROVED BY: R.L. Denton, II, PE

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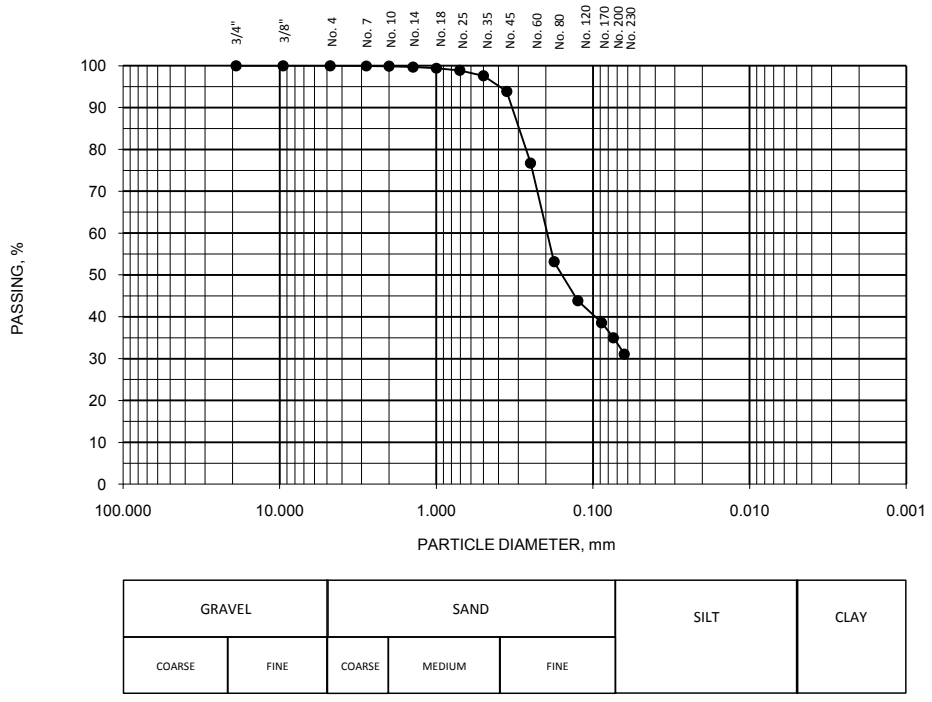
PROJECT NAME	Manteo (Old House Channel) 204 Study Area		
CLIENT	US Army Corps of Engineers	**BORING #**	MAN-10-V-11
PROJECT NO.	70105034	**SAMPLE #**	2
DATE SAMPLE RECEIVED	5/20/2010	**DEPTH, ft**	16.0-16.5
DATE TESTED	5/26/2010	**DESCRIPTION**	Silty Sand, SM
DATE REPORTED	5/26/2010		

TEST PROCEDURES

ASTM STANDARD D 422 - Particle Size Analysis of Soils	WEIGHT OF DRY SOLIDS (grams) 445.6

VISUALLY ESTIMATED SHELL CONTENT (%) #N/A



PERCENT FINER (dry weight basis)

GRAVEL			COARSE SAND		MEDIUM SAND				FINE SAND						SILT / CLAY
3/4"	3/8"	No. 4	No. 7	No. 10	No. 14	No. 18	No. 25	No. 35	No. 45	No. 60	No. 80	No. 120	No. 170	No. 200	No. 230
100.0	100.0	100.0	99.9	99.9	99.7	99.4	98.9	97.6	93.9	76.7	53.1	43.9	38.6	35.0	31.1

VISUALLY ESTIMATED SHELL CONTENT (percent)

#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	Shell Content <5% (Amount not visually estimated)

TESTED BY: S.E. Hardison / B.S. Junker CHECKED BY: S.E. Hardison APPROVED BY: R.L. Denton, II, PE

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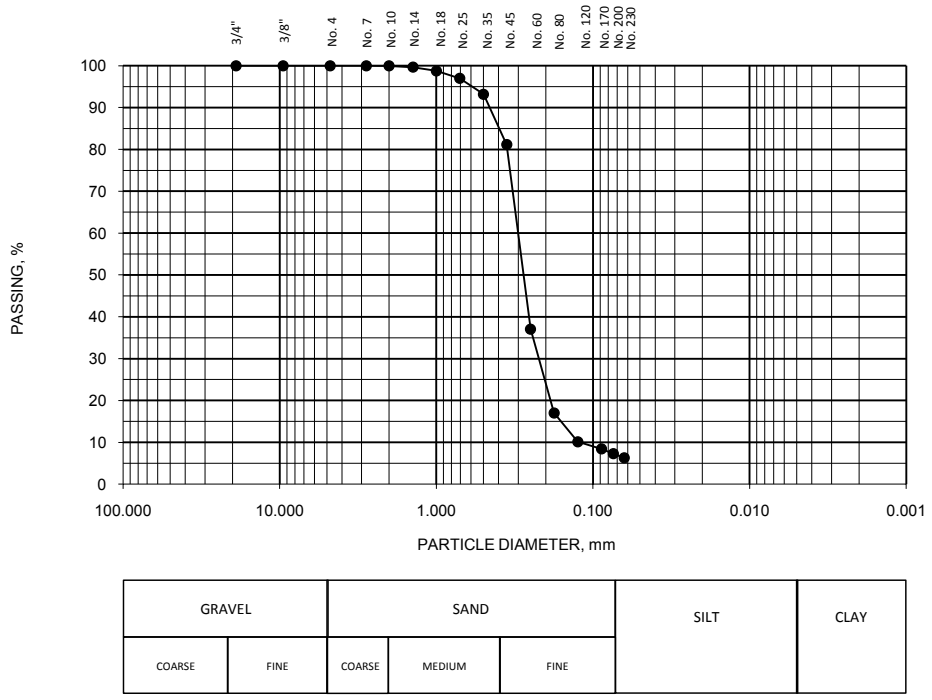
PROJECT NAME	Manteo (Old House Channel) 204 Study Area		
CLIENT	US Army Corps of Engineers	**BORING #**	MAN-10-V-11
PROJECT NO.	70105034	**SAMPLE #**	3
DATE SAMPLE RECEIVED	5/20/2010	**DEPTH, ft**	17.3-17.8
DATE TESTED	5/25/2010	**DESCRIPTION**	Poorly Graded Sand with Silt, SP-SM
DATE REPORTED	6/1/2010		

TEST PROCEDURES

ASTM STANDARD D 422 - Particle Size Analysis of Soils	WEIGHT OF DRY SOLIDS (grams) 551.9

VISUALLY ESTIMATED SHELL CONTENT (%) #N/A



PERCENT FINER (dry weight basis)

GRAVEL			COARSE SAND		MEDIUM SAND				FINE SAND						SILT / CLAY
3/4"	3/8"	No. 4	No. 7	No. 10	No. 14	No. 18	No. 25	No. 35	No. 45	No. 60	No. 80	No. 120	No. 170	No. 200	No. 230
100.0	100.0	100.0	100.0	99.9	99.7	98.8	97.0	93.2	81.1	37.1	17.0	10.1	8.4	7.3	6.3

VISUALLY ESTIMATED SHELL CONTENT (percent)

#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	Shell Content <5% (Amount not visually estimated)

TESTED BY: S.E. Hardison / B.S. Junker CHECKED BY: S.E. Hardison APPROVED BY: R.L. Denton, II, PE

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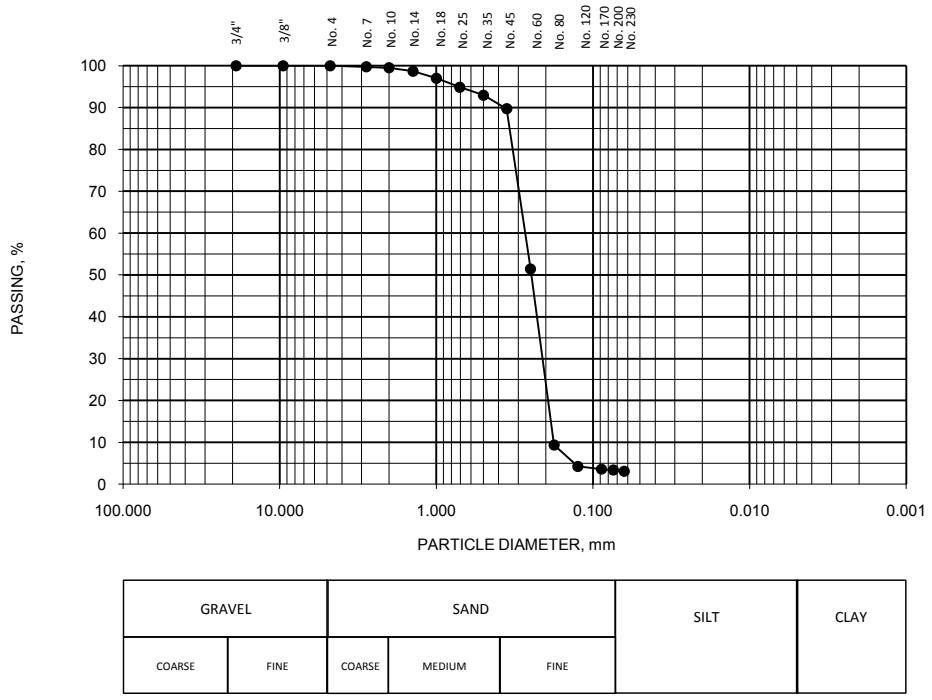
PROJECT NAME	Manteo (Old House Channel) 204 Study Area		
CLIENT	US Army Corps of Engineers	**BORING #**	MAN-10-V-11
PROJECT NO.	70105034	**SAMPLE #**	4
DATE SAMPLE RECEIVED	5/20/2010	**DEPTH, ft**	18.5-19.0
DATE TESTED	5/25/2010	**DESCRIPTION**	Poorly Graded Sand, SP
DATE REPORTED	6/1/2010		

TEST PROCEDURES

ASTM STANDARD D 422 - Particle Size Analysis of Soils	WEIGHT OF DRY SOLIDS (grams) 541.6

VISUALLY ESTIMATED SHELL CONTENT (%) #N/A



PERCENT FINER (dry weight basis)

GRAVEL			COARSE SAND		MEDIUM SAND				FINE SAND						SILT / CLAY
3/4"	3/8"	No. 4	No. 7	No. 10	No. 14	No. 18	No. 25	No. 35	No. 45	No. 60	No. 80	No. 120	No. 170	No. 200	No. 230
100.0	100.0	100.0	99.7	99.5	98.7	97.0	94.9	92.9	89.7	51.4	9.4	4.2	3.6	3.4	3.1

VISUALLY ESTIMATED SHELL CONTENT (percent)

#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	Shell Content <5% (Amount not visually estimated)

TESTED BY: S.E. Hardison / B.S. Junker CHECKED BY: S.E. Hardison APPROVED BY: R.L. Denton, II, PE

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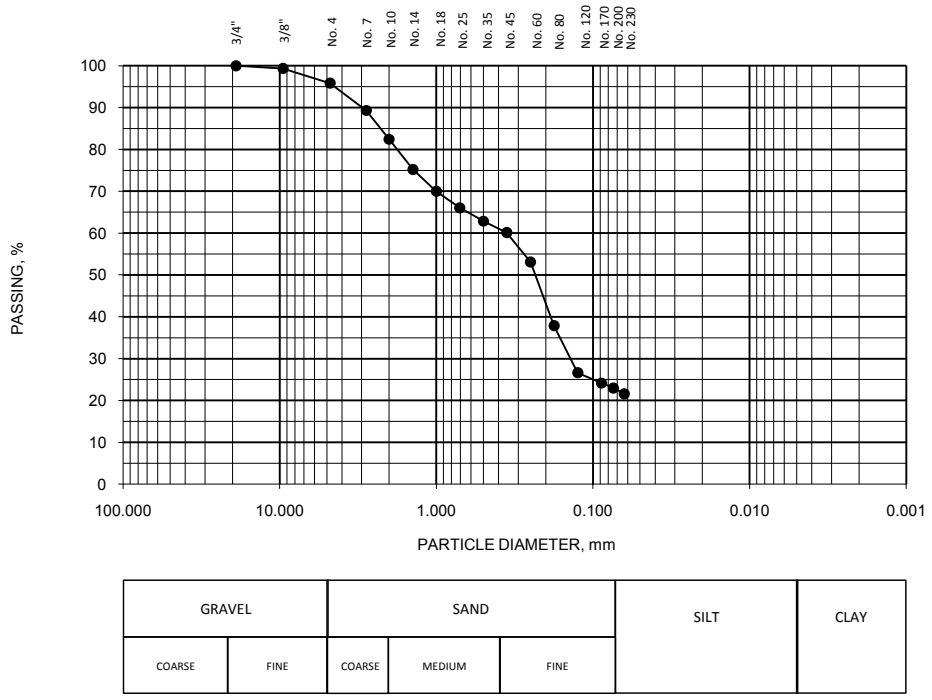
PROJECT NAME	Manteo (Old House Channel) 204 Study Area		
CLIENT	US Army Corps of Engineers	**BORING #**	MAN-10-V-11
PROJECT NO.	70105034	**SAMPLE #**	5
DATE SAMPLE RECEIVED	5/20/2010	**DEPTH, ft**	20.5-21.0
DATE TESTED	5/26/2010	**DESCRIPTION**	Silty Sand, SM
DATE REPORTED	5/27/2010		

TEST PROCEDURES

ASTM STANDARD D 422 - Particle Size Analysis of Soils	WEIGHT OF DRY SOLIDS (grams) 533.2

VISUALLY ESTIMATED SHELL CONTENT (%) #N/A



PERCENT FINER (dry weight basis)

GRAVEL			COARSE SAND		MEDIUM SAND				FINE SAND						SILT / CLAY
3/4"	3/8"	No. 4	No. 7	No. 10	No. 14	No. 18	No. 25	No. 35	No. 45	No. 60	No. 80	No. 120	No. 170	No. 200	No. 230
100.0	99.3	95.8	89.3	82.4	75.2	70.0	66.0	62.8	60.1	53.1	37.8	26.6	24.2	23.0	21.6

VISUALLY ESTIMATED SHELL CONTENT (percent)

#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	Shell Content <5% (Amount not visually estimated)

TESTED BY: S.E. Hardison / B.S. Junker CHECKED BY: S.E. Hardison APPROVED BY: R.L. Denton, II, PE

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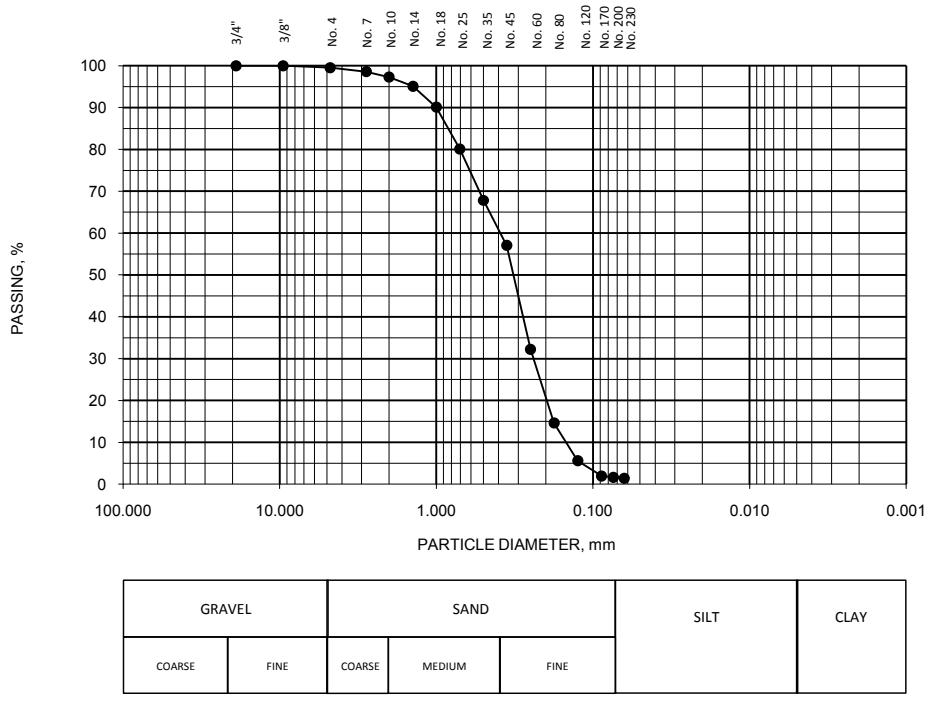
PROJECT NAME	Manteo (Old House Channel) 204 Study Area		
CLIENT	US Army Corps of Engineers	**BORING #**	MAN-10-V-11
PROJECT NO.	70105034	**SAMPLE #**	6
DATE SAMPLE RECEIVED	5/20/2010	**DEPTH, ft**	23.0-23.5
DATE TESTED	5/25/2010	**DESCRIPTION**	Poorly Graded Sand, SP
DATE REPORTED	6/1/2010		

TEST PROCEDURES

ASTM STANDARD D 422 - Particle Size Analysis of Soils	WEIGHT OF DRY SOLIDS (grams) 486.8

VISUALLY ESTIMATED SHELL CONTENT (%) #N/A



PERCENT FINER (dry weight basis)

GRAVEL			COARSE SAND		MEDIUM SAND				FINE SAND						SILT / CLAY
3/4"	3/8"	No. 4	No. 7	No. 10	No. 14	No. 18	No. 25	No. 35	No. 45	No. 60	No. 80	No. 120	No. 170	No. 200	No. 230
100.0	100.0	99.5	98.6	97.3	95.1	90.1	80.1	67.8	57.1	32.2	14.6	5.6	2.0	1.6	1.4

VISUALLY ESTIMATED SHELL CONTENT (percent)

#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	Shell Content <5% (Amount not visually estimated)

TESTED BY: S.E. Hardison / B.S. Junker CHECKED BY: S.E. Hardison APPROVED BY: R.L. Denton, II, PE

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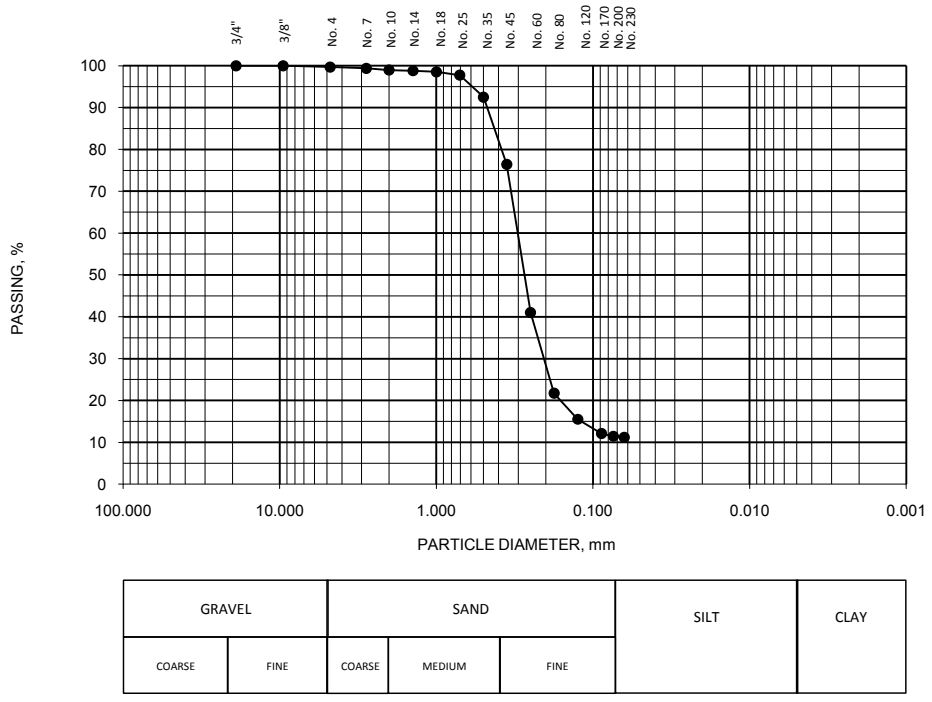
PROJECT NAME	Manteo (Old House Channel) 204 Study Area		
CLIENT	US Army Corps of Engineers	**BORING #**	MAN-10-V-12
PROJECT NO.	70105034	**SAMPLE #**	1
DATE SAMPLE RECEIVED	5/20/2010	**DEPTH, ft**	13.6-14.1
DATE TESTED	5/26/2010	**DESCRIPTION**	Poorly Graded Sand with Silt, SP-SM
DATE REPORTED	5/26/2010		

TEST PROCEDURES

ASTM STANDARD D 422 - Particle Size Analysis of Soils	WEIGHT OF DRY SOLIDS (grams) 454.0

VISUALLY ESTIMATED SHELL CONTENT (%) #N/A



PERCENT FINER (dry weight basis)

GRAVEL			COARSE SAND		MEDIUM SAND				FINE SAND						SILT / CLAY
3/4"	3/8"	No. 4	No. 7	No. 10	No. 14	No. 18	No. 25	No. 35	No. 45	No. 60	No. 80	No. 120	No. 170	No. 200	No. 230
100.0	100.0	99.7	99.4	99.0	98.8	98.5	97.8	92.5	76.4	41.0	21.7	15.5	12.1	11.5	11.2

VISUALLY ESTIMATED SHELL CONTENT (percent)

#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	Shell Content <5% (Amount not visually estimated)

TESTED BY: S.E. Hardison / B.S. Junker CHECKED BY: S.E. Hardison APPROVED BY: R.L. Denton, II, PE

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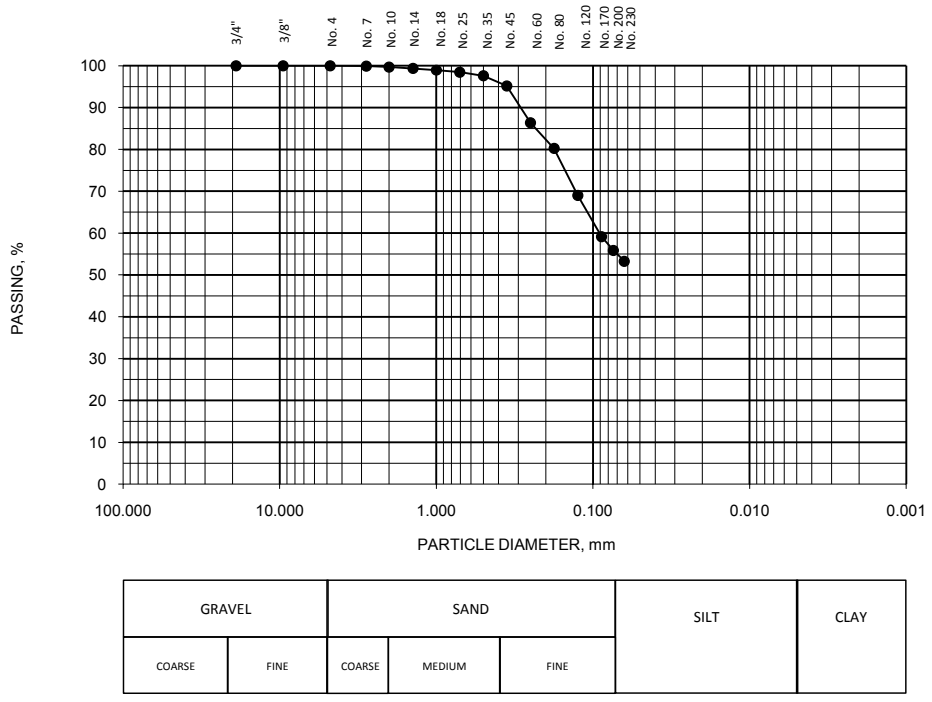
PROJECT NAME	Manteo (Old House Channel) 204 Study Area		
CLIENT	US Army Corps of Engineers	**BORING #**	MAN-10-V-12
PROJECT NO.	70105034	**SAMPLE #**	2
DATE SAMPLE RECEIVED	5/20/2010	**DEPTH, ft**	17.1-17.6
DATE TESTED	5/24/2010	**DESCRIPTION**	Sandy Silt, MH
DATE REPORTED	5/26/2010		

TEST PROCEDURES

ASTM STANDARD D 422 - Particle Size Analysis of Soils	WEIGHT OF DRY SOLIDS (grams) 311.7

VISUALLY ESTIMATED SHELL CONTENT (%) #N/A



PERCENT FINER (dry weight basis)

GRAVEL			COARSE SAND		MEDIUM SAND				FINE SAND						SILT / CLAY
3/4"	3/8"	No. 4	No. 7	No. 10	No. 14	No. 18	No. 25	No. 35	No. 45	No. 60	No. 80	No. 120	No. 170	No. 200	No. 230
100.0	100.0	100.0	99.9	99.7	99.4	98.9	98.5	97.6	95.2	86.3	80.2	69.0	59.1	55.9	53.3

VISUALLY ESTIMATED SHELL CONTENT (percent)

#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	Shell Content <5% (Amount not visually estimated)

TESTED BY: S.E. Hardison / B.S. Junker CHECKED BY: S.E. Hardison APPROVED BY: R.L. Denton, II, PE

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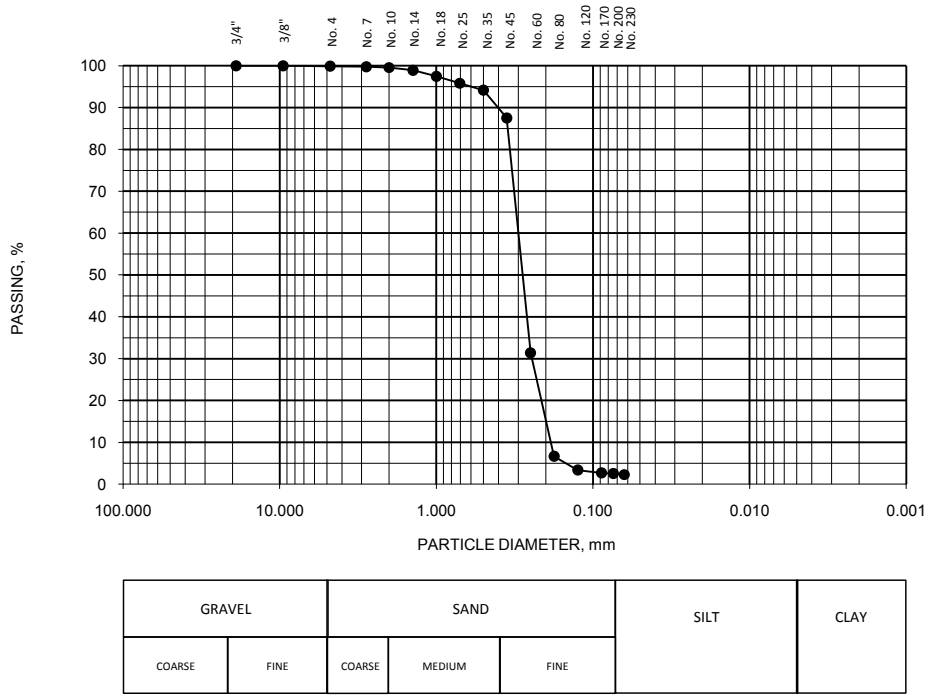
PROJECT NAME	Manteo (Old House Channel) 204 Study Area		
CLIENT	US Army Corps of Engineers	**BORING #**	MAN-10-V-12
PROJECT NO.	70105034	**SAMPLE #**	3
DATE SAMPLE RECEIVED	5/20/2010	**DEPTH, ft**	18.1-18.6
DATE TESTED	5/25/2010	**DESCRIPTION**	Poorly Graded Sand, SP
DATE REPORTED	6/1/2010		

TEST PROCEDURES

ASTM STANDARD D 422 - Particle Size Analysis of Soils	WEIGHT OF DRY SOLIDS (grams) 586.4

VISUALLY ESTIMATED SHELL CONTENT (%) #N/A



PERCENT FINER (dry weight basis)

