



# WOLF TECHNOLOGIES, INC.

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

## VISUAL SHELL CONTENT

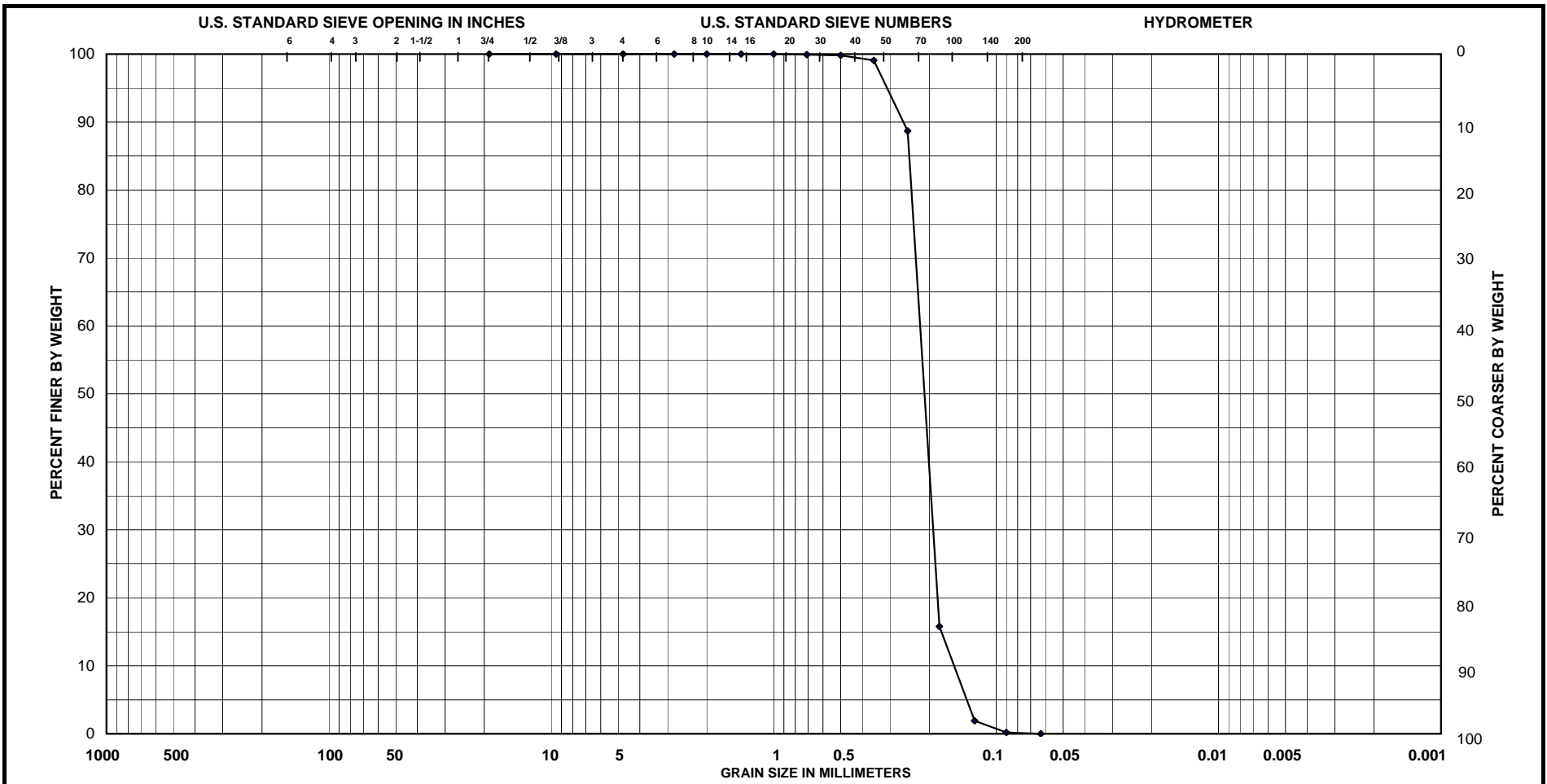
### GRAIN SIZE AND VISUAL SHELL CONTENT

Project:	<b>Topsail Beach, Surf City &amp; North Topsail</b>	Depth:	
Project No.:	<b>1584-01-40</b>	Date:	<b>7/25/2003</b>
Boring No.:	<b>TB1-TOE</b>		
Sample No.:	<b>1</b>		
Description:	<b>SAND, poorly-graded, mostly fine-grained quartz, trace carbonate, very pale brown (SP)</b>		

Tare Weight, (g):	<b>50.35</b>	
Dry Wt. Before Washing (g):	<b>166.07</b>	(with tare)
Dry Weight After Washing (g):	<b>166.03</b>	(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	0.00	100.00	0	0.00
#14	1.400	0.00	100.00	0	0.00
#18	1.000	0.02	99.98	5	0.00
#25	0.710	0.05	99.94	10	0.01
#35	0.500	0.15	99.81	10	0.02
#45	0.355	0.84	99.08	5	0.04
#60	0.250	12.04	88.68	5	0.60
#80	0.180	84.35	15.79	3	2.53
#120	0.125	16.06	1.91	1	0.16
#170	0.090	2.00	0.18	1	0.02
#230	0.063	0.21	0.00	1	0.00

**Total Shell Content:** **3** %



COBBLES	GRAVEL		SAND			SILT OR CLAY
	COARSE	FINE	COARSE	MEDIUM	FINE	

Sample No.	Elev. Or Depth	Classification	% CO <sub>3</sub>	G <sub>s</sub>	Nat w%	LL	PL	PI	Project
1		SAND, poorly-graded, mostly fine-grained quartz, trace carbonate, very pale brown (SP)	3						Topsail Beach, Surf City & North Topsail
									Area
									Boring No. TB1-TOE
									Date 7/25/2003

**GRADATION CURVES**



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## VISUAL SHELL CONTENT

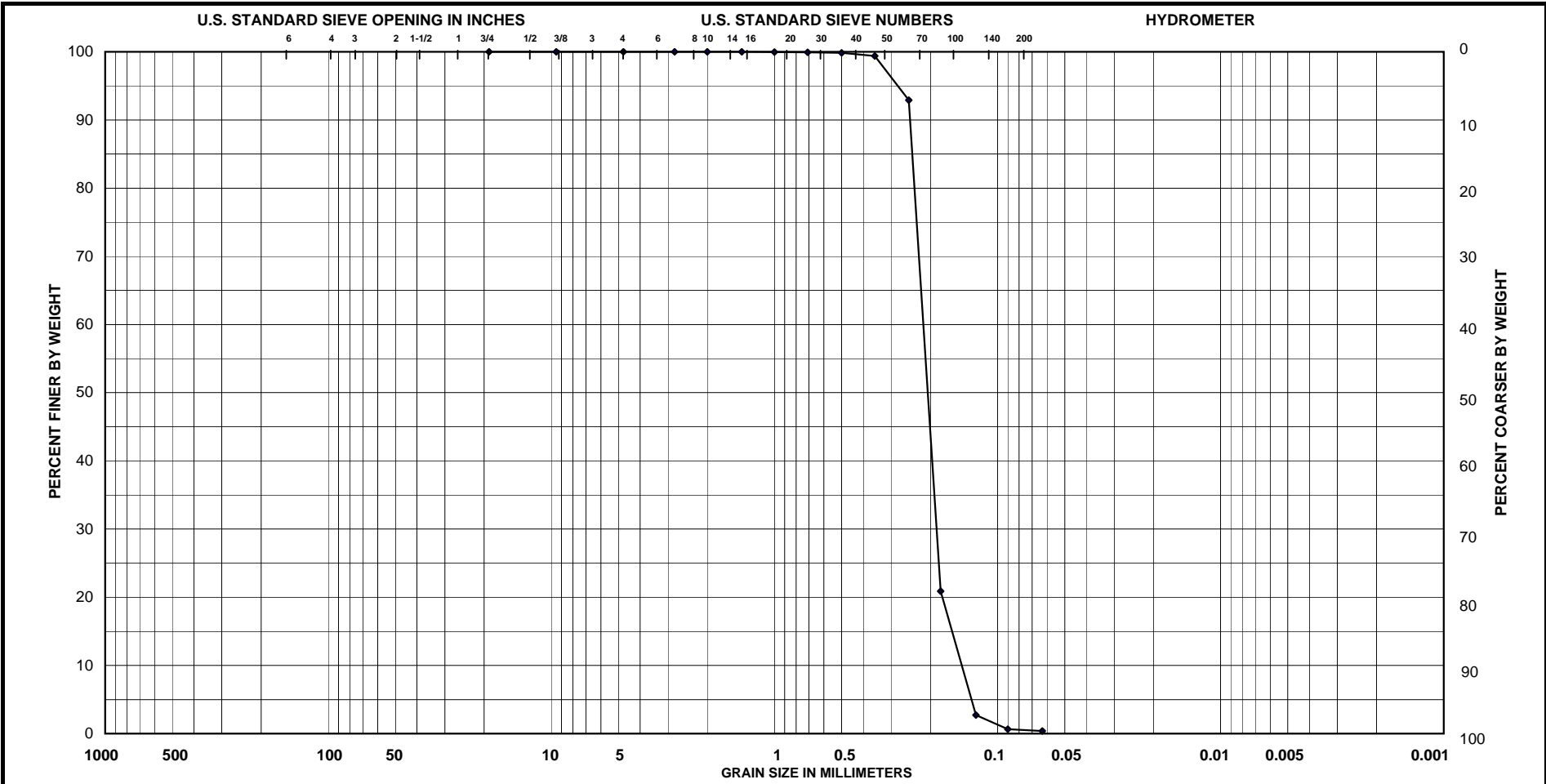
### GRAIN SIZE AND VISUAL SHELL CONTENT

Project:	<b>Topsail Beach, Surf City &amp; North Topsail</b>	Depth:	<b>CREST</b>
Project No.:	<b>1584-01-40</b>	Date:	<b>7/25/2003</b>
Boring No.:	<b>TB1-CREST</b>		
Sample No.:	<b>1</b>		
Description:	<b>SAND, poorly-graded, mostly fine-grained quartz, trace carbonate, light gray (SP)</b>		

Tare Weight, (g):	<b>50.11</b>	
Dry Wt. Before Washing (g):	<b>150.55</b>	(with tare)
Dry Weight After Washing (g):	<b>150.46</b>	(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	0.00	100.00	0	0.00
#14	1.400	0.01	99.99	0	0.00
#18	1.000	0.02	99.97	0	0.00
#25	0.710	0.05	99.92	10	0.01
#35	0.500	0.06	99.86	15	0.01
#45	0.355	0.49	99.37	20	0.10
#60	0.250	6.49	92.91	5	0.32
#80	0.180	72.34	20.89	3	2.17
#120	0.125	18.26	2.71	1	0.18
#170	0.090	2.06	0.66	1	0.02
#230	0.063	0.28	0.38	1	0.00

**Total Shell Content:** **3** %



COBBLES	GRAVEL		SAND			SILT OR CLAY
	COARSE	FINE	COARSE	MEDIUM	FINE	

Sample No.	Elev. Or Depth	Classification	% CO <sub>3</sub>	G <sub>s</sub>	Nat w%	LL	PL	PI	Project	
♦ 1	CREST	SAND, poorly-graded, mostly fine-grained quartz, trace carbonate, light gray (SP)	3						Topsail Beach, Surf City & North Topsail	
									Area	
									Boring No. TB1-CREST	
									Date 7/25/2003	

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## VISUAL SHELL CONTENT

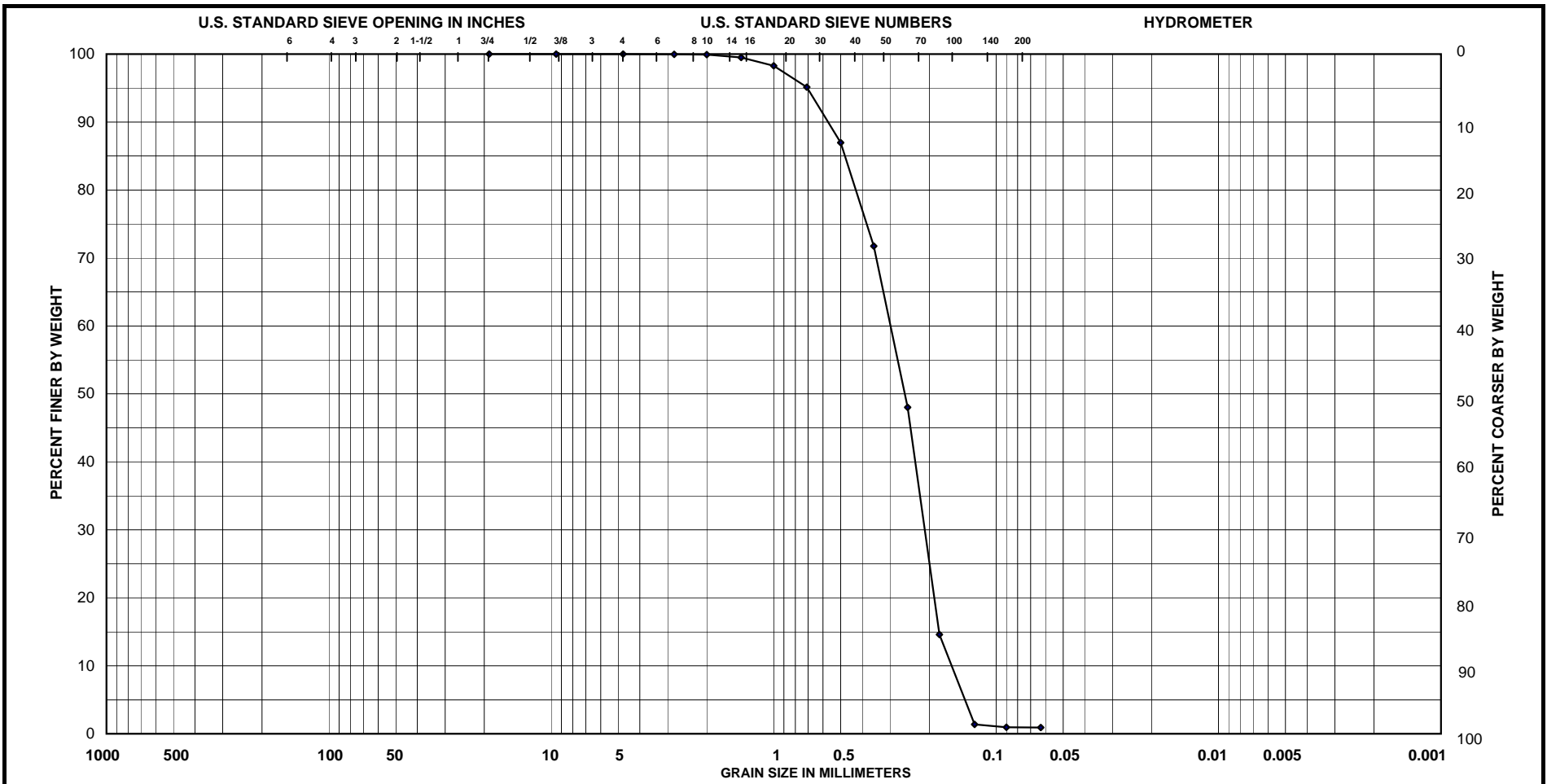
### GRAIN SIZE AND VISUAL SHELL CONTENT

Project:	<b>Topsail Beach, Surf City &amp; North Topsail</b>	Depth:	
Project No.:	<b>1584-01-40</b>	Date:	<b>7/25/2003</b>
Boring No.:	<b>TB1-MHW</b>		
Sample No.:	<b>1</b>		
Description:	<b>SAND, poorly-graded, mostly fine-grained quartz, little carbonate, gray (SP)</b>		

Tare Weight, (g):	<b>50.07</b>	
Dry Wt. Before Washing (g):	<b>129.94</b>	(with tare)
Dry Weight After Washing (g):	<b>129.74</b>	(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	99.97	100	0.02
#10	2.000	0.03	99.94	100	0.03
#14	1.400	0.34	99.51	100	0.34
#18	1.000	1.00	98.26	90	0.90
#25	0.710	2.51	95.12	70	1.76
#35	0.500	6.50	86.98	45	2.93
#45	0.355	12.17	71.74	20	2.43
#60	0.250	18.95	48.02	10	1.90
#80	0.180	26.69	14.60	3	0.80
#120	0.125	10.55	1.39	1	0.11
#170	0.090	0.35	0.95	1	0.00
#230	0.063	0.02	0.93	1	0.00

**Total Shell Content:** **14** %



COBBLES	GRAVEL		SAND			SILT OR CLAY
	COARSE	FINE	COARSE	MEDIUM	FINE	

Sample No.	Elev. Or Depth	Classification	% CO <sub>3</sub>	G <sub>s</sub>	Nat w%	LL	PL	PI	Project
1		SAND, poorly-graded, mostly fine-grained quartz, little carbonate, gray (SP)	14						Topsail Beach, Surf City & North Topsail
									Area
									Boring No. TB1-MHW
									Date 7/25/2003

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## VISUAL SHELL CONTENT

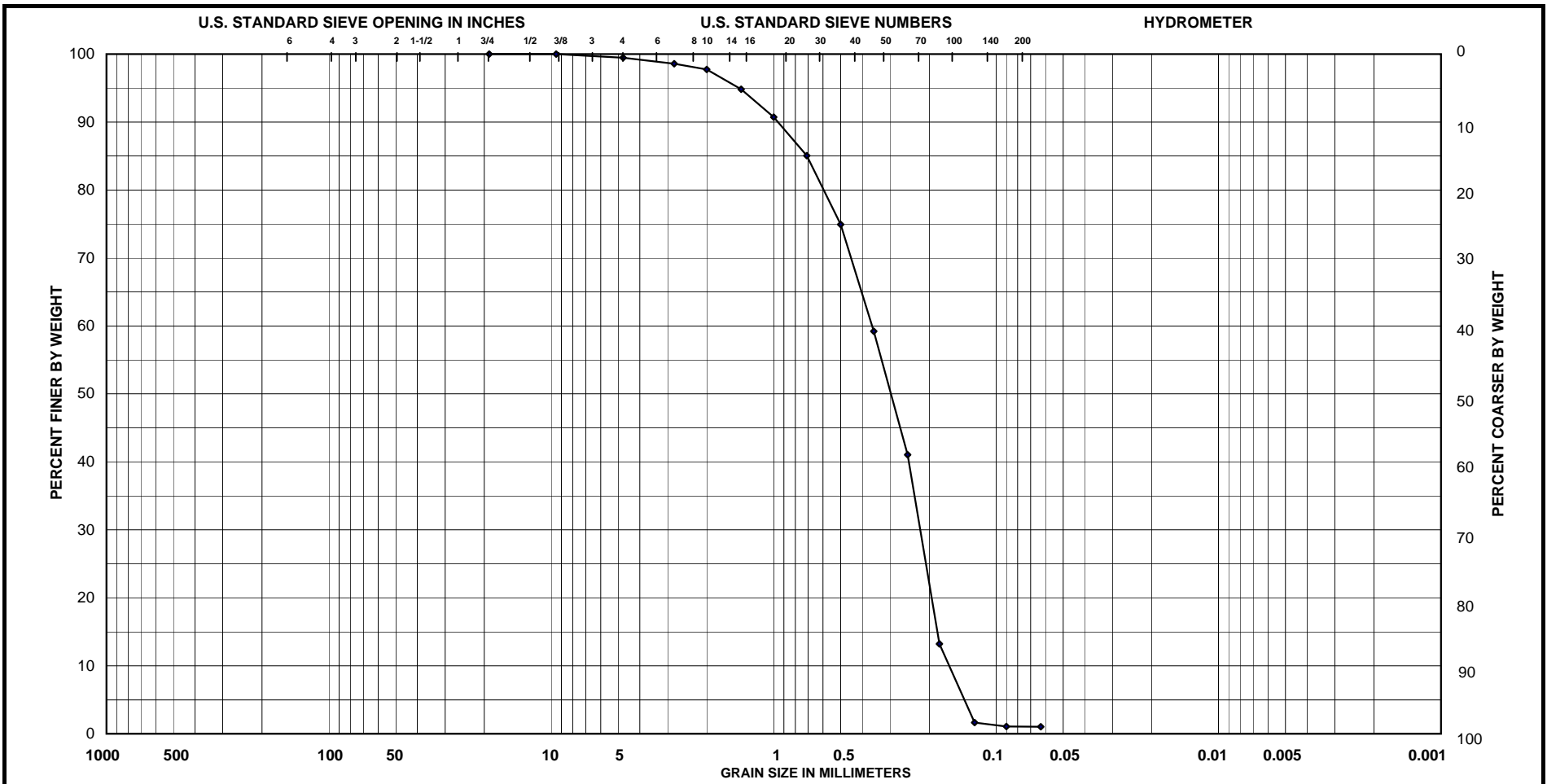
### GRAIN SIZE AND VISUAL SHELL CONTENT

Project:	<b>Topsail Beach, Surf City &amp; North Topsail</b>	Depth:	
Project No.:	<b>1584-01-40</b>	Date:	<b>7/25/2003</b>
Boring No.:	<b>TB1-MSL</b>		
Sample No.:	<b>1</b>		
Description:	<b>SAND, poorly-graded, mostly fine-grained quartz, little carbonate, gray (SP)</b>		

Tare Weight, (g):	<b>49.88</b>	
Dry Wt. Before Washing (g):	<b>174.85</b>	(with tare)
Dry Weight After Washing (g):	<b>173.82</b>	(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	0.68	99.46	100	0.68
#7	2.800	1.09	98.58	100	1.09
#10	2.000	1.06	97.74	100	1.06
#14	1.400	3.64	94.82	80	2.91
#18	1.000	5.11	90.73	75	3.83
#25	0.710	7.12	85.04	60	4.27
#35	0.500	12.62	74.94	45	5.68
#45	0.355	19.64	59.22	30	5.89
#60	0.250	22.70	41.06	10	2.27
#80	0.180	34.79	13.22	1	0.35
#120	0.125	14.47	1.64	1	0.14
#170	0.090	0.71	1.07	1	0.01
#230	0.063	0.03	1.05	1	0.00

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



<b>COBBLES</b>	<b>GRAVEL</b>		<b>SAND</b>			<b>SILT OR CLAY</b>
	COARSE	FINE	COARSE	MEDIUM	FINE	

Sample No.	Elev. Or Depth	Classification	% CO <sub>3</sub>	G <sub>s</sub>	Nat w%	LL	PL	PI	Project
♦ 1		SAND, poorly-graded, mostly fine-grained quartz, little carbonate, gray (SP)	23						Topsail Beach, Surf City & North Topsail
									Area
									Boring No. TB1-MSL
									Date 7/25/2003

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## VISUAL SHELL CONTENT

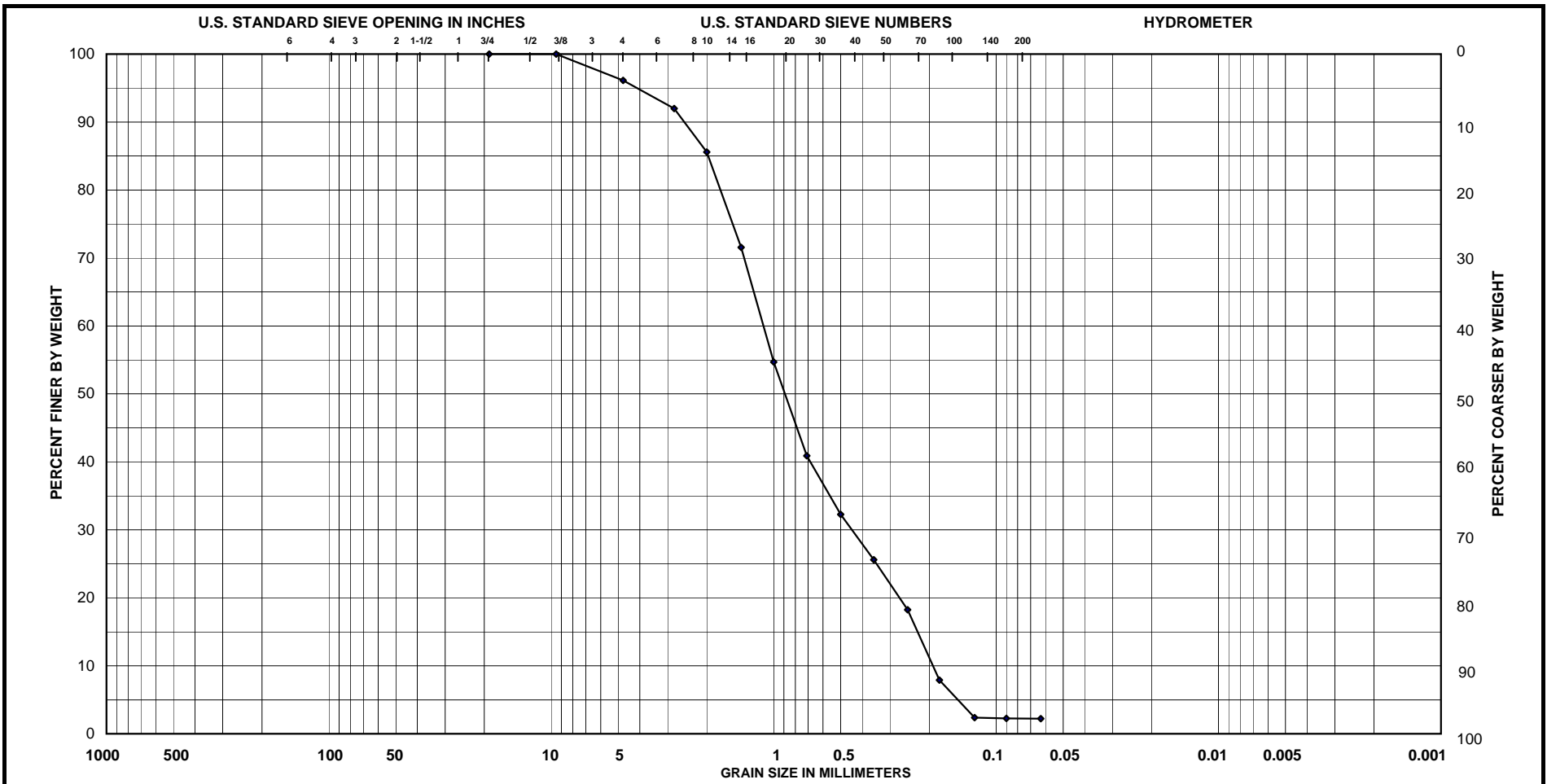
### GRAIN SIZE AND VISUAL SHELL CONTENT

Project:	<b>Topsail Beach, Surf City &amp; North Topsail</b>	Depth:	
Project No.:	<b>1584-01-40</b>	Date:	<b>7/25/2003</b>
Boring No.:	<b>TB1-MLW</b>		
Sample No.:	<b>1</b>		
Description:	<b>SAND, poorly-graded, mostly coarse to medium-grained carbonate, some medium to fine-grained quartz, gray (SP)</b>		

Tare Weight, (g):	<b>49.98</b>	
Dry Wt. Before Washing (g):	<b>158.88</b>	(with tare)
Dry Weight After Washing (g):	<b>158.18</b>	(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	4.23	96.12	100	4.23
#7	2.800	4.51	91.97	100	4.51
#10	2.000	6.97	85.57	100	6.97
#14	1.400	15.28	71.54	85	12.99
#18	1.000	18.36	54.68	70	12.85
#25	0.710	15.02	40.89	65	9.76
#35	0.500	9.38	32.28	45	4.22
#45	0.355	7.25	25.62	30	2.18
#60	0.250	8.02	18.26	10	0.80
#80	0.180	11.30	7.88	3	0.34
#120	0.125	6.01	2.36	1	0.06
#170	0.090	0.12	2.25	1	0.00
#230	0.063	0.01	2.24	1	0.00

**Total Shell Content:** **54** %



COBBLES	GRAVEL		SAND			SILT OR CLAY
	COARSE	FINE	COARSE	MEDIUM	FINE	

Sample No.	Elev. Or Depth	Classification	% CO <sub>3</sub>	G <sub>s</sub>	Nat w%	LL	PL	PI	Project
1		SAND, poorly-graded, mostly coarse to medium-grained carbonate, some medium to fine-grained quartz, gray (SP)	54						Topsail Beach, Surf City & North Topsail
									Area
									Boring No. TB1-MLW
									Date 7/25/2003

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## VISUAL SHELL CONTENT

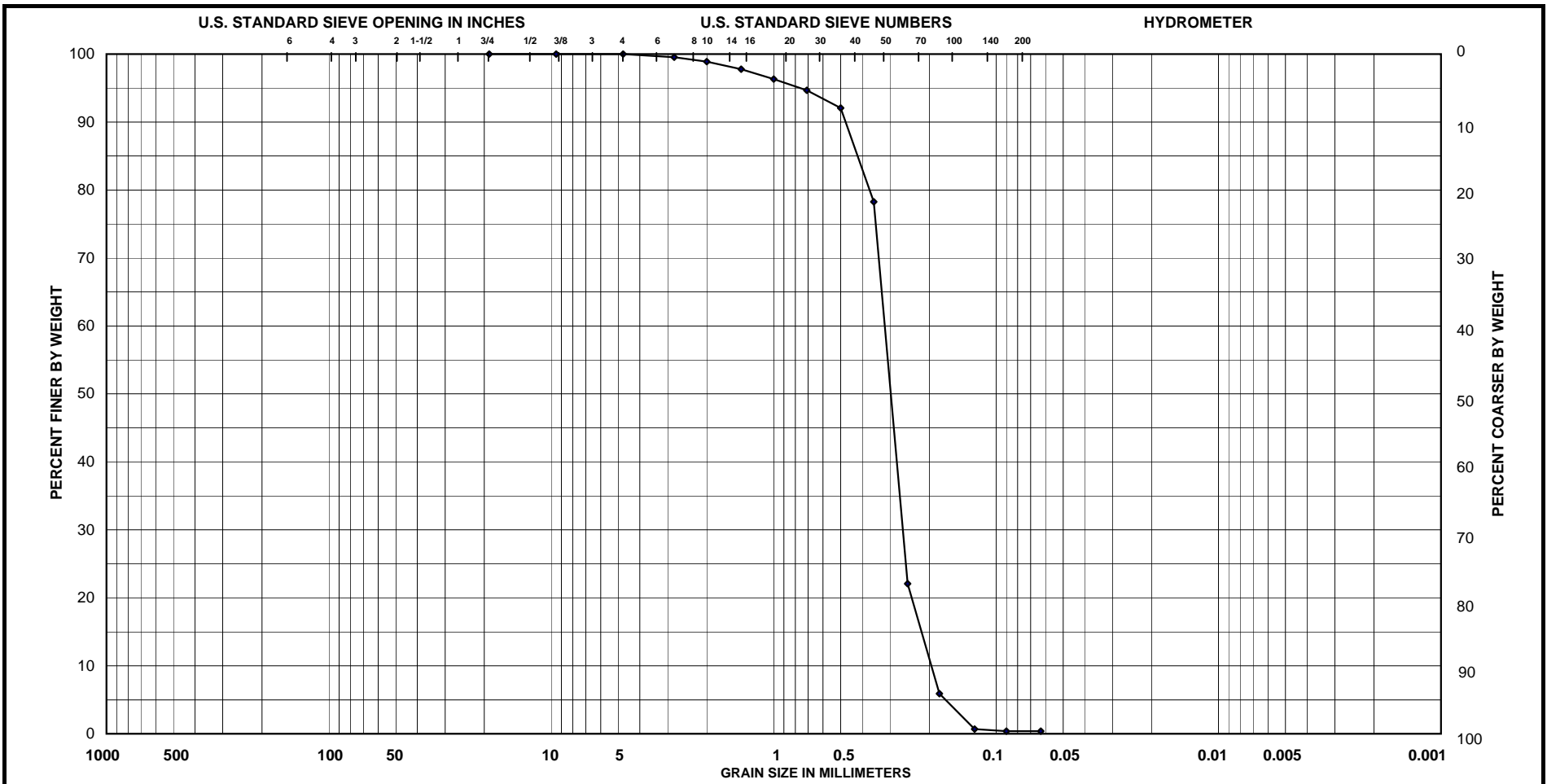
### GRAIN SIZE AND VISUAL SHELL CONTENT

Project:	<b>Topsail Beach, Surf City &amp; North Topsail</b>	Depth:	<b>-3</b>
Project No.:	<b>1584-01-40</b>	Date:	<b>7/25/2003</b>
Boring No.:	<b>TB1-3</b>		
Sample No.:	<b>1</b>		
Description:	<b>SAND, poorly-graded, mostly fine-grained quartz, few carbonate, gray (SP)</b>		

Tare Weight, (g):	<b>50.03</b>	
Dry Wt. Before Washing (g):	<b>159.64</b>	(with tare)
Dry Weight After Washing (g):	<b>159.32</b>	(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	0.51	99.53	100	0.51
#10	2.000	0.70	98.90	100	0.70
#14	1.400	1.24	97.76	95	1.18
#18	1.000	1.59	96.31	80	1.27
#25	0.710	1.80	94.67	70	1.26
#35	0.500	2.85	92.07	45	1.28
#45	0.355	15.11	78.29	20	3.02
#60	0.250	61.61	22.08	3	1.85
#80	0.180	17.71	5.92	1	0.18
#120	0.125	5.74	0.68	1	0.06
#170	0.090	0.33	0.38	1	0.00
#230	0.063	0.02	0.36	1	0.00

**Total Shell Content:** **10** %



COBBLES	GRAVEL		SAND			SILT OR CLAY
	COARSE	FINE	COARSE	MEDIUM	FINE	

Sample No.	Elev. Or Depth	Classification	% CO <sub>3</sub>	G <sub>s</sub>	Nat w%	LL	PL	PI	Project
1	-3	SAND, poorly-graded, mostly fine-grained quartz, few carbonate, gray (SP)	10						Topsail Beach, Surf City & North Topsail
									Area
									Boring No. TB1-3
									Date 7/25/2003

**GRADATION CURVES**



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## VISUAL SHELL CONTENT

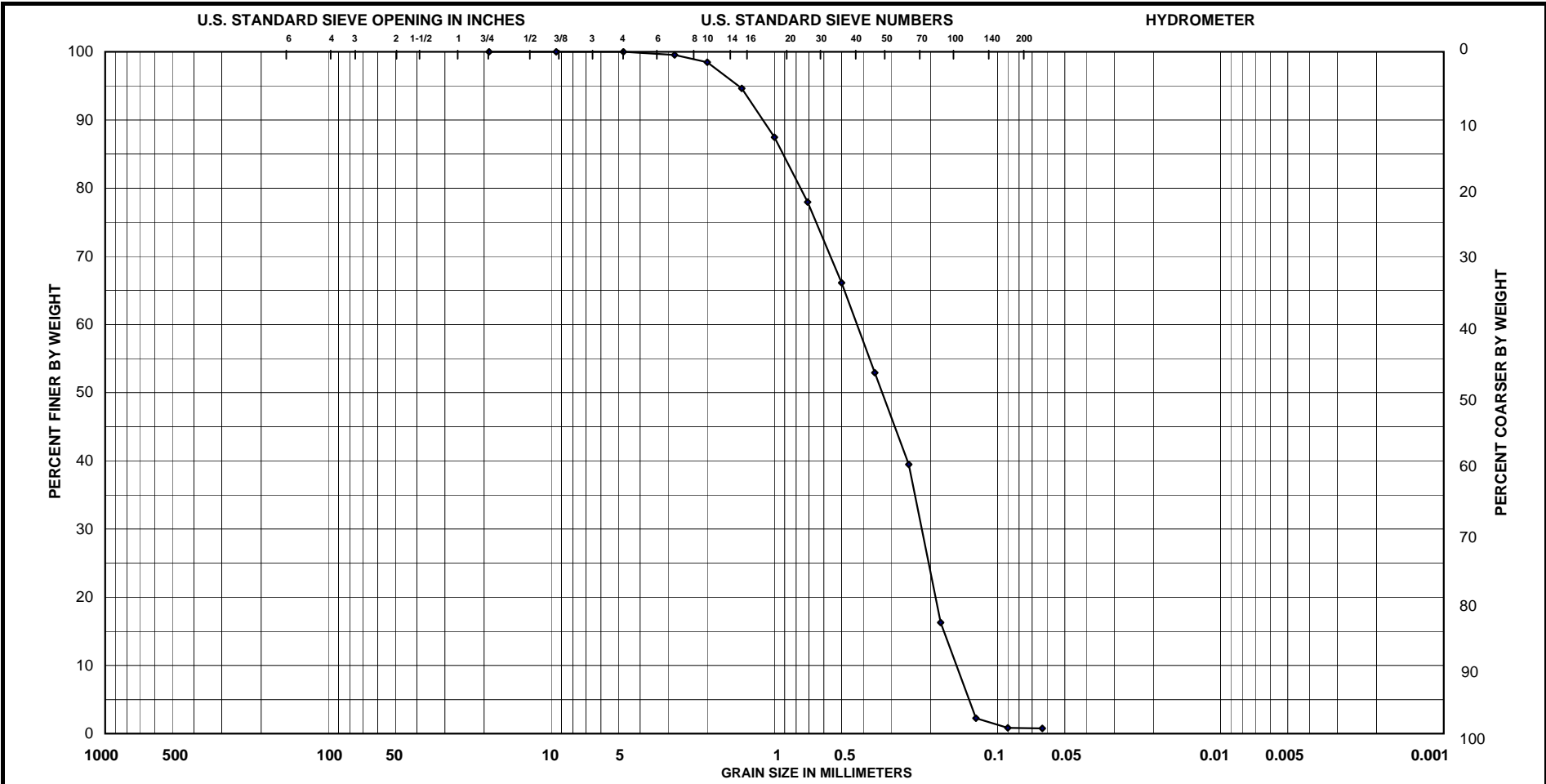
### GRAIN SIZE AND VISUAL SHELL CONTENT

Project:	<b>Topsail Beach, Surf City &amp; North Topsail</b>	Depth:	<b>-4</b>
Project No.:	<b>1584-01-40</b>	Date:	<b>7/25/2003</b>
Boring No.:	<b>TB1-4</b>		
Sample No.:	<b>1</b>		
Description:	<b>SAND, poorly-graded, mostly fine-grained quartz, some carbonate, gray (SP)</b>		

Tare Weight, (g):	<b>49.70</b>	
Dry Wt. Before Washing (g):	<b>152.47</b>	(with tare)
Dry Weight After Washing (g):	<b>151.84</b>	(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	0.46	99.55	100	0.46
#10	2.000	1.13	98.45	100	1.13
#14	1.400	3.93	94.63	95	3.73
#18	1.000	7.38	87.45	75	5.54
#25	0.710	9.74	77.97	65	6.33
#35	0.500	12.17	66.13	50	6.09
#45	0.355	13.55	52.94	25	3.39
#60	0.250	13.83	39.49	10	1.38
#80	0.180	23.82	16.31	3	0.71
#120	0.125	14.44	2.26	1	0.14
#170	0.090	1.46	0.84	1	0.01
#230	0.063	0.06	0.78	1	0.00

**Total Shell Content:** **28** %



COBBLES	GRAVEL		SAND			SILT OR CLAY
	COARSE	FINE	COARSE	MEDIUM	FINE	

Sample No.	Elev. Or Depth	Classification	% CO <sub>3</sub>	G <sub>s</sub>	Nat w%	LL	PL	PI	Project
1	-4	SAND, poorly-graded, mostly fine-grained quartz, some carbonate, gray (SP)	28						Topsail Beach, Surf City & North Topsail
									Area
									Boring No. TB1-4
									Date 7/25/2003

**GRADATION CURVES**



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## VISUAL SHELL CONTENT

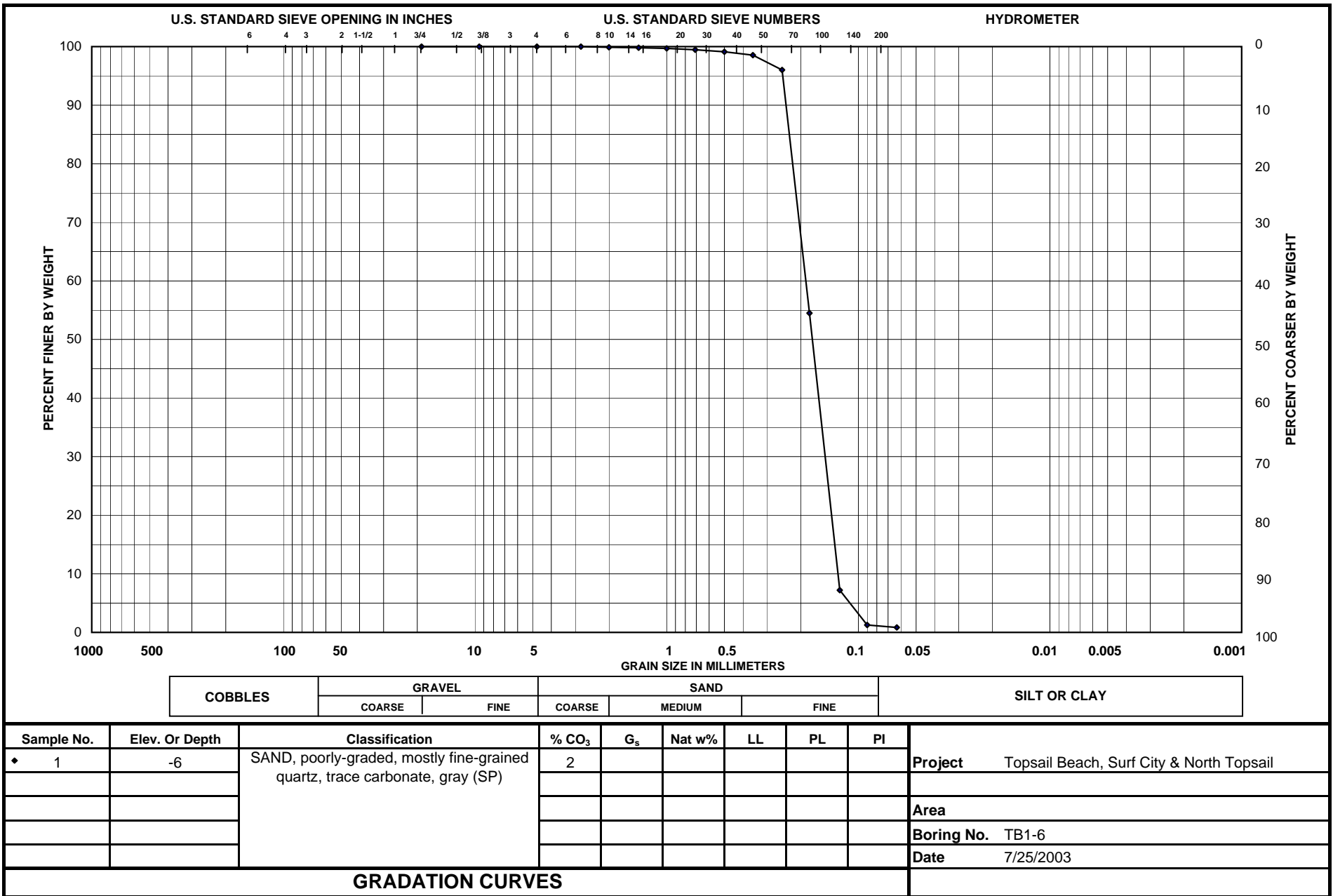
### GRAIN SIZE AND VISUAL SHELL CONTENT

Project:	<b>Topsail Beach, Surf City &amp; North Topsail</b>	Depth:	<b>-6</b>
Project No.:	<b>1584-01-40</b>	Date:	<b>7/25/2003</b>
Boring No.:	<b>TB1-6</b>		
Sample No.:	<b>1</b>		
Description:	<b>SAND, poorly-graded, mostly fine-grained quartz, trace carbonate, gray (SP)</b>		

Tare Weight, (g):	<b>50.56</b>	
Dry Wt. Before Washing (g):	<b>150.11</b>	(with tare)
Dry Weight After Washing (g):	<b>147.17</b>	(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	0.10	99.90	100	0.10
#14	1.400	0.09	99.81	99	0.09
#18	1.000	0.12	99.69	95	0.11
#25	0.710	0.22	99.47	85	0.19
#35	0.500	0.33	99.14	60	0.20
#45	0.355	0.59	98.54	20	0.12
#60	0.250	2.52	96.01	5	0.13
#80	0.180	41.32	54.51	1	0.41
#120	0.125	47.07	7.22	1	0.47
#170	0.090	5.94	1.26	1	0.06
#230	0.063	0.40	0.85	1	0.00

**Total Shell Content:** **2** %



COBBLES	GRAVEL		SAND			SILT OR CLAY
	COARSE	FINE	COARSE	MEDIUM	FINE	

Sample No.	Elev. Or Depth	Classification	% CO <sub>3</sub>	G <sub>s</sub>	Nat w%	LL	PL	PI	Project
♦ 1	-6	SAND, poorly-graded, mostly fine-grained quartz, trace carbonate, gray (SP)	2						Topsail Beach, Surf City & North Topsail
									Area
									Boring No. TB1-6
									Date 7/25/2003

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## VISUAL SHELL CONTENT

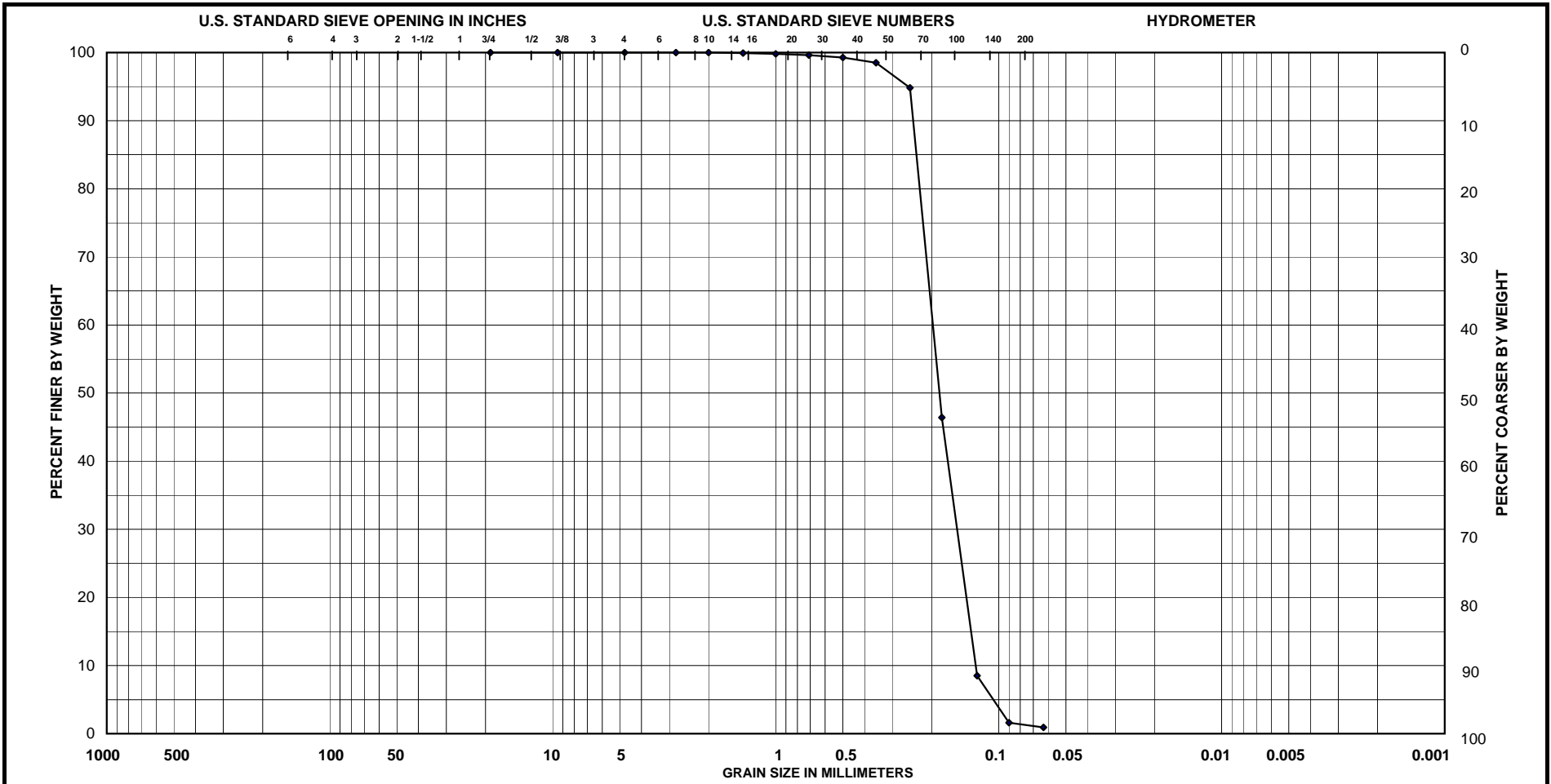
### GRAIN SIZE AND VISUAL SHELL CONTENT

Project:	<b>Topsail Beach, Surf City &amp; North Topsail</b>	Depth:	<b>-8</b>
Project No.:	<b>1584-01-40</b>	Date:	<b>7/25/2003</b>
Boring No.:	<b>TB1-8</b>		
Sample No.:	<b>1</b>		
Description:	<b>SAND, poorly-graded, mostly fine-grained quartz, trace carbonate, gray (SP)</b>		

Tare Weight, (g):	<b>50.64</b>	
Dry Wt. Before Washing (g):	<b>141.4</b>	(with tare)
Dry Weight After Washing (g):	<b>140.44</b>	(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	0.01	99.99	100	0.01
#14	1.400	0.06	99.92	100	0.06
#18	1.000	0.12	99.79	100	0.12
#25	0.710	0.17	99.60	70	0.12
#35	0.500	0.29	99.28	40	0.12
#45	0.355	0.71	98.50	20	0.14
#60	0.250	3.32	94.84	5	0.17
#80	0.180	43.94	46.43	1	0.44
#120	0.125	34.43	8.49	1	0.34
#170	0.090	6.24	1.62	1	0.06
#230	0.063	0.65	0.90	1	0.01

**Total Shell Content:** **2** %



COBBLES	GRAVEL		SAND			SILT OR CLAY
	COARSE	FINE	COARSE	MEDIUM	FINE	

Sample No.	Elev. Or Depth	Classification	% CO <sub>3</sub>	G <sub>s</sub>	Nat w%	LL	PL	PI	Project	
♦ 1	-8	SAND, poorly-graded, mostly fine-grained quartz, trace carbonate, gray (SP)	2						Topsail Beach, Surf City & North Topsail	
									Area	
									Boring No. TB1-8	
									Date 7/25/2003	

**GRADATION CURVES**



# WOLF TECHNOLOGIES, INC.

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## VISUAL SHELL CONTENT

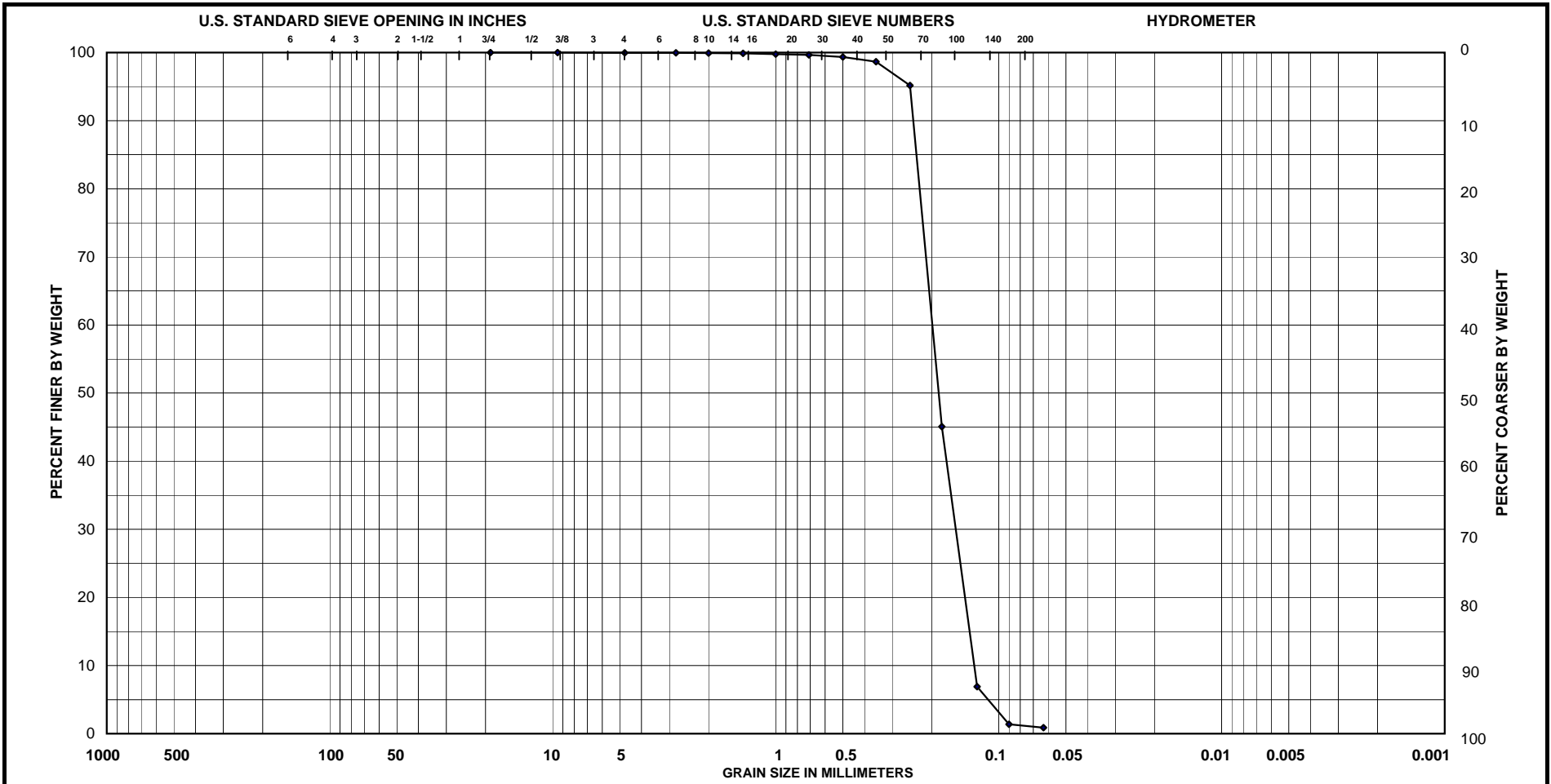
### GRAIN SIZE AND VISUAL SHELL CONTENT

Project:	<b>Topsail Beach, Surf City &amp; North Topsail</b>	Depth:	<b>-10</b>
Project No.:	<b>1584-01-40</b>	Date:	<b>7/25/2003</b>
Boring No.:	<b>TB1-10</b>		
Sample No.:	<b>1</b>		
Description:	<b>SAND, poorly-graded, mostly fine-grained quartz, trace carbonate, gray (SP)</b>		

Tare Weight, (g):	<b>49.71</b>	
Dry Wt. Before Washing (g):	<b>143.61</b>	(with tare)
Dry Weight After Washing (g):	<b>142.67</b>	(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	0.02	99.96	100	0.02
#10	2.000	0.02	99.94	100	0.02
#14	1.400	0.04	99.89	100	0.04
#18	1.000	0.11	99.78	95	0.10
#25	0.710	0.12	99.65	95	0.11
#35	0.500	0.27	99.36	60	0.16
#45	0.355	0.66	98.66	25	0.17
#60	0.250	3.29	95.15	5	0.16
#80	0.180	47.04	45.06	1	0.47
#120	0.125	35.83	6.90	1	0.36
#170	0.090	5.17	1.40	1	0.05
#230	0.063	0.49	0.87	1	0.00

**Total Shell Content:** **2** %



COBBLES	GRAVEL		SAND			SILT OR CLAY
	COARSE	FINE	COARSE	MEDIUM	FINE	

Sample No.	Elev. Or Depth	Classification	% CO <sub>3</sub>	G <sub>s</sub>	Nat w%	LL	PL	PI	Project	
♦ 1	-10	SAND, poorly-graded, mostly fine-grained quartz, trace carbonate, gray (SP)	2						Topsail Beach, Surf City & North Topsail	
									Area	
									Boring No. TB1-10	
									Date 7/25/2003	

**GRADATION CURVES**



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## VISUAL SHELL CONTENT

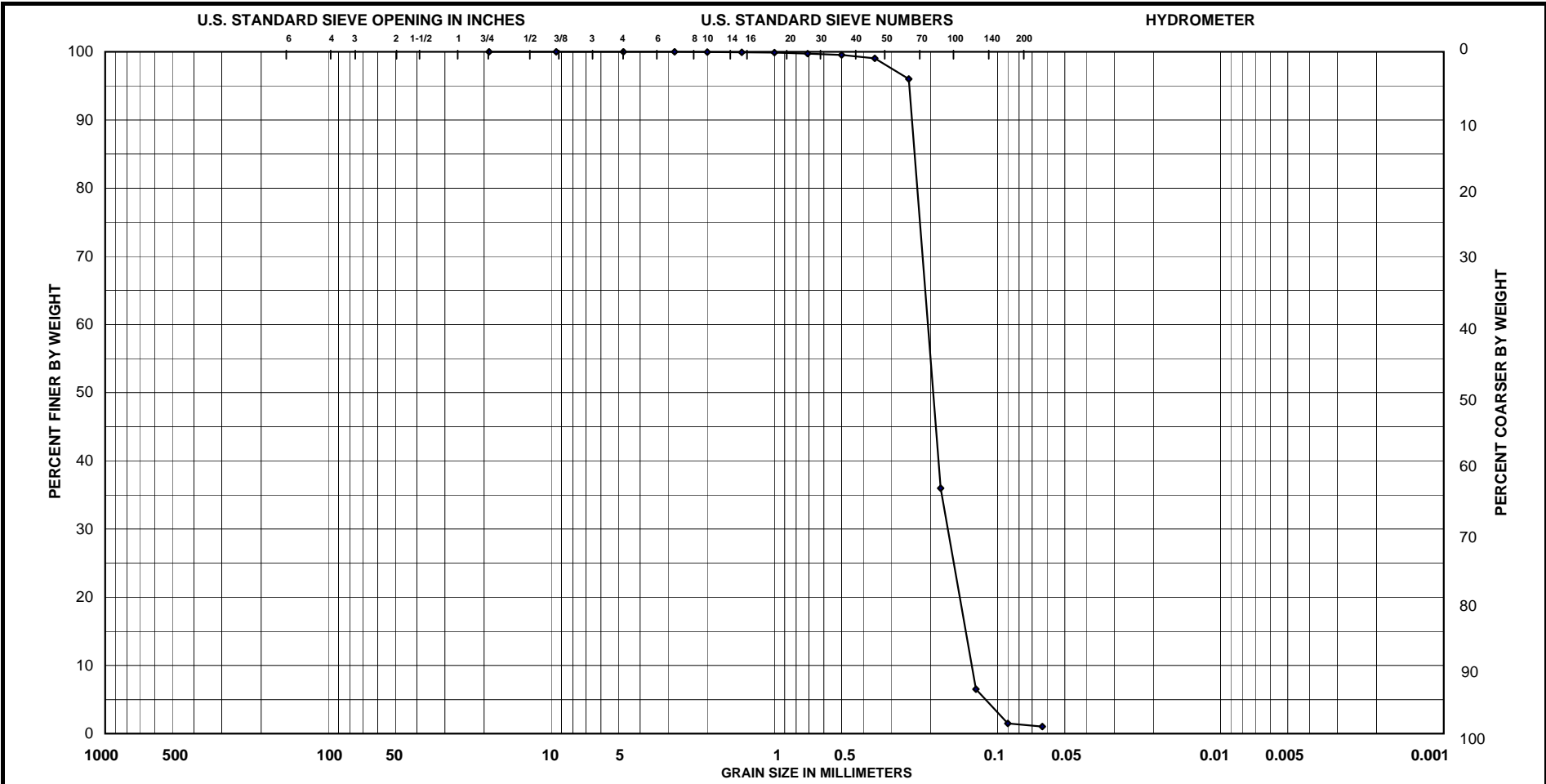
### GRAIN SIZE AND VISUAL SHELL CONTENT

Project:	<b>Topsail Beach, Surf City &amp; North Topsail</b>	Depth:	<b>-12</b>
Project No.:	<b>1584-01-40</b>	Date:	<b>7/25/2003</b>
Boring No.:	<b>TB1-12</b>		
Sample No.:	<b>1</b>		
Description:	<b>SAND, poorly-graded, mostly fine-grained quartz, trace carbonate, gray (SP)</b>		

Tare Weight, (g):	<b>50.25</b>	
Dry Wt. Before Washing (g):	<b>154.12</b>	(with tare)
Dry Weight After Washing (g):	<b>152.89</b>	(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	0.03	99.97	100	0.03
#14	1.400	0.05	99.92	100	0.05
#18	1.000	0.05	99.87	100	0.05
#25	0.710	0.13	99.75	99	0.13
#35	0.500	0.21	99.55	65	0.14
#45	0.355	0.51	99.06	40	0.20
#60	0.250	3.16	96.01	10	0.32
#80	0.180	62.34	36.00	3	1.87
#120	0.125	30.62	6.52	1	0.31
#170	0.090	5.21	1.50	1	0.05
#230	0.063	0.47	1.05	1	0.00

**Total Shell Content:** **3** %



COBBLES	GRAVEL		SAND			SILT OR CLAY
	COARSE	FINE	COARSE	MEDIUM	FINE	

Sample No.	Elev. Or Depth	Classification	% CO <sub>3</sub>	G <sub>s</sub>	Nat w%	LL	PL	PI	Project	
♦ 1	-12	SAND, poorly-graded, mostly fine-grained quartz, trace carbonate, gray (SP)	3						Topsail Beach, Surf City & North Topsail	
									Area	
									Boring No. TB1-12	
									Date 7/25/2003	

**GRADATION CURVES**



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## VISUAL SHELL CONTENT

### GRAIN SIZE AND VISUAL SHELL CONTENT

Project:	<b>Topsail Beach, Surf City &amp; North Topsail</b>	Depth:	<b>-14</b>
Project No.:	<b>1584-01-40</b>	Date:	<b>7/25/2003</b>
Boring No.:	<b>TB1-14</b>		
Sample No.:	<b>1</b>		
Description:	<b>SAND, poorly-graded, mostly fine-grained quartz, trace carbonate, gray (SP)</b>		

Tare Weight, (g):	<b>50.49</b>	
Dry Wt. Before Washing (g):	<b>139.49</b>	(with tare)
Dry Weight After Washing (g):	<b>138.53</b>	(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	0.00	100.00	0	0.00
#14	1.400	0.03	99.97	100	0.03
#18	1.000	0.05	99.91	100	0.05
#25	0.710	0.08	99.82	90	0.07
#35	0.500	0.19	99.61	45	0.09
#45	0.355	0.36	99.20	25	0.09
#60	0.250	2.63	96.25	15	0.39
#80	0.180	36.95	54.73	3	1.11
#120	0.125	41.87	7.69	1	0.42
#170	0.090	5.51	1.49	1	0.06
#230	0.063	0.43	1.01	1	0.00

**Total Shell Content:** **3** %



COBBLES	GRAVEL		SAND			SILT OR CLAY
	COARSE	FINE	COARSE	MEDIUM	FINE	

Sample No.	Elev. Or Depth	Classification	% CO <sub>3</sub>	G <sub>s</sub>	Nat w%	LL	PL	PI	Project
1	-14	SAND, poorly-graded, mostly fine-grained quartz, trace carbonate, gray (SP)	3						Topsail Beach, Surf City & North Topsail
									Area
									Boring No. TB1-14
									Date 7/25/2003

**GRADATION CURVES**





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## VISUAL SHELL CONTENT

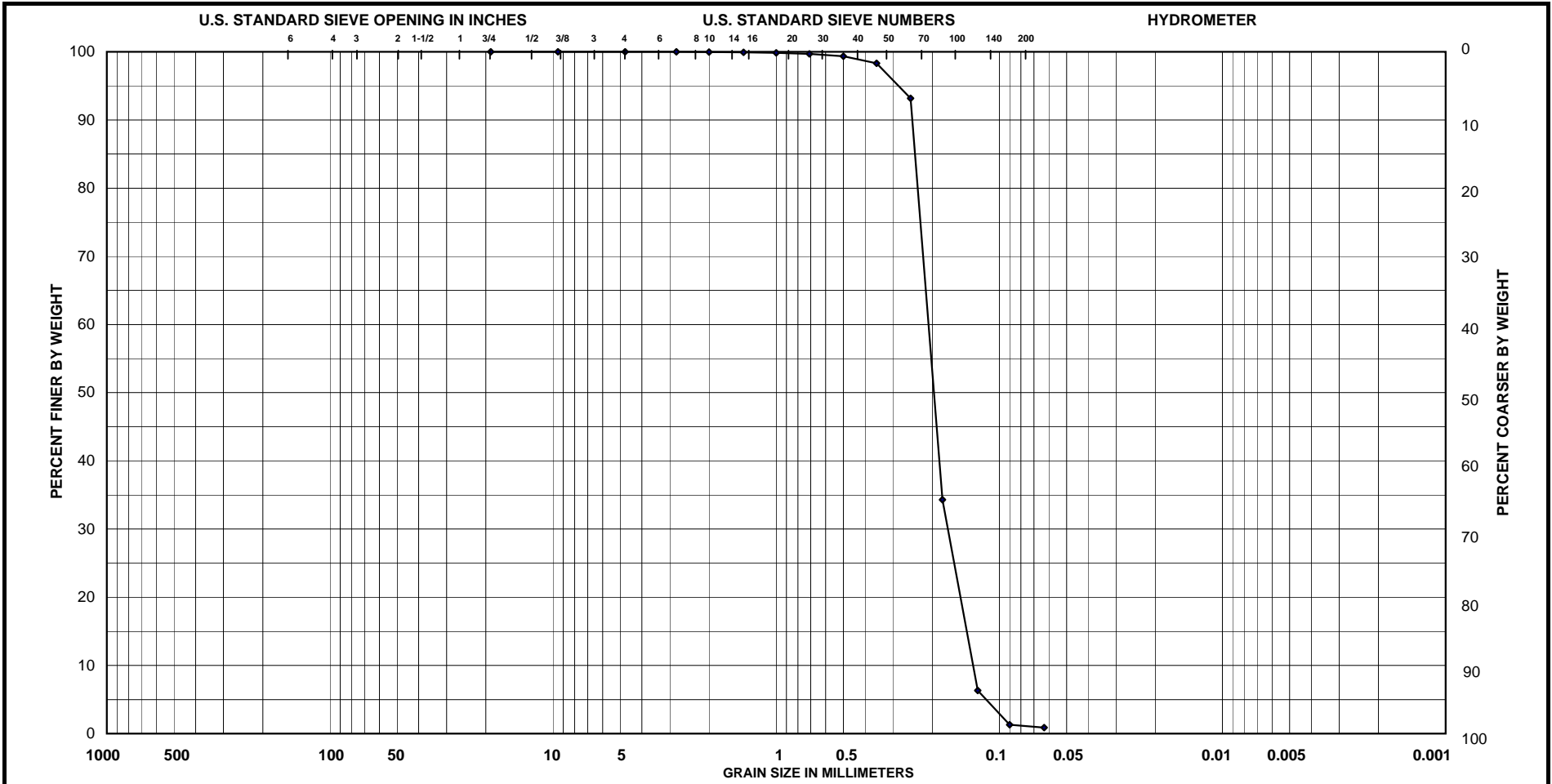
### GRAIN SIZE AND VISUAL SHELL CONTENT

Project:	<b>Topsail Beach, Surf City &amp; North Topsail</b>	Depth:	<b>-16</b>
Project No.:	<b>1584-01-40</b>	Date:	<b>7/25/2003</b>
Boring No.:	<b>TB1-16</b>		
Sample No.:	<b>1</b>		
Description:	<b>SAND, poorly-graded, mostly fine-grained quartz, trace carbonate, gray (SP)</b>		

Tare Weight, (g):	<b>50.61</b>	
Dry Wt. Before Washing (g):	<b>139.5</b>	(with tare)
Dry Weight After Washing (g):	<b>138.64</b>	(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	0.06	99.91	100	0.06
#18	1.000	0.07	99.83	100	0.07
#25	0.710	0.12	99.70	98	0.12
#35	0.500	0.32	99.34	55	0.18
#45	0.355	0.90	98.32	30	0.27
#60	0.250	4.58	93.17	10	0.46
#80	0.180	52.34	34.29	3	1.57
#120	0.125	24.87	6.31	1	0.25
#170	0.090	4.44	1.32	1	0.04
#230	0.063	0.39	0.88	1	0.00

**Total Shell Content:** **3** %



COBBLES	GRAVEL		SAND			SILT OR CLAY
	COARSE	FINE	COARSE	MEDIUM	FINE	

Sample No.	Elev. Or Depth	Classification	% CO <sub>3</sub>	G <sub>s</sub>	Nat w%	LL	PL	PI	Project
1	-16	SAND, poorly-graded, mostly fine-grained quartz, trace carbonate, gray (SP)	3						Topsail Beach, Surf City & North Topsail
									Area
									Boring No. TB1-16
									Date 7/25/2003

**GRADATION CURVES**



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## VISUAL SHELL CONTENT

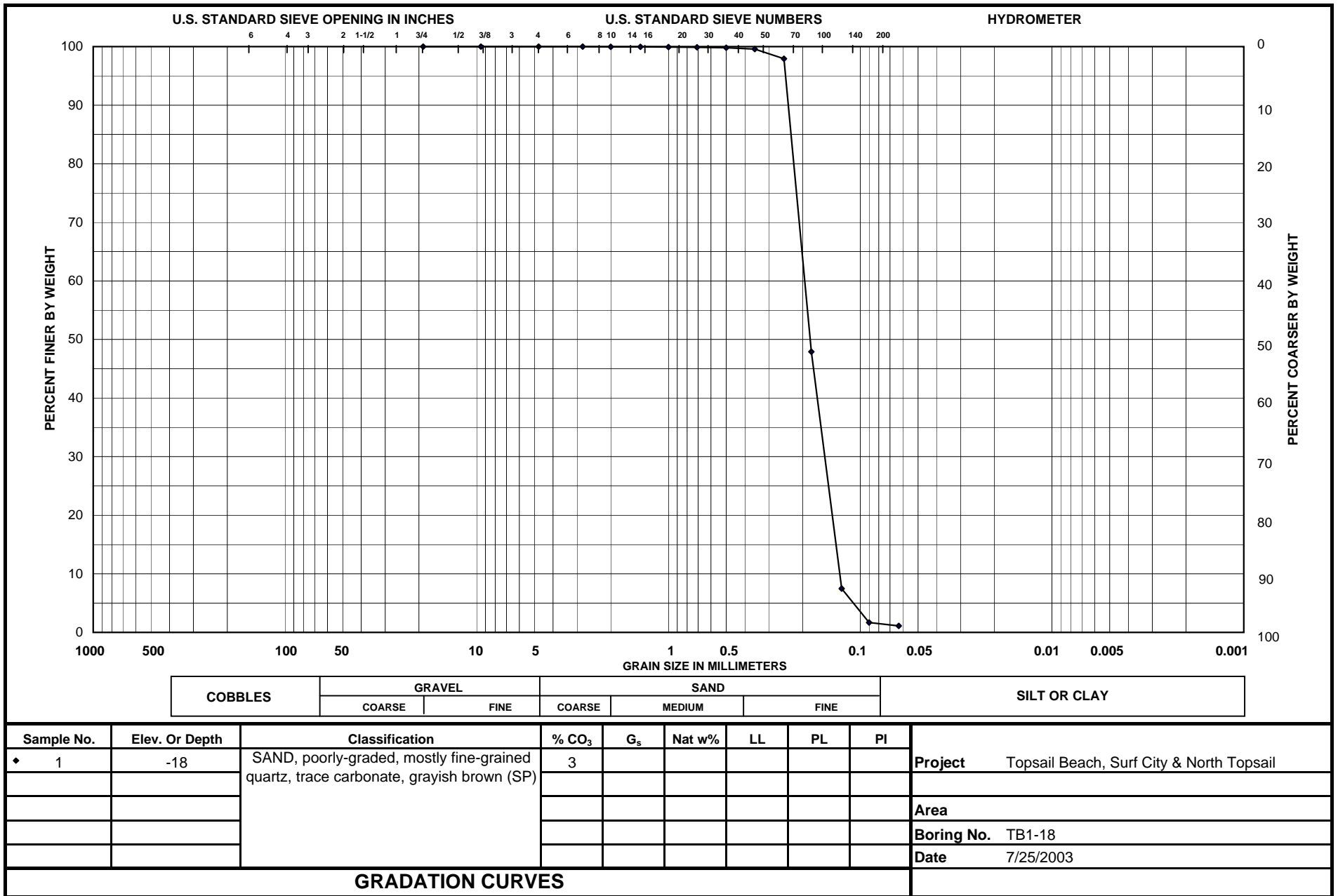
### GRAIN SIZE AND VISUAL SHELL CONTENT

Project:	<b>Topsail Beach, Surf City &amp; North Topsail</b>	Depth:	<b>-18</b>
Project No.:	<b>1584-01-40</b>	Date:	<b>7/25/2003</b>
Boring No.:	<b>TB1-18</b>		
Sample No.:	<b>1</b>		
Description:	<b>SAND, poorly-graded, mostly fine-grained quartz, trace carbonate, grayish brown (SP)</b>		

Tare Weight, (g):	<b>50.05</b>	
Dry Wt. Before Washing (g):	<b>148.26</b>	(with tare)
Dry Weight After Washing (g):	<b>147</b>	(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	0.04	99.96	100	0.04
#14	1.400	0.01	99.95	100	0.01
#18	1.000	0.03	99.92	75	0.02
#25	0.710	0.02	99.90	75	0.02
#35	0.500	0.07	99.83	70	0.05
#45	0.355	0.24	99.58	40	0.10
#60	0.250	1.62	97.93	20	0.32
#80	0.180	49.11	47.93	3	1.47
#120	0.125	39.73	7.47	1	0.40
#170	0.090	5.69	1.68	1	0.06
#230	0.063	0.56	1.11	1	0.01

**Total Shell Content:** **3** %





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## VISUAL SHELL CONTENT

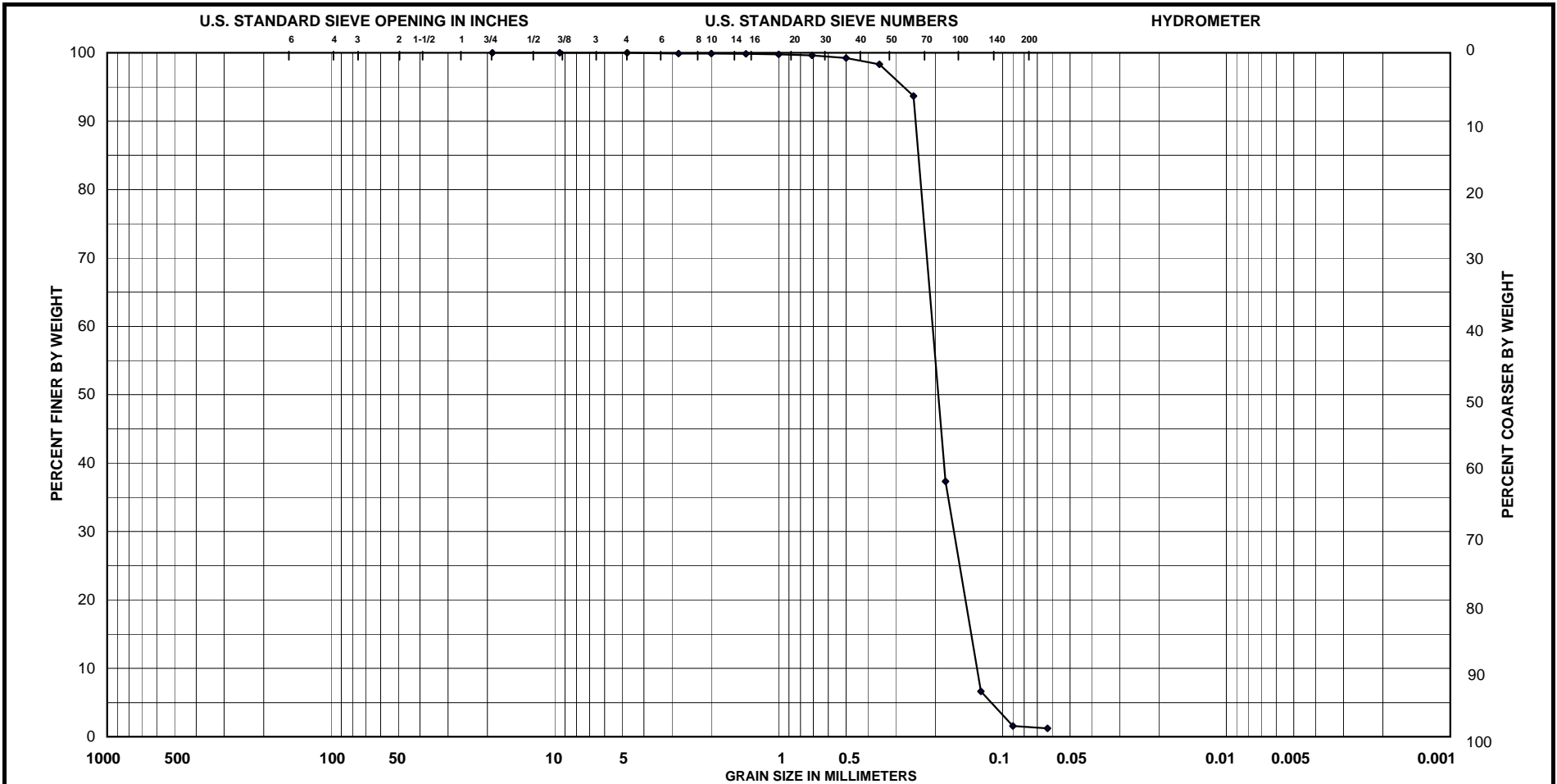
### GRAIN SIZE AND VISUAL SHELL CONTENT

Project:	<b>Topsail Beach, Surf City &amp; North Topsail</b>	Depth:	<b>-20</b>
Project No.:	<b>1584-01-40</b>	Date:	<b>7/25/2003</b>
Boring No.:	<b>TB1-20</b>		
Sample No.:	<b>1</b>		
Description:	<b>SAND, poorly-graded, mostly fine-grained quartz, trace carbonate, gray (SP)</b>		

Tare Weight, (g):	<b>50.36</b>	
Dry Wt. Before Washing (g):	<b>157.76</b>	(with tare)
Dry Weight After Washing (g):	<b>156.6</b>	(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	0.12	99.89	100	0.12
#10	2.000	0.02	99.87	100	0.02
#14	1.400	0.04	99.83	100	0.04
#18	1.000	0.08	99.76	95	0.08
#25	0.710	0.17	99.60	80	0.14
#35	0.500	0.38	99.25	40	0.15
#45	0.355	1.01	98.31	20	0.20
#60	0.250	4.99	93.66	15	0.75
#80	0.180	60.50	37.33	3	1.82
#120	0.125	32.95	6.65	1	0.33
#170	0.090	5.46	1.56	1	0.05
#230	0.063	0.36	1.23	1	0.00

**Total Shell Content:** **3** %



COBBLES	GRAVEL		SAND			SILT OR CLAY
	COARSE	FINE	COARSE	MEDIUM	FINE	

Sample No.	Elev. Or Depth	Classification	% CO <sub>3</sub>	G <sub>s</sub>	Nat w%	LL	PL	PI	Project
♦ 1	-20	SAND, poorly-graded, mostly fine-grained quartz, trace carbonate, gray (SP)	3						Topsail Beach, Surf City & North Topsail
									Area
									Boring No. TB1-20
									Date 7/25/2003

**GRADATION CURVES**



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## VISUAL SHELL CONTENT

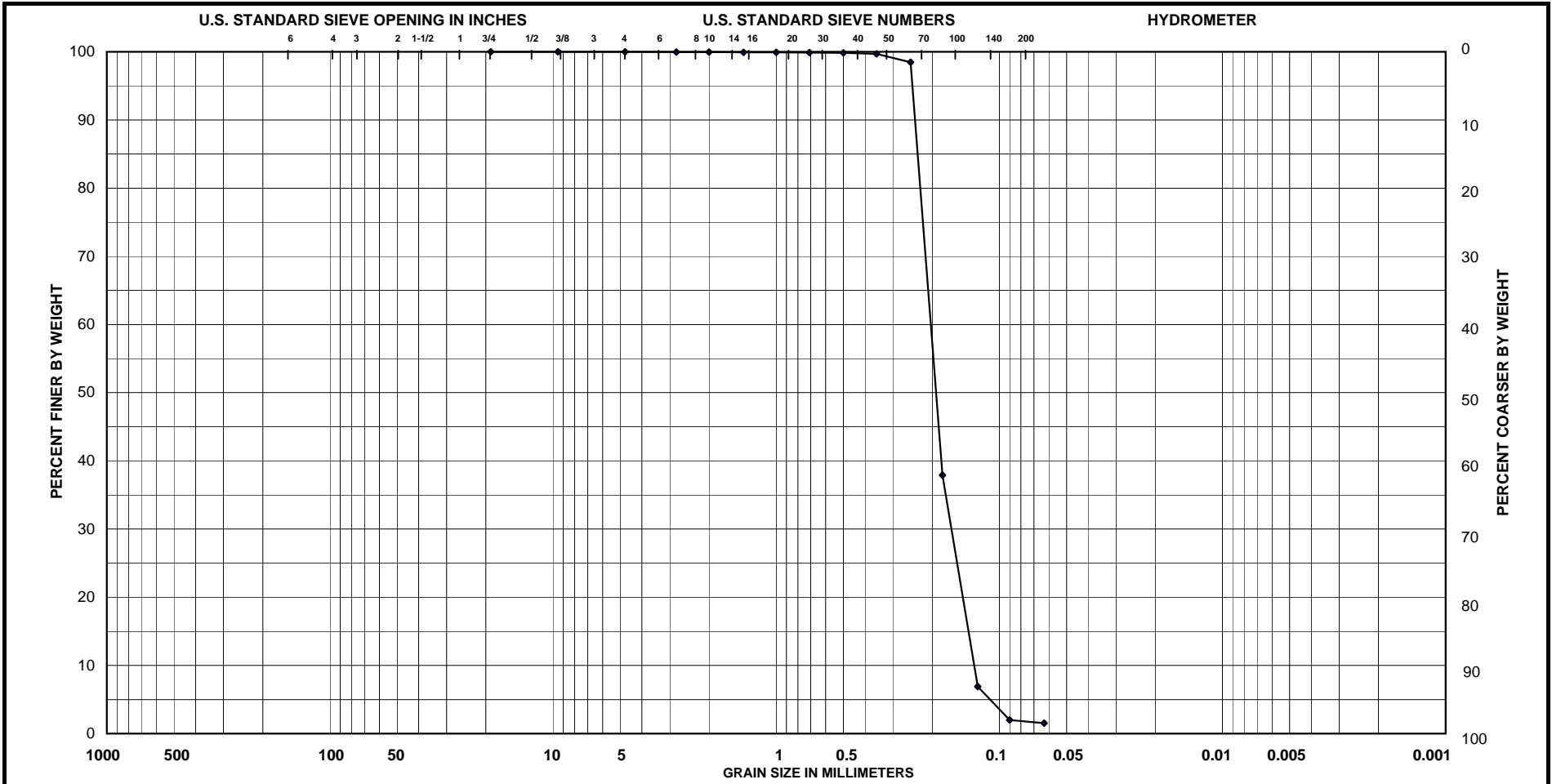
### GRAIN SIZE AND VISUAL SHELL CONTENT

Project:	<b>Topsail Beach, Surf City &amp; North Topsail</b>	Depth:	<b>-22</b>
Project No.:	<b>1584-01-40</b>	Date:	<b>7/25/2003</b>
Boring No.:	<b>TB1-22</b>		
Sample No.:	<b>1</b>		
Description:	<b>SAND, poorly-graded, mostly fine-grained quartz, few carbonate, very dark gray (SP)</b>		

Tare Weight, (g):	<b>49.82</b>	
Dry Wt. Before Washing (g):	<b>167.29</b>	(with tare)
Dry Weight After Washing (g):	<b>165.51</b>	(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	0.06	99.95	100	0.06
#10	2.000	0.00	99.95	0	0.00
#14	1.400	0.01	99.94	100	0.01
#18	1.000	0.03	99.91	98	0.03
#25	0.710	0.03	99.89	90	0.03
#35	0.500	0.06	99.84	90	0.05
#45	0.355	0.18	99.69	50	0.09
#60	0.250	1.42	98.48	25	0.36
#80	0.180	71.13	37.92	5	3.56
#120	0.125	36.46	6.89	3	1.09
#170	0.090	5.75	1.99	1	0.06
#230	0.063	0.55	1.52	1	0.01

**Total Shell Content:** **5** %



COBBLES	GRAVEL		SAND			SILT OR CLAY
	COARSE	FINE	COARSE	MEDIUM	FINE	

Sample No.	Elev. Or Depth	Classification	% CO <sub>3</sub>	G <sub>s</sub>	Nat w%	LL	PL	PI	Project	
1	-22	SAND, poorly-graded, mostly fine-grained quartz, few carbonate, very dark gray (SP)	5						Topsail Beach, Surf City & North Topsail	
									Area	
									Boring No. TB1-22	
									Date 7/25/2003	

**GRADATION CURVES**





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## VISUAL SHELL CONTENT

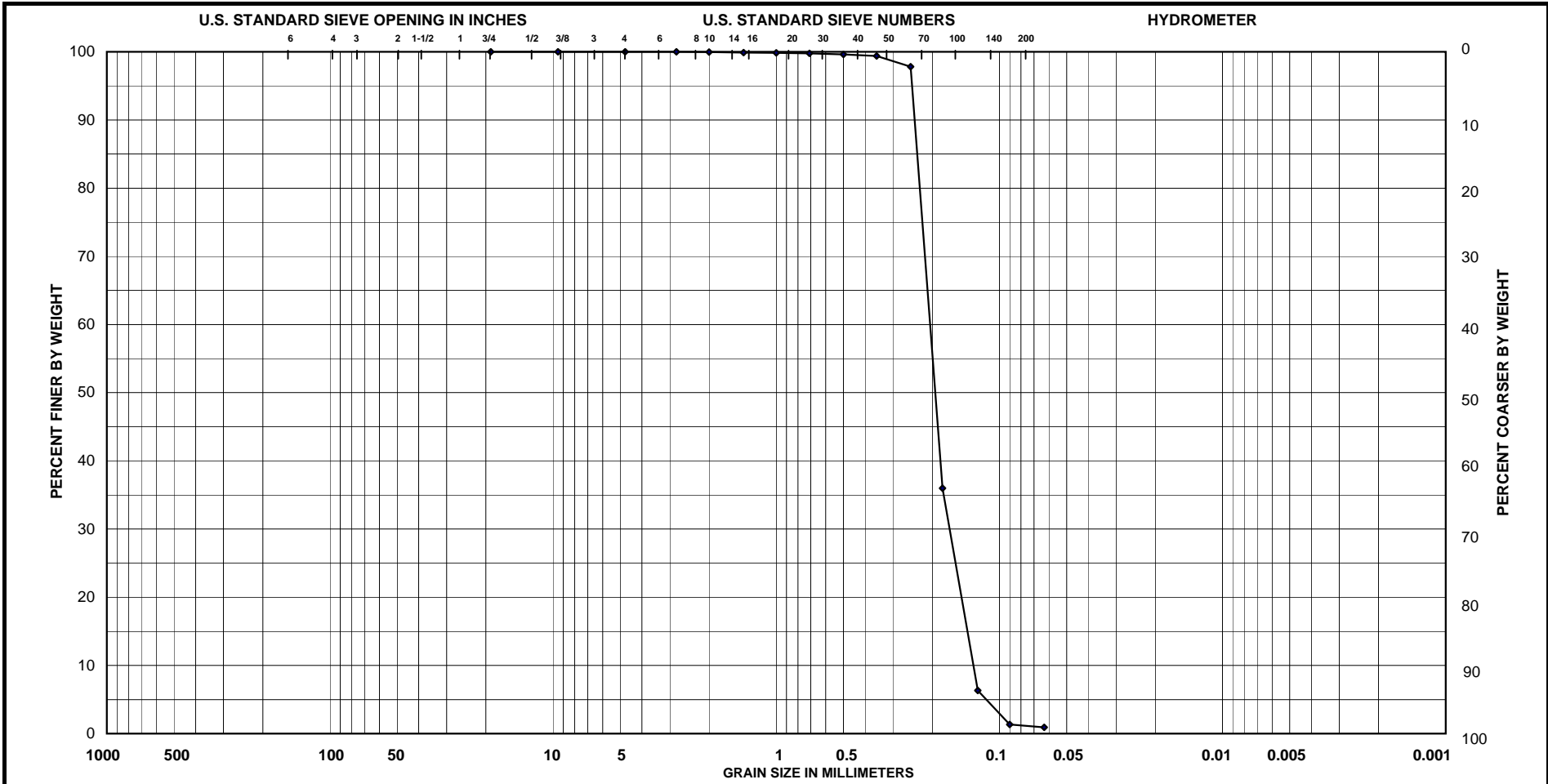
### GRAIN SIZE AND VISUAL SHELL CONTENT

Project:	<b>Topsail Beach, Surf City &amp; North Topsail</b>	Depth:	<b>-24</b>
Project No.:	<b>1584-01-40</b>	Date:	<b>7/25/2003</b>
Boring No.:	<b>TB1-24</b>		
Sample No.:	<b>1</b>		
Description:	<b>SAND, poorly-graded, mostly fine-grained quartz, few carbonate, light brownish gray (SP)</b>		

Tare Weight, (g):	<b>49.87</b>	
Dry Wt. Before Washing (g):	<b>140.44</b>	(with tare)
Dry Weight After Washing (g):	<b>139.45</b>	(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	0.04	99.94	100	0.04
#14	1.400	0.04	99.90	100	0.04
#18	1.000	0.05	99.85	100	0.05
#25	0.710	0.06	99.78	95	0.06
#35	0.500	0.13	99.64	95	0.12
#45	0.355	0.24	99.37	80	0.19
#60	0.250	1.41	97.81	40	0.56
#80	0.180	55.98	36.01	5	2.80
#120	0.125	26.89	6.32	3	0.81
#170	0.090	4.49	1.36	1	0.04
#230	0.063	0.38	0.94	1	0.00

**Total Shell Content:** **5** %



COBBLES	GRAVEL		SAND			SILT OR CLAY
	COARSE	FINE	COARSE	MEDIUM	FINE	

Sample No.	Elev. Or Depth	Classification	% CO <sub>3</sub>	G <sub>s</sub>	Nat w%	LL	PL	PI	Project	
1	-24	SAND, poorly-graded, mostly fine-grained quartz, few carbonate, light brownish gray (SP)	5						Topsail Beach, Surf City & North Topsail	
									Area	
									Boring No. TB1-24	
									Date 7/25/2003	

**GRADATION CURVES**



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## VISUAL SHELL CONTENT

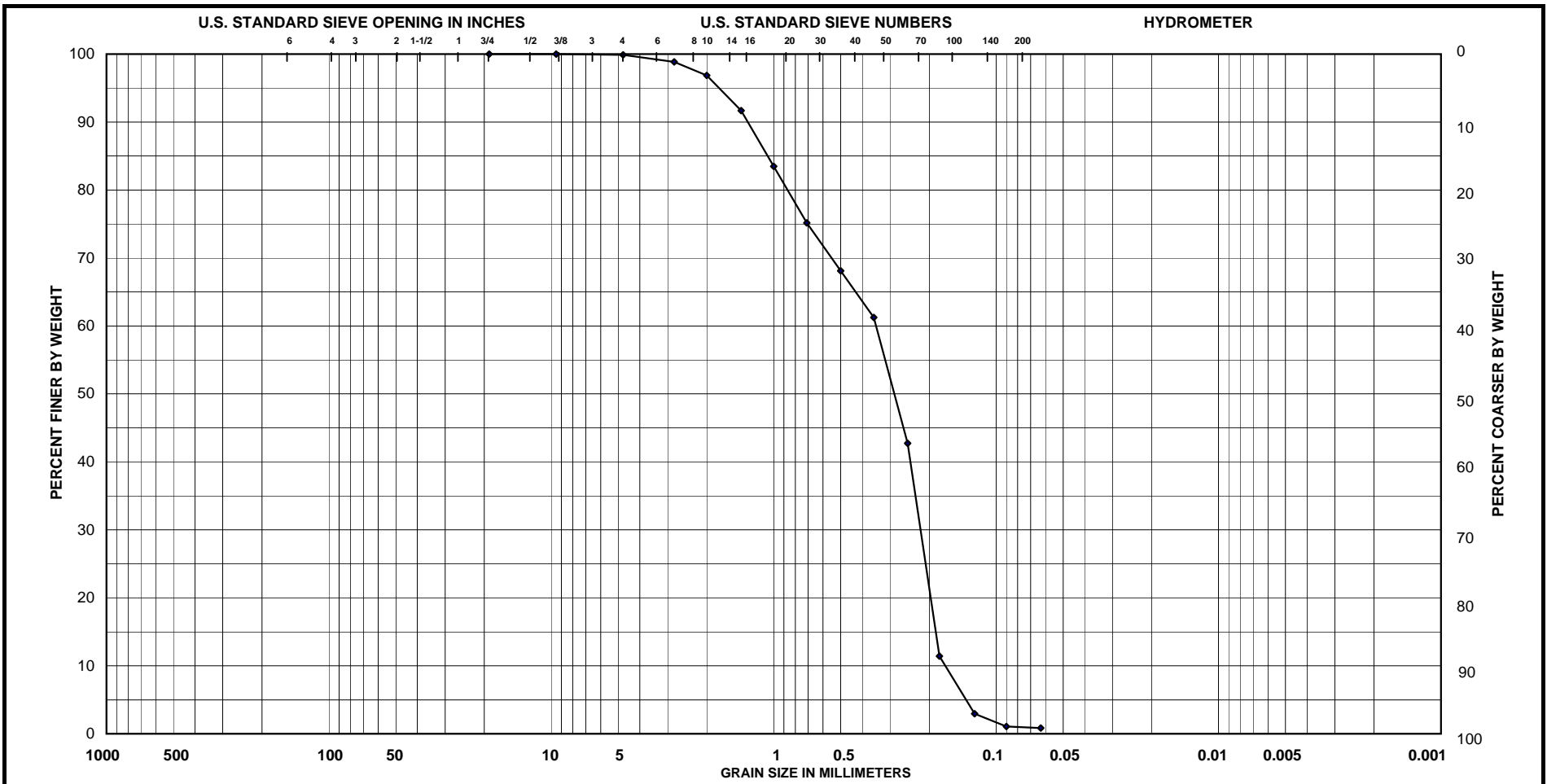
### GRAIN SIZE AND VISUAL SHELL CONTENT

Project:	<b>Topsail Beach, Surf City &amp; North Topsail</b>	Depth:	
Project No.:	<b>1584-01-40</b>	Date:	<b>7/25/2003</b>
Boring No.:	<b>TB2-TOE</b>		
Sample No.:	<b>1</b>		
Description:	<b>SAND, poorly-graded, mostly fine-grained quartz, some carbonate, light gray (SP)</b>		

Tare Weight, (g):	<b>49.81</b>	
Dry Wt. Before Washing (g):	<b>171.8</b>	(with tare)
Dry Weight After Washing (g):	<b>170.75</b>	(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	0.15	99.88	100	0.15
#7	2.800	1.25	98.85	100	1.25
#10	2.000	2.45	96.84	90	2.21
#14	1.400	6.31	91.67	85	5.36
#18	1.000	10.00	83.47	75	7.50
#25	0.710	10.14	75.16	70	7.10
#35	0.500	8.59	68.12	55	4.72
#45	0.355	8.39	61.24	30	2.52
#60	0.250	22.59	42.72	15	3.39
#80	0.180	38.17	11.44	5	1.91
#120	0.125	10.33	2.97	3	0.31
#170	0.090	2.32	1.07	1	0.02
#230	0.063	0.25	0.86	1	0.00

**Total Shell Content:** **30** %



COBBLES	GRAVEL		SAND			SILT OR CLAY
	COARSE	FINE	COARSE	MEDIUM	FINE	

Sample No.	Elev. Or Depth	Classification	% CO <sub>3</sub>	G <sub>s</sub>	Nat w%	LL	PL	PI	Project
1		SAND, poorly-graded, mostly fine-grained quartz, some carbonate, light gray (SP)	30						Topsail Beach, Surf City & North Topsail
									Area
									Boring No. TB2-TOE
									Date 7/25/2003

**GRADATION CURVES**



# WOLF TECHNOLOGIES, INC.

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

## VISUAL SHELL CONTENT

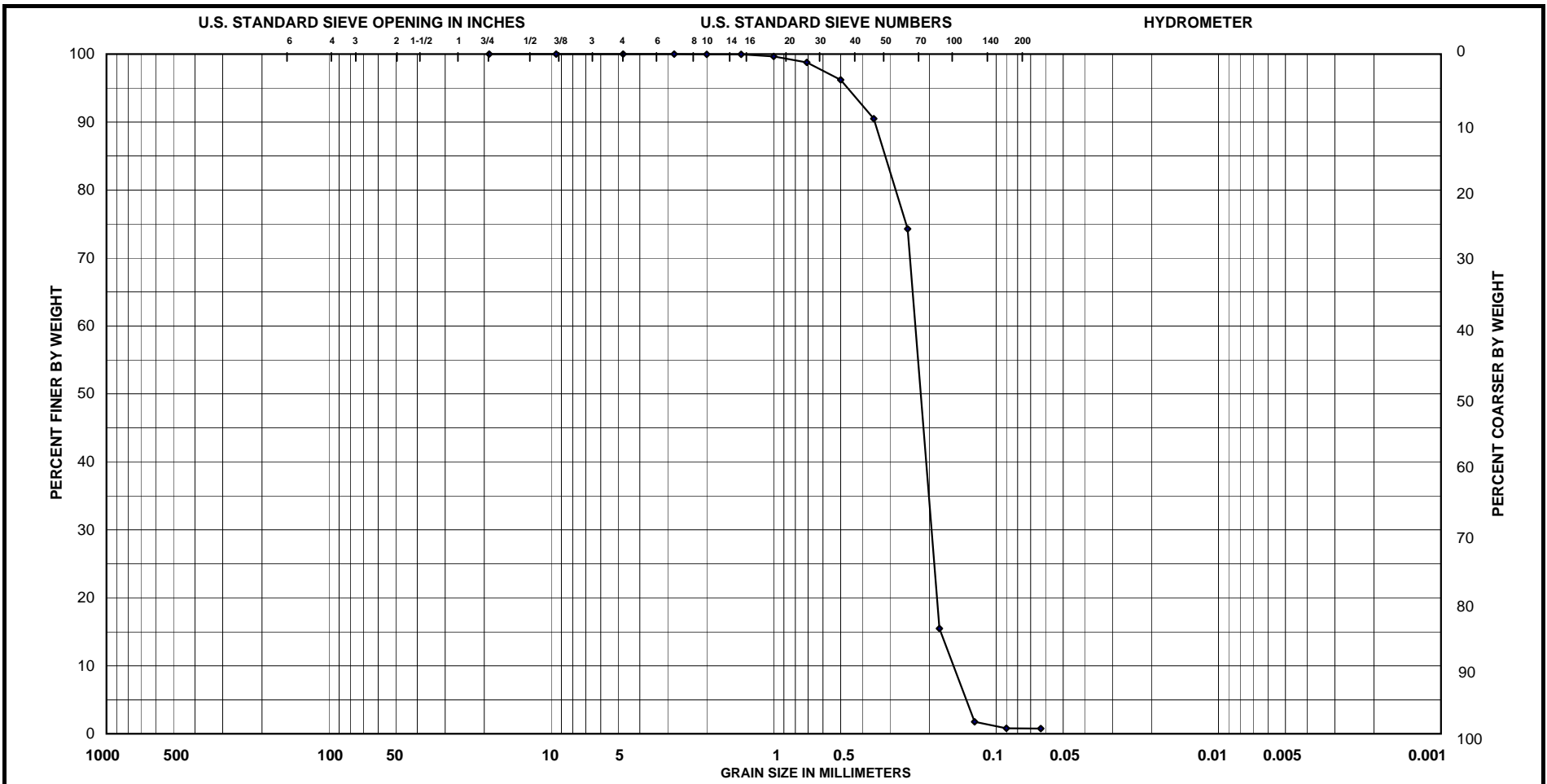
### GRAIN SIZE AND VISUAL SHELL CONTENT

Project:	<b>Topsail Beach, Surf City &amp; North Topsail</b>	Depth:	<b>0</b>
Project No.:	<b>1584-01-40</b>	Date:	<b>7/25/2003</b>
Boring No.:	<b>TB2-CREST</b>		
Sample No.:	<b>1</b>		
Description:	<b>SAND, poorly-graded, mostly fine-grained quartz, few carbonate, light gray (SP)</b>		

Tare Weight, (g):	<b>49.54</b>	
Dry Wt. Before Washing (g):	<b>144.4</b>	(with tare)
Dry Weight After Washing (g):	<b>144</b>	(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	0.03	99.95	100	0.03
#18	1.000	0.26	99.67	98	0.25
#25	0.710	0.84	98.79	80	0.67
#35	0.500	2.45	96.20	45	1.10
#45	0.355	5.43	90.48	25	1.36
#60	0.250	15.35	74.30	10	1.54
#80	0.180	55.80	15.48	3	1.67
#120	0.125	13.01	1.76	1	0.13
#170	0.090	0.91	0.80	1	0.01
#230	0.063	0.04	0.76	1	0.00

**Total Shell Content:** **7** %



COBBLES	GRAVEL		SAND			SILT OR CLAY
	COARSE	FINE	COARSE	MEDIUM	FINE	

Sample No.	Elev. Or Depth	Classification	% CO <sub>3</sub>	G <sub>s</sub>	Nat w%	LL	PL	PI	Project
1	0	SAND, poorly-graded, mostly fine-grained quartz, few carbonate, light gray (SP)	7						Topsail Beach, Surf City & North Topsail
									Area
									Boring No. TB2-CREST
									Date 7/25/2003

**GRADATION CURVES**



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## VISUAL SHELL CONTENT

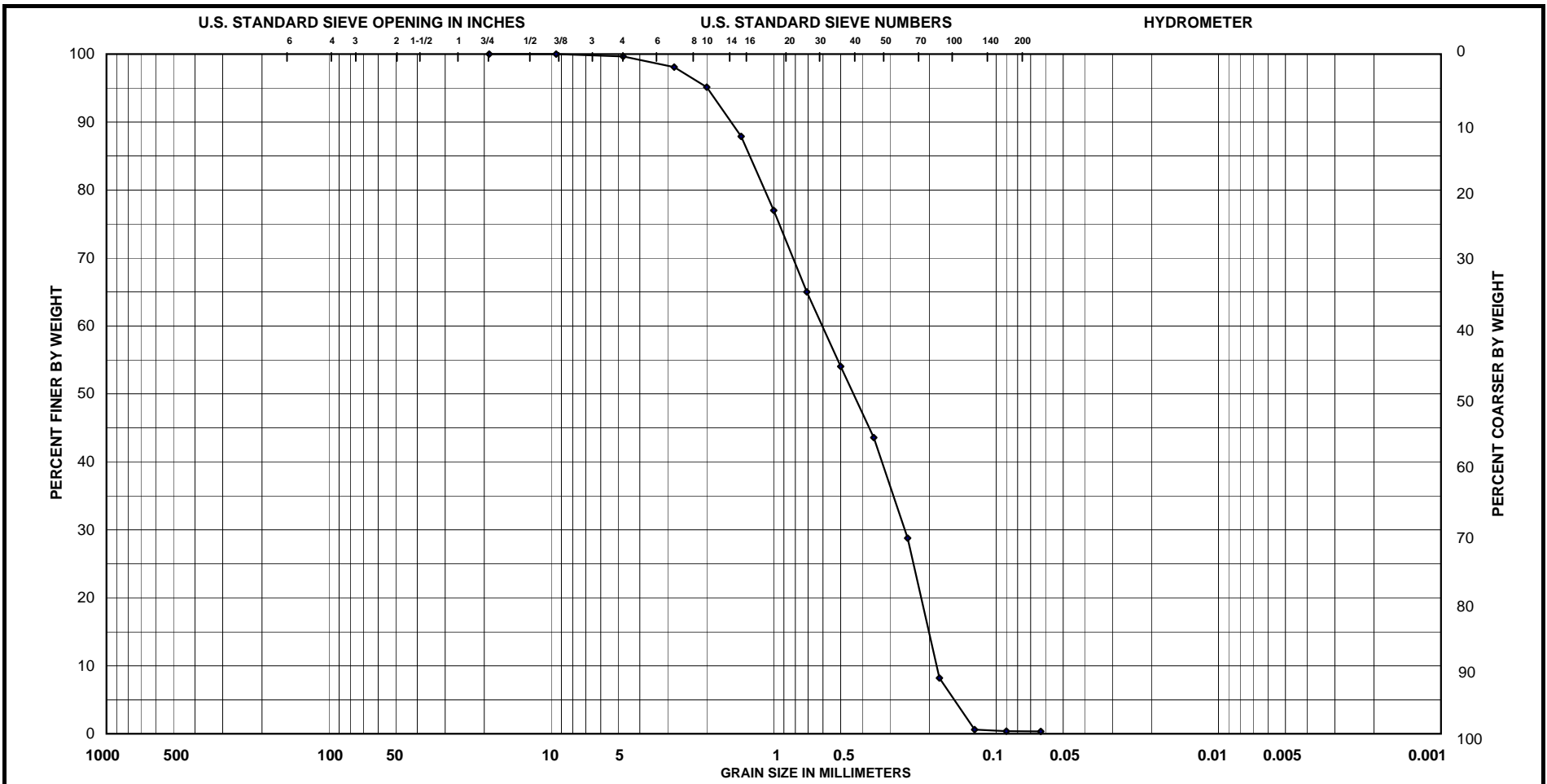
### GRAIN SIZE AND VISUAL SHELL CONTENT

Project:	<b>Topsail Beach, Surf City &amp; North Topsail</b>	Depth:	
Project No.:	<b>1584-01-40</b>	Date:	<b>7/25/2003</b>
Boring No.:	<b>TB2-MHW</b>		
Sample No.:	<b>1</b>		
Description:	<b>SAND, poorly-graded, mostly medium to fine-grained quartz, some carbonate, brownish gray (SP)</b>		

Tare Weight, (g):	<b>50.91</b>	
Dry Wt. Before Washing (g):	<b>145.76</b>	(with tare)
Dry Weight After Washing (g):	<b>145.47</b>	(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	0.31	99.67	100	0.31
#7	2.800	1.50	98.09	100	1.50
#10	2.000	2.80	95.14	80	2.24
#14	1.400	6.88	87.89	80	5.50
#18	1.000	10.33	77.00	75	7.75
#25	0.710	11.37	65.01	70	7.96
#35	0.500	10.39	54.05	55	5.71
#45	0.355	9.94	43.57	40	3.98
#60	0.250	14.01	28.80	10	1.40
#80	0.180	19.53	8.21	3	0.59
#120	0.125	7.21	0.61	1	0.07
#170	0.090	0.23	0.37	1	0.00
#230	0.063	0.01	0.36	1	0.00

**Total Shell Content:** **39** %



COBBLES	GRAVEL		SAND			SILT OR CLAY
	COARSE	FINE	COARSE	MEDIUM	FINE	

Sample No.	Elev. Or Depth	Classification	% CO <sub>3</sub>	G <sub>s</sub>	Nat w%	LL	PL	PI	Project	
♦ 1		SAND, poorly-graded, mostly medium to fine-grained quartz, some carbonate, brownish gray (SP)	39						Topsail Beach, Surf City & North Topsail	
									Area	
									Boring No. TB2-MHW	
									Date 7/25/2003	

**GRADATION CURVES**





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## VISUAL SHELL CONTENT

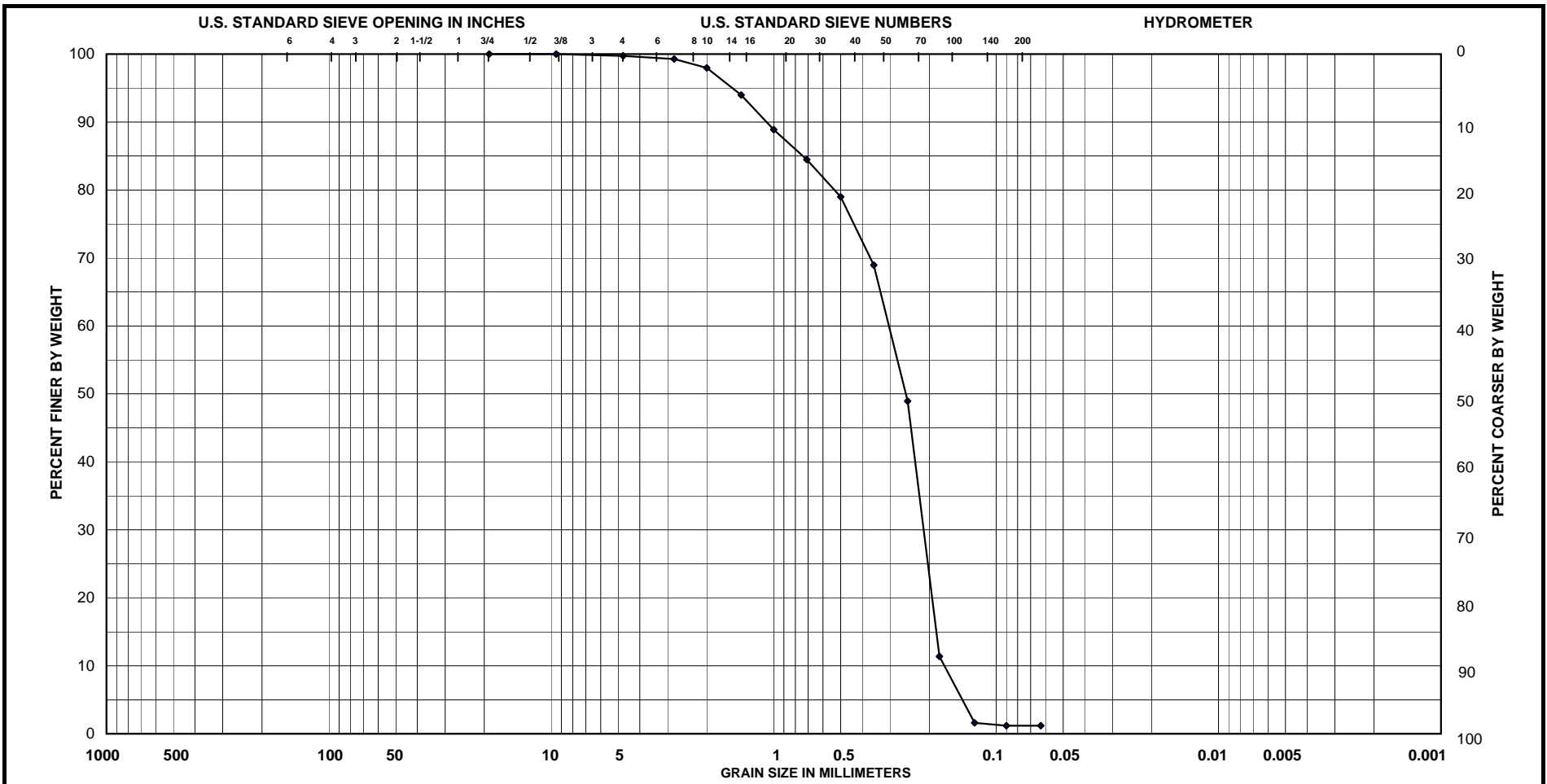
### GRAIN SIZE AND VISUAL SHELL CONTENT

Project:	<b>Topsail Beach, Surf City &amp; North Topsail</b>	Depth:	<b>0</b>
Project No.:	<b>1584-01-40</b>	Date:	<b>7/25/2003</b>
Boring No.:	<b>TB2-MSL</b>		
Sample No.:	<b>1</b>		
Description:	<b>SAND, poorly-graded, mostly fine-grained quartz, little carbonate, gray (SP)</b>		

Tare Weight, (g):	<b>50.88</b>	
Dry Wt. Before Washing (g):	<b>159.74</b>	(with tare)
Dry Weight After Washing (g):	<b>158.83</b>	(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	0.30	99.72	0	0.00
#7	2.800	0.49	99.27	80	0.39
#10	2.000	1.43	97.96	95	1.36
#14	1.400	4.33	93.98	85	3.68
#18	1.000	5.56	88.88	70	3.89
#25	0.710	4.77	84.49	65	3.10
#35	0.500	5.97	79.01	50	2.99
#45	0.355	10.94	68.96	35	3.83
#60	0.250	21.79	48.94	15	3.27
#80	0.180	40.87	11.40	5	2.04
#120	0.125	10.64	1.63	3	0.32
#170	0.090	0.47	1.19	1	0.00
#230	0.063	0.01	1.19	1	0.00

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



COBBLES	GRAVEL		SAND			SILT OR CLAY
	COARSE	FINE	COARSE	MEDIUM	FINE	

Sample No.	Elev. Or Depth	Classification	% CO <sub>3</sub>	G <sub>s</sub>	Nat w%	LL	PL	PI	Project
1	0	SAND, poorly-graded, mostly fine-grained quartz, little carbonate, gray (SP)	23						Topsail Beach, Surf City & North Topsail
									Area
									Boring No. TB2-MSL
									Date 7/25/2003

**GRADATION CURVES**



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## VISUAL SHELL CONTENT

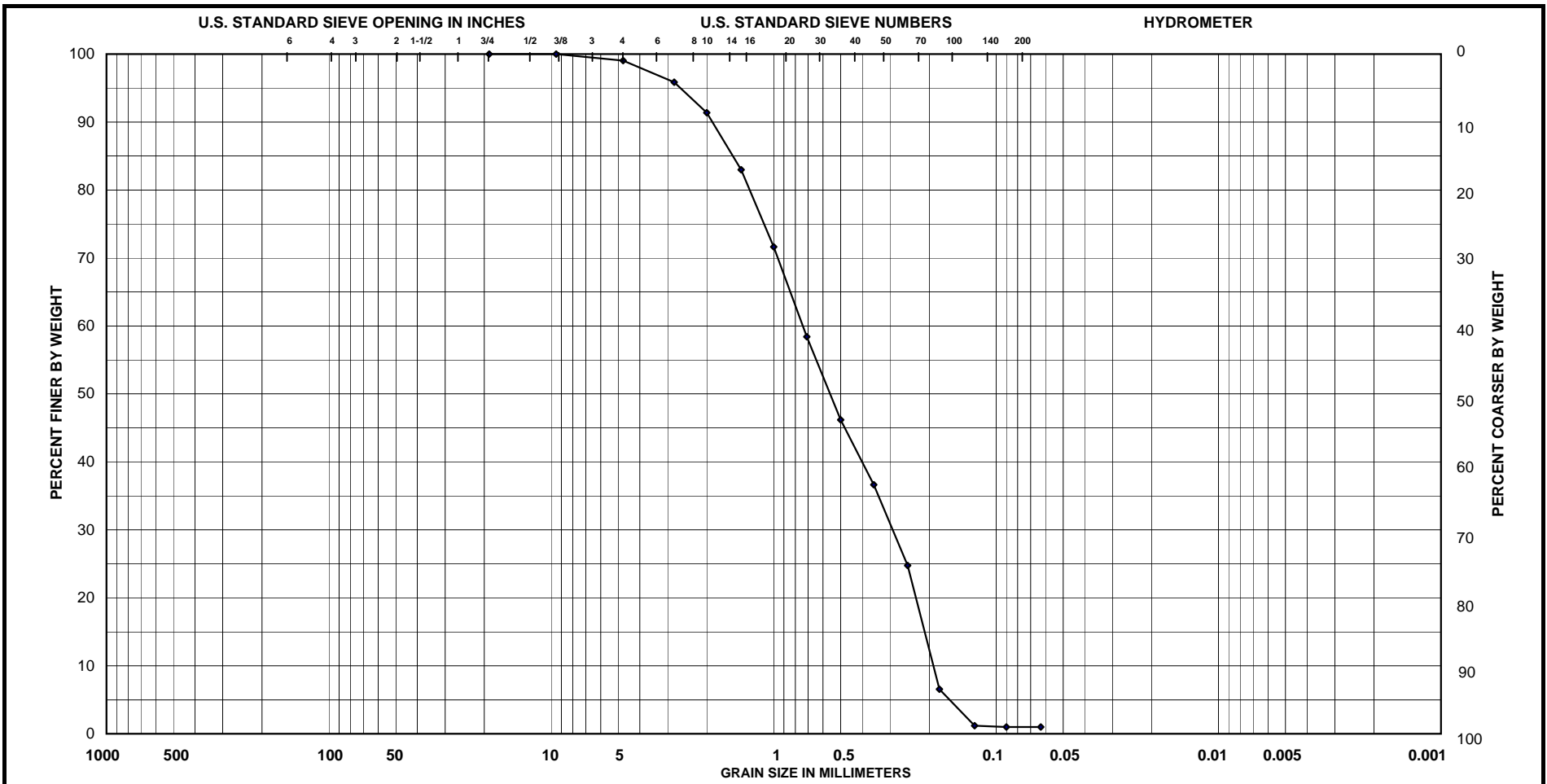
### GRAIN SIZE AND VISUAL SHELL CONTENT

Project:	<b>Topsail Beach, Surf City &amp; North Topsail</b>	Depth:	
Project No.:	<b>1584-01-40</b>	Date:	<b>7/25/2003</b>
Boring No.:	<b>TB2-MLW</b>		
Sample No.:	<b>1</b>		
Description:	<b>SAND, poorly-graded, mostly medium to fine-grained quartz, some carbonate, gray (SP)</b>		

Tare Weight, (g):	<b>47.96</b>	
Dry Wt. Before Washing (g):	<b>215.62</b>	(with tare)
Dry Weight After Washing (g):	<b>214.57</b>	(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	1.58	99.06	100	1.58
#7	2.800	5.38	95.85	100	5.38
#10	2.000	7.48	91.39	75	5.61
#14	1.400	14.12	82.97	70	9.88
#18	1.000	18.98	71.64	65	12.34
#25	0.710	22.21	58.40	65	14.44
#35	0.500	20.50	46.17	60	12.30
#45	0.355	16.00	36.63	35	5.60
#60	0.250	19.89	24.76	15	2.98
#80	0.180	30.50	6.57	3	0.92
#120	0.125	9.06	1.17	1	0.09
#170	0.090	0.26	1.01	1	0.00
#230	0.063	0.01	1.01	1	0.00

**Total Shell Content:** **42** %



COBBLES	GRAVEL		SAND			SILT OR CLAY
	COARSE	FINE	COARSE	MEDIUM	FINE	

Sample No.	Elev. Or Depth	Classification	% CO <sub>3</sub>	G <sub>s</sub>	Nat w%	LL	PL	PI	Project
♦ 1		SAND, poorly-graded, mostly medium to fine-grained quartz, some carbonate, gray (SP)	42						Topsail Beach, Surf City & North Topsail
									Area
									Boring No. TB2-MLW
									Date 7/25/2003

**GRADATION CURVES**



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## VISUAL SHELL CONTENT

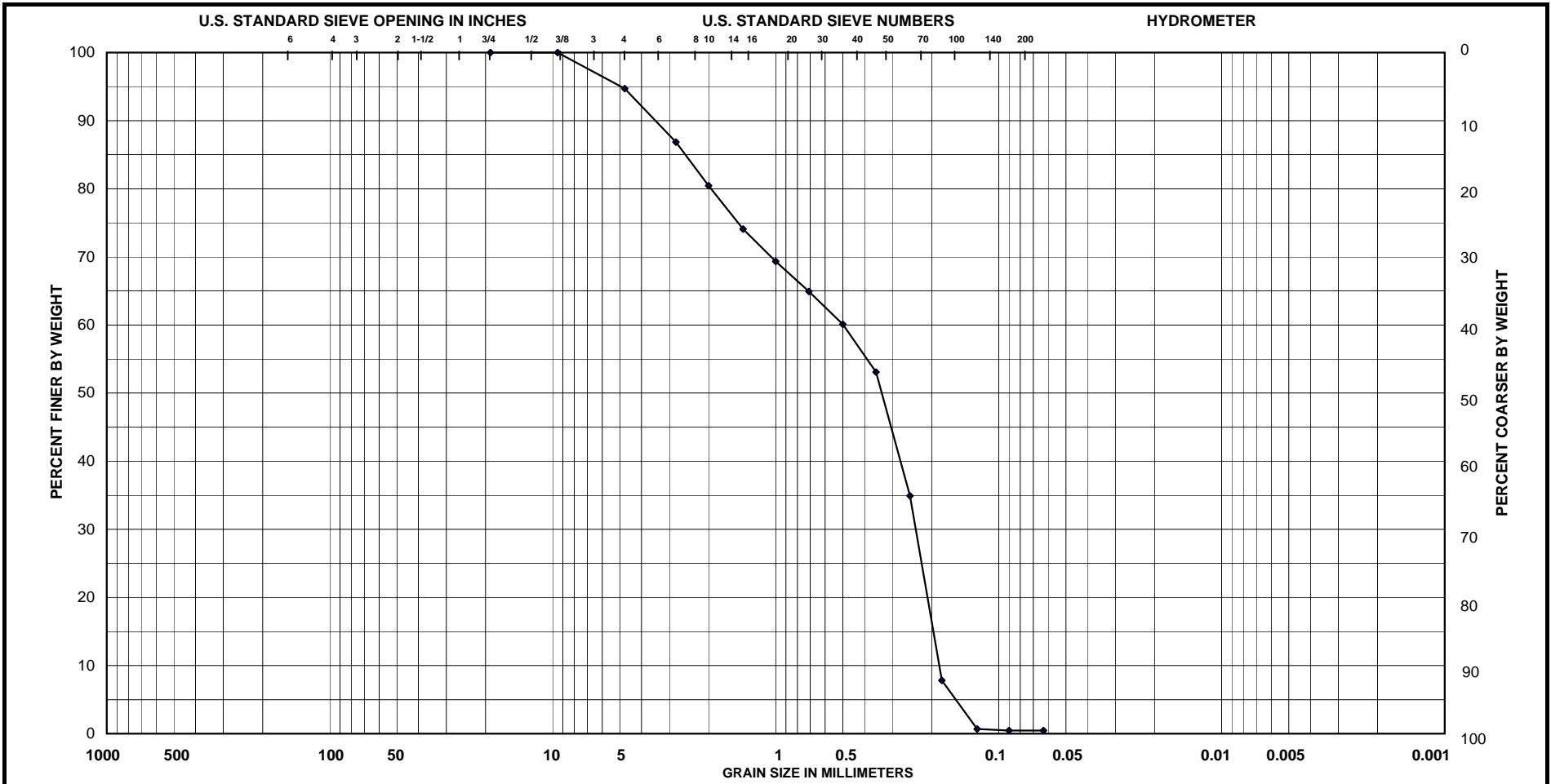
### GRAIN SIZE AND VISUAL SHELL CONTENT

Project:	<b>Topsail Beach, Surf City &amp; North Topsail</b>	Depth:	<b>-3</b>
Project No.:	<b>1584-01-40</b>	Date:	<b>7/25/2003</b>
Boring No.:	<b>TB2-3</b>		
Sample No.:	<b>1</b>		
Description:	<b>SAND, poorly-graded, mostly medium to fine-grained quartz, some carbonate, trace rock fragments, gray (SP)</b>		

Tare Weight, (g):	<b>49.87</b>	
Dry Wt. Before Washing (g):	<b>183.7</b>	(with tare)
Dry Weight After Washing (g):	<b>183.06</b>	(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	7.07	94.72	95	6.72
#7	2.800	10.54	86.84	75	7.91
#10	2.000	8.57	80.44	70	6.00
#14	1.400	8.52	74.07	65	5.54
#18	1.000	6.33	69.34	65	4.11
#25	0.710	5.92	64.92	55	3.26
#35	0.500	6.45	60.10	50	3.23
#45	0.355	9.38	53.09	40	3.75
#60	0.250	24.33	34.91	20	4.87
#80	0.180	36.26	7.82	3	1.09
#120	0.125	9.55	0.68	1	0.10
#170	0.090	0.27	0.48	1	0.00
#230	0.063	0.03	0.46	1	0.00

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



COBBLES	GRAVEL		SAND			SILT OR CLAY
	COARSE	FINE	COARSE	MEDIUM	FINE	

Sample No.	Elev. Or Depth	Classification	% CO <sub>3</sub>	G <sub>s</sub>	Nat w%	LL	PL	PI	Project
1	-3	SAND, poorly-graded, mostly medium to fine-grained quartz, some carbonate, trace rock fragments, gray (SP)	35						Topsail Beach, Surf City & North Topsail
									Area
									Boring No. TB2-3
									Date 7/25/2003

**GRADATION CURVES**



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## VISUAL SHELL CONTENT

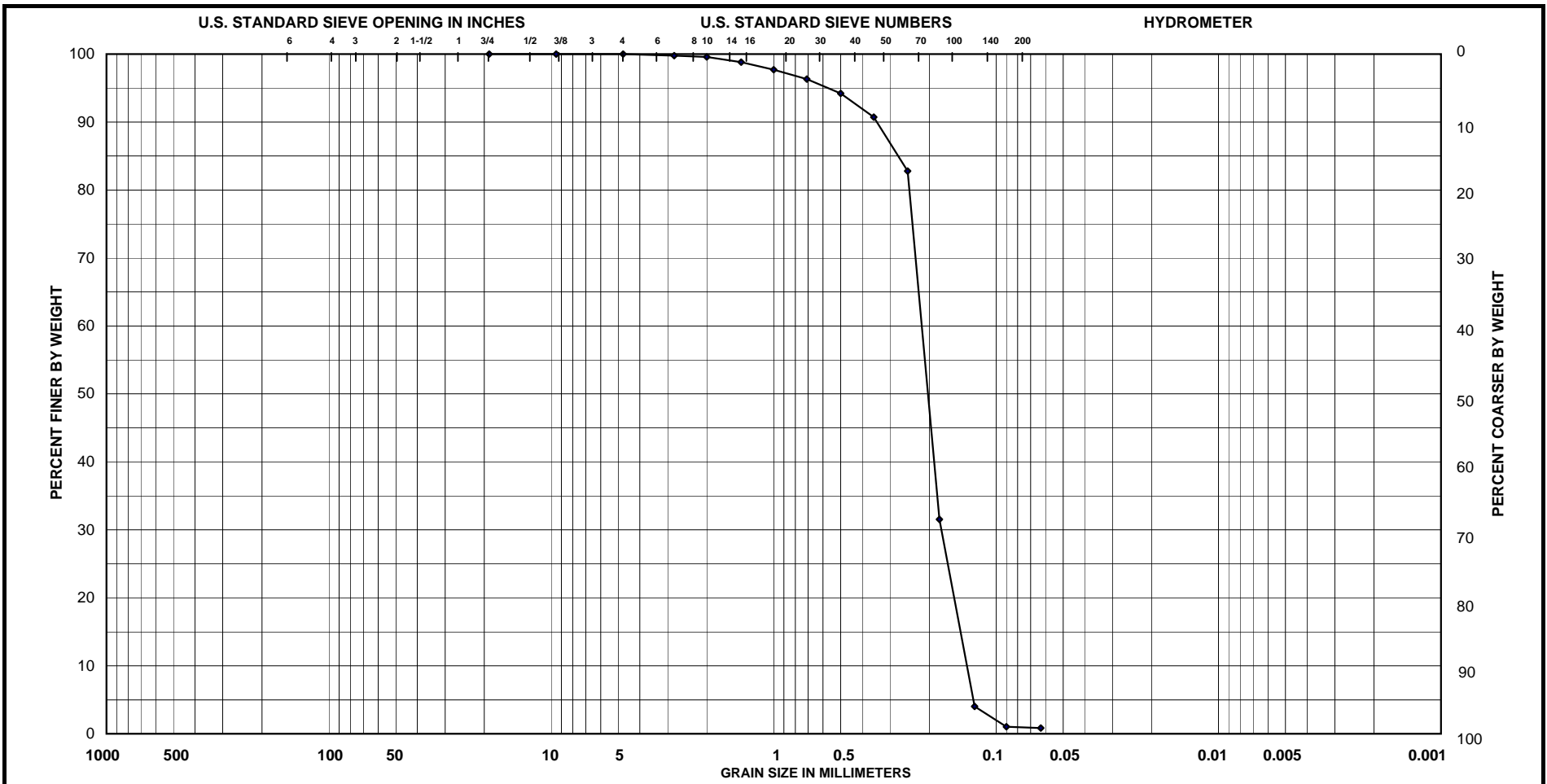
### GRAIN SIZE AND VISUAL SHELL CONTENT

Project:	<b>Topsail Beach, Surf City &amp; North Topsail</b>	Depth:	<b>-4</b>
Project No.:	<b>1584-01-40</b>	Date:	<b>7/25/2003</b>
Boring No.:	<b>TB2-4</b>		
Sample No.:	<b>1</b>		
Description:	<b>SAND, poorly-graded, mostly fine-grained quartz, few carbonate, gray (SP)</b>		

Tare Weight, (g):	<b>49.78</b>	
Dry Wt. Before Washing (g):	<b>146.38</b>	(with tare)
Dry Weight After Washing (g):	<b>145.4</b>	(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	0.22	99.77	100	0.22
#10	2.000	0.20	99.57	100	0.20
#14	1.400	0.71	98.83	95	0.67
#18	1.000	1.10	97.69	90	0.99
#25	0.710	1.33	96.31	75	1.00
#35	0.500	2.02	94.22	60	1.21
#45	0.355	3.38	90.72	40	1.35
#60	0.250	7.68	82.77	15	1.15
#80	0.180	49.48	31.55	3	1.48
#120	0.125	26.60	4.02	1	0.27
#170	0.090	2.87	1.05	1	0.03
#230	0.063	0.20	0.84	1	0.00

**Total Shell Content:** **9** %



COBBLES	GRAVEL		SAND			SILT OR CLAY
	COARSE	FINE	COARSE	MEDIUM	FINE	

Sample No.	Elev. Or Depth	Classification	% CO <sub>3</sub>	G <sub>s</sub>	Nat w%	LL	PL	PI	Project
1	-4	SAND, poorly-graded, mostly fine-grained quartz, few carbonate, gray (SP)	9						Topsail Beach, Surf City & North Topsail
									Area
									Boring No. TB2-4
									Date 7/25/2003

**GRADATION CURVES**





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## VISUAL SHELL CONTENT

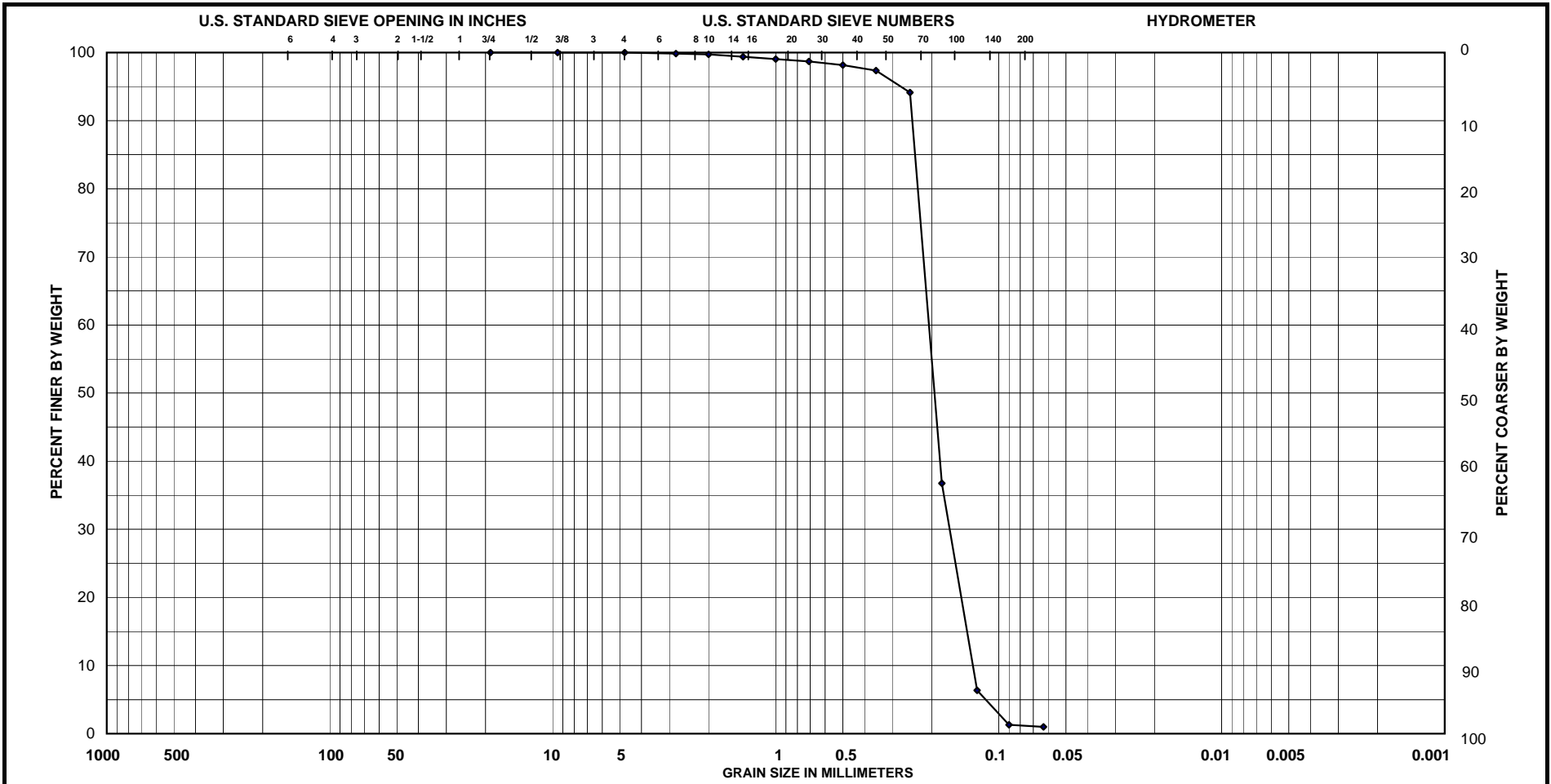
### GRAIN SIZE AND VISUAL SHELL CONTENT

Project:	<b>Topsail Beach, Surf City &amp; North Topsail</b>	Depth:	<b>-6</b>
Project No.:	<b>1584-01-40</b>	Date:	<b>7/29/2003</b>
Boring No.:	<b>TB2-6</b>		
Sample No.:	<b>1</b>		
Description:	<b>SAND, poorly-graded, mostly fine-grained quartz, trace carbonate, gray (SP)</b>		

Tare Weight, (g):	<b>50.13</b>	
Dry Wt. Before Washing (g):	<b>136.16</b>	(with tare)
Dry Weight After Washing (g):	<b>135.22</b>	(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	0.12	99.86	100	0.12
#10	2.000	0.11	99.73	100	0.11
#14	1.400	0.31	99.37	95	0.29
#18	1.000	0.29	99.04	95	0.28
#25	0.710	0.28	98.71	80	0.22
#35	0.500	0.48	98.15	45	0.22
#45	0.355	0.67	97.37	40	0.27
#60	0.250	2.78	94.14	20	0.56
#80	0.180	49.38	36.74	3	1.48
#120	0.125	26.12	6.38	1	0.26
#170	0.090	4.36	1.31	1	0.04
#230	0.063	0.27	1.00	1	0.00

**Total Shell Content:** **4** %



COBBLES	GRAVEL		SAND			SILT OR CLAY
	COARSE	FINE	COARSE	MEDIUM	FINE	

Sample No.	Elev. Or Depth	Classification	% CO <sub>3</sub>	G <sub>s</sub>	Nat w%	LL	PL	PI	Project
1	-6	SAND, poorly-graded, mostly fine-grained quartz, trace carbonate, gray (SP)	4						Topsail Beach, Surf City & North Topsail
									Area
									Boring No. TB2-6
									Date 7/29/2003

**GRADATION CURVES**



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## VISUAL SHELL CONTENT

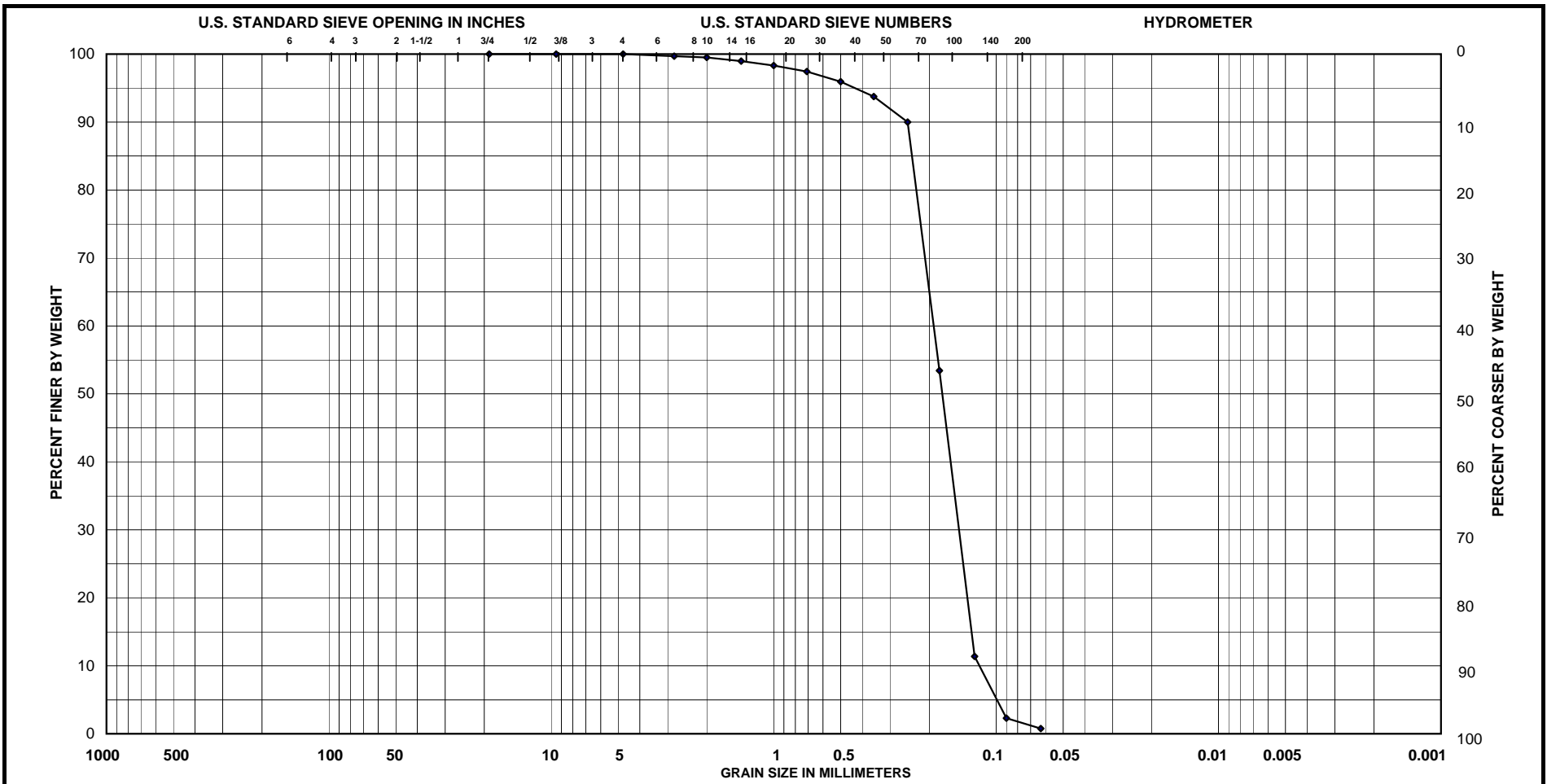
### GRAIN SIZE AND VISUAL SHELL CONTENT

Project:	<b>Topsail Beach, Surf City &amp; North Topsail</b>	Depth:	<b>-8</b>
Project No.:	<b>1584-01-40</b>	Date:	<b>7/29/2003</b>
Boring No.:	<b>TB2-8</b>		
Sample No.:	<b>1</b>		
Description:	<b>SAND, poorly-graded, mostly fine-grained quartz, few carbonate, gray (SP)</b>		

Tare Weight, (g):	<b>49.85</b>	
Dry Wt. Before Washing (g):	<b>153.65</b>	(with tare)
Dry Weight After Washing (g):	<b>152.48</b>	(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	0.33	99.68	100	0.33
#10	2.000	0.20	99.49	85	0.17
#14	1.400	0.56	98.95	80	0.45
#18	1.000	0.66	98.31	80	0.53
#25	0.710	0.93	97.42	70	0.65
#35	0.500	1.53	95.94	55	0.84
#45	0.355	2.26	93.77	40	0.90
#60	0.250	3.92	89.99	15	0.59
#80	0.180	37.95	53.43	3	1.14
#120	0.125	43.66	11.37	1	0.44
#170	0.090	9.41	2.30	1	0.09
#230	0.063	1.60	0.76	1	0.02

**Total Shell Content:** **6** %



COBBLES	GRAVEL		SAND			SILT OR CLAY
	COARSE	FINE	COARSE	MEDIUM	FINE	

Sample No.	Elev. Or Depth	Classification	% CO <sub>3</sub>	G <sub>s</sub>	Nat w%	LL	PL	PI	Project
♦ 1	-8	SAND, poorly-graded, mostly fine-grained quartz, few carbonate, gray (SP)	6						Topsail Beach, Surf City & North Topsail
									Area
									Boring No. TB2-8
									Date 7/29/2003

**GRADATION CURVES**



# WOLF TECHNOLOGIES, INC.

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

## VISUAL SHELL CONTENT

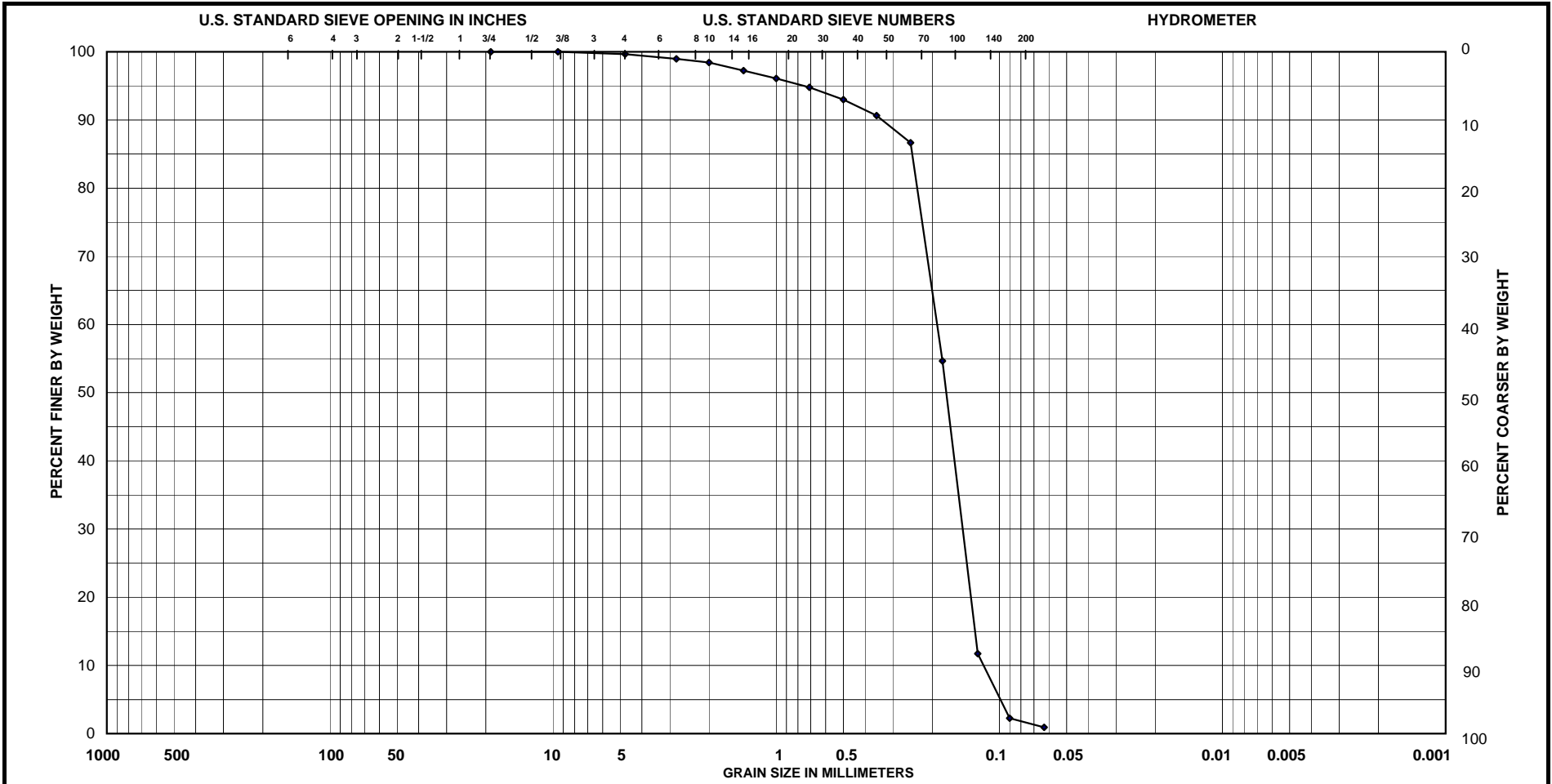
### GRAIN SIZE AND VISUAL SHELL CONTENT

Project:	<b>Topsail Beach, Surf City &amp; North Topsail</b>	Depth:	<b>-15</b>
Project No.:	<b>1584-01-40</b>	Date:	<b>7/29/2003</b>
Boring No.:	<b>TB2-10</b>		
Sample No.:	<b>1</b>		
Description:	<b>SAND, poorly-graded, mostly fine-grained quartz, few carbonate, gray (SP)</b>		

Tare Weight, (g):	<b>50.29</b>	
Dry Wt. Before Washing (g):	<b>144.75</b>	(with tare)
Dry Weight After Washing (g):	<b>143.73</b>	(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	0.34	99.64	100	0.34
#7	2.800	0.63	98.97	100	0.63
#10	2.000	0.53	98.41	80	0.42
#14	1.400	1.11	97.24	80	0.89
#18	1.000	1.09	96.08	75	0.82
#25	0.710	1.22	94.79	70	0.85
#35	0.500	1.69	93.00	50	0.85
#45	0.355	2.23	90.64	40	0.89
#60	0.250	3.75	86.67	20	0.75
#80	0.180	30.23	54.67	3	0.91
#120	0.125	40.55	11.74	1	0.41
#170	0.090	8.94	2.28	1	0.09
#230	0.063	1.27	0.93	1	0.01

**Total Shell Content:** **8** %



COBBLES	GRAVEL		SAND			SILT OR CLAY
	COARSE	FINE	COARSE	MEDIUM	FINE	

Sample No.	Elev. Or Depth	Classification	% CO <sub>3</sub>	G <sub>s</sub>	Nat w%	LL	PL	PI	Project
♦ 1	-15	SAND, poorly-graded, mostly fine-grained quartz, few carbonate, gray (SP)	8						Topsail Beach, Surf City & North Topsail
									Area
									Boring No. TB2-10
									Date 7/29/2003

**GRADATION CURVES**



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## VISUAL SHELL CONTENT

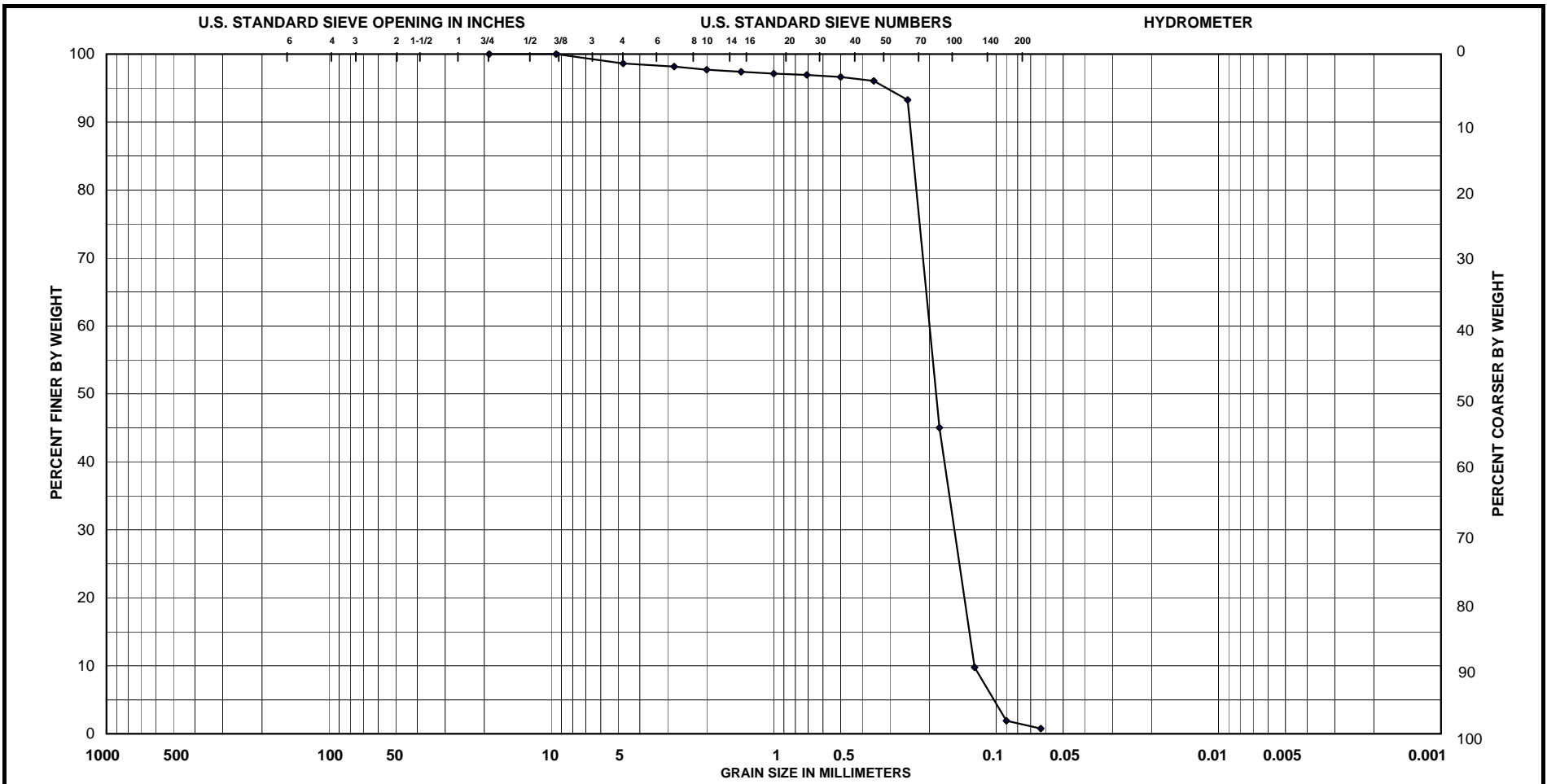
### GRAIN SIZE AND VISUAL SHELL CONTENT

Project:	<b>Topsail Beach, Surf City &amp; North Topsail</b>	Depth:	<b>-12</b>
Project No.:	<b>1584-01-40</b>	Date:	<b>7/29/2003</b>
Boring No.:	<b>TB2-12</b>		
Sample No.:	<b>1</b>		
Description:	<b>SAND, poorly-graded, mostly fine-grained quartz, few carbonate, bluish gray (SP)</b>		

Tare Weight, (g):	<b>50.49</b>	
Dry Wt. Before Washing (g):	<b>161.7</b>	(with tare)
Dry Weight After Washing (g):	<b>160.34</b>	(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	1.55	98.61	100	1.55
#7	2.800	0.51	98.15	100	0.51
#10	2.000	0.50	97.70	90	0.45
#14	1.400	0.33	97.40	85	0.28
#18	1.000	0.29	97.14	85	0.25
#25	0.710	0.22	96.94	90	0.20
#35	0.500	0.34	96.64	75	0.26
#45	0.355	0.63	96.07	45	0.28
#60	0.250	3.13	93.26	15	0.47
#80	0.180	53.62	45.04	5	2.68
#120	0.125	39.21	9.78	3	1.18
#170	0.090	8.73	1.93	1	0.09
#230	0.063	1.28	0.78	1	0.01

**Total Shell Content:** **7** %



COBBLES	GRAVEL		SAND			SILT OR CLAY
	COARSE	FINE	COARSE	MEDIUM	FINE	

Sample No.	Elev. Or Depth	Classification	% CO <sub>3</sub>	G <sub>s</sub>	Nat w%	LL	PL	PI	
♦ 1	-12	SAND, poorly-graded, mostly fine-grained quartz, few carbonate, bluish gray (SP)	7						<b>Project</b> Topsail Beach, Surf City & North Topsail
									<b>Area</b>
									<b>Boring No.</b> TB2-12
									<b>Date</b> 7/29/2003

**GRADATION CURVES**





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## VISUAL SHELL CONTENT

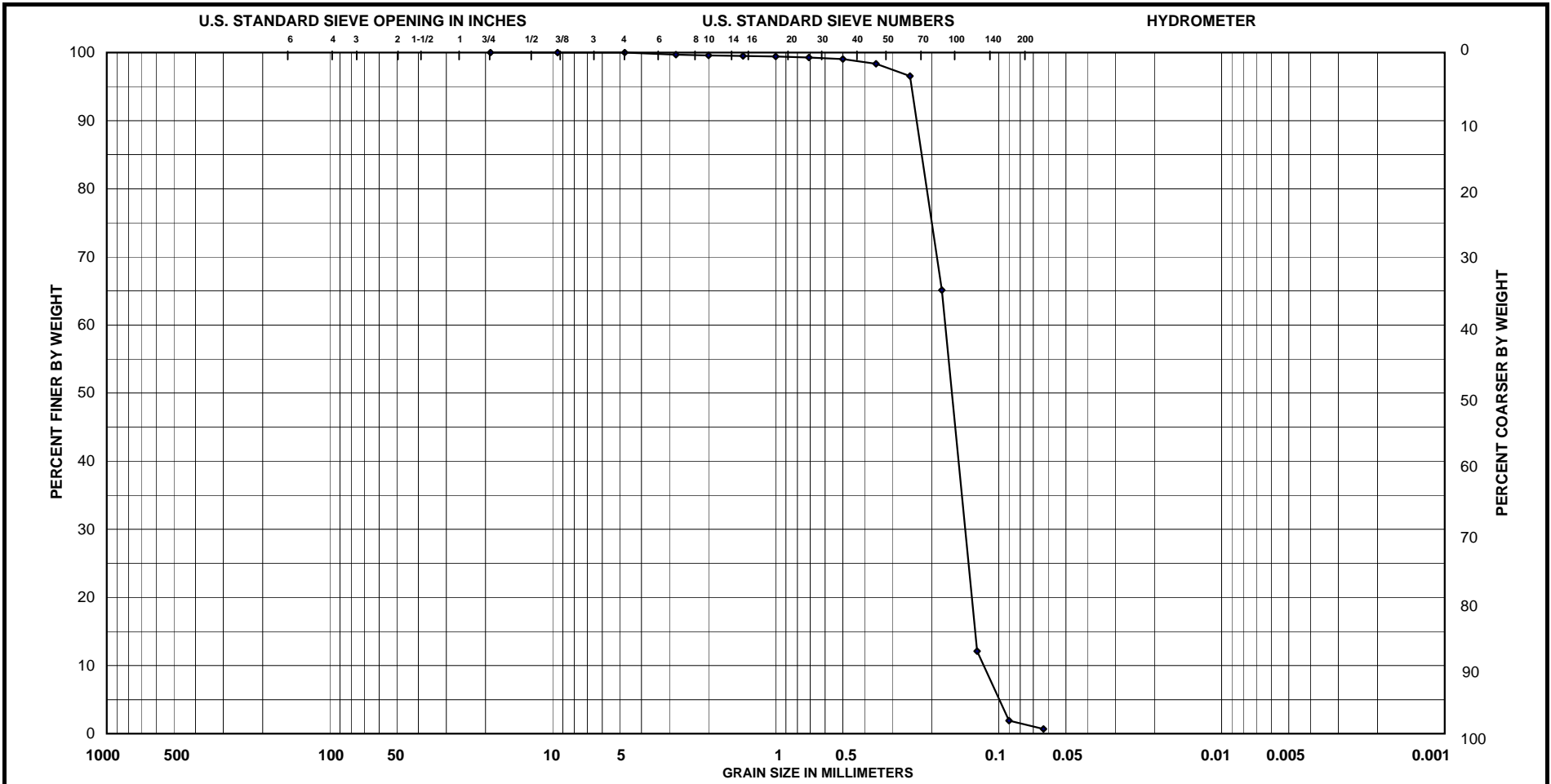
### GRAIN SIZE AND VISUAL SHELL CONTENT

Project:	<b>Topsail Beach, Surf City &amp; North Topsail</b>	Depth:	<b>-14</b>
Project No.:	<b>1584-01-40</b>	Date:	<b>7/29/2003</b>
Boring No.:	<b>TB2-14</b>		
Sample No.:	<b>1</b>		
Description:	<b>SAND, poorly-graded, mostly fine-grained quartz, trace carbonate, bluish gray (SP)</b>		

Tare Weight, (g):	<b>50.53</b>	
Dry Wt. Before Washing (g):	<b>130.01</b>	(with tare)
Dry Weight After Washing (g):	<b>129.09</b>	(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	0.25	99.69	100	0.25
#10	2.000	0.07	99.60	100	0.07
#14	1.400	0.07	99.51	100	0.07
#18	1.000	0.08	99.41	100	0.08
#25	0.710	0.10	99.28	75	0.08
#35	0.500	0.18	99.06	65	0.12
#45	0.355	0.55	98.36	25	0.14
#60	0.250	1.43	96.57	10	0.14
#80	0.180	25.00	65.11	3	0.75
#120	0.125	42.11	12.13	1	0.42
#170	0.090	8.11	1.93	1	0.08
#230	0.063	0.98	0.69	1	0.01

**Total Shell Content:** **3** %



COBBLES	GRAVEL		SAND			SILT OR CLAY
	COARSE	FINE	COARSE	MEDIUM	FINE	

Sample No.	Elev. Or Depth	Classification	% CO <sub>3</sub>	G <sub>s</sub>	Nat w%	LL	PL	PI	Project	
♦ 1	-14	SAND, poorly-graded, mostly fine-grained quartz, trace carbonate, bluish gray (SP)	3						Topsail Beach, Surf City & North Topsail	
									Area	
									Boring No. TB2-14	
									Date 7/29/2003	

**GRADATION CURVES**



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## VISUAL SHELL CONTENT

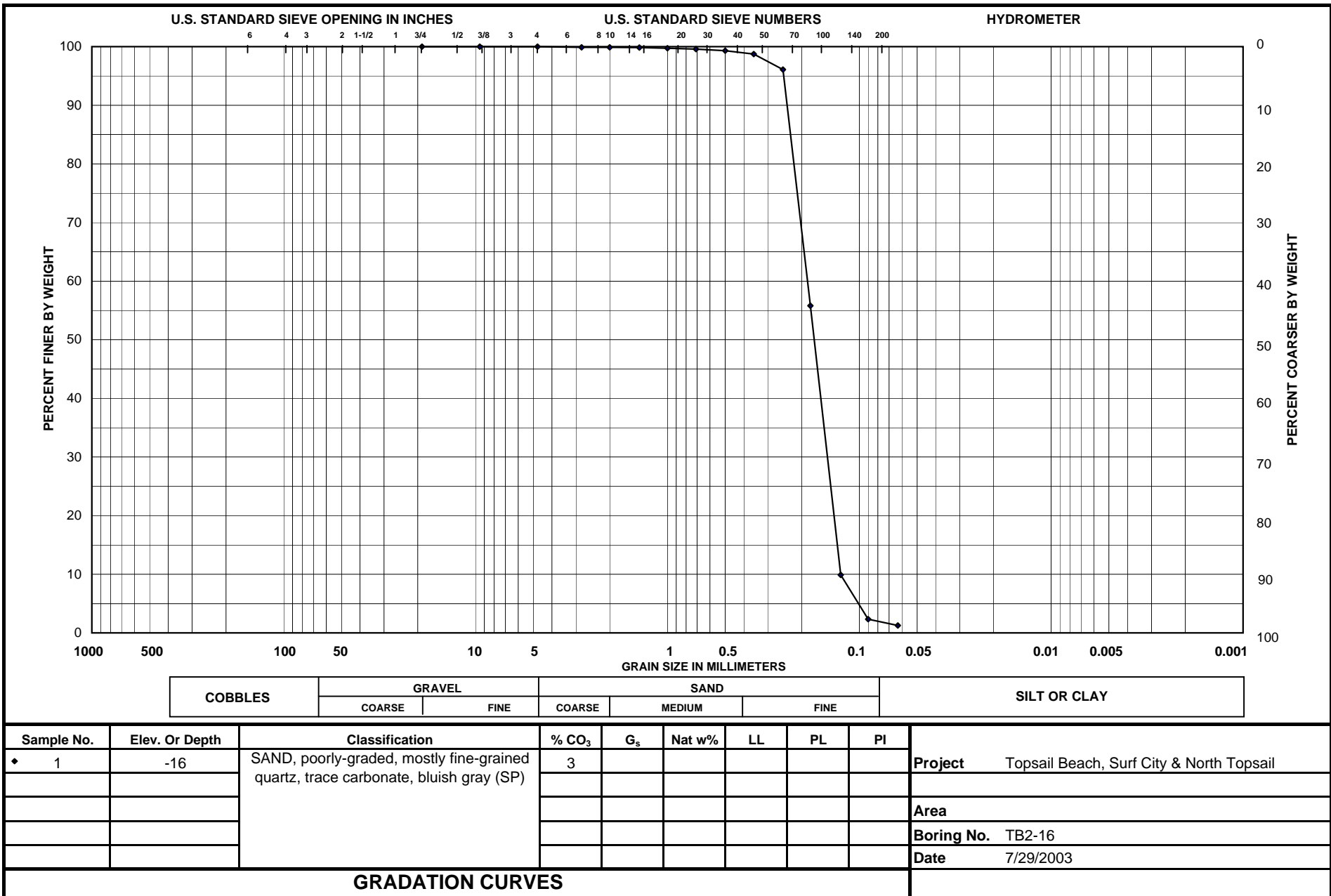
### GRAIN SIZE AND VISUAL SHELL CONTENT

Project:	<b>Topsail Beach, Surf City &amp; North Topsail</b>	Depth:	<b>-16</b>
Project No.:	<b>1584-01-40</b>	Date:	<b>7/29/2003</b>
Boring No.:	<b>TB2-16</b>		
Sample No.:	<b>1</b>		
Description:	<b>SAND, poorly-graded, mostly fine-grained quartz, trace carbonate, bluish gray (SP)</b>		

Tare Weight, (g):	<b>49.88</b>	
Dry Wt. Before Washing (g):	<b>145.11</b>	(with tare)
Dry Weight After Washing (g):	<b>143.85</b>	(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	0.10	99.89	100	0.10
#10	2.000	0.02	99.87	100	0.02
#14	1.400	0.04	99.83	100	0.04
#18	1.000	0.11	99.72	100	0.11
#25	0.710	0.12	99.59	100	0.12
#35	0.500	0.26	99.32	75	0.20
#45	0.355	0.55	98.74	55	0.30
#60	0.250	2.51	96.10	30	0.75
#80	0.180	38.37	55.81	3	1.15
#120	0.125	43.75	9.87	1	0.44
#170	0.090	7.18	2.33	1	0.07
#230	0.063	1.01	1.27	1	0.01

**Total Shell Content:** **3** %



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## VISUAL SHELL CONTENT

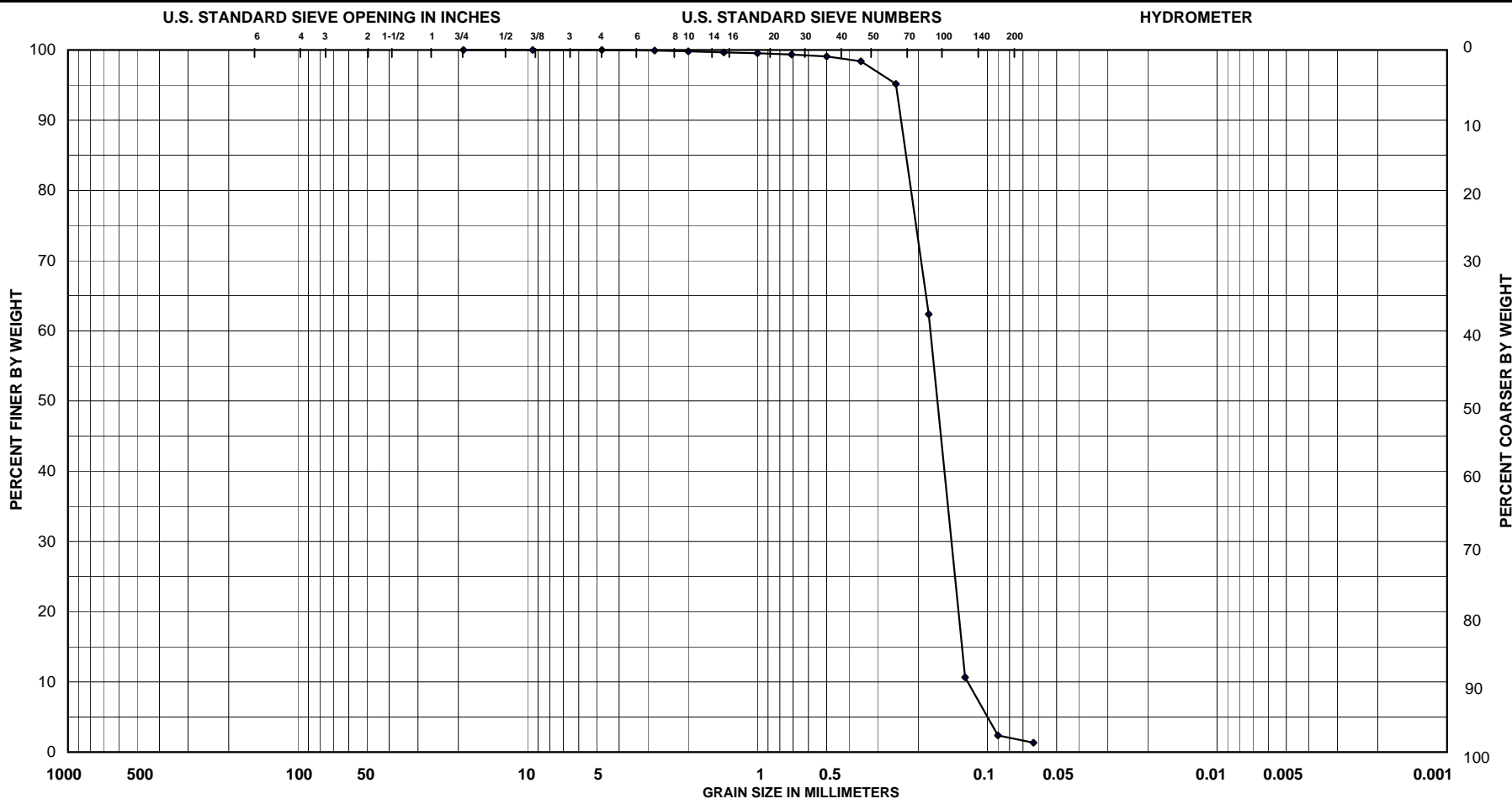
### GRAIN SIZE AND VISUAL SHELL CONTENT

Project:	<b>Topsail Beach, Surf City &amp; North Topsail</b>	Depth:	<b>-18</b>
Project No.:	<b>1584-01-40</b>	Date:	<b>7/29/2003</b>
Boring No.:	<b>TB2-18</b>		
Sample No.:	<b>1</b>		
Description:	<b>SAND, poorly-graded, mostly fine-grained quartz, trace carbonate, very dark bluish gray (SP)</b>		

Tare Weight, (g):	<b>49.84</b>	
Dry Wt. Before Washing (g):	<b>139.42</b>	(with tare)
Dry Weight After Washing (g):	<b>138.27</b>	(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	0.07	99.92	100	0.07
#10	2.000	0.09	99.82	100	0.09
#14	1.400	0.15	99.65	100	0.15
#18	1.000	0.09	99.55	100	0.09
#25	0.710	0.17	99.36	98	0.17
#35	0.500	0.27	99.06	65	0.18
#45	0.355	0.59	98.40	40	0.24
#60	0.250	2.90	95.17	15	0.44
#80	0.180	29.38	62.37	3	0.88
#120	0.125	46.34	10.64	3	1.39
#170	0.090	7.41	2.37	1	0.07
#230	0.063	0.91	1.35	1	0.01

**Total Shell Content:** **4** %



<b>COBBLES</b>	<b>GRAVEL</b>		<b>SAND</b>			<b>SILT OR CLAY</b>
	COARSE	FINE	COARSE	MEDIUM	FINE	

Sample No.	Elev. Or Depth	Classification	% CO <sub>3</sub>	G <sub>s</sub>	Nat w%	LL	PL	PI	Project
♦ 1	-18	SAND, poorly-graded, mostly fine-grained quartz, trace carbonate, very dark bluish gray (SP)	4						Topsail Beach, Surf City & North Topsail
									<b>Area</b>
									<b>Boring No.</b> TB2-18
									<b>Date</b> 7/29/2003

**GRADATION CURVES**



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## VISUAL SHELL CONTENT

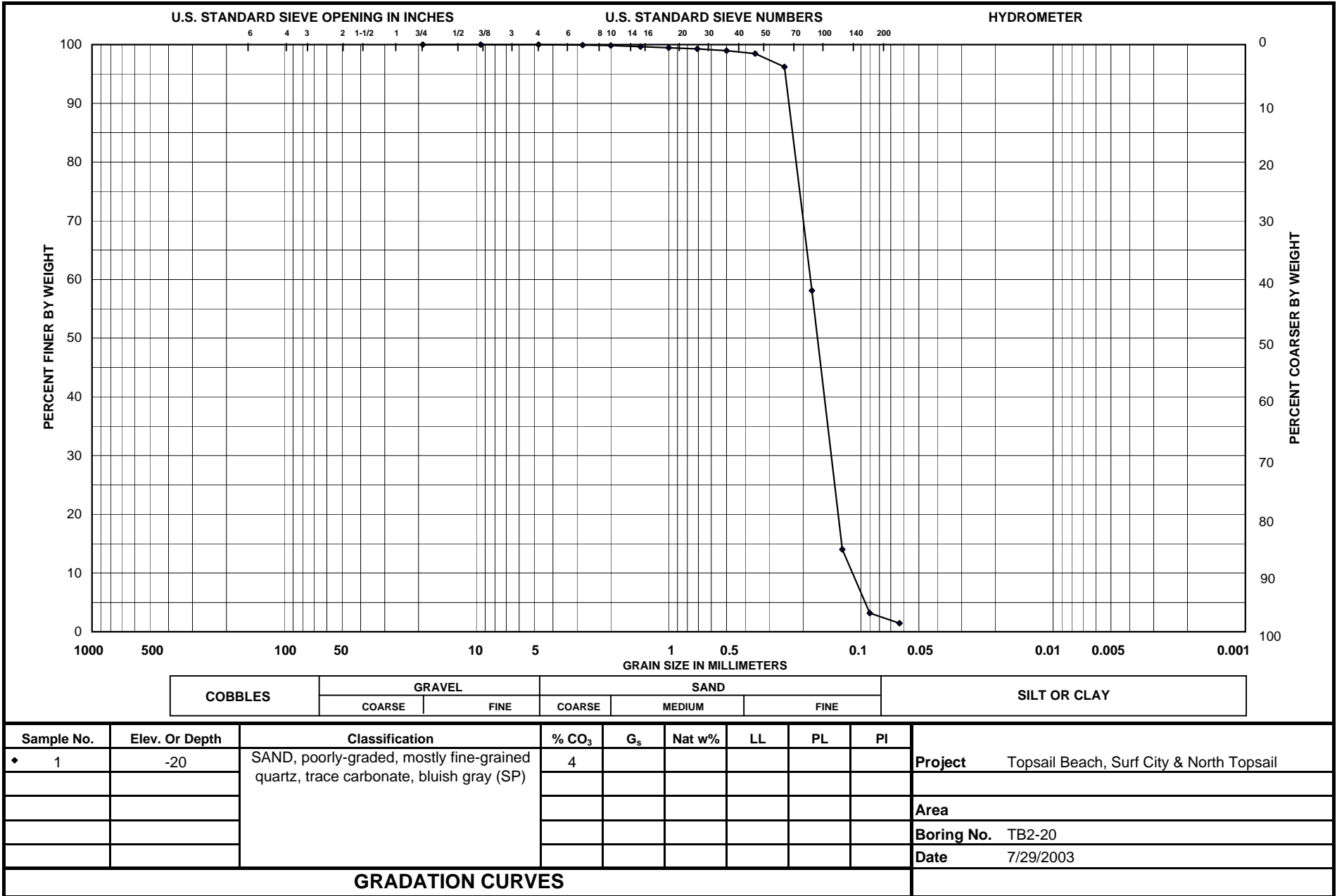
### GRAIN SIZE AND VISUAL SHELL CONTENT

Project:	<b>Topsail Beach, Surf City &amp; North Topsail</b>	Depth:	<b>-20</b>
Project No.:	<b>1584-01-40</b>	Date:	<b>7/29/2003</b>
Boring No.:	<b>TB2-20</b>		
Sample No.:	<b>1</b>		
Description:	<b>SAND, poorly-graded, mostly fine-grained quartz, trace carbonate, bluish gray (SP)</b>		

Tare Weight, (g):	<b>49.97</b>	
Dry Wt. Before Washing (g):	<b>143.96</b>	(with tare)
Dry Weight After Washing (g):	<b>142.69</b>	(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	0.06	99.94	100	0.06
#10	2.000	0.09	99.84	100	0.09
#14	1.400	0.18	99.65	100	0.18
#18	1.000	0.19	99.45	100	0.19
#25	0.710	0.17	99.27	95	0.16
#35	0.500	0.27	98.98	75	0.20
#45	0.355	0.48	98.47	55	0.26
#60	0.250	2.11	96.22	20	0.42
#80	0.180	35.82	58.11	3	1.07
#120	0.125	41.42	14.04	3	1.24
#170	0.090	10.20	3.19	1	0.10
#230	0.063	1.64	1.45	1	0.02

**Total Shell Content:** **4** %



COBBLES	GRAVEL		SAND			SILT OR CLAY
	COARSE	FINE	COARSE	MEDIUM	FINE	

Sample No.	Elev. Or Depth	Classification	% CO <sub>3</sub>	G <sub>s</sub>	Nat w%	LL	PL	PI	Project
♦ 1	-20	SAND, poorly-graded, mostly fine-grained quartz, trace carbonate, bluish gray (SP)	4						Topsail Beach, Surf City & North Topsail
									Area
									Boring No. TB2-20
									Date 7/29/2003

**GRADATION CURVES**





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## VISUAL SHELL CONTENT

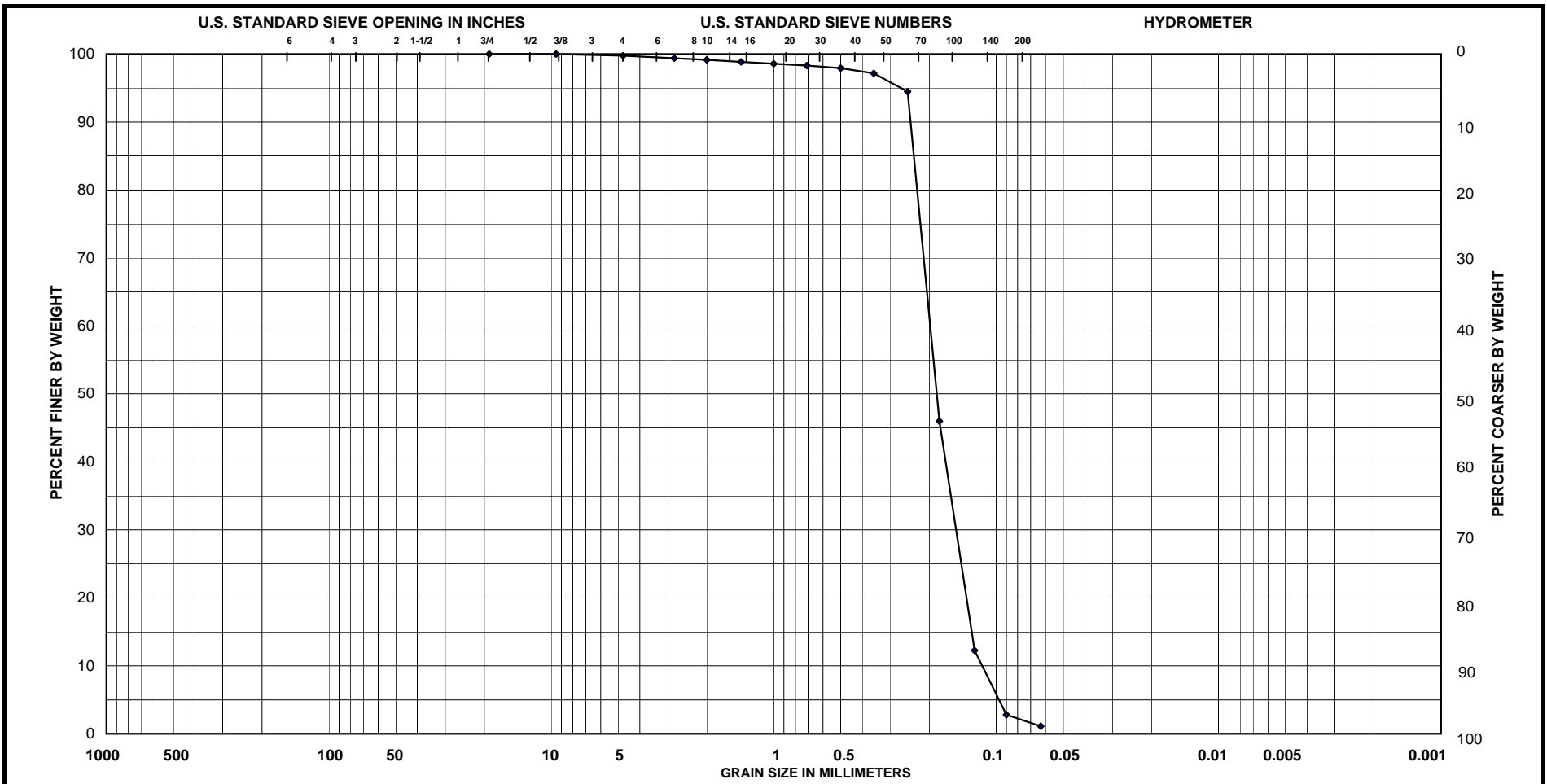
### GRAIN SIZE AND VISUAL SHELL CONTENT

Project:	<b>Topsail Beach, Surf City &amp; North Topsail</b>	Depth:	<b>-22</b>
Project No.:	<b>1584-01-40</b>	Date:	<b>7/29/2003</b>
Boring No.:	<b>TB2-22</b>		
Sample No.:	<b>1</b>		
Description:	<b>SAND, poorly-graded, mostly fine-grained quartz, few carbonate, bluish gray (SP)</b>		

Tare Weight, (g):	<b>49.72</b>	
Dry Wt. Before Washing (g):	<b>161.18</b>	(with tare)
Dry Weight After Washing (g):	<b>159.68</b>	(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	99.77	100	0.26
#7	2.800	0.41	99.40	100	0.41
#10	2.000	0.28	99.15	100	0.28
#14	1.400	0.35	98.83	100	0.35
#18	1.000	0.27	98.59	98	0.26
#25	0.710	0.31	98.31	95	0.29
#35	0.500	0.42	97.94	70	0.29
#45	0.355	0.87	97.16	45	0.39
#60	0.250	2.98	94.48	15	0.45
#80	0.180	54.04	46.00	5	2.70
#120	0.125	37.61	12.26	3	1.13
#170	0.090	10.52	2.82	1	0.11
#230	0.063	1.90	1.11	1	0.02

**Total Shell Content:** **6** %



<b>COBBLES</b>	<b>GRAVEL</b>		<b>SAND</b>			<b>SILT OR CLAY</b>
	COARSE	FINE	COARSE	MEDIUM	FINE	

Sample No.	Elev. Or Depth	Classification	% CO <sub>3</sub>	G <sub>s</sub>	Nat w%	LL	PL	PI	Project
♦ 1	-22	SAND, poorly-graded, mostly fine-grained quartz, few carbonate, bluish gray (SP)	6						Topsail Beach, Surf City & North Topsail
									Area
									Boring No. TB2-22
									Date 7/29/2003

**GRADATION CURVES**



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## VISUAL SHELL CONTENT

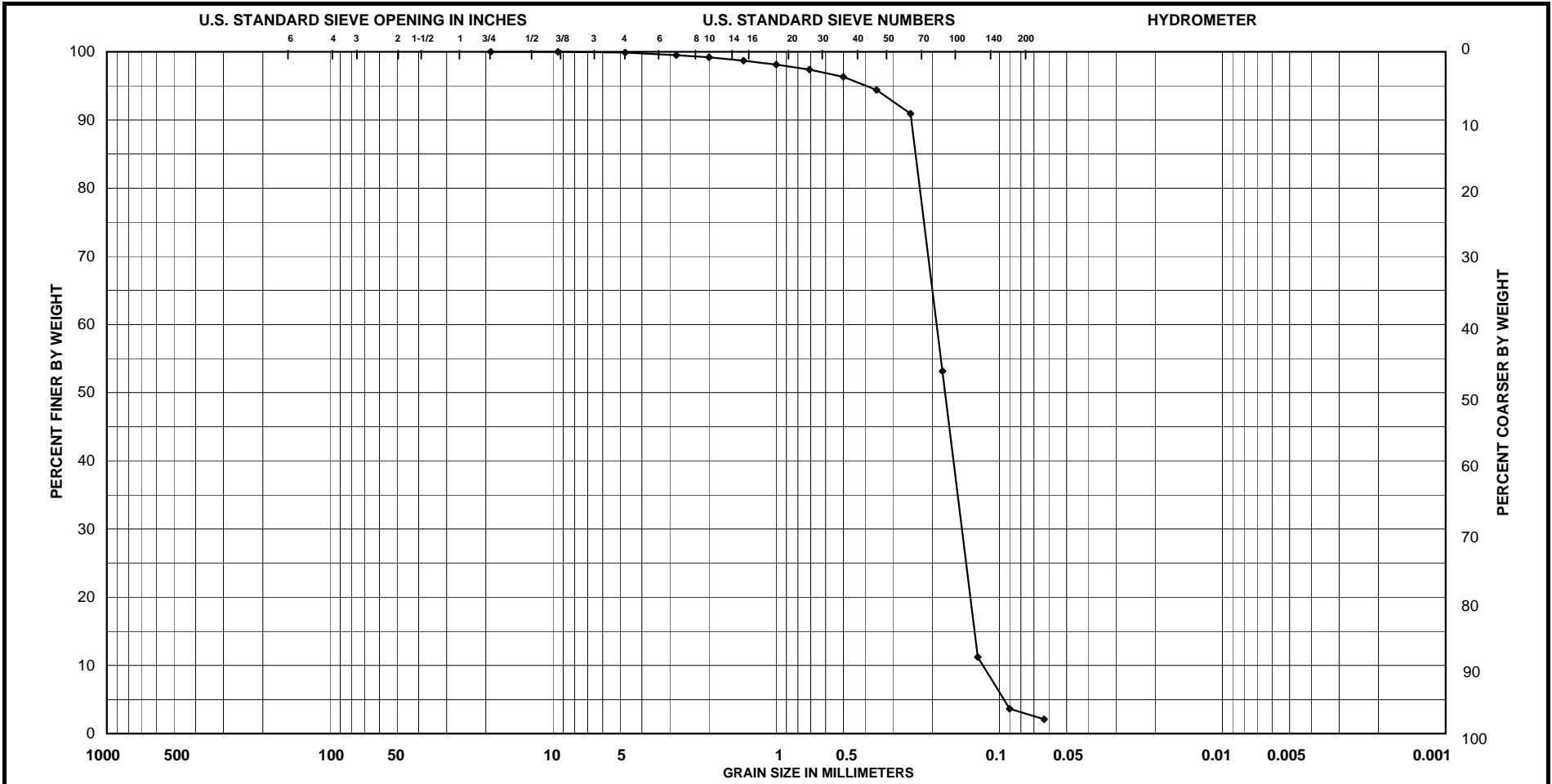
### GRAIN SIZE AND VISUAL SHELL CONTENT

Project:	<b>Topsail Beach, Surf City &amp; North Topsail</b>	Depth:	<b>-24</b>
Project No.:	<b>1584-01-40</b>	Date:	<b>7/29/2003</b>
Boring No.:	<b>TB2-24</b>		
Sample No.:	<b>1</b>		
Description:	<b>SAND, poorly-graded, mostly fine-grained quartz, few carbonate, brownish gray (SP)</b>		

Tare Weight, (g):	<b>48.53</b>	
Dry Wt. Before Washing (g):	<b>157.5</b>	(with tare)
Dry Weight After Washing (g):	<b>155.1</b>	(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	0.13	99.88	100	0.13
#7	2.800	0.42	99.50	100	0.42
#10	2.000	0.34	99.18	100	0.34
#14	1.400	0.54	98.69	100	0.54
#18	1.000	0.62	98.12	100	0.62
#25	0.710	0.79	97.39	95	0.75
#35	0.500	1.19	96.30	70	0.83
#45	0.355	2.06	94.41	35	0.72
#60	0.250	3.81	90.91	15	0.57
#80	0.180	41.13	53.17	5	2.06
#120	0.125	45.71	11.22	3	1.37
#170	0.090	8.25	3.65	1	0.08
#230	0.063	1.67	2.12	1	0.02

**Total Shell Content:** **8** %



COBBLES	GRAVEL		SAND			SILT OR CLAY
	COARSE	FINE	COARSE	MEDIUM	FINE	

Sample No.	Elev. Or Depth	Classification	% CO <sub>3</sub>	G <sub>s</sub>	Nat w%	LL	PL	PI	Project
♦ 1	-24	SAND, poorly-graded, mostly fine-grained quartz, few carbonate, brownish gray (SP)	8						Topsail Beach, Surf City & North Topsail
									Area
									Boring No. TB2-24
									Date 7/29/2003

**GRADATION CURVES**



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## VISUAL SHELL CONTENT

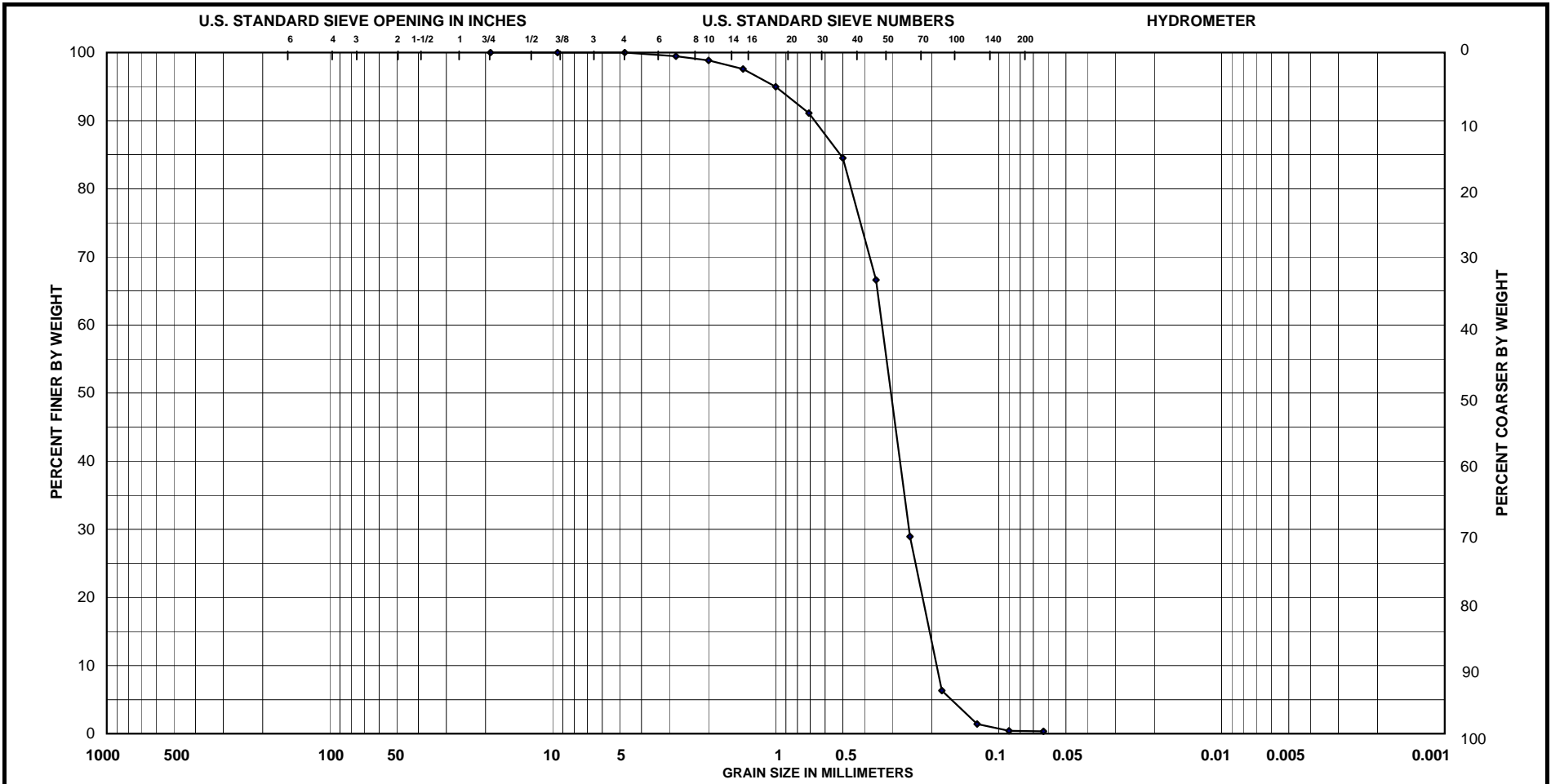
### GRAIN SIZE AND VISUAL SHELL CONTENT

Project:	<b>Topsail Beach, Surf City &amp; North Topsail</b>	Depth:	
Project No.:	<b>1584-01-40</b>	Date:	<b>7/29/2003</b>
Boring No.:	<b>TB3-TOE</b>		
Sample No.:	<b>1</b>		
Description:	<b>SAND, poorly-graded, mostly fine-grained quartz, little carbonate, light gray (SP)</b>		

Tare Weight, (g):	<b>50.34</b>	
Dry Wt. Before Washing (g):	<b>156.73</b>	(with tare)
Dry Weight After Washing (g):	<b>156.72</b>	(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	0.58	99.45	100	0.58
#10	2.000	0.64	98.85	75	0.48
#14	1.400	1.33	97.60	70	0.93
#18	1.000	2.80	94.97	60	1.68
#25	0.710	4.13	91.09	45	1.86
#35	0.500	6.99	84.52	40	2.80
#45	0.355	19.03	66.63	25	4.76
#60	0.250	40.09	28.95	10	4.01
#80	0.180	24.06	6.34	5	1.20
#120	0.125	5.25	1.40	3	0.16
#170	0.090	1.04	0.42	1	0.01
#230	0.063	0.07	0.36	1	0.00

**Total Shell Content:** **17** %



COBBLES	GRAVEL		SAND			SILT OR CLAY
	COARSE	FINE	COARSE	MEDIUM	FINE	

Sample No.	Elev. Or Depth	Classification	% CO <sub>3</sub>	G <sub>s</sub>	Nat w%	LL	PL	PI	Project
1		SAND, poorly-graded, mostly fine-grained quartz, little carbonate, light gray (SP)	17						Topsail Beach, Surf City & North Topsail
									Area
									Boring No. TB3-TOE
									Date 7/29/2003

**GRADATION CURVES**



# WOLF TECHNOLOGIES, INC.

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## VISUAL SHELL CONTENT

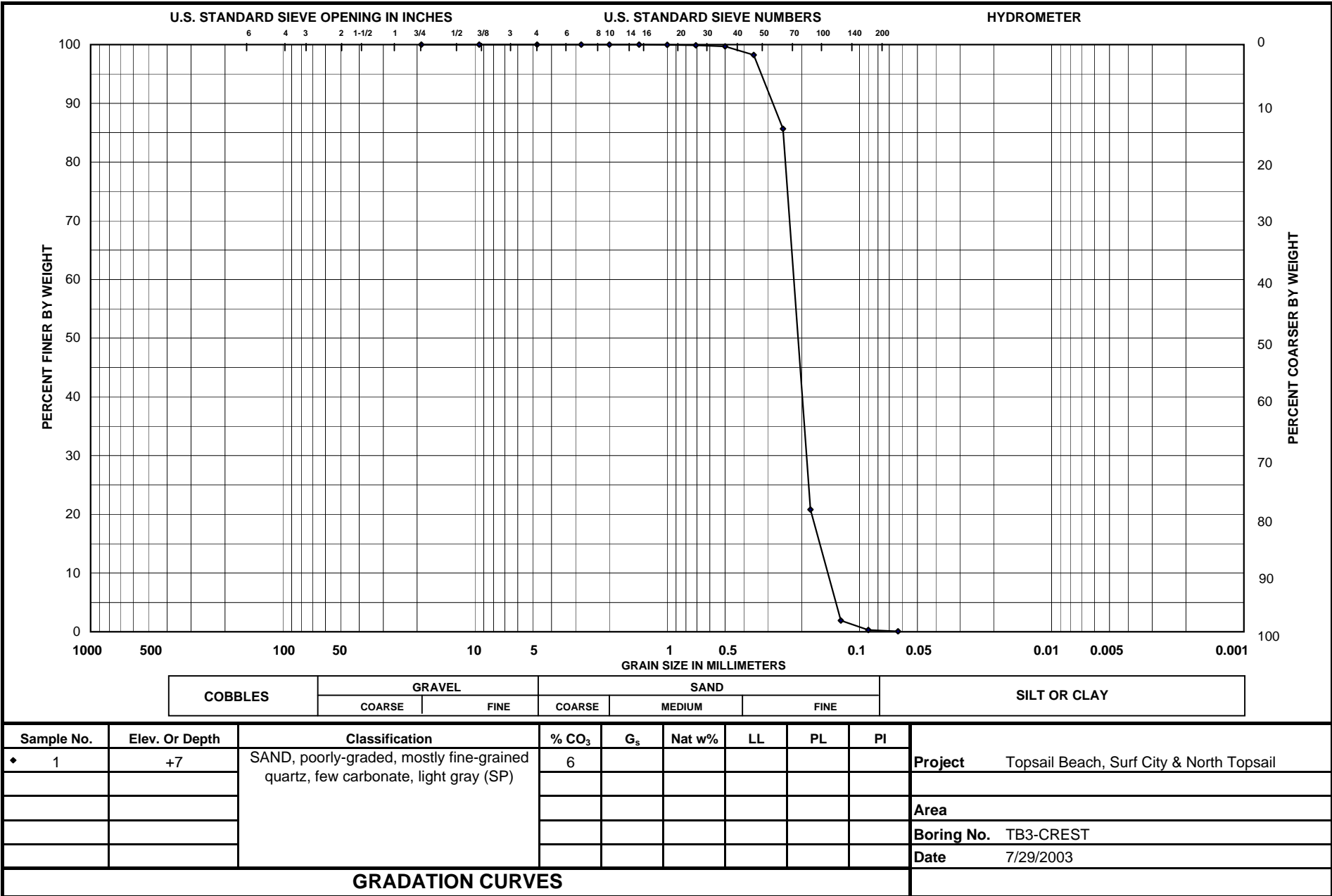
### GRAIN SIZE AND VISUAL SHELL CONTENT

Project:	<b>Topsail Beach, Surf City &amp; North Topsail</b>	Depth:	<b>+7</b>
Project No.:	<b>1584-01-40</b>	Date:	<b>7/29/2003</b>
Boring No.:	<b>TB3-CREST</b>		
Sample No.:	<b>1</b>		
Description:	<b>SAND, poorly-graded, mostly fine-grained quartz, few carbonate, light gray (SP)</b>		

Tare Weight, (g):	<b>50.20</b>	
Dry Wt. Before Washing (g):	<b>140.52</b>	(with tare)
Dry Weight After Washing (g):	<b>140.4</b>	(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	0.00	100.00	0	0.00
#14	1.400	0.00	100.00	0	0.00
#18	1.000	0.05	99.94	90	0.05
#25	0.710	0.05	99.89	75	0.04
#35	0.500	0.19	99.68	40	0.08
#45	0.355	1.30	98.24	30	0.39
#60	0.250	11.37	85.65	15	1.71
#80	0.180	58.56	20.81	5	2.93
#120	0.125	17.06	1.93	3	0.51
#170	0.090	1.47	0.30	1	0.01
#230	0.063	0.19	0.09	1	0.00

**Total Shell Content:** **6** %







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## VISUAL SHELL CONTENT

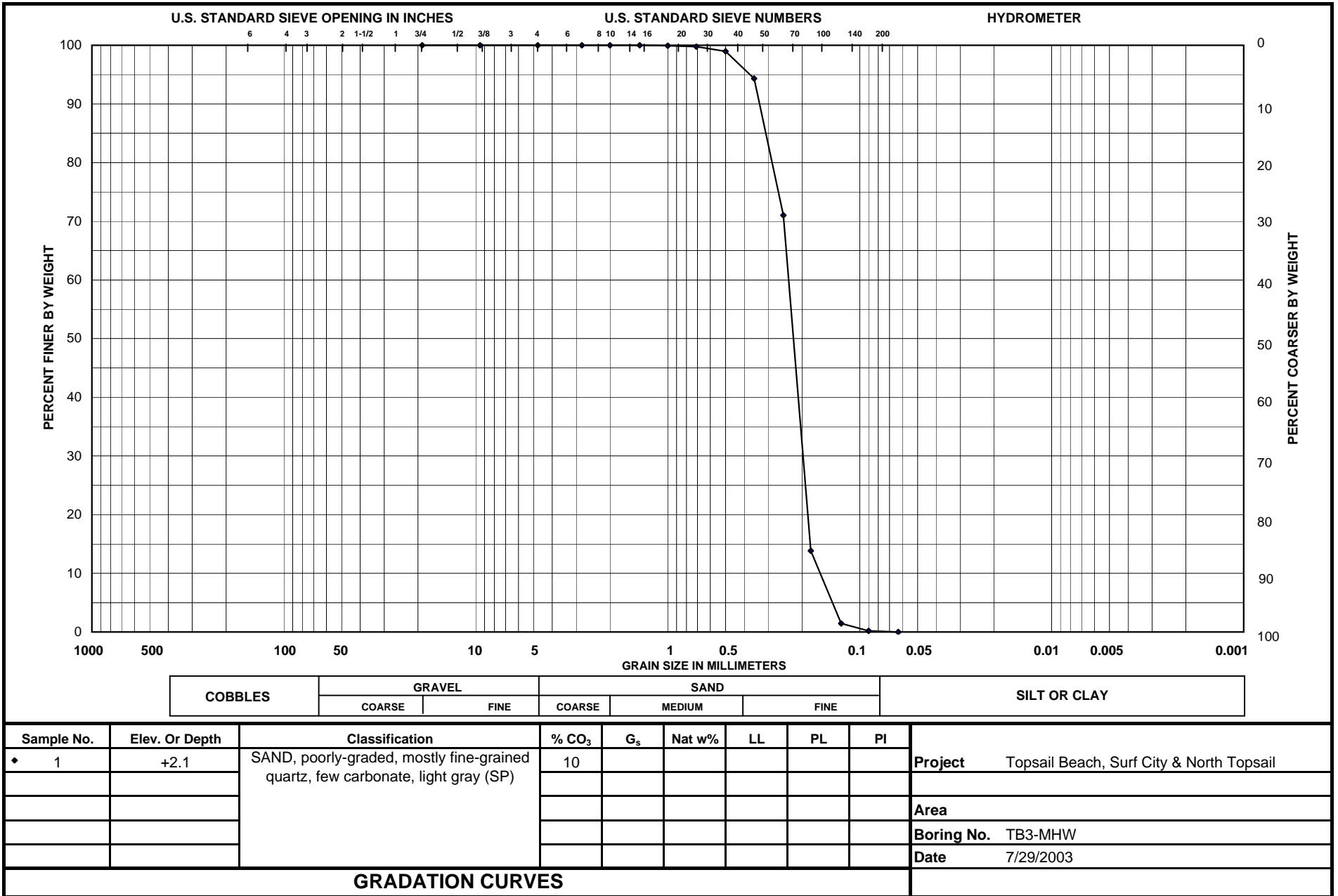
### GRAIN SIZE AND VISUAL SHELL CONTENT

Project:	<b>Topsail Beach, Surf City &amp; North Topsail</b>	Depth:	<b>+2.1</b>
Project No.:	<b>1584-01-40</b>	Date:	<b>7/29/2003</b>
Boring No.:	<b>TB3-MHW</b>		
Sample No.:	<b>1</b>		
Description:	<b>SAND, poorly-graded, mostly fine-grained quartz, few carbonate, light gray (SP)</b>		

Tare Weight, (g):	<b>50.16</b>	
Dry Wt. Before Washing (g):	<b>142.98</b>	(with tare)
Dry Weight After Washing (g):	<b>142.62</b>	(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	0.00	100.00	0	0.00
#14	1.400	0.00	100.00	0	0.00
#18	1.000	0.07	99.92	100	0.07
#25	0.710	0.16	99.75	98	0.16
#35	0.500	0.72	98.98	55	0.40
#45	0.355	4.32	94.32	30	1.30
#60	0.250	21.63	71.02	20	4.33
#80	0.180	53.08	13.83	5	2.65
#120	0.125	11.48	1.47	3	0.34
#170	0.090	1.18	0.19	1	0.01
#230	0.063	0.17	0.01	1	0.00

**Total Shell Content:** **10** %



**GRADATION CURVES**



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## VISUAL SHELL CONTENT

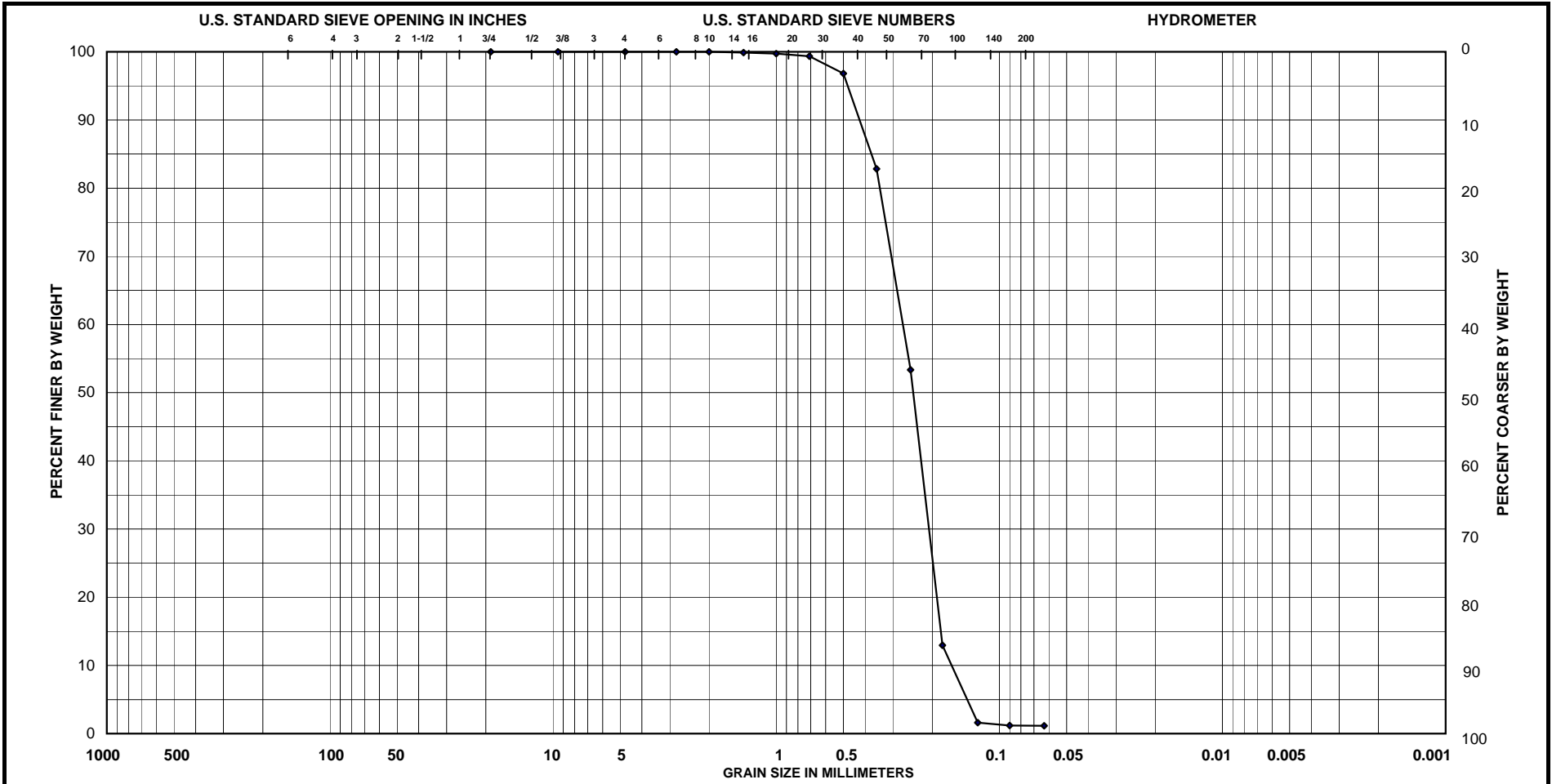
### GRAIN SIZE AND VISUAL SHELL CONTENT

Project:	<b>Topsail Beach, Surf City &amp; North Topsail</b>	Depth:	<b>0</b>
Project No.:	<b>1584-01-40</b>	Date:	<b>7/29/2003</b>
Boring No.:	<b>TB3-MSL</b>		
Sample No.:	<b>1</b>		
Description:	<b>SAND, poorly-graded, mostly fine-grained quartz, little carbonate, brownish gray (SP)</b>		

Tare Weight, (g):	<b>50.21</b>	
Dry Wt. Before Washing (g):	<b>151.67</b>	(with tare)
Dry Weight After Washing (g):	<b>150.75</b>	(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	0.00	100.00	0	0.00
#14	1.400	0.11	99.89	100	0.11
#18	1.000	0.16	99.73	90	0.14
#25	0.710	0.41	99.33	85	0.35
#35	0.500	2.56	96.81	45	1.15
#45	0.355	14.17	82.84	30	4.25
#60	0.250	29.92	53.35	20	5.98
#80	0.180	40.97	12.97	5	2.05
#120	0.125	11.51	1.63	3	0.35
#170	0.090	0.43	1.20	1	0.00
#230	0.063	0.05	1.15	1	0.00

**Total Shell Content:** **14** %



COBBLES	GRAVEL		SAND			SILT OR CLAY
	COARSE	FINE	COARSE	MEDIUM	FINE	

Sample No.	Elev. Or Depth	Classification	% CO <sub>3</sub>	G <sub>s</sub>	Nat w%	LL	PL	PI		
1	0	SAND, poorly-graded, mostly fine-grained quartz, little carbonate, brownish gray (SP)	14						<b>Project</b>	Topsail Beach, Surf City & North Topsail
									<b>Area</b>	
									<b>Boring No.</b>	TB3-MSL
									<b>Date</b>	7/29/2003

**GRADATION CURVES**



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## VISUAL SHELL CONTENT

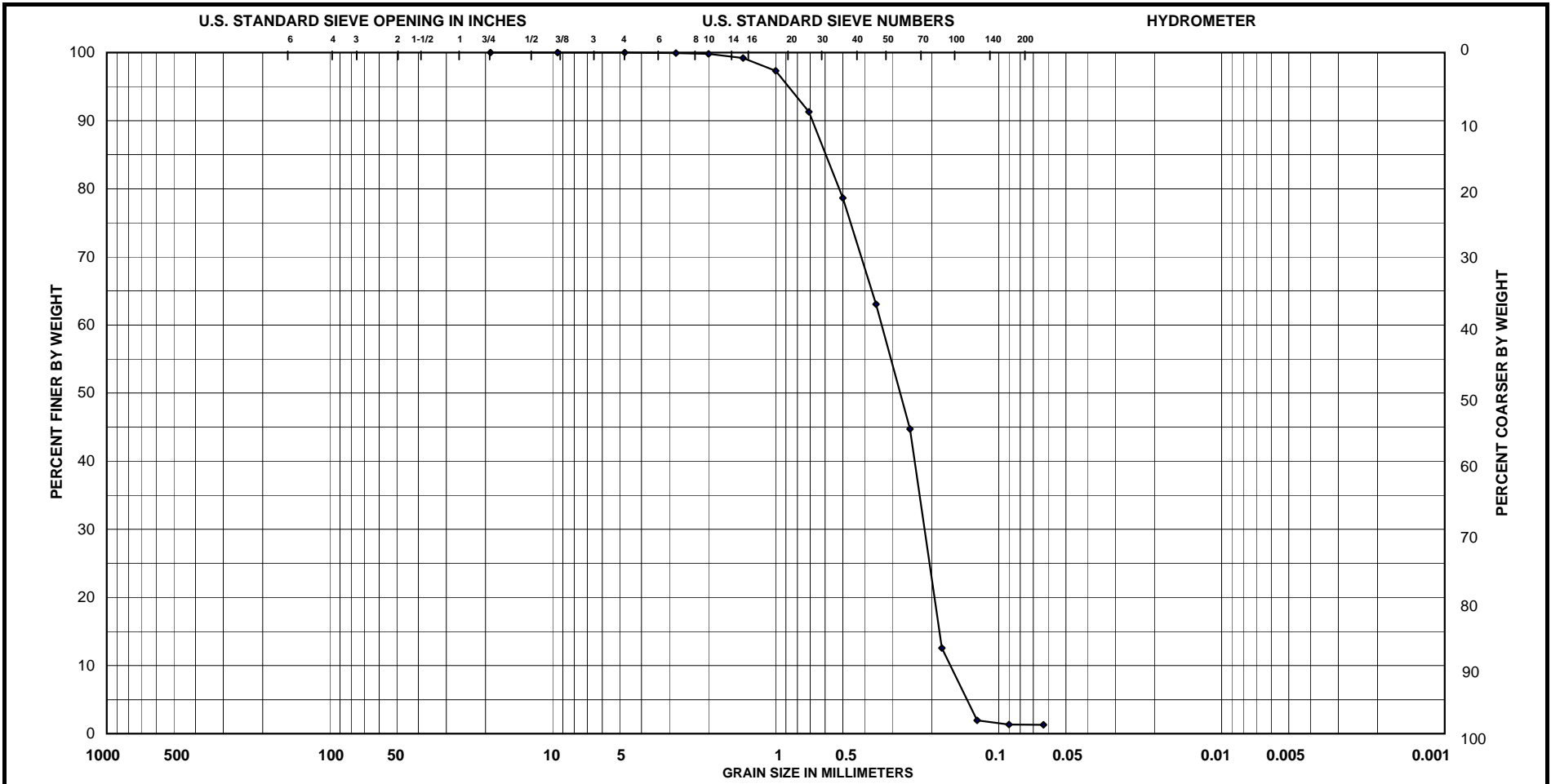
### GRAIN SIZE AND VISUAL SHELL CONTENT

Project:	<b>Topsail Beach, Surf City &amp; North Topsail</b>	Depth:	<b>-1.9</b>
Project No.:	<b>1584-01-40</b>	Date:	<b>7/29/2003</b>
Boring No.:	<b>TB3-MLW</b>		
Sample No.:	<b>1</b>		
Description:	<b>SAND, poorly-graded, mostly fine-grained quartz, little carbonate, brownish gray (SP)</b>		

Tare Weight, (g):	<b>50.65</b>	
Dry Wt. Before Washing (g):	<b>163.98</b>	(with tare)
Dry Weight After Washing (g):	<b>162.95</b>	(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	0.07	99.94	100	0.07
#10	2.000	0.13	99.82	100	0.13
#14	1.400	0.70	99.21	100	0.70
#18	1.000	2.14	97.32	80	1.71
#25	0.710	6.81	91.31	60	4.09
#35	0.500	14.33	78.66	55	7.88
#45	0.355	17.70	63.05	30	5.31
#60	0.250	20.76	44.73	15	3.11
#80	0.180	36.43	12.58	3	1.09
#120	0.125	12.06	1.94	1	0.12
#170	0.090	0.67	1.35	1	0.01
#230	0.063	0.05	1.31	1	0.00

**Total Shell Content:** **21** %



COBBLES	GRAVEL		SAND			SILT OR CLAY
	COARSE	FINE	COARSE	MEDIUM	FINE	

Sample No.	Elev. Or Depth	Classification	% CO <sub>3</sub>	G <sub>s</sub>	Nat w%	LL	PL	PI	Project
1	-1.9	SAND, poorly-graded, mostly fine-grained quartz, little carbonate, brownish gray (SP)	21						Topsail Beach, Surf City & North Topsail
									Area
									Boring No. TB3-MLW
									Date 7/29/2003

**GRADATION CURVES**



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## VISUAL SHELL CONTENT

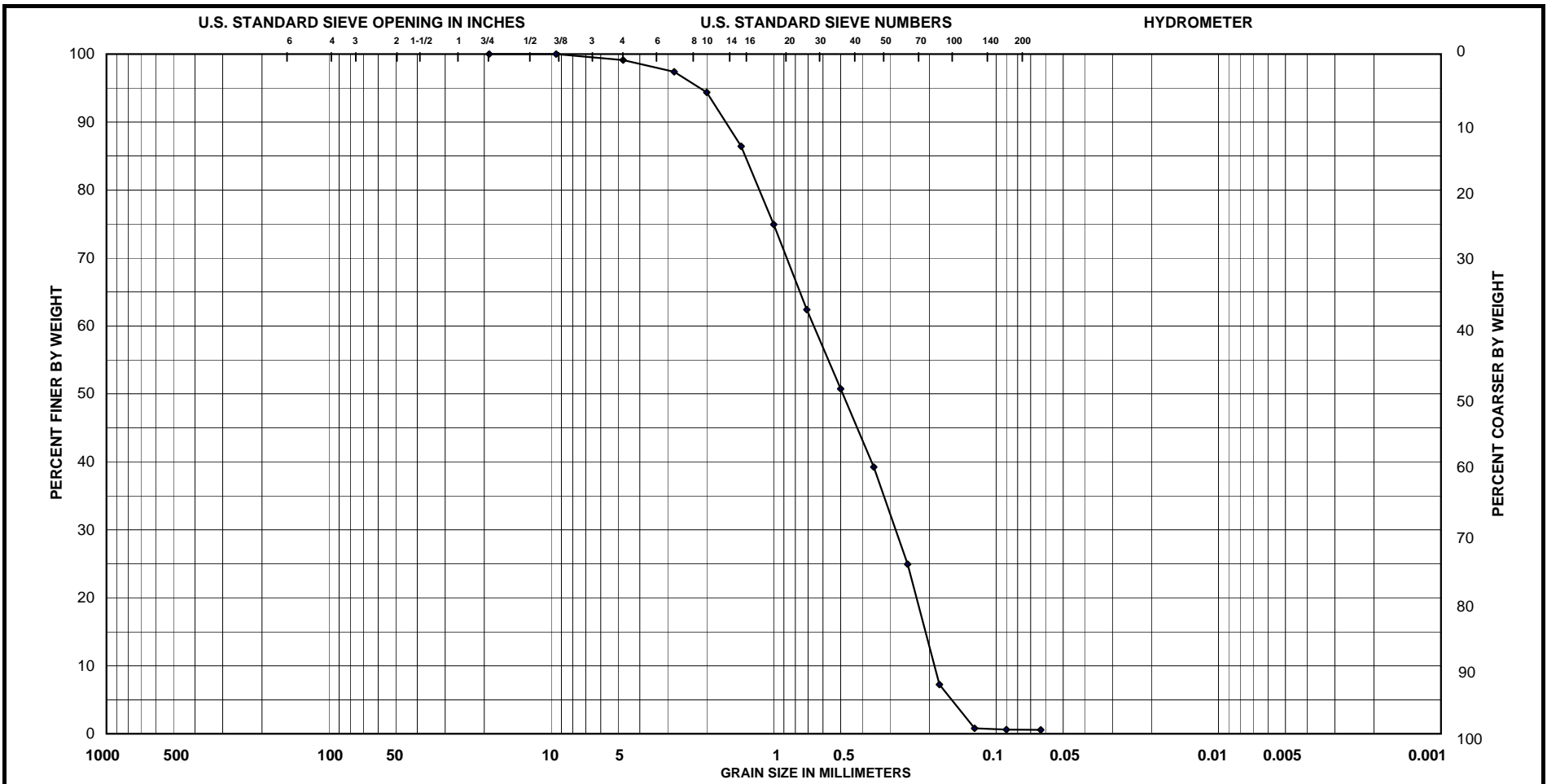
### GRAIN SIZE AND VISUAL SHELL CONTENT

Project:	<b>Topsail Beach, Surf City &amp; North Topsail</b>	Depth:	<b>-3</b>
Project No.:	<b>1584-01-40</b>	Date:	<b>7/29/2003</b>
Boring No.:	<b>TB3-3</b>		
Sample No.:	<b>1</b>		
Description:	<b>SAND, poorly-graded, mostly medium to fine-grained quartz, some carbonate, brownish gray (SP)</b>		

Tare Weight, (g):	<b>49.89</b>	
Dry Wt. Before Washing (g):	<b>167.81</b>	(with tare)
Dry Weight After Washing (g):	<b>167.13</b>	(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	1.05	99.11	100	1.05
#7	2.800	2.02	97.40	100	2.02
#10	2.000	3.57	94.37	95	3.39
#14	1.400	9.34	86.45	90	8.41
#18	1.000	13.59	74.92	70	9.51
#25	0.710	14.78	62.39	70	10.35
#35	0.500	13.72	50.75	60	8.23
#45	0.355	13.58	39.24	40	5.43
#60	0.250	16.84	24.96	10	1.68
#80	0.180	20.91	7.23	3	0.63
#120	0.125	7.56	0.81	1	0.08
#170	0.090	0.25	0.60	1	0.00
#230	0.063	0.02	0.59	1	0.00

**Total Shell Content:** **43** %



COBBLES	GRAVEL		SAND			SILT OR CLAY
	COARSE	FINE	COARSE	MEDIUM	FINE	

Sample No.	Elev. Or Depth	Classification	% CO <sub>3</sub>	G <sub>s</sub>	Nat w%	LL	PL	PI	Project	
1	-3	SAND, poorly-graded, mostly medium to fine-grained quartz, some carbonate, brownish gray (SP)	43						Topsail Beach, Surf City & North Topsail	
									Area	
									Boring No. TB3-3	
									Date 7/29/2003	

**GRADATION CURVES**





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## VISUAL SHELL CONTENT

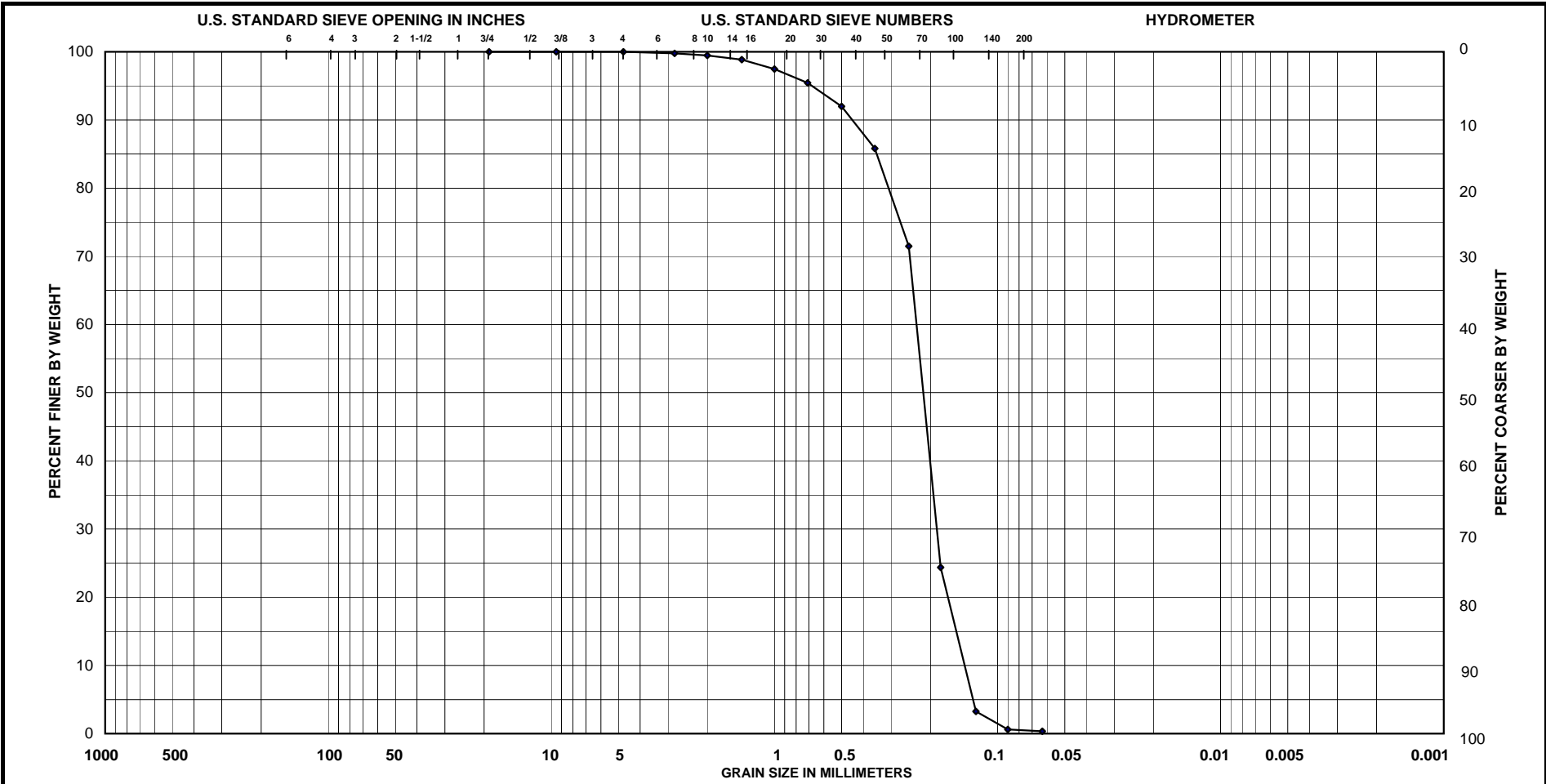
### GRAIN SIZE AND VISUAL SHELL CONTENT

Project:	<b>Topsail Beach, Surf City &amp; North Topsail</b>	Depth:	<b>-4</b>
Project No.:	<b>1584-01-40</b>	Date:	<b>7/29/2003</b>
Boring No.:	<b>TB3-4</b>		
Sample No.:	<b>1</b>		
Description:	<b>SAND, poorly-graded, mostly fine-grained quartz, little carbonate, gray (SP)</b>		

Tare Weight, (g):	<b>50.05</b>	
Dry Wt. Before Washing (g):	<b>149.91</b>	(with tare)
Dry Weight After Washing (g):	<b>148.96</b>	(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	0.23	99.77	100	0.23
#10	2.000	0.30	99.47	100	0.30
#14	1.400	0.62	98.85	90	0.56
#18	1.000	1.36	97.49	90	1.22
#25	0.710	2.03	95.45	75	1.52
#35	0.500	3.46	91.99	60	2.08
#45	0.355	6.18	85.80	40	2.47
#60	0.250	14.31	71.47	15	2.15
#80	0.180	47.03	24.37	5	2.35
#120	0.125	21.10	3.24	3	0.63
#170	0.090	2.64	0.60	1	0.03
#230	0.063	0.27	0.33	1	0.00

**Total Shell Content:** **14** %



COBBLES	GRAVEL		SAND			SILT OR CLAY
	COARSE	FINE	COARSE	MEDIUM	FINE	

Sample No.	Elev. Or Depth	Classification	% CO <sub>3</sub>	G <sub>s</sub>	Nat w%	LL	PL	PI	Project
♦ 1	-4	SAND, poorly-graded, mostly fine-grained quartz, little carbonate, gray (SP)	14						Topsail Beach, Surf City & North Topsail
									Area
									Boring No. TB3-4
									Date 7/29/2003

**GRADATION CURVES**



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## VISUAL SHELL CONTENT

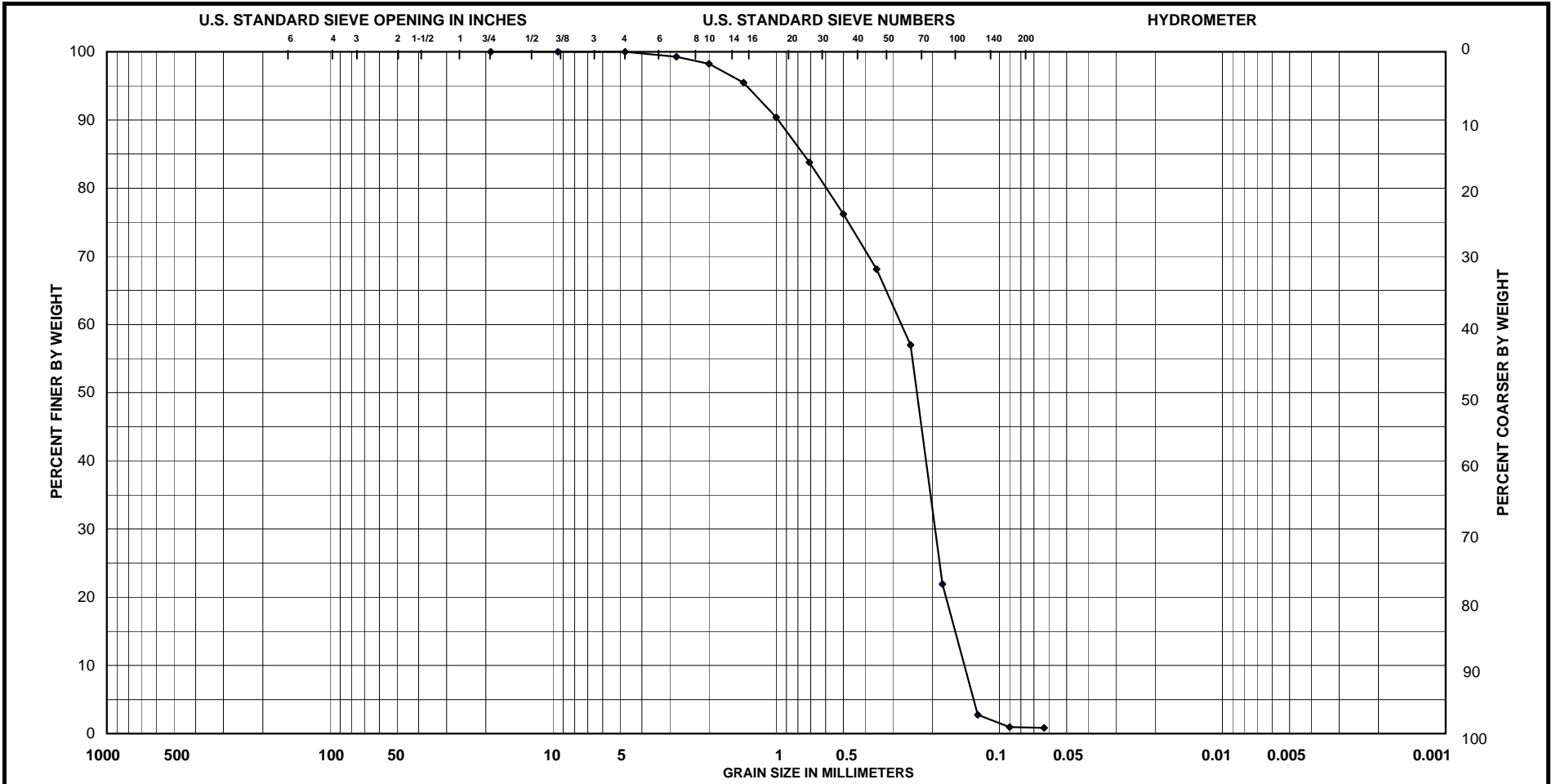
### GRAIN SIZE AND VISUAL SHELL CONTENT

Project:	<b>Topsail Beach, Surf City &amp; North Topsail</b>	Depth:	<b>-6</b>
Project No.:	<b>1584-01-40</b>	Date:	<b>7/29/2003</b>
Boring No.:	<b>TB3-6</b>		
Sample No.:	<b>1</b>		
Description:	<b>SAND, poorly-graded, mostly fine-grained quartz, little carbonate, gray (SP)</b>		

Tare Weight, (g):	<b>49.20</b>	
Dry Wt. Before Washing (g):	<b>162.51</b>	(with tare)
Dry Weight After Washing (g):	<b>161.67</b>	(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	0.84	99.26	85	0.71
#10	2.000	1.17	98.23	85	0.99
#14	1.400	3.13	95.46	70	2.19
#18	1.000	5.76	90.38	65	3.74
#25	0.710	7.47	83.79	60	4.48
#35	0.500	8.61	76.19	60	5.17
#45	0.355	9.16	68.11	25	2.29
#60	0.250	12.57	57.01	15	1.89
#80	0.180	39.77	21.91	3	1.19
#120	0.125	21.70	2.76	1	0.22
#170	0.090	2.06	0.94	1	0.02
#230	0.063	0.12	0.84	1	0.00

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



COBBLES	GRAVEL		SAND			SILT OR CLAY
	COARSE	FINE	COARSE	MEDIUM	FINE	

Sample No.	Elev. Or Depth	Classification	% CO <sub>3</sub>	G <sub>s</sub>	Nat w%	LL	PL	PI	Project	
♦ 1	-6	SAND, poorly-graded, mostly fine-grained quartz, little carbonate, gray (SP)	20						Topsail Beach, Surf City & North Topsail	
									Area	
									Boring No. TB3-6	
									Date 7/29/2003	

**GRADATION CURVES**



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## VISUAL SHELL CONTENT

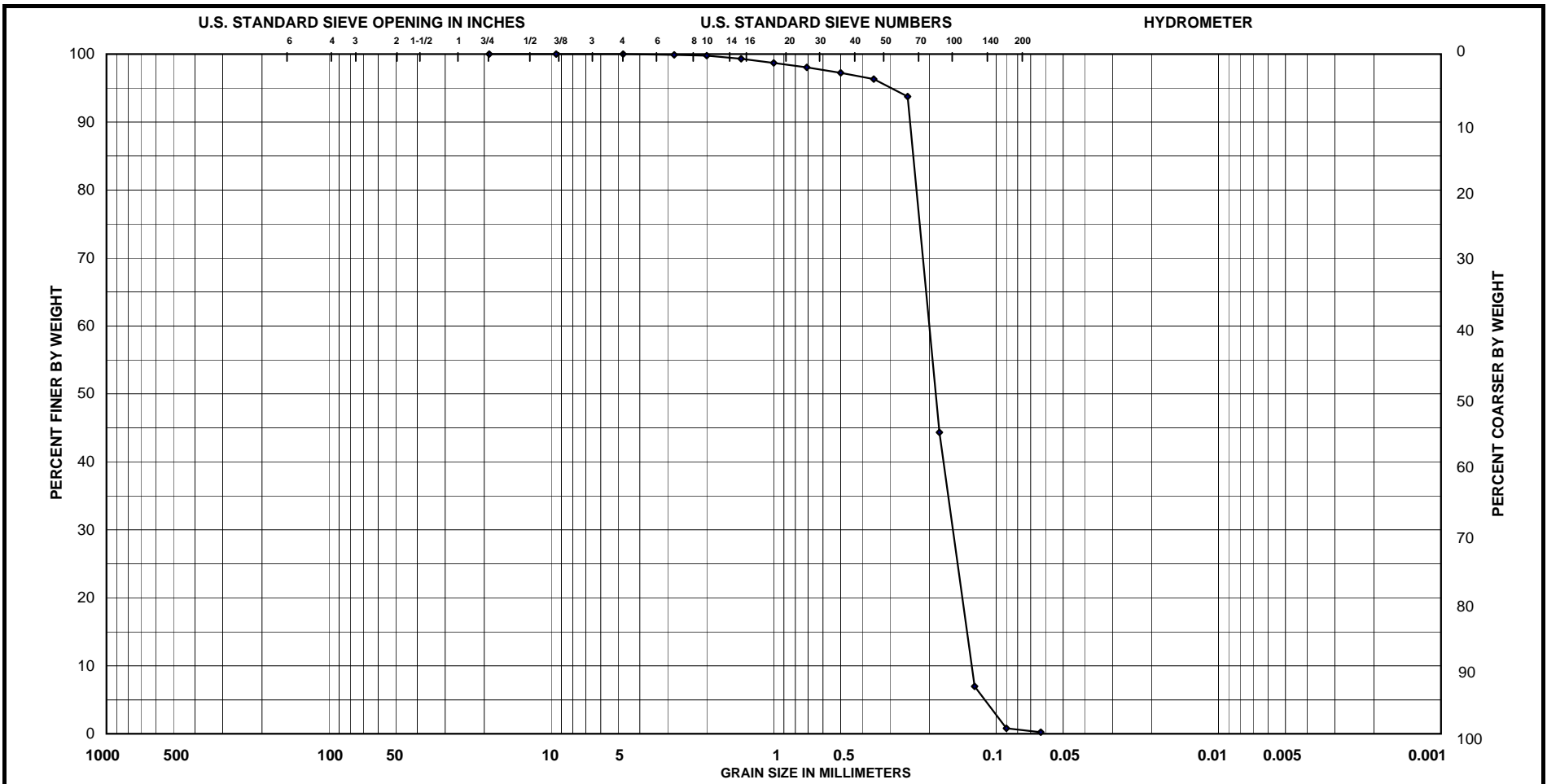
### GRAIN SIZE AND VISUAL SHELL CONTENT

Project:	<b>Topsail Beach, Surf City &amp; North Topsail</b>	Depth:	<b>-8</b>
Project No.:	<b>1584-01-40</b>	Date:	<b>7/29/2003</b>
Boring No.:	<b>TB3-8</b>		
Sample No.:	<b>1</b>		
Description:	<b>SAND, poorly-graded, mostly fine-grained quartz, few carbonate, gray (SP)</b>		

Tare Weight, (g):	<b>50.18</b>	
Dry Wt. Before Washing (g):	<b>137.16</b>	(with tare)
Dry Weight After Washing (g):	<b>136.37</b>	(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	0.11	99.87	100	0.11
#10	2.000	0.09	99.77	100	0.09
#14	1.400	0.39	99.32	95	0.37
#18	1.000	0.55	98.69	90	0.50
#25	0.710	0.56	98.05	75	0.42
#35	0.500	0.71	97.23	65	0.46
#45	0.355	0.78	96.33	40	0.31
#60	0.250	2.26	93.73	65	1.47
#80	0.180	42.97	44.33	3	1.29
#120	0.125	32.48	6.99	3	0.97
#170	0.090	5.39	0.79	1	0.05
#230	0.063	0.49	0.23	1	0.00

**Total Shell Content:** **7** %



COBBLES	GRAVEL		SAND			SILT OR CLAY
	COARSE	FINE	COARSE	MEDIUM	FINE	

Sample No.	Elev. Or Depth	Classification	% CO <sub>3</sub>	G <sub>s</sub>	Nat w%	LL	PL	PI	Project
1	-8	SAND, poorly-graded, mostly fine-grained quartz, few carbonate, gray (SP)	7						Topsail Beach, Surf City & North Topsail
									Area
									Boring No. TB3-8
									Date 7/29/2003

**GRADATION CURVES**



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## VISUAL SHELL CONTENT

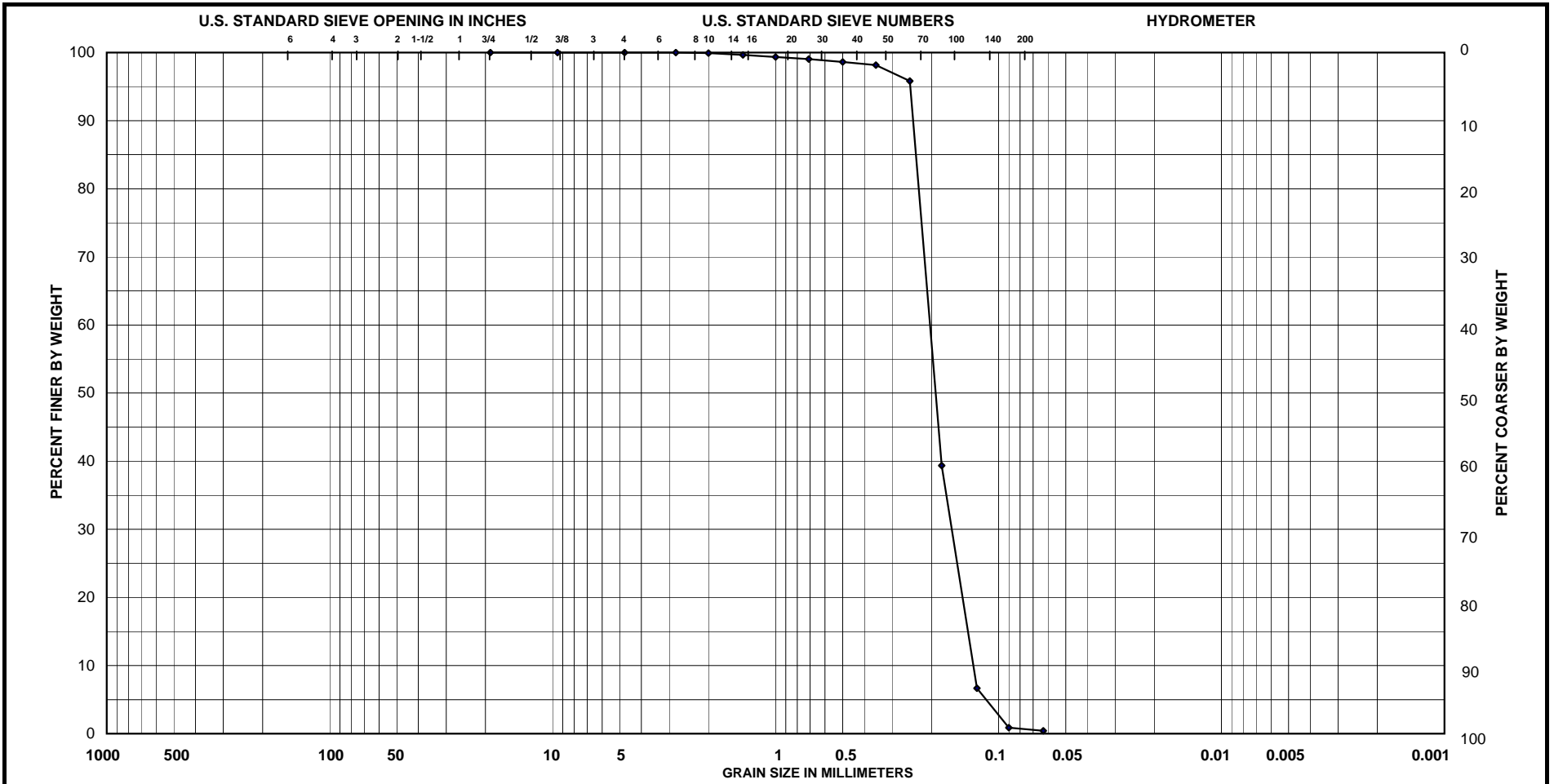
### GRAIN SIZE AND VISUAL SHELL CONTENT

Project:	<b>Topsail Beach, Surf City &amp; North Topsail</b>	Depth:	<b>-10</b>
Project No.:	<b>1584-01-40</b>	Date:	<b>7/29/2003</b>
Boring No.:	<b>TB3-10</b>		
Sample No.:	<b>1</b>		
Description:	<b>SAND, poorly-graded, mostly fine-grained quartz, few carbonate, gray (SP)</b>		

Tare Weight, (g):	<b>49.80</b>	
Dry Wt. Before Washing (g):	<b>136.34</b>	(with tare)
Dry Weight After Washing (g):	<b>135.65</b>	(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	99.92	100	0.07
#14	1.400	0.23	99.65	90	0.21
#18	1.000	0.28	99.33	70	0.20
#25	0.710	0.24	99.05	70	0.17
#35	0.500	0.37	98.62	65	0.24
#45	0.355	0.39	98.17	45	0.18
#60	0.250	2.04	95.82	15	0.31
#80	0.180	48.84	39.38	3	1.47
#120	0.125	28.30	6.68	3	0.85
#170	0.090	5.03	0.87	1	0.05
#230	0.063	0.37	0.44	1	0.00

**Total Shell Content:** **4** %



COBBLES	GRAVEL		SAND			SILT OR CLAY
	COARSE	FINE	COARSE	MEDIUM	FINE	

Sample No.	Elev. Or Depth	Classification	% CO <sub>3</sub>	G <sub>s</sub>	Nat w%	LL	PL	PI	Project
♦ 1	-10	SAND, poorly-graded, mostly fine-grained quartz, few carbonate, gray (SP)	4						Topsail Beach, Surf City & North Topsail
									Area
									Boring No. TB3-10
									Date 7/29/2003

**GRADATION CURVES**





# WOLF TECHNOLOGIES, INC.

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## VISUAL SHELL CONTENT

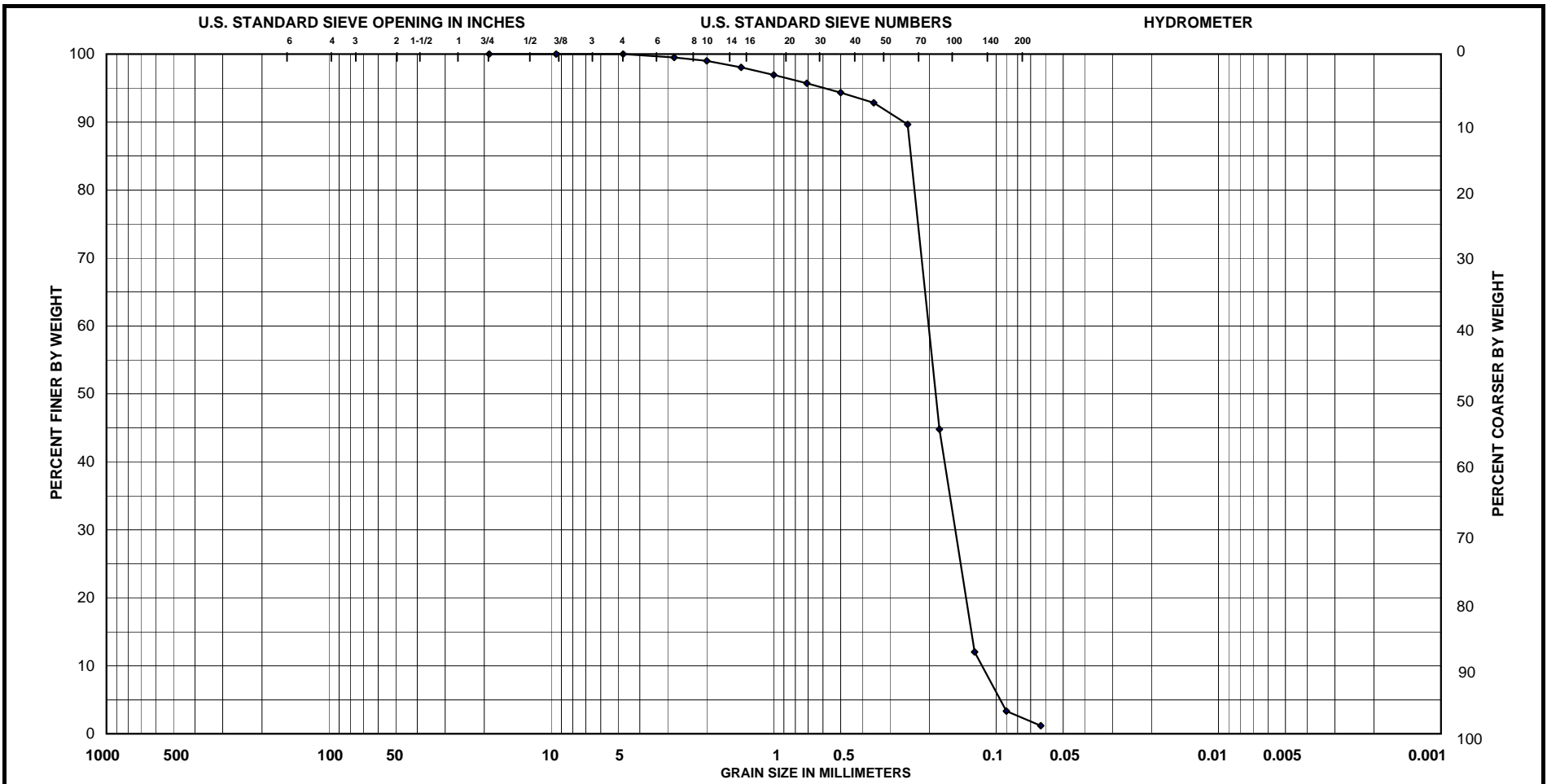
### GRAIN SIZE AND VISUAL SHELL CONTENT

Project:	<b>Topsail Beach, Surf City &amp; North Topsail</b>	Depth:	<b>-12</b>
Project No.:	<b>1584-01-40</b>	Date:	<b>7/29/2003</b>
Boring No.:	<b>TB3-12</b>		
Sample No.:	<b>1</b>		
Description:	<b>SAND, poorly-graded, mostly fine-grained quartz, few carbonate, gray (SP)</b>		

Tare Weight, (g):	<b>50.14</b>	
Dry Wt. Before Washing (g):	<b>166.76</b>	(with tare)
Dry Weight After Washing (g):	<b>165.43</b>	(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	0.60	99.49	100	0.60
#10	2.000	0.57	99.00	90	0.51
#14	1.400	1.09	98.06	75	0.82
#18	1.000	1.30	96.95	60	0.78
#25	0.710	1.43	95.72	60	0.86
#35	0.500	1.64	94.31	50	0.82
#45	0.355	1.75	92.81	25	0.44
#60	0.250	3.68	89.66	10	0.37
#80	0.180	52.30	44.81	3	1.57
#120	0.125	38.24	12.02	3	1.15
#170	0.090	10.11	3.35	1	0.10
#230	0.063	2.51	1.20	1	0.03

**Total Shell Content:** **7** %



COBBLES	GRAVEL		SAND			SILT OR CLAY
	COARSE	FINE	COARSE	MEDIUM	FINE	

Sample No.	Elev. Or Depth	Classification	% CO <sub>3</sub>	G <sub>s</sub>	Nat w%	LL	PL	PI	Project
1	-12	SAND, poorly-graded, mostly fine-grained quartz, few carbonate, gray (SP)	7						Topsail Beach, Surf City & North Topsail
									Area
									Boring No. TB3-12
									Date 7/29/2003

**GRADATION CURVES**



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## VISUAL SHELL CONTENT

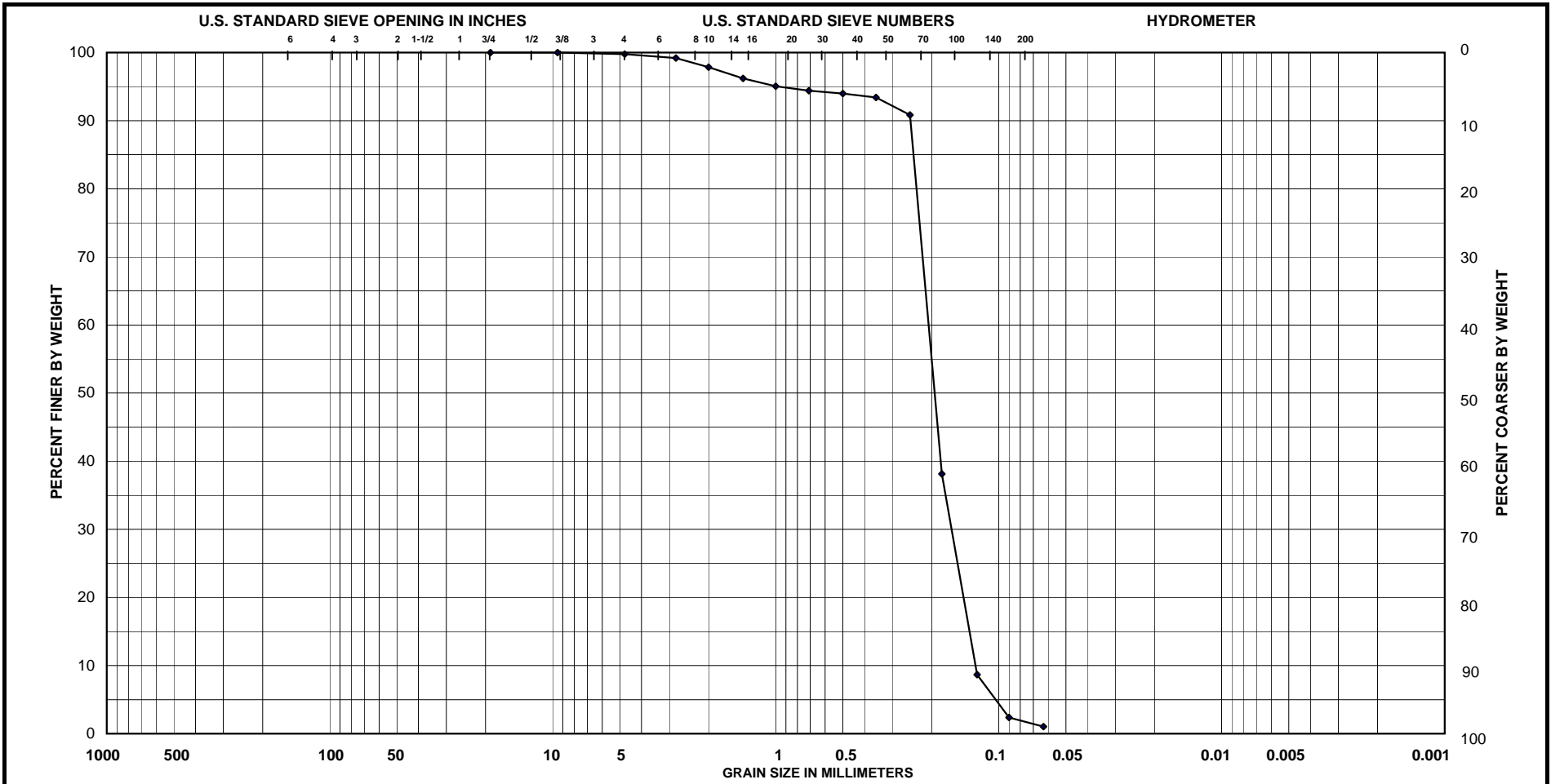
### GRAIN SIZE AND VISUAL SHELL CONTENT

Project:	<b>Topsail Beach, Surf City &amp; North Topsail</b>	Depth:	
Project No.:	<b>1584-01-40</b>	Date:	<b>7/29/2003</b>
Boring No.:	<b>TB3-14</b>		
Sample No.:	<b>1</b>		
Description:	<b>SAND, poorly-graded, mostly fine-grained quartz, few carbonate, bluish gray (SP)</b>		

Tare Weight, (g):	<b>49.00</b>	
Dry Wt. Before Washing (g):	<b>160.65</b>	(with tare)
Dry Weight After Washing (g):	<b>159.3</b>	(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	99.77	100	0.26
#7	2.800	0.66	99.18	60	0.40
#10	2.000	1.48	97.85	40	0.59
#14	1.400	1.84	96.20	25	0.46
#18	1.000	1.28	95.06	25	0.32
#25	0.710	0.73	94.40	20	0.15
#35	0.500	0.49	93.96	25	0.12
#45	0.355	0.64	93.39	15	0.10
#60	0.250	2.84	90.85	15	0.43
#80	0.180	58.84	38.15	5	2.94
#120	0.125	32.92	8.66	3	0.99
#170	0.090	7.00	2.39	1	0.07
#230	0.063	1.53	1.02	1	0.02

**Total Shell Content:** **6** %



COBBLES	GRAVEL		SAND			SILT OR CLAY
	COARSE	FINE	COARSE	MEDIUM	FINE	

Sample No.	Elev. Or Depth	Classification	% CO <sub>3</sub>	G <sub>s</sub>	Nat w%	LL	PL	PI	Project
♦ 1		SAND, poorly-graded, mostly fine-grained quartz, few carbonate, bluish gray (SP)	6						Topsail Beach, Surf City & North Topsail
									Area
									Boring No. TB3-14
									Date 7/29/2003

**GRADATION CURVES**



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## VISUAL SHELL CONTENT

### GRAIN SIZE AND VISUAL SHELL CONTENT

Project:	<b>Topsail Beach, Surf City &amp; North Topsail</b>	Depth:	<b>-16</b>
Project No.:	<b>1584-01-40</b>	Date:	<b>7/29/2003</b>
Boring No.:	<b>TB3-16</b>		
Sample No.:	<b>1</b>		
Description:	<b>SAND, poorly-graded, mostly fine-grained quartz, few carbonate, gray (SP)</b>		

Tare Weight, (g):	<b>49.74</b>	
Dry Wt. Before Washing (g):	<b>149.39</b>	(with tare)
Dry Weight After Washing (g):	<b>148.43</b>	(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	0.08	99.92	100	0.08
#14	1.400	0.04	99.88	100	0.04
#18	1.000	0.07	99.81	100	0.07
#25	0.710	0.08	99.73	95	0.08
#35	0.500	0.19	99.54	80	0.15
#45	0.355	0.33	99.21	65	0.21
#60	0.250	1.99	97.21	15	0.30
#80	0.180	56.07	40.94	5	2.80
#120	0.125	31.51	9.32	3	0.95
#170	0.090	7.20	2.10	1	0.07
#230	0.063	1.08	1.01	1	0.01

**Total Shell Content:** **5** %



COBBLES	GRAVEL		SAND			SILT OR CLAY
	COARSE	FINE	COARSE	MEDIUM	FINE	

Sample No.	Elev. Or Depth	Classification	% CO <sub>3</sub>	G <sub>s</sub>	Nat w%	LL	PL	PI	Project
1	-16	SAND, poorly-graded, mostly fine-grained quartz, few carbonate, gray (SP)	5						Topsail Beach, Surf City & North Topsail
									Area
									Boring No. TB3-16
									Date 7/29/2003

**GRADATION CURVES**



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## VISUAL SHELL CONTENT

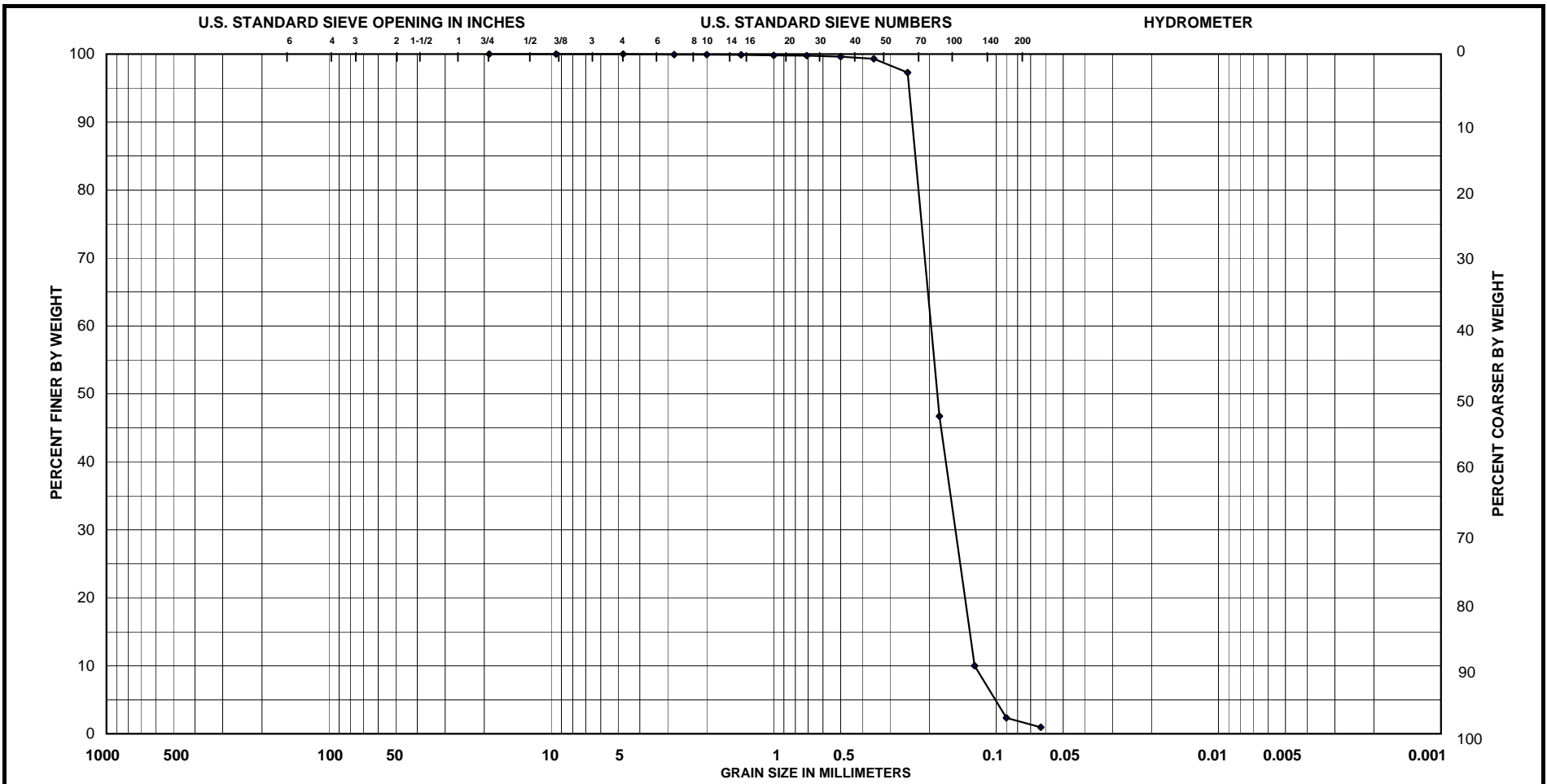
### GRAIN SIZE AND VISUAL SHELL CONTENT

Project:	<b>Topsail Beach, Surf City &amp; North Topsail</b>	Depth:	<b>-18</b>
Project No.:	<b>1584-01-40</b>	Date:	<b>7/29/2003</b>
Boring No.:	<b>TB3-18</b>		
Sample No.:	<b>1</b>		
Description:	<b>SAND, poorly-graded, mostly fine-grained quartz, few carbonate, bluish gray (SP)</b>		

Tare Weight, (g):	<b>50.03</b>	
Dry Wt. Before Washing (g):	<b>155.92</b>	(with tare)
Dry Weight After Washing (g):	<b>154.71</b>	(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	0.07	99.93	100	0.07
#10	2.000	0.01	99.92	100	0.01
#14	1.400	0.03	99.90	100	0.03
#18	1.000	0.10	99.80	99	0.10
#25	0.710	0.05	99.75	65	0.03
#35	0.500	0.13	99.63	65	0.08
#45	0.355	0.34	99.31	25	0.09
#60	0.250	2.16	97.27	20	0.43
#80	0.180	53.54	46.71	5	2.68
#120	0.125	38.88	9.99	3	1.17
#170	0.090	8.12	2.32	1	0.08
#230	0.063	1.44	0.96	1	0.01

**Total Shell Content:** **5** %



COBBLES	GRAVEL		SAND			SILT OR CLAY
	COARSE	FINE	COARSE	MEDIUM	FINE	

Sample No.	Elev. Or Depth	Classification	% CO <sub>3</sub>	G <sub>s</sub>	Nat w%	LL	PL	PI	Project
1	-18	SAND, poorly-graded, mostly fine-grained quartz, few carbonate, bluish gray (SP)	5						Topsail Beach, Surf City & North Topsail
									Area
									Boring No. TB3-18
									Date 7/29/2003

**GRADATION CURVES**





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## VISUAL SHELL CONTENT

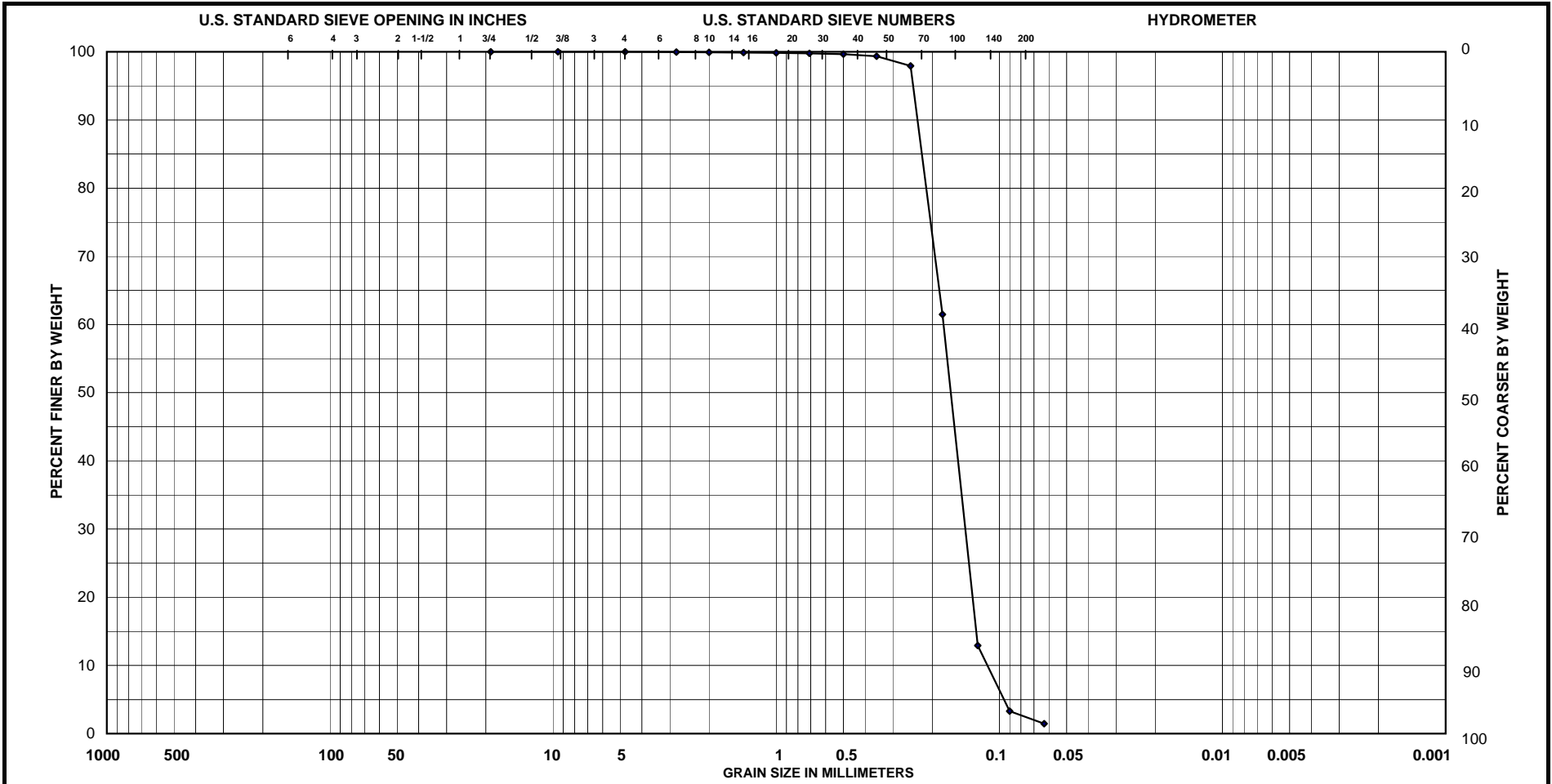
### GRAIN SIZE AND VISUAL SHELL CONTENT

Project:	<b>Topsail Beach, Surf City &amp; North Topsail</b>	Depth:	<b>-20</b>
Project No.:	<b>1584-01-40</b>	Date:	<b>7/29/2003</b>
Boring No.:	<b>TB3-20</b>		
Sample No.:	<b>1</b>		
Description:	<b>SAND, poorly-graded, mostly fine-grained quartz, few carbonate, bluish gray (SP)</b>		

Tare Weight, (g):	<b>50.60</b>	
Dry Wt. Before Washing (g):	<b>162.67</b>	(with tare)
Dry Weight After Washing (g):	<b>161.1</b>	(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	0.06	99.95	100	0.06
#10	2.000	0.01	99.94	100	0.01
#14	1.400	0.04	99.90	100	0.04
#18	1.000	0.06	99.85	100	0.06
#25	0.710	0.09	99.77	90	0.08
#35	0.500	0.12	99.66	90	0.11
#45	0.355	0.37	99.33	65	0.24
#60	0.250	1.57	97.93	30	0.47
#80	0.180	40.83	61.50	10	4.08
#120	0.125	54.45	12.91	5	2.72
#170	0.090	10.79	3.28	3	0.32
#230	0.063	2.05	1.45	1	0.02

**Total Shell Content:** **7** %



COBBLES	GRAVEL		SAND			SILT OR CLAY
	COARSE	FINE	COARSE	MEDIUM	FINE	

Sample No.	Elev. Or Depth	Classification	% CO <sub>3</sub>	G <sub>s</sub>	Nat w%	LL	PL	PI	Project
♦ 1	-20	SAND, poorly-graded, mostly fine-grained quartz, few carbonate, bluish gray (SP)	7						Topsail Beach, Surf City & North Topsail
									Area
									Boring No. TB3-20
									Date 7/29/2003

**GRADATION CURVES**



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## VISUAL SHELL CONTENT

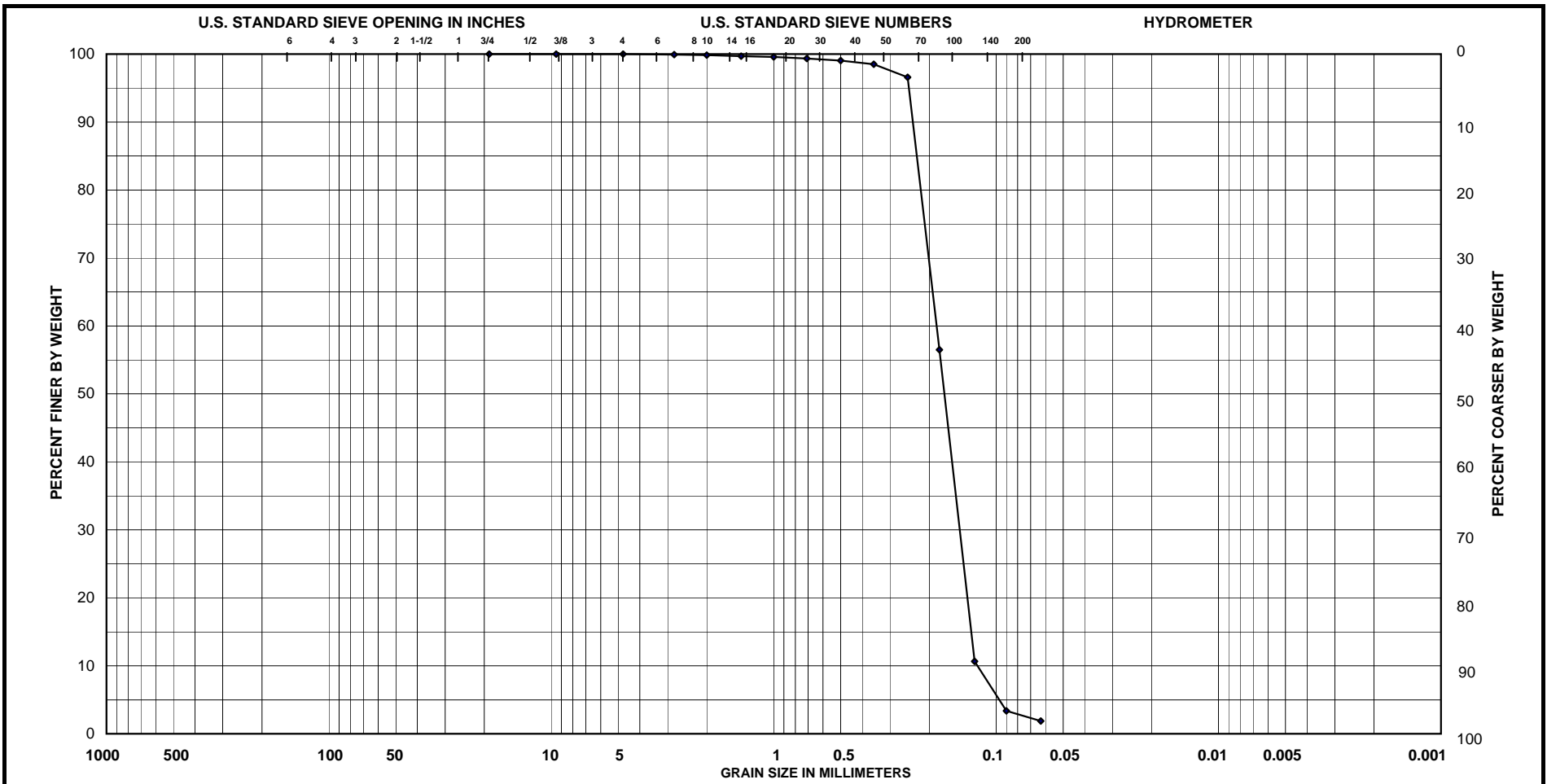
### GRAIN SIZE AND VISUAL SHELL CONTENT

Project:	<b>Topsail Beach, Surf City &amp; North Topsail</b>	Depth:	<b>-22</b>
Project No.:	<b>1584-01-40</b>	Date:	<b>7/29/2003</b>
Boring No.:	<b>TB3-22</b>		
Sample No.:	<b>1</b>		
Description:	<b>SAND, poorly-graded, mostly fine-grained quartz, few carbonate, bluish gray (SP)</b>		

Tare Weight, (g):	<b>50.90</b>	
Dry Wt. Before Washing (g):	<b>175.1</b>	(with tare)
Dry Weight After Washing (g):	<b>172.86</b>	(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	0.10	99.92	100	0.10
#10	2.000	0.11	99.83	100	0.11
#14	1.400	0.15	99.71	100	0.15
#18	1.000	0.16	99.58	100	0.16
#25	0.710	0.30	99.34	100	0.30
#35	0.500	0.37	99.04	90	0.33
#45	0.355	0.66	98.51	45	0.30
#60	0.250	2.37	96.60	25	0.59
#80	0.180	49.82	56.49	5	2.49
#120	0.125	56.92	10.66	3	1.71
#170	0.090	9.05	3.37	1	0.09
#230	0.063	1.87	1.87	1	0.02

**Total Shell Content:** **5** %



COBBLES	GRAVEL		SAND			SILT OR CLAY
	COARSE	FINE	COARSE	MEDIUM	FINE	

Sample No.	Elev. Or Depth	Classification	% CO <sub>3</sub>	G <sub>s</sub>	Nat w%	LL	PL	PI	Project	
♦ 1	-22	SAND, poorly-graded, mostly fine-grained quartz, few carbonate, bluish gray (SP)	5						Topsail Beach, Surf City & North Topsail	
									Area	
									Boring No. TB3-22	
									Date 7/29/2003	

**GRADATION CURVES**



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## VISUAL SHELL CONTENT

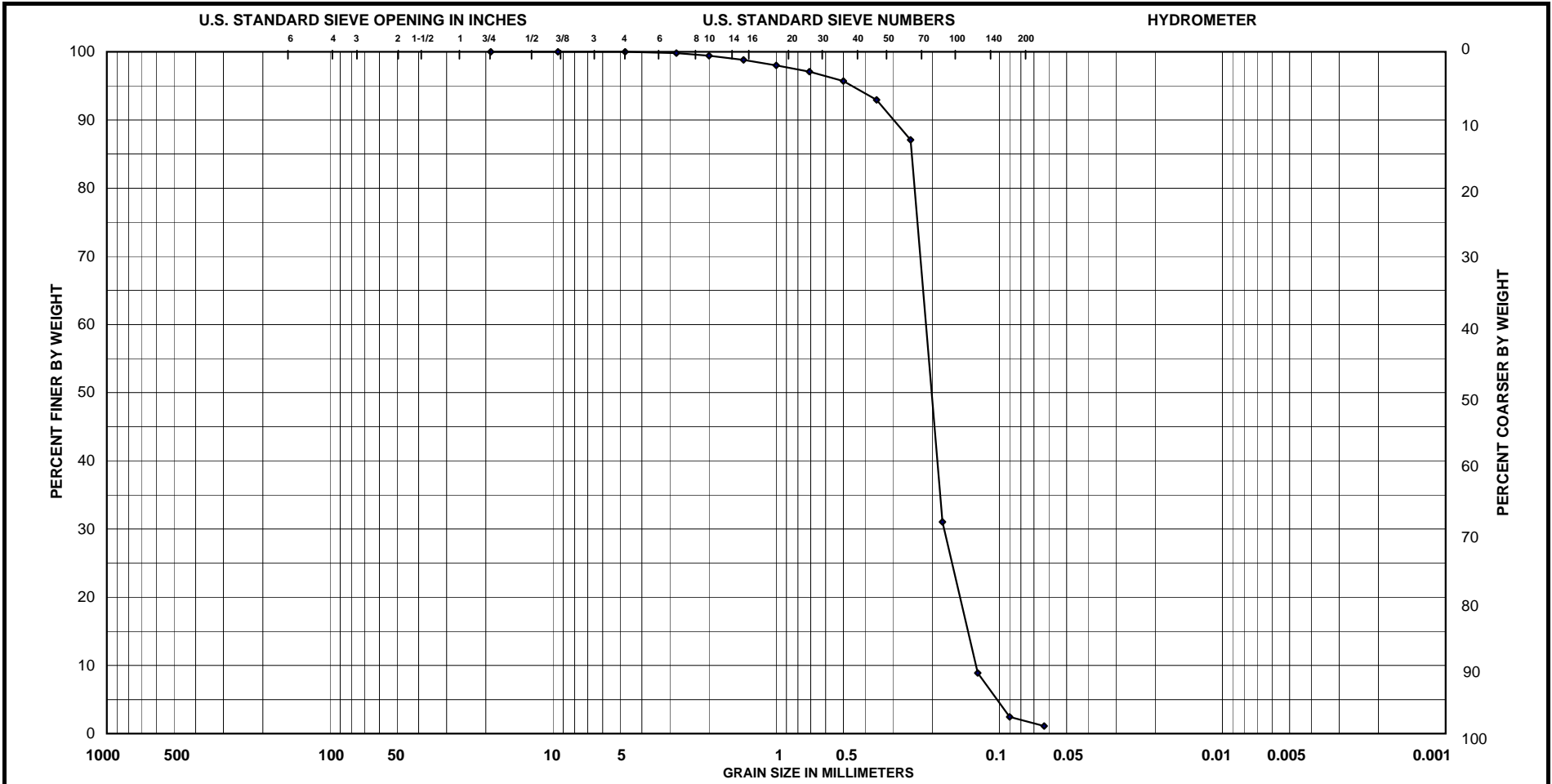
### GRAIN SIZE AND VISUAL SHELL CONTENT

Project:	<b>Topsail Beach, Surf City &amp; North Topsail</b>	Depth:	<b>-24</b>
Project No.:	<b>1584-01-40</b>	Date:	<b>7/29/2003</b>
Boring No.:	<b>TB3-24</b>		
Sample No.:	<b>1</b>		
Description:	<b>SAND, poorly-graded, mostly fine-grained quartz, few carbonate, bluish gray (SP)</b>		

Tare Weight, (g):	<b>50.15</b>	
Dry Wt. Before Washing (g):	<b>184.19</b>	(with tare)
Dry Weight After Washing (g):	<b>182.01</b>	(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	0.26	99.81	100	0.26
#10	2.000	0.50	99.43	100	0.50
#14	1.400	0.84	98.81	100	0.84
#18	1.000	1.07	98.01	100	1.07
#25	0.710	1.26	97.07	100	1.26
#35	0.500	1.84	95.70	95	1.75
#45	0.355	3.67	92.96	40	1.47
#60	0.250	7.86	87.09	15	1.18
#80	0.180	75.11	31.06	5	3.76
#120	0.125	29.72	8.89	3	0.89
#170	0.090	8.62	2.45	3	0.26
#230	0.063	1.78	1.13	1	0.02

**Total Shell Content:** **10** %



COBBLES	GRAVEL		SAND			SILT OR CLAY
	COARSE	FINE	COARSE	MEDIUM	FINE	

Sample No.	Elev. Or Depth	Classification	% CO <sub>3</sub>	G <sub>s</sub>	Nat w%	LL	PL	PI	Project
1	-24	SAND, poorly-graded, mostly fine-grained quartz, few carbonate, bluish gray (SP)	10						Topsail Beach, Surf City & North Topsail
									Area
									Boring No. TB3-24
									Date 7/29/2003

**GRADATION CURVES**



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## VISUAL SHELL CONTENT

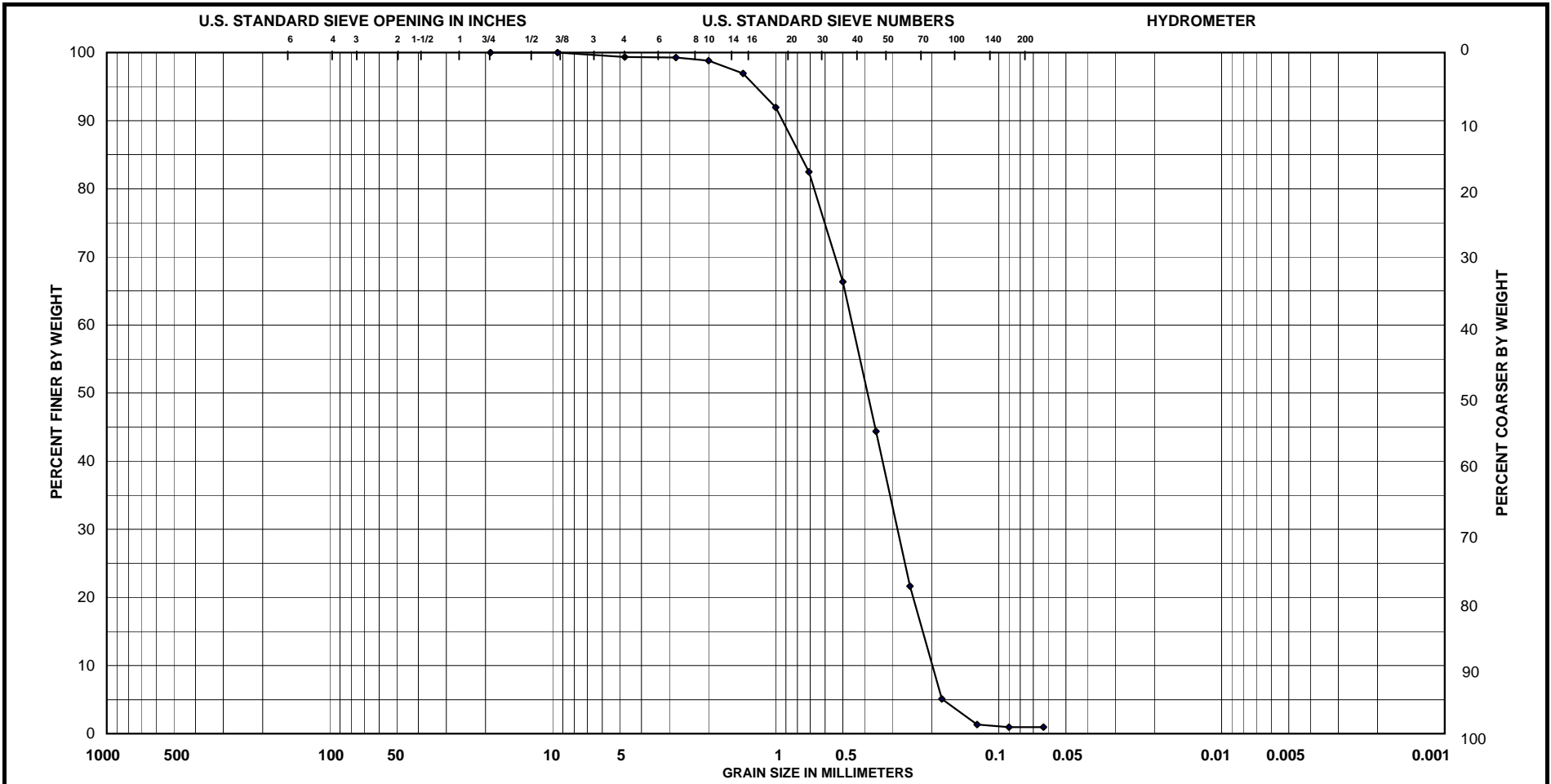
### GRAIN SIZE AND VISUAL SHELL CONTENT

Project:	<b>Topsail Beach, Surf City &amp; North Topsail</b>	Depth:	<b>-4</b>
Project No.:	<b>1584-01-40</b>	Date:	<b>7/29/2003</b>
Boring No.:	<b>TB4-TOE</b>		
Sample No.:	<b>1</b>		
Description:	<b>SAND, poorly-graded, mostly medium to fine-grained quartz, some carbonate, light gray (SP)</b>		

Tare Weight, (g):	<b>50.28</b>	
Dry Wt. Before Washing (g):	<b>151.21</b>	(with tare)
Dry Weight After Washing (g):	<b>151.16</b>	(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	0.65	99.36	100	0.65
#7	2.800	0.08	99.28	100	0.08
#10	2.000	0.47	98.81	100	0.47
#14	1.400	1.89	96.94	95	1.80
#18	1.000	5.03	91.95	70	3.52
#25	0.710	9.55	82.49	65	6.21
#35	0.500	16.31	66.33	30	4.89
#45	0.355	22.14	44.40	20	4.43
#60	0.250	22.96	21.65	10	2.30
#80	0.180	16.72	5.08	5	0.84
#120	0.125	3.77	1.35	3	0.11
#170	0.090	0.39	0.96	1	0.00
#230	0.063	0.02	0.94	1	0.00

**Total Shell Content:** **25** %



COBBLES	GRAVEL		SAND			SILT OR CLAY
	COARSE	FINE	COARSE	MEDIUM	FINE	

Sample No.	Elev. Or Depth	Classification	% CO <sub>3</sub>	G <sub>s</sub>	Nat w%	LL	PL	PI	Project	
1	-4	SAND, poorly-graded, mostly medium to fine-grained quartz, some carbonate, light gray (SP)	25						Topsail Beach, Surf City & North Topsail	
									Area	
									Boring No. TB4-TOE	
									Date 7/29/2003	

**GRADATION CURVES**





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## VISUAL SHELL CONTENT

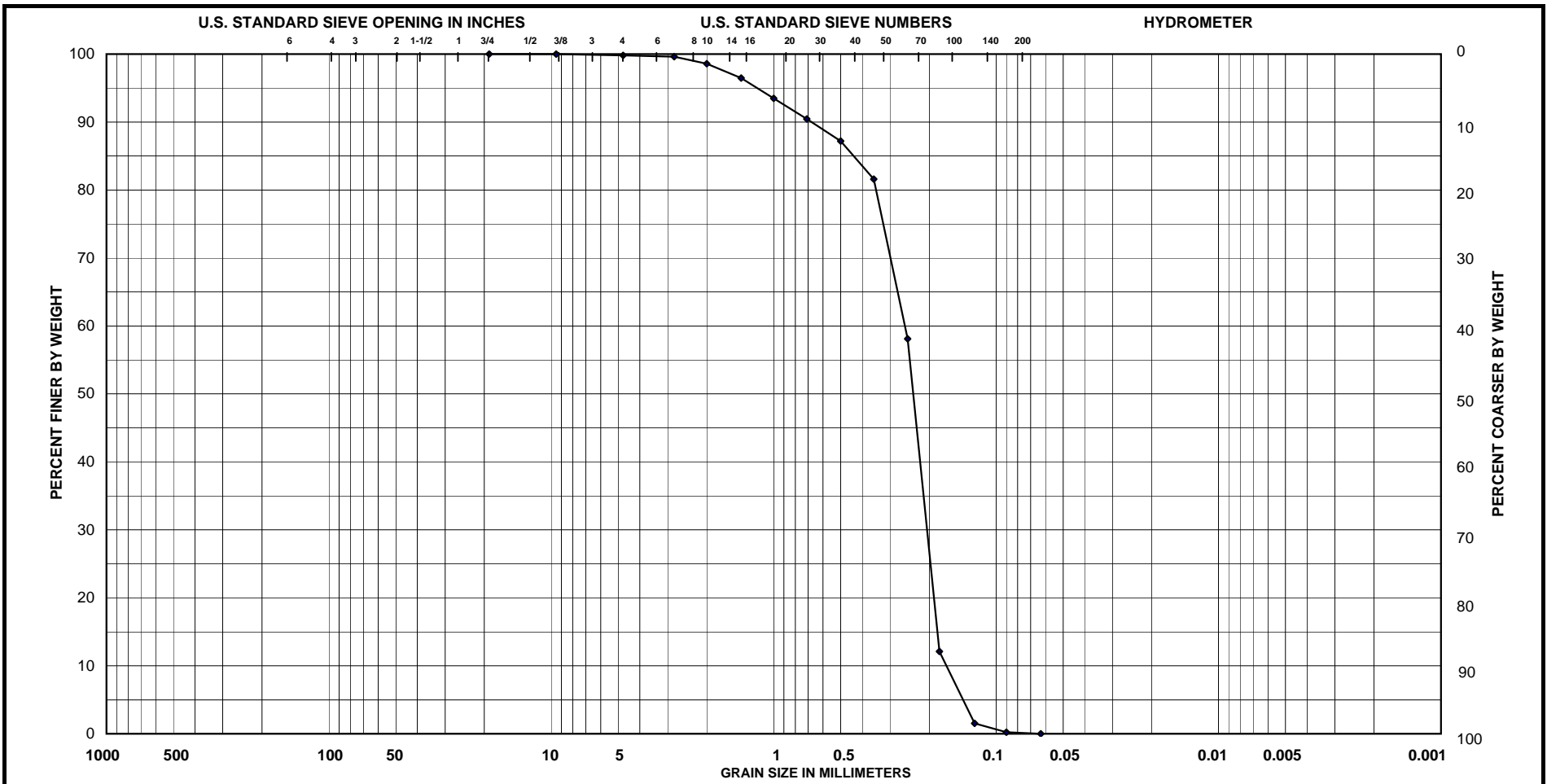
### GRAIN SIZE AND VISUAL SHELL CONTENT

Project:	<b>Topsail Beach, Surf City &amp; North Topsail</b>	Depth:	<b>+7</b>
Project No.:	<b>1584-01-40</b>	Date:	<b>7/29/2003</b>
Boring No.:	<b>TB4-CREST</b>		
Sample No.:	<b>1</b>		
Description:	<b>SAND, poorly-graded, mostly fine-grained quartz, little carbonate, light gray (SP)</b>		

Tare Weight, (g):	<b>49.84</b>	
Dry Wt. Before Washing (g):	<b>154.23</b>	(with tare)
Dry Weight After Washing (g):	<b>154.12</b>	(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	0.21	99.80	100	0.21
#7	2.800	0.20	99.61	100	0.20
#10	2.000	1.09	98.56	95	1.04
#14	1.400	2.20	96.46	95	2.09
#18	1.000	3.11	93.48	85	2.64
#25	0.710	3.17	90.44	50	1.59
#35	0.500	3.38	87.20	45	1.52
#45	0.355	5.85	81.60	20	1.17
#60	0.250	24.52	58.11	15	3.68
#80	0.180	48.02	12.11	5	2.40
#120	0.125	11.03	1.54	5	0.55
#170	0.090	1.36	0.24	1	0.01
#230	0.063	0.23	0.02	1	0.00

**Total Shell Content:** **16** %



COBBLES	GRAVEL		SAND			SILT OR CLAY
	COARSE	FINE	COARSE	MEDIUM	FINE	

Sample No.	Elev. Or Depth	Classification	% CO <sub>3</sub>	G <sub>s</sub>	Nat w%	LL	PL	PI	Project
♦ 1	+7	SAND, poorly-graded, mostly fine-grained quartz, little carbonate, light gray (SP)	16						Topsail Beach, Surf City & North Topsail
									Area
									Boring No. TB4-CREST
									Date 7/29/2003

**GRADATION CURVES**



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## VISUAL SHELL CONTENT

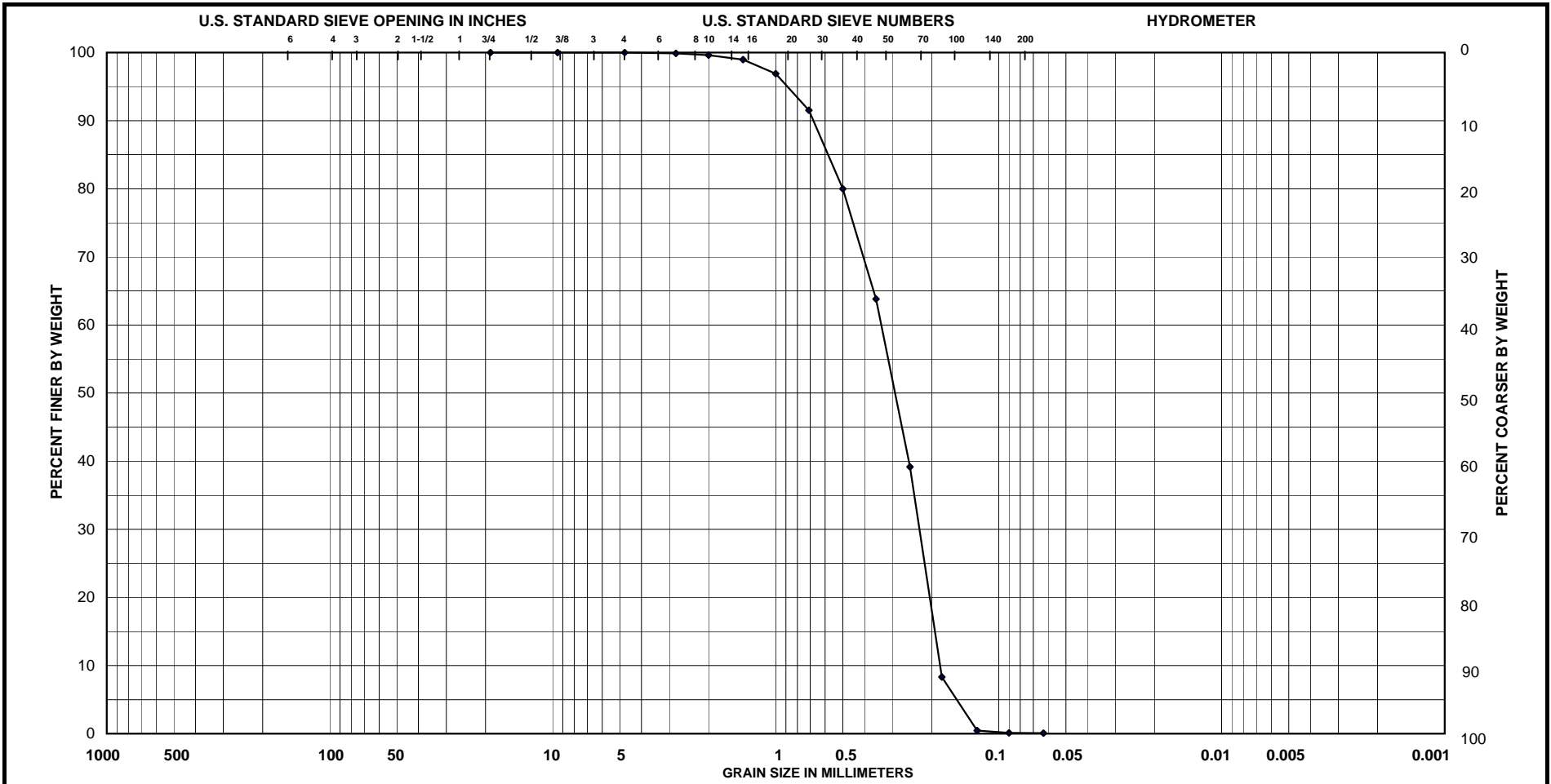
### GRAIN SIZE AND VISUAL SHELL CONTENT

Project:	<b>Topsail Beach, Surf City &amp; North Topsail</b>	Depth:	<b>+2.1</b>
Project No.:	<b>1584-01-40</b>	Date:	<b>7/29/2003</b>
Boring No.:	<b>TB4-MHW</b>		
Sample No.:	<b>1</b>		
Description:	<b>SAND, poorly-graded, mostly fine-grained quartz, little carbonate, light gray (SP)</b>		

Tare Weight, (g):	<b>49.86</b>	
Dry Wt. Before Washing (g):	<b>149.48</b>	(with tare)
Dry Weight After Washing (g):	<b>149.01</b>	(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	0.11	99.89	100	0.11
#10	2.000	0.29	99.60	100	0.29
#14	1.400	0.62	98.98	100	0.62
#18	1.000	2.06	96.91	90	1.85
#25	0.710	5.37	91.52	75	4.03
#35	0.500	11.47	80.00	35	4.01
#45	0.355	16.11	63.83	25	4.03
#60	0.250	24.58	39.16	15	3.69
#80	0.180	30.73	8.31	5	1.54
#120	0.125	7.81	0.47	5	0.39
#170	0.090	0.34	0.13	1	0.00
#230	0.063	0.07	0.06	1	0.00

**Total Shell Content:** **21** %



COBBLES	GRAVEL		SAND			SILT OR CLAY
	COARSE	FINE	COARSE	MEDIUM	FINE	

Sample No.	Elev. Or Depth	Classification	% CO <sub>3</sub>	G <sub>s</sub>	Nat w%	LL	PL	PI	Project
1	+2.1	SAND, poorly-graded, mostly fine-grained quartz, little carbonate, light gray (SP)	21						Topsail Beach, Surf City & North Topsail
									Area
									Boring No. TB4-MHW
									Date 7/29/2003

**GRADATION CURVES**



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## VISUAL SHELL CONTENT

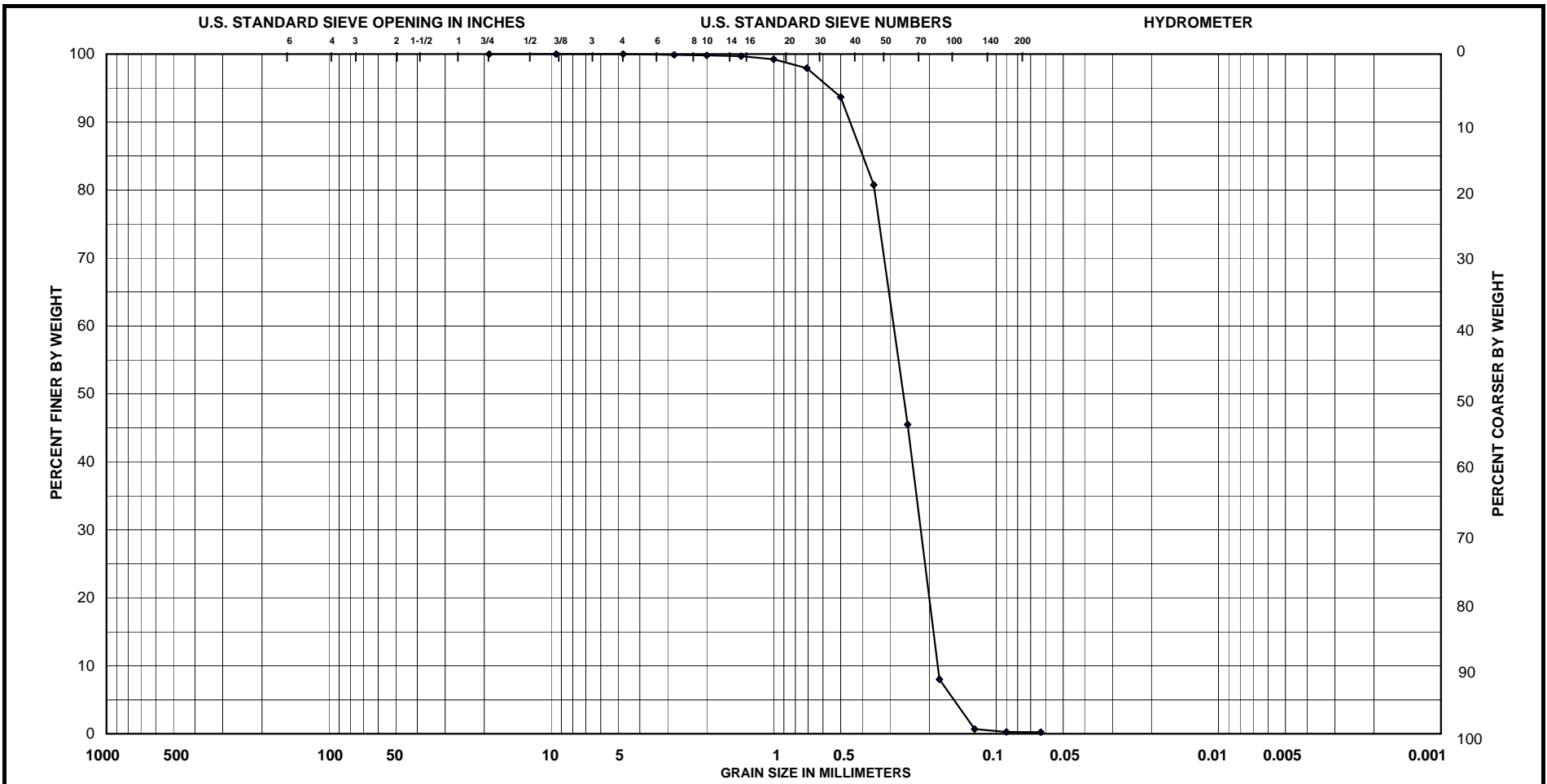
### GRAIN SIZE AND VISUAL SHELL CONTENT

Project:	<b>Topsail Beach, Surf City &amp; North Topsail</b>	Depth:	<b>0</b>
Project No.:	<b>1584-01-40</b>	Date:	<b>7/29/2003</b>
Boring No.:	<b>TB4-MSL</b>		
Sample No.:	<b>1</b>		
Description:	<b>SAND, poorly-graded, mostly fine-grained quartz, little carbonate, light gray (SP)</b>		

Tare Weight, (g):	<b>50.18</b>	
Dry Wt. Before Washing (g):	<b>141.11</b>	(with tare)
Dry Weight After Washing (g):	<b>140.06</b>	(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	0.12	99.87	100	0.12
#10	2.000	0.05	99.81	100	0.05
#14	1.400	0.12	99.68	100	0.12
#18	1.000	0.40	99.24	90	0.36
#25	0.710	1.19	97.93	75	0.89
#35	0.500	3.86	93.69	35	1.35
#45	0.355	11.77	80.74	25	2.94
#60	0.250	32.05	45.50	15	4.81
#80	0.180	34.07	8.03	5	1.70
#120	0.125	6.69	0.67	5	0.33
#170	0.090	0.35	0.29	1	0.00
#230	0.063	0.06	0.22	1	0.00

**Total Shell Content:** **14** %



COBBLES	GRAVEL		SAND			SILT OR CLAY
	COARSE	FINE	COARSE	MEDIUM	FINE	

Sample No.	Elev. Or Depth	Classification	% CO <sub>3</sub>	G <sub>s</sub>	Nat w%	LL	PL	PI	Project
♦ 1	0	SAND, poorly-graded, mostly fine-grained quartz, little carbonate, light gray (SP)	14						Topsail Beach, Surf City & North Topsail
									Area
									Boring No. TB4-MSL
									Date 7/29/2003

**GRADATION CURVES**



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## VISUAL SHELL CONTENT

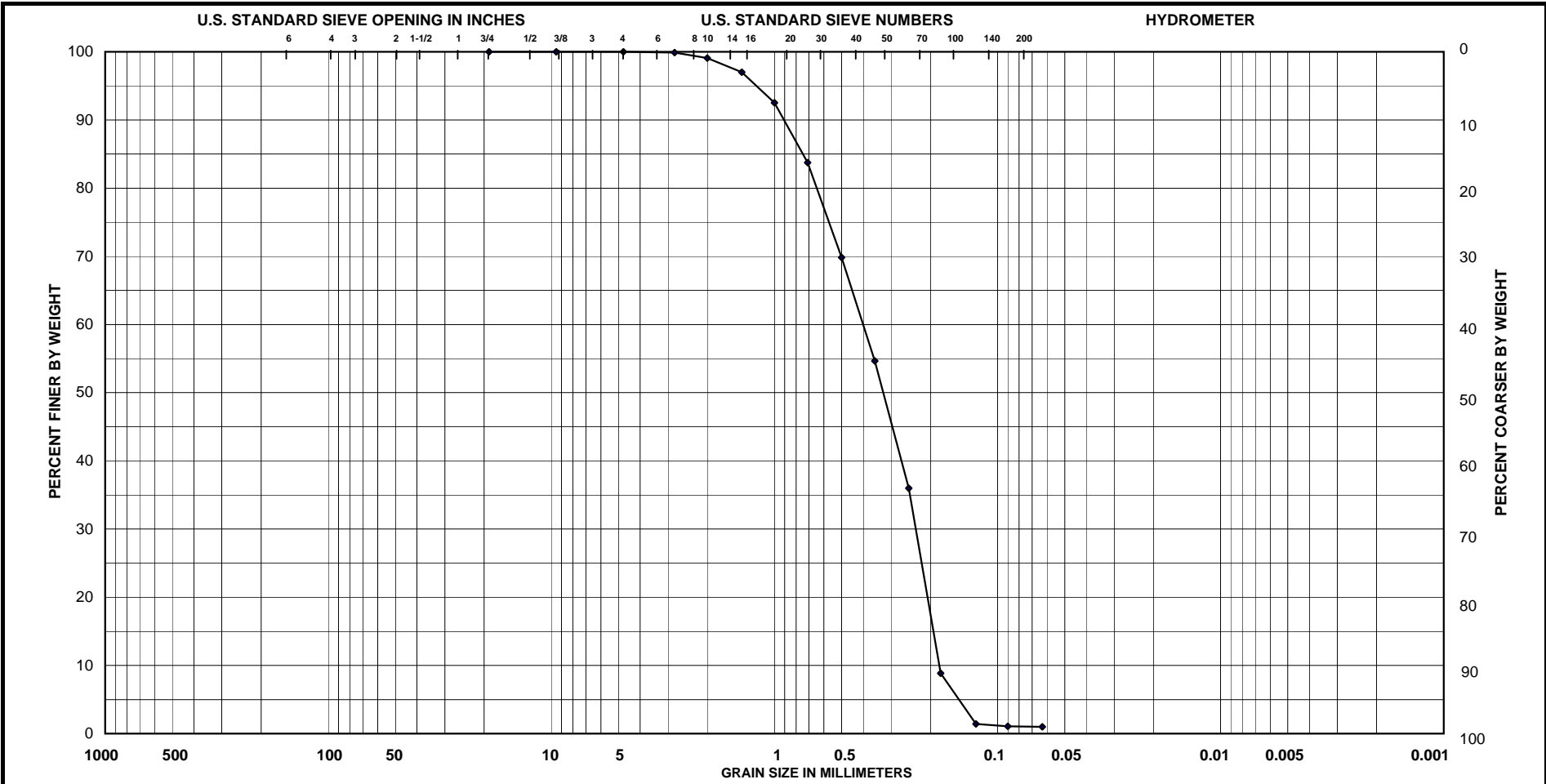
### GRAIN SIZE AND VISUAL SHELL CONTENT

Project:	<b>Topsail Beach, Surf City &amp; North Topsail</b>	Depth:	<b>-1.9</b>
Project No.:	<b>1584-01-40</b>	Date:	<b>7/29/2003</b>
Boring No.:	<b>TB4-MLW</b>		
Sample No.:	<b>1</b>		
Description:	<b>SAND, poorly-graded, mostly fine-grained quartz, little carbonate, brownish gray (SP)</b>		

Tare Weight, (g):	<b>50.85</b>	
Dry Wt. Before Washing (g):	<b>152.34</b>	(with tare)
Dry Weight After Washing (g):	<b>151.73</b>	(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	0.12	99.88	100	0.12
#10	2.000	0.83	99.06	100	0.83
#14	1.400	2.09	97.00	95	1.99
#18	1.000	4.56	92.51	75	3.42
#25	0.710	8.90	83.74	65	5.79
#35	0.500	14.13	69.82	45	6.36
#45	0.355	15.37	54.68	30	4.61
#60	0.250	18.96	35.99	10	1.90
#80	0.180	27.56	8.84	5	1.38
#120	0.125	7.53	1.42	3	0.23
#170	0.090	0.36	1.06	1	0.00
#230	0.063	0.08	0.99	1	0.00

**Total Shell Content:** **26** %



COBBLES	GRAVEL		SAND			SILT OR CLAY
	COARSE	FINE	COARSE	MEDIUM	FINE	

Sample No.	Elev. Or Depth	Classification	% CO <sub>3</sub>	G <sub>s</sub>	Nat w%	LL	PL	PI	Project	
♦ 1	-1.9	SAND, poorly-graded, mostly fine-grained quartz, little carbonate, brownish gray (SP)	26						Topsail Beach, Surf City & North Topsail	
									Area	
									Boring No. TB4-MLW	
									Date 7/29/2003	

**GRADATION CURVES**





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## VISUAL SHELL CONTENT

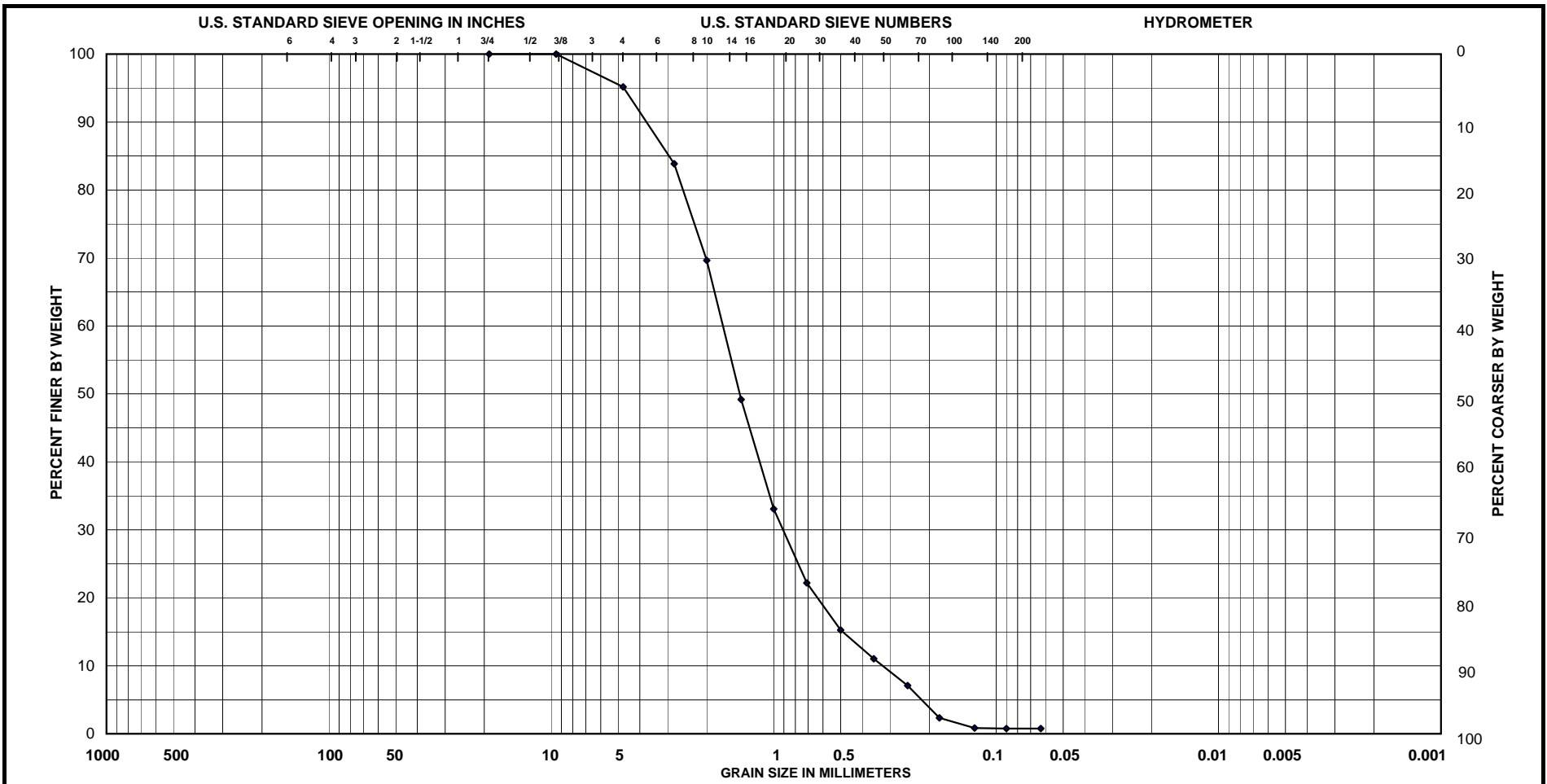
### GRAIN SIZE AND VISUAL SHELL CONTENT

Project:	<b>Topsail Beach, Surf City &amp; North Topsail</b>	Depth:	<b>-3</b>
Project No.:	<b>1584-01-40</b>	Date:	<b>7/29/2003</b>
Boring No.:	<b>TB4-3</b>		
Sample No.:	<b>1</b>		
Description:	<b>SAND, poorly-graded, mostly coarse to medium-grained carbonate, some medium to fine-grained quartz, brownish gray (SP)</b>		

Tare Weight, (g):	<b>50.11</b>	
Dry Wt. Before Washing (g):	<b>215.9</b>	(with tare)
Dry Weight After Washing (g):	<b>214.83</b>	(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	8.02	95.16	90	7.22
#7	2.800	18.71	83.88	75	14.03
#10	2.000	23.59	69.65	65	15.33
#14	1.400	33.95	49.17	65	22.07
#18	1.000	26.70	33.07	55	14.69
#25	0.710	18.04	22.18	50	9.02
#35	0.500	11.52	15.24	45	5.18
#45	0.355	6.98	11.03	25	1.75
#60	0.250	6.52	7.09	15	0.98
#80	0.180	7.86	2.35	5	0.39
#120	0.125	2.49	0.85	3	0.07
#170	0.090	0.12	0.78	1	0.00
#230	0.063	0.01	0.77	1	0.00

**Total Shell Content:** **55** %



COBBLES	GRAVEL		SAND			SILT OR CLAY
	COARSE	FINE	COARSE	MEDIUM	FINE	

Sample No.	Elev. Or Depth	Classification	% CO <sub>3</sub>	G <sub>s</sub>	Nat w%	LL	PL	PI	Project	
1	-3	SAND, poorly-graded, mostly coarse to medium-grained carbonate, some medium to fine-grained quartz, brownish gray (SP)	55						Topsail Beach, Surf City & North Topsail	
									Area	
									Boring No. TB4-3	
									Date 7/29/2003	

**GRADATION CURVES**



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## VISUAL SHELL CONTENT

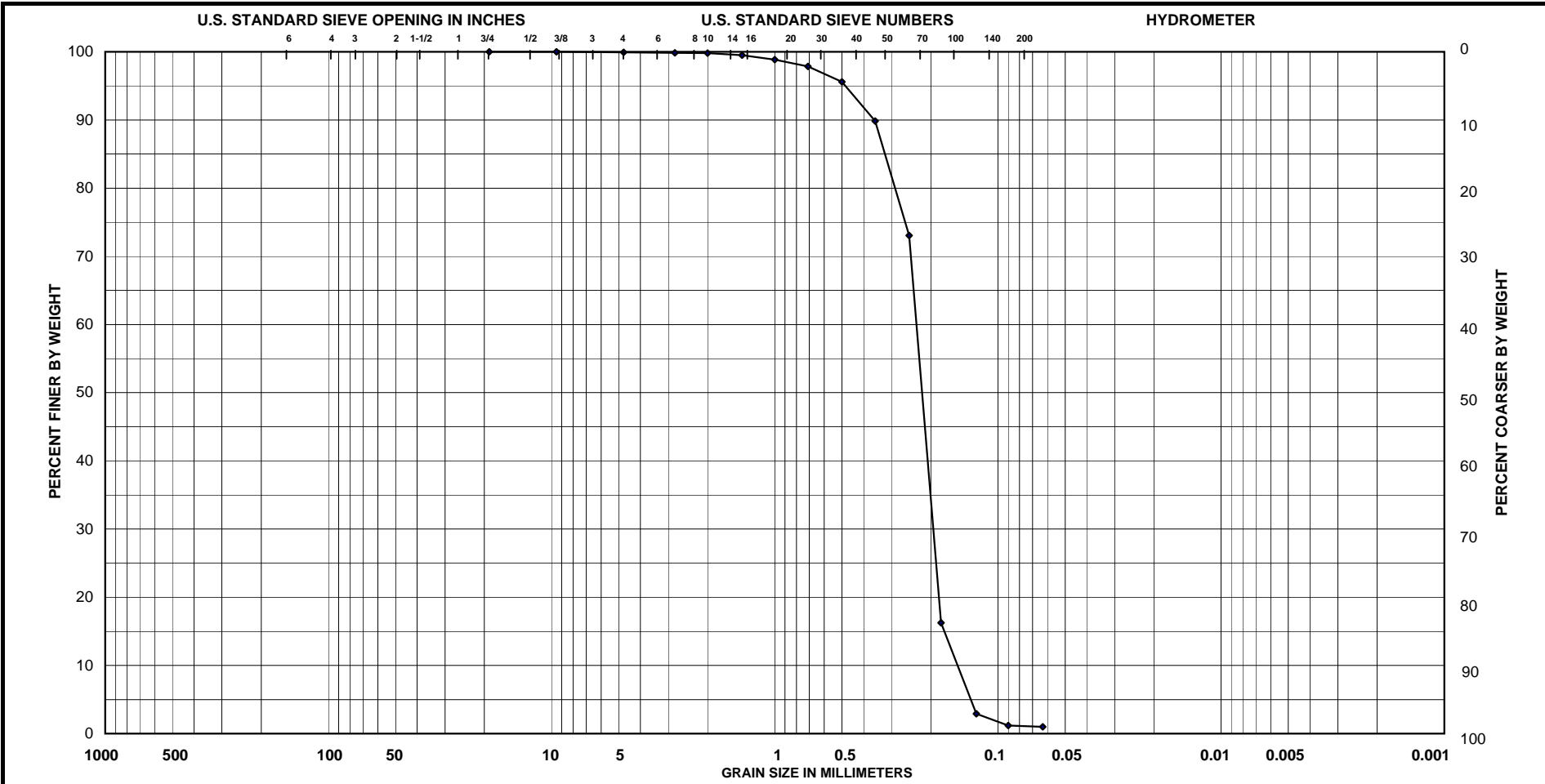
### GRAIN SIZE AND VISUAL SHELL CONTENT

Project:	<b>Topsail Beach, Surf City &amp; North Topsail</b>	Depth:	<b>-4</b>
Project No.:	<b>1584-01-40</b>	Date:	<b>7/29/2003</b>
Boring No.:	<b>TB4-4</b>		
Sample No.:	<b>1</b>		
Description:	<b>SAND, poorly-graded, mostly fine-grained quartz, few carbonate, gray (SP)</b>		

