APPENDIX 10
2005 & 2009 USACE VIBRACORE LOGS, GRANULARMETRIC REPORTS & GRAIN SIZE DISTRIBUTION CURVES

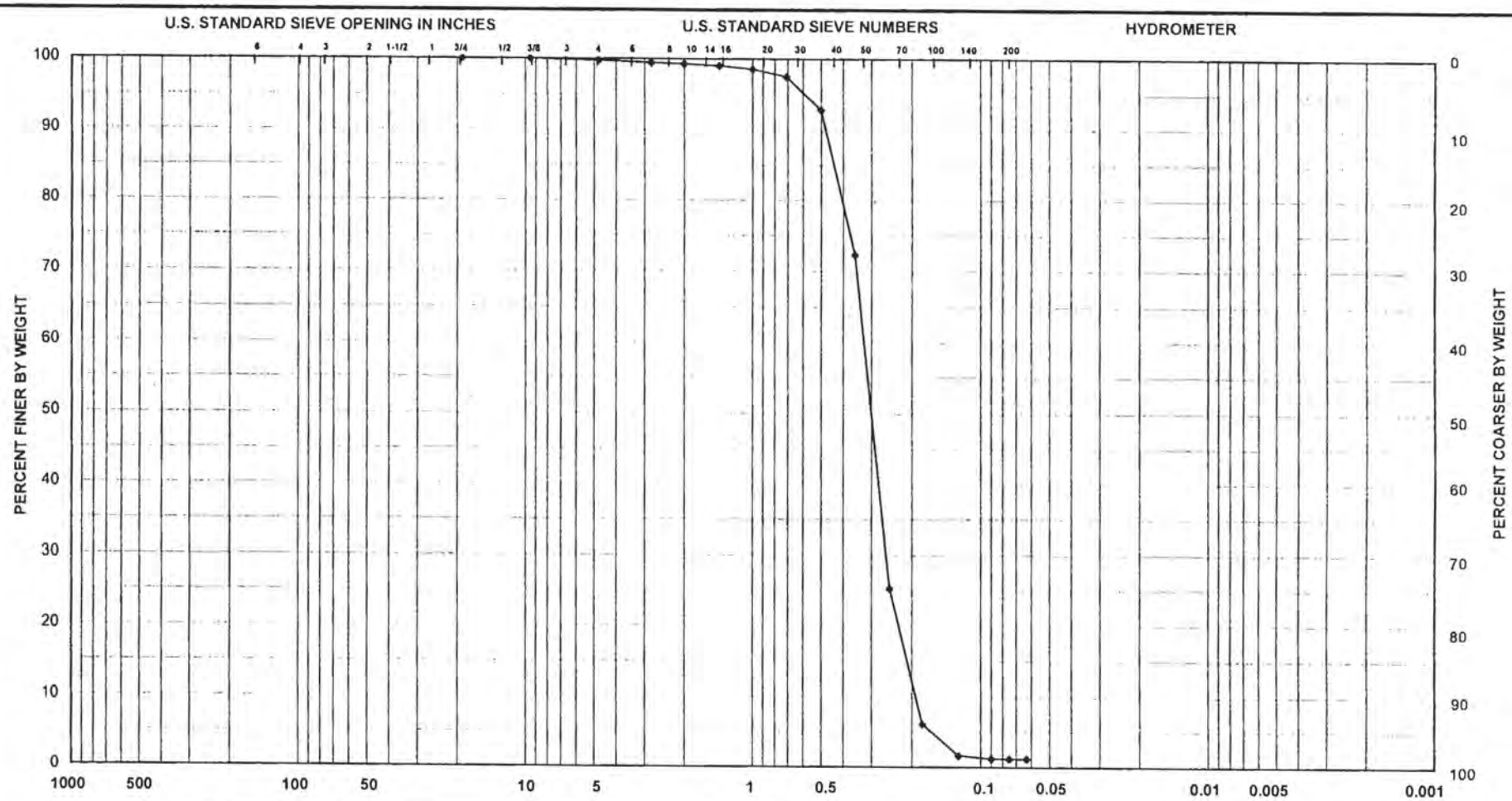
Hole No. 01-05-03

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

1. PROJECT OCEAN ISLE RENOURISHMENT	10. SIZE AND TYPE OF BIT 4" Dia. Vibracore
2. LOCATION (Coordinates or Station) NC Coord. E 2188487.9 N 55049.4	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) : 01-05-03	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 (7.7' of Water)	16. DATE HOLE : STARTED : 4/20/05 : COMPLETED : 4/20/05
8. DEPTH DRILLED INTO ROCK 0.0'	17. ELEVATION TOP OF HOLE 0.0 MLLW
9. TOTAL DEPTH OF HOLE 13.9'	18. TOTAL CORE RECOVERY FOR BORING N/A %
	19. SIGNATURE OF INSPECTOR KELLY KALTENBACH, GEOLOGIST TRAINEE

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 7.7' WATER			Time begin vibracoring: 1439 hrs. Soils described by Kelley J. Kaltenbach, Geologist-Trainee.
	7.0					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.
-7.7	7.7		OCEAN BOTTOM @7.7'		7.7'	
	8.0		SP Tan-light gray, fine to coarse sand, clean, poorly graded, w/some fine to medium sand size shell material.		1	
					8.2'	VIBRACORE BORING From 7.7' to 13.7' Ran 6.2' Rec: 6.2' 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.
	9.0					
			9.7' decreasing shell content, trace fine shells.			
	10.0					
					10.7'	
	11.0				2	LAB CLASSIFICATION: Jar Number 1 SP; 2 SP; 3 SP
					11.2'	
	12.0					
	13.0				13.2'	NOTE Assumed vibracore refusal @ 13.9'
			SP-SM Gray to dark gray, fine medium silty sand, traces silt trace shell, few silt seams. trace coarse shell material.		3	
					13.7'	
-13.9	13.9		BOTTOM OF HOLE @13.9'			

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



Sample No.	Elev. Or Depth	Classification	% CO_3	G_s	Nat w%	LL	PL	PI
◆ 1	7.7'- 8.2'	SAND, poorly-graded, mostly fine-grained quartz, little carbonate, trace silt, light olive brown (SP)	22					

Project	Ocean Isle Renourishment
Area	
Boring No.	OI-05-03
Date	8/1/2005

GRADATION CURVES

ENG FORM 2087

MAY 63

WOLF TECHNOLOGIES, INC.

3047-4 St. Johns Bluff Road S.
Jacksonville, Florida 32246
(904) 997-1400 (Tel) · (904) 997-9150 (Fax)

VISUAL SHELL CONTENT

GRAIN SIZE AND VISUAL SHELL CONTENT

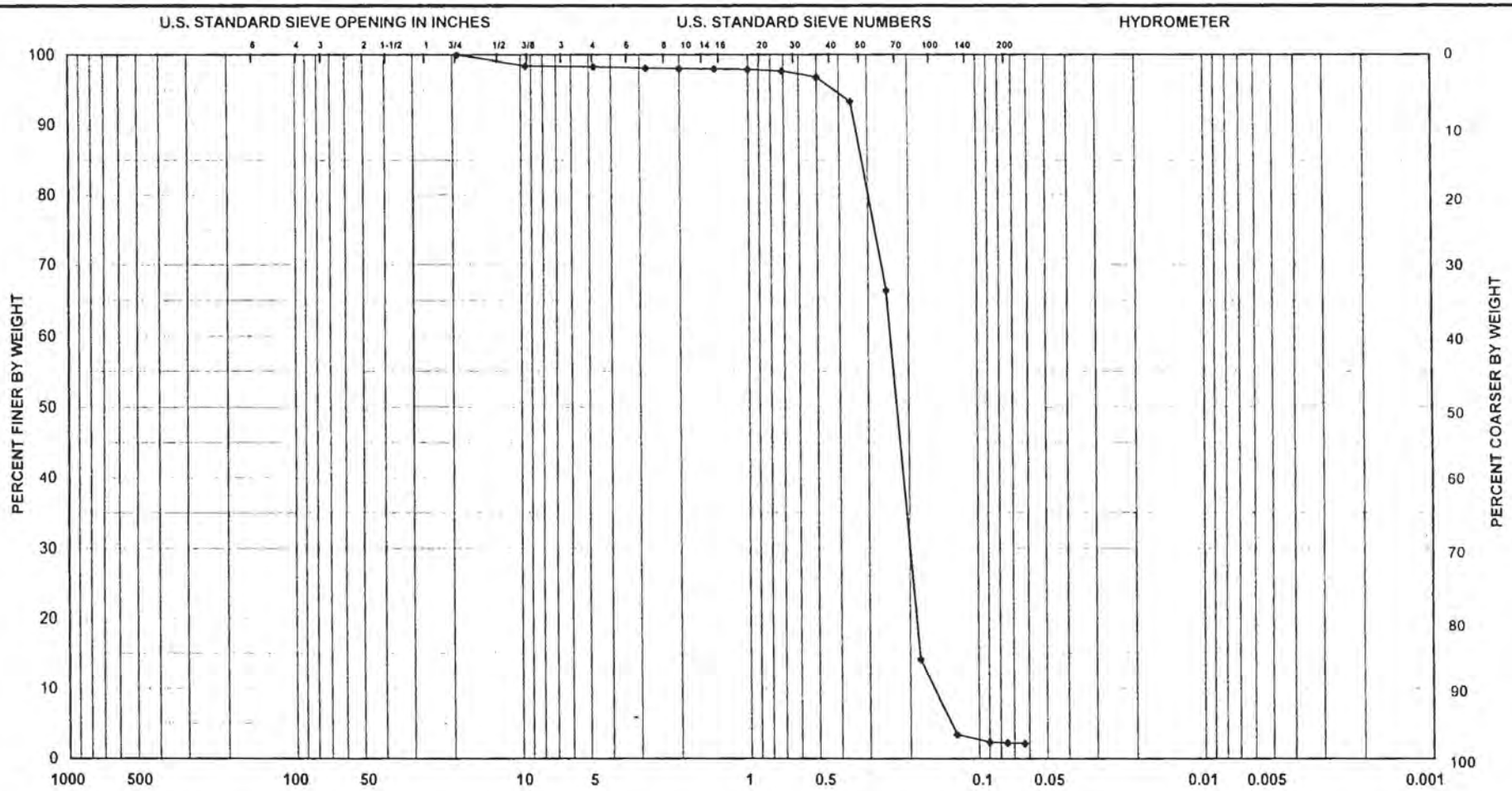
Project:	**Ocean Isle Renourishment**	**Depth:**	**7.7'- 8.2'**
Project No.:	**2216-01-60**	**Date:**	**8/1/2005**
Boring No.:	**OI-05-3**		
Sample No.:	**1**		
Description:	**SAND, poorly-graded, mostly fine-grained quartz, little carbonate, trace silt, light olive brown (SP)**		

Tare Weight, (g):	50.73	
Dry Wt. Before Washing (g):	158.51	(with tare)
Dry Weight After Washing (g):	157.68	(with tare)

Sieve Size (Name)	Sieve Size (mm)	Weight Retained (g)	% Passing	Approx. Visual Shell %	Approx. Visual Shell Wt. (g)
3/4"	19.000	0.00	100.00	0	0.00
3/8"	9.500	0.00	100.00	0	0.00
#4	4.750	0.28	99.74	100	0.28
#7	2.800	0.34	99.42	100	0.34
#10	2.000	0.14	99.29	100	0.14
#14	1.400	0.29	99.03	100	0.29
#18	1.000	0.51	98.55	95	0.48
#25	0.710	1.14	97.49	90	1.03
#35	0.500	4.97	92.88	70	3.48
#45	0.355	22.16	72.32	50	11.08
#60	0.250	50.72	25.26	30	15.22
#80	0.180	20.66	6.10	10	2.07
#120	0.125	4.81	1.63	5	0.24
#170	0.090	0.45	1.22	1	0.00
#200	0.075	0.04	1.18	1	0.00
#230	0.063	0.01	1.17	1	0.00

Total Shell Content: **22** **%**

cw 8/2/05



Sample No.	Elev. Or Depth	Classification	% CO_3	G_s	Nat w%	LL	PL	PI
• 2	10.7'- 11.2'	SAND, poorly-graded, mostly fine-grained quartz, little carbonate, trace silt, light olive brown (SP)	24					

Project Ocean Isle Renourishment

Area

Boring No. OI-05-03

Date 8/1/2005

GRADATION CURVES

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VISUAL SHELL CONTENT

GRAIN SIZE AND VISUAL SHELL CONTENT

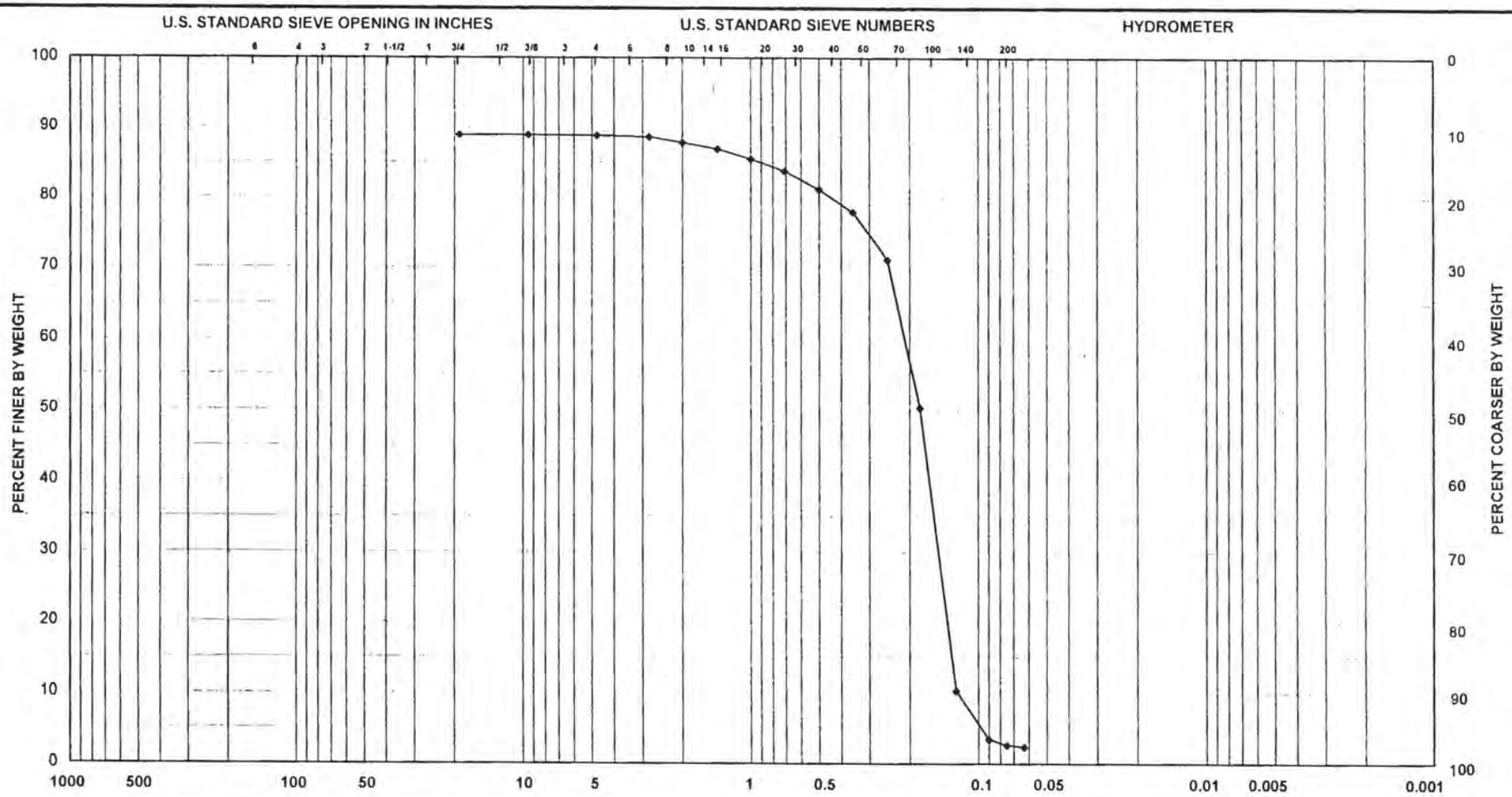
Project:	**Ocean Isle Renourishment**	**Depth:**	**10.7'- 11.2'**
Project No.:	**2216-01-60**	**Date:**	**8/1/2005**
Boring No.:	**OI-05-3**		
Sample No.:	**2**		
Description:	**SAND, poorly-graded, mostly fine-grained quartz, little carbonate, trace silt, light olive brown (SP)**		

Tare Weight, (g):	49.82	
Dry Wt. Before Washing (g):	140.33	(with tare)
Dry Weight After Washing (g):	139.05	(with tare)

Sieve Size (Name)	Sieve Size (mm)	Weight Retained (g)	% Passing	Approx. Visual Shell %	Approx. Visual Shell Wt. (g)
3/4"	19.000	0.00	100.00	0	0.00
3/8"	9.500	1.37	98.49	100	1.37
#4	4.750	0.09	98.39	100	0.09
#7	2.800	0.19	98.18	100	0.19
#10	2.000	0.06	98.11	100	0.06
#14	1.400	0.03	98.08	100	0.03
#18	1.000	0.07	98.00	100	0.07
#25	0.710	0.21	97.77	95	0.20
#35	0.500	0.75	96.94	80	0.60
#45	0.355	3.17	93.44	70	2.22
#60	0.250	24.51	66.36	50	12.26
#80	0.180	47.33	14.06	30	14.20
#120	0.125	9.67	3.38	20	1.93
#170	0.090	0.96	2.32	5	0.05
#200	0.075	0.09	2.22	1	0.00
#230	0.063	0.05	2.17	1	0.00

Total Shell Content: **24** **%**

CM 8/22/05



Sample No.	Elev. Or Depth	Classification	% CO_3	G_s	Nat w%	LL	PL	PI
• 3	13.2'- 13.7'	SAND, poorly-graded, mostly fine-grained quartz, little carbonate, trace silt, light olive brown (SP)	24					

Project	Ocean Isle Renourishment
Area	
Boring No.	OI-05-03
Date	8/1/2005

GRADATION CURVES

ENG FORM 2087

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VISUAL SHELL CONTENT

GRAIN SIZE AND VISUAL SHELL CONTENT

Project:	**Ocean Isle Renourishment**	**Depth:**	**13.2'- 13.7'**
Project No.:	**2216-01-60**	**Date:**	**8/1/2005**
Boring No.:	**OI-05-03**		
Sample No.:	**3**		
Description:	**SAND, poorly-graded, mostly fine-grained quartz, little carbonate, trace silt, light olive brown (SP)**		

Tare Weight, (g):	50.77	
Dry Wt. Before Washing (g):	166.68	(with tare)
Dry Weight After Washing (g):	164.16	(with tare)

Sieve Size (Name)	Sieve Size (mm)	Weight Retained (g)	% Passing	Approx. Visual Shell %	Approx. Visual Shell Wt. (g)
3/4"	19.000	12.89	88.88	100	12.89
3/8"	9.500	0.00	88.88	0	0.00
#4	4.750	0.09	88.80	100	0.09
#7	2.800	0.22	88.61	100	0.22
#10	2.000	0.98	87.77	100	0.98
#14	1.400	1.04	86.87	100	1.04
#18	1.000	1.65	85.45	100	1.65
#25	0.710	2.00	83.72	95	1.90
#35	0.500	3.01	81.12	80	2.41
#45	0.355	3.76	77.88	70	2.63
#60	0.250	7.84	71.12	50	3.92
#80	0.180	24.12	50.31	30	7.24
#120	0.125	46.37	10.30	10	4.64
#170	0.090	8.05	3.36	5	0.40
#200	0.075	0.95	2.54	1	0.01
#230	0.063	0.33	2.25	1	0.00

Total Shell Content: 24 %

8/2/05

Hole No. OI-05-05

DRILLING LOG	DIVISION SOUTH ATLANTIC	INSTALLATION WILMINGTON DISTRICT	SHEET 1 OF 1 SHEETS
1. PROJECT OCEAN ISLE RENOURISHMENT		10. SIZE AND TYPE OF BIT 4" Dia. Vibracore	
2. LOCATION (Coordinates or Station) NC Coord. E 2187652.9 N 56197.5		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) OI-05-05		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 4/20/05 : COMPLETED 4/20/05	
7. THICKNESS OF OVERBURDEN N/A (2.9' 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 11.9'		19. SIGNATURE OF INSPECTOR KELLY KALTENBACH, GEOLOGIST TRAINEE	

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 2.9' WATER			Time begin vibracoring: 1242 hrs. Soils described by Kelley J. Kaltenbach, Geologist-Trainee.
	2.0					
-2.9	2.9		OCEAN BOTTOM @ 2.9'		2.9'	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.
			SP Tan to light gray, fine to coarse sand, clean poorly graded, little shell material (sand sized).		1	
	4.0				3.4'	VIBRACORE BORING From 2.9' to 11.9' Ran 9.3' Rec: 9.0' 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.
	6.0				6.9'	
					2	
					7.4'	
	8.0					
	10.0					LAB CLASSIFICATION: Jar Number 1 SP; 2 SP; 3 SP
	11.0		10.9' coarse gravel size shell material.		10.9'	
					3	
					11.4'	
-11.9	11.9		BOTTOM OF HOLE @11.9'			NOTE Assumed vibracore refusal @ 11.9'

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

ENG FORM 1836 MAR 71 PREVIOUS EDITIONS ARE OBSOLETE.

PROJECT OCEAN ISLE RENOURISHMENT | HOLE NO. OI-05 05

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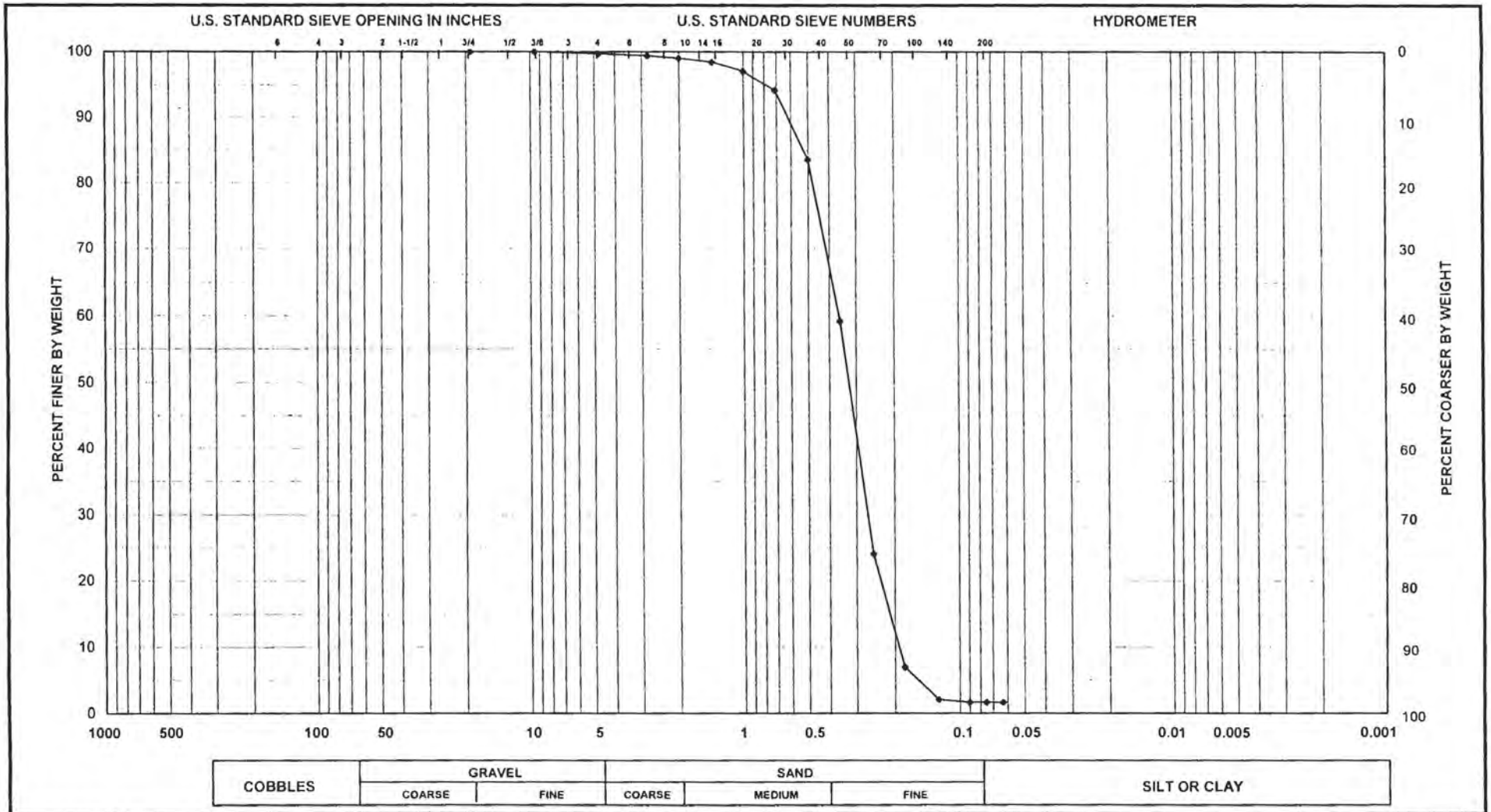

Sample No.	Elev. Or Depth	Classification	% CO_3	G_s	Nat w%	LL	PL	PI
• 1	2.9'- 3.4'	SAND, poorly-graded, mostly fine-grained quartz, little carbonate, trace silt, light olive brown (SP)	27					

Project Ocean Isle Renourishment

Area

Boring No. OI-05-05

Date 8/1/2005

GRADATION CURVES

ENG FORM 2087

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VISUAL SHELL CONTENT

GRAIN SIZE AND VISUAL SHELL CONTENT

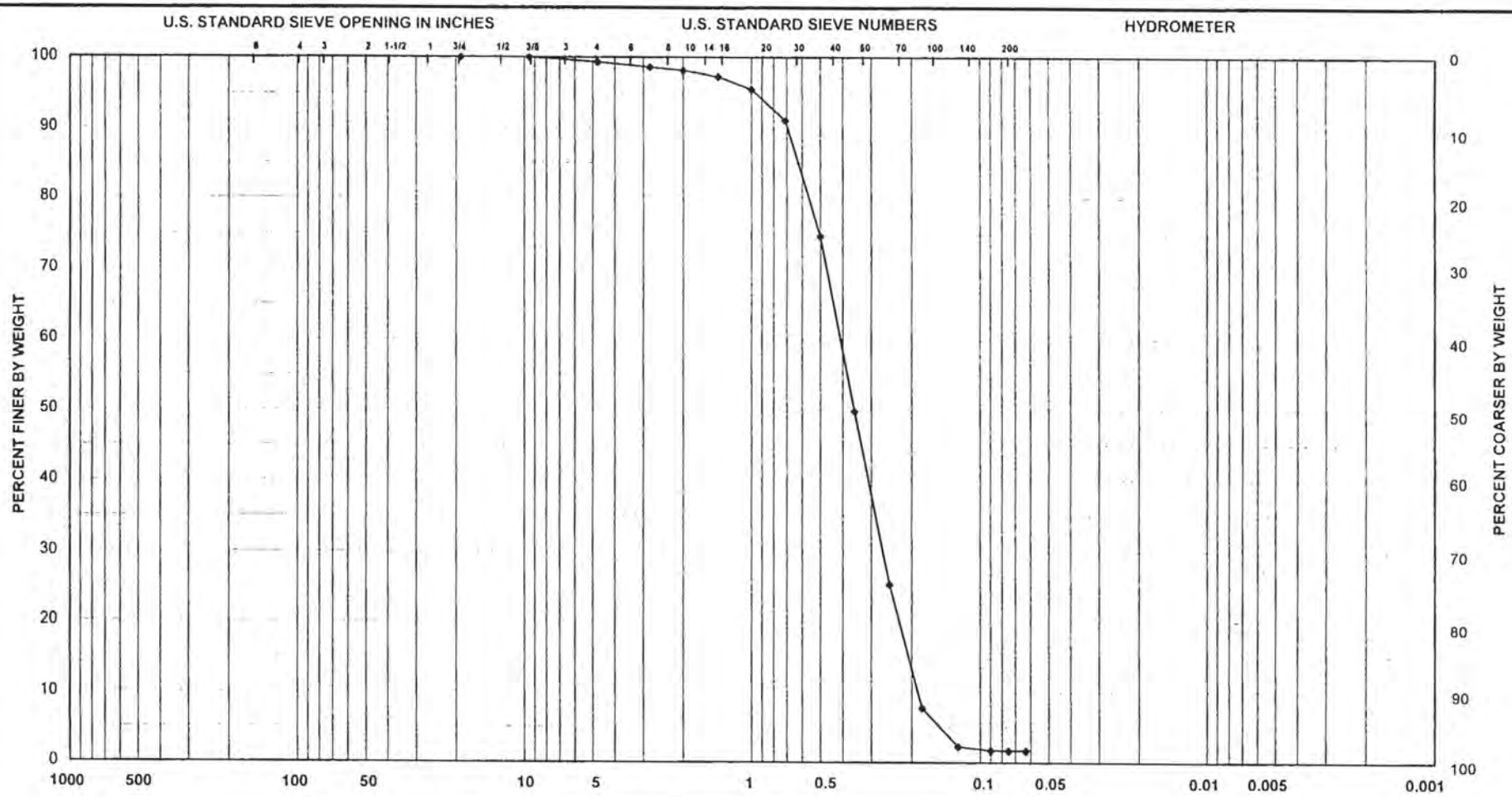
Project:	**Ocean Isle Renourishment**	**Depth:**	**2.9'- 3.4'**
Project No.:	**2216-01-60**	**Date:**	**8/1/2005**
Boring No.:	**OI-05-05**		
Sample No.:	**1**		
Description:	**SAND, poorly-graded, mostly fine-grained quartz, little carbonate, trace silt, light olive brown (SP)**		

Tare Weight, (g):	49.28	
Dry Wt. Before Washing (g):	174.98	(with tare)
Dry Weight After Washing (g):	173.71	(with tare)

Sieve Size (Name)	Sieve Size (mm)	Weight Retained (g)	% Passing	Approx. Visual Shell %	Approx. Visual Shell Wt. (g)
3/4"	19.000	0.00	100.00	0	0.00
3/8"	9.500	0.00	100.00	0	0.00
#4	4.750	0.36	99.71	100	0.36
#7	2.800	0.41	99.39	100	0.41
#10	2.000	0.45	99.03	100	0.45
#14	1.400	0.72	98.46	100	0.72
#18	1.000	1.70	97.10	95	1.62
#25	0.710	3.68	94.18	80	2.94
#35	0.500	13.40	83.52	70	9.38
#45	0.355	30.51	59.24	50	15.26
#60	0.250	44.29	24.01	30	13.29
#80	0.180	21.34	7.03	10	2.13
#120	0.125	6.27	2.04	5	0.31
#170	0.090	0.53	1.62	1	0.01
#200	0.075	0.01	1.61	1	0.00
#230	0.063	0.01	1.61	1	0.00

Total Shell Content: **27** **%**

8/2/05



Sample No.	Elev. Or Depth	Classification	% CO_3	G_s	Nat w%	LL	PL	PI
• 2	6.9'- 7.4'	SAND, poorly-graded, mostly fine-grained quartz, little carbonate, trace silt, light olive brown (SP)	29					

Project Ocean Isle Renourishment

Area

Boring No. OI-05-05

Date 8/1/2005

GRADATION CURVES

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VISUAL SHELL CONTENT

GRAIN SIZE AND VISUAL SHELL CONTENT

Project:	**Ocean Isle Renourishment**	**Depth:**	**6.9'- 7.4'**
Project No.:	**2216-01-60**	**Date:**	**8/1/2005**
Boring No.:	**OI-05-05**		
Sample No.:	**2**		
Description:	**SAND, poorly-graded, mostly fine-grained quartz, little carbonate, trace silt, light olive brown (SP)**		

Tare Weight, (g):	50.26	
Dry Wt. Before Washing (g):	166.39	(with tare)
Dry Weight After Washing (g):	165.12	(with tare)

Sieve Size (Name)	Sieve Size (mm)	Weight Retained (g)	% Passing	Approx. Visual Shell %	Approx. Visual Shell Wt. (g)
3/4"	19.000	0.00	100.00	0	0.00
3/8"	9.500	0.00	100.00	0	0.00
#4	4.750	0.79	99.32	100	0.79
#7	2.800	0.84	98.60	100	0.84
#10	2.000	0.53	98.14	100	0.53
#14	1.400	0.96	97.31	100	0.96
#18	1.000	2.00	95.59	95	1.90
#25	0.710	5.27	91.05	80	4.22
#35	0.500	19.06	74.64	70	13.34
#45	0.355	28.87	49.78	50	14.44
#60	0.250	28.47	25.26	30	8.54
#80	0.180	20.36	7.73	10	2.04
#120	0.125	6.43	2.20	5	0.32
#170	0.090	0.63	1.65	1	0.01
#200	0.075	0.03	1.63	1	0.00
#230	0.063	0.01	1.62	1	0.00

Total Shell Content: **29** **%**

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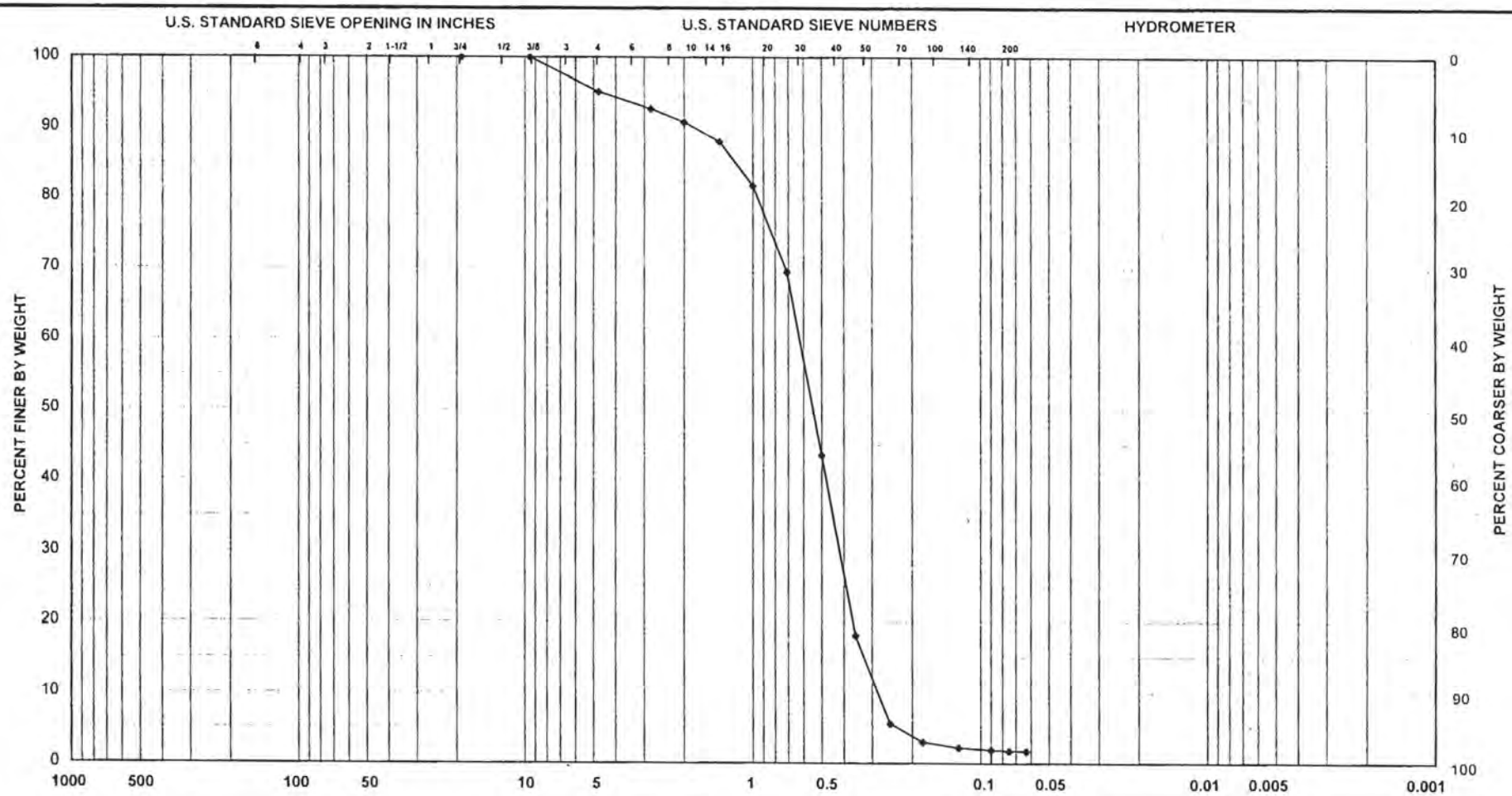

Sample No.	Elev. Or Depth	Classification	% CO_3	G_s	Nat w%	LL	PL	PI
• 3	10.9'- 11.4'	SAND, poorly-graded, mostly fine-grained quartz, some carbonate, trace silt, olive brown (SP)	44					

Project Ocean Isle Renourishment

Area

Boring No. OI-05-05

Date 8/1/2005

GRADATION CURVES

ENG FORM 2087

MAY 63

Hole No. 01-05-06

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

1. PROJECT OCEAN ISLE RENOURISHMENT	10. SIZE AND TYPE OF BIT 4" Dia. Vibracore
2. LOCATION (Coordinates or Station) NC Coord. E 2188206.5 N 56149.4	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) 01-05-06	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 (10.6' of Water)	16. DATE HOLE: STARTED 4/20/05 : COMPLETED 4/20/05
8. DEPTH DRILLED INTO ROCK 0.0'	17. ELEVATION TOP OF HOLE 0.0 MLLW
9. TOTAL DEPTH OF HOLE 19.4'	18. TOTAL CORE RECOVERY FOR BORING N/A %
	19. SIGNATURE OF INSPECTOR KELLY KALTENBACH, GEOLOGIST TRAINEE

ELEVATION MLLW	DEPTH feet	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 10.6' WATER			Time begin vibracoring: 1046 hrs. Soils described by Kelley J. Kaltenbach, Geologist-Trainee.
	10.0		OCEAN BOTTOM @ 10.6'			
-10.6	10.6		SP Tan to light gray, fine to coarse sand, clean, poorly graded, some fine to coarse sand size shell material.		10.6' 1 11.1'	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.
	12.0					VIBRACORE BORING From 10.6' to 19.4' Ran 9.0' Rec: 8.8'
			13.6' few gravel size shell material.			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				14.6' 2 15.1'	
-15.5	15.5		15.5' SP-SM Tan, mottled, w/dark gray fine to medium sand, trace fine sand size shell material.		15.5' 3 16.0'	
	16.0					
	18.0		18.3'		18.3' 4 18.8'	LAB CLASSIFICATION
			SP Light tan, mottled tan, fine-medium sand, clean, poorly graded, trace shell. Wood fragments @18.9'.			Jar Number / Classification: 1 SP; 2 SP; 3 SP; 4 SP
-19.4	19.4		BOTTOM OF HOLE @19.4'			
			SOILS ARE FIELD VISUALLY CLASSIFIED IN ACCORDANCE WITH THE UNIFIED SOIL CLASSIFICATION SYSTEM			NOTE Assumed vibracore refusal @ 19.4'
						*wood fragments @18.9'

ENG FORM 1836 MAR 71 PREVIOUS EDITIONS ARE OBSOLETE.

PROJECT OCEAN ISLE RENOURISHMENT HOLE NO. 01-05 06

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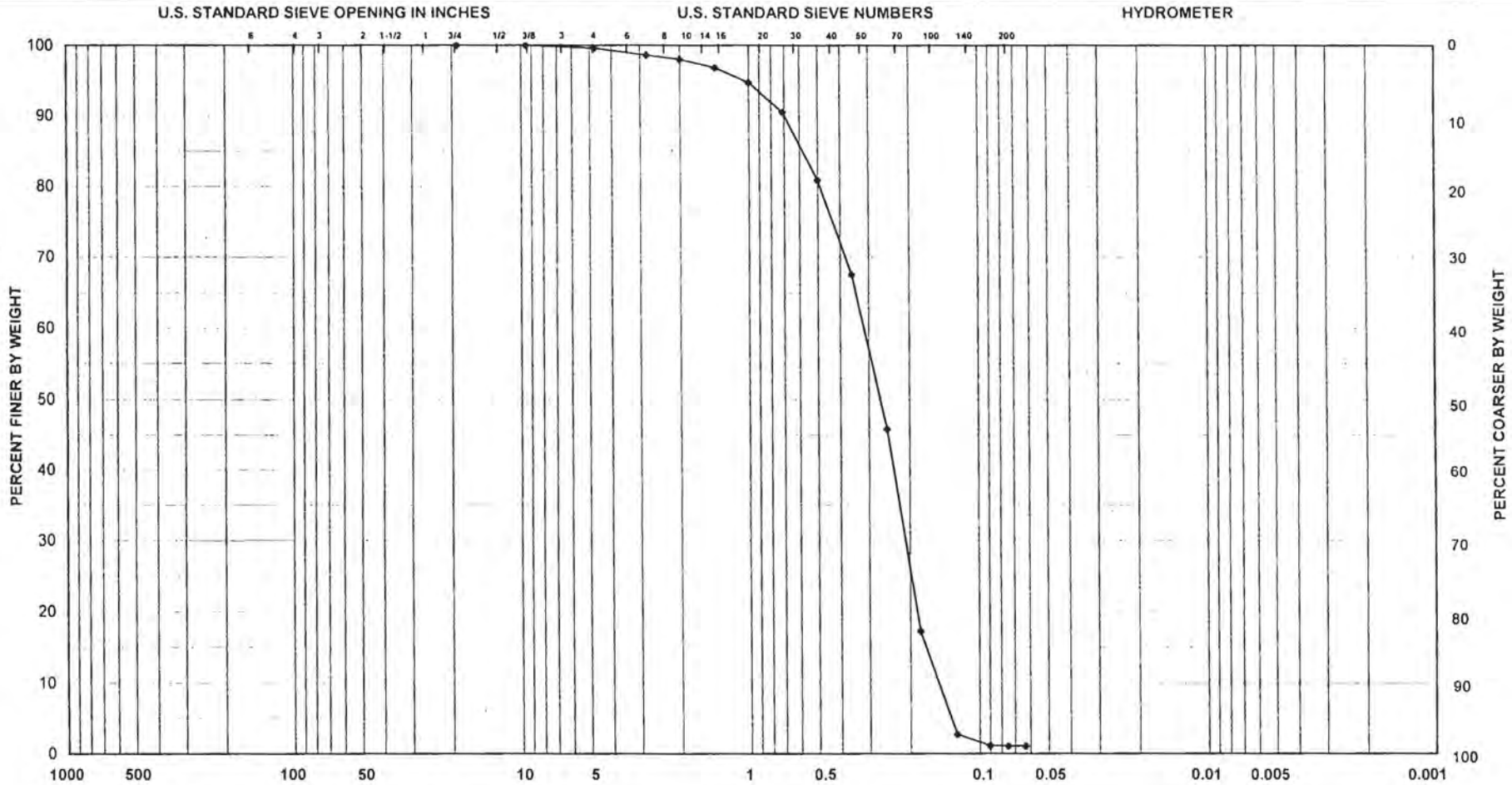

Sample No.	Elev. Or Depth	Classification	% CO_3	G_s	Nat w%	LL	PL	PI
• 1	10.6'- 11.1'	SAND, poorly-graded, mostly fine-grained quartz, little carbonate, trace silt, light olive brown (SP)	20					

Project: Ocean Isle Renourishment

Area:

Boring No.: OI-05-06

Date: 8/1/2005

GRADATION CURVES

ENG FORM 2087

MAY 63

WOLF TECHNOLOGIES, INC.

3047-4 St. Johns Bluff Road S.
Jacksonville, Florida 32246
(904) 997-1400 (Tel) · (904) 997-9150 (Fax)

VISUAL SHELL CONTENT

GRAIN SIZE AND VISUAL SHELL CONTENT

Project:	**Ocean Isle Renourishment**	**Depth:**	**10.6'- 11.1'**
Project No.:	**2216-01-60**	**Date:**	**8/1/2005**
Boring No.:	**OI-05-6**		
Sample No.:	**1**		
Description:	**SAND, poorly-graded, mostly fine-grained quartz, little carbonate, trace silt, light olive brown (SP)**		

Tare Weight, (g):	49.83	
Dry Wt. Before Washing (g):	144.88	(with tare)
Dry Weight After Washing (g):	143.92	(with tare)

Sieve Size (Name)	Sieve Size (mm)	Weight Retained (g)	% Passing	Approx. Visual Shell %	Approx. Visual Shell Wt. (g)
3/4"	19.000	0.00	100.00	0	0.00
3/8"	9.500	0.00	100.00	0	0.00
#4	4.750	0.39	99.59	100	0.39
#7	2.800	0.91	98.63	100	0.91
#10	2.000	0.56	98.04	100	0.56
#14	1.400	1.12	96.86	100	1.12
#18	1.000	1.97	94.79	100	1.97
#25	0.710	4.05	90.53	80	3.24
#35	0.500	9.14	80.92	50	4.57
#45	0.355	12.68	67.57	50	6.34
#60	0.250	20.68	45.82	30	6.20
#80	0.180	27.15	17.25	10	2.72
#120	0.125	13.83	2.70	5	0.69
#170	0.090	1.50	1.13	1	0.02
#200	0.075	0.06	1.06	1	0.00
#230	0.063	0.01	1.05	1	0.00

Total Shell Content: **20** %

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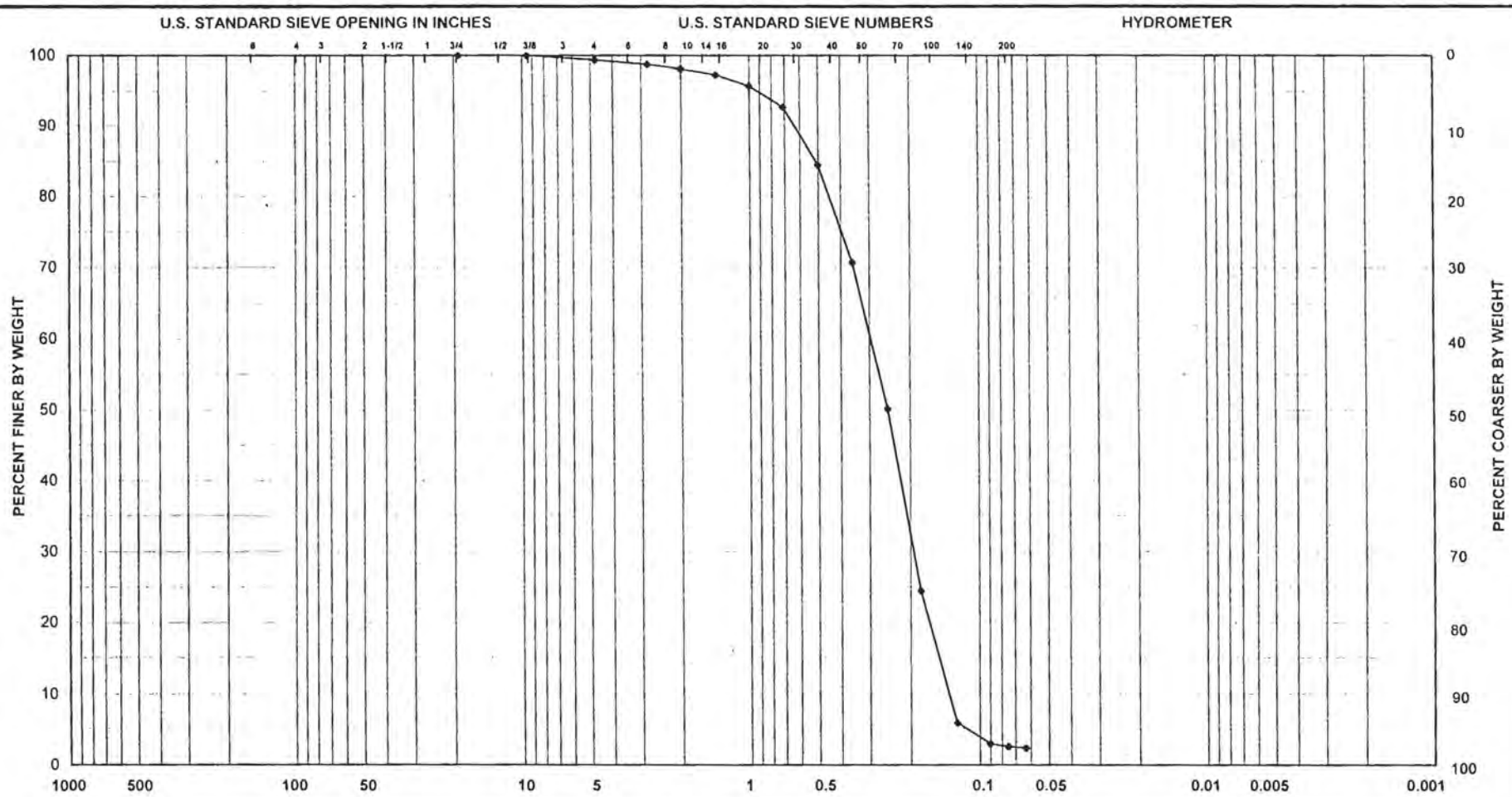

Sample No.	Elev. Or Depth	Classification	% CO_3	G_s	Nat w%	LL	PL	PI
• 2	14.6'- 15.1'	SAND, poorly-graded, mostly fine-grained quartz, little carbonate, trace silt, light olive brown (SP)	23					

Project: Ocean Isle Renourishment

Area:

Boring No.: OI-05-06

Date: 8/1/2005

GRADATION CURVES

ENG FORM 2087

MAY 63

WOLF TECHNOLOGIES, INC.
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VISUAL SHELL CONTENT

GRAIN SIZE AND VISUAL SHELL CONTENT

Project:	**Ocean Isle Renourishment**	**Depth:**	**14.6'- 15.1'**
Project No.:	**2216-01-60**	**Date:**	**8/1/2005**
Boring No.:	**OI-05-6**		
Sample No.:	**2**		
Description:	**SAND, poorly-graded, mostly fine-grained quartz, little carbonate, trace silt, light olive brown (SP)**		

Tare Weight, (g):	50.29	
Dry Wt. Before Washing (g):	163.55	(with tare)
Dry Weight After Washing (g):	161.77	(with tare)

Sieve Size (Name)	Sieve Size (mm)	Weight Retained (g)	% Passing	Approx. Visual Shell %	Approx. Visual Shell Wt. (g)
3/4"	19.000	0.00	100.00	0	0.00
3/8"	9.500	0.00	100.00	0	0.00
#4	4.750	0.73	99.36	100	0.73
#7	2.800	0.70	98.74	100	0.70
#10	2.000	0.65	98.16	100	0.65
#14	1.400	0.94	97.33	100	0.94
#18	1.000	1.77	95.77	95	1.68
#25	0.710	3.42	92.75	80	2.74
#35	0.500	9.35	84.50	70	6.55
#45	0.355	15.65	70.68	50	7.83
#60	0.250	23.25	50.15	30	6.98
#80	0.180	29.13	24.43	20	5.83
#120	0.125	21.09	5.81	10	2.11
#170	0.090	3.35	2.85	5	0.17
#200	0.075	0.45	2.45	1	0.00
#230	0.063	0.23	2.25	1	0.00

Total Shell Content: **23** **%**

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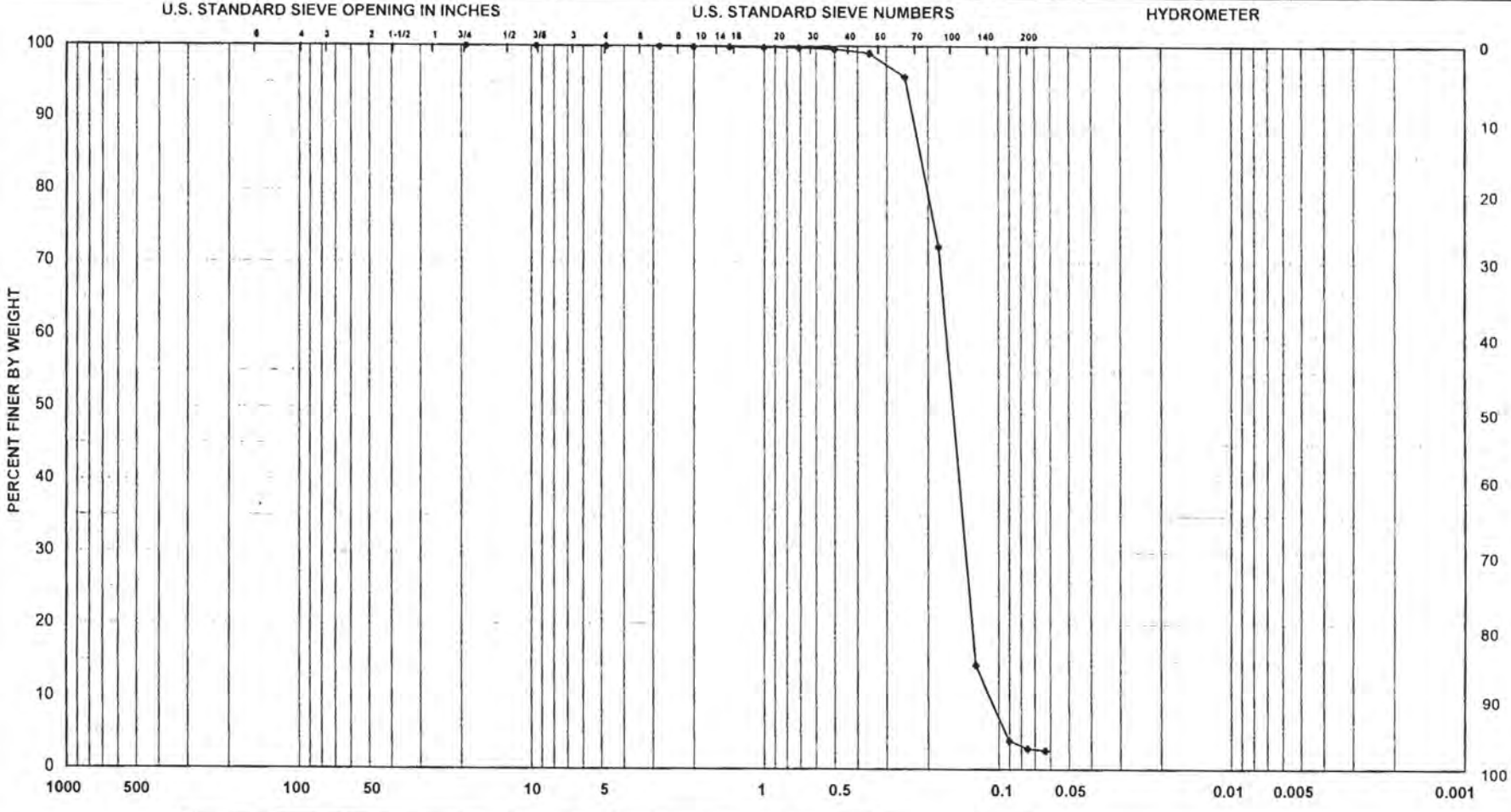

Sample No.	Elev. Or Depth	Classification	% CO_3	G_s	Nat w%	LL	PL	PI
◆ 3	15.5'- 16.0'	SAND, poorly-graded, mostly fine-grained quartz, few carbonate, trace silt, light olive brown (SP)	11					

Project: Ocean Isle Renourishment

Area:

Boring No.: OI-05-06

Date: 8/1/2005

GRADATION CURVES

ENG FORM 2087

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WOLF TECHNOLOGIES, INC.

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VISUAL SHELL CONTENT

GRAIN SIZE AND VISUAL SHELL CONTENT

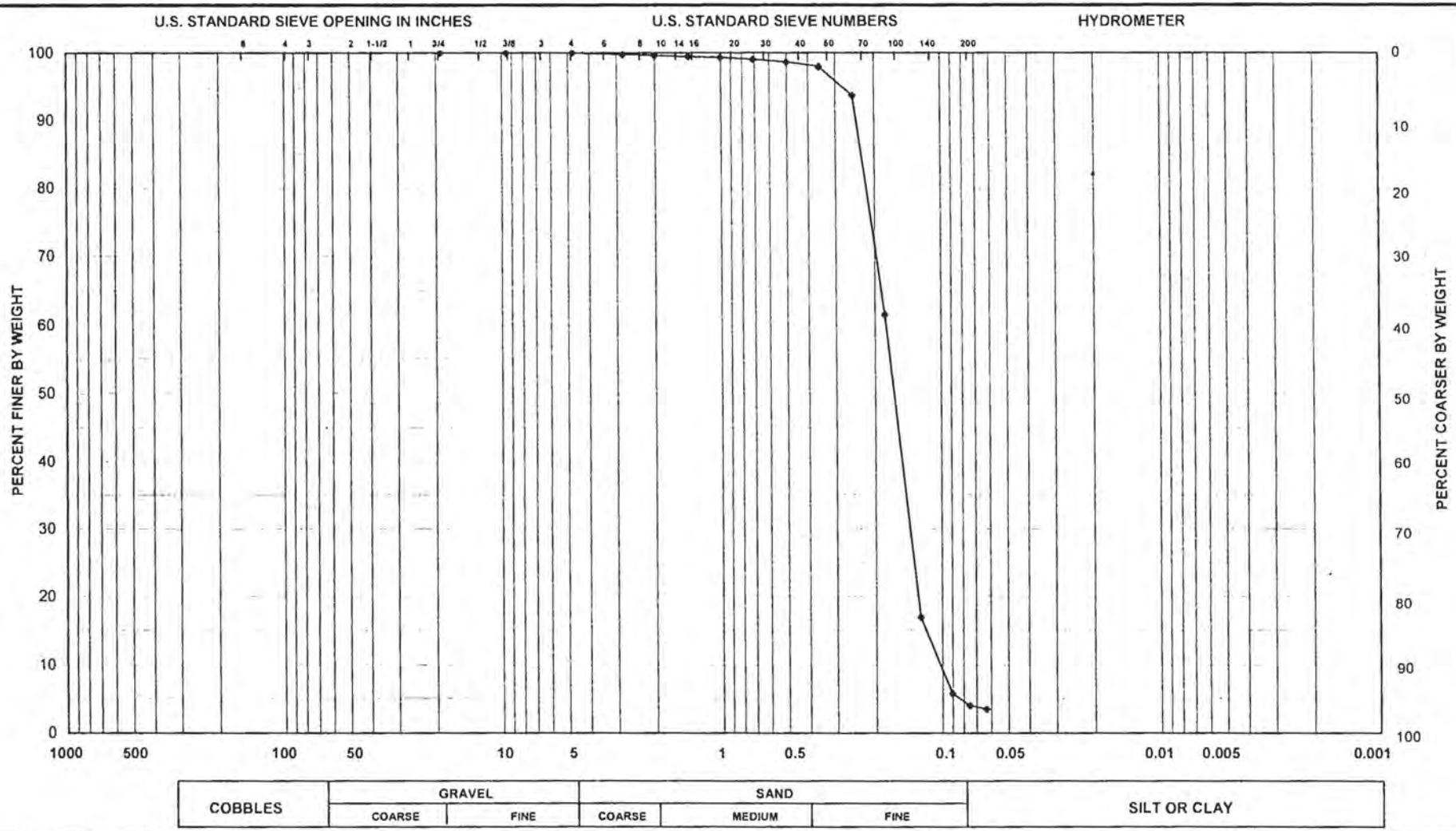
Project:	**Ocean Isle Renourishment**	**Depth:**	**15.5'- 16.0'**
Project No.:	**2216-01-60**	**Date:**	**8/1/2005**
Boring No.:	**OI-05-6**		
Sample No.:	**3**		
Description:	**SAND, poorly-graded, mostly fine-grained quartz, few carbonate, trace silt, light olive brown (SP)**		

Tare Weight, (g):	50.53	
Dry Wt. Before Washing (g):	150.54	(with tare)
Dry Weight After Washing (g):	148.01	(with tare)

Sieve Size (Name)	Sieve Size (mm)	Weight Retained (g)	% Passing	Approx. Visual Shell %	Approx. Visual Shell Wt. (g)
3/4"	19.000	0.00	100.00	0	0.00
3/8"	9.500	0.00	100.00	0	0.00
#4	4.750	0.00	100.00	0	0.00
#7	2.800	0.00	100.00	0	0.00
#10	2.000	0.07	99.93	100	0.07
#14	1.400	0.06	99.87	100	0.06
#18	1.000	0.05	99.82	100	0.05
#25	0.710	0.03	99.79	100	0.03
#35	0.500	0.21	99.58	95	0.20
#45	0.355	0.54	99.04	80	0.43
#60	0.250	3.21	95.83	50	1.61
#80	0.180	23.63	72.20	30	7.09
#120	0.125	57.75	14.46	10	5.78
#170	0.090	10.56	3.90	5	0.53
#200	0.075	1.11	2.79	1	0.01
#230	0.063	0.25	2.54	1	0.00

Total Shell Content: 11 %

8/2/05



Sample No.	Elev. Or Depth	Classification	% CO_3	G_s	Nat w%	LL	PL	PI
♦ 4	18.3'- 18.8'	SAND, poorly-graded, mostly fine-grained quartz, few carbonate, trace silt, light olive brown (SP)	6					

Project: Ocean Isle Renourishment

Area:

Boring No.: OI-05-06

Date: 8/1/2005

GRADATION CURVES

ENG FORM 2087

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VISUAL SHELL CONTENT

GRAIN SIZE AND VISUAL SHELL CONTENT

Project:	**Ocean Isle Renourishment**	**Depth:**	**18.3'- 18.8'**
Project No.:	**2216-01-60**	**Date:**	**8/1/2005**
Boring No.:	**OI-05-6**		
Sample No.:	**4**		
Description:	**SAND, poorly-graded, mostly fine-grained quartz, few carbonate, trace silt, light olive brown (SP)**		

Tare Weight, (g):	50.18	
Dry Wt. Before Washing (g):	161.3	(with tare)
Dry Weight After Washing (g):	157.92	(with tare)

Sieve Size (Name)	Sieve Size (mm)	Weight Retained (g)	% Passing	Approx. Visual Shell %	Approx. Visual Shell Wt. (g)
3/4"	19.000	0.00	100.00	0	0.00
3/8"	9.500	0.00	100.00	0	0.00
#4	4.750	0.00	100.00	0	0.00
#7	2.800	0.28	99.75	100	0.28
#10	2.000	0.16	99.60	100	0.16
#14	1.400	0.17	99.45	100	0.17
#18	1.000	0.16	99.31	100	0.16
#25	0.710	0.26	99.07	95	0.25
#35	0.500	0.42	98.70	90	0.38
#45	0.355	0.73	98.04	80	0.58
#60	0.250	4.70	93.81	40	1.88
#80	0.180	35.77	61.62	10	3.58
#120	0.125	49.69	16.90	5	2.48
#170	0.090	12.42	5.72	1	0.12
#200	0.075	2.00	3.92	1	0.02
#230	0.063	0.53	3.45	1	0.01

Total Shell Content: 6 %

8/2/05

Hole No. 01-05-07

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

1. PROJECT OCEAN ISLE RENOURISHMENT	10. SIZE AND TYPE OF BIT 4" Dia. Vibracore
2. LOCATION (Coordinates or Station) NC Coord. E 2186577.9 N 57340.5	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) 01-05-07	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 (3.8' of Water)	16. DATE HOLE: STARTED 4/20/05 : COMPLETED 4/20/05
8. DEPTH DRILLED INTO ROCK 0.0'	17. ELEVATION TOP OF HOLE 0.0 MLLW
9. TOTAL DEPTH OF HOLE 7.4'	18. TOTAL CORE RECOVERY FOR BORING N/A %
	19. SIGNATURE OF INSPECTOR KELLY KALTENBACH, GEOLOGST TRAINEE

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 3.8' WATER			Time begin vibracoring: 0839 hrs. Soils described by Kelley J. Kaltenbach, Geologist-Trainee.
	3.0					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.
-3.8	3.8		OCEAN BOTTOM @3.8'		3.8'	
	4.0		SP Gray, fine-medium sand, clean, poorly graded, trace fine sand size shell material.		1	
					4.3'	VIBRACORE BORING From 3.8' to 7.4' Ran 5.8' Rec: 3.6' 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.
	5.0					
					5.8'	
	6.0				2	
					6.3'	
-6.7	6.7				6.7'	
	7.0		GP Gray, mottled brown, fine-coarse gravel & rock fragments, some fine-coarse sand some inorganic silt, some to fine-coarse sand size shell material.		3	LAB CLASSIFICATION
-7.4	7.4		BOTTOM OF HOLE @7.4'		7.2'	

Jar Number	Classification
1	SP
2	SP
3	SM

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

NOTE Assumed vibracore refusal @ 6.8'

ENG FORM 1836 PREVIOUS EDITIONS ARE OBSOLETE. PROJECT OCEAN ISLE RENOURISHMENT HOLE NO. 01-05 07

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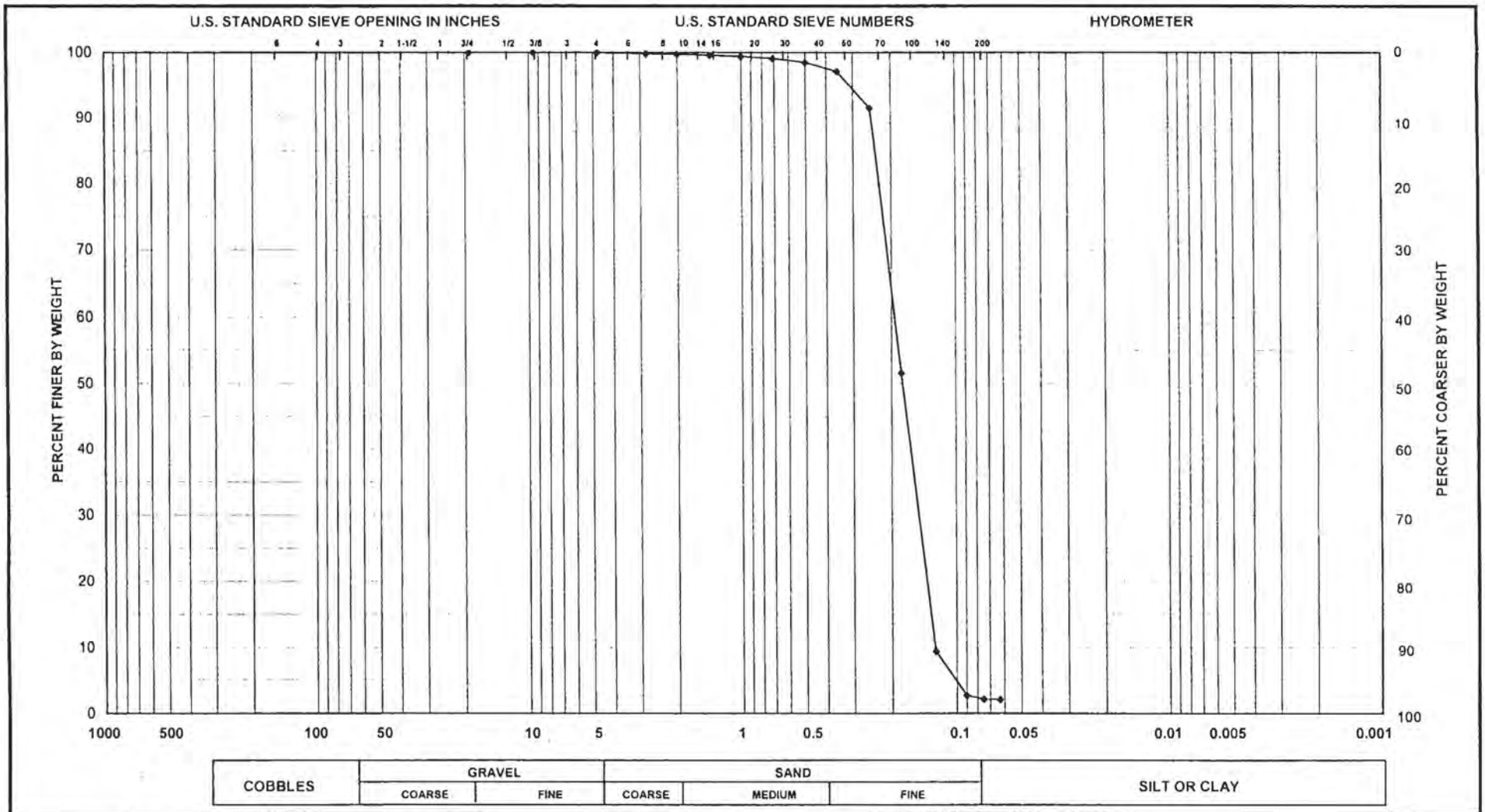

Sample No.	Elev. Or Depth	Classification	% CO_3	G_s	Nat w%	LL	PL	PI
• 1	3.8'- 4.3'	SAND, poorly-graded, mostly fine-grained quartz, few carbonate, trace silt, light olive brown (SP)	7					

Project: Ocean Isle Renourishment

Area:

Boring No.: OI-05-07

Date: 8/1/2005

GRADATION CURVES

ENG FORM 2087

MAY 63

WOLF TECHNOLOGIES, INC.