GRAVEL			COARSE SAND		MEDIUM SAND				FINE SAND						SILT / CLAY
3/4"	3/8"	No. 4	No. 7	No. 10	No. 14	No. 18	No. 25	No. 35	No. 45	No. 60	No. 80	No. 120	No. 170	No. 200	No. 230
100.0	100.0	99.9	99.8	99.6	98.9	97.5	95.8	94.1	87.5	31.4	6.7	3.4	2.7	2.5	2.3

VISUALLY ESTIMATED SHELL CONTENT (percent)

#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	Shell Content <5% (Amount not visually estimated)

TESTED BY: S.E. Hardison / B.S. Junker CHECKED BY: S.E. Hardison APPROVED BY: R.L. Denton, II, PE

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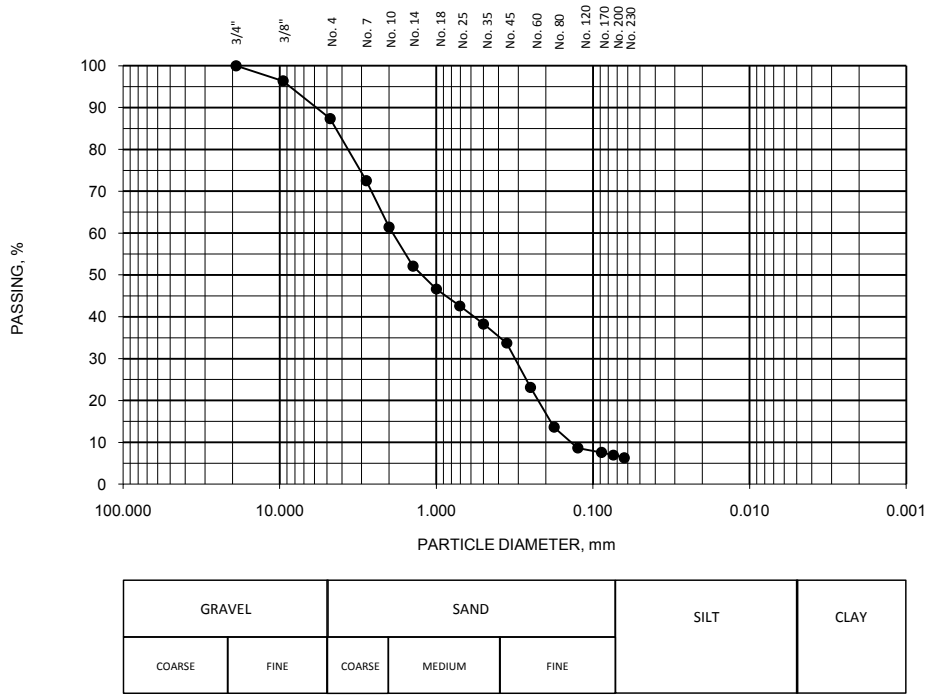
PROJECT NAME	Manteo (Old House Channel) 204 Study Area		
CLIENT	US Army Corps of Engineers	**BORING #**	MAN-10-V-12
PROJECT NO.	70105034	**SAMPLE #**	4
DATE SAMPLE RECEIVED	5/20/2010	**DEPTH, ft**	20.6-21.1
DATE TESTED	5/25/2010	**DESCRIPTION**	Poorly Graded Sand with Silt, SP-SM
DATE REPORTED	6/1/2010		

TEST PROCEDURES

ASTM STANDARD D 422 - Particle Size Analysis of Soils	WEIGHT OF DRY SOLIDS (grams) 613.7

VISUALLY ESTIMATED SHELL CONTENT (%) #N/A



PERCENT FINER (dry weight basis)

GRAVEL			COARSE SAND		MEDIUM SAND				FINE SAND						SILT / CLAY
3/4"	3/8"	No. 4	No. 7	No. 10	No. 14	No. 18	No. 25	No. 35	No. 45	No. 60	No. 80	No. 120	No. 170	No. 200	No. 230
100.0	96.4	87.4	72.5	61.4	52.1	46.6	42.6	38.3	33.7	23.1	13.6	8.6	7.6	6.9	6.3

VISUALLY ESTIMATED SHELL CONTENT (percent)

#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	Shell Content <5% (Amount not visually estimated)

TESTED BY: S.E. Hardison / B.S. Junker CHECKED BY: S.E. Hardison APPROVED BY: R.L. Denton, II, PE

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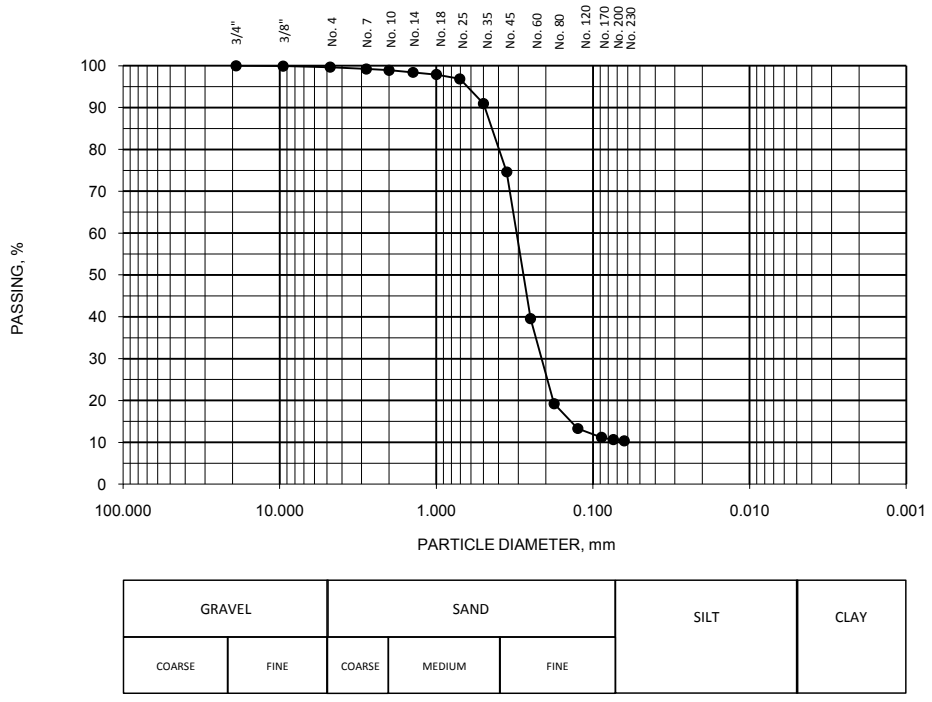
PROJECT NAME	Manteo (Old House Channel) 204 Study Area		
CLIENT	US Army Corps of Engineers	**BORING #**	MAN-10-V-13
PROJECT NO.	70105034	**SAMPLE #**	1
DATE SAMPLE RECEIVED	5/20/2010	**DEPTH, ft**	13.6-14.1
DATE TESTED	5/26/2010	**DESCRIPTION**	Poorly Graded Sand with Silt, SP-SM
DATE REPORTED	5/27/2010		

TEST PROCEDURES

ASTM STANDARD D 422 - Particle Size Analysis of Soils	WEIGHT OF DRY SOLIDS (grams) 387.3

VISUALLY ESTIMATED SHELL CONTENT (%) #N/A



PERCENT FINER (dry weight basis)

GRAVEL			COARSE SAND		MEDIUM SAND				FINE SAND						SILT / CLAY
3/4"	3/8"	No. 4	No. 7	No. 10	No. 14	No. 18	No. 25	No. 35	No. 45	No. 60	No. 80	No. 120	No. 170	No. 200	No. 230
100.0	99.9	99.6	99.2	98.9	98.4	97.9	96.8	90.9	74.6	39.6	19.2	13.3	11.2	10.6	10.3

VISUALLY ESTIMATED SHELL CONTENT (percent)

#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	Shell Content <5% (Amount not visually estimated)

TESTED BY: S.E. Hardison / B.S. Junker CHECKED BY: S.E. Hardison APPROVED BY: R.L. Denton, II, PE

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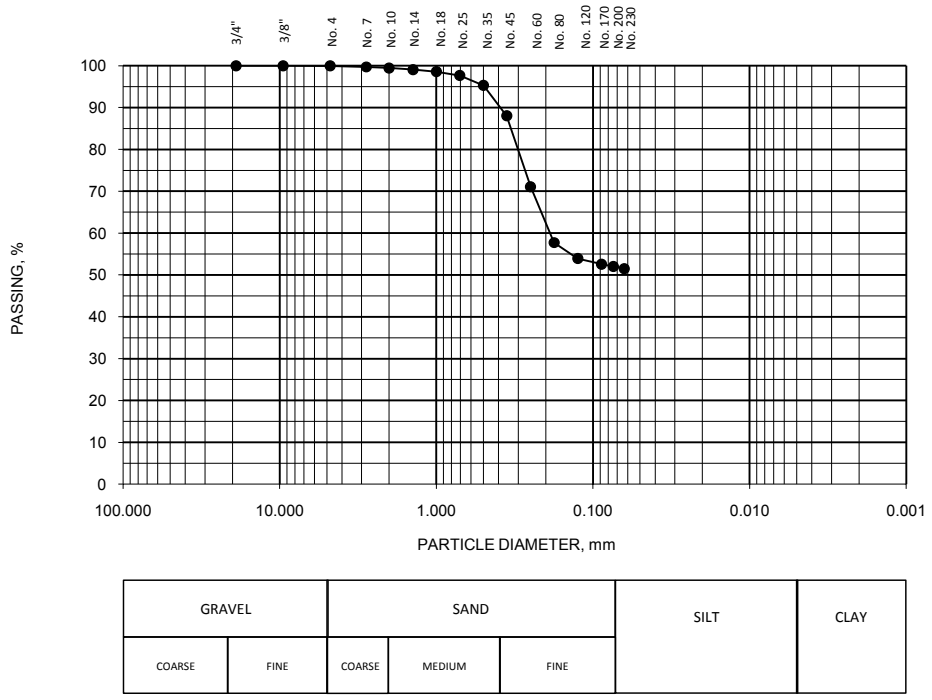
PROJECT NAME	Manteo (Old House Channel) 204 Study Area		
CLIENT	US Army Corps of Engineers	**BORING #**	MAN-10-V-13
PROJECT NO.	70105034	**SAMPLE #**	2
DATE SAMPLE RECEIVED	5/20/2010	**DEPTH, ft**	15.6-16.1
DATE TESTED	5/26/2010	**DESCRIPTION**	Sandy Silt, MH
DATE REPORTED	5/27/2010		

TEST PROCEDURES

ASTM STANDARD D 422 - Particle Size Analysis of Soils	WEIGHT OF DRY SOLIDS (grams) 305.4

VISUALLY ESTIMATED SHELL CONTENT (%) #N/A



PERCENT FINER (dry weight basis)

GRAVEL			COARSE SAND		MEDIUM SAND				FINE SAND						SILT / CLAY
3/4"	3/8"	No. 4	No. 7	No. 10	No. 14	No. 18	No. 25	No. 35	No. 45	No. 60	No. 80	No. 120	No. 170	No. 200	No. 230
100.0	100.0	100.0	99.7	99.4	99.1	98.6	97.7	95.3	88.0	71.1	57.7	53.9	52.6	52.0	51.5

VISUALLY ESTIMATED SHELL CONTENT (percent)

#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	Shell Content <5% (Amount not visually estimated)

TESTED BY: S.E. Hardison / B.S. Junker CHECKED BY: S.E. Hardison APPROVED BY: R.L. Denton, II, PE

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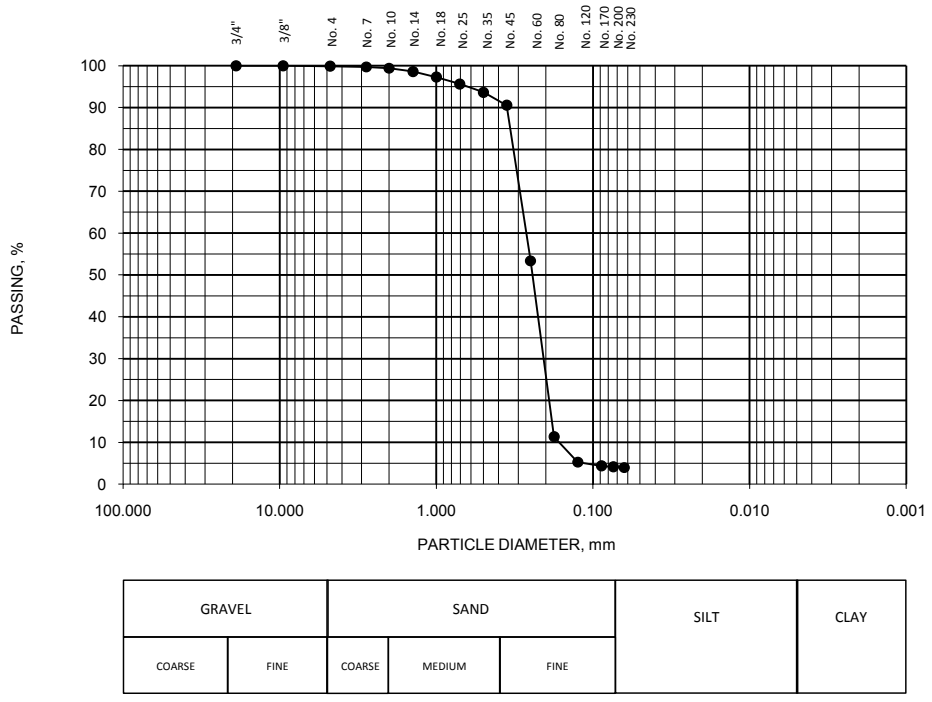
PROJECT NAME	Manteo (Old House Channel) 204 Study Area		
CLIENT	US Army Corps of Engineers	**BORING #**	MAN-10-V-13
PROJECT NO.	70105034	**SAMPLE #**	3
DATE SAMPLE RECEIVED	5/20/2010	**DEPTH, ft**	16.6-17.1
DATE TESTED	5/26/2010	**DESCRIPTION**	Poorly Graded Sand, SP
DATE REPORTED	6/1/2010		

TEST PROCEDURES

ASTM STANDARD D 422 - Particle Size Analysis of Soils	WEIGHT OF DRY SOLIDS (grams) 529.4

VISUALLY ESTIMATED SHELL CONTENT (%) #N/A



PERCENT FINER (dry weight basis)

GRAVEL			COARSE SAND		MEDIUM SAND				FINE SAND						SILT / CLAY
3/4"	3/8"	No. 4	No. 7	No. 10	No. 14	No. 18	No. 25	No. 35	No. 45	No. 60	No. 80	No. 120	No. 170	No. 200	No. 230
100.0	100.0	99.9	99.7	99.4	98.6	97.3	95.6	93.6	90.5	53.4	11.3	5.3	4.4	4.1	4.0

VISUALLY ESTIMATED SHELL CONTENT (percent)

#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	Shell Content <5% (Amount not visually estimated)

TESTED BY: S.E. Hardison / B.S. Junker CHECKED BY: S.E. Hardison APPROVED BY: R.L. Denton, II, PE

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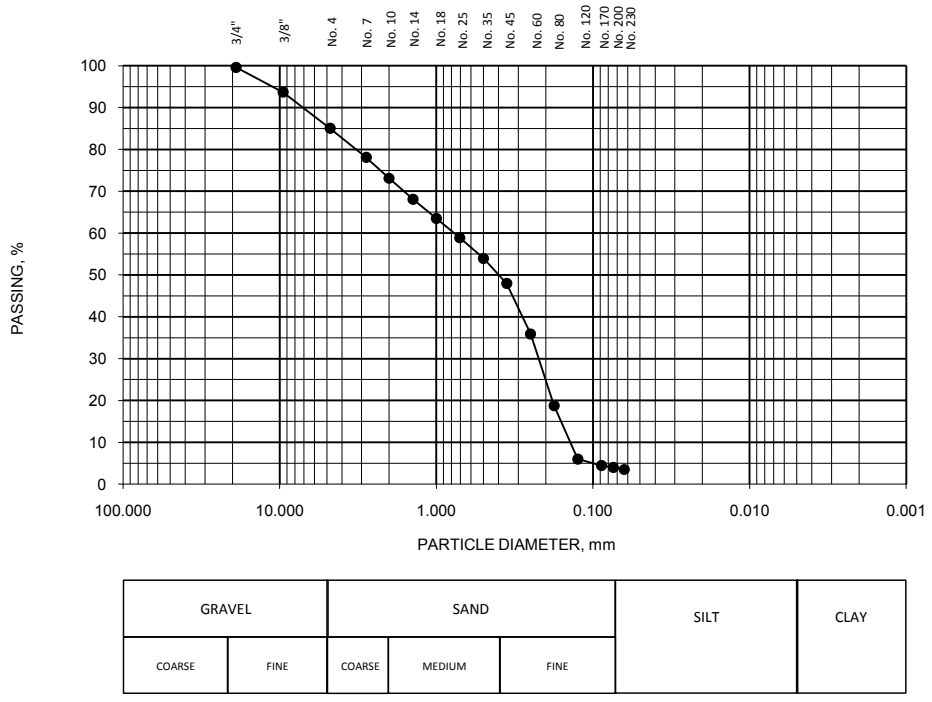
PROJECT NAME	Manteo (Old House Channel) 204 Study Area		
CLIENT	US Army Corps of Engineers	**BORING #**	MAN-10-V-13
PROJECT NO.	70105034	**SAMPLE #**	4
DATE SAMPLE RECEIVED	5/20/2010	**DEPTH, ft**	19.3-19.8
DATE TESTED	5/26/2010	**DESCRIPTION**	Poorly Graded Sand, SP
DATE REPORTED	6/1/2010		

TEST PROCEDURES

ASTM STANDARD D 422 - Particle Size Analysis of Soils	WEIGHT OF DRY SOLIDS (grams) 518.9

VISUALLY ESTIMATED SHELL CONTENT (%) #N/A



PERCENT FINER (dry weight basis)

GRAVEL			COARSE SAND		MEDIUM SAND				FINE SAND						SILT / CLAY
3/4"	3/8"	No. 4	No. 7	No. 10	No. 14	No. 18	No. 25	No. 35	No. 45	No. 60	No. 80	No. 120	No. 170	No. 200	No. 230
99.6	93.7	85.0	78.1	73.1	68.1	63.5	58.9	53.9	48.0	35.9	18.8	6.0	4.4	4.0	3.5

VISUALLY ESTIMATED SHELL CONTENT (percent)

#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	Shell Content <5% (Amount not visually estimated)

TESTED BY: S.E. Hardison / B.S. Junker CHECKED BY: S.E. Hardison APPROVED BY: R.L. Denton, II, PE

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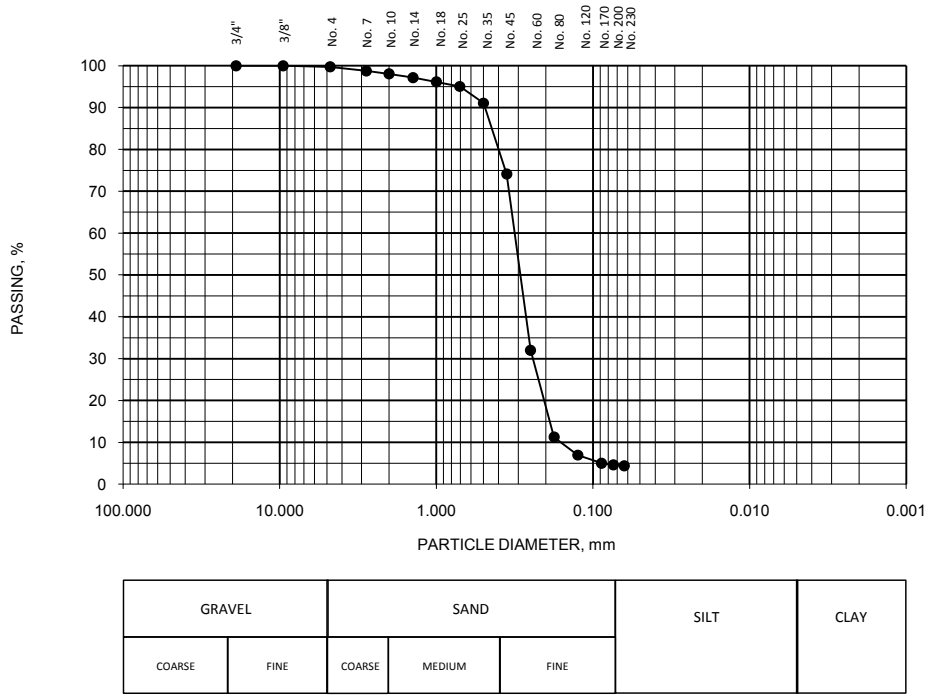
PROJECT NAME	Manteo (Old House Channel) 204 Study Area		
CLIENT	US Army Corps of Engineers	**BORING #**	MAN-10-V-14
PROJECT NO.	70105034	**SAMPLE #**	1
DATE SAMPLE RECEIVED	5/20/2010	**DEPTH, ft**	14.8-15.3
DATE TESTED	5/26/2010	**DESCRIPTION**	Poorly Graded Sand, SP
DATE REPORTED	6/1/2010		

TEST PROCEDURES

ASTM STANDARD D 422 - Particle Size Analysis of Soils	WEIGHT OF DRY SOLIDS (grams) 479.7

VISUALLY ESTIMATED SHELL CONTENT (%) #N/A



PERCENT FINER (dry weight basis)

GRAVEL			COARSE SAND		MEDIUM SAND				FINE SAND						SILT / CLAY
3/4"	3/8"	No. 4	No. 7	No. 10	No. 14	No. 18	No. 25	No. 35	No. 45	No. 60	No. 80	No. 120	No. 170	No. 200	No. 230
100.0	100.0	99.7	98.8	98.0	97.2	96.1	95.0	91.1	74.1	32.0	11.3	6.9	5.0	4.6	4.4

VISUALLY ESTIMATED SHELL CONTENT (percent)

#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	Shell Content <5% (Amount not visually estimated)

TESTED BY: S.E. Hardison / B.S. Junker CHECKED BY: S.E. Hardison APPROVED BY: R.L. Denton, II, PE

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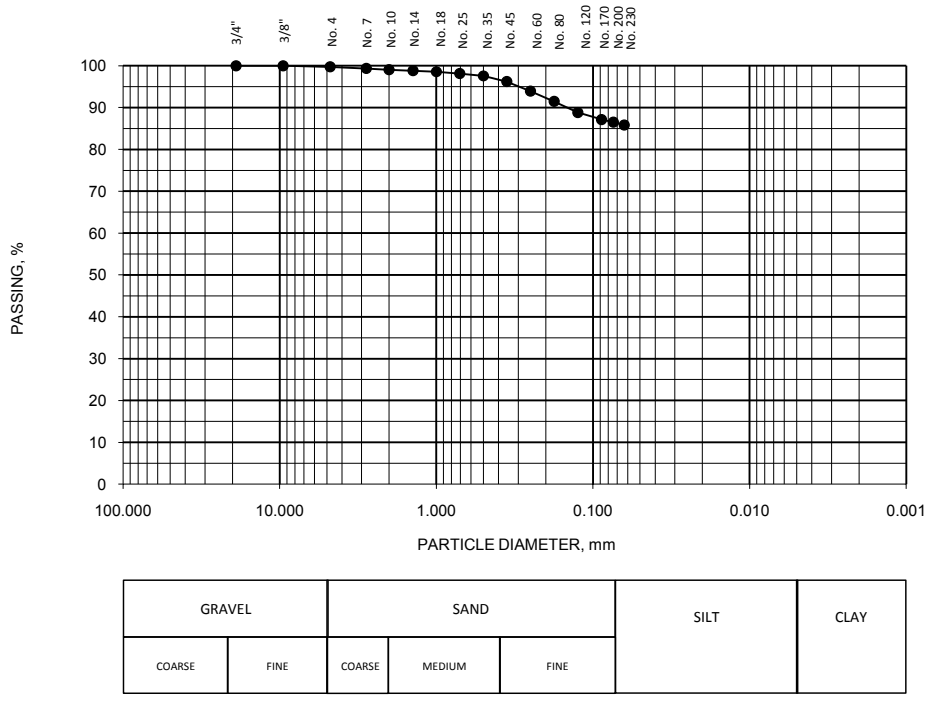
PROJECT NAME	Manteo (Old House Channel) 204 Study Area		
CLIENT	US Army Corps of Engineers	**BORING #**	MAN-10-V-14
PROJECT NO.	70105034	**SAMPLE #**	2
DATE SAMPLE RECEIVED	5/20/2010	**DEPTH, ft**	16.8-17.3
DATE TESTED	5/28/2010	**DESCRIPTION**	Silt, MH
DATE REPORTED	6/1/2010		

TEST PROCEDURES

ASTM STANDARD D 422 - Particle Size Analysis of Soils	WEIGHT OF DRY SOLIDS (grams) 262.9

VISUALLY ESTIMATED SHELL CONTENT (%) #N/A



PERCENT FINER (dry weight basis)

GRAVEL			COARSE SAND		MEDIUM SAND				FINE SAND						SILT / CLAY
3/4"	3/8"	No. 4	No. 7	No. 10	No. 14	No. 18	No. 25	No. 35	No. 45	No. 60	No. 80	No. 120	No. 170	No. 200	No. 230
100.0	100.0	99.7	99.4	99.0	98.8	98.6	98.1	97.6	96.2	93.9	91.5	88.8	87.1	86.5	85.8

VISUALLY ESTIMATED SHELL CONTENT (percent)

#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	Shell Content <5% (Amount not visually estimated)

TESTED BY: S.E. Hardison / B.S. Junker CHECKED BY: S.E. Hardison APPROVED BY: R.L. Denton, II, PE

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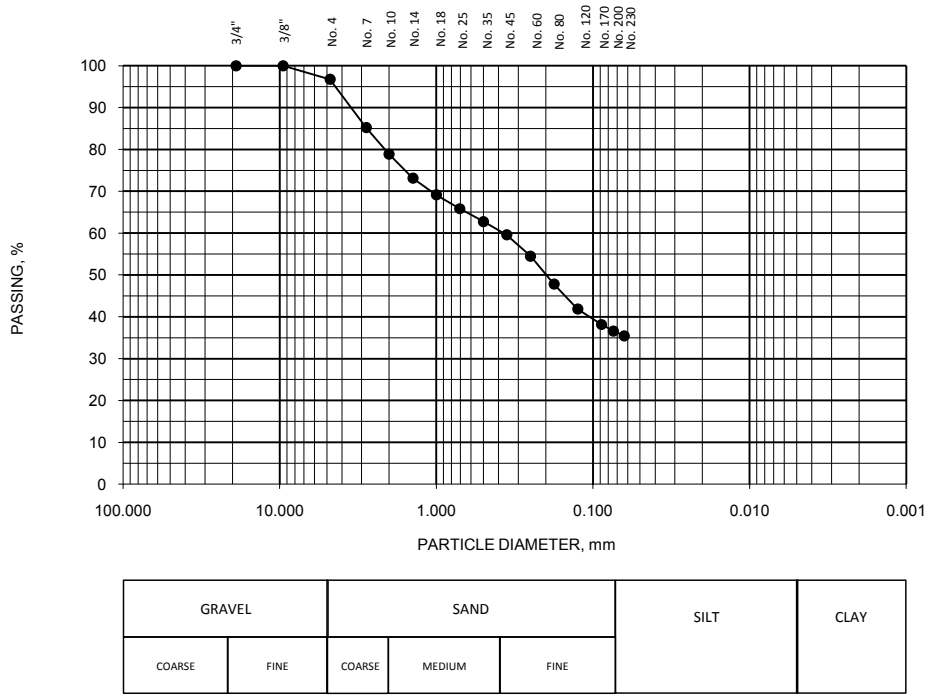
PROJECT NAME	Manteo (Old House Channel) 204 Study Area		
CLIENT	US Army Corps of Engineers	**BORING #**	MAN-10-V-14
PROJECT NO.	70105034	**SAMPLE #**	3
DATE SAMPLE RECEIVED	5/20/2010	**DEPTH, ft**	19.3-19.8
DATE TESTED	5/27/2010	**DESCRIPTION**	Silty Sand, SM
DATE REPORTED	6/1/2010		