Tare Weight, (g):	<b>50.45</b>	
Dry Wt. Before Washing (g):	<b>180.92</b>	(with tare)
Dry Weight After Washing (g):	<b>179.5</b>	(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	0.12	99.91	100	0.12
#7	2.800	0.09	99.84	100	0.09
#10	2.000	0.06	99.79	100	0.06
#14	1.400	0.39	99.49	99	0.39
#18	1.000	0.82	98.87	90	0.74
#25	0.710	1.33	97.85	60	0.80
#35	0.500	2.93	95.60	45	1.32
#45	0.355	7.50	89.85	25	1.88
#60	0.250	21.92	73.05	15	3.29
#80	0.180	74.11	16.25	5	3.71
#120	0.125	17.38	2.93	3	0.52
#170	0.090	2.26	1.20	1	0.02
#230	0.063	0.26	1.00	1	0.00

**Total Shell Content:** **10** %



COBBLES	GRAVEL		SAND			SILT OR CLAY
	COARSE	FINE	COARSE	MEDIUM	FINE	

Sample No.	Elev. Or Depth	Classification	% CO <sub>3</sub>	G <sub>s</sub>	Nat w%	LL	PL	PI	Project
◆ 1	-4	SAND, poorly-graded, mostly fine-grained quartz, few carbonate, gray (SP)	10						Topsail Beach, Surf City & North Topsail
									Area
									Boring No. TB4-4
									Date 7/29/2003

**GRADATION CURVES**



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## VISUAL SHELL CONTENT

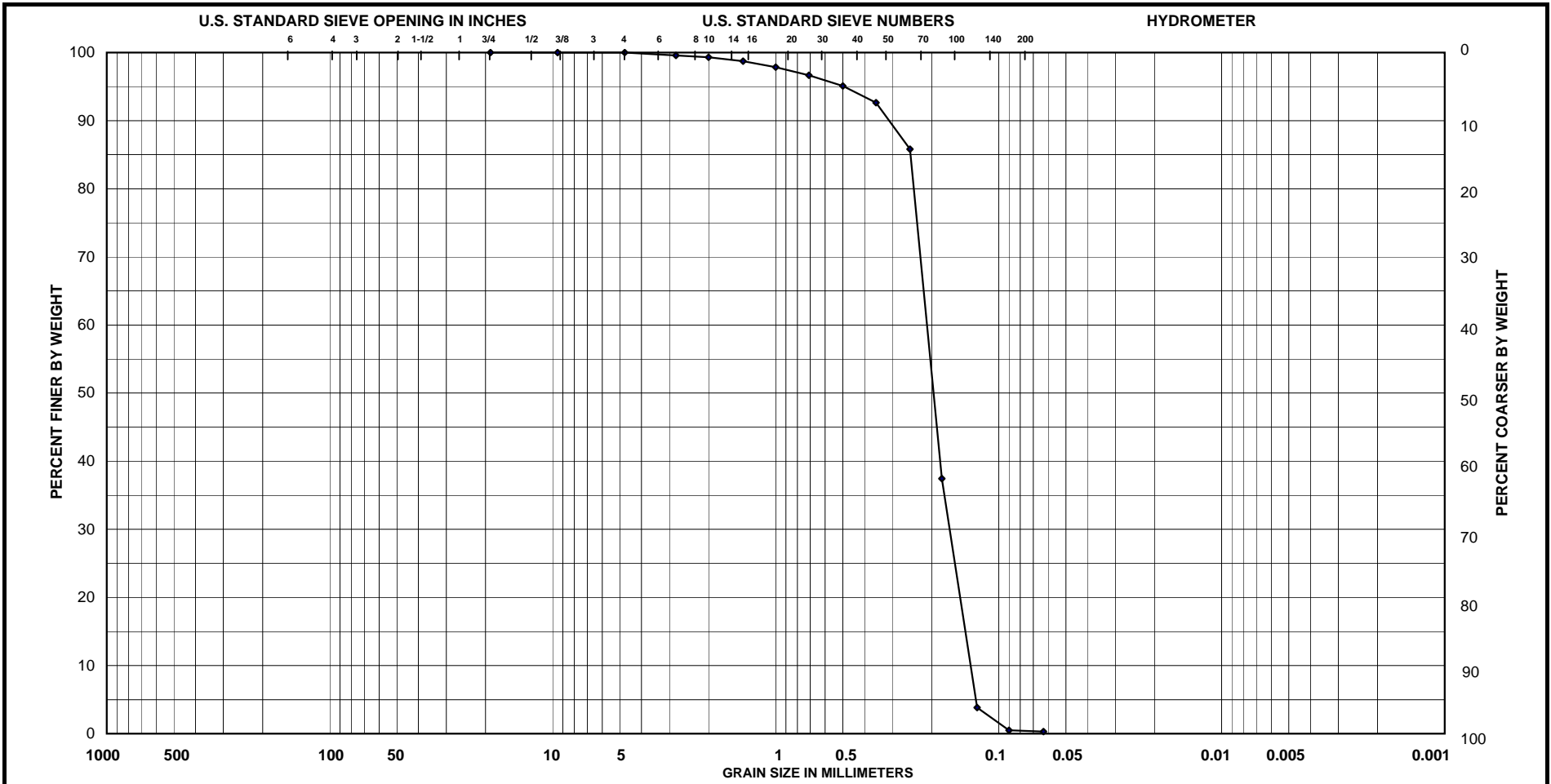
### GRAIN SIZE AND VISUAL SHELL CONTENT

Project:	<b>Topsail Beach, Surf City &amp; North Topsail</b>	Depth:	<b>-6</b>
Project No.:	<b>1584-01-40</b>	Date:	<b>7/29/2003</b>
Boring No.:	<b>TB4-6</b>		
Sample No.:	<b>1</b>		
Description:	<b>SAND, poorly-graded, mostly fine-grained quartz, few carbonate, gray (SP)</b>		

Tare Weight, (g):	<b>50.19</b>	
Dry Wt. Before Washing (g):	<b>138.41</b>	(with tare)
Dry Weight After Washing (g):	<b>137.54</b>	(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	0.36	99.59	100	0.36
#10	2.000	0.26	99.30	100	0.26
#14	1.400	0.49	98.74	95	0.47
#18	1.000	0.80	97.83	95	0.76
#25	0.710	1.03	96.67	75	0.77
#35	0.500	1.40	95.08	40	0.56
#45	0.355	2.16	92.63	25	0.54
#60	0.250	6.02	85.81	10	0.60
#80	0.180	42.66	37.45	5	2.13
#120	0.125	29.65	3.84	3	0.89
#170	0.090	2.94	0.51	1	0.03
#230	0.063	0.17	0.32	1	0.00

**Total Shell Content:** **8** %



COBBLES	GRAVEL		SAND			SILT OR CLAY
	COARSE	FINE	COARSE	MEDIUM	FINE	

Sample No.	Elev. Or Depth	Classification	% CO <sub>3</sub>	G <sub>s</sub>	Nat w%	LL	PL	PI	Project
1	-6	SAND, poorly-graded, mostly fine-grained quartz, few carbonate, gray (SP)	8						Topsail Beach, Surf City & North Topsail
									Area
									Boring No. TB4-6
									Date 7/29/2003

**GRADATION CURVES**



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## VISUAL SHELL CONTENT

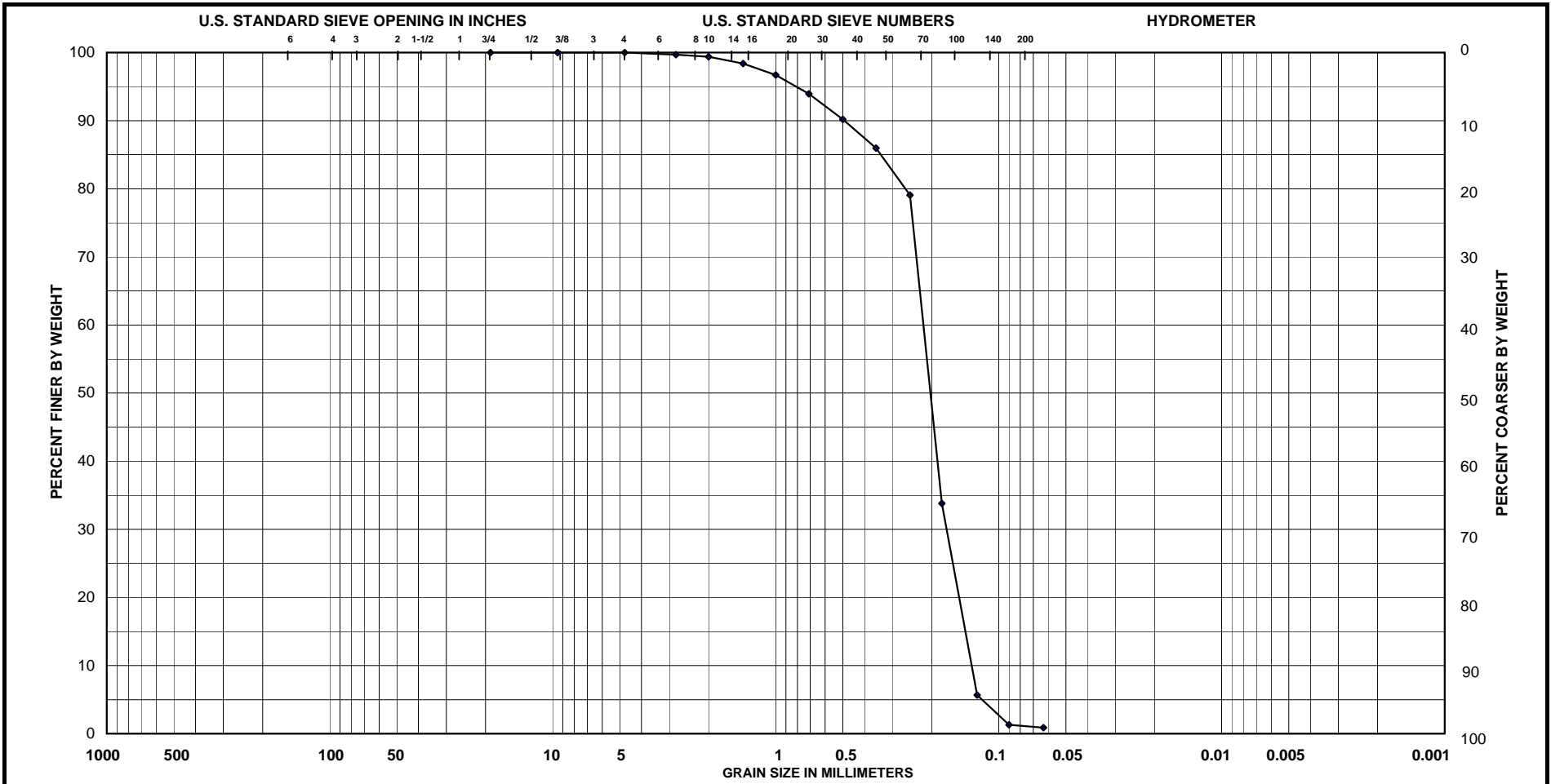
### GRAIN SIZE AND VISUAL SHELL CONTENT

Project:	<b>Topsail Beach, Surf City &amp; North Topsail</b>	Depth:	
Project No.:	<b>1584-01-40</b>	Date:	<b>7/29/2003</b>
Boring No.:	<b>TB4-8</b>		
Sample No.:	<b>1</b>		
Description:	<b>SAND, poorly-graded, mostly fine-grained quartz, few carbonate, gray (SP)</b>		

Tare Weight, (g):	<b>50.65</b>	
Dry Wt. Before Washing (g):	<b>153.68</b>	(with tare)
Dry Weight After Washing (g):	<b>153.03</b>	(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	0.31	99.70	100	0.31
#10	2.000	0.33	99.38	100	0.33
#14	1.400	1.02	98.39	95	0.97
#18	1.000	1.75	96.69	80	1.40
#25	0.710	2.83	93.94	65	1.84
#35	0.500	3.85	90.21	40	1.54
#45	0.355	4.37	85.97	15	0.66
#60	0.250	7.12	79.05	10	0.71
#80	0.180	46.62	33.81	5	2.33
#120	0.125	28.98	5.68	3	0.87
#170	0.090	4.52	1.29	1	0.05
#230	0.063	0.42	0.88	1	0.00

**Total Shell Content:** **11** %



COBBLES	GRAVEL		SAND			SILT OR CLAY
	COARSE	FINE	COARSE	MEDIUM	FINE	

Sample No.	Elev. Or Depth	Classification	% CO <sub>3</sub>	G <sub>s</sub>	Nat w%	LL	PL	PI	Project
1		SAND, poorly-graded, mostly fine-grained quartz, few carbonate, gray (SP)	11						Topsail Beach, Surf City & North Topsail
									Area
									Boring No. TB4-8
									Date 7/29/2003

**GRADATION CURVES**





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## VISUAL SHELL CONTENT

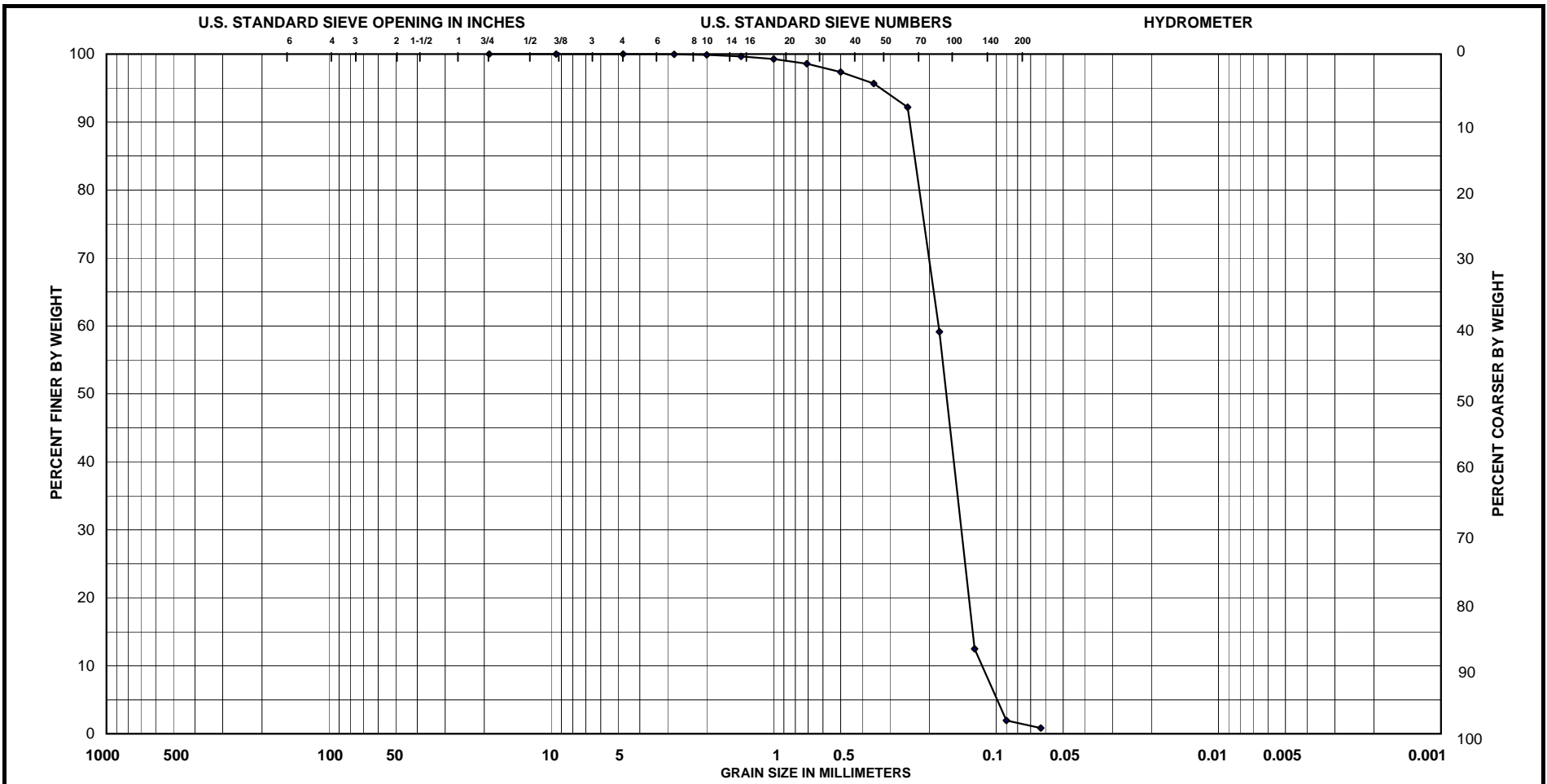
### GRAIN SIZE AND VISUAL SHELL CONTENT

Project:	<b>Topsail Beach, Surf City &amp; North Topsail</b>	Depth:	<b>-10</b>
Project No.:	<b>1584-01-40</b>	Date:	<b>7/30/2003</b>
Boring No.:	<b>TB4-10</b>		
Sample No.:	<b>1</b>		
Description:	<b>SAND, poorly-graded, mostly fine-grained quartz, few carbonate, gray (SP)</b>		

Tare Weight, (g):	<b>50.62</b>	
Dry Wt. Before Washing (g):	<b>152.76</b>	(with tare)
Dry Weight After Washing (g):	<b>151.86</b>	(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	0.05	99.95	100	0.05
#10	2.000	0.08	99.87	100	0.08
#14	1.400	0.24	99.64	90	0.22
#18	1.000	0.39	99.26	95	0.37
#25	0.710	0.70	98.57	70	0.49
#35	0.500	1.23	97.37	60	0.74
#45	0.355	1.75	95.65	40	0.70
#60	0.250	3.54	92.19	10	0.35
#80	0.180	33.76	59.13	5	1.69
#120	0.125	47.63	12.50	3	1.43
#170	0.090	10.79	1.94	1	0.11
#230	0.063	1.12	0.84	1	0.01

**Total Shell Content:** **6** %



COBBLES	GRAVEL		SAND			SILT OR CLAY
	COARSE	FINE	COARSE	MEDIUM	FINE	

Sample No.	Elev. Or Depth	Classification	% CO <sub>3</sub>	G <sub>s</sub>	Nat w%	LL	PL	PI	Project	
♦ 1	-10	SAND, poorly-graded, mostly fine-grained quartz, few carbonate, gray (SP)	6						Topsail Beach, Surf City & North Topsail	
			Area							
			Boring No. TB4-10							
			Date 7/30/2003							

**GRADATION CURVES**



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## VISUAL SHELL CONTENT

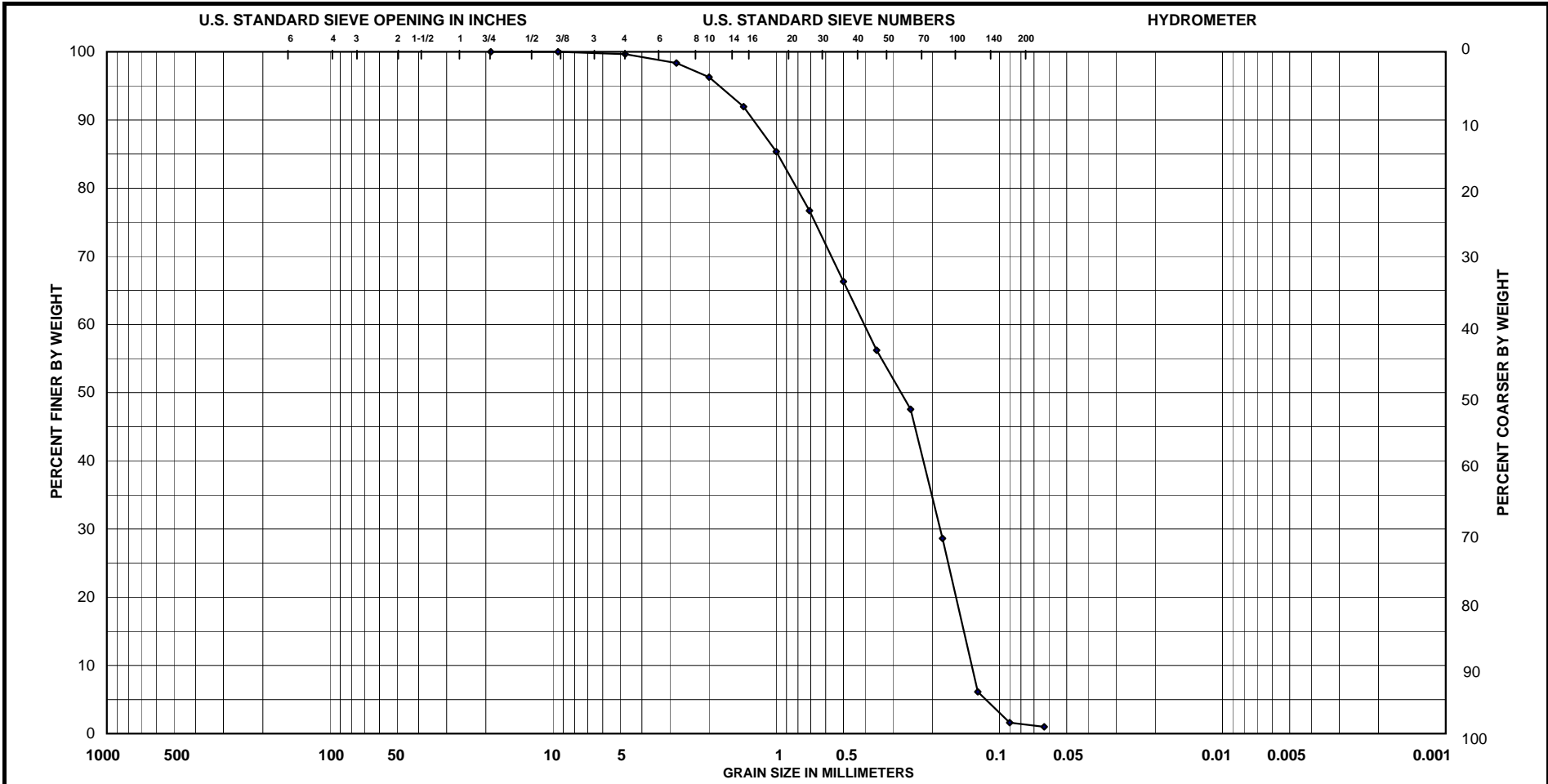
### GRAIN SIZE AND VISUAL SHELL CONTENT

Project:	<b>Topsail Beach, Surf City &amp; North Topsail</b>	Depth:	<b>-12</b>
Project No.:	<b>1584-01-40</b>	Date:	<b>7/30/2003</b>
Boring No.:	<b>TB4-12</b>		
Sample No.:	<b>1</b>		
Description:	<b>SAND, poorly-graded, mostly fine-grained quartz, little carbonate, gray (SP)</b>		

Tare Weight, (g):	<b>50.37</b>	
Dry Wt. Before Washing (g):	<b>176.66</b>	(with tare)
Dry Weight After Washing (g):	<b>175.68</b>	(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	0.42	99.67	100	0.42
#7	2.800	1.65	98.36	100	1.65
#10	2.000	2.62	96.29	85	2.23
#14	1.400	5.47	91.96	75	4.10
#18	1.000	8.32	85.37	60	4.99
#25	0.710	10.94	76.70	45	4.92
#35	0.500	13.14	66.30	40	5.26
#45	0.355	12.73	56.22	30	3.82
#60	0.250	10.92	47.57	15	1.64
#80	0.180	23.94	28.62	5	1.20
#120	0.125	28.39	6.14	3	0.85
#170	0.090	5.72	1.61	1	0.06
#230	0.063	0.77	1.00	1	0.01

**Total Shell Content:** **25** %



COBBLES	GRAVEL		SAND			SILT OR CLAY
	COARSE	FINE	COARSE	MEDIUM	FINE	

Sample No.	Elev. Or Depth	Classification	% CO <sub>3</sub>	G <sub>s</sub>	Nat w%	LL	PL	PI	Project	
1	-12	SAND, poorly-graded, mostly fine-grained quartz, little carbonate, gray (SP)	25						Topsail Beach, Surf City & North Topsail	
									Area	
									Boring No. TB4-12	
									Date 7/30/2003	

**GRADATION CURVES**



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## VISUAL SHELL CONTENT

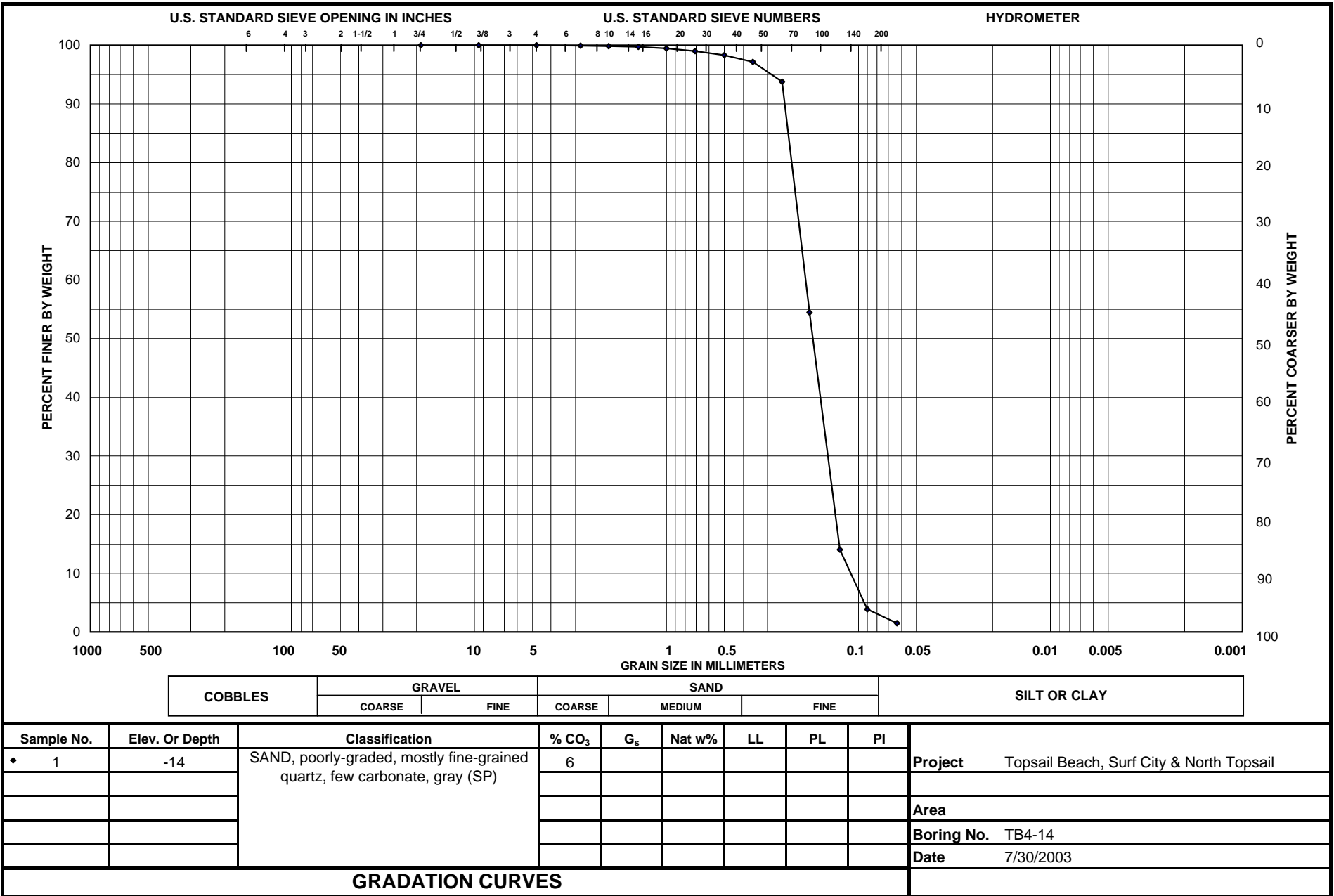
### GRAIN SIZE AND VISUAL SHELL CONTENT

Project:	<b>Topsail Beach, Surf City &amp; North Topsail</b>	Depth:	<b>-14</b>
Project No.:	<b>1584-01-40</b>	Date:	<b>7/30/2003</b>
Boring No.:	<b>TB4-14</b>		
Sample No.:	<b>1</b>		
Description:	<b>SAND, poorly-graded, mostly fine-grained quartz, few carbonate, gray (SP)</b>		

Tare Weight, (g):	<b>49.80</b>	
Dry Wt. Before Washing (g):	<b>152.83</b>	(with tare)
Dry Weight After Washing (g):	<b>151.21</b>	(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	0.07	99.93	100	0.07
#10	2.000	0.08	99.85	100	0.08
#14	1.400	0.12	99.74	100	0.12
#18	1.000	0.30	99.45	100	0.30
#25	0.710	0.44	99.02	95	0.42
#35	0.500	0.72	98.32	70	0.50
#45	0.355	1.19	97.17	35	0.42
#60	0.250	3.46	93.81	15	0.52
#80	0.180	40.52	54.48	5	2.03
#120	0.125	41.69	14.02	3	1.25
#170	0.090	10.46	3.86	1	0.10
#230	0.063	2.44	1.49	1	0.02

**Total Shell Content:** **6** %



Sample No.	Elev. Or Depth	Classification	% CO <sub>3</sub>	G <sub>s</sub>	Nat w%	LL	PL	PI
♦ 1	-14	SAND, poorly-graded, mostly fine-grained quartz, few carbonate, gray (SP)	6					
<b>GRADATION CURVES</b>								

<b>Project</b>	Topsail Beach, Surf City & North Topsail
<b>Area</b>	
<b>Boring No.</b>	TB4-14
<b>Date</b>	7/30/2003



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## VISUAL SHELL CONTENT

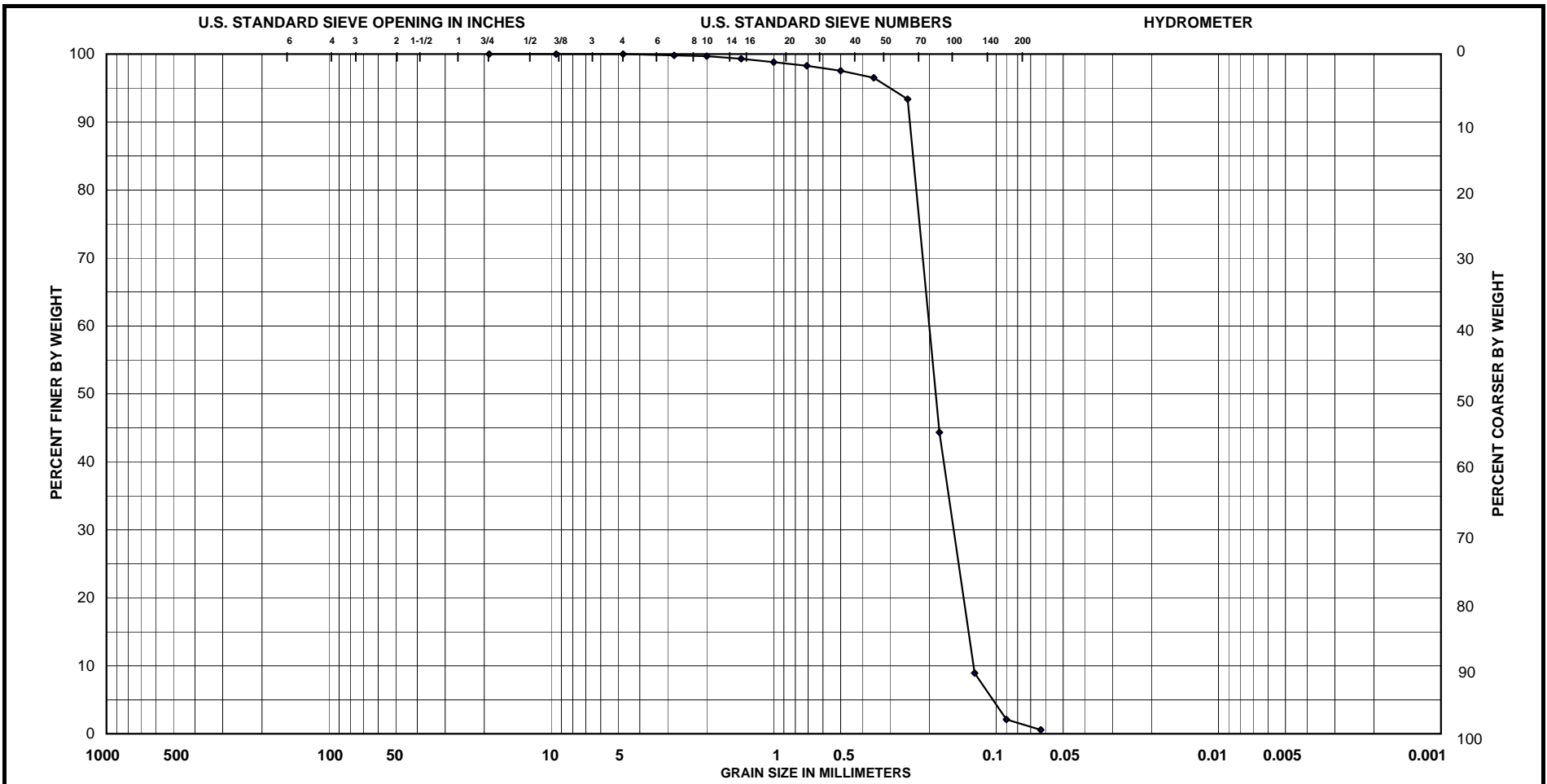
### GRAIN SIZE AND VISUAL SHELL CONTENT

Project:	<b>Topsail Beach, Surf City &amp; North Topsail</b>	Depth:	<b>-16</b>
Project No.:	<b>1584-01-40</b>	Date:	<b>7/30/2003</b>
Boring No.:	<b>TB4-16</b>		
Sample No.:	<b>1</b>		
Description:	<b>SAND, poorly-graded, mostly fine-grained quartz, few carbonate, dark bluish gray (SP)</b>		

Tare Weight, (g):	<b>49.33</b>	
Dry Wt. Before Washing (g):	<b>166.82</b>	(with tare)
Dry Weight After Washing (g):	<b>165.79</b>	(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	0.23	99.80	100	0.23
#10	2.000	0.13	99.69	100	0.13
#14	1.400	0.43	99.33	95	0.41
#18	1.000	0.59	98.83	80	0.47
#25	0.710	0.65	98.27	70	0.46
#35	0.500	0.83	97.57	55	0.46
#45	0.355	1.25	96.50	40	0.50
#60	0.250	3.70	93.35	15	0.56
#80	0.180	57.59	44.34	5	2.88
#120	0.125	41.60	8.93	3	1.25
#170	0.090	8.03	2.09	3	0.24
#230	0.063	1.77	0.59	1	0.02

**Total Shell Content:** **6** %



COBBLES	GRAVEL		SAND			SILT OR CLAY
	COARSE	FINE	COARSE	MEDIUM	FINE	

Sample No.	Elev. Or Depth	Classification	% CO <sub>3</sub>	G <sub>s</sub>	Nat w%	LL	PL	PI	Project
1	-16	SAND, poorly-graded, mostly fine-grained quartz, few carbonate, dark bluish gray (SP)	6						Topsail Beach, Surf City & North Topsail
									Area
									Boring No. TB4-16
									Date 7/30/2003

**GRADATION CURVES**





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## VISUAL SHELL CONTENT

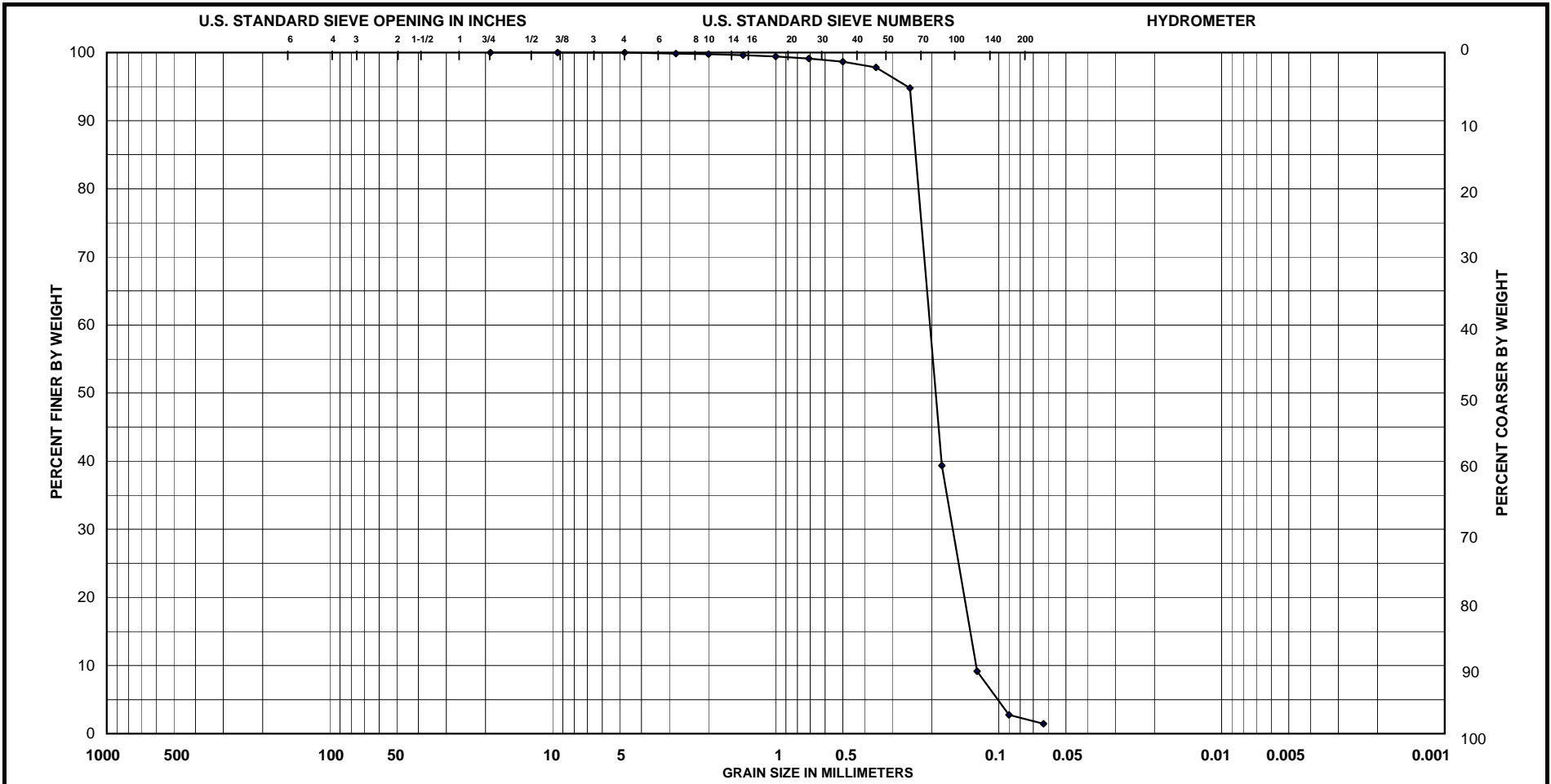
### GRAIN SIZE AND VISUAL SHELL CONTENT

Project:	<b>Topsail Beach, Surf City &amp; North Topsail</b>	Depth:	<b>-18</b>
Project No.:	<b>1584-01-40</b>	Date:	<b>7/30/2003</b>
Boring No.:	<b>TB4-18</b>		
Sample No.:	<b>1</b>		
Description:	<b>SAND, poorly-graded, mostly fine-grained quartz, few carbonate, bluish gray (SP)</b>		

Tare Weight, (g):	<b>48.97</b>	
Dry Wt. Before Washing (g):	<b>173.09</b>	(with tare)
Dry Weight After Washing (g):	<b>171.49</b>	(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	0.19	99.85	100	0.19
#10	2.000	0.10	99.77	100	0.10
#14	1.400	0.19	99.61	100	0.19
#18	1.000	0.24	99.42	100	0.24
#25	0.710	0.37	99.12	98	0.36
#35	0.500	0.57	98.66	60	0.34
#45	0.355	1.03	97.83	20	0.21
#60	0.250	3.76	94.80	15	0.56
#80	0.180	68.79	39.38	5	3.44
#120	0.125	37.50	9.17	3	1.13
#170	0.090	7.97	2.75	3	0.24
#230	0.063	1.61	1.45	1	0.02

**Total Shell Content:** **6** %



COBBLES	GRAVEL		SAND			SILT OR CLAY
	COARSE	FINE	COARSE	MEDIUM	FINE	

Sample No.	Elev. Or Depth	Classification	% CO <sub>3</sub>	G <sub>s</sub>	Nat w%	LL	PL	PI	Project
1	-18	SAND, poorly-graded, mostly fine-grained quartz, few carbonate, bluish gray (SP)	6						Topsail Beach, Surf City & North Topsail
									Area
									Boring No. TB4-18
									Date 7/30/2003

**GRADATION CURVES**



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## VISUAL SHELL CONTENT

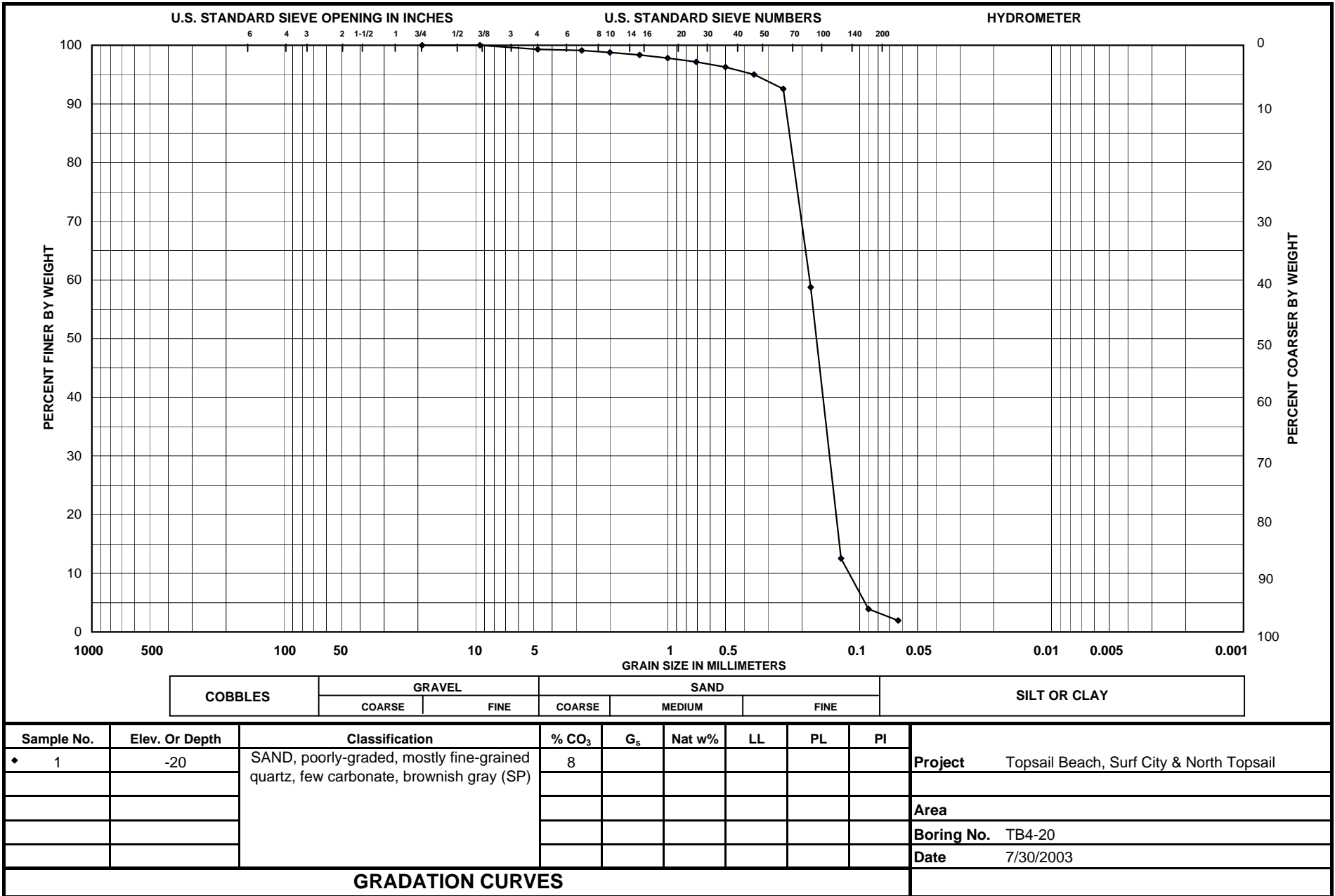
### GRAIN SIZE AND VISUAL SHELL CONTENT

Project:	<b>Topsail Beach, Surf City &amp; North Topsail</b>	Depth:	<b>-20</b>
Project No.:	<b>1584-01-40</b>	Date:	<b>7/30/2003</b>
Boring No.:	<b>TB4-20</b>		
Sample No.:	<b>1</b>		
Description:	<b>SAND, poorly-graded, mostly fine-grained quartz, few carbonate, brownish gray (SP)</b>		

Tare Weight, (g):	<b>48.66</b>	
Dry Wt. Before Washing (g):	<b>140.45</b>	(with tare)
Dry Weight After Washing (g):	<b>138.88</b>	(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	0.65	99.29	100	0.65
#7	2.800	0.17	99.11	100	0.17
#10	2.000	0.31	98.77	100	0.31
#14	1.400	0.40	98.33	100	0.40
#18	1.000	0.49	97.80	100	0.49
#25	0.710	0.60	97.15	98	0.59
#35	0.500	0.78	96.30	75	0.59
#45	0.355	1.19	95.00	45	0.54
#60	0.250	2.22	92.58	15	0.33
#80	0.180	31.05	58.75	5	1.55
#120	0.125	42.42	12.54	3	1.27
#170	0.090	7.91	3.92	3	0.24
#230	0.063	1.81	1.95	1	0.02

**Total Shell Content:** **8** %





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## VISUAL SHELL CONTENT

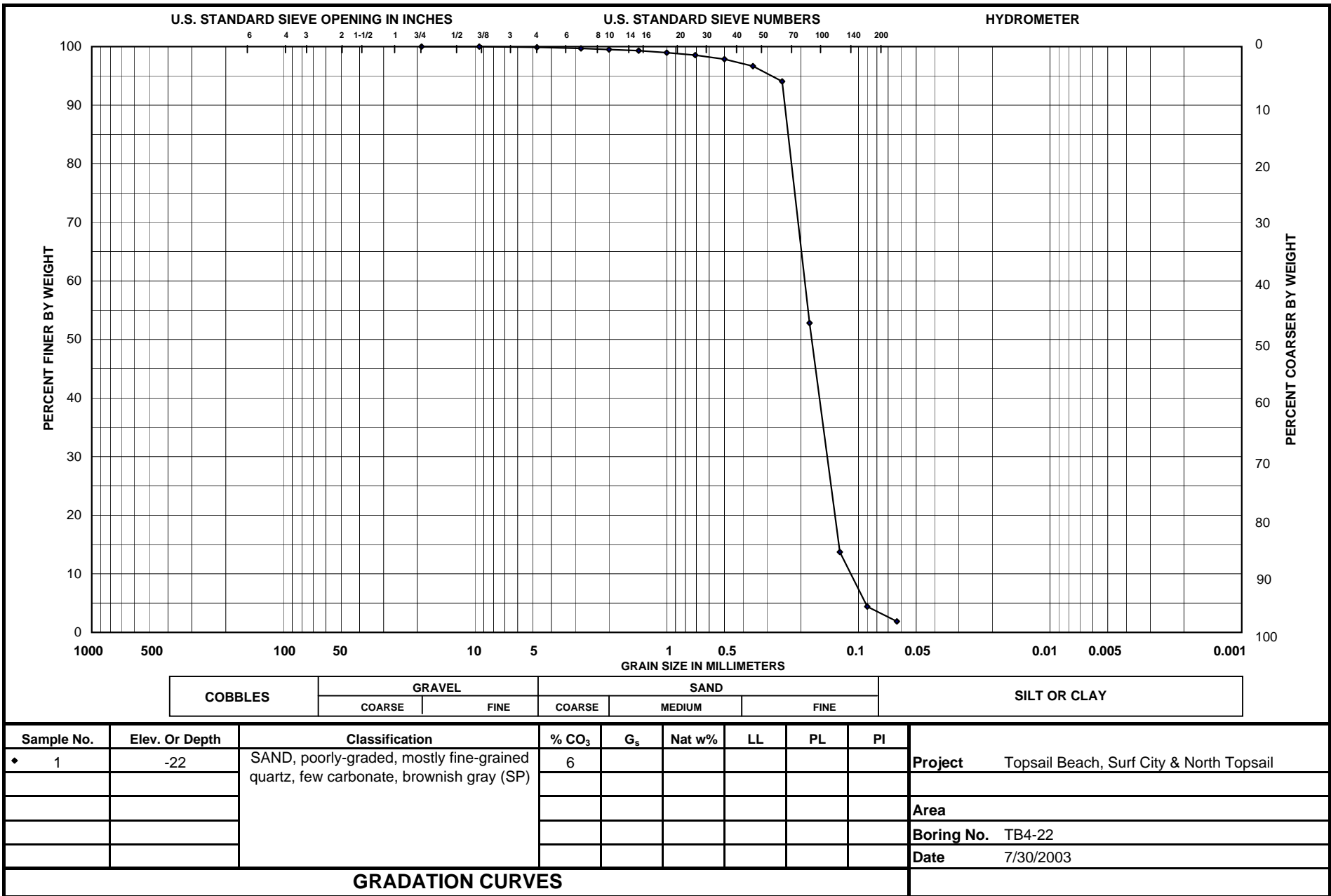
### GRAIN SIZE AND VISUAL SHELL CONTENT

Project:	<b>Topsail Beach, Surf City &amp; North Topsail</b>	Depth:	<b>-22</b>
Project No.:	<b>1584-01-40</b>	Date:	<b>7/30/2003</b>
Boring No.:	<b>TB4-22</b>		
Sample No.:	<b>1</b>		
Description:	<b>SAND, poorly-graded, mostly fine-grained quartz, few carbonate, brownish gray (SP)</b>		

Tare Weight, (g):	<b>50.12</b>	
Dry Wt. Before Washing (g):	<b>147.57</b>	(with tare)
Dry Weight After Washing (g):	<b>145.86</b>	(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	0.12	99.88	100	0.12
#7	2.800	0.19	99.68	100	0.19
#10	2.000	0.19	99.49	100	0.19
#14	1.400	0.17	99.31	100	0.17
#18	1.000	0.33	98.97	100	0.33
#25	0.710	0.43	98.53	95	0.41
#35	0.500	0.66	97.86	65	0.43
#45	0.355	1.16	96.66	15	0.17
#60	0.250	2.55	94.05	10	0.26
#80	0.180	40.18	52.82	5	2.01
#120	0.125	38.11	13.71	3	1.14
#170	0.090	9.08	4.39	1	0.09
#230	0.063	2.44	1.89	1	0.02

**Total Shell Content:** **6** %





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## VISUAL SHELL CONTENT

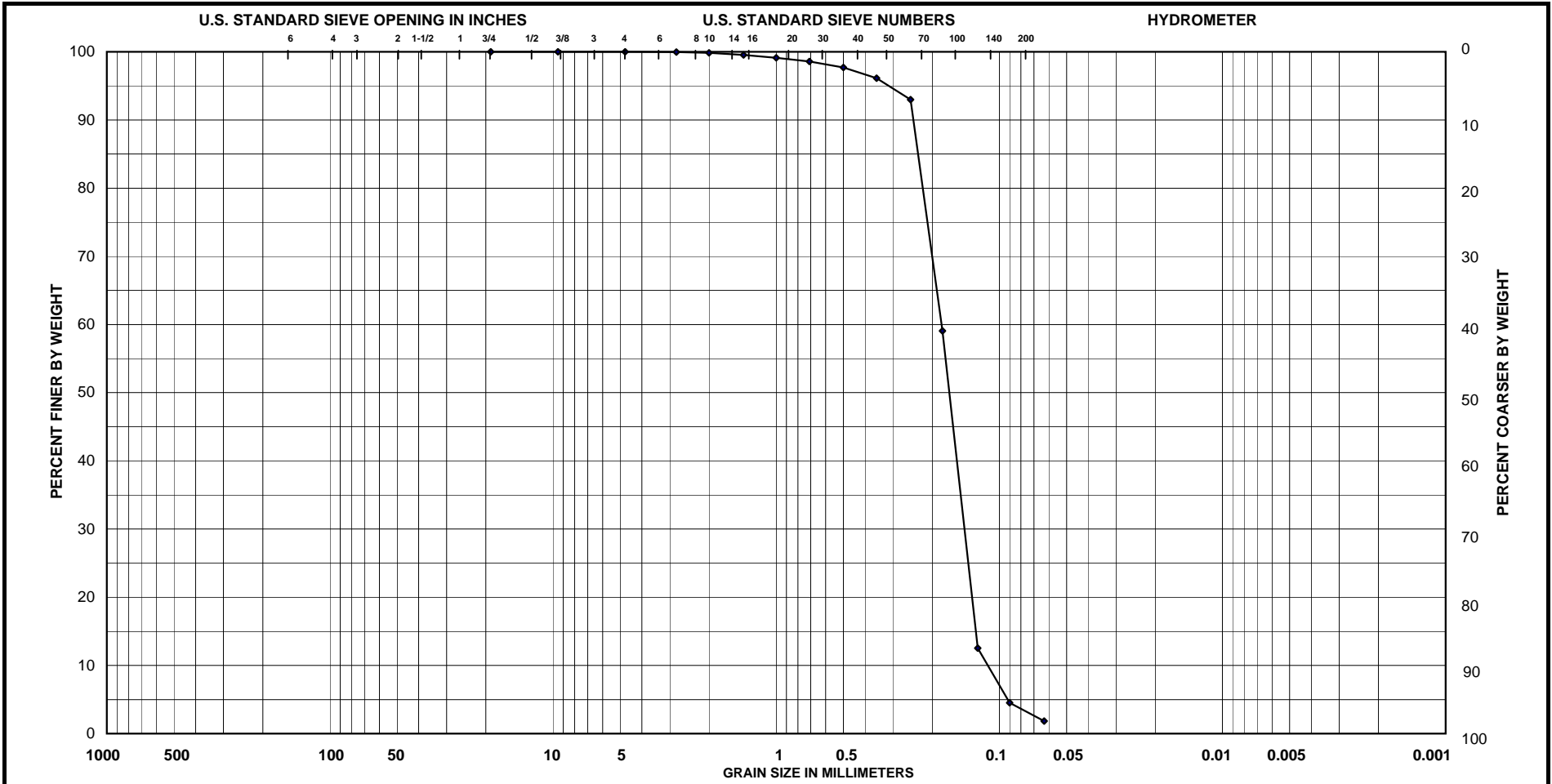
### GRAIN SIZE AND VISUAL SHELL CONTENT

Project:	<b>Topsail Beach, Surf City &amp; North Topsail</b>	Depth:	<b>-24</b>
Project No.:	<b>1584-01-40</b>	Date:	<b>7/30/2003</b>
Boring No.:	<b>TB4-24</b>		
Sample No.:	<b>1</b>		
Description:	<b>SAND, poorly-graded, mostly fine-grained quartz, few carbonate, grayish brown (SP)</b>		

Tare Weight, (g):	<b>50.24</b>	
Dry Wt. Before Washing (g):	<b>161.66</b>	(with tare)
Dry Weight After Washing (g):	<b>159.67</b>	(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	0.06	99.95	100	0.06
#10	2.000	0.11	99.85	100	0.11
#14	1.400	0.33	99.55	100	0.33
#18	1.000	0.47	99.13	100	0.47
#25	0.710	0.62	98.57	100	0.62
#35	0.500	0.96	97.71	60	0.58
#45	0.355	1.78	96.11	35	0.62
#60	0.250	3.47	93.00	20	0.69
#80	0.180	37.82	59.06	5	1.89
#120	0.125	51.83	12.54	3	1.55
#170	0.090	8.94	4.51	1	0.09
#230	0.063	2.96	1.86	1	0.03

**Total Shell Content:** **6** %



COBBLES	GRAVEL		SAND			SILT OR CLAY
	COARSE	FINE	COARSE	MEDIUM	FINE	

Sample No.	Elev. Or Depth	Classification	% CO <sub>3</sub>	G <sub>s</sub>	Nat w%	LL	PL	PI	Project
♦ 1	-24	SAND, poorly-graded, mostly fine-grained quartz, few carbonate, grayish brown (SP)	6						Topsail Beach, Surf City & North Topsail
									Area
									Boring No. TB4-24
									Date 7/30/2003

**GRADATION CURVES**





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## VISUAL SHELL CONTENT

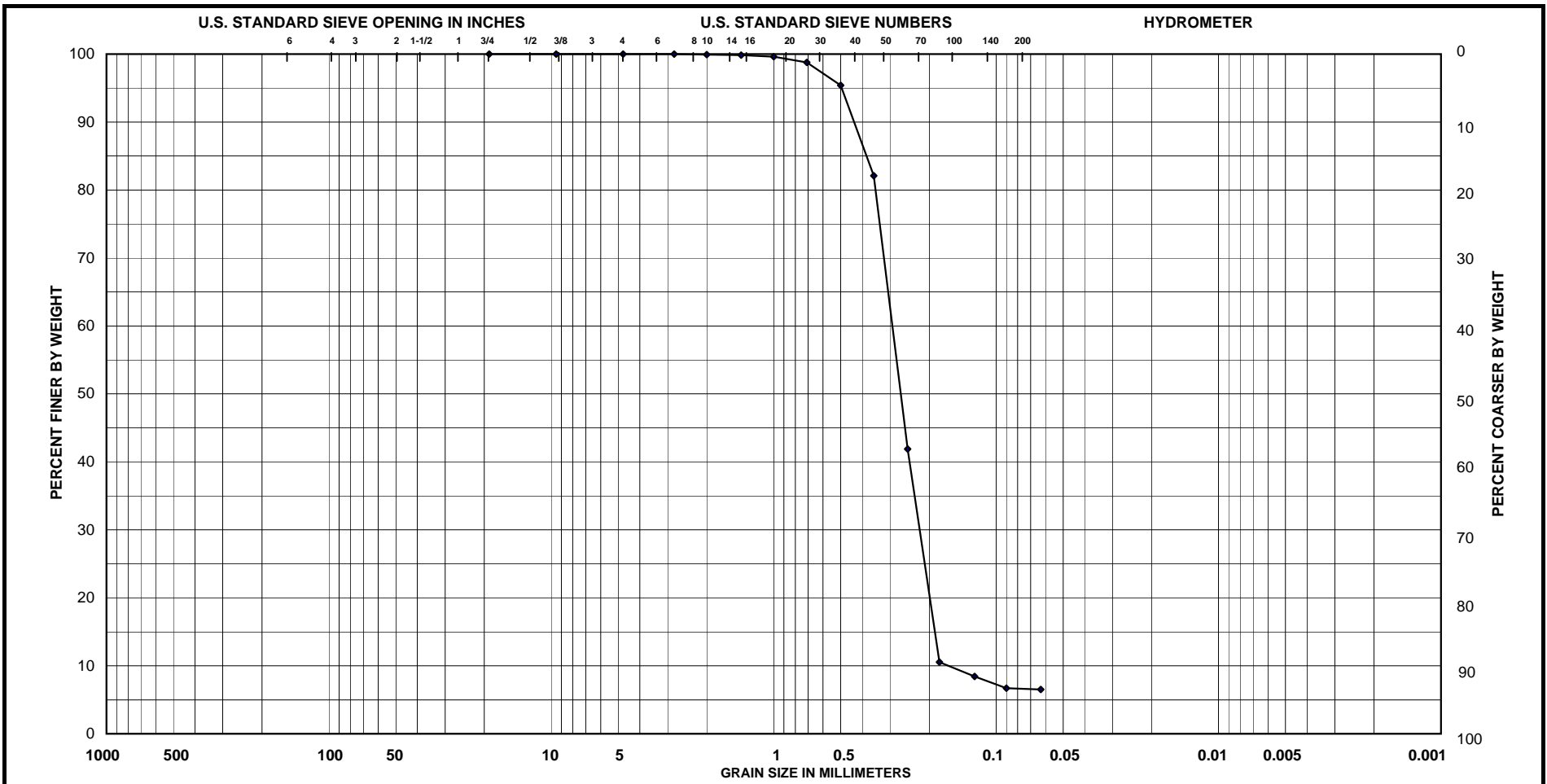
### GRAIN SIZE AND VISUAL SHELL CONTENT

Project:	<b>Topsail Beach, Surf City &amp; North Topsail</b>	Depth:	
Project No.:	<b>1584-01-40</b>	Date:	<b>7/30/2003</b>
Boring No.:	<b>TB5-TOE</b>		
Sample No.:	<b>1</b>		
Description:	<b>SAND, poorly-graded with silt, mostly fine-grained quartz, little carbonate, light gray (SP-SM)</b>		

Tare Weight, (g):	<b>49.97</b>	
Dry Wt. Before Washing (g):	<b>153.03</b>	(with tare)
Dry Weight After Washing (g):	<b>152.89</b>	(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	0.05	99.94	100	0.05
#14	1.400	0.08	99.86	100	0.08
#18	1.000	0.26	99.61	95	0.25
#25	0.710	0.88	98.76	75	0.66
#35	0.500	3.45	95.41	45	1.55
#45	0.355	13.72	82.10	20	2.74
#60	0.250	41.45	41.88	15	6.22
#80	0.180	32.28	10.56	10	3.23
#120	0.125	2.20	8.42	5	0.11
#170	0.090	1.76	6.71	3	0.05
#230	0.063	0.22	6.50	1	0.00

**Total Shell Content:** **15** %



COBBLES	GRAVEL		SAND			SILT OR CLAY
	COARSE	FINE	COARSE	MEDIUM	FINE	

Sample No.	Elev. Or Depth	Classification	% CO <sub>3</sub>	G <sub>s</sub>	Nat w%	LL	PL	PI	Project
1		SAND, poorly-graded with silt, mostly fine-grained quartz, little carbonate, light gray (SP-SM)	15						Topsail Beach, Surf City & North Topsail
									Area
									Boring No. TB5-TOE
									Date 7/30/2003

**GRADATION CURVES**



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## VISUAL SHELL CONTENT

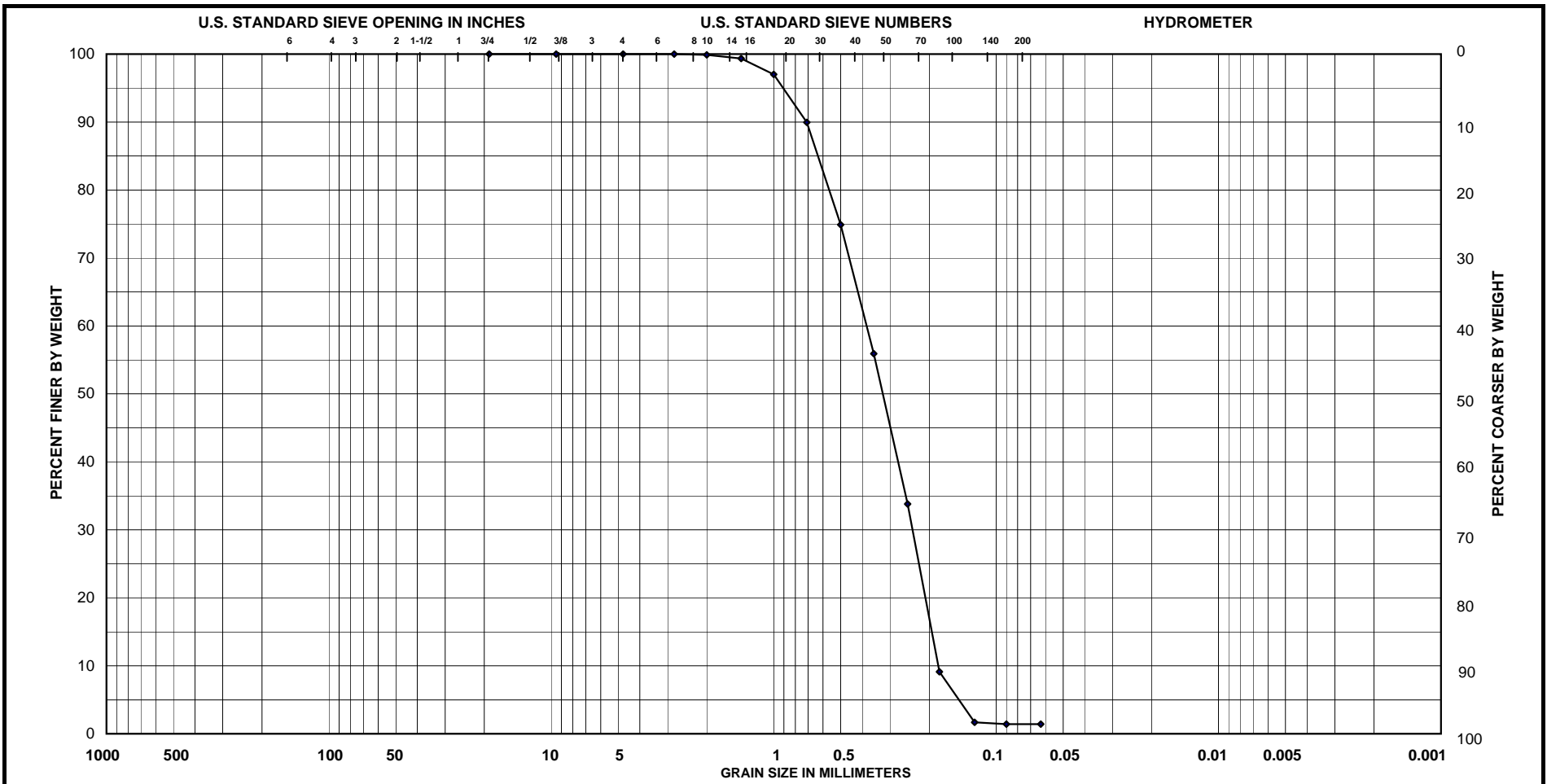
### GRAIN SIZE AND VISUAL SHELL CONTENT

Project:	<b>Topsail Beach, Surf City &amp; North Topsail</b>	Depth:	<b>+7</b>
Project No.:	<b>1584-01-40</b>	Date:	<b>7/30/2003</b>
Boring No.:	<b>TB5-CREST</b>		
Sample No.:	<b>1</b>		
Description:	<b>SAND, poorly-graded, mostly fine-grained quartz, little carbonate, light gray (SP)</b>		

Tare Weight, (g):	<b>50.23</b>	
Dry Wt. Before Washing (g):	<b>145.52</b>	(with tare)
Dry Weight After Washing (g):	<b>145.47</b>	(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	0.11	99.88	100	0.11
#14	1.400	0.52	99.34	100	0.52
#18	1.000	2.21	97.02	98	2.17
#25	0.710	6.74	89.95	80	5.39
#35	0.500	14.35	74.89	45	6.46
#45	0.355	18.06	55.93	30	5.42
#60	0.250	21.09	33.80	20	4.22
#80	0.180	23.51	9.13	5	1.18
#120	0.125	7.09	1.69	3	0.21
#170	0.090	0.26	1.42	1	0.00
#230	0.063	0.01	1.41	1	0.00

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



COBBLES	GRAVEL		SAND			SILT OR CLAY
	COARSE	FINE	COARSE	MEDIUM	FINE	

Sample No.	Elev. Or Depth	Classification	% CO <sub>3</sub>	G <sub>s</sub>	Nat w%	LL	PL	PI	Project
1	+7	SAND, poorly-graded, mostly fine-grained quartz, little carbonate, light gray (SP)	27						Topsail Beach, Surf City & North Topsail
									Area
									Boring No. TB5-CREST
									Date 7/30/2003

**GRADATION CURVES**



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Jacksonville, Florida 32246  
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## VISUAL SHELL CONTENT

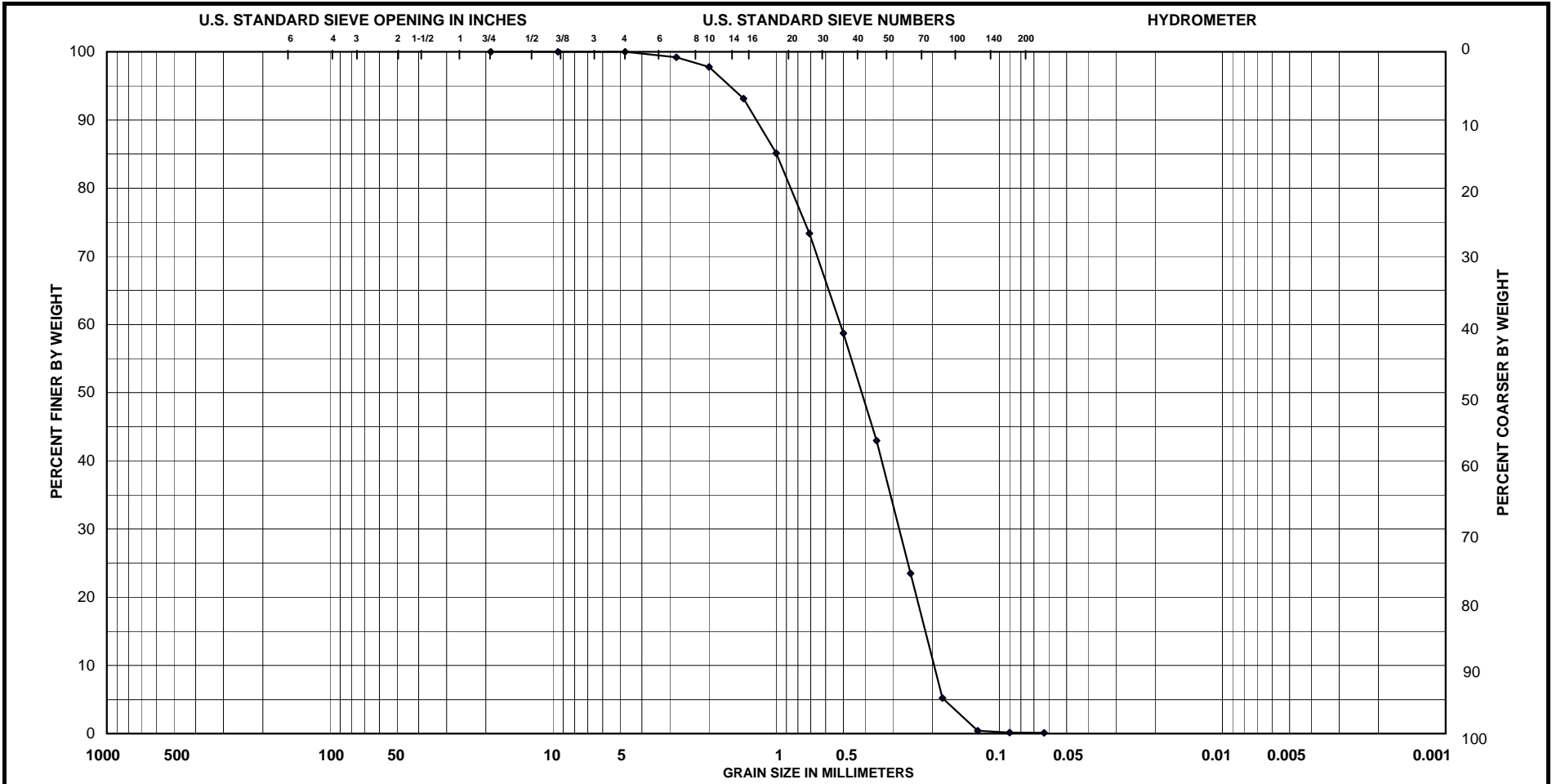
### GRAIN SIZE AND VISUAL SHELL CONTENT

Project:	<b>Topsail Beach, Surf City &amp; North Topsail</b>	Depth:	<b>+2.1</b>
Project No.:	<b>1584-01-40</b>	Date:	<b>7/30/2003</b>
Boring No.:	<b>TB5-MHW</b>		
Sample No.:	<b>1</b>		
Description:	<b>SAND, poorly-graded, mostly medium to fine-grained quartz, some carbonate, light gray (SP)</b>		

Tare Weight, (g):	<b>49.47</b>	
Dry Wt. Before Washing (g):	<b>154.64</b>	(with tare)
Dry Weight After Washing (g):	<b>154.45</b>	(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	0.85	99.19	100	0.85
#10	2.000	1.47	97.79	95	1.40
#14	1.400	4.88	93.15	80	3.90
#18	1.000	8.43	85.14	60	5.06
#25	0.710	12.37	73.38	60	7.42
#35	0.500	15.40	58.73	45	6.93
#45	0.355	16.60	42.95	25	4.15
#60	0.250	20.45	23.50	10	2.05
#80	0.180	19.24	5.21	5	0.96
#120	0.125	5.05	0.41	3	0.15
#170	0.090	0.28	0.14	1	0.00
#230	0.063	0.03	0.11	1	0.00

**Total Shell Content:** **31** %



COBBLES	GRAVEL		SAND			SILT OR CLAY
	COARSE	FINE	COARSE	MEDIUM	FINE	

Sample No.	Elev. Or Depth	Classification	% CO <sub>3</sub>	G <sub>s</sub>	Nat w%	LL	PL	PI	Project	
♦ 1	+2.1	SAND, poorly-graded, mostly medium to fine-grained quartz, some carbonate, light gray (SP)	31						Topsail Beach, Surf City & North Topsail	
									Area	
									Boring No. TB5-MHW	
									Date 7/30/2003	

**GRADATION CURVES**



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## VISUAL SHELL CONTENT

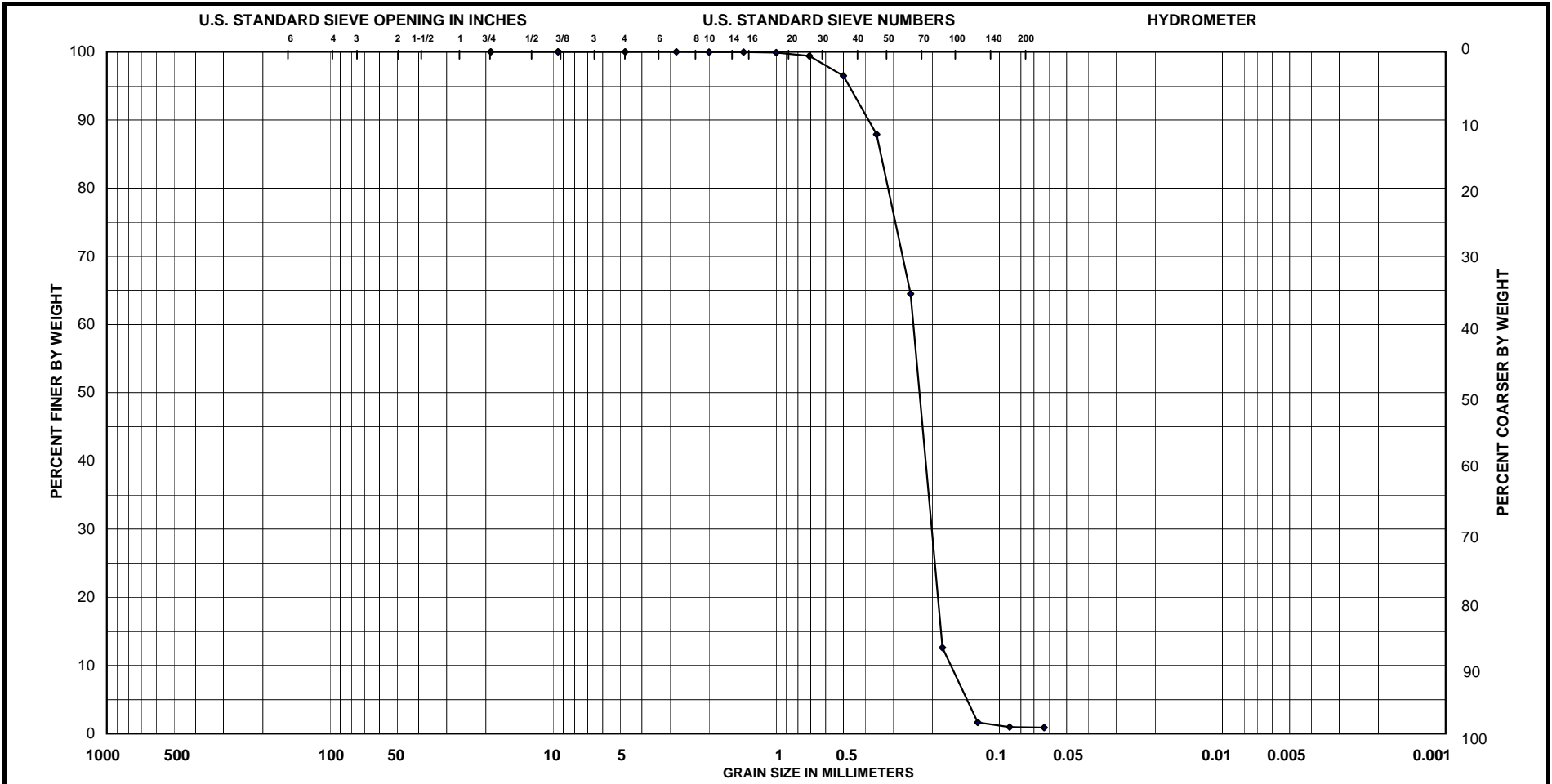
### GRAIN SIZE AND VISUAL SHELL CONTENT

Project:	<b>Topsail Beach, Surf City &amp; North Topsail</b>	Depth:	<b>0</b>
Project No.:	<b>1584-01-40</b>	Date:	<b>7/30/2003</b>
Boring No.:	<b>TB5-MSL</b>		
Sample No.:	<b>1</b>		
Description:	<b>SAND, poorly-graded, mostly fine-grained quartz, few carbonate, gray (SP)</b>		

Tare Weight, (g):	<b>49.75</b>	
Dry Wt. Before Washing (g):	<b>159.45</b>	(with tare)
Dry Weight After Washing (g):	<b>158.47</b>	(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	0.01	99.97	100	0.01
#14	1.400	0.02	99.95	100	0.02
#18	1.000	0.08	99.88	100	0.08
#25	0.710	0.55	99.38	95	0.52
#35	0.500	3.19	96.47	45	1.44
#45	0.355	9.42	87.89	35	3.30
#60	0.250	25.65	64.50	15	3.85
#80	0.180	56.92	12.62	5	2.85
#120	0.125	12.03	1.65	5	0.60
#170	0.090	0.75	0.97	3	0.02
#230	0.063	0.08	0.89	1	0.00

**Total Shell Content:** **12** %



COBBLES	GRAVEL		SAND			SILT OR CLAY
	COARSE	FINE	COARSE	MEDIUM	FINE	

Sample No.	Elev. Or Depth	Classification	% CO <sub>3</sub>	G <sub>s</sub>	Nat w%	LL	PL	PI	Project
♦ 1	+2.1	SAND, poorly-graded, mostly fine-grained quartz, few carbonate, gray (SP)	12						Topsail Beach, Surf City & North Topsail
									Area
									Boring No. TB5-MSL
									Date 7/30/2003

**GRADATION CURVES**





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## VISUAL SHELL CONTENT

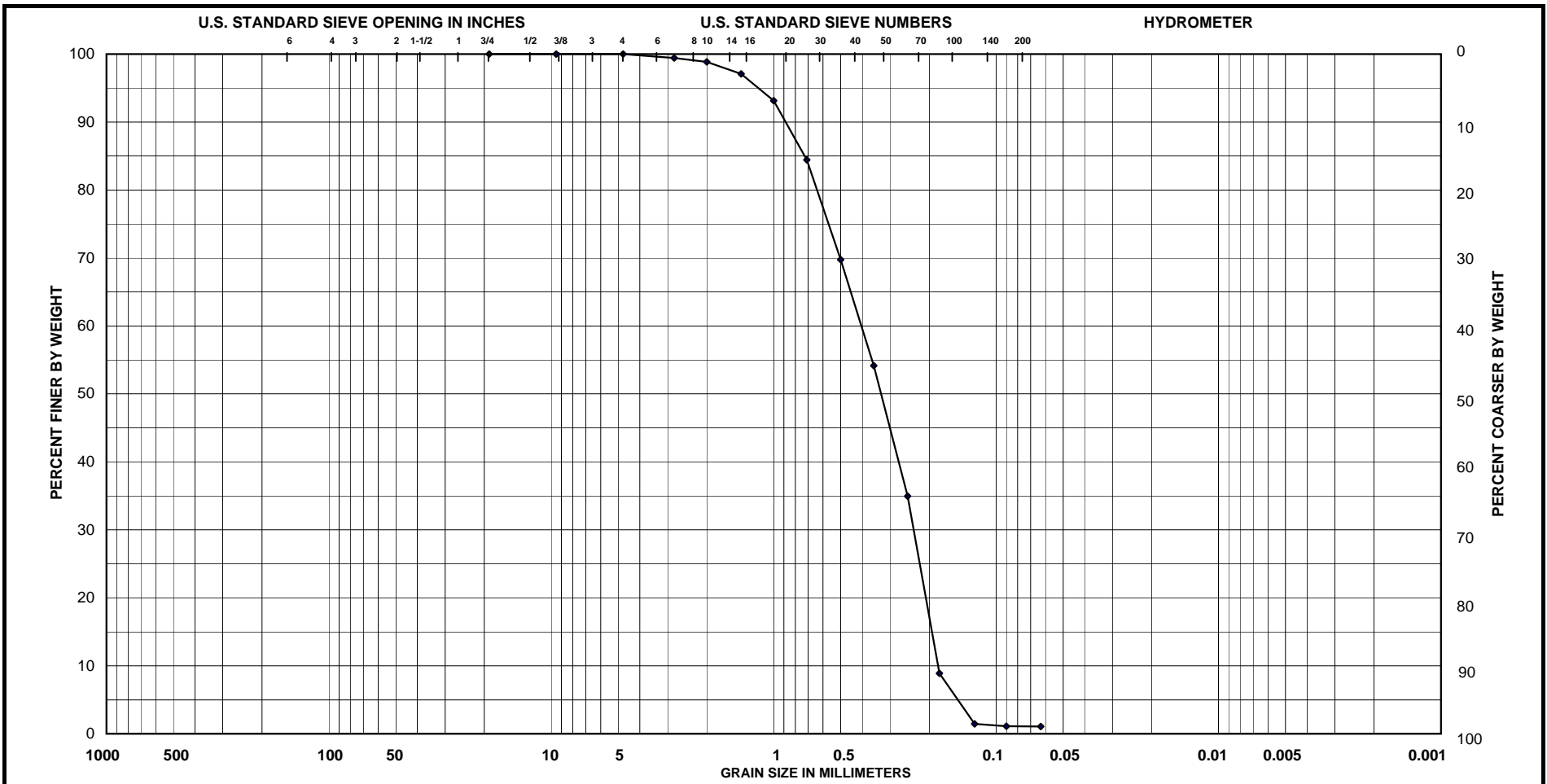
### GRAIN SIZE AND VISUAL SHELL CONTENT

Project:	<b>Topsail Beach, Surf City &amp; North Topsail</b>	Depth:	<b>-1.9</b>
Project No.:	<b>1584-01-40</b>	Date:	<b>7/30/2003</b>
Boring No.:	<b>TB5-MLW</b>		
Sample No.:	<b>1</b>		
Description:	<b>SAND, poorly-graded, mostly fine-grained quartz, little carbonate, grayish brown (SP)</b>		

Tare Weight, (g):	<b>50.08</b>	
Dry Wt. Before Washing (g):	<b>148.87</b>	(with tare)
Dry Weight After Washing (g):	<b>148.16</b>	(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	0.57	99.42	100	0.57
#10	2.000	0.58	98.84	100	0.58
#14	1.400	1.72	97.09	95	1.63
#18	1.000	3.89	93.16	75	2.92
#25	0.710	8.60	84.45	65	5.59
#35	0.500	14.53	69.74	45	6.54
#45	0.355	15.38	54.18	25	3.85
#60	0.250	18.97	34.97	15	2.85
#80	0.180	25.75	8.91	5	1.29
#120	0.125	7.38	1.44	3	0.22
#170	0.090	0.34	1.09	1	0.00
#230	0.063	0.02	1.07	1	0.00

**Total Shell Content:** **26** %



COBBLES	GRAVEL		SAND			SILT OR CLAY
	COARSE	FINE	COARSE	MEDIUM	FINE	

Sample No.	Elev. Or Depth	Classification	% CO <sub>3</sub>	G <sub>s</sub>	Nat w%	LL	PL	PI	Project
♦ 1	-1.9	SAND, poorly-graded, mostly fine-grained quartz, little carbonate, grayish brown (SP)	26						Topsail Beach, Surf City & North Topsail
									Area
									Boring No. TB5-MLW
									Date 7/30/2003

**GRADATION CURVES**



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## VISUAL SHELL CONTENT

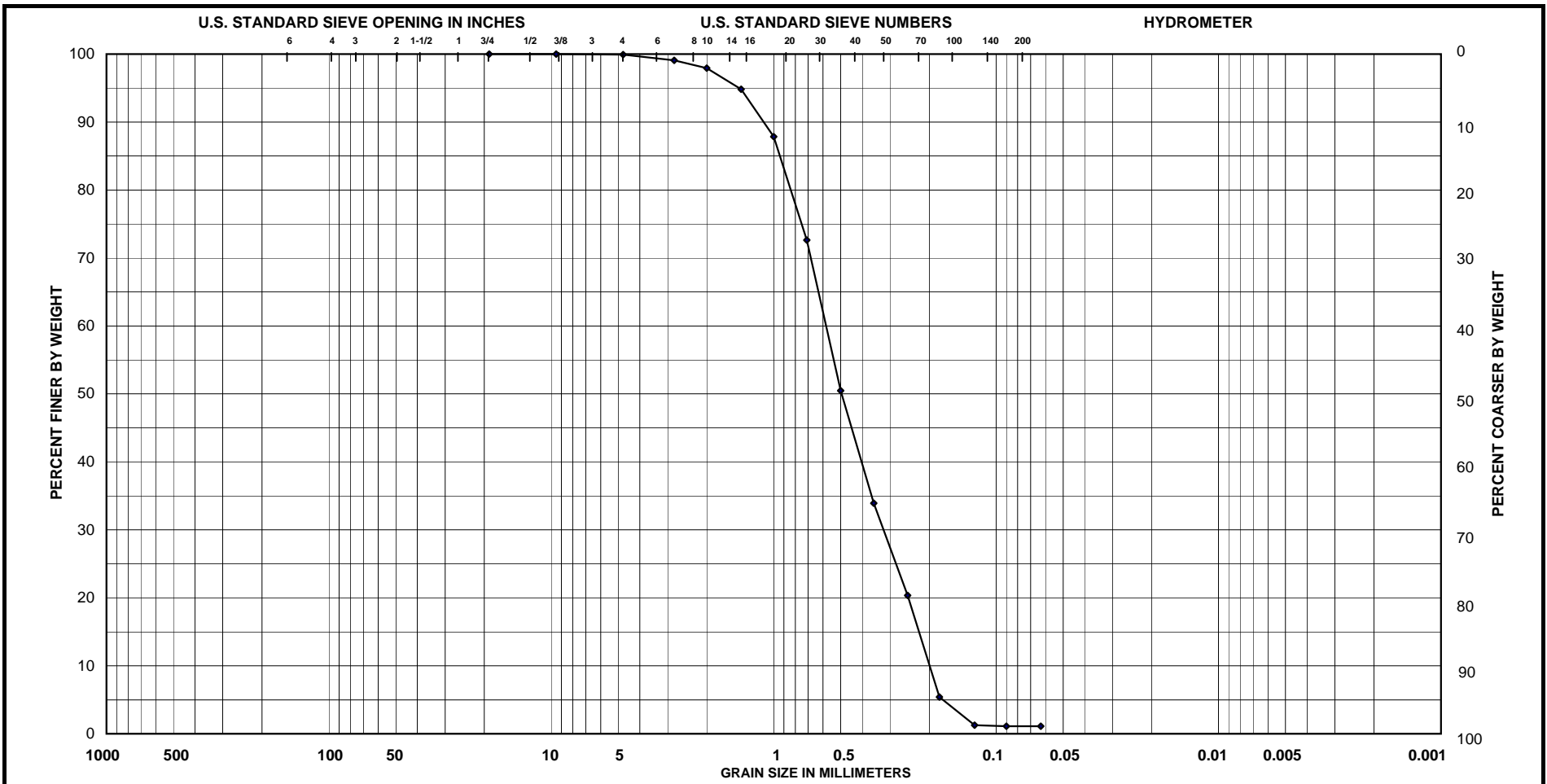
### GRAIN SIZE AND VISUAL SHELL CONTENT

Project:	<b>Topsail Beach, Surf City &amp; North Topsail</b>	Depth:	<b>-3</b>
Project No.:	<b>1584-01-40</b>	Date:	<b>7/30/2003</b>
Boring No.:	<b>TB5-3</b>		
Sample No.:	<b>1</b>		
Description:	<b>SAND, poorly-graded, mostly medium to fine-grained quartz, some carbonate, grayish brown (SP)</b>		

Tare Weight, (g):	<b>50.30</b>	
Dry Wt. Before Washing (g):	<b>178.19</b>	(with tare)
Dry Weight After Washing (g):	<b>177.36</b>	(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	0.12	99.91	100	0.12
#7	2.800	1.08	99.06	100	1.08
#10	2.000	1.47	97.91	100	1.47
#14	1.400	3.96	94.82	98	3.88
#18	1.000	8.92	87.84	80	7.14
#25	0.710	19.45	72.63	75	14.59
#35	0.500	28.32	50.49	60	16.99
#45	0.355	21.18	33.93	25	5.30
#60	0.250	17.34	20.37	15	2.60
#80	0.180	19.15	5.40	3	0.57
#120	0.125	5.30	1.25	3	0.16
#170	0.090	0.16	1.13	1	0.00
#230	0.063	0.02	1.11	1	0.00

**Total Shell Content:** **42** %



COBBLES	GRAVEL		SAND			SILT OR CLAY
	COARSE	FINE	COARSE	MEDIUM	FINE	

Sample No.	Elev. Or Depth	Classification	% CO <sub>3</sub>	G <sub>s</sub>	Nat w%	LL	PL	PI	Project	
1	-3	SAND, poorly-graded, mostly medium to fine-grained quartz, some carbonate, grayish brown (SP)	42						Topsail Beach, Surf City & North Topsail	
									Area	
									Boring No. TB5-3	
									Date 7/30/2003	

**GRADATION CURVES**



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## VISUAL SHELL CONTENT

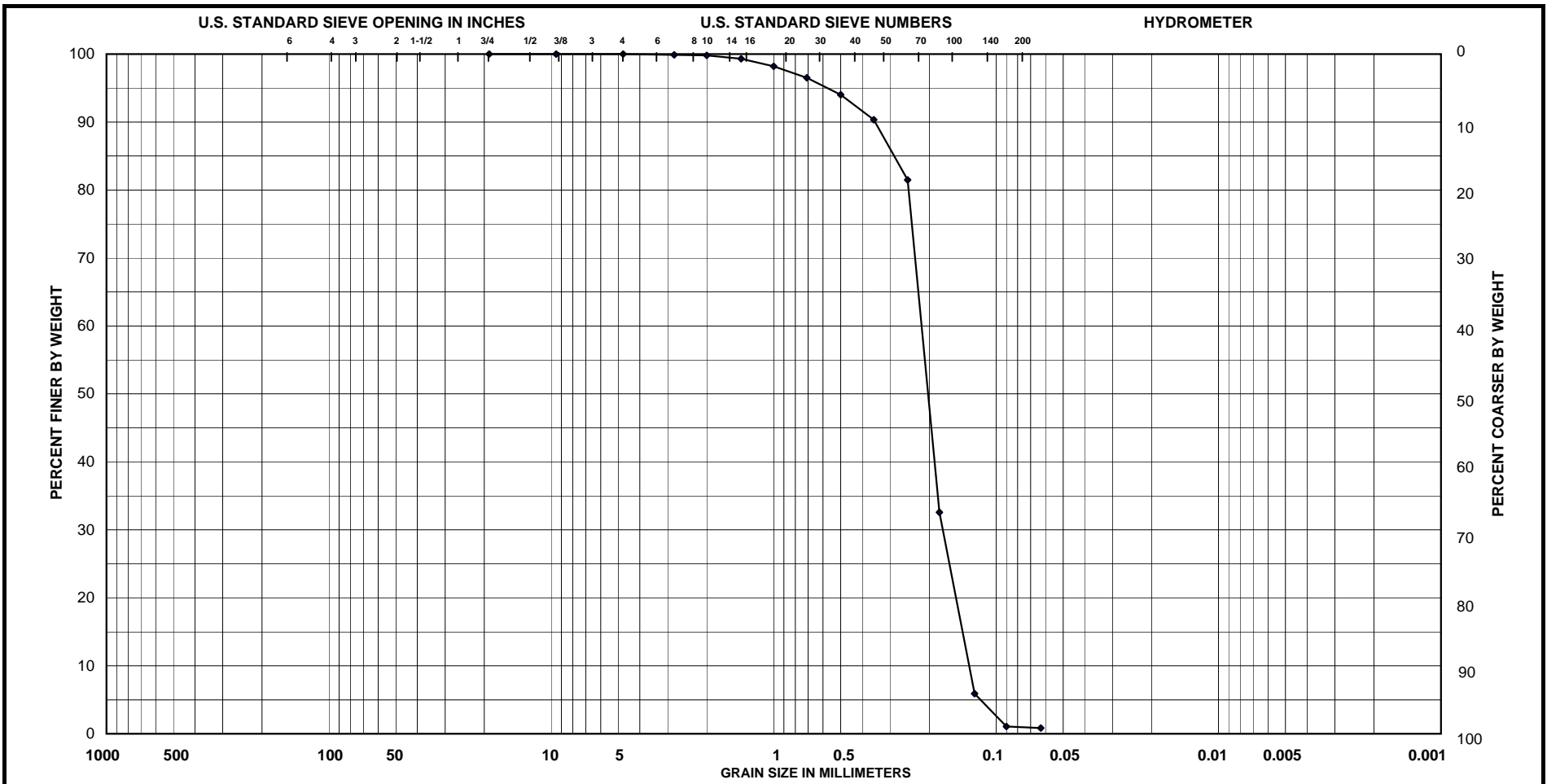
### GRAIN SIZE AND VISUAL SHELL CONTENT

Project:	<b>Topsail Beach, Surf City &amp; North Topsail</b>	Depth:	<b>-4</b>
Project No.:	<b>1584-01-40</b>	Date:	<b>7/30/2003</b>
Boring No.:	<b>TB5-4</b>		
Sample No.:	<b>1</b>		
Description:	<b>SAND, poorly-graded, mostly fine-grained quartz, few carbonate, gray (SP)</b>		

Tare Weight, (g):	<b>49.68</b>	
Dry Wt. Before Washing (g):	<b>143.28</b>	(with tare)
Dry Weight After Washing (g):	<b>142.52</b>	(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	0.09	99.90	100	0.09
#10	2.000	0.10	99.80	100	0.10
#14	1.400	0.47	99.29	98	0.46
#18	1.000	1.03	98.19	75	0.77
#25	0.710	1.58	96.51	70	1.11
#35	0.500	2.31	94.04	60	1.39
#45	0.355	3.47	90.33	40	1.39
#60	0.250	8.27	81.50	20	1.65
#80	0.180	45.80	32.56	5	2.29
#120	0.125	24.97	5.89	3	0.75
#170	0.090	4.52	1.06	1	0.05
#230	0.063	0.21	0.83	1	0.00

**Total Shell Content:** **11** %



COBBLES	GRAVEL		SAND			SILT OR CLAY
	COARSE	FINE	COARSE	MEDIUM	FINE	

Sample No.	Elev. Or Depth	Classification	% CO <sub>3</sub>	G <sub>s</sub>	Nat w%	LL	PL	PI	Project
1	-3	SAND, poorly-graded, mostly fine-grained quartz, few carbonate, gray (SP)	11						Topsail Beach, Surf City & North Topsail
									Area
									Boring No. TB5-4
									Date 7/30/2003

**GRADATION CURVES**



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## VISUAL SHELL CONTENT

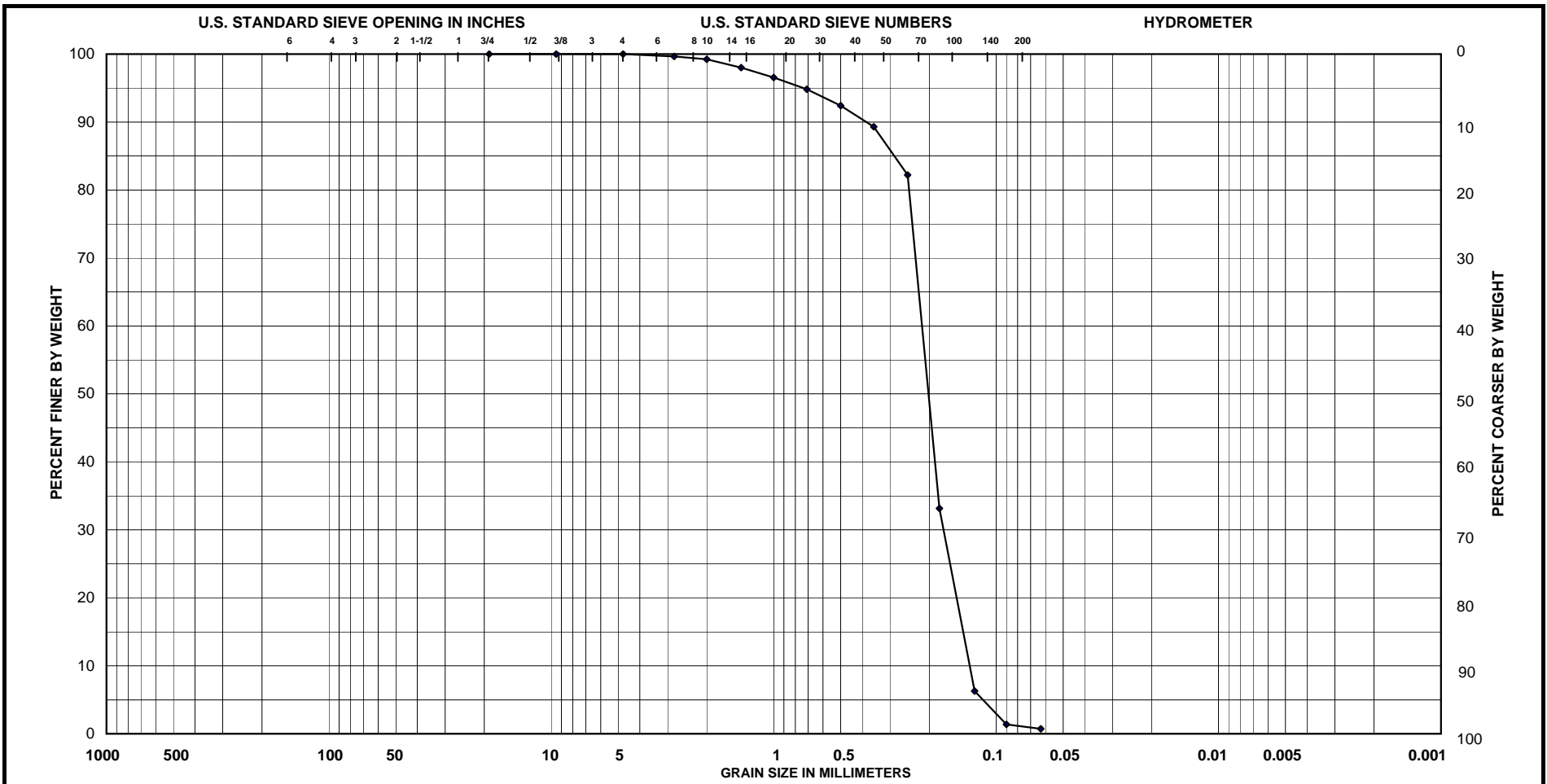
### GRAIN SIZE AND VISUAL SHELL CONTENT

Project:	<b>Topsail Beach, Surf City &amp; North Topsail</b>	Depth:	<b>-6</b>
Project No.:	<b>1584-01-40</b>	Date:	<b>7/30/2003</b>
Boring No.:	<b>TB5-6</b>		
Sample No.:	<b>1</b>		
Description:	<b>SAND, poorly-graded, mostly fine-grained quartz, few carbonate, gray (SP)</b>		

Tare Weight, (g):	<b>50.14</b>	
Dry Wt. Before Washing (g):	<b>144.14</b>	(with tare)
Dry Weight After Washing (g):	<b>143.47</b>	(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	0.31	99.67	100	0.31
#10	2.000	0.42	99.22	60	0.25
#14	1.400	1.13	98.02	40	0.45
#18	1.000	1.40	96.53	45	0.63
#25	0.710	1.62	94.81	40	0.65
#35	0.500	2.24	92.43	30	0.67
#45	0.355	2.94	89.30	25	0.74
#60	0.250	6.66	82.21	10	0.67
#80	0.180	46.13	33.14	5	2.31
#120	0.125	25.25	6.28	5	1.26
#170	0.090	4.60	1.38	3	0.14
#230	0.063	0.61	0.73	1	0.01

**Total Shell Content:** **9** %



COBBLES	GRAVEL		SAND			SILT OR CLAY
	COARSE	FINE	COARSE	MEDIUM	FINE	

Sample No.	Elev. Or Depth	Classification	% CO <sub>3</sub>	G <sub>s</sub>	Nat w%	LL	PL	PI	Project
♦ 1	-6	SAND, poorly-graded, mostly fine-grained quartz, few carbonate, gray (SP)	9						Topsail Beach, Surf City & North Topsail
									Area
									Boring No. TB5-6
									Date 7/30/2003

**GRADATION CURVES**





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## VISUAL SHELL CONTENT

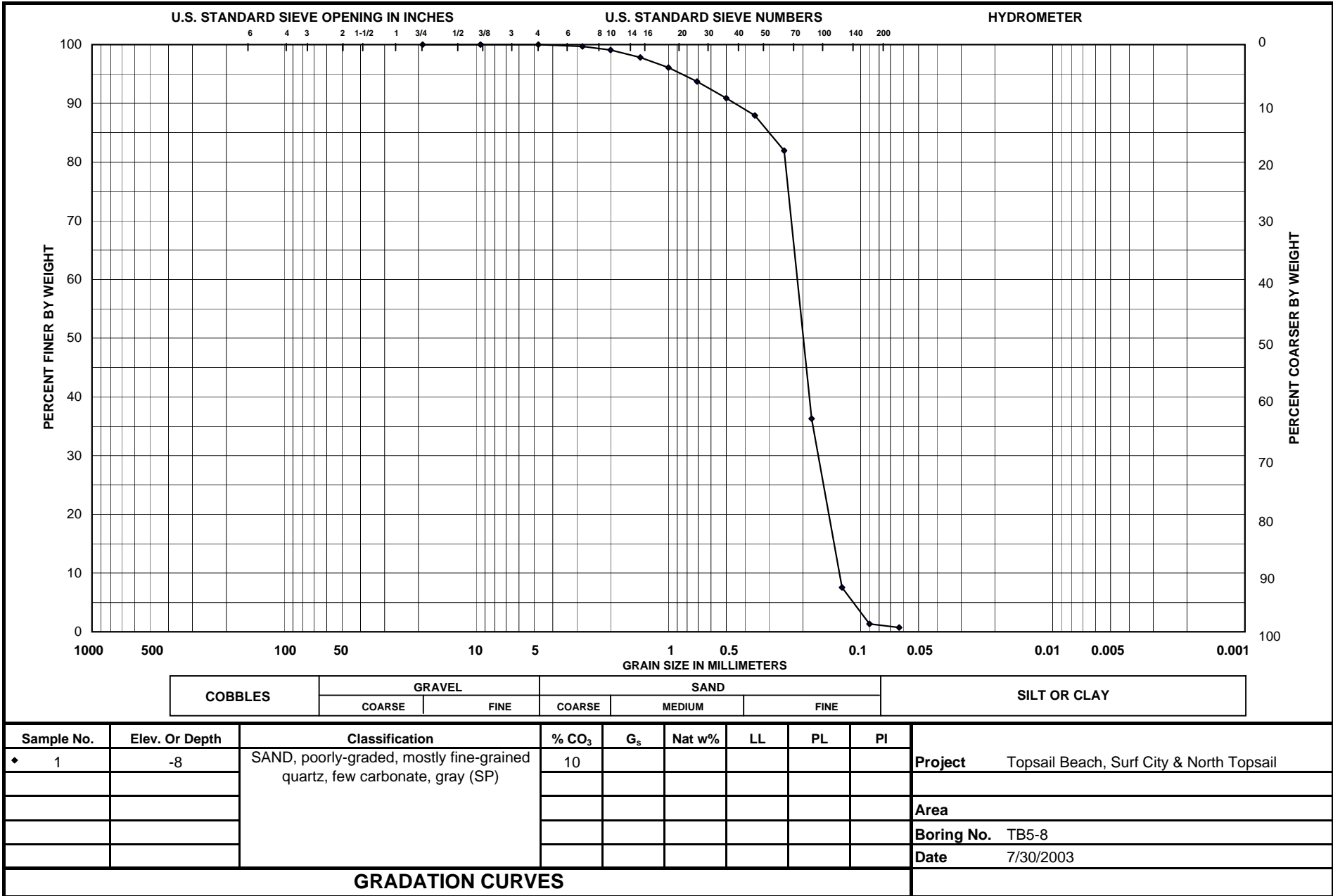
### GRAIN SIZE AND VISUAL SHELL CONTENT

Project:	<b>Topsail Beach, Surf City &amp; North Topsail</b>	Depth:	<b>-8</b>
Project No.:	<b>1584-01-40</b>	Date:	<b>7/30/2003</b>
Boring No.:	<b>TB5-8</b>		
Sample No.:	<b>1</b>		
Description:	<b>SAND, poorly-graded, mostly fine-grained quartz, few carbonate, gray (SP)</b>		

Tare Weight, (g):	<b>50.16</b>	
Dry Wt. Before Washing (g):	<b>140.03</b>	(with tare)
Dry Weight After Washing (g):	<b>135.31</b>	(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	0.27	99.70	100	0.27
#10	2.000	0.54	99.10	70	0.38
#14	1.400	1.15	97.82	75	0.86
#18	1.000	1.54	96.11	65	1.00
#25	0.710	2.16	93.70	50	1.08
#35	0.500	2.55	90.86	30	0.77
#45	0.355	2.65	87.92	25	0.66
#60	0.250	5.36	81.95	15	0.80
#80	0.180	41.02	36.31	5	2.05
#120	0.125	25.86	7.53	5	1.29
#170	0.090	5.56	1.35	3	0.17
#230	0.063	0.57	0.71	1	0.01

**Total Shell Content:** **10** %





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## VISUAL SHELL CONTENT

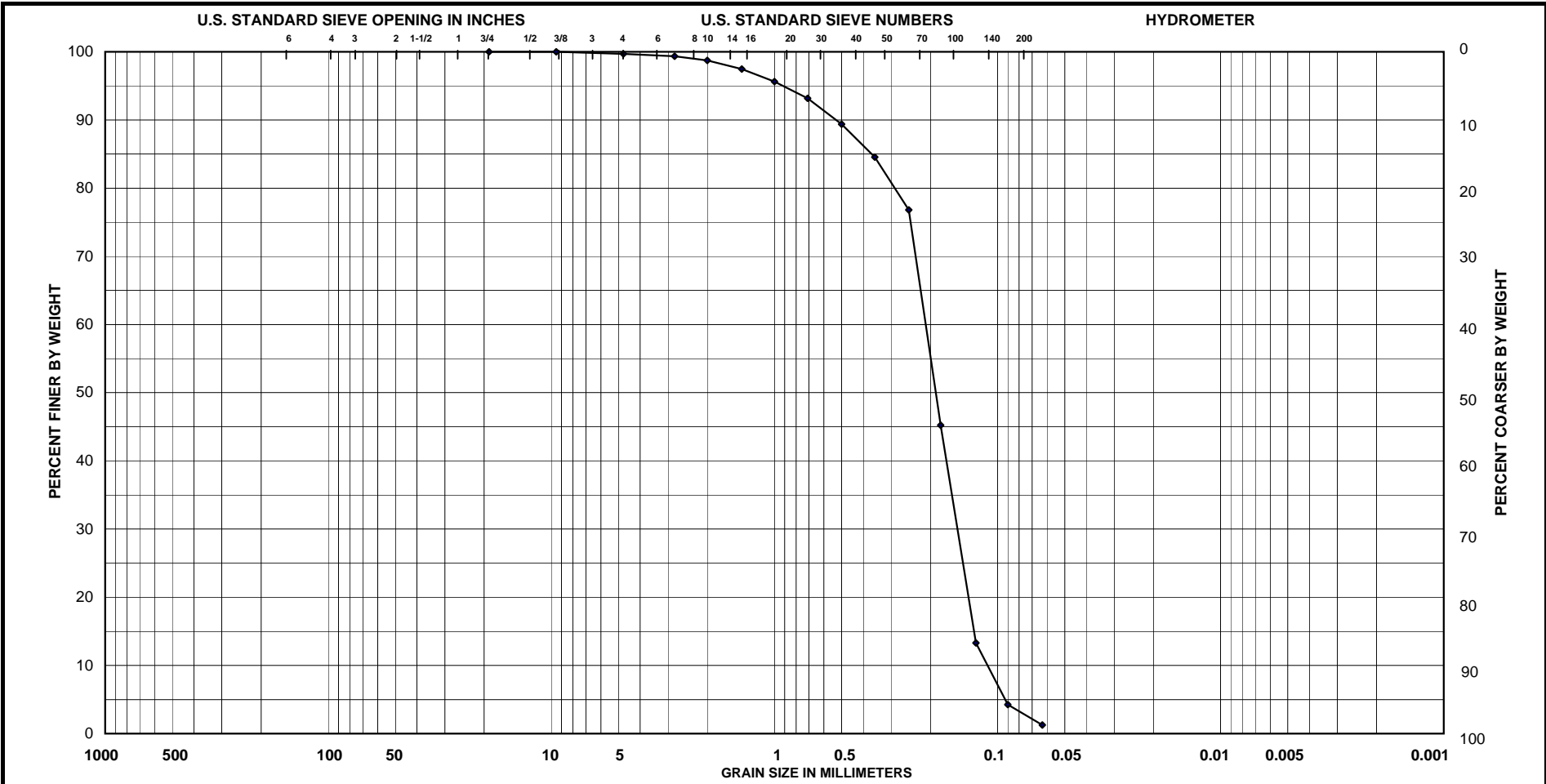
### GRAIN SIZE AND VISUAL SHELL CONTENT

Project:	<b>Topsail Beach, Surf City &amp; North Topsail</b>	Depth:	<b>-10</b>
Project No.:	<b>1584-01-40</b>	Date:	<b>7/30/2003</b>
Boring No.:	<b>TB5-10</b>		
Sample No.:	<b>1</b>		
Description:	<b>SAND, poorly-graded, mostly fine-grained quartz, little carbonate, gray (SP)</b>		

Tare Weight, (g):	<b>48.43</b>	
Dry Wt. Before Washing (g):	<b>152.62</b>	(with tare)
Dry Weight After Washing (g):	<b>151.69</b>	(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	0.31	99.70	100	0.31
#7	2.800	0.36	99.36	100	0.36
#10	2.000	0.64	98.74	100	0.64
#14	1.400	1.32	97.48	98	1.29
#18	1.000	1.94	95.61	95	1.84
#25	0.710	2.55	93.17	85	2.17
#35	0.500	3.93	89.39	65	2.55
#45	0.355	5.06	84.54	35	1.77
#60	0.250	8.06	76.80	10	0.81
#80	0.180	32.88	45.24	5	1.64
#120	0.125	33.30	13.28	5	1.67
#170	0.090	9.41	4.25	3	0.28
#230	0.063	3.11	1.27	1	0.03

**Total Shell Content:** **15** %



COBBLES	GRAVEL		SAND			SILT OR CLAY
	COARSE	FINE	COARSE	MEDIUM	FINE	

Sample No.	Elev. Or Depth	Classification	% CO <sub>3</sub>	G <sub>s</sub>	Nat w%	LL	PL	PI	Project	
♦ 1	-10	SAND, poorly-graded, mostly fine-grained quartz, little carbonate, gray (SP)	15						Topsail Beach, Surf City & North Topsail	
									Area	
									Boring No. TB5-10	
									Date 7/30/2003	

**GRADATION CURVES**



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## VISUAL SHELL CONTENT

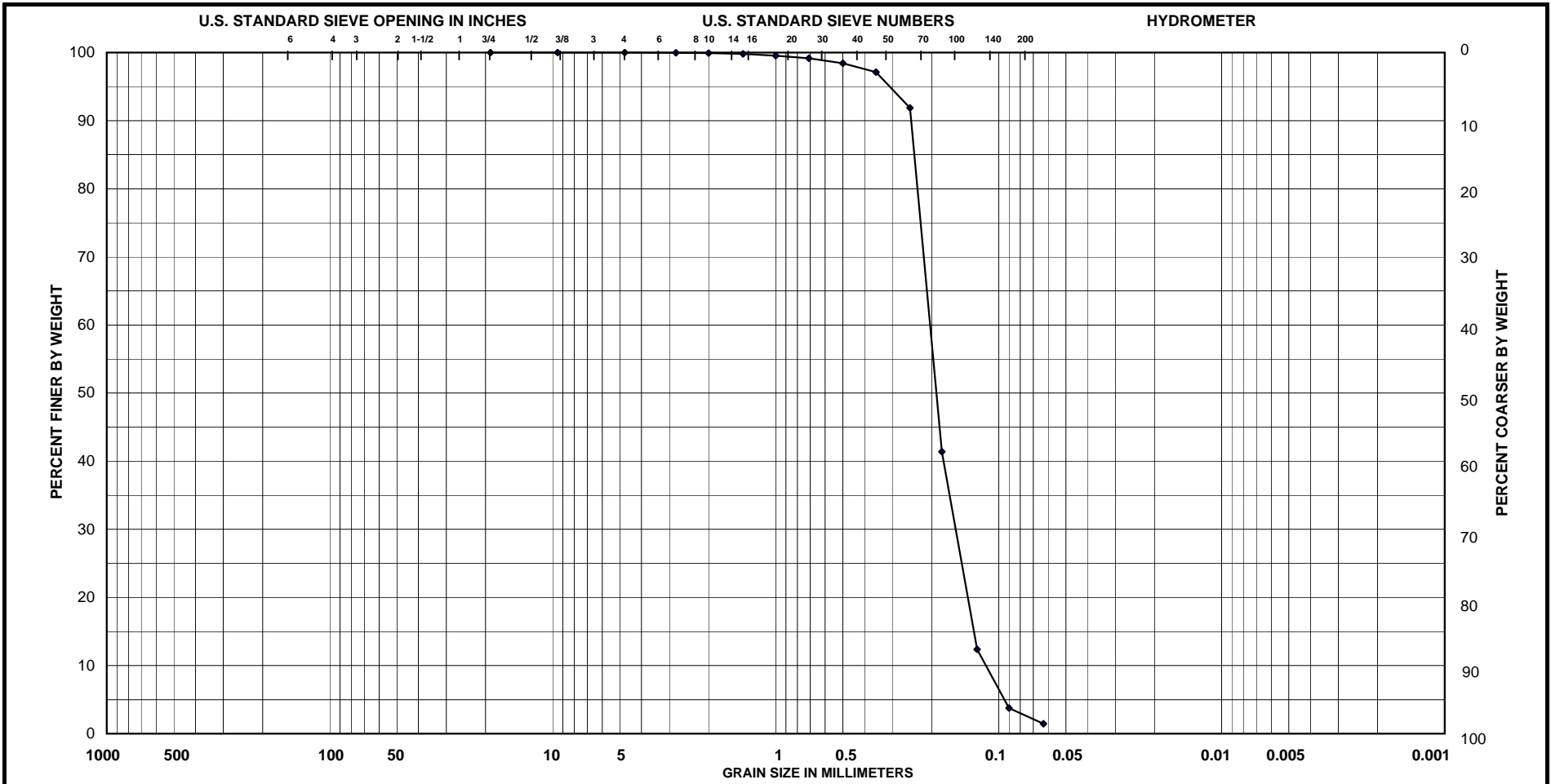
### GRAIN SIZE AND VISUAL SHELL CONTENT

Project:	<b>Topsail Beach, Surf City &amp; North Topsail</b>	Depth:	<b>-12</b>
Project No.:	<b>1584-01-40</b>	Date:	<b>7/30/2003</b>
Boring No.:	<b>TB5-12</b>		
Sample No.:	<b>1</b>		
Description:	<b>SAND, poorly-graded, mostly fine-grained quartz, few carbonate, gray (SP)</b>		

Tare Weight, (g):	<b>50.00</b>	
Dry Wt. Before Washing (g):	<b>150.13</b>	(with tare)
Dry Weight After Washing (g):	<b>148.96</b>	(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	0.04	99.96	100	0.04
#10	2.000	0.03	99.93	100	0.03
#14	1.400	0.12	99.81	100	0.12
#18	1.000	0.27	99.54	90	0.24
#25	0.710	0.40	99.14	65	0.26
#35	0.500	0.70	98.44	55	0.39
#45	0.355	1.31	97.13	40	0.52
#60	0.250	5.25	91.89	10	0.53
#80	0.180	50.58	41.38	5	2.53
#120	0.125	29.02	12.39	3	0.87
#170	0.090	8.63	3.78	1	0.09
#230	0.063	2.34	1.44	1	0.02

**Total Shell Content:** **6** %



COBBLES	GRAVEL		SAND			SILT OR CLAY
	COARSE	FINE	COARSE	MEDIUM	FINE	

Sample No.	Elev. Or Depth	Classification	% CO <sub>3</sub>	G <sub>s</sub>	Nat w%	LL	PL	PI	Project
1	-10	SAND, poorly-graded, mostly fine-grained quartz, few carbonate, gray (SP)	6						Topsail Beach, Surf City & North Topsail
									Area
									Boring No. TB5-12
									Date 7/30/2003

**GRADATION CURVES**



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## VISUAL SHELL CONTENT

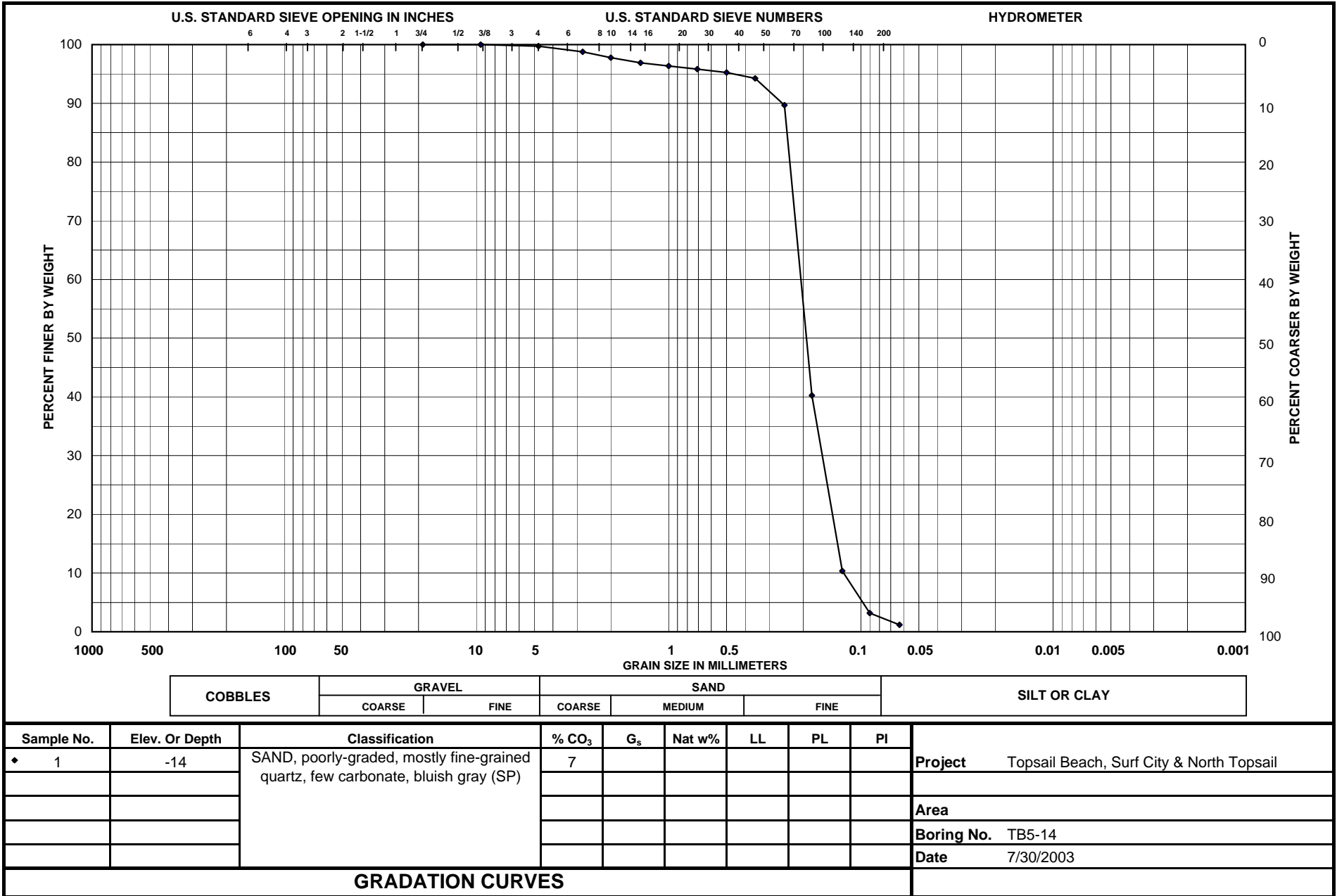
### GRAIN SIZE AND VISUAL SHELL CONTENT

Project:	<b>Topsail Beach, Surf City &amp; North Topsail</b>	Depth:	<b>-14</b>
Project No.:	<b>1584-01-40</b>	Date:	<b>7/30/2003</b>
Boring No.:	<b>TB5-14</b>		
Sample No.:	<b>1</b>		
Description:	<b>SAND, poorly-graded, mostly fine-grained quartz, few carbonate, bluish gray (SP)</b>		

Tare Weight, (g):	<b>49.74</b>	
Dry Wt. Before Washing (g):	<b>169.69</b>	(with tare)
Dry Weight After Washing (g):	<b>168.3</b>	(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	0.32	99.73	100	0.32
#7	2.800	1.17	98.76	75	0.88
#10	2.000	1.18	97.77	20	0.24
#14	1.400	1.07	96.88	40	0.43
#18	1.000	0.65	96.34	30	0.20
#25	0.710	0.60	95.84	40	0.24
#35	0.500	0.73	95.23	40	0.29
#45	0.355	1.19	94.24	30	0.36
#60	0.250	5.48	89.67	15	0.82
#80	0.180	59.29	40.24	5	2.96
#120	0.125	35.87	10.34	3	1.08
#170	0.090	8.57	3.19	1	0.09
#230	0.063	2.39	1.20	1	0.02

**Total Shell Content:** **7** %







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## VISUAL SHELL CONTENT

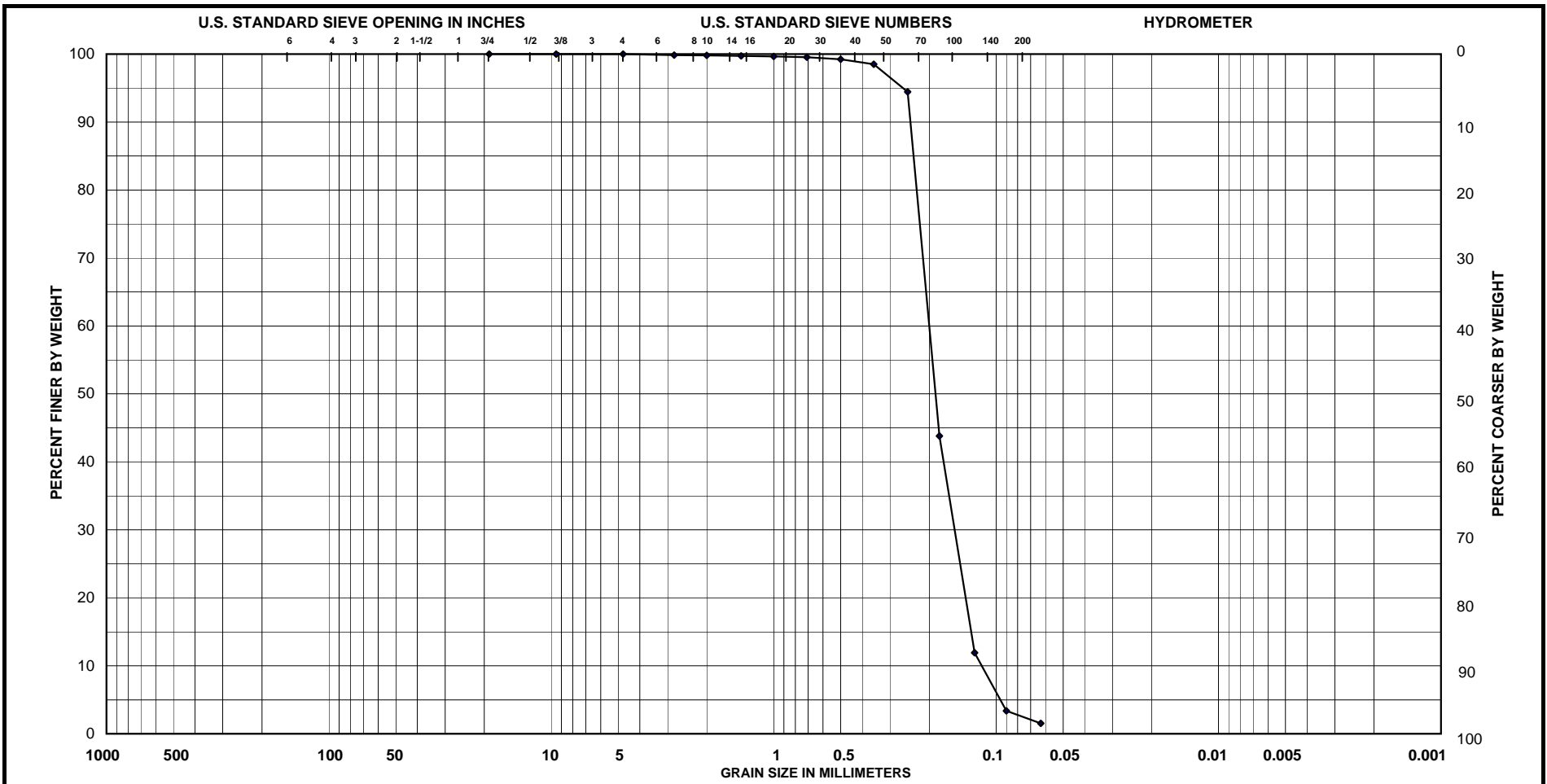
### GRAIN SIZE AND VISUAL SHELL CONTENT

Project:	<b>Topsail Beach, Surf City &amp; North Topsail</b>	Depth:	<b>-16</b>
Project No.:	<b>1584-01-40</b>	Date:	<b>7/30/2003</b>
Boring No.:	<b>TB5-16</b>		
Sample No.:	<b>1</b>		
Description:	<b>SAND, poorly-graded, mostly fine-grained quartz, few carbonate, bluish gray (SP)</b>		

Tare Weight, (g):	<b>49.88</b>	
Dry Wt. Before Washing (g):	<b>149.49</b>	(with tare)
Dry Weight After Washing (g):	<b>148.35</b>	(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	0.14	99.86	100	0.14
#10	2.000	0.04	99.82	100	0.04
#14	1.400	0.10	99.72	95	0.10
#18	1.000	0.05	99.67	95	0.05
#25	0.710	0.12	99.55	90	0.11
#35	0.500	0.30	99.25	90	0.27
#45	0.355	0.75	98.49	40	0.30
#60	0.250	4.02	94.46	20	0.80
#80	0.180	50.44	43.82	5	2.52
#120	0.125	31.79	11.91	3	0.95
#170	0.090	8.49	3.38	1	0.08
#230	0.063	1.86	1.52	1	0.02

**Total Shell Content:** **5** %



COBBLES	GRAVEL		SAND			SILT OR CLAY
	COARSE	FINE	COARSE	MEDIUM	FINE	

Sample No.	Elev. Or Depth	Classification	% CO <sub>3</sub>	G <sub>s</sub>	Nat w%	LL	PL	PI	Project	
♦ 1	-16	SAND, poorly-graded, mostly fine-grained quartz, few carbonate, bluish gray (SP)	5						Topsail Beach, Surf City & North Topsail	
									Area	
									Boring No. TB5-16	
									Date 7/30/2003	

**GRADATION CURVES**



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## VISUAL SHELL CONTENT

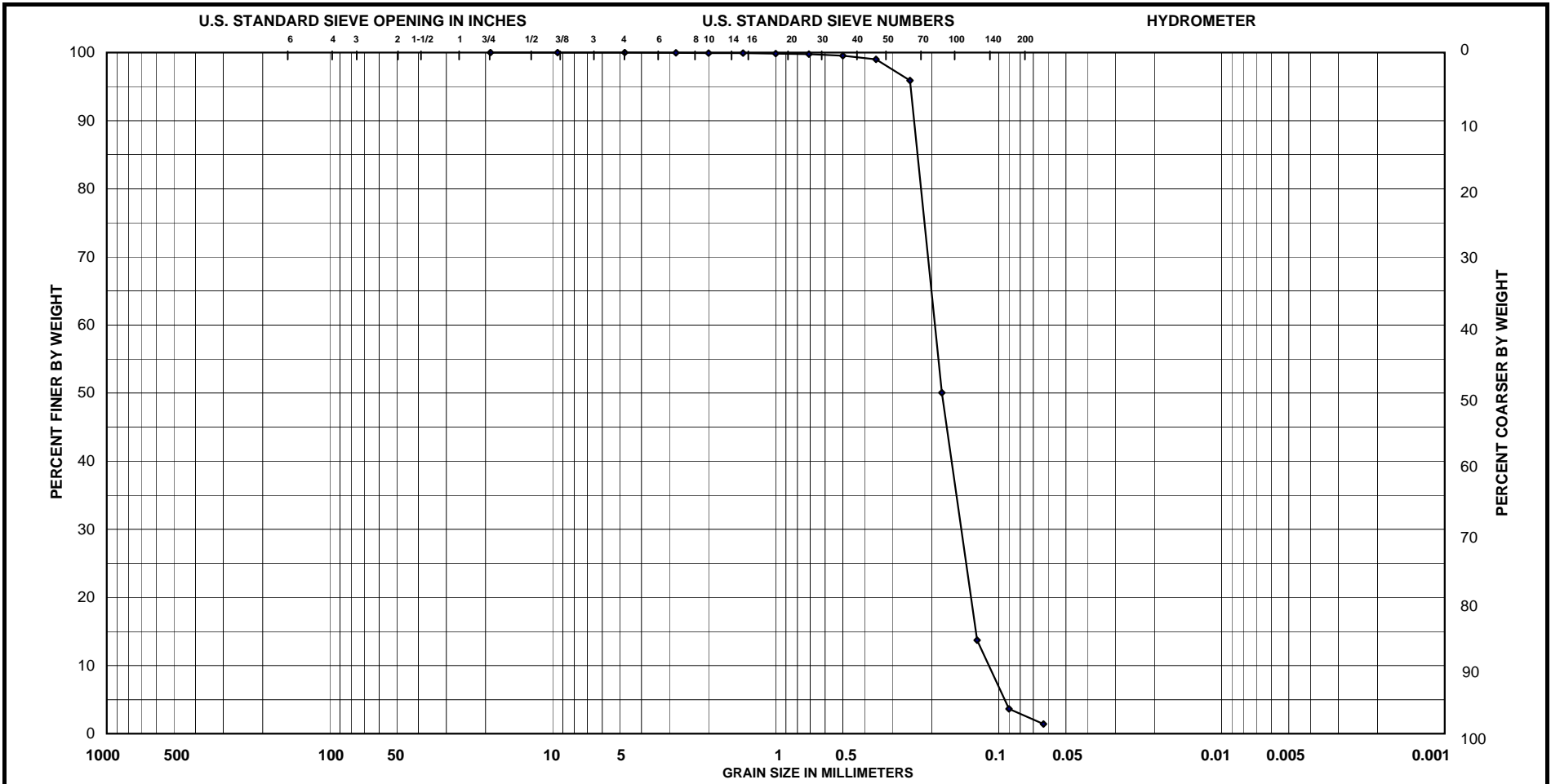
### GRAIN SIZE AND VISUAL SHELL CONTENT

Project:	<b>Topsail Beach, Surf City &amp; North Topsail</b>	Depth:	<b>-18</b>
Project No.:	<b>1584-01-40</b>	Date:	<b>7/30/2003</b>
Boring No.:	<b>TB5-18</b>		
Sample No.:	<b>1</b>		
Description:	<b>SAND, poorly-graded, mostly fine-grained quartz, trace carbonate, gray (SP)</b>		

Tare Weight, (g):	<b>50.16</b>	
Dry Wt. Before Washing (g):	<b>150.24</b>	(with tare)
Dry Weight After Washing (g):	<b>149.05</b>	(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	0.04	99.96	100	0.04
#10	2.000	0.02	99.94	100	0.02
#14	1.400	0.02	99.92	100	0.02
#18	1.000	0.06	99.86	100	0.06
#25	0.710	0.09	99.77	90	0.08
#35	0.500	0.24	99.53	85	0.20
#45	0.355	0.54	98.99	30	0.16
#60	0.250	3.09	95.90	15	0.46
#80	0.180	45.87	50.07	3	1.38
#120	0.125	36.38	13.72	3	1.09
#170	0.090	10.10	3.63	1	0.10
#230	0.063	2.22	1.41	1	0.02

**Total Shell Content:** **4** %



COBBLES	GRAVEL		SAND			SILT OR CLAY
	COARSE	FINE	COARSE	MEDIUM	FINE	

Sample No.	Elev. Or Depth	Classification	% CO <sub>3</sub>	G <sub>s</sub>	Nat w%	LL	PL	PI	Project
1	-16	SAND, poorly-graded, mostly fine-grained quartz, trace carbonate, gray (SP)	4						Topsail Beach, Surf City & North Topsail
									Area
									Boring No. TB5-18
									Date 7/30/2003

**GRADATION CURVES**



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## VISUAL SHELL CONTENT

### GRAIN SIZE AND VISUAL SHELL CONTENT

Project:	<b>Topsail Beach, Surf City &amp; North Topsail</b>	Depth:	<b>-20</b>
Project No.:	<b>1584-01-40</b>	Date:	<b>7/30/2003</b>
Boring No.:	<b>TB5-20</b>		
Sample No.:	<b>1</b>		
Description:	<b>SAND, poorly-graded, mostly fine-grained quartz, few carbonate, dark bluish gray (SP)</b>		

Tare Weight, (g):	<b>50.30</b>	
Dry Wt. Before Washing (g):	<b>184.72</b>	(with tare)
Dry Weight After Washing (g):	<b>182.52</b>	(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	99.99	100	0.02
#10	2.000	0.01	99.98	100	0.01
#14	1.400	0.04	99.95	100	0.04
#18	1.000	0.10	99.87	100	0.10
#25	0.710	0.10	99.80	95	0.10
#35	0.500	0.21	99.64	80	0.17
#45	0.355	0.48	99.29	40	0.19
#60	0.250	1.91	97.86	20	0.38
#80	0.180	60.10	53.15	10	6.01
#120	0.125	56.30	11.27	5	2.82
#170	0.090	9.88	3.92	3	0.30
#230	0.063	2.82	1.82	1	0.03

**Total Shell Content:** **8** %



COBBLES	GRAVEL		SAND			SILT OR CLAY
	COARSE	FINE	COARSE	MEDIUM	FINE	

Sample No.	Elev. Or Depth	Classification	% CO <sub>3</sub>	G <sub>s</sub>	Nat w%	LL	PL	PI	Project
1	-20	SAND, poorly-graded, mostly fine-grained quartz, few carbonate, dark bluish gray (SP)	8						Topsail Beach, Surf City & North Topsail
									Area
									Boring No. TB5-20
									Date 7/30/2003

**GRADATION CURVES**



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## VISUAL SHELL CONTENT

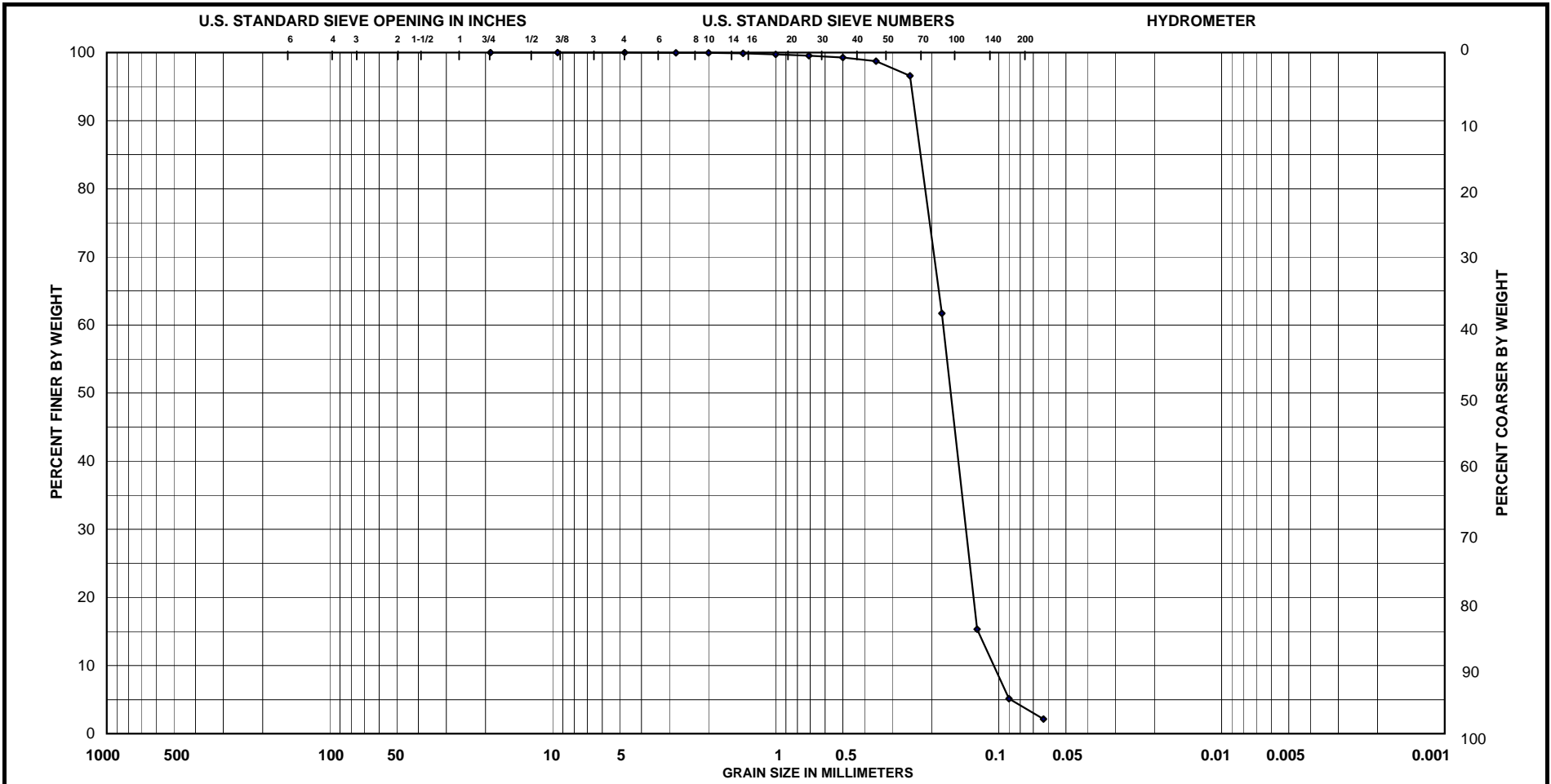
### GRAIN SIZE AND VISUAL SHELL CONTENT

Project:	<b>Topsail Beach, Surf City &amp; North Topsail</b>	Depth:	<b>-22</b>
Project No.:	<b>1584-01-40</b>	Date:	<b>7/30/2003</b>
Boring No.:	<b>TB5-22</b>		
Sample No.:	<b>1</b>		
Description:	<b>SAND, poorly-graded, mostly fine-grained quartz, trace carbonate, dark bluish gray (SP)</b>		

Tare Weight, (g):	<b>50.31</b>	
Dry Wt. Before Washing (g):	<b>158.4</b>	(with tare)
Dry Weight After Washing (g):	<b>156.42</b>	(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	0.04	99.96	100	0.04
#10	2.000	0.02	99.94	100	0.02
#14	1.400	0.05	99.90	100	0.05
#18	1.000	0.18	99.73	95	0.17
#25	0.710	0.20	99.55	98	0.20
#35	0.500	0.31	99.26	80	0.25
#45	0.355	0.56	98.74	40	0.22
#60	0.250	2.34	96.58	15	0.35
#80	0.180	37.69	61.71	5	1.88
#120	0.125	50.13	15.33	3	1.50
#170	0.090	11.03	5.13	1	0.11
#230	0.063	3.20	2.16	1	0.03

**Total Shell Content:** **4** %



COBBLES	GRAVEL		SAND			SILT OR CLAY
	COARSE	FINE	COARSE	MEDIUM	FINE	

Sample No.	Elev. Or Depth	Classification	% CO <sub>3</sub>	G <sub>s</sub>	Nat w%	LL	PL	PI	Project
1	-22	SAND, poorly-graded, mostly fine-grained quartz, trace carbonate, dark bluish gray (SP)	4						Topsail Beach, Surf City & North Topsail
									Area
									Boring No. TB5-22
									Date 7/30/2003

**GRADATION CURVES**





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## VISUAL SHELL CONTENT

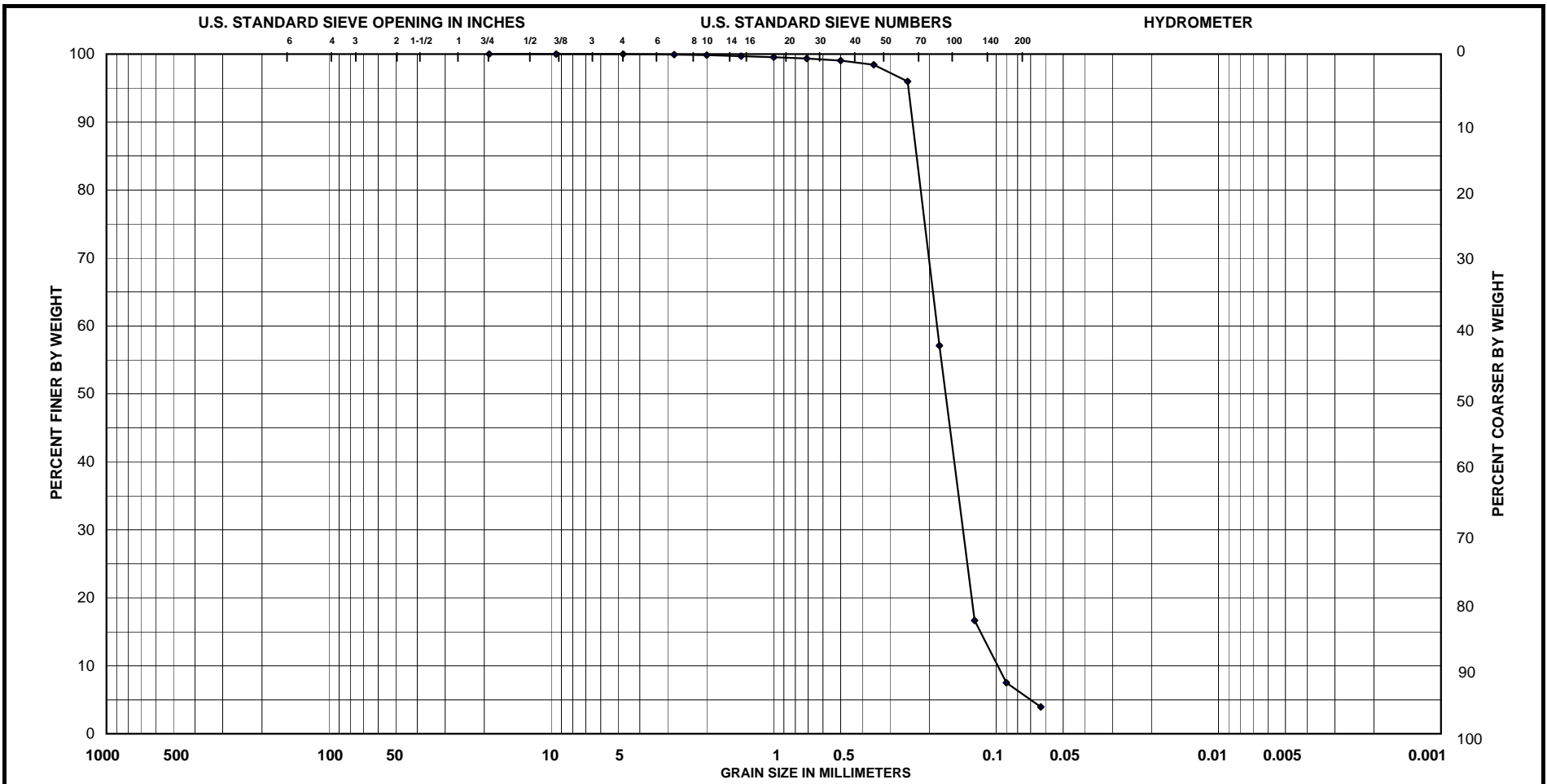
### GRAIN SIZE AND VISUAL SHELL CONTENT

Project:	<b>Topsail Beach, Surf City &amp; North Topsail</b>	Depth:	<b>-24</b>
Project No.:	<b>1584-01-40</b>	Date:	<b>7/30/2003</b>
Boring No.:	<b>TB5-24</b>		
Sample No.:	<b>1</b>		
Description:	<b>SAND, poorly-graded, mostly fine-grained quartz, few carbonate, dark bluish gray (SP)</b>		

Tare Weight, (g):	<b>50.05</b>	
Dry Wt. Before Washing (g):	<b>183.96</b>	(with tare)
Dry Weight After Washing (g):	<b>179.63</b>	(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	99.99	100	0.02
#7	2.800	0.08	99.93	100	0.08
#10	2.000	0.13	99.83	100	0.13
#14	1.400	0.17	99.70	100	0.17
#18	1.000	0.20	99.55	100	0.20
#25	0.710	0.27	99.35	98	0.26
#35	0.500	0.41	99.04	95	0.39
#45	0.355	0.82	98.43	50	0.41
#60	0.250	3.31	95.96	25	0.83
#80	0.180	52.00	57.13	5	2.60
#120	0.125	54.19	16.66	3	1.63
#170	0.090	12.25	7.51	1	0.12
#230	0.063	4.77	3.95	1	0.05

**Total Shell Content:** **5** %



COBBLES	GRAVEL		SAND			SILT OR CLAY
	COARSE	FINE	COARSE	MEDIUM	FINE	

Sample No.	Elev. Or Depth	Classification	% CO <sub>3</sub>	G <sub>s</sub>	Nat w%	LL	PL	PI	Project
1	-24	SAND, poorly-graded, mostly fine-grained quartz, few carbonate, dark bluish gray (SP)	5						Topsail Beach, Surf City & North Topsail
									Area
									Boring No. TB5-24
									Date 7/30/2003

**GRADATION CURVES**



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## VISUAL SHELL CONTENT

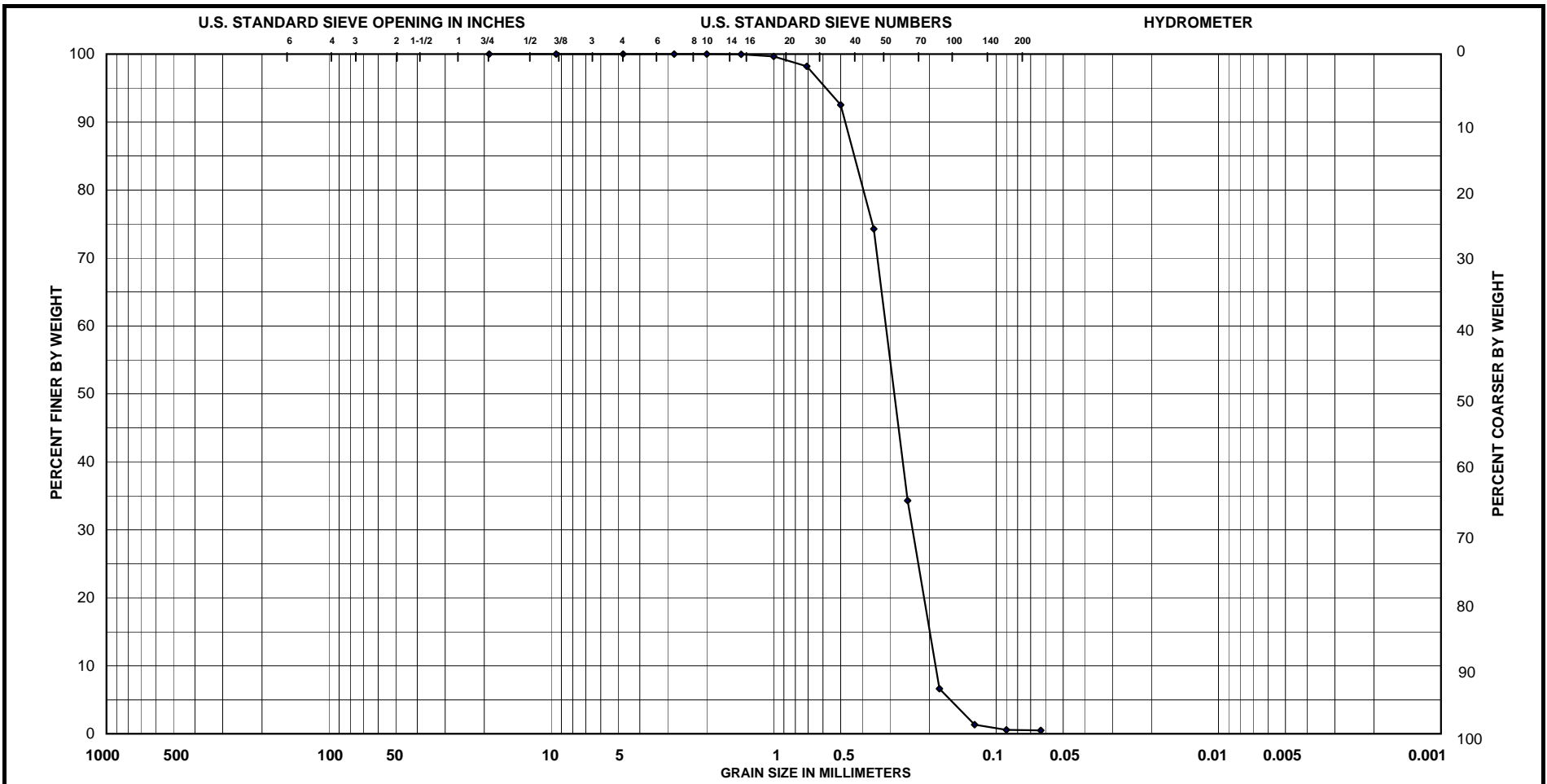
### GRAIN SIZE AND VISUAL SHELL CONTENT

Project:	<b>Topsail Beach, Surf City &amp; North Topsail</b>	Depth:	
Project No.:	<b>1584-01-40</b>	Date:	<b>7/30/2003</b>
Boring No.:	<b>TB6-TOE</b>		
Sample No.:	<b>1</b>		
Description:	<b>SAND, poorly-graded, mostly fine-grained quartz, little carbonate, light gray (SP)</b>		

Tare Weight, (g):	<b>50.56</b>	
Dry Wt. Before Washing (g):	<b>144.76</b>	(with tare)
Dry Weight After Washing (g):	<b>144.81</b>	(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	0.01	99.99	100	0.01
#14	1.400	0.03	99.96	100	0.03
#18	1.000	0.28	99.66	95	0.27
#25	0.710	1.38	98.20	75	1.04
#35	0.500	5.35	92.52	35	1.87
#45	0.355	17.19	74.27	25	4.30
#60	0.250	37.65	34.30	10	3.77
#80	0.180	26.05	6.65	5	1.30
#120	0.125	5.00	1.34	3	0.15
#170	0.090	0.71	0.58	1	0.01
#230	0.063	0.07	0.51	1	0.00

**Total Shell Content:** **14** %



COBBLES	GRAVEL		SAND			SILT OR CLAY
	COARSE	FINE	COARSE	MEDIUM	FINE	

Sample No.	Elev. Or Depth	Classification	% CO <sub>3</sub>	G <sub>s</sub>	Nat w%	LL	PL	PI	Project
1		SAND, poorly-graded, mostly fine-grained quartz, little carbonate, light gray (SP)	14						Topsail Beach, Surf City & North Topsail
									Area
									Boring No. TB6-TOE
									Date 7/30/2003

**GRADATION CURVES**



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## VISUAL SHELL CONTENT

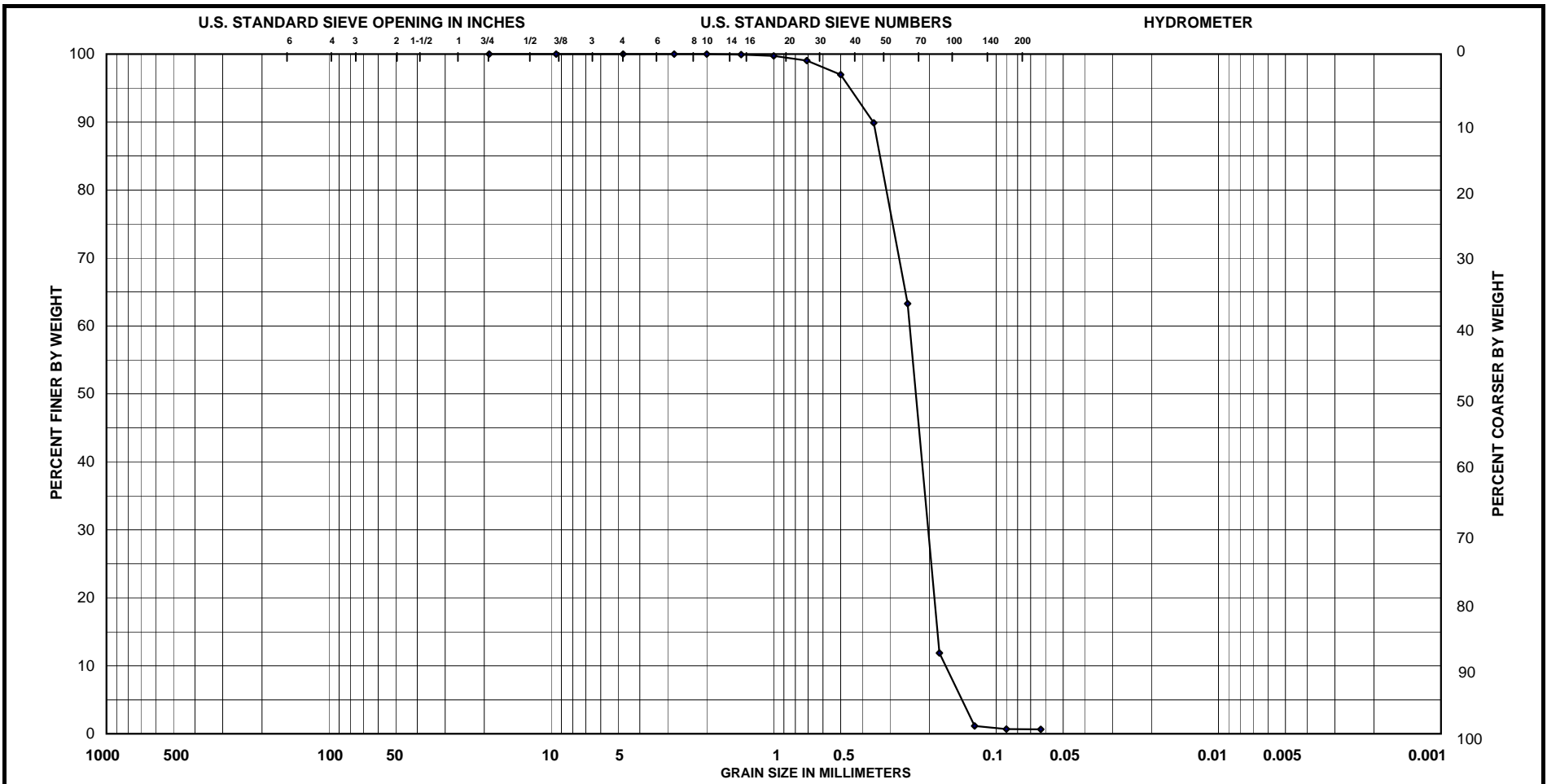
### GRAIN SIZE AND VISUAL SHELL CONTENT

<b>Project:</b>	<b>Topsail Beach, Surf City &amp; North Topsail</b>	<b>Depth:</b>	<b>+7</b>
<b>Project No.:</b>	<b>1584-01-40</b>	<b>Date:</b>	<b>7/30/2003</b>
<b>Boring No.:</b>	<b>TB6-CREST</b>		
<b>Sample No.:</b>	<b>1</b>		
<b>Description:</b>	<b>SAND, poorly-graded, mostly fine-grained quartz, few carbonate, light gray (SP)</b>		

Tare Weight, (g):	49.44	
Dry Wt. Before Washing (g):	147.02	(with tare)
Dry Weight After Washing (g):	146.83	(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	0.01	99.99	100	0.01
#14	1.400	0.08	99.91	100	0.08
#18	1.000	0.17	99.73	95	0.16
#25	0.710	0.68	99.04	60	0.41
#35	0.500	2.01	96.98	45	0.90
#45	0.355	6.93	89.87	30	2.08
#60	0.250	25.96	63.27	15	3.89
#80	0.180	50.14	11.89	5	2.51
#120	0.125	10.47	1.16	5	0.52
#170	0.090	0.45	0.70	3	0.01
#230	0.063	0.06	0.64	1	0.00

**Total Shell Content:** 11 %



COBBLES	GRAVEL		SAND			SILT OR CLAY
	COARSE	FINE	COARSE	MEDIUM	FINE	

Sample No.	Elev. Or Depth	Classification	% CO <sub>3</sub>	G <sub>s</sub>	Nat w%	LL	PL	PI	Project
♦ 1	+7	SAND, poorly-graded, mostly fine-grained quartz, few carbonate, light gray (SP)	11						Topsail Beach, Surf City & North Topsail
									Area
									Boring No. TB6-CREST
									Date 7/30/2003

**GRADATION CURVES**



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## VISUAL SHELL CONTENT

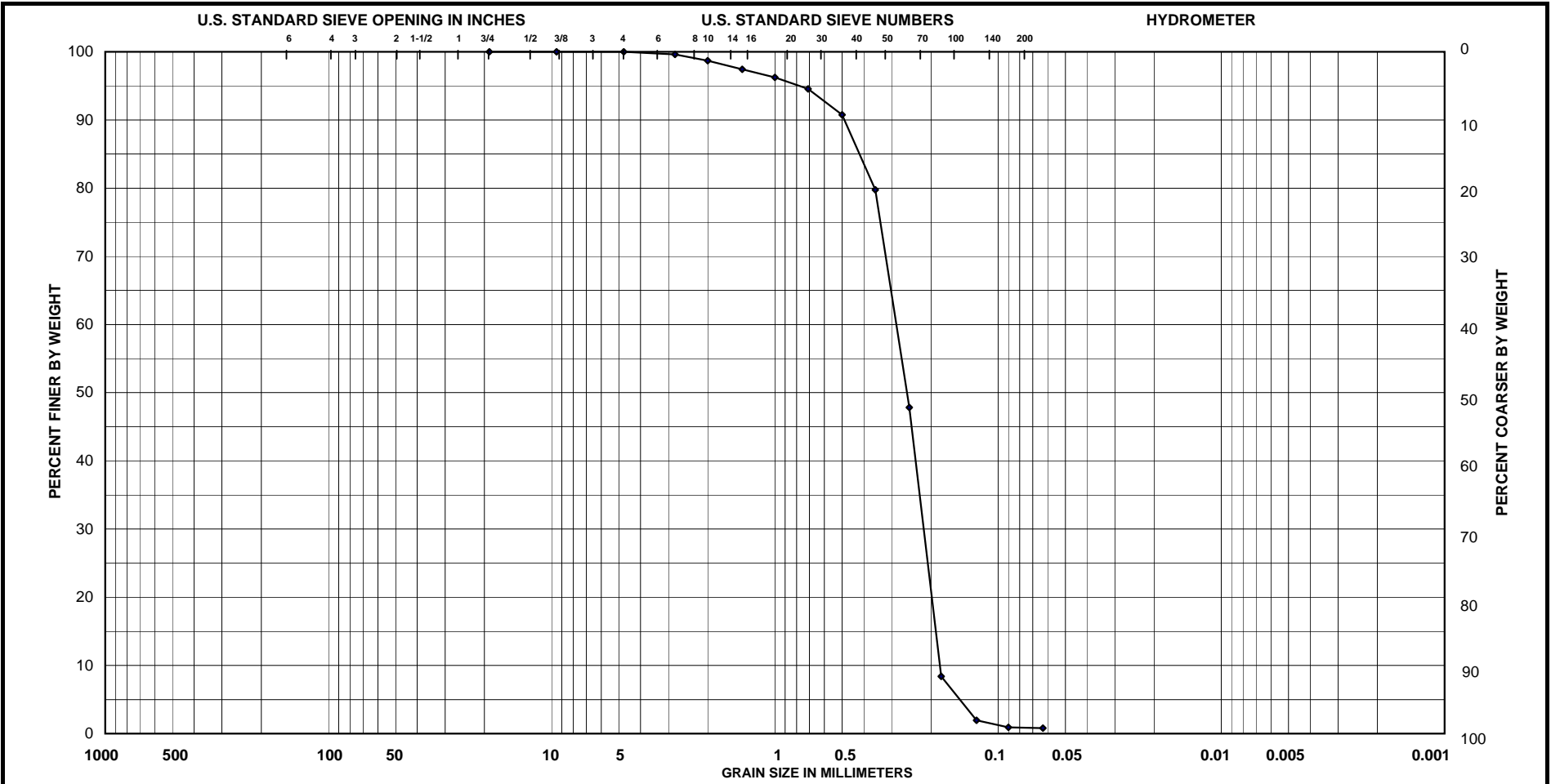
### GRAIN SIZE AND VISUAL SHELL CONTENT

Project:	<b>Topsail Beach, Surf City &amp; North Topsail</b>	Depth:	<b>+2.1</b>
Project No.:	<b>1584-01-40</b>	Date:	<b>7/30/2003</b>
Boring No.:	<b>TB6-MHW</b>		
Sample No.:	<b>1</b>		
Description:	<b>SAND, poorly-graded, mostly fine-grained quartz, little carbonate, light gray (SP)</b>		

Tare Weight, (g):	<b>50.56</b>	
Dry Wt. Before Washing (g):	<b>168.5</b>	(with tare)
Dry Weight After Washing (g):	<b>168.13</b>	(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	0.45	99.62	100	0.45
#10	2.000	1.09	98.69	85	0.93
#14	1.400	1.48	97.44	75	1.11
#18	1.000	1.43	96.23	60	0.86
#25	0.710	1.96	94.57	50	0.98
#35	0.500	4.49	90.76	45	2.02
#45	0.355	12.98	79.75	25	3.25
#60	0.250	37.64	47.84	10	3.76
#80	0.180	46.50	8.41	5	2.33
#120	0.125	7.61	1.96	3	0.23
#170	0.090	1.22	0.92	1	0.01
#230	0.063	0.14	0.81	1	0.00

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



COBBLES	GRAVEL		SAND			SILT OR CLAY
	COARSE	FINE	COARSE	MEDIUM	FINE	

Sample No.	Elev. Or Depth	Classification	% CO <sub>3</sub>	G <sub>s</sub>	Nat w%	LL	PL	PI	Project
♦ 1	+2.1	SAND, poorly-graded, mostly fine-grained quartz, little carbonate, light gray (SP)	13						Topsail Beach, Surf City & North Topsail
									Area
									Boring No. TB6-MHW
									Date 7/30/2003

**GRADATION CURVES**





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## VISUAL SHELL CONTENT

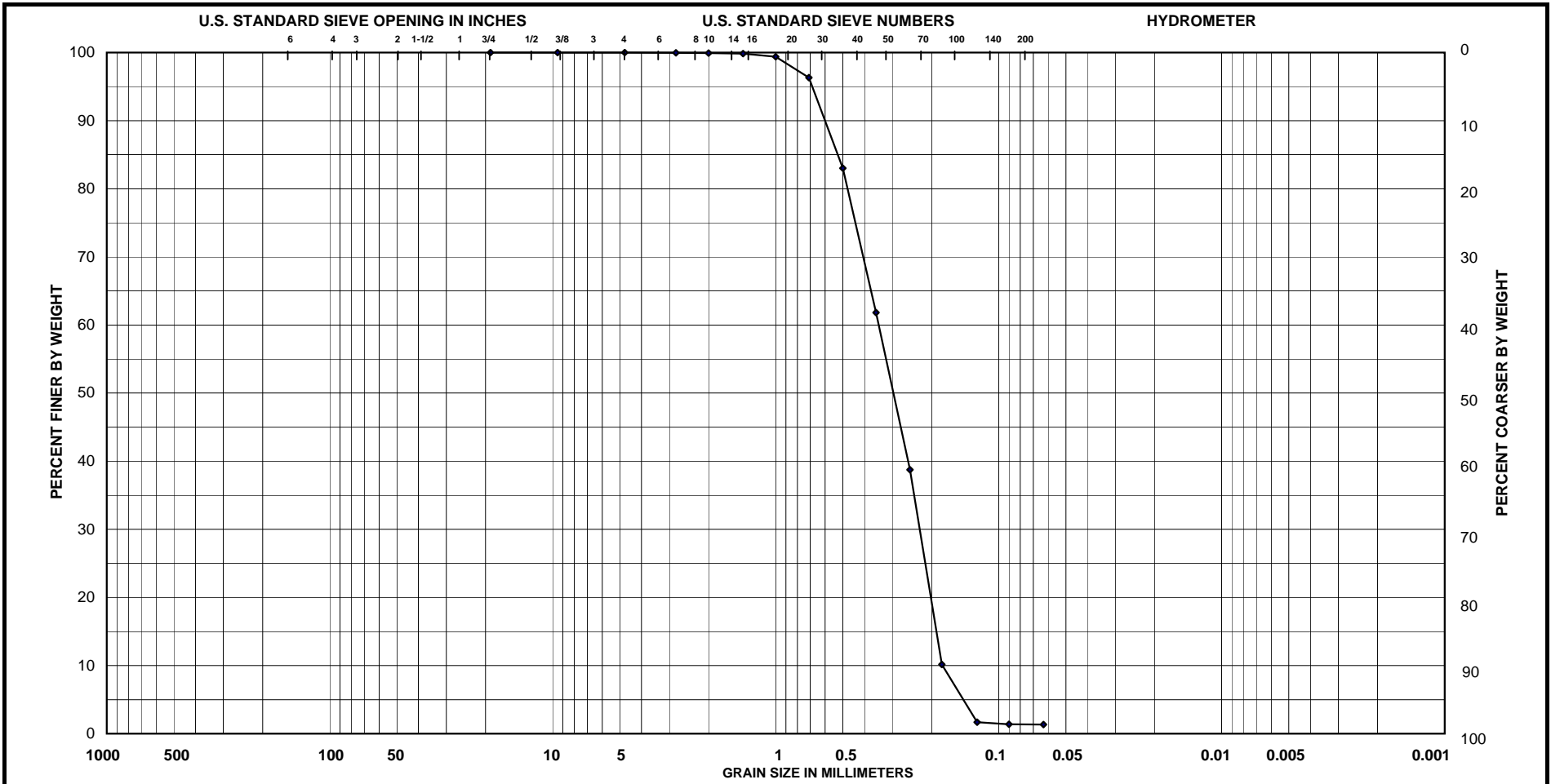
### GRAIN SIZE AND VISUAL SHELL CONTENT

Project:	<b>Topsail Beach, Surf City &amp; North Topsail</b>	Depth:	<b>0</b>
Project No.:	<b>1584-01-40</b>	Date:	<b>7/30/2003</b>
Boring No.:	<b>TB6-MSL</b>		
Sample No.:	<b>1</b>		
Description:	<b>SAND, poorly-graded, mostly fine-grained quartz, little carbonate, light brownish gray (SP)</b>		

Tare Weight, (g):	<b>49.39</b>	
Dry Wt. Before Washing (g):	<b>146.48</b>	(with tare)
Dry Weight After Washing (g):	<b>145.84</b>	(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	99.91	100	0.07
#14	1.400	0.05	99.86	100	0.05
#18	1.000	0.44	99.40	95	0.42
#25	0.710	3.00	96.31	65	1.95
#35	0.500	12.91	83.02	45	5.81
#45	0.355	20.58	61.82	30	6.17
#60	0.250	22.38	38.77	10	2.24
#80	0.180	27.79	10.15	3	0.83
#120	0.125	8.22	1.68	3	0.25
#170	0.090	0.30	1.37	1	0.00
#230	0.063	0.04	1.33	1	0.00

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



COBBLES	GRAVEL		SAND			SILT OR CLAY
	COARSE	FINE	COARSE	MEDIUM	FINE	

Sample No.	Elev. Or Depth	Classification	% CO <sub>3</sub>	G <sub>s</sub>	Nat w%	LL	PL	PI	Project
1	0	SAND, poorly-graded, mostly fine-grained quartz, little carbonate, light brownish gray (SP)	18						Topsail Beach, Surf City & North Topsail
									Area
									Boring No. TB6-MSL
									Date 7/30/2003

**GRADATION CURVES**



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## VISUAL SHELL CONTENT

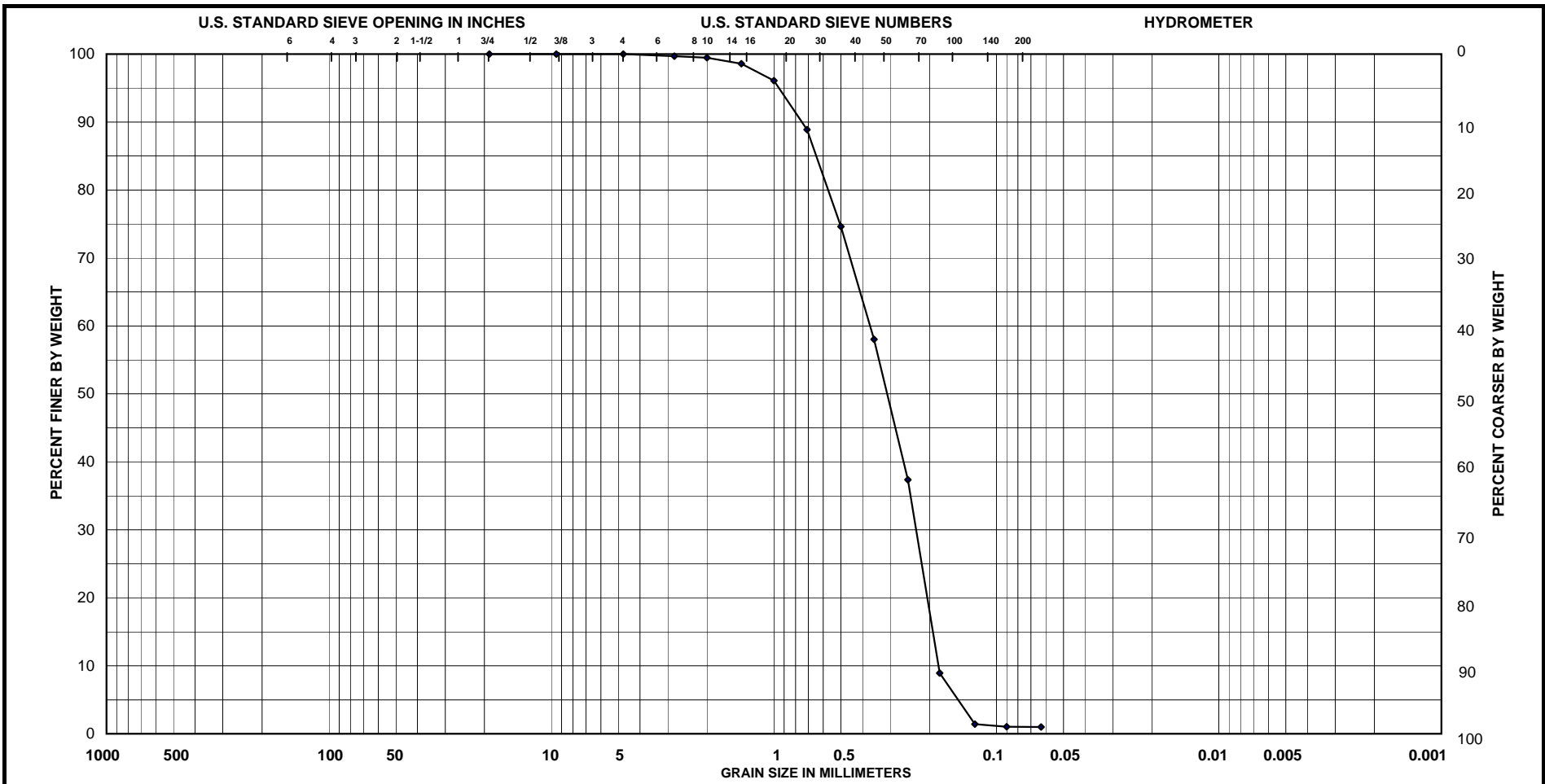
### GRAIN SIZE AND VISUAL SHELL CONTENT

Project:	<b>Topsail Beach, Surf City &amp; North Topsail</b>	Depth:	<b>-1.9</b>
Project No.:	<b>1584-01-40</b>	Date:	<b>7/30/2003</b>
Boring No.:	<b>TB6-MLW</b>		
Sample No.:	<b>1</b>		
Description:	<b>SAND, poorly-graded, mostly fine-grained quartz, some carbonate, brownish gray (SP)</b>		

Tare Weight, (g):	<b>50.41</b>	
Dry Wt. Before Washing (g):	<b>155.84</b>	(with tare)
Dry Weight After Washing (g):	<b>155.06</b>	(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	0.33	99.69	100	0.33
#10	2.000	0.25	99.45	95	0.24
#14	1.400	0.92	98.58	95	0.87
#18	1.000	2.62	96.09	80	2.10
#25	0.710	7.60	88.88	65	4.94
#35	0.500	15.04	74.62	50	7.52
#45	0.355	17.48	58.04	25	4.37
#60	0.250	21.77	37.39	10	2.18
#80	0.180	30.02	8.92	5	1.50
#120	0.125	7.89	1.43	3	0.24
#170	0.090	0.42	1.03	1	0.00
#230	0.063	0.03	1.01	1	0.00

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



COBBLES	GRAVEL		SAND			SILT OR CLAY
	COARSE	FINE	COARSE	MEDIUM	FINE	

Sample No.	Elev. Or Depth	Classification	% CO <sub>3</sub>	G <sub>s</sub>	Nat w%	LL	PL	PI								
1	-1.9	SAND, poorly-graded, mostly fine-grained quartz, some carbonate, brownish gray (SP)	23													
<table border="0" style="width:100%; border:none;"> <tr> <td style="border:none; width:50%;"></td> <td style="border:none; width:50%;"><b>Project</b> Topsail Beach, Surf City &amp; North Topsail</td> </tr> <tr> <td style="border:none;"></td> <td style="border:none;"><b>Area</b></td> </tr> <tr> <td style="border:none;"></td> <td style="border:none;"><b>Boring No.</b> TB6-MLW</td> </tr> <tr> <td style="border:none;"></td> <td style="border:none;"><b>Date</b> 7/30/2003</td> </tr> </table>										<b>Project</b> Topsail Beach, Surf City & North Topsail		<b>Area</b>		<b>Boring No.</b> TB6-MLW		<b>Date</b> 7/30/2003
	<b>Project</b> Topsail Beach, Surf City & North Topsail															
	<b>Area</b>															
	<b>Boring No.</b> TB6-MLW															
	<b>Date</b> 7/30/2003															

**GRADATION CURVES**



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## VISUAL SHELL CONTENT

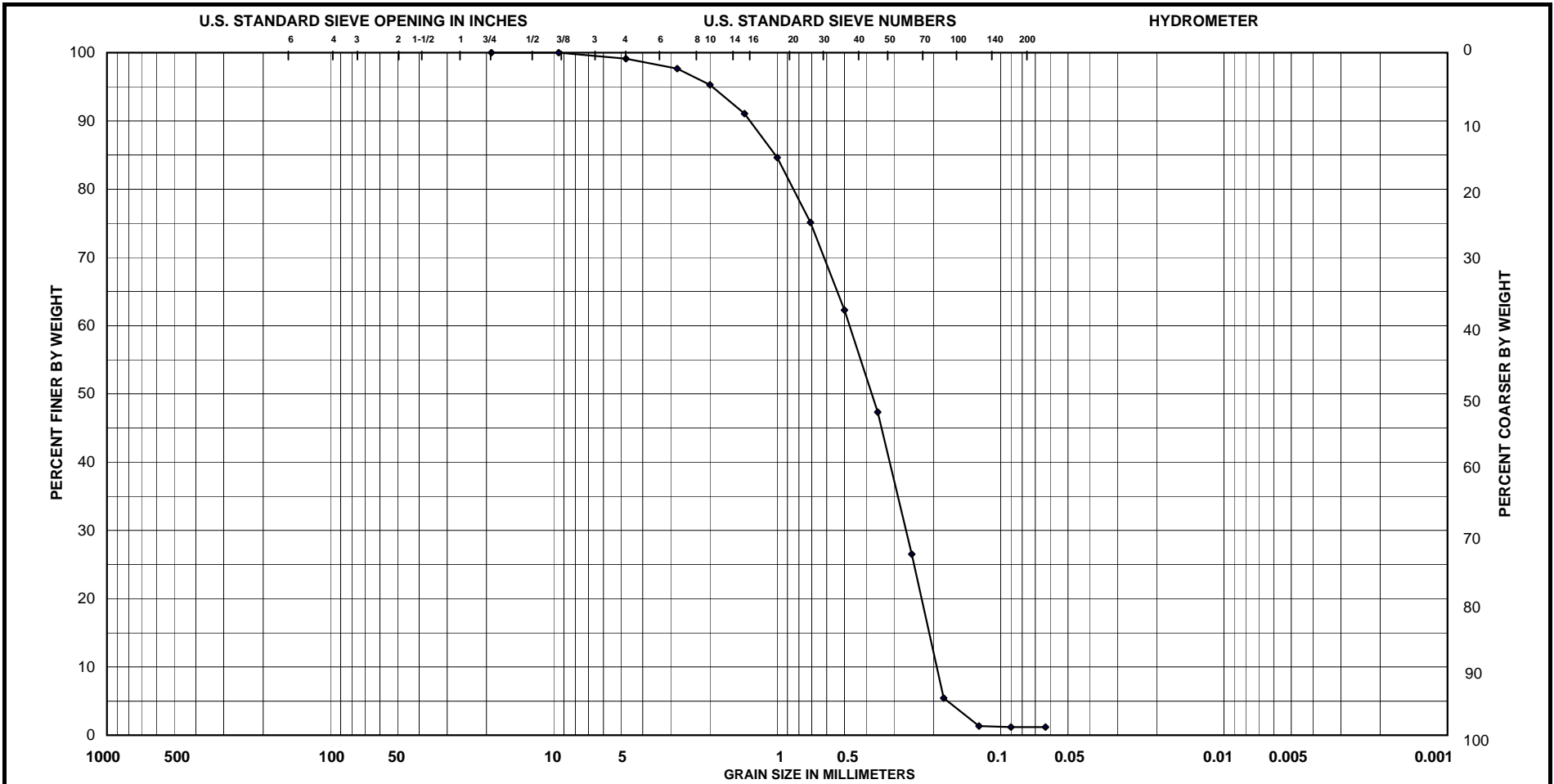
### GRAIN SIZE AND VISUAL SHELL CONTENT

Project:	<b>Topsail Beach, Surf City &amp; North Topsail</b>	Depth:	<b>-3</b>
Project No.:	<b>1584-01-40</b>	Date:	<b>7/30/2003</b>
Boring No.:	<b>TB6-3</b>		
Sample No.:	<b>1</b>		
Description:	<b>SAND, poorly-graded, mostly medium to fine-grained quartz, some carbonate, brownish gray (SP)</b>		

Tare Weight, (g):	<b>50.34</b>	
Dry Wt. Before Washing (g):	<b>180.22</b>	(with tare)
Dry Weight After Washing (g):	<b>179.33</b>	(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	1.13	99.13	100	1.13
#7	2.800	1.92	97.65	85	1.63
#10	2.000	3.09	95.27	80	2.47
#14	1.400	5.48	91.05	75	4.11
#18	1.000	8.33	84.64	50	4.17
#25	0.710	12.37	75.12	45	5.57
#35	0.500	16.65	62.30	45	7.49
#45	0.355	19.45	47.32	30	5.84
#60	0.250	27.03	26.51	20	5.41
#80	0.180	27.34	5.46	5	1.37
#120	0.125	5.35	1.34	3	0.16
#170	0.090	0.21	1.18	1	0.00
#230	0.063	0.01	1.17	1	0.00

**Total Shell Content:** **30** %



COBBLES	GRAVEL		SAND			SILT OR CLAY
	COARSE	FINE	COARSE	MEDIUM	FINE	

Sample No.	Elev. Or Depth	Classification	% CO <sub>3</sub>	G <sub>s</sub>	Nat w%	LL	PL	PI	Project
1	-3	SAND, poorly-graded, mostly medium to fine-grained quartz, some carbonate, brownish gray (SP)	30						Topsail Beach, Surf City & North Topsail
									Area
									Boring No. TB6-3
									Date 7/30/2003

**GRADATION CURVES**



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## VISUAL SHELL CONTENT

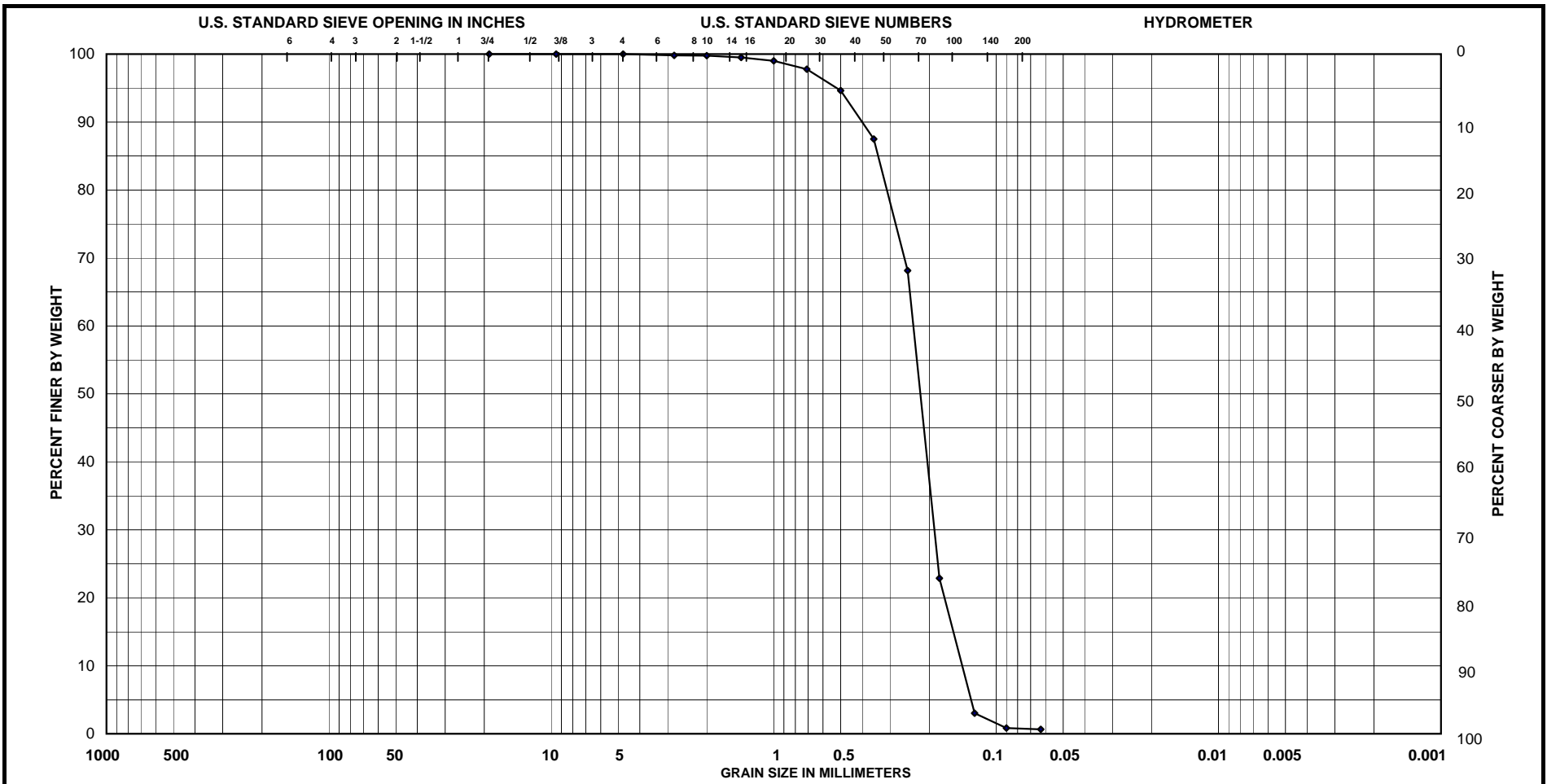
### GRAIN SIZE AND VISUAL SHELL CONTENT

Project:	<b>Topsail Beach, Surf City &amp; North Topsail</b>	Depth:	<b>-4</b>
Project No.:	<b>1584-01-40</b>	Date:	<b>7/30/2003</b>
Boring No.:	<b>TB6-4</b>		
Sample No.:	<b>1</b>		
Description:	<b>SAND, poorly-graded, mostly fine-grained quartz, few carbonate, gray (SP)</b>		

Tare Weight, (g):	<b>49.79</b>	
Dry Wt. Before Washing (g):	<b>148.37</b>	(with tare)
Dry Weight After Washing (g):	<b>147.62</b>	(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	0.20	99.80	90	0.18
#10	2.000	0.02	99.78	100	0.02
#14	1.400	0.27	99.50	90	0.24
#18	1.000	0.51	98.99	70	0.36
#25	0.710	1.19	97.78	50	0.60
#35	0.500	3.09	94.64	40	1.24
#45	0.355	7.02	87.52	25	1.76
#60	0.250	19.10	68.15	15	2.87
#80	0.180	44.61	22.90	3	1.34
#120	0.125	19.57	3.04	3	0.59
#170	0.090	2.18	0.83	1	0.02
#230	0.063	0.18	0.65	1	0.00

**Total Shell Content:** **9** %



COBBLES	GRAVEL		SAND			SILT OR CLAY
	COARSE	FINE	COARSE	MEDIUM	FINE	

Sample No.	Elev. Or Depth	Classification	% CO <sub>3</sub>	G <sub>s</sub>	Nat w%	LL	PL	PI	Project
1	-3	SAND, poorly-graded, mostly fine-grained quartz, few carbonate, gray (SP)	9						Topsail Beach, Surf City & North Topsail
									Area
									Boring No. TB6-4
									Date 7/30/2003

**GRADATION CURVES**





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## VISUAL SHELL CONTENT

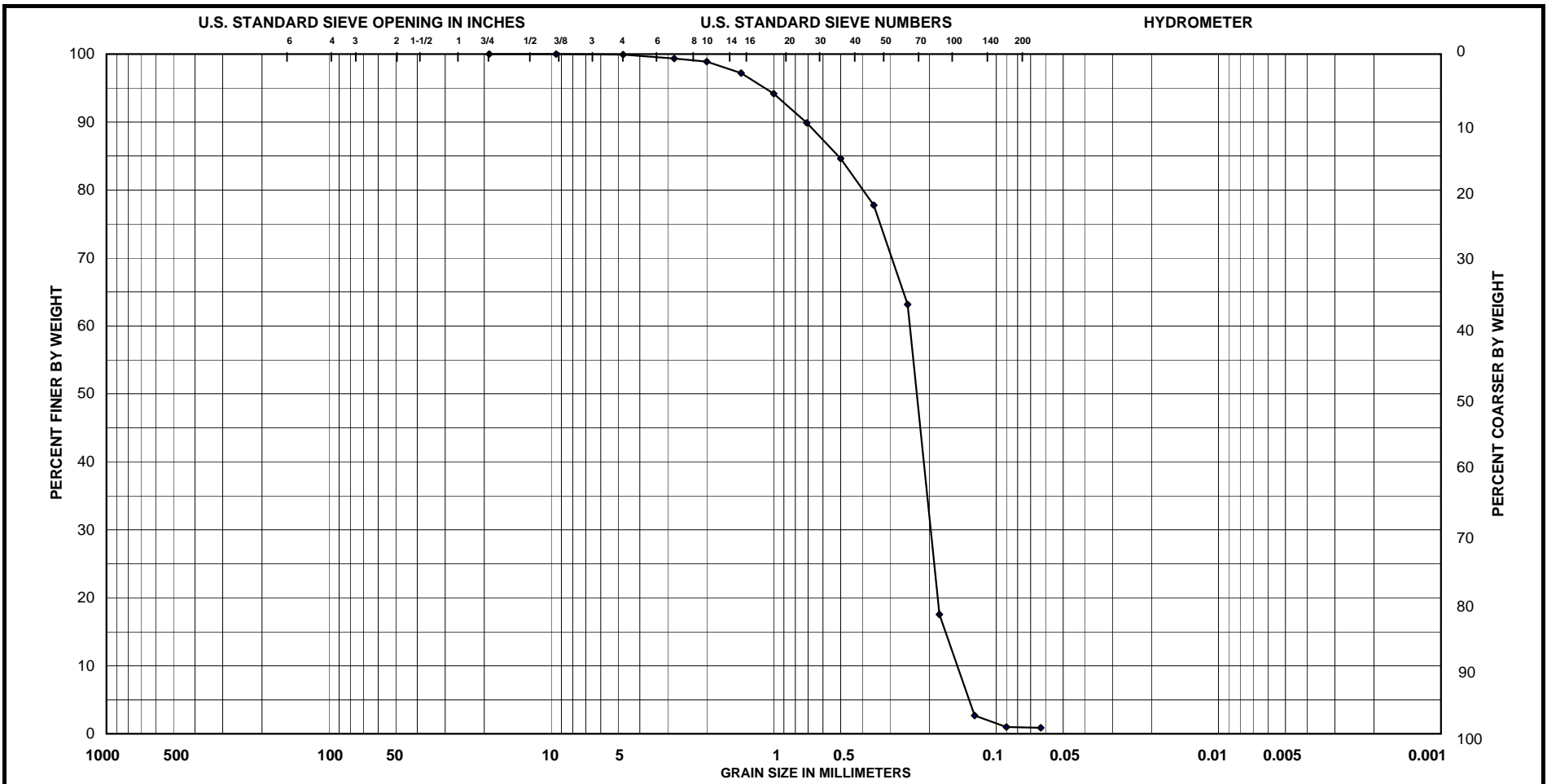
### GRAIN SIZE AND VISUAL SHELL CONTENT

Project:	<b>Topsail Beach, Surf City &amp; North Topsail</b>	Depth:	<b>-6</b>
Project No.:	<b>1584-01-40</b>	Date:	<b>7/30/2003</b>
Boring No.:	<b>TB6-6</b>		
Sample No.:	<b>1</b>		
Description:	<b>SAND, poorly-graded, mostly fine-grained quartz, little carbonate, gray (SP)</b>		

Tare Weight, (g):	<b>50.39</b>	
Dry Wt. Before Washing (g):	<b>152.22</b>	(with tare)
Dry Weight After Washing (g):	<b>151.26</b>	(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	0.08	99.92	100	0.08
#7	2.800	0.58	99.35	100	0.58
#10	2.000	0.49	98.87	80	0.39
#14	1.400	1.68	97.22	70	1.18
#18	1.000	3.12	94.16	50	1.56
#25	0.710	4.37	89.87	40	1.75
#35	0.500	5.32	84.64	35	1.86
#45	0.355	6.98	77.79	30	2.09
#60	0.250	14.87	63.18	15	2.23
#80	0.180	46.45	17.57	5	2.32
#120	0.125	15.16	2.68	3	0.45
#170	0.090	1.71	1.00	1	0.02
#230	0.063	0.12	0.88	1	0.00

**Total Shell Content:** **14** %



COBBLES	GRAVEL		SAND			SILT OR CLAY
	COARSE	FINE	COARSE	MEDIUM	FINE	

Sample No.	Elev. Or Depth	Classification	% CO <sub>3</sub>	G <sub>s</sub>	Nat w%	LL	PL	PI	Project
1	-6	SAND, poorly-graded, mostly fine-grained quartz, little carbonate, gray (SP)	14						Topsail Beach, Surf City & North Topsail
									Area
									Boring No. TB6-6
									Date 7/30/2003

**GRADATION CURVES**



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## VISUAL SHELL CONTENT

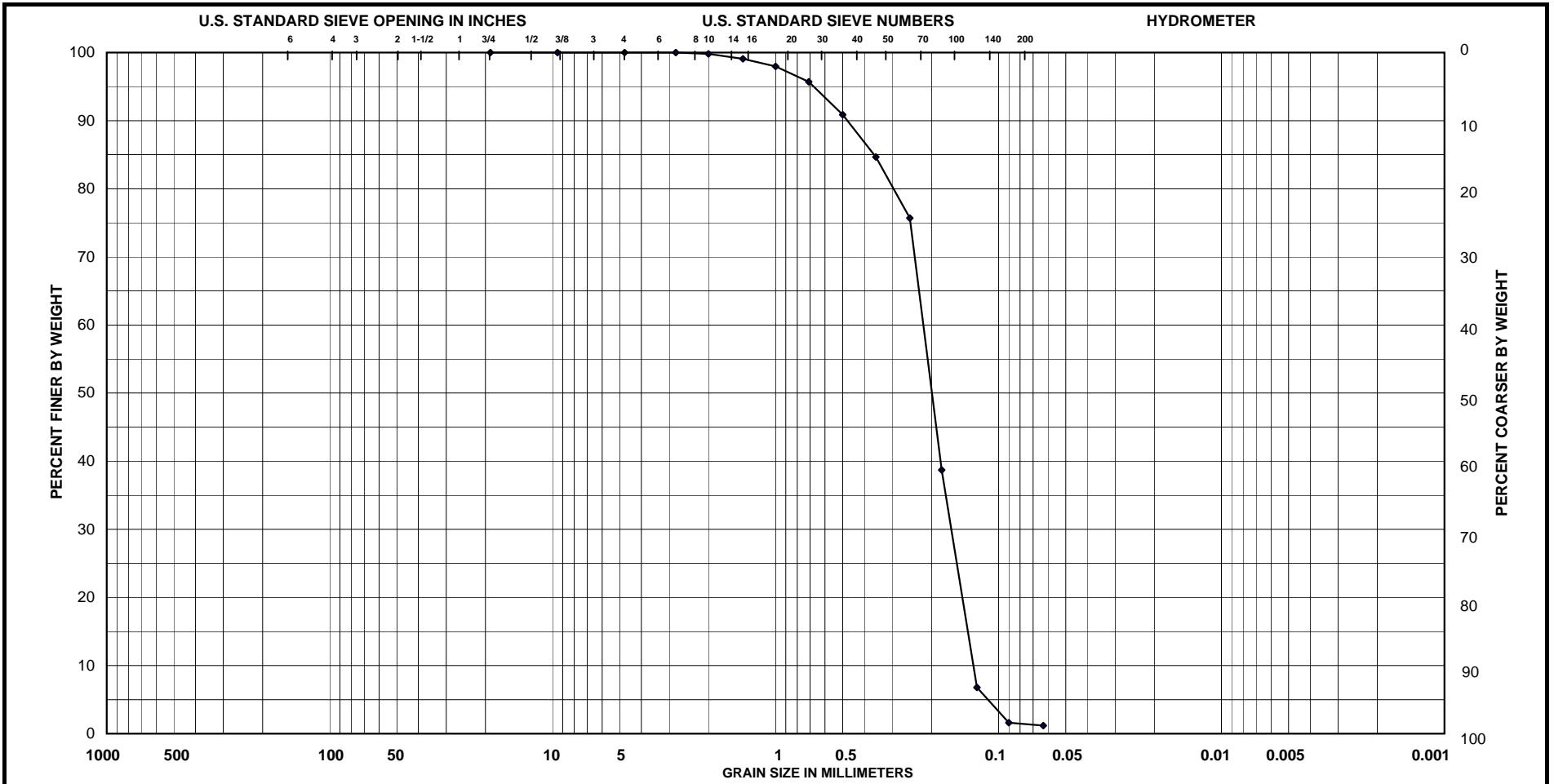
### GRAIN SIZE AND VISUAL SHELL CONTENT

Project:	<b>Topsail Beach, Surf City &amp; North Topsail</b>	Depth:	<b>-8</b>
Project No.:	<b>1584-01-40</b>	Date:	<b>7/30/2003</b>
Boring No.:	<b>TB6-8</b>		
Sample No.:	<b>1</b>		
Description:	<b>SAND, poorly-graded, mostly fine-grained quartz, little carbonate, gray (SP)</b>		

Tare Weight, (g):	<b>50.30</b>	
Dry Wt. Before Washing (g):	<b>149.17</b>	(with tare)
Dry Weight After Washing (g):	<b>148.31</b>	(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	0.18	99.82	100	0.18
#14	1.400	0.72	99.09	100	0.72
#18	1.000	1.12	97.96	90	1.01
#25	0.710	2.23	95.70	80	1.78
#35	0.500	4.78	90.87	65	3.11
#45	0.355	6.13	84.67	35	2.15
#60	0.250	8.88	75.69	25	2.22
#80	0.180	36.54	38.73	3	1.10
#120	0.125	31.60	6.77	3	0.95
#170	0.090	5.09	1.62	1	0.05
#230	0.063	0.42	1.19	1	0.00

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



COBBLES	GRAVEL		SAND			SILT OR CLAY
	COARSE	FINE	COARSE	MEDIUM	FINE	

Sample No.	Elev. Or Depth	Classification	% CO <sub>3</sub>	G <sub>s</sub>	Nat w%	LL	PL	PI	Project	
♦ 1	-8	SAND, poorly-graded, mostly fine-grained quartz, little carbonate, gray (SP)	13						Topsail Beach, Surf City & North Topsail	
									Area	
									Boring No. TB6-8	
									Date 7/30/2003	

**GRADATION CURVES**



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## VISUAL SHELL CONTENT

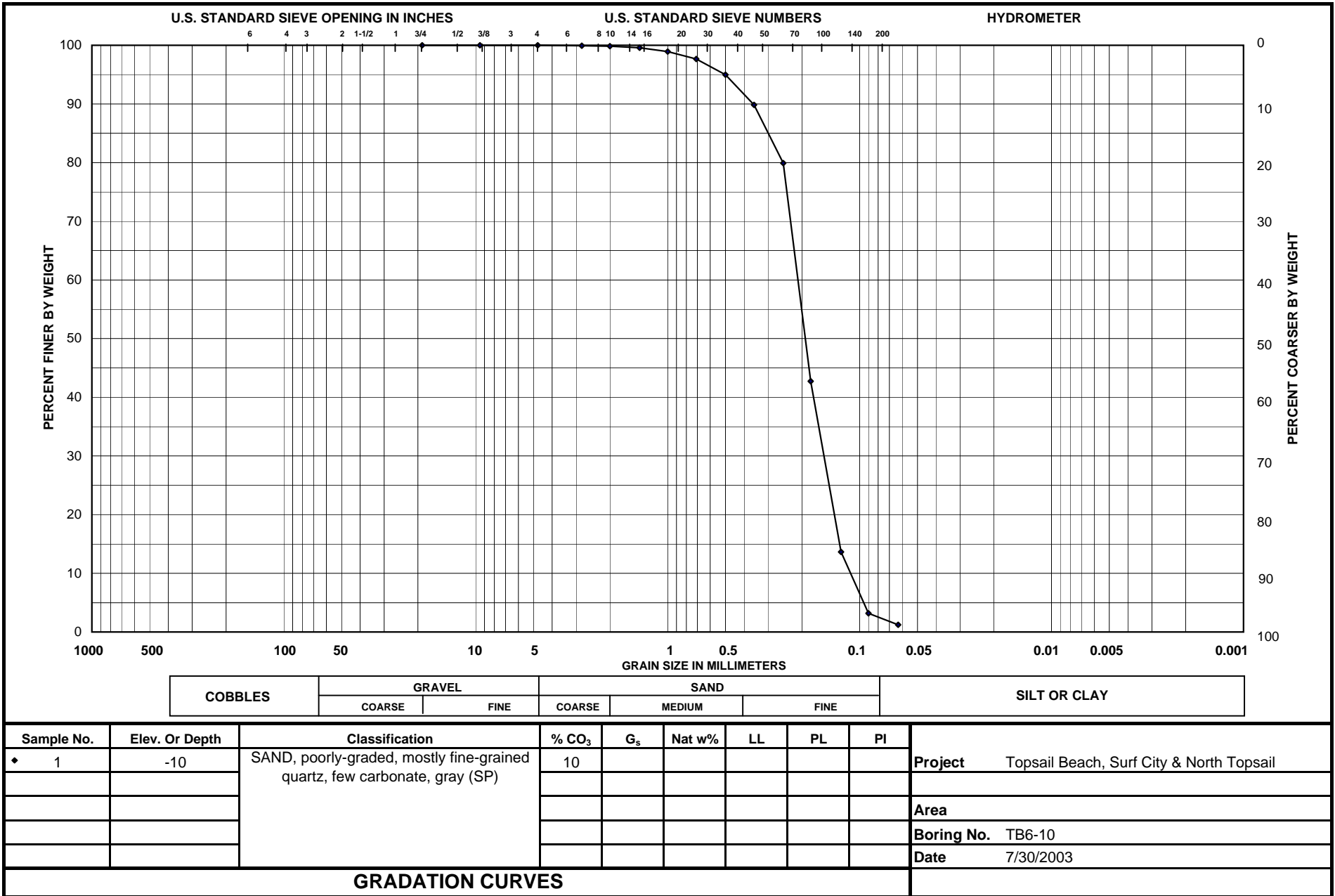
### GRAIN SIZE AND VISUAL SHELL CONTENT

Project:	<b>Topsail Beach, Surf City &amp; North Topsail</b>	Depth:	<b>-10</b>
Project No.:	<b>1584-01-40</b>	Date:	<b>7/30/2003</b>
Boring No.:	<b>TB6-10</b>		
Sample No.:	<b>1</b>		
Description:	<b>SAND, poorly-graded, mostly fine-grained quartz, few carbonate, gray (SP)</b>		

Tare Weight, (g):	<b>49.74</b>	
Dry Wt. Before Washing (g):	<b>139.45</b>	(with tare)
Dry Weight After Washing (g):	<b>138.49</b>	(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	99.91	100	0.08
#10	2.000	0.06	99.84	100	0.06
#14	1.400	0.25	99.57	100	0.25
#18	1.000	0.58	98.92	100	0.58
#25	0.710	1.12	97.67	95	1.06
#35	0.500	2.43	94.96	65	1.58
#45	0.355	4.59	89.85	40	1.84
#60	0.250	8.91	79.91	15	1.34
#80	0.180	33.35	42.74	5	1.67
#120	0.125	26.11	13.63	3	0.78
#170	0.090	9.36	3.20	1	0.09
#230	0.063	1.76	1.24	1	0.02

**Total Shell Content:** **10** %





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## VISUAL SHELL CONTENT

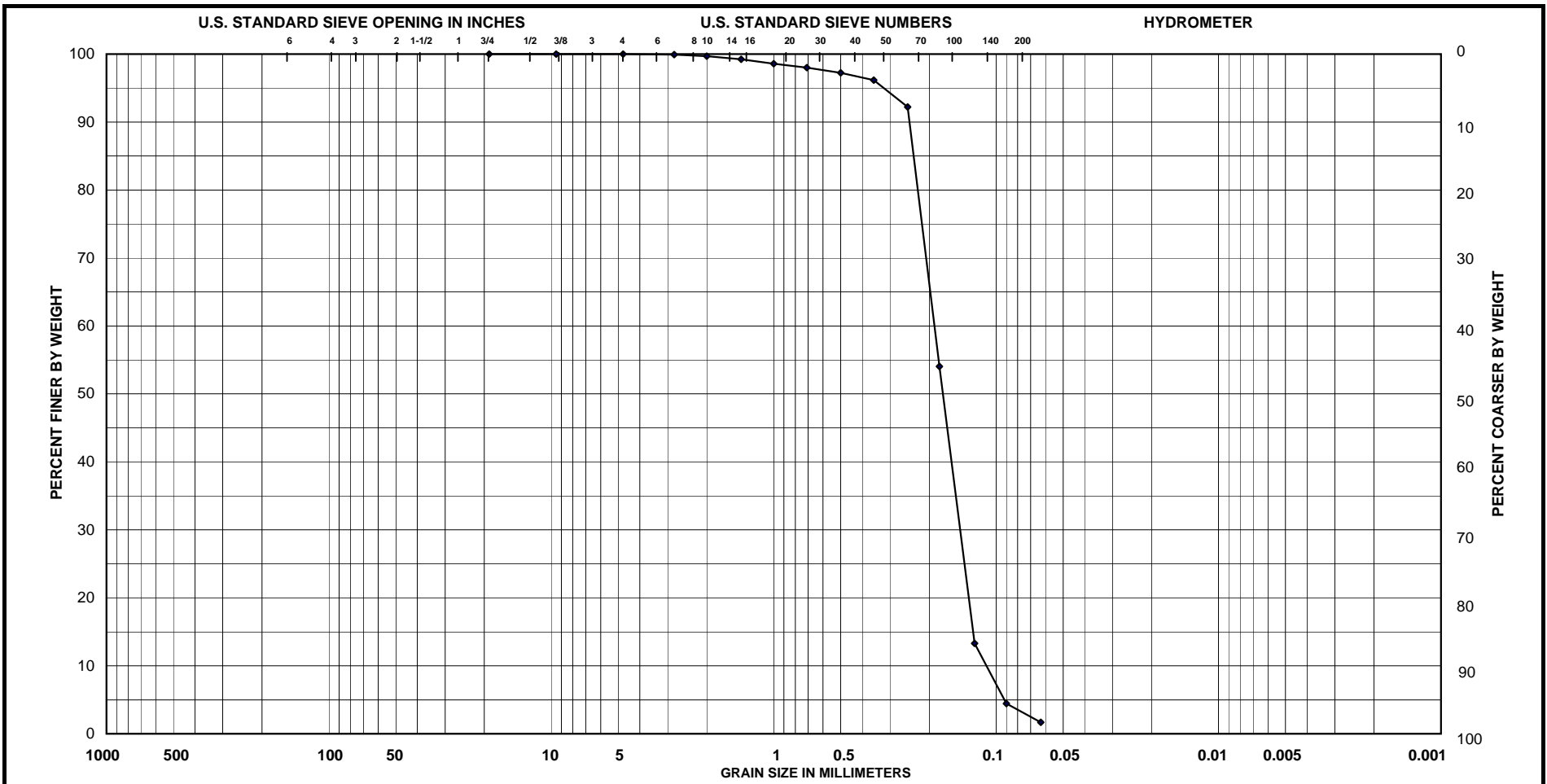
### GRAIN SIZE AND VISUAL SHELL CONTENT

Project:	<b>Topsail Beach, Surf City &amp; North Topsail</b>	Depth:	<b>-12</b>
Project No.:	<b>1584-01-40</b>	Date:	<b>7/30/2003</b>
Boring No.:	<b>TB6-12</b>		
Sample No.:	<b>1</b>		
Description:	<b>SAND, poorly-graded, mostly fine-grained quartz, few carbonate, gray (SP)</b>		

Tare Weight, (g):	<b>49.76</b>	
Dry Wt. Before Washing (g):	<b>147.4</b>	(with tare)
Dry Weight After Washing (g):	<b>146.2</b>	(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	0.07	99.93	100	0.07
#10	2.000	0.22	99.70	90	0.20
#14	1.400	0.47	99.22	80	0.38
#18	1.000	0.63	98.58	75	0.47
#25	0.710	0.56	98.00	45	0.25
#35	0.500	0.75	97.23	30	0.23
#45	0.355	1.04	96.17	25	0.26
#60	0.250	3.84	92.24	15	0.58
#80	0.180	37.29	54.05	5	1.86
#120	0.125	39.78	13.30	3	1.19
#170	0.090	8.66	4.43	1	0.09
#230	0.063	2.69	1.68	1	0.03

**Total Shell Content:** **6** %



COBBLES	GRAVEL		SAND			SILT OR CLAY
	COARSE	FINE	COARSE	MEDIUM	FINE	

Sample No.	Elev. Or Depth	Classification	% CO <sub>3</sub>	G <sub>s</sub>	Nat w%	LL	PL	PI	Project
1	-12	SAND, poorly-graded, mostly fine-grained quartz, few carbonate, gray (SP)	6						Topsail Beach, Surf City & North Topsail
									Area
									Boring No. TB6-12
									Date 7/30/2003

**GRADATION CURVES**





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## VISUAL SHELL CONTENT

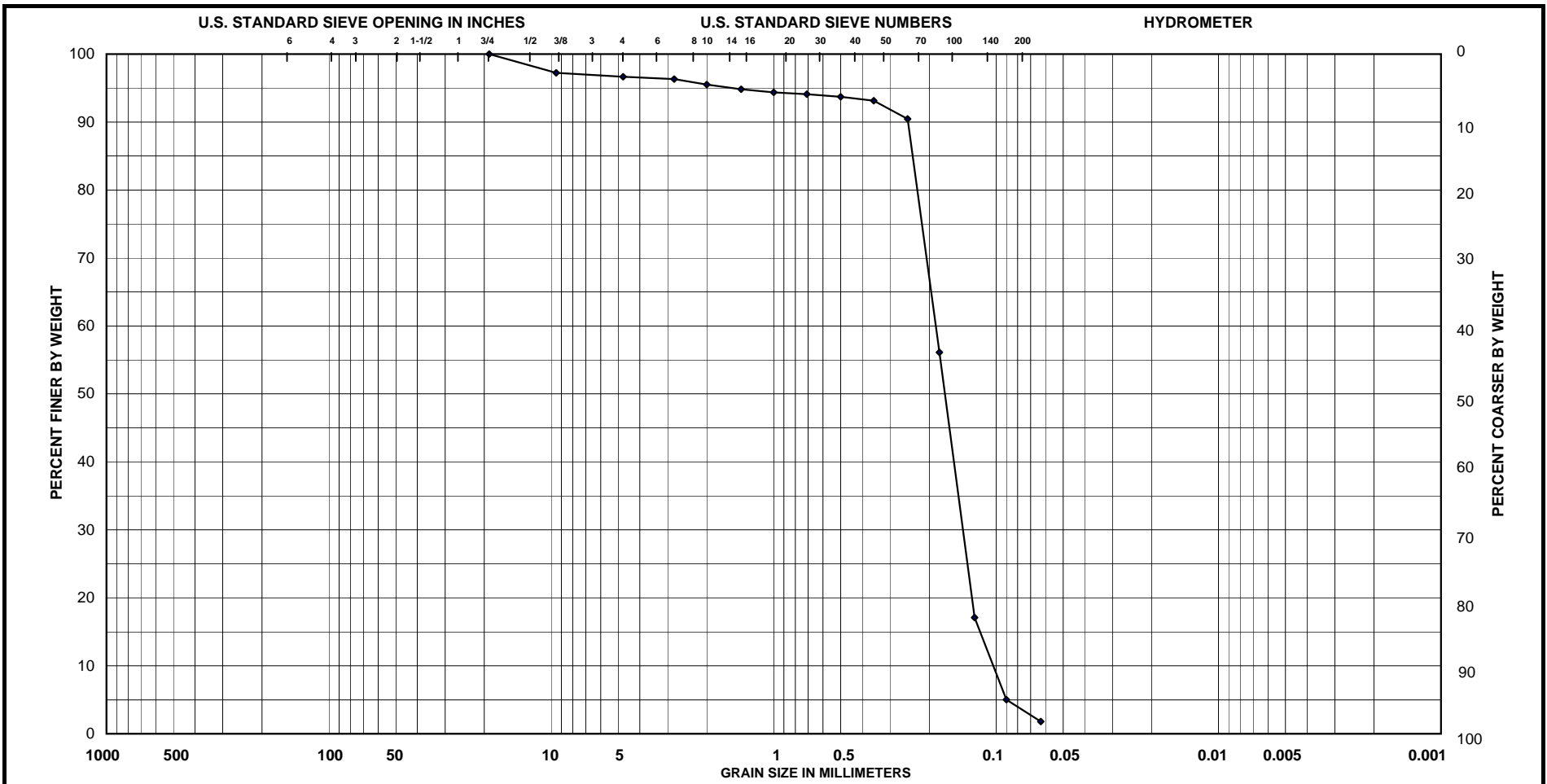
### GRAIN SIZE AND VISUAL SHELL CONTENT

Project:	<b>Topsail Beach, Surf City &amp; North Topsail</b>	Depth:	<b>-14</b>
Project No.:	<b>1584-01-40</b>	Date:	<b>7/30/2003</b>
Boring No.:	<b>TB6-14</b>		
Sample No.:	<b>1</b>		
Description:	<b>SAND, poorly-graded, mostly fine-grained quartz, few carbonate, bluish gray (SP)</b>		

Tare Weight, (g):	<b>49.91</b>	
Dry Wt. Before Washing (g):	<b>131.13</b>	(with tare)
Dry Weight After Washing (g):	<b>130.04</b>	(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	2.24	97.24	100	2.24
#4	4.750	0.46	96.68	0	0.00
#7	2.800	0.30	96.31	25	0.08
#10	2.000	0.65	95.51	35	0.23
#14	1.400	0.56	94.82	20	0.11
#18	1.000	0.36	94.37	30	0.11
#25	0.710	0.23	94.09	20	0.05
#35	0.500	0.31	93.71	20	0.06
#45	0.355	0.47	93.13	15	0.07
#60	0.250	2.17	90.46	10	0.22
#80	0.180	27.91	56.09	3	0.84
#120	0.125	31.67	17.10	3	0.95
#170	0.090	9.82	5.01	1	0.10
#230	0.063	2.60	1.81	1	0.03

**Total Shell Content:** **6** %



COBBLES	GRAVEL		SAND			SILT OR CLAY
	COARSE	FINE	COARSE	MEDIUM	FINE	

Sample No.	Elev. Or Depth	Classification	% CO <sub>3</sub>	G <sub>s</sub>	Nat w%	LL	PL	PI	Project	
♦ 1	-10	SAND, poorly-graded, mostly fine-grained quartz, few carbonate, bluish gray (SP)	6						Topsail Beach, Surf City & North Topsail	
									Area	
									Boring No. TB6-14	
									Date 7/30/2003	

**GRADATION CURVES**



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## VISUAL SHELL CONTENT

### GRAIN SIZE AND VISUAL SHELL CONTENT

Project:	<b>Topsail Beach, Surf City &amp; North Topsail</b>	Depth:	<b>-16</b>
Project No.:	<b>1584-01-40</b>	Date:	<b>7/30/2003</b>
Boring No.:	<b>TB6-16</b>		
Sample No.:	<b>1</b>		
Description:	<b>SAND, poorly-graded, mostly fine-grained quartz, trace carbonate, bluish gray (SP)</b>		

Tare Weight, (g):	<b>50.05</b>	
Dry Wt. Before Washing (g):	<b>156.79</b>	(with tare)
Dry Weight After Washing (g):	<b>155.5</b>	(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	0.10	99.89	100	0.10
#14	1.400	0.02	99.87	100	0.02
#18	1.000	0.02	99.85	100	0.02
#25	0.710	0.07	99.78	100	0.07
#35	0.500	0.15	99.64	90	0.14
#45	0.355	0.45	99.22	30	0.14
#60	0.250	2.45	96.93	10	0.25
#80	0.180	45.51	54.29	5	2.28
#120	0.125	44.13	12.95	3	1.32
#170	0.090	9.45	4.09	1	0.09
#230	0.063	2.48	1.77	1	0.02

**Total Shell Content:** **4** %



COBBLES	GRAVEL		SAND			SILT OR CLAY
	COARSE	FINE	COARSE	MEDIUM	FINE	

Sample No.	Elev. Or Depth	Classification	% CO <sub>3</sub>	G <sub>s</sub>	Nat w%	LL	PL	PI	Project
♦ 1	-16	SAND, poorly-graded, mostly fine-grained quartz, trace carbonate, bluish gray (SP)	4						Topsail Beach, Surf City & North Topsail
									Area
									Boring No. TB6-16
									Date 7/30/2003

**GRADATION CURVES**



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## VISUAL SHELL CONTENT

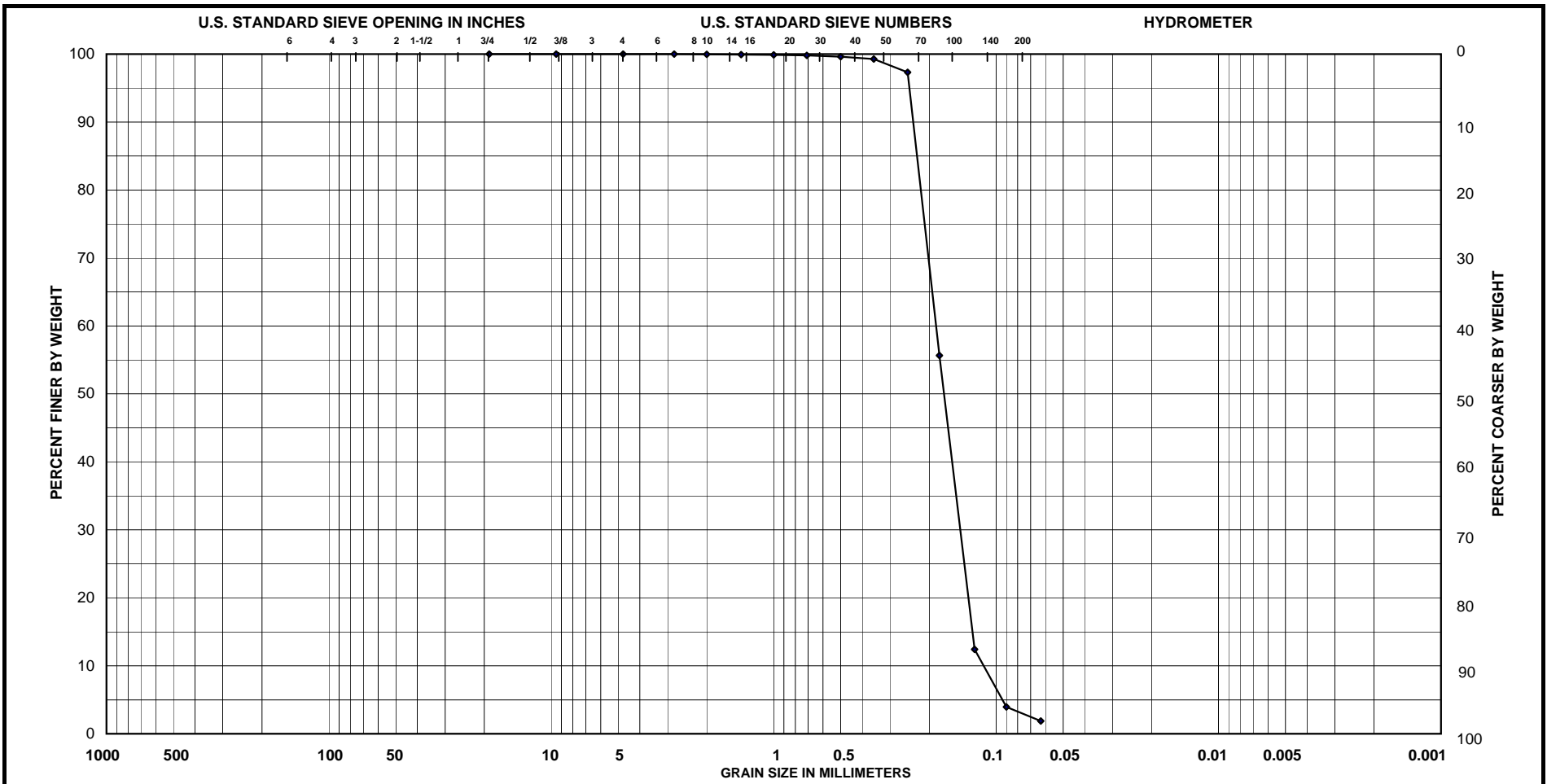
### GRAIN SIZE AND VISUAL SHELL CONTENT

Project:	<b>Topsail Beach, Surf City &amp; North Topsail</b>	Depth:	<b>-18</b>
Project No.:	<b>1584-01-40</b>	Date:	<b>7/30/2003</b>
Boring No.:	<b>TB6-18</b>		
Sample No.:	<b>1</b>		
Description:	<b>SAND, poorly-graded, mostly fine-grained quartz, trace carbonate, bluish gray (SP)</b>		

Tare Weight, (g):	<b>50.10</b>	
Dry Wt. Before Washing (g):	<b>146.17</b>	(with tare)
Dry Weight After Washing (g):	<b>144.39</b>	(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	0.05	99.88	100	0.05
#25	0.710	0.08	99.79	100	0.08
#35	0.500	0.17	99.61	60	0.10
#45	0.355	0.33	99.27	40	0.13
#60	0.250	1.86	97.34	15	0.28
#80	0.180	40.05	55.65	3	1.20
#120	0.125	41.53	12.42	3	1.25
#170	0.090	8.13	3.96	1	0.08
#230	0.063	1.99	1.88	1	0.02

**Total Shell Content:** **3** %



COBBLES	GRAVEL		SAND			SILT OR CLAY
	COARSE	FINE	COARSE	MEDIUM	FINE	

Sample No.	Elev. Or Depth	Classification	% CO <sub>3</sub>	G <sub>s</sub>	Nat w%	LL	PL	PI	Project	
♦ 1	-18	SAND, poorly-graded, mostly fine-grained quartz, trace carbonate, bluish gray (SP)	3						Topsail Beach, Surf City & North Topsail	
									Area	
									Boring No. TB6-18	
									Date 7/30/2003	

**GRADATION CURVES**



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## VISUAL SHELL CONTENT

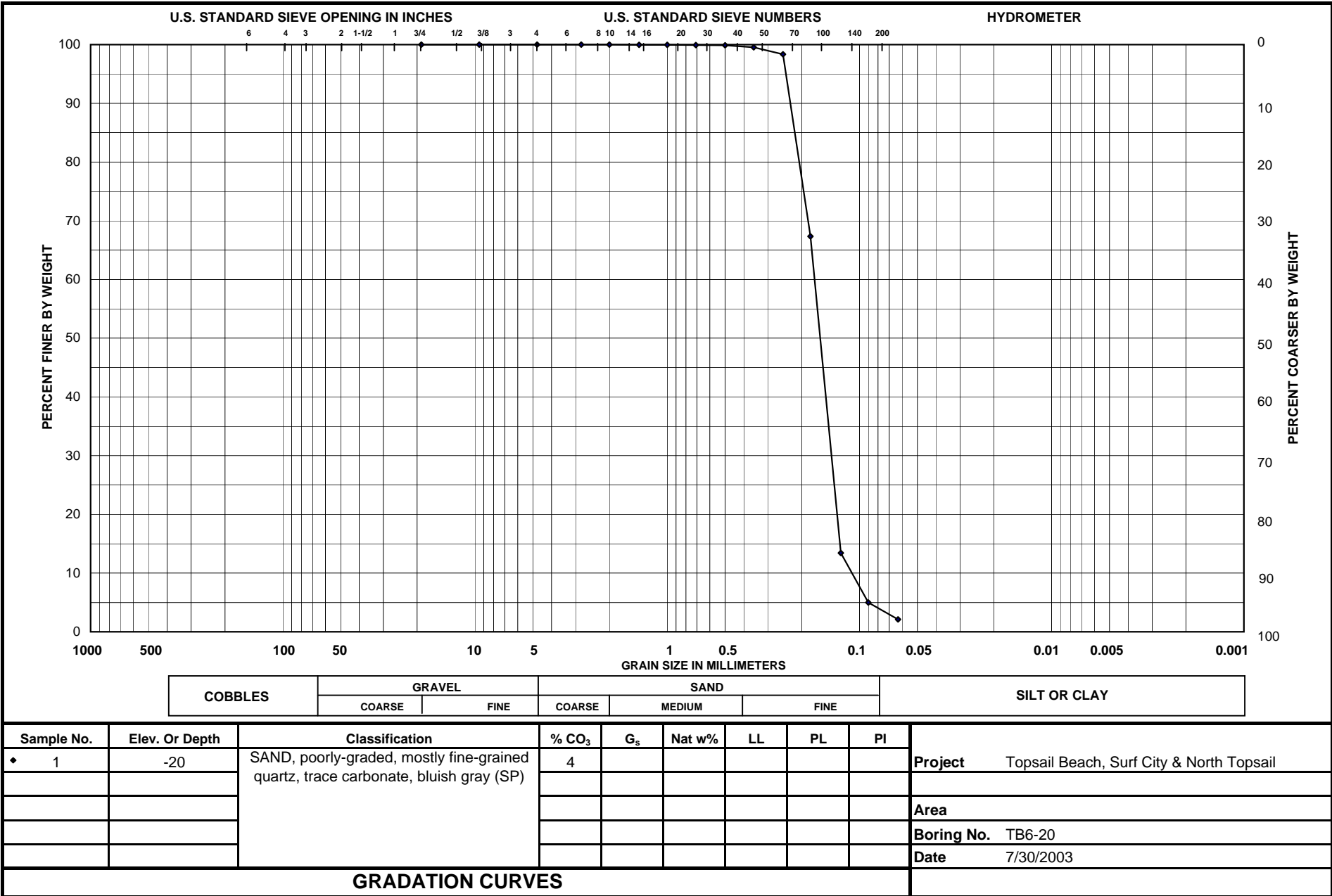
### GRAIN SIZE AND VISUAL SHELL CONTENT

Project:	<b>Topsail Beach, Surf City &amp; North Topsail</b>	Depth:	<b>-20</b>
Project No.:	<b>1584-01-40</b>	Date:	<b>7/30/2003</b>
Boring No.:	<b>TB6-20</b>		
Sample No.:	<b>1</b>		
Description:	<b>SAND, poorly-graded, mostly fine-grained quartz, trace carbonate, bluish gray (SP)</b>		

Tare Weight, (g):	<b>50.13</b>	
Dry Wt. Before Washing (g):	<b>163.31</b>	(with tare)
Dry Weight After Washing (g):	<b>160.97</b>	(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	0.01	99.97	100	0.01
#18	1.000	0.03	99.95	100	0.03
#25	0.710	0.03	99.92	98	0.03
#35	0.500	0.04	99.89	85	0.03
#45	0.355	0.41	99.52	40	0.16
#60	0.250	1.34	98.34	15	0.20
#80	0.180	35.10	67.33	5	1.76
#120	0.125	61.03	13.40	3	1.83
#170	0.090	9.52	4.99	1	0.10
#230	0.063	3.27	2.10	1	0.03

**Total Shell Content:** **4** %







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## VISUAL SHELL CONTENT

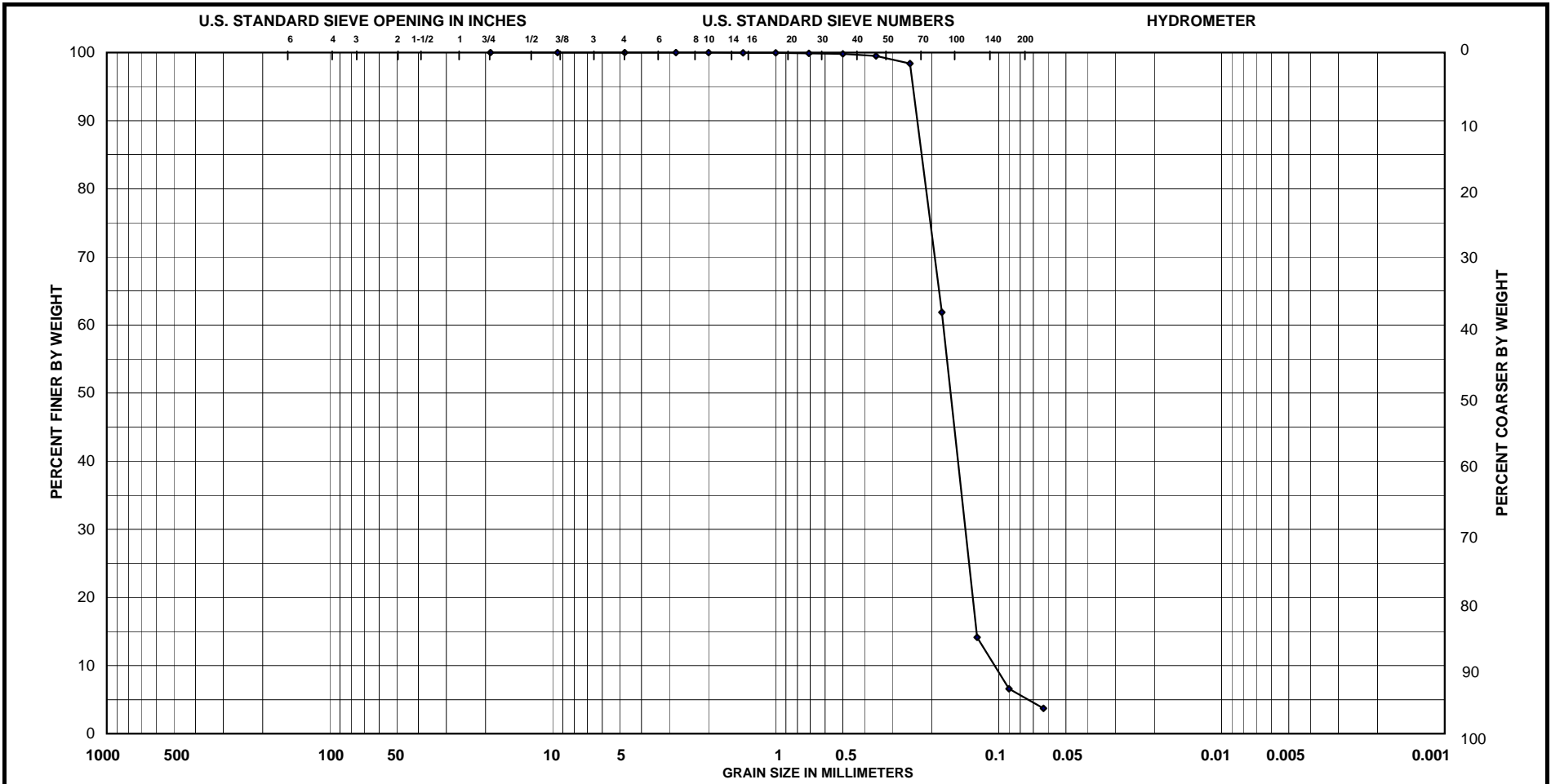
### GRAIN SIZE AND VISUAL SHELL CONTENT

Project:	<b>Topsail Beach, Surf City &amp; North Topsail</b>	Depth:	<b>-22</b>
Project No.:	<b>1584-01-40</b>	Date:	<b>7/30/2003</b>
Boring No.:	<b>TB6-22</b>		
Sample No.:	<b>1</b>		
Description:	<b>SAND, poorly-graded, mostly fine-grained quartz, trace carbonate, dark bluish gray (SP)</b>		

Tare Weight, (g):	<b>50.15</b>	
Dry Wt. Before Washing (g):	<b>179.88</b>	(with tare)
Dry Weight After Washing (g):	<b>175.59</b>	(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	0.01	99.98	100	0.01
#18	1.000	0.03	99.95	100	0.03
#25	0.710	0.07	99.90	100	0.07
#35	0.500	0.13	99.80	95	0.12
#45	0.355	0.37	99.51	60	0.22
#60	0.250	1.48	98.37	15	0.22
#80	0.180	47.37	61.86	5	2.37
#120	0.125	61.88	14.16	3	1.86
#170	0.090	9.82	6.59	1	0.10
#230	0.063	3.73	3.72	1	0.04

**Total Shell Content:** **4** %



COBBLES	GRAVEL		SAND			SILT OR CLAY
	COARSE	FINE	COARSE	MEDIUM	FINE	

Sample No.	Elev. Or Depth	Classification	% CO <sub>3</sub>	G <sub>s</sub>	Nat w%	LL	PL	PI	Project
♦ 1	-22	SAND, poorly-graded, mostly fine-grained quartz, trace carbonate, dark bluish gray (SP)	4						Topsail Beach, Surf City & North Topsail
									Area
									Boring No. TB6-22
									Date 7/30/2003

**GRADATION CURVES**



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## VISUAL SHELL CONTENT

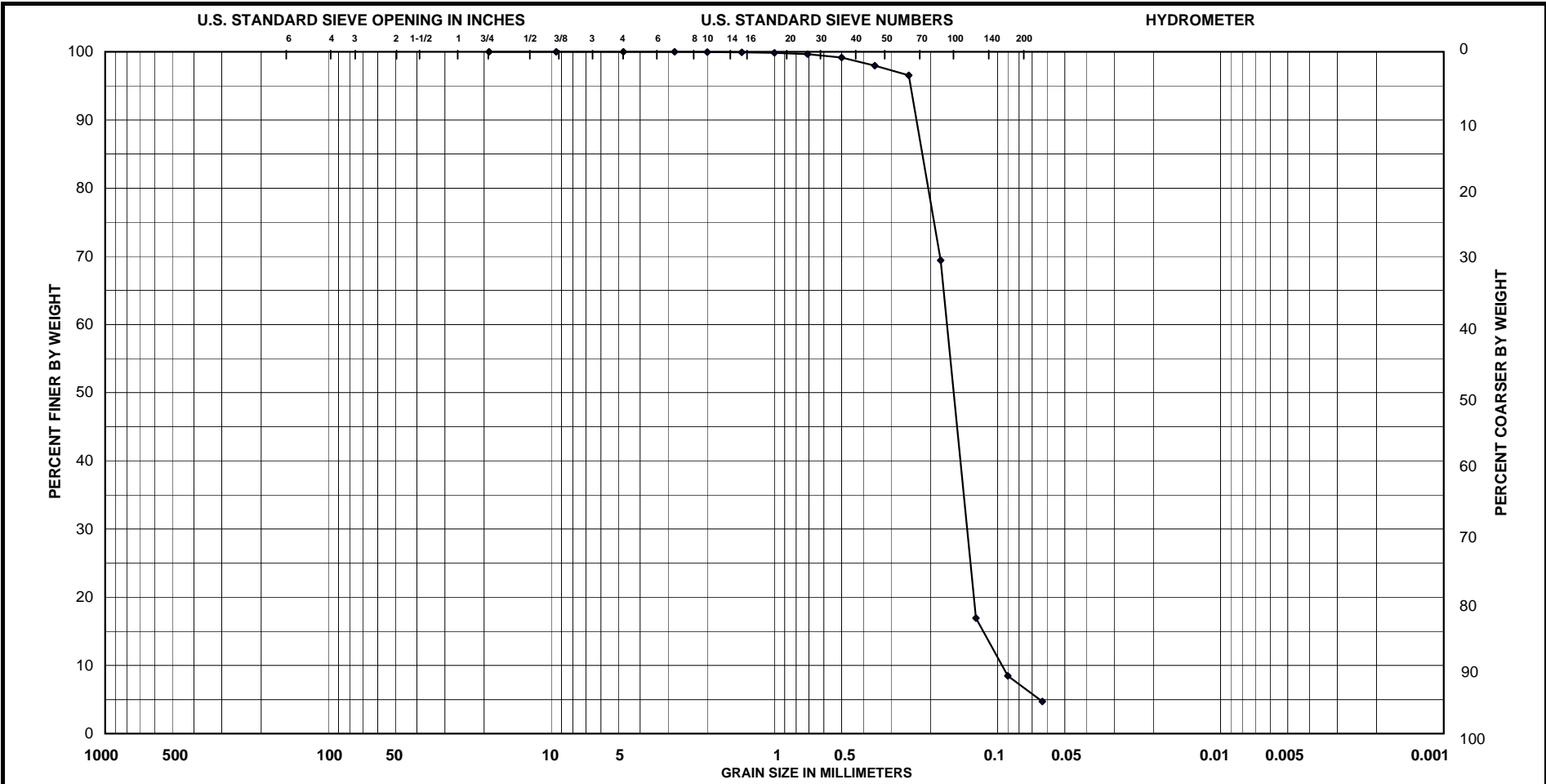
### GRAIN SIZE AND VISUAL SHELL CONTENT

Project:	<b>Topsail Beach, Surf City &amp; North Topsail</b>	Depth:	<b>-24</b>
Project No.:	<b>1584-01-40</b>	Date:	<b>7/30/2003</b>
Boring No.:	<b>TB6-24</b>		
Sample No.:	<b>1</b>		
Description:	<b>SAND, poorly-graded, mostly fine-grained quartz, trace carbonate, dark bluish gray (SP)</b>		

Tare Weight, (g):	<b>50.35</b>	
Dry Wt. Before Washing (g):	<b>161</b>	(with tare)
Dry Weight After Washing (g):	<b>155.8</b>	(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	0.04	99.95	100	0.04
#14	1.400	0.03	99.93	100	0.03
#18	1.000	0.09	99.85	100	0.09
#25	0.710	0.20	99.67	90	0.18
#35	0.500	0.55	99.17	30	0.17
#45	0.355	1.34	97.96	20	0.27
#60	0.250	1.57	96.54	5	0.08
#80	0.180	30.01	69.42	3	0.90
#120	0.125	58.05	16.95	1	0.58
#170	0.090	9.38	8.48	1	0.09
#230	0.063	4.16	4.72	1	0.04

**Total Shell Content:** **2** %





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## VISUAL SHELL CONTENT

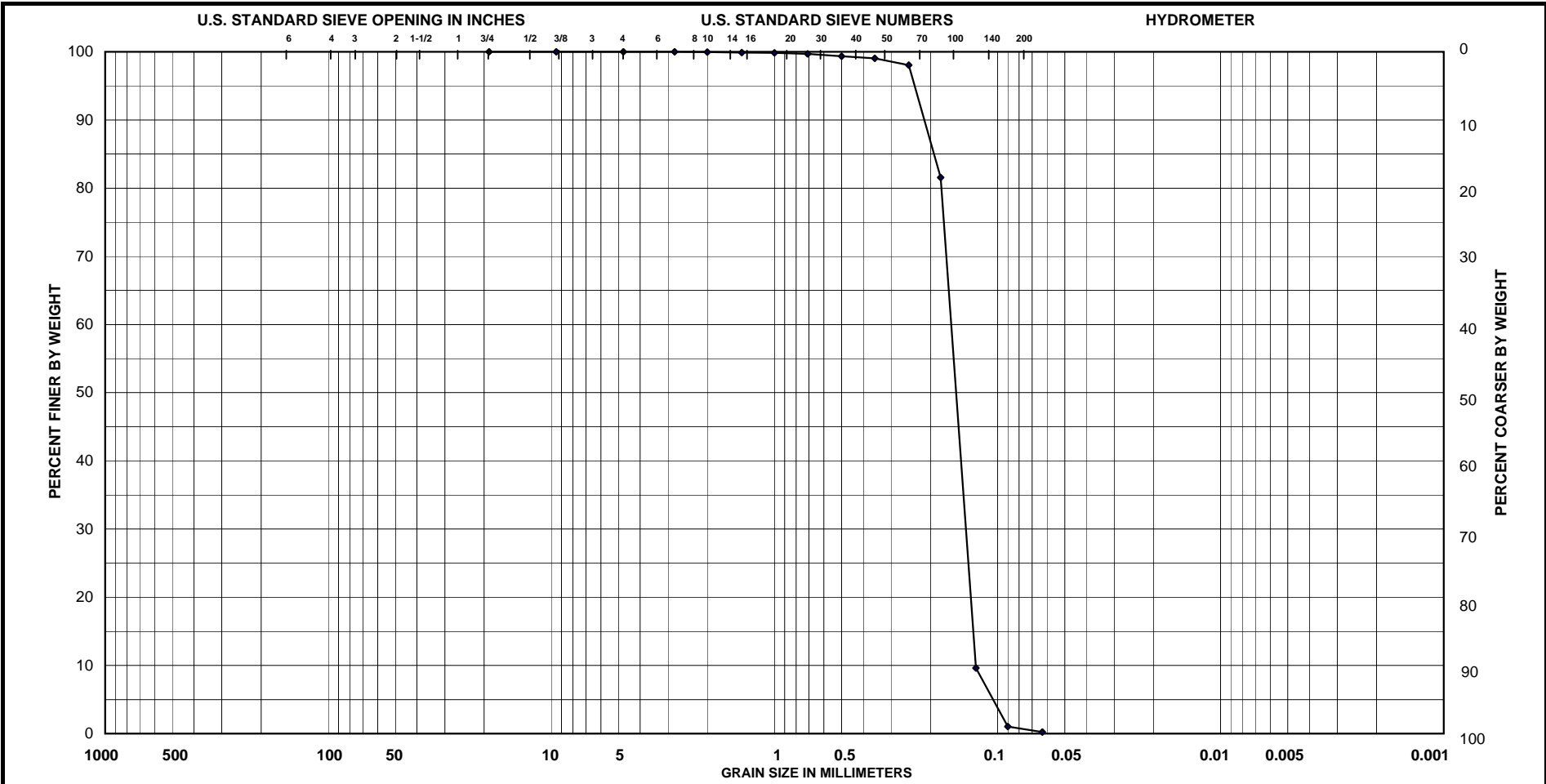
### GRAIN SIZE AND VISUAL SHELL CONTENT

Project:	<b>Topsail Beach, Surf City &amp; North Topsail</b>	Depth:	<b>14.0-14.5</b>
Project No.:	<b>1584-01-40</b>	Date:	<b>9/3/2003</b>
Boring No.:	<b>T1-03-V-1</b>		
Sample No.:	<b>1</b>		
Description:	<b>SAND, poorly-graded, mostly fine-grained quartz, few carbonate, gray (SP)</b>		

Tare Weight, (g):	<b>50.31</b>	
Dry Wt. Before Washing (g):	<b>142.05</b>	(with tare)
Dry Weight After Washing (g):	<b>140.7</b>	(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	0.09	99.88	50	0.05
#18	1.000	0.03	99.85	40	0.01
#25	0.710	0.15	99.68	50	0.08
#35	0.500	0.32	99.34	50	0.16
#45	0.355	0.26	99.05	40	0.10
#60	0.250	0.94	98.03	30	0.28
#80	0.180	15.09	81.58	20	3.02
#120	0.125	66.02	9.61	5	3.30
#170	0.090	7.86	1.05	1	0.08
#230	0.063	0.76	0.22	1	0.01

**Total Shell Content:** **8** %



COBBLES	GRAVEL		SAND			SILT OR CLAY
	COARSE	FINE	COARSE	MEDIUM	FINE	

Sample No.	Elev. Or Depth	Classification	% CO <sub>3</sub>	G <sub>s</sub>	Nat w%	LL	PL	PI	Project	
♦ 1	14.0-14.5	SAND, poorly-graded, mostly fine-grained quartz, few carbonate, gray (SP)	8						Topsail Beach, Surf City & North Topsail	
									Area	
									Boring No. T1-03-V-1	
									Date 9/3/2003	

**GRADATION CURVES**



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## VISUAL SHELL CONTENT

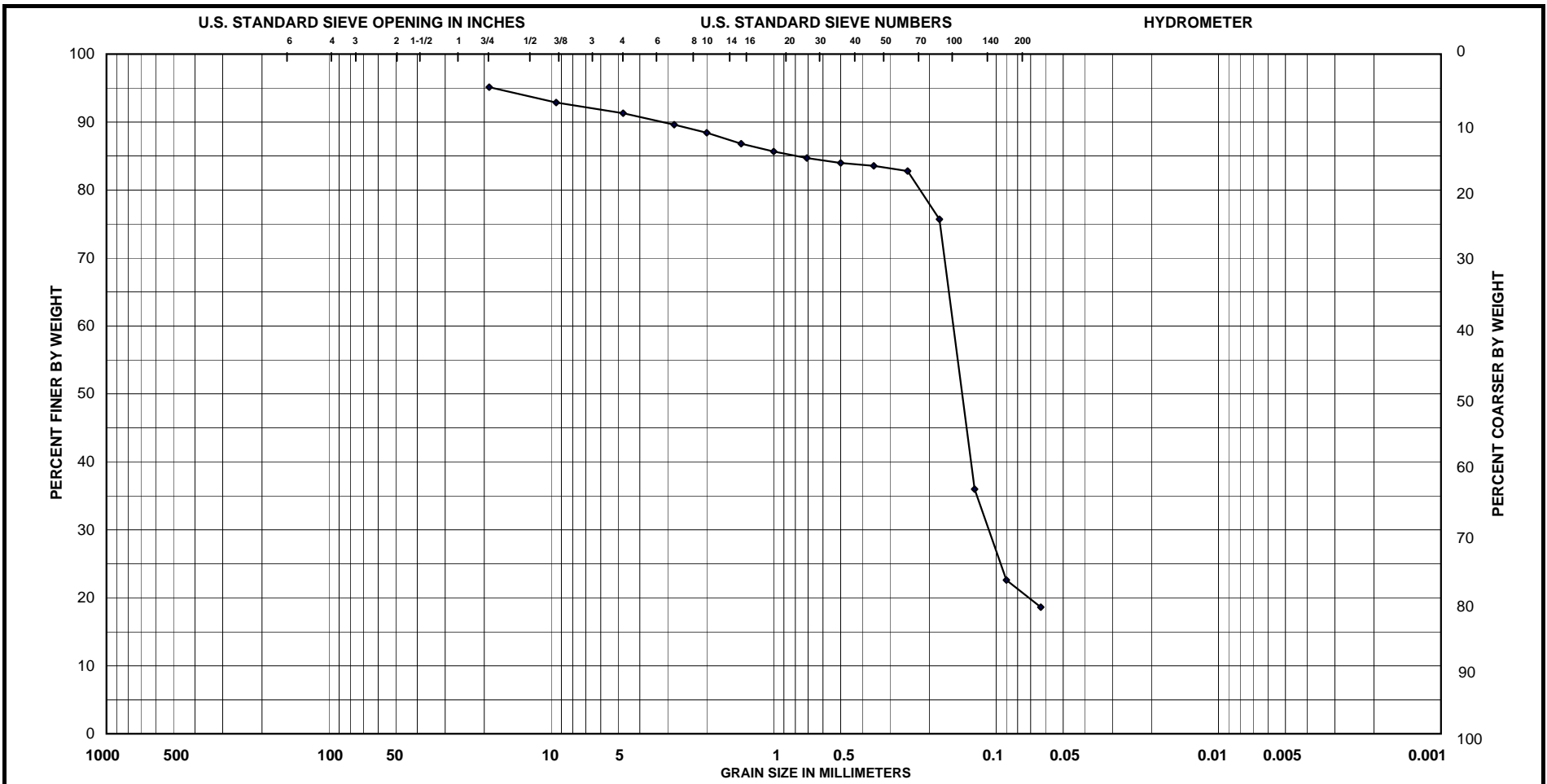
### GRAIN SIZE AND VISUAL SHELL CONTENT

Project:	<b>Topsail Beach, Surf City &amp; North Topsail</b>	Depth:	<b>17.5-18.0</b>
Project No.:	<b>1584-01-40</b>	Date:	<b>9/3/2003</b>
Boring No.:	<b>T1-03-V-1</b>		
Sample No.:	<b>2</b>		
Description:	<b>SAND, clayey, mostly fine-grained quartz, little carbonate, little clay, dark gray (SC)</b>		

Tare Weight, (g):	<b>49.31</b>	
Dry Wt. Before Washing (g):	<b>180.11</b>	(with tare)
Dry Weight After Washing (g):	<b>154.93</b>	(with tare)

Sieve Size (Name)	Sieve Size (mm)	Weight Retained (g)	% Passing	Approx. Visual Shell %	Approx. Visual Shell Wt. (g)
3/4"	19.000	6.36	95.14	100	6.36
3/8"	9.500	2.97	92.87	100	2.97
#4	4.750	2.03	91.31	100	2.03
#7	2.800	2.22	89.62	100	2.22
#10	2.000	1.57	88.42	90	1.41
#14	1.400	2.09	86.82	90	1.88
#18	1.000	1.50	85.67	90	1.35
#25	0.710	1.27	84.70	90	1.14
#35	0.500	0.96	83.97	90	0.86
#45	0.355	0.54	83.56	100	0.54
#60	0.250	0.99	82.80	90	0.89
#80	0.180	9.26	75.72	30	2.78
#120	0.125	51.95	36.00	5	2.60
#170	0.090	17.50	22.62	1	0.18
#230	0.063	5.21	18.64	1	0.05

**Total Shell Content:** **21** %



COBBLES	GRAVEL		SAND			SILT OR CLAY
	COARSE	FINE	COARSE	MEDIUM	FINE	

Sample No.	Elev. Or Depth	Classification	% CO <sub>3</sub>	G <sub>s</sub>	Nat w%	LL	PL	PI	Project	
♦ 2	17.5-18.0	SAND, clayey, mostly fine-grained quartz, little carbonate, little clay, dark gray (SC)	21						Topsail Beach, Surf City & North Topsail	
									Area	
									Boring No. T1-03-V-1	
									Date 9/3/2003	

**GRADATION CURVES**





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## VISUAL SHELL CONTENT

### GRAIN SIZE AND VISUAL SHELL CONTENT

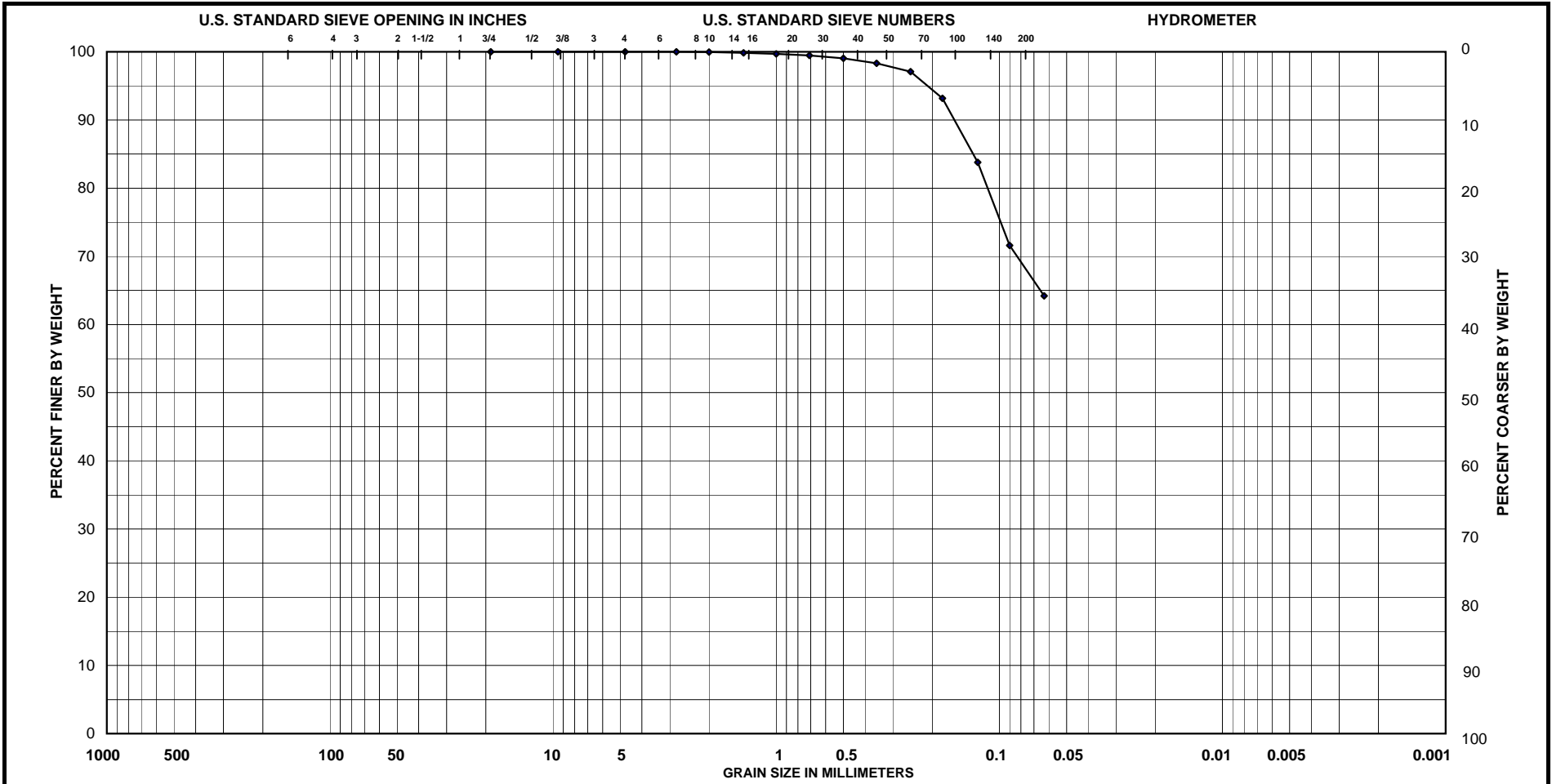
<b>Project:</b>	<b>Topsail Beach, Surf City &amp; North Topsail</b>	<b>Depth:</b>	<b>19.9-20.4</b>
<b>Project No.:</b>	<b>1584-01-40</b>	<b>Date:</b>	<b>9/3/2003</b>
<b>Boring No.:</b>	<b>T1-03-V-1</b>		
<b>Sample No.:</b>	<b>3</b>		
<b>Description:</b>	<b>CLAY, inorganic-H, some fine-grained quartz sand, trace carbonate, trace organic material, dark gray (CH)</b>		

Tare Weight, (g):	50.25	
Dry Wt. Before Washing (g):	175.05	(with tare)
Dry Weight After Washing (g):	95.14	(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	0.05	99.96	40	0.02
#14	1.400	0.12	99.86	40	0.05
#18	1.000	0.21	99.70	30	0.06
#25	0.710	0.28	99.47	20	0.06
#35	0.500	0.54	99.04	20	0.11
#45	0.355	0.89	98.33	5	0.04
#60	0.250	1.56	97.08	1	0.02
#80	0.180	4.86	93.18	1	0.05
#120	0.125	11.71	83.80	1	0.12
#170	0.090	15.21	71.61	1	0.15
#230	0.063	9.27	64.18	1	0.09

**Total Shell Content:**

<b>1</b>	<b>%</b>
----------	----------



COBBLES	GRAVEL		SAND			SILT OR CLAY
	COARSE	FINE	COARSE	MEDIUM	FINE	

Sample No.	Elev. Or Depth	Classification	% CO <sub>3</sub>	G <sub>s</sub>	Nat w%	LL	PL	PI	Project	
♦ 3	19.9-20.4	CLAY, inorganic-H, some fine-grained quartz sand, trace carbonate, trace organic material, dark gray (CH)	1						Topsail Beach, Surf City & North Topsail	
			Area							
			Boring No. T1-03-V-1							
			Date 9/3/2003							

**GRADATION CURVES**



# WOLF TECHNOLOGIES, INC.

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## VISUAL SHELL CONTENT

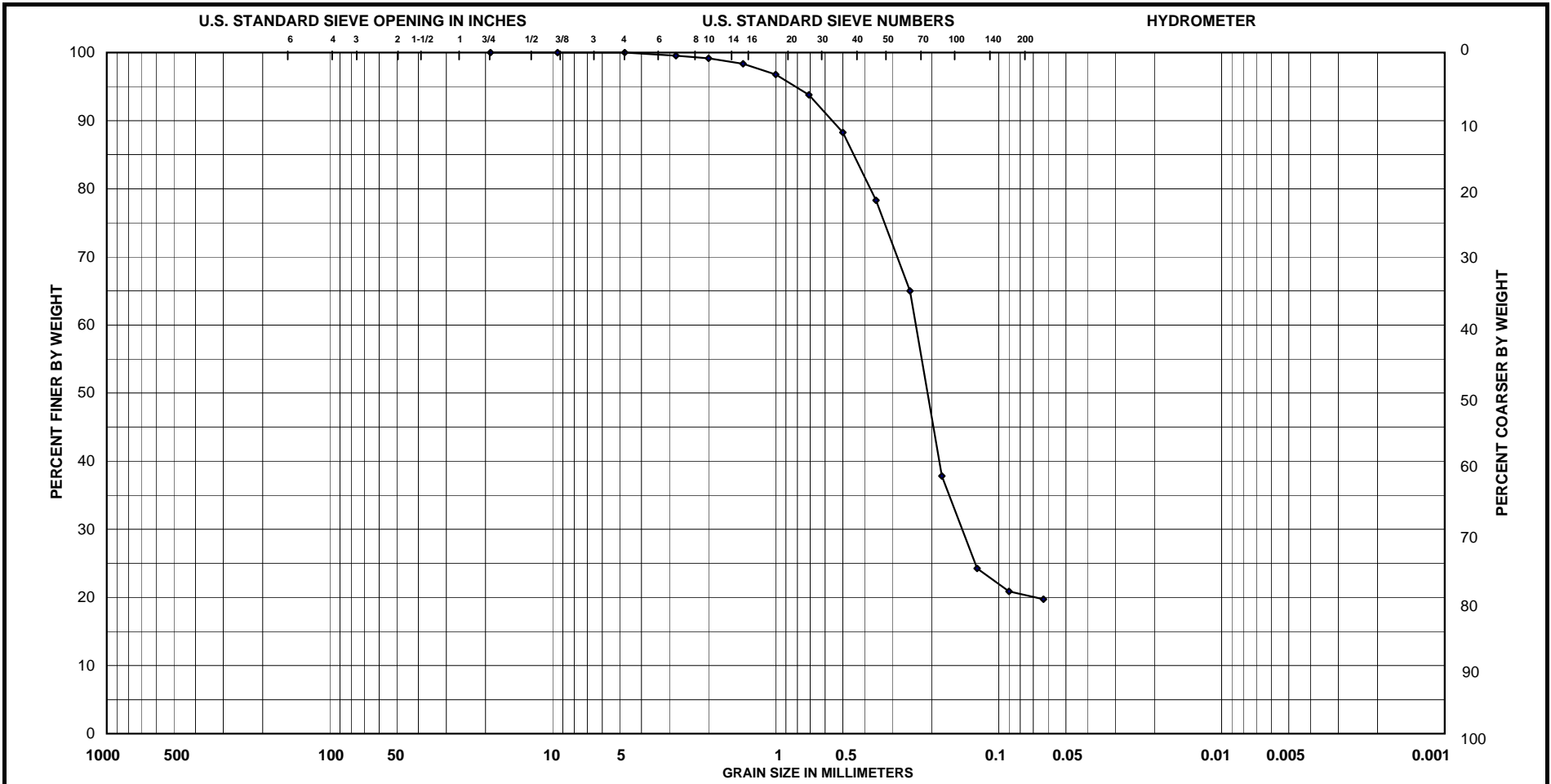
### GRAIN SIZE AND VISUAL SHELL CONTENT

Project:	<b>Topsail Beach, Surf City &amp; North Topsail</b>	Depth:	<b>21.0-21.5</b>
Project No.:	<b>1584-01-40</b>	Date:	<b>9/3/2003</b>
Boring No.:	<b>T1-03-V-1</b>		
Sample No.:	<b>4</b>		
Description:	<b>SAND, clayey, mostly fine-grained quartz, little clay, few organic material, trace carbonate, dark gray (SC)</b>		

Tare Weight, (g):	<b>49.47</b>	
Dry Wt. Before Washing (g):	<b>206.36</b>	(with tare)
Dry Weight After Washing (g):	<b>175.1</b>	(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	0.72	99.54	0	0.00
#10	2.000	0.58	99.17	0	0.00
#14	1.400	1.27	98.36	0	0.00
#18	1.000	2.50	96.77	5	0.13
#25	0.710	4.68	93.79	5	0.23
#35	0.500	8.67	88.26	10	0.87
#45	0.355	15.63	78.30	10	1.56
#60	0.250	20.88	64.99	5	1.04
#80	0.180	42.60	37.84	1	0.43
#120	0.125	21.27	24.28	1	0.21
#170	0.090	5.30	20.90	1	0.05
#230	0.063	1.81	19.75	1	0.02

**Total Shell Content:** **3** %



COBBLES	GRAVEL		SAND			SILT OR CLAY
	COARSE	FINE	COARSE	MEDIUM	FINE	

Sample No.	Elev. Or Depth	Classification	% CO <sub>3</sub>	G <sub>s</sub>	Nat w%	LL	PL	PI	Project	
4	21.0-21.5	SAND, clayey, mostly fine-grained quartz, little clay, few organic material, trace carbonate, dark gray (SC)	3						Topsail Beach, Surf City & North Topsail	
									Area	
									Boring No. T1-03-V-1	
									Date 9/3/2003	

**GRADATION CURVES**



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## VISUAL SHELL CONTENT

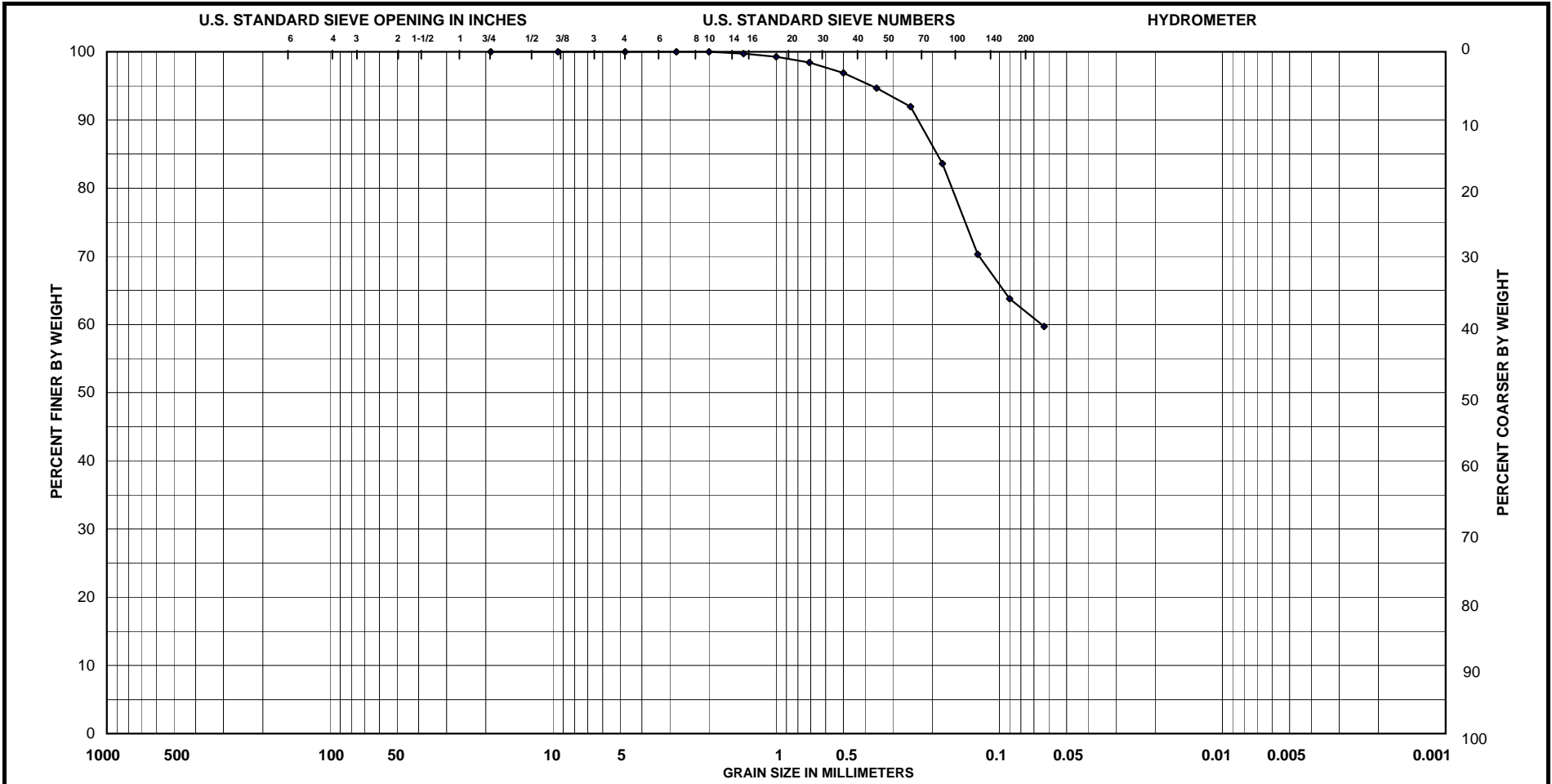
### GRAIN SIZE AND VISUAL SHELL CONTENT

Project:	<b>Topsail Beach, Surf City &amp; North Topsail</b>	Depth:	<b>22.8-23.3</b>
Project No.:	<b>1584-01-40</b>	Date:	<b>9/3/2003</b>
Boring No.:	<b>T1-03-V-1</b>		
Sample No.:	<b>5</b>		
Description:	<b>CLAY, inorganic-H, some fine-grained quartz sand, few organic matter, trace carbonate, dark gray</b>		

Tare Weight, (g):	<b>49.66</b>	
Dry Wt. Before Washing (g):	<b>192.43</b>	(with tare)
Dry Weight After Washing (g):	<b>107.59</b>	(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	0.01	99.99	0	0.00
#14	1.400	0.36	99.74	10	0.04
#18	1.000	0.65	99.29	10	0.07
#25	0.710	1.22	98.43	5	0.06
#35	0.500	2.17	96.91	5	0.11
#45	0.355	3.17	94.69	5	0.16
#60	0.250	3.93	91.94	1	0.04
#80	0.180	11.92	83.59	1	0.12
#120	0.125	18.99	70.29	1	0.19
#170	0.090	9.28	63.79	1	0.09
#230	0.063	5.84	59.70	1	0.06

**Total Shell Content:** **1** %



COBBLES	GRAVEL		SAND			SILT OR CLAY
	COARSE	FINE	COARSE	MEDIUM	FINE	

Sample No.	Elev. Or Depth	Classification	% CO <sub>3</sub>	G <sub>s</sub>	Nat w%	LL	PL	PI	Project	
5	22.8-23.3	CLAY, inorganic-H, some fine-grained quartz sand, few organic matter, trace carbonate, dark gray	1						Topsail Beach, Surf City & North Topsail	
									Area	
									Boring No. T1-03-V-1	
									Date 9/3/2003	

**GRADATION CURVES**



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## VISUAL SHELL CONTENT

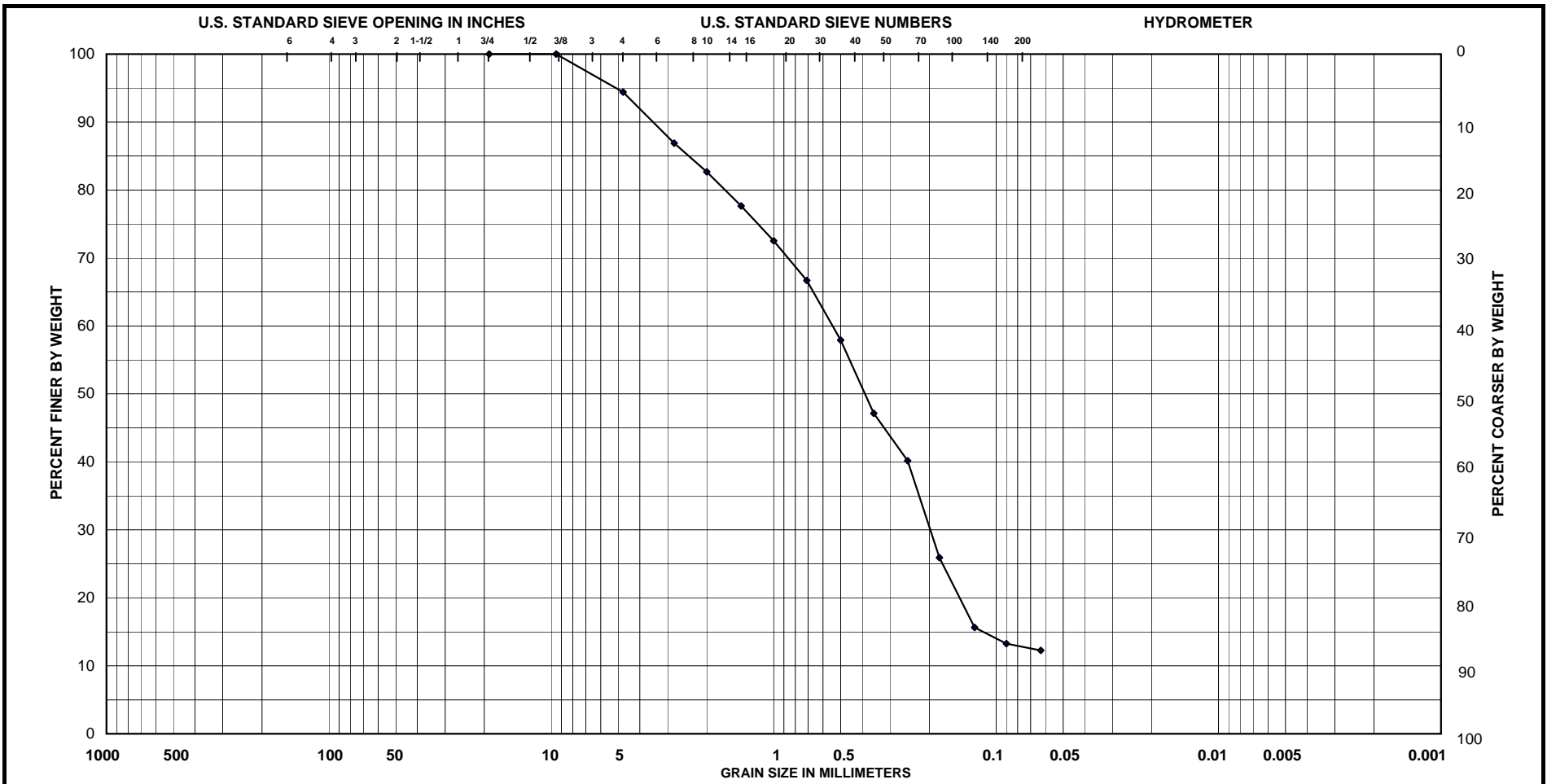
### GRAIN SIZE AND VISUAL SHELL CONTENT

Project:	<b>Topsail Beach, Surf City &amp; North Topsail</b>	Depth:	<b>23.8-24.3</b>
Project No.:	<b>1584-01-40</b>	Date:	<b>9/4/2003</b>
Boring No.:	<b>T1-03-V-1</b>		
Sample No.:	<b>6</b>		
Description:	<b>SAND, clayey, mostly medium to fine-grained quartz, little fragmented limestone, little clay, trace carbonate, gray (SC)</b>		

Tare Weight, (g):	<b>49.96</b>	
Dry Wt. Before Washing (g):	<b>223.98</b>	(with tare)
Dry Weight After Washing (g):	<b>202.63</b>	(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	9.77	94.39	0	0.00
#7	2.800	13.06	86.88	5	0.65
#10	2.000	7.29	82.69	5	0.36
#14	1.400	8.77	77.65	5	0.44
#18	1.000	8.94	72.51	5	0.45
#25	0.710	10.11	66.70	5	0.51
#35	0.500	15.27	57.93	10	1.53
#45	0.355	18.76	47.15	5	0.94
#60	0.250	12.18	40.15	1	0.12
#80	0.180	24.81	25.89	1	0.25
#120	0.125	17.85	15.64	1	0.18
#170	0.090	4.15	13.25	1	0.04
#230	0.063	1.73	12.26	1	0.02

**Total Shell Content:** **3** %



COBBLES	GRAVEL		SAND			SILT OR CLAY
	COARSE	FINE	COARSE	MEDIUM	FINE	

Sample No.	Elev. Or Depth	Classification	% CO <sub>3</sub>	G <sub>s</sub>	Nat w%	LL	PL	PI	Project	
6	23.8-24.3	SAND, clayey, mostly medium to fine-grained quartz, little fragmented limestone, little clay, trace carbonate, gray (SC)	3						Topsail Beach, Surf City & North Topsail	
									Area	
									Boring No. T1-03-V-1	
									Date 9/4/2003	

**GRADATION CURVES**





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## VISUAL SHELL CONTENT

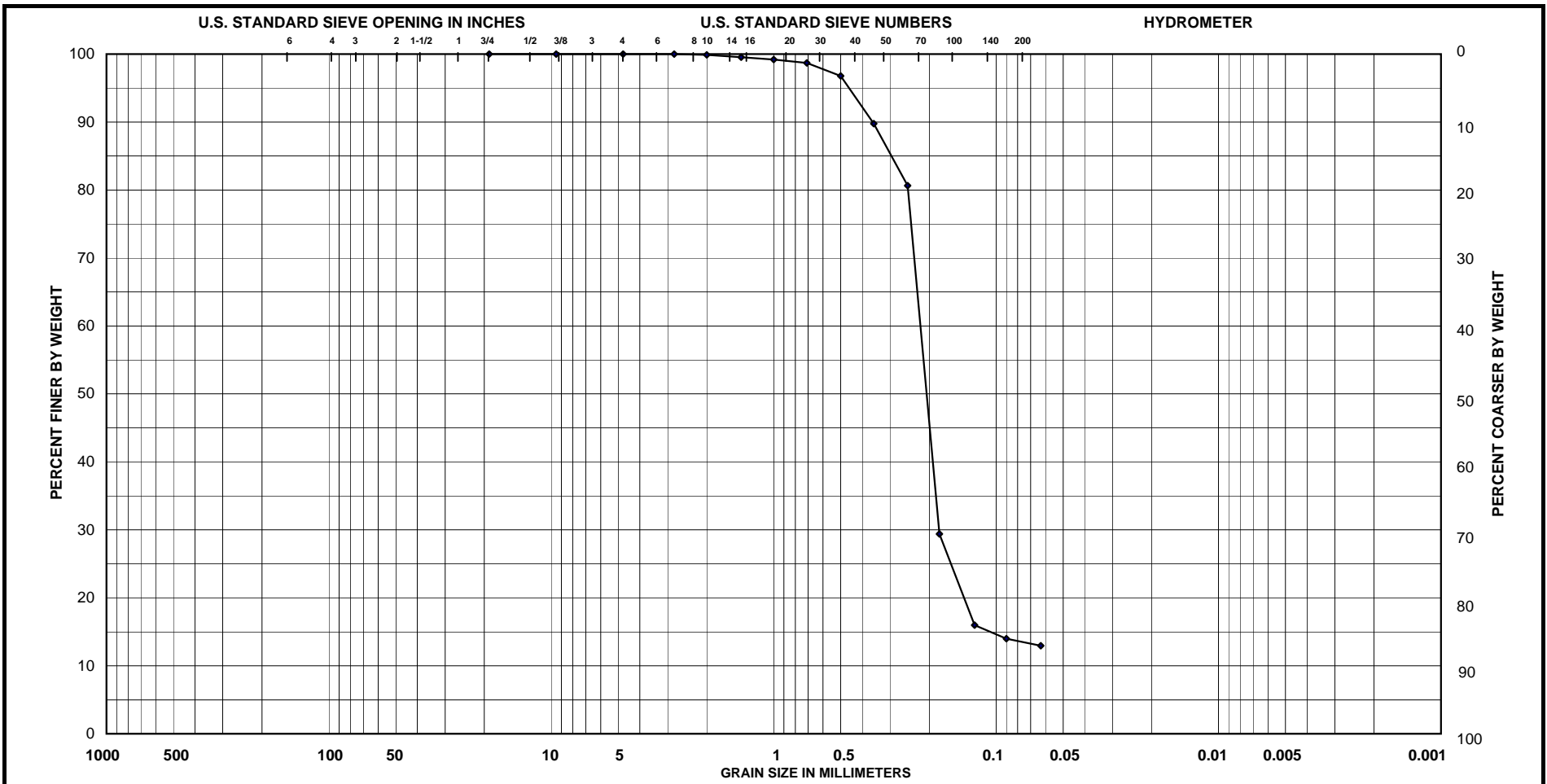
### GRAIN SIZE AND VISUAL SHELL CONTENT

Project:	<b>Topsail Beach, Surf City &amp; North Topsail</b>	Depth:	<b>26.0-26.5</b>
Project No.:	<b>1584-01-40</b>	Date:	<b>9/4/2003</b>
Boring No.:	<b>T1-03-V-1</b>		
Sample No.:	<b>7</b>		
Description:	<b>SAND, silty, mostly fine-grained quartz, little silt, few carbonate, few fragmented limestone, greenish gray (SM)</b>		

Tare Weight, (g):	<b>50.28</b>	
Dry Wt. Before Washing (g):	<b>199.3</b>	(with tare)
Dry Weight After Washing (g):	<b>180.14</b>	(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	0.17	99.88	80	0.14
#14	1.400	0.51	99.54	100	0.51
#18	1.000	0.49	99.21	80	0.39
#25	0.710	0.76	98.70	80	0.61
#35	0.500	2.86	96.78	50	1.43
#45	0.355	10.46	89.76	20	2.09
#60	0.250	13.56	80.66	20	2.71
#80	0.180	76.40	29.39	5	3.82
#120	0.125	19.98	15.98	5	1.00
#170	0.090	2.98	13.98	10	0.30
#230	0.063	1.55	12.94	30	0.47

**Total Shell Content:** **9** %



COBBLES	GRAVEL		SAND			SILT OR CLAY
	COARSE	FINE	COARSE	MEDIUM	FINE	

Sample No.	Elev. Or Depth	Classification	% CO <sub>3</sub>	G <sub>s</sub>	Nat w%	LL	PL	PI	Project
7	26.0-26.5	SAND, silty, mostly fine-grained quartz, little silt, few carbonate, few fragmented limestone, greenish gray (SM)	9						Topsail Beach, Surf City & North Topsail
									Area
									Boring No. T1-03-V-1
									Date 9/4/2003

**GRADATION CURVES**



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## VISUAL SHELL CONTENT

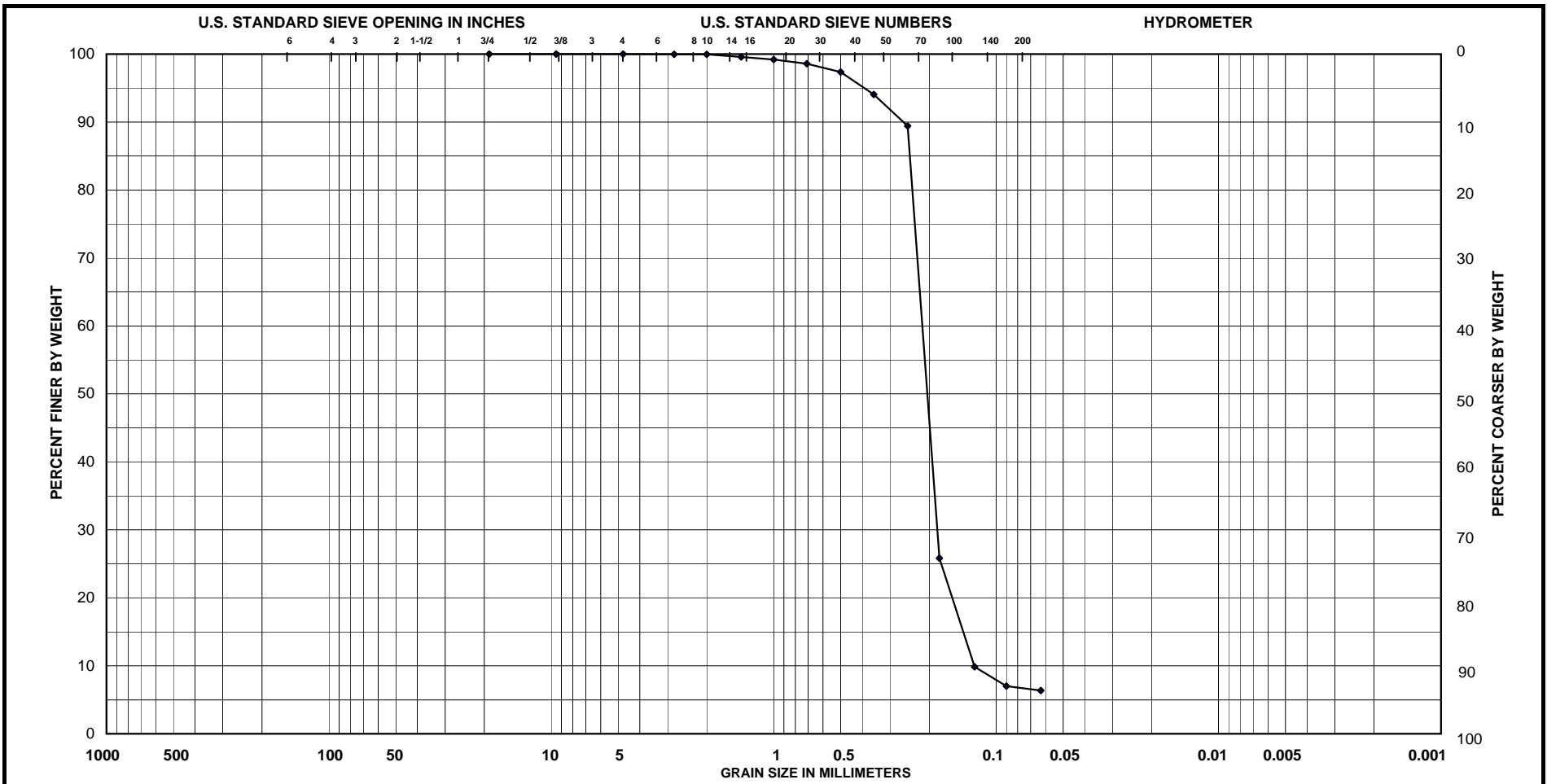
### GRAIN SIZE AND VISUAL SHELL CONTENT

Project:	<b>Topsail Beach, Surf City &amp; North Topsail</b>	Depth:	<b>28.5-29.0</b>
Project No.:	<b>1584-01-40</b>	Date:	<b>9/4/2003</b>
Boring No.:	<b>T1-03-V-1</b>		
Sample No.:	<b>8</b>		
Description:	<b>SAND, poorly-graded with silt, mostly fine-grained quartz, few carbonate, few silt, greenish gray (SP-SM)</b>		

Tare Weight, (g):	<b>50.05</b>	
Dry Wt. Before Washing (g):	<b>197.72</b>	(with tare)
Dry Weight After Washing (g):	<b>188.12</b>	(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	0.03	99.98	100	0.03
#10	2.000	0.01	99.97	100	0.01
#14	1.400	0.56	99.59	100	0.56
#18	1.000	0.61	99.18	90	0.55
#25	0.710	0.89	98.58	90	0.80
#35	0.500	1.82	97.35	60	1.09
#45	0.355	4.84	94.07	30	1.45
#60	0.250	6.87	89.42	20	1.37
#80	0.180	93.90	25.83	5	4.70
#120	0.125	23.59	9.85	5	1.18
#170	0.090	4.18	7.02	10	0.42
#230	0.063	0.97	6.37	40	0.39

**Total Shell Content:** **8** %



COBBLES	GRAVEL		SAND			SILT OR CLAY
	COARSE	FINE	COARSE	MEDIUM	FINE	

Sample No.	Elev. Or Depth	Classification	% CO <sub>3</sub>	G <sub>s</sub>	Nat w%	LL	PL	PI	Project
8	28.5-29.0	SAND, poorly-graded with silt, mostly fine-grained quartz, few carbonate, few silt, greenish gray (SP-SM)	8						Topsail Beach, Surf City & North Topsail
									Area
									Boring No. T1-03-V-1
									Date 9/4/2003

**GRADATION CURVES**



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## VISUAL SHELL CONTENT

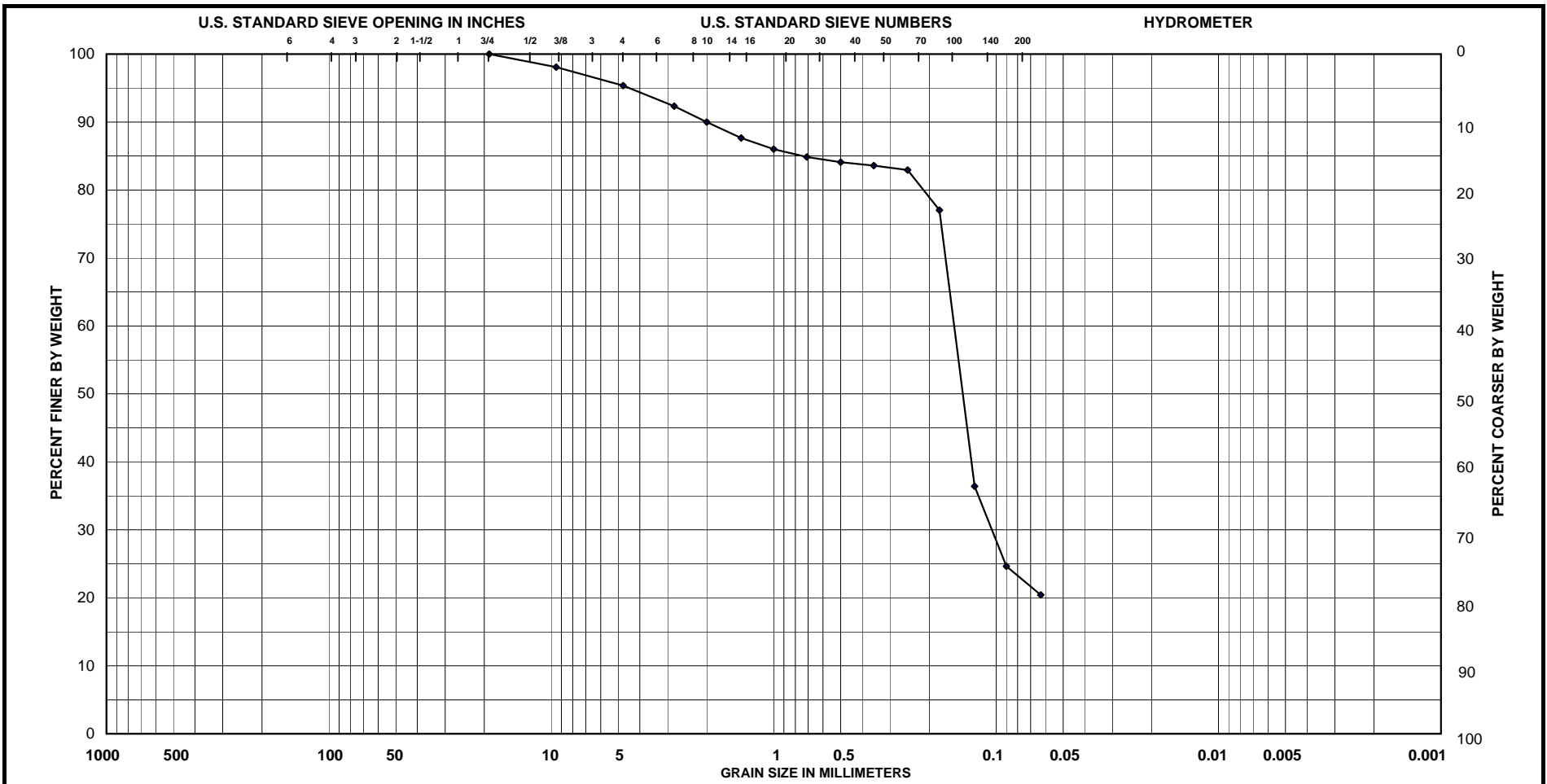
### GRAIN SIZE AND VISUAL SHELL CONTENT

Project:	<b>Topsail Beach, Surf City &amp; North Topsail</b>	Depth:	<b>4.5-5.0</b>
Project No.:	<b>1584-01-40</b>	Date:	<b>9/4/2003</b>
Boring No.:	<b>T1-03-V-2</b>		
Sample No.:	<b>1</b>		
Description:	<b>SAND, clayey, mostly fine-grained quartz, little carbonate, little clay, very dark gray (SC)</b>		

Tare Weight, (g):	<b>50.20</b>	
Dry Wt. Before Washing (g):	<b>172.36</b>	(with tare)
Dry Weight After Washing (g):	<b>147.83</b>	(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	2.35	98.08	100	2.35
#4	4.750	3.33	95.35	100	3.33
#7	2.800	3.68	92.34	100	3.68
#10	2.000	2.88	89.98	100	2.88
#14	1.400	2.85	87.65	100	2.85
#18	1.000	1.99	86.02	100	1.99
#25	0.710	1.43	84.85	100	1.43
#35	0.500	0.94	84.08	100	0.94
#45	0.355	0.60	83.59	85	0.51
#60	0.250	0.78	82.95	60	0.47
#80	0.180	7.23	77.03	20	1.45
#120	0.125	49.62	36.41	5	2.48
#170	0.090	14.38	24.64	1	0.14
#230	0.063	5.15	20.42	1	0.05

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



COBBLES	GRAVEL		SAND			SILT OR CLAY
	COARSE	FINE	COARSE	MEDIUM	FINE	

Sample No.	Elev. Or Depth	Classification	% CO <sub>3</sub>	G <sub>s</sub>	Nat w%	LL	PL	PI	Project	
♦ 1	4.5-5.0	SAND, clayey, mostly fine-grained quartz, little carbonate, little clay, very dark gray (SC)	20						Topsail Beach, Surf City & North Topsail	
									Area	
									Boring No. T1-03-V-2	
									Date 9/4/2003	

**GRADATION CURVES**



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## VISUAL SHELL CONTENT

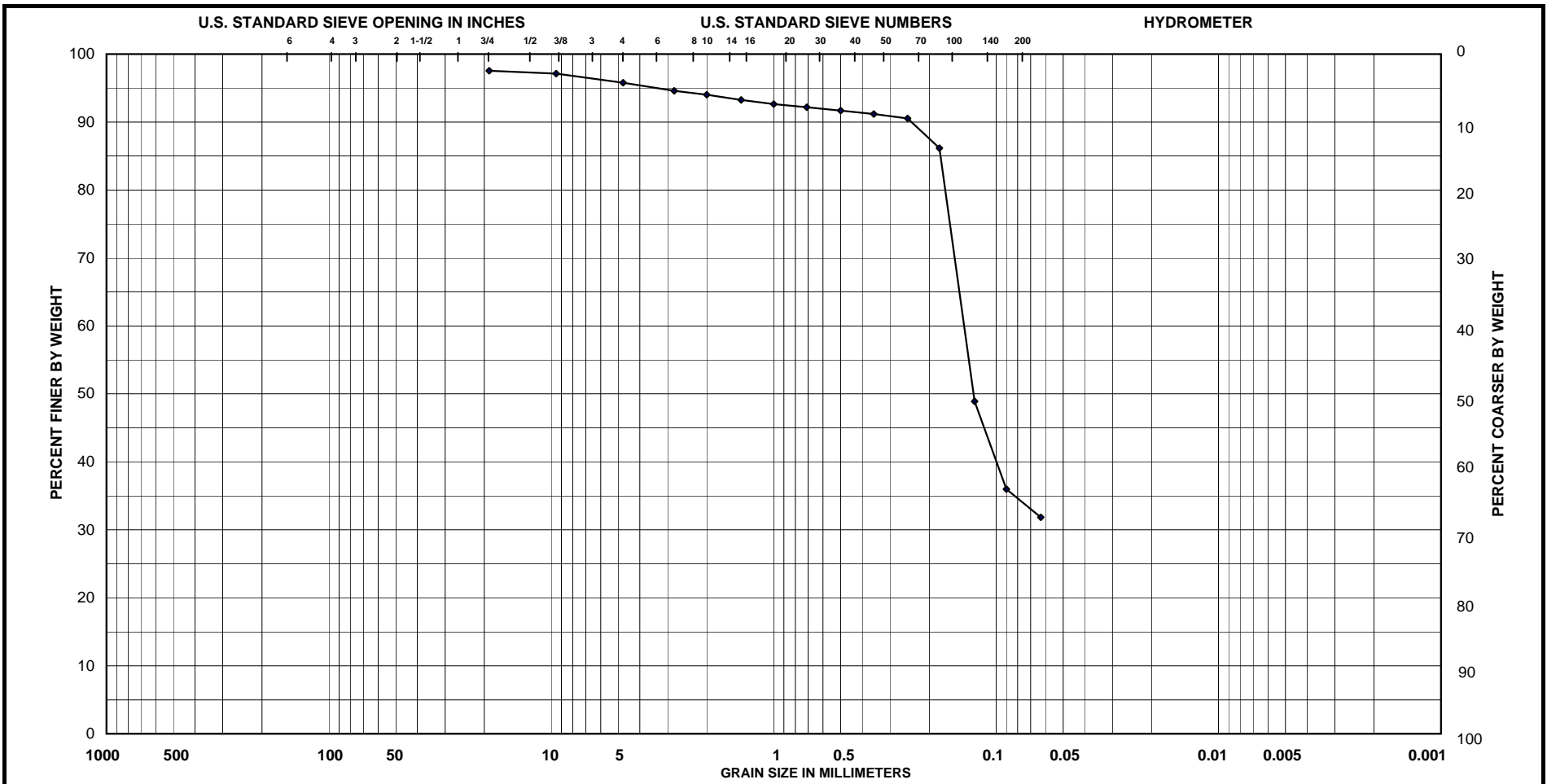
### GRAIN SIZE AND VISUAL SHELL CONTENT

Project:	<b>Topsail Beach, Surf City &amp; North Topsail</b>	Depth:	<b>6.3-6.8</b>
Project No.:	<b>1584-01-40</b>	Date:	<b>9/4/2003</b>
Boring No.:	<b>T1-03-V-2</b>		
Sample No.:	<b>2</b>		
Description:	<b>SAND, clayey, mostly fine-grained quartz, some clay, little carbonate, trace fragmented limestone, dark gray (SC)</b>		

Tare Weight, (g):	<b>50.37</b>	
Dry Wt. Before Washing (g):	<b>152.75</b>	(with tare)
Dry Weight After Washing (g):	<b>120.22</b>	(with tare)

Sieve Size (Name)	Sieve Size (mm)	Weight Retained (g)	% Passing	Approx. Visual Shell %	Approx. Visual Shell Wt. (g)
3/4"	19.000	2.51	97.55	100	2.51
3/8"	9.500	0.44	97.12	100	0.44
#4	4.750	1.36	95.79	100	1.36
#7	2.800	1.22	94.60	100	1.22
#10	2.000	0.59	94.02	100	0.59
#14	1.400	0.77	93.27	100	0.77
#18	1.000	0.63	92.65	100	0.63
#25	0.710	0.49	92.18	90	0.44
#35	0.500	0.50	91.69	80	0.40
#45	0.355	0.52	91.18	80	0.42
#60	0.250	0.68	90.52	70	0.48
#80	0.180	4.46	86.16	40	1.78
#120	0.125	38.14	48.91	15	5.72
#170	0.090	13.24	35.97	5	0.66
#230	0.063	4.24	31.83	1	0.04

**Total Shell Content:** **17** %



COBBLES	GRAVEL		SAND			SILT OR CLAY
	COARSE	FINE	COARSE	MEDIUM	FINE	

Sample No.	Elev. Or Depth	Classification	% CO <sub>3</sub>	G <sub>s</sub>	Nat w%	LL	PL	PI	Project
♦ 2	6.3-6.8	SAND, clayey, mostly fine-grained quartz, some clay, little carbonate, trace fragmented limestone, dark gray (SC)	17						Topsail Beach, Surf City & North Topsail
									Area
									Boring No. T1-03-V-2
									Date 9/4/2003

**GRADATION CURVES**





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## VISUAL SHELL CONTENT

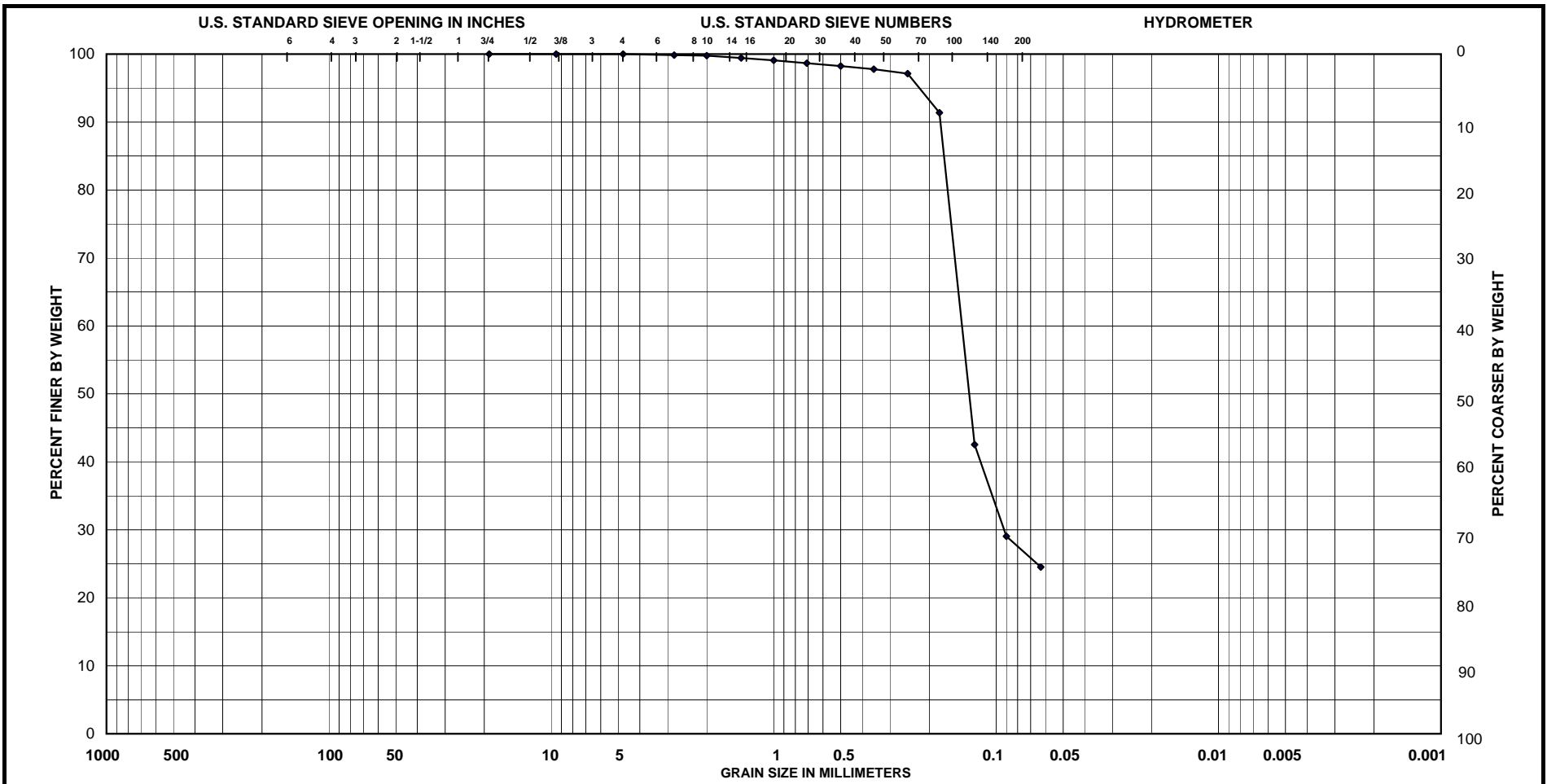
### GRAIN SIZE AND VISUAL SHELL CONTENT

Project:	<b>Topsail Beach, Surf City &amp; North Topsail</b>	Depth:	<b>8.5-9.0</b>
Project No.:	<b>1584-01-40</b>	Date:	<b>9/4/2003</b>
Boring No.:	<b>T1-03-V-2</b>		
Sample No.:	<b>3</b>		
Description:	<b>SAND, clayey, mostly fine-grained quartz, little clay, trace fragmented limestone, trace carbonate, very dark gray (SC)</b>		

Tare Weight, (g):	<b>50.06</b>	
Dry Wt. Before Washing (g):	<b>159.37</b>	(with tare)
Dry Weight After Washing (g):	<b>132.86</b>	(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	0.15	99.86	100	0.15
#10	2.000	0.11	99.76	100	0.11
#14	1.400	0.36	99.43	100	0.36
#18	1.000	0.38	99.09	30	0.11
#25	0.710	0.45	98.67	30	0.14
#35	0.500	0.47	98.24	20	0.09
#45	0.355	0.53	97.76	20	0.11
#60	0.250	0.71	97.11	20	0.14
#80	0.180	6.26	91.38	10	0.63
#120	0.125	53.39	42.54	3	1.60
#170	0.090	14.74	29.05	1	0.15
#230	0.063	4.94	24.54	1	0.05

**Total Shell Content:** **3** %



COBBLES	GRAVEL		SAND			SILT OR CLAY
	COARSE	FINE	COARSE	MEDIUM	FINE	

Sample No.	Elev. Or Depth	Classification	% CO <sub>3</sub>	G <sub>s</sub>	Nat w%	LL	PL	PI	Project	
♦ 3	8.5-9.0	SAND, clayey, mostly fine-grained quartz, little clay, trace fragmented limestone, trace carbonate, very dark gray (SC)	3						Topsail Beach, Surf City & North Topsail	
									Area	
									Boring No. T1-03-V-2	
									Date 9/4/2003	

**GRADATION CURVES**



# WOLF TECHNOLOGIES, INC.

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## VISUAL SHELL CONTENT

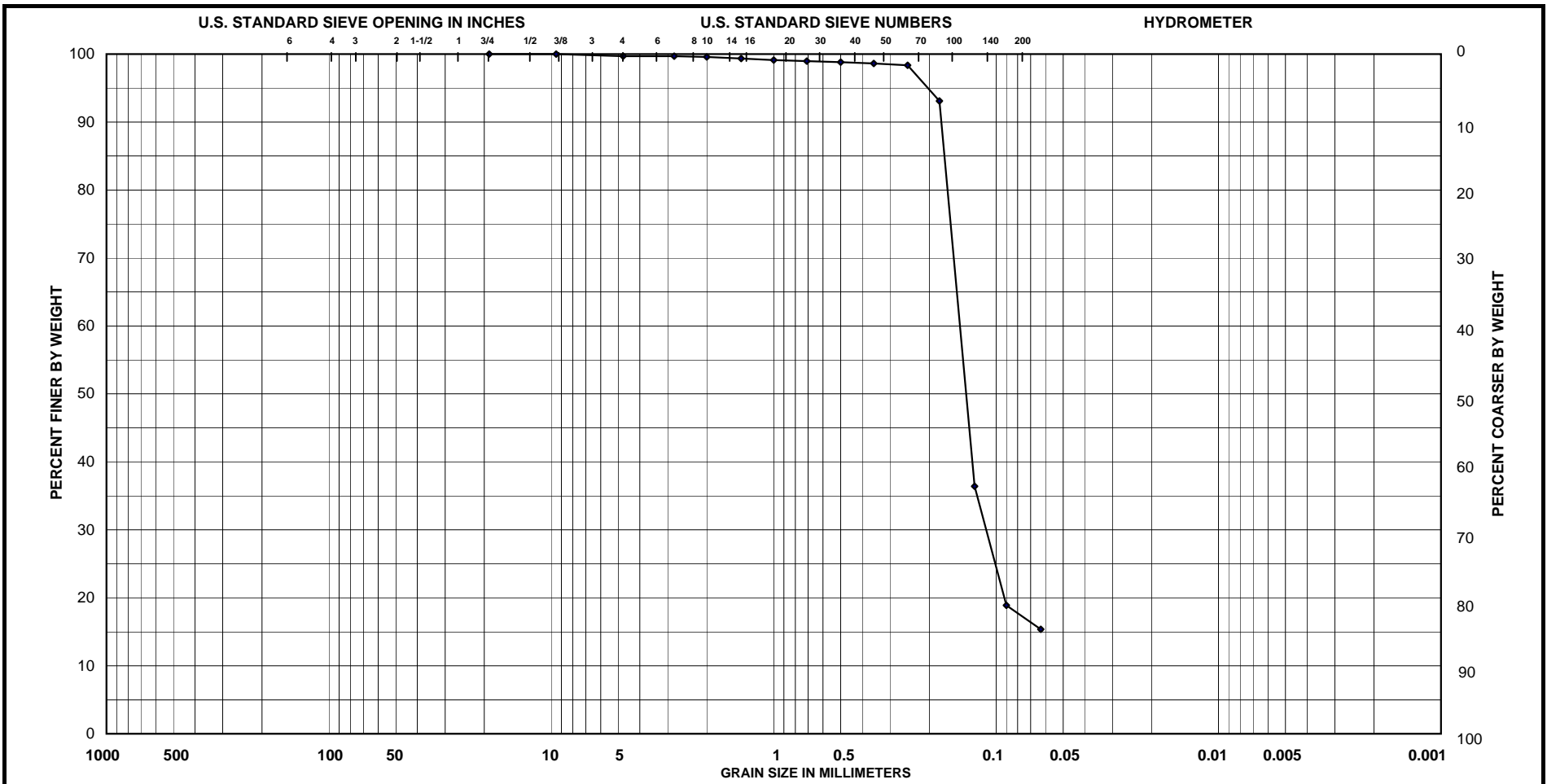
### GRAIN SIZE AND VISUAL SHELL CONTENT

Project:	<b>Topsail Beach, Surf City &amp; North Topsail</b>	Depth:	<b>10.0-10.5</b>
Project No.:	<b>1584-01-40</b>	Date:	<b>9/4/2003</b>
Boring No.:	<b>T1-03-V-2</b>		
Sample No.:	<b>4</b>		
Description:	<b>SAND, clayey, mostly fine-grained quartz, little clay, trace fragmented limestone, trace carbonate, trace organic material, dark gray (SC)</b>		

Tare Weight, (g):	<b>49.57</b>	
Dry Wt. Before Washing (g):	<b>167.43</b>	(with tare)
Dry Weight After Washing (g):	<b>149.44</b>	(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	0.37	99.69	100	0.37
#7	2.800	0.00	99.69	0	0.00
#10	2.000	0.12	99.58	0	0.00
#14	1.400	0.27	99.36	5	0.01
#18	1.000	0.26	99.13	5	0.01
#25	0.710	0.19	98.97	20	0.04
#35	0.500	0.17	98.83	10	0.02
#45	0.355	0.23	98.63	10	0.02
#60	0.250	0.32	98.36	10	0.03
#80	0.180	6.20	93.10	5	0.31
#120	0.125	66.82	36.41	1	0.67
#170	0.090	20.62	18.91	1	0.21
#230	0.063	4.16	15.38	1	0.04

**Total Shell Content:** **1** %



COBBLES	GRAVEL		SAND			SILT OR CLAY
	COARSE	FINE	COARSE	MEDIUM	FINE	

Sample No.	Elev. Or Depth	Classification	% CO <sub>3</sub>	G <sub>s</sub>	Nat w%	LL	PL	PI	Project	
4	10.0-10.5	SAND, clayey, mostly fine-grained quartz, little clay, trace fragmented limestone, trace carbonate, trace organic material, dark gray (SC)	1						Topsail Beach, Surf City & North Topsail	
									Area	
									Boring No. T1-03-V-2	
									Date 9/4/2003	

**GRADATION CURVES**



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## VISUAL SHELL CONTENT

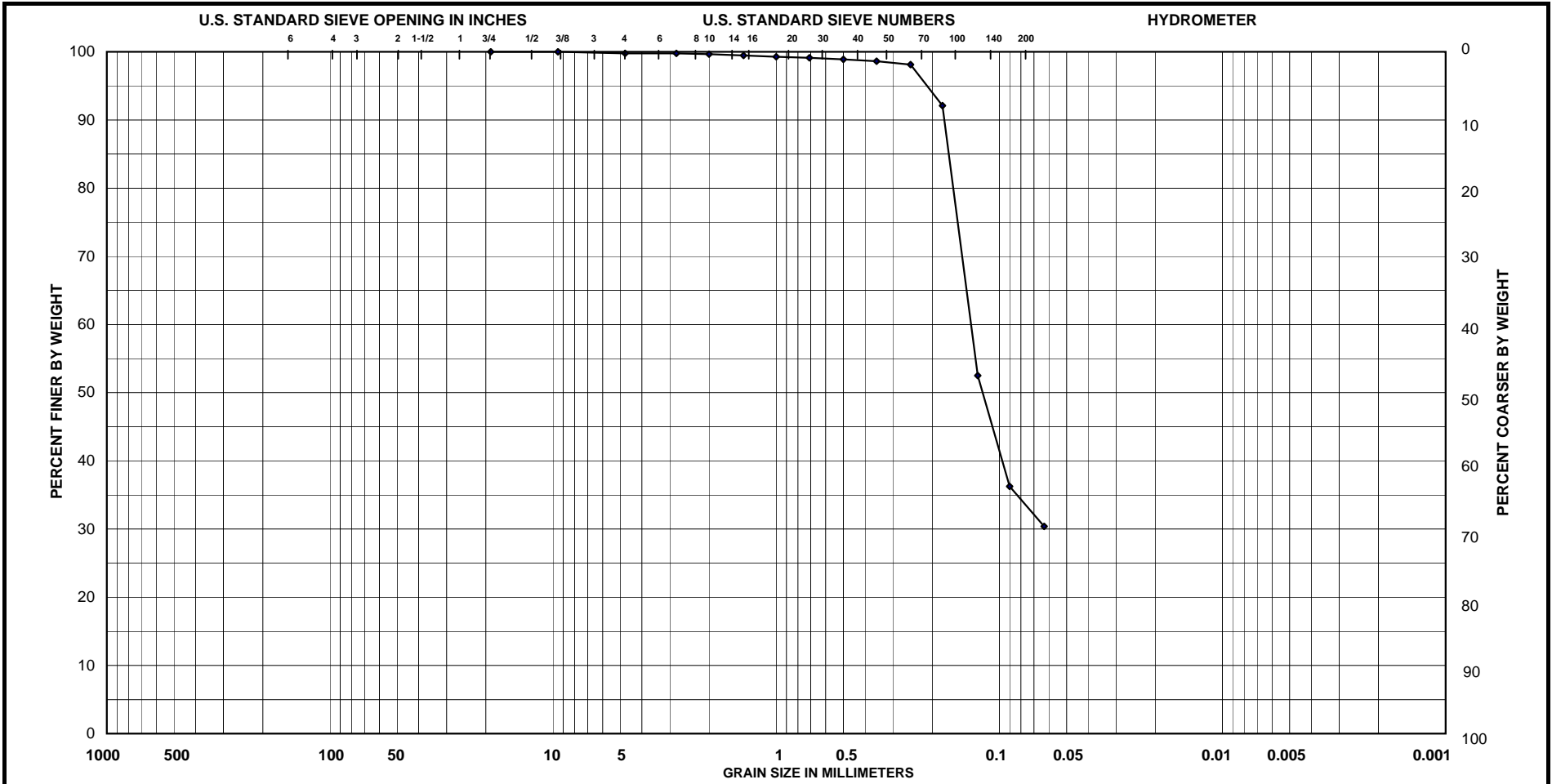
### GRAIN SIZE AND VISUAL SHELL CONTENT

Project:	<b>Topsail Beach, Surf City &amp; North Topsail</b>	Depth:	<b>12.0-12.5</b>
Project No.:	<b>1584-01-40</b>	Date:	<b>9/4/2003</b>
Boring No.:	<b>T1-03-V-2</b>		
Sample No.:	<b>5</b>		
Description:	<b>SAND, clayey, mostly fine-grained quartz, some clay, trace fragmented limestone, trace carbonate, dark gray (SC)</b>		

Tare Weight, (g):	<b>50.22</b>	
Dry Wt. Before Washing (g):	<b>149.41</b>	(with tare)
Dry Weight After Washing (g):	<b>119.51</b>	(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	0.23	99.77	100	0.23
#7	2.800	0.00	99.77	0	0.00
#10	2.000	0.12	99.65	80	0.10
#14	1.400	0.18	99.47	100	0.18
#18	1.000	0.19	99.27	50	0.10
#25	0.710	0.16	99.11	40	0.06
#35	0.500	0.23	98.88	30	0.07
#45	0.355	0.27	98.61	20	0.05
#60	0.250	0.50	98.10	20	0.10
#80	0.180	5.95	92.11	5	0.30
#120	0.125	39.29	52.50	1	0.39
#170	0.090	16.10	36.26	1	0.16
#230	0.063	5.82	30.40	1	0.06