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Jacksonville, Florida 32246
(904) 997-1400 (Tel) · (904) 997-9150 (Fax)

VISUAL SHELL CONTENT

GRAIN SIZE AND VISUAL SHELL CONTENT

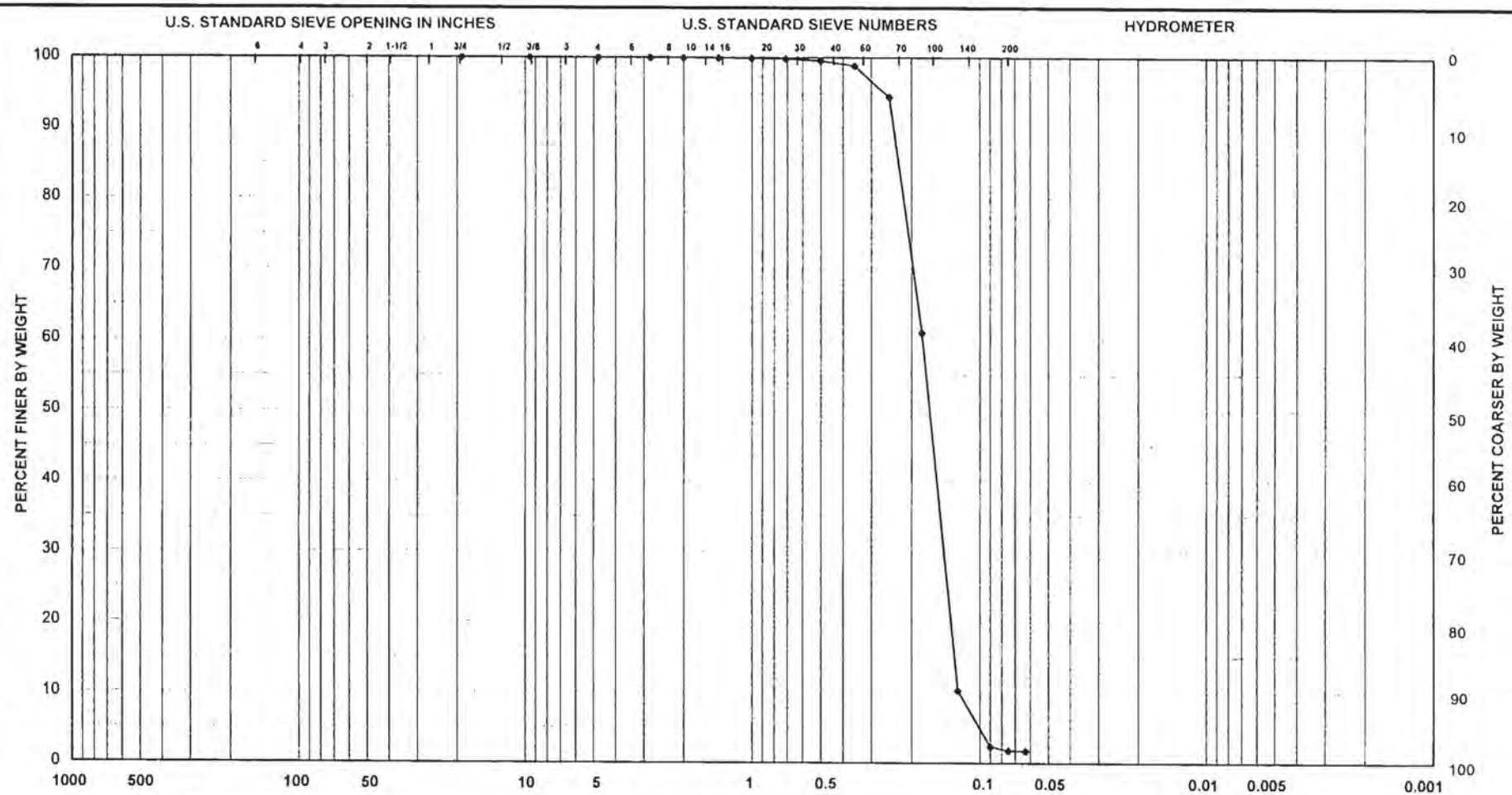
Project:	**Ocean Isle Renourishment**	**Depth:**	**3.8'- 4.3'**
Project No.:	**2216-01-60**	**Date:**	**8/1/2005**
Boring No.:	**OI-05-7**		
Sample No.:	**1**		
Description:	**SAND, poorly-graded, mostly fine-grained quartz, few carbonate, trace silt, light olive brown (SP)**		

Tare Weight, (g):	49.99	
Dry Wt. Before Washing (g):	178.29	(with tare)
Dry Weight After Washing (g):	175.86	(with tare)

Sieve Size (Name)	Sieve Size (mm)	Weight Retained (g)	% Passing	Approx. Visual Shell %	Approx. Visual Shell Wt. (g)
3/4"	19.000	0.00	100.00	0	0.00
3/8"	9.500	0.00	100.00	0	0.00
#4	4.750	0.00	100.00	0	0.00
#7	2.800	0.24	99.81	100	0.24
#10	2.000	0.08	99.75	100	0.08
#14	1.400	0.20	99.59	100	0.20
#18	1.000	0.25	99.40	100	0.25
#25	0.710	0.39	99.10	90	0.35
#35	0.500	0.79	98.48	70	0.55
#45	0.355	1.75	97.12	50	0.88
#60	0.250	7.17	91.53	30	2.15
#80	0.180	51.30	51.54	10	5.13
#120	0.125	54.07	9.40	5	2.70
#170	0.090	8.65	2.66	1	0.09
#200	0.075	0.68	2.13	1	0.01
#230	0.063	0.14	2.02	1	0.00

Total Shell Content: 7 %

8/2/05



Sample No.	Elev. Or Depth	Classification	% CO_3	G_s	Nat w%	LL	PL	PI
• 2	5.8'- 6.3'	SAND, poorly-graded, mostly fine-grained quartz, little carbonate, trace silt, light olive brown (SP)	16					

Project	Ocean Isle Renourishment
Area	
Boring No.	OI-05-07
Date	8/1/2005

GRADATION CURVES

ENG FORM 2087

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Jacksonville, Florida 32246
(904) 997-1400 (Tel) · (904) 997-9150 (Fax)

VISUAL SHELL CONTENT

GRAIN SIZE AND VISUAL SHELL CONTENT

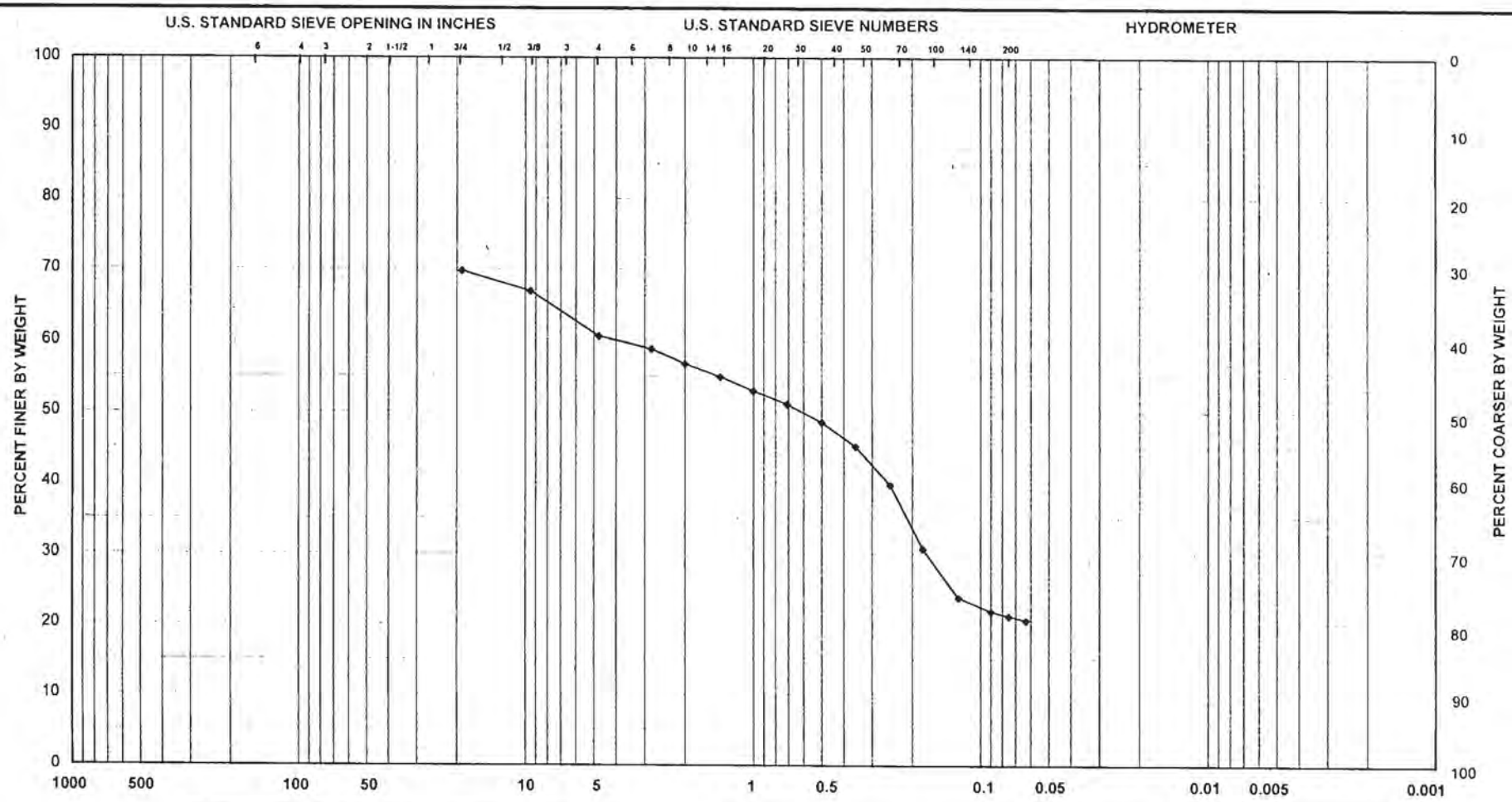
Project:	**Ocean Isle Renourishment**	**Depth:**	**5.8'- 6.3'**
Project No.:	**2216-01-60**	**Date:**	**8/1/2005**
Boring No.:	**OI-05-7**		
Sample No.:	**2**		
Description:	**SAND, poorly-graded, mostly fine-grained quartz, little carbonate, trace silt, light olive brown (SP)**		

Tare Weight, (g):	49.90	
Dry Wt. Before Washing (g):	151.49	(with tare)
Dry Weight After Washing (g):	150.16	(with tare)

Sieve Size (Name)	Sieve Size (mm)	Weight Retained (g)	% Passing	Approx. Visual Shell %	Approx. Visual Shell Wt. (g)
3/4"	19.000	0.00	100.00	0	0.00
3/8"	9.500	0.00	100.00	0	0.00
#4	4.750	0.00	100.00	0	0.00
#7	2.800	0.00	100.00	0	0.00
#10	2.000	0.02	99.98	100	0.02
#14	1.400	0.05	99.93	100	0.05
#18	1.000	0.06	99.87	100	0.06
#25	0.710	0.05	99.82	100	0.05
#35	0.500	0.27	99.56	95	0.26
#45	0.355	0.72	98.85	80	0.58
#60	0.250	4.49	94.43	50	2.25
#80	0.180	33.93	61.03	30	10.18
#120	0.125	51.57	10.27	20	10.31
#170	0.090	8.09	2.30	5	0.40
#200	0.075	0.56	1.75	1	0.01
#230	0.063	0.05	1.70	1	0.00

Total Shell Content: 16 %

8/2/05



Sample No.	Elev. Or Depth	Classification	% CO_3	G_s	Nat w%	LL	PL	PI
• 3	6.7'- 7.2'	SAND, silty, mostly fine-grained quartz sand, little silt, few carbonate, little limestone fragments, olive brown (SM)	7					

Project Ocean Isle Renourishment

Area

Boring No. OI-05-07

Date 8/1/2005

GRADATION CURVES

ENG FORM 2087

MAY 63

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Jacksonville, Florida 32246
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VISUAL SHELL CONTENT

GRAIN SIZE AND VISUAL SHELL CONTENT

Project:	**Ocean Isle Renourishment**	**Depth:**	**6.7'- 7.2'**
Project No.:	**2216-01-60**	**Date:**	**8/1/2005**
Boring No.:	**OI-05-7**		
Sample No.:	**3**		
Description:	**SAND, silty, mostly fine-grained quartz sand, little silt, few carbonate, little limestone fragments, olive brown (SM)**		

Tare Weight, (g):	50.95	
Dry Wt. Before Washing (g):	145.75	(with tare)
Dry Weight After Washing (g):	127.2	(with tare)

Sieve Size (Name)	Sieve Size (mm)	Weight Retained (g)	% Passing	Approx. Visual Shell %	Approx. Visual Shell Wt. (g)
3/4"	19.000	28.72	69.70	0	0.00
3/8"	9.500	2.65	66.91	50	1.33
#4	4.750	5.93	60.65	30	1.78
#7	2.800	1.73	58.83	50	0.87
#10	2.000	2.02	56.70	50	1.01
#14	1.400	1.74	54.86	50	0.87
#18	1.000	1.89	52.87	30	0.57
#25	0.710	1.71	51.07	30	0.51
#35	0.500	2.38	48.55	30	0.71
#45	0.355	3.22	45.16	20	0.64
#60	0.250	5.24	39.63	10	0.52
#80	0.180	8.50	30.66	1	0.09
#120	0.125	6.56	23.74	1	0.07
#170	0.090	1.86	21.78	1	0.02
#200	0.075	0.65	21.10	1	0.01
#230	0.063	0.59	20.47	1	0.01

Total Shell Content: 7 %

d 8/2/05

Hole No. 01-05-08A

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

1. PROJECT OCEAN ISLE RENOURISHMENT	10. SIZE AND TYPE OF BIT 4" Dia. Vibracore
2. LOCATION (Coordinates or Station) NC Coord. E 2187137.9 N 57204.5	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) 01-05-08A	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 (X) VERTICAL ☐ INCLINED _____ DEG. FROM VERT.	15. ELEVATION GROUND WATER N/A
	16. DATE HOLE: STARTED 4/20/05 : COMPLETED 4/20/05
	17. ELEVATION TOP OF HOLE 0.0 MLLW
7. THICKNESS OF OVERBURDEN N/A (3.4' of Water)	18. TOTAL CORE RECOVERY FOR BORING N/A %
8. DEPTH DRILLED INTO ROCK 0.0'	19. SIGNATURE OF INSPECTOR KELLY KALTENBACH, GEOLOGIST TRAINEE
9. TOTAL DEPTH OF HOLE 11.1'	

ELEVATION MLLW	DEPTH feet	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 3.4' WATER			Time begin vibracoring: 1300 hrs. Soils described by Kelley J. Kaltenbach, Geologist-Trainee.
	3.0					
-3.4	3.4		OCEAN BOTTOM @3.4'		3.4'	
			SP Tan, mottled dark gray fine-coarse sand and fine-coarse sand size shell hash. Trace organic silt, organic . Poorly graded, little to some gravel size shell material.		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.
	4.0				3.9'	VIBRACORE BORING From 3.4' to 11.1' Ran 8.1' Rec: 7.7' 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.
	5.0					
	6.0				6.4'	
					2	
			6.9'			
	7.0		shell hash content increases.		6.9'	LAB CLASSIFICATION
			7.3'		7.3'	Jar Number / Classification
			gray mottled, dark gray fine-medium sand little-trace fine-med sand size shell material. trace organic material poorly graded.		3	1 SP 2 SP 3 SP 4 SP
	8.0				7.8'	
	9.0					NOTE Assumed vibracore refusal @ 11.1'
			9.4'			
			fine-coarse sand shell content increases few gravel size shell material.		9.9'	
	10.0				4	
					10.4'	
	11.0					
-11.1	11.1		BOTTOM OF HOLE AT 11.1'			
			SOILS ARE FIELD VISUALLY CLASSIFIED IN ACCORDANCE WITH THE UNIFIED SOIL CLASSIFICATION SYSTEM			

ENG FORM 1836 PREVIOUS EDITIONS ARE OBSOLETE. PROJECT OCEAN ISLE RENOURISHMENT HOLE NO. 01-05 08A

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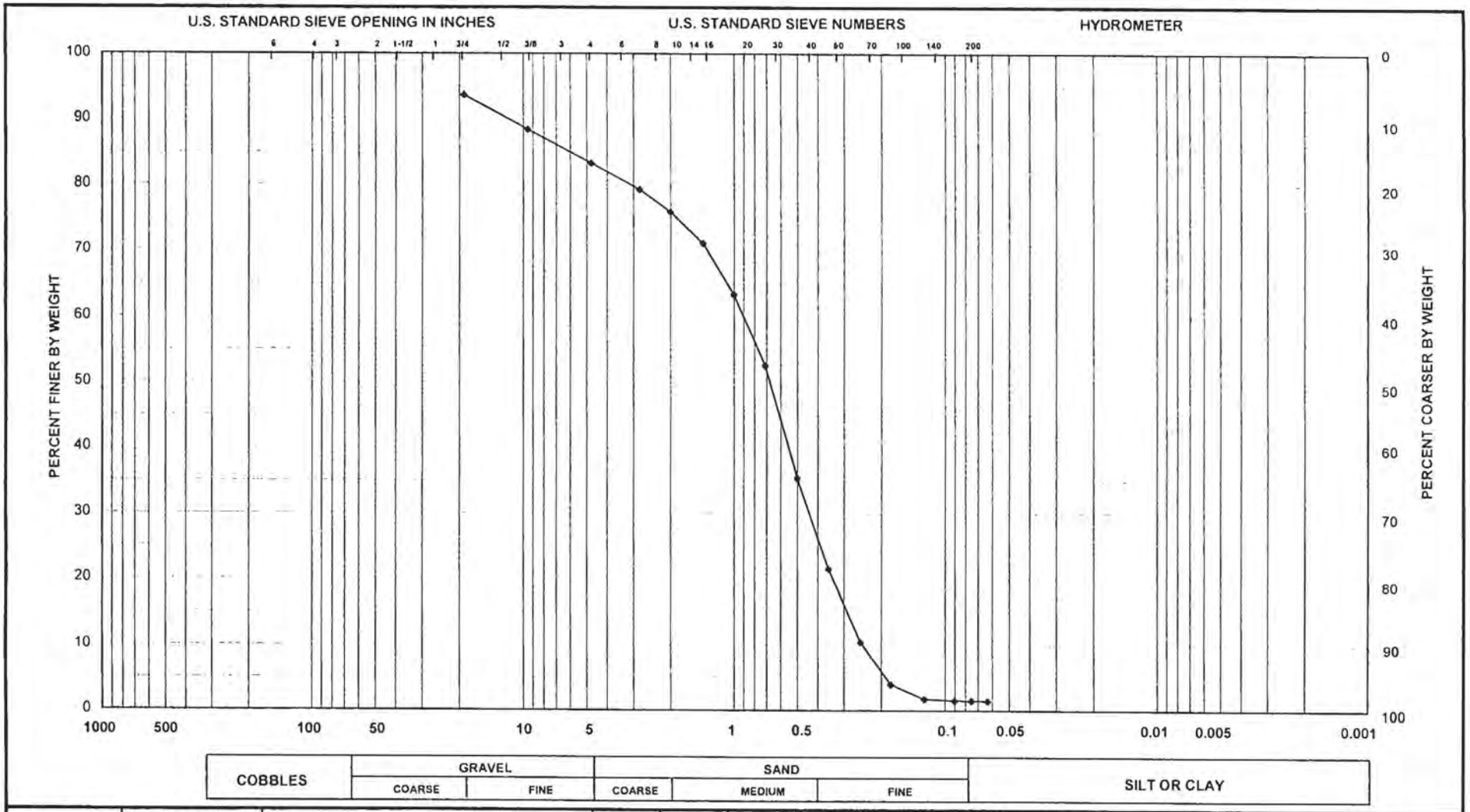


Sample No.	Elev. Or Depth	Classification	% CO_3	G_s	Nat w%	LL	PL	PI
* 1	3.4'- 3.9'	SAND, poorly graded, mostly fine-grained quartz, some carbonate, trace silt, olive brown (SP)	48					

Project: Ocean Isle Renourishment

Area:

Boring No.: OI-05-08A

Date: 8/1/2005

GRADATION CURVES

ENG FORM 2087

MAY 63

WOLF TECHNOLOGIES, INC.
3047-4 St. Johns Bluff Road S.
Jacksonville, Florida 32246
(904) 997-1400 (Tel) · (904) 997-9150 (Fax)

VISUAL SHELL CONTENT

GRAIN SIZE AND VISUAL SHELL CONTENT

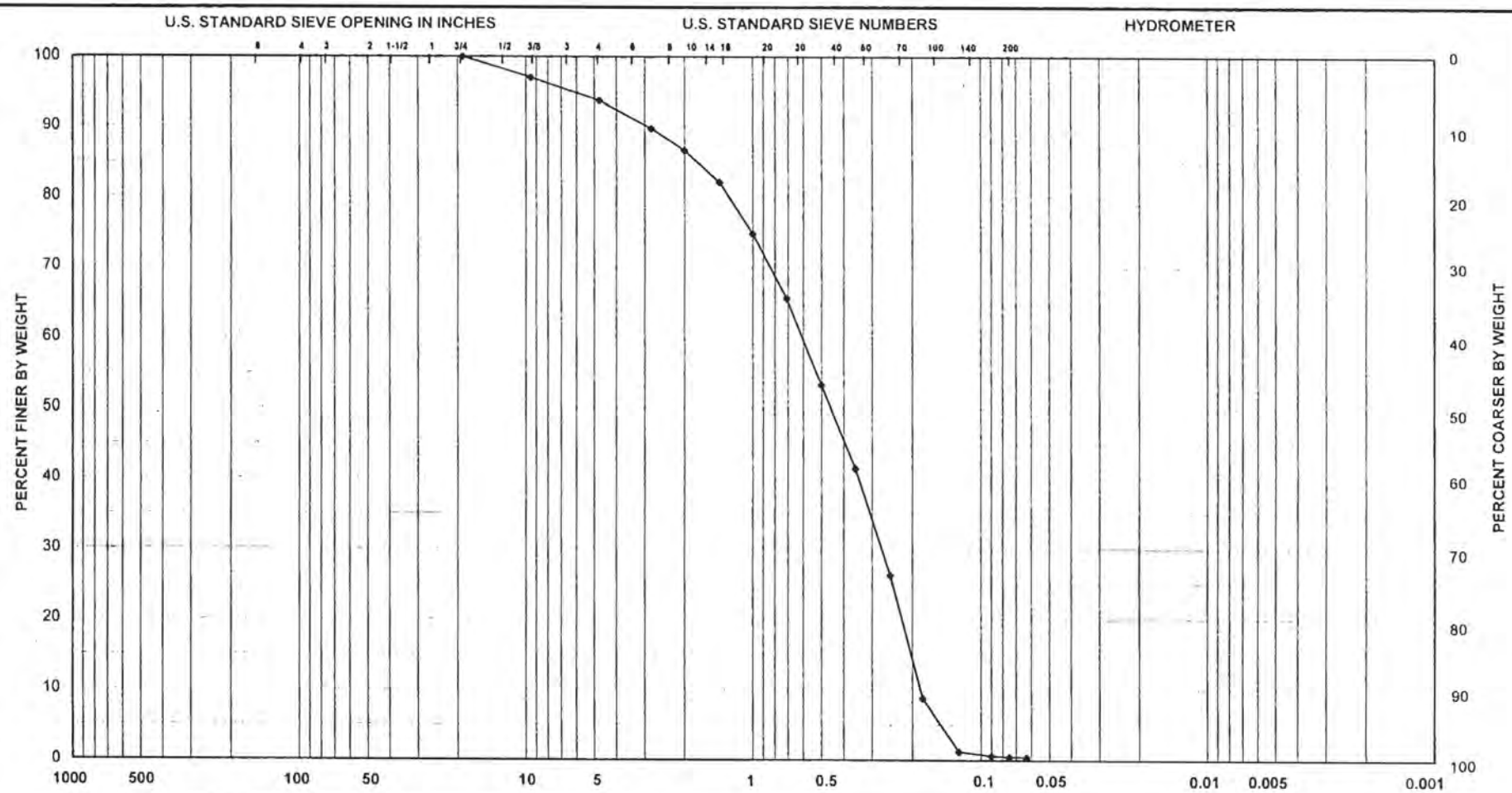
Project:	**Ocean Isle Renourishment**	**Depth:**	**3.4'- 3.9'**
Project No.:	**2216-01-60**	**Date:**	**8/1/2005**
Boring No.:	**OI-05-8A**		
Sample No.:	**1**		
Description:	**SAND, poorly graded, mostly fine-grained quartz, some carbonate, trace silt, olive brown (SP)**		

Tare Weight, (g):	49.48	
Dry Wt. Before Washing (g):	164.92	(with tare)
Dry Weight After Washing (g):	163.7	(with tare)

Sieve Size (Name)	Sieve Size (mm)	Weight Retained (g)	% Passing	Approx. Visual Shell %	Approx. Visual Shell Wt. (g)
3/4"	19.000	7.26	93.71	100	7.26
3/8"	9.500	6.16	88.37	100	6.16
#4	4.750	5.90	83.26	100	5.90
#7	2.800	4.57	79.31	100	4.57
#10	2.000	4.00	75.84	100	4.00
#14	1.400	5.52	71.06	100	5.52
#18	1.000	8.86	63.38	90	7.97
#25	0.710	12.48	52.57	80	9.98
#35	0.500	19.75	35.46	70	13.83
#45	0.355	16.17	21.46	50	8.09
#60	0.250	12.70	10.46	30	3.81
#80	0.180	7.52	3.94	10	0.75
#120	0.125	2.53	1.75	5	0.13
#170	0.090	0.27	1.52	1	0.00
#200	0.075	0.07	1.46	1	0.00
#230	0.063	0.02	1.44	1	0.00

Total Shell Content: **48** **%**

a 8/2/05



Sample No.	Elev. Or Depth	Classification	% CO_3	G_s	Nat w%	LL	PL	PI
• 2	6.4'- 6.9'	SAND, poorly graded, mostly fine-grained quartz, some carbonate, trace silt, olive brown (SP)	29					

Project Ocean Isle Renourishment

Area

Boring No. OI-05-08A

Date 8/1/2005

GRADATION CURVES

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Jacksonville, Florida 32246
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VISUAL SHELL CONTENT

GRAIN SIZE AND VISUAL SHELL CONTENT

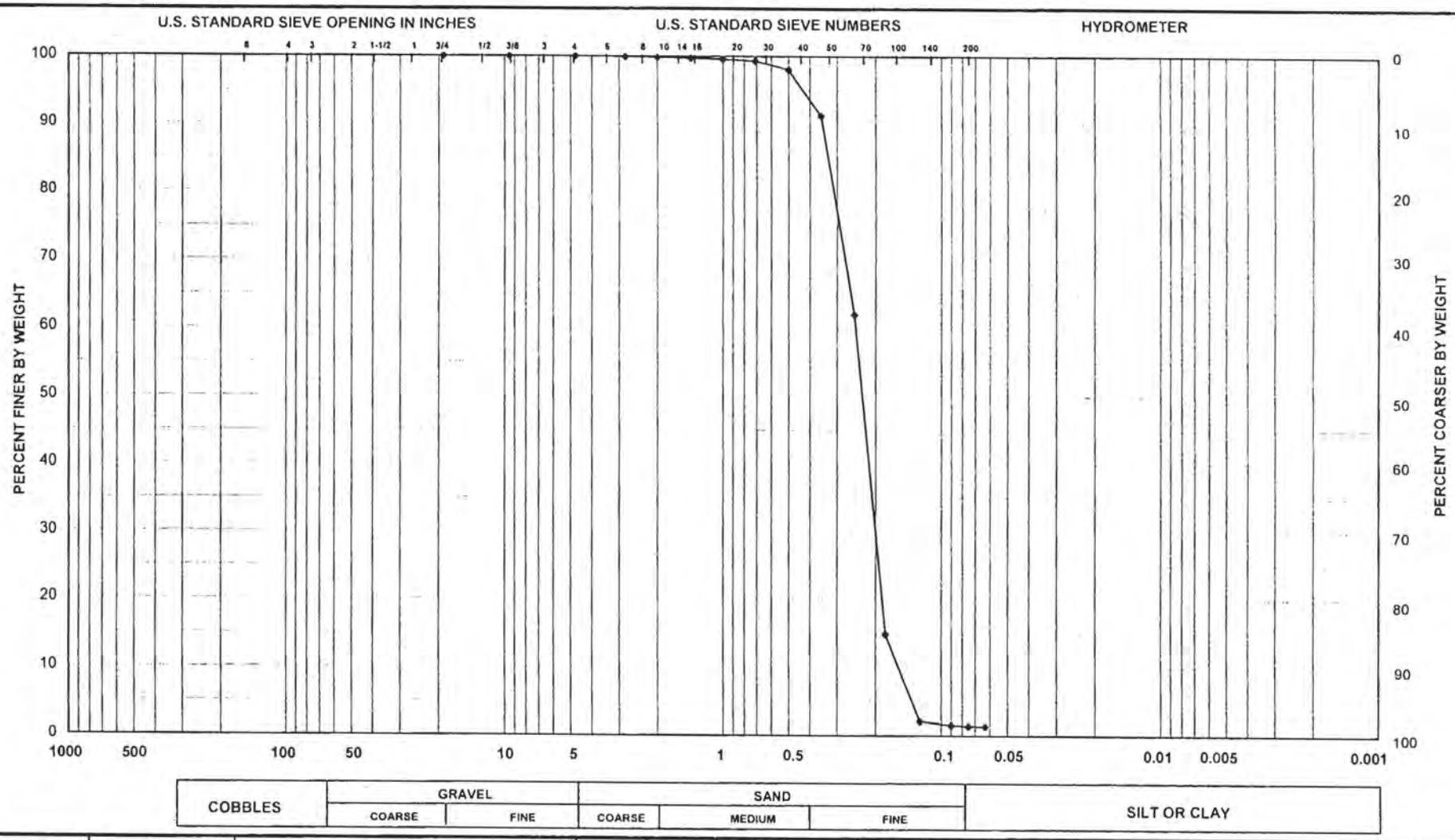
Project:	**Ocean Isle Renourishment**	**Depth:**	**6.4'- 6.9'**
Project No.:	**2216-01-60**	**Date:**	**8/1/2005**
Boring No.:	**OI-05-08A**		
Sample No.:	**2**		
Description:	**SAND, poorly graded, mostly fine-grained quartz, some carbonate, trace silt, olive brown (SP)**		

Tare Weight, (g):	49.72	
Dry Wt. Before Washing (g):	148.19	(with tare)
Dry Weight After Washing (g):	147.06	(with tare)

Sieve Size (Name)	Sieve Size (mm)	Weight Retained (g)	% Passing	Approx. Visual Shell %	Approx. Visual Shell Wt. (g)
3/4"	19.000	0.00	100.00	0	0.00
3/8"	9.500	2.94	97.01	100	2.94
#4	4.750	3.23	93.73	100	3.23
#7	2.800	3.98	89.69	100	3.98
#10	2.000	3.08	86.56	100	3.08
#14	1.400	4.41	82.09	100	4.41
#18	1.000	7.30	74.67	90	6.57
#25	0.710	8.93	65.60	70	6.25
#35	0.500	12.16	53.25	50	6.08
#45	0.355	11.64	41.43	30	3.49
#60	0.250	14.88	26.32	10	1.49
#80	0.180	17.32	8.73	5	0.87
#120	0.125	7.42	1.20	1	0.07
#170	0.090	0.54	0.65	1	0.01
#200	0.075	0.15	0.50	1	0.00
#230	0.063	0.08	0.42	1	0.00

Total Shell Content: **29** **%**

8/2/05



Sample No.	Elev. Or Depth	Classification	% CO_3	G_s	Nat w%	LL	PL	PI
◆ 3	7.3'- 7.8'	SAND, poorly graded, mostly fine-grained quartz, little carbonate, trace silt, greenish gray (SP)	26					

Project Ocean Isle Renourishment

Area

Boring No. OI-05-08A

Date 8/1/2005

GRADATION CURVES

ENG FORM 2087

MAY 63

WOLF TECHNOLOGIES, INC.
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VISUAL SHELL CONTENT

GRAIN SIZE AND VISUAL SHELL CONTENT

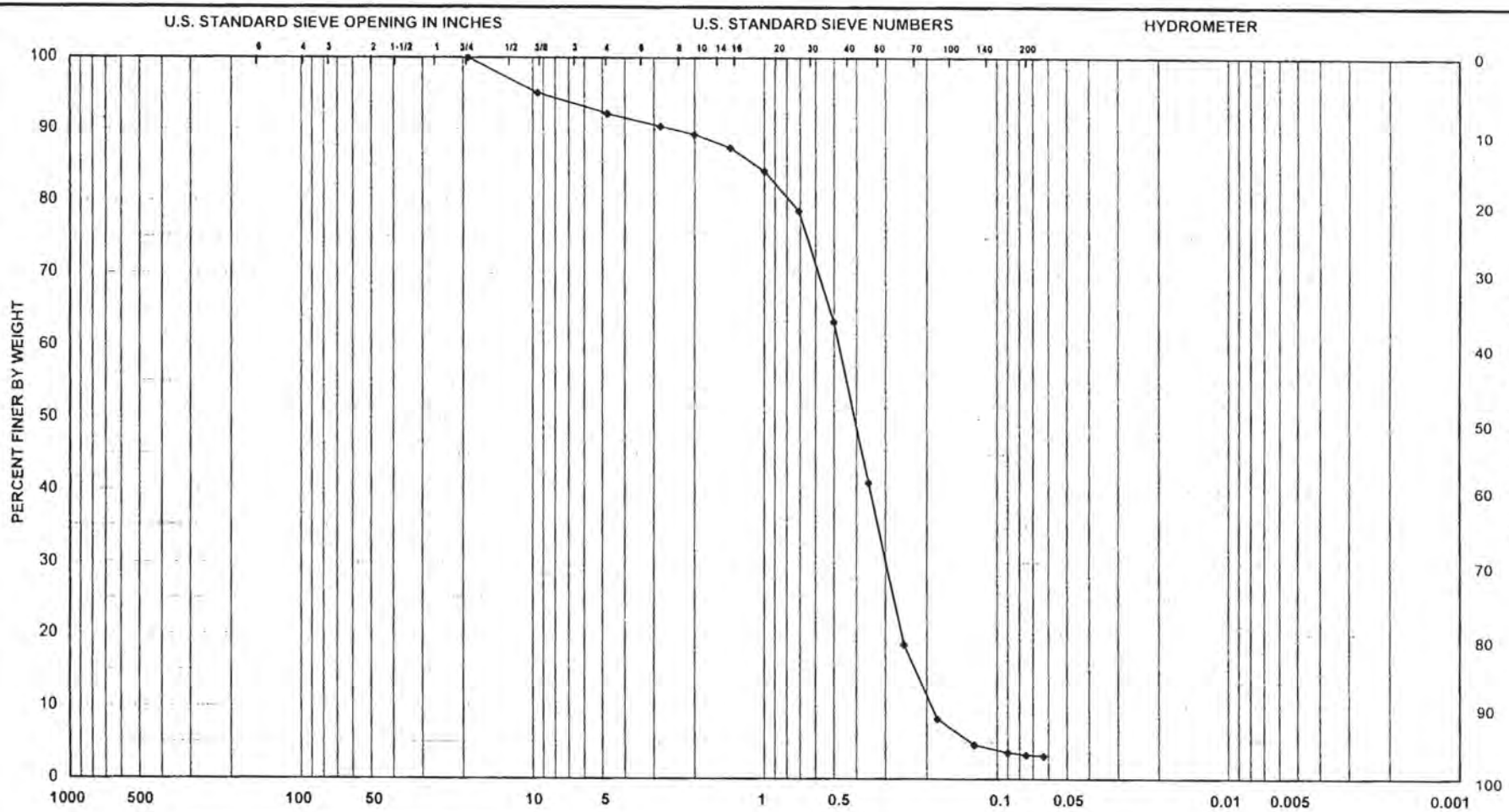
Project:	**Ocean Isle Renourishment**	**Depth:**	**7.3'- 7.8'**
Project No.:	**2216-01-60**	**Date:**	**8/1/2005**
Boring No.:	**OI-05-08A**		
Sample No.:	**3**		
Description:	**SAND, poorly graded, mostly fine-grained quartz, little carbonate, trace silt, greenish gray (SP)**		

Tare Weight, (g):	50.21	
Dry Wt. Before Washing (g):	170.68	(with tare)
Dry Weight After Washing (g):	168.96	(with tare)

Sieve Size (Name)	Sieve Size (mm)	Weight Retained (g)	% Passing	Approx. Visual Shell %	Approx. Visual Shell Wt. (g)
3/4"	19.000	0.00	100.00	0	0.00
3/8"	9.500	0.00	100.00	0	0.00
#4	4.750	0.00	100.00	0	0.00
#7	2.800	0.08	99.93	100	0.08
#10	2.000	0.11	99.84	100	0.11
#14	1.400	0.11	99.75	100	0.11
#18	1.000	0.19	99.59	100	0.19
#25	0.710	0.32	99.33	100	0.32
#35	0.500	1.44	98.13	90	1.30
#45	0.355	8.34	91.21	70	5.84
#60	0.250	35.16	62.02	50	17.58
#80	0.180	56.81	14.87	30	17.04
#120	0.125	15.40	2.08	10	1.54
#170	0.090	0.68	1.52	1	0.01
#200	0.075	0.19	1.36	1	0.00
#230	0.063	0.07	1.30	1	0.00

Total Shell Content: 26 %

8/2/05



Sample No.	Elev. Or Depth	Classification	% CO_3	G_s	Nat w%	LL	PL	PI
• 4	9.9'- 10.4'	SAND, poorly graded, mostly fine-grained quartz, some carbonate, trace silt, light olive brown (SP)	35					

Project Ocean Isle Renourishment

Area

Boring No. OI-05-08A

Date 8/1/2005

GRADATION CURVES

ENG FORM 2087

MAY 63

WOLF TECHNOLOGIES, INC.
3047-4 St. Johns Bluff Road S.
Jacksonville, Florida 32246
(904) 997-1400 (Tel) · (904) 997-9150 (Fax)

VISUAL SHELL CONTENT

GRAIN SIZE AND VISUAL SHELL CONTENT

Project:	**Ocean Isle Renourishment**	**Depth:**	**9.9'- 10.4'**
Project No.:	**2216-01-60**	**Date:**	**8/1/2005**
Boring No.:	**OI-05-8A**		
Sample No.:	**4**		
Description:	**SAND, poorly graded, mostly fine-grained quartz, some carbonate, trace silt, light olive brown (SP)**		

Tare Weight, (g):	50.03	
Dry Wt. Before Washing (g):	188.77	(with tare)
Dry Weight After Washing (g):	184.88	(with tare)

Sieve Size (Name)	Sieve Size (mm)	Weight Retained (g)	% Passing	Approx. Visual Shell %	Approx. Visual Shell Wt. (g)
3/4"	19.000	0.00	100.00	0	0.00
3/8"	9.500	6.86	95.06	100	6.86
#4	4.750	4.00	92.17	100	4.00
#7	2.800	2.43	90.42	100	2.43
#10	2.000	1.65	89.23	100	1.65
#14	1.400	2.55	87.39	100	2.55
#18	1.000	4.47	84.17	90	4.02
#25	0.710	7.60	78.69	70	5.32
#35	0.500	21.21	63.41	50	10.61
#45	0.355	31.01	41.06	50	15.51
#60	0.250	31.21	18.56	30	9.36
#80	0.180	14.30	8.25	10	1.43
#120	0.125	5.03	4.63	5	0.25
#170	0.090	1.45	3.58	1	0.01
#200	0.075	0.45	3.26	1	0.00
#230	0.063	0.25	3.08	1	0.00

Total Shell Content: **35** %

a 8/2/05

Hole No. 01-05-09

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

1. PROJECT OCEAN ISLE RENOURISHMENT	10. SIZE AND TYPE OF BIT 4" Dia. Vibracore
2. LOCATION (Coordinates or Station) NC Coord. E 2188487.9 N 57557.8	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) 01-05-09	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 (X) VERTICAL ☐ INCLINED _____ DEG. FROM VERT.	15. ELEVATION GROUND WATER N/A
7. THICKNESS OF OVERBURDEN N/A (4.7' of Water)	16. DATE HOLE STARTED 4/20/05 : COMPLETED 4/20/05
8. DEPTH DRILLED INTO ROCK 0.0'	17. ELEVATION TOP OF HOLE 0.0 MLLW
9. TOTAL DEPTH OF HOLE 8.9'	18. TOTAL CORE RECOVERY FOR BORING N/A %
	19. SIGNATURE OF INSPECTOR KELLY KALTENBACH, GEOLOGIST TRAINEE

ELEVATION MLLW	DEPTH feet	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 4.7' WATER			Time begin vibracoring: 1320 hrs. Soils described by Kelley J. Kaltenboch, Geologist-Trainee.
	4.0					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.
-4.7	4.7		OCEAN BOTTOM @ 4.7'		4.7'	
	5.0		SP Gray-tan, fine-coarse sand, clean, poorly graded. Little fine-medium sand sized shell material.		1	
					5.2'	VIBRACORE BORING From 4.7' to 8.9' Ran 4.9' Rec: 4.2' 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.
	6.0					
	7.0					
	8.0				8.2'	LAB CLASSIFICATION
					2	Jar Number / Classification: 1 SP; 2 SP
-8.9	8.9				8.7'	
	9.0		BOTTOM OF HOLE @8.9'			
			SOILS ARE FIELD VISUALLY CLASSIFIED IN ACCORDANCE WITH THE UNIFIED SOIL CLASSIFICATION SYSTEM			NOTE Assumed vibrocore refusal @ 8.9'

ENG FORM 1836 MAR 71 PREVIOUS EDITIONS ARE OBSOLETE.

PROJECT OCEAN ISLE RENOURISHMENT HOLE NO. 01-05 09

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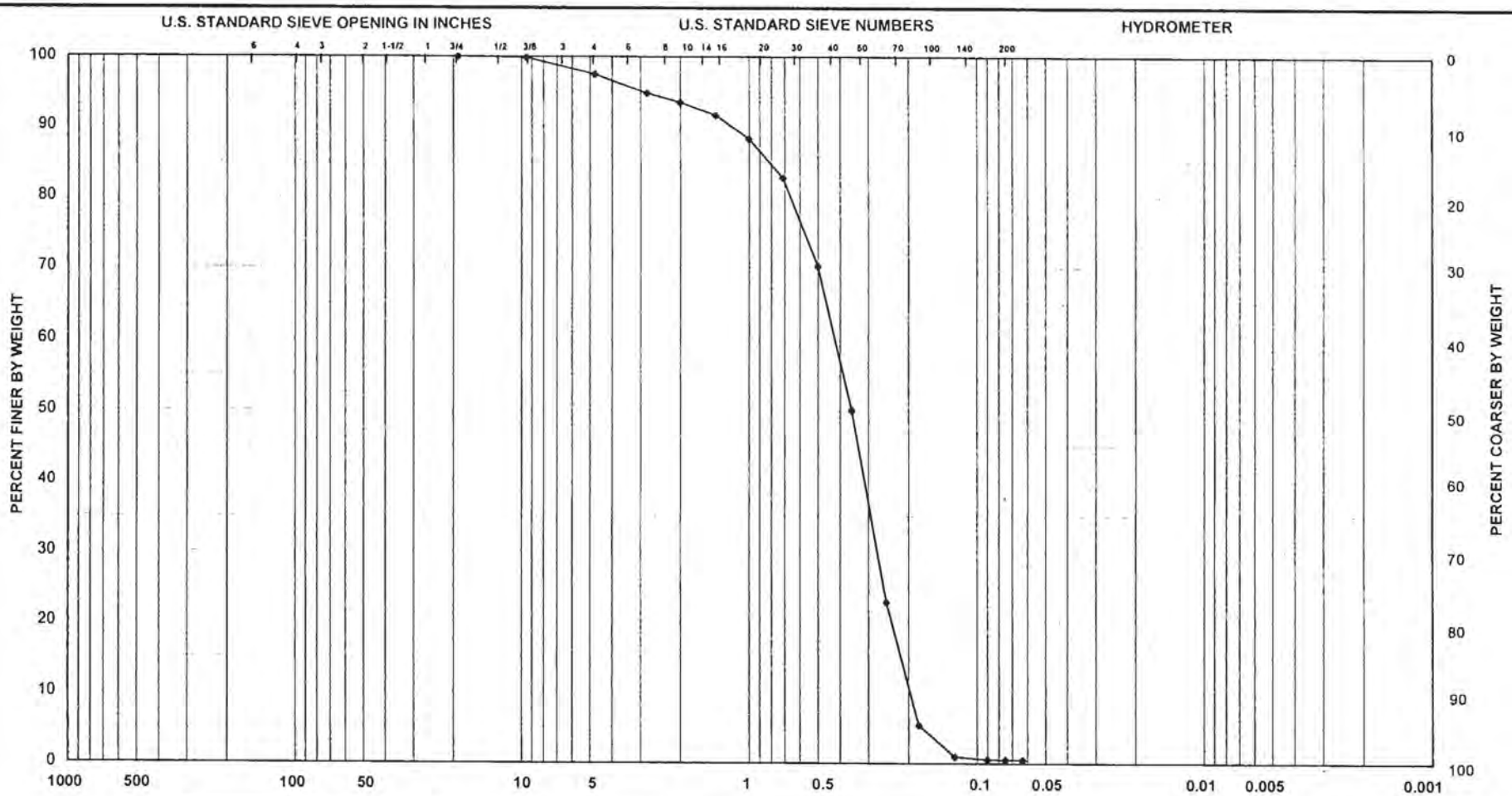


Sample No.	Elev. Or Depth	Classification	% CO_3	G_s	Nat w%	LL	PL	PI
• 1	4.7'- 5.2'	SAND, poorly-graded, mostly fine-grained quartz, some carbonate, trace silt, light olive brown (SP)	33					

Project Ocean Isle Renourishment

Area

Boring No. OI-05-09

Date 8/1/2005

GRADATION CURVES

ENG FORM 2087

MAY 63

WOLF TECHNOLOGIES, INC.

3047-4 St. Johns Bluff Road S.
Jacksonville, Florida 32246
(904) 997-1400 (Tel) · (904) 997-9150 (Fax)

VISUAL SHELL CONTENT

GRAIN SIZE AND VISUAL SHELL CONTENT

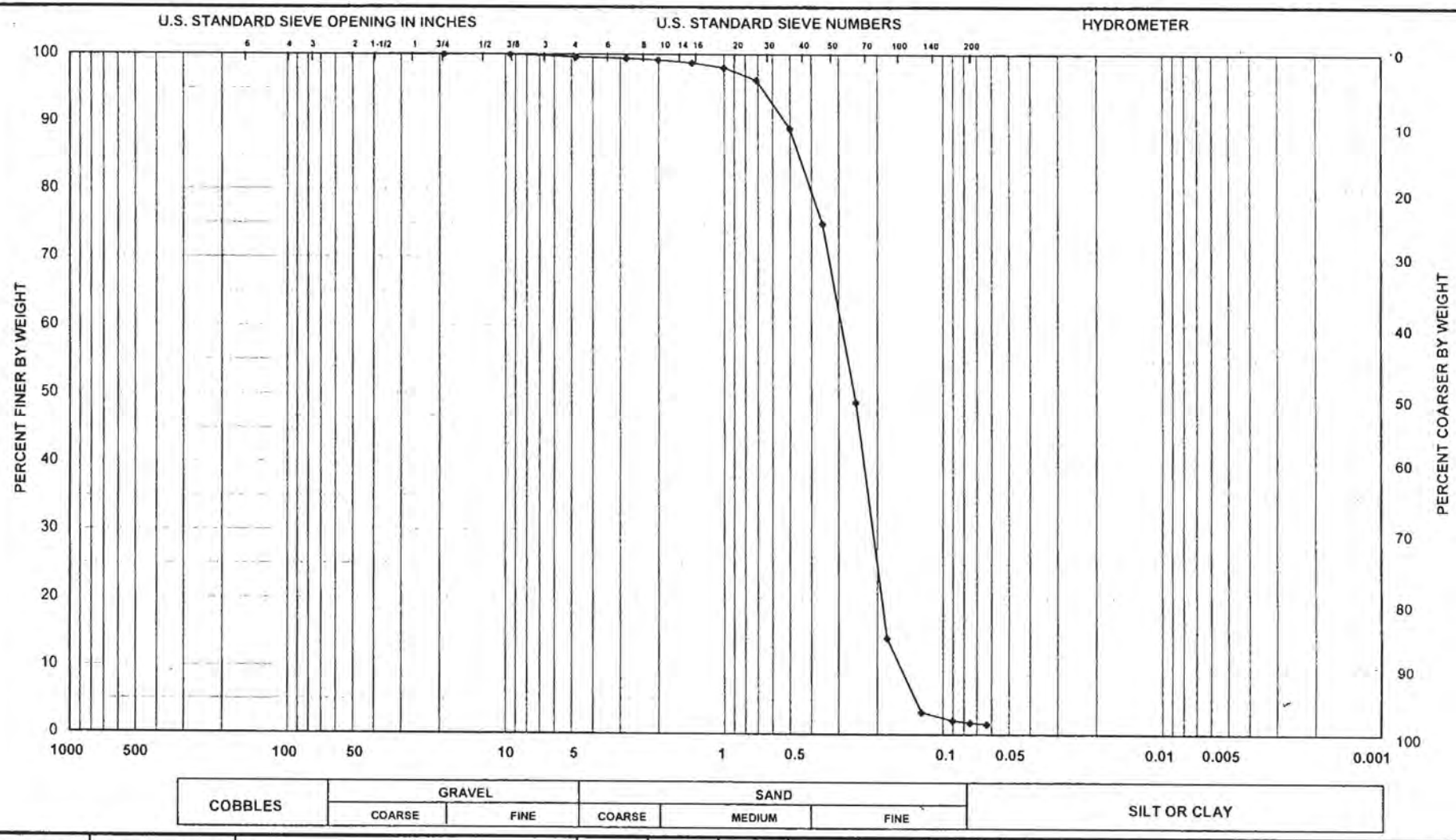
Project:	**Ocean Isle Renourishment**	**Depth:**	**4.7'- 5.2'**
Project No.:	**2216-01-60**	**Date:**	**8/1/2005**
Boring No.:	**OI-05-9**		
Sample No.:	**1**		
Description:	**SAND, poorly-graded, mostly fine-grained quartz, some carbonate, trace silt, light olive brown (SP)**		

Tare Weight, (g):	49.90	
Dry Wt. Before Washing (g):	162.09	(with tare)
Dry Weight After Washing (g):	161.23	(with tare)

Sieve Size (Name)	Sieve Size (mm)	Weight Retained (g)	% Passing	Approx. Visual Shell %	Approx. Visual Shell Wt. (g)
3/4"	19.000	0.00	100.00	0	0.00
3/8"	9.500	0.16	99.86	100	0.16
#4	4.750	2.66	97.49	100	2.66
#7	2.800	3.01	94.80	100	3.01
#10	2.000	1.49	93.48	100	1.49
#14	1.400	2.07	91.63	100	2.07
#18	1.000	3.80	88.24	95	3.61
#25	0.710	6.20	82.72	80	4.96
#35	0.500	14.01	70.23	70	9.81
#45	0.355	22.63	50.06	50	11.32
#60	0.250	30.58	22.80	30	9.17
#80	0.180	19.63	5.30	20	3.93
#120	0.125	4.91	0.93	5	0.25
#170	0.090	0.39	0.58	1	0.00
#200	0.075	0.06	0.53	1	0.00
#230	0.063	0.02	0.51	1	0.00

Total Shell Content: **33** %

a 8/2/05



Sample No.	Elev. Or Depth	Classification	% CO_3	G_s	Nat w%	LL	PL	PI
• 2	8.2'- 8.7'	SAND, poorly-graded, mostly fine-grained quartz, little carbonate, trace silt, light olive brown (SP)	19					

Project	Ocean Isle Renourishment
Area	
Boring No.	OI-05-09
Date	8/1/2005

GRADATION CURVES

ENG FORM 2087

MAY 63

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Jacksonville, Florida 32246
(904) 997-1400 (Tel) · (904) 997-9150 (Fax)

VISUAL SHELL CONTENT

GRAIN SIZE AND VISUAL SHELL CONTENT

Project:	**Ocean Isle Renourishment**	**Depth:**	**8.2'- 8.7'**
Project No.:	**2216-01-60**	**Date:**	**8/1/2005**
Boring No.:	**OI-05-9**		
Sample No.:	**2**		
Description:	**SAND, poorly-graded, mostly fine-grained quartz, little carbonate, trace silt, light olive brown (SP)**		

Tare Weight, (g):	50.32	
Dry Wt. Before Washing (g):	163.59	(with tare)
Dry Weight After Washing (g):	161.65	(with tare)

Sieve Size (Name)	Sieve Size (mm)	Weight Retained (g)	% Passing	Approx. Visual Shell %	Approx. Visual Shell Wt. (g)
3/4"	19.000	0.00	100.00	0	0.00
3/8"	9.500	0.00	100.00	0	0.00
#4	4.750	0.45	99.60	100	0.45
#7	2.800	0.24	99.39	100	0.24
#10	2.000	0.27	99.15	100	0.27
#14	1.400	0.44	98.76	100	0.44
#18	1.000	0.83	98.03	100	0.83
#25	0.710	2.02	96.25	90	1.82
#35	0.500	8.12	89.08	70	5.68
#45	0.355	16.05	74.91	50	8.03
#60	0.250	29.58	48.79	30	8.87
#80	0.180	39.10	14.28	10	3.91
#120	0.125	12.49	3.25	5	0.62
#170	0.090	1.37	2.04	1	0.01
#200	0.075	0.34	1.74	1	0.00
#230	0.063	0.24	1.53	1	0.00

Total Shell Content: **19** **%**

8/2/05

Hole No. 01-05-10

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

1. PROJECT OCEAN ISLE RENOURISHMENT	10. SIZE AND TYPE OF BIT 4" Dia. Vibracore
2. LOCATION (Coordinates or Station) NC Coord. E 2187473.4 N 57045.6	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) 01-05-10	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 (X) VERTICAL ☐ INCLINED _____ DEG. FROM VERT.	15. ELEVATION GROUND WATER N/A
7. THICKNESS OF OVERBURDEN N/A (7.6' of Water)	16. DATE HOLE: STARTED 4/20/05 : COMPLETED 4/20/05
8. DEPTH DRILLED INTO ROCK 0.0'	17. ELEVATION TOP OF HOLE 0.0 MLLW
9. TOTAL DEPTH OF HOLE 17.9'	18. TOTAL CORE RECOVERY FOR BORING N/A %
	19. SIGNATURE OF INSPECTOR KELLY KALTENBACH, GEOLOGIST TRAINEE

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 7.6' WATER			Time begin vibracoring: 0931 hrs. Soils described by Kelley J. Kaltenbach, Geologist-Trainee.
	7.0					
7.6	7.6		OCEAN BOTTOM @7.6'		7.6'	
			SP Tan-light gray, fine-coarse sand, some fine-coarse gravel size shell material. Contains gravel size rock fragments, poorly graded.		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.
					8.1'	
	9.0					VIBRACORE BORING From 7.6' to 17.9' Ran 10.3' Rec: 10.3'
			10.7' fine to medium sand little to some fine to medium shell material no gravel size material.			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.
	11.0				11.6'	
					2	
			12.5'		12.5'	
-12.5	12.5		SP-SM Gray, mottled with tan fine-medium sand, poorly sorted, T/silty material trace to little fine shell material, contains thin lenses of organic material (worm burrows).		3	
	13.0				13.0'	
	15.0					LAB CLASSIFICATION
						Jar Number / Classification: 1 SP; 2 SP; 3 SP; 4 SM
	17.0		17.2'		17.2'	
-17.2	17.2		SM Brown, fine to medium silty sand, little shell material.		4	
-17.9	17.9		BOTTOM OF HOLE @ 17.9'		17.7'	NOTE Assumed vibracore refusal @ 17.9'

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

ENG FORM 1836 MAR 71 PREVIOUS EDITIONS ARE OBSOLETE.

PROJECT OCEAN ISLE RENOURISHMENT | HOLE NO. 01-05 10

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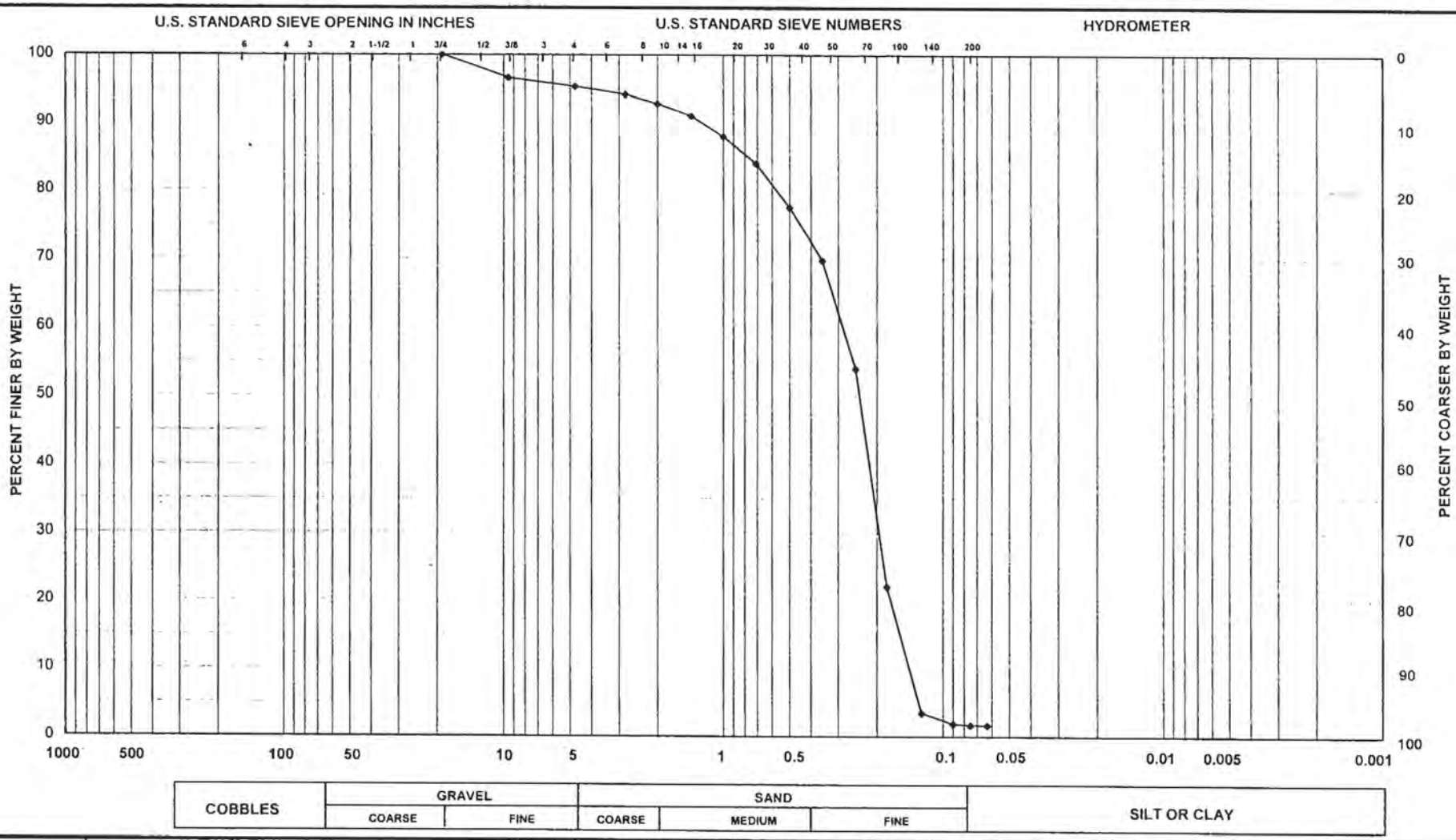


Sample No.	Elev. Or Depth	Classification	% CO_3	G_s	Nat w%	LL	PL	PI
• 1	7.6'- 8.1'	SAND, poorly-graded, mostly fine-grained quartz, some carbonate, trace silt, light olive brown (SP)	31					

Project Ocean Isle Renourishment

Area

Boring No. OI-05-10

Date 8/1/2005

GRADATION CURVES

ENG FORM 2087

MAY 63

WOLF TECHNOLOGIES, INC.

3047-4 St. Johns Bluff Road S.
Jacksonville, Florida 32246
(904) 997-1400 (Tel) · (904) 997-9150 (Fax)

VISUAL SHELL CONTENT

GRAIN SIZE AND VISUAL SHELL CONTENT

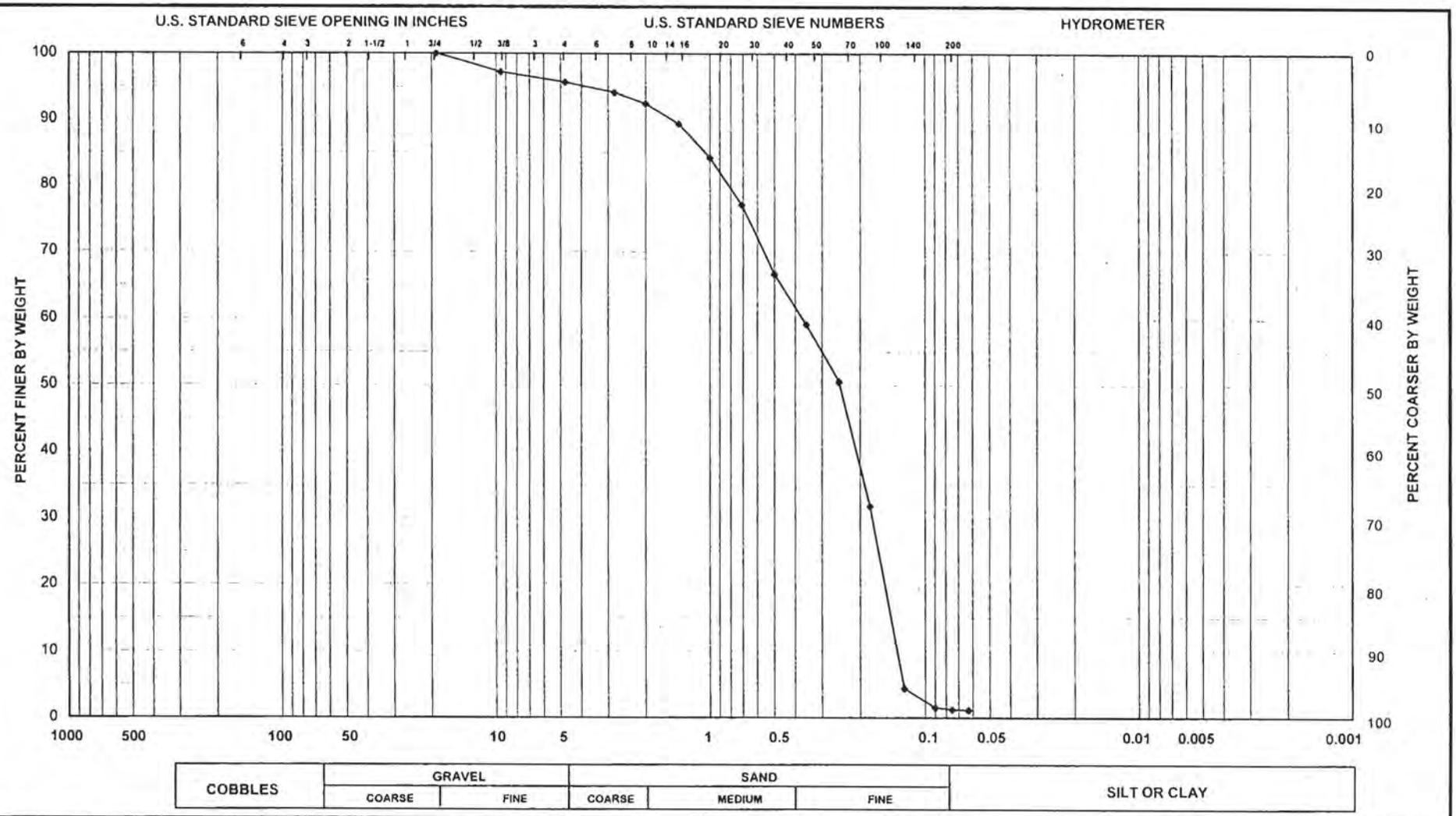
Project:	**Ocean Isle Renourishment**	**Depth:**	**7.6'- 8.1'**
Project No.:	**2216-01-60**	**Date:**	**8/1/2005**
Boring No.:	**OI-05-10**		
Sample No.:	**1**		
Description:	**SAND, poorly-graded, mostly fine-grained quartz, some carbonate, trace silt, light olive brown (SP)**		

Tare Weight, (g):	50.31	
Dry Wt. Before Washing (g):	163.65	(with tare)
Dry Weight After Washing (g):	162.21	(with tare)

Sieve Size (Name)	Sieve Size (mm)	Weight Retained (g)	% Passing	Approx. Visual Shell %	Approx. Visual Shell Wt. (g)
3/4"	19.000	0.00	100.00	0	0.00
3/8"	9.500	3.86	96.59	100	3.86
#4	4.750	1.45	95.31	100	1.45
#7	2.800	1.33	94.14	100	1.33
#10	2.000	1.52	92.80	100	1.52
#14	1.400	2.05	90.99	100	2.05
#18	1.000	3.49	87.91	95	3.32
#25	0.710	4.50	83.94	80	3.60
#35	0.500	7.28	77.52	70	5.10
#45	0.355	8.79	69.76	70	6.15
#60	0.250	17.94	53.94	50	8.97
#80	0.180	36.21	21.99	30	10.86
#120	0.125	21.03	3.43	10	2.10
#170	0.090	1.77	1.87	1	0.02
#200	0.075	0.21	1.69	1	0.00
#230	0.063	0.01	1.68	1	0.00

Total Shell Content: **31** %

e 8/2/05



Sample No.	Elev. Or Depth	Classification	% CO_3	G_s	Nat w%	LL	PL	PI
• 2	11.6'- 12.1'	SAND, poorly-graded, mostly fine-grained quartz, some carbonate, trace silt, light olive brown (SP)	31					

Project: Ocean Isle Renourishment

Area:

Boring No.: OI-05-10

Date: 8/1/2005

GRADATION CURVES

ENG FORM 2087

MAY 63

WOLF TECHNOLOGIES, INC.

3047-4 St. Johns Bluff Road S.
Jacksonville, Florida 32246
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VISUAL SHELL CONTENT

GRAIN SIZE AND VISUAL SHELL CONTENT

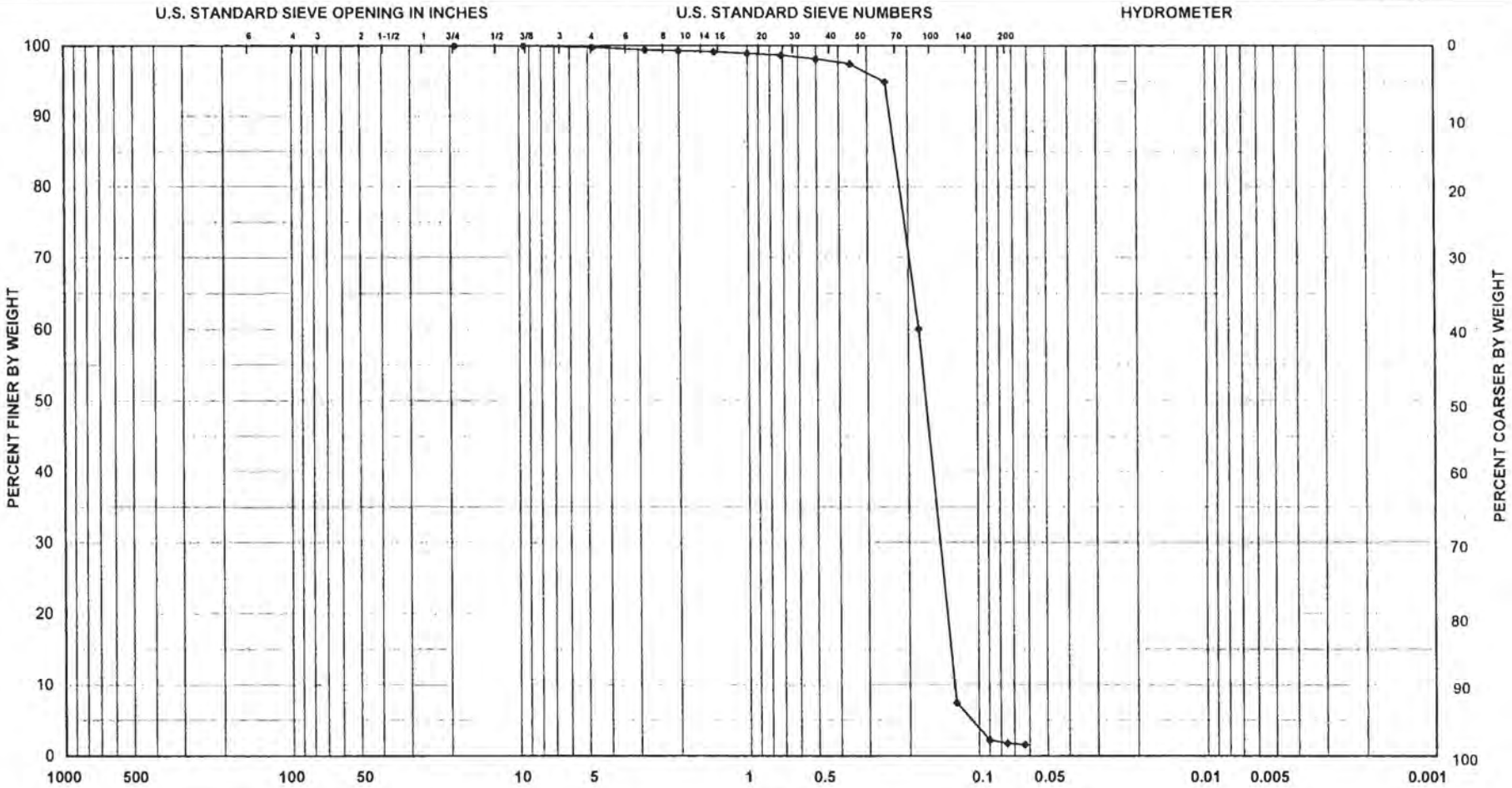
Project:	**Ocean Isle Renourishment**	**Depth:**	**11.6'- 12.1'**
Project No.:	**2216-01-60**	**Date:**	**8/1/2005**
Boring No.:	**OI-05-10**		
Sample No.:	**2**		
Description:	**SAND, poorly-graded, mostly fine-grained quartz, some carbonate, trace silt, light olive brown (SP)**		

Tare Weight, (g):	50.13	
Dry Wt. Before Washing (g):	157.83	(with tare)
Dry Weight After Washing (g):	156.31	(with tare)

Sieve Size (Name)	Sieve Size (mm)	Weight Retained (g)	% Passing	Approx. Visual Shell %	Approx. Visual Shell Wt. (g)
3/4"	19.000	0.00	100.00	0	0.00
3/8"	9.500	3.02	97.20	100	3.02
#4	4.750	1.66	95.65	100	1.66
#7	2.800	1.64	94.13	100	1.64
#10	2.000	1.82	92.44	100	1.82
#14	1.400	3.34	89.34	100	3.34
#18	1.000	5.55	84.19	95	5.27
#25	0.710	7.71	77.03	80	6.17
#35	0.500	11.10	66.72	70	7.77
#45	0.355	8.17	59.14	70	5.72
#60	0.250	9.32	50.48	50	4.66
#80	0.180	20.07	31.85	30	6.02
#120	0.125	29.60	4.36	5	1.48
#170	0.090	3.09	1.49	1	0.03
#200	0.075	0.30	1.22	1	0.00
#230	0.063	0.09	1.13	1	0.00

Total Shell Content: 31 %

8/2/05



Sample No.	Elev. Or Depth	Classification	% CO_3	G_s	Nat w%	LL	PL	PI
• 3	12.5'- 13.0'	SAND, poorly-graded, mostly fine-grained quartz, few carbonate, trace silt, greenish gray (SP)	13					

Project Ocean Isle Renourishment

Area

Boring No. OI-05-10

Date 8/1/2005

GRADATION CURVES

ENG FORM 2087

MAY 63

WOLF TECHNOLOGIES, INC.

3047-4 St. Johns Bluff Road S.
Jacksonville, Florida 32246
(904) 997-1400 (Tel) · (904) 997-9150 (Fax)

VISUAL SHELL CONTENT

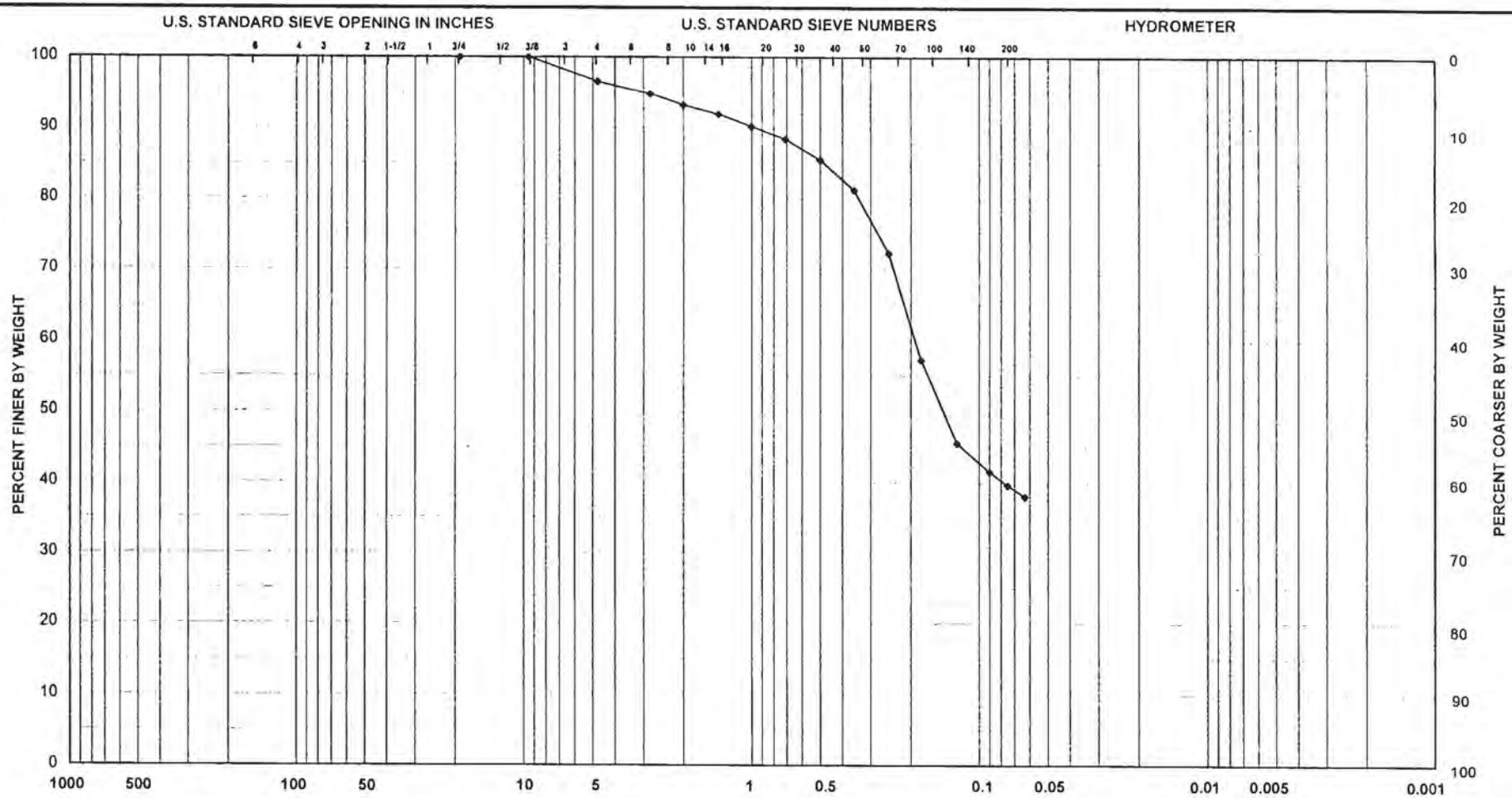
GRAIN SIZE AND VISUAL SHELL CONTENT

Project:	**Ocean Isle Renourishment**	**Depth:**	**12.5'- 13.0'**
Project No.:	**2216-01-60**	**Date:**	**8/1/2005**
Boring No.:	**OI-05-10**		
Sample No.:	**3**		
Description:	**SAND, poorly-graded, mostly fine-grained quartz, few carbonate, trace silt, greenish gray (SP)**		

Tare Weight, (g):	50.09	
Dry Wt. Before Washing (g):	158.54	(with tare)
Dry Weight After Washing (g):	156.75	(with tare)

Sieve Size (Name)	Sieve Size (mm)	Weight Retained (g)	% Passing	Approx. Visual Shell %	Approx. Visual Shell Wt. (g)
3/4"	19.000	0.00	100.00	0	0.00
3/8"	9.500	0.00	100.00	0	0.00
#4	4.750	0.26	99.76	100	0.26
#7	2.800	0.39	99.40	100	0.39
#10	2.000	0.11	99.30	100	0.11
#14	1.400	0.19	99.12	100	0.19
#18	1.000	0.23	98.91	100	0.23
#25	0.710	0.31	98.63	100	0.31
#35	0.500	0.55	98.12	90	0.50
#45	0.355	0.73	97.45	70	0.51
#60	0.250	2.75	94.91	50	1.38
#80	0.180	37.82	60.04	30	11.35
#120	0.125	57.00	7.48	10	5.70
#170	0.090	5.68	2.24	1	0.06
#200	0.075	0.50	1.78	1	0.01
#230	0.063	0.21	1.59	1	0.00

Total Shell Content: **13** **%**



Sample No.	Elev. Or Depth	Classification	% CO_3	G_s	Nat w%	LL	PL	PI
• 4	17.2'- 17.7'	SAND, silty, mostly fine-grained quartz sand, some silt, few carbonate, trace limestone fragments, olive brown (SM)	8					

Project Ocean Isle Renourishment

Area

Boring No. OI-05-10

Date 8/1/2005

GRADATION CURVES

ENG FORM 2087

MAY 63

WOLF TECHNOLOGIES, INC.