TEST PROCEDURES

ASTM STANDARD D 422 - Particle Size Analysis of Soils	WEIGHT OF DRY SOLIDS (grams) 135.8

VISUALLY ESTIMATED SHELL CONTENT (%) #N/A



PERCENT FINER (dry weight basis)

GRAVEL			COARSE SAND		MEDIUM SAND				FINE SAND						SILT / CLAY
3/4"	3/8"	No. 4	No. 7	No. 10	No. 14	No. 18	No. 25	No. 35	No. 45	No. 60	No. 80	No. 120	No. 170	No. 200	No. 230
100.0	100.0	96.8	85.2	78.9	73.1	69.1	65.8	62.7	59.6	54.5	47.8	41.8	38.1	36.6	35.4

VISUALLY ESTIMATED SHELL CONTENT (percent)

#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	Shell Content <5% (Amount not visually estimated)

TESTED BY: S.E. Hardison / B.S. Junker CHECKED BY: S.E. Hardison APPROVED BY: R.L. Denton, II, PE

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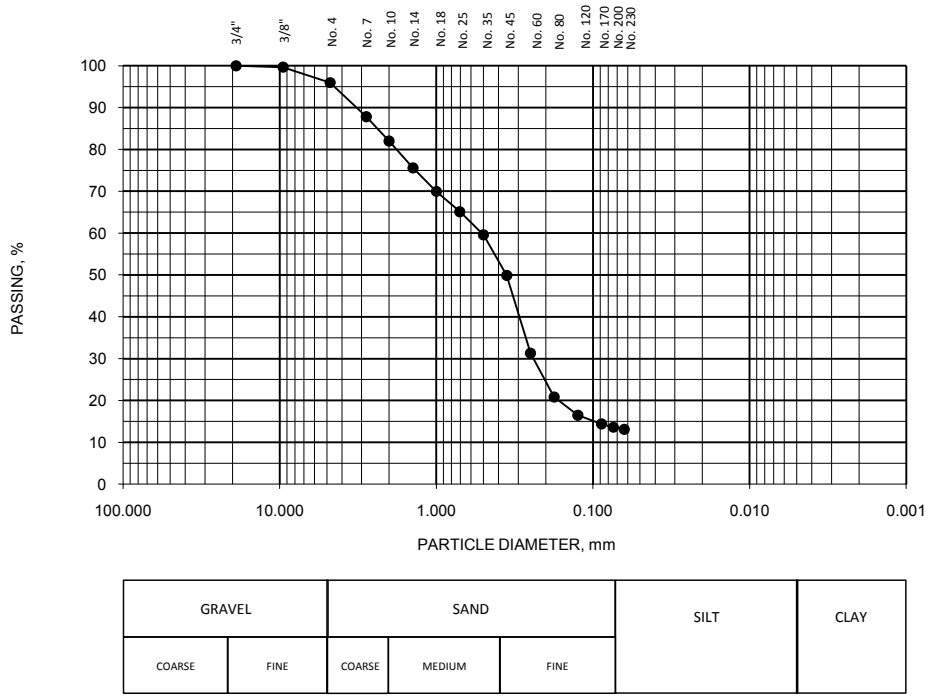
PROJECT NAME	Manteo (Old House Channel) 204 Study Area		
CLIENT	US Army Corps of Engineers	**BORING #**	MAN-10-V-14
PROJECT NO.	70105034	**SAMPLE #**	4
DATE SAMPLE RECEIVED	5/20/2010	**DEPTH, ft**	21.6-22.1
DATE TESTED	5/26/2010	**DESCRIPTION**	Silty Sand, SM
DATE REPORTED	6/1/2010		

TEST PROCEDURES

ASTM STANDARD D 422 - Particle Size Analysis of Soils	WEIGHT OF DRY SOLIDS (grams) 578.6

VISUALLY ESTIMATED SHELL CONTENT (%) #N/A



PERCENT FINER (dry weight basis)

GRAVEL			COARSE SAND		MEDIUM SAND				FINE SAND						SILT / CLAY
3/4"	3/8"	No. 4	No. 7	No. 10	No. 14	No. 18	No. 25	No. 35	No. 45	No. 60	No. 80	No. 120	No. 170	No. 200	No. 230
100.0	99.7	96.0	87.8	82.0	75.6	70.0	65.1	59.6	49.9	31.3	20.8	16.5	14.4	13.6	13.1

VISUALLY ESTIMATED SHELL CONTENT (percent)

#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	Shell Content <5% (Amount not visually estimated)

TESTED BY: S.E. Hardison / B.S. Junker CHECKED BY: S.E. Hardison APPROVED BY: R.L. Denton, II, PE

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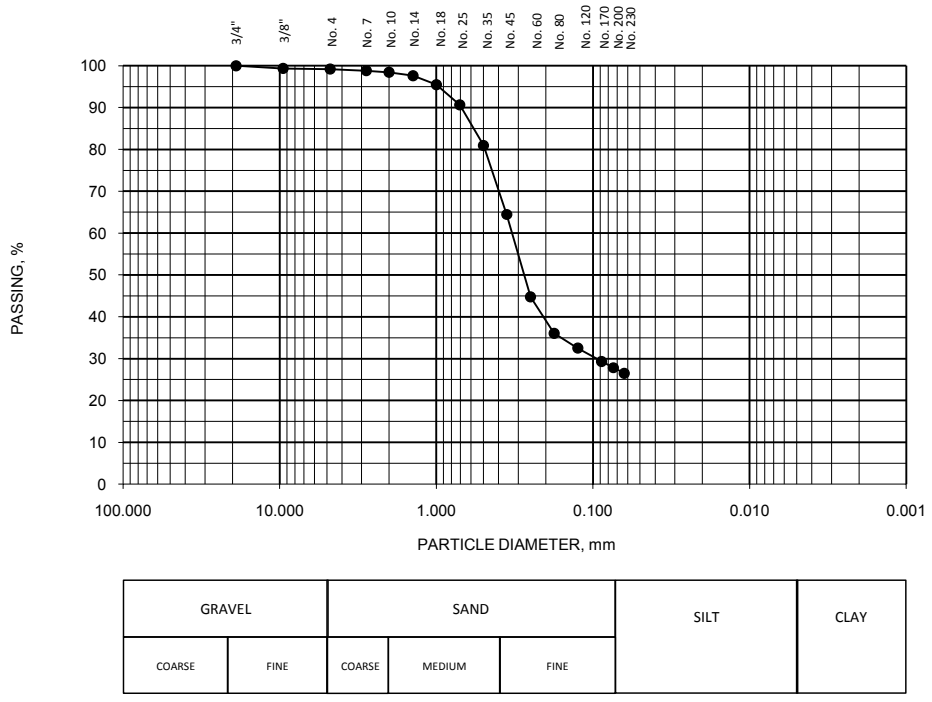
PROJECT NAME	Manteo (Old House Channel) 204 Study Area		
CLIENT	US Army Corps of Engineers	**BORING #**	MAN-10-V-15
PROJECT NO.	70105034	**SAMPLE #**	1
DATE SAMPLE RECEIVED	5/20/2010	**DEPTH, ft**	14.0-14.5
DATE TESTED	5/24/2010	**DESCRIPTION**	Silty Sand, SM
DATE REPORTED	5/27/2010		

TEST PROCEDURES

ASTM STANDARD D 422 - Particle Size Analysis of Soils	WEIGHT OF DRY SOLIDS (grams) 543.2

VISUALLY ESTIMATED SHELL CONTENT (%) #N/A



PERCENT FINER (dry weight basis)

GRAVEL			COARSE SAND		MEDIUM SAND				FINE SAND						SILT / CLAY
3/4"	3/8"	No. 4	No. 7	No. 10	No. 14	No. 18	No. 25	No. 35	No. 45	No. 60	No. 80	No. 120	No. 170	No. 200	No. 230
100.0	99.3	99.2	98.8	98.4	97.6	95.5	90.6	80.9	64.5	44.7	36.1	32.5	29.3	27.8	26.5

VISUALLY ESTIMATED SHELL CONTENT (percent)

#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	Shell Content <5% (Amount not visually estimated)

TESTED BY: S.E. Hardison / B.S. Junker CHECKED BY: S.E. Hardison APPROVED BY: R.L. Denton, II, PE

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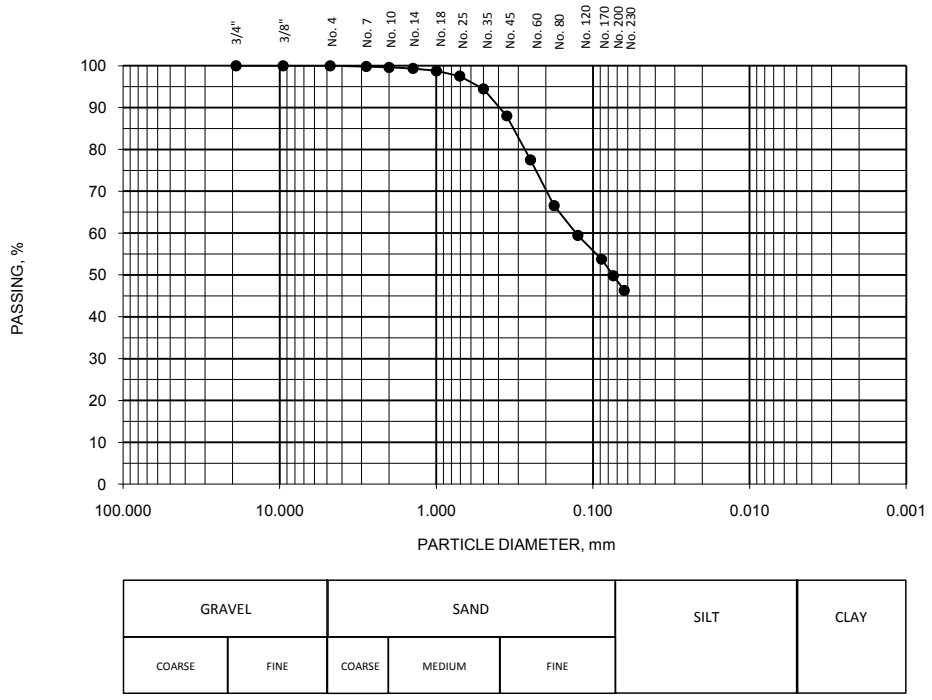
PROJECT NAME	Manteo (Old House Channel) 204 Study Area		
CLIENT	US Army Corps of Engineers	**BORING #**	MAN-10-V-15
PROJECT NO.	70105034	**SAMPLE #**	2
DATE SAMPLE RECEIVED	5/20/2010	**DEPTH, ft**	16.0-16.5
DATE TESTED	5/27/2010	**DESCRIPTION**	Silty Sand, SM
DATE REPORTED	6/1/2010		

TEST PROCEDURES

ASTM STANDARD D 422 - Particle Size Analysis of Soils	WEIGHT OF DRY SOLIDS (grams) 361.9

VISUALLY ESTIMATED SHELL CONTENT (%) #N/A



PERCENT FINER (dry weight basis)

GRAVEL			COARSE SAND		MEDIUM SAND				FINE SAND						SILT / CLAY
3/4"	3/8"	No. 4	No. 7	No. 10	No. 14	No. 18	No. 25	No. 35	No. 45	No. 60	No. 80	No. 120	No. 170	No. 200	No. 230
100.0	100.0	100.0	99.8	99.6	99.3	98.8	97.5	94.4	88.0	77.5	66.6	59.5	53.7	49.8	46.3

VISUALLY ESTIMATED SHELL CONTENT (percent)

#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	Shell Content <5% (Amount not visually estimated)

TESTED BY: S.E. Hardison / B.S. Junker CHECKED BY: S.E. Hardison APPROVED BY: R.L. Denton, II, PE

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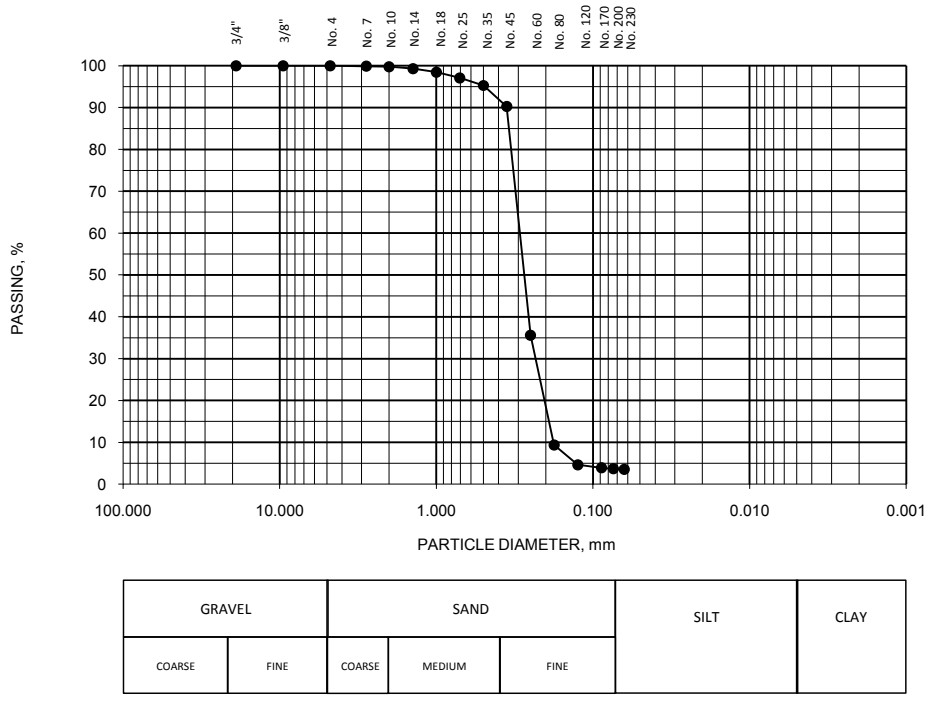
PROJECT NAME	Manteo (Old House Channel) 204 Study Area		
CLIENT	US Army Corps of Engineers	**BORING #**	MAN-10-V-15
PROJECT NO.	70105034	**SAMPLE #**	3
DATE SAMPLE RECEIVED	5/20/2010	**DEPTH, ft**	18.4-18.9
DATE TESTED	5/27/2010	**DESCRIPTION**	Poorly Graded Sand, SP
DATE REPORTED	6/1/2010		

TEST PROCEDURES

ASTM STANDARD D 422 - Particle Size Analysis of Soils	WEIGHT OF DRY SOLIDS (grams) 468.8

VISUALLY ESTIMATED SHELL CONTENT (%) #N/A



PERCENT FINER (dry weight basis)

GRAVEL			COARSE SAND		MEDIUM SAND				FINE SAND						SILT / CLAY
3/4"	3/8"	No. 4	No. 7	No. 10	No. 14	No. 18	No. 25	No. 35	No. 45	No. 60	No. 80	No. 120	No. 170	No. 200	No. 230
100.0	100.0	100.0	99.9	99.8	99.3	98.4	97.1	95.3	90.2	35.6	9.4	4.6	3.9	3.7	3.5

VISUALLY ESTIMATED SHELL CONTENT (percent)

#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	Shell Content <5% (Amount not visually estimated)

TESTED BY: S.E. Hardison / B.S. Junker CHECKED BY: S.E. Hardison APPROVED BY: R.L. Denton, II, PE

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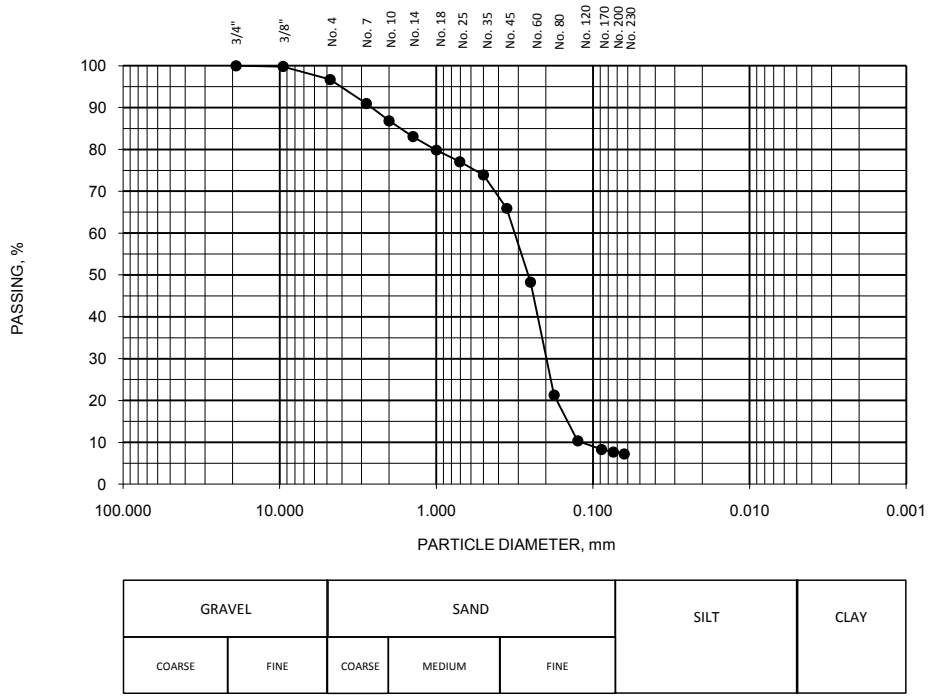
PROJECT NAME	Manteo (Old House Channel) 204 Study Area		
CLIENT	US Army Corps of Engineers	**BORING #**	MAN-10-V-15
PROJECT NO.	70105034	**SAMPLE #**	4
DATE SAMPLE RECEIVED	5/20/2010	**DEPTH, ft**	20.0-20.5
DATE TESTED	5/27/2010	**DESCRIPTION**	Poorly Graded Sand with Silt, SP-SM
DATE REPORTED	6/1/2010		

TEST PROCEDURES

ASTM STANDARD D 422 - Particle Size Analysis of Soils	WEIGHT OF DRY SOLIDS (grams) 590.7

VISUALLY ESTIMATED SHELL CONTENT (%) #N/A



PERCENT FINER (dry weight basis)

GRAVEL			COARSE SAND		MEDIUM SAND				FINE SAND						SILT / CLAY
3/4"	3/8"	No. 4	No. 7	No. 10	No. 14	No. 18	No. 25	No. 35	No. 45	No. 60	No. 80	No. 120	No. 170	No. 200	No. 230
100.0	99.8	96.7	91.0	86.8	83.1	79.8	77.1	73.9	65.9	48.3	21.3	10.3	8.3	7.7	7.2

VISUALLY ESTIMATED SHELL CONTENT (percent)

#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	Shell Content <5% (Amount not visually estimated)

TESTED BY: S.E. Hardison / B.S. Junker CHECKED BY: S.E. Hardison APPROVED BY: R.L. Denton, II, PE

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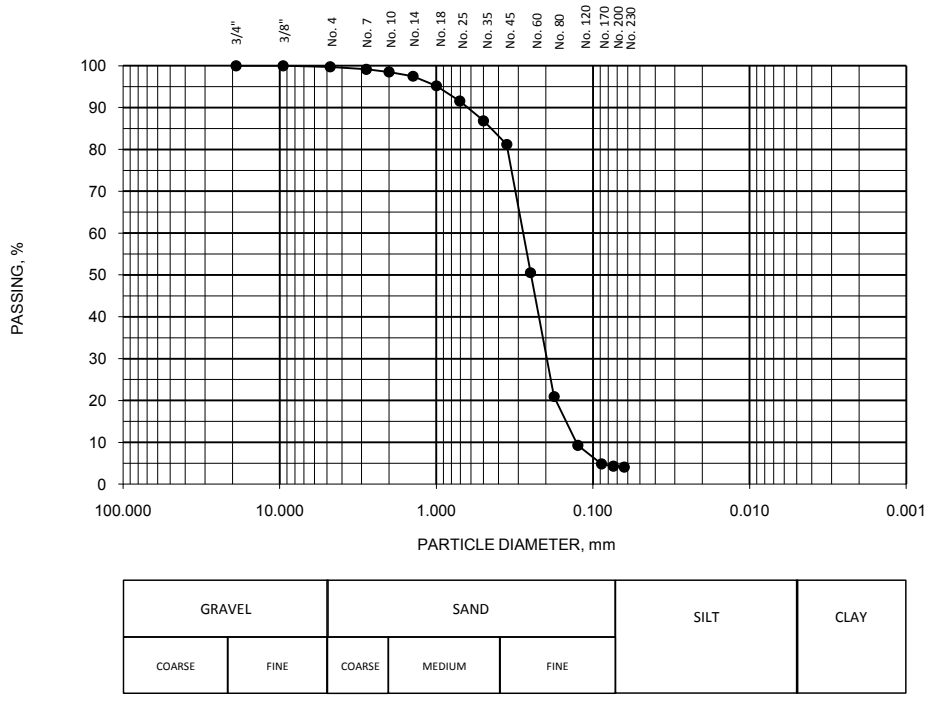
PROJECT NAME	Manteo (Old House Channel) 204 Study Area		
CLIENT	US Army Corps of Engineers	**BORING #**	MAN-10-V-15
PROJECT NO.	70105034	**SAMPLE #**	5
DATE SAMPLE RECEIVED	5/20/2010	**DEPTH, ft**	22.0-22.5
DATE TESTED	5/27/2010	**DESCRIPTION**	Poorly Graded Sand, SP
DATE REPORTED	6/1/2010		

TEST PROCEDURES

ASTM STANDARD D 422 - Particle Size Analysis of Soils	WEIGHT OF DRY SOLIDS (grams) 518.2

VISUALLY ESTIMATED SHELL CONTENT (%) #N/A



PERCENT FINER (dry weight basis)

GRAVEL			COARSE SAND		MEDIUM SAND				FINE SAND						SILT / CLAY
3/4"	3/8"	No. 4	No. 7	No. 10	No. 14	No. 18	No. 25	No. 35	No. 45	No. 60	No. 80	No. 120	No. 170	No. 200	No. 230
100.0	100.0	99.7	99.2	98.5	97.5	95.2	91.5	86.8	81.2	50.5	20.9	9.3	4.8	4.3	4.1

VISUALLY ESTIMATED SHELL CONTENT (percent)

#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	Shell Content <5% (Amount not visually estimated)

TESTED BY: S.E. Hardison / B.S. Junker CHECKED BY: S.E. Hardison APPROVED BY: R.L. Denton, II, PE

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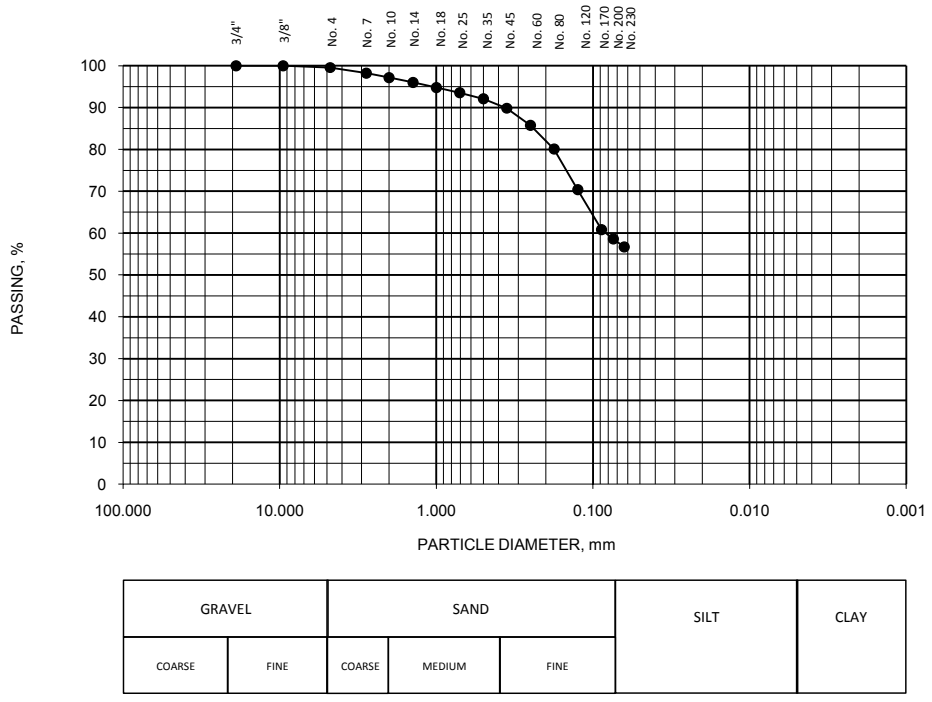
PROJECT NAME	Manteo (Old House Channel) 204 Study Area		
CLIENT	US Army Corps of Engineers	**BORING #**	MAN-10-V-16
PROJECT NO.	70105034	**SAMPLE #**	1
DATE SAMPLE RECEIVED	5/20/2010	**DEPTH, ft**	17.0-17.5
DATE TESTED	5/27/2010	**DESCRIPTION**	Sandy Silt, MH
DATE REPORTED	6/1/2010		

TEST PROCEDURES

ASTM STANDARD D 422 - Particle Size Analysis of Soils	WEIGHT OF DRY SOLIDS (grams) 270.7

VISUALLY ESTIMATED SHELL CONTENT (%) #N/A



PERCENT FINER (dry weight basis)

GRAVEL			COARSE SAND		MEDIUM SAND				FINE SAND						SILT / CLAY
3/4"	3/8"	No. 4	No. 7	No. 10	No. 14	No. 18	No. 25	No. 35	No. 45	No. 60	No. 80	No. 120	No. 170	No. 200	No. 230
100.0	100.0	99.6	98.2	97.2	96.0	94.8	93.5	92.1	89.8	85.7	80.1	70.4	60.8	58.6	56.7

VISUALLY ESTIMATED SHELL CONTENT (percent)

#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	Shell Content <5% (Amount not visually estimated)

TESTED BY: S.E. Hardison / B.S. Junker CHECKED BY: S.E. Hardison APPROVED BY: R.L. Denton, II, PE

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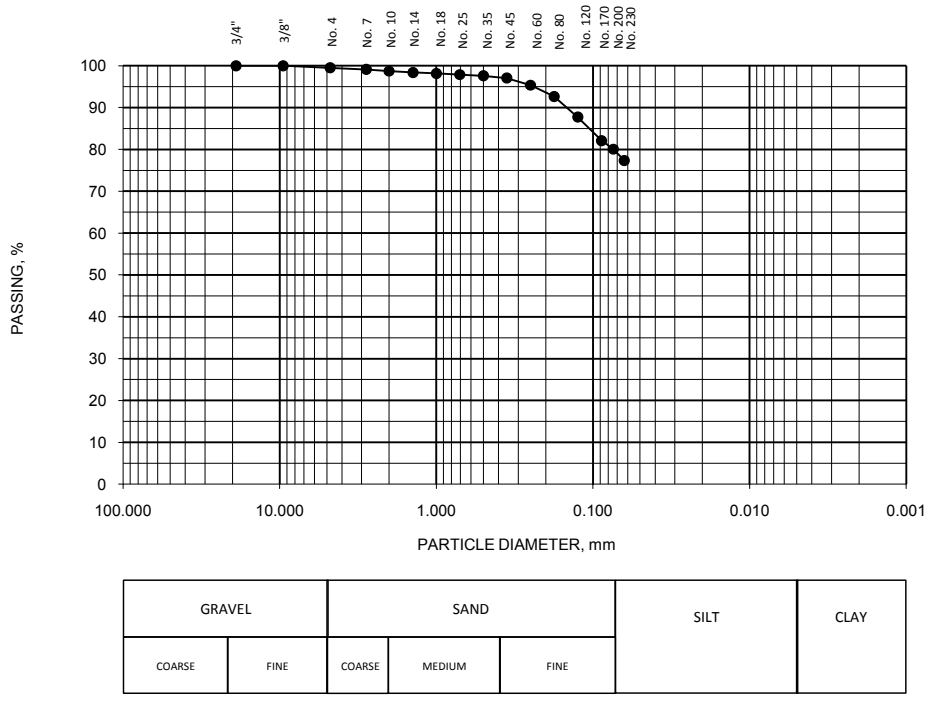
PROJECT NAME	Manteo (Old House Channel) 204 Study Area		
CLIENT	US Army Corps of Engineers	**BORING #**	MAN-10-V-16
PROJECT NO.	70105034	**SAMPLE #**	2
DATE SAMPLE RECEIVED	5/20/2010	**DEPTH, ft**	20.0-20.5
DATE TESTED	5/28/2010	**DESCRIPTION**	Silt with Sand, MH
DATE REPORTED	6/1/2010		