**Total Shell Content:** **2** %



COBBLES	GRAVEL		SAND			SILT OR CLAY
	COARSE	FINE	COARSE	MEDIUM	FINE	

Sample No.	Elev. Or Depth	Classification	% CO <sub>3</sub>	G <sub>s</sub>	Nat w%	LL	PL	PI	Project	
5	12.0-12.5	SAND, clayey, mostly fine-grained quartz, some clay, trace fragmented limestone, trace carbonate, dark gray (SC)	2						Topsail Beach, Surf City & North Topsail	
									Area	
									Boring No. T1-03-V-2	
									Date 9/4/2003	

**GRADATION CURVES**



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## VISUAL SHELL CONTENT

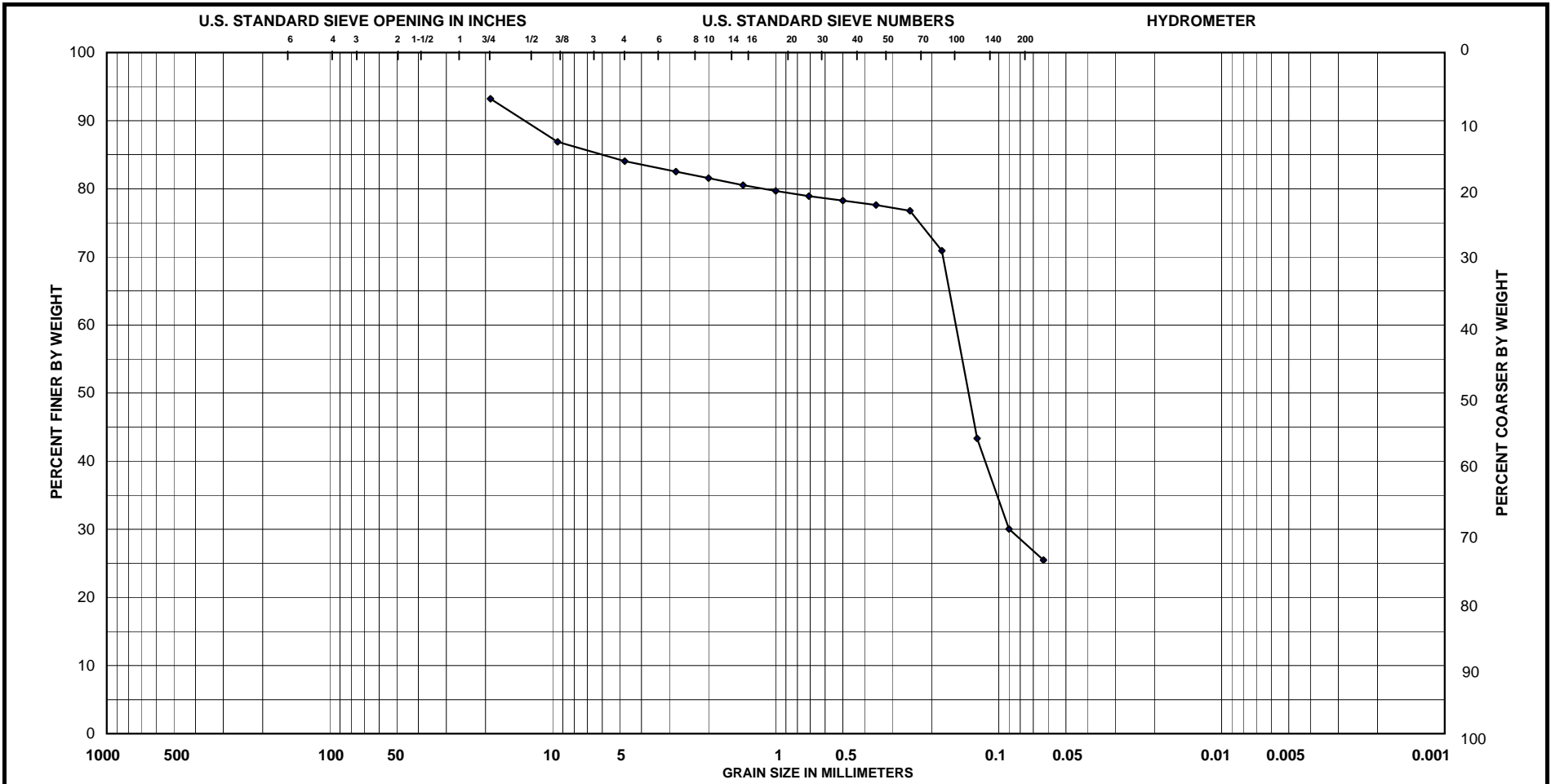
### GRAIN SIZE AND VISUAL SHELL CONTENT

Project:	<b>Topsail Beach, Surf City &amp; North Topsail</b>	Depth:	<b>13.7-14.2</b>
Project No.:	<b>1584-01-40</b>	Date:	<b>9/4/2003</b>
Boring No.:	<b>T1-03-V-2</b>		
Sample No.:	<b>6</b>		
Description:	<b>SAND, clayey, mostly fine-grained quartz, little carbonate, little clay, trace fragmented limestone, dark gray (SC)</b>		

Tare Weight, (g):	<b>50.75</b>	
Dry Wt. Before Washing (g):	<b>157.31</b>	(with tare)
Dry Weight After Washing (g):	<b>130.17</b>	(with tare)

Sieve Size (Name)	Sieve Size (mm)	Weight Retained (g)	% Passing	Approx. Visual Shell %	Approx. Visual Shell Wt. (g)
3/4"	19.000	7.21	93.23	100	7.21
3/8"	9.500	6.75	86.90	100	6.75
#4	4.750	3.04	84.05	100	3.04
#7	2.800	1.61	82.54	100	1.61
#10	2.000	1.03	81.57	100	1.03
#14	1.400	1.11	80.53	100	1.11
#18	1.000	0.88	79.70	80	0.70
#25	0.710	0.83	78.92	70	0.58
#35	0.500	0.68	78.28	70	0.48
#45	0.355	0.73	77.60	70	0.51
#60	0.250	0.90	76.75	40	0.36
#80	0.180	6.25	70.89	15	0.94
#120	0.125	29.35	43.35	5	1.47
#170	0.090	14.18	30.04	1	0.14
#230	0.063	4.85	25.49	1	0.05

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



COBBLES	GRAVEL		SAND			SILT OR CLAY
	COARSE	FINE	COARSE	MEDIUM	FINE	

Sample No.	Elev. Or Depth	Classification	% CO <sub>3</sub>	G <sub>s</sub>	Nat w%	LL	PL	PI	Project	
6	13.7-14.2	SAND, clayey, mostly fine-grained quartz, little carbonate, little clay, trace fragmented limestone, dark gray (SC)	24						Topsail Beach, Surf City & North Topsail	
									Area	
									Boring No. T1-03-V-2	
									Date 9/4/2003	

**GRADATION CURVES**





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## VISUAL SHELL CONTENT

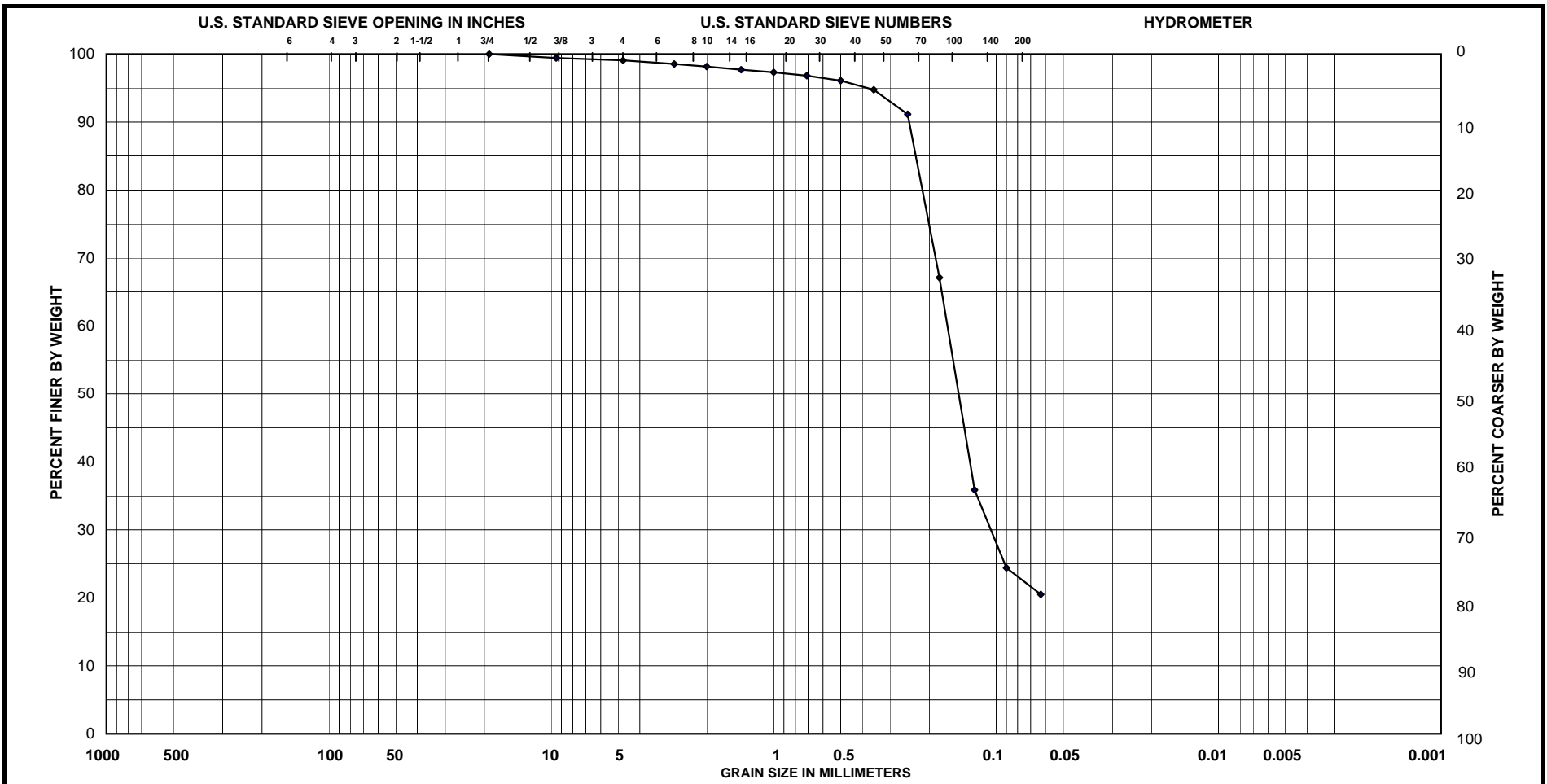
### GRAIN SIZE AND VISUAL SHELL CONTENT

Project:	<b>Topsail Beach, Surf City &amp; North Topsail</b>	Depth:	<b>15.3-15.8</b>
Project No.:	<b>1584-01-40</b>	Date:	<b>9/4/2003</b>
Boring No.:	<b>T1-03-V-2</b>		
Sample No.:	<b>7</b>		
Description:	<b>SAND, clayey, mostly fine-grained quartz, little clay, few carbonate, trace fragmented limestone, trace organic material, dark gray (SC)</b>		

Tare Weight, (g):	<b>50.15</b>	
Dry Wt. Before Washing (g):	<b>213.88</b>	(with tare)
Dry Weight After Washing (g):	<b>181.04</b>	(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	0.96	99.41	100	0.96
#4	4.750	0.52	99.10	80	0.42
#7	2.800	0.88	98.56	100	0.88
#10	2.000	0.68	98.14	90	0.61
#14	1.400	0.71	97.71	80	0.57
#18	1.000	0.66	97.31	80	0.53
#25	0.710	0.79	96.82	70	0.55
#35	0.500	1.18	96.10	40	0.47
#45	0.355	2.23	94.74	30	0.67
#60	0.250	5.86	91.16	15	0.88
#80	0.180	39.35	67.13	5	1.97
#120	0.125	51.18	35.87	1	0.51
#170	0.090	18.77	24.41	1	0.19
#230	0.063	6.40	20.50	1	0.06

**Total Shell Content:** **6** %



COBBLES	GRAVEL		SAND			SILT OR CLAY
	COARSE	FINE	COARSE	MEDIUM	FINE	

Sample No.	Elev. Or Depth	Classification	% CO <sub>3</sub>	G <sub>s</sub>	Nat w%	LL	PL	PI	Project	
7	15.3-15.8	SAND, clayey, mostly fine-grained quartz, little clay, few carbonate, trace fragmented limestone, trace organic material, dark gray (SC)	6						Topsail Beach, Surf City & North Topsail	
									Area	
									Boring No. T1-03-V-2	
									Date 9/4/2003	

**GRADATION CURVES**



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## VISUAL SHELL CONTENT

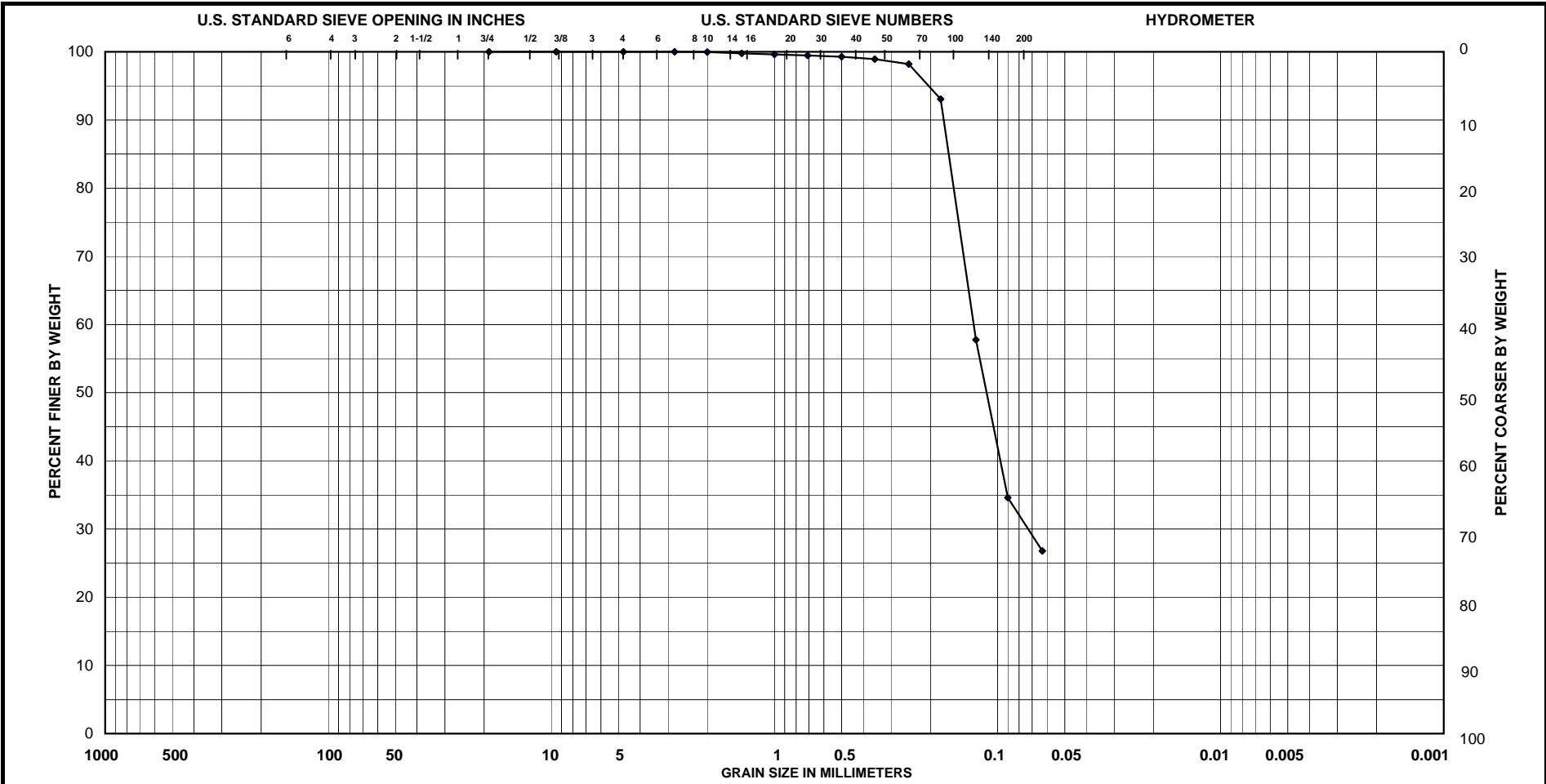
### GRAIN SIZE AND VISUAL SHELL CONTENT

Project:	<b>Topsail Beach, Surf City &amp; North Topsail</b>	Depth:	<b>17.3-17.8</b>
Project No.:	<b>1584-01-40</b>	Date:	<b>9/4/2003</b>
Boring No.:	<b>T1-03-V-2</b>		
Sample No.:	<b>8</b>		
Description:	<b>SAND, clayey, mostly fine-grained quartz, little clay, trace carbonate, trace fragmented limestone, dark gray (SC)</b>		

Tare Weight, (g):	<b>50.11</b>	
Dry Wt. Before Washing (g):	<b>178.77</b>	(with tare)
Dry Weight After Washing (g):	<b>145.22</b>	(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	0.05	99.95	0	0.00
#14	1.400	0.22	99.78	10	0.02
#18	1.000	0.19	99.63	20	0.04
#25	0.710	0.21	99.47	20	0.04
#35	0.500	0.27	99.26	10	0.03
#45	0.355	0.43	98.93	20	0.09
#60	0.250	0.95	98.19	10	0.10
#80	0.180	6.60	93.06	3	0.20
#120	0.125	45.41	57.76	1	0.45
#170	0.090	29.77	34.63	1	0.30
#230	0.063	10.07	26.80	1	0.10

**Total Shell Content:** **1** %



COBBLES	GRAVEL		SAND			SILT OR CLAY
	COARSE	FINE	COARSE	MEDIUM	FINE	

Sample No.	Elev. Or Depth	Classification	% CO <sub>3</sub>	G <sub>s</sub>	Nat w%	LL	PL	PI	Project
♦ 8	17.3-17.8	SAND, clayey, mostly fine-grained quartz, little clay, trace carbonate, trace fragmented limestone, dark gray (SC)	1						Topsail Beach, Surf City & North Topsail
									Area
									Boring No. T1-03-V-2
									Date 9/4/2003

**GRADATION CURVES**



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## VISUAL SHELL CONTENT

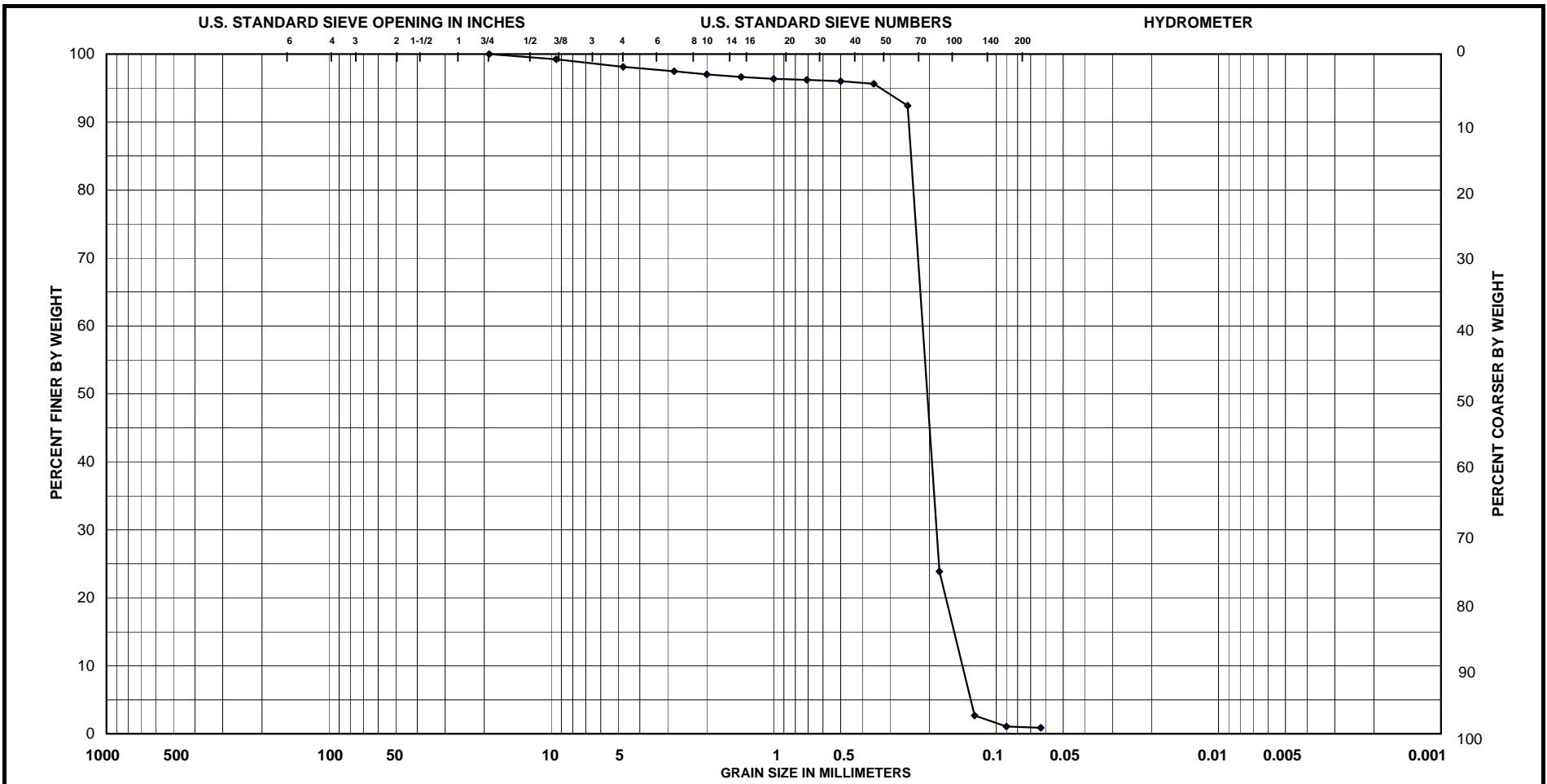
### GRAIN SIZE AND VISUAL SHELL CONTENT

Project:	<b>Topsail Beach, Surf City &amp; North Topsail</b>	Depth:	<b>5.2-5.7</b>
Project No.:	<b>1584-01-40</b>	Date:	<b>9/4/2003</b>
Boring No.:	<b>T1-03-V-3</b>		
Sample No.:	<b>1</b>		
Description:	<b>SAND, poorly-graded, mostly fine-grained quartz, few carbonate, gray (SP)</b>		

Tare Weight, (g):	<b>50.06</b>	
Dry Wt. Before Washing (g):	<b>191.31</b>	(with tare)
Dry Weight After Washing (g):	<b>189.97</b>	(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	1.07	99.24	100	1.07
#4	4.750	1.58	98.12	100	1.58
#7	2.800	0.90	97.49	100	0.90
#10	2.000	0.65	97.03	100	0.65
#14	1.400	0.58	96.62	100	0.58
#18	1.000	0.37	96.35	100	0.37
#25	0.710	0.22	96.20	100	0.22
#35	0.500	0.24	96.03	80	0.19
#45	0.355	0.55	95.64	40	0.22
#60	0.250	4.54	92.42	20	0.91
#80	0.180	96.81	23.89	5	4.84
#120	0.125	29.93	2.70	1	0.30
#170	0.090	2.32	1.05	1	0.02
#230	0.063	0.22	0.90	1	0.00

**Total Shell Content:** **8** %



COBBLES	GRAVEL		SAND			SILT OR CLAY
	COARSE	FINE	COARSE	MEDIUM	FINE	

Sample No.	Elev. Or Depth	Classification	% CO <sub>3</sub>	G <sub>s</sub>	Nat w%	LL	PL	PI	Project
♦ 1	5.2-5.7	SAND, poorly-graded, mostly fine-grained quartz, few carbonate, gray (SP)	8						Topsail Beach, Surf City & North Topsail
									Area
									Boring No. T1-03-V-3
									Date 9/4/2003

**GRADATION CURVES**



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## VISUAL SHELL CONTENT

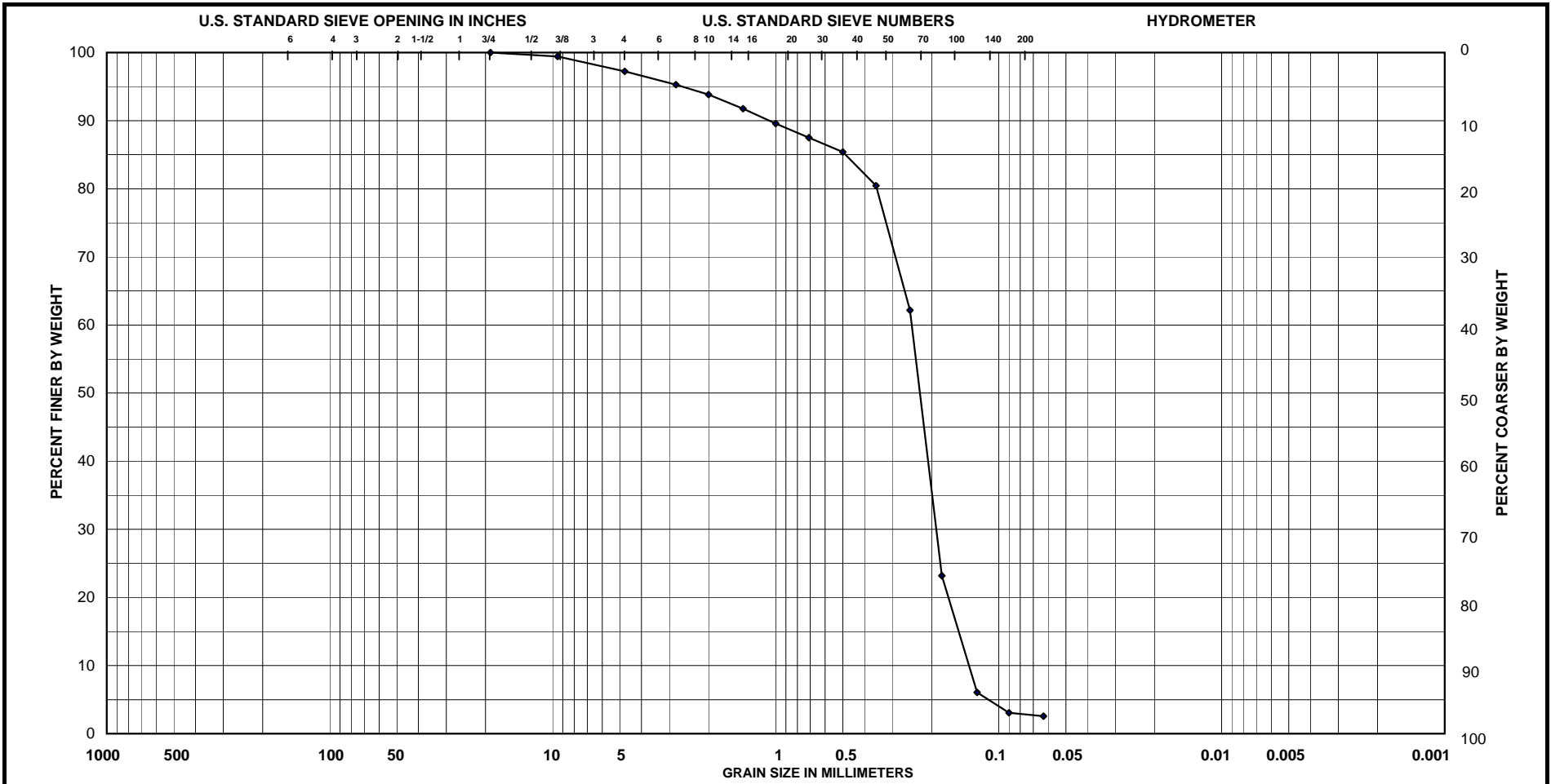
### GRAIN SIZE AND VISUAL SHELL CONTENT

Project:	<b>Topsail Beach, Surf City &amp; North Topsail</b>	Depth:	<b>7.0-7.5</b>
Project No.:	<b>1584-01-40</b>	Date:	<b>9/4/2003</b>
Boring No.:	<b>T1-03-V-3</b>		
Sample No.:	<b>2</b>		
Description:	<b>SAND, poorly-graded, mostly fine-grained quartz, little carbonate, gray (SP)</b>		

Tare Weight, (g):	<b>50.12</b>	
Dry Wt. Before Washing (g):	<b>174.79</b>	(with tare)
Dry Weight After Washing (g):	<b>171.94</b>	(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	0.71	99.43	100	0.71
#4	4.750	2.73	97.24	100	2.73
#7	2.800	2.45	95.28	100	2.45
#10	2.000	1.79	93.84	100	1.79
#14	1.400	2.61	91.75	100	2.61
#18	1.000	2.70	89.58	100	2.70
#25	0.710	2.61	87.49	100	2.61
#35	0.500	2.60	85.40	90	2.34
#45	0.355	6.18	80.44	40	2.47
#60	0.250	22.76	62.19	10	2.28
#80	0.180	48.64	23.17	3	1.46
#120	0.125	21.36	6.04	1	0.21
#170	0.090	3.72	3.06	1	0.04
#230	0.063	0.63	2.55	1	0.01

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



COBBLES	GRAVEL		SAND			SILT OR CLAY
	COARSE	FINE	COARSE	MEDIUM	FINE	

Sample No.	Elev. Or Depth	Classification	% CO <sub>3</sub>	G <sub>s</sub>	Nat w%	LL	PL	PI	Project
2	7.0-7.5	SAND, poorly-graded, mostly fine-grained quartz, little carbonate, gray (SP)	20						Topsail Beach, Surf City & North Topsail
									Area
									Boring No. T1-03-V-3
									Date 9/4/2003

**GRADATION CURVES**





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## VISUAL SHELL CONTENT

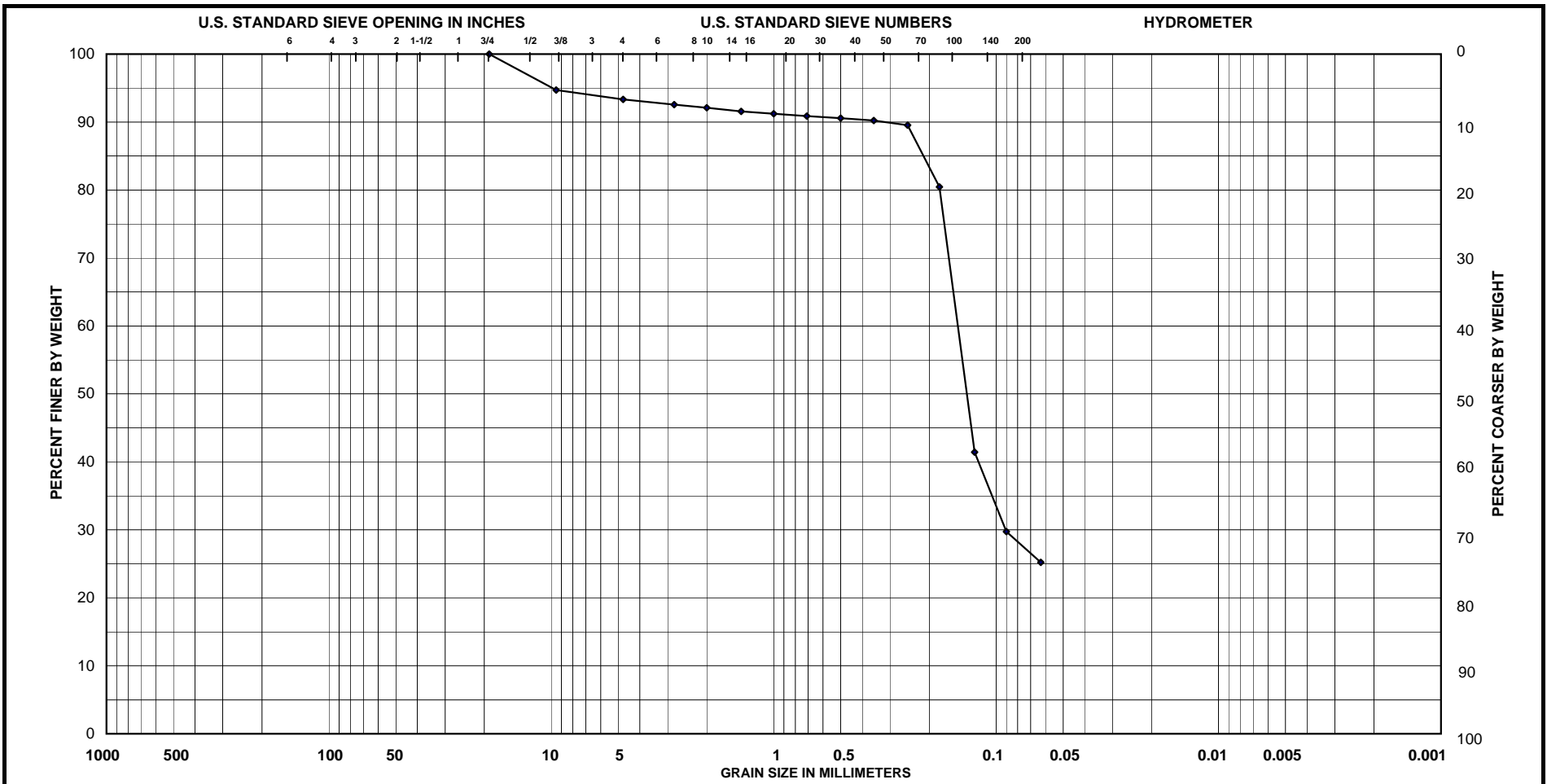
### GRAIN SIZE AND VISUAL SHELL CONTENT

Project:	<b>Topsail Beach, Surf City &amp; North Topsail</b>	Depth:	<b>9.2-9.7</b>
Project No.:	<b>1584-01-40</b>	Date:	<b>9/4/2003</b>
Boring No.:	<b>T1-03-V-3</b>		
Sample No.:	<b>3</b>		
Description:	<b>SAND, clayey, mostly fine-grained quartz, little clay, little carbonate, trace fragmented limestone, dark gray (SC)</b>		

Tare Weight, (g):	<b>50.56</b>	
Dry Wt. Before Washing (g):	<b>190.29</b>	(with tare)
Dry Weight After Washing (g):	<b>155.9</b>	(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	7.41	94.70	100	7.41
#4	4.750	1.90	93.34	100	1.90
#7	2.800	1.09	92.56	100	1.09
#10	2.000	0.64	92.10	100	0.64
#14	1.400	0.74	91.57	100	0.74
#18	1.000	0.50	91.21	80	0.40
#25	0.710	0.48	90.87	70	0.34
#35	0.500	0.42	90.57	80	0.34
#45	0.355	0.50	90.21	80	0.40
#60	0.250	0.94	89.54	70	0.66
#80	0.180	12.68	80.46	20	2.54
#120	0.125	54.52	41.44	5	2.73
#170	0.090	16.35	29.74	1	0.16
#230	0.063	6.30	25.23	1	0.06

**Total Shell Content:** **14** %



COBBLES	GRAVEL		SAND			SILT OR CLAY
	COARSE	FINE	COARSE	MEDIUM	FINE	

Sample No.	Elev. Or Depth	Classification	% CO <sub>3</sub>	G <sub>s</sub>	Nat w%	LL	PL	PI	Project
♦ 3	9.2-9.7	SAND, clayey, mostly fine-grained quartz, little clay, little carbonate, trace fragmented limestone, dark gray (SC)	14						Topsail Beach, Surf City & North Topsail
									Area
									Boring No. T1-03-V-3
									Date 9/4/2003

**GRADATION CURVES**



# WOLF TECHNOLOGIES, INC.

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

## VISUAL SHELL CONTENT

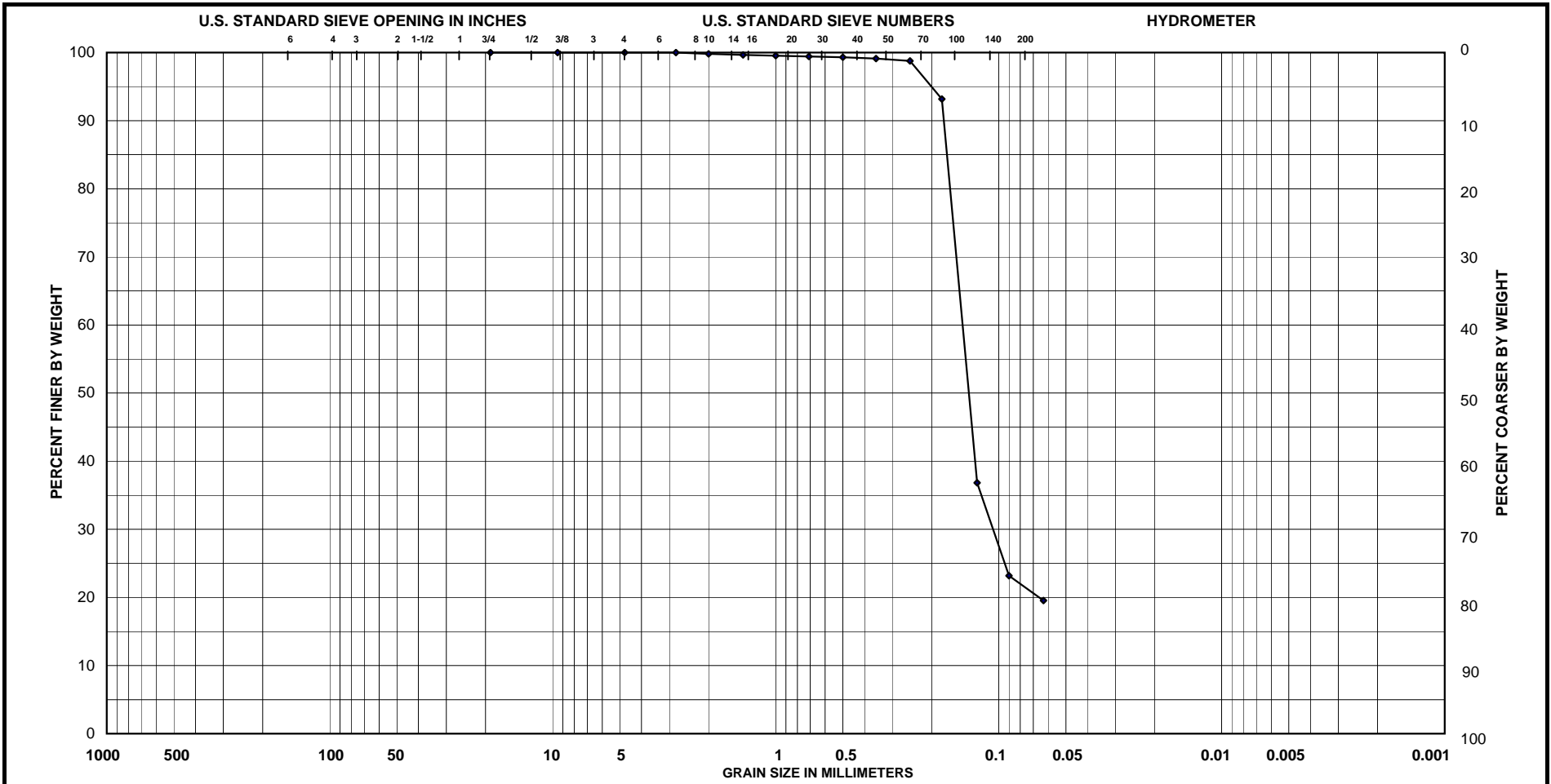
### GRAIN SIZE AND VISUAL SHELL CONTENT

Project:	<b>Topsail Beach, Surf City &amp; North Topsail</b>	Depth:	<b>11.0-11.5</b>
Project No.:	<b>1584-01-40</b>	Date:	<b>9/4/2003</b>
Boring No.:	<b>T1-03-V-3</b>		
Sample No.:	<b>4</b>		
Description:	<b>SAND, clayey, mostly fine-grained quartz, little clay, trace carbonate, trace fragmented limestone, dark gray (SC)</b>		

Tare Weight, (g):	<b>50.44</b>	
Dry Wt. Before Washing (g):	<b>189.17</b>	(with tare)
Dry Weight After Washing (g):	<b>162.67</b>	(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	0.25	99.81	0	0.00
#14	1.400	0.24	99.64	10	0.02
#18	1.000	0.14	99.54	20	0.03
#25	0.710	0.16	99.42	25	0.04
#35	0.500	0.16	99.31	25	0.04
#45	0.355	0.24	99.14	15	0.04
#60	0.250	0.50	98.77	10	0.05
#80	0.180	7.77	93.17	5	0.39
#120	0.125	78.18	36.82	1	0.78
#170	0.090	18.91	23.19	1	0.19
#230	0.063	5.06	19.54	1	0.05

**Total Shell Content:** **1** %



COBBLES	GRAVEL		SAND			SILT OR CLAY
	COARSE	FINE	COARSE	MEDIUM	FINE	

Sample No.	Elev. Or Depth	Classification	% CO <sub>3</sub>	G <sub>s</sub>	Nat w%	LL	PL	PI	Project	
4	11.0-11.5	SAND, clayey, mostly fine-grained quartz, little clay, trace carbonate, trace fragmented limestone, dark gray (SC)	1						Topsail Beach, Surf City & North Topsail	
									Area	
									Boring No. T1-03-V-3	
									Date 9/4/2003	

**GRADATION CURVES**



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## VISUAL SHELL CONTENT

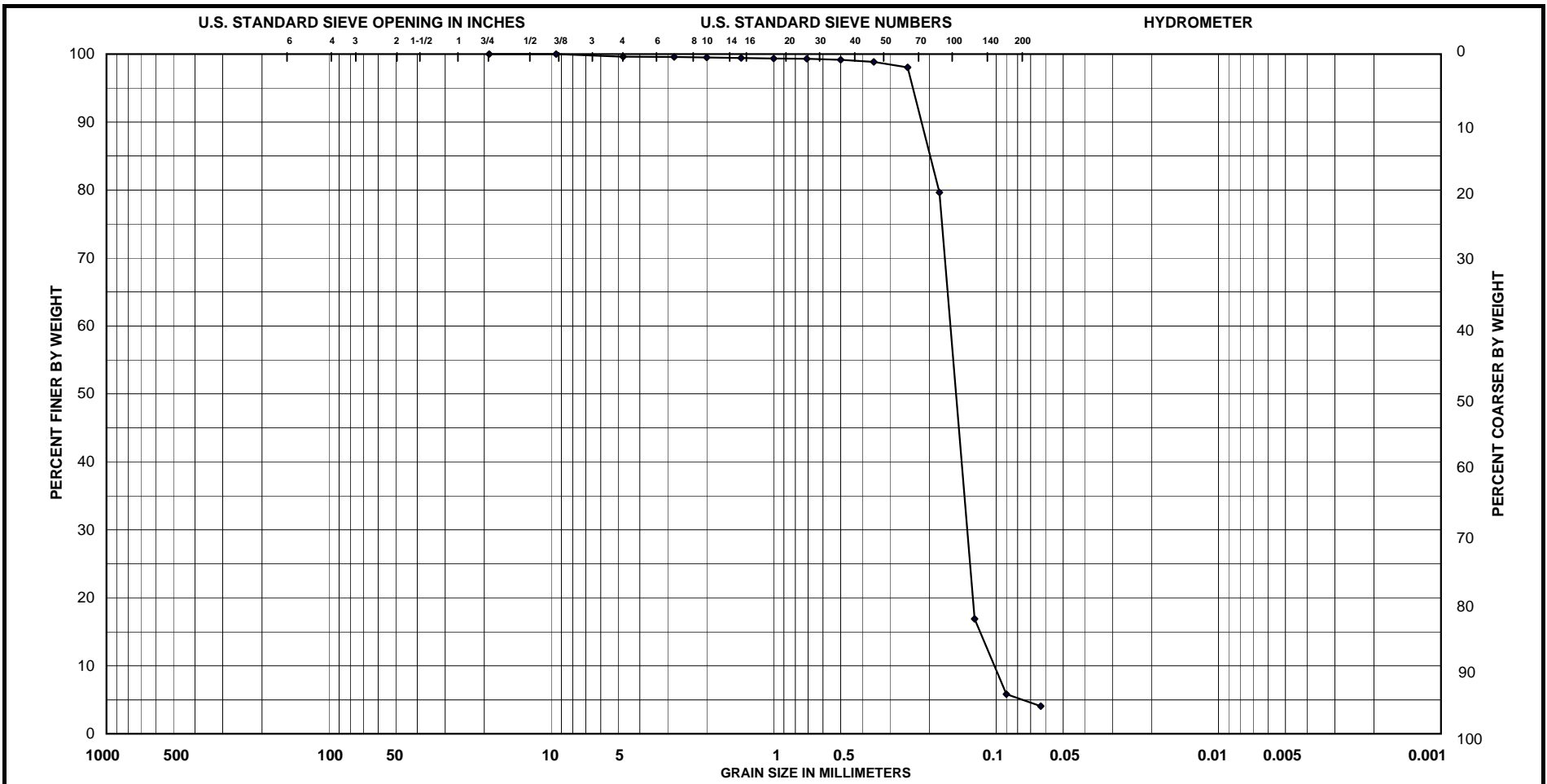
### GRAIN SIZE AND VISUAL SHELL CONTENT

Project:	<b>Topsail Beach, Surf City &amp; North Topsail</b>	Depth:	<b>12.2-12.7</b>
Project No.:	<b>1584-01-40</b>	Date:	<b>9/5/2003</b>
Boring No.:	<b>T1-03-V-3</b>		
Sample No.:	<b>5</b>		
Description:	<b>SAND, poorly-graded, mostly fine-grained quartz, trace carbonate, trace fragmented limestone, gray (SP)</b>		

Tare Weight, (g):	<b>50.34</b>	
Dry Wt. Before Washing (g):	<b>179.53</b>	(with tare)
Dry Weight After Washing (g):	<b>174.26</b>	(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	0.51	99.61	100	0.51
#7	2.800	0.04	99.57	100	0.04
#10	2.000	0.08	99.51	100	0.08
#14	1.400	0.12	99.42	80	0.10
#18	1.000	0.09	99.35	80	0.07
#25	0.710	0.07	99.30	30	0.02
#35	0.500	0.18	99.16	40	0.07
#45	0.355	0.38	98.86	30	0.11
#60	0.250	1.04	98.06	15	0.16
#80	0.180	23.80	79.63	5	1.19
#120	0.125	81.05	16.90	1	0.81
#170	0.090	14.30	5.83	1	0.14
#230	0.063	2.30	4.05	1	0.02

**Total Shell Content:** **3** %



COBBLES	GRAVEL		SAND			SILT OR CLAY
	COARSE	FINE	COARSE	MEDIUM	FINE	

Sample No.	Elev. Or Depth	Classification	% CO <sub>3</sub>	G <sub>s</sub>	Nat w%	LL	PL	PI	Project	
5	12.2-12.7	SAND, poorly-graded, mostly fine-grained quartz, trace carbonate, trace fragmented limestone, gray (SP)	3						Topsail Beach, Surf City & North Topsail	
									Area	
									Boring No. T1-03-V-3	
									Date 9/5/2003	

**GRADATION CURVES**



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## VISUAL SHELL CONTENT

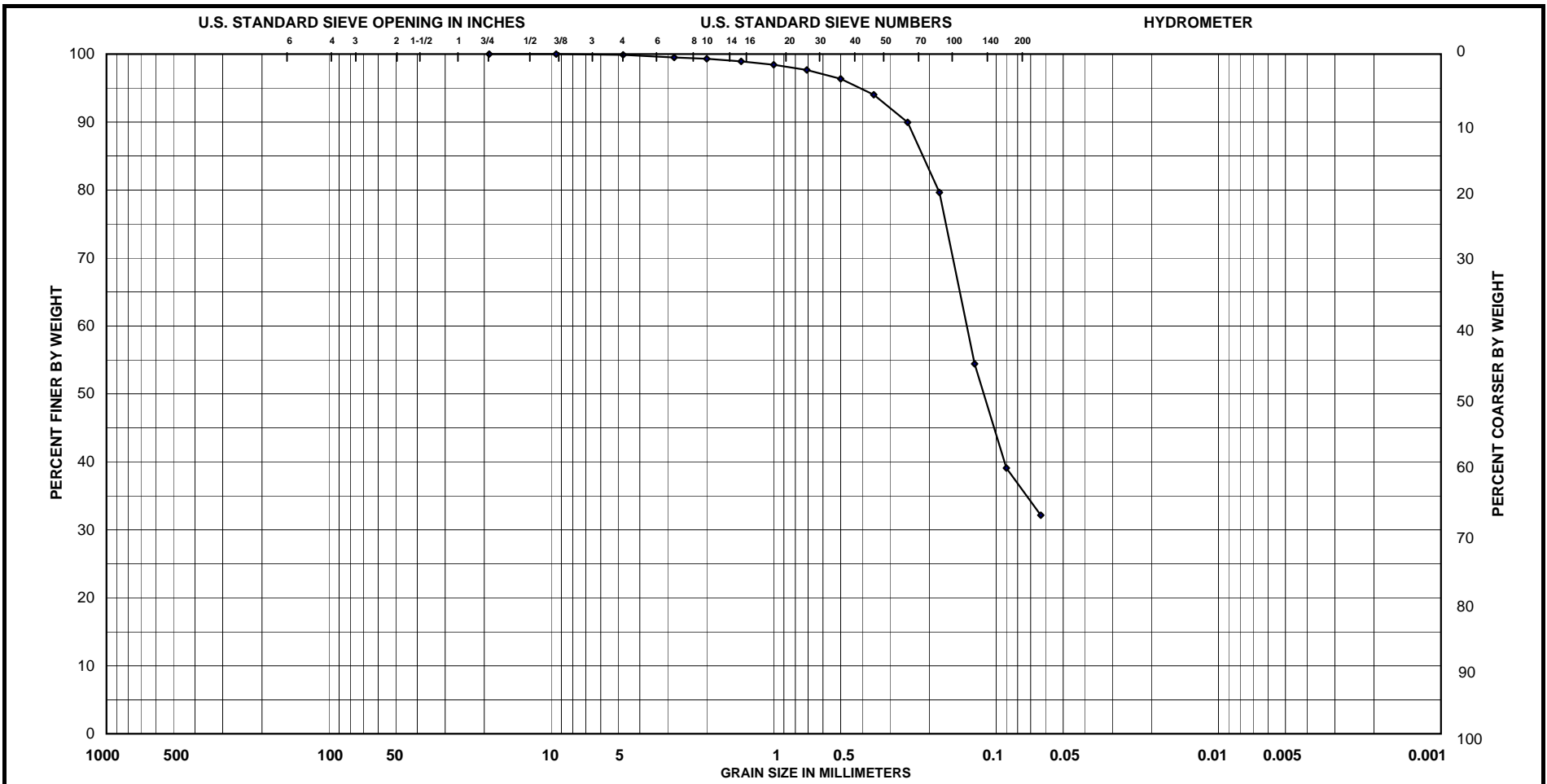
### GRAIN SIZE AND VISUAL SHELL CONTENT

Project:	<b>Topsail Beach, Surf City &amp; North Topsail</b>	Depth:	<b>13.0-13.5</b>
Project No.:	<b>1584-01-40</b>	Date:	<b>9/5/2003</b>
Boring No.:	<b>T1-03-V-3</b>		
Sample No.:	<b>6</b>		
Description:	<b>SAND, clayey, mostly fine-grained quartz, some clay, trace carbonate, trace fragmented limestone, trace organic material, dark gray (SC)</b>		

Tare Weight, (g):	<b>50.22</b>	
Dry Wt. Before Washing (g):	<b>161.12</b>	(with tare)
Dry Weight After Washing (g):	<b>126.13</b>	(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	0.13	99.88	100	0.13
#7	2.800	0.41	99.51	80	0.33
#10	2.000	0.23	99.31	80	0.18
#14	1.400	0.43	98.92	50	0.22
#18	1.000	0.54	98.43	30	0.16
#25	0.710	0.87	97.65	20	0.17
#35	0.500	1.43	96.36	5	0.07
#45	0.355	2.58	94.03	1	0.03
#60	0.250	4.50	89.97	1	0.05
#80	0.180	11.45	79.65	1	0.11
#120	0.125	27.96	54.44	1	0.28
#170	0.090	17.00	39.11	1	0.17
#230	0.063	7.72	32.15	1	0.08

**Total Shell Content:** **2** %



COBBLES	GRAVEL		SAND			SILT OR CLAY
	COARSE	FINE	COARSE	MEDIUM	FINE	

Sample No.	Elev. Or Depth	Classification	% CO <sub>3</sub>	G <sub>s</sub>	Nat w%	LL	PL	PI	Project
6	13.0-13.5	SAND, clayey, mostly fine-grained quartz, some clay, trace carbonate, trace fragmented limestone, trace organic material, dark gray (SC)	2						Topsail Beach, Surf City & North Topsail
									Area
									Boring No. T1-03-V-3
									Date 9/5/2003

**GRADATION CURVES**





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## VISUAL SHELL CONTENT

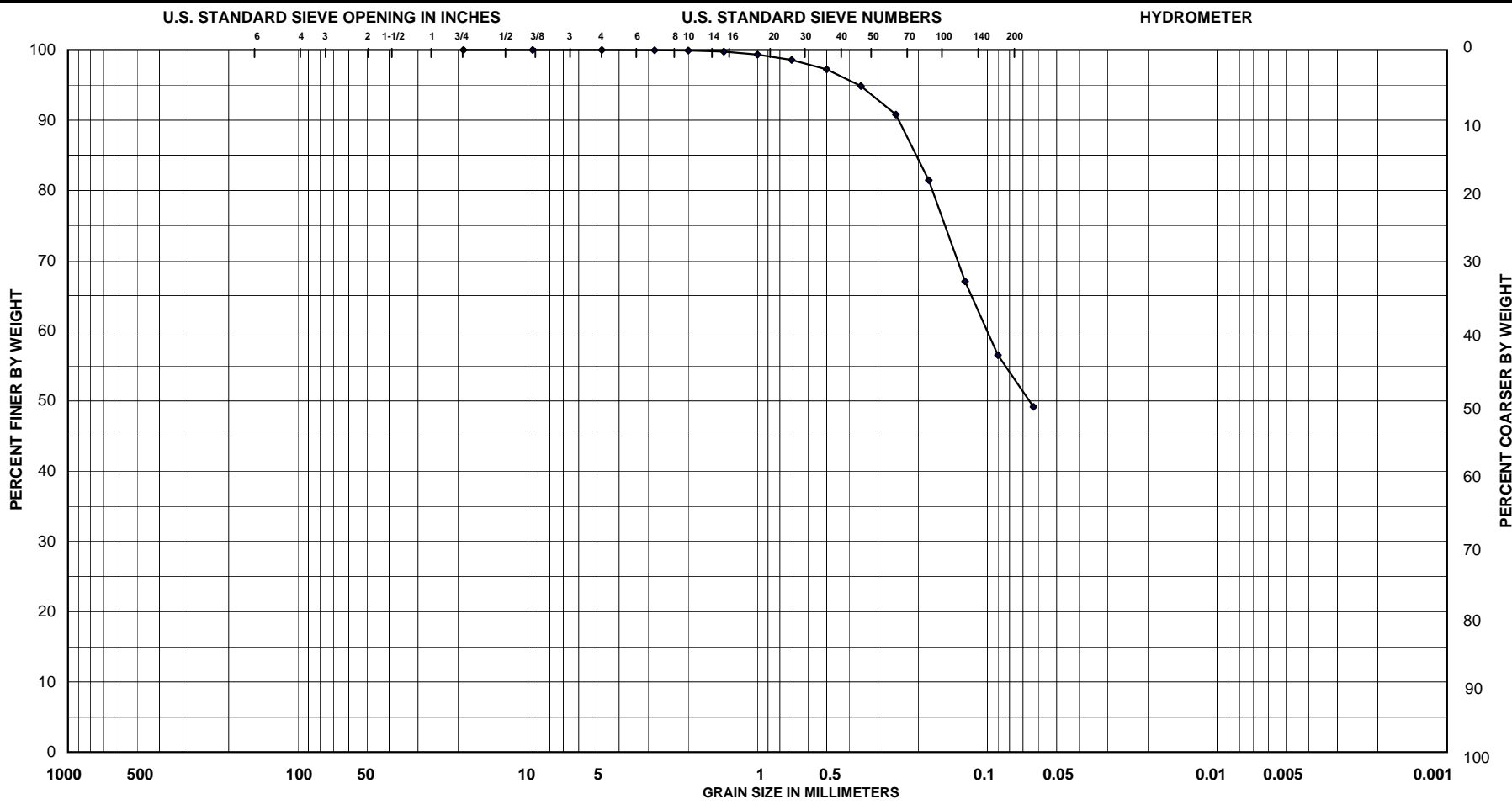
### GRAIN SIZE AND VISUAL SHELL CONTENT

Project:	<b>Topsail Beach, Surf City &amp; North Topsail</b>	Depth:	<b>16.0-16.5</b>
Project No.:	<b>1584-01-40</b>	Date:	<b>9/5/2003</b>
Boring No.:	<b>T1-03-V-3</b>		
Sample No.:	<b>7</b>		
Description:	<b>SAND, clayey, mostly fine-grained quartz, some clay, trace carbonate, trace fragmented limestone, dark gray (SC)</b>		

Tare Weight, (g):	<b>48.73</b>	
Dry Wt. Before Washing (g):	<b>177.46</b>	(with tare)
Dry Weight After Washing (g):	<b>114.75</b>	(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	0.05	99.96	0	0.00
#10	2.000	0.06	99.91	0	0.00
#14	1.400	0.19	99.77	10	0.02
#18	1.000	0.54	99.35	10	0.05
#25	0.710	0.99	98.58	10	0.10
#35	0.500	1.71	97.25	1	0.02
#45	0.355	3.06	94.87	5	0.15
#60	0.250	5.25	90.79	1	0.05
#80	0.180	12.01	81.47	1	0.12
#120	0.125	18.57	67.04	1	0.19
#170	0.090	13.51	56.54	1	0.14
#230	0.063	9.49	49.17	1	0.09

**Total Shell Content:** **1** %



<b>COBBLES</b>	<b>GRAVEL</b>		<b>SAND</b>			<b>SILT OR CLAY</b>
	COARSE	FINE	COARSE	MEDIUM	FINE	

Sample No.	Elev. Or Depth	Classification	% CO <sub>3</sub>	G <sub>s</sub>	Nat w%	LL	PL	PI	Project
7	16.0-16.5	SAND, clayey, mostly fine-grained quartz, some clay, trace carbonate, trace fragmented limestone, dark gray (SC)	1						Topsail Beach, Surf City & North Topsail
									Area
									Boring No. T1-03-V-3
									Date 9/5/2003

**GRADATION CURVES**



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## VISUAL SHELL CONTENT

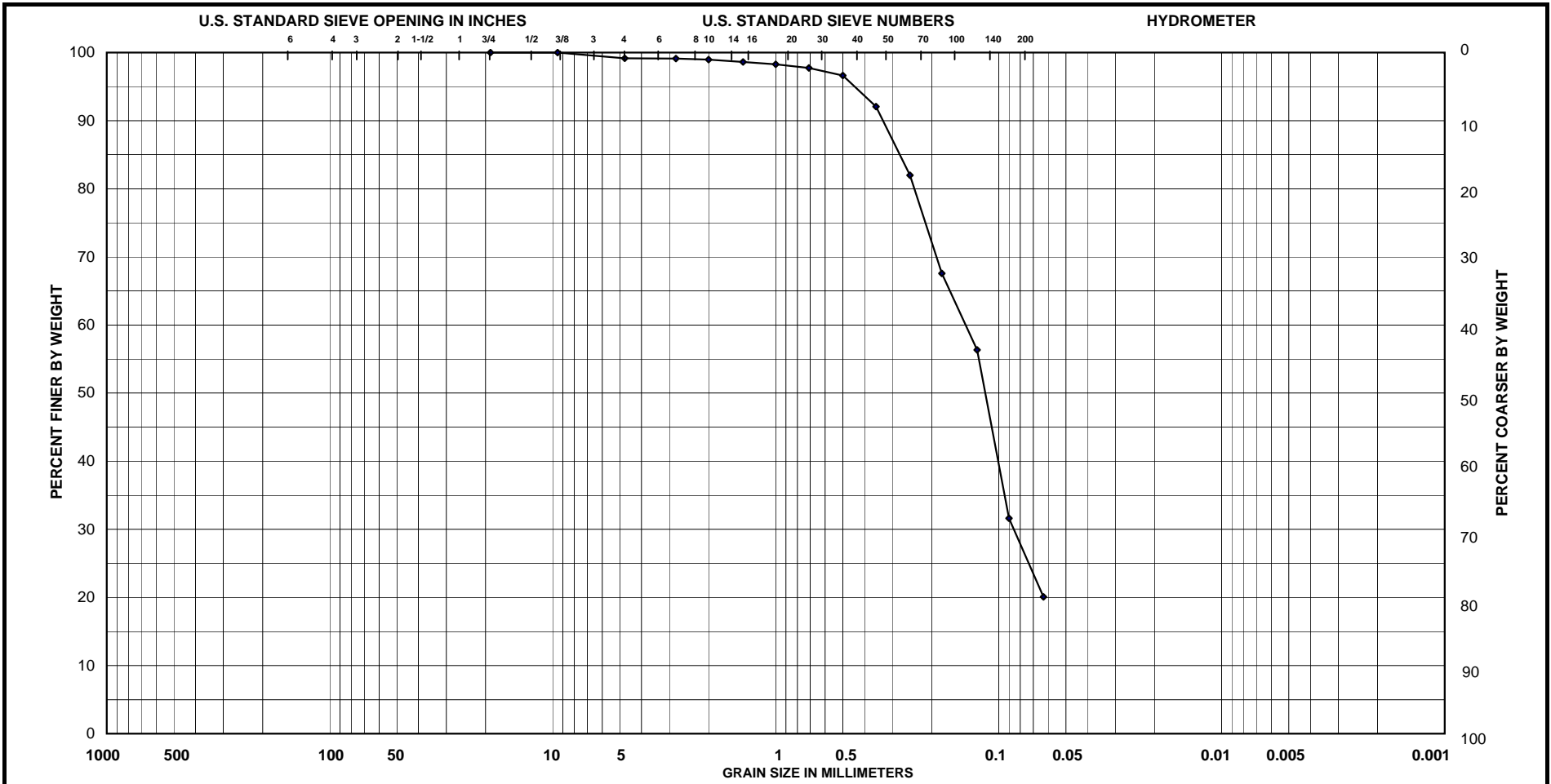
### GRAIN SIZE AND VISUAL SHELL CONTENT

Project:	<b>Topsail Beach, Surf City &amp; North Topsail</b>	Depth:	<b>17.4-17.9</b>
Project No.:	<b>1584-01-40</b>	Date:	<b>9/5/2003</b>
Boring No.:	<b>T1-03-V-3</b>		
Sample No.:	<b>8</b>		
Description:	<b>SAND, clayey, mostly fine-grained quartz, little clay, trace carbonate, trace organic material, gray (SC)</b>		

Tare Weight, (g):	<b>49.22</b>	
Dry Wt. Before Washing (g):	<b>172.51</b>	(with tare)
Dry Weight After Washing (g):	<b>149.12</b>	(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	1.05	99.15	0	0.00
#7	2.800	0.05	99.11	0	0.00
#10	2.000	0.17	98.97	0	0.00
#14	1.400	0.42	98.63	10	0.04
#18	1.000	0.42	98.29	10	0.04
#25	0.710	0.69	97.73	5	0.03
#35	0.500	1.35	96.63	5	0.07
#45	0.355	5.64	92.06	1	0.06
#60	0.250	12.43	81.98	1	0.12
#80	0.180	17.77	67.56	1	0.18
#120	0.125	13.85	56.33	1	0.14
#170	0.090	30.46	31.62	1	0.30
#230	0.063	14.21	20.10	1	0.14

**Total Shell Content:** **1** %



COBBLES	GRAVEL		SAND			SILT OR CLAY
	COARSE	FINE	COARSE	MEDIUM	FINE	

Sample No.	Elev. Or Depth	Classification	% CO <sub>3</sub>	G <sub>s</sub>	Nat w%	LL	PL	PI		
♦ 8	17.4-17.9	SAND, clayey, mostly fine-grained quartz, little clay, trace carbonate, trace organic material, gray (SC)	1						<b>Project</b>	Topsail Beach, Surf City & North Topsail
									<b>Area</b>	
									<b>Boring No.</b>	T1-03-V-3
									<b>Date</b>	9/5/2003

**GRADATION CURVES**



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## VISUAL SHELL CONTENT

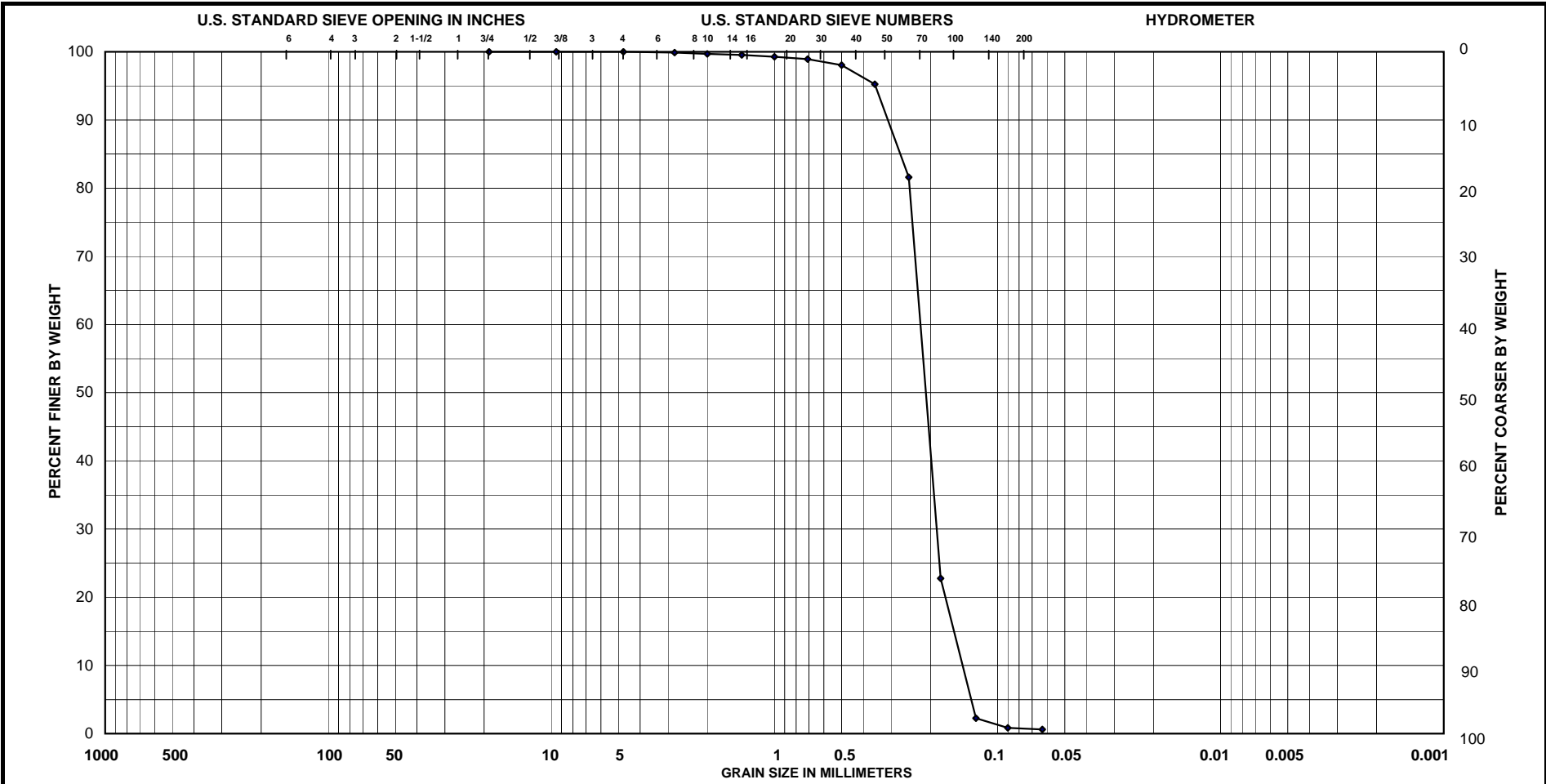
### GRAIN SIZE AND VISUAL SHELL CONTENT

Project:	<b>Topsail Beach, Surf City &amp; North Topsail</b>	Depth:	<b>5.6-6.1</b>
Project No.:	<b>1584-01-40</b>	Date:	<b>9/5/2003</b>
Boring No.:	<b>T1-03-V-4</b>		
Sample No.:	<b>1</b>		
Description:	<b>SAND, poorly-graded, mostly fine-grained quartz, few carbonate, gray (SP)</b>		

Tare Weight, (g):	<b>49.77</b>	
Dry Wt. Before Washing (g):	<b>161.01</b>	(with tare)
Dry Weight After Washing (g):	<b>160.05</b>	(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	0.13	99.88	100	0.13
#10	2.000	0.21	99.69	50	0.11
#14	1.400	0.17	99.54	70	0.12
#18	1.000	0.31	99.26	50	0.16
#25	0.710	0.39	98.91	70	0.27
#35	0.500	0.97	98.04	50	0.49
#45	0.355	3.11	95.24	30	0.93
#60	0.250	15.17	81.61	10	1.52
#80	0.180	65.46	22.76	5	3.27
#120	0.125	22.81	2.26	1	0.23
#170	0.090	1.58	0.84	1	0.02
#230	0.063	0.24	0.62	1	0.00

**Total Shell Content:** **7** %



COBBLES	GRAVEL		SAND			SILT OR CLAY
	COARSE	FINE	COARSE	MEDIUM	FINE	

Sample No.	Elev. Or Depth	Classification	% CO <sub>3</sub>	G <sub>s</sub>	Nat w%	LL	PL	PI	Project
♦ 1	5.6-6.1	SAND, poorly-graded, mostly fine-grained quartz, few carbonate, gray (SP)	7						Topsail Beach, Surf City & North Topsail
									Area
									Boring No. T1-03-V-4
									Date 9/5/2003

**GRADATION CURVES**



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## VISUAL SHELL CONTENT

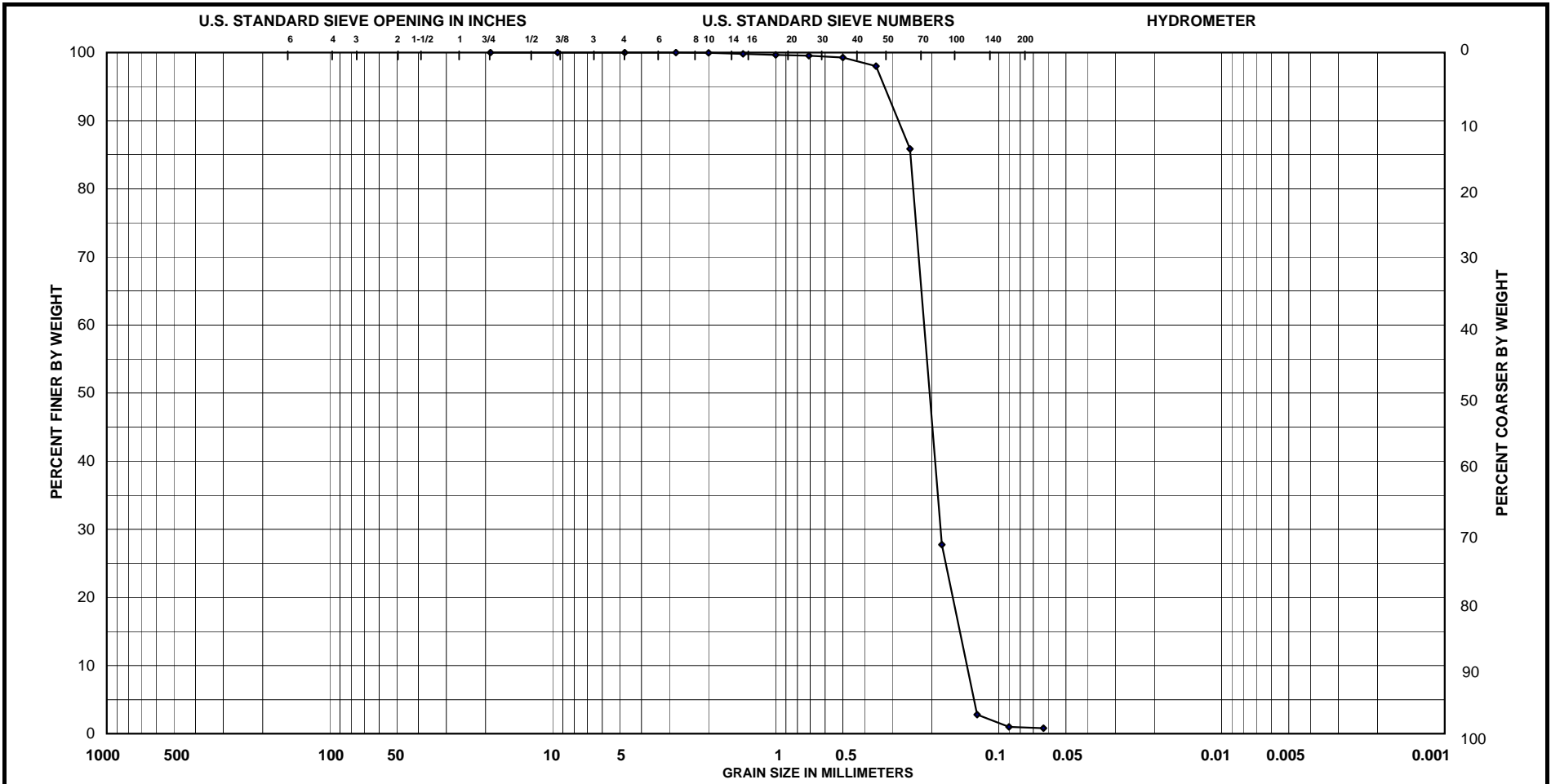
### GRAIN SIZE AND VISUAL SHELL CONTENT

Project:	<b>Topsail Beach, Surf City &amp; North Topsail</b>	Depth:	<b>7.5-8.0</b>
Project No.:	<b>1584-01-40</b>	Date:	<b>9/5/2003</b>
Boring No.:	<b>T1-03-V-4</b>		
Sample No.:	<b>2</b>		
Description:	<b>SAND, poorly-graded, mostly fine-grained quartz, few carbonate, gray (SP)</b>		

Tare Weight, (g):	<b>49.80</b>	
Dry Wt. Before Washing (g):	<b>137.21</b>	(with tare)
Dry Weight After Washing (g):	<b>136.34</b>	(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	0.14	99.82	10	0.01
#18	1.000	0.15	99.65	10	0.02
#25	0.710	0.08	99.55	50	0.04
#35	0.500	0.23	99.29	90	0.21
#45	0.355	1.12	98.01	50	0.56
#60	0.250	10.62	85.86	20	2.12
#80	0.180	50.80	27.74	5	2.54
#120	0.125	21.80	2.80	1	0.22
#170	0.090	1.57	1.01	1	0.02
#230	0.063	0.18	0.80	1	0.00

**Total Shell Content:** **7** %



<b>COBBLES</b>	<b>GRAVEL</b>		<b>SAND</b>			<b>SILT OR CLAY</b>
	COARSE	FINE	COARSE	MEDIUM	FINE	

Sample No.	Elev. Or Depth	Classification	% CO <sub>3</sub>	G <sub>s</sub>	Nat w%	LL	PL	PI	
2	7.5-8.0	SAND, poorly-graded, mostly fine-grained quartz, few carbonate, gray (SP)	7						<b>Project</b> Topsail Beach, Surf City & North Topsail  <b>Area</b> <b>Boring No.</b> T1-03-V-4 <b>Date</b> 9/5/2003

**GRADATION CURVES**





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## VISUAL SHELL CONTENT

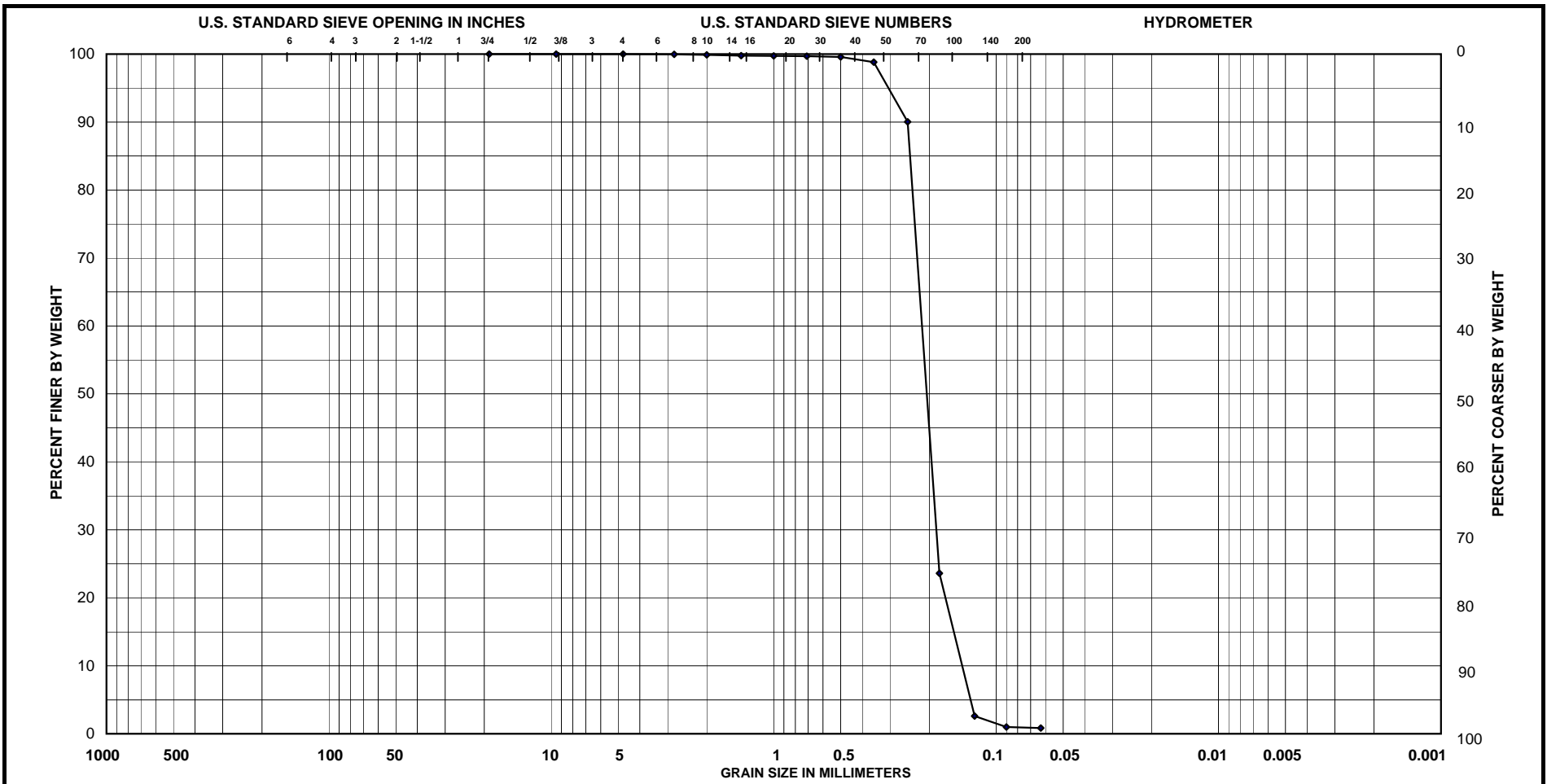
### GRAIN SIZE AND VISUAL SHELL CONTENT

Project:	<b>Topsail Beach, Surf City &amp; North Topsail</b>	Depth:	<b>9.0-9.5</b>
Project No.:	<b>1584-01-40</b>	Date:	<b>9/5/2003</b>
Boring No.:	<b>T1-03-V-4</b>		
Sample No.:	<b>3</b>		
Description:	<b>SAND, poorly-graded, mostly fine-grained quartz, few carbonate, gray (SP)</b>		

Tare Weight, (g):	<b>49.88</b>	
Dry Wt. Before Washing (g):	<b>176.55</b>	(with tare)
Dry Weight After Washing (g):	<b>175.38</b>	(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	0.06	99.95	30	0.02
#10	2.000	0.08	99.89	20	0.02
#14	1.400	0.16	99.76	30	0.05
#18	1.000	0.05	99.72	20	0.01
#25	0.710	0.05	99.68	40	0.02
#35	0.500	0.14	99.57	70	0.10
#45	0.355	0.98	98.80	50	0.49
#60	0.250	11.09	90.04	20	2.22
#80	0.180	84.15	23.61	5	4.21
#120	0.125	26.61	2.61	1	0.27
#170	0.090	2.02	1.01	1	0.02
#230	0.063	0.22	0.84	1	0.00

**Total Shell Content:** **6** %



COBBLES	GRAVEL		SAND			SILT OR CLAY
	COARSE	FINE	COARSE	MEDIUM	FINE	

Sample No.	Elev. Or Depth	Classification	% CO <sub>3</sub>	G <sub>s</sub>	Nat w%	LL	PL	PI	Project	
3	9.0-9.5	SAND, poorly-graded, mostly fine-grained quartz, few carbonate, gray (SP)	6						Topsail Beach, Surf City & North Topsail	
			Area							
			Boring No. T1-03-V-4							
			Date 9/5/2003							

**GRADATION CURVES**



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## VISUAL SHELL CONTENT

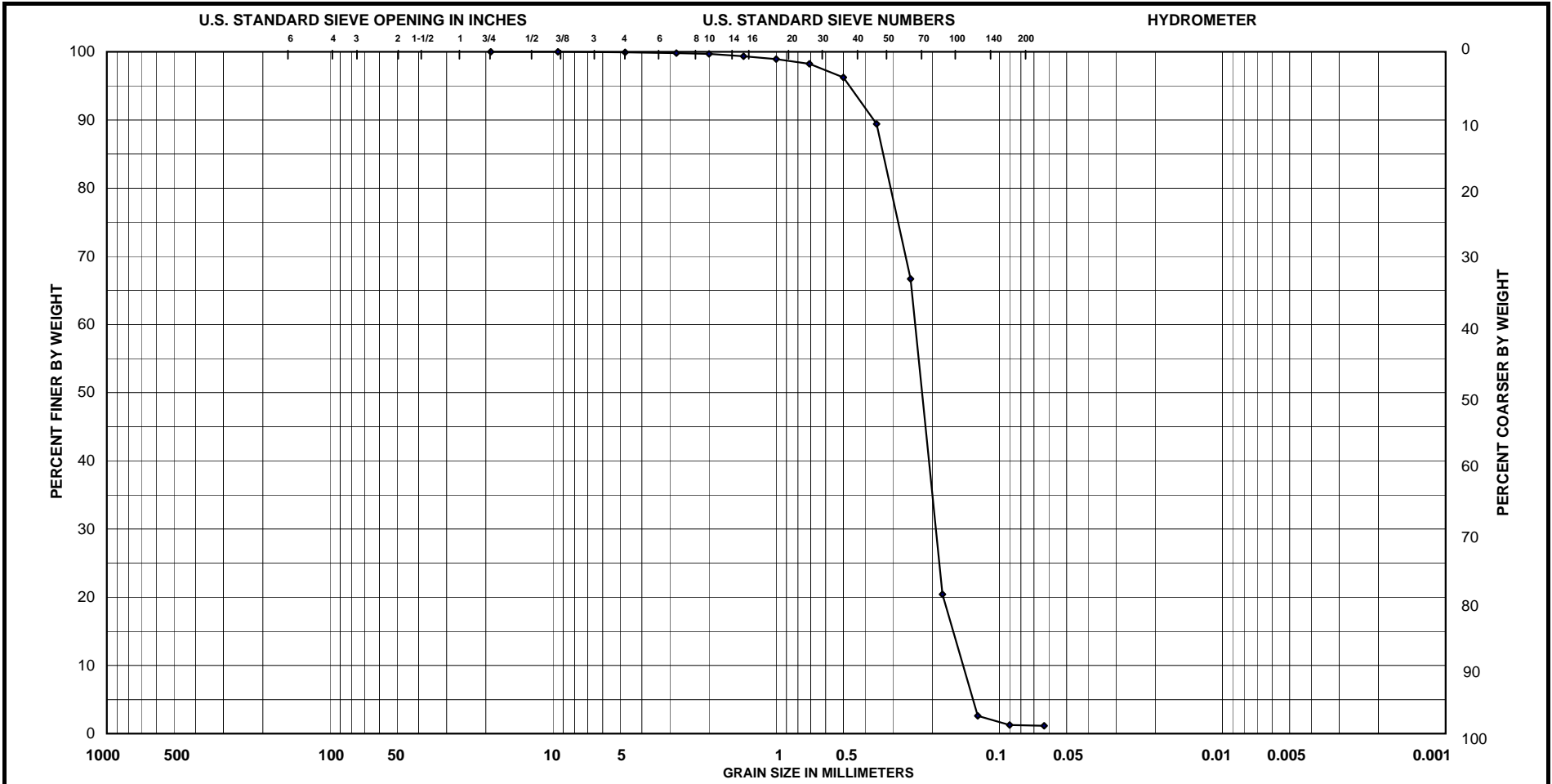
### GRAIN SIZE AND VISUAL SHELL CONTENT

<b>Project:</b>	<b>Topsail Beach, Surf City &amp; North Topsail</b>	<b>Depth:</b>	<b>6.6-7.1</b>
<b>Project No.:</b>	<b>1584-01-40</b>	<b>Date:</b>	<b>9/5/2003</b>
<b>Boring No.:</b>	<b>T1-03-V-5</b>		
<b>Sample No.:</b>	<b>1</b>		
<b>Description:</b>	<b>SAND, poorly-graded, mostly fine-grained quartz, few carbonate, gray (SP)</b>		

Tare Weight, (g):	50.31	
Dry Wt. Before Washing (g):	171.38	(with tare)
Dry Weight After Washing (g):	170.44	(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	0.11	99.91	50	0.06
#7	2.800	0.14	99.79	100	0.14
#10	2.000	0.13	99.69	100	0.13
#14	1.400	0.43	99.33	80	0.34
#18	1.000	0.47	98.94	90	0.42
#25	0.710	0.87	98.22	90	0.78
#35	0.500	2.38	96.26	60	1.43
#45	0.355	8.28	89.42	30	2.48
#60	0.250	27.52	66.69	15	4.13
#80	0.180	55.99	20.44	5	2.80
#120	0.125	21.61	2.59	1	0.22
#170	0.090	1.60	1.27	1	0.02
#230	0.063	0.17	1.13	1	0.00

**Total Shell Content:** 11 %



COBBLES	GRAVEL		SAND			SILT OR CLAY
	COARSE	FINE	COARSE	MEDIUM	FINE	

Sample No.	Elev. Or Depth	Classification	% CO <sub>3</sub>	G <sub>s</sub>	Nat w%	LL	PL	PI	Project
♦ 1	6.6-7.1	SAND, poorly-graded, mostly fine-grained quartz, few carbonate, gray (SP)	11						Topsail Beach, Surf City & North Topsail
									Area
									Boring No. T1-03-V-5
									Date 9/5/2003

**GRADATION CURVES**



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## VISUAL SHELL CONTENT

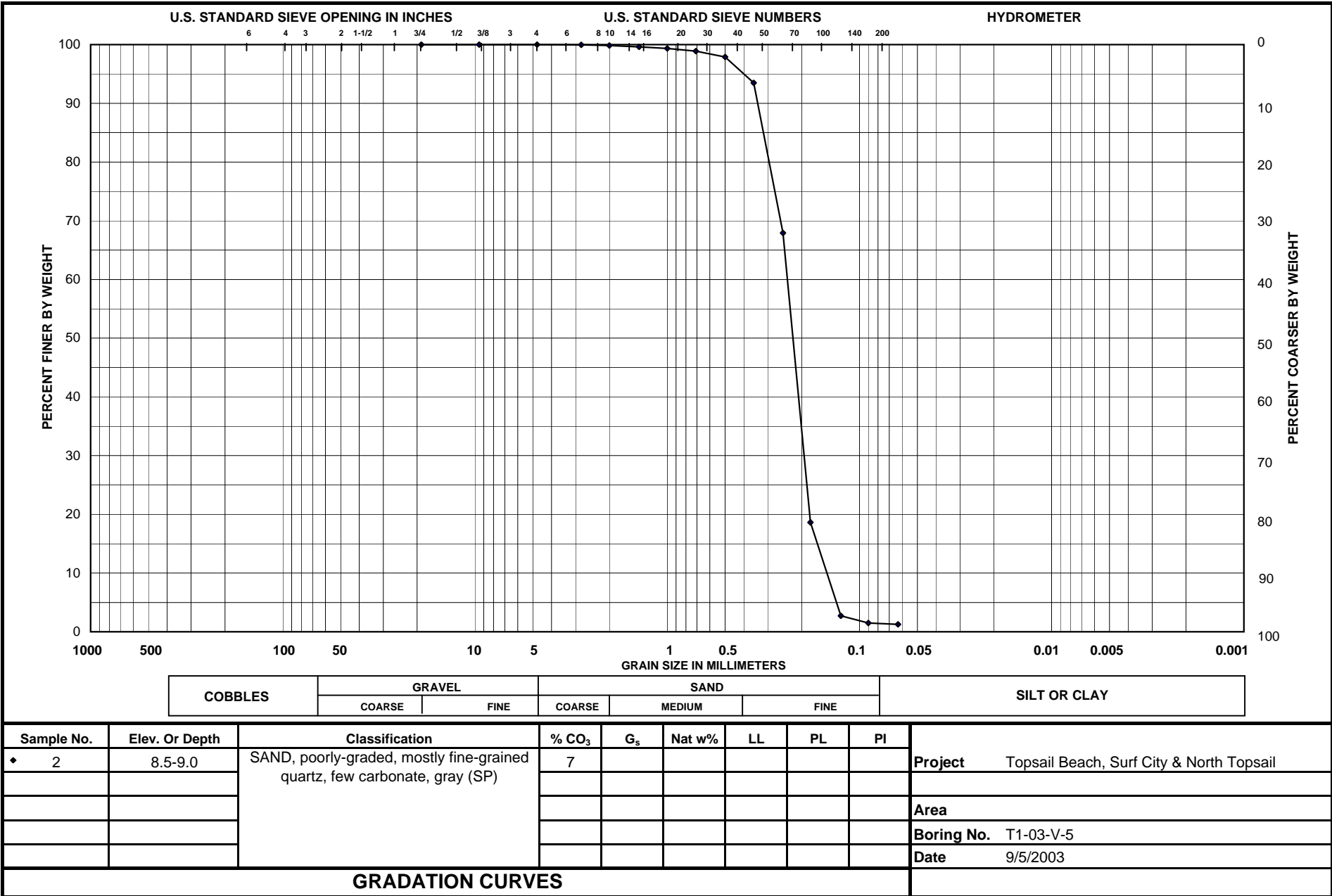
### GRAIN SIZE AND VISUAL SHELL CONTENT

Project:	<b>Topsail Beach, Surf City &amp; North Topsail</b>	Depth:	<b>8.5-9.0</b>
Project No.:	<b>1584-01-40</b>	Date:	<b>9/5/2003</b>
Boring No.:	<b>T1-03-V-5</b>		
Sample No.:	<b>2</b>		
Description:	<b>SAND, poorly-graded, mostly fine-grained quartz, few carbonate, gray (SP)</b>		

Tare Weight, (g):	<b>50.16</b>	
Dry Wt. Before Washing (g):	<b>188.35</b>	(with tare)
Dry Weight After Washing (g):	<b>186.97</b>	(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	0.07	99.95	90	0.06
#10	2.000	0.14	99.85	100	0.14
#14	1.400	0.30	99.63	90	0.27
#18	1.000	0.40	99.34	90	0.36
#25	0.710	0.60	98.91	80	0.48
#35	0.500	1.41	97.89	50	0.71
#45	0.355	6.10	93.47	30	1.83
#60	0.250	35.30	67.93	10	3.53
#80	0.180	68.12	18.63	3	2.04
#120	0.125	21.98	2.73	1	0.22
#170	0.090	1.72	1.48	1	0.02
#230	0.063	0.28	1.28	1	0.00

**Total Shell Content:** **7** %





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## VISUAL SHELL CONTENT

### GRAIN SIZE AND VISUAL SHELL CONTENT

Project:	<b>Topsail Beach, Surf City &amp; North Topsail</b>	Depth:	<b>4.7-5.2</b>
Project No.:	<b>1584-01-40</b>	Date:	<b>9/5/2003</b>
Boring No.:	<b>T1-03-V-6</b>		
Sample No.:	<b>1</b>		
Description:	<b>SAND, poorly-graded, mostly fine-grained quartz, few carbonate, gray (SP)</b>		

Tare Weight, (g):	<b>50.16</b>	
Dry Wt. Before Washing (g):	<b>205.75</b>	(with tare)
Dry Weight After Washing (g):	<b>203.99</b>	(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	0.14	99.91	50	0.07
#10	2.000	0.13	99.83	70	0.09
#14	1.400	0.36	99.60	70	0.25
#18	1.000	0.53	99.25	80	0.42
#25	0.710	1.06	98.57	70	0.74
#35	0.500	2.03	97.27	60	1.22
#45	0.355	5.20	93.93	40	2.08
#60	0.250	21.73	79.96	15	3.26
#80	0.180	88.18	23.29	3	2.65
#120	0.125	31.09	3.30	1	0.31
#170	0.090	2.98	1.39	1	0.03
#230	0.063	0.28	1.21	1	0.00

**Total Shell Content:** **7** %







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## VISUAL SHELL CONTENT

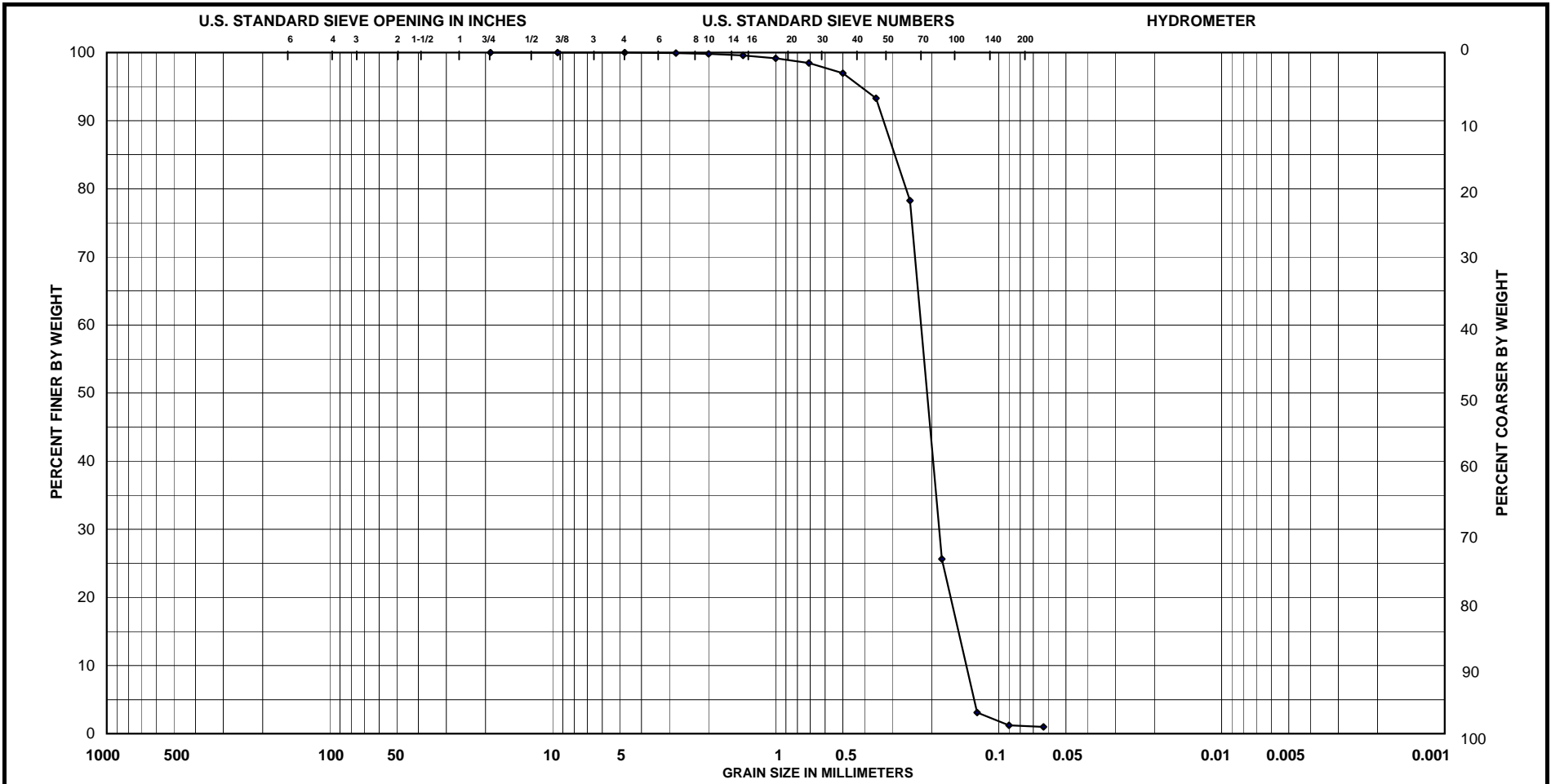
### GRAIN SIZE AND VISUAL SHELL CONTENT

Project:	<b>Topsail Beach, Surf City &amp; North Topsail</b>	Depth:	<b>6.5-7.0</b>
Project No.:	<b>1584-01-40</b>	Date:	<b>9/5/2003</b>
Boring No.:	<b>T1-03-V-6</b>		
Sample No.:	<b>2</b>		
Description:	<b>SAND, poorly-graded, mostly fine-grained quartz, few carbonate, gray (SP)</b>		

Tare Weight, (g):	<b>50.40</b>	
Dry Wt. Before Washing (g):	<b>165.23</b>	(with tare)
Dry Weight After Washing (g):	<b>164</b>	(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	0.01	99.99	0	0.00
#7	2.800	0.08	99.92	100	0.08
#10	2.000	0.11	99.83	90	0.10
#14	1.400	0.27	99.59	90	0.24
#18	1.000	0.50	99.16	90	0.45
#25	0.710	0.81	98.45	70	0.57
#35	0.500	1.68	96.99	70	1.18
#45	0.355	4.24	93.29	60	2.54
#60	0.250	17.27	78.25	10	1.73
#80	0.180	60.42	25.64	3	1.81
#120	0.125	25.87	3.11	1	0.26
#170	0.090	2.18	1.21	1	0.02
#230	0.063	0.24	1.00	1	0.00

**Total Shell Content:** **8** %



COBBLES	GRAVEL		SAND			SILT OR CLAY
	COARSE	FINE	COARSE	MEDIUM	FINE	

Sample No.	Elev. Or Depth	Classification	% CO <sub>3</sub>	G <sub>s</sub>	Nat w%	LL	PL	PI	Project
♦ 2	6.5-7.0	SAND, poorly-graded, mostly fine-grained quartz, few carbonate, gray (SP)	8						Topsail Beach, Surf City & North Topsail
									Area
									Boring No. T1-03-V-6
									Date 9/5/2003

**GRADATION CURVES**



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## VISUAL SHELL CONTENT

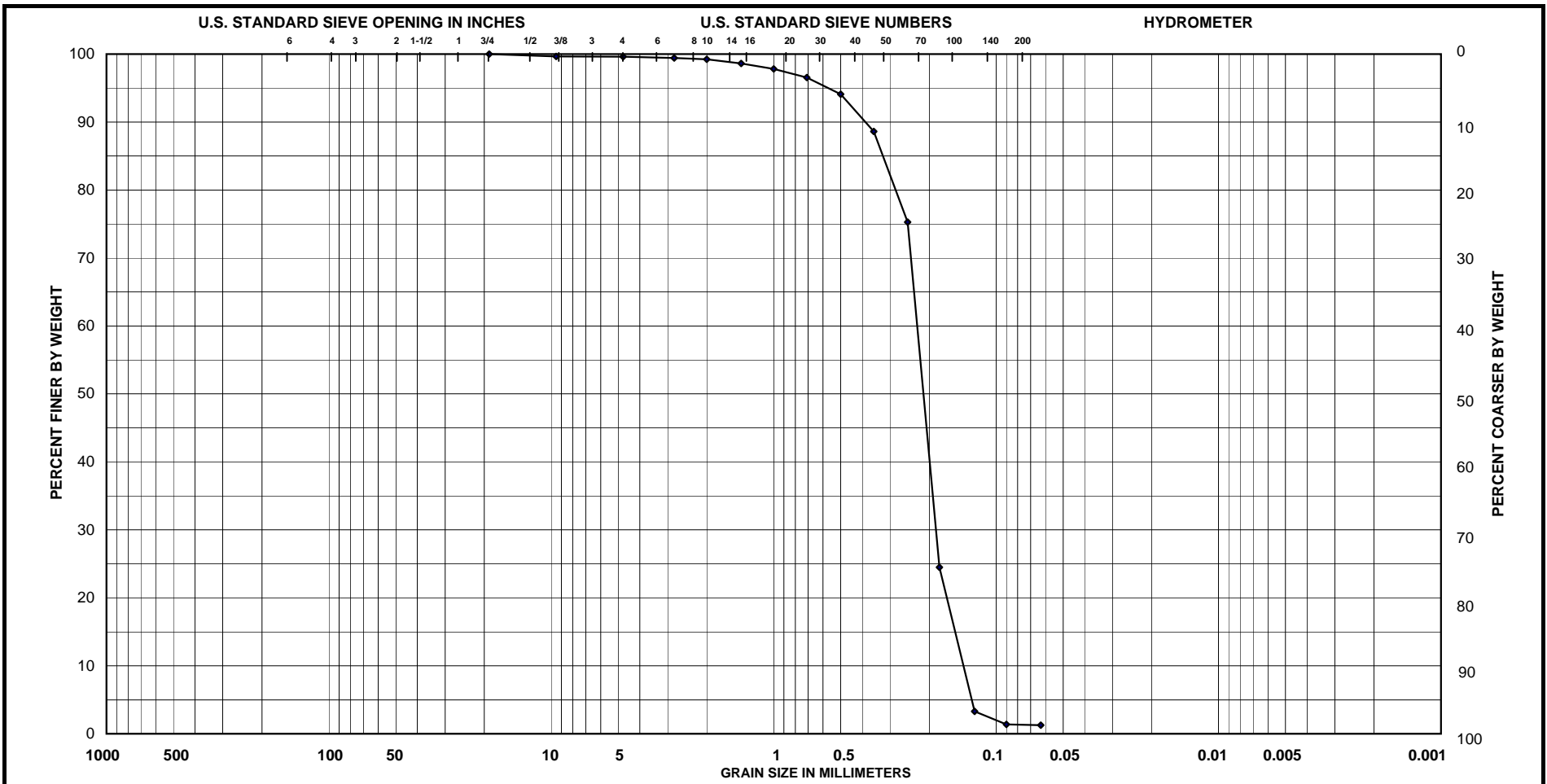
### GRAIN SIZE AND VISUAL SHELL CONTENT

Project:	<b>Topsail Beach, Surf City &amp; North Topsail</b>	Depth:	<b>4.8-5.3</b>
Project No.:	<b>1584-01-40</b>	Date:	<b>9/5/2003</b>
Boring No.:	<b>T1-03-V-7</b>		
Sample No.:	<b>1</b>		
Description:	<b>SAND, poorly-graded, mostly fine-grained quartz, few carbonate, gray (SP)</b>		

Tare Weight, (g):	<b>48.59</b>	
Dry Wt. Before Washing (g):	<b>195.45</b>	(with tare)
Dry Weight After Washing (g):	<b>194.17</b>	(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	0.51	99.65	100	0.51
#4	4.750	0.04	99.63	100	0.04
#7	2.800	0.28	99.43	90	0.25
#10	2.000	0.30	99.23	100	0.30
#14	1.400	0.87	98.64	90	0.78
#18	1.000	1.19	97.83	90	1.07
#25	0.710	1.88	96.55	70	1.32
#35	0.500	3.60	94.10	40	1.44
#45	0.355	8.04	88.62	20	1.61
#60	0.250	19.57	75.30	5	0.98
#80	0.180	74.60	24.50	1	0.75
#120	0.125	31.13	3.30	1	0.31
#170	0.090	2.81	1.39	1	0.03
#230	0.063	0.18	1.27	1	0.00

**Total Shell Content:** **6** %



COBBLES	GRAVEL		SAND			SILT OR CLAY
	COARSE	FINE	COARSE	MEDIUM	FINE	

Sample No.	Elev. Or Depth	Classification	% CO <sub>3</sub>	G <sub>s</sub>	Nat w%	LL	PL	PI	Project
♦ 1	4.8-5.3	SAND, poorly-graded, mostly fine-grained quartz, few carbonate, gray (SP)	6						Topsail Beach, Surf City & North Topsail
									Area
									Boring No. T1-03-V-7
									Date 9/5/2003

**GRADATION CURVES**



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## VISUAL SHELL CONTENT

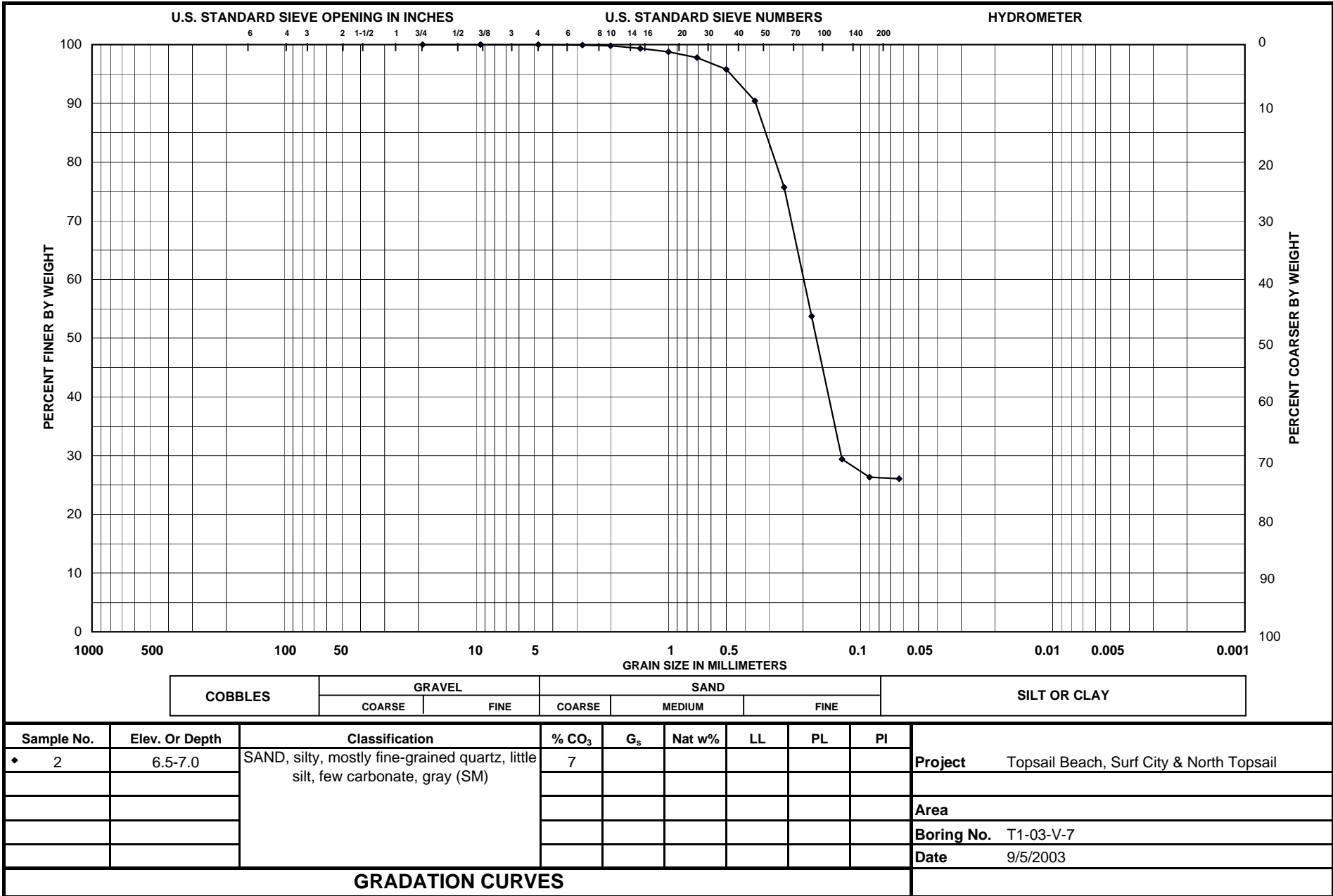
### GRAIN SIZE AND VISUAL SHELL CONTENT

Project:	<b>Topsail Beach, Surf City &amp; North Topsail</b>	Depth:	<b>6.5-7.0</b>
Project No.:	<b>1584-01-40</b>	Date:	<b>9/5/2003</b>
Boring No.:	<b>T1-03-V-7</b>		
Sample No.:	<b>2</b>		
Description:	<b>SAND, silty, mostly fine-grained quartz, little silt, few carbonate, gray (SM)</b>		

Tare Weight, (g):	<b>49.70</b>	
Dry Wt. Before Washing (g):	<b>171.2</b>	(with tare)
Dry Weight After Washing (g):	<b>169.97</b>	(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	0.09	99.93	100	0.09
#10	2.000	0.12	99.83	100	0.12
#14	1.400	0.56	99.37	90	0.50
#18	1.000	0.73	98.77	90	0.66
#25	0.710	1.22	97.76	80	0.98
#35	0.500	2.39	95.79	70	1.67
#45	0.355	6.52	90.43	30	1.96
#60	0.250	17.90	75.70	10	1.79
#80	0.180	26.70	53.72	3	0.80
#120	0.125	29.53	29.42	1	0.30
#170	0.090	3.73	26.35	1	0.04
#230	0.063	0.34	26.07	1	0.00

**Total Shell Content:** **7** %



COBBLES	GRAVEL		SAND			SILT OR CLAY
	COARSE	FINE	COARSE	MEDIUM	FINE	

Sample No.	Elev. Or Depth	Classification	% CO <sub>3</sub>	G <sub>s</sub>	Nat w%	LL	PL	PI	Project
◆ 2	6.5-7.0	SAND, silty, mostly fine-grained quartz, little silt, few carbonate, gray (SM)	7						Topsail Beach, Surf City & North Topsail
									Area
									Boring No. T1-03-V-7
									Date 9/5/2003

**GRADATION CURVES**



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## VISUAL SHELL CONTENT

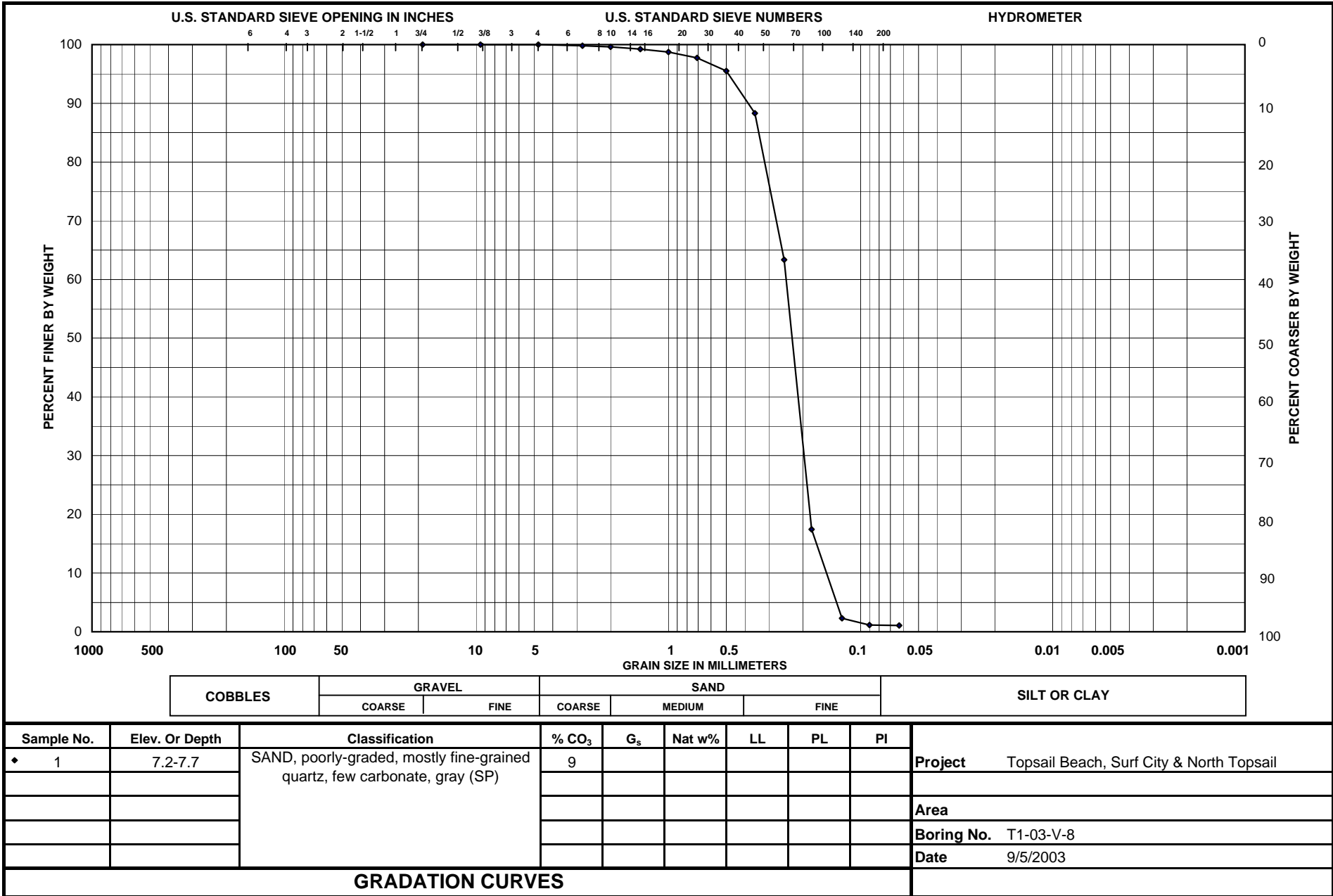
### GRAIN SIZE AND VISUAL SHELL CONTENT

Project:	<b>Topsail Beach, Surf City &amp; North Topsail</b>	Depth:	<b>7.2-7.7</b>
Project No.:	<b>1584-01-40</b>	Date:	<b>9/5/2003</b>
Boring No.:	<b>T1-03-V-8</b>		
Sample No.:	<b>1</b>		
Description:	<b>SAND, poorly-graded, mostly fine-grained quartz, few carbonate, gray (SP)</b>		

Tare Weight, (g):	<b>50.27</b>	
Dry Wt. Before Washing (g):	<b>172.45</b>	(with tare)
Dry Weight After Washing (g):	<b>171.6</b>	(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	0.01	99.99	0	0.00
#7	2.800	0.23	99.80	90	0.21
#10	2.000	0.24	99.61	100	0.24
#14	1.400	0.45	99.24	90	0.41
#18	1.000	0.60	98.75	90	0.54
#25	0.710	1.25	97.72	80	1.00
#35	0.500	2.71	95.51	50	1.36
#45	0.355	8.80	88.30	30	2.64
#60	0.250	30.46	63.37	10	3.05
#80	0.180	56.11	17.45	3	1.68
#120	0.125	18.51	2.30	1	0.19
#170	0.090	1.42	1.14	1	0.01
#230	0.063	0.08	1.07	1	0.00

**Total Shell Content:** **9** %



**GRADATION CURVES**





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## VISUAL SHELL CONTENT

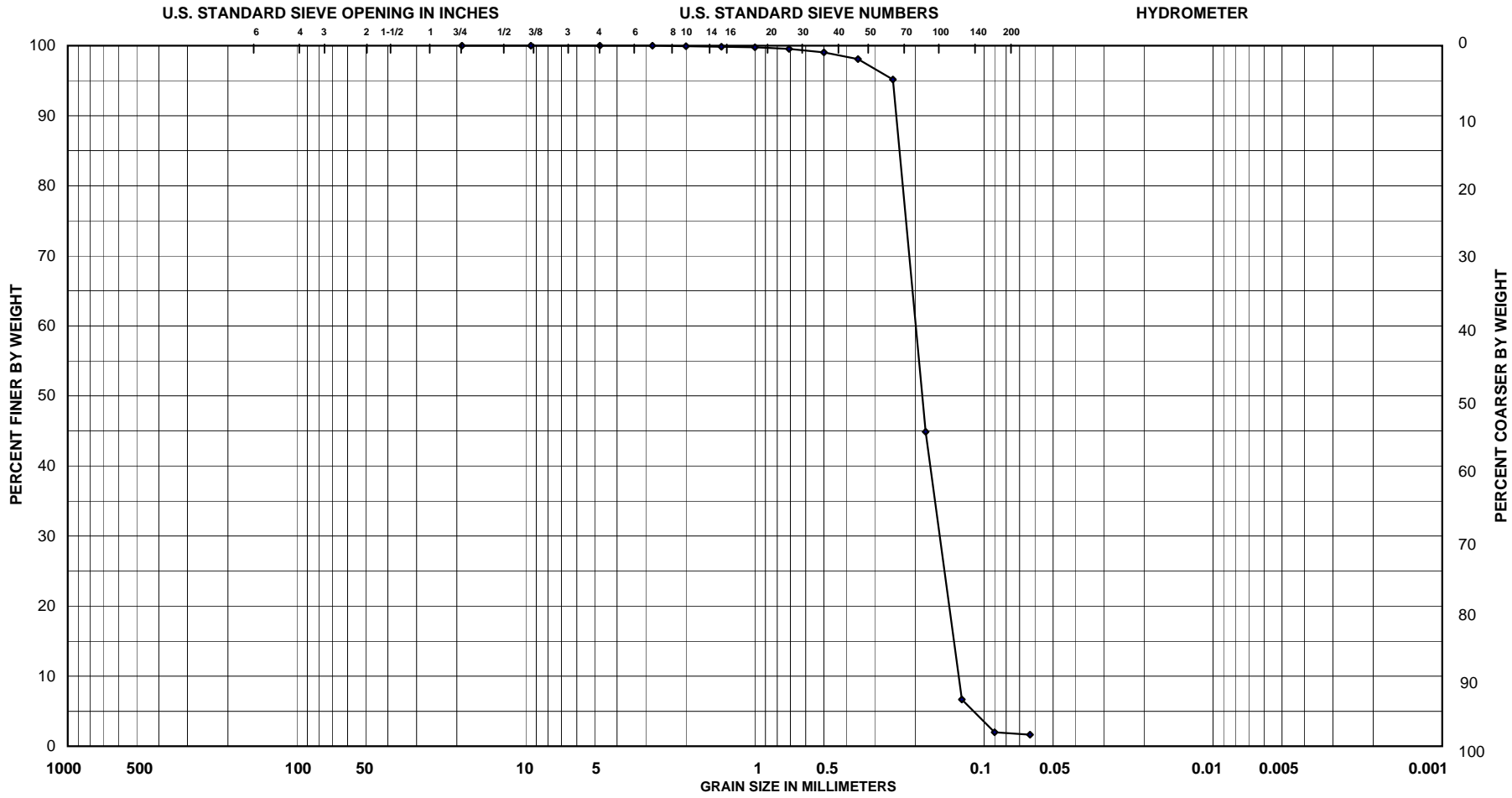
### GRAIN SIZE AND VISUAL SHELL CONTENT

Project:	<b>Topsail Beach, Surf City &amp; North Topsail</b>	Depth:	<b>9.0-9.5</b>
Project No.:	<b>1584-01-40</b>	Date:	<b>9/5/2003</b>
Boring No.:	<b>T1-03-V-8</b>		
Sample No.:	<b>2</b>		
Description:	<b>SAND, poorly-graded, mostly fine-grained quartz, few carbonate, gray (SP)</b>		

Tare Weight, (g):	<b>50.54</b>	
Dry Wt. Before Washing (g):	<b>167.3</b>	(with tare)
Dry Weight After Washing (g):	<b>165.74</b>	(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	0.06	99.94	20	0.01
#14	1.400	0.10	99.85	20	0.02
#18	1.000	0.12	99.75	30	0.04
#25	0.710	0.25	99.54	80	0.20
#35	0.500	0.56	99.06	70	0.39
#45	0.355	1.16	98.06	50	0.58
#60	0.250	3.40	95.15	30	1.02
#80	0.180	58.69	44.89	5	2.93
#120	0.125	44.64	6.65	1	0.45
#170	0.090	5.45	1.99	1	0.05
#230	0.063	0.40	1.64	1	0.00

**Total Shell Content:** **5** %



COBBLES	GRAVEL		SAND			SILT OR CLAY
	COARSE	FINE	COARSE	MEDIUM	FINE	

Sample No.	Elev. Or Depth	Classification	% CO <sub>3</sub>	G <sub>s</sub>	Nat w%	LL	PL	PI		
♦ 2	9.0-9.5	SAND, poorly-graded, mostly fine-grained quartz, few carbonate, gray (SP)	5						<b>Project</b>	Topsail Beach, Surf City & North Topsail
									<b>Area</b>	
									<b>Boring No.</b>	T1-03-V-8
									<b>Date</b>	9/5/2003

**GRADATION CURVES**



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## VISUAL SHELL CONTENT

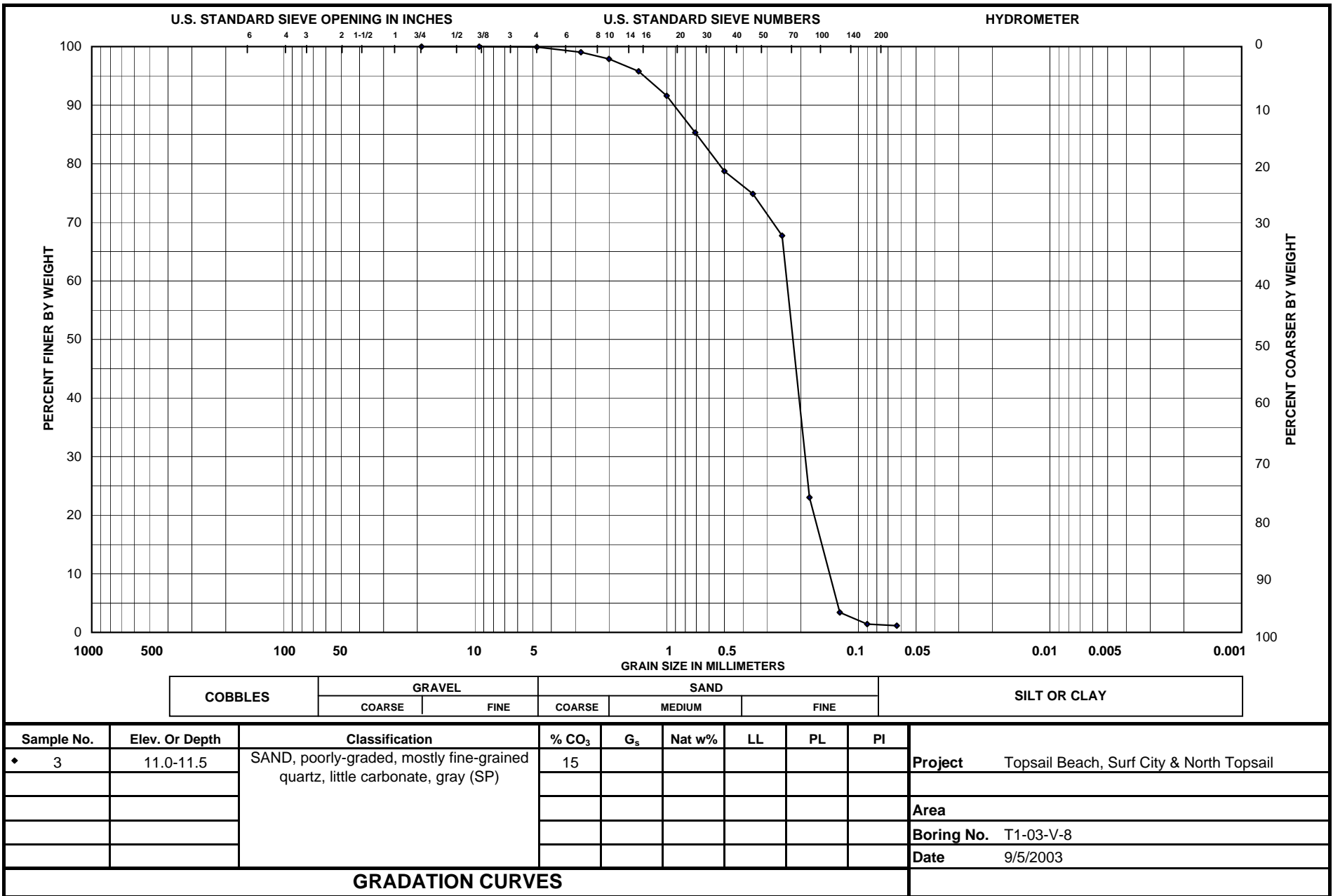
### GRAIN SIZE AND VISUAL SHELL CONTENT

Project:	<b>Topsail Beach, Surf City &amp; North Topsail</b>	Depth:	<b>11.0-11.5</b>
Project No.:	<b>1584-01-40</b>	Date:	<b>9/5/2003</b>
Boring No.:	<b>T1-03-V-8</b>		
Sample No.:	<b>3</b>		
Description:	<b>SAND, poorly-graded, mostly fine-grained quartz, little carbonate, gray (SP)</b>		

Tare Weight, (g):	<b>50.33</b>	
Dry Wt. Before Washing (g):	<b>183</b>	(with tare)
Dry Weight After Washing (g):	<b>181.49</b>	(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	0.08	99.94	100	0.08
#7	2.800	1.19	99.04	100	1.19
#10	2.000	1.52	97.90	95	1.44
#14	1.400	2.78	95.80	100	2.78
#18	1.000	5.55	91.62	80	4.44
#25	0.710	8.36	85.32	50	4.18
#35	0.500	8.75	78.72	30	2.63
#45	0.355	5.15	74.84	15	0.77
#60	0.250	9.44	67.72	10	0.94
#80	0.180	59.27	23.05	3	1.78
#120	0.125	26.07	3.40	1	0.26
#170	0.090	2.65	1.40	1	0.03
#230	0.063	0.31	1.17	1	0.00

**Total Shell Content:** **15** %





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## VISUAL SHELL CONTENT

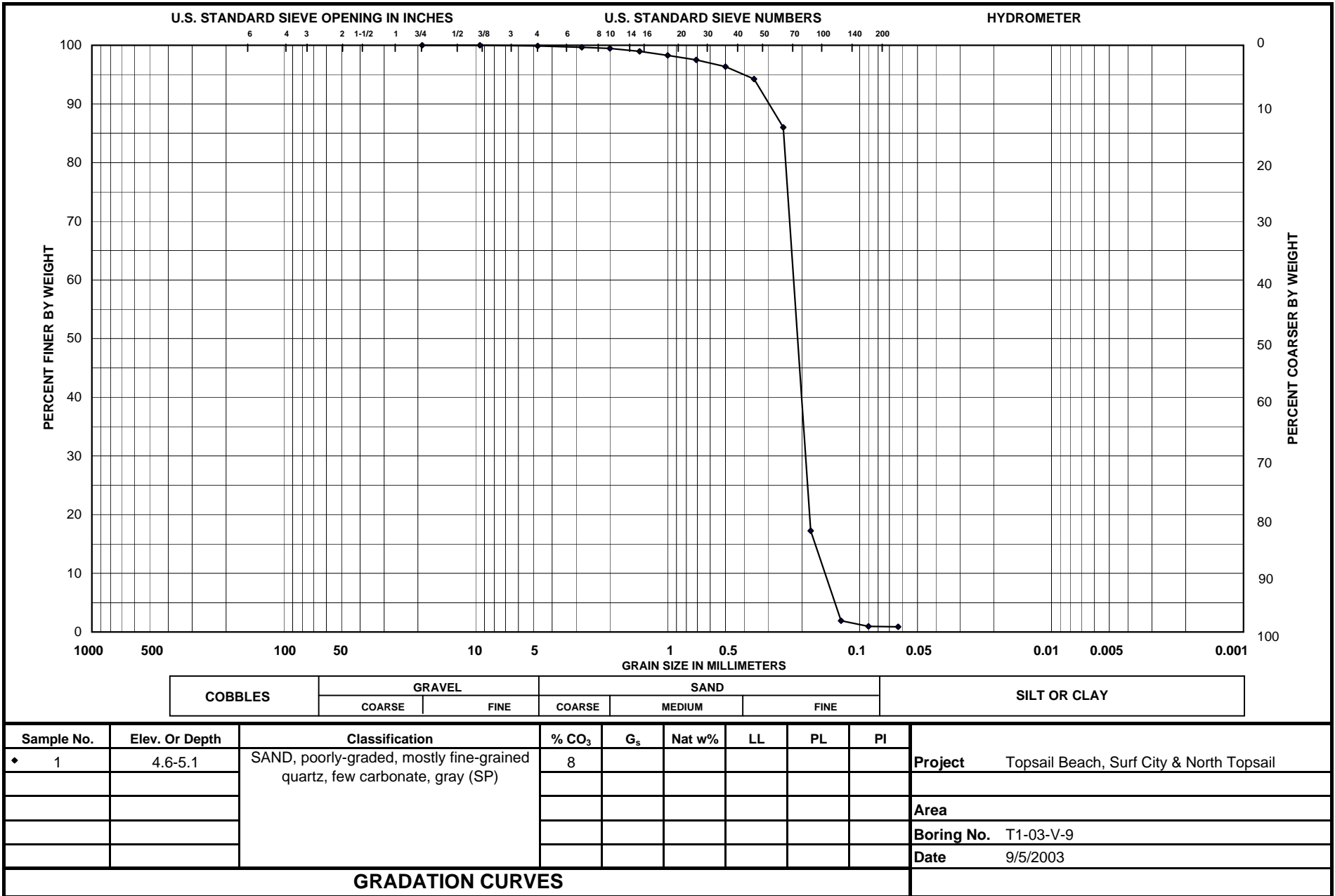
### GRAIN SIZE AND VISUAL SHELL CONTENT

Project:	<b>Topsail Beach, Surf City &amp; North Topsail</b>	Depth:	<b>4.6-5.1</b>
Project No.:	<b>1584-01-40</b>	Date:	<b>9/5/2003</b>
Boring No.:	<b>T1-03-V-9</b>		
Sample No.:	<b>1</b>		
Description:	<b>SAND, poorly-graded, mostly fine-grained quartz, few carbonate, gray (SP)</b>		

Tare Weight, (g):	<b>49.81</b>	
Dry Wt. Before Washing (g):	<b>182.98</b>	(with tare)
Dry Weight After Washing (g):	<b>181.9</b>	(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	0.13	99.90	100	0.13
#7	2.800	0.34	99.65	100	0.34
#10	2.000	0.27	99.44	100	0.27
#14	1.400	0.66	98.95	90	0.59
#18	1.000	0.88	98.29	80	0.70
#25	0.710	1.04	97.51	70	0.73
#35	0.500	1.54	96.35	40	0.62
#45	0.355	2.81	94.24	20	0.56
#60	0.250	10.96	86.01	20	2.19
#80	0.180	91.55	17.26	5	4.58
#120	0.125	20.43	1.92	1	0.20
#170	0.090	1.30	0.95	1	0.01
#230	0.063	0.07	0.89	1	0.00

**Total Shell Content:** **8** %



**GRADATION CURVES**



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## VISUAL SHELL CONTENT

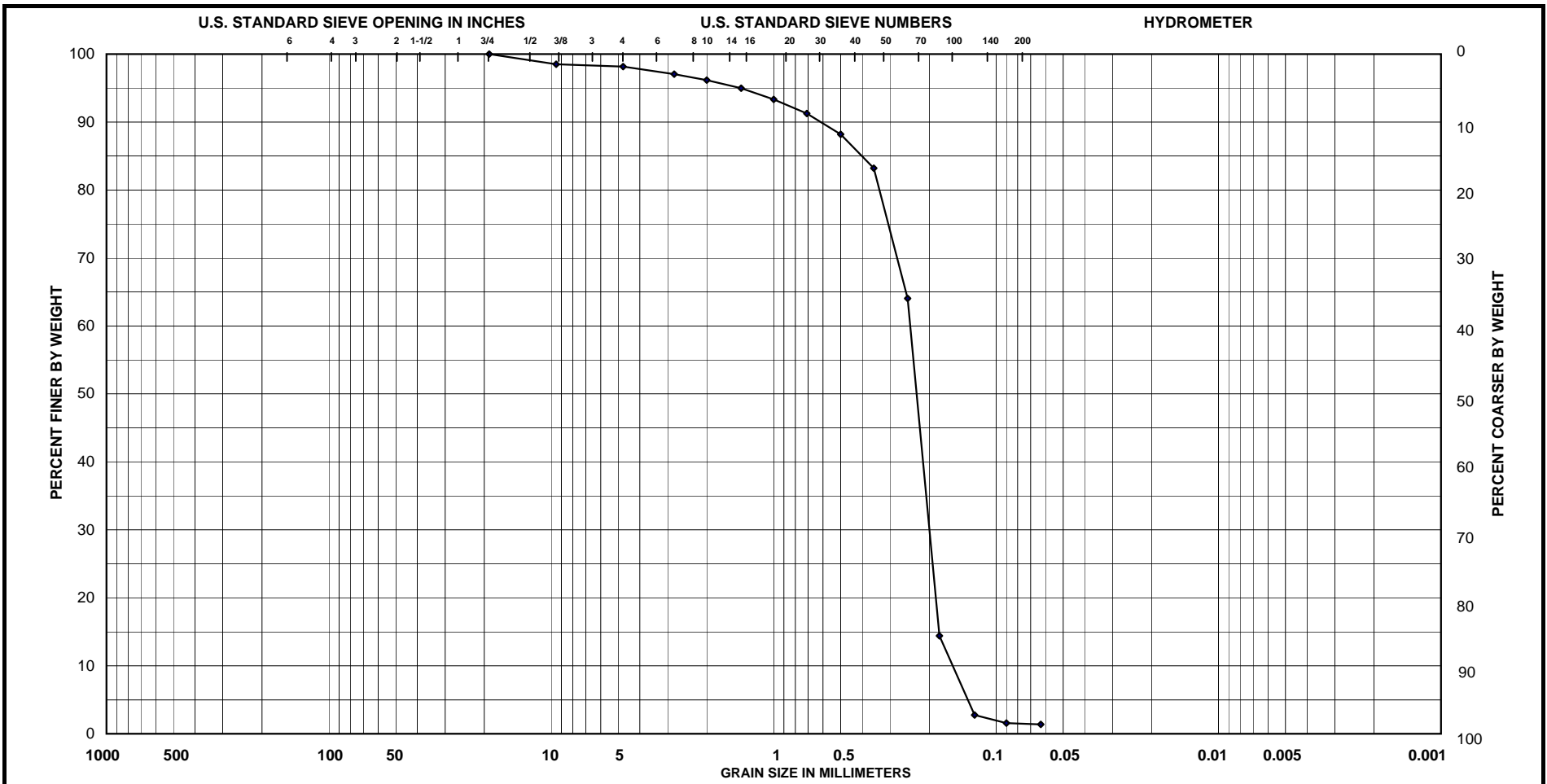
### GRAIN SIZE AND VISUAL SHELL CONTENT

Project:	<b>Topsail Beach, Surf City &amp; North Topsail</b>	Depth:	<b>8.4-8.9</b>
Project No.:	<b>1584-01-40</b>	Date:	<b>9/5/2003</b>
Boring No.:	<b>T1-03-V-10</b>		
Sample No.:	<b>1</b>		
Description:	<b>SAND, poorly-graded, mostly fine-grained quartz, little carbonate, gray (SP)</b>		

Tare Weight, (g):	<b>50.19</b>	
Dry Wt. Before Washing (g):	<b>205.84</b>	(with tare)
Dry Weight After Washing (g):	<b>203.83</b>	(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	2.30	98.52	100	2.30
#4	4.750	0.59	98.14	100	0.59
#7	2.800	1.70	97.05	100	1.70
#10	2.000	1.37	96.17	90	1.23
#14	1.400	1.84	94.99	90	1.66
#18	1.000	2.56	93.34	80	2.05
#25	0.710	3.23	91.27	60	1.94
#35	0.500	4.80	88.19	40	1.92
#45	0.355	7.77	83.19	30	2.33
#60	0.250	29.82	64.03	10	2.98
#80	0.180	77.22	14.42	3	2.32
#120	0.125	18.17	2.75	1	0.18
#170	0.090	1.81	1.59	1	0.02
#230	0.063	0.35	1.36	1	0.00

**Total Shell Content:** **14** %



COBBLES	GRAVEL		SAND			SILT OR CLAY
	COARSE	FINE	COARSE	MEDIUM	FINE	

Sample No.	Elev. Or Depth	Classification	% CO <sub>3</sub>	G <sub>s</sub>	Nat w%	LL	PL	PI	Project
♦ 1	8.4-8.9	SAND, poorly-graded, mostly fine-grained quartz, little carbonate, gray (SP)	14						Topsail Beach, Surf City & North Topsail
									Area
									Boring No. T1-03-V-10
									Date 9/5/2003

**GRADATION CURVES**





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## VISUAL SHELL CONTENT

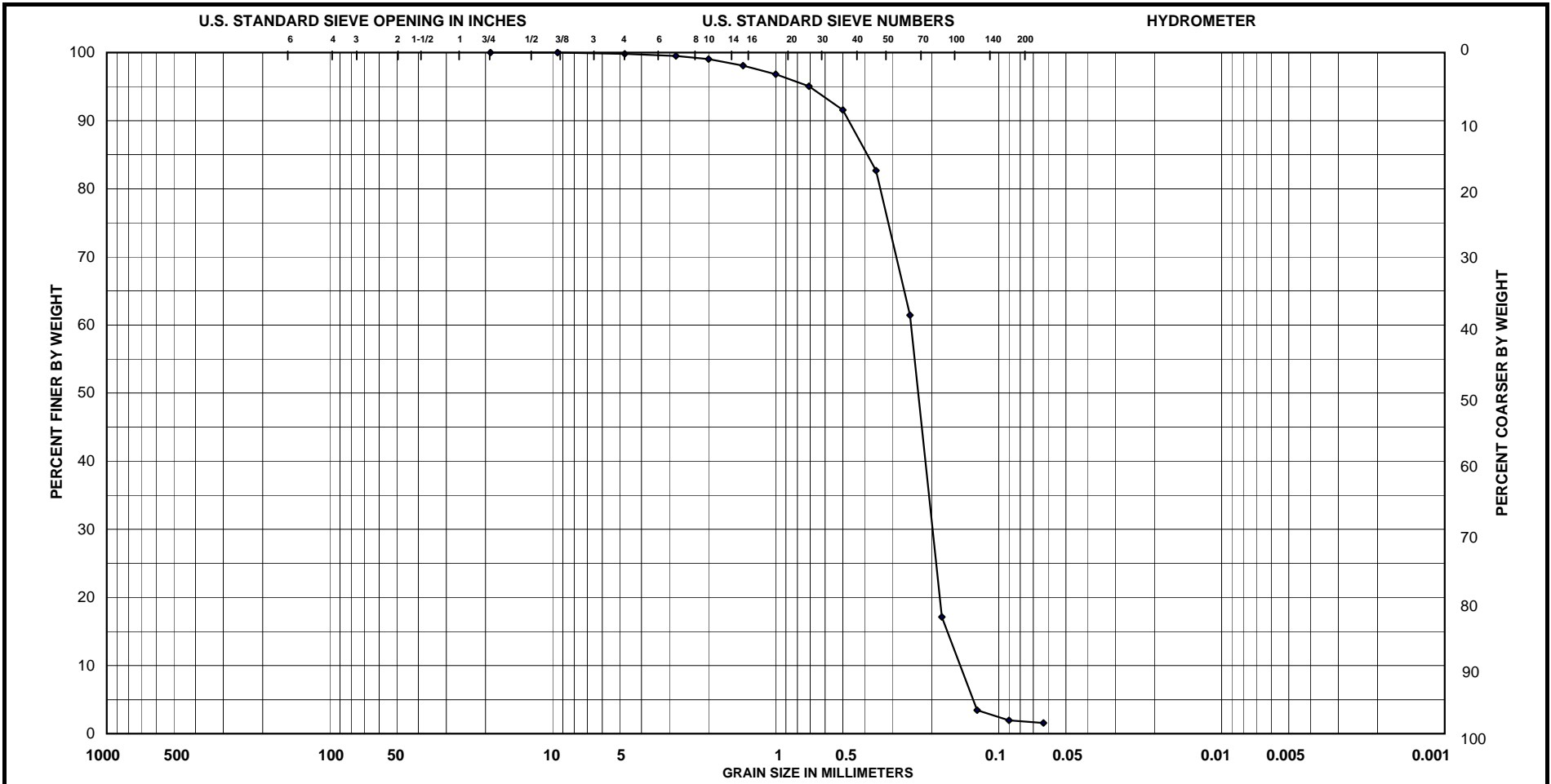
### GRAIN SIZE AND VISUAL SHELL CONTENT

Project:	<b>Topsail Beach, Surf City &amp; North Topsail</b>	Depth:	<b>10.4-10.9</b>
Project No.:	<b>1584-01-40</b>	Date:	<b>9/5/2003</b>
Boring No.:	<b>T1-03-V-10</b>		
Sample No.:	<b>2</b>		
Description:	<b>SAND, poorly-graded, mostly fine-grained quartz, little carbonate, gray (SP)</b>		

Tare Weight, (g):	<b>49.95</b>	
Dry Wt. Before Washing (g):	<b>179.77</b>	(with tare)
Dry Weight After Washing (g):	<b>177.63</b>	(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	0.24	99.82	100	0.24
#7	2.800	0.40	99.51	100	0.40
#10	2.000	0.61	99.04	90	0.55
#14	1.400	1.22	98.10	90	1.10
#18	1.000	1.67	96.81	90	1.50
#25	0.710	2.30	95.04	80	1.84
#35	0.500	4.53	91.55	60	2.72
#45	0.355	11.50	82.69	30	3.45
#60	0.250	27.61	61.42	10	2.76
#80	0.180	57.51	17.12	1	0.58
#120	0.125	17.74	3.46	1	0.18
#170	0.090	1.94	1.96	1	0.02
#230	0.063	0.52	1.56	1	0.01

**Total Shell Content:** **12** %



COBBLES	GRAVEL		SAND			SILT OR CLAY
	COARSE	FINE	COARSE	MEDIUM	FINE	

Sample No.	Elev. Or Depth	Classification	% CO <sub>3</sub>	G <sub>s</sub>	Nat w%	LL	PL	PI		
♦ 2	10.4-10.9	SAND, poorly-graded, mostly fine-grained quartz, little carbonate, gray (SP)	12						<b>Project</b>	Topsail Beach, Surf City & North Topsail
			<b>Area</b>							
			<b>Boring No.</b>	T1-03-V-10						
			<b>Date</b>	9/5/2003						

**GRADATION CURVES**



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## VISUAL SHELL CONTENT

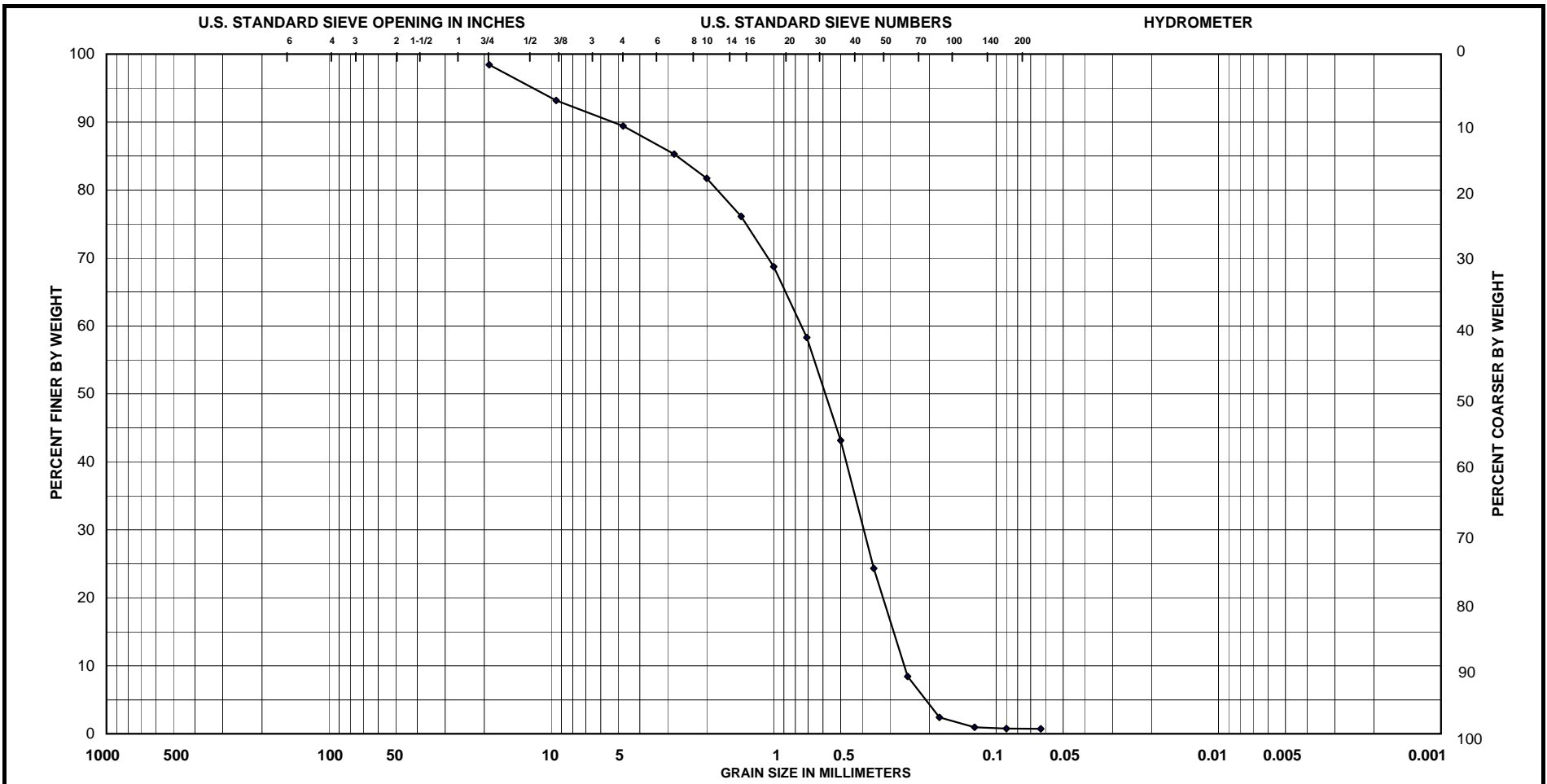
### GRAIN SIZE AND VISUAL SHELL CONTENT

Project:	<b>Topsail Beach, Surf City &amp; North Topsail</b>	Depth:	<b>15.5-16.0</b>
Project No.:	<b>1584-01-40</b>	Date:	<b>9/5/2003</b>
Boring No.:	<b>T1-03-V-11A</b>		
Sample No.:	<b>1</b>		
Description:	<b>SAND, poorly-graded, mostly medium to fine-grained quartz, some carbonate, gray (SP)</b>		

Tare Weight, (g):	<b>49.87</b>	
Dry Wt. Before Washing (g):	<b>232.02</b>	(with tare)
Dry Weight After Washing (g):	<b>230.7</b>	(with tare)

Sieve Size (Name)	Sieve Size (mm)	Weight Retained (g)	% Passing	Approx. Visual Shell %	Approx. Visual Shell Wt. (g)
3/4"	19.000	2.88	98.42	100	2.88
3/8"	9.500	9.55	93.18	100	9.55
#4	4.750	6.87	89.40	100	6.87
#7	2.800	7.48	85.30	90	6.73
#10	2.000	6.54	81.71	95	6.21
#14	1.400	10.16	76.13	80	8.13
#18	1.000	13.51	68.71	80	10.81
#25	0.710	18.99	58.29	70	13.29
#35	0.500	27.57	43.15	40	11.03
#45	0.355	34.28	24.33	20	6.86
#60	0.250	28.98	8.42	5	1.45
#80	0.180	10.95	2.41	1	0.11
#120	0.125	2.63	0.97	1	0.03
#170	0.090	0.33	0.79	1	0.00
#230	0.063	0.09	0.74	1	0.00

**Total Shell Content:** **46** %



COBBLES	GRAVEL		SAND			SILT OR CLAY
	COARSE	FINE	COARSE	MEDIUM	FINE	

Sample No.	Elev. Or Depth	Classification	% CO <sub>3</sub>	G <sub>s</sub>	Nat w%	LL	PL	PI	Project	
♦ 1	15.5-16.0	SAND, poorly-graded, mostly medium to fine-grained quartz, some carbonate, gray (SP)	46						Topsail Beach, Surf City & North Topsail	
									Area	
									Boring No. T1-03-V-11A	
									Date 9/5/2003	

**GRADATION CURVES**



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## VISUAL SHELL CONTENT

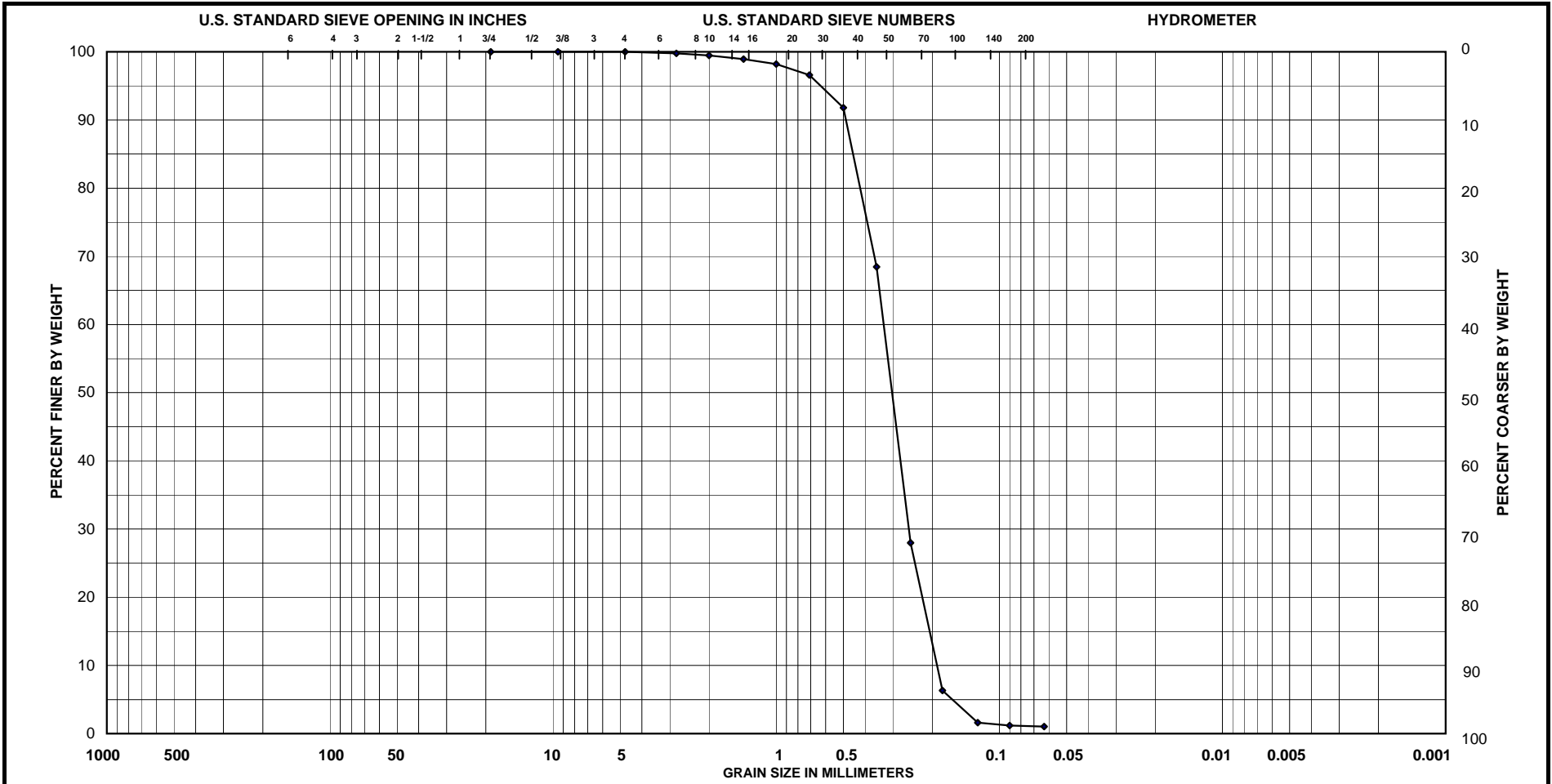
### GRAIN SIZE AND VISUAL SHELL CONTENT

Project:	<b>Topsail Beach, Surf City &amp; North Topsail</b>	Depth:	<b>17.5-18.0</b>
Project No.:	<b>1584-01-40</b>	Date:	<b>9/5/2003</b>
Boring No.:	<b>T1-03-V-11A</b>		
Sample No.:	<b>2</b>		
Description:	<b>SAND, poorly-graded, mostly fine-grained quartz, little carbonate, gray (SP)</b>		

Tare Weight, (g):	<b>50.34</b>	
Dry Wt. Before Washing (g):	<b>183.49</b>	(with tare)
Dry Weight After Washing (g):	<b>181.99</b>	(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	0.31	99.77	90	0.28
#10	2.000	0.41	99.46	50	0.21
#14	1.400	0.71	98.93	70	0.50
#18	1.000	0.95	98.21	90	0.86
#25	0.710	2.14	96.61	80	1.71
#35	0.500	6.39	91.81	70	4.47
#45	0.355	31.09	68.46	60	18.65
#60	0.250	53.89	27.98	15	8.08
#80	0.180	28.86	6.31	5	1.44
#120	0.125	6.27	1.60	1	0.06
#170	0.090	0.57	1.17	1	0.01
#230	0.063	0.17	1.04	1	0.00

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



<b>COBBLES</b>	<b>GRAVEL</b>		<b>SAND</b>			<b>SILT OR CLAY</b>
	COARSE	FINE	COARSE	MEDIUM	FINE	

Sample No.	Elev. Or Depth	Classification	% CO <sub>3</sub>	G <sub>s</sub>	Nat w%	LL	PL	PI	
♦ 2	17.5-18.0	SAND, poorly-graded, mostly fine-grained quartz, little carbonate, gray (SP)	27						<b>Project</b> Topsail Beach, Surf City & North Topsail
									<b>Area</b>
									<b>Boring No.</b> T1-03-V-11A
									<b>Date</b> 9/5/2003

**GRADATION CURVES**



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## VISUAL SHELL CONTENT

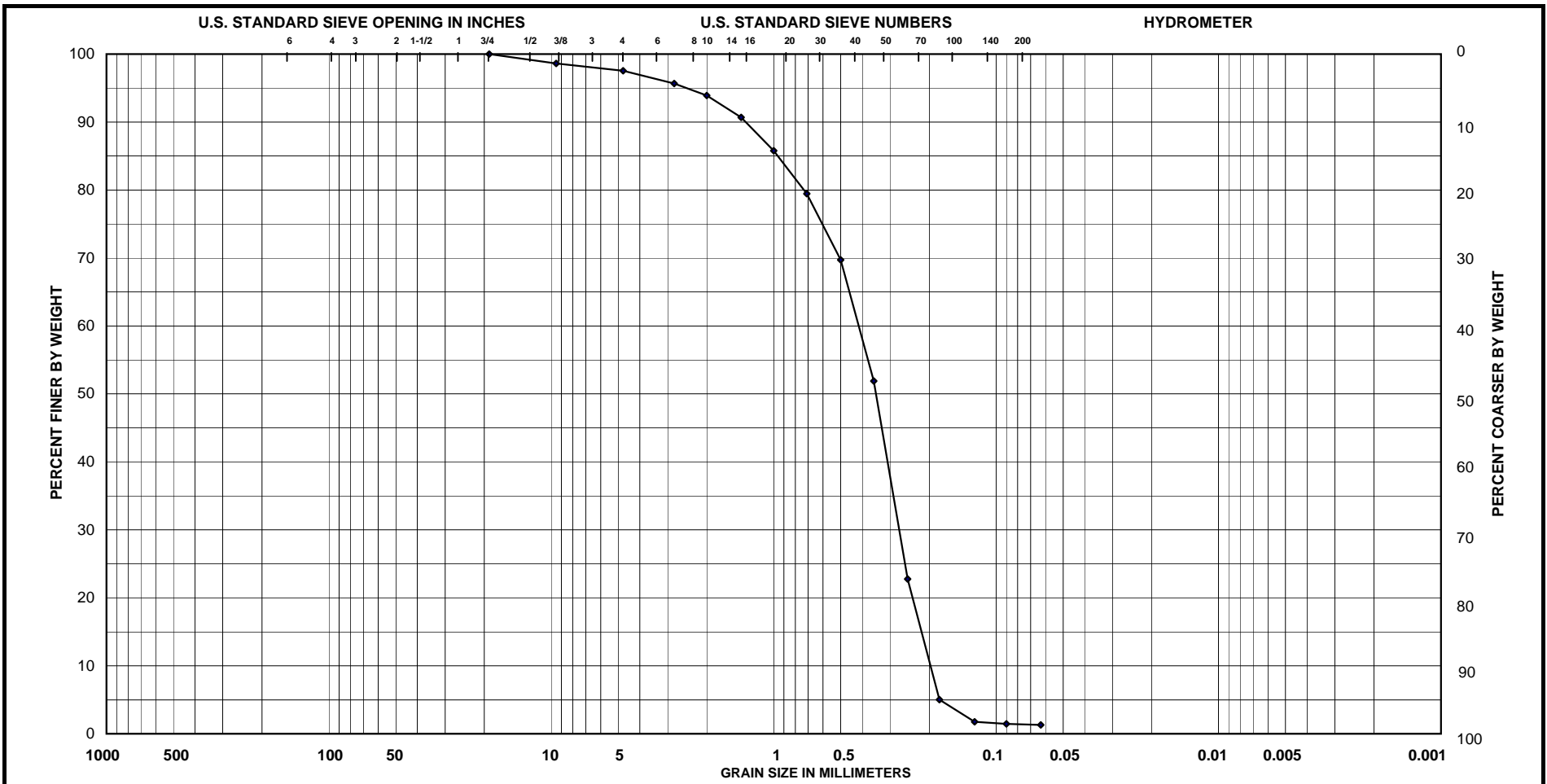
### GRAIN SIZE AND VISUAL SHELL CONTENT

Project:	<b>Topsail Beach, Surf City &amp; North Topsail</b>	Depth:	<b>19.5-20.0</b>
Project No.:	<b>1584-01-40</b>	Date:	<b>9/5/2003</b>
Boring No.:	<b>T1-03-V-11A</b>		
Sample No.:	<b>3</b>		
Description:	<b>SAND, poorly-graded, mostly fine-grained quartz, little carbonate, trace limestone fragments, gray (SP)</b>		

Tare Weight, (g):	<b>50.06</b>	
Dry Wt. Before Washing (g):	<b>204.29</b>	(with tare)
Dry Weight After Washing (g):	<b>202.41</b>	(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	2.15	98.61	100	2.15
#4	4.750	1.65	97.54	100	1.65
#7	2.800	2.87	95.68	95	2.73
#10	2.000	2.70	93.92	80	2.16
#14	1.400	5.00	90.68	75	3.75
#18	1.000	7.55	85.79	70	5.29
#25	0.710	9.77	79.45	50	4.89
#35	0.500	15.03	69.71	40	6.01
#45	0.355	27.46	51.90	15	4.12
#60	0.250	44.94	22.76	5	2.25
#80	0.180	27.39	5.01	1	0.27
#120	0.125	5.00	1.76	1	0.05
#170	0.090	0.47	1.46	1	0.00
#230	0.063	0.26	1.29	1	0.00

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



COBBLES	GRAVEL		SAND			SILT OR CLAY
	COARSE	FINE	COARSE	MEDIUM	FINE	

Sample No.	Elev. Or Depth	Classification	% CO <sub>3</sub>	G <sub>s</sub>	Nat w%	LL	PL	PI	Project
♦ 3	19.5-20.0	SAND, poorly-graded, mostly fine-grained quartz, little carbonate, trace limestone fragments, gray (SP)	23						Topsail Beach, Surf City & North Topsail
									Area
									Boring No. T1-03-V-11A
									Date 9/5/2003

**GRADATION CURVES**





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## VISUAL SHELL CONTENT

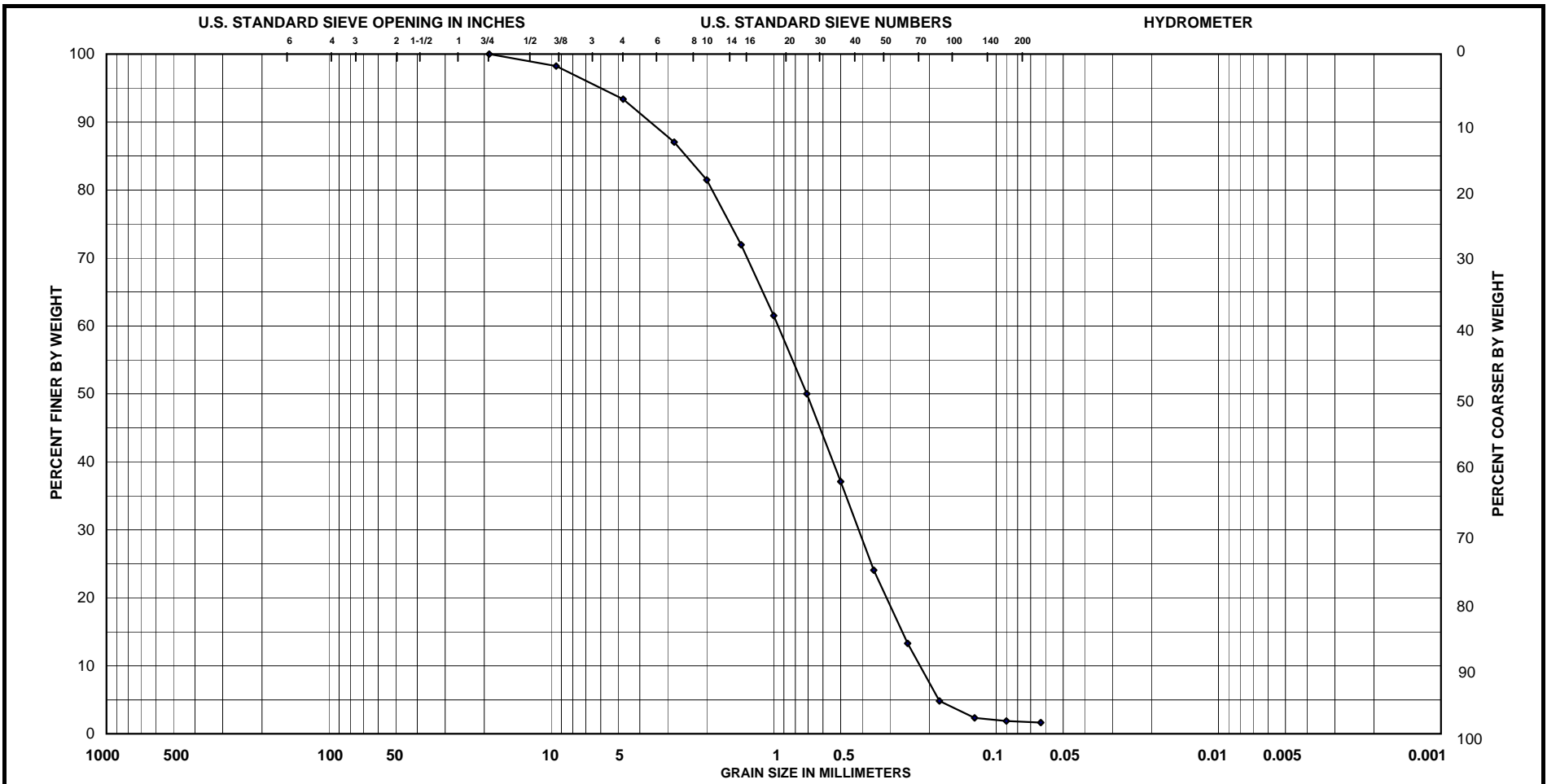
### GRAIN SIZE AND VISUAL SHELL CONTENT

Project:	<b>Topsail Beach, Surf City &amp; North Topsail</b>	Depth:	<b>21.0-21.5</b>
Project No.:	<b>1584-01-40</b>	Date:	<b>9/5/2003</b>
Boring No.:	<b>T1-03-V-11A</b>		
Sample No.:	<b>4</b>		
Description:	<b>SAND, poorly-graded, mostly coarse to medium-grained carbonate, some medium to fine-grained quartz, gray (SP)</b>		

Tare Weight, (g):	<b>50.31</b>	
Dry Wt. Before Washing (g):	<b>172.79</b>	(with tare)
Dry Weight After Washing (g):	<b>170.98</b>	(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	2.14	98.25	100	2.14
#4	4.750	6.00	93.35	100	6.00
#7	2.800	7.74	87.03	95	7.35
#10	2.000	6.78	81.50	90	6.10
#14	1.400	11.71	71.94	90	10.54
#18	1.000	12.75	61.53	75	9.56
#25	0.710	14.10	50.02	70	9.87
#35	0.500	15.80	37.12	60	9.48
#45	0.355	15.99	24.06	20	3.20
#60	0.250	13.18	13.30	10	1.32
#80	0.180	10.39	4.82	3	0.31
#120	0.125	3.04	2.34	1	0.03
#170	0.090	0.55	1.89	1	0.01
#230	0.063	0.29	1.65	1	0.00

**Total Shell Content:** **54** %



COBBLES	GRAVEL		SAND			SILT OR CLAY
	COARSE	FINE	COARSE	MEDIUM	FINE	

Sample No.	Elev. Or Depth	Classification	% CO <sub>3</sub>	G <sub>s</sub>	Nat w%	LL	PL	PI	Project
4	21.0-21.5	SAND, poorly-graded, mostly coarse to medium-grained carbonate, some medium to fine-grained quartz, gray (SP)	54						Topsail Beach, Surf City & North Topsail
									Area
									Boring No. T1-03-V-11A
									Date 9/5/2003

**GRADATION CURVES**



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## VISUAL SHELL CONTENT

### GRAIN SIZE AND VISUAL SHELL CONTENT

Project:	<b>Topsail Beach, Surf City &amp; North Topsail</b>	Depth:	<b>22.5-23.0</b>
Project No.:	<b>1584-01-40</b>	Date:	<b>9/5/2003</b>
Boring No.:	<b>T1-03-V-11A</b>		
Sample No.:	<b>5</b>		
Description:	<b>SAND, poorly-graded, mostly medium to fine-grained quartz, some carbonate, gray (SP)</b>		

Tare Weight, (g):	<b>50.18</b>	
Dry Wt. Before Washing (g):	<b>209.05</b>	(with tare)
Dry Weight After Washing (g):	<b>206.78</b>	(with tare)

Sieve Size (Name)	Sieve Size (mm)	Weight Retained (g)	% Passing	Approx. Visual Shell %	Approx. Visual Shell Wt. (g)
3/4"	19.000	6.13	96.14	100	6.13
3/8"	9.500	11.63	88.82	100	11.63
#4	4.750	6.25	84.89	100	6.25
#7	2.800	6.15	81.02	95	5.84
#10	2.000	4.43	78.23	100	4.43
#14	1.400	6.51	74.13	95	6.18
#18	1.000	7.24	69.57	80	5.79
#25	0.710	8.55	64.19	70	5.99
#35	0.500	12.64	56.23	60	7.58
#45	0.355	21.85	42.48	30	6.56
#60	0.250	30.80	23.09	10	3.08
#80	0.180	26.64	6.33	3	0.80
#120	0.125	6.13	2.47	1	0.06
#170	0.090	0.88	1.91	1	0.01
#230	0.063	0.46	1.62	1	0.00

**Total Shell Content:** **44** %



COBBLES	GRAVEL		SAND			SILT OR CLAY
	COARSE	FINE	COARSE	MEDIUM	FINE	

Sample No.	Elev. Or Depth	Classification	% CO <sub>3</sub>	G <sub>s</sub>	Nat w%	LL	PL	PI	Project	
5	22.5-23.0	SAND, poorly-graded, mostly medium to fine-grained quartz, some carbonate, gray (SP)	44						Topsail Beach, Surf City & North Topsail	
									Area	
									Boring No. T1-03-V-11A	
									Date 9/5/2003	

**GRADATION CURVES**



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## VISUAL SHELL CONTENT

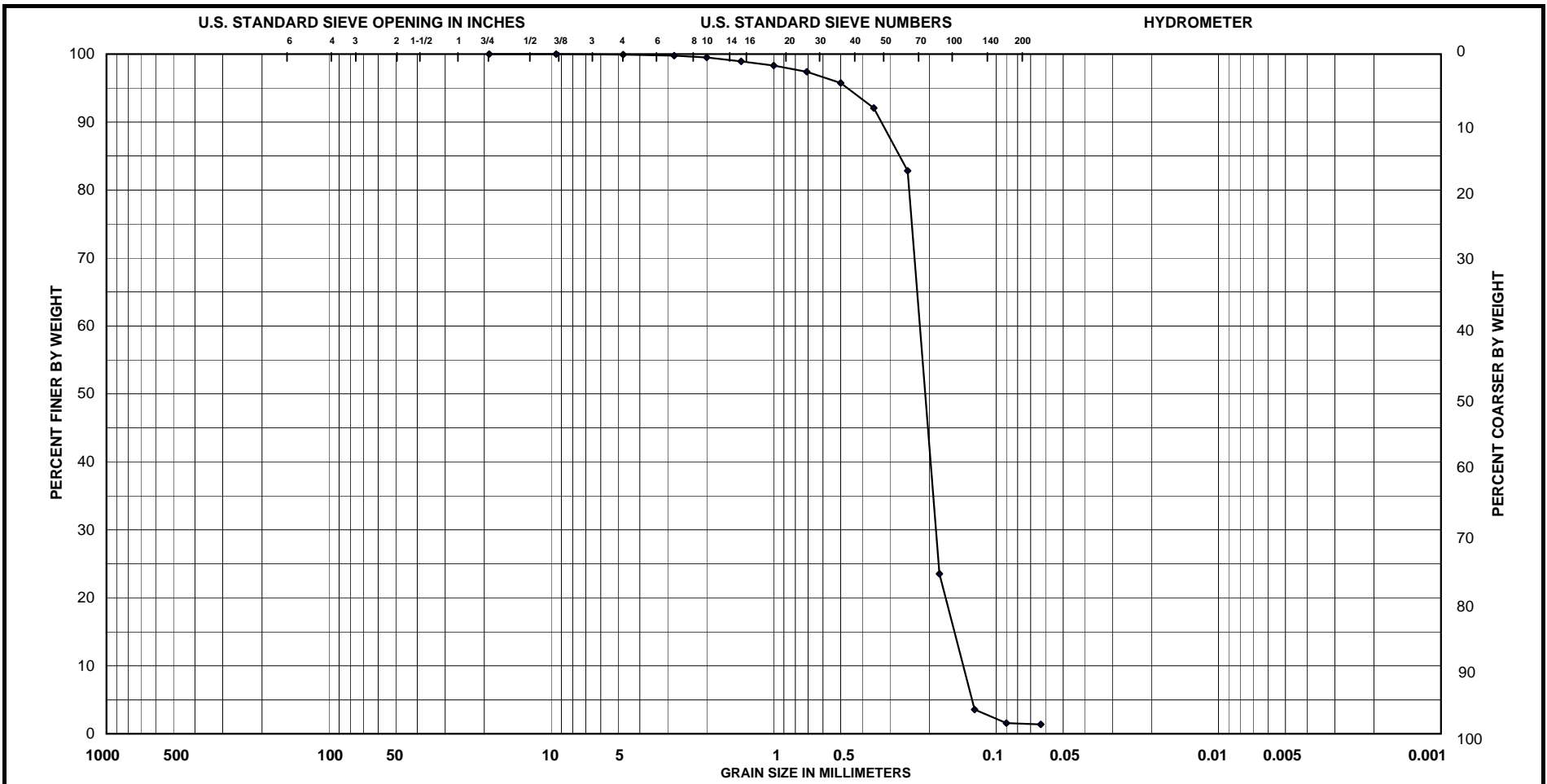
### GRAIN SIZE AND VISUAL SHELL CONTENT

<b>Project:</b>	<b>Topsail Beach, Surf City &amp; North Topsail</b>	<b>Depth:</b>	<b>3.0-3.5</b>
<b>Project No.:</b>	<b>1584-01-40</b>	<b>Date:</b>	<b>9/5/2003</b>
<b>Boring No.:</b>	<b>T1-03-V-12A</b>		
<b>Sample No.:</b>	<b>1</b>		
<b>Description:</b>	<b>SAND, poorly-graded, mostly fine-grained quartz, few carbonate, gray (SP)</b>		

Tare Weight, (g):	50.26	
Dry Wt. Before Washing (g):	192.63	(with tare)
Dry Weight After Washing (g):	191.16	(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	0.12	99.92	100	0.12
#7	2.800	0.21	99.77	100	0.21
#10	2.000	0.39	99.49	90	0.35
#14	1.400	0.80	98.93	90	0.72
#18	1.000	0.87	98.32	80	0.70
#25	0.710	1.30	97.41	50	0.65
#35	0.500	2.39	95.73	40	0.96
#45	0.355	5.20	92.08	25	1.30
#60	0.250	13.19	82.81	10	1.32
#80	0.180	84.38	23.54	3	2.53
#120	0.125	28.42	3.58	1	0.28
#170	0.090	2.86	1.57	1	0.03
#230	0.063	0.25	1.40	1	0.00

**Total Shell Content:** 6 %



COBBLES	GRAVEL		SAND			SILT OR CLAY
	COARSE	FINE	COARSE	MEDIUM	FINE	

Sample No.	Elev. Or Depth	Classification	% CO <sub>3</sub>	G <sub>s</sub>	Nat w%	LL	PL	PI	Project
1	3.0-3.5	SAND, poorly-graded, mostly fine-grained quartz, few carbonate, gray (SP)	6						Topsail Beach, Surf City & North Topsail
									Area
									Boring No. T1-03-V-12A
									Date 9/5/2003

**GRADATION CURVES**



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## VISUAL SHELL CONTENT

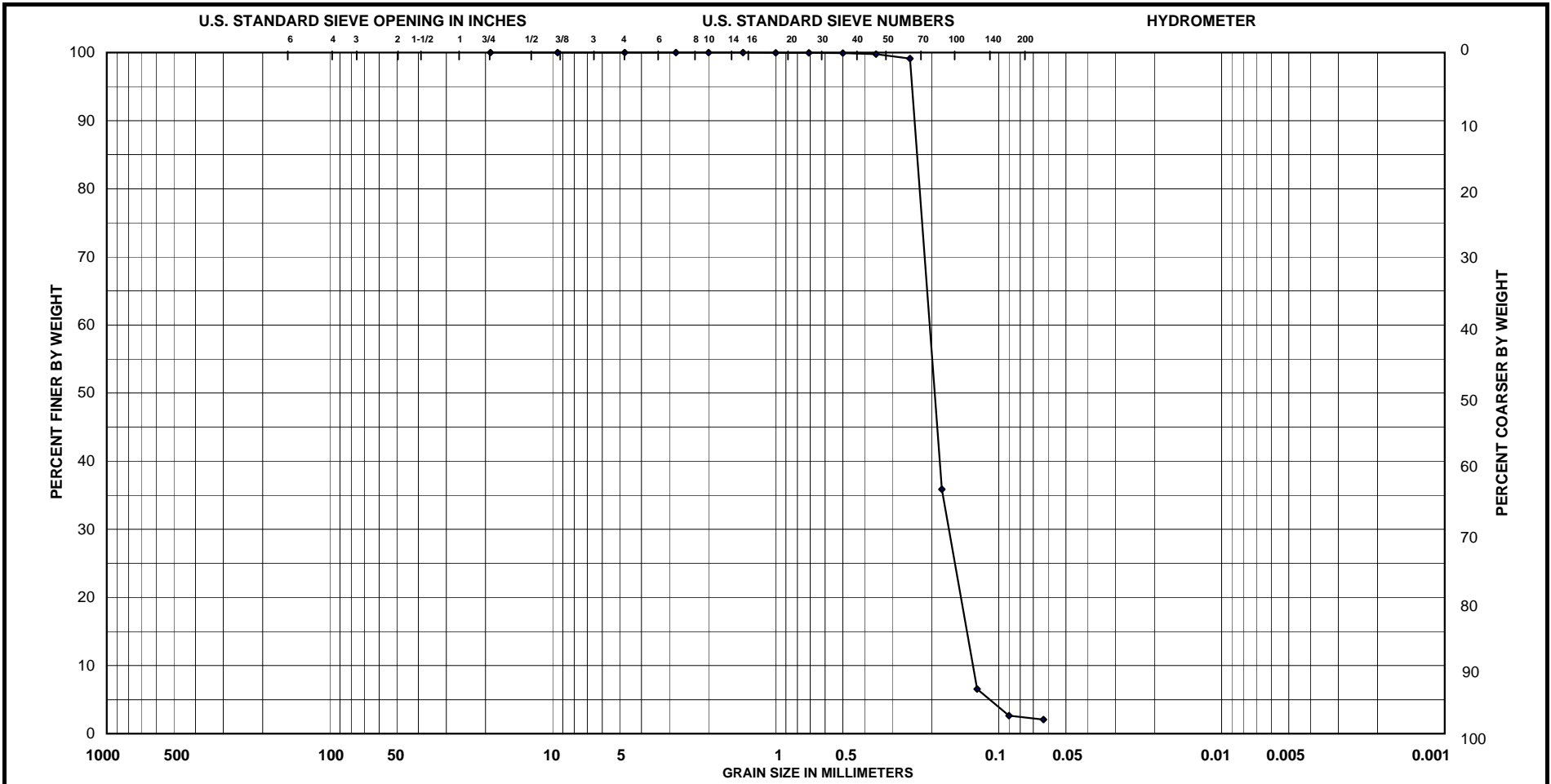
### GRAIN SIZE AND VISUAL SHELL CONTENT

Project:	<b>Topsail Beach, Surf City &amp; North Topsail</b>	Depth:	<b>5.5-6.0</b>
Project No.:	<b>1584-01-40</b>	Date:	<b>9/5/2003</b>
Boring No.:	<b>T1-03-V-12A</b>		
Sample No.:	<b>2</b>		
Description:	<b>SAND, poorly-graded, mostly fine-grained quartz, trace carbonate, gray (SP)</b>		

Tare Weight, (g):	<b>50.43</b>	
Dry Wt. Before Washing (g):	<b>178.48</b>	(with tare)
Dry Weight After Washing (g):	<b>175.76</b>	(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	0.00	100.00	0	0.00
#14	1.400	0.01	99.99	100	0.01
#18	1.000	0.04	99.96	100	0.04
#25	0.710	0.01	99.95	100	0.01
#35	0.500	0.02	99.93	100	0.02
#45	0.355	0.22	99.76	90	0.20
#60	0.250	0.84	99.11	40	0.34
#80	0.180	80.99	35.86	5	4.05
#120	0.125	37.54	6.54	1	0.38
#170	0.090	5.01	2.63	1	0.05
#230	0.063	0.73	2.06	1	0.01

**Total Shell Content:** **4** %



COBBLES	GRAVEL		SAND			SILT OR CLAY
	COARSE	FINE	COARSE	MEDIUM	FINE	

Sample No.	Elev. Or Depth	Classification	% CO <sub>3</sub>	G <sub>s</sub>	Nat w%	LL	PL	PI	Project
♦ 2	5.5-6.0	SAND, poorly-graded, mostly fine-grained quartz, trace carbonate, gray (SP)	4						Topsail Beach, Surf City & North Topsail
									Area
									Boring No. T1-03-V-12A
									Date 9/5/2003

**GRADATION CURVES**





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## VISUAL SHELL CONTENT

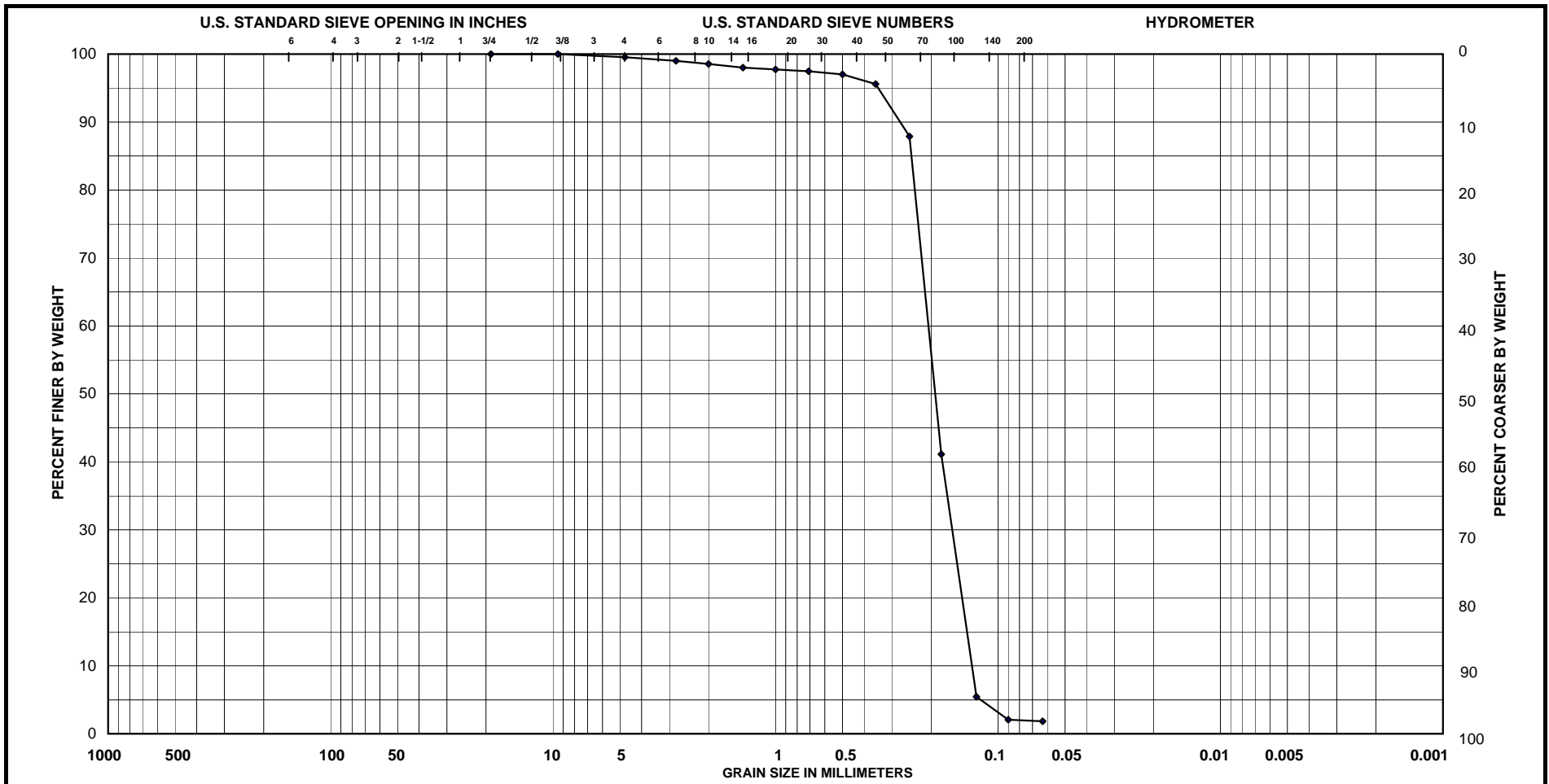
### GRAIN SIZE AND VISUAL SHELL CONTENT

Project:	<b>Topsail Beach, Surf City &amp; North Topsail</b>	Depth:	<b>6.7-7.2</b>
Project No.:	<b>1584-01-40</b>	Date:	<b>9/15/2003</b>
Boring No.:	<b>T1-03-V-105</b>		
Sample No.:	<b>1</b>		
Description:	<b>SAND, poorly-graded, mostly fine-grained quartz, trace fragmented limestone, trace carbonate, gray (SP)</b>		

Tare Weight, (g):	<b>49.37</b>	
Dry Wt. Before Washing (g):	<b>141.53</b>	(with tare)
Dry Weight After Washing (g):	<b>140.35</b>	(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	0.41	99.56	100	0.41
#7	2.800	0.50	99.01	90	0.45
#10	2.000	0.43	98.55	90	0.39
#14	1.400	0.51	97.99	70	0.36
#18	1.000	0.23	97.74	80	0.18
#25	0.710	0.26	97.46	60	0.16
#35	0.500	0.41	97.02	60	0.25
#45	0.355	1.31	95.59	30	0.39
#60	0.250	7.10	87.89	10	0.71
#80	0.180	43.08	41.15	1	0.43
#120	0.125	32.90	5.45	1	0.33
#170	0.090	3.11	2.07	1	0.03
#230	0.063	0.20	1.86	1	0.00

**Total Shell Content:** **4** %



<b>COBBLES</b>	<b>GRAVEL</b>		<b>SAND</b>			<b>SILT OR CLAY</b>
	COARSE	FINE	COARSE	MEDIUM	FINE	

Sample No.	Elev. Or Depth	Classification	% CO <sub>3</sub>	G <sub>s</sub>	Nat w%	LL	PL	PI	Project
♦ 1	6.7-7.2	SAND, poorly-graded, mostly fine-grained quartz, trace fragmented limestone, trace carbonate, gray (SP)	4						Topsail Beach, Surf City & North Topsail
									Area
									Boring No. T1-03-V-105
									Date 9/15/2003
<b>GRADATION CURVES</b>									



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## VISUAL SHELL CONTENT

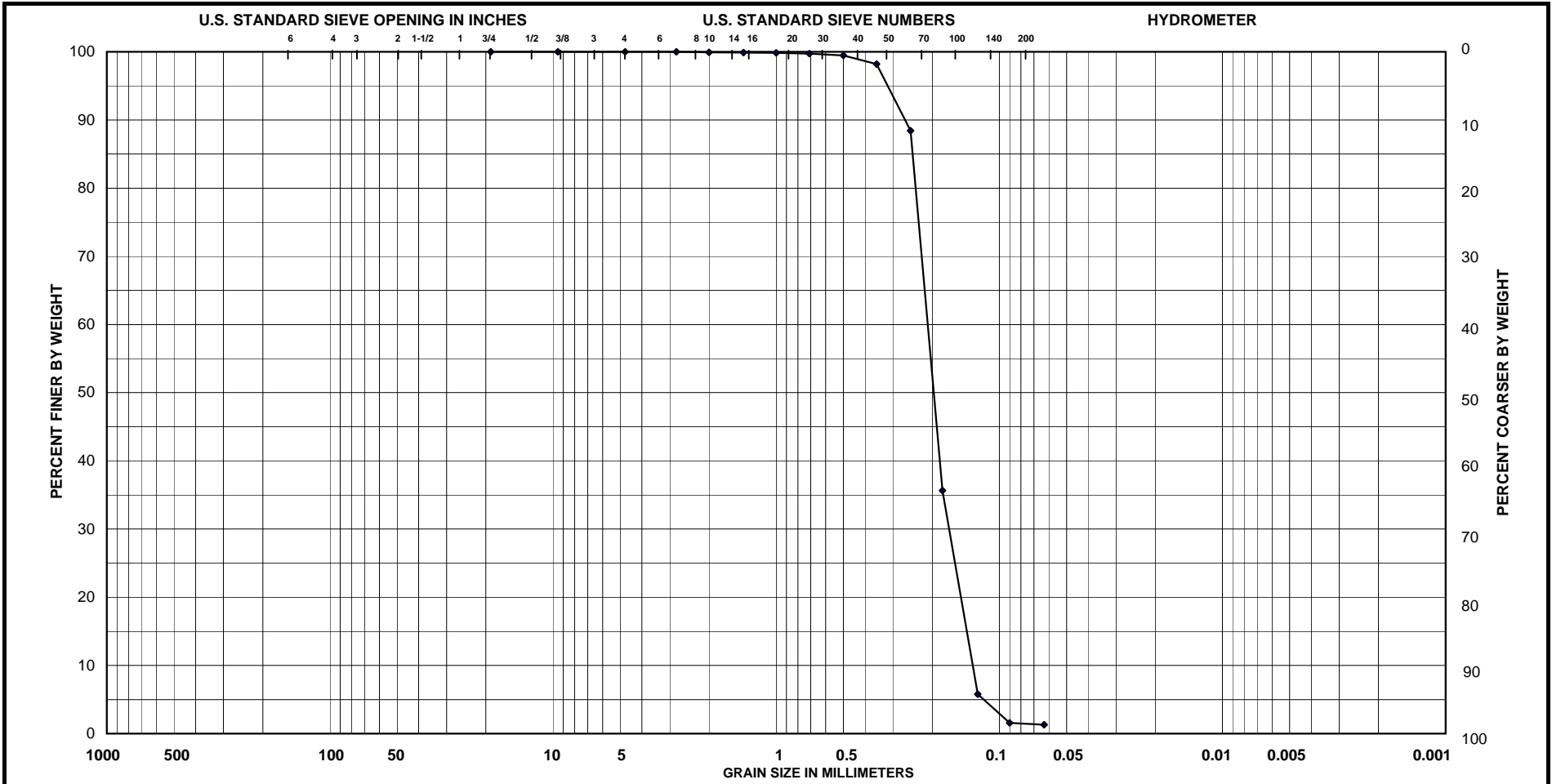
### GRAIN SIZE AND VISUAL SHELL CONTENT

Project:	<b>Topsail Beach, Surf City &amp; North Topsail</b>	Depth:	<b>9.0-9.5</b>
Project No.:	<b>1584-01-40</b>	Date:	<b>9/16/2003</b>
Boring No.:	<b>T1-03-V-105</b>		
Sample No.:	<b>2</b>		
Description:	<b>SAND, poorly-graded, mostly fine-grained quartz, trace carbonate, gray (SP)</b>		

Tare Weight, (g):	<b>49.72</b>	
Dry Wt. Before Washing (g):	<b>177.4</b>	(with tare)
Dry Weight After Washing (g):	<b>175.96</b>	(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	0	0.00
#10	2.000	0.08	99.93	20	0.02
#14	1.400	0.07	99.87	30	0.02
#18	1.000	0.06	99.83	70	0.04
#25	0.710	0.11	99.74	90	0.10
#35	0.500	0.36	99.46	70	0.25
#45	0.355	1.61	98.20	30	0.48
#60	0.250	12.50	88.41	5	0.63
#80	0.180	67.36	35.65	1	0.67
#120	0.125	38.14	5.78	1	0.38
#170	0.090	5.39	1.56	1	0.05
#230	0.063	0.32	1.31	1	0.00

**Total Shell Content:** **2** %



COBBLES	GRAVEL		SAND			SILT OR CLAY
	COARSE	FINE	COARSE	MEDIUM	FINE	

Sample No.	Elev. Or Depth	Classification	% CO <sub>3</sub>	G <sub>s</sub>	Nat w%	LL	PL	PI		
♦ 2	9.0-9.5	SAND, poorly-graded, mostly fine-grained quartz, trace carbonate, gray (SP)	2						<b>Project</b>	Topsail Beach, Surf City & North Topsail
									<b>Area</b>	
									<b>Boring No.</b>	T1-03-V-105
									<b>Date</b>	9/16/2003
<b>GRADATION CURVES</b>										



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## VISUAL SHELL CONTENT

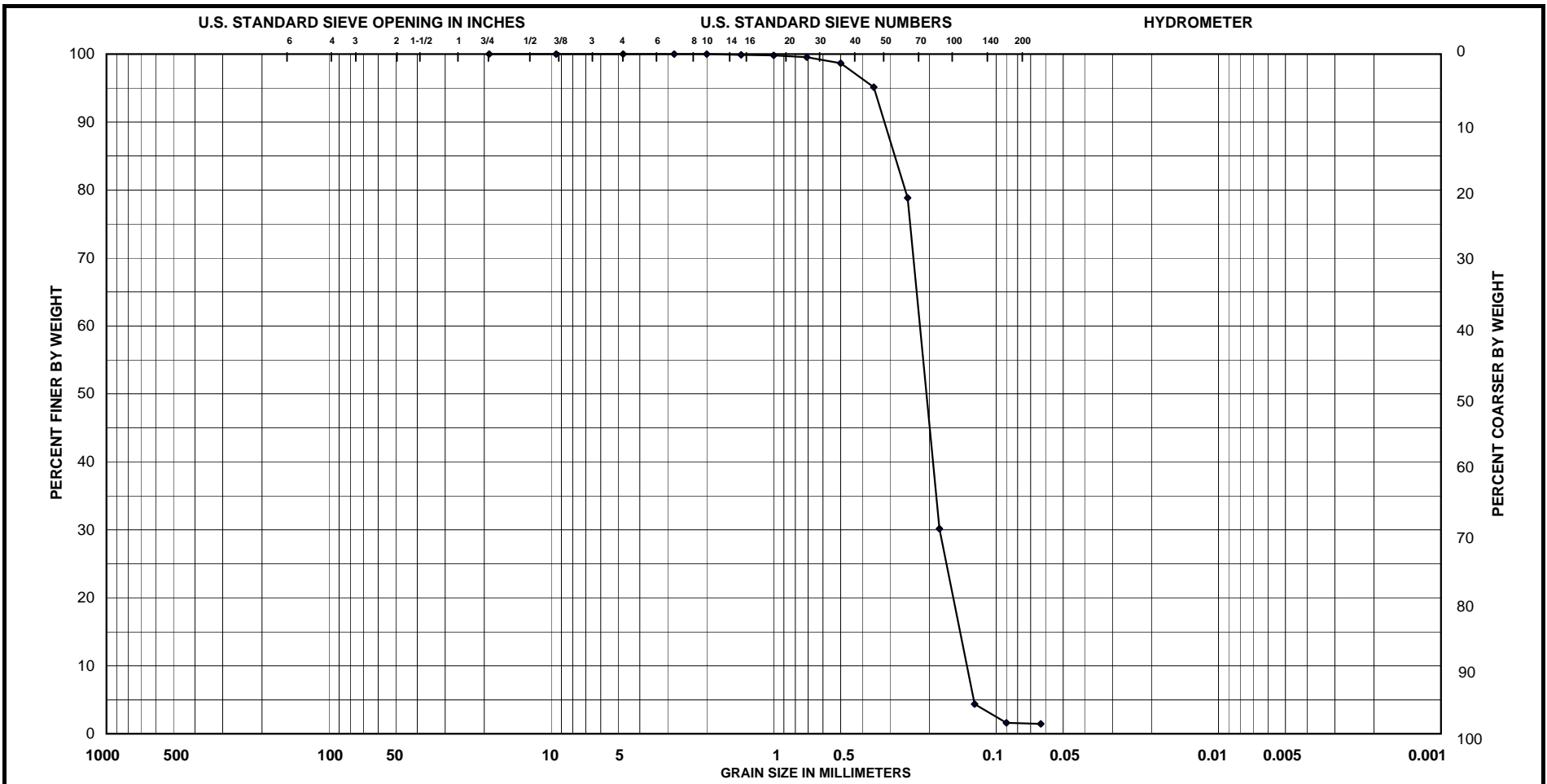
### GRAIN SIZE AND VISUAL SHELL CONTENT

Project:	<b>Topsail Beach, Surf City &amp; North Topsail</b>	Depth:	<b>11.0-11.5</b>
Project No.:	<b>1584-01-40</b>	Date:	<b>9/16/2003</b>
Boring No.:	<b>T1-03-V-105</b>		
Sample No.:	<b>3</b>		
Description:	<b>SAND, poorly-graded, mostly fine-grained quartz, trace carbonate, gray (SP)</b>		

Tare Weight, (g):	<b>50.18</b>	
Dry Wt. Before Washing (g):	<b>160.51</b>	(with tare)
Dry Weight After Washing (g):	<b>159.38</b>	(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	30	0.01
#14	1.400	0.10	99.89	100	0.10
#18	1.000	0.11	99.79	100	0.11
#25	0.710	0.29	99.53	90	0.26
#35	0.500	0.94	98.68	80	0.75
#45	0.355	3.93	95.11	30	1.18
#60	0.250	17.94	78.85	5	0.90
#80	0.180	53.70	30.18	1	0.54
#120	0.125	28.46	4.39	1	0.28
#170	0.090	3.06	1.61	1	0.03
#230	0.063	0.19	1.44	1	0.00

**Total Shell Content:** **4** %



COBBLES	GRAVEL		SAND			SILT OR CLAY
	COARSE	FINE	COARSE	MEDIUM	FINE	

Sample No.	Elev. Or Depth	Classification	% CO <sub>3</sub>	G <sub>s</sub>	Nat w%	LL	PL	PI	Project
3	11.0-11.5	SAND, poorly-graded, mostly fine-grained quartz, trace carbonate, gray (SP)	4						Topsail Beach, Surf City & North Topsail
									Area
									Boring No. T1-03-V-105
									Date 9/16/2003

**GRADATION CURVES**



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## VISUAL SHELL CONTENT

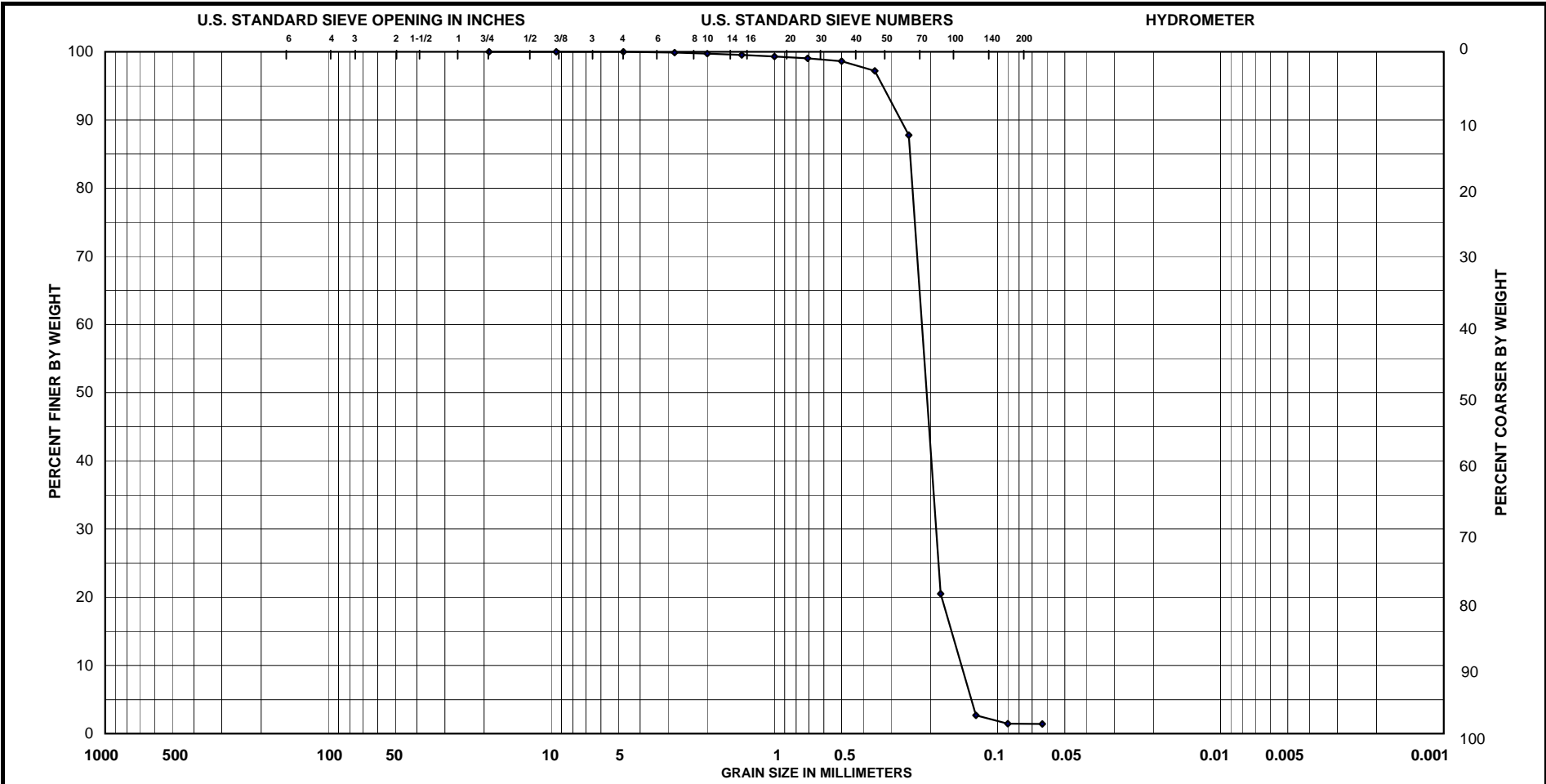
### GRAIN SIZE AND VISUAL SHELL CONTENT

Project:	<b>Topsail Beach, Surf City &amp; North Topsail</b>	Depth:	<b>7.0-7.5</b>
Project No.:	<b>1584-01-40</b>	Date:	<b>9/16/2003</b>
Boring No.:	<b>T1-03-V-106</b>		
Sample No.:	<b>1</b>		
Description:	<b>SAND, poorly-graded, mostly fine-grained quartz, trace carbonate, trace fragmented limestone, gray (SP)</b>		

Tare Weight, (g):	<b>50.28</b>	
Dry Wt. Before Washing (g):	<b>152.17</b>	(with tare)
Dry Weight After Washing (g):	<b>151.15</b>	(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	0.13	99.87	100	0.13
#10	2.000	0.14	99.74	100	0.14
#14	1.400	0.21	99.53	80	0.17
#18	1.000	0.23	99.30	60	0.14
#25	0.710	0.25	99.06	50	0.13
#35	0.500	0.46	98.61	30	0.14
#45	0.355	1.43	97.20	20	0.29
#60	0.250	9.62	87.76	10	0.96
#80	0.180	68.51	20.52	1	0.69
#120	0.125	18.17	2.69	1	0.18
#170	0.090	1.24	1.47	1	0.01
#230	0.063	0.05	1.42	1	0.00

**Total Shell Content:** **3** %



COBBLES	GRAVEL		SAND			SILT OR CLAY
	COARSE	FINE	COARSE	MEDIUM	FINE	

Sample No.	Elev. Or Depth	Classification	% CO <sub>3</sub>	G <sub>s</sub>	Nat w%	LL	PL	PI	Project
♦ 1	7.0-7.5	SAND, poorly-graded, mostly fine-grained quartz, trace carbonate, trace fragmented limestone, gray (SP)	3						Topsail Beach, Surf City & North Topsail
									Area
									Boring No. T1-03-V-106
									Date 9/16/2003

**GRADATION CURVES**





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## VISUAL SHELL CONTENT

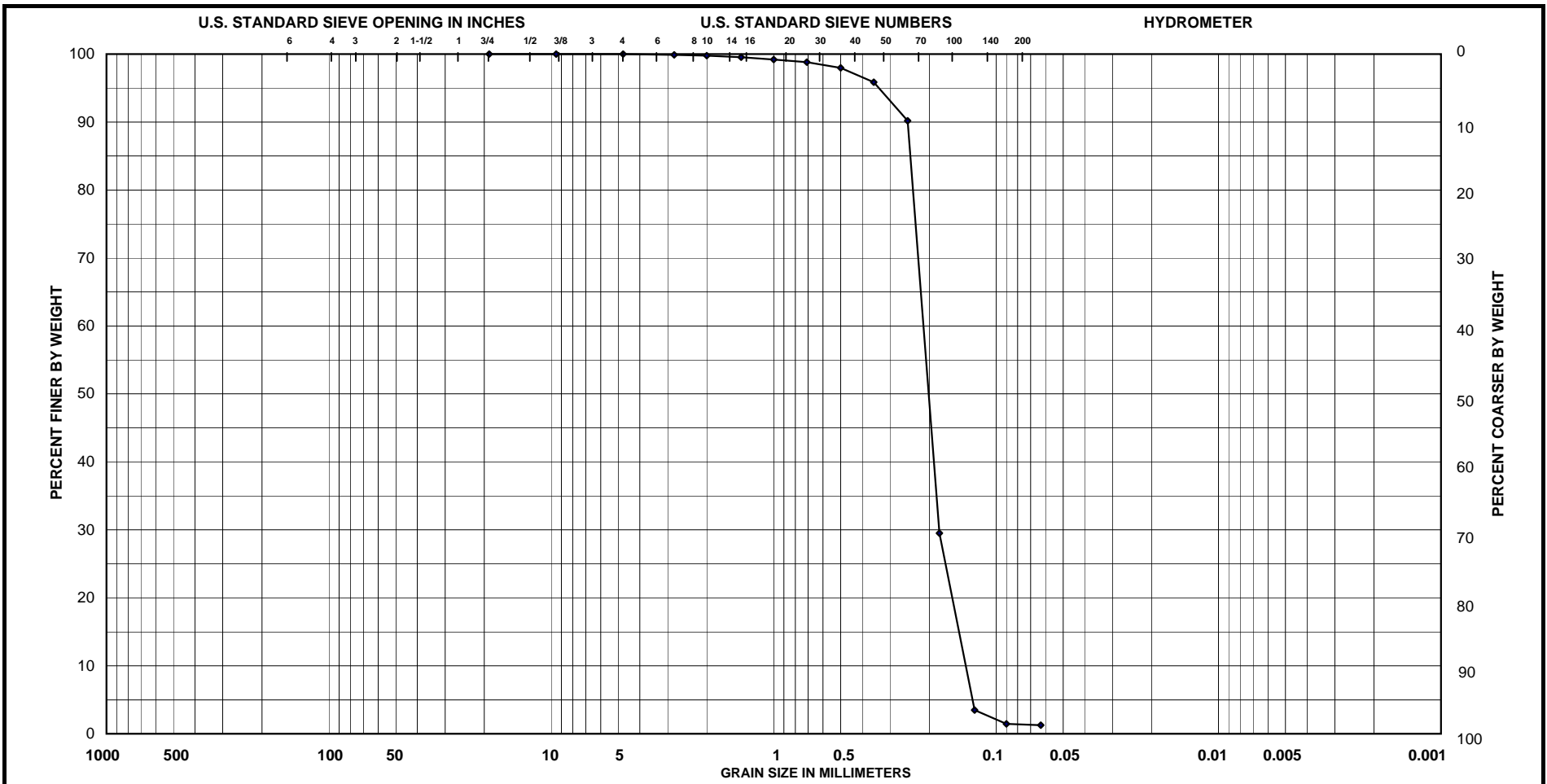
### GRAIN SIZE AND VISUAL SHELL CONTENT

Project:	<b>Topsail Beach, Surf City &amp; North Topsail</b>	Depth:	<b>9.0-9.5</b>
Project No.:	<b>1584-01-40</b>	Date:	<b>9/16/2003</b>
Boring No.:	<b>T1-03-V-106</b>		
Sample No.:	<b>2</b>		
Description:	<b>SAND, poorly-graded, mostly fine-grained quartz, trace carbonate, gray (SP)</b>		

Tare Weight, (g):	<b>49.92</b>	
Dry Wt. Before Washing (g):	<b>163.68</b>	(with tare)
Dry Weight After Washing (g):	<b>162.42</b>	(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	0.13	99.89	80	0.10
#10	2.000	0.11	99.79	70	0.08
#14	1.400	0.27	99.55	45	0.12
#18	1.000	0.42	99.18	35	0.15
#25	0.710	0.43	98.80	30	0.13
#35	0.500	0.95	97.97	10	0.10
#45	0.355	2.39	95.87	5	0.12
#60	0.250	6.46	90.19	3	0.19
#80	0.180	69.04	29.50	1	0.69
#120	0.125	29.58	3.50	1	0.30
#170	0.090	2.34	1.44	1	0.02
#230	0.063	0.19	1.27	1	0.00

**Total Shell Content:** **2** %



COBBLES	GRAVEL		SAND			SILT OR CLAY
	COARSE	FINE	COARSE	MEDIUM	FINE	

Sample No.	Elev. Or Depth	Classification	% CO <sub>3</sub>	G <sub>s</sub>	Nat w%	LL	PL	PI	Project
♦ 2	9.0-9.5	SAND, poorly-graded, mostly fine-grained quartz, trace carbonate, gray (SP)	2						Topsail Beach, Surf City & North Topsail
									Area
									Boring No. T1-03-V-106
									Date 9/16/2003

**GRADATION CURVES**



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## VISUAL SHELL CONTENT

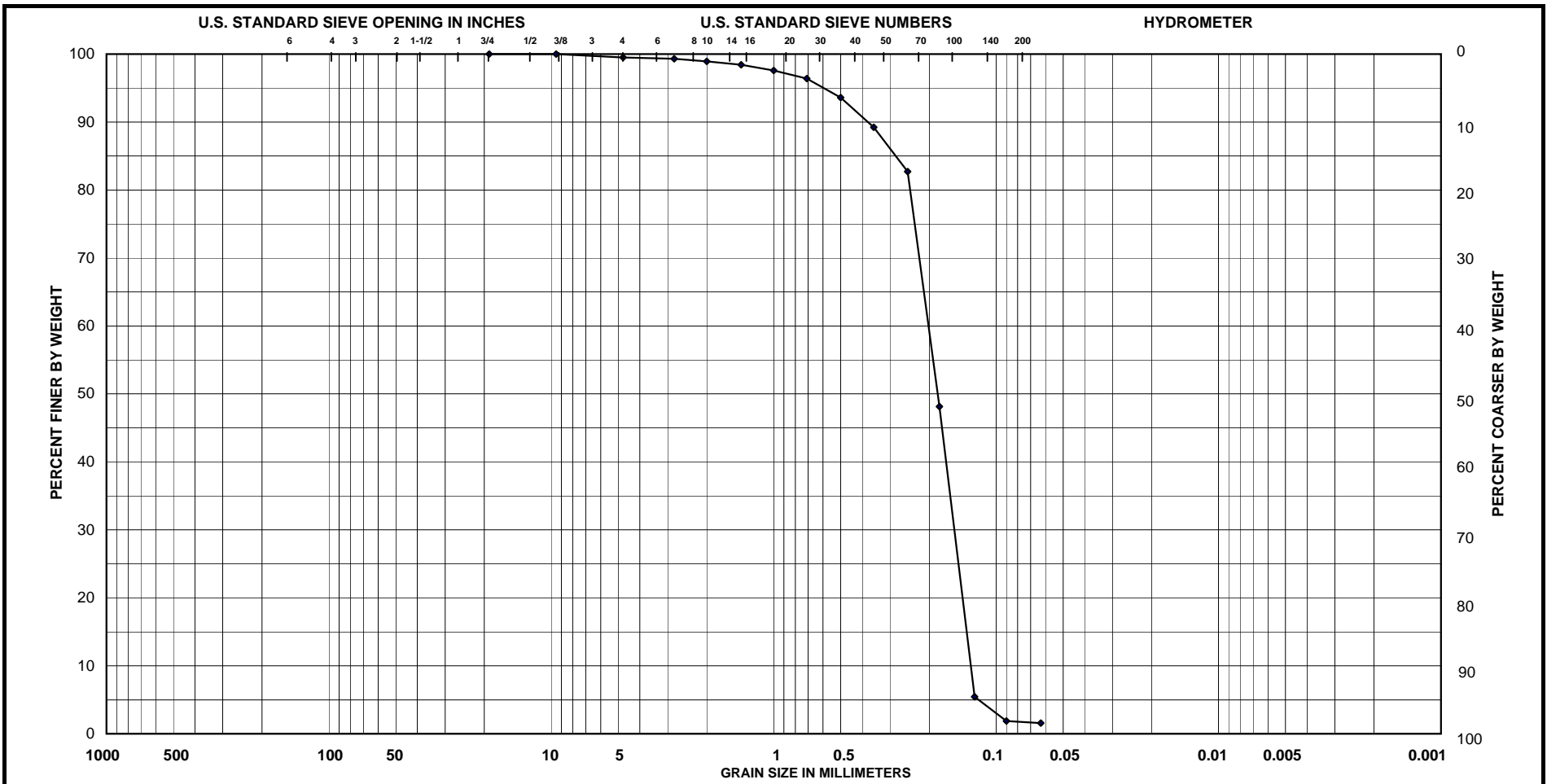
### GRAIN SIZE AND VISUAL SHELL CONTENT

Project:	<b>Topsail Beach, Surf City &amp; North Topsail</b>	Depth:	<b>11.0-11.5</b>
Project No.:	<b>1584-01-40</b>	Date:	<b>9/16/2003</b>
Boring No.:	<b>T1-03-V-106</b>		
Sample No.:	<b>3</b>		
Description:	<b>SAND, poorly-graded, mostly fine-grained quartz, trace carbonate, trace fragmented limestone, gray (SP)</b>		

Tare Weight, (g):	<b>49.34</b>	
Dry Wt. Before Washing (g):	<b>173.98</b>	(with tare)
Dry Weight After Washing (g):	<b>172.6</b>	(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	0.61	99.51	100	0.61
#7	2.800	0.26	99.30	100	0.26
#10	2.000	0.45	98.94	90	0.41
#14	1.400	0.62	98.44	95	0.59
#18	1.000	1.06	97.59	65	0.69
#25	0.710	1.49	96.40	20	0.30
#35	0.500	3.48	93.61	10	0.35
#45	0.355	5.45	89.23	3	0.16
#60	0.250	8.11	82.73	3	0.24
#80	0.180	43.09	48.15	1	0.43
#120	0.125	53.22	5.46	1	0.53
#170	0.090	4.45	1.89	1	0.04
#230	0.063	0.40	1.56	1	0.00

**Total Shell Content:** **4** %



COBBLES	GRAVEL		SAND			SILT OR CLAY
	COARSE	FINE	COARSE	MEDIUM	FINE	

Sample No.	Elev. Or Depth	Classification	% CO <sub>3</sub>	G <sub>s</sub>	Nat w%	LL	PL	PI	
♦ 3	11.0-11.5	SAND, poorly-graded, mostly fine-grained quartz, trace carbonate, trace fragmented limestone, gray (SP)	4						<b>Project</b> Topsail Beach, Surf City & North Topsail
									<b>Area</b>
									<b>Boring No.</b> T1-03-V-106
									<b>Date</b> 9/16/2003

**GRADATION CURVES**



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## VISUAL SHELL CONTENT

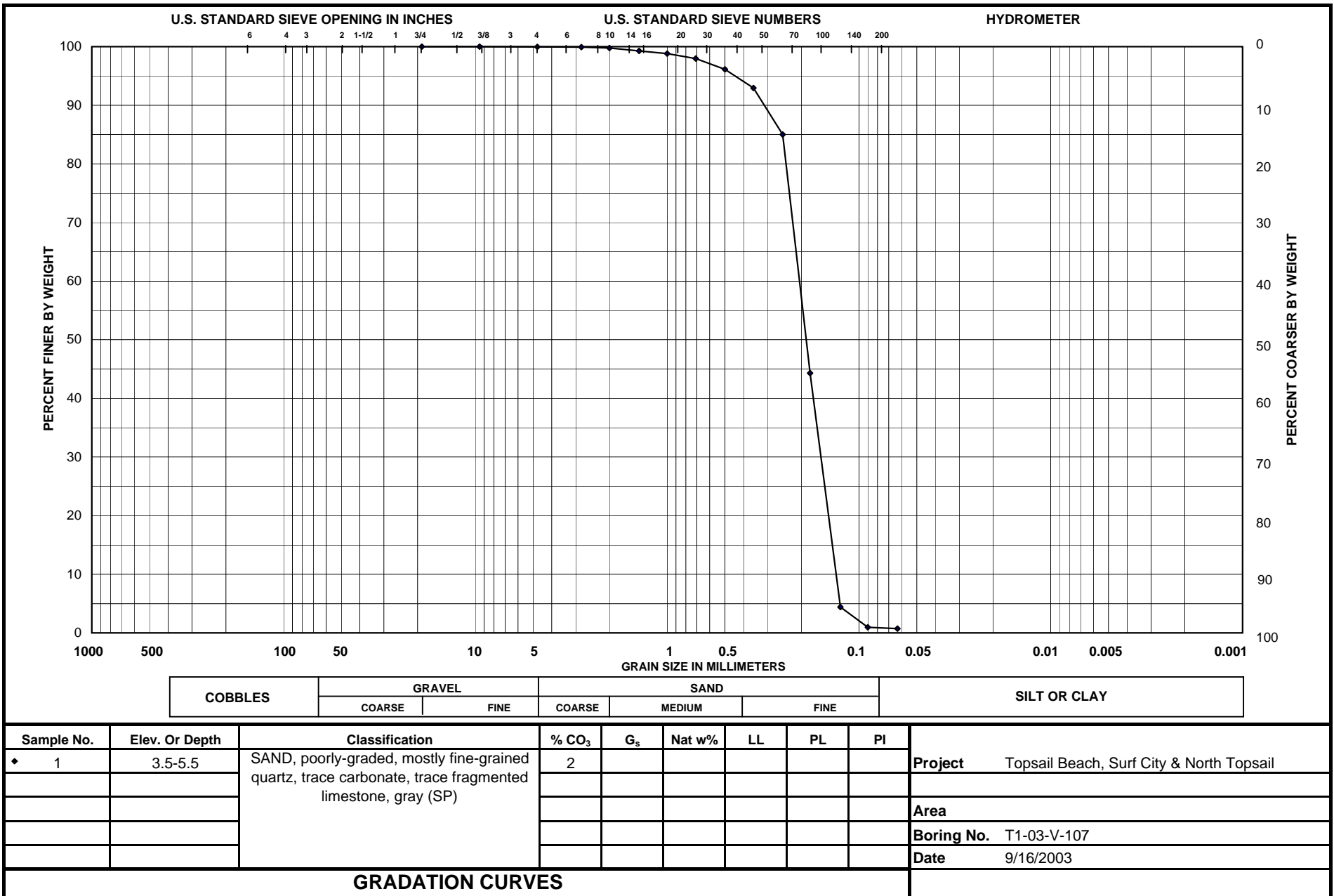
### GRAIN SIZE AND VISUAL SHELL CONTENT

Project:	<b>Topsail Beach, Surf City &amp; North Topsail</b>	Depth:	<b>3.5-5.5</b>
Project No.:	<b>1584-01-40</b>	Date:	<b>9/16/2003</b>
Boring No.:	<b>T1-03-V-107</b>		
Sample No.:	<b>1</b>		
Description:	<b>SAND, poorly-graded, mostly fine-grained quartz, trace carbonate, trace fragmented limestone, gray (SP)</b>		

Tare Weight, (g):	<b>50.04</b>	
Dry Wt. Before Washing (g):	<b>187.83</b>	(with tare)
Dry Weight After Washing (g):	<b>186.38</b>	(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	0.05	99.96	100	0.05
#7	2.800	0.06	99.92	100	0.06
#10	2.000	0.19	99.78	80	0.15
#14	1.400	0.69	99.28	60	0.41
#18	1.000	0.65	98.81	50	0.33
#25	0.710	1.15	97.98	20	0.23
#35	0.500	2.55	96.12	10	0.26
#45	0.355	4.38	92.95	3	0.13
#60	0.250	10.91	85.03	1	0.11
#80	0.180	56.12	44.30	1	0.56
#120	0.125	54.95	4.42	1	0.55
#170	0.090	4.79	0.94	1	0.05
#230	0.063	0.32	0.71	1	0.00

**Total Shell Content:** **2** %



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## VISUAL SHELL CONTENT

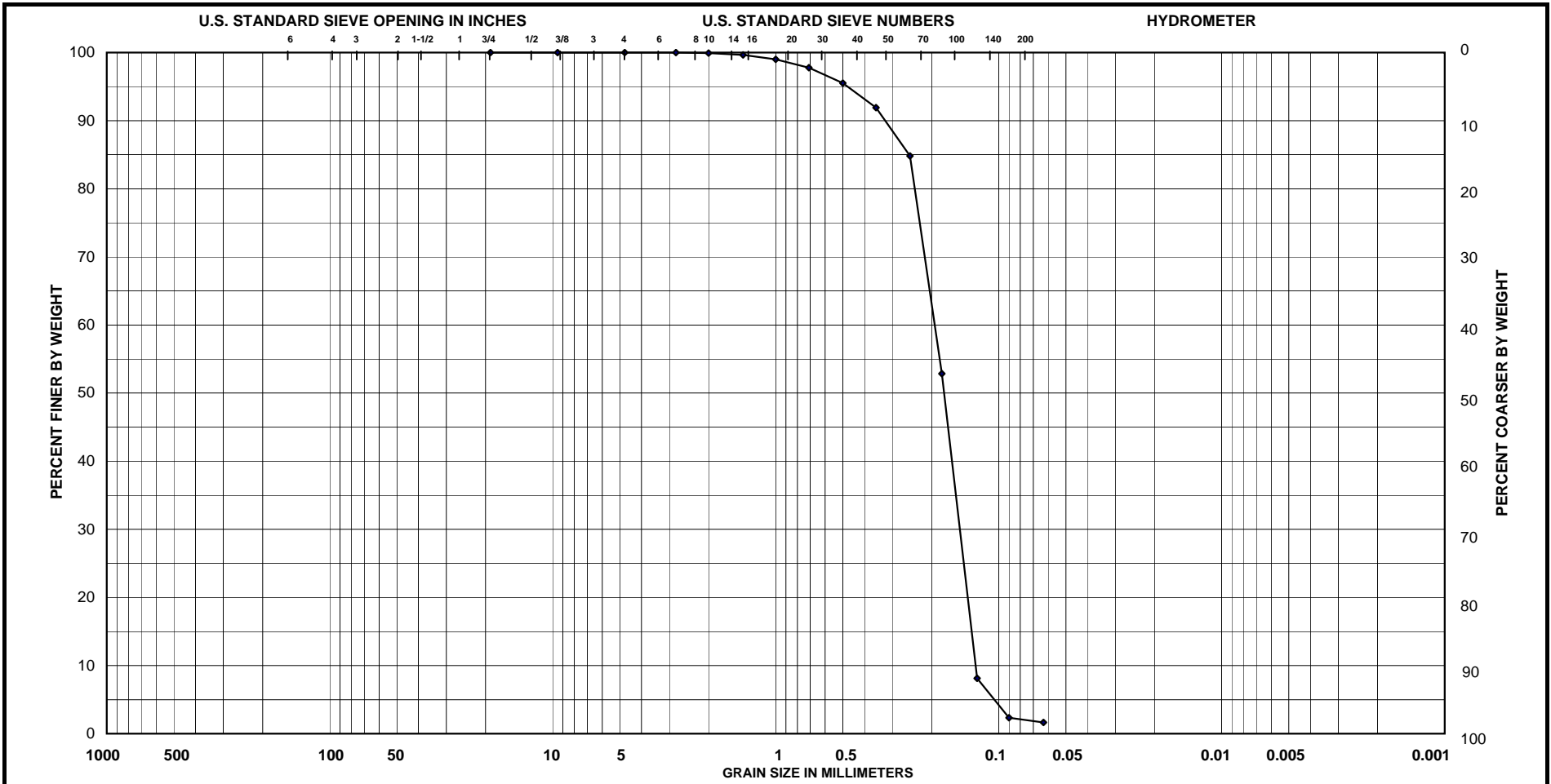
### GRAIN SIZE AND VISUAL SHELL CONTENT

Project:	<b>Topsail Beach, Surf City &amp; North Topsail</b>	Depth:	<b>4.0-6.0</b>
Project No.:	<b>1584-01-40</b>	Date:	<b>9/16/2003</b>
Boring No.:	<b>T1-03-V-107</b>		
Sample No.:	<b>2</b>		
Description:	<b>SAND, poorly-graded, mostly fine-grained quartz, trace carbonate, trace fragmented limestone, gray (SP)</b>		

Tare Weight, (g):	<b>49.96</b>	
Dry Wt. Before Washing (g):	<b>186.77</b>	(with tare)
Dry Weight After Washing (g):	<b>184.84</b>	(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	0.08	99.94	100	0.08
#14	1.400	0.38	99.66	60	0.23
#18	1.000	0.90	99.01	40	0.36
#25	0.710	1.66	97.79	20	0.33
#35	0.500	3.13	95.50	10	0.31
#45	0.355	4.91	91.92	5	0.25
#60	0.250	9.71	84.82	3	0.29
#80	0.180	43.73	52.85	1	0.44
#120	0.125	61.18	8.14	1	0.61
#170	0.090	7.95	2.32	1	0.08
#230	0.063	0.90	1.67	1	0.01

**Total Shell Content:** **2** %



COBBLES	GRAVEL		SAND			SILT OR CLAY
	COARSE	FINE	COARSE	MEDIUM	FINE	

Sample No.	Elev. Or Depth	Classification	% CO <sub>3</sub>	G <sub>s</sub>	Nat w%	LL	PL	PI	
♦ 2	4.0-6.0	SAND, poorly-graded, mostly fine-grained quartz, trace carbonate, trace fragmented limestone, gray (SP)	2						<b>Project</b> Topsail Beach, Surf City & North Topsail
									<b>Area</b>
									<b>Boring No.</b> T1-03-V-107
									<b>Date</b> 9/16/2003

**GRADATION CURVES**





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## VISUAL SHELL CONTENT

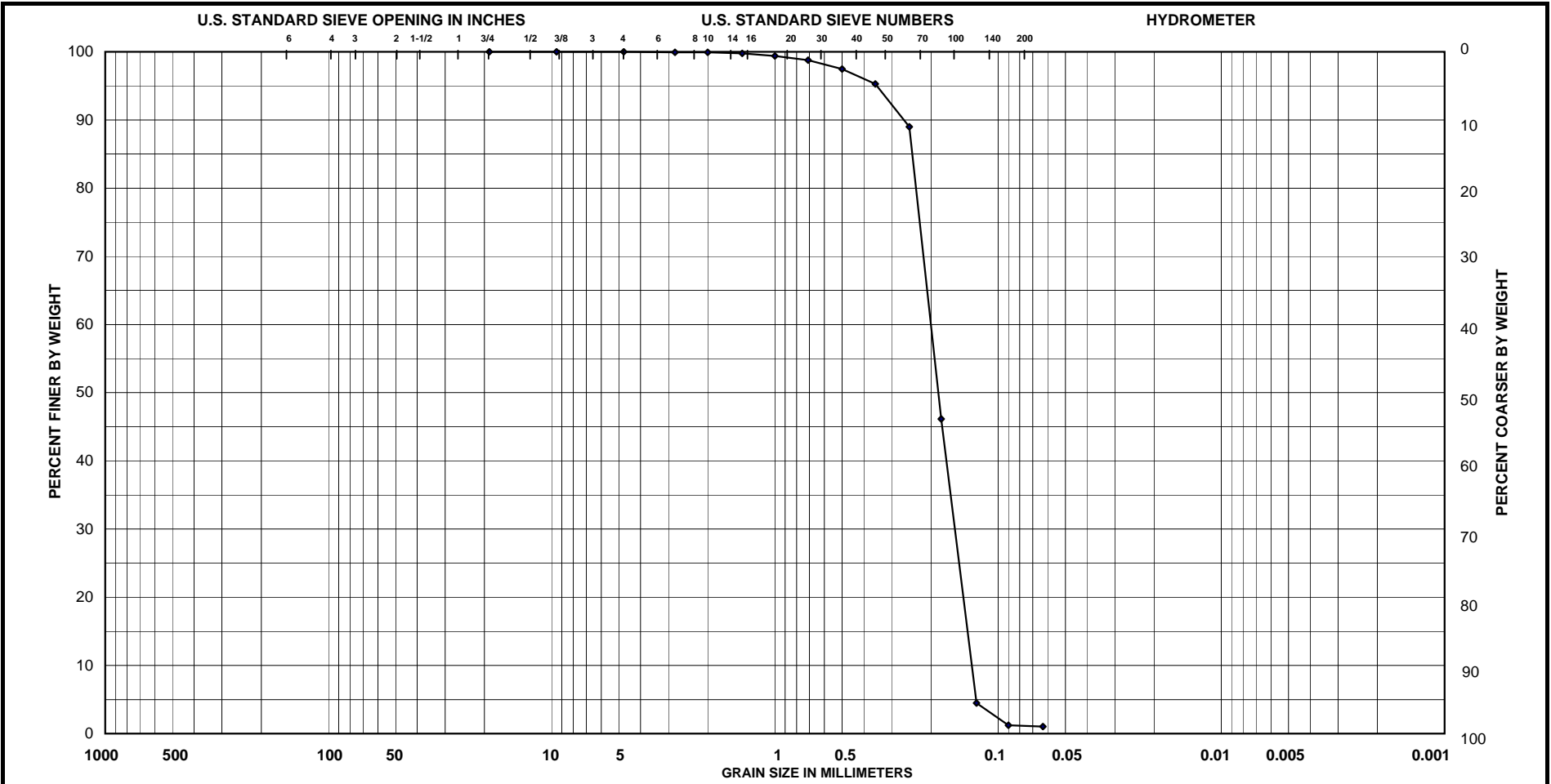
### GRAIN SIZE AND VISUAL SHELL CONTENT

Project:	<b>Topsail Beach, Surf City &amp; North Topsail</b>	Depth:	<b>8.0-8.5</b>
Project No.:	<b>1584-01-40</b>	Date:	<b>9/16/2003</b>
Boring No.:	<b>T1-03-V-108</b>		
Sample No.:	<b>1</b>		
Description:	<b>SAND, poorly-graded, mostly fine-grained quartz, trace carbonate, trace fragmented limestone, gray (SP)</b>		

Tare Weight, (g):	<b>50.22</b>	
Dry Wt. Before Washing (g):	<b>166.12</b>	(with tare)
Dry Weight After Washing (g):	<b>165.06</b>	(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	0.07	99.94	35	0.02
#10	2.000	0.04	99.91	65	0.03
#14	1.400	0.14	99.78	80	0.11
#18	1.000	0.47	99.38	75	0.35
#25	0.710	0.71	98.77	50	0.36
#35	0.500	1.49	97.48	5	0.07
#45	0.355	2.55	95.28	3	0.08
#60	0.250	7.29	88.99	1	0.07
#80	0.180	49.65	46.15	1	0.50
#120	0.125	48.30	4.48	1	0.48
#170	0.090	3.76	1.23	1	0.04
#230	0.063	0.25	1.02	1	0.00

**Total Shell Content:** **2** %





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## VISUAL SHELL CONTENT

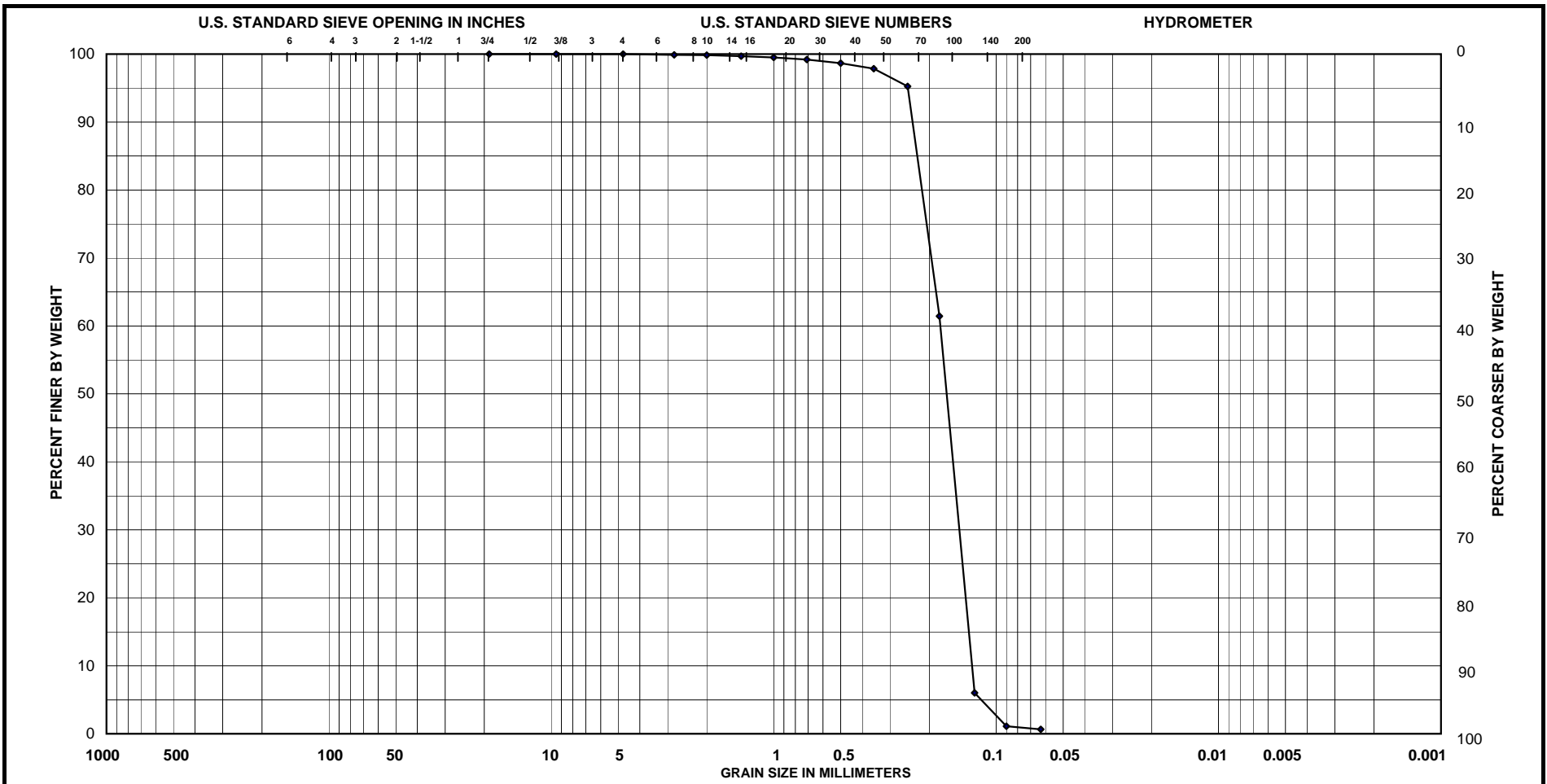
### GRAIN SIZE AND VISUAL SHELL CONTENT

Project:	<b>Topsail Beach, Surf City &amp; North Topsail</b>	Depth:	<b>10.0-10.5</b>
Project No.:	<b>1584-01-40</b>	Date:	<b>9/16/2003</b>
Boring No.:	<b>T1-03-V-108</b>		
Sample No.:	<b>2</b>		
Description:	<b>SAND, poorly-graded, mostly fine-grained quartz, trace carbonate, trace fragmented limestone, gray (SP)</b>		

Tare Weight, (g):	<b>50.45</b>	
Dry Wt. Before Washing (g):	<b>145.64</b>	(with tare)
Dry Weight After Washing (g):	<b>144.76</b>	(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	0.11	99.88	100	0.11
#10	2.000	0.04	99.84	100	0.04
#14	1.400	0.15	99.68	75	0.11
#18	1.000	0.19	99.49	80	0.15
#25	0.710	0.27	99.20	60	0.16
#35	0.500	0.53	98.64	15	0.08
#45	0.355	0.75	97.86	3	0.02
#60	0.250	2.49	95.24	1	0.02
#80	0.180	32.17	61.45	1	0.32
#120	0.125	52.76	6.02	1	0.53
#170	0.090	4.69	1.09	1	0.05
#230	0.063	0.42	0.65	1	0.00

**Total Shell Content:** **2** %



COBBLES	GRAVEL		SAND			SILT OR CLAY
	COARSE	FINE	COARSE	MEDIUM	FINE	

Sample No.	Elev. Or Depth	Classification	% CO <sub>3</sub>	G <sub>s</sub>	Nat w%	LL	PL	PI	Project	
2	10.0-10.5	SAND, poorly-graded, mostly fine-grained quartz, trace carbonate, trace fragmented limestone, gray (SP)	2						Topsail Beach, Surf City & North Topsail	
									Area	
									Boring No. T1-03-V-108	
									Date 9/16/2003	

**GRADATION CURVES**



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## VISUAL SHELL CONTENT

### GRAIN SIZE AND VISUAL SHELL CONTENT

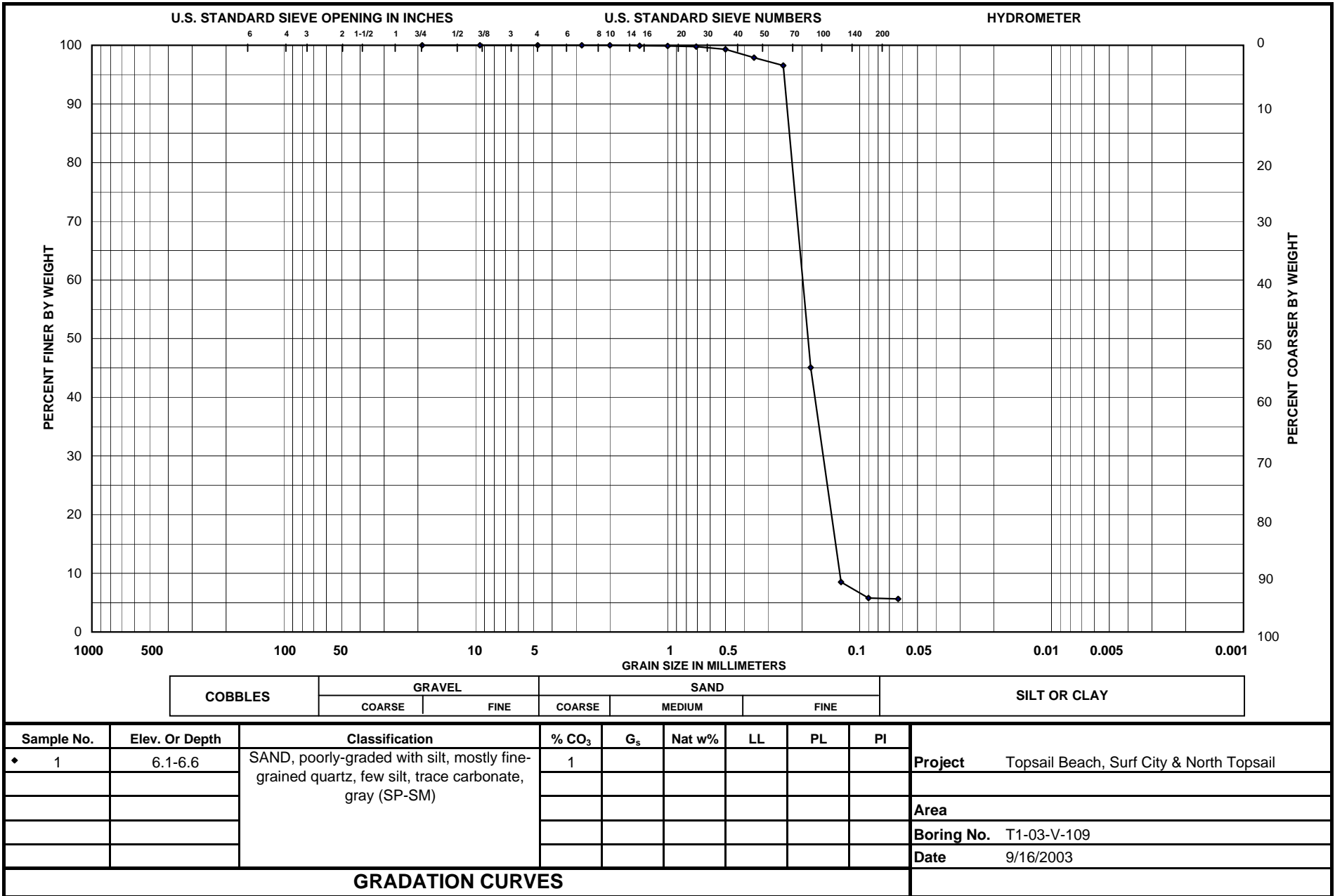
<b>Project:</b>	<b>Topsail Beach, Surf City &amp; North Topsail</b>	<b>Depth:</b>	<b>6.1-6.6</b>
<b>Project No.:</b>	<b>1584-01-40</b>	<b>Date:</b>	<b>9/16/2003</b>
<b>Boring No.:</b>	<b>T1-03-V-109</b>		
<b>Sample No.:</b>	<b>1</b>		
<b>Description:</b>	<b>SAND, poorly-graded with silt, mostly fine-grained quartz, few silt, trace carbonate, gray (SP-SM)</b>		

Tare Weight, (g):	50.25	
Dry Wt. Before Washing (g):	161.85	(with tare)
Dry Weight After Washing (g):	160.86	(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	0.00	100.00	0	0.00
#10	2.000	0.01	99.99	65	0.01
#14	1.400	0.07	99.93	75	0.05
#18	1.000	0.06	99.87	60	0.04
#25	0.710	0.12	99.77	45	0.05
#35	0.500	0.50	99.32	15	0.08
#45	0.355	1.60	97.89	10	0.16
#60	0.250	1.47	96.57	3	0.04
#80	0.180	57.48	45.06	1	0.57
#120	0.125	40.78	8.52	1	0.41
#170	0.090	3.03	5.81	1	0.03
#230	0.063	0.18	5.65	1	0.00

**Total Shell Content:**

1	%
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## VISUAL SHELL CONTENT

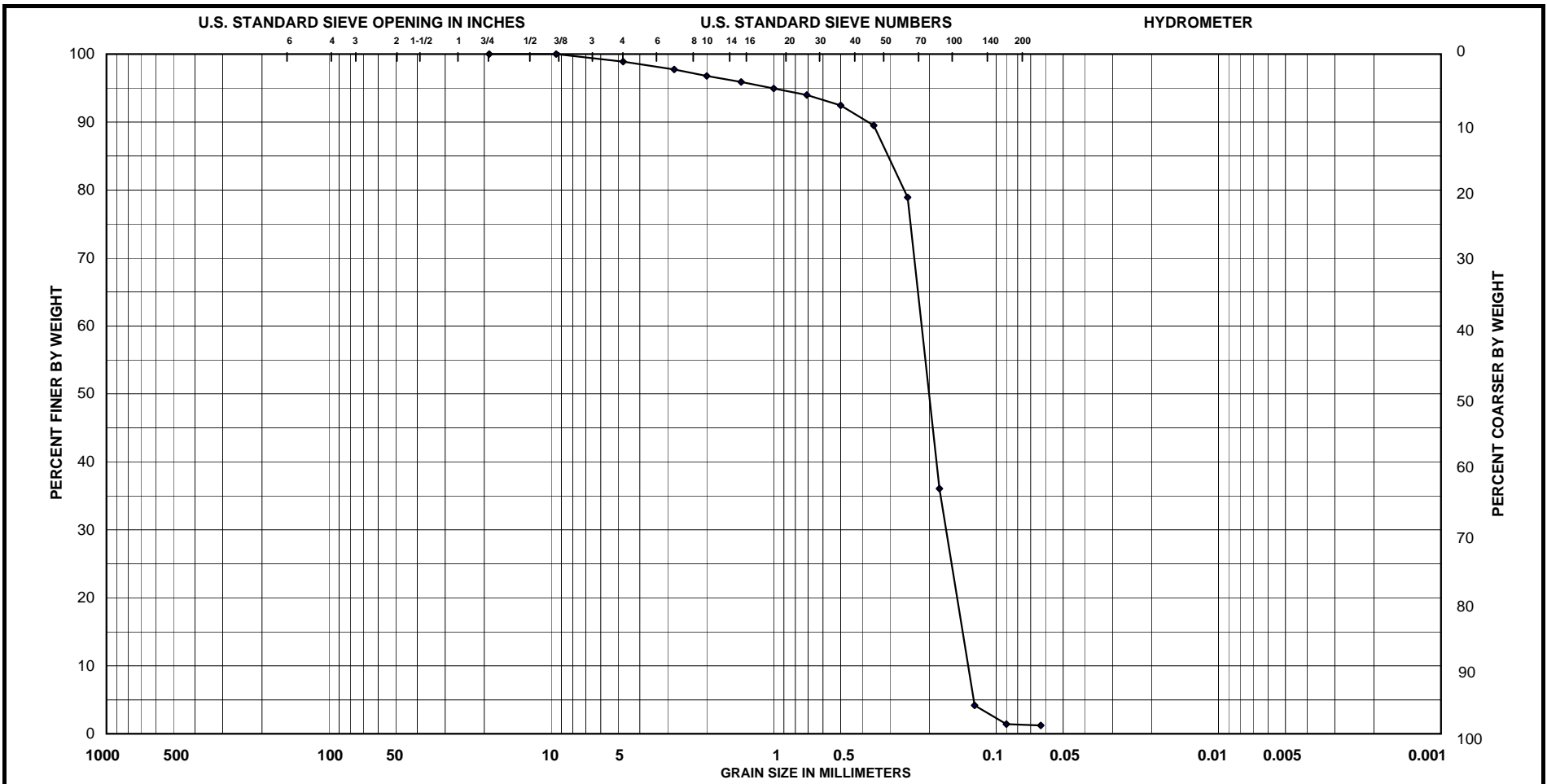
### GRAIN SIZE AND VISUAL SHELL CONTENT

Project:	<b>Topsail Beach, Surf City &amp; North Topsail</b>	Depth:	<b>10.6-11.1</b>
Project No.:	<b>1584-01-40</b>	Date:	<b>9/16/2003</b>
Boring No.:	<b>T1-03-V-110</b>		
Sample No.:	<b>1</b>		
Description:	<b>SAND, poorly-graded, mostly fine-grained quartz, few fragmented limestone, trace carbonate, gray (SP)</b>		

Tare Weight, (g):	<b>50.17</b>	
Dry Wt. Before Washing (g):	<b>181.37</b>	(with tare)
Dry Weight After Washing (g):	<b>180.29</b>	(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	1.46	98.89	100	1.46
#7	2.800	1.53	97.72	60	0.92
#10	2.000	1.25	96.77	60	0.75
#14	1.400	1.14	95.90	50	0.57
#18	1.000	1.25	94.95	25	0.31
#25	0.710	1.24	94.00	10	0.12
#35	0.500	2.03	92.45	3	0.06
#45	0.355	3.87	89.50	1	0.04
#60	0.250	13.88	78.93	1	0.14
#80	0.180	56.21	36.08	1	0.56
#120	0.125	41.88	4.16	1	0.42
#170	0.090	3.59	1.43	1	0.04
#230	0.063	0.26	1.23	1	0.00

**Total Shell Content:** **4** %



COBBLES	GRAVEL		SAND			SILT OR CLAY
	COARSE	FINE	COARSE	MEDIUM	FINE	

Sample No.	Elev. Or Depth	Classification	% CO <sub>3</sub>	G <sub>s</sub>	Nat w%	LL	PL	PI	Project
♦ 1	10.6-11.1	SAND, poorly-graded, mostly fine-grained quartz, few fragmented limestone, trace carbonate, gray (SP)	4						Topsail Beach, Surf City & North Topsail
									Area
									Boring No. T1-03-V-110
									Date 9/16/2003

**GRADATION CURVES**





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## VISUAL SHELL CONTENT

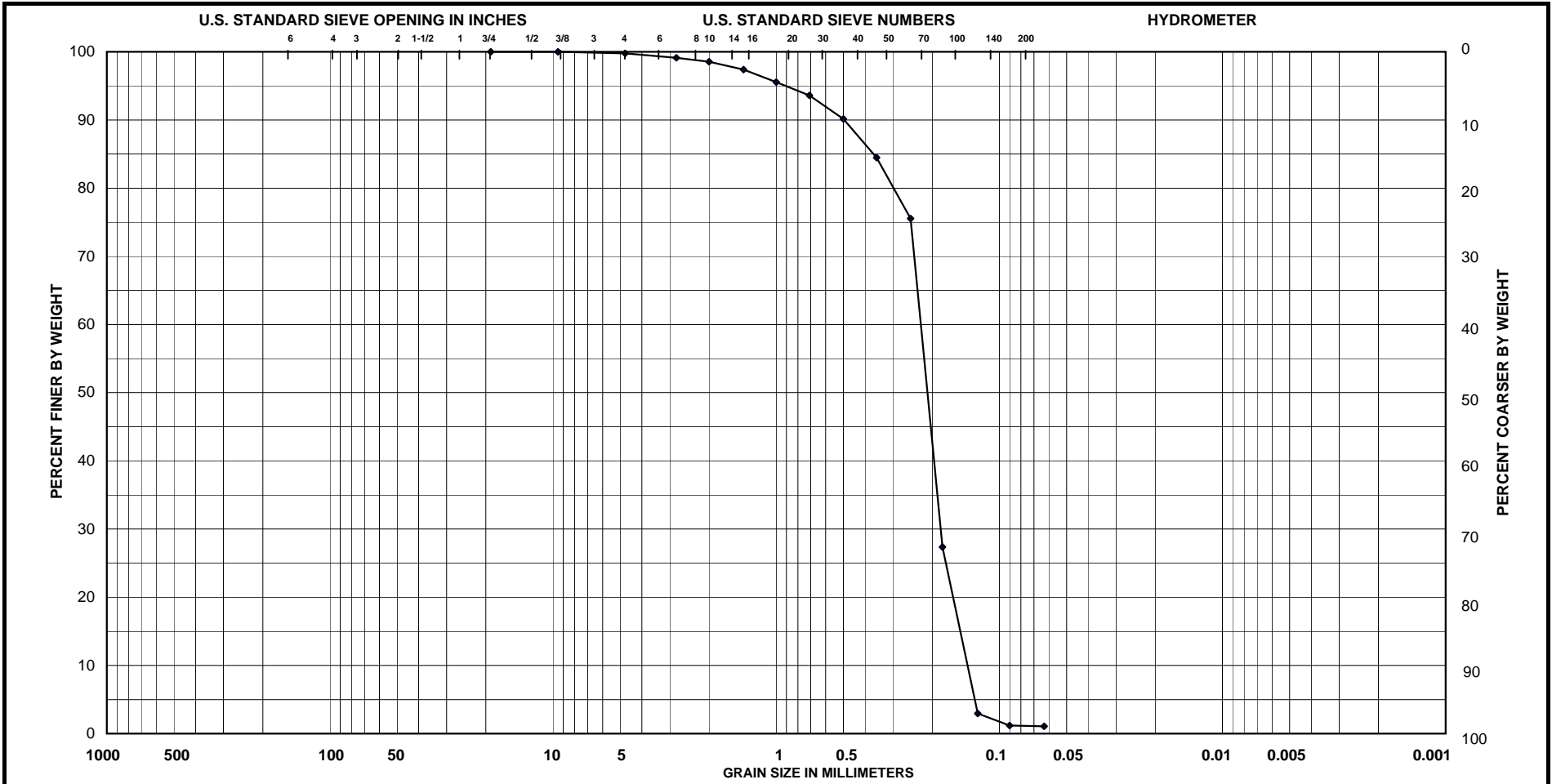
### GRAIN SIZE AND VISUAL SHELL CONTENT

Project:	<b>Topsail Beach, Surf City &amp; North Topsail</b>	Depth:	<b>12.5-13.0</b>
Project No.:	<b>1584-01-40</b>	Date:	<b>9/16/2003</b>
Boring No.:	<b>T1-03-V-110</b>		
Sample No.:	<b>2</b>		
Description:	<b>SAND, poorly-graded, mostly fine-grained quartz, few fragmented limestone, trace carbonate, gray (SP)</b>		

Tare Weight, (g):	<b>50.44</b>	
Dry Wt. Before Washing (g):	<b>178.57</b>	(with tare)
Dry Weight After Washing (g):	<b>177.46</b>	(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	0.31	99.76	100	0.31
#7	2.800	0.84	99.10	80	0.67
#10	2.000	0.71	98.55	75	0.53
#14	1.400	1.49	97.39	50	0.75
#18	1.000	2.35	95.55	20	0.47
#25	0.710	2.49	93.61	15	0.37
#35	0.500	4.44	90.14	10	0.44
#45	0.355	7.28	84.46	3	0.22
#60	0.250	11.42	75.55	1	0.11
#80	0.180	61.75	27.36	1	0.62
#120	0.125	31.28	2.94	1	0.31
#170	0.090	2.23	1.20	1	0.02
#230	0.063	0.15	1.08	1	0.00

**Total Shell Content:** **4** %



<b>COBBLES</b>	<b>GRAVEL</b>		<b>SAND</b>			<b>SILT OR CLAY</b>	
	COARSE	FINE	COARSE	MEDIUM	FINE		

Sample No.	Elev. Or Depth	Classification	% CO <sub>3</sub>	G <sub>s</sub>	Nat w%	LL	PL	PI		
♦ 2	12.5-13.0	SAND, poorly-graded, mostly fine-grained quartz, few fragmented limestone, trace carbonate, gray (SP)	4						<b>Project</b>	Topsail Beach, Surf City & North Topsail
									<b>Area</b>	
									<b>Boring No.</b>	T1-03-V-110
									<b>Date</b>	9/16/2003

**GRADATION CURVES**



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## VISUAL SHELL CONTENT

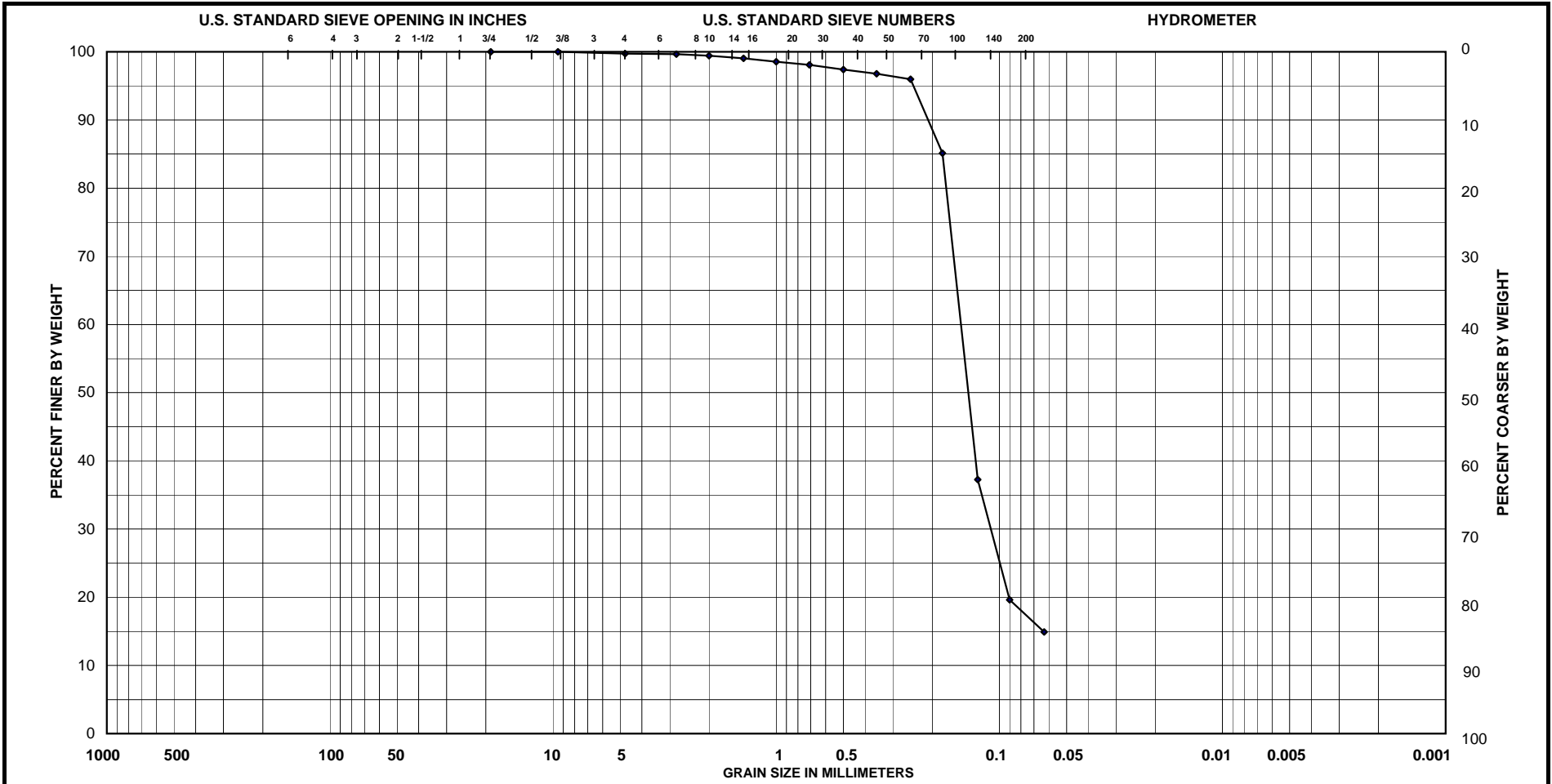
### GRAIN SIZE AND VISUAL SHELL CONTENT

Project:	<b>Topsail Beach, Surf City &amp; North Topsail</b>	Depth:	<b>15.2-15.7</b>
Project No.:	<b>1584-01-40</b>	Date:	<b>9/16/2003</b>
Boring No.:	<b>T1-03-V-110</b>		
Sample No.:	<b>3</b>		
Description:	<b>SAND, clayey, mostly fine-grained quartz, little clay, trace carbonate, dark greenish gray (SC)</b>		

Tare Weight, (g):	<b>50.10</b>	
Dry Wt. Before Washing (g):	<b>186.69</b>	(with tare)
Dry Weight After Washing (g):	<b>167.17</b>	(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	99.71	100	0.39
#7	2.800	0.07	99.66	100	0.07
#10	2.000	0.31	99.44	30	0.09
#14	1.400	0.54	99.04	10	0.05
#18	1.000	0.68	98.54	20	0.14
#25	0.710	0.65	98.07	5	0.03
#35	0.500	0.90	97.41	3	0.03
#45	0.355	0.86	96.78	3	0.03
#60	0.250	1.11	95.97	1	0.01
#80	0.180	14.82	85.12	1	0.15
#120	0.125	65.38	37.25	1	0.65
#170	0.090	24.07	19.63	1	0.24
#230	0.063	6.45	14.91	1	0.06

**Total Shell Content:** **1** %



COBBLES	GRAVEL		SAND			SILT OR CLAY
	COARSE	FINE	COARSE	MEDIUM	FINE	

Sample No.	Elev. Or Depth	Classification	% CO <sub>3</sub>	G <sub>s</sub>	Nat w%	LL	PL	PI	Project	
3	15.2-15.7	SAND, clayey, mostly fine-grained quartz, little clay, trace carbonate, dark greenish gray (SC)	1						Topsail Beach, Surf City & North Topsail	
									Area	
									Boring No. T1-03-V-110	
									Date 9/16/2003	

**GRADATION CURVES**



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## VISUAL SHELL CONTENT

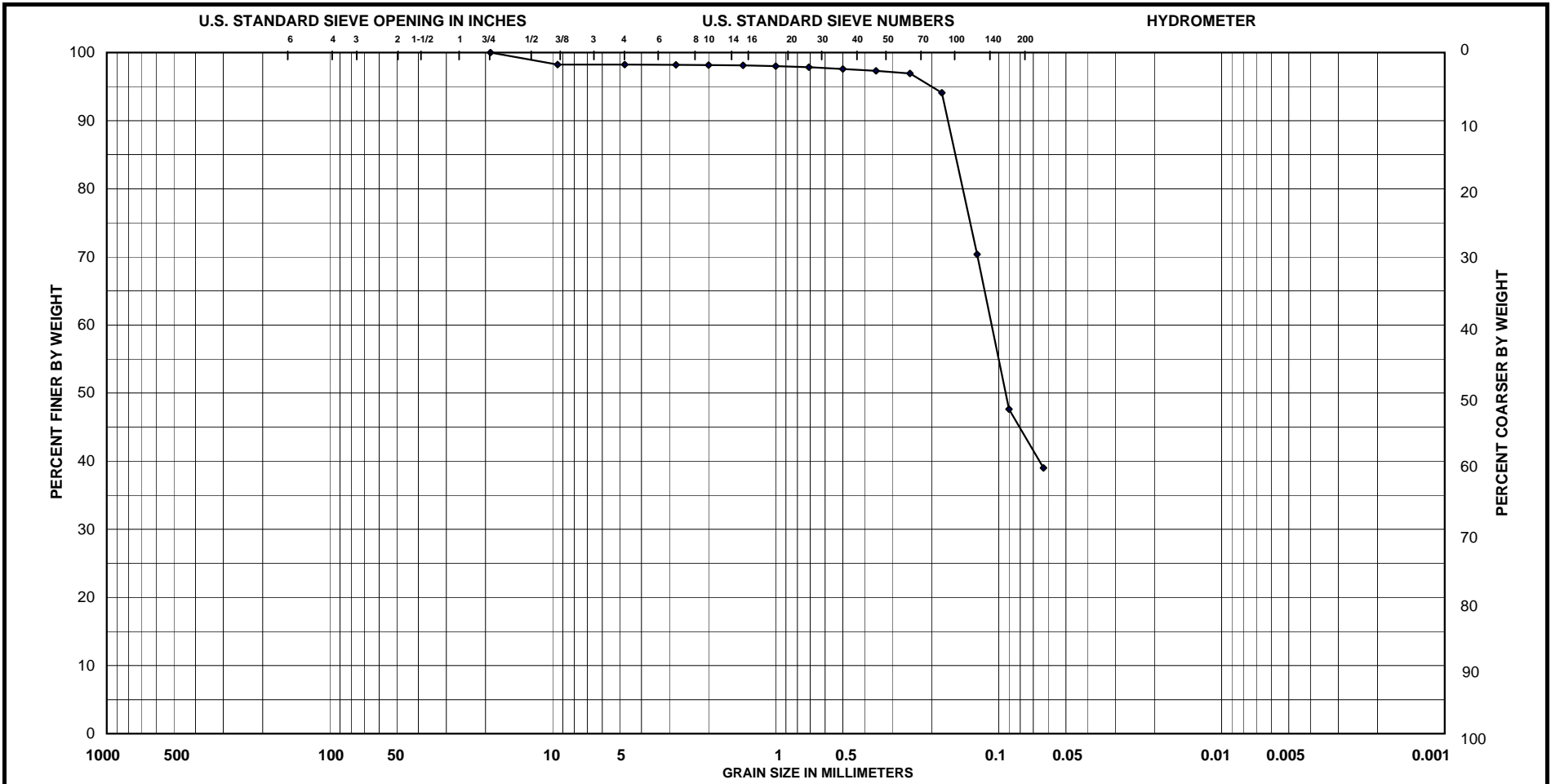
### GRAIN SIZE AND VISUAL SHELL CONTENT

Project:	<b>Topsail Beach, Surf City &amp; North Topsail</b>	Depth:	<b>16.4-16.9</b>
Project No.:	<b>1584-01-40</b>	Date:	<b>9/16/2003</b>
Boring No.:	<b>T1-03-V-110</b>		
Sample No.:	<b>4</b>		
Description:	<b>SAND, clayey, mostly fine-grained quartz, some clay, trace carbonate, trace organic material, very dark gray (SC)</b>		

Tare Weight, (g):	<b>50.21</b>	
Dry Wt. Before Washing (g):	<b>146.52</b>	(with tare)
Dry Weight After Washing (g):	<b>108.93</b>	(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	1.70	98.23	100	1.70
#4	4.750	0.01	98.22	100	0.01
#7	2.800	0.03	98.19	100	0.03
#10	2.000	0.03	98.16	70	0.02
#14	1.400	0.03	98.13	40	0.01
#18	1.000	0.11	98.02	40	0.04
#25	0.710	0.16	97.85	15	0.02
#35	0.500	0.24	97.60	5	0.01
#45	0.355	0.28	97.31	1	0.00
#60	0.250	0.36	96.94	1	0.00
#80	0.180	2.75	94.08	1	0.03
#120	0.125	22.82	70.39	1	0.23
#170	0.090	21.92	47.63	1	0.22
#230	0.063	8.28	39.03	1	0.08

**Total Shell Content:** **3** %



COBBLES	GRAVEL		SAND			SILT OR CLAY
	COARSE	FINE	COARSE	MEDIUM	FINE	

Sample No.	Elev. Or Depth	Classification	% CO <sub>3</sub>	G <sub>s</sub>	Nat w%	LL	PL	PI	Project	
4	16.4-16.9	SAND, clayey, mostly fine-grained quartz, some clay, trace carbonate, trace organic material, very dark gray (SC)	3						Topsail Beach, Surf City & North Topsail	
									Area	
									Boring No. T1-03-V-110	
									Date 9/16/2003	

**GRADATION CURVES**



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## VISUAL SHELL CONTENT

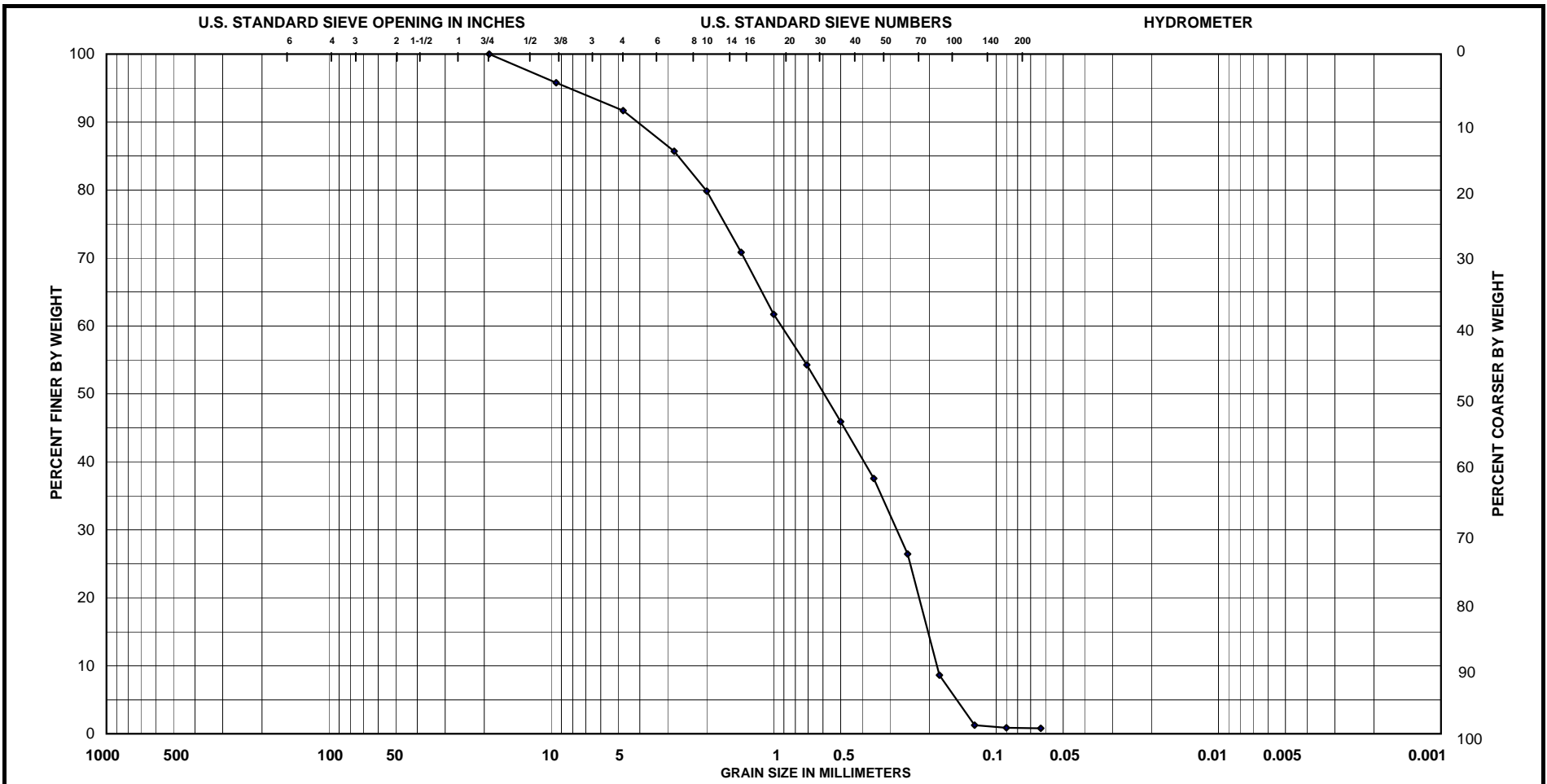
### GRAIN SIZE AND VISUAL SHELL CONTENT

Project:	<b>Topsail Beach, Surf City &amp; North Topsail</b>	Depth:	<b>5.0-5.5</b>
Project No.:	<b>1584-01-40</b>	Date:	<b>9/16/2003</b>
Boring No.:	<b>T1-03-V-111</b>		
Sample No.:	<b>1</b>		
Description:	<b>SAND, poorly-graded, mostly medium to fine-grained quartz, some carbonate, little fine gravel to medium sand-size fragmented limestone,</b>		

Tare Weight, (g):	<b>49.92</b>	
Dry Wt. Before Washing (g):	<b>188.56</b>	(with tare)
Dry Weight After Washing (g):	<b>187.97</b>	(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	5.87	95.77	100	5.87
#4	4.750	5.67	91.68	80	4.54
#7	2.800	8.26	85.72	70	5.78
#10	2.000	8.16	79.83	50	4.08
#14	1.400	12.49	70.82	30	3.75
#18	1.000	12.62	61.72	30	3.79
#25	0.710	10.33	54.27	25	2.58
#35	0.500	11.56	45.93	15	1.73
#45	0.355	11.62	37.55	5	0.58
#60	0.250	15.41	26.44	3	0.46
#80	0.180	24.72	8.61	3	0.74
#120	0.125	10.15	1.28	1	0.10
#170	0.090	0.58	0.87	1	0.01
#230	0.063	0.11	0.79	1	0.00

**Total Shell Content:** **25** %



COBBLES	GRAVEL		SAND			SILT OR CLAY
	COARSE	FINE	COARSE	MEDIUM	FINE	

Sample No.	Elev. Or Depth	Classification	% CO <sub>3</sub>	G <sub>s</sub>	Nat w%	LL	PL	PI	Project	
♦ 1	5.0-5.5	SAND, poorly-graded, mostly medium to fine-grained quartz, some carbonate, little fine gravel to medium sand-size fragmented limestone, gray (SP)	25						Topsail Beach, Surf City & North Topsail	
			Area							
			Boring No. T1-03-V-111							
			Date 9/16/2003							

**GRADATION CURVES**





# WOLF TECHNOLOGIES, INC.

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## VISUAL SHELL CONTENT

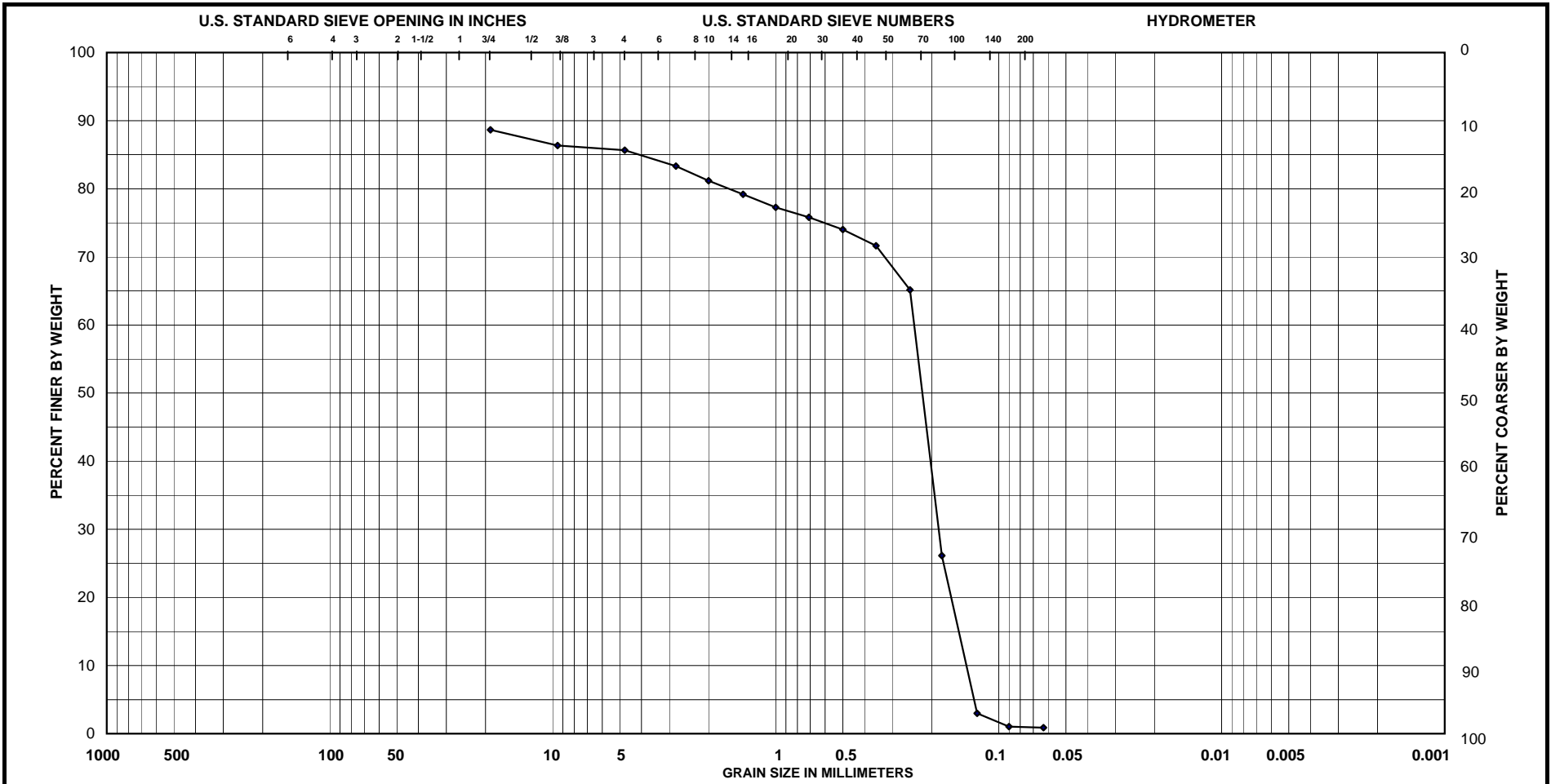
### GRAIN SIZE AND VISUAL SHELL CONTENT

Project:	<b>Topsail Beach, Surf City &amp; North Topsail</b>	Depth:	<b>7.0-7.5</b>
Project No.:	<b>1584-01-40</b>	Date:	<b>9/16/2003</b>
Boring No.:	<b>T1-03-V-112</b>		
Sample No.:	<b>1</b>		
Description:	<b>SAND, poorly-graded, mostly fine-grained quartz, little carbonate, few fragmented limestone, gray (SP)</b>		

Tare Weight, (g):	<b>50.41</b>	
Dry Wt. Before Washing (g):	<b>210.59</b>	(with tare)
Dry Weight After Washing (g):	<b>209.28</b>	(with tare)

Sieve Size (Name)	Sieve Size (mm)	Weight Retained (g)	% Passing	Approx. Visual Shell %	Approx. Visual Shell Wt. (g)
3/4"	19.000	18.18	88.65	100	18.18
3/8"	9.500	3.68	86.35	100	3.68
#4	4.750	1.12	85.65	100	1.12
#7	2.800	3.73	83.33	75	2.80
#10	2.000	3.42	81.19	60	2.05
#14	1.400	3.18	79.20	60	1.91
#18	1.000	3.09	77.28	50	1.55
#25	0.710	2.34	75.81	20	0.47
#35	0.500	2.88	74.02	10	0.29
#45	0.355	3.81	71.64	3	0.11
#60	0.250	10.35	65.18	1	0.10
#80	0.180	62.50	26.16	1	0.63
#120	0.125	37.13	2.98	1	0.37
#170	0.090	3.10	1.04	1	0.03
#230	0.063	0.25	0.89	1	0.00

**Total Shell Content:** **21** %



COBBLES	GRAVEL		SAND			SILT OR CLAY
	COARSE	FINE	COARSE	MEDIUM	FINE	

Sample No.	Elev. Or Depth	Classification	% CO <sub>3</sub>	G <sub>s</sub>	Nat w%	LL	PL	PI	Project
♦ 1	7.0-7.5	SAND, poorly-graded, mostly fine-grained quartz, little carbonate, few fragmented limestone, gray (SP)	21						Topsail Beach, Surf City & North Topsail
									Area
									Boring No. T1-03-V-112
									Date 9/16/2003

**GRADATION CURVES**



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## VISUAL SHELL CONTENT

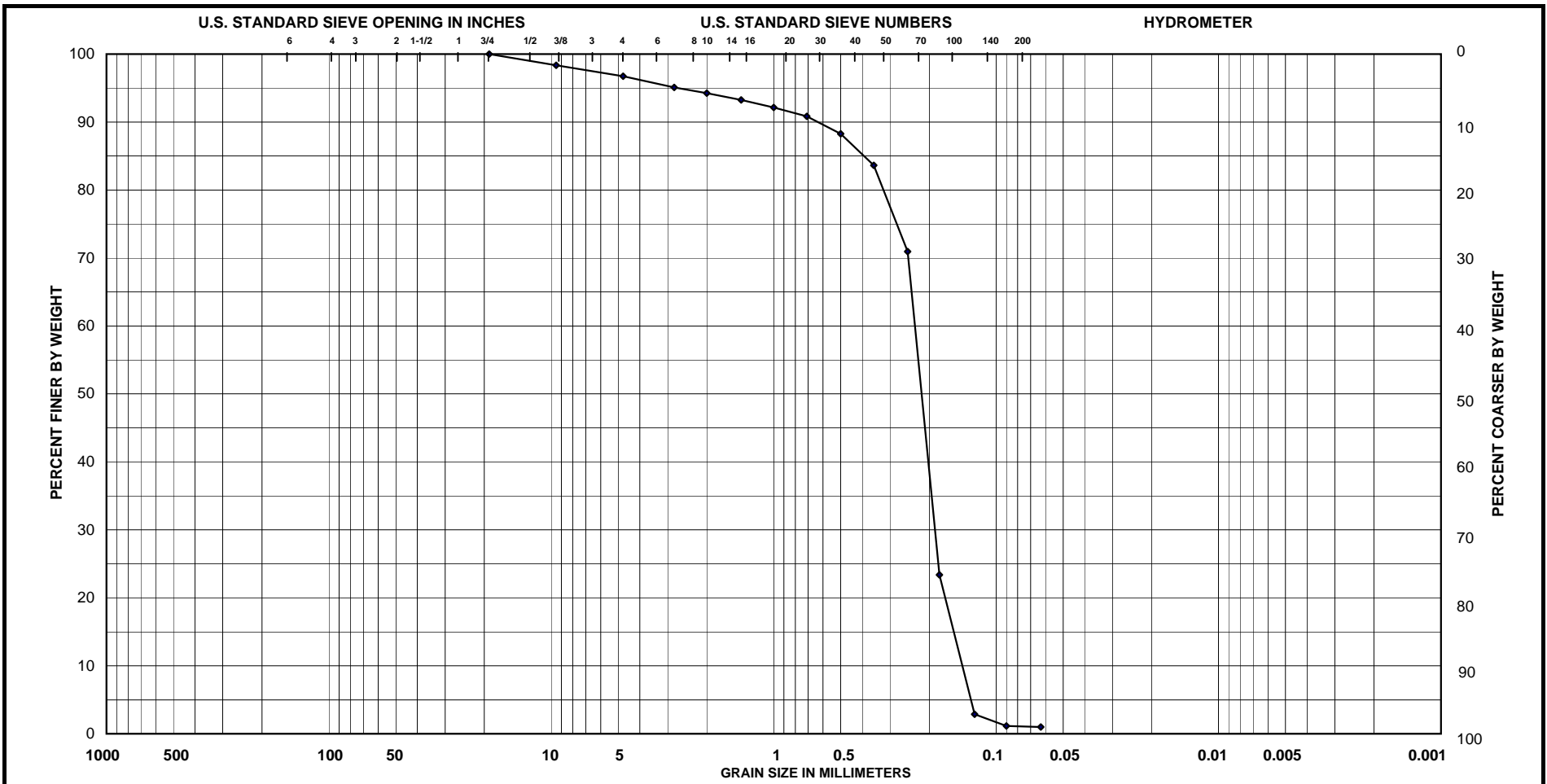
### GRAIN SIZE AND VISUAL SHELL CONTENT

<b>Project:</b>	<b>Topsail Beach, Surf City &amp; North Topsail</b>	<b>Depth:</b>	<b>9.0-9.5</b>
<b>Project No.:</b>	<b>1584-01-40</b>	<b>Date:</b>	<b>9/16/2003</b>
<b>Boring No.:</b>	<b>T1-03-V-112</b>		
<b>Sample No.:</b>	<b>2</b>		
<b>Description:</b>	<b>SAND, poorly-graded, mostly fine-grained quartz, few carbonate, gray (SP)</b>		

Tare Weight, (g):	49.89	
Dry Wt. Before Washing (g):	174.87	(with tare)
Dry Weight After Washing (g):	173.72	(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	2.07	98.34	100	2.07
#4	4.750	2.01	96.74	100	2.01
#7	2.800	2.05	95.10	65	1.33
#10	2.000	1.07	94.24	70	0.75
#14	1.400	1.21	93.27	60	0.73
#18	1.000	1.39	92.16	40	0.56
#25	0.710	1.66	90.83	20	0.33
#35	0.500	3.21	88.26	10	0.32
#45	0.355	5.78	83.64	3	0.17
#60	0.250	15.87	70.94	1	0.16
#80	0.180	59.44	23.38	1	0.59
#120	0.125	25.61	2.89	1	0.26
#170	0.090	2.17	1.15	1	0.02
#230	0.063	0.20	0.99	1	0.00

**Total Shell Content:** 7 %



COBBLES	GRAVEL		SAND			SILT OR CLAY
	COARSE	FINE	COARSE	MEDIUM	FINE	

Sample No.	Elev. Or Depth	Classification	% CO <sub>3</sub>	G <sub>s</sub>	Nat w%	LL	PL	PI	Project
♦ 2	9.0-9.5	SAND, poorly-graded, mostly fine-grained quartz, few carbonate, gray (SP)	7						Topsail Beach, Surf City & North Topsail
									Area
									Boring No. T1-03-V-112
									Date 9/16/2003

**GRADATION CURVES**



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## VISUAL SHELL CONTENT

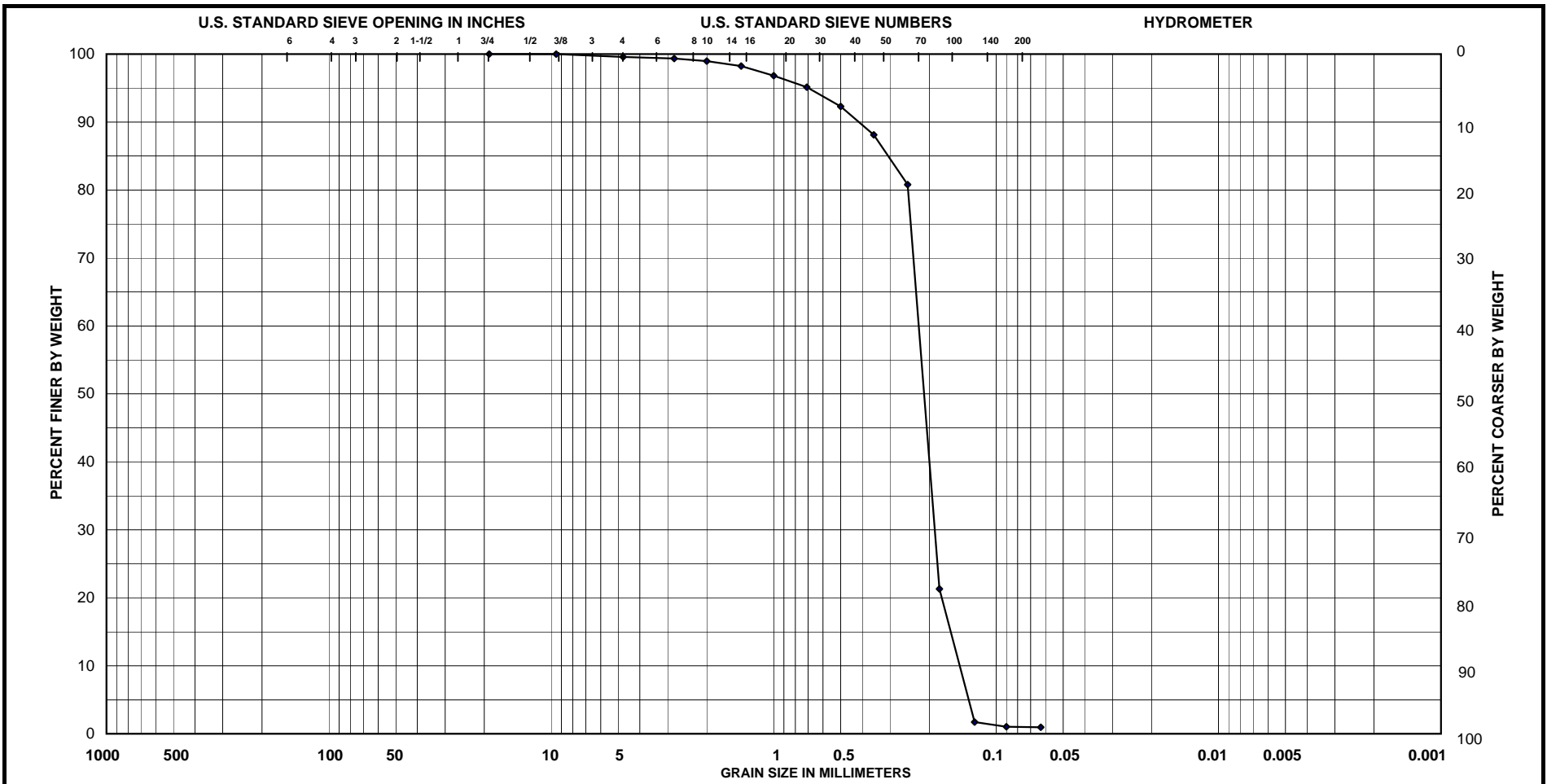
### GRAIN SIZE AND VISUAL SHELL CONTENT

Project:	<b>Topsail Beach, Surf City &amp; North Topsail</b>	Depth:	<b>3.5-4.0</b>
Project No.:	<b>1584-01-40</b>	Date:	<b>9/16/2003</b>
Boring No.:	<b>T1-03-V-113c</b>		
Sample No.:	<b>1</b>		
Description:	<b>SAND, poorly-graded, mostly fine-grained quartz, few carbonate, trace fragmented limestone, gray (SP)</b>		

Tare Weight, (g):	<b>49.74</b>	
Dry Wt. Before Washing (g):	<b>173.69</b>	(with tare)
Dry Weight After Washing (g):	<b>172.55</b>	(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	0.54	99.56	100	0.54
#7	2.800	0.25	99.36	100	0.25
#10	2.000	0.48	98.98	85	0.41
#14	1.400	0.92	98.23	70	0.64
#18	1.000	1.74	96.83	65	1.13
#25	0.710	2.12	95.12	60	1.27
#35	0.500	3.52	92.28	25	0.88
#45	0.355	5.15	88.12	5	0.26
#60	0.250	9.10	80.78	3	0.27
#80	0.180	73.72	21.31	1	0.74
#120	0.125	24.25	1.74	1	0.24
#170	0.090	0.89	1.02	1	0.01
#230	0.063	0.07	0.97	1	0.00

**Total Shell Content:** **5** %



<b>COBBLES</b>	<b>GRAVEL</b>		<b>SAND</b>			<b>SILT OR CLAY</b>
	COARSE	FINE	COARSE	MEDIUM	FINE	

Sample No.	Elev. Or Depth	Classification	% CO <sub>3</sub>	G <sub>s</sub>	Nat w%	LL	PL	PI	
♦ 1	3.5-4.0	SAND, poorly-graded, mostly fine-grained quartz, few carbonate, trace fragmented limestone, gray (SP)	5						<b>Project</b> Topsail Beach, Surf City & North Topsail
									<b>Area</b>
									<b>Boring No.</b> T1-03-V-113c
									<b>Date</b> 9/16/2003

**GRADATION CURVES**



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## VISUAL SHELL CONTENT

### GRAIN SIZE AND VISUAL SHELL CONTENT

Project:	<b>Topsail Beach, Surf City &amp; North Topsail</b>	Depth:	<b>6.7-7.2</b>
Project No.:	<b>1584-01-40</b>	Date:	<b>9/16/2003</b>
Boring No.:	<b>T1-03-V-113d</b>		
Sample No.:	<b>1</b>		
Description:	<b>SAND, poorly-graded, mostly fine-grained quartz, few carbonate, gray (SP)</b>		

Tare Weight, (g):	<b>50.68</b>	
Dry Wt. Before Washing (g):	<b>169.06</b>	(with tare)
Dry Weight After Washing (g):	<b>168.42</b>	(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	1.18	99.00	70	0.83
#7	2.800	1.14	98.04	70	0.80
#10	2.000	1.23	97.00	55	0.68
#14	1.400	1.96	95.35	45	0.88
#18	1.000	3.06	92.76	40	1.22
#25	0.710	3.76	89.58	30	1.13
#35	0.500	7.53	83.22	20	1.51
#45	0.355	14.12	71.30	5	0.71
#60	0.250	28.69	47.06	3	0.86
#80	0.180	43.57	10.26	1	0.44
#120	0.125	9.71	2.05	1	0.10
#170	0.090	0.63	1.52	1	0.01
#230	0.063	0.03	1.50	1	0.00

**Total Shell Content:** **8** %







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## VISUAL SHELL CONTENT

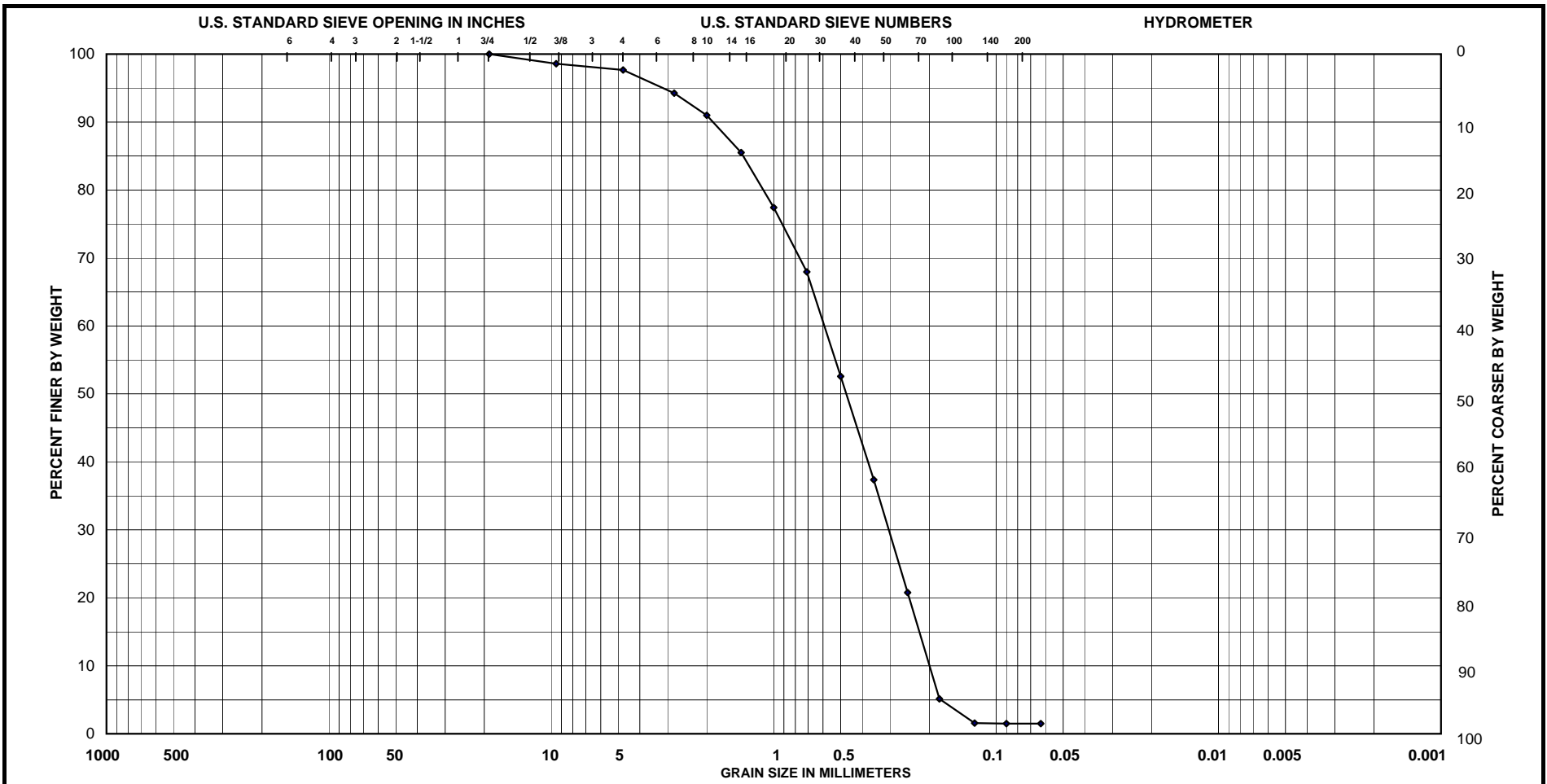
### GRAIN SIZE AND VISUAL SHELL CONTENT

Project:	<b>Topsail Beach, Surf City &amp; North Topsail</b>	Depth:	<b>9.0-9.5</b>
Project No.:	<b>1584-01-40</b>	Date:	<b>9/16/2003</b>
Boring No.:	<b>T1-03-V-113d</b>		
Sample No.:	<b>2</b>		
Description:	<b>SAND, poorly-graded, mostly medium to fine-grained quartz, little carbonate, few fragmented limestone, dark gray (SP)</b>		

Tare Weight, (g):	<b>50.10</b>	
Dry Wt. Before Washing (g):	<b>173.01</b>	(with tare)
Dry Weight After Washing (g):	<b>172.23</b>	(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	1.72	98.60	100	1.72
#4	4.750	1.16	97.66	70	0.81
#7	2.800	4.17	94.26	70	2.92
#10	2.000	4.01	91.00	65	2.61
#14	1.400	6.76	85.50	40	2.70
#18	1.000	9.94	77.41	30	2.98
#25	0.710	11.61	67.97	15	1.74
#35	0.500	18.92	52.58	10	1.89
#45	0.355	18.67	37.39	5	0.93
#60	0.250	20.43	20.76	3	0.61
#80	0.180	19.20	5.14	1	0.19
#120	0.125	4.37	1.59	1	0.04
#170	0.090	0.09	1.51	1	0.00
#230	0.063	0.01	1.51	1	0.00

**Total Shell Content:** **16** %



COBBLES	GRAVEL		SAND			SILT OR CLAY
	COARSE	FINE	COARSE	MEDIUM	FINE	

Sample No.	Elev. Or Depth	Classification	% CO <sub>3</sub>	G <sub>s</sub>	Nat w%	LL	PL	PI	Project	
♦ 2	9.0-9.5	SAND, poorly-graded, mostly medium to fine-grained quartz, little carbonate, few fragmented limestone, dark gray (SP)	16						Topsail Beach, Surf City & North Topsail	
			Area							
			Boring No. T1-03-V-113d							
			Date 9/16/2003							

**GRADATION CURVES**



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## VISUAL SHELL CONTENT

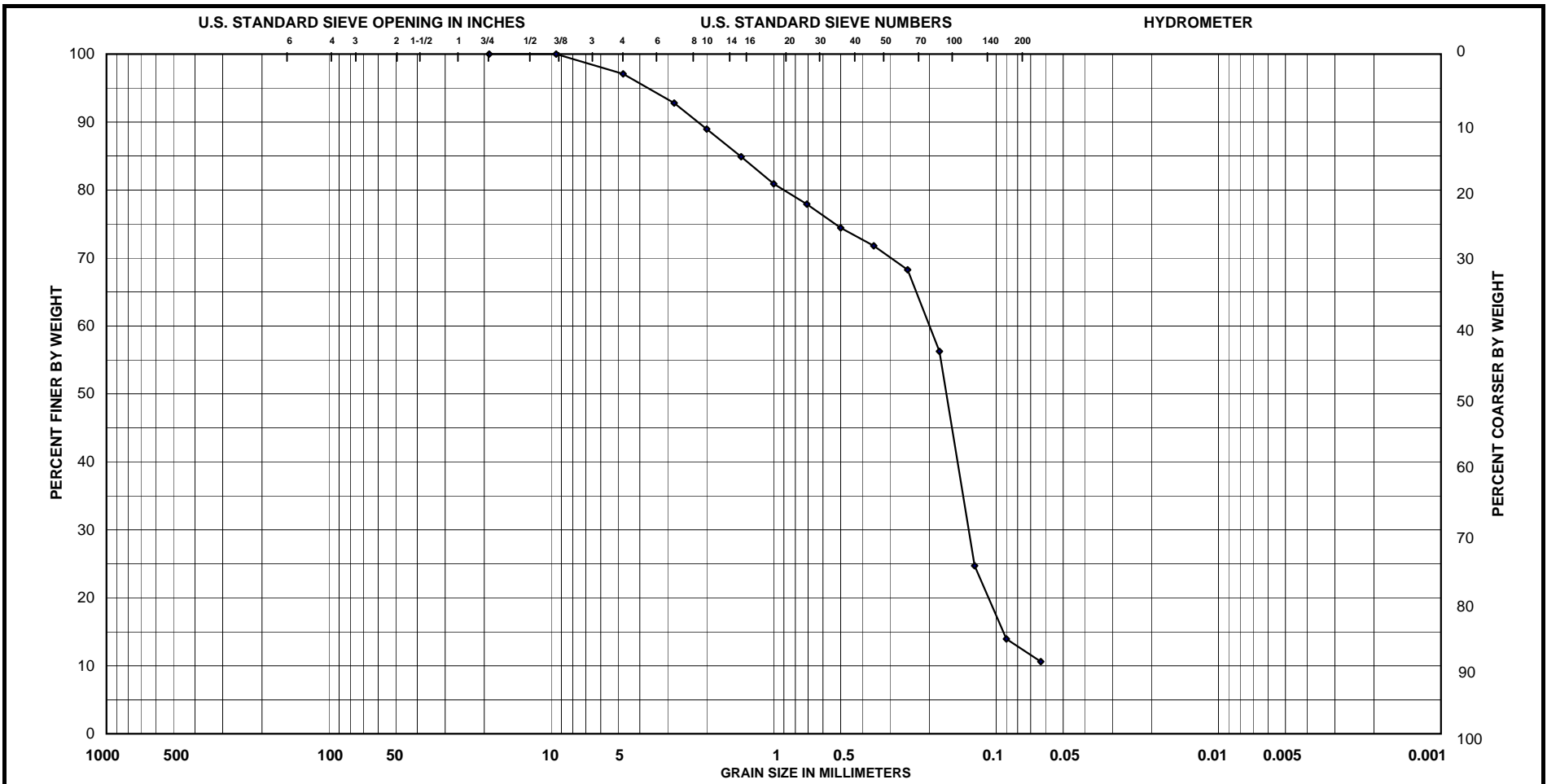
### GRAIN SIZE AND VISUAL SHELL CONTENT

Project:	<b>Topsail Beach, Surf City &amp; North Topsail</b>	Depth:	<b>36.2-36.7</b>
Project No.:	<b>1584-01-40</b>	Date:	<b>9/16/2003</b>
Boring No.:	<b>T1-03-V-114</b>		
Sample No.:	<b>1</b>		
Description:	<b>SAND, poorly-graded with clay, mostly fine-grained quartz, few clay, few carbonate, few fragmented limestone, gray (SP-SC)</b>		

Tare Weight, (g):	<b>49.68</b>	
Dry Wt. Before Washing (g):	<b>144.6</b>	(with tare)
Dry Weight After Washing (g):	<b>134.58</b>	(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	2.76	97.09	70	1.93
#7	2.800	4.09	92.78	80	3.27
#10	2.000	3.62	88.97	60	2.17
#14	1.400	3.85	84.91	40	1.54
#18	1.000	3.79	80.92	20	0.76
#25	0.710	2.86	77.91	10	0.29
#35	0.500	3.31	74.42	3	0.10
#45	0.355	2.51	71.78	1	0.03
#60	0.250	3.34	68.26	1	0.03
#80	0.180	11.38	56.27	1	0.11
#120	0.125	29.96	24.71	1	0.30
#170	0.090	10.19	13.97	1	0.10
#230	0.063	3.17	10.63	1	0.03

**Total Shell Content:** **11** %



COBBLES	GRAVEL		SAND			SILT OR CLAY
	COARSE	FINE	COARSE	MEDIUM	FINE	

Sample No.	Elev. Or Depth	Classification	% CO <sub>3</sub>	G <sub>s</sub>	Nat w%	LL	PL	PI	Project
♦ 1	36.2-36.7	SAND, poorly-graded with clay, mostly fine-grained quartz, few clay, few carbonate, few fragmented limestone, gray (SP-SC)	11						Topsail Beach, Surf City & North Topsail
									Area
									Boring No. T1-03-V-114
									Date 9/16/2003

**GRADATION CURVES**



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## VISUAL SHELL CONTENT

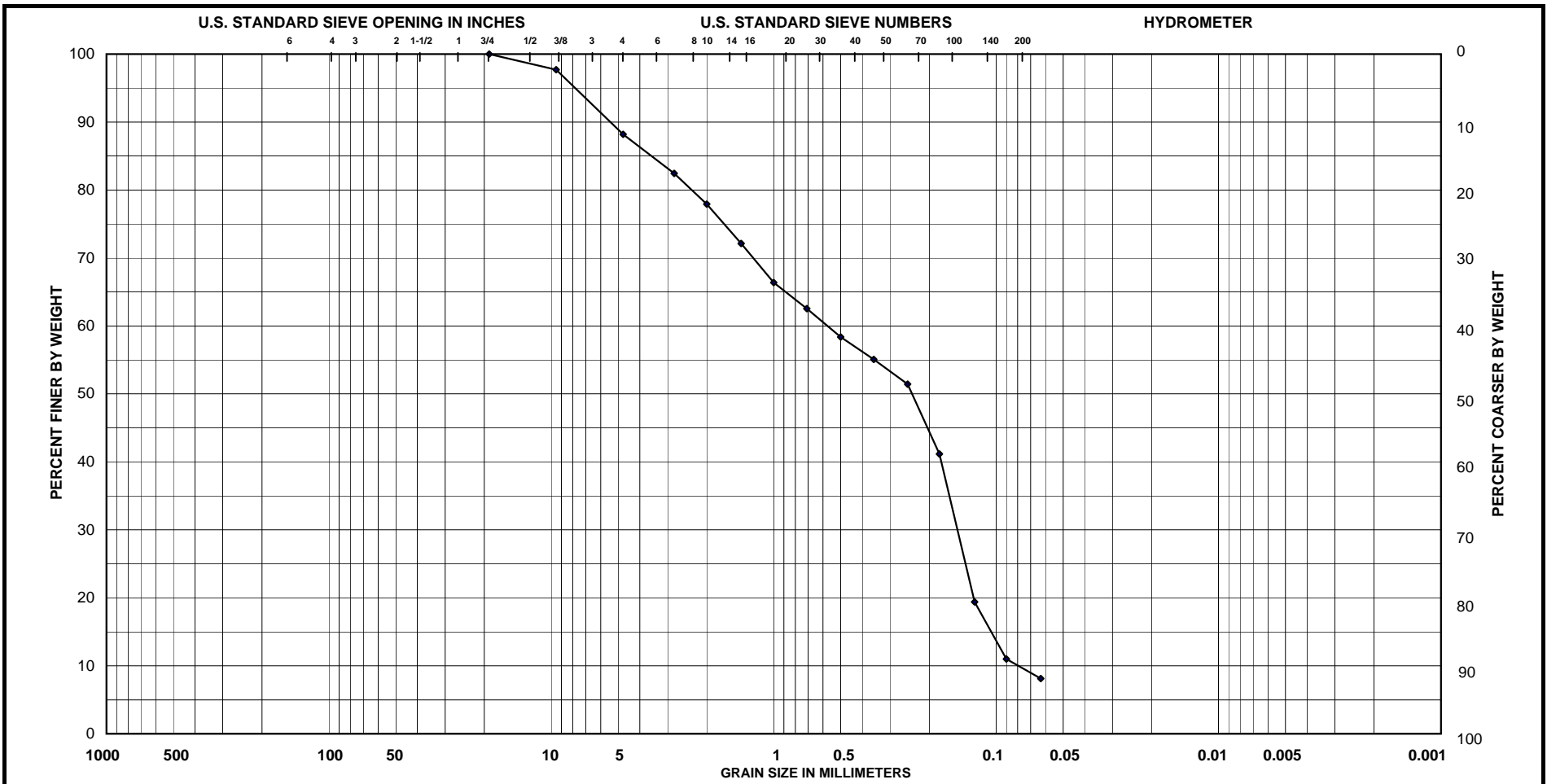
### GRAIN SIZE AND VISUAL SHELL CONTENT

Project:	<b>Topsail Beach, Surf City &amp; North Topsail</b>	Depth:	<b>39.0-39.5</b>
Project No.:	<b>1584-01-40</b>	Date:	<b>9/16/2003</b>
Boring No.:	<b>T1-03-V-114</b>		
Sample No.:	<b>2</b>		
Description:	<b>SAND, poorly-graded with clay, mostly fine-grained quartz, some carbonate, few clay, few fragmented limestone, dark gray (SP-SC)</b>		

Tare Weight, (g):	<b>49.76</b>	
Dry Wt. Before Washing (g):	<b>167.07</b>	(with tare)
Dry Weight After Washing (g):	<b>157.77</b>	(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	2.71	97.69	100	2.71
#4	4.750	11.12	88.21	100	11.12
#7	2.800	6.75	82.46	90	6.08
#10	2.000	5.30	77.94	70	3.71
#14	1.400	6.79	72.15	65	4.41
#18	1.000	6.75	66.40	50	3.38
#25	0.710	4.53	62.54	20	0.91
#35	0.500	4.87	58.38	15	0.73
#45	0.355	3.86	55.09	5	0.19
#60	0.250	4.31	51.42	3	0.13
#80	0.180	12.04	41.16	1	0.12
#120	0.125	25.51	19.41	1	0.26
#170	0.090	9.85	11.01	1	0.10
#230	0.063	3.37	8.14	1	0.03

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



COBBLES	GRAVEL		SAND			SILT OR CLAY
	COARSE	FINE	COARSE	MEDIUM	FINE	

Sample No.	Elev. Or Depth	Classification	% CO <sub>3</sub>	G <sub>s</sub>	Nat w%	LL	PL	PI	Project	
♦ 2	39.0-39.5	SAND, poorly-graded with clay, mostly fine-grained quartz, some carbonate, few clay, few fragmented limestone, dark gray (SP-SC)	29						Topsail Beach, Surf City & North Topsail	
									Area	
									Boring No. T1-03-V-114	
									Date 9/16/2003	

**GRADATION CURVES**



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## VISUAL SHELL CONTENT

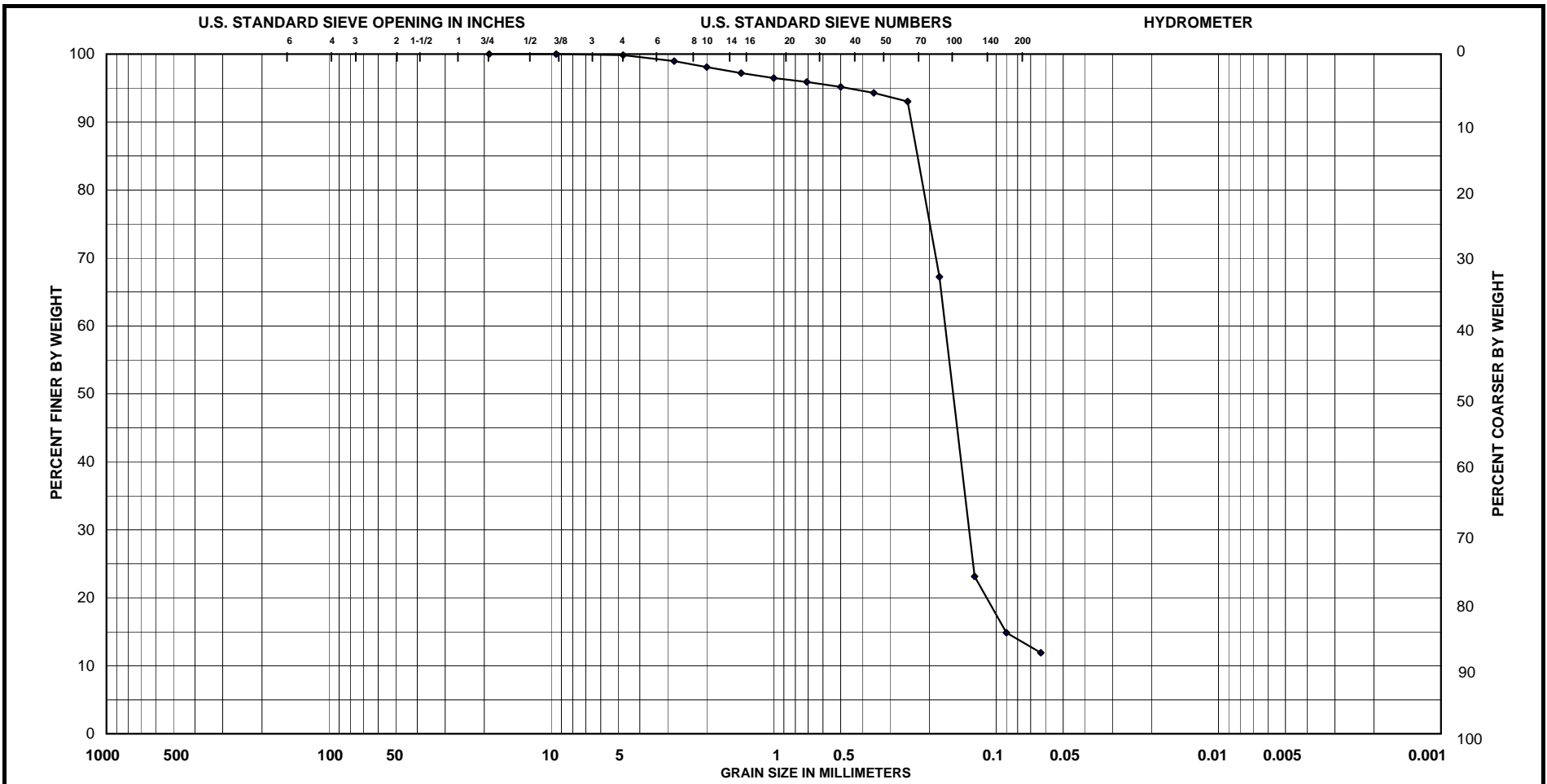
### GRAIN SIZE AND VISUAL SHELL CONTENT

Project:	<b>Topsail Beach, Surf City &amp; North Topsail</b>	Depth:	<b>42.0-42.5</b>
Project No.:	<b>1584-01-40</b>	Date:	<b>9/16/2003</b>
Boring No.:	<b>T1-03-V-114</b>		
Sample No.:	<b>3</b>		
Description:	<b>SAND, poorly-graded with silt, mostly fine-grained quartz, , few silt, few carbonate, trace fragmented limestone, dark gray (SP-SM)</b>		

Tare Weight, (g):	<b>50.49</b>	
Dry Wt. Before Washing (g):	<b>167.77</b>	(with tare)
Dry Weight After Washing (g):	<b>154.06</b>	(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	0.17	99.86	100	0.17
#7	2.800	1.04	98.97	100	1.04
#10	2.000	1.04	98.08	100	1.04
#14	1.400	1.04	97.19	85	0.88
#18	1.000	0.85	96.47	75	0.64
#25	0.710	0.66	95.91	50	0.33
#35	0.500	0.86	95.17	25	0.22
#45	0.355	1.04	94.29	10	0.10
#60	0.250	1.47	93.03	3	0.04
#80	0.180	30.27	67.22	1	0.30
#120	0.125	51.70	23.14	1	0.52
#170	0.090	9.69	14.88	1	0.10
#230	0.063	3.45	11.94	1	0.03

**Total Shell Content:** **5** %



COBBLES	GRAVEL		SAND			SILT OR CLAY
	COARSE	FINE	COARSE	MEDIUM	FINE	

Sample No.	Elev. Or Depth	Classification	% CO <sub>3</sub>	G <sub>s</sub>	Nat w%	LL	PL	PI	Project
3	42.0-42.5	SAND, poorly-graded with silt, mostly fine-grained quartz, , few silt, few carbonate, trace fragmented limestone, dark gray (SP-SM)	5						Topsail Beach, Surf City & North Topsail
									Area
									Boring No. T1-03-V-114
									Date 9/16/2003