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Jacksonville, Florida 32246
(904) 997-1400 (Tel) · (904) 997-9150 (Fax)

VISUAL SHELL CONTENT

GRAIN SIZE AND VISUAL SHELL CONTENT

Project:	**Ocean Isle Renourishment**	**Depth:**	**17.2'- 17.7'**
Project No.:	**2216-01-60**	**Date:**	**8/1/2005**
Boring No.:	**OI-05-10**		
Sample No.:	**4**		
Description:	**SAND, silty, mostly fine-grained quartz sand, some silt, few carbonate, trace limestone fragments, olive brown (SM)**		

Tare Weight, (g):	49.77	
Dry Wt. Before Washing (g):	147.7	(with tare)
Dry Weight After Washing (g):	110.73	(with tare)

Sieve Size (Name)	Sieve Size (mm)	Weight Retained (g)	% Passing	Approx. Visual Shell %	Approx. Visual Shell Wt. (g)
3/4"	19.000	0.00	100.00	0	0.00
3/8"	9.500	0.00	100.00	0	0.00
#4	4.750	3.36	96.57	25	0.84
#7	2.800	1.70	94.83	50	0.85
#10	2.000	1.56	93.24	30	0.47
#14	1.400	1.29	91.92	20	0.26
#18	1.000	1.68	90.21	20	0.34
#25	0.710	1.80	88.37	20	0.36
#35	0.500	2.88	85.43	30	0.86
#45	0.355	4.17	81.17	30	1.25
#60	0.250	8.75	72.24	20	1.75
#80	0.180	14.66	57.27	10	1.47
#120	0.125	11.45	45.57	5	0.57
#170	0.090	4.00	41.49	1	0.04
#200	0.075	1.87	39.58	1	0.02
#230	0.063	1.60	37.95	1	0.02

Total Shell Content: 8 %

8/2/05

Hole No. OI-05-11

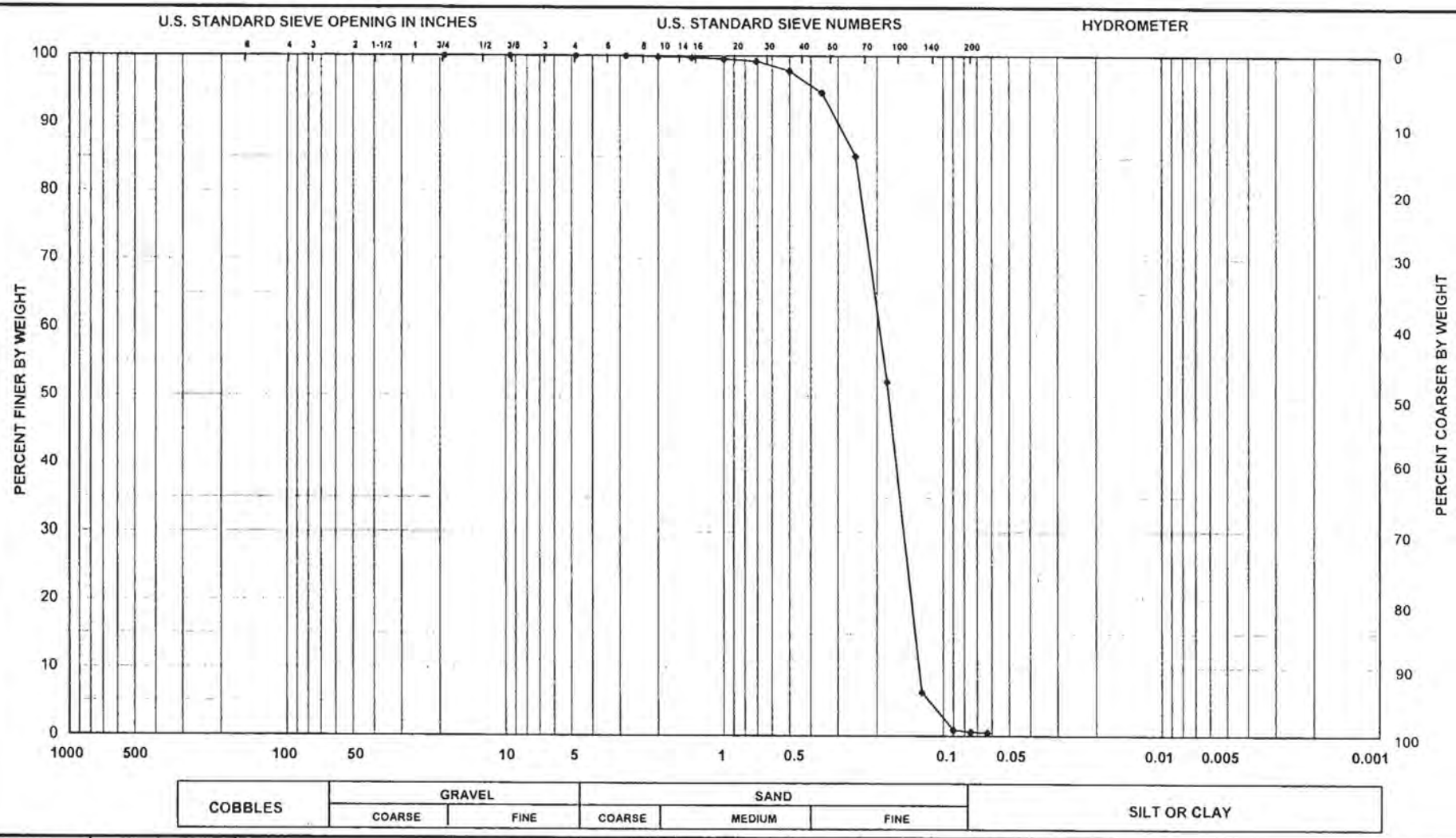
DRILLING LOG	DIVISION SOUTH ATLANTIC	INSTALLATION WILMINGTON DISTRICT	SHEET 1 OF 1 SHEETS

1. PROJECT OCEAN ISLE RENOURISHMENT	10. SIZE AND TYPE OF BIT 4" Dia. Vibracore
2. LOCATION (Coordinates or Station) NC Coord. E 2187039.7 N 56840.9	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) OI-05-11	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 (8.2' of Water)	16. DATE HOLE: STARTED 4/20/05 : COMPLETED 4/20/05
8. DEPTH DRILLED INTO ROCK 0.0'	17. ELEVATION TOP OF HOLE 0.0 MLLW
9. TOTAL DEPTH OF HOLE 13.7'	18. TOTAL CORE RECOVERY FOR BORING N/A %
	19. SIGNATURE OF INSPECTOR KELLY KALTENBACH, GEOLOGIST TRAINEE

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 8.2' WATER			Time begin vibracoring: 1013 hrs. Soils described by Kelley J. Kaltenbach, Geologist-Trainee.
	8.0		OCEAN BOTTOM @8.2'		8.2'	
8.2	8.2		SP Tan-light gray, fine-medium sand, clean, poorly graded, trace fine-coarse sand size shell material. Contains a few black organic silty lenses 2mm in thickness.		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.
	9.0				8.7'	VIBRACORE BORING From 8.2' to 13.7' Ran 8.2' Rec: 5.5' 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.
	10.0					
	11.0				11.2'	
					2	
					11.7'	LAB CLASSIFICATION: Jar Number / Classification: 1 SP; 2 SP; 3 SM
	12.0		12.6' some coarse shelly material, little black organic silty sand. 13.0'			
	13.0		MH Brown to dark gray sandy silt, little fine-medium sand. Little shell material, inorganic trace ore silt.		13.0'	
					3	
					13.5'	
-13.7	13.7		BOTTOM OF HOLE @13.7'			
	14.0		SOILS ARE FIELD VISUALLY CLASSIFIED IN ACCORDANCE WITH THE UNIFIED SOIL CLASSIFICATION SYSTEM			NOTE Assumed vibracore refusal @ 13.7'

ENG FORM 1836 MAR 71 PREVIOUS EDITIONS ARE OBSOLETE.

PROJECT OCEAN ISLE RENOURISHMENT | HOLE NO. OI-05 11



Sample No.	Elev. Or Depth	Classification	% CO_3	G_s	Nat w%	LL	PL	PI
• 1	8.2'- 8.7'	SAND, poorly-graded, mostly fine-grained quartz, little carbonate, trace silt, greenish gray (SP)	15					

Project: Ocean Isle Renourishment

Area

Boring No. OI-05-11

Date 8/1/2005

GRADATION CURVES

ENG FORM 2087

MAY 63

WOLF TECHNOLOGIES, INC.

3047-4 St. Johns Bluff Road S.
Jacksonville, Florida 32246
(904) 997-1400 (Tel) · (904) 997-9150 (Fax)

VISUAL SHELL CONTENT

GRAIN SIZE AND VISUAL SHELL CONTENT

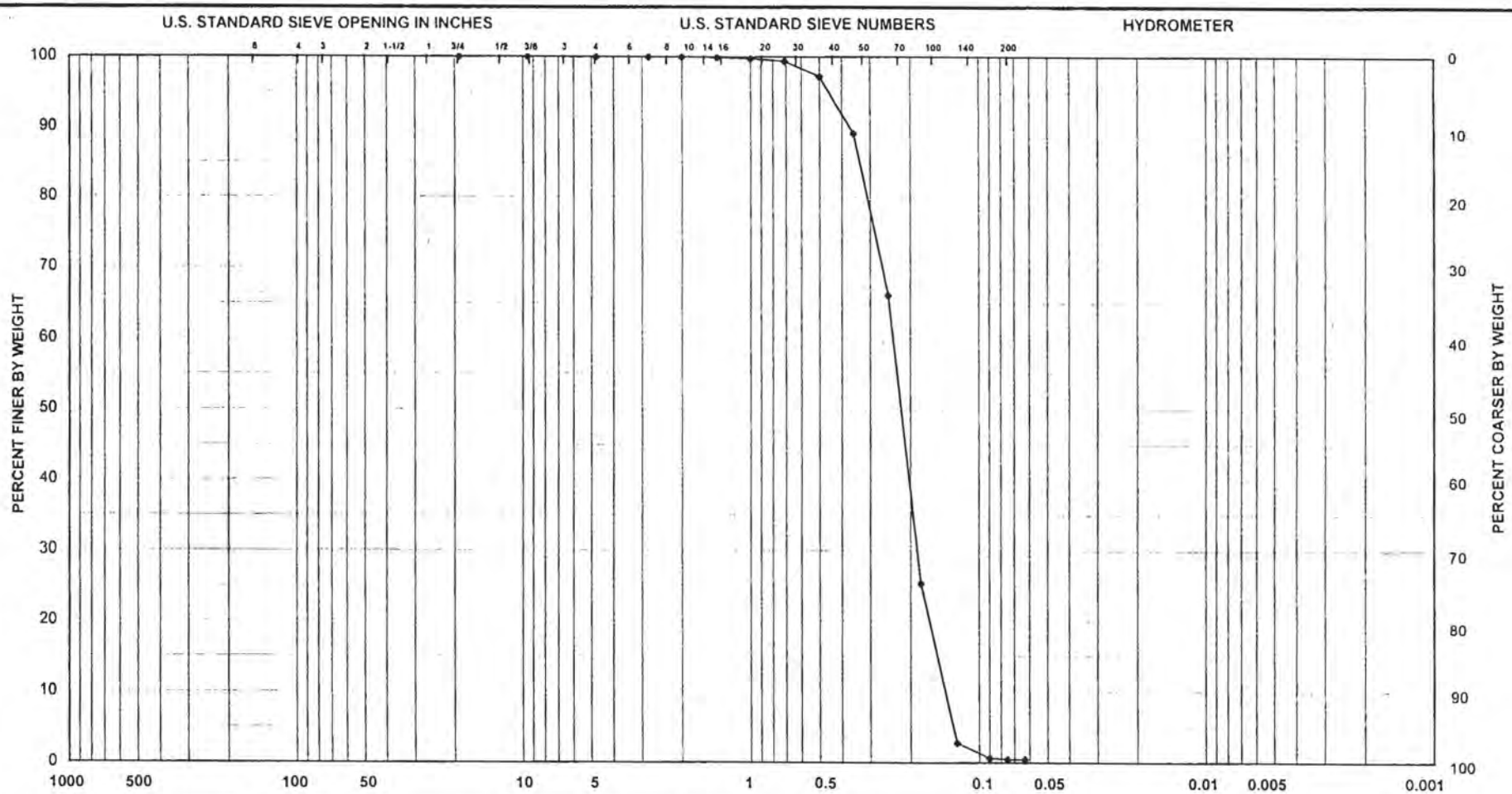
Project:	**Ocean Isle Renourishment**	**Depth:**	**8.2'- 8.7'**
Project No.:	**2216-01-60**	**Date:**	**8/1/2005**
Boring No.:	**OI-05-11**		
Sample No.:	**1**		
Description:	**SAND, poorly-graded, mostly fine-grained quartz, little carbonate, trace silt, greenish gray (SP)**		

Tare Weight, (g):	50.18	
Dry Wt. Before Washing (g):	138.64	(with tare)
Dry Weight After Washing (g):	137.71	(with tare)

Sieve Size (Name)	Sieve Size (mm)	Weight Retained (g)	% Passing	Approx. Visual Shell %	Approx. Visual Shell Wt. (g)
3/4"	19.000	0.00	100.00	0	0.00
3/8"	9.500	0.00	100.00	0	0.00
#4	4.750	0.00	100.00	0	0.00
#7	2.800	0.01	99.99	100	0.01
#10	2.000	0.12	99.85	100	0.12
#14	1.400	0.12	99.72	100	0.12
#18	1.000	0.15	99.55	100	0.15
#25	0.710	0.31	99.20	100	0.31
#35	0.500	1.21	97.83	60	0.73
#45	0.355	2.85	94.61	50	1.43
#60	0.250	8.32	85.20	50	4.16
#80	0.180	29.33	52.05	30	8.80
#120	0.125	40.36	6.42	10	4.04
#170	0.090	4.91	0.87	5	0.25
#200	0.075	0.24	0.60	1	0.00
#230	0.063	0.08	0.51	1	0.00

Total Shell Content: **15** %

8/2/05



Sample No.	Elev. Or Depth	Classification	% CO_3	G_s	Nat w%	LL	PL	PI
• 2	11.2'- 11.7'	SAND, poorly-graded, mostly fine-grained quartz, little carbonate, trace silt, greenish gray (SP)	20					

Project: Ocean Isle Renourishment

Area:

Boring No.: OI-05-11

Date: 8/1/2005

GRADATION CURVES

ENG FORM 2087

MAY 63

WOLF TECHNOLOGIES, INC.

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Jacksonville, Florida 32246
(904) 997-1400 (Tel) · (904) 997-9150 (Fax)

VISUAL SHELL CONTENT

GRAIN SIZE AND VISUAL SHELL CONTENT

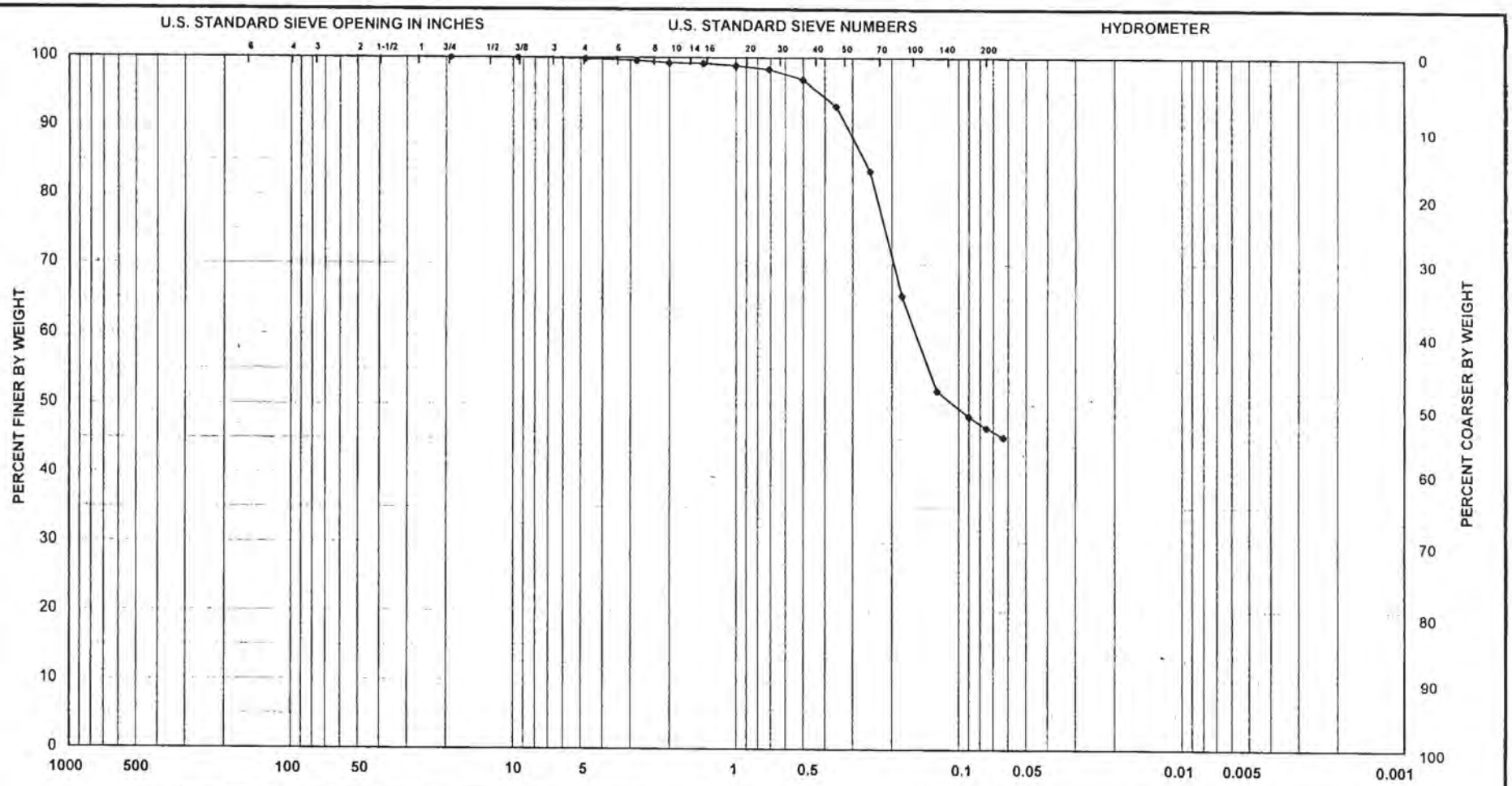
Project:	**Ocean Isle Renourishment**	**Depth:**	**11.2'- 11.7'**
Project No.:	**2216-01-60**	**Date:**	**8/1/2005**
Boring No.:	**OI-05-11**		
Sample No.:	**2**		
Description:	**SAND, poorly-graded, mostly fine-grained quartz, little carbonate, trace silt, greenish gray (SP)**		

Tare Weight, (g):	50.13	
Dry Wt. Before Washing (g):	145.19	(with tare)
Dry Weight After Washing (g):	144.43	(with tare)

Sieve Size (Name)	Sieve Size (mm)	Weight Retained (g)	% Passing	Approx. Visual Shell %	Approx. Visual Shell Wt. (g)
3/4"	19.000	0.00	100.00	0	0.00
3/8"	9.500	0.00	100.00	0	0.00
#4	4.750	0.02	99.98	100	0.02
#7	2.800	0.01	99.97	100	0.01
#10	2.000	0.02	99.95	100	0.02
#14	1.400	0.06	99.88	100	0.06
#18	1.000	0.15	99.73	100	0.15
#25	0.710	0.35	99.36	90	0.32
#35	0.500	2.01	97.24	70	1.41
#45	0.355	7.74	89.10	50	3.87
#60	0.250	21.82	66.15	40	8.73
#80	0.180	38.78	25.35	30	11.63
#120	0.125	21.50	2.74	10	2.15
#170	0.090	1.97	0.66	5	0.10
#200	0.075	0.17	0.48	1	0.00
#230	0.063	0.01	0.47	1	0.00

Total Shell Content: **20** **%**

c: 2/2/05



Sample No.	Elev. Or Depth	Classification	% CO_3	G_s	Nat w%	LL	PL	PI
• 3	13'- 13.5'	SAND, silty, mostly fine-grained quartz sand, some silt, few carbonate, dark greenish gray (SM)	9					

Project: Ocean Isle Renourishment

Area:

Boring No.: OI-05-11

Date: 8/1/2005

GRADATION CURVES

ENG FORM 2087

MAY 63

WOLF TECHNOLOGIES, INC.

3047-4 St. Johns Bluff Road S.
Jacksonville, Florida 32246
(904) 997-1400 (Tel) · (904) 997-9150 (Fax)

VISUAL SHELL CONTENT

GRAIN SIZE AND VISUAL SHELL CONTENT

Project:	**Ocean Isle Renourishment**	**Depth:**	**13'- 13.5'**
Project No.:	**2216-01-60**	**Date:**	**8/1/2005**
Boring No.:	**OI-05-11**		
Sample No.:	**3**		
Description:	**SAND, silty, mostly fine-grained quartz sand, some silt, few carbonate, dark greenish gray (SM)**		

Tare Weight, (g):	50.25	
Dry Wt. Before Washing (g):	129.39	(with tare)
Dry Weight After Washing (g):	93.2	(with tare)

Sieve Size (Name)	Sieve Size (mm)	Weight Retained (g)	% Passing	Approx. Visual Shell %	Approx. Visual Shell Wt. (g)
3/4"	19.000	0.00	100.00	0	0.00
3/8"	9.500	0.00	100.00	0	0.00
#4	4.750	0.14	99.82	100	0.14
#7	2.800	0.23	99.53	100	0.23
#10	2.000	0.22	99.25	100	0.22
#14	1.400	0.08	99.15	100	0.08
#18	1.000	0.24	98.85	90	0.22
#25	0.710	0.36	98.40	90	0.32
#35	0.500	1.22	96.85	80	0.98
#45	0.355	3.05	93.00	50	1.53
#60	0.250	7.52	83.50	30	2.26
#80	0.180	14.19	65.57	10	1.42
#120	0.125	10.75	51.98	5	0.54
#170	0.090	2.91	48.31	5	0.15
#200	0.075	1.30	46.66	1	0.01
#230	0.063	1.06	45.32	1	0.01

Total Shell Content: 9 %

8/2/05

Hole No. OI-05-12

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

1. PROJECT OCEAN ISLE RENOURISHMENT	10. SIZE AND TYPE OF BIT 4" Dia. Vibracore
2. LOCATION (Coordinates or Station) NC Coord. E 2187399.2 N 56483.8	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) OI-05-12	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 (1.3' of Water)	16. DATE HOLE: STARTED 4/20/05 : COMPLETED 4/20/05
8. DEPTH DRILLED INTO ROCK 0.0'	17. ELEVATION TOP OF HOLE 0.0 MLLW
9. TOTAL DEPTH OF HOLE 10.0'	18. TOTAL CORE RECOVERY FOR BORING N/A %
	19. SIGNATURE OF INSPECTOR KELLY KALTENBACH, GEOLOGIST TRAINEE

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 1.3' WATER			Time begin vibracoring: 1155 hrs. Soils described by Kelley J. Kaltenbach, Geologist-Trainee.
	1.0		OCEAN BOTTOM @1.3'		1.3'	
1.3	1.3		SP Tan, mottled light gray fine-coarse sand, clean, poorly graded. Little to trace fine shell.		1 / 1.8'	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.
	3.0		2.9' some fine to coarse sand size shell material.		3.3' / 2 / 3.8'	VIBRACORE BORING From 1.3' to 10.0' Ran 9.8' Rec: 8.7' 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.
	5.0					
	7.0		7.7' shell content increases cont gravel size shell material.		7.3' / 3 / 7.8'	
	9.0					LAB CLASSIFICATION: Jar Number 1 SP; 2 SP; 3 SP
-10.0	10.0		BOTTOM OF HOLE @10.0'			
			SOILS ARE FIELD VISUALLY CLASSIFIED IN ACCORDANCE WITH THE UNIFIED SOIL CLASSIFICATION SYSTEM			NOTE Assumed vibracore refusal @ 10.0'

ENG FORM 1836 MAR 71 PREVIOUS EDITIONS ARE OBSOLETE.

PROJECT OCEAN ISLE RENOURISHMENT | HOLE NO. OI-05 12

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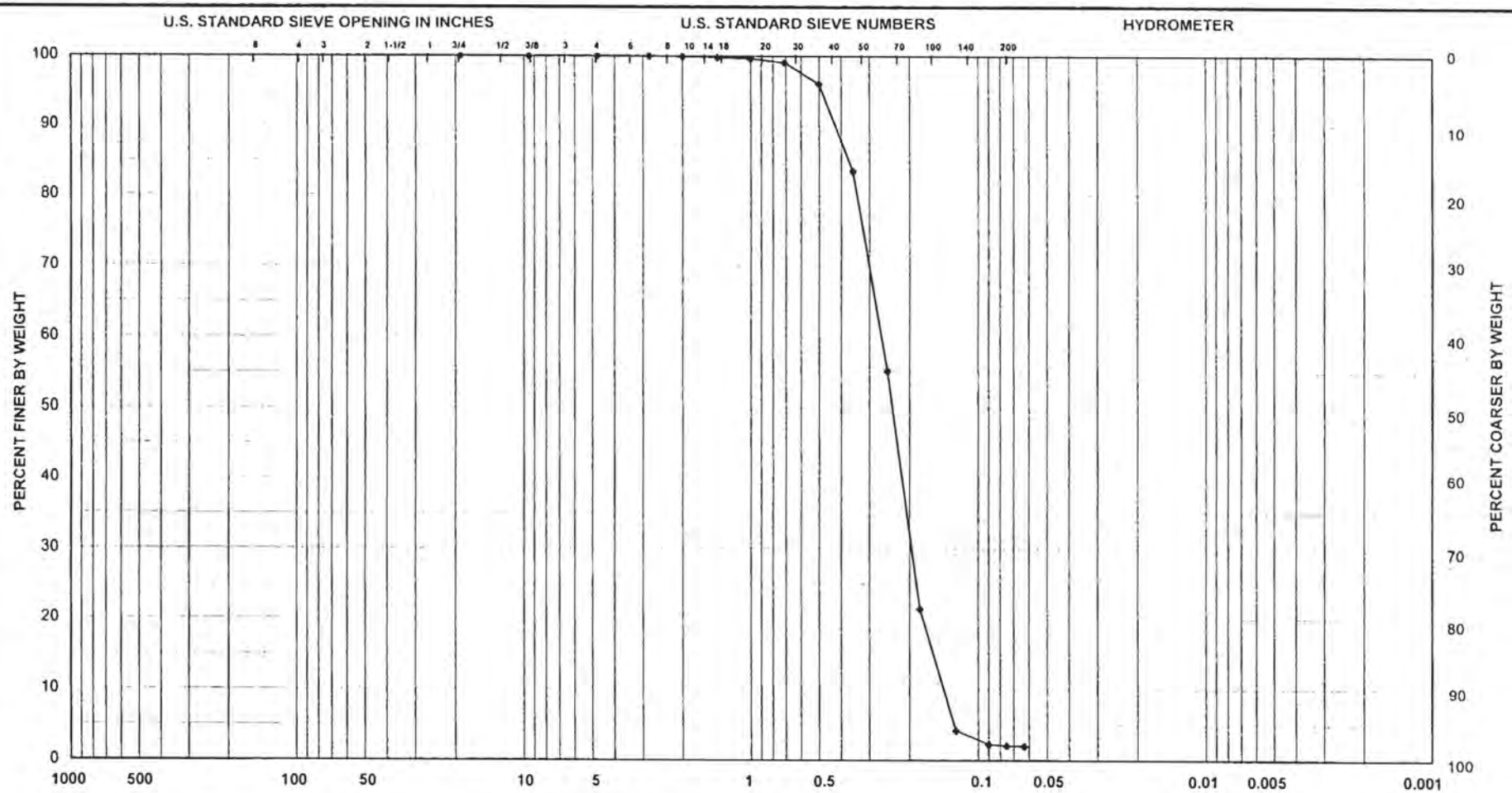


Sample No.	Elev. Or Depth	Classification	% CO_3	G_s	Nat w%	LL	PL	PI
• 1	1.3'- 1.8'	SAND, poorly-graded, mostly fine-grained quartz, little carbonate, trace silt, greenish brown (SP)	18					

Project: Ocean Isle Renourishment

Area:

Boring No.: OI-05-12

Date: 8/1/2005

GRADATION CURVES

ENG FORM 2087

MAY 63

WOLF TECHNOLOGIES, INC.

3047-4 St. Johns Bluff Road S.
Jacksonville, Florida 32246
(904) 997-1400 (Tel) · (904) 997-9150 (Fax)

VISUAL SHELL CONTENT

GRAIN SIZE AND VISUAL SHELL CONTENT

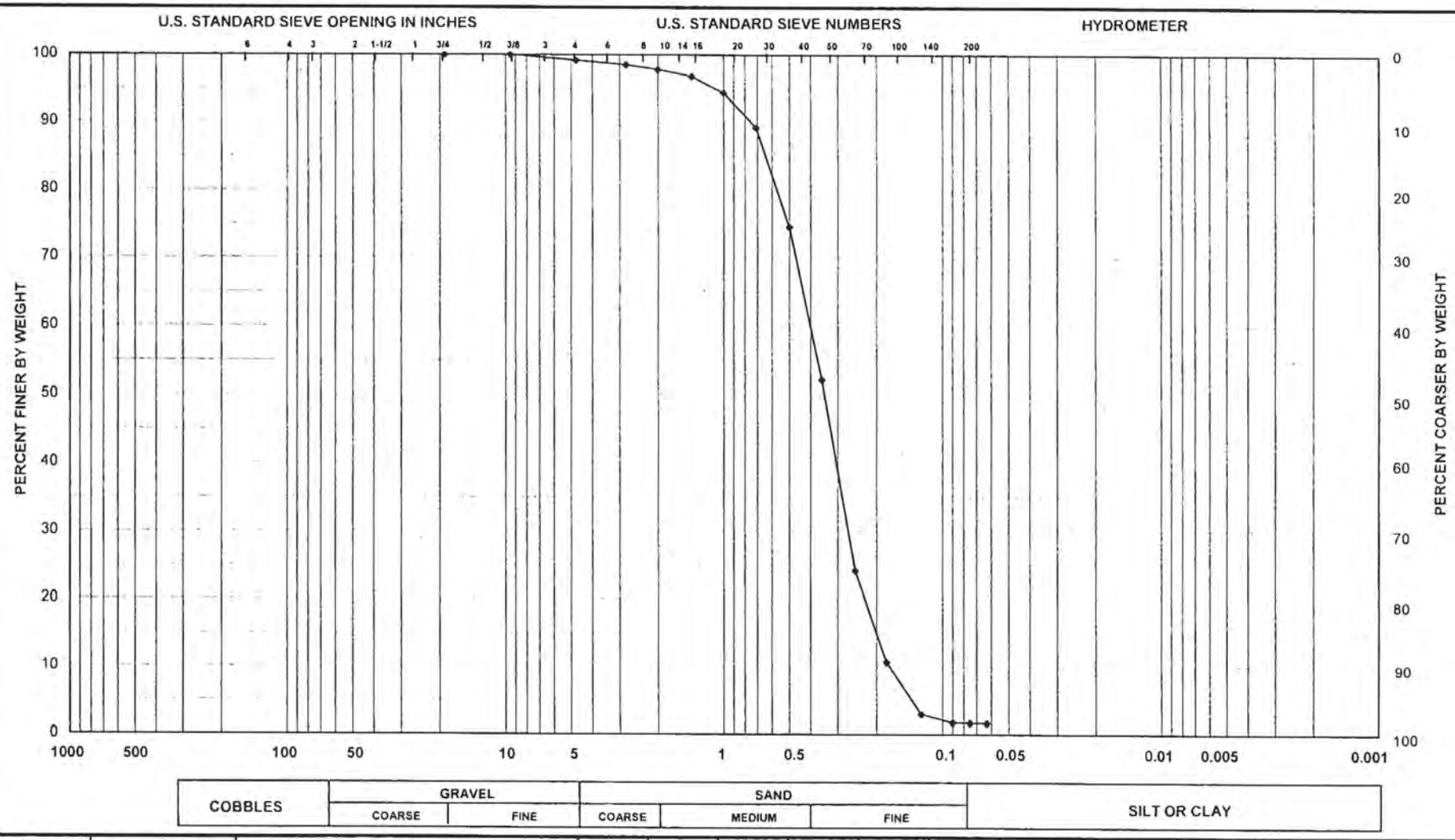
Project:	**Ocean Isle Renourishment**	**Depth:**	**1.3'- 1.8'**
Project No.:	**2216-01-60**	**Date:**	**8/1/2005**
Boring No.:	**OI-05-12**		
Sample No.:	**1**		
Description:	**SAND, poorly-graded, mostly fine-grained quartz, little carbonate, trace silt, greenish brown (SP)**		

Tare Weight, (g):	51.01	
Dry Wt. Before Washing (g):	158.11	(with tare)
Dry Weight After Washing (g):	156.48	(with tare)

Sieve Size (Name)	Sieve Size (mm)	Weight Retained (g)	% Passing	Approx. Visual Shell %	Approx. Visual Shell Wt. (g)
3/4"	19.000	0.00	100.00	0	0.00
3/8"	9.500	0.00	100.00	0	0.00
#4	4.750	0.00	100.00	0	0.00
#7	2.800	0.02	99.98	100	0.02
#10	2.000	0.07	99.92	100	0.07
#14	1.400	0.10	99.82	100	0.10
#18	1.000	0.21	99.63	100	0.21
#25	0.710	0.63	99.04	95	0.60
#35	0.500	3.20	96.05	70	2.24
#45	0.355	13.50	83.45	50	6.75
#60	0.250	30.28	55.17	30	9.08
#80	0.180	36.19	21.38	20	7.24
#120	0.125	18.41	4.19	10	1.84
#170	0.090	2.08	2.25	5	0.10
#200	0.075	0.20	2.06	1	0.00
#230	0.063	0.06	2.01	1	0.00

Total Shell Content: **18** **%**

8/2/05



Sample No.	Elev. Or Depth	Classification	% CO_3	G_s	Nat w%	LL	PL	PI
• 2	3.3'- 3.8'	SAND, poorly-graded, mostly fine-grained quartz, little carbonate, trace silt, light olive brown (SP)	27					

Project	Ocean Isle Renourishment
Area	
Boring No.	OI-05-12
Date	8/1/2005

GRADATION CURVES

ENG FORM 2087

MAY 63

WOLF TECHNOLOGIES, INC.
3047-4 St. Johns Bluff Road S.
Jacksonville, Florida 32246
(904) 997-1400 (Tel) · (904) 997-9150 (Fax)

VISUAL SHELL CONTENT

GRAIN SIZE AND VISUAL SHELL CONTENT

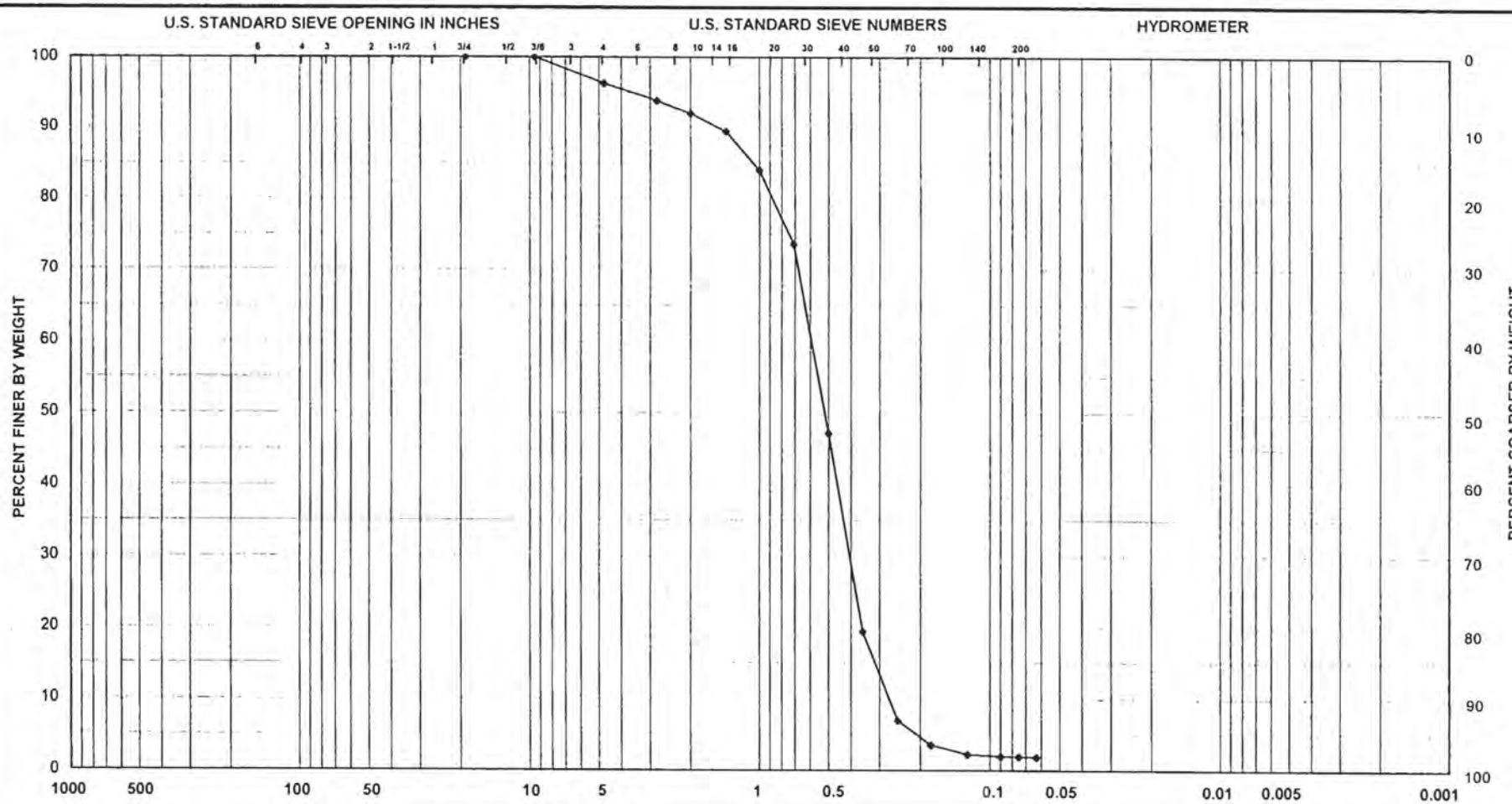
Project:	**Ocean Isle Renourishment**	**Depth:**	**3.3'- 3.8'**
Project No.:	**2216-01-60**	**Date:**	**8/1/2005**
Boring No.:	**OI-05-12**		
Sample No.:	**2**		
Description:	**SAND, poorly-graded, mostly fine-grained quartz, little carbonate, trace silt, light olive brown (SP)**		

Tare Weight, (g):	50.04	
Dry Wt. Before Washing (g):	147.88	(with tare)
Dry Weight After Washing (g):	146.71	(with tare)

Sieve Size (Name)	Sieve Size (mm)	Weight Retained (g)	% Passing	Approx. Visual Shell %	Approx. Visual Shell Wt. (g)
3/4"	19.000	0.00	100.00	0	0.00
3/8"	9.500	0.00	100.00	0	0.00
#4	4.750	0.81	99.17	100	0.81
#7	2.800	0.64	98.52	100	0.64
#10	2.000	0.67	97.83	100	0.67
#14	1.400	0.94	96.87	100	0.94
#18	1.000	2.39	94.43	95	2.27
#25	0.710	5.09	89.23	80	4.07
#35	0.500	14.33	74.58	70	10.03
#45	0.355	21.90	52.20	50	10.95
#60	0.250	27.46	24.13	30	8.24
#80	0.180	13.21	10.63	10	1.32
#120	0.125	7.57	2.89	5	0.38
#170	0.090	1.14	1.73	1	0.01
#200	0.075	0.06	1.67	1	0.00
#230	0.063	0.04	1.63	1	0.00

Total Shell Content: **27** **%**

8/2/05



Sample No.	Elev. Or Depth	Classification	% CO_3	G_s	Nat w%	LL	PL	PI
• 3	7.3'- 7.8'	SAND, poorly-graded, mostly medium to fine-grained quartz, some carbonate, trace silt, light olive brown (SP)	40					

Project: Ocean Isle Renourishment

Area:

Boring No.: OI-05-12

Date: 8/1/2005

GRADATION CURVES

ENG FORM 2087

MAY 63

WOLF TECHNOLOGIES, INC.
3047-4 St. Johns Bluff Road S.
Jacksonville, Florida 32246
(904) 997-1400 (Tel) · (904) 997-9150 (Fax)

VISUAL SHELL CONTENT

GRAIN SIZE AND VISUAL SHELL CONTENT

Project:	**Ocean Isle Renourishment**	**Depth:**	**7.3'- 7.8'**
Project No.:	**2216-01-60**	**Date:**	**8/1/2005**
Boring No.:	**OI-05-12**		
Sample No.:	**3**		
Description:	**SAND, poorly-graded, mostly medium to fine-grained quartz, some carbonate, trace silt, light olive brown (SP)**		

Tare Weight, (g):	50.16	
Dry Wt. Before Washing (g):	164.59	(with tare)
Dry Weight After Washing (g):	162.65	(with tare)

Sieve Size (Name)	Sieve Size (mm)	Weight Retained (g)	% Passing	Approx. Visual Shell %	Approx. Visual Shell Wt. (g)
3/4"	19.000	0.00	100.00	0	0.00
3/8"	9.500	0.00	100.00	0	0.00
#4	4.750	4.20	96.33	100	4.20
#7	2.800	2.84	93.85	100	2.84
#10	2.000	2.09	92.02	100	2.09
#14	1.400	2.96	89.43	100	2.96
#18	1.000	6.26	83.96	90	5.63
#25	0.710	11.88	73.58	70	8.32
#35	0.500	30.18	47.21	60	18.11
#45	0.355	31.89	19.34	50	15.95
#60	0.250	14.20	6.93	30	4.26
#80	0.180	3.91	3.51	10	0.39
#120	0.125	1.47	2.23	5	0.07
#170	0.090	0.31	1.96	1	0.00
#200	0.075	0.05	1.91	1	0.00
#230	0.063	0.08	1.84	1	0.00

Total Shell Content: **40** **%**

Hole No. 01-05-13

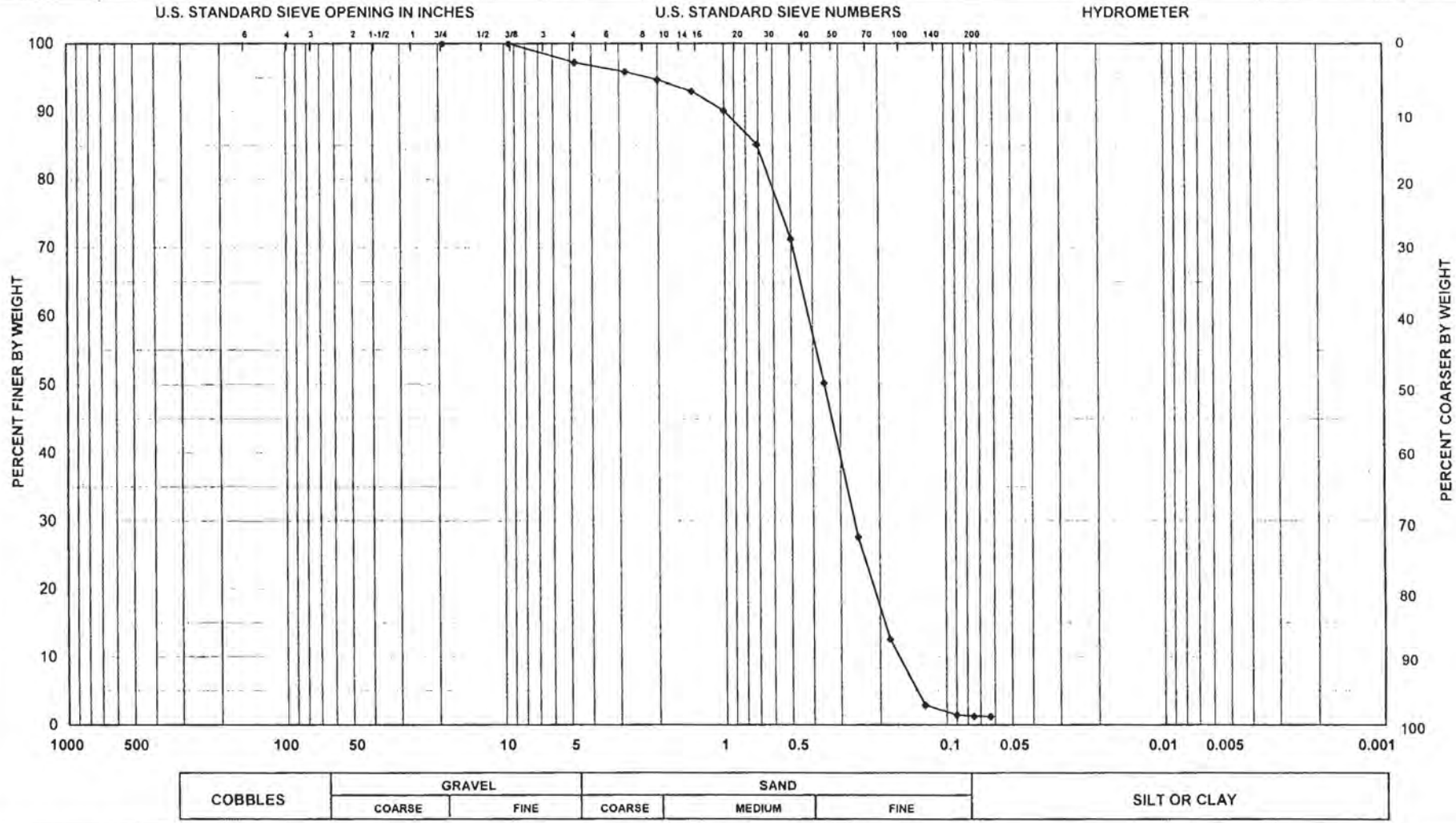
DRILLING LOG	DIVISION SOUTH ATLANTIC	INSTALLATION WILMINGTON DISTRICT	SHEET 1 OF 1 SHEETS

1. PROJECT OCEAN ISLE RENOURISHMENT	10. SIZE AND TYPE OF BIT 4" Dia. Vibracore
2. LOCATION (Coordinates or Station) NC Coord. E 2187968.5 N 55646.7	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) 01-05-13	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 (X) VERTICAL ☐ INCLINED _____ DEG. FROM VERT.	15. ELEVATION GROUND WATER N/A
7. THICKNESS OF OVERBURDEN N/A (2.5' of Water)	16. DATE HOLE: STARTED 4/20/05 : COMPLETED 4/20/05
8. DEPTH DRILLED INTO ROCK 0.0'	17. ELEVATION TOP OF HOLE 0.0 MLLW
9. TOTAL DEPTH OF HOLE 12.6'	18. TOTAL CORE RECOVERY FOR BORING N/A %
	19. SIGNATURE OF INSPECTOR KELLY KALTENBACH, GEOLOGIST TRAINEE

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 2.5' WATER			Time begin vibracoring: 1110 hrs. Soils described by Kelley J. Kaltenbach, Geologist-Trainee.
	2.0		OCEAN BOTTOM @ 2.5'			
-2.5	2.5		SP Tan-light gray, fine-coarse sand, clean, poorly graded, some fine-coarse sand size shell material. Little gravel size shell material. Trace organic material.		2.5' 1 3.0'	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.
	4.0					VIBRACORE BORING From 2.5' to 12.6' Ran 8.3' Rec: 10.1'
					5.5' 2 6.0'	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.
	6.0					
	8.0				8.5' 3 9.0'	
	10.0					LAB CLASSIFICATION
					11.5' 4 12.0'	Jar Number / Classification: 1 SP; 2 SP; 3 SP; 4 SP
	12.0					
-12.6	12.6		BOTTOM OF HOLE AT 12.6' SOILS ARE FIELD VISUALLY CLASSIFIED IN ACCORDANCE WITH THE UNIFIED SOIL CLASSIFICATION SYSTEM			NOTE Assumed vibracore refusal @ 12.6'

ENG FORM 1836 MAR 71 PREVIOUS EDITIONS ARE OBSOLETE.

PROJECT OCEAN ISLE RENOURISHMENT HOLE NO. 01-05 13



Sample No.	Elev. Or Depth	Classification	% CO_3	G_s	Nat w%	LL	PL	PI
• 1	2.5'- 3.0'	SAND, poorly graded, mostly medium to fine-grained quartz, little carbonate, trace silt, trace limestone fragments, light olive brown (SP)	27					

Project Ocean Isle Renourishment

Area

Boring No. OI-05-13

Date 8/1/2005

GRADATION CURVES

ENG FORM 2087

MAY 63

WOLF TECHNOLOGIES, INC.
3047-4 St. Johns Bluff Road S.
Jacksonville, Florida 32246
(904) 997-1400 (Tel) · (904) 997-9150 (Fax)

VISUAL SHELL CONTENT

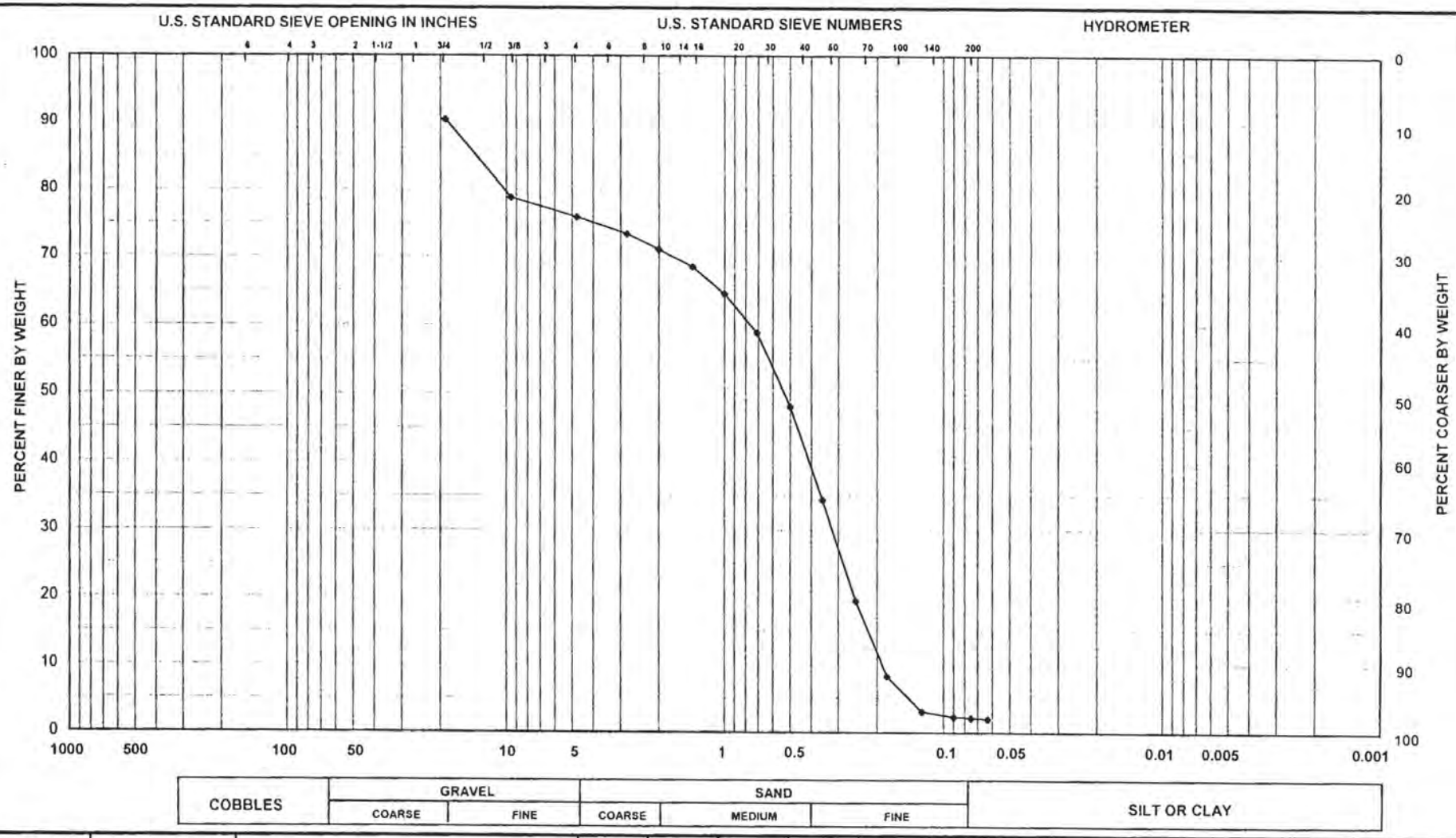
GRAIN SIZE AND VISUAL SHELL CONTENT

Project:	**Ocean Isle Renourishment**	**Depth:**	**2.5'- 3.0'**
Project No.:	**2216-01-60**	**Date:**	**8/1/2005**
Boring No.:	**OI-05-13**		
Sample No.:	**1**		
Description:	**SAND, poorly graded, mostly medium to fine-grained quartz, little carbonate, trace silt, trace limestone fragments, light olive brown (SP)**		

Tare Weight, (g):	50.11	
Dry Wt. Before Washing (g):	185.79	(with tare)
Dry Weight After Washing (g):	183.92	(with tare)

Sieve Size (Name)	Sieve Size (mm)	Weight Retained (g)	% Passing	Approx. Visual Shell %	Approx. Visual Shell Wt. (g)
3/4"	19.000	0.00	100.00	0	0.00
3/8"	9.500	0.00	100.00	0	0.00
#4	4.750	3.75	97.24	80	3.00
#7	2.800	1.82	95.89	90	1.64
#10	2.000	1.64	94.69	100	1.64
#14	1.400	2.23	93.04	100	2.23
#18	1.000	3.95	90.13	95	3.75
#25	0.710	6.79	85.13	80	5.43
#35	0.500	18.86	71.23	50	9.43
#45	0.355	28.54	50.19	40	11.42
#60	0.250	30.56	27.67	30	9.17
#80	0.180	20.49	12.57	10	2.05
#120	0.125	13.18	2.85	5	0.66
#170	0.090	1.92	1.44	1	0.02
#200	0.075	0.27	1.24	1	0.00
#230	0.063	0.05	1.20	1	0.00

Total Shell Content: **27** **%**



Sample No.	Elev. Or Depth	Classification	% CO_3	G_s	Nat w%	LL	PL	PI
• 2	5.5'- 6.0'	SAND, poorly graded, mostly medium to fine-grained quartz, some carbonate, trace silt, few limestone fragments, olive brown (SP)	35					

Project Ocean Isle Renourishment

Area

Boring No. OI-05-13

Date 8/1/2005

GRADATION CURVES

ENG FORM 2087

MAY 63

WOLF TECHNOLOGIES, INC.

3047-4 St. Johns Bluff Road S.
Jacksonville, Florida 32246
(904) 997-1400 (Tel) · (904) 997-9150 (Fax)

VISUAL SHELL CONTENT

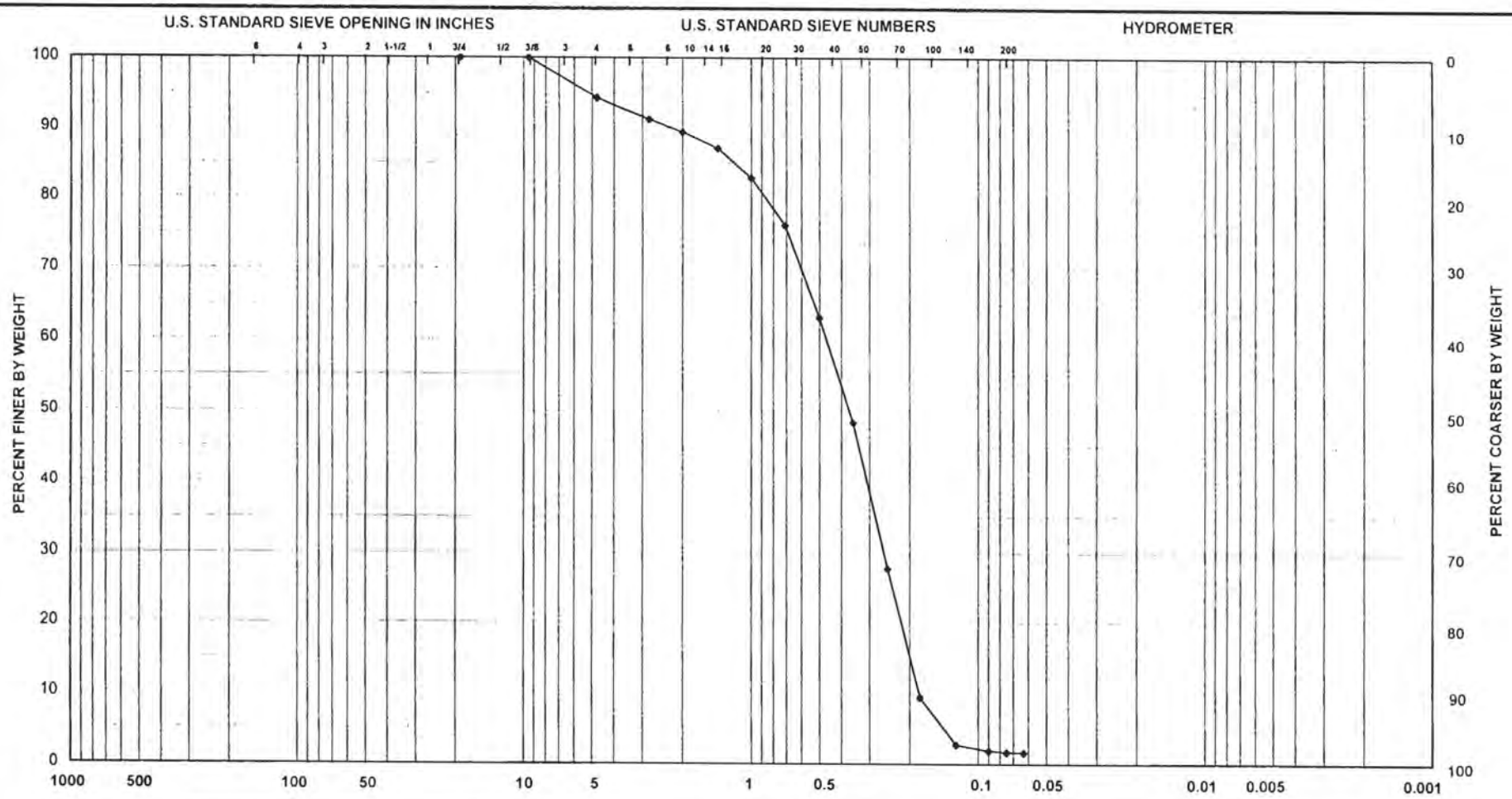
GRAIN SIZE AND VISUAL SHELL CONTENT

Project:	**Ocean Isle Renourishment**	**Depth:**	**5.5'- 6.0'**
Project No.:	**2216-01-60**	**Date:**	**8/1/2005**
Boring No.:	**OI-05-13**		
Sample No.:	**2**		
Description:	**SAND, poorly graded, mostly medium to fine-grained quartz, some carbonate, trace silt, few limestone fragments, olive brown (SP)**		

Tare Weight, (g):	50.21	
Dry Wt. Before Washing (g):	169.68	(with tare)
Dry Weight After Washing (g):	167.96	(with tare)

Sieve Size (Name)	Sieve Size (mm)	Weight Retained (g)	% Passing	Approx. Visual Shell %	Approx. Visual Shell Wt. (g)
3/4"	19.000	11.44	90.42	0	0.00
3/8"	9.500	13.90	78.79	90	12.51
#4	4.750	3.48	75.88	95	3.31
#7	2.800	3.05	73.32	95	2.90
#10	2.000	2.73	71.04	100	2.73
#14	1.400	3.02	68.51	100	3.02
#18	1.000	4.77	64.52	90	4.29
#25	0.710	6.71	58.90	80	5.37
#35	0.500	12.93	48.08	70	9.05
#45	0.355	16.45	34.31	50	8.23
#60	0.250	17.80	19.41	30	5.34
#80	0.180	13.31	8.27	10	1.33
#120	0.125	6.30	3.00	5	0.32
#170	0.090	0.90	2.24	1	0.01
#200	0.075	0.22	2.06	1	0.00
#230	0.063	0.14	1.94	1	0.00

Total Shell Content: **35** **%**



Sample No.	Elev. Or Depth	Classification	% CO_3	G_s	Nat w%	LL	PL	PI
• 3	8.5'- 9.0'	SAND, poorly graded, mostly fine-grained quartz, some carbonate, trace silt, light olive brown (SP)	32					

Project Ocean Isle Renourishment

Area

Boring No. OI-05-13

Date 8/1/2005

GRADATION CURVES

ENG FORM 2087

MAY 63

WOLF TECHNOLOGIES, INC.
3047-4 St. Johns Bluff Road S.
Jacksonville, Florida 32246
(904) 997-1400 (Tel) · (904) 997-9150 (Fax)

VISUAL SHELL CONTENT

GRAIN SIZE AND VISUAL SHELL CONTENT

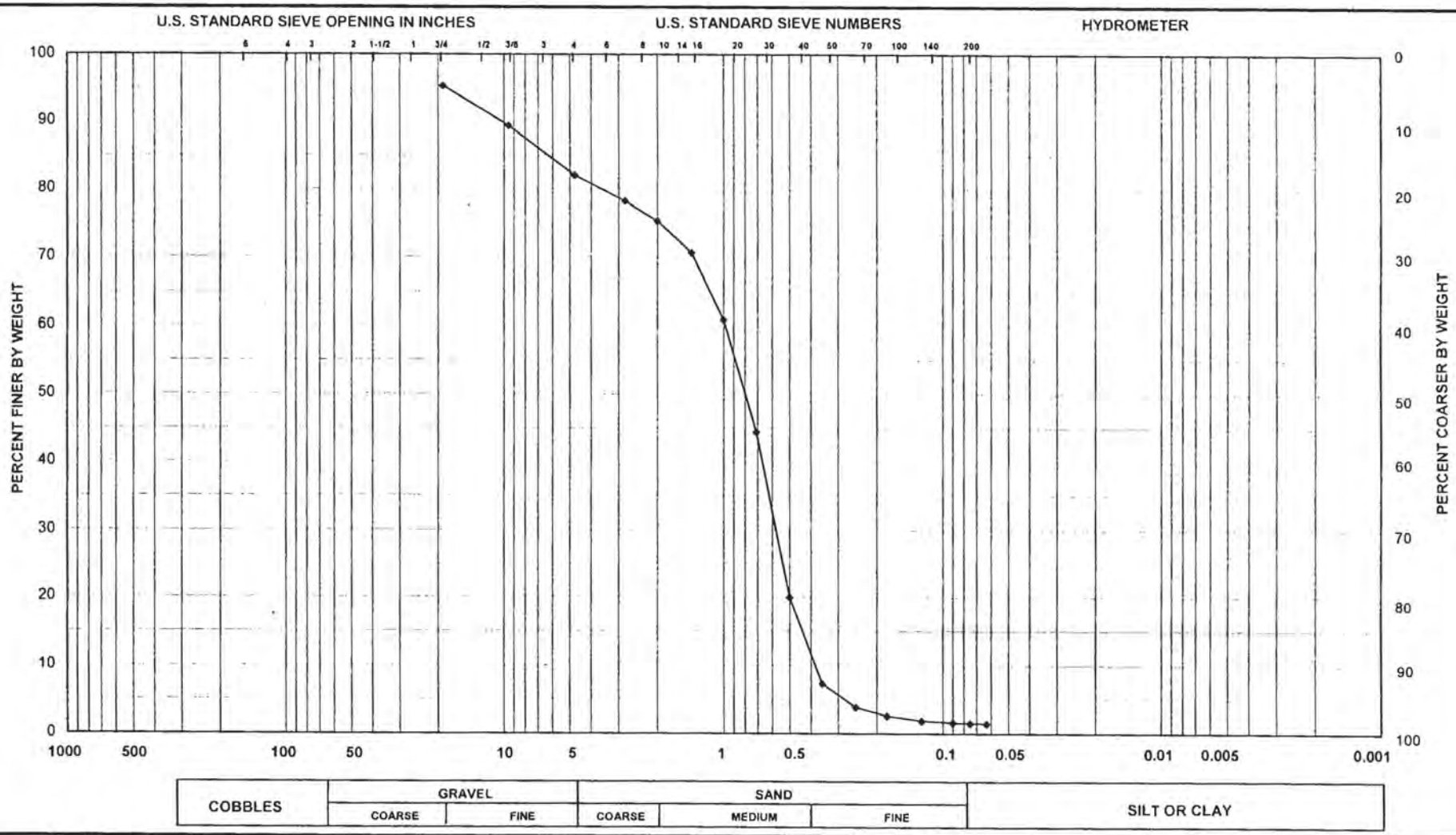
Project:	**Ocean Isle Renourishment**	**Depth:**	**8.5'- 9.0'**
Project No.:	**2216-01-60**	**Date:**	**8/1/2005**
Boring No.:	**OI-05-13**		
Sample No.:	**3**		
Description:	**SAND, poorly graded, mostly fine-grained quartz, some carbonate, trace silt, light olive brown (SP)**		

Tare Weight, (g):	50.62	
Dry Wt. Before Washing (g):	151.97	(with tare)
Dry Weight After Washing (g):	150.28	(with tare)

Sieve Size (Name)	Sieve Size (mm)	Weight Retained (g)	% Passing	Approx. Visual Shell %	Approx. Visual Shell Wt. (g)
3/4"	19.000	0.00	100.00	0	0.00
3/8"	9.500	0.00	100.00	0	0.00
#4	4.750	5.75	94.33	100	5.75
#7	2.800	3.11	91.26	100	3.11
#10	2.000	1.87	89.41	100	1.87
#14	1.400	2.35	87.09	100	2.35
#18	1.000	4.32	82.83	95	4.10
#25	0.710	6.84	76.08	80	5.47
#35	0.500	13.15	63.11	70	9.21
#45	0.355	14.93	48.38	50	7.47
#60	0.250	20.84	27.81	30	6.25
#80	0.180	18.73	9.33	10	1.87
#120	0.125	6.75	2.67	5	0.34
#170	0.090	0.82	1.86	1	0.01
#200	0.075	0.19	1.68	1	0.00
#230	0.063	0.11	1.57	1	0.00

Total Shell Content: **32** **%**

8/2/05



Sample No.	Elev. Or Depth	Classification	% CO_3	G_s	Nat w%	LL	PL	PI
♦ 4	11.5'- 12.0'	SAND, poorly graded, mostly medium to fine-grained quartz, some carbonate, trace silt, light olive brown (SP)	47					

Project Ocean Isle Renourishment

Area

Boring No. OI-05-13

Date 8/1/2005

GRADATION CURVES

ENG FORM 2087

MAY 63

2009 USACE VIBRACORE LOGS & GRANULARMETRIC DATA

DRILLING LOG

DIVISION	SOUTH ATLANTIC
INSTALLATION	WILMINGTON DISTRICT
SHEET	1 OF 1 SHEETS
1. PROJECT	SHALLOTTE INLET
2. LOCATION (Coordinates or Station)	NCSP NAD 83 (USft) N 57,586 E 2,186,898
3. DRILLING AGENCY	WILMINGTON DISTRICT
4. HOLE NO. *(As shown on drawing title and file number)*	SHI-V-09-01
5. NAME OF DRILLER	ROBIE PAGE CRANE OPERATOR
6. DIRECTION OF HOLE	☒ VERTICAL ☐ INCLINED ---- DEG. FROM VERT.
7. WATER DEPTH (BELOW MLW)	7.9'
8. DEPTH DRILLED INTO ROCK	0.0'
9. TOTAL DEPTH OF HOLE	27.9'
10. SIZE AND TYPE OF BIT	4" Dia. Vibracore
11. DATUM FOR ELEVATION SHOWN *(TBM or MSL)*	MLW
12. MANUFACTURER'S DESIGNATION OF DRILL	ALPINE VIBRACORE - SNELL
13. TOTAL NO. OF OVERBURDEN SAMPLES TAKEN	DISTURBED 7 / UNDISTURBED 0
14. TOTAL NUMBER CORE BOXES	N/A
15. ELEVATION GROUND WATER	N/A
16. DATE HOLE	STARTED 2/19/2009 / COMPLETED 2/19/2009
17. ELEVATION TOP OF HOLE	0.0' MLW
18. TOTAL CORE RECOVERY FOR BORING	100%
19. SIGNATURE OF INSPECTOR	LARRY BENJAMIN

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 weathering, etc., if significant)* g
0.0	0.0		0.0' TO 7.9' WATER			Time begin vibracoring: 09:57 hrs. Soils described by LARRY BENJAMIN, Civil Engr. Tech.
-7.9	7.9		SEDIMENT SURFACE (7.9')		7.9'	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' MLW
			SP - Light tan, coarse, poorly graded SAND w/trace shell fragments.		1 8.4' 11.0' 2 11.5' 14.0' 3 14.5'	VIBRACORE BORING From 0.0' to 20' Run: 20' Rec: 20' Top of vibracore soil sample is logged as beginning at water bottom. When Run is greater than Recovery, the difference is depicted as Assumed Not Recovered.
-15.4	15.4				15.4' 4 15.9'	NOTE: Soils Commercial Lab Classified in Accordance with ASTM-D2487
-17.9	17.9		SC - Greenish tan, fine, Clayey SAND.		17.9' 5 18.4'	LAB CLASSIFICATION Jar Number / Classification 1 SP 2 SP 3 SP 4 SC 5 SC-CL 6 NOT TESTED 7 NOT TESTED
			CL - Greenish tan, lean CLAY with thin layers of ML zones to bottom.		21.0' 6 21.5' 24.0' 7 24.5'	
-27.9	27.9					
			Bottom of Hole Terminated at Elev. -27.9 ft SOILS ARE FIELD VISUALLY CLASSIFIED IN ACCORDANCE WITH THE UNIFIED SOIL CLASSIFICATION SYSTEM			NOTE: Hole terminated at predetermined depth at 20' below sediment surface.

DRILLING LOG

DIVISION	SOUTH ATLANTIC
INSTALLATION	WILMINGTON DISTRICT
SHEET	1 OF 1 SHEETS
1. PROJECT	SHALLOTTE INLET
2. LOCATION (Coordinates or Station)	NCSP NAD 83 (USft) N 57,580 E 2,187,095
3. DRILLING AGENCY	WILMINGTON DISTRICT
4. HOLE NO. *(As shown on drawing title and file number)*	SHI-V-09-02
5. NAME OF DRILLER	ROBIE PAGE CRANE OPERATOR
6. DIRECTION OF HOLE	☒ VERTICAL ☐ INCLINED --- DEG. FROM VERT
7. WATER DEPTH (BELOW MLW)	12.3'
8. DEPTH DRILLED INTO ROCK	0.0'
9. TOTAL DEPTH OF HOLE	32.3'
10. SIZE AND TYPE OF BIT	4" Dia. Vibracore
11. DATUM FOR ELEVATION SHOWN *(TBM or MSL)*	MLW
12. MANUFACTURER'S DESIGNATION OF DRILL	ALPINE VIBRACORE - SNELL
13. TOTAL NO. OF OVERBURDEN SAMPLES TAKEN	DISTURBED 7 / UNDISTURBED 0
14. TOTAL NUMBER CORE BOXES	N/A
15. ELEVATION GROUND WATER	N/A
16. DATE HOLE	STARTED 2/19/2009 / COMPLETED 2/19/2009
17. ELEVATION TOP OF HOLE	0.0' MLW
18. TOTAL CORE RECOVERY FOR BORING	98%
19. SIGNATURE OF INSPECTOR	LARRY BENJAMIN

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 weathering, etc., if significant)* g
0.0	0.0		0.0' TO 12.3' WATER			Time begin vibracoring: 09:57 hrs. Soils described by LARRY BENJAMIN, Civil Engr. Tech.
-12.3	12.3		SEDIMENT SURFACE (12.3')		12.3'	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' MLW
-13.3	13.3		SP - Tan, coarse, poorly graded SAND w/shell fragments	12.8'	1 / 13.3'	
			SC - Greenish gray, fine Clayey SAND		2 / 13.8'	VIBRACORE BORING From 0.0' to 20' Run: 20' Rec: 19.6' Top of vibracore soil sample is logged as beginning at water bottom. When Run is greater than Recovery, the difference is depicted as Assumed Not Recovered.
					16.0' / 3 / 16.5'	
-19.3	19.3				19.3' / 4 / 19.8'	NOTE: Soils Commercial Lab Classified in Accordance with ASTM-D2487
			CL - Greenish gray, lean CLAY with hard thin layers of ML		22.0' / 5 / 22.5'	LAB CLASSIFICATION Jar Number — Classification 1 — SP 2 — SM 3 — SC 4 — NOT TESTED 5 — NOT TESTED 6 — NOT TESTED 7 — NOT TESTED
					26.0' / 6 / 26.5'	
					29.0' / 7 / 29.5'	
-32.0	32.0					
-32.3	32.3		ASSUMED NOT RECOVERED Bottom of Hole Terminated at Elev. -32.3 ft SOILS ARE FIELD VISUALLY CLASSIFIED IN ACCORDANCE WITH THE UNIFIED SOIL CLASSIFICATION SYSTEM			NOTE: Hole terminated at predetermined depth at 20' below sediment surface.

Hole No. SHI-V-09-03

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

1. PROJECT SHALLOTTE INLET	10. SIZE AND TYPE OF BIT 4" Dia. Vibracore
2. LOCATION (Coordinates or Station) NCSP NAD 83 (USft) N 56,990 E 2,187,216	11. DATUM FOR ELEVATION SHOWN (TBM or MSL) MLW
3. DRILLING AGENCY WILMINGTON DISTRICT	12. MANUFACTURER'S DESIGNATION OF DRILL ALPINE VIBRACORE - SNELL
4. HOLE NO. (As shown on drawing title and file number) SHI-V-09-03	13. TOTAL NO. OF OVERBURDEN SAMPLES TAKEN: DISTURBED 5; UNDISTURBED 0
5. NAME OF DRILLER ROBIE PAGE 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. WATER DEPTH (BELOW MLW) 1.7'	16. DATE HOLE: STARTED 2/19/2009; COMPLETED 2/19/2009
8. DEPTH DRILLED INTO ROCK 0.0'	17. ELEVATION TOP OF HOLE 0.0' MLW
9. TOTAL DEPTH OF HOLE 21.7'	18. TOTAL CORE RECOVERY FOR BORING 60%
	19. SIGNATURE OF INSPECTOR LARRY BENJAMIN

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 weathering, etc., if significant) g
0.0	0.0		0.0' TO 1.7' WATER			
-1.7	1.7		SEDIMENT SURFACE (1.7')			Time begin vibracoring: 10:27 hrs. Soils described by LARRY BENJAMIN, Civil Engr. Tech.
			SP - Tan, coarse, poorly graded SAND w/trace shell fragments		1.7' 1 2.2' 5.0' 2 5.5' 8.0' 3 8.5'	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' MLW
-9.2	9.2		With shell fragments		11.0' 4	VIBRACORE BORING From 0.0' to 20' Run: 20' Rec: 12' Top of vibracore soil sample is logged as beginning at water bottom. When Run is greater than Recovery, the difference is depicted as Assumed Not Recovered.
-11.7	11.7		SC - Greenish gray, fine, Clayey SAND	11.5' 11.7'	5 12.2'	NOTE: Soils Commercial Lab Classified in Accordance with ASTM-D2487
-13.7	13.7		ASSUMED NOT RECOVERED			LAB CLASSIFICATION Jar Number / Classification 1 SP 2 SP 3 SP 4 SP 5 SM
-21.7	21.7		Bottom of Hole Terminated at Elev. -21.7 ft SOILS ARE FIELD VISUALLY CLASSIFIED IN ACCORDANCE WITH THE UNIFIED SOIL CLASSIFICATION SYSTEM			NOTE: Hole terminated at predetermined depth at 20' below sediment surface.