TEST PROCEDURES

ASTM STANDARD D 422 - Particle Size Analysis of Soils	WEIGHT OF DRY SOLIDS (grams) 285.7

VISUALLY ESTIMATED SHELL CONTENT (%) #N/A



PERCENT FINER (dry weight basis)

GRAVEL			COARSE SAND		MEDIUM SAND				FINE SAND						SILT / CLAY
3/4"	3/8"	No. 4	No. 7	No. 10	No. 14	No. 18	No. 25	No. 35	No. 45	No. 60	No. 80	No. 120	No. 170	No. 200	No. 230
100.0	100.0	99.5	99.1	98.7	98.4	98.1	97.9	97.6	97.1	95.3	92.6	87.7	82.1	80.0	77.3

VISUALLY ESTIMATED SHELL CONTENT (percent)

#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	Shell Content <5% (Amount not visually estimated)

TESTED BY: S.E. Hardison / B.S. Junker CHECKED BY: S.E. Hardison APPROVED BY: R.L. Denton, II, PE

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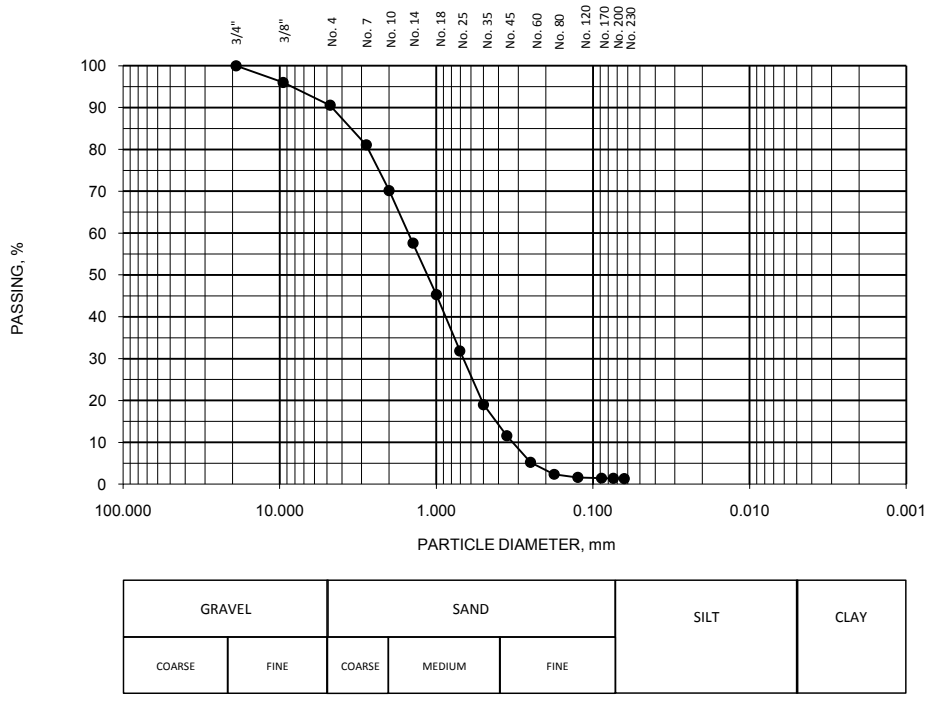
PROJECT NAME	Manteo (Old House Channel) 204 Study Area		
CLIENT	US Army Corps of Engineers	**BORING #**	MAN-10-V-16
PROJECT NO.	70105034	**SAMPLE #**	3
DATE SAMPLE RECEIVED	5/20/2010	**DEPTH, ft**	23.3-23.8
DATE TESTED	5/27/2010	**DESCRIPTION**	Poorly Graded Sand, SP
DATE REPORTED	6/1/2010		

TEST PROCEDURES

ASTM STANDARD D 422 - Particle Size Analysis of Soils	WEIGHT OF DRY SOLIDS (grams) 576.6

VISUALLY ESTIMATED SHELL CONTENT (%) #N/A



PERCENT FINER (dry weight basis)

GRAVEL			COARSE SAND		MEDIUM SAND				FINE SAND						SILT / CLAY
3/4"	3/8"	No. 4	No. 7	No. 10	No. 14	No. 18	No. 25	No. 35	No. 45	No. 60	No. 80	No. 120	No. 170	No. 200	No. 230
100.0	96.0	90.6	81.1	70.2	57.6	45.3	31.8	19.0	11.6	5.2	2.4	1.6	1.4	1.4	1.3

VISUALLY ESTIMATED SHELL CONTENT (percent)

#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	Shell Content <5% (Amount not visually estimated)

TESTED BY: S.E. Hardison / B.S. Junker CHECKED BY: S.E. Hardison APPROVED BY: R.L. Denton, II, PE

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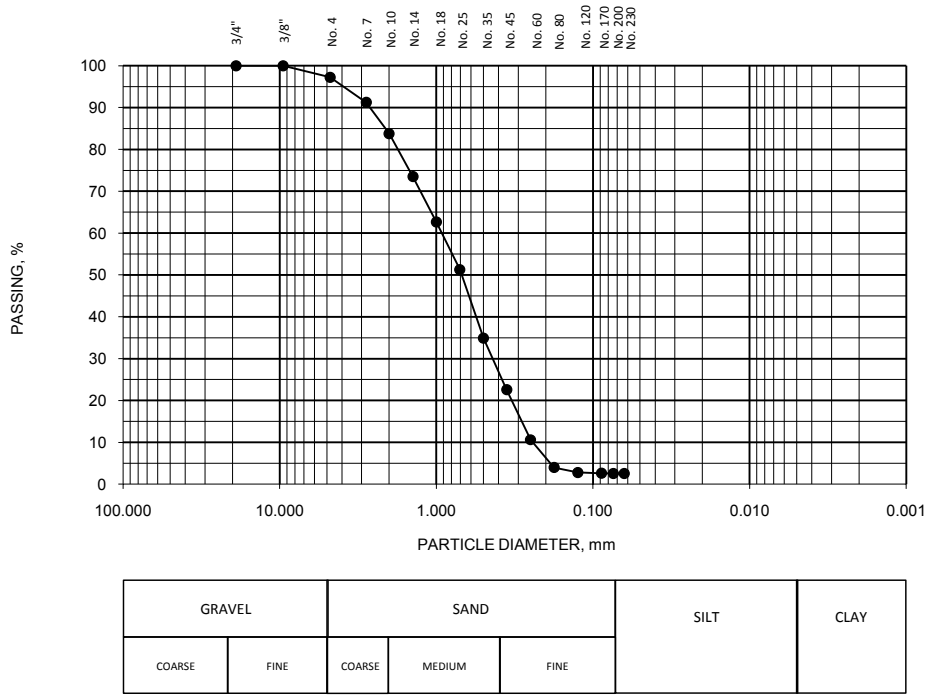
PROJECT NAME	Manteo (Old House Channel) 204 Study Area		
CLIENT	US Army Corps of Engineers	**BORING #**	MAN-10-V-16
PROJECT NO.	70105034	**SAMPLE #**	4
DATE SAMPLE RECEIVED	5/20/2010	**DEPTH, ft**	25.0-25.5
DATE TESTED	5/27/2010	**DESCRIPTION**	Poorly Graded Sand, SP
DATE REPORTED	6/1/2010		

TEST PROCEDURES

ASTM STANDARD D 422 - Particle Size Analysis of Soils	WEIGHT OF DRY SOLIDS (grams) 530.9

VISUALLY ESTIMATED SHELL CONTENT (%) #N/A



PERCENT FINER (dry weight basis)

GRAVEL			COARSE SAND		MEDIUM SAND				FINE SAND						SILT / CLAY
3/4"	3/8"	No. 4	No. 7	No. 10	No. 14	No. 18	No. 25	No. 35	No. 45	No. 60	No. 80	No. 120	No. 170	No. 200	No. 230
100.0	100.0	97.2	91.2	83.8	73.5	62.7	51.3	34.9	22.6	10.6	4.0	2.8	2.6	2.6	2.5

VISUALLY ESTIMATED SHELL CONTENT (percent)

#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	Shell Content <5% (Amount not visually estimated)

TESTED BY: S.E. Hardison / B.S. Junker CHECKED BY: S.E. Hardison APPROVED BY: R.L. Denton, II, PE

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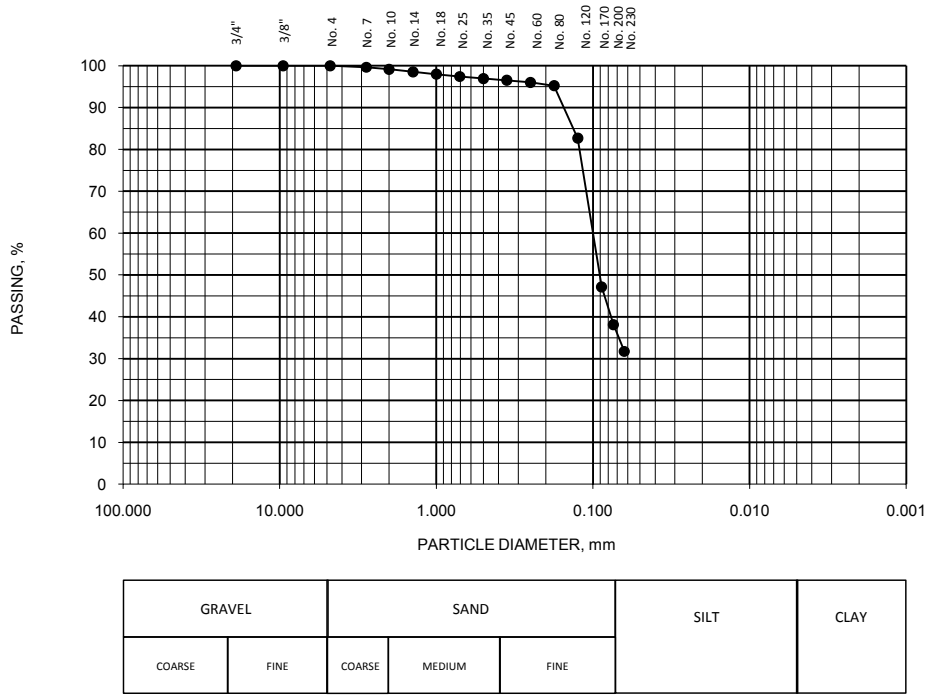
PROJECT NAME	Manteo (Old House Channel) 204 Study Area		
CLIENT	US Army Corps of Engineers	**BORING #**	MAN-10-V-17
PROJECT NO.	70105034	**SAMPLE #**	1
DATE SAMPLE RECEIVED	5/20/2010	**DEPTH, ft**	14.3-14.8
DATE TESTED	5/27/2010	**DESCRIPTION**	Silty Sand, SM
DATE REPORTED	6/1/2010		

TEST PROCEDURES

ASTM STANDARD D 422 - Particle Size Analysis of Soils	WEIGHT OF DRY SOLIDS (grams) 382.1

VISUALLY ESTIMATED SHELL CONTENT (%) #N/A



PERCENT FINER (dry weight basis)

GRAVEL			COARSE SAND		MEDIUM SAND				FINE SAND						SILT / CLAY
3/4"	3/8"	No. 4	No. 7	No. 10	No. 14	No. 18	No. 25	No. 35	No. 45	No. 60	No. 80	No. 120	No. 170	No. 200	No. 230
100.0	100.0	100.0	99.6	99.1	98.5	98.0	97.4	96.9	96.5	96.0	95.2	82.7	47.1	38.1	31.7

VISUALLY ESTIMATED SHELL CONTENT (percent)

#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	Shell Content <5% (Amount not visually estimated)

TESTED BY: S.E. Hardison / B.S. Junker CHECKED BY: S.E. Hardison APPROVED BY: R.L. Denton, II, PE

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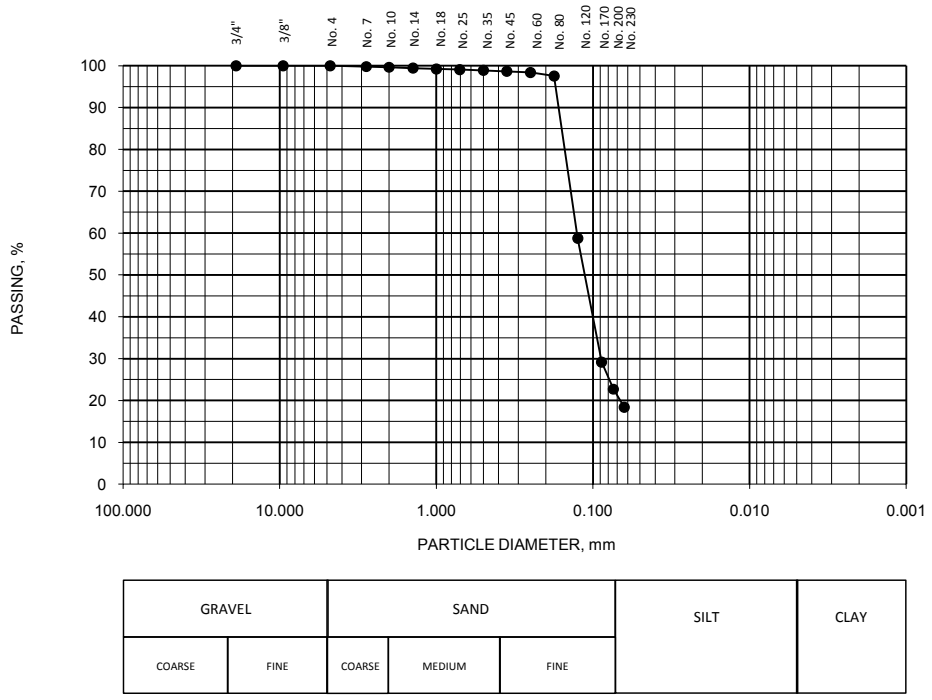
PROJECT NAME	Manteo (Old House Channel) 204 Study Area		
CLIENT	US Army Corps of Engineers	**BORING #**	MAN-10-V-17
PROJECT NO.	70105034	**SAMPLE #**	2
DATE SAMPLE RECEIVED	5/20/2010	**DEPTH, ft**	16.3-16.8
DATE TESTED	5/27/2010	**DESCRIPTION**	Silty Sand, SM
DATE REPORTED	6/1/2010		

TEST PROCEDURES

ASTM STANDARD D 422 - Particle Size Analysis of Soils	WEIGHT OF DRY SOLIDS (grams) 403.2

VISUALLY ESTIMATED SHELL CONTENT (%) #N/A



PERCENT FINER (dry weight basis)

GRAVEL			COARSE SAND		MEDIUM SAND				FINE SAND						SILT / CLAY
3/4"	3/8"	No. 4	No. 7	No. 10	No. 14	No. 18	No. 25	No. 35	No. 45	No. 60	No. 80	No. 120	No. 170	No. 200	No. 230
100.0	100.0	100.0	99.8	99.6	99.4	99.2	99.1	98.9	98.7	98.4	97.5	58.7	29.2	22.7	18.4

VISUALLY ESTIMATED SHELL CONTENT (percent)

#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	Shell Content <5% (Amount not visually estimated)

TESTED BY: S.E. Hardison / B.S. Junker CHECKED BY: S.E. Hardison APPROVED BY: R.L. Denton, II, PE

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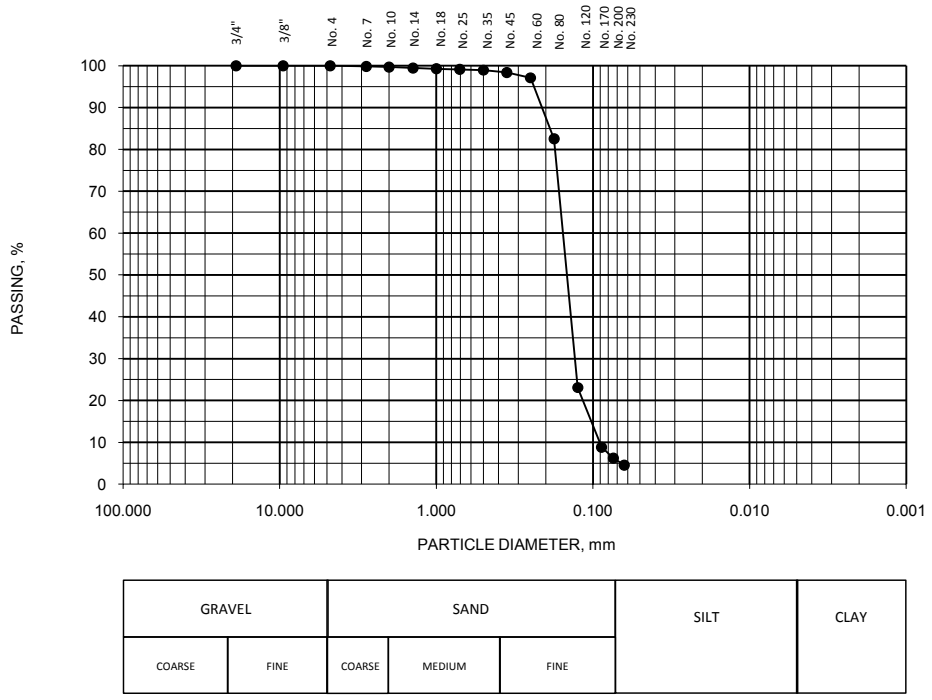
PROJECT NAME	Manteo (Old House Channel) 204 Study Area		
CLIENT	US Army Corps of Engineers	**BORING #**	MAN-10-V-18
PROJECT NO.	70105034	**SAMPLE #**	1
DATE SAMPLE RECEIVED	5/20/2010	**DEPTH, ft**	11.5-12.0
DATE TESTED	5/27/2010	**DESCRIPTION**	Poorly Graded Sand with Silt, SP-SM
DATE REPORTED	6/1/2010		

TEST PROCEDURES

ASTM STANDARD D 422 - Particle Size Analysis of Soils	WEIGHT OF DRY SOLIDS (grams) 460.1

VISUALLY ESTIMATED SHELL CONTENT (%) #N/A



PERCENT FINER (dry weight basis)

GRAVEL			COARSE SAND		MEDIUM SAND				FINE SAND						SILT / CLAY
3/4"	3/8"	No. 4	No. 7	No. 10	No. 14	No. 18	No. 25	No. 35	No. 45	No. 60	No. 80	No. 120	No. 170	No. 200	No. 230
100.0	100.0	100.0	99.8	99.7	99.5	99.3	99.1	98.9	98.4	97.1	82.5	23.1	8.8	6.2	4.6

VISUALLY ESTIMATED SHELL CONTENT (percent)

#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	Shell Content <5% (Amount not visually estimated)

TESTED BY: S.E. Hardison / B.S. Junker CHECKED BY: S.E. Hardison APPROVED BY: R.L. Denton, II, PE

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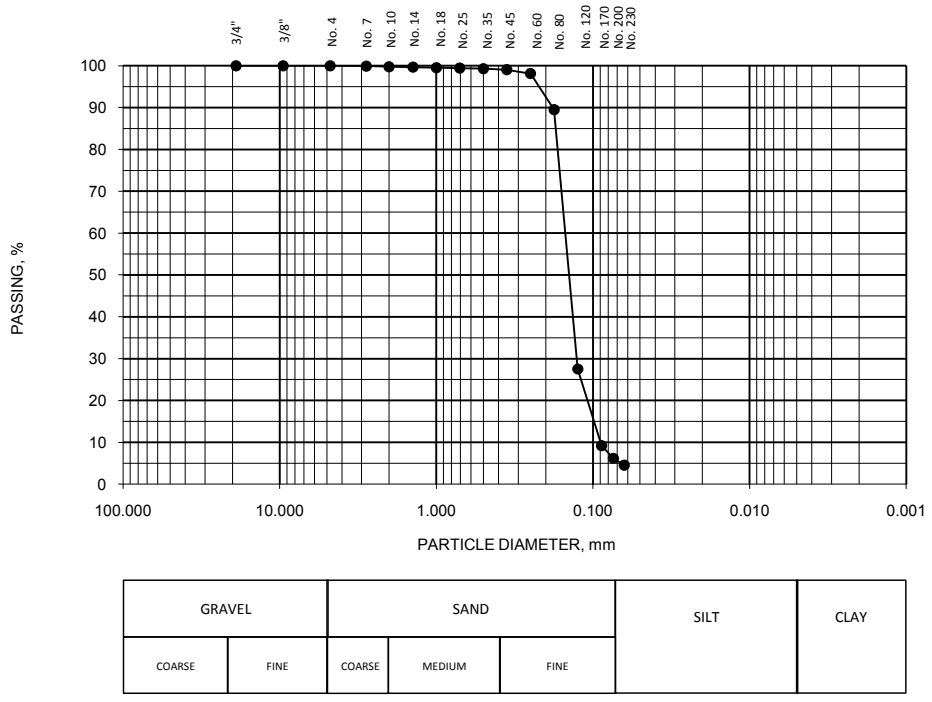
PROJECT NAME	Manteo (Old House Channel) 204 Study Area		
CLIENT	US Army Corps of Engineers	**BORING #**	MAN-10-V-18
PROJECT NO.	70105034	**SAMPLE #**	2
DATE SAMPLE RECEIVED	5/20/2010	**DEPTH, ft**	13.5-14.0
DATE TESTED	5/27/2010	**DESCRIPTION**	Poorly Graded Sand with Silt, SP-SM
DATE REPORTED	6/1/2010		

TEST PROCEDURES

ASTM STANDARD D 422 - Particle Size Analysis of Soils	WEIGHT OF DRY SOLIDS (grams) 477.5

VISUALLY ESTIMATED SHELL CONTENT (%) #N/A



PERCENT FINER (dry weight basis)

GRAVEL			COARSE SAND		MEDIUM SAND				FINE SAND						SILT / CLAY
3/4"	3/8"	No. 4	No. 7	No. 10	No. 14	No. 18	No. 25	No. 35	No. 45	No. 60	No. 80	No. 120	No. 170	No. 200	No. 230
100.0	100.0	100.0	99.9	99.8	99.6	99.5	99.4	99.3	99.0	98.1	89.5	27.5	9.2	6.2	4.5

VISUALLY ESTIMATED SHELL CONTENT (percent)

#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	Shell Content <5% (Amount not visually estimated)

TESTED BY: S.E. Hardison / B.S. Junker CHECKED BY: S.E. Hardison APPROVED BY: R.L. Denton, II, PE

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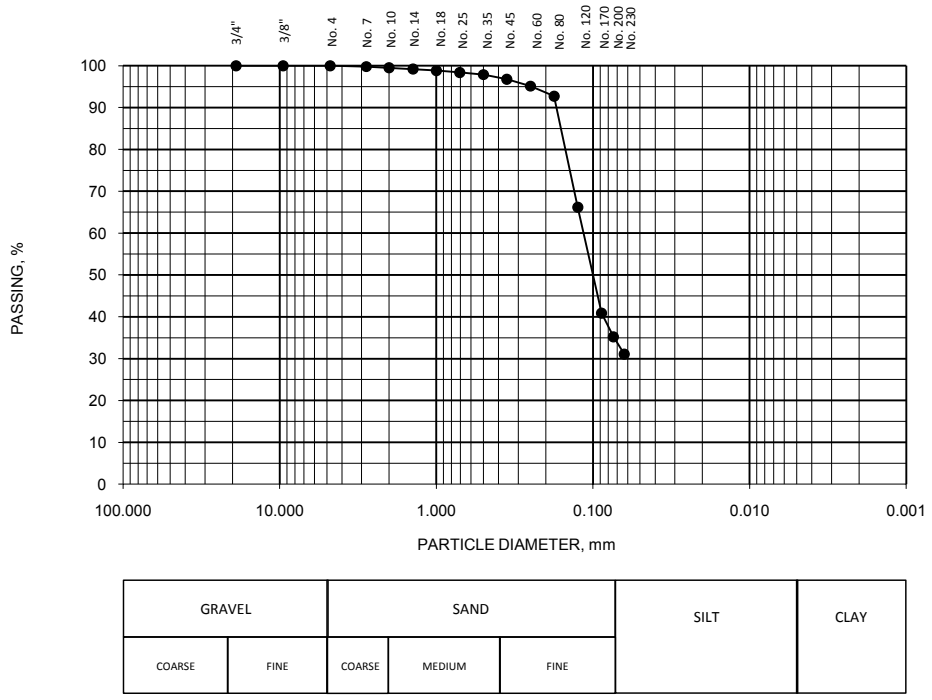
PROJECT NAME	Manteo (Old House Channel) 204 Study Area		
CLIENT	US Army Corps of Engineers	**BORING #**	MAN-10-V-18
PROJECT NO.	70105034	**SAMPLE #**	3
DATE SAMPLE RECEIVED	5/20/2010	**DEPTH, ft**	16.0-16.5
DATE TESTED	5/27/2010	**DESCRIPTION**	Silty Sand, SM
DATE REPORTED	6/1/2010		

TEST PROCEDURES

ASTM STANDARD D 422 - Particle Size Analysis of Soils	WEIGHT OF DRY SOLIDS (grams) 417.3

VISUALLY ESTIMATED SHELL CONTENT (%) #N/A



PERCENT FINER (dry weight basis)

GRAVEL			COARSE SAND		MEDIUM SAND				FINE SAND						SILT / CLAY
3/4"	3/8"	No. 4	No. 7	No. 10	No. 14	No. 18	No. 25	No. 35	No. 45	No. 60	No. 80	No. 120	No. 170	No. 200	No. 230
100.0	100.0	100.0	99.8	99.5	99.2	98.8	98.4	97.9	96.8	95.1	92.7	66.2	40.9	35.2	31.1

VISUALLY ESTIMATED SHELL CONTENT (percent)

#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	Shell Content <5% (Amount not visually estimated)

TESTED BY: S.E. Hardison / B.S. Junker CHECKED BY: S.E. Hardison APPROVED BY: R.L. Denton, II, PE