**GRADATION CURVES**





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## VISUAL SHELL CONTENT

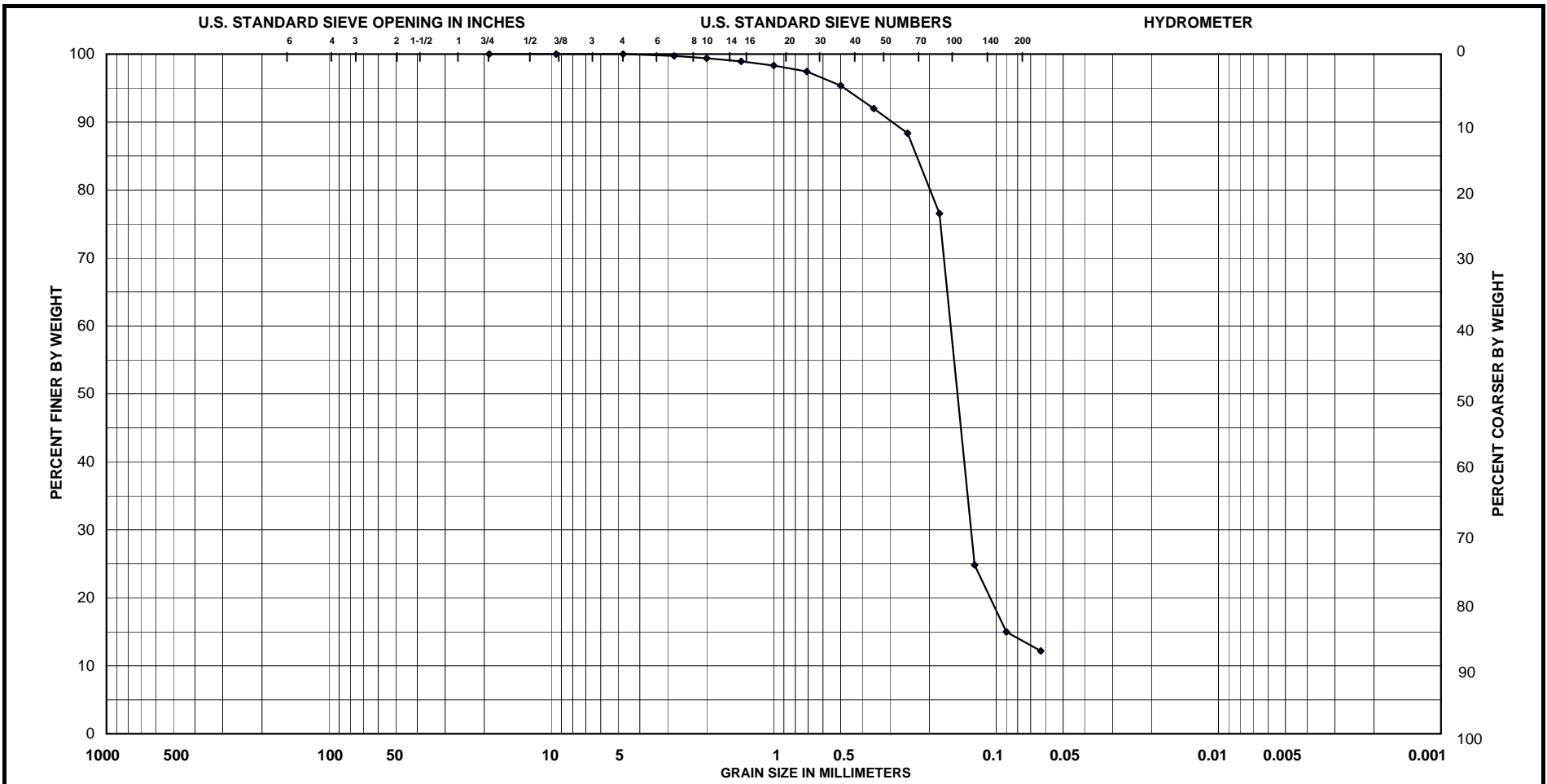
### GRAIN SIZE AND VISUAL SHELL CONTENT

Project:	<b>Topsail Beach, Surf City &amp; North Topsail</b>	Depth:	<b>45.0-45.5</b>
Project No.:	<b>1584-01-40</b>	Date:	<b>9/16/2003</b>
Boring No.:	<b>T1-03-V-114</b>		
Sample No.:	<b>4</b>		
Description:	<b>SAND, poorly-graded with silt, mostly fine-grained quartz, few fragmented limestone, few silt, trace carbonate, greenish gray (SP-SM)</b>		

Tare Weight, (g):	<b>49.95</b>	
Dry Wt. Before Washing (g):	<b>182.03</b>	(with tare)
Dry Weight After Washing (g):	<b>167.01</b>	(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	0.35	99.74	80	0.28
#10	2.000	0.48	99.37	60	0.29
#14	1.400	0.58	98.93	30	0.17
#18	1.000	0.81	98.32	10	0.08
#25	0.710	1.19	97.42	3	0.04
#35	0.500	2.74	95.34	1	0.03
#45	0.355	4.41	92.00	1	0.04
#60	0.250	4.83	88.35	1	0.05
#80	0.180	15.58	76.55	1	0.16
#120	0.125	68.28	24.86	1	0.68
#170	0.090	13.04	14.98	1	0.13
#230	0.063	3.69	12.19	1	0.04

**Total Shell Content:** **2** %



COBBLES	GRAVEL		SAND			SILT OR CLAY
	COARSE	FINE	COARSE	MEDIUM	FINE	

Sample No.	Elev. Or Depth	Classification	% CO <sub>3</sub>	G <sub>s</sub>	Nat w%	LL	PL	PI	Project	
4	45.0-45.5	SAND, poorly-graded with silt, mostly fine-grained quartz, few fragmented limestone, few silt, trace carbonate, greenish gray (SP-SM)	2						Topsail Beach, Surf City & North Topsail	
									Area	
									Boring No. T1-03-V-114	
									Date 9/16/2003	

**GRADATION CURVES**



# WOLF TECHNOLOGIES, INC.

3047-4 St. Johns Bluff Road S.  
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## VISUAL SHELL CONTENT

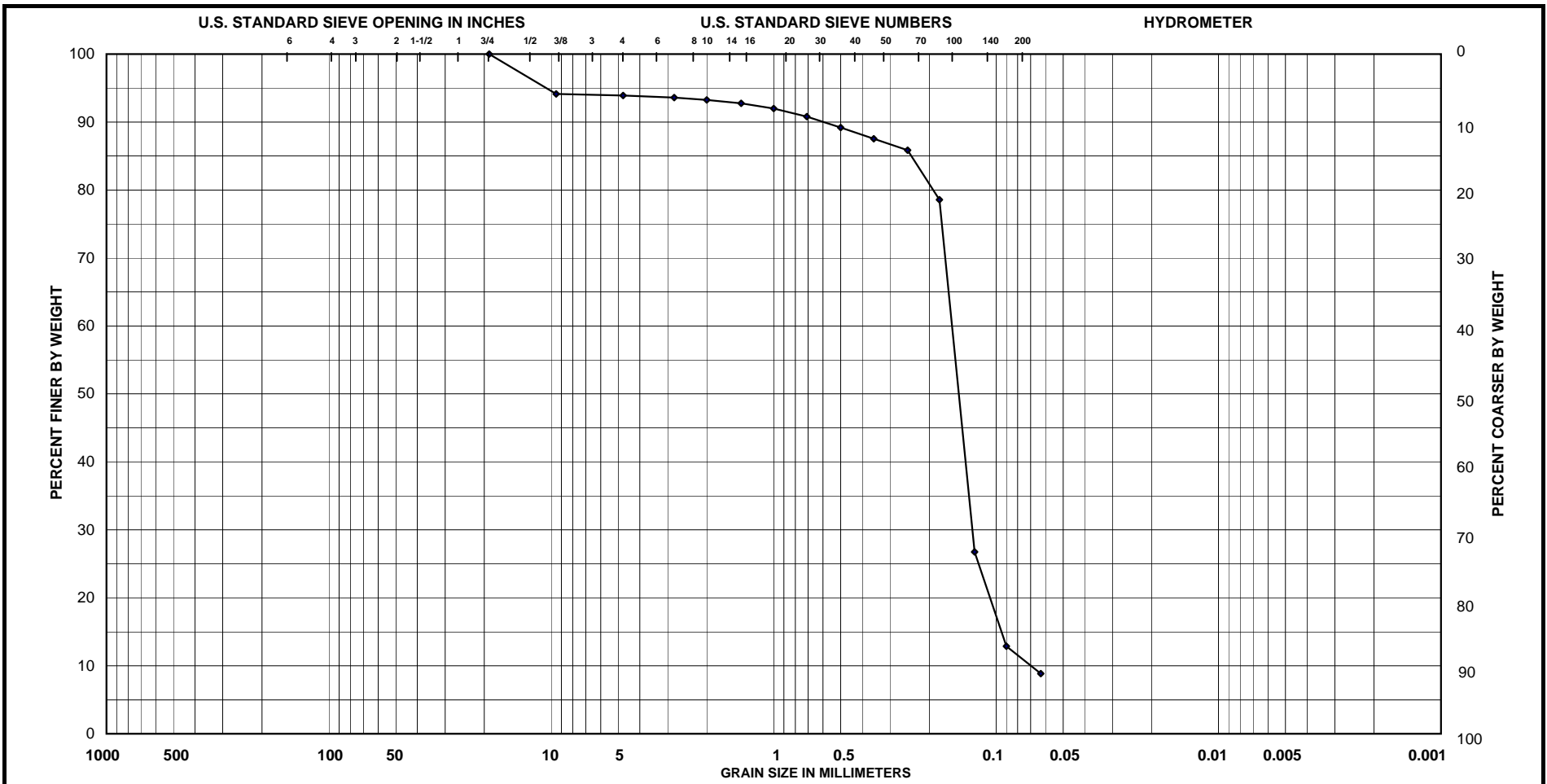
### GRAIN SIZE AND VISUAL SHELL CONTENT

Project:	<b>Topsail Beach, Surf City &amp; North Topsail</b>	Depth:	<b>48.0-48.5</b>
Project No.:	<b>1584-01-40</b>	Date:	<b>9/16/2003</b>
Boring No.:	<b>T1-03-V-114</b>		
Sample No.:	<b>5</b>		
Description:	<b>SAND, poorly-graded with silt, mostly fine-grained quartz, few fragmented limestone, few silt, trace carbonate, olive (SP-SM)</b>		

Tare Weight, (g):	<b>50.14</b>	
Dry Wt. Before Washing (g):	<b>220.48</b>	(with tare)
Dry Weight After Washing (g):	<b>206.4</b>	(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	9.97	94.15	0	0.00
#4	4.750	0.39	93.92	0	0.00
#7	2.800	0.52	93.61	20	0.10
#10	2.000	0.60	93.26	60	0.36
#14	1.400	0.89	92.74	40	0.36
#18	1.000	1.29	91.98	15	0.19
#25	0.710	2.02	90.79	3	0.06
#35	0.500	2.75	89.18	3	0.08
#45	0.355	2.82	87.52	1	0.03
#60	0.250	2.85	85.85	1	0.03
#80	0.180	12.38	78.58	1	0.12
#120	0.125	88.29	26.75	1	0.88
#170	0.090	23.64	12.87	1	0.24
#230	0.063	6.83	8.86	1	0.07

**Total Shell Content:** **1** %



COBBLES	GRAVEL		SAND			SILT OR CLAY
	COARSE	FINE	COARSE	MEDIUM	FINE	

Sample No.	Elev. Or Depth	Classification	% CO <sub>3</sub>	G <sub>s</sub>	Nat w%	LL	PL	PI	Project	
5	48.0-48.5	SAND, poorly-graded with silt, mostly fine-grained quartz, few fragmented limestone, few silt, trace carbonate, olive (SP-SM)	1						Topsail Beach, Surf City & North Topsail	
									Area	
									Boring No. T1-03-V-114	
									Date 9/16/2003	

**GRADATION CURVES**



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## VISUAL SHELL CONTENT

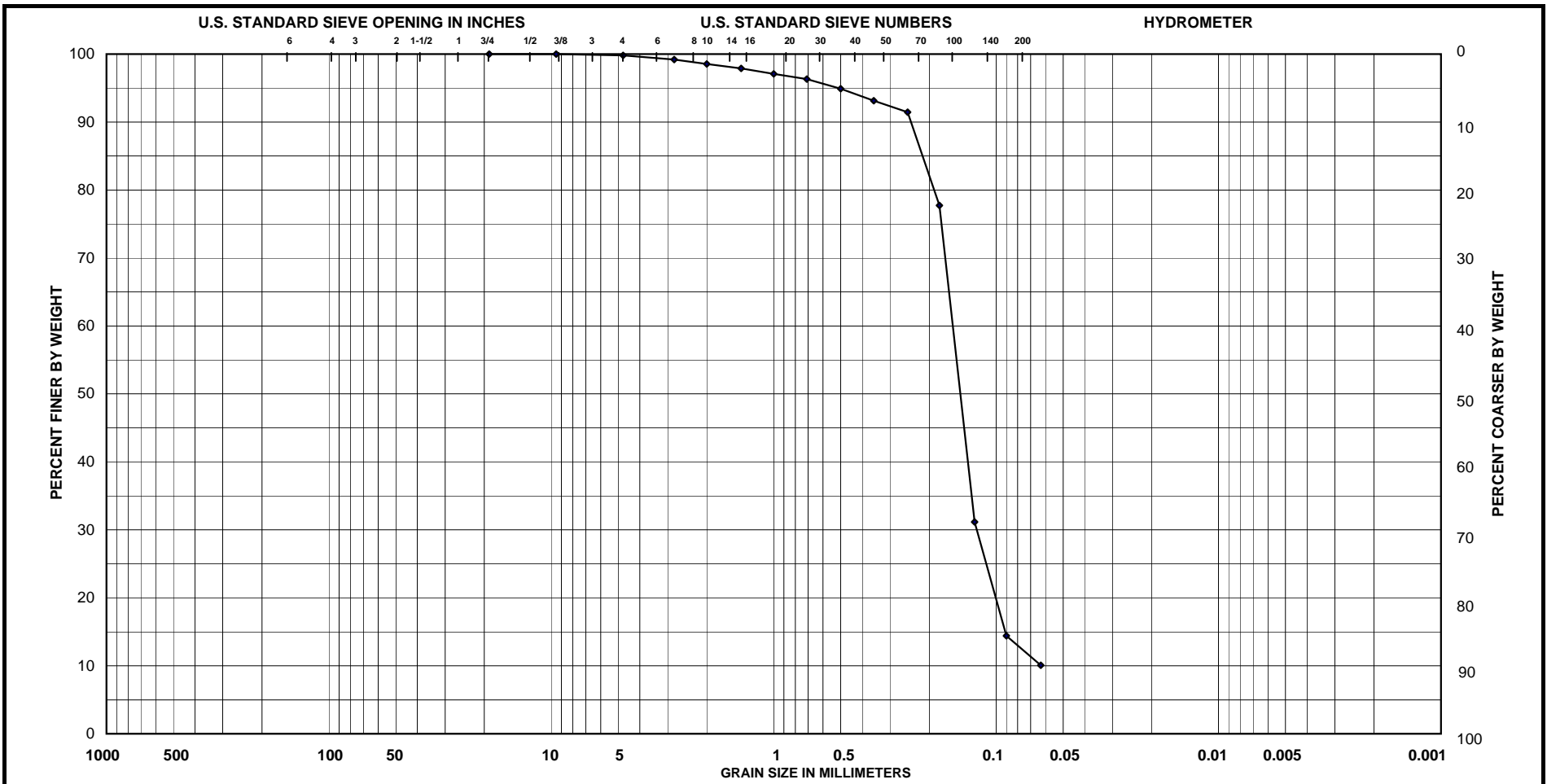
### GRAIN SIZE AND VISUAL SHELL CONTENT

Project:	<b>Topsail Beach, Surf City &amp; North Topsail</b>	Depth:	<b>50.0-50.5</b>
Project No.:	<b>1584-01-40</b>	Date:	<b>9/16/2003</b>
Boring No.:	<b>T1-03-V-114</b>		
Sample No.:	<b>6</b>		
Description:	<b>SAND, poorly-graded with silt, mostly fine-grained quartz, few silt, few fragmented limestone, trace carbonate, olive (SP-SM)</b>		

Tare Weight, (g):	<b>50.07</b>	
Dry Wt. Before Washing (g):	<b>175.93</b>	(with tare)
Dry Weight After Washing (g):	<b>163.91</b>	(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	0.24	99.81	0	0.00
#7	2.800	0.79	99.18	10	0.08
#10	2.000	0.82	98.53	30	0.25
#14	1.400	0.81	97.89	20	0.16
#18	1.000	1.01	97.08	20	0.20
#25	0.710	0.97	96.31	10	0.10
#35	0.500	1.80	94.88	5	0.09
#45	0.355	2.18	93.15	3	0.07
#60	0.250	2.12	91.47	1	0.02
#80	0.180	17.28	77.74	1	0.17
#120	0.125	58.60	31.18	1	0.59
#170	0.090	21.12	14.40	1	0.21
#230	0.063	5.43	10.08	1	0.05

**Total Shell Content:** **2** %



COBBLES	GRAVEL		SAND			SILT OR CLAY
	COARSE	FINE	COARSE	MEDIUM	FINE	

Sample No.	Elev. Or Depth	Classification	% CO <sub>3</sub>	G <sub>s</sub>	Nat w%	LL	PL	PI	Project
6	50.0-50.5	SAND, poorly-graded with silt, mostly fine-grained quartz, few silt, few fragmented limestone, trace carbonate, olive (SP-SM)	2						Topsail Beach, Surf City & North Topsail
									Area
									Boring No. T1-03-V-114
									Date 9/16/2003

**GRADATION CURVES**



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## VISUAL SHELL CONTENT

### GRAIN SIZE AND VISUAL SHELL CONTENT

Project:	<b>Topsail Beach, Surf City &amp; North Topsail</b>	Depth:	<b>36.5-37.0</b>
Project No.:	<b>1584-01-40</b>	Date:	<b>9/16/2003</b>
Boring No.:	<b>T1-03-V-115</b>		
Sample No.:	<b>1</b>		
Description:	<b>SAND, poorly-graded, mostly fine-grained quartz, few carbonate, few fragmented limestone, bluish gray (SP)</b>		

Tare Weight, (g):	<b>50.19</b>	
Dry Wt. Before Washing (g):	<b>188.41</b>	(with tare)
Dry Weight After Washing (g):	<b>184.57</b>	(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	1.89	98.63	100	1.89
#7	2.800	2.26	97.00	90	2.03
#10	2.000	2.49	95.20	85	2.12
#14	1.400	2.90	93.10	65	1.89
#18	1.000	3.16	90.81	40	1.26
#25	0.710	2.89	88.72	30	0.87
#35	0.500	4.06	85.78	10	0.41
#45	0.355	5.68	81.67	5	0.28
#60	0.250	9.19	75.03	3	0.28
#80	0.180	31.02	52.58	1	0.31
#120	0.125	52.67	14.48	1	0.53
#170	0.090	13.16	4.96	1	0.13
#230	0.063	2.53	3.13	1	0.03

**Total Shell Content:** **9** %



COBBLES	GRAVEL		SAND			SILT OR CLAY
	COARSE	FINE	COARSE	MEDIUM	FINE	

Sample No.	Elev. Or Depth	Classification	% CO <sub>3</sub>	G <sub>s</sub>	Nat w%	LL	PL	PI	Project
1	36.5-37.0	SAND, poorly-graded, mostly fine-grained quartz, few carbonate, few fragmented limestone, bluish gray (SP)	9						Topsail Beach, Surf City & North Topsail
									Area
									Boring No. T1-03-V-115
									Date 9/16/2003

**GRADATION CURVES**





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## VISUAL SHELL CONTENT

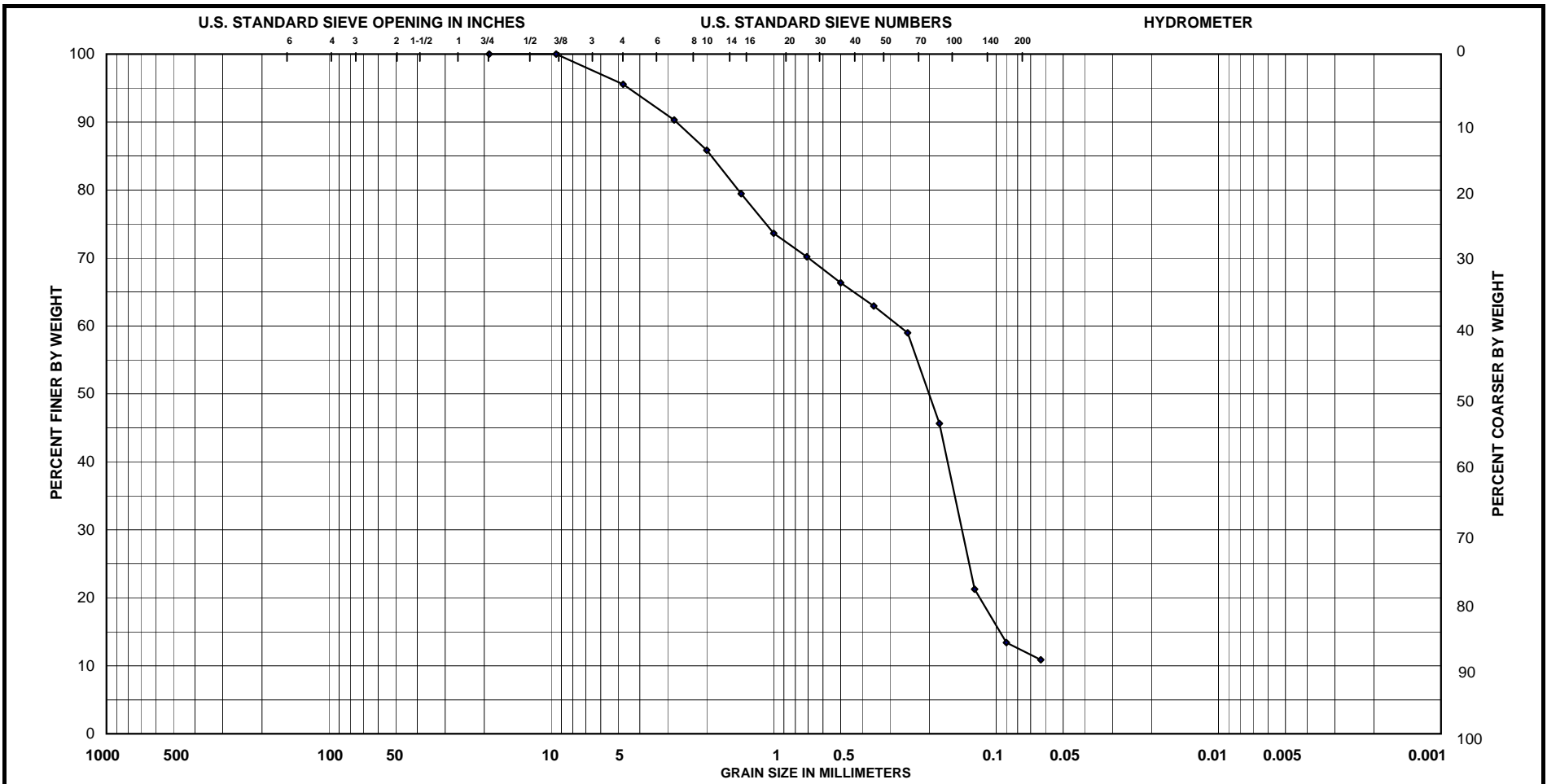
### GRAIN SIZE AND VISUAL SHELL CONTENT

<b>Project:</b>	<b>Topsail Beach, Surf City &amp; North Topsail</b>	<b>Depth:</b>	<b>38.5-39.0</b>
<b>Project No.:</b>	<b>1584-01-40</b>	<b>Date:</b>	<b>9/16/2003</b>
<b>Boring No.:</b>	<b>T1-03-V-115</b>		
<b>Sample No.:</b>	<b>2</b>		
<b>Description:</b>	<b>SAND, poorly-graded with clay, mostly fine-grained quartz, some fine gravel to medium sand-size fragmented limestone, little carbonate, few</b>		

Tare Weight, (g):	49.50	
Dry Wt. Before Washing (g):	180.02	(with tare)
Dry Weight After Washing (g):	166.29	(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	5.80	95.56	65	3.77
#7	2.800	6.88	90.29	70	4.82
#10	2.000	5.78	85.86	80	4.62
#14	1.400	8.35	79.46	60	5.01
#18	1.000	7.61	73.63	40	3.04
#25	0.710	4.51	70.17	20	0.90
#35	0.500	4.97	66.37	10	0.50
#45	0.355	4.47	62.94	5	0.22
#60	0.250	5.17	58.98	3	0.16
#80	0.180	17.41	45.64	1	0.17
#120	0.125	31.83	21.25	1	0.32
#170	0.090	10.21	13.43	1	0.10
#230	0.063	3.32	10.89	1	0.03

**Total Shell Content:** 18 %



COBBLES	GRAVEL		SAND			SILT OR CLAY
	COARSE	FINE	COARSE	MEDIUM	FINE	

Sample No.	Elev. Or Depth	Classification	% CO <sub>3</sub>	G <sub>s</sub>	Nat w%	LL	PL	PI	Project	
♦ 2	38.5-39.0	SAND, poorly-graded with clay, mostly fine-grained quartz, some fine gravel to medium sand-size fragmented limestone, little carbonate, few silt, dark greenish gray (SP-SC)	18						Topsail Beach, Surf City & North Topsail	
									Area	
									Boring No. T1-03-V-115	
									Date 9/16/2003	

**GRADATION CURVES**



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## VISUAL SHELL CONTENT

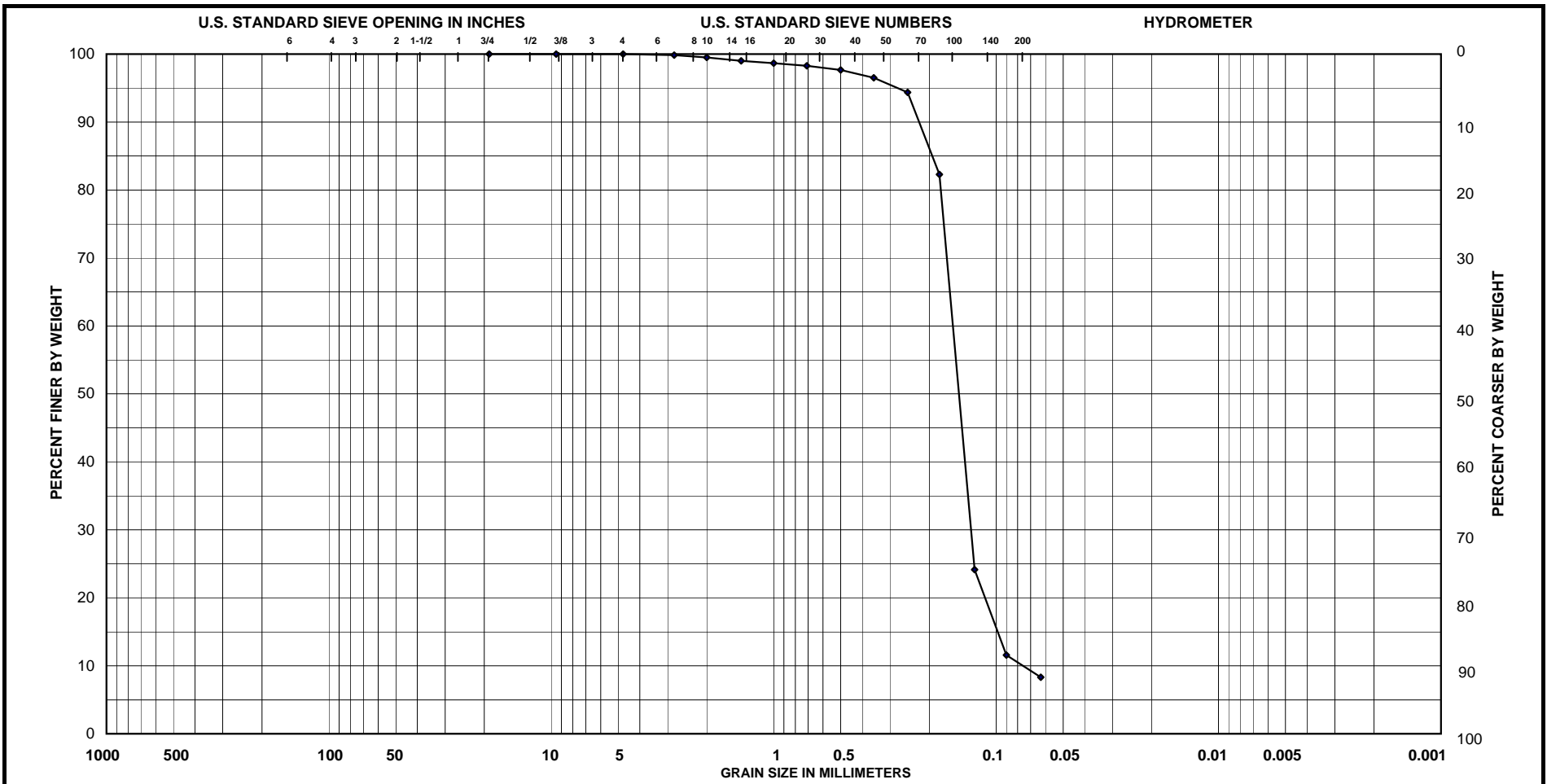
### GRAIN SIZE AND VISUAL SHELL CONTENT

<b>Project:</b>	<b>Topsail Beach, Surf City &amp; North Topsail</b>	<b>Depth:</b>	<b>40.0-40.5</b>
<b>Project No.:</b>	<b>1584-01-40</b>	<b>Date:</b>	<b>9/16/2003</b>
<b>Boring No.:</b>	<b>T1-03-V-115</b>		
<b>Sample No.:</b>	<b>3</b>		
<b>Description:</b>	<b>SAND, poorly-graded with silt, mostly fine-grained quartz, few silt, trace fragmented limestone, trace carbonate, olive (SP-SM)</b>		

Tare Weight, (g):	50.30	
Dry Wt. Before Washing (g):	151.07	(with tare)
Dry Weight After Washing (g):	142.97	(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	0.16	99.84	50	0.08
#10	2.000	0.36	99.48	30	0.11
#14	1.400	0.47	99.02	30	0.14
#18	1.000	0.38	98.64	40	0.15
#25	0.710	0.37	98.27	25	0.09
#35	0.500	0.60	97.68	15	0.09
#45	0.355	1.16	96.53	3	0.03
#60	0.250	2.16	94.38	1	0.02
#80	0.180	12.20	82.28	1	0.12
#120	0.125	58.58	24.14	1	0.59
#170	0.090	12.66	11.58	1	0.13
#230	0.063	3.28	8.33	1	0.03

**Total Shell Content:** 2 %



COBBLES	GRAVEL		SAND			SILT OR CLAY
	COARSE	FINE	COARSE	MEDIUM	FINE	

Sample No.	Elev. Or Depth	Classification	% CO <sub>3</sub>	G <sub>s</sub>	Nat w%	LL	PL	PI	Project
3	40.0-40.5	SAND, poorly-graded with silt, mostly fine-grained quartz, few silt, trace fragmented limestone, trace carbonate, olive (SP-SM)	2						Topsail Beach, Surf City & North Topsail
									Area
									Boring No. T1-03-V-115
									Date 9/16/2003

**GRADATION CURVES**



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## VISUAL SHELL CONTENT

### GRAIN SIZE AND VISUAL SHELL CONTENT

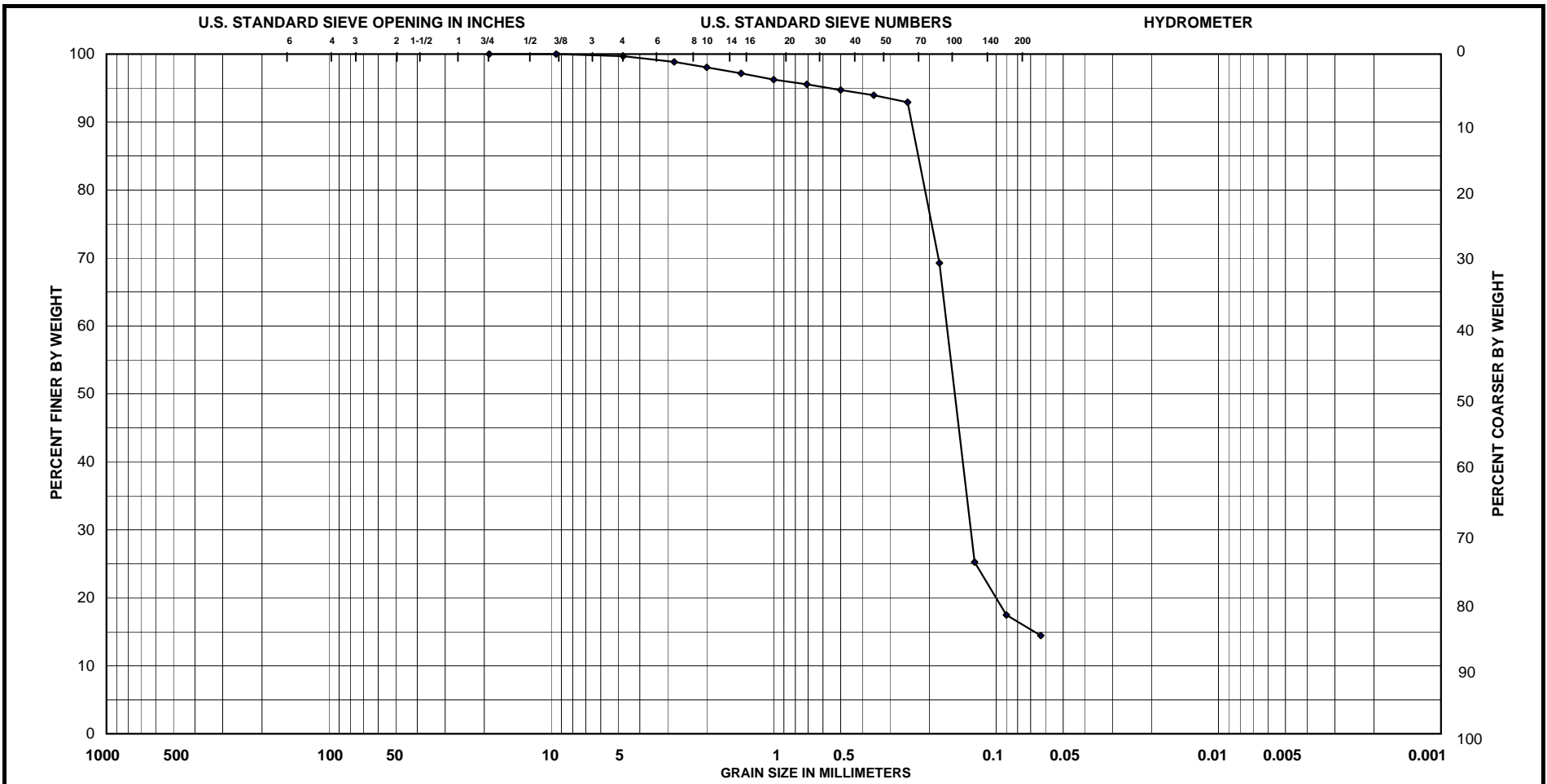
Project:	<b>Topsail Beach, Surf City &amp; North Topsail</b>	Depth:	<b>42.0-42.5</b>
Project No.:	<b>1584-01-40</b>	Date:	<b>9/16/2003</b>
Boring No.:	<b>T1-03-V-115</b>		
Sample No.:	<b>4</b>		
Description:	<b>SAND, silty, mostly fine-grained quartz, little silt, few fragmented limestone, trace carbonate, greenish gray (SM)</b>		

Tare Weight, (g):	<b>50.08</b>	
Dry Wt. Before Washing (g):	<b>201.44</b>	(with tare)
Dry Weight After Washing (g):	<b>180.08</b>	(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	0.47	99.69	0	0.00
#7	2.800	1.29	98.84	5	0.06
#10	2.000	1.18	98.06	3	0.04
#14	1.400	1.38	97.15	1	0.01
#18	1.000	1.35	96.25	1	0.01
#25	0.710	1.04	95.57	1	0.01
#35	0.500	1.28	94.72	1	0.01
#45	0.355	1.18	93.94	1	0.01
#60	0.250	1.54	92.92	1	0.02
#80	0.180	35.81	69.27	1	0.36
#120	0.125	66.59	25.27	1	0.67
#170	0.090	11.82	17.46	1	0.12
#230	0.063	4.56	14.45	1	0.05

**Total Shell Content:**

<b>1</b>	<b>%</b>
----------	----------



COBBLES	GRAVEL		SAND			SILT OR CLAY
	COARSE	FINE	COARSE	MEDIUM	FINE	

Sample No.	Elev. Or Depth	Classification	% CO <sub>3</sub>	G <sub>s</sub>	Nat w%	LL	PL	PI	Project
4	42.0-42.5	SAND, silty, mostly fine-grained quartz, little silt, few fragmented limestone, trace carbonate, greenish gray (SM)	1						Topsail Beach, Surf City & North Topsail
									Area
									Boring No. T1-03-V-115
									Date 9/16/2003

**GRADATION CURVES**



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## VISUAL SHELL CONTENT

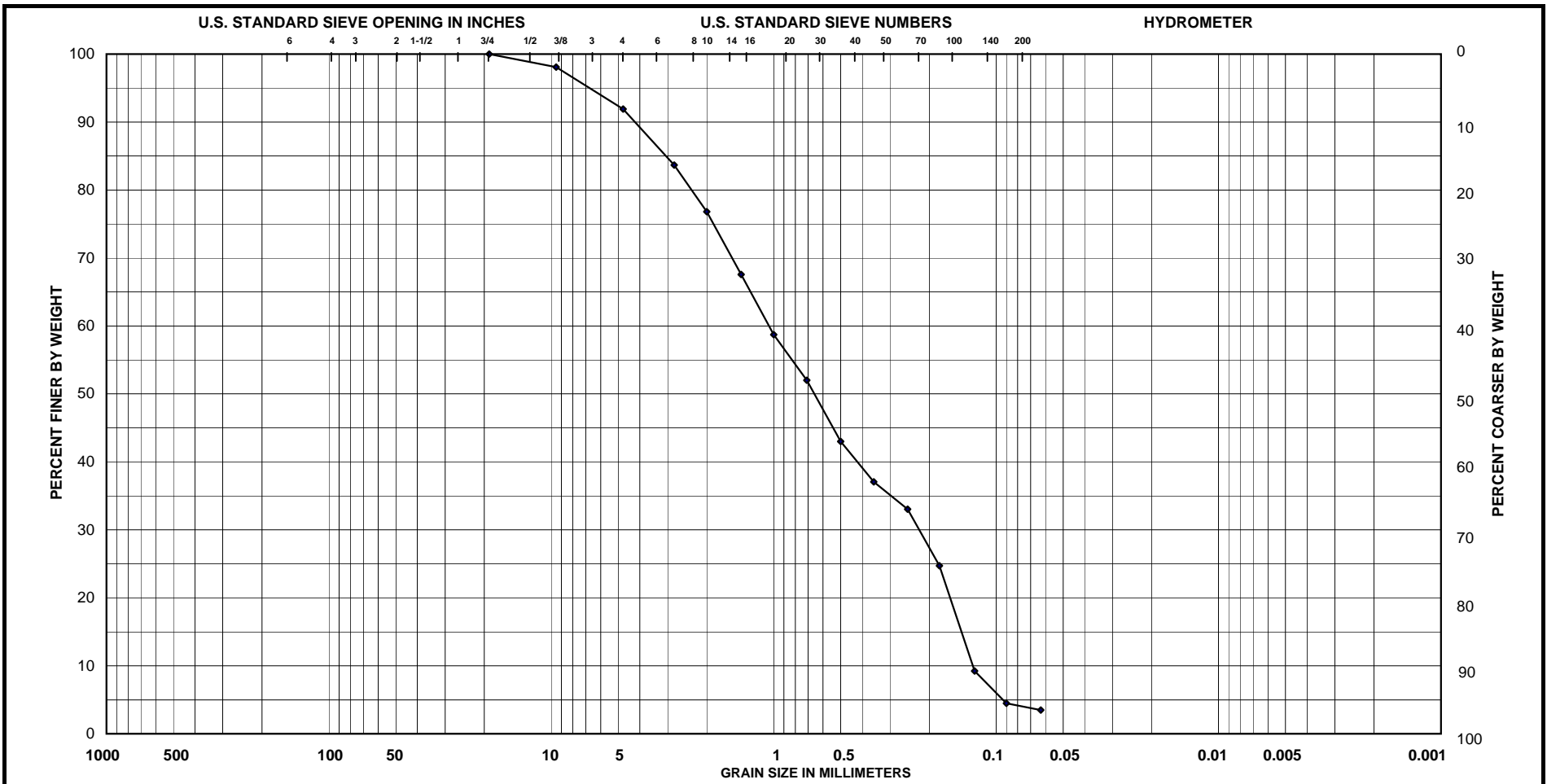
### GRAIN SIZE AND VISUAL SHELL CONTENT

Project:	<b>Topsail Beach, Surf City &amp; North Topsail</b>	Depth:	<b>35.7-36.2</b>
Project No.:	<b>1584-01-40</b>	Date:	<b>9/16/2003</b>
Boring No.:	<b>T1-03-V-116</b>		
Sample No.:	<b>1</b>		
Description:	<b>SAND, poorly-graded, mostly medium to fine-grained quartz, some carbonate, little fine gravel to medium sand-size fragmented limestone,</b>		

Tare Weight, (g):	<b>49.81</b>	
Dry Wt. Before Washing (g):	<b>206.57</b>	(with tare)
Dry Weight After Washing (g):	<b>201.89</b>	(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	2.99	98.09	65	1.94
#4	4.750	9.69	91.91	90	8.72
#7	2.800	12.92	83.67	80	10.34
#10	2.000	10.77	76.80	65	7.00
#14	1.400	14.45	67.58	40	5.78
#18	1.000	13.92	58.70	40	5.57
#25	0.710	10.50	52.00	35	3.68
#35	0.500	14.11	43.00	10	1.41
#45	0.355	9.32	37.06	3	0.28
#60	0.250	6.30	33.04	3	0.19
#80	0.180	13.05	24.71	1	0.13
#120	0.125	24.27	9.23	1	0.24
#170	0.090	7.43	4.49	1	0.07
#230	0.063	1.60	3.47	1	0.02

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



COBBLES	GRAVEL		SAND			SILT OR CLAY
	COARSE	FINE	COARSE	MEDIUM	FINE	

Sample No.	Elev. Or Depth	Classification	% CO <sub>3</sub>	G <sub>s</sub>	Nat w%	LL	PL	PI	Project	
♦ 1	35.7-36.2	SAND, poorly-graded, mostly medium to fine-grained quartz, some carbonate, little fine gravel to medium sand-size fragmented limestone, bluish gray (SP)	29						Topsail Beach, Surf City & North Topsail	
			Area							
			Boring No. T1-03-V-116							
			Date 9/16/2003							

**GRADATION CURVES**





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## VISUAL SHELL CONTENT

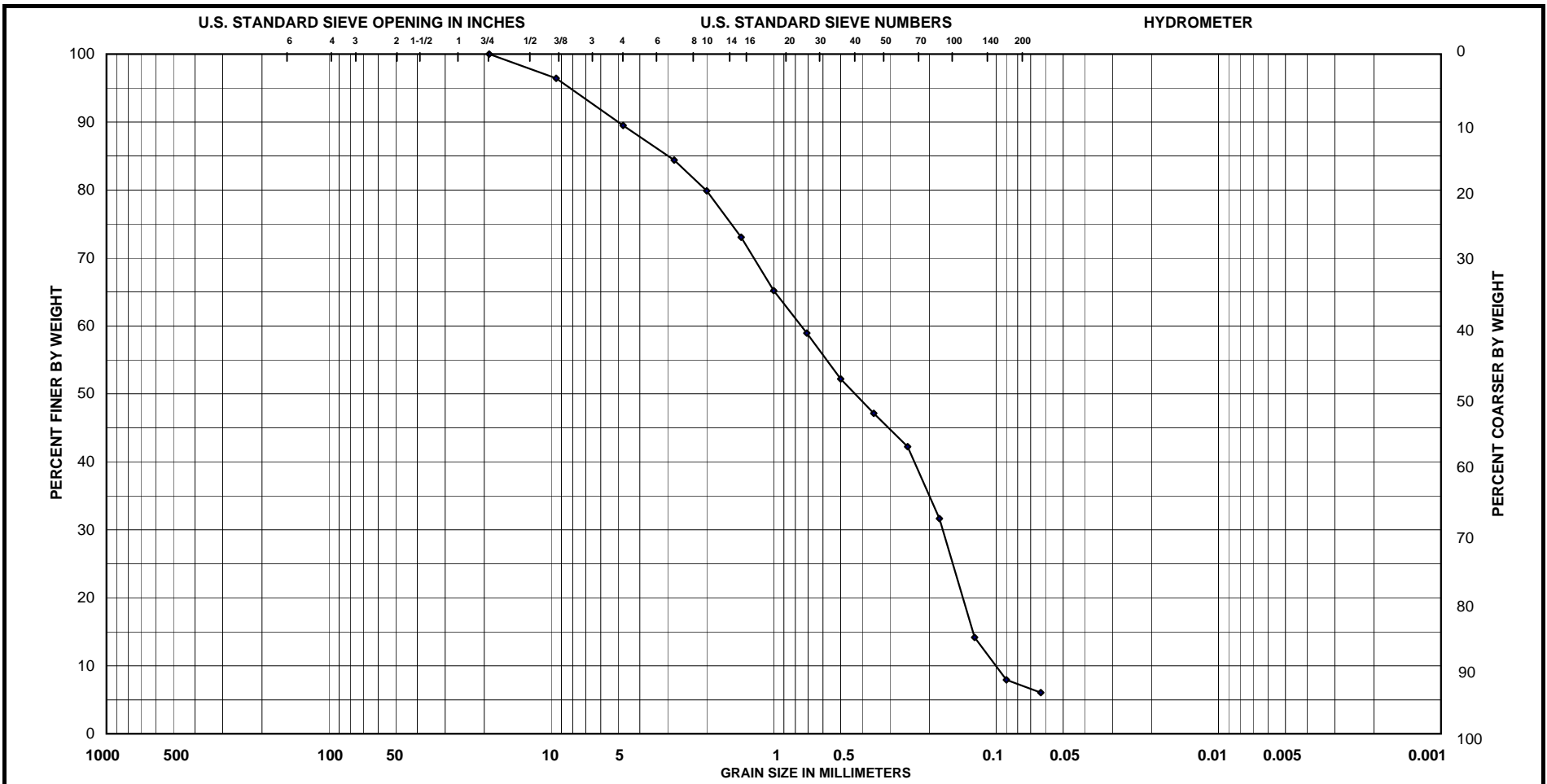
### GRAIN SIZE AND VISUAL SHELL CONTENT

Project:	<b>Topsail Beach, Surf City &amp; North Topsail</b>	Depth:	<b>37.0-37.5</b>
Project No.:	<b>1584-01-40</b>	Date:	<b>9/16/2003</b>
Boring No.:	<b>T1-03-V-116</b>		
Sample No.:	<b>2</b>		
Description:	<b>SAND, poorly-graded with silt, mostly fine-grained quartz, some carbonate, little fine gravel to medium sand-size fragmented limestone,</b>		

Tare Weight, (g):	<b>50.39</b>	
Dry Wt. Before Washing (g):	<b>184.84</b>	(with tare)
Dry Weight After Washing (g):	<b>176.69</b>	(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	4.78	96.44	25	1.20
#4	4.750	9.35	89.49	70	6.55
#7	2.800	6.82	84.42	85	5.80
#10	2.000	6.11	79.87	75	4.58
#14	1.400	9.15	73.07	65	5.95
#18	1.000	10.58	65.20	50	5.29
#25	0.710	8.39	58.96	40	3.36
#35	0.500	9.07	52.21	30	2.72
#45	0.355	6.82	47.14	15	1.02
#60	0.250	6.60	42.23	3	0.20
#80	0.180	14.21	31.66	1	0.14
#120	0.125	23.49	14.19	1	0.23
#170	0.090	8.42	7.93	1	0.08
#230	0.063	2.53	6.05	1	0.03

**Total Shell Content:** **28** %



COBBLES	GRAVEL		SAND			SILT OR CLAY
	COARSE	FINE	COARSE	MEDIUM	FINE	

Sample No.	Elev. Or Depth	Classification	% CO <sub>3</sub>	G <sub>s</sub>	Nat w%	LL	PL	PI	Project	
♦ 2	37.0-37.5	SAND, poorly-graded with silt, mostly fine-grained quartz, some carbonate, little fine gravel to medium sand-size fragmented limestone, few silt, bluish gray (SP-SM)	28						Topsail Beach, Surf City & North Topsail	
									Area	
									Boring No. T1-03-V-116	
									Date 9/16/2003	

**GRADATION CURVES**



# WOLF TECHNOLOGIES, INC.

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## VISUAL SHELL CONTENT

### GRAIN SIZE AND VISUAL SHELL CONTENT

<b>Project:</b>	<b>Topsail Beach, Surf City &amp; North Topsail</b>	<b>Depth:</b>	<b>38.0-38.5</b>
<b>Project No.:</b>	<b>1584-01-40</b>	<b>Date:</b>	<b>9/16/2003</b>
<b>Boring No.:</b>	<b>T1-03-V-116</b>		
<b>Sample No.:</b>	<b>3</b>		
<b>Description:</b>	<b>SAND, poorly-graded with silt, mostly fine-grained quartz, few silt, trace carbonate, trace fragmented limestone, olive (SP-SM)</b>		

Tare Weight, (g):	49.84	
Dry Wt. Before Washing (g):	166.32	(with tare)
Dry Weight After Washing (g):	158.63	(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	0.15	99.87	85	0.13
#10	2.000	0.40	99.53	70	0.28
#14	1.400	0.37	99.21	45	0.17
#18	1.000	0.48	98.80	35	0.17
#25	0.710	0.56	98.32	30	0.17
#35	0.500	0.95	97.50	10	0.10
#45	0.355	1.29	96.39	3	0.04
#60	0.250	1.88	94.78	1	0.02
#80	0.180	13.94	82.81	1	0.14
#120	0.125	68.46	24.04	1	0.68
#170	0.090	14.51	11.58	1	0.15
#230	0.063	3.64	8.46	1	0.04

**Total Shell Content:** 2 %





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## VISUAL SHELL CONTENT

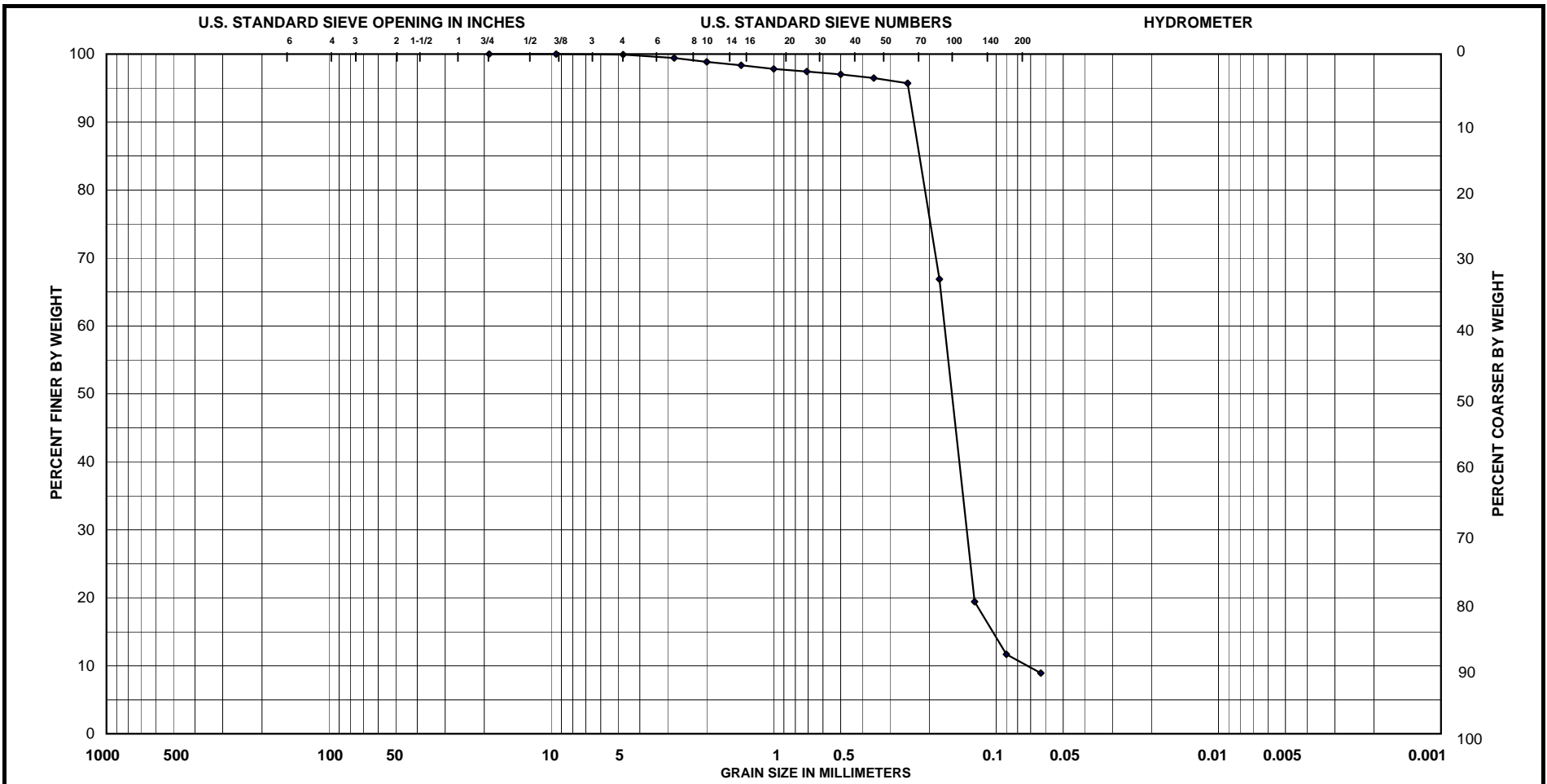
### GRAIN SIZE AND VISUAL SHELL CONTENT

Project:	<b>Topsail Beach, Surf City &amp; North Topsail</b>	Depth:	<b>40.0-40.5</b>
Project No.:	<b>1584-01-40</b>	Date:	<b>9/16/2003</b>
Boring No.:	<b>T1-03-V-116</b>		
Sample No.:	<b>4</b>		
Description:	<b>SAND, poorly-graded with silt, mostly fine-grained quartz, few silt, trace carbonate, trace fragmented limestone, olive (SP-SM)</b>		

Tare Weight, (g):	<b>49.94</b>	
Dry Wt. Before Washing (g):	<b>185.22</b>	(with tare)
Dry Weight After Washing (g):	<b>173.98</b>	(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	0.12	99.91	100	0.12
#7	2.800	0.68	99.41	100	0.68
#10	2.000	0.75	98.85	100	0.75
#14	1.400	0.70	98.34	95	0.67
#18	1.000	0.73	97.80	90	0.66
#25	0.710	0.49	97.43	60	0.29
#35	0.500	0.60	96.99	30	0.18
#45	0.355	0.72	96.46	15	0.11
#60	0.250	1.01	95.71	5	0.05
#80	0.180	38.99	66.89	3	1.17
#120	0.125	64.21	19.43	1	0.64
#170	0.090	10.49	11.67	1	0.10
#230	0.063	3.71	8.93	1	0.04

**Total Shell Content:** **4** %



COBBLES	GRAVEL		SAND			SILT OR CLAY
	COARSE	FINE	COARSE	MEDIUM	FINE	

Sample No.	Elev. Or Depth	Classification	% CO <sub>3</sub>	G <sub>s</sub>	Nat w%	LL	PL	PI	Project	
4	40.0-40.5	SAND, poorly-graded with silt, mostly fine-grained quartz, few silt, trace carbonate, trace fragmented limestone, olive (SP-SM)	4						Topsail Beach, Surf City & North Topsail	
									Area	
									Boring No. T1-03-V-116	
									Date 9/16/2003	

**GRADATION CURVES**



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## VISUAL SHELL CONTENT

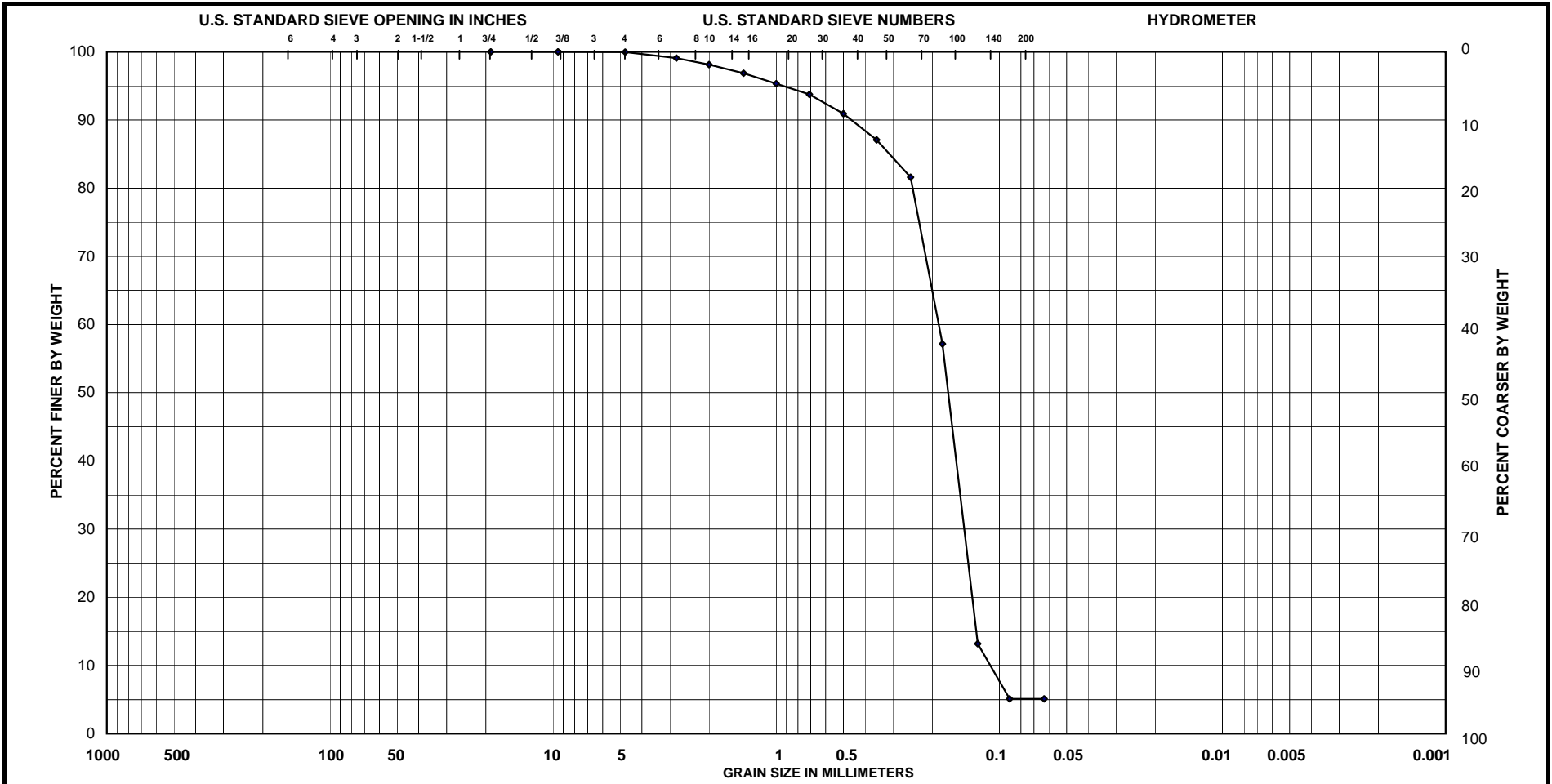
### GRAIN SIZE AND VISUAL SHELL CONTENT

<b>Project:</b>	<b>Topsail Beach, Surf City &amp; North Topsail</b>	<b>Depth:</b>	<b>40.3-40.8</b>
<b>Project No.:</b>	<b>1584-01-40</b>	<b>Date:</b>	<b>9/16/2003</b>
<b>Boring No.:</b>	<b>T1-03-V-117</b>		
<b>Sample No.:</b>	<b>1</b>		
<b>Description:</b>	<b>SAND, poorly-graded with silt, mostly fine-grained quartz, few carbonate, few silt, trace fragmented limestone, very dark gray (SP-SM)</b>		

Tare Weight, (g):	50.09	
Dry Wt. Before Washing (g):	172.67	(with tare)
Dry Weight After Washing (g):	168.65	(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	0.04	99.97	100	0.04
#7	2.800	1.09	99.08	100	1.09
#10	2.000	1.19	98.11	100	1.19
#14	1.400	1.53	96.86	95	1.45
#18	1.000	1.89	95.32	95	1.80
#25	0.710	1.94	93.73	65	1.26
#35	0.500	3.44	90.93	45	1.55
#45	0.355	4.72	87.08	15	0.71
#60	0.250	6.71	81.60	3	0.20
#80	0.180	30.00	57.13	1	0.30
#120	0.125	53.89	13.17	1	0.54
#170	0.090	9.90	5.09	1	0.10
#230	0.063	0.00	5.09	1	0.00

**Total Shell Content:** 8 %



COBBLES	GRAVEL		SAND			SILT OR CLAY
	COARSE	FINE	COARSE	MEDIUM	FINE	

Sample No.	Elev. Or Depth	Classification	% CO <sub>3</sub>	G <sub>s</sub>	Nat w%	LL	PL	PI	Project
1	40.3-40.8	SAND, poorly-graded with silt, mostly fine-grained quartz, few carbonate, few silt, trace fragmented limestone, very dark gray (SP-SM)	8						Topsail Beach, Surf City & North Topsail
									Area
									Boring No. T1-03-V-117
									Date 9/16/2003

**GRADATION CURVES**





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## VISUAL SHELL CONTENT

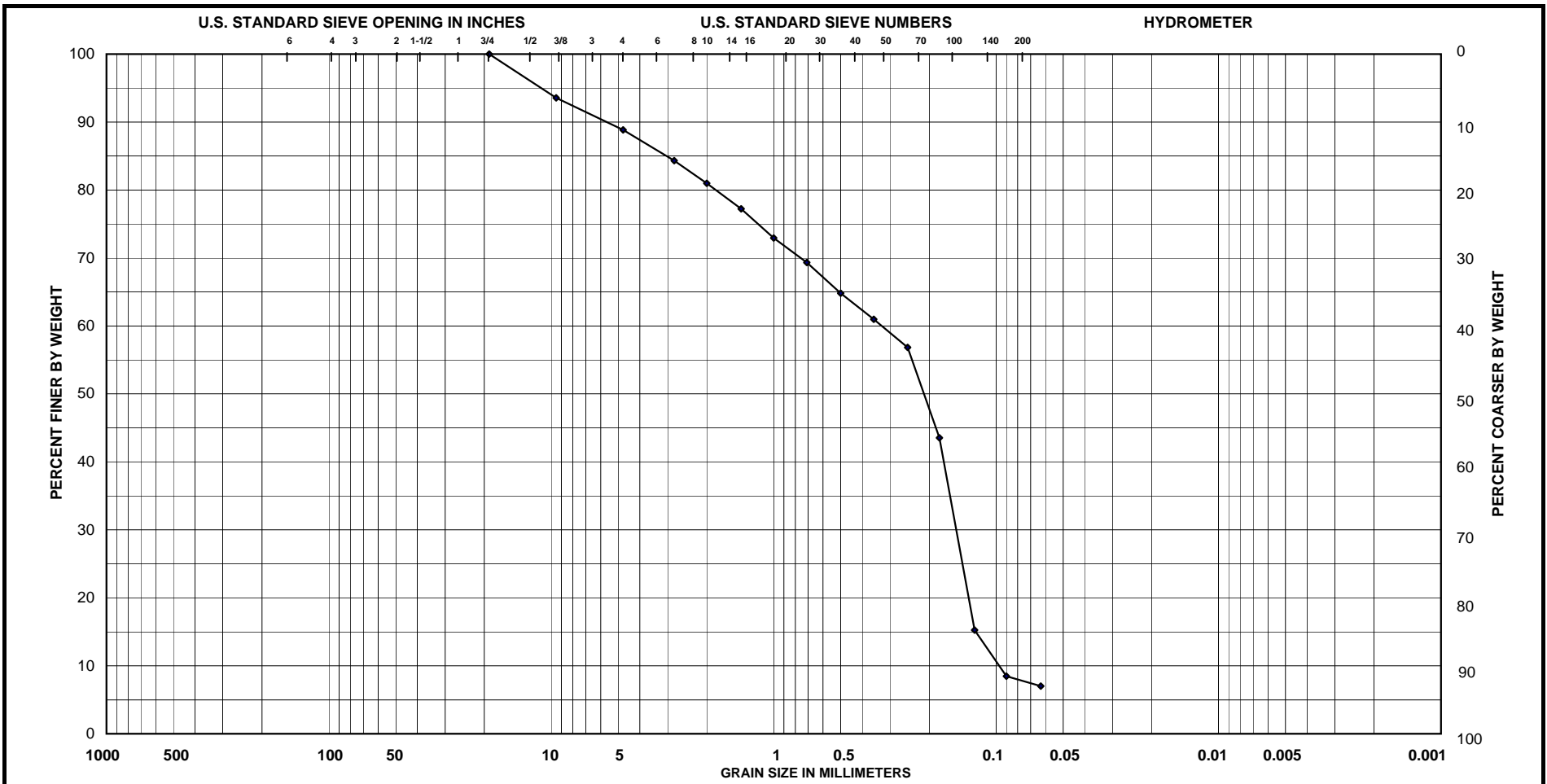
### GRAIN SIZE AND VISUAL SHELL CONTENT

Project:	<b>Topsail Beach, Surf City &amp; North Topsail</b>	Depth:	<b>41.9-42.4</b>
Project No.:	<b>1584-01-40</b>	Date:	<b>9/16/2003</b>
Boring No.:	<b>T1-03-V-117</b>		
Sample No.:	<b>2</b>		
Description:	<b>SAND, poorly-graded with silt, mostly fine-grained quartz, some carbonate, few silt, few fragmented limestone, dark greenish gray (SP-</b>		

Tare Weight, (g):	<b>49.94</b>	
Dry Wt. Before Washing (g):	<b>192.75</b>	(with tare)
Dry Weight After Washing (g):	<b>183.13</b>	(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	9.17	93.58	100	9.17
#4	4.750	6.75	88.85	90	6.08
#7	2.800	6.47	84.32	90	5.82
#10	2.000	4.74	81.00	75	3.56
#14	1.400	5.36	77.25	60	3.22
#18	1.000	6.15	72.94	60	3.69
#25	0.710	5.15	69.34	45	2.32
#35	0.500	6.47	64.81	25	1.62
#45	0.355	5.46	60.98	10	0.55
#60	0.250	5.94	56.82	3	0.18
#80	0.180	18.97	43.54	1	0.19
#120	0.125	40.42	15.24	1	0.40
#170	0.090	9.68	8.46	1	0.10
#230	0.063	2.06	7.02	1	0.02

**Total Shell Content:** **26** %



COBBLES	GRAVEL		SAND			SILT OR CLAY
	COARSE	FINE	COARSE	MEDIUM	FINE	

Sample No.	Elev. Or Depth	Classification	% CO <sub>3</sub>	G <sub>s</sub>	Nat w%	LL	PL	PI	Project	
♦ 2	41.9-42.4	SAND, poorly-graded with silt, mostly fine-grained quartz, some carbonate, few silt, few fragmented limestone, dark greenish gray (SP-SM)	26						Topsail Beach, Surf City & North Topsail	
			Area							
			Boring No. T1-03-V-117							
			Date 9/16/2003							

**GRADATION CURVES**



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## VISUAL SHELL CONTENT

### GRAIN SIZE AND VISUAL SHELL CONTENT

Project:	<b>Topsail Beach, Surf City &amp; North Topsail</b>	Depth:	<b>43.1-43.6</b>
Project No.:	<b>1584-01-40</b>	Date:	<b>9/16/2003</b>
Boring No.:	<b>T1-03-V-117</b>		
Sample No.:	<b>3</b>		
Description:	<b>SAND, poorly-graded with silt, mostly fine-grained quartz, few silt, trace carbonate, trace fragmented limestone, gray (SP-SM)</b>		

Tare Weight, (g):	<b>50.04</b>	
Dry Wt. Before Washing (g):	<b>165.8</b>	(with tare)
Dry Weight After Washing (g):	<b>155.1</b>	(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	99.78	100	0.26
#7	2.800	0.44	99.40	90	0.40
#10	2.000	0.51	98.95	90	0.46
#14	1.400	0.78	98.28	75	0.59
#18	1.000	1.22	97.23	45	0.55
#25	0.710	1.78	95.69	40	0.71
#35	0.500	2.33	93.68	25	0.58
#45	0.355	2.30	91.69	10	0.23
#60	0.250	3.32	88.82	5	0.17
#80	0.180	10.93	79.38	3	0.33
#120	0.125	59.76	27.76	1	0.60
#170	0.090	16.34	13.64	1	0.16
#230	0.063	4.56	9.70	1	0.05

**Total Shell Content:** **4** %





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## VISUAL SHELL CONTENT

### GRAIN SIZE AND VISUAL SHELL CONTENT

Project:	<b>Topsail Beach, Surf City &amp; North Topsail</b>	Depth:	<b>42.1-42.6</b>
Project No.:	<b>1584-01-40</b>	Date:	<b>9/16/2003</b>
Boring No.:	<b>T1-03-V-119</b>		
Sample No.:	<b>1</b>		
Description:	<b>SAND, poorly-graded with silt, mostly fine-grained quartz, few silt, few fragmented limestone, trace carbonate, gray (SP-SM)</b>		

Tare Weight, (g):	<b>50.57</b>	
Dry Wt. Before Washing (g):	<b>146.06</b>	(with tare)
Dry Weight After Washing (g):	<b>136.92</b>	(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	0.56	99.41	40	0.22
#10	2.000	0.46	98.93	60	0.28
#14	1.400	0.52	98.39	40	0.21
#18	1.000	0.74	97.61	20	0.15
#25	0.710	0.82	96.75	30	0.25
#35	0.500	1.73	94.94	15	0.26
#45	0.355	3.12	91.67	10	0.31
#60	0.250	3.52	87.99	5	0.18
#80	0.180	12.03	75.39	3	0.36
#120	0.125	49.85	23.19	1	0.50
#170	0.090	9.85	12.87	1	0.10
#230	0.063	2.41	10.35	1	0.02

**Total Shell Content:** **3** %





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## VISUAL SHELL CONTENT

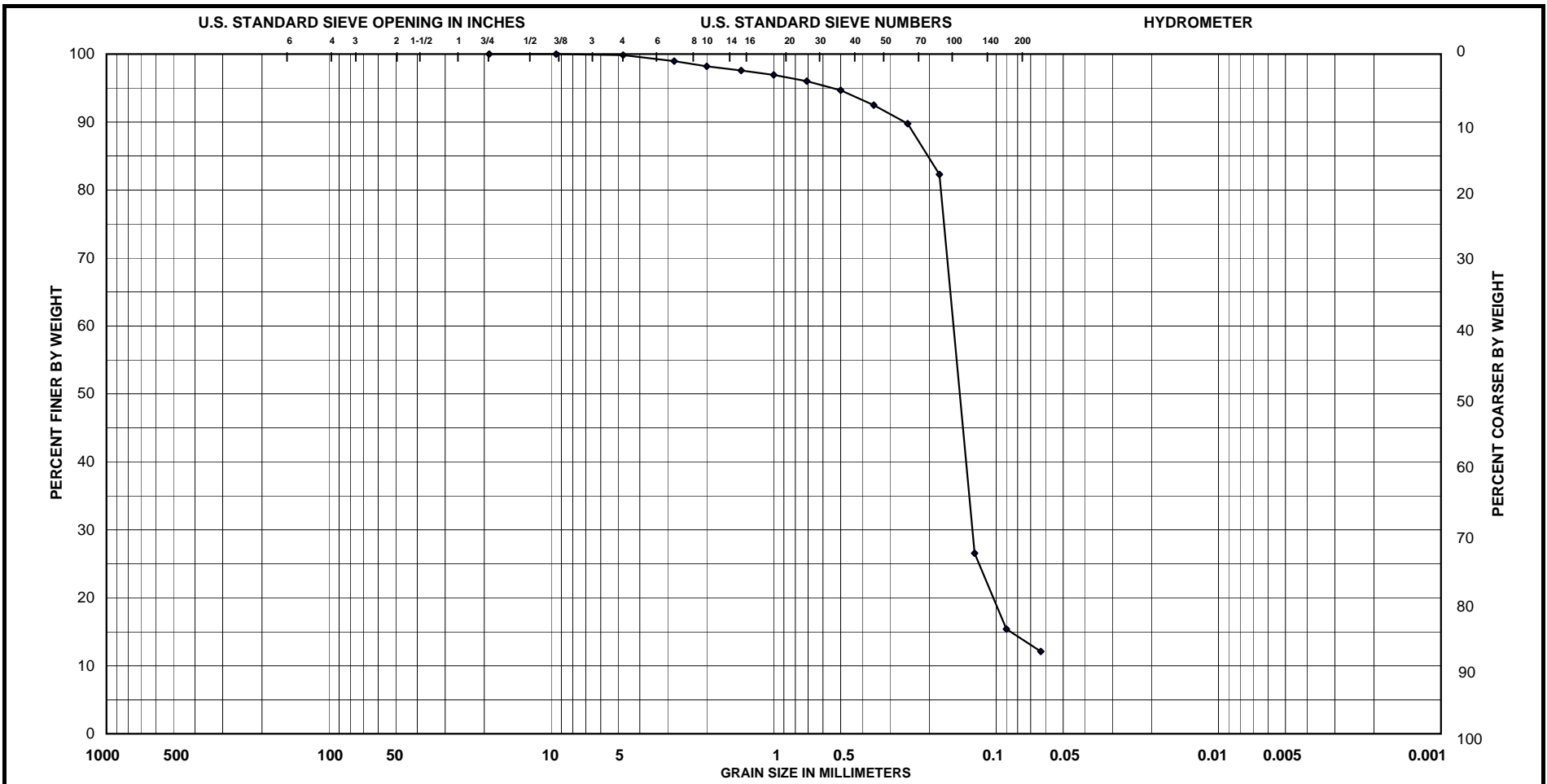
### GRAIN SIZE AND VISUAL SHELL CONTENT

<b>Project:</b>	<b>Topsail Beach, Surf City &amp; North Topsail</b>	<b>Depth:</b>	<b>44.0-44.5</b>
<b>Project No.:</b>	<b>1584-01-40</b>	<b>Date:</b>	<b>9/16/2003</b>
<b>Boring No.:</b>	<b>T1-03-V-119</b>		
<b>Sample No.:</b>	<b>2</b>		
<b>Description:</b>	<b>SAND, poorly-graded with silt, mostly fine-grained quartz, few silt, few fragmented limestone, trace carbonate, olive (SP-SM)</b>		

Tare Weight, (g):	50.09	
Dry Wt. Before Washing (g):	180.84	(with tare)
Dry Weight After Washing (g):	165.66	(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	0.21	99.84	100	0.21
#7	2.800	1.12	98.98	90	1.01
#10	2.000	1.01	98.21	85	0.86
#14	1.400	0.80	97.60	80	0.64
#18	1.000	0.89	96.92	75	0.67
#25	0.710	1.19	96.01	40	0.48
#35	0.500	1.75	94.67	30	0.53
#45	0.355	2.83	92.50	10	0.28
#60	0.250	3.60	89.75	3	0.11
#80	0.180	9.76	82.29	1	0.10
#120	0.125	72.86	26.56	1	0.73
#170	0.090	14.58	15.41	1	0.15
#230	0.063	4.29	12.13	1	0.04

**Total Shell Content:** 4 %



COBBLES	GRAVEL		SAND			SILT OR CLAY
	COARSE	FINE	COARSE	MEDIUM	FINE	

Sample No.	Elev. Or Depth	Classification	% CO <sub>3</sub>	G <sub>s</sub>	Nat w%	LL	PL	PI	Project
♦ 2	44.0-44.5	SAND, poorly-graded with silt, mostly fine-grained quartz, few silt, few fragmented limestone, trace carbonate, olive (SP-SM)	4						Topsail Beach, Surf City & North Topsail
									Area
									Boring No. T1-03-V-119
									Date 9/16/2003

**GRADATION CURVES**





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## VISUAL SHELL CONTENT

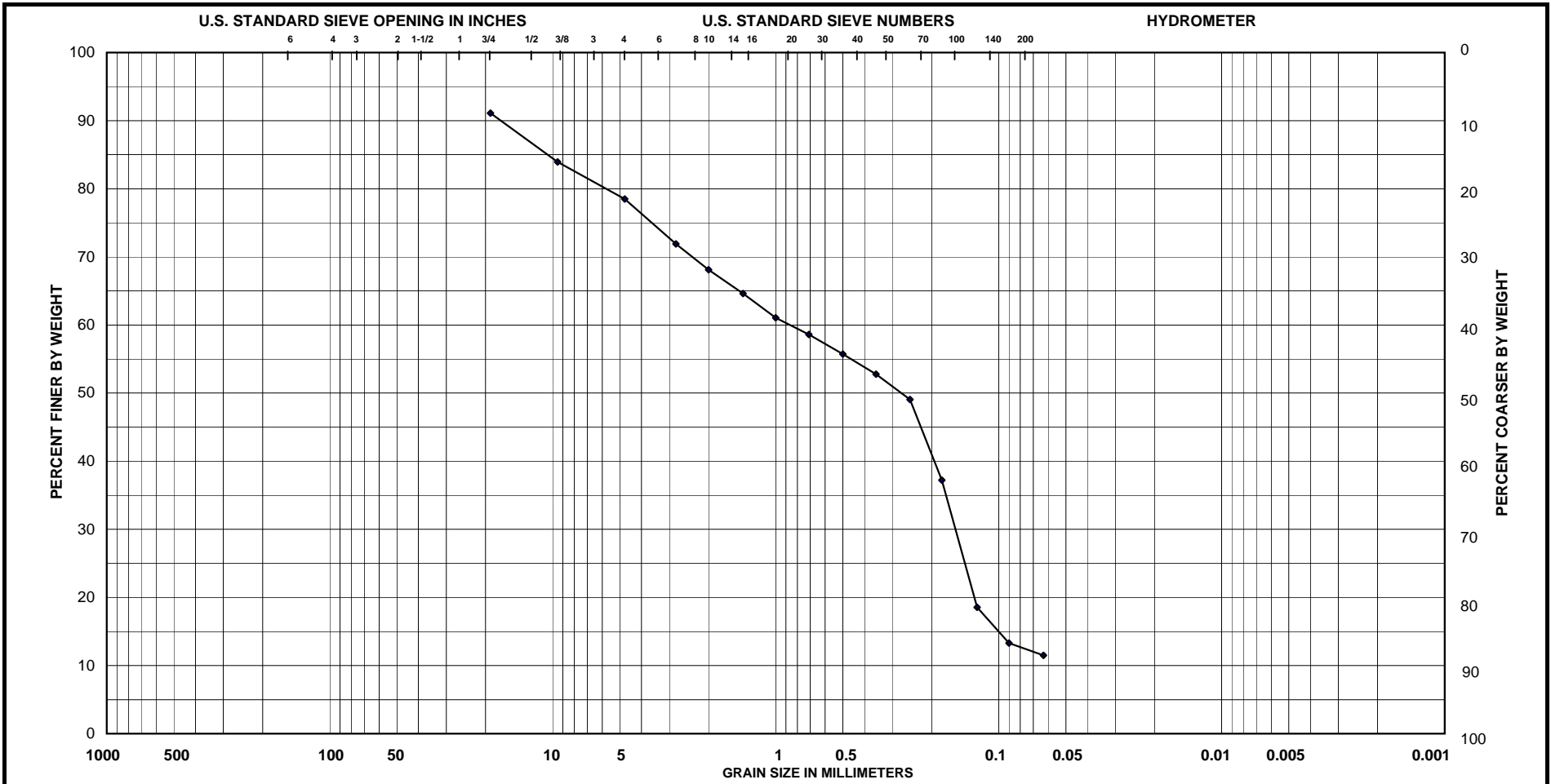
### GRAIN SIZE AND VISUAL SHELL CONTENT

Project:	<b>Topsail Beach, Surf City &amp; North Topsail</b>	Depth:	<b>39.5-40.0</b>
Project No.:	<b>1584-01-40</b>	Date:	<b>9/16/2003</b>
Boring No.:	<b>T1-03-V-120</b>		
Sample No.:	<b>1</b>		
Description:	<b>SAND, poorly-graded with silt, mostly fine-grained quartz, some carbonate, few silt, few fragmented limestone, greenish gray (SP-SM)</b>		

Tare Weight, (g):	<b>49.90</b>	
Dry Wt. Before Washing (g):	<b>221.87</b>	(with tare)
Dry Weight After Washing (g):	<b>203.31</b>	(with tare)

Sieve Size (Name)	Sieve Size (mm)	Weight Retained (g)	% Passing	Approx. Visual Shell %	Approx. Visual Shell Wt. (g)
3/4"	19.000	15.29	91.11	100	15.29
3/8"	9.500	12.31	83.95	100	12.31
#4	4.750	9.38	78.50	75	7.04
#7	2.800	11.32	71.91	70	7.92
#10	2.000	6.54	68.11	55	3.60
#14	1.400	6.00	64.62	45	2.70
#18	1.000	6.10	61.07	30	1.83
#25	0.710	4.24	58.61	25	1.06
#35	0.500	4.92	55.75	15	0.74
#45	0.355	5.12	52.77	5	0.26
#60	0.250	6.39	49.06	3	0.19
#80	0.180	20.36	37.22	1	0.20
#120	0.125	32.08	18.56	1	0.32
#170	0.090	9.08	13.28	1	0.09
#230	0.063	3.06	11.50	1	0.03

**Total Shell Content:** **31** %



COBBLES	GRAVEL		SAND			SILT OR CLAY
	COARSE	FINE	COARSE	MEDIUM	FINE	

Sample No.	Elev. Or Depth	Classification	% CO <sub>3</sub>	G <sub>s</sub>	Nat w%	LL	PL	PI	Project
♦ 1	39.5-40.0	SAND, poorly-graded with silt, mostly fine-grained quartz, some carbonate, few silt, few fragmented limestone, greenish gray (SP-SM)	31						Topsail Beach, Surf City & North Topsail
									Area
									Boring No. T1-03-V-120
									Date 9/16/2003

**GRADATION CURVES**



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## VISUAL SHELL CONTENT

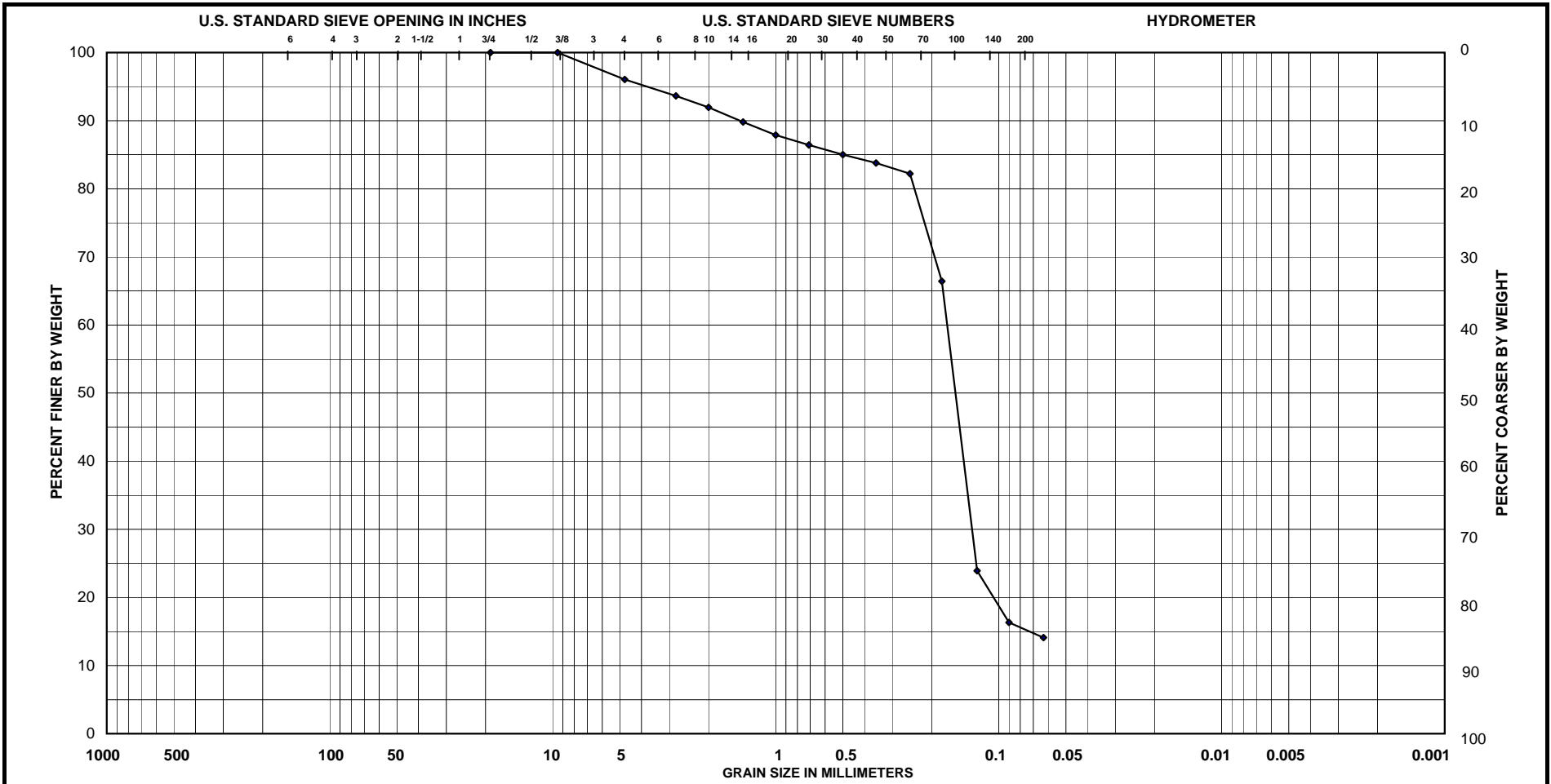
### GRAIN SIZE AND VISUAL SHELL CONTENT

Project:	<b>Topsail Beach, Surf City &amp; North Topsail</b>	Depth:	<b>41.0-41.5</b>
Project No.:	<b>1584-01-40</b>	Date:	<b>9/16/2003</b>
Boring No.:	<b>T1-03-V-120</b>		
Sample No.:	<b>2</b>		
Description:	<b>SAND, silty, mostly fine-grained quartz, little silt, few fragmented limestone, few carbonate, olive (SM)</b>		

Tare Weight, (g):	<b>48.46</b>	
Dry Wt. Before Washing (g):	<b>170.68</b>	(with tare)
Dry Weight After Washing (g):	<b>154.42</b>	(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	4.83	96.05	20	0.97
#7	2.800	2.95	93.63	30	0.89
#10	2.000	2.04	91.97	50	1.02
#14	1.400	2.62	89.82	40	1.05
#18	1.000	2.36	87.89	30	0.71
#25	0.710	1.77	86.44	30	0.53
#35	0.500	1.77	84.99	15	0.27
#45	0.355	1.46	83.80	5	0.07
#60	0.250	1.93	82.22	3	0.06
#80	0.180	19.31	66.42	1	0.19
#120	0.125	51.97	23.90	1	0.52
#170	0.090	9.25	16.33	1	0.09
#230	0.063	2.70	14.12	1	0.03

**Total Shell Content:** **5** %



COBBLES	GRAVEL		SAND			SILT OR CLAY
	COARSE	FINE	COARSE	MEDIUM	FINE	

Sample No.	Elev. Or Depth	Classification	% CO <sub>3</sub>	G <sub>s</sub>	Nat w%	LL	PL	PI	Project
♦ 2	41.0-41.5	SAND, silty, mostly fine-grained quartz, little silt, few fragmented limestone, few carbonate, olive (SM)	5						Topsail Beach, Surf City & North Topsail
									Area
									Boring No. T1-03-V-120
									Date 9/16/2003

**GRADATION CURVES**



# WOLF TECHNOLOGIES, INC.

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## VISUAL SHELL CONTENT

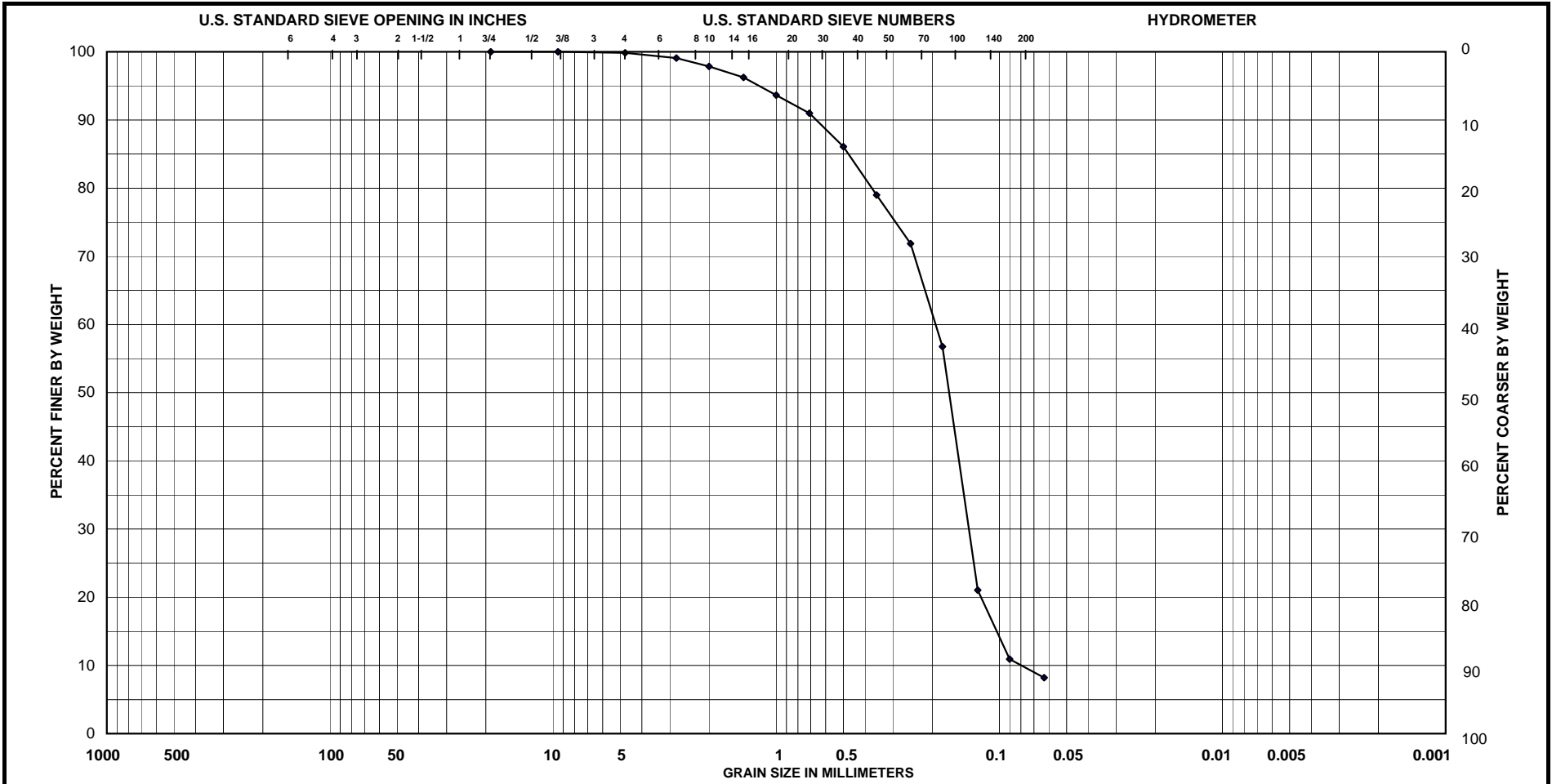
### GRAIN SIZE AND VISUAL SHELL CONTENT

<b>Project:</b>	<b>Topsail Beach, Surf City &amp; North Topsail</b>	<b>Depth:</b>	<b>33.3-33.8</b>
<b>Project No.:</b>	<b>1584-01-40</b>	<b>Date:</b>	<b>9/16/2003</b>
<b>Boring No.:</b>	<b>T1-03-V-121</b>		
<b>Sample No.:</b>	<b>1</b>		
<b>Description:</b>	<b>SAND, poorly-graded with silt, mostly fine-grained quartz, few silt, few carbonate, dark bluish gray (SP-SM)</b>		

Tare Weight, (g):	50.14	
Dry Wt. Before Washing (g):	202.03	(with tare)
Dry Weight After Washing (g):	190.41	(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	0.23	99.85	100	0.23
#7	2.800	1.19	99.07	90	1.07
#10	2.000	1.85	97.85	85	1.57
#14	1.400	2.46	96.23	65	1.60
#18	1.000	3.94	93.63	45	1.77
#25	0.710	4.03	90.98	40	1.61
#35	0.500	7.46	86.07	40	2.98
#45	0.355	10.72	79.01	25	2.68
#60	0.250	10.85	71.87	10	1.09
#80	0.180	22.94	56.76	3	0.69
#120	0.125	54.24	21.05	1	0.54
#170	0.090	15.40	10.92	1	0.15
#230	0.063	4.10	8.22	1	0.04

**Total Shell Content:** 11 %



COBBLES	GRAVEL		SAND			SILT OR CLAY
	COARSE	FINE	COARSE	MEDIUM	FINE	

Sample No.	Elev. Or Depth	Classification	% CO <sub>3</sub>	G <sub>s</sub>	Nat w%	LL	PL	PI	Project	
1	33.3-33.8	SAND, poorly-graded with silt, mostly fine-grained quartz, few silt, few carbonate, dark bluish gray (SP-SM)	11						Topsail Beach, Surf City & North Topsail	
									Area	
									Boring No. T1-03-V-121	
									Date 9/16/2003	

**GRADATION CURVES**



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## VISUAL SHELL CONTENT

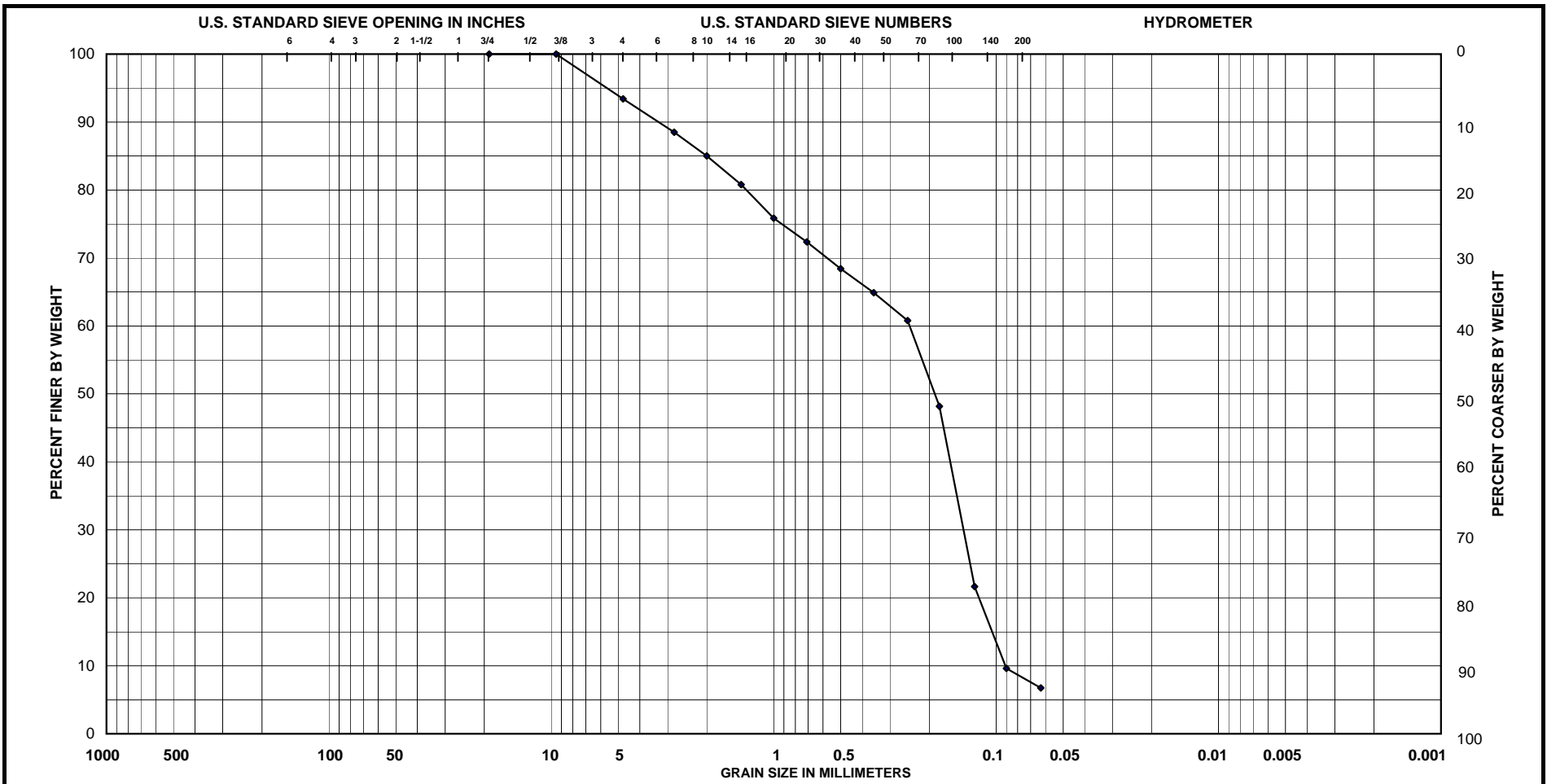
### GRAIN SIZE AND VISUAL SHELL CONTENT

Project:	<b>Topsail Beach, Surf City &amp; North Topsail</b>	Depth:	<b>35.0-35.5</b>
Project No.:	<b>1584-01-40</b>	Date:	<b>9/16/2003</b>
Boring No.:	<b>T1-03-V-121</b>		
Sample No.:	<b>2</b>		
Description:	<b>SAND, poorly-graded with clay, mostly fine-grained quartz, some carbonate, few clay, trace fragmented limestone, dark greenish gray</b>		

Tare Weight, (g):	<b>49.41</b>	
Dry Wt. Before Washing (g):	<b>192.95</b>	(with tare)
Dry Weight After Washing (g):	<b>182.98</b>	(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	9.48	93.40	100	9.48
#7	2.800	7.00	88.52	100	7.00
#10	2.000	5.04	85.01	95	4.79
#14	1.400	6.06	80.79	95	5.76
#18	1.000	7.06	75.87	95	6.71
#25	0.710	5.02	72.37	90	4.52
#35	0.500	5.68	68.41	50	2.84
#45	0.355	5.03	64.91	20	1.01
#60	0.250	5.94	60.77	10	0.59
#80	0.180	18.05	48.20	5	0.90
#120	0.125	38.08	21.67	3	1.14
#170	0.090	17.29	9.62	1	0.17
#230	0.063	4.12	6.75	1	0.04

**Total Shell Content:** **31** %



COBBLES	GRAVEL		SAND			SILT OR CLAY
	COARSE	FINE	COARSE	MEDIUM	FINE	

Sample No.	Elev. Or Depth	Classification	% CO <sub>3</sub>	G <sub>s</sub>	Nat w%	LL	PL	PI	Project
♦ 2	35.0-35.5	SAND, poorly-graded with clay, mostly fine-grained quartz, some carbonate, few clay, trace fragmented limestone, dark greenish gray (SP-SC)	31						Topsail Beach, Surf City & North Topsail
									Area
									Boring No. T1-03-V-121
									Date 9/16/2003

**GRADATION CURVES**





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## VISUAL SHELL CONTENT

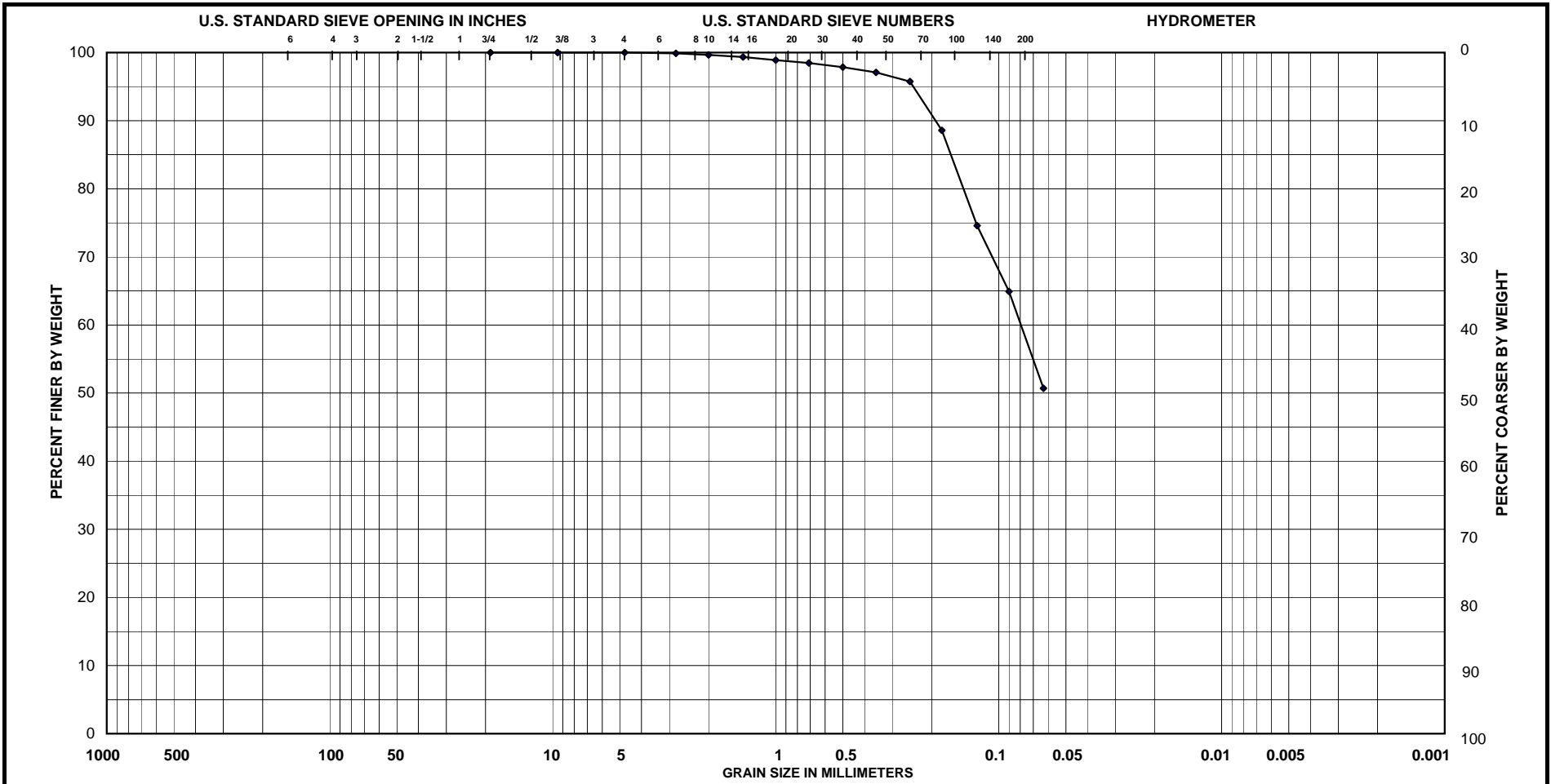
### GRAIN SIZE AND VISUAL SHELL CONTENT

Project:	<b>Topsail Beach, Surf City &amp; North Topsail</b>	Depth:	<b>36.2-36.7</b>
Project No.:	<b>1584-01-40</b>	Date:	<b>9/16/2003</b>
Boring No.:	<b>T1-03-V-121</b>		
Sample No.:	<b>3</b>		
Description:	<b>CLAY, inorganic-H, some fine-grained quartz sand, trace carbonate, trace fragmented limestone, very dark gray (CH)</b>		

Tare Weight, (g):	<b>49.97</b>	
Dry Wt. Before Washing (g):	<b>166.63</b>	(with tare)
Dry Weight After Washing (g):	<b>108.29</b>	(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	0.14	99.88	100	0.14
#10	2.000	0.28	99.64	50	0.14
#14	1.400	0.36	99.33	50	0.18
#18	1.000	0.52	98.89	30	0.16
#25	0.710	0.49	98.47	20	0.10
#35	0.500	0.73	97.84	10	0.07
#45	0.355	0.86	97.10	5	0.04
#60	0.250	1.58	95.75	1	0.02
#80	0.180	8.38	88.57	1	0.08
#120	0.125	16.32	74.58	1	0.16
#170	0.090	11.27	64.92	1	0.11
#230	0.063	16.57	50.71	1	0.17

**Total Shell Content:** **1** %



COBBLES	GRAVEL		SAND			SILT OR CLAY
	COARSE	FINE	COARSE	MEDIUM	FINE	

Sample No.	Elev. Or Depth	Classification	% CO <sub>3</sub>	G <sub>s</sub>	Nat w%	LL	PL	PI	Project	
3	36.2-36.7	CLAY, inorganic-H, some fine-grained quartz sand, trace carbonate, trace fragmented limestone, very dark gray (CH)	1						Topsail Beach, Surf City & North Topsail	
									Area	
									Boring No. T1-03-V-121	
									Date 9/16/2003	

**GRADATION CURVES**



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## VISUAL SHELL CONTENT

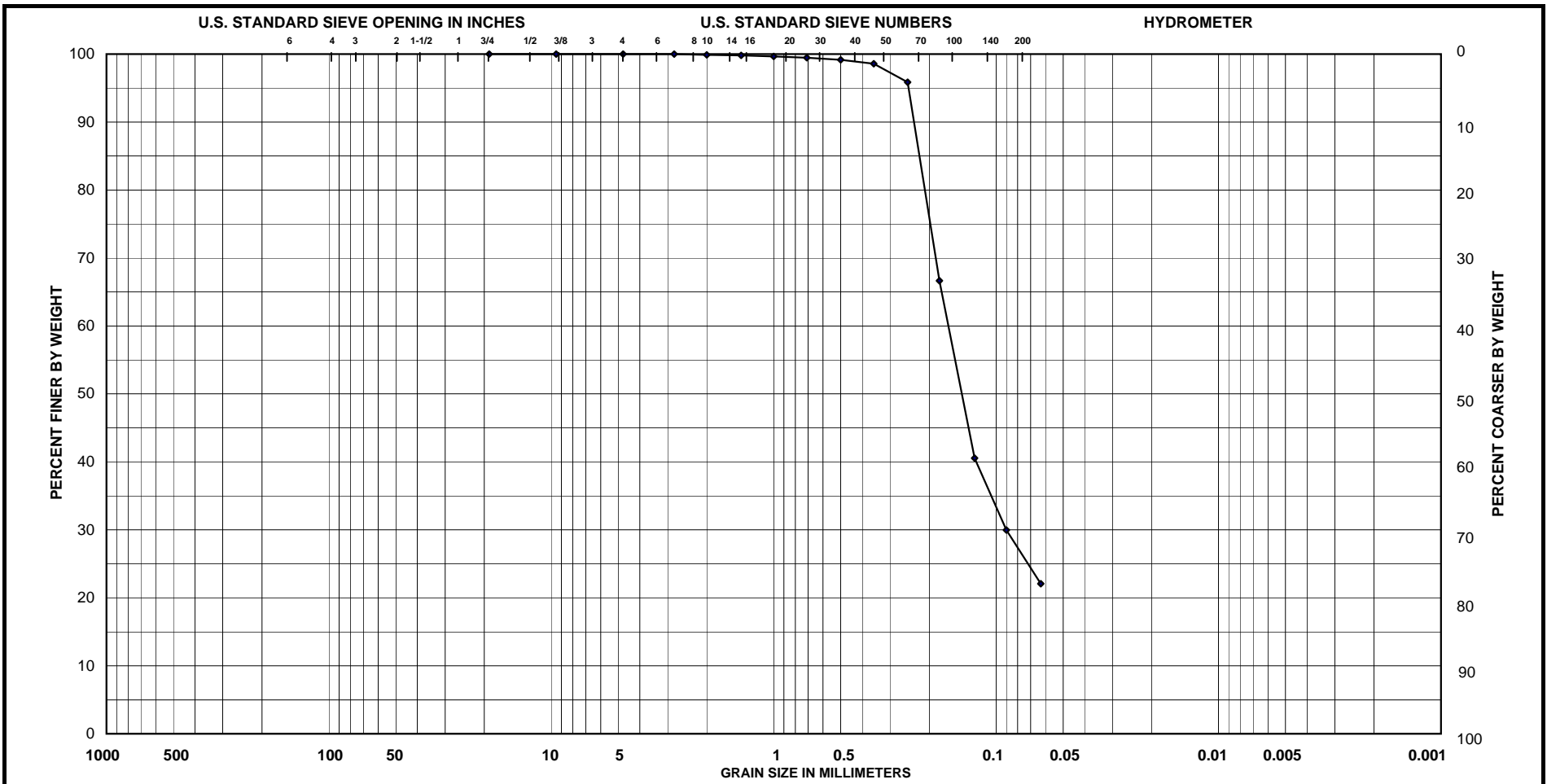
### GRAIN SIZE AND VISUAL SHELL CONTENT

Project:	<b>Topsail Beach, Surf City &amp; North Topsail</b>	Depth:	<b>37.7-38.2</b>
Project No.:	<b>1584-01-40</b>	Date:	<b>9/16/2003</b>
Boring No.:	<b>T1-03-V-121</b>		
Sample No.:	<b>4</b>		
Description:	<b>SAND, clayey, mostly fine-grained quartz, little clay, trace carbonate, dark gray (SC)</b>		

Tare Weight, (g):	<b>50.20</b>	
Dry Wt. Before Washing (g):	<b>186.83</b>	(with tare)
Dry Weight After Washing (g):	<b>158.5</b>	(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	0.14	99.90	20	0.03
#14	1.400	0.13	99.80	40	0.05
#18	1.000	0.19	99.66	40	0.08
#25	0.710	0.26	99.47	30	0.08
#35	0.500	0.41	99.17	30	0.12
#45	0.355	0.82	98.57	20	0.16
#60	0.250	3.69	95.87	10	0.37
#80	0.180	39.93	66.65	2	0.80
#120	0.125	35.65	40.55	1	0.36
#170	0.090	14.47	29.96	1	0.14
#230	0.063	10.80	22.06	1	0.11

**Total Shell Content:** **2** %



COBBLES	GRAVEL		SAND			SILT OR CLAY
	COARSE	FINE	COARSE	MEDIUM	FINE	

Sample No.	Elev. Or Depth	Classification	% CO <sub>3</sub>	G <sub>s</sub>	Nat w%	LL	PL	PI	Project	
4	37.7-38.2	SAND, clayey, mostly fine-grained quartz, little clay, trace carbonate, dark gray (SC)	2						Topsail Beach, Surf City & North Topsail	
									Area	
									Boring No. T1-03-V-121	
									Date 9/16/2003	

**GRADATION CURVES**



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## VISUAL SHELL CONTENT

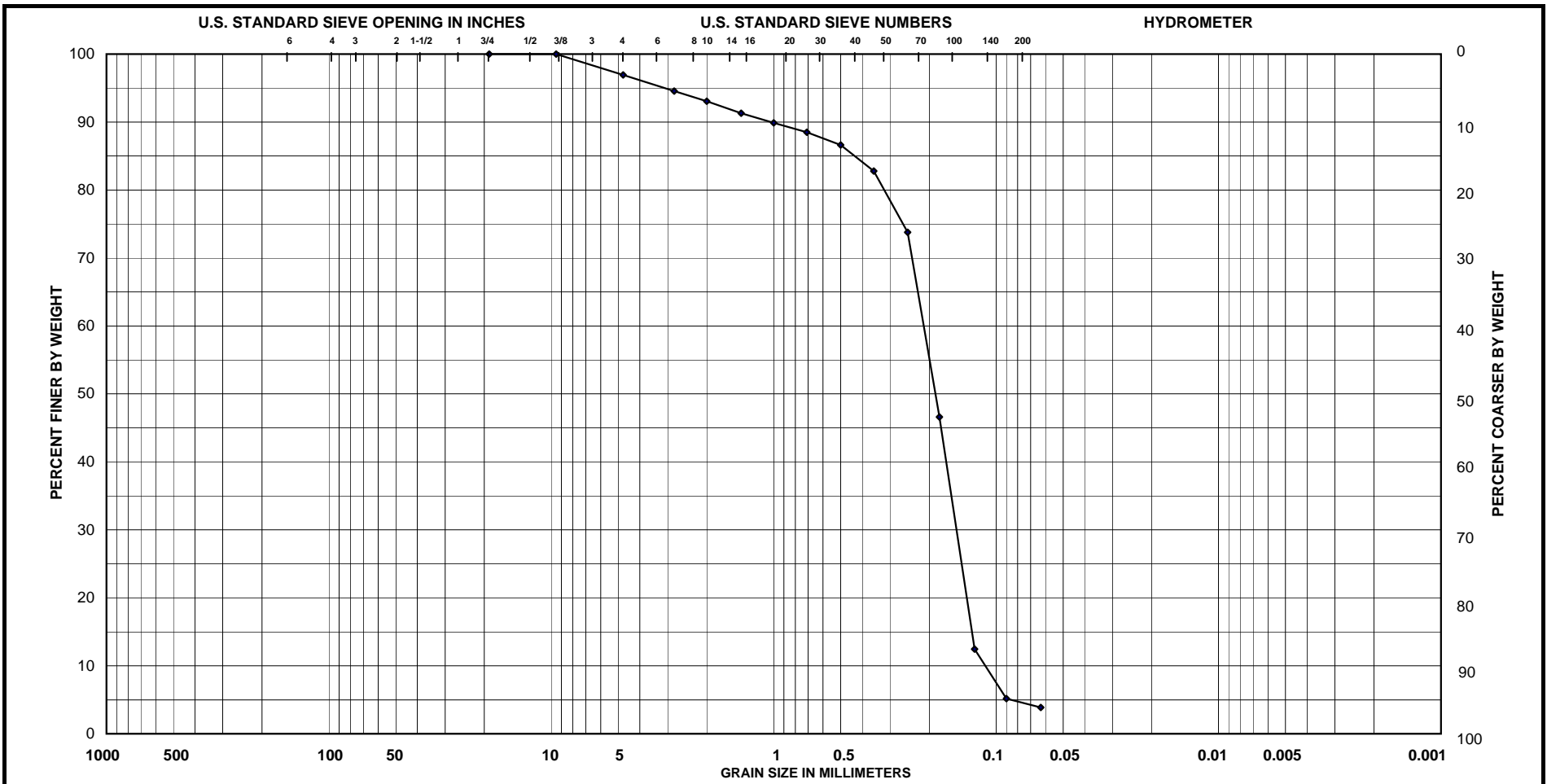
### GRAIN SIZE AND VISUAL SHELL CONTENT

Project:	<b>Topsail Beach, Surf City &amp; North Topsail</b>	Depth:	<b>38.8-39.3</b>
Project No.:	<b>1584-01-40</b>	Date:	<b>9/16/2003</b>
Boring No.:	<b>T1-03-V-122</b>		
Sample No.:	<b>1</b>		
Description:	<b>SAND, poorly-graded, mostly fine-grained quartz, little carbonate, gray (SP)</b>		

Tare Weight, (g):	<b>49.79</b>	
Dry Wt. Before Washing (g):	<b>186.57</b>	(with tare)
Dry Weight After Washing (g):	<b>180.85</b>	(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	4.19	96.94	100	4.19
#7	2.800	3.27	94.55	100	3.27
#10	2.000	2.03	93.06	100	2.03
#14	1.400	2.40	91.31	100	2.40
#18	1.000	1.95	89.88	90	1.76
#25	0.710	1.89	88.50	80	1.51
#35	0.500	2.56	86.63	50	1.28
#45	0.355	5.27	82.78	20	1.05
#60	0.250	12.29	73.79	5	0.61
#80	0.180	37.16	46.62	2	0.74
#120	0.125	46.71	12.47	1	0.47
#170	0.090	9.99	5.17	1	0.10
#230	0.063	1.79	3.86	1	0.02

**Total Shell Content:** **14** %



COBBLES	GRAVEL		SAND			SILT OR CLAY
	COARSE	FINE	COARSE	MEDIUM	FINE	

Sample No.	Elev. Or Depth	Classification	% CO <sub>3</sub>	G <sub>s</sub>	Nat w%	LL	PL	PI	Project
1	38.8-39.3	SAND, poorly-graded, mostly fine-grained quartz, little carbonate, gray (SP)	14						Topsail Beach, Surf City & North Topsail
									Area
									Boring No. T1-03-V-122
									Date 9/16/2003

**GRADATION CURVES**



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## VISUAL SHELL CONTENT

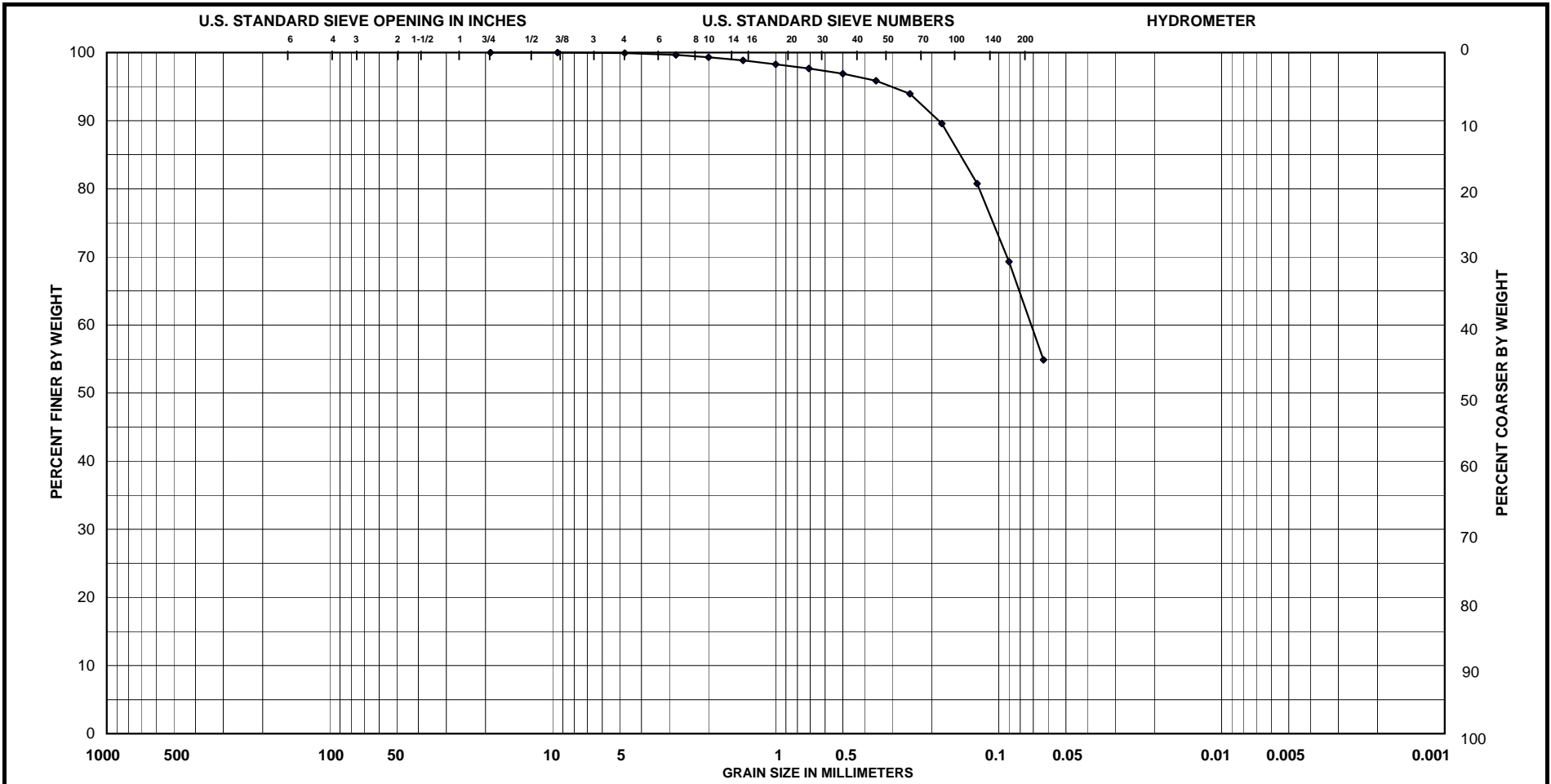
### GRAIN SIZE AND VISUAL SHELL CONTENT

Project:	<b>Topsail Beach, Surf City &amp; North Topsail</b>	Depth:	<b>40.1-40.6</b>
Project No.:	<b>1584-01-40</b>	Date:	<b>9/16/2003</b>
Boring No.:	<b>T1-03-V-122</b>		
Sample No.:	<b>2</b>		
Description:	<b>CLAY, inorganic-H, some fine-grained quartz sand, trace carbonate, trace fragmented limestone, very dark gray (CH)</b>		

Tare Weight, (g):	<b>49.84</b>	
Dry Wt. Before Washing (g):	<b>145.3</b>	(with tare)
Dry Weight After Washing (g):	<b>94.63</b>	(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	0.09	99.91	100	0.09
#7	2.800	0.25	99.64	100	0.25
#10	2.000	0.32	99.31	80	0.26
#14	1.400	0.45	98.84	40	0.18
#18	1.000	0.54	98.27	30	0.16
#25	0.710	0.60	97.64	20	0.12
#35	0.500	0.72	96.89	10	0.07
#45	0.355	0.99	95.85	5	0.05
#60	0.250	1.81	93.96	3	0.05
#80	0.180	4.17	89.59	1	0.04
#120	0.125	8.41	80.78	1	0.08
#170	0.090	10.96	69.30	1	0.11
#230	0.063	13.76	54.88	1	0.14

**Total Shell Content:** **2** %



COBBLES	GRAVEL		SAND			SILT OR CLAY
	COARSE	FINE	COARSE	MEDIUM	FINE	

Sample No.	Elev. Or Depth	Classification	% CO <sub>3</sub>	G <sub>s</sub>	Nat w%	LL	PL	PI	Project	
♦ 2	40.1-40.6	CLAY, inorganic-H, some fine-grained quartz sand, trace carbonate, trace fragmented limestone, very dark gray (CH)	2						Topsail Beach, Surf City & North Topsail	
			Area							
			Boring No. T1-03-V-122							
			Date 9/16/2003							

**GRADATION CURVES**





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## VISUAL SHELL CONTENT

### GRAIN SIZE AND VISUAL SHELL CONTENT

Project:	<b>Topsail Beach, Surf City &amp; North Topsail</b>	Depth:	<b>42.0-42.5</b>
Project No.:	<b>1584-01-40</b>	Date:	<b>9/16/2003</b>
Boring No.:	<b>T1-03-V-122</b>		
Sample No.:	<b>3</b>		
Description:	<b>CLAY, inorganic-H, some fine-grained quartz sand, very dark gray (CH)</b>		

Tare Weight, (g):	<b>50.34</b>	
Dry Wt. Before Washing (g):	<b>128.17</b>	(with tare)
Dry Weight After Washing (g):	<b>79.23</b>	(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	0.11	99.86	0	0.00
#14	1.400	0.28	99.50	10	0.03
#18	1.000	0.59	98.74	5	0.03
#25	0.710	0.83	97.67	5	0.04
#35	0.500	1.07	96.30	2	0.02
#45	0.355	1.07	94.92	2	0.02
#60	0.250	1.07	93.55	1	0.01
#80	0.180	1.26	91.93	1	0.01
#120	0.125	3.87	86.96	1	0.04
#170	0.090	6.31	78.85	1	0.06
#230	0.063	10.42	65.46	1	0.10

**Total Shell Content:** **0** %





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## VISUAL SHELL CONTENT

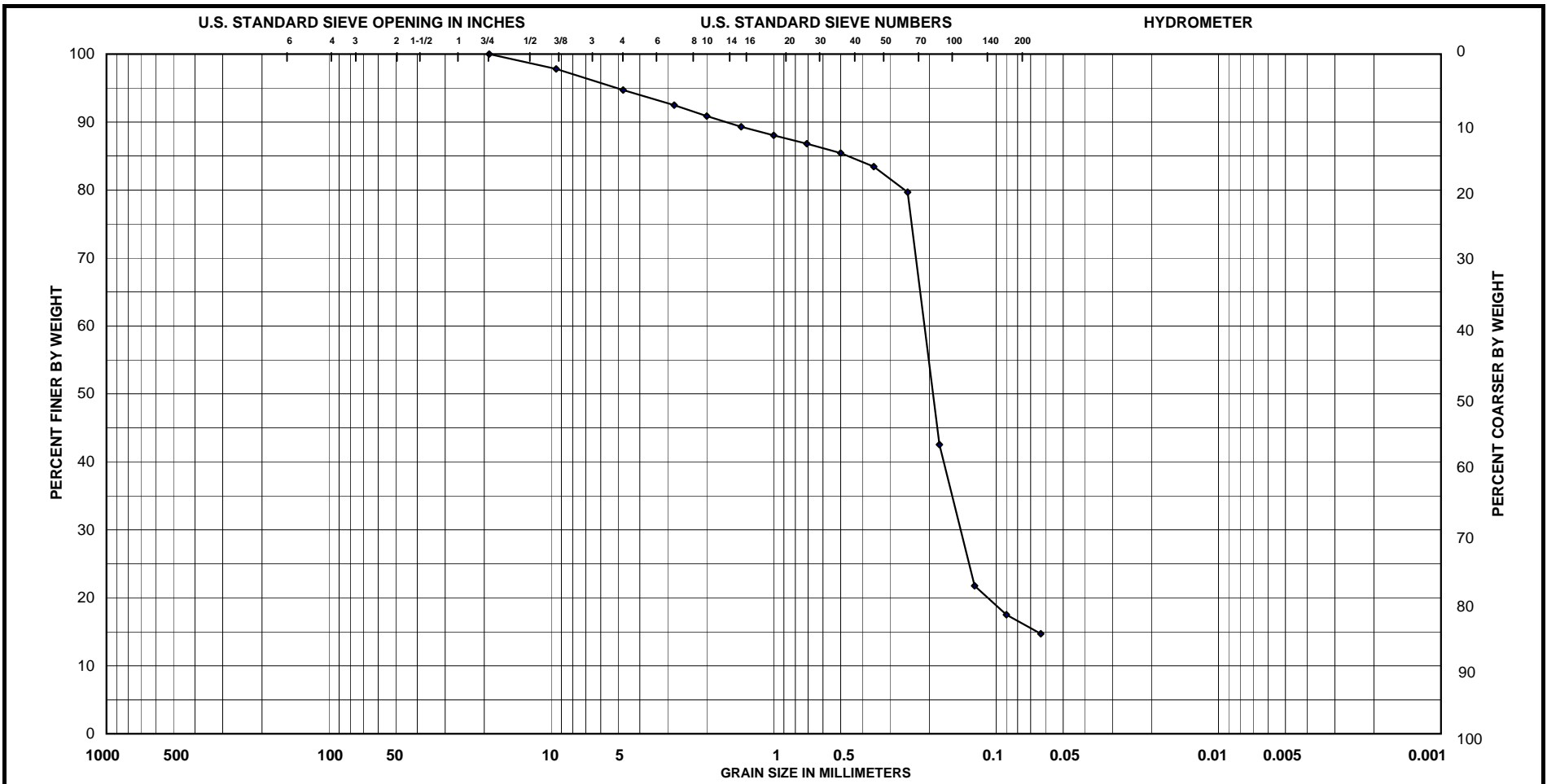
### GRAIN SIZE AND VISUAL SHELL CONTENT

<b>Project:</b>	<b>Topsail Beach, Surf City &amp; North Topsail</b>	<b>Depth:</b>	<b>45.0-45.5</b>
<b>Project No.:</b>	<b>1584-01-40</b>	<b>Date:</b>	<b>9/16/2003</b>
<b>Boring No.:</b>	<b>T1-03-V-122</b>		
<b>Sample No.:</b>	<b>4</b>		
<b>Description:</b>	<b>SAND, clayey, mostly fine-grained quartz, little clay, little carbonate, very dark gray (SC)</b>		

Tare Weight, (g):	50.12	
Dry Wt. Before Washing (g):	178.77	(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	2.82	97.81	100	2.82
#4	4.750	3.97	94.72	100	3.97
#7	2.800	2.86	92.50	100	2.86
#10	2.000	2.07	90.89	90	1.86
#14	1.400	2.05	89.30	90	1.85
#18	1.000	1.62	88.04	80	1.30
#25	0.710	1.55	86.83	70	1.09
#35	0.500	1.79	85.44	50	0.90
#45	0.355	2.55	83.46	20	0.51
#60	0.250	4.87	79.67	10	0.49
#80	0.180	47.78	42.53	3	1.43
#120	0.125	26.72	21.76	1	0.27
#170	0.090	5.47	17.51	1	0.05
#230	0.063	3.60	14.71	1	0.04

**Total Shell Content:** 15 %



COBBLES	GRAVEL		SAND			SILT OR CLAY
	COARSE	FINE	COARSE	MEDIUM	FINE	

Sample No.	Elev. Or Depth	Classification	% CO <sub>3</sub>	G <sub>s</sub>	Nat w%	LL	PL	PI	Project
4	45.0-45.5	SAND, clayey, mostly fine-grained quartz, little clay, little carbonate, very dark gray (SC)	15						Topsail Beach, Surf City & North Topsail
									Area
									Boring No. T1-03-V-122
									Date 9/16/2003

**GRADATION CURVES**



# WOLF TECHNOLOGIES, INC.

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## VISUAL SHELL CONTENT

### GRAIN SIZE AND VISUAL SHELL CONTENT

Project:	<b>Topsail Beach, Surf City &amp; North Topsail</b>	Depth:	<b>33.5-34.0</b>
Project No.:	<b>1584-01-40</b>	Date:	<b>9/16/2003</b>
Boring No.:	<b>T1-03-V-123</b>		
Sample No.:	<b>1</b>		
Description:	<b>SAND, poorly-graded, mostly fine-grained quartz, some carbonate, trace fragmented limestone, gray (SP)</b>		

Tare Weight, (g):	<b>50.30</b>	
Dry Wt. Before Washing (g):	<b>166.02</b>	(with tare)
Dry Weight After Washing (g):	<b>164.78</b>	(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	0.13	99.89	100	0.13
#4	4.750	1.81	98.32	100	1.81
#7	2.800	3.03	95.71	100	3.03
#10	2.000	2.65	93.42	100	2.65
#14	1.400	3.52	90.37	100	3.52
#18	1.000	3.72	87.16	100	3.72
#25	0.710	3.66	84.00	90	3.29
#35	0.500	4.33	80.25	70	3.03
#45	0.355	11.08	70.68	40	4.43
#60	0.250	20.47	52.99	10	2.05
#80	0.180	28.35	28.49	3	0.85
#120	0.125	23.29	8.37	1	0.23
#170	0.090	6.55	2.70	1	0.07
#230	0.063	0.99	1.85	1	0.01

**Total Shell Content:** **25** %



COBBLES	GRAVEL		SAND			SILT OR CLAY
	COARSE	FINE	COARSE	MEDIUM	FINE	

Sample No.	Elev. Or Depth	Classification	% CO <sub>3</sub>	G <sub>s</sub>	Nat w%	LL	PL	PI	Project
♦ 1	33.5-34.0	SAND, poorly-graded, mostly fine-grained quartz, some carbonate, trace fragmented limestone, gray (SP)	25						Topsail Beach, Surf City & North Topsail
									Area
									Boring No. T1-03-V-123
									Date 9/16/2003

**GRADATION CURVES**



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## VISUAL SHELL CONTENT

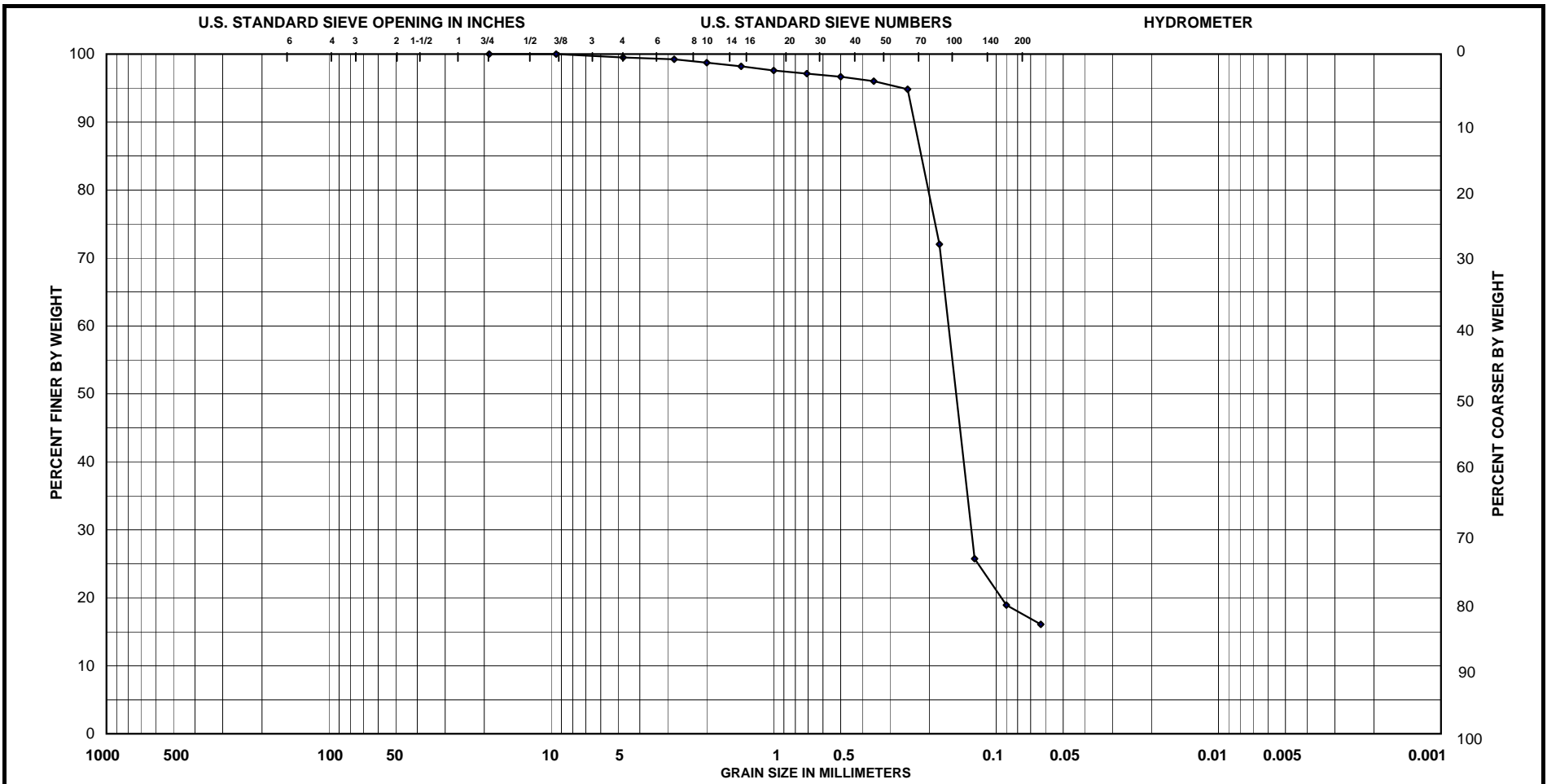
### GRAIN SIZE AND VISUAL SHELL CONTENT

Project:	<b>Topsail Beach, Surf City &amp; North Topsail</b>	Depth:	<b>35.0-35.5</b>
Project No.:	<b>1584-01-40</b>	Date:	<b>9/16/2003</b>
Boring No.:	<b>T1-03-V-123</b>		
Sample No.:	<b>2</b>		
Description:	<b>SAND, silty, mostly fine-grained quartz, little clay, trace carbonate, trace fragmented limestone, trace organic matter, gray (SM)</b>		

Tare Weight, (g):	<b>49.71</b>	
Dry Wt. Before Washing (g):	<b>172.87</b>	(with tare)
Dry Weight After Washing (g):	<b>154.53</b>	(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	0.61	99.50	80	0.49
#7	2.800	0.34	99.23	90	0.31
#10	2.000	0.61	98.73	90	0.55
#14	1.400	0.65	98.21	70	0.46
#18	1.000	0.76	97.59	70	0.53
#25	0.710	0.58	97.12	70	0.41
#35	0.500	0.56	96.66	60	0.34
#45	0.355	0.80	96.01	50	0.40
#60	0.250	1.46	94.83	20	0.29
#80	0.180	28.07	72.04	3	0.84
#120	0.125	56.99	25.76	1	0.57
#170	0.090	8.39	18.95	1	0.08
#230	0.063	3.53	16.08	1	0.04

**Total Shell Content:** **4** %



COBBLES	GRAVEL		SAND			SILT OR CLAY
	COARSE	FINE	COARSE	MEDIUM	FINE	

Sample No.	Elev. Or Depth	Classification	% CO <sub>3</sub>	G <sub>s</sub>	Nat w%	LL	PL	PI	Project
♦ 2	35.0-35.5	SAND, silty, mostly fine-grained quartz, little clay, trace carbonate, trace fragmented limestone, trace organic matter, gray (SM)	4						Topsail Beach, Surf City & North Topsail
									Area
									Boring No. T1-03-V-123
									Date 9/16/2003

**GRADATION CURVES**





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## VISUAL SHELL CONTENT

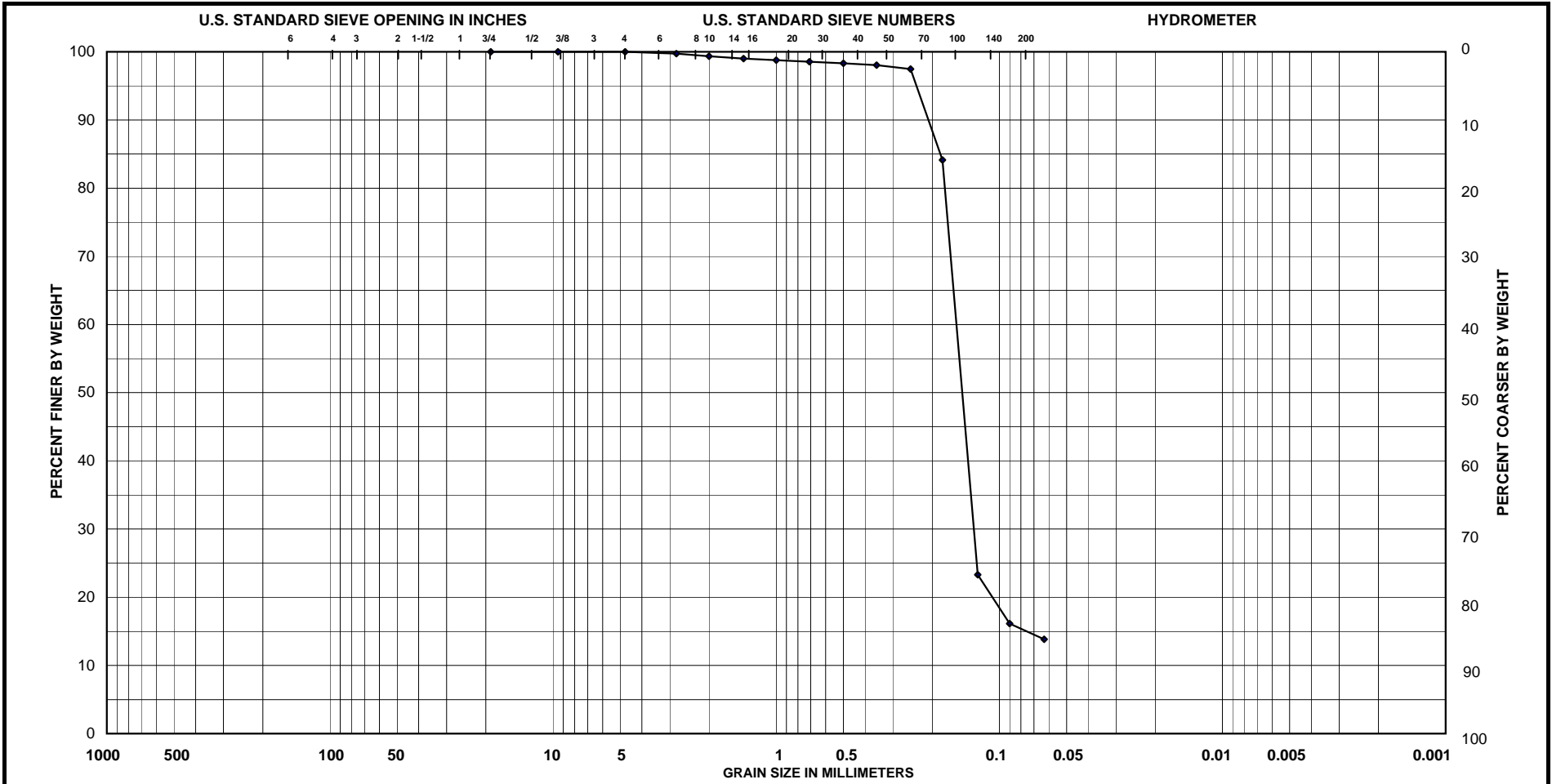
### GRAIN SIZE AND VISUAL SHELL CONTENT

Project:	<b>Topsail Beach, Surf City &amp; North Topsail</b>	Depth:	<b>37.0-37.5</b>
Project No.:	<b>1584-01-40</b>	Date:	<b>9/16/2003</b>
Boring No.:	<b>T1-03-V-123</b>		
Sample No.:	<b>3</b>		
Description:	<b>SAND, silty, mostly fine-grained quartz, little silt, trace carbonate, trace fragmented limestone, olive (SM)</b>		

Tare Weight, (g):	<b>49.89</b>	
Dry Wt. Before Washing (g):	<b>185.32</b>	(with tare)
Dry Weight After Washing (g):	<b>167.35</b>	(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	0.38	99.72	0	0.00
#10	2.000	0.52	99.34	0	0.00
#14	1.400	0.44	99.01	0	0.00
#18	1.000	0.34	98.76	5	0.02
#25	0.710	0.27	98.56	5	0.01
#35	0.500	0.31	98.33	5	0.02
#45	0.355	0.38	98.05	5	0.02
#60	0.250	0.81	97.45	1	0.01
#80	0.180	18.06	84.12	1	0.18
#120	0.125	82.36	23.30	1	0.82
#170	0.090	9.72	16.13	1	0.10
#230	0.063	3.09	13.84	1	0.03

**Total Shell Content:** **1** %



COBBLES	GRAVEL		SAND			SILT OR CLAY
	COARSE	FINE	COARSE	MEDIUM	FINE	

Sample No.	Elev. Or Depth	Classification	% CO <sub>3</sub>	G <sub>s</sub>	Nat w%	LL	PL	PI	Project	
♦ 3	37.0-37.5	SAND, silty, mostly fine-grained quartz, little silt, trace carbonate, trace fragmented limestone, olive (SM)	1						Topsail Beach, Surf City & North Topsail	
									Area	
									Boring No. T1-03-V-123	
									Date 9/16/2003	

**GRADATION CURVES**



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## VISUAL SHELL CONTENT

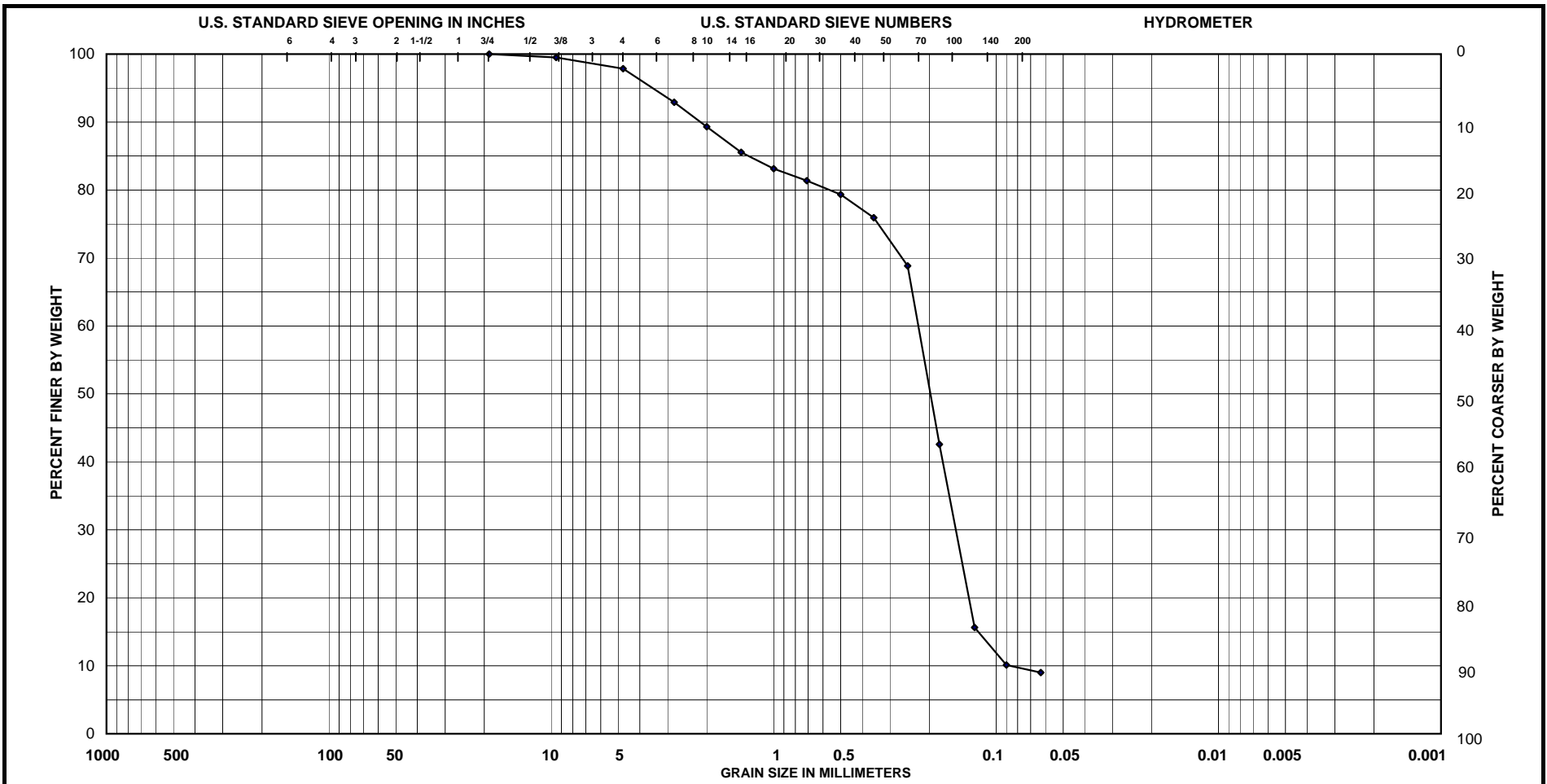
### GRAIN SIZE AND VISUAL SHELL CONTENT

Project:	<b>Topsail Beach, Surf City &amp; North Topsail</b>	Depth:	<b>38.5-39.0</b>
Project No.:	<b>1584-01-40</b>	Date:	<b>9/16/2003</b>
Boring No.:	<b>T1-03-V-124</b>		
Sample No.:	<b>1</b>		
Description:	<b>SAND, poorly-graded with silt, mostly fine-grained quartz, little carbonate, few silt, trace fragmented limestone, dark gray (SP-SM)</b>		

Tare Weight, (g):	<b>49.91</b>	
Dry Wt. Before Washing (g):	<b>178.8</b>	(with tare)
Dry Weight After Washing (g):	<b>167.7</b>	(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	0.63	99.51	100	0.63
#4	4.750	2.14	97.85	100	2.14
#7	2.800	6.38	92.90	100	6.38
#10	2.000	4.61	89.32	95	4.38
#14	1.400	4.87	85.55	90	4.38
#18	1.000	3.09	83.15	80	2.47
#25	0.710	2.30	81.36	70	1.61
#35	0.500	2.61	79.34	70	1.83
#45	0.355	4.41	75.92	30	1.32
#60	0.250	9.11	68.85	20	1.82
#80	0.180	33.83	42.60	3	1.01
#120	0.125	34.75	15.64	1	0.35
#170	0.090	7.14	10.10	1	0.07
#230	0.063	1.40	9.02	1	0.01

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



COBBLES	GRAVEL		SAND			SILT OR CLAY
	COARSE	FINE	COARSE	MEDIUM	FINE	

Sample No.	Elev. Or Depth	Classification	% CO <sub>3</sub>	G <sub>s</sub>	Nat w%	LL	PL	PI	Project
♦ 1	38.5-39.0	SAND, poorly-graded with silt, mostly fine-grained quartz, little carbonate, few silt, trace fragmented limestone, dark gray (SP-SM)	22						Topsail Beach, Surf City & North Topsail
									Area
									Boring No. T1-03-V-124
									Date 9/16/2003

**GRADATION CURVES**



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## VISUAL SHELL CONTENT

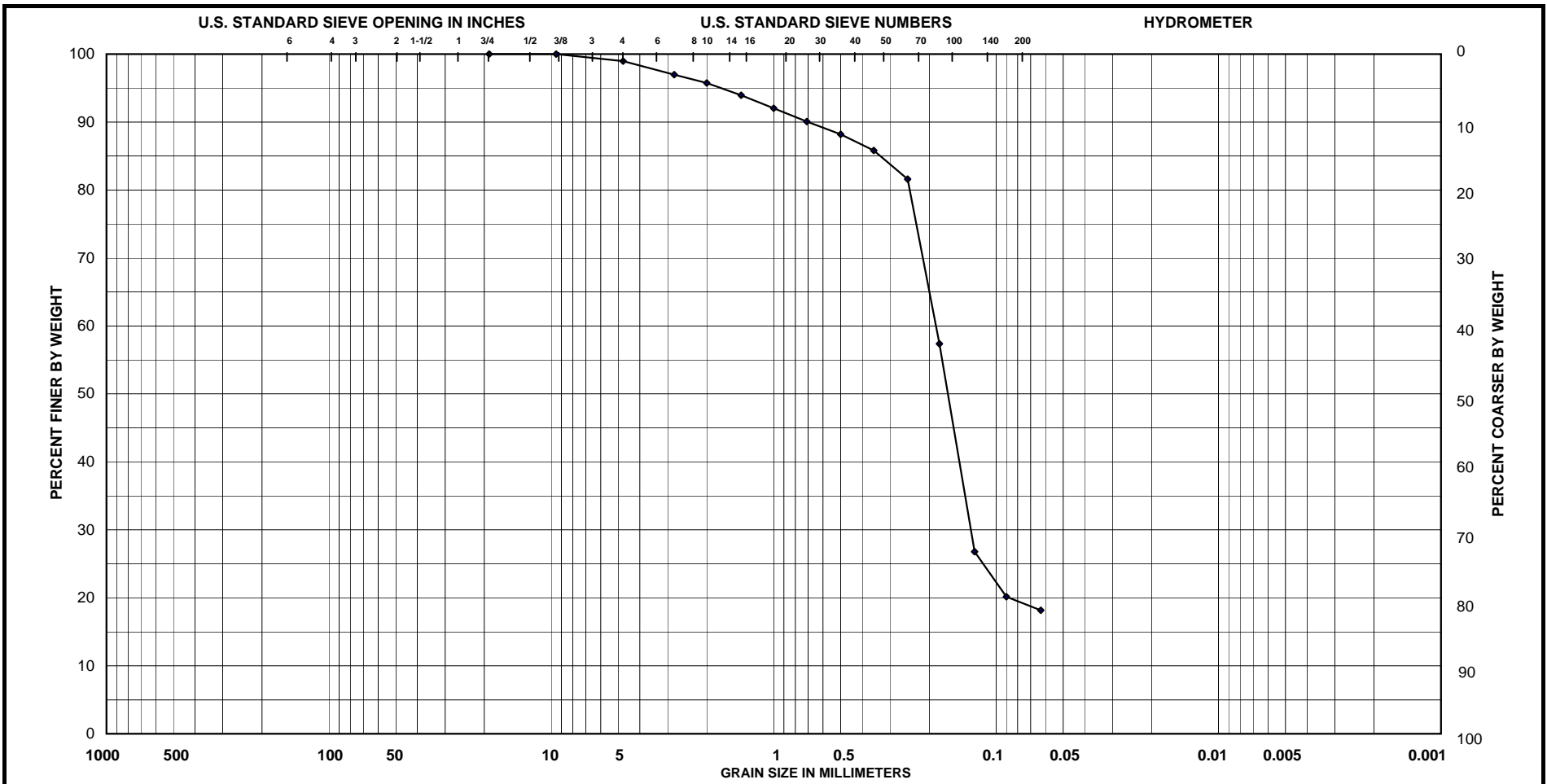
### GRAIN SIZE AND VISUAL SHELL CONTENT

Project:	<b>Topsail Beach, Surf City &amp; North Topsail</b>	Depth:	<b>40.5-41.0</b>
Project No.:	<b>1584-01-40</b>	Date:	<b>9/16/2003</b>
Boring No.:	<b>T1-03-V-124</b>		
Sample No.:	<b>2</b>		
Description:	<b>SAND, clayey, mostly fine-grained quartz, little clay, few carbonate, trace fragmented limestone, dark gray (SC)</b>		

Tare Weight, (g):	<b>50.21</b>	
Dry Wt. Before Washing (g):	<b>172.44</b>	(with tare)
Dry Weight After Washing (g):	<b>151.02</b>	(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	1.27	98.96	100	1.27
#7	2.800	2.41	96.99	90	2.17
#10	2.000	1.53	95.74	90	1.38
#14	1.400	2.20	93.94	90	1.98
#18	1.000	2.33	92.03	80	1.86
#25	0.710	2.41	90.06	70	1.69
#35	0.500	2.30	88.18	40	0.92
#45	0.355	2.89	85.81	20	0.58
#60	0.250	5.14	81.61	10	0.51
#80	0.180	29.61	57.38	2	0.59
#120	0.125	37.39	26.79	1	0.37
#170	0.090	8.13	20.14	1	0.08
#230	0.063	2.40	18.18	1	0.02

**Total Shell Content:** **11** %



COBBLES	GRAVEL		SAND			SILT OR CLAY
	COARSE	FINE	COARSE	MEDIUM	FINE	

Sample No.	Elev. Or Depth	Classification	% CO <sub>3</sub>	G <sub>s</sub>	Nat w%	LL	PL	PI	Project	
♦ 2	40.5-41.0	SAND, clayey, mostly fine-grained quartz, little clay, few carbonate, trace fragmented limestone, dark gray (SC)	11						Topsail Beach, Surf City & North Topsail	
									Area	
									Boring No. T1-03-V-124	
									Date 9/16/2003	

**GRADATION CURVES**



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## VISUAL SHELL CONTENT

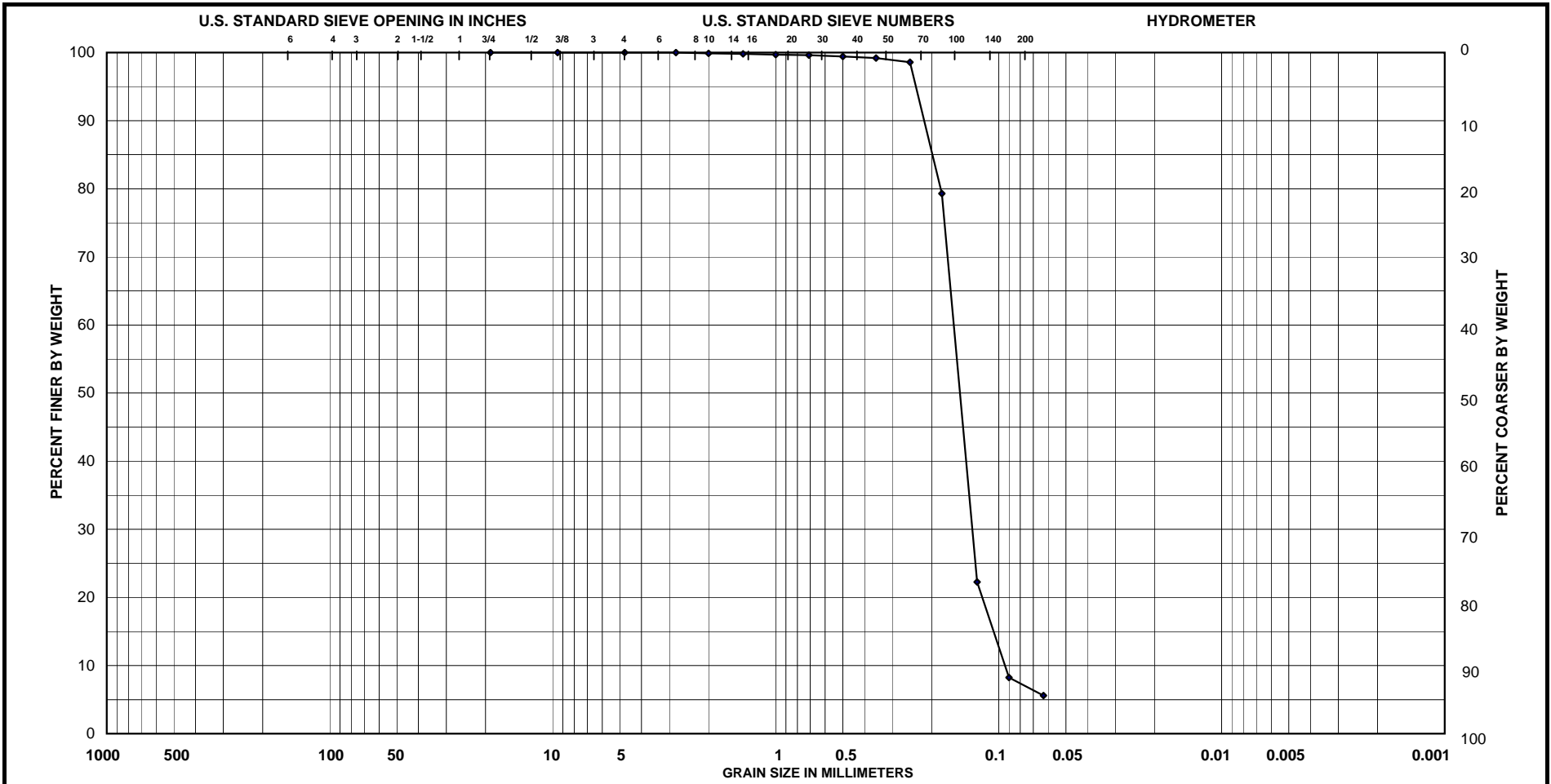
### GRAIN SIZE AND VISUAL SHELL CONTENT

Project:	<b>Topsail Beach, Surf City &amp; North Topsail</b>	Depth:	<b>42.5-43.0</b>
Project No.:	<b>1584-01-40</b>	Date:	<b>9/16/2003</b>
Boring No.:	<b>T1-03-V-124</b>		
Sample No.:	<b>3</b>		
Description:	<b>SAND, poorly-graded with silt, mostly fine-grained quartz, few silt, trace carbonate, dark gray (SP-SM)</b>		

Tare Weight, (g):	<b>49.91</b>	
Dry Wt. Before Washing (g):	<b>161.71</b>	(with tare)
Dry Weight After Washing (g):	<b>155.83</b>	(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	0.10	99.90	100	0.10
#14	1.400	0.10	99.81	100	0.10
#18	1.000	0.12	99.70	90	0.11
#25	0.710	0.09	99.62	90	0.08
#35	0.500	0.21	99.44	80	0.17
#45	0.355	0.29	99.18	70	0.20
#60	0.250	0.67	98.58	40	0.27
#80	0.180	21.55	79.30	5	1.08
#120	0.125	63.78	22.25	1	0.64
#170	0.090	15.66	8.25	1	0.16
#230	0.063	2.98	5.58	1	0.03

**Total Shell Content:** **3** %



COBBLES	GRAVEL		SAND			SILT OR CLAY
	COARSE	FINE	COARSE	MEDIUM	FINE	

Sample No.	Elev. Or Depth	Classification	% CO <sub>3</sub>	G <sub>s</sub>	Nat w%	LL	PL	PI	Project	
3	42.5-43.0	SAND, poorly-graded with silt, mostly fine-grained quartz, few silt, trace carbonate, dark gray (SP-SM)	3						Topsail Beach, Surf City & North Topsail	
									Area	
									Boring No. T1-03-V-124	
									Date 9/16/2003	

**GRADATION CURVES**





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## VISUAL SHELL CONTENT

### GRAIN SIZE AND VISUAL SHELL CONTENT

Project:	<b>Topsail Beach, Surf City &amp; North Topsail</b>	Depth:	<b>45.0-45.5</b>
Project No.:	<b>1584-01-40</b>	Date:	<b>9/16/2003</b>
Boring No.:	<b>T1-03-V-124</b>		
Sample No.:	<b>4</b>		
Description:	<b>SAND, poorly-graded with silt, mostly fine-grained quartz, few silt, trace carbonate, trace organic matter, dark greenish gray (SP-SM)</b>		

Tare Weight, (g):	<b>50.52</b>	
Dry Wt. Before Washing (g):	<b>201.91</b>	(with tare)
Dry Weight After Washing (g):	<b>183.48</b>	(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	0.04	99.97	0	0.00
#14	1.400	0.08	99.92	20	0.02
#18	1.000	0.08	99.87	20	0.02
#25	0.710	0.07	99.82	30	0.02
#35	0.500	0.08	99.77	20	0.02
#45	0.355	0.19	99.64	20	0.04
#60	0.250	0.41	99.37	5	0.02
#80	0.180	38.08	74.22	1	0.38
#120	0.125	75.08	24.63	1	0.75
#170	0.090	14.04	15.35	1	0.14
#230	0.063	3.95	12.74	1	0.04

**Total Shell Content:** **1** %



COBBLES	GRAVEL		SAND			SILT OR CLAY
	COARSE	FINE	COARSE	MEDIUM	FINE	

Sample No.	Elev. Or Depth	Classification	% CO <sub>3</sub>	G <sub>s</sub>	Nat w%	LL	PL	PI	Project	
4	45.0-45.5	SAND, poorly-graded with silt, mostly fine-grained quartz, few silt, trace carbonate, trace organic matter, dark greenish gray (SP-SM)	1						Topsail Beach, Surf City & North Topsail	
									Area	
									Boring No. T1-03-V-124	
									Date 9/16/2003	

**GRADATION CURVES**



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## VISUAL SHELL CONTENT

### GRAIN SIZE AND VISUAL SHELL CONTENT

Project:	<b>Topsail Beach, Surf City &amp; North Topsail</b>	Depth:	<b>48.0-48.5</b>
Project No.:	<b>1584-01-40</b>	Date:	<b>9/16/2003</b>
Boring No.:	<b>T1-03-V-124</b>		
Sample No.:	<b>5</b>		
Description:	<b>SAND, silty, mostly fine-grained quartz, little silt, trace carbonate, trace fragmented limestone, trace organic matter, dark greenish gray (SM)</b>		

Tare Weight, (g):	<b>50.24</b>	
Dry Wt. Before Washing (g):	<b>200</b>	(with tare)
Dry Weight After Washing (g):	<b>179.94</b>	(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	0.03	99.98	0	0.00
#14	1.400	0.02	99.97	50	0.01
#18	1.000	0.04	99.94	10	0.00
#25	0.710	0.05	99.91	10	0.01
#35	0.500	0.06	99.87	10	0.01
#45	0.355	0.13	99.78	5	0.01
#60	0.250	0.40	99.51	1	0.00
#80	0.180	71.82	51.56	1	0.72
#120	0.125	44.48	21.85	1	0.44
#170	0.090	8.76	16.01	1	0.09
#230	0.063	3.20	13.87	1	0.03

**Total Shell Content:** **1** %





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## VISUAL SHELL CONTENT

### GRAIN SIZE AND VISUAL SHELL CONTENT

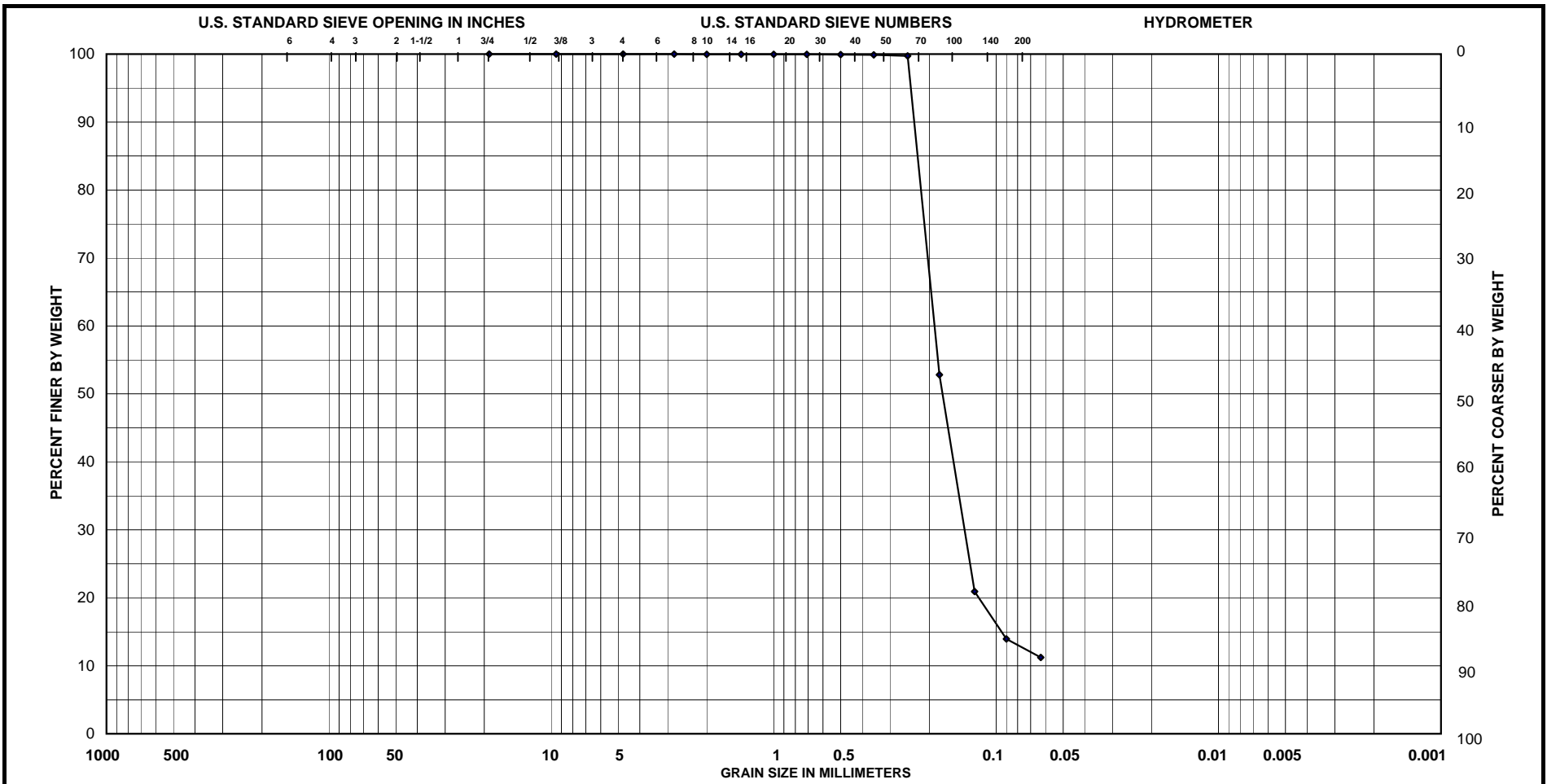
Project:	<b>Topsail Beach, Surf City &amp; North Topsail</b>	Depth:	<b>51.0-51.5</b>
Project No.:	<b>1584-01-40</b>	Date:	<b>9/16/2003</b>
Boring No.:	<b>T1-03-V-124</b>		
Sample No.:	<b>6</b>		
Description:	<b>SAND, poorly-graded with silt, mostly fine-grained quartz, few silt, trace carbonate, trace organic matter, dark greenish gray (SP-SM)</b>		

Tare Weight, (g):	<b>49.63</b>	
Dry Wt. Before Washing (g):	<b>207.98</b>	(with tare)
Dry Weight After Washing (g):	<b>190.86</b>	(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	0.04	99.97	0	0.00
#14	1.400	0.01	99.97	0	0.00
#18	1.000	0.01	99.96	0	0.00
#25	0.710	0.02	99.95	10	0.00
#35	0.500	0.02	99.94	10	0.00
#45	0.355	0.06	99.90	10	0.01
#60	0.250	0.24	99.75	1	0.00
#80	0.180	74.30	52.83	1	0.74
#120	0.125	50.54	20.91	1	0.51
#170	0.090	11.02	13.95	1	0.11
#230	0.063	4.28	11.25	1	0.04

**Total Shell Content:**

<b>1</b>	<b>%</b>
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COBBLES	GRAVEL		SAND			SILT OR CLAY
	COARSE	FINE	COARSE	MEDIUM	FINE	

Sample No.	Elev. Or Depth	Classification	% CO <sub>3</sub>	G <sub>s</sub>	Nat w%	LL	PL	PI	Project
6	51.0-51.5	SAND, poorly-graded with silt, mostly fine-grained quartz, few silt, trace carbonate, trace organic matter, dark greenish gray (SP-SM)	1						Topsail Beach, Surf City & North Topsail
									Area
									Boring No. T1-03-V-124
									Date 9/16/2003

**GRADATION CURVES**



# WOLF TECHNOLOGIES, INC.

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

## VISUAL SHELL CONTENT

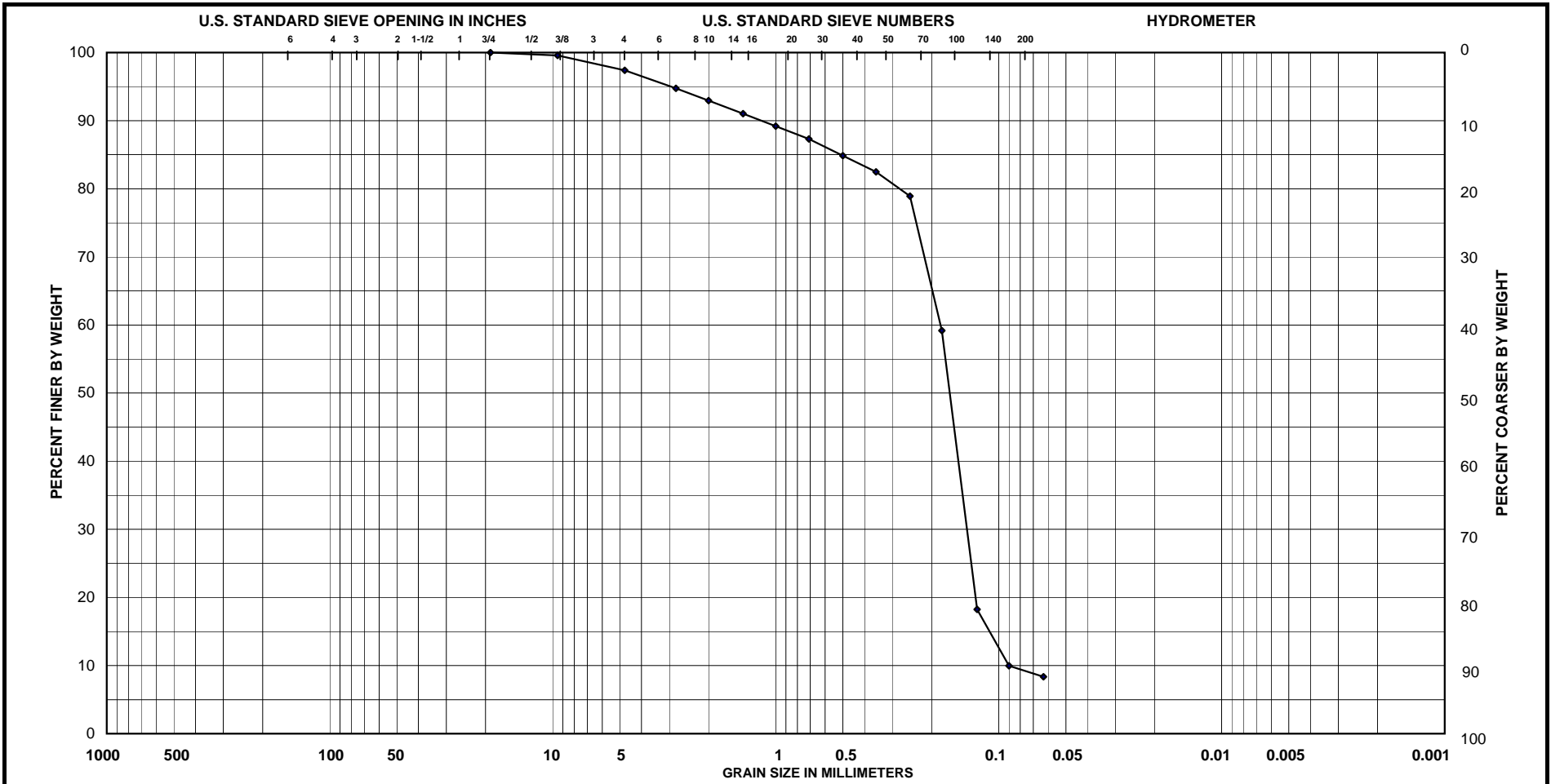
### GRAIN SIZE AND VISUAL SHELL CONTENT

Project:	<b>Topsail Beach, Surf City &amp; North Topsail</b>	Depth:	<b>38.9-39.4</b>
Project No.:	<b>1584-01-40</b>	Date:	<b>9/16/2003</b>
Boring No.:	<b>T1-03-V-125</b>		
Sample No.:	<b>1</b>		
Description:	<b>SAND, poorly-graded with silt, mostly fine-grained quartz, little carbonate, few silt, dark greenish gray (SP-SM)</b>		

Tare Weight, (g):	<b>49.68</b>	
Dry Wt. Before Washing (g):	<b>179.54</b>	(with tare)
Dry Weight After Washing (g):	<b>169.08</b>	(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	0.55	99.58	100	0.55
#4	4.750	2.82	97.40	100	2.82
#7	2.800	3.47	94.73	100	3.47
#10	2.000	2.31	92.95	100	2.31
#14	1.400	2.51	91.02	100	2.51
#18	1.000	2.38	89.19	90	2.14
#25	0.710	2.42	87.32	80	1.94
#35	0.500	3.18	84.88	70	2.23
#45	0.355	3.10	82.49	40	1.24
#60	0.250	4.65	78.91	20	0.93
#80	0.180	25.61	59.19	5	1.28
#120	0.125	53.19	18.23	1	0.53
#170	0.090	10.72	9.97	1	0.11
#230	0.063	2.10	8.36	1	0.02

**Total Shell Content:** **17** %



COBBLES	GRAVEL		SAND			SILT OR CLAY
	COARSE	FINE	COARSE	MEDIUM	FINE	

Sample No.	Elev. Or Depth	Classification	% CO <sub>3</sub>	G <sub>s</sub>	Nat w%	LL	PL	PI	Project
1	38.9-39.4	SAND, poorly-graded with silt, mostly fine-grained quartz, little carbonate, few silt, dark greenish gray (SP-SM)	17						Topsail Beach, Surf City & North Topsail
									Area
									Boring No. T1-03-V-125
									Date 9/16/2003

**GRADATION CURVES**





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## VISUAL SHELL CONTENT

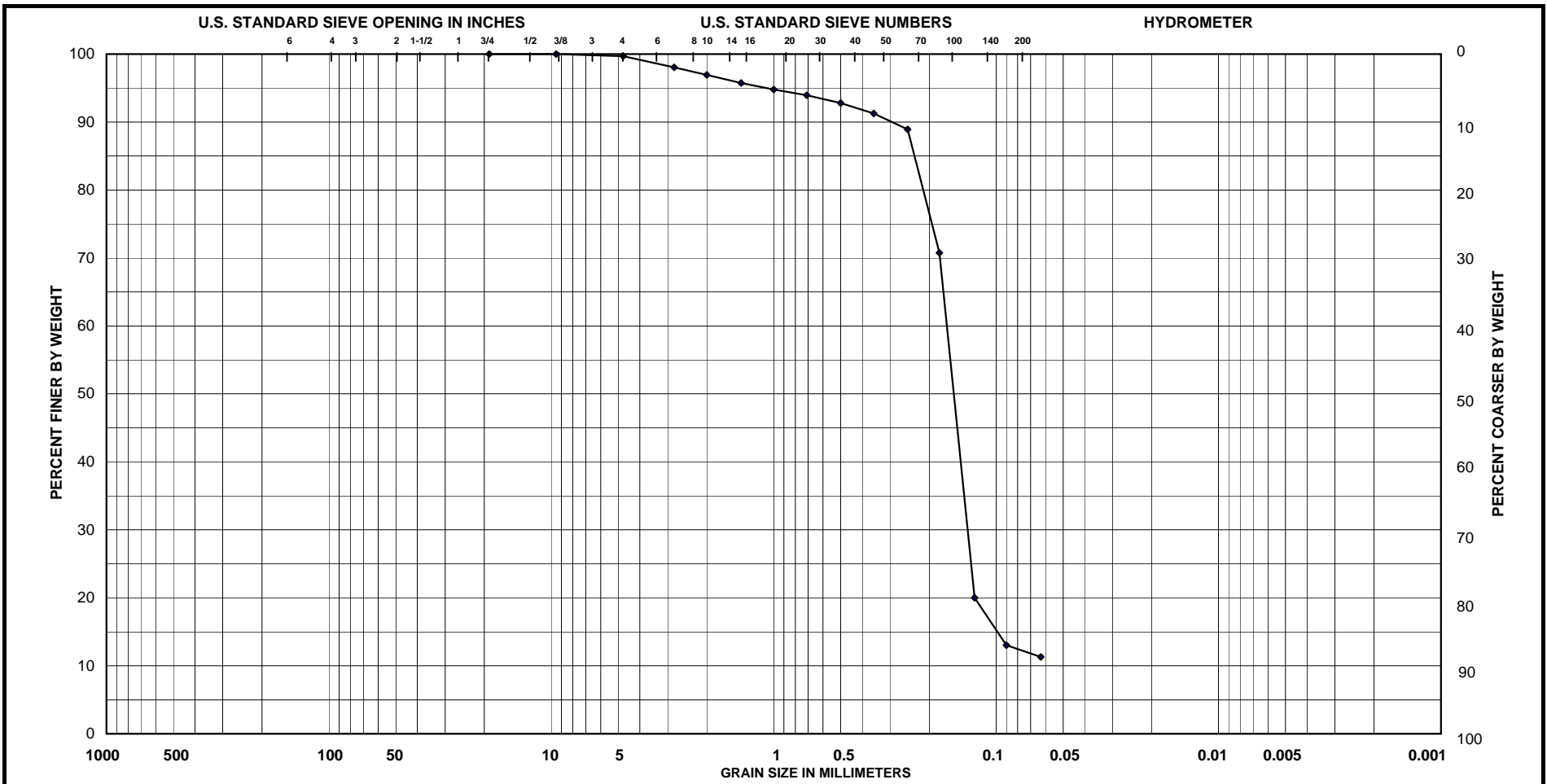
### GRAIN SIZE AND VISUAL SHELL CONTENT

Project:	<b>Topsail Beach, Surf City &amp; North Topsail</b>	Depth:	<b>40.9-41.4</b>
Project No.:	<b>1584-01-40</b>	Date:	<b>9/16/2003</b>
Boring No.:	<b>T1-03-V-125</b>		
Sample No.:	<b>2</b>		
Description:	<b>SAND, poorly-graded with silt, mostly fine-grained quartz, few carbonate, few silt, trace fragmented limestone, dark greenish gray (SP-</b>		

Tare Weight, (g):	<b>50.19</b>	
Dry Wt. Before Washing (g):	<b>173.1</b>	(with tare)
Dry Weight After Washing (g):	<b>159.72</b>	(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	0.38	99.69	100	0.38
#7	2.800	2.04	98.03	90	1.84
#10	2.000	1.36	96.92	100	1.36
#14	1.400	1.45	95.74	90	1.31
#18	1.000	1.19	94.78	90	1.07
#25	0.710	1.02	93.95	80	0.82
#35	0.500	1.42	92.79	80	1.14
#45	0.355	1.88	91.26	40	0.75
#60	0.250	2.87	88.93	20	0.57
#80	0.180	22.35	70.74	5	1.12
#120	0.125	62.38	19.99	1	0.62
#170	0.090	8.54	13.04	1	0.09
#230	0.063	2.13	11.31	1	0.02

**Total Shell Content:** **9** %



COBBLES	GRAVEL		SAND			SILT OR CLAY
	COARSE	FINE	COARSE	MEDIUM	FINE	

Sample No.	Elev. Or Depth	Classification	% CO <sub>3</sub>	G <sub>s</sub>	Nat w%	LL	PL	PI	Project	
♦ 2	40.9-41.4	SAND, poorly-graded with silt, mostly fine-grained quartz, few carbonate, few silt, trace fragmented limestone, dark greenish gray (SP-SM)	9						Topsail Beach, Surf City & North Topsail	
									Area	
									Boring No. T1-03-V-125	
									Date 9/16/2003	

**GRADATION CURVES**



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## VISUAL SHELL CONTENT

### GRAIN SIZE AND VISUAL SHELL CONTENT

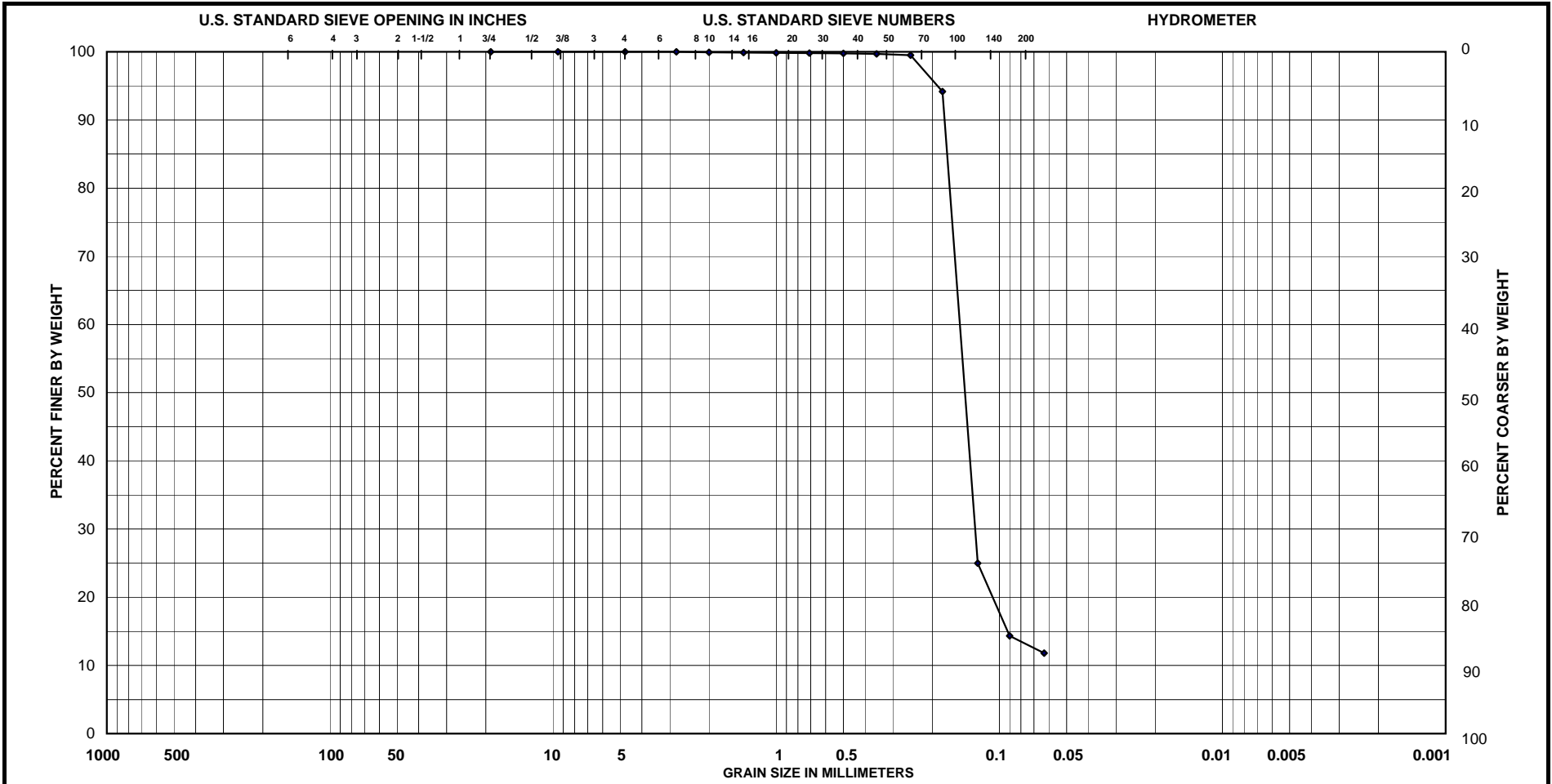
Project:	<b>Topsail Beach, Surf City &amp; North Topsail</b>	Depth:	<b>43.0-43.5</b>
Project No.:	<b>1584-01-40</b>	Date:	<b>9/16/2003</b>
Boring No.:	<b>T1-03-V-125</b>		
Sample No.:	<b>3</b>		
Description:	<b>SAND, poorly-graded with silt, mostly fine-grained quartz, few silt, trace carbonate, trace organic matter, dark greenish gray (SP-SM)</b>		

Tare Weight, (g):	<b>49.52</b>	
Dry Wt. Before Washing (g):	<b>187.28</b>	(with tare)
Dry Weight After Washing (g):	<b>171.63</b>	(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	0.10	99.92	100	0.10
#14	1.400	0.05	99.88	100	0.05
#18	1.000	0.05	99.85	100	0.05
#25	0.710	0.04	99.82	90	0.04
#35	0.500	0.07	99.77	90	0.06
#45	0.355	0.10	99.70	80	0.08
#60	0.250	0.27	99.50	40	0.11
#80	0.180	7.32	94.19	5	0.37
#120	0.125	95.34	24.98	1	0.95
#170	0.090	14.67	14.33	1	0.15
#230	0.063	3.47	11.81	1	0.03

**Total Shell Content:**

<b>1</b>	<b>%</b>
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COBBLES	GRAVEL		SAND			SILT OR CLAY
	COARSE	FINE	COARSE	MEDIUM	FINE	

Sample No.	Elev. Or Depth	Classification	% CO <sub>3</sub>	G <sub>s</sub>	Nat w%	LL	PL	PI	Project
3	43.0-43.5	SAND, poorly-graded with silt, mostly fine-grained quartz, few silt, trace carbonate, trace organic matter, dark greenish gray (SP-SM)	1						Topsail Beach, Surf City & North Topsail
									Area
									Boring No. T1-03-V-125
									Date 9/16/2003

**GRADATION CURVES**



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## VISUAL SHELL CONTENT

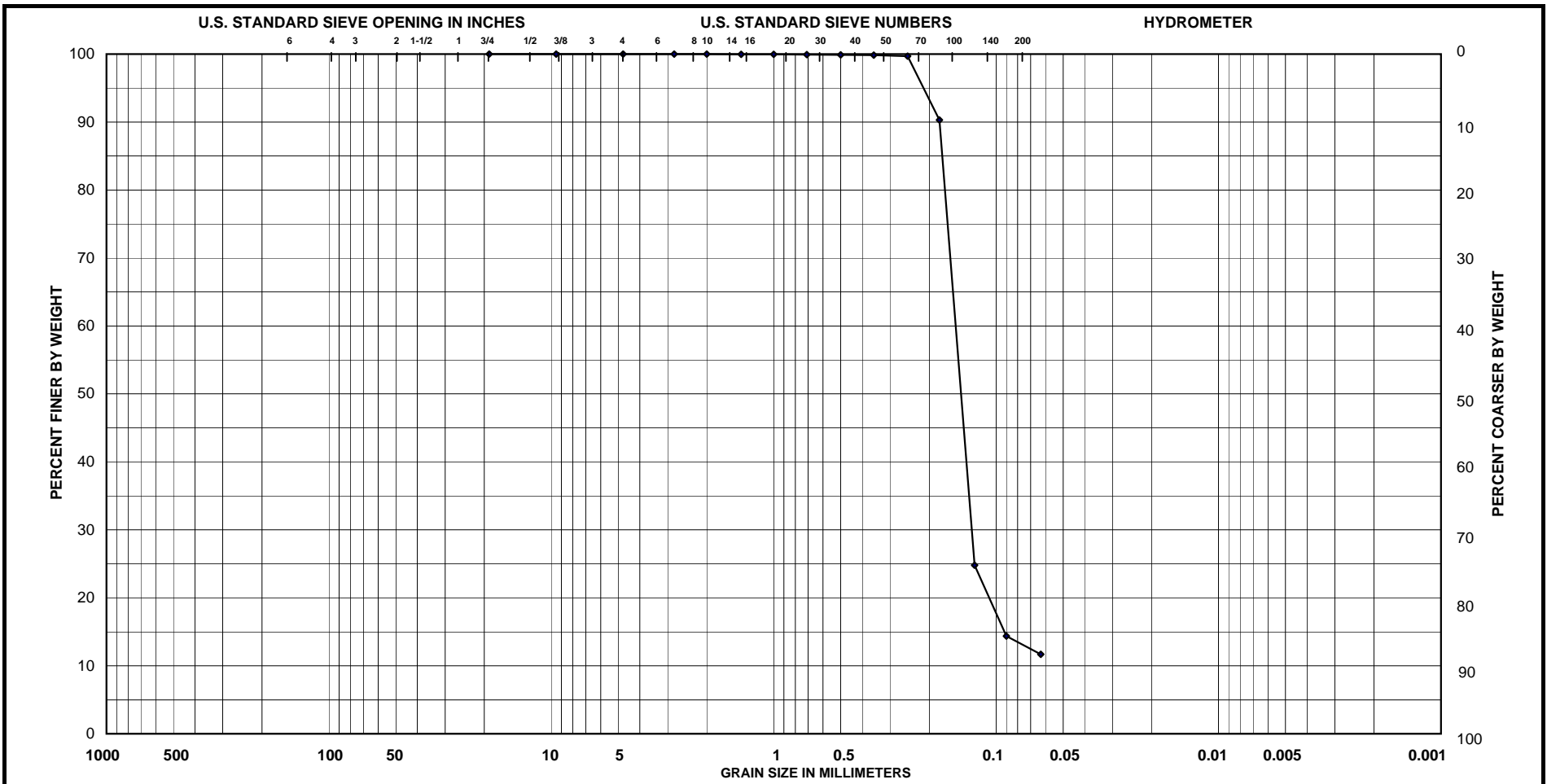
### GRAIN SIZE AND VISUAL SHELL CONTENT

Project:	<b>Topsail Beach, Surf City &amp; North Topsail</b>	Depth:	<b>46.0-46.5</b>
Project No.:	<b>1584-01-40</b>	Date:	<b>9/16/2003</b>
Boring No.:	<b>T1-03-V-125</b>		
Sample No.:	<b>4</b>		
Description:	<b>SAND, poorly-graded with silt, mostly fine-grained quartz, few silt, trace carbonate, dark greenish gray (SP-SM)</b>		

Tare Weight, (g):	<b>50.58</b>	
Dry Wt. Before Washing (g):	<b>182.13</b>	(with tare)
Dry Weight After Washing (g):	<b>167.19</b>	(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	0.01	99.98	0	0.00
#14	1.400	0.02	99.97	80	0.02
#18	1.000	0.03	99.95	80	0.02
#25	0.710	0.03	99.92	70	0.02
#35	0.500	0.03	99.90	70	0.02
#45	0.355	0.05	99.86	40	0.02
#60	0.250	0.22	99.70	20	0.04
#80	0.180	12.35	90.31	5	0.62
#120	0.125	86.20	24.78	1	0.86
#170	0.090	13.70	14.37	1	0.14
#230	0.063	3.53	11.68	1	0.04

**Total Shell Content:** **1** %



COBBLES	GRAVEL		SAND			SILT OR CLAY
	COARSE	FINE	COARSE	MEDIUM	FINE	

Sample No.	Elev. Or Depth	Classification	% CO <sub>3</sub>	G <sub>s</sub>	Nat w%	LL	PL	PI	Project	
4	46.0-46.5	SAND, poorly-graded with silt, mostly fine-grained quartz, few silt, trace carbonate, dark greenish gray (SP-SM)	1						Topsail Beach, Surf City & North Topsail	
									Area	
									Boring No. T1-03-V-125	
									Date 9/16/2003	

**GRADATION CURVES**



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## VISUAL SHELL CONTENT

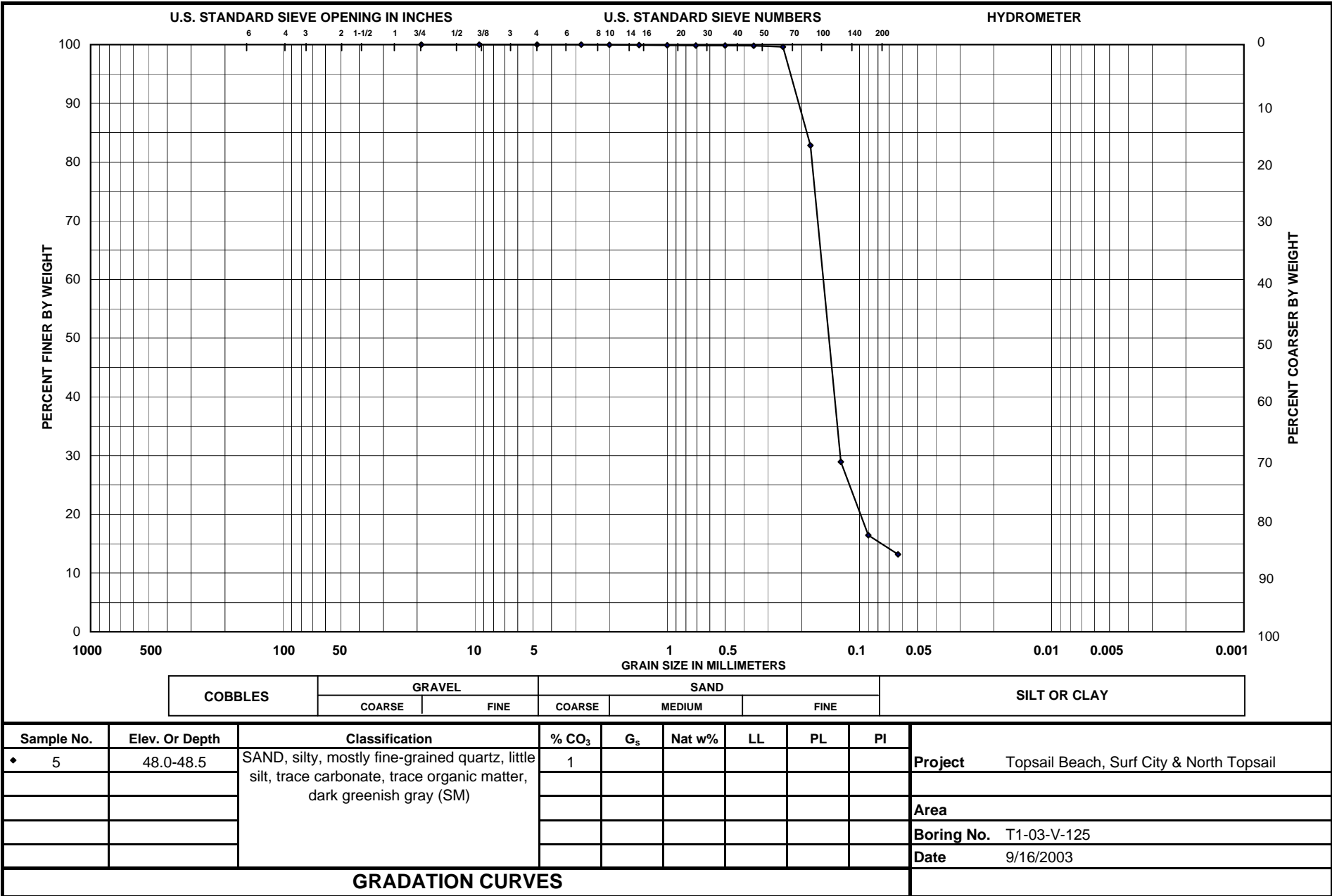
### GRAIN SIZE AND VISUAL SHELL CONTENT

Project:	<b>Topsail Beach, Surf City &amp; North Topsail</b>	Depth:	<b>48.0-48.5</b>
Project No.:	<b>1584-01-40</b>	Date:	<b>9/16/2003</b>
Boring No.:	<b>T1-03-V-125</b>		
Sample No.:	<b>5</b>		
Description:	<b>SAND, silty, mostly fine-grained quartz, little silt, trace carbonate, trace organic matter, dark greenish gray (SM)</b>		

Tare Weight, (g):	<b>50.06</b>	
Dry Wt. Before Washing (g):	<b>173.19</b>	(with tare)
Dry Weight After Washing (g):	<b>157.39</b>	(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	0.04	99.97	0	0.00
#14	1.400	0.06	99.92	0	0.00
#18	1.000	0.04	99.89	10	0.00
#25	0.710	0.03	99.86	10	0.00
#35	0.500	0.03	99.84	10	0.00
#45	0.355	0.05	99.80	1	0.00
#60	0.250	0.23	99.61	1	0.00
#80	0.180	20.68	82.81	1	0.21
#120	0.125	66.35	28.93	1	0.66
#170	0.090	15.37	16.45	1	0.15
#230	0.063	4.02	13.18	1	0.04

**Total Shell Content:** **1** %



**GRADATION CURVES**





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## VISUAL SHELL CONTENT

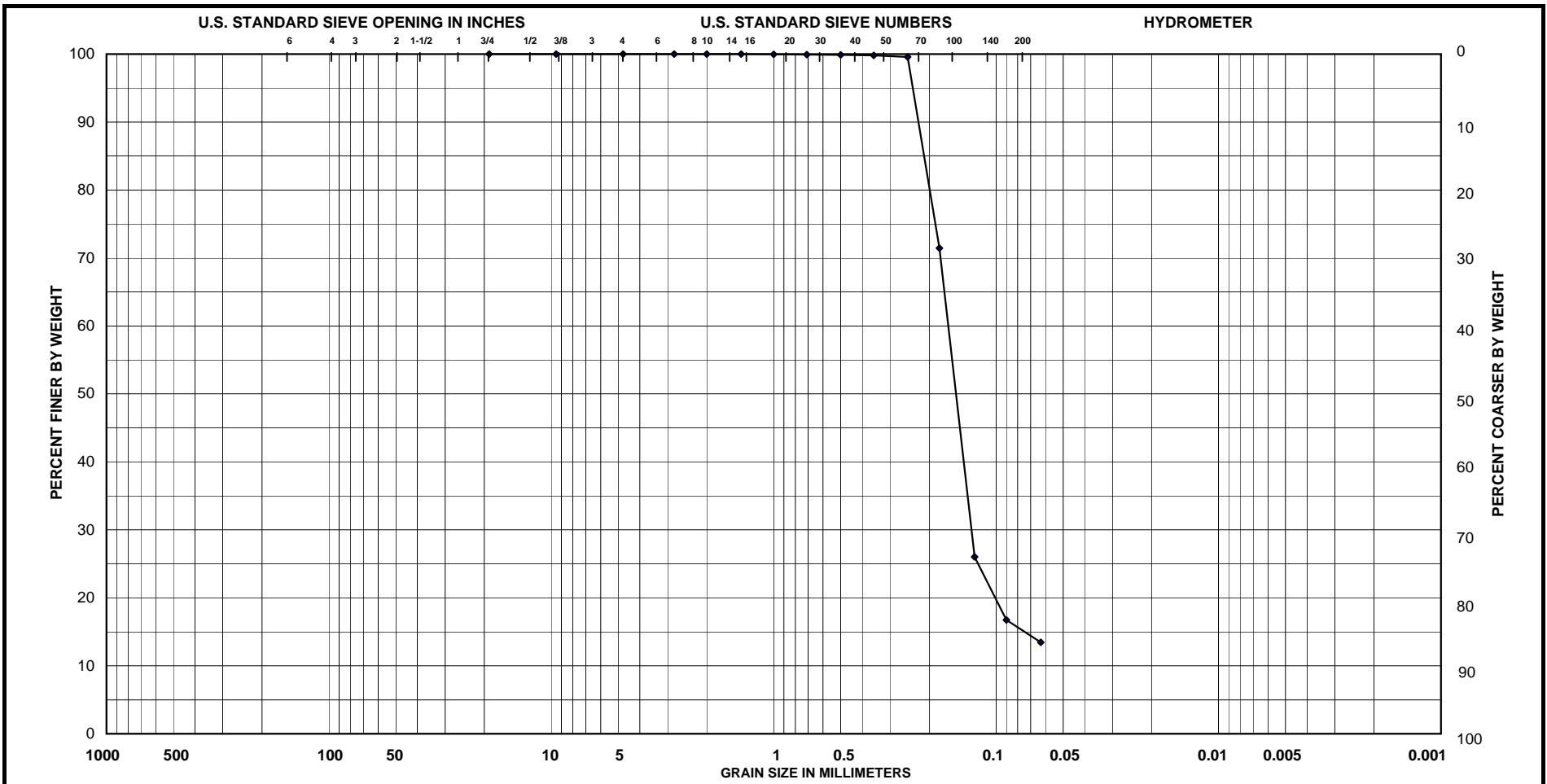
### GRAIN SIZE AND VISUAL SHELL CONTENT

Project:	<b>Topsail Beach, Surf City &amp; North Topsail</b>	Depth:	<b>50.5-51.0</b>
Project No.:	<b>1584-01-40</b>	Date:	<b>9/16/2003</b>
Boring No.:	<b>T1-03-V-125</b>		
Sample No.:	<b>6</b>		
Description:	<b>SAND, silty, mostly fine-grained quartz, little silt, trace carbonate, trace organic matter, dark greenish gray (SM)</b>		

Tare Weight, (g):	<b>49.70</b>	
Dry Wt. Before Washing (g):	<b>167.85</b>	(with tare)
Dry Weight After Washing (g):	<b>152.69</b>	(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	0.01	99.99	0	0.00
#14	1.400	0.01	99.98	0	0.00
#18	1.000	0.02	99.97	20	0.00
#25	0.710	0.05	99.92	10	0.01
#35	0.500	0.04	99.89	5	0.00
#45	0.355	0.10	99.81	5	0.01
#60	0.250	0.28	99.57	1	0.00
#80	0.180	33.23	71.44	1	0.33
#120	0.125	53.64	26.04	1	0.54
#170	0.090	10.97	16.76	1	0.11
#230	0.063	3.91	13.45	1	0.04

**Total Shell Content:** **1** %



COBBLES	GRAVEL		SAND			SILT OR CLAY
	COARSE	FINE	COARSE	MEDIUM	FINE	

Sample No.	Elev. Or Depth	Classification	% CO <sub>3</sub>	G <sub>s</sub>	Nat w%	LL	PL	PI	Project
6	50.5-51.0	SAND, silty, mostly fine-grained quartz, little silt, trace carbonate, trace organic matter, dark greenish gray (SM)	1						Topsail Beach, Surf City & North Topsail
									Area
									Boring No. T1-03-V-125
									Date 9/16/2003

**GRADATION CURVES**



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Jacksonville, Florida 32246  
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## VISUAL SHELL CONTENT

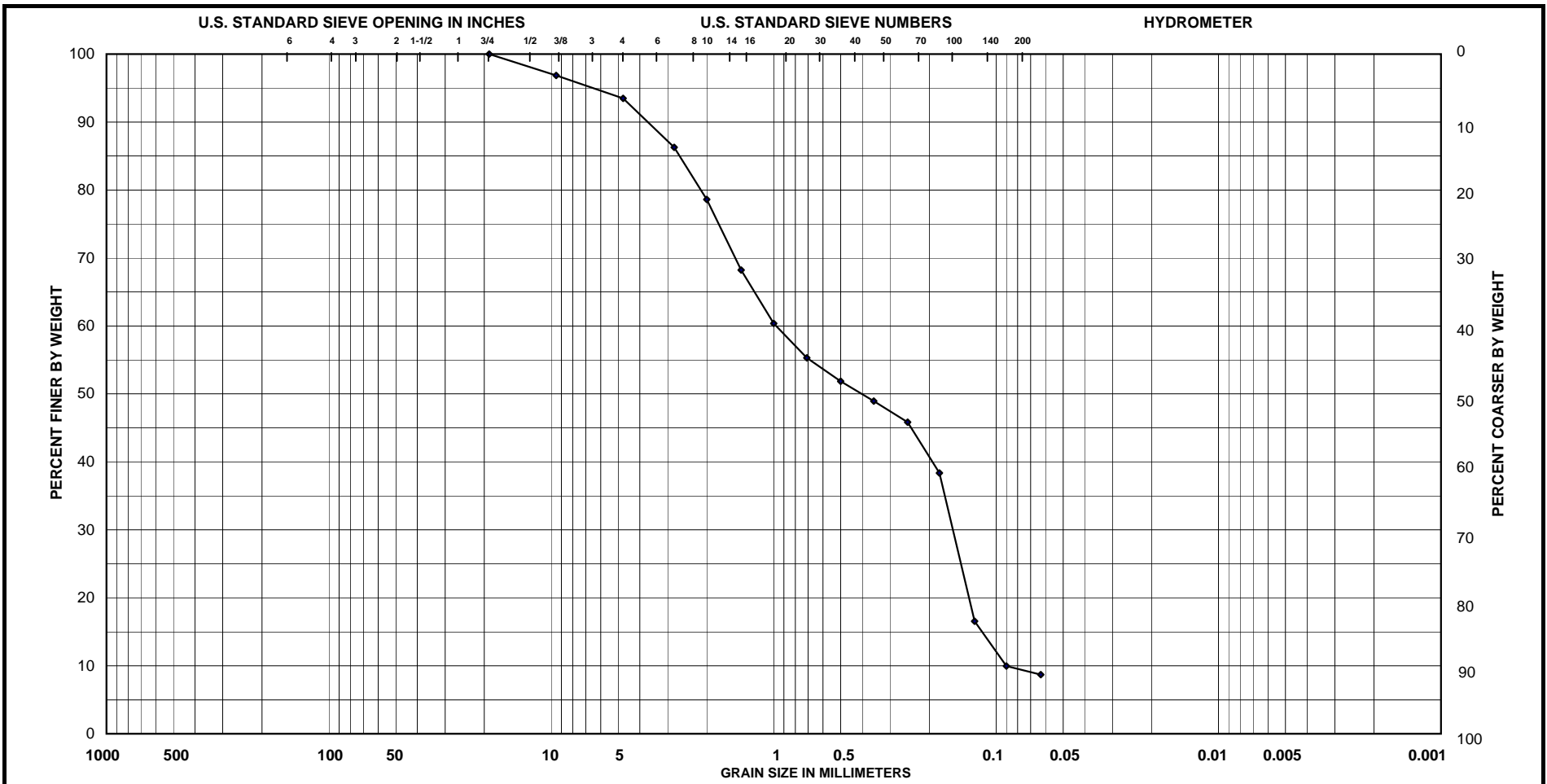
### GRAIN SIZE AND VISUAL SHELL CONTENT

Project:	<b>Topsail Beach, Surf City &amp; North Topsail</b>	Depth:	<b>38.7-39.2</b>
Project No.:	<b>1584-01-40</b>	Date:	<b>9/16/2003</b>
Boring No.:	<b>T1-03-V-126</b>		
Sample No.:	<b>1</b>		
Description:	<b>SAND, poorly-graded with silt, mostly fine-grained quartz, some carbonate, few silt, trace fragmented limestone, dark gray (SP-SM)</b>		

Tare Weight, (g):	<b>49.57</b>	
Dry Wt. Before Washing (g):	<b>175.35</b>	(with tare)
Dry Weight After Washing (g):	<b>164.92</b>	(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	3.94	96.87	100	3.94
#4	4.750	4.26	93.48	100	4.26
#7	2.800	9.07	86.27	95	8.62
#10	2.000	9.63	78.61	90	8.67
#14	1.400	13.08	68.21	80	10.46
#18	1.000	9.87	60.37	80	7.90
#25	0.710	6.38	55.29	70	4.47
#35	0.500	4.32	51.86	70	3.02
#45	0.355	3.67	48.94	40	1.47
#60	0.250	3.92	45.83	20	0.78
#80	0.180	9.37	38.38	5	0.47
#120	0.125	27.43	16.57	1	0.27
#170	0.090	8.30	9.97	1	0.08
#230	0.063	1.61	8.69	1	0.02

**Total Shell Content:** **43** %



COBBLES	GRAVEL		SAND			SILT OR CLAY
	COARSE	FINE	COARSE	MEDIUM	FINE	

Sample No.	Elev. Or Depth	Classification	% CO <sub>3</sub>	G <sub>s</sub>	Nat w%	LL	PL	PI	Project	
♦ 1	38.7-39.2	SAND, poorly-graded with silt, mostly fine-grained quartz, some carbonate, few silt, trace fragmented limestone, dark gray (SP-SM)	43						Topsail Beach, Surf City & North Topsail	
									Area	
									Boring No. T1-03-V-126	
									Date 9/16/2003	

**GRADATION CURVES**



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## VISUAL SHELL CONTENT

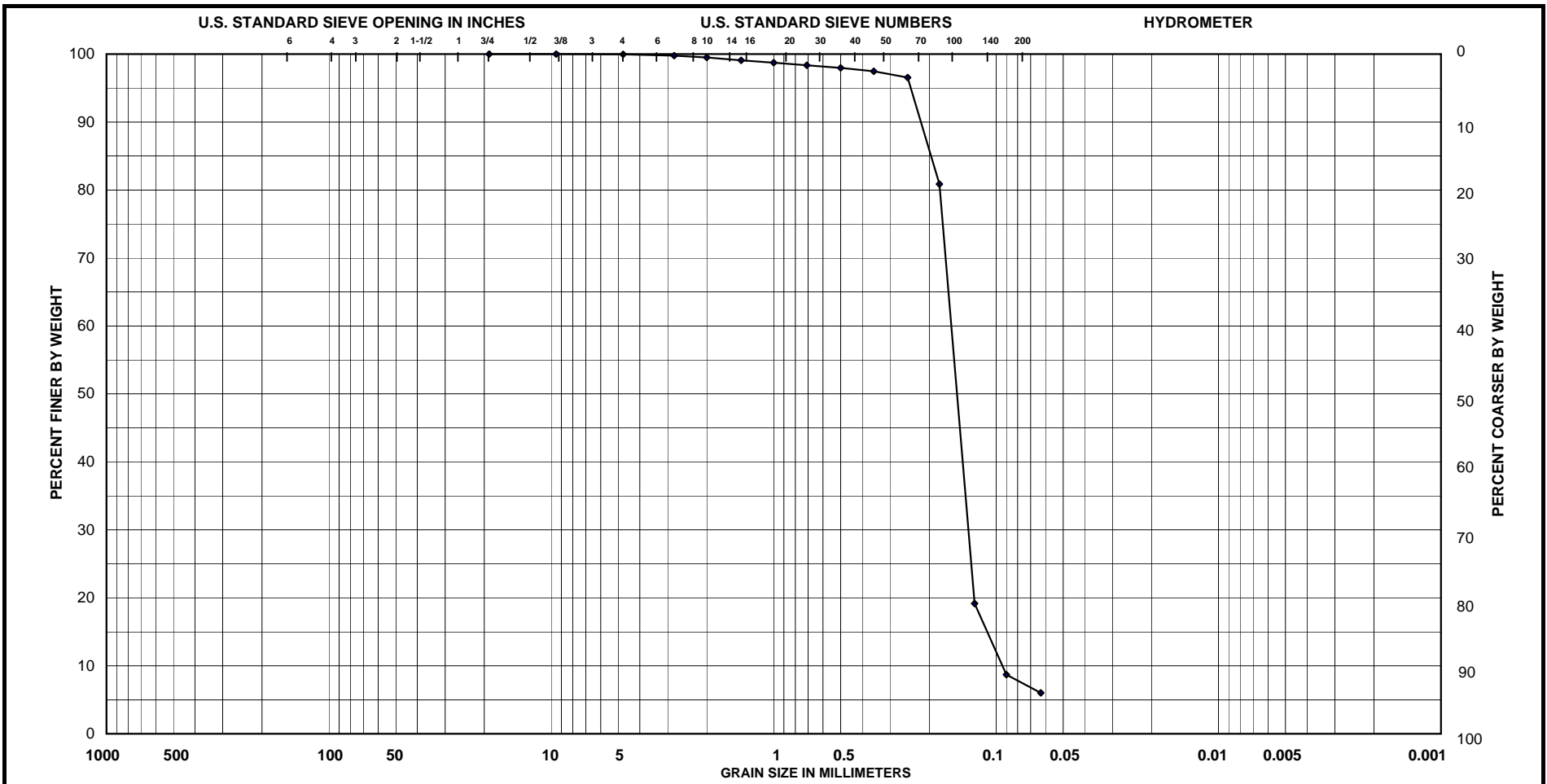
### GRAIN SIZE AND VISUAL SHELL CONTENT

Project:	<b>Topsail Beach, Surf City &amp; North Topsail</b>	Depth:	<b>41.0-41.5</b>
Project No.:	<b>1584-01-40</b>	Date:	<b>9/16/2003</b>
Boring No.:	<b>T1-03-V-126</b>		
Sample No.:	<b>2</b>		
Description:	<b>SAND, poorly-graded with silt, mostly fine-grained quartz, few silt, trace carbonate, trace fragmented limestone, dark greenish gray (SP-</b>		

Tare Weight, (g):	<b>50.07</b>	
Dry Wt. Before Washing (g):	<b>167.4</b>	(with tare)
Dry Weight After Washing (g):	<b>160.98</b>	(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	0.06	99.95	100	0.06
#7	2.800	0.22	99.76	100	0.22
#10	2.000	0.32	99.49	95	0.30
#14	1.400	0.50	99.06	90	0.45
#18	1.000	0.40	98.72	70	0.28
#25	0.710	0.45	98.34	70	0.32
#35	0.500	0.45	97.95	40	0.18
#45	0.355	0.57	97.47	20	0.11
#60	0.250	1.08	96.55	10	0.11
#80	0.180	18.38	80.88	2	0.37
#120	0.125	72.40	19.18	1	0.72
#170	0.090	12.31	8.68	1	0.12
#230	0.063	3.14	6.01	1	0.03

**Total Shell Content:** **3** %



COBBLES	GRAVEL		SAND			SILT OR CLAY
	COARSE	FINE	COARSE	MEDIUM	FINE	

Sample No.	Elev. Or Depth	Classification	% CO <sub>3</sub>	G <sub>s</sub>	Nat w%	LL	PL	PI	Project	
♦ 2	41.0-41.5	SAND, poorly-graded with silt, mostly fine-grained quartz, few silt, trace carbonate, trace fragmented limestone, dark greenish gray (SP-SM)	3						Topsail Beach, Surf City & North Topsail	
									Area	
									Boring No. T1-03-V-126	
									Date 9/16/2003	

**GRADATION CURVES**



# WOLF TECHNOLOGIES, INC.

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## VISUAL SHELL CONTENT

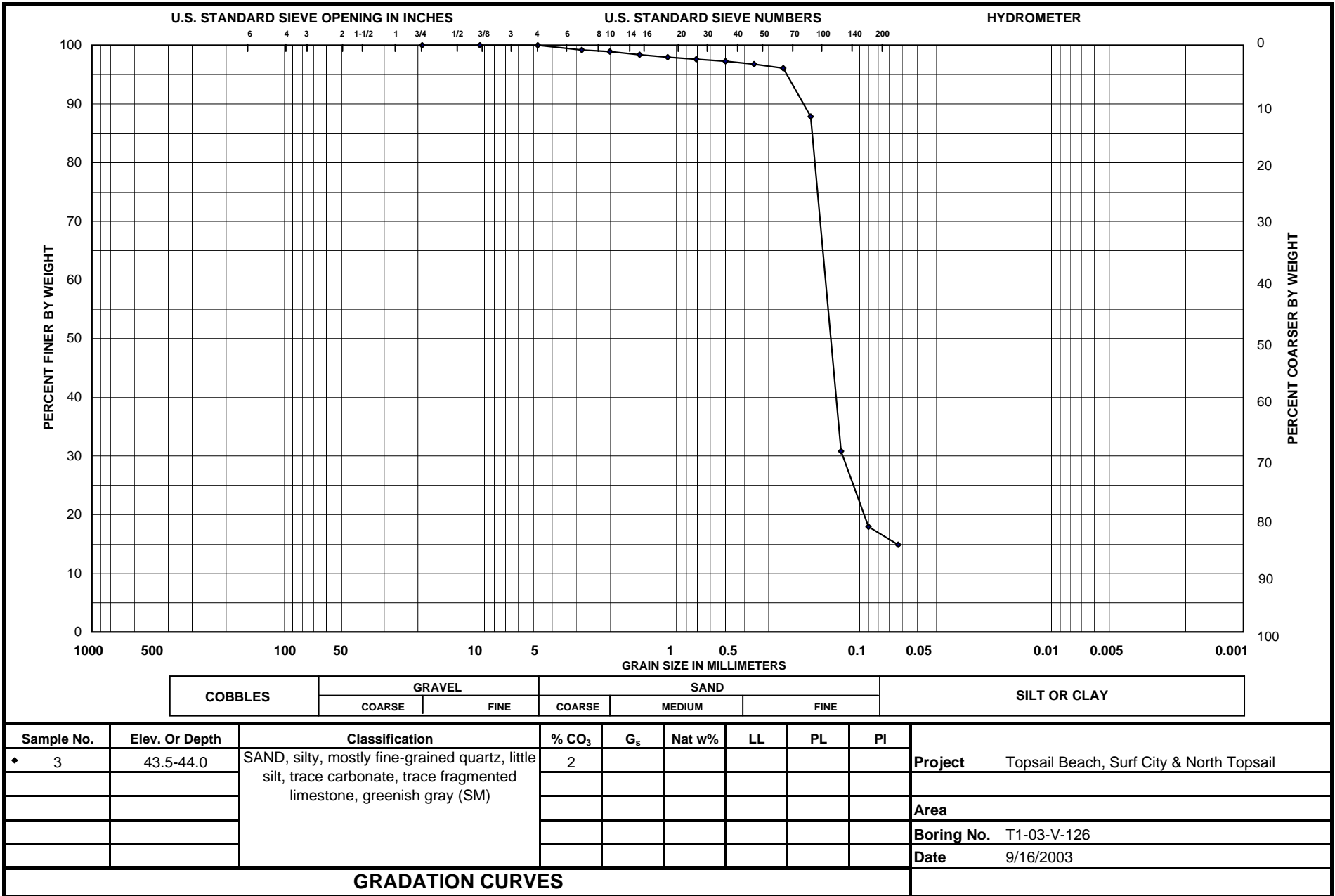
### GRAIN SIZE AND VISUAL SHELL CONTENT

Project:	<b>Topsail Beach, Surf City &amp; North Topsail</b>	Depth:	<b>43.5-44.0</b>
Project No.:	<b>1584-01-40</b>	Date:	<b>9/16/2003</b>
Boring No.:	<b>T1-03-V-126</b>		
Sample No.:	<b>3</b>		
Description:	<b>SAND, silty, mostly fine-grained quartz, little silt, trace carbonate, trace fragmented limestone, greenish gray (SM)</b>		

Tare Weight, (g):	<b>50.31</b>	
Dry Wt. Before Washing (g):	<b>151.09</b>	(with tare)
Dry Weight After Washing (g):	<b>136.69</b>	(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	0.80	99.21	20	0.16
#10	2.000	0.30	98.91	20	0.06
#14	1.400	0.54	98.37	20	0.11
#18	1.000	0.42	97.96	20	0.08
#25	0.710	0.34	97.62	30	0.10
#35	0.500	0.36	97.26	10	0.04
#45	0.355	0.48	96.79	10	0.05
#60	0.250	0.71	96.08	5	0.04
#80	0.180	8.28	87.86	2	0.17
#120	0.125	57.51	30.80	1	0.58
#170	0.090	12.96	17.94	1	0.13
#230	0.063	3.11	14.85	1	0.03

**Total Shell Content:** **2** %



**GRADATION CURVES**





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## VISUAL SHELL CONTENT

### GRAIN SIZE AND VISUAL SHELL CONTENT

Project:	<b>Topsail Beach, Surf City &amp; North Topsail</b>	Depth:	<b>45.5-46.0</b>
Project No.:	<b>1584-01-40</b>	Date:	<b>9/16/2003</b>
Boring No.:	<b>T1-03-V-126</b>		
Sample No.:	<b>4</b>		
Description:	<b>SAND, poorly-graded with silt, mostly fine-grained quartz, few silt, trace carbonate, greenish gray (SP-SM)</b>		

Tare Weight, (g):	<b>50.20</b>	
Dry Wt. Before Washing (g):	<b>153.78</b>	(with tare)
Dry Weight After Washing (g):	<b>142.85</b>	(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	99.77	100	0.24
#10	2.000	0.15	99.62	100	0.15
#14	1.400	0.16	99.47	100	0.16
#18	1.000	0.16	99.31	100	0.16
#25	0.710	0.18	99.14	70	0.13
#35	0.500	0.23	98.92	60	0.14
#45	0.355	0.43	98.50	30	0.13
#60	0.250	0.81	97.72	10	0.08
#80	0.180	33.53	65.35	2	0.67
#120	0.125	46.29	20.66	1	0.46
#170	0.090	6.76	14.13	1	0.07
#230	0.063	3.00	11.24	1	0.03

**Total Shell Content:** **2** %





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## VISUAL SHELL CONTENT

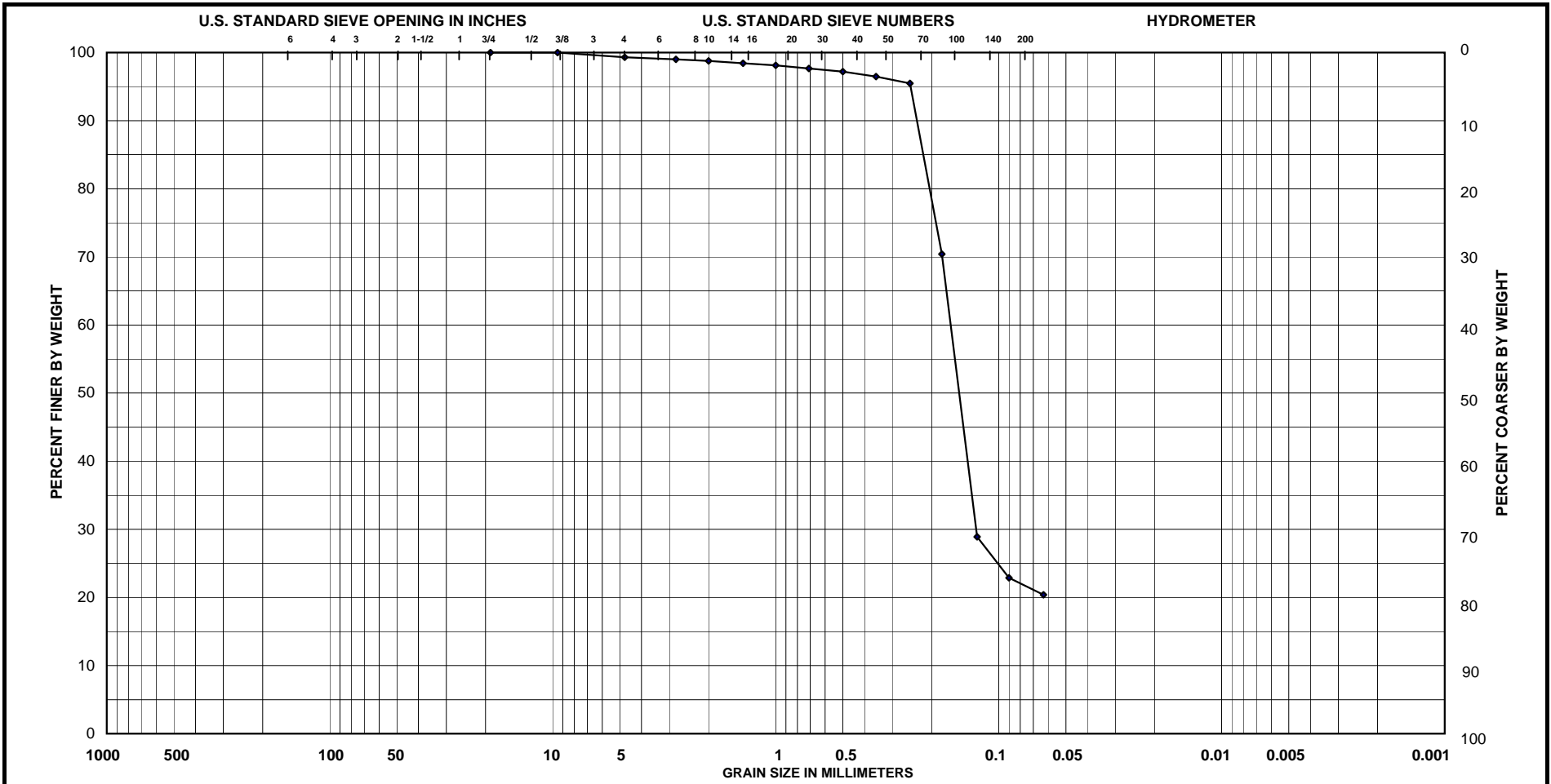
### GRAIN SIZE AND VISUAL SHELL CONTENT

Project:	<b>Topsail Beach, Surf City &amp; North Topsail</b>	Depth:	<b>47.5-48.0</b>
Project No.:	<b>1584-01-40</b>	Date:	<b>9/16/2003</b>
Boring No.:	<b>T1-03-V-126</b>		
Sample No.:	<b>5</b>		
Description:	<b>SAND, silty, mostly fine-grained quartz, little silt, trace carbonate, trace fragmented limestone, trace organic matter, olive (SM)</b>		

Tare Weight, (g):	<b>50.18</b>	
Dry Wt. Before Washing (g):	<b>178.18</b>	(with tare)
Dry Weight After Washing (g):	<b>152.63</b>	(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	0.87	99.32	0	0.00
#7	2.800	0.43	98.98	0	0.00
#10	2.000	0.27	98.77	0	0.00
#14	1.400	0.45	98.42	0	0.00
#18	1.000	0.40	98.11	0	0.00
#25	0.710	0.56	97.67	5	0.03
#35	0.500	0.60	97.20	5	0.03
#45	0.355	0.91	96.49	2	0.02
#60	0.250	1.32	95.46	1	0.01
#80	0.180	32.06	70.41	1	0.32
#120	0.125	53.12	28.91	1	0.53
#170	0.090	7.70	22.90	1	0.08
#230	0.063	3.22	20.38	1	0.03

**Total Shell Content:** **1** %



COBBLES	GRAVEL		SAND			SILT OR CLAY
	COARSE	FINE	COARSE	MEDIUM	FINE	

Sample No.	Elev. Or Depth	Classification	% CO <sub>3</sub>	G <sub>s</sub>	Nat w%	LL	PL	PI	Project
5	47.5-48.0	SAND, silty, mostly fine-grained quartz, little silt, trace carbonate, trace fragmented limestone, trace organic matter, olive (SM)	1						Topsail Beach, Surf City & North Topsail
									Area
									Boring No. T1-03-V-126
									Date 9/16/2003

**GRADATION CURVES**



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## VISUAL SHELL CONTENT

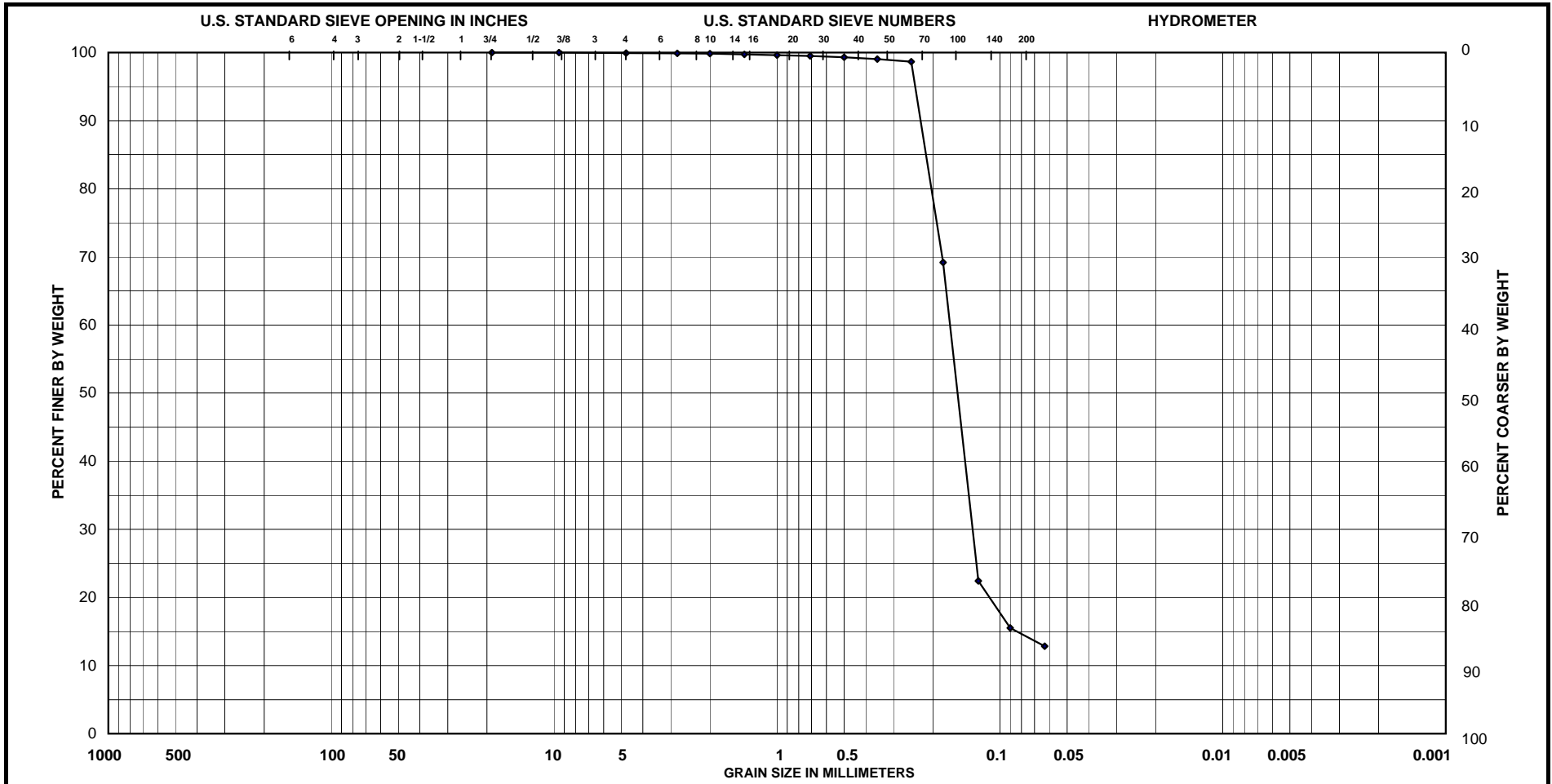
### GRAIN SIZE AND VISUAL SHELL CONTENT

Project:	<b>Topsail Beach, Surf City &amp; North Topsail</b>	Depth:	<b>49.2-49.7</b>
Project No.:	<b>1584-01-40</b>	Date:	<b>9/16/2003</b>
Boring No.:	<b>T1-03-V-126</b>		
Sample No.:	<b>6</b>		
Description:	<b>SAND, poorly-graded with silt, mostly fine-grained quartz, few silt, trace carbonate, trace organic matter, dark greenish gray (SP-SM)</b>		

Tare Weight, (g):	<b>50.78</b>	
Dry Wt. Before Washing (g):	<b>182.74</b>	(with tare)
Dry Weight After Washing (g):	<b>166.27</b>	(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	0.10	99.92	100	0.10
#7	2.800	0.04	99.89	100	0.04
#10	2.000	0.08	99.83	100	0.08
#14	1.400	0.15	99.72	100	0.15
#18	1.000	0.13	99.62	100	0.13
#25	0.710	0.15	99.51	80	0.12
#35	0.500	0.24	99.33	30	0.07
#45	0.355	0.37	99.05	20	0.07
#60	0.250	0.53	98.64	5	0.03
#80	0.180	38.89	69.17	2	0.78
#120	0.125	61.70	22.42	1	0.62
#170	0.090	9.10	15.52	1	0.09
#230	0.063	3.52	12.85	1	0.04

**Total Shell Content:** **2** %



COBBLES	GRAVEL		SAND			SILT OR CLAY
	COARSE	FINE	COARSE	MEDIUM	FINE	

Sample No.	Elev. Or Depth	Classification	% CO <sub>3</sub>	G <sub>s</sub>	Nat w%	LL	PL	PI	Project Topsail Beach, Surf City & North Topsail  Area  Boring No. T1-03-V-126  Date 9/16/2003
♦ 6	49.2-49.7	SAND, poorly-graded with silt, mostly fine-grained quartz, few silt, trace carbonate, trace organic matter, dark greenish gray (SP-SM)	2						

**GRADATION CURVES**



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## VISUAL SHELL CONTENT

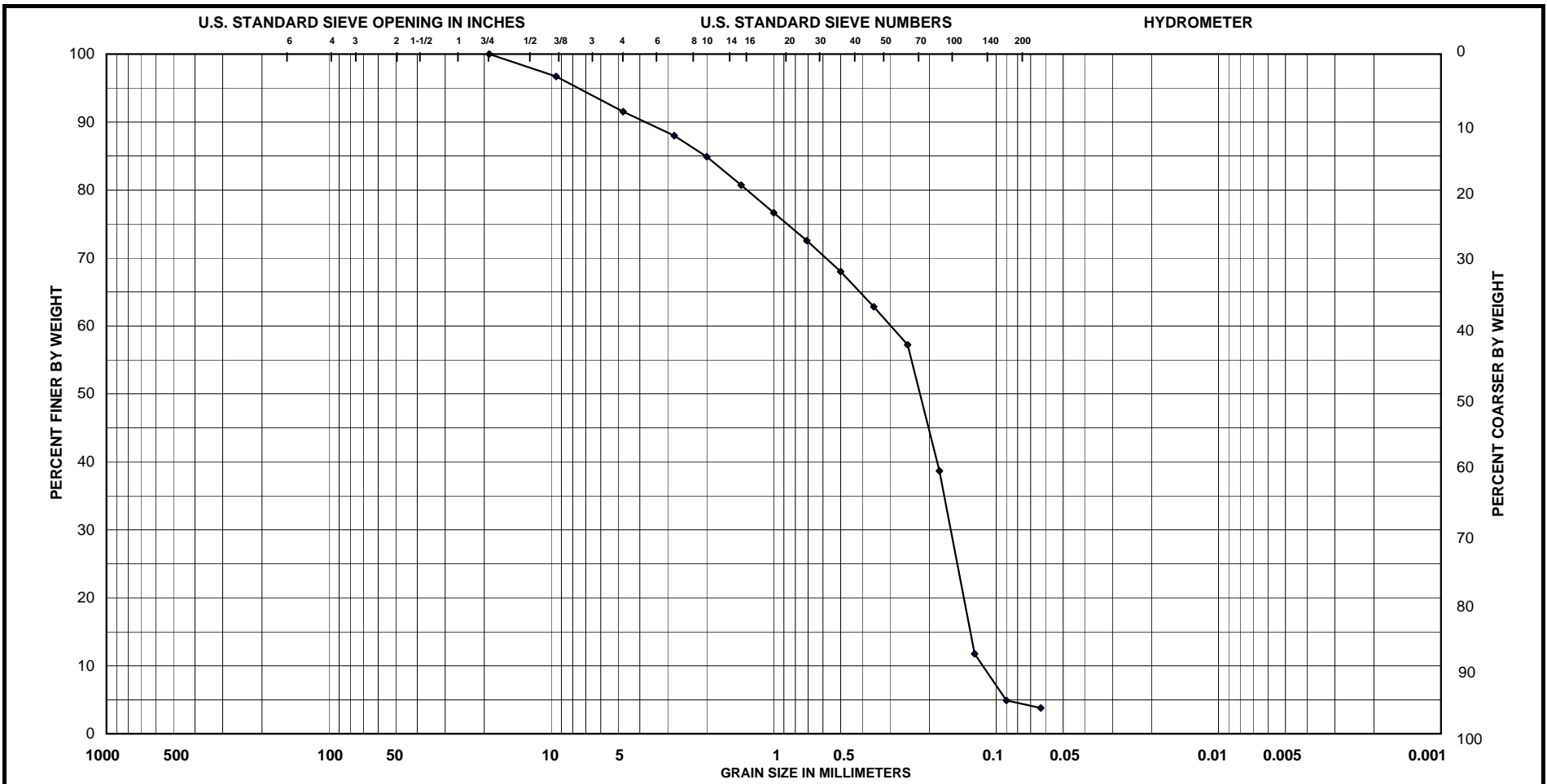
### GRAIN SIZE AND VISUAL SHELL CONTENT

Project:	<b>Topsail Beach, Surf City &amp; North Topsail</b>	Depth:	<b>39.8-40.3</b>
Project No.:	<b>1584-01-40</b>	Date:	<b>9/16/2003</b>
Boring No.:	<b>T1-03-V-127</b>		
Sample No.:	<b>1</b>		
Description:	<b>SAND, poorly-graded, mostly fine-grained quartz, some carbonate, trace fragmented limestone, gray (SP)</b>		

Tare Weight, (g):	<b>50.28</b>	
Dry Wt. Before Washing (g):	<b>180.72</b>	(with tare)
Dry Weight After Washing (g):	<b>176.06</b>	(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	4.30	96.70	100	4.30
#4	4.750	6.74	91.54	100	6.74
#7	2.800	4.61	88.00	100	4.61
#10	2.000	4.04	84.90	95	3.84
#14	1.400	5.44	80.73	95	5.17
#18	1.000	5.31	76.66	70	3.72
#25	0.710	5.34	72.57	50	2.67
#35	0.500	5.96	68.00	30	1.79
#45	0.355	6.77	62.81	20	1.35
#60	0.250	7.30	57.21	5	0.37
#80	0.180	24.19	38.67	5	1.21
#120	0.125	35.09	11.77	1	0.35
#170	0.090	8.93	4.92	1	0.09
#230	0.063	1.48	3.79	1	0.01

**Total Shell Content:** **28** %



COBBLES	GRAVEL		SAND			SILT OR CLAY
	COARSE	FINE	COARSE	MEDIUM	FINE	

Sample No.	Elev. Or Depth	Classification	% CO <sub>3</sub>	G <sub>s</sub>	Nat w%	LL	PL	PI	Project
♦ 1	39.8-40.3	SAND, poorly-graded, mostly fine-grained quartz, some carbonate, trace fragmented limestone, gray (SP)	28						Topsail Beach, Surf City & North Topsail
									Area
									Boring No. T1-03-V-127
									Date 9/16/2003

**GRADATION CURVES**





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## VISUAL SHELL CONTENT

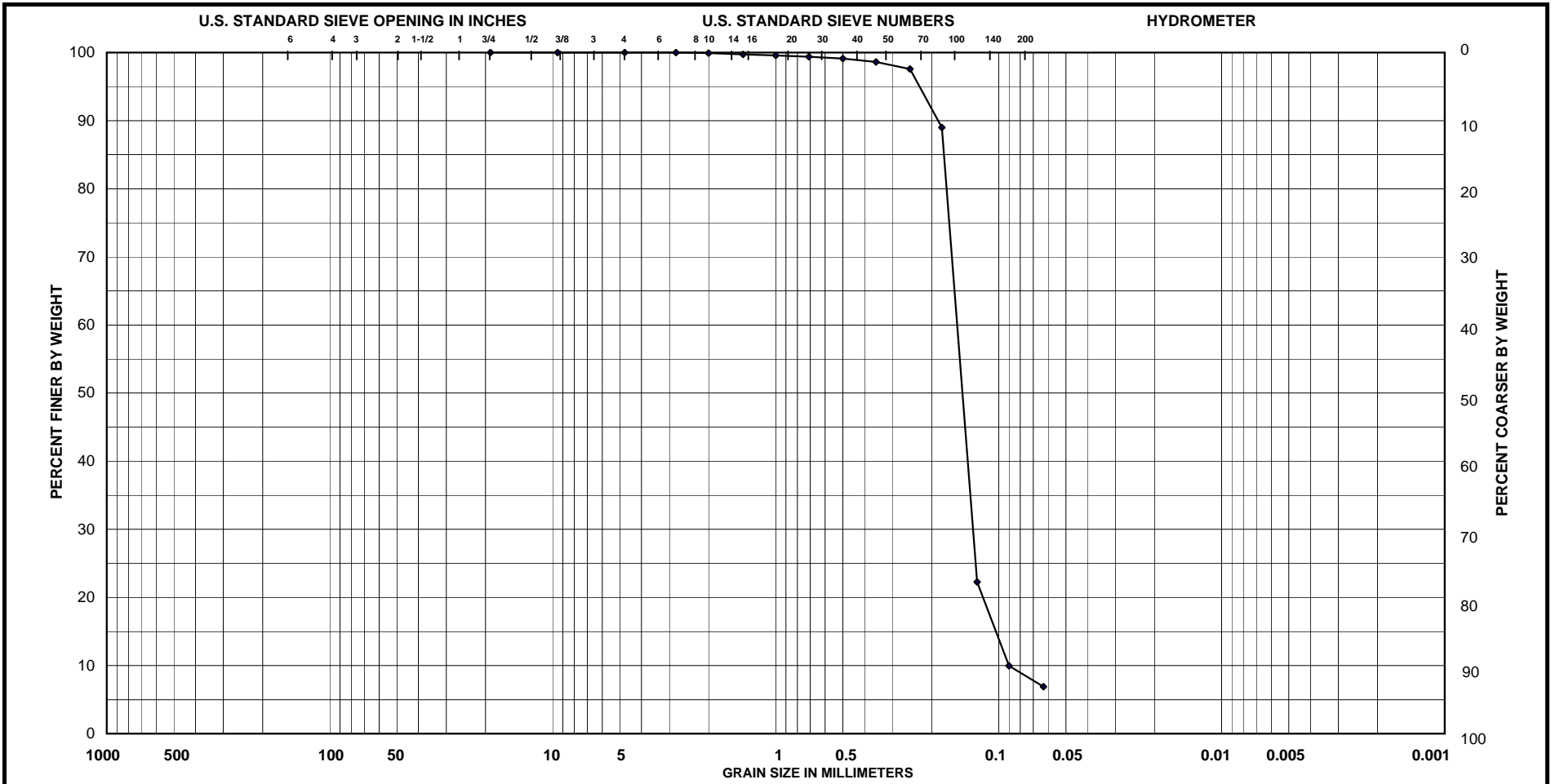
### GRAIN SIZE AND VISUAL SHELL CONTENT

Project:	<b>Topsail Beach, Surf City &amp; North Topsail</b>	Depth:	<b>42.3-42.8</b>
Project No.:	<b>1584-01-40</b>	Date:	<b>9/18/2003</b>
Boring No.:	<b>T1-03-V-127</b>		
Sample No.:	<b>2</b>		
Description:	<b>SAND, poorly-graded with silt, mostly fine-grained quartz, few silt, trace carbonate, trace fragmented limestone, dark greenish gray (SP-</b>		

Tare Weight, (g):	<b>50.17</b>	
Dry Wt. Before Washing (g):	<b>161.04</b>	(with tare)
Dry Weight After Washing (g):	<b>153.83</b>	(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	0.09	99.92	20	0.02
#14	1.400	0.20	99.74	70	0.14
#18	1.000	0.17	99.59	50	0.09
#25	0.710	0.24	99.37	50	0.12
#35	0.500	0.26	99.13	20	0.05
#45	0.355	0.57	98.62	5	0.03
#60	0.250	1.14	97.59	5	0.06
#80	0.180	9.52	89.01	1	0.10
#120	0.125	74.00	22.26	1	0.74
#170	0.090	13.65	9.95	1	0.14
#230	0.063	3.37	6.91	1	0.03

**Total Shell Content:** **1** %



COBBLES	GRAVEL		SAND			SILT OR CLAY
	COARSE	FINE	COARSE	MEDIUM	FINE	

Sample No.	Elev. Or Depth	Classification	% CO <sub>3</sub>	G <sub>s</sub>	Nat w%	LL	PL	PI	Project	
♦ 2	42.3-42.8	SAND, poorly-graded with silt, mostly fine-grained quartz, few silt, trace carbonate, trace fragmented limestone, dark greenish gray (SP-SM)	1						Topsail Beach, Surf City & North Topsail	
			Area							
			Boring No. T1-03-V-127							
			Date 9/18/2003							

**GRADATION CURVES**



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## VISUAL SHELL CONTENT

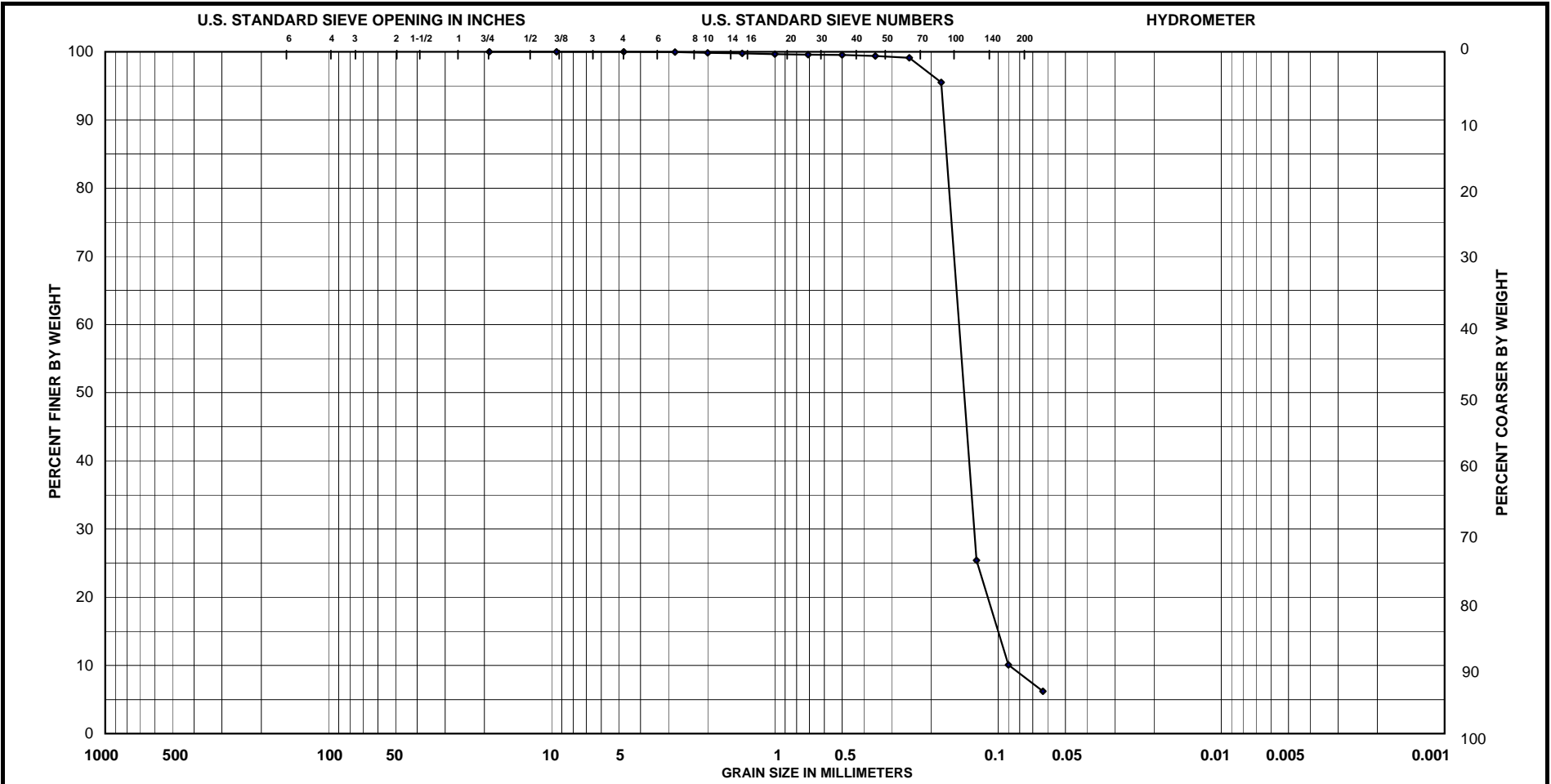
### GRAIN SIZE AND VISUAL SHELL CONTENT

<b>Project:</b>	<b>Topsail Beach, Surf City &amp; North Topsail</b>	<b>Depth:</b>	<b>44.0-44.5</b>
<b>Project No.:</b>	<b>1584-01-40</b>	<b>Date:</b>	<b>9/18/2003</b>
<b>Boring No.:</b>	<b>T1-03-V-127</b>		
<b>Sample No.:</b>	<b>3</b>		
<b>Description:</b>	<b>SAND, poorly-graded with silt, mostly fine-grained quartz, few silt, trace carbonate, trace fragmented limestone, greenish gray (SP-SM)</b>		

Tare Weight, (g):	49.95	
Dry Wt. Before Washing (g):	158.26	(with tare)
Dry Weight After Washing (g):	151.79	(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	0.03	99.97	100	0.03
#10	2.000	0.14	99.84	50	0.07
#14	1.400	0.09	99.76	50	0.05
#18	1.000	0.11	99.66	50	0.06
#25	0.710	0.09	99.58	50	0.05
#35	0.500	0.05	99.53	30	0.02
#45	0.355	0.14	99.40	20	0.03
#60	0.250	0.30	99.12	10	0.03
#80	0.180	3.92	95.50	2	0.08
#120	0.125	75.90	25.43	1	0.76
#170	0.090	16.64	10.06	1	0.17
#230	0.063	4.17	6.21	1	0.04

**Total Shell Content:** 1 %



COBBLES	GRAVEL		SAND			SILT OR CLAY
	COARSE	FINE	COARSE	MEDIUM	FINE	

Sample No.	Elev. Or Depth	Classification	% CO <sub>3</sub>	G <sub>s</sub>	Nat w%	LL	PL	PI
3	44.0-44.5	SAND, poorly-graded with silt, mostly fine-grained quartz, few silt, trace carbonate, trace fragmented limestone, greenish gray (SP-SM)	1					

<b>Project</b>	Topsail Beach, Surf City & North Topsail
<b>Area</b>	
<b>Boring No.</b>	T1-03-V-127
<b>Date</b>	9/18/2003

**GRADATION CURVES**



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## VISUAL SHELL CONTENT

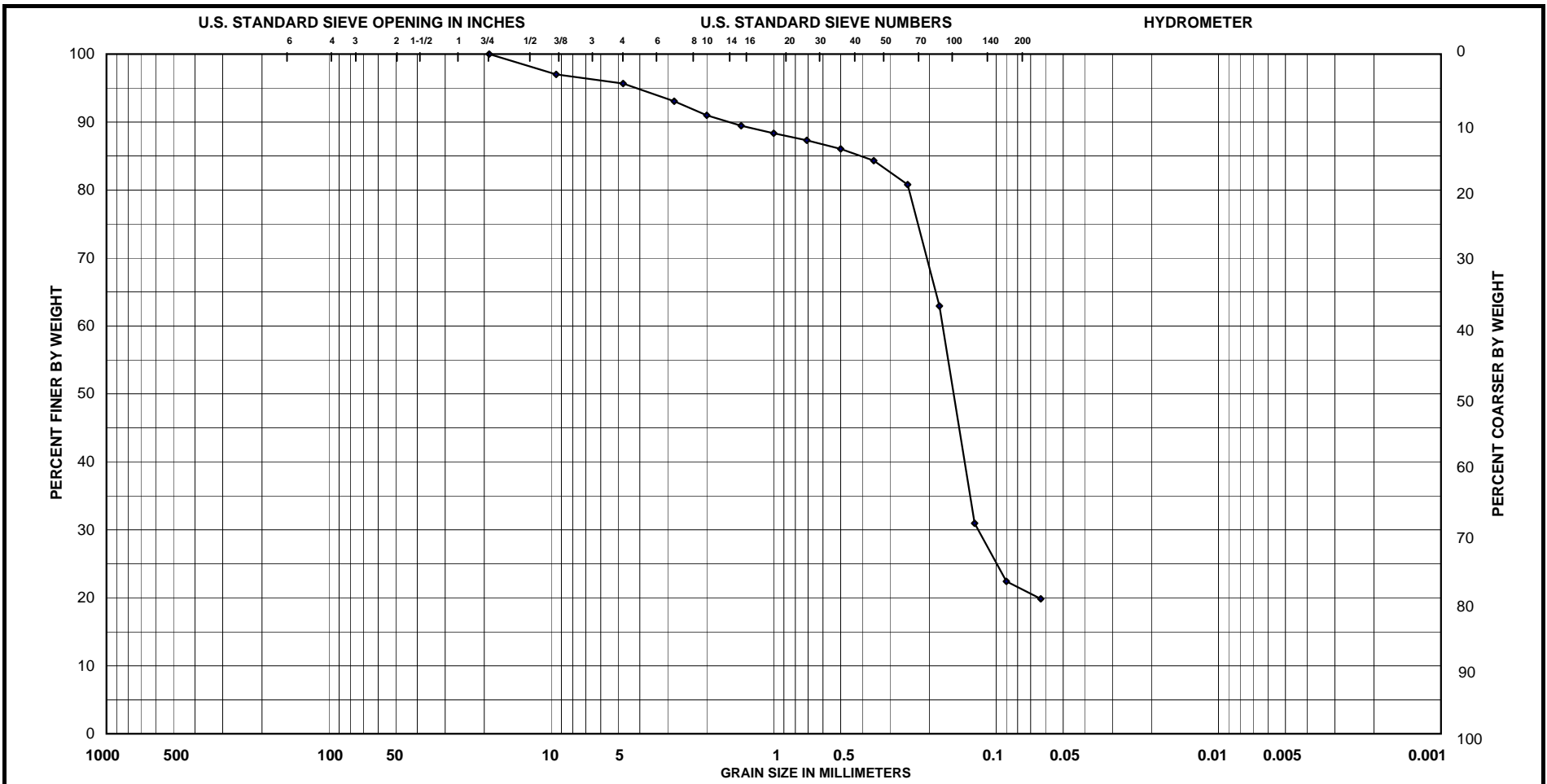
### GRAIN SIZE AND VISUAL SHELL CONTENT

Project:	<b>Topsail Beach, Surf City &amp; North Topsail</b>	Depth:	<b>43.8-44.3</b>
Project No.:	<b>1584-01-40</b>	Date:	<b>9/18/2003</b>
Boring No.:	<b>T1-03-V-128</b>		
Sample No.:	<b>1</b>		
Description:	<b>SAND, clayey, mostly fine-grained quartz, little carbonate, little clay, trace fragmented limestone, dark gray (SC)</b>		

Tare Weight, (g):	<b>49.80</b>	
Dry Wt. Before Washing (g):	<b>139.88</b>	(with tare)
Dry Weight After Washing (g):	<b>122.49</b>	(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	2.70	97.00	100	2.70
#4	4.750	1.21	95.66	100	1.21
#7	2.800	2.34	93.06	95	2.22
#10	2.000	1.87	90.99	90	1.68
#14	1.400	1.37	89.46	80	1.10
#18	1.000	1.02	88.33	80	0.82
#25	0.710	0.91	87.32	50	0.46
#35	0.500	1.14	86.06	30	0.34
#45	0.355	1.57	84.31	20	0.31
#60	0.250	3.17	80.79	10	0.32
#80	0.180	16.08	62.94	5	0.80
#120	0.125	28.79	30.98	1	0.29
#170	0.090	7.72	22.41	1	0.08
#230	0.063	2.31	19.85	1	0.02

**Total Shell Content:** **14** %



COBBLES	GRAVEL		SAND			SILT OR CLAY
	COARSE	FINE	COARSE	MEDIUM	FINE	

Sample No.	Elev. Or Depth	Classification	% CO <sub>3</sub>	G <sub>s</sub>	Nat w%	LL	PL	PI	Project
♦ 1	43.8-44.3	SAND, clayey, mostly fine-grained quartz, little carbonate, little clay, trace fragmented limestone, dark gray (SC)	14						Topsail Beach, Surf City & North Topsail
									Area
									Boring No. T1-03-V-128
									Date 9/18/2003

**GRADATION CURVES**



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## VISUAL SHELL CONTENT

### GRAIN SIZE AND VISUAL SHELL CONTENT

Project:	<b>Topsail Beach, Surf City &amp; North Topsail</b>	Depth:	<b>45.6-46.1</b>
Project No.:	<b>1584-01-40</b>	Date:	<b>9/18/2003</b>
Boring No.:	<b>T1-03-V-128</b>		
Sample No.:	<b>2</b>		
Description:	<b>SAND, poorly-graded with silt, mostly fine-grained quartz, few silt, trace carbonate, dark gray (SP-SM)</b>		

Tare Weight, (g):	<b>50.46</b>	
Dry Wt. Before Washing (g):	<b>189.32</b>	(with tare)
Dry Weight After Washing (g):	<b>182.85</b>	(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	0.19	99.86	100	0.19
#10	2.000	0.23	99.70	70	0.16
#14	1.400	0.37	99.43	80	0.30
#18	1.000	0.24	99.26	90	0.22
#25	0.710	0.21	99.11	90	0.19
#35	0.500	0.33	98.87	80	0.26
#45	0.355	0.93	98.20	30	0.28
#60	0.250	8.69	91.94	5	0.43
#80	0.180	70.20	41.39	1	0.70
#120	0.125	30.78	19.22	1	0.31
#170	0.090	7.53	13.80	1	0.08
#230	0.063	2.09	12.29	1	0.02

**Total Shell Content:** **2** %







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## VISUAL SHELL CONTENT

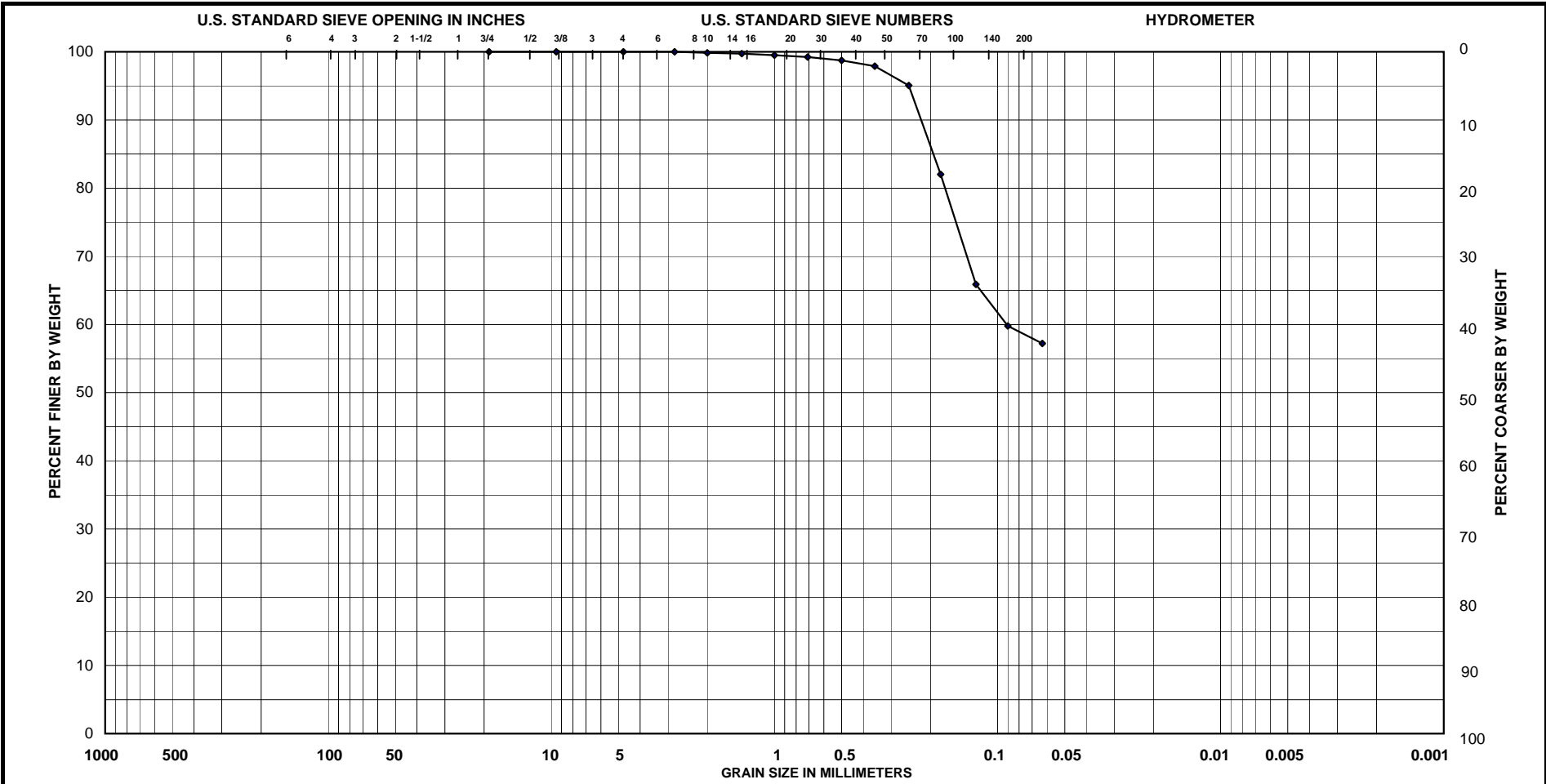
### GRAIN SIZE AND VISUAL SHELL CONTENT

Project:	<b>Topsail Beach, Surf City &amp; North Topsail</b>	Depth:	<b>47.3-47.8</b>
Project No.:	<b>1584-01-40</b>	Date:	<b>9/18/2003</b>
Boring No.:	<b>T1-03-V-128</b>		
Sample No.:	<b>3</b>		
Description:	<b>CLAY, inorganic-H, some fine-grained quartz sand, trace carbonate, trace fragmented limestone, very dark gray (CH)</b>		

Tare Weight, (g):	<b>50.35</b>	
Dry Wt. Before Washing (g):	<b>123.34</b>	(with tare)
Dry Weight After Washing (g):	<b>81.89</b>	(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	0.12	99.84	50	0.06
#14	1.400	0.08	99.73	50	0.04
#18	1.000	0.15	99.52	60	0.09
#25	0.710	0.21	99.23	70	0.15
#35	0.500	0.36	98.74	80	0.29
#45	0.355	0.62	97.89	30	0.19
#60	0.250	2.07	95.05	10	0.21
#80	0.180	9.52	82.01	2	0.19
#120	0.125	11.76	65.90	1	0.12
#170	0.090	4.46	59.79	1	0.04
#230	0.063	1.87	57.23	1	0.02

**Total Shell Content:** **2** %



COBBLES	GRAVEL		SAND			SILT OR CLAY
	COARSE	FINE	COARSE	MEDIUM	FINE	

Sample No.	Elev. Or Depth	Classification	% CO <sub>3</sub>	G <sub>s</sub>	Nat w%	LL	PL	PI	Project	
♦ 3	47.3-47.8	CLAY, inorganic-H, some fine-grained quartz sand, trace carbonate, trace fragmented limestone, very dark gray (CH)	2						Topsail Beach, Surf City & North Topsail	
									Area	
									Boring No. T1-03-V-128	
									Date 9/18/2003	

**GRADATION CURVES**



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## VISUAL SHELL CONTENT

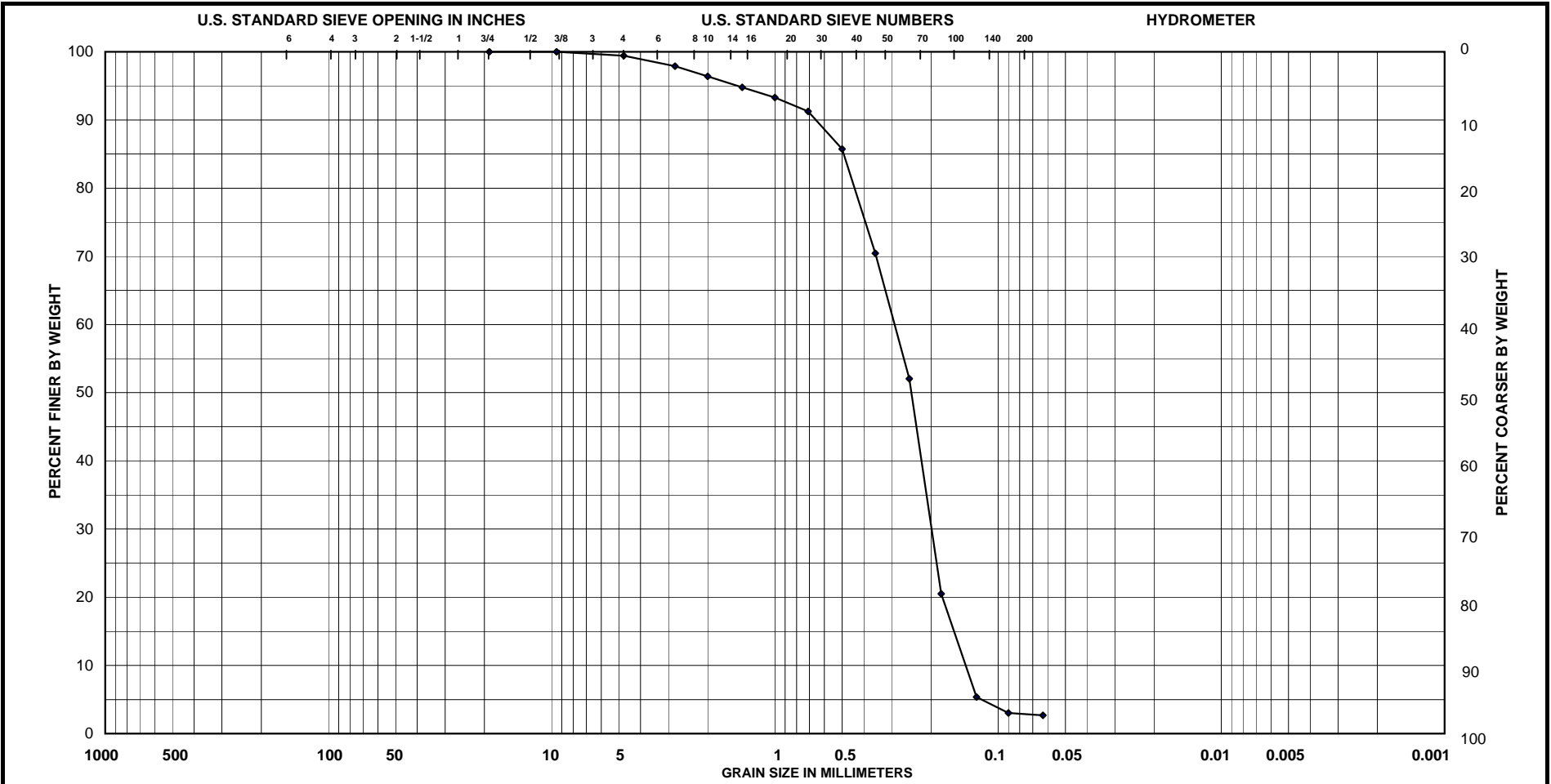
### GRAIN SIZE AND VISUAL SHELL CONTENT

Project:	<b>Topsail Beach, Surf City &amp; North Topsail</b>	Depth:	<b>50.1-50.6</b>
Project No.:	<b>1584-01-40</b>	Date:	<b>9/18/2003</b>
Boring No.:	<b>T1-03-V-128</b>		
Sample No.:	<b>4</b>		
Description:	<b>SAND, poorly-graded, mostly fine-grained quartz, few carbonate, gray (SP)</b>		

Tare Weight, (g):	<b>50.30</b>	
Dry Wt. Before Washing (g):	<b>168.47</b>	(with tare)
Dry Weight After Washing (g):	<b>166.04</b>	(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	0.70	99.41	100	0.70
#7	2.800	1.81	97.88	100	1.81
#10	2.000	1.73	96.41	100	1.73
#14	1.400	1.90	94.80	90	1.71
#18	1.000	1.79	93.29	80	1.43
#25	0.710	2.40	91.26	50	1.20
#35	0.500	6.52	85.74	20	1.30
#45	0.355	18.08	70.44	5	0.90
#60	0.250	21.75	52.04	2	0.44
#80	0.180	37.25	20.51	1	0.37
#120	0.125	17.90	5.37	1	0.18
#170	0.090	2.78	3.01	1	0.03
#230	0.063	0.40	2.67	1	0.00

**Total Shell Content:** **10** %



COBBLES	GRAVEL		SAND			SILT OR CLAY
	COARSE	FINE	COARSE	MEDIUM	FINE	

Sample No.	Elev. Or Depth	Classification	% CO <sub>3</sub>	G <sub>s</sub>	Nat w%	LL	PL	PI	Project	
♦ 4	50.1-50.6	SAND, poorly-graded, mostly fine-grained quartz, few carbonate, gray (SP)	10						Topsail Beach, Surf City & North Topsail	
									Area	
									Boring No. T1-03-V-128	
									Date 9/18/2003	

**GRADATION CURVES**



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## VISUAL SHELL CONTENT

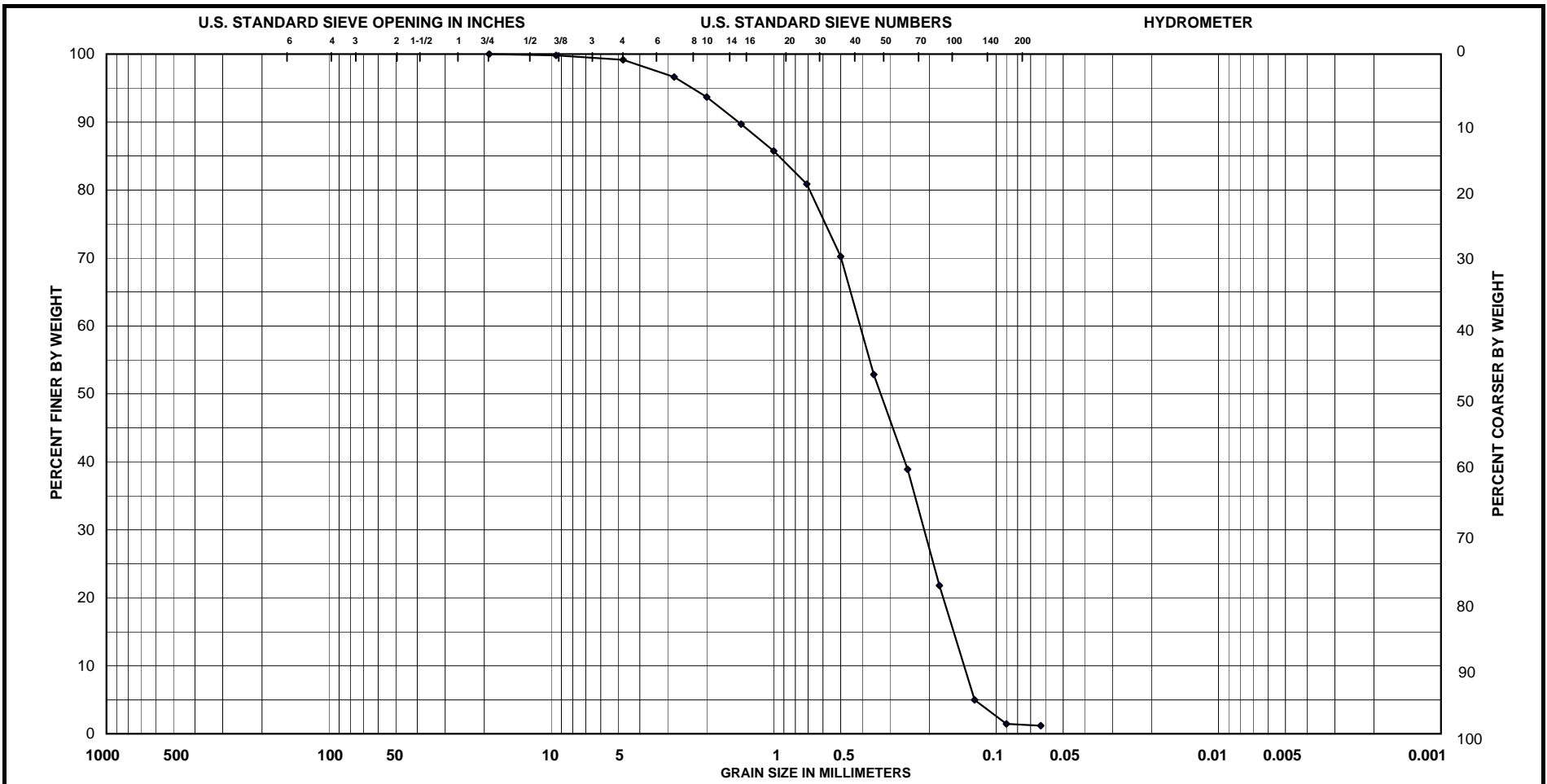
### GRAIN SIZE AND VISUAL SHELL CONTENT

Project:	<b>Topsail Beach, Surf City &amp; North Topsail</b>	Depth:	<b>40.9-41.4</b>
Project No.:	<b>1584-01-40</b>	Date:	<b>9/18/2003</b>
Boring No.:	<b>T1-03-V-129</b>		
Sample No.:	<b>1</b>		
Description:	<b>SAND, poorly-graded, mostly fine-grained quartz, some carbonate, brownish gray (SP)</b>		

Tare Weight, (g):	<b>50.24</b>	
Dry Wt. Before Washing (g):	<b>163.73</b>	(with tare)
Dry Weight After Washing (g):	<b>162.81</b>	(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	0.21	99.81	100	0.21
#4	4.750	0.76	99.15	100	0.76
#7	2.800	2.86	96.63	100	2.86
#10	2.000	3.34	93.68	100	3.34
#14	1.400	4.54	89.68	100	4.54
#18	1.000	4.46	85.75	100	4.46
#25	0.710	5.53	80.88	80	4.42
#35	0.500	12.08	70.24	30	3.62
#45	0.355	19.73	52.85	10	1.97
#60	0.250	15.83	38.90	3	0.47
#80	0.180	19.38	21.83	1	0.19
#120	0.125	19.12	4.98	1	0.19
#170	0.090	4.01	1.45	1	0.04
#230	0.063	0.31	1.17	1	0.00

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



COBBLES	GRAVEL		SAND			SILT OR CLAY
	COARSE	FINE	COARSE	MEDIUM	FINE	

Sample No.	Elev. Or Depth	Classification	% CO <sub>3</sub>	G <sub>s</sub>	Nat w%	LL	PL	PI	Project
1	40.9-41.4	SAND, poorly-graded, mostly fine-grained quartz, some carbonate, brownish gray (SP)	24						Topsail Beach, Surf City & North Topsail
									Area
									Boring No. T1-03-V-129
									Date 9/18/2003

**GRADATION CURVES**



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## VISUAL SHELL CONTENT

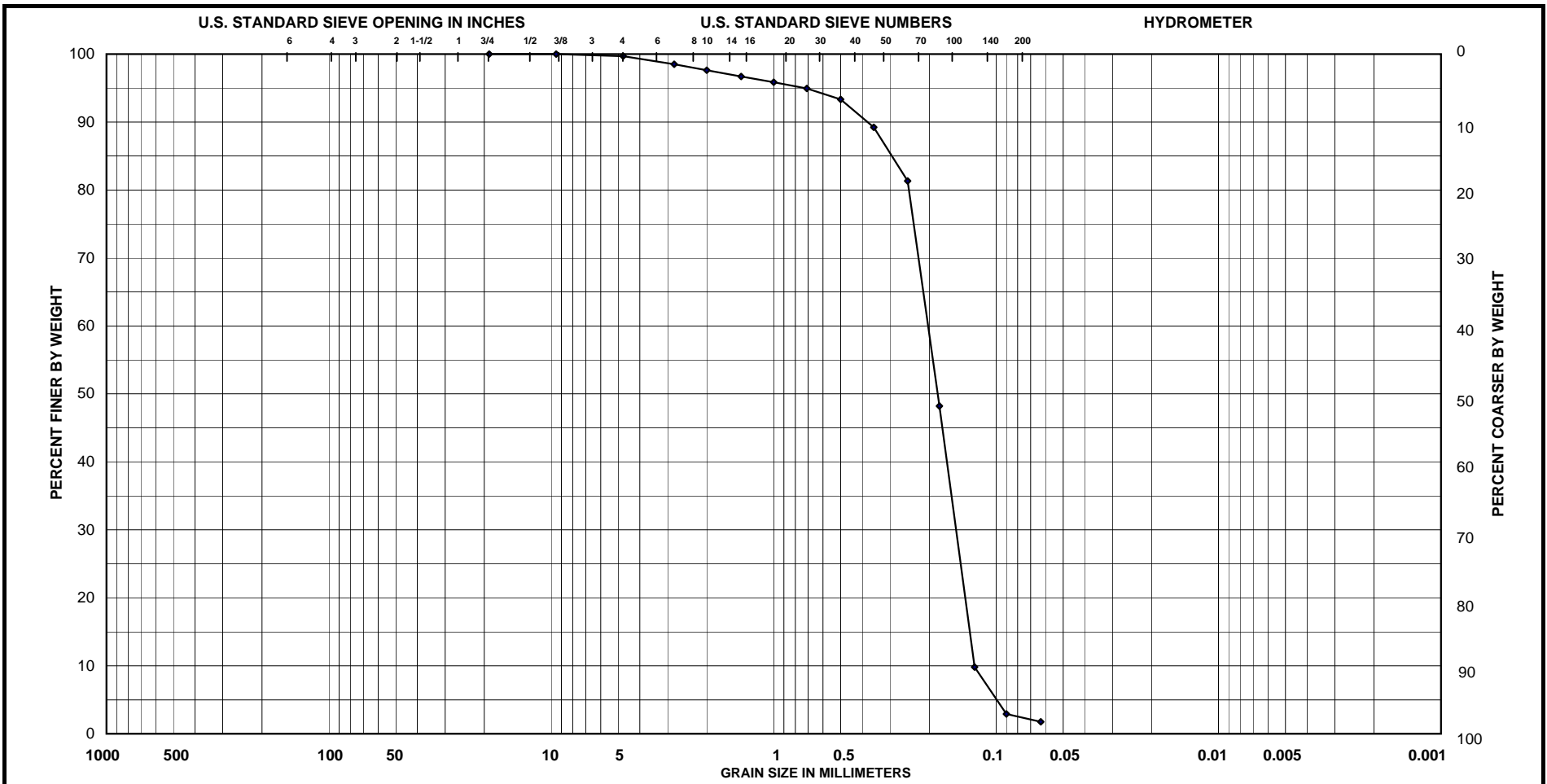
### GRAIN SIZE AND VISUAL SHELL CONTENT

Project:	<b>Topsail Beach, Surf City &amp; North Topsail</b>	Depth:	<b>42.5-43.0</b>
Project No.:	<b>1584-01-40</b>	Date:	<b>9/18/2003</b>
Boring No.:	<b>T1-03-V-129</b>		
Sample No.:	<b>2</b>		
Description:	<b>SAND, poorly-graded, mostly fine-grained quartz, few carbonate, trace fragmented limestone, gray (SP)</b>		

Tare Weight, (g):	<b>48.77</b>	
Dry Wt. Before Washing (g):	<b>169.1</b>	(with tare)
Dry Weight After Washing (g):	<b>167.16</b>	(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	99.68	100	0.39
#7	2.800	1.42	98.50	100	1.42
#10	2.000	1.05	97.62	100	1.05
#14	1.400	1.10	96.71	100	1.10
#18	1.000	1.00	95.88	90	0.90
#25	0.710	1.13	94.94	80	0.90
#35	0.500	1.94	93.33	60	1.16
#45	0.355	4.92	89.24	30	1.48
#60	0.250	9.51	81.33	5	0.48
#80	0.180	39.84	48.23	2	0.80
#120	0.125	46.21	9.82	1	0.46
#170	0.090	8.33	2.90	1	0.08
#230	0.063	1.38	1.75	1	0.01

**Total Shell Content:** **9** %



COBBLES	GRAVEL		SAND			SILT OR CLAY
	COARSE	FINE	COARSE	MEDIUM	FINE	

Sample No.	Elev. Or Depth	Classification	% CO <sub>3</sub>	G <sub>s</sub>	Nat w%	LL	PL	PI	Project
♦ 2	42.5-43.0	SAND, poorly-graded, mostly fine-grained quartz, few carbonate, trace fragmented limestone, gray (SP)	9						Topsail Beach, Surf City & North Topsail
									Area
									Boring No. T1-03-V-129
									Date 9/18/2003

**GRADATION CURVES**





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## VISUAL SHELL CONTENT

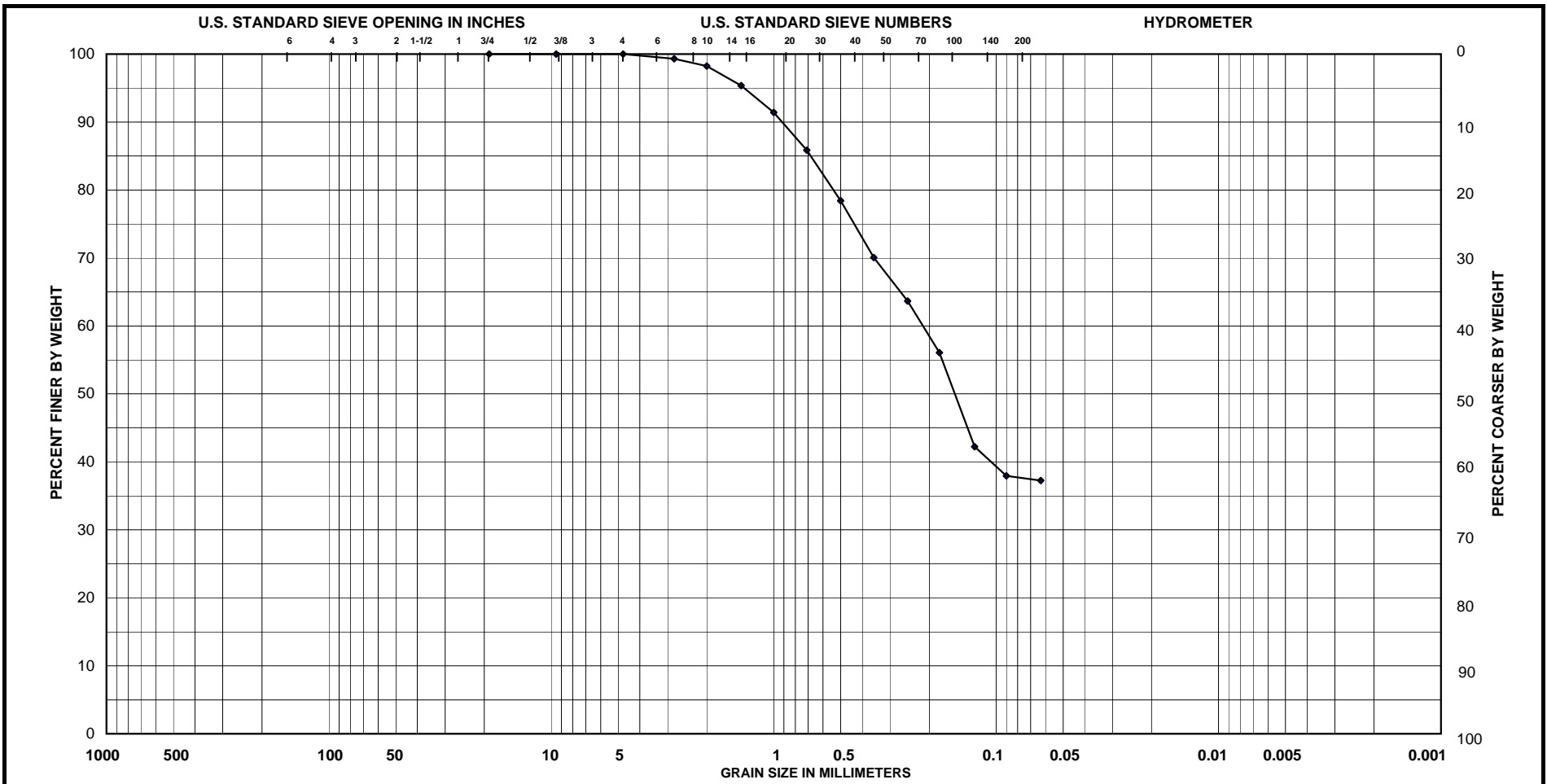
### GRAIN SIZE AND VISUAL SHELL CONTENT

Project:	<b>Topsail Beach, Surf City &amp; North Topsail</b>	Depth:	<b>43.4-43.9</b>
Project No.:	<b>1584-01-40</b>	Date:	<b>9/18/2003</b>
Boring No.:	<b>T1-03-V-129</b>		
Sample No.:	<b>3</b>		
Description:	<b>SAND, clayey, mostly medium to fine-grained quartz, few carbonate, dark gray (SC)</b>		

Tare Weight, (g):	<b>49.51</b>	
Dry Wt. Before Washing (g):	<b>137.07</b>	(with tare)
Dry Weight After Washing (g):	<b>104.88</b>	(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	0.62	99.29	80	0.50
#10	2.000	0.93	98.23	70	0.65
#14	1.400	2.50	95.37	60	1.50
#18	1.000	3.48	91.40	40	1.39
#25	0.710	4.84	85.87	20	0.97
#35	0.500	6.51	78.44	10	0.65
#45	0.355	7.33	70.07	5	0.37
#60	0.250	5.61	63.66	2	0.11
#80	0.180	6.65	56.06	1	0.07
#120	0.125	12.10	42.25	1	0.12
#170	0.090	3.75	37.96	1	0.04
#230	0.063	0.62	37.25	1	0.01

**Total Shell Content:** **7** %



COBBLES	GRAVEL		SAND			SILT OR CLAY
	COARSE	FINE	COARSE	MEDIUM	FINE	

Sample No.	Elev. Or Depth	Classification	% CO <sub>3</sub>	G <sub>s</sub>	Nat w%	LL	PL	PI	Project	
♦ 3	43.4-43.9	SAND, clayey, mostly medium to fine-grained quartz, few carbonate, dark gray (SC)	7						Topsail Beach, Surf City & North Topsail	
									Area	
									Boring No. T1-03-V-129	
									Date 9/18/2003	

**GRADATION CURVES**



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## VISUAL SHELL CONTENT

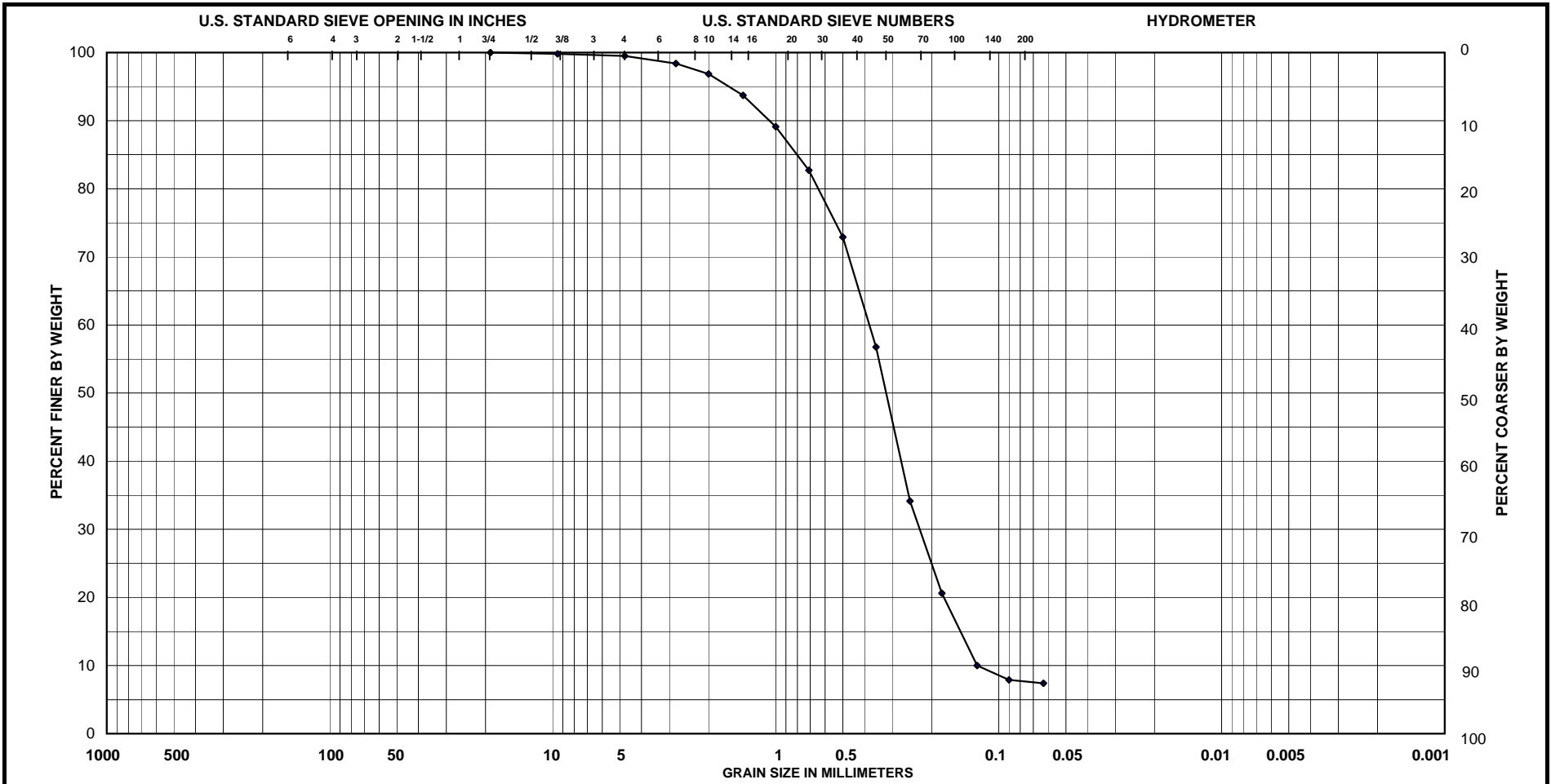
### GRAIN SIZE AND VISUAL SHELL CONTENT

Project:	<b>Topsail Beach, Surf City &amp; North Topsail</b>	Depth:	<b>44.3-44.8</b>
Project No.:	<b>1584-01-40</b>	Date:	<b>9/18/2003</b>
Boring No.:	<b>T1-03-V-129</b>		
Sample No.:	<b>4</b>		
Description:	<b>SAND, poorly-graded with clay, mostly medium to fine-grained quartz, few clay, few carbonate, trace fragmented limestone, trace organic</b>		

Tare Weight, (g):	<b>49.22</b>	
Dry Wt. Before Washing (g):	<b>197.45</b>	(with tare)
Dry Weight After Washing (g):	<b>187.23</b>	(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	0.29	99.80	100	0.29
#4	4.750	0.43	99.51	100	0.43
#7	2.800	1.66	98.39	90	1.49
#10	2.000	2.27	96.86	70	1.59
#14	1.400	4.68	93.71	30	1.40
#18	1.000	6.78	89.13	10	0.68
#25	0.710	9.52	82.71	10	0.95
#35	0.500	14.55	72.89	5	0.73
#45	0.355	23.92	56.76	3	0.72
#60	0.250	33.52	34.14	1	0.34
#80	0.180	20.03	20.63	1	0.20
#120	0.125	15.76	10.00	1	0.16
#170	0.090	3.10	7.91	1	0.03
#230	0.063	0.76	7.39	1	0.01

**Total Shell Content:** **6** %



COBBLES	GRAVEL		SAND			SILT OR CLAY
	COARSE	FINE	COARSE	MEDIUM	FINE	

Sample No.	Elev. Or Depth	Classification	% CO <sub>3</sub>	G <sub>s</sub>	Nat w%	LL	PL	PI	Project	
4	44.3-44.8	SAND, poorly-graded with clay, mostly medium to fine-grained quartz, few clay, few carbonate, trace fragmented limestone, trace organic matter, gray (SP-SC)	6						Topsail Beach, Surf City & North Topsail	
									Area	
									Boring No. T1-03-V-129	
									Date 9/18/2003	

**GRADATION CURVES**



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## VISUAL SHELL CONTENT

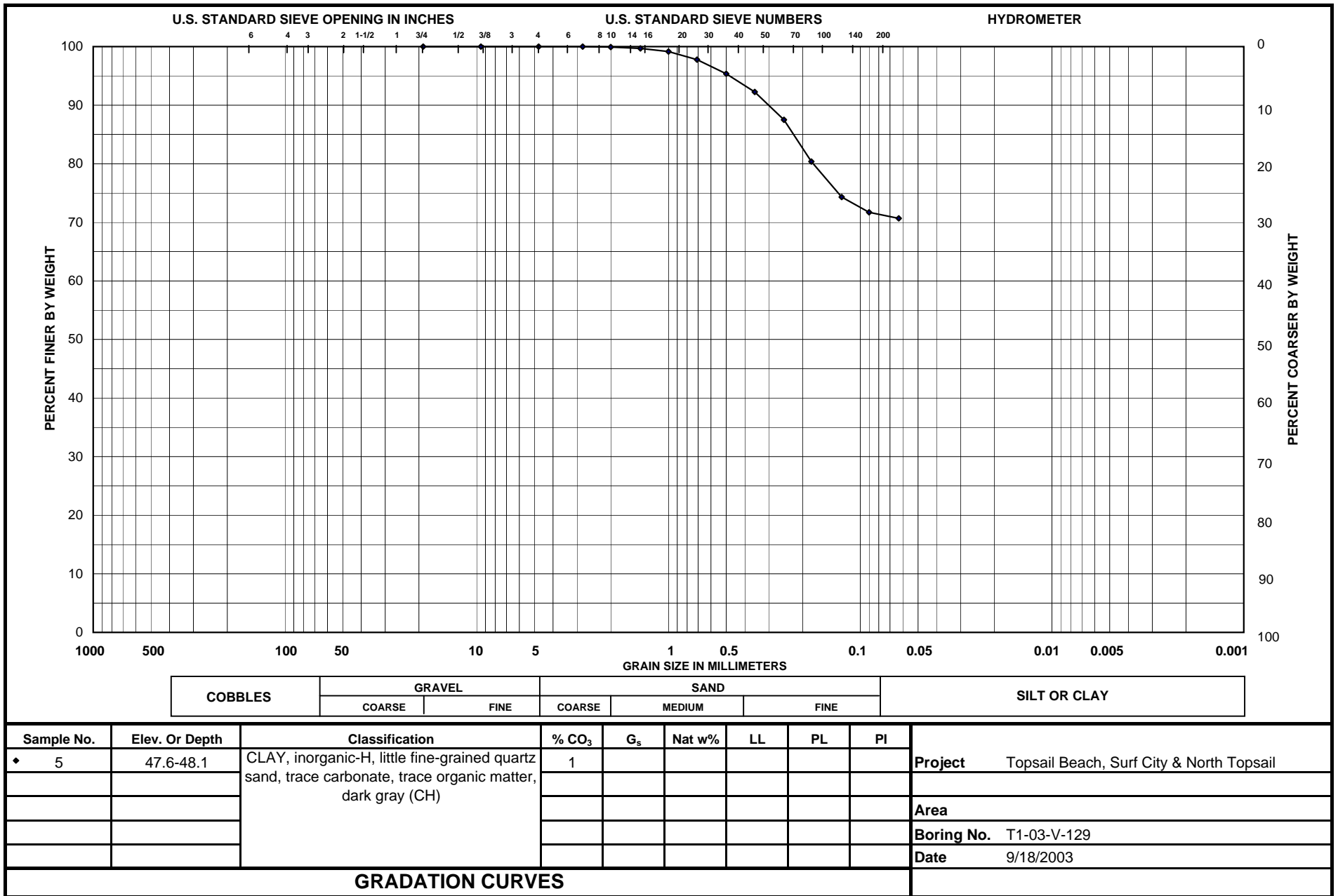
### GRAIN SIZE AND VISUAL SHELL CONTENT

Project:	<b>Topsail Beach, Surf City &amp; North Topsail</b>	Depth:	<b>47.6-48.1</b>
Project No.:	<b>1584-01-40</b>	Date:	<b>9/18/2003</b>
Boring No.:	<b>T1-03-V-129</b>		
Sample No.:	<b>5</b>		
Description:	<b>CLAY, inorganic-H, little fine-grained quartz sand, trace carbonate, trace organic matter, dark gray (CH)</b>		

Tare Weight, (g):	<b>49.66</b>	
Dry Wt. Before Washing (g):	<b>121.45</b>	(with tare)
Dry Weight After Washing (g):	<b>70.88</b>	(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	0.05	99.93	20	0.01
#14	1.400	0.18	99.68	20	0.04
#18	1.000	0.38	99.15	5	0.02
#25	0.710	0.98	97.79	5	0.05
#35	0.500	1.75	95.35	5	0.09
#45	0.355	2.22	92.26	2	0.04
#60	0.250	3.40	87.52	1	0.03
#80	0.180	5.12	80.39	1	0.05
#120	0.125	4.35	74.33	1	0.04
#170	0.090	1.87	71.72	1	0.02
#230	0.063	0.76	70.66	1	0.01

**Total Shell Content:** **1** %





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## VISUAL SHELL CONTENT

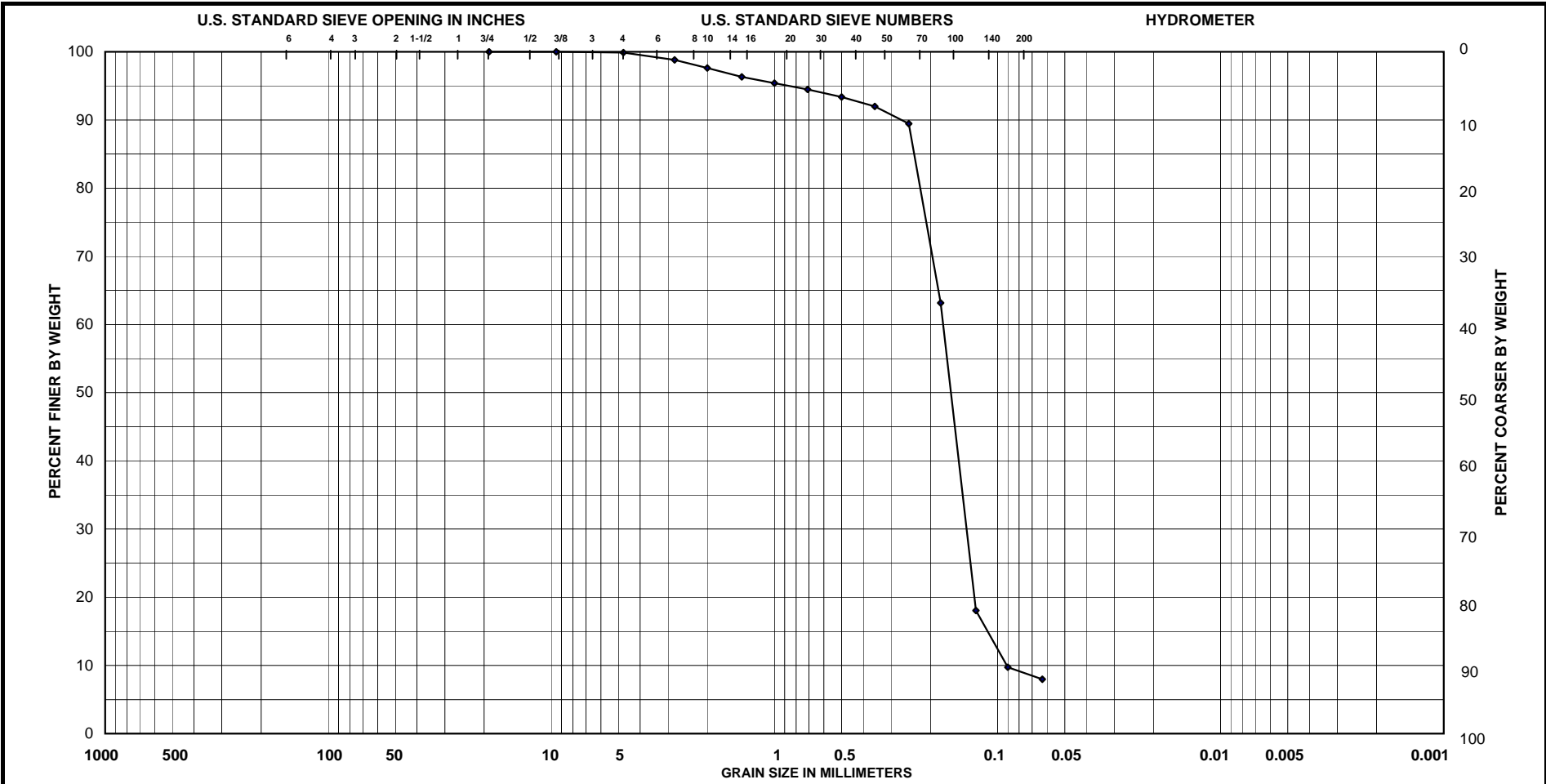
### GRAIN SIZE AND VISUAL SHELL CONTENT

Project:	<b>Topsail Beach, Surf City &amp; North Topsail</b>	Depth:	<b>42.6-43.1</b>
Project No.:	<b>1584-01-40</b>	Date:	<b>9/18/2003</b>
Boring No.:	<b>T1-03-V-130</b>		
Sample No.:	<b>1</b>		
Description:	<b>SAND, poorly-graded with silt, mostly fine-grained quartz, few silt, few carbonate, trace fragmented limestone, greenish gray (SP-SM)</b>		

Tare Weight, (g):	<b>50.00</b>	
Dry Wt. Before Washing (g):	<b>183.61</b>	(with tare)
Dry Weight After Washing (g):	<b>173.01</b>	(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	99.90	100	0.14
#7	2.800	1.46	98.80	100	1.46
#10	2.000	1.56	97.63	80	1.25
#14	1.400	1.75	96.33	80	1.40
#18	1.000	1.26	95.38	70	0.88
#25	0.710	1.23	94.46	60	0.74
#35	0.500	1.44	93.38	40	0.58
#45	0.355	1.87	91.98	30	0.56
#60	0.250	3.35	89.48	20	0.67
#80	0.180	35.15	63.17	2	0.70
#120	0.125	60.29	18.05	1	0.60
#170	0.090	11.11	9.73	1	0.11
#230	0.063	2.34	7.98	1	0.02

**Total Shell Content:** **7** %



COBBLES	GRAVEL		SAND			SILT OR CLAY
	COARSE	FINE	COARSE	MEDIUM	FINE	

Sample No.	Elev. Or Depth	Classification	% CO <sub>3</sub>	G <sub>s</sub>	Nat w%	LL	PL	PI	Project
♦ 1	42.6-43.1	SAND, poorly-graded with silt, mostly fine-grained quartz, few silt, few carbonate, trace fragmented limestone, greenish gray (SP-SM)	7						Topsail Beach, Surf City & North Topsail
									Area
									Boring No. T1-03-V-130
									Date 9/18/2003

**GRADATION CURVES**





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## VISUAL SHELL CONTENT

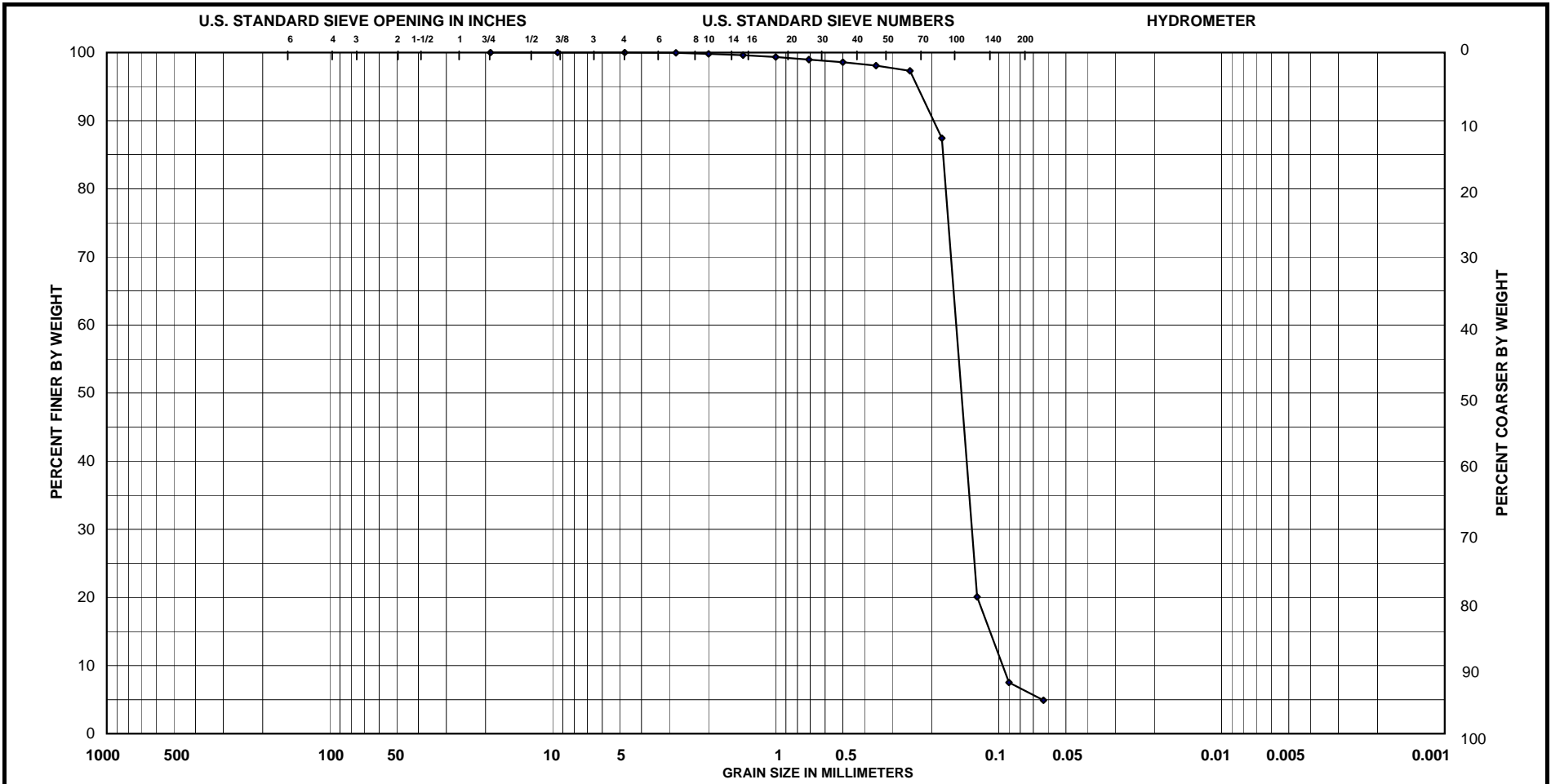
### GRAIN SIZE AND VISUAL SHELL CONTENT

Project:	<b>Topsail Beach, Surf City &amp; North Topsail</b>	Depth:	<b>45.1-45.6</b>
Project No.:	<b>1584-01-40</b>	Date:	<b>9/18/2003</b>
Boring No.:	<b>T1-03-V-130</b>		
Sample No.:	<b>2</b>		
Description:	<b>SAND, poorly-graded, mostly fine-grained quartz, trace carbonate, trace fragmented limestone, greenish gray (SP)</b>		

Tare Weight, (g):	<b>50.22</b>	
Dry Wt. Before Washing (g):	<b>167.84</b>	(with tare)
Dry Weight After Washing (g):	<b>162.54</b>	(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	0.04	99.97	100	0.04
#10	2.000	0.18	99.81	70	0.13
#14	1.400	0.24	99.61	80	0.19
#18	1.000	0.31	99.35	90	0.28
#25	0.710	0.43	98.98	80	0.34
#35	0.500	0.49	98.56	60	0.29
#45	0.355	0.55	98.10	40	0.22
#60	0.250	0.90	97.33	10	0.09
#80	0.180	11.64	87.43	1	0.12
#120	0.125	79.23	20.07	1	0.79
#170	0.090	14.79	7.50	1	0.15
#230	0.063	3.04	4.91	1	0.03

**Total Shell Content:** **2** %



COBBLES	GRAVEL		SAND			SILT OR CLAY
	COARSE	FINE	COARSE	MEDIUM	FINE	

Sample No.	Elev. Or Depth	Classification	% CO <sub>3</sub>	G <sub>s</sub>	Nat w%	LL	PL	PI	Project
2	45.1-45.6	SAND, poorly-graded, mostly fine-grained quartz, trace carbonate, trace fragmented limestone, greenish gray (SP)	2						Topsail Beach, Surf City & North Topsail
									Area
									Boring No. T1-03-V-130
									Date 9/18/2003

**GRADATION CURVES**



# WOLF TECHNOLOGIES, INC.

3047-4 St. Johns Bluff Road S.  
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## VISUAL SHELL CONTENT

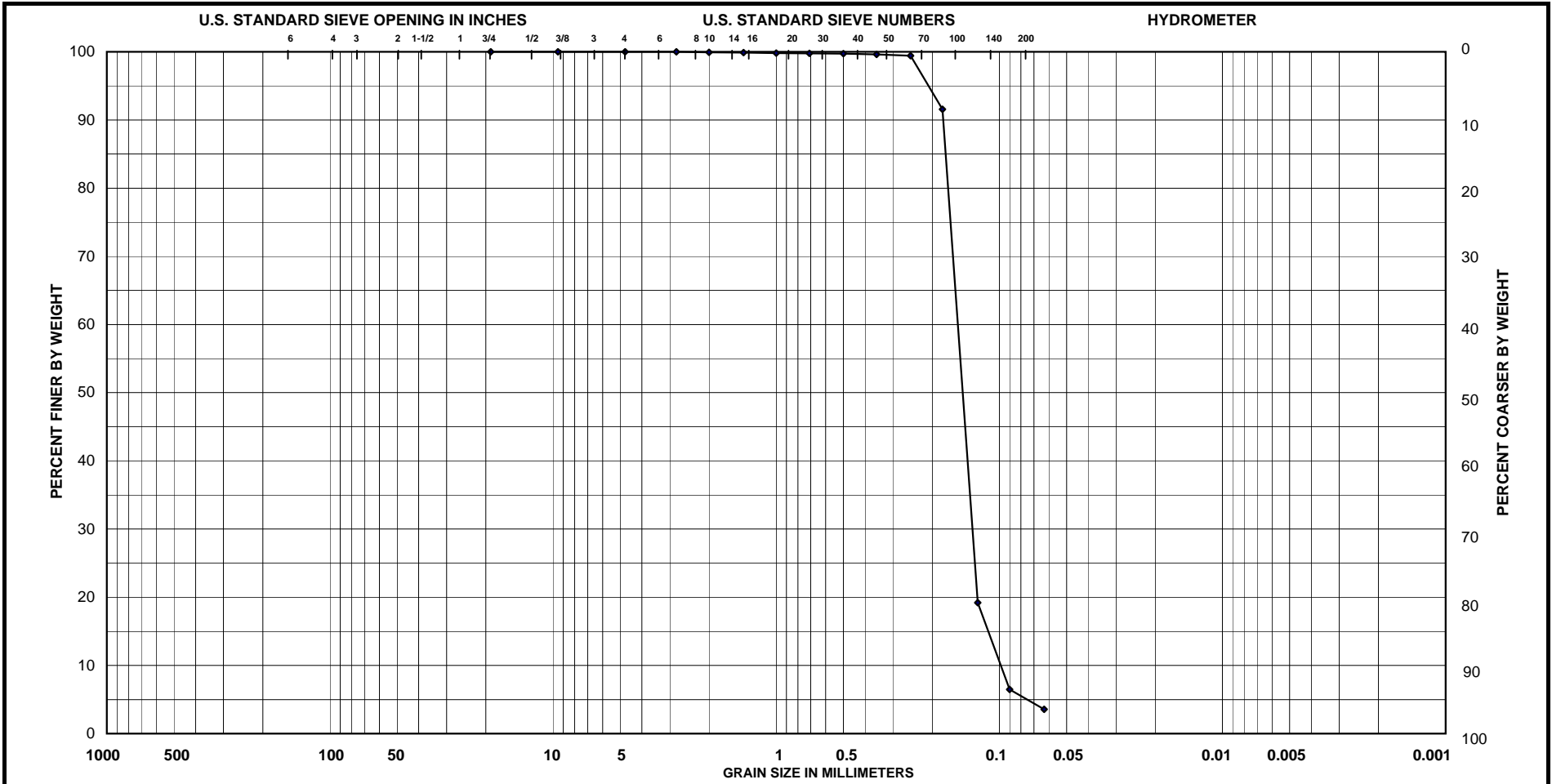
### GRAIN SIZE AND VISUAL SHELL CONTENT

Project:	<b>Topsail Beach, Surf City &amp; North Topsail</b>	Depth:	<b>47.0-47.5</b>
Project No.:	<b>1584-01-40</b>	Date:	<b>9/18/2003</b>
Boring No.:	<b>T1-03-V-130</b>		
Sample No.:	<b>3</b>		
Description:	<b>SAND, poorly-graded, mostly fine-grained quartz, trace carbonate, trace fragmented limestone, gray (SP)</b>		

Tare Weight, (g):	<b>49.87</b>	
Dry Wt. Before Washing (g):	<b>152.01</b>	(with tare)
Dry Weight After Washing (g):	<b>148.67</b>	(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	0.08	99.91	20	0.02
#14	1.400	0.03	99.88	0	0.00
#18	1.000	0.06	99.82	50	0.03
#25	0.710	0.05	99.77	80	0.04
#35	0.500	0.05	99.73	70	0.04
#45	0.355	0.10	99.63	30	0.03
#60	0.250	0.22	99.41	30	0.07
#80	0.180	8.01	91.57	1	0.08
#120	0.125	73.93	19.19	1	0.74
#170	0.090	13.00	6.46	1	0.13
#230	0.063	2.94	3.58	1	0.03

**Total Shell Content:** **1** %



COBBLES	GRAVEL		SAND			SILT OR CLAY
	COARSE	FINE	COARSE	MEDIUM	FINE	

Sample No.	Elev. Or Depth	Classification	% CO <sub>3</sub>	G <sub>s</sub>	Nat w%	LL	PL	PI	Project	
3	47.0-47.5	SAND, poorly-graded, mostly fine-grained quartz, trace carbonate, trace fragmented limestone, gray (SP)	1						Topsail Beach, Surf City & North Topsail	
									Area	
									Boring No. T1-03-V-130	
									Date 9/18/2003	