Hole No. SHI-V-09-04

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

1. PROJECT SHALLOTTE INLET	10. SIZE AND TYPE OF BIT 4" Dia. Vibracore
2. LOCATION (Coordinates or Station) NCSP NAD 83 (USft) N 56,549 E 2,187,502	11. DATUM FOR ELEVATION SHOWN (TBM or MSL) MLW
3. DRILLING AGENCY WILMINGTON DISTRICT	12. MANUFACTURER'S DESIGNATION OF DRILL ALPINE VIBRACORE - SNELL
4. HOLE NO. (As shown on drawing title and file number) SHI-V-09-04	13. TOTAL NO. OF OVERBURDEN SAMPLES TAKEN: DISTURBED 7; UNDISTURBED 0
5. NAME OF DRILLER ROBIE PAGE 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. WATER DEPTH (BELOW MLW) 5.1'	16. DATE HOLE: STARTED 2/19/2009; COMPLETED 2/19/2009
8. DEPTH DRILLED INTO ROCK 0.0'	17. ELEVATION TOP OF HOLE 0.0' MLW
9. TOTAL DEPTH OF HOLE 25.1'	18. TOTAL CORE RECOVERY FOR BORING 88%
	19. SIGNATURE OF INSPECTOR LARRY BENJAMIN

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 weathering, etc., if significant) g
0.0	0.0		0.0' TO 5.1' WATER			Time begin vibracoring: 11:06 hrs. Soils described by LARRY BENJAMIN, Civil Engr. Tech.
-5.1	5.1		SEDIMENT SURFACE (5.1')		5.1'	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' MLW
			SP - Tan, coarse, poorly graded SAND with trace shell fragments		1 5.6' 8.0' 2 8.5' 11.0' 3 11.5'	VIBRACORE BORING: From 0.0' to 20'; Run: 20' Rec: 17.6'. Top of vibracore soil sample is logged as beginning at water bottom. When Run is greater than Recovery, the difference is depicted as Assumed Not Recovered.
-14.1	14.1				14.0' 4 14.5'	NOTE: Soils Commercial Lab Classified in Accordance with ASTM-D2487
-15.0	15.0		With shell fragments			LAB CLASSIFICATION: Jar Number / Classification: 1 SP; 2 SP; 3 SP; 4 SP; 5 SP; 6 NOT TESTED; 7 NOT TESTED
			SP - Tan, coarse, poorly graded SAND		16.5' 5 17.0'	
-18.1	18.1				18.1' 6 18.6'	
			SM - Greenish gray, fine, Silty SAND		21.0' 7 21.5'	
-22.7	22.7					
-25.1	25.1		ASSUMED NOT RECOVERED			
			Bottom of Hole Terminated at Elev. -25.1 ft SOILS ARE FIELD VISUALLY CLASSIFIED IN ACCORDANCE WITH THE UNIFIED SOIL CLASSIFICATION SYSTEM			NOTE: Hole terminated at predetermined depth at 20' below sediment surface.

Hole No. SHI-V-09-05

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

1. PROJECT SHALLOTTE INLET	10. SIZE AND TYPE OF BIT 4" Dia. Vibracore
2. LOCATION (Coordinates or Station) NCSP NAD 83 (USft) N 56,120 E 2,187,843	11. DATUM FOR ELEVATION SHOWN (TBM or MSL) MLW
3. DRILLING AGENCY WILMINGTON DISTRICT	12. MANUFACTURER'S DESIGNATION OF DRILL ALPINE VIBRACORE - SNELL
4. HOLE NO. (As shown on drawing title and file number) SHI-V-09-05	13. TOTAL NO. OF OVERBURDEN SAMPLES TAKEN: DISTURBED 5; UNDISTURBED 0
5. NAME OF DRILLER ROBIE PAGE 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. WATER DEPTH (BELOW MLW) 3.7'	16. DATE HOLE: STARTED 2/20/2009; COMPLETED 2/20/2009
8. DEPTH DRILLED INTO ROCK 0.0'	17. ELEVATION TOP OF HOLE 0.0' MLW
9. TOTAL DEPTH OF HOLE 23.7'	18. TOTAL CORE RECOVERY FOR BORING 73%
	19. SIGNATURE OF INSPECTOR LARRY BENJAMIN

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 weathering, etc., if significant) g
0.0	0.0		0.0' TO 3.7' WATER			Time begin vibracoring: 11:06 hrs. Soils described by LARRY BENJAMIN, Civil Engr. Tech.
-3.7	3.7		SEDIMENT SURFACE (3.7')		3.7'	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' MLW
			SP - Tan, coarse, poorly graded SAND with trace shell fragments		1 4.2' 7.0' 2 7.5' 10.0' 3 10.5'	VIBRACORE BORING: From 0.0' to 20'; Run: 20' Rec: 14.5'. Top of vibracore soil sample is logged as beginning at water bottom. When Run is greater than Recovery, the difference is depicted as Assumed Not Recovered. NOTE: Soils Commercial Lab Classified in Accordance with ASTM-D2487
-13.0	13.0		SP - Tan, coarse, poorly graded SAND with shell fragments		13.0' 4 13.5'	LAB CLASSIFICATION: Jar Number 1 SP; 2 SP; 3 SP; 4 SP; 5 SM
-16.2	16.2		SM - Gray, fine Silty SAND		16.2' 5 16.7'	
-18.2	18.2		ASSUMED NOT RECOVERED			
-23.7	23.7		Bottom of Hole Terminated at Elev. -23.7 ft. SOILS ARE FIELD VISUALLY CLASSIFIED IN ACCORDANCE WITH THE UNIFIED SOIL CLASSIFICATION SYSTEM			NOTE: Hole terminated at predetermined depth at 20' below sediment surface.

Hole No. SHI-V-09-06

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

1. PROJECT SHALLOTTE INLET	10. SIZE AND TYPE OF BIT 4" Dia. Vibracore
2. LOCATION (Coordinates or Station) NCSP NAD 83 (USft) N 56,291 E 2,187,710	11. DATUM FOR ELEVATION SHOWN (TBM or MSL) MLW
3. DRILLING AGENCY WILMINGTON DISTRICT	12. MANUFACTURER'S DESIGNATION OF DRILL ALPINE VIBRACORE - SNELL
4. HOLE NO. (As shown on drawing title and file number) SHI-V-09-06	13. TOTAL NO. OF OVERBURDEN SAMPLES TAKEN: DISTURBED 5; UNDISTURBED 0
5. NAME OF DRILLER ROBIE PAGE 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. WATER DEPTH (BELOW MLW) 6.1'	16. DATE HOLE: STARTED 2/20/2009; COMPLETED 2/20/2009
8. DEPTH DRILLED INTO ROCK 0.0'	17. ELEVATION TOP OF HOLE 0.0' MLW
9. TOTAL DEPTH OF HOLE 26.1'	18. TOTAL CORE RECOVERY FOR BORING 69%
	19. SIGNATURE OF INSPECTOR LARRY BENJAMIN

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 weathering, etc., if significant) g
0.0	0.0		0.0' TO 6.1' WATER			Time begin vibracoring: 10:53 hrs. Soils described by LARRY BENJAMIN, Civil Engr. Tech.
-6.1	6.1		SEDIMENT SURFACE (6.1')		6.1'	
			SP - Tan, coarse, poorly graded SAND with shell fragments		1 6.6'	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' MLW
					9.0' 2 9.5'	VIBRACORE BORING From 0.0' to 20' Run: 20' Rec: 13.6' Top of vibracore soil sample is logged as beginning at water bottom. When Run is greater than Recovery, the difference is depicted as Assumed Not Recovered.
					12.0' 3 12.5'	NOTE: Soils Commercial Lab Classified in Accordance with ASTM-D2487
					15.0' 4 15.5'	LAB CLASSIFICATION Jar Number / Classification 1 SP 2 SP 3 SP 4 SP 5 NOT TESTED
-18.6	18.6		SM - Gray, fine, Silty SAND		18.6' 5 19.1'	
-19.9	19.9		ASSUMED NOT RECOVERED			
-26.1	26.1		Bottom of Hole Terminated at Elev. -26.1 ft SOILS ARE FIELD VISUALLY CLASSIFIED IN ACCORDANCE WITH THE UNIFIED SOIL CLASSIFICATION SYSTEM			NOTE: Hole terminated at predetermined depth at 20' below sediment surface.

Hole No. SHI-V-09-07

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

1. PROJECT SHALLOTTE INLET	10. SIZE AND TYPE OF BIT 4" Dia. Vibracore
2. LOCATION (Coordinates or Station) NCSP NAD 83 (USft) N 55,778 E 2,188,158	11. DATUM FOR ELEVATION SHOWN (TBM or MSL) MLW
3. DRILLING AGENCY WILMINGTON DISTRICT	12. MANUFACTURER'S DESIGNATION OF DRILL ALPINE VIBRACORE - SNELL
4. HOLE NO. (As shown on drawing title and file number) SHI-V-09-07	13. TOTAL NO. OF OVERBURDEN SAMPLES TAKEN: DISTURBED 6; UNDISTURBED 0
5. NAME OF DRILLER ROBIE PAGE 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. WATER DEPTH (BELOW MLW) 5.3'	16. DATE HOLE: STARTED 2/20/2009; COMPLETED 2/20/2009
8. DEPTH DRILLED INTO ROCK 0.0'	17. ELEVATION TOP OF HOLE 0.0' MLW
9. TOTAL DEPTH OF HOLE 23.3'	18. TOTAL CORE RECOVERY FOR BORING 79%
	19. SIGNATURE OF INSPECTOR LARRY BENJAMIN

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 weathering, etc., if significant) g
0.0	0.0		0.0' TO 5.3' WATER			Time begin vibracoring: 11:13 hrs. Soils described by LARRY BENJAMIN, Civil Engr. Tech.
-5.3	5.3		SEDIMENT SURFACE (5.3')		5.3'	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' MLW
			SP - Tan, coarse, poorly graded SAND with shell fragments		1 5.8' 8.0' 2 8.5' 11.0' 3 11.5' 13.0' 4 13.5' 16.0' 5 16.5'	VIBRACORE BORING From 0.0' to 18' Run: 18' Rec: 14.3' Top of vibracore soil sample is logged as beginning at water bottom. When Run is greater than Recovery, the difference is depicted as Assumed Not Recovered.
-17.3	17.3		SM - Dark gray, fine, Silty SAND		17.3' 6 17.8'	NOTE: Soils Commercial Lab Classified in Accordance with ASTM-D2487
-19.6	19.6		ASSUMED NOT RECOVERED			LAB CLASSIFICATION Jar Number / Classification 1 SP 2 SP 3 SP 4 SP 5 SP 6 SM
-23.3	23.3		Bottom of Hole Terminated at Elev. -23.3 ft SOILS ARE FIELD VISUALLY CLASSIFIED IN ACCORDANCE WITH THE UNIFIED SOIL CLASSIFICATION SYSTEM			NOTE: Hole terminated at refusal depth at 18' below sediment surface.

DRILLING LOG

DIVISION	SOUTH ATLANTIC
INSTALLATION	WILMINGTON DISTRICT
SHEET	1 OF 1 SHEETS
1. PROJECT	SHALLOTTE INLET
2. LOCATION (Coordinates or Station)	NCSP NAD 83 (USft) N 55,156 E 2,188,426
3. DRILLING AGENCY	WILMINGTON DISTRICT
4. HOLE NO. (As shown on drawing title and file number)	SHI-V-09-08
5. NAME OF DRILLER	ROBIE PAGE CRANE OPERATOR
6. DIRECTION OF HOLE	☒ VERTICAL ☐ INCLINED --- DEG. FROM VERT.
7. WATER DEPTH (BELOW MLW)	7.1'
8. DEPTH DRILLED INTO ROCK	0.0'
9. TOTAL DEPTH OF HOLE	27.1'
10. SIZE AND TYPE OF BIT	4" Dia. Vibracore
11. DATUM FOR ELEVATION SHOWN (TBM or MSL)	MLW
12. MANUFACTURER'S DESIGNATION OF DRILL	ALPINE VIBRACORE - SNELL
13. TOTAL NO. OF OVERBURDEN SAMPLES TAKEN	DISTURBED 6 / UNDISTURBED 0
14. TOTAL NUMBER CORE BOXES	N/A
15. ELEVATION GROUND WATER	N/A
16. DATE HOLE	STARTED 2/20/2009 / COMPLETED 2/20/2009
17. ELEVATION TOP OF HOLE	0.0' MLW
18. TOTAL CORE RECOVERY FOR BORING	70%
19. SIGNATURE OF INSPECTOR	LARRY BENJAMIN

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 weathering, etc., if significant) g
0.0	0.0		0.0' TO 7.1' WATER			Time begin vibracoring: 11:32 hrs. Soils described by LARRY BENJAMIN, Civil Engr. Tech.
-7.1	7.1		SEDIMENT SURFACE (7.1')		7.1'	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' MLW
			SP - Tan, coarse, poorly graded SAND		1 7.6'	
					9.5' 2 10.0'	VIBRACORE BORING From 0.0' to 20' Run: 20' Rec: 14' Top of vibracore soil sample is logged as beginning at water bottom. When Run is greater than Recovery, the difference is depicted as Assumed Not Recovered.
-13.1	13.1				13.0' 3 13.5'	
			Trace shell fragments			NOTE: Soils Commercial Lab Classified in Accordance with ASTM-D2487
					16.0' 4 16.5'	LAB CLASSIFICATION Jar Number / Classification 1 SP 2 SP 3 SP 4 SP 5 SP 6 NOT TESTED
-17.0	17.0					
			SP - Tan, coarse, poorly graded SAND with shell fragments		18.0' 5 18.5'	
-18.6	18.6		Trace shell fragments			
-21.1	21.1				20.6' 6 21.1'	
			ASSUMED NOT RECOVERED			
-27.1	27.1					
			Bottom of Hole Terminated at Elev. -27.1 ft SOILS ARE FIELD VISUALLY CLASSIFIED IN ACCORDANCE WITH THE UNIFIED SOIL CLASSIFICATION SYSTEM			NOTE: Hole terminated at predetermined depth at 20' below sediment surface.

Hole No. SHI-V-09-09

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

1. PROJECT SHALLOTTE INLET	10. SIZE AND TYPE OF BIT 4" Dia. Vibracore
2. LOCATION (Coordinates or Station) NCSP NAD 83 (USft) N 57,263 E 2,187,186	11. DATUM FOR ELEVATION SHOWN (TBM or MSL) MLW
3. DRILLING AGENCY WILMINGTON DISTRICT	12. MANUFACTURER'S DESIGNATION OF DRILL ALPINE VIBRACORE - SNELL
4. HOLE NO. (As shown on drawing title and file number) SHI-V-09-09	13. TOTAL NO. OF OVERBURDEN SAMPLES TAKEN: DISTURBED 7; UNDISTURBED 0
5. NAME OF DRILLER ROBIE PAGE 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. WATER DEPTH (BELOW MLW) 20.7'	16. DATE HOLE: STARTED 3/4/2009; COMPLETED 3/4/2009
8. DEPTH DRILLED INTO ROCK 0.0'	17. ELEVATION TOP OF HOLE 0.0' MLW
9. TOTAL DEPTH OF HOLE 40.7'	18. TOTAL CORE RECOVERY FOR BORING 100%
	19. SIGNATURE OF INSPECTOR LARRY BENJAMIN

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 weathering, etc., if significant) g
0.0	0.0		0.0' TO 20.7' WATER			Time begin vibracoring: 09:58 hrs. Soils described by LARRY BENJAMIN, Civil Engr. Tech.
-20.7	20.7		SEDIMENT SURFACE (20.7')		20.7'	
			SM - Greenish gray, fine Silty SAND		1 21.2' 23.5' 2 24.0'	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' MLW VIBRACORE BORING From 0.0' to 20' Run: 20' Rec: 20' Top of vibracore soil sample is logged as beginning at water bottom. When Run is greater than Recovery, the difference is depicted as Assumed Not Recovered.
-26.0	26.0		CL - Greenish gray, lean CLAY		26.0' 3 26.5' 29.0' 4 29.5' 32.0' 5 32.5' 35.0' 6 35.5' 38.0' 7 38.5'	NOTE: Soils Commercial Lab Classified in Accordance with ASTM-D2487 LAB CLASSIFICATION Jar Number / Classification 1 SM 2 NOT TESTED 3 NOT TESTED 4 NOT TESTED 5 NOT TESTED 6 NOT TESTED 7 NOT TESTED
-40.7	40.7					
			Bottom of Hole Terminated at Elev. -40.7 ft SOILS ARE FIELD VISUALLY CLASSIFIED IN ACCORDANCE WITH THE UNIFIED SOIL CLASSIFICATION SYSTEM			NOTE: Hole terminated at predetermined depth at 20' below sediment surface.

Hole No. SHI-V-09-10

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

1. PROJECT SHALLOTTE INLET	10. SIZE AND TYPE OF BIT 4" Dia. Vibracore
2. LOCATION (Coordinates or Station) NCSP NAD 83 (USft) N 57,465 E 2,187,333	11. DATUM FOR ELEVATION SHOWN (TBM or MSL) MLW
3. DRILLING AGENCY WILMINGTON DISTRICT	12. MANUFACTURER'S DESIGNATION OF DRILL ALPINE VIBRACORE - SNELL
4. HOLE NO. (As shown on drawing title and file number) SHI-V-09-10	13. TOTAL NO. OF OVERBURDEN SAMPLES TAKEN: DISTURBED 8; UNDISTURBED 0
5. NAME OF DRILLER ROBIE PAGE 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. WATER DEPTH (BELOW MLW) 4.9'	16. DATE HOLE: STARTED 3/4/2009; COMPLETED 3/4/2009
8. DEPTH DRILLED INTO ROCK 0.0'	17. ELEVATION TOP OF HOLE 0.0' MLW
9. TOTAL DEPTH OF HOLE 24.9'	18. TOTAL CORE RECOVERY FOR BORING 94%
	19. SIGNATURE OF INSPECTOR LARRY BENJAMIN

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 weathering, etc., if significant) g
0.0	0.0		0.0' TO 4.9' WATER			Time begin vibracoring: 09:26 hrs. Soils described by LARRY BENJAMIN, Civil Engr. Tech. 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' MLW
-4.9	4.9		SEDIMENT SURFACE (4.9')		4.9'	
-5.9	5.9		SM - Gray, fine Silty SAND		1 5.4'	
-12.9	12.9		SP - Tan, coarse, poorly graded SAND with shell fragments		2 6.4' 9.0' 3 9.5' 12.9'	VIBRACORE BORING: From 0.0' to 20'; Run: 20' Rec: 18.8'. Top of vibracore soil sample is logged as beginning at water bottom. When Run is greater than Recovery, the difference is depicted as Assumed Not Recovered. NOTE: Soils Commercial Lab Classified in Accordance with ASTM-D2487
-17.3	17.3		SM - Gray, fine Silty SAND		4 13.4' 15.0' 5 15.5' 17.3'	LAB CLASSIFICATION: Jar 1 SM; Jar 2 SP-SM; Jar 3 SP-SM; Jar 4 SM; Jar 5 SM; Jar 6 MH; Jar 7 NOT TESTED; Jar 8 NOT TESTED
-18.4	18.4		MH - Dark gray, elastic SILT		6 17.9' 18.4'	
-20.4	20.4		SP - White, coarse, poorly graded SAND with wood		7 18.9' 20.4'	
-23.7	23.7		SM - Gray, fine Silty SAND		8 20.9'	
-24.9	24.9		ASSUMED NOT RECOVERED			
			Bottom of Hole Terminated at Elev. -24.9 ft. SOILS ARE FIELD VISUALLY CLASSIFIED IN ACCORDANCE WITH THE UNIFIED SOIL CLASSIFICATION SYSTEM			NOTE: Hole terminated at predetermined depth at 20' below sediment surface.

Hole No. SHI-V-09-11

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

1. PROJECT SHALLOTTE INLET	10. SIZE AND TYPE OF BIT 4" Dia. Vibracore
2. LOCATION (Coordinates or Station) NCSP NAD 83 (USft) N 57,368 E 2,187,577	11. DATUM FOR ELEVATION SHOWN (TBM or MSL) MLW
3. DRILLING AGENCY WILMINGTON DISTRICT	12. MANUFACTURER'S DESIGNATION OF DRILL ALPINE VIBRACORE - SNELL
4. HOLE NO. (As shown on drawing title and file number) SHI-V-09-11	13. TOTAL NO. OF OVERBURDEN SAMPLES TAKEN: DISTURBED 5; UNDISTURBED 0
5. NAME OF DRILLER ROBIE PAGE 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. WATER DEPTH (BELOW MLW) 5.2'	16. DATE HOLE: STARTED 3/4/2009; COMPLETED 3/4/2009
8. DEPTH DRILLED INTO ROCK 0.0'	17. ELEVATION TOP OF HOLE 0.0' MLW
9. TOTAL DEPTH OF HOLE 25.2'	18. TOTAL CORE RECOVERY FOR BORING 62%
	19. SIGNATURE OF INSPECTOR LARRY BENJAMIN

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 weathering, etc., if significant) g
0.0	0.0		0.0' TO 5.2' WATER			Time begin vibracoring: 10:40 hrs. Soils described by LARRY BENJAMIN, Civil Engr. Tech.
-5.2	5.2		SEDIMENT SURFACE (5.2')		5.2'	
			SP - Tan, coarse, poorly graded SAND with shell fragments		1 5.7'	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' MLW
					8.0' 2 8.5'	VIBRACORE BORING From 0.0' to 20' Run: 20' Rec: 12.4' Top of vibracore soil sample is logged as beginning at water bottom. When Run is greater than Recovery, the difference is depicted as Assumed Not Recovered.
-9.4	9.4		Trace shell fragments			
					11.0' 3 11.5'	NOTE: Soils Commercial Lab Classified in Accordance with ASTM-D2487
					14.0' 4 14.5'	LAB CLASSIFICATION Jar Number / Classification 1 SP 2 SP 3 SP 4 SP 5 SM
-15.0	15.0		SP - Tan, coarse, poorly graded SAND			
-17.6	17.6				17.1' 5 17.6'	
			ASSUMED NOT RECOVERED			
-25.2	25.2					
			Bottom of Hole Terminated at Elev. -25.2 ft SOILS ARE FIELD VISUALLY CLASSIFIED IN ACCORDANCE WITH THE UNIFIED SOIL CLASSIFICATION SYSTEM			NOTE: Hole terminated at predetermined depth at 20' below sediment surface.

DRILLING LOG

DIVISION	SOUTH ATLANTIC
INSTALLATION	WILMINGTON DISTRICT
SHEET	1 OF 1 SHEETS
1. PROJECT	SHALLOTTE INLET
2. LOCATION (Coordinates or Station)	NCSP NAD 83 (USft) N 53,455 E 2,187,870
3. DRILLING AGENCY	WILMINGTON DISTRICT
4. HOLE NO. (As shown on drawing title and file number)	SHI-V-09-12
5. NAME OF DRILLER	ROBIE PAGE CRANE OPERATOR
6. DIRECTION OF HOLE	☒ VERTICAL ☐ INCLINED --- DEG. FROM VERT.
7. WATER DEPTH (BELOW MLW)	12.5'
8. DEPTH DRILLED INTO ROCK	0.0'
9. TOTAL DEPTH OF HOLE	32.5'
10. SIZE AND TYPE OF BIT	4" Dia. Vibracore
11. DATUM FOR ELEVATION SHOWN (TBM or MSL)	MLW
12. MANUFACTURER'S DESIGNATION OF DRILL	ALPINE VIBRACORE - SNELL
13. TOTAL NO. OF OVERBURDEN SAMPLES TAKEN	DISTURBED 8 / UNDISTURBED 0
14. TOTAL NUMBER CORE BOXES	N/A
15. ELEVATION GROUND WATER	N/A
16. DATE HOLE	STARTED 3/4/2009 / COMPLETED 3/4/2009
17. ELEVATION TOP OF HOLE	0.0' MLW
18. TOTAL CORE RECOVERY FOR BORING	87%
19. SIGNATURE OF INSPECTOR	LARRY BENJAMIN

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 weathering, etc., if significant) g
0.0	0.0		0.0' TO 12.5' WATER			Time begin vibracoring: 11:44 hrs. Soils described by LARRY BENJAMIN, Civil Engr. Tech.
-12.5	12.5		SEDIMENT SURFACE (12.5')		12.5'	
			SP - Gray, coarse, poorly graded SAND with shell fragments		1 13.0'	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' MLW
					15.5' 2 16.0'	VIBRACORE BORING From 0.0' to 20' Run: 20' Rec: 17.3' Top of vibracore soil sample is logged as beginning at water bottom. When Run is greater than Recovery, the difference is depicted as Assumed Not Recovered.
					18.0' 3 18.5'	
-19.7	19.7		SP-SM - Gray, fine, poorly graded Silty SAND		19.7' 4 20.2'	NOTE: Soils Commercial Lab Classified in Accordance with ASTM-D2487
-21.0	21.0		SM - Gray, fine, Silty SAND with shell fragments		21.0' 5 21.5'	LAB CLASSIFICATION Jar Number / Classification 1 SP 2 SP 3 SP 4 NOT TESTED 5 NOT TESTED 6 NOT TESTED 7 NOT TESTED 8 NOT TESTED
-22.0	22.0		SM - Gray, fine, Silty SAND			
-22.7	22.7		With shell fragments		23.7' 6 24.2'	
-23.7	23.7		MH - Dark gray, elastic SILT		25.1' 7 26.0'	
-25.1	25.1		SM - Gray, fine, Silty SAND		8 26.8'	
-26.0	26.0		CL - Dark gray, lean CLAY			
-29.8	29.8		ASSUMED NOT RECOVERED			
-32.5	32.5		Bottom of Hole Terminated at Elev. -32.5 ft SOILS ARE FIELD VISUALLY CLASSIFIED IN ACCORDANCE WITH THE UNIFIED SOIL CLASSIFICATION SYSTEM			NOTE: Hole terminated at predetermined depth at 20' below sediment surface.

Hole No. SHI-V-09-13

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

1. PROJECT SHALLOTTE INLET	10. SIZE AND TYPE OF BIT 4" Dia. Vibracore
2. LOCATION (Coordinates or Station) NCSP NAD 83 (USft) N 54,056 E 2,187,889	11. DATUM FOR ELEVATION SHOWN (TBM or MSL) MLW
3. DRILLING AGENCY WILMINGTON DISTRICT	12. MANUFACTURER'S DESIGNATION OF DRILL ALPINE VIBRACORE - SNELL
4. HOLE NO. (As shown on drawing title and file number) SHI-V-09-13	13. TOTAL NO. OF OVERBURDEN SAMPLES TAKEN: DISTURBED 6; UNDISTURBED 0
5. NAME OF DRILLER ROBIE PAGE 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. WATER DEPTH (BELOW MLW) 3.6'	16. DATE HOLE: STARTED 3/4/2009; COMPLETED 3/4/2009
8. DEPTH DRILLED INTO ROCK 0.0'	17. ELEVATION TOP OF HOLE 0.0' MLW
9. TOTAL DEPTH OF HOLE 23.6'	18. TOTAL CORE RECOVERY FOR BORING 72%
	19. SIGNATURE OF INSPECTOR LARRY BENJAMIN

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 weathering, etc., if significant) g
0.0	0.0		0.0' TO 3.6' WATER			Time begin vibracoring: 11:57 hrs. Soils described by LARRY BENJAMIN, Civil Engr. Tech.
-3.6	3.6		SEDIMENT SURFACE (3.6')		3.6'	
			SP - Tan, coarse, poorly graded, SAND		1 4.1'	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' MLW
					6.0' 2 6.5'	VIBRACORE BORING From 0.0' to 20' Run: 20' Rec: 14.3' Top of vibracore soil sample is logged as beginning at water bottom. When Run is greater than Recovery, the difference is depicted as Assumed Not Recovered.
-8.6	8.6				8.6'	
			SP-SM - Grayish tan, fine to medium, poorly graded, Silty SAND		3 9.1'	NOTE: Soils Commercial Lab Classified in Accordance with ASTM-D2487
-11.6	11.6				11.6'	
			SP - Tan, coarse, poorly graded, SAND		4 12.1' 13.5' 5 14.0' 16.0' 6 16.5'	LAB CLASSIFICATION Jar Number / Classification 1 SP 2 SP 3 SP 4 SP 5 SP 6 SP
-17.9	17.9					
			ASSUMED NOT RECOVERED			
-23.6	23.6					
			Bottom of Hole Terminated at Elev. -23.6 ft SOILS ARE FIELD VISUALLY CLASSIFIED IN ACCORDANCE WITH THE UNIFIED SOIL CLASSIFICATION SYSTEM			NOTE: Hole terminated at predetermined depth at 20' below sediment surface.

DRILLING LOG

DIVISION	SOUTH ATLANTIC
INSTALLATION	WILMINGTON DISTRICT
SHEET	1 OF 1 SHEETS
1. PROJECT	SHALLOTTE INLET
2. LOCATION (Coordinates or Station)	NCSP NAD 83 (USft) N 53,891 E 2,187,642
3. DRILLING AGENCY	WILMINGTON DISTRICT
4. HOLE NO. (As shown on drawing title and file number)	SHI-V-09-14
5. NAME OF DRILLER	ROBIE PAGE CRANE OPERATOR
6. DIRECTION OF HOLE	☒ VERTICAL ☐ INCLINED --- DEG. FROM VERT.
7. WATER DEPTH (BELOW MLW)	6.6'
8. DEPTH DRILLED INTO ROCK	0.0'
9. TOTAL DEPTH OF HOLE	26.6'
10. SIZE AND TYPE OF BIT	4" Dia. Vibracore
11. DATUM FOR ELEVATION SHOWN (TBM or MSL)	MLW
12. MANUFACTURER'S DESIGNATION OF DRILL	ALPINE VIBRACORE - SNELL
13. TOTAL NO. OF OVERBURDEN SAMPLES TAKEN	DISTURBED 6 / UNDISTURBED 0
14. TOTAL NUMBER CORE BOXES	N/A
15. ELEVATION GROUND WATER	N/A
16. DATE HOLE	STARTED 3/4/2009 / COMPLETED 3/4/2009
17. ELEVATION TOP OF HOLE	0.0' MLW
18. TOTAL CORE RECOVERY FOR BORING	64%
19. SIGNATURE OF INSPECTOR	LARRY BENJAMIN

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 weathering, etc., if significant) g
0.0	0.0		0.0' TO 6.6' WATER			Time begin vibracoring: 12:17 hrs. Soils described by LARRY BENJAMIN, Civil Engr. Tech.
-6.6	6.6		SEDIMENT SURFACE (6.6')		6.6'	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' MLW
			SP - Tan, coarse, poorly graded, SAND with trace shell fragments		1 7.1' 9.0' 2 9.5' 11.0' 3 11.5' 13.0' 4 13.5' 15.0' 5 15.5' 17.0' 6 17.5'	VIBRACORE BORING From 0.0' to 20' Run: 20' Rec: 12.8' Top of vibracore soil sample is logged as beginning at water bottom. When Run is greater than Recovery, the difference is depicted as Assumed Not Recovered. NOTE: Soils Commercial Lab Classified in Accordance with ASTM-D2487
-16.0	16.0		SP - Tan, coarse, poorly graded SAND with shell fragments			
-17.0	17.0		SM - Gray, fine, Silty SAND			
-19.4	19.4		ASSUMED NOT RECOVERED			
-26.6	26.6		Bottom of Hole Terminated at Elev. -26.6 ft SOILS ARE FIELD VISUALLY CLASSIFIED IN ACCORDANCE WITH THE UNIFIED SOIL CLASSIFICATION SYSTEM			NOTE: Hole terminated at predetermined depth at 20' below sediment surface.

LAB CLASSIFICATION

Jar Number	Classification
1	SP
2	SP
3	SP-SM
4	SP
5	SP
6	SP-SM

Hole No. SHI-V-09-15

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

1. PROJECT SHALLOTTE INLET	10. SIZE AND TYPE OF BIT 4" Dia. Vibracore
2. LOCATION (Coordinates or Station) NCSP NAD 83 (USft) N 53,978 E 2,188,075	11. DATUM FOR ELEVATION SHOWN (TBM or MSL) MLW
3. DRILLING AGENCY WILMINGTON DISTRICT	12. MANUFACTURER'S DESIGNATION OF DRILL ALPINE VIBRACORE - SNELL
4. HOLE NO. (As shown on drawing title and file number) SHI-V-09-15	13. TOTAL NO. OF OVERBURDEN SAMPLES TAKEN: DISTURBED 6; UNDISTURBED 0
5. NAME OF DRILLER ROBIE PAGE 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. WATER DEPTH (BELOW MLW) 3.2'	16. DATE HOLE: STARTED 3/4/2009; COMPLETED 3/4/2009
8. DEPTH DRILLED INTO ROCK 0.0'	17. ELEVATION TOP OF HOLE 0.0' MLW
9. TOTAL DEPTH OF HOLE 23.2'	18. TOTAL CORE RECOVERY FOR BORING 73%
	19. SIGNATURE OF INSPECTOR LARRY BENJAMIN

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 weathering, etc., if significant) g
0.0	0.0		0.0' TO 3.2' WATER			Time begin vibracoring: 12:49 hrs. Soils described by LARRY BENJAMIN, Civil Engr. Tech.
-3.2	3.2		SEDIMENT SURFACE (3.2')		3.2'	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' MLW
			SP - Tan, coarse, poorly graded, SAND		1 / 3.7'	
					5.5' / 2 / 6.0'	VIBRACORE BORING From 0.0' to 20' Run: 20' Rec: 14.5' Top of vibracore soil sample is logged as beginning at water bottom. When Run is greater than Recovery, the difference is depicted as Assumed Not Recovered.
					8.0' / 3 / 8.5'	
					10.0' / 4 / 10.5'	NOTE: Soils Commercial Lab Classified in Accordance with ASTM-D2487
					12.0' / 5 / 12.5'	LAB CLASSIFICATION Jar Number — Classification 1 SP 2 SP 3 SP 4 SP 5 SP 6 SP
					14.0' / 6 / 14.5'	
-17.7	17.7					
			ASSUMED NOT RECOVERED			
-23.2	23.2					
			Bottom of Hole Terminated at Elev. -23.2 ft SOILS ARE FIELD VISUALLY CLASSIFIED IN ACCORDANCE WITH THE UNIFIED SOIL CLASSIFICATION SYSTEM			NOTE: Hole terminated at predetermined depth at 20' below sediment surface.

DRILLING LOG

DIVISION	SOUTH ATLANTIC
INSTALLATION	WILMINGTON DISTRICT
SHEET	1 OF 1 SHEETS
1. PROJECT	SHALLOTTE INLET
2. LOCATION (Coordinates or Station)	NCSP NAD 83 (USft) N 54,092 E 2,188,645
3. DRILLING AGENCY	WILMINGTON DISTRICT
4. HOLE NO. (As shown on drawing title and file number)	SHI-V-09-16
5. NAME OF DRILLER	ROBIE PAGE CRANE OPERATOR
6. DIRECTION OF HOLE	☒ VERTICAL ☐ INCLINED ---- DEG. FROM VERT.
7. WATER DEPTH (BELOW MLW)	3.8'
8. DEPTH DRILLED INTO ROCK	0.0'
9. TOTAL DEPTH OF HOLE	23.8'
10. SIZE AND TYPE OF BIT	4" Dia. Vibracore
11. DATUM FOR ELEVATION SHOWN (TBM or MSL)	MLW
12. MANUFACTURER'S DESIGNATION OF DRILL	ALPINE VIBRACORE - SNELL
13. TOTAL NO. OF OVERBURDEN SAMPLES TAKEN	DISTURBED 6 / UNDISTURBED 0
14. TOTAL NUMBER CORE BOXES	N/A
15. ELEVATION GROUND WATER	N/A
16. DATE HOLE	STARTED 3/4/2009 / COMPLETED 3/4/2009
17. ELEVATION TOP OF HOLE	0.0' MLW
18. TOTAL CORE RECOVERY FOR BORING	68%
19. SIGNATURE OF INSPECTOR	LARRY BENJAMIN

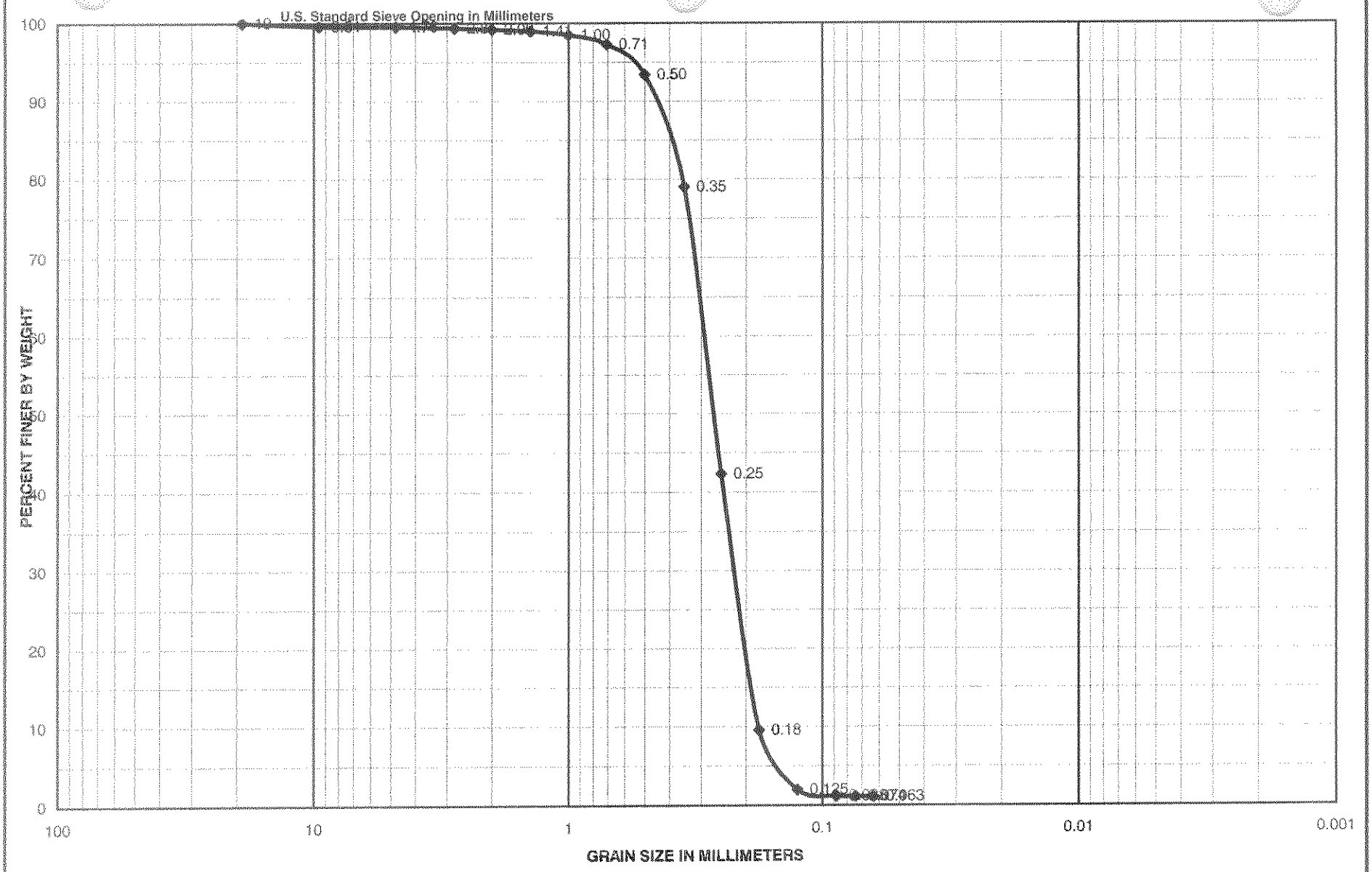
ELEVATION a	DEPTH b	LEGEND c	CLASSIFICATION OF MATERIALS (Description) d	% CORE RECOVERY e	BOX OR SAMPLE NO. f	REMARKS (Drilling time, water loss, depth weathering, etc., if significant) g
0.0	0.0		0.0' TO 3.8' WATER			Time begin vibracoring: 13:18 hrs. Soils described by LARRY BENJAMIN, Civil Engr. Tech.
-3.8	3.8		SEDIMENT SURFACE (3.8')		3.8'	
			SP - Tan, coarse, poorly graded, SAND		1 4.3' 6.0' 2 6.5' 8.5' 3 9.0' 11.0' 4 11.5' 13.0'	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' MLW VIBRACORE BORING From 0.0' to 20' Run: 20' Rec: 13.5' Top of vibracore soil sample is logged as beginning at water bottom. When Run is greater than Recovery, the difference is depicted as Assumed Not Recovered. NOTE: Soils Commercial Lab Classified in Accordance with ASTM-D2487
-13.0	13.0		SP-SM - Tan, fine, poorly graded, Silty SAND		5 13.5' 15.0' 6 15.5'	LAB CLASSIFICATION Jar Number / Classification 1 SP 2 SP 3 SP 4 SP 5 SP 6 SP-SM
-17.3	17.3		ASSUMED NOT RECOVERED			
-23.8	23.8		Bottom of Hole Terminated at Elev. -23.8 ft SOILS ARE FIELD VISUALLY CLASSIFIED IN ACCORDANCE WITH THE UNIFIED SOIL CLASSIFICATION SYSTEM			NOTE: Hole terminated at predetermined depth at 20' below sediment surface.

Hole No. SHI-V-09-17

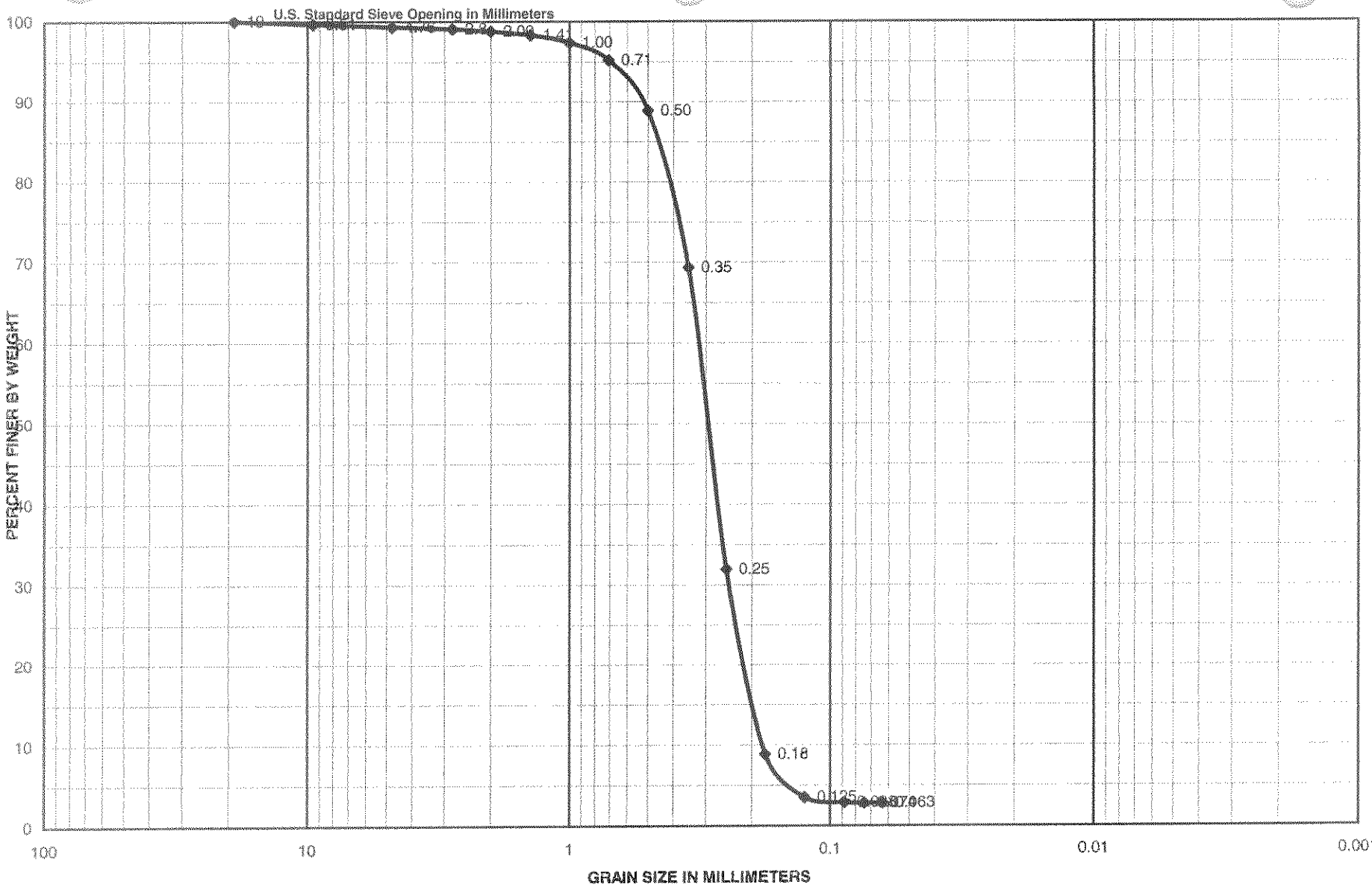
DRILLING LOG	DIVISION SOUTH ATLANTIC	INSTALLATION WILMINGTON DISTRICT	SHEET 1 OF 1 SHEETS

1. PROJECT SHALLOTTE INLET	10. SIZE AND TYPE OF BIT 4" Dia. Vibracore
2. LOCATION (Coordinates or Station) NCSP NAD 83 (USft) N 54,511 E 2,187,018	11. DATUM FOR ELEVATION SHOWN (TBM or MSL) MLW
3. DRILLING AGENCY WILMINGTON DISTRICT	12. MANUFACTURER'S DESIGNATION OF DRILL ALPINE VIBRACORE - SNELL
4. HOLE NO. (As shown on drawing title and file number) SHI-V-09-17	13. TOTAL NO. OF OVERBURDEN SAMPLES TAKEN: DISTURBED 5; UNDISTURBED 0
5. NAME OF DRILLER ROBIE PAGE 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. WATER DEPTH (BELOW MLW) 5.7'	16. DATE HOLE: STARTED 3/4/2009; COMPLETED 3/4/2009
8. DEPTH DRILLED INTO ROCK 0.0'	17. ELEVATION TOP OF HOLE 0.0' MLW
9. TOTAL DEPTH OF HOLE 20.7'	18. TOTAL CORE RECOVERY FOR BORING 57%
	19. SIGNATURE OF INSPECTOR LARRY BENJAMIN

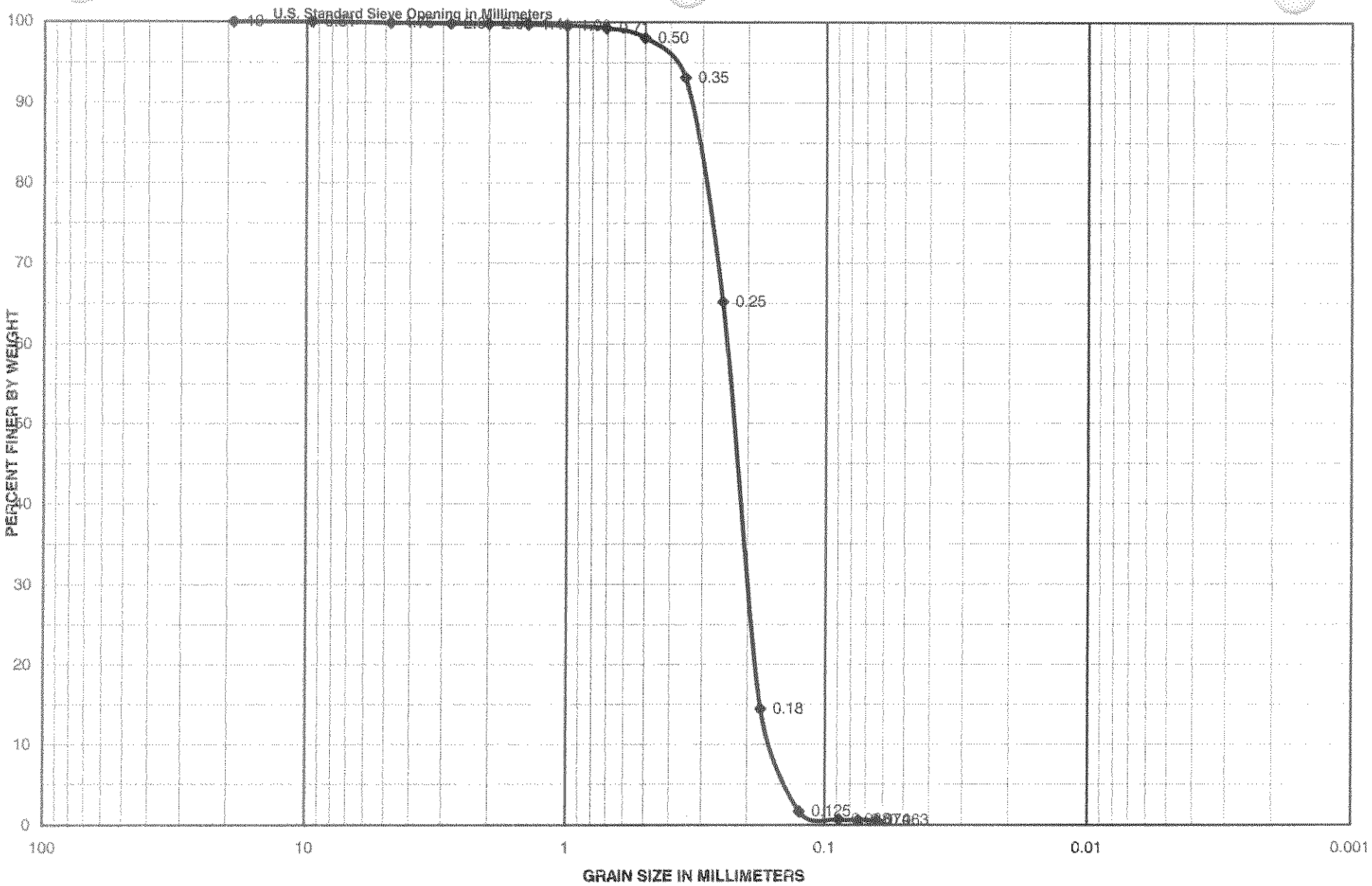
ELEVATION a	DEPTH b	LEGEND c	CLASSIFICATION OF MATERIALS (Description) d	% CORE RECOVERY e	BOX OR SAMPLE NO. f	REMARKS (Drilling time, water loss, depth weathering, etc., if significant) g
0.0	0.0		0.0' TO 5.7' WATER			Time begin vibracoring: 13:57 hrs. Soils described by LARRY BENJAMIN, Civil Engr. Tech.
-5.7	5.7		SEDIMENT SURFACE (5.7')		5.7'	
			SP - Tan, coarse, poorly graded, 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' MLW
					6.2'	
					8.0'	VIBRACORE BORING From 0.0' to 15' Run: 15' Rec: 8.6' Top of vibracore soil sample is logged as beginning at water bottom. When Run is greater than Recovery, the difference is depicted as Assumed Not Recovered.
					2	
					8.5'	
					10.0'	
					3	
					10.5'	
-12.7	12.7				12.7'	
-13.2	13.2		MH - Dark gray, elastic SILT with shell fragments	13.2	4	NOTE: Soils Commercial Lab Classified in Accordance with ASTM-D2487
					5	
-14.3	14.3		SP - Tan, coarse, poorly graded, SAND		13.7'	LAB CLASSIFICATION Jar Number / Classification 1 SP 2 SP 3 SP 4 SM 5 SP-SM
			ASSUMED NOT RECOVERED			
-20.7	20.7					
			Bottom of Hole Terminated at Elev. -20.7 ft SOILS ARE FIELD VISUALLY CLASSIFIED IN ACCORDANCE WITH THE UNIFIED SOIL CLASSIFICATION SYSTEM			NOTE: Hole terminated at refusal depth at 15' below sediment surface.



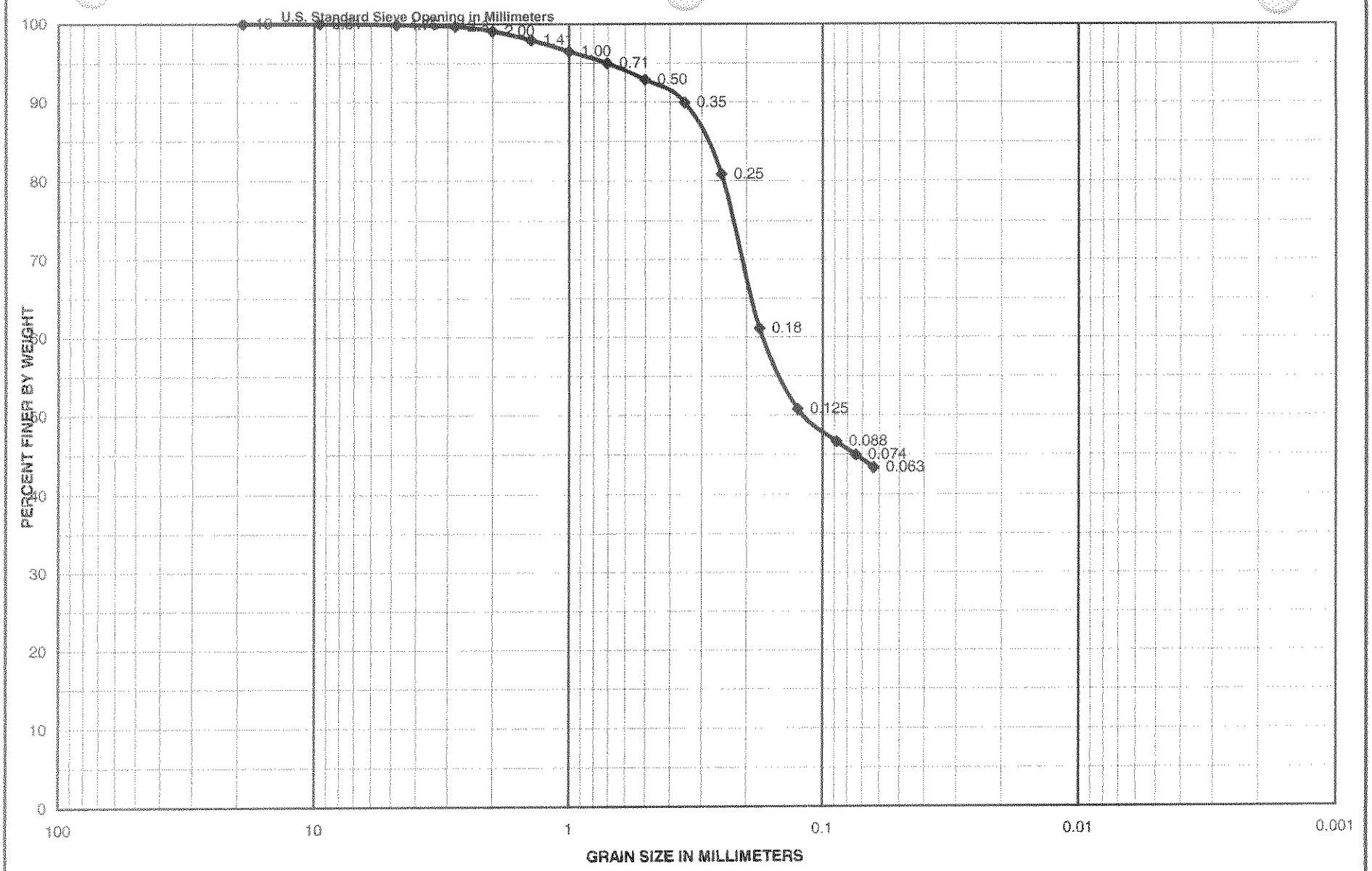
Sample No.	Depth	Classification		
1	7.9-8.4	Olive gray poorly graded sand with few shells, SP	Area	Shallotte Inlet
			CATLIN Geotechnical Laboratory	
		6.6% shells	Boring No.	SHI-V-09-1
			Date	4/29/2009



Sample No.	Depth	Classification		
2	11.0-11.5	Olive gray poorly graded sand with trace shells, SP	Area	Shallotte Inlet
			CATLIN Geotechnical Laboratory	
		4.8% shells	Boring No.	SHI-V-09-1
			Date	4/29/2009

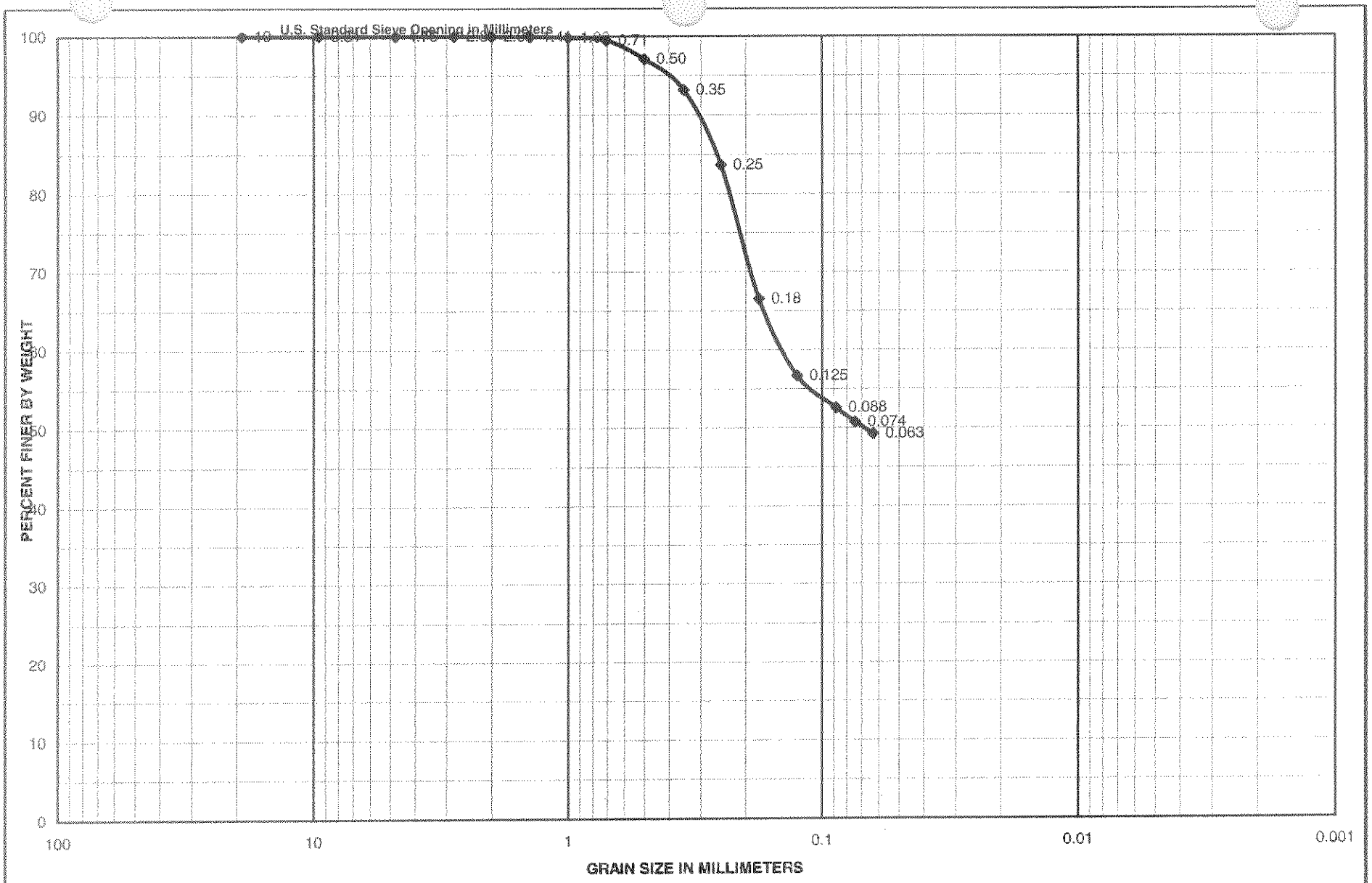


Sample No.	Depth	Classification		
3	14.0-14.5	Olive gray poorly graded sand with trace shells, SP	Area	Shallotte Inlet
			CATLIN Geotechnical Laboratory	
		1.9% shells	Boring No.	SHI-V-09-1
			Date	4/29/2009

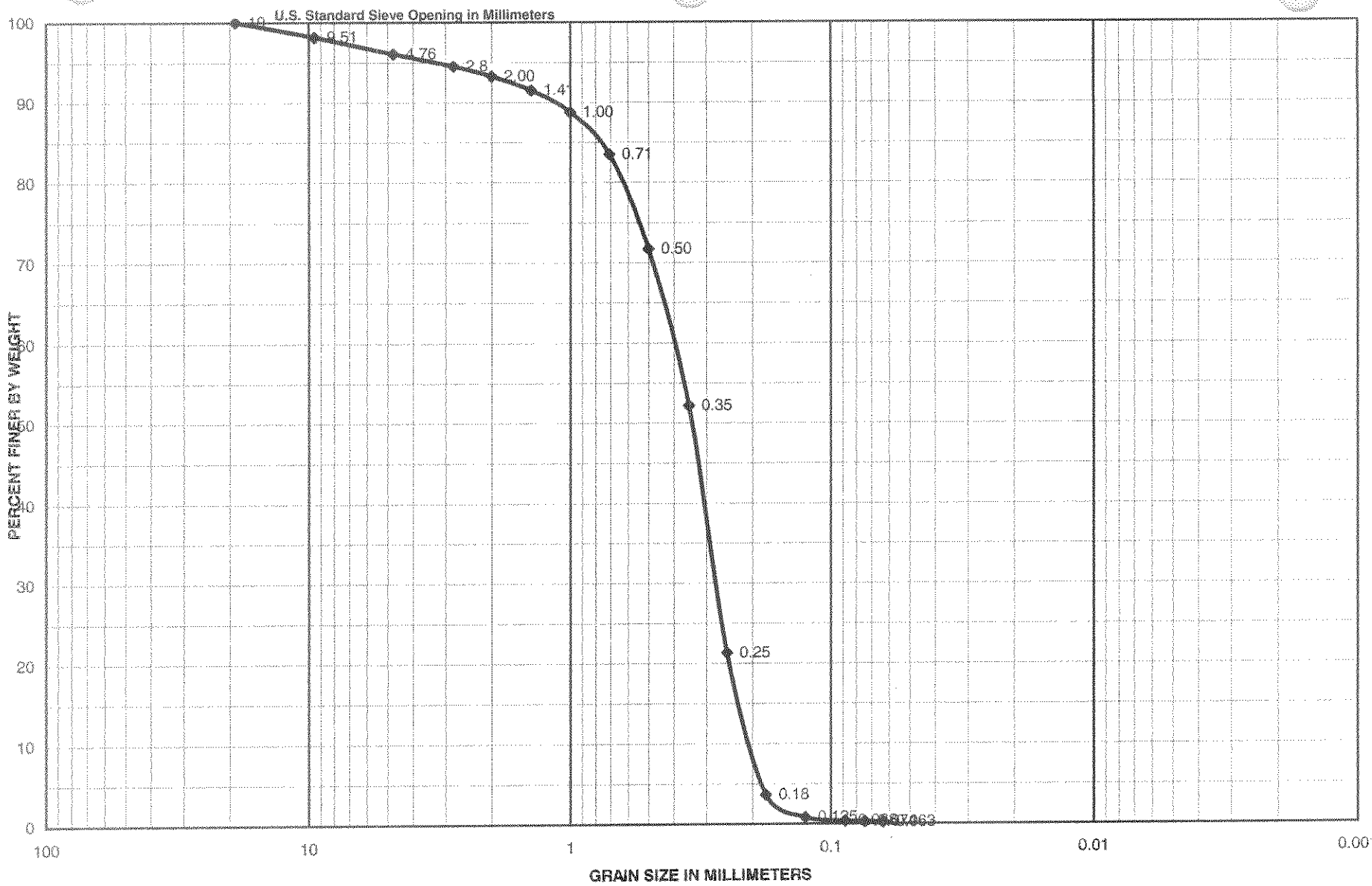


Sample No.	Depth	Classification
4	15.4-15.9	Olive gray clayey sand with trace fine gravel, SC

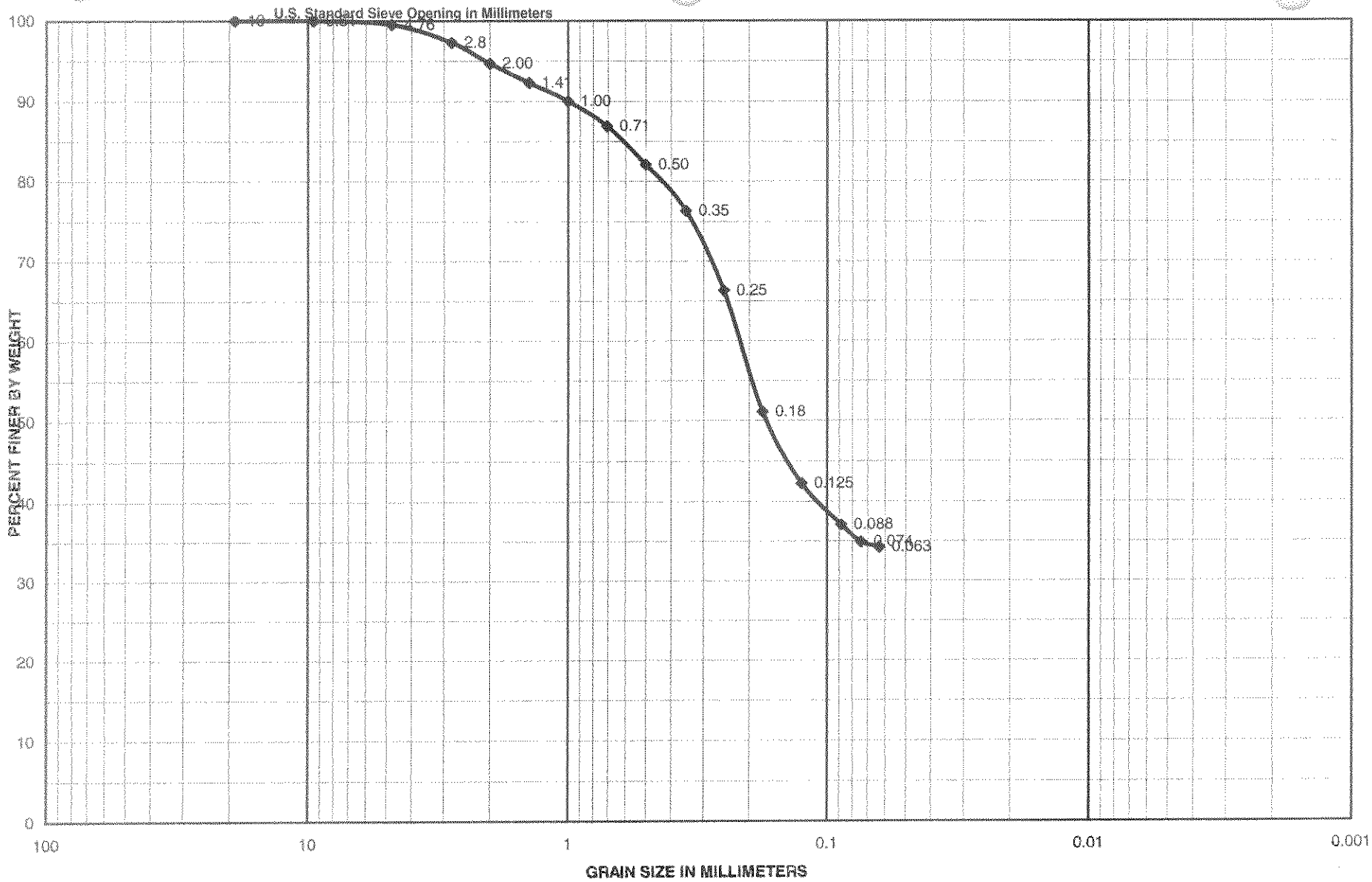
Area	Shallotte Inlet
CATLIN Geotechnical Laboratory	
Boring No.	SHI-V-09-1
Date	4/29/2009



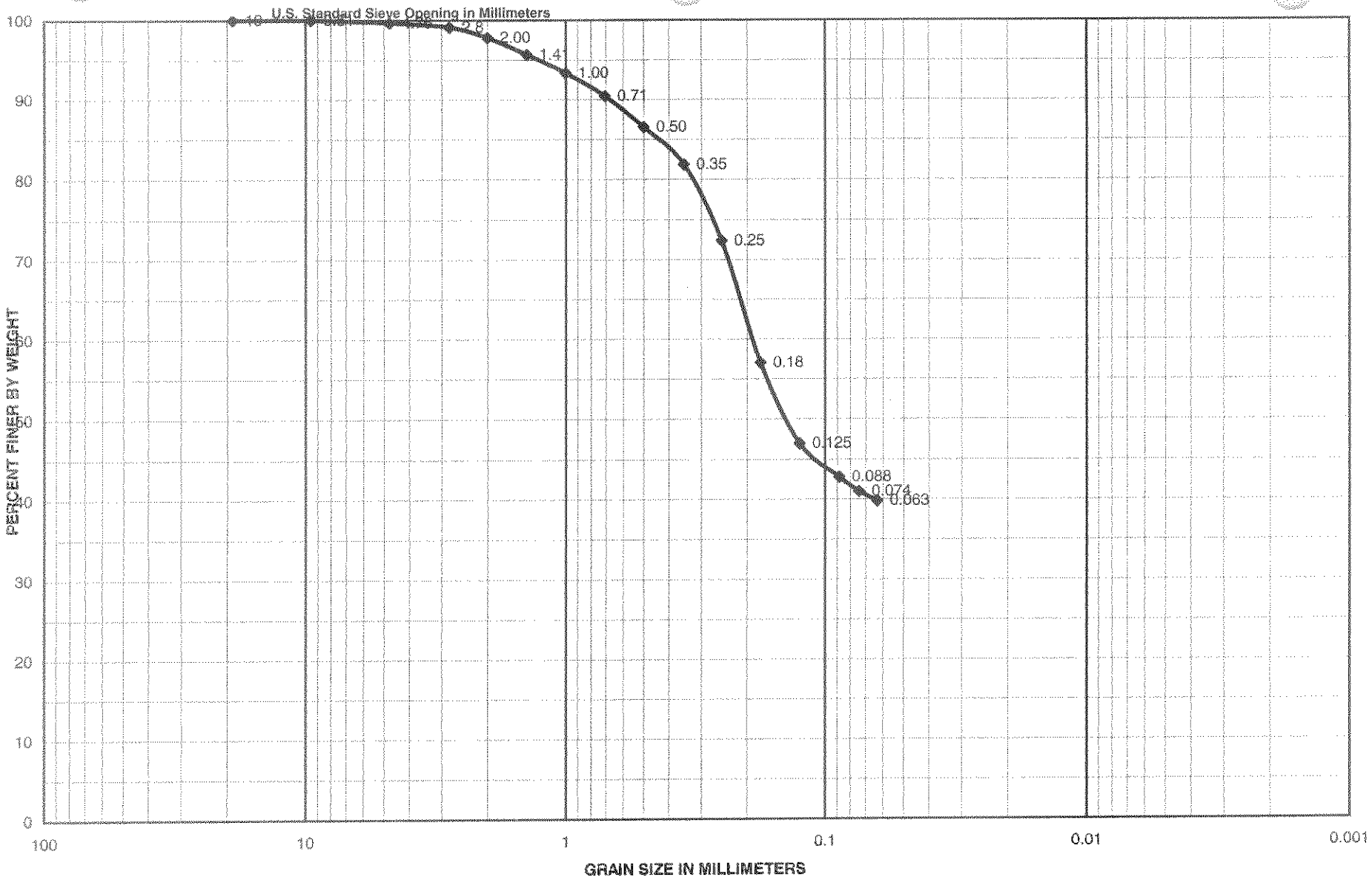
Sample No.	Depth	Classification		
5	17.9-18.4	Olive gray ~~clayey sand to~~ sandy lean clay with trace fine gravel, SC/CL	Area	Shallotte Inlet
			CATLIN Geotechnical Laboratory	
			Boring No.	SHI-V-09-1
			Date	4/29/2009



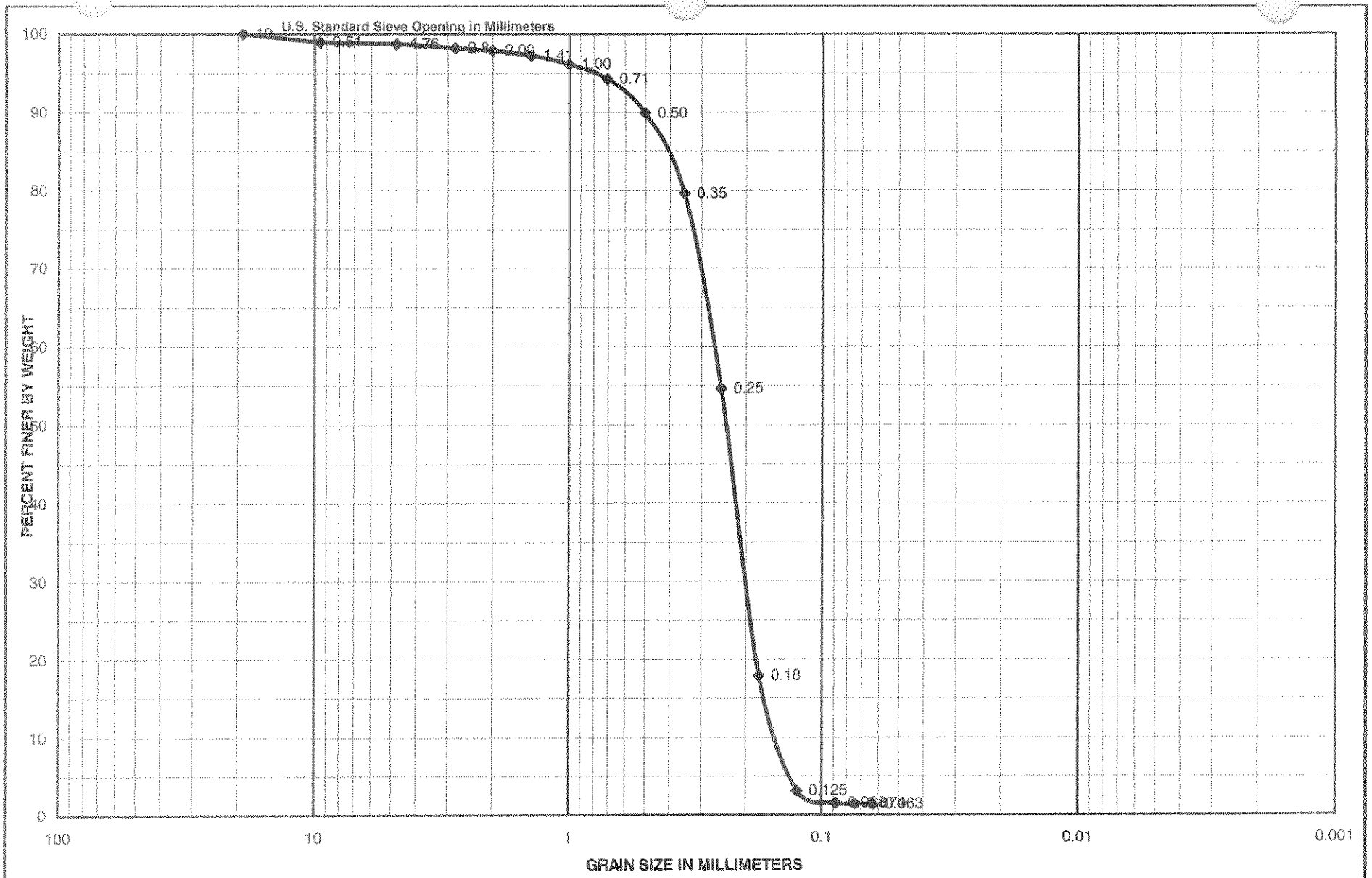
Sample No.	Depth	Classification		
1	12.3-12.8	Olive gray poorly graded sand with little shells, SP	Area	Shallotte Inlet
			CATLIN Geotechnical Laboratory	
		16.5% shells	Boring No.	SHI-V-09-2
			Date	4/29/2009