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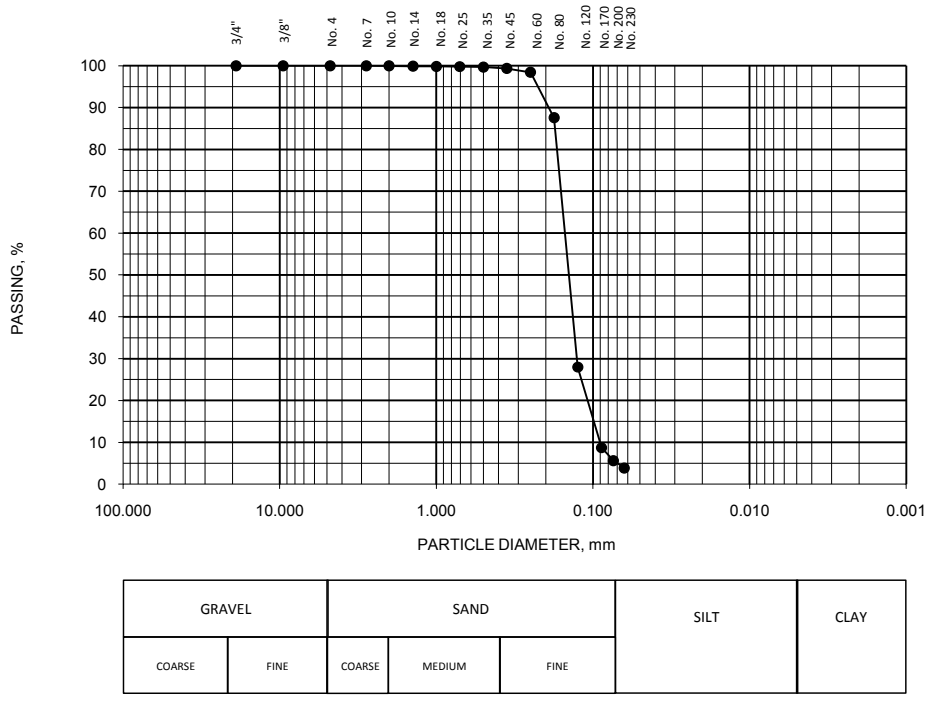
PROJECT NAME	Manteo (Old House Channel) 204 Study Area		
CLIENT	US Army Corps of Engineers	**BORING #**	MAN-10-V-19
PROJECT NO.	70105034	**SAMPLE #**	1
DATE SAMPLE RECEIVED	5/20/2010	**DEPTH, ft**	11.6-12.1
DATE TESTED	5/27/2010	**DESCRIPTION**	Poorly Graded Sand with Silt, SP-SM
DATE REPORTED	6/1/2010		

TEST PROCEDURES

ASTM STANDARD D 422 - Particle Size Analysis of Soils	WEIGHT OF DRY SOLIDS (grams) 514.8

VISUALLY ESTIMATED SHELL CONTENT (%) #N/A



PERCENT FINER (dry weight basis)

GRAVEL			COARSE SAND		MEDIUM SAND				FINE SAND						SILT / CLAY
3/4"	3/8"	No. 4	No. 7	No. 10	No. 14	No. 18	No. 25	No. 35	No. 45	No. 60	No. 80	No. 120	No. 170	No. 200	No. 230
100.0	100.0	100.0	100.0	99.9	99.9	99.8	99.8	99.7	99.4	98.4	87.6	28.0	8.7	5.6	3.9

VISUALLY ESTIMATED SHELL CONTENT (percent)

#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	Shell Content <5% (Amount not visually estimated)

TESTED BY: S.E. Hardison / B.S. Junker CHECKED BY: S.E. Hardison APPROVED BY: R.L. Denton, II, PE

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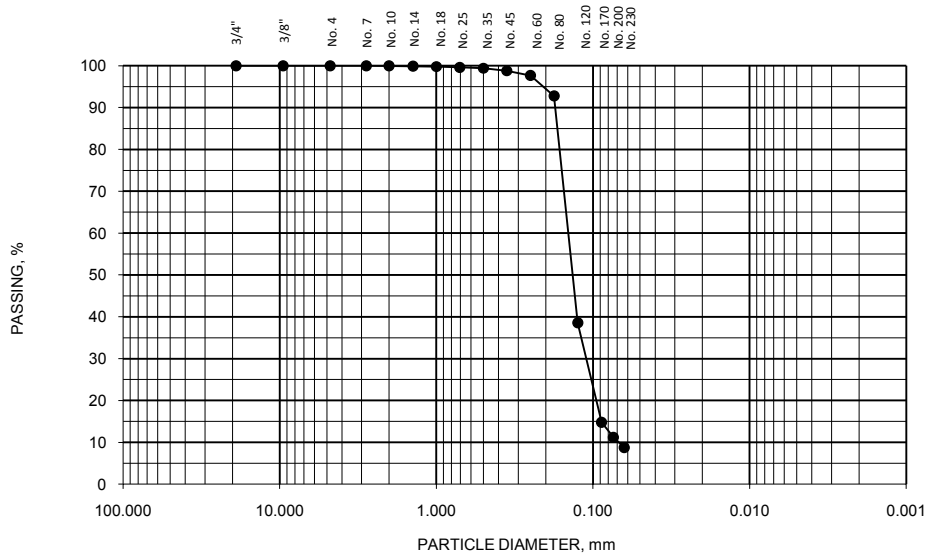
PROJECT NAME	Manteo (Old House Channel) 204 Study Area		
CLIENT	US Army Corps of Engineers	**BORING #**	MAN-10-V-19
PROJECT NO.	70105034	**SAMPLE #**	2
DATE SAMPLE RECEIVED	5/20/2010	**DEPTH, ft**	13.5-14.0
DATE TESTED	5/27/2010	**DESCRIPTION**	Poorly Graded Sand with Silt, SP-SM
DATE REPORTED	6/1/2010		

TEST PROCEDURES

ASTM STANDARD D 422 - Particle Size Analysis of Soils	WEIGHT OF DRY SOLIDS (grams) 512.4

VISUALLY ESTIMATED SHELL CONTENT (%) #N/A



PERCENT FINER (dry weight basis)

GRAVEL			COARSE SAND		MEDIUM SAND				FINE SAND						SILT / CLAY
3/4"	3/8"	No. 4	No. 7	No. 10	No. 14	No. 18	No. 25	No. 35	No. 45	No. 60	No. 80	No. 120	No. 170	No. 200	No. 230
100.0	100.0	100.0	100.0	99.9	99.9	99.8	99.6	99.4	98.8	97.7	92.8	38.6	14.8	11.2	8.7

VISUALLY ESTIMATED SHELL CONTENT (percent)

#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	Shell Content <5% (Amount not visually estimated)

TESTED BY: S.E. Hardison / B.S. Junker CHECKED BY: S.E. Hardison APPROVED BY: R.L. Denton, II, PE

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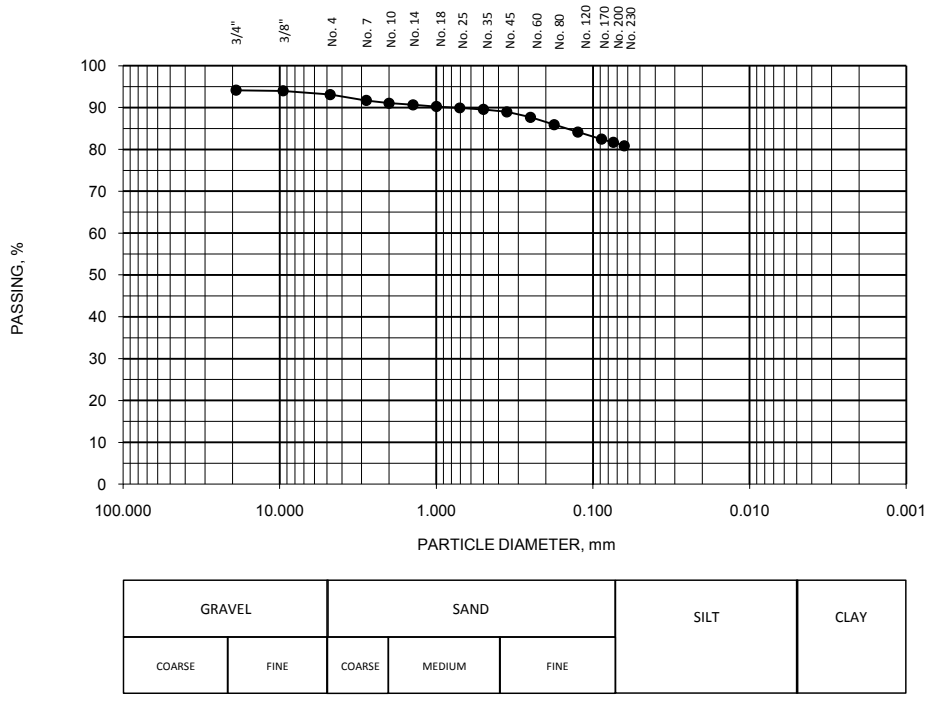
PROJECT NAME	Manteo (Old House Channel) 204 Study Area		
CLIENT	US Army Corps of Engineers	**BORING #**	MAN-10-V-19
PROJECT NO.	70105034	**SAMPLE #**	3
DATE SAMPLE RECEIVED	5/20/2010	**DEPTH, ft**	15.6-16.1
DATE TESTED	5/27/2010	**DESCRIPTION**	Silt with Sand, MH
DATE REPORTED	6/1/2010		

TEST PROCEDURES

ASTM STANDARD D 422 - Particle Size Analysis of Soils	WEIGHT OF DRY SOLIDS (grams) 272.7

VISUALLY ESTIMATED SHELL CONTENT (%) #N/A



PERCENT FINER (dry weight basis)

GRAVEL			COARSE SAND		MEDIUM SAND				FINE SAND						SILT / CLAY
3/4"	3/8"	No. 4	No. 7	No. 10	No. 14	No. 18	No. 25	No. 35	No. 45	No. 60	No. 80	No. 120	No. 170	No. 200	No. 230
94.1	94.0	93.1	91.7	91.1	90.6	90.2	89.9	89.5	89.0	87.7	85.9	84.2	82.4	81.7	80.9

VISUALLY ESTIMATED SHELL CONTENT (percent)

#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	Shell Content <5% (Amount not visually estimated)

TESTED BY: S.E. Hardison / B.S. Junker CHECKED BY: S.E. Hardison APPROVED BY: R.L. Denton, II, PE

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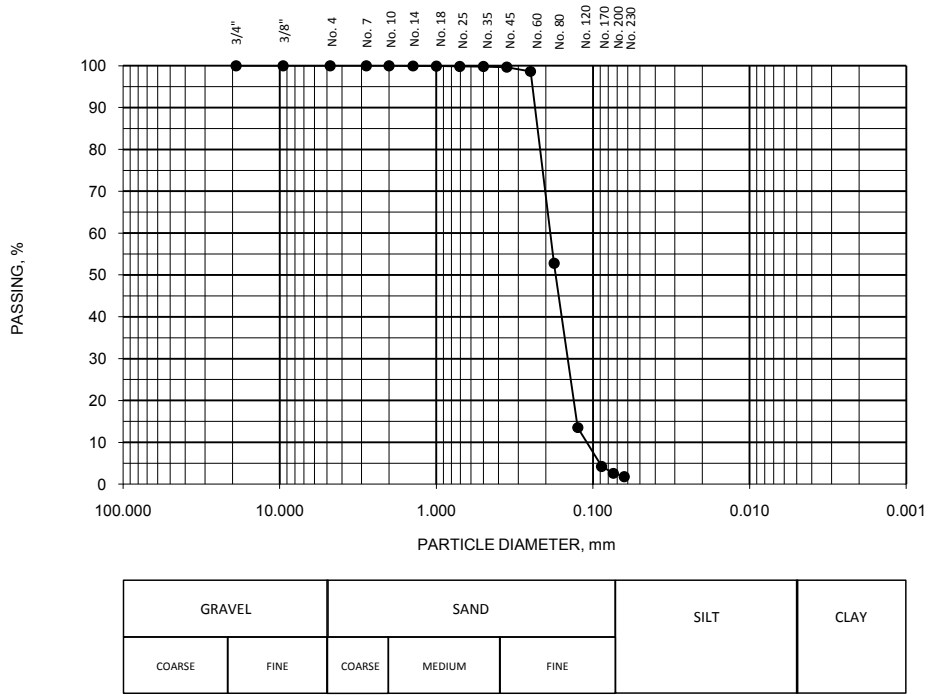
PROJECT NAME	Manteo (Old House Channel) 204 Study Area		
CLIENT	US Army Corps of Engineers	**BORING #**	MAN-10-V-20
PROJECT NO.	70105034	**SAMPLE #**	1
DATE SAMPLE RECEIVED	5/20/2010	**DEPTH, ft**	8.6-9.1
DATE TESTED	5/27/2010	**DESCRIPTION**	Poorly Graded Sand, SP
DATE REPORTED	6/1/2010		

TEST PROCEDURES

ASTM STANDARD D 422 - Particle Size Analysis of Soils	WEIGHT OF DRY SOLIDS (grams) 491.0

VISUALLY ESTIMATED SHELL CONTENT (%) #N/A



PERCENT FINER (dry weight basis)

GRAVEL			COARSE SAND		MEDIUM SAND				FINE SAND						SILT / CLAY
3/4"	3/8"	No. 4	No. 7	No. 10	No. 14	No. 18	No. 25	No. 35	No. 45	No. 60	No. 80	No. 120	No. 170	No. 200	No. 230
100.0	100.0	100.0	100.0	100.0	99.9	99.9	99.8	99.8	99.7	98.6	52.8	13.5	4.3	2.6	1.8

VISUALLY ESTIMATED SHELL CONTENT (percent)

#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	Shell Content <5% (Amount not visually estimated)

TESTED BY: S.E. Hardison / B.S. Junker CHECKED BY: S.E. Hardison APPROVED BY: R.L. Denton, II, PE

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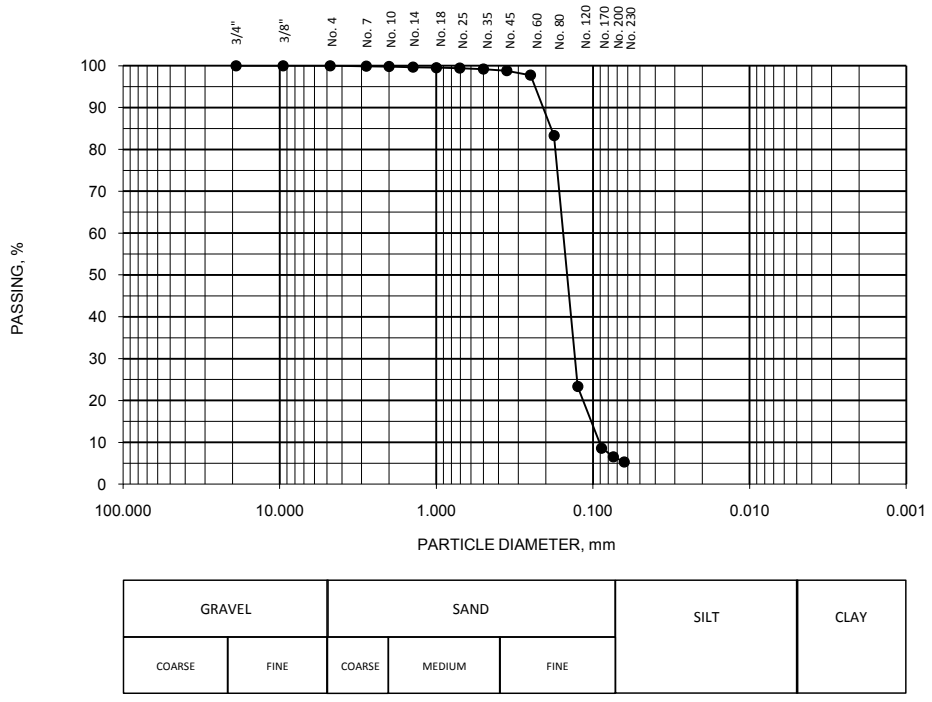
PROJECT NAME	Manteo (Old House Channel) 204 Study Area		
CLIENT	US Army Corps of Engineers	**BORING #**	MAN-10-V-20
PROJECT NO.	70105034	**SAMPLE #**	2
DATE SAMPLE RECEIVED	5/20/2010	**DEPTH, ft**	11.0-11.5
DATE TESTED	5/27/2010	**DESCRIPTION**	Poorly Graded Sand with Silt, SP-SM
DATE REPORTED	6/1/2010		

TEST PROCEDURES

ASTM STANDARD D 422 - Particle Size Analysis of Soils	WEIGHT OF DRY SOLIDS (grams) 473.4

VISUALLY ESTIMATED SHELL CONTENT (%) #N/A



PERCENT FINER (dry weight basis)

GRAVEL			COARSE SAND		MEDIUM SAND				FINE SAND						SILT / CLAY
3/4"	3/8"	No. 4	No. 7	No. 10	No. 14	No. 18	No. 25	No. 35	No. 45	No. 60	No. 80	No. 120	No. 170	No. 200	No. 230
100.0	100.0	100.0	99.9	99.8	99.7	99.5	99.4	99.2	98.8	97.7	83.3	23.3	8.6	6.5	5.3

VISUALLY ESTIMATED SHELL CONTENT (percent)

#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	Shell Content <5% (Amount not visually estimated)

TESTED BY: S.E. Hardison / B.S. Junker CHECKED BY: S.E. Hardison APPROVED BY: R.L. Denton, II, PE

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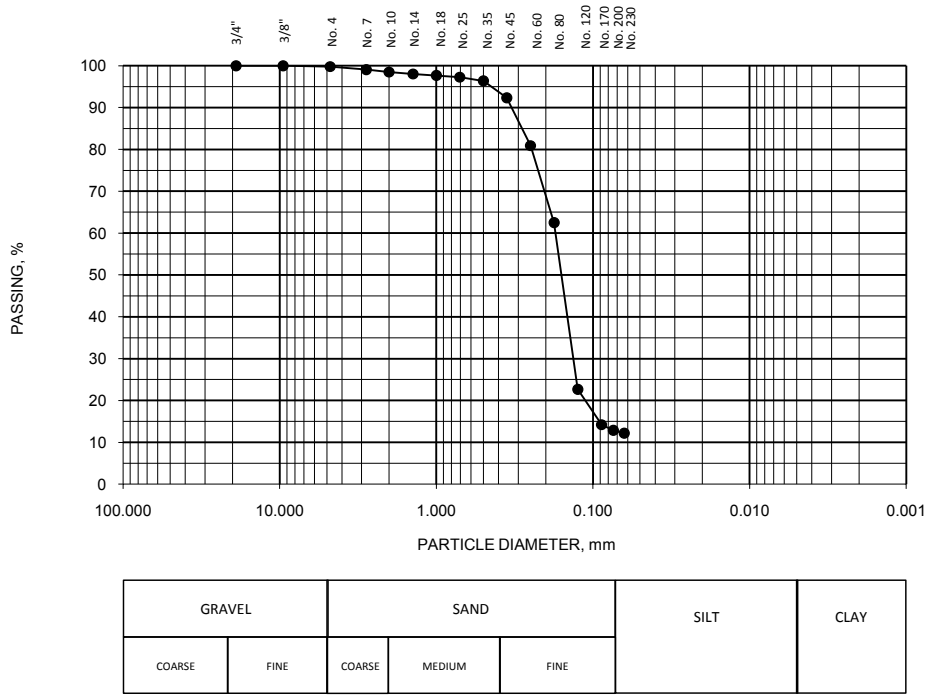
PROJECT NAME	Manteo (Old House Channel) 204 Study Area		
CLIENT	US Army Corps of Engineers	**BORING #**	MAN-10-V-20
PROJECT NO.	70105034	**SAMPLE #**	3
DATE SAMPLE RECEIVED	5/20/2010	**DEPTH, ft**	13.6-14.1
DATE TESTED	5/27/2010	**DESCRIPTION**	Silty Sand, SM
DATE REPORTED	6/1/2010		

TEST PROCEDURES

ASTM STANDARD D 422 - Particle Size Analysis of Soils	WEIGHT OF DRY SOLIDS (grams) 460.1

VISUALLY ESTIMATED SHELL CONTENT (%) #N/A



PERCENT FINER (dry weight basis)

GRAVEL			COARSE SAND		MEDIUM SAND				FINE SAND						SILT / CLAY
3/4"	3/8"	No. 4	No. 7	No. 10	No. 14	No. 18	No. 25	No. 35	No. 45	No. 60	No. 80	No. 120	No. 170	No. 200	No. 230
100.0	100.0	99.8	99.1	98.5	98.0	97.7	97.3	96.3	92.3	80.9	62.5	22.7	14.2	12.9	12.2

VISUALLY ESTIMATED SHELL CONTENT (percent)

#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	Shell Content <5% (Amount not visually estimated)

TESTED BY: S.E. Hardison / B.S. Junker CHECKED BY: S.E. Hardison APPROVED BY: R.L. Denton, II, PE

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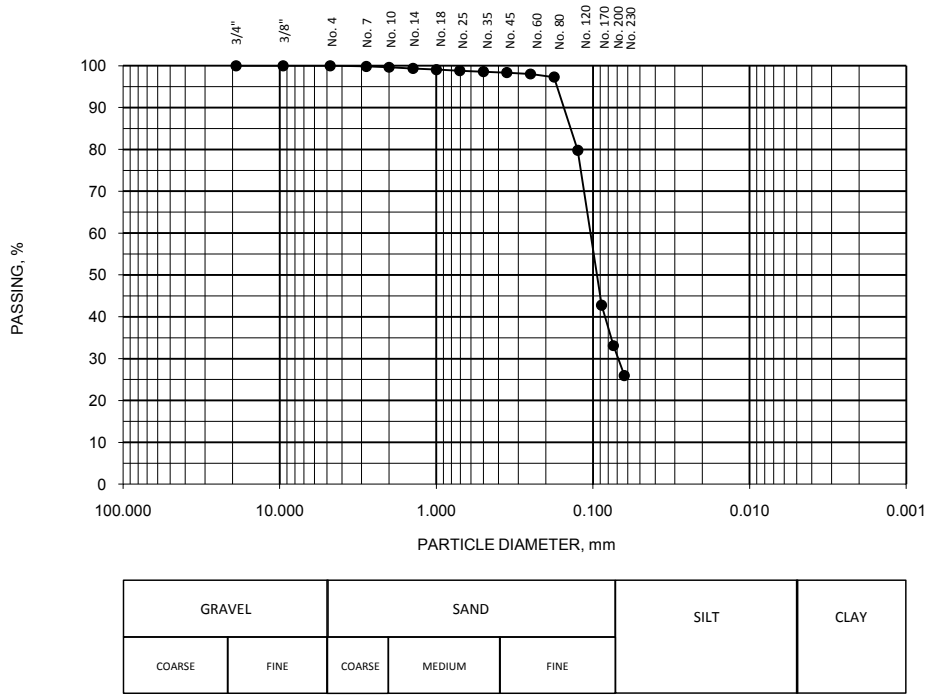
PROJECT NAME	Manteo (Old House Channel) 204 Study Area		
CLIENT	US Army Corps of Engineers	**BORING #**	MAN-10-V-21
PROJECT NO.	70105034	**SAMPLE #**	1
DATE SAMPLE RECEIVED	5/20/2010	**DEPTH, ft**	12.5-13.0
DATE TESTED	5/27/2010	**DESCRIPTION**	Silty Sand, SM
DATE REPORTED	6/1/2010		

TEST PROCEDURES

ASTM STANDARD D 422 - Particle Size Analysis of Soils	WEIGHT OF DRY SOLIDS (grams) 404.9

VISUALLY ESTIMATED SHELL CONTENT (%) #N/A



PERCENT FINER (dry weight basis)

GRAVEL			COARSE SAND		MEDIUM SAND				FINE SAND						SILT / CLAY
3/4"	3/8"	No. 4	No. 7	No. 10	No. 14	No. 18	No. 25	No. 35	No. 45	No. 60	No. 80	No. 120	No. 170	No. 200	No. 230
100.0	100.0	100.0	99.8	99.6	99.3	99.1	98.8	98.6	98.3	98.0	97.3	79.8	42.8	33.1	26.0

VISUALLY ESTIMATED SHELL CONTENT (percent)

#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	Shell Content <5% (Amount not visually estimated)

TESTED BY: S.E. Hardison / B.S. Junker CHECKED BY: S.E. Hardison APPROVED BY: R.L. Denton, II, PE

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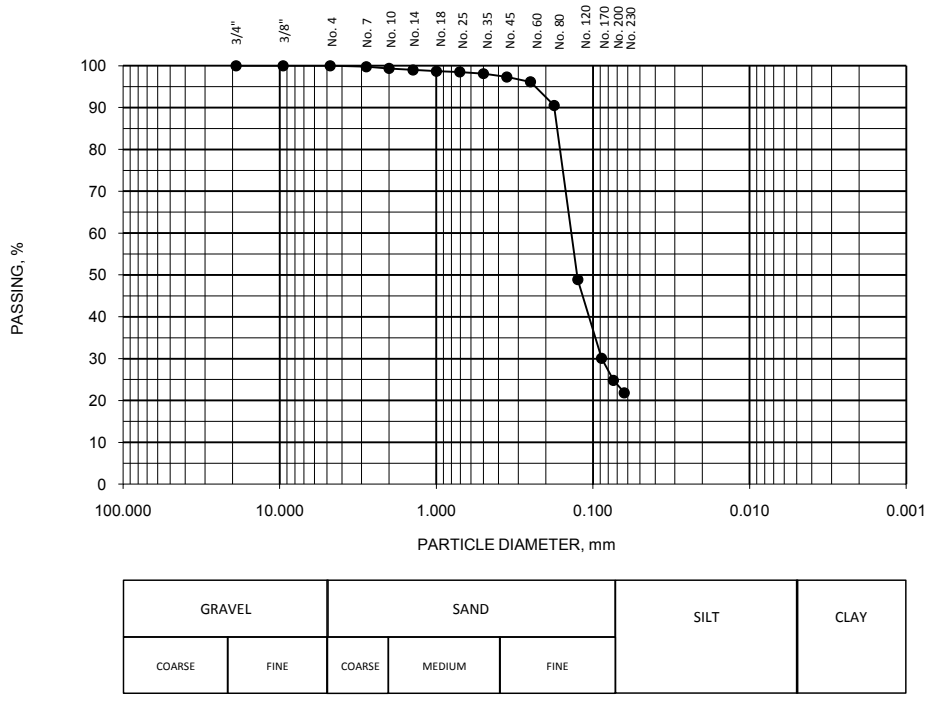
PROJECT NAME	Manteo (Old House Channel) 204 Study Area		
CLIENT	US Army Corps of Engineers	**BORING #**	MAN-10-V-21
PROJECT NO.	70105034	**SAMPLE #**	2
DATE SAMPLE RECEIVED	5/20/2010	**DEPTH, ft**	14.5-15.0
DATE TESTED	5/27/2010	**DESCRIPTION**	Silty Sand, SM
DATE REPORTED	6/1/2010		

TEST PROCEDURES

ASTM STANDARD D 422 - Particle Size Analysis of Soils	WEIGHT OF DRY SOLIDS (grams) 393.1

VISUALLY ESTIMATED SHELL CONTENT (%) #N/A



PERCENT FINER (dry weight basis)

GRAVEL			COARSE SAND		MEDIUM SAND				FINE SAND						SILT / CLAY
3/4"	3/8"	No. 4	No. 7	No. 10	No. 14	No. 18	No. 25	No. 35	No. 45	No. 60	No. 80	No. 120	No. 170	No. 200	No. 230
100.0	100.0	100.0	99.7	99.3	99.0	98.7	98.5	98.1	97.3	96.1	90.5	48.9	30.1	24.8	21.8

VISUALLY ESTIMATED SHELL CONTENT (percent)

#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	Shell Content <5% (Amount not visually estimated)

TESTED BY: S.E. Hardison / B.S. Junker CHECKED BY: S.E. Hardison APPROVED BY: R.L. Denton, II, PE