**GRADATION CURVES**



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## VISUAL SHELL CONTENT

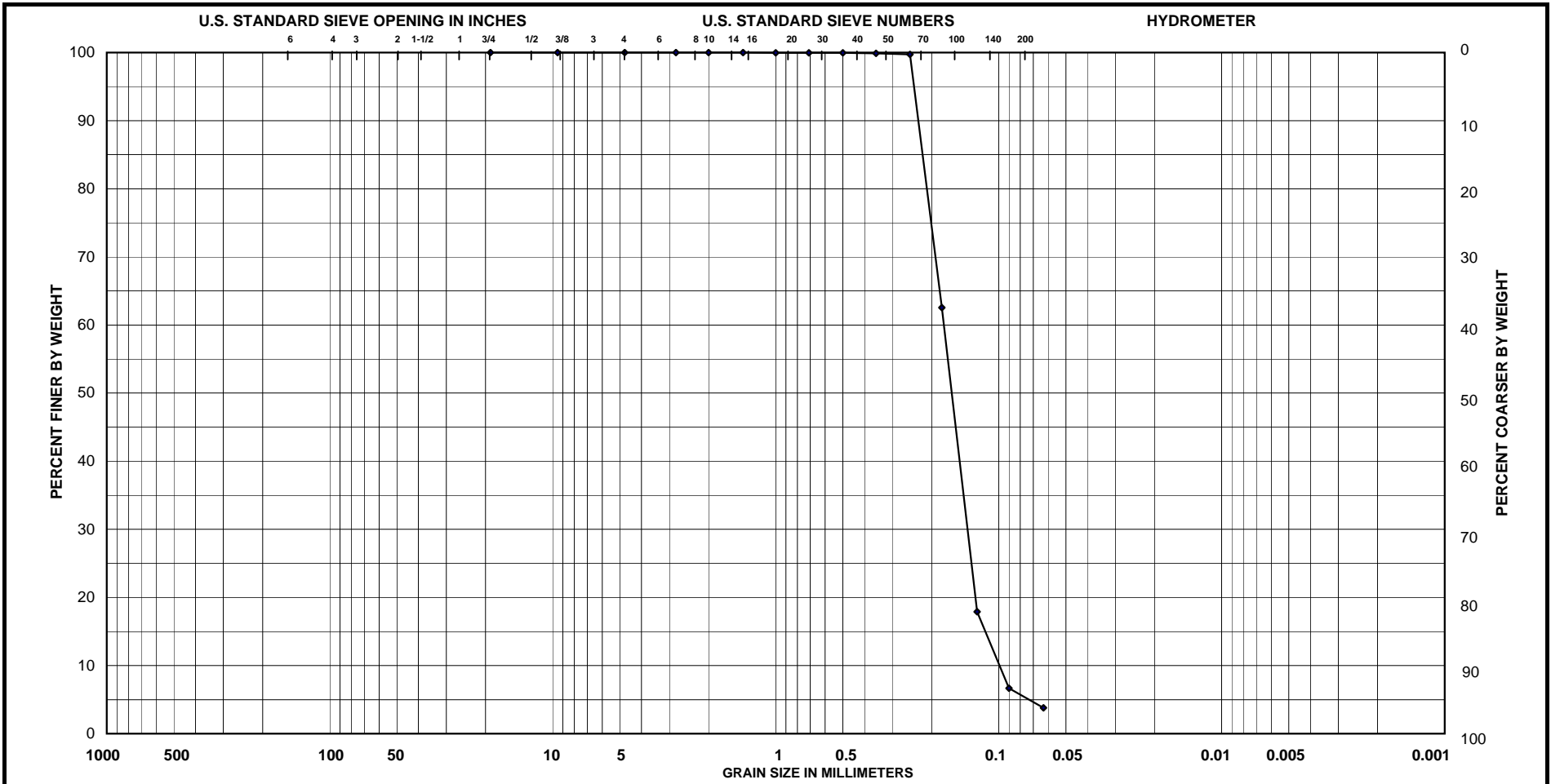
### GRAIN SIZE AND VISUAL SHELL CONTENT

Project:	<b>Topsail Beach, Surf City &amp; North Topsail</b>	Depth:	<b>49.0-49.5</b>
Project No.:	<b>1584-01-40</b>	Date:	<b>9/18/2003</b>
Boring No.:	<b>T1-03-V-130</b>		
Sample No.:	<b>4</b>		
Description:	<b>SAND, poorly-graded, mostly fine-grained quartz, trace carbonate, gray (SP)</b>		

Tare Weight, (g):	<b>49.38</b>	
Dry Wt. Before Washing (g):	<b>156.28</b>	(with tare)
Dry Weight After Washing (g):	<b>152.59</b>	(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	0.00	100.00	0	0.00
#14	1.400	0.02	99.98	20	0.00
#18	1.000	0.01	99.97	50	0.01
#25	0.710	0.01	99.96	30	0.00
#35	0.500	0.02	99.94	30	0.01
#45	0.355	0.07	99.88	30	0.02
#60	0.250	0.17	99.72	10	0.02
#80	0.180	39.73	62.55	1	0.40
#120	0.125	47.74	17.90	1	0.48
#170	0.090	12.02	6.65	1	0.12
#230	0.063	3.04	3.81	1	0.03

**Total Shell Content:** **1** %



COBBLES	GRAVEL		SAND			SILT OR CLAY
	COARSE	FINE	COARSE	MEDIUM	FINE	

Sample No.	Elev. Or Depth	Classification	% CO <sub>3</sub>	G <sub>s</sub>	Nat w%	LL	PL	PI	Project	
4	49.0-49.5	SAND, poorly-graded, mostly fine-grained quartz, trace carbonate, gray (SP)	1						Topsail Beach, Surf City & North Topsail	
									Area	
									Boring No. T1-03-V-130	
									Date 9/18/2003	

**GRADATION CURVES**



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## VISUAL SHELL CONTENT

### GRAIN SIZE AND VISUAL SHELL CONTENT

Project:	<b>Topsail Beach, Surf City &amp; North Topsail</b>	Depth:	<b>42.2-42.7</b>
Project No.:	<b>1584-01-40</b>	Date:	<b>9/18/2003</b>
Boring No.:	<b>T1-03-V-131</b>		
Sample No.:	<b>1</b>		
Description:	<b>SAND, poorly-graded, mostly coarse to medium-grained carbonate, little fine-grained quartz, few fine gravel-size carbonate, gray (GP)</b>		

Tare Weight, (g):	<b>50.08</b>	
Dry Wt. Before Washing (g):	<b>180.86</b>	(with tare)
Dry Weight After Washing (g):	<b>179.97</b>	(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	4.15	96.83	100	4.15
#4	4.750	10.94	88.46	100	10.94
#7	2.800	11.65	79.55	100	11.65
#10	2.000	8.82	72.81	100	8.82
#14	1.400	10.95	64.44	100	10.95
#18	1.000	10.33	56.54	90	9.30
#25	0.710	11.62	47.65	70	8.13
#35	0.500	15.06	36.14	30	4.52
#45	0.355	11.74	27.16	20	2.35
#60	0.250	9.52	19.88	5	0.48
#80	0.180	10.26	12.04	2	0.21
#120	0.125	12.04	2.83	1	0.12
#170	0.090	2.04	1.27	1	0.02
#230	0.063	0.21	1.11	1	0.00

**Total Shell Content:** **55** %



COBBLES	GRAVEL		SAND			SILT OR CLAY
	COARSE	FINE	COARSE	MEDIUM	FINE	

Sample No.	Elev. Or Depth	Classification	% CO <sub>3</sub>	G <sub>s</sub>	Nat w%	LL	PL	PI	Project	
♦ 1	42.2-42.7	SAND, poorly-graded, mostly coarse to medium-grained carbonate, little fine-grained quartz, few fine gravel-size carbonate, gray (GP)	55						Topsail Beach, Surf City & North Topsail	
									Area	
									Boring No. T1-03-V-131	
									Date 9/18/2003	

**GRADATION CURVES**





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## VISUAL SHELL CONTENT

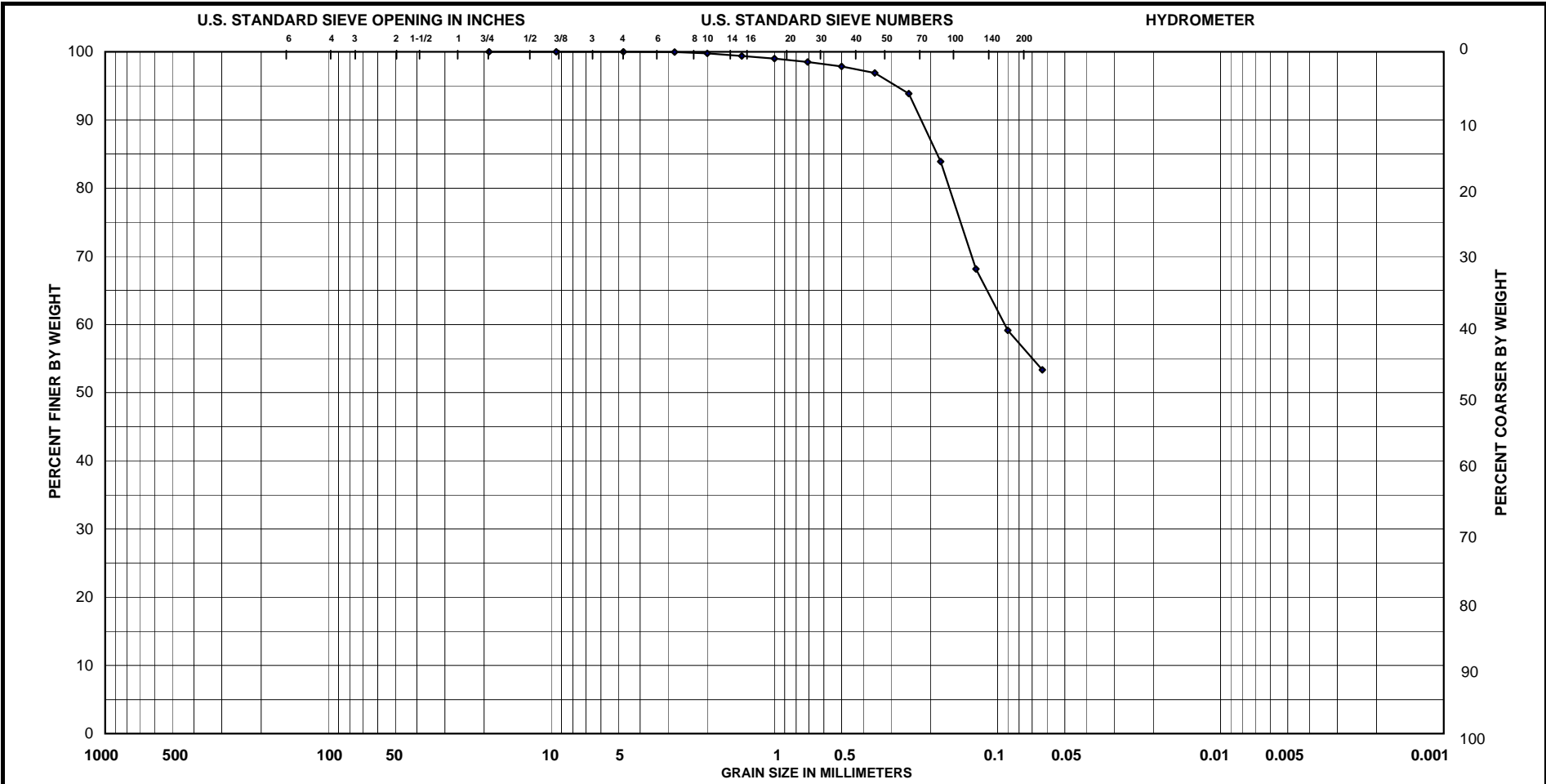
### GRAIN SIZE AND VISUAL SHELL CONTENT

<b>Project:</b>	<b>Topsail Beach, Surf City &amp; North Topsail</b>	<b>Depth:</b>	<b>44.7-45.2</b>
<b>Project No.:</b>	<b>1584-01-40</b>	<b>Date:</b>	<b>9/18/2003</b>
<b>Boring No.:</b>	<b>T1-03-V-131</b>		
<b>Sample No.:</b>	<b>2</b>		
<b>Description:</b>	<b>CLAY, inorganic-H, some fine-grained quartz sand, trace carbonate, , very dark gray (CH)</b>		

Tare Weight, (g):	49.70	
Dry Wt. Before Washing (g):	155.42	(with tare)
Dry Weight After Washing (g):	99.77	(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	0.00	100.00	0	0.00
#7	2.800	0.05	99.95	100	0.05
#10	2.000	0.18	99.78	100	0.18
#14	1.400	0.42	99.39	40	0.17
#18	1.000	0.42	98.99	40	0.17
#25	0.710	0.52	98.50	30	0.16
#35	0.500	0.69	97.84	10	0.07
#45	0.355	1.02	96.88	10	0.10
#60	0.250	3.19	93.86	5	0.16
#80	0.180	10.54	83.89	1	0.11
#120	0.125	16.63	68.16	1	0.17
#170	0.090	9.53	59.15	1	0.10
#230	0.063	6.13	53.35	1	0.06

**Total Shell Content:** 1 %



COBBLES	GRAVEL		SAND			SILT OR CLAY
	COARSE	FINE	COARSE	MEDIUM	FINE	

Sample No.	Elev. Or Depth	Classification	% CO <sub>3</sub>	G <sub>s</sub>	Nat w%	LL	PL	PI	Project	
♦ 2	44.7-45.2	CLAY, inorganic-H, some fine-grained quartz sand, trace carbonate, , very dark gray (CH)	1						Topsail Beach, Surf City & North Topsail	
									Area	
									Boring No. T1-03-V-131	
									Date 9/18/2003	

**GRADATION CURVES**



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## VISUAL SHELL CONTENT

### GRAIN SIZE AND VISUAL SHELL CONTENT

Project:	<b>Topsail Beach, Surf City &amp; North Topsail</b>	Depth:	<b>47.0-47.5</b>
Project No.:	<b>1584-01-40</b>	Date:	<b>9/18/2003</b>
Boring No.:	<b>T1-03-V-131</b>		
Sample No.:	<b>3</b>		
Description:	<b>SAND, poorly-graded, mostly fine-grained quartz, trace carbonate, dark greenish gray (SP)</b>		

Tare Weight, (g):	<b>50.17</b>	
Dry Wt. Before Washing (g):	<b>172.93</b>	(with tare)
Dry Weight After Washing (g):	<b>168.36</b>	(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	0.03	99.98	100	0.03
#10	2.000	0.16	99.85	80	0.13
#14	1.400	0.12	99.75	90	0.11
#18	1.000	0.12	99.65	80	0.10
#25	0.710	0.05	99.61	60	0.03
#35	0.500	0.13	99.50	50	0.07
#45	0.355	0.35	99.22	30	0.11
#60	0.250	0.85	98.53	10	0.09
#80	0.180	20.85	81.54	1	0.21
#120	0.125	81.66	15.02	1	0.82
#170	0.090	11.30	5.82	1	0.11
#230	0.063	2.32	3.93	1	0.02

**Total Shell Content:** **1** %



COBBLES	GRAVEL		SAND			SILT OR CLAY
	COARSE	FINE	COARSE	MEDIUM	FINE	

Sample No.	Elev. Or Depth	Classification	% CO <sub>3</sub>	G <sub>s</sub>	Nat w%	LL	PL	PI	Project	
3	47.0-47.5	SAND, poorly-graded, mostly fine-grained quartz, trace carbonate, dark greenish gray (SP)	1						Topsail Beach, Surf City & North Topsail	
									Area	
									Boring No. T1-03-V-131	
									Date 9/18/2003	

**GRADATION CURVES**



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## VISUAL SHELL CONTENT

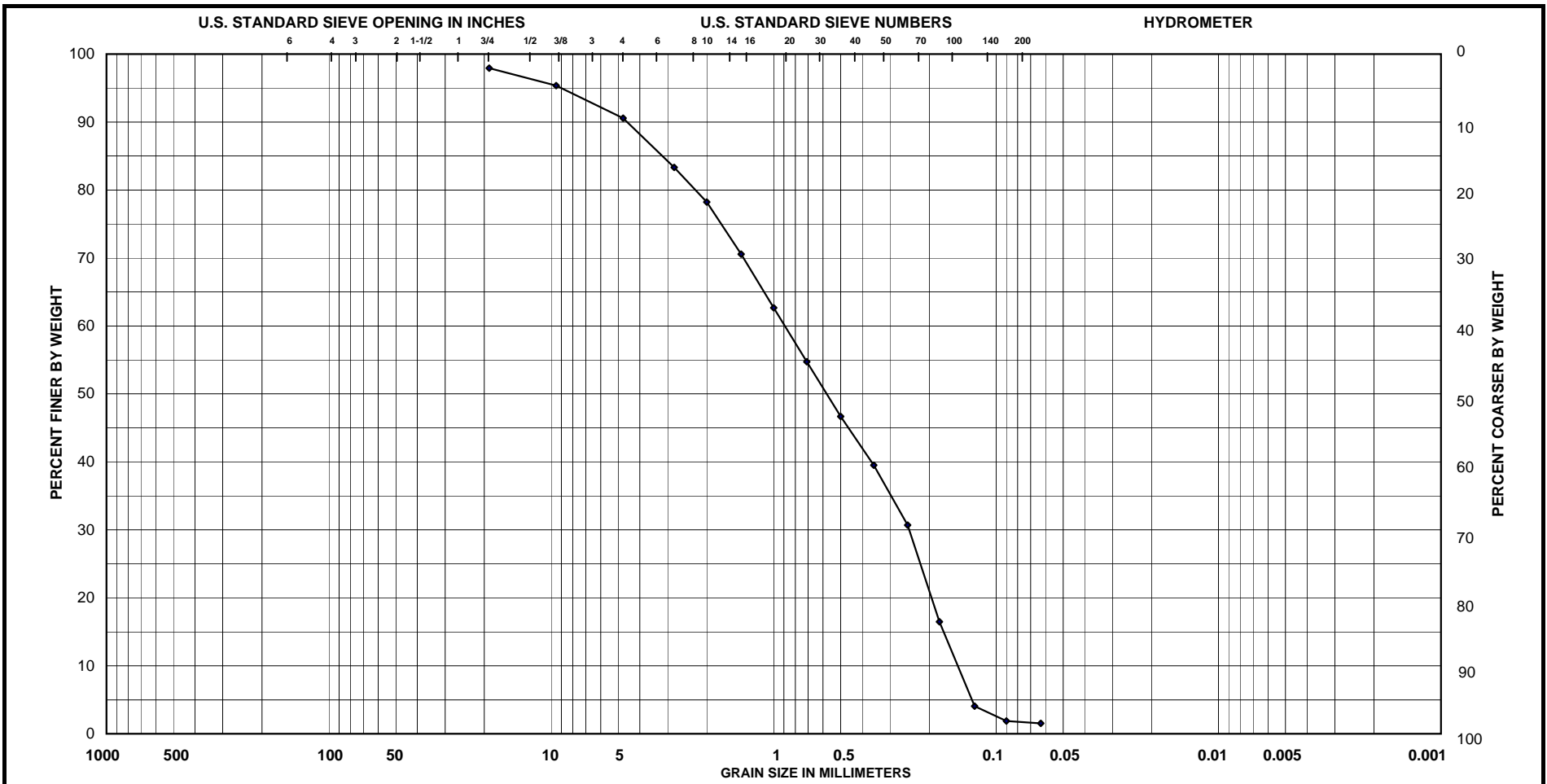
### GRAIN SIZE AND VISUAL SHELL CONTENT

Project:	<b>Topsail Beach, Surf City &amp; North Topsail</b>	Depth:	<b>42.2-42.7</b>
Project No.:	<b>1584-01-40</b>	Date:	<b>9/18/2003</b>
Boring No.:	<b>T1-03-V-132</b>		
Sample No.:	<b>1</b>		
Description:	<b>SAND, poorly-graded, mostly medium to fine-grained quartz, some carbonate, trace fragmented limestone, dark gray (SP)</b>		

Tare Weight, (g):	<b>49.85</b>	
Dry Wt. Before Washing (g):	<b>175.12</b>	(with tare)
Dry Weight After Washing (g):	<b>173.6</b>	(with tare)

Sieve Size (Name)	Sieve Size (mm)	Weight Retained (g)	% Passing	Approx. Visual Shell %	Approx. Visual Shell Wt. (g)
3/4"	19.000	2.59	97.93	100	2.59
3/8"	9.500	3.20	95.38	100	3.20
#4	4.750	6.01	90.58	100	6.01
#7	2.800	9.07	83.34	95	8.62
#10	2.000	6.40	78.23	95	6.08
#14	1.400	9.60	70.57	90	8.64
#18	1.000	9.89	62.67	70	6.92
#25	0.710	9.94	54.74	60	5.96
#35	0.500	10.10	46.68	40	4.04
#45	0.355	8.97	39.51	20	1.79
#60	0.250	11.05	30.69	5	0.55
#80	0.180	17.82	16.47	2	0.36
#120	0.125	15.52	4.08	1	0.16
#170	0.090	2.76	1.88	1	0.03
#230	0.063	0.44	1.52	1	0.00

**Total Shell Content:** **44** %



COBBLES	GRAVEL		SAND			SILT OR CLAY
	COARSE	FINE	COARSE	MEDIUM	FINE	

Sample No.	Elev. Or Depth	Classification	% CO <sub>3</sub>	G <sub>s</sub>	Nat w%	LL	PL	PI	Project	
♦ 1	42.2-42.7	SAND, poorly-graded, mostly medium to fine-grained quartz, some carbonate, trace fragmented limestone, dark gray (SP)	44						Topsail Beach, Surf City & North Topsail	
									Area	
									Boring No. T1-03-V-132	
									Date 9/18/2003	

**GRADATION CURVES**



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## VISUAL SHELL CONTENT

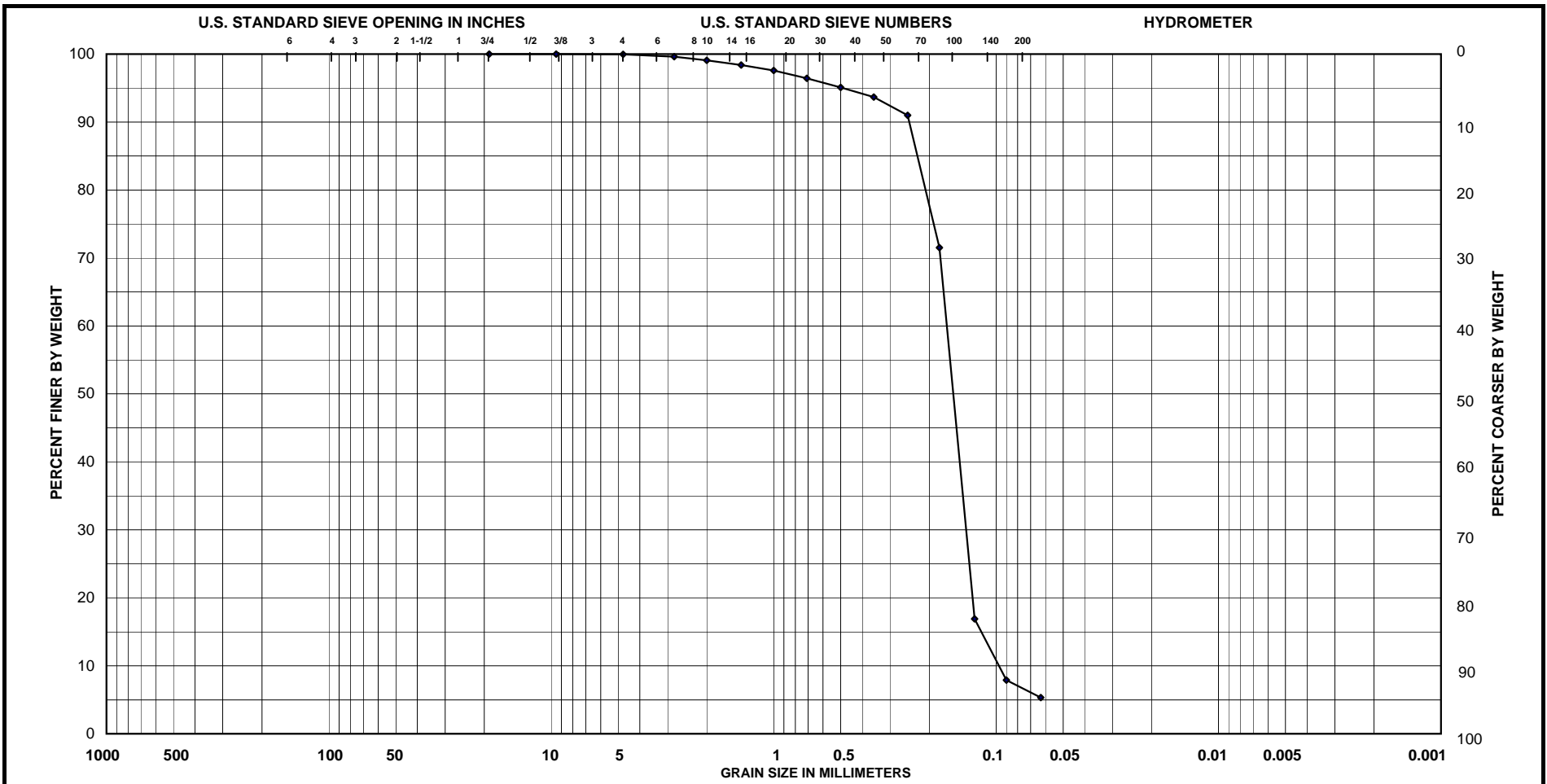
### GRAIN SIZE AND VISUAL SHELL CONTENT

Project:	<b>Topsail Beach, Surf City &amp; North Topsail</b>	Depth:	<b>43.8-44.3</b>
Project No.:	<b>1584-01-40</b>	Date:	<b>9/18/2003</b>
Boring No.:	<b>T1-03-V-132</b>		
Sample No.:	<b>2</b>		
Description:	<b>SAND, poorly-graded with silt, mostly fine-grained quartz, few carbonate, few silt, greenish gray (SP-SM)</b>		

Tare Weight, (g):	<b>49.40</b>	
Dry Wt. Before Washing (g):	<b>166.96</b>	(with tare)
Dry Weight After Washing (g):	<b>161.29</b>	(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	0.06	99.95	100	0.06
#7	2.800	0.38	99.63	100	0.38
#10	2.000	0.63	99.09	100	0.63
#14	1.400	0.83	98.38	90	0.75
#18	1.000	0.95	97.58	70	0.67
#25	0.710	1.33	96.44	60	0.80
#35	0.500	1.57	95.11	60	0.94
#45	0.355	1.70	93.66	20	0.34
#60	0.250	3.15	90.98	10	0.32
#80	0.180	22.88	71.52	1	0.23
#120	0.125	64.19	16.92	1	0.64
#170	0.090	10.60	7.90	1	0.11
#230	0.063	3.02	5.33	1	0.03

**Total Shell Content:** **5** %



COBBLES	GRAVEL		SAND			SILT OR CLAY
	COARSE	FINE	COARSE	MEDIUM	FINE	

Sample No.	Elev. Or Depth	Classification	% CO <sub>3</sub>	G <sub>s</sub>	Nat w%	LL	PL	PI	Project
2	43.8-44.3	SAND, poorly-graded with silt, mostly fine-grained quartz, few carbonate, few silt, greenish gray (SP-SM)	5						Topsail Beach, Surf City & North Topsail
									Area
									Boring No. T1-03-V-132
									Date 9/18/2003

**GRADATION CURVES**





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## VISUAL SHELL CONTENT

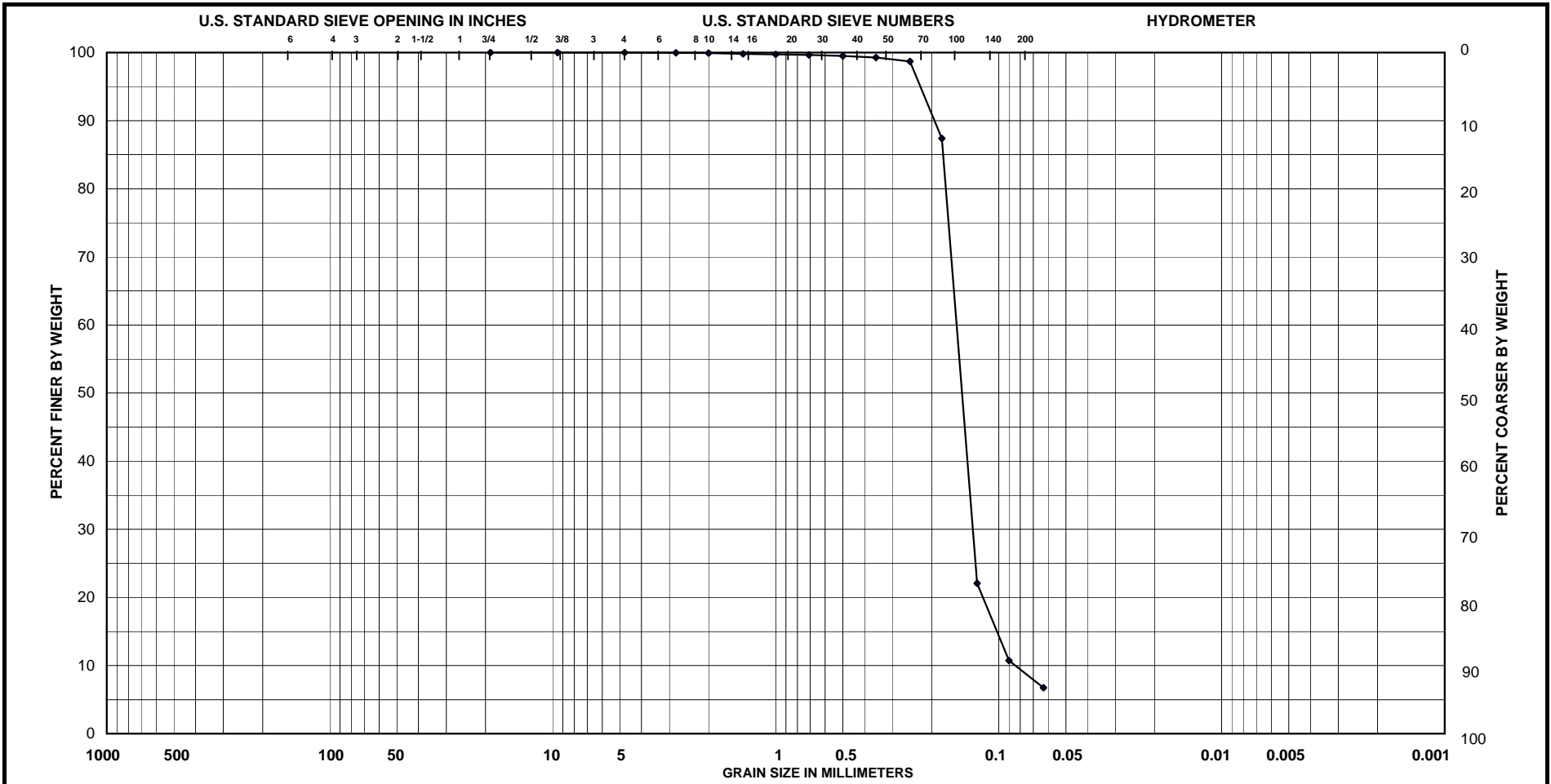
### GRAIN SIZE AND VISUAL SHELL CONTENT

Project:	<b>Topsail Beach, Surf City &amp; North Topsail</b>	Depth:	<b>46.0-46.5</b>
Project No.:	<b>1584-01-40</b>	Date:	<b>9/18/2003</b>
Boring No.:	<b>T1-03-V-132</b>		
Sample No.:	<b>3</b>		
Description:	<b>SAND, poorly-graded with silt, mostly fine-grained quartz, few carbonate, few silt, greenish gray (SP-SM)</b>		

Tare Weight, (g):	<b>49.28</b>	
Dry Wt. Before Washing (g):	<b>175.66</b>	(with tare)
Dry Weight After Washing (g):	<b>167.99</b>	(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	0.06	99.95	100	0.06
#10	2.000	0.06	99.91	100	0.06
#14	1.400	0.11	99.82	95	0.10
#18	1.000	0.10	99.74	80	0.08
#25	0.710	0.10	99.66	40	0.04
#35	0.500	0.18	99.52	40	0.07
#45	0.355	0.32	99.26	30	0.10
#60	0.250	0.72	98.69	20	0.14
#80	0.180	14.30	87.38	2	0.29
#120	0.125	82.51	22.09	1	0.83
#170	0.090	14.38	10.71	1	0.14
#230	0.063	5.02	6.74	1	0.05

**Total Shell Content:** **2** %



COBBLES	GRAVEL		SAND			SILT OR CLAY
	COARSE	FINE	COARSE	MEDIUM	FINE	

Sample No.	Elev. Or Depth	Classification	% CO <sub>3</sub>	G <sub>s</sub>	Nat w%	LL	PL	PI	Project	
3	46.0-46.5	SAND, poorly-graded with silt, mostly fine-grained quartz, few carbonate, few silt, greenish gray (SP-SM)	2						Topsail Beach, Surf City & North Topsail	
									Area	
									Boring No. T1-03-V-132	
									Date 9/18/2003	

**GRADATION CURVES**



# WOLF TECHNOLOGIES, INC.

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## VISUAL SHELL CONTENT

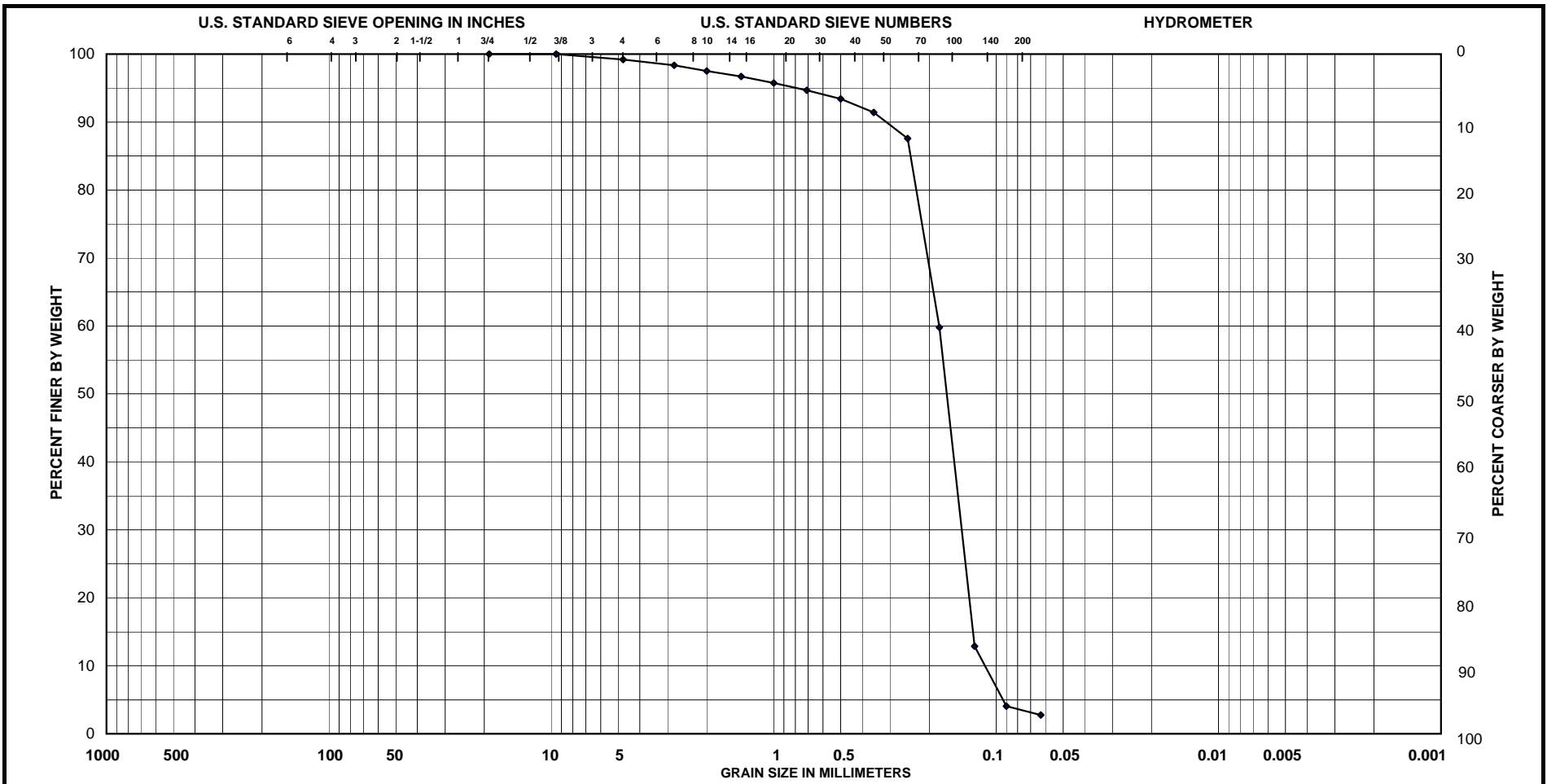
### GRAIN SIZE AND VISUAL SHELL CONTENT

Project:	<b>Topsail Beach, Surf City &amp; North Topsail</b>	Depth:	<b>44.1-44.6</b>
Project No.:	<b>1584-01-40</b>	Date:	<b>9/18/2003</b>
Boring No.:	<b>T1-03-V-133</b>		
Sample No.:	<b>1</b>		
Description:	<b>SAND, poorly-graded, mostly fine-grained quartz, few carbonate, trace fragmented limestone, greenish gray (SP)</b>		

Tare Weight, (g):	<b>50.20</b>	
Dry Wt. Before Washing (g):	<b>159.55</b>	(with tare)
Dry Weight After Washing (g):	<b>157.14</b>	(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	0.87	99.20	100	0.87
#7	2.800	0.94	98.34	90	0.85
#10	2.000	0.90	97.52	90	0.81
#14	1.400	0.90	96.70	90	0.81
#18	1.000	1.06	95.73	70	0.74
#25	0.710	1.14	94.69	70	0.80
#35	0.500	1.41	93.40	50	0.71
#45	0.355	2.17	91.41	30	0.65
#60	0.250	4.20	87.57	10	0.42
#80	0.180	30.38	59.79	2	0.61
#120	0.125	51.30	12.88	1	0.51
#170	0.090	9.63	4.07	1	0.10
#230	0.063	1.45	2.74	1	0.01

**Total Shell Content:** **7** %



COBBLES	GRAVEL		SAND			SILT OR CLAY
	COARSE	FINE	COARSE	MEDIUM	FINE	

Sample No.	Elev. Or Depth	Classification	% CO <sub>3</sub>	G <sub>s</sub>	Nat w%	LL	PL	PI	Project	
♦ 1	44.1-44.6	SAND, poorly-graded, mostly fine-grained quartz, few carbonate, trace fragmented limestone, greenish gray (SP)	7						Topsail Beach, Surf City & North Topsail	
			Area							
			Boring No. T1-03-V-133							
			Date 9/18/2003							

**GRADATION CURVES**



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## VISUAL SHELL CONTENT

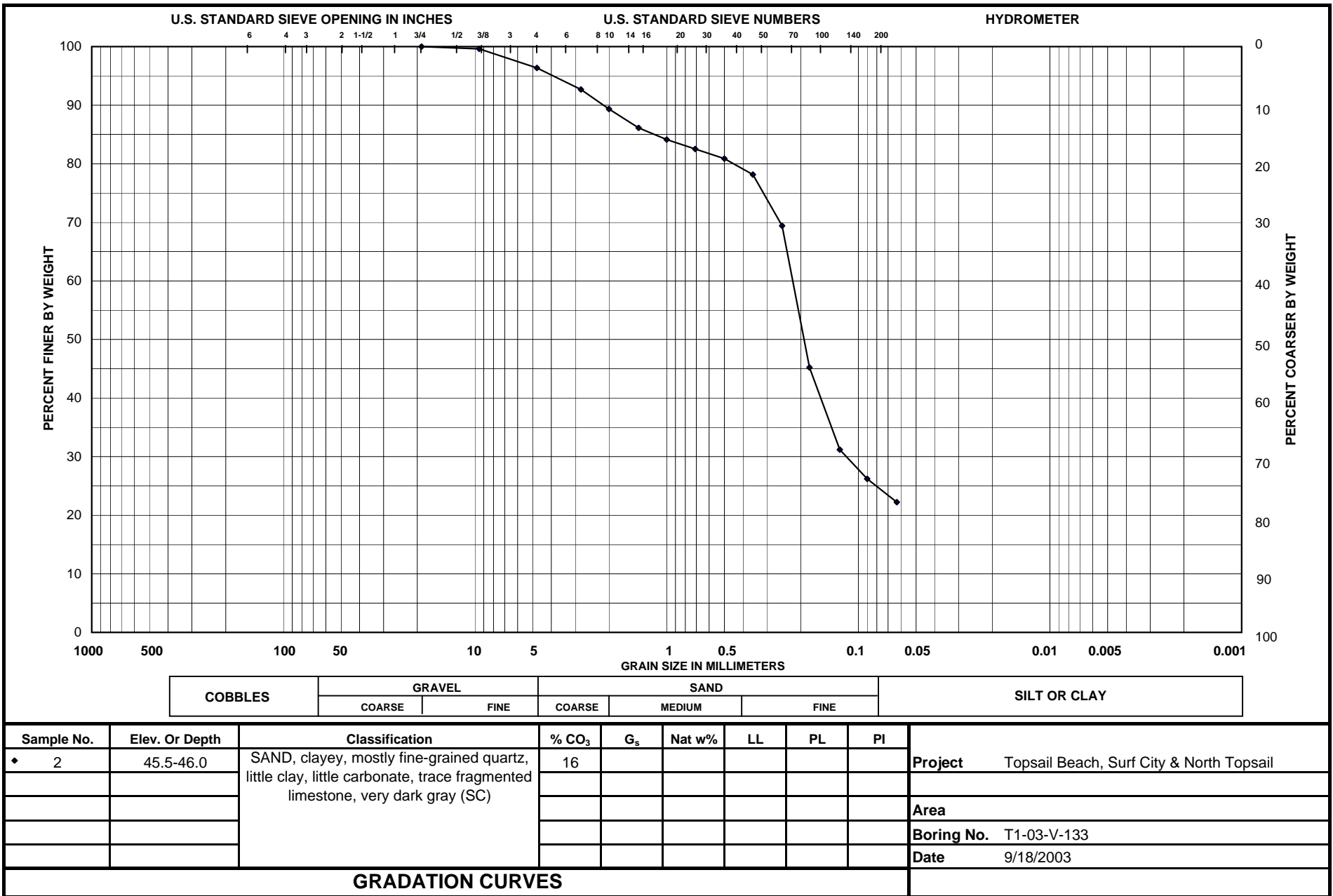
### GRAIN SIZE AND VISUAL SHELL CONTENT

Project:	<b>Topsail Beach, Surf City &amp; North Topsail</b>	Depth:	<b>45.5-46.0</b>
Project No.:	<b>1584-01-40</b>	Date:	<b>9/18/2003</b>
Boring No.:	<b>T1-03-V-133</b>		
Sample No.:	<b>2</b>		
Description:	<b>SAND, clayey, mostly fine-grained quartz, little clay, little carbonate, trace fragmented limestone, very dark gray (SC)</b>		

Tare Weight, (g):	<b>49.93</b>	
Dry Wt. Before Washing (g):	<b>189.21</b>	(with tare)
Dry Weight After Washing (g):	<b>160.04</b>	(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	0.55	99.61	100	0.55
#4	4.750	4.50	96.37	80	3.60
#7	2.800	5.16	92.67	90	4.64
#10	2.000	4.62	89.35	80	3.70
#14	1.400	4.50	86.12	80	3.60
#18	1.000	2.76	84.14	70	1.93
#25	0.710	2.23	82.54	40	0.89
#35	0.500	2.33	80.87	20	0.47
#45	0.355	3.78	78.15	20	0.76
#60	0.250	12.18	69.41	10	1.22
#80	0.180	33.70	45.21	3	1.01
#120	0.125	19.49	31.22	1	0.19
#170	0.090	6.99	26.20	1	0.07
#230	0.063	5.55	22.21	1	0.06

**Total Shell Content:** **16** %





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## VISUAL SHELL CONTENT

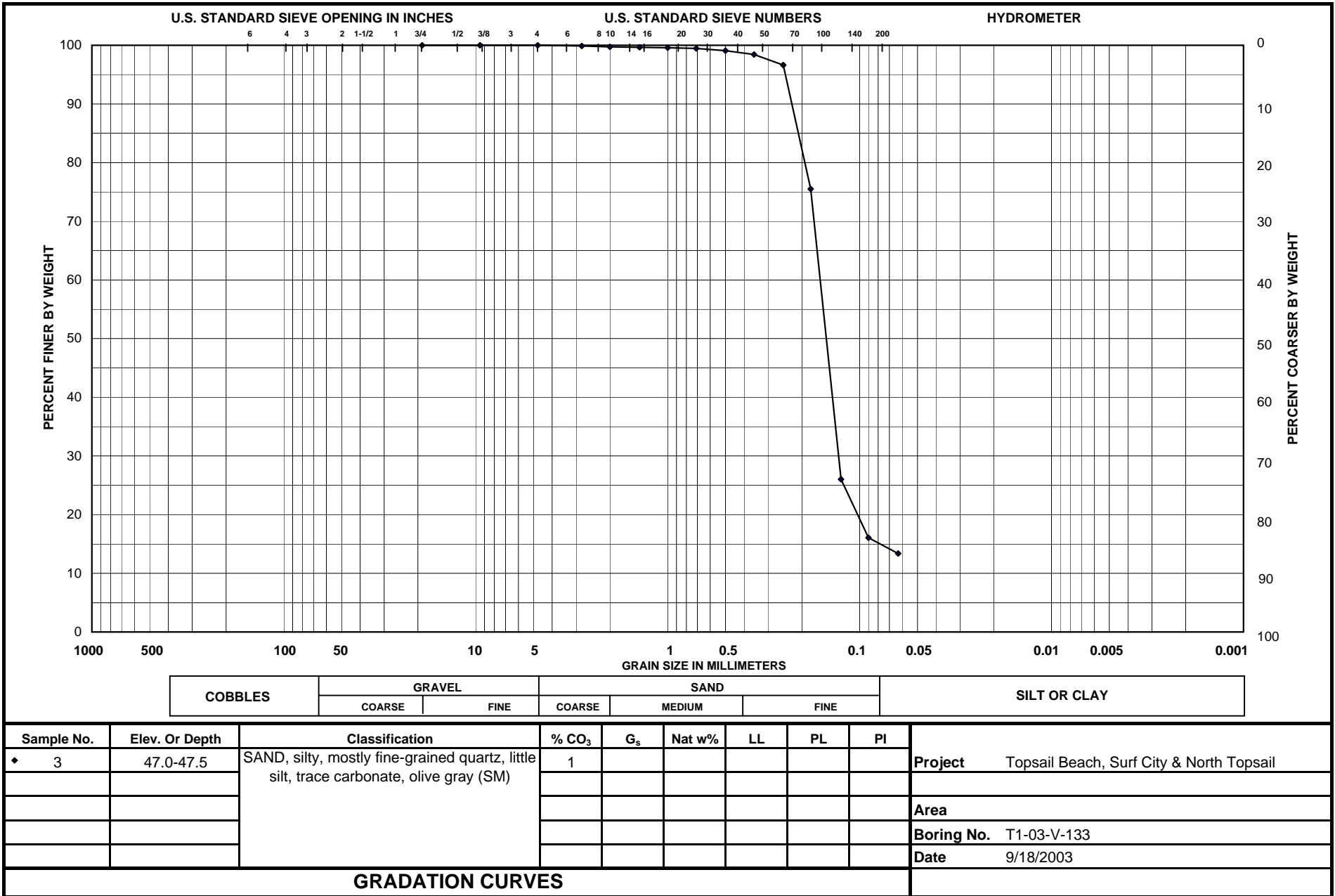
### GRAIN SIZE AND VISUAL SHELL CONTENT

Project:	<b>Topsail Beach, Surf City &amp; North Topsail</b>	Depth:	<b>47.0-47.5</b>
Project No.:	<b>1584-01-40</b>	Date:	<b>9/18/2003</b>
Boring No.:	<b>T1-03-V-133</b>		
Sample No.:	<b>3</b>		
Description:	<b>SAND, silty, mostly fine-grained quartz, little silt, trace carbonate, olive gray (SM)</b>		

Tare Weight, (g):	<b>49.95</b>	
Dry Wt. Before Washing (g):	<b>171.83</b>	(with tare)
Dry Weight After Washing (g):	<b>157.48</b>	(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	0.13	99.89	0	0.00
#10	2.000	0.20	99.73	0	0.00
#14	1.400	0.10	99.65	0	0.00
#18	1.000	0.10	99.57	0	0.00
#25	0.710	0.14	99.45	10	0.01
#35	0.500	0.43	99.10	10	0.04
#45	0.355	0.83	98.42	5	0.04
#60	0.250	2.20	96.61	1	0.02
#80	0.180	25.72	75.51	1	0.26
#120	0.125	60.32	26.02	1	0.60
#170	0.090	12.12	16.07	1	0.12
#230	0.063	3.28	13.38	1	0.03

**Total Shell Content:** **1** %







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## VISUAL SHELL CONTENT

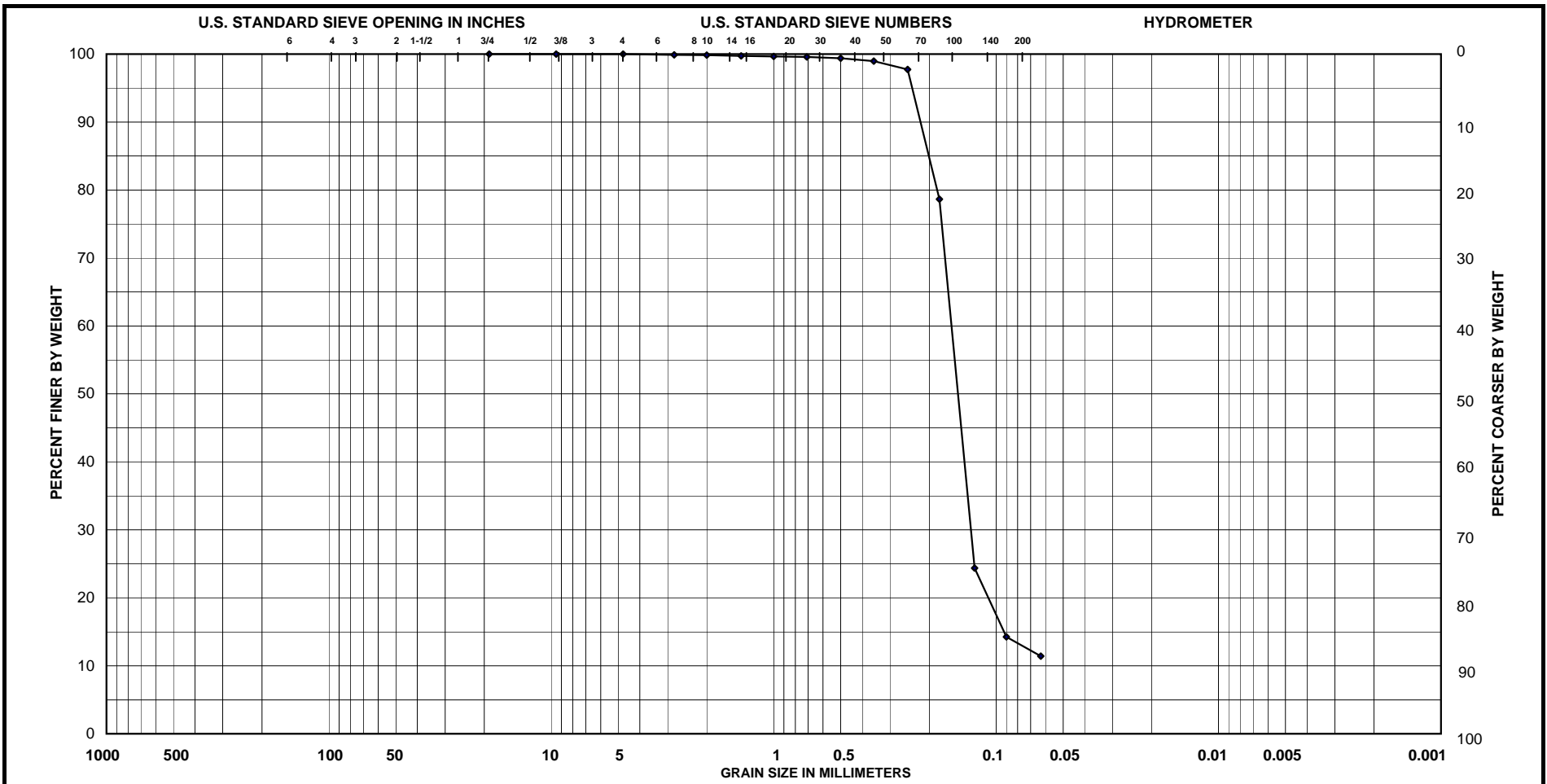
### GRAIN SIZE AND VISUAL SHELL CONTENT

Project:	<b>Topsail Beach, Surf City &amp; North Topsail</b>	Depth:	<b>49.0-49.5</b>
Project No.:	<b>1584-01-40</b>	Date:	<b>9/18/2003</b>
Boring No.:	<b>T1-03-V-133</b>		
Sample No.:	<b>4</b>		
Description:	<b>SAND, poorly-graded with silt, mostly fine-grained quartz, few silt, trace carbonate, olive gray (SP-SM)</b>		

Tare Weight, (g):	<b>49.73</b>	
Dry Wt. Before Washing (g):	<b>173.48</b>	(with tare)
Dry Weight After Washing (g):	<b>159.86</b>	(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	0.12	99.90	0	0.00
#10	2.000	0.09	99.83	0	0.00
#14	1.400	0.11	99.74	0	0.00
#18	1.000	0.11	99.65	0	0.00
#25	0.710	0.10	99.57	0	0.00
#35	0.500	0.21	99.40	0	0.00
#45	0.355	0.53	98.97	1	0.01
#60	0.250	1.55	97.72	0	0.00
#80	0.180	23.59	78.66	0	0.00
#120	0.125	67.15	24.40	1	0.67
#170	0.090	12.53	14.27	1	0.13
#230	0.063	3.52	11.43	1	0.04

**Total Shell Content:** **1** %



COBBLES	GRAVEL		SAND			SILT OR CLAY
	COARSE	FINE	COARSE	MEDIUM	FINE	

Sample No.	Elev. Or Depth	Classification	% CO <sub>3</sub>	G <sub>s</sub>	Nat w%	LL	PL	PI	Project
4	49.0-49.5	SAND, poorly-graded with silt, mostly fine-grained quartz, few silt, trace carbonate, olive gray (SP-SM)	1						Topsail Beach, Surf City & North Topsail
									Area
									Boring No. T1-03-V-133
									Date 9/18/2003

**GRADATION CURVES**



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## VISUAL SHELL CONTENT

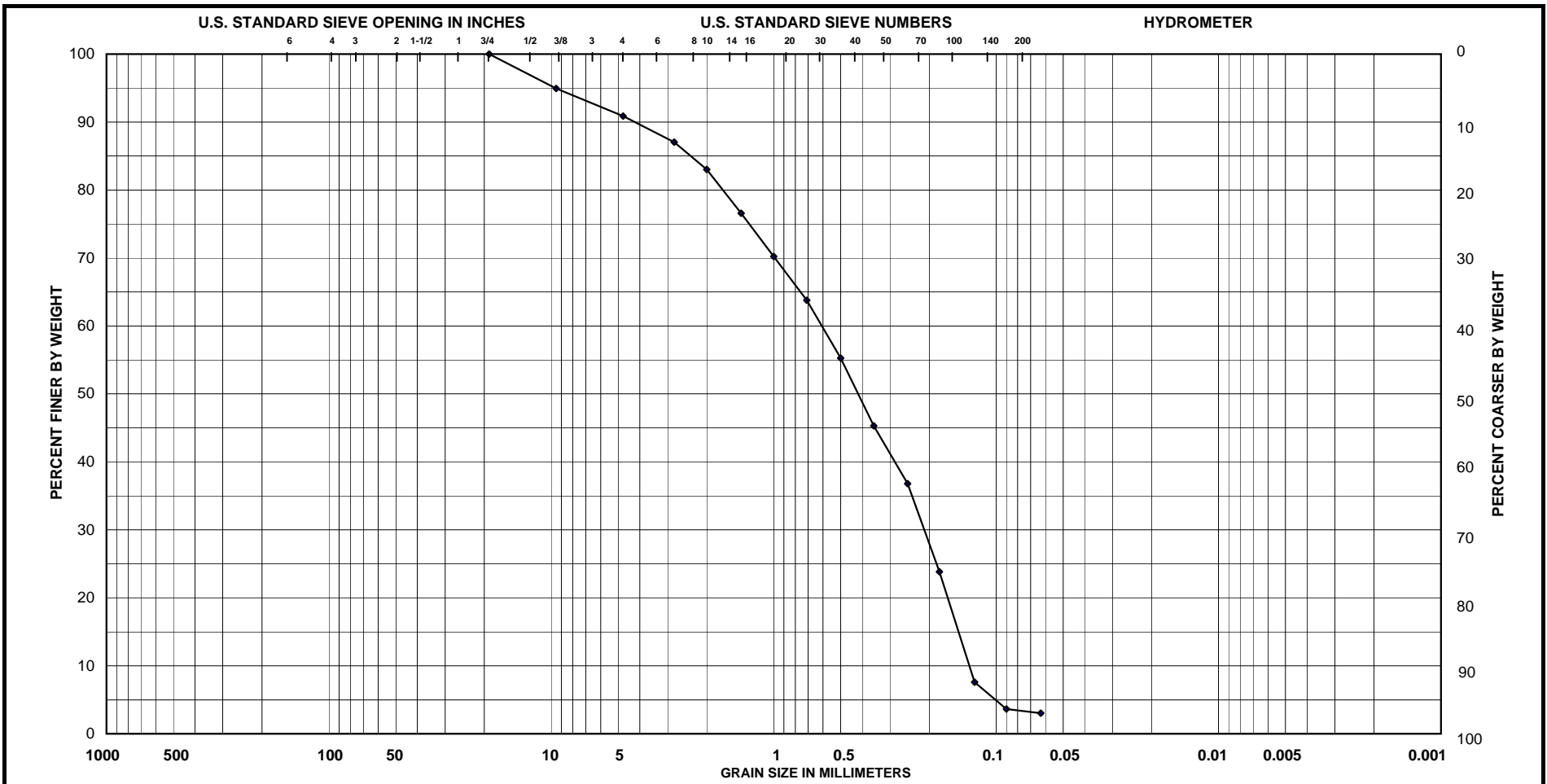
### GRAIN SIZE AND VISUAL SHELL CONTENT

Project:	<b>Topsail Beach, Surf City &amp; North Topsail</b>	Depth:	<b>41.4-41.9</b>
Project No.:	<b>1584-01-40</b>	Date:	<b>9/18/2003</b>
Boring No.:	<b>T1-03-V-134</b>		
Sample No.:	<b>1</b>		
Description:	<b>SAND, poorly-graded, mostly medium to fine-grained quartz, some coarse to medium-grained carbonate, few fine gravel-size carbonate,</b>		

Tare Weight, (g):	<b>50.15</b>	
Dry Wt. Before Washing (g):	<b>187.11</b>	(with tare)
Dry Weight After Washing (g):	<b>183.65</b>	(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	6.93	94.94	100	6.93
#4	4.750	5.56	90.88	100	5.56
#7	2.800	5.23	87.06	100	5.23
#10	2.000	5.52	83.03	90	4.97
#14	1.400	8.84	76.58	90	7.96
#18	1.000	8.72	70.21	90	7.85
#25	0.710	8.83	63.76	80	7.06
#35	0.500	11.64	55.26	50	5.82
#45	0.355	13.64	45.31	20	2.73
#60	0.250	11.67	36.78	5	0.58
#80	0.180	17.73	23.84	2	0.35
#120	0.125	22.26	7.59	1	0.22
#170	0.090	5.41	3.64	1	0.05
#230	0.063	0.85	3.02	1	0.01

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



COBBLES	GRAVEL		SAND			SILT OR CLAY
	COARSE	FINE	COARSE	MEDIUM	FINE	

Sample No.	Elev. Or Depth	Classification	% CO <sub>3</sub>	G <sub>s</sub>	Nat w%	LL	PL	PI	Project	
♦ 1	41.4-41.9	SAND, poorly-graded, mostly medium to fine-grained quartz, some coarse to medium grained carbonate, few fine gravel-size carbonate, dark gray (SP)	40						Topsail Beach, Surf City & North Topsail	
									Area	
									Boring No. T1-03-V-134	
									Date 9/18/2003	

**GRADATION CURVES**



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## VISUAL SHELL CONTENT

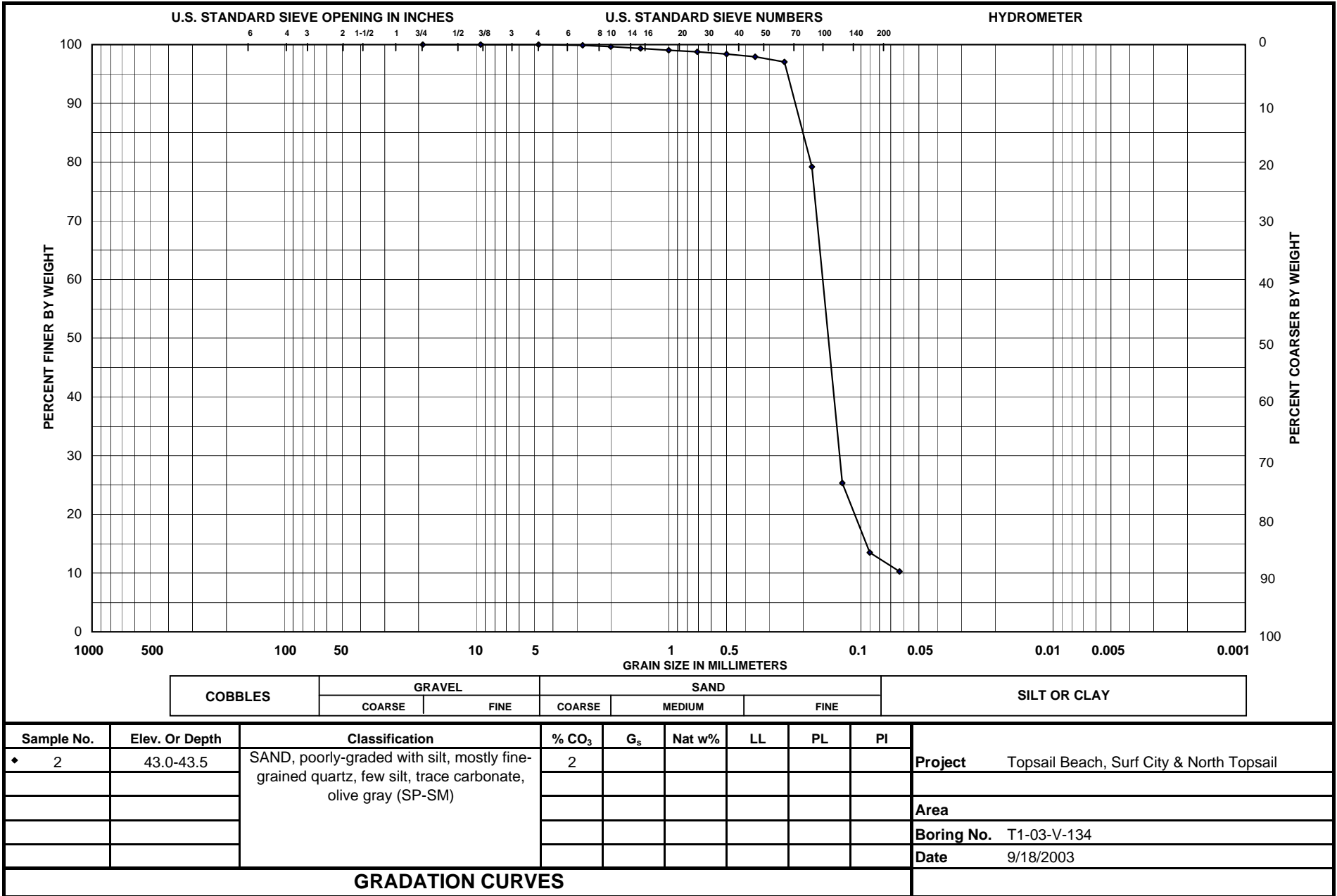
### GRAIN SIZE AND VISUAL SHELL CONTENT

Project:	<b>Topsail Beach, Surf City &amp; North Topsail</b>	Depth:	<b>43.0-43.5</b>
Project No.:	<b>1584-01-40</b>	Date:	<b>9/18/2003</b>
Boring No.:	<b>T1-03-V-134</b>		
Sample No.:	<b>2</b>		
Description:	<b>SAND, poorly-graded with silt, mostly fine-grained quartz, few silt, trace carbonate, olive gray (SP-SM)</b>		

Tare Weight, (g):	<b>49.39</b>	
Dry Wt. Before Washing (g):	<b>173.67</b>	(with tare)
Dry Weight After Washing (g):	<b>161.35</b>	(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	0.13	99.90	100	0.13
#10	2.000	0.28	99.67	80	0.22
#14	1.400	0.40	99.35	70	0.28
#18	1.000	0.36	99.06	50	0.18
#25	0.710	0.35	98.78	40	0.14
#35	0.500	0.50	98.37	20	0.10
#45	0.355	0.57	97.92	10	0.06
#60	0.250	1.08	97.05	5	0.05
#80	0.180	22.21	79.18	1	0.22
#120	0.125	66.92	25.33	1	0.67
#170	0.090	14.71	13.49	1	0.15
#230	0.063	3.98	10.29	1	0.04

**Total Shell Content:** **2** %



COBBLES	GRAVEL		SAND			SILT OR CLAY
	COARSE	FINE	COARSE	MEDIUM	FINE	

Sample No.	Elev. Or Depth	Classification	% CO <sub>3</sub>	G <sub>s</sub>	Nat w%	LL	PL	PI	Project
♦ 2	43.0-43.5	SAND, poorly-graded with silt, mostly fine-grained quartz, few silt, trace carbonate, olive gray (SP-SM)	2						Topsail Beach, Surf City & North Topsail
									Area
									Boring No. T1-03-V-134
									Date 9/18/2003

**GRADATION CURVES**



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## VISUAL SHELL CONTENT

### GRAIN SIZE AND VISUAL SHELL CONTENT

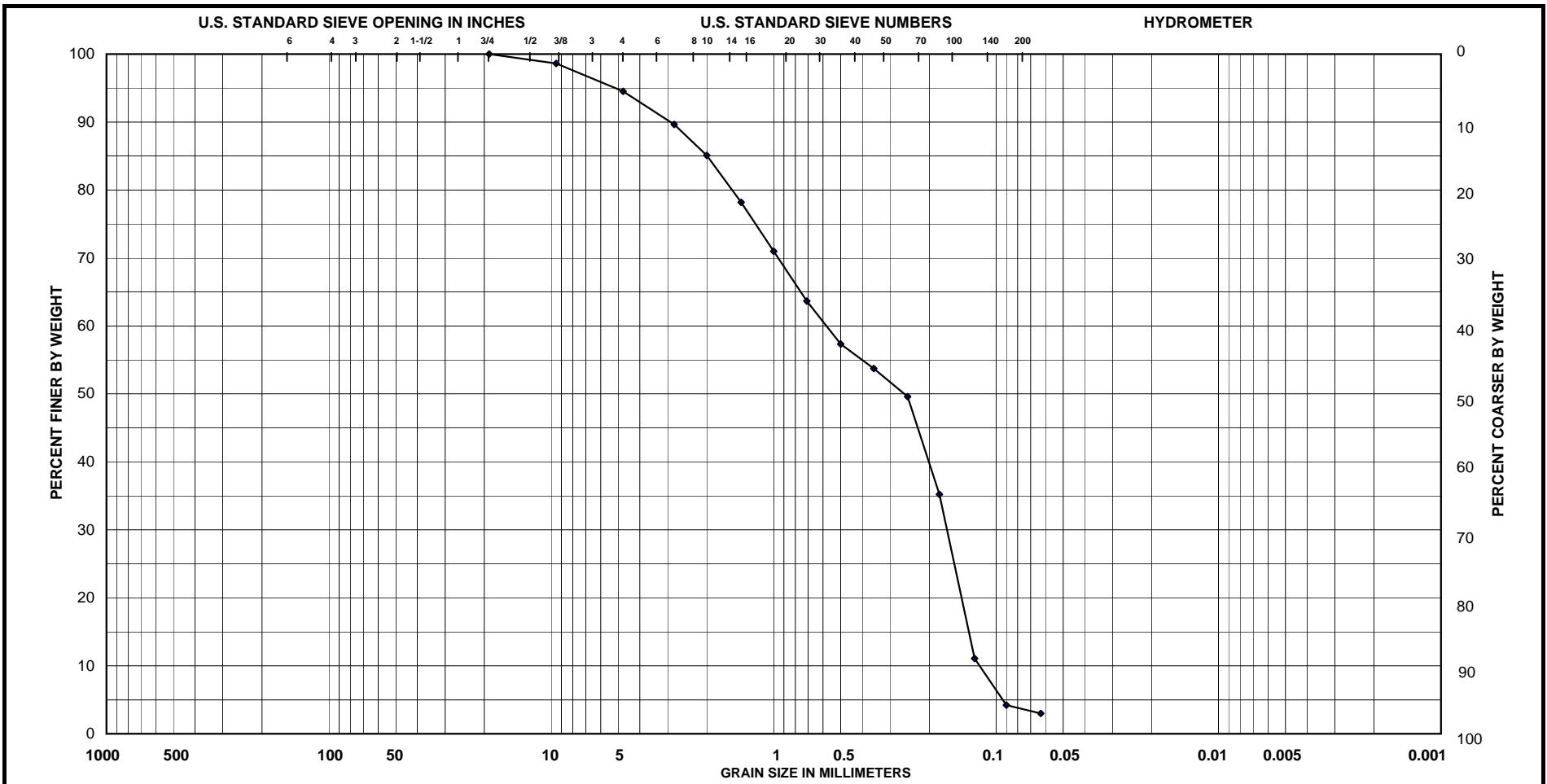
Project:	<b>Topsail Beach, Surf City &amp; North Topsail</b>	Depth:	<b>36.7-37.2</b>
Project No.:	<b>1584-01-40</b>	Date:	<b>9/18/2003</b>
Boring No.:	<b>T1-03-V-135</b>		
Sample No.:	<b>1</b>		
Description:	<b>SAND, poorly-graded, mostly fine-grained quartz, some coarse to medium-grained carbonate, few fine gravel-size carbonate, very dark</b>		

Tare Weight, (g):	<b>49.90</b>	
Dry Wt. Before Washing (g):	<b>189.43</b>	(with tare)
Dry Weight After Washing (g):	<b>185.42</b>	(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	1.91	98.63	100	1.91
#4	4.750	5.75	94.51	100	5.75
#7	2.800	6.77	89.66	100	6.77
#10	2.000	6.39	85.08	100	6.39
#14	1.400	9.62	78.18	95	9.14
#18	1.000	10.02	71.00	90	9.02
#25	0.710	10.26	63.65	80	8.21
#35	0.500	8.78	57.36	70	6.15
#45	0.355	5.07	53.72	60	3.04
#60	0.250	5.78	49.58	20	1.16
#80	0.180	20.03	35.23	3	0.60
#120	0.125	33.72	11.06	1	0.34
#170	0.090	9.57	4.20	1	0.10
#230	0.063	1.68	3.00	1	0.02

**Total Shell Content:**

<b>42</b>	<b>%</b>
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COBBLES	GRAVEL		SAND			SILT OR CLAY
	COARSE	FINE	COARSE	MEDIUM	FINE	

Sample No.	Elev. Or Depth	Classification	% CO <sub>3</sub>	G <sub>s</sub>	Nat w%	LL	PL	PI	Project	
♦ 1	36.7-37.2	SAND, poorly-graded, mostly fine-grained quartz, some coarse to medium-grained carbonate, few fine gravel-size carbonate, very dark gray (SP)	42						Topsail Beach, Surf City & North Topsail	
									Area	
									Boring No. T1-03-V-135	
									Date 9/18/2003	

**GRADATION CURVES**





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## VISUAL SHELL CONTENT

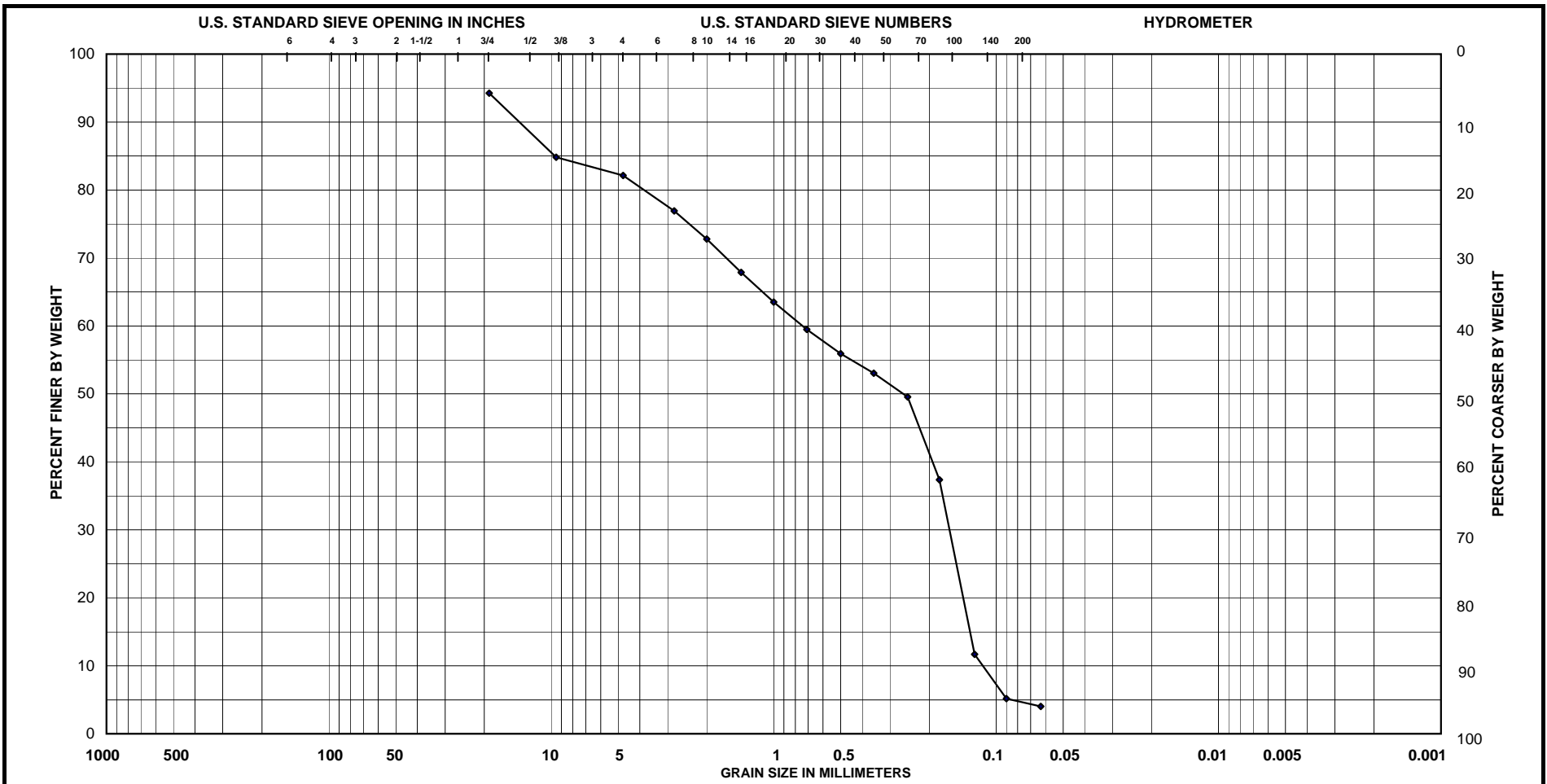
### GRAIN SIZE AND VISUAL SHELL CONTENT

<b>Project:</b>	<b>Topsail Beach, Surf City &amp; North Topsail</b>	<b>Depth:</b>	<b>39.0-39.5</b>
<b>Project No.:</b>	<b>1584-01-40</b>	<b>Date:</b>	<b>9/18/2003</b>
<b>Boring No.:</b>	<b>T1-03-V-135</b>		
<b>Sample No.:</b>	<b>2</b>		
<b>Description:</b>	<b>SAND, poorly-graded, mostly medium to fine-grained quartz, little fine gravel-size carbonate, few coarse-grained carbonate, dark greenish</b>		

Tare Weight, (g):	49.83	
Dry Wt. Before Washing (g):	217.89	(with tare)
Dry Weight After Washing (g):	211.84	(with tare)

Sieve Size (Name)	Sieve Size (mm)	Weight Retained (g)	% Passing	Approx. Visual Shell %	Approx. Visual Shell Wt. (g)
3/4"	19.000	9.69	94.23	0	0.00
3/8"	9.500	15.81	84.83	50	7.91
#4	4.750	4.54	82.13	80	3.63
#7	2.800	8.72	76.94	90	7.85
#10	2.000	7.00	72.77	90	6.30
#14	1.400	8.19	67.90	90	7.37
#18	1.000	7.36	63.52	80	5.89
#25	0.710	6.80	59.47	70	4.76
#35	0.500	5.94	55.94	50	2.97
#45	0.355	4.86	53.05	20	0.97
#60	0.250	5.84	49.57	10	0.58
#80	0.180	20.48	37.39	2	0.41
#120	0.125	43.17	11.70	1	0.43
#170	0.090	10.94	5.19	1	0.11
#230	0.063	1.97	4.02	1	0.02

**Total Shell Content:** 29 %



COBBLES	GRAVEL		SAND			SILT OR CLAY
	COARSE	FINE	COARSE	MEDIUM	FINE	

Sample No.	Elev. Or Depth	Classification	% CO <sub>3</sub>	G <sub>s</sub>	Nat w%	LL	PL	PI	Project	
♦ 2	39.0-39.5	SAND, poorly-graded, mostly medium to fine-grained quartz, little fine gravel-size carbonate, few coarse-grained carbonate, dark greenish gray (SP)	29						Topsail Beach, Surf City & North Topsail	
			Area							
			Boring No. T1-03-V-135							
			Date 9/18/2003							

**GRADATION CURVES**



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## VISUAL SHELL CONTENT

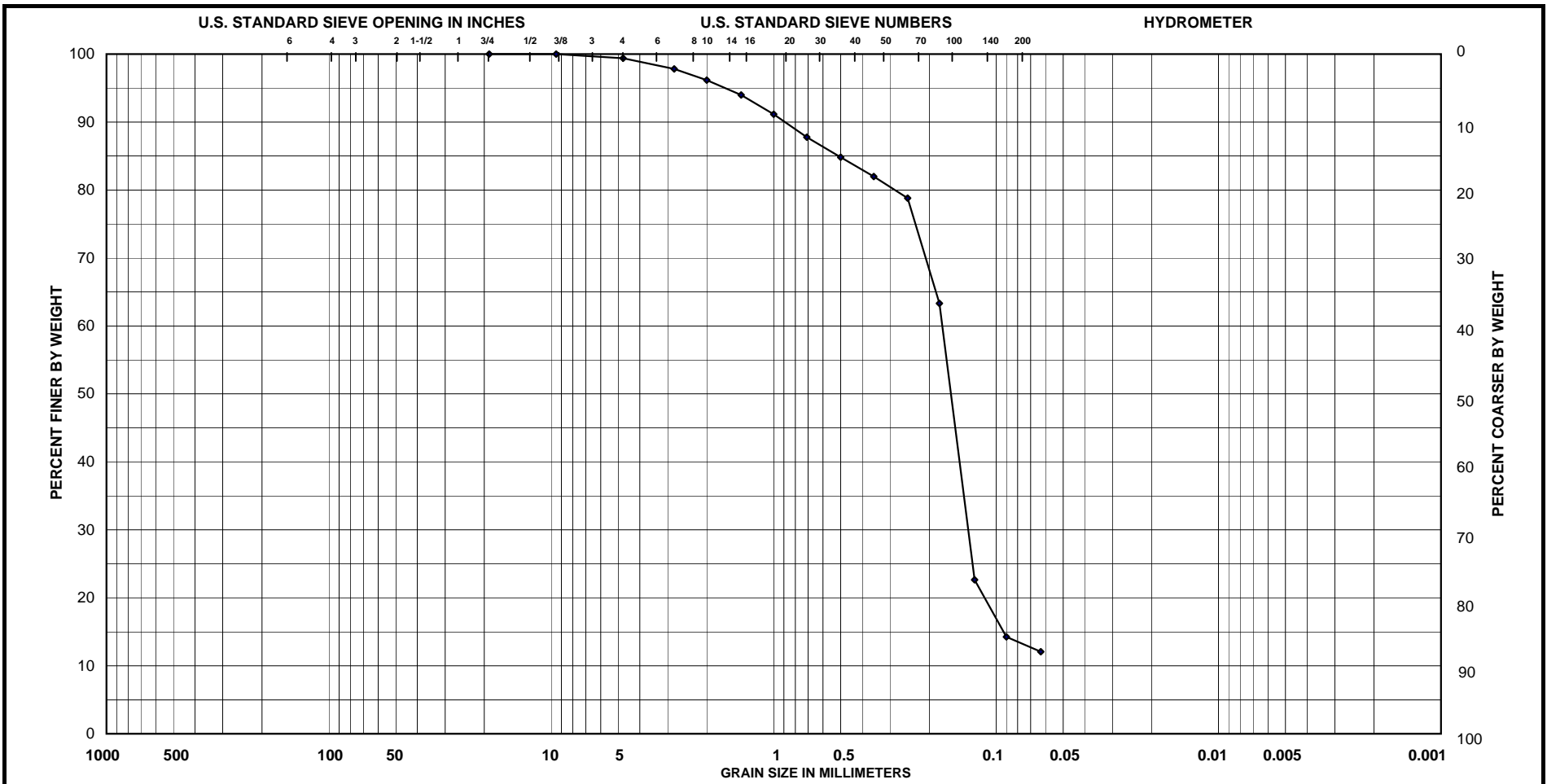
### GRAIN SIZE AND VISUAL SHELL CONTENT

Project:	<b>Topsail Beach, Surf City &amp; North Topsail</b>	Depth:	<b>40.2-40.7</b>
Project No.:	<b>1584-01-40</b>	Date:	<b>9/18/2003</b>
Boring No.:	<b>T1-03-V-135</b>		
Sample No.:	<b>3</b>		
Description:	<b>SAND, poorly-graded with silt, mostly fine-grained quartz, little coarse to medium-grained carbonate, olive gray (SP-SM)</b>		

Tare Weight, (g):	<b>49.65</b>	
Dry Wt. Before Washing (g):	<b>177.5</b>	(with tare)
Dry Weight After Washing (g):	<b>162.61</b>	(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	0.80	99.37	100	0.80
#7	2.800	1.97	97.83	100	1.97
#10	2.000	2.13	96.17	100	2.13
#14	1.400	2.78	93.99	100	2.78
#18	1.000	3.66	91.13	90	3.29
#25	0.710	4.30	87.77	90	3.87
#35	0.500	3.76	84.83	80	3.01
#45	0.355	3.62	81.99	60	2.17
#60	0.250	4.08	78.80	40	1.63
#80	0.180	19.78	63.33	10	1.98
#120	0.125	52.00	22.66	1	0.52
#170	0.090	10.74	14.26	1	0.11
#230	0.063	2.81	12.06	1	0.03

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



COBBLES	GRAVEL		SAND			SILT OR CLAY
	COARSE	FINE	COARSE	MEDIUM	FINE	

Sample No.	Elev. Or Depth	Classification	% CO <sub>3</sub>	G <sub>s</sub>	Nat w%	LL	PL	PI	Project	
3	40.2-40.7	SAND, poorly-graded with silt, mostly fine-grained quartz, little coarse to medium-grained carbonate, olive gray (SP-SM)	19						Topsail Beach, Surf City & North Topsail	
									Area	
									Boring No. T1-03-V-135	
									Date 9/18/2003	

**GRADATION CURVES**



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## VISUAL SHELL CONTENT

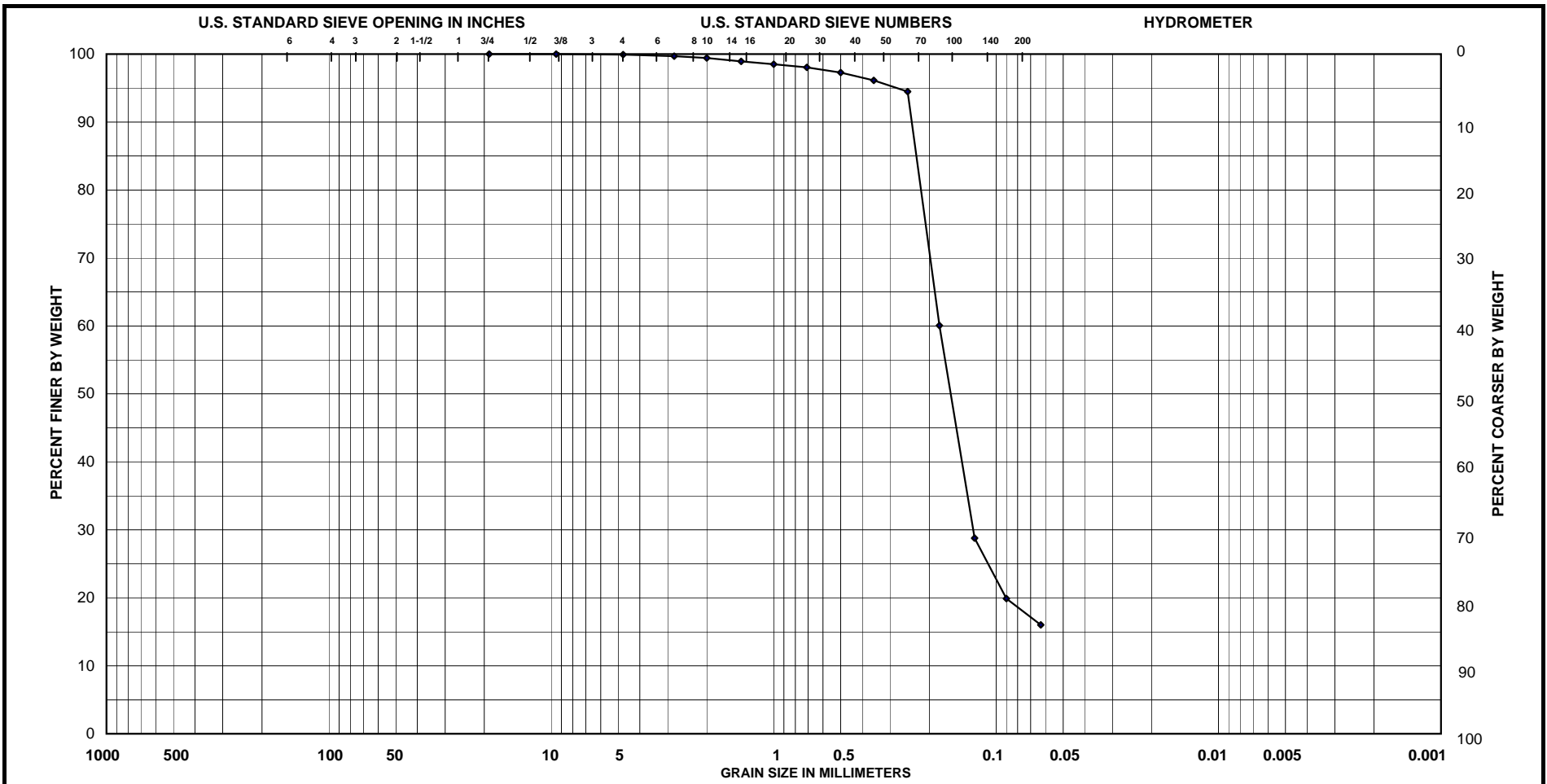
### GRAIN SIZE AND VISUAL SHELL CONTENT

Project:	<b>Topsail Beach, Surf City &amp; North Topsail</b>	Depth:	<b>43.0-43.5</b>
Project No.:	<b>1584-01-40</b>	Date:	<b>9/18/2003</b>
Boring No.:	<b>T1-03-V-135</b>		
Sample No.:	<b>4</b>		
Description:	<b>SAND, silty, mostly fine-grained quartz, trace carbonate, olive gray (SM)</b>		

Tare Weight, (g):	<b>48.74</b>	
Dry Wt. Before Washing (g):	<b>169.64</b>	(with tare)
Dry Weight After Washing (g):	<b>151.13</b>	(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	0.09	99.93	100	0.09
#7	2.800	0.26	99.71	100	0.26
#10	2.000	0.33	99.44	100	0.33
#14	1.400	0.63	98.92	100	0.63
#18	1.000	0.51	98.49	90	0.46
#25	0.710	0.54	98.05	90	0.49
#35	0.500	0.91	97.30	60	0.55
#45	0.355	1.41	96.13	30	0.42
#60	0.250	2.00	94.47	20	0.40
#80	0.180	41.62	60.05	2	0.83
#120	0.125	37.79	28.79	1	0.38
#170	0.090	10.76	19.89	1	0.11
#230	0.063	4.70	16.00	1	0.05

**Total Shell Content:** **4** %



COBBLES	GRAVEL		SAND			SILT OR CLAY
	COARSE	FINE	COARSE	MEDIUM	FINE	

Sample No.	Elev. Or Depth	Classification	% CO <sub>3</sub>	G <sub>s</sub>	Nat w%	LL	PL	PI	Project
4	43.0-43.5	SAND, silty, mostly fine-grained quartz, trace carbonate, olive gray (SM)	4						Topsail Beach, Surf City & North Topsail
									Area
									Boring No. T1-03-V-135
									Date 9/18/2003

**GRADATION CURVES**



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## VISUAL SHELL CONTENT

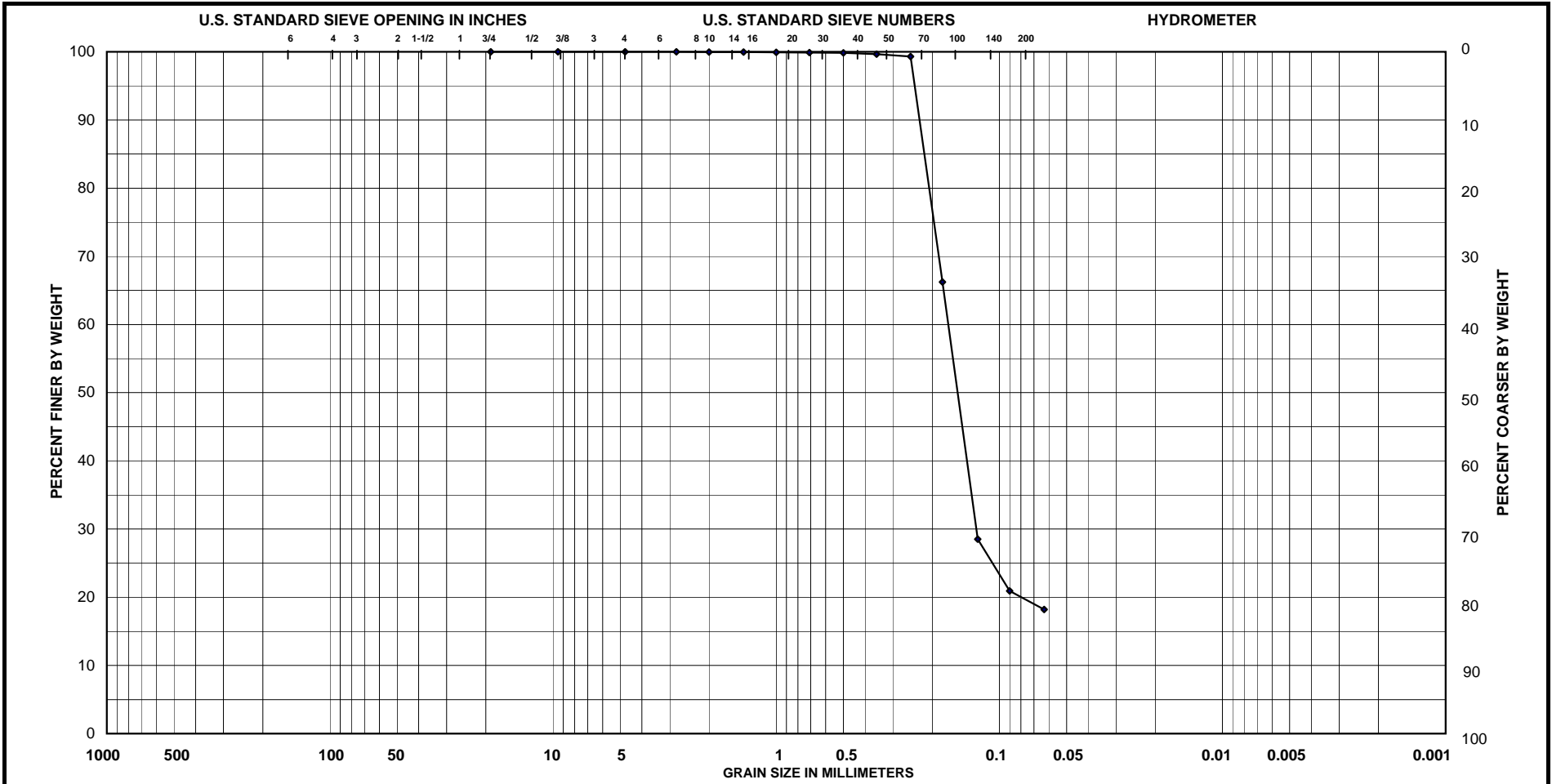
### GRAIN SIZE AND VISUAL SHELL CONTENT

Project:	<b>Topsail Beach, Surf City &amp; North Topsail</b>	Depth:	<b>45.0-45.5</b>
Project No.:	<b>1584-01-40</b>	Date:	<b>9/18/2003</b>
Boring No.:	<b>T1-03-V-135</b>		
Sample No.:	<b>5</b>		
Description:	<b>SAND, silty, mostly fine-grained quartz, trace carbonate, olive gray (SM)</b>		

Tare Weight, (g):	<b>50.21</b>	
Dry Wt. Before Washing (g):	<b>179.58</b>	(with tare)
Dry Weight After Washing (g):	<b>156.61</b>	(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	0.03	99.98	50	0.02
#14	1.400	0.03	99.95	50	0.02
#18	1.000	0.05	99.91	40	0.02
#25	0.710	0.05	99.88	40	0.02
#35	0.500	0.06	99.83	20	0.01
#45	0.355	0.23	99.65	10	0.02
#60	0.250	0.45	99.30	2	0.01
#80	0.180	42.80	66.22	1	0.43
#120	0.125	48.79	28.51	1	0.49
#170	0.090	9.82	20.92	1	0.10
#230	0.063	3.49	18.22	1	0.03

**Total Shell Content:** **1** %



COBBLES	GRAVEL		SAND			SILT OR CLAY
	COARSE	FINE	COARSE	MEDIUM	FINE	

Sample No.	Elev. Or Depth	Classification	% CO <sub>3</sub>	G <sub>s</sub>	Nat w%	LL	PL	PI	Project	
5	45.0-45.5	SAND, silty, mostly fine-grained quartz, trace carbonate, olive gray (SM)	1						Topsail Beach, Surf City & North Topsail	
									Area	
									Boring No. T1-03-V-135	
									Date 9/18/2003	

**GRADATION CURVES**





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## VISUAL SHELL CONTENT

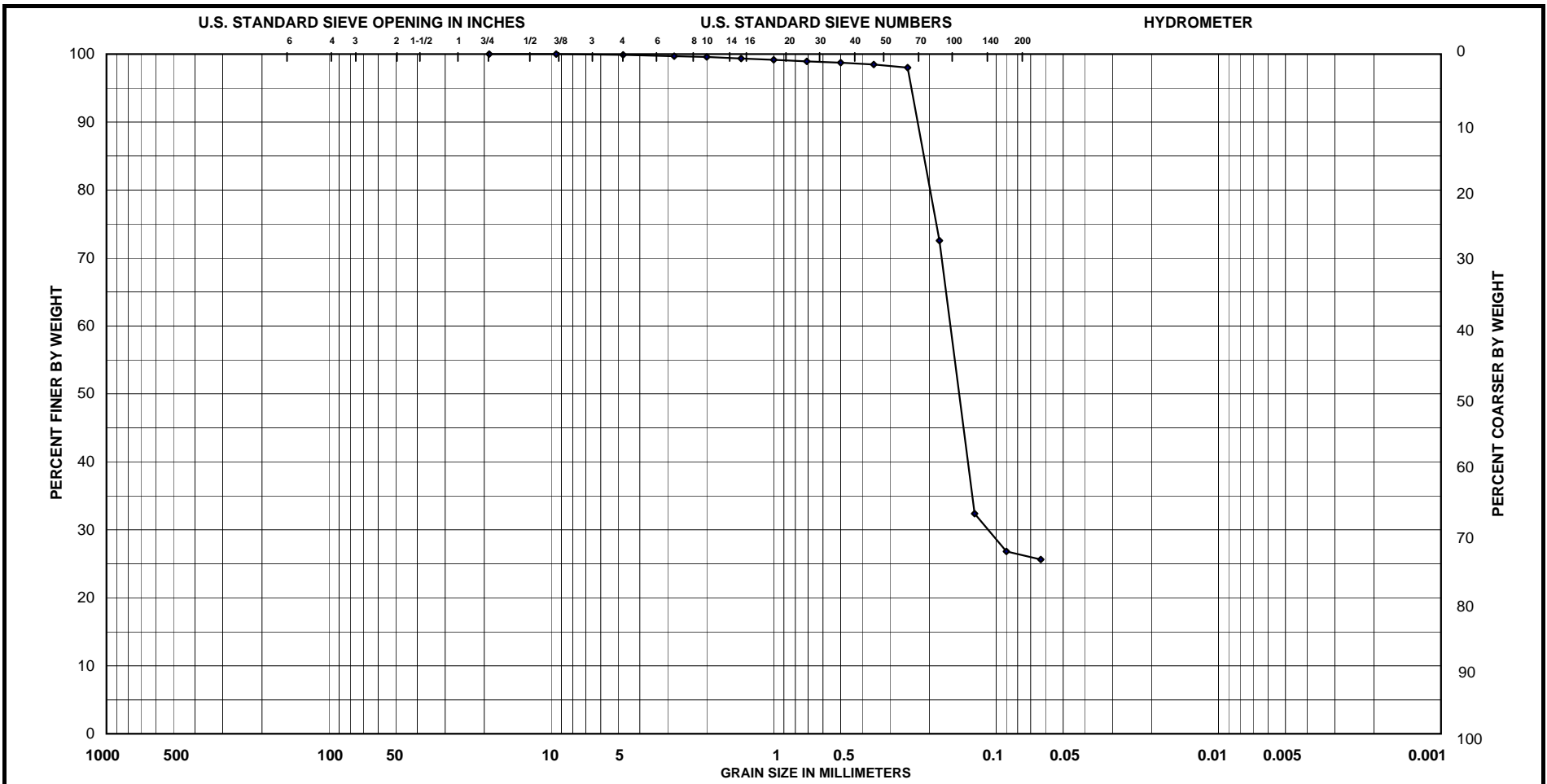
### GRAIN SIZE AND VISUAL SHELL CONTENT

Project:	<b>Topsail Beach, Surf City &amp; North Topsail</b>	Depth:	<b>47.5-48.0</b>
Project No.:	<b>1584-01-40</b>	Date:	<b>9/18/2003</b>
Boring No.:	<b>T1-03-V-135</b>		
Sample No.:	<b>6</b>		
Description:	<b>SAND, silty, mostly fine-grained quartz, trace carbonate, olive gray (SM)</b>		

Tare Weight, (g):	<b>50.49</b>	
Dry Wt. Before Washing (g):	<b>185.01</b>	(with tare)
Dry Weight After Washing (g):	<b>150.92</b>	(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	0.17	99.87	0	0.00
#7	2.800	0.22	99.71	0	0.00
#10	2.000	0.20	99.56	0	0.00
#14	1.400	0.29	99.35	5	0.01
#18	1.000	0.28	99.14	5	0.01
#25	0.710	0.28	98.93	5	0.01
#35	0.500	0.26	98.74	5	0.01
#45	0.355	0.35	98.48	5	0.02
#60	0.250	0.62	98.02	1	0.01
#80	0.180	34.23	72.57	1	0.34
#120	0.125	54.06	32.38	1	0.54
#170	0.090	7.47	26.83	1	0.07
#230	0.063	1.62	25.62	1	0.02

**Total Shell Content:** **1** %



COBBLES	GRAVEL		SAND			SILT OR CLAY
	COARSE	FINE	COARSE	MEDIUM	FINE	

Sample No.	Elev. Or Depth	Classification	% CO <sub>3</sub>	G <sub>s</sub>	Nat w%	LL	PL	PI	Project	
6	47.5-48.0	SAND, silty, mostly fine-grained quartz, trace carbonate, olive gray (SM)	1						Topsail Beach, Surf City & North Topsail	
									Area	
									Boring No. T1-03-V-135	
									Date 9/18/2003	

**GRADATION CURVES**



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## VISUAL SHELL CONTENT

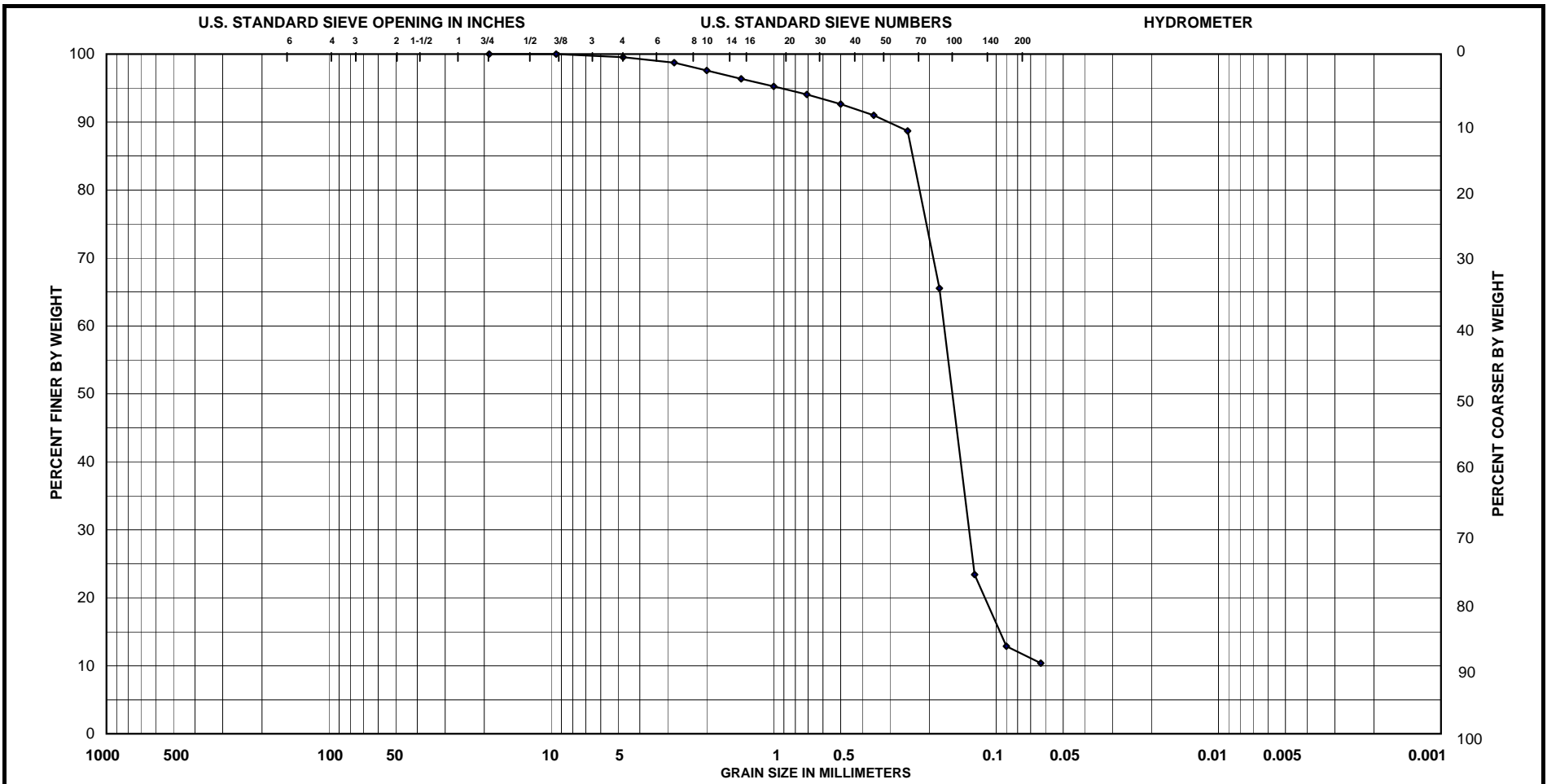
### GRAIN SIZE AND VISUAL SHELL CONTENT

Project:	<b>Topsail Beach, Surf City &amp; North Topsail</b>	Depth:	<b>36.8-37.3</b>
Project No.:	<b>1584-01-40</b>	Date:	<b>9/18/2003</b>
Boring No.:	<b>T1-03-V-136</b>		
Sample No.:	<b>1</b>		
Description:	<b>SAND, poorly-graded with silt, mostly fine-grained quartz, few silt, few carbonate, olive gray (SP-SM)</b>		

Tare Weight, (g):	<b>50.32</b>	
Dry Wt. Before Washing (g):	<b>179.38</b>	(with tare)
Dry Weight After Washing (g):	<b>166.21</b>	(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	0.61	99.53	100	0.61
#7	2.800	1.03	98.73	100	1.03
#10	2.000	1.49	97.57	95	1.42
#14	1.400	1.57	96.36	95	1.49
#18	1.000	1.43	95.25	90	1.29
#25	0.710	1.54	94.06	80	1.23
#35	0.500	1.83	92.64	70	1.28
#45	0.355	2.12	91.00	30	0.64
#60	0.250	2.97	88.70	10	0.30
#80	0.180	29.86	65.56	1	0.30
#120	0.125	54.40	23.41	1	0.54
#170	0.090	13.57	12.89	1	0.14
#230	0.063	3.23	10.39	1	0.03

**Total Shell Content:** **8** %



COBBLES	GRAVEL		SAND			SILT OR CLAY
	COARSE	FINE	COARSE	MEDIUM	FINE	

Sample No.	Elev. Or Depth	Classification	% CO <sub>3</sub>	G <sub>s</sub>	Nat w%	LL	PL	PI	Project
♦ 1	36.8-37.3	SAND, poorly-graded with silt, mostly fine-grained quartz, few silt, few carbonate, olive gray (SP-SM)	8						Topsail Beach, Surf City & North Topsail
									Area
									Boring No. T1-03-V-136
									Date 9/18/2003

**GRADATION CURVES**



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## VISUAL SHELL CONTENT

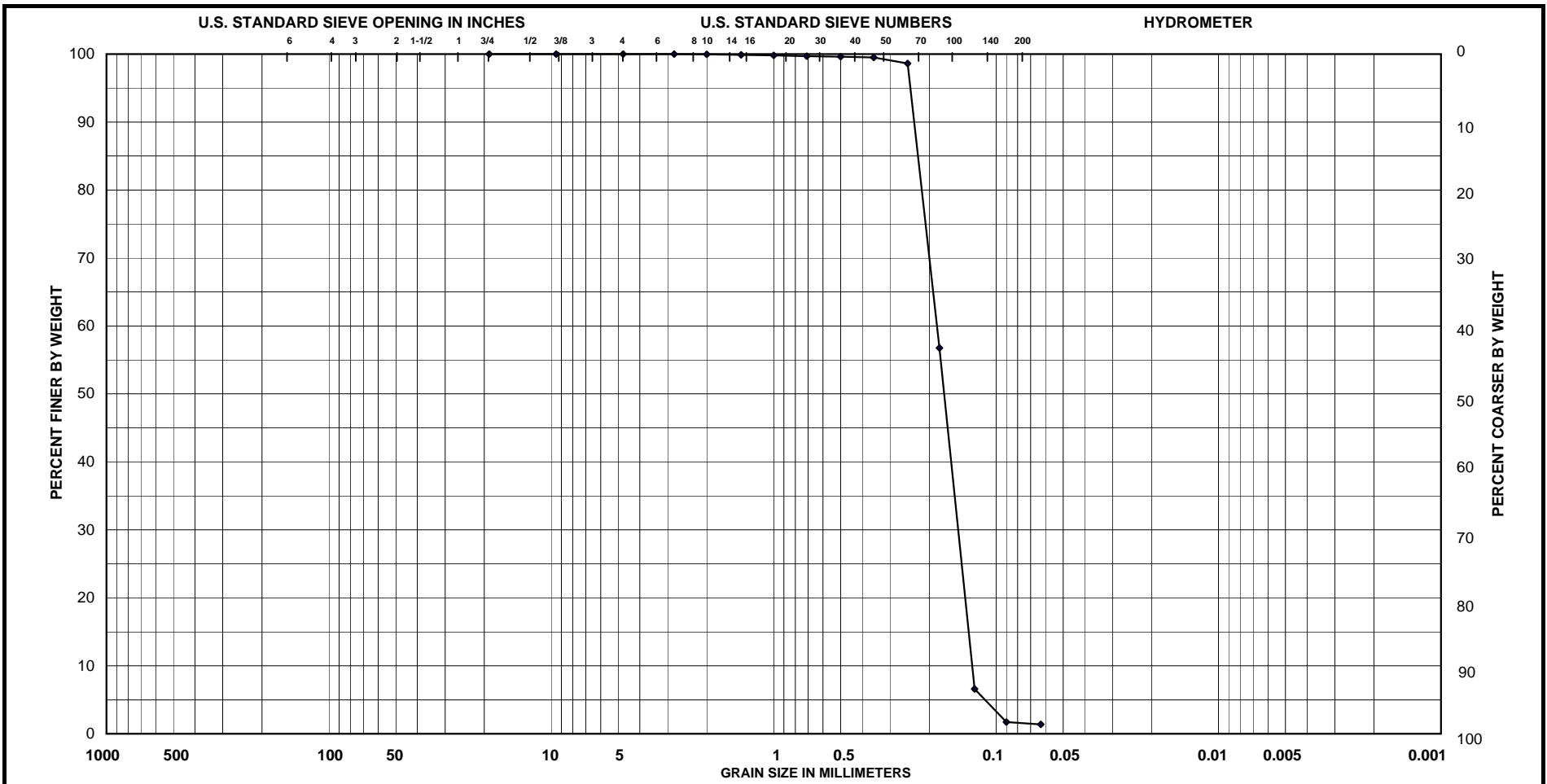
### GRAIN SIZE AND VISUAL SHELL CONTENT

Project:	<b>Topsail Beach, Surf City &amp; North Topsail</b>	Depth:	<b>3.7-4.2</b>
Project No.:	<b>1584-01-40</b>	Date:	<b>9/18/2003</b>
Boring No.:	<b>T1-03-V-137</b>		
Sample No.:	<b>1</b>		
Description:	<b>SAND, poorly-graded, mostly fine-grained quartz, trace carbonate, gray (SP)</b>		

Tare Weight, (g):	<b>49.47</b>	
Dry Wt. Before Washing (g):	<b>169.72</b>	(with tare)
Dry Weight After Washing (g):	<b>168.32</b>	(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	0.04	99.95	80	0.03
#14	1.400	0.08	99.88	80	0.06
#18	1.000	0.11	99.79	80	0.09
#25	0.710	0.10	99.71	70	0.07
#35	0.500	0.10	99.63	50	0.05
#45	0.355	0.17	99.48	40	0.07
#60	0.250	1.02	98.64	20	0.20
#80	0.180	50.33	56.78	2	1.01
#120	0.125	60.36	6.59	1	0.60
#170	0.090	5.86	1.71	1	0.06
#230	0.063	0.39	1.39	1	0.00

**Total Shell Content:** **2** %



<b>COBBLES</b>	<b>GRAVEL</b>		<b>SAND</b>			<b>SILT OR CLAY</b>
	COARSE	FINE	COARSE	MEDIUM	FINE	

Sample No.	Elev. Or Depth	Classification	% CO <sub>3</sub>	G <sub>s</sub>	Nat w%	LL	PL	PI		
♦ 1	3.7-4.2	SAND, poorly-graded, mostly fine-grained quartz, trace carbonate, gray (SP)	2						<b>Project</b>	Topsail Beach, Surf City & North Topsail
									<b>Area</b>	
									<b>Boring No.</b>	T1-03-V-137
									<b>Date</b>	9/18/2003

**GRADATION CURVES**



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## VISUAL SHELL CONTENT

### GRAIN SIZE AND VISUAL SHELL CONTENT

<b>Project:</b>	<b>Topsail Beach, Surf City &amp; North Topsail</b>	<b>Depth:</b>	<b>5.5-6.0</b>
<b>Project No.:</b>	<b>1584-01-40</b>	<b>Date:</b>	<b>9/18/2003</b>
<b>Boring No.:</b>	<b>T1-03-V-137</b>		
<b>Sample No.:</b>	<b>2</b>		
<b>Description:</b>	<b>SAND, poorly-graded, mostly fine-grained quartz, trace carbonate, gray (SP)</b>		

Tare Weight, (g):	50.33	
Dry Wt. Before Washing (g):	177.95	(with tare)
Dry Weight After Washing (g):	176.58	(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	0.04	99.97	10	0.00
#14	1.400	0.02	99.95	0	0.00
#18	1.000	0.03	99.93	10	0.00
#25	0.710	0.03	99.91	20	0.01
#35	0.500	0.04	99.87	30	0.01
#45	0.355	0.06	99.83	80	0.05
#60	0.250	0.81	99.19	60	0.49
#80	0.180	63.34	49.56	2	1.27
#120	0.125	56.06	5.63	1	0.56
#170	0.090	5.28	1.50	1	0.05
#230	0.063	0.43	1.16	1	0.00

**Total Shell Content:** 2 %



COBBLES	GRAVEL		SAND			SILT OR CLAY
	COARSE	FINE	COARSE	MEDIUM	FINE	

Sample No.	Elev. Or Depth	Classification	% CO <sub>3</sub>	G <sub>s</sub>	Nat w%	LL	PL	PI	Project
♦ 2	5.5-6.0	SAND, poorly-graded, mostly fine-grained quartz, trace carbonate, gray (SP)	2						Topsail Beach, Surf City & North Topsail
									Area
									Boring No. T1-03-V-137
									Date 9/18/2003

**GRADATION CURVES**





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## VISUAL SHELL CONTENT

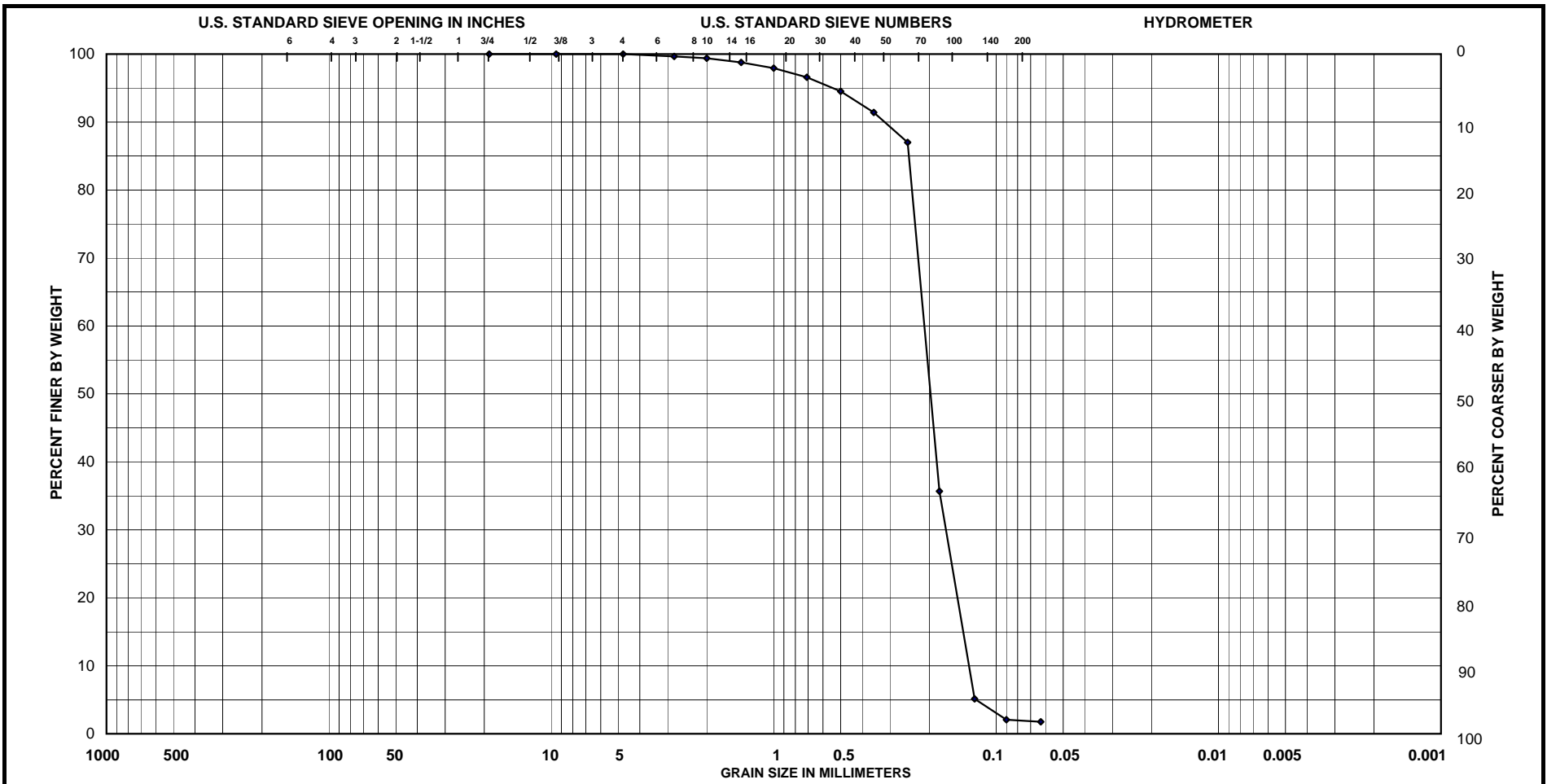
### GRAIN SIZE AND VISUAL SHELL CONTENT

Project:	<b>Topsail Beach, Surf City &amp; North Topsail</b>	Depth:	<b>7.5-8.0</b>
Project No.:	<b>1584-01-40</b>	Date:	<b>9/18/2003</b>
Boring No.:	<b>T1-03-V-137</b>		
Sample No.:	<b>3</b>		
Description:	<b>SAND, poorly-graded, mostly fine-grained quartz, trace carbonate, gray (SP)</b>		

Tare Weight, (g):	<b>50.58</b>	
Dry Wt. Before Washing (g):	<b>172.72</b>	(with tare)
Dry Weight After Washing (g):	<b>170.88</b>	(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	0.44	99.64	80	0.35
#10	2.000	0.29	99.40	90	0.26
#14	1.400	0.77	98.77	90	0.69
#18	1.000	1.05	97.91	90	0.95
#25	0.710	1.63	96.58	50	0.82
#35	0.500	2.51	94.52	20	0.50
#45	0.355	3.79	91.42	10	0.38
#60	0.250	5.40	87.00	5	0.27
#80	0.180	62.69	35.67	1	0.63
#120	0.125	37.30	5.13	1	0.37
#170	0.090	3.73	2.08	1	0.04
#230	0.063	0.40	1.75	1	0.00

**Total Shell Content:** **4** %



COBBLES	GRAVEL		SAND			SILT OR CLAY
	COARSE	FINE	COARSE	MEDIUM	FINE	

Sample No.	Elev. Or Depth	Classification	% CO <sub>3</sub>	G <sub>s</sub>	Nat w%	LL	PL	PI	Project
3	7.5-8.0	SAND, poorly-graded, mostly fine-grained quartz, trace carbonate, gray (SP)	4						Topsail Beach, Surf City & North Topsail
									Area
									Boring No. T1-03-V-137
									Date 9/18/2003

**GRADATION CURVES**



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## VISUAL SHELL CONTENT

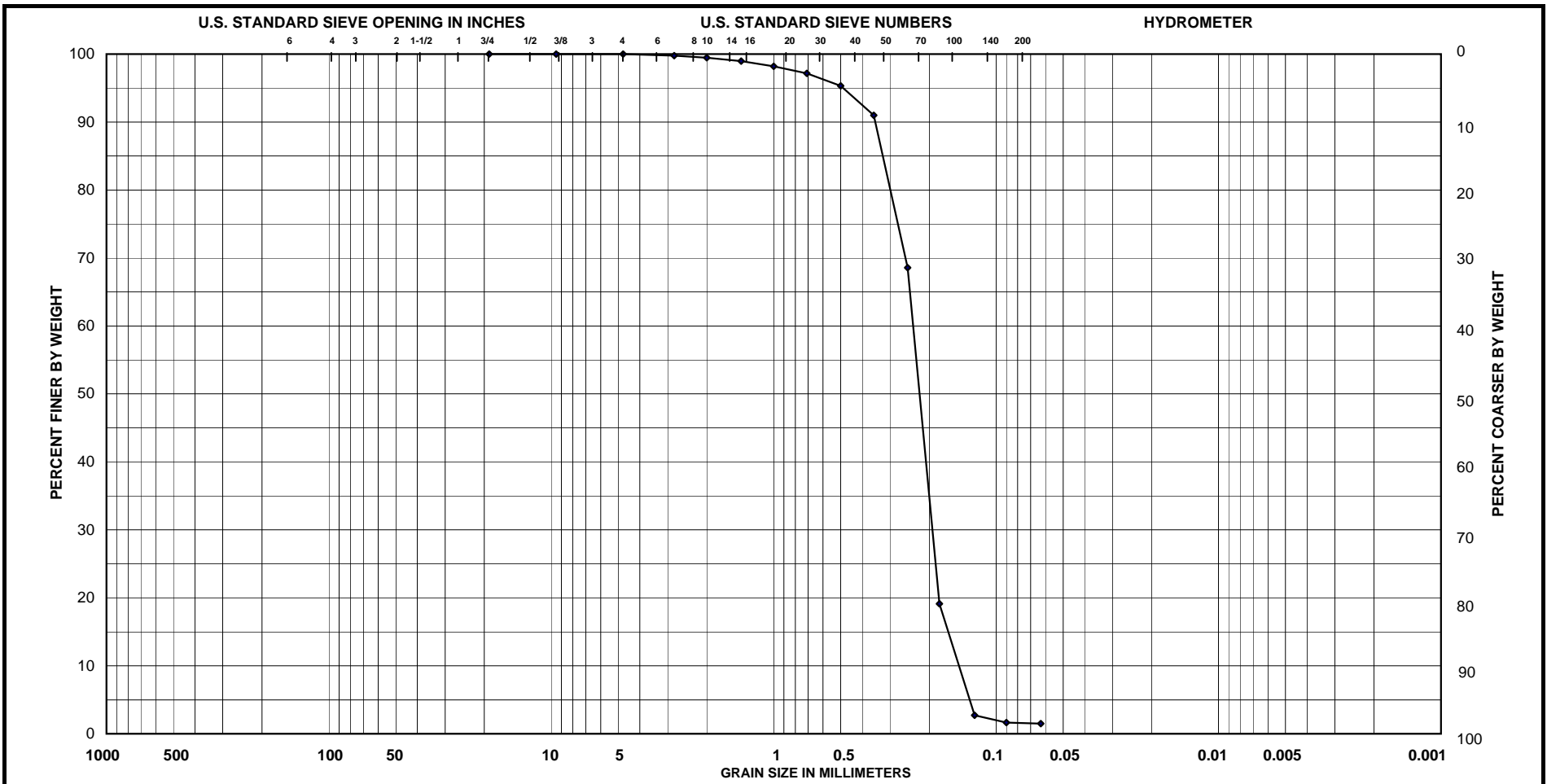
### GRAIN SIZE AND VISUAL SHELL CONTENT

Project:	<b>Topsail Beach, Surf City &amp; North Topsail</b>	Depth:	<b>10.0-10.5</b>
Project No.:	<b>1584-01-40</b>	Date:	<b>9/18/2003</b>
Boring No.:	<b>T1-03-V-137</b>		
Sample No.:	<b>4</b>		
Description:	<b>SAND, poorly-graded, mostly fine-grained quartz, trace carbonate, gray (SP)</b>		

Tare Weight, (g):	<b>50.85</b>	
Dry Wt. Before Washing (g):	<b>173.29</b>	(with tare)
Dry Weight After Washing (g):	<b>171.79</b>	(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	0.27	99.78	100	0.27
#10	2.000	0.38	99.47	90	0.34
#14	1.400	0.64	98.95	80	0.51
#18	1.000	0.91	98.20	70	0.64
#25	0.710	1.29	97.15	60	0.77
#35	0.500	2.23	95.33	30	0.67
#45	0.355	5.30	91.00	10	0.53
#60	0.250	27.46	68.57	2	0.55
#80	0.180	60.56	19.11	1	0.61
#120	0.125	20.07	2.72	1	0.20
#170	0.090	1.33	1.63	1	0.01
#230	0.063	0.17	1.49	1	0.00

**Total Shell Content:** **4** %



COBBLES	GRAVEL		SAND			SILT OR CLAY
	COARSE	FINE	COARSE	MEDIUM	FINE	

Sample No.	Elev. Or Depth	Classification	% CO <sub>3</sub>	G <sub>s</sub>	Nat w%	LL	PL	PI	
4	10.0-10.5	SAND, poorly-graded, mostly fine-grained quartz, trace carbonate, gray (SP)	4						<b>Project</b> Topsail Beach, Surf City & North Topsail
			<b>Area</b>						
			<b>Boring No.</b> T1-03-V-137						
			<b>Date</b> 9/18/2003						

**GRADATION CURVES**



# WOLF TECHNOLOGIES, INC.

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

## VISUAL SHELL CONTENT

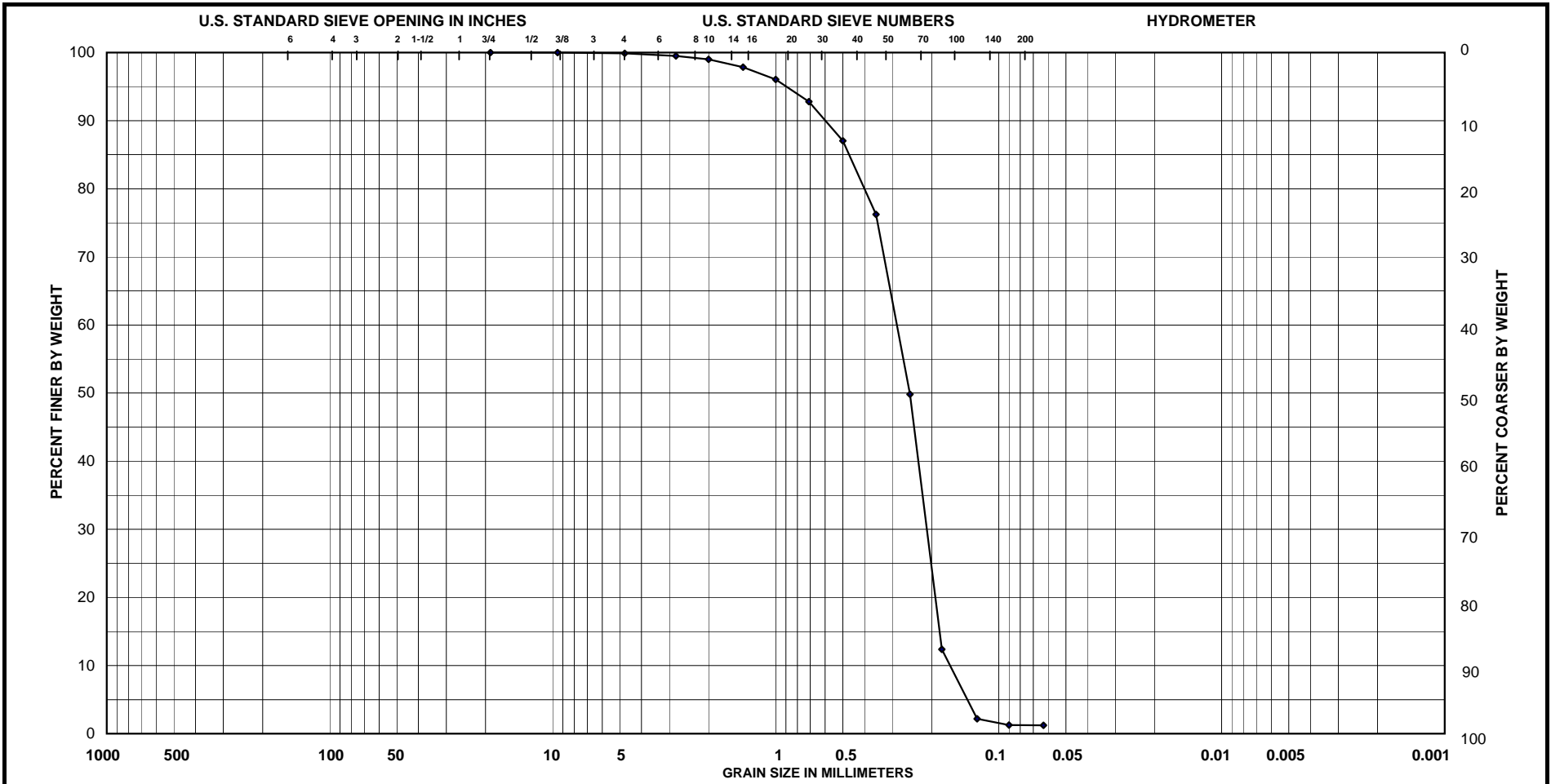
### GRAIN SIZE AND VISUAL SHELL CONTENT

Project:	<b>Topsail Beach, Surf City &amp; North Topsail</b>	Depth:	<b>7.5-8.0</b>
Project No.:	<b>1584-01-40</b>	Date:	<b>9/18/2003</b>
Boring No.:	<b>T1-03-V-137A</b>		
Sample No.:	<b>1</b>		
Description:	<b>SAND, poorly-graded, mostly fine-grained quartz, few carbonate, gray (SP)</b>		

Tare Weight, (g):	<b>50.08</b>	
Dry Wt. Before Washing (g):	<b>193.49</b>	(with tare)
Dry Weight After Washing (g):	<b>192.08</b>	(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	0.17	99.88	100	0.17
#7	2.800	0.55	99.50	90	0.50
#10	2.000	0.70	99.01	90	0.63
#14	1.400	1.64	97.87	80	1.31
#18	1.000	2.62	96.04	70	1.83
#25	0.710	4.66	92.79	50	2.33
#35	0.500	8.23	87.05	30	2.47
#45	0.355	15.51	76.24	10	1.55
#60	0.250	37.87	49.83	2	0.76
#80	0.180	53.72	12.37	1	0.54
#120	0.125	14.59	2.20	1	0.15
#170	0.090	1.35	1.26	1	0.01
#230	0.063	0.03	1.23	1	0.00

**Total Shell Content:** **9** %



COBBLES	GRAVEL		SAND			SILT OR CLAY
	COARSE	FINE	COARSE	MEDIUM	FINE	

Sample No.	Elev. Or Depth	Classification	% CO <sub>3</sub>	G <sub>s</sub>	Nat w%	LL	PL	PI	Project
♦ 1	7.5-8.0	SAND, poorly-graded, mostly fine-grained quartz, few carbonate, gray (SP)	9						Topsail Beach, Surf City & North Topsail
									Area
									Boring No. T1-03-V-137A
									Date 9/18/2003

**GRADATION CURVES**



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## VISUAL SHELL CONTENT

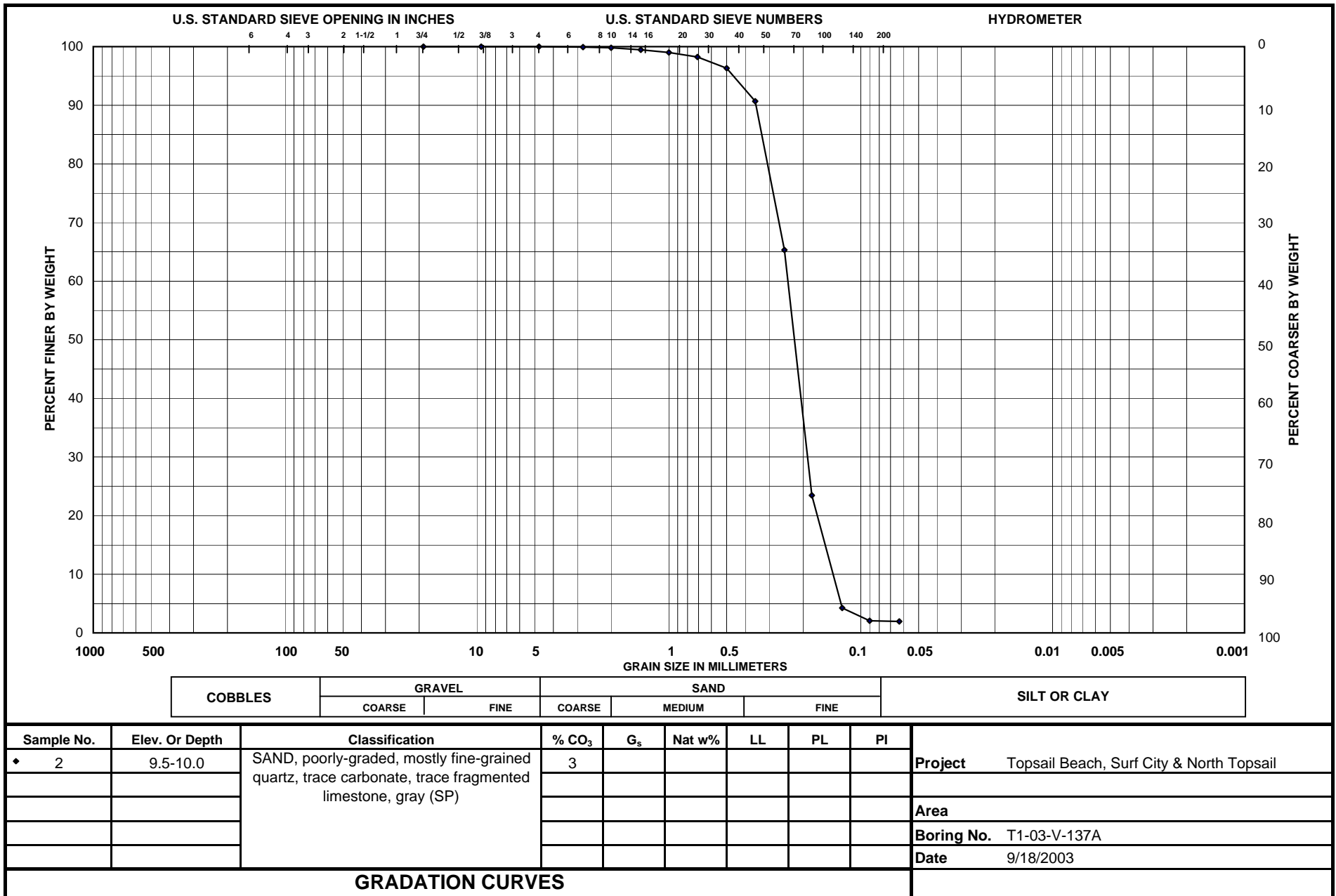
### GRAIN SIZE AND VISUAL SHELL CONTENT

Project:	<b>Topsail Beach, Surf City &amp; North Topsail</b>	Depth:	<b>9.5-10.0</b>
Project No.:	<b>1584-01-40</b>	Date:	<b>9/18/2003</b>
Boring No.:	<b>T1-03-V-137A</b>		
Sample No.:	<b>2</b>		
Description:	<b>SAND, poorly-graded, mostly fine-grained quartz, trace carbonate, trace fragmented limestone, gray (SP)</b>		

Tare Weight, (g):	<b>49.83</b>	
Dry Wt. Before Washing (g):	<b>170.63</b>	(with tare)
Dry Weight After Washing (g):	<b>169.55</b>	(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	0.17	99.79	90	0.15
#14	1.400	0.40	99.46	90	0.36
#18	1.000	0.56	99.00	60	0.34
#25	0.710	0.94	98.22	30	0.28
#35	0.500	2.28	96.33	10	0.23
#45	0.355	6.82	90.69	5	0.34
#60	0.250	30.66	65.31	3	0.92
#80	0.180	50.54	23.47	1	0.51
#120	0.125	23.20	4.26	1	0.23
#170	0.090	2.64	2.08	1	0.03
#230	0.063	0.14	1.96	1	0.00

**Total Shell Content:** **3** %







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## VISUAL SHELL CONTENT

### GRAIN SIZE AND VISUAL SHELL CONTENT

<b>Project:</b>	<b>Topsail Beach, Surf City &amp; North Topsail</b>	<b>Depth:</b>	<b>5.8-6.3</b>
<b>Project No.:</b>	<b>1584-01-40</b>	<b>Date:</b>	<b>9/18/2003</b>
<b>Boring No.:</b>	<b>T1-03-V-138</b>		
<b>Sample No.:</b>	<b>1</b>		
<b>Description:</b>	<b>SAND, poorly-graded with silt, mostly medium to fine-grained quartz, few carbonate, few silt, trace fragmented limestone, olive gray (SP-SM)</b>		

Tare Weight, (g):	49.81	
Dry Wt. Before Washing (g):	179.88	(with tare)
Dry Weight After Washing (g):	178.76	(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	0.71	99.45	85	0.60
#7	2.800	1.41	98.37	80	1.13
#10	2.000	2.02	96.82	65	1.31
#14	1.400	3.93	93.80	55	2.16
#18	1.000	5.77	89.36	20	1.15
#25	0.710	7.28	83.76	30	2.18
#35	0.500	11.09	75.24	20	2.22
#45	0.355	12.87	65.34	10	1.29
#60	0.250	35.02	38.42	3	1.05
#80	0.180	34.29	12.06	1	0.34
#120	0.125	6.58	7.00	1	0.07
#170	0.090	0.72	6.44	1	0.01
#230	0.063	0.06	6.40	1	0.00

**Total Shell Content:** 10 %





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## VISUAL SHELL CONTENT

### GRAIN SIZE AND VISUAL SHELL CONTENT

Project:	<b>Topsail Beach, Surf City &amp; North Topsail</b>	Depth:	<b>8.0-8.5</b>
Project No.:	<b>1584-01-40</b>	Date:	<b>9/22/2003</b>
Boring No.:	<b>T1-03-V-138</b>		
Sample No.:	<b>2</b>		
Description:	<b>SAND, poorly-graded, mostly fine-grained quartz, few carbonate, trace fragmented limestone, gray (SP)</b>		

Tare Weight, (g):	<b>50.20</b>	
Dry Wt. Before Washing (g):	<b>176.22</b>	(with tare)
Dry Weight After Washing (g):	<b>175.07</b>	(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	99.42	25	0.18
#7	2.800	0.81	98.78	85	0.69
#10	2.000	0.83	98.12	75	0.62
#14	1.400	1.46	96.96	60	0.88
#18	1.000	2.24	95.18	40	0.90
#25	0.710	2.70	93.04	20	0.54
#35	0.500	4.67	89.34	10	0.47
#45	0.355	8.08	82.92	5	0.40
#60	0.250	14.55	71.38	3	0.44
#80	0.180	60.19	23.62	1	0.60
#120	0.125	26.06	2.94	1	0.26
#170	0.090	2.19	1.20	1	0.02
#230	0.063	0.22	1.02	1	0.00

**Total Shell Content:** **5** %





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## VISUAL SHELL CONTENT

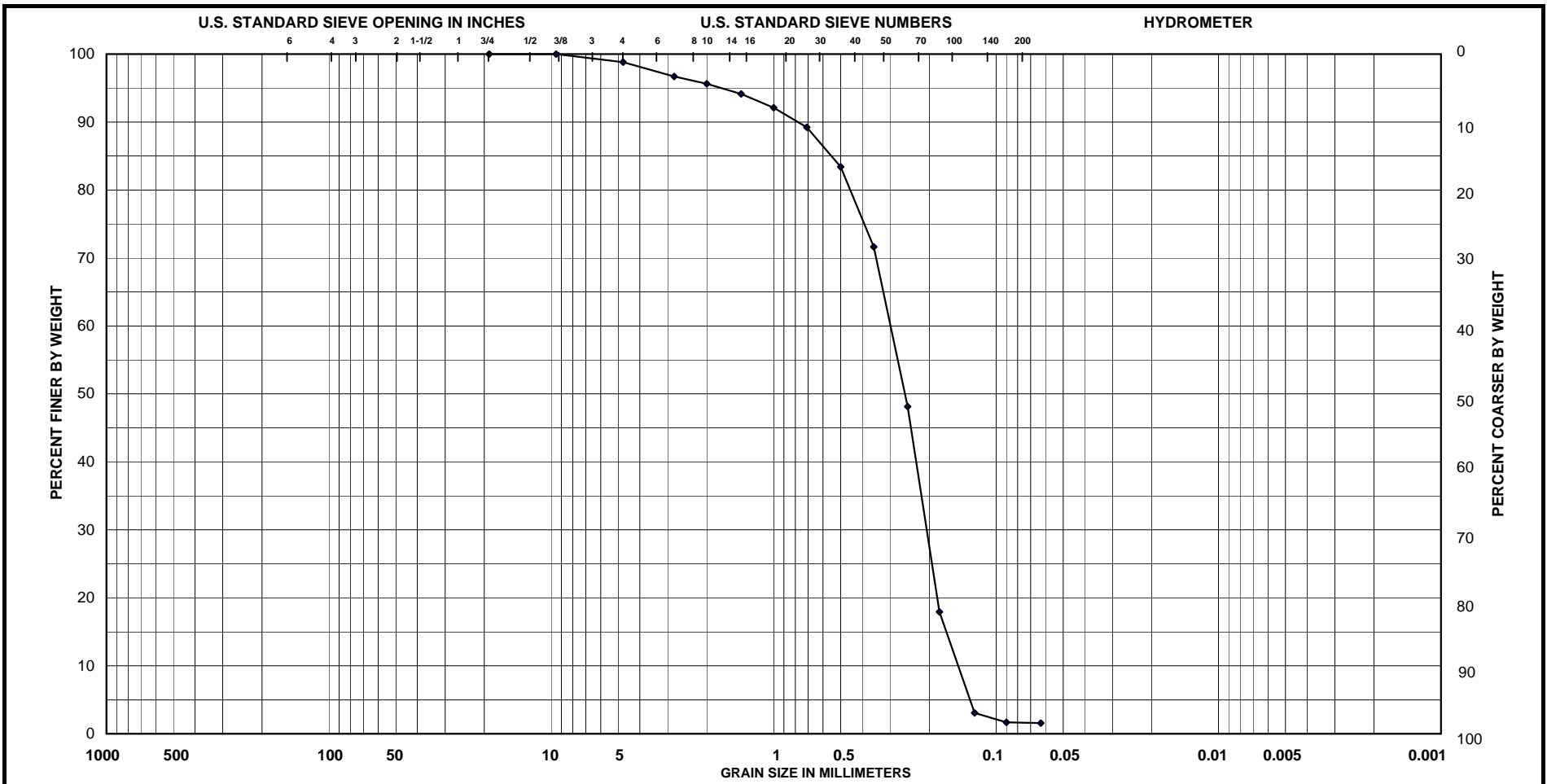
### GRAIN SIZE AND VISUAL SHELL CONTENT

Project:	<b>Topsail Beach, Surf City &amp; North Topsail</b>	Depth:	<b>8.1-8.6</b>
Project No.:	<b>1584-01-40</b>	Date:	<b>9/22/2003</b>
Boring No.:	<b>T1-03-V-138A</b>		
Sample No.:	<b>1</b>		
Description:	<b>SAND, poorly-graded, mostly fine-grained quartz, few carbonate, trace fragmented limestone, dark gray (SP)</b>		

Tare Weight, (g):	<b>49.79</b>	
Dry Wt. Before Washing (g):	<b>181.72</b>	(with tare)
Dry Weight After Washing (g):	<b>180.31</b>	(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	1.57	98.81	100	1.57
#7	2.800	2.77	96.71	75	2.08
#10	2.000	1.42	95.63	85	1.21
#14	1.400	1.96	94.15	45	0.88
#18	1.000	2.68	92.12	40	1.07
#25	0.710	3.80	89.24	30	1.14
#35	0.500	7.71	83.39	10	0.77
#45	0.355	15.50	71.64	5	0.78
#60	0.250	31.00	48.15	3	0.93
#80	0.180	39.87	17.93	1	0.40
#120	0.125	19.61	3.06	1	0.20
#170	0.090	1.81	1.69	1	0.02
#230	0.063	0.15	1.58	1	0.00

**Total Shell Content:** **8** %



COBBLES	GRAVEL		SAND			SILT OR CLAY
	COARSE	FINE	COARSE	MEDIUM	FINE	

Sample No.	Elev. Or Depth	Classification	% CO <sub>3</sub>	G <sub>s</sub>	Nat w%	LL	PL	PI	Project
♦ 1	8.1-8.6	SAND, poorly-graded, mostly fine-grained quartz, few carbonate, trace fragmented limestone, dark gray (SP)	8						Topsail Beach, Surf City & North Topsail
									Area
									Boring No. T1-03-V-138A
									Date 9/22/2003

**GRADATION CURVES**



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## VISUAL SHELL CONTENT

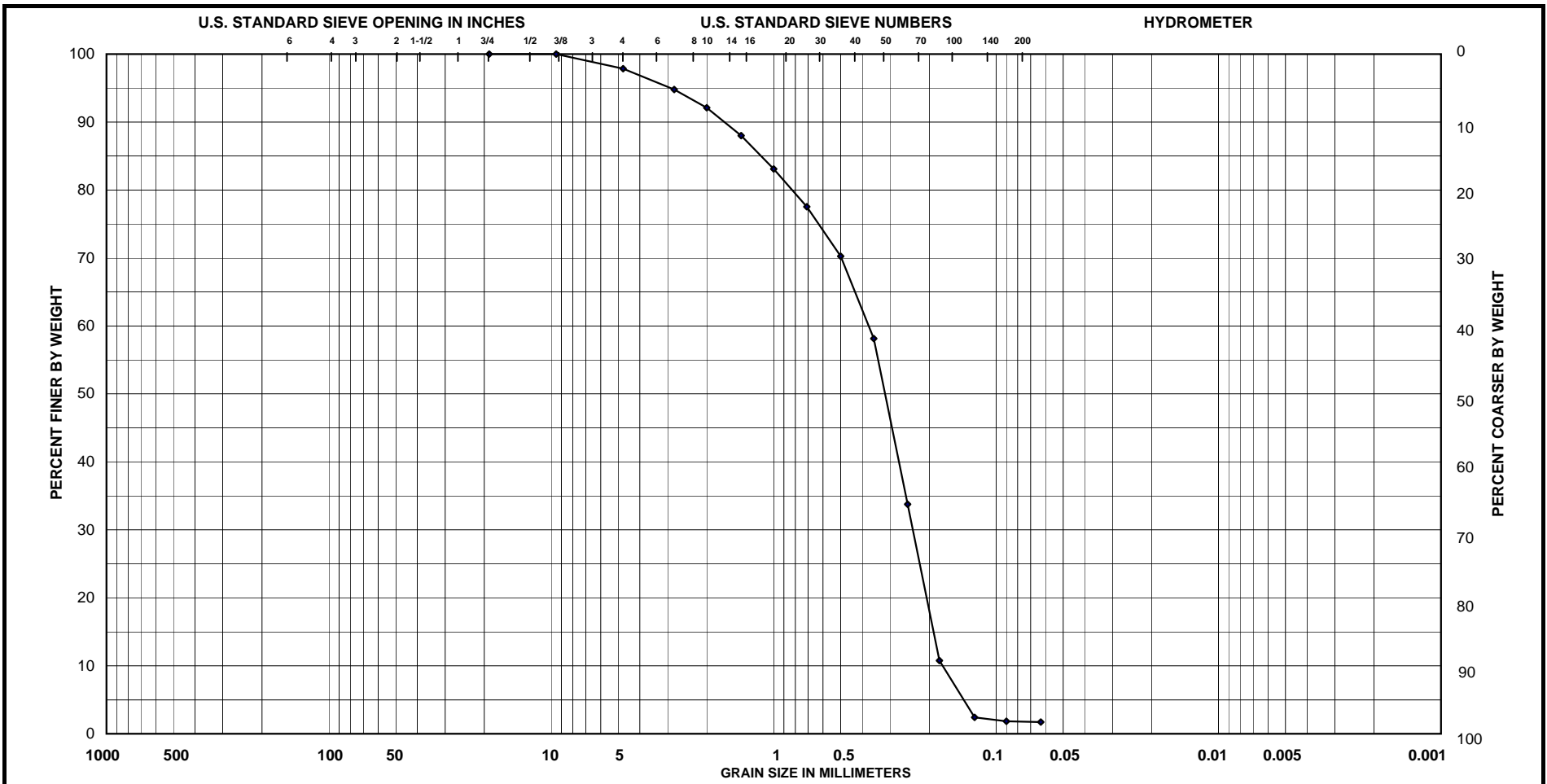
### GRAIN SIZE AND VISUAL SHELL CONTENT

Project:	<b>Topsail Beach, Surf City &amp; North Topsail</b>	Depth:	<b>10.0-10.5</b>
Project No.:	<b>1584-01-40</b>	Date:	<b>9/22/2003</b>
Boring No.:	<b>T1-03-V-138A</b>		
Sample No.:	<b>2</b>		
Description:	<b>SAND, poorly-graded, mostly medium to fine-grained quartz, little coarse to medium-grained carbonate, trace fragmented limestone, gray</b>		

Tare Weight, (g):	<b>48.71</b>	
Dry Wt. Before Washing (g):	<b>185.53</b>	(with tare)
Dry Weight After Washing (g):	<b>184.11</b>	(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	2.93	97.86	100	2.93
#7	2.800	4.19	94.80	70	2.93
#10	2.000	3.67	92.11	75	2.75
#14	1.400	5.60	88.02	30	1.68
#18	1.000	6.74	83.09	30	2.02
#25	0.710	7.60	77.54	25	1.90
#35	0.500	9.97	70.25	20	1.99
#45	0.355	16.55	58.16	10	1.66
#60	0.250	33.38	33.76	3	1.00
#80	0.180	31.45	10.77	1	0.31
#120	0.125	11.44	2.41	1	0.11
#170	0.090	0.80	1.83	1	0.01
#230	0.063	0.15	1.72	1	0.00

**Total Shell Content:** **14** %



COBBLES	GRAVEL		SAND			SILT OR CLAY
	COARSE	FINE	COARSE	MEDIUM	FINE	

Sample No.	Elev. Or Depth	Classification	% CO <sub>3</sub>	G <sub>s</sub>	Nat w%	LL	PL	PI	Project	
♦ 2	10.0-10.5	SAND, poorly-graded, mostly medium to fine-grained quartz, little coarse to medium-grained carbonate, trace fragmented limestone, gray (SP)	14						Topsail Beach, Surf City & North Topsail	
									Area	
									Boring No. T1-03-V-138A	
									Date 9/22/2003	

**GRADATION CURVES**





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## VISUAL SHELL CONTENT

### GRAIN SIZE AND VISUAL SHELL CONTENT

Project:	<b>Topsail Beach, Surf City &amp; North Topsail</b>	Depth:	<b>6.5-7.0</b>
Project No.:	<b>1584-01-40</b>	Date:	<b>9/22/2003</b>
Boring No.:	<b>T1-03-V-139</b>		
Sample No.:	<b>1</b>		
Description:	<b>SAND, poorly-graded, mostly fine-grained quartz, trace carbonate, trace fragmented limestone, gray (SP)</b>		

Tare Weight, (g):	<b>50.06</b>	
Dry Wt. Before Washing (g):	<b>174.35</b>	(with tare)
Dry Weight After Washing (g):	<b>172.85</b>	(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	99.77	100	0.28
#10	2.000	0.34	99.50	70	0.24
#14	1.400	0.88	98.79	70	0.62
#18	1.000	0.82	98.13	40	0.33
#25	0.710	0.83	97.47	25	0.21
#35	0.500	1.15	96.54	15	0.17
#45	0.355	2.99	94.13	10	0.30
#60	0.250	15.71	81.49	3	0.47
#80	0.180	58.32	34.57	1	0.58
#120	0.125	36.09	5.54	1	0.36
#170	0.090	4.73	1.73	1	0.05
#230	0.063	0.44	1.38	1	0.00

**Total Shell Content:** **3** %





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## VISUAL SHELL CONTENT

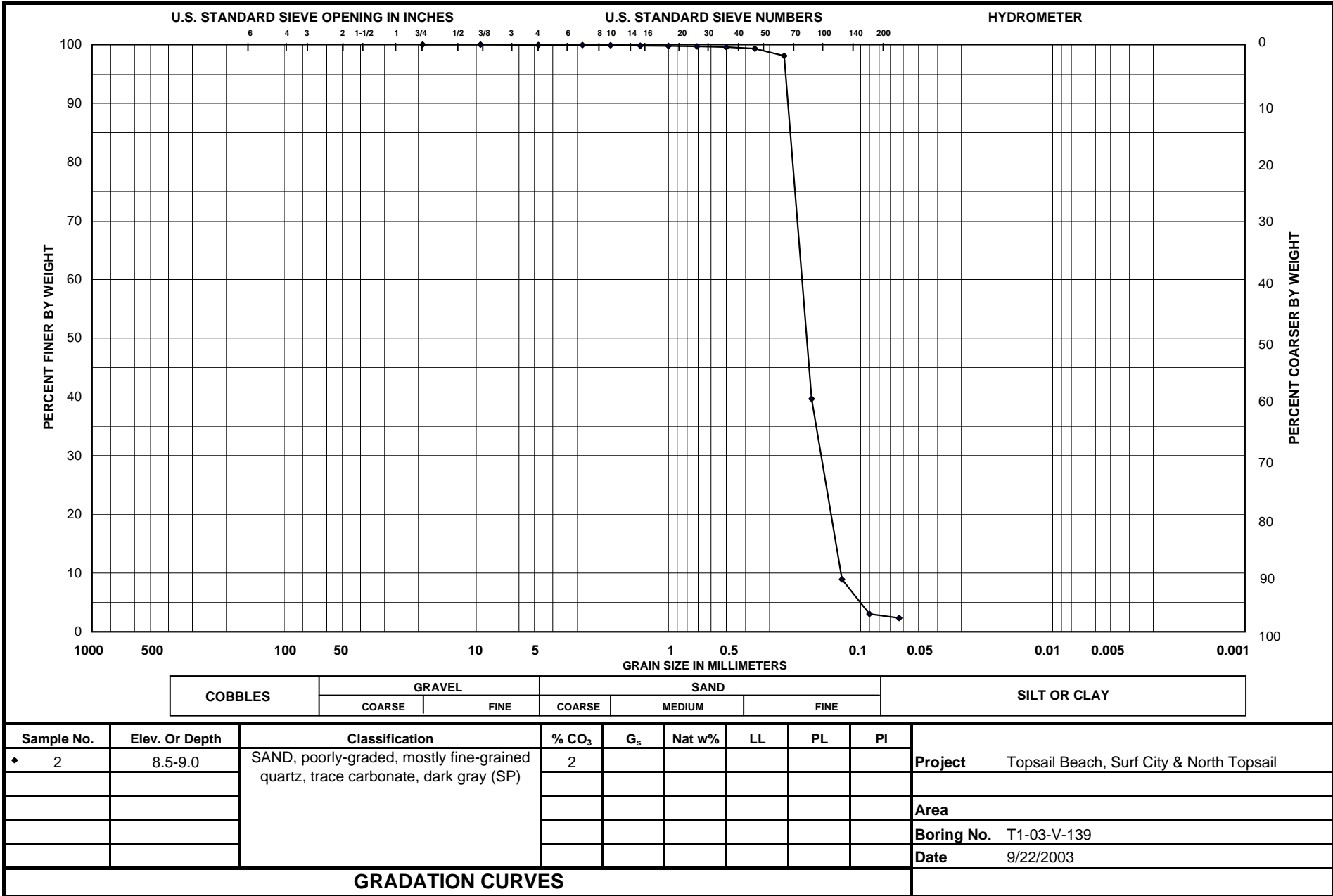
### GRAIN SIZE AND VISUAL SHELL CONTENT

Project:	<b>Topsail Beach, Surf City &amp; North Topsail</b>	Depth:	<b>8.5-9.0</b>
Project No.:	<b>1584-01-40</b>	Date:	<b>9/22/2003</b>
Boring No.:	<b>T1-03-V-139</b>		
Sample No.:	<b>2</b>		
Description:	<b>SAND, poorly-graded, mostly fine-grained quartz, trace carbonate, dark gray (SP)</b>		

Tare Weight, (g):	<b>49.48</b>	
Dry Wt. Before Washing (g):	<b>167.63</b>	(with tare)
Dry Weight After Washing (g):	<b>165.05</b>	(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	0.08	99.93	100	0.08
#7	2.800	0.03	99.91	100	0.03
#10	2.000	0.02	99.89	100	0.02
#14	1.400	0.10	99.81	60	0.06
#18	1.000	0.05	99.76	65	0.03
#25	0.710	0.07	99.70	60	0.04
#35	0.500	0.14	99.59	60	0.08
#45	0.355	0.32	99.31	55	0.18
#60	0.250	1.47	98.07	20	0.29
#80	0.180	69.02	39.65	1	0.69
#120	0.125	36.29	8.94	1	0.36
#170	0.090	6.96	3.05	1	0.07
#230	0.063	0.85	2.33	1	0.01

**Total Shell Content:** **2** %





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## VISUAL SHELL CONTENT

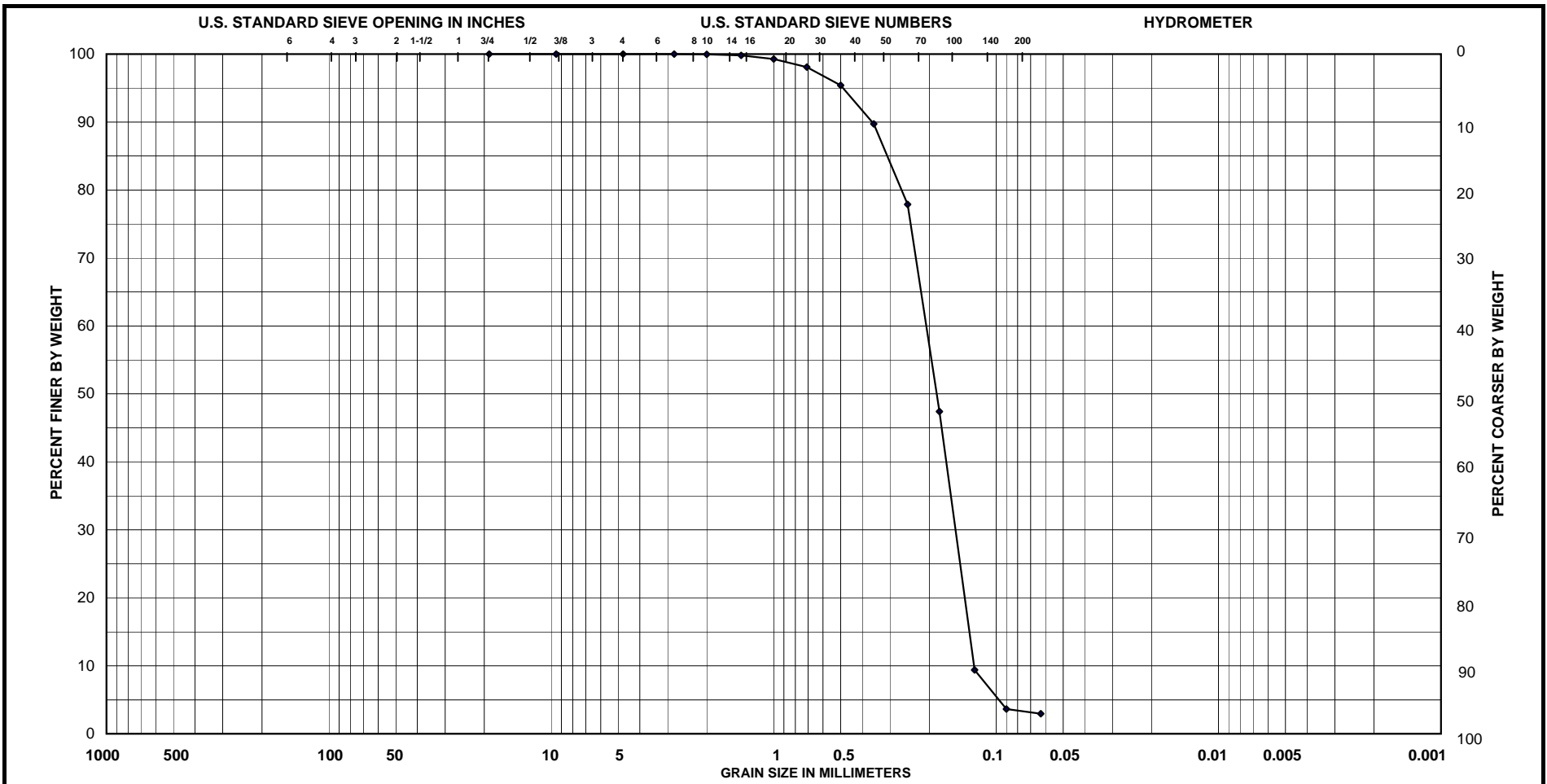
### GRAIN SIZE AND VISUAL SHELL CONTENT

Project:	<b>Topsail Beach, Surf City &amp; North Topsail</b>	Depth:	<b>10.5-11.0</b>
Project No.:	<b>1584-01-40</b>	Date:	<b>9/22/2003</b>
Boring No.:	<b>T1-03-V-139</b>		
Sample No.:	<b>3</b>		
Description:	<b>SAND, poorly-graded, mostly fine-grained quartz, trace carbonate, dark gray (SP)</b>		

Tare Weight, (g):	<b>50.14</b>	
Dry Wt. Before Washing (g):	<b>170.17</b>	(with tare)
Dry Weight After Washing (g):	<b>167.44</b>	(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	100	0.00
#10	2.000	0.03	99.98	90	0.03
#14	1.400	0.18	99.83	90	0.16
#18	1.000	0.66	99.28	80	0.53
#25	0.710	1.42	98.09	45	0.64
#35	0.500	3.24	95.39	20	0.65
#45	0.355	6.82	89.71	5	0.34
#60	0.250	14.18	77.90	1	0.14
#80	0.180	36.60	47.40	1	0.37
#120	0.125	45.65	9.37	1	0.46
#170	0.090	6.88	3.64	1	0.07
#230	0.063	0.85	2.93	1	0.01

**Total Shell Content:** **3** %



COBBLES	GRAVEL		SAND			SILT OR CLAY
	COARSE	FINE	COARSE	MEDIUM	FINE	

Sample No.	Elev. Or Depth	Classification	% CO <sub>3</sub>	G <sub>s</sub>	Nat w%	LL	PL	PI	Project	
3	10.5-11.0	SAND, poorly-graded, mostly fine-grained quartz, trace carbonate, dark gray (SP)	3						Topsail Beach, Surf City & North Topsail	
									Area	
									Boring No. T1-03-V-139	
									Date 9/22/2003	

**GRADATION CURVES**



# WOLF TECHNOLOGIES, INC.

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

## VISUAL SHELL CONTENT

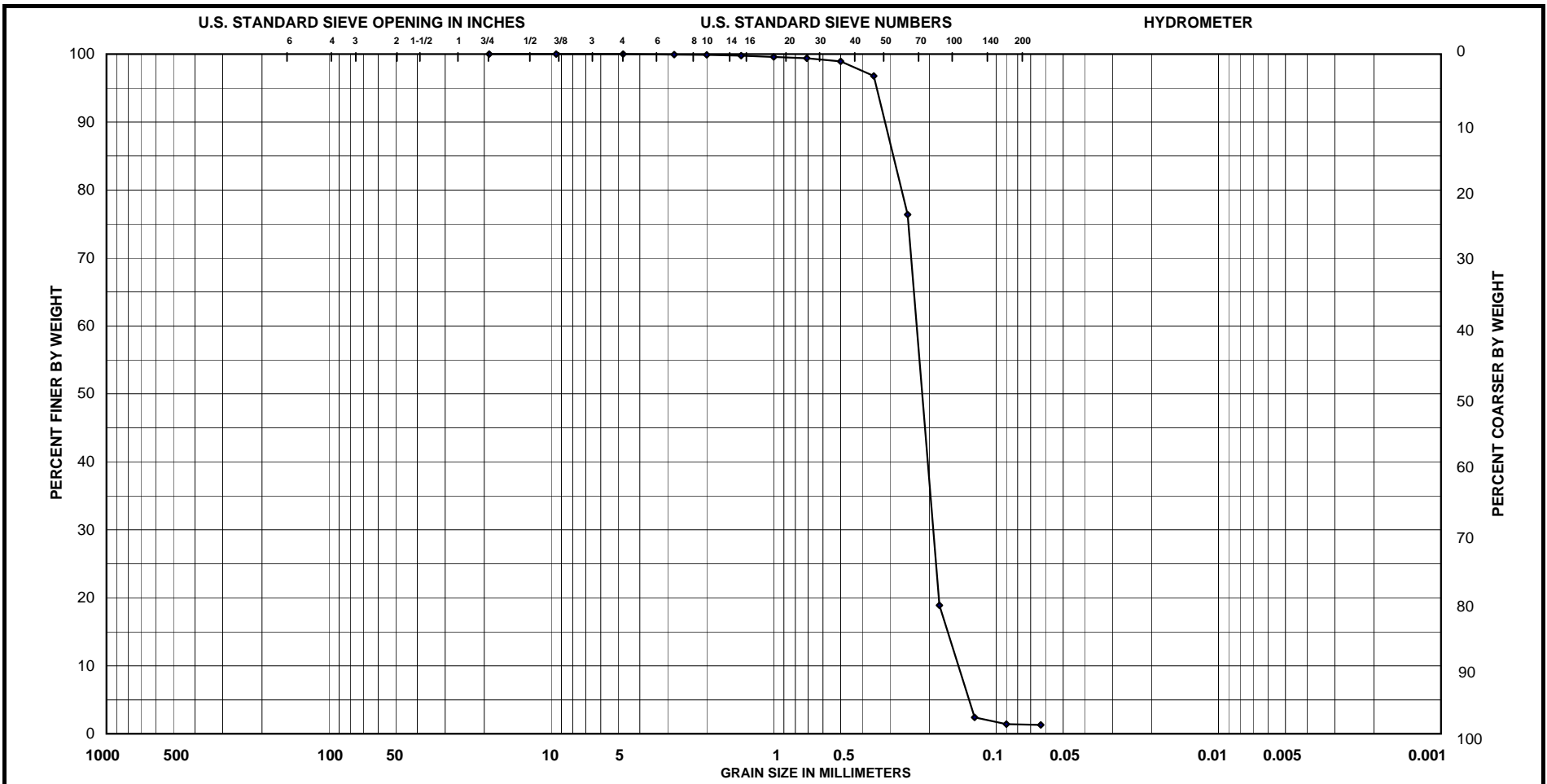
### GRAIN SIZE AND VISUAL SHELL CONTENT

Project:	<b>Topsail Beach, Surf City &amp; North Topsail</b>	Depth:	<b>7.8-8.3</b>
Project No.:	<b>1584-01-40</b>	Date:	<b>9/22/2003</b>
Boring No.:	<b>T1-03-V-141</b>		
Sample No.:	<b>1</b>		
Description:	<b>SAND, poorly-graded, mostly fine-grained quartz, trace carbonate, gray (SP)</b>		

Tare Weight, (g):	<b>50.38</b>	
Dry Wt. Before Washing (g):	<b>175.68</b>	(with tare)
Dry Weight After Washing (g):	<b>174.66</b>	(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	0.09	99.93	100	0.09
#10	2.000	0.06	99.88	100	0.06
#14	1.400	0.15	99.76	100	0.15
#18	1.000	0.21	99.59	70	0.15
#25	0.710	0.25	99.39	65	0.16
#35	0.500	0.57	98.94	40	0.23
#45	0.355	2.70	96.78	15	0.41
#60	0.250	25.54	76.40	3	0.77
#80	0.180	72.07	18.88	1	0.72
#120	0.125	20.62	2.43	1	0.21
#170	0.090	1.28	1.40	1	0.01
#230	0.063	0.12	1.31	1	0.00

**Total Shell Content:** **2** %



COBBLES	GRAVEL		SAND			SILT OR CLAY
	COARSE	FINE	COARSE	MEDIUM	FINE	

Sample No.	Elev. Or Depth	Classification	% CO <sub>3</sub>	G <sub>s</sub>	Nat w%	LL	PL	PI	Project	
♦ 1	7.8-8.3	SAND, poorly-graded, mostly fine-grained quartz, trace carbonate, gray (SP)	2						Topsail Beach, Surf City & North Topsail	
									Area	
									Boring No. T1-03-V-141	
									Date 9/22/2003	

**GRADATION CURVES**





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## VISUAL SHELL CONTENT

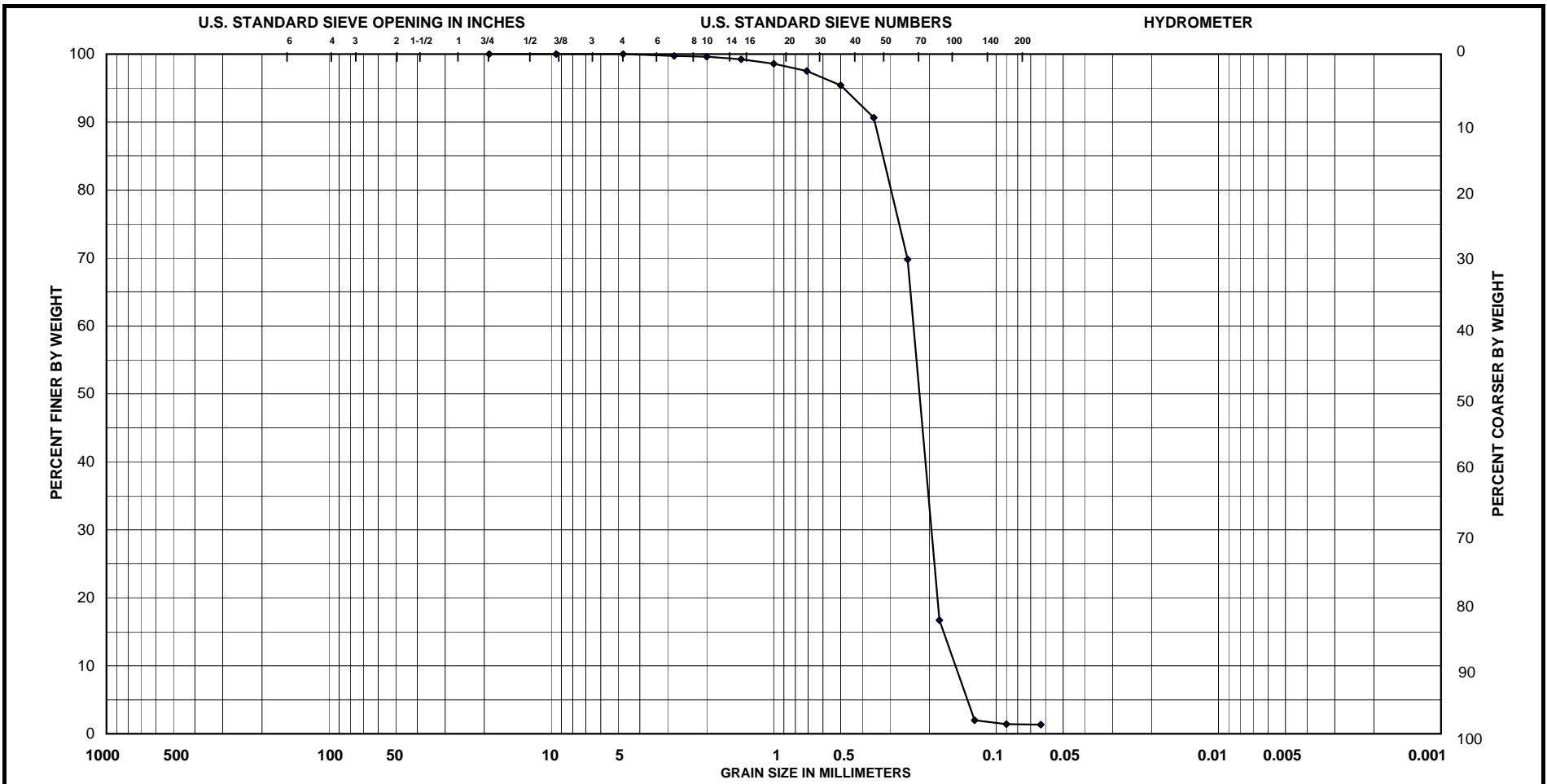
### GRAIN SIZE AND VISUAL SHELL CONTENT

Project:	<b>Topsail Beach, Surf City &amp; North Topsail</b>	Depth:	<b>10.0-10.5</b>
Project No.:	<b>1584-01-40</b>	Date:	<b>9/22/2003</b>
Boring No.:	<b>T1-03-V-141</b>		
Sample No.:	<b>2</b>		
Description:	<b>SAND, poorly-graded, mostly fine-grained quartz, few carbonate, gray (SP)</b>		

Tare Weight, (g):	<b>50.20</b>	
Dry Wt. Before Washing (g):	<b>172.21</b>	(with tare)
Dry Weight After Washing (g):	<b>171.12</b>	(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	0.33	99.73	100	0.33
#10	2.000	0.13	99.62	90	0.12
#14	1.400	0.47	99.24	75	0.35
#18	1.000	0.80	98.58	60	0.48
#25	0.710	1.33	97.49	30	0.40
#35	0.500	2.53	95.42	20	0.51
#45	0.355	5.84	90.63	10	0.58
#60	0.250	25.41	69.81	5	1.27
#80	0.180	64.78	16.71	3	1.94
#120	0.125	17.98	1.98	1	0.18
#170	0.090	0.70	1.40	1	0.01
#230	0.063	0.07	1.34	1	0.00

**Total Shell Content:** **5** %



COBBLES	GRAVEL		SAND			SILT OR CLAY
	COARSE	FINE	COARSE	MEDIUM	FINE	

Sample No.	Elev. Or Depth	Classification	% CO <sub>3</sub>	G <sub>s</sub>	Nat w%	LL	PL	PI	Project
2	10.0-10.5	SAND, poorly-graded, mostly fine-grained quartz, few carbonate, gray (SP)	5						Topsail Beach, Surf City & North Topsail
									Area
									Boring No. T1-03-V-141
									Date 9/22/2003

**GRADATION CURVES**



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## VISUAL SHELL CONTENT

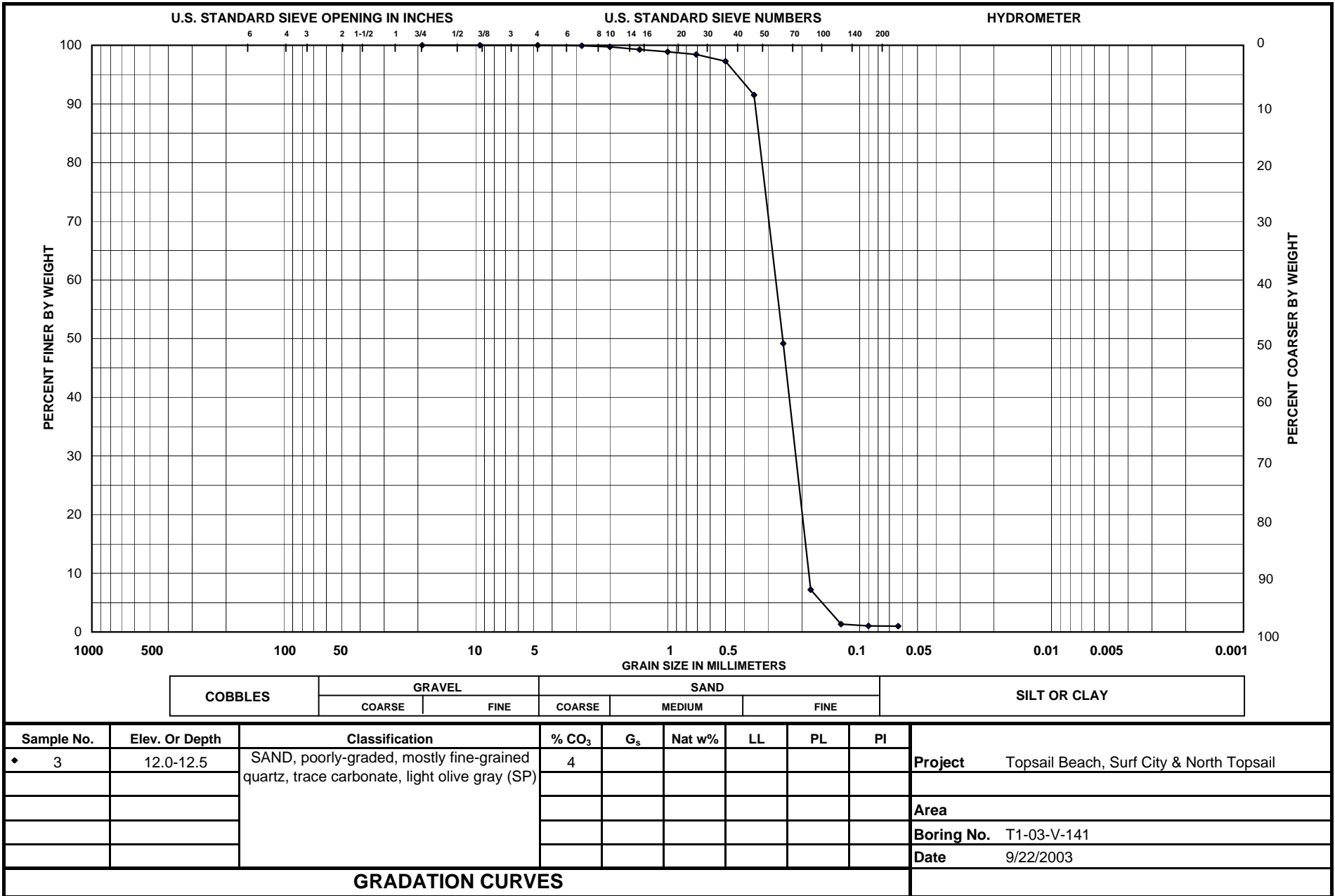
### GRAIN SIZE AND VISUAL SHELL CONTENT

Project:	<b>Topsail Beach, Surf City &amp; North Topsail</b>	Depth:	<b>12.0-12.5</b>
Project No.:	<b>1584-01-40</b>	Date:	<b>9/22/2003</b>
Boring No.:	<b>T1-03-V-141</b>		
Sample No.:	<b>3</b>		
Description:	<b>SAND, poorly-graded, mostly fine-grained quartz, trace carbonate, light olive gray (SP)</b>		

Tare Weight, (g):	<b>49.91</b>	
Dry Wt. Before Washing (g):	<b>177.26</b>	(with tare)
Dry Weight After Washing (g):	<b>176.2</b>	(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	0.11	99.91	100	0.11
#10	2.000	0.22	99.74	100	0.22
#14	1.400	0.59	99.28	95	0.56
#18	1.000	0.48	98.90	70	0.34
#25	0.710	0.60	98.43	50	0.30
#35	0.500	1.48	97.27	20	0.30
#45	0.355	7.33	91.51	10	0.73
#60	0.250	53.92	49.17	3	1.62
#80	0.180	53.46	7.19	1	0.53
#120	0.125	7.44	1.35	1	0.07
#170	0.090	0.38	1.05	1	0.00
#230	0.063	0.07	1.00	1	0.00

**Total Shell Content:** **4** %





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## VISUAL SHELL CONTENT

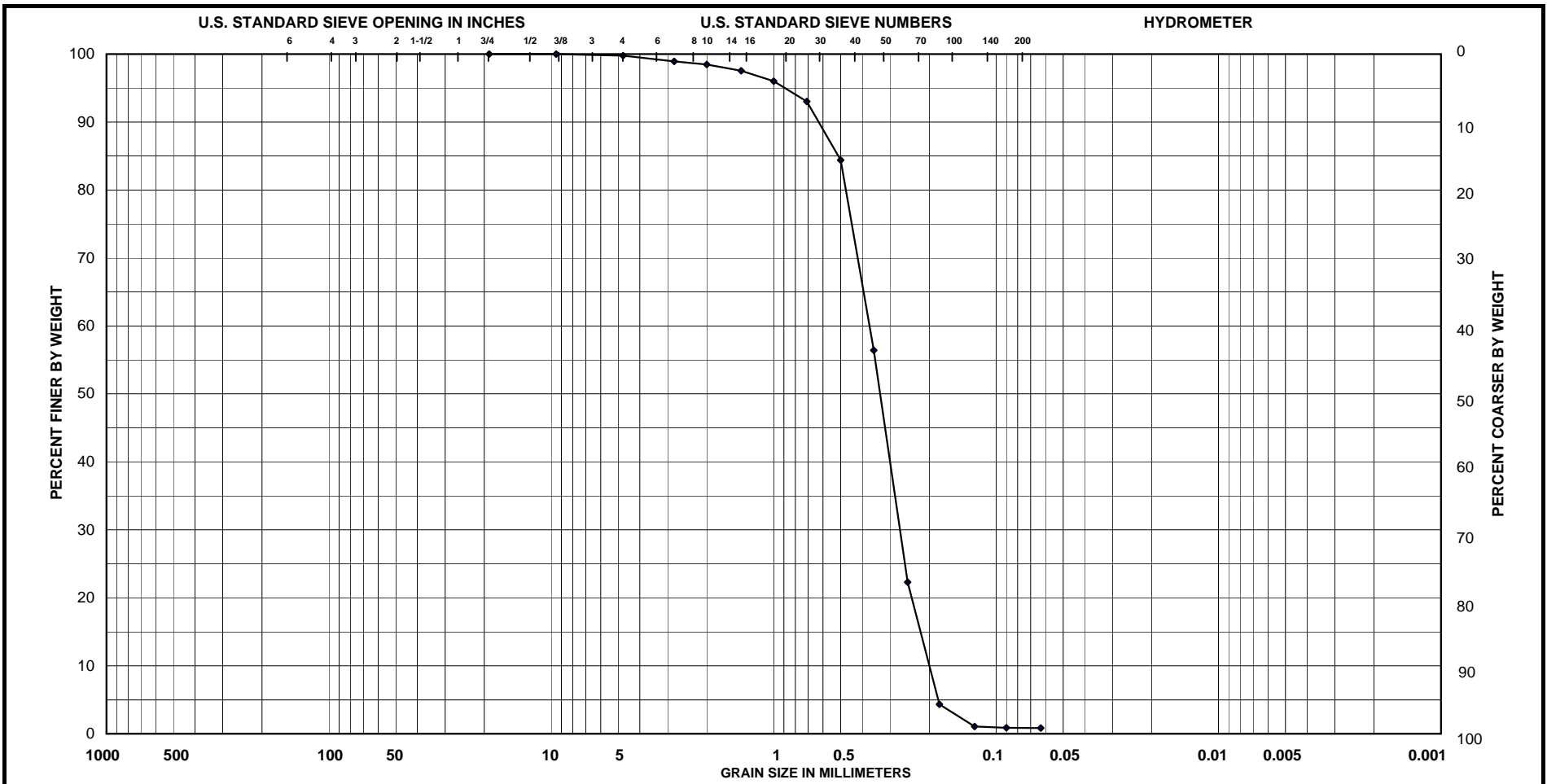
### GRAIN SIZE AND VISUAL SHELL CONTENT

Project:	<b>Topsail Beach, Surf City &amp; North Topsail</b>	Depth:	<b>11.4-11.9</b>
Project No.:	<b>1584-01-40</b>	Date:	<b>9/22/2003</b>
Boring No.:	<b>T1-03-V-142</b>		
Sample No.:	<b>1</b>		
Description:	<b>SAND, poorly-graded, mostly fine-grained quartz, little medium-grained carbonate, gray (SP)</b>		

Tare Weight, (g):	<b>50.62</b>	
Dry Wt. Before Washing (g):	<b>180.25</b>	(with tare)
Dry Weight After Washing (g):	<b>179.41</b>	(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	0.30	99.77	100	0.30
#7	2.800	1.07	98.94	100	1.07
#10	2.000	0.64	98.45	100	0.64
#14	1.400	1.17	97.55	95	1.11
#18	1.000	2.01	96.00	80	1.61
#25	0.710	3.87	93.01	65	2.52
#35	0.500	11.17	84.39	40	4.47
#45	0.355	36.28	56.41	20	7.26
#60	0.250	44.20	22.31	5	2.21
#80	0.180	23.30	4.34	3	0.70
#120	0.125	4.24	1.06	1	0.04
#170	0.090	0.23	0.89	1	0.00
#230	0.063	0.04	0.86	1	0.00

**Total Shell Content:** **17** %



COBBLES	GRAVEL		SAND			SILT OR CLAY
	COARSE	FINE	COARSE	MEDIUM	FINE	

Sample No.	Elev. Or Depth	Classification	% CO <sub>3</sub>	G <sub>s</sub>	Nat w%	LL	PL	PI	Project	
♦ 1	11.4-11.9	SAND, poorly-graded, mostly fine-grained quartz, little medium-grained carbonate, gray (SP)	17						Topsail Beach, Surf City & North Topsail	
									Area	
									Boring No. T1-03-V-142	
									Date 9/22/2003	

**GRADATION CURVES**



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## VISUAL SHELL CONTENT

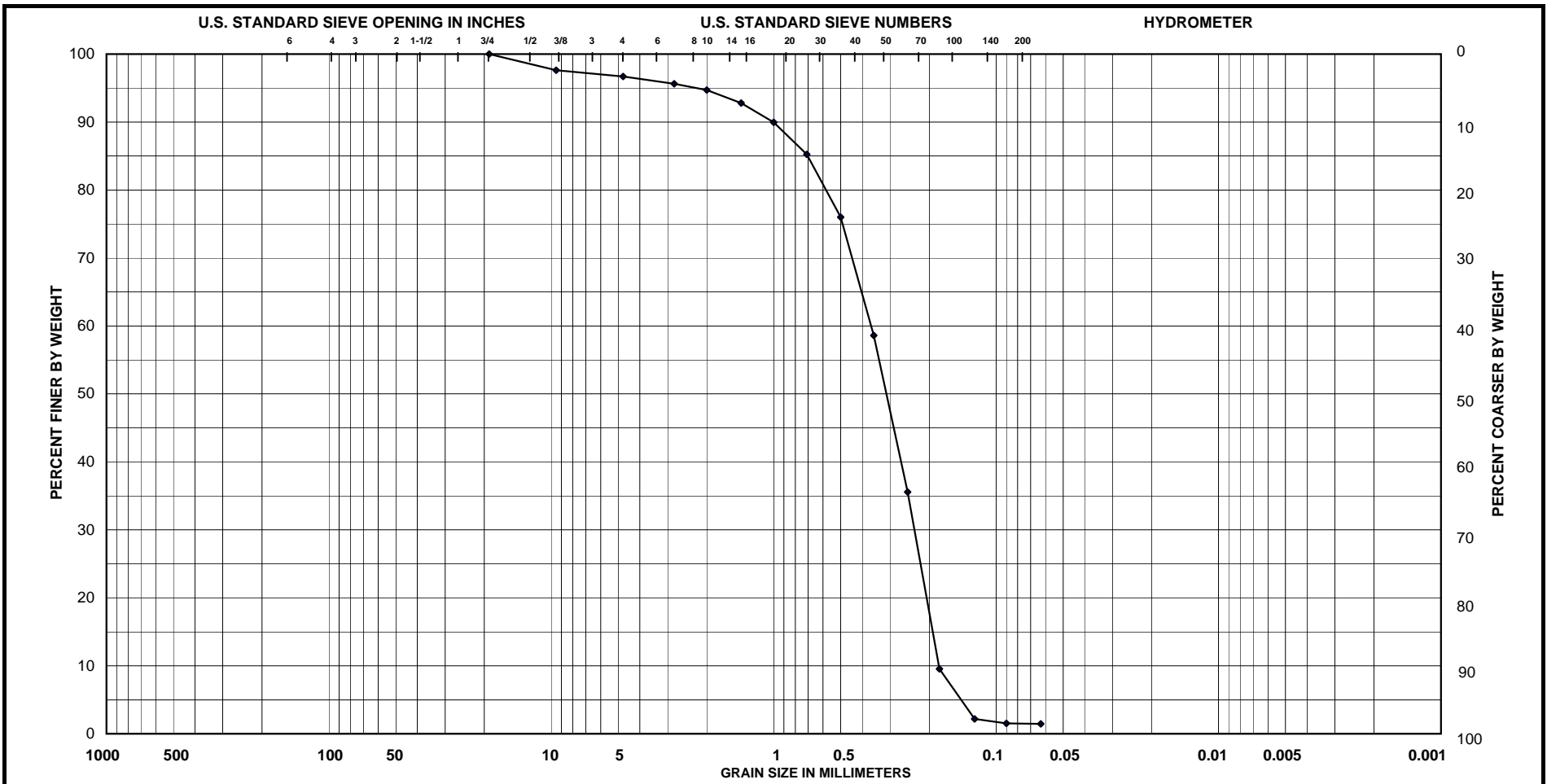
### GRAIN SIZE AND VISUAL SHELL CONTENT

Project:	<b>Topsail Beach, Surf City &amp; North Topsail</b>	Depth:	<b>13.5-14.0</b>
Project No.:	<b>1584-01-40</b>	Date:	<b>9/22/2003</b>
Boring No.:	<b>T1-03-V-142</b>		
Sample No.:	<b>2</b>		
Description:	<b>SAND, poorly-graded, mostly fine-grained quartz, little coarse to medium-grained carbonate, trace fine gravel-size carbonate, gray (SP)</b>		

Tare Weight, (g):	<b>50.11</b>	
Dry Wt. Before Washing (g):	<b>177.64</b>	(with tare)
Dry Weight After Washing (g):	<b>176.62</b>	(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	97.63	100	3.02
#4	4.750	1.20	96.69	100	1.20
#7	2.800	1.36	95.62	100	1.36
#10	2.000	1.18	94.70	90	1.06
#14	1.400	2.43	92.79	90	2.19
#18	1.000	3.64	89.94	70	2.55
#25	0.710	5.97	85.26	60	3.58
#35	0.500	11.81	76.00	40	4.72
#45	0.355	22.18	58.61	10	2.22
#60	0.250	29.39	35.56	5	1.47
#80	0.180	33.18	9.54	3	1.00
#120	0.125	9.39	2.18	1	0.09
#170	0.090	0.81	1.54	1	0.01
#230	0.063	0.11	1.46	1	0.00

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



COBBLES	GRAVEL		SAND			SILT OR CLAY
	COARSE	FINE	COARSE	MEDIUM	FINE	

Sample No.	Elev. Or Depth	Classification	% CO <sub>3</sub>	G <sub>s</sub>	Nat w%	LL	PL	PI	Project	
♦ 2	13.5-14.0	SAND, poorly-graded, mostly fine-grained quartz, little coarse to medium-grained carbonate, trace fine gravel-size carbonate, gray (SP)	19						Topsail Beach, Surf City & North Topsail	
									Area	
									Boring No. T1-03-V-142	
									Date 9/22/2003	

**GRADATION CURVES**





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## VISUAL SHELL CONTENT

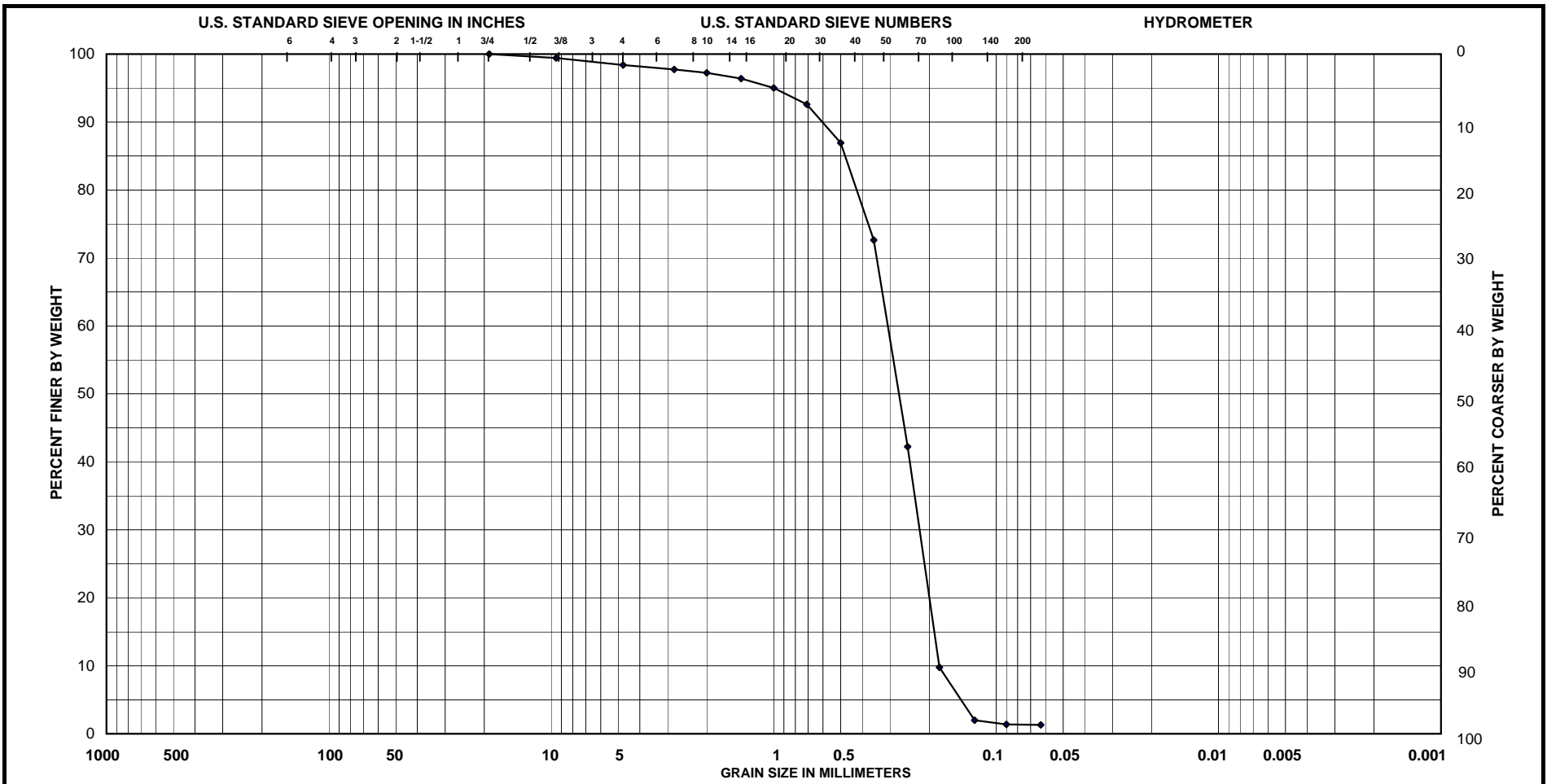
### GRAIN SIZE AND VISUAL SHELL CONTENT

Project:	<b>Topsail Beach, Surf City &amp; North Topsail</b>	Depth:	<b>15.3-15.8</b>
Project No.:	<b>1584-01-40</b>	Date:	<b>9/22/2003</b>
Boring No.:	<b>T1-03-V-142</b>		
Sample No.:	<b>3</b>		
Description:	<b>SAND, poorly-graded, mostly fine-grained quartz, few carbonate, gray (SP)</b>		

Tare Weight, (g):	<b>50.39</b>	
Dry Wt. Before Washing (g):	<b>175.61</b>	(with tare)
Dry Weight After Washing (g):	<b>174.61</b>	(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	0.72	99.43	100	0.72
#4	4.750	1.30	98.39	100	1.30
#7	2.800	0.83	97.72	100	0.83
#10	2.000	0.61	97.24	100	0.61
#14	1.400	1.06	96.39	90	0.95
#18	1.000	1.72	95.02	70	1.20
#25	0.710	3.04	92.59	45	1.37
#35	0.500	7.09	86.93	30	2.13
#45	0.355	17.92	72.62	10	1.79
#60	0.250	38.03	42.25	3	1.14
#80	0.180	40.68	9.76	1	0.41
#120	0.125	9.74	1.98	1	0.10
#170	0.090	0.73	1.40	1	0.01
#230	0.063	0.14	1.29	1	0.00

**Total Shell Content:** **10** %



COBBLES	GRAVEL		SAND			SILT OR CLAY
	COARSE	FINE	COARSE	MEDIUM	FINE	

Sample No.	Elev. Or Depth	Classification	% CO <sub>3</sub>	G <sub>s</sub>	Nat w%	LL	PL	PI	Project
♦ 3	15.3-15.8	SAND, poorly-graded, mostly fine-grained quartz, few carbonate, gray (SP)	10						Topsail Beach, Surf City & North Topsail
									Area
									Boring No. T1-03-V-142
									Date 9/22/2003

**GRADATION CURVES**



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## VISUAL SHELL CONTENT

### GRAIN SIZE AND VISUAL SHELL CONTENT

Project:	<b>Topsail Beach, Surf City &amp; North Topsail</b>	Depth:	<b>13.7-14.2</b>
Project No.:	<b>1584-01-40</b>	Date:	<b>9/22/2003</b>
Boring No.:	<b>T1-03-V-143</b>		
Sample No.:	<b>1</b>		
Description:	<b>SAND, poorly-graded, mostly medium to fine-grained quartz, little coarse to medium-grained carbonate, few fine gravel-size carbonate,</b>		

Tare Weight, (g):	<b>50.28</b>	
Dry Wt. Before Washing (g):	<b>176.71</b>	(with tare)
Dry Weight After Washing (g):	<b>175.72</b>	(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	3.39	97.32	100	3.39
#4	4.750	4.47	93.78	100	4.47
#7	2.800	3.87	90.72	98	3.79
#10	2.000	3.26	88.14	95	3.10
#14	1.400	5.47	83.82	80	4.38
#18	1.000	7.59	77.81	70	5.31
#25	0.710	9.39	70.39	55	5.16
#35	0.500	14.64	58.81	30	4.39
#45	0.355	23.83	39.96	5	1.19
#60	0.250	23.04	21.74	3	0.69
#80	0.180	21.26	4.92	1	0.21
#120	0.125	4.26	1.55	1	0.04
#170	0.090	0.28	1.33	1	0.00
#230	0.063	0.07	1.27	1	0.00

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





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## VISUAL SHELL CONTENT

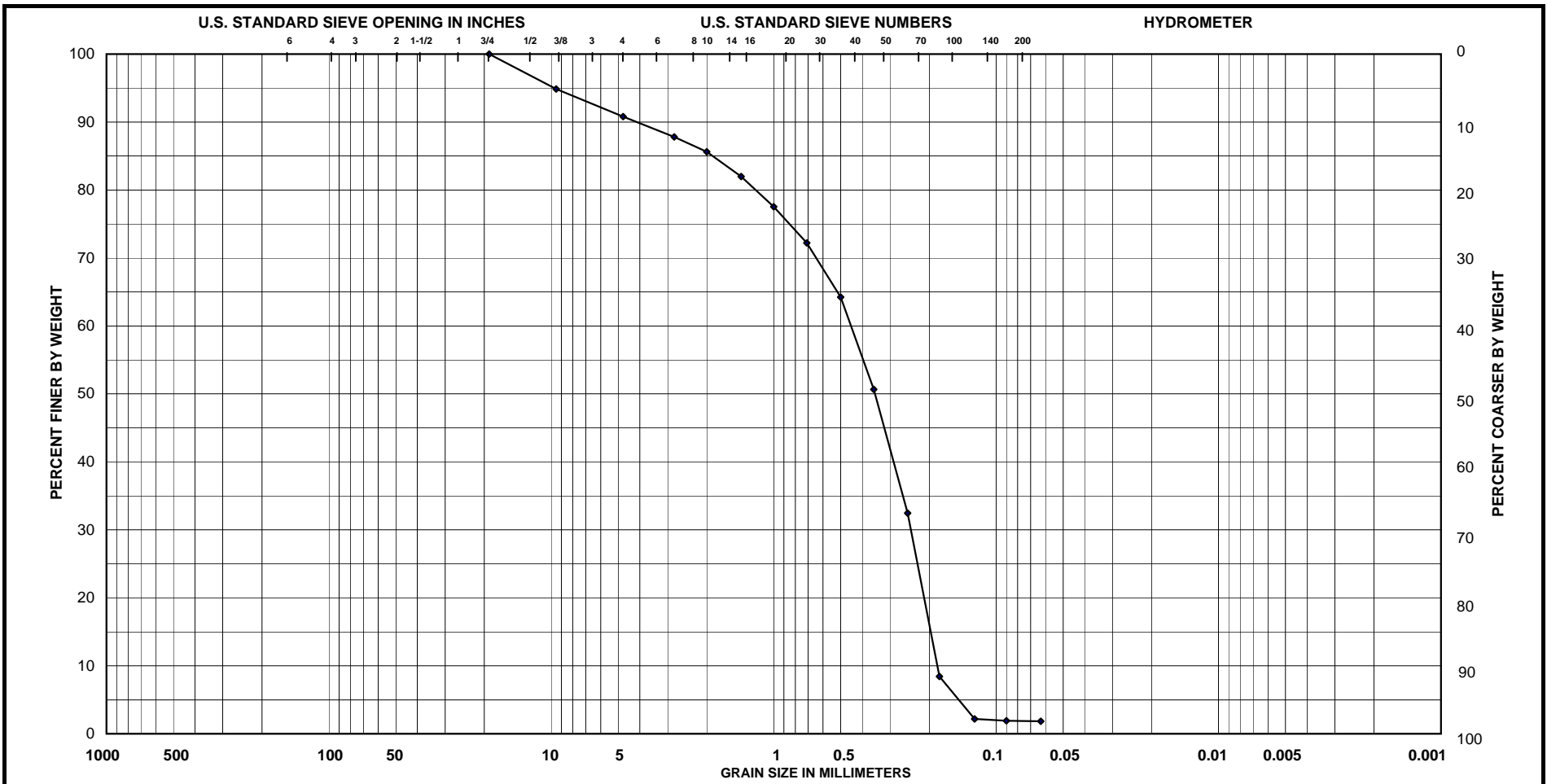
### GRAIN SIZE AND VISUAL SHELL CONTENT

Project:	<b>Topsail Beach, Surf City &amp; North Topsail</b>	Depth:	<b>16.0-16.5</b>
Project No.:	<b>1584-01-40</b>	Date:	<b>9/22/2003</b>
Boring No.:	<b>T1-03-V-143</b>		
Sample No.:	<b>2</b>		
Description:	<b>SAND, poorly-graded, mostly fine-grained quartz, little coarse to medium-grained carbonate, few fine gravel-size carbonate, few</b>		

Tare Weight, (g):	<b>50.30</b>	
Dry Wt. Before Washing (g):	<b>182.21</b>	(with tare)
Dry Weight After Washing (g):	<b>180.99</b>	(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	6.76	94.88	75	5.07
#4	4.750	5.38	90.80	100	5.38
#7	2.800	3.94	87.81	100	3.94
#10	2.000	2.90	85.61	90	2.61
#14	1.400	4.79	81.98	75	3.59
#18	1.000	5.85	77.55	70	4.10
#25	0.710	7.02	72.22	60	4.21
#35	0.500	10.55	64.23	50	5.28
#45	0.355	17.86	50.69	5	0.89
#60	0.250	24.03	32.47	3	0.72
#80	0.180	31.72	8.42	1	0.32
#120	0.125	8.23	2.18	1	0.08
#170	0.090	0.37	1.90	1	0.00
#230	0.063	0.10	1.83	1	0.00

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



COBBLES	GRAVEL		SAND			SILT OR CLAY
	COARSE	FINE	COARSE	MEDIUM	FINE	

Sample No.	Elev. Or Depth	Classification	% CO <sub>3</sub>	G <sub>s</sub>	Nat w%	LL	PL	PI	Project
♦ 2	16.0-16.5	SAND, poorly-graded, mostly fine-grained quartz, little coarse to medium-grained carbonate, few fine gravel-size carbonate, few fragmented limestone, gray (SP)	27						Topsail Beach, Surf City & North Topsail
									Area
									Boring No. T1-03-V-143
									Date 9/22/2003

**GRADATION CURVES**



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## VISUAL SHELL CONTENT

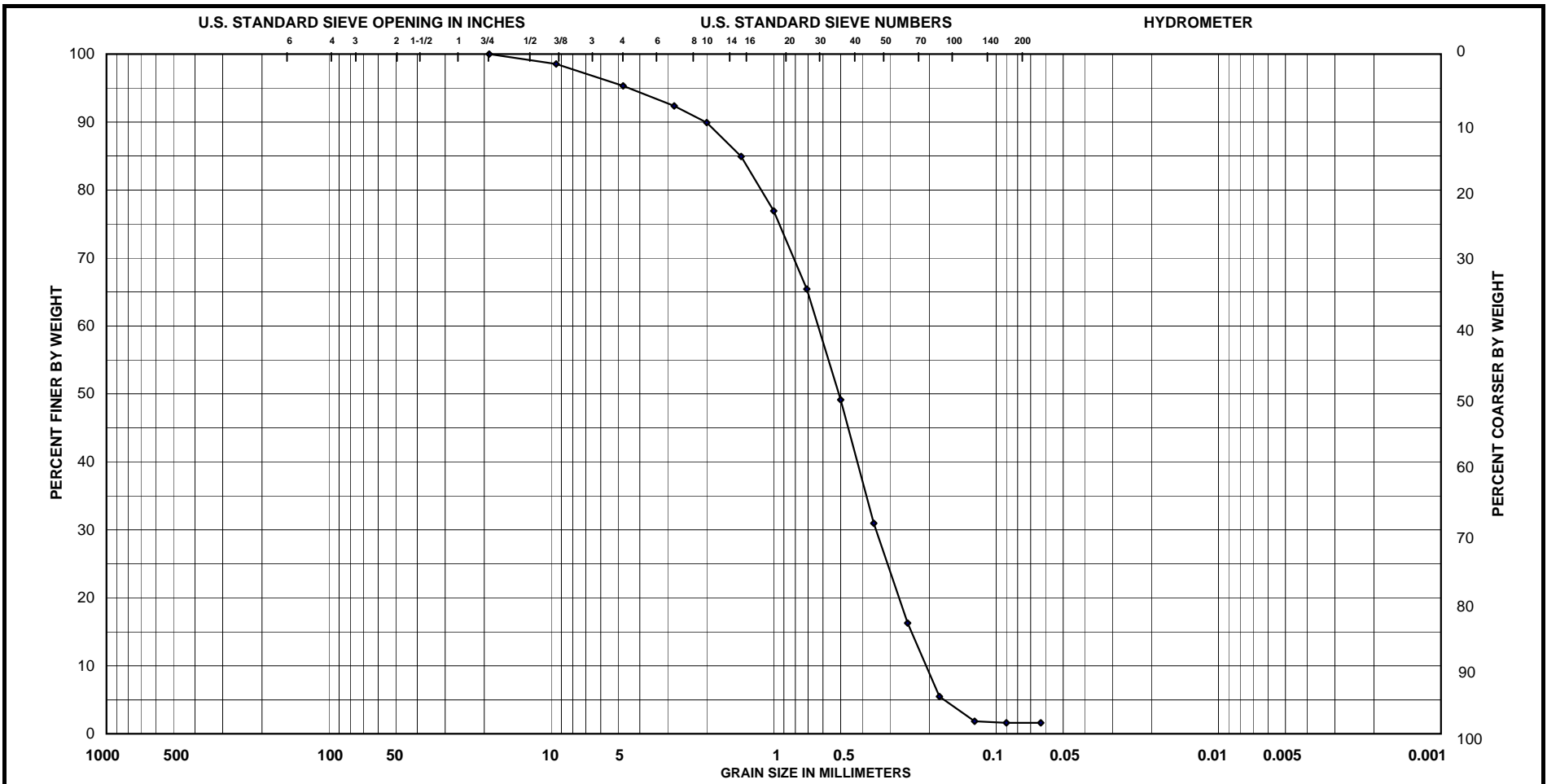
### GRAIN SIZE AND VISUAL SHELL CONTENT

Project:	<b>Topsail Beach, Surf City &amp; North Topsail</b>	Depth:	<b>13.5-14.0</b>
Project No.:	<b>1584-01-40</b>	Date:	<b>9/22/2003</b>
Boring No.:	<b>T1-03-V-144</b>		
Sample No.:	<b>1</b>		
Description:	<b>SAND, poorly-graded, mostly medium to fine-grained quartz, little coarse to medium-grained carbonate, few fine gravel-size carbonate,</b>		

Tare Weight, (g):	<b>49.96</b>	
Dry Wt. Before Washing (g):	<b>189.96</b>	(with tare)
Dry Weight After Washing (g):	<b>188.85</b>	(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	2.02	98.56	100	2.02
#4	4.750	4.50	95.34	80	3.60
#7	2.800	4.15	92.38	70	2.91
#10	2.000	3.42	89.94	65	2.22
#14	1.400	7.02	84.92	60	4.21
#18	1.000	11.21	76.91	60	6.73
#25	0.710	16.06	65.44	40	6.42
#35	0.500	22.85	49.12	25	5.71
#45	0.355	25.40	30.98	10	2.54
#60	0.250	20.58	16.28	5	1.03
#80	0.180	15.10	5.49	3	0.45
#120	0.125	5.10	1.85	1	0.05
#170	0.090	0.31	1.63	1	0.00
#230	0.063	0.05	1.59	1	0.00

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



COBBLES	GRAVEL		SAND			SILT OR CLAY
	COARSE	FINE	COARSE	MEDIUM	FINE	

Sample No.	Elev. Or Depth	Classification	% CO <sub>3</sub>	G <sub>s</sub>	Nat w%	LL	PL	PI	Project	
♦ 1	13.5-14.0	SAND, poorly-graded, mostly medium to fine-grained quartz, little coarse to medium-grained carbonate, few fine gravel-size carbonate, trace fragmented limestone, olive gray (SP)	27						Topsail Beach, Surf City & North Topsail	
									Area	
									Boring No. T1-03-V-144	
									Date 9/22/2003	

**GRADATION CURVES**





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## VISUAL SHELL CONTENT

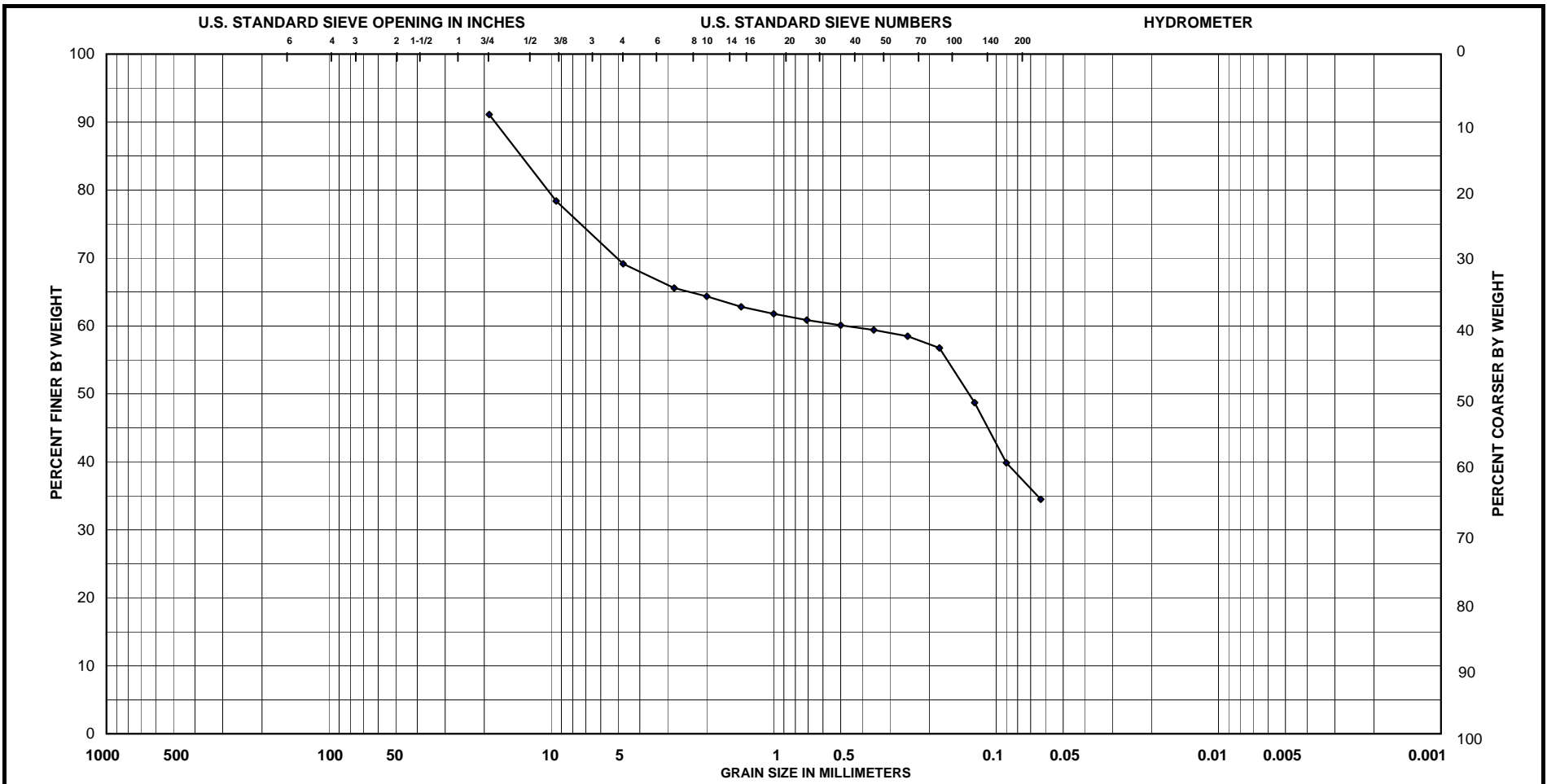
### GRAIN SIZE AND VISUAL SHELL CONTENT

Project:	<b>Topsail Beach, Surf City &amp; North Topsail</b>	Depth:	<b>14.5-15.0</b>
Project No.:	<b>1584-01-40</b>	Date:	<b>9/22/2003</b>
Boring No.:	<b>T1-03-V-144</b>		
Sample No.:	<b>2</b>		
Description:	<b>SAND, silty, some fine gravel-size carbonate, some silt, little fine-grained quartz sand, few coarse to medium-grained carbonate, dark</b>		

Tare Weight, (g):	<b>50.16</b>	
Dry Wt. Before Washing (g):	<b>158.29</b>	(with tare)
Dry Weight After Washing (g):	<b>121.28</b>	(with tare)

Sieve Size (Name)	Sieve Size (mm)	Weight Retained (g)	% Passing	Approx. Visual Shell %	Approx. Visual Shell Wt. (g)
3/4"	19.000	9.62	91.10	100	9.62
3/8"	9.500	13.74	78.40	100	13.74
#4	4.750	10.00	69.15	100	10.00
#7	2.800	3.84	65.60	100	3.84
#10	2.000	1.34	64.36	99	1.33
#14	1.400	1.65	62.83	98	1.62
#18	1.000	1.15	61.77	98	1.13
#25	0.710	0.96	60.88	95	0.91
#35	0.500	0.84	60.10	90	0.76
#45	0.355	0.77	59.39	85	0.65
#60	0.250	0.96	58.50	60	0.58
#80	0.180	1.89	56.76	20	0.38
#120	0.125	8.69	48.72	3	0.26
#170	0.090	9.56	39.88	3	0.29
#230	0.063	5.83	34.49	1	0.06

**Total Shell Content:** **42** %



COBBLES	GRAVEL		SAND			SILT OR CLAY
	COARSE	FINE	COARSE	MEDIUM	FINE	

Sample No.	Elev. Or Depth	Classification	% CO <sub>3</sub>	G <sub>s</sub>	Nat w%	LL	PL	PI	Project	
♦ 2	14.5-15.0	SAND, silty, some fine gravel-size carbonate, some silt, little fine-grained quartz sand, few coarse to medium-grained carbonate, dark greenish gray (SM)	42						Topsail Beach, Surf City & North Topsail	
			Area							
			Boring No. T1-03-V-144							
			Date 9/22/2003							

**GRADATION CURVES**



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## VISUAL SHELL CONTENT

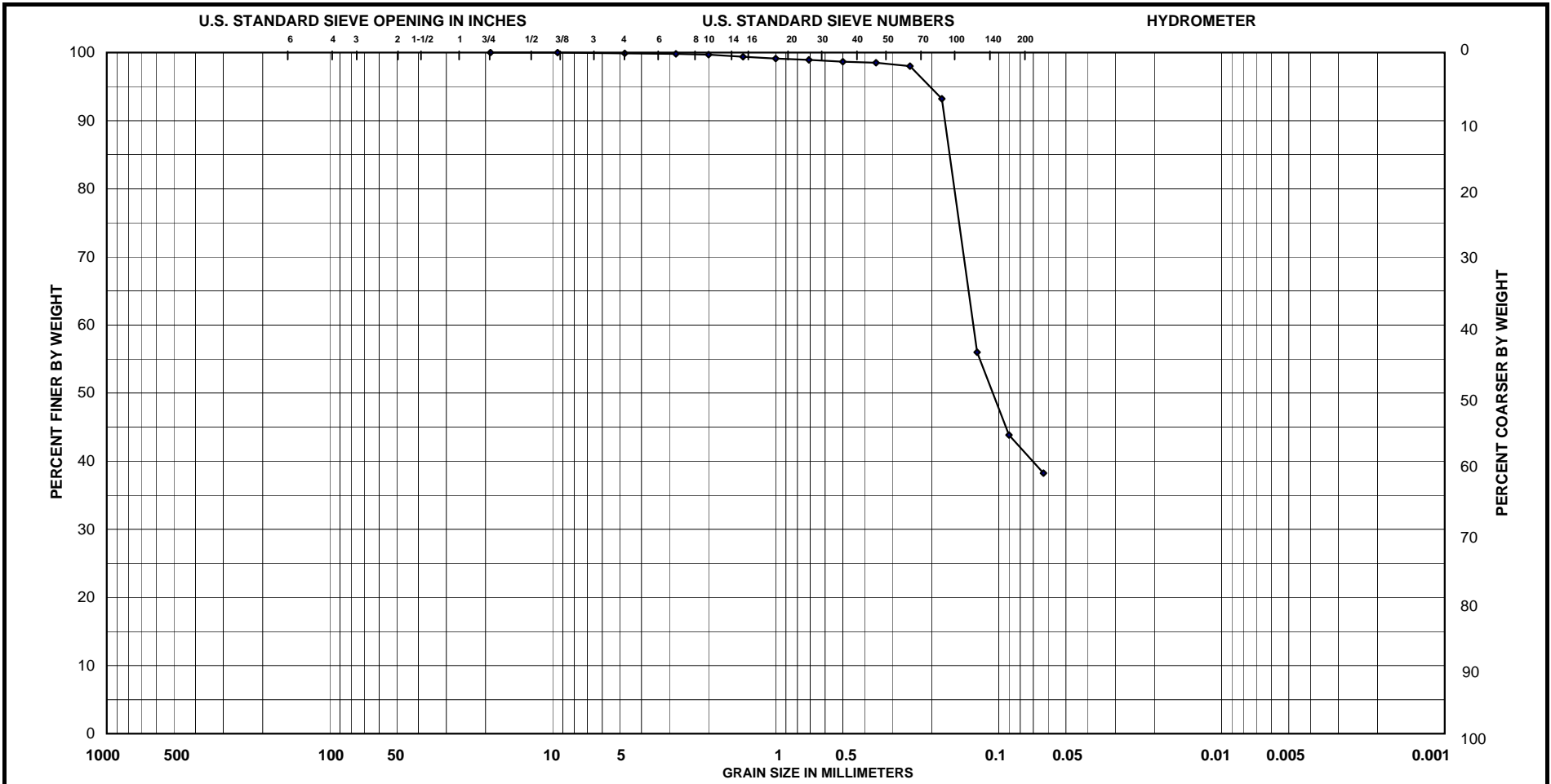
### GRAIN SIZE AND VISUAL SHELL CONTENT

Project:	<b>Topsail Beach, Surf City &amp; North Topsail</b>	Depth:	<b>16.3-16.8</b>
Project No.:	<b>1584-01-40</b>	Date:	<b>9/22/2003</b>
Boring No.:	<b>T1-03-V-144</b>		
Sample No.:	<b>3</b>		
Description:	<b>SAND, clayey, mostly fine-grained quartz, some clay, trace carbonate, dark greenish gray (SC)</b>		

Tare Weight, (g):	<b>50.07</b>	
Dry Wt. Before Washing (g):	<b>151.82</b>	(with tare)
Dry Weight After Washing (g):	<b>113.42</b>	(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	0.11	99.89	100	0.11
#7	2.800	0.07	99.82	100	0.07
#10	2.000	0.13	99.70	80	0.10
#14	1.400	0.33	99.37	85	0.28
#18	1.000	0.24	99.14	60	0.14
#25	0.710	0.23	98.91	30	0.07
#35	0.500	0.26	98.65	10	0.03
#45	0.355	0.17	98.49	5	0.01
#60	0.250	0.50	98.00	5	0.03
#80	0.180	4.88	93.20	3	0.15
#120	0.125	37.85	56.00	1	0.38
#170	0.090	12.36	43.85	1	0.12
#230	0.063	5.70	38.25	1	0.06

**Total Shell Content:** **2** %



COBBLES	GRAVEL		SAND			SILT OR CLAY
	COARSE	FINE	COARSE	MEDIUM	FINE	

Sample No.	Elev. Or Depth	Classification	% CO <sub>3</sub>	G <sub>s</sub>	Nat w%	LL	PL	PI	Project
3	16.3-16.8	SAND, clayey, mostly fine-grained quartz, some clay, trace carbonate, dark greenish gray (SC)	2						Topsail Beach, Surf City & North Topsail
									Area
									Boring No. T1-03-V-144
									Date 9/22/2003

**GRADATION CURVES**



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## VISUAL SHELL CONTENT

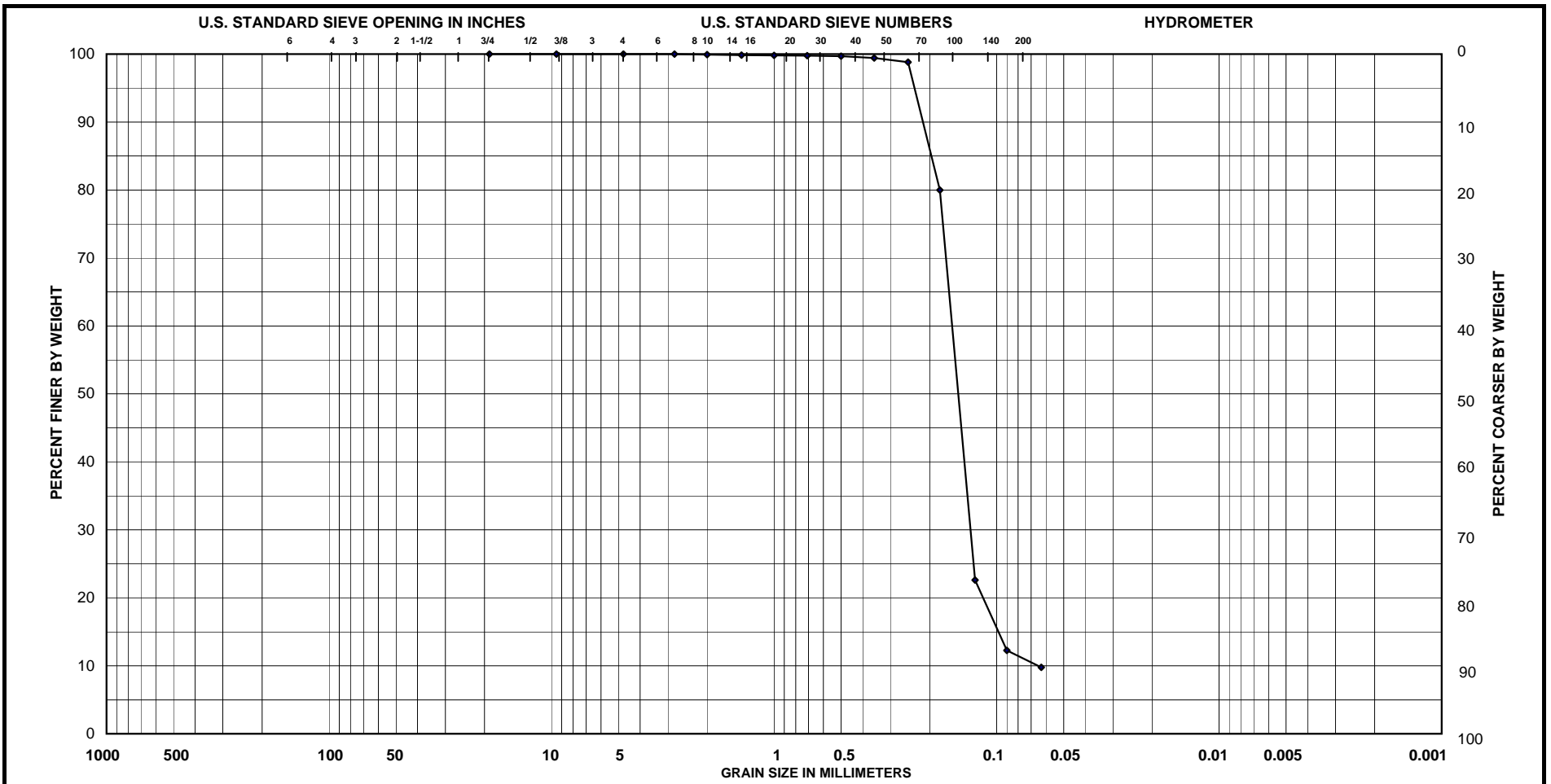
### GRAIN SIZE AND VISUAL SHELL CONTENT

Project:	<b>Topsail Beach, Surf City &amp; North Topsail</b>	Depth:	<b>17.3-17.8</b>
Project No.:	<b>1584-01-40</b>	Date:	<b>9/22/2003</b>
Boring No.:	<b>T1-03-V-144</b>		
Sample No.:	<b>4</b>		
Description:	<b>SAND, poorly-graded with silt, mostly fine-grained quartz, few silt, trace carbonate, greenish gray (SP-SM)</b>		

Tare Weight, (g):	<b>49.85</b>	
Dry Wt. Before Washing (g):	<b>173.63</b>	(with tare)
Dry Weight After Washing (g):	<b>161.55</b>	(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	0.08	99.92	100	0.08
#14	1.400	0.07	99.86	100	0.07
#18	1.000	0.06	99.81	70	0.04
#25	0.710	0.07	99.76	50	0.04
#35	0.500	0.10	99.68	30	0.03
#45	0.355	0.33	99.41	20	0.07
#60	0.250	0.75	98.80	5	0.04
#80	0.180	23.28	80.00	3	0.70
#120	0.125	71.05	22.60	1	0.71
#170	0.090	12.81	12.25	1	0.13
#230	0.063	3.06	9.78	1	0.03

**Total Shell Content:** **2** %



COBBLES	GRAVEL		SAND			SILT OR CLAY
	COARSE	FINE	COARSE	MEDIUM	FINE	

Sample No.	Elev. Or Depth	Classification	% CO <sub>3</sub>	G <sub>s</sub>	Nat w%	LL	PL	PI	Project	
4	17.3-17.8	SAND, poorly-graded with silt, mostly fine-grained quartz, few silt, trace carbonate, greenish gray (SP-SM)	2						Topsail Beach, Surf City & North Topsail	
									Area	
									Boring No. T1-03-V-144	
									Date 9/22/2003	

**GRADATION CURVES**



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## VISUAL SHELL CONTENT

### GRAIN SIZE AND VISUAL SHELL CONTENT

Project:	<b>Topsail Beach, Surf City &amp; North Topsail</b>	Depth:	<b>19.0-19.5</b>
Project No.:	<b>1584-01-40</b>	Date:	<b>9/22/2003</b>
Boring No.:	<b>T1-03-V-144</b>		
Sample No.:	<b>5</b>		
Description:	<b>SAND, poorly-graded, mostly fine-grained quartz, trace carbonate, greenish gray (SP)</b>		

Tare Weight, (g):	<b>49.81</b>	
Dry Wt. Before Washing (g):	<b>169.59</b>	(with tare)
Dry Weight After Washing (g):	<b>165.41</b>	(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	0.08	99.93	100	0.08
#14	1.400	0.07	99.87	100	0.07
#18	1.000	0.07	99.82	80	0.06
#25	0.710	0.10	99.73	60	0.06
#35	0.500	0.15	99.61	60	0.09
#45	0.355	0.46	99.22	55	0.25
#60	0.250	0.77	98.58	70	0.54
#80	0.180	35.87	68.63	3	1.08
#120	0.125	67.61	12.19	1	0.68
#170	0.090	9.53	4.23	1	0.10
#230	0.063	1.58	2.91	1	0.02

**Total Shell Content:** **3** %



COBBLES	GRAVEL		SAND			SILT OR CLAY
	COARSE	FINE	COARSE	MEDIUM	FINE	

Sample No.	Elev. Or Depth	Classification	% CO <sub>3</sub>	G <sub>s</sub>	Nat w%	LL	PL	PI	Project
5	19.0-19.5	SAND, poorly-graded, mostly fine-grained quartz, trace carbonate, greenish gray (SP)	3						Topsail Beach, Surf City & North Topsail
									Area
									Boring No. T1-03-V-144
									Date 9/22/2003

**GRADATION CURVES**





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## VISUAL SHELL CONTENT

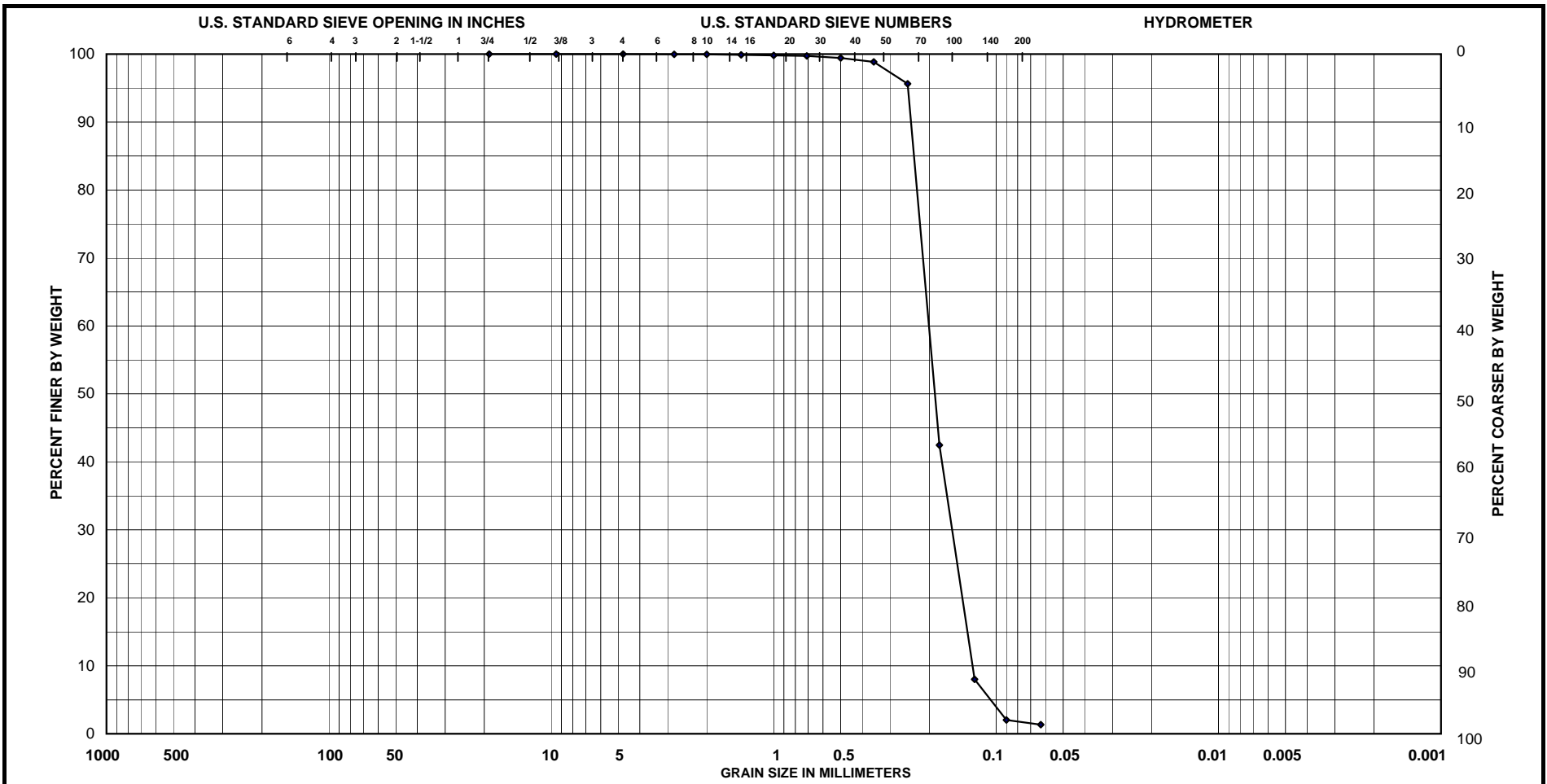
### GRAIN SIZE AND VISUAL SHELL CONTENT

Project:	<b>Topsail Beach, Surf City &amp; North Topsail</b>	Depth:	<b>3.1-3.6</b>
Project No.:	<b>1584-01-40</b>	Date:	<b>9/22/2003</b>
Boring No.:	<b>T1-03-V-145</b>		
Sample No.:	<b>1</b>		
Description:	<b>SAND, poorly-graded, mostly fine-grained quartz, trace carbonate, light olive gray (SP)</b>		

Tare Weight, (g):	<b>50.42</b>	
Dry Wt. Before Washing (g):	<b>176</b>	(with tare)
Dry Weight After Washing (g):	<b>174.65</b>	(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	0.03	99.98	100	0.03
#10	2.000	0.03	99.95	100	0.03
#14	1.400	0.08	99.89	70	0.06
#18	1.000	0.08	99.82	90	0.07
#25	0.710	0.14	99.71	70	0.10
#35	0.500	0.35	99.43	45	0.16
#45	0.355	0.75	98.84	15	0.11
#60	0.250	4.02	95.64	5	0.20
#80	0.180	66.78	42.46	3	2.00
#120	0.125	43.24	8.03	1	0.43
#170	0.090	7.55	2.01	1	0.08
#230	0.063	0.86	1.33	1	0.01

**Total Shell Content:** **3** %



COBBLES	GRAVEL		SAND			SILT OR CLAY
	COARSE	FINE	COARSE	MEDIUM	FINE	

Sample No.	Elev. Or Depth	Classification	% CO <sub>3</sub>	G <sub>s</sub>	Nat w%	LL	PL	PI	Project	
♦ 1	3.1-3.6	SAND, poorly-graded, mostly fine-grained quartz, trace carbonate, light olive gray (SP)	3						Topsail Beach, Surf City & North Topsail	
									Area	
									Boring No. T1-03-V-145	
									Date 9/22/2003	

**GRADATION CURVES**



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## VISUAL SHELL CONTENT

### GRAIN SIZE AND VISUAL SHELL CONTENT

<b>Project:</b>	<b>Topsail Beach, Surf City &amp; North Topsail</b>	<b>Depth:</b>	<b>5.0-5.5</b>
<b>Project No.:</b>	<b>1584-01-40</b>	<b>Date:</b>	<b>9/22/2003</b>
<b>Boring No.:</b>	<b>T1-03-V-145</b>		
<b>Sample No.:</b>	<b>2</b>		
<b>Description:</b>	<b>SAND, poorly-graded, mostly fine-grained quartz, trace carbonate, trace fragmented limestone, light olive gray (SP)</b>		

Tare Weight, (g):	49.69	
Dry Wt. Before Washing (g):	174.24	(with tare)
Dry Weight After Washing (g):	172.46	(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	0.83	99.33	40	0.33
#7	2.800	0.31	99.08	90	0.28
#10	2.000	0.14	98.97	70	0.10
#14	1.400	0.18	98.83	65	0.12
#18	1.000	0.22	98.65	60	0.13
#25	0.710	0.34	98.38	50	0.17
#35	0.500	0.48	97.99	25	0.12
#45	0.355	1.08	97.13	15	0.16
#60	0.250	5.36	92.82	3	0.16
#80	0.180	71.58	35.35	1	0.72
#120	0.125	36.37	6.15	1	0.36
#170	0.090	4.88	2.23	1	0.05
#230	0.063	0.63	1.73	1	0.01

**Total Shell Content:** 2 %





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## VISUAL SHELL CONTENT

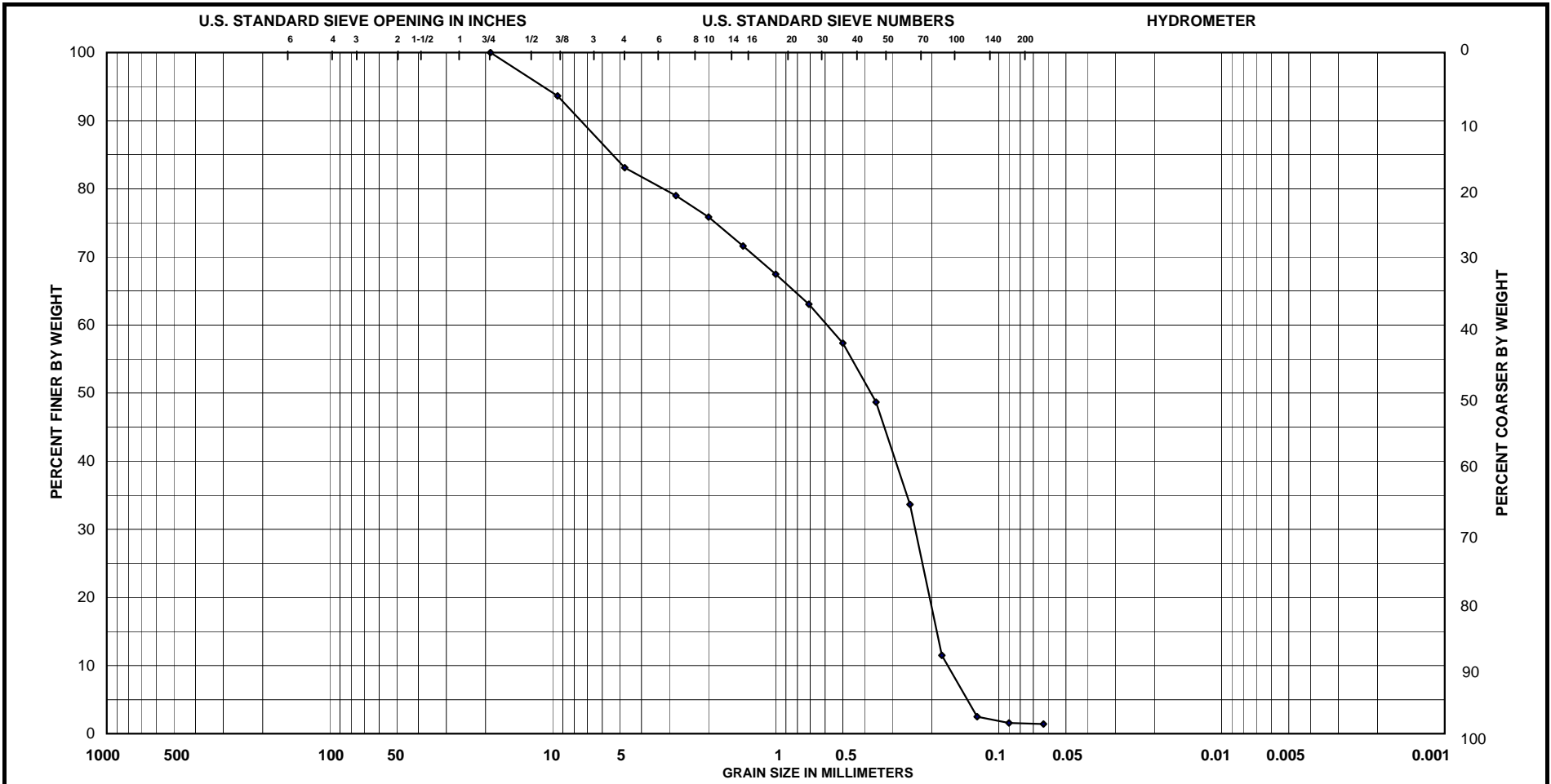
### GRAIN SIZE AND VISUAL SHELL CONTENT

Project:	<b>Topsail Beach, Surf City &amp; North Topsail</b>	Depth:	<b>7.0-7.5</b>
Project No.:	<b>1584-01-40</b>	Date:	<b>9/22/2003</b>
Boring No.:	<b>T1-03-V-145</b>		
Sample No.:	<b>3</b>		
Description:	<b>SAND, poorly-graded, mostly medium to fine-grained quartz, little fine gravel-size carbonate, few coarse-grained carbonate, few fragmented</b>		

Tare Weight, (g):	<b>49.85</b>	
Dry Wt. Before Washing (g):	<b>187.25</b>	(with tare)
Dry Weight After Washing (g):	<b>186.13</b>	(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	8.73	93.65	100	8.73
#4	4.750	14.50	83.09	80	11.60
#7	2.800	5.62	79.00	70	3.93
#10	2.000	4.33	75.85	65	2.81
#14	1.400	5.85	71.59	50	2.93
#18	1.000	5.68	67.46	50	2.84
#25	0.710	6.06	63.05	30	1.82
#35	0.500	7.85	57.34	15	1.18
#45	0.355	11.91	48.67	5	0.60
#60	0.250	20.64	33.65	3	0.62
#80	0.180	30.41	11.51	1	0.30
#120	0.125	12.42	2.47	1	0.12
#170	0.090	1.25	1.56	1	0.01
#230	0.063	0.19	1.43	1	0.00

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



COBBLES	GRAVEL		SAND			SILT OR CLAY
	COARSE	FINE	COARSE	MEDIUM	FINE	

Sample No.	Elev. Or Depth	Classification	% CO <sub>3</sub>	G <sub>s</sub>	Nat w%	LL	PL	PI	Project	
♦ 3	7.0-7.5	SAND, poorly-graded, mostly medium to fine-grained quartz, little fine gravel-size carbonate, few coarse-grained carbonate, few fragmented limestone, light olive gray (SP)	27						Topsail Beach, Surf City & North Topsail	
			Area							
			Boring No. T1-03-V-145							
			Date 9/22/2003							

**GRADATION CURVES**



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## VISUAL SHELL CONTENT

### GRAIN SIZE AND VISUAL SHELL CONTENT

<b>Project:</b>	<b>Topsail Beach, Surf City &amp; North Topsail</b>	<b>Depth:</b>	<b>6.4-6.9</b>
<b>Project No.:</b>	<b>1584-01-40</b>	<b>Date:</b>	<b>9/22/2003</b>
<b>Boring No.:</b>	<b>T1-03-V-145A</b>		
<b>Sample No.:</b>	<b>1</b>		
<b>Description:</b>	<b>SAND, poorly-graded, mostly fine-grained quartz, few coarse to medium-grained carbonate, trace fine gravel-size carbonate, trace fragmented</b>		

Tare Weight, (g):	50.30	
Dry Wt. Before Washing (g):	181.87	(with tare)
Dry Weight After Washing (g):	180.55	(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	3.11	97.64	100	3.11
#7	2.800	2.95	95.39	90	2.66
#10	2.000	2.96	93.14	70	2.07
#14	1.400	3.44	90.53	50	1.72
#18	1.000	4.07	87.44	50	2.04
#25	0.710	4.58	83.96	40	1.83
#35	0.500	6.85	78.75	30	2.06
#45	0.355	11.07	70.34	10	1.11
#60	0.250	22.82	52.99	5	1.14
#80	0.180	46.13	17.93	3	1.38
#120	0.125	19.20	3.34	1	0.19
#170	0.090	2.86	1.16	1	0.03
#230	0.063	0.30	0.93	1	0.00

**Total Shell Content:** 15 %



COBBLES	GRAVEL		SAND			SILT OR CLAY
	COARSE	FINE	COARSE	MEDIUM	FINE	

Sample No.	Elev. Or Depth	Classification	% CO <sub>3</sub>	G <sub>s</sub>	Nat w%	LL	PL	PI	Project
1	6.4-6.9	SAND, poorly-graded, mostly fine-grained quartz, few coarse to mediu-grained carbonate, trace fine gravel-size carbonate, trace fragmented limestone, olive gray (SP)	15						Topsail Beach, Surf City & North Topsail
									Area
									Boring No. T1-03-V-145A
									Date 9/22/2003

**GRADATION CURVES**





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## VISUAL SHELL CONTENT

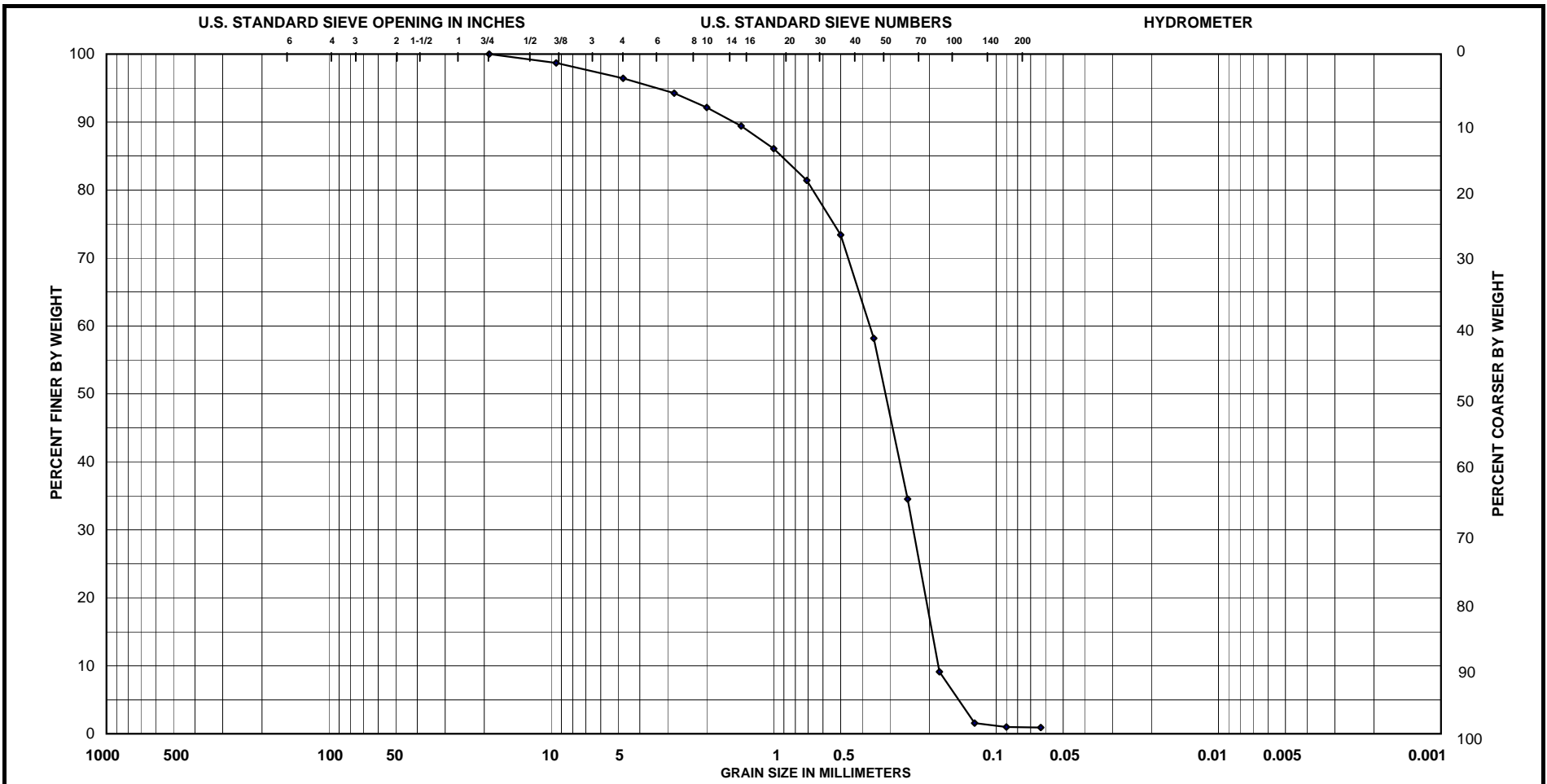
### GRAIN SIZE AND VISUAL SHELL CONTENT

Project:	<b>Topsail Beach, Surf City &amp; North Topsail</b>	Depth:	<b>8.0-8.5</b>
Project No.:	<b>1584-01-40</b>	Date:	<b>9/22/2003</b>
Boring No.:	<b>T1-03-V-145A</b>		
Sample No.:	<b>2</b>		
Description:	<b>SAND, poorly-graded, mostly medium to fine-grained quartz, little coarse to medium-grained carbonate, trace fine gravel-size carbonate,</b>		

Tare Weight, (g):	<b>50.12</b>	
Dry Wt. Before Washing (g):	<b>190.01</b>	(with tare)
Dry Weight After Washing (g):	<b>188.93</b>	(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	1.82	98.70	100	1.82
#4	4.750	3.14	96.45	100	3.14
#7	2.800	3.08	94.25	90	2.77
#10	2.000	2.94	92.15	70	2.06
#14	1.400	3.80	89.43	60	2.28
#18	1.000	4.70	86.07	45	2.12
#25	0.710	6.55	81.39	40	2.62
#35	0.500	11.18	73.40	25	2.80
#45	0.355	21.27	58.20	10	2.13
#60	0.250	33.08	34.55	3	0.99
#80	0.180	35.58	9.11	1	0.36
#120	0.125	10.53	1.59	1	0.11
#170	0.090	0.80	1.02	1	0.01
#230	0.063	0.12	0.93	1	0.00

**Total Shell Content:** **17** %



COBBLES	GRAVEL		SAND			SILT OR CLAY
	COARSE	FINE	COARSE	MEDIUM	FINE	

Sample No.	Elev. Or Depth	Classification	% CO <sub>3</sub>	G <sub>s</sub>	Nat w%	LL	PL	PI	Project
♦ 2	8.0-8.5	SAND, poorly-graded, mostly medium to fine-grained quartz, little coarse to medium-grained carbonate, trace fine gravel-size carbonate, trace fragmented limestone, gray (SP)	17						Topsail Beach, Surf City & North Topsail
									Area
									Boring No. T1-03-V-145A
									Date 9/22/2003

**GRADATION CURVES**



# WOLF TECHNOLOGIES, INC.

3047-4 St. Johns Bluff Road S.  
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## VISUAL SHELL CONTENT

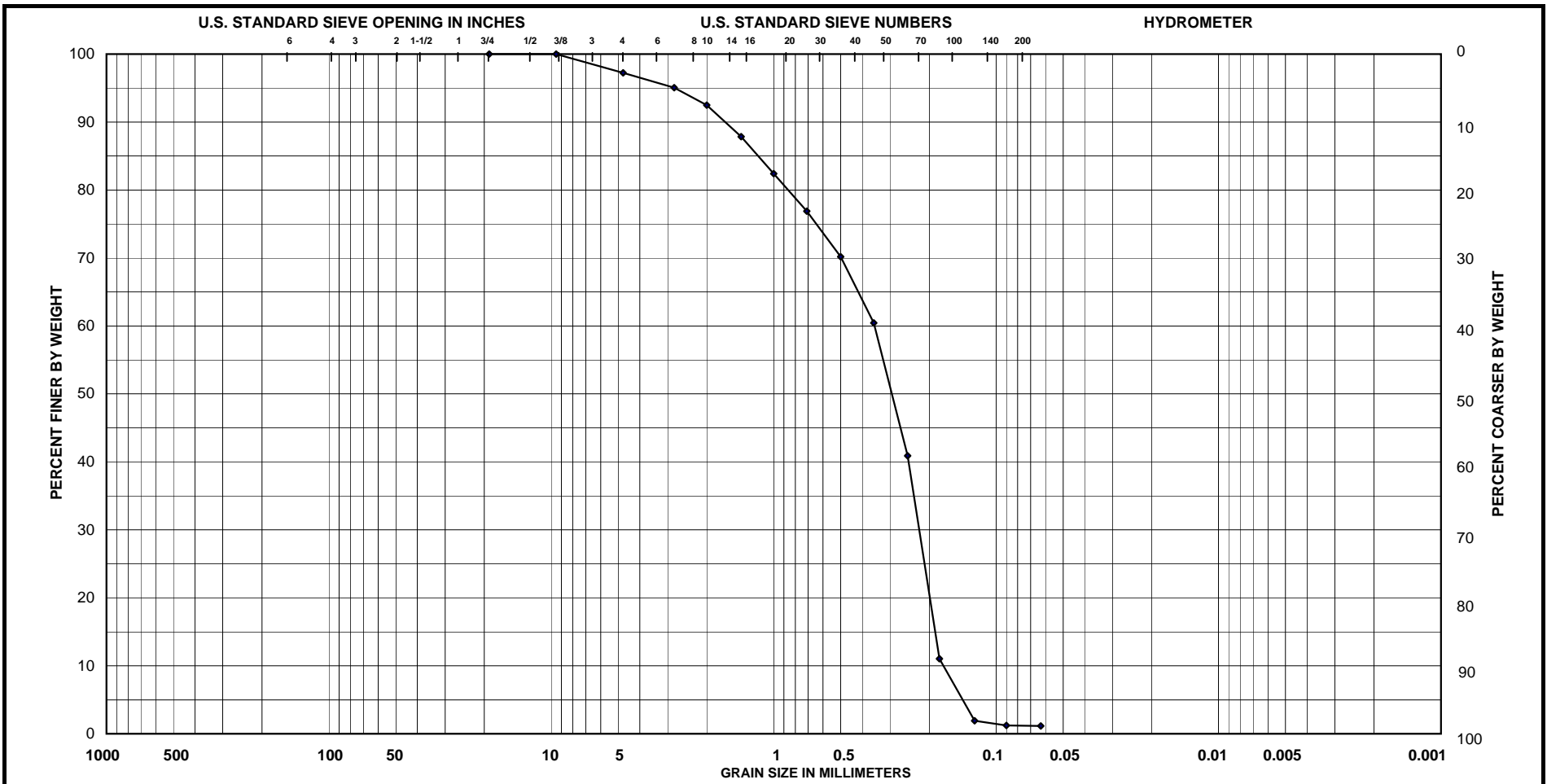
### GRAIN SIZE AND VISUAL SHELL CONTENT

Project:	<b>Topsail Beach, Surf City &amp; North Topsail</b>	Depth:	<b>10.0-10.5</b>
Project No.:	<b>1584-01-40</b>	Date:	<b>9/22/2003</b>
Boring No.:	<b>T1-03-V-145A</b>		
Sample No.:	<b>3</b>		
Description:	<b>SAND, poorly-graded, mostly medium to fine-grained quartz, little coarse to medium-grained carbonate, trace fine gravel-size carbonate,</b>		

Tare Weight, (g):	<b>50.03</b>	
Dry Wt. Before Washing (g):	<b>179.49</b>	(with tare)
Dry Weight After Washing (g):	<b>178.4</b>	(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	3.58	97.23	90	3.22
#7	2.800	2.84	95.04	80	2.27
#10	2.000	3.29	92.50	65	2.14
#14	1.400	6.00	87.86	60	3.60
#18	1.000	7.09	82.39	50	3.55
#25	0.710	7.10	76.90	40	2.84
#35	0.500	8.70	70.18	25	2.18
#45	0.355	12.61	60.44	15	1.89
#60	0.250	25.32	40.89	5	1.27
#80	0.180	38.62	11.05	3	1.16
#120	0.125	11.83	1.92	1	0.12
#170	0.090	0.87	1.24	1	0.01
#230	0.063	0.11	1.16	1	0.00

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



COBBLES	GRAVEL		SAND			SILT OR CLAY
	COARSE	FINE	COARSE	MEDIUM	FINE	

Sample No.	Elev. Or Depth	Classification	% CO <sub>3</sub>	G <sub>s</sub>	Nat w%	LL	PL	PI	Project	
♦ 3	10.0-10.5	SAND, poorly-graded, mostly medium to fine-grained quartz, little coarse to medium-grained carbonate, trace fine gravel-size carbonate, trace fragmented limestone, gray (SP)	19						Topsail Beach, Surf City & North Topsail	
									Area	
									Boring No. T1-03-V-145A	
									Date 9/22/2003	

**GRADATION CURVES**



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## VISUAL SHELL CONTENT

### GRAIN SIZE AND VISUAL SHELL CONTENT

Project:	<b>Topsail Beach, Surf City &amp; North Topsail</b>	Depth:	<b>7.7-8.2</b>
Project No.:	<b>1584-01-40</b>	Date:	<b>9/22/2003</b>
Boring No.:	<b>T1-03-V-146A</b>		
Sample No.:	<b>1</b>		
Description:	<b>SAND, poorly-graded, mostly fine-grained quartz, trace carbonate, trace fragmented limestone, olive gray (SP)</b>		

Tare Weight, (g):	<b>50.12</b>	
Dry Wt. Before Washing (g):	<b>170.6</b>	(with tare)
Dry Weight After Washing (g):	<b>169.25</b>	(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	0.04	99.95	100	0.04
#14	1.400	0.23	99.76	80	0.18
#18	1.000	0.41	99.42	75	0.31
#25	0.710	0.81	98.75	50	0.41
#35	0.500	1.96	97.12	20	0.39
#45	0.355	6.53	91.70	5	0.33
#60	0.250	22.34	73.16	3	0.67
#80	0.180	56.30	26.43	1	0.56
#120	0.125	27.58	3.54	1	0.28
#170	0.090	2.70	1.29	1	0.03
#230	0.063	0.11	1.20	1	0.00

**Total Shell Content:** **3** %





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## VISUAL SHELL CONTENT

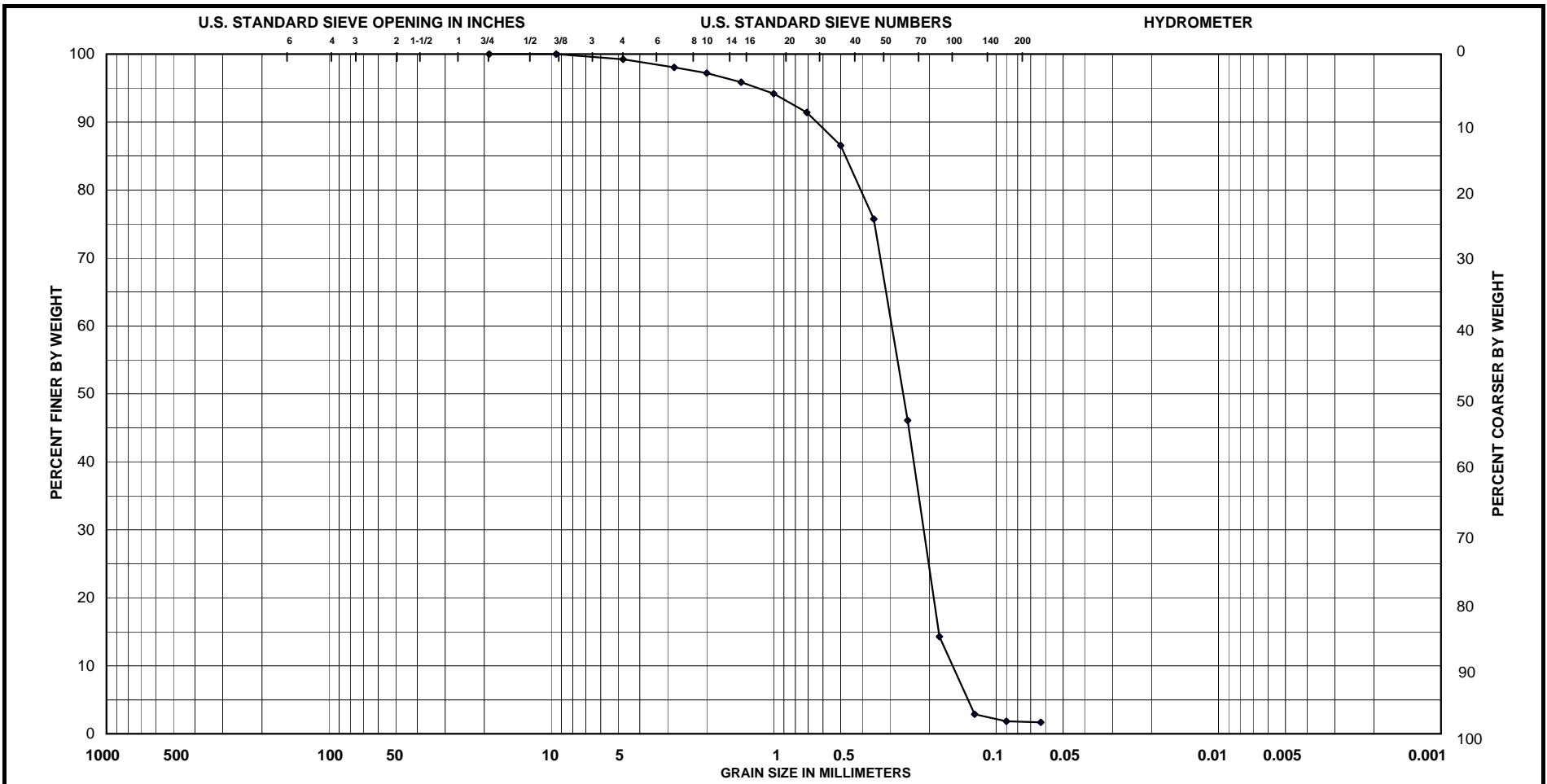
### GRAIN SIZE AND VISUAL SHELL CONTENT

Project:	<b>Topsail Beach, Surf City &amp; North Topsail</b>	Depth:	<b>10.0-10.5</b>
Project No.:	<b>1584-01-40</b>	Date:	<b>9/22/2003</b>
Boring No.:	<b>T1-03-V-146A</b>		
Sample No.:	<b>2</b>		
Description:	<b>SAND, poorly-graded, mostly fine-grained quartz, few carbonate, light olive gray (SP)</b>		

Tare Weight, (g):	<b>49.02</b>	
Dry Wt. Before Washing (g):	<b>167.97</b>	(with tare)
Dry Weight After Washing (g):	<b>166.64</b>	(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	0.92	99.23	100	0.92
#7	2.800	1.40	98.05	65	0.91
#10	2.000	1.02	97.19	60	0.61
#14	1.400	1.58	95.86	60	0.95
#18	1.000	1.99	94.19	40	0.80
#25	0.710	3.32	91.40	35	1.16
#35	0.500	5.76	86.56	20	1.15
#45	0.355	12.89	75.72	10	1.29
#60	0.250	35.21	46.12	5	1.76
#80	0.180	37.84	14.31	3	1.14
#120	0.125	13.61	2.87	1	0.14
#170	0.090	1.24	1.82	1	0.01
#230	0.063	0.16	1.69	1	0.00

**Total Shell Content:** **9** %



COBBLES	GRAVEL		SAND			SILT OR CLAY
	COARSE	FINE	COARSE	MEDIUM	FINE	

Sample No.	Elev. Or Depth	Classification	% CO <sub>3</sub>	G <sub>s</sub>	Nat w%	LL	PL	PI	Project
♦ 2	10.0-10.5	SAND, poorly-graded, mostly fine-grained quartz, few carbonate, light olive gray (SP)	9						Topsail Beach, Surf City & North Topsail
									Area
									Boring No. T1-03-V-146A
									Date 9/22/2003

**GRADATION CURVES**





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## VISUAL SHELL CONTENT

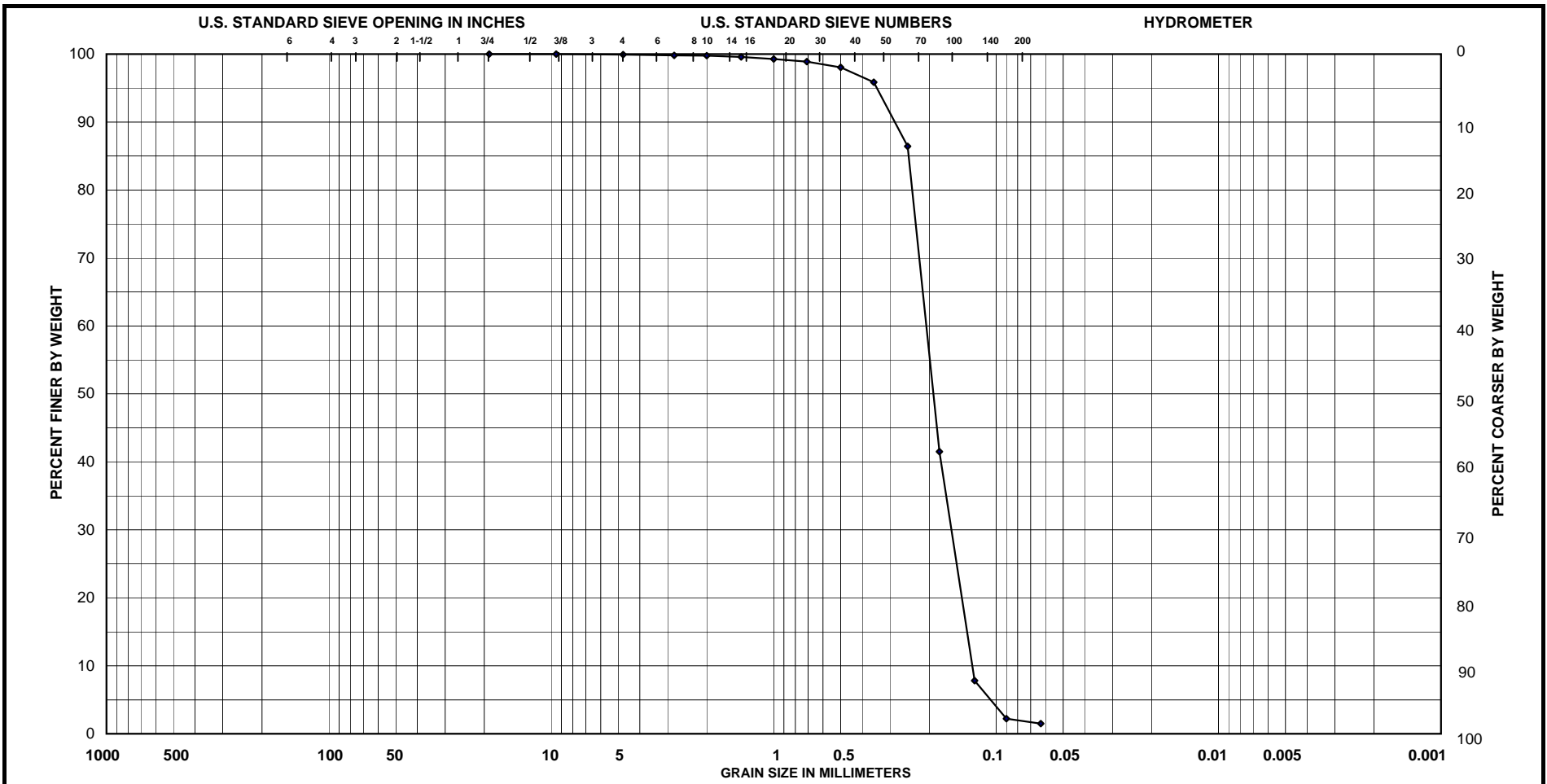
### GRAIN SIZE AND VISUAL SHELL CONTENT

Project:	<b>Topsail Beach, Surf City &amp; North Topsail</b>	Depth:	<b>4.8-5.3</b>
Project No.:	<b>1584-01-40</b>	Date:	<b>9/22/2003</b>
Boring No.:	<b>T1-03-V-147</b>		
Sample No.:	<b>1</b>		
Description:	<b>SAND, poorly-graded, mostly fine-grained quartz, trace carbonate, olive gray (SP)</b>		

Tare Weight, (g):	<b>49.91</b>	
Dry Wt. Before Washing (g):	<b>167.67</b>	(with tare)
Dry Weight After Washing (g):	<b>166.13</b>	(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	0.11	99.91	100	0.11
#7	2.800	0.11	99.81	100	0.11
#10	2.000	0.07	99.75	100	0.07
#14	1.400	0.21	99.58	85	0.18
#18	1.000	0.35	99.28	80	0.28
#25	0.710	0.47	98.88	65	0.31
#35	0.500	0.99	98.04	25	0.25
#45	0.355	2.58	95.85	10	0.26
#60	0.250	11.11	86.41	3	0.33
#80	0.180	52.88	41.51	1	0.53
#120	0.125	39.67	7.82	1	0.40
#170	0.090	6.60	2.22	1	0.07
#230	0.063	0.83	1.51	1	0.01

**Total Shell Content:** **2** %



COBBLES	GRAVEL		SAND			SILT OR CLAY
	COARSE	FINE	COARSE	MEDIUM	FINE	

Sample No.	Elev. Or Depth	Classification	% CO <sub>3</sub>	G <sub>s</sub>	Nat w%	LL	PL	PI	Project
♦ 1	4.8-5.3	SAND, poorly-graded, mostly fine-grained quartz, trace carbonate, olive gray (SP)	2						Topsail Beach, Surf City & North Topsail
									Area
									Boring No. T1-03-V-147
									Date 9/22/2003

**GRADATION CURVES**



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## VISUAL SHELL CONTENT

### GRAIN SIZE AND VISUAL SHELL CONTENT

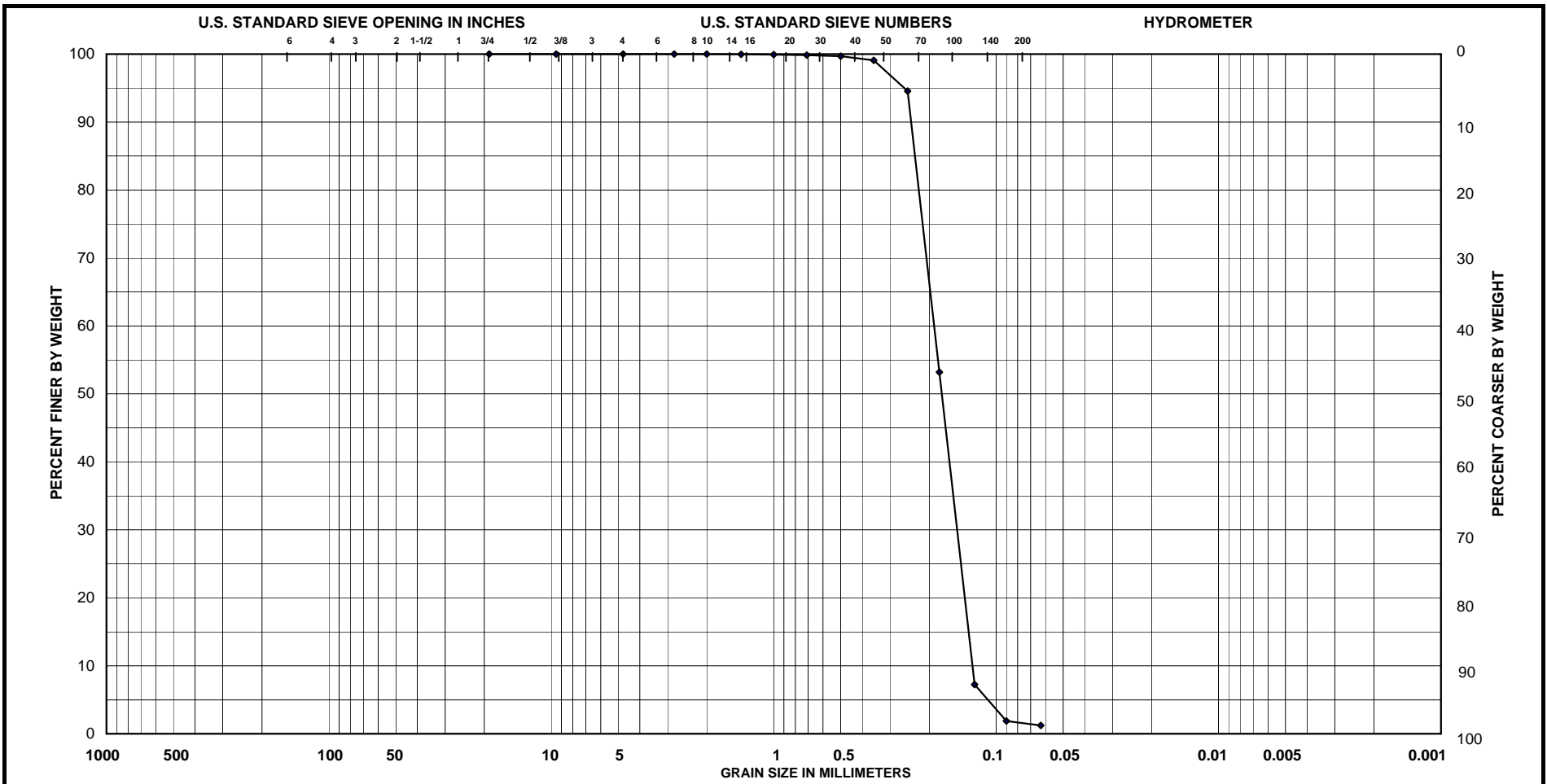
Project:	<b>Topsail Beach, Surf City &amp; North Topsail</b>	Depth:	<b>6.5-7.0</b>
Project No.:	<b>1584-01-40</b>	Date:	<b>9/22/2003</b>
Boring No.:	<b>T1-03-V-147</b>		
Sample No.:	<b>2</b>		
Description:	<b>SAND, poorly-graded, mostly fine-grained quartz, trace carbonate, trace fragmented limestone, gray (SP)</b>		

Tare Weight, (g):	<b>49.89</b>	
Dry Wt. Before Washing (g):	<b>169.13</b>	(with tare)
Dry Weight After Washing (g):	<b>167.61</b>	(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	0.04	99.95	100	0.04
#18	1.000	0.05	99.91	90	0.05
#25	0.710	0.07	99.85	90	0.06
#35	0.500	0.20	99.68	40	0.08
#45	0.355	0.71	99.09	30	0.21
#60	0.250	5.41	94.55	3	0.16
#80	0.180	49.30	53.20	1	0.49
#120	0.125	54.78	7.26	1	0.55
#170	0.090	6.41	1.89	1	0.06
#230	0.063	0.77	1.24	1	0.01

**Total Shell Content:**

<b>1</b>	<b>%</b>
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COBBLES	GRAVEL		SAND			SILT OR CLAY
	COARSE	FINE	COARSE	MEDIUM	FINE	

Sample No.	Elev. Or Depth	Classification	% CO <sub>3</sub>	G <sub>s</sub>	Nat w%	LL	PL	PI	Project
2	6.5-7.0	SAND, poorly-graded, mostly fine-grained quartz, trace carbonate, trace fragmented limestone, gray (SP)	1						Topsail Beach, Surf City & North Topsail
									Area
									Boring No. T1-03-V-147
									Date 9/22/2003

**GRADATION CURVES**



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## VISUAL SHELL CONTENT

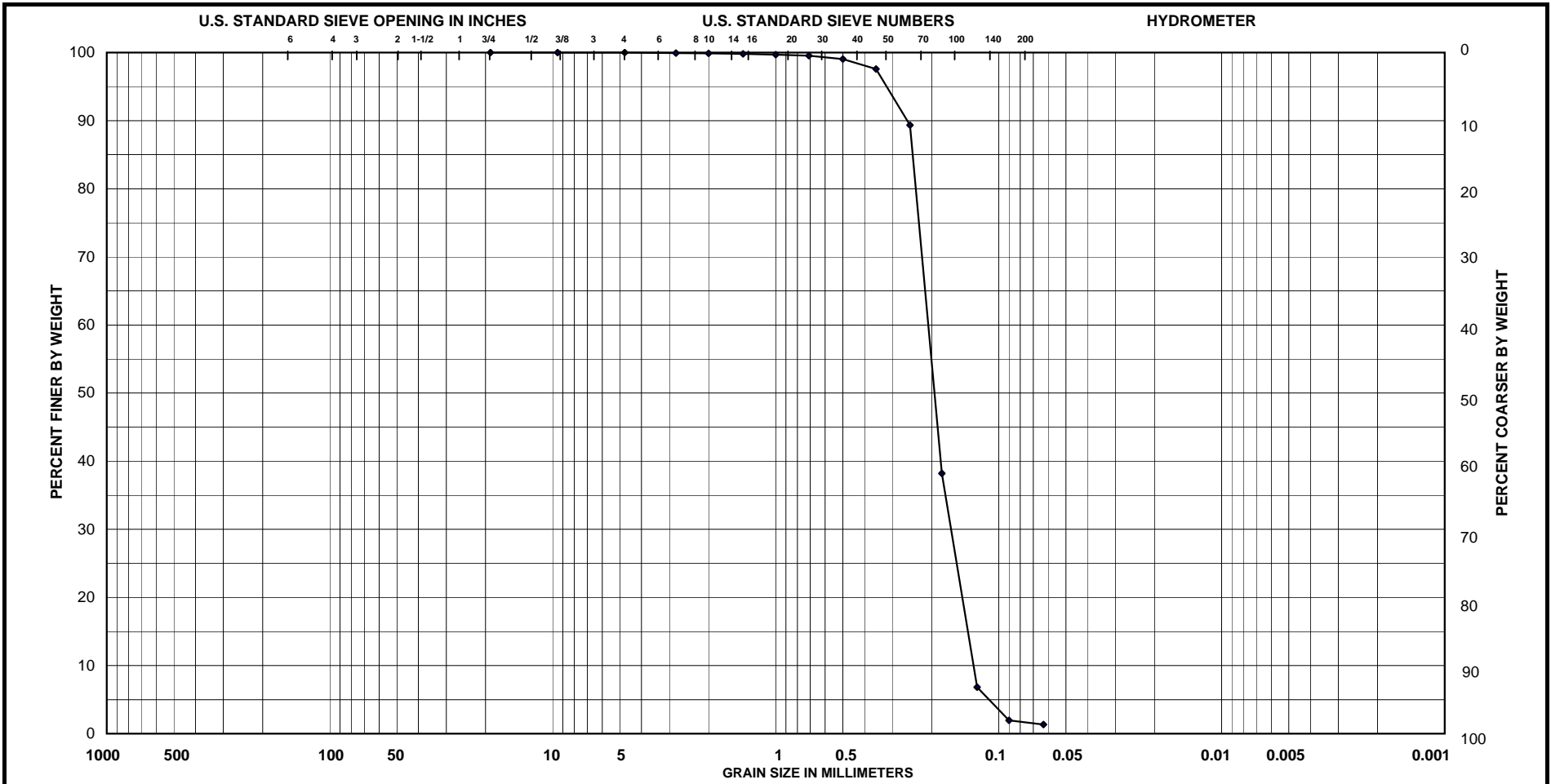
### GRAIN SIZE AND VISUAL SHELL CONTENT

Project:	<b>Topsail Beach, Surf City &amp; North Topsail</b>	Depth:	<b>8.5-9.0</b>
Project No.:	<b>1584-01-40</b>	Date:	<b>9/22/2003</b>
Boring No.:	<b>T1-03-V-147</b>		
Sample No.:	<b>3</b>		
Description:	<b>SAND, poorly-graded, mostly fine-grained quartz, trace carbonate, trace fragmented limestone, gray (SP)</b>		

Tare Weight, (g):	<b>49.31</b>	
Dry Wt. Before Washing (g):	<b>175.9</b>	(with tare)
Dry Weight After Washing (g):	<b>174.22</b>	(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	0.11	99.91	100	0.11
#10	2.000	0.05	99.87	100	0.05
#14	1.400	0.09	99.80	100	0.09
#18	1.000	0.12	99.71	70	0.08
#25	0.710	0.22	99.53	40	0.09
#35	0.500	0.60	99.06	50	0.30
#45	0.355	1.88	97.57	20	0.38
#60	0.250	10.43	89.34	5	0.52
#80	0.180	64.70	38.23	1	0.65
#120	0.125	39.76	6.82	1	0.40
#170	0.090	6.15	1.96	1	0.06
#230	0.063	0.78	1.34	1	0.01

**Total Shell Content:** **2** %



COBBLES	GRAVEL		SAND			SILT OR CLAY
	COARSE	FINE	COARSE	MEDIUM	FINE	

Sample No.	Elev. Or Depth	Classification	% CO <sub>3</sub>	G <sub>s</sub>	Nat w%	LL	PL	PI	Project	
3	8.5-9.0	SAND, poorly-graded, mostly fine-grained quartz, trace carbonate, trace fragmented limestone, gray (SP)	2						Topsail Beach, Surf City & North Topsail	
									Area	
									Boring No. T1-03-V-147	
									Date 9/22/2003	

**GRADATION CURVES**



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## VISUAL SHELL CONTENT

### GRAIN SIZE AND VISUAL SHELL CONTENT

Project:	<b>Topsail Beach, Surf City &amp; North Topsail</b>	Depth:	<b>8.0-8.5</b>
Project No.:	<b>1584-01-40</b>	Date:	<b>9/22/2003</b>
Boring No.:	<b>T1-03-V-147A</b>		
Sample No.:	<b>1</b>		
Description:	<b>SAND, poorly-graded, mostly fine-grained quartz, trace carbonate, olive gray (SP)</b>		

Tare Weight, (g):	<b>50.20</b>	
Dry Wt. Before Washing (g):	<b>169.45</b>	(with tare)
Dry Weight After Washing (g):	<b>167.82</b>	(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	0.01	99.99	100	0.01
#14	1.400	0.02	99.97	100	0.02
#18	1.000	0.06	99.92	75	0.05
#25	0.710	0.06	99.87	70	0.04
#35	0.500	0.22	99.69	65	0.14
#45	0.355	0.50	99.27	40	0.20
#60	0.250	3.01	96.75	10	0.30
#80	0.180	43.99	59.86	3	1.32
#120	0.125	62.68	7.30	1	0.63
#170	0.090	6.66	1.71	1	0.07
#230	0.063	0.58	1.22	1	0.01

**Total Shell Content:** **2** %







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## VISUAL SHELL CONTENT

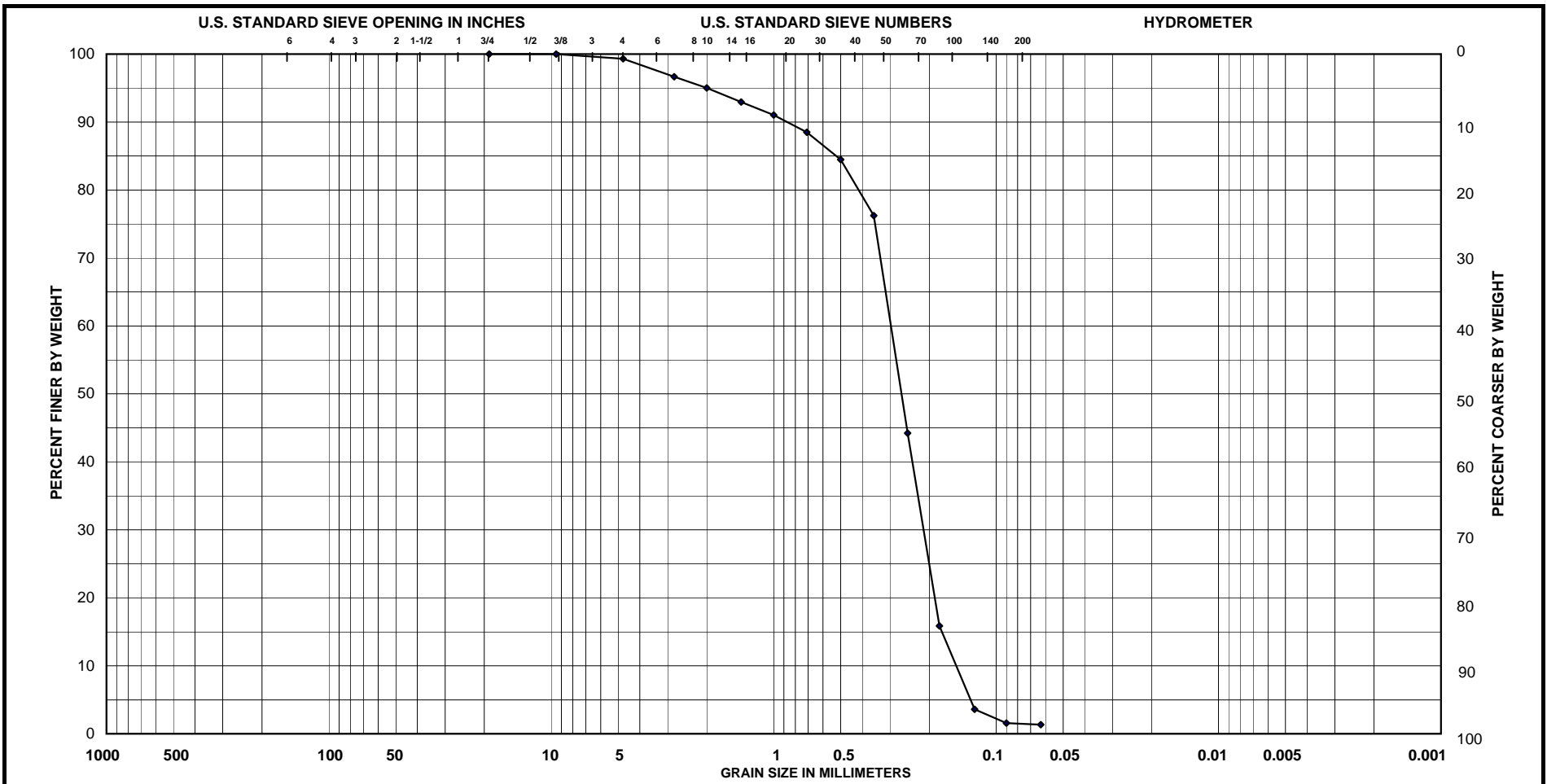
### GRAIN SIZE AND VISUAL SHELL CONTENT

Project:	<b>Topsail Beach, Surf City &amp; North Topsail</b>	Depth:	<b>10.0-10.5</b>
Project No.:	<b>1584-01-40</b>	Date:	<b>9/22/2003</b>
Boring No.:	<b>T1-03-V-147A</b>		
Sample No.:	<b>2</b>		
Description:	<b>SAND, poorly-graded, mostly fine-grained quartz, little coarse to medium-grained carbonate, few fragmented limestone, gray (SP)</b>		

Tare Weight, (g):	<b>49.33</b>	
Dry Wt. Before Washing (g):	<b>178.83</b>	(with tare)
Dry Weight After Washing (g):	<b>177.29</b>	(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	0.89	99.31	100	0.89
#7	2.800	3.41	96.68	70	2.39
#10	2.000	2.17	95.00	70	1.52
#14	1.400	2.65	92.96	70	1.86
#18	1.000	2.51	91.02	65	1.63
#25	0.710	3.28	88.49	60	1.97
#35	0.500	5.18	84.49	40	2.07
#45	0.355	10.67	76.25	25	2.67
#60	0.250	41.47	44.22	5	2.07
#80	0.180	36.74	15.85	3	1.10
#120	0.125	15.87	3.60	1	0.16
#170	0.090	2.64	1.56	1	0.03
#230	0.063	0.27	1.35	1	0.00

**Total Shell Content:** **14** %



COBBLES	GRAVEL		SAND			SILT OR CLAY
	COARSE	FINE	COARSE	MEDIUM	FINE	

Sample No.	Elev. Or Depth	Classification	% CO <sub>3</sub>	G <sub>s</sub>	Nat w%	LL	PL	PI	Project	
♦ 2	10.0-10.5	SAND, poorly-graded, mostly fine-grained quartz, little coarse to medium-grained carbonate, few fragmented limestone, gray (SP)	14						Topsail Beach, Surf City & North Topsail	
									Area	
									Boring No. T1-03-V-147A	
									Date 9/22/2003	

**GRADATION CURVES**



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## VISUAL SHELL CONTENT

### GRAIN SIZE AND VISUAL SHELL CONTENT

Project:	<b>Topsail Beach, Surf City &amp; North Topsail</b>	Depth:	<b>2.8-3.3</b>
Project No.:	<b>1584-01-40</b>	Date:	<b>9/22/2003</b>
Boring No.:	<b>T1-03-V-148</b>		
Sample No.:	<b>1</b>		
Description:	<b>SAND, poorly-graded, mostly fine-grained quartz, trace carbonate, trace fragmented limestone, gray (SP)</b>		

Tare Weight, (g):	<b>50.04</b>	
Dry Wt. Before Washing (g):	<b>169.5</b>	(with tare)
Dry Weight After Washing (g):	<b>167.48</b>	(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	0.30	99.75	100	0.30
#7	2.800	0.06	99.70	100	0.06
#10	2.000	0.03	99.67	100	0.03
#14	1.400	0.03	99.65	100	0.03
#18	1.000	0.05	99.61	80	0.04
#25	0.710	0.10	99.52	80	0.08
#35	0.500	0.26	99.31	40	0.10
#45	0.355	0.90	98.55	20	0.18
#60	0.250	3.62	95.52	10	0.36
#80	0.180	30.24	70.21	3	0.91
#120	0.125	69.45	12.07	1	0.69
#170	0.090	11.03	2.84	1	0.11
#230	0.063	1.15	1.88	1	0.01

**Total Shell Content:** **2** %



COBBLES	GRAVEL		SAND			SILT OR CLAY
	COARSE	FINE	COARSE	MEDIUM	FINE	

Sample No.	Elev. Or Depth	Classification	% CO <sub>3</sub>	G <sub>s</sub>	Nat w%	LL	PL	PI	Project	
♦ 1	2.8-3.3	SAND, poorly-graded, mostly fine-grained quartz, trace carbonate, trace fragmented limestone, gray (SP)	2						Topsail Beach, Surf City & North Topsail	
									Area	
									Boring No. T1-03-V-148	
									Date 9/22/2003	

**GRADATION CURVES**



# WOLF TECHNOLOGIES, INC.

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## VISUAL SHELL CONTENT

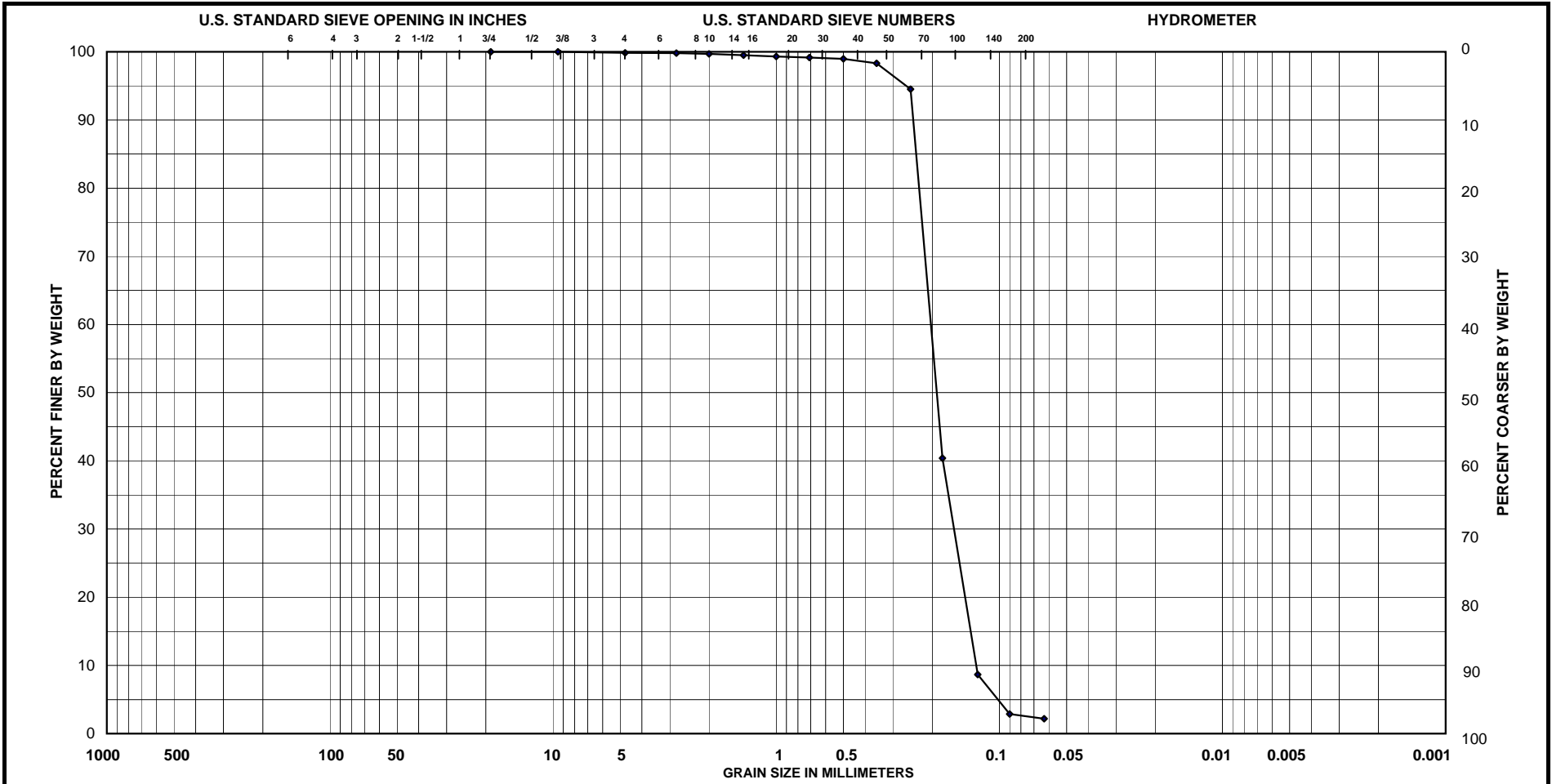
### GRAIN SIZE AND VISUAL SHELL CONTENT

Project:	<b>Topsail Beach, Surf City &amp; North Topsail</b>	Depth:	<b>4.7-5.2</b>
Project No.:	<b>1584-01-40</b>	Date:	<b>9/22/2003</b>
Boring No.:	<b>T1-03-V-148</b>		
Sample No.:	<b>2</b>		
Description:	<b>SAND, poorly-graded, mostly fine-grained quartz, trace carbonate, trace fragmented limestone, gray (SP)</b>		

Tare Weight, (g):	<b>50.25</b>	
Dry Wt. Before Washing (g):	<b>174.25</b>	(with tare)
Dry Weight After Washing (g):	<b>171.75</b>	(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	0.17	99.86	100	0.17
#7	2.800	0.08	99.80	100	0.08
#10	2.000	0.11	99.71	100	0.11
#14	1.400	0.28	99.48	70	0.20
#18	1.000	0.21	99.31	70	0.15
#25	0.710	0.19	99.16	60	0.11
#35	0.500	0.25	98.96	55	0.14
#45	0.355	0.78	98.33	20	0.16
#60	0.250	4.74	94.51	10	0.47
#80	0.180	67.11	40.39	3	2.01
#120	0.125	39.32	8.68	1	0.39
#170	0.090	7.21	2.86	1	0.07
#230	0.063	0.86	2.17	1	0.01

**Total Shell Content:** **3** %



COBBLES	GRAVEL		SAND			SILT OR CLAY
	COARSE	FINE	COARSE	MEDIUM	FINE	

Sample No.	Elev. Or Depth	Classification	% CO <sub>3</sub>	G <sub>s</sub>	Nat w%	LL	PL	PI	Project
♦ 2	4.7-5.2	SAND, poorly-graded, mostly fine-grained quartz, trace carbonate, trace fragmented limestone, gray (SP)	3						Topsail Beach, Surf City & North Topsail
									Area
									Boring No. T1-03-V-148
									Date 9/22/2003

**GRADATION CURVES**



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## VISUAL SHELL CONTENT

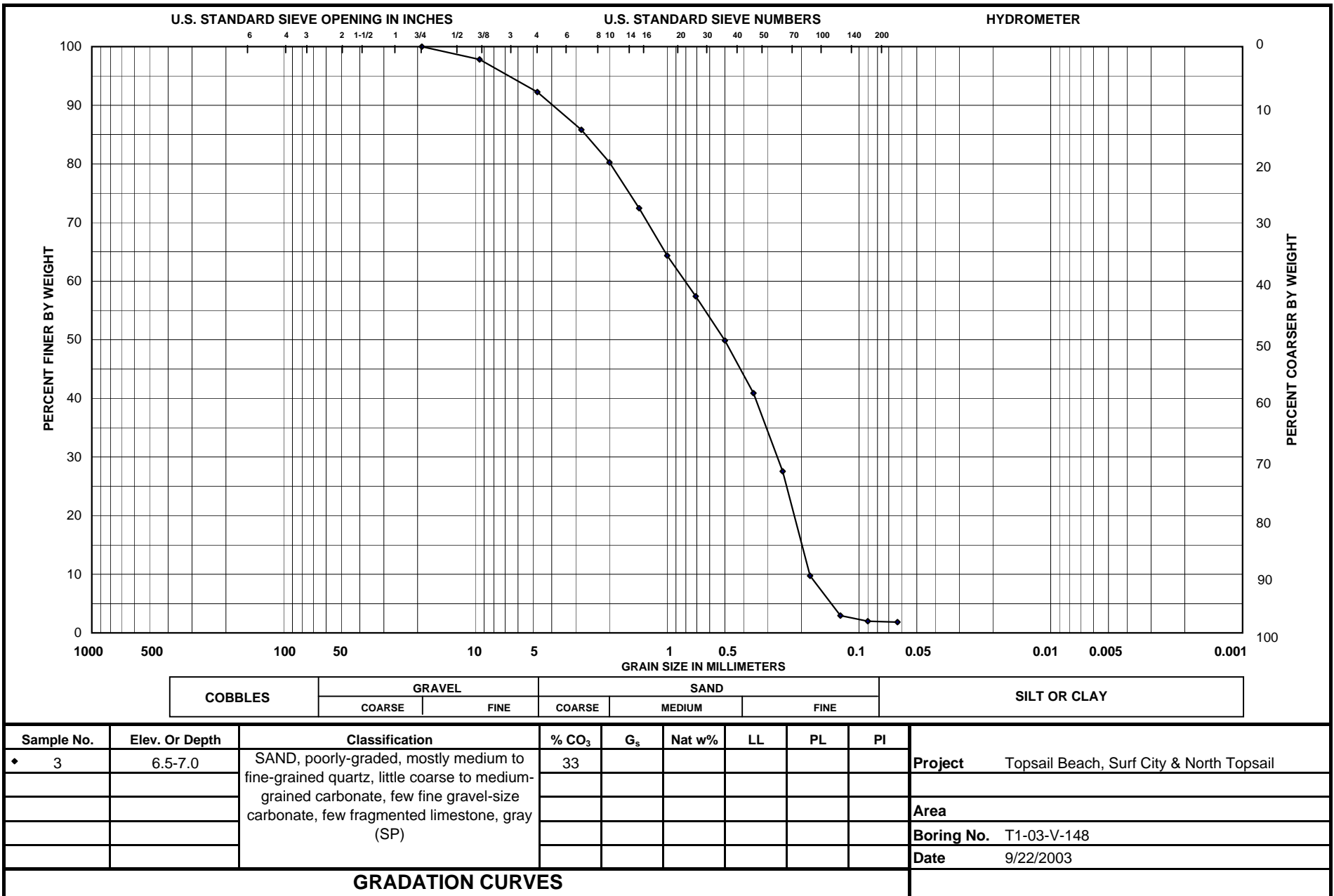
### GRAIN SIZE AND VISUAL SHELL CONTENT

Project:	<b>Topsail Beach, Surf City &amp; North Topsail</b>	Depth:	<b>6.5-7.0</b>
Project No.:	<b>1584-01-40</b>	Date:	<b>9/22/2003</b>
Boring No.:	<b>T1-03-V-148</b>		
Sample No.:	<b>3</b>		
Description:	<b>SAND, poorly-graded, mostly medium to fine-grained quartz, little coarse to medium-grained carbonate, few fine gravel-size carbonate,</b>		

Tare Weight, (g):	<b>50.29</b>	
Dry Wt. Before Washing (g):	<b>181.55</b>	(with tare)
Dry Weight After Washing (g):	<b>180.29</b>	(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	2.88	97.81	100	2.88
#4	4.750	7.27	92.27	70	5.09
#7	2.800	8.48	85.81	70	5.94
#10	2.000	7.26	80.28	65	4.72
#14	1.400	10.30	72.43	65	6.70
#18	1.000	10.60	64.35	60	6.36
#25	0.710	9.11	57.41	50	4.56
#35	0.500	9.89	49.88	30	2.97
#45	0.355	11.81	40.88	20	2.36
#60	0.250	17.50	27.55	5	0.88
#80	0.180	23.36	9.75	1	0.23
#120	0.125	8.91	2.96	1	0.09
#170	0.090	1.27	2.00	1	0.01
#230	0.063	0.18	1.86	1	0.00

**Total Shell Content:** **33** %







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## VISUAL SHELL CONTENT

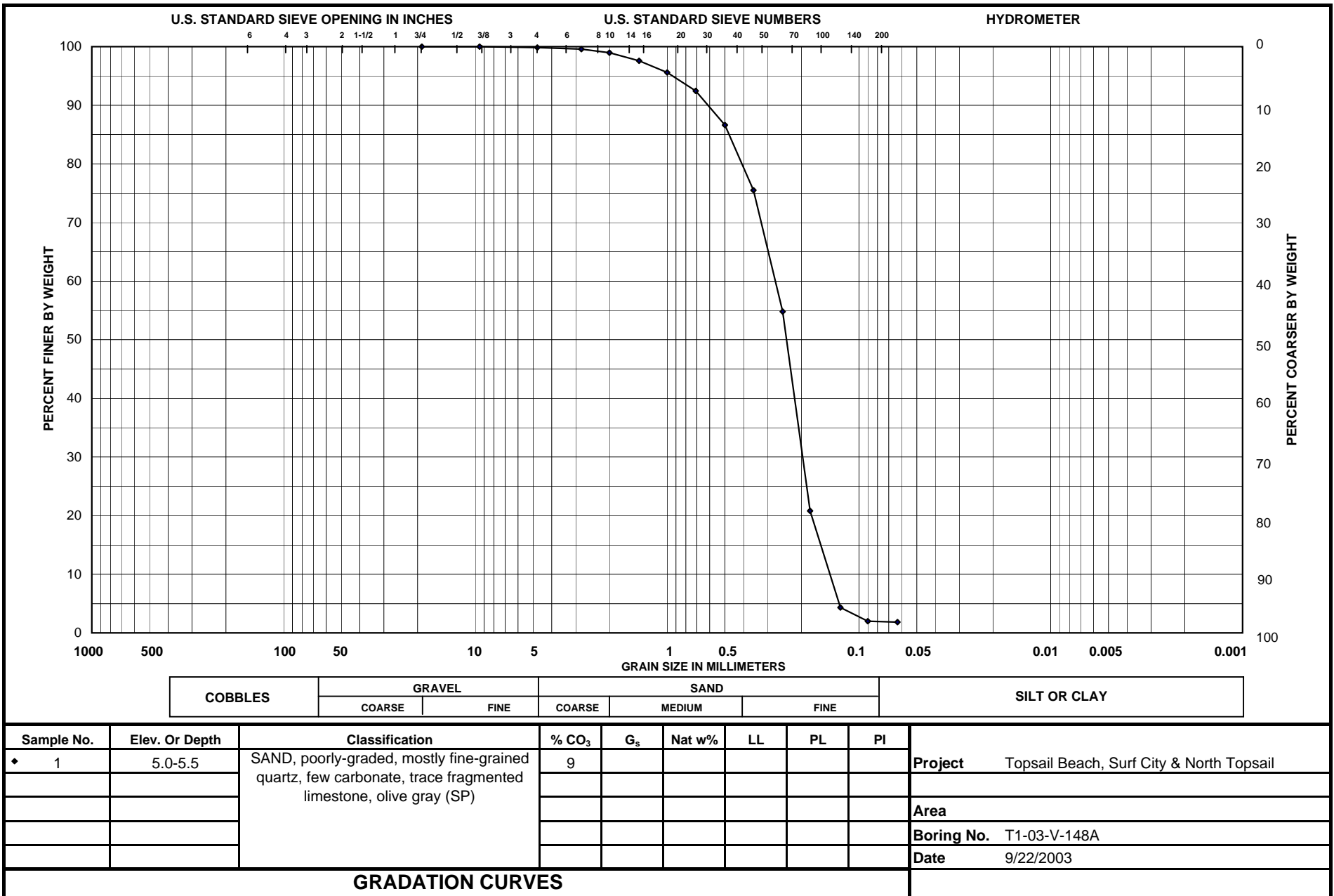
### GRAIN SIZE AND VISUAL SHELL CONTENT

Project:	<b>Topsail Beach, Surf City &amp; North Topsail</b>	Depth:	<b>5.0-5.5</b>
Project No.:	<b>1584-01-40</b>	Date:	<b>9/22/2003</b>
Boring No.:	<b>T1-03-V-148A</b>		
Sample No.:	<b>1</b>		
Description:	<b>SAND, poorly-graded, mostly fine-grained quartz, few carbonate, trace fragmented limestone, olive gray (SP)</b>		

Tare Weight, (g):	<b>49.76</b>	
Dry Wt. Before Washing (g):	<b>194.6</b>	(with tare)
Dry Weight After Washing (g):	<b>192.71</b>	(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	0.20	99.86	100	0.20
#7	2.800	0.43	99.57	100	0.43
#10	2.000	0.88	98.96	95	0.84
#14	1.400	2.00	97.58	85	1.70
#18	1.000	2.86	95.60	65	1.86
#25	0.710	4.55	92.46	40	1.82
#35	0.500	8.48	86.61	30	2.54
#45	0.355	16.06	75.52	10	1.61
#60	0.250	30.00	54.81	3	0.90
#80	0.180	49.21	20.83	1	0.49
#120	0.125	23.90	4.33	1	0.24
#170	0.090	3.41	1.97	1	0.03
#230	0.063	0.20	1.84	1	0.00

**Total Shell Content:** **9** %





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## VISUAL SHELL CONTENT

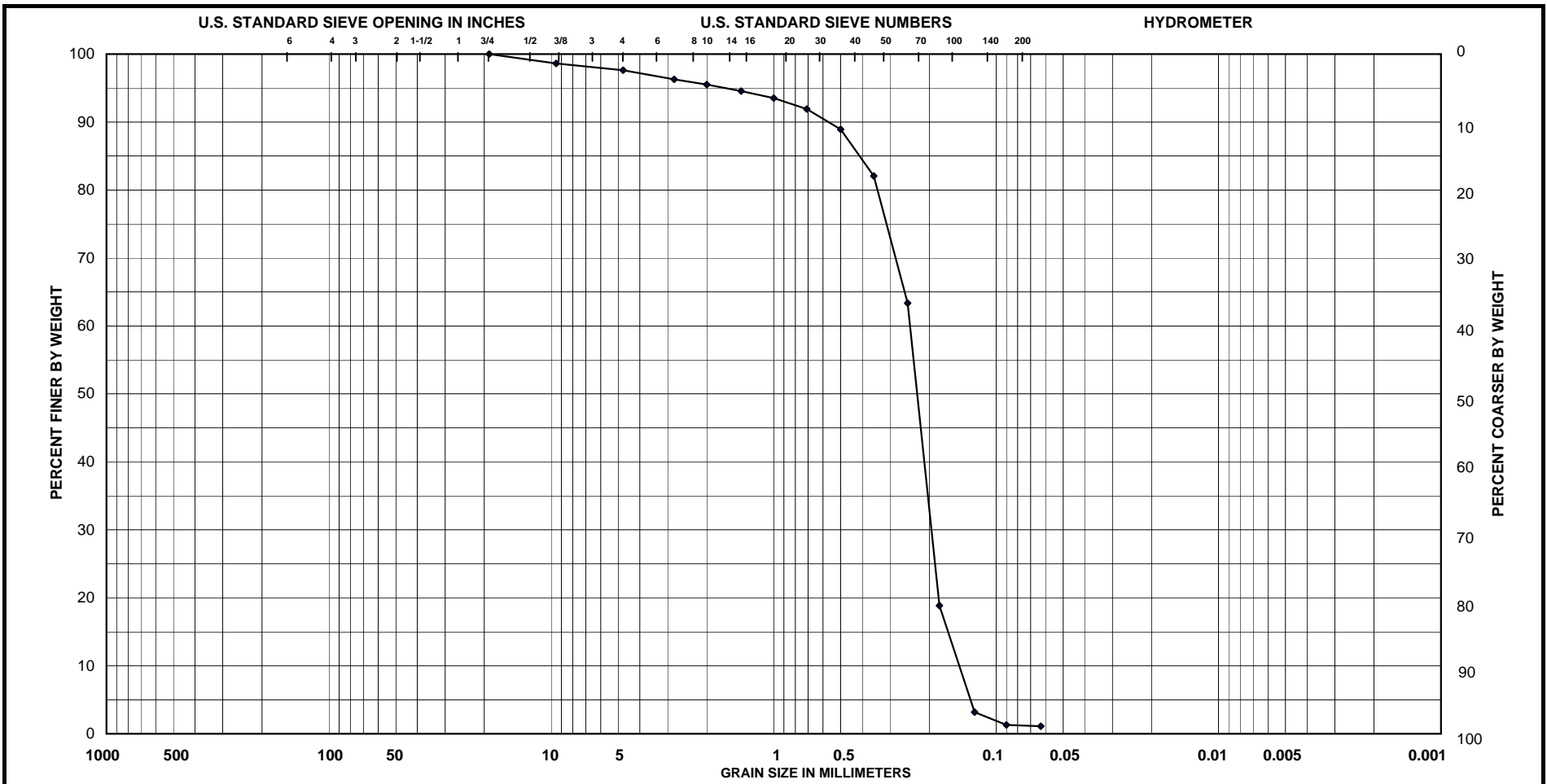
### GRAIN SIZE AND VISUAL SHELL CONTENT

Project:	<b>Topsail Beach, Surf City &amp; North Topsail</b>	Depth:	<b>7.0-7.5</b>
Project No.:	<b>1584-01-40</b>	Date:	<b>9/22/2003</b>
Boring No.:	<b>T1-03-V-148A</b>		
Sample No.:	<b>2</b>		
Description:	<b>SAND, poorly-graded, mostly fine-grained quartz, few carbonate, trace fragmented limestone, gray (SP)</b>		

Tare Weight, (g):	<b>50.41</b>	
Dry Wt. Before Washing (g):	<b>181.41</b>	(with tare)
Dry Weight After Washing (g):	<b>179.9</b>	(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	1.82	98.61	100	1.82
#4	4.750	1.30	97.62	100	1.30
#7	2.800	1.73	96.30	75	1.30
#10	2.000	1.00	95.53	65	0.65
#14	1.400	1.28	94.56	60	0.77
#18	1.000	1.34	93.53	45	0.60
#25	0.710	2.11	91.92	40	0.84
#35	0.500	3.92	88.93	30	1.18
#45	0.355	8.98	82.08	15	1.35
#60	0.250	24.52	63.36	5	1.23
#80	0.180	58.29	18.86	3	1.75
#120	0.125	20.52	3.20	1	0.21
#170	0.090	2.48	1.31	1	0.02
#230	0.063	0.24	1.12	1	0.00

**Total Shell Content:** **10** %



COBBLES	GRAVEL		SAND			SILT OR CLAY
	COARSE	FINE	COARSE	MEDIUM	FINE	

Sample No.	Elev. Or Depth	Classification	% CO <sub>3</sub>	G <sub>s</sub>	Nat w%	LL	PL	PI	Project
♦ 2	7.0-7.5	SAND, poorly-graded, mostly fine-grained quartz, few carbonate, trace fragmented limestone, gray (SP)	10						Topsail Beach, Surf City & North Topsail
									Area
									Boring No. T1-03-V-148A
									Date 9/22/2003