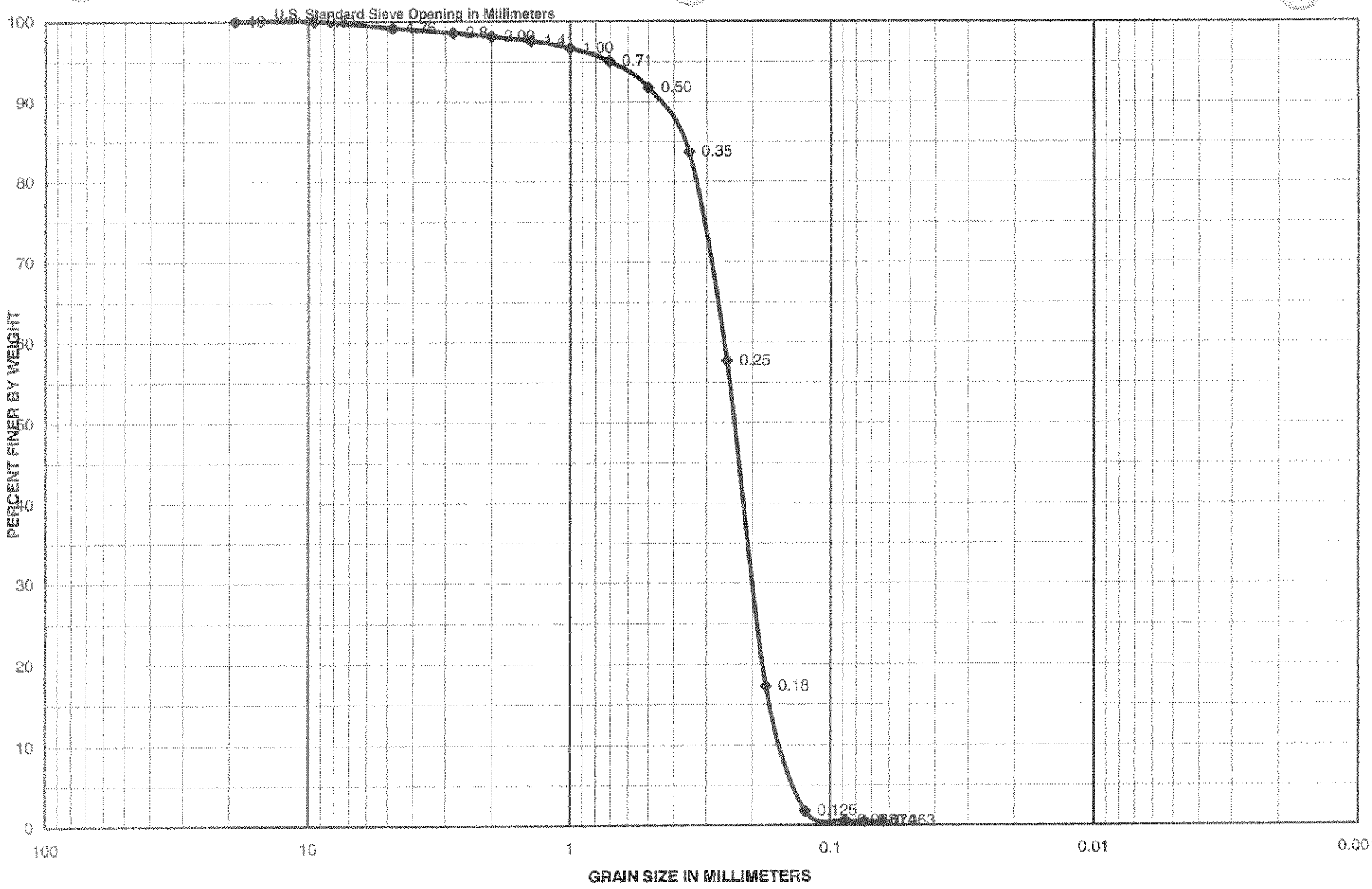
Sample No.	Depth	Classification		
2	13.3-13.8	Olive gray silty sand with trace fine gravel, SM	Area	Shallotte Inlet
			CATLIN Geotechnical Laboratory	
			Boring No.	SHI-V-09-2
			Date	4/29/2009



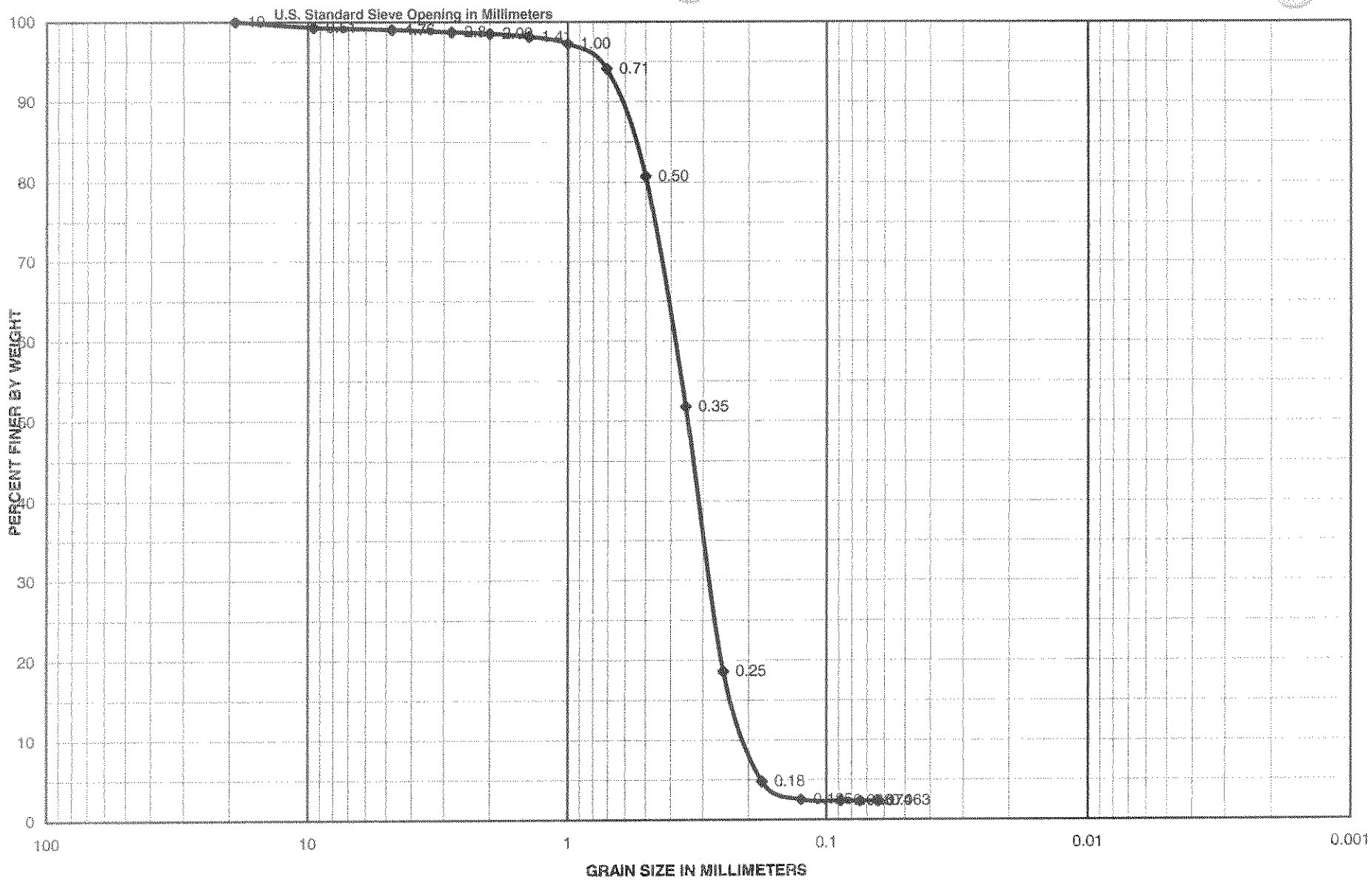
Sample No.	Depth	Classification		
3	16.0-16.5	Olive gray clayey sand with trace fine gravel, SC	Area	Shallotte Inlet
			CATLIN Geotechnical Laboratory	
			Boring No.	SHI-V-09-2
			Date	4/29/2009



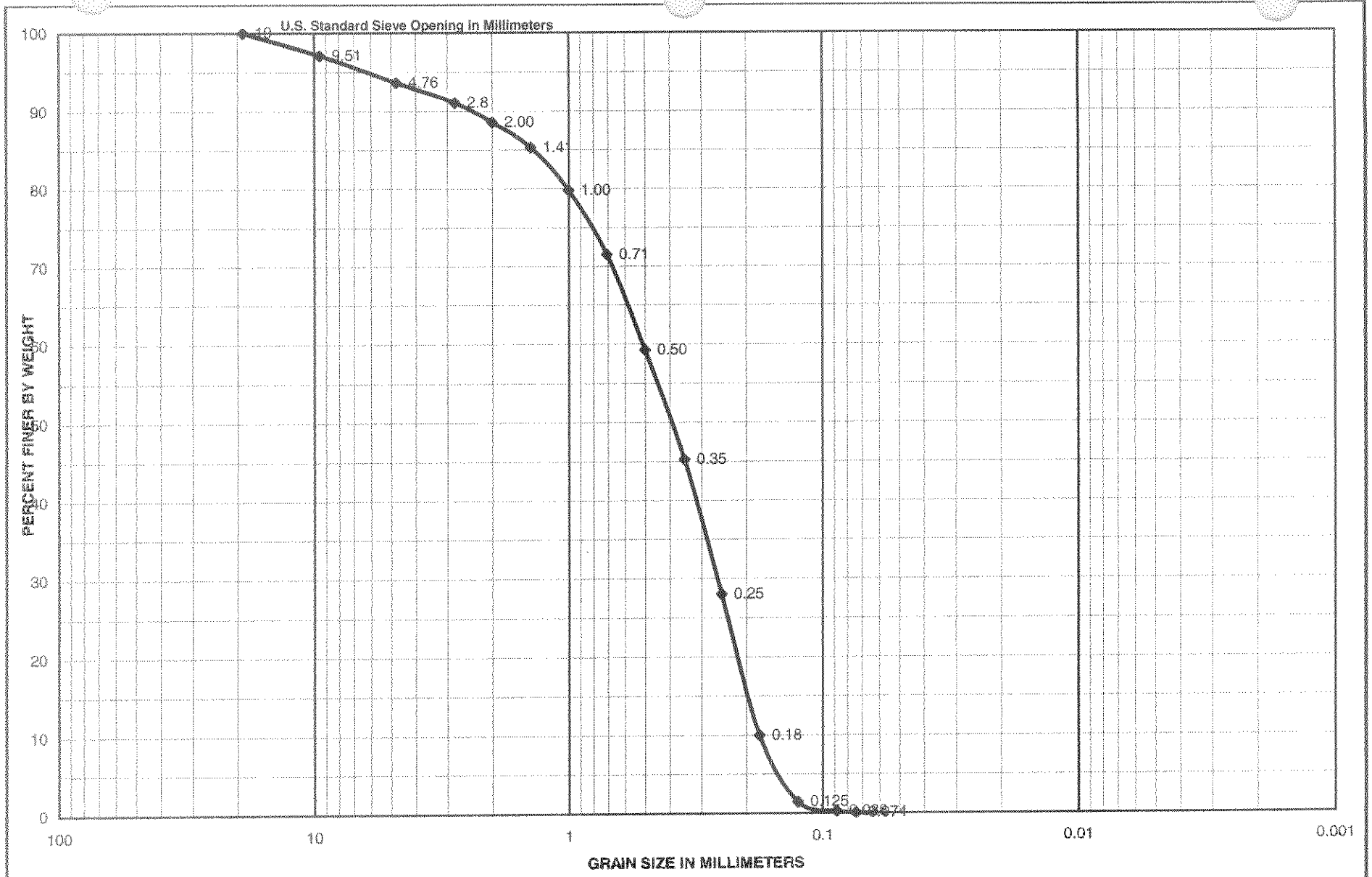
Sample No.	Depth	Classification		
1	1.7-2.2	Olive gray poorly graded sand with trace shells, SP	**Area**	Shallotte Inlet
			CATLIN Geotechnical Laboratory	
		3.9% shells	**Boring No.**	SHI-V-09-3
			Date	4/29/2009



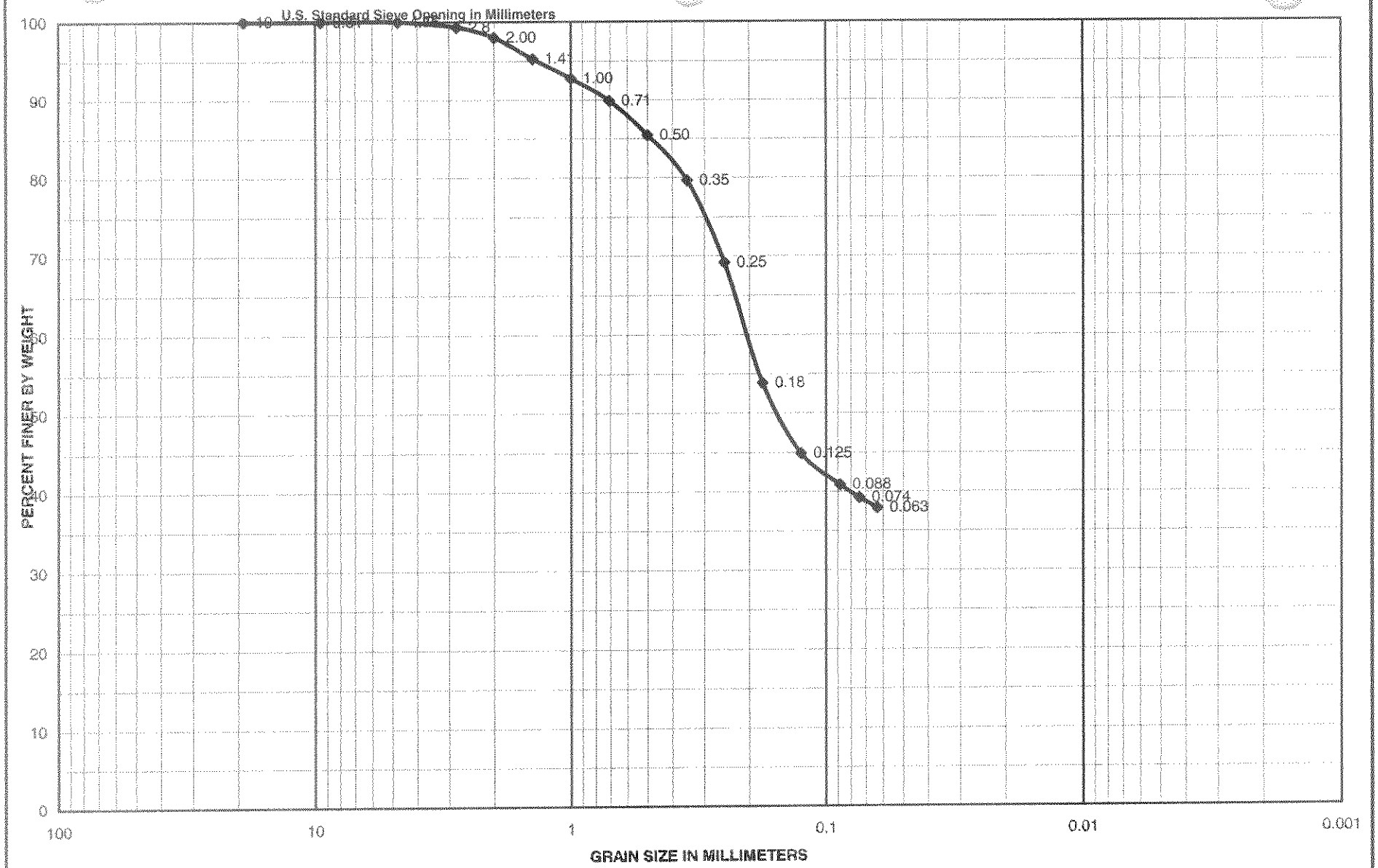
Sample No.	Depth	Classification		
2	5.0-5.5	Olive gray poorly graded sand with trace shells, SP	Area	Shallotte Inlet
		3.3% shells	CATLIN Geotechnical Laboratory	
			Boring No.	SHI-V-09-3
			Date	4/29/2009



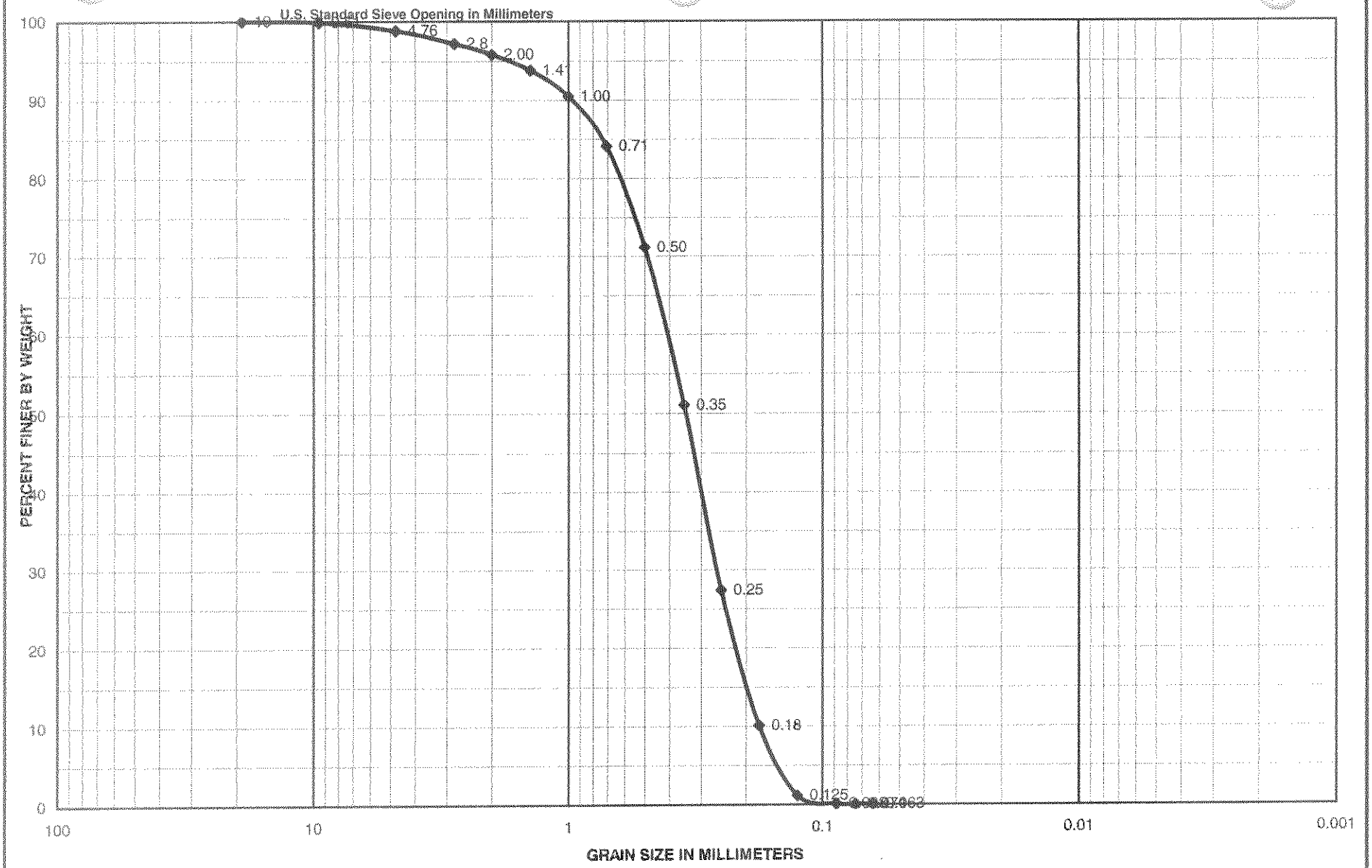
Sample No.	Depth	Classification		
3	8.0-8.5	Olive gray poorly graded sand with trace shells, SP	Area	Shallotte Inlet
			CATLIN Geotechnical Laboratory	
		5.9% shells	Boring No.	SHI-V-09-3
			Date	4/29/2009



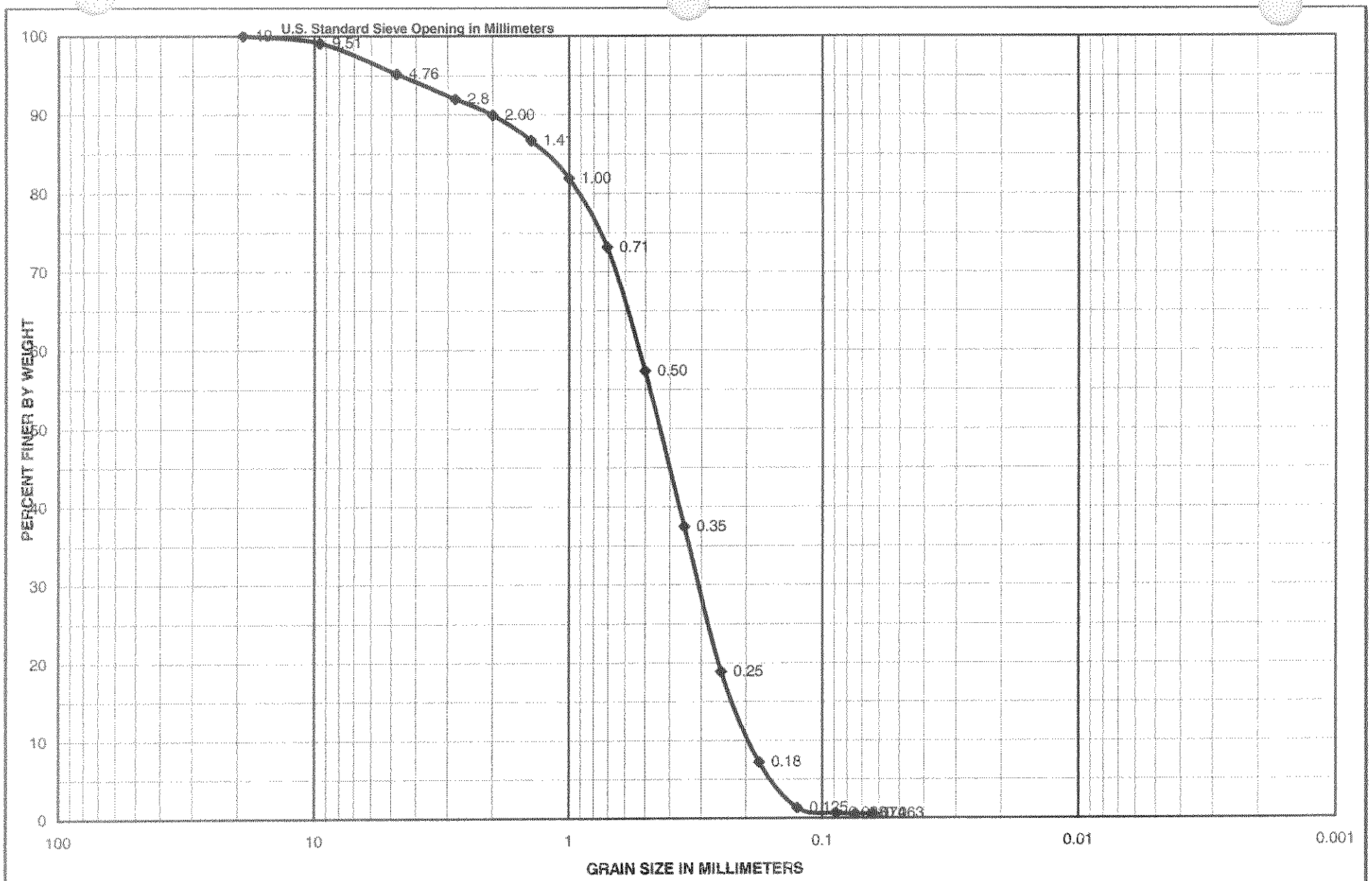
Sample No.	Depth	Classification		
4	11.0-11.5	Olive gray poorly graded sand with little shells, SP	Area	Shallotte Inlet
		20.2% shells	CATLIN Geotechnical Laboratory	
			Boring No.	SHI-V-09-3
			Date	4/29/2009



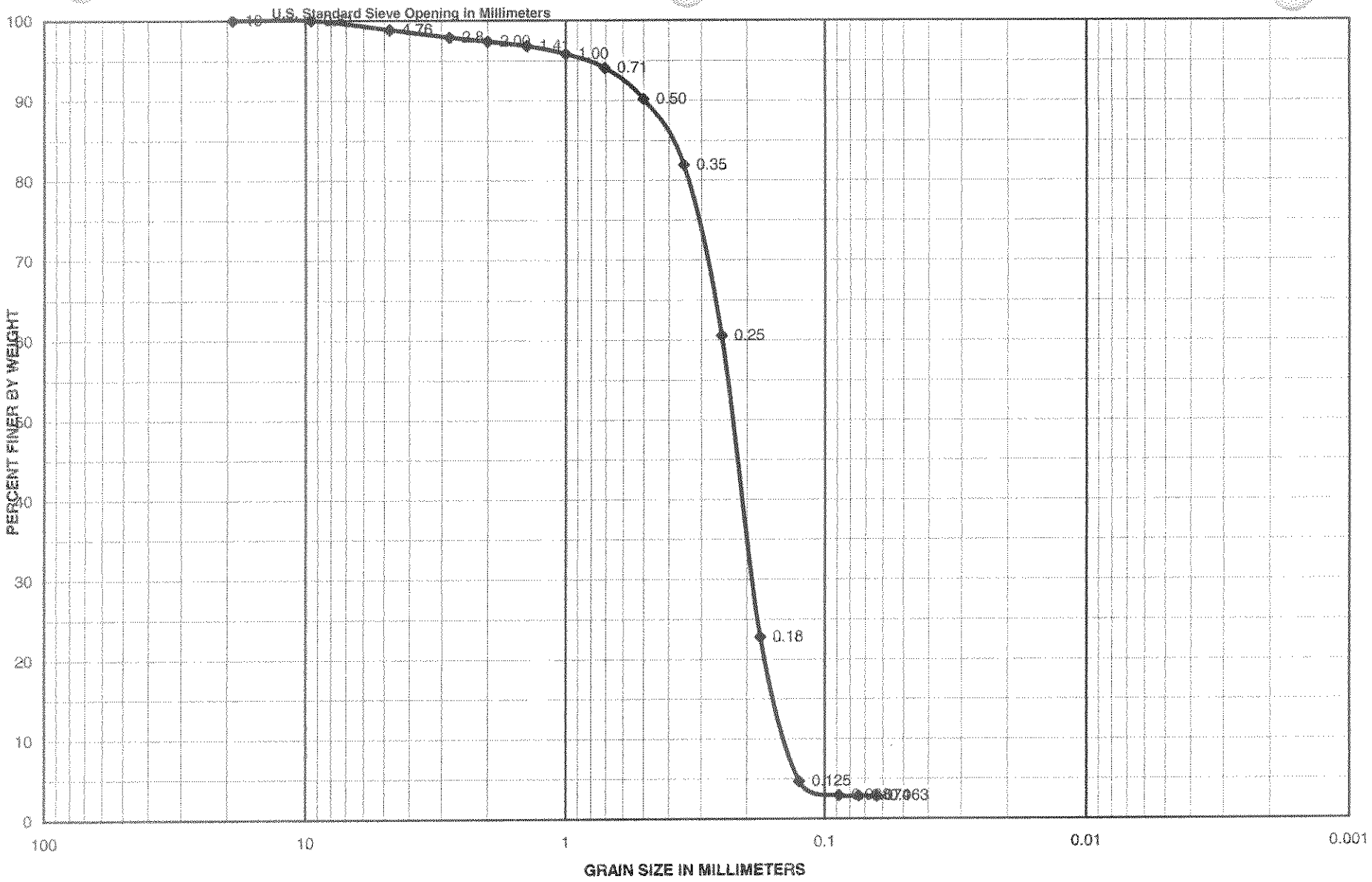
Sample No.	Depth	Classification		
5	11.7-12.2	Olive gray silty sand with fine gravel, SM	Area	Shallotte Inlet
			CATLIN Geotechnical Laboratory	
			Boring No.	SHI-V-09-3
			Date	4/29/2009



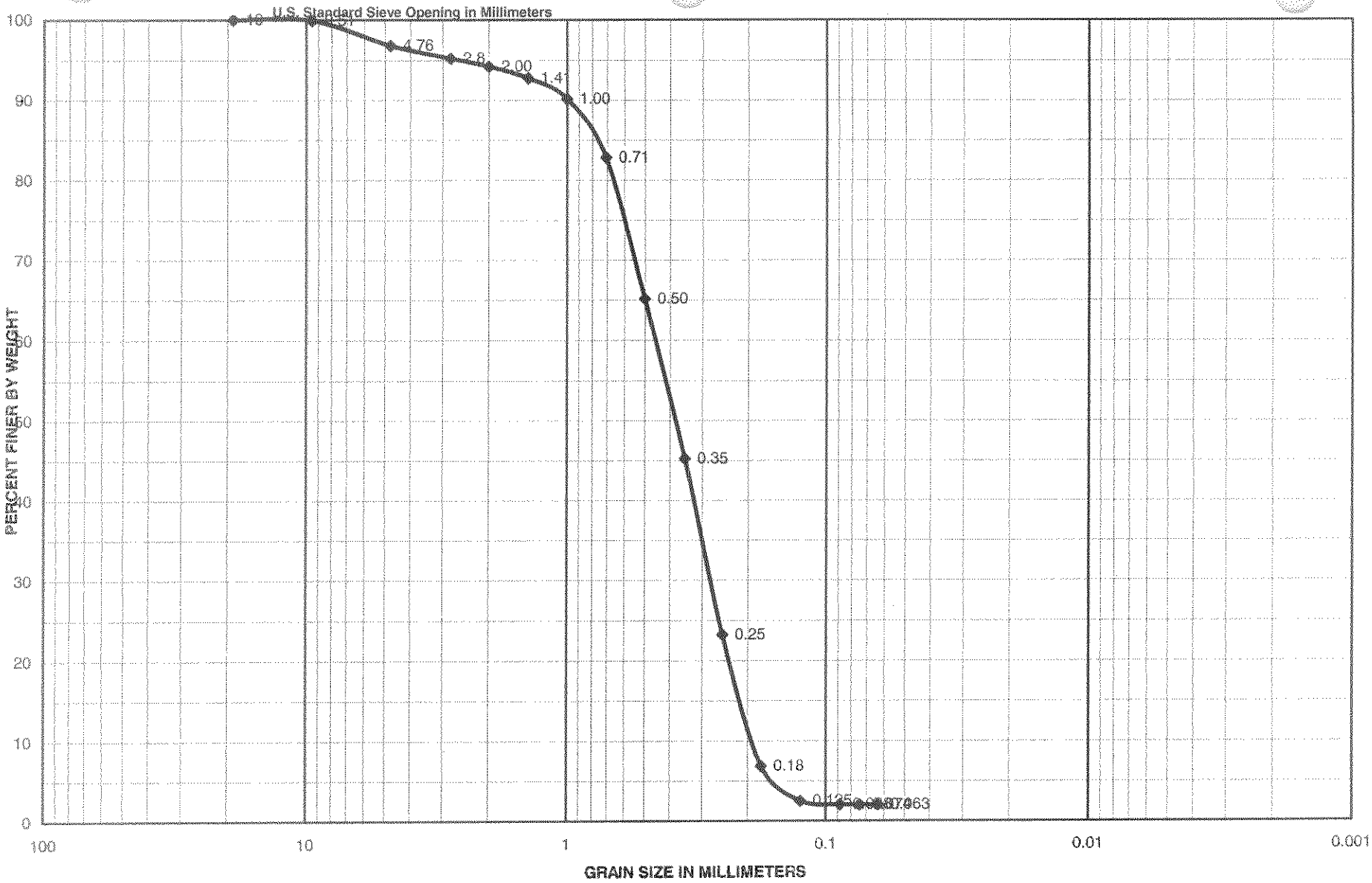
Sample No.	Depth	Classification		
1	5.1-5.6	Olive gray poorly graded sand with few shells, SP	Area	Shallotte Inlet
		9.5% shells	CATLIN Geotechnical Laboratory	
			Boring No.	SHI-V-09-4
			Date	4/29/2009



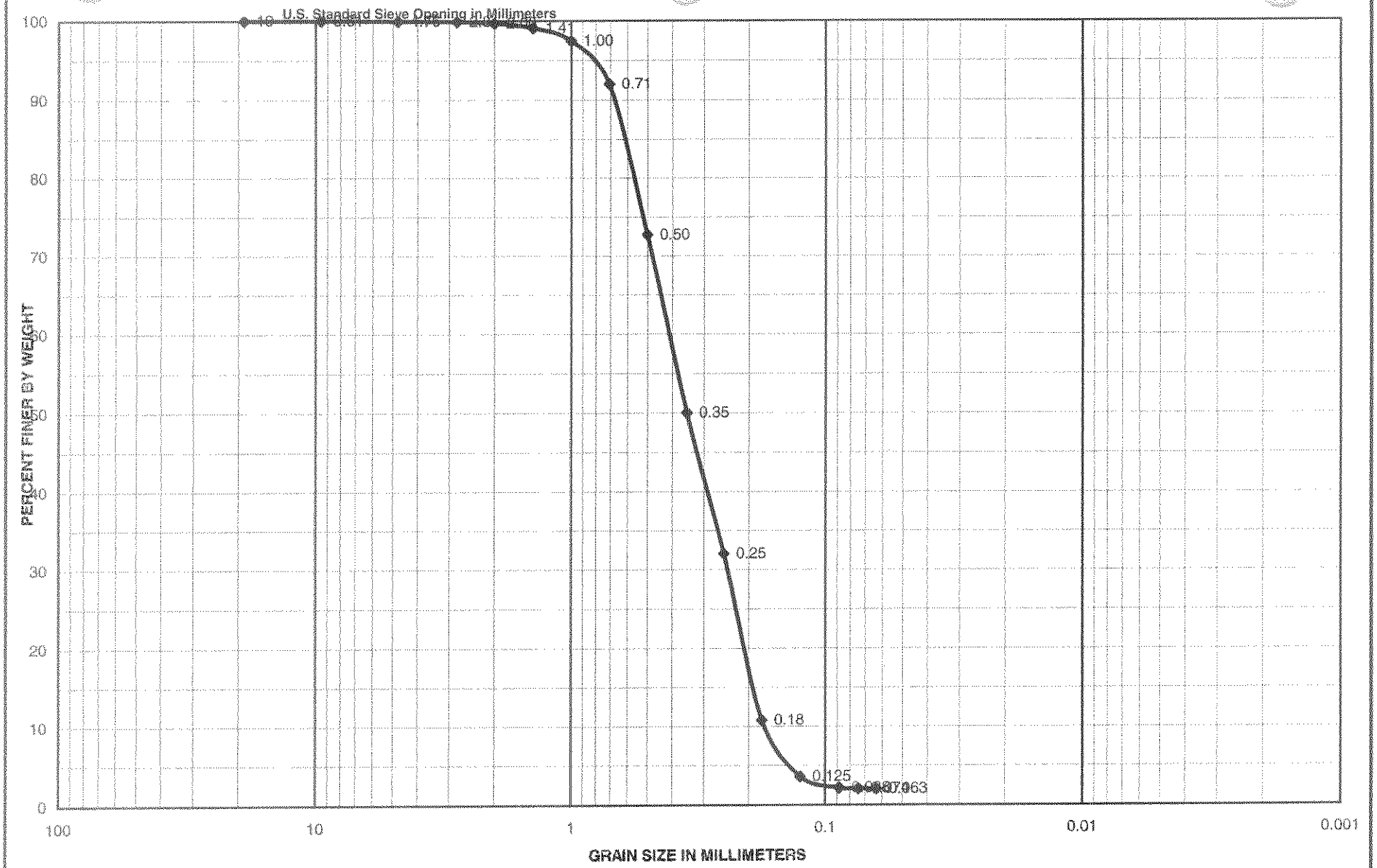
Sample No.	Depth	Classification		
2	8.0-8.5	Olive gray poorly graded sand with little shells, SP	Area	Shallotte Inlet
			CATLIN Geotechnical Laboratory	
		18.1% shells	Boring No.	SHI-V-09-4
			Date	4/29/2009



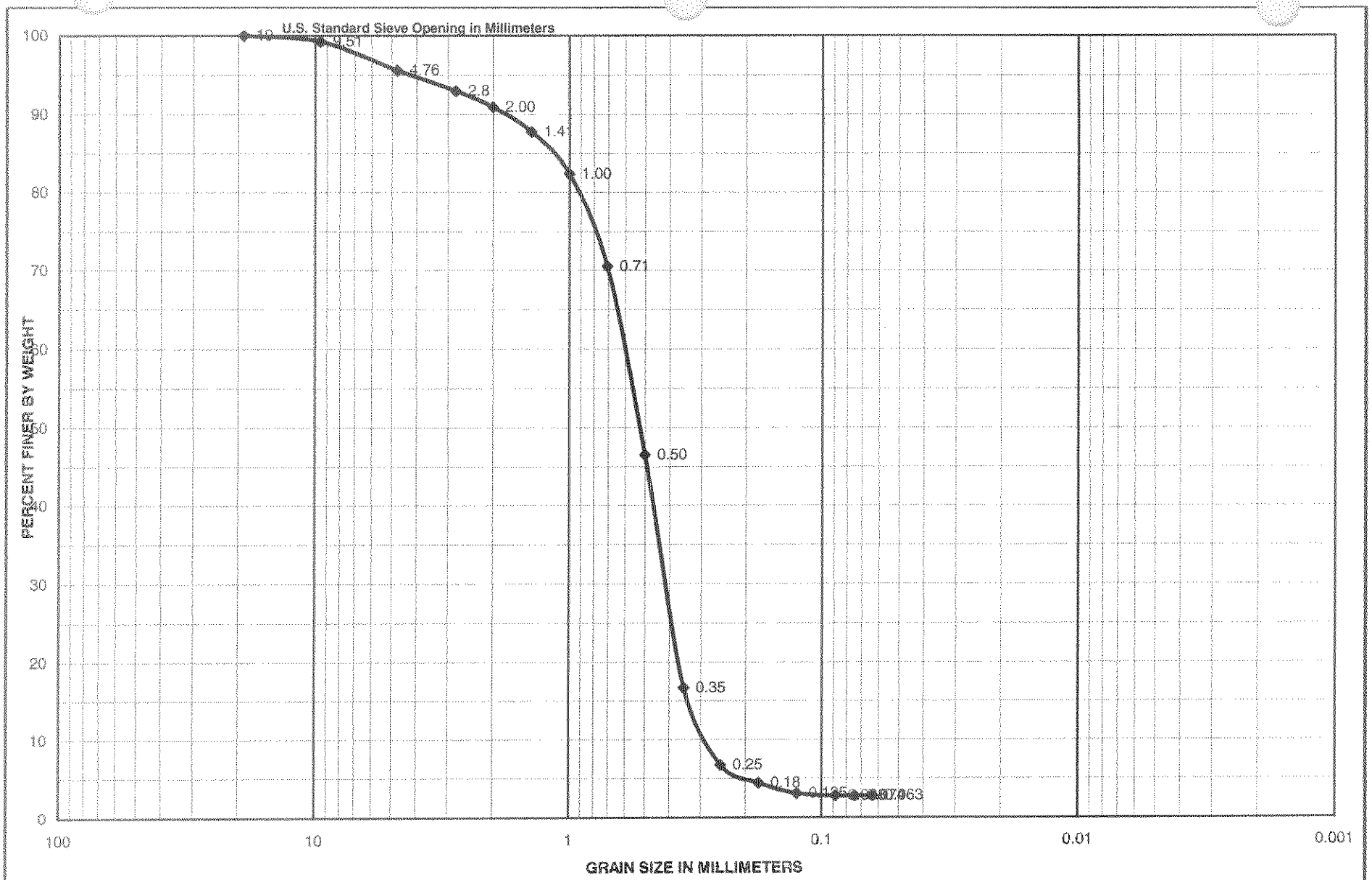
Sample No.	Depth	Classification		
3	11.0-11.5	Olive gray poorly graded sand with trace shells, SP	Area	Shallotte Inlet
			CATLIN Geotechnical Laboratory	
		4.2% shells	Boring No.	SHI-V-09-4
			Date	4/29/2009



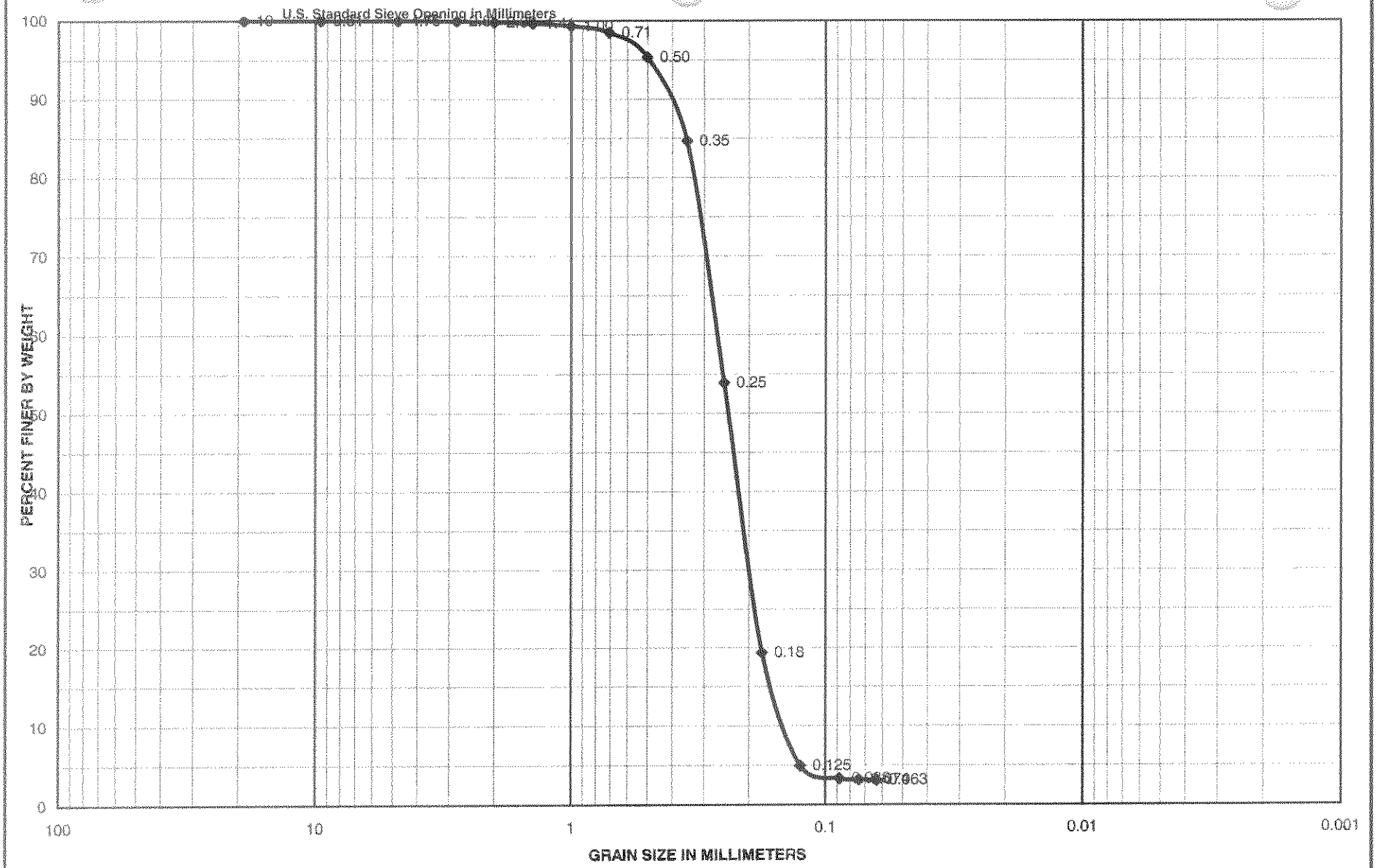
Sample No.	Depth	Classification		
4	14.0-14.5	Olive gray poorly graded sand with few shells, SP	Area	Shallotte Inlet
		9.8% shells	CATLIN Geotechnical Laboratory	
			Boring No.	SHI-V-09-4
			Date	4/29/2009



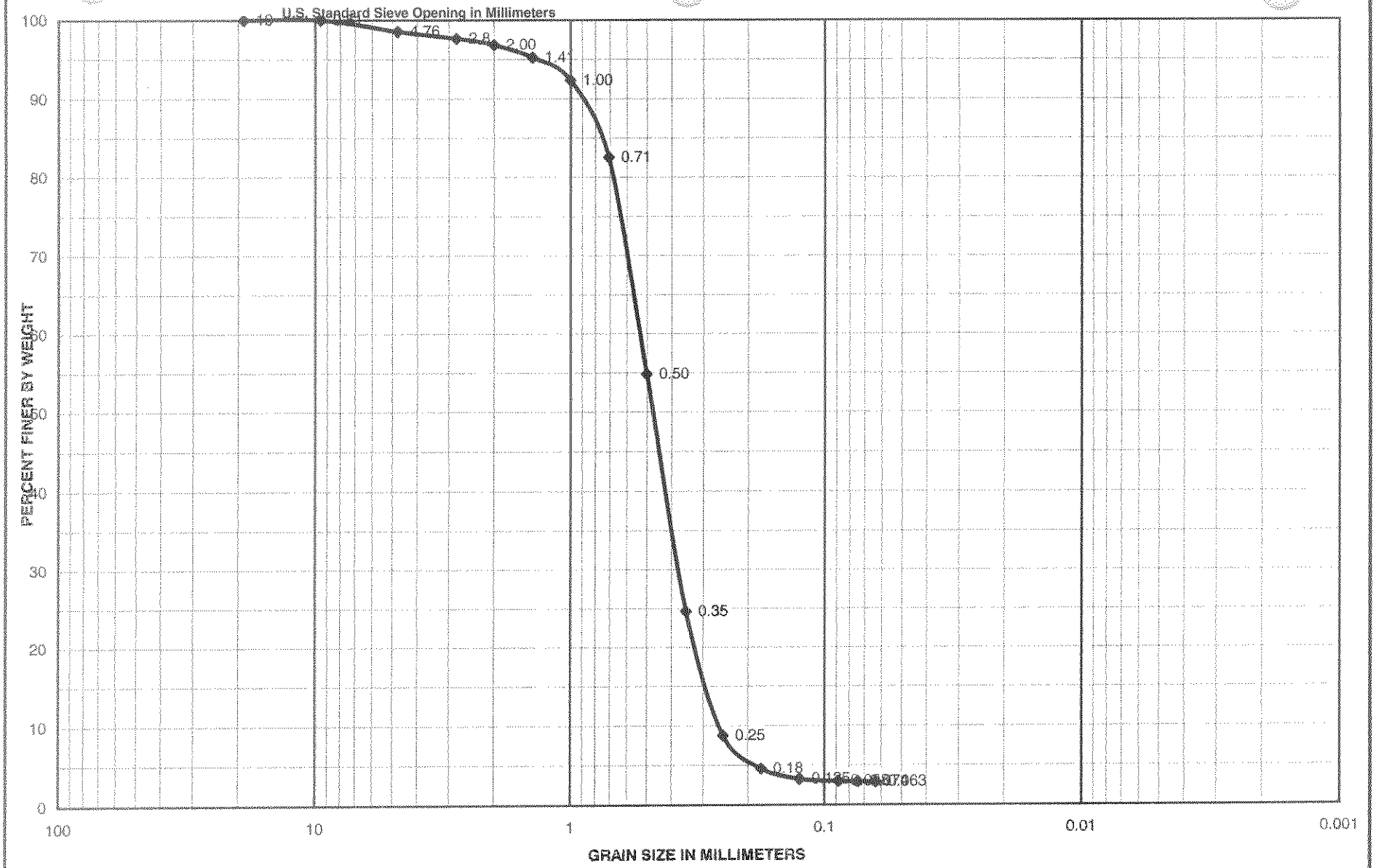
Sample No.	Depth	Classification		
5	16.5-17.0	Olive gray poorly graded sand, SP	Area	Shallotte Inlet
			CATLIN Geotechnical Laboratory	
			Boring No.	SHI-V-09-4
			Date	4/29/2009



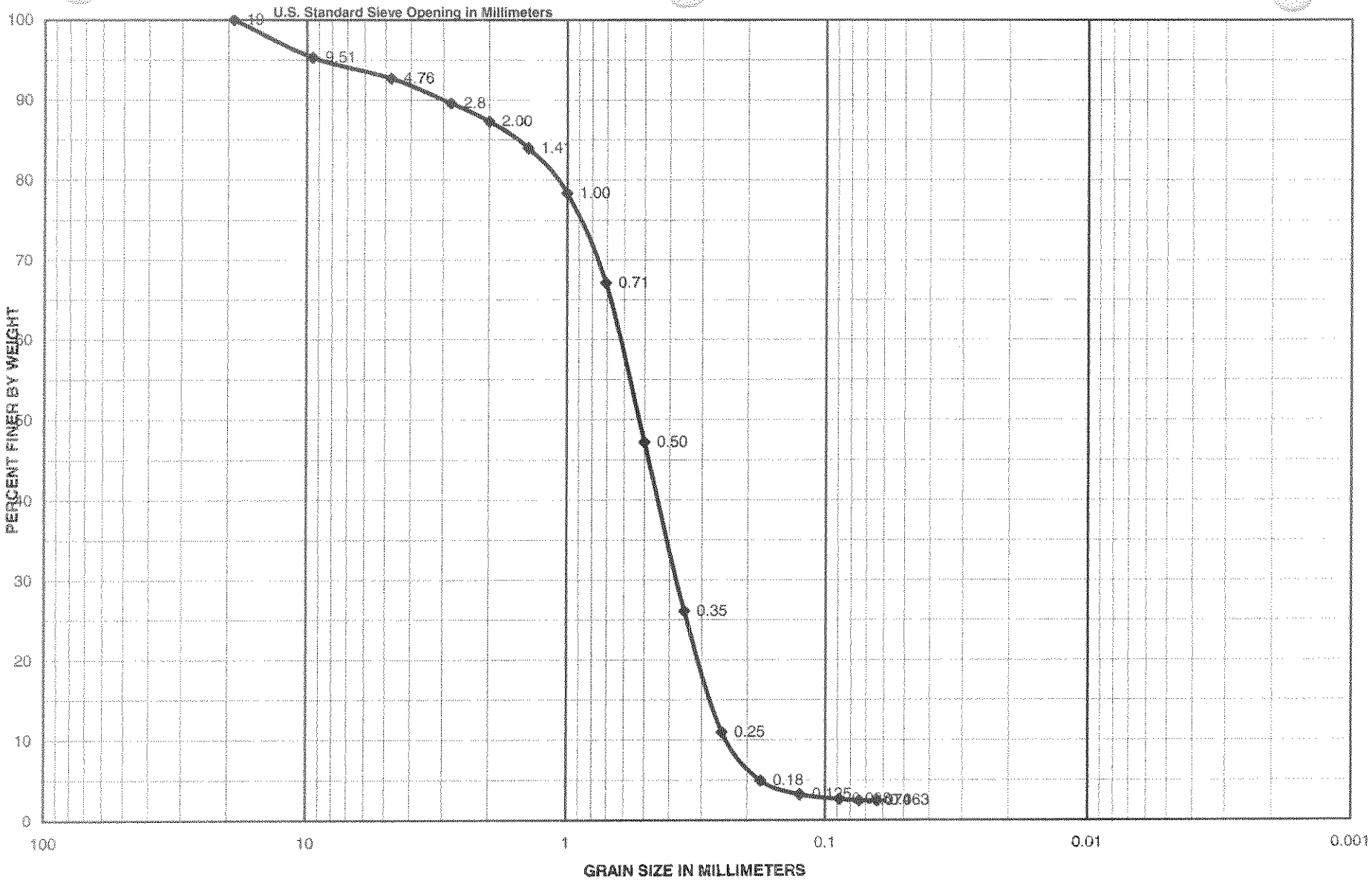
Sample No.	Depth	Classification		
1	3.7-4.2	Olive gray poorly graded sand with little shells, SP	Area	Shallotte Inlet
			CATLIN Geotechnical Laboratory	
		17.6% shells	Boring No.	SHI-V-09-5
			Date	4/29/2009



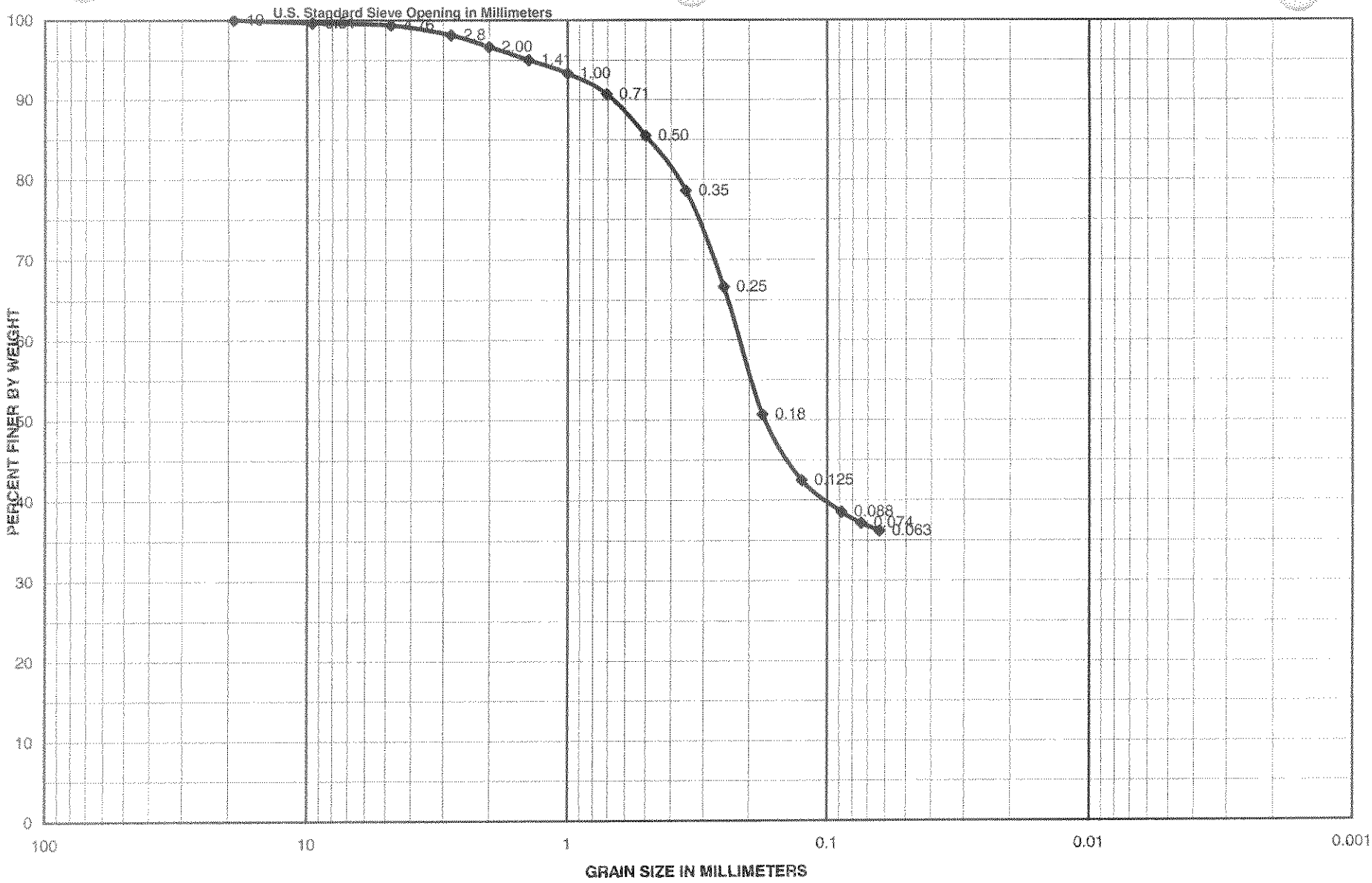
Sample No.	Depth	Classification		
2	7.0-7.5	Olive gray poorly graded sand with trace shells, SP	Area	Shallotte Inlet
			CATLIN Geotechnical Laboratory	
		1.5% shells	Boring No.	SHI-V-09-5
			Date	4/29/2009



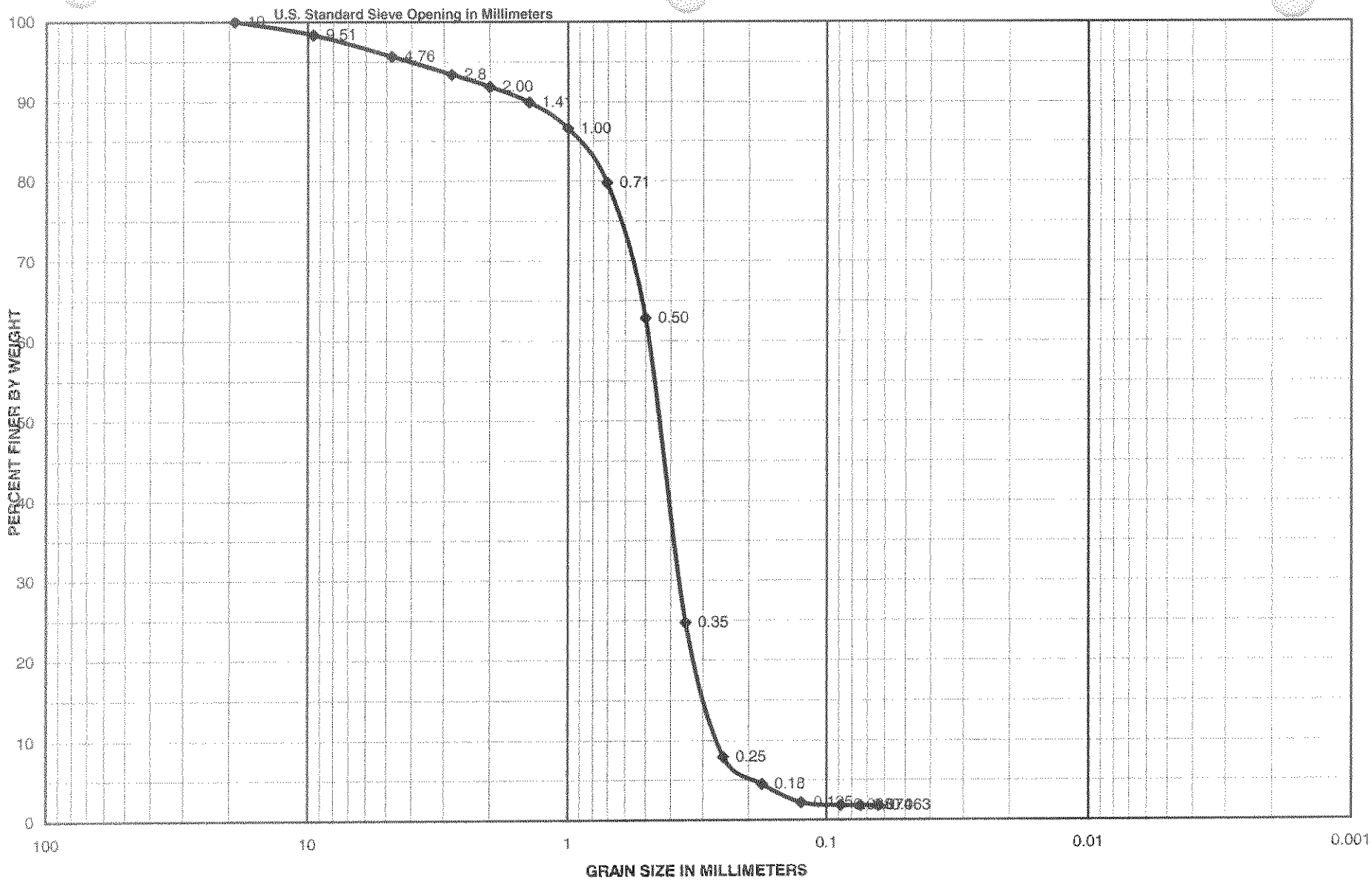
Sample No.	Depth	Classification		
3	10.0-10.5	Olive gray poorly graded sand with few shells, SP	Area	Shallotte Inlet
		7.7% shells	CATLIN Geotechnical Laboratory	
			Boring No.	SHI-V-09-5
			Date	4/29/2009



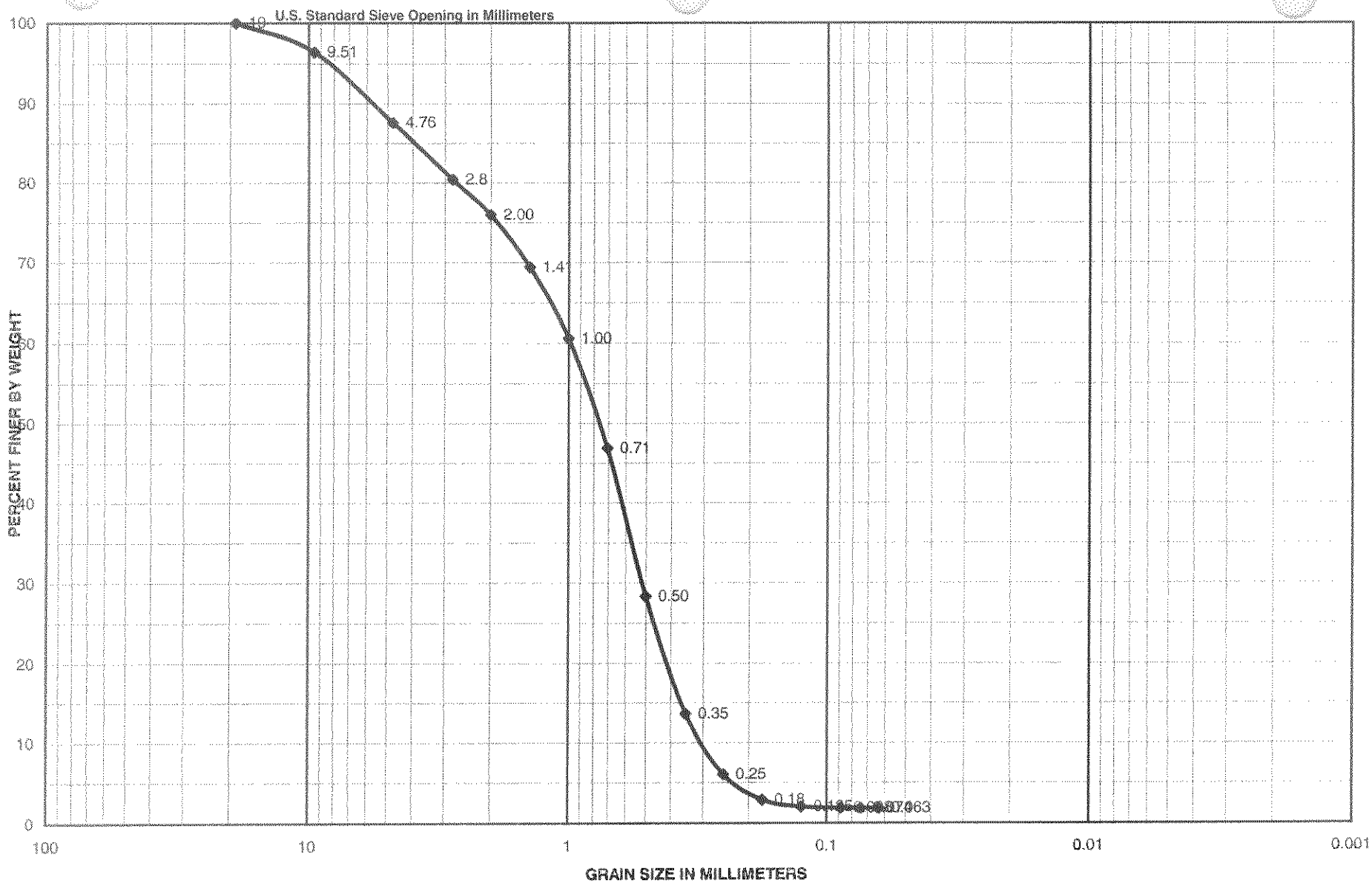
Sample No.	Depth	Classification		
4	13.0-13.5	Olive gray poorly graded sand with little shells, SP	Area	Shallotte Inlet
			CATLIN Geotechnical Laboratory	
		21.6% shells	Boring No.	SHI-V-09-5
			Date	4/29/2009



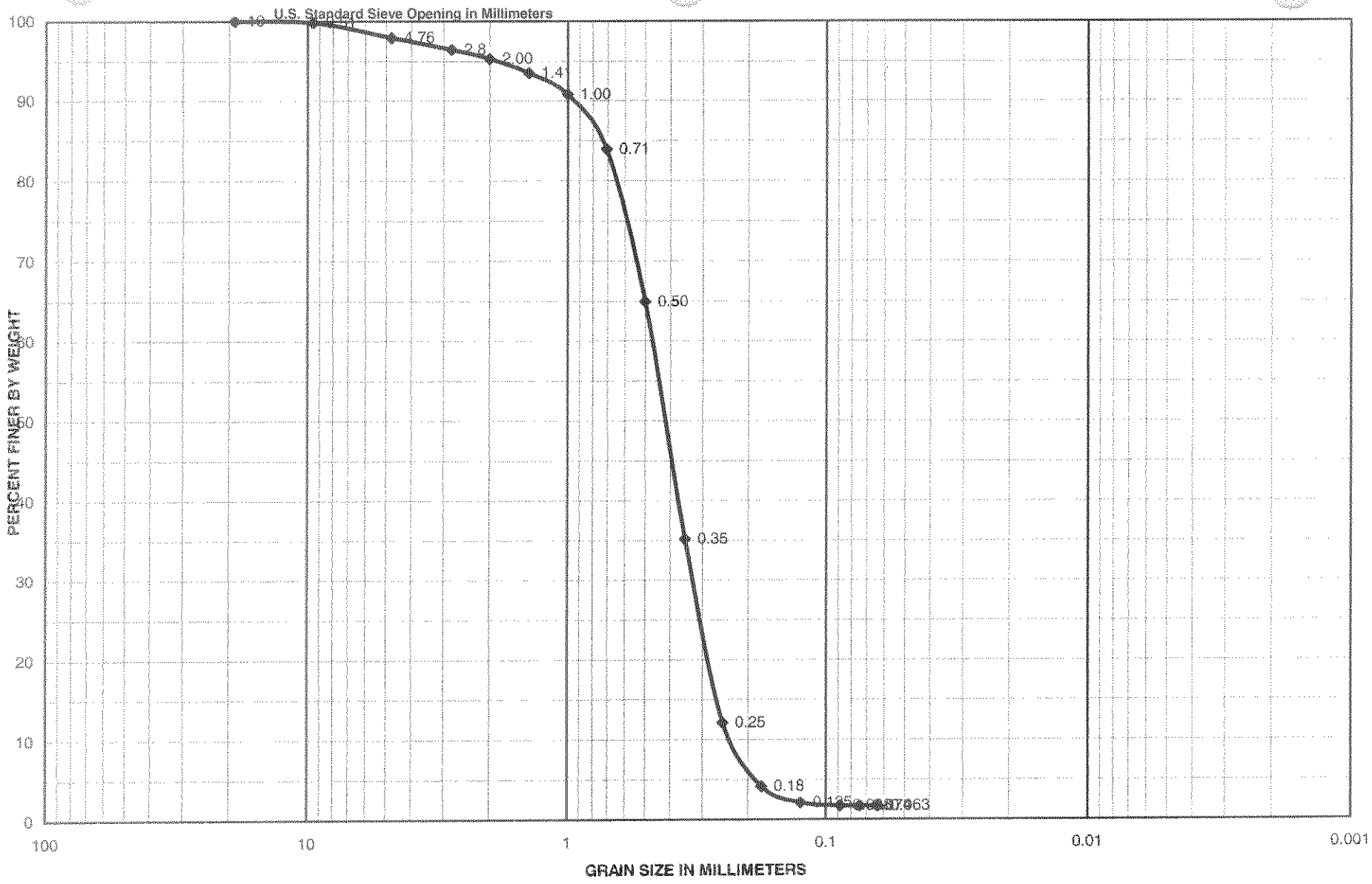
Sample No.	Depth	Classification		
5	16.2-16.7	Olive gray silty sand with trace shells and fine gravel, SM	Area	Shallotte Inlet
		1.9% shells	CATLIN Geotechnical Laboratory	
			Boring No.	SHI-V-09-5
			Date	4/29/2009



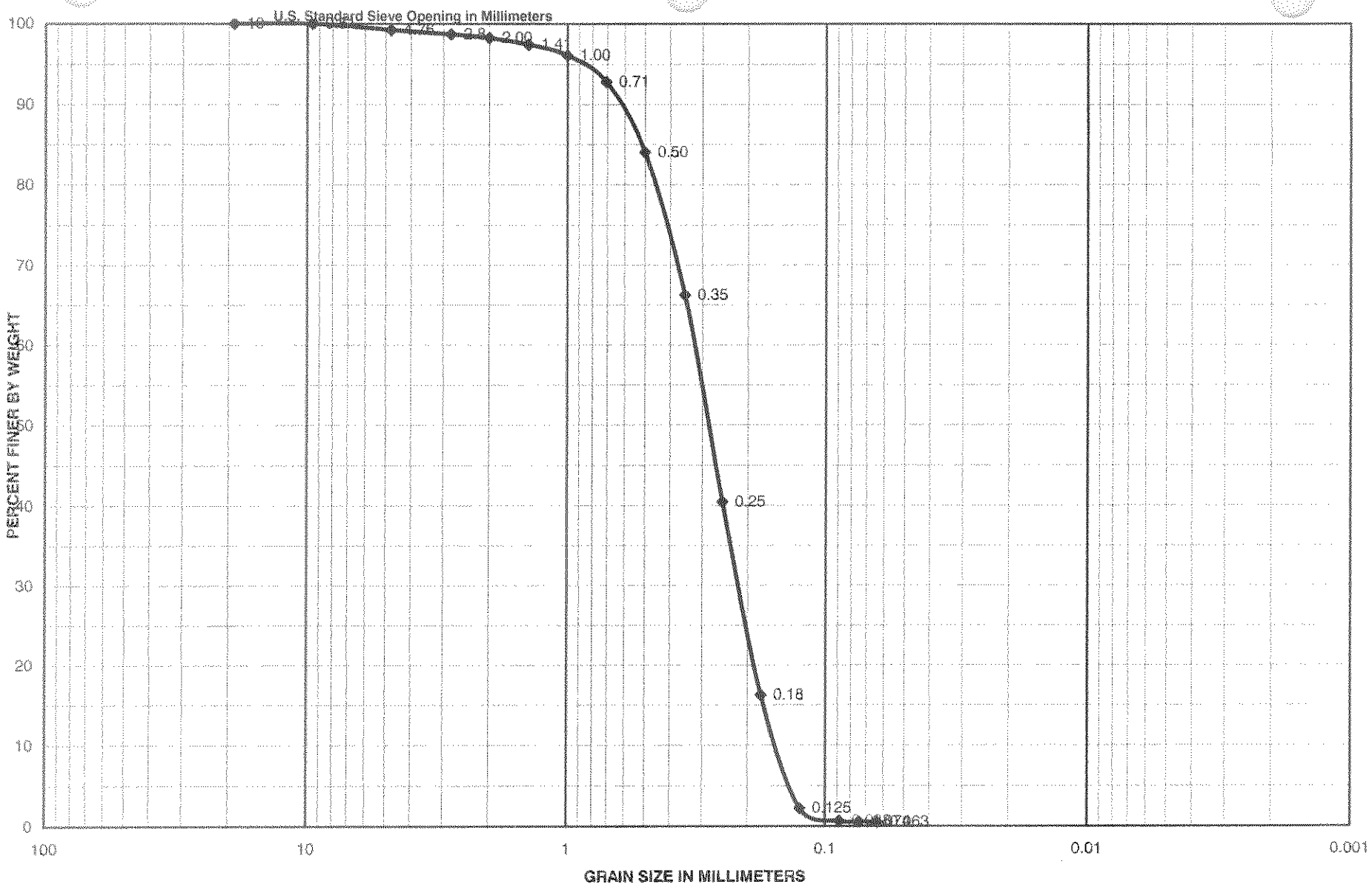
Sample No.	Depth	Classification		
1	6.1-6.6	Olive gray poorly graded sand with little shells, SP	Area	Shallotte Inlet
			CATLIN Geotechnical Laboratory	
		20.2% shells	Boring No.	SHI-V-09-6
			Date	4/29/2009