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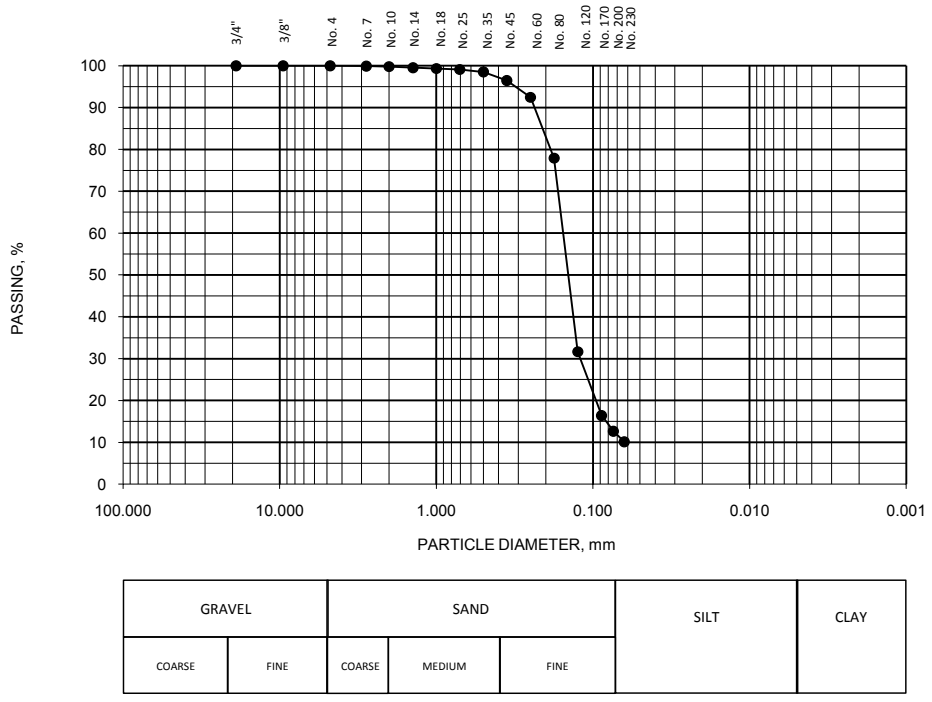
PROJECT NAME	Manteo (Old House Channel) 204 Study Area		
CLIENT	US Army Corps of Engineers	**BORING #**	MAN-10-V-21
PROJECT NO.	70105034	**SAMPLE #**	3
DATE SAMPLE RECEIVED	5/20/2010	**DEPTH, ft**	16.2-16.7
DATE TESTED	5/27/2010	**DESCRIPTION**	Silty Sand, SM
DATE REPORTED	6/1/2010		

TEST PROCEDURES

ASTM STANDARD D 422 - Particle Size Analysis of Soils	WEIGHT OF DRY SOLIDS (grams) 499.0

VISUALLY ESTIMATED SHELL CONTENT (%) #N/A



PERCENT FINER (dry weight basis)

GRAVEL			COARSE SAND		MEDIUM SAND				FINE SAND						SILT / CLAY
3/4"	3/8"	No. 4	No. 7	No. 10	No. 14	No. 18	No. 25	No. 35	No. 45	No. 60	No. 80	No. 120	No. 170	No. 200	No. 230
100.0	100.0	100.0	99.9	99.8	99.5	99.3	99.1	98.5	96.5	92.4	77.9	31.6	16.4	12.7	10.1

VISUALLY ESTIMATED SHELL CONTENT (percent)

#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	Shell Content <5% (Amount not visually estimated)

TESTED BY: S.E. Hardison / B.S. Junker CHECKED BY: S.E. Hardison APPROVED BY: R.L. Denton, II, PE

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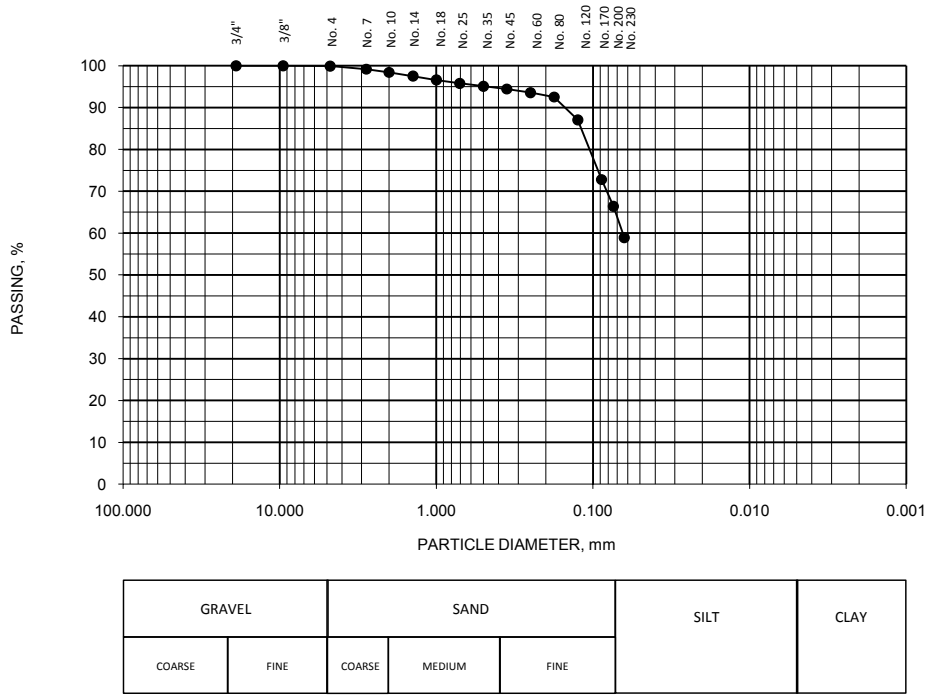
PROJECT NAME	Manteo (Old House Channel) 204 Study Area		
CLIENT	US Army Corps of Engineers	**BORING #**	MAN-10-V-22
PROJECT NO.	70105034	**SAMPLE #**	1
DATE SAMPLE RECEIVED	5/20/2010	**DEPTH, ft**	14.0-14.5
DATE TESTED	5/27/2010	**DESCRIPTION**	Sandy Silt, MH
DATE REPORTED	6/1/2010		

TEST PROCEDURES

ASTM STANDARD D 422 - Particle Size Analysis of Soils	WEIGHT OF DRY SOLIDS (grams) 251.3

VISUALLY ESTIMATED SHELL CONTENT (%) #N/A



PERCENT FINER (dry weight basis)

GRAVEL			COARSE SAND		MEDIUM SAND				FINE SAND						SILT / CLAY
3/4"	3/8"	No. 4	No. 7	No. 10	No. 14	No. 18	No. 25	No. 35	No. 45	No. 60	No. 80	No. 120	No. 170	No. 200	No. 230
100.0	100.0	99.9	99.2	98.4	97.5	96.6	95.8	95.1	94.4	93.6	92.5	87.1	72.8	66.4	58.9

VISUALLY ESTIMATED SHELL CONTENT (percent)

#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	Shell Content <5% (Amount not visually estimated)

TESTED BY: S.E. Hardison / B.S. Junker CHECKED BY: S.E. Hardison APPROVED BY: R.L. Denton, II, PE

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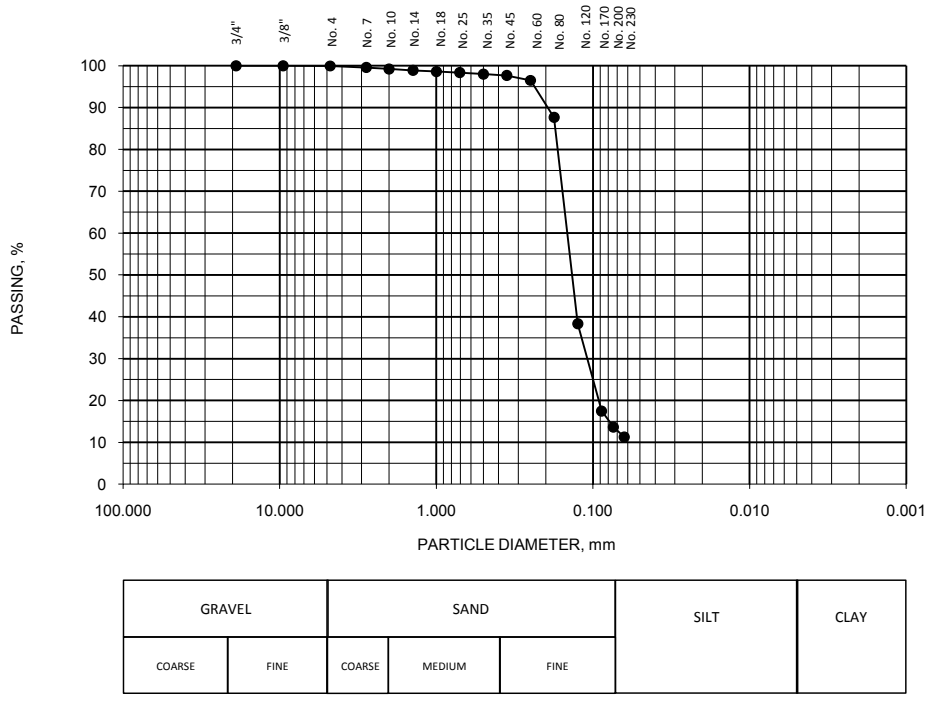
PROJECT NAME	Manteo (Old House Channel) 204 Study Area		
CLIENT	US Army Corps of Engineers	**BORING #**	MAN-10-V-22
PROJECT NO.	70105034	**SAMPLE #**	2
DATE SAMPLE RECEIVED	5/20/2010	**DEPTH, ft**	15.5-16.0
DATE TESTED	5/27/2010	**DESCRIPTION**	Silty Sand, SM
DATE REPORTED	6/1/2010		

TEST PROCEDURES

ASTM STANDARD D 422 - Particle Size Analysis of Soils	WEIGHT OF DRY SOLIDS (grams) 415.8

VISUALLY ESTIMATED SHELL CONTENT (%) #N/A



PERCENT FINER (dry weight basis)

GRAVEL			COARSE SAND		MEDIUM SAND				FINE SAND						SILT / CLAY
3/4"	3/8"	No. 4	No. 7	No. 10	No. 14	No. 18	No. 25	No. 35	No. 45	No. 60	No. 80	No. 120	No. 170	No. 200	No. 230
100.0	100.0	99.9	99.6	99.2	98.9	98.6	98.4	98.0	97.7	96.5	87.6	38.4	17.5	13.7	11.3

VISUALLY ESTIMATED SHELL CONTENT (percent)

#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	Shell Content <5% (Amount not visually estimated)

TESTED BY: S.E. Hardison / B.S. Junker CHECKED BY: S.E. Hardison APPROVED BY: R.L. Denton, II, PE

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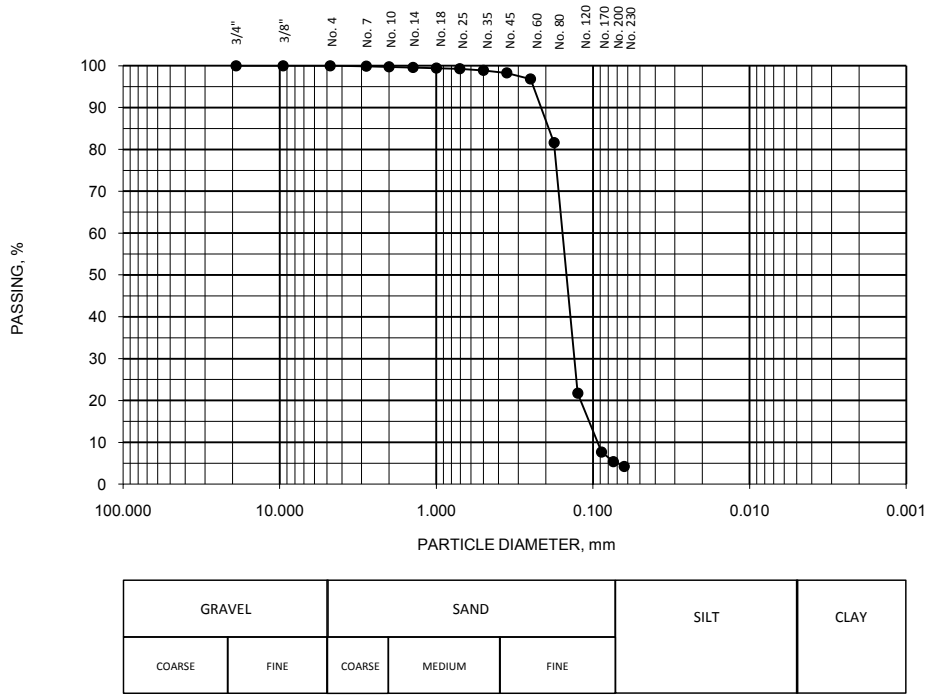
PROJECT NAME	Manteo (Old House Channel) 204 Study Area		
CLIENT	US Army Corps of Engineers	**BORING #**	MAN-10-V-22
PROJECT NO.	70105034	**SAMPLE #**	3
DATE SAMPLE RECEIVED	5/20/2010	**DEPTH, ft**	16.7-17.2
DATE TESTED	5/27/2010	**DESCRIPTION**	Poorly Graded Sand with Silt, SP-SM
DATE REPORTED	6/1/2010		

TEST PROCEDURES

ASTM STANDARD D 422 - Particle Size Analysis of Soils	WEIGHT OF DRY SOLIDS (grams) 335.8

VISUALLY ESTIMATED SHELL CONTENT (%) #N/A



PERCENT FINER (dry weight basis)

GRAVEL			COARSE SAND		MEDIUM SAND				FINE SAND						SILT / CLAY
3/4"	3/8"	No. 4	No. 7	No. 10	No. 14	No. 18	No. 25	No. 35	No. 45	No. 60	No. 80	No. 120	No. 170	No. 200	No. 230
100.0	100.0	100.0	99.9	99.7	99.6	99.4	99.3	98.9	98.3	96.8	81.6	21.7	7.7	5.4	4.3

VISUALLY ESTIMATED SHELL CONTENT (percent)

#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	Shell Content <5% (Amount not visually estimated)

TESTED BY: S.E. Hardison / B.S. Junker CHECKED BY: S.E. Hardison APPROVED BY: R.L. Denton, II, PE

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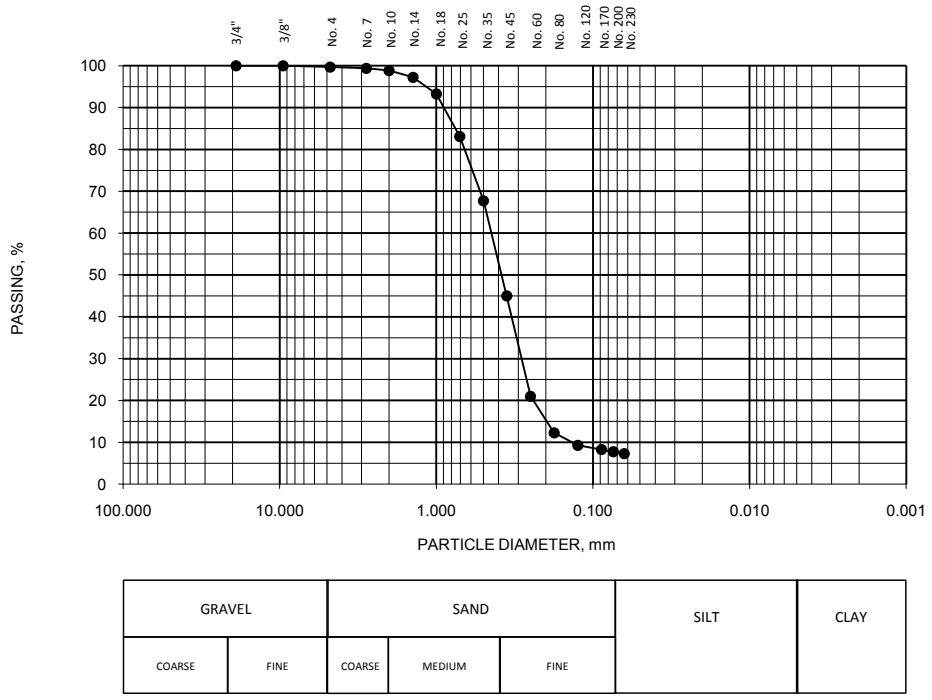
PROJECT NAME	Manteo (Old House Channel) 204 Study Area		
CLIENT	US Army Corps of Engineers	**BORING #**	MAN-10-V-22
PROJECT NO.	70105034	**SAMPLE #**	4
DATE SAMPLE RECEIVED	5/20/2010	**DEPTH, ft**	18.3-18.8
DATE TESTED	5/27/2010	**DESCRIPTION**	Poorly Graded Sand with Silt, SP-SM
DATE REPORTED	6/1/2010		

TEST PROCEDURES

ASTM STANDARD D 422 - Particle Size Analysis of Soils	WEIGHT OF DRY SOLIDS (grams) 619.5

VISUALLY ESTIMATED SHELL CONTENT (%) #N/A



PERCENT FINER (dry weight basis)

GRAVEL			COARSE SAND		MEDIUM SAND				FINE SAND						SILT / CLAY
3/4"	3/8"	No. 4	No. 7	No. 10	No. 14	No. 18	No. 25	No. 35	No. 45	No. 60	No. 80	No. 120	No. 170	No. 200	No. 230
100.0	100.0	99.7	99.4	98.8	97.2	93.3	83.1	67.7	45.0	21.0	12.3	9.3	8.3	7.7	7.3

VISUALLY ESTIMATED SHELL CONTENT (percent)

#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	Shell Content <5% (Amount not visually estimated)

TESTED BY: S.E. Hardison / B.S. Junker CHECKED BY: S.E. Hardison APPROVED BY: R.L. Denton, II, PE

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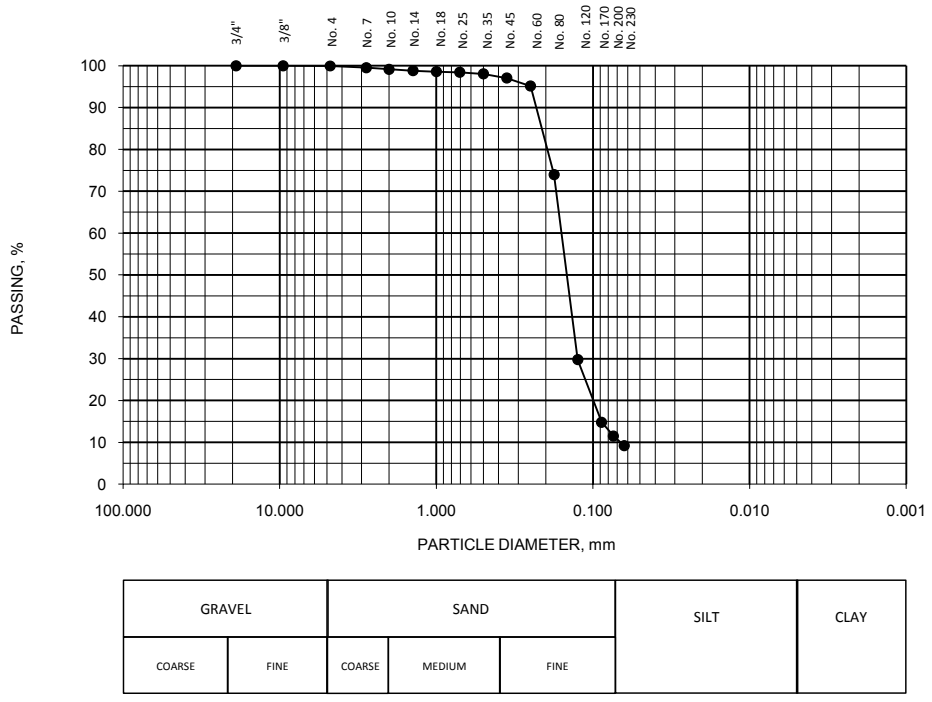
PROJECT NAME	Manteo (Old House Channel) 204 Study Area		
CLIENT	US Army Corps of Engineers	**BORING #**	MAN-10-V-23
PROJECT NO.	70105034	**SAMPLE #**	1
DATE SAMPLE RECEIVED	5/20/2010	**DEPTH, ft**	14.8-15.3
DATE TESTED	5/27/2010	**DESCRIPTION**	Poorly Graded Sand with Silt, SP-SM
DATE REPORTED	6/1/2010		

TEST PROCEDURES

ASTM STANDARD D 422 - Particle Size Analysis of Soils	WEIGHT OF DRY SOLIDS (grams) 457.8

VISUALLY ESTIMATED SHELL CONTENT (%) #N/A



PERCENT FINER (dry weight basis)

GRAVEL			COARSE SAND		MEDIUM SAND				FINE SAND						SILT / CLAY
3/4"	3/8"	No. 4	No. 7	No. 10	No. 14	No. 18	No. 25	No. 35	No. 45	No. 60	No. 80	No. 120	No. 170	No. 200	No. 230
100.0	100.0	99.9	99.5	99.1	98.8	98.6	98.4	98.1	97.1	95.1	74.0	29.8	14.8	11.5	9.2

VISUALLY ESTIMATED SHELL CONTENT (percent)

#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	Shell Content <5% (Amount not visually estimated)

TESTED BY: S.E. Hardison / B.S. Junker CHECKED BY: S.E. Hardison APPROVED BY: R.L. Denton, II, PE

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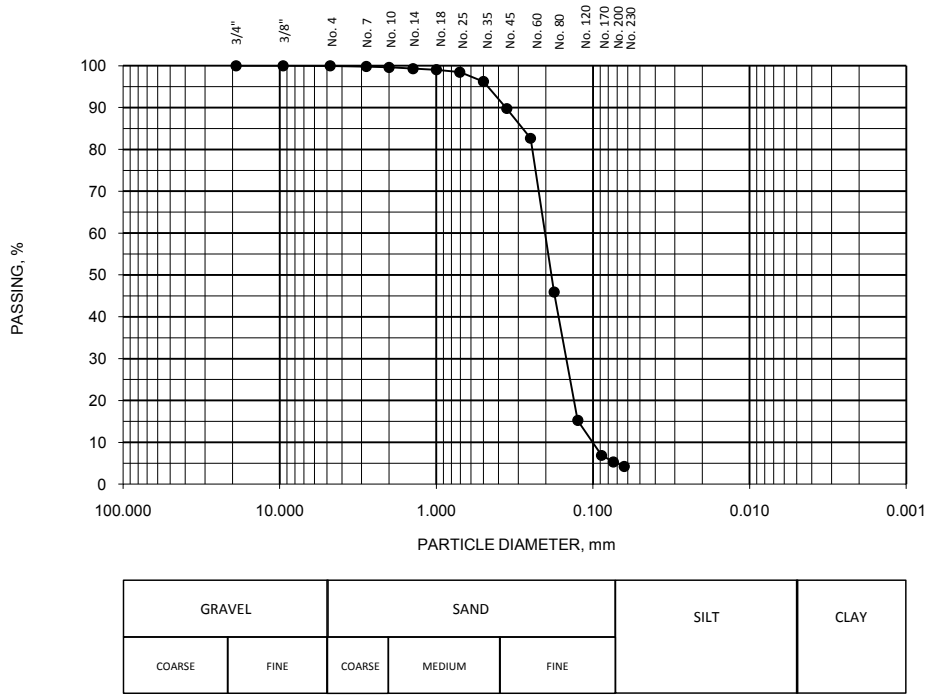
PROJECT NAME	Manteo (Old House Channel) 204 Study Area		
CLIENT	US Army Corps of Engineers	**BORING #**	MAN-10-V-23
PROJECT NO.	70105034	**SAMPLE #**	2
DATE SAMPLE RECEIVED	5/20/2010	**DEPTH, ft**	17.0-17.5
DATE TESTED	5/28/2010	**DESCRIPTION**	Poorly Graded Sand with Silt, SP-SM
DATE REPORTED	6/1/2010		

TEST PROCEDURES

ASTM STANDARD D 422 - Particle Size Analysis of Soils	WEIGHT OF DRY SOLIDS (grams) 522.9

VISUALLY ESTIMATED SHELL CONTENT (%) #N/A



PERCENT FINER (dry weight basis)

GRAVEL			COARSE SAND		MEDIUM SAND				FINE SAND						SILT / CLAY
3/4"	3/8"	No. 4	No. 7	No. 10	No. 14	No. 18	No. 25	No. 35	No. 45	No. 60	No. 80	No. 120	No. 170	No. 200	No. 230
100.0	100.0	100.0	99.8	99.6	99.3	99.0	98.5	96.2	89.8	82.7	45.9	15.2	6.9	5.3	4.2

VISUALLY ESTIMATED SHELL CONTENT (percent)

#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	Shell Content <5% (Amount not visually estimated)

TESTED BY: S.E. Hardison / B.S. Junker CHECKED BY: S.E. Hardison APPROVED BY: R.L. Denton, II, PE

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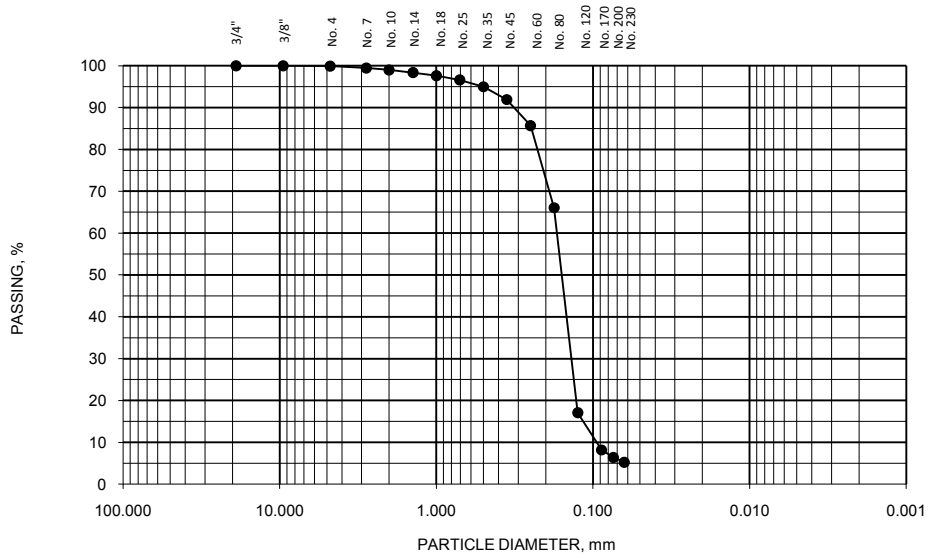
PROJECT NAME	Manteo (Old House Channel) 204 Study Area		
CLIENT	US Army Corps of Engineers	**BORING #**	MAN-10-V-23
PROJECT NO.	70105034	**SAMPLE #**	3
DATE SAMPLE RECEIVED	5/20/2010	**DEPTH, ft**	19.5-20.0
DATE TESTED	5/28/2010	**DESCRIPTION**	Poorly Graded Sand with Silt, SP-SM
DATE REPORTED	6/1/2010		

TEST PROCEDURES

ASTM STANDARD D 422 - Particle Size Analysis of Soils	WEIGHT OF DRY SOLIDS (grams) 506.5

VISUALLY ESTIMATED SHELL CONTENT (%) #N/A



GRAVEL		SAND			SILT	CLAY
COARSE	FINE	COARSE	MEDIUM	FINE		

PERCENT FINER (dry weight basis)

GRAVEL			COARSE SAND		MEDIUM SAND				FINE SAND						SILT / CLAY
3/4"	3/8"	No. 4	No. 7	No. 10	No. 14	No. 18	No. 25	No. 35	No. 45	No. 60	No. 80	No. 120	No. 170	No. 200	No. 230
100.0	100.0	99.9	99.5	99.0	98.4	97.6	96.6	95.0	91.9	85.7	66.1	17.1	8.2	6.4	5.2

VISUALLY ESTIMATED SHELL CONTENT (percent)

#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	Shell Content <5% (Amount not visually estimated)

TESTED BY: S.E. Hardison / B.S. Junker CHECKED BY: S.E. Hardison APPROVED BY: R.L. Denton, II, PE