**GRADATION CURVES**



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## VISUAL SHELL CONTENT

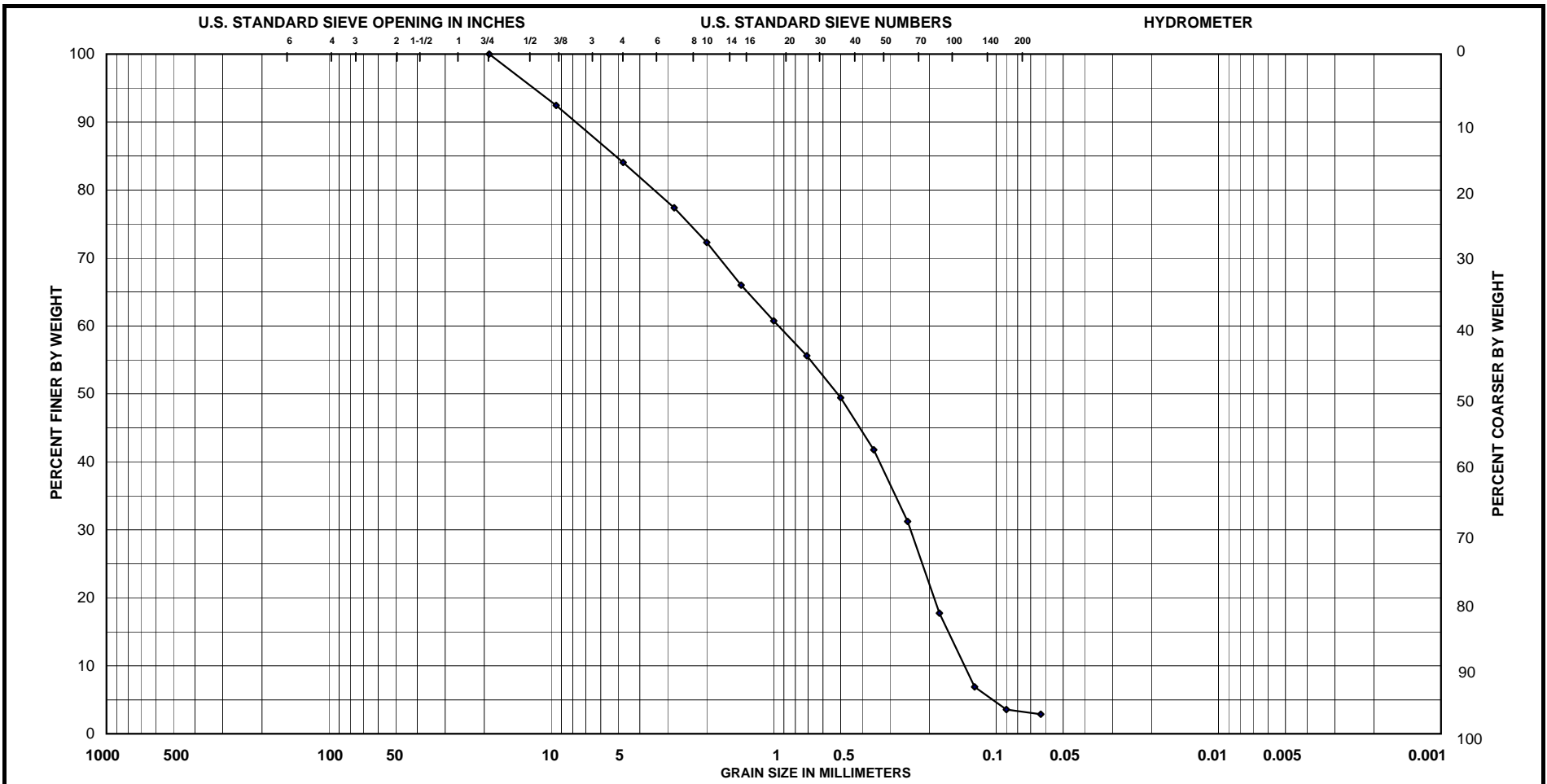
### GRAIN SIZE AND VISUAL SHELL CONTENT

Project:	<b>Topsail Beach, Surf City &amp; North Topsail</b>	Depth:	<b>7.0-7.5</b>
Project No.:	<b>1584-01-40</b>	Date:	<b>9/22/2003</b>
Boring No.:	<b>T1-03-V-149</b>		
Sample No.:	<b>1</b>		
Description:	<b>SAND, poorly-graded, mostly medium to fine-grained quartz, little fine gravel-size carbonate, little coarse to medium-grained carbonate, trace</b>		

Tare Weight, (g):	<b>49.85</b>	
Dry Wt. Before Washing (g):	<b>182.77</b>	(with tare)
Dry Weight After Washing (g):	<b>179.03</b>	(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	10.05	92.44	100	10.05
#4	4.750	11.15	84.05	95	10.59
#7	2.800	8.86	77.38	80	7.09
#10	2.000	6.75	72.31	76	5.13
#14	1.400	8.39	65.99	65	5.45
#18	1.000	6.98	60.74	50	3.49
#25	0.710	6.84	55.60	50	3.42
#35	0.500	8.16	49.46	25	2.04
#45	0.355	10.21	41.78	10	1.02
#60	0.250	14.00	31.24	5	0.70
#80	0.180	17.96	17.73	3	0.54
#120	0.125	14.42	6.88	1	0.14
#170	0.090	4.40	3.57	1	0.04
#230	0.063	0.92	2.88	1	0.01

**Total Shell Content:** **37** %



COBBLES	GRAVEL		SAND			SILT OR CLAY
	COARSE	FINE	COARSE	MEDIUM	FINE	

Sample No.	Elev. Or Depth	Classification	% CO <sub>3</sub>	G <sub>s</sub>	Nat w%	LL	PL	PI	Project	
♦ 1	7.0-7.5	SAND, poorly-graded, mostly medium to fine-grained quartz, little fine gravel-size carbonate, little coarse to medium-grained carbonate, trace fragmented limestone, olive gray (SP)	37						Topsail Beach, Surf City & North Topsail	
									Area	
									Boring No. T1-03-V-149	
									Date 9/22/2003	

**GRADATION CURVES**



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## VISUAL SHELL CONTENT

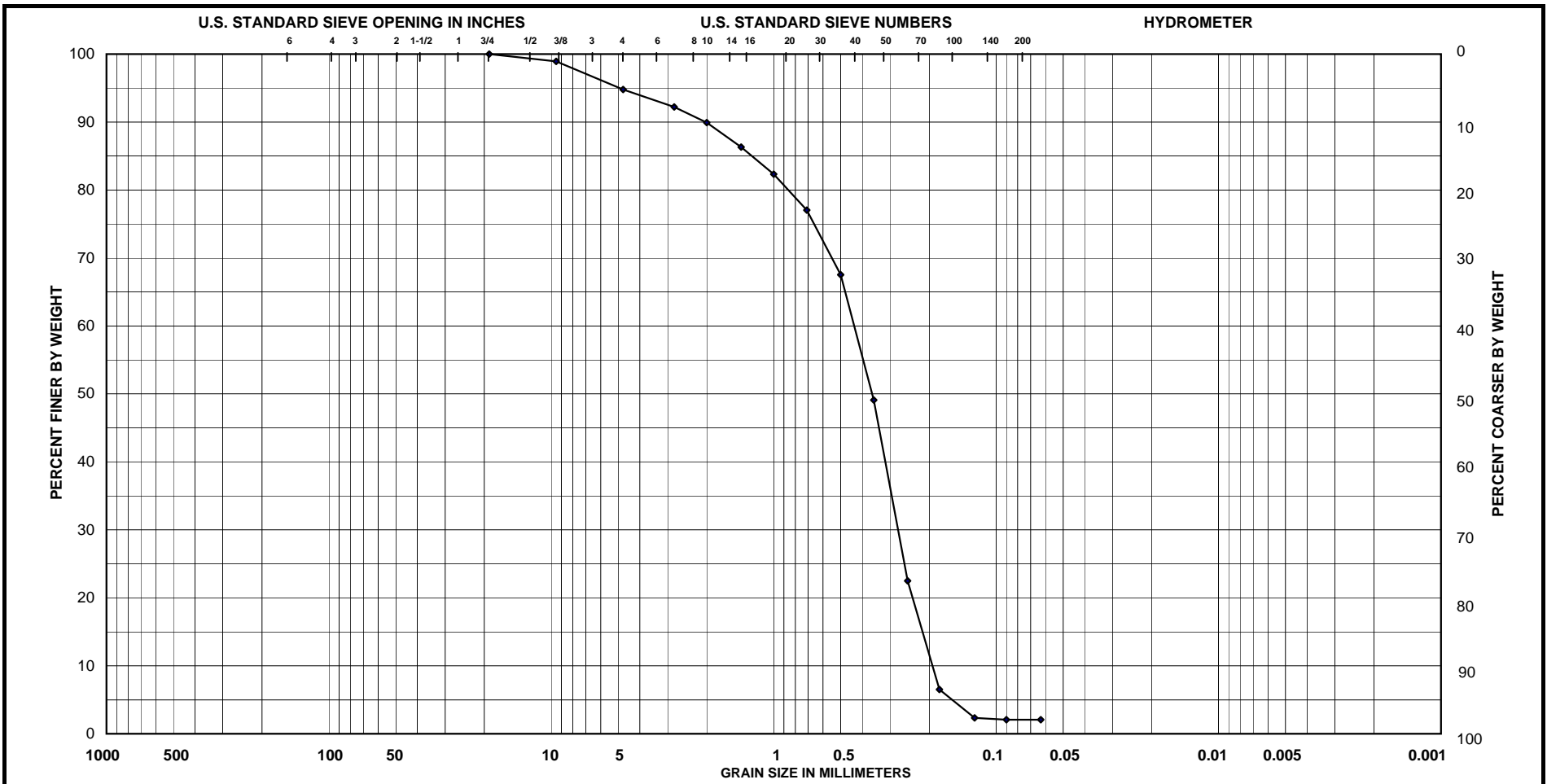
### GRAIN SIZE AND VISUAL SHELL CONTENT

Project:	<b>Topsail Beach, Surf City &amp; North Topsail</b>	Depth:	<b>9.5-10.0</b>
Project No.:	<b>1584-01-40</b>	Date:	<b>9/22/2003</b>
Boring No.:	<b>T1-03-V-149</b>		
Sample No.:	<b>2</b>		
Description:	<b>SAND, poorly-graded, mostly medium to fine-grained quartz, little coarse to medium-grained carbonate, few fine gravel-size carbonate,</b>		

Tare Weight, (g):	<b>50.92</b>	
Dry Wt. Before Washing (g):	<b>192.14</b>	(with tare)
Dry Weight After Washing (g):	<b>190.96</b>	(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	1.50	98.94	100	1.50
#4	4.750	5.86	94.79	100	5.86
#7	2.800	3.62	92.22	80	2.90
#10	2.000	3.28	89.90	70	2.30
#14	1.400	5.08	86.31	65	3.30
#18	1.000	5.60	82.34	65	3.64
#25	0.710	7.48	77.04	60	4.49
#35	0.500	13.43	67.53	35	4.70
#45	0.355	26.01	49.11	10	2.60
#60	0.250	37.58	22.50	5	1.88
#80	0.180	22.58	6.51	3	0.68
#120	0.125	5.89	2.34	1	0.06
#170	0.090	0.37	2.08	1	0.00
#230	0.063	0.03	2.06	1	0.00

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



COBBLES	GRAVEL		SAND			SILT OR CLAY
	COARSE	FINE	COARSE	MEDIUM	FINE	

Sample No.	Elev. Or Depth	Classification	% CO <sub>3</sub>	G <sub>s</sub>	Nat w%	LL	PL	PI	Project	
♦ 2	9.5-10.0	SAND, poorly-graded, mostly medium to fine-grained quartz, little coarse to medium-grained carbonate, few fine gravel-size carbonate, trace fragmented limestone, gray (SP)	24						Topsail Beach, Surf City & North Topsail	
									Area	
									Boring No. T1-03-V-149	
									Date 9/22/2003	

**GRADATION CURVES**





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## VISUAL SHELL CONTENT

### GRAIN SIZE AND VISUAL SHELL CONTENT

Project:	<b>Topsail Beach, Surf City &amp; North Topsail</b>	Depth:	<b>3.1-3.6</b>
Project No.:	<b>1584-01-40</b>	Date:	<b>9/22/2003</b>
Boring No.:	<b>T1-03-V-150</b>		
Sample No.:	<b>1</b>		
Description:	<b>SAND, poorly-graded, mostly fine-grained quartz, few carbonate, trace fragmented limestone, gray (SP)</b>		

Tare Weight, (g):	<b>50.77</b>	
Dry Wt. Before Washing (g):	<b>169.29</b>	(with tare)
Dry Weight After Washing (g):	<b>167.48</b>	(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	0.14	99.88	100	0.14
#10	2.000	0.24	99.68	100	0.24
#14	1.400	0.41	99.33	80	0.33
#18	1.000	0.49	98.92	65	0.32
#25	0.710	0.54	98.46	60	0.32
#35	0.500	0.88	97.72	30	0.26
#45	0.355	2.67	95.47	20	0.53
#60	0.250	16.16	81.83	5	0.81
#80	0.180	73.55	19.78	3	2.21
#120	0.125	18.32	4.32	1	0.18
#170	0.090	3.05	1.75	1	0.03
#230	0.063	0.36	1.44	1	0.00

**Total Shell Content:** **5** %





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## VISUAL SHELL CONTENT

### GRAIN SIZE AND VISUAL SHELL CONTENT

<b>Project:</b>	<b>Topsail Beach, Surf City &amp; North Topsail</b>	<b>Depth:</b>	<b>5.0-5.5</b>
<b>Project No.:</b>	<b>1584-01-40</b>	<b>Date:</b>	<b>9/22/2003</b>
<b>Boring No.:</b>	<b>T1-03-V-150</b>		
<b>Sample No.:</b>	<b>2</b>		
<b>Description:</b>	<b>SAND, poorly-graded, mostly fine-grained quartz, trace carbonate, trace fragmented limestone, gray (SP)</b>		

Tare Weight, (g):	48.82	
Dry Wt. Before Washing (g):	170.47	(with tare)
Dry Weight After Washing (g):	168.23	(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	0.00	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	0.00	100.00	0	0.00
#14	1.400	0.01	99.99	60	0.01
#18	1.000	0.02	99.98	40	0.01
#25	0.710	0.06	99.93	40	0.02
#35	0.500	0.11	99.84	30	0.03
#45	0.355	0.35	99.55	10	0.04
#60	0.250	2.07	97.85	3	0.06
#80	0.180	69.07	41.07	1	0.69
#120	0.125	41.06	7.32	1	0.41
#170	0.090	6.56	1.92	1	0.07
#230	0.063	0.88	1.20	1	0.01

**Total Shell Content:** 1 %





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## VISUAL SHELL CONTENT

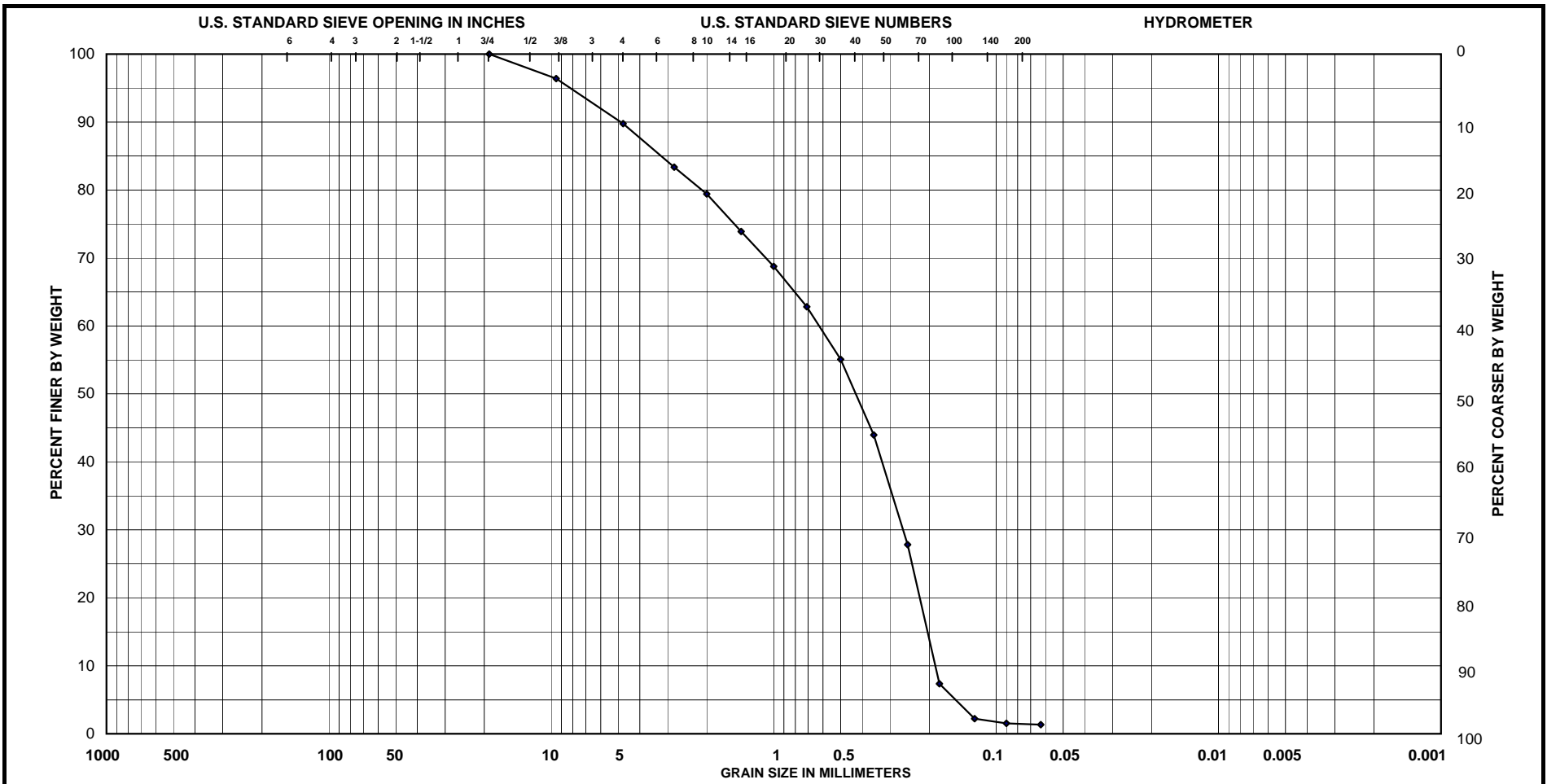
### GRAIN SIZE AND VISUAL SHELL CONTENT

Project:	<b>Topsail Beach, Surf City &amp; North Topsail</b>	Depth:	<b>7.0-7.5</b>
Project No.:	<b>1584-01-40</b>	Date:	<b>9/22/2003</b>
Boring No.:	<b>T1-03-V-150</b>		
Sample No.:	<b>3</b>		
Description:	<b>SAND, poorly-graded, mostly medium to fine-grained quartz, little coarse to medium-grained carbonate, few fine gravel-size carbonate,</b>		

Tare Weight, (g):	<b>50.23</b>	
Dry Wt. Before Washing (g):	<b>184.74</b>	(with tare)
Dry Weight After Washing (g):	<b>183.38</b>	(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	4.87	96.38	100	4.87
#4	4.750	8.90	89.76	90	8.01
#7	2.800	8.59	83.38	70	6.01
#10	2.000	5.34	79.41	55	2.94
#14	1.400	7.43	73.88	45	3.34
#18	1.000	6.88	68.77	40	2.75
#25	0.710	8.01	62.81	40	3.20
#35	0.500	10.42	55.07	30	3.13
#45	0.355	14.93	43.97	15	2.24
#60	0.250	21.73	27.81	5	1.09
#80	0.180	27.50	7.37	3	0.83
#120	0.125	6.93	2.22	1	0.07
#170	0.090	0.92	1.53	1	0.01
#230	0.063	0.26	1.34	1	0.00

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



<b>COBBLES</b>	<b>GRAVEL</b>		<b>SAND</b>			<b>SILT OR CLAY</b>
	COARSE	FINE	COARSE	MEDIUM	FINE	

Sample No.	Elev. Or Depth	Classification	% CO <sub>3</sub>	G <sub>s</sub>	Nat w%	LL	PL	PI			
♦ 3	7.0-7.5	SAND, poorly-graded, mostly medium to fine-grained quartz, little coarse to medium-grained carbonate, few fine gravel-size carbonate, few fragmented limestone, light olive gray (SP)	29						<b>Project</b>	Topsail Beach, Surf City & North Topsail	
			<b>Area</b>								
			<b>Boring No.</b>	T1-03-V-150							
			<b>Date</b>	9/22/2003							

**GRADATION CURVES**



# WOLF TECHNOLOGIES, INC.

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## VISUAL SHELL CONTENT

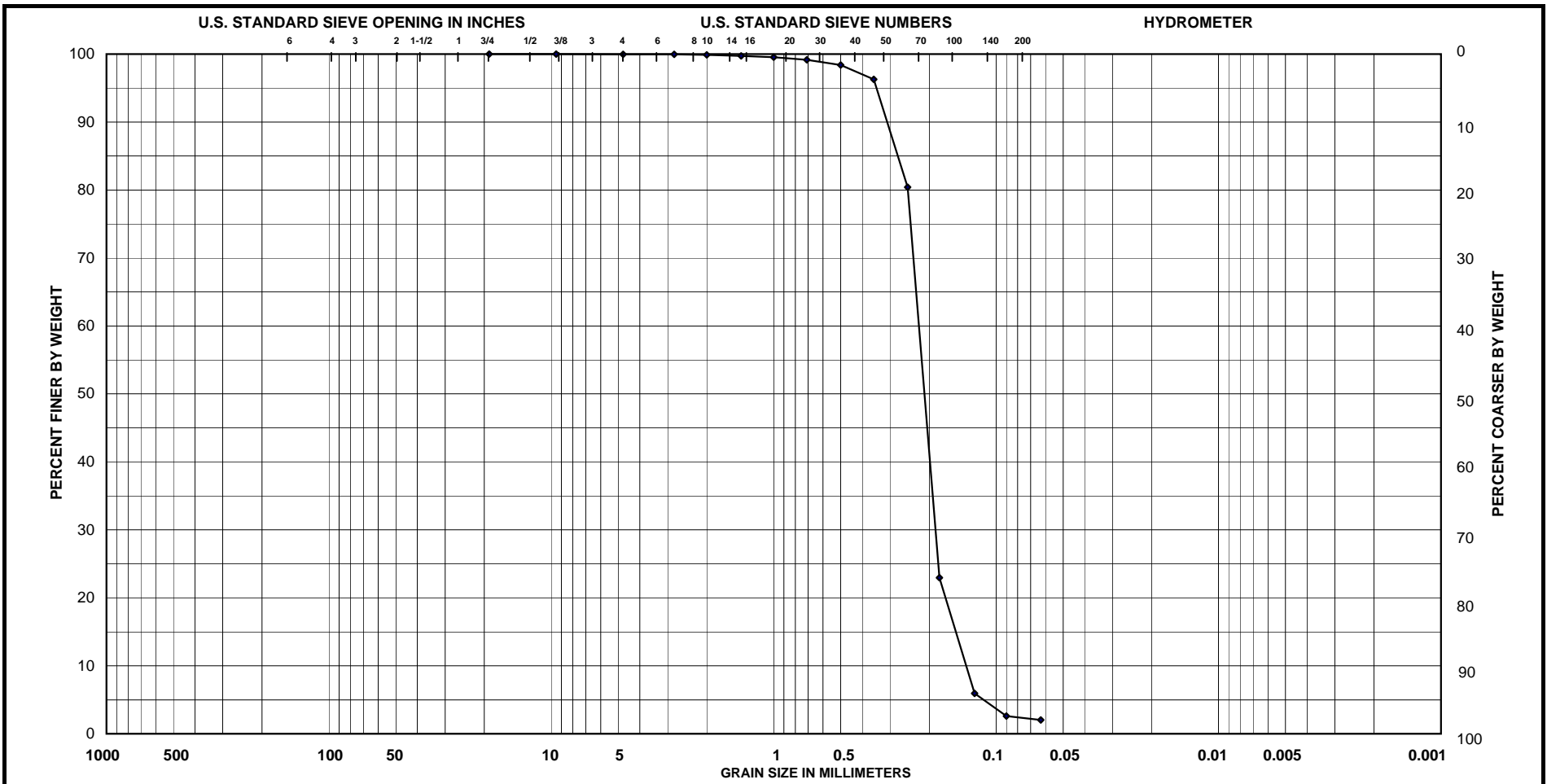
### GRAIN SIZE AND VISUAL SHELL CONTENT

Project:	<b>Topsail Beach, Surf City &amp; North Topsail</b>	Depth:	<b>3.1-3.6</b>
Project No.:	<b>1584-01-40</b>	Date:	<b>9/22/2003</b>
Boring No.:	<b>T1-03-V-150A</b>		
Sample No.:	<b>1</b>		
Description:	<b>SAND, poorly-graded, mostly fine-grained quartz, trace carbonate, trace fragmented limestone, dark gray (SP)</b>		

Tare Weight, (g):	<b>50.09</b>	
Dry Wt. Before Washing (g):	<b>175.35</b>	(with tare)
Dry Weight After Washing (g):	<b>173.41</b>	(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	0.03	99.98	100	0.03
#7	2.800	0.04	99.94	100	0.04
#10	2.000	0.06	99.90	100	0.06
#14	1.400	0.19	99.74	70	0.13
#18	1.000	0.28	99.52	55	0.15
#25	0.710	0.47	99.15	50	0.24
#35	0.500	0.97	98.37	30	0.29
#45	0.355	2.60	96.30	15	0.39
#60	0.250	19.91	80.40	5	1.00
#80	0.180	71.95	22.96	1	0.72
#120	0.125	21.34	5.92	1	0.21
#170	0.090	4.14	2.62	1	0.04
#230	0.063	0.73	2.04	1	0.01

**Total Shell Content:** **3** %



COBBLES	GRAVEL		SAND			SILT OR CLAY
	COARSE	FINE	COARSE	MEDIUM	FINE	

Sample No.	Elev. Or Depth	Classification	% CO <sub>3</sub>	G <sub>s</sub>	Nat w%	LL	PL	PI	Project	
♦ 1	3.1-3.6	SAND, poorly-graded, mostly fine-grained quartz, trace carbonate, trace fragmented limestone, dark gray (SP)	3						Topsail Beach, Surf City & North Topsail	
									Area	
									Boring No. T1-03-V-150A	
									Date 9/22/2003	

**GRADATION CURVES**





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## VISUAL SHELL CONTENT

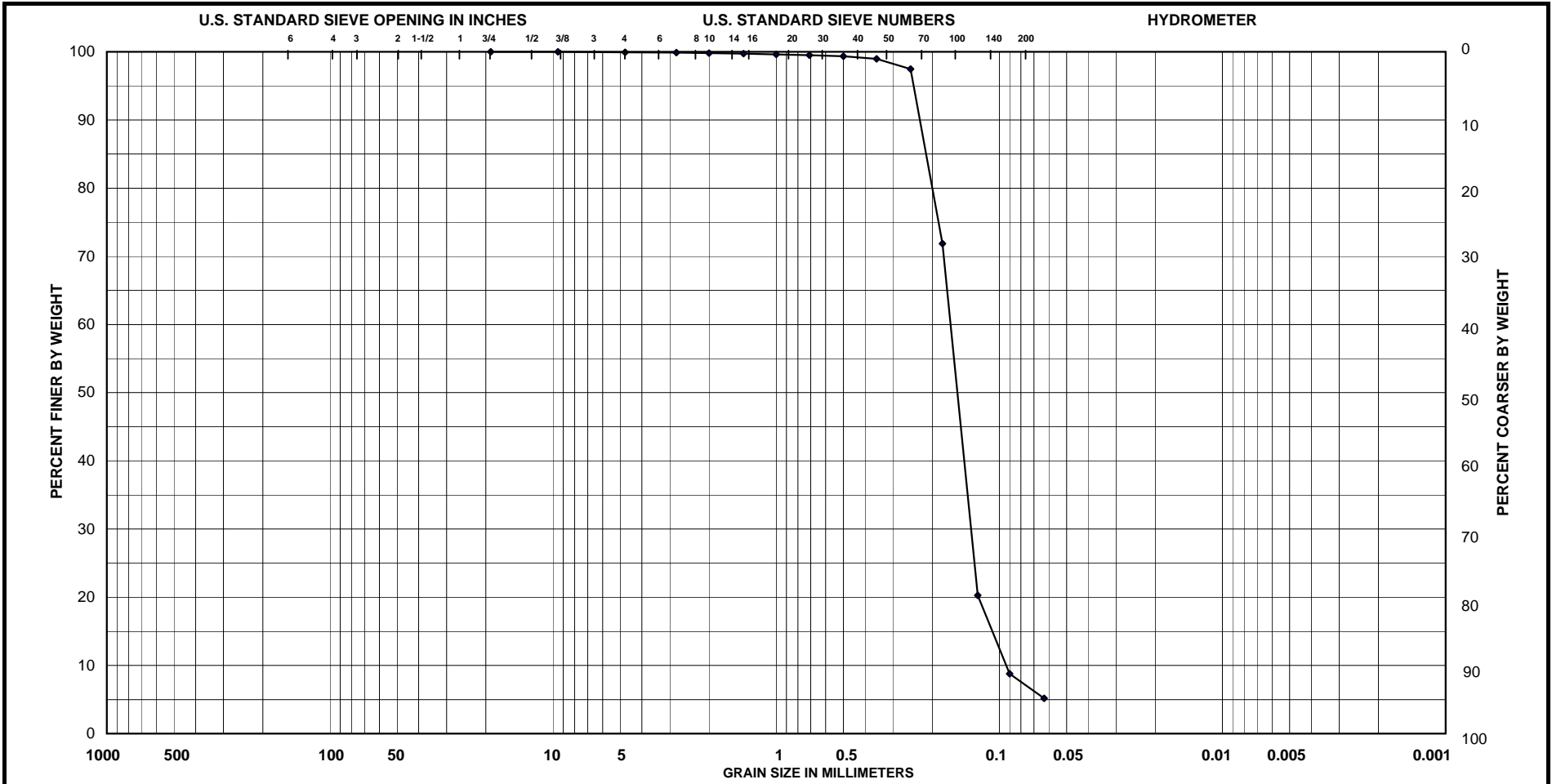
### GRAIN SIZE AND VISUAL SHELL CONTENT

Project:	<b>Topsail Beach, Surf City &amp; North Topsail</b>	Depth:	<b>2.4-2.9</b>
Project No.:	<b>1584-01-40</b>	Date:	<b>9/22/2003</b>
Boring No.:	<b>T1-03-V-151</b>		
Sample No.:	<b>1</b>		
Description:	<b>SAND, poorly-graded, mostly fine-grained quartz, trace carbonate, dark greenish gray (SP)</b>		

Tare Weight, (g):	<b>49.73</b>	
Dry Wt. Before Washing (g):	<b>175.54</b>	(with tare)
Dry Weight After Washing (g):	<b>169.17</b>	(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	0.10	99.92	100	0.10
#7	2.800	0.04	99.89	100	0.04
#10	2.000	0.10	99.81	100	0.10
#14	1.400	0.08	99.75	100	0.08
#18	1.000	0.14	99.63	80	0.11
#25	0.710	0.15	99.52	80	0.12
#35	0.500	0.21	99.35	80	0.17
#45	0.355	0.50	98.95	40	0.20
#60	0.250	1.88	97.46	10	0.19
#80	0.180	32.18	71.88	3	0.97
#120	0.125	64.94	20.26	1	0.65
#170	0.090	14.43	8.79	1	0.14
#230	0.063	4.54	5.18	1	0.05

**Total Shell Content:** **2** %



COBBLES	GRAVEL		SAND			SILT OR CLAY
	COARSE	FINE	COARSE	MEDIUM	FINE	

Sample No.	Elev. Or Depth	Classification	% CO <sub>3</sub>	G <sub>s</sub>	Nat w%	LL	PL	PI	Project	
♦ 1	2.4-2.9	SAND, poorly-graded, mostly fine-grained quartz, trace carbonate, dark greenish gray (SP)	2						Topsail Beach, Surf City & North Topsail	
									Area	
									Boring No. T1-03-V-151	
									Date 9/22/2003	

**GRADATION CURVES**



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## VISUAL SHELL CONTENT

### GRAIN SIZE AND VISUAL SHELL CONTENT

Project:	<b>Topsail Beach, Surf City &amp; North Topsail</b>	Depth:	<b>5.0-5.5</b>
Project No.:	<b>1584-01-40</b>	Date:	<b>9/22/2003</b>
Boring No.:	<b>T1-03-V-151</b>		
Sample No.:	<b>2</b>		
Description:	<b>SAND, poorly-graded, mostly fine-grained quartz, trace carbonate, dark gray (SP)</b>		

Tare Weight, (g):	<b>48.42</b>	
Dry Wt. Before Washing (g):	<b>170.83</b>	(with tare)
Dry Weight After Washing (g):	<b>166.93</b>	(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	0.09	99.93	100	0.09
#10	2.000	0.02	99.91	100	0.02
#14	1.400	0.13	99.80	100	0.13
#18	1.000	0.17	99.67	60	0.10
#25	0.710	0.32	99.40	60	0.19
#35	0.500	0.64	98.88	25	0.16
#45	0.355	1.38	97.75	10	0.14
#60	0.250	3.59	94.82	5	0.18
#80	0.180	44.61	58.38	3	1.34
#120	0.125	56.26	12.42	1	0.56
#170	0.090	10.10	4.17	1	0.10
#230	0.063	1.38	3.04	1	0.01

**Total Shell Content:** **2** %





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## VISUAL SHELL CONTENT

### GRAIN SIZE AND VISUAL SHELL CONTENT

Project:	<b>Topsail Beach, Surf City &amp; North Topsail</b>	Depth:	<b>7.0-7.5</b>
Project No.:	<b>1584-01-40</b>	Date:	<b>9/22/2003</b>
Boring No.:	<b>T1-03-V-151</b>		
Sample No.:	<b>3</b>		
Description:	<b>SAND, poorly-graded, mostly fine-grained quartz, trace carbonate, gray (SP)</b>		

Tare Weight, (g):	<b>50.82</b>	
Dry Wt. Before Washing (g):	<b>170.05</b>	(with tare)
Dry Weight After Washing (g):	<b>165.07</b>	(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	0.08	99.92	100	0.08
#14	1.400	0.16	99.79	90	0.14
#18	1.000	0.24	99.59	80	0.19
#25	0.710	0.35	99.30	60	0.21
#35	0.500	1.07	98.40	25	0.27
#45	0.355	2.97	95.91	10	0.30
#60	0.250	8.27	88.97	5	0.41
#80	0.180	30.91	63.05	3	0.93
#120	0.125	54.74	17.13	1	0.55
#170	0.090	12.73	6.46	1	0.13
#230	0.063	2.31	4.52	1	0.02

**Total Shell Content:** **3** %





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## VISUAL SHELL CONTENT

### GRAIN SIZE AND VISUAL SHELL CONTENT

Project:	<b>Topsail Beach, Surf City &amp; North Topsail</b>	Depth:	<b>8.3-8.8</b>
Project No.:	<b>1584-01-40</b>	Date:	<b>9/22/2003</b>
Boring No.:	<b>T1-03-V-151A</b>		
Sample No.:	<b>3</b>		
Description:	<b>SAND, silty, mostly fine-grained quartz, few carbonate, trace fragmented limestone, dark greenish gray (SM)</b>		

Tare Weight, (g):	<b>50.25</b>	
Dry Wt. Before Washing (g):	<b>170.41</b>	(with tare)
Dry Weight After Washing (g):	<b>150.88</b>	(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	5.98	95.02	100	5.98
#4	4.750	1.01	94.18	100	1.01
#7	2.800	0.78	93.53	100	0.78
#10	2.000	0.31	93.28	80	0.25
#14	1.400	0.60	92.78	65	0.39
#18	1.000	0.50	92.36	45	0.23
#25	0.710	0.45	91.99	35	0.16
#35	0.500	0.40	91.65	30	0.12
#45	0.355	0.53	91.21	20	0.11
#60	0.250	1.26	90.16	10	0.13
#80	0.180	12.01	80.17	3	0.36
#120	0.125	59.62	30.55	1	0.60
#170	0.090	12.97	19.76	1	0.13
#230	0.063	3.66	16.71	1	0.04

**Total Shell Content:** **9** %







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## VISUAL SHELL CONTENT

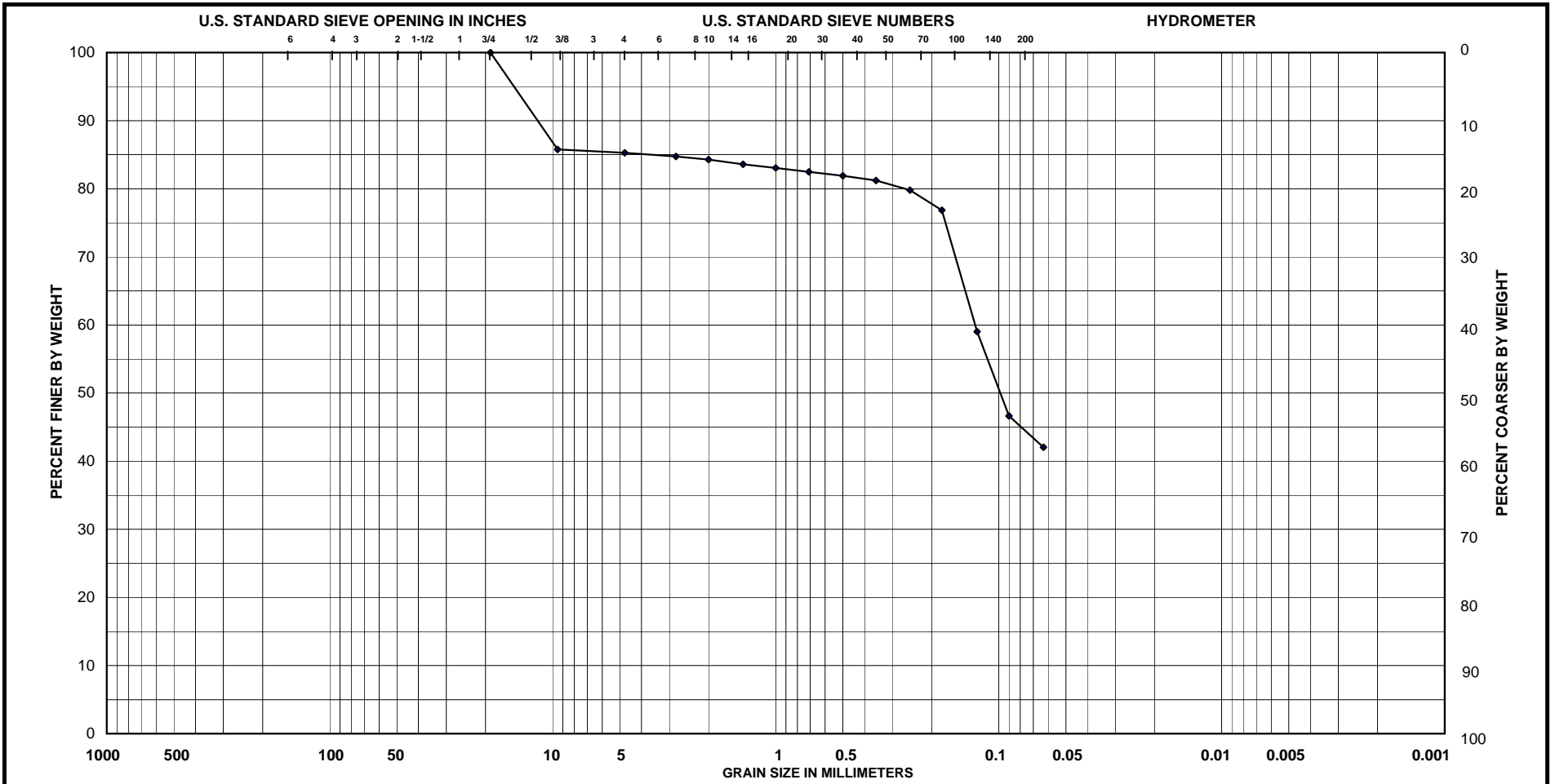
### GRAIN SIZE AND VISUAL SHELL CONTENT

<b>Project:</b>	<b>Topsail Beach, Surf City &amp; North Topsail</b>	<b>Depth:</b>	<b>6.0-6.5</b>
<b>Project No.:</b>	<b>1584-01-40</b>	<b>Date:</b>	<b>9/22/2003</b>
<b>Boring No.:</b>	<b>T1-03-V-151A</b>		
<b>Sample No.:</b>	<b>2</b>		
<b>Description:</b>	<b>SAND, silty, some fine-grained quartz, some silt, little fine gravel-size carbonate, few coarse to medium-grained carbonate, dark greenish</b>		

Tare Weight, (g):	50.67	
Dry Wt. Before Washing (g):	146.75	(with tare)
Dry Weight After Washing (g):	106.93	(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	13.66	85.78	100	13.66
#4	4.750	0.49	85.27	100	0.49
#7	2.800	0.51	84.74	100	0.51
#10	2.000	0.45	84.27	100	0.45
#14	1.400	0.65	83.60	100	0.65
#18	1.000	0.53	83.05	95	0.50
#25	0.710	0.53	82.49	95	0.50
#35	0.500	0.56	81.91	90	0.50
#45	0.355	0.65	81.23	60	0.39
#60	0.250	1.37	79.81	25	0.34
#80	0.180	2.83	76.86	10	0.28
#120	0.125	17.12	59.04	3	0.51
#170	0.090	11.90	46.66	1	0.12
#230	0.063	4.44	42.04	1	0.04

**Total Shell Content:** 20 %



COBBLES	GRAVEL		SAND			SILT OR CLAY
	COARSE	FINE	COARSE	MEDIUM	FINE	

Sample No.	Elev. Or Depth	Classification	% CO <sub>3</sub>	G <sub>s</sub>	Nat w%	LL	PL	PI	Project	
♦ 2	6.0-6.5	SAND, silty, some fine-grained quartz, some silt, little fine gravel-size carbonate, few coarse to medium-grained carbonate, dark greenish gray (SM)	20						Topsail Beach, Surf City & North Topsail	
			Area							
			Boring No. T1-03-V-151A							
			Date 9/22/2003							

**GRADATION CURVES**



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## VISUAL SHELL CONTENT

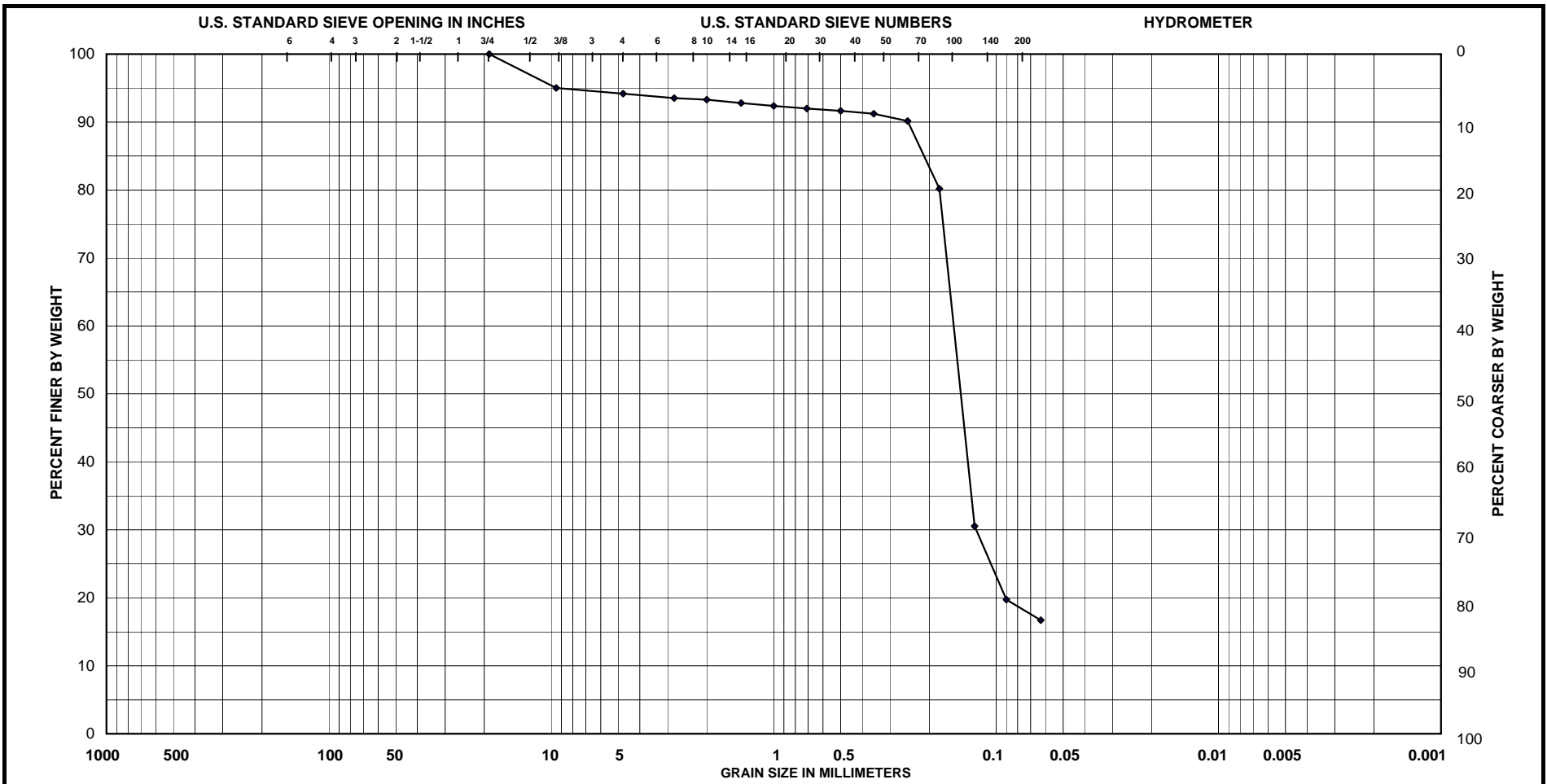
### GRAIN SIZE AND VISUAL SHELL CONTENT

Project:	<b>Topsail Beach, Surf City &amp; North Topsail</b>	Depth:	<b>4.5-5.0</b>
Project No.:	<b>1584-01-40</b>	Date:	<b>9/22/2003</b>
Boring No.:	<b>T1-03-V-151A</b>		
Sample No.:	<b>1</b>		
Description:	<b>SAND, poorly-graded, mostly fine-grained quartz, trace carbonate, trace fragmented limestone, olive gray (SP)</b>		

Tare Weight, (g):	<b>49.83</b>	
Dry Wt. Before Washing (g):	<b>174.48</b>	(with tare)
Dry Weight After Washing (g):	<b>172.27</b>	(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	0.05	99.96	100	0.05
#7	2.800	0.10	99.88	100	0.10
#10	2.000	0.15	99.76	100	0.15
#14	1.400	0.24	99.57	85	0.20
#18	1.000	0.25	99.37	80	0.20
#25	0.710	0.24	99.17	65	0.16
#35	0.500	0.63	98.67	35	0.22
#45	0.355	1.95	97.10	20	0.39
#60	0.250	6.93	91.54	5	0.35
#80	0.180	43.42	56.71	3	1.30
#120	0.125	54.75	12.79	1	0.55
#170	0.090	10.46	4.40	1	0.10
#230	0.063	2.68	2.25	1	0.03

**Total Shell Content:** **3** %



COBBLES	GRAVEL		SAND			SILT OR CLAY
	COARSE	FINE	COARSE	MEDIUM	FINE	

Sample No.	Elev. Or Depth	Classification	% CO <sub>3</sub>	G <sub>s</sub>	Nat w%	LL	PL	PI	Project
3	8.3-8.8	SAND, silty, mostly fine-grained quartz, few carbonate, trace fragmented limestone, dark greenish gray (SM)	9						Topsail Beach, Surf City & North Topsail
									Area
									Boring No. T1-03-V-151A
									Date 9/22/2003

**GRADATION CURVES**



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## VISUAL SHELL CONTENT

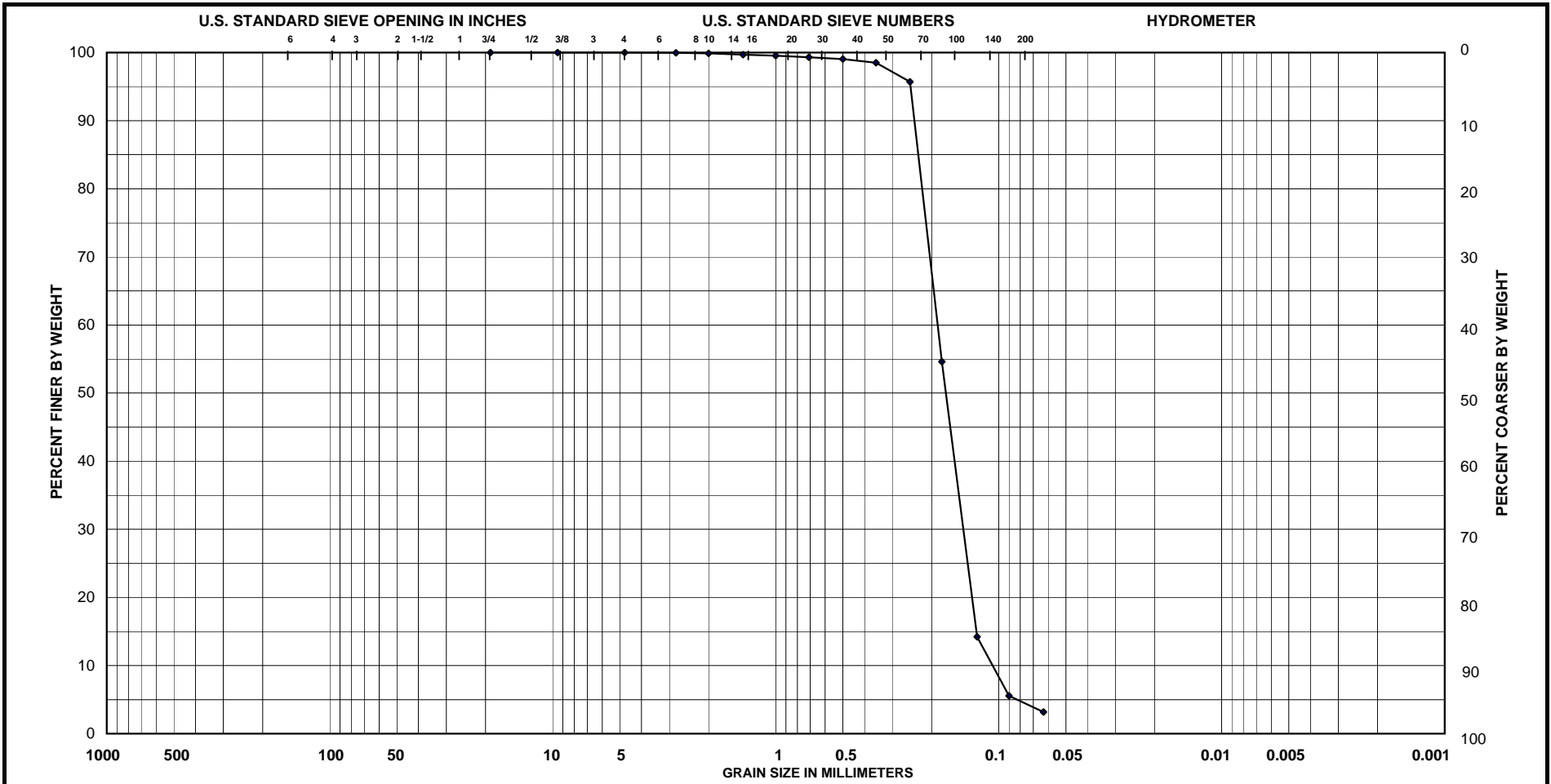
### GRAIN SIZE AND VISUAL SHELL CONTENT

Project:	<b>Topsail Beach, Surf City &amp; North Topsail</b>	Depth:	<b>3.9-4.4</b>
Project No.:	<b>1584-01-40</b>	Date:	<b>9/22/2003</b>
Boring No.:	<b>T1-03-V-152</b>		
Sample No.:	<b>1</b>		
Description:	<b>SAND, poorly-graded, mostly fine-grained quartz, trace carbonate, dark gray (SP)</b>		

Tare Weight, (g):	<b>50.59</b>	
Dry Wt. Before Washing (g):	<b>171.36</b>	(with tare)
Dry Weight After Washing (g):	<b>167.79</b>	(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	0.02	99.97	100	0.02
#10	2.000	0.09	99.89	100	0.09
#14	1.400	0.25	99.69	80	0.20
#18	1.000	0.19	99.53	60	0.11
#25	0.710	0.25	99.32	40	0.10
#35	0.500	0.33	99.05	30	0.10
#45	0.355	0.66	98.50	25	0.17
#60	0.250	3.38	95.70	5	0.17
#80	0.180	49.60	54.63	3	1.49
#120	0.125	48.80	14.23	1	0.49
#170	0.090	10.48	5.55	1	0.10
#230	0.063	2.87	3.17	1	0.03

**Total Shell Content:** **3** %



COBBLES	GRAVEL		SAND			SILT OR CLAY
	COARSE	FINE	COARSE	MEDIUM	FINE	

Sample No.	Elev. Or Depth	Classification	% CO <sub>3</sub>	G <sub>s</sub>	Nat w%	LL	PL	PI	
♦ 1	3.9-4.4	SAND, poorly-graded, mostly fine-grained quartz, trace carbonate, dark gray (SP)	3						<b>Project</b> Topsail Beach, Surf City & North Topsail
									<b>Area</b>
									<b>Boring No.</b> T1-03-V-152
									<b>Date</b> 9/22/2003

**GRADATION CURVES**



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## VISUAL SHELL CONTENT

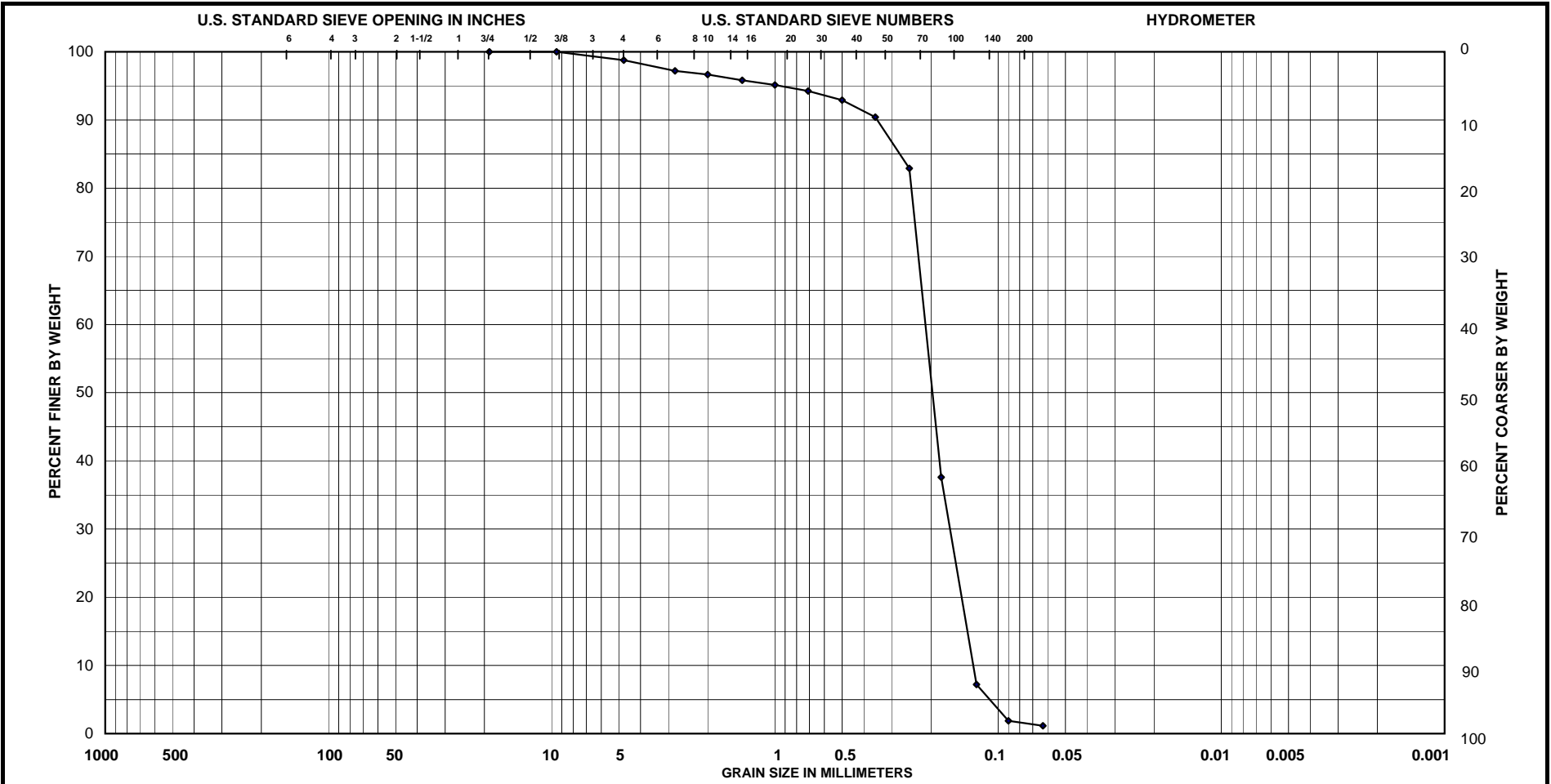
### GRAIN SIZE AND VISUAL SHELL CONTENT

Project:	<b>Topsail Beach, Surf City &amp; North Topsail</b>	Depth:	<b>5.5-6.0</b>
Project No.:	<b>1584-01-40</b>	Date:	<b>9/22/2003</b>
Boring No.:	<b>T1-03-V-152</b>		
Sample No.:	<b>2</b>		
Description:	<b>SAND, poorly-graded, mostly fine-grained quartz, few carbonate, dark gray (SP)</b>		

Tare Weight, (g):	<b>50.82</b>	
Dry Wt. Before Washing (g):	<b>177.99</b>	(with tare)
Dry Weight After Washing (g):	<b>175.11</b>	(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	1.54	98.79	100	1.54
#7	2.800	2.03	97.19	100	2.03
#10	2.000	0.65	96.68	100	0.65
#14	1.400	1.07	95.84	90	0.96
#18	1.000	0.91	95.12	80	0.73
#25	0.710	1.11	94.25	70	0.78
#35	0.500	1.73	92.89	40	0.69
#45	0.355	3.17	90.40	10	0.32
#60	0.250	9.52	82.91	5	0.48
#80	0.180	57.62	37.60	1	0.58
#120	0.125	38.66	7.20	1	0.39
#170	0.090	6.78	1.87	1	0.07
#230	0.063	0.92	1.15	1	0.01

**Total Shell Content:** **7** %



COBBLES	GRAVEL		SAND			SILT OR CLAY
	COARSE	FINE	COARSE	MEDIUM	FINE	

Sample No.	Elev. Or Depth	Classification	% CO <sub>3</sub>	G <sub>s</sub>	Nat w%	LL	PL	PI	Project
♦ 2	5.5-6.0	SAND, poorly-graded, mostly fine-grained quartz, few carbonate, dark gray (SP)	7						Topsail Beach, Surf City & North Topsail
									Area
									Boring No. T1-03-V-152
									Date 9/22/2003

**GRADATION CURVES**





# WOLF TECHNOLOGIES, INC.

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

## VISUAL SHELL CONTENT

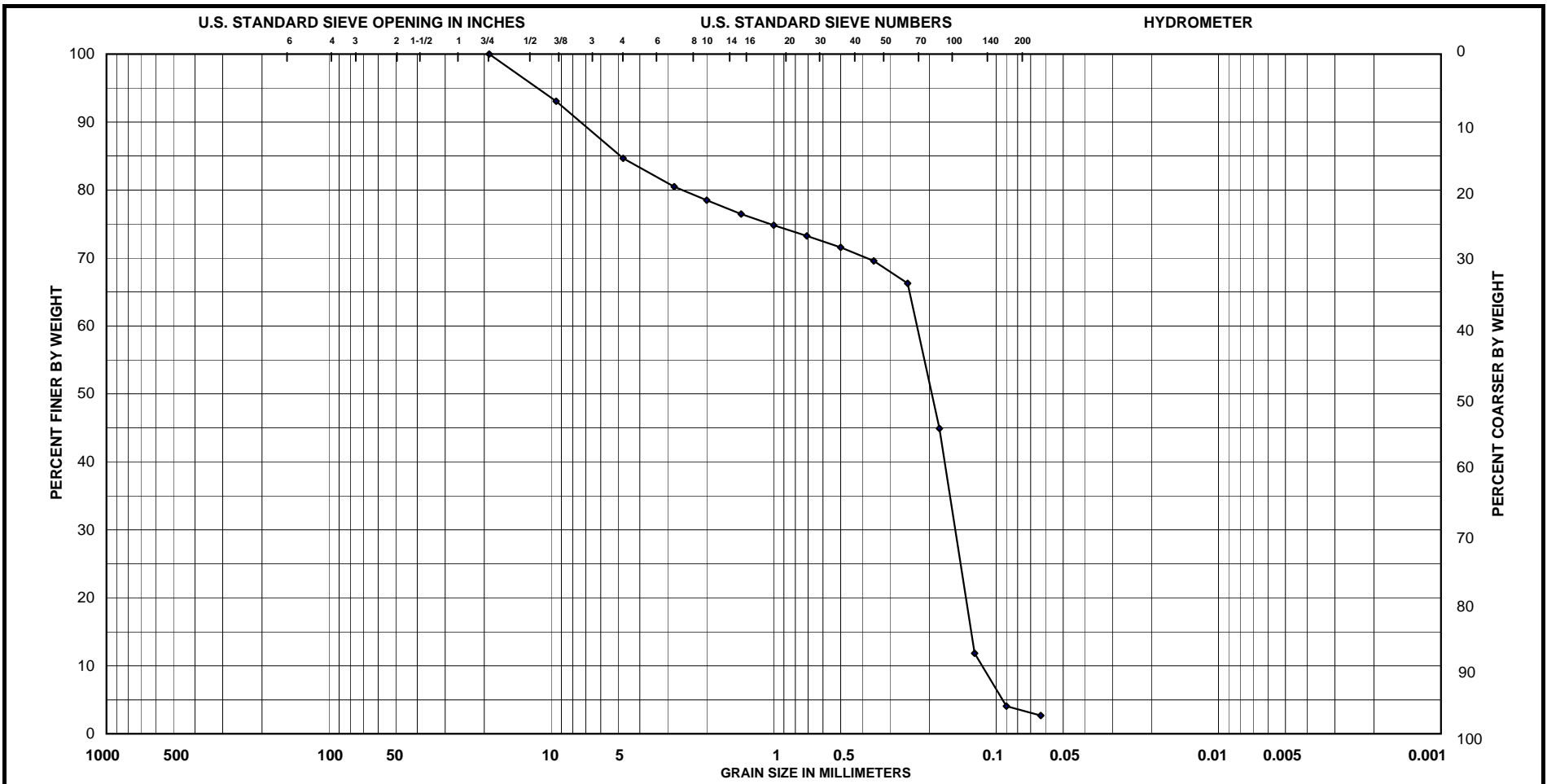
### GRAIN SIZE AND VISUAL SHELL CONTENT

Project:	<b>Topsail Beach, Surf City &amp; North Topsail</b>	Depth:	<b>7.9-8.4</b>
Project No.:	<b>1584-01-40</b>	Date:	<b>9/22/2003</b>
Boring No.:	<b>T1-03-V-152</b>		
Sample No.:	<b>3</b>		
Description:	<b>SAND, poorly-graded, mostly fine-grained quartz, little fine gravel-size carbonate, little coarse to medium-grained carbonate, dark gray (SP)</b>		

Tare Weight, (g):	<b>49.79</b>	
Dry Wt. Before Washing (g):	<b>168.09</b>	(with tare)
Dry Weight After Washing (g):	<b>163.41</b>	(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	8.19	93.08	100	8.19
#4	4.750	9.96	84.66	100	9.96
#7	2.800	4.93	80.49	100	4.93
#10	2.000	2.34	78.51	100	2.34
#14	1.400	2.42	76.47	100	2.42
#18	1.000	1.97	74.80	100	1.97
#25	0.710	1.82	73.26	80	1.46
#35	0.500	2.03	71.55	50	1.02
#45	0.355	2.32	69.59	30	0.70
#60	0.250	3.91	66.28	10	0.39
#80	0.180	25.29	44.90	1	0.25
#120	0.125	39.11	11.84	1	0.39
#170	0.090	9.21	4.06	1	0.09
#230	0.063	1.64	2.67	1	0.02

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



COBBLES	GRAVEL		SAND			SILT OR CLAY
	COARSE	FINE	COARSE	MEDIUM	FINE	

Sample No.	Elev. Or Depth	Classification	% CO <sub>3</sub>	G <sub>s</sub>	Nat w%	LL	PL	PI	Project	
♦ 3	7.9-8.4	SAND, poorly-graded, mostly fine-grained quartz, little fine gravel-size carbonate, little coarse to medium-grained carbonate, dark gray (SP)	29						Topsail Beach, Surf City & North Topsail	
									Area	
									Boring No. T1-03-V-152	
									Date 9/22/2003	

**GRADATION CURVES**



# WOLF TECHNOLOGIES, INC.

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## VISUAL SHELL CONTENT

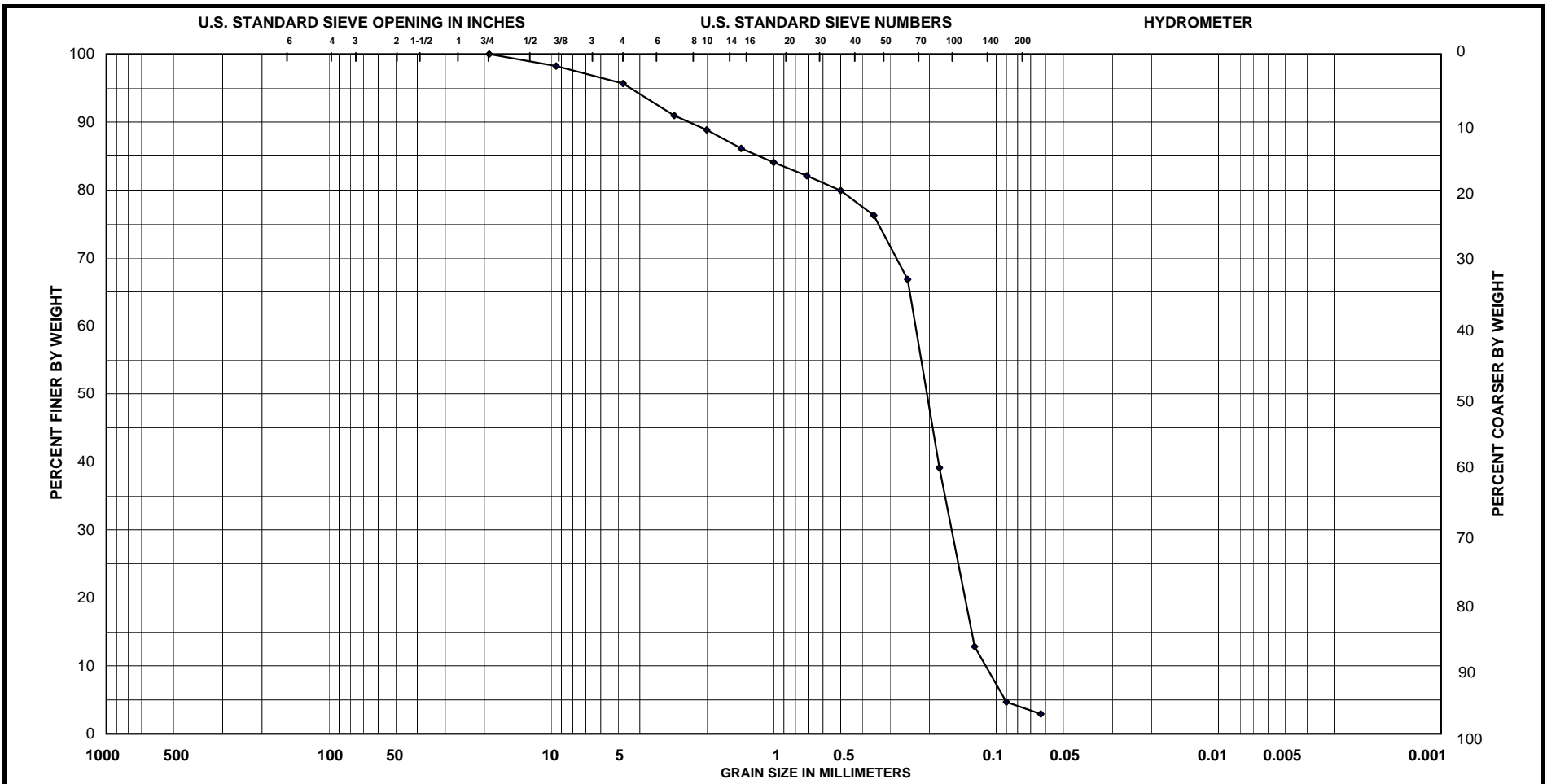
### GRAIN SIZE AND VISUAL SHELL CONTENT

Project:	<b>Topsail Beach, Surf City &amp; North Topsail</b>	Depth:	<b>6.2-6.7</b>
Project No.:	<b>1584-01-40</b>	Date:	<b>9/22/2003</b>
Boring No.:	<b>T1-03-V-152A</b>		
Sample No.:	<b>1</b>		
Description:	<b>SAND, poorly-graded, mostly fine-grained quartz, little coarse to medium-grained carbonate, trace fine gravel-size carbonate, very dark</b>		

Tare Weight, (g):	<b>49.54</b>	
Dry Wt. Before Washing (g):	<b>176.41</b>	(with tare)
Dry Weight After Washing (g):	<b>172.67</b>	(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	2.26	98.22	100	2.26
#4	4.750	3.23	95.67	100	3.23
#7	2.800	5.99	90.95	100	5.99
#10	2.000	2.66	88.85	100	2.66
#14	1.400	3.46	86.13	90	3.11
#18	1.000	2.63	84.05	80	2.10
#25	0.710	2.46	82.12	70	1.72
#35	0.500	2.80	79.91	30	0.84
#45	0.355	4.61	76.27	10	0.46
#60	0.250	11.94	66.86	5	0.60
#80	0.180	35.20	39.12	1	0.35
#120	0.125	33.35	12.83	1	0.33
#170	0.090	10.33	4.69	1	0.10
#230	0.063	2.24	2.92	1	0.02

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



COBBLES	GRAVEL		SAND			SILT OR CLAY
	COARSE	FINE	COARSE	MEDIUM	FINE	

Sample No.	Elev. Or Depth	Classification	% CO <sub>3</sub>	G <sub>s</sub>	Nat w%	LL	PL	PI	Project
♦ 1	6.2-6.7	SAND, poorly-graded, mostly fine-grained quartz, little coarse to medium-grained carbonate, trace fine gravel-size carbonate, very dark greenish gray (SP)	19						Topsail Beach, Surf City & North Topsail
									Area
									Boring No. T1-03-V-152A
									Date 9/22/2003

**GRADATION CURVES**



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## VISUAL SHELL CONTENT

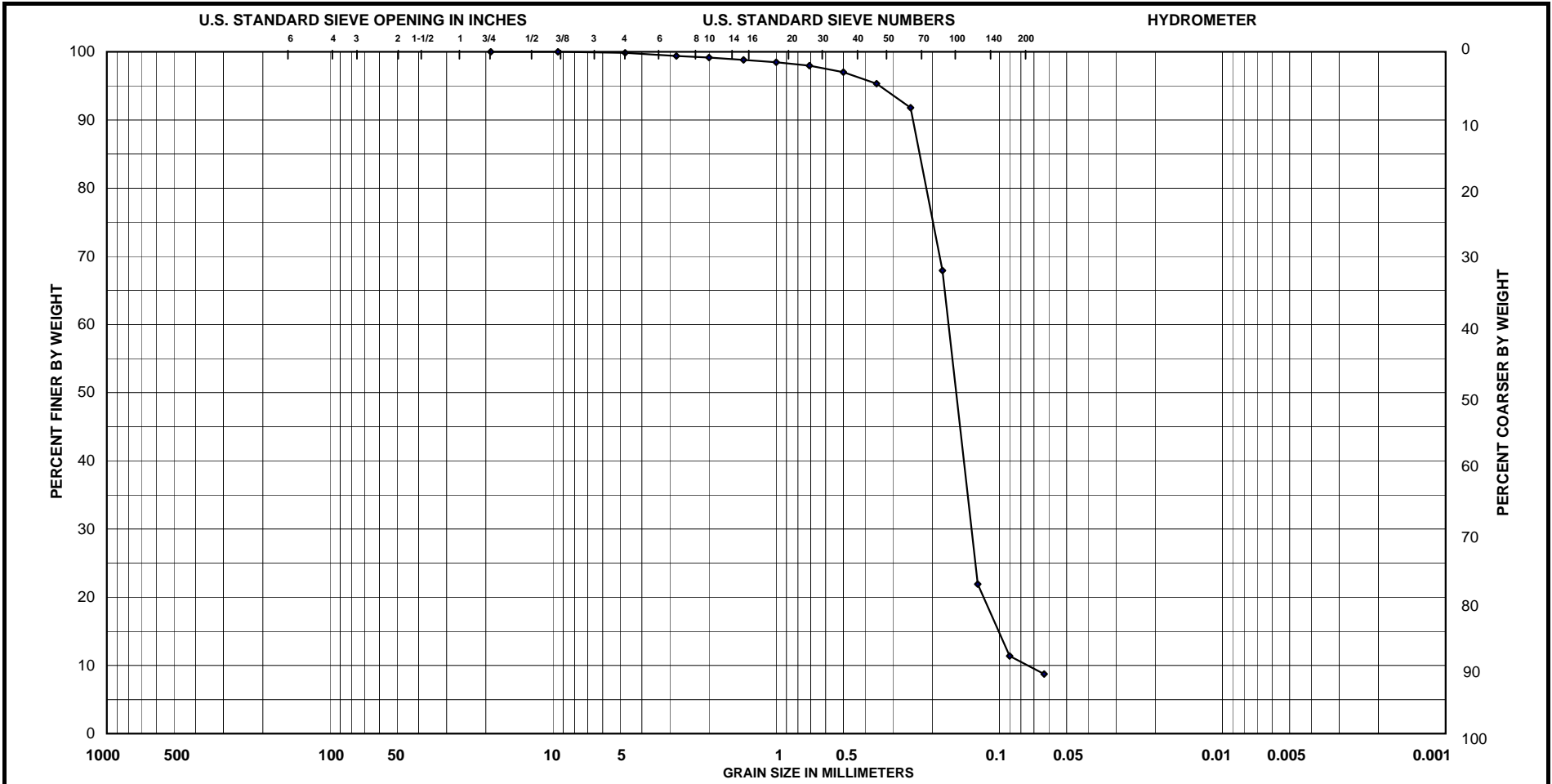
### GRAIN SIZE AND VISUAL SHELL CONTENT

Project:	<b>Topsail Beach, Surf City &amp; North Topsail</b>	Depth:	<b>8.2-8.7</b>
Project No.:	<b>1584-01-40</b>	Date:	<b>9/22/2003</b>
Boring No.:	<b>T1-03-V-152A</b>		
Sample No.:	<b>2</b>		
Description:	<b>SAND, poorly-graded with silt, mostly fine-grained quartz, few silt, trace carbonate, dark greenish gray (SP-SM)</b>		

Tare Weight, (g):	<b>50.00</b>	
Dry Wt. Before Washing (g):	<b>173.77</b>	(with tare)
Dry Weight After Washing (g):	<b>163.09</b>	(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	0.18	99.85	100	0.18
#7	2.800	0.57	99.39	100	0.57
#10	2.000	0.28	99.17	100	0.28
#14	1.400	0.43	98.82	90	0.39
#18	1.000	0.43	98.47	100	0.43
#25	0.710	0.64	97.96	80	0.51
#35	0.500	1.18	97.00	50	0.59
#45	0.355	2.06	95.34	20	0.41
#60	0.250	4.37	91.81	5	0.22
#80	0.180	29.57	67.92	1	0.30
#120	0.125	56.93	21.92	1	0.57
#170	0.090	13.04	11.38	1	0.13
#230	0.063	3.29	8.73	1	0.03

**Total Shell Content:** **4** %



COBBLES	GRAVEL		SAND			SILT OR CLAY
	COARSE	FINE	COARSE	MEDIUM	FINE	

Sample No.	Elev. Or Depth	Classification	% CO <sub>3</sub>	G <sub>s</sub>	Nat w%	LL	PL	PI	Project
♦ 2	8.2-8.7	SAND, poorly-graded with silt, mostly fine-grained quartz, few silt, trace carbonate, dark greenish gray (SP-SM)	4						Topsail Beach, Surf City & North Topsail
									Area
									Boring No. T1-03-V-152A
									Date 9/22/2003

**GRADATION CURVES**



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## VISUAL SHELL CONTENT

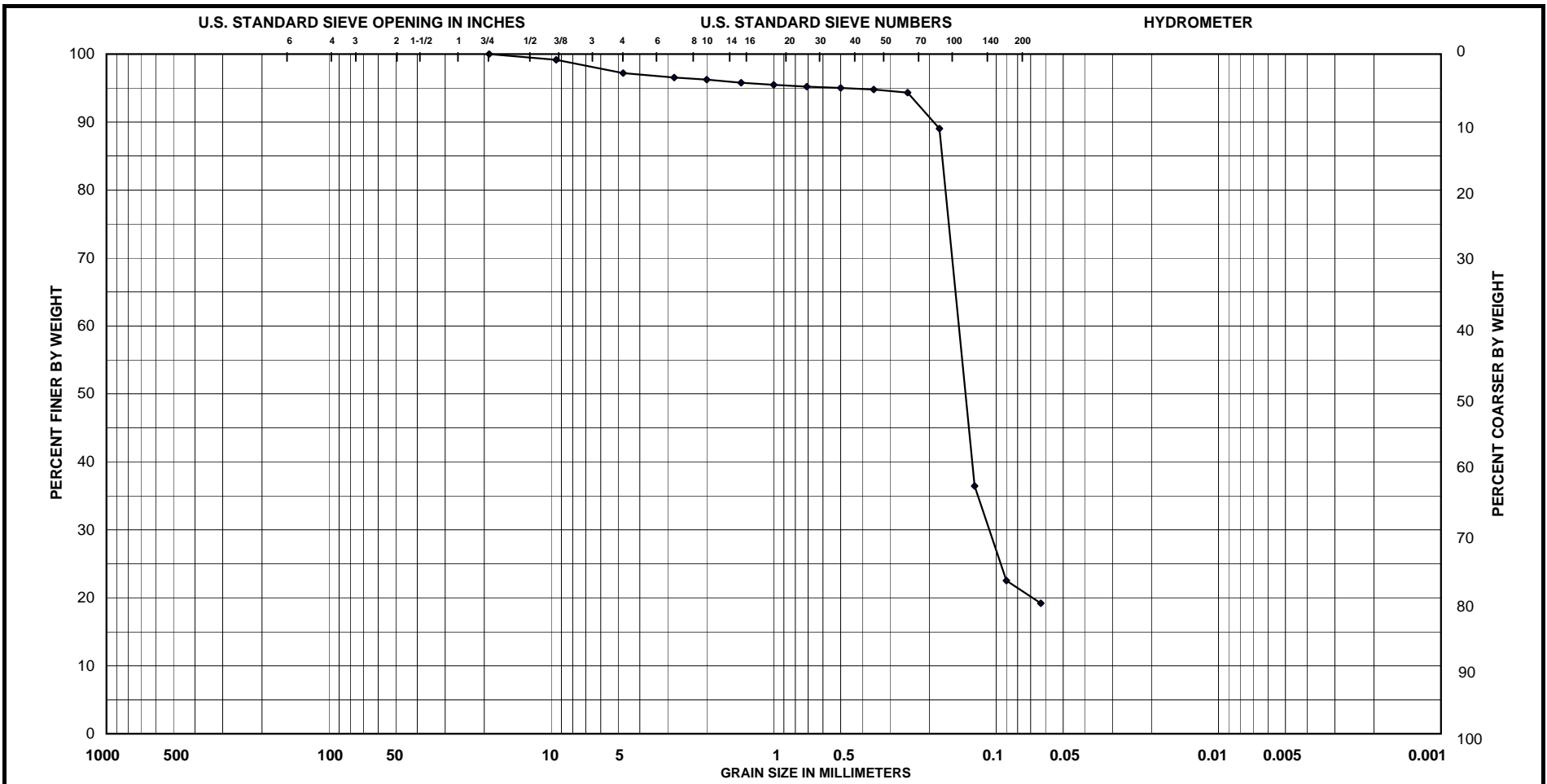
### GRAIN SIZE AND VISUAL SHELL CONTENT

Project:	<b>Topsail Beach, Surf City &amp; North Topsail</b>	Depth:	<b>10.8-11.3</b>
Project No.:	<b>1584-01-40</b>	Date:	<b>9/22/2003</b>
Boring No.:	<b>T1-03-V-152A</b>		
Sample No.:	<b>3</b>		
Description:	<b>SAND, clayey, mostly fine-grained quartz, little clay, few carbonate, dark greenish gray (SC)</b>		

Tare Weight, (g):	<b>49.22</b>	
Dry Wt. Before Washing (g):	<b>158.06</b>	(with tare)
Dry Weight After Washing (g):	<b>137.45</b>	(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	0.91	99.16	100	0.91
#4	4.750	2.12	97.22	100	2.12
#7	2.800	0.74	96.54	100	0.74
#10	2.000	0.33	96.23	100	0.33
#14	1.400	0.47	95.80	90	0.42
#18	1.000	0.36	95.47	80	0.29
#25	0.710	0.28	95.21	40	0.11
#35	0.500	0.21	95.02	30	0.06
#45	0.355	0.26	94.78	20	0.05
#60	0.250	0.48	94.34	10	0.05
#80	0.180	5.79	89.02	1	0.06
#120	0.125	57.22	36.45	1	0.57
#170	0.090	15.12	22.56	1	0.15
#230	0.063	3.65	19.20	1	0.04

**Total Shell Content:** **5** %



COBBLES	GRAVEL		SAND			SILT OR CLAY
	COARSE	FINE	COARSE	MEDIUM	FINE	

Sample No.	Elev. Or Depth	Classification	% CO <sub>3</sub>	G <sub>s</sub>	Nat w%	LL	PL	PI	Project
3	10.8-11.3	SAND, clayey, mostly fine-grained quartz, little clay, few carbonate, dark greenish gray (SC)	5						Topsail Beach, Surf City & North Topsail
									Area
									Boring No. T1-03-V-152A
									Date 9/22/2003

**GRADATION CURVES**





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## VISUAL SHELL CONTENT

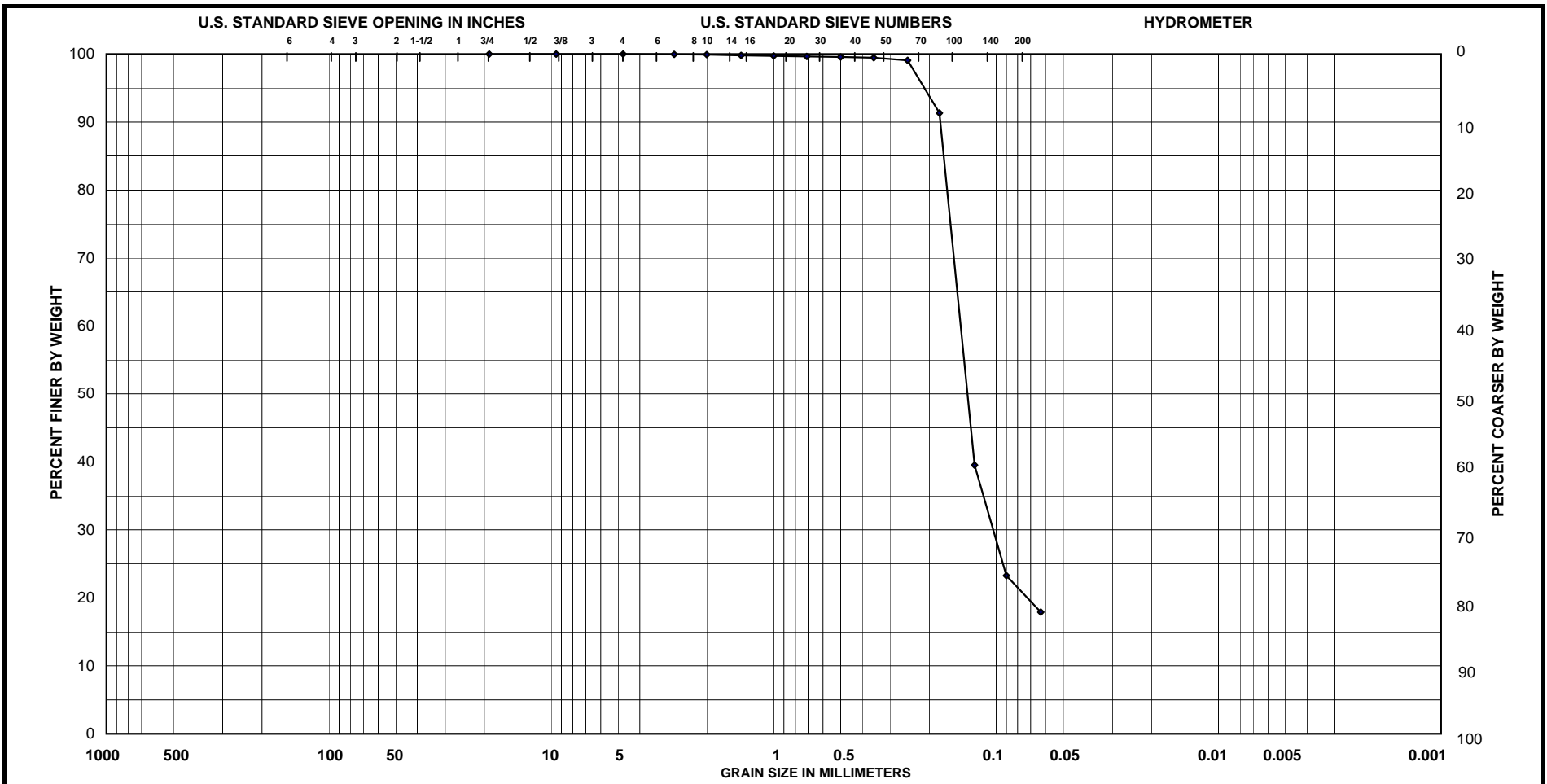
### GRAIN SIZE AND VISUAL SHELL CONTENT

Project:	<b>Topsail Beach, Surf City &amp; North Topsail</b>	Depth:	<b>13.0-13.5</b>
Project No.:	<b>1584-01-40</b>	Date:	<b>9/22/2003</b>
Boring No.:	<b>T1-03-V-152A</b>		
Sample No.:	<b>4</b>		
Description:	<b>SAND, silty, mostly fine-grained quartz, little silt, trace carbonate, dark greenish gray (SM)</b>		

Tare Weight, (g):	<b>50.49</b>	
Dry Wt. Before Washing (g):	<b>170.71</b>	(with tare)
Dry Weight After Washing (g):	<b>149.84</b>	(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	0.05	99.96	100	0.05
#10	2.000	0.04	99.93	100	0.04
#14	1.400	0.14	99.81	100	0.14
#18	1.000	0.09	99.73	50	0.05
#25	0.710	0.09	99.66	50	0.05
#35	0.500	0.08	99.59	30	0.02
#45	0.355	0.17	99.45	20	0.03
#60	0.250	0.43	99.09	10	0.04
#80	0.180	9.32	91.34	1	0.09
#120	0.125	62.32	39.50	1	0.62
#170	0.090	19.54	23.25	1	0.20
#230	0.063	6.42	17.91	1	0.06

**Total Shell Content:** **1** %



COBBLES	GRAVEL		SAND			SILT OR CLAY
	COARSE	FINE	COARSE	MEDIUM	FINE	

Sample No.	Elev. Or Depth	Classification	% CO <sub>3</sub>	G <sub>s</sub>	Nat w%	LL	PL	PI	Project
4	13.0-13.5	SAND, silty, mostly fine-grained quartz, little silt, trace carbonate, dark greenish gray (SM)	1						Topsail Beach, Surf City & North Topsail
									Area
									Boring No. T1-03-V-152A
									Date 9/22/2003

**GRADATION CURVES**



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## VISUAL SHELL CONTENT

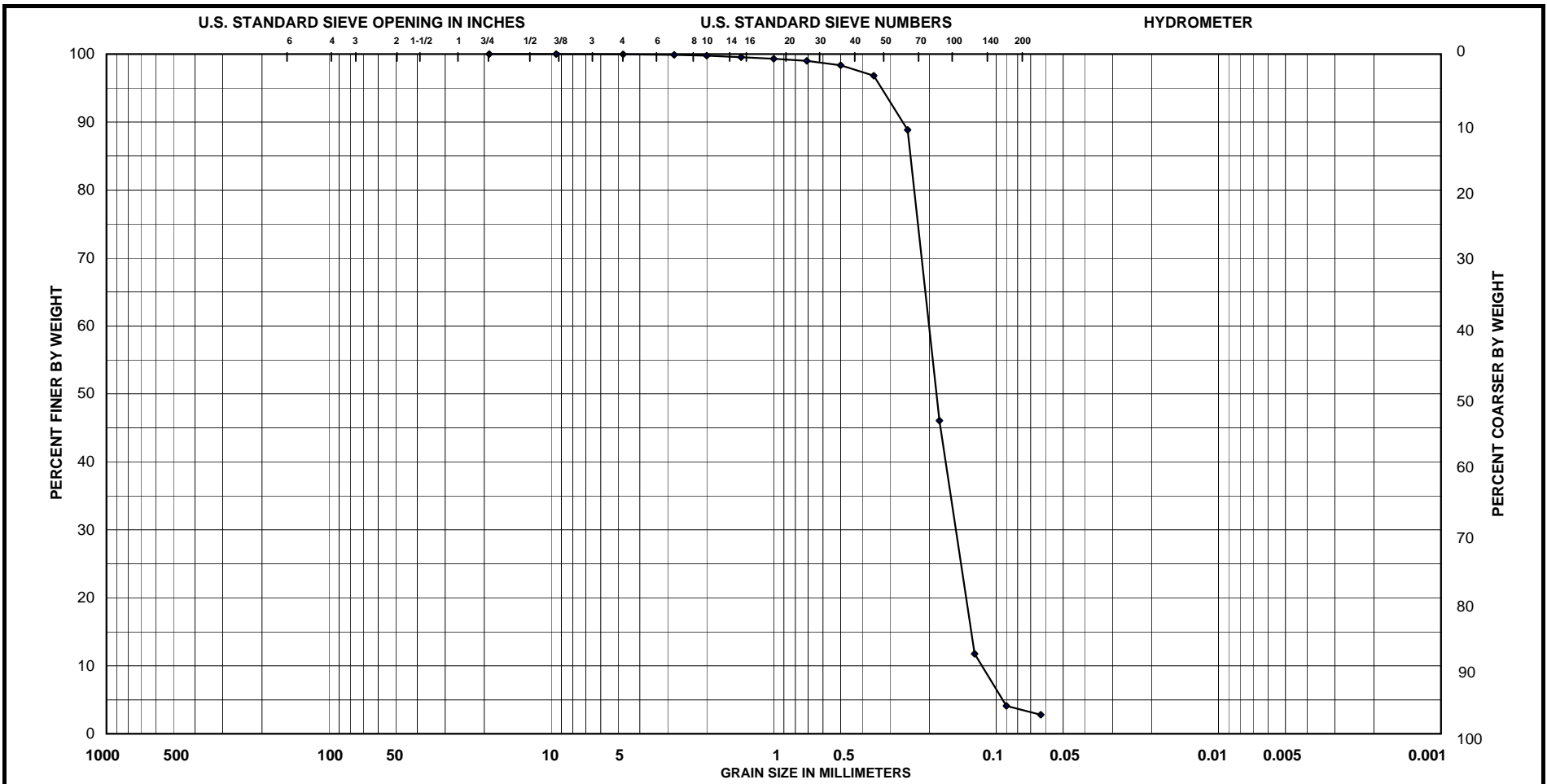
### GRAIN SIZE AND VISUAL SHELL CONTENT

<b>Project:</b>	<b>Topsail Beach, Surf City &amp; North Topsail</b>	<b>Depth:</b>	<b>2.9-3.4</b>
<b>Project No.:</b>	<b>1584-01-40</b>	<b>Date:</b>	<b>9/22/2003</b>
<b>Boring No.:</b>	<b>T1-03-V-153</b>		
<b>Sample No.:</b>	<b>1</b>		
<b>Description:</b>	<b>SAND, poorly-graded, mostly fine-grained quartz, trace carbonate, dark greenish gray (SP)</b>		

Tare Weight, (g):	49.77	
Dry Wt. Before Washing (g):	175.08	(with tare)
Dry Weight After Washing (g):	171.89	(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	0.03	99.98	100	0.03
#7	2.800	0.11	99.89	100	0.11
#10	2.000	0.14	99.78	100	0.14
#14	1.400	0.30	99.54	100	0.30
#18	1.000	0.28	99.31	100	0.28
#25	0.710	0.40	98.99	80	0.32
#35	0.500	0.81	98.35	60	0.49
#45	0.355	1.93	96.81	20	0.39
#60	0.250	9.96	88.86	5	0.50
#80	0.180	53.62	46.07	1	0.54
#120	0.125	42.98	11.77	1	0.43
#170	0.090	9.59	4.12	1	0.10
#230	0.063	1.67	2.79	1	0.02

**Total Shell Content:** 3 %



COBBLES	GRAVEL		SAND			SILT OR CLAY
	COARSE	FINE	COARSE	MEDIUM	FINE	

Sample No.	Elev. Or Depth	Classification	% CO <sub>3</sub>	G <sub>s</sub>	Nat w%	LL	PL	PI	Project	
1	2.9-3.4	SAND, poorly-graded, mostly fine-grained quartz, trace carbonate, dark greenish gray (SP)	3						Topsail Beach, Surf City & North Topsail	
									Area	
									Boring No. T1-03-V-153	
									Date 9/22/2003	

**GRADATION CURVES**



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## VISUAL SHELL CONTENT

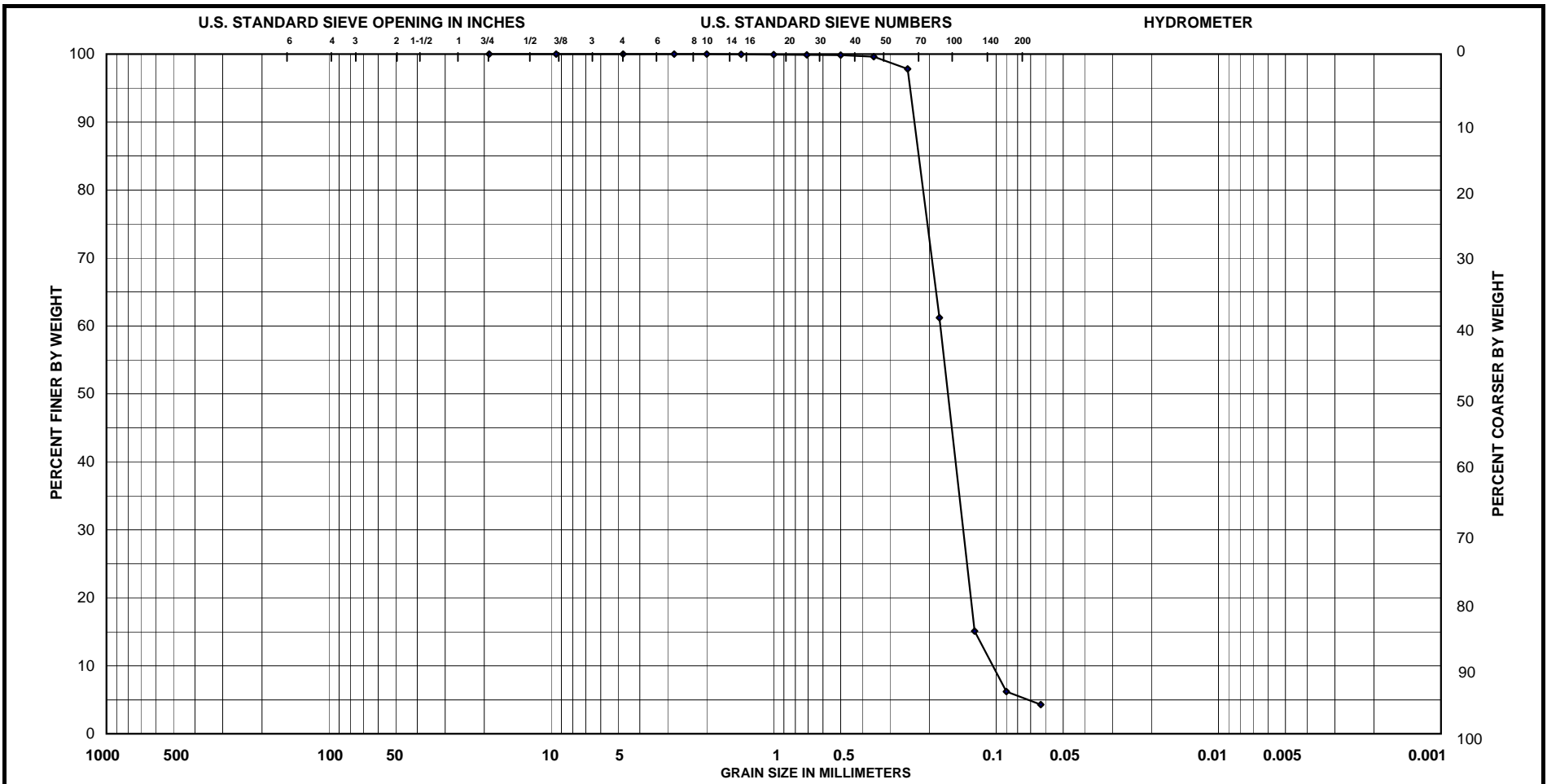
### GRAIN SIZE AND VISUAL SHELL CONTENT

Project:	<b>Topsail Beach, Surf City &amp; North Topsail</b>	Depth:	<b>5.0-5.5</b>
Project No.:	<b>1584-01-40</b>	Date:	<b>9/22/2003</b>
Boring No.:	<b>T1-03-V-153</b>		
Sample No.:	<b>2</b>		
Description:	<b>SAND, poorly-graded, mostly fine-grained quartz, trace carbonate, dark greenish gray (SP)</b>		

Tare Weight, (g):	<b>49.85</b>	
Dry Wt. Before Washing (g):	<b>176.86</b>	(with tare)
Dry Weight After Washing (g):	<b>171.83</b>	(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	0.00	100.00	0	0.00
#14	1.400	0.07	99.94	30	0.02
#18	1.000	0.03	99.92	20	0.01
#25	0.710	0.03	99.90	20	0.01
#35	0.500	0.08	99.83	30	0.02
#45	0.355	0.26	99.63	30	0.08
#60	0.250	2.32	97.80	10	0.23
#80	0.180	46.47	61.22	1	0.46
#120	0.125	58.55	15.12	1	0.59
#170	0.090	11.29	6.23	1	0.11
#230	0.063	2.45	4.30	1	0.02

**Total Shell Content:** **1** %



COBBLES	GRAVEL		SAND			SILT OR CLAY
	COARSE	FINE	COARSE	MEDIUM	FINE	

Sample No.	Elev. Or Depth	Classification	% CO <sub>3</sub>	G <sub>s</sub>	Nat w%	LL	PL	PI	Project
2	5.0-5.5	SAND, poorly-graded, mostly fine-grained quartz, trace carbonate, dark greenish gray (SP)	1						Topsail Beach, Surf City & North Topsail
									Area
									Boring No. T1-03-V-153
									Date 9/22/2003

**GRADATION CURVES**



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## VISUAL SHELL CONTENT

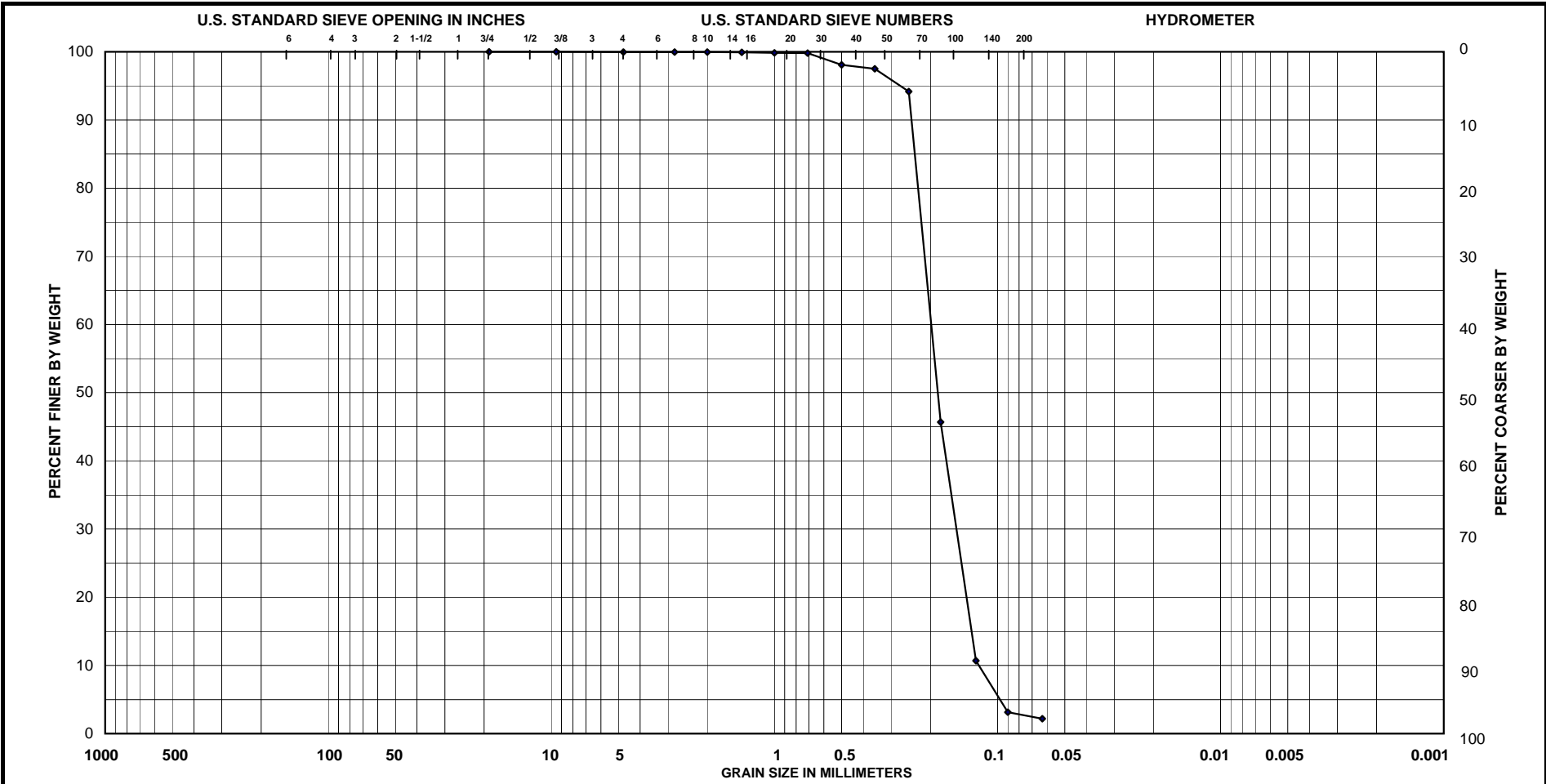
### GRAIN SIZE AND VISUAL SHELL CONTENT

Project:	<b>Topsail Beach, Surf City &amp; North Topsail</b>	Depth:	<b>6.5-7.0</b>
Project No.:	<b>1584-01-40</b>	Date:	<b>9/22/2003</b>
Boring No.:	<b>T1-03-V-153</b>		
Sample No.:	<b>3</b>		
Description:	<b>SAND, poorly-graded, mostly fine-grained quartz, trace carbonate, dark gray (SP)</b>		

Tare Weight, (g):	<b>50.26</b>	
Dry Wt. Before Washing (g):	<b>167.05</b>	(with tare)
Dry Weight After Washing (g):	<b>163.02</b>	(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	0.04	99.97	100	0.04
#7	2.800	0.00	99.97	0	0.00
#10	2.000	0.02	99.95	100	0.02
#14	1.400	0.04	99.91	90	0.04
#18	1.000	0.06	99.86	50	0.03
#25	0.710	0.07	99.80	40	0.03
#35	0.500	2.00	98.09	50	1.00
#45	0.355	0.67	97.52	40	0.27
#60	0.250	3.92	94.16	5	0.20
#80	0.180	56.60	45.70	1	0.57
#120	0.125	40.89	10.69	1	0.41
#170	0.090	8.83	3.13	1	0.09
#230	0.063	1.09	2.19	1	0.01

**Total Shell Content:** **2** %



COBBLES	GRAVEL		SAND			SILT OR CLAY
	COARSE	FINE	COARSE	MEDIUM	FINE	

Sample No.	Elev. Or Depth	Classification	% CO <sub>3</sub>	G <sub>s</sub>	Nat w%	LL	PL	PI	Project	
3	6.5-7.0	SAND, poorly-graded, mostly fine-grained quartz, trace carbonate, dark gray (SP)	2						Topsail Beach, Surf City & North Topsail	
									Area	
									Boring No. T1-03-V-153	
									Date 9/22/2003	

**GRADATION CURVES**





# WOLF TECHNOLOGIES, INC.

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

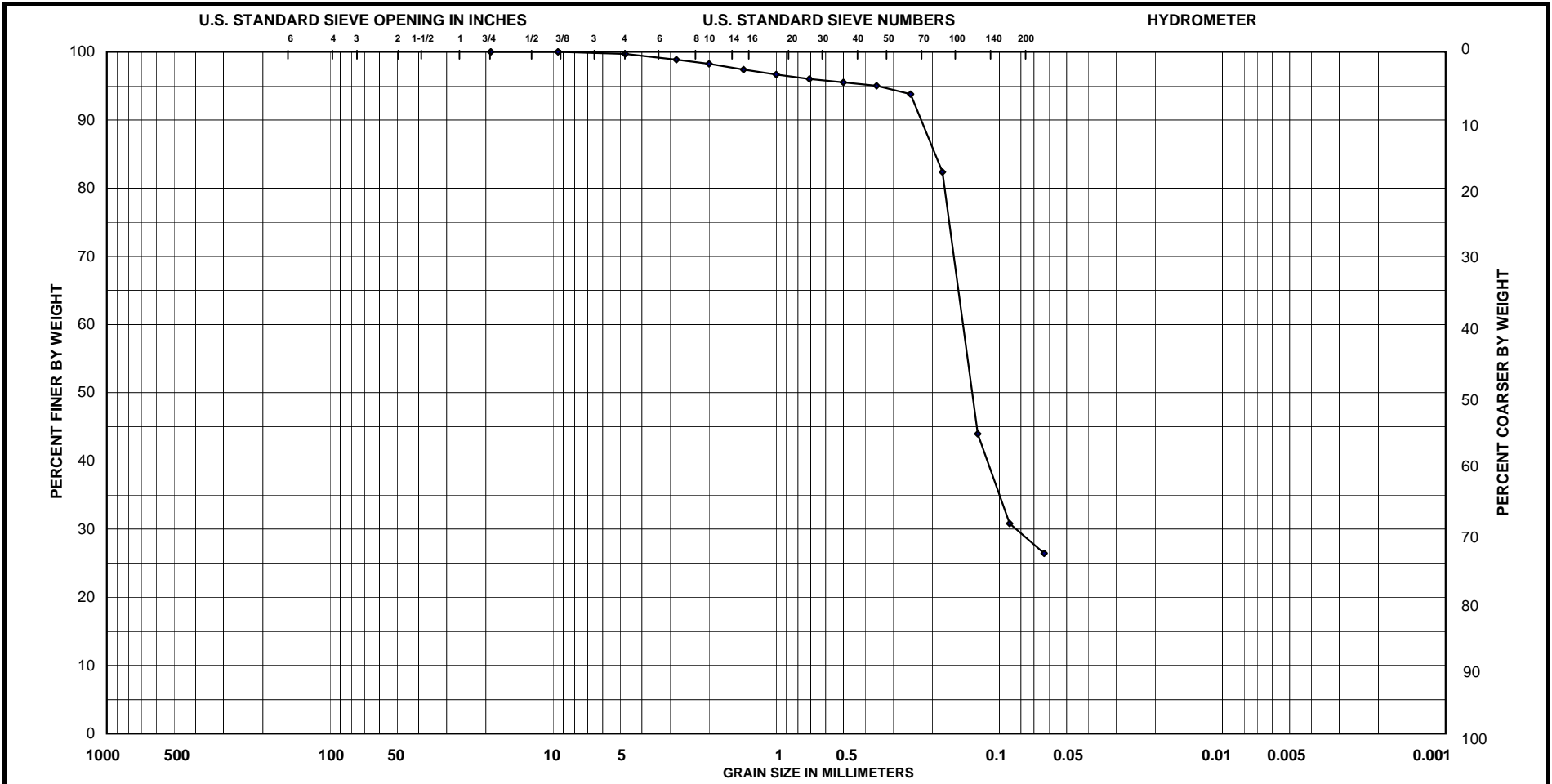
### GRAIN SIZE AND VISUAL SHELL CONTENT

Project:	<b>Topsail Beach, Surf City &amp; North Topsail</b>	Depth:	<b>8.3-8.8</b>
Project No.:	<b>1584-01-40</b>	Date:	<b>9/22/2003</b>
Boring No.:	<b>T1-03-V-153</b>		
Sample No.:	<b>4</b>		
Description:	<b>SAND, silty, mostly fine-grained quartz, little silt, trace carbonate, trace organic matter, dark greenish gray (SM)</b>		

Tare Weight, (g):	<b>50.41</b>	
Dry Wt. Before Washing (g):	<b>164.24</b>	(with tare)
Dry Weight After Washing (g):	<b>134.99</b>	(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	99.68	100	0.36
#7	2.800	0.94	98.86	100	0.94
#10	2.000	0.69	98.25	100	0.69
#14	1.400	0.98	97.39	90	0.88
#18	1.000	0.84	96.65	70	0.59
#25	0.710	0.73	96.01	50	0.37
#35	0.500	0.57	95.51	20	0.11
#45	0.355	0.58	95.00	5	0.03
#60	0.250	1.38	93.79	3	0.04
#80	0.180	12.98	82.39	1	0.13
#120	0.125	43.72	43.98	1	0.44
#170	0.090	15.00	30.80	1	0.15
#230	0.063	4.97	26.43	1	0.05

**Total Shell Content:** **4** %



COBBLES	GRAVEL		SAND			SILT OR CLAY
	COARSE	FINE	COARSE	MEDIUM	FINE	

Sample No.	Elev. Or Depth	Classification	% CO <sub>3</sub>	G <sub>s</sub>	Nat w%	LL	PL	PI	Project	
4	8.3-8.8	SAND, silty, mostly fine-grained quartz, little silt, trace carbonate, trace organic matter, dark greenish gray (SM)	4						Topsail Beach, Surf City & North Topsail	
									Area	
									Boring No. T1-03-V-153	
									Date 9/22/2003	

**GRADATION CURVES**



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## VISUAL SHELL CONTENT

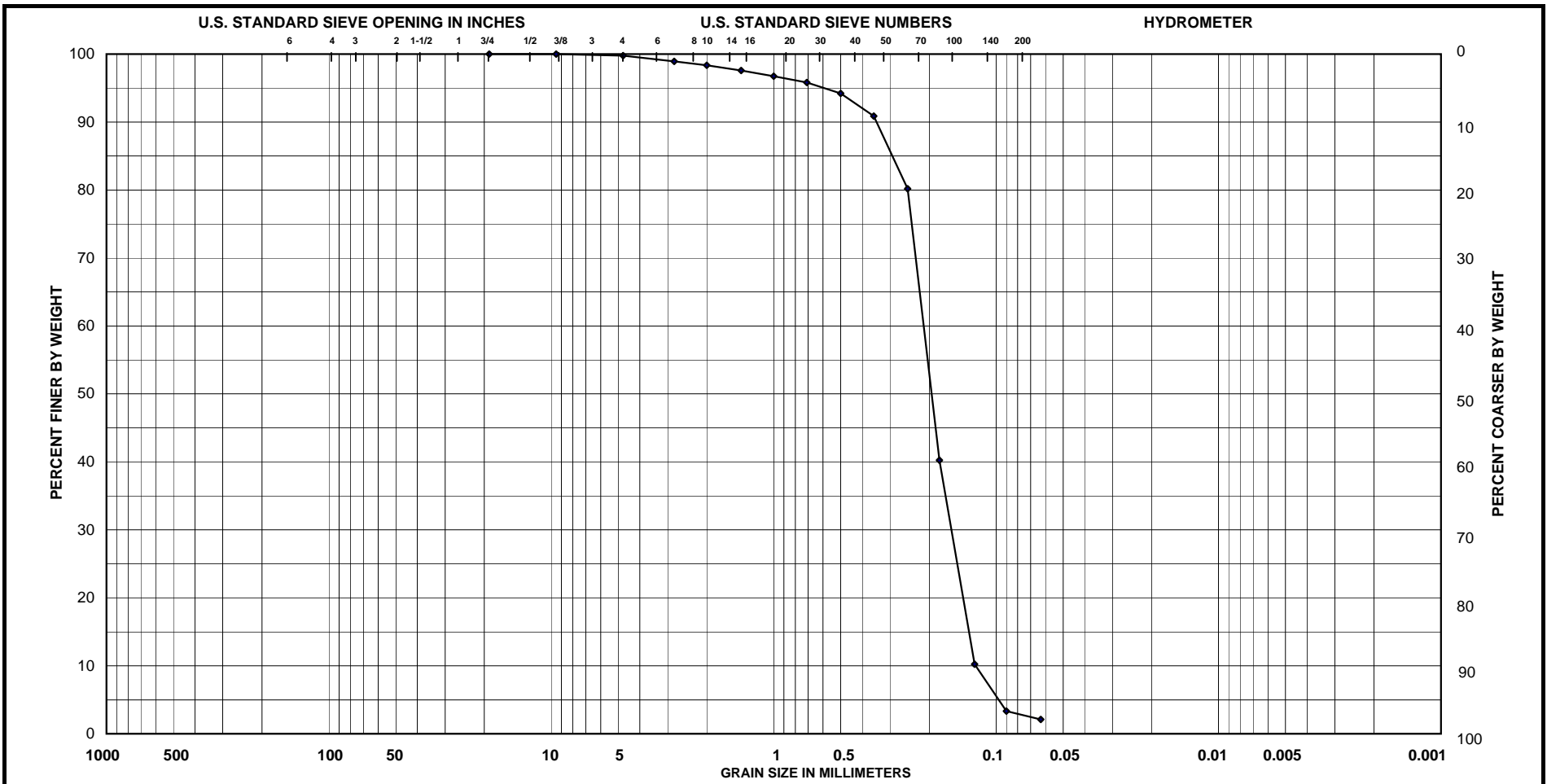
### GRAIN SIZE AND VISUAL SHELL CONTENT

Project:	<b>Topsail Beach, Surf City &amp; North Topsail</b>	Depth:	<b>2.1-2.6</b>
Project No.:	<b>1584-01-40</b>	Date:	<b>9/22/2003</b>
Boring No.:	<b>T1-03-V-153A</b>		
Sample No.:	<b>1</b>		
Description:	<b>SAND, poorly-graded, mostly fine-grained quartz, few carbonate, dark gray (SP)</b>		

Tare Weight, (g):	<b>50.14</b>	
Dry Wt. Before Washing (g):	<b>178.25</b>	(with tare)
Dry Weight After Washing (g):	<b>175.68</b>	(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	0.31	99.76	100	0.31
#7	2.800	1.05	98.94	100	1.05
#10	2.000	0.75	98.35	100	0.75
#14	1.400	0.97	97.60	100	0.97
#18	1.000	1.10	96.74	100	1.10
#25	0.710	1.15	95.84	90	1.04
#35	0.500	2.07	94.22	40	0.83
#45	0.355	4.29	90.88	10	0.43
#60	0.250	13.68	80.20	1	0.14
#80	0.180	51.18	40.25	1	0.51
#120	0.125	38.45	10.23	1	0.38
#170	0.090	8.84	3.33	1	0.09
#230	0.063	1.59	2.09	1	0.02

**Total Shell Content:** **6** %



COBBLES	GRAVEL		SAND			SILT OR CLAY
	COARSE	FINE	COARSE	MEDIUM	FINE	

Sample No.	Elev. Or Depth	Classification	% CO <sub>3</sub>	G <sub>s</sub>	Nat w%	LL	PL	PI	Project
1	2.1-2.6	SAND, poorly-graded, mostly fine-grained quartz, few carbonate, dark gray (SP)	6						Topsail Beach, Surf City & North Topsail
									Area
									Boring No. T1-03-V-153A
									Date 9/22/2003

**GRADATION CURVES**



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## VISUAL SHELL CONTENT

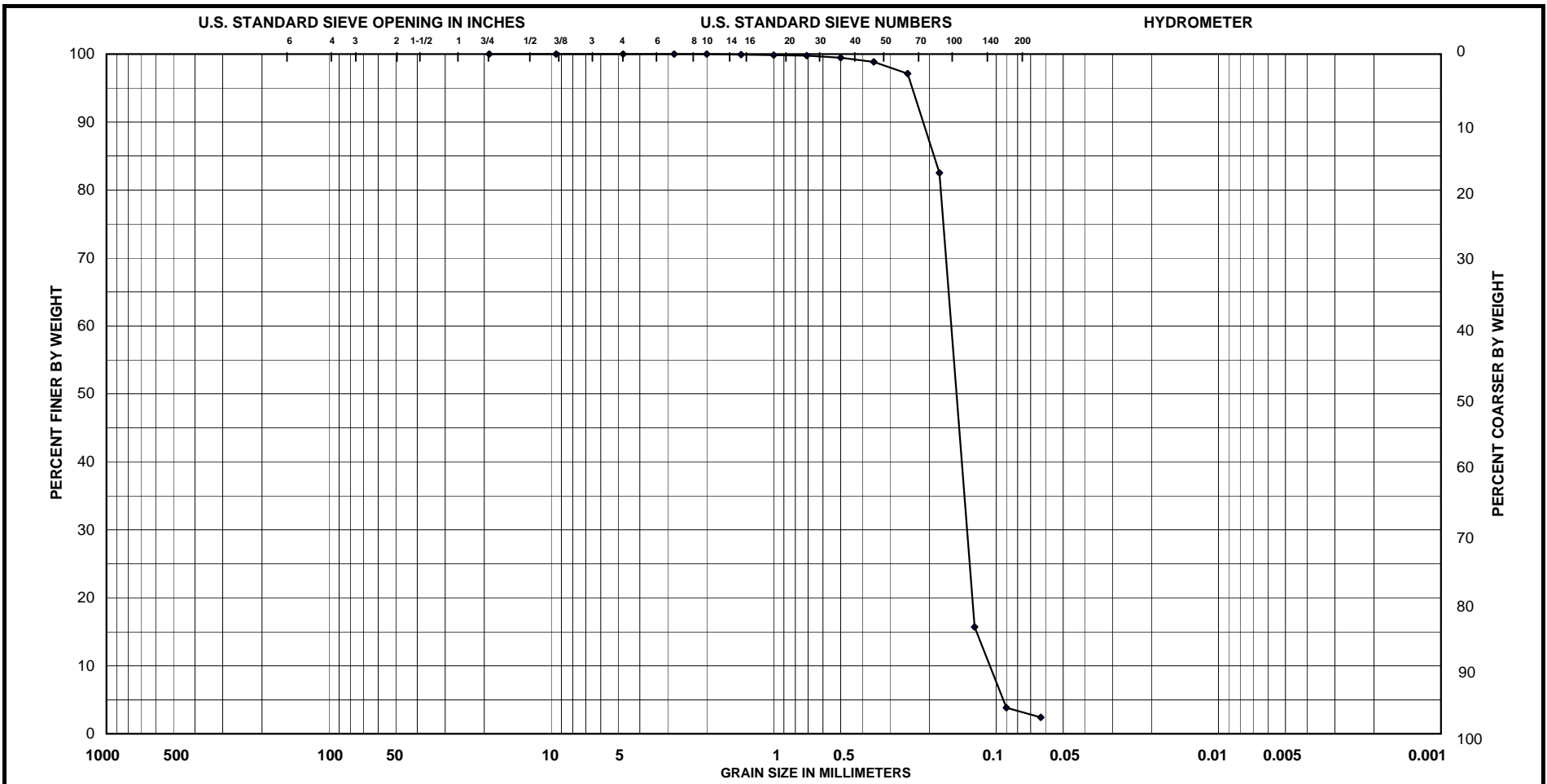
### GRAIN SIZE AND VISUAL SHELL CONTENT

Project:	<b>Topsail Beach, Surf City &amp; North Topsail</b>	Depth:	<b>4.0-4.5</b>
Project No.:	<b>1584-01-40</b>	Date:	<b>9/22/2003</b>
Boring No.:	<b>T1-03-V-153A</b>		
Sample No.:	<b>2</b>		
Description:	<b>SAND, poorly-graded, mostly fine-grained quartz, trace carbonate, dark gray (SP)</b>		

Tare Weight, (g):	<b>50.34</b>	
Dry Wt. Before Washing (g):	<b>171.55</b>	(with tare)
Dry Weight After Washing (g):	<b>168.46</b>	(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	0.01	99.98	100	0.01
#14	1.400	0.05	99.94	100	0.05
#18	1.000	0.12	99.84	100	0.12
#25	0.710	0.11	99.75	90	0.10
#35	0.500	0.35	99.46	50	0.18
#45	0.355	0.73	98.86	20	0.15
#60	0.250	2.10	97.13	5	0.11
#80	0.180	17.72	82.51	1	0.18
#120	0.125	80.97	15.71	1	0.81
#170	0.090	14.39	3.84	1	0.14
#230	0.063	1.74	2.40	1	0.02

**Total Shell Content:** **2** %



COBBLES	GRAVEL		SAND			SILT OR CLAY
	COARSE	FINE	COARSE	MEDIUM	FINE	

Sample No.	Elev. Or Depth	Classification	% CO <sub>3</sub>	G <sub>s</sub>	Nat w%	LL	PL	PI	Project
♦ 2	4.0-4.5	SAND, poorly-graded, mostly fine-grained quartz, trace carbonate, dark gray (SP)	2						Topsail Beach, Surf City & North Topsail
									Area
									Boring No. T1-03-V-153A
									Date 9/22/2003

**GRADATION CURVES**



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## VISUAL SHELL CONTENT

### GRAIN SIZE AND VISUAL SHELL CONTENT

Project:	<b>Topsail Beach, Surf City &amp; North Topsail</b>	Depth:	<b>6.0-6.5</b>
Project No.:	<b>1584-01-40</b>	Date:	<b>9/22/2003</b>
Boring No.:	<b>T1-03-V-153A</b>		
Sample No.:	<b>3</b>		
Description:	<b>SAND, poorly-graded, mostly fine-grained quartz, trace carbonate, dark greenish gray (SP)</b>		

Tare Weight, (g):	<b>49.67</b>	
Dry Wt. Before Washing (g):	<b>166.67</b>	(with tare)
Dry Weight After Washing (g):	<b>163.63</b>	(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	99.76	100	0.28
#7	2.800	0.10	99.68	100	0.10
#10	2.000	0.06	99.62	100	0.06
#14	1.400	0.15	99.50	100	0.15
#18	1.000	0.20	99.32	100	0.20
#25	0.710	0.22	99.14	80	0.18
#35	0.500	0.74	98.50	30	0.22
#45	0.355	1.33	97.37	10	0.13
#60	0.250	3.13	94.69	3	0.09
#80	0.180	34.65	65.08	1	0.35
#120	0.125	62.73	11.46	1	0.63
#170	0.090	9.39	3.44	1	0.09
#230	0.063	1.20	2.41	1	0.01

**Total Shell Content:** **2** %







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## VISUAL SHELL CONTENT

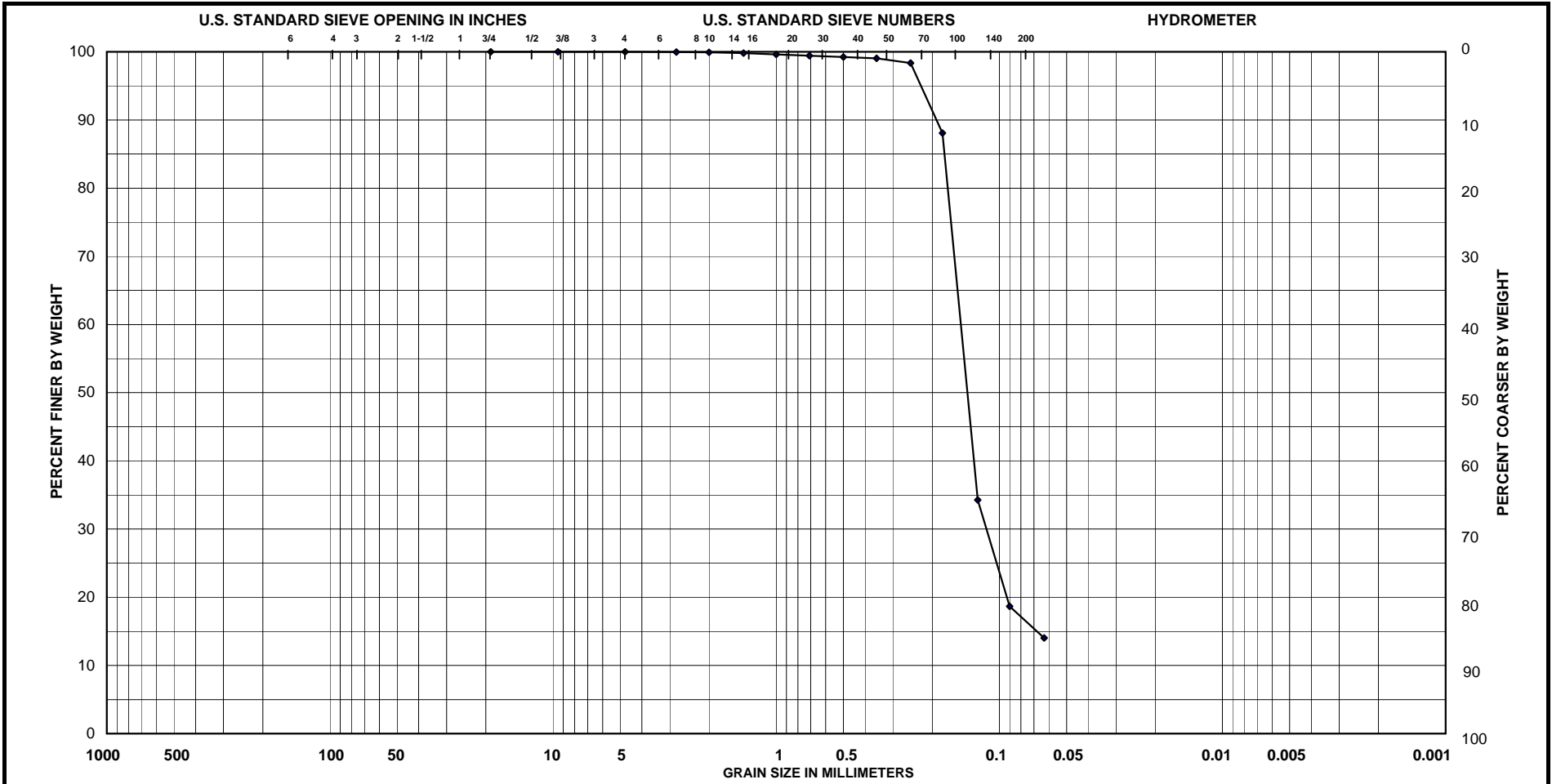
### GRAIN SIZE AND VISUAL SHELL CONTENT

Project:	<b>Topsail Beach, Surf City &amp; North Topsail</b>	Depth:	<b>8.3-8.8</b>
Project No.:	<b>1584-01-40</b>	Date:	<b>9/22/2003</b>
Boring No.:	<b>T1-03-V-153A</b>		
Sample No.:	<b>4</b>		
Description:	<b>SAND, silty, mostly fine-grained quartz, little silt, trace carbonate, dark greenish gray (SM)</b>		

Tare Weight, (g):	<b>48.35</b>	
Dry Wt. Before Washing (g):	<b>160.92</b>	(with tare)
Dry Weight After Washing (g):	<b>145.85</b>	(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	0.03	99.97	100	0.03
#10	2.000	0.06	99.92	40	0.02
#14	1.400	0.12	99.81	40	0.05
#18	1.000	0.23	99.61	20	0.05
#25	0.710	0.19	99.44	20	0.04
#35	0.500	0.23	99.24	10	0.02
#45	0.355	0.24	99.02	3	0.01
#60	0.250	0.74	98.37	3	0.02
#80	0.180	11.56	88.10	1	0.12
#120	0.125	60.58	34.28	1	0.61
#170	0.090	17.58	18.66	1	0.18
#230	0.063	5.20	14.04	1	0.05

**Total Shell Content:** **1** %



COBBLES	GRAVEL		SAND			SILT OR CLAY
	COARSE	FINE	COARSE	MEDIUM	FINE	

Sample No.	Elev. Or Depth	Classification	% CO <sub>3</sub>	G <sub>s</sub>	Nat w%	LL	PL	PI	Project
4	8.3-8.8	SAND, silty, mostly fine-grained quartz, little silt, trace carbonate, dark greenish gray (SM)	1						Topsail Beach, Surf City & North Topsail
									Area
									Boring No. T1-03-V-153A
									Date 9/22/2003

**GRADATION CURVES**



# WOLF TECHNOLOGIES, INC.

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## VISUAL SHELL CONTENT

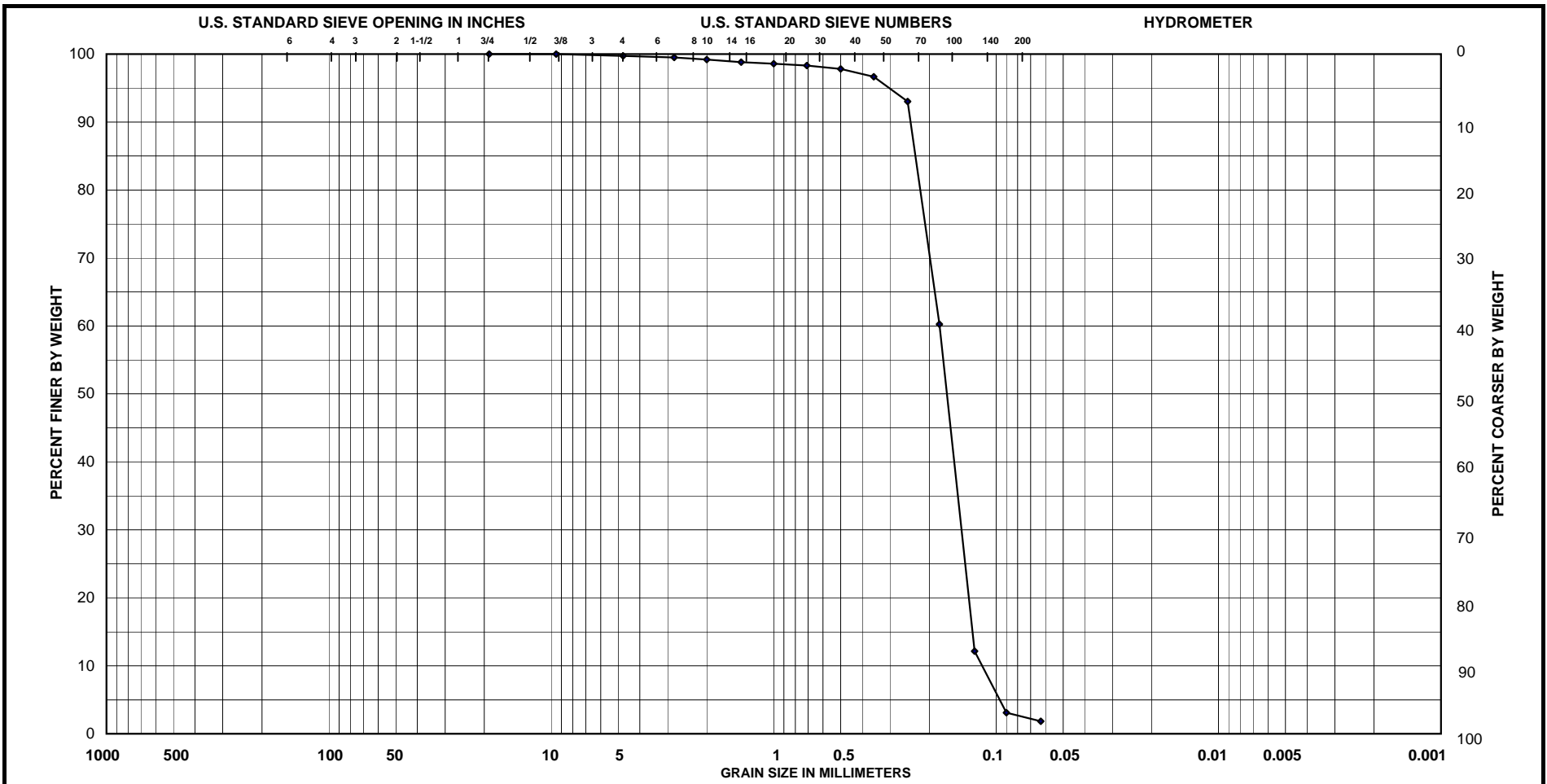
### GRAIN SIZE AND VISUAL SHELL CONTENT

Project:	<b>Topsail Beach, Surf City &amp; North Topsail</b>	Depth:	<b>42.4-42.9</b>
Project No.:	<b>1584-01-40</b>	Date:	<b>9/24/2003</b>
Boring No.:	<b>T1-03-V-170</b>		
Sample No.:	<b>1</b>		
Description:	<b>SAND, poorly-graded, mostly fine-grained quartz, trace carbonate, olive gray (SP)</b>		

Tare Weight, (g):	<b>50.22</b>	
Dry Wt. Before Washing (g):	<b>176.91</b>	(with tare)
Dry Weight After Washing (g):	<b>174.92</b>	(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	0.33	99.74	100	0.33
#7	2.800	0.31	99.49	100	0.31
#10	2.000	0.37	99.20	90	0.33
#14	1.400	0.48	98.82	100	0.48
#18	1.000	0.29	98.59	90	0.26
#25	0.710	0.38	98.30	90	0.34
#35	0.500	0.61	97.81	80	0.49
#45	0.355	1.47	96.65	40	0.59
#60	0.250	4.59	93.03	10	0.46
#80	0.180	41.52	60.26	1	0.42
#120	0.125	60.94	12.16	1	0.61
#170	0.090	11.46	3.11	1	0.11
#230	0.063	1.60	1.85	1	0.02

**Total Shell Content:** **4** %



COBBLES	GRAVEL		SAND			SILT OR CLAY
	COARSE	FINE	COARSE	MEDIUM	FINE	

Sample No.	Elev. Or Depth	Classification	% CO <sub>3</sub>	G <sub>s</sub>	Nat w%	LL	PL	PI	Project
♦ 1	42.4-42.9	SAND, poorly-graded, mostly fine-grained quartz, trace carbonate, olive gray (SP)	4						Topsail Beach, Surf City & North Topsail
									Area
									Boring No. T1-03-V-170
									Date 9/24/2003

**GRADATION CURVES**



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## VISUAL SHELL CONTENT

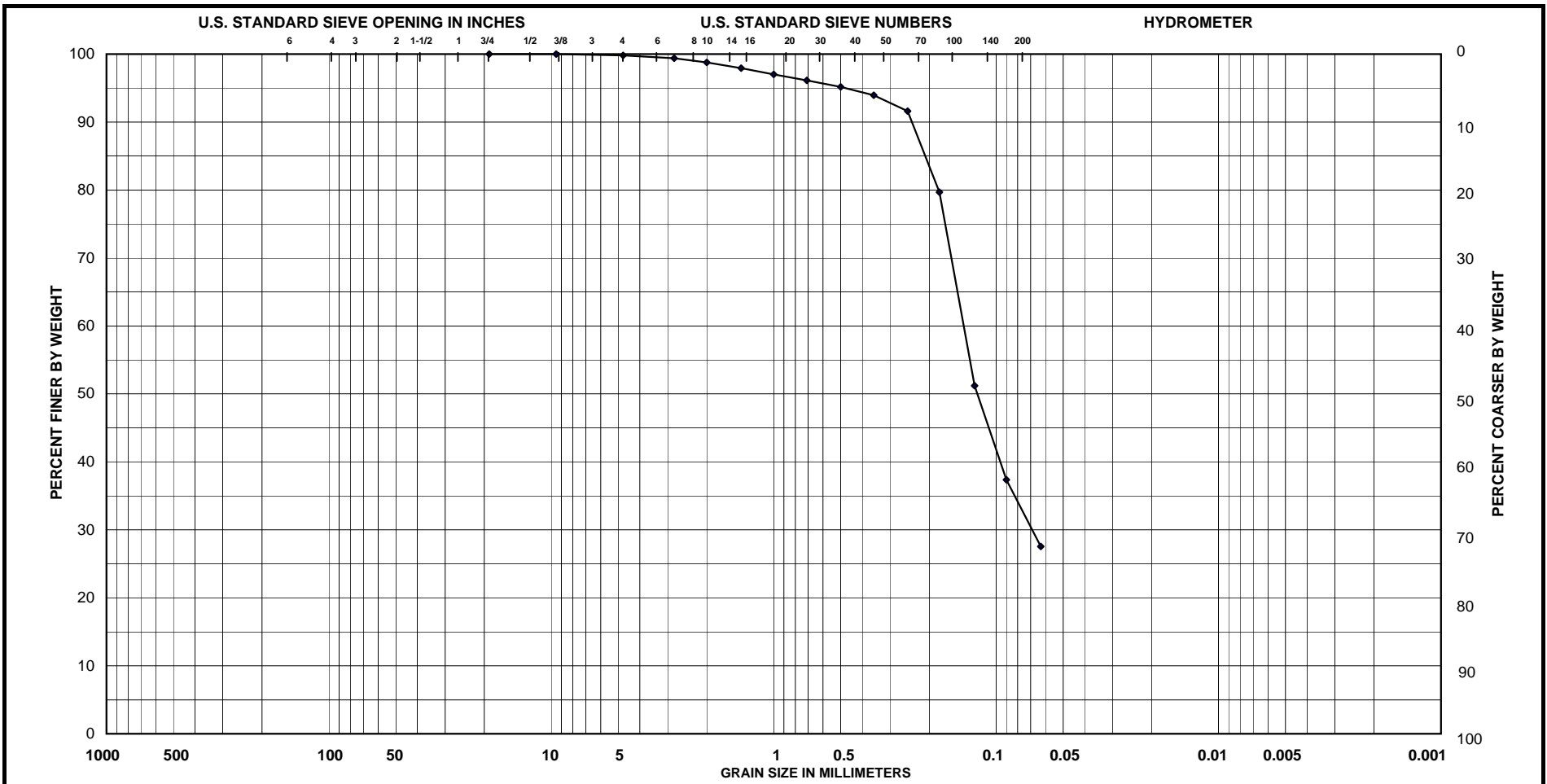
### GRAIN SIZE AND VISUAL SHELL CONTENT

Project:	<b>Topsail Beach, Surf City &amp; North Topsail</b>	Depth:	<b>43.4-43.9</b>
Project No.:	<b>1584-01-40</b>	Date:	<b>9/24/2003</b>
Boring No.:	<b>T1-03-V-170</b>		
Sample No.:	<b>2</b>		
Description:	<b>SAND, silty, mostly fine-grained quartz, little silt, few carbonate, dark greenish gray (SM)</b>		

Tare Weight, (g):	<b>49.91</b>	
Dry Wt. Before Washing (g):	<b>172.85</b>	(with tare)
Dry Weight After Washing (g):	<b>141.29</b>	(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	0.23	99.81	100	0.23
#7	2.800	0.54	99.37	100	0.54
#10	2.000	0.75	98.76	90	0.68
#14	1.400	1.01	97.94	90	0.91
#18	1.000	1.15	97.01	90	1.04
#25	0.710	1.06	96.14	80	0.85
#35	0.500	1.20	95.17	60	0.72
#45	0.355	1.51	93.94	30	0.45
#60	0.250	2.86	91.61	10	0.29
#80	0.180	14.65	79.70	3	0.44
#120	0.125	35.03	51.20	1	0.35
#170	0.090	17.00	37.38	1	0.17
#230	0.063	12.06	27.57	1	0.12

**Total Shell Content:** **6** %



COBBLES	GRAVEL		SAND			SILT OR CLAY
	COARSE	FINE	COARSE	MEDIUM	FINE	

Sample No.	Elev. Or Depth	Classification	% CO <sub>3</sub>	G <sub>s</sub>	Nat w%	LL	PL	PI	Project	
♦ 2	43.4-43.9	SAND, silty, mostly fine-grained quartz, little silt, few carbonate, dark greenish gray (SM)	6						Topsail Beach, Surf City & North Topsail	
									Area	
									Boring No. T1-03-V-170	
									Date 9/24/2003	

**GRADATION CURVES**



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## VISUAL SHELL CONTENT

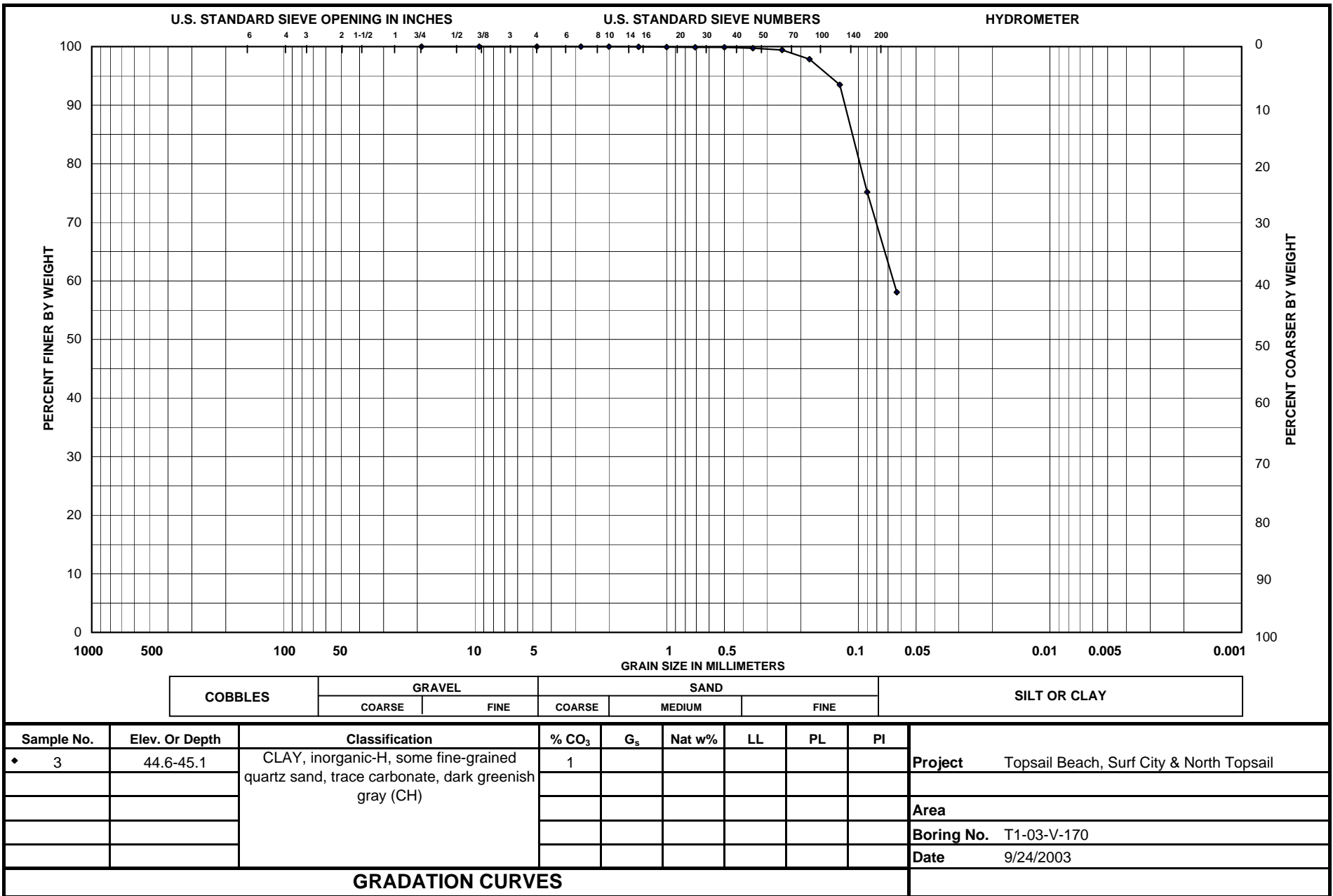
### GRAIN SIZE AND VISUAL SHELL CONTENT

Project:	<b>Topsail Beach, Surf City &amp; North Topsail</b>	Depth:	<b>44.6-45.1</b>
Project No.:	<b>1584-01-40</b>	Date:	<b>9/24/2003</b>
Boring No.:	<b>T1-03-V-170</b>		
Sample No.:	<b>3</b>		
Description:	<b>CLAY, inorganic-H, some fine-grained quartz sand, trace carbonate, dark greenish gray (CH)</b>		

Tare Weight, (g):	<b>50.48</b>	
Dry Wt. Before Washing (g):	<b>148.99</b>	(with tare)
Dry Weight After Washing (g):	<b>95.97</b>	(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	0.00	100.00	0	0.00
#14	1.400	0.02	99.98	20	0.00
#18	1.000	0.04	99.94	20	0.01
#25	0.710	0.04	99.90	20	0.01
#35	0.500	0.03	99.87	30	0.01
#45	0.355	0.12	99.75	20	0.02
#60	0.250	0.32	99.42	20	0.06
#80	0.180	1.54	97.86	1	0.02
#120	0.125	4.30	93.49	1	0.04
#170	0.090	18.06	75.16	1	0.18
#230	0.063	16.83	58.08	1	0.17

**Total Shell Content:** **1** %



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## VISUAL SHELL CONTENT

### GRAIN SIZE AND VISUAL SHELL CONTENT

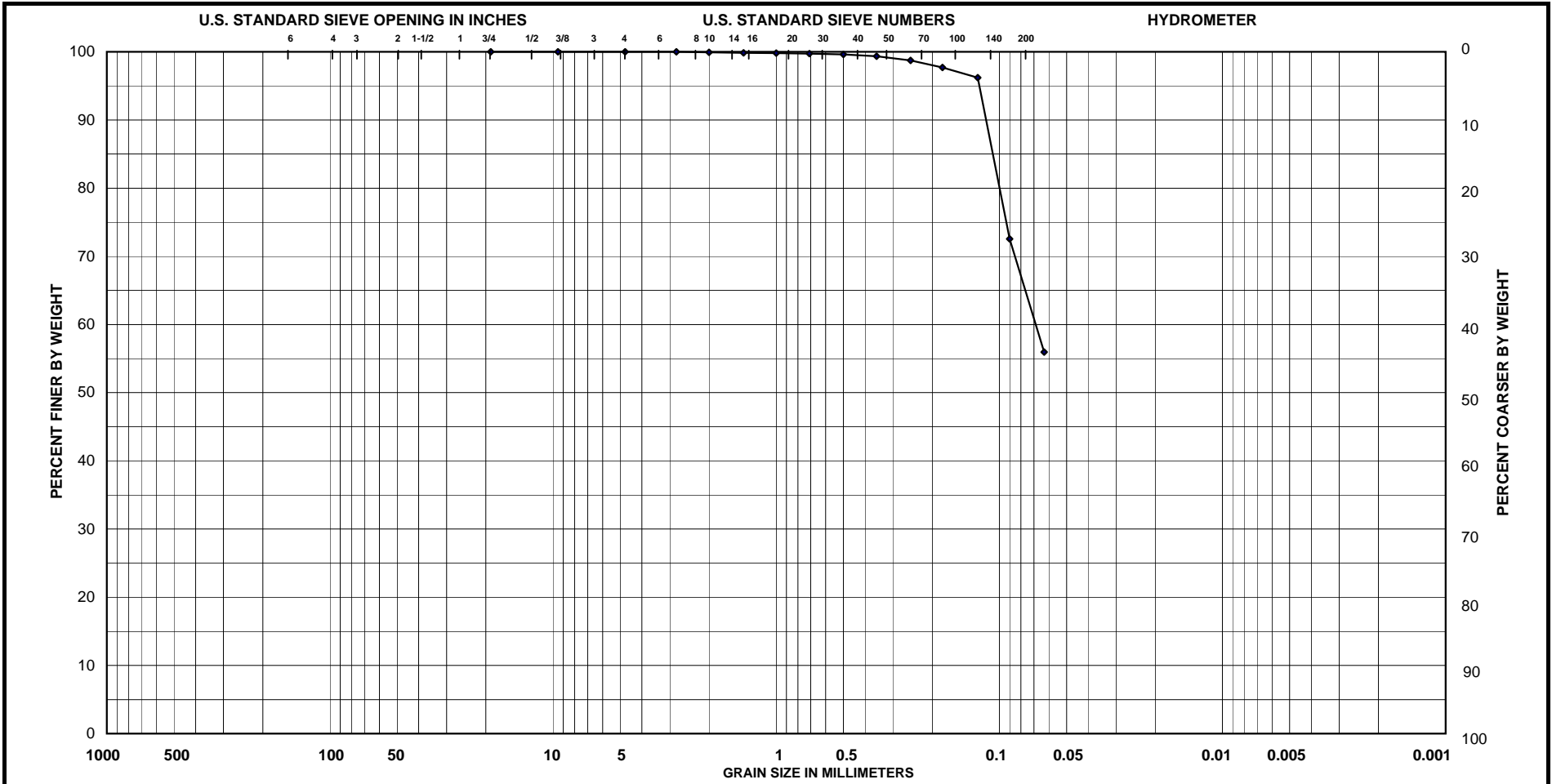
Project:	<b>Topsail Beach, Surf City &amp; North Topsail</b>	Depth:	<b>50.0-50.5</b>
Project No.:	<b>1584-01-40</b>	Date:	<b>9/24/2003</b>
Boring No.:	<b>T1-03-V-170</b>		
Sample No.:	<b>4</b>		
Description:	<b>CLAY, inorganic-H, some fine-grained quartz sand, trace carbonate, trace organic matter, dark greenish gray (CH)</b>		

Tare Weight, (g):	<b>50.34</b>	
Dry Wt. Before Washing (g):	<b>162.09</b>	(with tare)
Dry Weight After Washing (g):	<b>103.88</b>	(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	0.09	99.92	100	0.09
#14	1.400	0.07	99.86	20	0.01
#18	1.000	0.07	99.79	70	0.05
#25	0.710	0.08	99.72	100	0.08
#35	0.500	0.11	99.62	80	0.09
#45	0.355	0.30	99.36	50	0.15
#60	0.250	0.71	98.72	20	0.14
#80	0.180	1.13	97.71	5	0.06
#120	0.125	1.70	96.19	1	0.02
#170	0.090	26.42	72.55	1	0.26
#230	0.063	18.53	55.96	1	0.19

**Total Shell Content:**

<b>1</b>	<b>%</b>
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COBBLES	GRAVEL		SAND			SILT OR CLAY
	COARSE	FINE	COARSE	MEDIUM	FINE	

Sample No.	Elev. Or Depth	Classification	% CO <sub>3</sub>	G <sub>s</sub>	Nat w%	LL	PL	PI	Project	
4	50.0-50.5	CLAY, inorganic-H, some fine-grained quartz sand, trace carbonate, trace organic matter, dark greenish gray (CH)	1						Topsail Beach, Surf City & North Topsail	
									Area	
									Boring No. T1-03-V-170	
									Date 9/24/2003	

**GRADATION CURVES**



# WOLF TECHNOLOGIES, INC.

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(904) 997-1400 (Tel) • (904) 997-9150 (Fax)

## VISUAL SHELL CONTENT

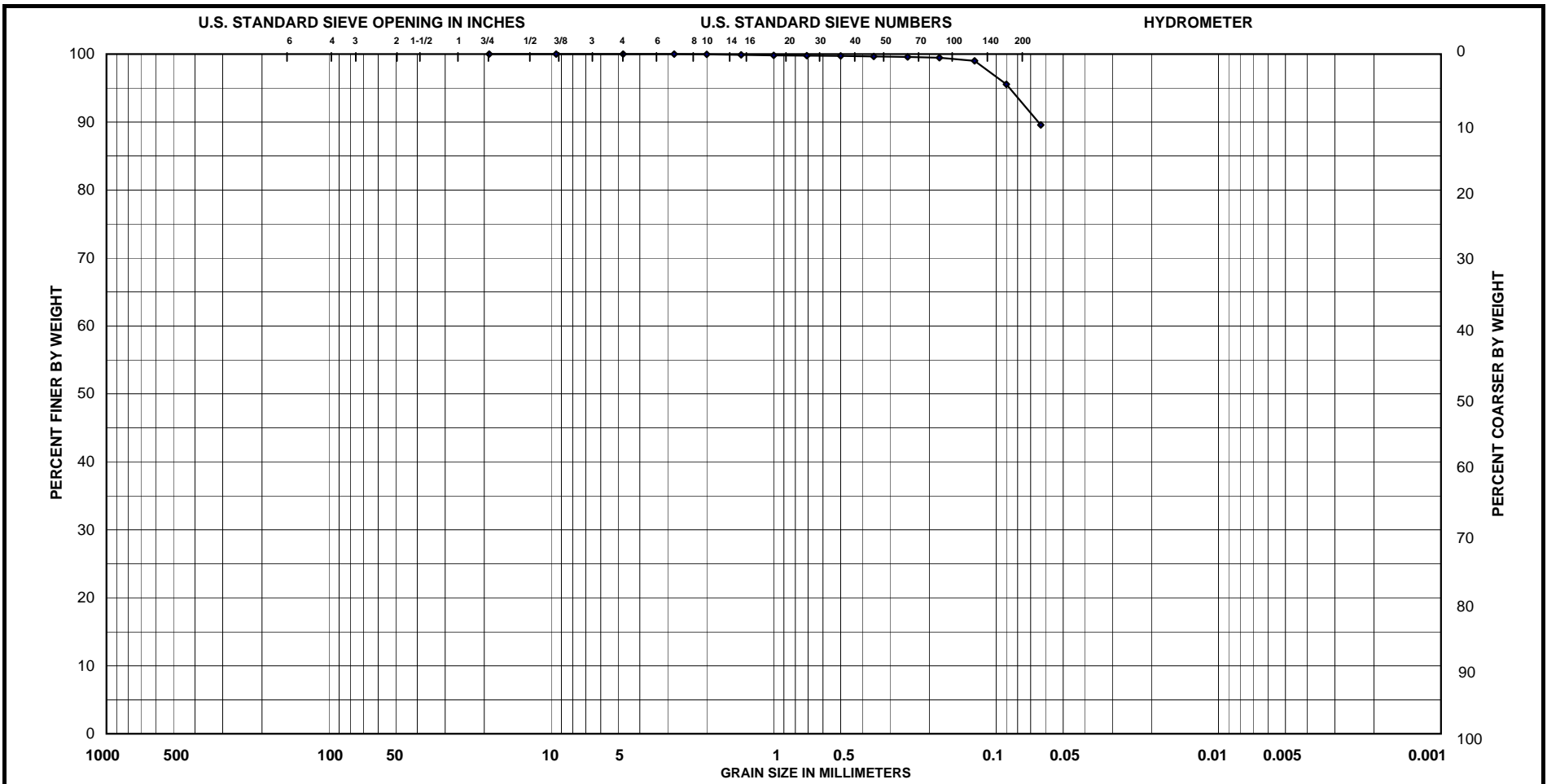
### GRAIN SIZE AND VISUAL SHELL CONTENT

Project:	<b>Topsail Beach, Surf City &amp; North Topsail</b>	Depth:	<b>55.0-55.5</b>
Project No.:	<b>1584-01-40</b>	Date:	<b>9/24/2003</b>
Boring No.:	<b>T1-03-V-170</b>		
Sample No.:	<b>5</b>		
Description:	<b>CLAY, inorganic-H, few fine-grained quartz sand, trace organic matter, very dark greenish gray (CH)</b>		

Tare Weight, (g):	<b>50.38</b>	
Dry Wt. Before Washing (g):	<b>139.14</b>	(with tare)
Dry Weight After Washing (g):	<b>60.39</b>	(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	0	0.00
#14	1.400	0.07	99.90	0	0.00
#18	1.000	0.09	99.80	10	0.01
#25	0.710	0.03	99.76	30	0.01
#35	0.500	0.04	99.72	20	0.01
#45	0.355	0.05	99.66	20	0.01
#60	0.250	0.06	99.59	10	0.01
#80	0.180	0.12	99.46	5	0.01
#120	0.125	0.42	98.99	1	0.00
#170	0.090	3.05	95.55	1	0.03
#230	0.063	5.29	89.59	1	0.05

**Total Shell Content:** **0** %



COBBLES	GRAVEL		SAND			SILT OR CLAY
	COARSE	FINE	COARSE	MEDIUM	FINE	

Sample No.	Elev. Or Depth	Classification	% CO <sub>3</sub>	G <sub>s</sub>	Nat w%	LL	PL	PI	Project
5	55.0-55.5	CLAY, inorganic-H, few fine-grained quartz sand, trace organic matter, very dark greenish gray (CH)	0						Topsail Beach, Surf City & North Topsail
									Area
									Boring No. T1-03-V-170
									Date 9/24/2003

**GRADATION CURVES**



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## VISUAL SHELL CONTENT

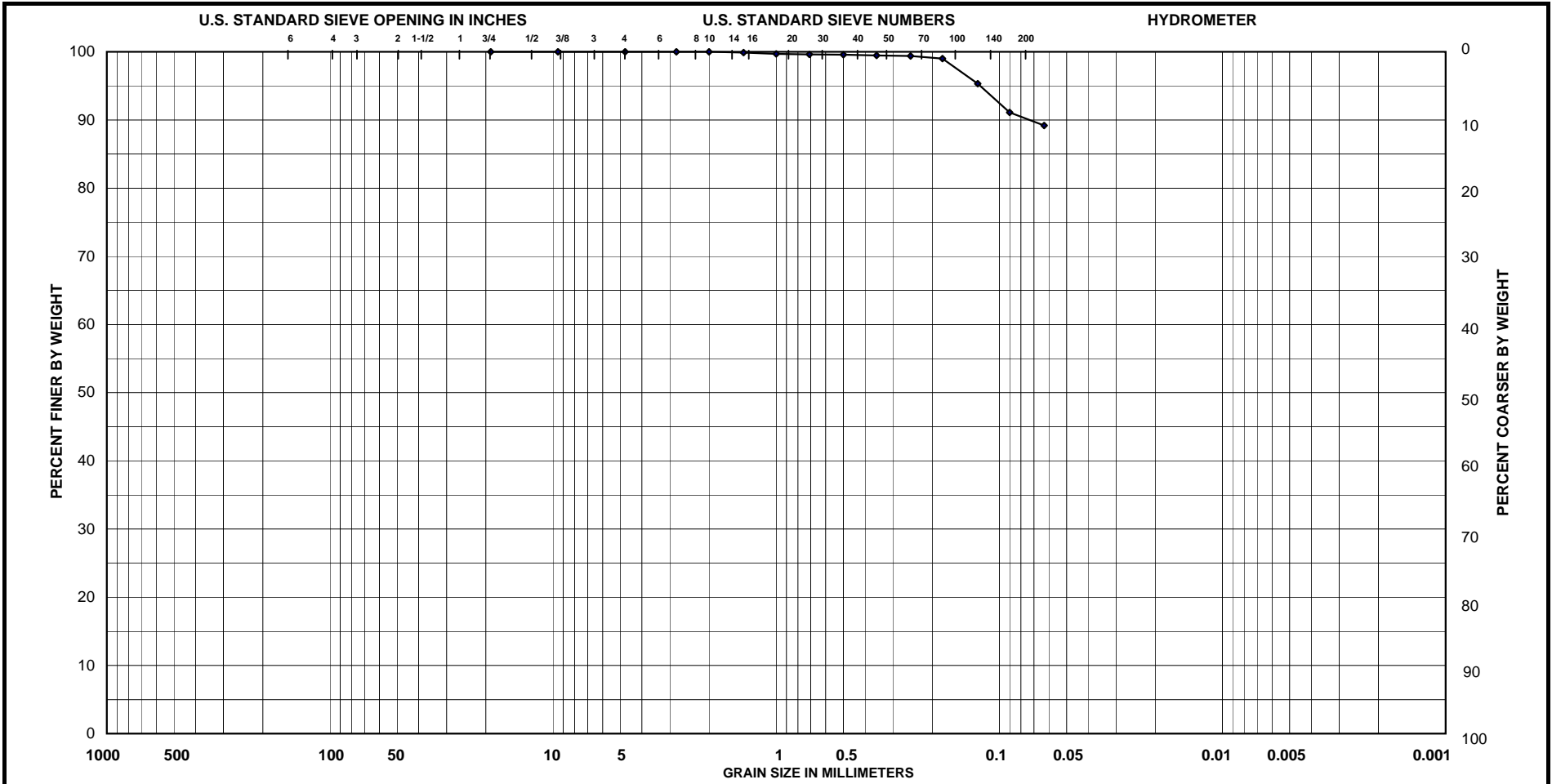
### GRAIN SIZE AND VISUAL SHELL CONTENT

Project:	<b>Topsail Beach, Surf City &amp; North Topsail</b>	Depth:	<b>60.0-60.5</b>
Project No.:	<b>1584-01-40</b>	Date:	<b>9/24/2003</b>
Boring No.:	<b>T1-03-V-170</b>		
Sample No.:	<b>6</b>		
Description:	<b>CLAY, inorganic-H, few fine-grained quartz sand, trace organic matter, black (CH)</b>		

Tare Weight, (g):	<b>50.01</b>	
Dry Wt. Before Washing (g):	<b>129.56</b>	(with tare)
Dry Weight After Washing (g):	<b>58.65</b>	(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	0.01	99.99	0	0.00
#14	1.400	0.07	99.90	0	0.00
#18	1.000	0.15	99.71	5	0.01
#25	0.710	0.08	99.61	10	0.01
#35	0.500	0.04	99.56	10	0.00
#45	0.355	0.07	99.47	5	0.00
#60	0.250	0.07	99.38	1	0.00
#80	0.180	0.29	99.02	1	0.00
#120	0.125	2.93	95.34	1	0.03
#170	0.090	3.36	91.11	1	0.03
#230	0.063	1.54	89.18	1	0.02

**Total Shell Content:** **0** %



COBBLES	GRAVEL		SAND			SILT OR CLAY
	COARSE	FINE	COARSE	MEDIUM	FINE	

Sample No.	Elev. Or Depth	Classification	% CO <sub>3</sub>	G <sub>s</sub>	Nat w%	LL	PL	PI	Project	
6	60.0-60.5	CLAY, inorganic-H, few fine-grained quartz sand, trace organic matter, black (CH)	0						Topsail Beach, Surf City & North Topsail	
									Area	
									Boring No. T1-03-V-170	
									Date 9/24/2003	

**GRADATION CURVES**



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## VISUAL SHELL CONTENT

### GRAIN SIZE AND VISUAL SHELL CONTENT

Project:	<b>Topsail Beach, Surf City &amp; North Topsail</b>	Depth:	<b>42.8-43.3</b>
Project No.:	<b>1584-01-40</b>	Date:	<b>9/24/2003</b>
Boring No.:	<b>T1-03-V-171</b>		
Sample No.:	<b>1</b>		
Description:	<b>SAND, poorly-graded, mostly fine-grained quartz, few carbonate, olive gray (SP)</b>		

Tare Weight, (g):	<b>49.92</b>	
Dry Wt. Before Washing (g):	<b>168.27</b>	(with tare)
Dry Weight After Washing (g):	<b>165.97</b>	(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	3.52	97.03	60	2.11
#4	4.750	1.29	95.94	100	1.29
#7	2.800	2.06	94.20	100	2.06
#10	2.000	1.43	92.99	90	1.29
#14	1.400	1.36	91.84	100	1.36
#18	1.000	0.89	91.09	90	0.80
#25	0.710	0.83	90.38	90	0.75
#35	0.500	1.18	89.39	70	0.83
#45	0.355	2.71	87.10	30	0.81
#60	0.250	5.85	82.15	5	0.29
#80	0.180	36.32	51.47	2	0.73
#120	0.125	46.17	12.45	1	0.46
#170	0.090	10.70	3.41	1	0.11
#230	0.063	1.45	2.19	1	0.01

**Total Shell Content:** **11** %



COBBLES	GRAVEL		SAND			SILT OR CLAY
	COARSE	FINE	COARSE	MEDIUM	FINE	

Sample No.	Elev. Or Depth	Classification	% CO <sub>3</sub>	G <sub>s</sub>	Nat w%	LL	PL	PI	Project	
♦ 1	42.8-43.3	SAND, poorly-graded, mostly fine-grained quartz, few carbonate, olive gray (SP)	11						Topsail Beach, Surf City & North Topsail	
									Area	
									Boring No. T1-03-V-171	
									Date 9/24/2003	

**GRADATION CURVES**





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## VISUAL SHELL CONTENT

### GRAIN SIZE AND VISUAL SHELL CONTENT

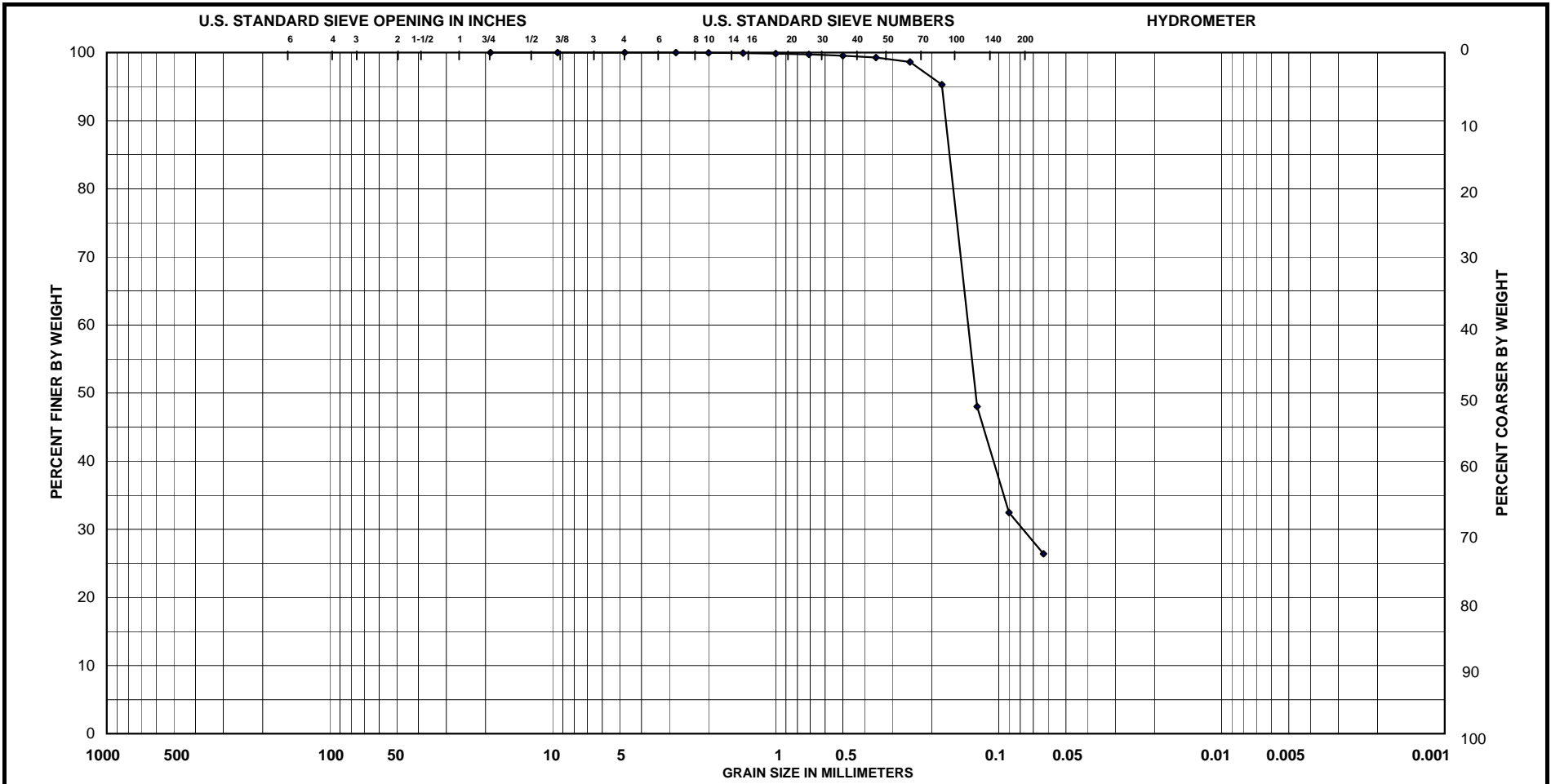
Project:	<b>Topsail Beach, Surf City &amp; North Topsail</b>	Depth:	<b>44.5-45.0</b>
Project No.:	<b>1584-01-40</b>	Date:	<b>9/24/2003</b>
Boring No.:	<b>T1-03-V-171</b>		
Sample No.:	<b>2</b>		
Description:	<b>SAND, silty, mostly fine-grained quartz, little silt, trace carbonate, very dark greenish gray (SM)</b>		

Tare Weight, (g):	<b>49.60</b>	
Dry Wt. Before Washing (g):	<b>166.27</b>	(with tare)
Dry Weight After Washing (g):	<b>136.66</b>	(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	0.04	99.97	25	0.01
#14	1.400	0.07	99.91	30	0.02
#18	1.000	0.09	99.83	30	0.03
#25	0.710	0.10	99.74	10	0.01
#35	0.500	0.23	99.55	10	0.02
#45	0.355	0.33	99.26	10	0.03
#60	0.250	0.74	98.63	10	0.07
#80	0.180	3.91	95.28	5	0.20
#120	0.125	55.14	48.02	1	0.55
#170	0.090	18.16	32.45	1	0.18
#230	0.063	7.06	26.40	1	0.07

**Total Shell Content:**

<b>1</b>	<b>%</b>
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COBBLES	GRAVEL		SAND			SILT OR CLAY
	COARSE	FINE	COARSE	MEDIUM	FINE	

Sample No.	Elev. Or Depth	Classification	% CO <sub>3</sub>	G <sub>s</sub>	Nat w%	LL	PL	PI	Project
♦ 2	44.5-45.0	SAND, silty, mostly fine-grained quartz, little silt, trace carbonate, very dark greenish gray (SM)	1						Topsail Beach, Surf City & North Topsail
									Area
									Boring No. T1-03-V-171
									Date 9/24/2003

**GRADATION CURVES**



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## VISUAL SHELL CONTENT

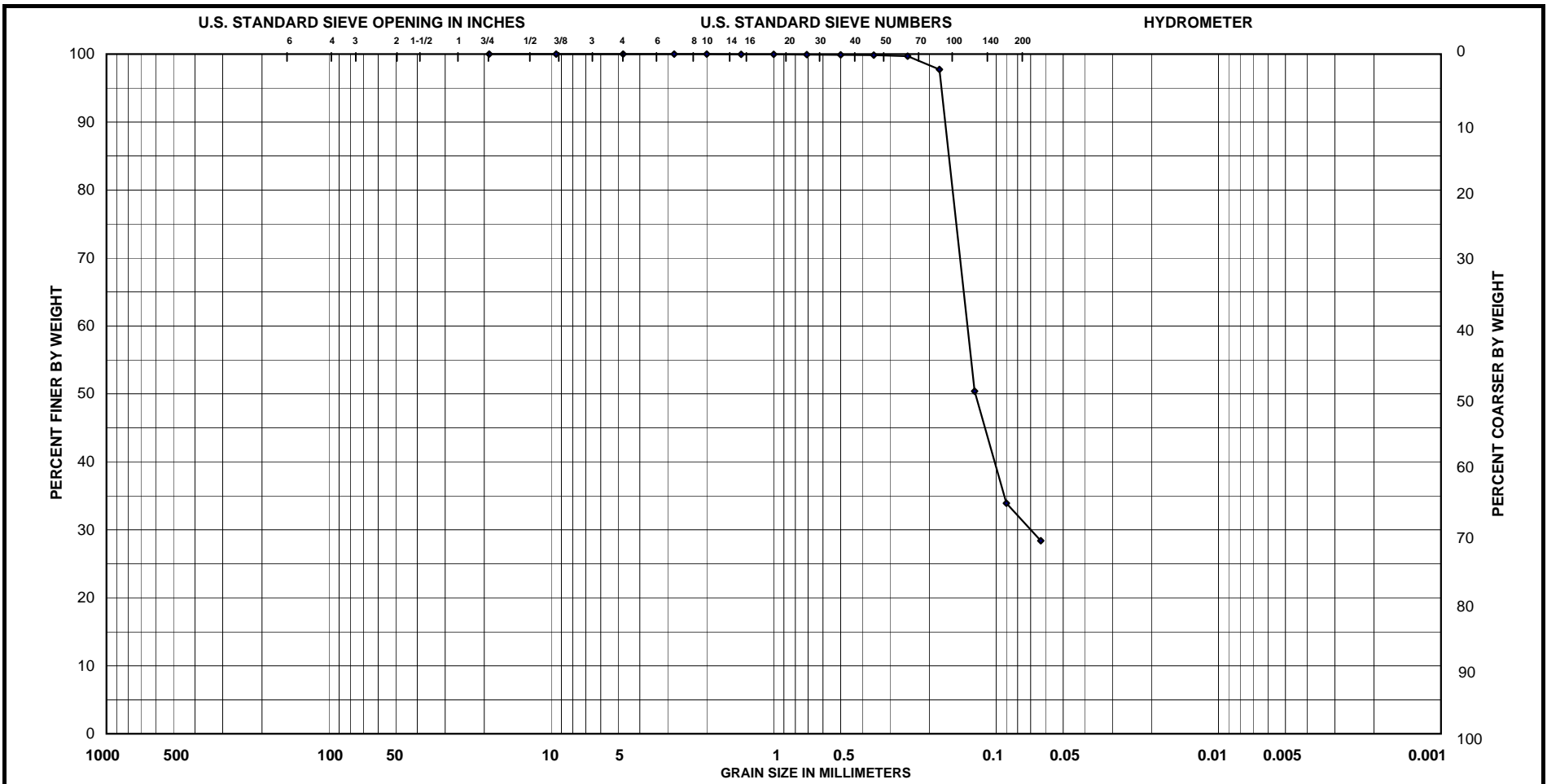
### GRAIN SIZE AND VISUAL SHELL CONTENT

Project:	<b>Topsail Beach, Surf City &amp; North Topsail</b>	Depth:	<b>47.0-47.5</b>
Project No.:	<b>1584-01-40</b>	Date:	<b>9/24/2003</b>
Boring No.:	<b>T1-03-V-171</b>		
Sample No.:	<b>3</b>		
Description:	<b>SAND, silty, mostly fine-grained quartz, some silt, trace carbonate, trace organic matter, very dark greenish gray (SM)</b>		

Tare Weight, (g):	<b>50.23</b>	
Dry Wt. Before Washing (g):	<b>183.71</b>	(with tare)
Dry Weight After Washing (g):	<b>147.24</b>	(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	0.00	100.00	0	0.00
#14	1.400	0.03	99.98	0	0.00
#18	1.000	0.03	99.96	20	0.01
#25	0.710	0.06	99.91	30	0.02
#35	0.500	0.04	99.88	30	0.01
#45	0.355	0.05	99.84	50	0.03
#60	0.250	0.20	99.69	20	0.04
#80	0.180	2.59	97.75	2	0.05
#120	0.125	63.22	50.39	1	0.63
#170	0.090	21.99	33.92	1	0.22
#230	0.063	7.35	28.41	1	0.07

**Total Shell Content:** **1** %



COBBLES	GRAVEL		SAND			SILT OR CLAY
	COARSE	FINE	COARSE	MEDIUM	FINE	

Sample No.	Elev. Or Depth	Classification	% CO <sub>3</sub>	G <sub>s</sub>	Nat w%	LL	PL	PI	Project	
♦ 3	47.0-47.5	SAND, silty, mostly fine-grained quartz, some silt, trace carbonate, trace organic matter, very dark greenish gray (SM)	1						Topsail Beach, Surf City & North Topsail	
			Area							
			Boring No. T1-03-V-171							
			Date 9/24/2003							

**GRADATION CURVES**



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## VISUAL SHELL CONTENT

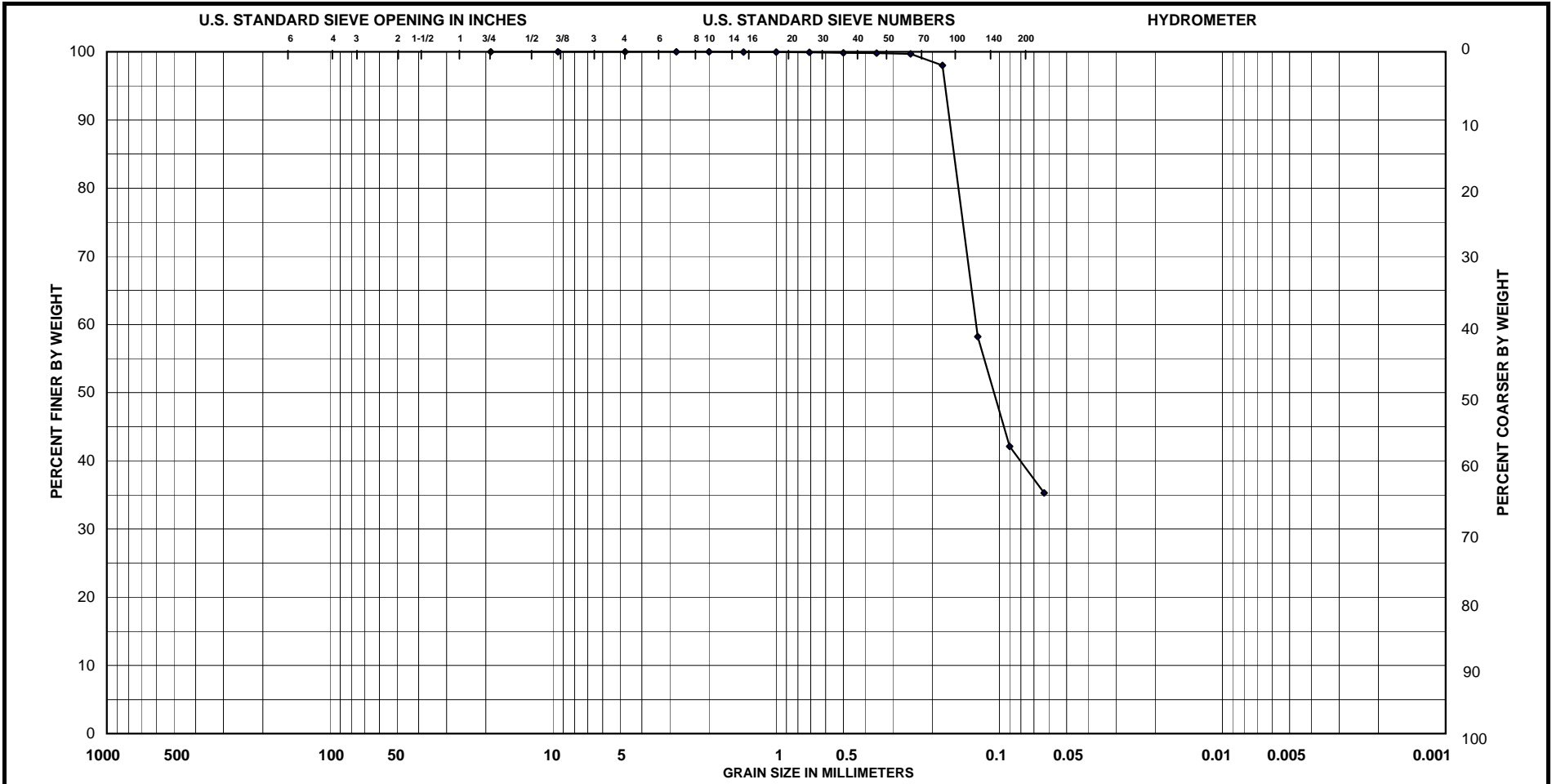
### GRAIN SIZE AND VISUAL SHELL CONTENT

Project:	<b>Topsail Beach, Surf City &amp; North Topsail</b>	Depth:	<b>49.7-50.2</b>
Project No.:	<b>1584-01-40</b>	Date:	<b>9/24/2003</b>
Boring No.:	<b>T1-03-V-171</b>		
Sample No.:	<b>4</b>		
Description:	<b>SAND, silty, mostly fine-grained quartz, some silt, trace carbonate, trace organic matter, dark greenish gray (SM)</b>		

Tare Weight, (g):	<b>50.19</b>	
Dry Wt. Before Washing (g):	<b>161.31</b>	(with tare)
Dry Weight After Washing (g):	<b>123.29</b>	(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	0.00	100.00	0	0.00
#14	1.400	0.03	99.97	10	0.00
#18	1.000	0.03	99.95	10	0.00
#25	0.710	0.03	99.92	40	0.01
#35	0.500	0.06	99.87	30	0.02
#45	0.355	0.06	99.81	30	0.02
#60	0.250	0.11	99.71	30	0.03
#80	0.180	1.89	98.01	5	0.09
#120	0.125	44.20	58.23	1	0.44
#170	0.090	17.91	42.12	1	0.18
#230	0.063	7.56	35.31	1	0.08

**Total Shell Content:** **1** %



COBBLES	GRAVEL		SAND			SILT OR CLAY
	COARSE	FINE	COARSE	MEDIUM	FINE	

Sample No.	Elev. Or Depth	Classification	% CO <sub>3</sub>	G <sub>s</sub>	Nat w%	LL	PL	PI	Project	
4	49.7-50.2	SAND, silty, mostly fine-grained quartz, some silt, trace carbonate, trace organic matter, dark greenish gray (SM)	1						Topsail Beach, Surf City & North Topsail	
									Area	
									Boring No. T1-03-V-171	
									Date 9/24/2003	

**GRADATION CURVES**



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## VISUAL SHELL CONTENT

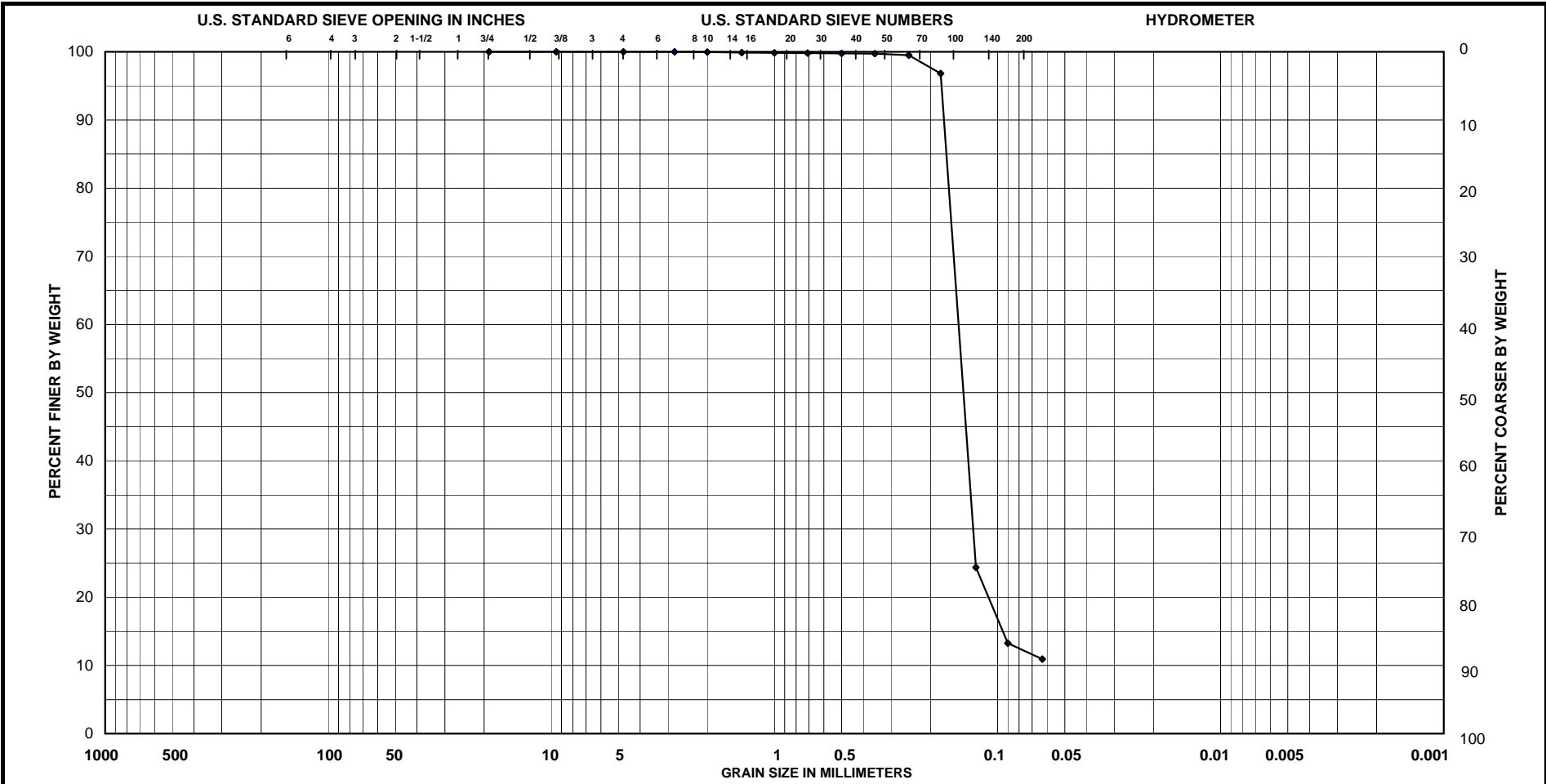
### GRAIN SIZE AND VISUAL SHELL CONTENT

<b>Project:</b>	<b>Topsail Beach, Surf City &amp; North Topsail</b>	<b>Depth:</b>	<b>52.8-53.3</b>
<b>Project No.:</b>	<b>1584-01-40</b>	<b>Date:</b>	<b>9/24/2003</b>
<b>Boring No.:</b>	<b>T1-03-V-171</b>		
<b>Sample No.:</b>	<b>5</b>		
<b>Description:</b>	<b>SAND, poorly-graded with silt, mostly fine-grained quartz, few silt, trace carbonate, trace organic matter, olive gray (SP-SM)</b>		

Tare Weight, (g):	50.29	
Dry Wt. Before Washing (g):	168.47	(with tare)
Dry Weight After Washing (g):	156.43	(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	0.00	100.00	0	0.00
#7	2.800	0.00	100.00	0	0.00
#10	2.000	0.05	99.96	5	0.00
#14	1.400	0.07	99.90	5	0.00
#18	1.000	0.08	99.83	20	0.02
#25	0.710	0.04	99.80	20	0.01
#35	0.500	0.04	99.76	10	0.00
#45	0.355	0.05	99.72	10	0.01
#60	0.250	0.26	99.50	3	0.01
#80	0.180	3.19	96.80	1	0.03
#120	0.125	85.58	24.39	1	0.86
#170	0.090	13.14	13.27	1	0.13
#230	0.063	2.77	10.92	1	0.03

**Total Shell Content:** 1 %



COBBLES	GRAVEL		SAND			SILT OR CLAY
	COARSE	FINE	COARSE	MEDIUM	FINE	

Sample No.	Elev. Or Depth	Classification	% CO <sub>3</sub>	G <sub>s</sub>	Nat w%	LL	PL	PI	Project
♦ 5	52.8-53.3	SAND, poorly-graded with silt, mostly fine-grained quartz, few silt, trace carbonate, trace organic matter, olive gray (SP-SM)	1						Topsail Beach, Surf City & North Topsail
									Area
									Boring No. T1-03-V-171
									Date 9/24/2003

**GRADATION CURVES**





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## VISUAL SHELL CONTENT

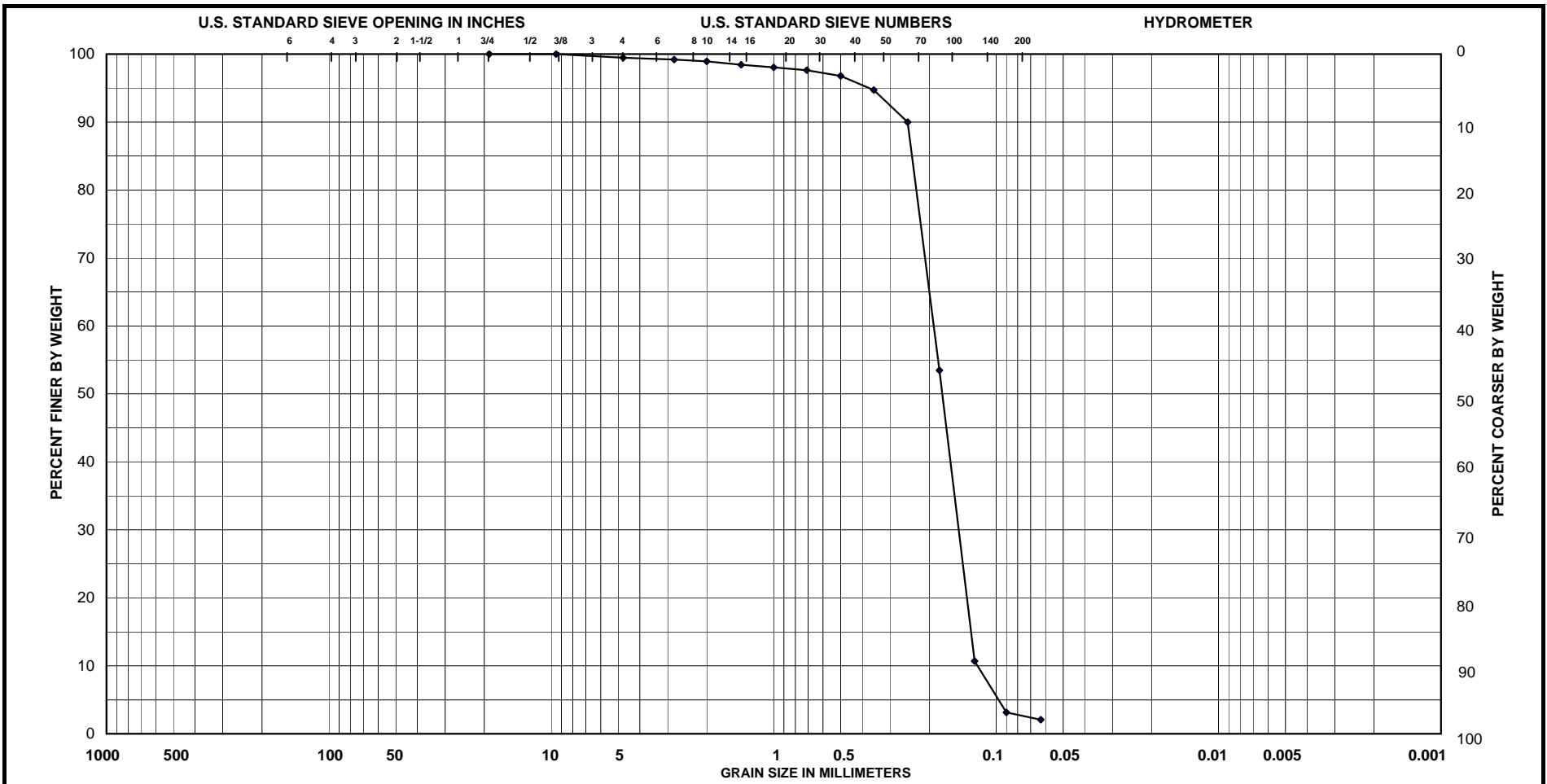
### GRAIN SIZE AND VISUAL SHELL CONTENT

Project:	<b>Topsail Beach, Surf City &amp; North Topsail</b>	Depth:	<b>44.4-44.9</b>
Project No.:	<b>1584-01-40</b>	Date:	<b>9/24/2003</b>
Boring No.:	<b>T1-03-V-172</b>		
Sample No.:	<b>1</b>		
Description:	<b>SAND, poorly-graded, mostly fine-grained quartz, trace carbonate, olive gray (SP)</b>		

Tare Weight, (g):	<b>50.04</b>	
Dry Wt. Before Washing (g):	<b>174.21</b>	(with tare)
Dry Weight After Washing (g):	<b>171.99</b>	(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	0.69	99.44	100	0.69
#7	2.800	0.32	99.19	90	0.29
#10	2.000	0.33	98.92	100	0.33
#14	1.400	0.59	98.45	90	0.53
#18	1.000	0.49	98.05	90	0.44
#25	0.710	0.52	97.63	90	0.47
#35	0.500	1.05	96.79	50	0.53
#45	0.355	2.58	94.71	20	0.52
#60	0.250	5.85	90.00	10	0.59
#80	0.180	45.37	53.46	1	0.45
#120	0.125	53.08	10.71	1	0.53
#170	0.090	9.42	3.12	1	0.09
#230	0.063	1.31	2.07	1	0.01

**Total Shell Content:** **4** %



COBBLES	GRAVEL		SAND			SILT OR CLAY
	COARSE	FINE	COARSE	MEDIUM	FINE	

Sample No.	Elev. Or Depth	Classification	% CO <sub>3</sub>	G <sub>s</sub>	Nat w%	LL	PL	PI	Project
♦ 1	44.4-44.9	SAND, poorly-graded, mostly fine-grained quartz, trace carbonate, olive gray (SP)	4						Topsail Beach, Surf City & North Topsail
									Area
									Boring No. T1-03-V-172
									Date 9/24/2003

**GRADATION CURVES**



# WOLF TECHNOLOGIES, INC.

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## VISUAL SHELL CONTENT

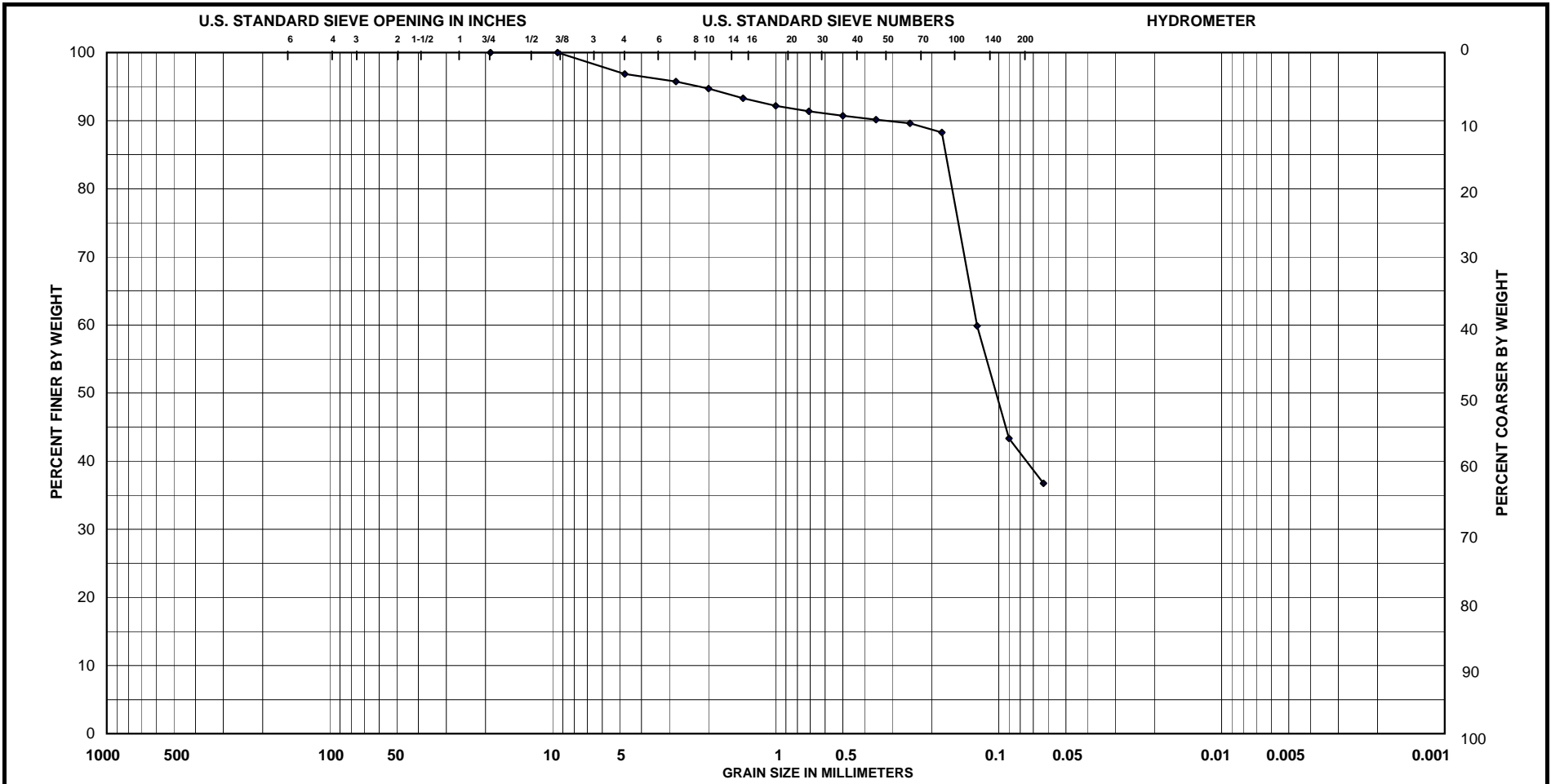
### GRAIN SIZE AND VISUAL SHELL CONTENT

Project:	<b>Topsail Beach, Surf City &amp; North Topsail</b>	Depth:	<b>45.4-45.9</b>
Project No.:	<b>1584-01-40</b>	Date:	<b>9/24/2003</b>
Boring No.:	<b>T1-03-V-172</b>		
Sample No.:	<b>2</b>		
Description:	<b>SAND, clayey, mostly fine-grained quartz, some clay, few carbonate, dark greenish gray (SC)</b>		

Tare Weight, (g):	<b>49.35</b>	
Dry Wt. Before Washing (g):	<b>159.43</b>	(with tare)
Dry Weight After Washing (g):	<b>120.25</b>	(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	3.44	96.88	100	3.44
#7	2.800	1.23	95.76	100	1.23
#10	2.000	1.15	94.71	100	1.15
#14	1.400	1.58	93.28	100	1.58
#18	1.000	1.20	92.19	90	1.08
#25	0.710	0.90	91.37	80	0.72
#35	0.500	0.73	90.71	50	0.37
#45	0.355	0.60	90.16	40	0.24
#60	0.250	0.60	89.62	20	0.12
#80	0.180	1.46	88.29	20	0.29
#120	0.125	31.28	59.87	2	0.63
#170	0.090	18.21	43.33	1	0.18
#230	0.063	7.25	36.75	1	0.07

**Total Shell Content:** **10** %



COBBLES	GRAVEL		SAND			SILT OR CLAY
	COARSE	FINE	COARSE	MEDIUM	FINE	

Sample No.	Elev. Or Depth	Classification	% CO <sub>3</sub>	G <sub>s</sub>	Nat w%	LL	PL	PI	Project	
♦ 2	45.4-45.9	SAND, clayey, mostly fine-grained quartz, some clay, few carbonate, dark greenish gray (SC)	10						Topsail Beach, Surf City & North Topsail	
									Area	
									Boring No. T1-03-V-172	
									Date 9/24/2003	

**GRADATION CURVES**



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## VISUAL SHELL CONTENT

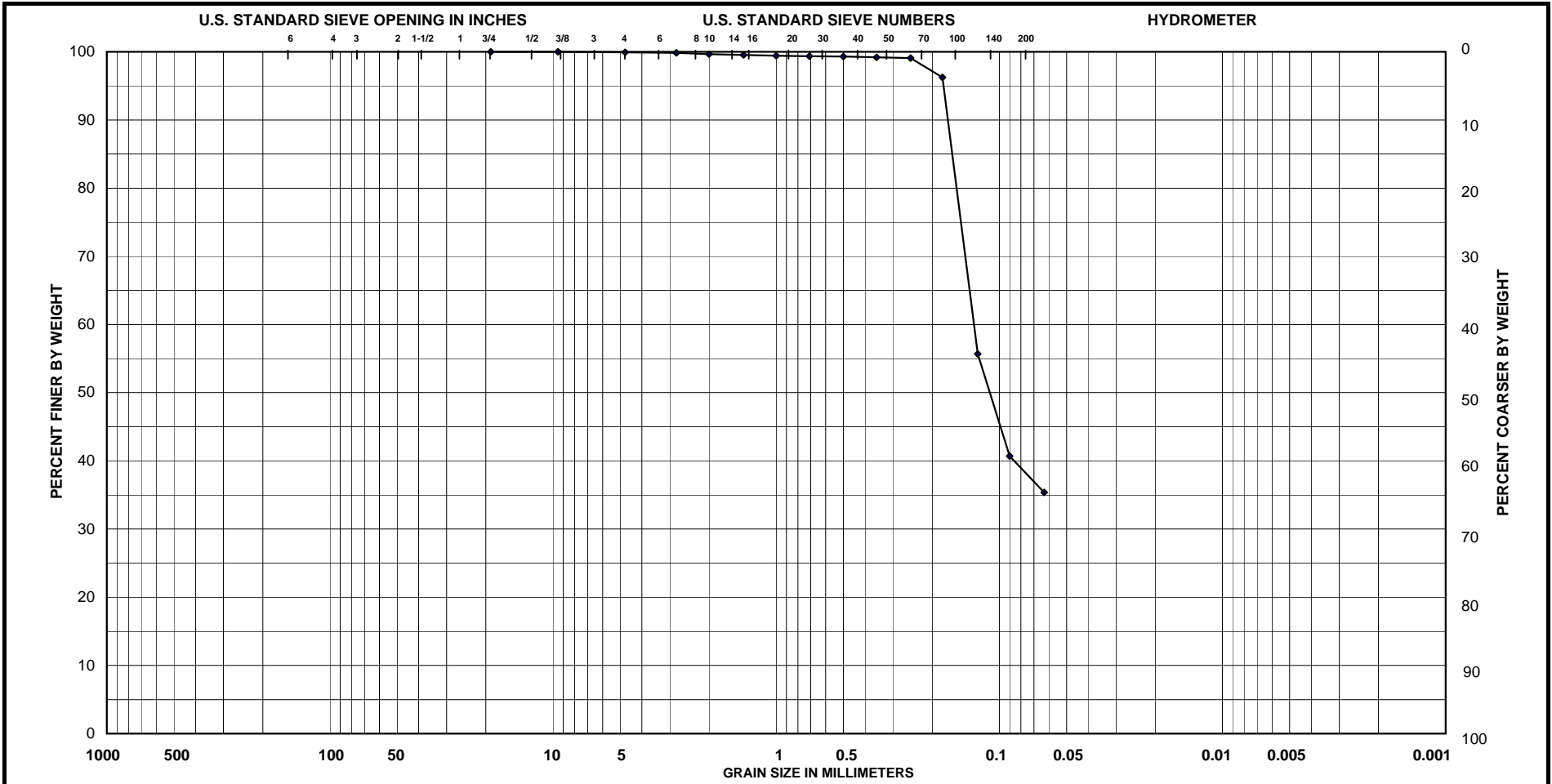
### GRAIN SIZE AND VISUAL SHELL CONTENT

Project:	<b>Topsail Beach, Surf City &amp; North Topsail</b>	Depth:	<b>47.0-47.5</b>
Project No.:	<b>1584-01-40</b>	Date:	<b>9/24/2003</b>
Boring No.:	<b>T1-03-V-172</b>		
Sample No.:	<b>3</b>		
Description:	<b>SAND, clayey, mostly fine-grained quartz, some clay, trace carbonate, trace organic matter, dark greenish gray (SC)</b>		

Tare Weight, (g):	<b>50.11</b>	
Dry Wt. Before Washing (g):	<b>158.55</b>	(with tare)
Dry Weight After Washing (g):	<b>120.92</b>	(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	0.09	99.92	100	0.09
#7	2.800	0.08	99.84	100	0.08
#10	2.000	0.21	99.65	90	0.19
#14	1.400	0.12	99.54	100	0.12
#18	1.000	0.13	99.42	90	0.12
#25	0.710	0.06	99.36	100	0.06
#35	0.500	0.06	99.31	80	0.05
#45	0.355	0.11	99.21	80	0.09
#60	0.250	0.15	99.07	50	0.08
#80	0.180	3.06	96.25	5	0.15
#120	0.125	43.99	55.68	1	0.44
#170	0.090	16.24	40.70	1	0.16
#230	0.063	5.76	35.39	1	0.06

**Total Shell Content:** **2** %



COBBLES	GRAVEL		SAND			SILT OR CLAY
	COARSE	FINE	COARSE	MEDIUM	FINE	

Sample No.	Elev. Or Depth	Classification	% CO <sub>3</sub>	G <sub>s</sub>	Nat w%	LL	PL	PI	Project	
3	47.0-47.5	SAND, clayey, mostly fine-grained quartz, some clay, trace carbonate, trace organic matter, dark greenish gray (SC)	2						Topsail Beach, Surf City & North Topsail	
									Area	
									Boring No. T1-03-V-172	
									Date 9/24/2003	

**GRADATION CURVES**



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## VISUAL SHELL CONTENT

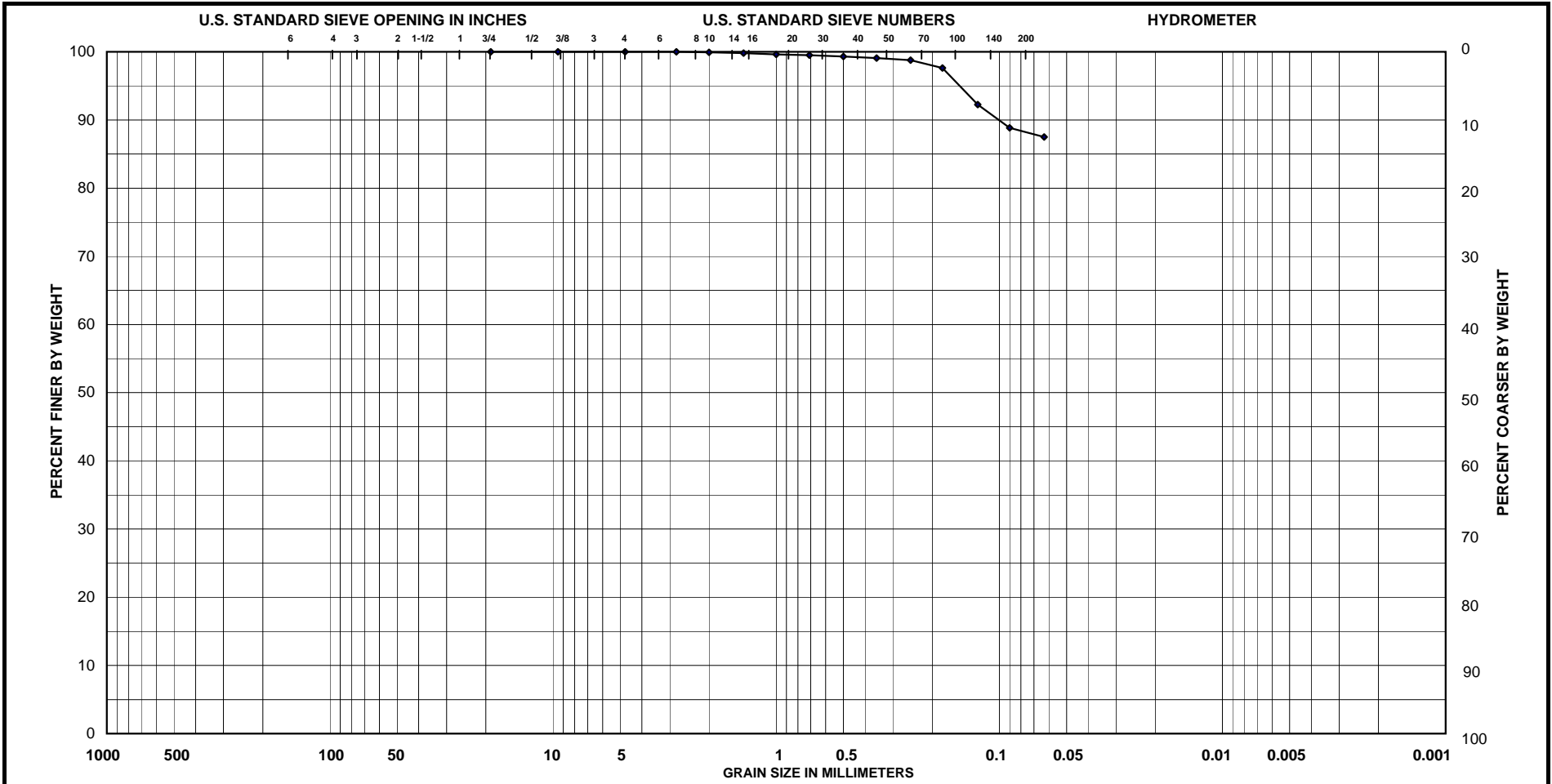
### GRAIN SIZE AND VISUAL SHELL CONTENT

Project:	<b>Topsail Beach, Surf City &amp; North Topsail</b>	Depth:	<b>51.9-52.4</b>
Project No.:	<b>1584-01-40</b>	Date:	<b>9/24/2003</b>
Boring No.:	<b>T1-03-V-172</b>		
Sample No.:	<b>4</b>		
Description:	<b>CLAY, inorganic-H, few fine-grained quartz sand, trace organic matter, black (CH)</b>		

Tare Weight, (g):	<b>50.18</b>	
Dry Wt. Before Washing (g):	<b>112.44</b>	(with tare)
Dry Weight After Washing (g):	<b>58.29</b>	(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	0.05	99.92	20	0.01
#14	1.400	0.07	99.81	0	0.00
#18	1.000	0.12	99.61	5	0.01
#25	0.710	0.07	99.50	5	0.00
#35	0.500	0.12	99.31	5	0.01
#45	0.355	0.15	99.07	10	0.02
#60	0.250	0.19	98.76	5	0.01
#80	0.180	0.72	97.61	1	0.01
#120	0.125	3.33	92.26	1	0.03
#170	0.090	2.13	88.84	1	0.02
#230	0.063	0.82	87.52	1	0.01

**Total Shell Content:** **0** %



COBBLES	GRAVEL		SAND			SILT OR CLAY
	COARSE	FINE	COARSE	MEDIUM	FINE	

Sample No.	Elev. Or Depth	Classification	% CO <sub>3</sub>	G <sub>s</sub>	Nat w%	LL	PL	PI	Project
4	51.9-52.4	CLAY, inorganic-H, few fine-grained quartz sand, trace organic matter, black (CH)	0						Topsail Beach, Surf City & North Topsail
									Area
									Boring No. T1-03-V-172
									Date 9/24/2003

**GRADATION CURVES**





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## VISUAL SHELL CONTENT

### GRAIN SIZE AND VISUAL SHELL CONTENT

Project:	<b>Topsail Beach, Surf City &amp; North Topsail</b>	Depth:	<b>55.0-55.5</b>
Project No.:	<b>1584-01-40</b>	Date:	<b>9/24/2003</b>
Boring No.:	<b>T1-03-V-172</b>		
Sample No.:	<b>5</b>		
Description:	<b>CLAY, inorganic-H, few fine-grained quartz sand, trace organic matter, greenish black (CH)</b>		

Tare Weight, (g):	<b>50.05</b>	
Dry Wt. Before Washing (g):	<b>115.63</b>	(with tare)
Dry Weight After Washing (g):	<b>55.24</b>	(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	99.98	0	0.00
#10	2.000	0.02	99.95	0	0.00
#14	1.400	0.04	99.89	0	0.00
#18	1.000	0.05	99.82	0	0.00
#25	0.710	0.08	99.70	5	0.00
#35	0.500	0.20	99.39	5	0.01
#45	0.355	0.39	98.80	5	0.02
#60	0.250	0.34	98.28	5	0.02
#80	0.180	0.37	97.71	1	0.00
#120	0.125	1.34	95.67	1	0.01
#170	0.090	1.15	93.92	1	0.01
#230	0.063	0.83	92.65	1	0.01

**Total Shell Content:** **0** %





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## VISUAL SHELL CONTENT

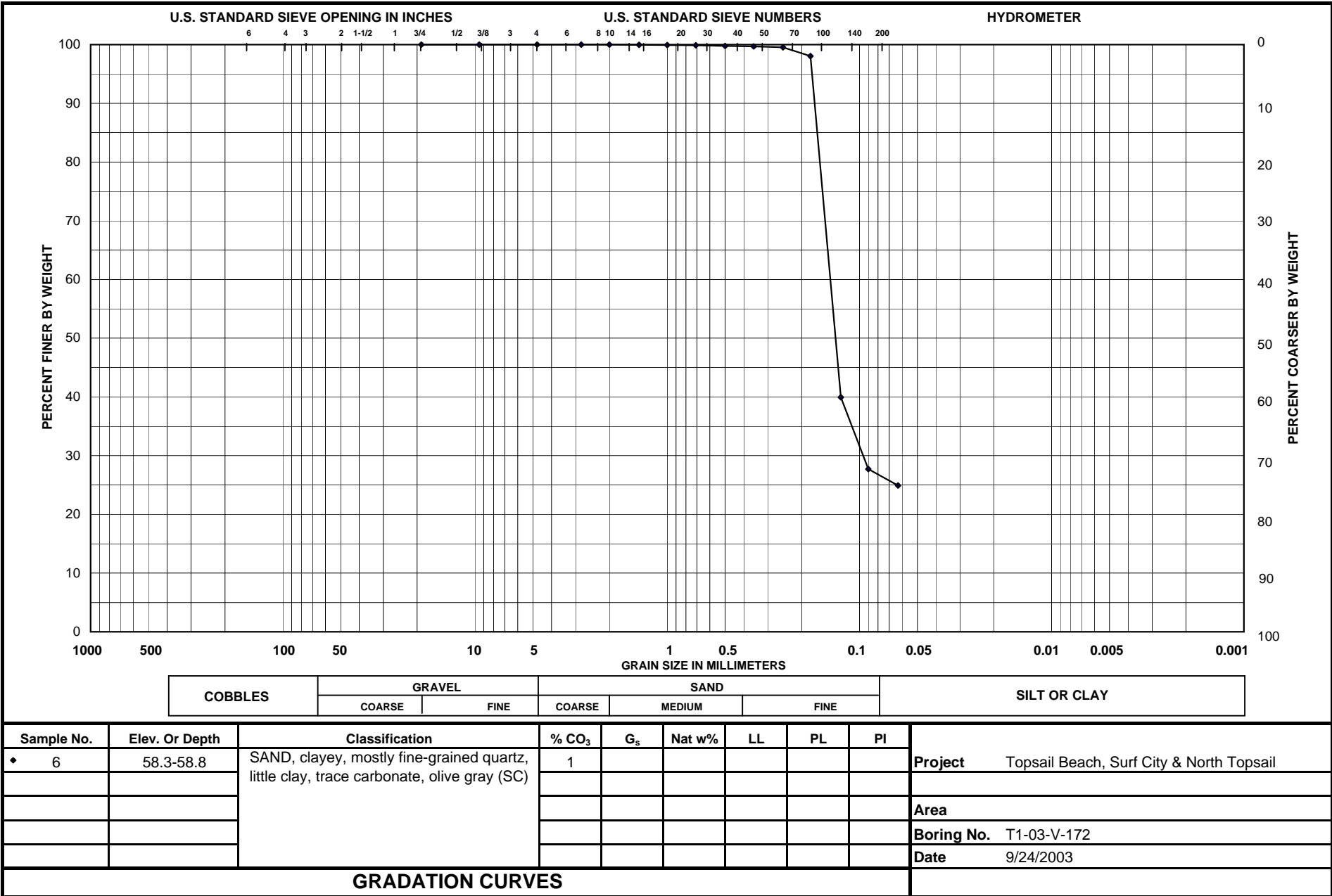
### GRAIN SIZE AND VISUAL SHELL CONTENT

Project:	<b>Topsail Beach, Surf City &amp; North Topsail</b>	Depth:	<b>58.3-58.8</b>
Project No.:	<b>1584-01-40</b>	Date:	<b>9/24/2003</b>
Boring No.:	<b>T1-03-V-172</b>		
Sample No.:	<b>6</b>		
Description:	<b>SAND, clayey, mostly fine-grained quartz, little clay, trace carbonate, olive gray (SC)</b>		

Tare Weight, (g):	<b>50.34</b>	
Dry Wt. Before Washing (g):	<b>163.59</b>	(with tare)
Dry Weight After Washing (g):	<b>135.77</b>	(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	0.00	100.00	0	0.00
#14	1.400	0.06	99.95	5	0.00
#18	1.000	0.03	99.92	0	0.00
#25	0.710	0.06	99.87	30	0.02
#35	0.500	0.09	99.79	5	0.00
#45	0.355	0.12	99.68	5	0.01
#60	0.250	0.18	99.52	5	0.01
#80	0.180	1.68	98.04	1	0.02
#120	0.125	65.79	39.95	1	0.66
#170	0.090	13.84	27.73	1	0.14
#230	0.063	3.19	24.91	1	0.03

**Total Shell Content:** **1** %



COBBLES	GRAVEL		SAND			SILT OR CLAY
	COARSE	FINE	COARSE	MEDIUM	FINE	

Sample No.	Elev. Or Depth	Classification	% CO <sub>3</sub>	G <sub>s</sub>	Nat w%	LL	PL	PI	Project
6	58.3-58.8	SAND, clayey, mostly fine-grained quartz, little clay, trace carbonate, olive gray (SC)	1						Topsail Beach, Surf City & North Topsail
									Area
									Boring No. T1-03-V-172
									Date 9/24/2003

**GRADATION CURVES**



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## VISUAL SHELL CONTENT

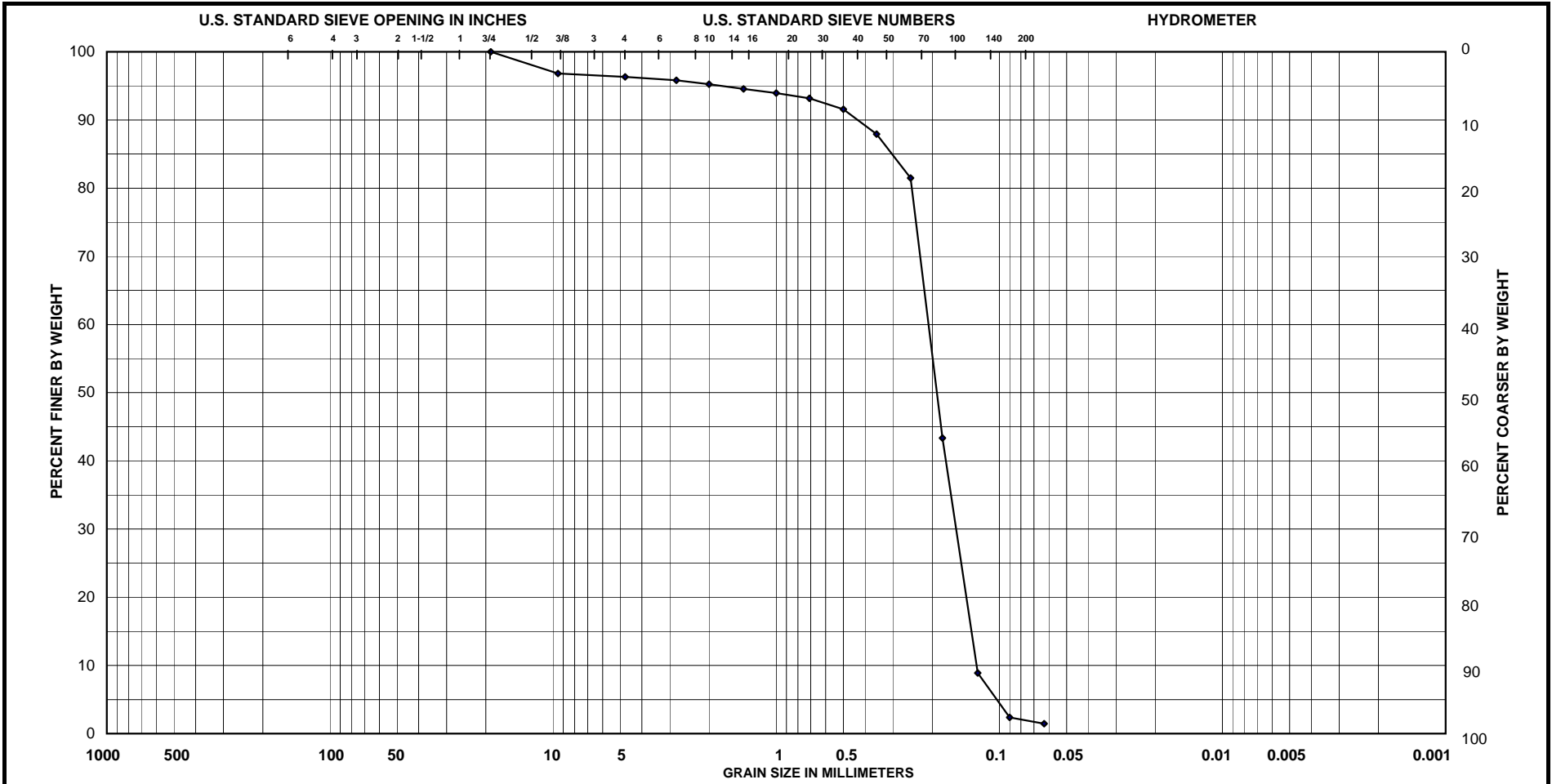
### GRAIN SIZE AND VISUAL SHELL CONTENT

Project:	<b>Topsail Beach, Surf City &amp; North Topsail</b>	Depth:	<b>44.2-44.7</b>
Project No.:	<b>1584-01-40</b>	Date:	<b>9/24/2003</b>
Boring No.:	<b>T1-03-V-173</b>		
Sample No.:	<b>1</b>		
Description:	<b>SAND, poorly-graded, mostly fine-grained quartz, few carbonate, olive gray (SP)</b>		

Tare Weight, (g):	<b>49.44</b>	
Dry Wt. Before Washing (g):	<b>176.41</b>	(with tare)
Dry Weight After Washing (g):	<b>174.68</b>	(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	4.03	96.83	100	4.03
#4	4.750	0.62	96.34	100	0.62
#7	2.800	0.65	95.83	100	0.65
#10	2.000	0.72	95.26	100	0.72
#14	1.400	0.89	94.56	100	0.89
#18	1.000	0.79	93.94	100	0.79
#25	0.710	0.96	93.18	80	0.77
#35	0.500	2.06	91.56	30	0.62
#45	0.355	4.62	87.92	10	0.46
#60	0.250	8.15	81.50	5	0.41
#80	0.180	48.46	43.33	1	0.48
#120	0.125	43.74	8.88	1	0.44
#170	0.090	8.25	2.39	1	0.08
#230	0.063	1.16	1.47	1	0.01

**Total Shell Content:** **9** %



COBBLES	GRAVEL		SAND			SILT OR CLAY
	COARSE	FINE	COARSE	MEDIUM	FINE	

Sample No.	Elev. Or Depth	Classification	% CO <sub>3</sub>	G <sub>s</sub>	Nat w%	LL	PL	PI	Project	
♦ 1	44.2-44.7	SAND, poorly-graded, mostly fine-grained quartz, few carbonate, olive gray (SP)	9						Topsail Beach, Surf City & North Topsail	
									Area	
									Boring No. T1-03-V-173	
									Date 9/24/2003	

**GRADATION CURVES**



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## VISUAL SHELL CONTENT

### GRAIN SIZE AND VISUAL SHELL CONTENT

Project:	<b>Topsail Beach, Surf City &amp; North Topsail</b>	Depth:	<b>45.4-45.9</b>
Project No.:	<b>1584-01-40</b>	Date:	<b>9/24/2003</b>
Boring No.:	<b>T1-03-V-173</b>		
Sample No.:	<b>2</b>		
Description:	<b>CLAY, inorganic-H, some fine-grained quartz sand, trace organic matter, very dark greenish gray (CH)</b>		

Tare Weight, (g):	<b>50.05</b>	
Dry Wt. Before Washing (g):	<b>158.23</b>	(with tare)
Dry Weight After Washing (g):	<b>92.24</b>	(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	40	0.01
#14	1.400	0.11	99.88	20	0.02
#18	1.000	0.06	99.82	20	0.01
#25	0.710	0.03	99.80	30	0.01
#35	0.500	0.03	99.77	30	0.01
#45	0.355	0.06	99.71	30	0.02
#60	0.250	0.13	99.59	20	0.03
#80	0.180	0.44	99.19	5	0.02
#120	0.125	3.41	96.03	1	0.03
#170	0.090	18.50	78.93	1	0.19
#230	0.063	15.66	64.46	1	0.16

**Total Shell Content:** **0** %



COBBLES	GRAVEL		SAND			SILT OR CLAY
	COARSE	FINE	COARSE	MEDIUM	FINE	

Sample No.	Elev. Or Depth	Classification	% CO <sub>3</sub>	G <sub>s</sub>	Nat w%	LL	PL	PI	Project
♦ 2	45.4-45.9	CLAY, inorganic-H, some fine-grained quartz sand, trace organic matter, very dark greenish gray (CH)	0						Topsail Beach, Surf City & North Topsail
									Area
									Boring No. T1-03-V-173
									Date 9/24/2003

**GRADATION CURVES**





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## VISUAL SHELL CONTENT

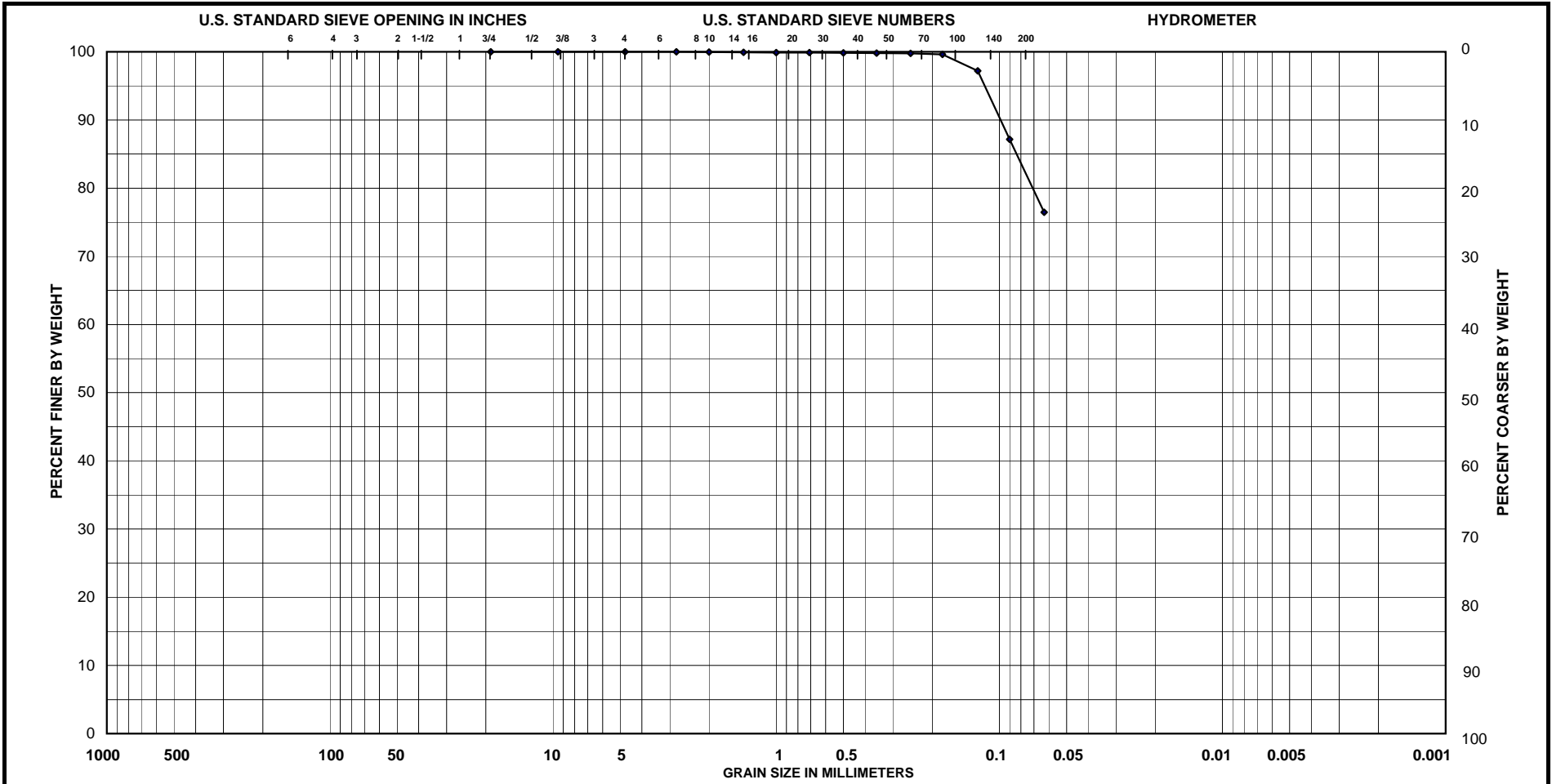
### GRAIN SIZE AND VISUAL SHELL CONTENT

<b>Project:</b>	<b>Topsail Beach, Surf City &amp; North Topsail</b>	<b>Depth:</b>	<b>48.0-48.5</b>
<b>Project No.:</b>	<b>1584-01-40</b>	<b>Date:</b>	<b>9/24/2003</b>
<b>Boring No.:</b>	<b>T1-03-V-173</b>		
<b>Sample No.:</b>	<b>3</b>		
<b>Description:</b>	<b>CLAY, inorganic-H, little fine-grained quartz sand, trace organic matter, very dark greenish gray (CH)</b>		

Tare Weight, (g):	50.56	
Dry Wt. Before Washing (g):	152.12	(with tare)
Dry Weight After Washing (g):	75.91	(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	0.03	99.97	0	0.00
#14	1.400	0.05	99.92	0	0.00
#18	1.000	0.02	99.90	10	0.00
#25	0.710	0.02	99.88	0	0.00
#35	0.500	0.02	99.86	20	0.00
#45	0.355	0.04	99.82	20	0.01
#60	0.250	0.06	99.76	20	0.01
#80	0.180	0.13	99.64	10	0.01
#120	0.125	2.49	97.18	5	0.12
#170	0.090	10.19	87.15	1	0.10
#230	0.063	10.87	76.45	1	0.11

**Total Shell Content:** 0 %



COBBLES	GRAVEL		SAND			SILT OR CLAY
	COARSE	FINE	COARSE	MEDIUM	FINE	

Sample No.	Elev. Or Depth	Classification	% CO <sub>3</sub>	G <sub>s</sub>	Nat w%	LL	PL	PI	Project
3	48.0-48.5	CLAY, inorganic-H, little fine-grained quartz sand, trace organic matter, very dark greenish gray (CH)	0						Topsail Beach, Surf City & North Topsail
									Area
									Boring No. T1-03-V-173
									Date 9/24/2003

**GRADATION CURVES**



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## VISUAL SHELL CONTENT

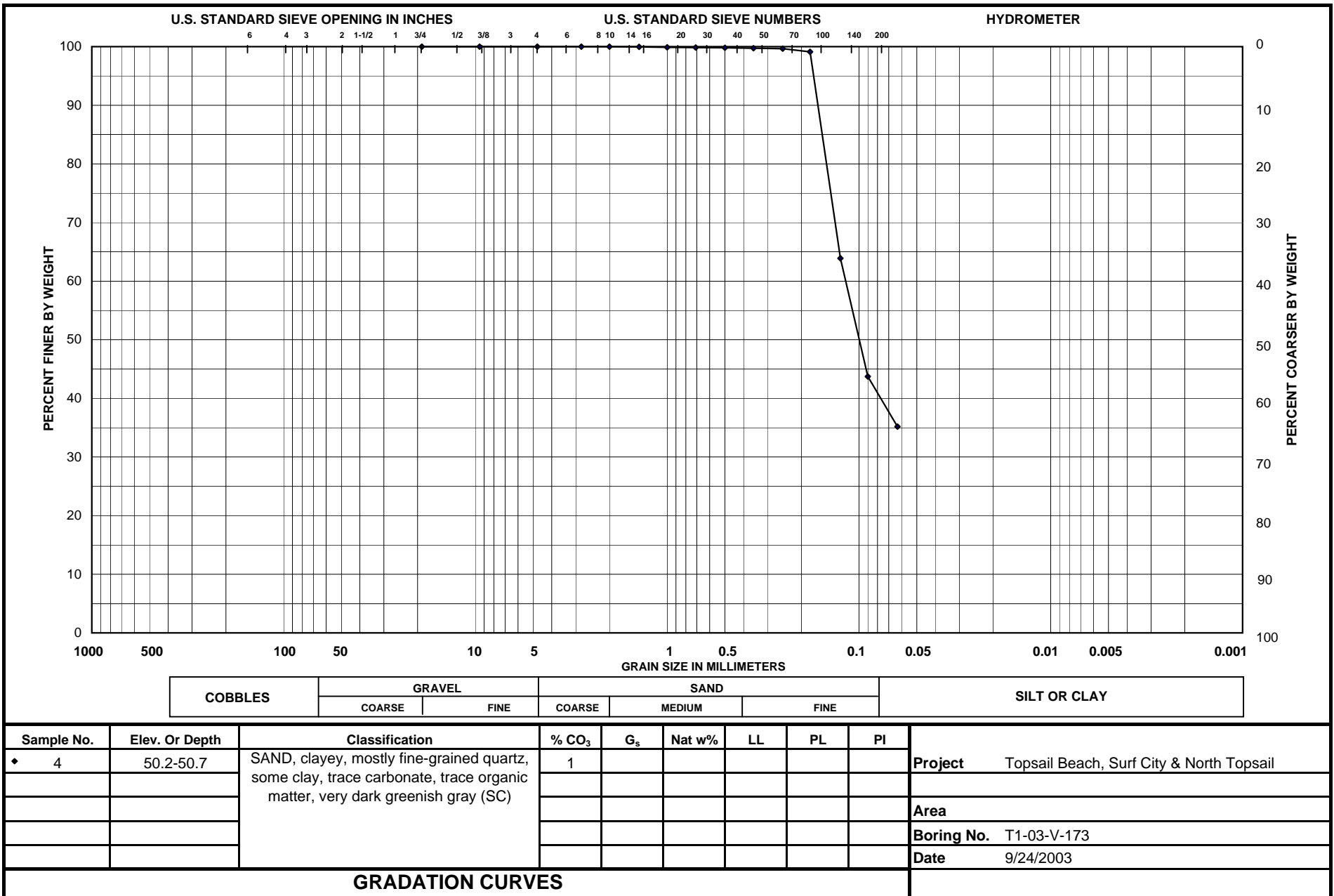
### GRAIN SIZE AND VISUAL SHELL CONTENT

Project:	<b>Topsail Beach, Surf City &amp; North Topsail</b>	Depth:	<b>50.2-50.7</b>
Project No.:	<b>1584-01-40</b>	Date:	<b>9/24/2003</b>
Boring No.:	<b>T1-03-V-173</b>		
Sample No.:	<b>4</b>		
Description:	<b>SAND, clayey, mostly fine-grained quartz, some clay, trace carbonate, trace organic matter, very dark greenish gray (SC)</b>		

Tare Weight, (g):	<b>49.81</b>	
Dry Wt. Before Washing (g):	<b>174.2</b>	(with tare)
Dry Weight After Washing (g):	<b>133.01</b>	(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	30	0.01
#14	1.400	0.05	99.94	10	0.01
#18	1.000	0.07	99.89	30	0.02
#25	0.710	0.04	99.86	71	0.03
#35	0.500	0.06	99.81	70	0.04
#45	0.355	0.07	99.75	71	0.05
#60	0.250	0.10	99.67	60	0.06
#80	0.180	0.67	99.13	20	0.13
#120	0.125	43.83	63.90	1	0.44
#170	0.090	25.06	43.75	1	0.25
#230	0.063	10.66	35.18	1	0.11

**Total Shell Content:** **1** %



**GRADATION CURVES**



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## VISUAL SHELL CONTENT

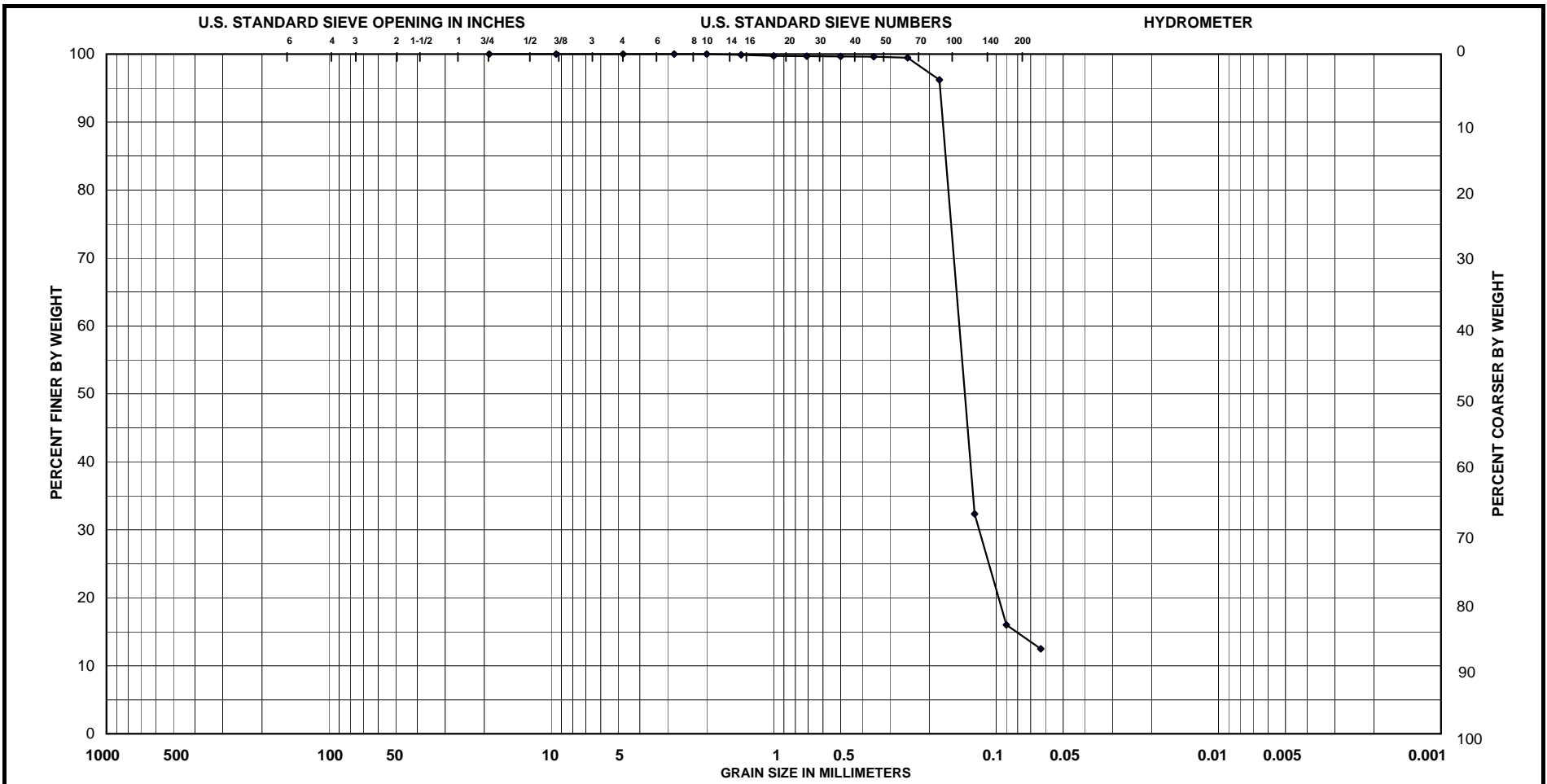
### GRAIN SIZE AND VISUAL SHELL CONTENT

Project:	<b>Topsail Beach, Surf City &amp; North Topsail</b>	Depth:	<b>53.2-53.7</b>
Project No.:	<b>1584-01-40</b>	Date:	<b>9/24/2003</b>
Boring No.:	<b>T1-03-V-173</b>		
Sample No.:	<b>5</b>		
Description:	<b>SAND, poorly-graded with silt, mostly fine-grained quartz, few silt, trace carbonate, trace organic matter, dark greenish gray (SP-SM)</b>		

Tare Weight, (g):	<b>50.58</b>	
Dry Wt. Before Washing (g):	<b>170.13</b>	(with tare)
Dry Weight After Washing (g):	<b>155.48</b>	(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	0.00	100.00	0	0.00
#14	1.400	0.15	99.87	0	0.00
#18	1.000	0.18	99.72	20	0.04
#25	0.710	0.05	99.68	40	0.02
#35	0.500	0.05	99.64	40	0.02
#45	0.355	0.05	99.60	50	0.03
#60	0.250	0.14	99.48	50	0.07
#80	0.180	3.90	96.22	5	0.20
#120	0.125	76.35	32.35	1	0.76
#170	0.090	19.52	16.03	1	0.20
#230	0.063	4.23	12.49	1	0.04

**Total Shell Content:** **1** %



COBBLES	GRAVEL		SAND			SILT OR CLAY
	COARSE	FINE	COARSE	MEDIUM	FINE	

Sample No.	Elev. Or Depth	Classification	% CO <sub>3</sub>	G <sub>s</sub>	Nat w%	LL	PL	PI	Project
5	53.2-53.7	SAND, poorly-graded with silt, mostly fine-grained quartz, few silt, trace carbonate, trace organic matter, dark greenish gray (SP-SM)	1						Topsail Beach, Surf City & North Topsail
									Area
									Boring No. T1-03-V-173
									Date 9/24/2003

**GRADATION CURVES**



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## VISUAL SHELL CONTENT

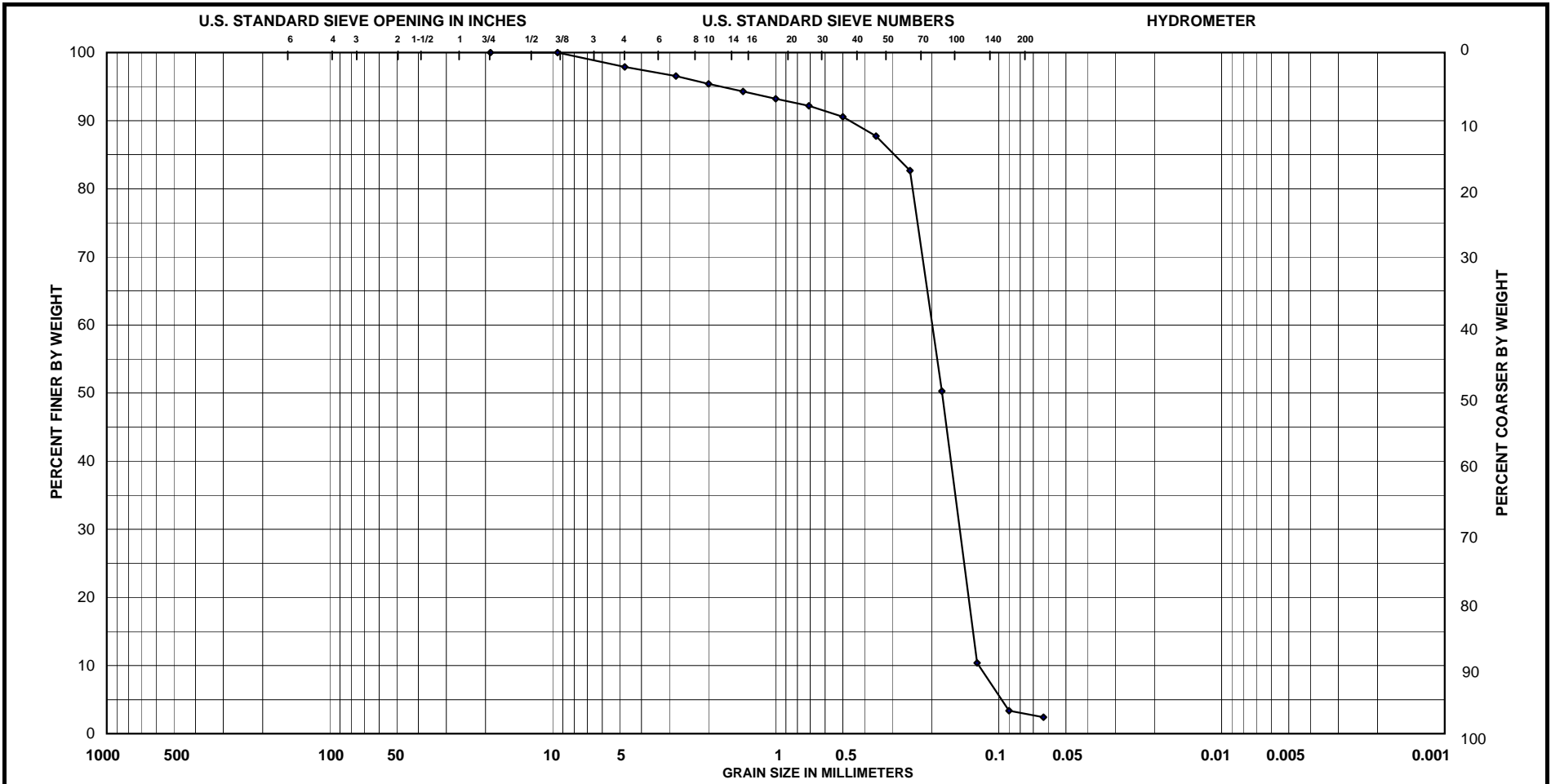
### GRAIN SIZE AND VISUAL SHELL CONTENT

Project:	<b>Topsail Beach, Surf City &amp; North Topsail</b>	Depth:	<b>45.5-46.0</b>
Project No.:	<b>1584-01-40</b>	Date:	<b>9/24/2003</b>
Boring No.:	<b>T1-03-V-174</b>		
Sample No.:	<b>1</b>		
Description:	<b>SAND, poorly-graded, mostly fine-grained quartz, few carbonate, dark gray (SP)</b>		

Tare Weight, (g):	<b>49.64</b>	
Dry Wt. Before Washing (g):	<b>173.73</b>	(with tare)
Dry Weight After Washing (g):	<b>171.08</b>	(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	2.60	97.90	100	2.60
#7	2.800	1.66	96.57	100	1.66
#10	2.000	1.44	95.41	100	1.44
#14	1.400	1.41	94.27	100	1.41
#18	1.000	1.31	93.21	90	1.18
#25	0.710	1.27	92.19	70	0.89
#35	0.500	2.03	90.56	40	0.81
#45	0.355	3.48	87.75	10	0.35
#60	0.250	6.29	82.68	5	0.31
#80	0.180	40.18	50.30	1	0.40
#120	0.125	49.55	10.37	1	0.50
#170	0.090	8.70	3.36	1	0.09
#230	0.063	1.19	2.40	1	0.01

**Total Shell Content:** **9** %



COBBLES	GRAVEL		SAND			SILT OR CLAY
	COARSE	FINE	COARSE	MEDIUM	FINE	

Sample No.	Elev. Or Depth	Classification	% CO <sub>3</sub>	G <sub>s</sub>	Nat w%	LL	PL	PI	Project
♦ 1	45.5-46.0	SAND, poorly-graded, mostly fine-grained quartz, few carbonate, dark gray (SP)	9						Topsail Beach, Surf City & North Topsail
									Area
									Boring No. T1-03-V-174
									Date 9/24/2003

**GRADATION CURVES**





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## VISUAL SHELL CONTENT

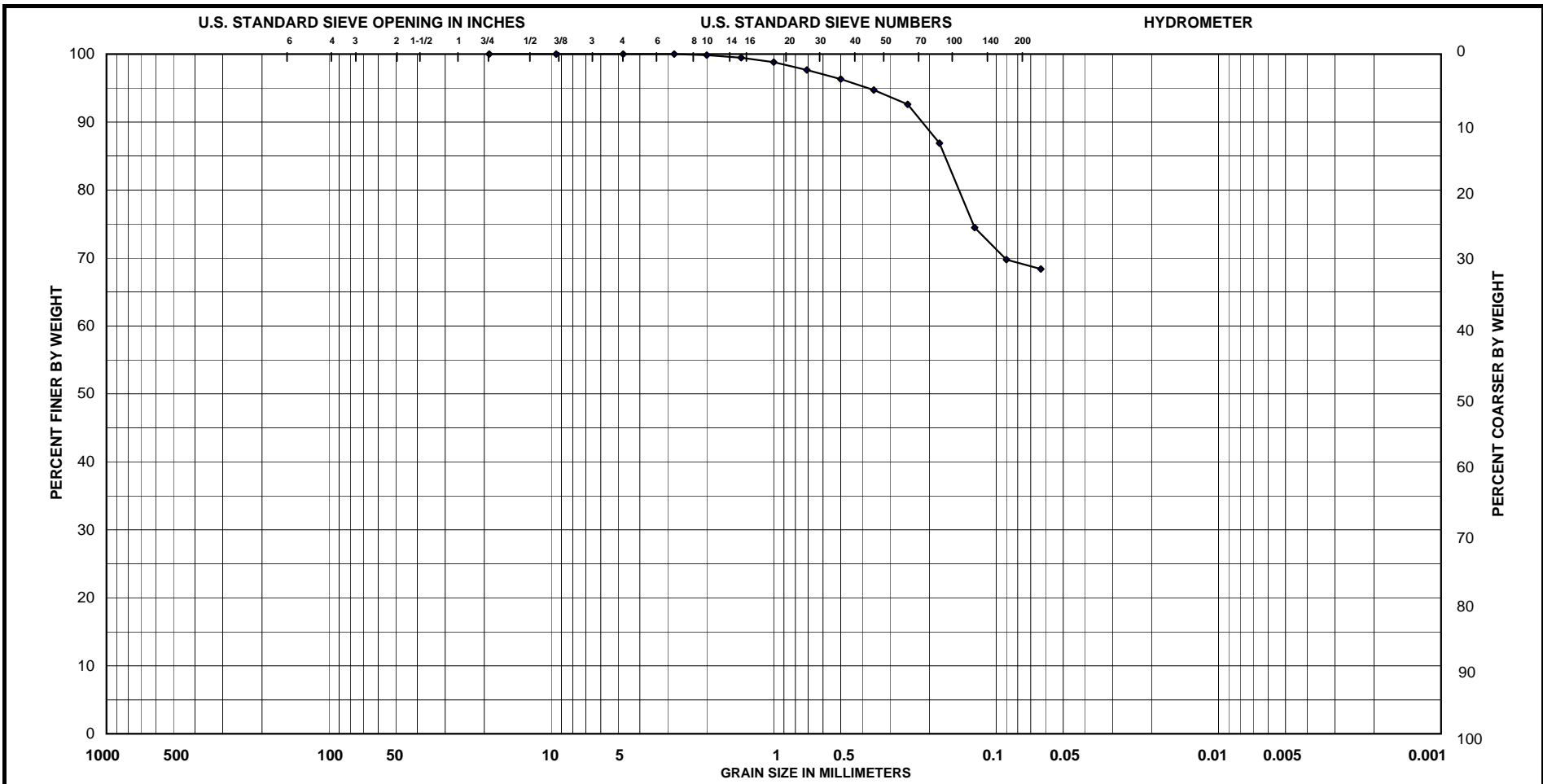
### GRAIN SIZE AND VISUAL SHELL CONTENT

Project:	<b>Topsail Beach, Surf City &amp; North Topsail</b>	Depth:	<b>47.8-48.3</b>
Project No.:	<b>1584-01-40</b>	Date:	<b>9/24/2003</b>
Boring No.:	<b>T1-03-V-174</b>		
Sample No.:	<b>2</b>		
Description:	<b>CLAY, inorganic-H, some fine-grained quartz sand, trace carbonate, trace organic matter, very dark gray (CH)</b>		

Tare Weight, (g):	<b>49.74</b>	
Dry Wt. Before Washing (g):	<b>133.24</b>	(with tare)
Dry Weight After Washing (g):	<b>76.59</b>	(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	0.12	99.86	20	0.02
#14	1.400	0.32	99.47	50	0.16
#18	1.000	0.56	98.80	80	0.45
#25	0.710	0.94	97.68	70	0.66
#35	0.500	1.14	96.31	40	0.46
#45	0.355	1.35	94.69	20	0.27
#60	0.250	1.76	92.59	10	0.18
#80	0.180	4.75	86.90	2	0.10
#120	0.125	10.39	74.46	1	0.10
#170	0.090	3.92	69.76	1	0.04
#230	0.063	1.15	68.38	1	0.01

**Total Shell Content:** **3** %



COBBLES	GRAVEL		SAND			SILT OR CLAY
	COARSE	FINE	COARSE	MEDIUM	FINE	

Sample No.	Elev. Or Depth	Classification	% CO <sub>3</sub>	G <sub>s</sub>	Nat w%	LL	PL	PI	
♦ 2	47.8-48.3	CLAY, inorganic-H, some fine-grained quartz sand, trace carbonate, trace organic matter, very dark gray (CH)	3						Project
									Area
									Boring No.
									Date

**GRADATION CURVES**

Project: Topsail Beach, Surf City & North Topsail  
 Area:  
 Boring No.: T1-03-V-174  
 Date: 9/24/2003



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## VISUAL SHELL CONTENT

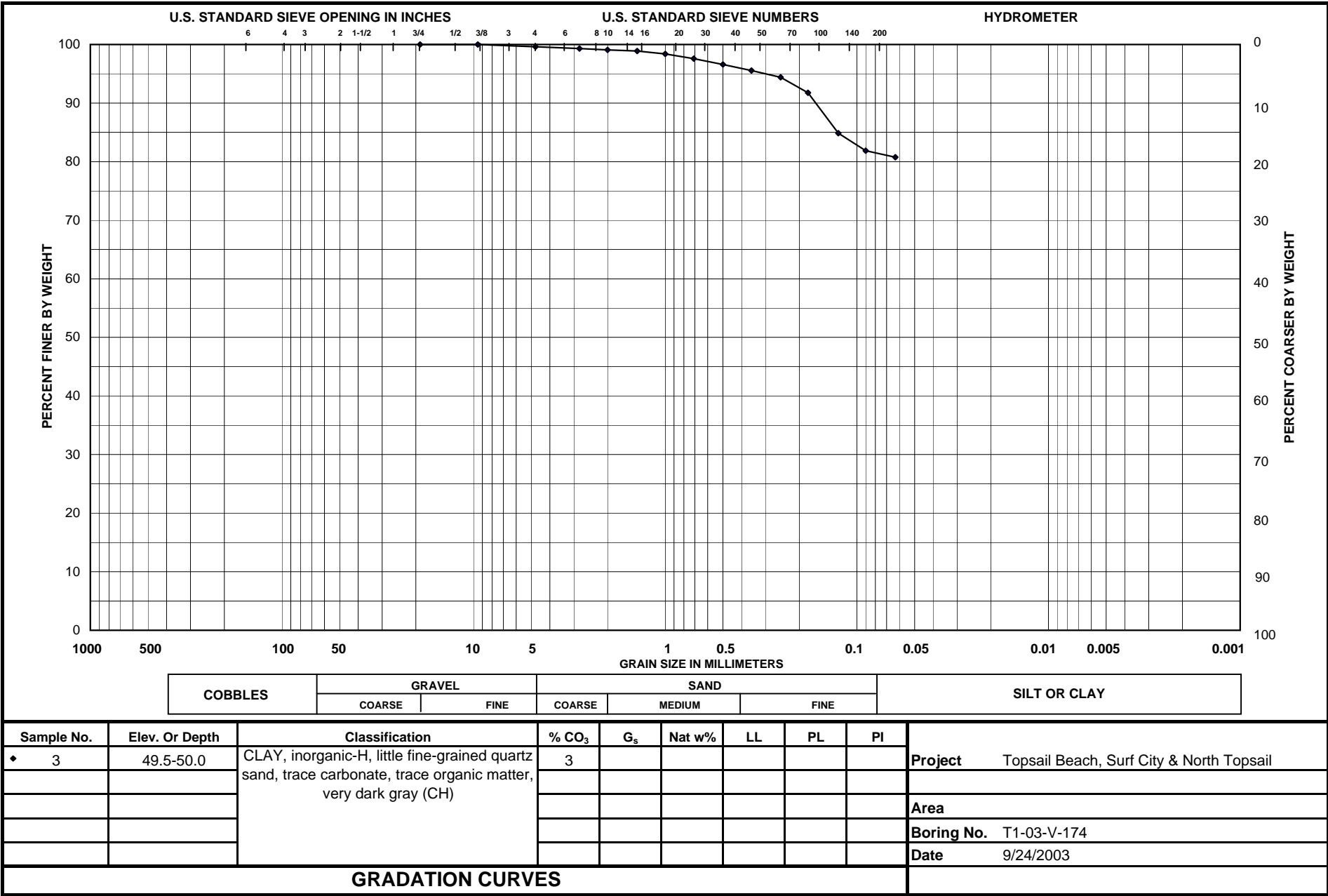
### GRAIN SIZE AND VISUAL SHELL CONTENT

Project:	<b>Topsail Beach, Surf City &amp; North Topsail</b>	Depth:	<b>49.5-50.0</b>
Project No.:	<b>1584-01-40</b>	Date:	<b>9/24/2003</b>
Boring No.:	<b>T1-03-V-174</b>		
Sample No.:	<b>3</b>		
Description:	<b>CLAY, inorganic-H, little fine-grained quartz sand, trace carbonate, trace organic matter, very dark gray (CH)</b>		

Tare Weight, (g):	<b>50.12</b>	
Dry Wt. Before Washing (g):	<b>123.29</b>	(with tare)
Dry Weight After Washing (g):	<b>64.38</b>	(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	0.27	99.63	100	0.27
#7	2.800	0.23	99.32	100	0.23
#10	2.000	0.18	99.07	80	0.14
#14	1.400	0.13	98.89	70	0.09
#18	1.000	0.38	98.37	70	0.27
#25	0.710	0.59	97.57	80	0.47
#35	0.500	0.73	96.57	50	0.37
#45	0.355	0.73	95.57	30	0.22
#60	0.250	0.85	94.41	10	0.09
#80	0.180	1.95	91.75	2	0.04
#120	0.125	5.03	84.87	1	0.05
#170	0.090	2.20	81.86	1	0.02
#230	0.063	0.80	80.77	1	0.01

**Total Shell Content:** **3** %



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## VISUAL SHELL CONTENT

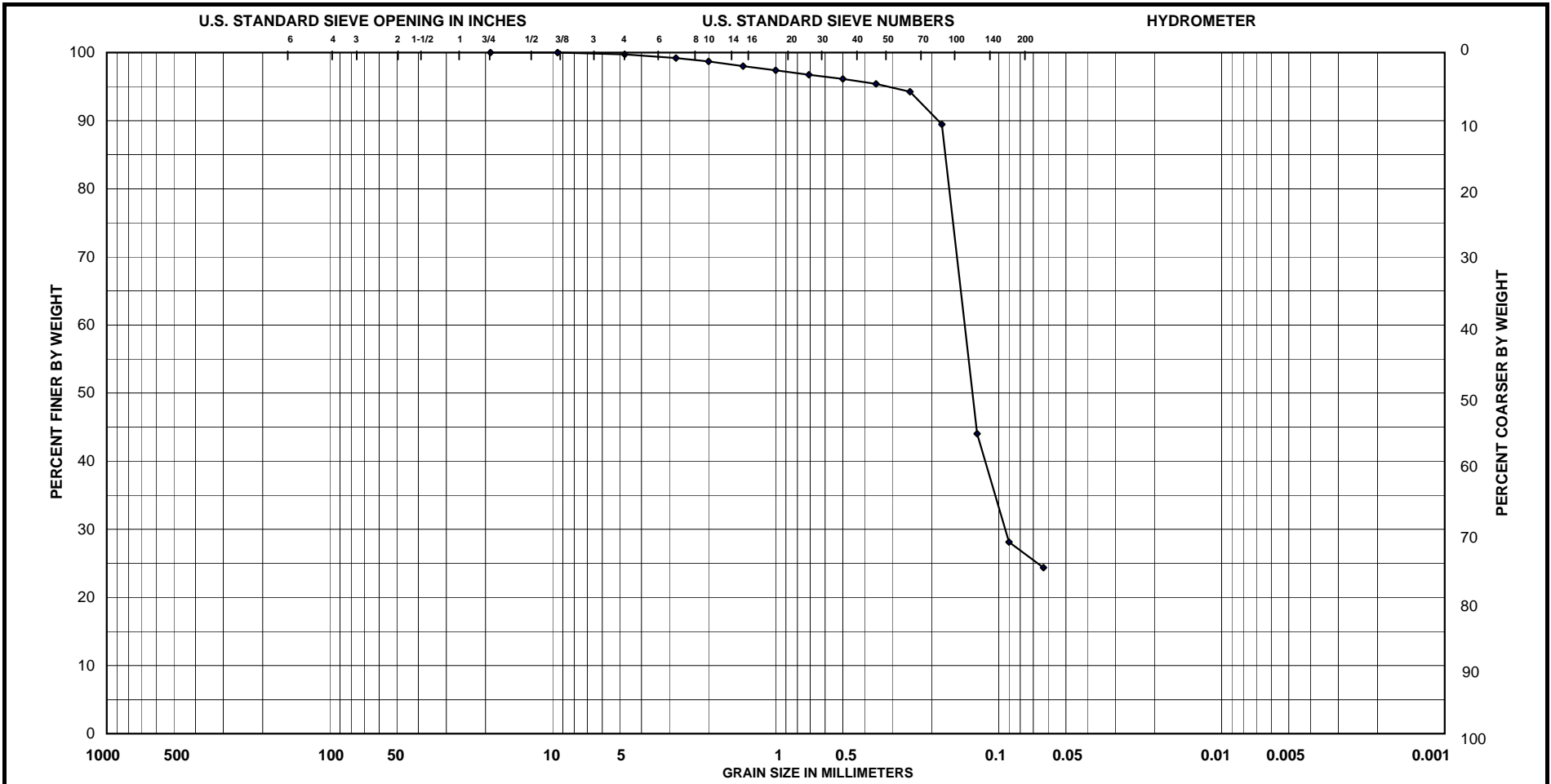
### GRAIN SIZE AND VISUAL SHELL CONTENT

Project:	<b>Topsail Beach, Surf City &amp; North Topsail</b>	Depth:	<b>50.5-51.0</b>
Project No.:	<b>1584-01-40</b>	Date:	<b>9/24/2003</b>
Boring No.:	<b>T1-03-V-174</b>		
Sample No.:	<b>4</b>		
Description:	<b>SAND, silty, mostly fine-grained quartz, little silt, trace carbonate, trace fragmented limestone, olive gray (SM)</b>		

Tare Weight, (g):	<b>50.63</b>	
Dry Wt. Before Washing (g):	<b>183.62</b>	(with tare)
Dry Weight After Washing (g):	<b>151.98</b>	(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	0.37	99.72	70	0.26
#7	2.800	0.71	99.19	70	0.50
#10	2.000	0.63	98.71	50	0.32
#14	1.400	0.95	98.00	40	0.38
#18	1.000	0.79	97.41	20	0.16
#25	0.710	0.86	96.76	10	0.09
#35	0.500	0.83	96.14	10	0.08
#45	0.355	1.00	95.38	10	0.10
#60	0.250	1.52	94.24	5	0.08
#80	0.180	6.38	89.44	1	0.06
#120	0.125	60.37	44.05	1	0.60
#170	0.090	21.15	28.14	1	0.21
#230	0.063	5.00	24.39	1	0.05

**Total Shell Content:** **2** %



<b>COBBLES</b>	<b>GRAVEL</b>		<b>SAND</b>			<b>SILT OR CLAY</b>
	COARSE	FINE	COARSE	MEDIUM	FINE	

Sample No.	Elev. Or Depth	Classification	% CO <sub>3</sub>	G <sub>s</sub>	Nat w%	LL	PL	PI		
♦ 4	50.5-51.0	SAND, silty, mostly fine-grained quartz, little silt, trace carbonate, trace fragmented limestone, olive gray (SM)	2						<b>Project</b> Topsail Beach, Surf City & North Topsail	
									<b>Area</b>	
									<b>Boring No.</b> T1-03-V-174	
									<b>Date</b> 9/24/2003	

**GRADATION CURVES**



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## VISUAL SHELL CONTENT

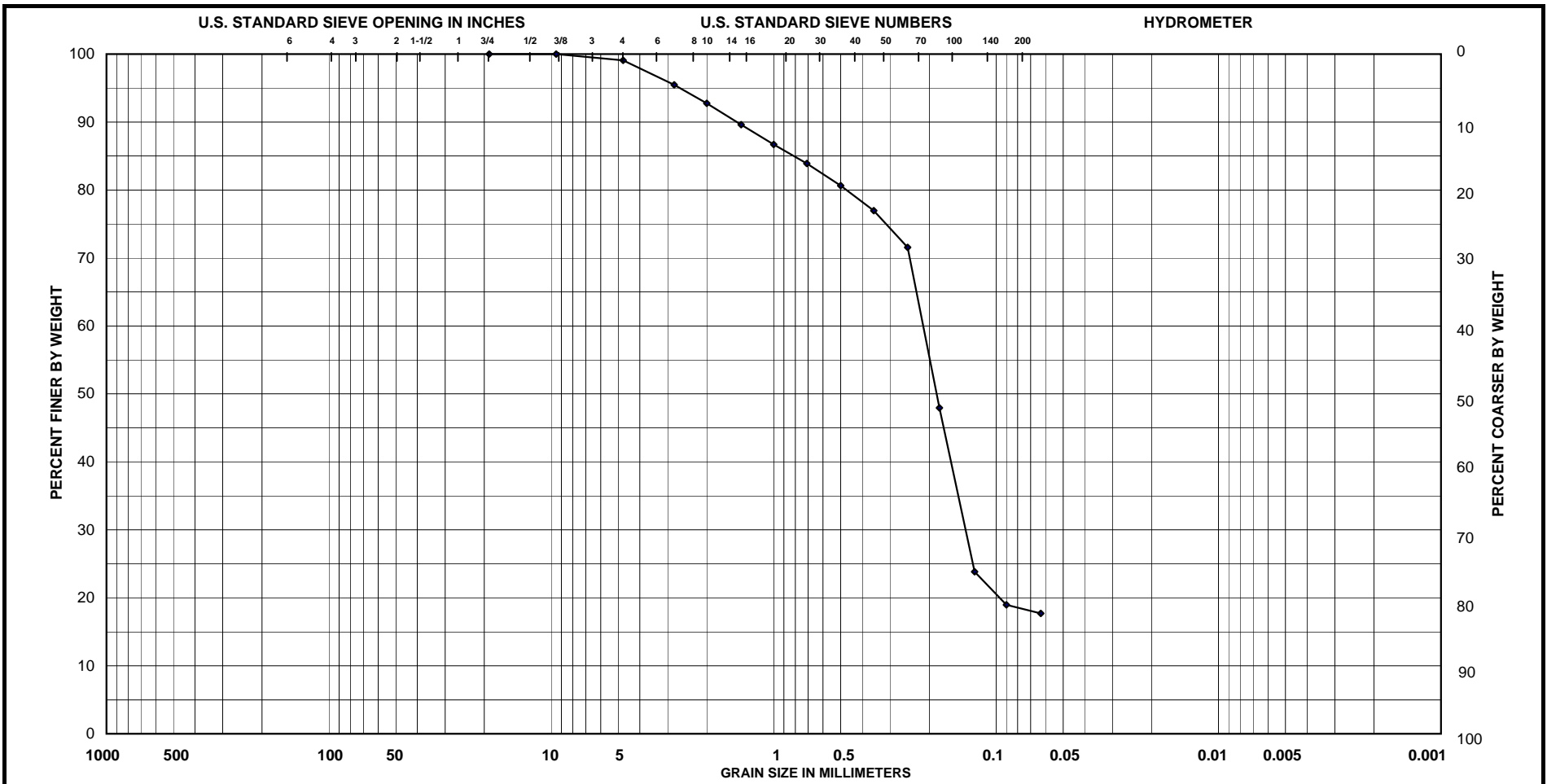
### GRAIN SIZE AND VISUAL SHELL CONTENT

Project:	<b>Topsail Beach, Surf City &amp; North Topsail</b>	Depth:	<b>46.4-46.9</b>
Project No.:	<b>1584-01-40</b>	Date:	<b>9/24/2003</b>
Boring No.:	<b>T1-03-V-175</b>		
Sample No.:	<b>1</b>		
Description:	<b>SAND, silty, mostly fine-grained quartz, little coarse to medium-grained carbonate, little silt, greenish gray (SM)</b>		

Tare Weight, (g):	<b>50.03</b>	
Dry Wt. Before Washing (g):	<b>182.21</b>	(with tare)
Dry Weight After Washing (g):	<b>159.19</b>	(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	1.21	99.08	100	1.21
#7	2.800	4.76	95.48	95	4.52
#10	2.000	3.63	92.74	90	3.27
#14	1.400	4.14	89.61	95	3.93
#18	1.000	3.82	86.72	90	3.44
#25	0.710	3.72	83.90	80	2.98
#35	0.500	4.30	80.65	70	3.01
#45	0.355	4.86	76.97	60	2.92
#60	0.250	7.15	71.56	30	2.15
#80	0.180	31.21	47.95	5	1.56
#120	0.125	31.85	23.85	1	0.32
#170	0.090	6.46	18.97	1	0.06
#230	0.063	1.65	17.72	1	0.02

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



COBBLES	GRAVEL		SAND			SILT OR CLAY
	COARSE	FINE	COARSE	MEDIUM	FINE	

Sample No.	Elev. Or Depth	Classification	% CO <sub>3</sub>	G <sub>s</sub>	Nat w%	LL	PL	PI	Project
1	46.4-46.9	SAND, silty, mostly fine-grained quartz, little coarse to medium-grained carbonate, little silt, greenish gray (SM)	22						Topsail Beach, Surf City & North Topsail
									Area
									Boring No. T1-03-V-175
									Date 9/24/2003

**GRADATION CURVES**





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## VISUAL SHELL CONTENT

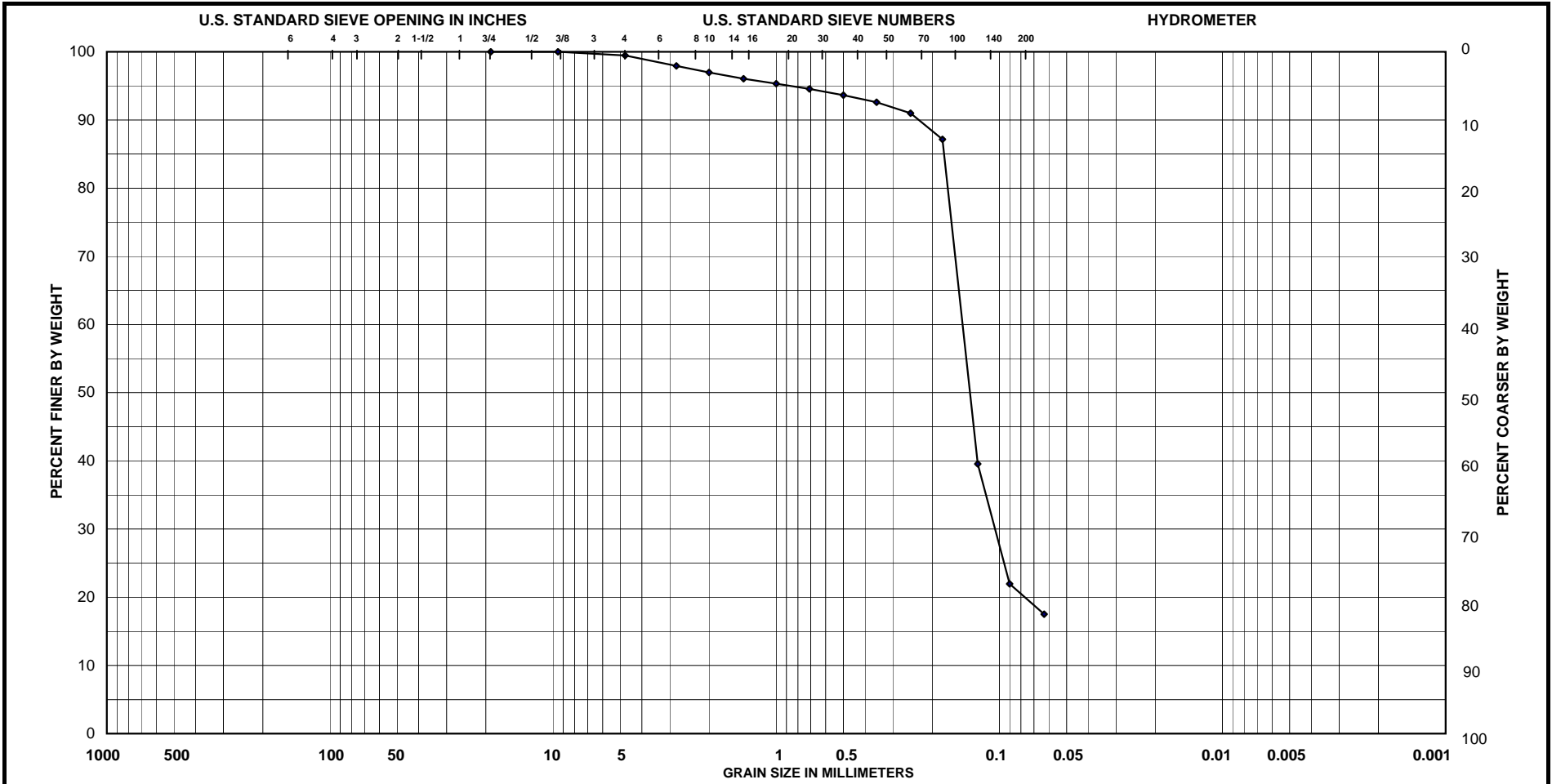
### GRAIN SIZE AND VISUAL SHELL CONTENT

Project:	<b>Topsail Beach, Surf City &amp; North Topsail</b>	Depth:	<b>49.6-50.1</b>
Project No.:	<b>1584-01-40</b>	Date:	<b>9/24/2003</b>
Boring No.:	<b>T1-03-V-175</b>		
Sample No.:	<b>2</b>		
Description:	<b>SAND, silty, mostly fine-grained quartz, little silt, few carbonate, olive gray (SM)</b>		

Tare Weight, (g):	<b>49.91</b>	
Dry Wt. Before Washing (g):	<b>172.81</b>	(with tare)
Dry Weight After Washing (g):	<b>151.82</b>	(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	0.68	99.45	100	0.68
#7	2.800	1.86	97.93	100	1.86
#10	2.000	1.17	96.98	100	1.17
#14	1.400	1.15	96.05	100	1.15
#18	1.000	0.90	95.31	90	0.81
#25	0.710	0.94	94.55	90	0.85
#35	0.500	1.11	93.65	70	0.78
#45	0.355	1.27	92.61	30	0.38
#60	0.250	2.01	90.98	10	0.20
#80	0.180	4.69	87.16	5	0.23
#120	0.125	58.49	39.57	1	0.58
#170	0.090	21.66	21.94	1	0.22
#230	0.063	5.46	17.50	1	0.05

**Total Shell Content:** **7** %



COBBLES	GRAVEL		SAND			SILT OR CLAY
	COARSE	FINE	COARSE	MEDIUM	FINE	

Sample No.	Elev. Or Depth	Classification	% CO <sub>3</sub>	G <sub>s</sub>	Nat w%	LL	PL	PI	Project
♦ 2	49.6-50.1	SAND, silty, mostly fine-grained quartz, little silt, few carbonate, olive gray (SM)	7						Topsail Beach, Surf City & North Topsail
									Area
									Boring No. T1-03-V-175
									Date 9/24/2003

**GRADATION CURVES**



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## VISUAL SHELL CONTENT

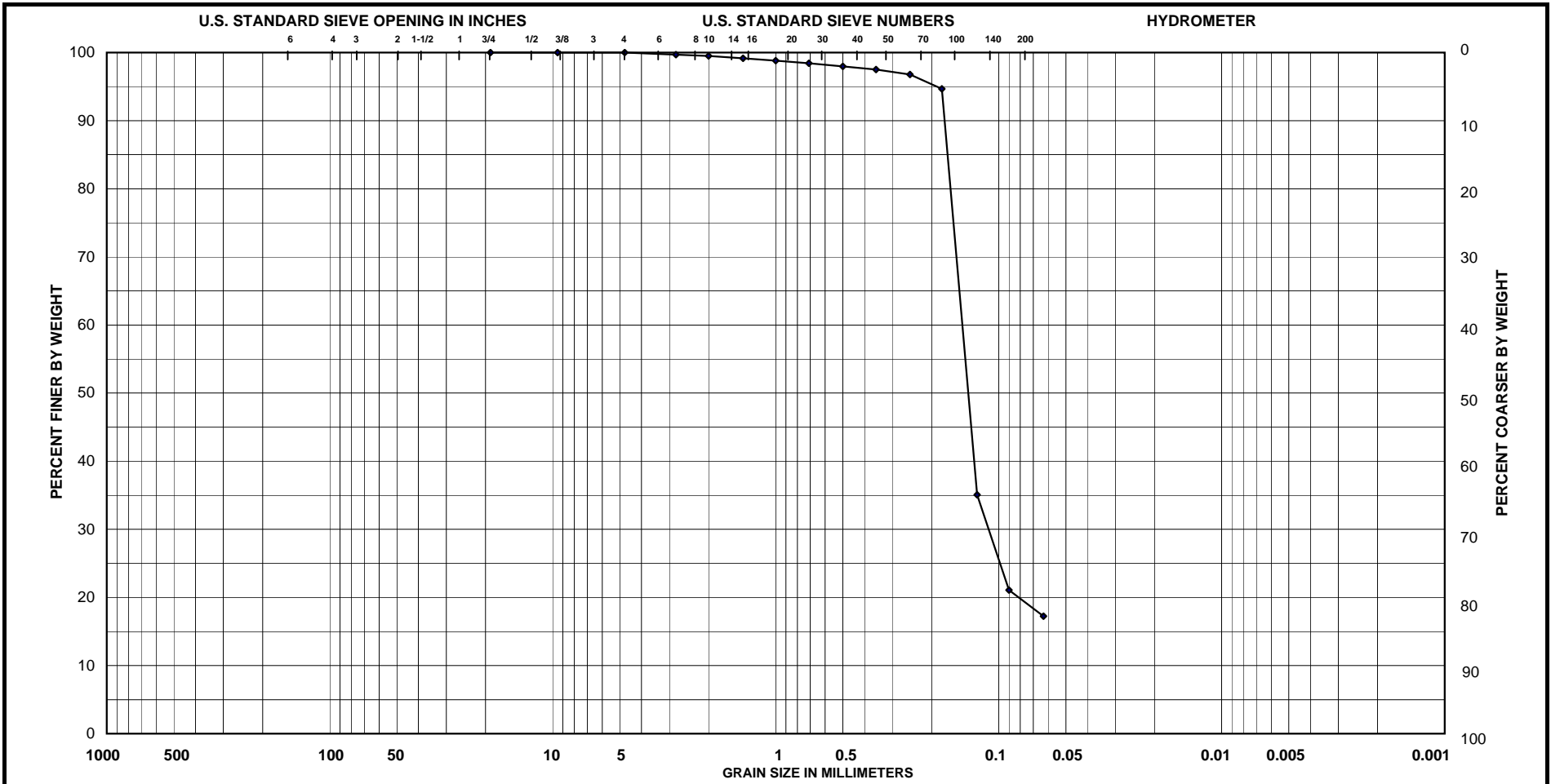
### GRAIN SIZE AND VISUAL SHELL CONTENT

Project:	<b>Topsail Beach, Surf City &amp; North Topsail</b>	Depth:	<b>52.0-52.5</b>
Project No.:	<b>1584-01-40</b>	Date:	<b>9/24/2003</b>
Boring No.:	<b>T1-03-V-175</b>		
Sample No.:	<b>3</b>		
Description:	<b>SAND, silty, mostly fine-grained quartz, little silt, trace carbonate, olive gray (SM)</b>		

Tare Weight, (g):	<b>50.23</b>	
Dry Wt. Before Washing (g):	<b>194.13</b>	(with tare)
Dry Weight After Washing (g):	<b>170.08</b>	(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	0.42	99.71	100	0.42
#10	2.000	0.30	99.50	100	0.30
#14	1.400	0.47	99.17	60	0.28
#18	1.000	0.50	98.83	40	0.20
#25	0.710	0.57	98.43	30	0.17
#35	0.500	0.64	97.98	20	0.13
#45	0.355	0.71	97.49	10	0.07
#60	0.250	1.01	96.79	5	0.05
#80	0.180	3.03	94.68	2	0.06
#120	0.125	85.76	35.09	1	0.86
#170	0.090	20.15	21.08	1	0.20
#230	0.063	5.52	17.25	1	0.06

**Total Shell Content:** **2** %



COBBLES	GRAVEL		SAND			SILT OR CLAY
	COARSE	FINE	COARSE	MEDIUM	FINE	

Sample No.	Elev. Or Depth	Classification	% CO <sub>3</sub>	G <sub>s</sub>	Nat w%	LL	PL	PI	Project
3	52.0-52.5	SAND, silty, mostly fine-grained quartz, little silt, trace carbonate, olive gray (SM)	2						Topsail Beach, Surf City & North Topsail
									Area
									Boring No. T1-03-V-175
									Date 9/24/2003

**GRADATION CURVES**



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## VISUAL SHELL CONTENT

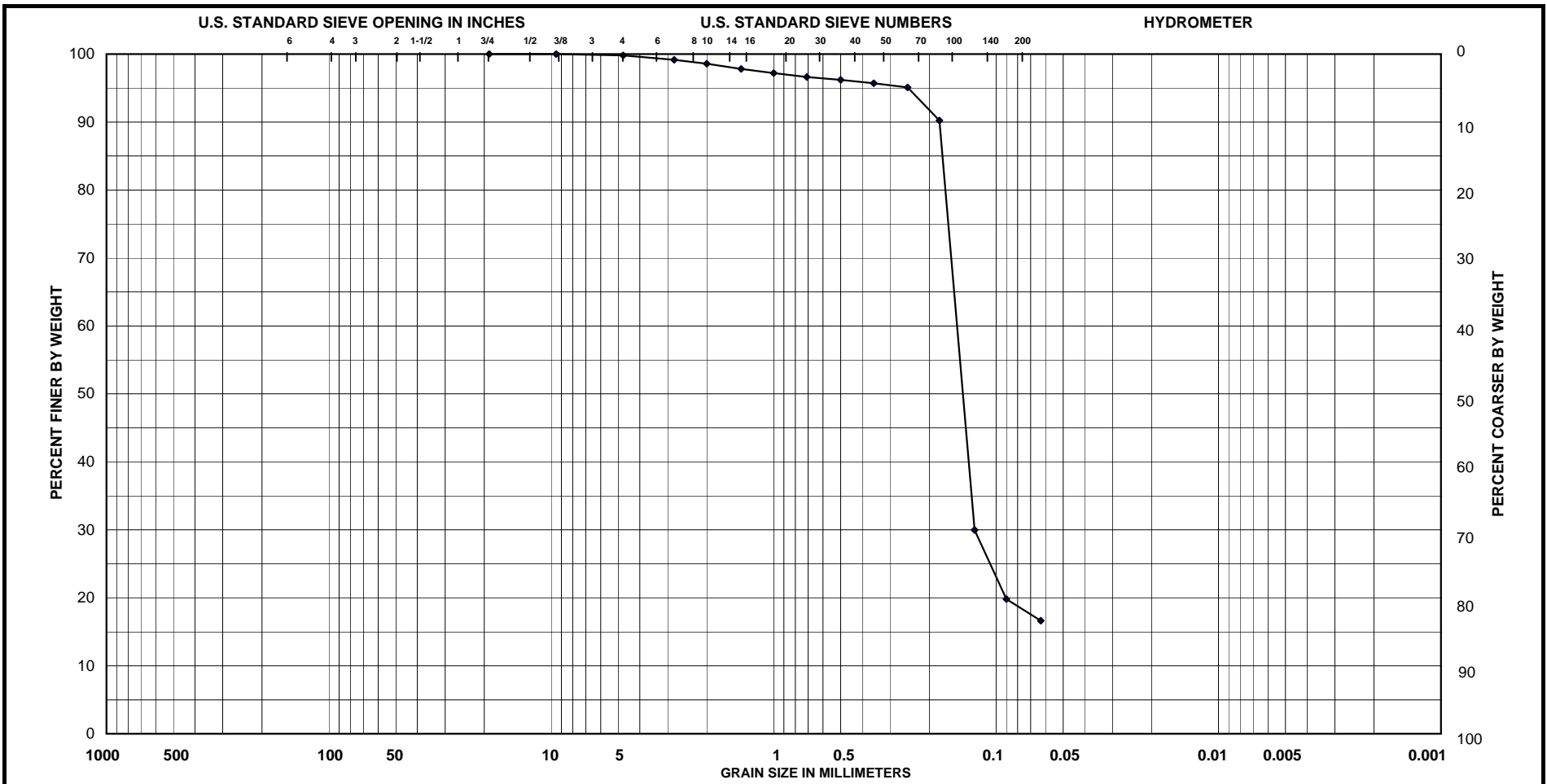
### GRAIN SIZE AND VISUAL SHELL CONTENT

Project:	<b>Topsail Beach, Surf City &amp; North Topsail</b>	Depth:	<b>55.0-55.5</b>
Project No.:	<b>1584-01-40</b>	Date:	<b>9/24/2003</b>
Boring No.:	<b>T1-03-V-175</b>		
Sample No.:	<b>4</b>		
Description:	<b>SAND, silty, mostly fine-grained quartz, little silt, trace carbonate, olive gray (SM)</b>		

Tare Weight, (g):	<b>50.60</b>	
Dry Wt. Before Washing (g):	<b>187.11</b>	(with tare)
Dry Weight After Washing (g):	<b>165.08</b>	(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	99.79	100	0.28
#7	2.800	0.87	99.16	80	0.70
#10	2.000	0.76	98.60	80	0.61
#14	1.400	1.07	97.82	70	0.75
#18	1.000	0.82	97.22	70	0.57
#25	0.710	0.78	96.64	40	0.31
#35	0.500	0.61	96.20	20	0.12
#45	0.355	0.65	95.72	5	0.03
#60	0.250	0.84	95.11	1	0.01
#80	0.180	6.65	90.24	1	0.07
#120	0.125	82.27	29.97	1	0.82
#170	0.090	13.88	19.80	1	0.14
#230	0.063	4.30	16.65	1	0.04

**Total Shell Content:** **3** %



COBBLES	GRAVEL		SAND			SILT OR CLAY
	COARSE	FINE	COARSE	MEDIUM	FINE	

Sample No.	Elev. Or Depth	Classification	% CO <sub>3</sub>	G <sub>s</sub>	Nat w%	LL	PL	PI	Project	
4	55.0-55.5	SAND, silty, mostly fine-grained quartz, little silt, trace carbonate, olive gray (SM)	3						Topsail Beach, Surf City & North Topsail	
									Area	
									Boring No. T1-03-V-175	
									Date 9/24/2003	

**GRADATION CURVES**



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## VISUAL SHELL CONTENT

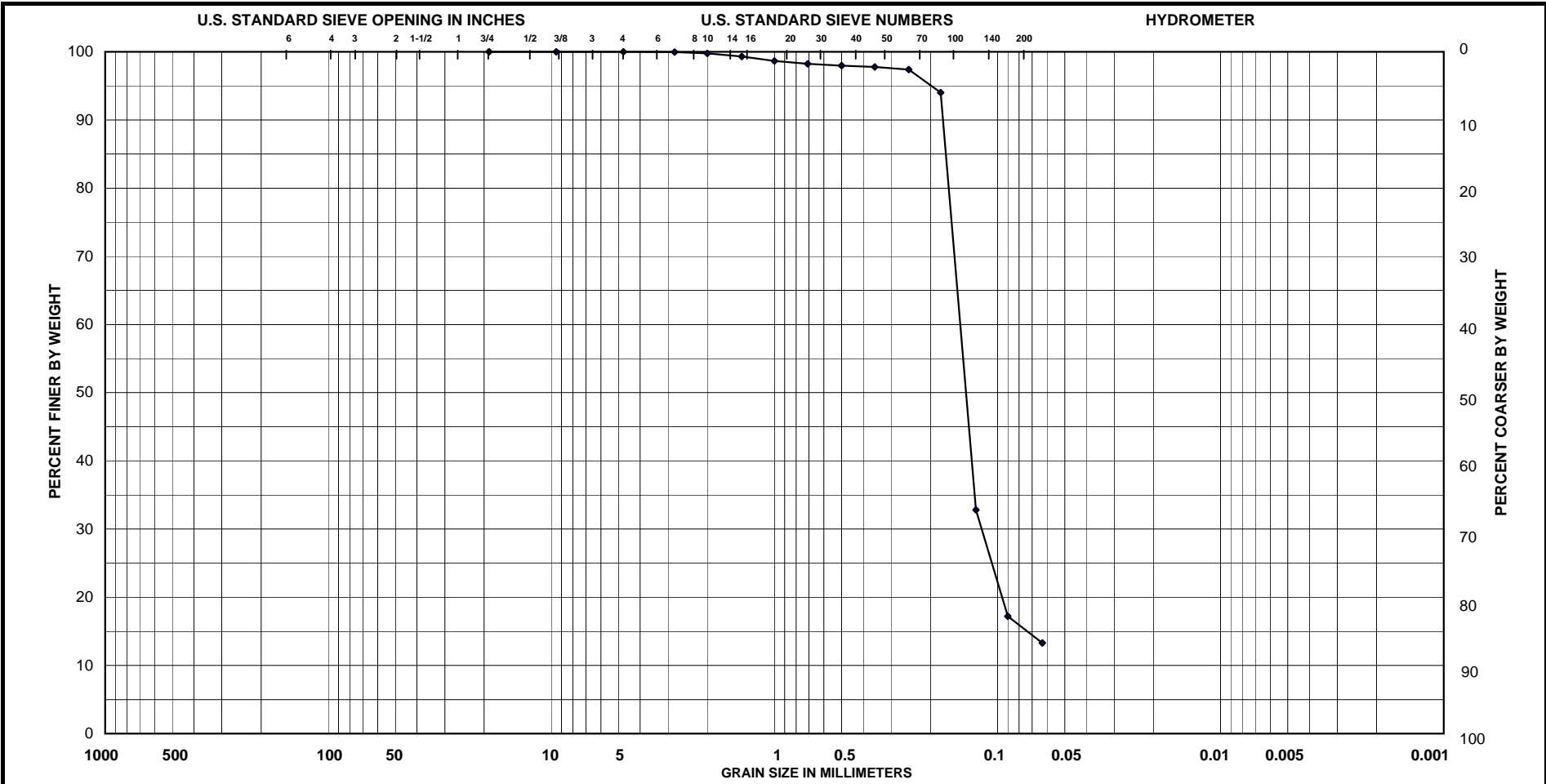
### GRAIN SIZE AND VISUAL SHELL CONTENT

Project:	<b>Topsail Beach, Surf City &amp; North Topsail</b>	Depth:	<b>57.5-58.0</b>
Project No.:	<b>1584-01-40</b>	Date:	<b>9/24/2003</b>
Boring No.:	<b>T1-03-V-175</b>		
Sample No.:	<b>5</b>		
Description:	<b>SAND, silty, mostly fine-grained quartz, little silt, trace carbonate, olive gray (SM)</b>		

Tare Weight, (g):	<b>49.52</b>	
Dry Wt. Before Washing (g):	<b>167.36</b>	(with tare)
Dry Weight After Washing (g):	<b>152.37</b>	(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	0.06	99.95	100	0.06
#10	2.000	0.22	99.76	100	0.22
#14	1.400	0.53	99.31	90	0.48
#18	1.000	0.75	98.68	50	0.38
#25	0.710	0.54	98.22	10	0.05
#35	0.500	0.29	97.97	10	0.03
#45	0.355	0.25	97.76	5	0.01
#60	0.250	0.41	97.41	5	0.02
#80	0.180	4.01	94.01	1	0.04
#120	0.125	72.13	32.80	1	0.72
#170	0.090	18.37	17.21	1	0.18
#230	0.063	4.61	13.30	1	0.05

**Total Shell Content:** **2** %



COBBLES	GRAVEL		SAND			SILT OR CLAY
	COARSE	FINE	COARSE	MEDIUM	FINE	

Sample No.	Elev. Or Depth	Classification	% CO <sub>3</sub>	G <sub>s</sub>	Nat w%	LL	PL	PI	Project
5	57.5-58.0	SAND, silty, mostly fine-grained quartz, little silt, trace carbonate, olive gray (SM)	2						Topsail Beach, Surf City & North Topsail
									Area
									Boring No. T1-03-V-175
									Date 9/24/2003

**GRADATION CURVES**





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## VISUAL SHELL CONTENT

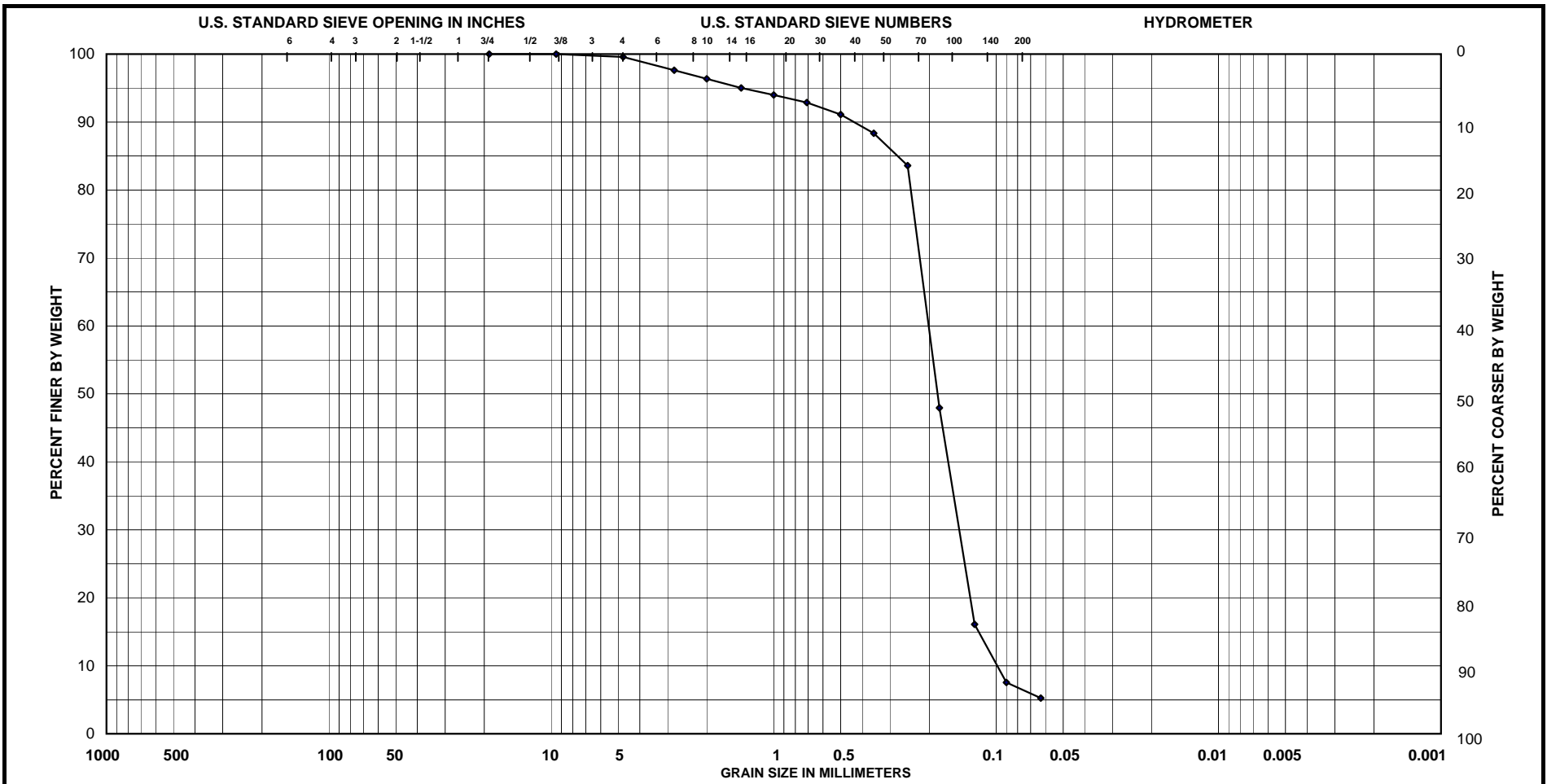
### GRAIN SIZE AND VISUAL SHELL CONTENT

Project:	<b>Topsail Beach, Surf City &amp; North Topsail</b>	Depth:	<b>47.5-48.0</b>
Project No.:	<b>1584-01-40</b>	Date:	<b>9/24/2003</b>
Boring No.:	<b>T1-03-V-176</b>		
Sample No.:	<b>1</b>		
Description:	<b>SAND, poorly-graded with silt, mostly fine-grained quartz, few silt, few carbonate, dark greenish gray (SP-SM)</b>		

Tare Weight, (g):	<b>49.67</b>	
Dry Wt. Before Washing (g):	<b>176.79</b>	(with tare)
Dry Weight After Washing (g):	<b>170.64</b>	(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	0.54	99.58	100	0.54
#7	2.800	2.48	97.62	90	2.23
#10	2.000	1.60	96.37	80	1.28
#14	1.400	1.69	95.04	80	1.35
#18	1.000	1.36	93.97	70	0.95
#25	0.710	1.39	92.87	50	0.70
#35	0.500	2.24	91.11	30	0.67
#45	0.355	3.50	88.36	10	0.35
#60	0.250	6.03	83.61	5	0.30
#80	0.180	45.34	47.95	1	0.45
#120	0.125	40.47	16.11	1	0.40
#170	0.090	10.86	7.57	1	0.11
#230	0.063	2.95	5.25	1	0.03

**Total Shell Content:** **7** %



COBBLES	GRAVEL		SAND			SILT OR CLAY
	COARSE	FINE	COARSE	MEDIUM	FINE	

Sample No.	Elev. Or Depth	Classification	% CO <sub>3</sub>	G <sub>s</sub>	Nat w%	LL	PL	PI	Project
♦ 1	47.5-48.0	SAND, poorly-graded with silt, mostly fine-grained quartz, few silt, few carbonate, dark greenish gray (SP-SM)	7						Topsail Beach, Surf City & North Topsail
									Area
									Boring No. T1-03-V-176
									Date 9/24/2003

**GRADATION CURVES**



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## VISUAL SHELL CONTENT

### GRAIN SIZE AND VISUAL SHELL CONTENT

Project:	<b>Topsail Beach, Surf City &amp; North Topsail</b>	Depth:	<b>48.5-49.0</b>
Project No.:	<b>1584-01-40</b>	Date:	<b>9/24/2003</b>
Boring No.:	<b>T1-03-V-176</b>		
Sample No.:	<b>2</b>		
Description:	<b>SAND, silty, mostly fine-grained quartz, few coarse to medium-grained carbonate, trace fine gravel-size carbonate, little silt, dark greenish</b>		

Tare Weight, (g):	<b>50.13</b>	
Dry Wt. Before Washing (g):	<b>171.69</b>	(with tare)
Dry Weight After Washing (g):	<b>150.85</b>	(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	4.51	96.29	100	4.51
#4	4.750	0.15	96.17	50	0.08
#7	2.800	1.67	94.79	100	1.67
#10	2.000	1.09	93.90	100	1.09
#14	1.400	1.64	92.55	100	1.64
#18	1.000	1.52	91.30	90	1.37
#25	0.710	1.82	89.80	80	1.46
#35	0.500	2.50	87.74	70	1.75
#45	0.355	3.31	85.02	50	1.66
#60	0.250	4.73	81.13	30	1.42
#80	0.180	10.92	72.15	5	0.55
#120	0.125	34.49	43.77	1	0.34
#170	0.090	23.89	24.12	1	0.24
#230	0.063	6.86	18.48	1	0.07

**Total Shell Content:** **15** %



COBBLES	GRAVEL		SAND			SILT OR CLAY
	COARSE	FINE	COARSE	MEDIUM	FINE	

Sample No.	Elev. Or Depth	Classification	% CO <sub>3</sub>	G <sub>s</sub>	Nat w%	LL	PL	PI	Project	
♦ 2	48.5-49.0	SAND, silty, mostly fine-grained quartz, few coarse to medium-grained carbonate, trace fine gravel-size carbonate, little silt, dark greenish gray (SM)	15						Topsail Beach, Surf City & North Topsail	
									Area	
									Boring No. T1-03-V-176	
									Date 9/24/2003	

**GRADATION CURVES**



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## VISUAL SHELL CONTENT

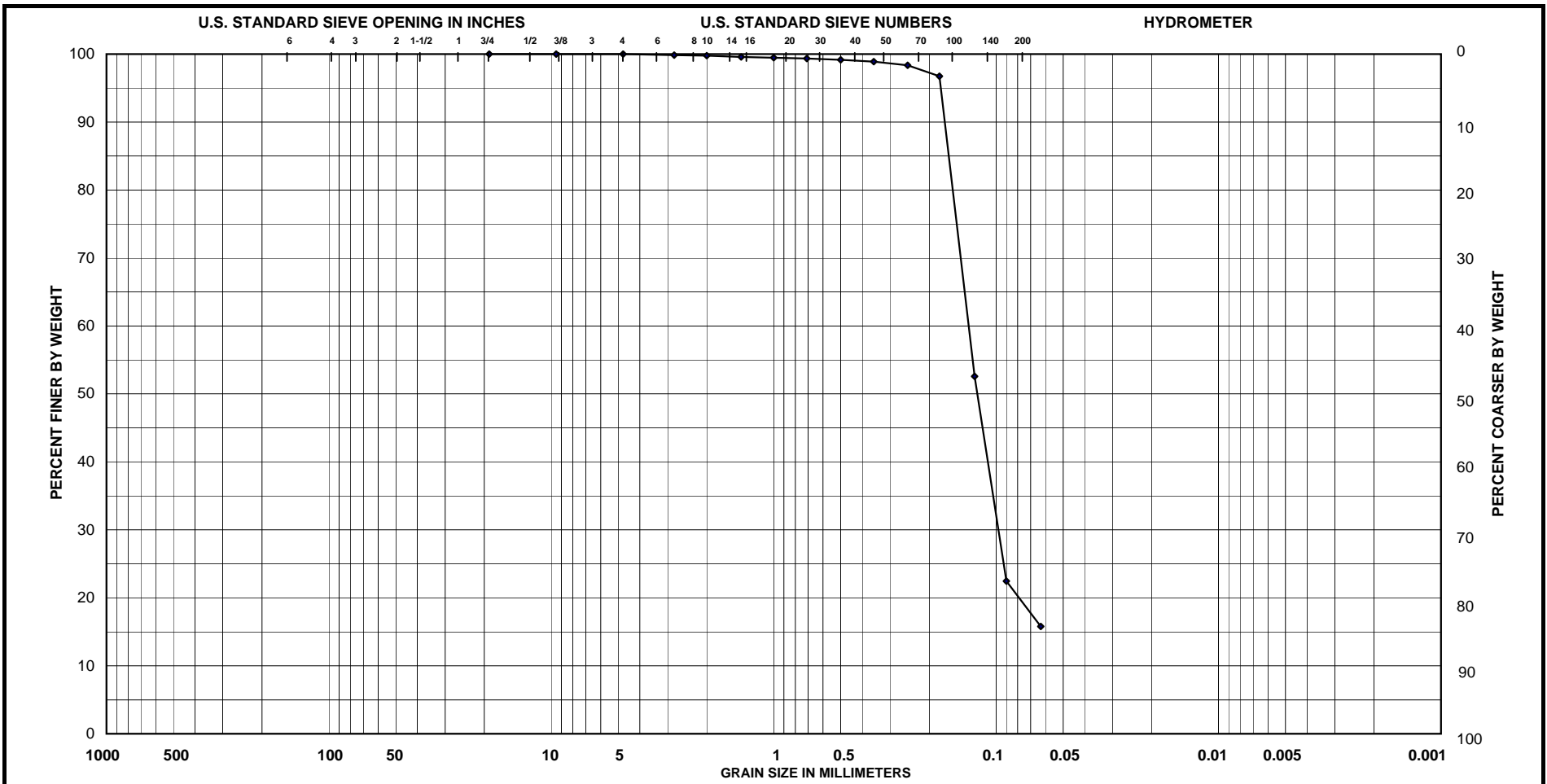
### GRAIN SIZE AND VISUAL SHELL CONTENT

Project:	<b>Topsail Beach, Surf City &amp; North Topsail</b>	Depth:	<b>51.5-52.0</b>
Project No.:	<b>1584-01-40</b>	Date:	<b>9/24/2003</b>
Boring No.:	<b>T1-03-V-176</b>		
Sample No.:	<b>3</b>		
Description:	<b>SAND, silty, mostly fine-grained quartz, little silt, trace carbonate, dark greenish gray (SM)</b>		

Tare Weight, (g):	<b>50.09</b>	
Dry Wt. Before Washing (g):	<b>183.47</b>	(with tare)
Dry Weight After Washing (g):	<b>163.86</b>	(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	0.22	99.84	100	0.22
#10	2.000	0.08	99.78	50	0.04
#14	1.400	0.25	99.59	70	0.18
#18	1.000	0.18	99.45	50	0.09
#25	0.710	0.15	99.34	100	0.15
#35	0.500	0.25	99.15	70	0.18
#45	0.355	0.36	98.88	70	0.25
#60	0.250	0.72	98.34	40	0.29
#80	0.180	2.15	96.73	5	0.11
#120	0.125	58.87	52.59	1	0.59
#170	0.090	40.18	22.47	1	0.40
#230	0.063	8.90	15.80	1	0.09

**Total Shell Content:** **2** %



COBBLES	GRAVEL		SAND			SILT OR CLAY
	COARSE	FINE	COARSE	MEDIUM	FINE	

Sample No.	Elev. Or Depth	Classification	% CO <sub>3</sub>	G <sub>s</sub>	Nat w%	LL	PL	PI	Project	
3	51.5-52.0	SAND, silty, mostly fine-grained quartz, little silt, trace carbonate, dark greenish gray (SM)	2						Topsail Beach, Surf City & North Topsail	
									Area	
									Boring No. T1-03-V-176	
									Date 9/24/2003	

**GRADATION CURVES**



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## VISUAL SHELL CONTENT

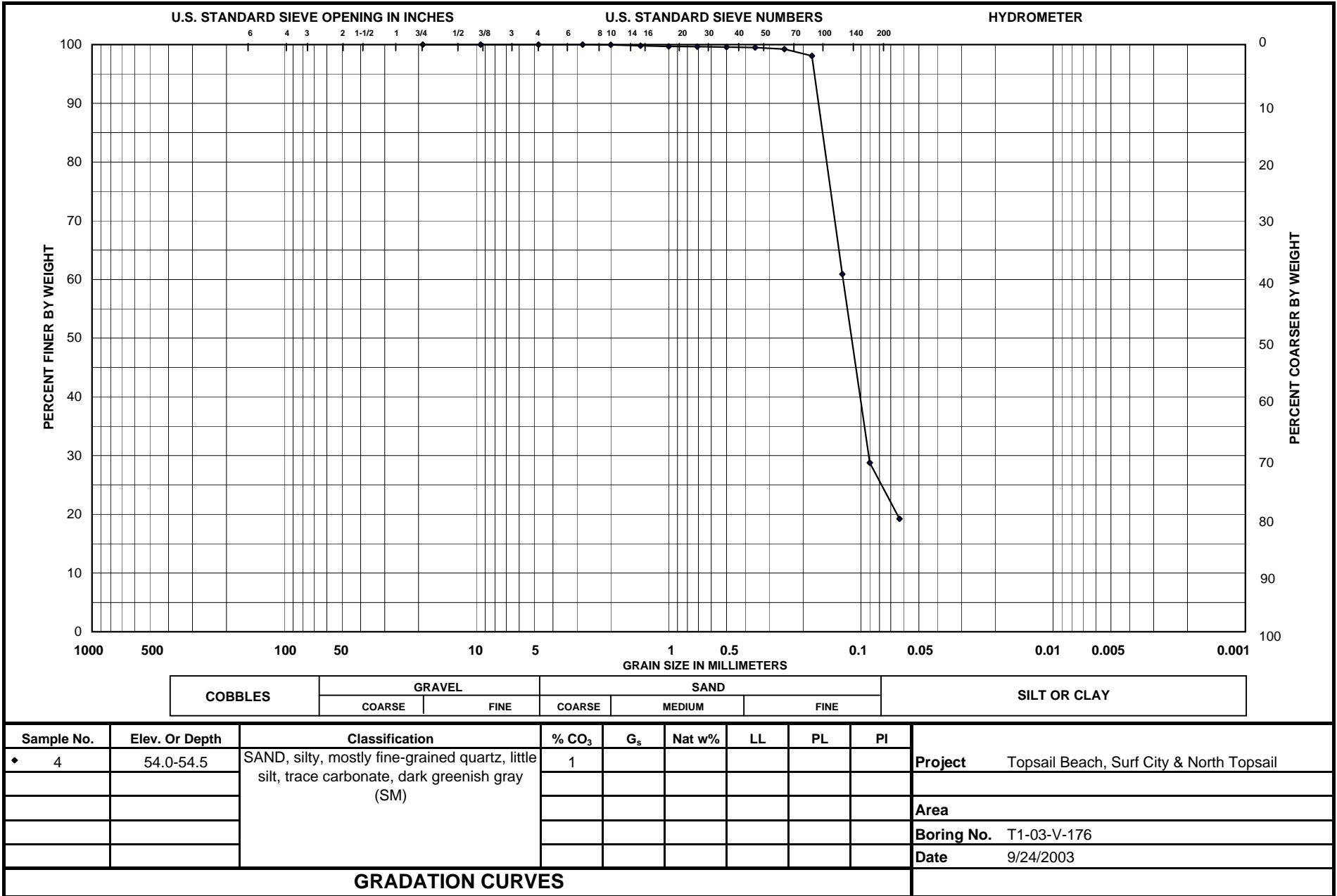
### GRAIN SIZE AND VISUAL SHELL CONTENT

Project:	<b>Topsail Beach, Surf City &amp; North Topsail</b>	Depth:	<b>54.0-54.5</b>
Project No.:	<b>1584-01-40</b>	Date:	<b>9/24/2003</b>
Boring No.:	<b>T1-03-V-176</b>		
Sample No.:	<b>4</b>		
Description:	<b>SAND, silty, mostly fine-grained quartz, little silt, trace carbonate, dark greenish gray (SM)</b>		

Tare Weight, (g):	<b>50.16</b>	
Dry Wt. Before Washing (g):	<b>173.13</b>	(with tare)
Dry Weight After Washing (g):	<b>151.32</b>	(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	0.05	99.94	70	0.04
#14	1.400	0.18	99.80	30	0.05
#18	1.000	0.11	99.71	50	0.06
#25	0.710	0.07	99.65	80	0.06
#35	0.500	0.07	99.59	60	0.04
#45	0.355	0.13	99.49	40	0.05
#60	0.250	0.30	99.24	30	0.09
#80	0.180	1.43	98.08	5	0.07
#120	0.125	45.71	60.91	1	0.46
#170	0.090	39.52	28.77	1	0.40
#230	0.063	11.72	19.24	1	0.12

**Total Shell Content:** **1** %



**GRADATION CURVES**





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## VISUAL SHELL CONTENT

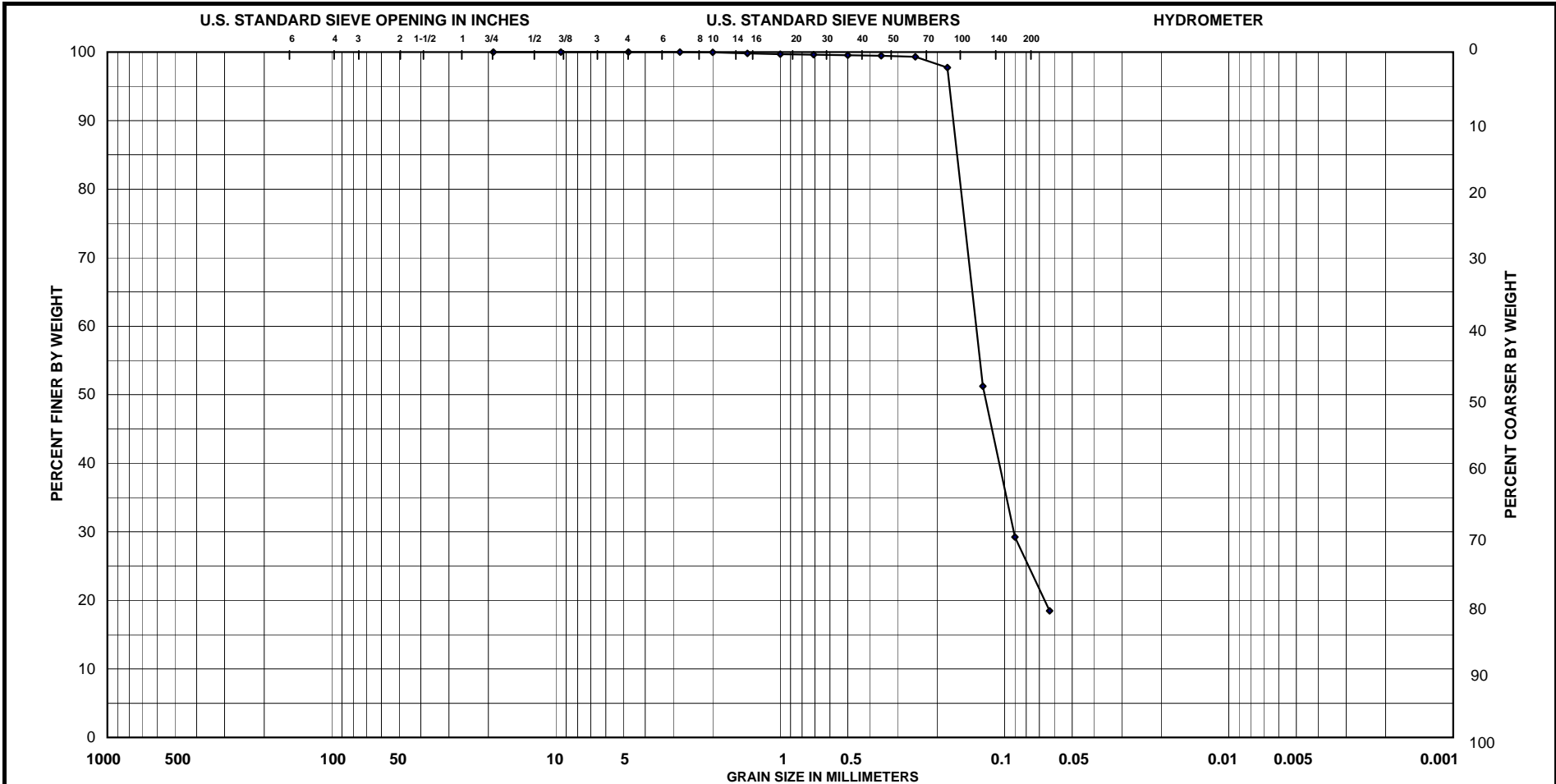
### GRAIN SIZE AND VISUAL SHELL CONTENT

Project:	<b>Topsail Beach, Surf City &amp; North Topsail</b>	Depth:	<b>57.0-57.5</b>
Project No.:	<b>1584-01-40</b>	Date:	<b>9/24/2003</b>
Boring No.:	<b>T1-03-V-176</b>		
Sample No.:	<b>5</b>		
Description:	<b>SAND, silty, mostly fine-grained quartz, little silt, trace carbonate, olive gray (SM)</b>		