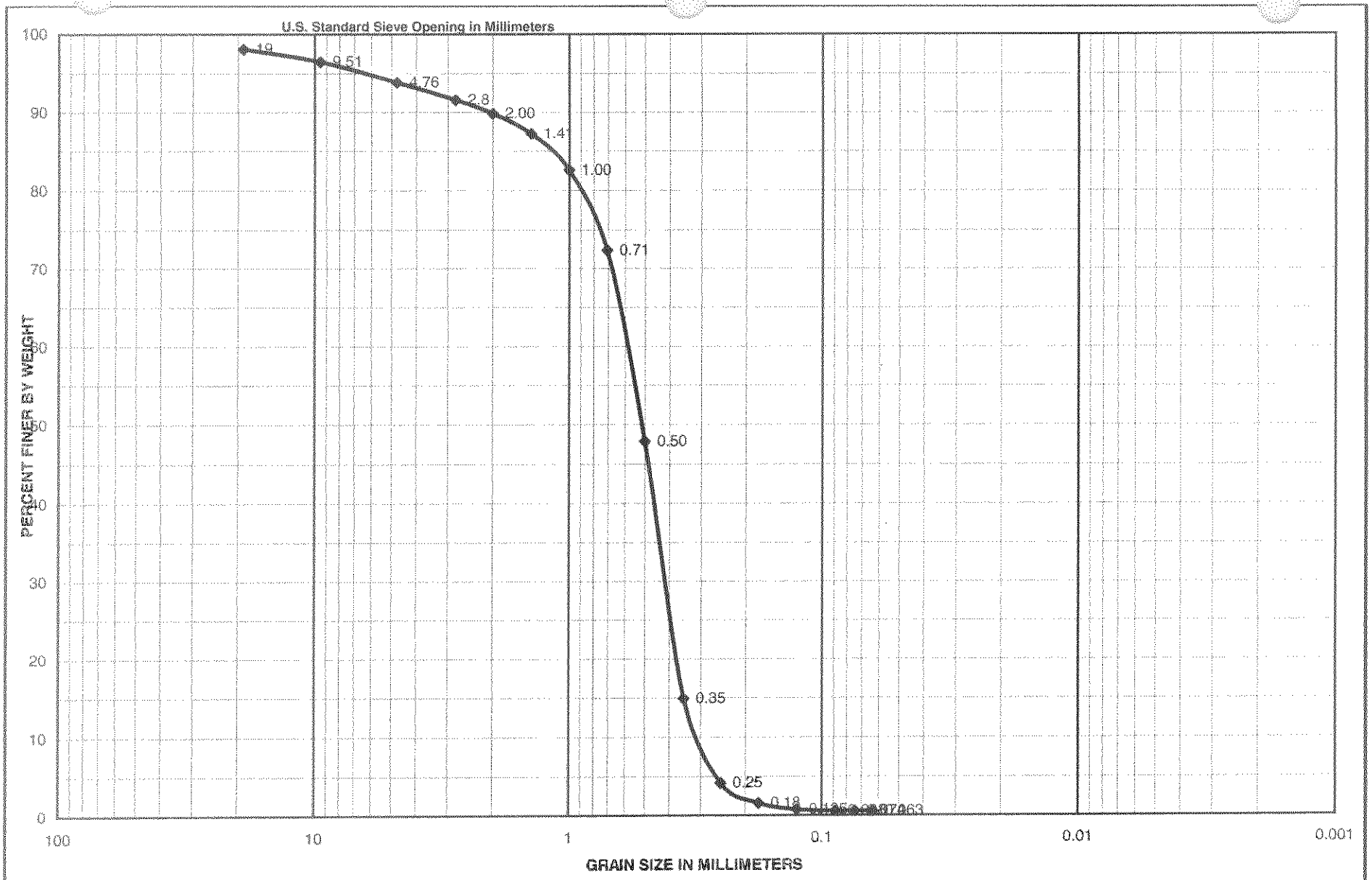
Sample No.	Depth	Classification		
2	9.0-9.5	Olive gray poorly graded sand with some shells, SP	Area	Shallotte Inlet
			CATLIN Geotechnical Laboratory	
		30.6% shells	Boring No.	SHI-V-09-6
			Date	4/29/2009



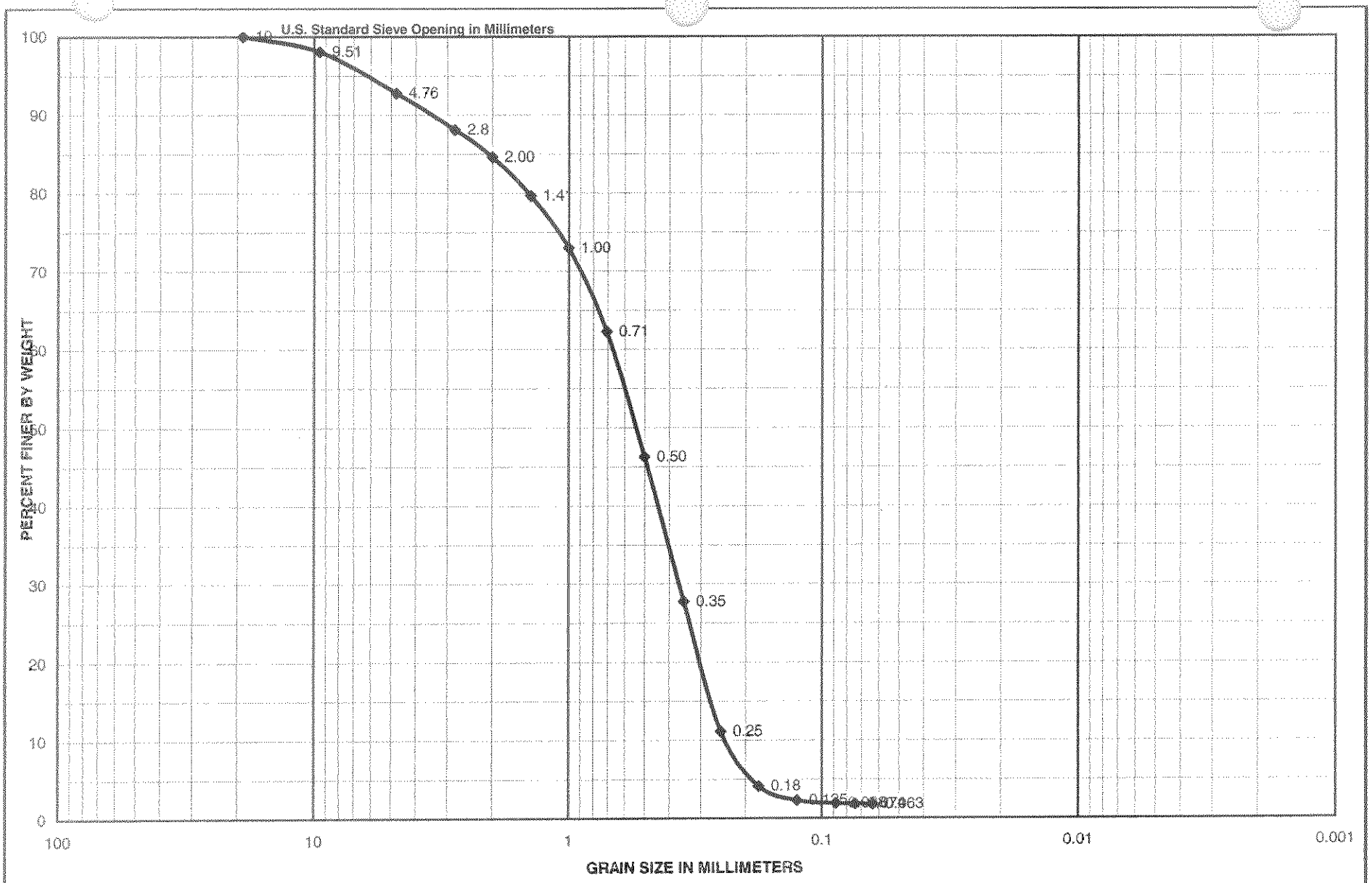
Sample No.	Depth	Classification		
3	12.0-12.5	Olive gray poorly graded sand with little shells, SP	Area	Shallotte Inlet
			CATLIN Geotechnical Laboratory	
		16.1% shells	Boring No.	SHI-V-09-6
			Date	4/29/2009



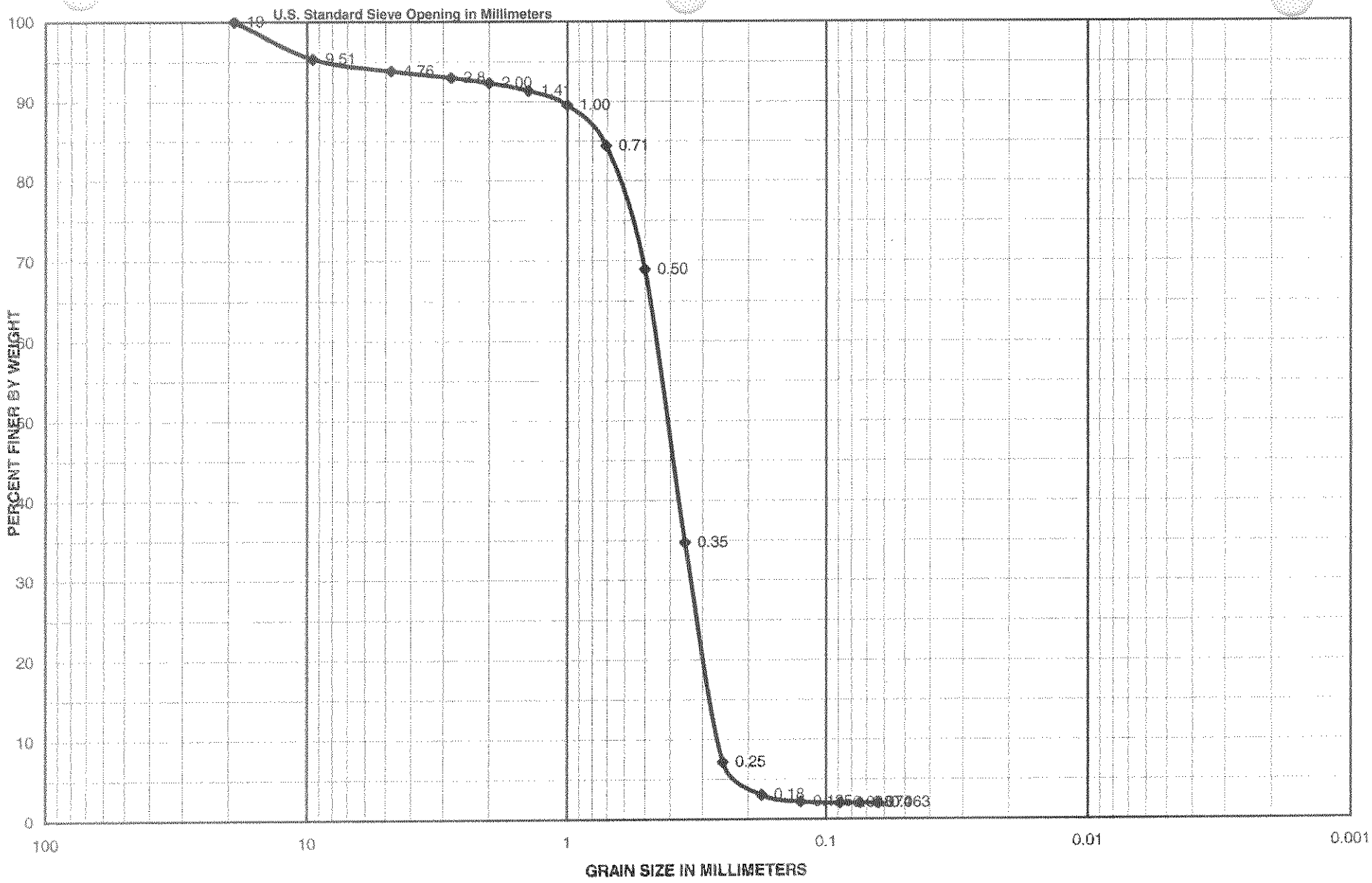
Sample No.	Depth	Classification		
4	15.0-15.5	Olive gray poorly graded sand with few shells, SP	**Area**	Shallotte Inlet
			CATLIN Geotechnical Laboratory	
		7.2% shells	**Boring No.**	SHI-V-09-6
			Date	4/29/2009



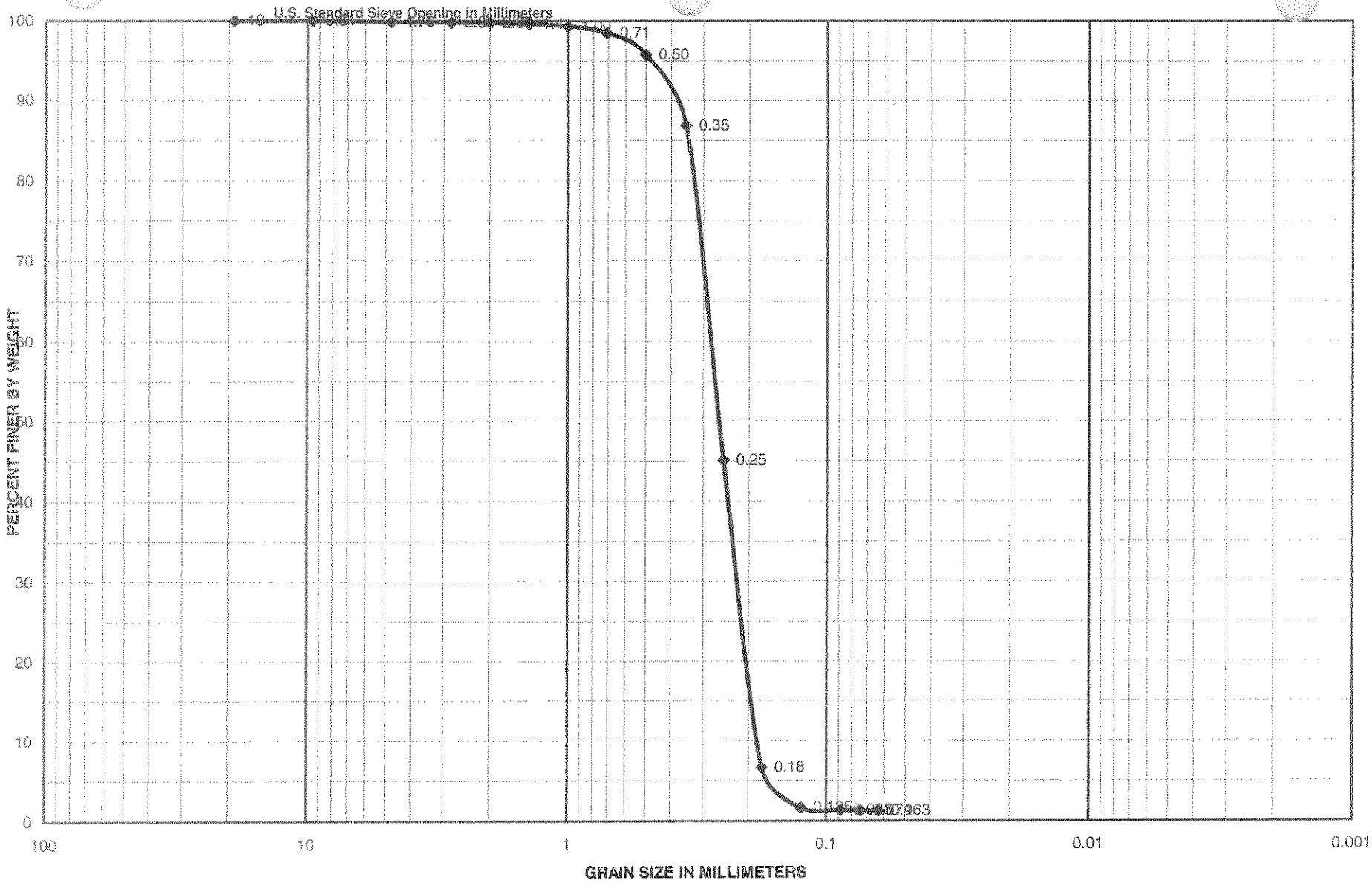
Sample No.	Depth	Classification		
1	5.3-6.8	Olive gray poorly graded sand with some shells, SP	Area	Shallotte Inlet
			CATLIN Geotechnical Laboratory	
		27.7% shells	Boring No.	SHI-V-09-7
			Date	4/29/2009



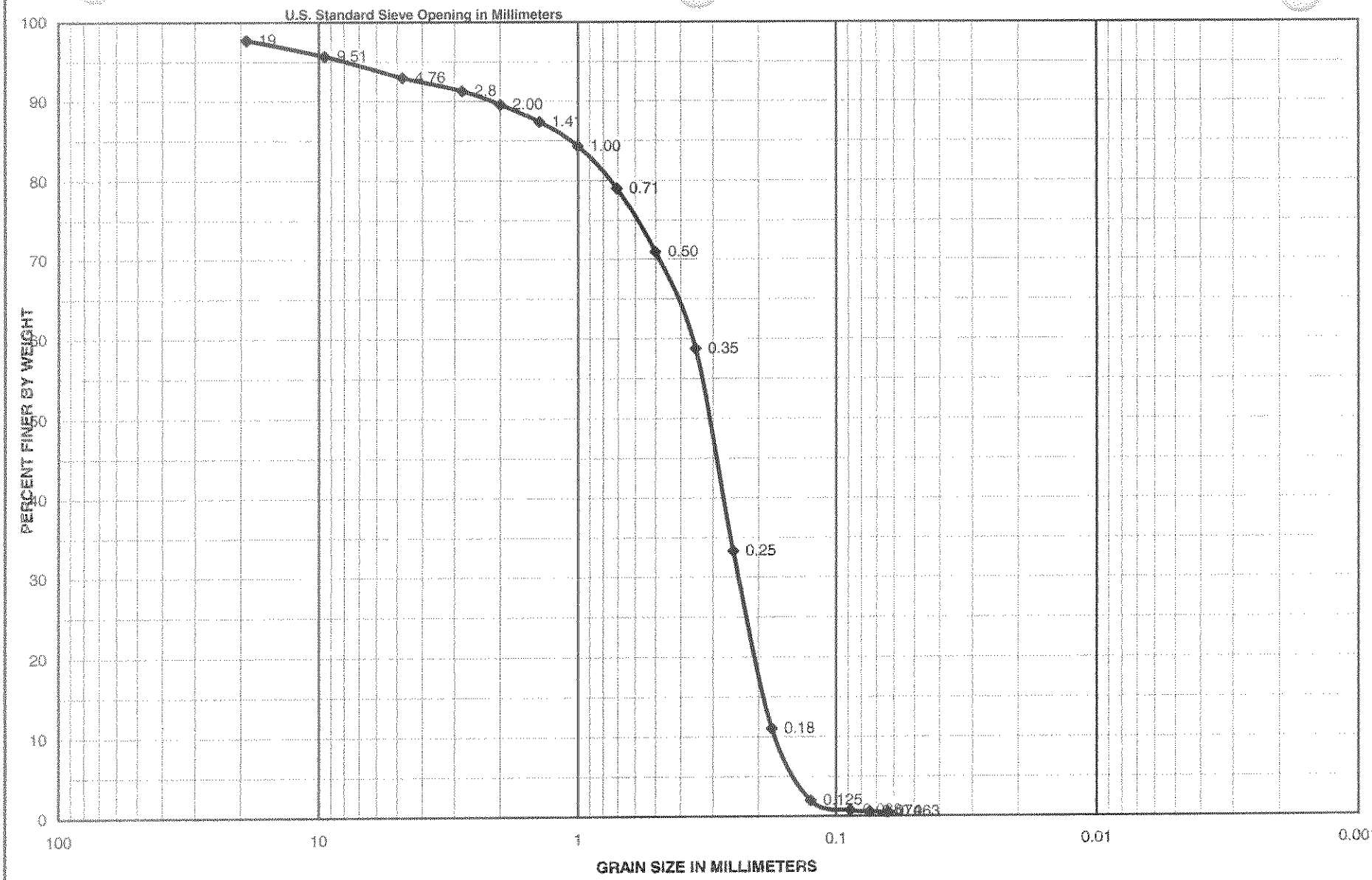
Sample No.	Depth	Classification		
2	8.0-8.5	Olive gray poorly graded sand with some shells, SP	Area	Shallotte Inlet
			CATLIN Geotechnical Laboratory	
		37.7% shells	Boring No.	SHI-V-09-7
			Date	4/29/2009



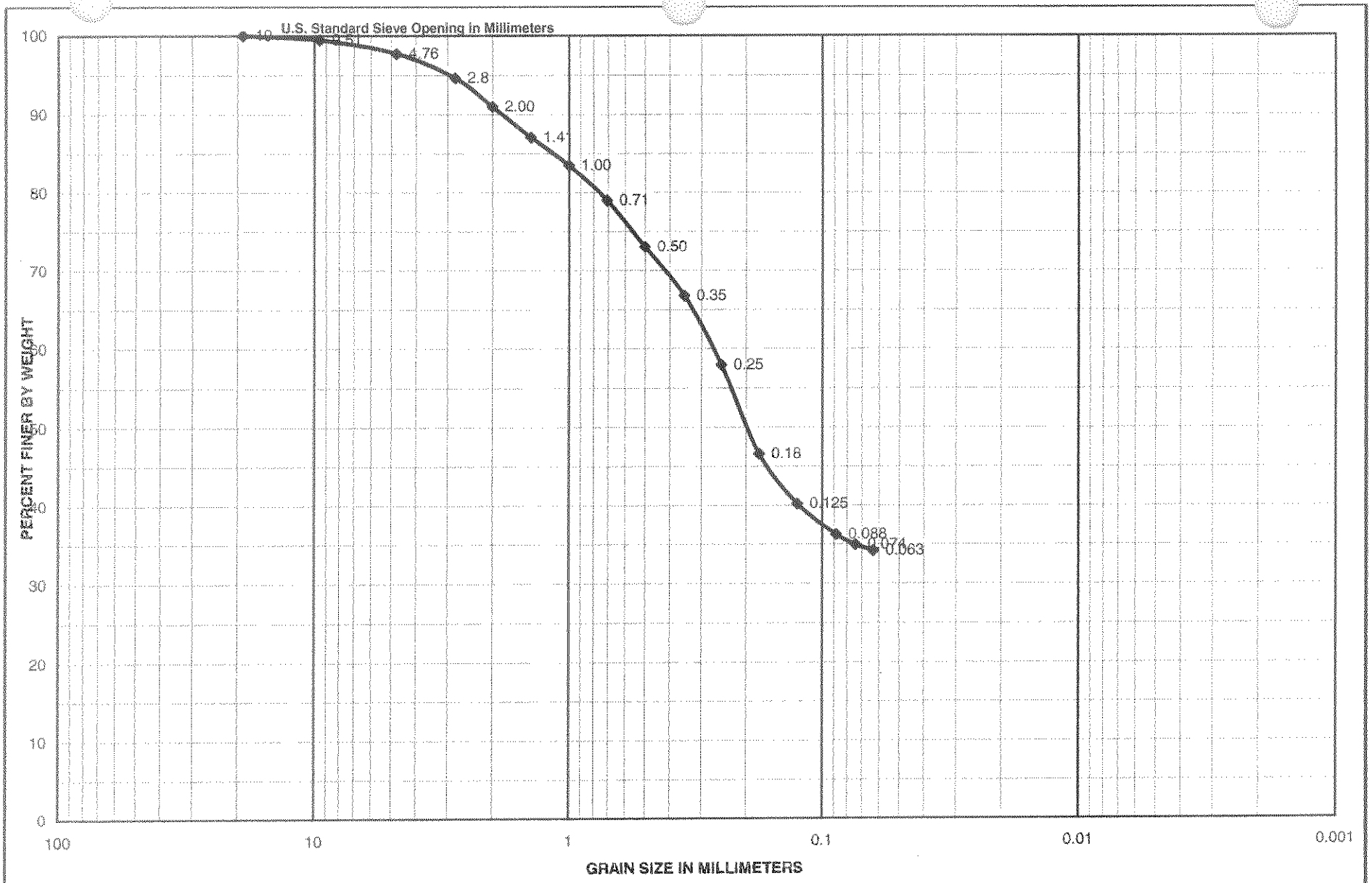
Sample No.	Depth	Classification		
3	11.0-11.5	Olive gray poorly graded sand with few shells, SP	Area	Shallotte Inlet
			CATLIN Geotechnical Laboratory	
		10.4% shells	Boring No.	SHI-V-09-7
			Date	4/30/2009



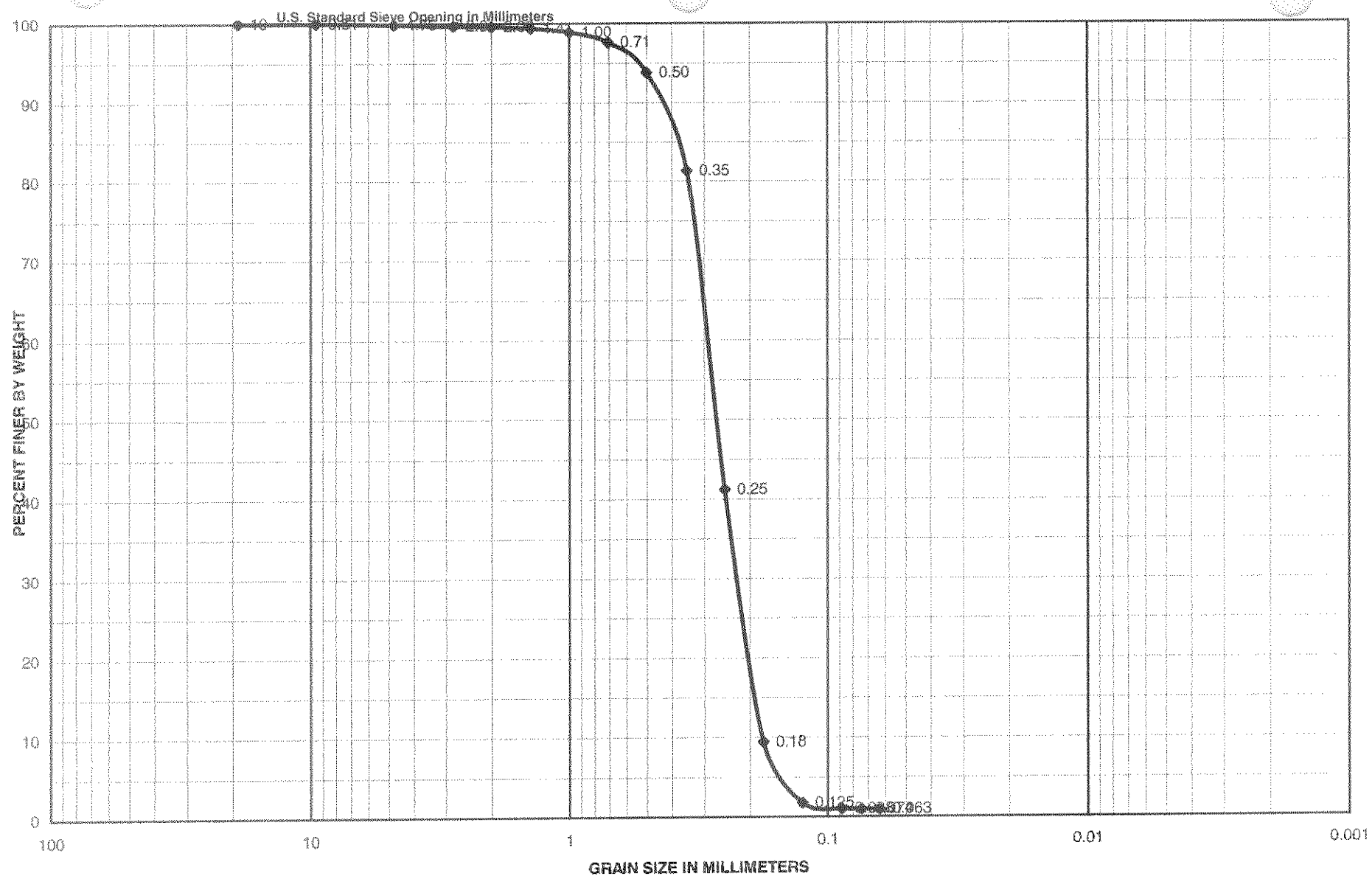
Sample No.	Depth	Classification		
4	13.0-13.5	Olive gray poorly graded sand with trace shells, SP	Area	Shallotte Inlet
			CATLIN Geotechnical Laboratory	
		0.7% shells	Boring No.	SHI-V-09-7
			Date	4/30/2009



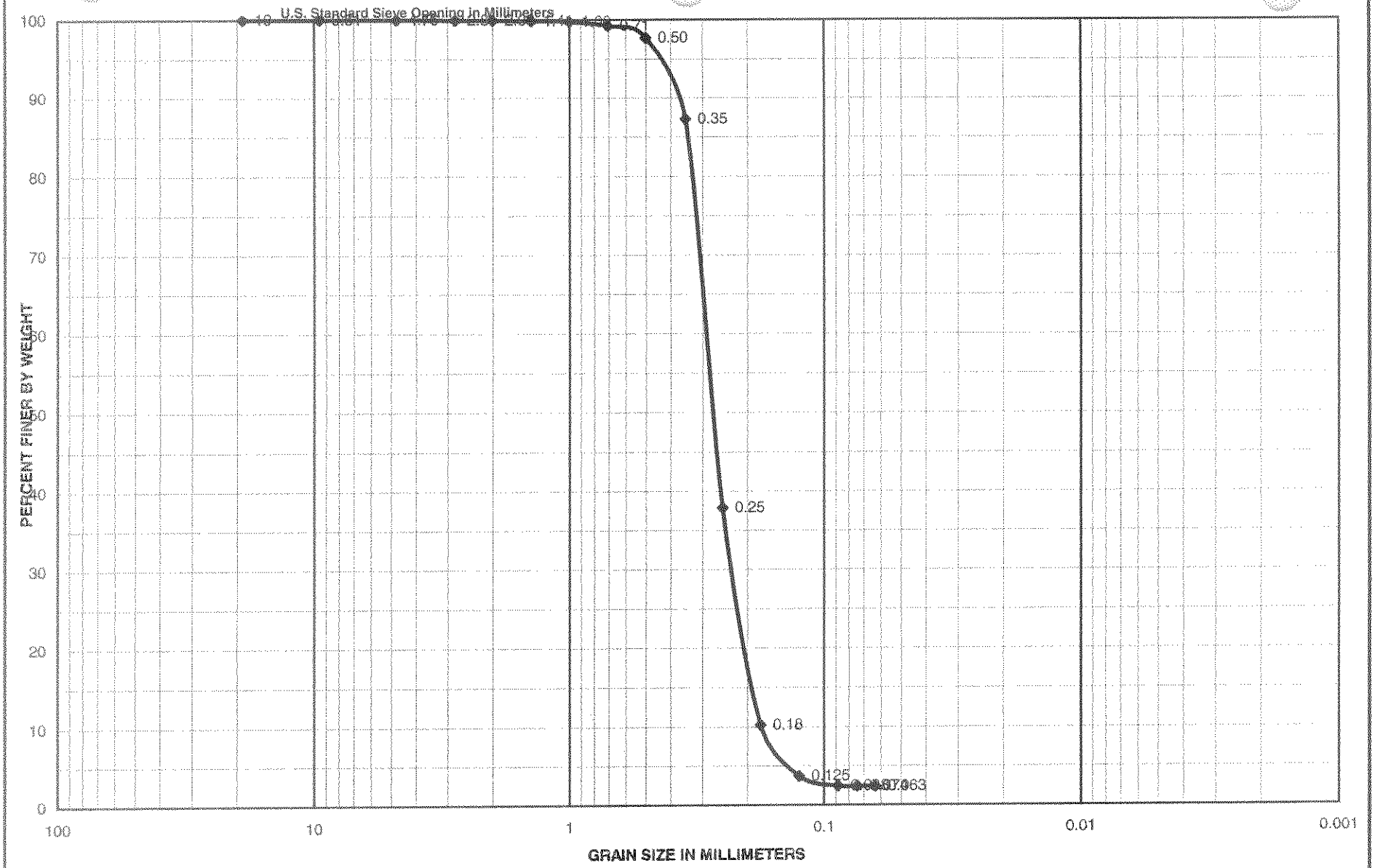
Sample No.	Depth	Classification		
5	16.0-16.5	Olive gray poorly graded sand with little shells, SP	Area	Shallotte Inlet
			CATLIN Geotechnical Laboratory	
		15.7% shells	Boring No.	SHI-V-09-7
			Date	4/30/2009



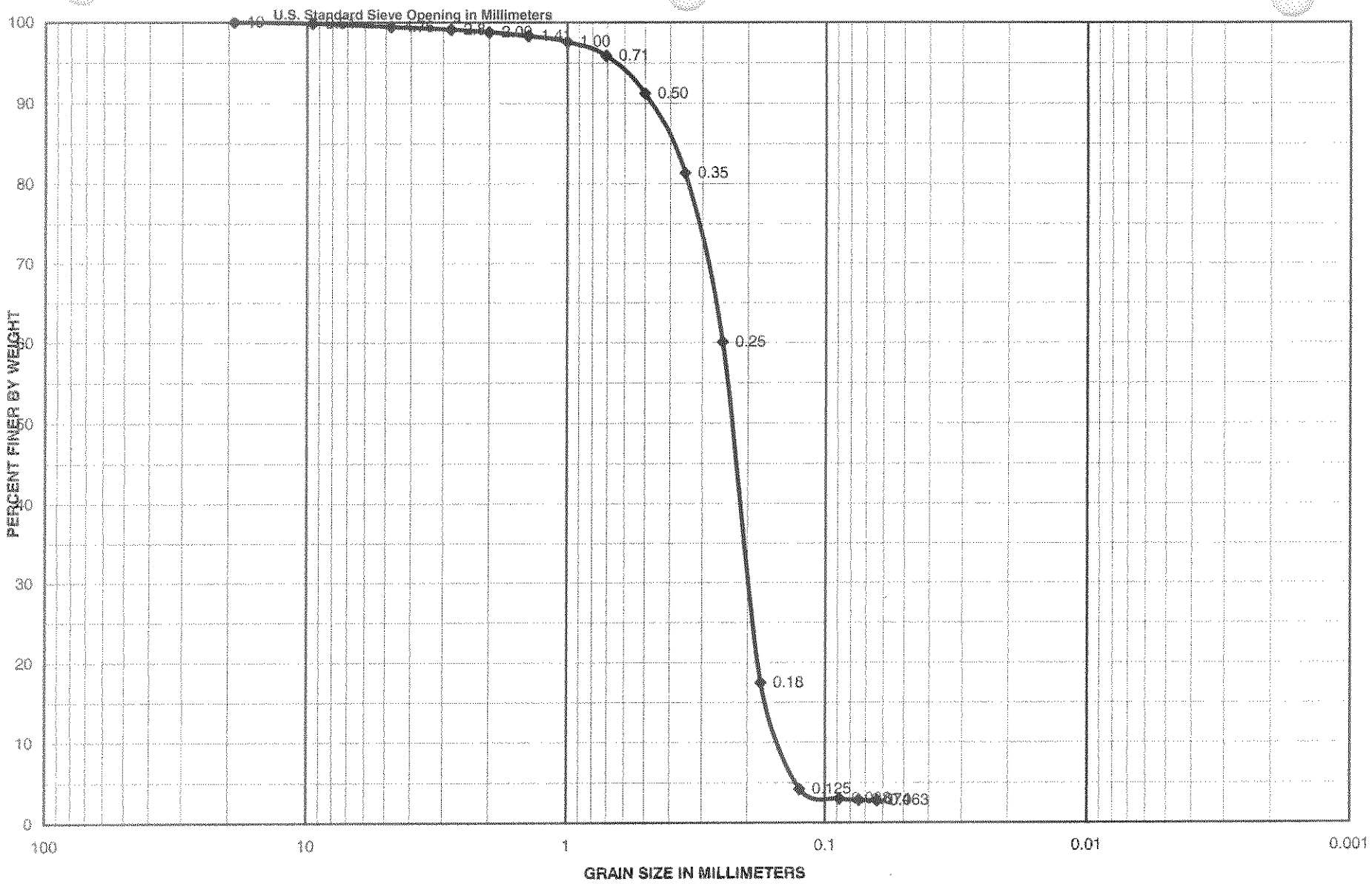
Sample No.	Depth	Classification		
6	17.3-17.8	Olive gray silty sand with trace shells and fine gravel, SM	Area	Shallotte Inlet
			CATLIN Geotechnical Laboratory	
		2.3% shells	Boring No.	SHI-V-09-7
			Date	4/30/2009



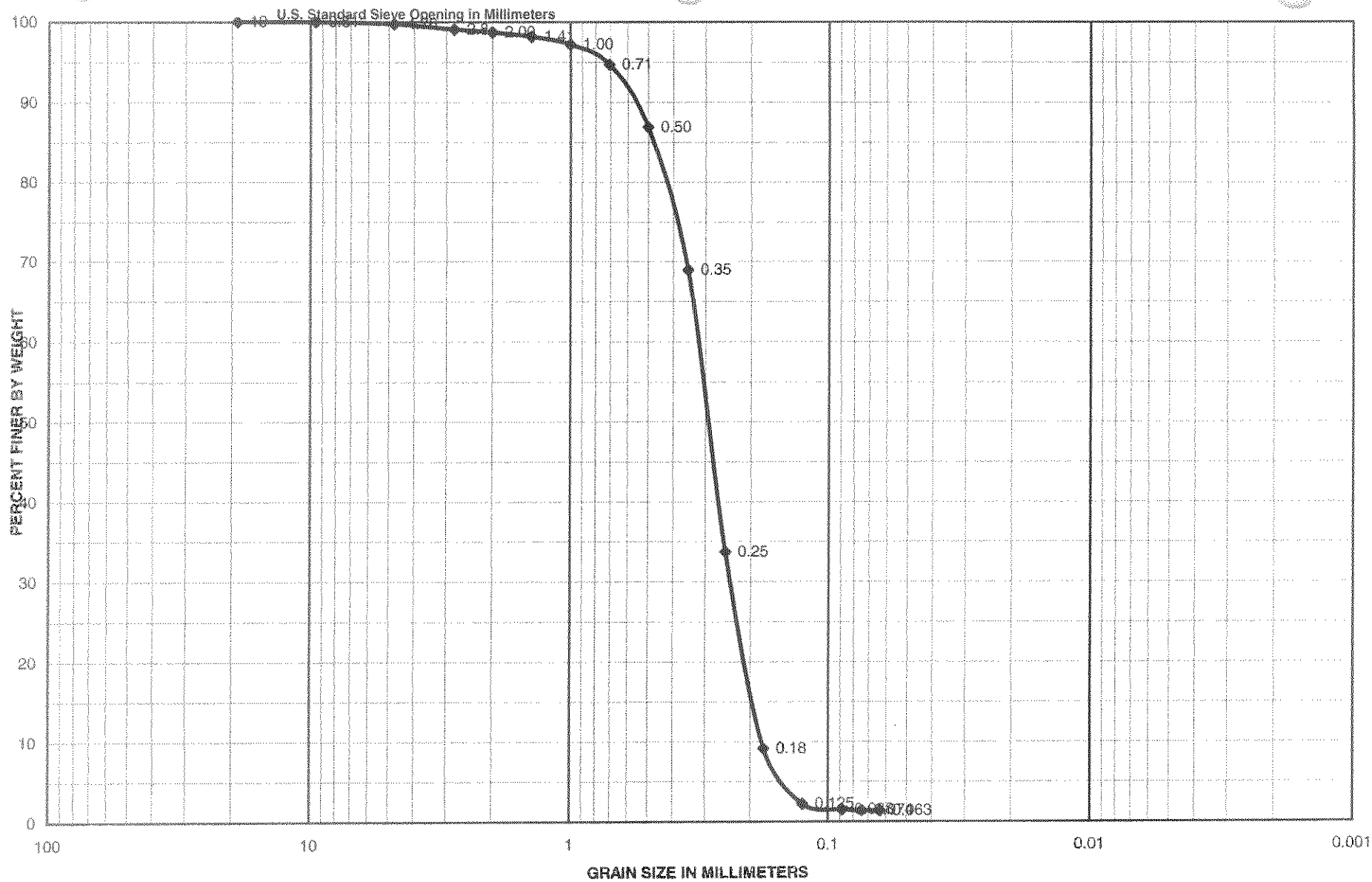
Sample No.	Depth	Classification		
1	7.1-7.6	Olive gray poorly graded sand with trace shells, SP	Area	Shallotte Inlet
			CATLIN Geotechnical Laboratory	
		1.1% shells	Boring No.	SHI-V-09-8
			Date	4/30/2009



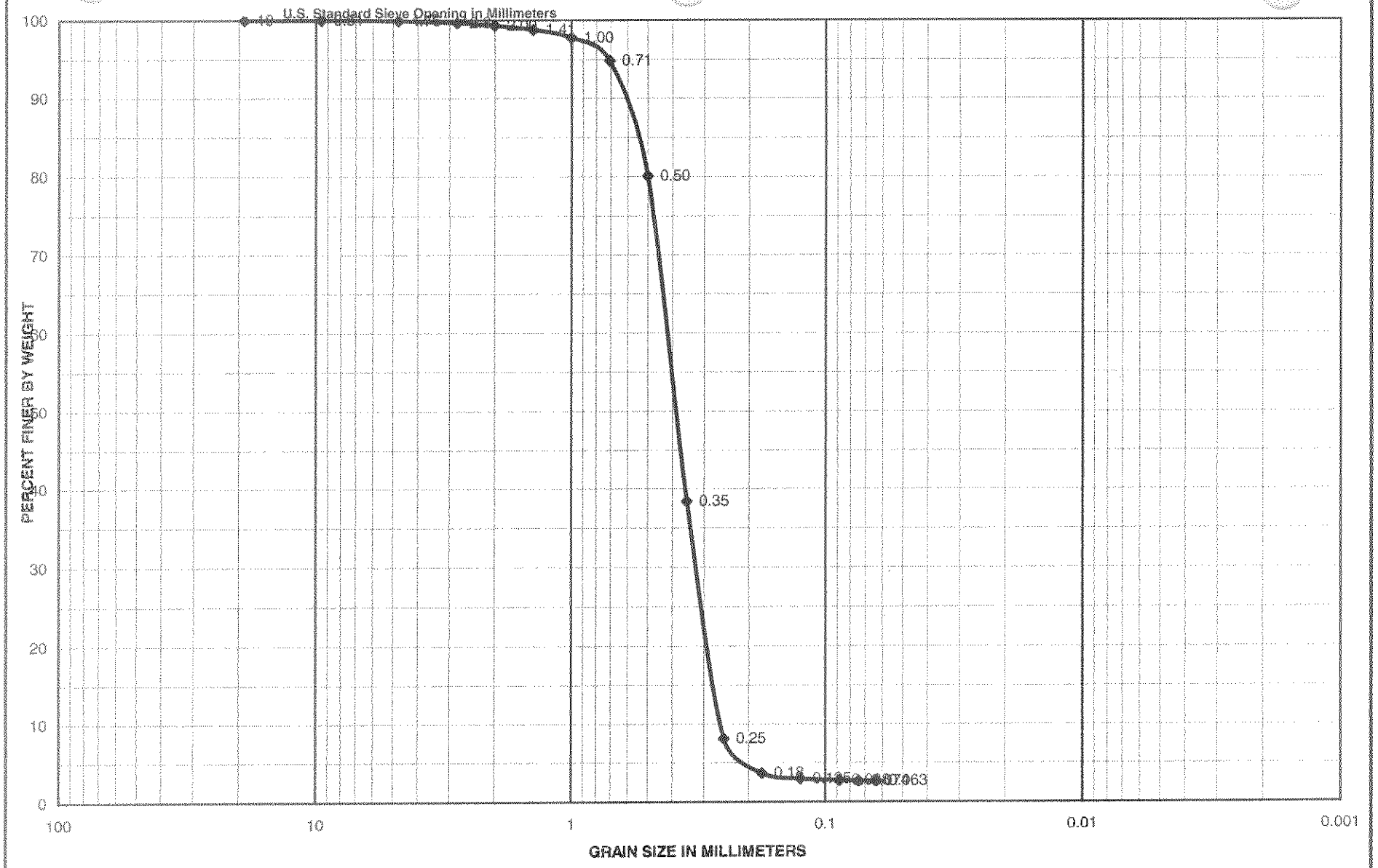
Sample No.	Depth	Classification		
2	9.5-10.0	Olive gray poorly graded sand with trace shells, SP	Area	Shallotte Inlet
			CATLIN Geotechnical Laboratory	
		0.8% shells	Boring No.	SHI-V-09-8
			Date	4/30/2009



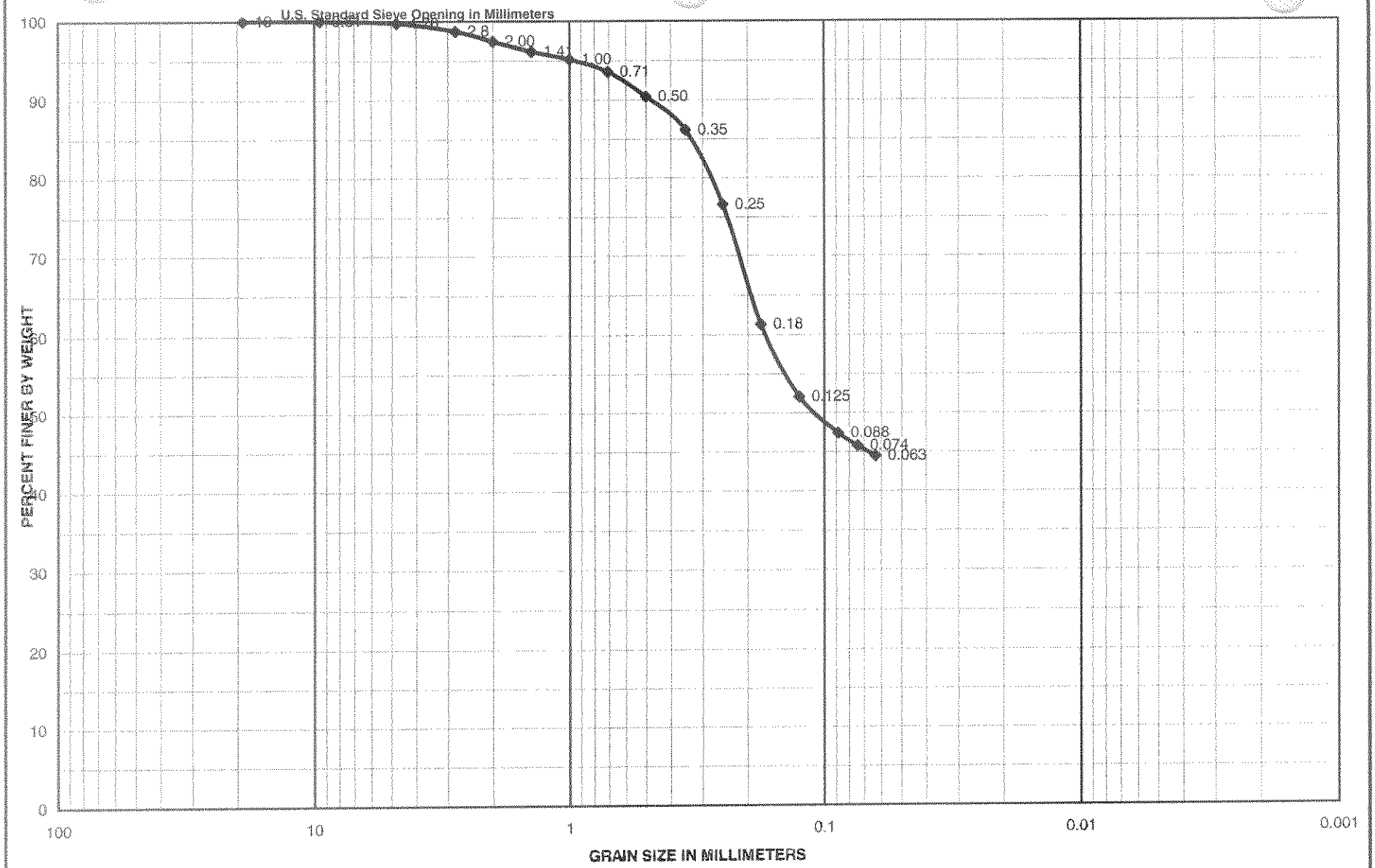
Sample No.	Depth	Classification		
3	13.0-13.5	Olive gray poorly graded sand with trace shells, SP	**Area**	Shallotte Inlet
			CATLIN Geotechnical Laboratory	
		2.4% shells	**Boring No.**	SHI-V-09-8
			Date	4/30/2009



Sample No.	Depth	Classification		
4	16.0-16.5	Light gray poorly graded sand with trace shells, SP	Area	Shallotte Inlet
			CATLIN Geotechnical Laboratory	
		2.8% shells	Boring No.	SHI-V-09-8
			Date	4/30/2009

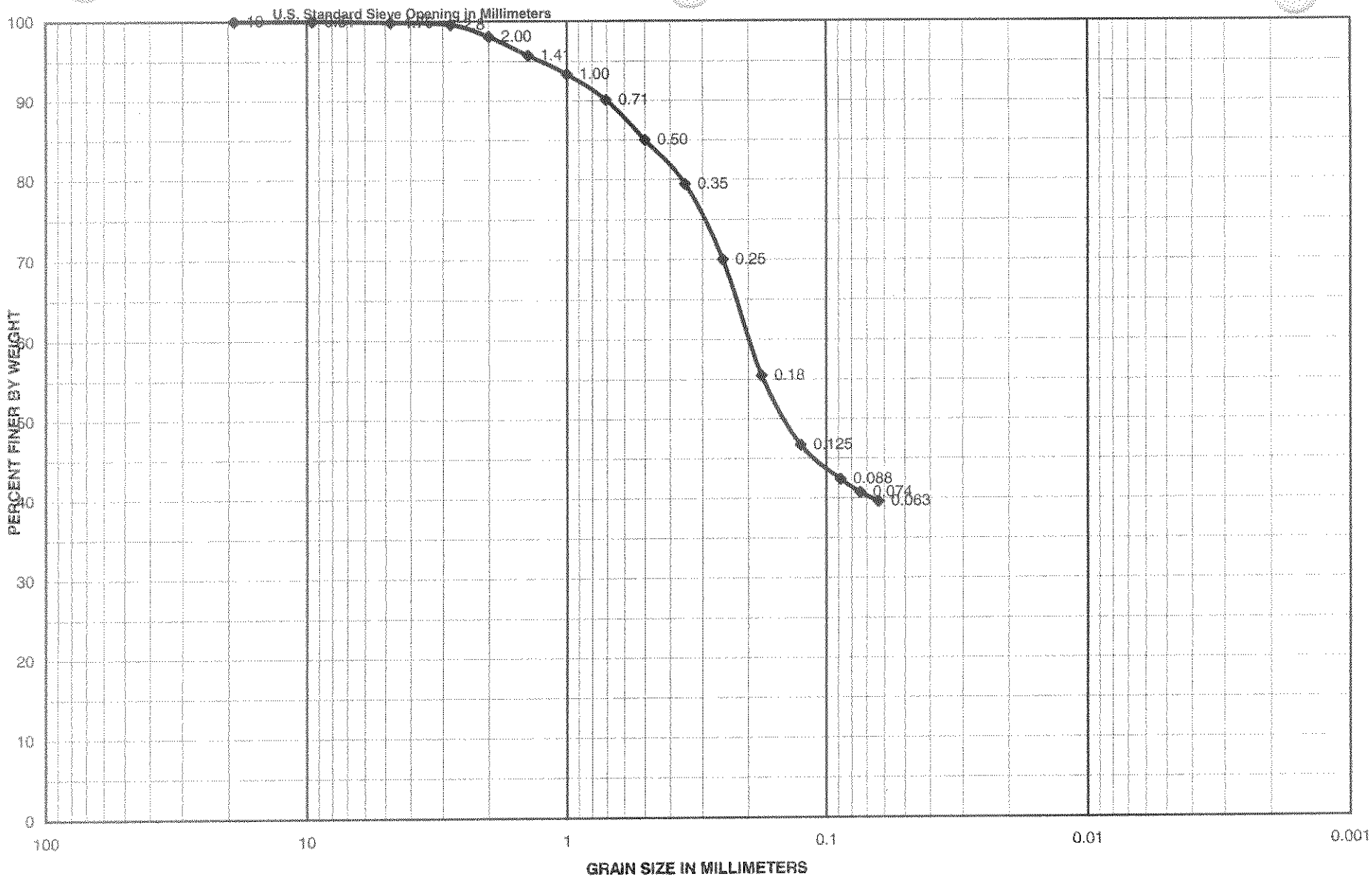


Sample No.	Depth	Classification		
5	18.0-18.5	Light brown poorly graded sand with trace shells, SP	**Area**	Shallotte Inlet
			CATLIN Geotechnical Laboratory	
		5.2% shells	**Boring No.**	SHI-V-09-8
			Date	4/30/2009

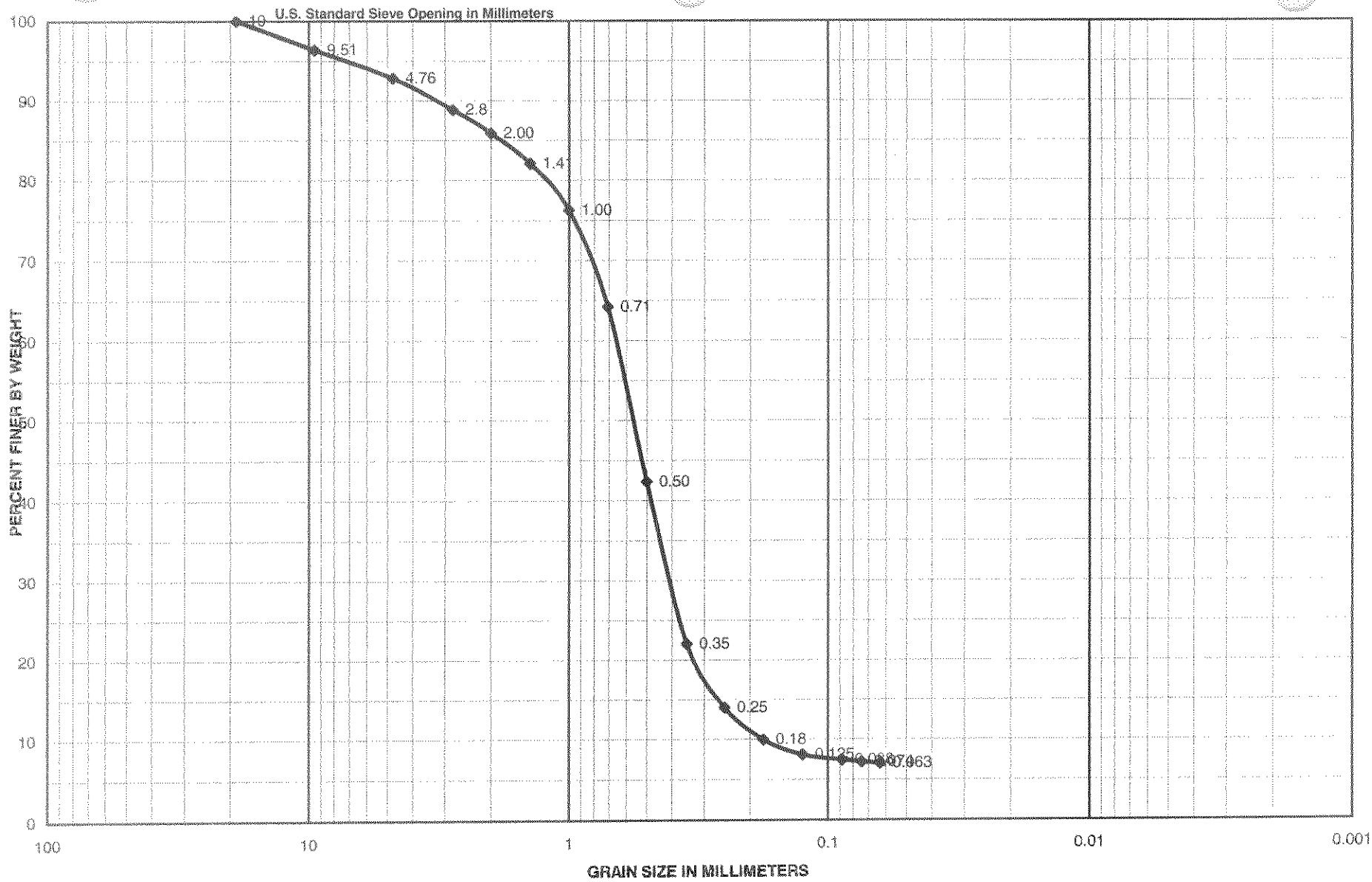


Sample No.	Depth	Classification
1	20.7-21.2	Olive gray silty sand with trace fine gravel, SM

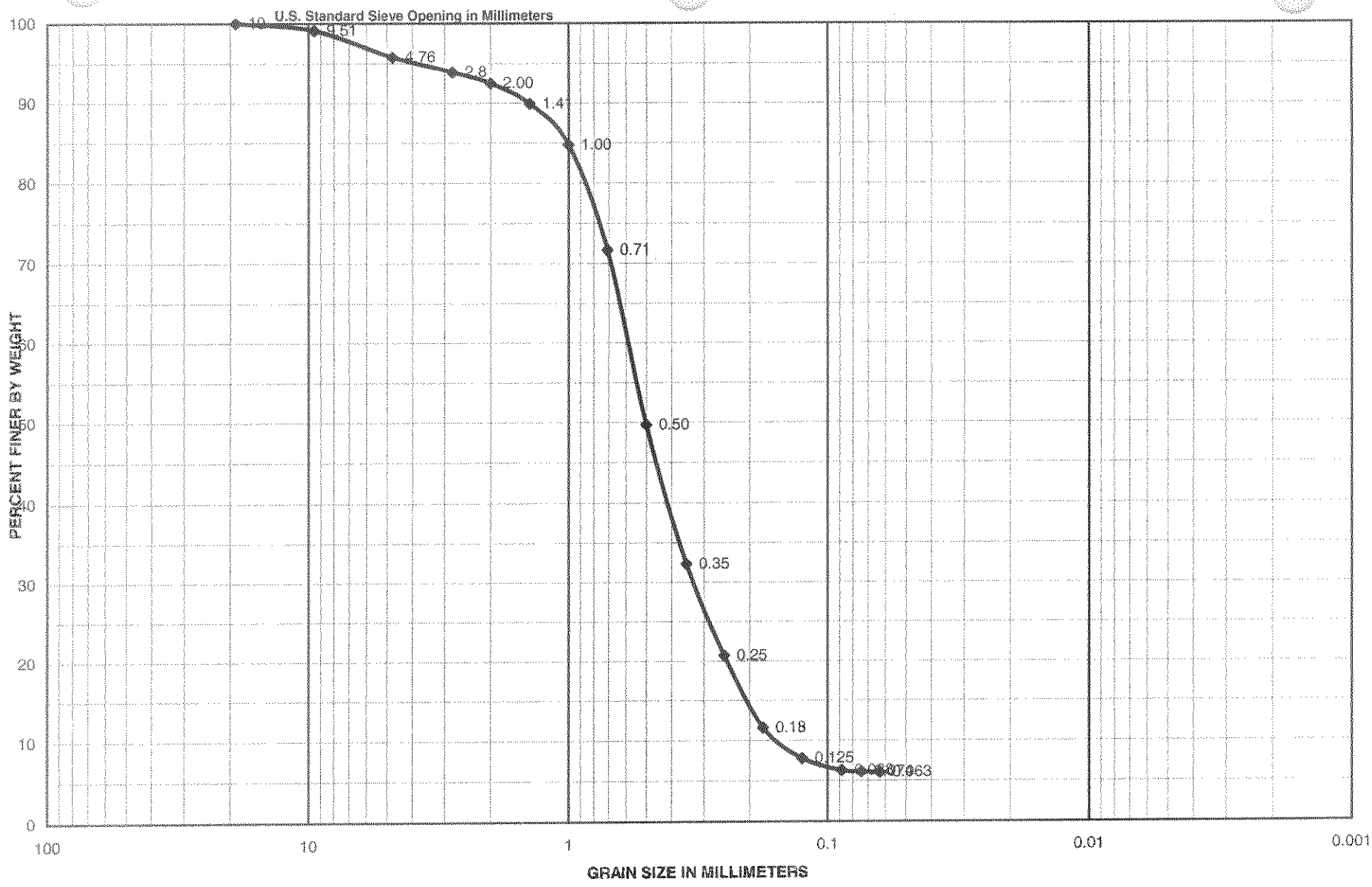
Area	Shallotte Inlet
CATLIN Geotechnical Laboratory	
Boring No.	SHI-V-09-9
Date	4/30/2009



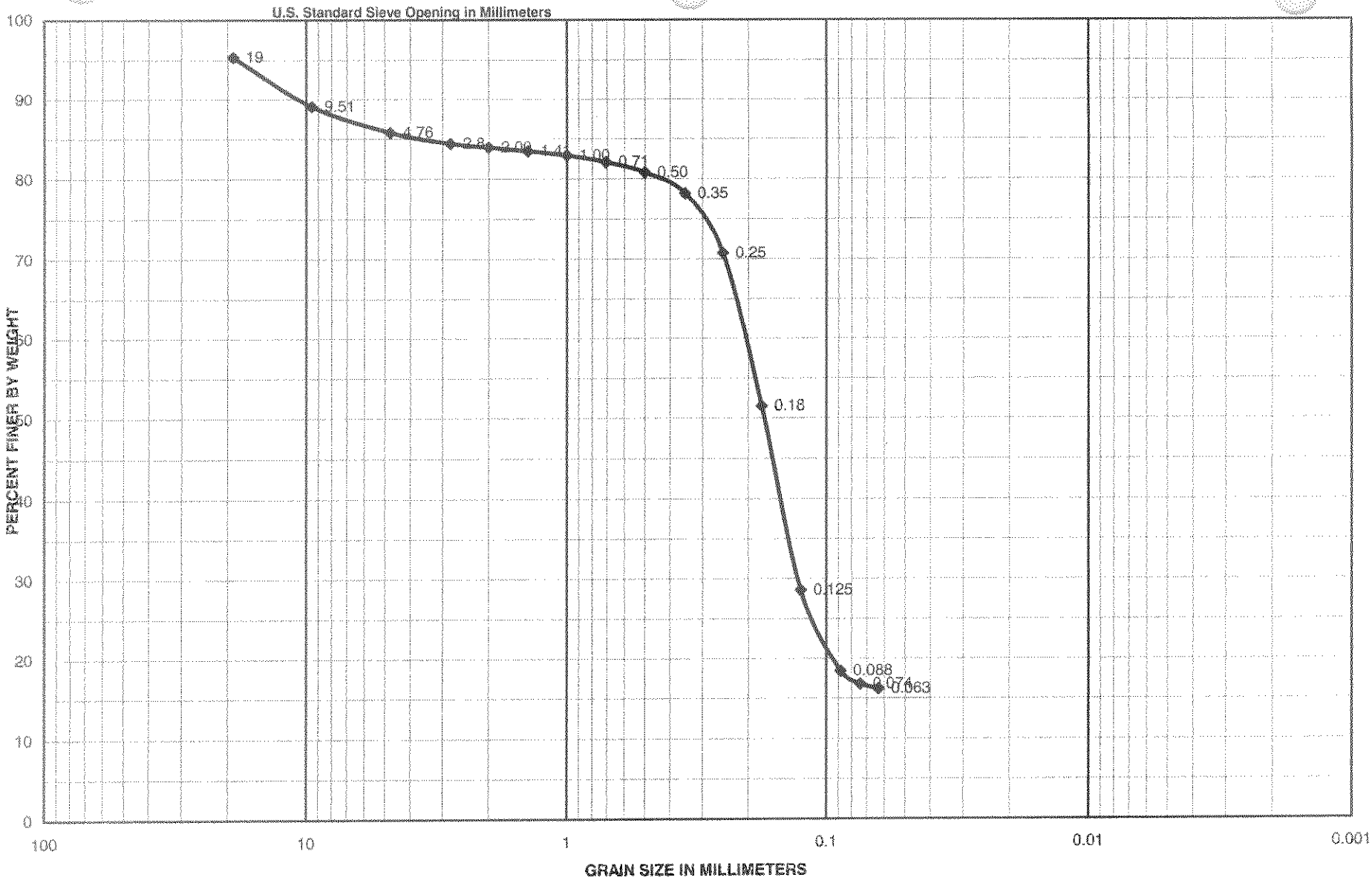
Sample No.	Depth	Classification		
1	4.9-5.4	Olive gray silty sand with trace fine gravel, SM	Area	Shallotte Inlet
			CATLIN Geotechnical Laboratory	
			Boring No.	SHI-V-09-10
			Date	4/30/2009



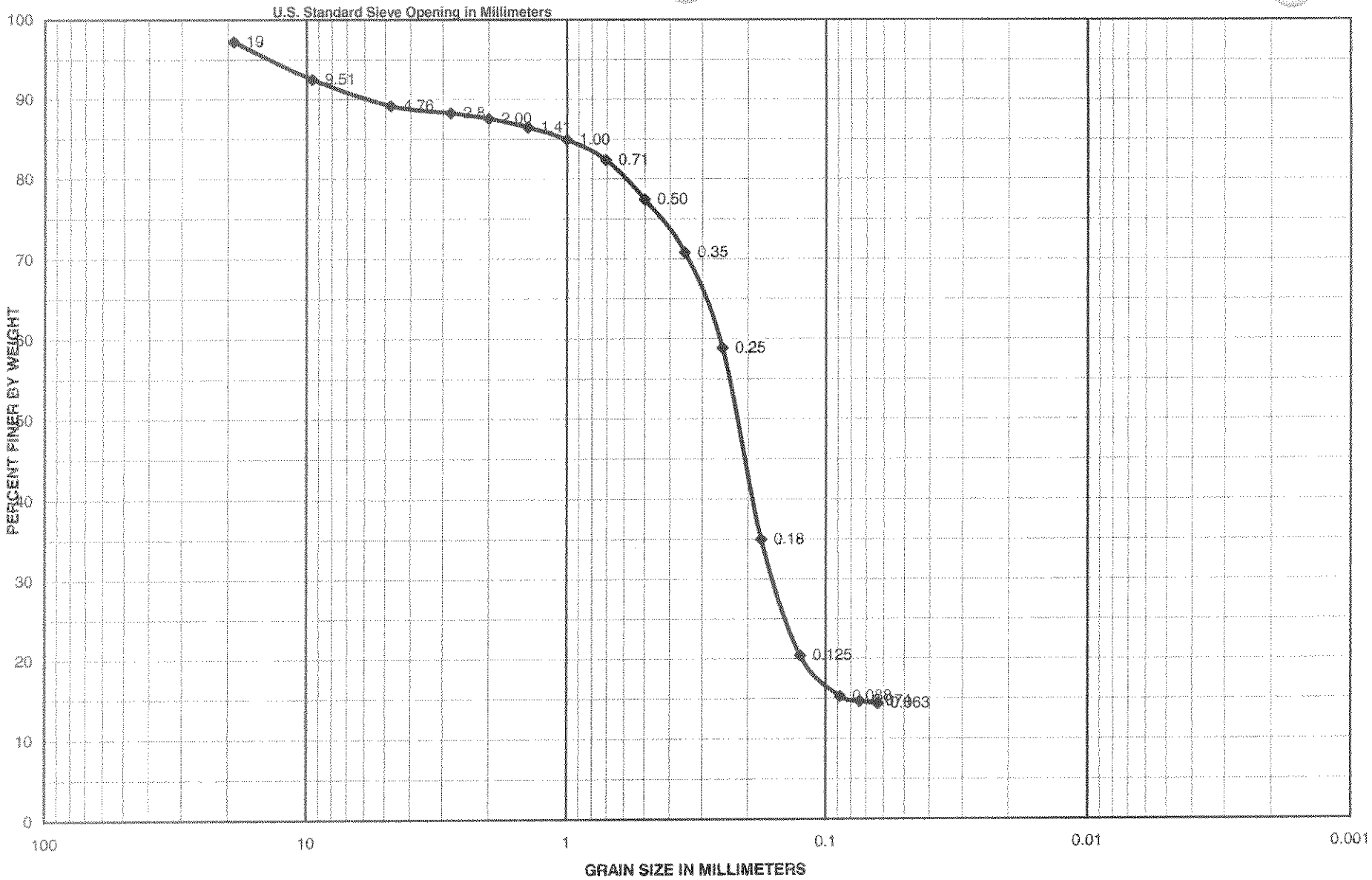
Sample No.	Depth	Classification		
2	5.9-6.4	Olive gray poorly graded sand with silt and little shells, SP-SM	**Area**	Shallotte Inlet
			CATLIN Geotechnical Laboratory	
		23.7% shells	**Boring No.**	SHI-V-09-10
			Date	4/30/2009



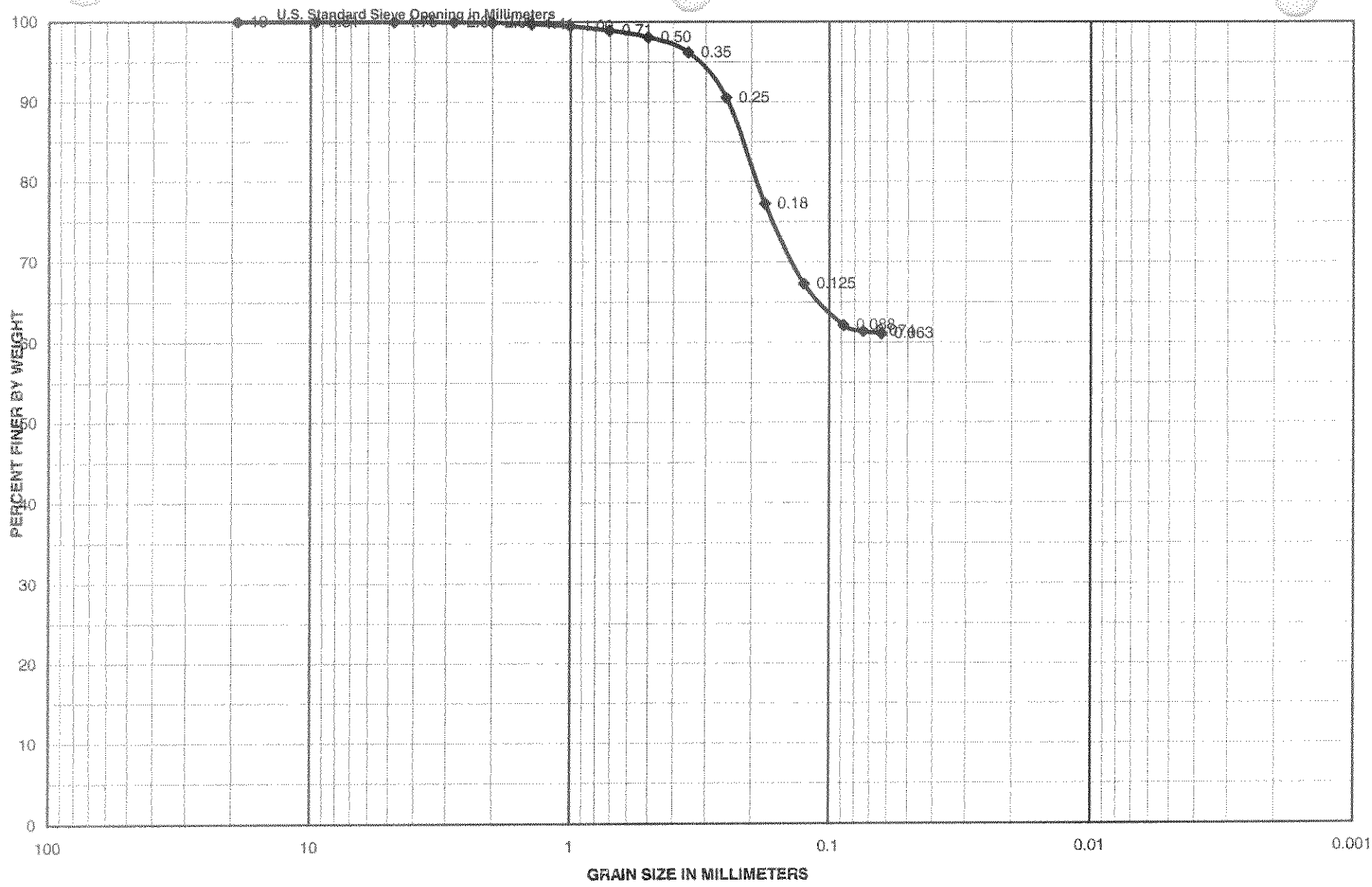
Sample No.	Depth	Classification		
3	9.0-9.5	Olive gray poorly graded sand with silt and little shells, SP-SM	Area	Shallotte Inlet
			CATLIN Geotechnical Laboratory	
		15.2% shells	Boring No.	SHI-V-09-10
			Date	4/30/2009