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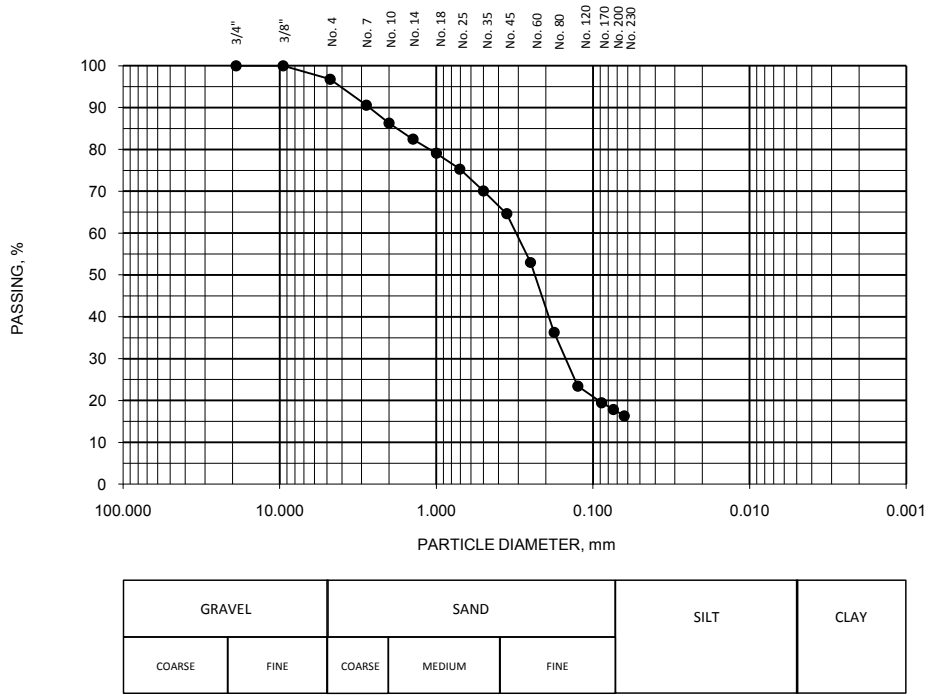
PROJECT NAME	Manteo (Old House Channel) 204 Study Area		
CLIENT	US Army Corps of Engineers	**BORING #**	MAN-10-V-23
PROJECT NO.	70105034	**SAMPLE #**	4
DATE SAMPLE RECEIVED	5/20/2010	**DEPTH, ft**	21.8-22.3
DATE TESTED	5/28/2010	**DESCRIPTION**	Silty Sand, SM
DATE REPORTED	6/1/2010		

TEST PROCEDURES

ASTM STANDARD D 422 - Particle Size Analysis of Soils	WEIGHT OF DRY SOLIDS (grams) 559.1

VISUALLY ESTIMATED SHELL CONTENT (%) #N/A



PERCENT FINER (dry weight basis)

GRAVEL			COARSE SAND		MEDIUM SAND				FINE SAND						SILT / CLAY
3/4"	3/8"	No. 4	No. 7	No. 10	No. 14	No. 18	No. 25	No. 35	No. 45	No. 60	No. 80	No. 120	No. 170	No. 200	No. 230
100.0	100.0	96.8	90.6	86.3	82.5	79.1	75.3	70.1	64.6	53.0	36.3	23.4	19.5	17.9	16.3

VISUALLY ESTIMATED SHELL CONTENT (percent)

#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	Shell Content <5% (Amount not visually estimated)

TESTED BY: S.E. Hardison / B.S. Junker CHECKED BY: S.E. Hardison APPROVED BY: R.L. Denton, II, PE

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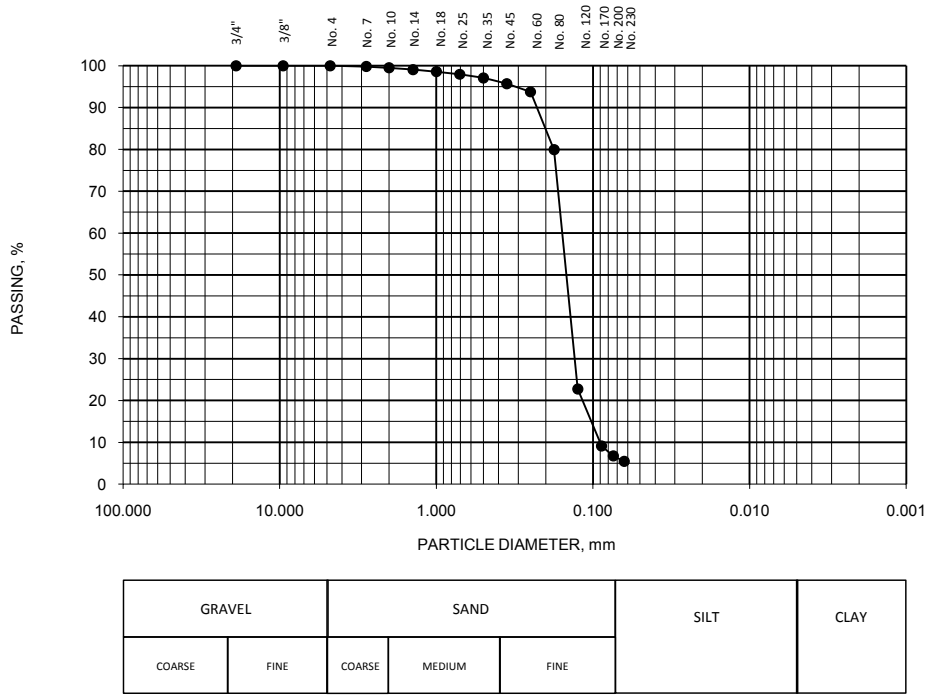
PROJECT NAME	Manteo (Old House Channel) 204 Study Area		
CLIENT	US Army Corps of Engineers	**BORING #**	MAN-10-V-24
PROJECT NO.	70105034	**SAMPLE #**	1
DATE SAMPLE RECEIVED	5/20/2010	**DEPTH, ft**	16.7-17.2
DATE TESTED	5/28/2010	**DESCRIPTION**	Poorly Graded Sand with Silt, SP-SM
DATE REPORTED	6/1/2010		

TEST PROCEDURES

ASTM STANDARD D 422 - Particle Size Analysis of Soils	WEIGHT OF DRY SOLIDS (grams) 476.3

VISUALLY ESTIMATED SHELL CONTENT (%) #N/A



PERCENT FINER (dry weight basis)

GRAVEL			COARSE SAND		MEDIUM SAND				FINE SAND						SILT / CLAY
3/4"	3/8"	No. 4	No. 7	No. 10	No. 14	No. 18	No. 25	No. 35	No. 45	No. 60	No. 80	No. 120	No. 170	No. 200	No. 230
100.0	100.0	100.0	99.8	99.5	99.1	98.6	97.9	97.1	95.7	93.7	79.9	22.8	9.1	6.7	5.4

VISUALLY ESTIMATED SHELL CONTENT (percent)

#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	Shell Content <5% (Amount not visually estimated)

TESTED BY: S.E. Hardison / B.S. Junker CHECKED BY: S.E. Hardison APPROVED BY: R.L. Denton, II, PE

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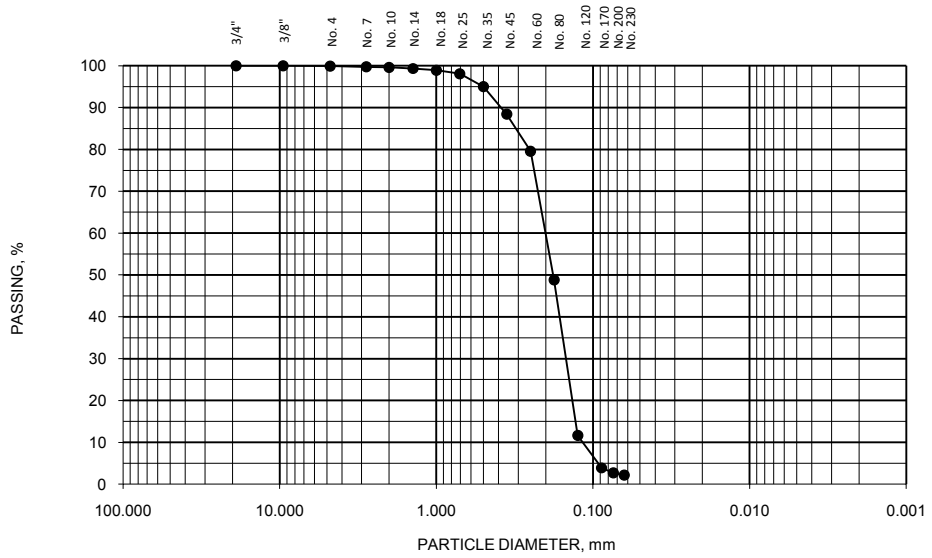
PROJECT NAME	Manteo (Old House Channel) 204 Study Area		
CLIENT	US Army Corps of Engineers	**BORING #**	MAN-10-V-24
PROJECT NO.	70105034	**SAMPLE #**	2
DATE SAMPLE RECEIVED	5/20/2010	**DEPTH, ft**	18.7-19.2
DATE TESTED	5/28/2010	**DESCRIPTION**	Poorly Graded Sand, SP
DATE REPORTED	6/1/2010		

TEST PROCEDURES

ASTM STANDARD D 422 - Particle Size Analysis of Soils	WEIGHT OF DRY SOLIDS (grams) 575.2

VISUALLY ESTIMATED SHELL CONTENT (%) #N/A



PERCENT FINER (dry weight basis)

GRAVEL			COARSE SAND		MEDIUM SAND				FINE SAND						SILT / CLAY
3/4"	3/8"	No. 4	No. 7	No. 10	No. 14	No. 18	No. 25	No. 35	No. 45	No. 60	No. 80	No. 120	No. 170	No. 200	No. 230
100.0	100.0	99.9	99.7	99.6	99.3	98.9	98.1	95.0	88.4	79.6	48.8	11.6	3.9	2.7	2.2

VISUALLY ESTIMATED SHELL CONTENT (percent)

#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	Shell Content <5% (Amount not visually estimated)

TESTED BY: S.E. Hardison / B.S. Junker CHECKED BY: S.E. Hardison APPROVED BY: R.L. Denton, II, PE

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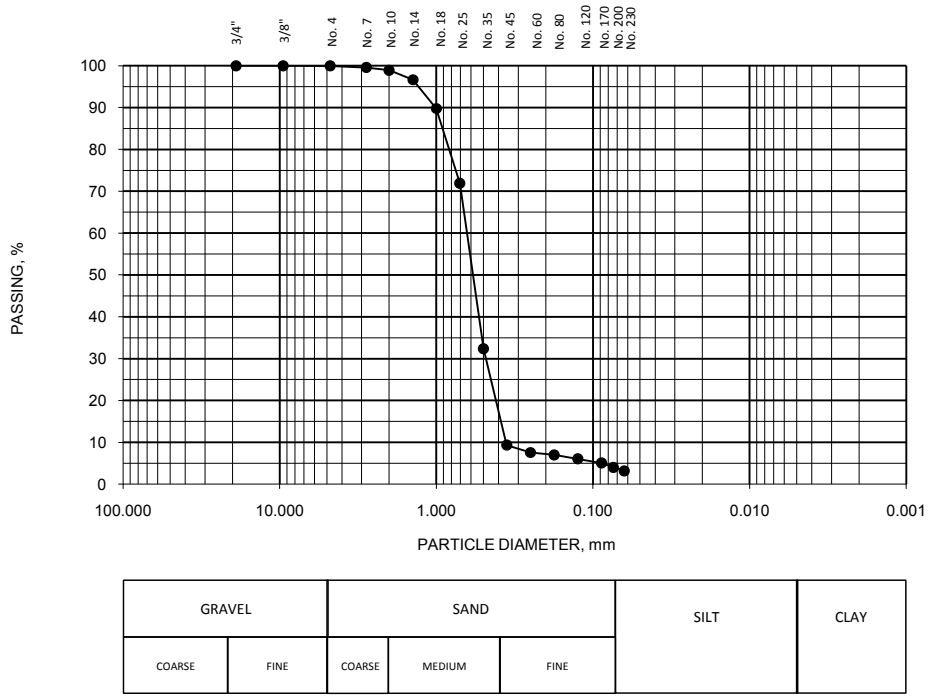
PROJECT NAME	Manteo (Old House Channel) 204 Study Area		
CLIENT	US Army Corps of Engineers	**BORING #**	MAN-10-V-24
PROJECT NO.	70105034	**SAMPLE #**	3
DATE SAMPLE RECEIVED	5/20/2010	**DEPTH, ft**	21.0-21.5
DATE TESTED	5/28/2010	**DESCRIPTION**	Poorly Graded Sand, SP
DATE REPORTED	6/1/2010		

TEST PROCEDURES

ASTM STANDARD D 422 - Particle Size Analysis of Soils	WEIGHT OF DRY SOLIDS (grams) 632.0

VISUALLY ESTIMATED SHELL CONTENT (%) #N/A



PERCENT FINER (dry weight basis)

GRAVEL			COARSE SAND		MEDIUM SAND				FINE SAND						SILT / CLAY
3/4"	3/8"	No. 4	No. 7	No. 10	No. 14	No. 18	No. 25	No. 35	No. 45	No. 60	No. 80	No. 120	No. 170	No. 200	No. 230
100.0	100.0	100.0	99.6	98.9	96.6	89.8	71.9	32.3	9.3	7.6	7.0	6.1	5.0	4.0	3.1

VISUALLY ESTIMATED SHELL CONTENT (percent)

#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	Shell Content <5% (Amount not visually estimated)

TESTED BY: S.E. Hardison / B.S. Junker CHECKED BY: S.E. Hardison APPROVED BY: R.L. Denton, II, PE

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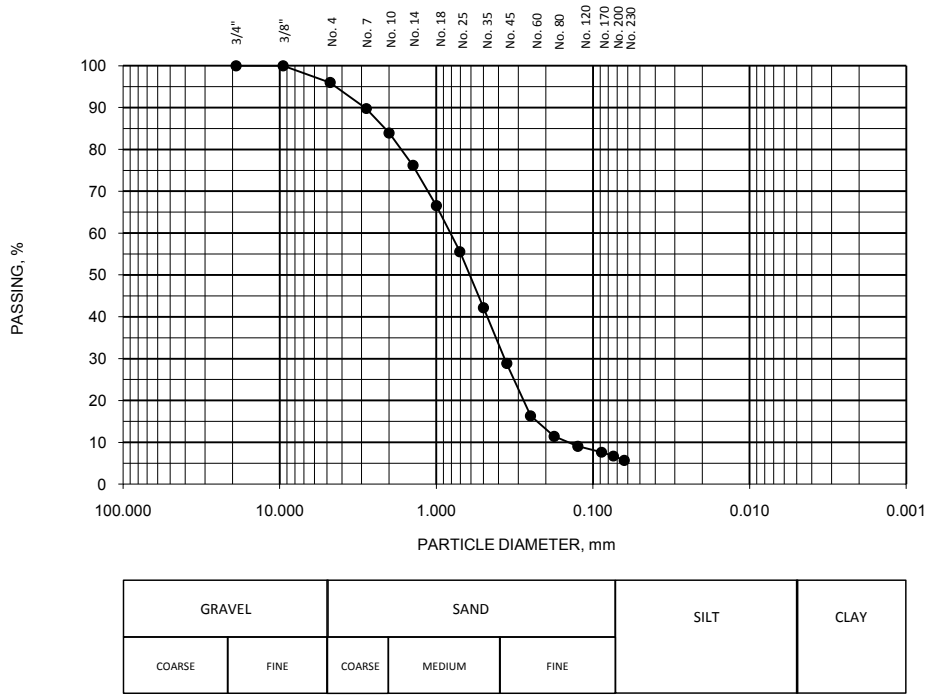
PROJECT NAME	Manteo (Old House Channel) 204 Study Area		
CLIENT	US Army Corps of Engineers	**BORING #**	MAN-10-V-24
PROJECT NO.	70105034	**SAMPLE #**	4
DATE SAMPLE RECEIVED	5/20/2010	**DEPTH, ft**	23.7-24.2
DATE TESTED	5/28/2010	**DESCRIPTION**	Poorly Graded Sand with Silt, SP-SM
DATE REPORTED	6/1/2010		

TEST PROCEDURES

ASTM STANDARD D 422 - Particle Size Analysis of Soils	WEIGHT OF DRY SOLIDS (grams) 596.0

VISUALLY ESTIMATED SHELL CONTENT (%) #N/A



PERCENT FINER (dry weight basis)

GRAVEL			COARSE SAND		MEDIUM SAND				FINE SAND						SILT / CLAY
3/4"	3/8"	No. 4	No. 7	No. 10	No. 14	No. 18	No. 25	No. 35	No. 45	No. 60	No. 80	No. 120	No. 170	No. 200	No. 230
100.0	100.0	96.0	89.8	83.9	76.2	66.6	55.6	42.1	28.8	16.3	11.4	9.1	7.6	6.7	5.7

VISUALLY ESTIMATED SHELL CONTENT (percent)

#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	Shell Content <5% (Amount not visually estimated)

TESTED BY: S.E. Hardison / B.S. Junker CHECKED BY: S.E. Hardison APPROVED BY: R.L. Denton, II, PE

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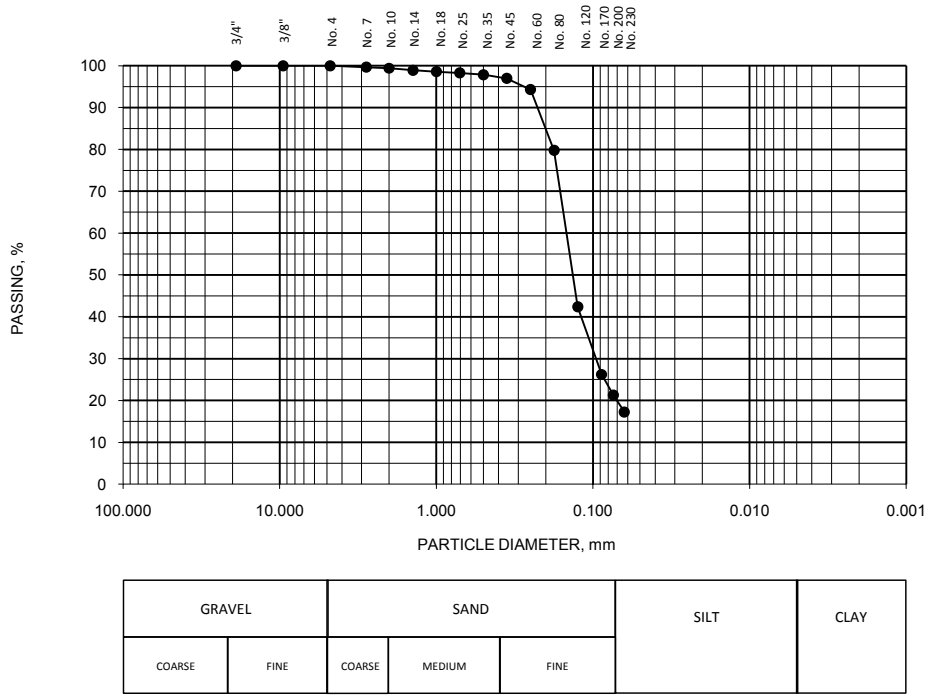
PROJECT NAME	Manteo (Old House Channel) 204 Study Area		
CLIENT	US Army Corps of Engineers	**BORING #**	MAN-10-V-25
PROJECT NO.	70105034	**SAMPLE #**	1
DATE SAMPLE RECEIVED	5/20/2010	**DEPTH, ft**	14.2-14.7
DATE TESTED	5/27/2010	**DESCRIPTION**	Silty Sand, SM
DATE REPORTED	6/1/2010		

TEST PROCEDURES

ASTM STANDARD D 422 - Particle Size Analysis of Soils	WEIGHT OF DRY SOLIDS (grams) 412.7

VISUALLY ESTIMATED SHELL CONTENT (%) #N/A



PERCENT FINER (dry weight basis)

GRAVEL			COARSE SAND		MEDIUM SAND				FINE SAND						SILT / CLAY
3/4"	3/8"	No. 4	No. 7	No. 10	No. 14	No. 18	No. 25	No. 35	No. 45	No. 60	No. 80	No. 120	No. 170	No. 200	No. 230
100.0	100.0	100.0	99.7	99.4	98.9	98.6	98.3	97.8	97.0	94.3	79.8	42.4	26.2	21.3	17.3

VISUALLY ESTIMATED SHELL CONTENT (percent)

#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	Shell Content <5% (Amount not visually estimated)

TESTED BY: S.E. Hardison / B.S. Junker CHECKED BY: S.E. Hardison APPROVED BY: R.L. Denton, II, PE

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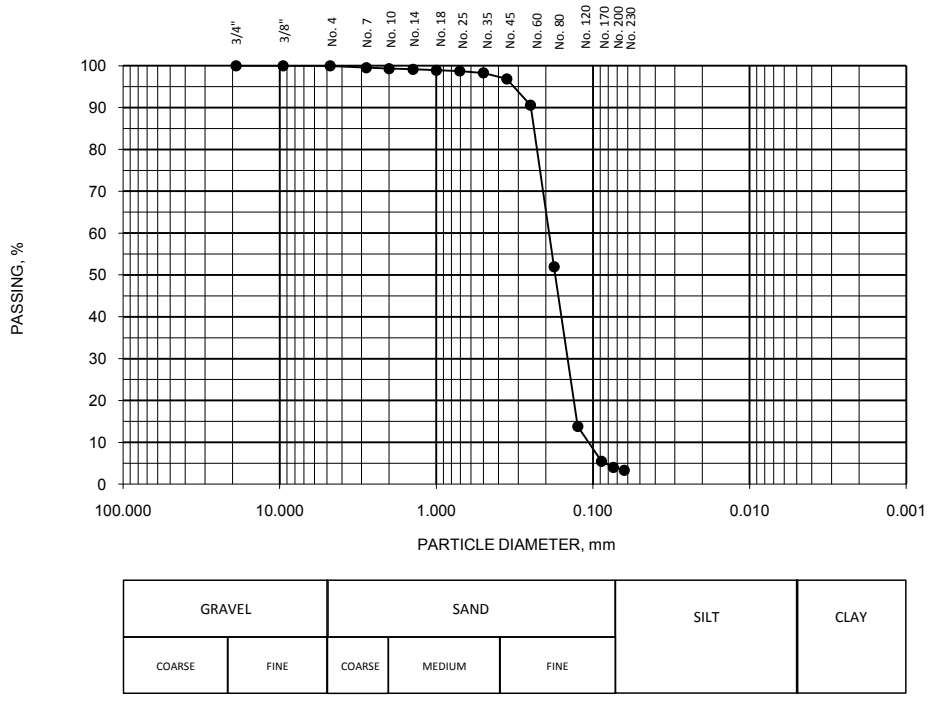
PROJECT NAME	Manteo (Old House Channel) 204 Study Area		
CLIENT	US Army Corps of Engineers	**BORING #**	MAN-10-V-25
PROJECT NO.	70105034	**SAMPLE #**	2
DATE SAMPLE RECEIVED	5/20/2010	**DEPTH, ft**	16.0-16.5
DATE TESTED	5/28/2010	**DESCRIPTION**	Poorly Graded Sand, SP
DATE REPORTED	6/1/2010		

TEST PROCEDURES

ASTM STANDARD D 422 - Particle Size Analysis of Soils	WEIGHT OF DRY SOLIDS (grams) 518.9

VISUALLY ESTIMATED SHELL CONTENT (%) #N/A



PERCENT FINER (dry weight basis)

GRAVEL			COARSE SAND		MEDIUM SAND				FINE SAND						SILT / CLAY
3/4"	3/8"	No. 4	No. 7	No. 10	No. 14	No. 18	No. 25	No. 35	No. 45	No. 60	No. 80	No. 120	No. 170	No. 200	No. 230
100.0	100.0	99.9	99.5	99.3	99.1	98.9	98.7	98.3	96.8	90.6	51.9	13.8	5.5	4.0	3.3

VISUALLY ESTIMATED SHELL CONTENT (percent)

#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	Shell Content <5% (Amount not visually estimated)

TESTED BY: S.E. Hardison / B.S. Junker CHECKED BY: S.E. Hardison APPROVED BY: R.L. Denton, II, PE

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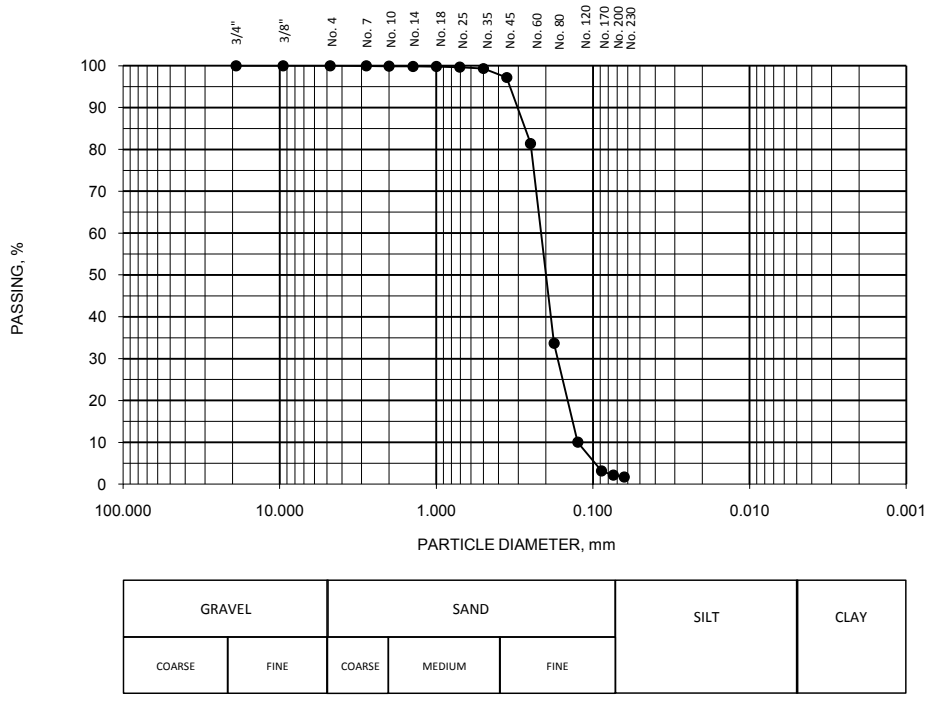
PROJECT NAME	Manteo (Old House Channel) 204 Study Area		
CLIENT	US Army Corps of Engineers	**BORING #**	MAN-10-V-25
PROJECT NO.	70105034	**SAMPLE #**	3
DATE SAMPLE RECEIVED	5/20/2010	**DEPTH, ft**	18.0-18.5
DATE TESTED	5/28/2010	**DESCRIPTION**	Poorly Graded Sand, SP
DATE REPORTED	6/1/2010		

TEST PROCEDURES

ASTM STANDARD D 422 - Particle Size Analysis of Soils	WEIGHT OF DRY SOLIDS (grams) 564.3

VISUALLY ESTIMATED SHELL CONTENT (%) #N/A



PERCENT FINER (dry weight basis)

GRAVEL			COARSE SAND		MEDIUM SAND				FINE SAND						SILT / CLAY
3/4"	3/8"	No. 4	No. 7	No. 10	No. 14	No. 18	No. 25	No. 35	No. 45	No. 60	No. 80	No. 120	No. 170	No. 200	No. 230
100.0	100.0	100.0	99.9	99.9	99.8	99.8	99.6	99.3	97.2	81.4	33.7	10.0	3.2	2.1	1.7

VISUALLY ESTIMATED SHELL CONTENT (percent)

#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	Shell Content <5% (Amount not visually estimated)

TESTED BY: S.E. Hardison / B.S. Junker CHECKED BY: S.E. Hardison APPROVED BY: R.L. Denton, II, PE