Tare Weight, (g):	<b>50.00</b>	
Dry Wt. Before Washing (g):	<b>176.61</b>	(with tare)
Dry Weight After Washing (g):	<b>155.29</b>	(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	0.05	99.96	0	0.00
#14	1.400	0.20	99.80	50	0.10
#18	1.000	0.16	99.68	20	0.03
#25	0.710	0.07	99.62	10	0.01
#35	0.500	0.08	99.56	3	0.00
#45	0.355	0.12	99.46	1	0.00
#60	0.250	0.19	99.31	1	0.00
#80	0.180	1.98	97.75	1	0.02
#120	0.125	58.90	51.23	1	0.59
#170	0.090	27.83	29.25	1	0.28
#230	0.063	13.64	18.47	1	0.14

**Total Shell Content:** **1** %



<b>COBBLES</b>	<b>GRAVEL</b>		<b>SAND</b>			<b>SILT OR CLAY</b>
	COARSE	FINE	COARSE	MEDIUM	FINE	

<b>Sample No.</b>	<b>Elev. Or Depth</b>	<b>Classification</b>	<b>% CO<sub>3</sub></b>	<b>G<sub>s</sub></b>	<b>Nat w%</b>	<b>LL</b>	<b>PL</b>	<b>PI</b>	<b>Project</b>
5	57.0-57.5	SAND, silty, mostly fine-grained quartz, little silt, trace carbonate, olive gray (SM)	1						Topsail Beach, Surf City & North Topsail
									<b>Area</b>
									<b>Boring No.</b> T1-03-V-176
									<b>Date</b> 9/24/2003

**GRADATION CURVES**



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## VISUAL SHELL CONTENT

### GRAIN SIZE AND VISUAL SHELL CONTENT

Project:	<b>Topsail Beach, Surf City &amp; North Topsail</b>	Depth:	<b>61.0-61.5</b>
Project No.:	<b>1584-01-40</b>	Date:	<b>9/24/2003</b>
Boring No.:	<b>T1-03-V-176</b>		
Sample No.:	<b>6</b>		
Description:	<b>SAND, silty, mostly fine-grained quartz, little silt, trace carbonate, olive gray (SM)</b>		

Tare Weight, (g):	<b>50.40</b>	
Dry Wt. Before Washing (g):	<b>177.59</b>	(with tare)
Dry Weight After Washing (g):	<b>152.17</b>	(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	0.19	99.83	3	0.01
#18	1.000	0.11	99.75	3	0.00
#25	0.710	0.06	99.70	3	0.00
#35	0.500	0.05	99.66	1	0.00
#45	0.355	0.06	99.61	1	0.00
#60	0.250	0.10	99.54	1	0.00
#80	0.180	1.48	98.37	1	0.01
#120	0.125	51.92	57.55	1	0.52
#170	0.090	33.70	31.06	1	0.34
#230	0.063	12.15	21.50	1	0.12

**Total Shell Content:** **1** %



COBBLES	GRAVEL		SAND			SILT OR CLAY
	COARSE	FINE	COARSE	MEDIUM	FINE	

Sample No.	Elev. Or Depth	Classification	% CO <sub>3</sub>	G <sub>s</sub>	Nat w%	LL	PL	PI	Project	
6	61.0-61.5	SAND, silty, mostly fine-grained quartz, little silt, trace carbonate, olive gray (SM)	1						Topsail Beach, Surf City & North Topsail	
									Area	
									Boring No. T1-03-V-176	
									Date 9/24/2003	

**GRADATION CURVES**



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## VISUAL SHELL CONTENT

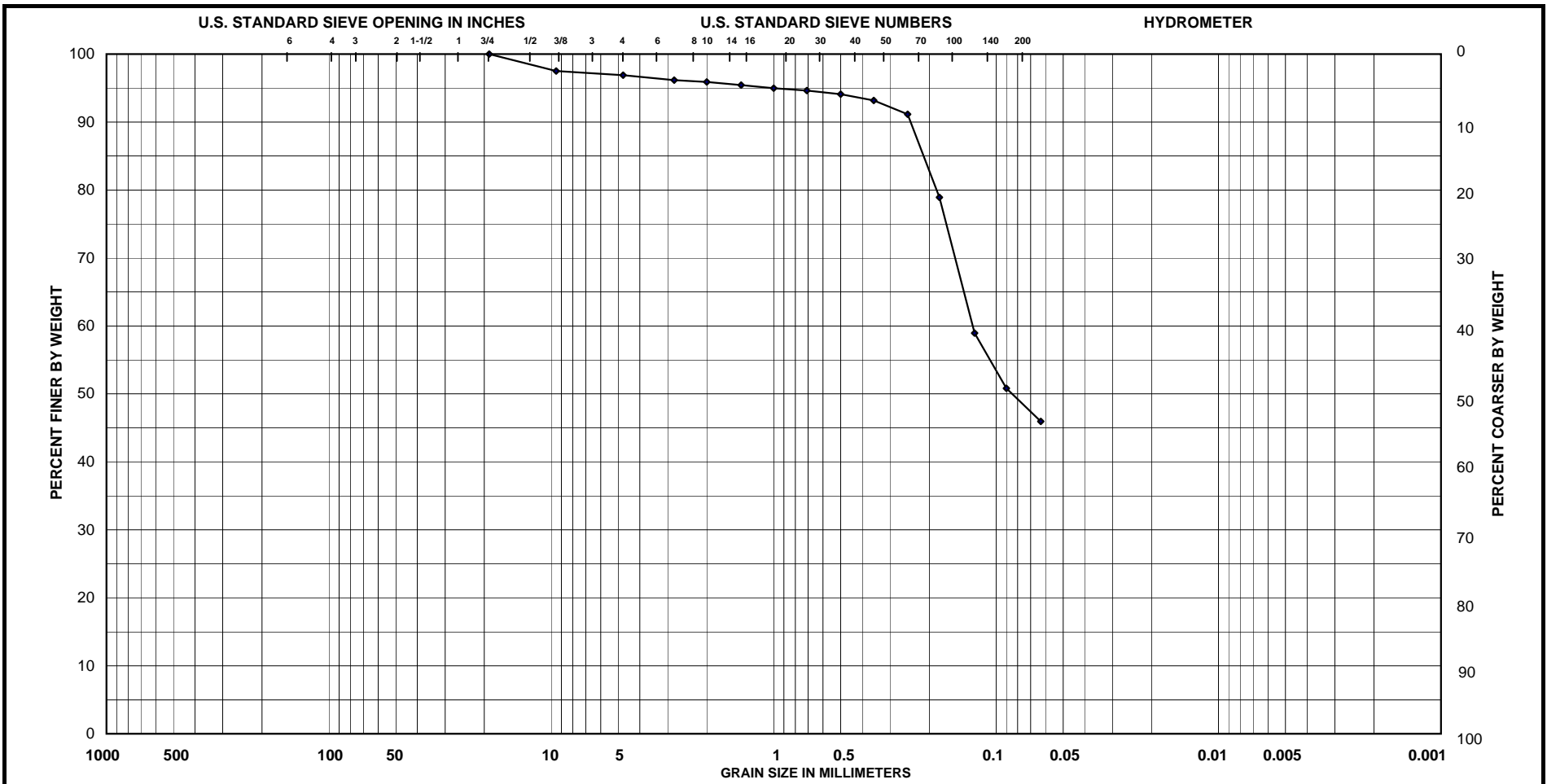
### GRAIN SIZE AND VISUAL SHELL CONTENT

Project:	<b>Topsail Beach, Surf City &amp; North Topsail</b>	Depth:	<b>46.5-47.0</b>
Project No.:	<b>1584-01-40</b>	Date:	<b>9/24/2003</b>
Boring No.:	<b>T1-03-V-177</b>		
Sample No.:	<b>1</b>		
Description:	<b>SAND, silty, mostly fine-grained quartz, some silt, few carbonate, greenish black (SM)</b>		

Tare Weight, (g):	<b>50.30</b>	
Dry Wt. Before Washing (g):	<b>145.81</b>	(with tare)
Dry Weight After Washing (g):	<b>102.42</b>	(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	2.38	97.51	100	2.38
#4	4.750	0.58	96.90	100	0.58
#7	2.800	0.69	96.18	100	0.69
#10	2.000	0.26	95.91	100	0.26
#14	1.400	0.44	95.45	90	0.40
#18	1.000	0.46	94.96	90	0.41
#25	0.710	0.31	94.64	80	0.25
#35	0.500	0.51	94.11	40	0.20
#45	0.355	0.90	93.16	20	0.18
#60	0.250	1.92	91.15	10	0.19
#80	0.180	11.70	78.90	3	0.35
#120	0.125	19.04	58.97	1	0.19
#170	0.090	7.78	50.82	1	0.08
#230	0.063	4.65	45.95	1	0.05

**Total Shell Content:** **7** %



COBBLES	GRAVEL		SAND			SILT OR CLAY
	COARSE	FINE	COARSE	MEDIUM	FINE	

Sample No.	Elev. Or Depth	Classification	% CO <sub>3</sub>	G <sub>s</sub>	Nat w%	LL	PL	PI	Project	
♦ 1	46.5-47.0	SAND, silty, mostly fine-grained quartz, some silt, few carbonate, greenish black (SM)	7						Topsail Beach, Surf City & North Topsail	
									Area	
									Boring No. T1-03-V-177	
									Date 9/24/2003	

**GRADATION CURVES**



# WOLF TECHNOLOGIES, INC.

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

## VISUAL SHELL CONTENT

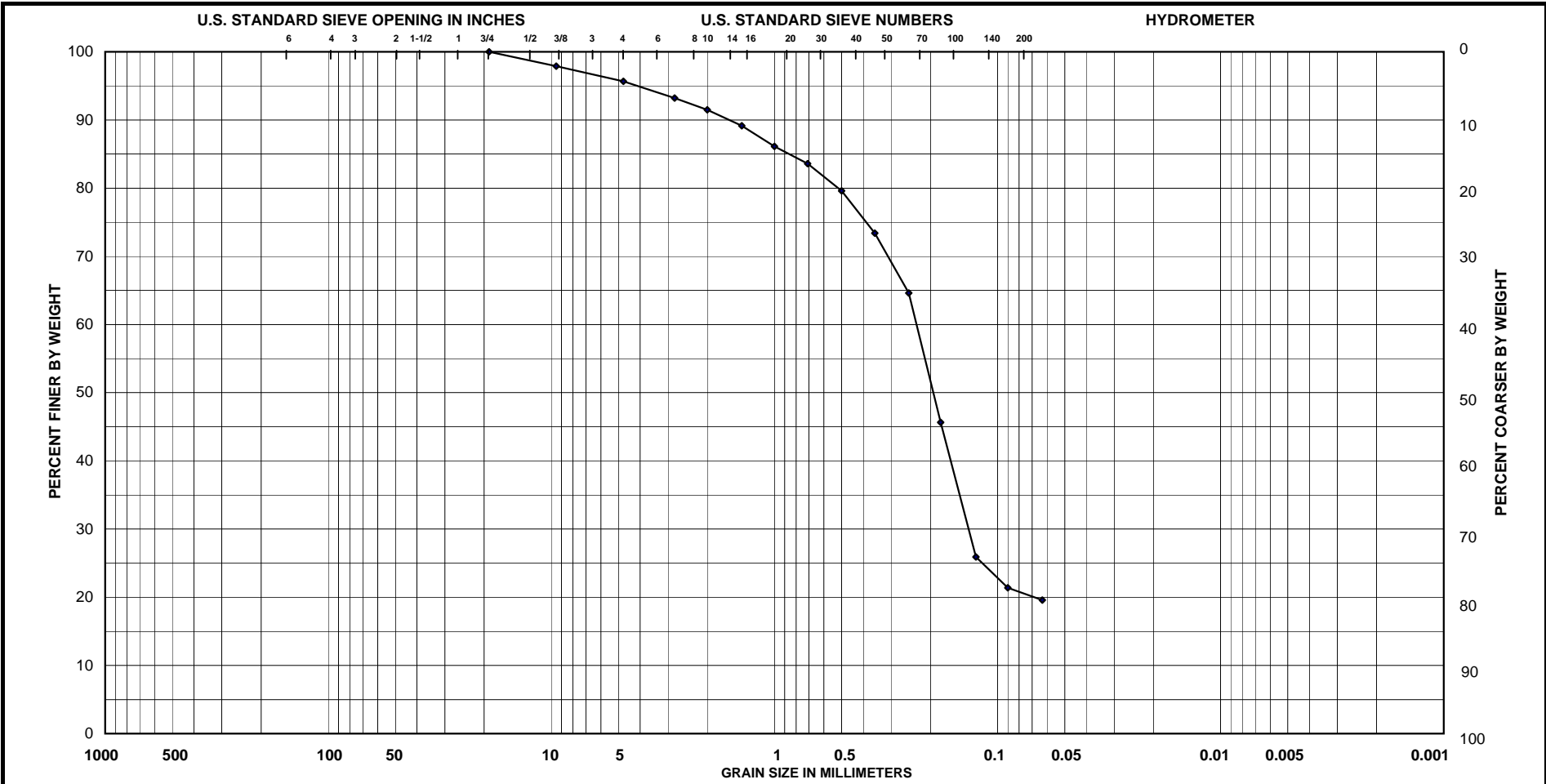
### GRAIN SIZE AND VISUAL SHELL CONTENT

Project:	<b>Topsail Beach, Surf City &amp; North Topsail</b>	Depth:	<b>48.0-48.5</b>
Project No.:	<b>1584-01-40</b>	Date:	<b>9/24/2003</b>
Boring No.:	<b>T1-03-V-177</b>		
Sample No.:	<b>2</b>		
Description:	<b>SAND, silty, mostly fine-grained quartz, little coarse to medium-grained carbonate, little silt, trace fine gravel-size carbonate, trace fragmented</b>		

Tare Weight, (g):	<b>50.08</b>	
Dry Wt. Before Washing (g):	<b>183.88</b>	(with tare)
Dry Weight After Washing (g):	<b>158.37</b>	(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	2.82	97.89	100	2.82
#4	4.750	2.95	95.69	100	2.95
#7	2.800	3.30	93.22	80	2.64
#10	2.000	2.34	91.47	70	1.64
#14	1.400	3.10	89.16	70	2.17
#18	1.000	4.04	86.14	55	2.22
#25	0.710	3.42	83.58	50	1.71
#35	0.500	5.32	79.60	50	2.66
#45	0.355	8.30	73.40	25	2.08
#60	0.250	11.73	64.63	10	1.17
#80	0.180	25.40	45.65	3	0.76
#120	0.125	26.40	25.92	1	0.26
#170	0.090	6.08	21.38	1	0.06
#230	0.063	2.38	19.60	1	0.02

**Total Shell Content:** **17** %



COBBLES	GRAVEL		SAND			SILT OR CLAY
	COARSE	FINE	COARSE	MEDIUM	FINE	

Sample No.	Elev. Or Depth	Classification	% CO <sub>3</sub>	G <sub>s</sub>	Nat w%	LL	PL	PI	Project
♦ 2	48.0-48.5	SAND, silty, mostly fine-grained quartz, little coarse to medium-grained carbonate, little silt, trace fine gravel-size carbonate, trace fragmented limestone, dark greenish gray (SM)	17						Topsail Beach, Surf City & North Topsail
									Area
									Boring No. T1-03-V-177
									Date 9/24/2003

**GRADATION CURVES**





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## VISUAL SHELL CONTENT

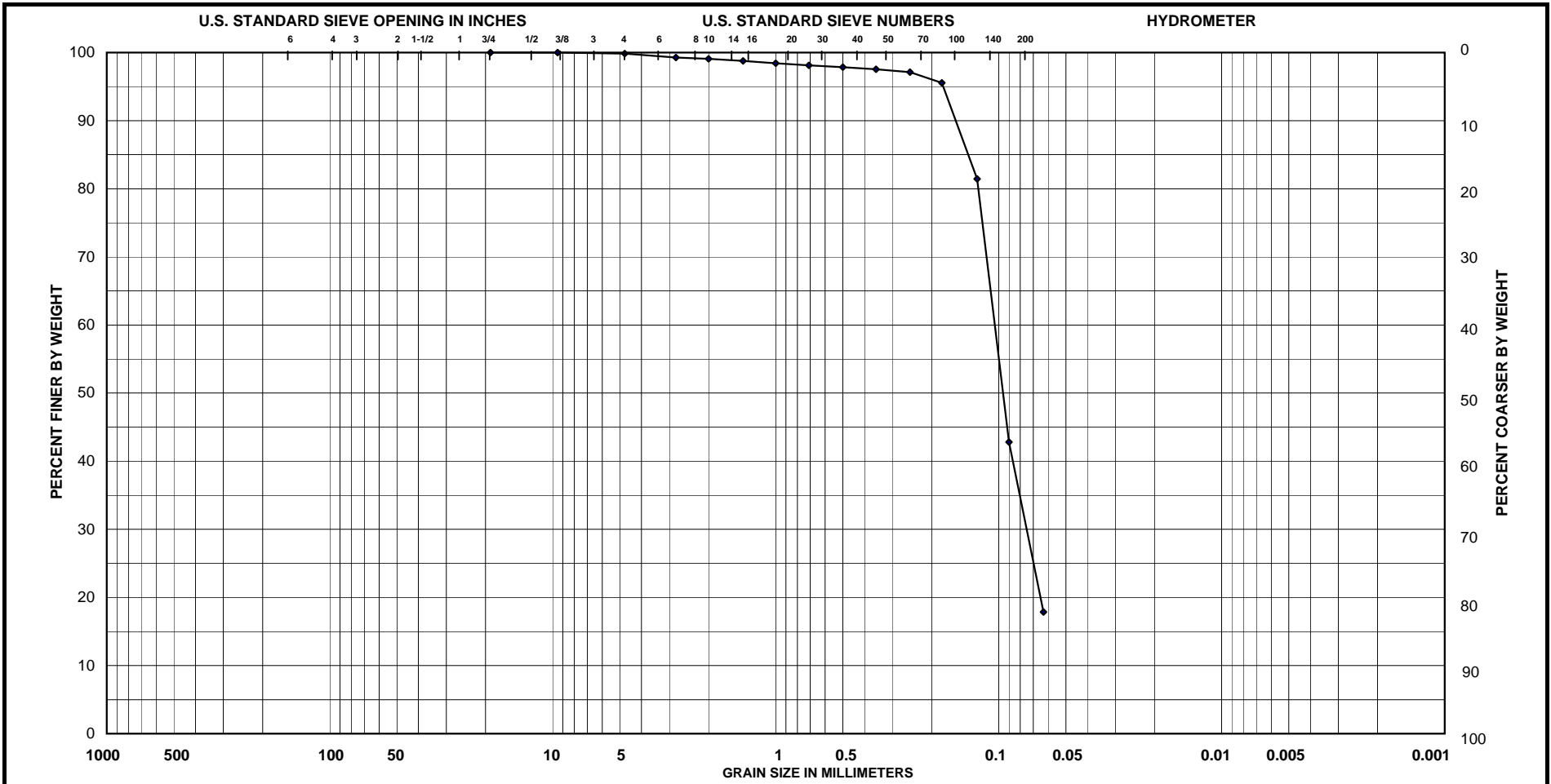
### GRAIN SIZE AND VISUAL SHELL CONTENT

Project:	<b>Topsail Beach, Surf City &amp; North Topsail</b>	Depth:	<b>49.7-50.2</b>
Project No.:	<b>1584-01-40</b>	Date:	<b>9/24/2003</b>
Boring No.:	<b>T1-03-V-177</b>		
Sample No.:	<b>3</b>		
Description:	<b>SAND, silty, mostly fine-grained quartz, little silt, trace carbonate, olive gray (SM)</b>		

Tare Weight, (g):	<b>49.98</b>	
Dry Wt. Before Washing (g):	<b>172.19</b>	(with tare)
Dry Weight After Washing (g):	<b>153.35</b>	(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	0.19	99.84	100	0.19
#7	2.800	0.69	99.28	100	0.69
#10	2.000	0.24	99.08	100	0.24
#14	1.400	0.39	98.76	90	0.35
#18	1.000	0.43	98.41	70	0.30
#25	0.710	0.35	98.13	70	0.25
#35	0.500	0.31	97.87	50	0.16
#45	0.355	0.38	97.56	20	0.08
#60	0.250	0.52	97.14	15	0.08
#80	0.180	1.93	95.56	5	0.10
#120	0.125	17.26	81.43	1	0.17
#170	0.090	47.18	42.83	1	0.47
#230	0.063	30.49	17.88	1	0.30

**Total Shell Content:** **3** %



COBBLES	GRAVEL		SAND			SILT OR CLAY
	COARSE	FINE	COARSE	MEDIUM	FINE	

Sample No.	Elev. Or Depth	Classification	% CO <sub>3</sub>	G <sub>s</sub>	Nat w%	LL	PL	PI	Project
3	49.7-50.2	SAND, silty, mostly fine-grained quartz, little silt, trace carbonate, olive gray (SM)	3						Topsail Beach, Surf City & North Topsail
									Area
									Boring No. T1-03-V-177
									Date 9/24/2003

**GRADATION CURVES**



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## VISUAL SHELL CONTENT

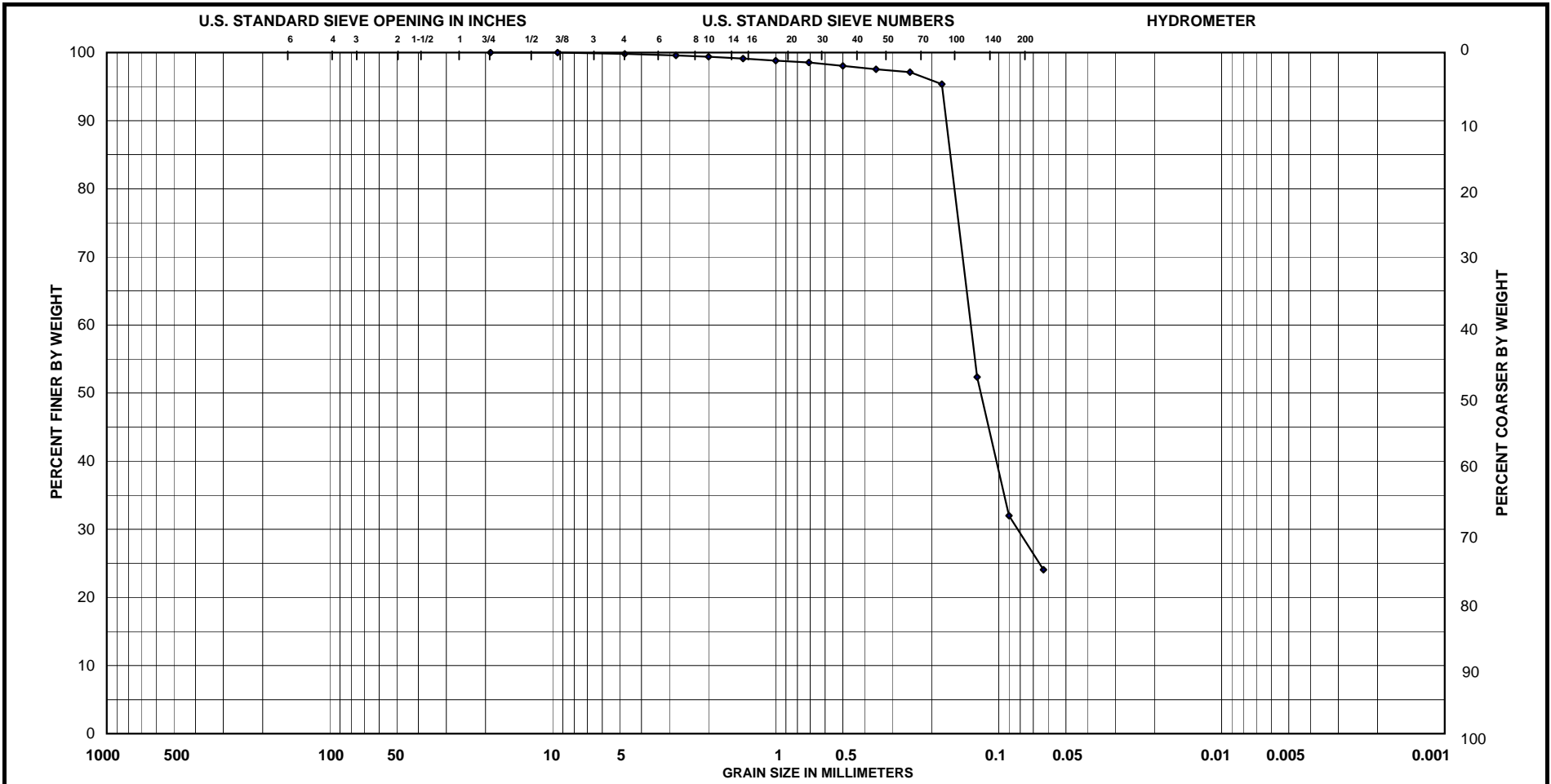
### GRAIN SIZE AND VISUAL SHELL CONTENT

Project:	<b>Topsail Beach, Surf City &amp; North Topsail</b>	Depth:	<b>52.0-52.5</b>
Project No.:	<b>1584-01-40</b>	Date:	<b>9/24/2003</b>
Boring No.:	<b>T1-03-V-177</b>		
Sample No.:	<b>4</b>		
Description:	<b>SAND, silty, mostly fine-grained quartz, little silt, trace carbonate, trace fragmented limestone, dark greenish gray (SM)</b>		

Tare Weight, (g):	<b>50.30</b>	
Dry Wt. Before Washing (g):	<b>180.55</b>	(with tare)
Dry Weight After Washing (g):	<b>150.58</b>	(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	0.25	99.81	100	0.25
#7	2.800	0.31	99.57	100	0.31
#10	2.000	0.23	99.39	100	0.23
#14	1.400	0.36	99.12	90	0.32
#18	1.000	0.38	98.83	70	0.27
#25	0.710	0.38	98.53	40	0.15
#35	0.500	0.65	98.03	10	0.07
#45	0.355	0.62	97.56	3	0.02
#60	0.250	0.58	97.11	1	0.01
#80	0.180	2.27	95.37	1	0.02
#120	0.125	56.03	52.35	1	0.56
#170	0.090	26.50	32.01	1	0.27
#230	0.063	10.36	24.05	1	0.10

**Total Shell Content:** **2** %



COBBLES	GRAVEL		SAND			SILT OR CLAY
	COARSE	FINE	COARSE	MEDIUM	FINE	

Sample No.	Elev. Or Depth	Classification	% CO <sub>3</sub>	G <sub>s</sub>	Nat w%	LL	PL	PI	Project	
4	52.0-52.5	SAND, silty, mostly fine-grained quartz, little silt, trace carbonate, trace fragmented limestone, dark greenish gray (SM)	2						Topsail Beach, Surf City & North Topsail	
									Area	
									Boring No. T1-03-V-177	
									Date 9/24/2003	

**GRADATION CURVES**



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## VISUAL SHELL CONTENT

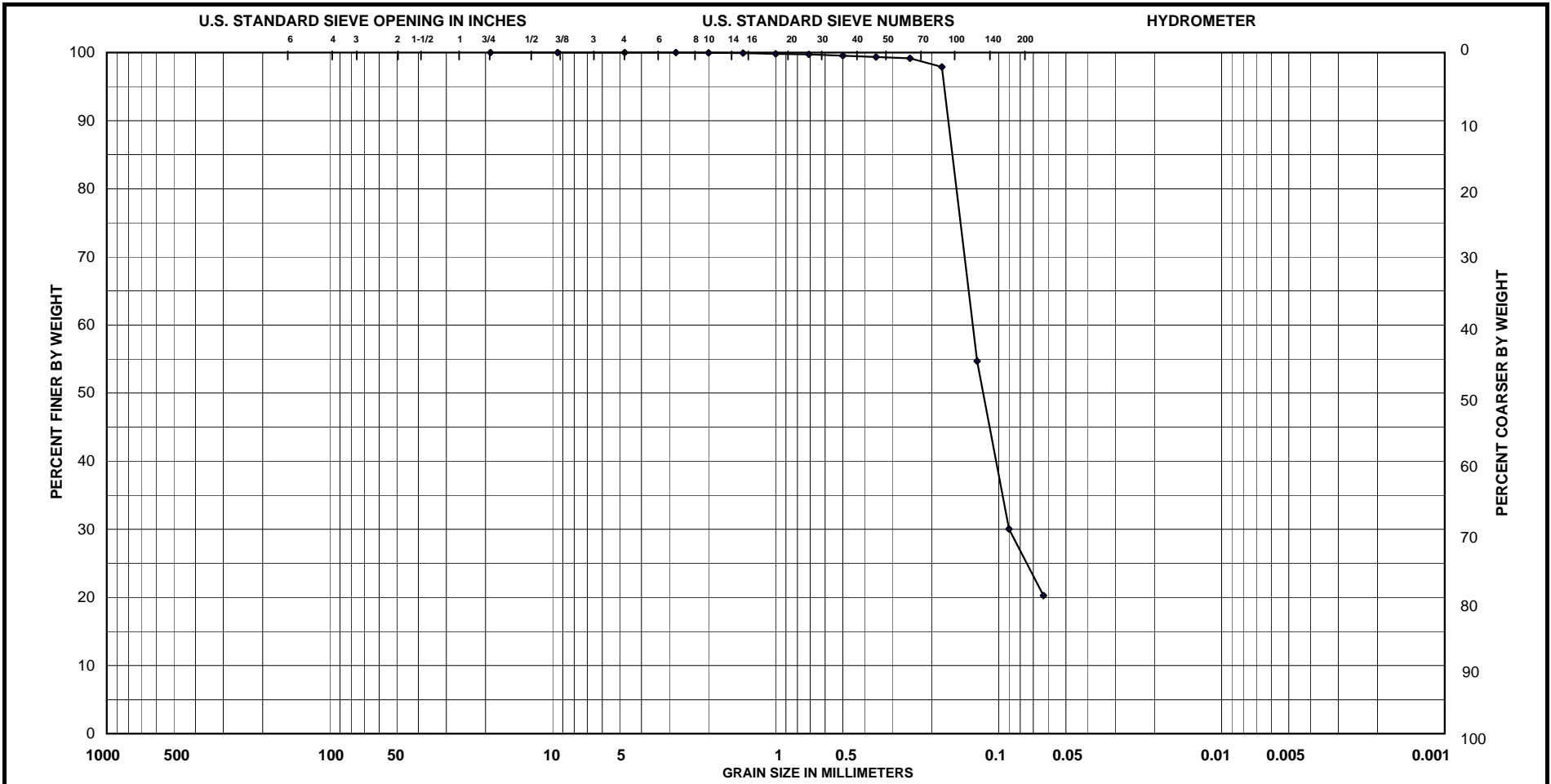
### GRAIN SIZE AND VISUAL SHELL CONTENT

Project:	<b>Topsail Beach, Surf City &amp; North Topsail</b>	Depth:	<b>54.0-54.5</b>
Project No.:	<b>1584-01-40</b>	Date:	<b>9/24/2003</b>
Boring No.:	<b>T1-03-V-177</b>		
Sample No.:	<b>5</b>		
Description:	<b>SAND, silty, mostly fine-grained quartz, little silt, trace carbonate, trace fragmented limestone, olive gray (SM)</b>		

Tare Weight, (g):	<b>50.35</b>	
Dry Wt. Before Washing (g):	<b>172.11</b>	(with tare)
Dry Weight After Washing (g):	<b>149.51</b>	(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	0.03	99.97	90	0.03
#14	1.400	0.06	99.92	80	0.05
#18	1.000	0.12	99.82	30	0.04
#25	0.710	0.13	99.71	10	0.01
#35	0.500	0.20	99.55	5	0.01
#45	0.355	0.24	99.35	3	0.01
#60	0.250	0.25	99.15	3	0.01
#80	0.180	1.53	97.89	3	0.05
#120	0.125	52.61	54.68	1	0.53
#170	0.090	30.01	30.03	1	0.30
#230	0.063	11.88	20.28	1	0.12

**Total Shell Content:** **1** %



COBBLES	GRAVEL		SAND			SILT OR CLAY
	COARSE	FINE	COARSE	MEDIUM	FINE	

Sample No.	Elev. Or Depth	Classification	% CO <sub>3</sub>	G <sub>s</sub>	Nat w%	LL	PL	PI	Project	
5	54.0-54.5	SAND, silty, mostly fine-grained quartz, little silt, trace carbonate, trace fragmented limestone, olive gray (SM)	1						Topsail Beach, Surf City & North Topsail	
									Area	
									Boring No. T1-03-V-177	
									Date 9/24/2003	

**GRADATION CURVES**



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## VISUAL SHELL CONTENT

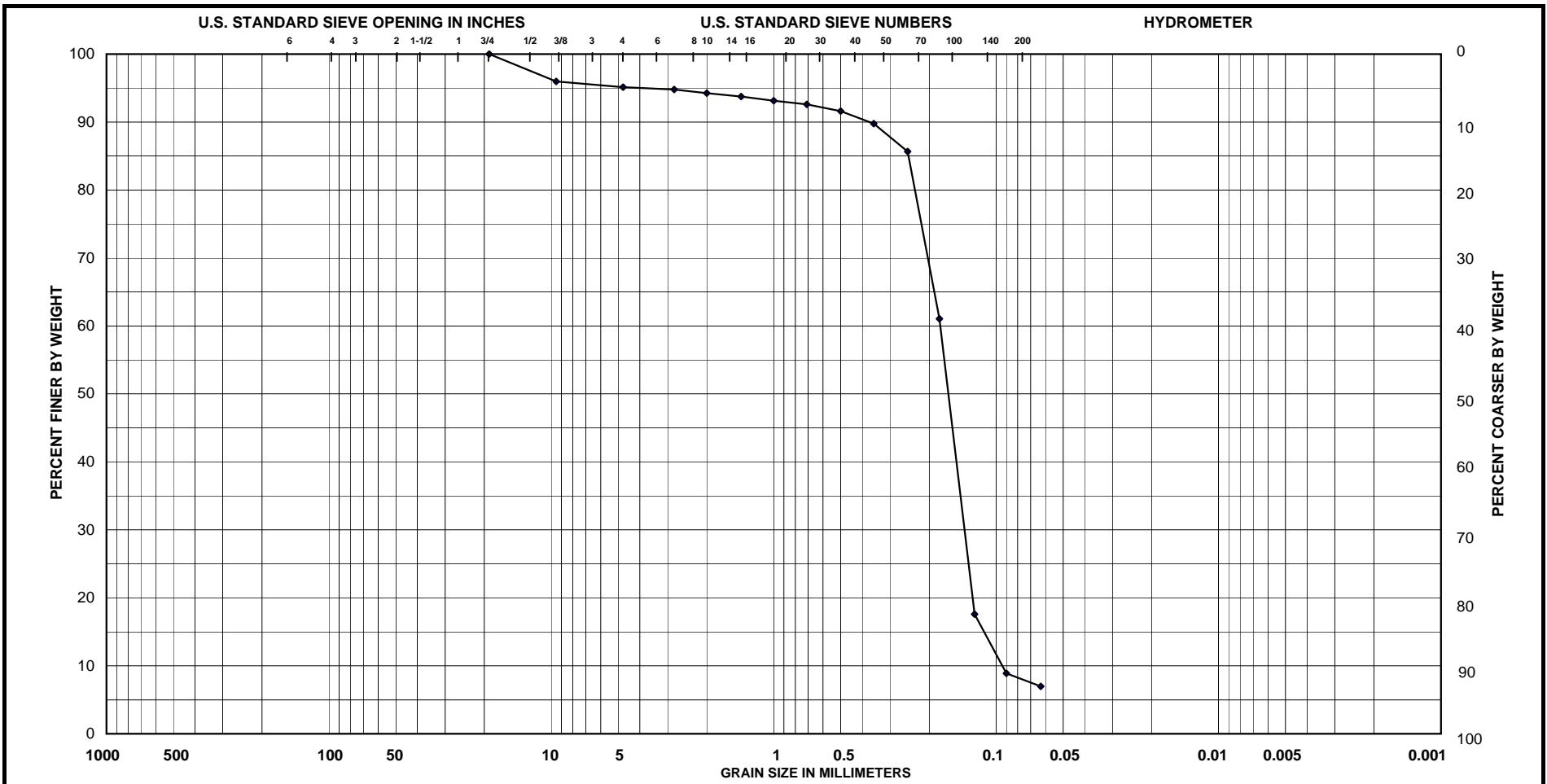
### GRAIN SIZE AND VISUAL SHELL CONTENT

Project:	<b>Topsail Beach, Surf City &amp; North Topsail</b>	Depth:	<b>46.3-46.8</b>
Project No.:	<b>1584-01-40</b>	Date:	<b>9/24/2003</b>
Boring No.:	<b>T1-03-V-178</b>		
Sample No.:	<b>1</b>		
Description:	<b>SAND, poorly-graded with silt, mostly fine-grained quartz, few silt, few carbonate, trace fragmented limestone, dark gray (SP-SM)</b>		

Tare Weight, (g):	<b>50.52</b>	
Dry Wt. Before Washing (g):	<b>175.79</b>	(with tare)
Dry Weight After Washing (g):	<b>167.78</b>	(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	5.05	95.97	100	5.05
#4	4.750	1.03	95.15	100	1.03
#7	2.800	0.47	94.77	100	0.47
#10	2.000	0.65	94.25	100	0.65
#14	1.400	0.65	93.73	80	0.52
#18	1.000	0.73	93.15	80	0.58
#25	0.710	0.67	92.62	65	0.44
#35	0.500	1.25	91.62	60	0.75
#45	0.355	2.32	89.77	25	0.58
#60	0.250	5.14	85.66	10	0.51
#80	0.180	30.83	61.05	1	0.31
#120	0.125	54.44	17.59	1	0.54
#170	0.090	10.92	8.88	1	0.11
#230	0.063	2.36	6.99	1	0.02

**Total Shell Content:** **9** %



COBBLES	GRAVEL		SAND			SILT OR CLAY
	COARSE	FINE	COARSE	MEDIUM	FINE	

Sample No.	Elev. Or Depth	Classification	% CO <sub>3</sub>	G <sub>s</sub>	Nat w%	LL	PL	PI	Project	
♦ 1	46.3-46.8	SAND, poorly-graded with silt, mostly fine-grained quartz, few silt, few carbonate, trace fragmented limestone, dark gray (SP-SM)	9						Topsail Beach, Surf City & North Topsail	
									Area	
									Boring No. T1-03-V-178	
									Date 9/24/2003	

**GRADATION CURVES**





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## VISUAL SHELL CONTENT

### GRAIN SIZE AND VISUAL SHELL CONTENT

Project:	<b>Topsail Beach, Surf City &amp; North Topsail</b>	Depth:	<b>48.5-49.0</b>
Project No.:	<b>1584-01-40</b>	Date:	<b>9/24/2003</b>
Boring No.:	<b>T1-03-V-178</b>		
Sample No.:	<b>2</b>		
Description:	<b>SAND, poorly-graded with silt, mostly fine-grained quartz, few silt, trace carbonate, dark greenish gray (SP-SM)</b>		

Tare Weight, (g):	<b>50.22</b>	
Dry Wt. Before Washing (g):	<b>169.99</b>	(with tare)
Dry Weight After Washing (g):	<b>159.07</b>	(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	0.31	99.74	100	0.31
#7	2.800	0.09	99.67	100	0.09
#10	2.000	0.13	99.56	90	0.12
#14	1.400	0.11	99.47	40	0.04
#18	1.000	0.09	99.39	40	0.04
#25	0.710	0.20	99.22	30	0.06
#35	0.500	0.25	99.01	25	0.06
#45	0.355	0.26	98.80	20	0.05
#60	0.250	0.70	98.21	15	0.11
#80	0.180	4.62	94.36	5	0.23
#120	0.125	75.88	31.00	1	0.76
#170	0.090	20.77	13.66	1	0.21
#230	0.063	4.98	9.50	1	0.05

**Total Shell Content:** **2** %





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## VISUAL SHELL CONTENT

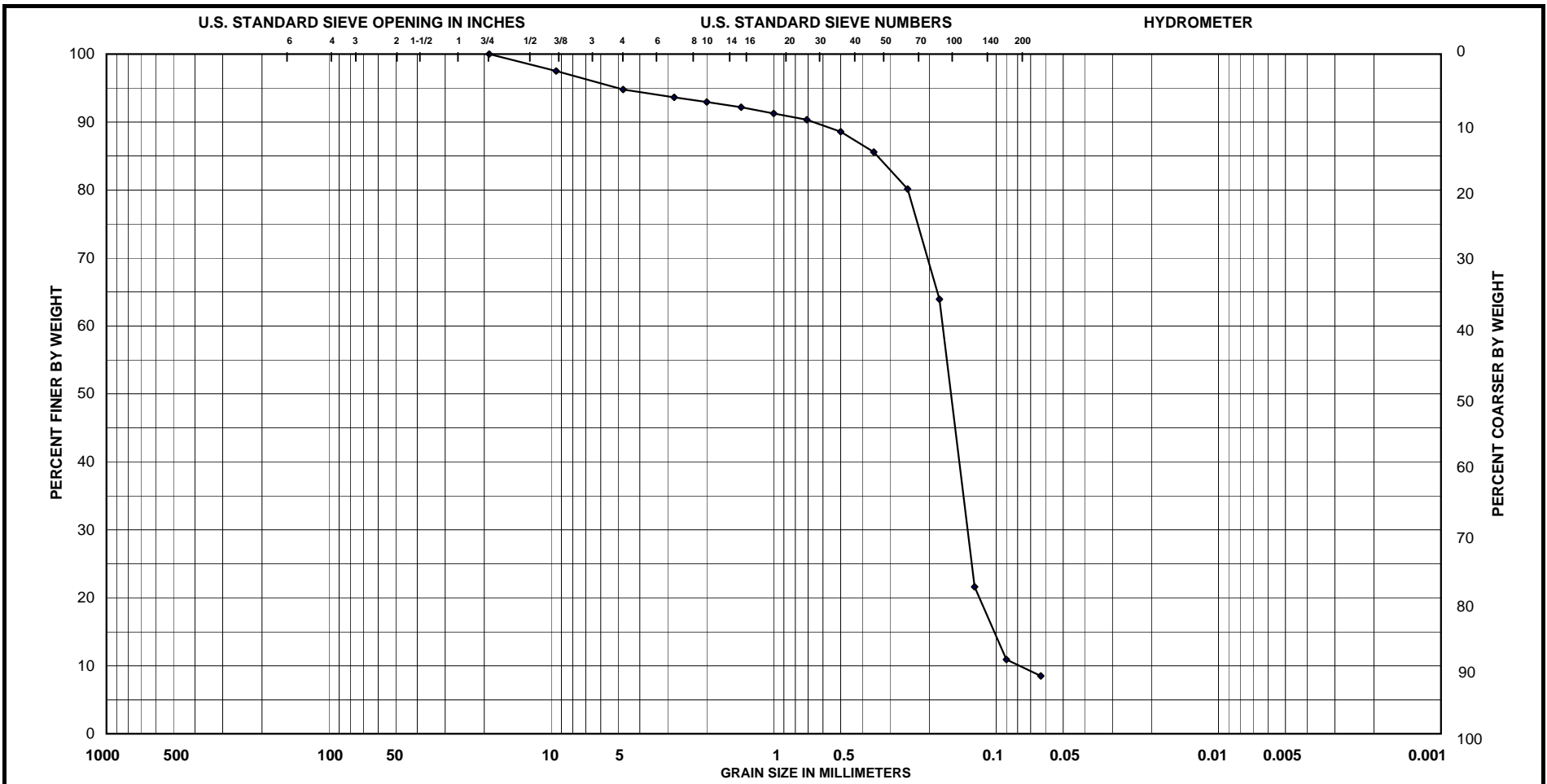
### GRAIN SIZE AND VISUAL SHELL CONTENT

Project:	<b>Topsail Beach, Surf City &amp; North Topsail</b>	Depth:	<b>50.5-51.0</b>
Project No.:	<b>1584-01-40</b>	Date:	<b>9/24/2003</b>
Boring No.:	<b>T1-03-V-178</b>		
Sample No.:	<b>3</b>		
Description:	<b>SAND, poorly-graded with silt, mostly fine-grained quartz, few silt, few carbonate, trace fragmented limestone, dark greenish gray (SP-SM)</b>		

Tare Weight, (g):	<b>50.20</b>	
Dry Wt. Before Washing (g):	<b>170.73</b>	(with tare)
Dry Weight After Washing (g):	<b>161.2</b>	(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	97.49	100	3.02
#4	4.750	3.28	94.77	100	3.28
#7	2.800	1.35	93.65	100	1.35
#10	2.000	0.84	92.96	100	0.84
#14	1.400	0.93	92.18	90	0.84
#18	1.000	1.13	91.25	70	0.79
#25	0.710	1.09	90.34	60	0.65
#35	0.500	2.13	88.58	30	0.64
#45	0.355	3.58	85.61	10	0.36
#60	0.250	6.60	80.13	3	0.20
#80	0.180	19.51	63.94	3	0.59
#120	0.125	51.01	21.62	1	0.51
#170	0.090	12.89	10.93	1	0.13
#230	0.063	2.90	8.52	1	0.03

**Total Shell Content:** **11** %



COBBLES	GRAVEL		SAND			SILT OR CLAY
	COARSE	FINE	COARSE	MEDIUM	FINE	

Sample No.	Elev. Or Depth	Classification	% CO <sub>3</sub>	G <sub>s</sub>	Nat w%	LL	PL	PI	Project
3	50.5-51.0	SAND, poorly-graded with silt, mostly fine-grained quartz, few silt, few carbonate, trace fragmented limestone, dark greenish gray (SP-SM)	11						Topsail Beach, Surf City & North Topsail
									Area
									Boring No. T1-03-V-178
									Date 9/24/2003

**GRADATION CURVES**



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## VISUAL SHELL CONTENT

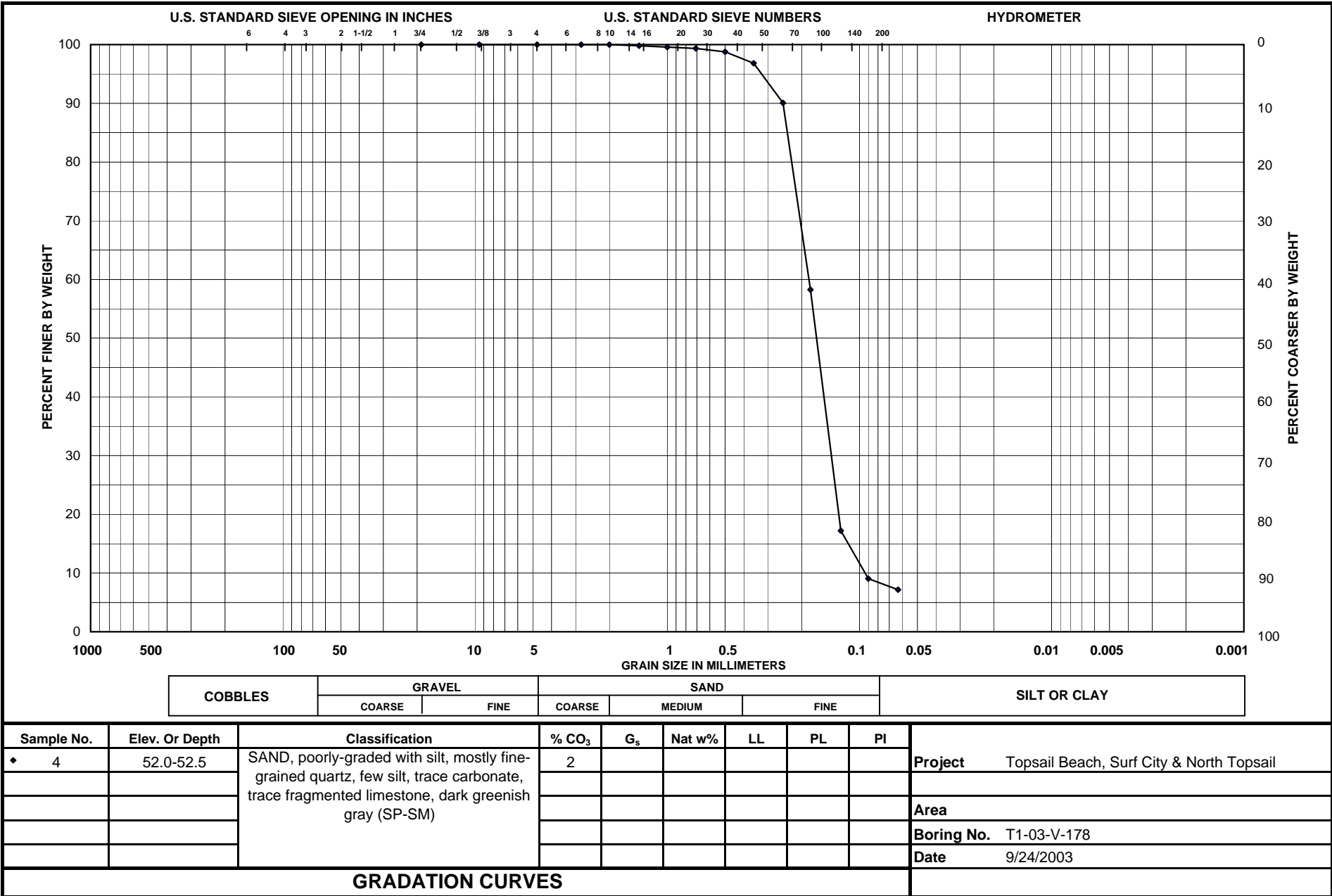
### GRAIN SIZE AND VISUAL SHELL CONTENT

Project:	<b>Topsail Beach, Surf City &amp; North Topsail</b>	Depth:	<b>52.0-52.5</b>
Project No.:	<b>1584-01-40</b>	Date:	<b>9/24/2003</b>
Boring No.:	<b>T1-03-V-178</b>		
Sample No.:	<b>4</b>		
Description:	<b>SAND, poorly-graded with silt, mostly fine-grained quartz, few silt, trace carbonate, trace fragmented limestone, dark greenish gray (SP-</b>		

Tare Weight, (g):	<b>50.16</b>	
Dry Wt. Before Washing (g):	<b>178.2</b>	(with tare)
Dry Weight After Washing (g):	<b>169.57</b>	(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	0.22	99.81	70	0.15
#18	1.000	0.28	99.59	65	0.18
#25	0.710	0.30	99.36	50	0.15
#35	0.500	0.73	98.79	50	0.37
#45	0.355	2.54	96.81	20	0.51
#60	0.250	8.63	90.07	3	0.26
#80	0.180	40.73	58.26	1	0.41
#120	0.125	52.55	17.21	1	0.53
#170	0.090	10.45	9.05	1	0.10
#230	0.063	2.43	7.15	1	0.02

**Total Shell Content:** **2** %



**GRADATION CURVES**



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## VISUAL SHELL CONTENT

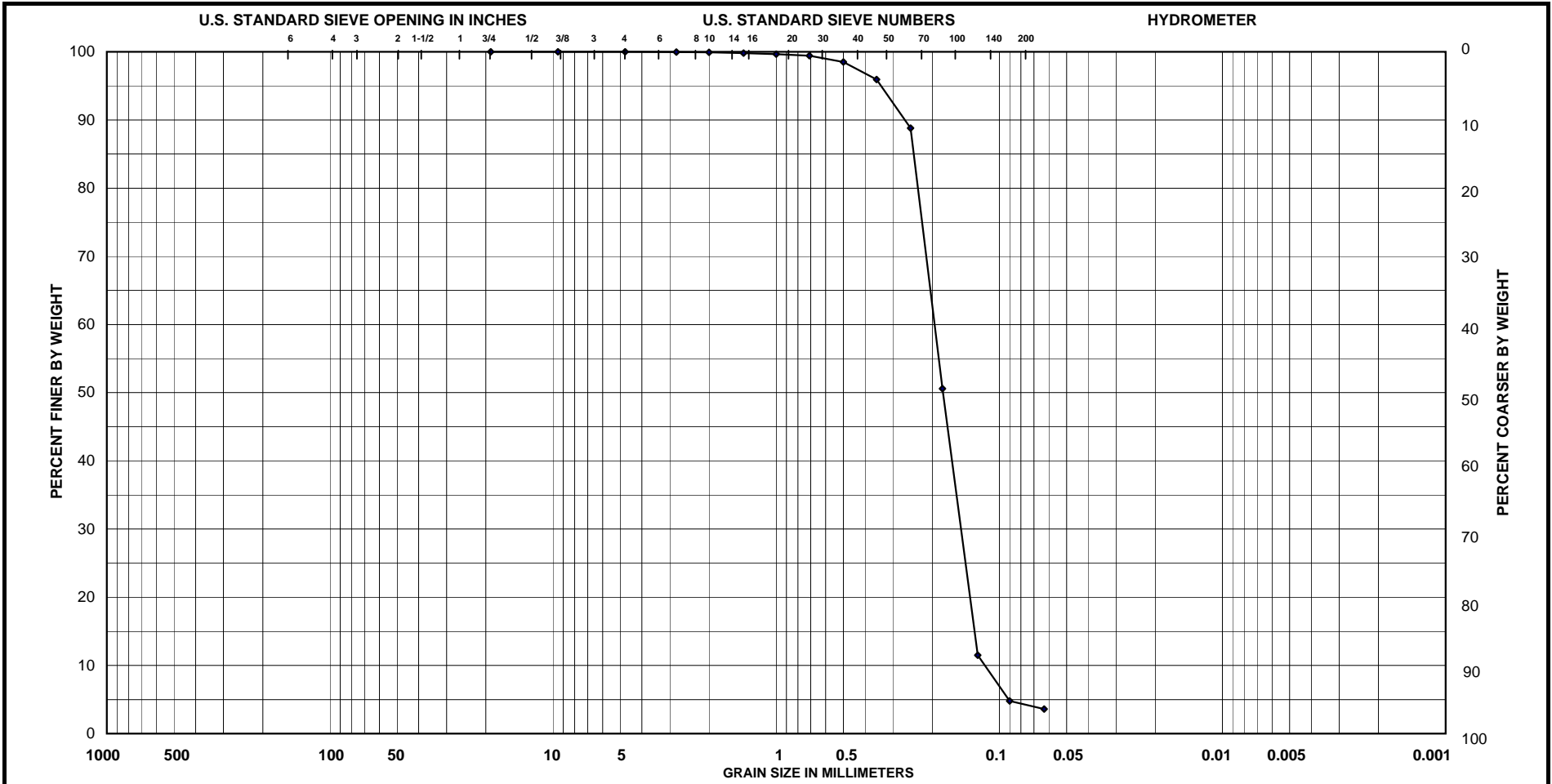
### GRAIN SIZE AND VISUAL SHELL CONTENT

Project:	<b>Topsail Beach, Surf City &amp; North Topsail</b>	Depth:	<b>54.5-55.0</b>
Project No.:	<b>1584-01-40</b>	Date:	<b>9/24/2003</b>
Boring No.:	<b>T1-03-V-178</b>		
Sample No.:	<b>5</b>		
Description:	<b>SAND, poorly-graded, mostly fine-grained quartz, trace carbonate, dark greenish gray (SP)</b>		

Tare Weight, (g):	<b>50.53</b>	
Dry Wt. Before Washing (g):	<b>175.82</b>	(with tare)
Dry Weight After Washing (g):	<b>171.51</b>	(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	0.04	99.97	100	0.04
#10	2.000	0.04	99.94	100	0.04
#14	1.400	0.15	99.82	100	0.15
#18	1.000	0.18	99.67	90	0.16
#25	0.710	0.29	99.44	80	0.23
#35	0.500	1.18	98.50	75	0.89
#45	0.355	3.22	95.93	20	0.64
#60	0.250	8.91	88.82	3	0.27
#80	0.180	47.89	50.59	1	0.48
#120	0.125	48.97	11.51	1	0.49
#170	0.090	8.44	4.77	1	0.08
#230	0.063	1.48	3.59	1	0.01

**Total Shell Content:** **3** %



COBBLES	GRAVEL		SAND			SILT OR CLAY
	COARSE	FINE	COARSE	MEDIUM	FINE	

Sample No.	Elev. Or Depth	Classification	% CO <sub>3</sub>	G <sub>s</sub>	Nat w%	LL	PL	PI	Project
5	54.5-55.0	SAND, poorly-graded, mostly fine-grained quartz, trace carbonate, dark greenish gray (SP)	3						Topsail Beach, Surf City & North Topsail
									Area
									Boring No. T1-03-V-178
									Date 9/24/2003

**GRADATION CURVES**





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## VISUAL SHELL CONTENT

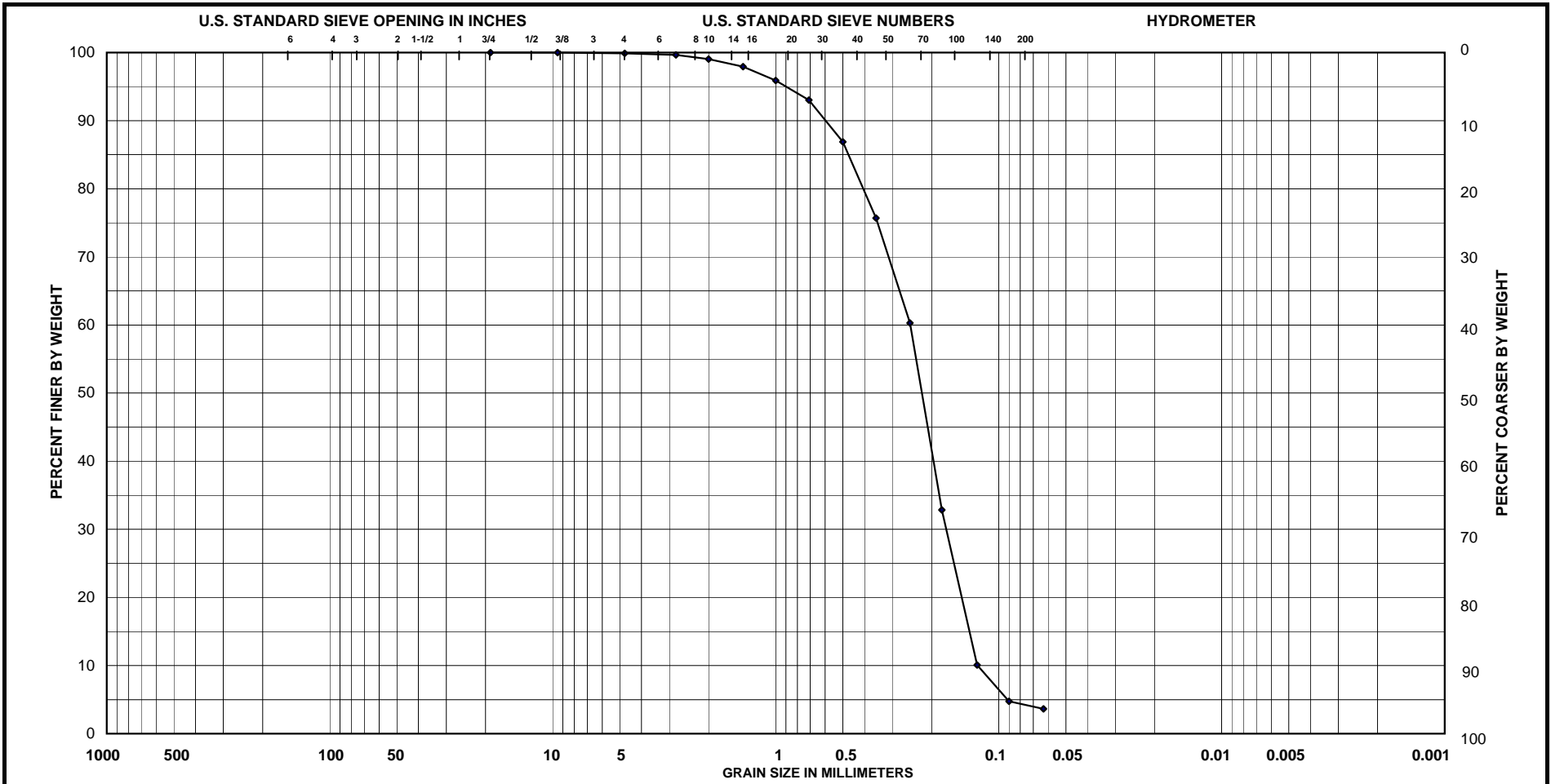
### GRAIN SIZE AND VISUAL SHELL CONTENT

Project:	<b>Topsail Beach, Surf City &amp; North Topsail</b>	Depth:	<b>57.0-57.5</b>
Project No.:	<b>1584-01-40</b>	Date:	<b>9/24/2003</b>
Boring No.:	<b>T1-03-V-178</b>		
Sample No.:	<b>6</b>		
Description:	<b>SAND, poorly-graded, mostly fine-grained quartz, few carbonate, olive gray (SP)</b>		

Tare Weight, (g):	<b>50.34</b>	
Dry Wt. Before Washing (g):	<b>175.62</b>	(with tare)
Dry Weight After Washing (g):	<b>171.75</b>	(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	0.13	99.90	100	0.13
#7	2.800	0.29	99.66	100	0.29
#10	2.000	0.76	99.06	90	0.68
#14	1.400	1.42	97.92	70	0.99
#18	1.000	2.54	95.90	70	1.78
#25	0.710	3.58	93.04	50	1.79
#35	0.500	7.69	86.90	20	1.54
#45	0.355	14.03	75.70	10	1.40
#60	0.250	19.31	60.29	5	0.97
#80	0.180	34.37	32.85	3	1.03
#120	0.125	28.53	10.08	1	0.29
#170	0.090	6.68	4.75	1	0.07
#230	0.063	1.39	3.64	1	0.01

**Total Shell Content:** **9** %



COBBLES	GRAVEL		SAND			SILT OR CLAY
	COARSE	FINE	COARSE	MEDIUM	FINE	

Sample No.	Elev. Or Depth	Classification	% CO <sub>3</sub>	G <sub>s</sub>	Nat w%	LL	PL	PI	Project
6	57.0-57.5	SAND, poorly-graded, mostly fine-grained quartz, few carbonate, olive gray (SP)	9						Topsail Beach, Surf City & North Topsail
									Area
									Boring No. T1-03-V-178
									Date 9/24/2003

**GRADATION CURVES**



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## VISUAL SHELL CONTENT

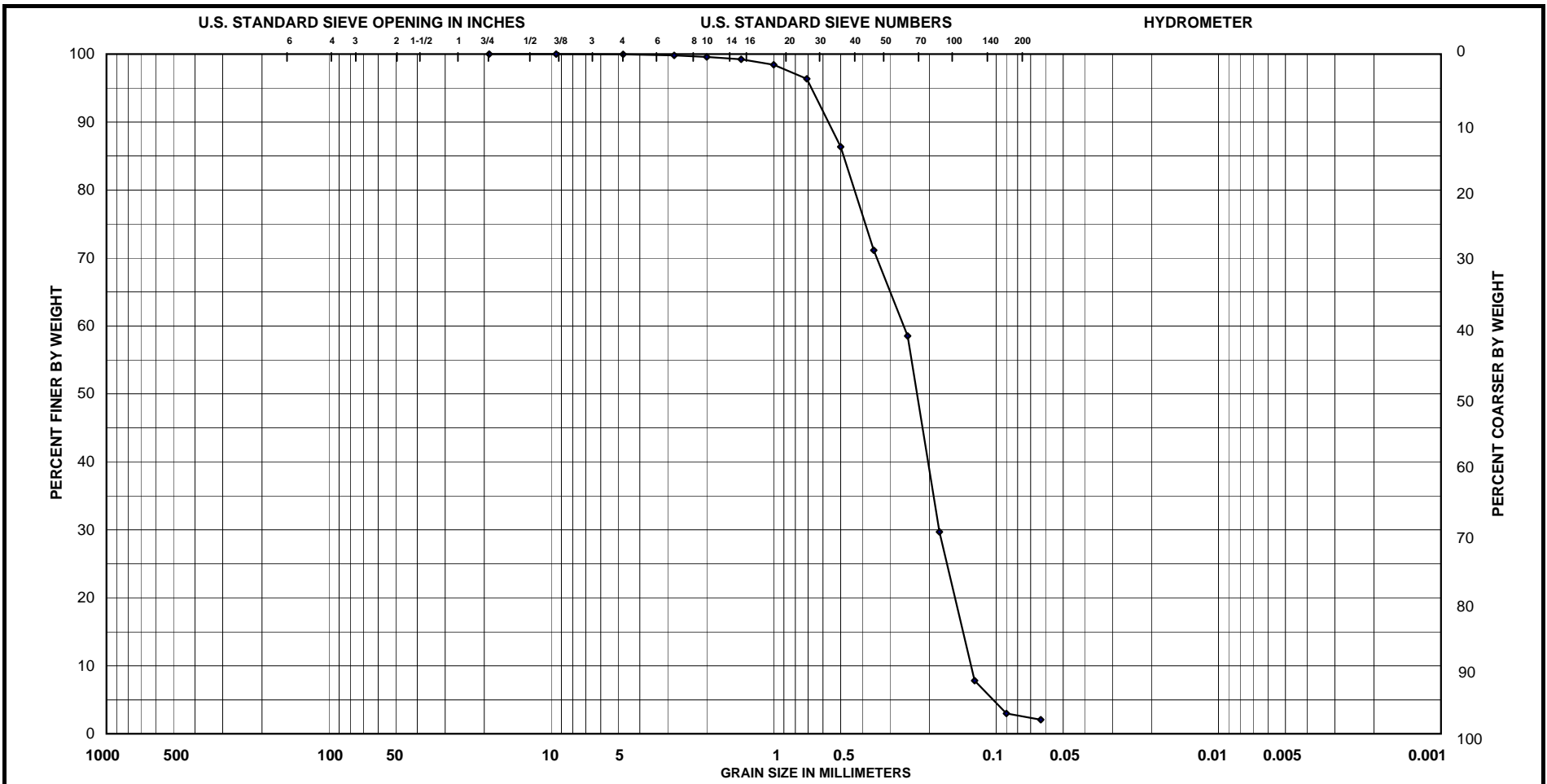
### GRAIN SIZE AND VISUAL SHELL CONTENT

Project:	<b>Topsail Beach, Surf City &amp; North Topsail</b>	Depth:	<b>60.0-60.5</b>
Project No.:	<b>1584-01-40</b>	Date:	<b>9/24/2003</b>
Boring No.:	<b>T1-03-V-178</b>		
Sample No.:	<b>7</b>		
Description:	<b>SAND, poorly-graded, mostly medium to fine-grained quartz, trace carbonate, trace fragmented limestone, gray (SP)</b>		

Tare Weight, (g):	<b>49.46</b>	
Dry Wt. Before Washing (g):	<b>176.61</b>	(with tare)
Dry Weight After Washing (g):	<b>174.34</b>	(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	0.04	99.97	100	0.04
#7	2.800	0.21	99.80	100	0.21
#10	2.000	0.27	99.59	100	0.27
#14	1.400	0.44	99.24	70	0.31
#18	1.000	1.05	98.42	65	0.68
#25	0.710	2.63	96.35	5	0.13
#35	0.500	12.69	86.37	3	0.38
#45	0.355	19.39	71.12	1	0.19
#60	0.250	16.03	58.51	1	0.16
#80	0.180	36.61	29.72	1	0.37
#120	0.125	27.83	7.83	1	0.28
#170	0.090	6.17	2.98	1	0.06
#230	0.063	1.16	2.07	1	0.01

**Total Shell Content:** **2** %



COBBLES	GRAVEL		SAND			SILT OR CLAY
	COARSE	FINE	COARSE	MEDIUM	FINE	

Sample No.	Elev. Or Depth	Classification	% CO <sub>3</sub>	G <sub>s</sub>	Nat w%	LL	PL	PI	Project
7	60.0-60.5	SAND, poorly-graded, mostly medium to fine-grained quartz, trace carbonate, trace fragmented limestone, gray (SP)	2						Topsail Beach, Surf City & North Topsail
									Area
									Boring No. T1-03-V-178
									Date 9/24/2003

**GRADATION CURVES**



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## VISUAL SHELL CONTENT

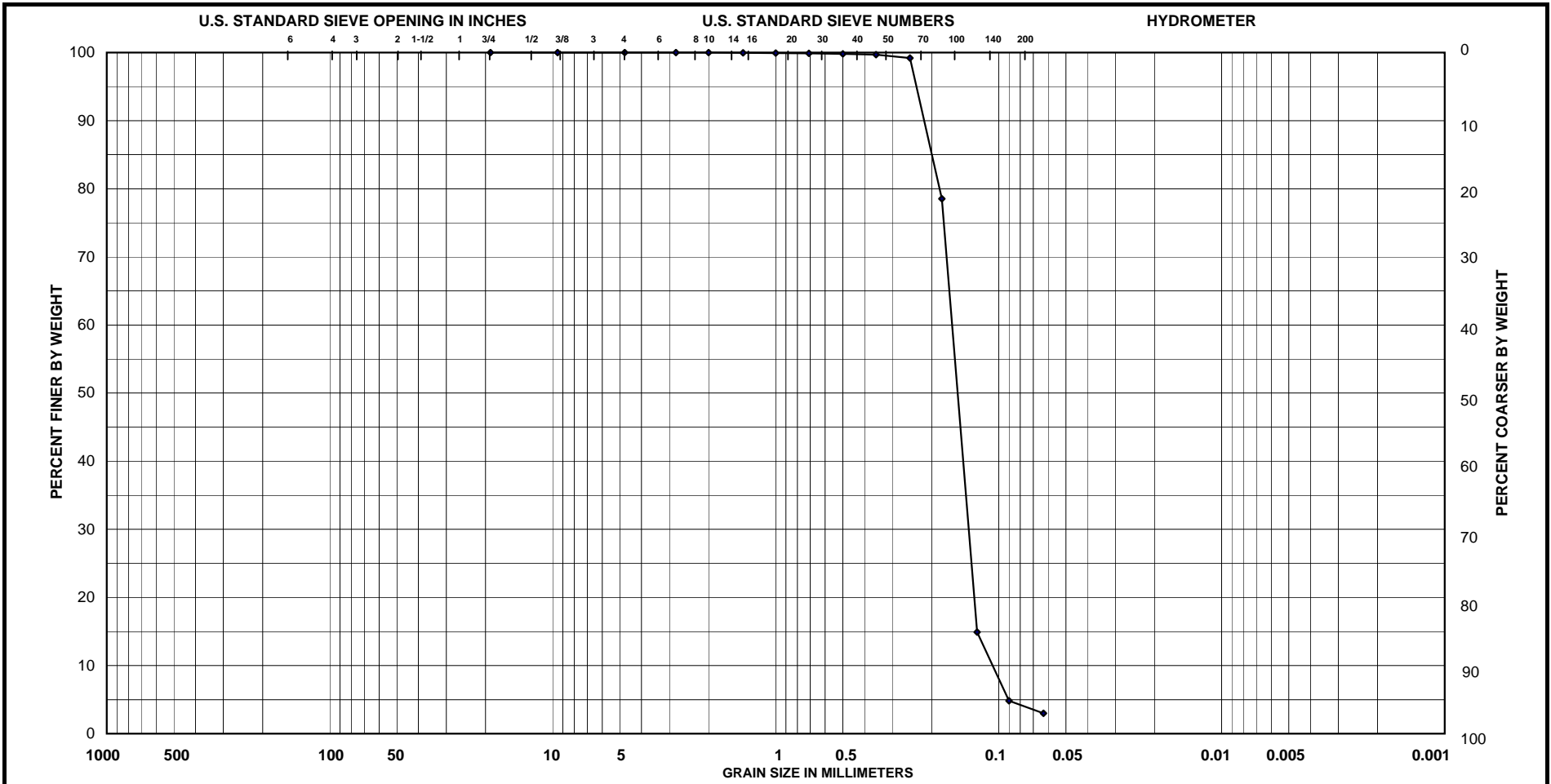
### GRAIN SIZE AND VISUAL SHELL CONTENT

Project:	<b>Topsail Beach, Surf City &amp; North Topsail</b>	Depth:	<b>62.5-63.0</b>
Project No.:	<b>1584-01-40</b>	Date:	<b>9/24/2003</b>
Boring No.:	<b>T1-03-V-178</b>		
Sample No.:	<b>8</b>		
Description:	<b>SAND, poorly-graded, mostly fine-grained quartz, trace carbonate, trace fragmented limestone, gray (SP)</b>		

Tare Weight, (g):	<b>50.01</b>	
Dry Wt. Before Washing (g):	<b>176.66</b>	(with tare)
Dry Weight After Washing (g):	<b>172.86</b>	(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	0.00	100.00	0	0.00
#14	1.400	0.05	99.96	50	0.03
#18	1.000	0.05	99.92	5	0.00
#25	0.710	0.04	99.89	3	0.00
#35	0.500	0.08	99.83	1	0.00
#45	0.355	0.18	99.68	1	0.00
#60	0.250	0.63	99.19	1	0.01
#80	0.180	26.16	78.53	1	0.26
#120	0.125	80.59	14.90	1	0.81
#170	0.090	12.76	4.82	1	0.13
#230	0.063	2.30	3.01	1	0.02

**Total Shell Content:** **1** %



COBBLES	GRAVEL		SAND			SILT OR CLAY
	COARSE	FINE	COARSE	MEDIUM	FINE	

Sample No.	Elev. Or Depth	Classification	% CO <sub>3</sub>	G <sub>s</sub>	Nat w%	LL	PL	PI	Project	
♦ 8	62.5-63.0	SAND, poorly-graded, mostly fine-grained quartz, trace carbonate, trace fragmented limestone, gray (SP)	1						Topsail Beach, Surf City & North Topsail	
									Area	
									Boring No. T1-03-V-178	
									Date 9/24/2003	

**GRADATION CURVES**



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## VISUAL SHELL CONTENT

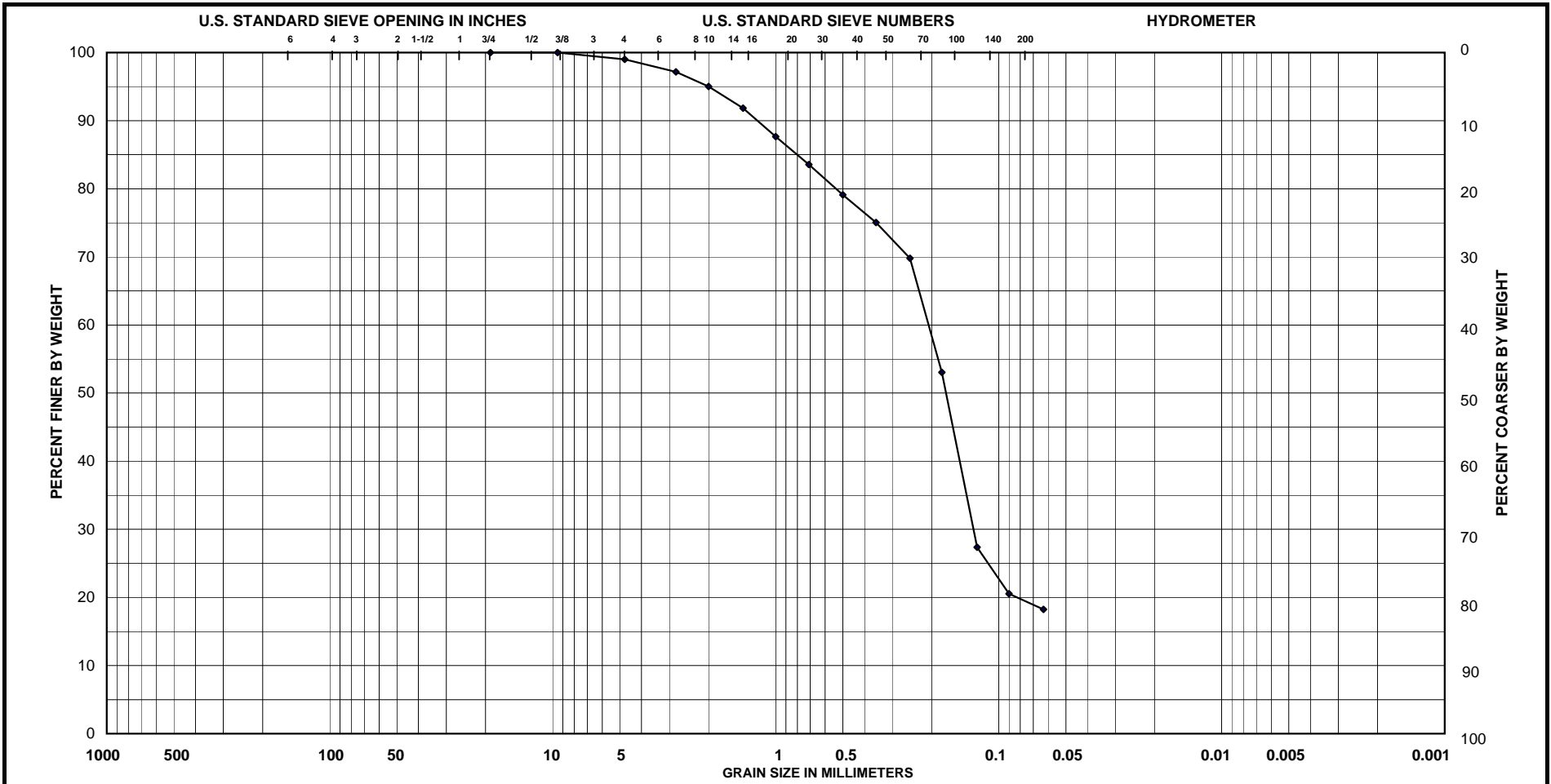
### GRAIN SIZE AND VISUAL SHELL CONTENT

Project:	<b>Topsail Beach, Surf City &amp; North Topsail</b>	Depth:	<b>46.0-46.5</b>
Project No.:	<b>1584-01-40</b>	Date:	<b>9/24/2003</b>
Boring No.:	<b>T1-03-V-179</b>		
Sample No.:	<b>1</b>		
Description:	<b>SAND, silty, mostly fine-grained quartz, little coarse to medium-grained carbonate, little silt, trace fragmented limestone, dark greenish gray</b>		

Tare Weight, (g):	<b>49.98</b>	
Dry Wt. Before Washing (g):	<b>162.54</b>	(with tare)
Dry Weight After Washing (g):	<b>142.3</b>	(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	1.13	99.00	100	1.13
#7	2.800	2.08	97.15	80	1.66
#10	2.000	2.42	95.00	80	1.94
#14	1.400	3.55	91.84	70	2.49
#18	1.000	4.73	87.64	65	3.07
#25	0.710	4.59	83.56	60	2.75
#35	0.500	5.01	79.11	60	3.01
#45	0.355	4.58	75.04	40	1.83
#60	0.250	5.89	69.81	20	1.18
#80	0.180	18.88	53.04	5	0.94
#120	0.125	28.91	27.35	3	0.87
#170	0.090	7.67	20.54	1	0.08
#230	0.063	2.58	18.25	1	0.03

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



COBBLES	GRAVEL		SAND			SILT OR CLAY
	COARSE	FINE	COARSE	MEDIUM	FINE	

Sample No.	Elev. Or Depth	Classification	% CO <sub>3</sub>	G <sub>s</sub>	Nat w%	LL	PL	PI	Project
♦ 1	46.0-46.5	SAND, silty, mostly fine-grained quartz, little coarse to medium-grained carbonate, little silt, trace fragmented limestone, dark greenish gray (SM)	19						Topsail Beach, Surf City & North Topsail
									Area
									Boring No. T1-03-V-179
									Date 9/24/2003

**GRADATION CURVES**





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## VISUAL SHELL CONTENT

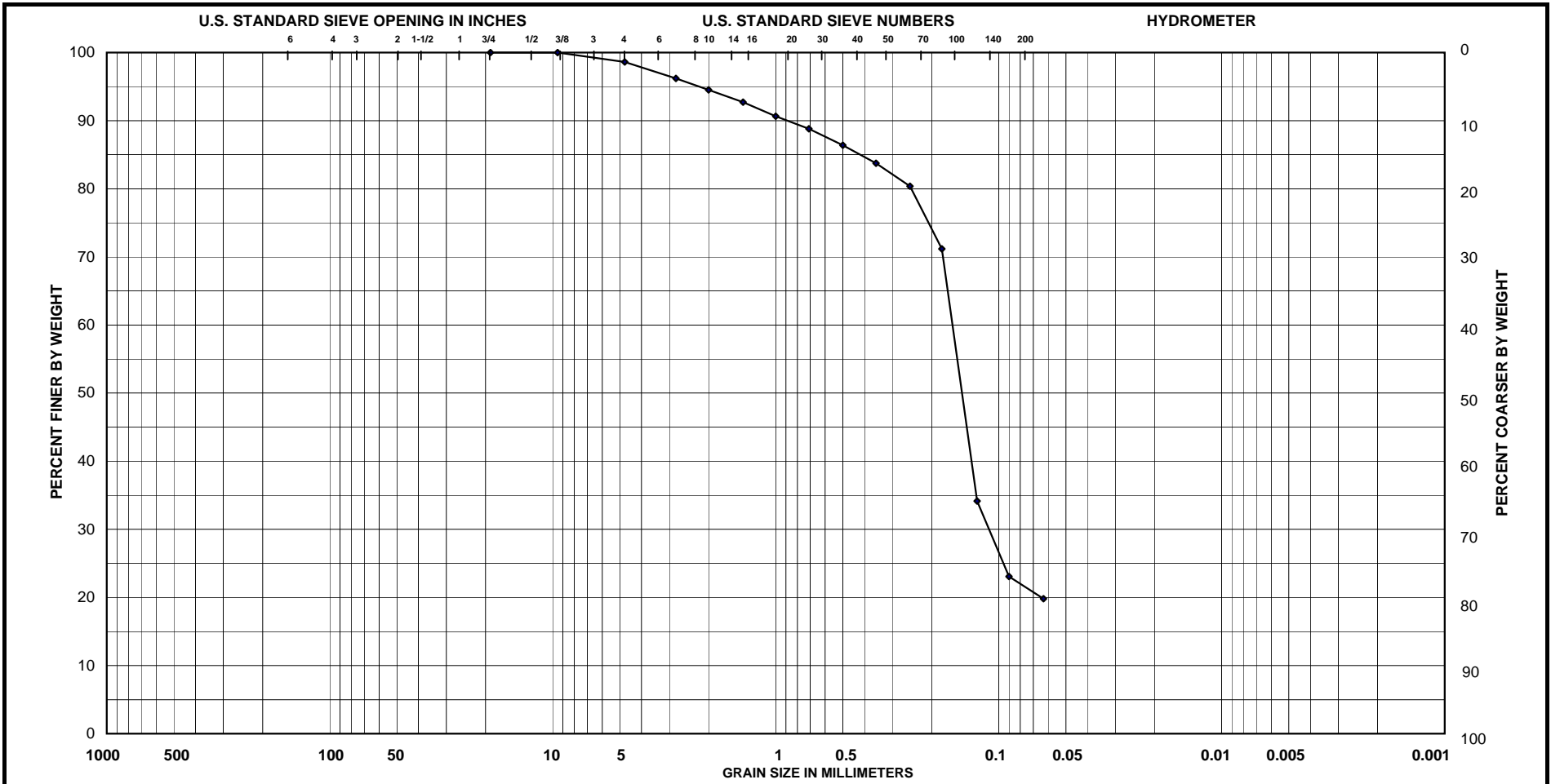
### GRAIN SIZE AND VISUAL SHELL CONTENT

Project:	<b>Topsail Beach, Surf City &amp; North Topsail</b>	Depth:	<b>48.0-48.5</b>
Project No.:	<b>1584-01-40</b>	Date:	<b>9/24/2003</b>
Boring No.:	<b>T1-03-V-179</b>		
Sample No.:	<b>2</b>		
Description:	<b>SAND, silty, mostly fine-grained quartz, little silt, few carbonate, trace fragmented limestone, dark greenish gray (SM)</b>		

Tare Weight, (g):	<b>49.46</b>	
Dry Wt. Before Washing (g):	<b>176.44</b>	(with tare)
Dry Weight After Washing (g):	<b>152.35</b>	(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	1.77	98.61	100	1.77
#7	2.800	3.04	96.21	90	2.74
#10	2.000	2.16	94.51	90	1.94
#14	1.400	2.28	92.72	70	1.60
#18	1.000	2.63	90.64	65	1.71
#25	0.710	2.32	88.82	60	1.39
#35	0.500	3.07	86.40	60	1.84
#45	0.355	3.35	83.76	20	0.67
#60	0.250	4.29	80.38	15	0.64
#80	0.180	11.71	71.16	3	0.35
#120	0.125	47.00	34.15	1	0.47
#170	0.090	14.04	23.09	1	0.14
#230	0.063	4.15	19.82	1	0.04

**Total Shell Content:** **12** %



COBBLES	GRAVEL		SAND			SILT OR CLAY
	COARSE	FINE	COARSE	MEDIUM	FINE	

Sample No.	Elev. Or Depth	Classification	% CO <sub>3</sub>	G <sub>s</sub>	Nat w%	LL	PL	PI	Project
2	48.0-48.5	SAND, silty, mostly fine-grained quartz, little silt, few carbonate, trace fragmented limestone, dark greenish gray (SM)	12						Topsail Beach, Surf City & North Topsail
									Area
									Boring No. T1-03-V-179
									Date 9/24/2003

**GRADATION CURVES**



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## VISUAL SHELL CONTENT

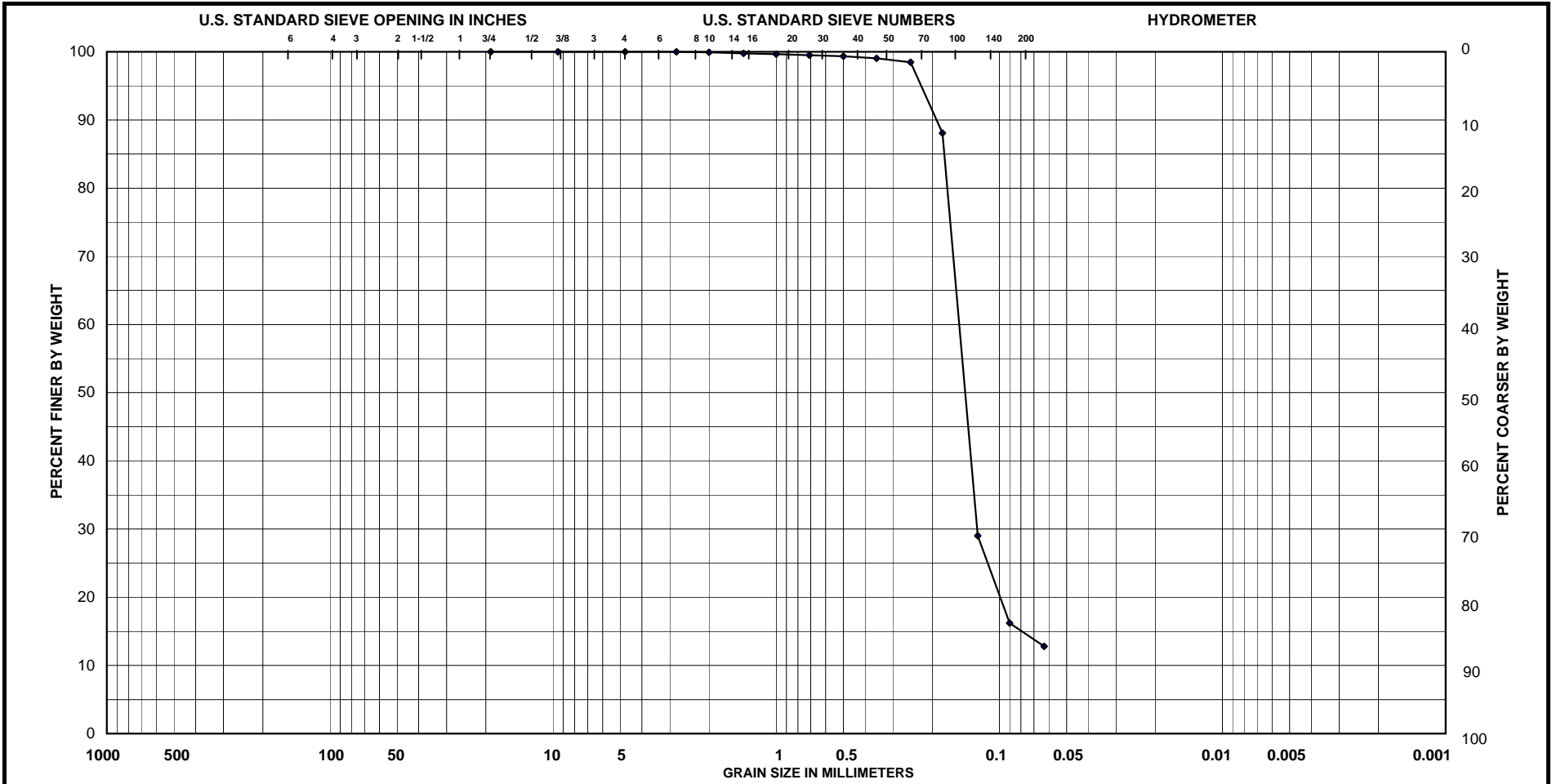
### GRAIN SIZE AND VISUAL SHELL CONTENT

Project:	<b>Topsail Beach, Surf City &amp; North Topsail</b>	Depth:	<b>49.4-49.9</b>
Project No.:	<b>1584-01-40</b>	Date:	<b>9/24/2003</b>
Boring No.:	<b>T1-03-V-179</b>		
Sample No.:	<b>3</b>		
Description:	<b>SAND, poorly-graded with silt, mostly fine-grained quartz, few silt, trace carbonate, trace limestone fragmentes, olive gray (SP-SM)</b>		

Tare Weight, (g):	<b>49.69</b>	
Dry Wt. Before Washing (g):	<b>169.31</b>	(with tare)
Dry Weight After Washing (g):	<b>154.92</b>	(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	0.08	99.93	90	0.07
#14	1.400	0.19	99.77	60	0.11
#18	1.000	0.14	99.66	30	0.04
#25	0.710	0.17	99.52	20	0.03
#35	0.500	0.21	99.34	5	0.01
#45	0.355	0.34	99.06	3	0.01
#60	0.250	0.72	98.45	1	0.01
#80	0.180	12.42	88.07	1	0.12
#120	0.125	70.66	29.00	1	0.71
#170	0.090	15.28	16.23	1	0.15
#230	0.063	4.11	12.79	1	0.04

**Total Shell Content:** **1** %



COBBLES	GRAVEL		SAND			SILT OR CLAY
	COARSE	FINE	COARSE	MEDIUM	FINE	

Sample No.	Elev. Or Depth	Classification	% CO <sub>3</sub>	G <sub>s</sub>	Nat w%	LL	PL	PI	Project	
3	49.4-49.9	SAND, poorly-graded with silt, mostly fine-grained quartz, few silt, trace carbonate, trace limestone fragments, olive gray (SP-SM)	1						Topsail Beach, Surf City & North Topsail	
			Area							
			Boring No. T1-03-V-179							
			Date 9/24/2003							

**GRADATION CURVES**



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## VISUAL SHELL CONTENT

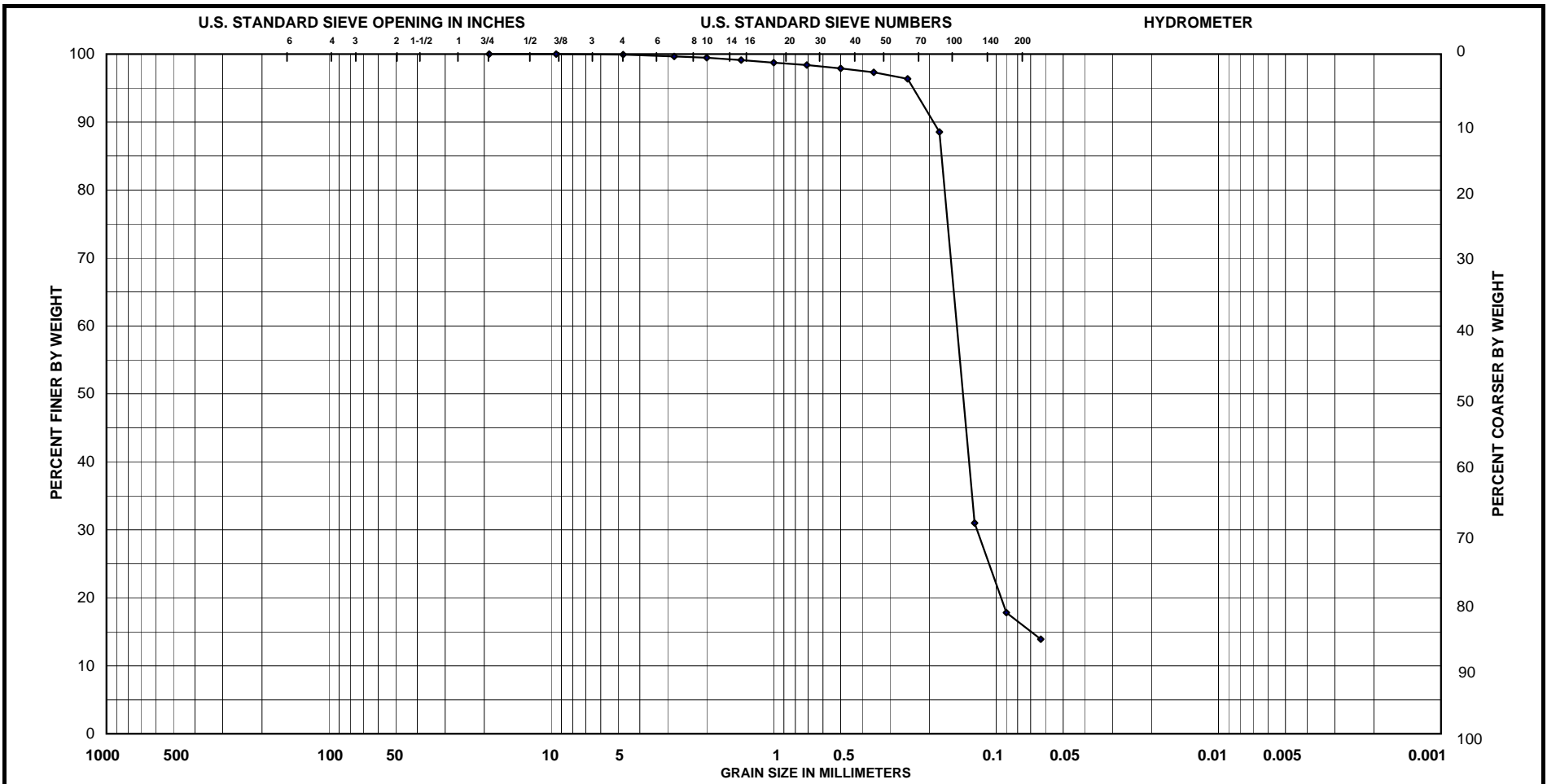
### GRAIN SIZE AND VISUAL SHELL CONTENT

Project:	<b>Topsail Beach, Surf City &amp; North Topsail</b>	Depth:	<b>51.5-52.0</b>
Project No.:	<b>1584-01-40</b>	Date:	<b>9/24/2003</b>
Boring No.:	<b>T1-03-V-179</b>		
Sample No.:	<b>4</b>		
Description:	<b>SAND, silty, mostly fine-grained quartz, little silt, trace carbonate, trace fragmented limestone, olive gray (SM)</b>		

Tare Weight, (g):	<b>50.60</b>	
Dry Wt. Before Washing (g):	<b>166.02</b>	(with tare)
Dry Weight After Washing (g):	<b>150.99</b>	(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	0.07	99.94	100	0.07
#7	2.800	0.32	99.66	100	0.32
#10	2.000	0.25	99.45	80	0.20
#14	1.400	0.38	99.12	60	0.23
#18	1.000	0.45	98.73	40	0.18
#25	0.710	0.38	98.40	25	0.10
#35	0.500	0.59	97.89	10	0.06
#45	0.355	0.64	97.33	5	0.03
#60	0.250	1.12	96.36	3	0.03
#80	0.180	9.01	88.55	1	0.09
#120	0.125	66.43	31.00	1	0.66
#170	0.090	15.20	17.83	1	0.15
#230	0.063	4.52	13.91	1	0.05

**Total Shell Content:** **2** %



COBBLES	GRAVEL		SAND			SILT OR CLAY
	COARSE	FINE	COARSE	MEDIUM	FINE	

Sample No.	Elev. Or Depth	Classification	% CO <sub>3</sub>	G <sub>s</sub>	Nat w%	LL	PL	PI	Project
4	51.5-52.0	SAND, silty, mostly fine-grained quartz, little silt, trace carbonate, trace fragmented limestone, olive gray (SM)	2						Topsail Beach, Surf City & North Topsail
									Area
									Boring No. T1-03-V-179
									Date 9/24/2003

**GRADATION CURVES**



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## VISUAL SHELL CONTENT

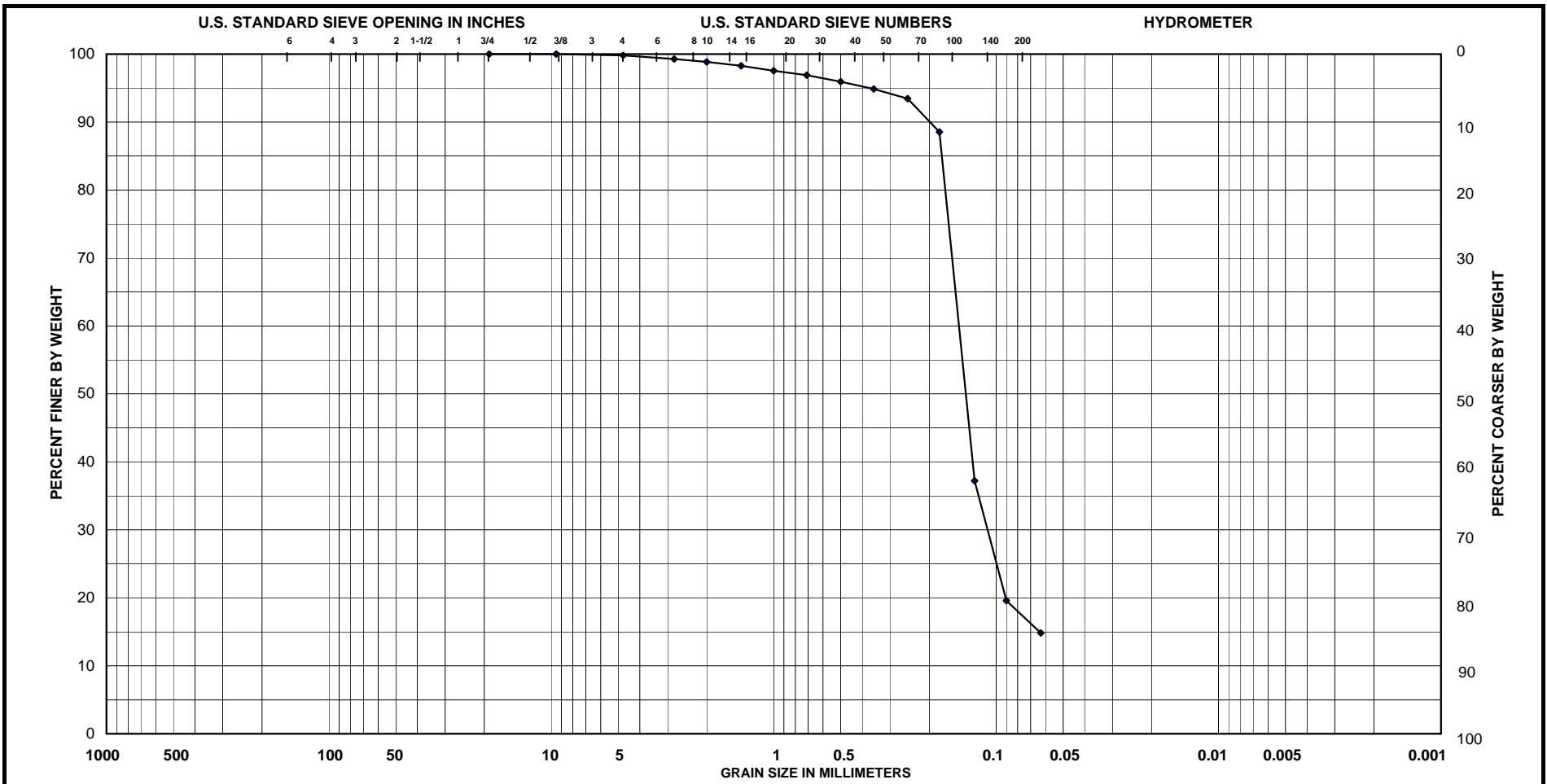
### GRAIN SIZE AND VISUAL SHELL CONTENT

Project:	<b>Topsail Beach, Surf City &amp; North Topsail</b>	Depth:	<b>53.0-53.5</b>
Project No.:	<b>1584-01-40</b>	Date:	<b>9/24/2003</b>
Boring No.:	<b>T1-03-V-179</b>		
Sample No.:	<b>5</b>		
Description:	<b>SAND, silty, mostly fine-grained quartz, little silt, trace carbonate, trace fragmented limestone, olive gray (SM)</b>		

Tare Weight, (g):	<b>50.33</b>	
Dry Wt. Before Washing (g):	<b>167.94</b>	(with tare)
Dry Weight After Washing (g):	<b>152</b>	(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	0.24	99.80	100	0.24
#7	2.800	0.62	99.27	100	0.62
#10	2.000	0.47	98.87	100	0.47
#14	1.400	0.71	98.27	65	0.46
#18	1.000	0.85	97.54	60	0.51
#25	0.710	0.78	96.88	30	0.23
#35	0.500	1.12	95.93	25	0.28
#45	0.355	1.25	94.86	15	0.19
#60	0.250	1.66	93.45	10	0.17
#80	0.180	5.77	88.55	3	0.17
#120	0.125	60.38	37.21	1	0.60
#170	0.090	20.72	19.59	1	0.21
#230	0.063	5.60	14.83	1	0.06

**Total Shell Content:** **4** %



COBBLES	GRAVEL		SAND			SILT OR CLAY
	COARSE	FINE	COARSE	MEDIUM	FINE	

Sample No.	Elev. Or Depth	Classification	% CO <sub>3</sub>	G <sub>s</sub>	Nat w%	LL	PL	PI	Project
5	53.0-53.5	SAND, silty, mostly fine-grained quartz, little silt, trace carbonate, trace fragmented limestone, olive gray (SM)	4						Topsail Beach, Surf City & North Topsail
									Area
									Boring No. T1-03-V-179
									Date 9/24/2003

**GRADATION CURVES**





# WOLF TECHNOLOGIES, INC.

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

## VISUAL SHELL CONTENT

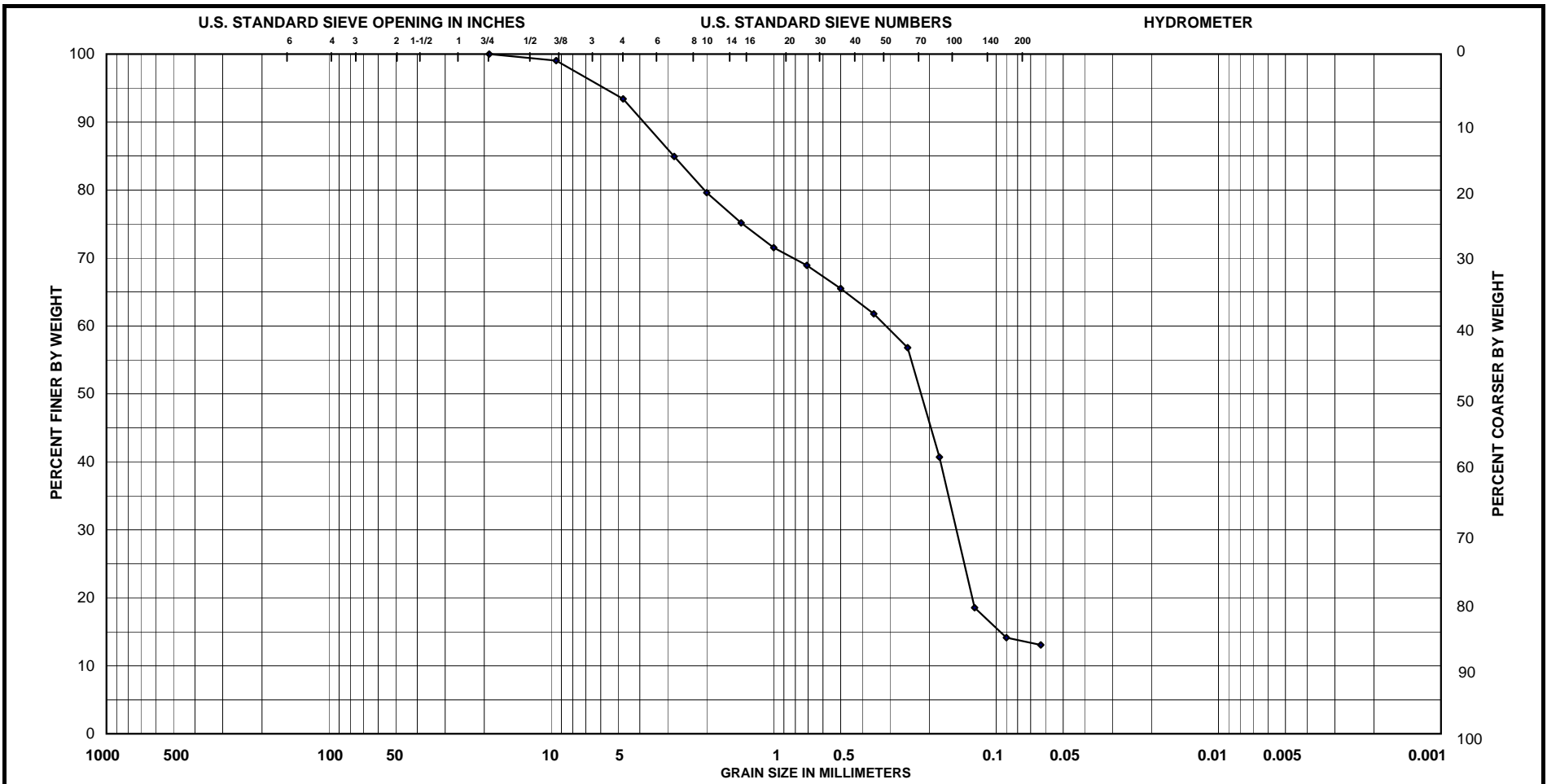
### GRAIN SIZE AND VISUAL SHELL CONTENT

Project:	<b>Topsail Beach, Surf City &amp; North Topsail</b>	Depth:	<b>44.2-44.7</b>
Project No.:	<b>1584-01-40</b>	Date:	<b>9/24/2003</b>
Boring No.:	<b>T1-03-V-180</b>		
Sample No.:	<b>1</b>		
Description:	<b>SAND, silty, mostly fine-grained quartz, some coarse to medium-grained carbonate, few fine gravel-size carbonate, few silt, trace</b>		

Tare Weight, (g):	<b>50.00</b>	
Dry Wt. Before Washing (g):	<b>171.02</b>	(with tare)
Dry Weight After Washing (g):	<b>155.34</b>	(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	1.17	99.03	100	1.17
#4	4.750	6.83	93.39	100	6.83
#7	2.800	10.25	84.92	100	10.25
#10	2.000	6.45	79.59	100	6.45
#14	1.400	5.37	75.15	98	5.26
#18	1.000	4.40	71.52	98	4.31
#25	0.710	3.16	68.91	95	3.00
#35	0.500	4.12	65.50	80	3.30
#45	0.355	4.51	61.77	45	2.03
#60	0.250	6.02	56.80	10	0.60
#80	0.180	19.46	40.72	3	0.58
#120	0.125	26.82	18.56	1	0.27
#170	0.090	5.36	14.13	1	0.05
#230	0.063	1.29	13.06	1	0.01

**Total Shell Content:** **36** %



COBBLES	GRAVEL		SAND			SILT OR CLAY
	COARSE	FINE	COARSE	MEDIUM	FINE	

Sample No.	Elev. Or Depth	Classification	% CO <sub>3</sub>	G <sub>s</sub>	Nat w%	LL	PL	PI	Project	
♦ 1	44.2-44.7	SAND, silty, mostly fine-grained quartz, some coarse to medium-grained carbonate, few fine gravel-size carbonate, few silt, trace fragmented limestone, dark greenish gray (SM)	36						Topsail Beach, Surf City & North Topsail	
									Area	
									Boring No. T1-03-V-180	
									Date 9/24/2003	

**GRADATION CURVES**



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## VISUAL SHELL CONTENT

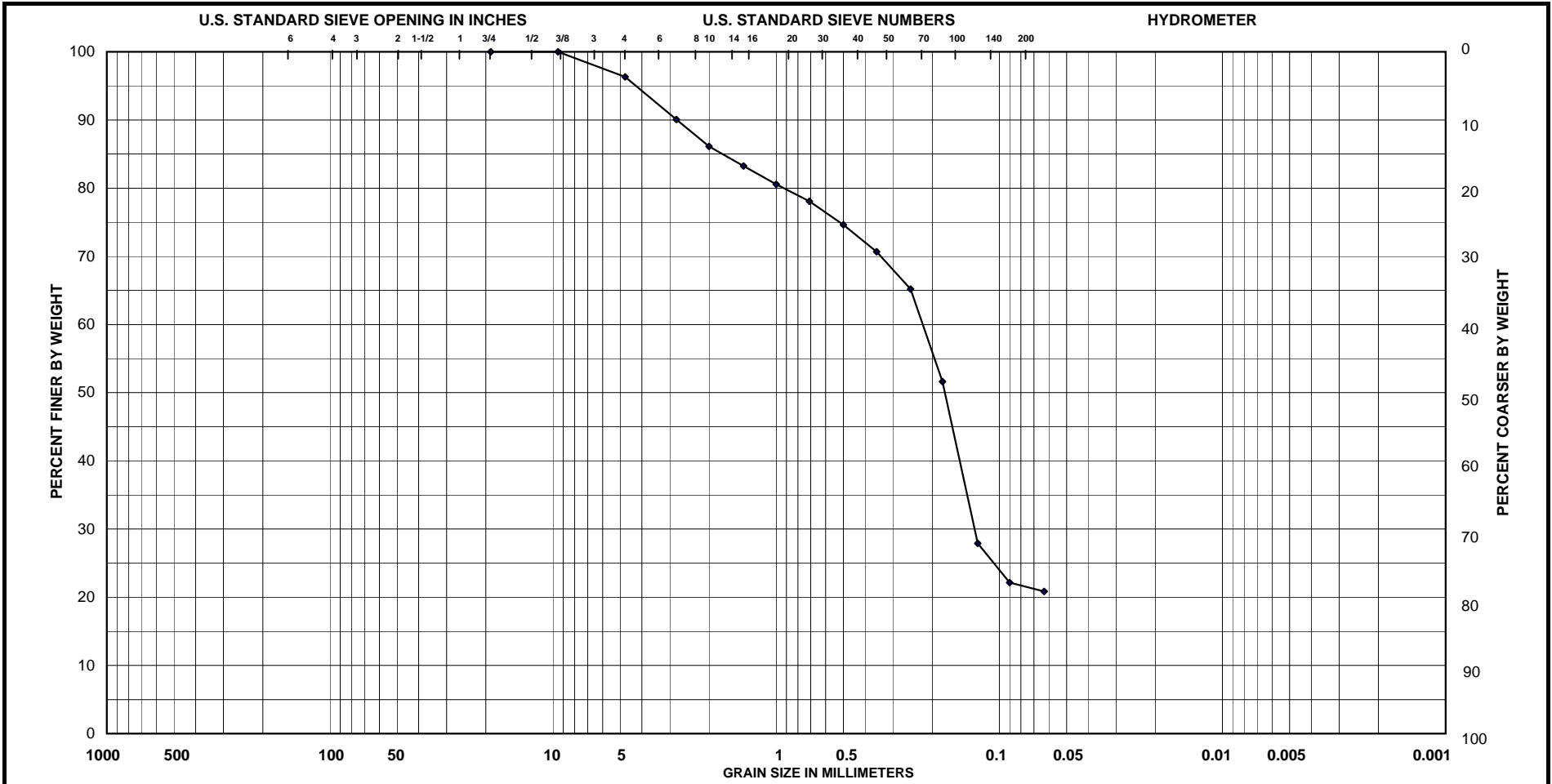
### GRAIN SIZE AND VISUAL SHELL CONTENT

Project:	<b>Topsail Beach, Surf City &amp; North Topsail</b>	Depth:	<b>46.0-46.5</b>
Project No.:	<b>1584-01-40</b>	Date:	<b>9/24/2003</b>
Boring No.:	<b>T1-03-V-180</b>		
Sample No.:	<b>2</b>		
Description:	<b>SAND, silty, mostly fine-grained quartz, little coarse to medium-grained carbonate, little silt, few fragmented limestone, trace fine gravel-size</b>		

Tare Weight, (g):	<b>48.43</b>	
Dry Wt. Before Washing (g):	<b>162.59</b>	(with tare)
Dry Weight After Washing (g):	<b>139.24</b>	(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	4.21	96.31	100	4.21
#7	2.800	7.11	90.08	100	7.11
#10	2.000	4.51	86.13	90	4.06
#14	1.400	3.29	83.25	90	2.96
#18	1.000	3.05	80.58	70	2.14
#25	0.710	2.87	78.07	65	1.87
#35	0.500	3.92	74.63	60	2.35
#45	0.355	4.52	70.67	50	2.26
#60	0.250	6.25	65.20	30	1.88
#80	0.180	15.50	51.62	3	0.47
#120	0.125	27.08	27.90	1	0.27
#170	0.090	6.56	22.15	1	0.07
#230	0.063	1.50	20.84	1	0.02

**Total Shell Content:** **26** %





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## VISUAL SHELL CONTENT

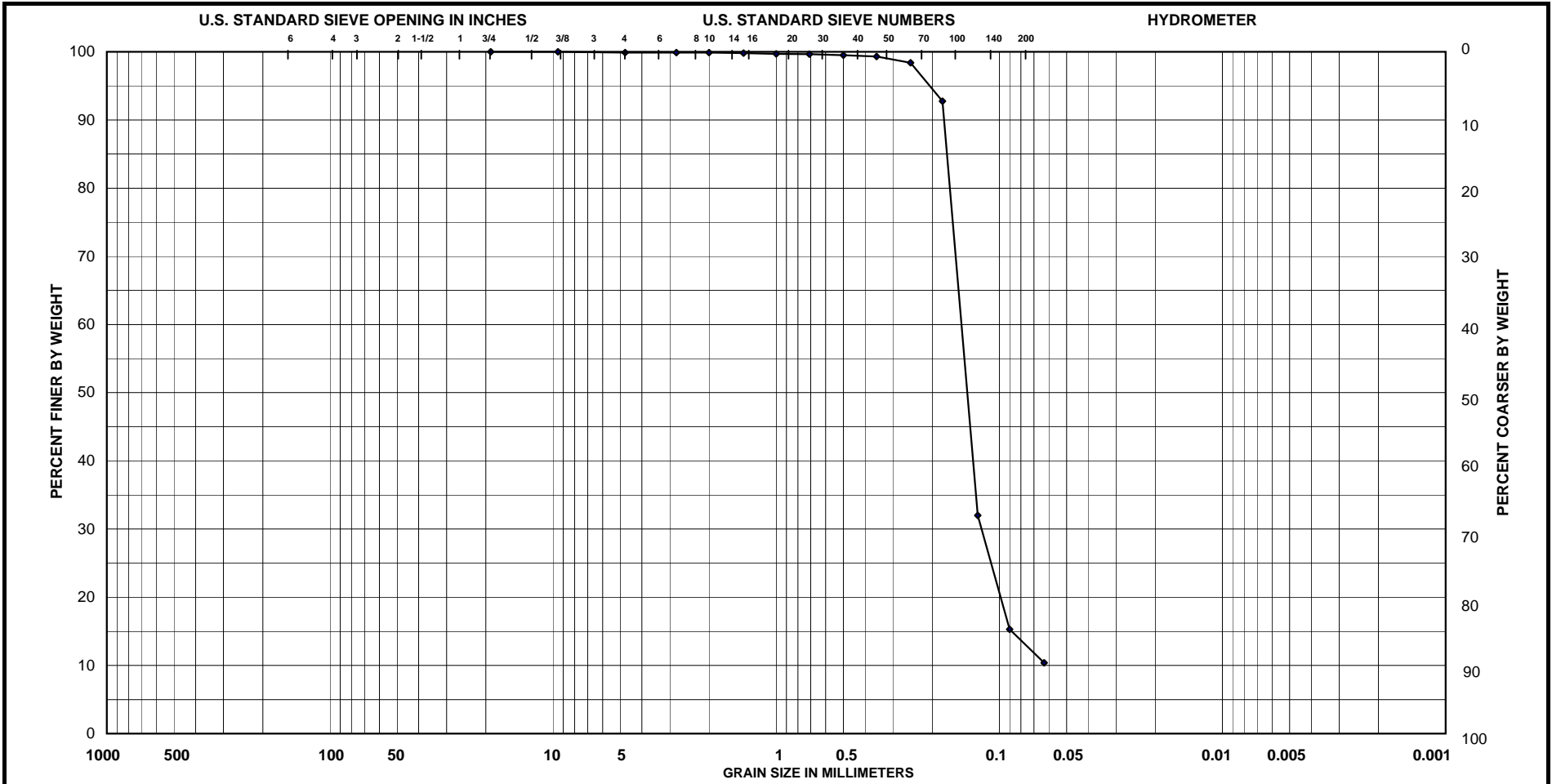
### GRAIN SIZE AND VISUAL SHELL CONTENT

Project:	<b>Topsail Beach, Surf City &amp; North Topsail</b>	Depth:	<b>47.2-47.7</b>
Project No.:	<b>1584-01-40</b>	Date:	<b>9/24/2003</b>
Boring No.:	<b>T1-03-V-180</b>		
Sample No.:	<b>3</b>		
Description:	<b>SAND, poorly-graded with silt, mostly fine-grained quartz, few silt, trace carbonate, trace fragmented limestone, olive gray (SP-SM)</b>		

Tare Weight, (g):	<b>48.90</b>	
Dry Wt. Before Washing (g):	<b>169.66</b>	(with tare)
Dry Weight After Washing (g):	<b>159.29</b>	(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	0.13	99.89	100	0.13
#7	2.800	0.00	99.89	0	0.00
#10	2.000	0.01	99.88	100	0.01
#14	1.400	0.11	99.79	100	0.11
#18	1.000	0.10	99.71	20	0.02
#25	0.710	0.06	99.66	10	0.01
#35	0.500	0.17	99.52	3	0.01
#45	0.355	0.27	99.30	1	0.00
#60	0.250	1.10	98.39	1	0.01
#80	0.180	6.79	92.76	1	0.07
#120	0.125	73.36	32.01	1	0.73
#170	0.090	20.20	15.29	1	0.20
#230	0.063	5.92	10.38	1	0.06

**Total Shell Content:** **1** %



COBBLES	GRAVEL		SAND			SILT OR CLAY
	COARSE	FINE	COARSE	MEDIUM	FINE	

Sample No.	Elev. Or Depth	Classification	% CO <sub>3</sub>	G <sub>s</sub>	Nat w%	LL	PL	PI	Project	
♦ 3	47.2-47.7	SAND, poorly-graded with silt, mostly fine-grained quartz, few silt, trace carbonate, trace fragmented limestone, olive gray (SP-SM)	1						Topsail Beach, Surf City & North Topsail	
									Area	
									Boring No. T1-03-V-180	
									Date 9/24/2003	

**GRADATION CURVES**



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## VISUAL SHELL CONTENT

### GRAIN SIZE AND VISUAL SHELL CONTENT

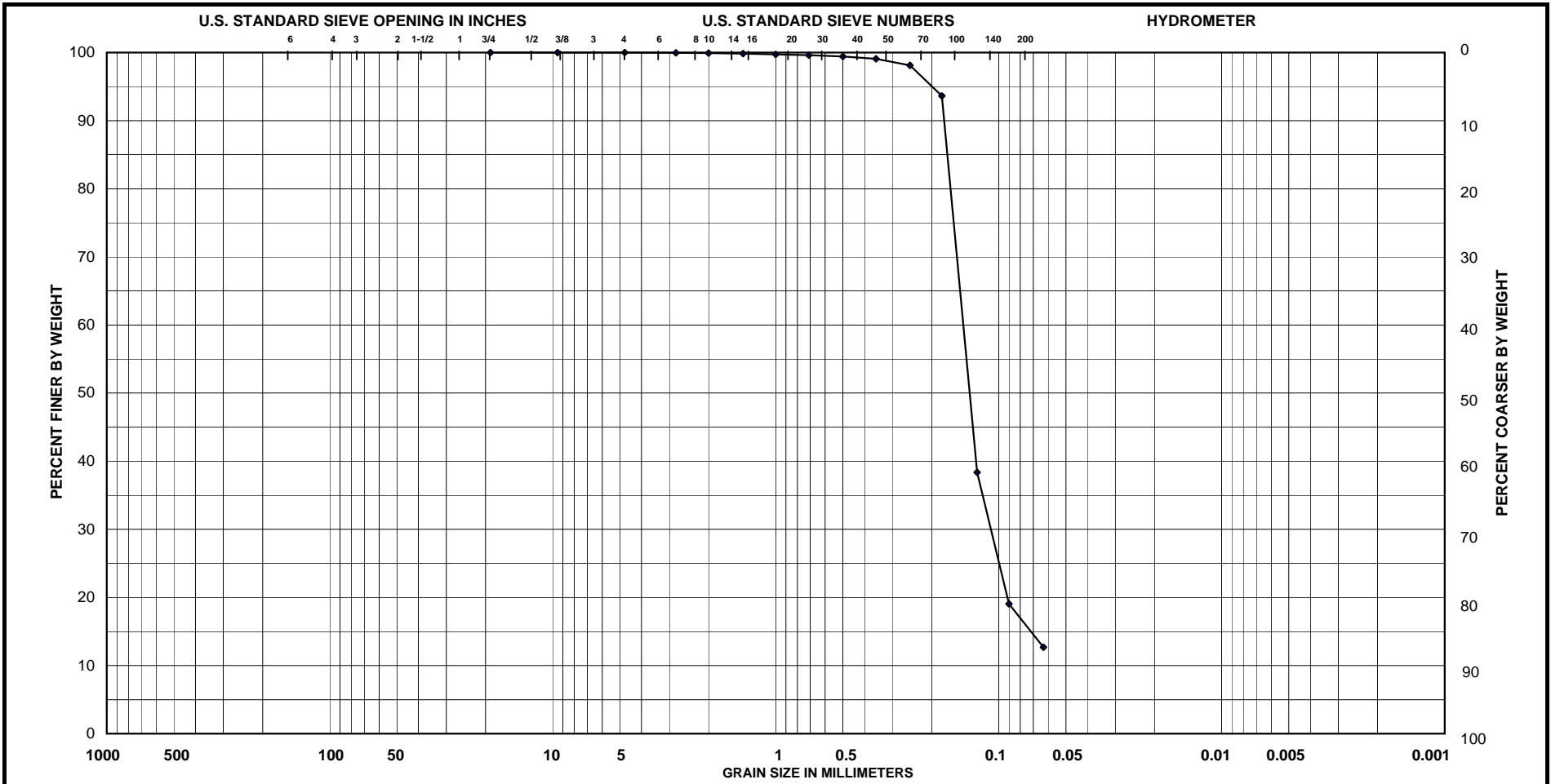
Project:	<b>Topsail Beach, Surf City &amp; North Topsail</b>	Depth:	<b>49.0-49.5</b>
Project No.:	<b>1584-01-40</b>	Date:	<b>9/24/2003</b>
Boring No.:	<b>T1-03-V-180</b>		
Sample No.:	<b>4</b>		
Description:	<b>SAND, poorly-graded with silt, mostly fine-grained quartz, few silt, trace carbonate, trace fragmented limestone, olive gray (SP-SM)</b>		

Tare Weight, (g):	<b>49.87</b>	
Dry Wt. Before Washing (g):	<b>172.81</b>	(with tare)
Dry Weight After Washing (g):	<b>159.42</b>	(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	0.06	99.95	100	0.06
#10	2.000	0.02	99.93	60	0.01
#14	1.400	0.10	99.85	20	0.02
#18	1.000	0.15	99.73	10	0.02
#25	0.710	0.12	99.63	10	0.01
#35	0.500	0.25	99.43	3	0.01
#45	0.355	0.43	99.08	1	0.00
#60	0.250	1.20	98.10	1	0.01
#80	0.180	5.50	93.63	1	0.06
#120	0.125	67.96	38.35	1	0.68
#170	0.090	23.71	19.07	1	0.24
#230	0.063	7.84	12.69	1	0.08

**Total Shell Content:**

<b>1</b>	<b>%</b>
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COBBLES	GRAVEL		SAND			SILT OR CLAY
	COARSE	FINE	COARSE	MEDIUM	FINE	

Sample No.	Elev. Or Depth	Classification	% CO <sub>3</sub>	G <sub>s</sub>	Nat w%	LL	PL	PI	Project
4	49.0-49.5	SAND, poorly-graded with silt, mostly fine-grained quartz, few silt, trace carbonate, trace fragmented limestone, olive gray (SP-SM)	1						Topsail Beach, Surf City & North Topsail
									Area
									Boring No. T1-03-V-180
									Date 9/24/2003

**GRADATION CURVES**





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## VISUAL SHELL CONTENT

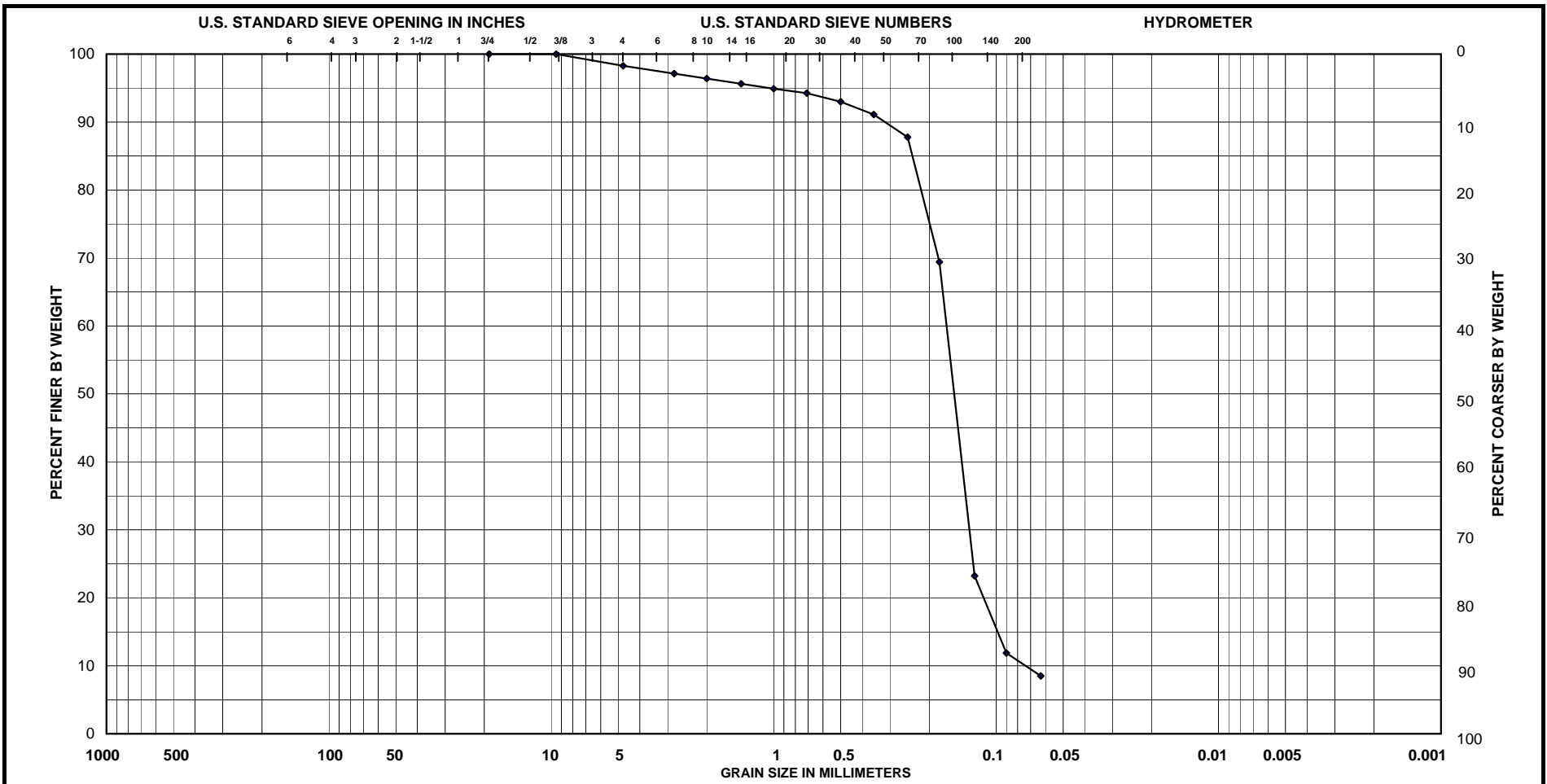
### GRAIN SIZE AND VISUAL SHELL CONTENT

Project:	<b>Topsail Beach, Surf City &amp; North Topsail</b>	Depth:	<b>44.0-44.5</b>
Project No.:	<b>1584-01-40</b>	Date:	<b>9/24/2003</b>
Boring No.:	<b>T1-03-V-181</b>		
Sample No.:	<b>1</b>		
Description:	<b>SAND, poorly-graded with silt, mostly fine-grained quartz, few carbonate, few silt, dark greenish gray (SP-SM)</b>		

Tare Weight, (g):	<b>49.42</b>	
Dry Wt. Before Washing (g):	<b>174.07</b>	(with tare)
Dry Weight After Washing (g):	<b>164.3</b>	(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	2.13	98.29	100	2.13
#7	2.800	1.47	97.11	100	1.47
#10	2.000	0.89	96.40	90	0.80
#14	1.400	0.96	95.63	80	0.77
#18	1.000	0.90	94.91	70	0.63
#25	0.710	0.82	94.25	15	0.12
#35	0.500	1.57	92.99	10	0.16
#45	0.355	2.36	91.10	5	0.12
#60	0.250	4.14	87.77	3	0.12
#80	0.180	22.89	69.41	1	0.23
#120	0.125	57.58	23.22	1	0.58
#170	0.090	14.11	11.90	1	0.14
#230	0.063	4.22	8.51	1	0.04

**Total Shell Content:** **6** %



COBBLES	GRAVEL		SAND			SILT OR CLAY
	COARSE	FINE	COARSE	MEDIUM	FINE	

Sample No.	Elev. Or Depth	Classification	% CO <sub>3</sub>	G <sub>s</sub>	Nat w%	LL	PL	PI	Project	
♦ 1	44.0-44.5	SAND, poorly-graded with silt, mostly fine-grained quartz, few carbonate, few silt, dark greenish gray (SP-SM)	6						Topsail Beach, Surf City & North Topsail	
									Area	
									Boring No. T1-03-V-181	
									Date 9/24/2003	

**GRADATION CURVES**



# WOLF TECHNOLOGIES, INC.

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Jacksonville, Florida 32246  
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## VISUAL SHELL CONTENT

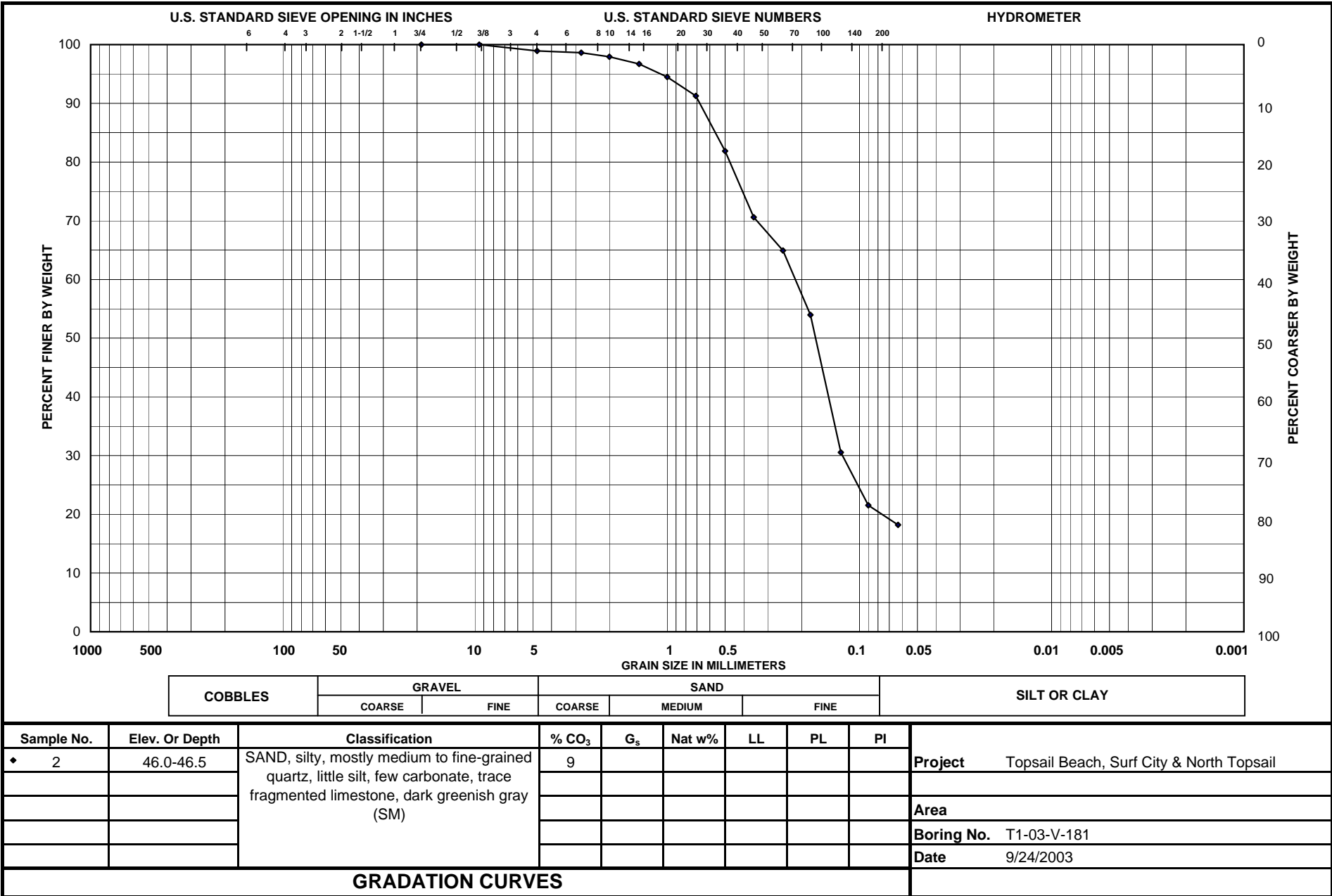
### GRAIN SIZE AND VISUAL SHELL CONTENT

Project:	<b>Topsail Beach, Surf City &amp; North Topsail</b>	Depth:	<b>46.0-46.5</b>
Project No.:	<b>1584-01-40</b>	Date:	<b>9/24/2003</b>
Boring No.:	<b>T1-03-V-181</b>		
Sample No.:	<b>2</b>		
Description:	<b>SAND, silty, mostly medium to fine-grained quartz, little silt, few carbonate, trace fragmented limestone, dark greenish gray (SM)</b>		

Tare Weight, (g):	<b>50.14</b>	
Dry Wt. Before Washing (g):	<b>178.05</b>	(with tare)
Dry Weight After Washing (g):	<b>155.15</b>	(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	1.39	98.91	100	1.39
#7	2.800	0.39	98.61	100	0.39
#10	2.000	0.88	97.92	90	0.79
#14	1.400	1.58	96.69	65	1.03
#18	1.000	2.83	94.47	60	1.70
#25	0.710	4.10	91.27	30	1.23
#35	0.500	12.01	81.88	25	3.00
#45	0.355	14.40	70.62	10	1.44
#60	0.250	7.26	64.94	3	0.22
#80	0.180	14.02	53.98	1	0.14
#120	0.125	29.98	30.54	1	0.30
#170	0.090	11.51	21.55	1	0.12
#230	0.063	4.28	18.20	1	0.04

**Total Shell Content:** **9** %





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## VISUAL SHELL CONTENT

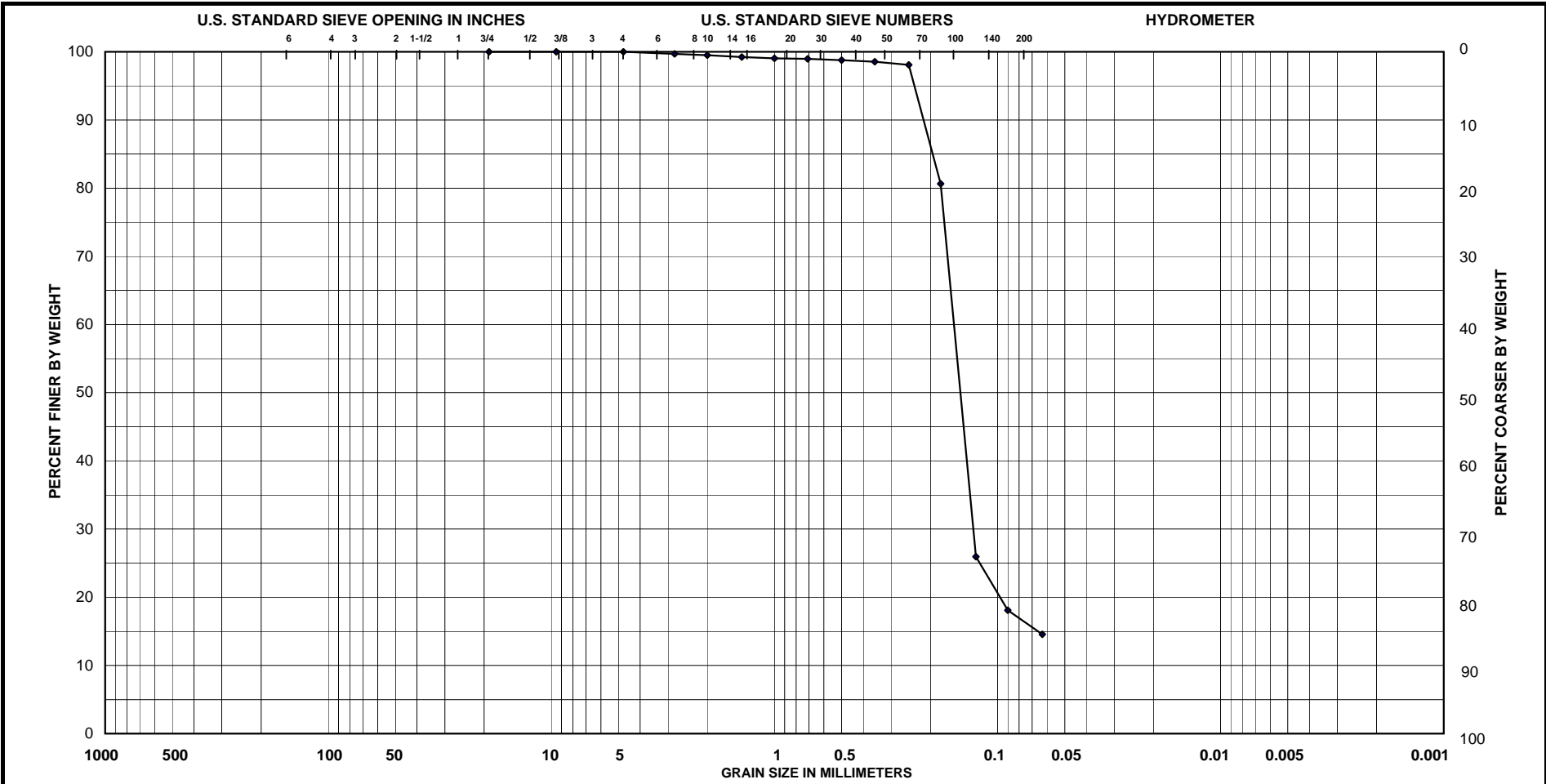
### GRAIN SIZE AND VISUAL SHELL CONTENT

Project:	<b>Topsail Beach, Surf City &amp; North Topsail</b>	Depth:	<b>48.0-48.5</b>
Project No.:	<b>1584-01-40</b>	Date:	<b>9/24/2003</b>
Boring No.:	<b>T1-03-V-181</b>		
Sample No.:	<b>3</b>		
Description:	<b>SAND, silty, mostly fine-grained quartz, little silt, trace carbonate, olive gray (SM)</b>		

Tare Weight, (g):	<b>50.55</b>	
Dry Wt. Before Washing (g):	<b>179.21</b>	(with tare)
Dry Weight After Washing (g):	<b>161.2</b>	(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	0.40	99.69	80	0.32
#10	2.000	0.24	99.50	60	0.14
#14	1.400	0.34	99.24	60	0.20
#18	1.000	0.23	99.06	50	0.12
#25	0.710	0.14	98.95	40	0.06
#35	0.500	0.23	98.77	20	0.05
#45	0.355	0.27	98.56	5	0.01
#60	0.250	0.63	98.07	3	0.02
#80	0.180	22.43	80.64	1	0.22
#120	0.125	70.37	25.94	1	0.70
#170	0.090	10.11	18.09	1	0.10
#230	0.063	4.54	14.56	1	0.05

**Total Shell Content:** **2** %



COBBLES	GRAVEL		SAND			SILT OR CLAY
	COARSE	FINE	COARSE	MEDIUM	FINE	

Sample No.	Elev. Or Depth	Classification	% CO <sub>3</sub>	G <sub>s</sub>	Nat w%	LL	PL	PI	Project
3	48.0-48.5	SAND, silty, mostly fine-grained quartz, little silt, trace carbonate, olive gray (SM)	2						Topsail Beach, Surf City & North Topsail
									Area
									Boring No. T1-03-V-181
									Date 9/24/2003

**GRADATION CURVES**



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## VISUAL SHELL CONTENT

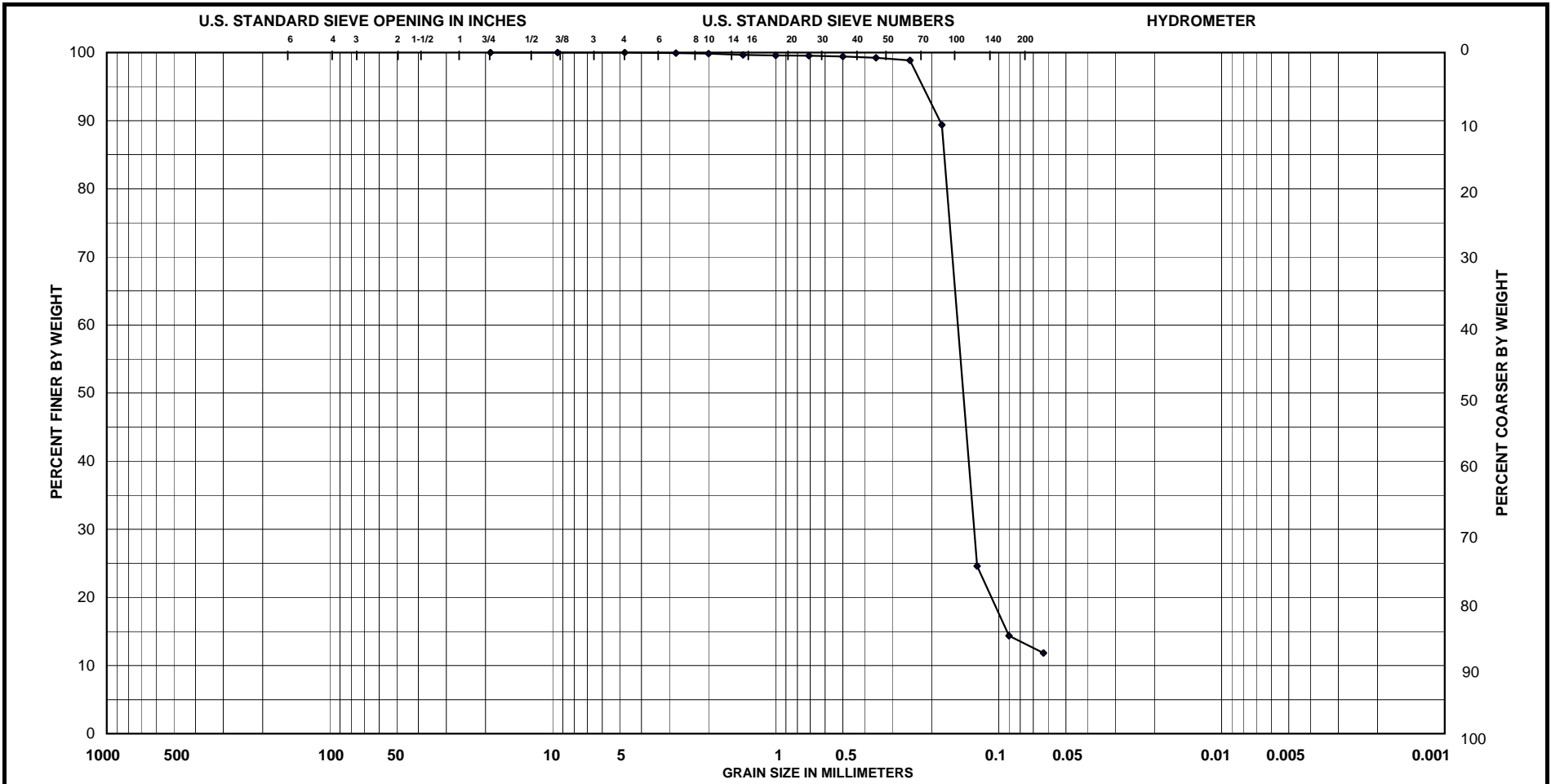
### GRAIN SIZE AND VISUAL SHELL CONTENT

Project:	<b>Topsail Beach, Surf City &amp; North Topsail</b>	Depth:	<b>50.0-50.5</b>
Project No.:	<b>1584-01-40</b>	Date:	<b>9/24/2003</b>
Boring No.:	<b>T1-03-V-181</b>		
Sample No.:	<b>4</b>		
Description:	<b>SAND, poorly-graded with silt, mostly fine-grained quartz, few silt, trace carbonate, olive gray (SP-SM)</b>		

Tare Weight, (g):	<b>50.39</b>	
Dry Wt. Before Washing (g):	<b>170.42</b>	(with tare)
Dry Weight After Washing (g):	<b>157.41</b>	(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	0.10	99.92	25	0.03
#10	2.000	0.07	99.86	60	0.04
#14	1.400	0.23	99.67	40	0.09
#18	1.000	0.10	99.58	25	0.03
#25	0.710	0.06	99.53	20	0.01
#35	0.500	0.13	99.43	20	0.03
#45	0.355	0.24	99.23	10	0.02
#60	0.250	0.47	98.83	3	0.01
#80	0.180	11.34	89.39	1	0.11
#120	0.125	77.76	24.60	1	0.78
#170	0.090	12.26	14.39	1	0.12
#230	0.063	3.07	11.83	1	0.03

**Total Shell Content:** **1** %



COBBLES	GRAVEL		SAND			SILT OR CLAY
	COARSE	FINE	COARSE	MEDIUM	FINE	

Sample No.	Elev. Or Depth	Classification	% CO <sub>3</sub>	G <sub>s</sub>	Nat w%	LL	PL	PI	Project
4	50.0-50.5	SAND, poorly-graded with silt, mostly fine-grained quartz, few silt, trace carbonate, olive gray (SP-SM)	1						Topsail Beach, Surf City & North Topsail
									Area
									Boring No. T1-03-V-181
									Date 9/24/2003

**GRADATION CURVES**





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## VISUAL SHELL CONTENT

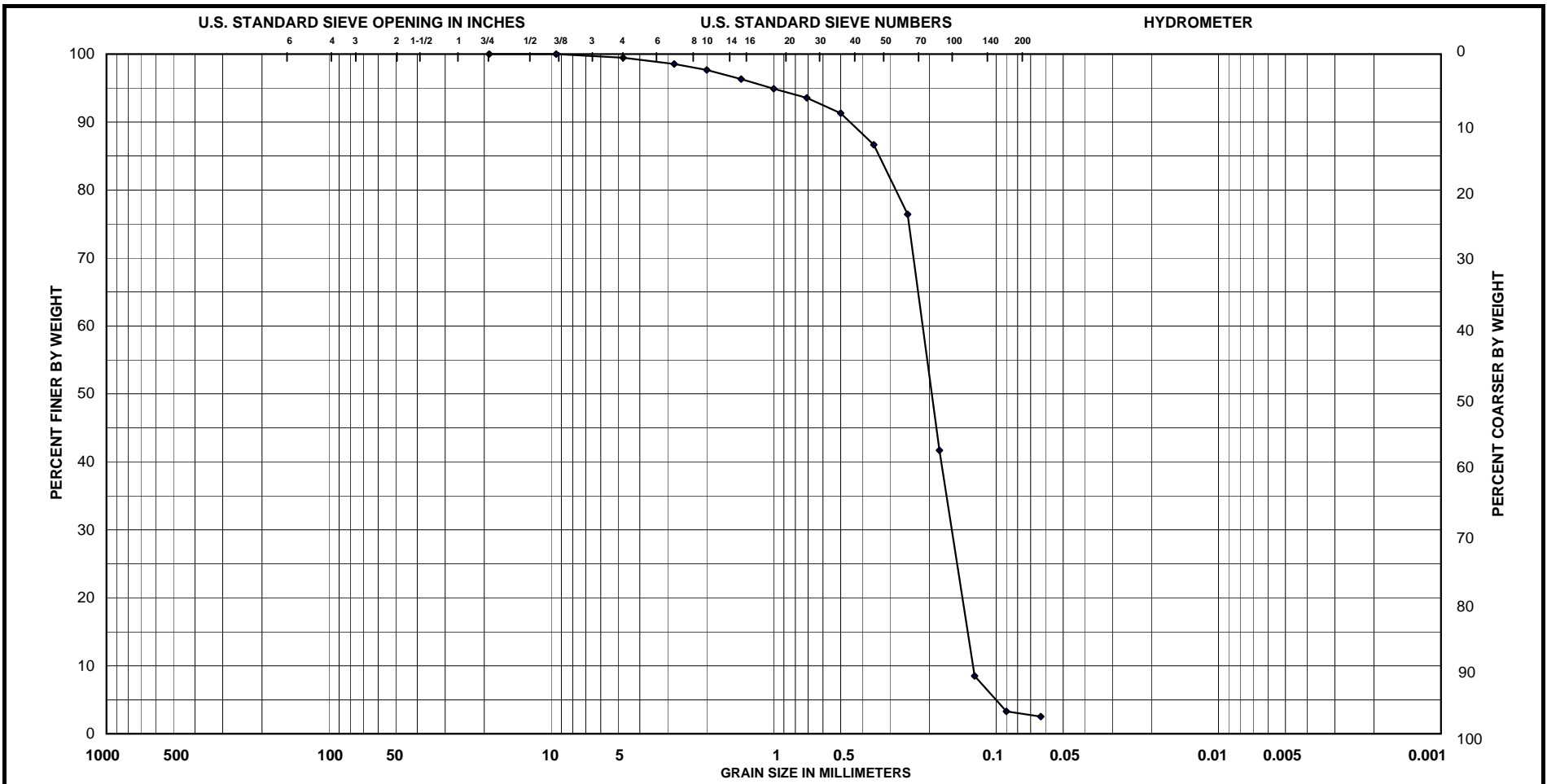
### GRAIN SIZE AND VISUAL SHELL CONTENT

Project:	<b>Topsail Beach, Surf City &amp; North Topsail</b>	Depth:	<b>44.7-45.2</b>
Project No.:	<b>1584-01-40</b>	Date:	<b>9/24/2003</b>
Boring No.:	<b>T1-03-V-182</b>		
Sample No.:	<b>1</b>		
Description:	<b>SAND, poorly-graded, mostly fine-grained quartz, few carbonate, few fragmented limestone, olive gray (SP)</b>		

Tare Weight, (g):	<b>50.25</b>	
Dry Wt. Before Washing (g):	<b>178.12</b>	(with tare)
Dry Weight After Washing (g):	<b>175.14</b>	(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	0.68	99.47	25	0.17
#7	2.800	1.18	98.55	85	1.00
#10	2.000	1.12	97.67	70	0.78
#14	1.400	1.72	96.32	70	1.20
#18	1.000	1.82	94.90	60	1.09
#25	0.710	1.71	93.56	45	0.77
#35	0.500	2.92	91.28	30	0.88
#45	0.355	5.91	86.66	15	0.89
#60	0.250	13.06	76.44	5	0.65
#80	0.180	44.41	41.71	3	1.33
#120	0.125	42.46	8.51	1	0.42
#170	0.090	6.67	3.29	1	0.07
#230	0.063	0.97	2.53	1	0.01

**Total Shell Content:** **7** %





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## VISUAL SHELL CONTENT

### GRAIN SIZE AND VISUAL SHELL CONTENT

Project:	<b>Topsail Beach, Surf City &amp; North Topsail</b>	Depth:	<b>46.0-46.5</b>
Project No.:	<b>1584-01-40</b>	Date:	<b>9/24/2003</b>
Boring No.:	<b>T1-03-V-182</b>		
Sample No.:	<b>2</b>		
Description:	<b>SAND, poorly-graded, mostly fine-grained quartz, few carbonate, trace fragmented limestone, gray (SP)</b>		

Tare Weight, (g):	<b>49.32</b>	
Dry Wt. Before Washing (g):	<b>173.39</b>	(with tare)
Dry Weight After Washing (g):	<b>171.03</b>	(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	2.57	97.93	60	1.54
#7	2.800	4.86	94.01	70	3.40
#10	2.000	3.09	91.52	55	1.70
#14	1.400	4.01	88.29	40	1.60
#18	1.000	3.47	85.49	40	1.39
#25	0.710	2.42	83.54	30	0.73
#35	0.500	2.80	81.28	25	0.70
#45	0.355	4.54	77.63	20	0.91
#60	0.250	8.56	70.73	5	0.43
#80	0.180	34.71	42.75	3	1.04
#120	0.125	41.78	9.08	1	0.42
#170	0.090	7.62	2.93	1	0.08
#230	0.063	0.97	2.15	1	0.01

**Total Shell Content:** **11** %



COBBLES	GRAVEL		SAND			SILT OR CLAY
	COARSE	FINE	COARSE	MEDIUM	FINE	

Sample No.	Elev. Or Depth	Classification	% CO <sub>3</sub>	G <sub>s</sub>	Nat w%	LL	PL	PI	
♦ 2	46.0-46.5	SAND, poorly-graded, mostly fine-grained quartz, few carbonate, trace fragmented limestone, gray (SP)	11						<b>Project</b> Topsail Beach, Surf City & North Topsail
									<b>Area</b>
									<b>Boring No.</b> T1-03-V-182
									<b>Date</b> 9/24/2003

**GRADATION CURVES**



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## VISUAL SHELL CONTENT

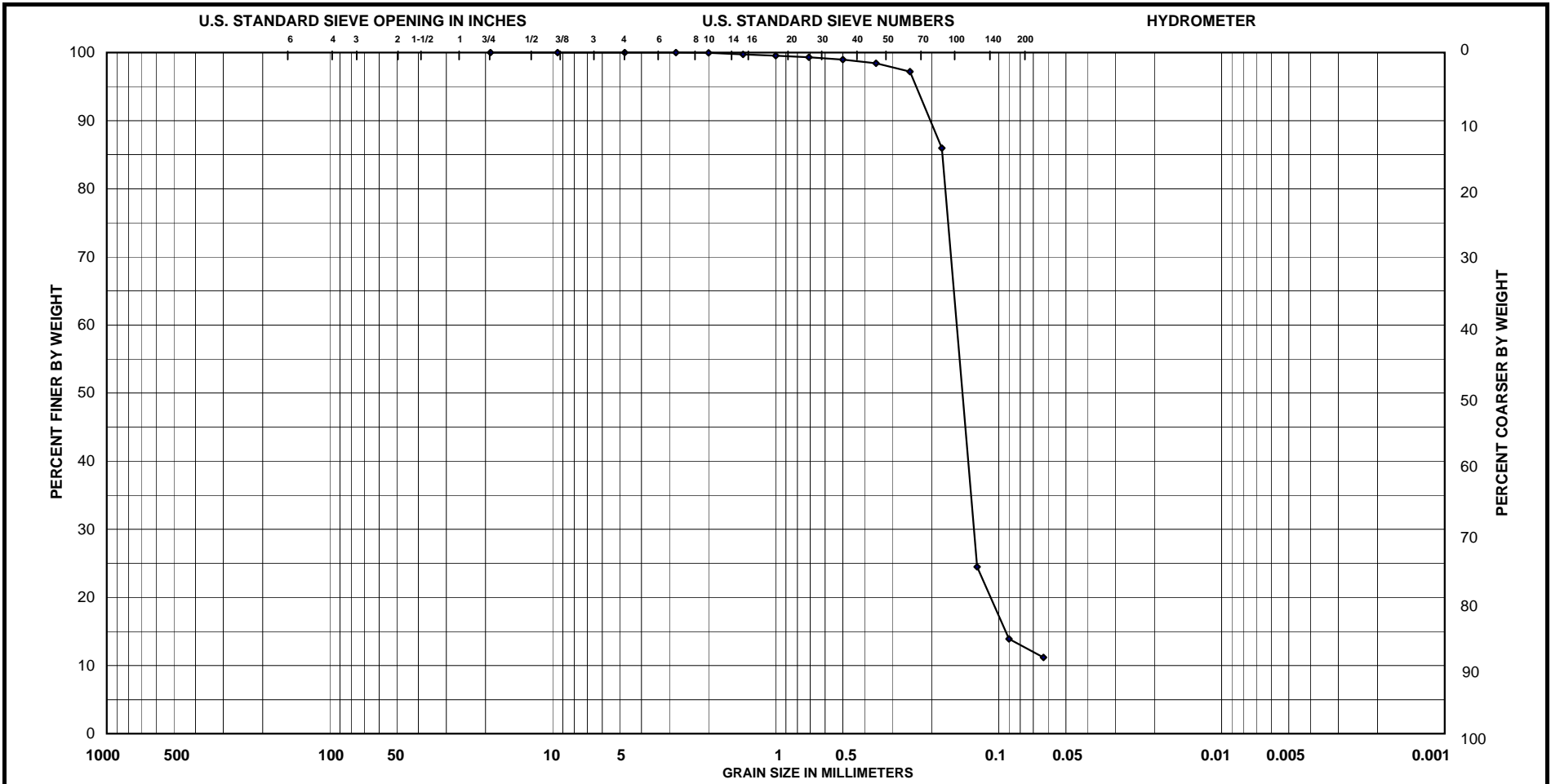
### GRAIN SIZE AND VISUAL SHELL CONTENT

Project:	<b>Topsail Beach, Surf City &amp; North Topsail</b>	Depth:	<b>47.0-47.5</b>
Project No.:	<b>1584-01-40</b>	Date:	<b>9/24/2003</b>
Boring No.:	<b>T1-03-V-182</b>		
Sample No.:	<b>3</b>		
Description:	<b>SAND, poorly-graded with silt, mostly fine-grained quartz, few silt, trace carbonate, trace fragmented limestone, olive gray (SP-SM)</b>		

Tare Weight, (g):	<b>50.12</b>	
Dry Wt. Before Washing (g):	<b>177.51</b>	(with tare)
Dry Weight After Washing (g):	<b>164.44</b>	(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	0.06	99.95	100	0.06
#14	1.400	0.27	99.73	70	0.19
#18	1.000	0.26	99.53	65	0.17
#25	0.710	0.28	99.31	60	0.17
#35	0.500	0.42	98.98	25	0.11
#45	0.355	0.71	98.42	5	0.04
#60	0.250	1.57	97.19	3	0.05
#80	0.180	14.31	85.96	1	0.14
#120	0.125	78.30	24.49	1	0.78
#170	0.090	13.49	13.90	1	0.13
#230	0.063	3.45	11.19	1	0.03

**Total Shell Content:** **1** %



COBBLES	GRAVEL		SAND			SILT OR CLAY
	COARSE	FINE	COARSE	MEDIUM	FINE	

Sample No.	Elev. Or Depth	Classification	% CO <sub>3</sub>	G <sub>s</sub>	Nat w%	LL	PL	PI	
♦ 3	47.0-47.5	SAND, poorly-graded with silt, mostly fine-grained quartz, few silt, trace carbonate, trace fragmented limestone, olive gray (SP-SM)	1						<b>Project</b> Topsail Beach, Surf City & North Topsail
			<b>Area</b>						
			<b>Boring No.</b> T1-03-V-182						
			<b>Date</b> 9/24/2003						

**GRADATION CURVES**



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## VISUAL SHELL CONTENT

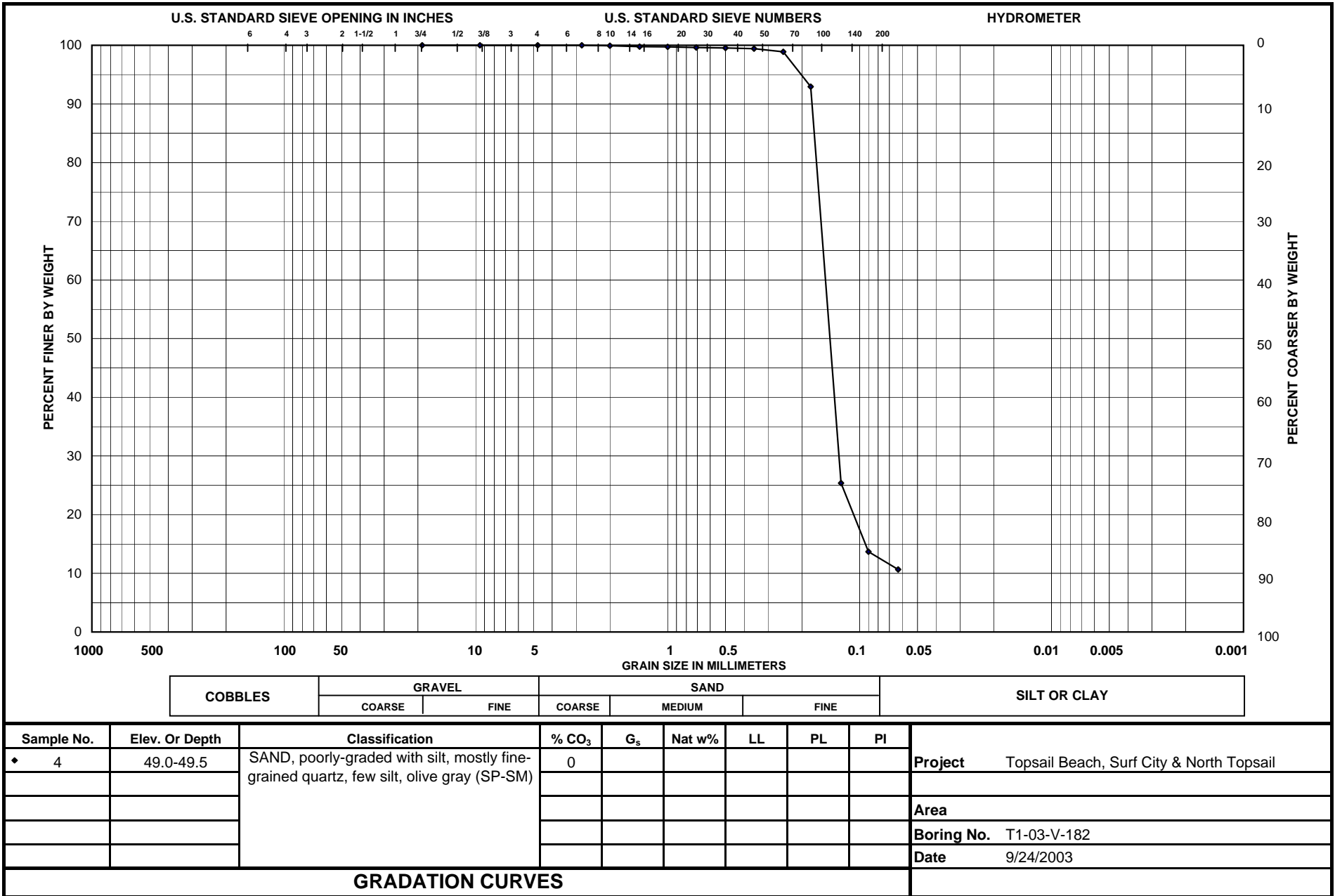
### GRAIN SIZE AND VISUAL SHELL CONTENT

Project:	<b>Topsail Beach, Surf City &amp; North Topsail</b>	Depth:	<b>49.0-49.5</b>
Project No.:	<b>1584-01-40</b>	Date:	<b>9/24/2003</b>
Boring No.:	<b>T1-03-V-182</b>		
Sample No.:	<b>4</b>		
Description:	<b>SAND, poorly-graded with silt, mostly fine-grained quartz, few silt, olive gray (SP-SM)</b>		

Tare Weight, (g):	<b>50.26</b>	
Dry Wt. Before Washing (g):	<b>162.97</b>	(with tare)
Dry Weight After Washing (g):	<b>151.81</b>	(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	0.08	99.93	0	0.00
#14	1.400	0.16	99.79	0	0.00
#18	1.000	0.08	99.72	0	0.00
#25	0.710	0.10	99.63	0	0.00
#35	0.500	0.09	99.55	0	0.00
#45	0.355	0.14	99.42	0	0.00
#60	0.250	0.62	98.87	0	0.00
#80	0.180	6.67	92.96	0	0.00
#120	0.125	76.15	25.39	0	0.00
#170	0.090	13.18	13.70	0	0.00
#230	0.063	3.43	10.66	0	0.00

**Total Shell Content:** **0** %







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## VISUAL SHELL CONTENT

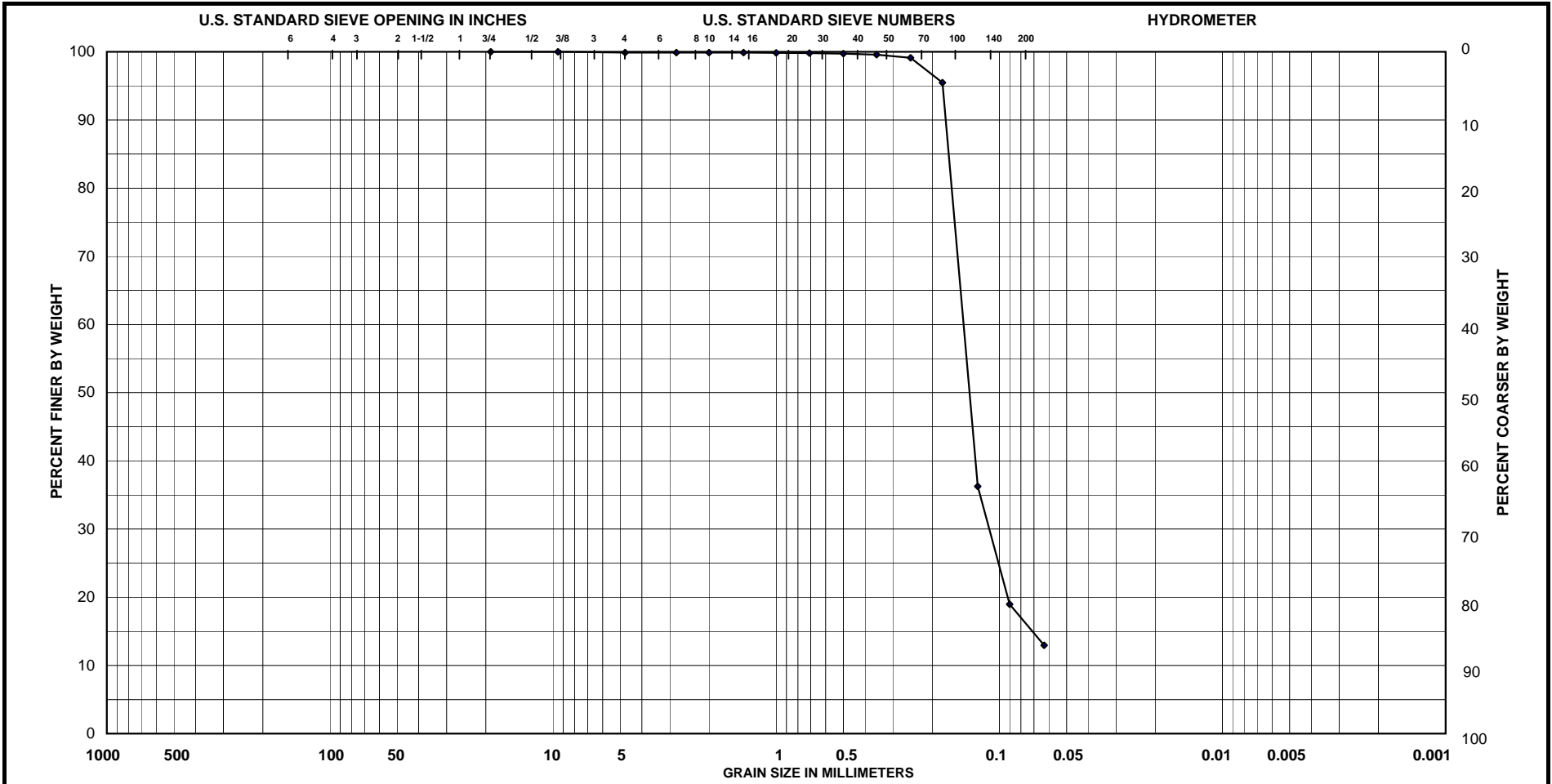
### GRAIN SIZE AND VISUAL SHELL CONTENT

Project:	<b>Topsail Beach, Surf City &amp; North Topsail</b>	Depth:	<b>45.7-46.2</b>
Project No.:	<b>1584-01-40</b>	Date:	<b>9/24/2003</b>
Boring No.:	<b>T1-03-V-183</b>		
Sample No.:	<b>1</b>		
Description:	<b>SAND, poorly-graded with silt, mostly fine-grained quartz, few silt, trace carbonate, olive gray (SP-SM)</b>		

Tare Weight, (g):	<b>50.65</b>	
Dry Wt. Before Washing (g):	<b>177.87</b>	(with tare)
Dry Weight After Washing (g):	<b>164.08</b>	(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	0.13	99.90	100	0.13
#7	2.800	0.00	99.90	0	0.00
#10	2.000	0.01	99.89	100	0.01
#14	1.400	0.03	99.87	100	0.03
#18	1.000	0.04	99.83	50	0.02
#25	0.710	0.04	99.80	10	0.00
#35	0.500	0.07	99.75	3	0.00
#45	0.355	0.20	99.59	3	0.01
#60	0.250	0.59	99.13	1	0.01
#80	0.180	4.63	95.49	1	0.05
#120	0.125	75.37	36.24	1	0.75
#170	0.090	21.96	18.98	1	0.22
#230	0.063	7.69	12.94	1	0.08

**Total Shell Content:** **1** %



COBBLES	GRAVEL		SAND			SILT OR CLAY
	COARSE	FINE	COARSE	MEDIUM	FINE	

Sample No.	Elev. Or Depth	Classification	% CO <sub>3</sub>	G <sub>s</sub>	Nat w%	LL	PL	PI	Project
♦ 1	45.7-46.2	SAND, poorly-graded with silt, mostly fine-grained quartz, few silt, trace carbonate, olive gray (SP-SM)	1						Topsail Beach, Surf City & North Topsail
									Area
									Boring No. T1-03-V-183
									Date 9/24/2003

**GRADATION CURVES**



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## VISUAL SHELL CONTENT

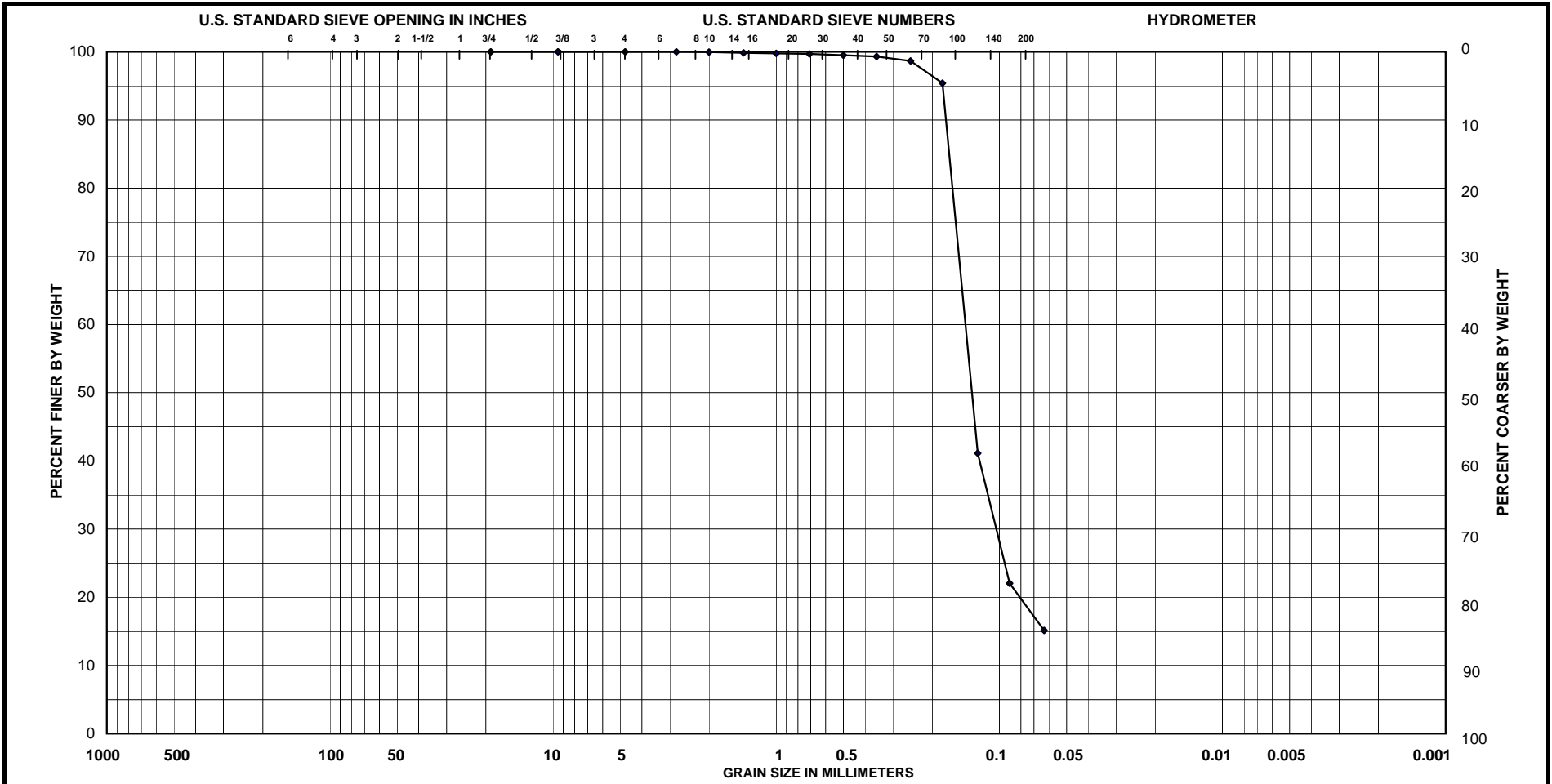
### GRAIN SIZE AND VISUAL SHELL CONTENT

Project:	<b>Topsail Beach, Surf City &amp; North Topsail</b>	Depth:	<b>48.0-48.5</b>
Project No.:	<b>1584-01-40</b>	Date:	<b>9/24/2003</b>
Boring No.:	<b>T1-03-V-183</b>		
Sample No.:	<b>2</b>		
Description:	<b>SAND, silty, mostly fine-grained quartz, little silt, olive gray (SM)</b>		

Tare Weight, (g):	<b>50.24</b>	
Dry Wt. Before Washing (g):	<b>173.57</b>	(with tare)
Dry Weight After Washing (g):	<b>156.3</b>	(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	0.03	99.98	0	0.00
#14	1.400	0.14	99.86	5	0.01
#18	1.000	0.13	99.76	0	0.00
#25	0.710	0.10	99.68	0	0.00
#35	0.500	0.21	99.51	3	0.01
#45	0.355	0.24	99.31	1	0.00
#60	0.250	0.80	98.66	1	0.01
#80	0.180	4.02	95.40	0	0.00
#120	0.125	66.96	41.11	0	0.00
#170	0.090	23.53	22.03	0	0.00
#230	0.063	8.48	15.15	0	0.00

**Total Shell Content:** **0** %



COBBLES	GRAVEL		SAND			SILT OR CLAY
	COARSE	FINE	COARSE	MEDIUM	FINE	

Sample No.	Elev. Or Depth	Classification	% CO <sub>3</sub>	G <sub>s</sub>	Nat w%	LL	PL	PI	Project
♦ 2	48.0-48.5	SAND, silty, mostly fine-grained quartz, little silt, olive gray (SM)	0						Topsail Beach, Surf City & North Topsail
									Area
									Boring No. T1-03-V-183
									Date 9/24/2003

**GRADATION CURVES**



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## VISUAL SHELL CONTENT

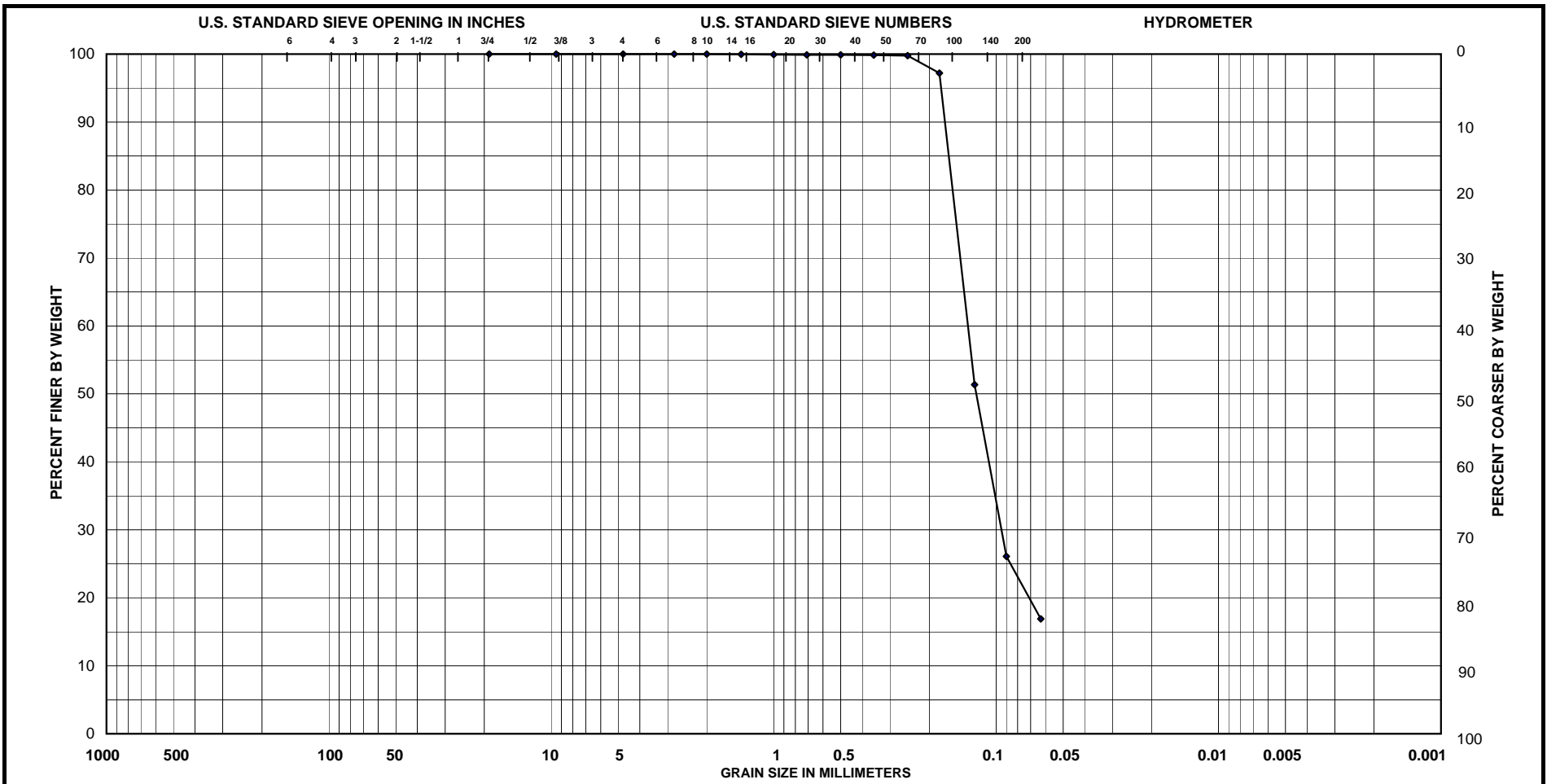
### GRAIN SIZE AND VISUAL SHELL CONTENT

Project:	<b>Topsail Beach, Surf City &amp; North Topsail</b>	Depth:	<b>49.5-50.0</b>
Project No.:	<b>1584-01-40</b>	Date:	<b>9/24/2003</b>
Boring No.:	<b>T1-03-V-183</b>		
Sample No.:	<b>3</b>		
Description:	<b>SAND, silty, mostly fine-grained quartz, little silt, trace carbonate, olive gray (SM)</b>		

Tare Weight, (g):	<b>50.87</b>	
Dry Wt. Before Washing (g):	<b>169.4</b>	(with tare)
Dry Weight After Washing (g):	<b>153.16</b>	(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	0.00	100.00	0	0.00
#14	1.400	0.03	99.97	0	0.00
#18	1.000	0.07	99.92	60	0.04
#25	0.710	0.03	99.89	20	0.01
#35	0.500	0.02	99.87	5	0.00
#45	0.355	0.05	99.83	3	0.00
#60	0.250	0.07	99.77	1	0.00
#80	0.180	3.03	97.22	1	0.03
#120	0.125	54.33	51.38	1	0.54
#170	0.090	29.98	26.09	1	0.30
#230	0.063	10.89	16.90	1	0.11

**Total Shell Content:** **1** %



COBBLES	GRAVEL		SAND			SILT OR CLAY
	COARSE	FINE	COARSE	MEDIUM	FINE	

Sample No.	Elev. Or Depth	Classification	% CO <sub>3</sub>	G <sub>s</sub>	Nat w%	LL	PL	PI	Project
3	49.5-50.0	SAND, silty, mostly fine-grained quartz, little silt, trace carbonate, olive gray (SM)	1						Topsail Beach, Surf City & North Topsail
									Area
									Boring No. T1-03-V-183
									Date 9/24/2003

**GRADATION CURVES**



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## VISUAL SHELL CONTENT

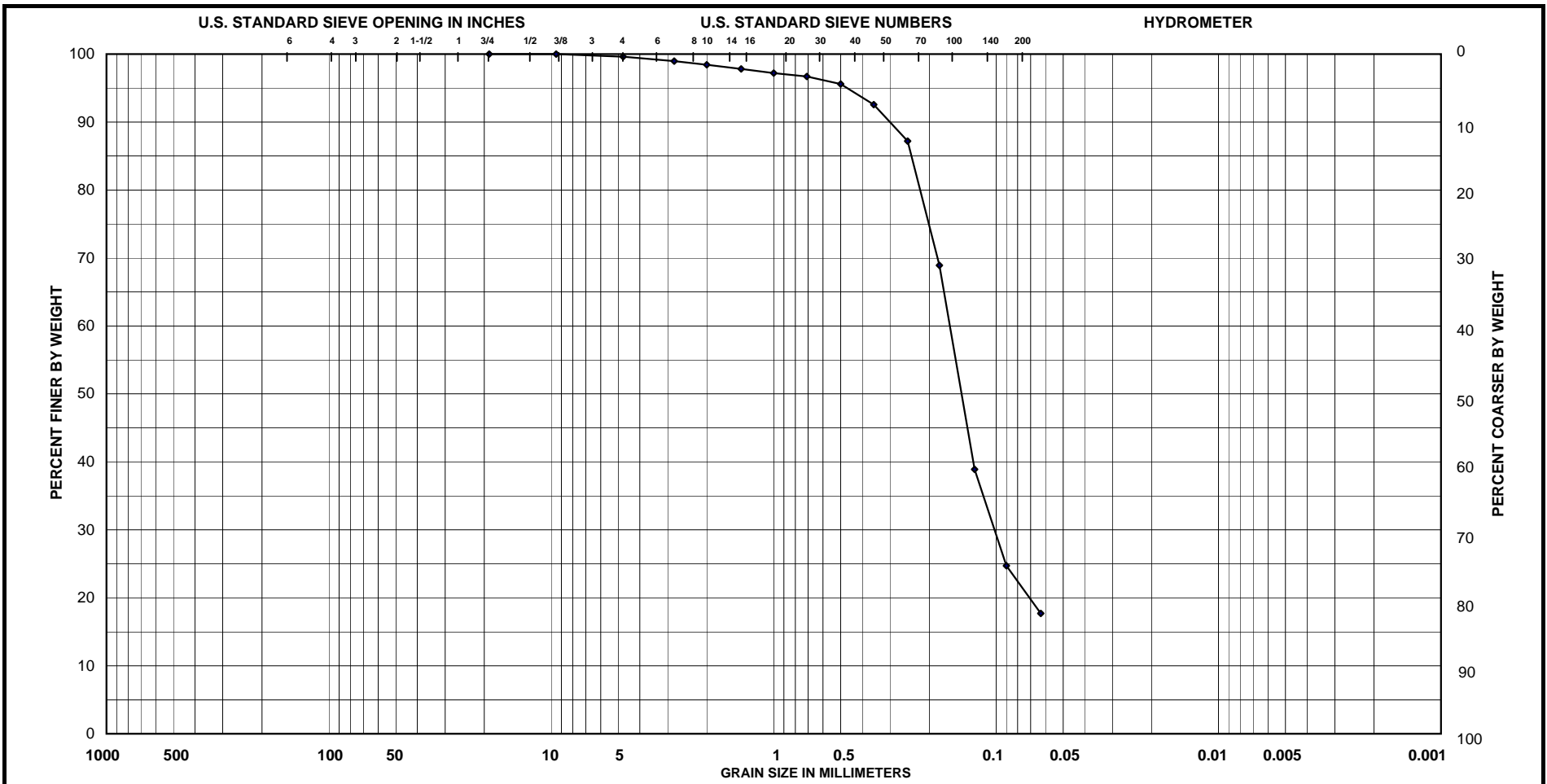
### GRAIN SIZE AND VISUAL SHELL CONTENT

Project:	<b>Topsail Beach, Surf City &amp; North Topsail</b>	Depth:	<b>47.1-47.6</b>
Project No.:	<b>1584-01-40</b>	Date:	<b>9/24/2003</b>
Boring No.:	<b>T1-03-V-184</b>		
Sample No.:	<b>1</b>		
Description:	<b>SAND, silty, mostly fine-grained quartz, little silt, trace carbonate, dark greenish gray (SM)</b>		

Tare Weight, (g):	<b>50.03</b>	
Dry Wt. Before Washing (g):	<b>170.81</b>	(with tare)
Dry Weight After Washing (g):	<b>151.53</b>	(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	0.47	99.61	100	0.47
#7	2.800	0.80	98.95	90	0.72
#10	2.000	0.61	98.44	80	0.49
#14	1.400	0.74	97.83	60	0.44
#18	1.000	0.75	97.21	60	0.45
#25	0.710	0.59	96.72	50	0.30
#35	0.500	1.37	95.59	20	0.27
#45	0.355	3.65	92.56	10	0.37
#60	0.250	6.49	87.19	3	0.19
#80	0.180	22.07	68.92	1	0.22
#120	0.125	36.23	38.92	1	0.36
#170	0.090	17.14	24.73	1	0.17
#230	0.063	8.49	17.70	1	0.08

**Total Shell Content:** **4** %



COBBLES	GRAVEL		SAND			SILT OR CLAY
	COARSE	FINE	COARSE	MEDIUM	FINE	

Sample No.	Elev. Or Depth	Classification	% CO <sub>3</sub>	G <sub>s</sub>	Nat w%	LL	PL	PI	Project
1	47.1-47.6	SAND, silty, mostly fine-grained quartz, little silt, trace carbonate, dark greenish gray (SM)	4						Topsail Beach, Surf City & North Topsail
									Area
									Boring No. T1-03-V-184
									Date 9/24/2003

**GRADATION CURVES**





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## VISUAL SHELL CONTENT

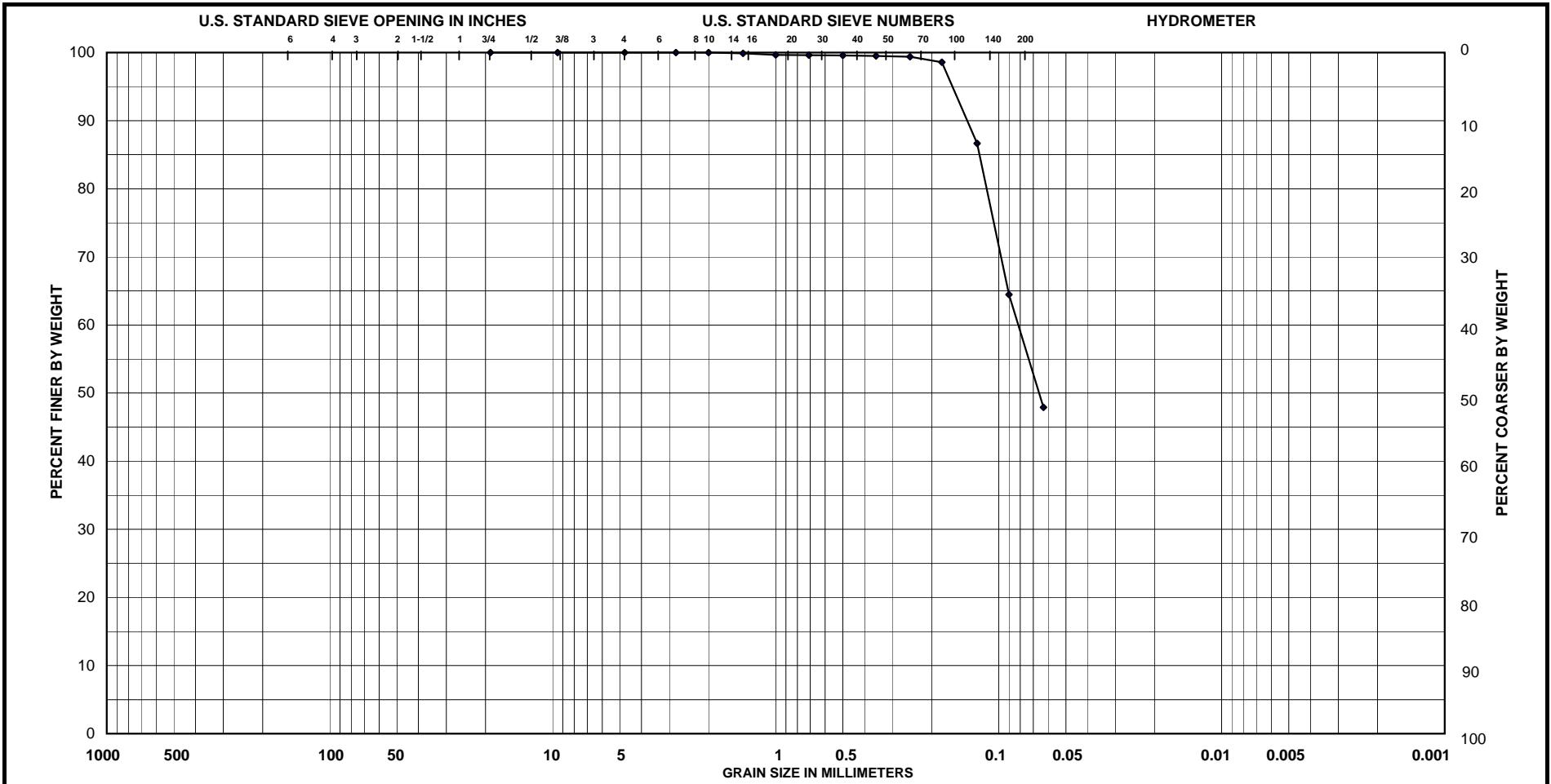
### GRAIN SIZE AND VISUAL SHELL CONTENT

Project:	<b>Topsail Beach, Surf City &amp; North Topsail</b>	Depth:	<b>50.3-50.8</b>
Project No.:	<b>1584-01-40</b>	Date:	<b>9/24/2003</b>
Boring No.:	<b>T1-03-V-184</b>		
Sample No.:	<b>2</b>		
Description:	<b>SAND, clayey, mostly fine-grained quartz, some clay, trace carbonate, dark greenish gray (SC)</b>		

Tare Weight, (g):	<b>50.28</b>	
Dry Wt. Before Washing (g):	<b>155.26</b>	(with tare)
Dry Weight After Washing (g):	<b>109.18</b>	(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	0	0.00
#14	1.400	0.10	99.89	10	0.01
#18	1.000	0.26	99.64	35	0.09
#25	0.710	0.04	99.60	20	0.01
#35	0.500	0.04	99.56	10	0.00
#45	0.355	0.06	99.50	10	0.01
#60	0.250	0.11	99.40	3	0.00
#80	0.180	0.84	98.60	1	0.01
#120	0.125	12.53	86.66	1	0.13
#170	0.090	23.31	64.46	1	0.23
#230	0.063	17.37	47.91	1	0.17

**Total Shell Content:** **1** %



COBBLES	GRAVEL		SAND			SILT OR CLAY
	COARSE	FINE	COARSE	MEDIUM	FINE	

Sample No.	Elev. Or Depth	Classification	% CO <sub>3</sub>	G <sub>s</sub>	Nat w%	LL	PL	PI	Project	
♦ 2	50.3-50.8	SAND, clayey, mostly fine-grained quartz, some clay, trace carbonate, dark greenish gray (SC)	1						Topsail Beach, Surf City & North Topsail	
			Area							
			Boring No. T1-03-V-184							
			Date 9/24/2003							

**GRADATION CURVES**



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## VISUAL SHELL CONTENT

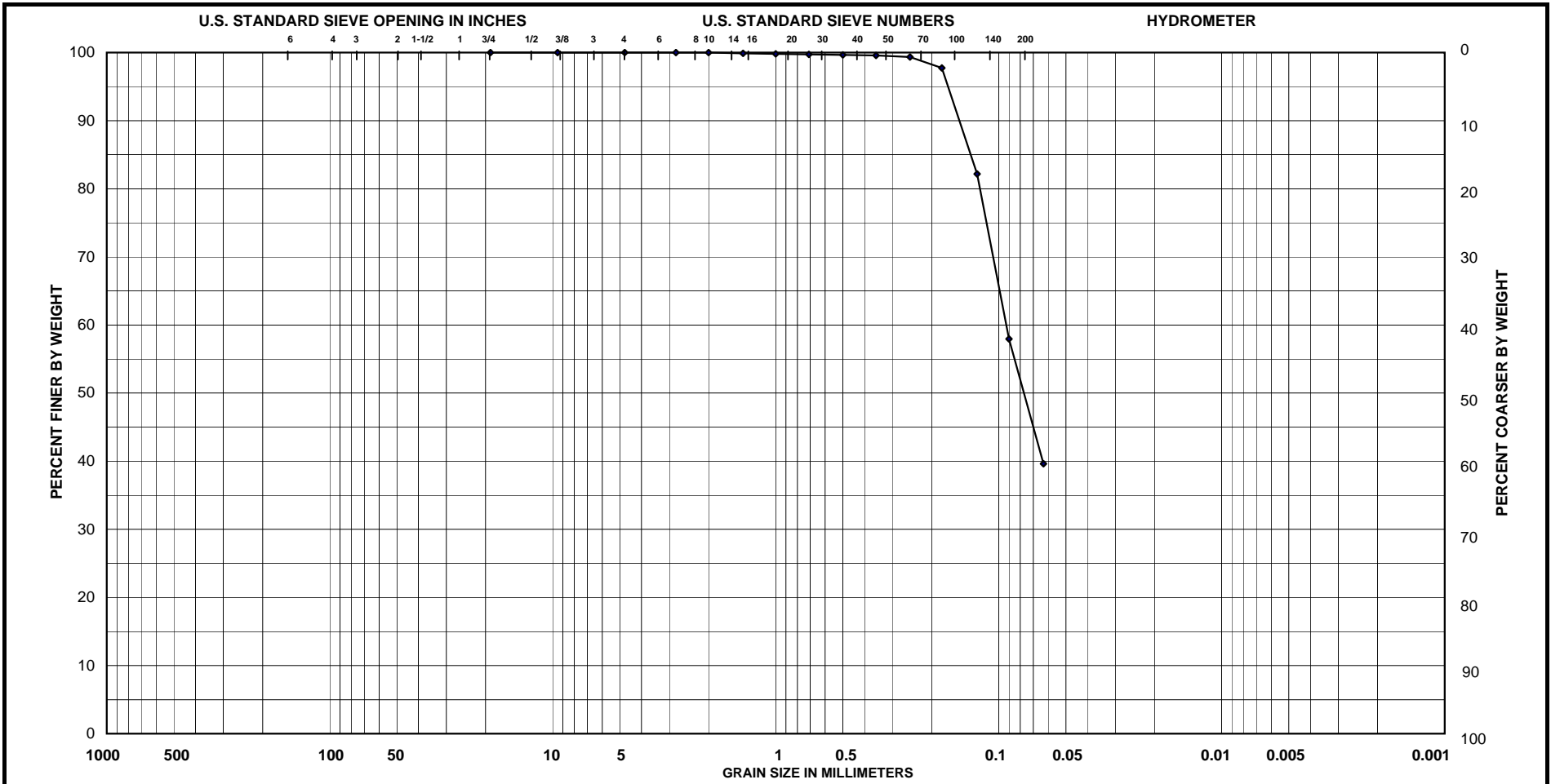
### GRAIN SIZE AND VISUAL SHELL CONTENT

Project:	<b>Topsail Beach, Surf City &amp; North Topsail</b>	Depth:	<b>51.3-51.8</b>
Project No.:	<b>1584-01-40</b>	Date:	<b>9/24/2003</b>
Boring No.:	<b>T1-03-V-184</b>		
Sample No.:	<b>3</b>		
Description:	<b>SAND, silty, mostly fine-grained quartz, some silt, trace carbonate, very dark greenish gray (SM)</b>		

Tare Weight, (g):	<b>50.41</b>	
Dry Wt. Before Washing (g):	<b>159.82</b>	(with tare)
Dry Weight After Washing (g):	<b>121.72</b>	(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	0	0.00
#14	1.400	0.09	99.90	20	0.02
#18	1.000	0.11	99.80	10	0.01
#25	0.710	0.07	99.73	15	0.01
#35	0.500	0.08	99.66	20	0.02
#45	0.355	0.09	99.58	5	0.00
#60	0.250	0.24	99.36	3	0.01
#80	0.180	1.78	97.73	1	0.02
#120	0.125	17.01	82.19	1	0.17
#170	0.090	26.52	57.95	1	0.27
#230	0.063	20.05	39.62	1	0.20

**Total Shell Content:** **1** %



COBBLES	GRAVEL		SAND			SILT OR CLAY
	COARSE	FINE	COARSE	MEDIUM	FINE	

Sample No.	Elev. Or Depth	Classification	% CO <sub>3</sub>	G <sub>s</sub>	Nat w%	LL	PL	PI	Project	
♦ 3	51.3-51.8	SAND, silty, mostly fine-grained quartz, some silt, trace carbonate, very dark greenish gray (SM)	1						Topsail Beach, Surf City & North Topsail	
			Area							
			Boring No. T1-03-V-184							
			Date 9/24/2003							

**GRADATION CURVES**



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## VISUAL SHELL CONTENT

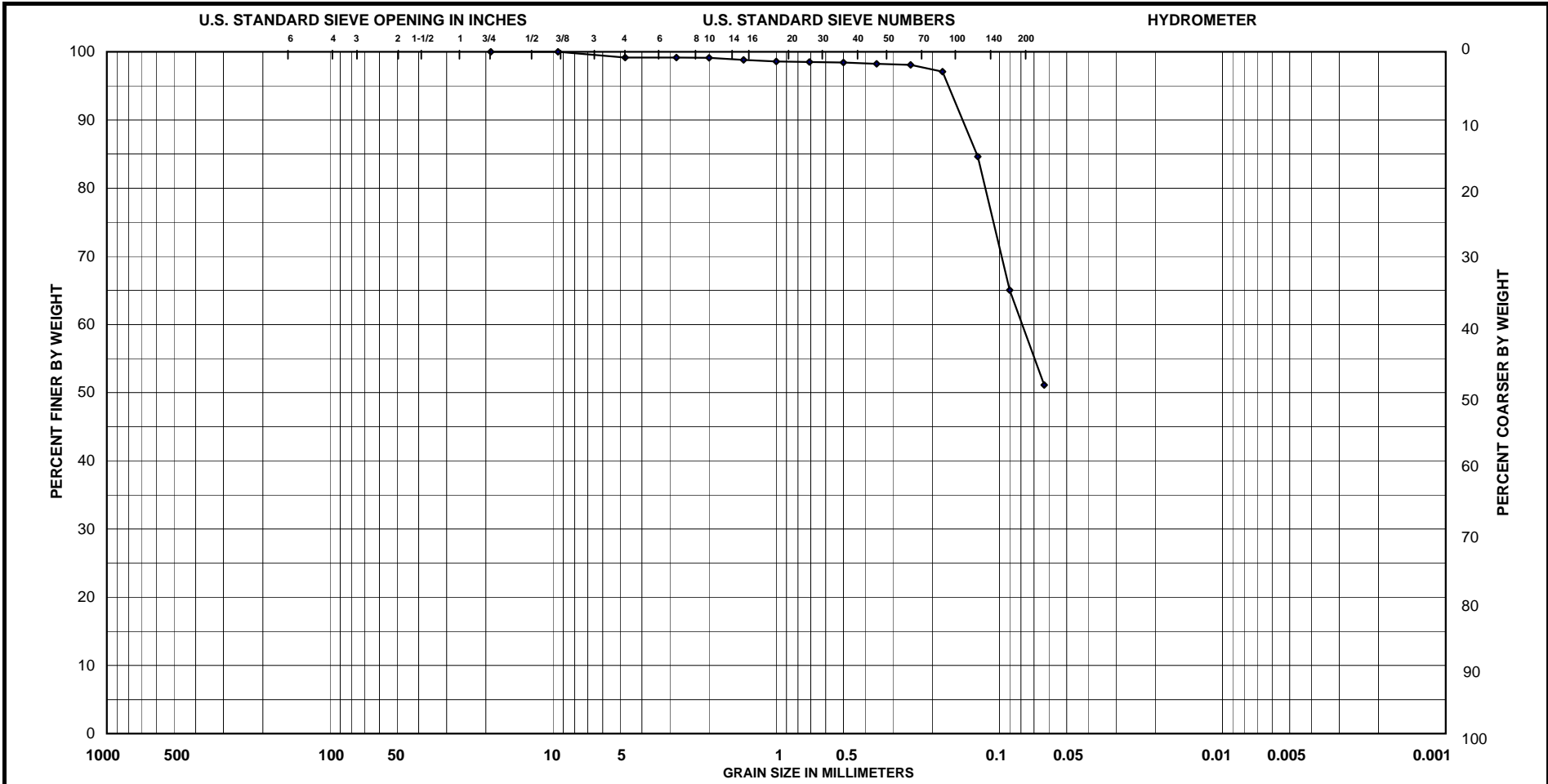
### GRAIN SIZE AND VISUAL SHELL CONTENT

<b>Project:</b>	<b>Topsail Beach, Surf City &amp; North Topsail</b>	<b>Depth:</b>	<b>54.0-54.5</b>
<b>Project No.:</b>	<b>1584-01-40</b>	<b>Date:</b>	<b>9/24/2003</b>
<b>Boring No.:</b>	<b>T1-03-V-184</b>		
<b>Sample No.:</b>	<b>4</b>		
<b>Description:</b>	<b>SILT, inorganic-H, some fine-grained quartz sand, trace carbonate, very dark greenish gray (MH)</b>		

Tare Weight, (g):	50.48	
Dry Wt. Before Washing (g):	142.09	(with tare)
Dry Weight After Washing (g):	97.99	(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	0.77	99.16	100	0.77
#7	2.800	0.01	99.15	0	0.00
#10	2.000	0.04	99.10	30	0.01
#14	1.400	0.28	98.80	5	0.01
#18	1.000	0.19	98.59	3	0.01
#25	0.710	0.07	98.52	3	0.00
#35	0.500	0.09	98.42	3	0.00
#45	0.355	0.15	98.25	3	0.00
#60	0.250	0.16	98.08	1	0.00
#80	0.180	0.90	97.10	1	0.01
#120	0.125	11.42	84.63	1	0.11
#170	0.090	17.96	65.03	1	0.18
#230	0.063	12.73	51.13	1	0.13

**Total Shell Content:** 1 %



COBBLES	GRAVEL		SAND			SILT OR CLAY
	COARSE	FINE	COARSE	MEDIUM	FINE	

Sample No.	Elev. Or Depth	Classification	% CO <sub>3</sub>	G <sub>s</sub>	Nat w%	LL	PL	PI		
4	54.0-54.5	SILT, inorganic-H, some fine-grained quartz sand, trace carbonate, very dark greenish gray (MH)	1						<b>Project</b>	Topsail Beach, Surf City & North Topsail
									<b>Area</b>	
									<b>Boring No.</b>	T1-03-V-184
									<b>Date</b>	9/24/2003

**GRADATION CURVES**



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## VISUAL SHELL CONTENT

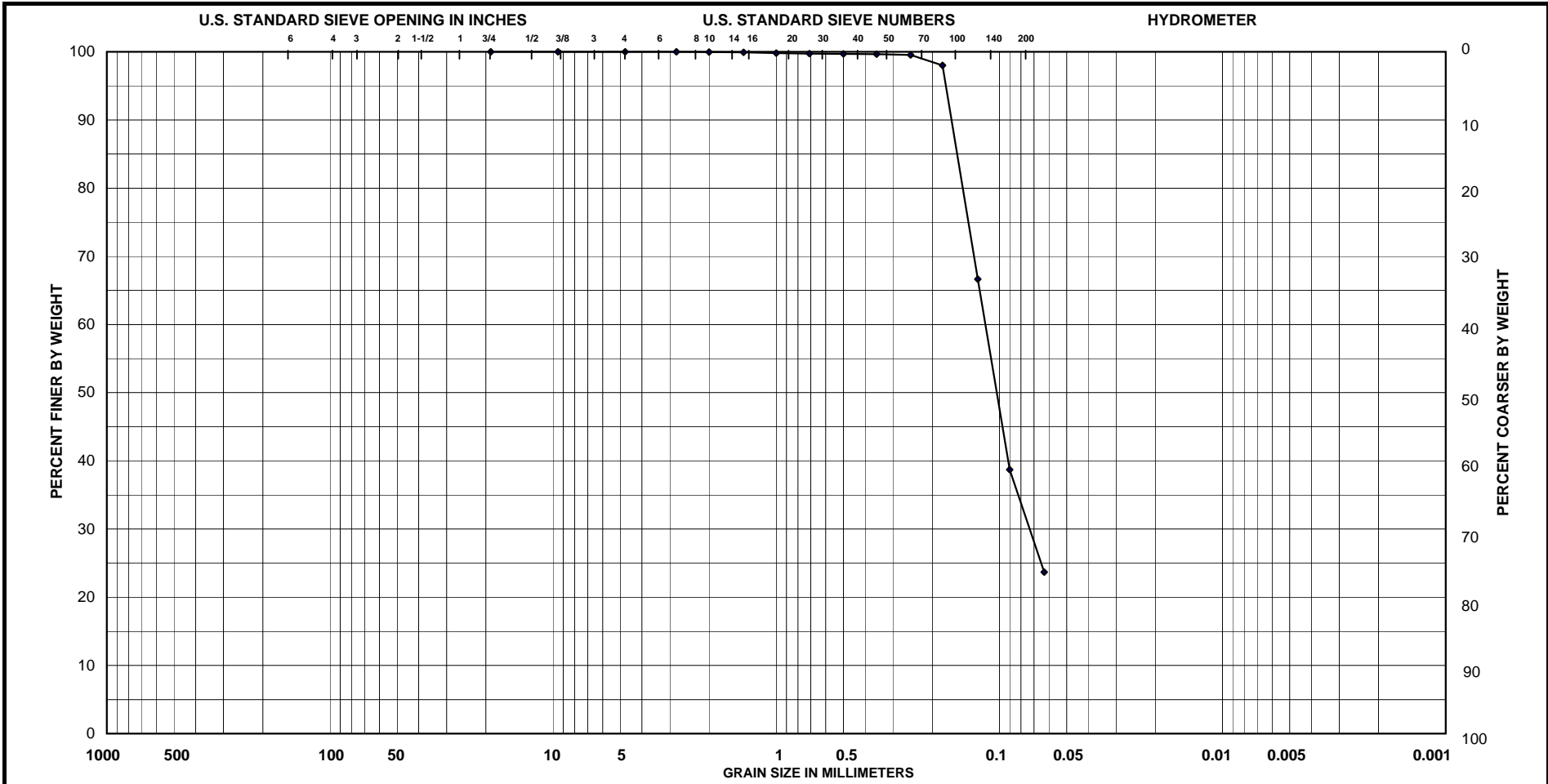
### GRAIN SIZE AND VISUAL SHELL CONTENT

Project:	<b>Topsail Beach, Surf City &amp; North Topsail</b>	Depth:	<b>54.7-55.2</b>
Project No.:	<b>1584-01-40</b>	Date:	<b>9/24/2003</b>
Boring No.:	<b>T1-03-V-184</b>		
Sample No.:	<b>5</b>		
Description:	<b>SAND, silty, mostly fine-grained quartz, little silt, trace carbonate, dark greenish gray (SM)</b>		

Tare Weight, (g):	<b>49.79</b>	
Dry Wt. Before Washing (g):	<b>167.04</b>	(with tare)
Dry Weight After Washing (g):	<b>143.31</b>	(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	0.04	99.96	100	0.04
#14	1.400	0.05	99.91	20	0.01
#18	1.000	0.13	99.80	15	0.02
#25	0.710	0.08	99.74	25	0.02
#35	0.500	0.04	99.70	30	0.01
#45	0.355	0.05	99.66	30	0.02
#60	0.250	0.16	99.52	40	0.06
#80	0.180	1.76	98.02	25	0.44
#120	0.125	36.78	66.65	1	0.37
#170	0.090	32.77	38.70	1	0.33
#230	0.063	17.61	23.68	1	0.18

**Total Shell Content:** **1** %



COBBLES	GRAVEL		SAND			SILT OR CLAY
	COARSE	FINE	COARSE	MEDIUM	FINE	

Sample No.	Elev. Or Depth	Classification	% CO <sub>3</sub>	G <sub>s</sub>	Nat w%	LL	PL	PI	Project
5	54.7-55.2	SAND, silty, mostly fine-grained quartz, little silt, trace carbonate, dark greenish gray (SM)	1						Topsail Beach, Surf City & North Topsail
									Area
									Boring No. T1-03-V-184
									Date 9/24/2003

**GRADATION CURVES**





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## VISUAL SHELL CONTENT

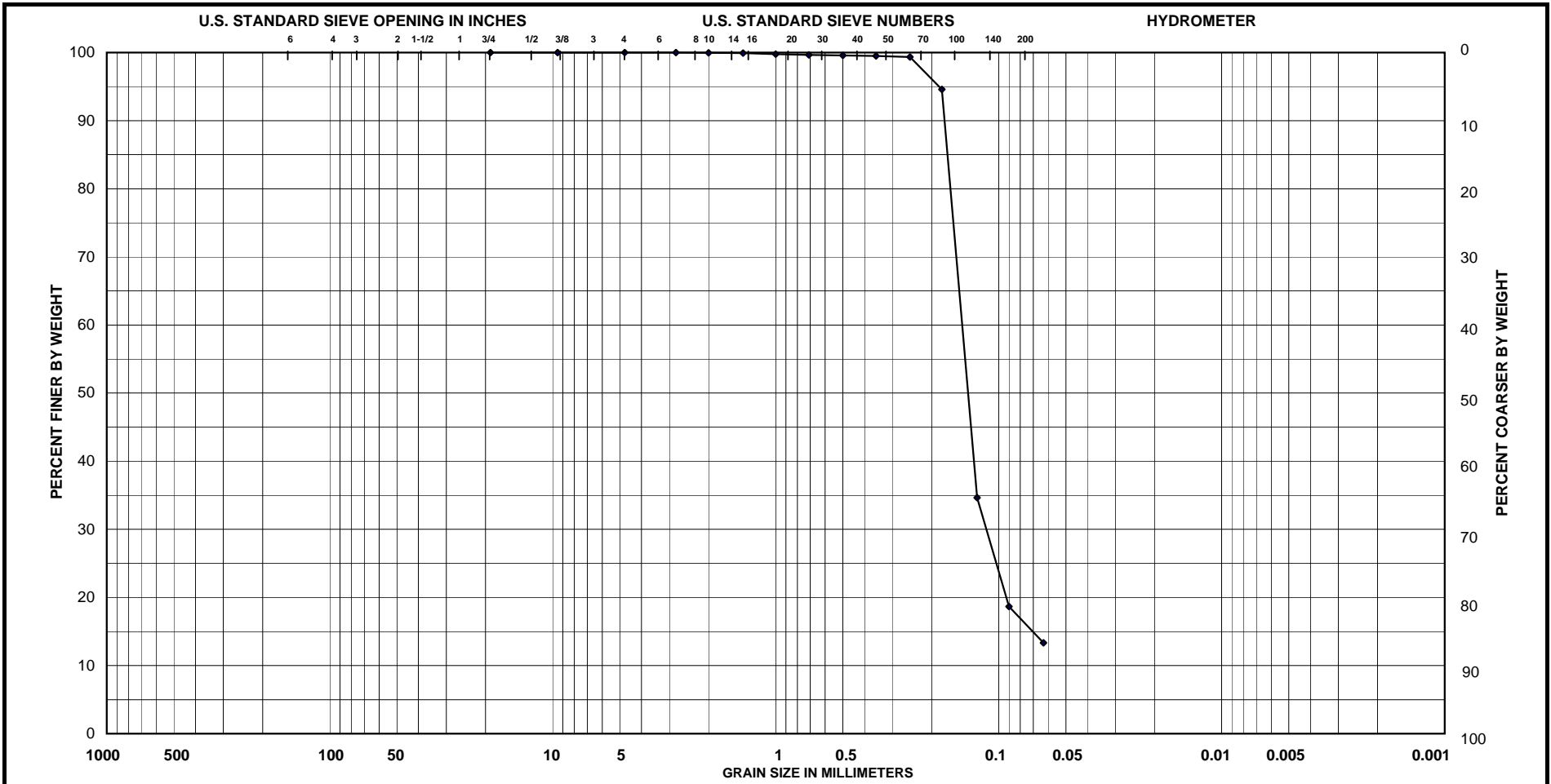
### GRAIN SIZE AND VISUAL SHELL CONTENT

Project:	<b>Topsail Beach, Surf City &amp; North Topsail</b>	Depth:	<b>58.0-58.5</b>
Project No.:	<b>1584-01-40</b>	Date:	<b>9/24/2003</b>
Boring No.:	<b>T1-03-V-184</b>		
Sample No.:	<b>6</b>		
Description:	<b>SAND, silty, mostly fine-grained quartz, few silt, trace carbonate, dark greenish gray (SM)</b>		

Tare Weight, (g):	<b>50.49</b>	
Dry Wt. Before Washing (g):	<b>172.79</b>	(with tare)
Dry Weight After Washing (g):	<b>157.41</b>	(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	0.02	99.97	0	0.00
#14	1.400	0.06	99.92	20	0.01
#18	1.000	0.19	99.76	15	0.03
#25	0.710	0.11	99.67	10	0.01
#35	0.500	0.11	99.58	15	0.02
#45	0.355	0.10	99.50	3	0.00
#60	0.250	0.17	99.36	3	0.01
#80	0.180	5.84	94.59	1	0.06
#120	0.125	73.29	34.66	1	0.73
#170	0.090	19.54	18.68	1	0.20
#230	0.063	6.54	13.34	1	0.07

**Total Shell Content:** **1** %



COBBLES	GRAVEL		SAND			SILT OR CLAY
	COARSE	FINE	COARSE	MEDIUM	FINE	

Sample No.	Elev. Or Depth	Classification	% CO <sub>3</sub>	G <sub>s</sub>	Nat w%	LL	PL	PI	Project
6	58.0-58.5	SAND, silty, mostly fine-grained quartz, few silt, trace carbonate, dark greenish gray (SM)	1						Topsail Beach, Surf City & North Topsail
									Area
									Boring No. T1-03-V-184
									Date 9/24/2003

**GRADATION CURVES**



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## VISUAL SHELL CONTENT

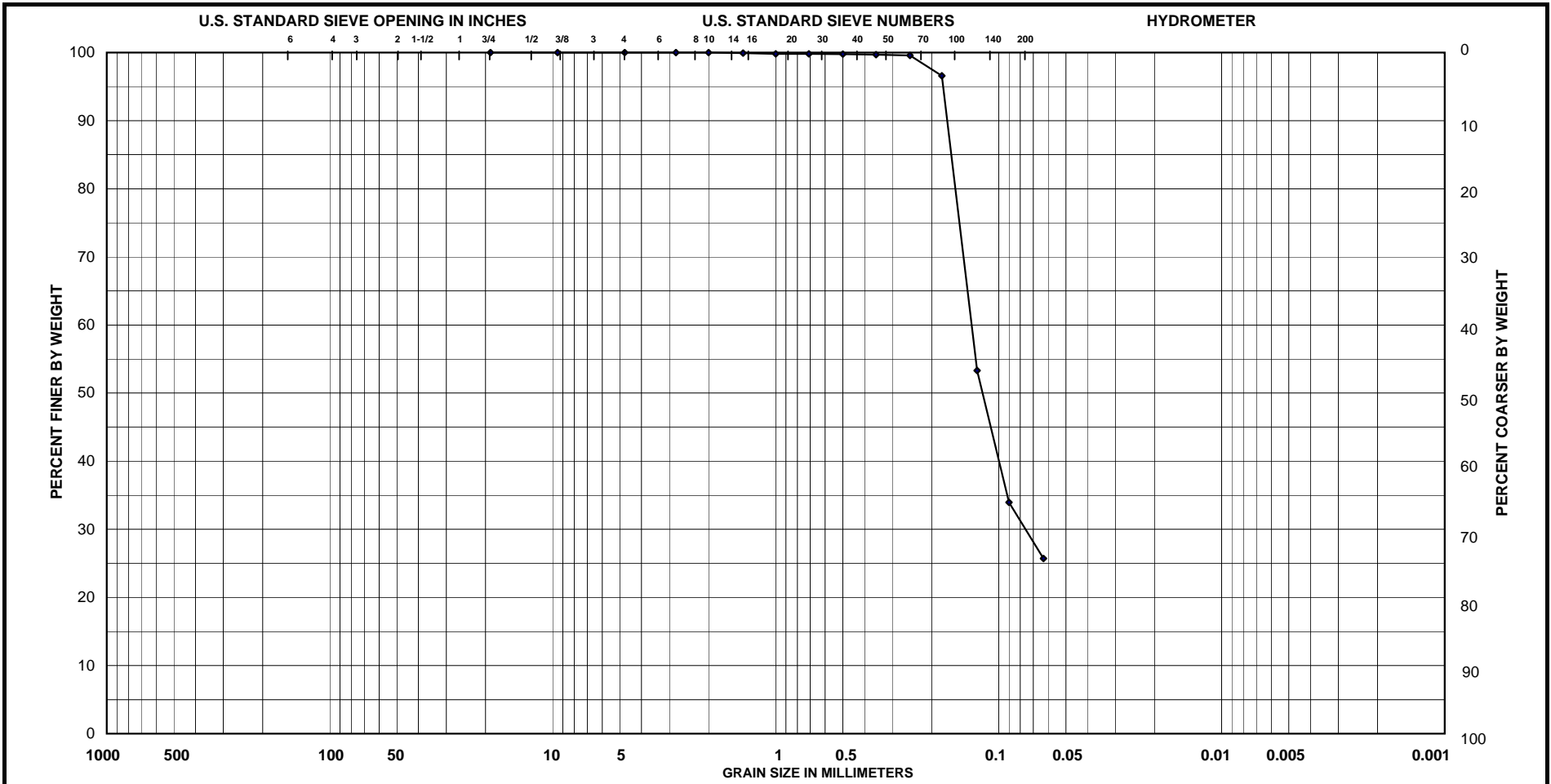
### GRAIN SIZE AND VISUAL SHELL CONTENT

Project:	<b>Topsail Beach, Surf City &amp; North Topsail</b>	Depth:	<b>63.0-63.5</b>
Project No.:	<b>1584-01-40</b>	Date:	<b>9/24/2003</b>
Boring No.:	<b>T1-03-V-184</b>		
Sample No.:	<b>7</b>		
Description:	<b>SAND, silty, mostly fine-grained quartz, little silt, trace carbonate, dark greenish gray (SM)</b>		

Tare Weight, (g):	<b>48.26</b>	
Dry Wt. Before Washing (g):	<b>162.51</b>	(with tare)
Dry Weight After Washing (g):	<b>134.38</b>	(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	0.01	99.99	0	0.00
#14	1.400	0.06	99.94	10	0.01
#18	1.000	0.13	99.82	10	0.01
#25	0.710	0.03	99.80	20	0.01
#35	0.500	0.05	99.75	5	0.00
#45	0.355	0.05	99.71	5	0.00
#60	0.250	0.16	99.57	3	0.00
#80	0.180	3.42	96.58	1	0.03
#120	0.125	49.41	53.33	1	0.49
#170	0.090	22.12	33.97	1	0.22
#230	0.063	9.44	25.71	1	0.09

**Total Shell Content:** **1** %



COBBLES	GRAVEL		SAND			SILT OR CLAY
	COARSE	FINE	COARSE	MEDIUM	FINE	

Sample No.	Elev. Or Depth	Classification	% CO <sub>3</sub>	G <sub>s</sub>	Nat w%	LL	PL	PI	Project
7	63.0-63.5	SAND, silty, mostly fine-grained quartz, little silt, trace carbonate, dark greenish gray (SM)	1						Topsail Beach, Surf City & North Topsail
									Area
									Boring No. T1-03-V-184
									Date 9/24/2003

**GRADATION CURVES**



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## VISUAL SHELL CONTENT

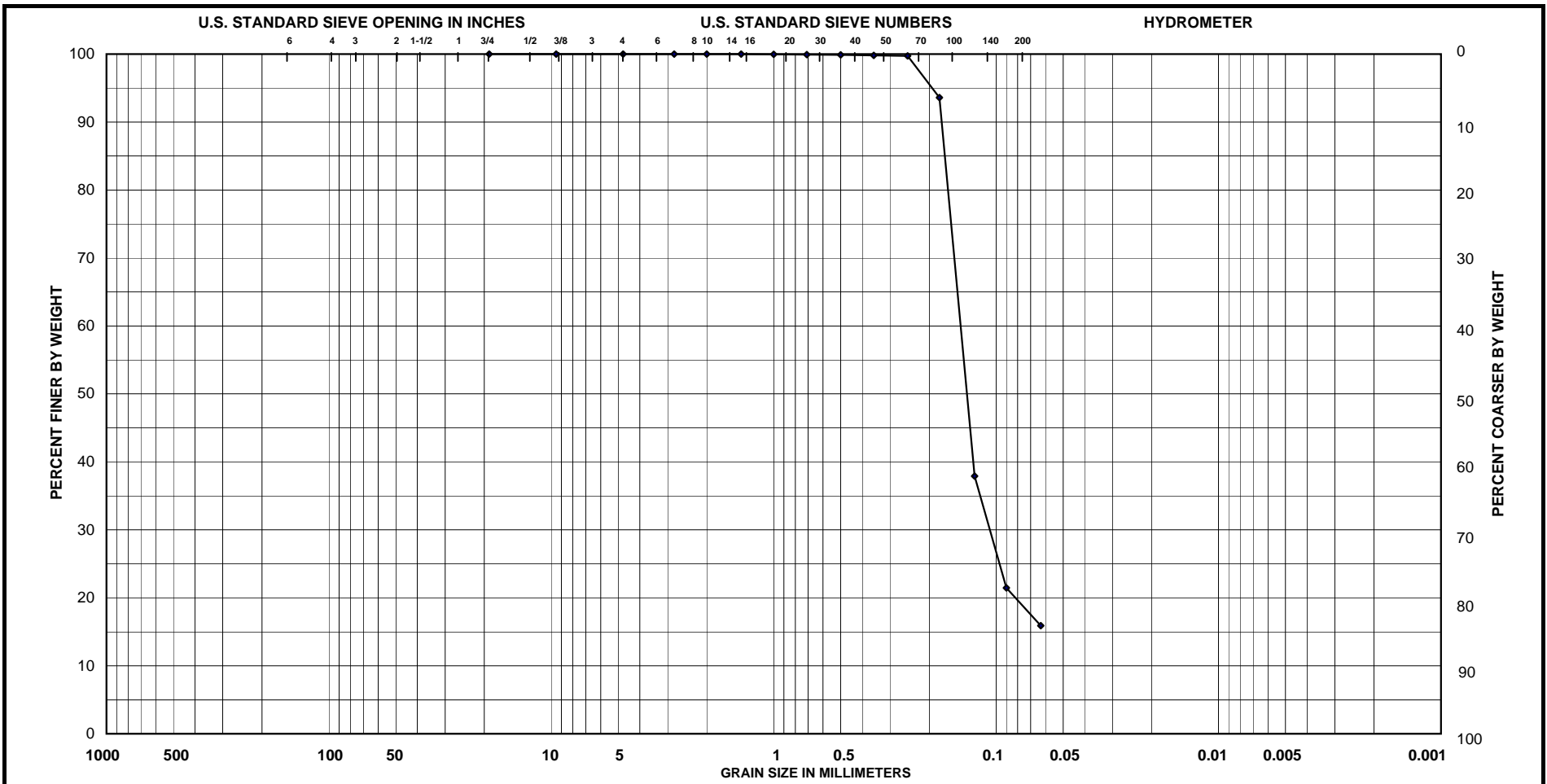
### GRAIN SIZE AND VISUAL SHELL CONTENT

Project:	<b>Topsail Beach, Surf City &amp; North Topsail</b>	Depth:	<b>65.3-65.8</b>
Project No.:	<b>1584-01-40</b>	Date:	<b>9/24/2003</b>
Boring No.:	<b>T1-03-V-184</b>		
Sample No.:	<b>8</b>		
Description:	<b>SAND, silty, mostly fine-grained quartz, little silt, trace carbonate, dark greenish gray (SM)</b>		

Tare Weight, (g):	<b>50.01</b>	
Dry Wt. Before Washing (g):	<b>164.08</b>	(with tare)
Dry Weight After Washing (g):	<b>146.55</b>	(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	0.00	100.00	0	0.00
#14	1.400	0.02	99.98	0	0.00
#18	1.000	0.04	99.95	5	0.00
#25	0.710	0.04	99.91	30	0.01
#35	0.500	0.05	99.87	30	0.02
#45	0.355	0.06	99.82	10	0.01
#60	0.250	0.08	99.75	5	0.00
#80	0.180	7.00	93.61	3	0.21
#120	0.125	63.52	37.92	1	0.64
#170	0.090	18.76	21.48	1	0.19
#230	0.063	6.34	15.92	1	0.06

**Total Shell Content:** **1** %



COBBLES	GRAVEL		SAND			SILT OR CLAY
	COARSE	FINE	COARSE	MEDIUM	FINE	

Sample No.	Elev. Or Depth	Classification	% CO <sub>3</sub>	G <sub>s</sub>	Nat w%	LL	PL	PI	Project
8	65.3-65.8	SAND, silty, mostly fine-grained quartz, little silt, trace carbonate, dark greenish gray (SM)	1						Topsail Beach, Surf City & North Topsail
									Area
									Boring No. T1-03-V-184
									Date 9/24/2003

**GRADATION CURVES**



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## VISUAL SHELL CONTENT

### GRAIN SIZE AND VISUAL SHELL CONTENT

Project:	<b>Topsail Beach, Surf City &amp; North Topsail</b>	Depth:	<b>46.5-47.0</b>
Project No.:	<b>1584-01-40</b>	Date:	<b>9/24/2003</b>
Boring No.:	<b>T1-03-V-185</b>		
Sample No.:	<b>1</b>		
Description:	<b>SAND, poorly-graded, mostly fine-grained quartz, few carbonate, dark greenish gray (SP)</b>		

Tare Weight, (g):	<b>50.12</b>	
Dry Wt. Before Washing (g):	<b>152.83</b>	(with tare)
Dry Weight After Washing (g):	<b>151.78</b>	(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	0.54	99.47	100	0.54
#7	2.800	0.84	98.66	100	0.84
#10	2.000	0.59	98.08	90	0.53
#14	1.400	0.49	97.60	85	0.42
#18	1.000	0.50	97.12	85	0.43
#25	0.710	0.50	96.63	80	0.40
#35	0.500	2.19	94.50	20	0.44
#45	0.355	5.01	89.62	10	0.50
#60	0.250	8.73	81.12	3	0.26
#80	0.180	38.33	43.80	1	0.38
#120	0.125	37.28	7.51	1	0.37
#170	0.090	5.65	2.01	1	0.06
#230	0.063	0.83	1.20	1	0.01

**Total Shell Content:** **5** %







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## VISUAL SHELL CONTENT

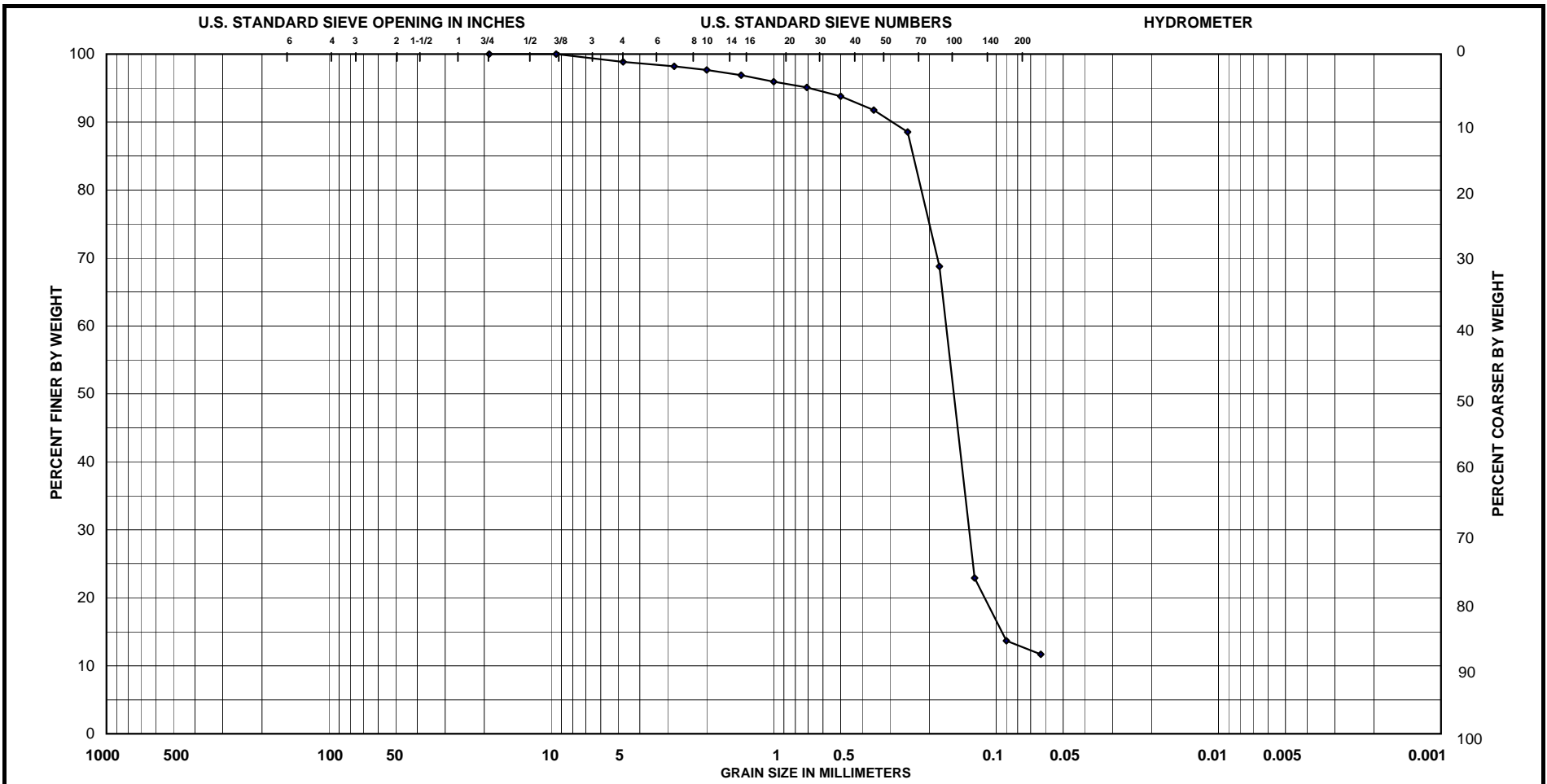
### GRAIN SIZE AND VISUAL SHELL CONTENT

Project:	<b>Topsail Beach, Surf City &amp; North Topsail</b>	Depth:	<b>48.5-49.0</b>
Project No.:	<b>1584-01-40</b>	Date:	<b>9/24/2003</b>
Boring No.:	<b>T1-03-V-185</b>		
Sample No.:	<b>2</b>		
Description:	<b>SAND, poorly-graded with silt, mostly fine-grained quartz, few silt, few carbonate, trace fragmented limestone, greenish gray (SP-SM)</b>		

Tare Weight, (g):	<b>50.25</b>	
Dry Wt. Before Washing (g):	<b>178.91</b>	(with tare)
Dry Weight After Washing (g):	<b>164.47</b>	(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	1.49	98.84	100	1.49
#7	2.800	0.81	98.21	100	0.81
#10	2.000	0.70	97.67	100	0.70
#14	1.400	0.99	96.90	90	0.89
#18	1.000	1.22	95.95	85	1.04
#25	0.710	1.11	95.09	75	0.83
#35	0.500	1.66	93.80	55	0.91
#45	0.355	2.62	91.76	40	1.05
#60	0.250	4.13	88.55	20	0.83
#80	0.180	25.48	68.75	3	0.76
#120	0.125	58.97	22.91	1	0.59
#170	0.090	11.89	13.67	1	0.12
#230	0.063	2.55	11.69	1	0.03

**Total Shell Content:** **8** %



COBBLES	GRAVEL		SAND			SILT OR CLAY
	COARSE	FINE	COARSE	MEDIUM	FINE	

Sample No.	Elev. Or Depth	Classification	% CO <sub>3</sub>	G <sub>s</sub>	Nat w%	LL	PL	PI	Project
2	48.5-49.0	SAND, poorly-graded with silt, mostly fine-grained quartz, few silt, few carbonate, trace fragmented limestone, greenish gray (SP-SM)	8						Topsail Beach, Surf City & North Topsail
									Area
									Boring No. T1-03-V-185
									Date 9/24/2003

**GRADATION CURVES**



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## VISUAL SHELL CONTENT

### GRAIN SIZE AND VISUAL SHELL CONTENT

Project:	<b>Topsail Beach, Surf City &amp; North Topsail</b>	Depth:	<b>51.0-51.5</b>
Project No.:	<b>1584-01-40</b>	Date:	<b>9/24/2003</b>
Boring No.:	<b>T1-03-V-185</b>		
Sample No.:	<b>3</b>		
Description:	<b>SAND, silty, mostly fine-grained quartz, little silt, few carbonate, dark greenish gray (SM)</b>		

Tare Weight, (g):	<b>50.64</b>	
Dry Wt. Before Washing (g):	<b>165.63</b>	(with tare)
Dry Weight After Washing (g):	<b>149.26</b>	(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	0.61	99.47	100	0.61
#7	2.800	0.50	99.03	100	0.50
#10	2.000	0.39	98.70	100	0.39
#14	1.400	0.39	98.36	100	0.39
#18	1.000	0.55	97.88	90	0.50
#25	0.710	0.46	97.48	75	0.35
#35	0.500	0.57	96.98	70	0.40
#45	0.355	0.64	96.43	60	0.38
#60	0.250	1.24	95.35	60	0.74
#80	0.180	6.03	90.10	40	2.41
#120	0.125	58.63	39.12	3	1.76
#170	0.090	21.33	20.57	1	0.21
#230	0.063	6.31	15.08	1	0.06

**Total Shell Content:** **8** %





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## VISUAL SHELL CONTENT

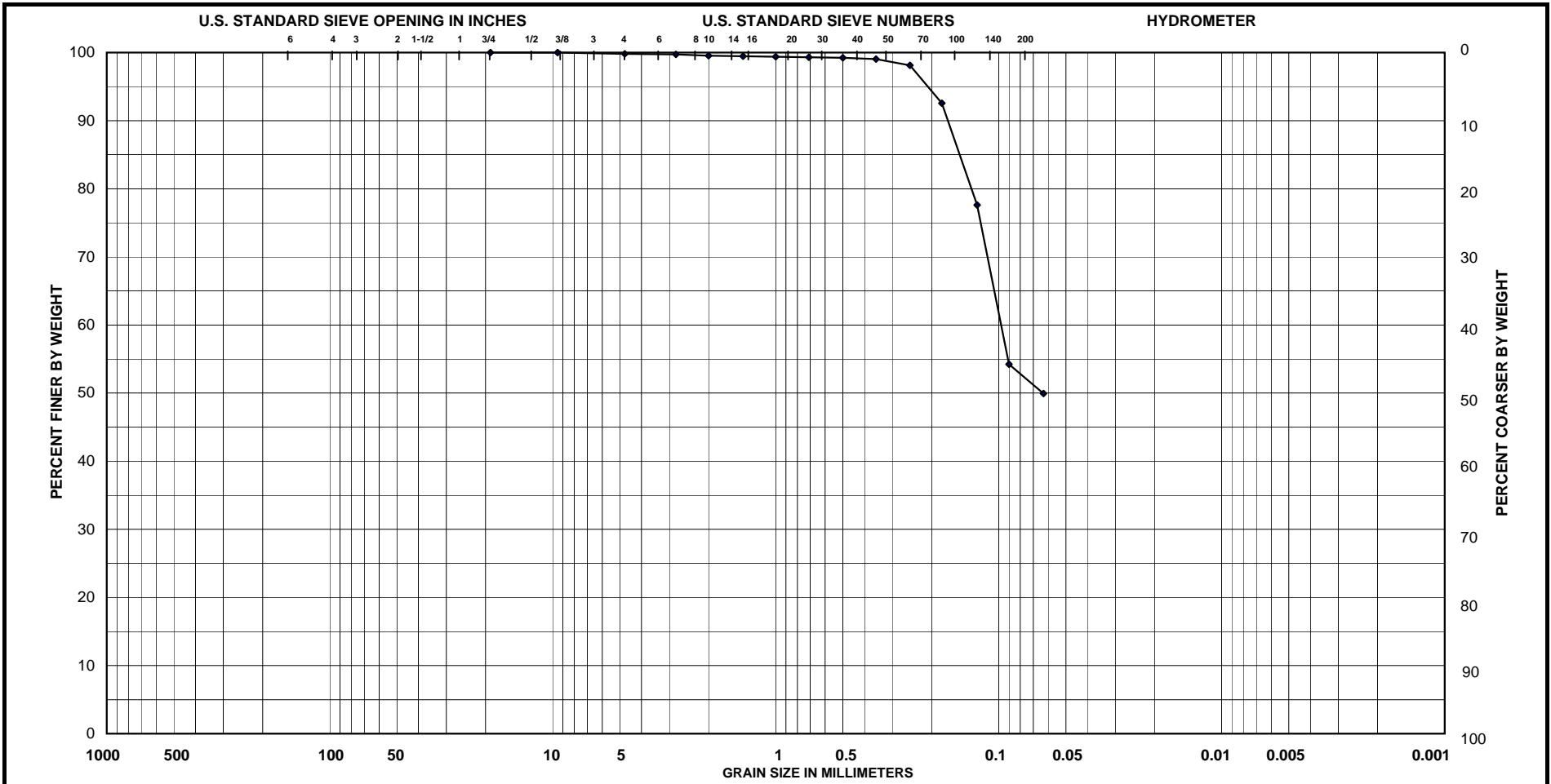
### GRAIN SIZE AND VISUAL SHELL CONTENT

Project:	<b>Topsail Beach, Surf City &amp; North Topsail</b>	Depth:	<b>53.0-53.5</b>
Project No.:	<b>1584-01-40</b>	Date:	<b>9/24/2003</b>
Boring No.:	<b>T1-03-V-185</b>		
Sample No.:	<b>4</b>		
Description:	<b>SAND, silty, mostly fine-grained quartz, some silt, trace carbonate, dark greenish gray (SM)</b>		

Tare Weight, (g):	<b>49.90</b>	
Dry Wt. Before Washing (g):	<b>143.82</b>	(with tare)
Dry Weight After Washing (g):	<b>96.59</b>	(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	0.18	99.81	100	0.18
#7	2.800	0.06	99.74	20	0.01
#10	2.000	0.18	99.55	20	0.04
#14	1.400	0.07	99.48	20	0.01
#18	1.000	0.08	99.39	60	0.05
#25	0.710	0.09	99.30	40	0.04
#35	0.500	0.05	99.24	30	0.02
#45	0.355	0.18	99.05	5	0.01
#60	0.250	0.87	98.13	3	0.03
#80	0.180	5.21	92.58	1	0.05
#120	0.125	14.07	77.60	1	0.14
#170	0.090	21.95	54.23	1	0.22
#230	0.063	4.03	49.94	1	0.04

**Total Shell Content:** **1** %



COBBLES	GRAVEL		SAND			SILT OR CLAY
	COARSE	FINE	COARSE	MEDIUM	FINE	

Sample No.	Elev. Or Depth	Classification	% CO <sub>3</sub>	G <sub>s</sub>	Nat w%	LL	PL	PI	Project	
4	53.0-53.5	SAND, silty, mostly fine-grained quartz, some silt, trace carbonate, dark greenish gray (SM)	1						Topsail Beach, Surf City & North Topsail	
									Area	
									Boring No. T1-03-V-185	
									Date 9/24/2003	

**GRADATION CURVES**



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## VISUAL SHELL CONTENT

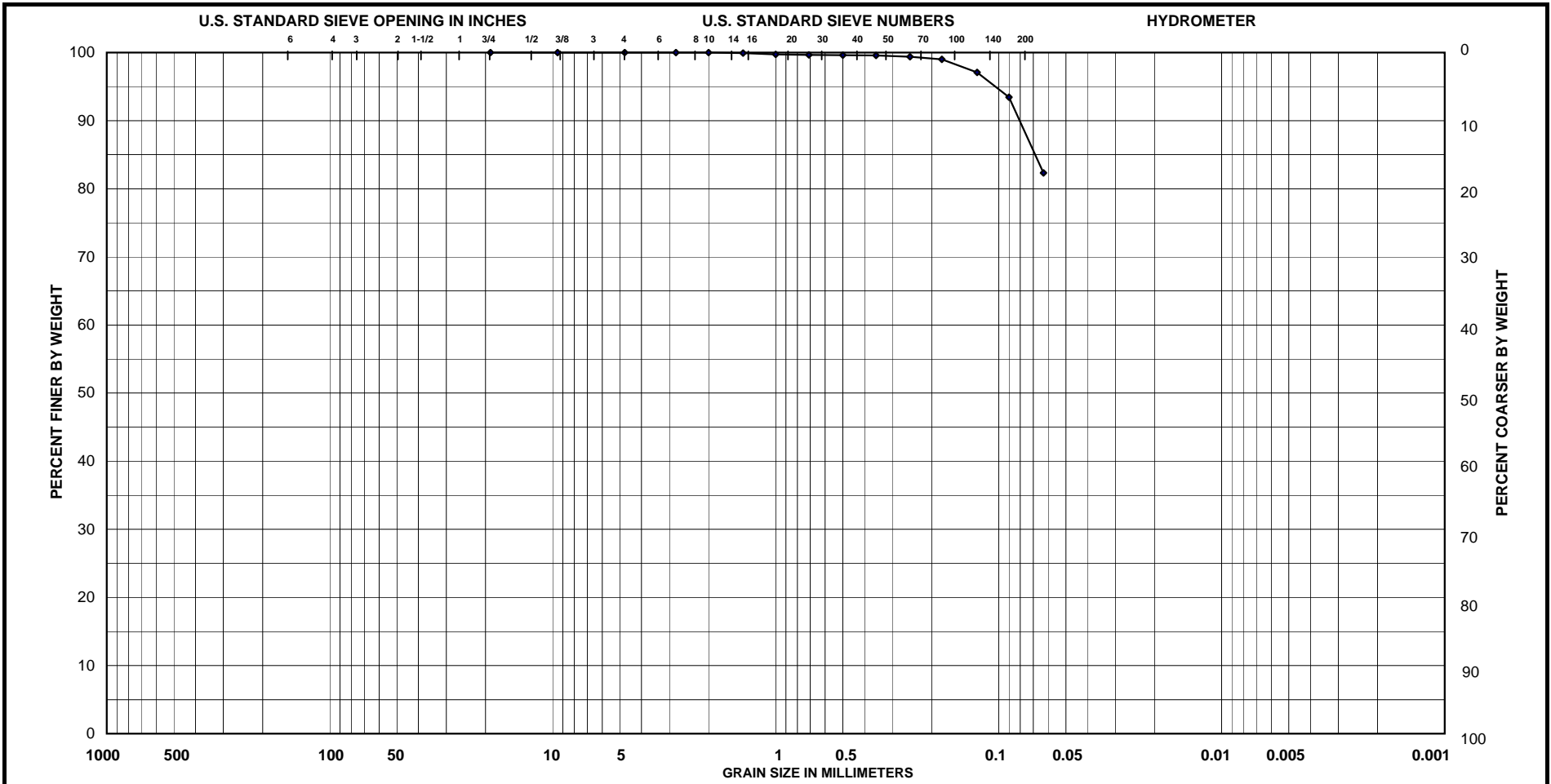
### GRAIN SIZE AND VISUAL SHELL CONTENT

Project:	<b>Topsail Beach, Surf City &amp; North Topsail</b>	Depth:	<b>55.0-55.5</b>
Project No.:	<b>1584-01-40</b>	Date:	<b>9/24/2003</b>
Boring No.:	<b>T1-03-V-185</b>		
Sample No.:	<b>5</b>		
Description:	<b>CLAY, inorganic-H, little fine-grained quartz sand, very dark greenish gray (CH)</b>		

Tare Weight, (g):	<b>50.21</b>	
Dry Wt. Before Washing (g):	<b>126.93</b>	(with tare)
Dry Weight After Washing (g):	<b>64.83</b>	(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	0.01	99.99	0	0.00
#14	1.400	0.05	99.92	0	0.00
#18	1.000	0.16	99.71	0	0.00
#25	0.710	0.04	99.66	0	0.00
#35	0.500	0.04	99.61	3	0.00
#45	0.355	0.02	99.58	3	0.00
#60	0.250	0.14	99.40	1	0.00
#80	0.180	0.29	99.02	1	0.00
#120	0.125	1.48	97.09	1	0.01
#170	0.090	2.80	93.44	1	0.03
#230	0.063	8.52	82.34	1	0.09

**Total Shell Content:** **0** %



COBBLES	GRAVEL		SAND			SILT OR CLAY
	COARSE	FINE	COARSE	MEDIUM	FINE	

Sample No.	Elev. Or Depth	Classification	% CO <sub>3</sub>	G <sub>s</sub>	Nat w%	LL	PL	PI	Project	
5	55.0-55.5	CLAY, inorganic-H, little fine-grained quartz sand, very dark greenish gray (CH)	0						Topsail Beach, Surf City & North Topsail	
									Area	
									Boring No. T1-03-V-185	
									Date 9/24/2003	

**GRADATION CURVES**





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## VISUAL SHELL CONTENT

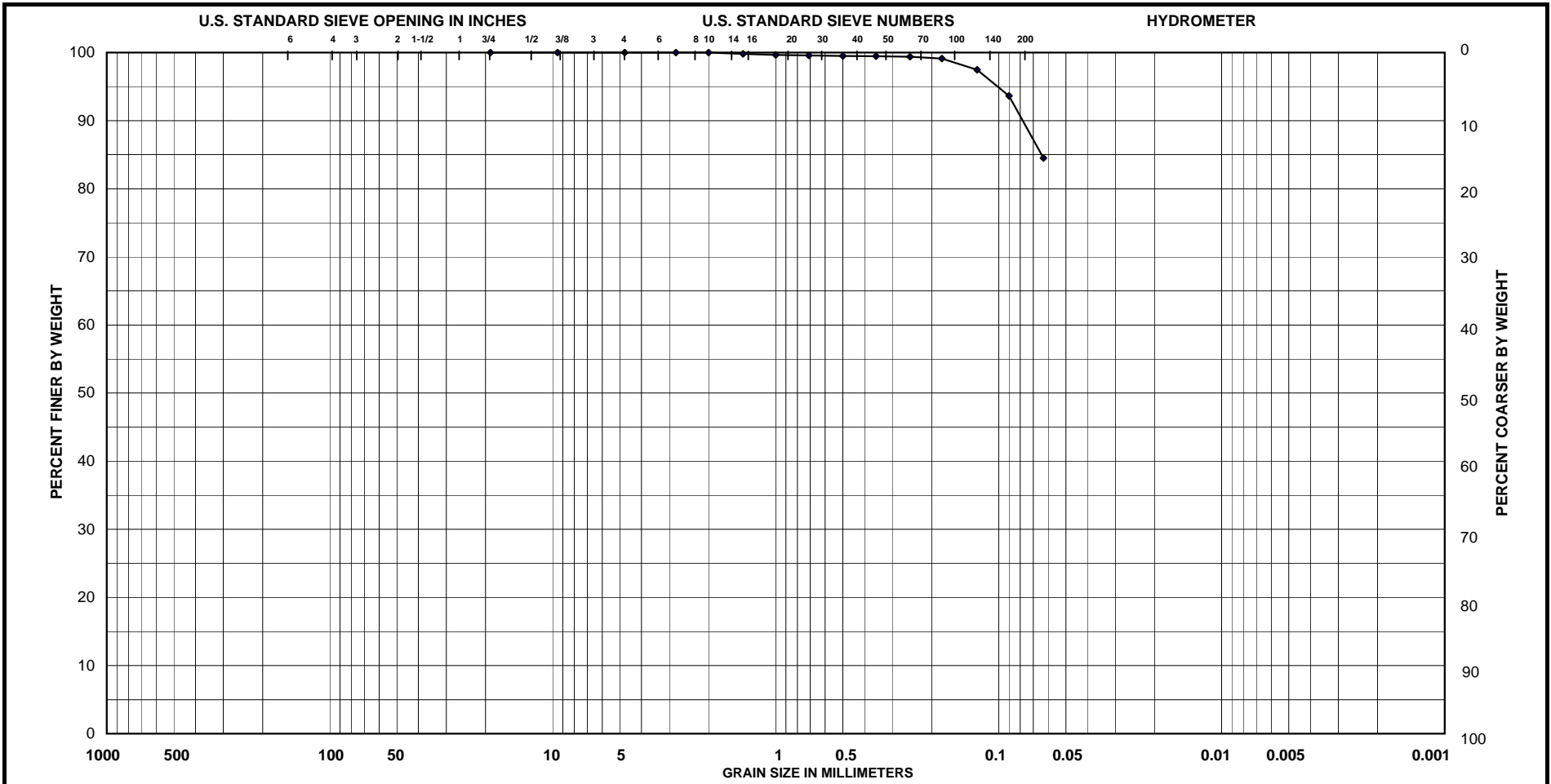
### GRAIN SIZE AND VISUAL SHELL CONTENT

Project:	<b>Topsail Beach, Surf City &amp; North Topsail</b>	Depth:	<b>58.0-58.5</b>
Project No.:	<b>1584-01-40</b>	Date:	<b>9/24/2003</b>
Boring No.:	<b>T1-03-V-185</b>		
Sample No.:	<b>6</b>		
Description:	<b>CLAY, inorganic-H, little fine-grained quartz sand, dark greenish gray (CH)</b>		

Tare Weight, (g):	<b>50.03</b>	
Dry Wt. Before Washing (g):	<b>122.82</b>	(with tare)
Dry Weight After Washing (g):	<b>61.92</b>	(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	0.01	99.99	0	0.00
#14	1.400	0.12	99.82	0	0.00
#18	1.000	0.13	99.64	0	0.00
#25	0.710	0.04	99.59	3	0.00
#35	0.500	0.05	99.52	3	0.00
#45	0.355	0.04	99.46	3	0.00
#60	0.250	0.06	99.38	1	0.00
#80	0.180	0.20	99.11	1	0.00
#120	0.125	1.20	97.46	1	0.01
#170	0.090	2.78	93.64	1	0.03
#230	0.063	6.64	84.52	1	0.07

**Total Shell Content:** **0** %



COBBLES	GRAVEL		SAND			SILT OR CLAY
	COARSE	FINE	COARSE	MEDIUM	FINE	

Sample No.	Elev. Or Depth	Classification	% CO <sub>3</sub>	G <sub>s</sub>	Nat w%	LL	PL	PI	Project
6	58.0-58.5	CLAY, inorganic-H, little fine-grained quartz sand, dark greenish gray (CH)	0						Topsail Beach, Surf City & North Topsail
									Area
									Boring No. T1-03-V-185
									Date 9/24/2003

**GRADATION CURVES**



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## VISUAL SHELL CONTENT

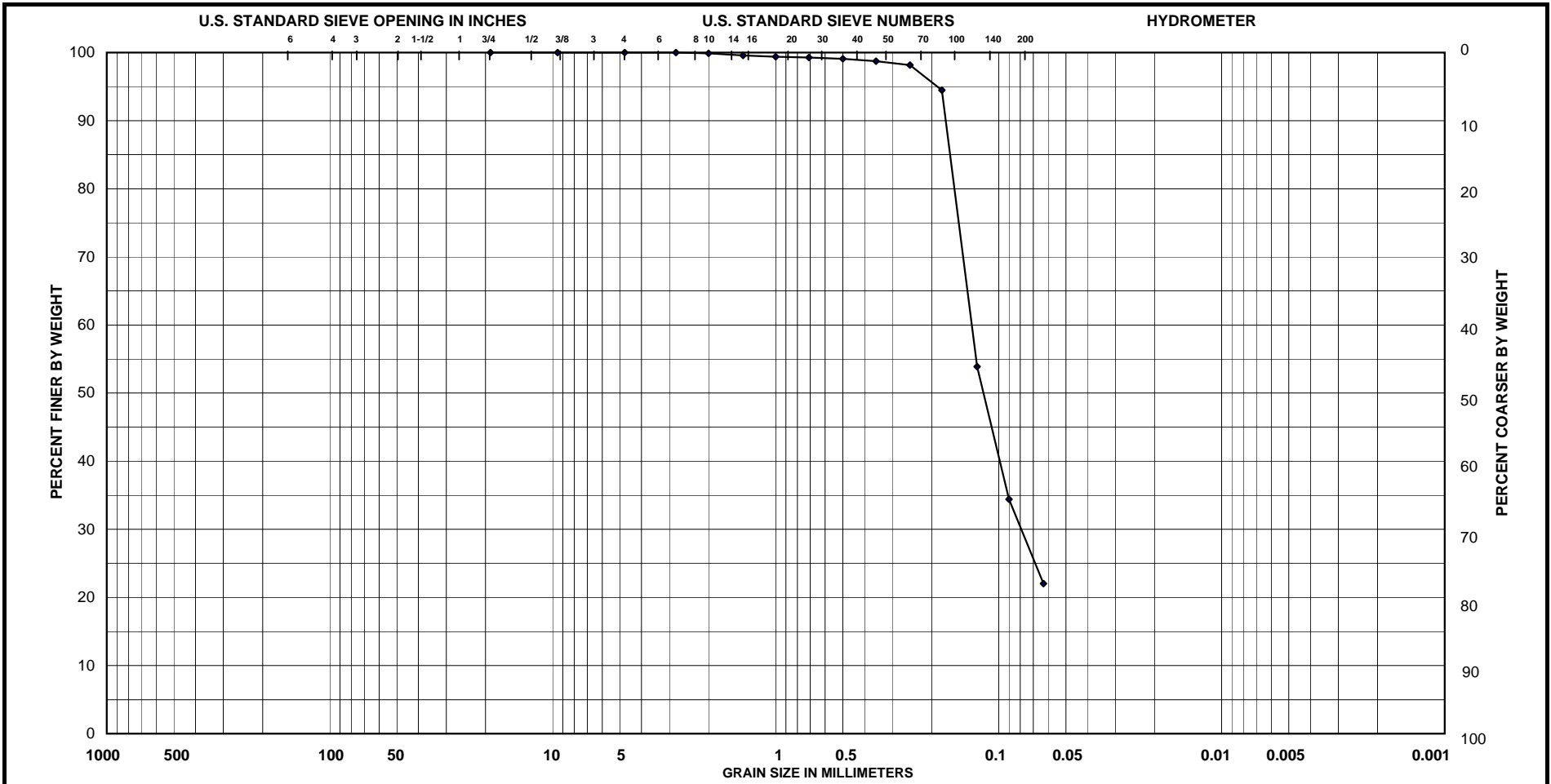
### GRAIN SIZE AND VISUAL SHELL CONTENT

Project:	<b>Topsail Beach, Surf City &amp; North Topsail</b>	Depth:	<b>61.0-61.5</b>
Project No.:	<b>1584-01-40</b>	Date:	<b>9/24/2003</b>
Boring No.:	<b>T1-03-V-185</b>		
Sample No.:	<b>7</b>		
Description:	<b>SAND, silty, mostly fine-grained quartz, little silt, trace carbonate, dark greenish gray (SM)</b>		

Tare Weight, (g):	<b>50.06</b>	
Dry Wt. Before Washing (g):	<b>164.78</b>	(with tare)
Dry Weight After Washing (g):	<b>140.97</b>	(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	0.14	99.88	80	0.11
#14	1.400	0.34	99.58	40	0.14
#18	1.000	0.22	99.39	30	0.07
#25	0.710	0.14	99.27	30	0.04
#35	0.500	0.21	99.08	25	0.05
#45	0.355	0.39	98.74	20	0.08
#60	0.250	0.67	98.16	3	0.02
#80	0.180	4.20	94.50	3	0.13
#120	0.125	46.60	53.88	1	0.47
#170	0.090	22.33	34.41	1	0.22
#230	0.063	14.19	22.04	1	0.14

**Total Shell Content:** **1** %



COBBLES	GRAVEL		SAND			SILT OR CLAY
	COARSE	FINE	COARSE	MEDIUM	FINE	

Sample No.	Elev. Or Depth	Classification	% CO <sub>3</sub>	G <sub>s</sub>	Nat w%	LL	PL	PI	Project
7	61.0-61.5	SAND, silty, mostly fine-grained quartz, little silt, trace carbonate, dark greenish gray (SM)	1						Topsail Beach, Surf City & North Topsail
									Area
									Boring No. T1-03-V-185
									Date 9/24/2003

**GRADATION CURVES**



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## VISUAL SHELL CONTENT

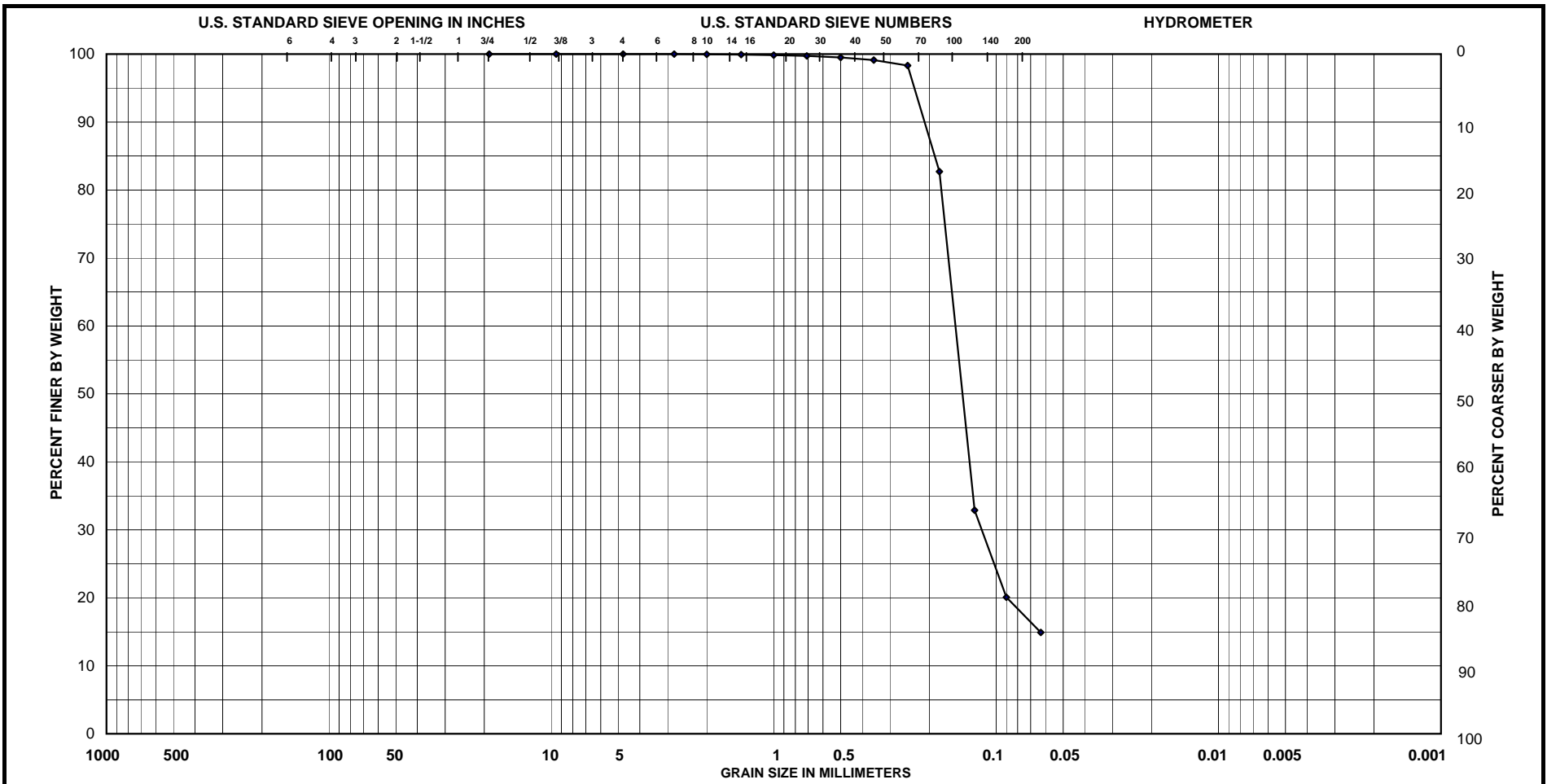
### GRAIN SIZE AND VISUAL SHELL CONTENT

Project:	<b>Topsail Beach, Surf City &amp; North Topsail</b>	Depth:	<b>64.3-64.8</b>
Project No.:	<b>1584-01-40</b>	Date:	<b>9/24/2003</b>
Boring No.:	<b>T1-03-V-185</b>		
Sample No.:	<b>8</b>		
Description:	<b>SAND, silty, mostly fine-grained quartz, little silt, trace carbonate, dark greenish gray (SM)</b>		

Tare Weight, (g):	<b>49.51</b>	
Dry Wt. Before Washing (g):	<b>164.63</b>	(with tare)
Dry Weight After Washing (g):	<b>149.07</b>	(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	0.02	99.97	25	0.01
#14	1.400	0.03	99.94	35	0.01
#18	1.000	0.11	99.84	40	0.04
#25	0.710	0.12	99.74	30	0.04
#35	0.500	0.28	99.50	25	0.07
#45	0.355	0.44	99.11	5	0.02
#60	0.250	0.91	98.32	5	0.05
#80	0.180	17.97	82.71	1	0.18
#120	0.125	57.38	32.87	1	0.57
#170	0.090	14.70	20.10	1	0.15
#230	0.063	5.97	14.91	1	0.06

**Total Shell Content:** **1** %



COBBLES	GRAVEL		SAND			SILT OR CLAY
	COARSE	FINE	COARSE	MEDIUM	FINE	

Sample No.	Elev. Or Depth	Classification	% CO <sub>3</sub>	G <sub>s</sub>	Nat w%	LL	PL	PI	Project
8	64.3-64.8	SAND, silty, mostly fine-grained quartz, little silt, trace carbonate, dark greenish gray (SM)	1						Topsail Beach, Surf City & North Topsail
									Area
									Boring No. T1-03-V-185
									Date 9/24/2003

**GRADATION CURVES**



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## VISUAL SHELL CONTENT

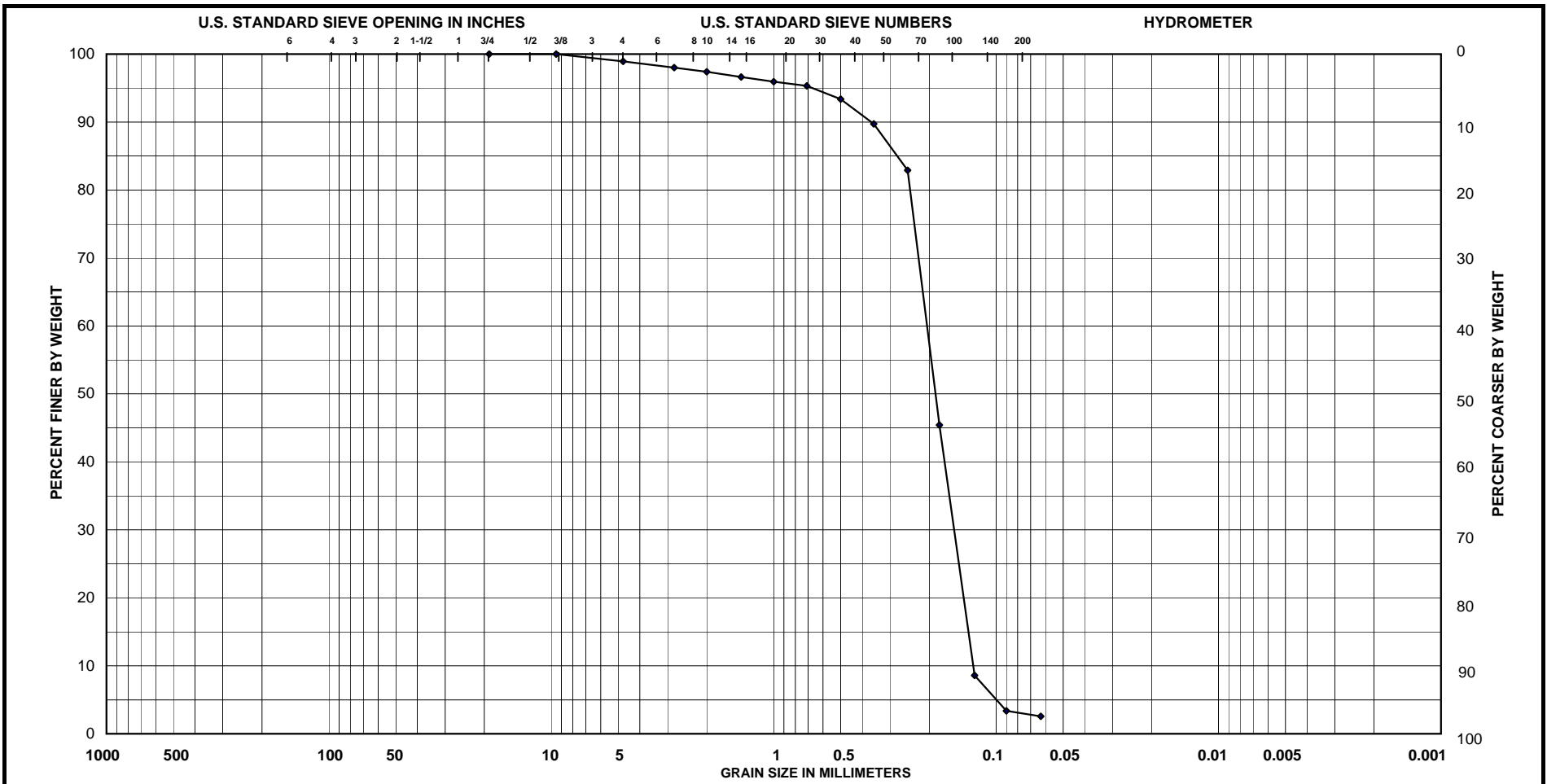
### GRAIN SIZE AND VISUAL SHELL CONTENT

Project:	<b>Topsail Beach, Surf City &amp; North Topsail</b>	Depth:	<b>47.7-48.2</b>
Project No.:	<b>1584-01-40</b>	Date:	<b>9/24/2003</b>
Boring No.:	<b>T1-03-V-186</b>		
Sample No.:	<b>1</b>		
Description:	<b>SAND, poorly-graded, mostly fine-grained quartz, few carbonate, trace fragmented limestone, greenish gray (SP)</b>		

Tare Weight, (g):	<b>50.00</b>	
Dry Wt. Before Washing (g):	<b>168.96</b>	(with tare)
Dry Weight After Washing (g):	<b>166.17</b>	(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	1.29	98.92	100	1.29
#7	2.800	1.08	98.01	100	1.08
#10	2.000	0.73	97.39	100	0.73
#14	1.400	0.89	96.65	70	0.62
#18	1.000	0.86	95.92	65	0.56
#25	0.710	0.73	95.31	70	0.51
#35	0.500	2.32	93.36	40	0.93
#45	0.355	4.31	89.74	30	1.29
#60	0.250	8.11	82.92	3	0.24
#80	0.180	44.63	45.40	1	0.45
#120	0.125	43.81	8.57	1	0.44
#170	0.090	6.20	3.36	1	0.06
#230	0.063	0.94	2.57	1	0.01

**Total Shell Content:** **7** %







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## VISUAL SHELL CONTENT

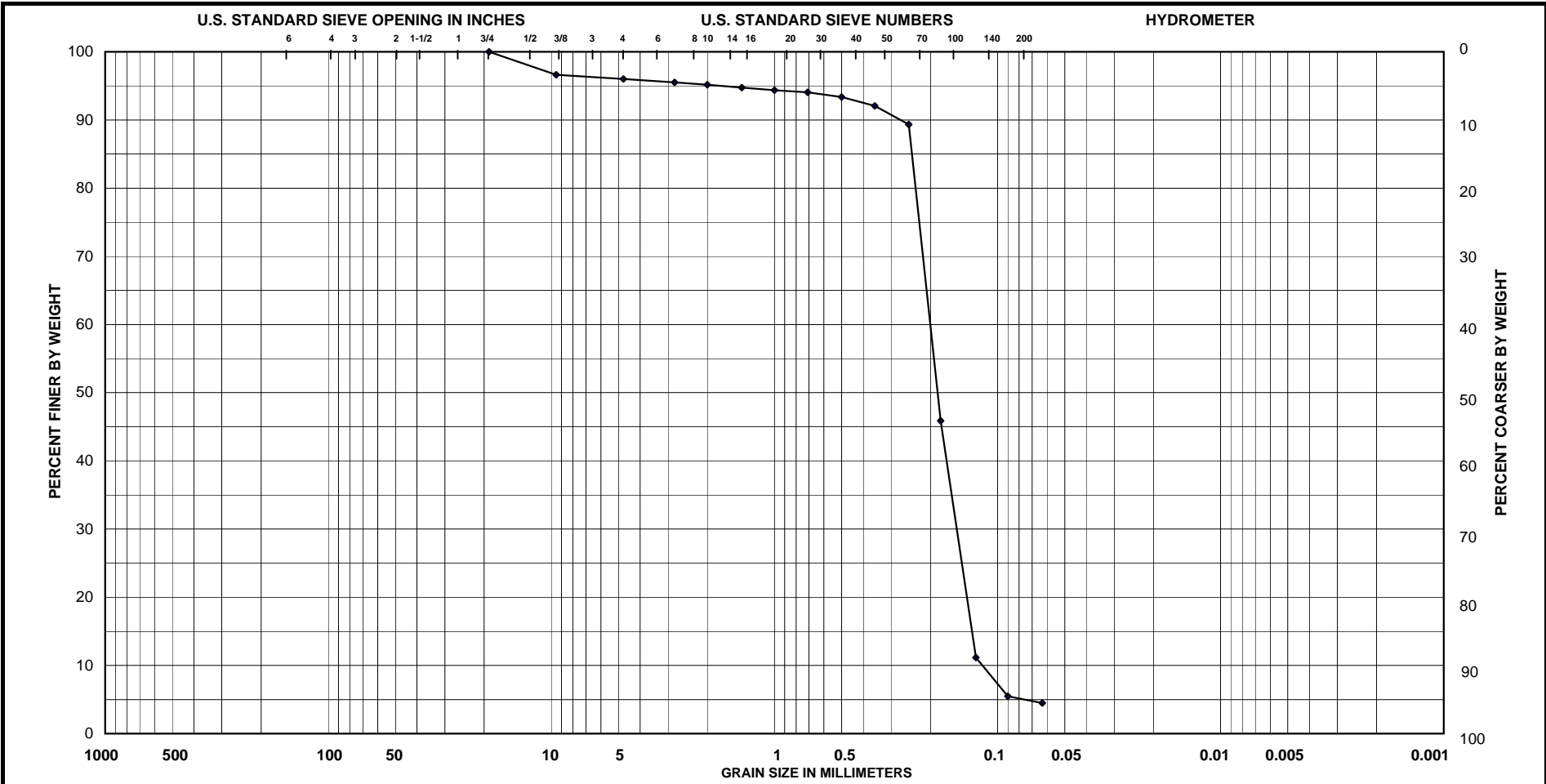
### GRAIN SIZE AND VISUAL SHELL CONTENT

Project:	<b>Topsail Beach, Surf City &amp; North Topsail</b>	Depth:	<b>49.5-50.0</b>
Project No.:	<b>1584-01-40</b>	Date:	<b>9/24/2003</b>
Boring No.:	<b>T1-03-V-186</b>		
Sample No.:	<b>2</b>		
Description:	<b>SAND, poorly-graded, mostly fine-grained quartz, few carbonate, trace fragmented limestone, greenish gray (SP)</b>		

Tare Weight, (g):	<b>48.51</b>	
Dry Wt. Before Washing (g):	<b>175.65</b>	(with tare)
Dry Weight After Washing (g):	<b>170.33</b>	(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	4.29	96.63	100	4.29
#4	4.750	0.76	96.03	100	0.76
#7	2.800	0.66	95.51	100	0.66
#10	2.000	0.45	95.15	98	0.44
#14	1.400	0.50	94.76	95	0.48
#18	1.000	0.51	94.36	80	0.41
#25	0.710	0.39	94.05	70	0.27
#35	0.500	0.88	93.36	40	0.35
#45	0.355	1.65	92.06	5	0.08
#60	0.250	3.48	89.33	3	0.10
#80	0.180	55.25	45.87	1	0.55
#120	0.125	44.16	11.14	1	0.44
#170	0.090	7.18	5.49	1	0.07
#230	0.063	1.29	4.48	1	0.01

**Total Shell Content:** **7** %



COBBLES	GRAVEL		SAND			SILT OR CLAY
	COARSE	FINE	COARSE	MEDIUM	FINE	

Sample No.	Elev. Or Depth	Classification	% CO <sub>3</sub>	G <sub>s</sub>	Nat w%	LL	PL	PI	Project	
♦ 2	49.5-50.0	SAND, poorly-graded, mostly fine-grained quartz, few carbonate, trace fragmented limestone, greenish gray (SP)	7						Topsail Beach, Surf City & North Topsail	
			Area							
			Boring No. T1-03-V-186							
			Date 9/24/2003							

**GRADATION CURVES**



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## VISUAL SHELL CONTENT

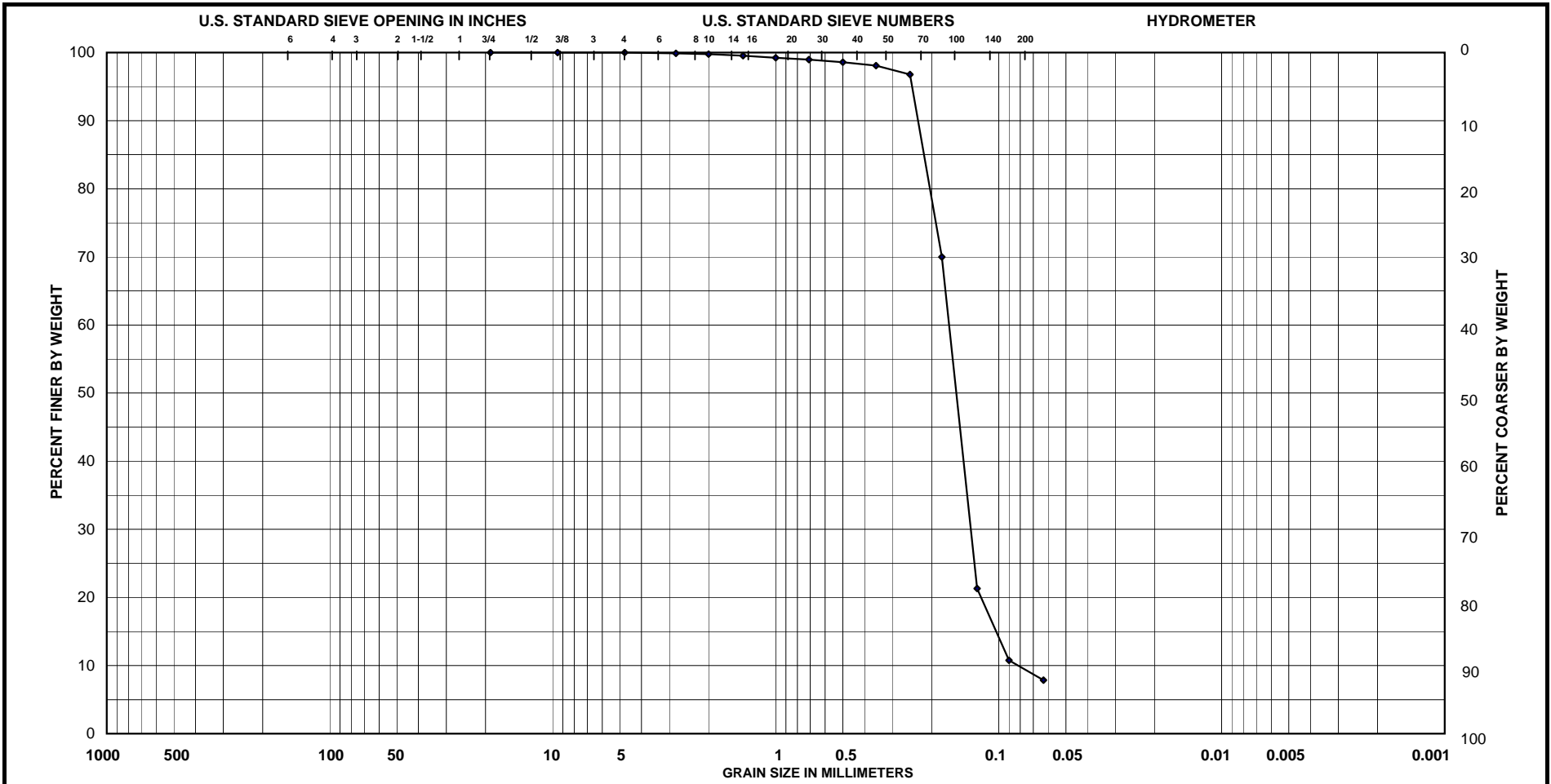
### GRAIN SIZE AND VISUAL SHELL CONTENT

Project:	<b>Topsail Beach, Surf City &amp; North Topsail</b>	Depth:	<b>51.0-51.5</b>
Project No.:	<b>1584-01-40</b>	Date:	<b>9/24/2003</b>
Boring No.:	<b>T1-03-V-186</b>		
Sample No.:	<b>3</b>		
Description:	<b>SAND, poorly-graded with silt, mostly fine-grained quartz, few silt, trace carbonate, greenish gray (SP-SM)</b>		

Tare Weight, (g):	<b>50.00</b>	
Dry Wt. Before Washing (g):	<b>168.06</b>	(with tare)
Dry Weight After Washing (g):	<b>159.4</b>	(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	0.15	99.87	100	0.15
#10	2.000	0.14	99.75	80	0.11
#14	1.400	0.27	99.53	80	0.22
#18	1.000	0.34	99.24	70	0.24
#25	0.710	0.33	98.96	45	0.15
#35	0.500	0.44	98.59	35	0.15
#45	0.355	0.59	98.09	15	0.09
#60	0.250	1.54	96.78	10	0.15
#80	0.180	31.62	70.00	1	0.32
#120	0.125	57.50	21.29	1	0.58
#170	0.090	12.44	10.76	1	0.12
#230	0.063	3.42	7.86	1	0.03

**Total Shell Content:** **2** %



COBBLES	GRAVEL		SAND			SILT OR CLAY
	COARSE	FINE	COARSE	MEDIUM	FINE	

Sample No.	Elev. Or Depth	Classification	% CO <sub>3</sub>	G <sub>s</sub>	Nat w%	LL	PL	PI	Project	
3	51.0-51.5	SAND, poorly-graded with silt, mostly fine-grained quartz, few silt, trace carbonate, greenish gray (SP-SM)	2						Topsail Beach, Surf City & North Topsail	
									Area	
									Boring No. T1-03-V-186	
									Date 9/24/2003	

**GRADATION CURVES**



# WOLF TECHNOLOGIES, INC.

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## VISUAL SHELL CONTENT

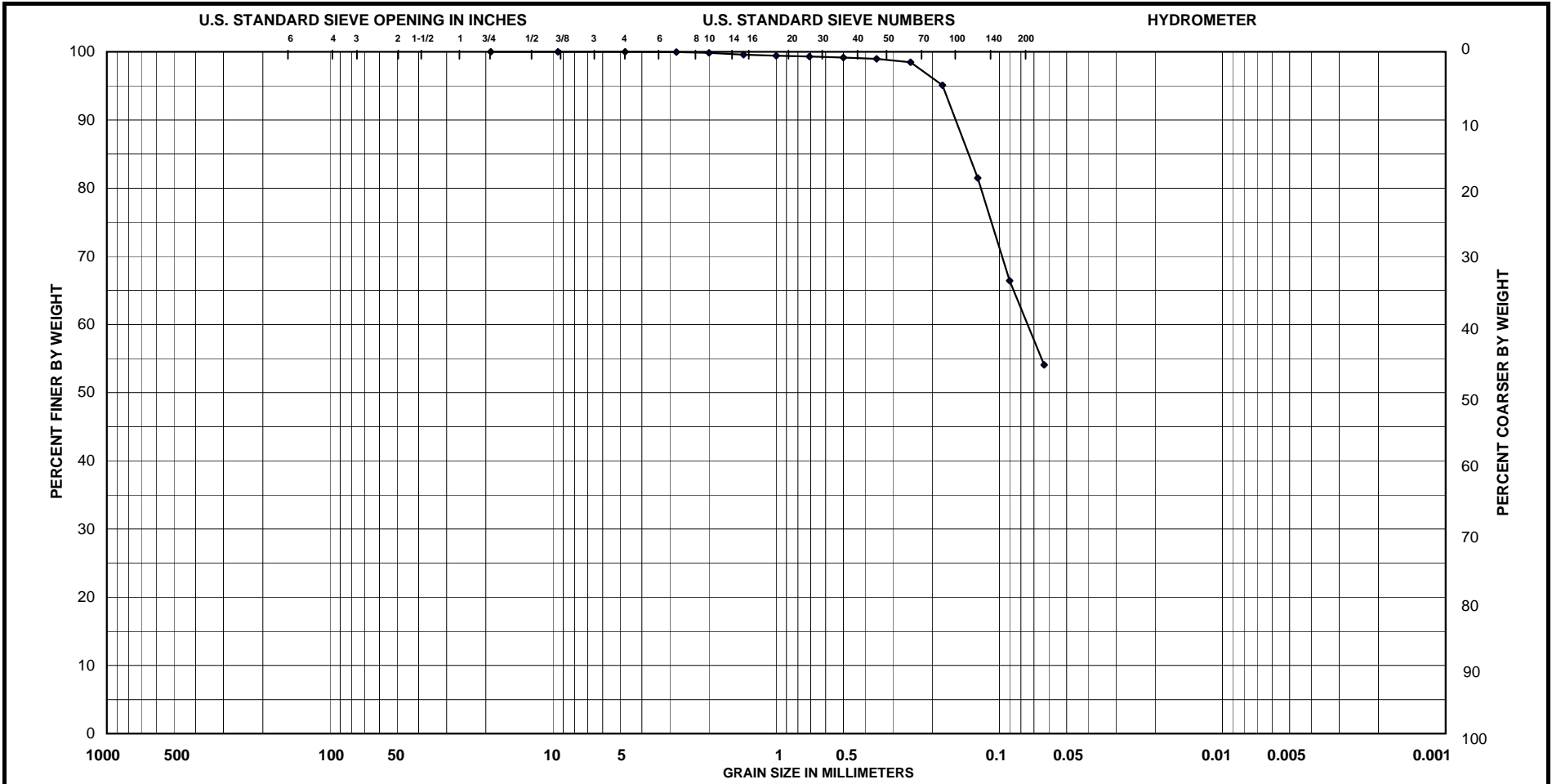
### GRAIN SIZE AND VISUAL SHELL CONTENT

Project:	<b>Topsail Beach, Surf City &amp; North Topsail</b>	Depth:	<b>53.9-54.4</b>
Project No.:	<b>1584-01-40</b>	Date:	<b>9/24/2003</b>
Boring No.:	<b>T1-03-V-186</b>		
Sample No.:	<b>4</b>		
Description:	<b>CLAY, inorganic-H, some fine-grained quartz sand, trace carbonate, dark greenish gray (CH)</b>		

Tare Weight, (g):	<b>49.85</b>	
Dry Wt. Before Washing (g):	<b>137.71</b>	(with tare)
Dry Weight After Washing (g):	<b>91.2</b>	(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	0.04	99.95	100	0.04
#10	2.000	0.10	99.84	90	0.09
#14	1.400	0.23	99.58	40	0.09
#18	1.000	0.14	99.42	65	0.09
#25	0.710	0.11	99.29	70	0.08
#35	0.500	0.12	99.16	60	0.07
#45	0.355	0.18	98.95	60	0.11
#60	0.250	0.43	98.46	20	0.09
#80	0.180	2.96	95.09	10	0.30
#120	0.125	11.96	81.48	3	0.36
#170	0.090	13.23	66.42	1	0.13
#230	0.063	10.86	54.06	1	0.11

**Total Shell Content:** **2** %



COBBLES	GRAVEL		SAND			SILT OR CLAY
	COARSE	FINE	COARSE	MEDIUM	FINE	

Sample No.	Elev. Or Depth	Classification	% CO <sub>3</sub>	G <sub>s</sub>	Nat w%	LL	PL	PI	Project	
4	53.9-54.4	CLAY, inorganic-H, some fine-grained quartz sand, trace carbonate, dark greenish gray (CH)	2						Topsail Beach, Surf City & North Topsail	
									Area	
									Boring No. T1-03-V-186	
									Date 9/24/2003	

**GRADATION CURVES**



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## VISUAL SHELL CONTENT

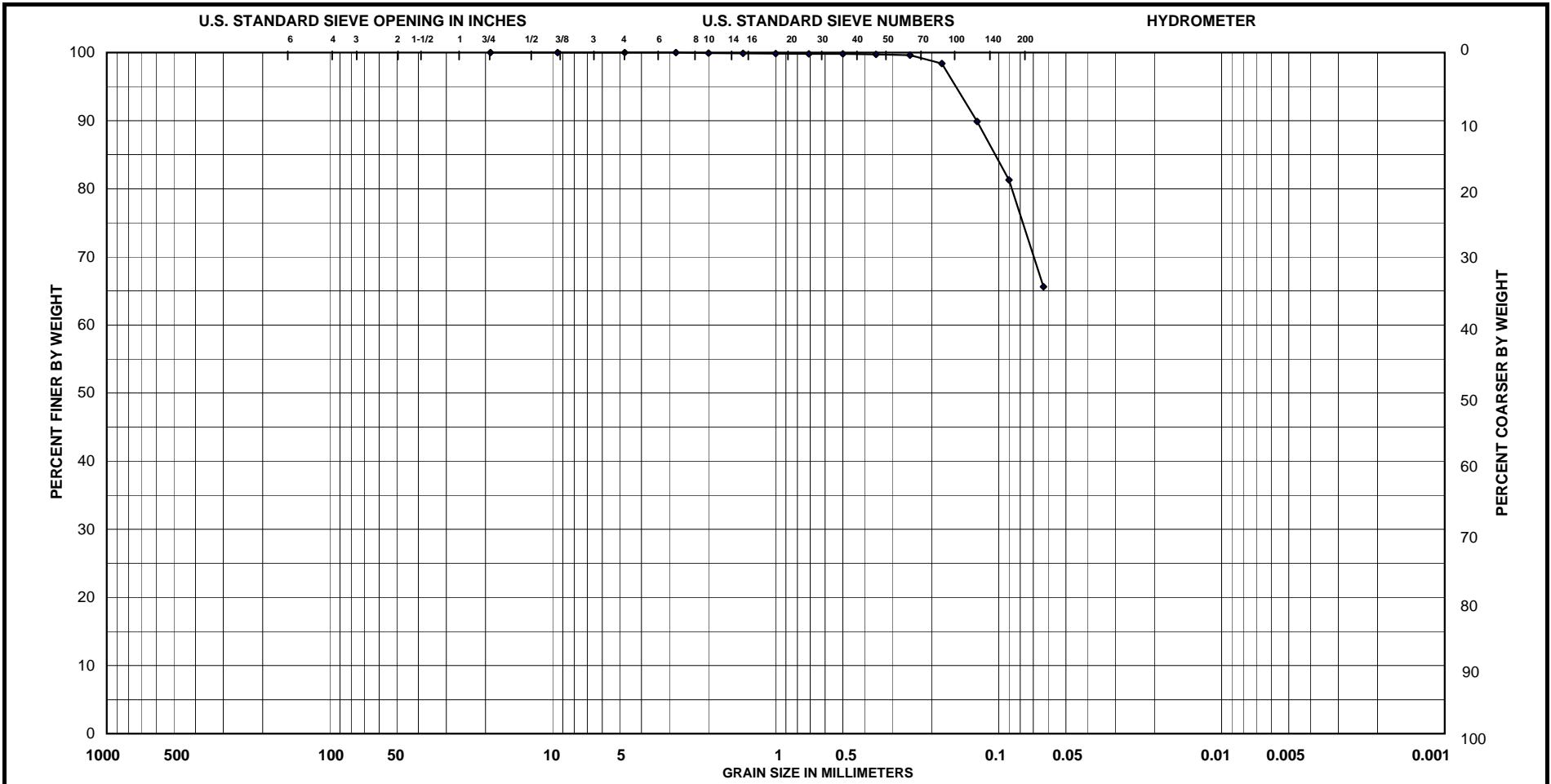
### GRAIN SIZE AND VISUAL SHELL CONTENT

Project:	<b>Topsail Beach, Surf City &amp; North Topsail</b>	Depth:	<b>56.0-56.5</b>
Project No.:	<b>1584-01-40</b>	Date:	<b>9/24/2003</b>
Boring No.:	<b>T1-03-V-186</b>		
Sample No.:	<b>5</b>		
Description:	<b>CLAY, inorganic-H, some fine-grained quartz sand, dark greenish gray (CH)</b>		

Tare Weight, (g):	<b>49.69</b>	
Dry Wt. Before Washing (g):	<b>130.37</b>	(with tare)
Dry Weight After Washing (g):	<b>79.38</b>	(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	0.05	99.94	0	0.00
#14	1.400	0.03	99.90	10	0.00
#18	1.000	0.05	99.84	5	0.00
#25	0.710	0.02	99.81	3	0.00
#35	0.500	0.02	99.79	3	0.00
#45	0.355	0.04	99.74	3	0.00
#60	0.250	0.09	99.63	1	0.00
#80	0.180	1.00	98.39	1	0.01
#120	0.125	6.87	89.87	1	0.07
#170	0.090	6.93	81.28	1	0.07
#230	0.063	12.63	65.63	1	0.13

**Total Shell Content:** **0** %



COBBLES	GRAVEL		SAND			SILT OR CLAY
	COARSE	FINE	COARSE	MEDIUM	FINE	

Sample No.	Elev. Or Depth	Classification	% CO <sub>3</sub>	G <sub>s</sub>	Nat w%	LL	PL	PI	Project	
5	56.0-56.5	CLAY, inorganic-H, some fine-grained quartz sand, dark greenish gray (CH)	0						Topsail Beach, Surf City & North Topsail	
									Area	
									Boring No. T1-03-V-186	
									Date 9/24/2003	

**GRADATION CURVES**





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## VISUAL SHELL CONTENT

### GRAIN SIZE AND VISUAL SHELL CONTENT

Project:	<b>Topsail Beach, Surf City &amp; North Topsail</b>	Depth:	<b>57.0-57.5</b>
Project No.:	<b>1584-01-40</b>	Date:	<b>9/24/2003</b>
Boring No.:	<b>T1-03-V-186</b>		
Sample No.:	<b>6</b>		
Description:	<b>SAND, silty, mostly fine-grained quartz, little silt, trace carbonate, dark greenish gray (SM)</b>		

Tare Weight, (g):	<b>50.25</b>	
Dry Wt. Before Washing (g):	<b>162.58</b>	(with tare)
Dry Weight After Washing (g):	<b>140.45</b>	(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	99.88	100	0.14
#7	2.800	0.05	99.83	100	0.05
#10	2.000	0.16	99.69	100	0.16
#14	1.400	0.21	99.50	40	0.08
#18	1.000	0.15	99.37	30	0.05
#25	0.710	0.10	99.28	45	0.05
#35	0.500	0.16	99.14	30	0.05
#45	0.355	0.22	98.94	30	0.07
#60	0.250	0.57	98.43	10	0.06
#80	0.180	7.83	91.46	3	0.23
#120	0.125	47.34	49.32	1	0.47
#170	0.090	18.83	32.56	1	0.19
#230	0.063	12.06	21.82	1	0.12

**Total Shell Content:** **2** %





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## VISUAL SHELL CONTENT

### GRAIN SIZE AND VISUAL SHELL CONTENT

Project:	<b>Topsail Beach, Surf City &amp; North Topsail</b>	Depth:	<b>60.0-60.5</b>
Project No.:	<b>1584-01-40</b>	Date:	<b>9/24/2003</b>
Boring No.:	<b>T1-03-V-186</b>		
Sample No.:	<b>7</b>		
Description:	<b>SAND, poorly-graded with silt, mostly fine-grained quartz, few silt, trace carbonate, greenish gray (SP-SM)</b>		

Tare Weight, (g):	<b>50.41</b>	
Dry Wt. Before Washing (g):	<b>167.18</b>	(with tare)
Dry Weight After Washing (g):	<b>155.3</b>	(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	0.07	99.93	90	0.06
#14	1.400	0.13	99.82	40	0.05
#18	1.000	0.11	99.73	70	0.08
#25	0.710	0.08	99.66	60	0.05
#35	0.500	0.17	99.51	60	0.10
#45	0.355	0.27	99.28	40	0.11
#60	0.250	0.78	98.61	40	0.31
#80	0.180	11.96	88.37	5	0.60
#120	0.125	72.11	26.62	1	0.72
#170	0.090	14.07	14.57	1	0.14
#230	0.063	4.40	10.80	1	0.04

**Total Shell Content:** **2** %





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## VISUAL SHELL CONTENT

### GRAIN SIZE AND VISUAL SHELL CONTENT

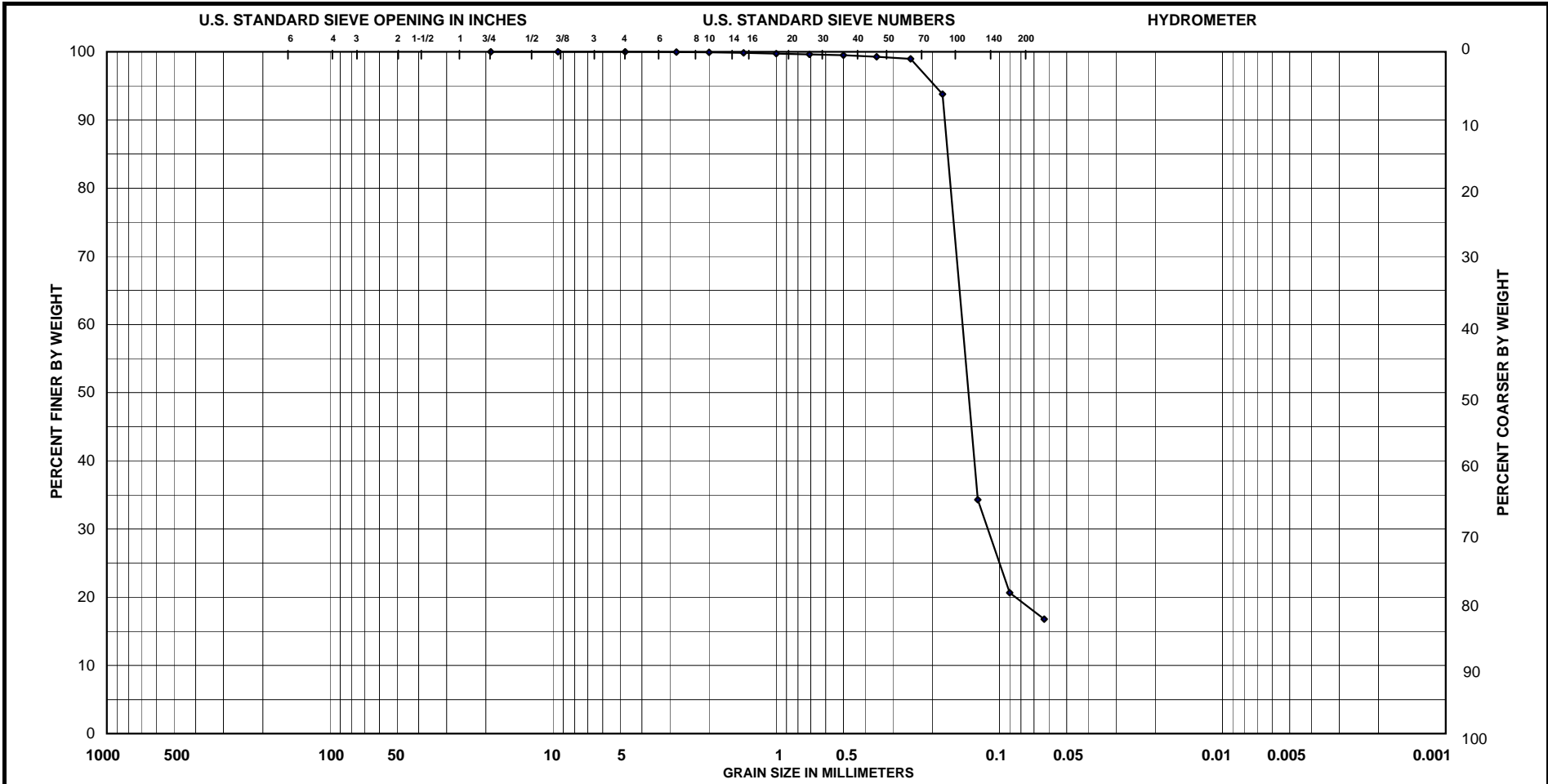
Project:	<b>Topsail Beach, Surf City &amp; North Topsail</b>	Depth:	<b>63.0-63.5</b>
Project No.:	<b>1584-01-40</b>	Date:	<b>9/24/2003</b>
Boring No.:	<b>T1-03-V-186</b>		
Sample No.:	<b>8</b>		
Description:	<b>SAND, clayey, mostly fine-grained quartz, little silt, trace carbonate, light olive gray (SC)</b>		

Tare Weight, (g):	<b>49.31</b>	
Dry Wt. Before Washing (g):	<b>189.41</b>	(with tare)
Dry Weight After Washing (g):	<b>169.06</b>	(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	0.06	99.96	0	0.00
#10	2.000	0.06	99.91	25	0.02
#14	1.400	0.09	99.85	70	0.06
#18	1.000	0.18	99.72	20	0.04
#25	0.710	0.13	99.63	10	0.01
#35	0.500	0.18	99.50	5	0.01
#45	0.355	0.31	99.28	3	0.01
#60	0.250	0.41	98.98	1	0.00
#80	0.180	7.30	93.77	1	0.07
#120	0.125	83.34	34.29	1	0.83
#170	0.090	19.08	20.67	1	0.19
#230	0.063	5.42	16.80	1	0.05

**Total Shell Content:**

<b>1</b>	<b>%</b>
----------	----------



COBBLES	GRAVEL	SAND			SILT OR CLAY
	COARSE	FINE	COARSE	MEDIUM	FINE

Sample No.	Elev. Or Depth	Classification	% CO <sub>3</sub>	G <sub>s</sub>	Nat w%	LL	PL	PI		
♦ 8	63.0-63.5	SAND, clayey, mostly fine-grained quartz, little silt, trace carbonate, light olive gray (SC)	1						<b>Project</b>	Topsail Beach, Surf City & North Topsail
									<b>Area</b>	
									<b>Boring No.</b>	T1-03-V-186
									<b>Date</b>	9/24/2003

**GRADATION CURVES**



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## VISUAL SHELL CONTENT

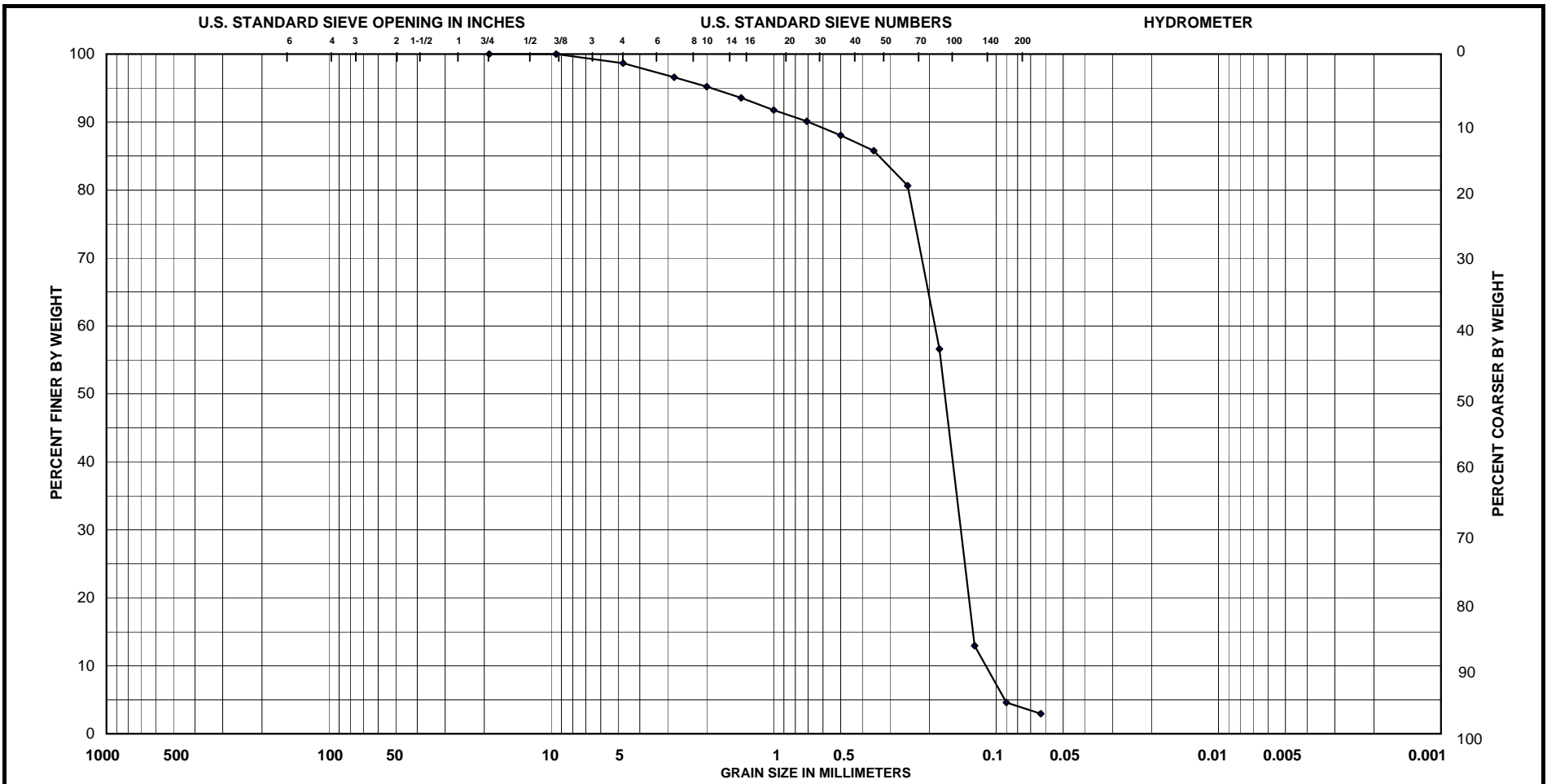
### GRAIN SIZE AND VISUAL SHELL CONTENT

Project:	<b>Topsail Beach, Surf City &amp; North Topsail</b>	Depth:	<b>42.5-43.0</b>
Project No.:	<b>1584-01-40</b>	Date:	<b>9/24/2003</b>
Boring No.:	<b>T1-03-V-187</b>		
Sample No.:	<b>1</b>		
Description:	<b>SAND, poorly-graded, mostly fine-grained quartz, few carbonate, trace fragmented limestone, dark greenish gray (SP)</b>		

Tare Weight, (g):	<b>49.77</b>	
Dry Wt. Before Washing (g):	<b>181.71</b>	(with tare)
Dry Weight After Washing (g):	<b>178.27</b>	(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	1.75	98.67	100	1.75
#7	2.800	2.73	96.60	100	2.73
#10	2.000	1.83	95.22	100	1.83
#14	1.400	2.18	93.57	90	1.96
#18	1.000	2.40	91.75	70	1.68
#25	0.710	2.16	90.11	50	1.08
#35	0.500	2.75	88.02	40	1.10
#45	0.355	2.95	85.79	25	0.74
#60	0.250	6.80	80.64	5	0.34
#80	0.180	31.69	56.62	3	0.95
#120	0.125	57.60	12.96	1	0.58
#170	0.090	11.02	4.61	1	0.11
#230	0.063	2.19	2.95	1	0.02

**Total Shell Content:** **11** %



COBBLES	GRAVEL		SAND			SILT OR CLAY
	COARSE	FINE	COARSE	MEDIUM	FINE	

Sample No.	Elev. Or Depth	Classification	% CO <sub>3</sub>	G <sub>s</sub>	Nat w%	LL	PL	PI	Project
1	42.5-43.0	SAND, poorly-graded, mostly fine-grained quartz, few carbonate, trace fragmented limestone, dark greenish gray (SP)	11						Topsail Beach, Surf City & North Topsail
									Area
									Boring No. T1-03-V-187
									Date 9/24/2003

**GRADATION CURVES**





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## VISUAL SHELL CONTENT

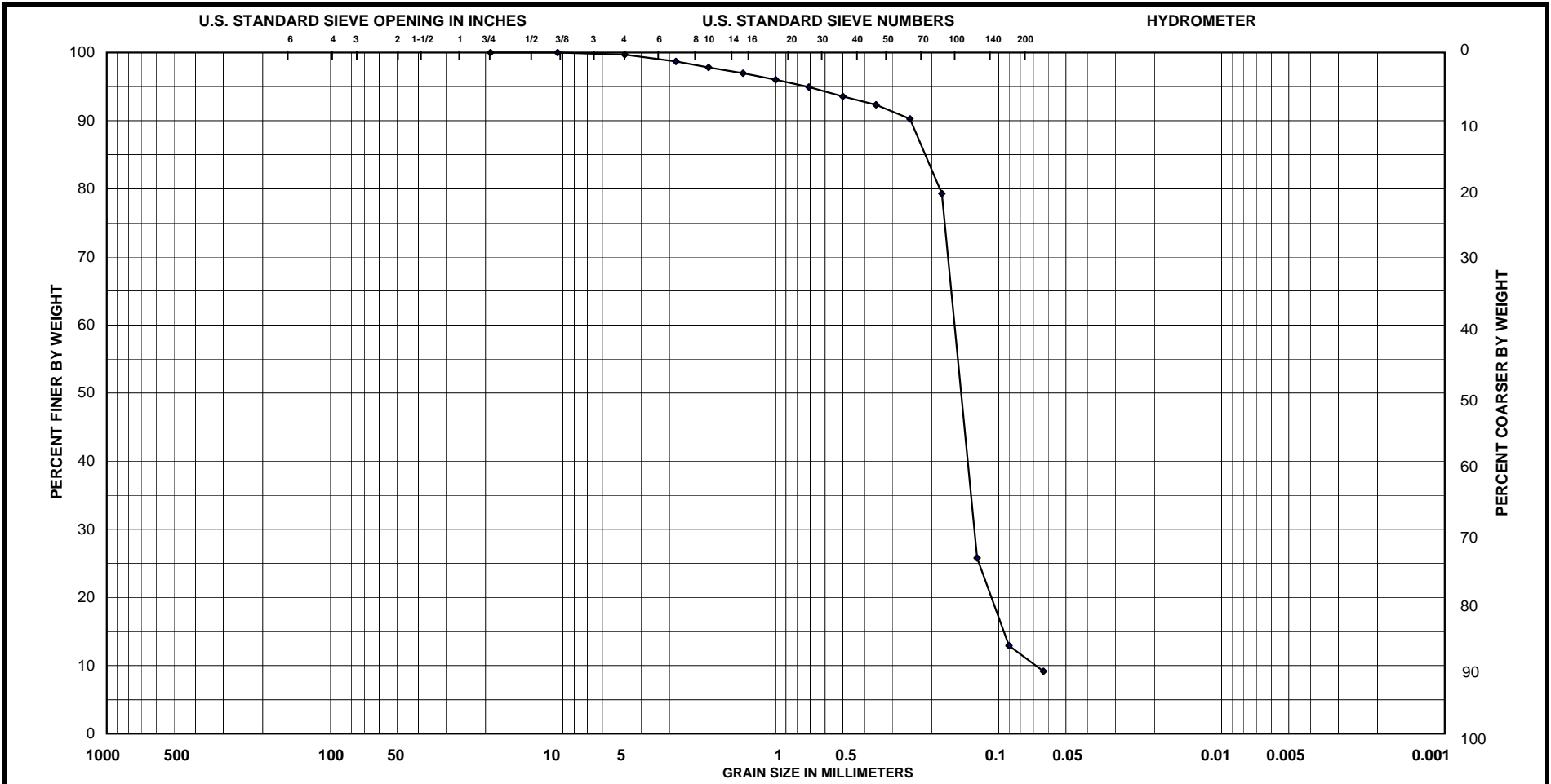
### GRAIN SIZE AND VISUAL SHELL CONTENT

Project:	<b>Topsail Beach, Surf City &amp; North Topsail</b>	Depth:	<b>44.5-45.0</b>
Project No.:	<b>1584-01-40</b>	Date:	<b>9/24/2003</b>
Boring No.:	<b>T1-03-V-187</b>		
Sample No.:	<b>2</b>		
Description:	<b>SAND, poorly-graded with silt, mostly fine-grained quartz, few silt, few carbonate, dark greenish gray (SP-SM)</b>		

Tare Weight, (g):	<b>49.43</b>	
Dry Wt. Before Washing (g):	<b>176.32</b>	(with tare)
Dry Weight After Washing (g):	<b>165.8</b>	(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	99.69	100	0.39
#7	2.800	1.24	98.72	100	1.24
#10	2.000	1.13	97.82	80	0.90
#14	1.400	1.08	96.97	80	0.86
#18	1.000	1.24	96.00	85	1.05
#25	0.710	1.34	94.94	75	1.01
#35	0.500	1.74	93.57	65	1.13
#45	0.355	1.58	92.32	30	0.47
#60	0.250	2.59	90.28	20	0.52
#80	0.180	13.92	79.31	3	0.42
#120	0.125	67.93	25.78	1	0.68
#170	0.090	16.30	12.93	1	0.16
#230	0.063	4.81	9.14	1	0.05

**Total Shell Content:** **7** %



COBBLES	GRAVEL		SAND			SILT OR CLAY
	COARSE	FINE	COARSE	MEDIUM	FINE	

Sample No.	Elev. Or Depth	Classification	% CO <sub>3</sub>	G <sub>s</sub>	Nat w%	LL	PL	PI	Project
2	44.5-45.0	SAND, poorly-graded with silt, mostly fine-grained quartz, few silt, few carbonate, dark greenish gray (SP-SM)	7						Topsail Beach, Surf City & North Topsail
									Area
									Boring No. T1-03-V-187
									Date 9/24/2003