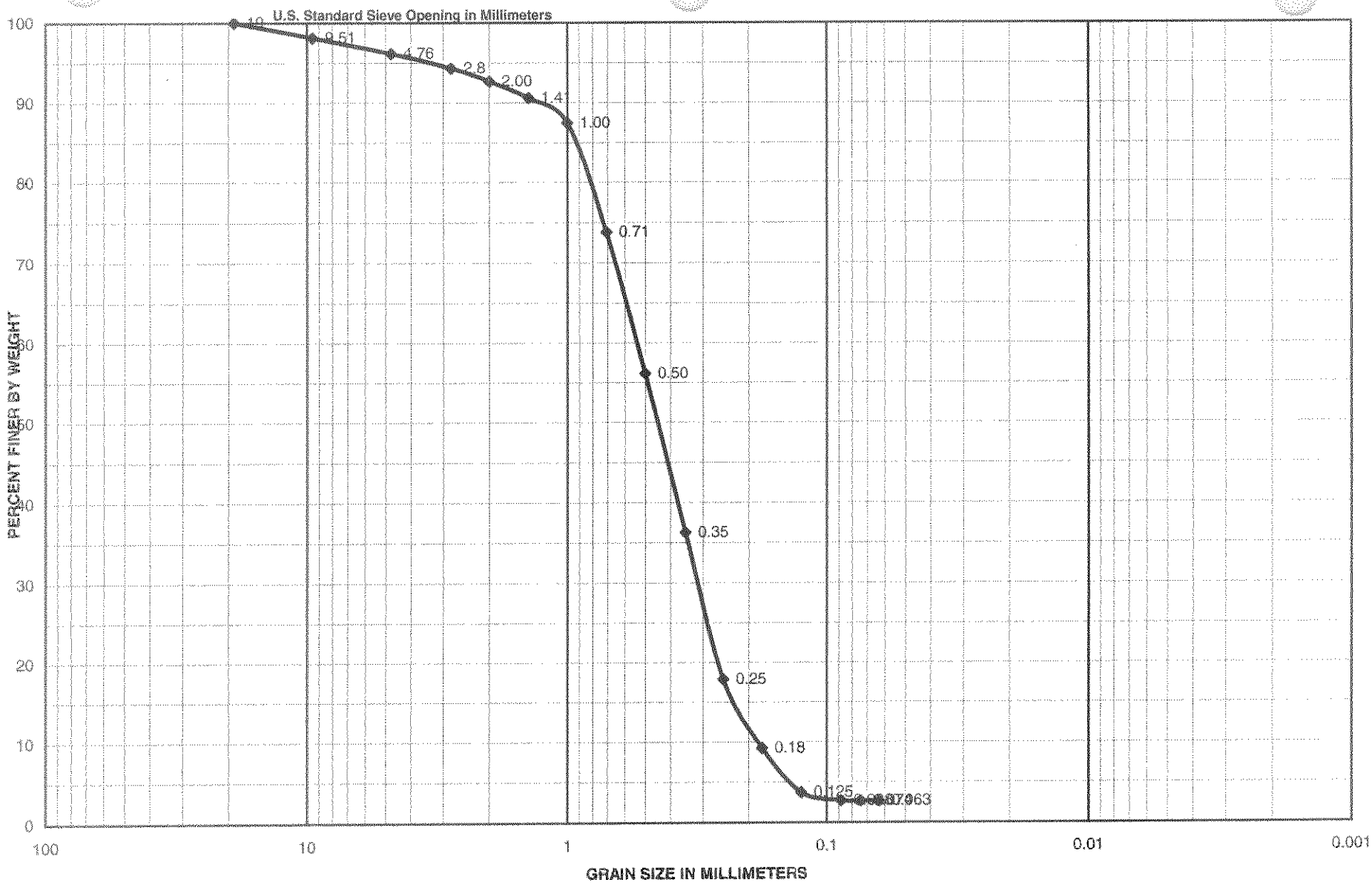
Sample No.	Depth	Classification		
4	12.9-13.4	Dark gray silty sand with little shells, SM	Area	Shallotte Inlet
			CATLIN Geotechnical Laboratory	
		17.9% shells	Boring No.	SHI-V-09-10
			Date	4/30/2009



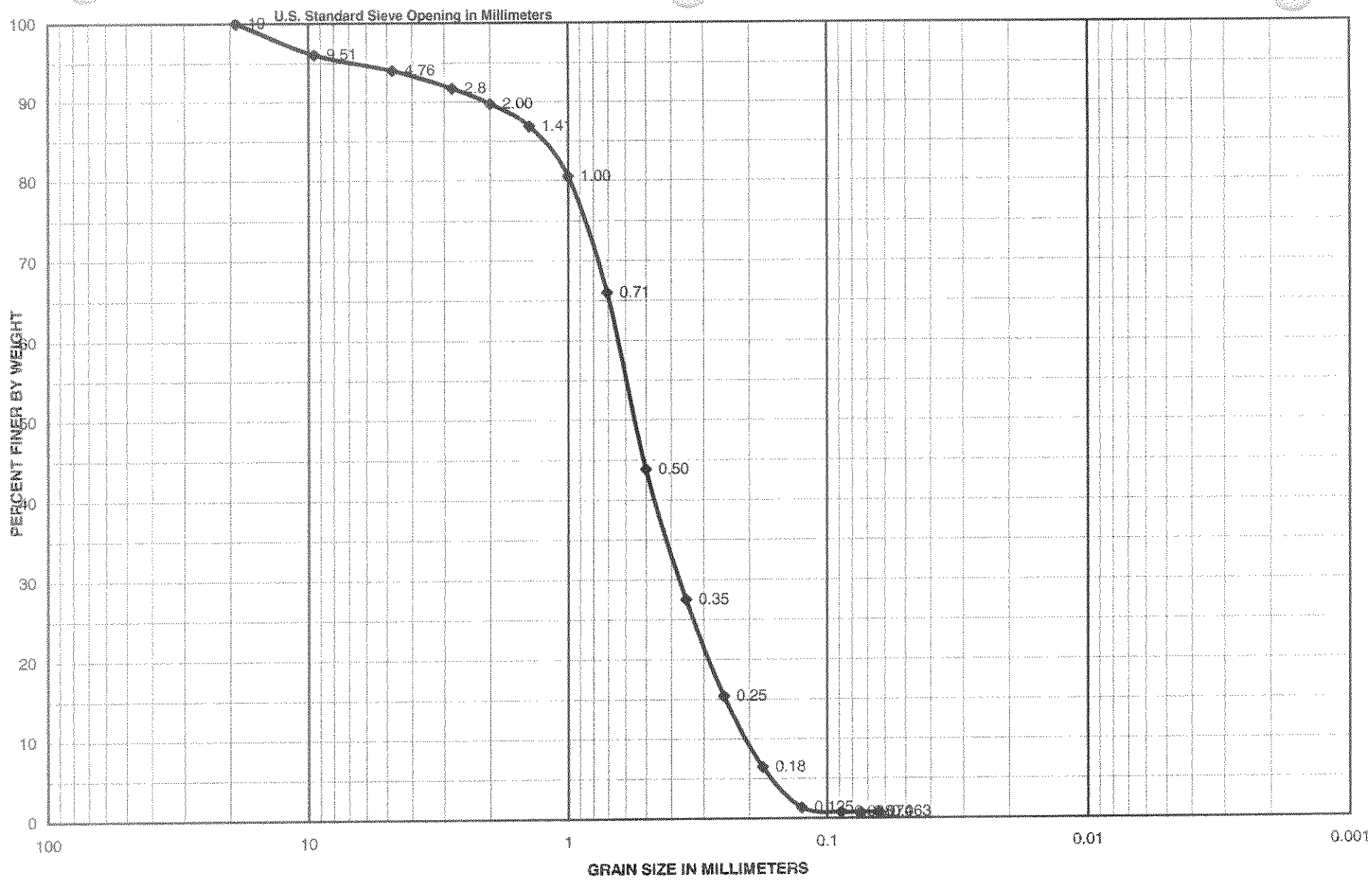
Sample No.	Depth	Classification		
5	15.0-15.5	Dark gray silty sand with little shells, SM	Area	Shallotte Inlet
		15.1% shells	CATLIN Geotechnical Laboratory	
			Boring No.	SHI-V-09-10
			Date	4/30/2009



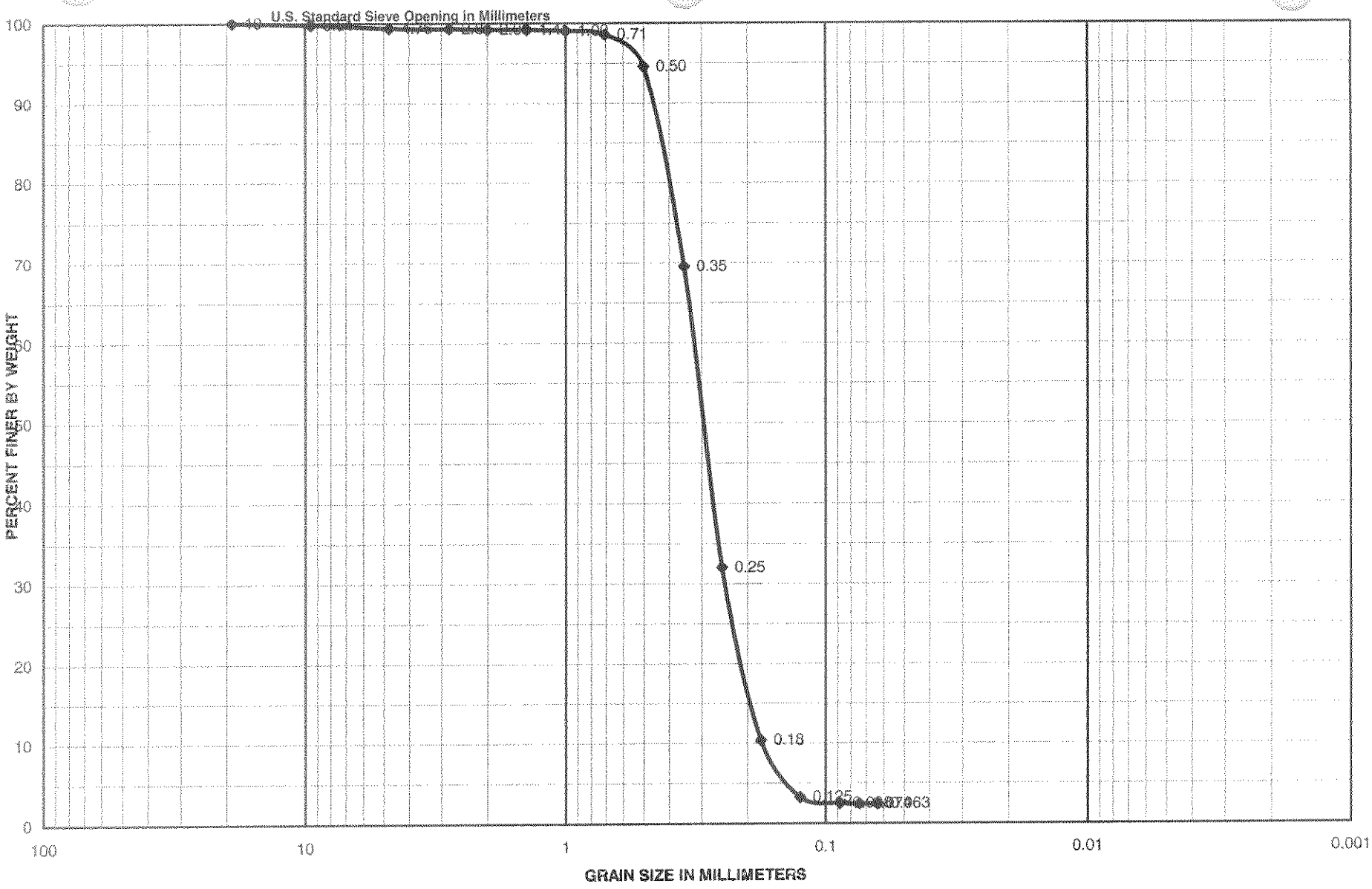
Sample No.	Depth	Classification		
6	17.3-17.8	Dark gray sandy elastic silt with trace shells, MH	Area	Shallotte Inlet
		0.5% shells	CATLIN Geotechnical Laboratory	
			Boring No.	SHI-V-09-10
			Date	4/30/2009



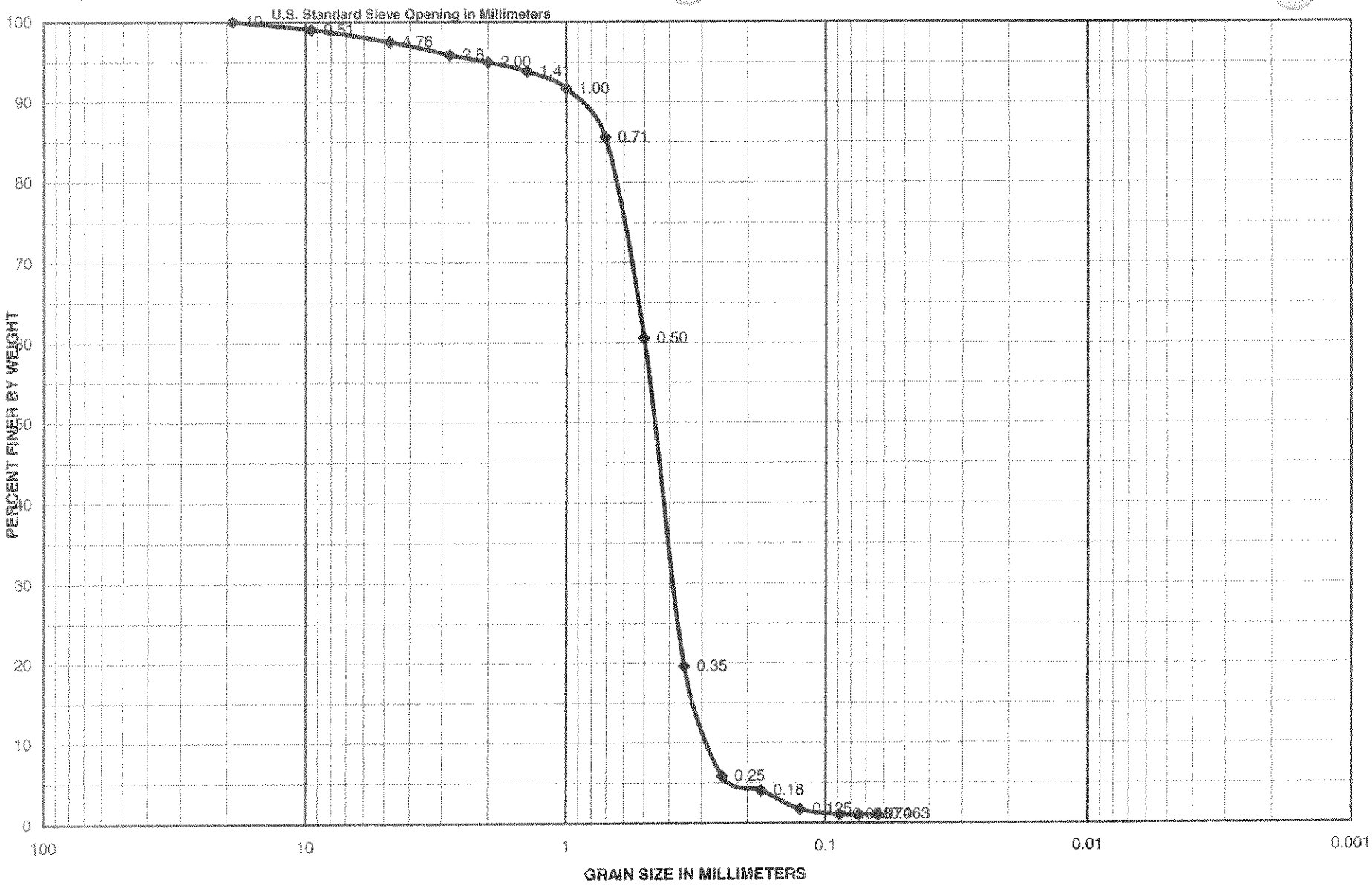
Sample No.	Depth	Classification		
1	5.2-5.7	Olive gray poorly graded sand with little shells, SP	Area	Shallotte Inlet
		12.6% shells	CATLIN Geotechnical Laboratory	
			Boring No.	SHI-V-09-11
			Date	4/30/2009



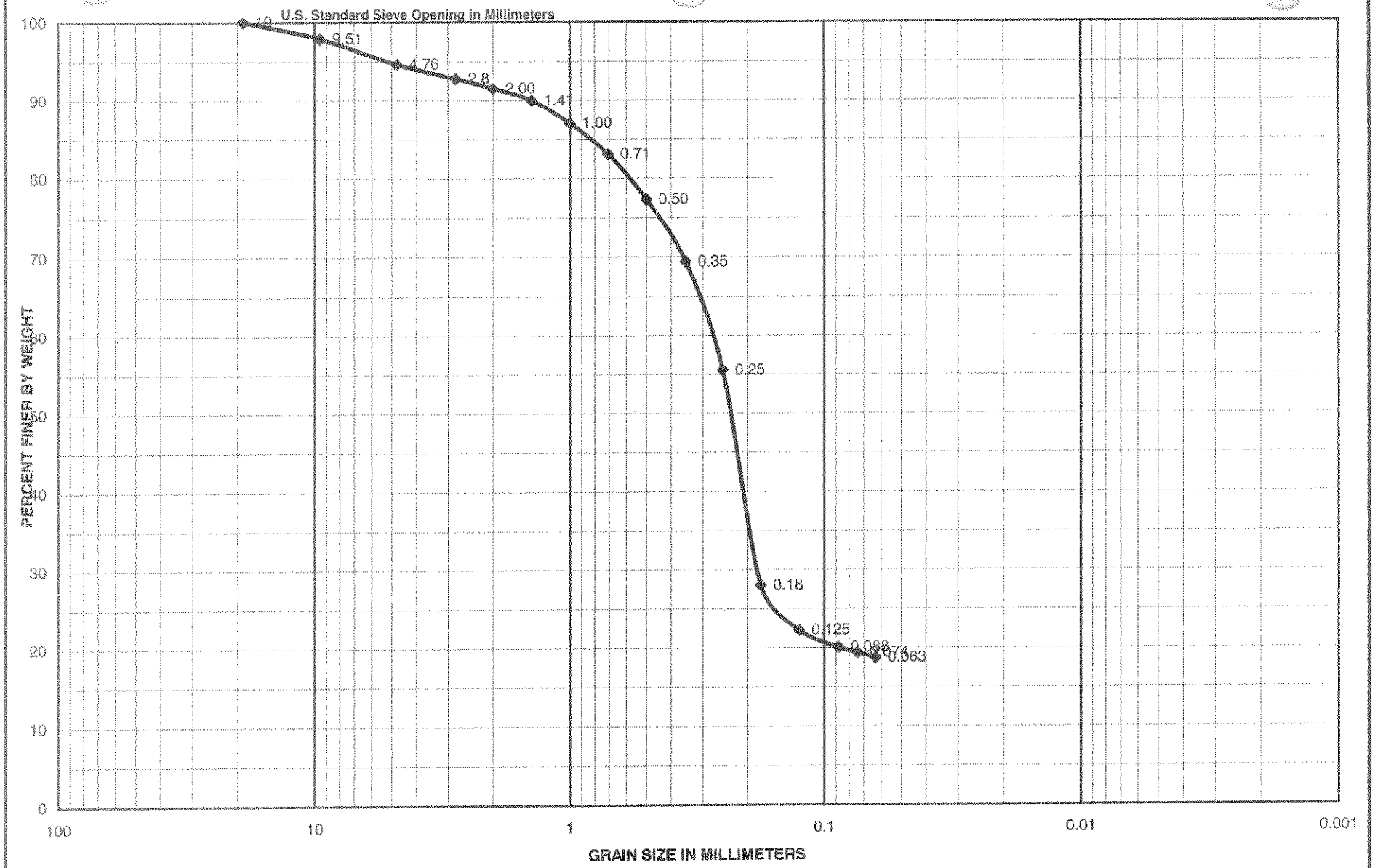
Sample No.	Depth	Classification		
2	8.0-8.5	Olive gray poorly graded sand with little shells, SP	Area	Shallotte Inlet
			CATLIN Geotechnical Laboratory	
		19.5% shells	Boring No.	SHI-V-09-11
			Date	4/30/2009



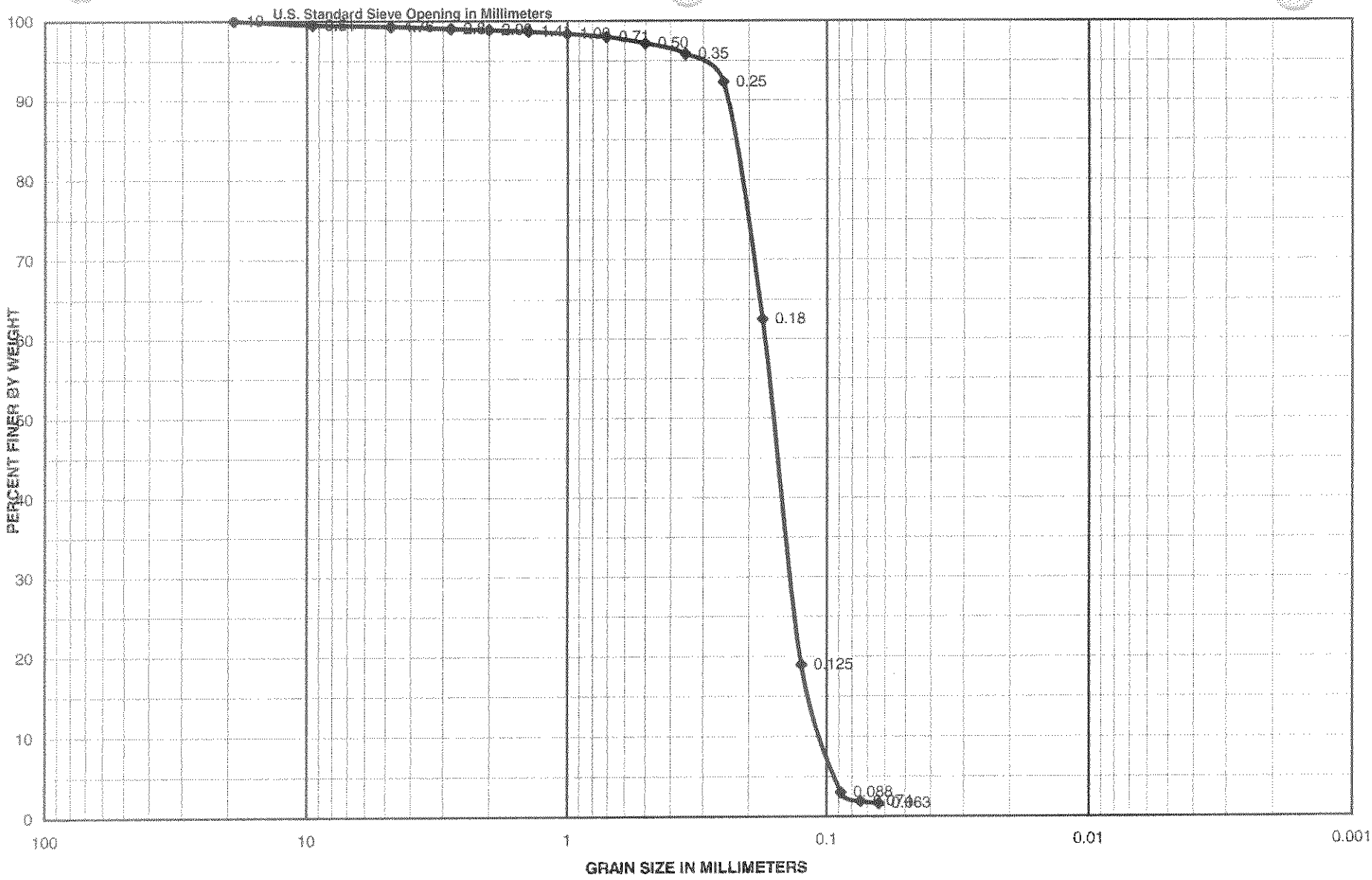
Sample No.	Depth	Classification		
3	11.0-11.5	Olive gray poorly graded sand with trace shells, SP	Area	Shallotte Inlet
			CATLIN Geotechnical Laboratory	
		1.4% shells	Boring No.	SHI-V-09-11
			Date	4/30/2009



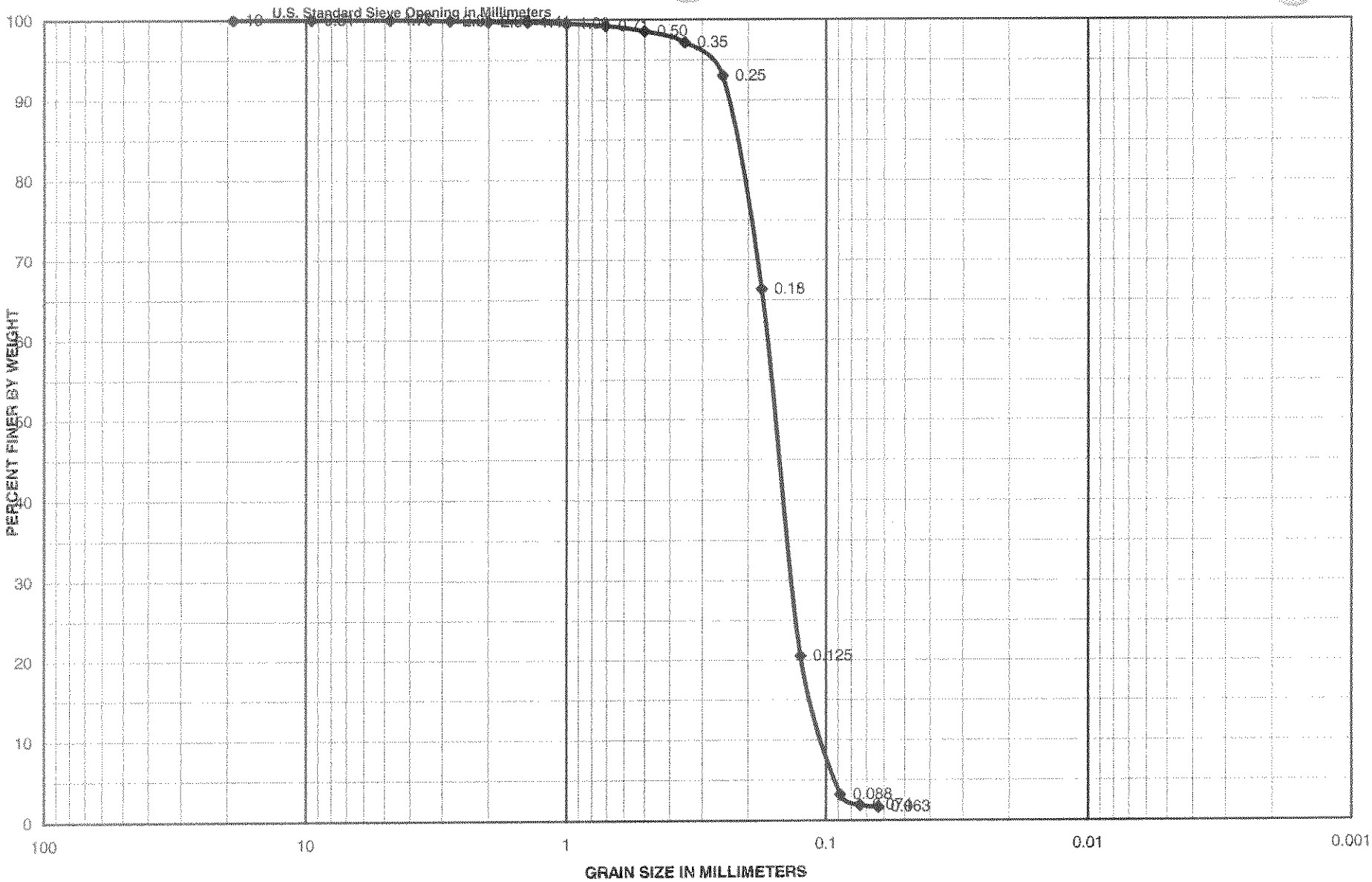
Sample No.	Depth	Classification		
4	14.0-14.5	Olive gray poorly graded sand with little shells, SP	Area	Shallotte Inlet
			CATLIN Geotechnical Laboratory	
		14.5% shells	Boring No.	SHI-V-09-11
			Date	4/30/2009



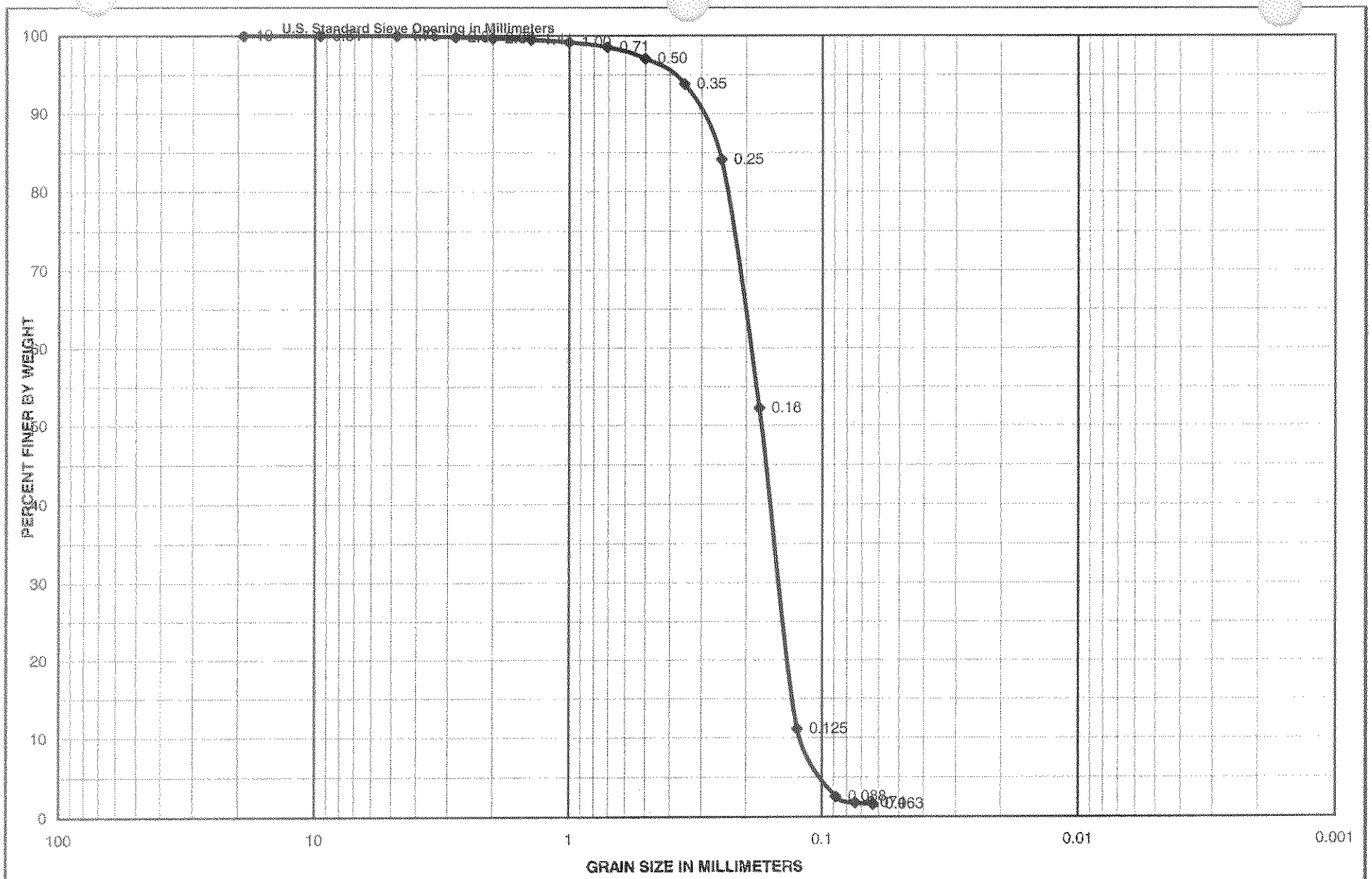
Sample No.	Depth	Classification		
5	17.1-17.6	Olive gray silty sand with few shells, SM	Area	Shallotte Inlet
			CATLIN Geotechnical Laboratory	
		10.1% shells	Boring No.	SHI-V-09-11
			Date	4/30/2009



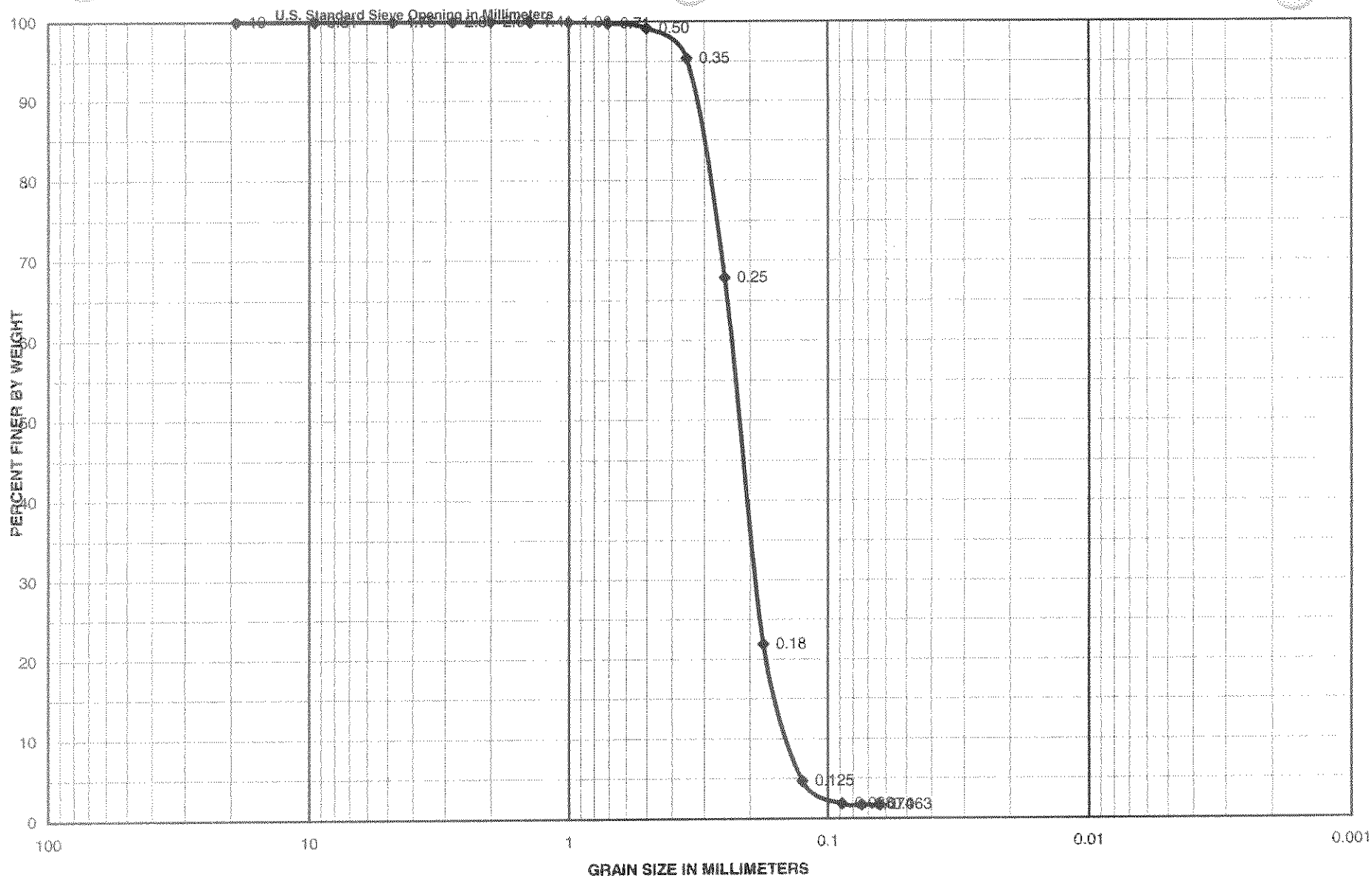
Sample No.	Depth	Classification		
1	12.5-13.0	Olive gray poorly graded sand with trace shells, SP	Area	Shallotte Inlet
		2.0% shells	CATLIN Geotechnical Laboratory	
			Boring No.	SHI-V-09-12
			Date	4/30/2009



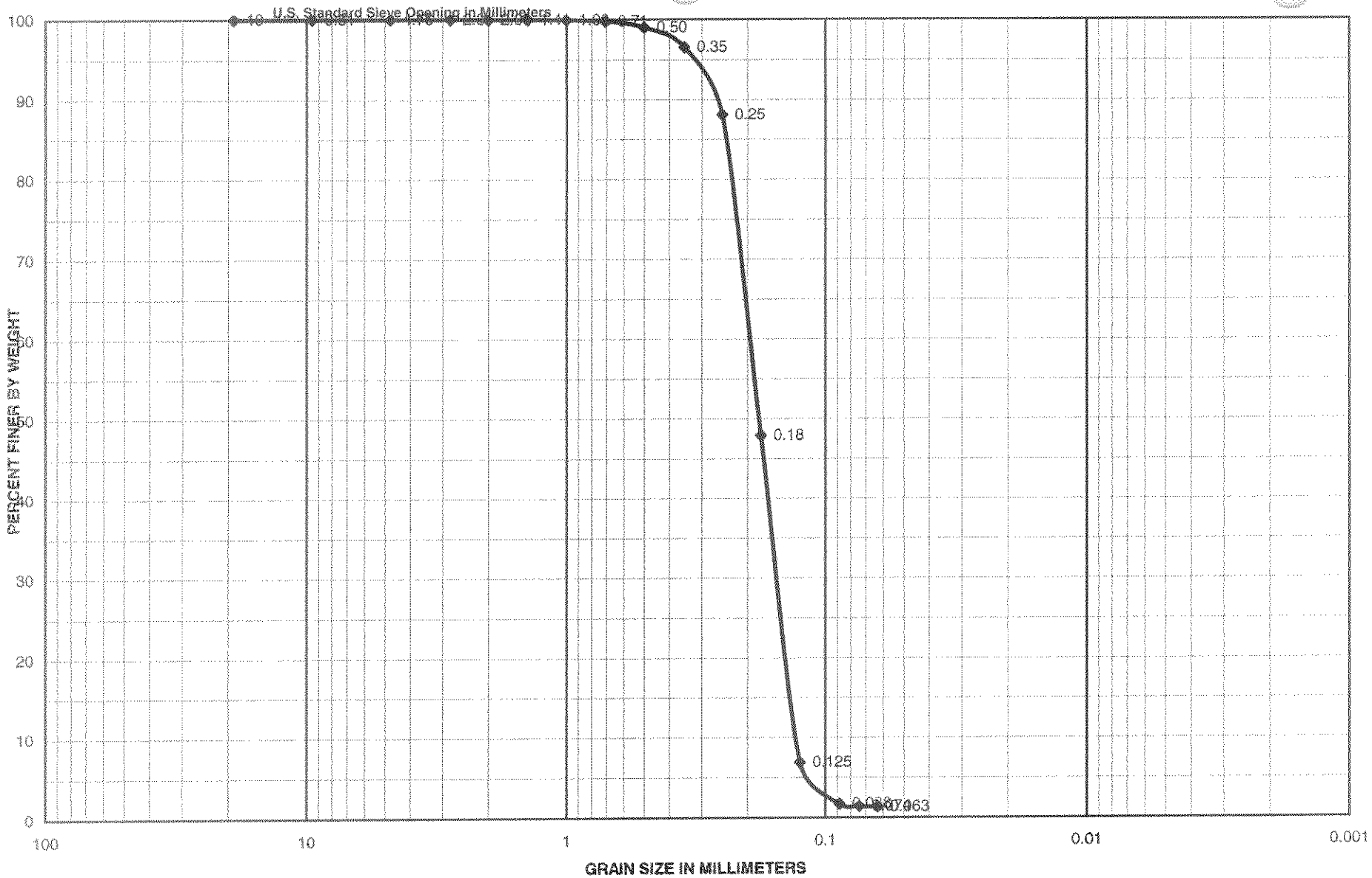
Sample No.	Depth	Classification		
2	15.5-16.0	Olive gray poorly graded sand with trace shells, SP	Area	Shallotte Inlet
			CATLIN Geotechnical Laboratory	
		0.8% shells	Boring No.	SHI-V-09-12
			Date	5/1/2009



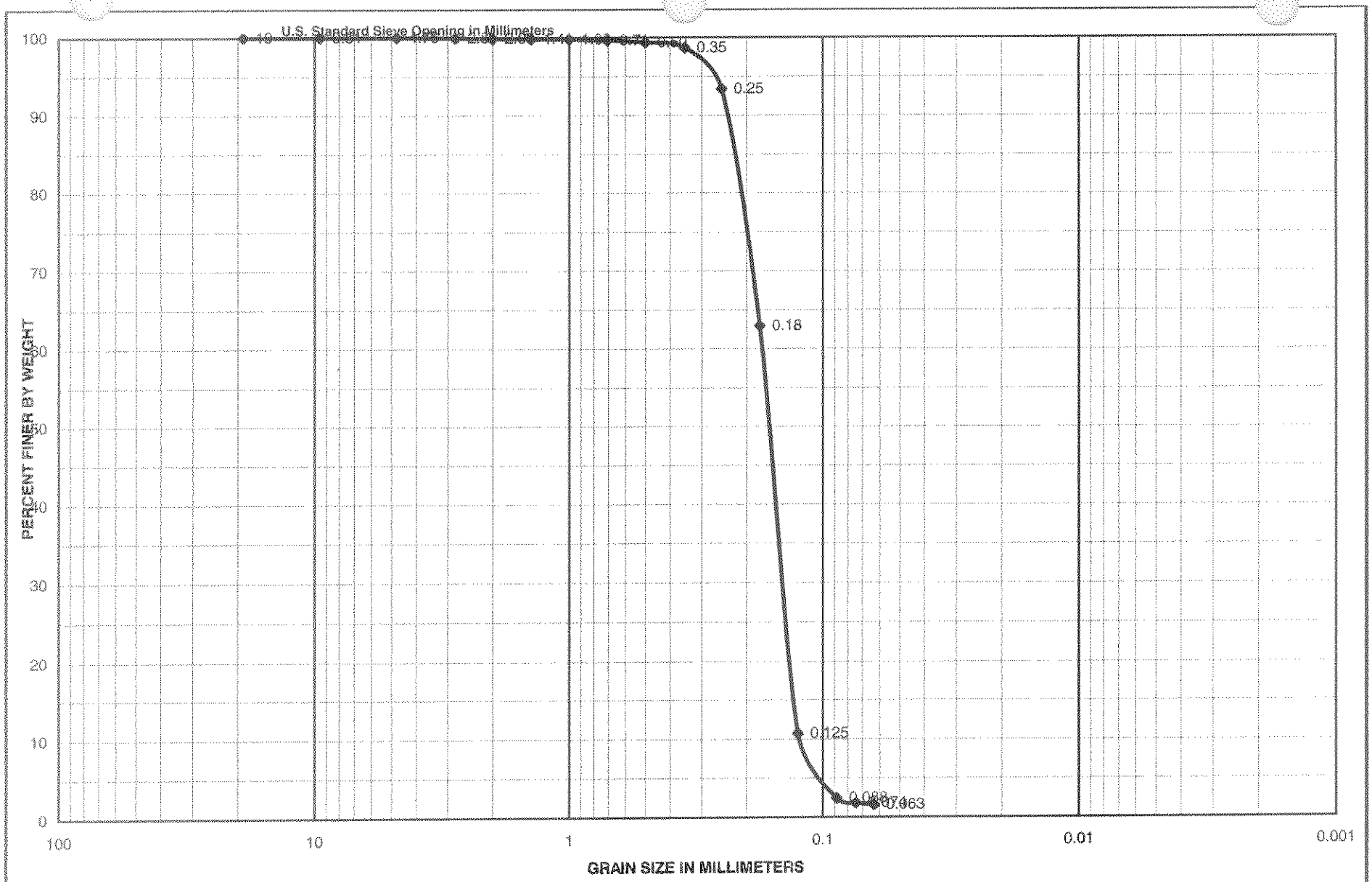
Sample No.	Depth	Classification		
3	18.0-18.5	Olive gray poorly graded sand with trace shells, SP	Area	Shallotte Inlet
			CATLIN Geotechnical Laboratory	
		1.5% shells	Boring No.	SHI-V-09-12
			Date	4/30/2009



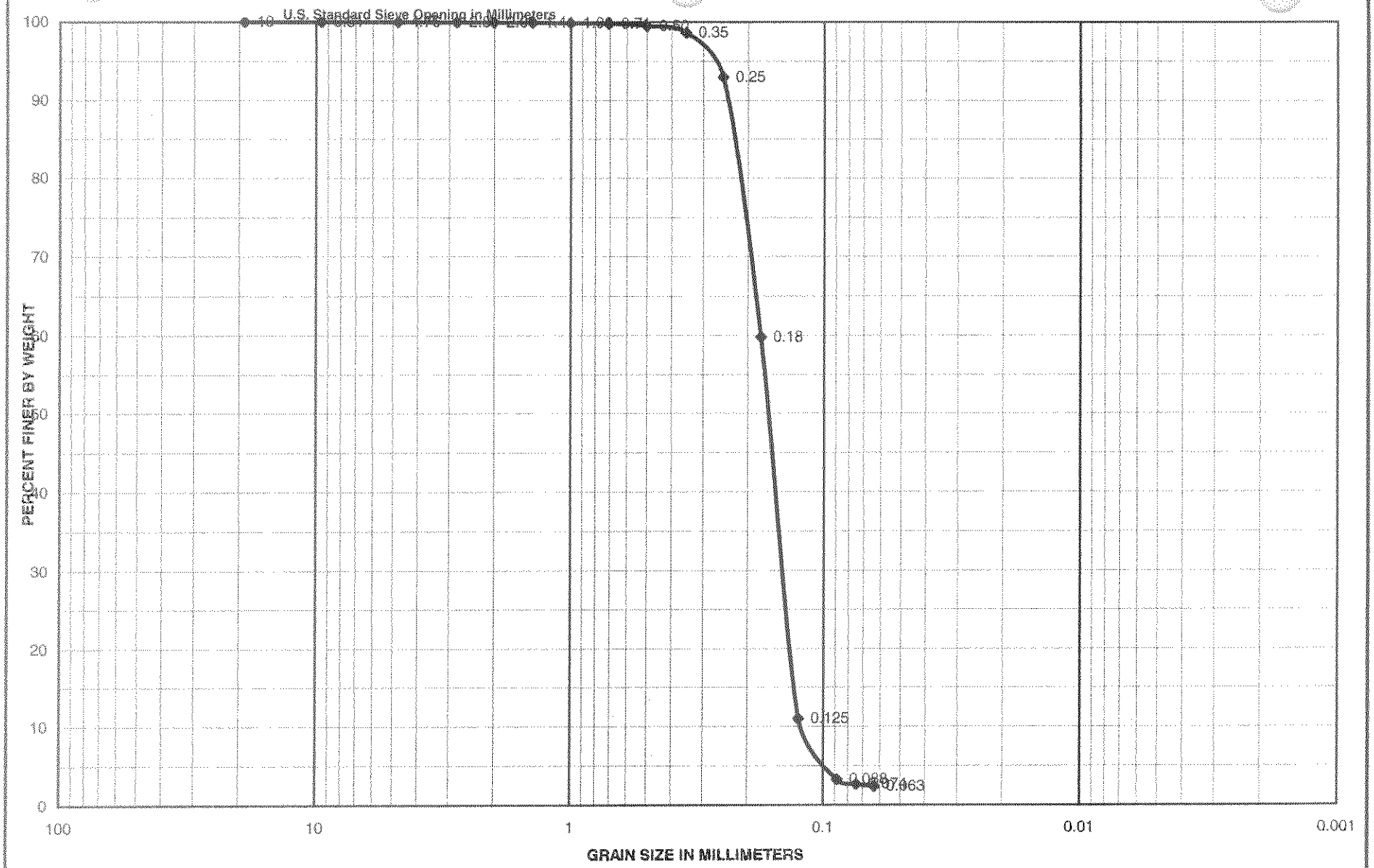
Sample No.	Depth	Classification		
1	3.6-4.1	Olive gray poorly graded sand with trace shells, SP	Area	Shallotte Inlet
		0.3% shells	CATLIN Geotechnical Laboratory	
			Boring No.	SHI-V-09-13
			Date	4/30/2009



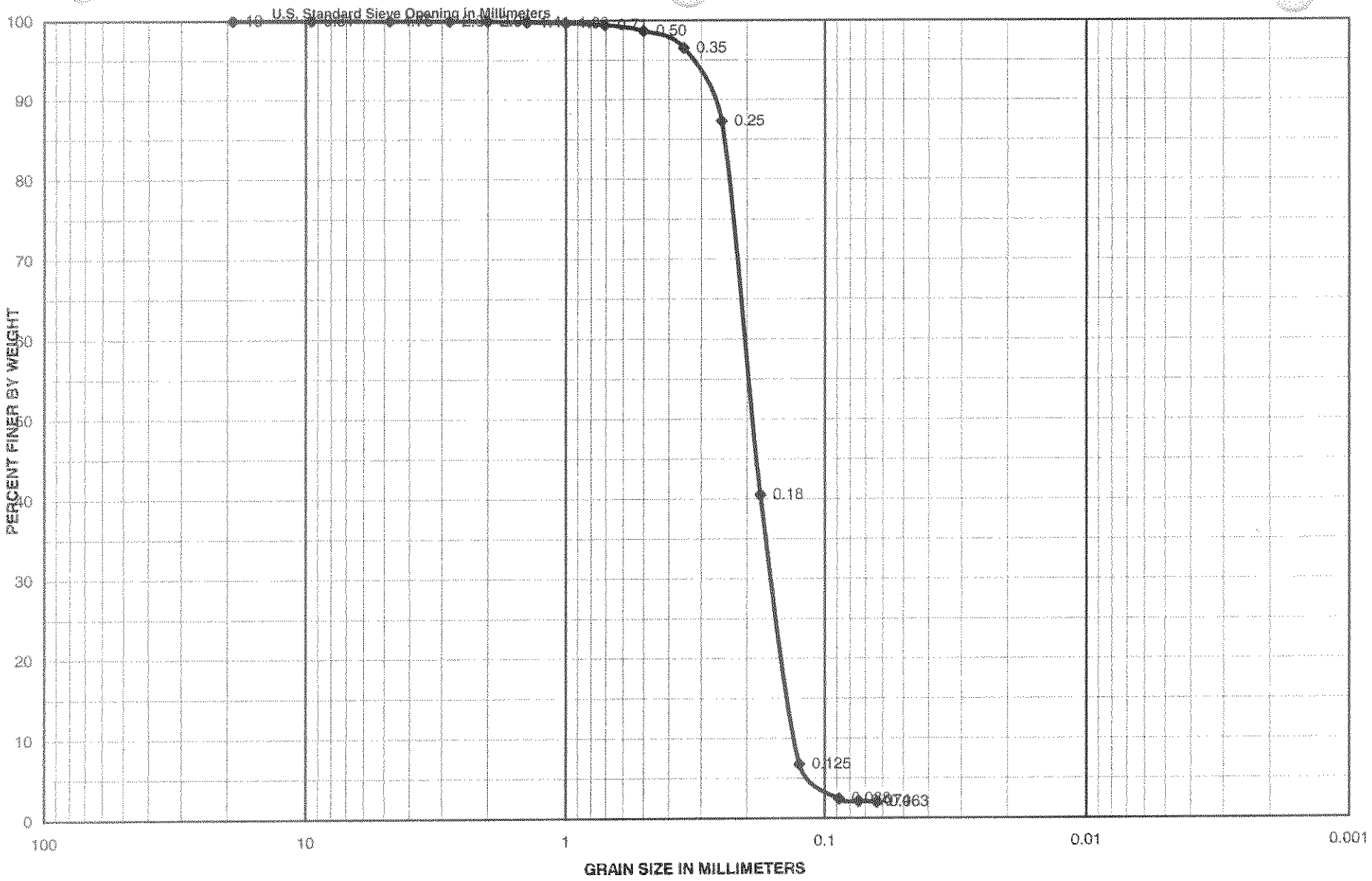
Sample No.	Depth	Classification		
2	6.0-6.5	Olive gray poorly graded sand with trace shells, SP	Area	Shallotte Inlet
			CATLIN Geotechnical Laboratory	
		0.2% shells	Boring No.	SHI-V-09-13
			Date	4/30/2009



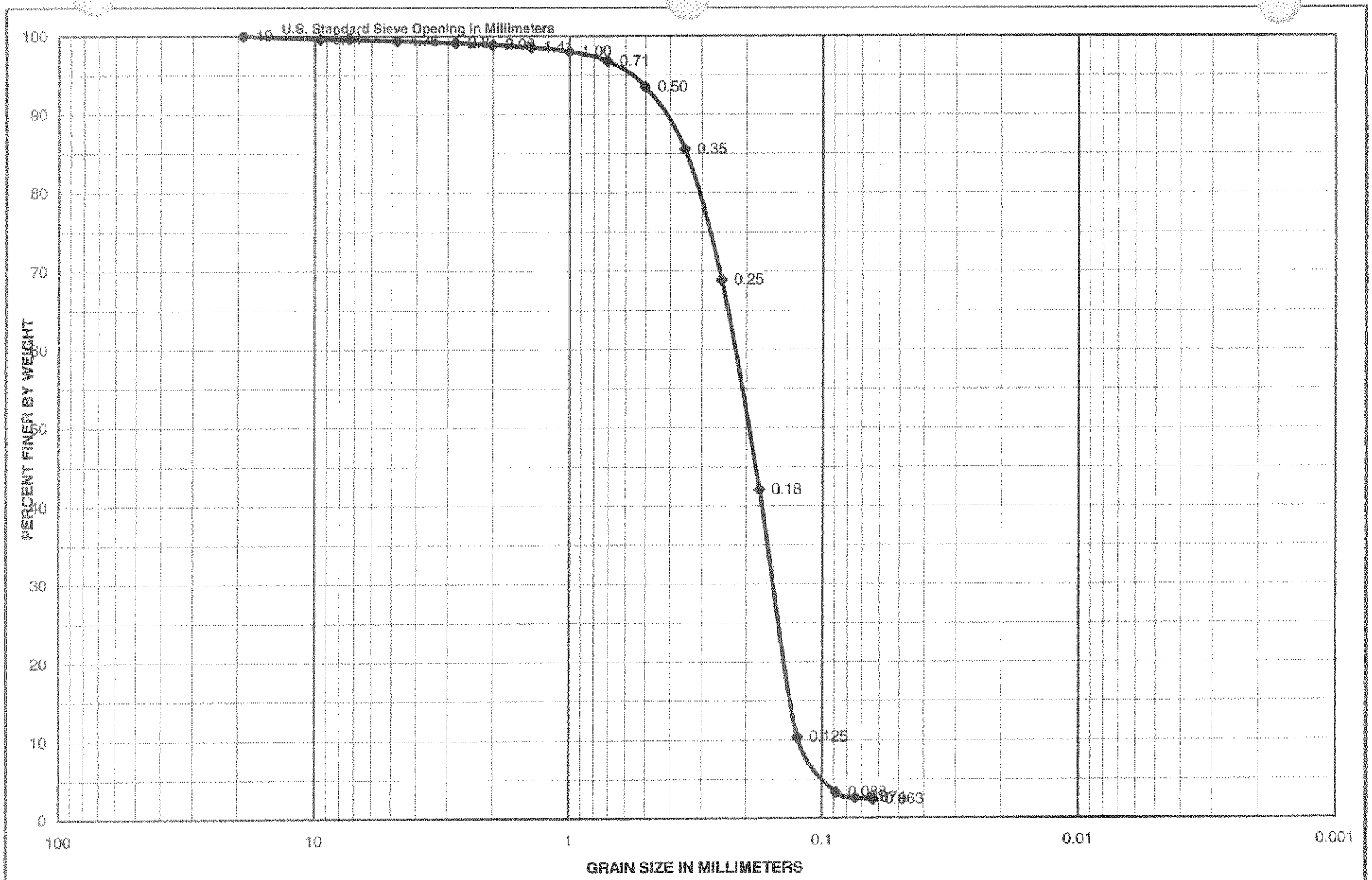
Sample No.	Depth	Classification		
3	8.6-9.1	Olive gray poorly graded sand with trace shells, SP	**Area**	Shallotte Inlet
			CATLIN Geotechnical Laboratory	
		0.4% shells	**Boring No.**	SHI-V-09-13
			Date	5/1/2009



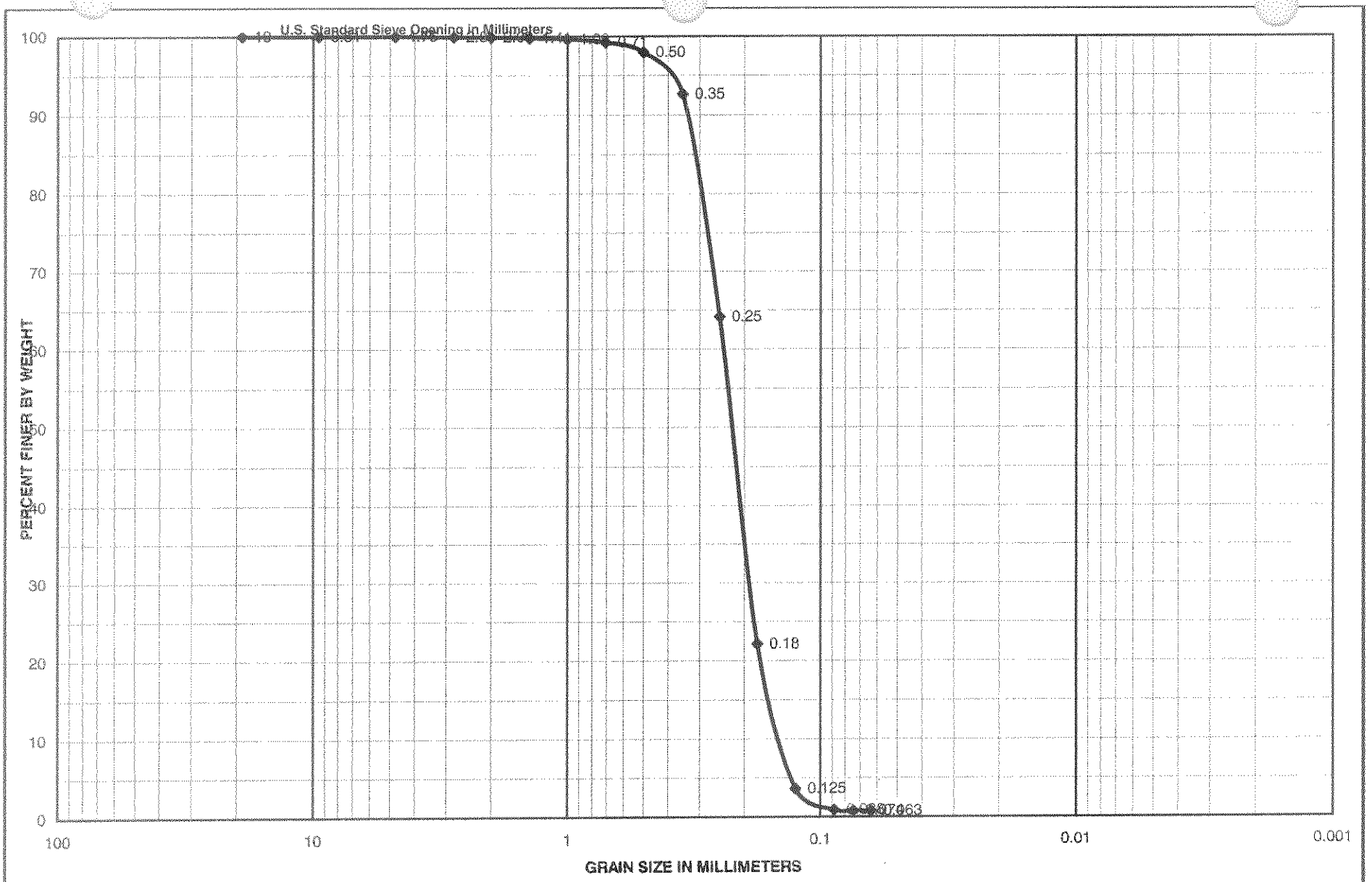
Sample No.	Depth	Classification		
4	11.6-12.1	Olive gray poorly graded sand with trace shells, SP	Area	Shallotte Inlet
			CATLIN Geotechnical Laboratory	
		0.2% shells	Boring No.	SHI-V-09-13
			Date	5/1/2009



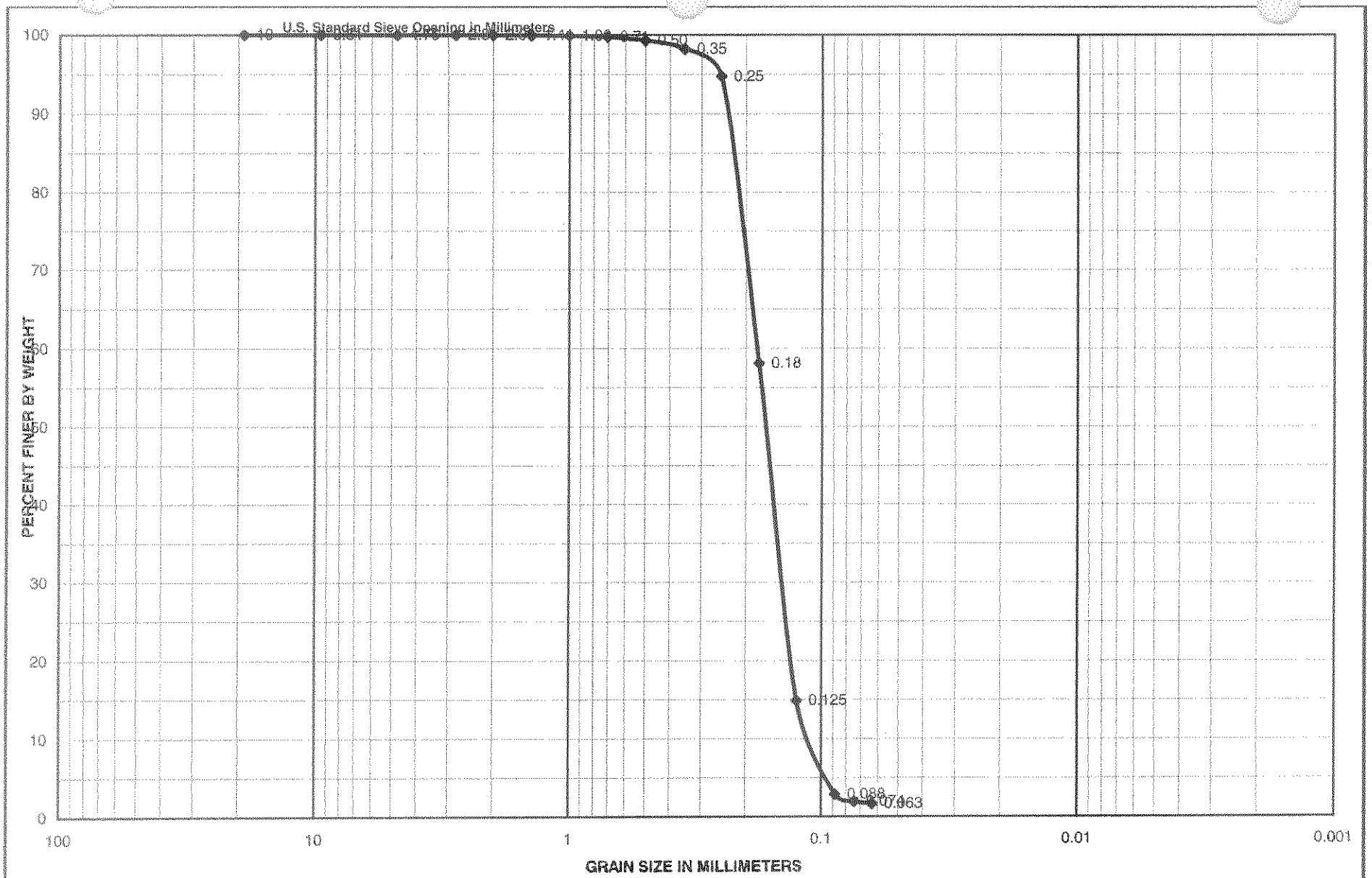
Sample No.	Depth	Classification		
5	13.5-14.0	Olive gray poorly graded sand with trace shells, SP	Area	Shallotte Inlet
		1.3% shells	CATLIN Geotechnical Laboratory	
			Boring No.	SHI-V-09-13
			Date	5/1/2009



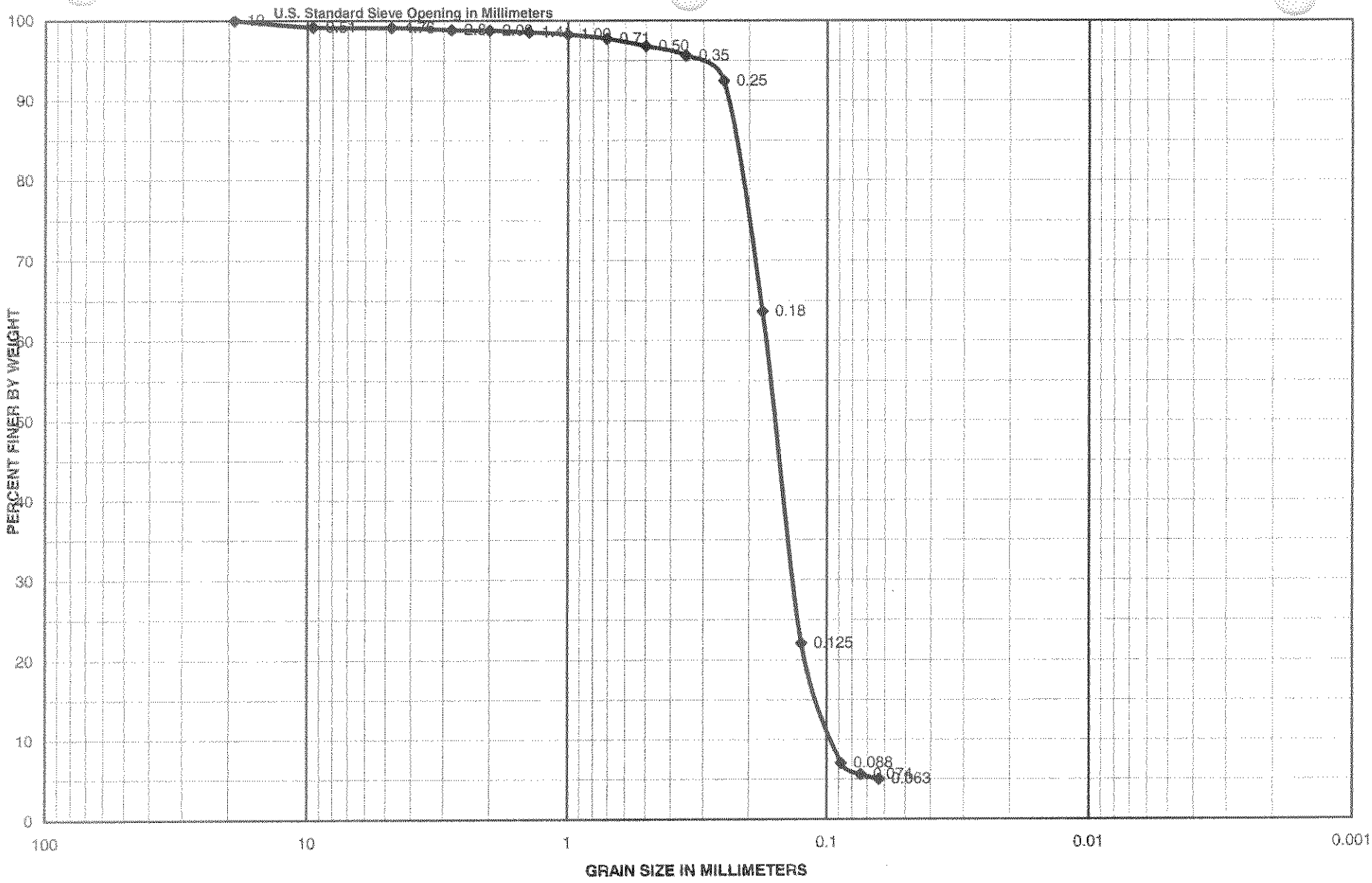
Sample No.	Depth	Classification		
6	16.0-16.5	Olive gray poorly graded sand with trace shells, SP	Area	Shallotte Inlet
			CATLIN Geotechnical Laboratory	
		3.2% shells	Boring No.	SHI-V-09-13
			Date	5/1/2009



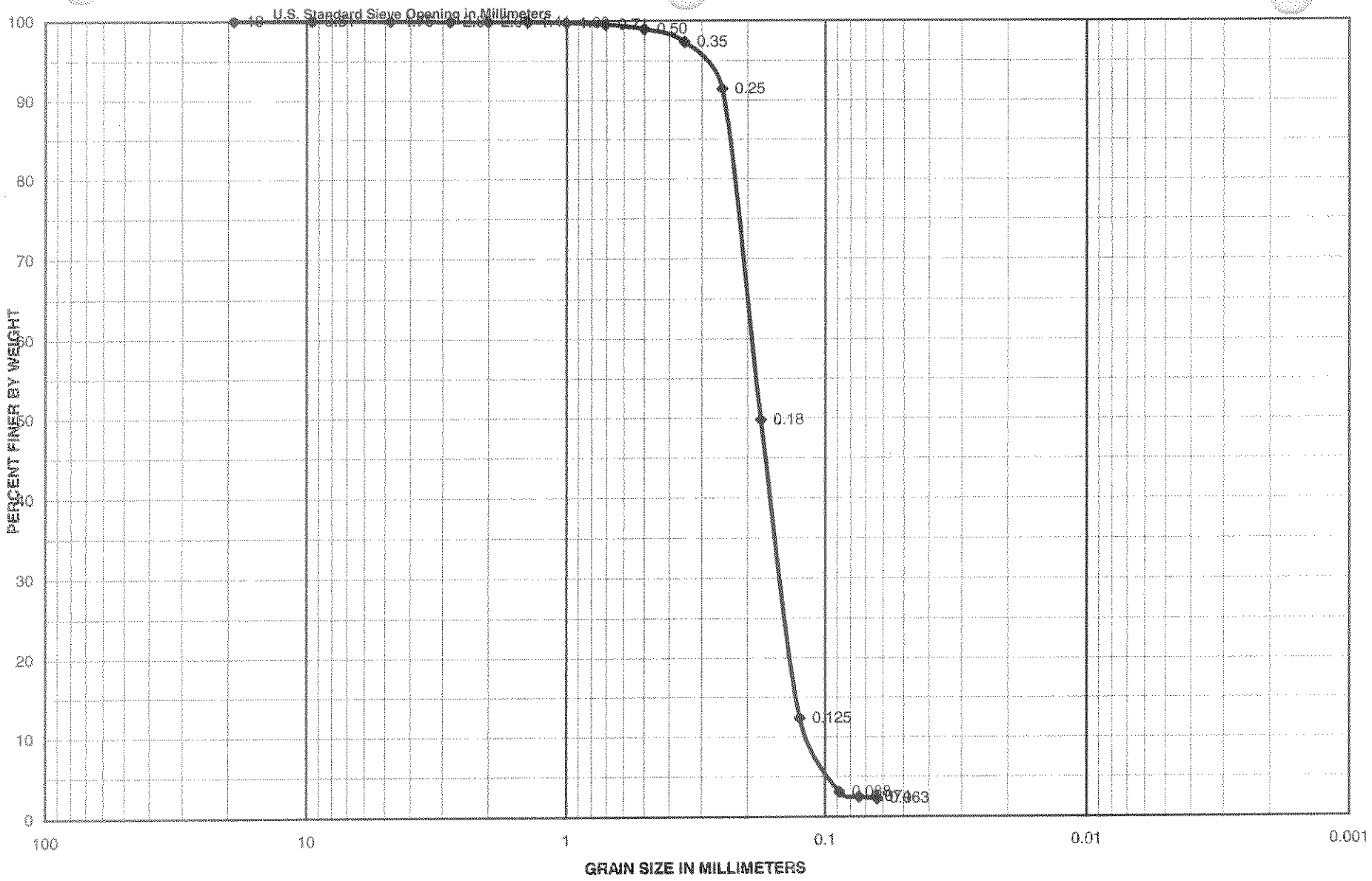
Sample No.	Depth	Classification		
1	6.6-7.1	Olive gray poorly graded sand with trace shells, SP	Area	Shallotte Inlet
		0.8% shells	CATLIN Geotechnical Laboratory	
			Boring No.	SHI-V-09-14
			Date	5/1/2009



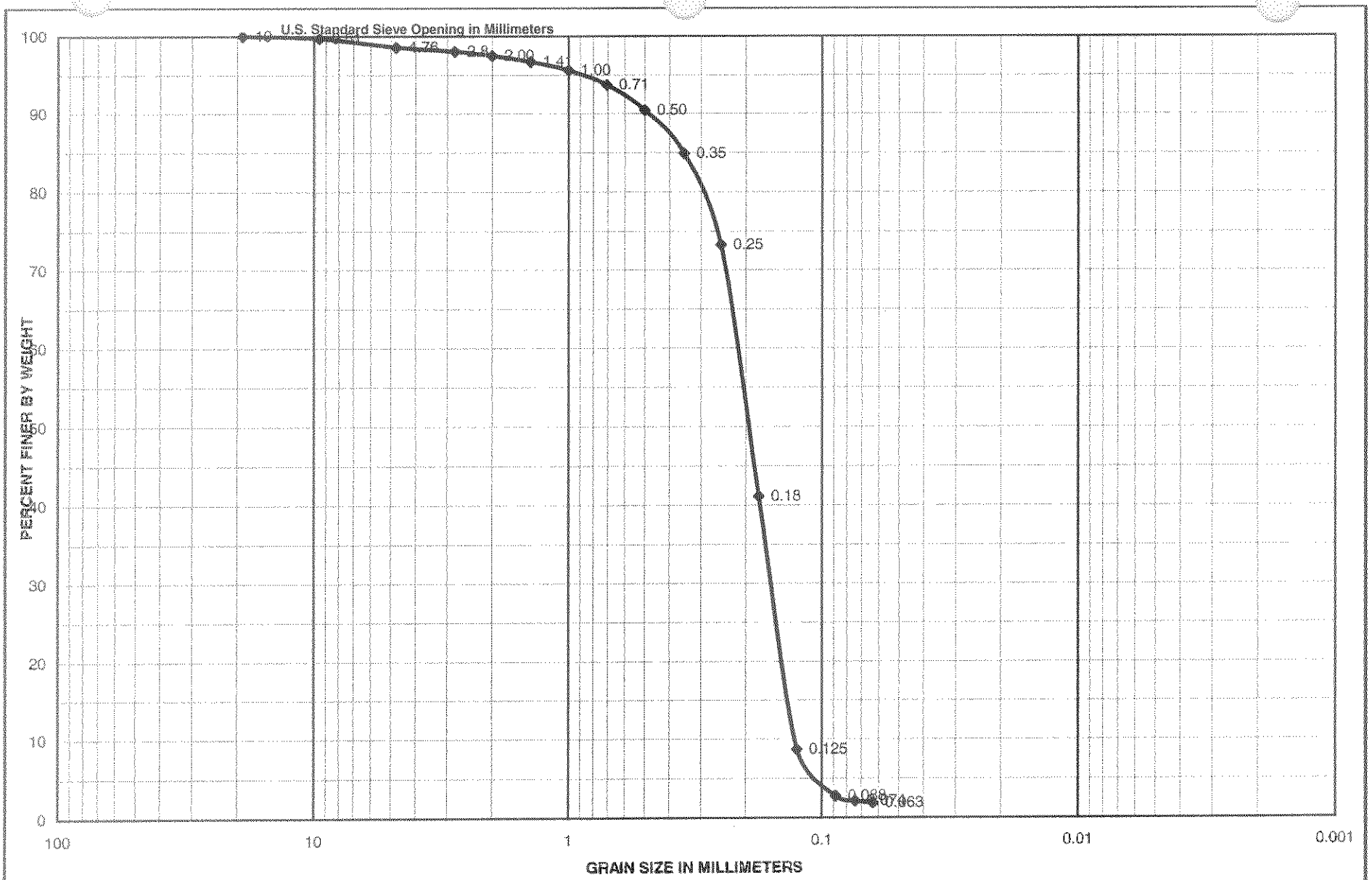
Sample No.	Depth	Classification		
2	9.0-9.5	Olive gray poorly graded sand with trace shells, SP	Area	Shallotte Inlet
			CATLIN Geotechnical Laboratory	
		0.3% shells	Boring No.	SHI-V-09-14
			Date	4/30/2009