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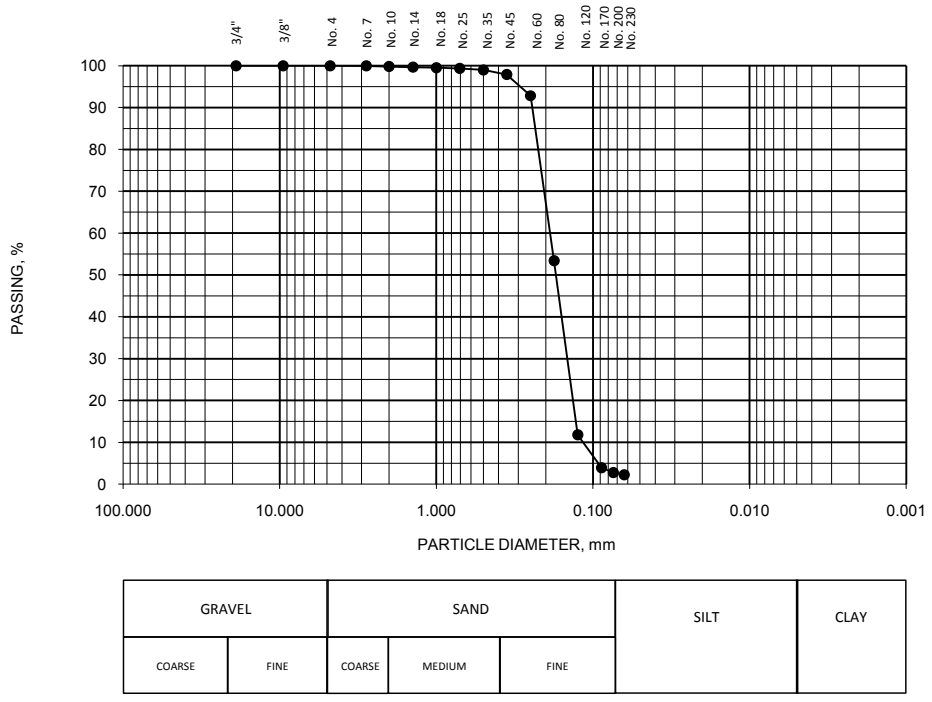
PROJECT NAME	Manteo (Old House Channel) 204 Study Area		
CLIENT	US Army Corps of Engineers	**BORING #**	MAN-10-V-25
PROJECT NO.	70105034	**SAMPLE #**	4
DATE SAMPLE RECEIVED	5/20/2010	**DEPTH, ft**	20.0-20.5
DATE TESTED	5/28/2010	**DESCRIPTION**	Poorly Graded Sand, SP
DATE REPORTED	6/1/2010		

TEST PROCEDURES

ASTM STANDARD D 422 - Particle Size Analysis of Soils	WEIGHT OF DRY SOLIDS (grams) 529.5

VISUALLY ESTIMATED SHELL CONTENT (%) #N/A



PERCENT FINER (dry weight basis)

GRAVEL			COARSE SAND		MEDIUM SAND				FINE SAND						SILT / CLAY
3/4"	3/8"	No. 4	No. 7	No. 10	No. 14	No. 18	No. 25	No. 35	No. 45	No. 60	No. 80	No. 120	No. 170	No. 200	No. 230
100.0	100.0	100.0	99.9	99.8	99.6	99.5	99.3	99.0	97.9	92.8	53.4	11.8	3.9	2.8	2.2

VISUALLY ESTIMATED SHELL CONTENT (percent)

#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	Shell Content <5% (Amount not visually estimated)

TESTED BY: S.E. Hardison / B.S. Junker CHECKED BY: S.E. Hardison APPROVED BY: R.L. Denton, II, PE

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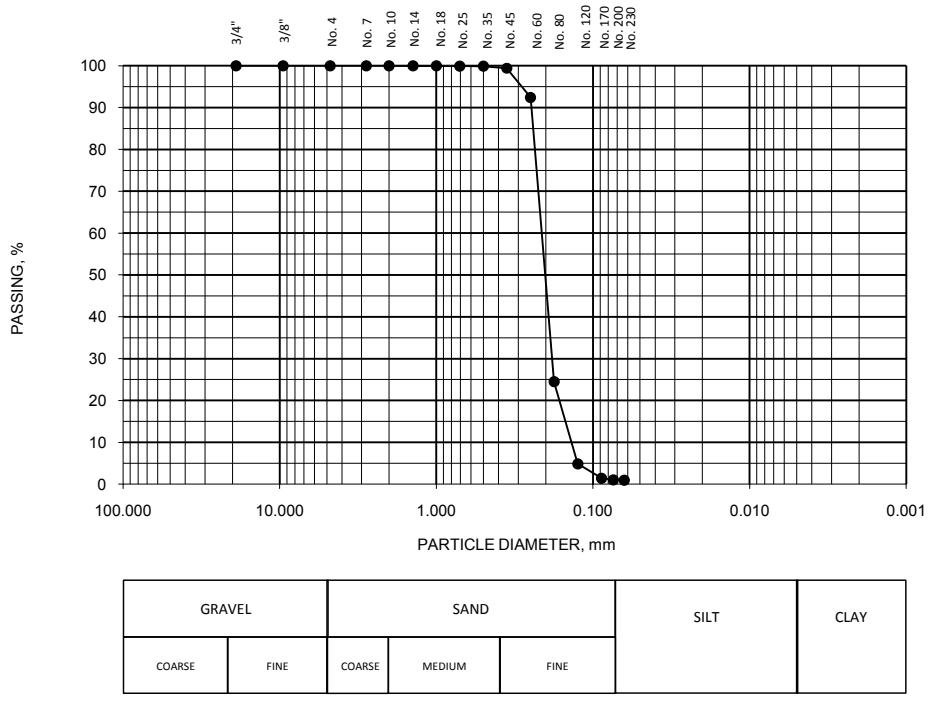
PROJECT NAME	Manteo (Old House Channel) 204 Study Area		
CLIENT	US Army Corps of Engineers	**BORING #**	MAN-10-V-26
PROJECT NO.	70105034	**SAMPLE #**	1
DATE SAMPLE RECEIVED	5/20/2010	**DEPTH, ft**	15.3-15.8
DATE TESTED	5/27/2010	**DESCRIPTION**	Poorly Graded Sand, SP
DATE REPORTED	6/1/2010		

TEST PROCEDURES

ASTM STANDARD D 422 - Particle Size Analysis of Soils	WEIGHT OF DRY SOLIDS (grams) 511.0

VISUALLY ESTIMATED SHELL CONTENT (%) #N/A



PERCENT FINER (dry weight basis)

GRAVEL			COARSE SAND		MEDIUM SAND				FINE SAND						SILT / CLAY
3/4"	3/8"	No. 4	No. 7	No. 10	No. 14	No. 18	No. 25	No. 35	No. 45	No. 60	No. 80	No. 120	No. 170	No. 200	No. 230
100.0	100.0	100.0	100.0	100.0	100.0	99.9	99.9	99.9	99.4	92.4	24.5	4.9	1.4	1.0	0.9

VISUALLY ESTIMATED SHELL CONTENT (percent)

#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	Shell Content <5% (Amount not visually estimated)

TESTED BY: S.E. Hardison / B.S. Junker CHECKED BY: S.E. Hardison APPROVED BY: R.L. Denton, II, PE

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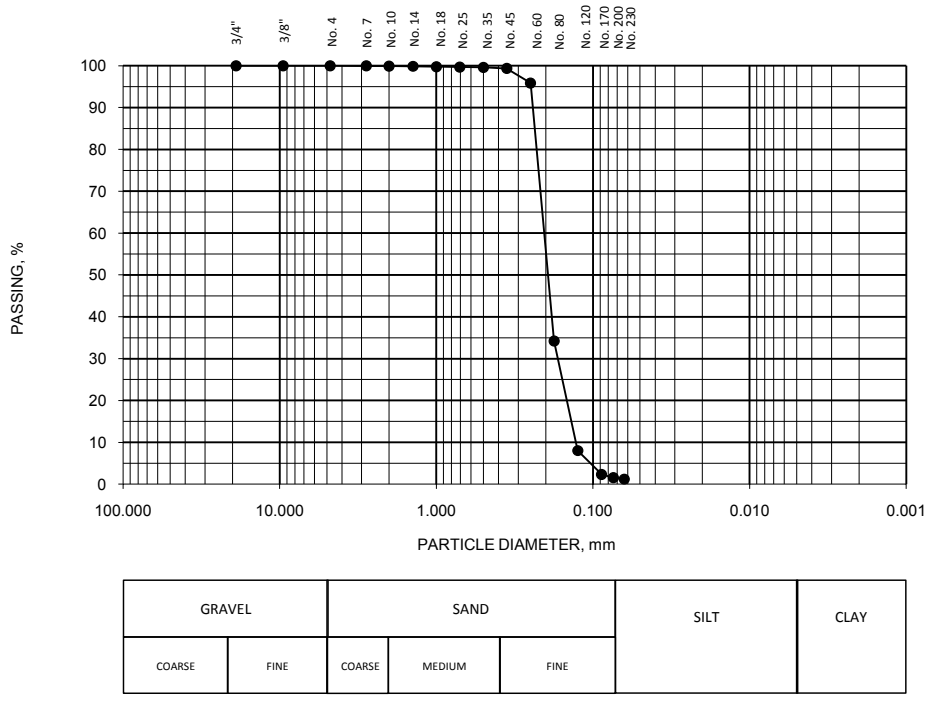
PROJECT NAME	Manteo (Old House Channel) 204 Study Area		
CLIENT	US Army Corps of Engineers	**BORING #**	MAN-10-V-26
PROJECT NO.	70105034	**SAMPLE #**	2
DATE SAMPLE RECEIVED	5/20/2010	**DEPTH, ft**	17.5-18.0
DATE TESTED	5/28/2010	**DESCRIPTION**	Poorly Graded Sand, SP
DATE REPORTED	6/1/2010		

TEST PROCEDURES

ASTM STANDARD D 422 - Particle Size Analysis of Soils	WEIGHT OF DRY SOLIDS (grams) 496.6

VISUALLY ESTIMATED SHELL CONTENT (%) #N/A



PERCENT FINER (dry weight basis)

GRAVEL			COARSE SAND		MEDIUM SAND				FINE SAND						SILT / CLAY
3/4"	3/8"	No. 4	No. 7	No. 10	No. 14	No. 18	No. 25	No. 35	No. 45	No. 60	No. 80	No. 120	No. 170	No. 200	No. 230
100.0	100.0	100.0	100.0	99.9	99.9	99.8	99.7	99.6	99.4	95.9	34.2	8.0	2.3	1.5	1.2

VISUALLY ESTIMATED SHELL CONTENT (percent)

#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	Shell Content <5% (Amount not visually estimated)

TESTED BY: S.E. Hardison / B.S. Junker CHECKED BY: S.E. Hardison APPROVED BY: R.L. Denton, II, PE

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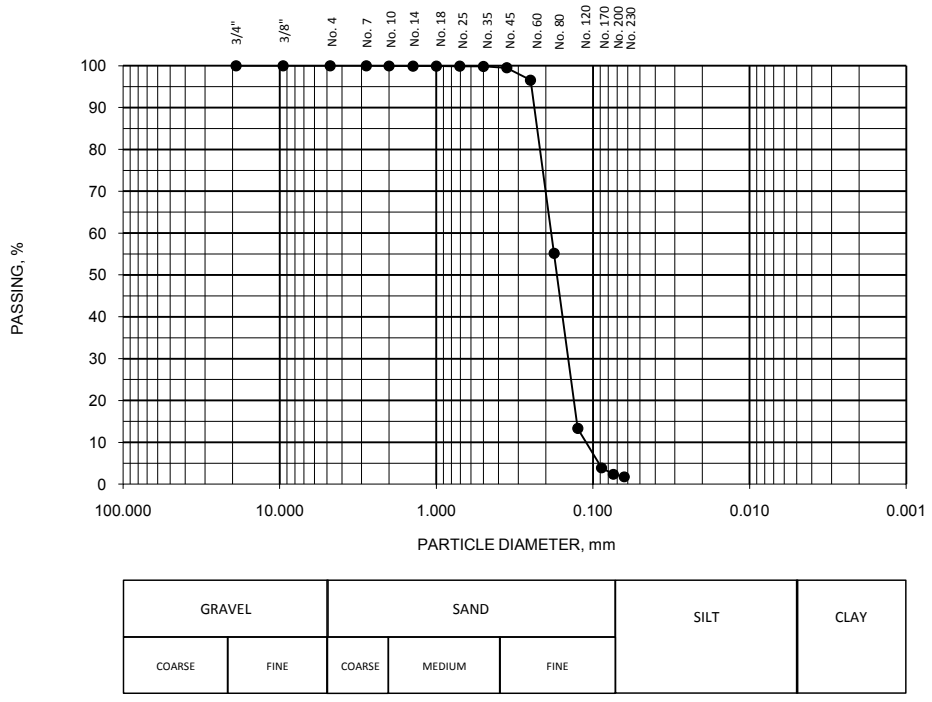
PROJECT NAME	Manteo (Old House Channel) 204 Study Area		
CLIENT	US Army Corps of Engineers	**BORING #**	MAN-10-V-26
PROJECT NO.	70105034	**SAMPLE #**	3
DATE SAMPLE RECEIVED	5/20/2010	**DEPTH, ft**	19.0-19.5
DATE TESTED	5/28/2010	**DESCRIPTION**	Poorly Graded Sand, SP
DATE REPORTED	6/1/2010		

TEST PROCEDURES

ASTM STANDARD D 422 - Particle Size Analysis of Soils	WEIGHT OF DRY SOLIDS (grams) 488.3

VISUALLY ESTIMATED SHELL CONTENT (%) #N/A



PERCENT FINER (dry weight basis)

GRAVEL			COARSE SAND		MEDIUM SAND				FINE SAND						SILT / CLAY
3/4"	3/8"	No. 4	No. 7	No. 10	No. 14	No. 18	No. 25	No. 35	No. 45	No. 60	No. 80	No. 120	No. 170	No. 200	No. 230
100.0	100.0	100.0	100.0	99.9	99.9	99.9	99.9	99.8	99.5	96.6	55.2	13.3	3.9	2.4	1.7

VISUALLY ESTIMATED SHELL CONTENT (percent)

#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	Shell Content <5% (Amount not visually estimated)

TESTED BY: S.E. Hardison / B.S. Junker CHECKED BY: S.E. Hardison APPROVED BY: R.L. Denton, II, PE

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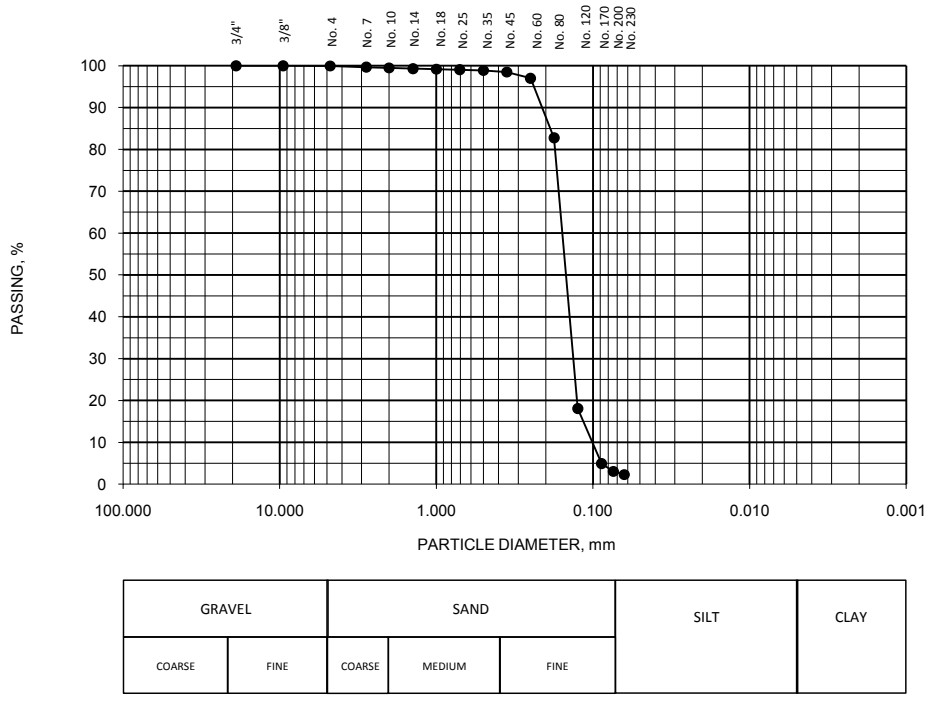
PROJECT NAME	Manteo (Old House Channel) 204 Study Area		
CLIENT	US Army Corps of Engineers	**BORING #**	MAN-10-V-27
PROJECT NO.	70105034	**SAMPLE #**	1
DATE SAMPLE RECEIVED	5/20/2010	**DEPTH, ft**	14.8-15.3
DATE TESTED	5/28/2010	**DESCRIPTION**	Poorly Graded Sand, SP
DATE REPORTED	6/1/2010		

TEST PROCEDURES

ASTM STANDARD D 422 - Particle Size Analysis of Soils	WEIGHT OF DRY SOLIDS (grams) 458.8

VISUALLY ESTIMATED SHELL CONTENT (%) #N/A



PERCENT FINER (dry weight basis)

GRAVEL			COARSE SAND		MEDIUM SAND				FINE SAND						SILT / CLAY
3/4"	3/8"	No. 4	No. 7	No. 10	No. 14	No. 18	No. 25	No. 35	No. 45	No. 60	No. 80	No. 120	No. 170	No. 200	No. 230
100.0	100.0	99.9	99.7	99.5	99.3	99.2	99.0	98.9	98.5	97.0	82.7	18.1	4.9	3.1	2.3

VISUALLY ESTIMATED SHELL CONTENT (percent)

#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	Shell Content <5% (Amount not visually estimated)

TESTED BY: S.E. Hardison / B.S. Junker CHECKED BY: S.E. Hardison APPROVED BY: R.L. Denton, II, PE

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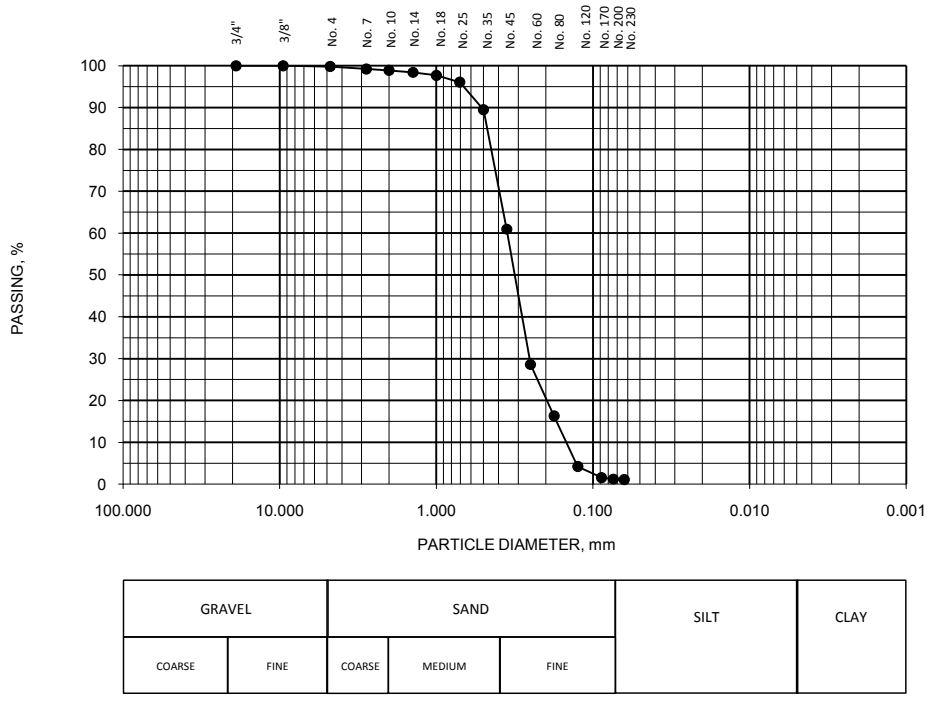
PROJECT NAME	Manteo (Old House Channel) 204 Study Area		
CLIENT	US Army Corps of Engineers	**BORING #**	MAN-10-V-27
PROJECT NO.	70105034	**SAMPLE #**	2
DATE SAMPLE RECEIVED	5/20/2010	**DEPTH, ft**	16.8-17.3
DATE TESTED	5/28/2010	**DESCRIPTION**	Poorly Graded Sand, SP
DATE REPORTED	6/1/2010		

TEST PROCEDURES

ASTM STANDARD D 422 - Particle Size Analysis of Soils	WEIGHT OF DRY SOLIDS (grams) 562.4

VISUALLY ESTIMATED SHELL CONTENT (%) #N/A



PERCENT FINER (dry weight basis)

GRAVEL			COARSE SAND		MEDIUM SAND				FINE SAND						SILT / CLAY
3/4"	3/8"	No. 4	No. 7	No. 10	No. 14	No. 18	No. 25	No. 35	No. 45	No. 60	No. 80	No. 120	No. 170	No. 200	No. 230
100.0	100.0	99.8	99.2	98.9	98.4	97.7	96.1	89.5	60.9	28.6	16.3	4.2	1.6	1.2	1.1

VISUALLY ESTIMATED SHELL CONTENT (percent)

#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	Shell Content <5% (Amount not visually estimated)

TESTED BY: S.E. Hardison / B.S. Junker CHECKED BY: S.E. Hardison APPROVED BY: R.L. Denton, II, PE

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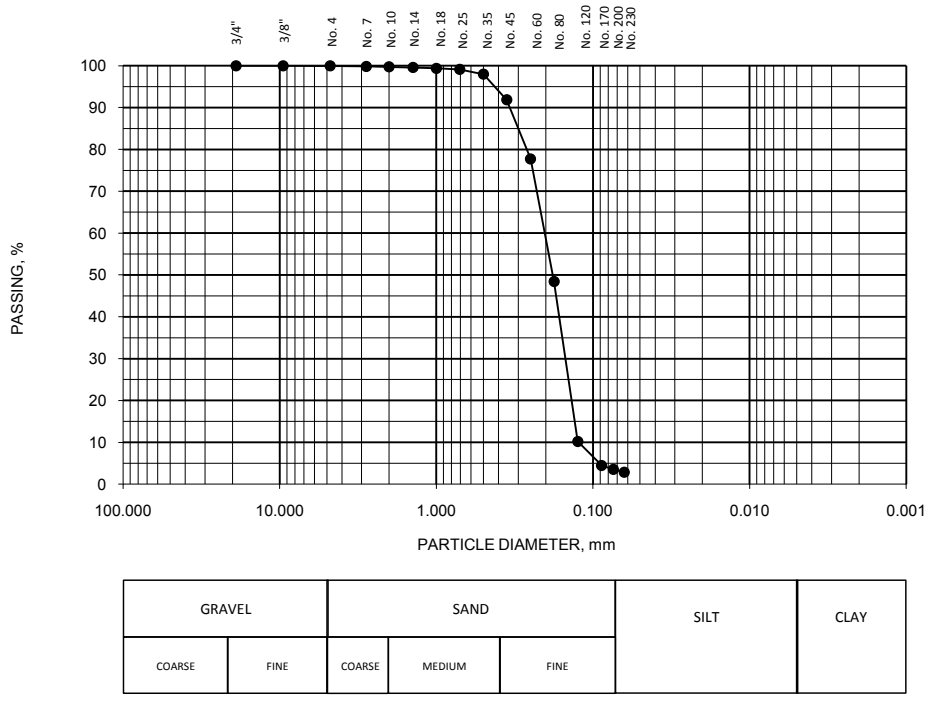
PROJECT NAME	Manteo (Old House Channel) 204 Study Area		
CLIENT	US Army Corps of Engineers	**BORING #**	MAN-10-V-27
PROJECT NO.	70105034	**SAMPLE #**	3
DATE SAMPLE RECEIVED	5/20/2010	**DEPTH, ft**	17.3-18.1
DATE TESTED	5/28/2010	**DESCRIPTION**	Poorly Graded Sand, SP
DATE REPORTED	6/1/2010		

TEST PROCEDURES

ASTM STANDARD D 422 - Particle Size Analysis of Soils	WEIGHT OF DRY SOLIDS (grams) 554.9

VISUALLY ESTIMATED SHELL CONTENT (%) #N/A



PERCENT FINER (dry weight basis)

GRAVEL			COARSE SAND		MEDIUM SAND				FINE SAND						SILT / CLAY
3/4"	3/8"	No. 4	No. 7	No. 10	No. 14	No. 18	No. 25	No. 35	No. 45	No. 60	No. 80	No. 120	No. 170	No. 200	No. 230
100.0	100.0	99.9	99.8	99.7	99.6	99.4	99.1	98.0	91.8	77.7	48.4	10.2	4.5	3.5	2.8

VISUALLY ESTIMATED SHELL CONTENT (percent)

#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	Shell Content <5% (Amount not visually estimated)

TESTED BY: S.E. Hardison / B.S. Junker CHECKED BY: S.E. Hardison APPROVED BY: R.L. Denton, II, PE

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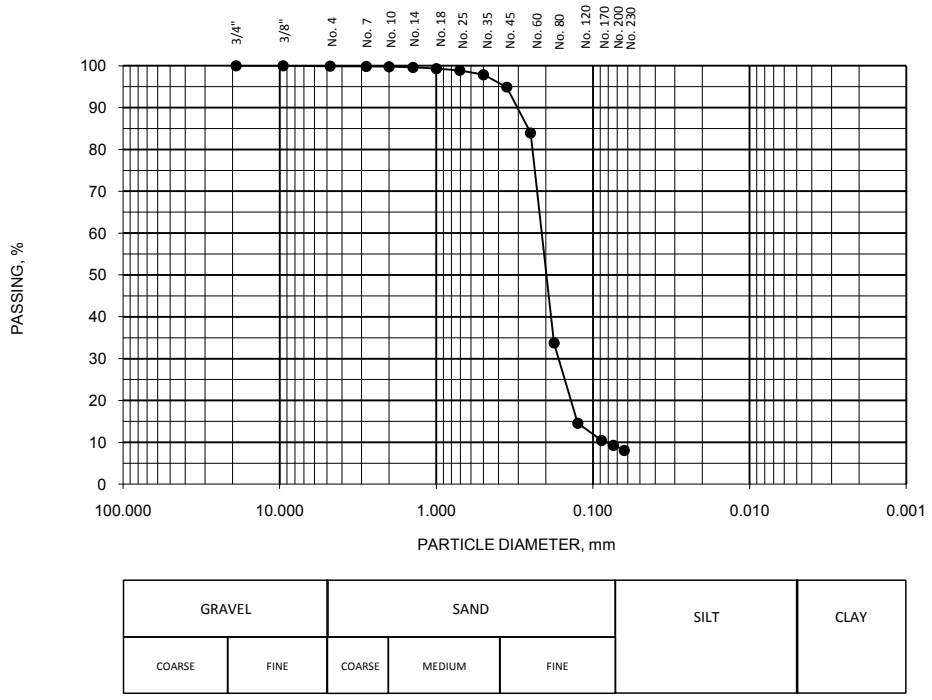
PROJECT NAME	Manteo (Old House Channel) 204 Study Area		
CLIENT	US Army Corps of Engineers	**BORING #**	MAN-10-V-27
PROJECT NO.	70105034	**SAMPLE #**	4
DATE SAMPLE RECEIVED	5/20/2010	**DEPTH, ft**	19.5-20.0
DATE TESTED	5/28/2010	**DESCRIPTION**	Poorly Graded Sand with Silt, SP-SM
DATE REPORTED	6/1/2010		

TEST PROCEDURES

ASTM STANDARD D 422 - Particle Size Analysis of Soils	WEIGHT OF DRY SOLIDS (grams) 571.3

VISUALLY ESTIMATED SHELL CONTENT (%) #N/A



PERCENT FINER (dry weight basis)

GRAVEL			COARSE SAND		MEDIUM SAND				FINE SAND						SILT / CLAY
3/4"	3/8"	No. 4	No. 7	No. 10	No. 14	No. 18	No. 25	No. 35	No. 45	No. 60	No. 80	No. 120	No. 170	No. 200	No. 230
100.0	100.0	99.9	99.8	99.8	99.6	99.3	98.9	97.8	94.9	83.9	33.7	14.6	10.4	9.3	8.1

VISUALLY ESTIMATED SHELL CONTENT (percent)

#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	Shell Content <5% (Amount not visually estimated)

TESTED BY: S.E. Hardison / B.S. Junker CHECKED BY: S.E. Hardison APPROVED BY: R.L. Denton, II, PE

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