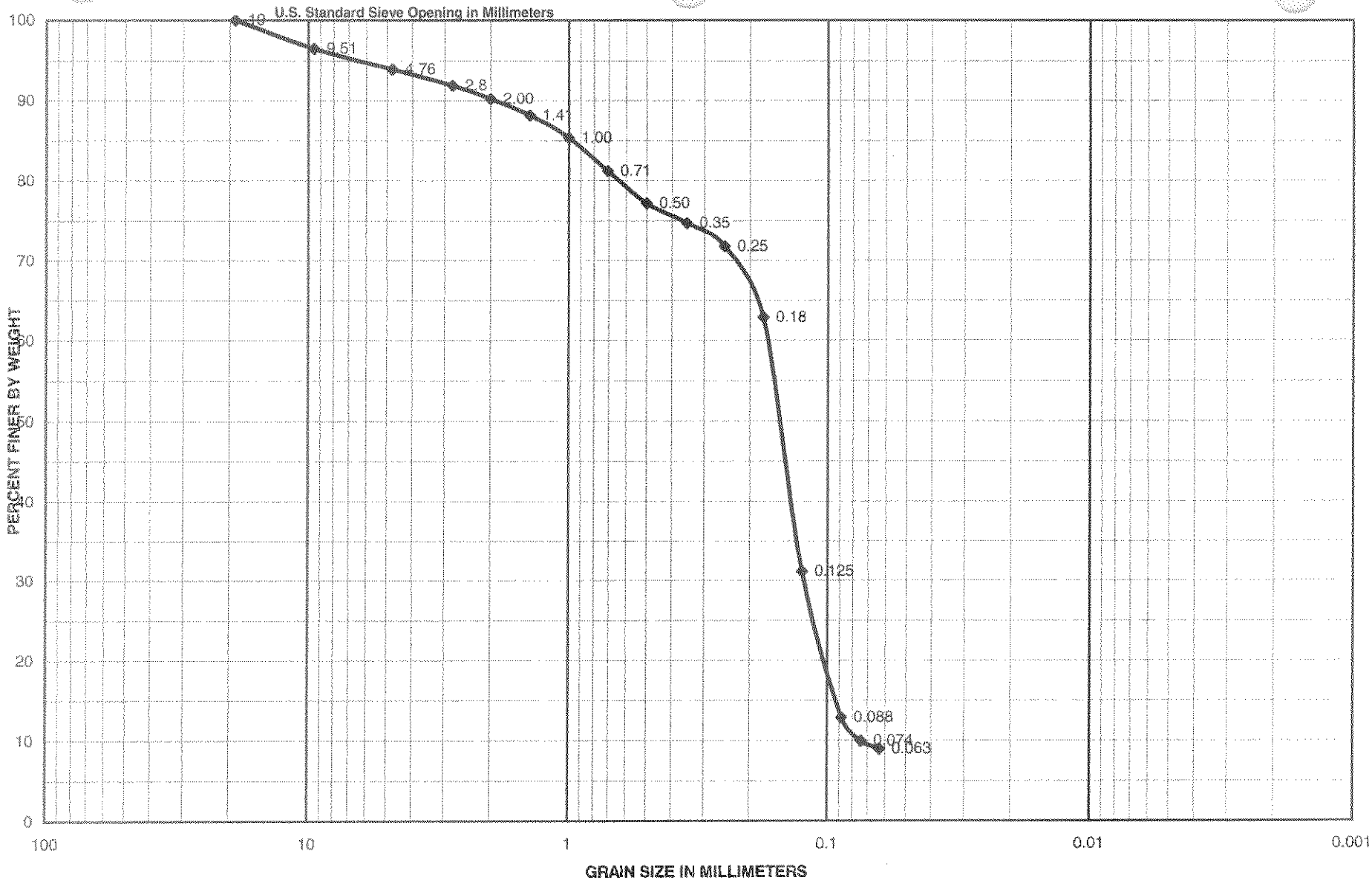
Sample No.	Depth	Classification		
3	11.0-11.5	Olive gray poorly graded sand with silt and trace shells, SP-SM	Area	Shallotte Inlet
			CATLIN Geotechnical Laboratory	
		2.3% shells	Boring No.	SHI-V-09-14
			Date	5/1/2009



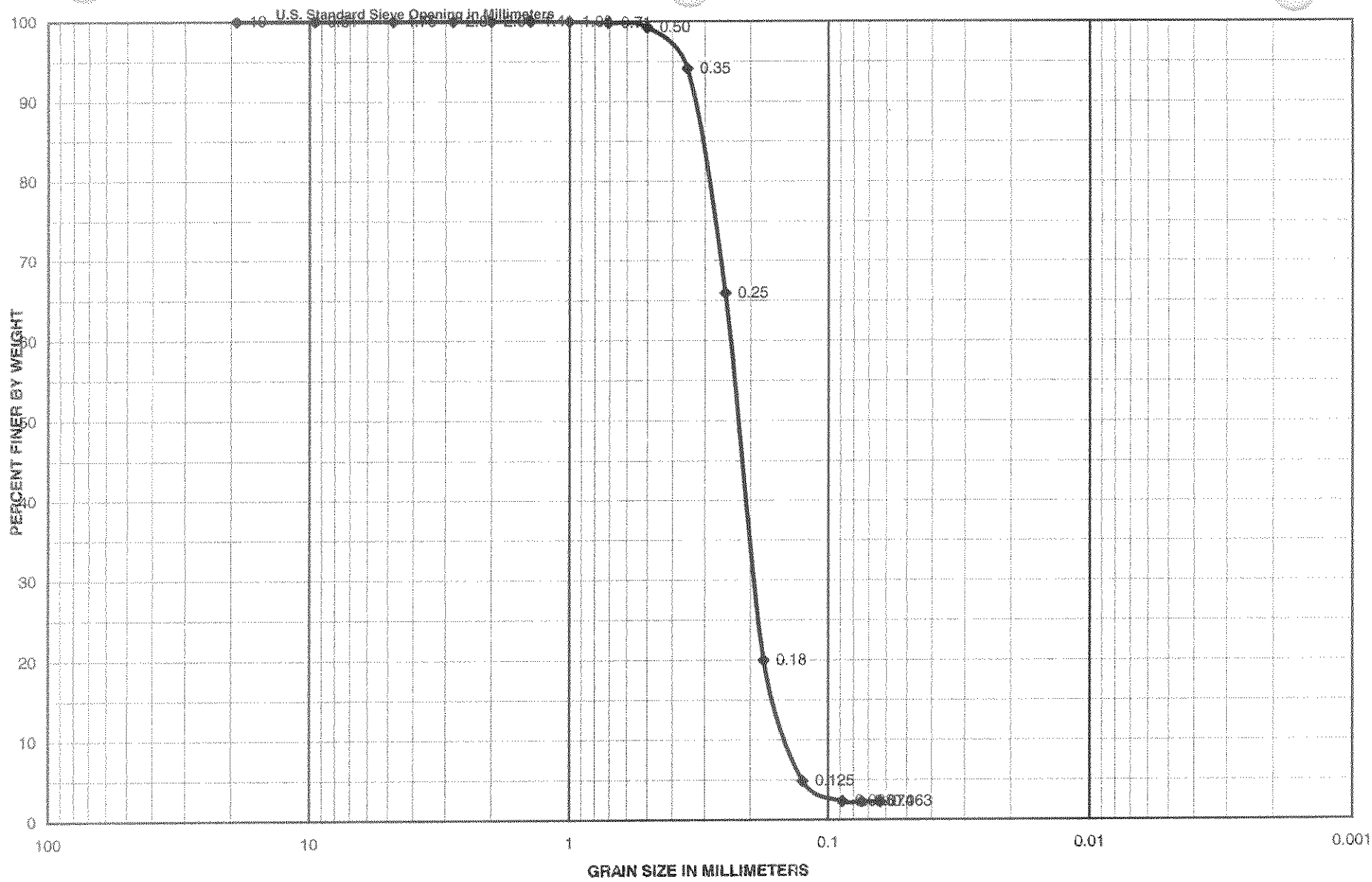
Sample No.	Depth	Classification		
4	13.0-13.5	Olive gray poorly graded sand with trace shells, SP	Area	Shallotte Inlet
			CATLIN Geotechnical Laboratory	
		0.3% shells	Boring No.	SHI-V-09-14
			Date	5/1/2009



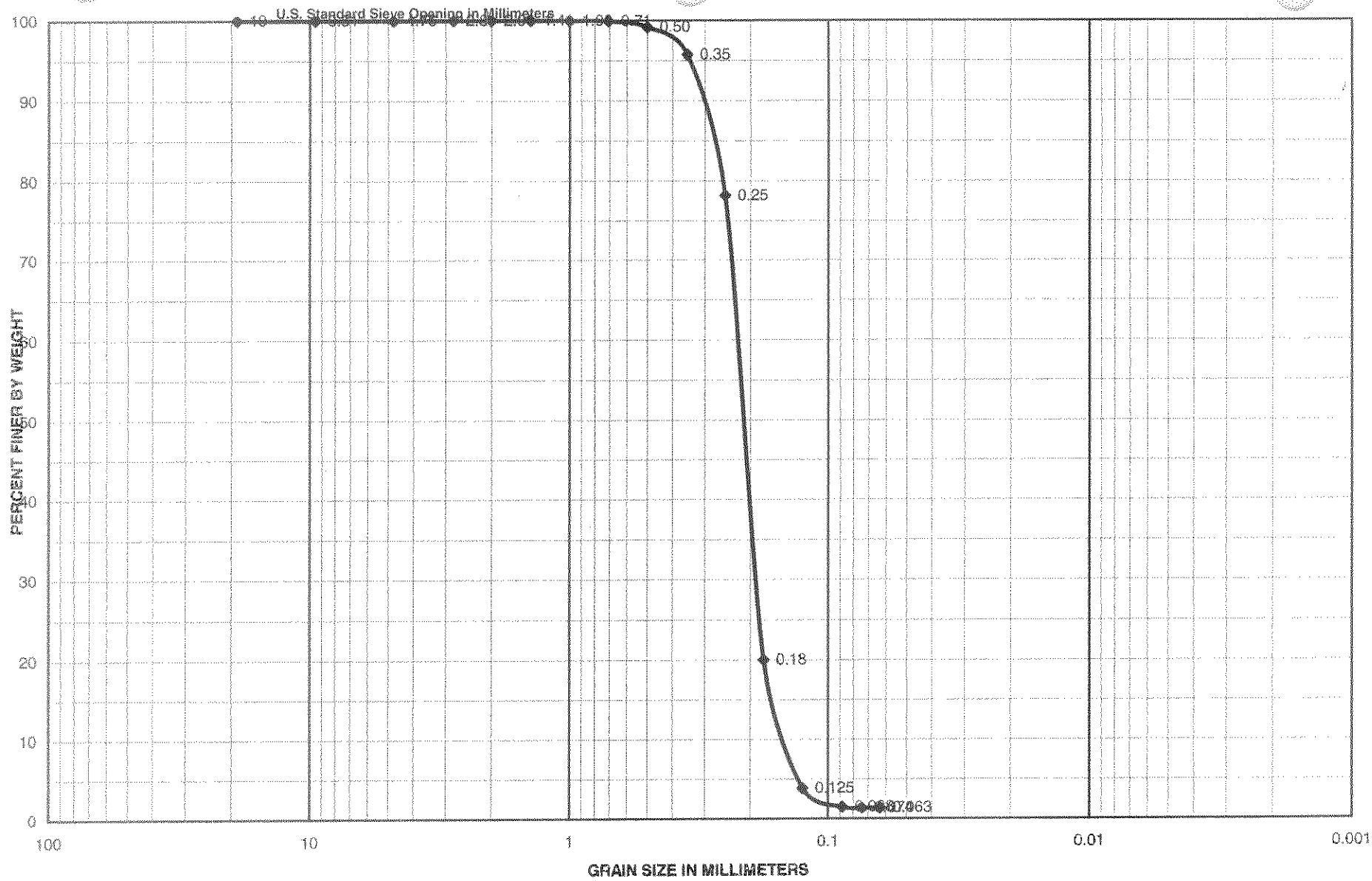
Sample No.	Depth	Classification	Area	Shallotte Inlet
5	15.0-15.5	Olive gray poorly graded sand with few shells, SP	**CATLIN Geotechnical Laboratory**	
		6.3% shells	**Boring No.**	SHI-V-09-14
			Date	5/1/2009



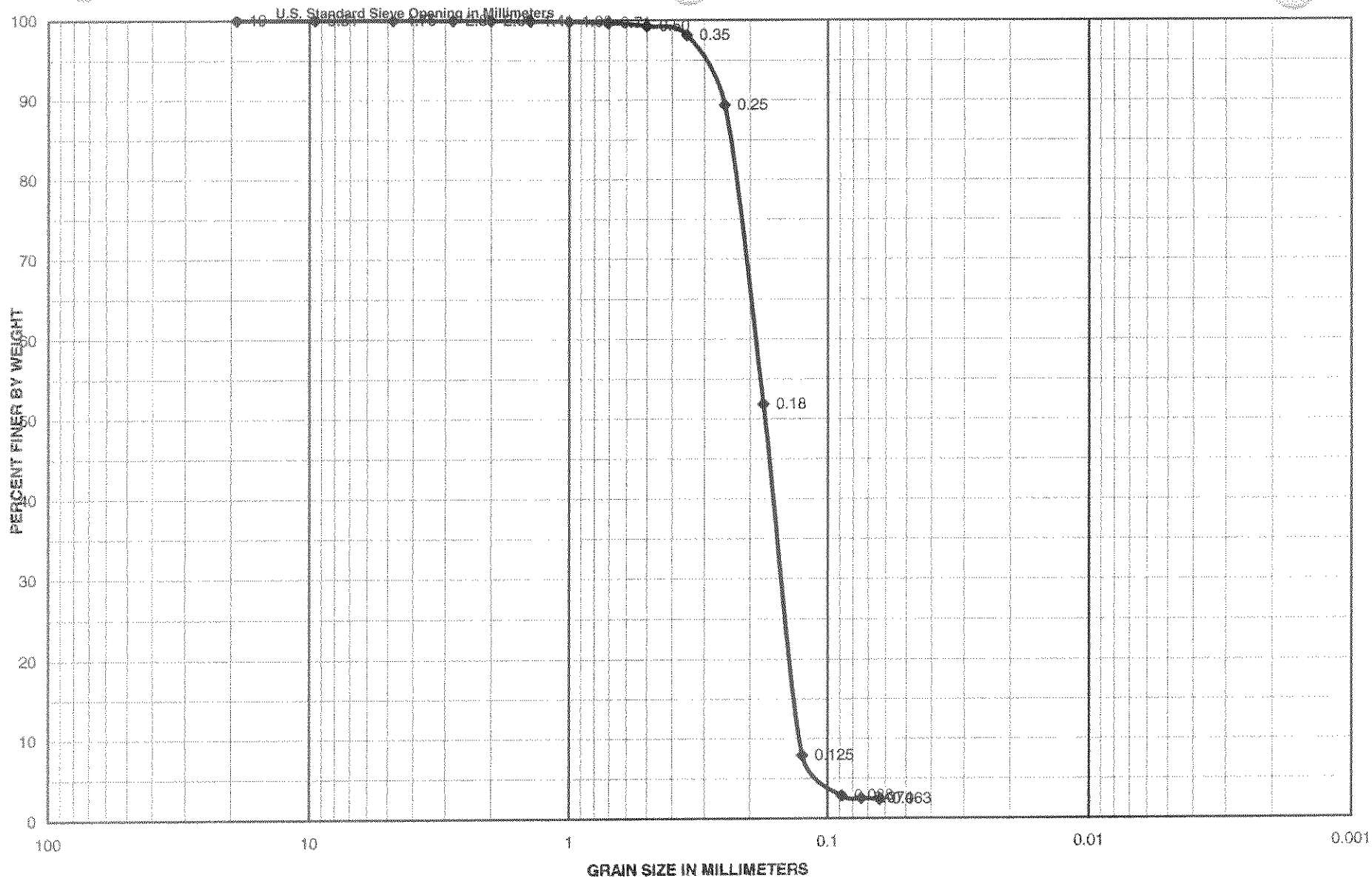
Sample No.	Depth	Classification		
6	17.0-17.5	Dark gray poorly graded sand with silt and little shells, SP-SM	Area	Shallotte Inlet
			CATLIN Geotechnical Laboratory	
		18.8% shells	Boring No.	SHI-V-09-14
			Date	5/1/2009



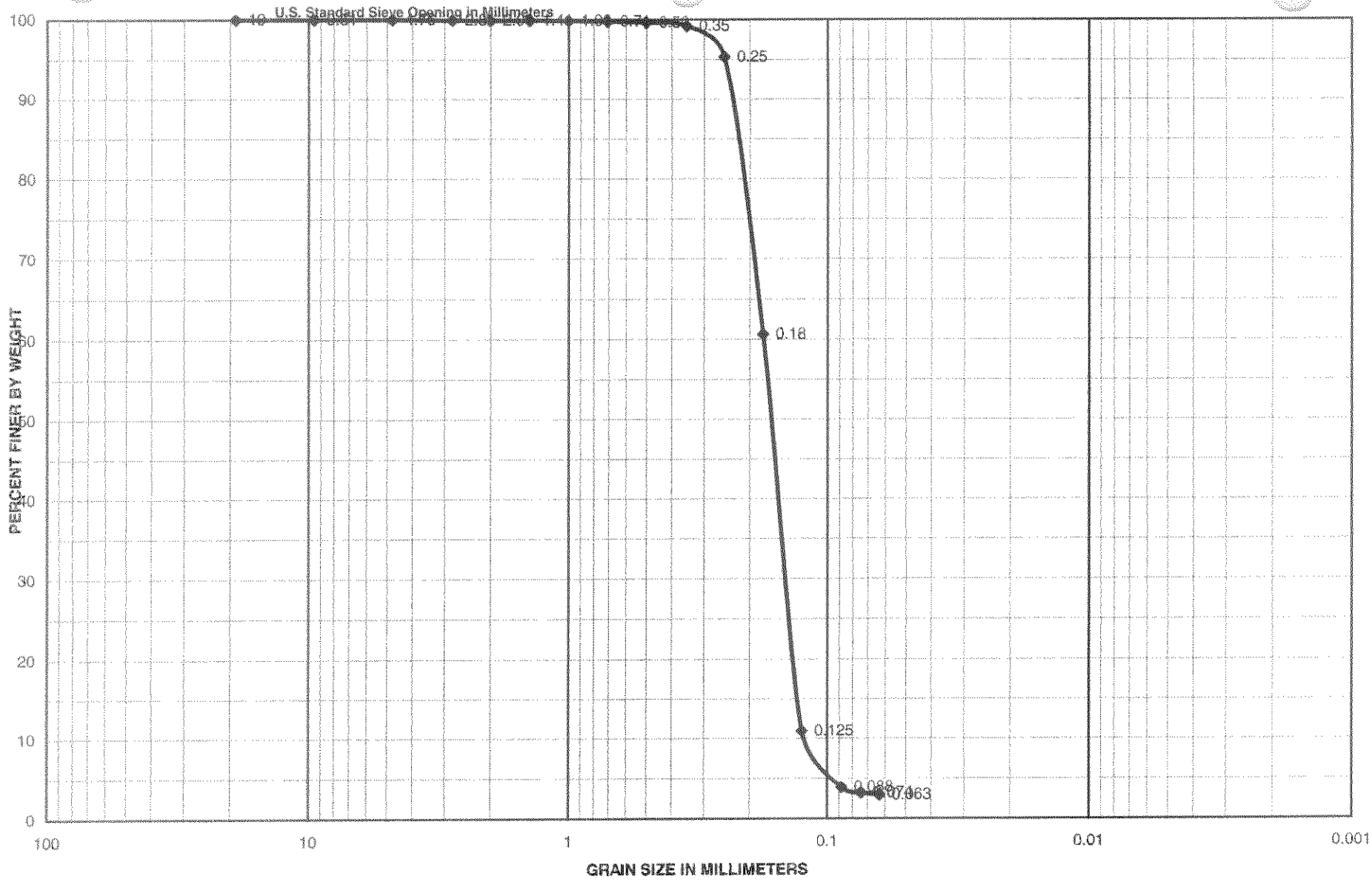
Sample No.	Depth	Classification	Area	Shallotte Inlet
1	3.2-3.7	Olive gray poorly graded sand with trace shells, SP	CATLIN Geotechnical Laboratory	
		0.2% shells	Boring No.	SHI-V-09-15
			Date	5/1/2009



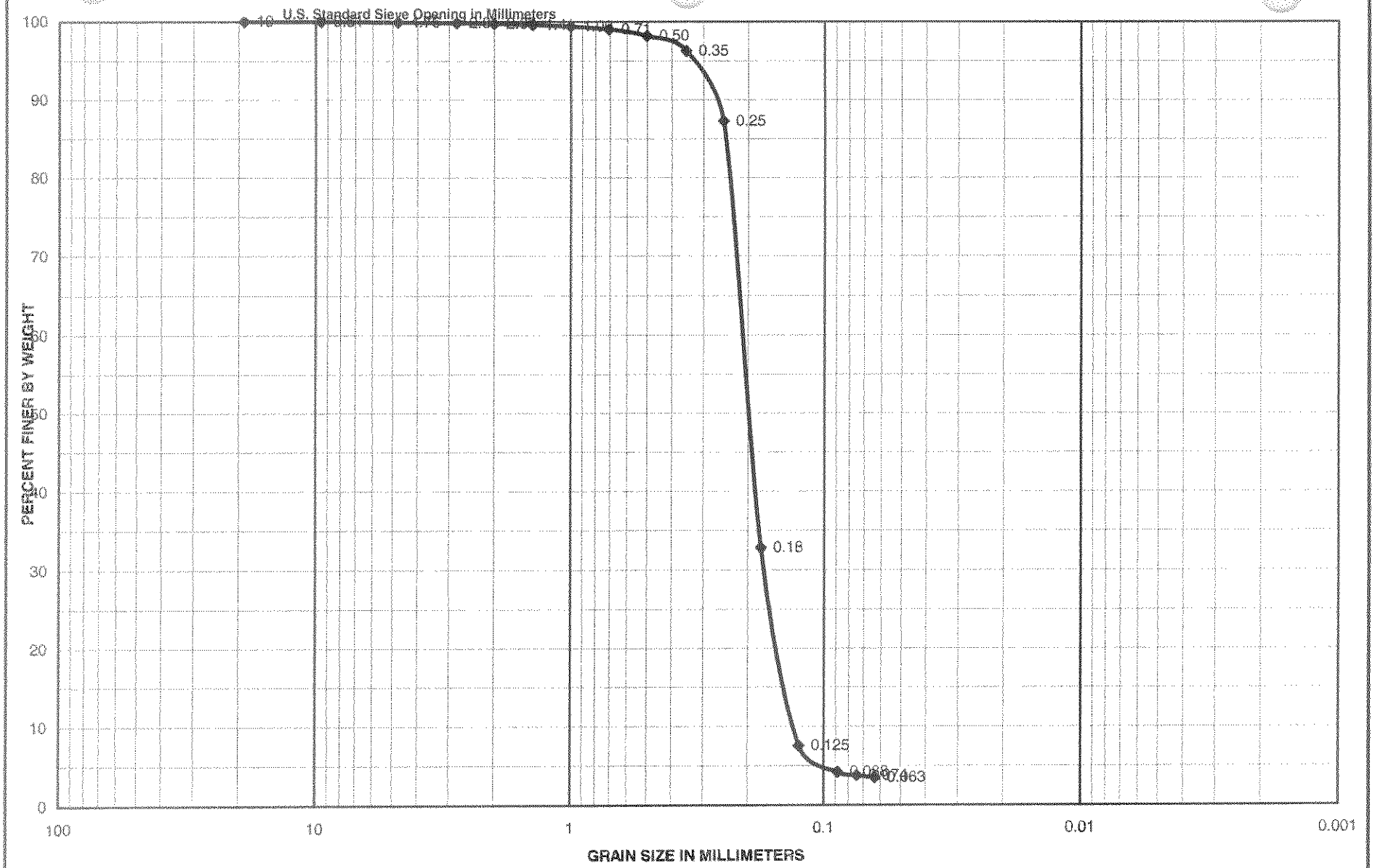
Sample No.	Depth	Classification		
2	5.5-6.0	Olive gray poorly graded sand, SP	**Area**	Shallotte Inlet
			CATLIN Geotechnical Laboratory	
			Boring No.	SHI-V-09-15
			Date	5/1/2009



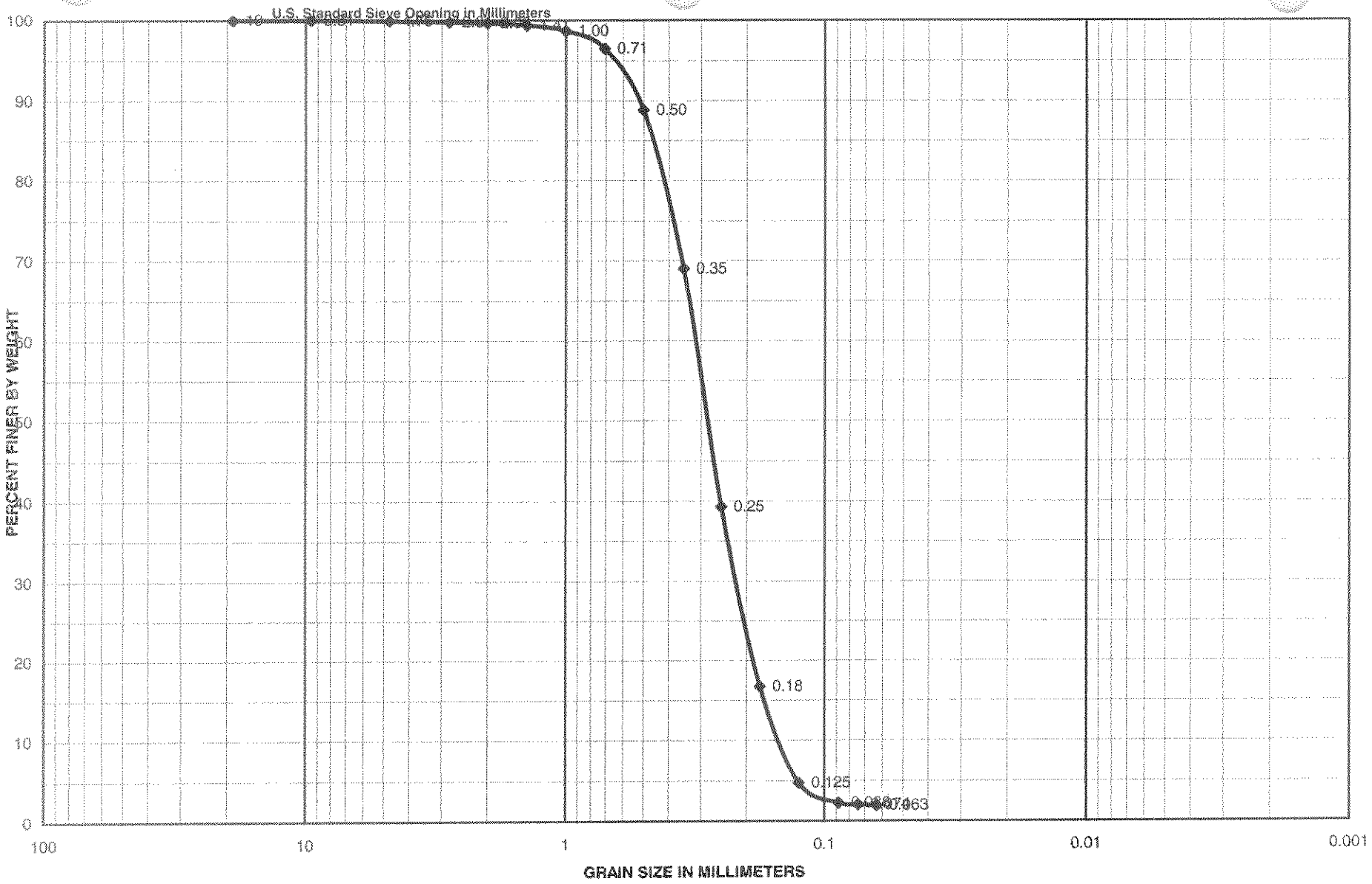
Sample No.	Depth	Classification		
3	8.0-8.5	Olive gray poorly graded sand with trace shells, SP	Area	Shallotte Inlet
		0.4% shells	CATLIN Geotechnical Laboratory	
			Boring No.	SHI-V-09-15
			Date	5/1/2009



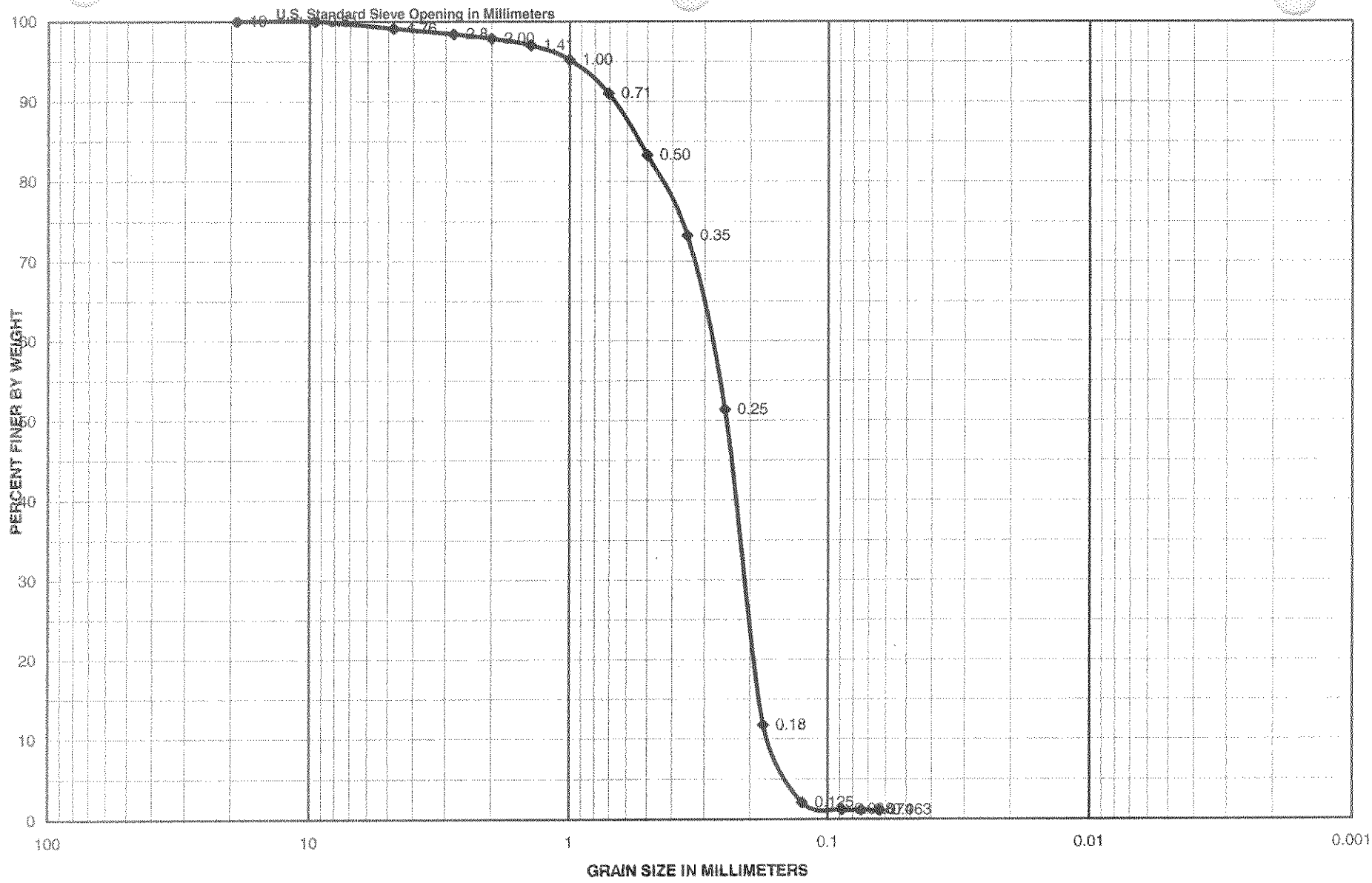
Sample No.	Depth	Classification	Area	Shallotte Inlet
4	10.0-10.5	Olive gray poorly graded sand with trace shells, SP	CATLIN Geotechnical Laboratory	
		0.1% shells	Boring No.	SHI-V-09-15
			Date	5/1/2009



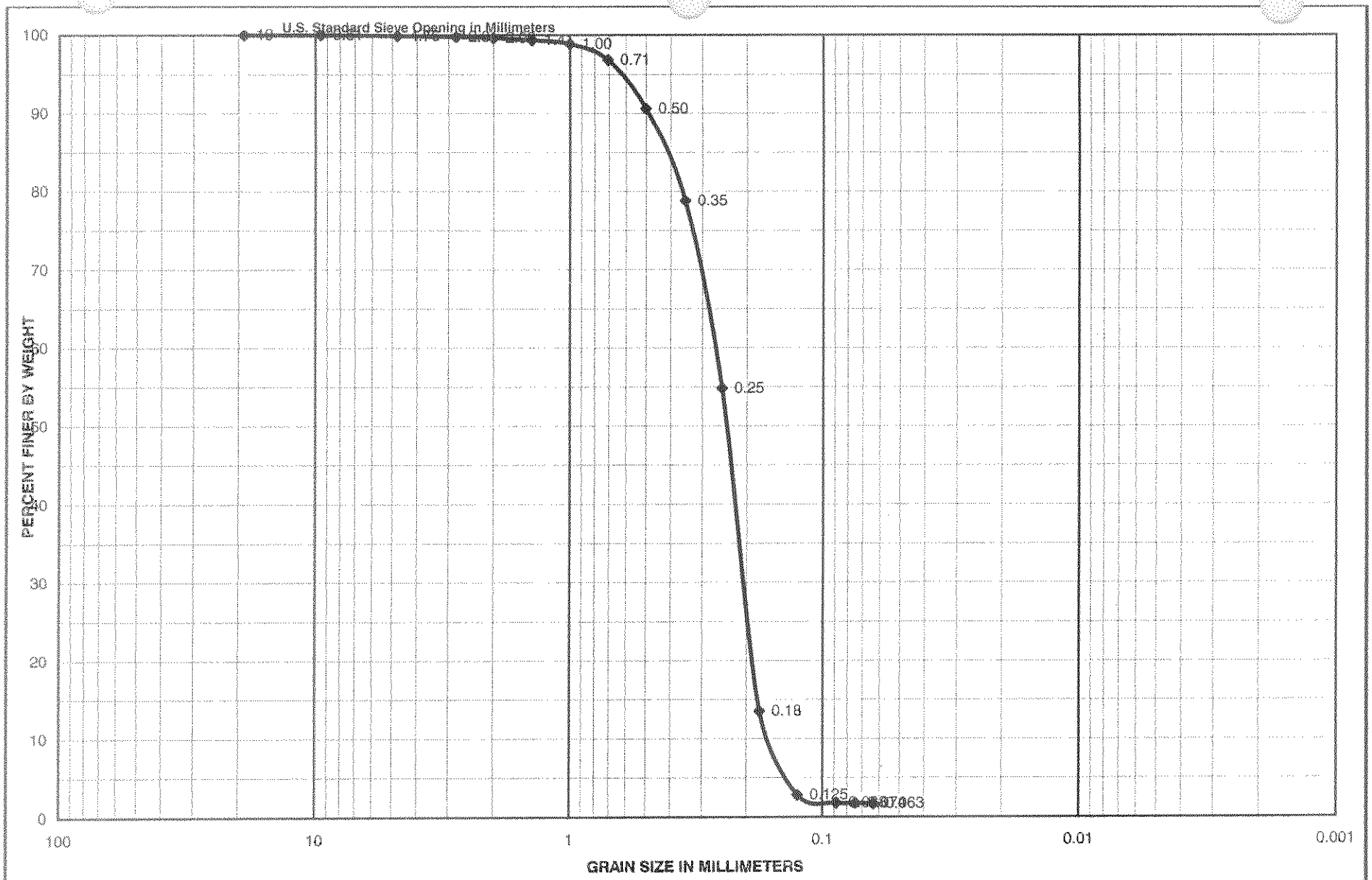
Sample No.	Depth	Classification		
5	12.0-12.5	Olive gray poorly graded sand with trace shells, SP	Area	Shallotte Inlet
			CATLIN Geotechnical Laboratory	
		1.0% shells	Boring No.	SHI-V-09-15
			Date	5/1/2009



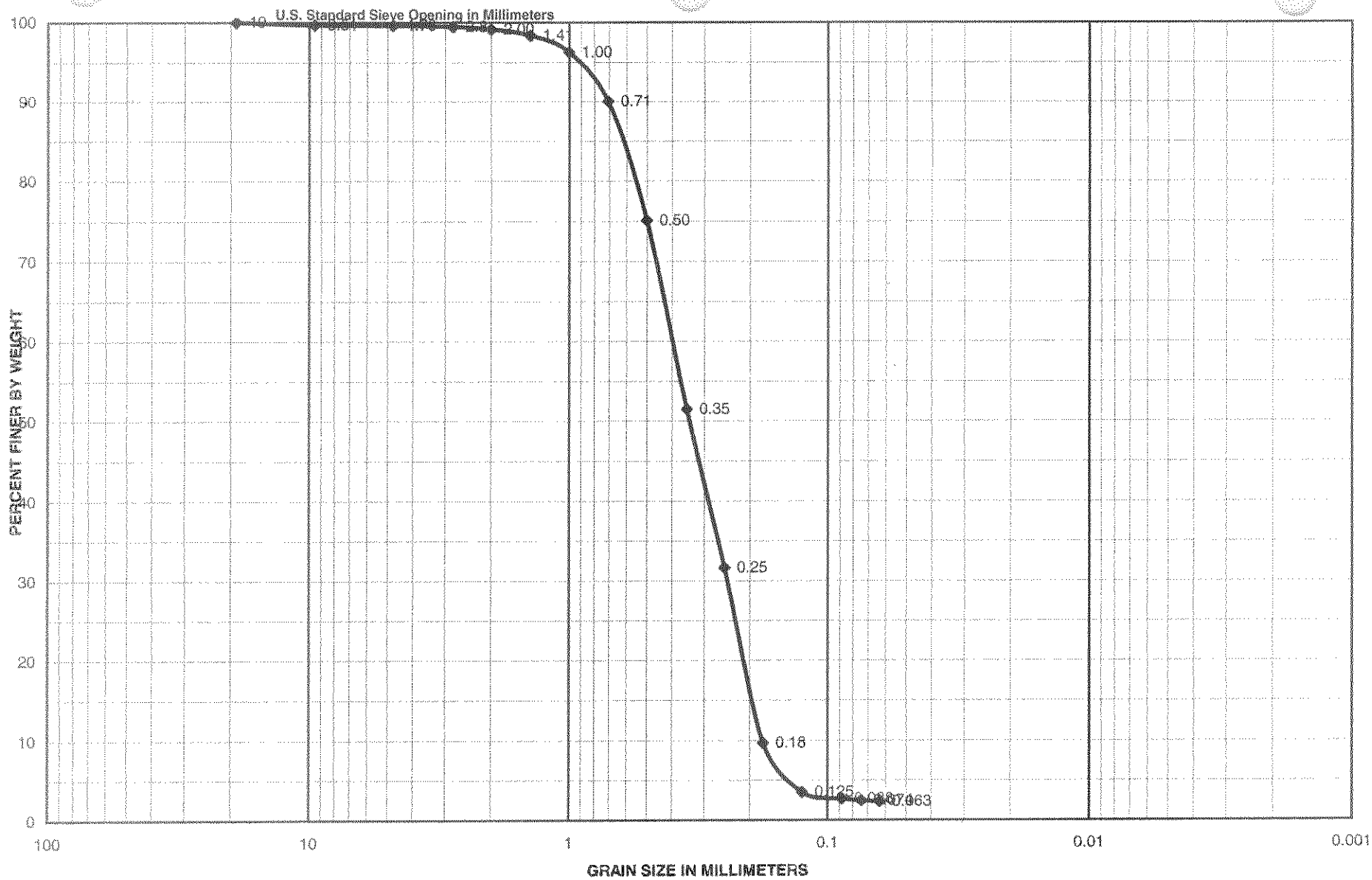
Sample No.	Depth	Classification		
6	14.0-14.5	Olive gray poorly graded sand with trace shells, SP	Area	Shallotte Inlet
		3.5% shells	CATLIN Geotechnical Laboratory	
			Boring No.	SHI-V-09-15
			Date	5/1/2009



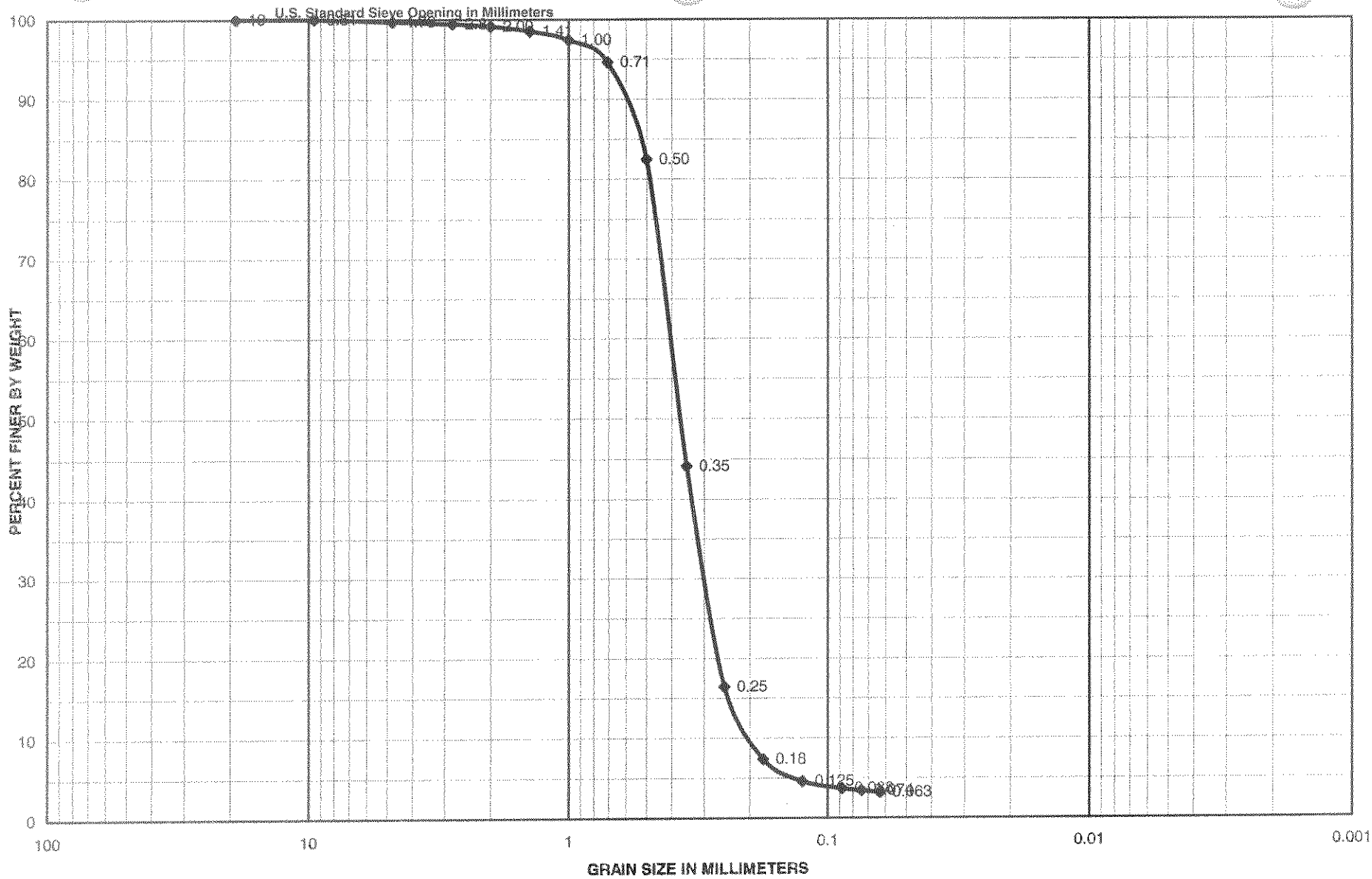
Sample No.	Depth	Classification		
1	3.8-4.3	Olive gray poorly graded sand with trace shells, SP	Area	Shallotte Inlet
		4.8% shells	CATLIN Geotechnical Laboratory	
			Boring No.	SHI-V-09-16
			Date	5/1/2009



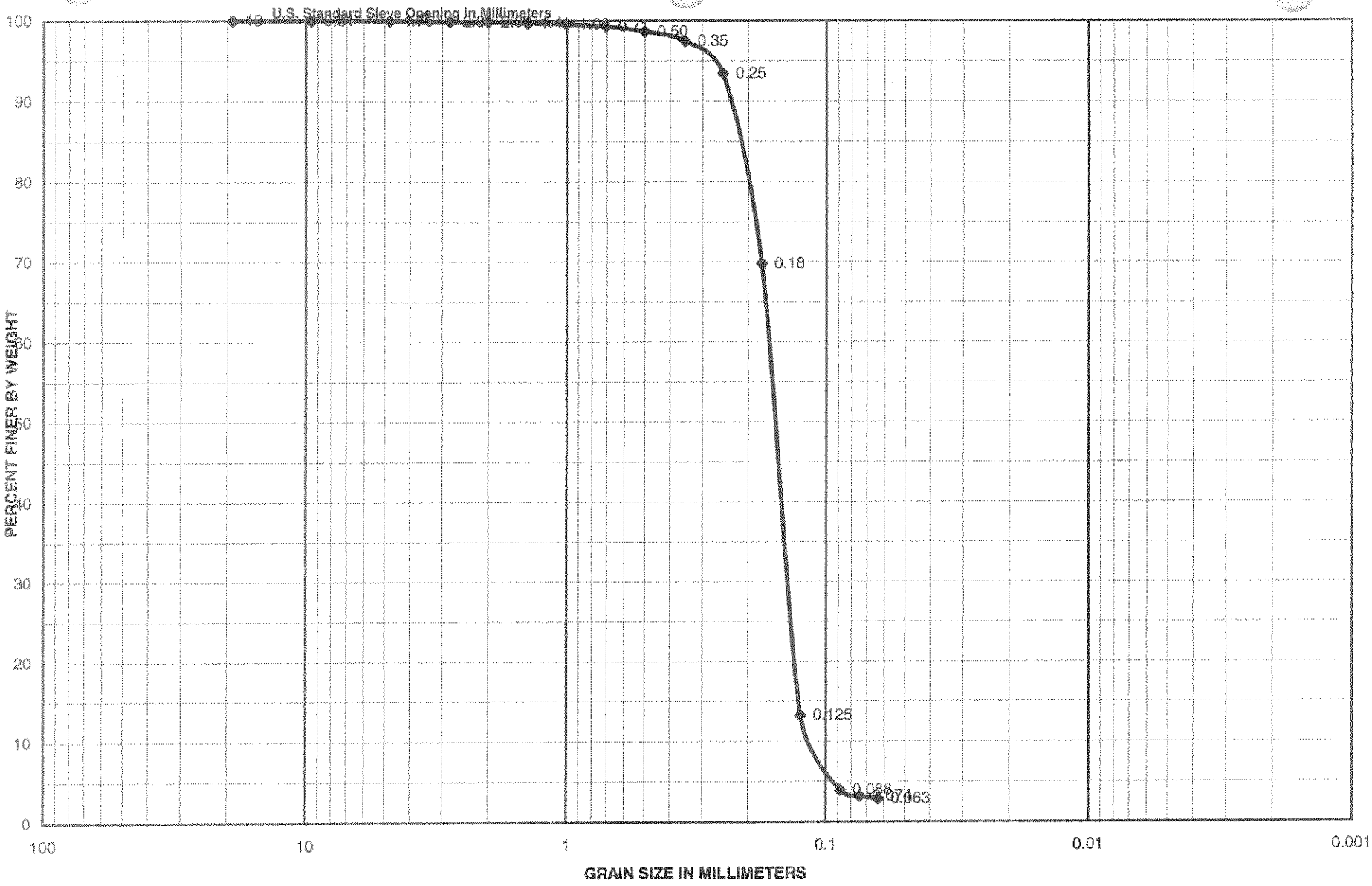
Sample No.	Depth	Classification	Area	Shallotte Inlet
2	6.0-6.5	Olive gray poorly graded sand with trace shells, SP	**CATLIN Geotechnical Laboratory**	
		3.2% shells	**Boring No.**	SHI-V-09-16
			Date	5/4/2009



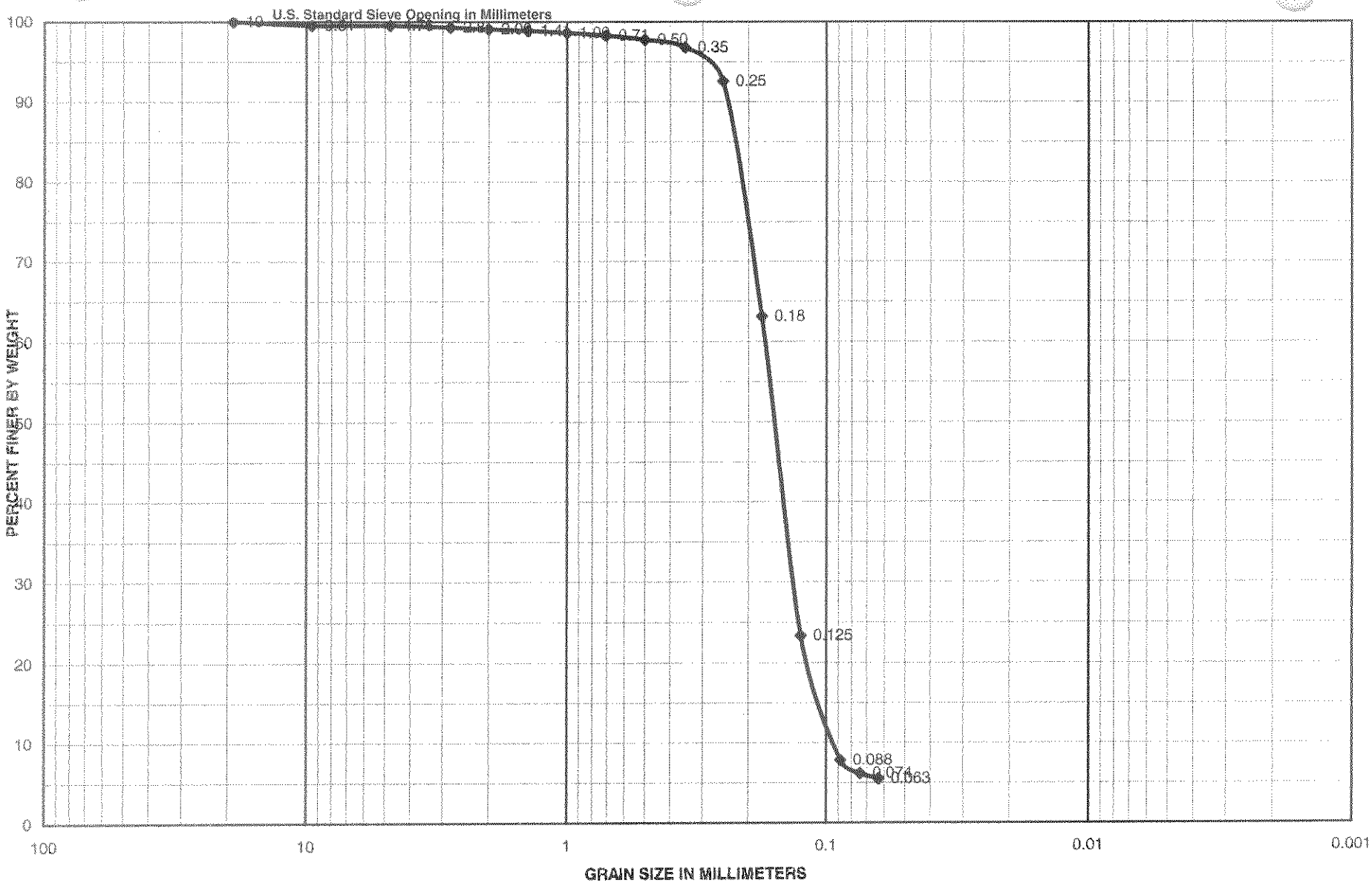
Sample No.	Depth	Classification		
3	8.5-9.0	Olive gray poorly graded sand with trace shells, SP	Area	Shallotte Inlet
			CATLIN Geotechnical Laboratory	
		3.8% shells	Boring No.	SHI-V-09-16
			Date	5/4/2009



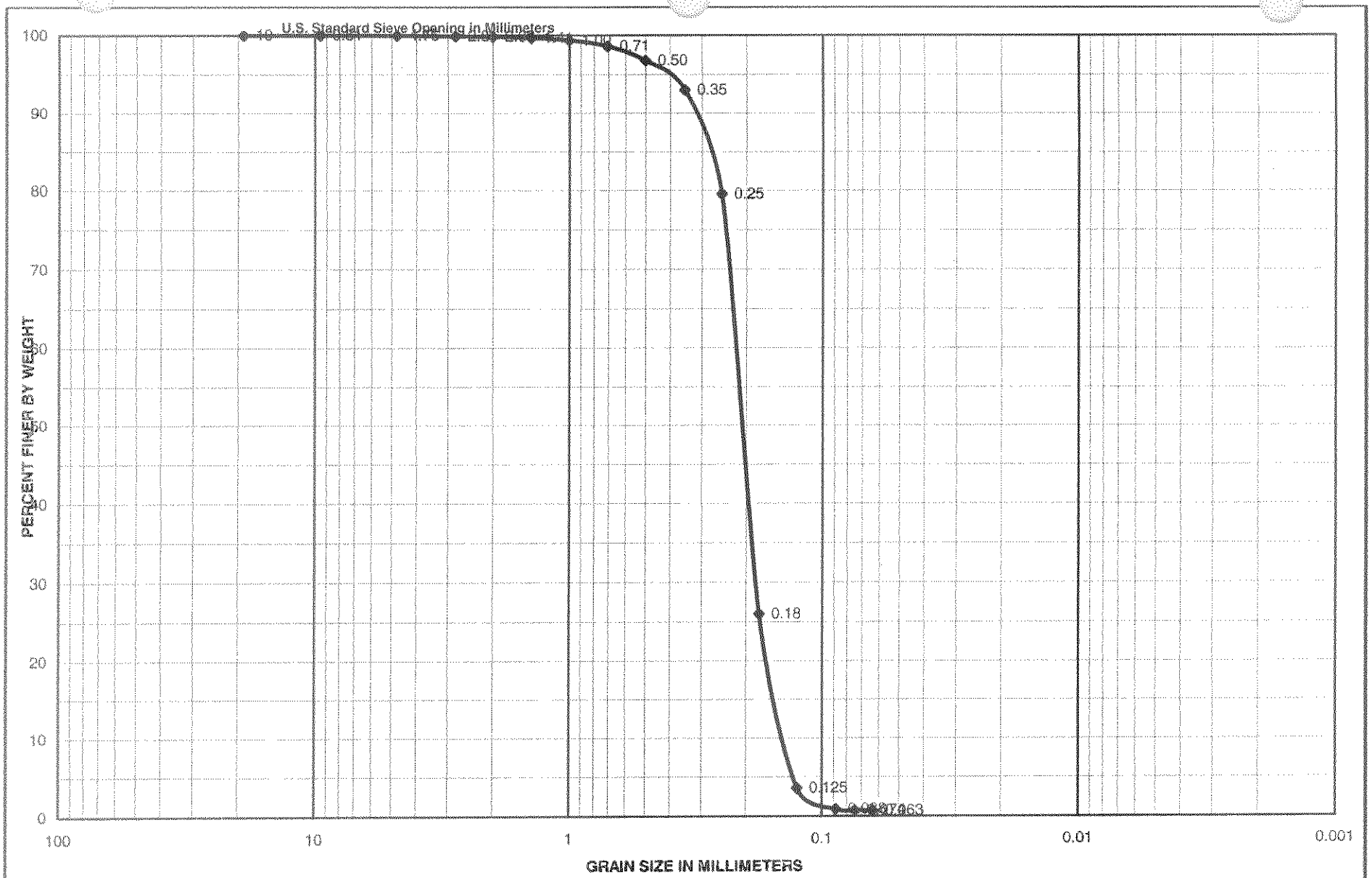
Sample No.	Depth	Classification	Area	Shallotte Inlet
4	11.0-11.5	Olive gray poorly graded sand with trace shells, SP	**CATLIN Geotechnical Laboratory**	
		5.4% shells	**Boring No.**	SHI-V-09-16
			Date	5/4/2009



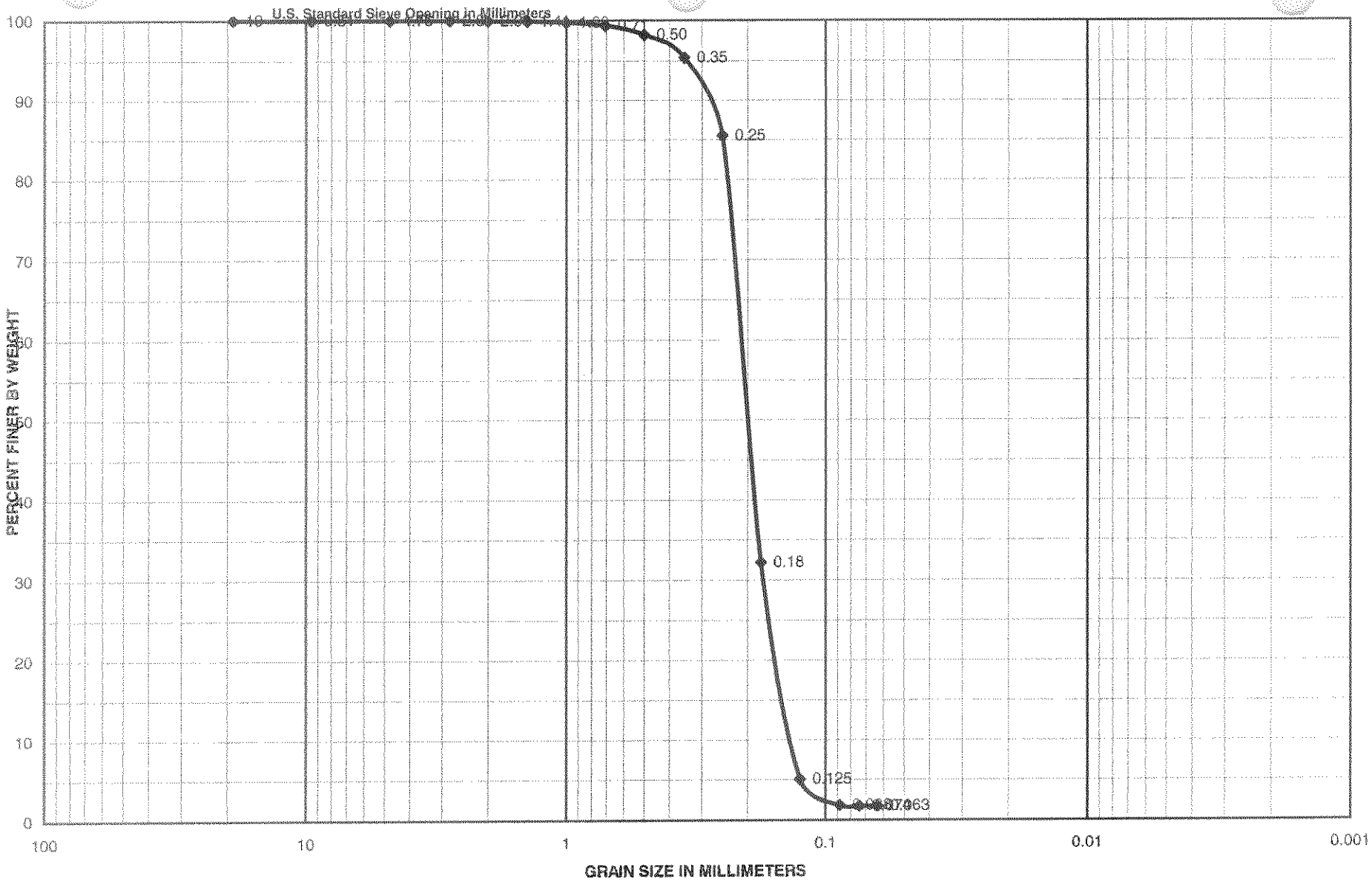
Sample No.	Depth	Classification	Area	Shallotte Inlet
5	13.0-13.5	Olive gray poorly graded sand with trace shells, SP	CATLIN Geotechnical Laboratory	
		0.7% shells	Boring No.	SHI-V-09-16
			Date	5/4/2009



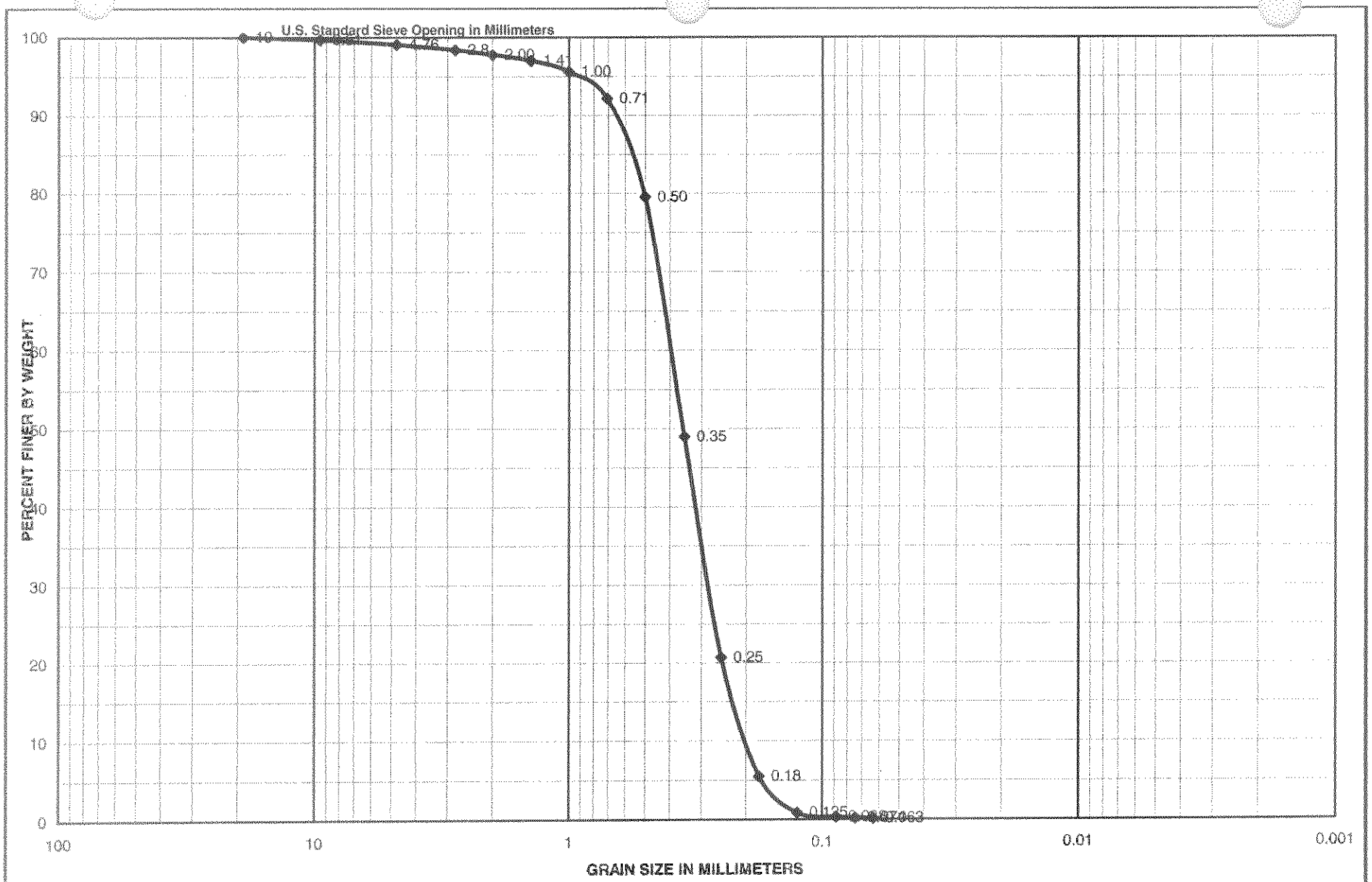
Sample No.	Depth	Classification		
6	15.0-15.5	Olive gray poorly graded sand with silt and trace shells, SP-SM	**Area**	Shallotte Inlet
			CATLIN Geotechnical Laboratory	
		1.8% shells	**Boring No.**	SHI-V-09-16
			Date	5/4/2009



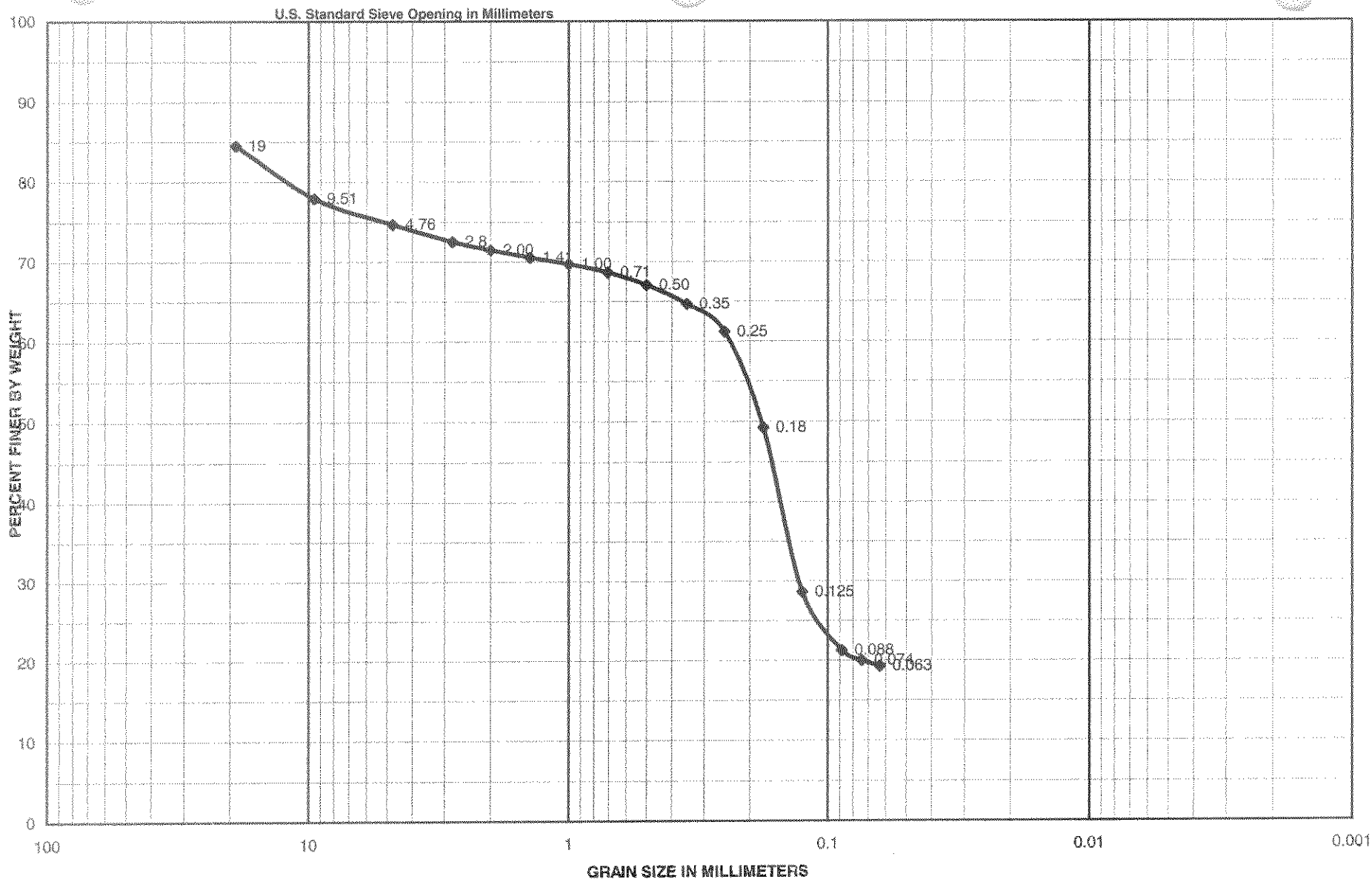
Sample No.	Depth	Classification	Area	Shallotte Inlet
1	5.7-6.2	Olive gray poorly graded sand with trace shells, SP	CATLIN Geotechnical Laboratory	
		1.4% shells	Boring No.	SHI-V-09-17
			Date	5/4/2009



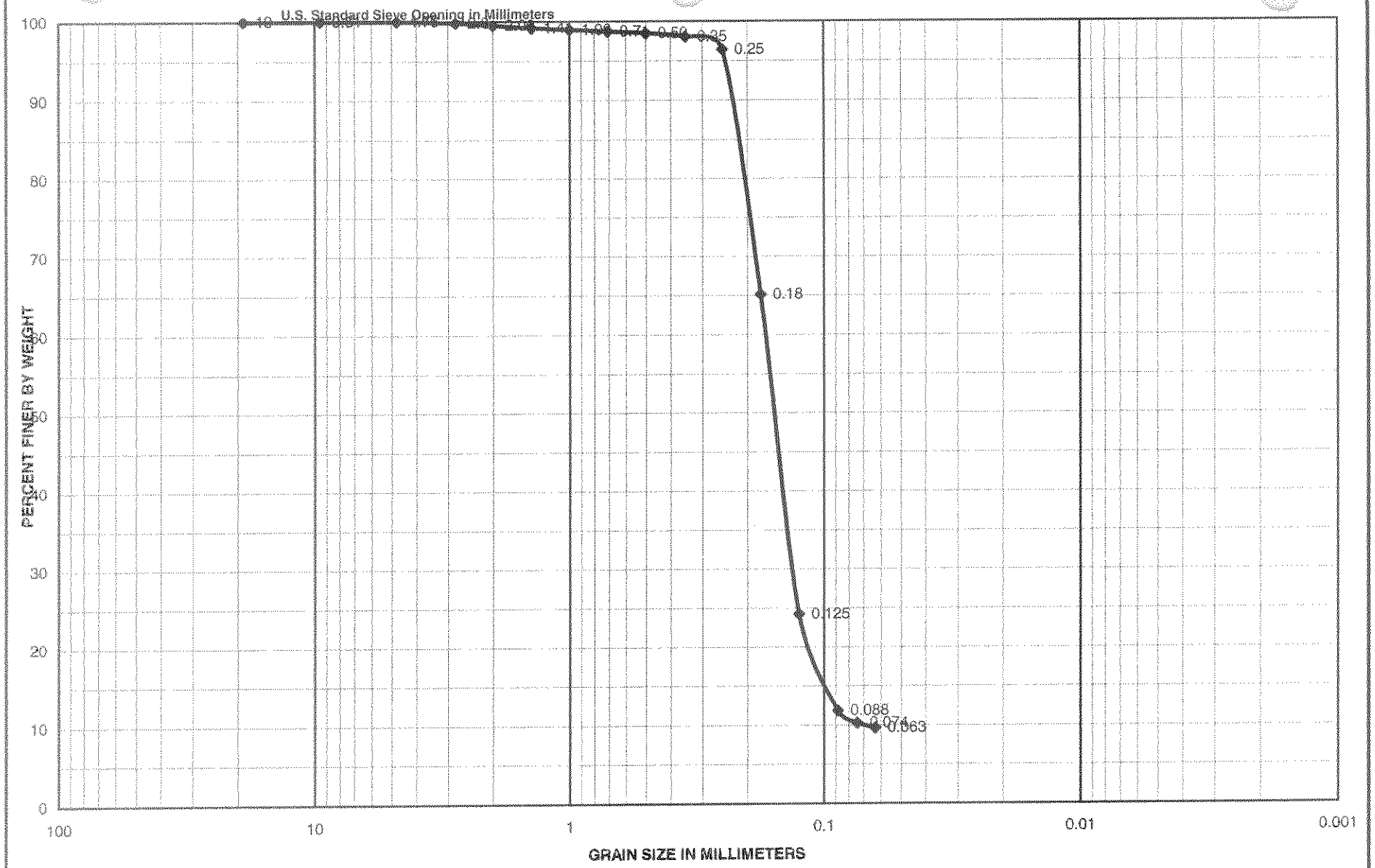
Sample No.	Depth	Classification		
2	8.0-8.5	Olive gray poorly graded sand with trace shells, SP	Area	Shallotte Inlet
			CATLIN Geotechnical Laboratory	
		0.6% shells	Boring No.	SHI-V-09-17
			Date	5/4/2009



Sample No.	Depth	Classification		
3	10.0-10.5	Olive gray poorly graded sand with few shells, SP	Area	Shallotte Inlet
		7.8% shells	CATLIN Geotechnical Laboratory	
			Boring No.	SHI-V-09-17
			Date	5/4/2009



Sample No.	Depth	Classification		
4	12.7-13.2	Dark gray silty sand with some shells, SM	Area	Shallotte Inlet
		31.4% shells	CATLIN Geotechnical Laboratory	
			Boring No.	SHI-V-09-17
			Date	5/4/2009



Sample No.	Depth	Classification		
5	13.2-13.7	Light/olive gray poorly graded sand with silt and trace shells, SP-SM	Area	Shallotte Inlet
			CATLIN Geotechnical Laboratory	
		1.3% shells	Boring No.	SHI-V-09-17
			Date	5/4/2009