**GRADATION CURVES**



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## VISUAL SHELL CONTENT

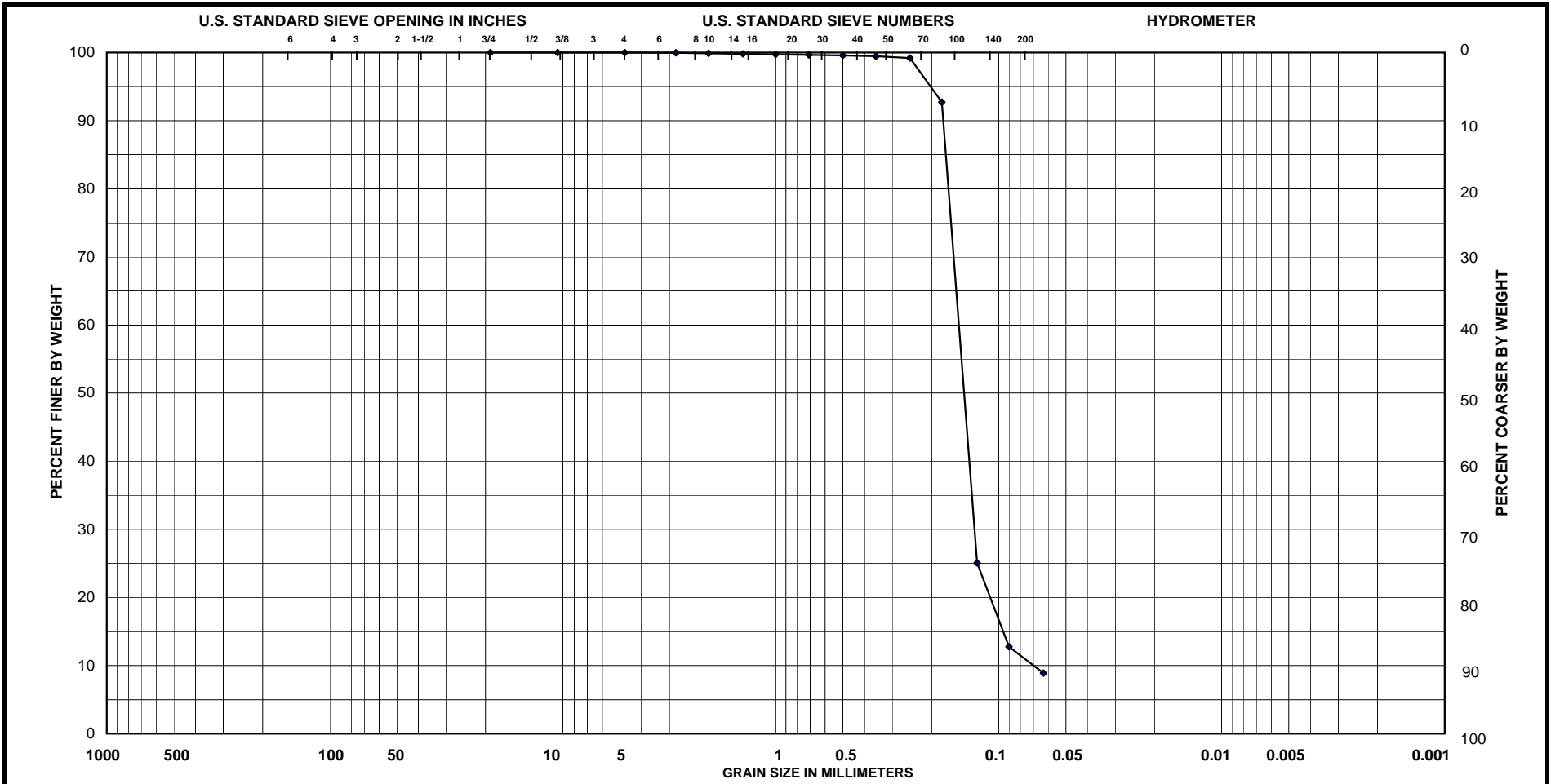
### GRAIN SIZE AND VISUAL SHELL CONTENT

<b>Project:</b>	<b>Topsail Beach, Surf City &amp; North Topsail</b>	<b>Depth:</b>	<b>46.5-47.0</b>
<b>Project No.:</b>	<b>1584-01-40</b>	<b>Date:</b>	<b>9/24/2003</b>
<b>Boring No.:</b>	<b>T1-03-V-187</b>		
<b>Sample No.:</b>	<b>3</b>		
<b>Description:</b>	<b>SAND, poorly-graded with silt, mostly fine-grained quartz, few silt, trace carbonate, olive (SP-SM)</b>		

Tare Weight, (g):	49.88	
Dry Wt. Before Washing (g):	174.7	(with tare)
Dry Weight After Washing (g):	164.87	(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	0.06	99.95	80	0.05
#10	2.000	0.09	99.88	95	0.09
#14	1.400	0.08	99.82	80	0.06
#18	1.000	0.11	99.73	80	0.09
#25	0.710	0.07	99.67	75	0.05
#35	0.500	0.11	99.58	40	0.04
#45	0.355	0.13	99.48	10	0.01
#60	0.250	0.35	99.20	3	0.01
#80	0.180	8.07	92.73	1	0.08
#120	0.125	84.48	25.05	1	0.84
#170	0.090	15.35	12.75	1	0.15
#230	0.063	4.84	8.88	1	0.05

**Total Shell Content:** 1 %



COBBLES	GRAVEL		SAND			SILT OR CLAY
	COARSE	FINE	COARSE	MEDIUM	FINE	

Sample No.	Elev. Or Depth	Classification	% CO <sub>3</sub>	G <sub>s</sub>	Nat w%	LL	PL	PI	Project
♦ 3	46.5-47.0	SAND, poorly-graded with silt, mostly fine-grained quartz, few silt, trace carbonate, olive (SP-SM)	1						Topsail Beach, Surf City & North Topsail
									Area
									Boring No. T1-03-V-187
									Date 9/24/2003

**GRADATION CURVES**



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## VISUAL SHELL CONTENT

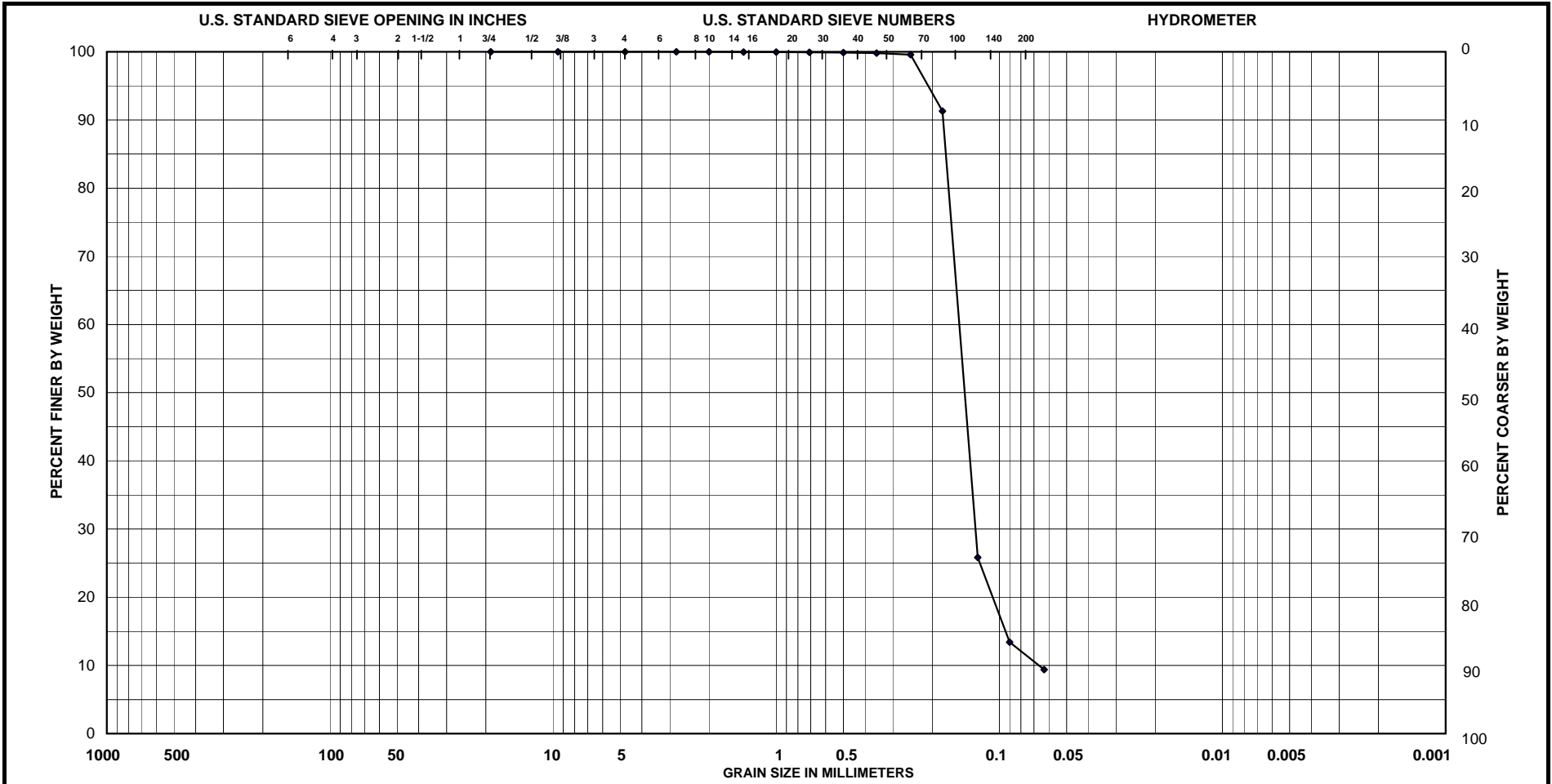
### GRAIN SIZE AND VISUAL SHELL CONTENT

Project:	<b>Topsail Beach, Surf City &amp; North Topsail</b>	Depth:	<b>49.0-49.5</b>
Project No.:	<b>1584-01-40</b>	Date:	<b>9/24/2003</b>
Boring No.:	<b>T1-03-V-187</b>		
Sample No.:	<b>4</b>		
Description:	<b>SAND, poorly-graded with silt, mostly fine-grained quartz, few silt, trace carbonate, olive gray (SP-SM)</b>		

Tare Weight, (g):	<b>49.88</b>	
Dry Wt. Before Washing (g):	<b>171.16</b>	(with tare)
Dry Weight After Washing (g):	<b>160.15</b>	(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	0.01	99.99	0	0.00
#14	1.400	0.02	99.98	25	0.01
#18	1.000	0.02	99.96	10	0.00
#25	0.710	0.05	99.92	20	0.01
#35	0.500	0.05	99.88	15	0.01
#45	0.355	0.07	99.82	3	0.00
#60	0.250	0.30	99.57	1	0.00
#80	0.180	10.01	91.32	1	0.10
#120	0.125	79.42	25.83	1	0.79
#170	0.090	15.06	13.42	1	0.15
#230	0.063	4.88	9.39	1	0.05

**Total Shell Content:** **1** %



COBBLES	GRAVEL		SAND			SILT OR CLAY
	COARSE	FINE	COARSE	MEDIUM	FINE	

Sample No.	Elev. Or Depth	Classification	% CO <sub>3</sub>	G <sub>s</sub>	Nat w%	LL	PL	PI	Project	
4	49.0-49.5	SAND, poorly-graded with silt, mostly fine-grained quartz, few silt, trace carbonate, olive gray (SP-SM)	1						Topsail Beach, Surf City & North Topsail	
									Area	
									Boring No. T1-03-V-187	
									Date 9/24/2003	

**GRADATION CURVES**



# WOLF TECHNOLOGIES, INC.

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## VISUAL SHELL CONTENT

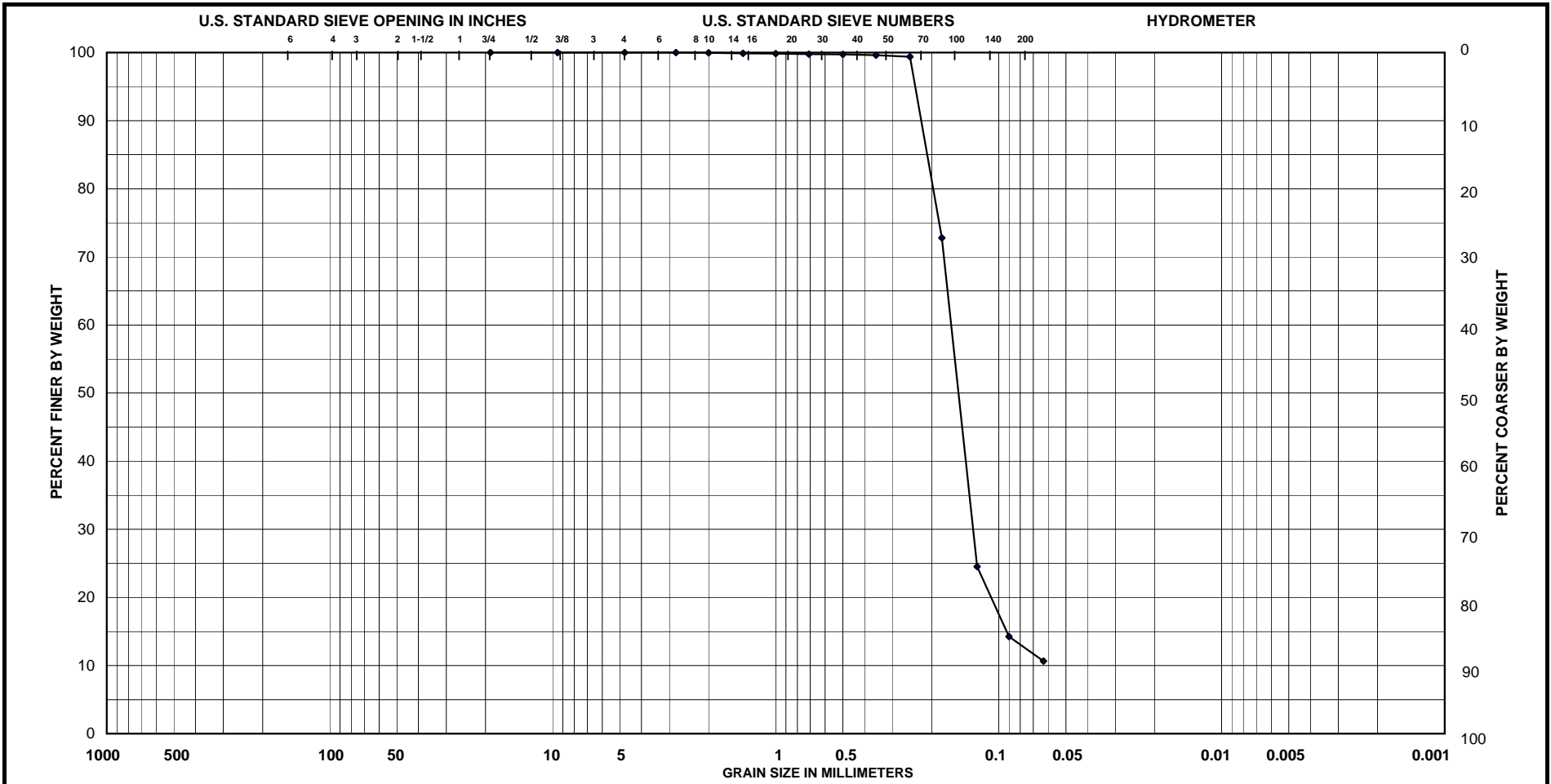
### GRAIN SIZE AND VISUAL SHELL CONTENT

Project:	<b>Topsail Beach, Surf City &amp; North Topsail</b>	Depth:	<b>52.0-52.5</b>
Project No.:	<b>1584-01-40</b>	Date:	<b>9/24/2003</b>
Boring No.:	<b>T1-03-V-187</b>		
Sample No.:	<b>5</b>		
Description:	<b>SAND, poorly-graded with silt, mostly fine-grained quartz, few silt, trace carbonate, olive gray (SP-SM)</b>		

Tare Weight, (g):	<b>50.12</b>	
Dry Wt. Before Washing (g):	<b>177.54</b>	(with tare)
Dry Weight After Washing (g):	<b>164.65</b>	(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	0.04	99.96	30	0.01
#14	1.400	0.08	99.90	30	0.02
#18	1.000	0.08	99.84	70	0.06
#25	0.710	0.07	99.78	65	0.05
#35	0.500	0.07	99.73	20	0.01
#45	0.355	0.12	99.63	3	0.00
#60	0.250	0.29	99.40	1	0.00
#80	0.180	33.91	72.79	1	0.34
#120	0.125	61.47	24.55	1	0.61
#170	0.090	13.12	14.25	1	0.13
#230	0.063	4.59	10.65	1	0.05

**Total Shell Content:** **1** %



COBBLES	GRAVEL		SAND			SILT OR CLAY
	COARSE	FINE	COARSE	MEDIUM	FINE	

Sample No.	Elev. Or Depth	Classification	% CO <sub>3</sub>	G <sub>s</sub>	Nat w%	LL	PL	PI	Project
5	52.0-52.5	SAND, poorly-graded with silt, mostly fine-grained quartz, few silt, trace carbonate, olive gray (SP-SM)	1						Topsail Beach, Surf City & North Topsail
									Area
									Boring No. T1-03-V-187
									Date 9/24/2003

**GRADATION CURVES**





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## VISUAL SHELL CONTENT

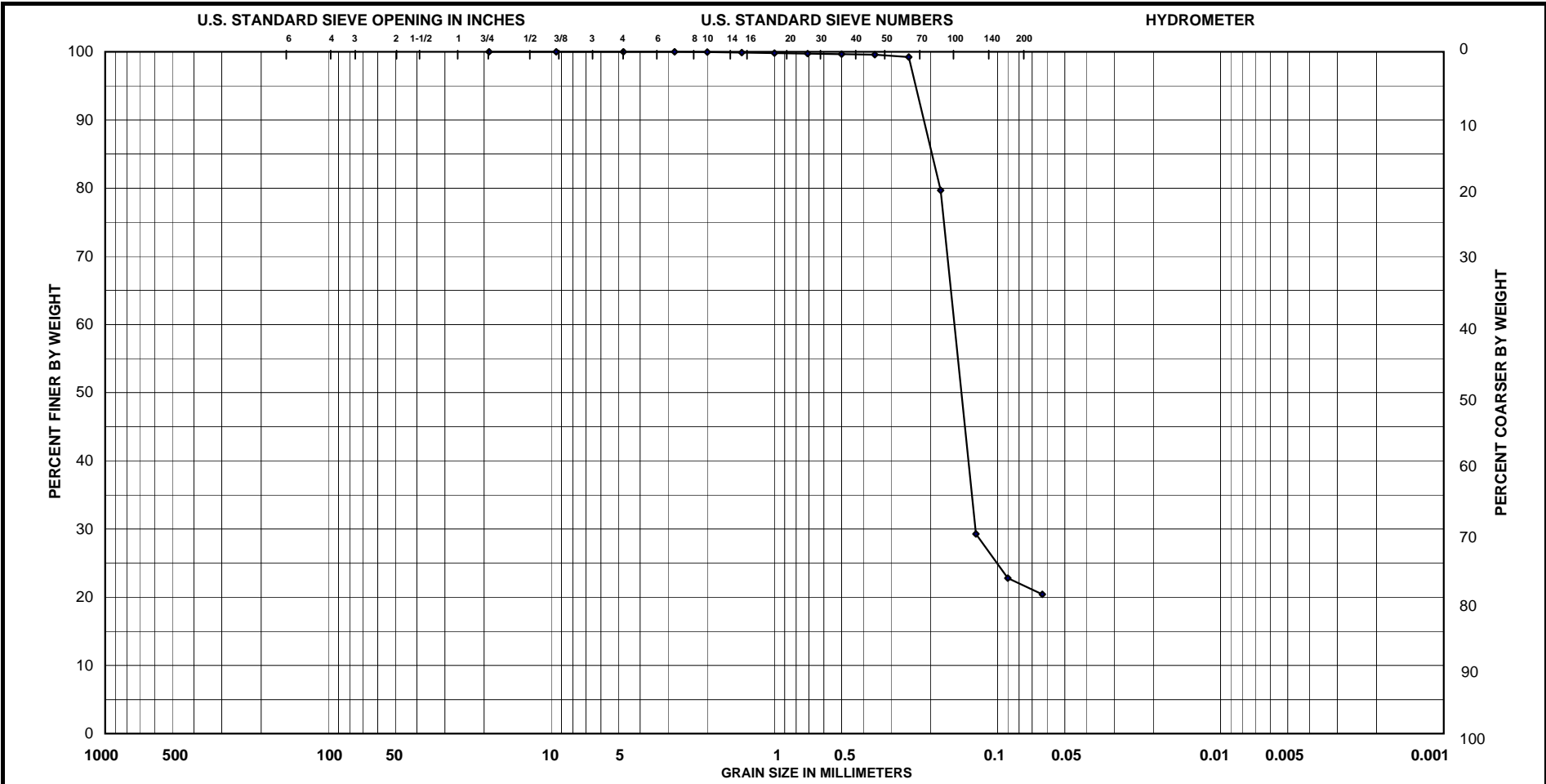
### GRAIN SIZE AND VISUAL SHELL CONTENT

Project:	<b>Topsail Beach, Surf City &amp; North Topsail</b>	Depth:	<b>54.0-54.5</b>
Project No.:	<b>1584-01-40</b>	Date:	<b>9/24/2003</b>
Boring No.:	<b>T1-03-V-187</b>		
Sample No.:	<b>6</b>		
Description:	<b>SAND, silty, mostly fine-grained quartz, little silt, trace carbonate, olive gray (SM)</b>		

Tare Weight, (g):	<b>50.17</b>	
Dry Wt. Before Washing (g):	<b>178.43</b>	(with tare)
Dry Weight After Washing (g):	<b>152.83</b>	(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	100	0.00
#10	2.000	0.05	99.96	30	0.02
#14	1.400	0.10	99.88	30	0.03
#18	1.000	0.11	99.80	70	0.08
#25	0.710	0.08	99.73	65	0.05
#35	0.500	0.11	99.65	20	0.02
#45	0.355	0.10	99.57	3	0.00
#60	0.250	0.41	99.25	1	0.00
#80	0.180	25.11	79.67	1	0.25
#120	0.125	64.62	29.29	1	0.65
#170	0.090	8.34	22.79	1	0.08
#230	0.063	3.02	20.44	1	0.03

**Total Shell Content:** **1** %



COBBLES	GRAVEL		SAND			SILT OR CLAY
	COARSE	FINE	COARSE	MEDIUM	FINE	

Sample No.	Elev. Or Depth	Classification	% CO <sub>3</sub>	G <sub>s</sub>	Nat w%	LL	PL	PI	Project	
6	54.0-54.5	SAND, silty, mostly fine-grained quartz, little silt, trace carbonate, olive gray (SM)	1						Topsail Beach, Surf City & North Topsail	
									Area	
									Boring No. T1-03-V-187	
									Date 9/24/2003	

**GRADATION CURVES**



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## VISUAL SHELL CONTENT

### GRAIN SIZE AND VISUAL SHELL CONTENT

Project:	<b>Topsail Beach, Surf City &amp; North Topsail</b>	Depth:	<b>44.2-44.7</b>
Project No.:	<b>1584-01-40</b>	Date:	<b>9/24/2003</b>
Boring No.:	<b>T1-03-V-188</b>		
Sample No.:	<b>1</b>		
Description:	<b>SAND, poorly-graded, mostly fine-grained quartz, little coarse to medium-grained carbonate, few fine gravel-size carbonate, trace</b>		

Tare Weight, (g):	<b>49.98</b>	
Dry Wt. Before Washing (g):	<b>177.9</b>	(with tare)
Dry Weight After Washing (g):	<b>174.16</b>	(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	2.38	98.14	100	2.38
#4	4.750	5.53	93.82	100	5.53
#7	2.800	3.94	90.74	100	3.94
#10	2.000	2.76	88.58	85	2.35
#14	1.400	3.24	86.05	80	2.59
#18	1.000	3.25	83.51	70	2.28
#25	0.710	2.87	81.26	55	1.58
#35	0.500	3.49	78.53	30	1.05
#45	0.355	4.77	74.80	25	1.19
#60	0.250	8.17	68.42	5	0.41
#80	0.180	29.19	45.60	3	0.88
#120	0.125	44.20	11.05	1	0.44
#170	0.090	8.67	4.27	1	0.09
#230	0.063	1.36	3.21	1	0.01

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



COBBLES	GRAVEL		SAND			SILT OR CLAY
	COARSE	FINE	COARSE	MEDIUM	FINE	

Sample No.	Elev. Or Depth	Classification	% CO <sub>3</sub>	G <sub>s</sub>	Nat w%	LL	PL	PI	Project	
♦ 1	44.2-44.7	SAND, poorly-graded, mostly fine-grained quartz, little coarse to medium-grained carbonate, few fine gravel-size carbonate, trace fragmented limestone, olive gray (SP)	19						Topsail Beach, Surf City & North Topsail	
									Area	
									Boring No. T1-03-V-188	
									Date 9/24/2003	

**GRADATION CURVES**



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## VISUAL SHELL CONTENT

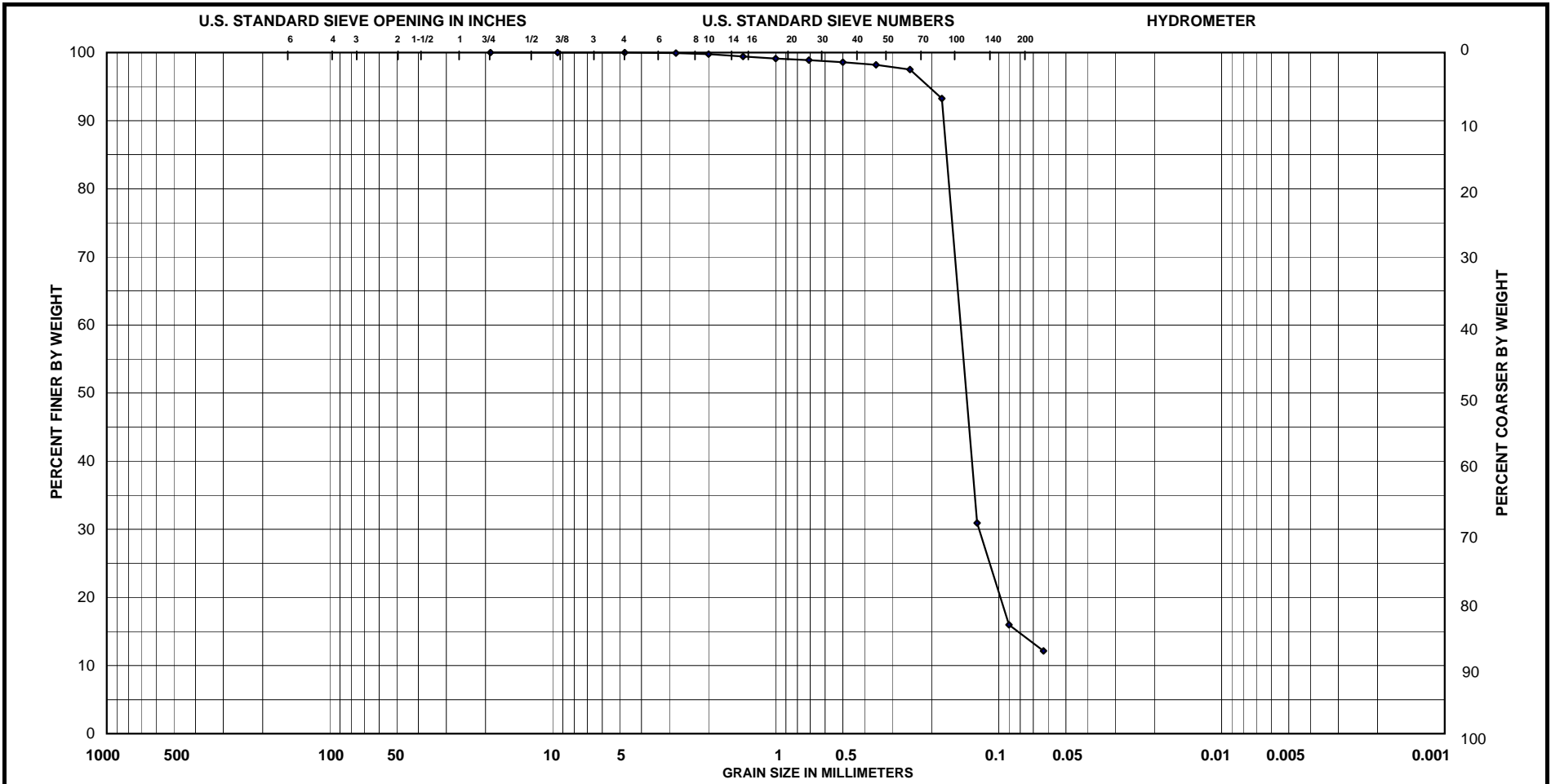
### GRAIN SIZE AND VISUAL SHELL CONTENT

Project:	<b>Topsail Beach, Surf City &amp; North Topsail</b>	Depth:	<b>47.8-48.3</b>
Project No.:	<b>1584-01-40</b>	Date:	<b>9/24/2003</b>
Boring No.:	<b>T1-03-V-188</b>		
Sample No.:	<b>2</b>		
Description:	<b>SAND, poorly-graded with silt, mostly fine-grained quartz, few silt, trace carbonate, trace fragmented limestone, olive gray (SP-SM)</b>		

Tare Weight, (g):	<b>50.85</b>	
Dry Wt. Before Washing (g):	<b>174.1</b>	(with tare)
Dry Weight After Washing (g):	<b>159.5</b>	(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	0.10	99.92	100	0.10
#10	2.000	0.20	99.76	100	0.20
#14	1.400	0.39	99.44	60	0.23
#18	1.000	0.40	99.12	45	0.18
#25	0.710	0.28	98.89	60	0.17
#35	0.500	0.40	98.56	40	0.16
#45	0.355	0.47	98.18	25	0.12
#60	0.250	0.82	97.52	10	0.08
#80	0.180	5.25	93.26	3	0.16
#120	0.125	76.80	30.95	1	0.77
#170	0.090	18.45	15.98	1	0.18
#230	0.063	4.70	12.16	1	0.05

**Total Shell Content:** **2** %



COBBLES	GRAVEL		SAND			SILT OR CLAY
	COARSE	FINE	COARSE	MEDIUM	FINE	

Sample No.	Elev. Or Depth	Classification	% CO <sub>3</sub>	G <sub>s</sub>	Nat w%	LL	PL	PI	Project
♦ 2	47.8-48.3	SAND, poorly-graded with silt, mostly fine-grained quartz, few silt, trace carbonate, trace fragmented limestone, olive gray (SP-SM)	2						Topsail Beach, Surf City & North Topsail
									Area
									Boring No. T1-03-V-188
									Date 9/24/2003

**GRADATION CURVES**



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## VISUAL SHELL CONTENT

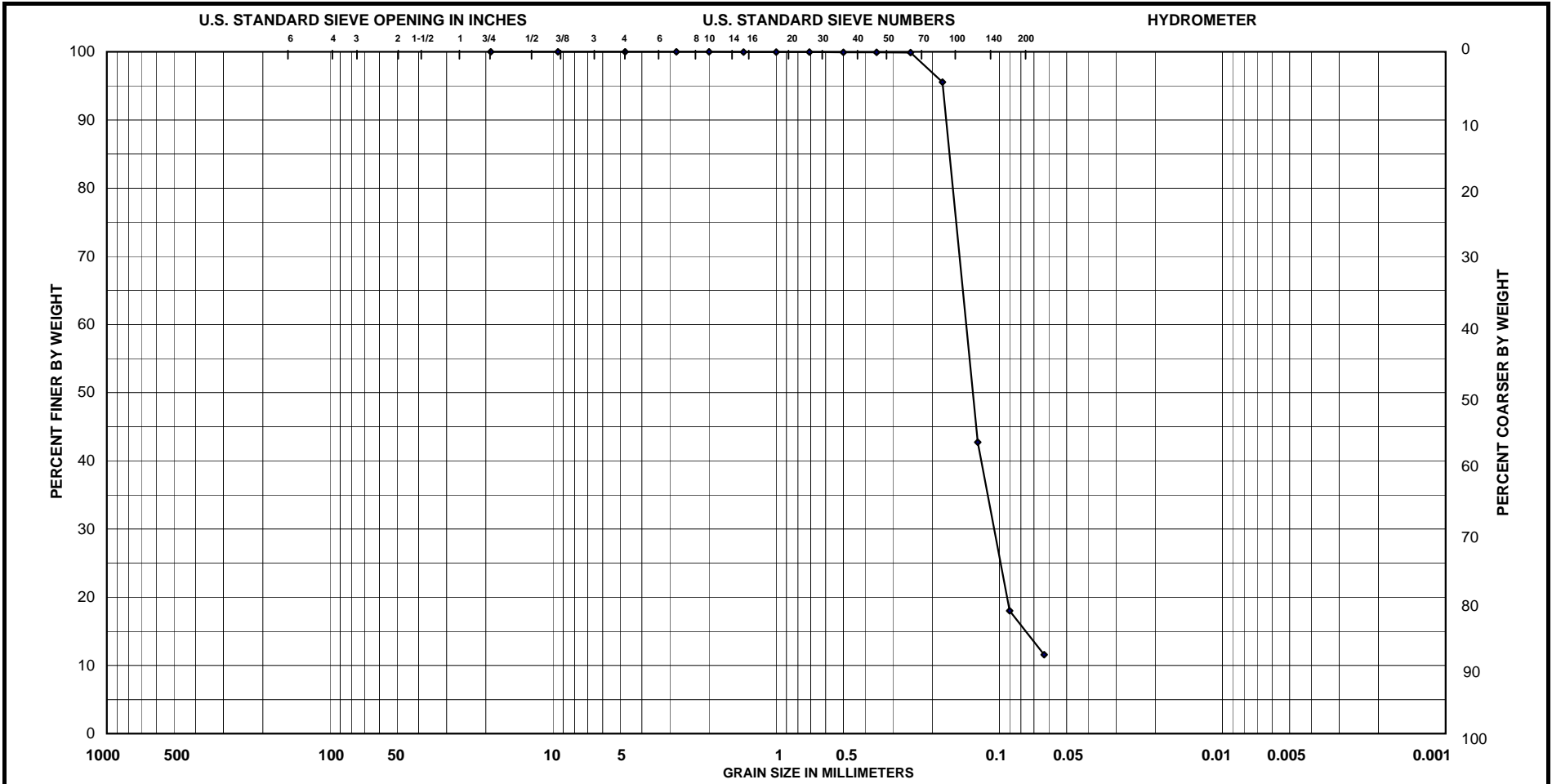
### GRAIN SIZE AND VISUAL SHELL CONTENT

Project:	<b>Topsail Beach, Surf City &amp; North Topsail</b>	Depth:	<b>50.0-50.5</b>
Project No.:	<b>1584-01-40</b>	Date:	<b>9/24/2003</b>
Boring No.:	<b>T1-03-V-188</b>		
Sample No.:	<b>3</b>		
Description:	<b>SAND, poorly-graded with silt, mostly fine-grained quartz, few silt, olive gray (SP-SM)</b>		

Tare Weight, (g):	<b>50.59</b>	
Dry Wt. Before Washing (g):	<b>177.67</b>	(with tare)
Dry Weight After Washing (g):	<b>163.99</b>	(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	0.00	100.00	0	0.00
#14	1.400	0.03	99.98	0	0.00
#18	1.000	0.02	99.96	0	0.00
#25	0.710	0.01	99.95	3	0.00
#35	0.500	0.02	99.94	1	0.00
#45	0.355	0.04	99.91	1	0.00
#60	0.250	0.05	99.87	0	0.00
#80	0.180	5.48	95.55	0	0.00
#120	0.125	67.12	42.74	0	0.00
#170	0.090	31.41	18.02	0	0.00
#230	0.063	8.21	11.56	0	0.00

**Total Shell Content:** **0** %



COBBLES	GRAVEL		SAND			SILT OR CLAY
	COARSE	FINE	COARSE	MEDIUM	FINE	

Sample No.	Elev. Or Depth	Classification	% CO <sub>3</sub>	G <sub>s</sub>	Nat w%	LL	PL	PI	Project	
3	50.0-50.5	SAND, poorly-graded with silt, mostly fine-grained quartz, few silt, olive gray (SP-SM)	0						Topsail Beach, Surf City & North Topsail	
									Area	
									Boring No. T1-03-V-188	
									Date 9/24/2003	

**GRADATION CURVES**





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## VISUAL SHELL CONTENT

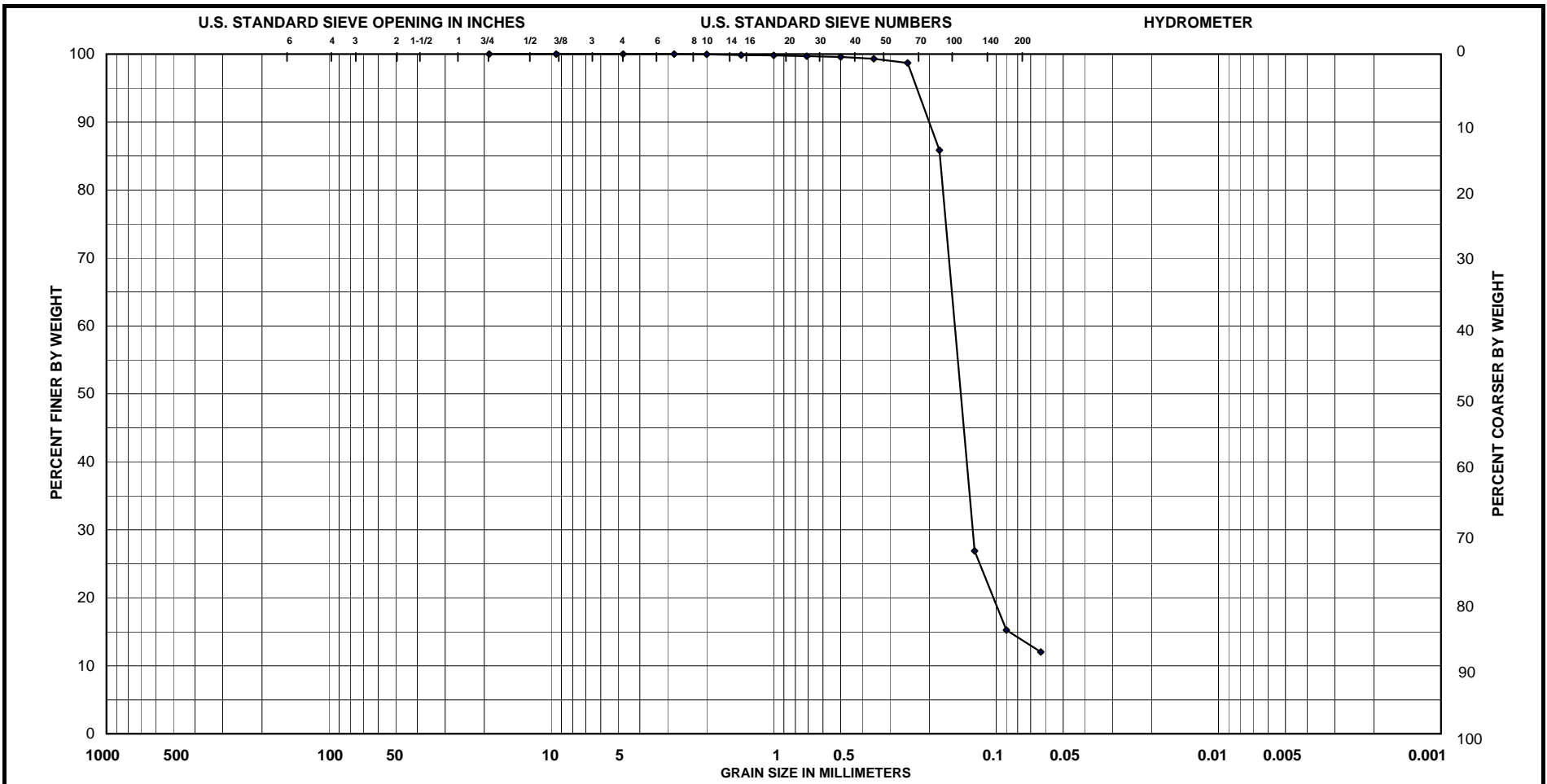
### GRAIN SIZE AND VISUAL SHELL CONTENT

Project:	<b>Topsail Beach, Surf City &amp; North Topsail</b>	Depth:	<b>52.0-52.5</b>
Project No.:	<b>1584-01-40</b>	Date:	<b>9/24/2003</b>
Boring No.:	<b>T1-03-V-188</b>		
Sample No.:	<b>4</b>		
Description:	<b>SAND, poorly-graded with silt, mostly fine-grained quartz, few silt, trace carbonate, olive gray (SP-SM)</b>		

Tare Weight, (g):	<b>50.35</b>	
Dry Wt. Before Washing (g):	<b>175.45</b>	(with tare)
Dry Weight After Washing (g):	<b>160.69</b>	(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	99.94	75	0.05
#14	1.400	0.12	99.85	40	0.05
#18	1.000	0.06	99.80	20	0.01
#25	0.710	0.12	99.70	20	0.02
#35	0.500	0.15	99.58	30	0.05
#45	0.355	0.36	99.30	15	0.05
#60	0.250	0.76	98.69	5	0.04
#80	0.180	16.05	85.86	3	0.48
#120	0.125	73.74	26.91	1	0.74
#170	0.090	14.57	15.27	1	0.15
#230	0.063	4.05	12.03	1	0.04

**Total Shell Content:** **1** %



COBBLES	GRAVEL		SAND			SILT OR CLAY
	COARSE	FINE	COARSE	MEDIUM	FINE	

Sample No.	Elev. Or Depth	Classification	% CO <sub>3</sub>	G <sub>s</sub>	Nat w%	LL	PL	PI	Project
4	52.0-52.5	SAND, poorly-graded with silt, mostly fine-grained quartz, few silt, trace carbonate, olive gray (SP-SM)	1						Topsail Beach, Surf City & North Topsail
									Area
									Boring No. T1-03-V-188
									Date 9/24/2003

**GRADATION CURVES**



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## VISUAL SHELL CONTENT

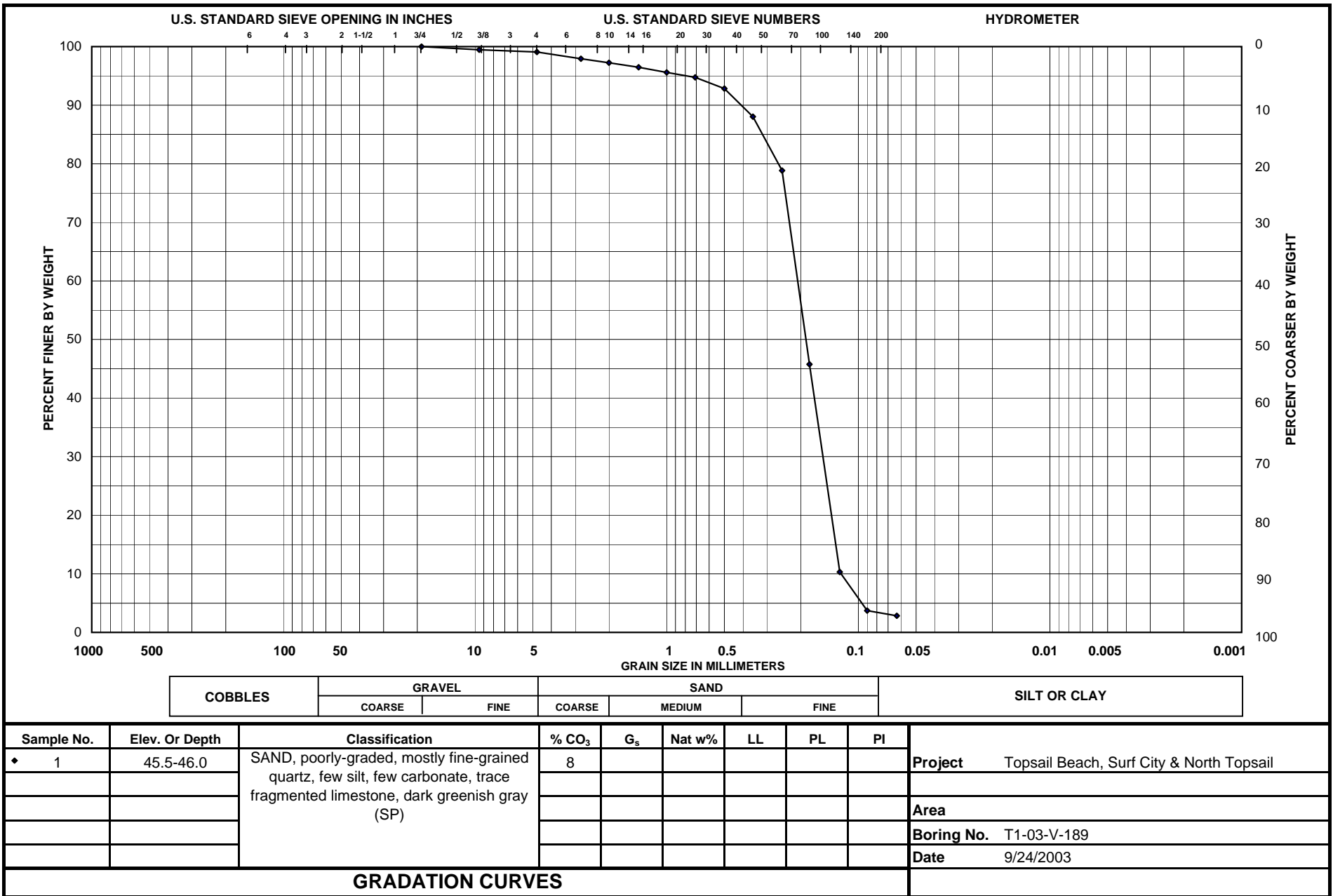
### GRAIN SIZE AND VISUAL SHELL CONTENT

Project:	<b>Topsail Beach, Surf City &amp; North Topsail</b>	Depth:	<b>45.5-46.0</b>
Project No.:	<b>1584-01-40</b>	Date:	<b>9/24/2003</b>
Boring No.:	<b>T1-03-V-189</b>		
Sample No.:	<b>1</b>		
Description:	<b>SAND, poorly-graded, mostly fine-grained quartz, few silt, few carbonate, trace fragmented limestone, dark greenish gray (SP)</b>		

Tare Weight, (g):	<b>50.30</b>	
Dry Wt. Before Washing (g):	<b>177.8</b>	(with tare)
Dry Weight After Washing (g):	<b>174.53</b>	(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	0.66	99.48	100	0.66
#4	4.750	0.51	99.08	100	0.51
#7	2.800	1.47	97.93	100	1.47
#10	2.000	0.87	97.25	98	0.85
#14	1.400	0.99	96.47	95	0.94
#18	1.000	1.11	95.60	90	1.00
#25	0.710	1.07	94.76	70	0.75
#35	0.500	2.48	92.82	40	0.99
#45	0.355	6.10	88.03	20	1.22
#60	0.250	11.73	78.83	5	0.59
#80	0.180	42.17	45.76	3	1.27
#120	0.125	45.21	10.30	1	0.45
#170	0.090	8.37	3.73	1	0.08
#230	0.063	1.12	2.85	1	0.01

**Total Shell Content:** **8** %





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## VISUAL SHELL CONTENT

### GRAIN SIZE AND VISUAL SHELL CONTENT

Project:	<b>Topsail Beach, Surf City &amp; North Topsail</b>	Depth:	<b>47.5-48.0</b>
Project No.:	<b>1584-01-40</b>	Date:	<b>9/24/2003</b>
Boring No.:	<b>T1-03-V-189</b>		
Sample No.:	<b>2</b>		
Description:	<b>SAND, poorly-graded with silt, mostly fine-grained quartz, few coarse to medium-grained carbonate, few silt, trace fine gravel-size carbonate,</b>		

Tare Weight, (g):	<b>49.46</b>	
Dry Wt. Before Washing (g):	<b>172.97</b>	(with tare)
Dry Weight After Washing (g):	<b>163.89</b>	(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	2.48	97.99	100	2.48
#4	4.750	2.27	96.15	100	2.27
#7	2.800	4.22	92.74	90	3.80
#10	2.000	2.70	90.55	85	2.30
#14	1.400	2.61	88.44	65	1.70
#18	1.000	2.33	86.55	70	1.63
#25	0.710	2.07	84.88	60	1.24
#35	0.500	3.05	82.41	30	0.92
#45	0.355	4.55	78.72	30	1.37
#60	0.250	7.84	72.37	5	0.39
#80	0.180	26.03	51.30	3	0.78
#120	0.125	44.25	15.47	1	0.44
#170	0.090	8.33	8.73	1	0.08
#230	0.063	1.38	7.61	1	0.01

**Total Shell Content:** **16** %





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## VISUAL SHELL CONTENT

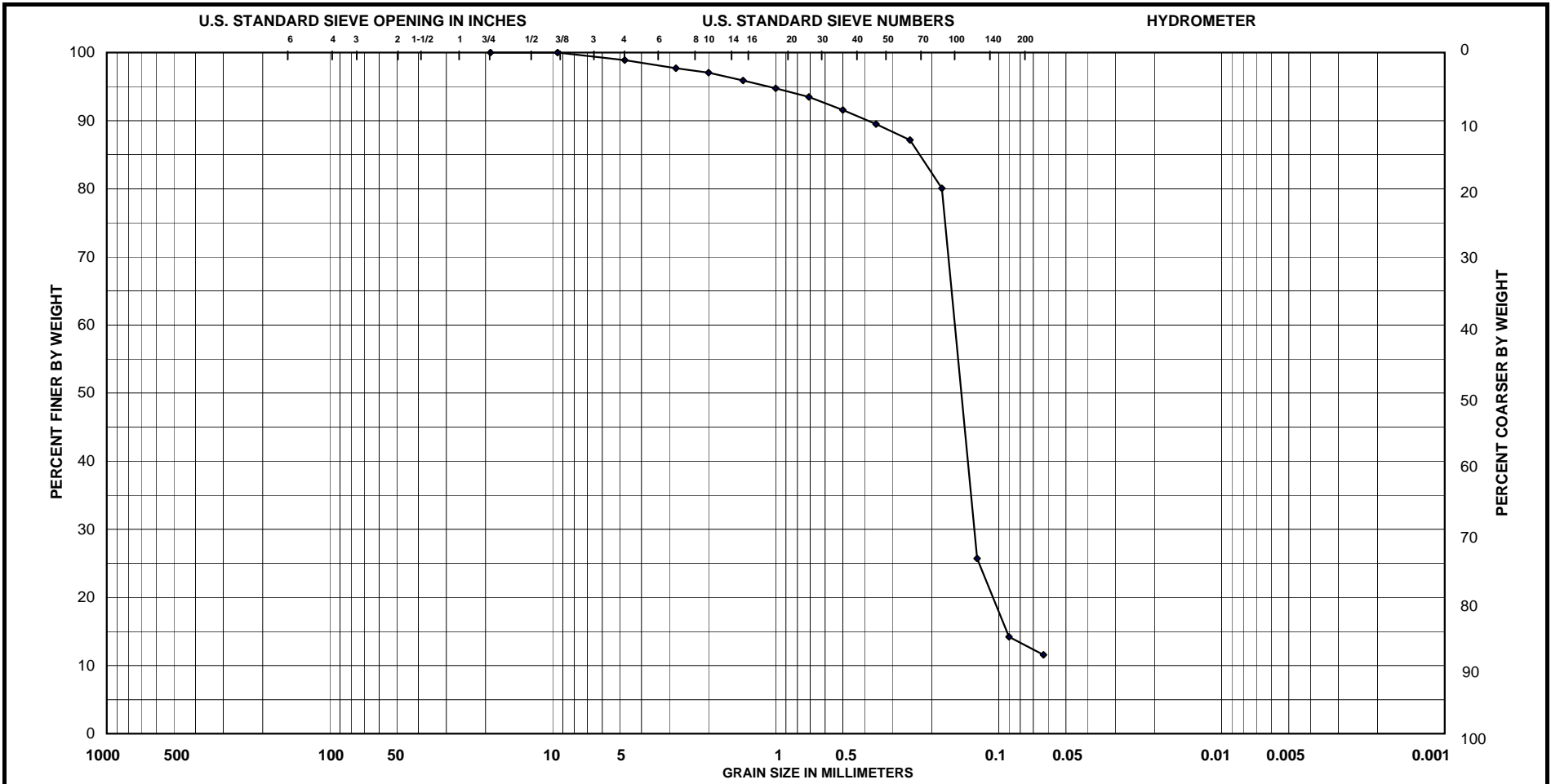
### GRAIN SIZE AND VISUAL SHELL CONTENT

Project:	<b>Topsail Beach, Surf City &amp; North Topsail</b>	Depth:	<b>51.0-51.5</b>
Project No.:	<b>1584-01-40</b>	Date:	<b>9/24/2003</b>
Boring No.:	<b>T1-03-V-189</b>		
Sample No.:	<b>3</b>		
Description:	<b>SAND, poorly-graded with silt, mostly fine-grained quartz, few carbonate, few silt, trace fragmented limestone, greenish gray (SP-SM)</b>		

Tare Weight, (g):	<b>50.29</b>	
Dry Wt. Before Washing (g):	<b>166.18</b>	(with tare)
Dry Weight After Washing (g):	<b>153.12</b>	(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	1.28	98.90	100	1.28
#7	2.800	1.37	97.71	100	1.37
#10	2.000	0.77	97.05	90	0.69
#14	1.400	1.35	95.88	70	0.95
#18	1.000	1.32	94.75	60	0.79
#25	0.710	1.46	93.49	55	0.80
#35	0.500	2.21	91.58	40	0.88
#45	0.355	2.40	89.51	40	0.96
#60	0.250	2.74	87.14	5	0.14
#80	0.180	8.20	80.07	3	0.25
#120	0.125	62.98	25.72	1	0.63
#170	0.090	13.31	14.24	1	0.13
#230	0.063	3.09	11.57	1	0.03

**Total Shell Content:** **8** %



COBBLES	GRAVEL		SAND			SILT OR CLAY
	COARSE	FINE	COARSE	MEDIUM	FINE	

Sample No.	Elev. Or Depth	Classification	% CO <sub>3</sub>	G <sub>s</sub>	Nat w%	LL	PL	PI	Project
3	51.0-51.5	SAND, poorly-graded with silt, mostly fine-grained quartz, few carbonate, few silt, trace fragmented limestone, greenish gray (SP-SM)	8						Topsail Beach, Surf City & North Topsail
									Area
									Boring No. T1-03-V-189
									Date 9/24/2003

**GRADATION CURVES**





# WOLF TECHNOLOGIES, INC.

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

## VISUAL SHELL CONTENT

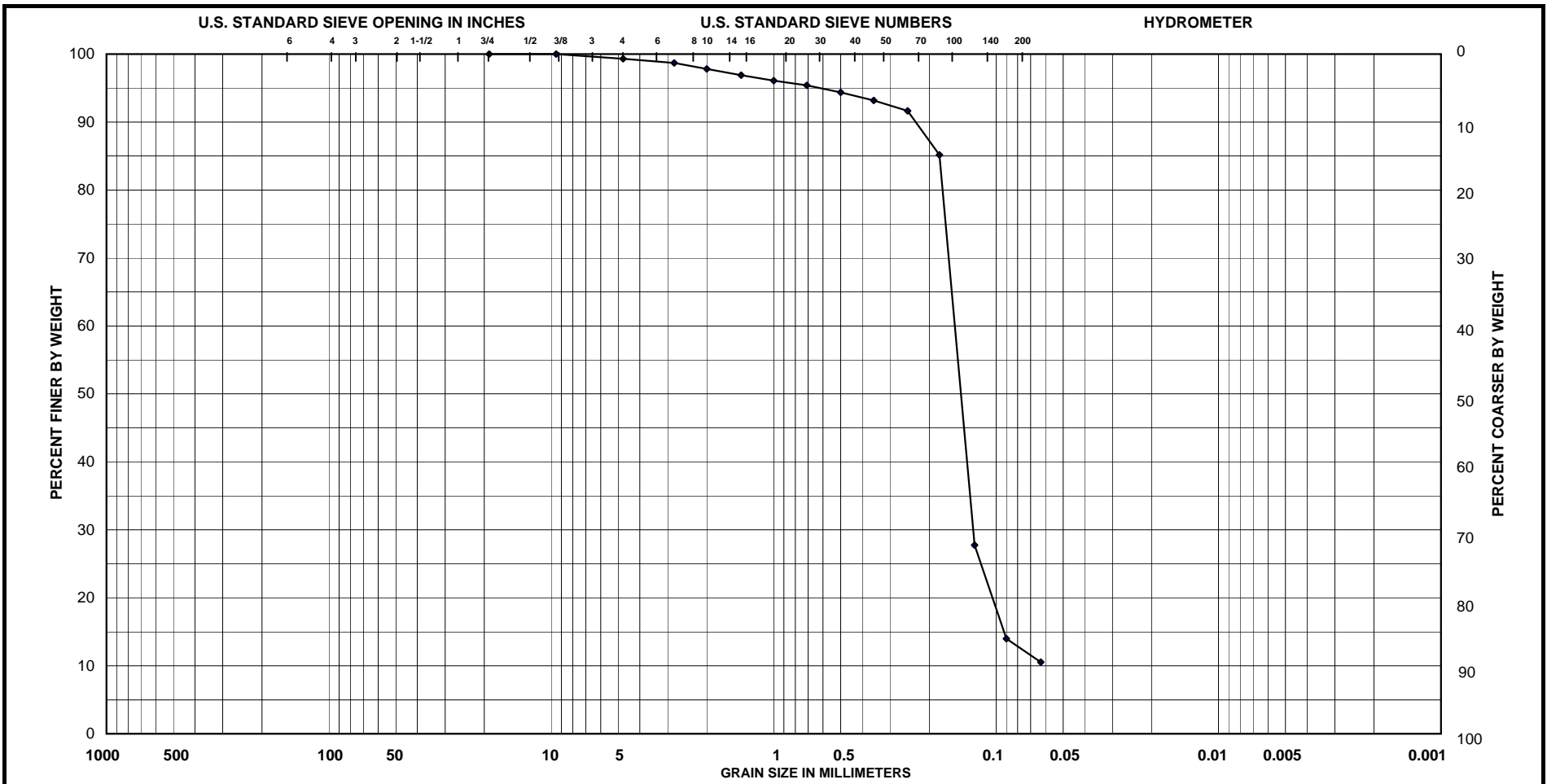
### GRAIN SIZE AND VISUAL SHELL CONTENT

Project:	<b>Topsail Beach, Surf City &amp; North Topsail</b>	Depth:	<b>54.8-55.3</b>
Project No.:	<b>1584-01-40</b>	Date:	<b>9/24/2003</b>
Boring No.:	<b>T1-03-V-189</b>		
Sample No.:	<b>4</b>		
Description:	<b>SAND, poorly-graded with silt, mostly fine-grained quartz, few silt, few carbonate, trace fragmented limestone, greenish gray (SP-SM)</b>		

Tare Weight, (g):	<b>50.33</b>	
Dry Wt. Before Washing (g):	<b>171.32</b>	(with tare)
Dry Weight After Washing (g):	<b>158.83</b>	(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	0.84	99.31	75	0.63
#7	2.800	0.72	98.71	100	0.72
#10	2.000	1.07	97.83	80	0.86
#14	1.400	1.11	96.91	60	0.67
#18	1.000	1.01	96.07	55	0.56
#25	0.710	0.81	95.40	65	0.53
#35	0.500	1.26	94.36	45	0.57
#45	0.355	1.43	93.18	30	0.43
#60	0.250	1.84	91.66	20	0.37
#80	0.180	7.85	85.17	3	0.24
#120	0.125	69.46	27.76	1	0.69
#170	0.090	16.67	13.98	1	0.17
#230	0.063	4.19	10.52	1	0.04

**Total Shell Content:** **5** %



COBBLES	GRAVEL		SAND			SILT OR CLAY
	COARSE	FINE	COARSE	MEDIUM	FINE	

Sample No.	Elev. Or Depth	Classification	% CO <sub>3</sub>	G <sub>s</sub>	Nat w%	LL	PL	PI	Project
4	54.8-55.3	SAND, poorly-graded with silt, mostly fine-grained quartz, few silt, few carbonate, trace fragmented limestone, greenish gray (SP-SM)	5						Topsail Beach, Surf City & North Topsail
									Area
									Boring No. T1-03-V-189
									Date 9/24/2003

**GRADATION CURVES**



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## VISUAL SHELL CONTENT

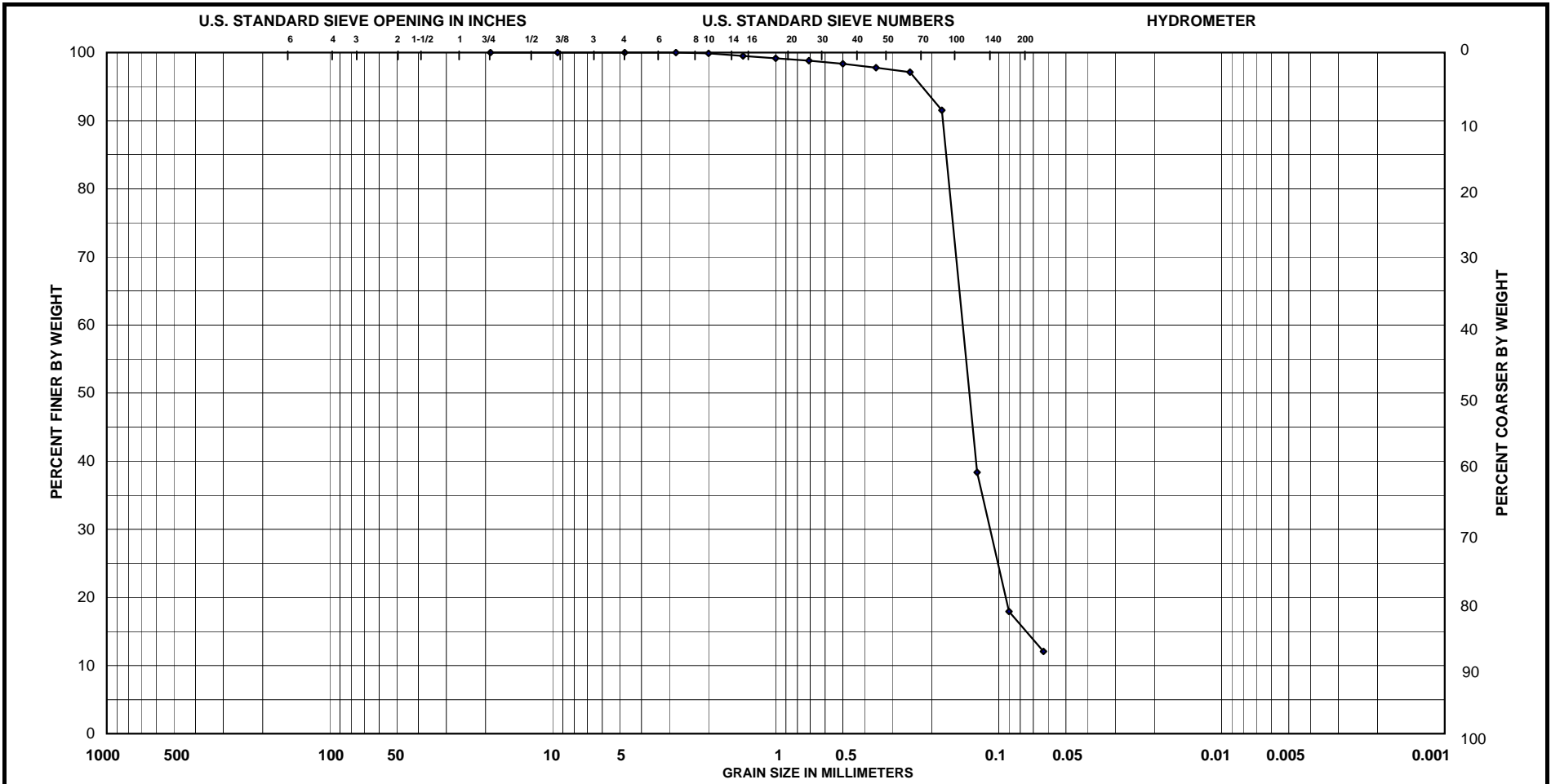
### GRAIN SIZE AND VISUAL SHELL CONTENT

<b>Project:</b>	<b>Topsail Beach, Surf City &amp; North Topsail</b>	<b>Depth:</b>	<b>57.0-57.5</b>
<b>Project No.:</b>	<b>1584-01-40</b>	<b>Date:</b>	<b>9/24/2003</b>
<b>Boring No.:</b>	<b>T1-03-V-189</b>		
<b>Sample No.:</b>	<b>5</b>		
<b>Description:</b>	<b>SAND, poorly-graded with silt, mostly fine-grained quartz, few silt, trace carbonate, olive gray (SP-SM)</b>		

Tare Weight, (g):	50.39	
Dry Wt. Before Washing (g):	179.93	(with tare)
Dry Weight After Washing (g):	165.17	(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	50	0.01
#10	2.000	0.15	99.87	80	0.12
#14	1.400	0.46	99.51	80	0.37
#18	1.000	0.47	99.15	75	0.35
#25	0.710	0.45	98.80	70	0.32
#35	0.500	0.60	98.34	70	0.42
#45	0.355	0.74	97.77	40	0.30
#60	0.250	0.84	97.12	20	0.17
#80	0.180	7.23	91.54	3	0.22
#120	0.125	68.90	38.35	1	0.69
#170	0.090	26.42	17.96	1	0.26
#230	0.063	7.61	12.08	1	0.08

**Total Shell Content:** 3 %



COBBLES	GRAVEL		SAND			SILT OR CLAY
	COARSE	FINE	COARSE	MEDIUM	FINE	

Sample No.	Elev. Or Depth	Classification	% CO <sub>3</sub>	G <sub>s</sub>	Nat w%	LL	PL	PI	Project
5	57.0-57.5	SAND, poorly-graded with silt, mostly fine-grained quartz, few silt, trace carbonate, olive gray (SP-SM)	3						Topsail Beach, Surf City & North Topsail
									Area
									Boring No. T1-03-V-189
									Date 9/24/2003

**GRADATION CURVES**



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## VISUAL SHELL CONTENT

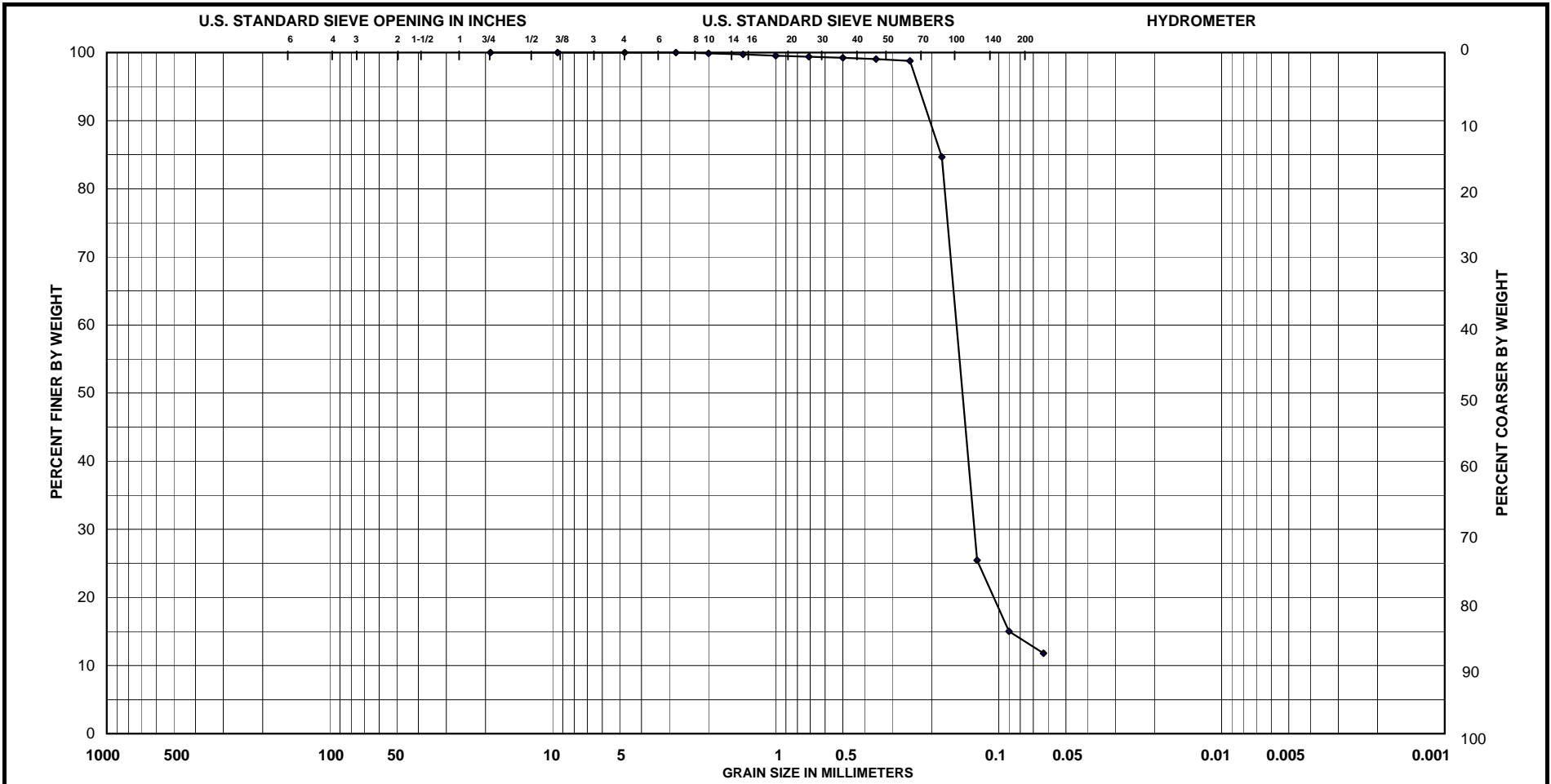
### GRAIN SIZE AND VISUAL SHELL CONTENT

Project:	<b>Topsail Beach, Surf City &amp; North Topsail</b>	Depth:	<b>59.0-59.5</b>
Project No.:	<b>1584-01-40</b>	Date:	<b>9/24/2003</b>
Boring No.:	<b>T1-03-V-189</b>		
Sample No.:	<b>6</b>		
Description:	<b>SAND, poorly-graded with silt, mostly fine-grained quartz, few silt, trace carbonate, trace fragmented limestone, olive gray (SP-SM)</b>		

Tare Weight, (g):	<b>48.68</b>	
Dry Wt. Before Washing (g):	<b>180.38</b>	(with tare)
Dry Weight After Washing (g):	<b>165.28</b>	(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	0.13	99.90	90	0.12
#14	1.400	0.21	99.74	80	0.17
#18	1.000	0.25	99.55	70	0.18
#25	0.710	0.21	99.39	70	0.15
#35	0.500	0.22	99.23	50	0.11
#45	0.355	0.22	99.06	35	0.08
#60	0.250	0.37	98.78	25	0.09
#80	0.180	18.58	84.67	3	0.56
#120	0.125	77.98	25.46	1	0.78
#170	0.090	13.76	15.01	1	0.14
#230	0.063	4.22	11.81	1	0.04

**Total Shell Content:** **2** %



COBBLES	GRAVEL		SAND			SILT OR CLAY
	COARSE	FINE	COARSE	MEDIUM	FINE	

Sample No.	Elev. Or Depth	Classification	% CO <sub>3</sub>	G <sub>s</sub>	Nat w%	LL	PL	PI	Project
6	59.0-59.5	SAND, poorly-graded with silt, mostly fine-grained quartz, few silt, trace carbonate, trace fragmented limestone, olive gray (SP-SM)	2						Topsail Beach, Surf City & North Topsail
									Area
									Boring No. T1-03-V-189
									Date 9/24/2003

**GRADATION CURVES**



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## VISUAL SHELL CONTENT

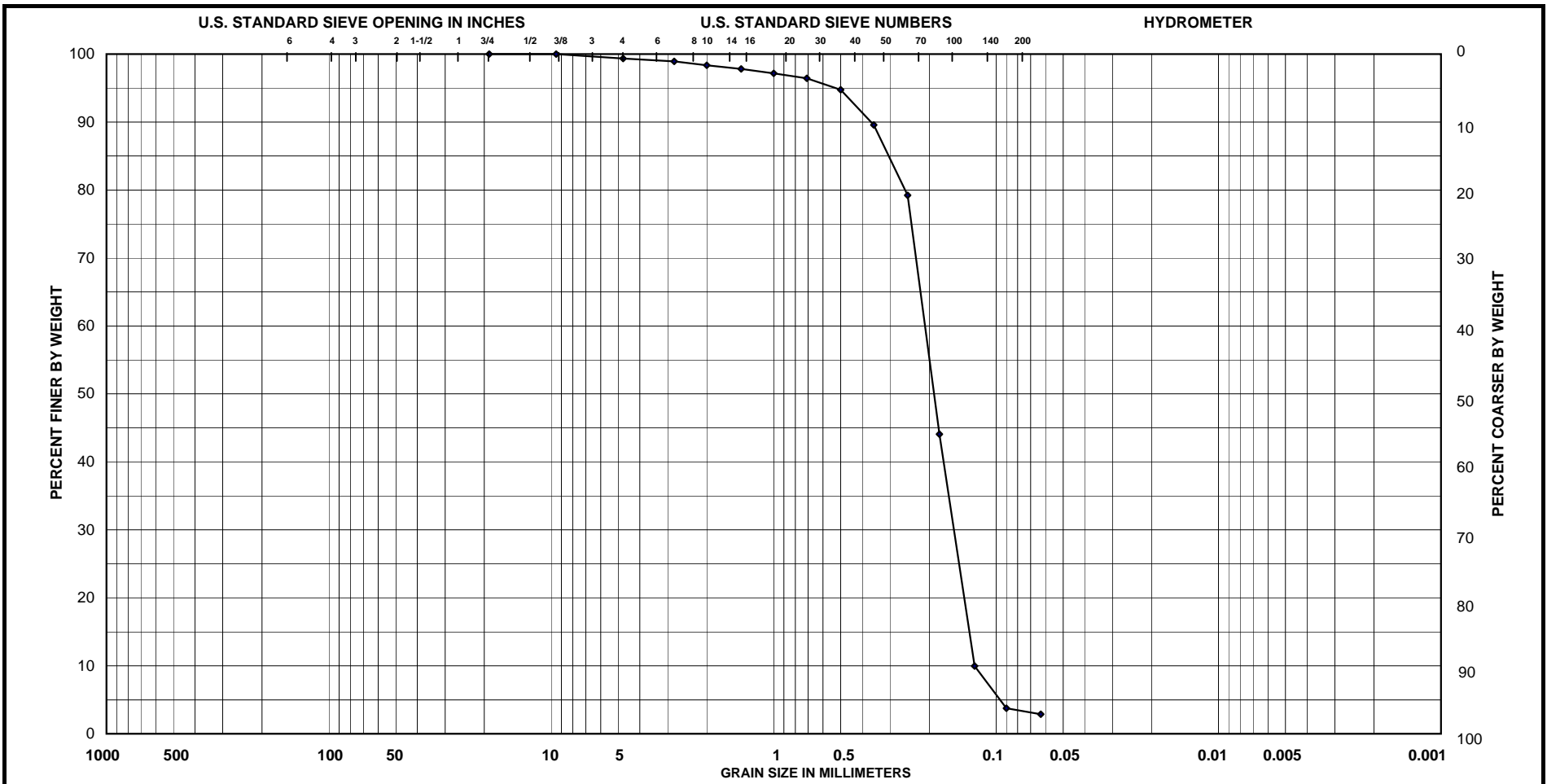
### GRAIN SIZE AND VISUAL SHELL CONTENT

Project:	<b>Topsail Beach, Surf City &amp; North Topsail</b>	Depth:	<b>47.5-48.0</b>
Project No.:	<b>1584-01-40</b>	Date:	<b>9/26/2003</b>
Boring No.:	<b>T1-03-V-190</b>		
Sample No.:	<b>1</b>		
Description:	<b>SAND, poorly-graded, mostly fine-grained quartz, few carbonate, trace fragmented limestone, dark greenish gray (SP)</b>		

Tare Weight, (g):	<b>49.81</b>	
Dry Wt. Before Washing (g):	<b>173.52</b>	(with tare)
Dry Weight After Washing (g):	<b>170.24</b>	(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	99.36	100	0.79
#7	2.800	0.53	98.93	100	0.53
#10	2.000	0.70	98.37	80	0.56
#14	1.400	0.67	97.83	70	0.47
#18	1.000	0.84	97.15	70	0.59
#25	0.710	0.89	96.43	65	0.58
#35	0.500	2.06	94.76	50	1.03
#45	0.355	6.44	89.56	35	2.25
#60	0.250	12.78	79.23	10	1.28
#80	0.180	43.49	44.07	1	0.43
#120	0.125	42.18	9.97	1	0.42
#170	0.090	7.67	3.77	1	0.08
#230	0.063	1.12	2.87	1	0.01

**Total Shell Content:** **7** %



COBBLES	GRAVEL		SAND			SILT OR CLAY
	COARSE	FINE	COARSE	MEDIUM	FINE	

Sample No.	Elev. Or Depth	Classification	% CO <sub>3</sub>	G <sub>s</sub>	Nat w%	LL	PL	PI	Project
♦ 1	47.5-48.0	SAND, poorly-graded, mostly fine-grained quartz, few carbonate, trace fragmented limestone, dark greenish gray (SP)	7						Topsail Beach, Surf City & North Topsail
									Area
									Boring No. T1-03-V-190
									Date 9/26/2003

**GRADATION CURVES**





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## VISUAL SHELL CONTENT

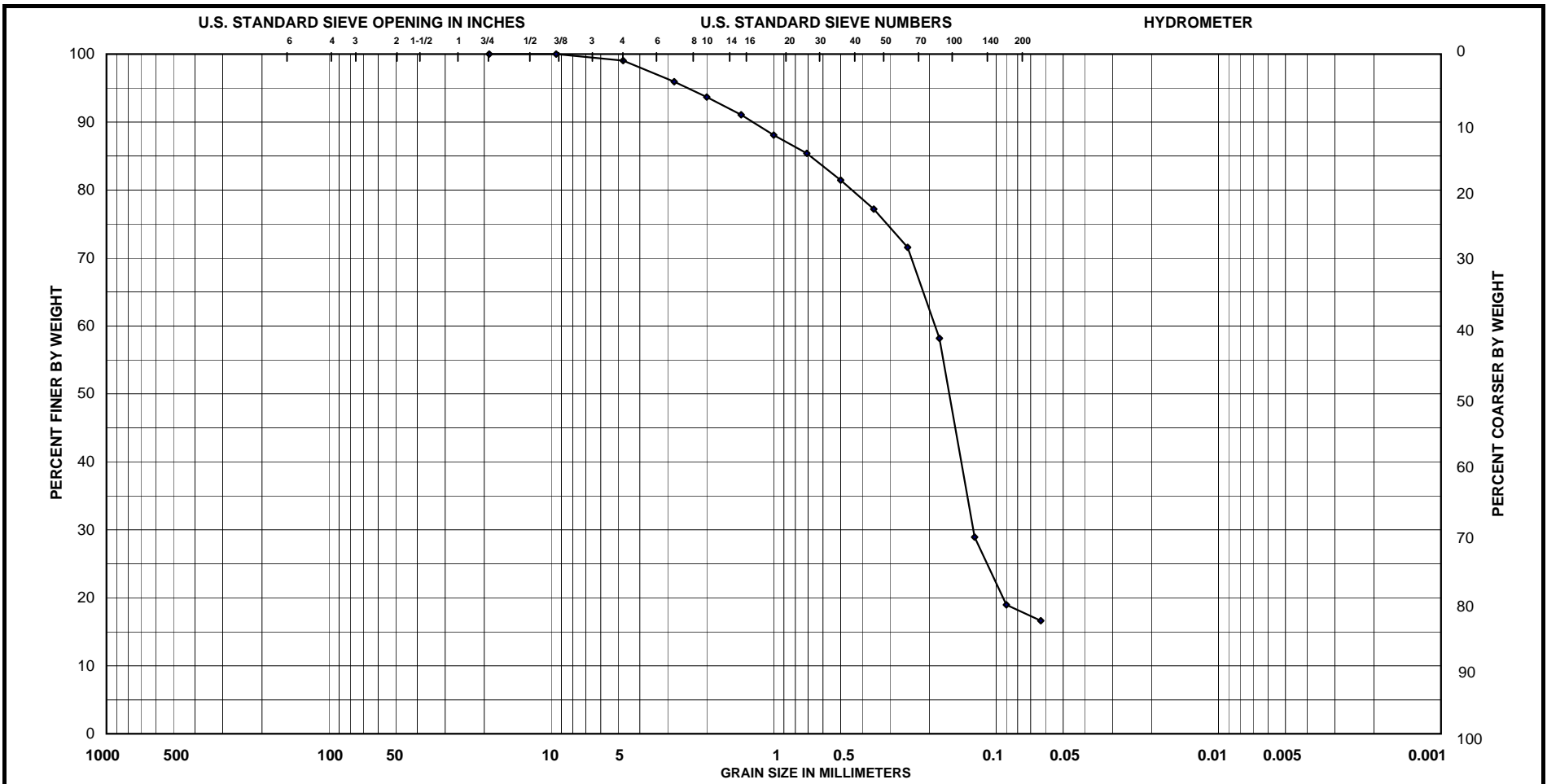
### GRAIN SIZE AND VISUAL SHELL CONTENT

Project:	<b>Topsail Beach, Surf City &amp; North Topsail</b>	Depth:	<b>48.9-49.4</b>
Project No.:	<b>1584-01-40</b>	Date:	<b>9/26/2003</b>
Boring No.:	<b>T1-03-V-190</b>		
Sample No.:	<b>2</b>		
Description:	<b>SAND, silty, mostly fine-grained quartz, little coarse to medium-grained carbonate, little silt, dark greenish gray (SM)</b>		

Tare Weight, (g):	<b>50.12</b>	
Dry Wt. Before Washing (g):	<b>166.15</b>	(with tare)
Dry Weight After Washing (g):	<b>146.83</b>	(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	1.09	99.06	100	1.09
#7	2.800	3.62	95.94	90	3.26
#10	2.000	2.65	93.66	70	1.86
#14	1.400	2.99	91.08	75	2.24
#18	1.000	3.47	88.09	70	2.43
#25	0.710	3.13	85.39	65	2.03
#35	0.500	4.57	81.45	60	2.74
#45	0.355	4.94	77.20	45	2.22
#60	0.250	6.56	71.54	20	1.31
#80	0.180	15.51	58.17	3	0.47
#120	0.125	33.94	28.92	1	0.34
#170	0.090	11.53	18.99	1	0.12
#230	0.063	2.75	16.62	1	0.03

**Total Shell Content:** **17** %



COBBLES	GRAVEL		SAND			SILT OR CLAY
	COARSE	FINE	COARSE	MEDIUM	FINE	

Sample No.	Elev. Or Depth	Classification	% CO <sub>3</sub>	G <sub>s</sub>	Nat w%	LL	PL	PI	Project
♦ 2	48.9-49.4	SAND, silty, mostly fine-grained quartz, little coarse to medium-grained carbonate, little silt, dark greenish gray (SM)	17						Topsail Beach, Surf City & North Topsail
									Area
									Boring No. T1-03-V-190
									Date 9/26/2003

**GRADATION CURVES**



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Jacksonville, Florida 32246  
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## VISUAL SHELL CONTENT

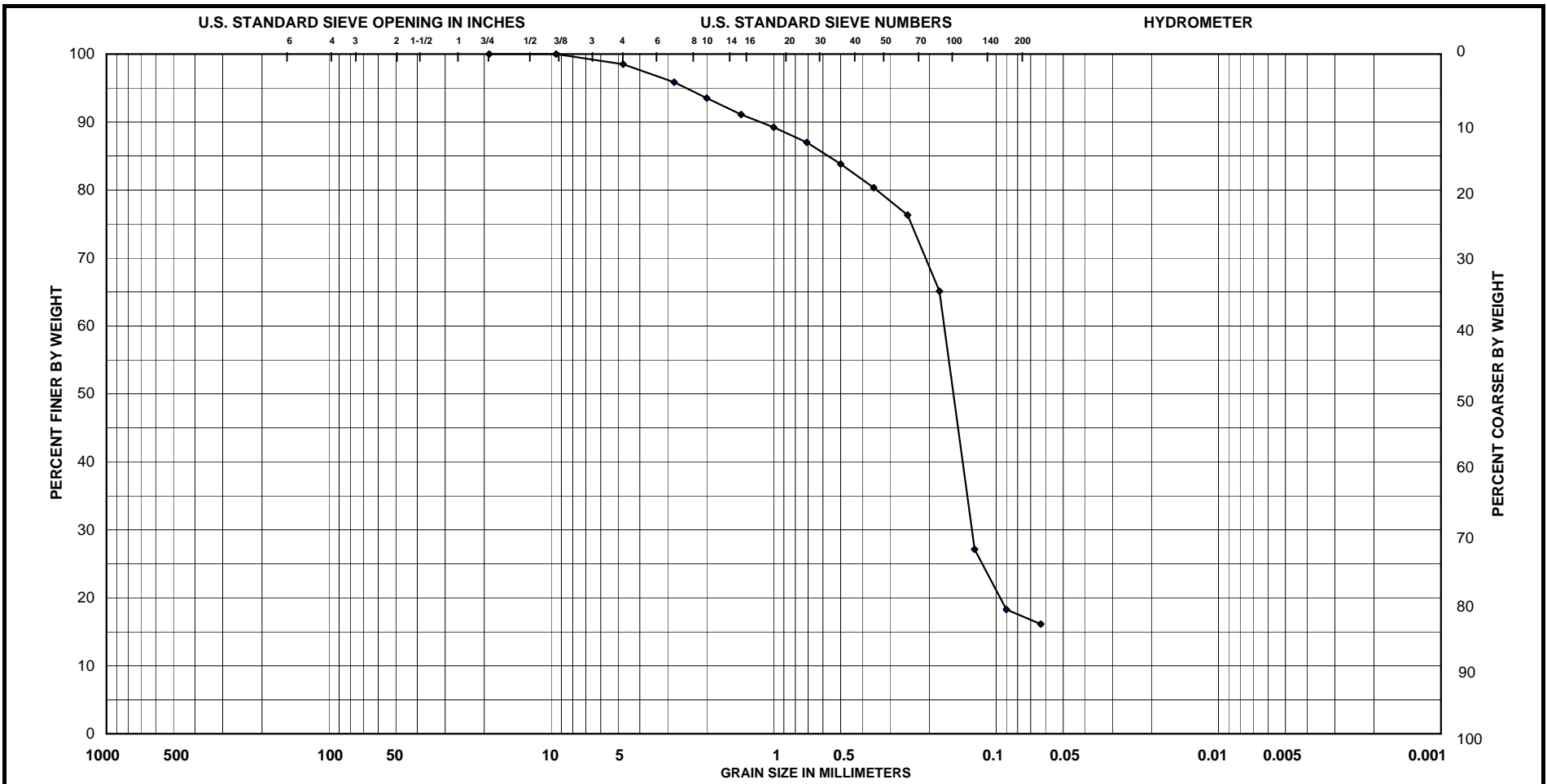
### GRAIN SIZE AND VISUAL SHELL CONTENT

Project:	<b>Topsail Beach, Surf City &amp; North Topsail</b>	Depth:	<b>51.0-51.5</b>
Project No.:	<b>1584-01-40</b>	Date:	<b>9/26/2003</b>
Boring No.:	<b>T1-03-V-190</b>		
Sample No.:	<b>3</b>		
Description:	<b>SAND, silty, mostly fine-grained quartz, little silt, few coarse to medium-grained carbonate, trace fine gravel-size carbonate, trace fragmented</b>		

Tare Weight, (g):	<b>50.20</b>	
Dry Wt. Before Washing (g):	<b>172.5</b>	(with tare)
Dry Weight After Washing (g):	<b>153.56</b>	(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	1.84	98.50	90	1.66
#7	2.800	3.24	95.85	75	2.43
#10	2.000	2.85	93.52	70	2.00
#14	1.400	2.95	91.10	60	1.77
#18	1.000	2.27	89.25	50	1.14
#25	0.710	2.73	87.02	50	1.37
#35	0.500	3.88	83.84	40	1.55
#45	0.355	4.29	80.34	40	1.72
#60	0.250	4.94	76.30	30	1.48
#80	0.180	13.67	65.12	1	0.14
#120	0.125	46.47	27.12	1	0.46
#170	0.090	10.81	18.28	1	0.11
#230	0.063	2.63	16.13	1	0.03

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



COBBLES	GRAVEL		SAND			SILT OR CLAY
	COARSE	FINE	COARSE	MEDIUM	FINE	

Sample No.	Elev. Or Depth	Classification	% CO <sub>3</sub>	G <sub>s</sub>	Nat w%	LL	PL	PI	Project
3	51.0-51.5	SAND, silty, mostly fine-grained quartz, little silt, few coarse to medium-grained carbonate, trace fine gravel-size carbonate, trace fragmented limestone, dark greenish gray (SM)	13						Topsail Beach, Surf City & North Topsail
									Area
									Boring No. T1-03-V-190
									Date 9/26/2003

**GRADATION CURVES**



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## VISUAL SHELL CONTENT

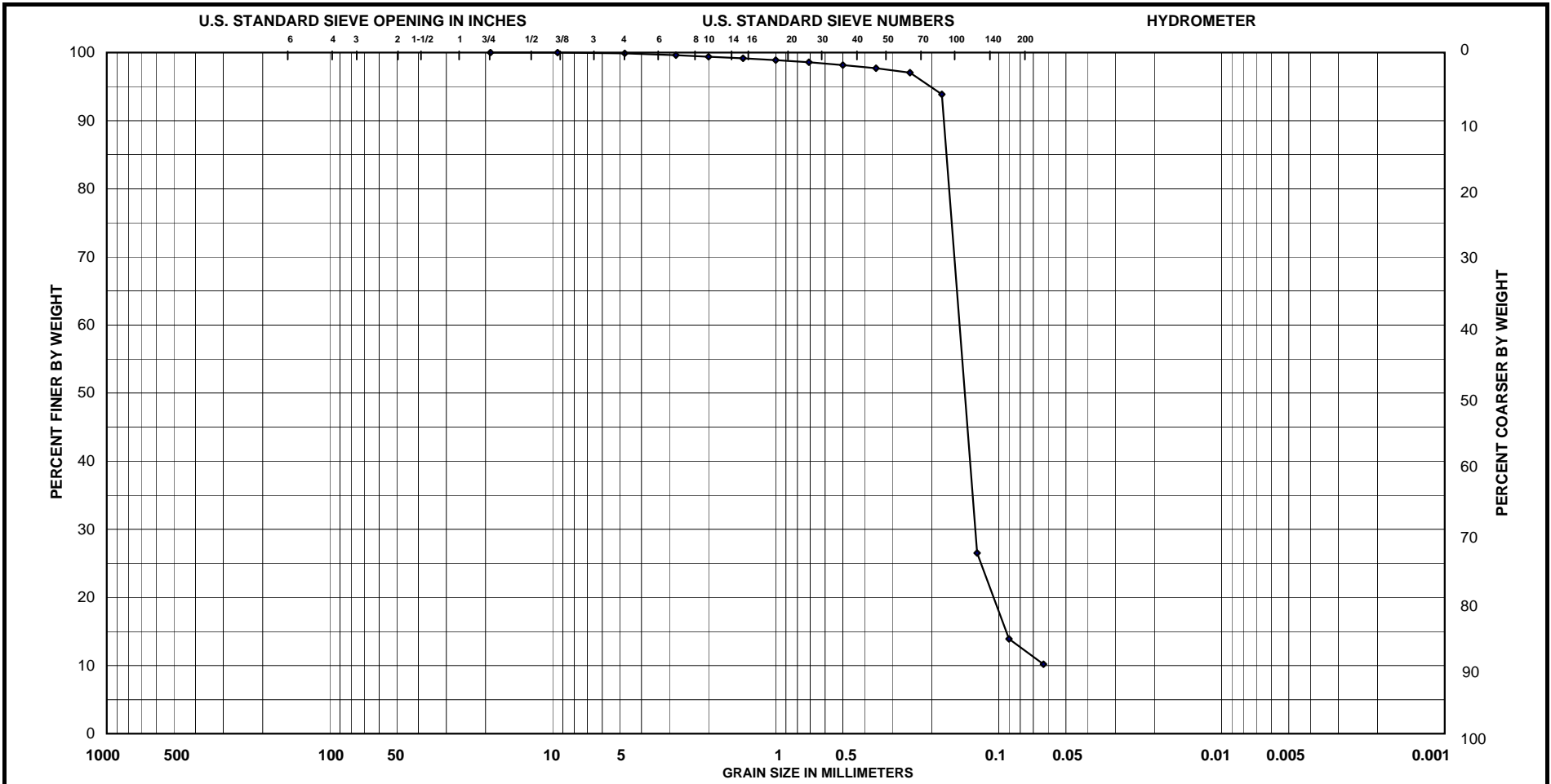
### GRAIN SIZE AND VISUAL SHELL CONTENT

Project:	<b>Topsail Beach, Surf City &amp; North Topsail</b>	Depth:	<b>54.0-54.5</b>
Project No.:	<b>1584-01-40</b>	Date:	<b>9/26/2003</b>
Boring No.:	<b>T1-03-V-190</b>		
Sample No.:	<b>4</b>		
Description:	<b>SAND, poorly-graded with silt, mostly fine-grained quartz, few silt, trace carbonate, trace fragmented limestone, olive gray (SP-SM)</b>		

Tare Weight, (g):	<b>49.48</b>	
Dry Wt. Before Washing (g):	<b>174.9</b>	(with tare)
Dry Weight After Washing (g):	<b>162.33</b>	(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	99.89	100	0.14
#7	2.800	0.35	99.61	100	0.35
#10	2.000	0.26	99.40	100	0.26
#14	1.400	0.32	99.15	90	0.29
#18	1.000	0.33	98.88	70	0.23
#25	0.710	0.37	98.59	65	0.24
#35	0.500	0.55	98.15	40	0.22
#45	0.355	0.58	97.69	20	0.12
#60	0.250	0.79	97.06	20	0.16
#80	0.180	4.01	93.86	3	0.12
#120	0.125	84.46	26.52	1	0.84
#170	0.090	15.81	13.91	1	0.16
#230	0.063	4.65	10.21	1	0.05

**Total Shell Content:** **3** %



COBBLES	GRAVEL		SAND			SILT OR CLAY
	COARSE	FINE	COARSE	MEDIUM	FINE	

Sample No.	Elev. Or Depth	Classification	% CO <sub>3</sub>	G <sub>s</sub>	Nat w%	LL	PL	PI	Project
4	54.0-54.5	SAND, poorly-graded with silt, mostly fine-grained quartz, few silt, trace carbonate, trace fragmented limestone, olive gray (SP-SM)	3						Topsail Beach, Surf City & North Topsail
									Area
									Boring No. T1-03-V-190
									Date 9/26/2003

**GRADATION CURVES**



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## VISUAL SHELL CONTENT

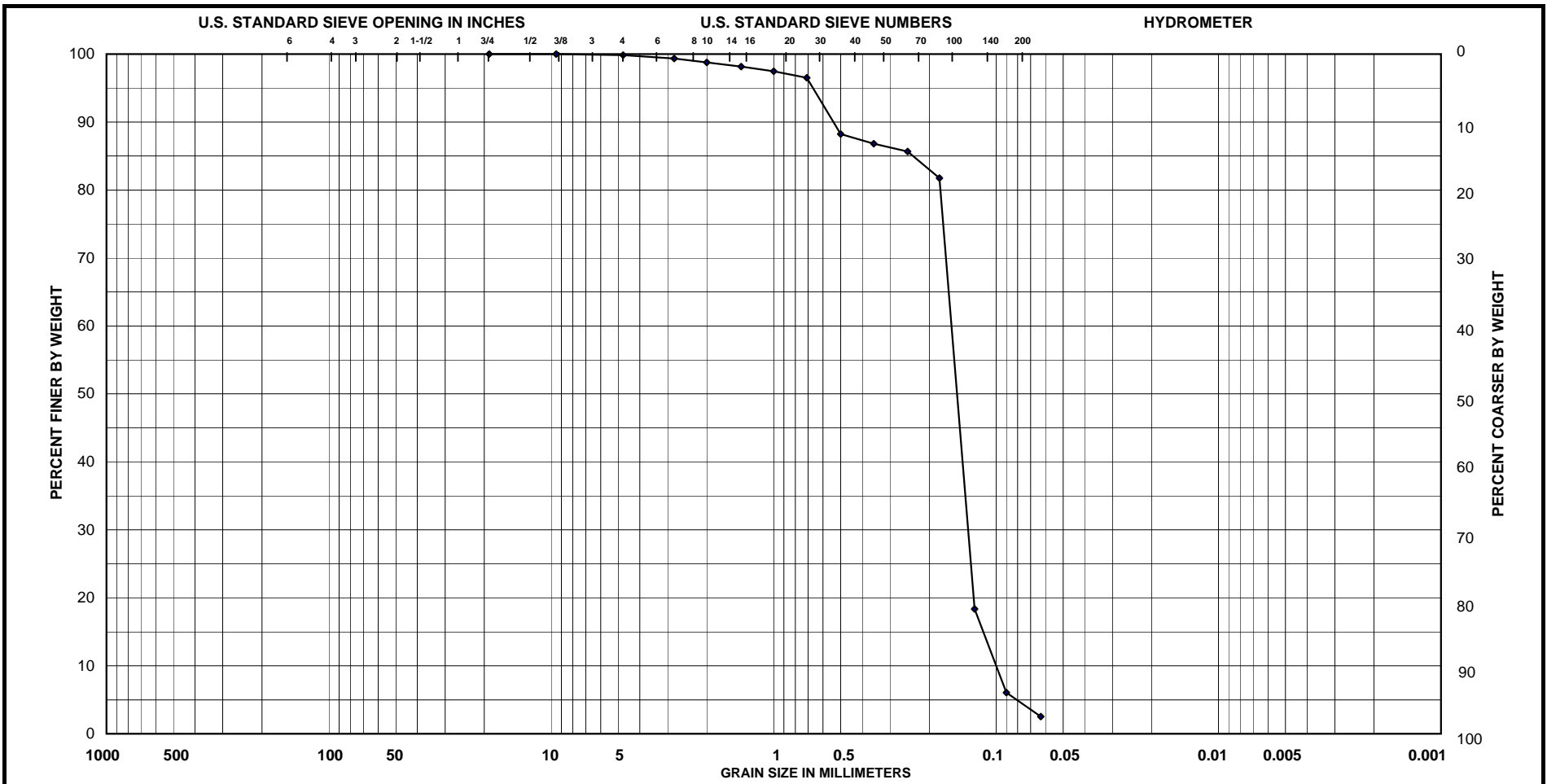
### GRAIN SIZE AND VISUAL SHELL CONTENT

Project:	<b>Topsail Beach, Surf City &amp; North Topsail</b>	Depth:	<b>57.0-57.5</b>
Project No.:	<b>1584-01-40</b>	Date:	<b>9/26/2003</b>
Boring No.:	<b>T1-03-V-190</b>		
Sample No.:	<b>5</b>		
Description:	<b>SAND, poorly-graded, mostly fine-grained quartz, few carbonate, olive gray (SP)</b>		

Tare Weight, (g):	<b>50.06</b>	
Dry Wt. Before Washing (g):	<b>170.13</b>	(with tare)
Dry Weight After Washing (g):	<b>159.31</b>	(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	0.17	99.86	100	0.17
#7	2.800	0.60	99.36	100	0.60
#10	2.000	0.71	98.77	100	0.71
#14	1.400	0.72	98.17	75	0.54
#18	1.000	0.85	97.46	80	0.68
#25	0.710	1.13	96.52	65	0.73
#35	0.500	9.96	88.22	40	3.98
#45	0.355	1.70	86.81	40	0.68
#60	0.250	1.35	85.68	40	0.54
#80	0.180	4.71	81.76	3	0.14
#120	0.125	76.13	18.36	1	0.76
#170	0.090	14.75	6.07	1	0.15
#230	0.063	4.23	2.55	1	0.04

**Total Shell Content:** **8** %



COBBLES	GRAVEL		SAND			SILT OR CLAY
	COARSE	FINE	COARSE	MEDIUM	FINE	

Sample No.	Elev. Or Depth	Classification	% CO <sub>3</sub>	G <sub>s</sub>	Nat w%	LL	PL	PI	Project
5	57.0-57.5	SAND, poorly-graded, mostly fine-grained quartz, few carbonate, olive gray (SP)	8						Topsail Beach, Surf City & North Topsail
									Area
									Boring No. T1-03-V-190
									Date 9/26/2003

**GRADATION CURVES**





# WOLF TECHNOLOGIES, INC.

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## VISUAL SHELL CONTENT

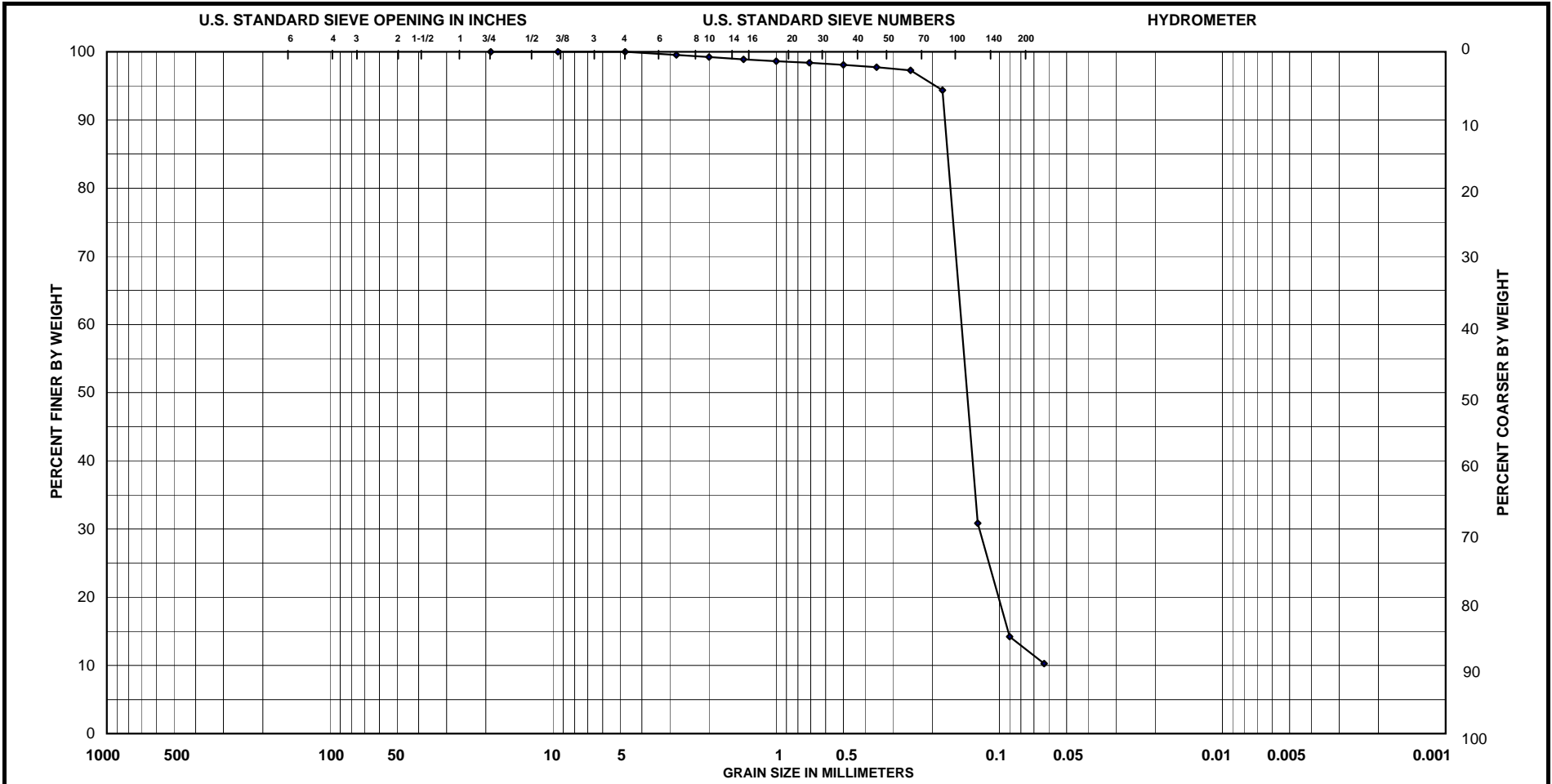
### GRAIN SIZE AND VISUAL SHELL CONTENT

Project:	<b>Topsail Beach, Surf City &amp; North Topsail</b>	Depth:	<b>59.0-59.5</b>
Project No.:	<b>1584-01-40</b>	Date:	<b>9/26/2003</b>
Boring No.:	<b>T1-03-V-190</b>		
Sample No.:	<b>6</b>		
Description:	<b>SAND, poorly-graded with silt, mostly fine-grained quartz, few silt, trace carbonate, trace fragmented limestone, olive gray (SP-SM)</b>		

Tare Weight, (g):	<b>49.80</b>	
Dry Wt. Before Washing (g):	<b>175.07</b>	(with tare)
Dry Weight After Washing (g):	<b>162.6</b>	(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	0.60	99.52	100	0.60
#10	2.000	0.38	99.22	90	0.34
#14	1.400	0.40	98.90	80	0.32
#18	1.000	0.35	98.62	75	0.26
#25	0.710	0.29	98.39	65	0.19
#35	0.500	0.39	98.08	40	0.16
#45	0.355	0.44	97.72	30	0.13
#60	0.250	0.56	97.27	10	0.06
#80	0.180	3.66	94.35	3	0.11
#120	0.125	79.53	30.87	1	0.80
#170	0.090	20.83	14.24	1	0.21
#230	0.063	4.99	10.25	1	0.05

**Total Shell Content:** **3** %



COBBLES	GRAVEL		SAND			SILT OR CLAY
	COARSE	FINE	COARSE	MEDIUM	FINE	

Sample No.	Elev. Or Depth	Classification	% CO <sub>3</sub>	G <sub>s</sub>	Nat w%	LL	PL	PI	Project	
6	59.0-59.5	SAND, poorly-graded with silt, mostly fine-grained quartz, few silt, trace carbonate, trace fragmented limestone, olive gray (SP-SM)	3						Topsail Beach, Surf City & North Topsail	
			Area							
			Boring No. T1-03-V-190							
			Date 9/26/2003							

**GRADATION CURVES**



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## VISUAL SHELL CONTENT

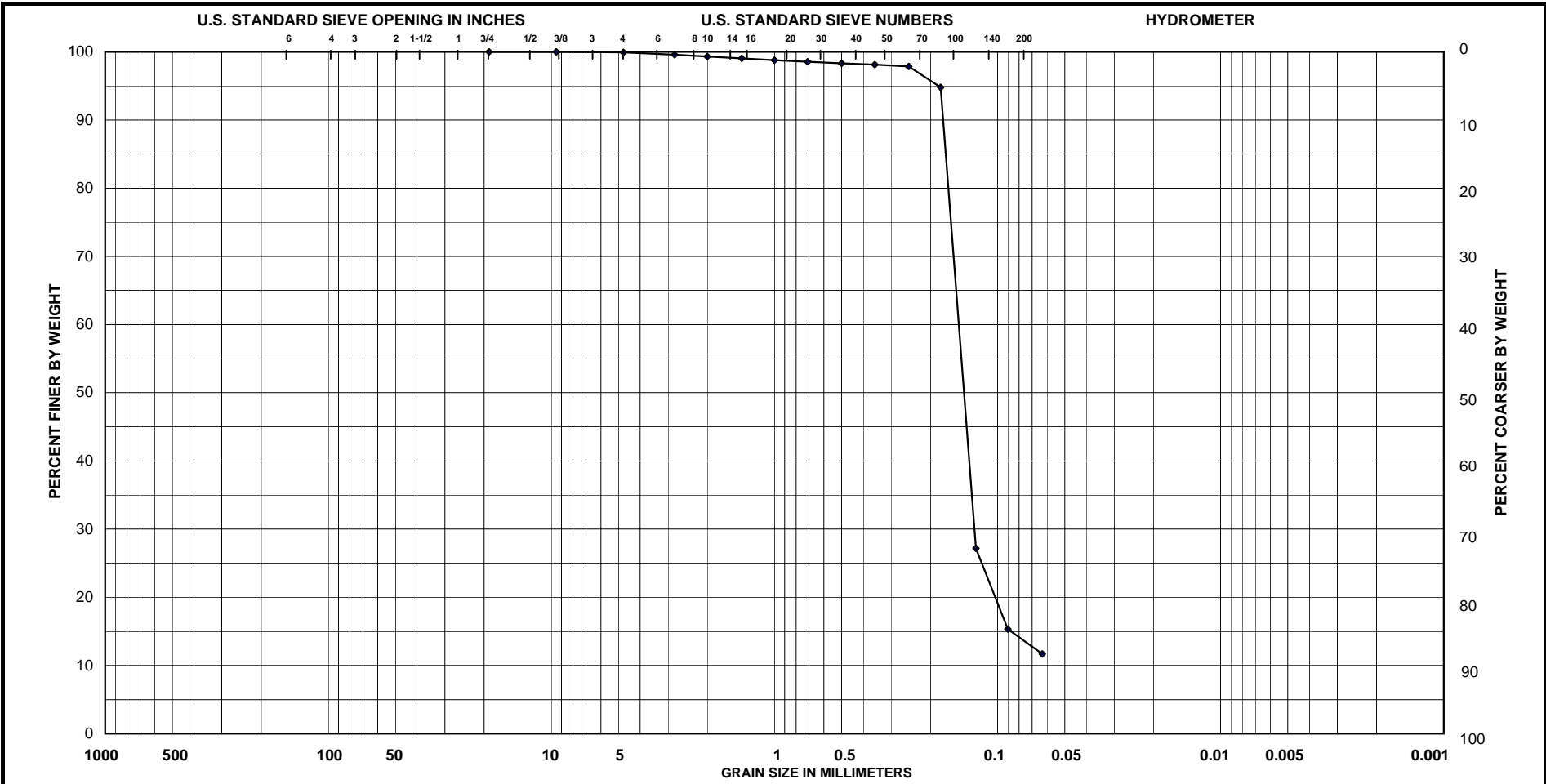
### GRAIN SIZE AND VISUAL SHELL CONTENT

Project:	<b>Topsail Beach, Surf City &amp; North Topsail</b>	Depth:	<b>61.0-61.5</b>
Project No.:	<b>1584-01-40</b>	Date:	<b>9/26/2003</b>
Boring No.:	<b>T1-03-V-190</b>		
Sample No.:	<b>7</b>		
Description:	<b>SAND, poorly-graded with silt, mostly fine-grained quartz, few silt, trace carbonate, trace fragmented limestone, olive gray (SP-SM)</b>		

Tare Weight, (g):	<b>50.08</b>	
Dry Wt. Before Washing (g):	<b>175</b>	(with tare)
Dry Weight After Washing (g):	<b>160.67</b>	(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	0.11	99.91	100	0.11
#7	2.800	0.42	99.58	90	0.38
#10	2.000	0.34	99.30	90	0.31
#14	1.400	0.31	99.06	85	0.26
#18	1.000	0.35	98.78	75	0.26
#25	0.710	0.29	98.54	50	0.15
#35	0.500	0.28	98.32	25	0.07
#45	0.355	0.24	98.13	15	0.04
#60	0.250	0.32	97.87	10	0.03
#80	0.180	3.84	94.80	3	0.12
#120	0.125	84.48	27.17	1	0.84
#170	0.090	14.81	15.31	1	0.15
#230	0.063	4.55	11.67	1	0.05

**Total Shell Content:** **2** %



COBBLES	GRAVEL		SAND			SILT OR CLAY
	COARSE	FINE	COARSE	MEDIUM	FINE	

Sample No.	Elev. Or Depth	Classification	% CO <sub>3</sub>	G <sub>s</sub>	Nat w%	LL	PL	PI	Project	
7	61.0-61.5	SAND, poorly-graded with silt, mostly fine-grained quartz, few silt, trace carbonate, trace fragmented limestone, olive gray (SP-SM)	2						Topsail Beach, Surf City & North Topsail	
									Area	
									Boring No. T1-03-V-190	
									Date 9/26/2003	

**GRADATION CURVES**



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## VISUAL SHELL CONTENT

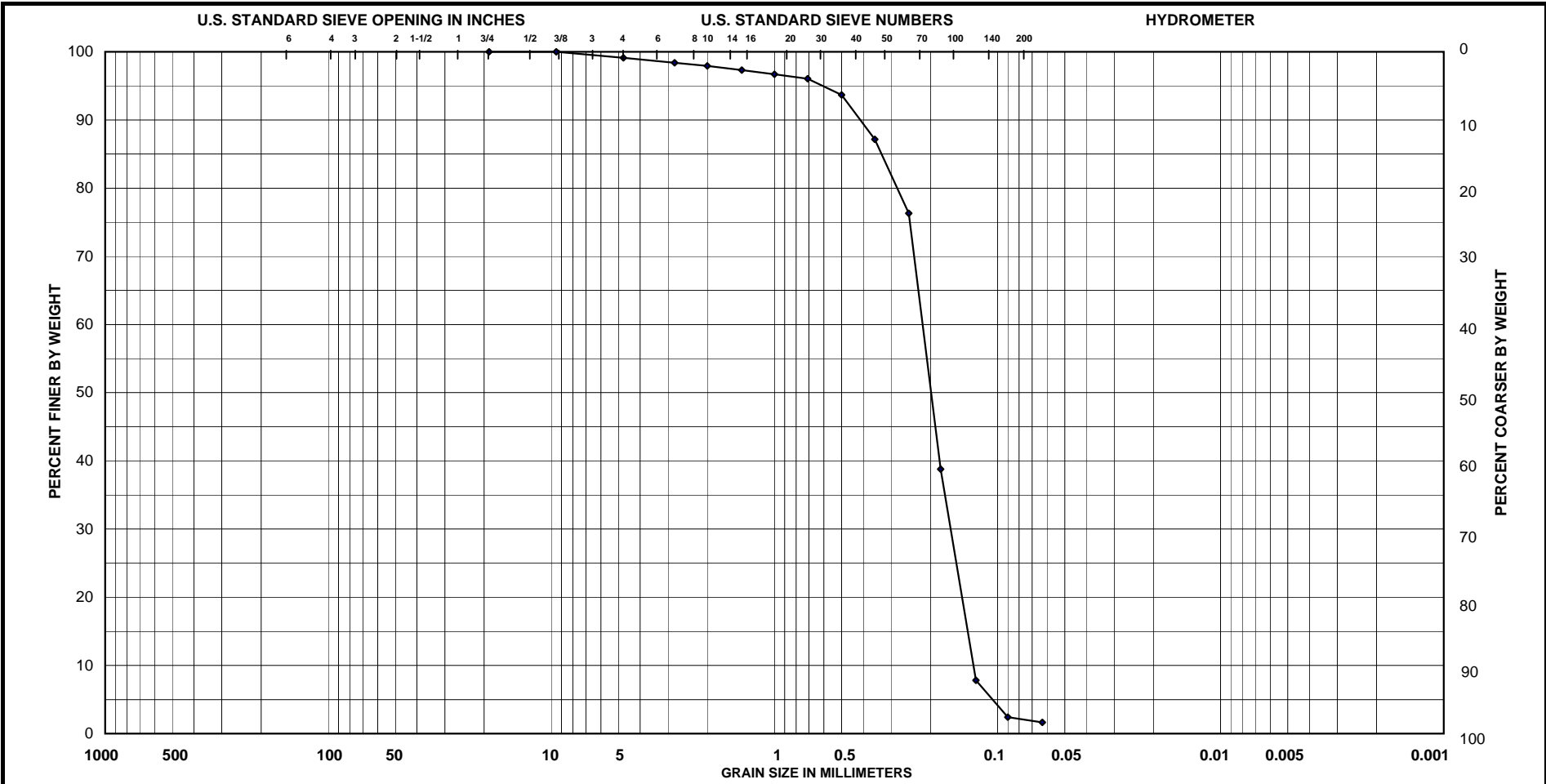
### GRAIN SIZE AND VISUAL SHELL CONTENT

Project:	<b>Topsail Beach, Surf City &amp; North Topsail</b>	Depth:	<b>47.2-47.7</b>
Project No.:	<b>1584-01-40</b>	Date:	<b>9/26/2003</b>
Boring No.:	<b>T1-03-V-191</b>		
Sample No.:	<b>1</b>		
Description:	<b>SAND, poorly-graded, mostly fine-grained quartz, few carbonate, dark greenish gray (SP)</b>		

Tare Weight, (g):	<b>49.83</b>	
Dry Wt. Before Washing (g):	<b>171.38</b>	(with tare)
Dry Weight After Washing (g):	<b>169.62</b>	(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	1.06	99.13	100	1.06
#7	2.800	0.92	98.37	100	0.92
#10	2.000	0.53	97.94	90	0.48
#14	1.400	0.75	97.32	60	0.45
#18	1.000	0.75	96.70	60	0.45
#25	0.710	0.79	96.05	40	0.32
#35	0.500	2.87	93.69	20	0.57
#45	0.355	7.93	87.17	10	0.79
#60	0.250	13.19	76.31	3	0.40
#80	0.180	45.63	38.77	1	0.46
#120	0.125	37.61	7.83	1	0.38
#170	0.090	6.57	2.43	1	0.07
#230	0.063	0.96	1.64	1	0.01

**Total Shell Content:** **5** %



COBBLES	GRAVEL		SAND			SILT OR CLAY
	COARSE	FINE	COARSE	MEDIUM	FINE	

Sample No.	Elev. Or Depth	Classification	% CO <sub>3</sub>	G <sub>s</sub>	Nat w%	LL	PL	PI	Project
♦ 1	47.2-47.7	SAND, poorly-graded, mostly fine-grained quartz, few carbonate, dark greenish gray (SP)	5						Topsail Beach, Surf City & North Topsail
									Area
									Boring No. T1-03-V-191
									Date 9/26/2003

**GRADATION CURVES**



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## VISUAL SHELL CONTENT

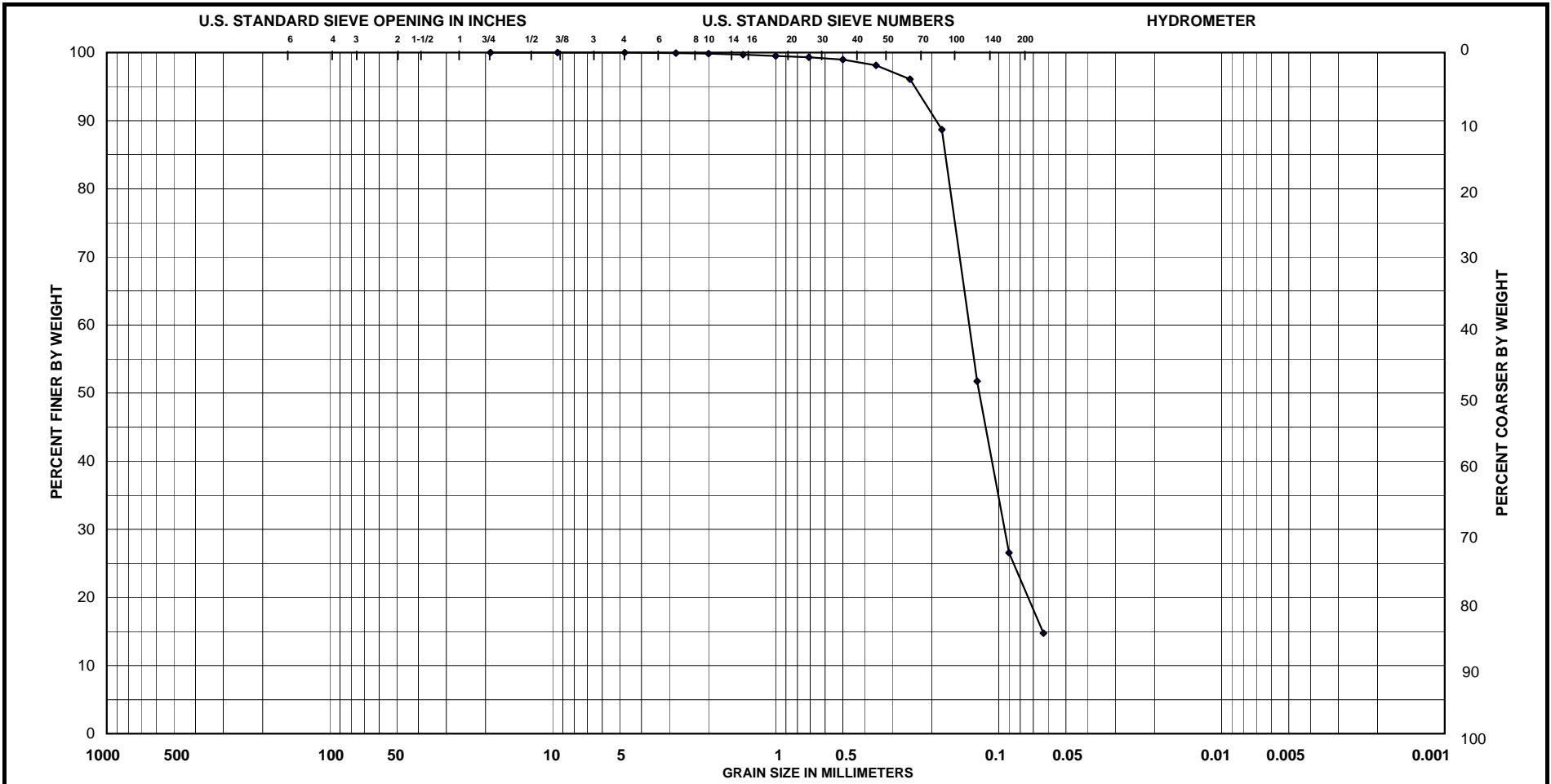
### GRAIN SIZE AND VISUAL SHELL CONTENT

Project:	<b>Topsail Beach, Surf City &amp; North Topsail</b>	Depth:	<b>48.0-48.5</b>
Project No.:	<b>1584-01-40</b>	Date:	<b>9/26/2003</b>
Boring No.:	<b>T1-03-V-191</b>		
Sample No.:	<b>2</b>		
Description:	<b>SAND, silty, mostly fine-grained quartz, little silt, trace carbonate, dark greenish gray (SM)</b>		

Tare Weight, (g):	<b>49.01</b>	
Dry Wt. Before Washing (g):	<b>173.93</b>	(with tare)
Dry Weight After Washing (g):	<b>155.75</b>	(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	99.94	100	0.08
#10	2.000	0.11	99.85	70	0.08
#14	1.400	0.21	99.68	50	0.11
#18	1.000	0.23	99.50	70	0.16
#25	0.710	0.22	99.32	40	0.09
#35	0.500	0.42	98.98	30	0.13
#45	0.355	1.06	98.13	10	0.11
#60	0.250	2.56	96.09	5	0.13
#80	0.180	9.23	88.70	3	0.28
#120	0.125	46.18	51.73	1	0.46
#170	0.090	31.43	26.57	1	0.31
#230	0.063	14.77	14.75	1	0.15

**Total Shell Content:** **2** %



COBBLES	GRAVEL		SAND			SILT OR CLAY
	COARSE	FINE	COARSE	MEDIUM	FINE	

Sample No.	Elev. Or Depth	Classification	% CO <sub>3</sub>	G <sub>s</sub>	Nat w%	LL	PL	PI	Project	
♦ 2	48.0-48.5	SAND, silty, mostly fine-grained quartz, little silt, trace carbonate, dark greenish gray (SM)	2						Topsail Beach, Surf City & North Topsail	
									Area	
									Boring No. T1-03-V-191	
									Date 9/26/2003	

**GRADATION CURVES**





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## VISUAL SHELL CONTENT

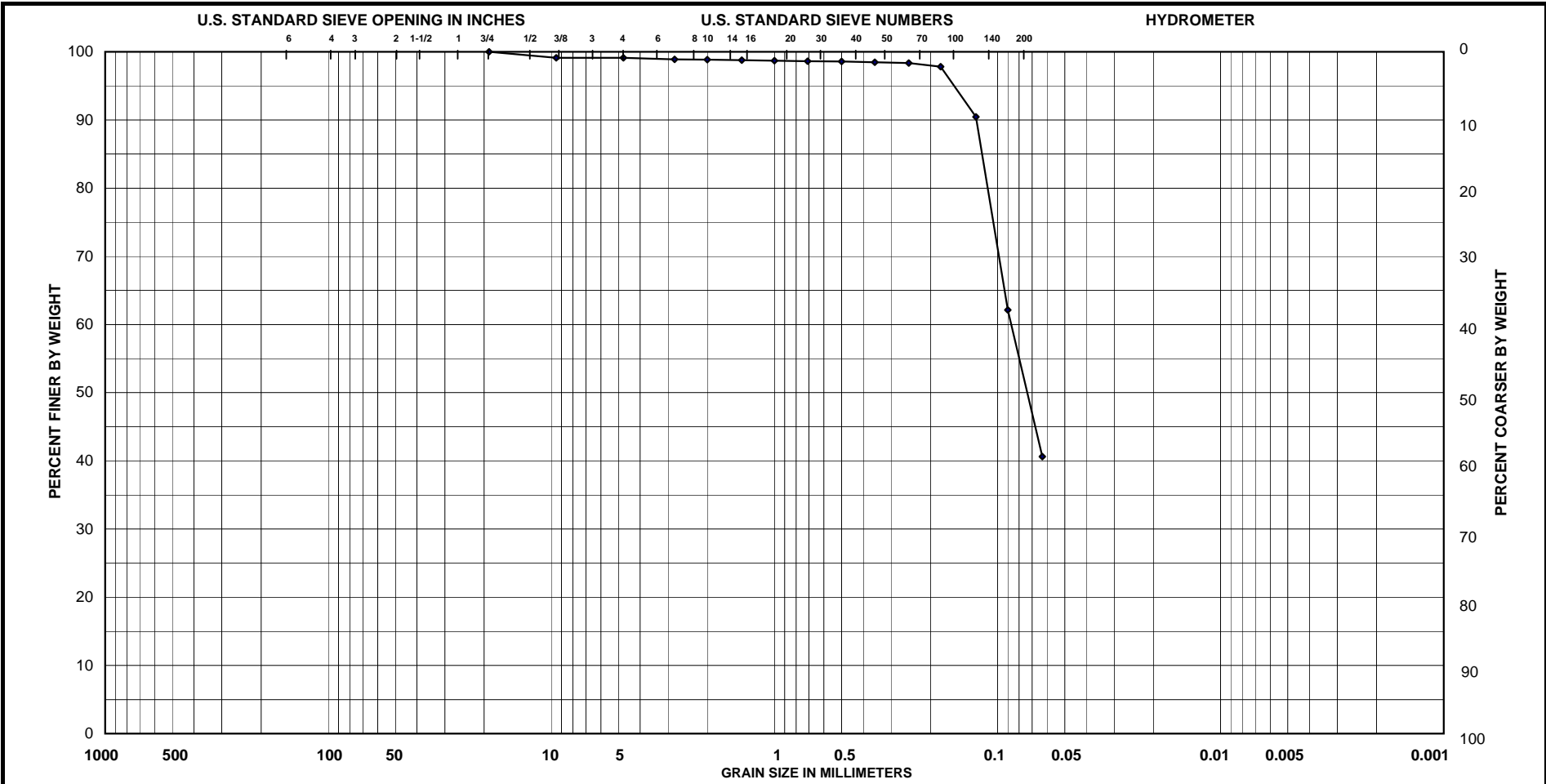
### GRAIN SIZE AND VISUAL SHELL CONTENT

Project:	<b>Topsail Beach, Surf City &amp; North Topsail</b>	Depth:	<b>51.7-52.2</b>
Project No.:	<b>1584-01-40</b>	Date:	<b>9/26/2003</b>
Boring No.:	<b>T1-03-V-191</b>		
Sample No.:	<b>3</b>		
Description:	<b>SAND, clayey, mostly fine-grained quartz, some clay, trace carbonate, dark greenish gray (SC)</b>		

Tare Weight, (g):	<b>50.12</b>	
Dry Wt. Before Washing (g):	<b>163.92</b>	(with tare)
Dry Weight After Washing (g):	<b>119.04</b>	(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	0.99	99.13	100	0.99
#4	4.750	0.00	99.13	0	0.00
#7	2.800	0.29	98.88	100	0.29
#10	2.000	0.02	98.86	100	0.02
#14	1.400	0.10	98.77	40	0.04
#18	1.000	0.08	98.70	70	0.06
#25	0.710	0.07	98.64	60	0.04
#35	0.500	0.08	98.57	40	0.03
#45	0.355	0.10	98.48	10	0.01
#60	0.250	0.15	98.35	3	0.00
#80	0.180	0.61	97.81	3	0.02
#120	0.125	8.37	90.46	1	0.08
#170	0.090	32.23	62.14	1	0.32
#230	0.063	24.46	40.64	1	0.24

**Total Shell Content:** **2** %



COBBLES	GRAVEL		SAND			SILT OR CLAY
	COARSE	FINE	COARSE	MEDIUM	FINE	

Sample No.	Elev. Or Depth	Classification	% CO <sub>3</sub>	G <sub>s</sub>	Nat w%	LL	PL	PI	Project	
♦ 3	51.7-52.2	SAND, clayey, mostly fine-grained quartz, some clay, trace carbonate, dark greenish gray (SC)	2						Topsail Beach, Surf City & North Topsail	
									Area	
									Boring No. T1-03-V-191	
									Date 9/26/2003	

**GRADATION CURVES**



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## VISUAL SHELL CONTENT

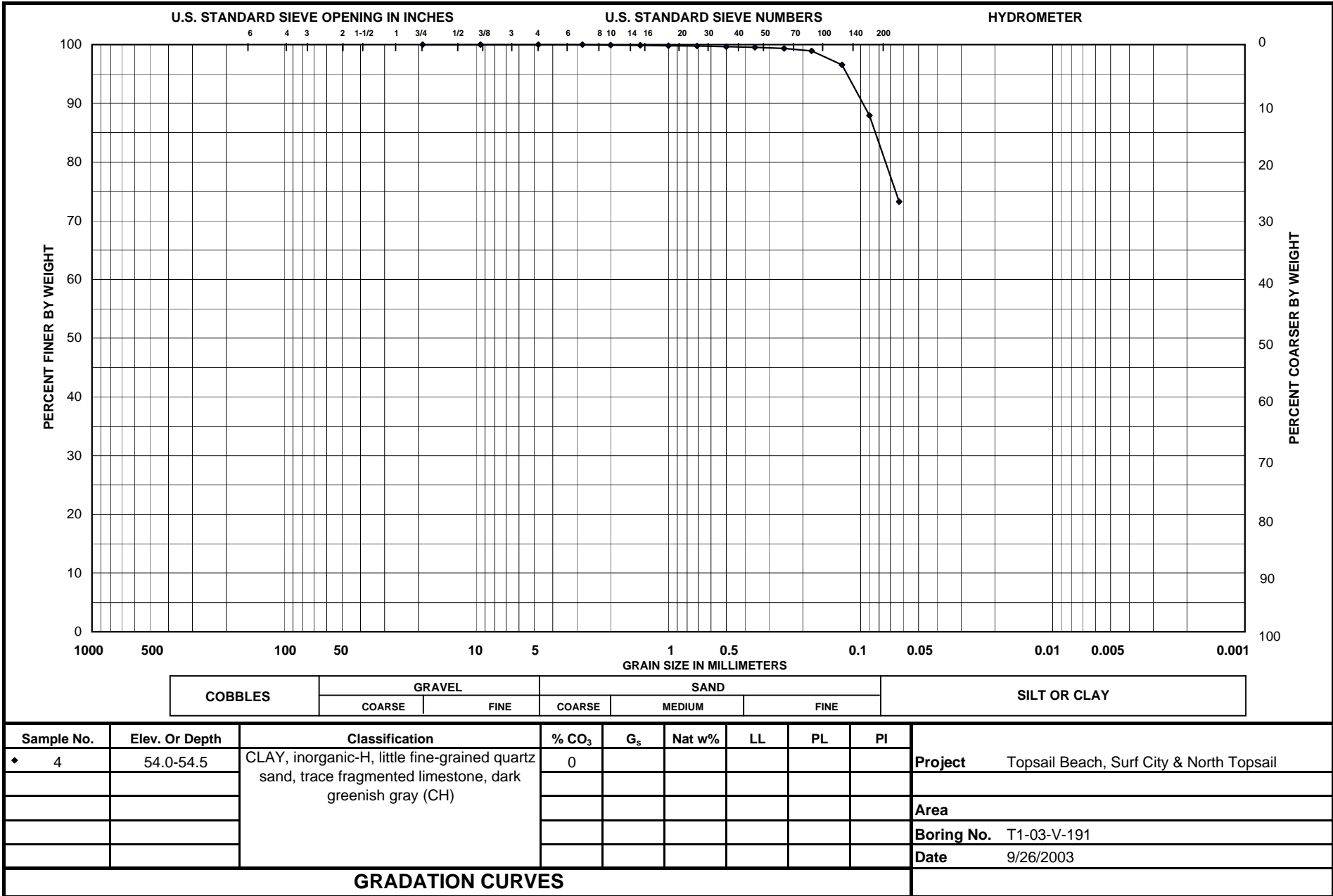
### GRAIN SIZE AND VISUAL SHELL CONTENT

Project:	<b>Topsail Beach, Surf City &amp; North Topsail</b>	Depth:	<b>54.0-54.5</b>
Project No.:	<b>1584-01-40</b>	Date:	<b>9/26/2003</b>
Boring No.:	<b>T1-03-V-191</b>		
Sample No.:	<b>4</b>		
Description:	<b>CLAY, inorganic-H, little fine-grained quartz sand, trace fragmented limestone, dark greenish gray (CH)</b>		

Tare Weight, (g):	<b>50.02</b>	
Dry Wt. Before Washing (g):	<b>146.47</b>	(with tare)
Dry Weight After Washing (g):	<b>76.46</b>	(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	0.06	99.94	25	0.02
#14	1.400	0.05	99.89	20	0.01
#18	1.000	0.08	99.80	40	0.03
#25	0.710	0.02	99.78	20	0.00
#35	0.500	0.12	99.66	3	0.00
#45	0.355	0.13	99.52	1	0.00
#60	0.250	0.18	99.34	1	0.00
#80	0.180	0.41	98.91	1	0.00
#120	0.125	2.26	96.57	1	0.02
#170	0.090	8.32	87.94	1	0.08
#230	0.063	14.16	73.26	1	0.14

**Total Shell Content:** **0** %





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## VISUAL SHELL CONTENT

### GRAIN SIZE AND VISUAL SHELL CONTENT

Project:	<b>Topsail Beach, Surf City &amp; North Topsail</b>	Depth:	<b>56.2-56.7</b>
Project No.:	<b>1584-01-40</b>	Date:	<b>9/26/2003</b>
Boring No.:	<b>T1-03-V-191</b>		
Sample No.:	<b>5</b>		
Description:	<b>SAND, clayey, mostly fine-grained quartz, little clay, trace carbonate, trace fragmented limestone, dark greenish gray (SC)</b>		

Tare Weight, (g):	<b>50.11</b>	
Dry Wt. Before Washing (g):	<b>169.97</b>	(with tare)
Dry Weight After Washing (g):	<b>137.34</b>	(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	0.29	99.76	100	0.29
#7	2.800	0.60	99.26	100	0.60
#10	2.000	0.16	99.12	100	0.16
#14	1.400	0.53	98.68	70	0.37
#18	1.000	0.76	98.05	65	0.49
#25	0.710	0.75	97.42	45	0.34
#35	0.500	1.30	96.34	35	0.46
#45	0.355	1.88	94.77	20	0.38
#60	0.250	2.96	92.30	5	0.15
#80	0.180	12.20	82.12	3	0.37
#120	0.125	35.84	52.22	1	0.36
#170	0.090	15.87	38.98	1	0.16
#230	0.063	13.56	27.67	1	0.14

**Total Shell Content:** **4** %





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## VISUAL SHELL CONTENT

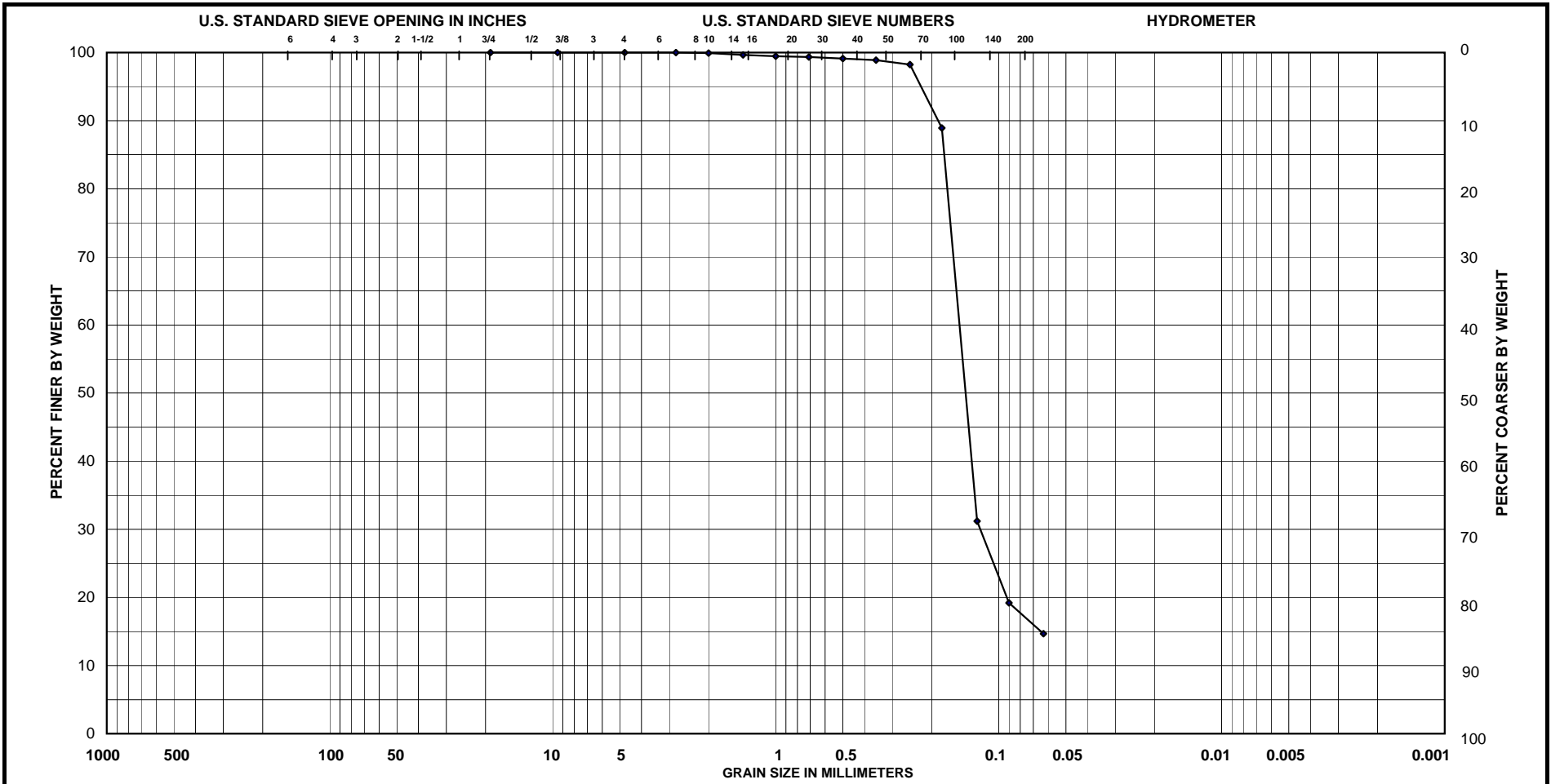
### GRAIN SIZE AND VISUAL SHELL CONTENT

Project:	<b>Topsail Beach, Surf City &amp; North Topsail</b>	Depth:	<b>59.0-59.5</b>
Project No.:	<b>1584-01-40</b>	Date:	<b>9/26/2003</b>
Boring No.:	<b>T1-03-V-191</b>		
Sample No.:	<b>6</b>		
Description:	<b>SAND, poorly-graded with silt, mostly fine-grained quartz, little silt, trace carbonate, dark greenish gray (SP-SM)</b>		

Tare Weight, (g):	<b>50.30</b>	
Dry Wt. Before Washing (g):	<b>169.62</b>	(with tare)
Dry Weight After Washing (g):	<b>152.65</b>	(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	0.09	99.91	30	0.03
#14	1.400	0.32	99.64	5	0.02
#18	1.000	0.21	99.46	5	0.01
#25	0.710	0.14	99.35	75	0.11
#35	0.500	0.26	99.13	55	0.14
#45	0.355	0.29	98.89	15	0.04
#60	0.250	0.78	98.23	5	0.04
#80	0.180	11.12	88.91	3	0.33
#120	0.125	68.85	31.21	1	0.69
#170	0.090	14.35	19.18	1	0.14
#230	0.063	5.37	14.68	1	0.05

**Total Shell Content:** **1** %



COBBLES	GRAVEL		SAND			SILT OR CLAY
	COARSE	FINE	COARSE	MEDIUM	FINE	

Sample No.	Elev. Or Depth	Classification	% CO <sub>3</sub>	G <sub>s</sub>	Nat w%	LL	PL	PI	Project	
6	59.0-59.5	SAND, poorly-graded with silt, mostly fine-grained quartz, little silt, trace carbonate, dark greenish gray (SP-SM)	1						Topsail Beach, Surf City & North Topsail	
									Area	
									Boring No. T1-03-V-191	
									Date 9/26/2003	

**GRADATION CURVES**





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## VISUAL SHELL CONTENT

### GRAIN SIZE AND VISUAL SHELL CONTENT

Project:	<b>Topsail Beach, Surf City &amp; North Topsail</b>	Depth:	<b>62.0-62.5</b>
Project No.:	<b>1584-01-40</b>	Date:	<b>9/26/2003</b>
Boring No.:	<b>T1-03-V-191</b>		
Sample No.:	<b>7</b>		
Description:	<b>SAND, silty, mostly fine-grained quartz, little silt, trace carbonate, dark greenish gray (SM)</b>		

Tare Weight, (g):	<b>50.23</b>	
Dry Wt. Before Washing (g):	<b>169.6</b>	(with tare)
Dry Weight After Washing (g):	<b>148.48</b>	(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	0.03	99.96	70	0.02
#14	1.400	0.14	99.84	15	0.02
#18	1.000	0.17	99.70	30	0.05
#25	0.710	0.17	99.56	20	0.03
#35	0.500	0.15	99.43	10	0.02
#45	0.355	0.23	99.24	10	0.02
#60	0.250	0.35	98.94	3	0.01
#80	0.180	5.17	94.61	1	0.05
#120	0.125	64.71	40.40	1	0.65
#170	0.090	18.24	25.12	1	0.18
#230	0.063	8.29	18.18	1	0.08

**Total Shell Content:** **1** %





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## VISUAL SHELL CONTENT

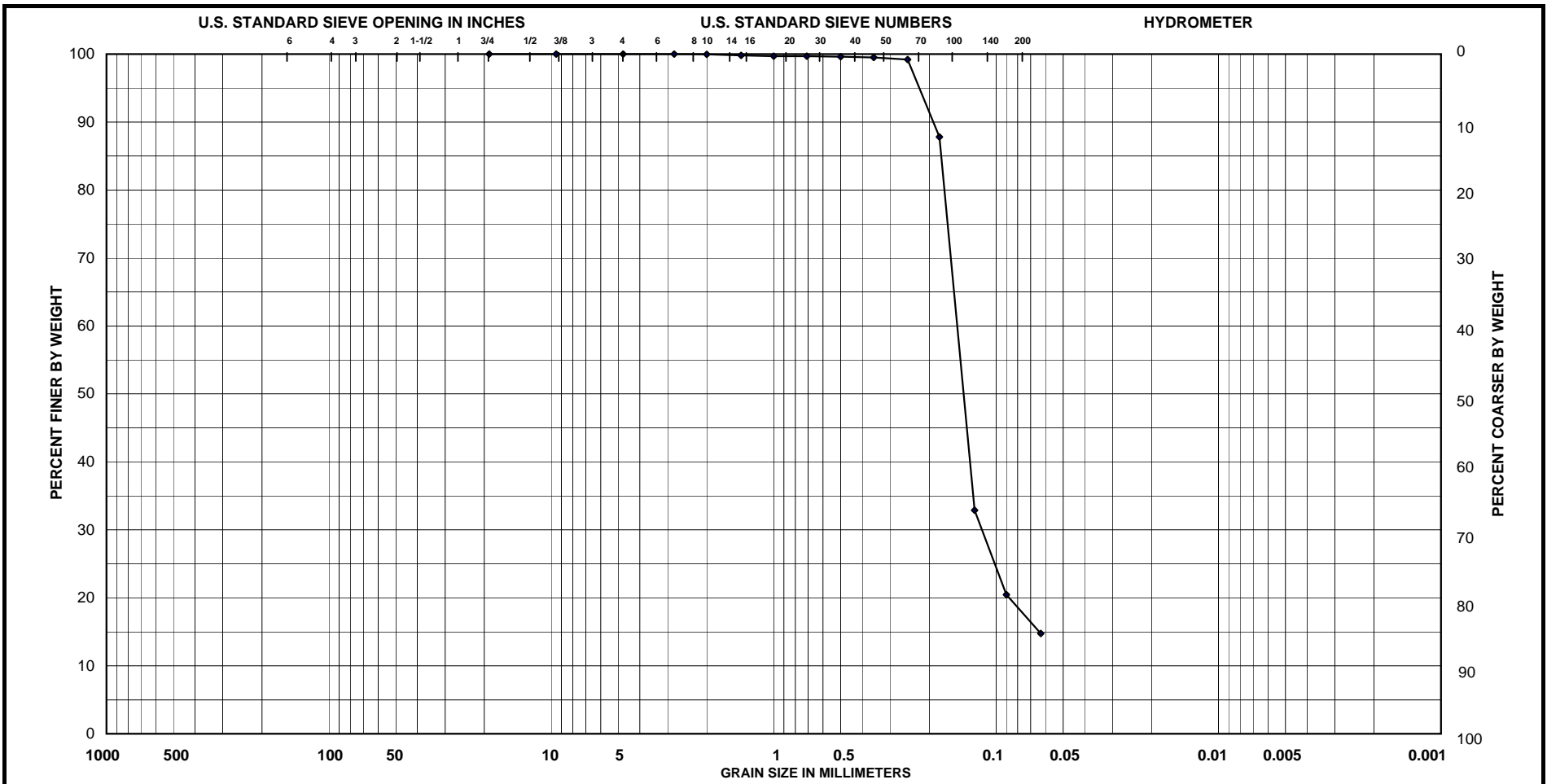
### GRAIN SIZE AND VISUAL SHELL CONTENT

Project:	<b>Topsail Beach, Surf City &amp; North Topsail</b>	Depth:	<b>66.2-66.7</b>
Project No.:	<b>1584-01-40</b>	Date:	<b>9/26/2003</b>
Boring No.:	<b>T1-03-V-191</b>		
Sample No.:	<b>8</b>		
Description:	<b>SAND, silty, mostly fine-grained quartz, little silt, trace carbonate, dark greenish gray (SM)</b>		

Tare Weight, (g):	<b>50.01</b>	
Dry Wt. Before Washing (g):	<b>173.13</b>	(with tare)
Dry Weight After Washing (g):	<b>155.72</b>	(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	0	0.00
#10	2.000	0.06	99.94	60	0.04
#14	1.400	0.17	99.81	10	0.02
#18	1.000	0.13	99.70	15	0.02
#25	0.710	0.03	99.68	10	0.00
#35	0.500	0.06	99.63	10	0.01
#45	0.355	0.13	99.52	10	0.01
#60	0.250	0.42	99.18	3	0.01
#80	0.180	13.99	87.82	1	0.14
#120	0.125	67.62	32.89	1	0.68
#170	0.090	15.31	20.46	1	0.15
#230	0.063	7.02	14.76	1	0.07

**Total Shell Content:** **1** %



COBBLES	GRAVEL		SAND			SILT OR CLAY
	COARSE	FINE	COARSE	MEDIUM	FINE	

Sample No.	Elev. Or Depth	Classification	% CO <sub>3</sub>	G <sub>s</sub>	Nat w%	LL	PL	PI	Project
8	66.2-66.7	SAND, silty, mostly fine-grained quartz, little silt, trace carbonate, dark greenish gray (SM)	1						Topsail Beach, Surf City & North Topsail
									Area
									Boring No. T1-03-V-191
									Date 9/26/2003

**GRADATION CURVES**



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## VISUAL SHELL CONTENT

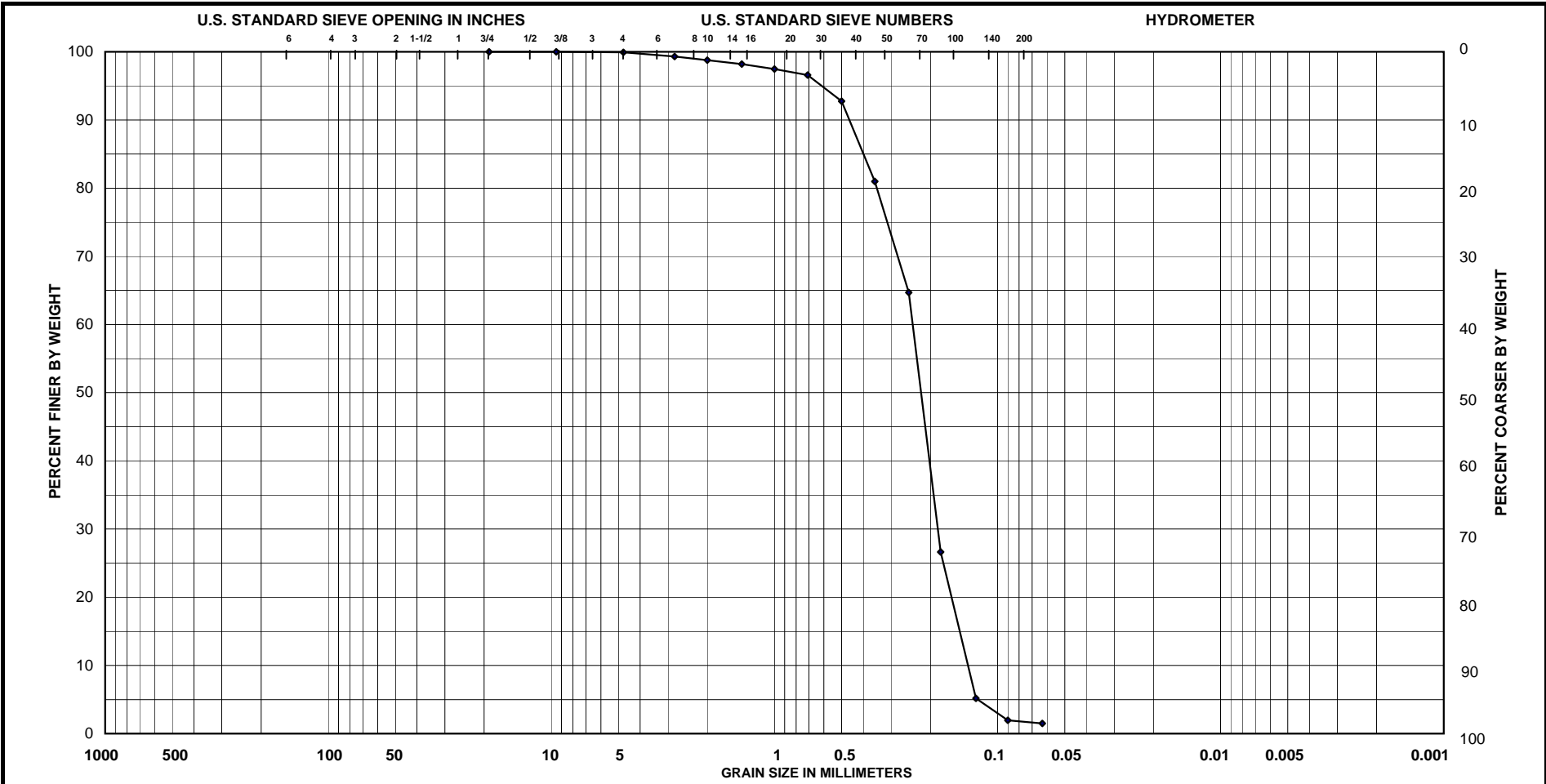
### GRAIN SIZE AND VISUAL SHELL CONTENT

Project:	<b>Topsail Beach, Surf City &amp; North Topsail</b>	Depth:	<b>47.0-47.5</b>
Project No.:	<b>1584-01-40</b>	Date:	<b>9/26/2003</b>
Boring No.:	<b>T1-03-V-192</b>		
Sample No.:	<b>1</b>		
Description:	<b>SAND, poorly-graded, mostly fine-grained quartz, few carbonate, dark greenish gray (SP)</b>		

Tare Weight, (g):	<b>49.66</b>	
Dry Wt. Before Washing (g):	<b>169.68</b>	(with tare)
Dry Weight After Washing (g):	<b>168.16</b>	(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	0.08	99.93	100	0.08
#7	2.800	0.77	99.29	100	0.77
#10	2.000	0.63	98.77	100	0.63
#14	1.400	0.70	98.18	90	0.63
#18	1.000	0.84	97.48	90	0.76
#25	0.710	1.07	96.59	80	0.86
#35	0.500	4.60	92.76	30	1.38
#45	0.355	14.12	80.99	15	2.12
#60	0.250	19.54	64.71	5	0.98
#80	0.180	45.69	26.65	1	0.46
#120	0.125	25.78	5.17	1	0.26
#170	0.090	3.84	1.97	1	0.04
#230	0.063	0.55	1.51	1	0.01

**Total Shell Content:** **7** %



COBBLES	GRAVEL		SAND			SILT OR CLAY
	COARSE	FINE	COARSE	MEDIUM	FINE	

Sample No.	Elev. Or Depth	Classification	% CO <sub>3</sub>	G <sub>s</sub>	Nat w%	LL	PL	PI	Project
1	47.0-47.5	SAND, poorly-graded, mostly fine-grained quartz, few carbonate, dark greenish gray (SP)	7						Topsail Beach, Surf City & North Topsail
									Area
									Boring No. T1-03-V-192
									Date 9/26/2003

**GRADATION CURVES**



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## VISUAL SHELL CONTENT

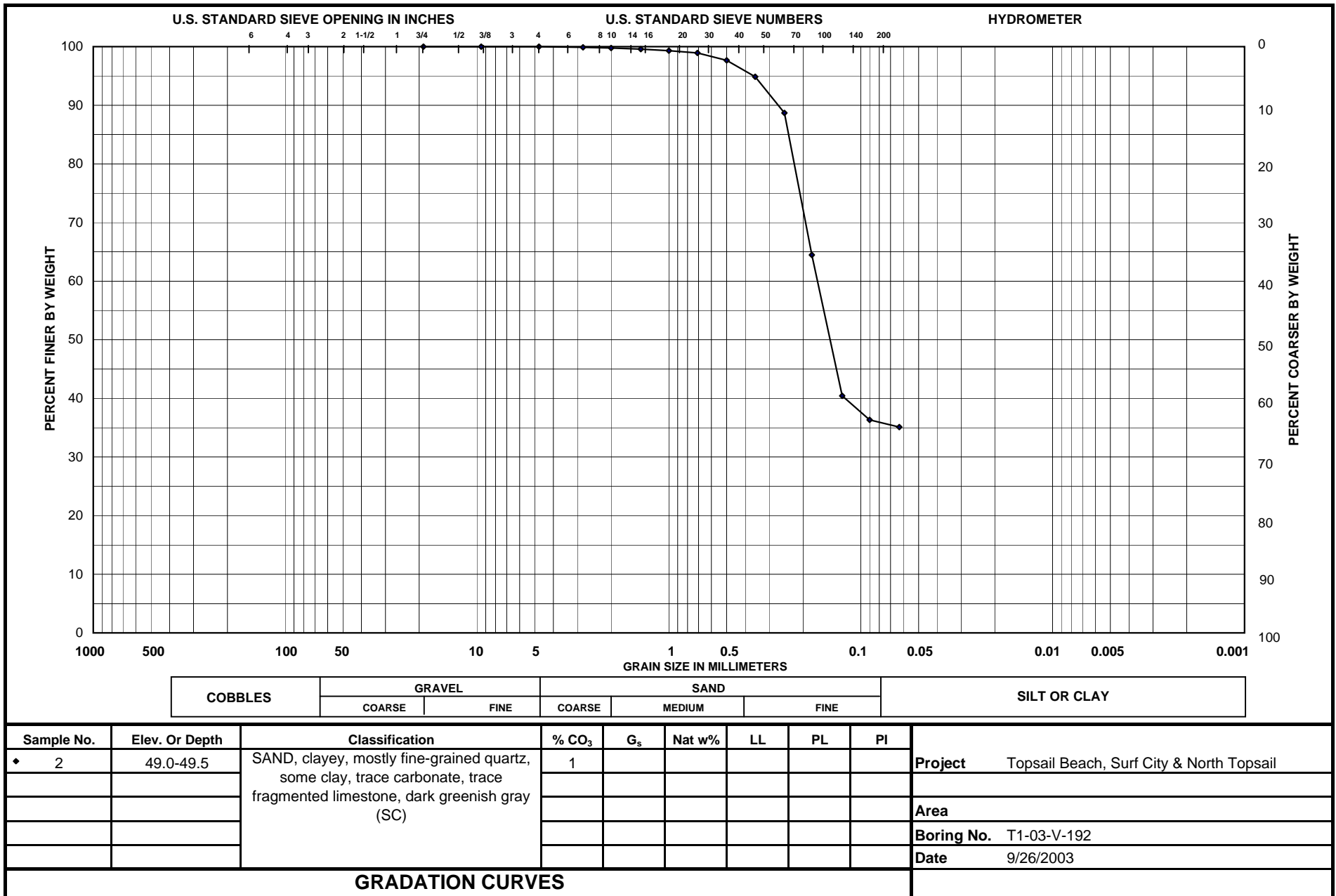
### GRAIN SIZE AND VISUAL SHELL CONTENT

Project:	<b>Topsail Beach, Surf City &amp; North Topsail</b>	Depth:	<b>49.0-49.5</b>
Project No.:	<b>1584-01-40</b>	Date:	<b>9/26/2003</b>
Boring No.:	<b>T1-03-V-192</b>		
Sample No.:	<b>2</b>		
Description:	<b>SAND, clayey, mostly fine-grained quartz, some clay, trace carbonate, trace fragmented limestone, dark greenish gray (SC)</b>		

Tare Weight, (g):	<b>49.32</b>	
Dry Wt. Before Washing (g):	<b>163.05</b>	(with tare)
Dry Weight After Washing (g):	<b>123.37</b>	(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	0.14	99.88	100	0.14
#10	2.000	0.12	99.77	70	0.08
#14	1.400	0.21	99.59	40	0.08
#18	1.000	0.32	99.31	20	0.06
#25	0.710	0.45	98.91	3	0.01
#35	0.500	1.41	97.67	3	0.04
#45	0.355	3.17	94.88	1	0.03
#60	0.250	7.05	88.68	1	0.07
#80	0.180	27.55	64.46	1	0.28
#120	0.125	27.31	40.45	1	0.27
#170	0.090	4.68	36.33	1	0.05
#230	0.063	1.38	35.12	1	0.01

**Total Shell Content:** **1** %







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## VISUAL SHELL CONTENT

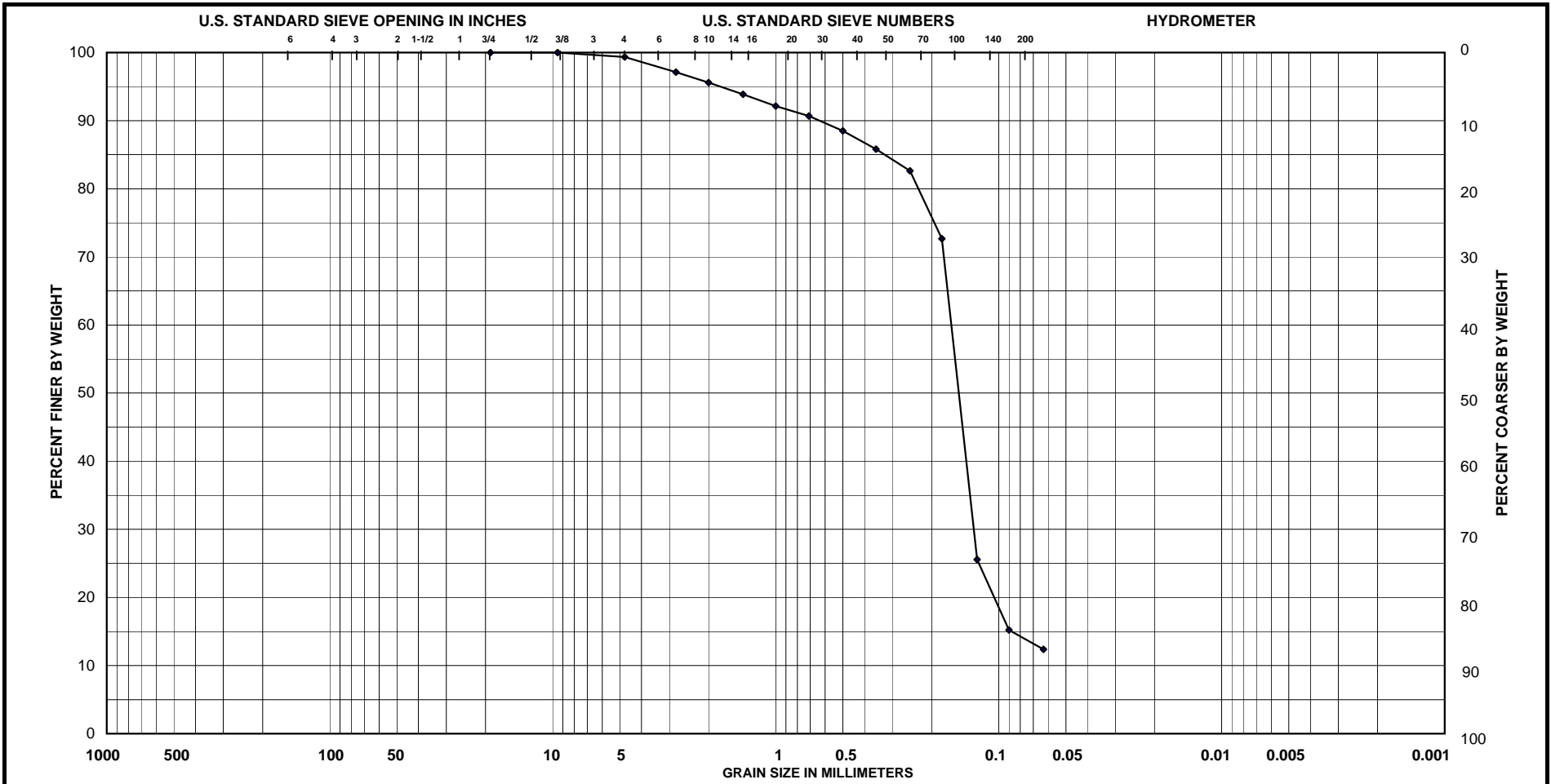
### GRAIN SIZE AND VISUAL SHELL CONTENT

Project:	<b>Topsail Beach, Surf City &amp; North Topsail</b>	Depth:	<b>42.7-43.2</b>
Project No.:	<b>1584-01-40</b>	Date:	<b>9/26/2003</b>
Boring No.:	<b>T1-03-V-193</b>		
Sample No.:	<b>1</b>		
Description:	<b>SAND, poorly-graded with silt, mostly fine-grained quartz, few silt, few carbonate, trace fragmented limestone, dark gray (SP-SM)</b>		

Tare Weight, (g):	<b>50.50</b>	
Dry Wt. Before Washing (g):	<b>170.53</b>	(with tare)
Dry Weight After Washing (g):	<b>156.13</b>	(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	0.80	99.33	100	0.80
#7	2.800	2.64	97.13	80	2.11
#10	2.000	1.87	95.58	75	1.40
#14	1.400	2.05	93.87	70	1.44
#18	1.000	2.05	92.16	70	1.44
#25	0.710	1.75	90.70	65	1.14
#35	0.500	2.62	88.52	50	1.31
#45	0.355	3.22	85.84	20	0.64
#60	0.250	3.84	82.64	10	0.38
#80	0.180	11.98	72.66	3	0.36
#120	0.125	56.52	25.57	1	0.57
#170	0.090	12.43	15.21	1	0.12
#230	0.063	3.40	12.38	1	0.03

**Total Shell Content:** **10** %



COBBLES	GRAVEL		SAND			SILT OR CLAY
	COARSE	FINE	COARSE	MEDIUM	FINE	

Sample No.	Elev. Or Depth	Classification	% CO <sub>3</sub>	G <sub>s</sub>	Nat w%	LL	PL	PI	Project
1	42.7-43.2	SAND, poorly-graded with silt, mostly fine-grained quartz, few silt, few carbonate, trace fragmented limestone, dark gray (SP-SM)	10						Topsail Beach, Surf City & North Topsail
									Area
									Boring No. T1-03-V-193
									Date 9/26/2003

**GRADATION CURVES**



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## VISUAL SHELL CONTENT

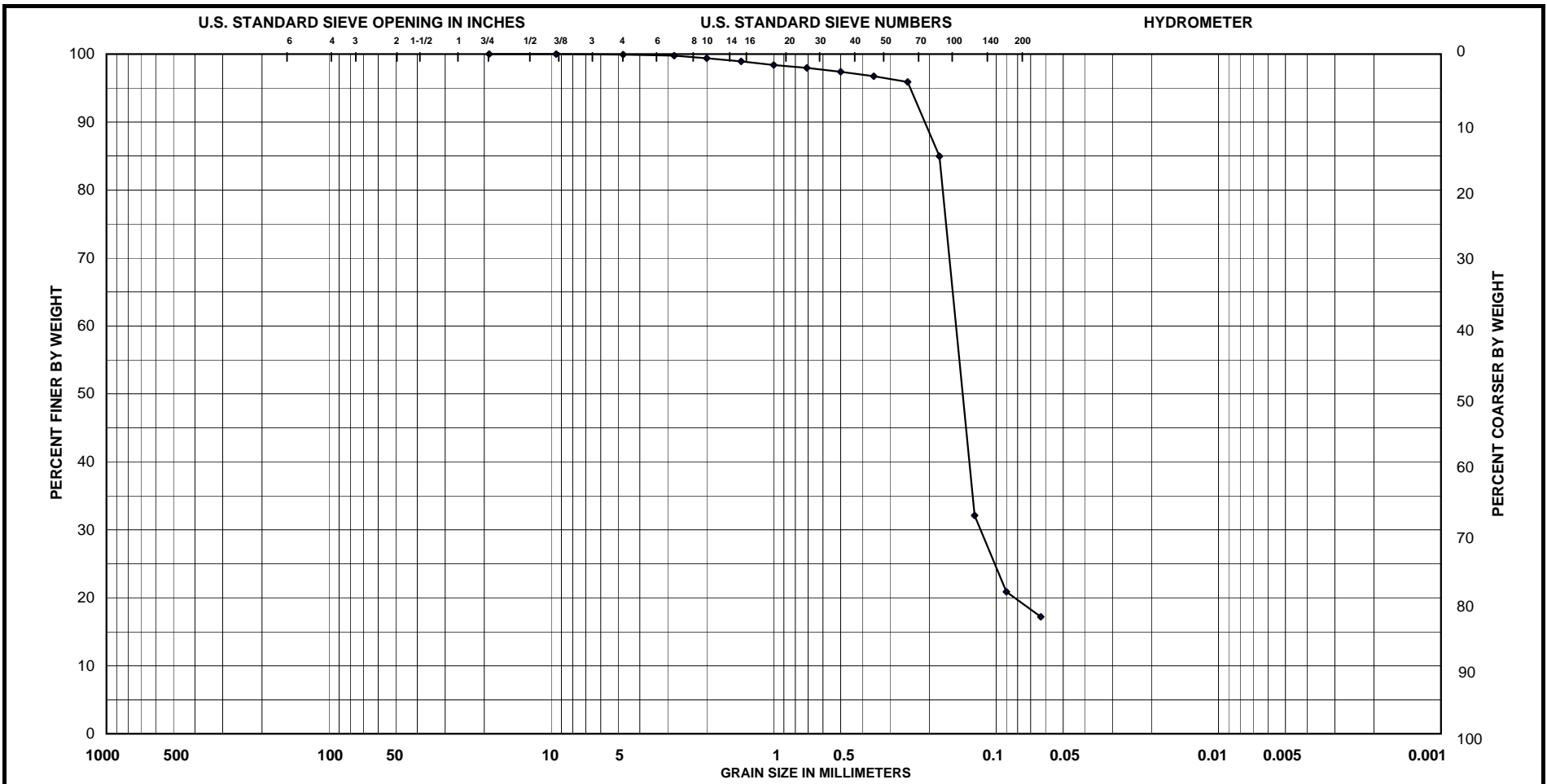
### GRAIN SIZE AND VISUAL SHELL CONTENT

Project:	<b>Topsail Beach, Surf City &amp; North Topsail</b>	Depth:	<b>45.0-45.5</b>
Project No.:	<b>1584-01-40</b>	Date:	<b>9/26/2003</b>
Boring No.:	<b>T1-03-V-194</b>		
Sample No.:	<b>2</b>		
Description:	<b>SAND, silty, mostly fine-grained quartz, little silt, trace carbonate, trace fragmented limestone, olive (SM)</b>		

Tare Weight, (g):	<b>50.00</b>	
Dry Wt. Before Washing (g):	<b>174.6</b>	(with tare)
Dry Weight After Washing (g):	<b>153.67</b>	(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	0.09	99.93	100	0.09
#7	2.800	0.19	99.78	90	0.17
#10	2.000	0.48	99.39	40	0.19
#14	1.400	0.59	98.92	20	0.12
#18	1.000	0.66	98.39	10	0.07
#25	0.710	0.53	97.96	3	0.02
#35	0.500	0.71	97.39	1	0.01
#45	0.355	0.80	96.75	1	0.01
#60	0.250	1.06	95.90	1	0.01
#80	0.180	13.61	84.98	1	0.14
#120	0.125	65.85	32.13	1	0.66
#170	0.090	13.99	20.90	1	0.14
#230	0.063	4.60	17.21	1	0.05

**Total Shell Content:** **1** %



COBBLES	GRAVEL		SAND			SILT OR CLAY
	COARSE	FINE	COARSE	MEDIUM	FINE	

Sample No.	Elev. Or Depth	Classification	% CO <sub>3</sub>	G <sub>s</sub>	Nat w%	LL	PL	PI	Project
♦ 2	45.0-45.5	SAND, silty, mostly fine-grained quartz, little silt, trace carbonate, trace fragmented limestone, olive (SM)	1						Topsail Beach, Surf City & North Topsail
									Area
									Boring No. T1-03-V-194
									Date 9/26/2003

**GRADATION CURVES**



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## VISUAL SHELL CONTENT

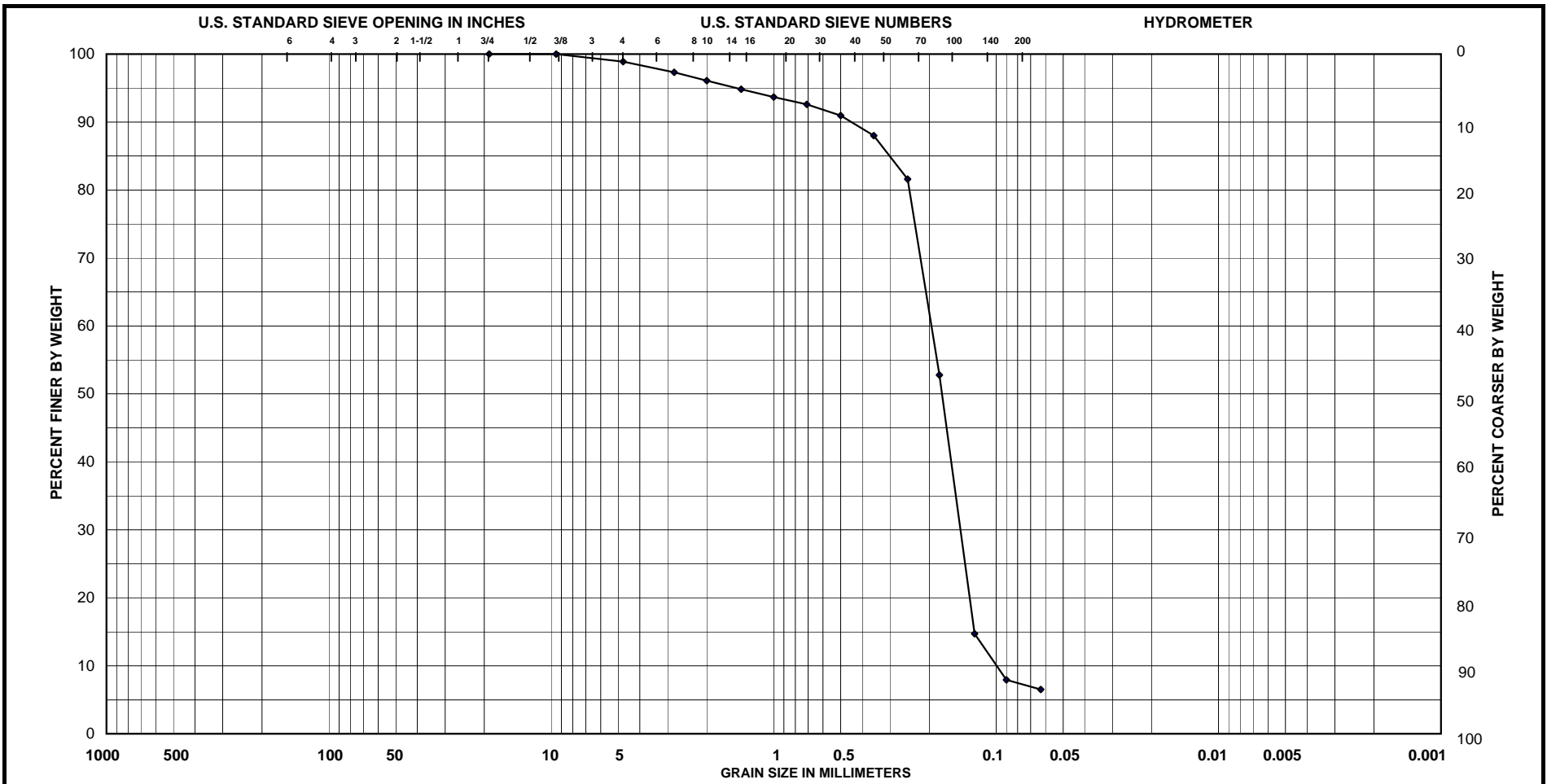
### GRAIN SIZE AND VISUAL SHELL CONTENT

Project:	<b>Topsail Beach, Surf City &amp; North Topsail</b>	Depth:	<b>47.5-48.0</b>
Project No.:	<b>1584-01-40</b>	Date:	<b>9/26/2003</b>
Boring No.:	<b>T1-03-V-194</b>		
Sample No.:	<b>3</b>		
Description:	<b>SAND, poorly-graded with silt, mostly fine-grained quartz, few carbonate, few silt, trace fragmented limestone, dark greenish gray (SP-</b>		

Tare Weight, (g):	<b>50.21</b>	
Dry Wt. Before Washing (g):	<b>178.86</b>	(with tare)
Dry Weight After Washing (g):	<b>170.8</b>	(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	1.45	98.87	100	1.45
#7	2.800	2.00	97.32	100	2.00
#10	2.000	1.60	96.07	80	1.28
#14	1.400	1.59	94.84	65	1.03
#18	1.000	1.49	93.68	60	0.89
#25	0.710	1.40	92.59	60	0.84
#35	0.500	2.12	90.94	35	0.74
#45	0.355	3.77	88.01	15	0.57
#60	0.250	8.27	81.59	3	0.25
#80	0.180	37.08	52.76	1	0.37
#120	0.125	48.93	14.73	1	0.49
#170	0.090	8.74	7.94	1	0.09
#230	0.063	1.81	6.53	1	0.02

**Total Shell Content:** **8** %



COBBLES	GRAVEL		SAND			SILT OR CLAY
	COARSE	FINE	COARSE	MEDIUM	FINE	

Sample No.	Elev. Or Depth	Classification	% CO <sub>3</sub>	G <sub>s</sub>	Nat w%	LL	PL	PI	Project
♦ 3	47.5-48.0	SAND, poorly-graded with silt, mostly fine-grained quartz, few carbonate, few silt, trace fragmented limestone, dark greenish gray (SP-SM)	8						Topsail Beach, Surf City & North Topsail
									Area
									Boring No. T1-03-V-194
									Date 9/26/2003

**GRADATION CURVES**



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## VISUAL SHELL CONTENT

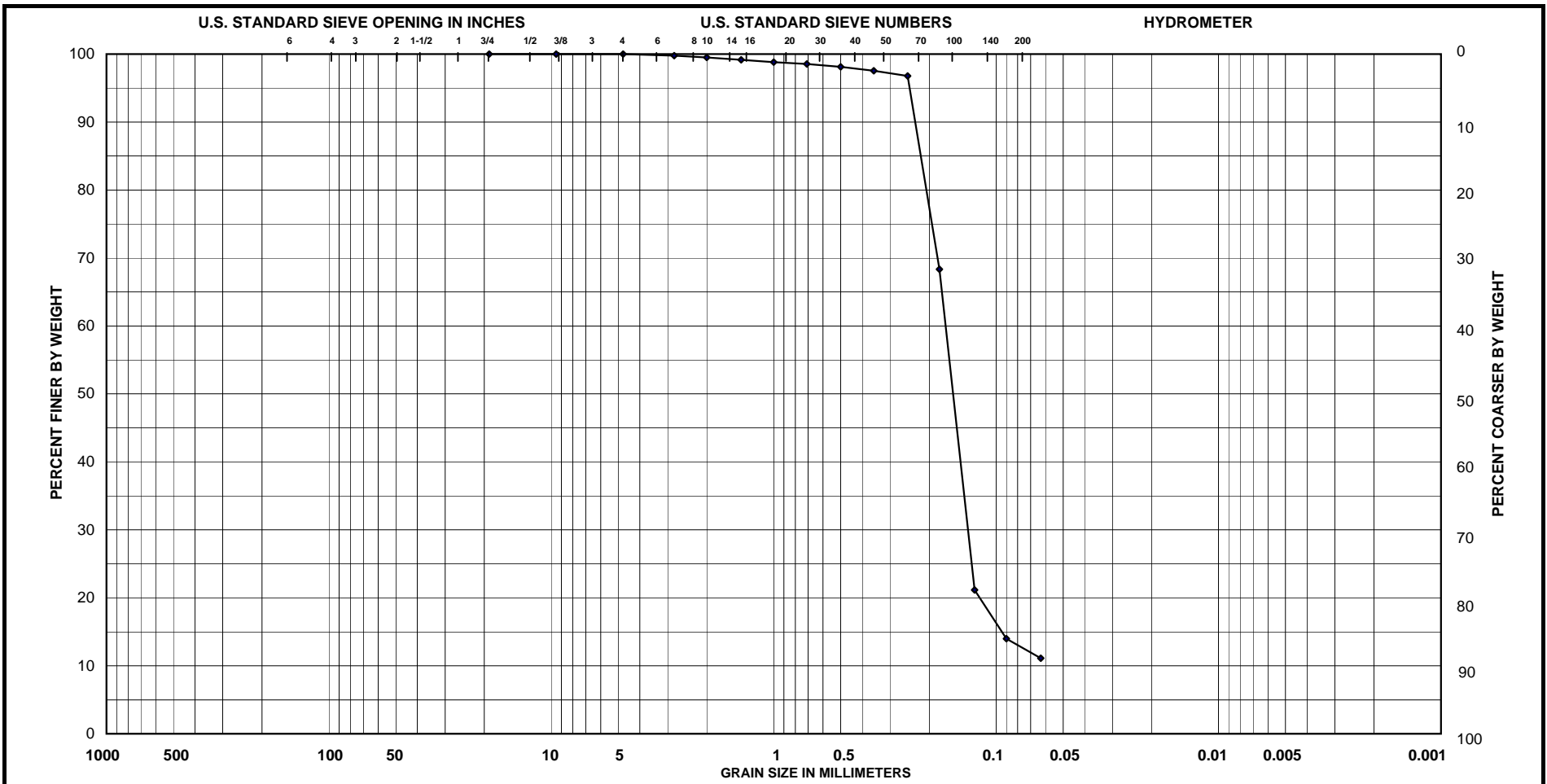
### GRAIN SIZE AND VISUAL SHELL CONTENT

Project:	<b>Topsail Beach, Surf City &amp; North Topsail</b>	Depth:	<b>43.7-44.2</b>
Project No.:	<b>1584-01-40</b>	Date:	<b>9/26/2003</b>
Boring No.:	<b>T1-03-V-195</b>		
Sample No.:	<b>1</b>		
Description:	<b>SAND, poorly-graded with silt, mostly fine-grained quartz, few silt, trace carbonate, trace fragmented limestone, olive gray (SP-SM)</b>		

Tare Weight, (g):	<b>50.20</b>	
Dry Wt. Before Washing (g):	<b>174.45</b>	(with tare)
Dry Weight After Washing (g):	<b>160.91</b>	(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	0.30	99.76	80	0.24
#10	2.000	0.31	99.51	40	0.12
#14	1.400	0.45	99.15	30	0.14
#18	1.000	0.42	98.81	45	0.19
#25	0.710	0.35	98.53	40	0.14
#35	0.500	0.51	98.12	30	0.15
#45	0.355	0.71	97.55	5	0.04
#60	0.250	0.93	96.80	3	0.03
#80	0.180	35.36	68.34	1	0.35
#120	0.125	58.62	21.16	1	0.59
#170	0.090	8.92	13.98	1	0.09
#230	0.063	3.54	11.13	1	0.04

**Total Shell Content:** **2** %







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## VISUAL SHELL CONTENT

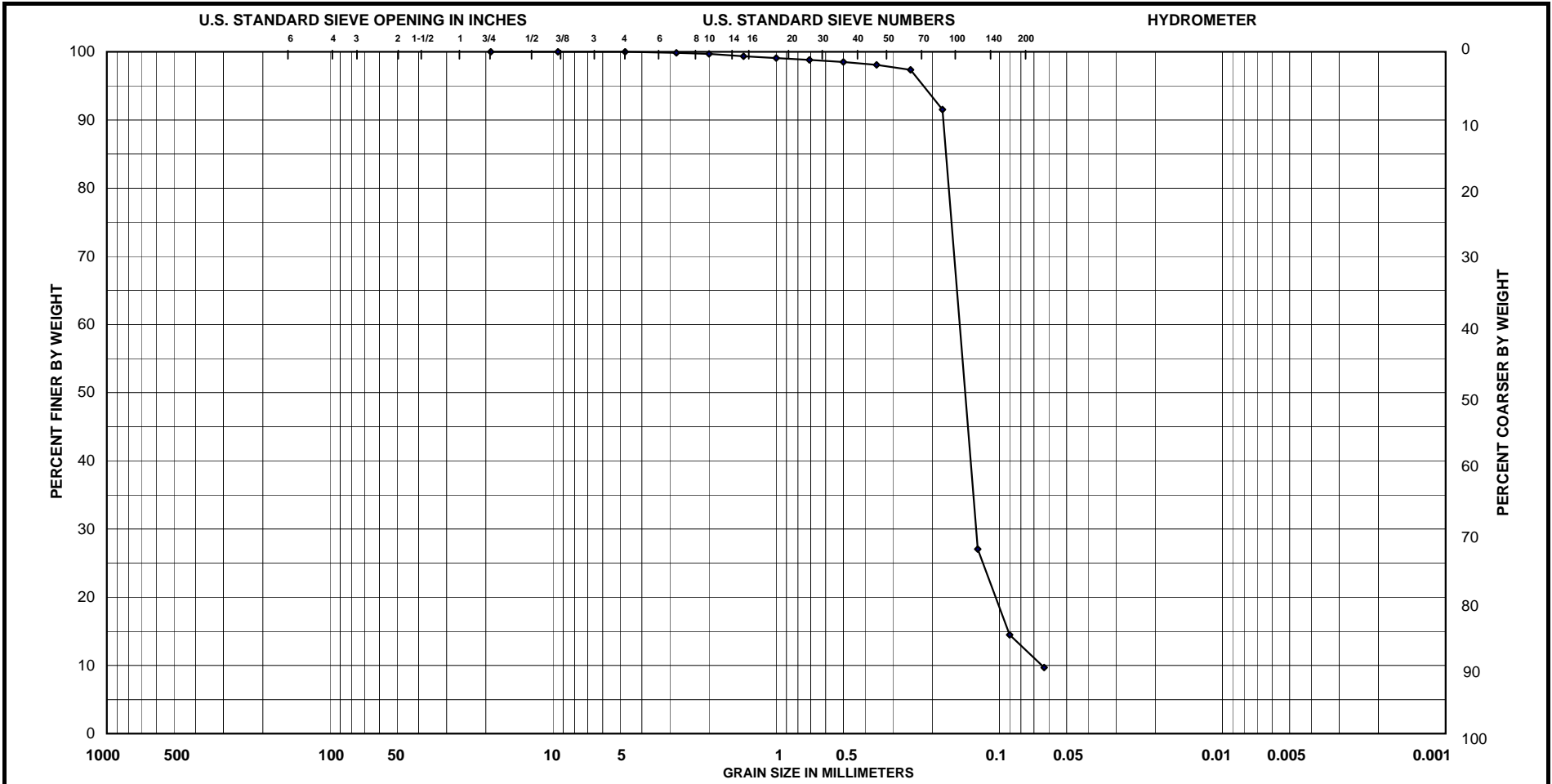
### GRAIN SIZE AND VISUAL SHELL CONTENT

Project:	<b>Topsail Beach, Surf City &amp; North Topsail</b>	Depth:	<b>46.0-46.5</b>
Project No.:	<b>1584-01-40</b>	Date:	<b>9/26/2003</b>
Boring No.:	<b>T1-03-V-195</b>		
Sample No.:	<b>2</b>		
Description:	<b>SAND, poorly-graded with silt, mostly fine-grained quartz, few silt, trace carbonate, olive gray (SP-SM)</b>		

Tare Weight, (g):	<b>49.43</b>	
Dry Wt. Before Washing (g):	<b>173.29</b>	(with tare)
Dry Weight After Washing (g):	<b>162.39</b>	(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	0.18	99.85	100	0.18
#10	2.000	0.21	99.69	60	0.13
#14	1.400	0.41	99.35	40	0.16
#18	1.000	0.35	99.07	35	0.12
#25	0.710	0.30	98.83	40	0.12
#35	0.500	0.42	98.49	40	0.17
#45	0.355	0.51	98.08	20	0.10
#60	0.250	0.91	97.34	3	0.03
#80	0.180	7.18	91.55	1	0.07
#120	0.125	79.89	27.05	1	0.80
#170	0.090	15.55	14.49	1	0.16
#230	0.063	5.96	9.68	1	0.06

**Total Shell Content:** **2** %



COBBLES	GRAVEL		SAND			SILT OR CLAY
	COARSE	FINE	COARSE	MEDIUM	FINE	

Sample No.	Elev. Or Depth	Classification	% CO <sub>3</sub>	G <sub>s</sub>	Nat w%	LL	PL	PI	Project
♦ 2	46.0-46.5	SAND, poorly-graded with silt, mostly fine-grained quartz, few silt, trace carbonate, olive gray (SP-SM)	2						Topsail Beach, Surf City & North Topsail
									Area
									Boring No. T1-03-V-195
									Date 9/26/2003

**GRADATION CURVES**



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## VISUAL SHELL CONTENT

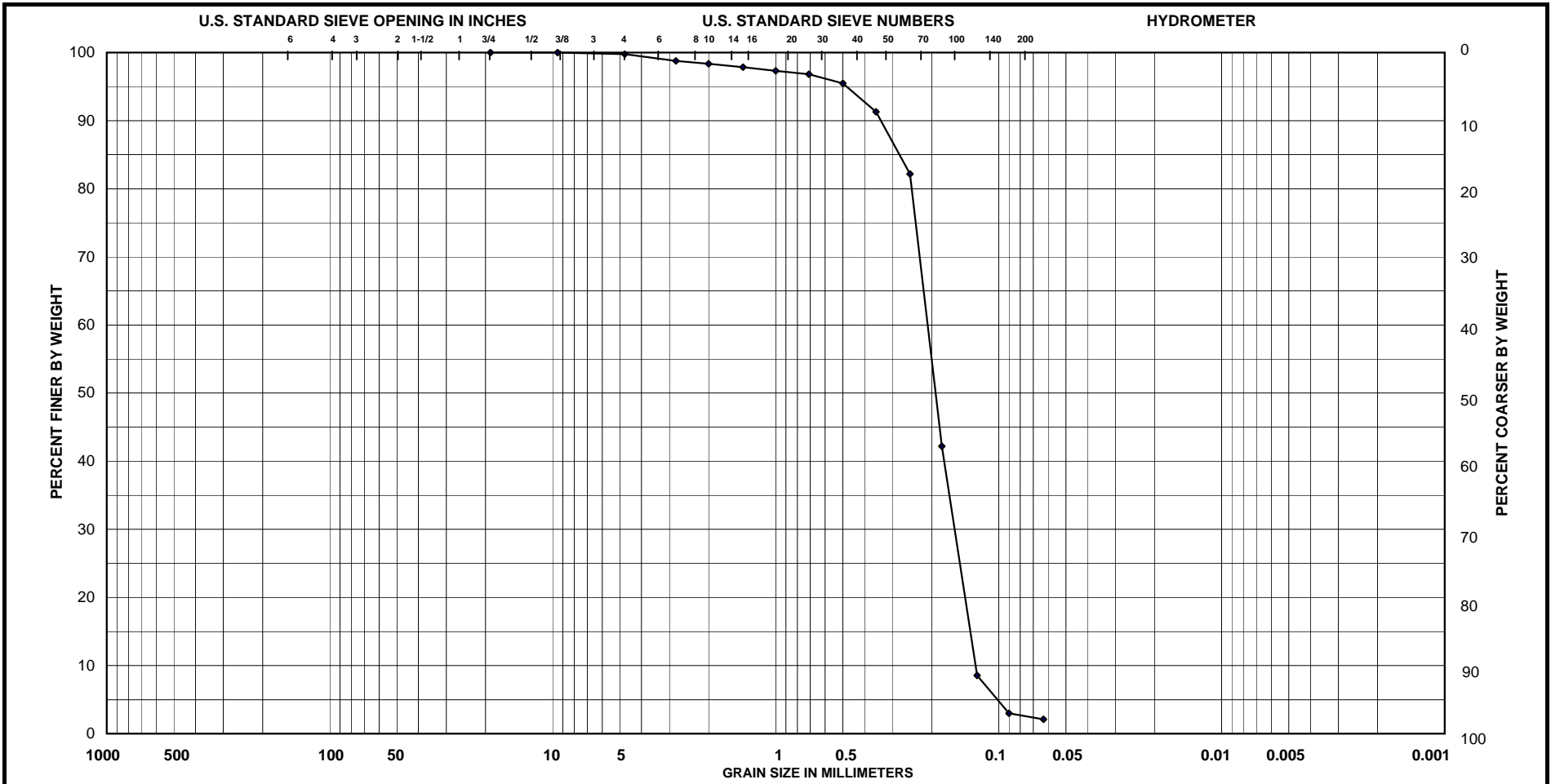
### GRAIN SIZE AND VISUAL SHELL CONTENT

Project:	<b>Topsail Beach, Surf City &amp; North Topsail</b>	Depth:	<b>44.8-45.3</b>
Project No.:	<b>1584-01-40</b>	Date:	<b>9/26/2003</b>
Boring No.:	<b>T1-03-V-196</b>		
Sample No.:	<b>1</b>		
Description:	<b>SAND, poorly-graded, mostly fine-grained quartz, few carbonate, trace fragmented limestone, dark greenish gray (SP)</b>		

Tare Weight, (g):	<b>50.33</b>	
Dry Wt. Before Washing (g):	<b>168.51</b>	(with tare)
Dry Weight After Washing (g):	<b>166.37</b>	(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	0.29	99.75	100	0.29
#7	2.800	1.16	98.77	100	1.16
#10	2.000	0.49	98.36	70	0.34
#14	1.400	0.60	97.85	70	0.42
#18	1.000	0.61	97.33	70	0.43
#25	0.710	0.63	96.80	65	0.41
#35	0.500	1.56	95.48	30	0.47
#45	0.355	4.92	91.32	15	0.74
#60	0.250	10.82	82.16	5	0.54
#80	0.180	47.22	42.21	3	1.42
#120	0.125	39.79	8.54	1	0.40
#170	0.090	6.55	3.00	1	0.07
#230	0.063	1.07	2.09	1	0.01

**Total Shell Content:** **6** %



COBBLES	GRAVEL		SAND			SILT OR CLAY
	COARSE	FINE	COARSE	MEDIUM	FINE	

Sample No.	Elev. Or Depth	Classification	% CO <sub>3</sub>	G <sub>s</sub>	Nat w%	LL	PL	PI	Project
♦ 1	44.8-45.3	SAND, poorly-graded, mostly fine-grained quartz, few carbonate, trace fragmented limestone, dark greenish gray (SP)	6						Topsail Beach, Surf City & North Topsail
									Area
									Boring No. T1-03-V-196
									Date 9/26/2003

**GRADATION CURVES**



# WOLF TECHNOLOGIES, INC.

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## VISUAL SHELL CONTENT

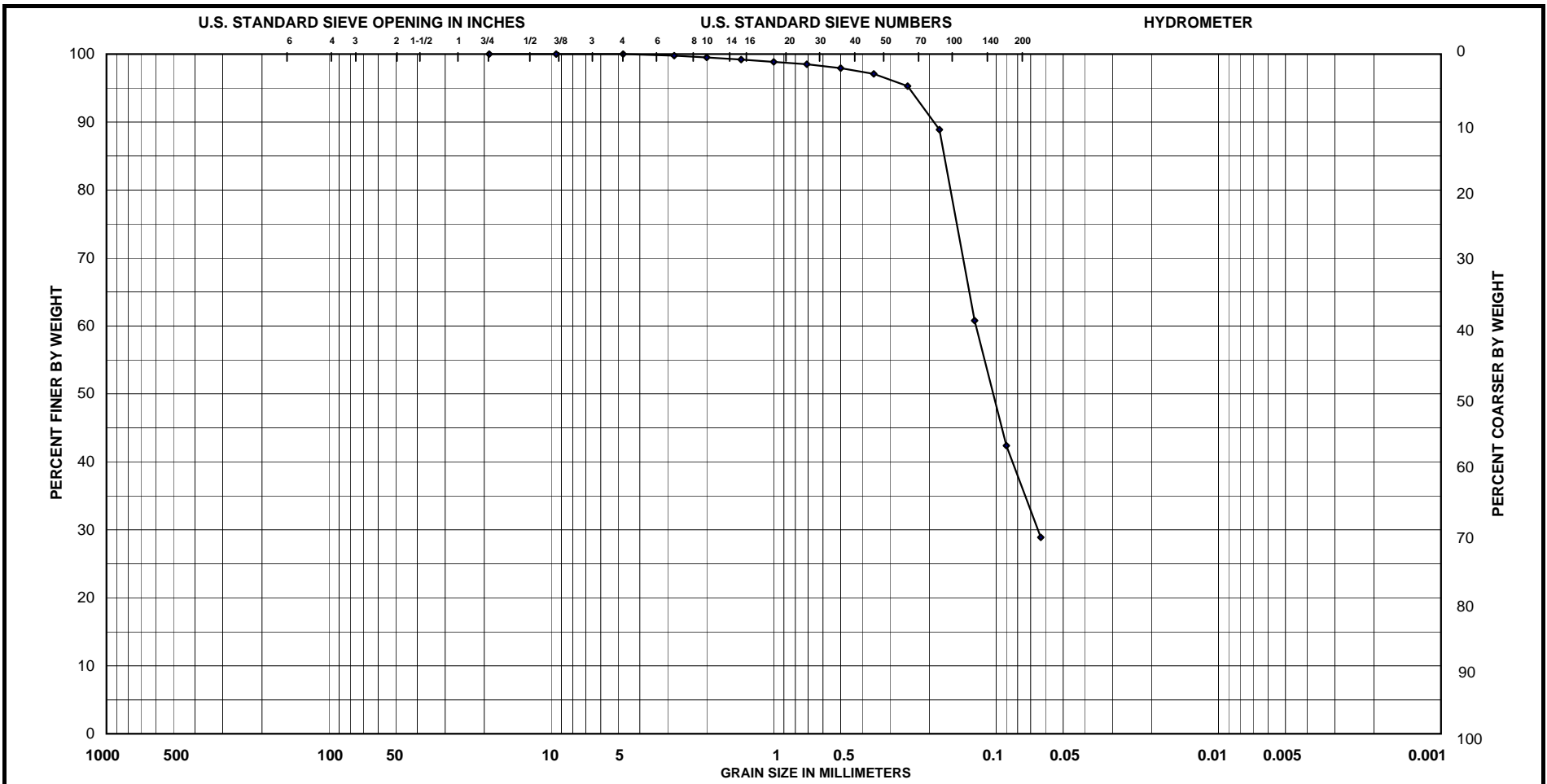
### GRAIN SIZE AND VISUAL SHELL CONTENT

Project:	<b>Topsail Beach, Surf City &amp; North Topsail</b>	Depth:	<b>46.4-46.9</b>
Project No.:	<b>1584-01-40</b>	Date:	<b>9/26/2003</b>
Boring No.:	<b>T1-03-V-196</b>		
Sample No.:	<b>2</b>		
Description:	<b>SAND, clayey, mostly fine-grained quartz, some clay, trace carbonate, trace fragmented limestone, dark greenish gray (SC)</b>		

Tare Weight, (g):	<b>49.53</b>	
Dry Wt. Before Washing (g):	<b>166.83</b>	(with tare)
Dry Weight After Washing (g):	<b>135.16</b>	(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	0.26	99.78	100	0.26
#10	2.000	0.32	99.51	30	0.10
#14	1.400	0.36	99.20	30	0.11
#18	1.000	0.41	98.85	20	0.08
#25	0.710	0.39	98.52	20	0.08
#35	0.500	0.68	97.94	10	0.07
#45	0.355	0.99	97.09	5	0.05
#60	0.250	2.10	95.30	3	0.06
#80	0.180	7.53	88.88	1	0.08
#120	0.125	32.94	60.80	1	0.33
#170	0.090	21.61	42.38	1	0.22
#230	0.063	15.82	28.89	1	0.16

**Total Shell Content:** **1** %



COBBLES	GRAVEL		SAND			SILT OR CLAY
	COARSE	FINE	COARSE	MEDIUM	FINE	

Sample No.	Elev. Or Depth	Classification	% CO <sub>3</sub>	G <sub>s</sub>	Nat w%	LL	PL	PI	Project
♦ 2	46.4-46.9	SAND, clayey, mostly fine-grained quartz, some clay, trace carbonate, trace fragmented limestone, dark greenish gray (SC)	1						Topsail Beach, Surf City & North Topsail
									Area
									Boring No. T1-03-V-196
									Date 9/26/2003

**GRADATION CURVES**



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## VISUAL SHELL CONTENT

### GRAIN SIZE AND VISUAL SHELL CONTENT

Project:	<b>Topsail Beach, Surf City &amp; North Topsail</b>	Depth:	<b>48.5-49.0</b>
Project No.:	<b>1584-01-40</b>	Date:	<b>9/26/2003</b>
Boring No.:	<b>T1-03-V-196</b>		
Sample No.:	<b>3</b>		
Description:	<b>SAND, clayey, mostly fine-grained quartz, little clay, few carbonate, few fragmented limestone, dark greenish gray (SC)</b>		

Tare Weight, (g):	<b>49.89</b>	
Dry Wt. Before Washing (g):	<b>166.95</b>	(with tare)
Dry Weight After Washing (g):	<b>150.02</b>	(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	99.69	100	0.36
#7	2.800	1.60	98.33	100	1.60
#10	2.000	1.73	96.85	90	1.56
#14	1.400	1.57	95.51	70	1.10
#18	1.000	1.78	93.99	65	1.16
#25	0.710	1.67	92.56	50	0.84
#35	0.500	2.36	90.54	45	1.06
#45	0.355	2.16	88.70	30	0.65
#60	0.250	2.23	86.79	15	0.33
#80	0.180	7.45	80.43	3	0.22
#120	0.125	57.55	31.27	1	0.58
#170	0.090	13.91	19.38	1	0.14
#230	0.063	3.97	15.99	1	0.04

**Total Shell Content:** **8** %







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## VISUAL SHELL CONTENT

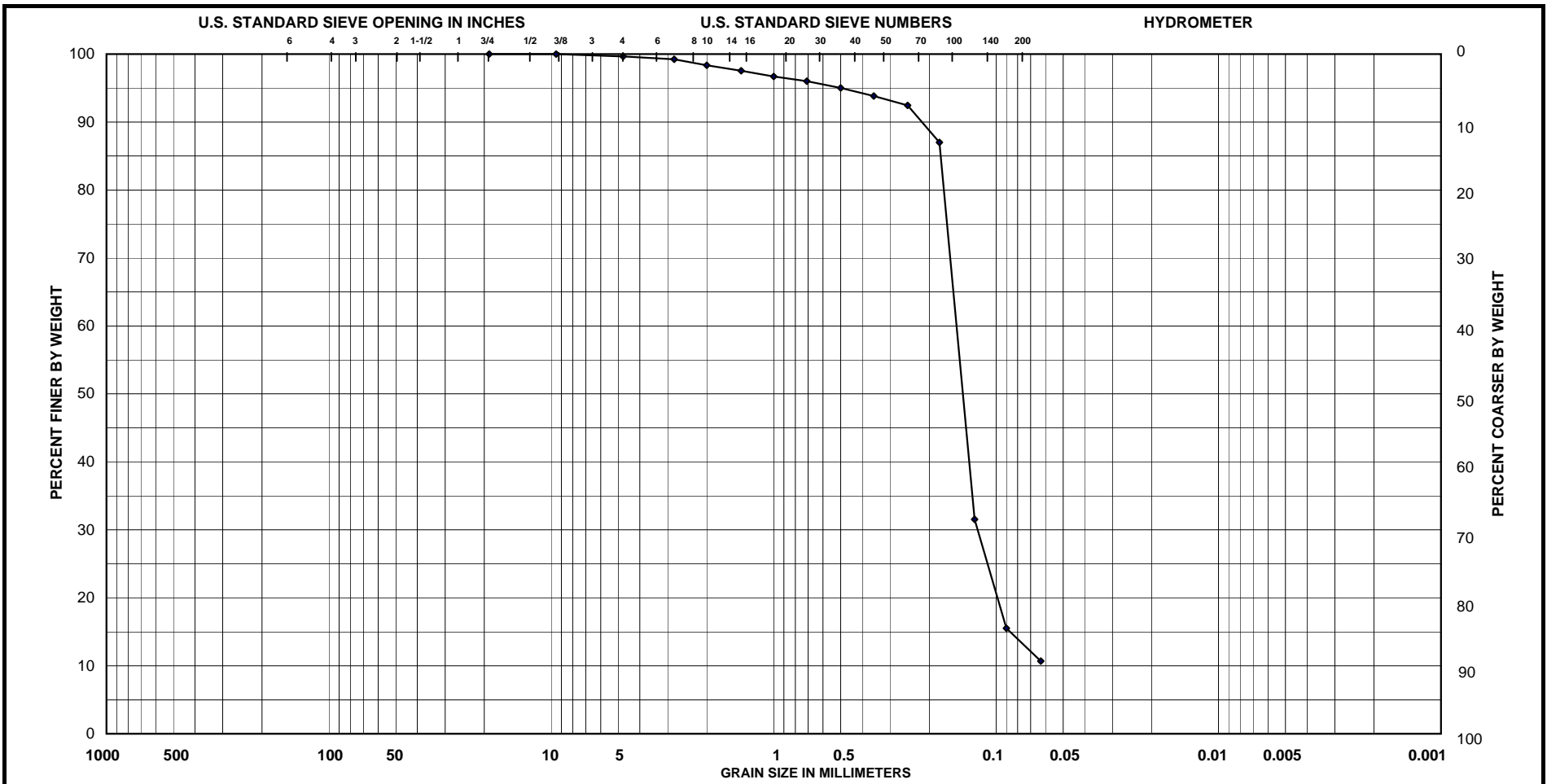
### GRAIN SIZE AND VISUAL SHELL CONTENT

Project:	<b>Topsail Beach, Surf City &amp; North Topsail</b>	Depth:	<b>50.5-51.0</b>
Project No.:	<b>1584-01-40</b>	Date:	<b>9/26/2003</b>
Boring No.:	<b>T1-03-V-196</b>		
Sample No.:	<b>4</b>		
Description:	<b>SAND, poorly-graded with silt, mostly fine-grained quartz, few silt, few carbonate, trace fragmented limestone, olive gray (SP-SM)</b>		

Tare Weight, (g):	<b>49.98</b>	
Dry Wt. Before Washing (g):	<b>181.25</b>	(with tare)
Dry Weight After Washing (g):	<b>168.11</b>	(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	0.43	99.67	100	0.43
#7	2.800	0.57	99.24	100	0.57
#10	2.000	1.14	98.37	90	1.03
#14	1.400	1.10	97.53	85	0.94
#18	1.000	1.07	96.72	80	0.86
#25	0.710	0.93	96.01	75	0.70
#35	0.500	1.32	95.00	70	0.92
#45	0.355	1.54	93.83	30	0.46
#60	0.250	1.81	92.45	5	0.09
#80	0.180	7.14	87.01	1	0.07
#120	0.125	72.81	31.55	1	0.73
#170	0.090	21.02	15.53	1	0.21
#230	0.063	6.37	10.68	1	0.06

**Total Shell Content:** **5** %



COBBLES	GRAVEL		SAND			SILT OR CLAY
	COARSE	FINE	COARSE	MEDIUM	FINE	

Sample No.	Elev. Or Depth	Classification	% CO <sub>3</sub>	G <sub>s</sub>	Nat w%	LL	PL	PI	Project
4	50.5-51.0	SAND, poorly-graded with silt, mostly fine-grained quartz, few silt, few carbonate, trace fragmented limestone, olive gray (SP-SM)	5						Topsail Beach, Surf City & North Topsail
									Area
									Boring No. T1-03-V-196
									Date 9/26/2003

**GRADATION CURVES**



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## VISUAL SHELL CONTENT

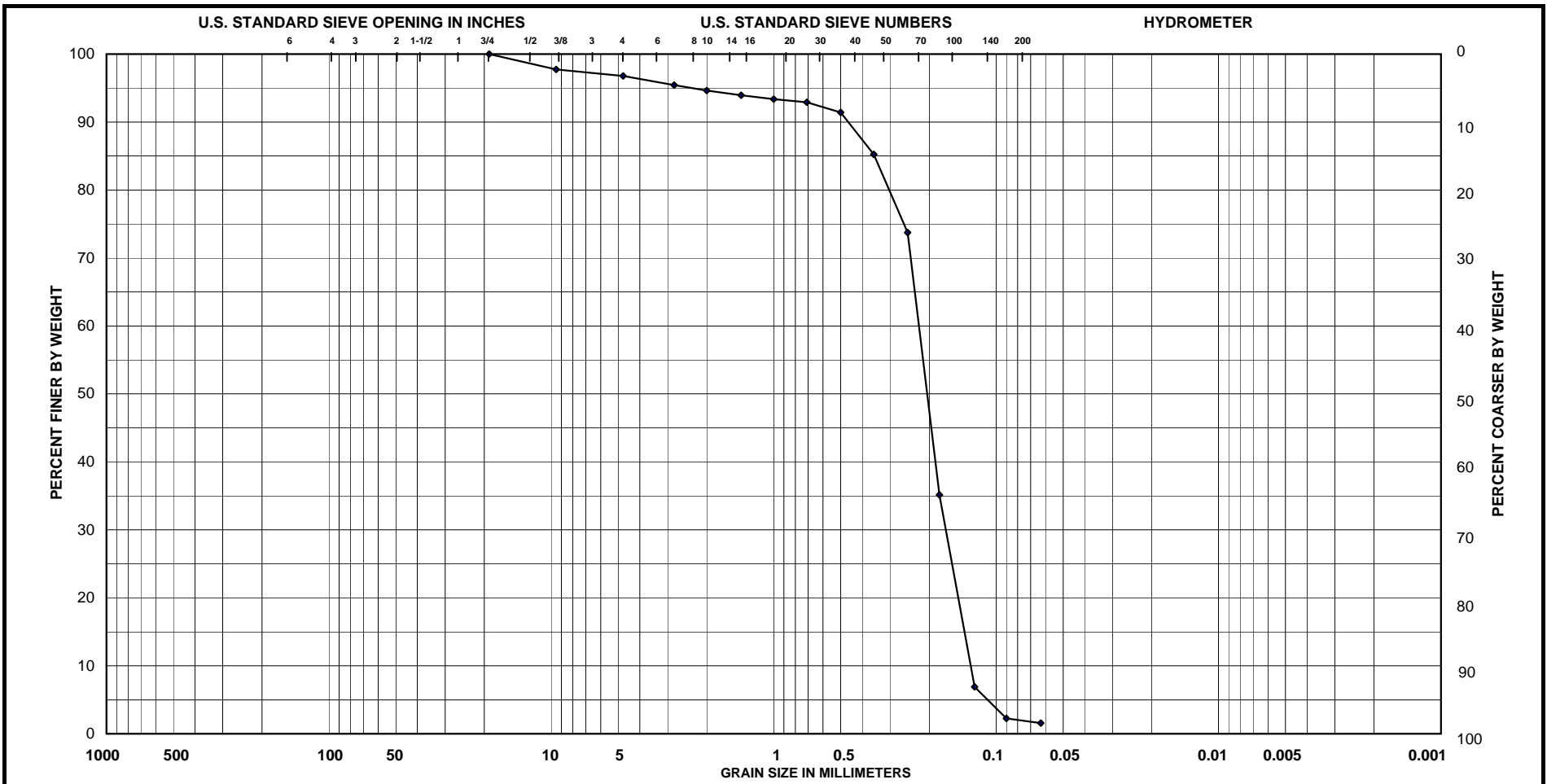
### GRAIN SIZE AND VISUAL SHELL CONTENT

Project:	<b>Topsail Beach, Surf City &amp; North Topsail</b>	Depth:	<b>45.5-46.0</b>
Project No.:	<b>1584-01-40</b>	Date:	<b>9/26/2003</b>
Boring No.:	<b>T1-03-V-197</b>		
Sample No.:	<b>1</b>		
Description:	<b>SAND, poorly-graded, mostly fine-grained quartz, few carbonate, trace fragmented limestone, dark gray (SP)</b>		

Tare Weight, (g):	<b>50.06</b>	
Dry Wt. Before Washing (g):	<b>178.6</b>	(with tare)
Dry Weight After Washing (g):	<b>177.01</b>	(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	2.92	97.73	100	2.92
#4	4.750	1.23	96.77	100	1.23
#7	2.800	1.71	95.44	100	1.71
#10	2.000	1.02	94.65	90	0.92
#14	1.400	0.91	93.94	80	0.73
#18	1.000	0.72	93.38	65	0.47
#25	0.710	0.59	92.92	75	0.44
#35	0.500	1.96	91.40	25	0.49
#45	0.355	7.90	85.25	5	0.40
#60	0.250	14.77	73.76	3	0.44
#80	0.180	49.64	35.14	1	0.50
#120	0.125	36.29	6.91	1	0.36
#170	0.090	5.97	2.26	1	0.06
#230	0.063	0.90	1.56	1	0.01

**Total Shell Content:** **8** %



COBBLES	GRAVEL		SAND			SILT OR CLAY
	COARSE	FINE	COARSE	MEDIUM	FINE	

Sample No.	Elev. Or Depth	Classification	% CO <sub>3</sub>	G <sub>s</sub>	Nat w%	LL	PL	PI	Project	
♦ 1	45.5-46.0	SAND, poorly-graded, mostly fine-grained quartz, few carbonate, trace fragmented limestone, dark gray (SP)	8						Topsail Beach, Surf City & North Topsail	
									Area	
									Boring No. T1-03-V-197	
									Date 9/26/2003	

**GRADATION CURVES**



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## VISUAL SHELL CONTENT

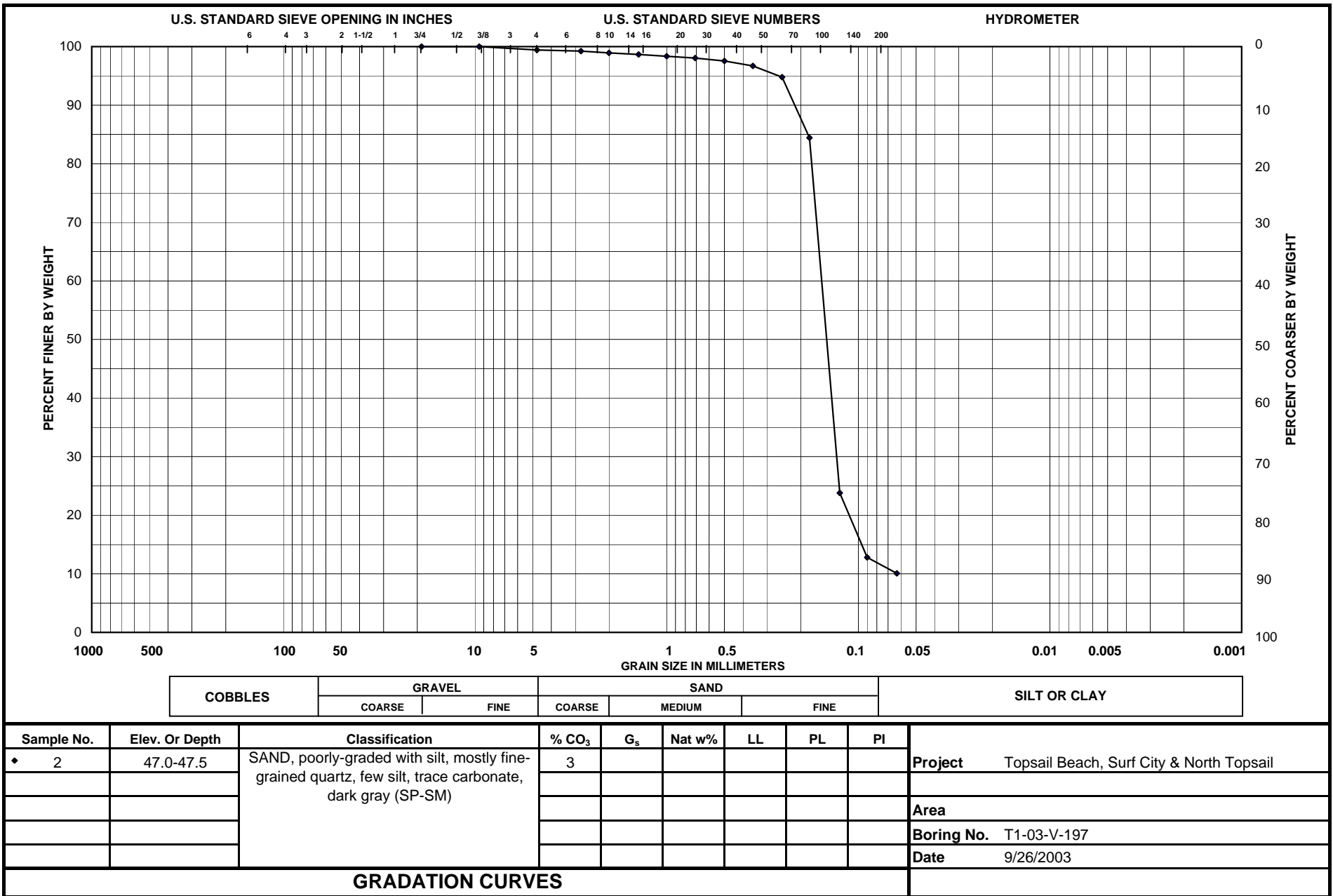
### GRAIN SIZE AND VISUAL SHELL CONTENT

Project:	<b>Topsail Beach, Surf City &amp; North Topsail</b>	Depth:	<b>47.0-47.5</b>
Project No.:	<b>1584-01-40</b>	Date:	<b>9/26/2003</b>
Boring No.:	<b>T1-03-V-197</b>		
Sample No.:	<b>2</b>		
Description:	<b>SAND, poorly-graded with silt, mostly fine-grained quartz, few silt, trace carbonate, dark gray (SP-SM)</b>		

Tare Weight, (g):	<b>50.62</b>	
Dry Wt. Before Washing (g):	<b>170.14</b>	(with tare)
Dry Weight After Washing (g):	<b>158.12</b>	(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	0.67	99.44	100	0.67
#7	2.800	0.25	99.23	95	0.24
#10	2.000	0.36	98.93	90	0.32
#14	1.400	0.34	98.64	85	0.29
#18	1.000	0.35	98.35	90	0.32
#25	0.710	0.37	98.04	40	0.15
#35	0.500	0.60	97.54	40	0.24
#45	0.355	1.00	96.70	10	0.10
#60	0.250	2.29	94.79	5	0.11
#80	0.180	12.37	84.44	3	0.37
#120	0.125	72.47	23.80	1	0.72
#170	0.090	13.16	12.79	1	0.13
#230	0.063	3.24	10.08	1	0.03

**Total Shell Content:** **3** %



COBBLES	GRAVEL		SAND			SILT OR CLAY
	COARSE	FINE	COARSE	MEDIUM	FINE	

Sample No.	Elev. Or Depth	Classification	% CO <sub>3</sub>	G <sub>s</sub>	Nat w%	LL	PL	PI	Project	
♦ 2	47.0-47.5	SAND, poorly-graded with silt, mostly fine-grained quartz, few silt, trace carbonate, dark gray (SP-SM)	3						Topsail Beach, Surf City & North Topsail	
									Area	
									Boring No. T1-03-V-197	
									Date 9/26/2003	

**GRADATION CURVES**



# WOLF TECHNOLOGIES, INC.

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## VISUAL SHELL CONTENT

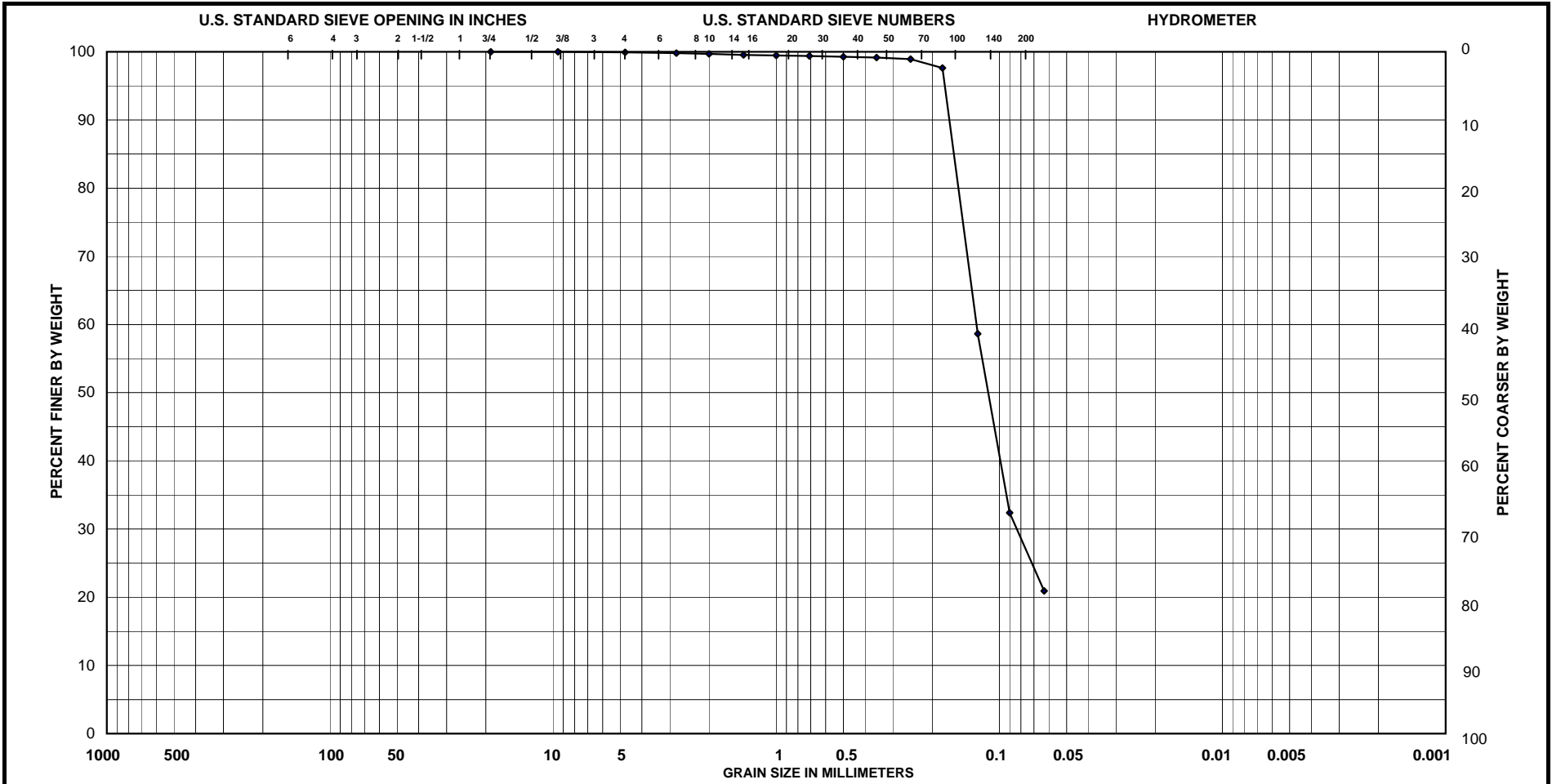
### GRAIN SIZE AND VISUAL SHELL CONTENT

Project:	<b>Topsail Beach, Surf City &amp; North Topsail</b>	Depth:	<b>49.5-50.0</b>
Project No.:	<b>1584-01-40</b>	Date:	<b>9/26/2003</b>
Boring No.:	<b>T1-03-V-197</b>		
Sample No.:	<b>3</b>		
Description:	<b>SAND, silty, mostly fine-grained quartz, little silt, trace carbonate, dark greenish gray (SM)</b>		

Tare Weight, (g):	<b>50.17</b>	
Dry Wt. Before Washing (g):	<b>165.53</b>	(with tare)
Dry Weight After Washing (g):	<b>142.98</b>	(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	0.10	99.91	100	0.10
#7	2.800	0.13	99.80	100	0.13
#10	2.000	0.11	99.71	30	0.03
#14	1.400	0.18	99.55	40	0.07
#18	1.000	0.12	99.45	40	0.05
#25	0.710	0.08	99.38	45	0.04
#35	0.500	0.11	99.28	70	0.08
#45	0.355	0.13	99.17	40	0.05
#60	0.250	0.27	98.93	15	0.04
#80	0.180	1.52	97.62	3	0.05
#120	0.125	44.97	58.63	1	0.45
#170	0.090	30.26	32.40	1	0.30
#230	0.063	13.22	20.94	1	0.13

**Total Shell Content:** **1** %



COBBLES	GRAVEL		SAND			SILT OR CLAY
	COARSE	FINE	COARSE	MEDIUM	FINE	

Sample No.	Elev. Or Depth	Classification	% CO <sub>3</sub>	G <sub>s</sub>	Nat w%	LL	PL	PI	Project
3	49.5-50.0	SAND, silty, mostly fine-grained quartz, little silt, trace carbonate, dark greenish gray (SM)	1						Topsail Beach, Surf City & North Topsail
									Area
									Boring No. T1-03-V-197
									Date 9/26/2003

**GRADATION CURVES**





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## VISUAL SHELL CONTENT

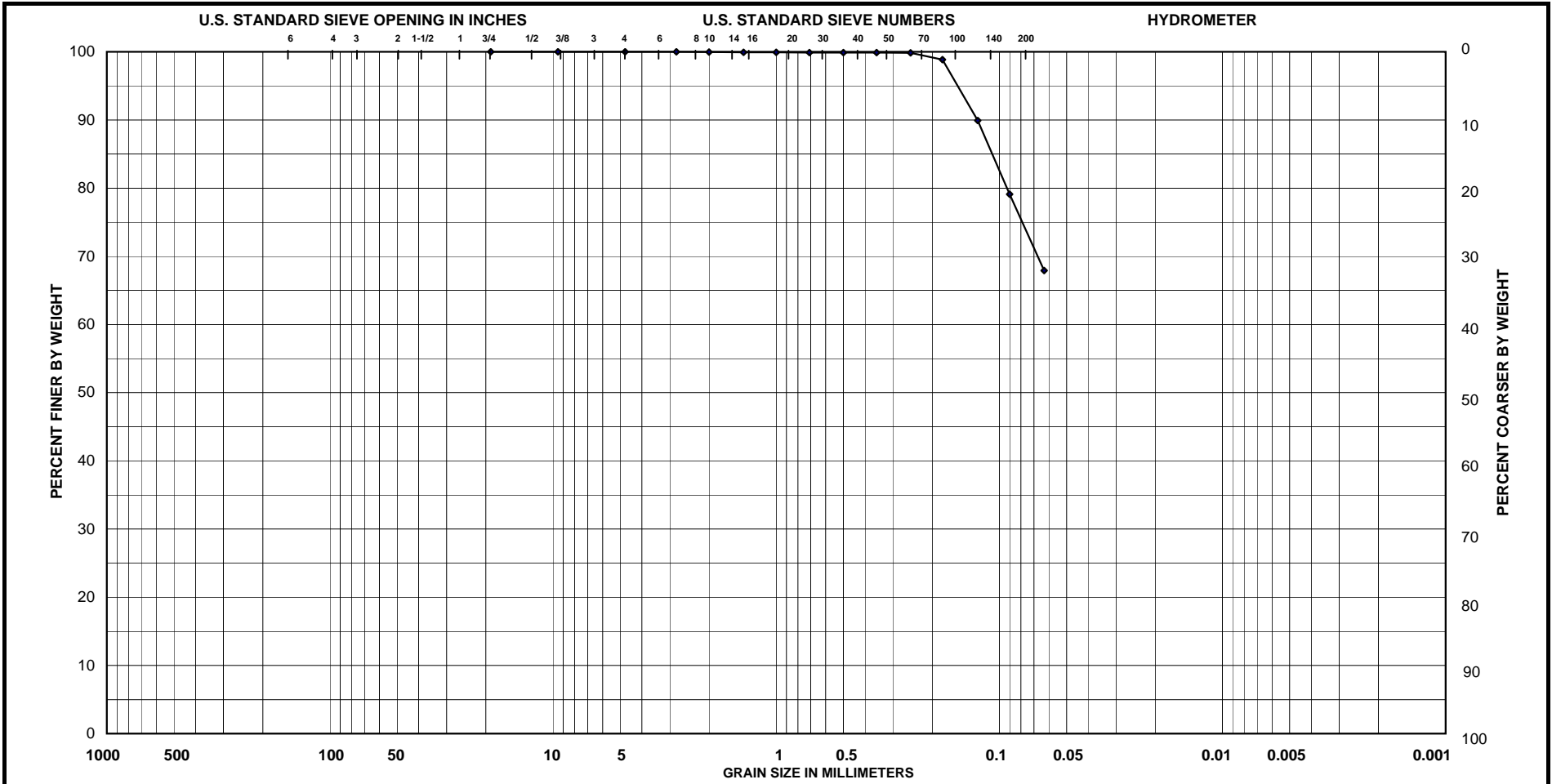
### GRAIN SIZE AND VISUAL SHELL CONTENT

Project:	<b>Topsail Beach, Surf City &amp; North Topsail</b>	Depth:	<b>52.0-52.5</b>
Project No.:	<b>1584-01-40</b>	Date:	<b>9/26/2003</b>
Boring No.:	<b>T1-03-V-197</b>		
Sample No.:	<b>4</b>		
Description:	<b>CLAY, inorganic-H, some fine-grained quartz sand, dark greenish gray (CH)</b>		

Tare Weight, (g):	<b>50.17</b>	
Dry Wt. Before Washing (g):	<b>143.53</b>	(with tare)
Dry Weight After Washing (g):	<b>83.92</b>	(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	0.03	99.97	0	0.00
#14	1.400	0.03	99.94	0	0.00
#18	1.000	0.02	99.91	5	0.00
#25	0.710	0.02	99.89	1	0.00
#35	0.500	0.01	99.88	3	0.00
#45	0.355	0.01	99.87	1	0.00
#60	0.250	0.02	99.85	1	0.00
#80	0.180	0.92	98.86	1	0.01
#120	0.125	8.36	89.91	1	0.08
#170	0.090	10.07	79.12	1	0.10
#230	0.063	10.47	67.91	1	0.10

**Total Shell Content:** **0** %



COBBLES	GRAVEL		SAND			SILT OR CLAY
	COARSE	FINE	COARSE	MEDIUM	FINE	

Sample No.	Elev. Or Depth	Classification	% CO <sub>3</sub>	G <sub>s</sub>	Nat w%	LL	PL	PI	Project	
♦ 4	52.0-52.5	CLAY, inorganic-H, some fine-grained quartz sand, dark greenish gray (CH)	0						Topsail Beach, Surf City & North Topsail	
									Area	
									Boring No. T1-03-V-197	
									Date 9/26/2003	

**GRADATION CURVES**



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## VISUAL SHELL CONTENT

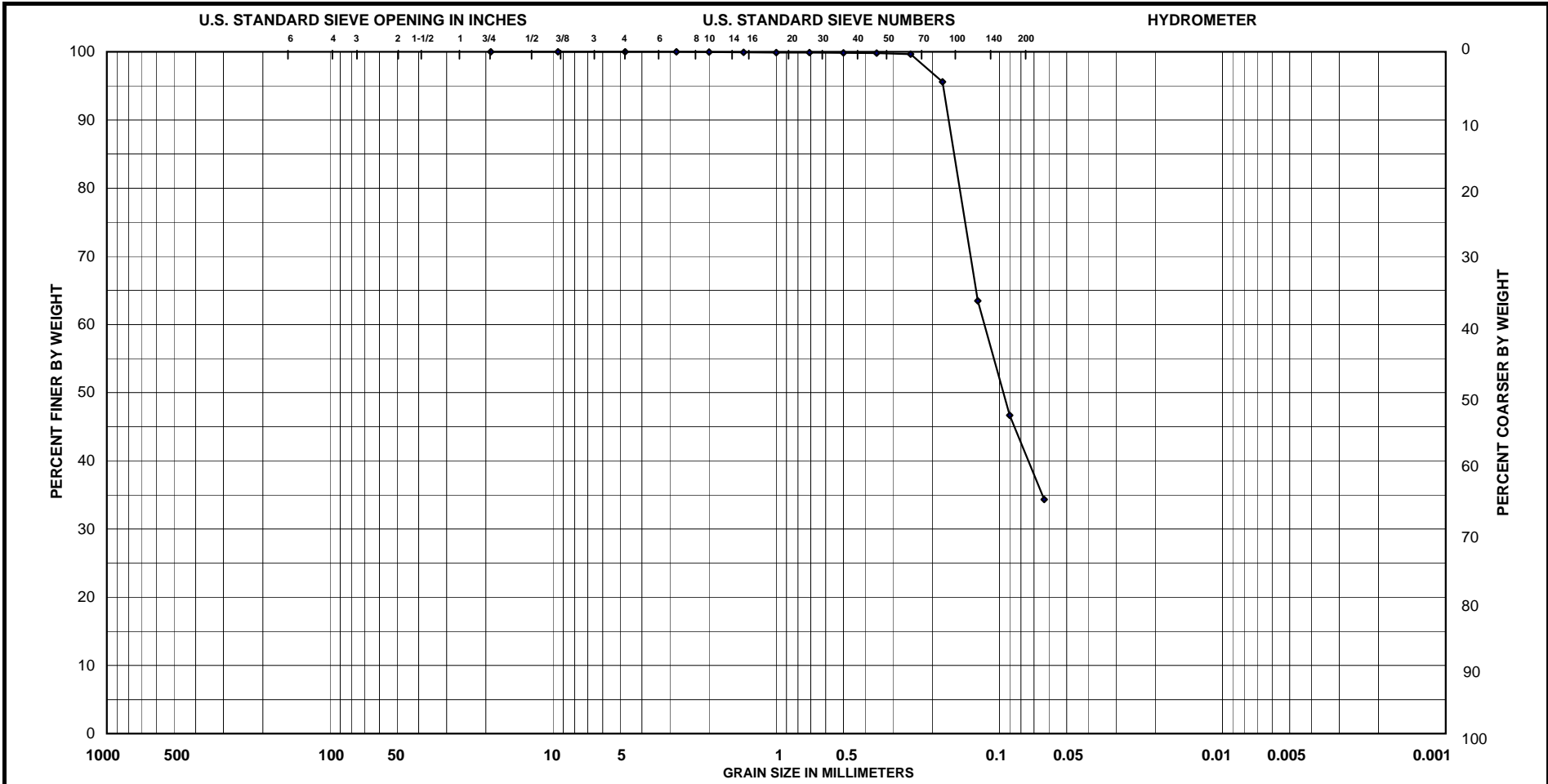
### GRAIN SIZE AND VISUAL SHELL CONTENT

Project:	<b>Topsail Beach, Surf City &amp; North Topsail</b>	Depth:	<b>52.9-53.4</b>
Project No.:	<b>1584-01-40</b>	Date:	<b>9/26/2003</b>
Boring No.:	<b>T1-03-V-197</b>		
Sample No.:	<b>5</b>		
Description:	<b>SAND, clayey, mostly fine-grained quartz, some clay, trace carbonate, dark greenish gray (SC)</b>		

Tare Weight, (g):	<b>50.07</b>	
Dry Wt. Before Washing (g):	<b>163.34</b>	(with tare)
Dry Weight After Washing (g):	<b>127.79</b>	(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	0.05	99.96	0	0.00
#14	1.400	0.05	99.91	0	0.00
#18	1.000	0.03	99.89	5	0.00
#25	0.710	0.01	99.88	60	0.01
#35	0.500	0.03	99.85	75	0.02
#45	0.355	0.05	99.81	60	0.03
#60	0.250	0.15	99.67	15	0.02
#80	0.180	4.62	95.59	5	0.23
#120	0.125	36.38	63.48	1	0.36
#170	0.090	19.01	46.69	1	0.19
#230	0.063	13.99	34.34	1	0.14

**Total Shell Content:** **1** %



COBBLES	GRAVEL		SAND			SILT OR CLAY
	COARSE	FINE	COARSE	MEDIUM	FINE	

Sample No.	Elev. Or Depth	Classification	% CO <sub>3</sub>	G <sub>s</sub>	Nat w%	LL	PL	PI	Project	
5	52.9-53.4	SAND, clayey, mostly fine-grained quartz, some clay, trace carbonate, dark greenish gray (SC)	1						Topsail Beach, Surf City & North Topsail	
									Area	
									Boring No. T1-03-V-197	
									Date 9/26/2003	

**GRADATION CURVES**



# WOLF TECHNOLOGIES, INC.

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## VISUAL SHELL CONTENT

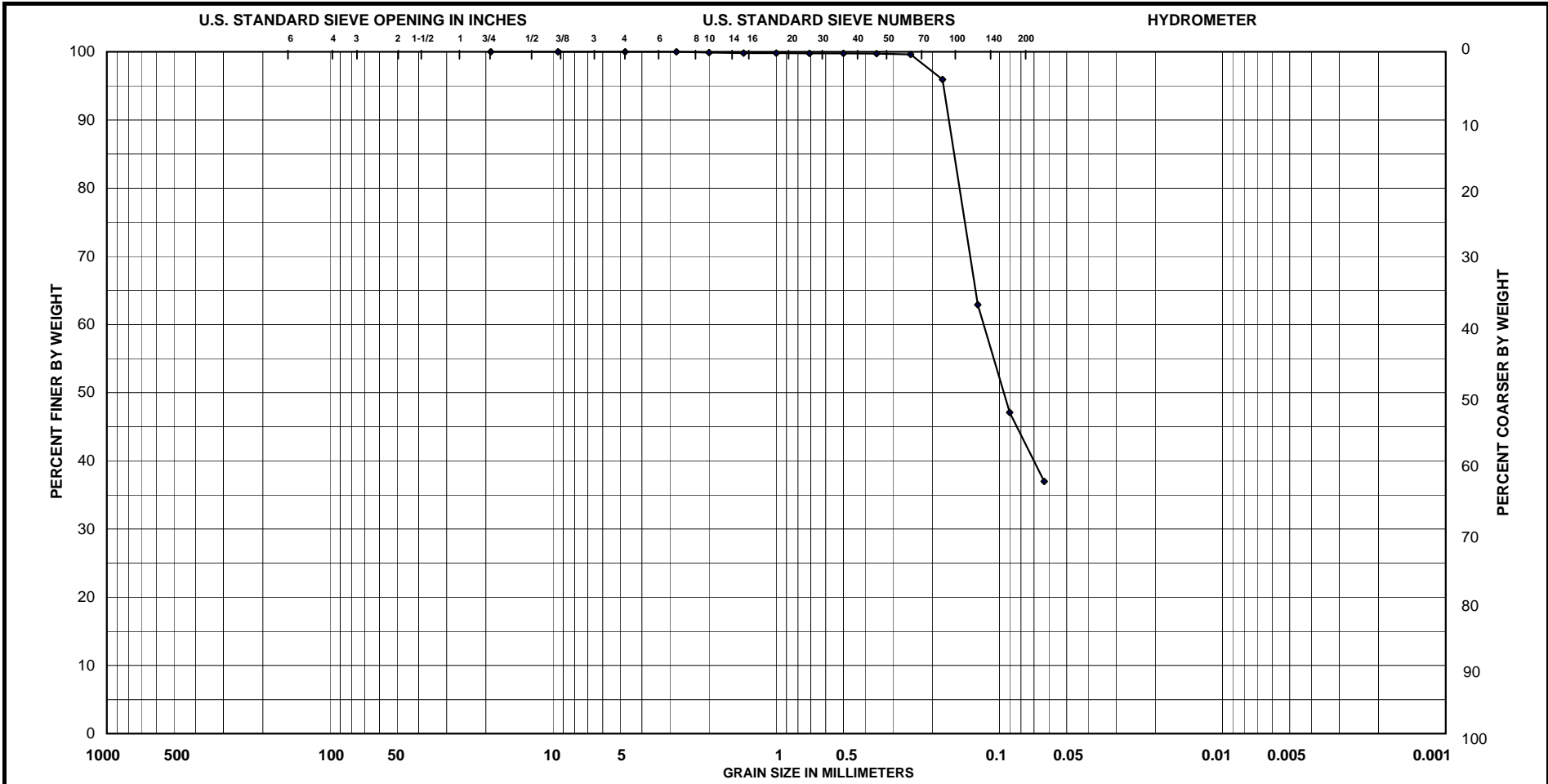
### GRAIN SIZE AND VISUAL SHELL CONTENT

Project:	<b>Topsail Beach, Surf City &amp; North Topsail</b>	Depth:	<b>55.0-55.5</b>
Project No.:	<b>1584-01-40</b>	Date:	<b>9/26/2003</b>
Boring No.:	<b>T1-03-V-197</b>		
Sample No.:	<b>6</b>		
Description:	<b>SAND, clayey, mostly fine-grained quartz, some clay, trace carbonate, dark greenish gray (SC)</b>		

Tare Weight, (g):	<b>50.18</b>	
Dry Wt. Before Washing (g):	<b>164.9</b>	(with tare)
Dry Weight After Washing (g):	<b>125.54</b>	(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	0.15	99.87	5	0.01
#14	1.400	0.06	99.82	0	0.00
#18	1.000	0.02	99.80	3	0.00
#25	0.710	0.02	99.78	90	0.02
#35	0.500	0.02	99.76	40	0.01
#45	0.355	0.05	99.72	10	0.01
#60	0.250	0.11	99.63	3	0.00
#80	0.180	4.25	95.92	1	0.04
#120	0.125	37.89	62.89	1	0.38
#170	0.090	18.11	47.11	1	0.18
#230	0.063	11.63	36.97	1	0.12

**Total Shell Content:** **1** %



COBBLES	GRAVEL		SAND			SILT OR CLAY
	COARSE	FINE	COARSE	MEDIUM	FINE	

Sample No.	Elev. Or Depth	Classification	% CO <sub>3</sub>	G <sub>s</sub>	Nat w%	LL	PL	PI	Project	
6	55.0-55.5	SAND, clayey, mostly fine-grained quartz, some clay, trace carbonate, dark greenish gray (SC)	1						Topsail Beach, Surf City & North Topsail	
									Area	
									Boring No. T1-03-V-197	
									Date 9/26/2003	

**GRADATION CURVES**



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## VISUAL SHELL CONTENT

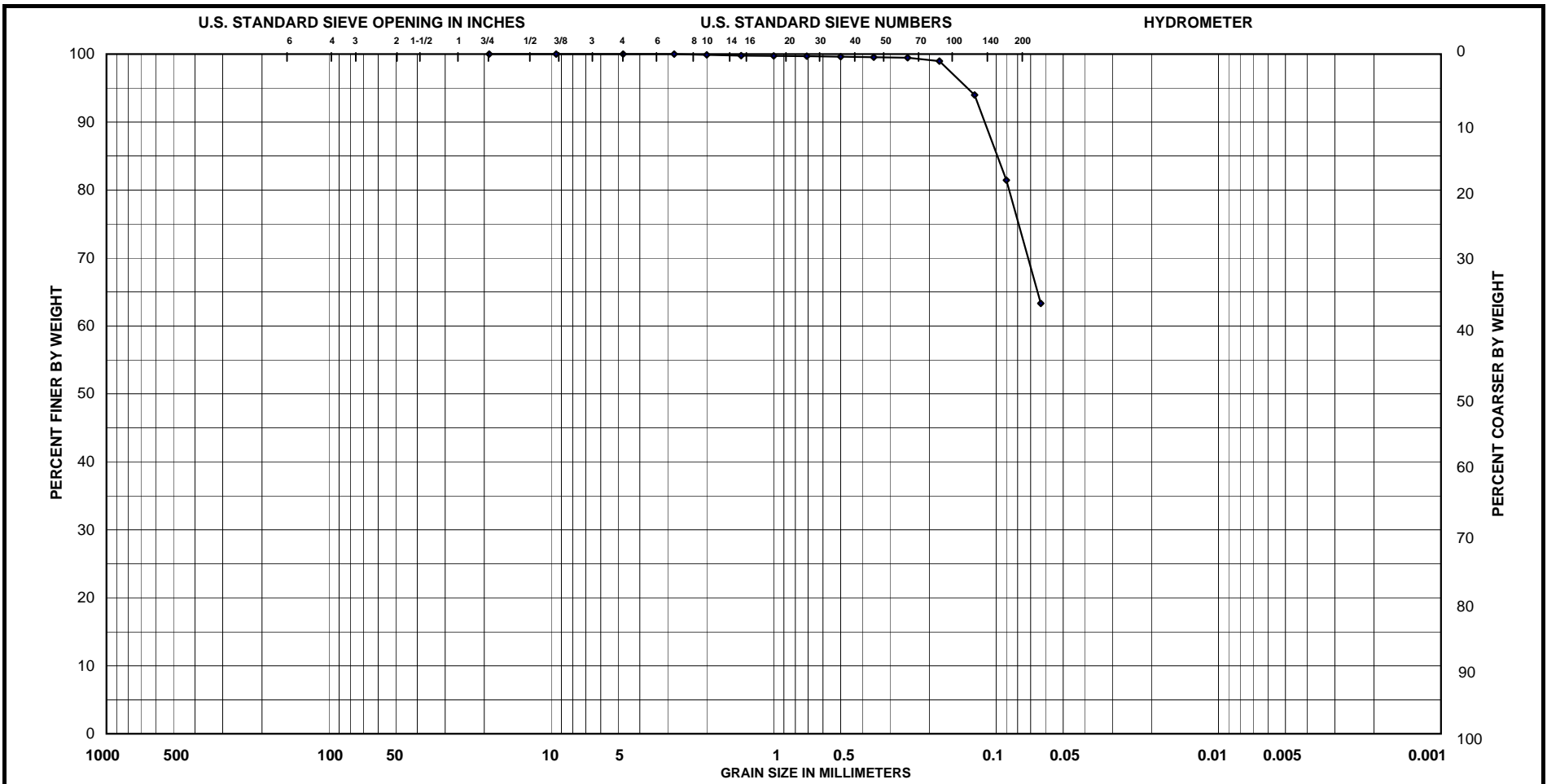
### GRAIN SIZE AND VISUAL SHELL CONTENT

Project:	<b>Topsail Beach, Surf City &amp; North Topsail</b>	Depth:	<b>56.7-57.2</b>
Project No.:	<b>1584-01-40</b>	Date:	<b>9/26/2003</b>
Boring No.:	<b>T1-03-V-197</b>		
Sample No.:	<b>7</b>		
Description:	<b>CLAY, inorganic-H, some fine-grained quartz sand, dark greenish gray (CH)</b>		

Tare Weight, (g):	<b>49.94</b>	
Dry Wt. Before Washing (g):	<b>152.29</b>	(with tare)
Dry Weight After Washing (g):	<b>92.94</b>	(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	0.13	99.87	3	0.00
#14	1.400	0.10	99.78	5	0.01
#18	1.000	0.06	99.72	65	0.04
#25	0.710	0.02	99.70	40	0.01
#35	0.500	0.09	99.61	10	0.01
#45	0.355	0.06	99.55	3	0.00
#60	0.250	0.07	99.48	1	0.00
#80	0.180	0.51	98.98	1	0.01
#120	0.125	5.13	93.97	1	0.05
#170	0.090	12.82	81.45	1	0.13
#230	0.063	18.55	63.32	1	0.19

**Total Shell Content:** **0** %



COBBLES	GRAVEL		SAND			SILT OR CLAY
	COARSE	FINE	COARSE	MEDIUM	FINE	

Sample No.	Elev. Or Depth	Classification	% CO <sub>3</sub>	G <sub>s</sub>	Nat w%	LL	PL	PI	Project	
7	56.7-57.2	CLAY, inorganic-H, some fine-grained quartz sand, dark greenish gray (CH)	0						Topsail Beach, Surf City & North Topsail	
									Area	
									Boring No. T1-03-V-197	
									Date 9/26/2003	

**GRADATION CURVES**





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## VISUAL SHELL CONTENT

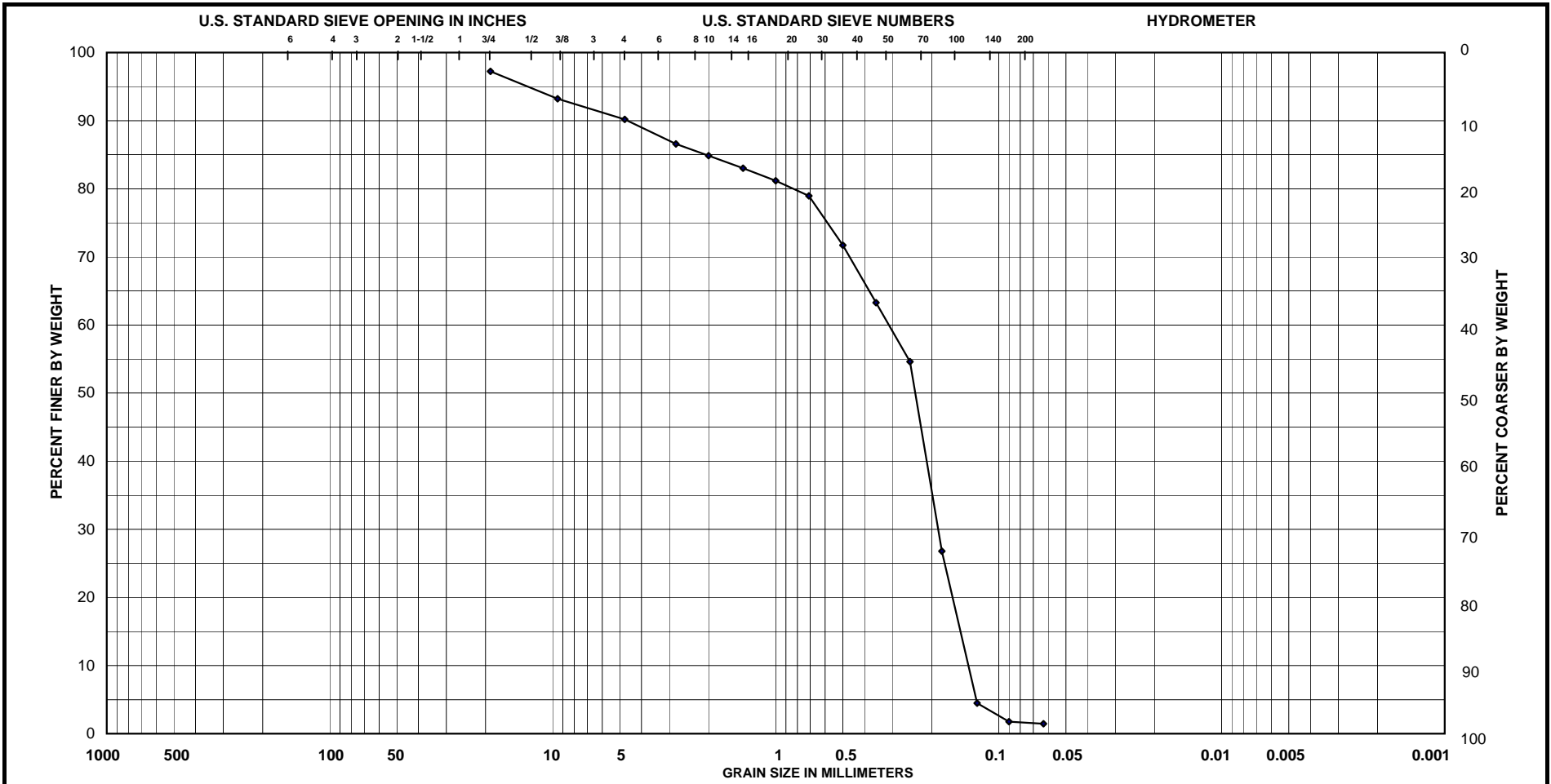
### GRAIN SIZE AND VISUAL SHELL CONTENT

Project:	<b>Topsail Beach, Surf City &amp; North Topsail</b>	Depth:	<b>46.5-47.0</b>
Project No.:	<b>1584-01-40</b>	Date:	<b>9/26/2003</b>
Boring No.:	<b>T1-03-V-198</b>		
Sample No.:	<b>1</b>		
Description:	<b>SAND, poorly-graded, mostly fine-grained quartz, few coarse to fine gravel-size carbonate, few coarse to medium-grained carbonate, trace</b>		

Tare Weight, (g):	<b>49.70</b>	
Dry Wt. Before Washing (g):	<b>182.94</b>	(with tare)
Dry Weight After Washing (g):	<b>181.47</b>	(with tare)

Sieve Size (Name)	Sieve Size (mm)	Weight Retained (g)	% Passing	Approx. Visual Shell %	Approx. Visual Shell Wt. (g)
3/4"	19.000	3.69	97.23	100	3.69
3/8"	9.500	5.35	93.22	100	5.35
#4	4.750	4.05	90.18	100	4.05
#7	2.800	4.80	86.57	100	4.80
#10	2.000	2.27	84.87	90	2.04
#14	1.400	2.47	83.02	75	1.85
#18	1.000	2.47	81.16	70	1.73
#25	0.710	2.95	78.95	30	0.89
#35	0.500	9.62	71.73	10	0.96
#45	0.355	11.23	63.30	3	0.34
#60	0.250	11.56	54.62	1	0.12
#80	0.180	37.08	26.79	1	0.37
#120	0.125	29.71	4.50	1	0.30
#170	0.090	3.62	1.78	1	0.04
#230	0.063	0.43	1.46	1	0.00

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



COBBLES	GRAVEL		SAND			SILT OR CLAY
	COARSE	FINE	COARSE	MEDIUM	FINE	

Sample No.	Elev. Or Depth	Classification	% CO <sub>3</sub>	G <sub>s</sub>	Nat w%	LL	PL	PI	Project	
♦ 1	46.5-47.0	SAND, poorly-graded, mostly fine-grained quartz, few coarse to fine gravel-size carbonate, few coarse to medium-grained carbonate, trace fragmented limestone, greenish gray (SP)	20						Topsail Beach, Surf City & North Topsail	
									Area	
									Boring No. T1-03-V-198	
									Date 9/26/2003	

**GRADATION CURVES**



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## VISUAL SHELL CONTENT

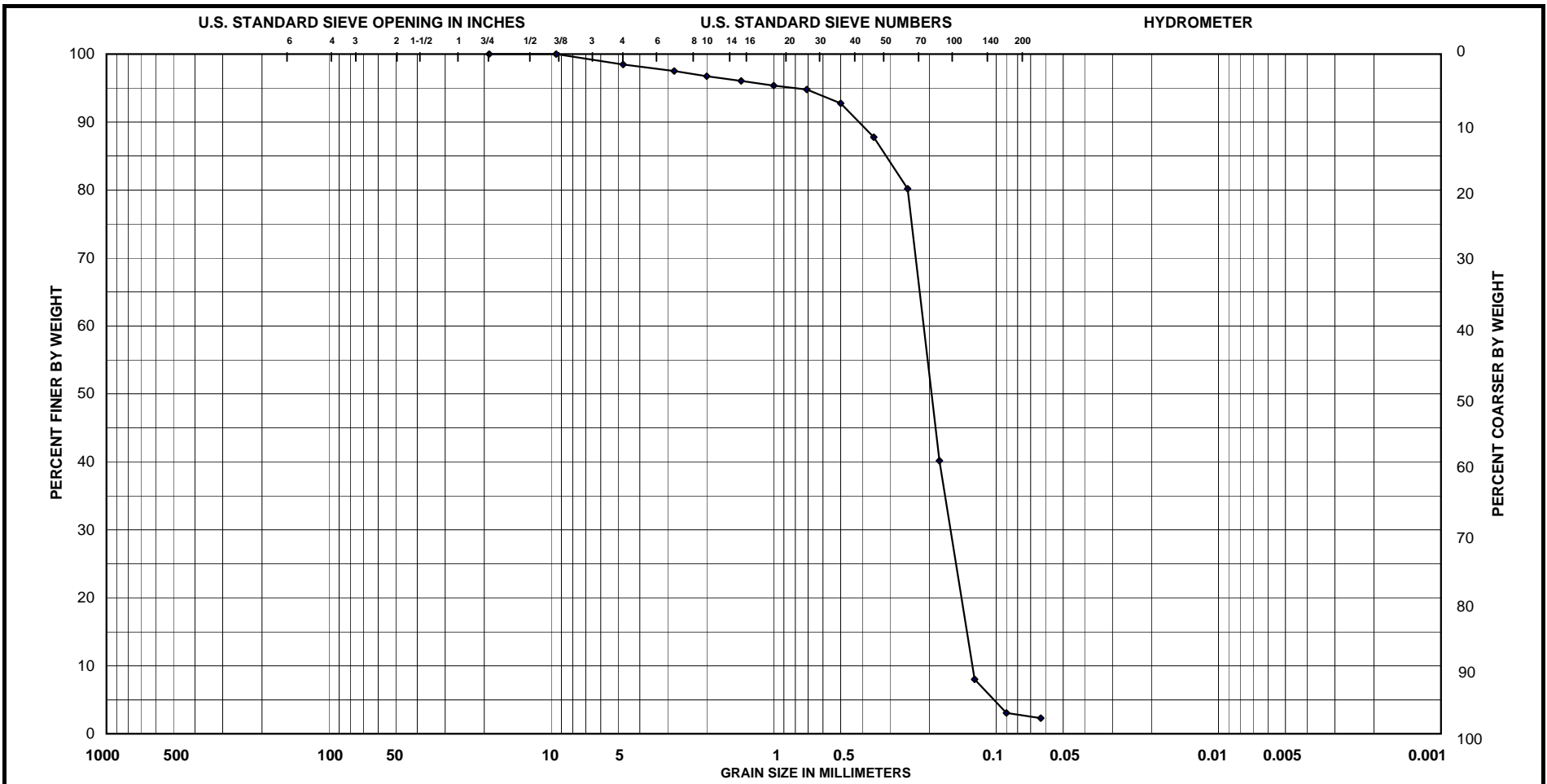
### GRAIN SIZE AND VISUAL SHELL CONTENT

Project:	<b>Topsail Beach, Surf City &amp; North Topsail</b>	Depth:	<b>48.5-49.0</b>
Project No.:	<b>1584-01-40</b>	Date:	<b>9/26/2003</b>
Boring No.:	<b>T1-03-V-198</b>		
Sample No.:	<b>2</b>		
Description:	<b>SAND, poorly-graded, mostly fine-grained quartz, few carbonate, greenish gray (SP)</b>		

Tare Weight, (g):	<b>49.54</b>	
Dry Wt. Before Washing (g):	<b>174.26</b>	(with tare)
Dry Weight After Washing (g):	<b>171.69</b>	(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	1.91	98.47	100	1.91
#7	2.800	1.19	97.51	100	1.19
#10	2.000	0.97	96.74	65	0.63
#14	1.400	0.87	96.04	55	0.48
#18	1.000	0.84	95.37	40	0.34
#25	0.710	0.74	94.77	70	0.52
#35	0.500	2.51	92.76	40	1.00
#45	0.355	6.24	87.76	20	1.25
#60	0.250	9.46	80.17	3	0.28
#80	0.180	49.87	40.19	1	0.50
#120	0.125	40.12	8.02	1	0.40
#170	0.090	6.17	3.07	1	0.06
#230	0.063	0.94	2.32	1	0.01

**Total Shell Content:** **7** %



COBBLES	GRAVEL		SAND			SILT OR CLAY
	COARSE	FINE	COARSE	MEDIUM	FINE	

Sample No.	Elev. Or Depth	Classification	% CO <sub>3</sub>	G <sub>s</sub>	Nat w%	LL	PL	PI	Project	
♦ 2	48.5-49.0	SAND, poorly-graded, mostly fine-grained quartz, few carbonate, greenish gray (SP)	7						Topsail Beach, Surf City & North Topsail	
									Area	
									Boring No. T1-03-V-198	
									Date 9/26/2003	

**GRADATION CURVES**



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## VISUAL SHELL CONTENT

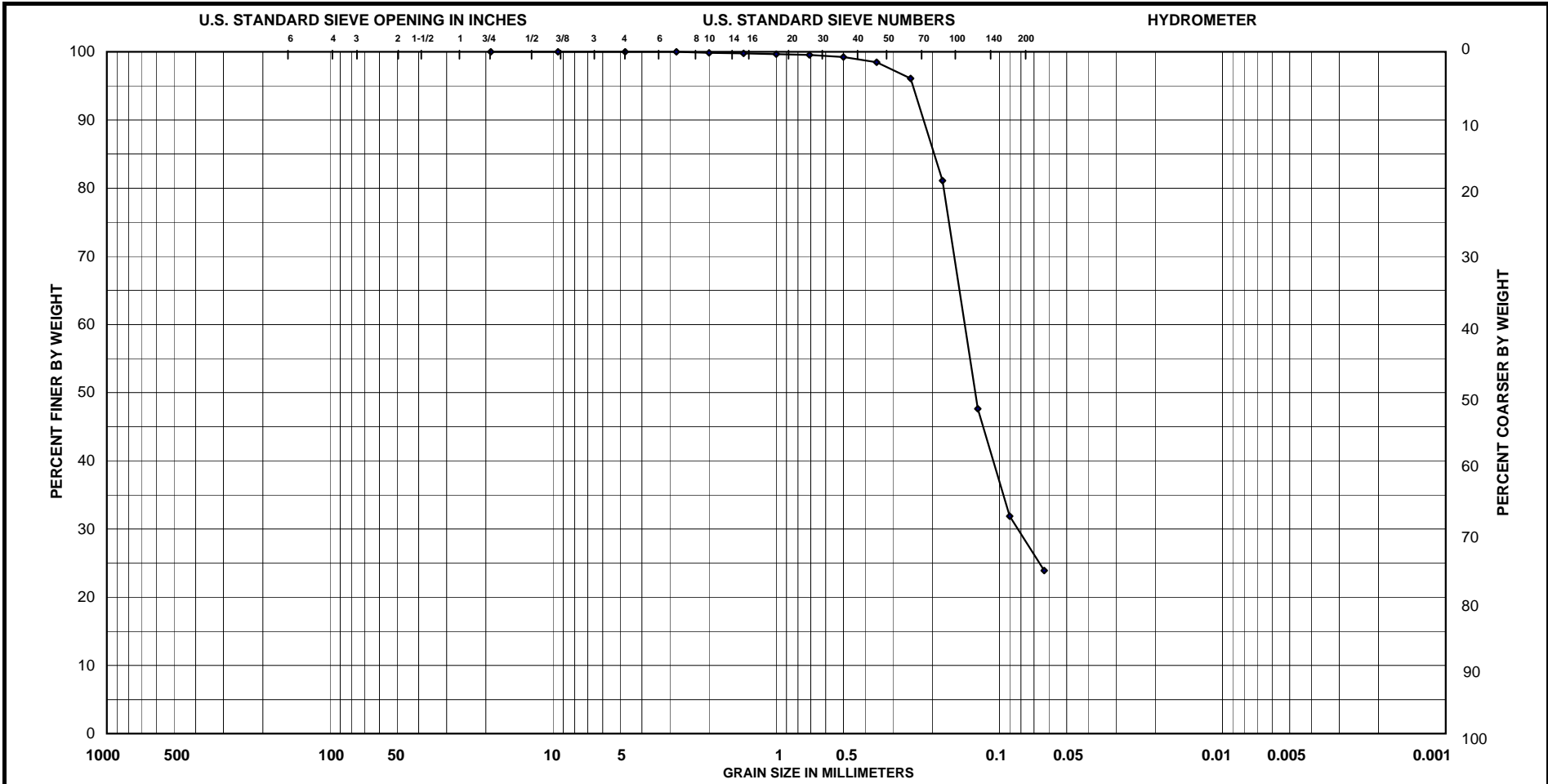
### GRAIN SIZE AND VISUAL SHELL CONTENT

Project:	<b>Topsail Beach, Surf City &amp; North Topsail</b>	Depth:	<b>49.5-50.0</b>
Project No.:	<b>1584-01-40</b>	Date:	<b>9/26/2003</b>
Boring No.:	<b>T1-03-V-198</b>		
Sample No.:	<b>3</b>		
Description:	<b>SAND, silty, mostly fine-grained quartz, little silt, trace carbonate, very dark greenish gray (SM)</b>		

Tare Weight, (g):	<b>50.07</b>	
Dry Wt. Before Washing (g):	<b>170.76</b>	(with tare)
Dry Weight After Washing (g):	<b>143.19</b>	(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	0.17	99.86	0	0.00
#14	1.400	0.12	99.76	0	0.00
#18	1.000	0.14	99.64	3	0.00
#25	0.710	0.13	99.54	1	0.00
#35	0.500	0.38	99.22	3	0.01
#45	0.355	0.92	98.46	1	0.01
#60	0.250	2.86	96.09	1	0.03
#80	0.180	18.08	81.11	1	0.18
#120	0.125	40.39	47.64	1	0.40
#170	0.090	18.99	31.91	1	0.19
#230	0.063	9.63	23.93	1	0.10

**Total Shell Content:** **1** %



COBBLES	GRAVEL		SAND			SILT OR CLAY
	COARSE	FINE	COARSE	MEDIUM	FINE	

Sample No.	Elev. Or Depth	Classification	% CO <sub>3</sub>	G <sub>s</sub>	Nat w%	LL	PL	PI	Project	
3	49.5-50.0	SAND, silty, mostly fine-grained quartz, little silt, trace carbonate, very dark greenish gray (SM)	1						Topsail Beach, Surf City & North Topsail	
									Area	
									Boring No. T1-03-V-198	
									Date 9/26/2003	

**GRADATION CURVES**



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## VISUAL SHELL CONTENT

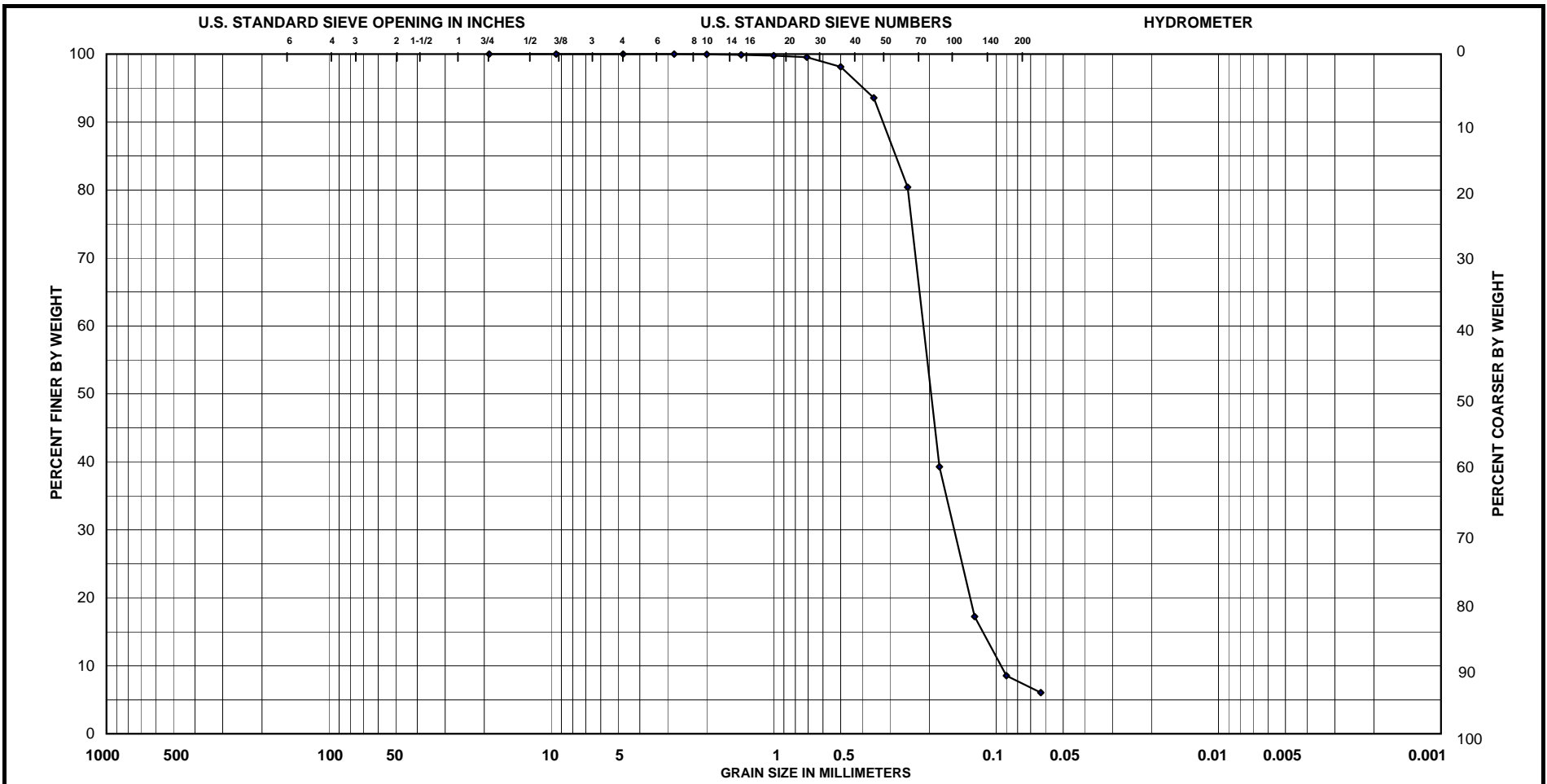
### GRAIN SIZE AND VISUAL SHELL CONTENT

Project:	<b>Topsail Beach, Surf City &amp; North Topsail</b>	Depth:	<b>50.5-51.0</b>
Project No.:	<b>1584-01-40</b>	Date:	<b>9/26/2003</b>
Boring No.:	<b>T1-03-V-198</b>		
Sample No.:	<b>4</b>		
Description:	<b>SAND, poorly-graded with silt, mostly fine-grained quartz, few silt, greenish gray (SP-SM)</b>		

Tare Weight, (g):	<b>50.60</b>	
Dry Wt. Before Washing (g):	<b>180.34</b>	(with tare)
Dry Weight After Washing (g):	<b>173.24</b>	(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	0.06	99.95	0	0.00
#14	1.400	0.09	99.88	0	0.00
#18	1.000	0.17	99.75	1	0.00
#25	0.710	0.30	99.52	1	0.00
#35	0.500	1.80	98.13	1	0.02
#45	0.355	5.91	93.58	1	0.06
#60	0.250	17.08	80.41	0	0.00
#80	0.180	53.34	39.30	0	0.00
#120	0.125	28.63	17.23	0	0.00
#170	0.090	11.27	8.55	0	0.00
#230	0.063	3.24	6.05	0	0.00

**Total Shell Content:** **0** %



COBBLES	GRAVEL		SAND			SILT OR CLAY
	COARSE	FINE	COARSE	MEDIUM	FINE	

Sample No.	Elev. Or Depth	Classification	% CO <sub>3</sub>	G <sub>s</sub>	Nat w%	LL	PL	PI	Project	
4	50.5-51.0	SAND, poorly-graded with silt, mostly fine-grained quartz, few silt, greenish gray (SP-SM)	0						Topsail Beach, Surf City & North Topsail	
									Area	
									Boring No. T1-03-V-198	
									Date 9/26/2003	

**GRADATION CURVES**





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## VISUAL SHELL CONTENT

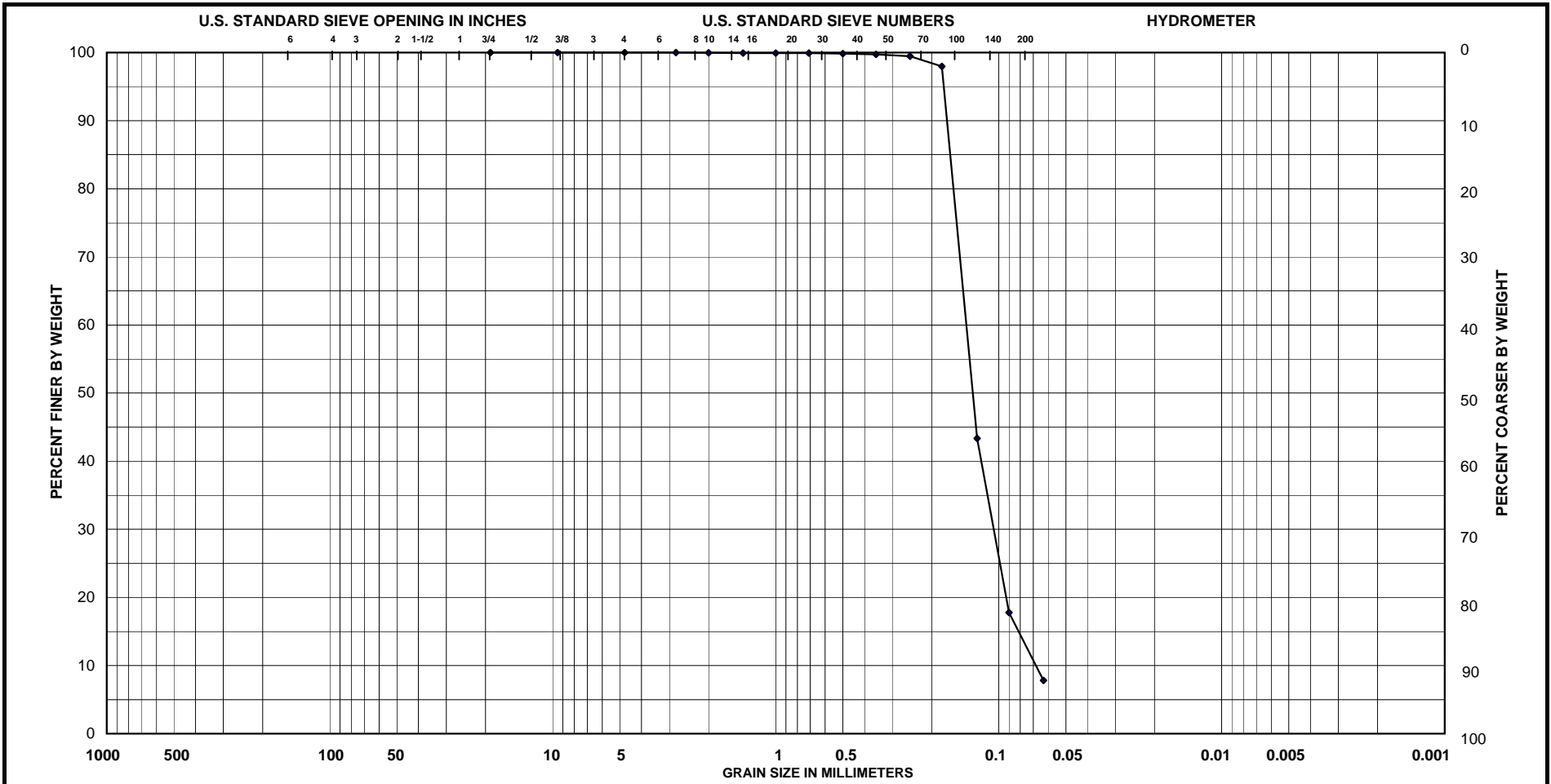
### GRAIN SIZE AND VISUAL SHELL CONTENT

Project:	<b>Topsail Beach, Surf City &amp; North Topsail</b>	Depth:	<b>52.5-53.0</b>
Project No.:	<b>1584-01-40</b>	Date:	<b>9/26/2003</b>
Boring No.:	<b>T1-03-V-198</b>		
Sample No.:	<b>5</b>		
Description:	<b>SAND, poorly-graded with silt, mostly fine-grained quartz, few silt, greenish gray (SP-SM)</b>		

Tare Weight, (g):	<b>50.03</b>	
Dry Wt. Before Washing (g):	<b>179.39</b>	(with tare)
Dry Weight After Washing (g):	<b>170.37</b>	(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	0.05	99.96	0	0.00
#14	1.400	0.03	99.94	0	0.00
#18	1.000	0.02	99.92	0	0.00
#25	0.710	0.02	99.91	3	0.00
#35	0.500	0.10	99.83	1	0.00
#45	0.355	0.15	99.71	1	0.00
#60	0.250	0.30	99.48	1	0.00
#80	0.180	1.97	97.96	0	0.00
#120	0.125	70.63	43.36	0	0.00
#170	0.090	33.06	17.80	0	0.00
#230	0.063	12.90	7.83	0	0.00

**Total Shell Content:** **0** %



COBBLES	GRAVEL		SAND			SILT OR CLAY
	COARSE	FINE	COARSE	MEDIUM	FINE	

Sample No.	Elev. Or Depth	Classification	% CO <sub>3</sub>	G <sub>s</sub>	Nat w%	LL	PL	PI	Project	
5	52.5-53.0	SAND, poorly-graded with silt, mostly fine-grained quartz, few silt, greenish gray (SP-SM)	0						Topsail Beach, Surf City & North Topsail	
									Area	
									Boring No. T1-03-V-198	
									Date 9/26/2003	

**GRADATION CURVES**



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## VISUAL SHELL CONTENT

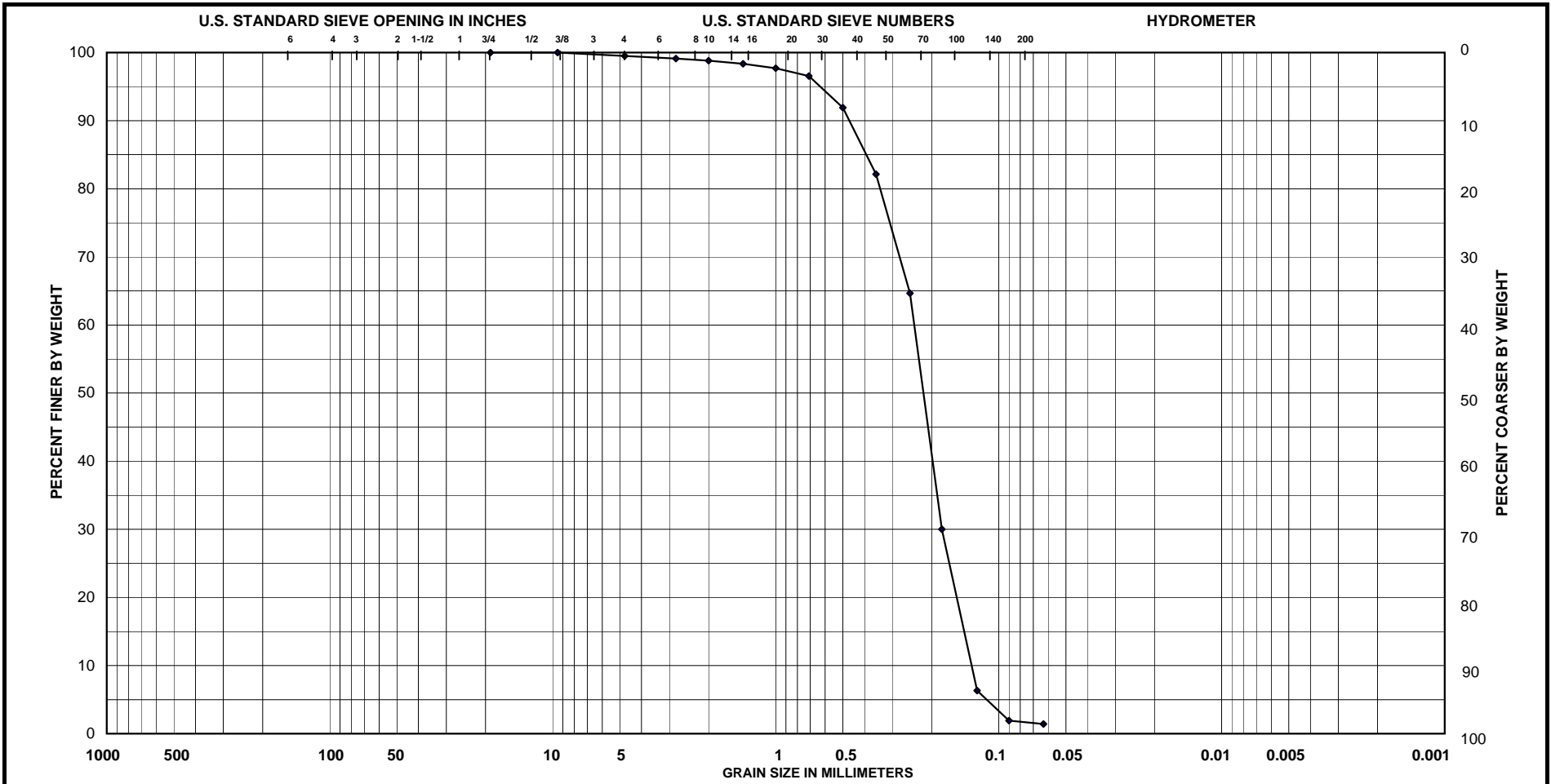
### GRAIN SIZE AND VISUAL SHELL CONTENT

Project:	<b>Topsail Beach, Surf City &amp; North Topsail</b>	Depth:	<b>46.6-47.1</b>
Project No.:	<b>1584-01-40</b>	Date:	<b>9/26/2003</b>
Boring No.:	<b>T1-03-V-199</b>		
Sample No.:	<b>1</b>		
Description:	<b>SAND, poorly-graded, mostly fine-grained quartz, few carbonate, dark greenish gray (SP)</b>		

Tare Weight, (g):	<b>49.46</b>	
Dry Wt. Before Washing (g):	<b>175.59</b>	(with tare)
Dry Weight After Washing (g):	<b>174.36</b>	(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	0.62	99.51	100	0.62
#7	2.800	0.48	99.13	90	0.43
#10	2.000	0.39	98.82	100	0.39
#14	1.400	0.59	98.35	85	0.50
#18	1.000	0.82	97.70	85	0.70
#25	0.710	1.44	96.56	70	1.01
#35	0.500	5.86	91.91	20	1.17
#45	0.355	12.34	82.13	10	1.23
#60	0.250	22.01	64.68	5	1.10
#80	0.180	43.75	29.99	3	1.31
#120	0.125	29.83	6.34	1	0.30
#170	0.090	5.56	1.93	1	0.06
#230	0.063	0.65	1.42	1	0.01

**Total Shell Content:** **7** %



COBBLES	GRAVEL		SAND			SILT OR CLAY
	COARSE	FINE	COARSE	MEDIUM	FINE	

Sample No.	Elev. Or Depth	Classification	% CO <sub>3</sub>	G <sub>s</sub>	Nat w%	LL	PL	PI	Project
1	46.6-47.1	SAND, poorly-graded, mostly fine-grained quartz, few carbonate, dark greenish gray (SP)	7						Topsail Beach, Surf City & North Topsail
									Area
									Boring No. T1-03-V-199
									Date 9/26/2003

**GRADATION CURVES**



# WOLF TECHNOLOGIES, INC.

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

## VISUAL SHELL CONTENT

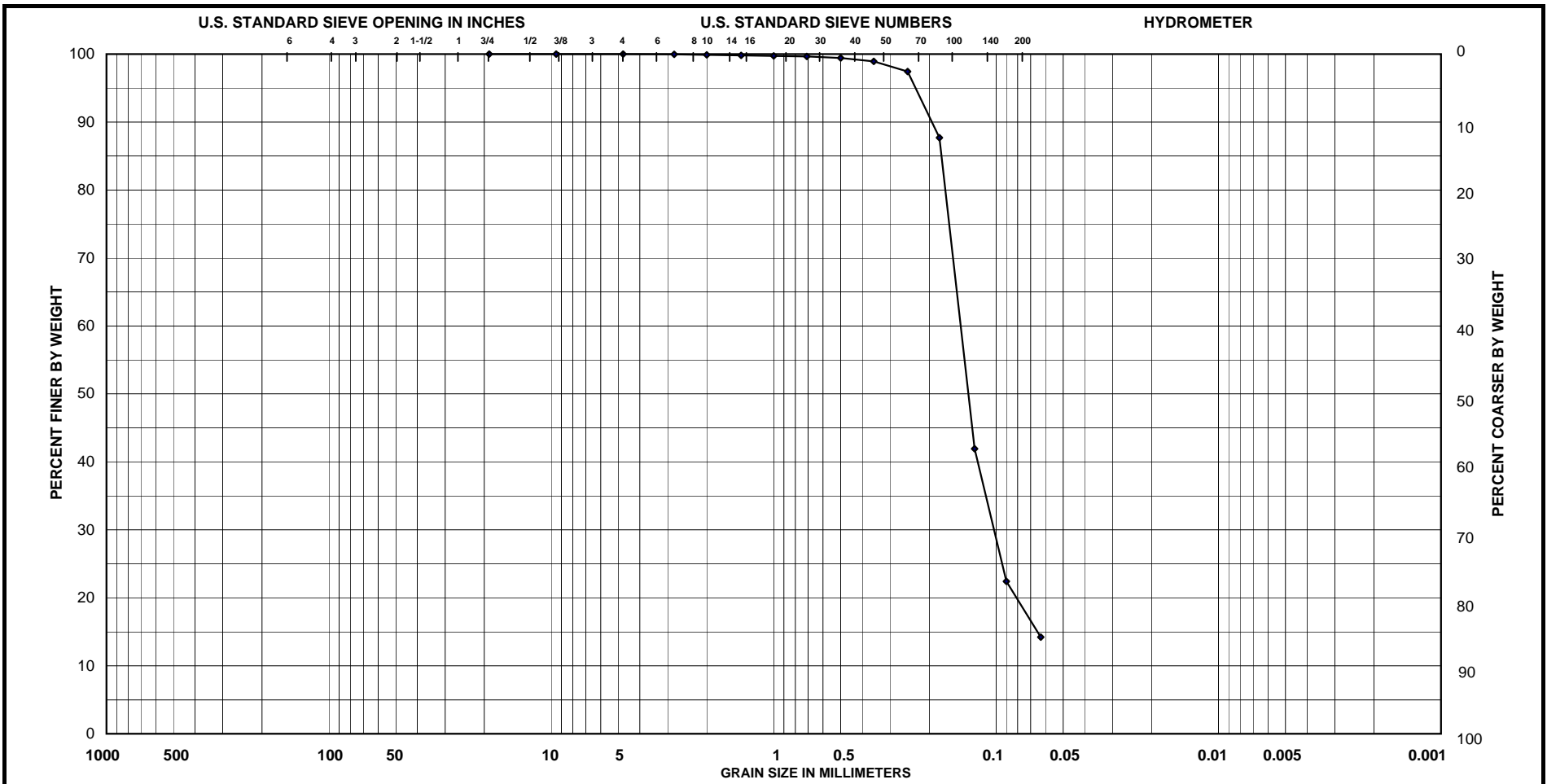
### GRAIN SIZE AND VISUAL SHELL CONTENT

<b>Project:</b>	<b>Topsail Beach, Surf City &amp; North Topsail</b>	<b>Depth:</b>	<b>48.8-49.3</b>
<b>Project No.:</b>	<b>1584-01-40</b>	<b>Date:</b>	<b>9/26/2003</b>
<b>Boring No.:</b>	<b>T1-03-V-199</b>		
<b>Sample No.:</b>	<b>2</b>		
<b>Description:</b>	<b>SAND, silty, mostly fine-grained quartz, little silt, trace carbonate, dark greenish gray (SM)</b>		

Tare Weight, (g):	50.33	
Dry Wt. Before Washing (g):	178.36	(with tare)
Dry Weight After Washing (g):	161.19	(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	0.03	99.98	100	0.03
#10	2.000	0.14	99.87	60	0.08
#14	1.400	0.06	99.82	85	0.05
#18	1.000	0.10	99.74	80	0.08
#25	0.710	0.11	99.66	85	0.09
#35	0.500	0.28	99.44	60	0.17
#45	0.355	0.67	98.91	40	0.27
#60	0.250	1.90	97.43	5	0.10
#80	0.180	12.47	87.69	3	0.37
#120	0.125	58.58	41.94	1	0.59
#170	0.090	24.97	22.43	1	0.25
#230	0.063	10.50	14.23	1	0.11

**Total Shell Content:** 2 %





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## VISUAL SHELL CONTENT

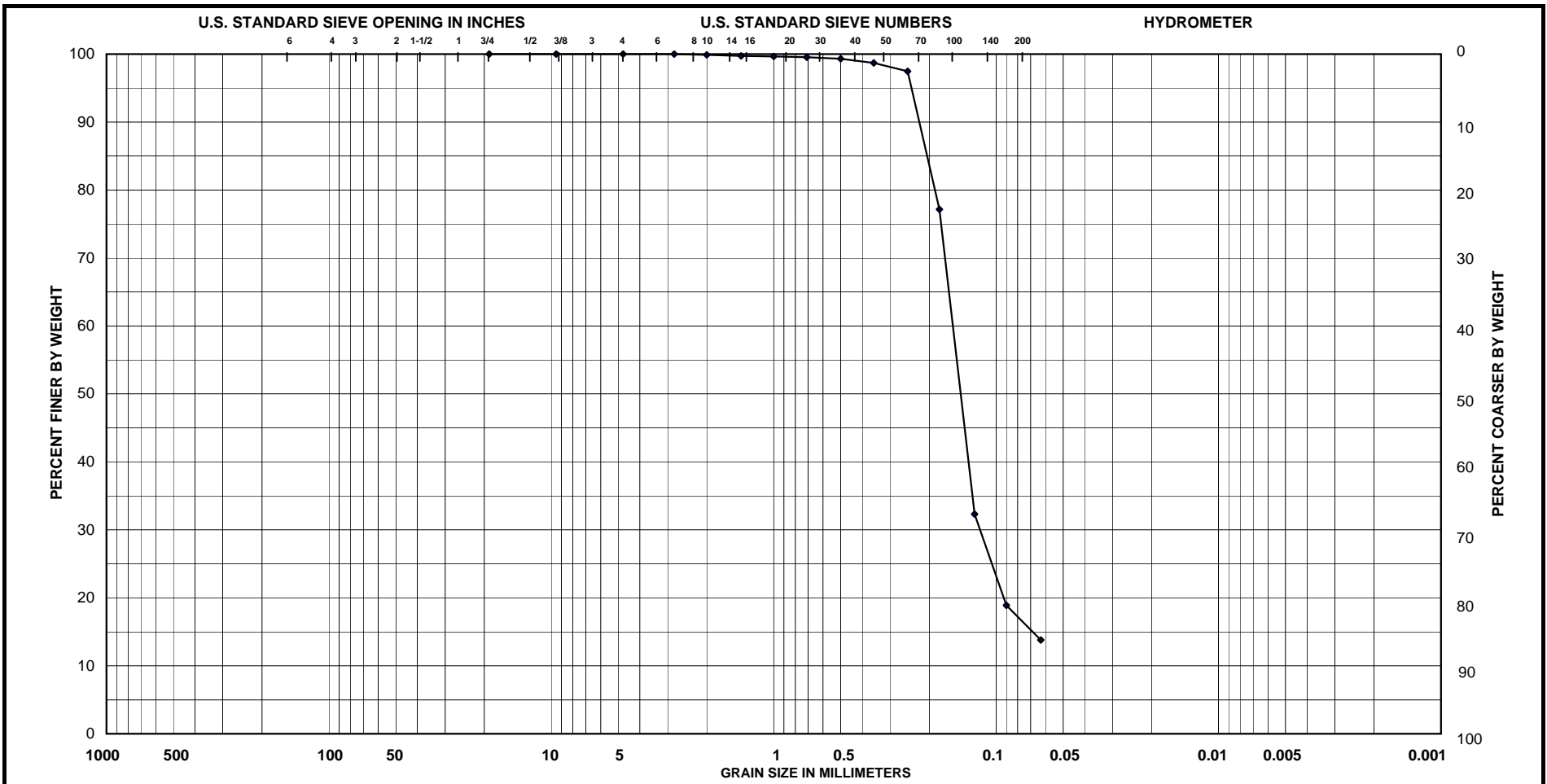
### GRAIN SIZE AND VISUAL SHELL CONTENT

Project:	<b>Topsail Beach, Surf City &amp; North Topsail</b>	Depth:	<b>51.1-51.8</b>
Project No.:	<b>1584-01-40</b>	Date:	<b>9/26/2003</b>
Boring No.:	<b>T1-03-V-199</b>		
Sample No.:	<b>3</b>		
Description:	<b>SAND, silty, mostly fine-grained quartz, little silt, trace carbonate, dark greenish gray (SM)</b>		

Tare Weight, (g):	<b>49.43</b>	
Dry Wt. Before Washing (g):	<b>171.01</b>	(with tare)
Dry Weight After Washing (g):	<b>154.61</b>	(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	0.16	99.87	30	0.05
#14	1.400	0.15	99.75	30	0.05
#18	1.000	0.11	99.65	30	0.03
#25	0.710	0.13	99.55	60	0.08
#35	0.500	0.31	99.29	40	0.12
#45	0.355	0.72	98.70	10	0.07
#60	0.250	1.49	97.47	3	0.04
#80	0.180	24.70	77.16	3	0.74
#120	0.125	54.52	32.32	1	0.55
#170	0.090	16.32	18.89	1	0.16
#230	0.063	6.21	13.79	1	0.06

**Total Shell Content:** **2** %



COBBLES	GRAVEL		SAND			SILT OR CLAY
	COARSE	FINE	COARSE	MEDIUM	FINE	

Sample No.	Elev. Or Depth	Classification	% CO <sub>3</sub>	G <sub>s</sub>	Nat w%	LL	PL	PI	Project	
3	51.1-51.8	SAND, silty, mostly fine-grained quartz, little silt, trace carbonate, dark greenish gray (SM)	2						Topsail Beach, Surf City & North Topsail	
									Area	
									Boring No. T1-03-V-199	
									Date 9/26/2003	

**GRADATION CURVES**





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## VISUAL SHELL CONTENT

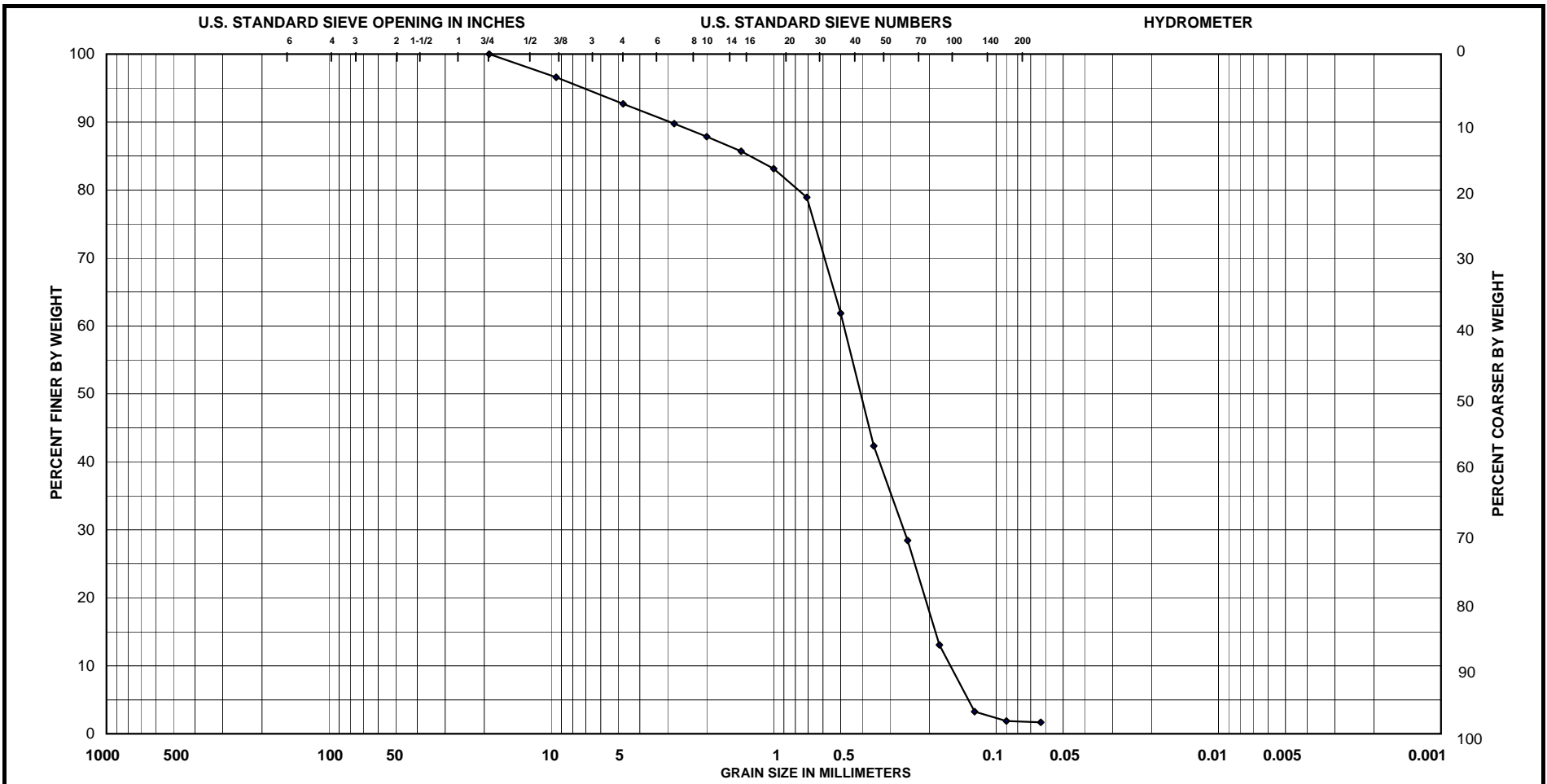
### GRAIN SIZE AND VISUAL SHELL CONTENT

Project:	<b>Topsail Beach, Surf City &amp; North Topsail</b>	Depth:	<b>46.3-46.8</b>
Project No.:	<b>1584-01-40</b>	Date:	<b>9/26/2003</b>
Boring No.:	<b>T1-03-V-200</b>		
Sample No.:	<b>1</b>		
Description:	<b>SAND, poorly-graded, mostly medium to fine-grained quartz, few fine gravel-size carbonate, few coarse to medium-grained carbonate, trace</b>		

Tare Weight, (g):	<b>49.90</b>	
Dry Wt. Before Washing (g):	<b>184.01</b>	(with tare)
Dry Weight After Washing (g):	<b>182.17</b>	(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	4.57	96.59	100	4.57
#4	4.750	5.27	92.66	100	5.27
#7	2.800	3.87	89.78	100	3.87
#10	2.000	2.57	87.86	80	2.06
#14	1.400	2.88	85.71	70	2.02
#18	1.000	3.44	83.15	70	2.41
#25	0.710	5.69	78.91	40	2.28
#35	0.500	22.88	61.84	10	2.29
#45	0.355	26.12	42.37	5	1.31
#60	0.250	18.70	28.42	3	0.56
#80	0.180	20.58	13.08	1	0.21
#120	0.125	13.15	3.27	1	0.13
#170	0.090	1.86	1.89	1	0.02
#230	0.063	0.28	1.68	1	0.00

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



COBBLES	GRAVEL		SAND			SILT OR CLAY
	COARSE	FINE	COARSE	MEDIUM	FINE	

Sample No.	Elev. Or Depth	Classification	% CO <sub>3</sub>	G <sub>s</sub>	Nat w%	LL	PL	PI	Project	
♦ 1	46.3-46.8	SAND, poorly-graded, mostly medium to fine-grained quartz, few fine gravel-size carbonate, few coarse to medium-grained carbonate, trace fragmented limestone, dark gray (SP)	20						Topsail Beach, Surf City & North Topsail	
			Area							
			Boring No. T1-03-V-200							
			Date 9/26/2003							

**GRADATION CURVES**



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## VISUAL SHELL CONTENT

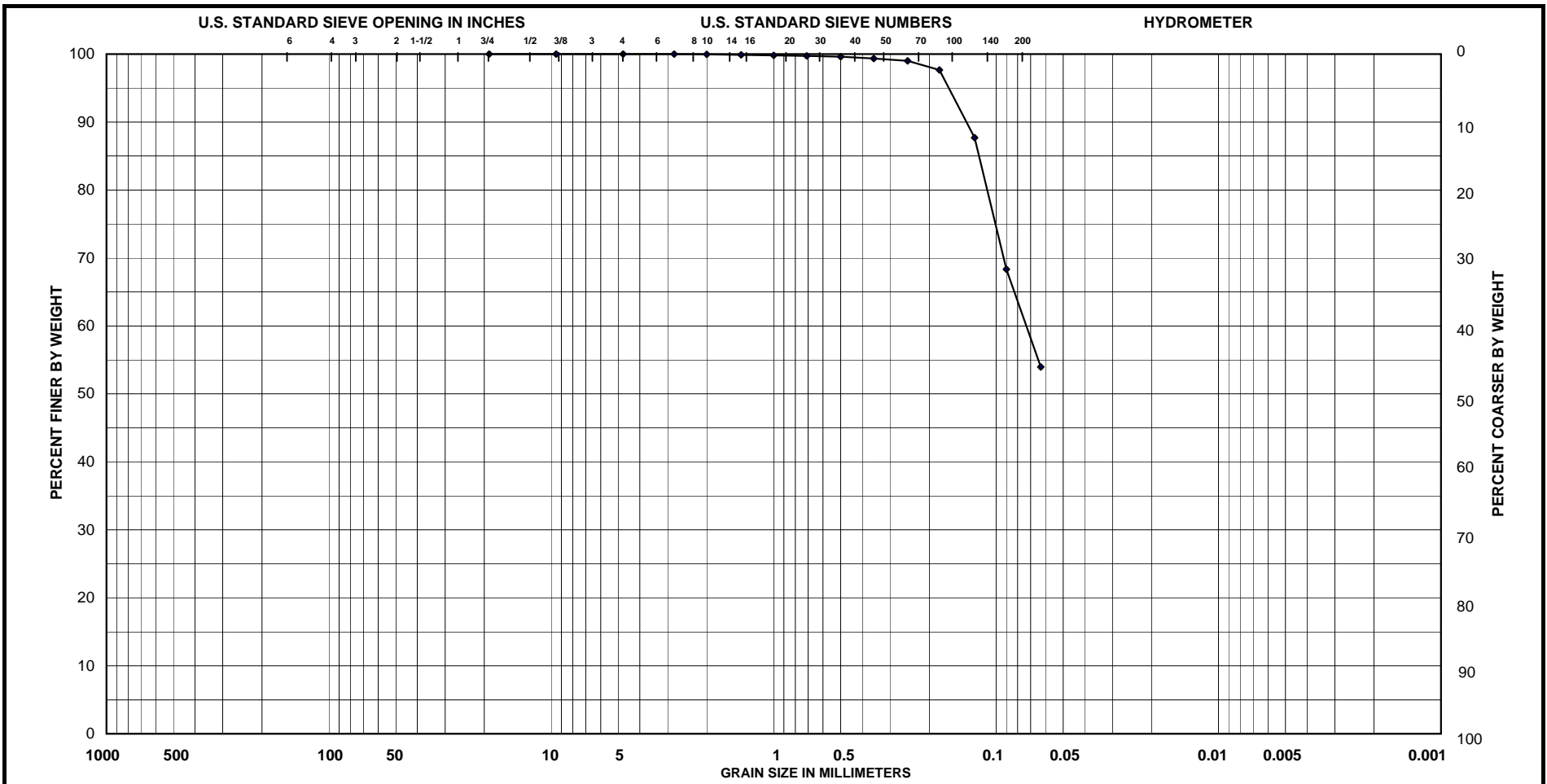
### GRAIN SIZE AND VISUAL SHELL CONTENT

Project:	<b>Topsail Beach, Surf City &amp; North Topsail</b>	Depth:	<b>47.6-48.1</b>
Project No.:	<b>1584-01-40</b>	Date:	<b>9/26/2003</b>
Boring No.:	<b>T1-03-V-200</b>		
Sample No.:	<b>2</b>		
Description:	<b>CLAY, inorganic-H, some fine-grained quartz sand, dark greenish gray (CH)</b>		

Tare Weight, (g):	<b>48.93</b>	
Dry Wt. Before Washing (g):	<b>149.41</b>	(with tare)
Dry Weight After Washing (g):	<b>97.13</b>	(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	0.04	99.96	0	0.00
#14	1.400	0.07	99.89	15	0.01
#18	1.000	0.07	99.82	3	0.00
#25	0.710	0.08	99.74	5	0.00
#35	0.500	0.13	99.61	3	0.00
#45	0.355	0.27	99.34	1	0.00
#60	0.250	0.35	98.99	1	0.00
#80	0.180	1.33	97.67	1	0.01
#120	0.125	10.02	87.70	1	0.10
#170	0.090	19.46	68.33	1	0.19
#230	0.063	14.44	53.96	1	0.14

**Total Shell Content:** **0** %



COBBLES	GRAVEL		SAND			SILT OR CLAY
	COARSE	FINE	COARSE	MEDIUM	FINE	

Sample No.	Elev. Or Depth	Classification	% CO <sub>3</sub>	G <sub>s</sub>	Nat w%	LL	PL	PI	Project	
♦ 2	47.6-48.1	CLAY, inorganic-H, some fine-grained quartz sand, dark greenish gray (CH)	0						Topsail Beach, Surf City & North Topsail	
									Area	
									Boring No. T1-03-V-200	
									Date 9/26/2003	

**GRADATION CURVES**



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## VISUAL SHELL CONTENT

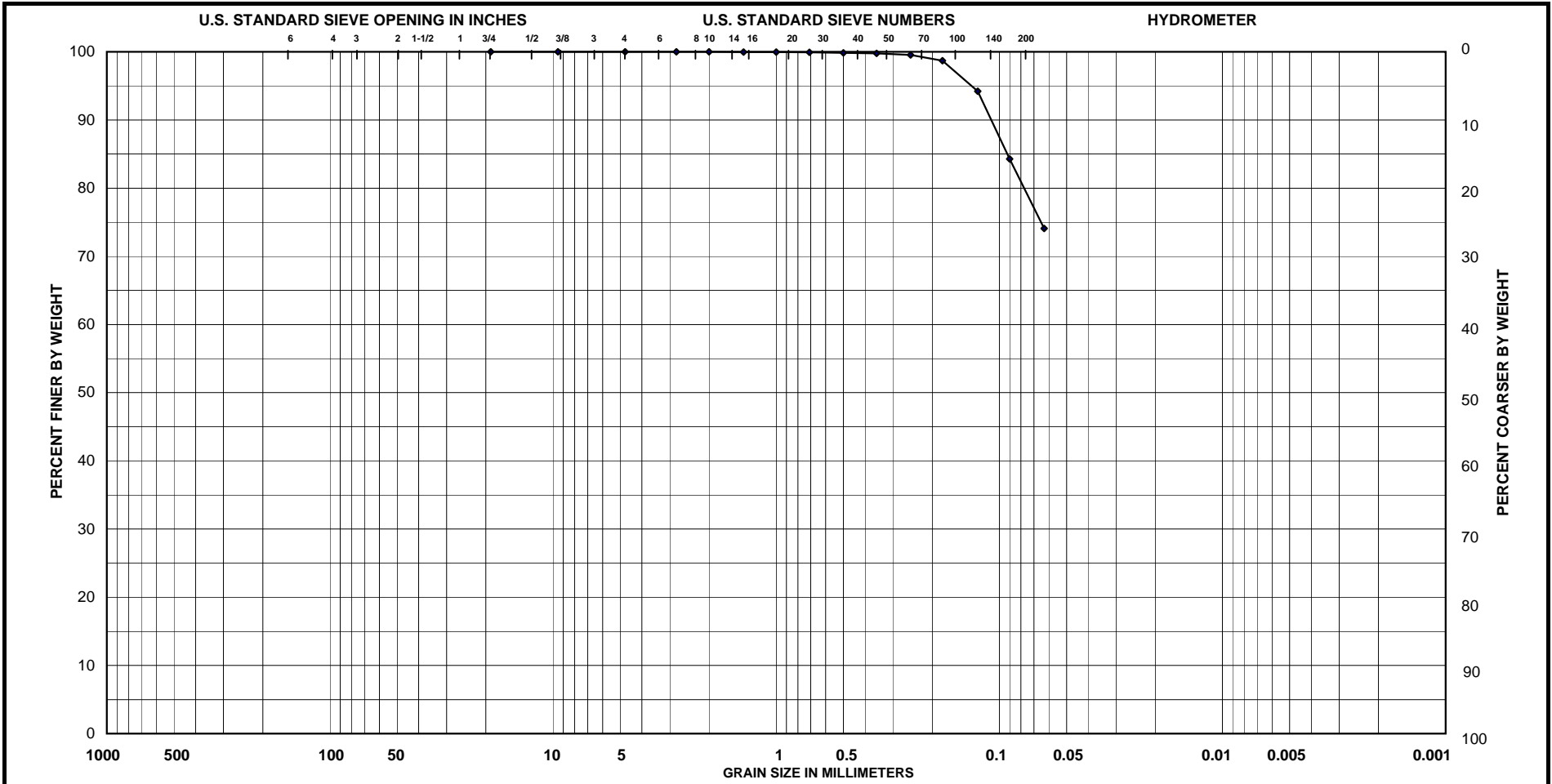
### GRAIN SIZE AND VISUAL SHELL CONTENT

Project:	<b>Topsail Beach, Surf City &amp; North Topsail</b>	Depth:	<b>49.5-50.0</b>
Project No.:	<b>1584-01-40</b>	Date:	<b>9/26/2003</b>
Boring No.:	<b>T1-03-V-200</b>		
Sample No.:	<b>3</b>		
Description:	<b>CLAY, inorganic-H, little fine-grained quartz sand, dark greenish gray (CH)</b>		

Tare Weight, (g):	<b>48.47</b>	
Dry Wt. Before Washing (g):	<b>133.57</b>	(with tare)
Dry Weight After Washing (g):	<b>71.34</b>	(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	0.00	100.00	0	0.00
#14	1.400	0.02	99.98	30	0.01
#18	1.000	0.02	99.95	5	0.00
#25	0.710	0.04	99.91	30	0.01
#35	0.500	0.05	99.85	40	0.02
#45	0.355	0.06	99.78	20	0.01
#60	0.250	0.19	99.55	3	0.01
#80	0.180	0.72	98.71	1	0.01
#120	0.125	3.81	94.23	1	0.04
#170	0.090	8.46	84.29	1	0.08
#230	0.063	8.68	74.09	1	0.09

**Total Shell Content:** **0** %



COBBLES	GRAVEL		SAND			SILT OR CLAY
	COARSE	FINE	COARSE	MEDIUM	FINE	

Sample No.	Elev. Or Depth	Classification	% CO <sub>3</sub>	G <sub>s</sub>	Nat w%	LL	PL	PI	Project
3	49.5-50.0	CLAY, inorganic-H, little fine-grained quartz sand, dark greenish gray (CH)	0						Topsail Beach, Surf City & North Topsail
									Area
									Boring No. T1-03-V-200
									Date 9/26/2003

**GRADATION CURVES**



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## VISUAL SHELL CONTENT

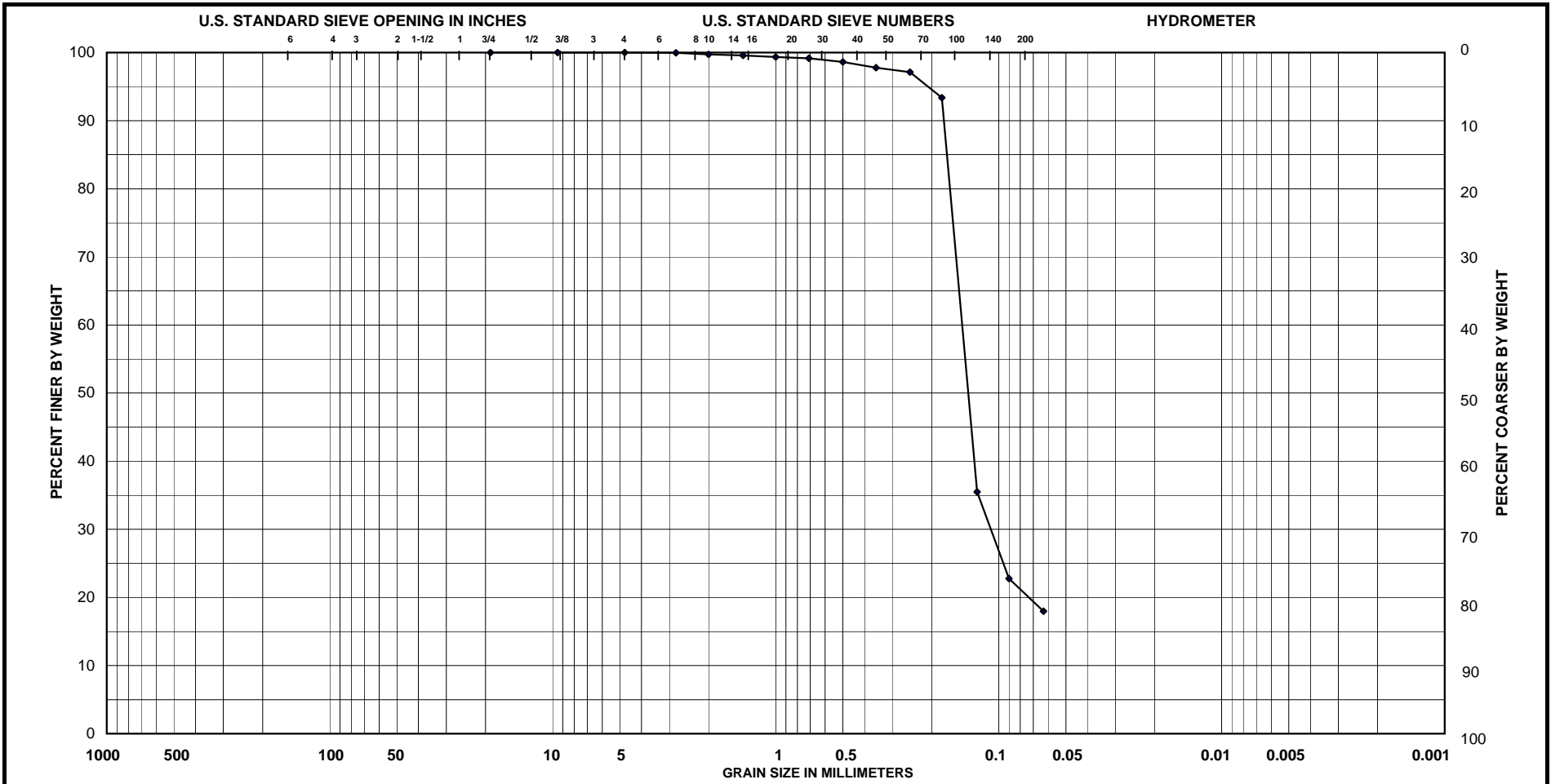
### GRAIN SIZE AND VISUAL SHELL CONTENT

Project:	<b>Topsail Beach, Surf City &amp; North Topsail</b>	Depth:	<b>51.3-51.8</b>
Project No.:	<b>1584-01-40</b>	Date:	<b>9/26/2003</b>
Boring No.:	<b>T1-03-V-200</b>		
Sample No.:	<b>4</b>		
Description:	<b>SAND, silty, mostly fine-grained quartz, little silt, trace carbonate, olive gray (SM)</b>		

Tare Weight, (g):	<b>50.38</b>	
Dry Wt. Before Washing (g):	<b>184.53</b>	(with tare)
Dry Weight After Washing (g):	<b>161.06</b>	(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	0.07	99.95	100	0.07
#10	2.000	0.29	99.73	60	0.17
#14	1.400	0.22	99.57	65	0.14
#18	1.000	0.27	99.37	40	0.11
#25	0.710	0.26	99.17	55	0.14
#35	0.500	0.73	98.63	20	0.15
#45	0.355	1.16	97.76	10	0.12
#60	0.250	0.84	97.14	5	0.04
#80	0.180	5.07	93.36	3	0.15
#120	0.125	77.61	35.51	1	0.78
#170	0.090	17.09	22.77	1	0.17
#230	0.063	6.45	17.96	1	0.06

**Total Shell Content:** **2** %



COBBLES	GRAVEL		SAND			SILT OR CLAY
	COARSE	FINE	COARSE	MEDIUM	FINE	

Sample No.	Elev. Or Depth	Classification	% CO <sub>3</sub>	G <sub>s</sub>	Nat w%	LL	PL	PI	Project	
4	51.3-51.8	SAND, silty, mostly fine-grained quartz, little silt, trace carbonate, olive gray (SM)	2						Topsail Beach, Surf City & North Topsail	
									Area	
									Boring No. T1-03-V-200	
									Date 9/26/2003	

**GRADATION CURVES**





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## VISUAL SHELL CONTENT

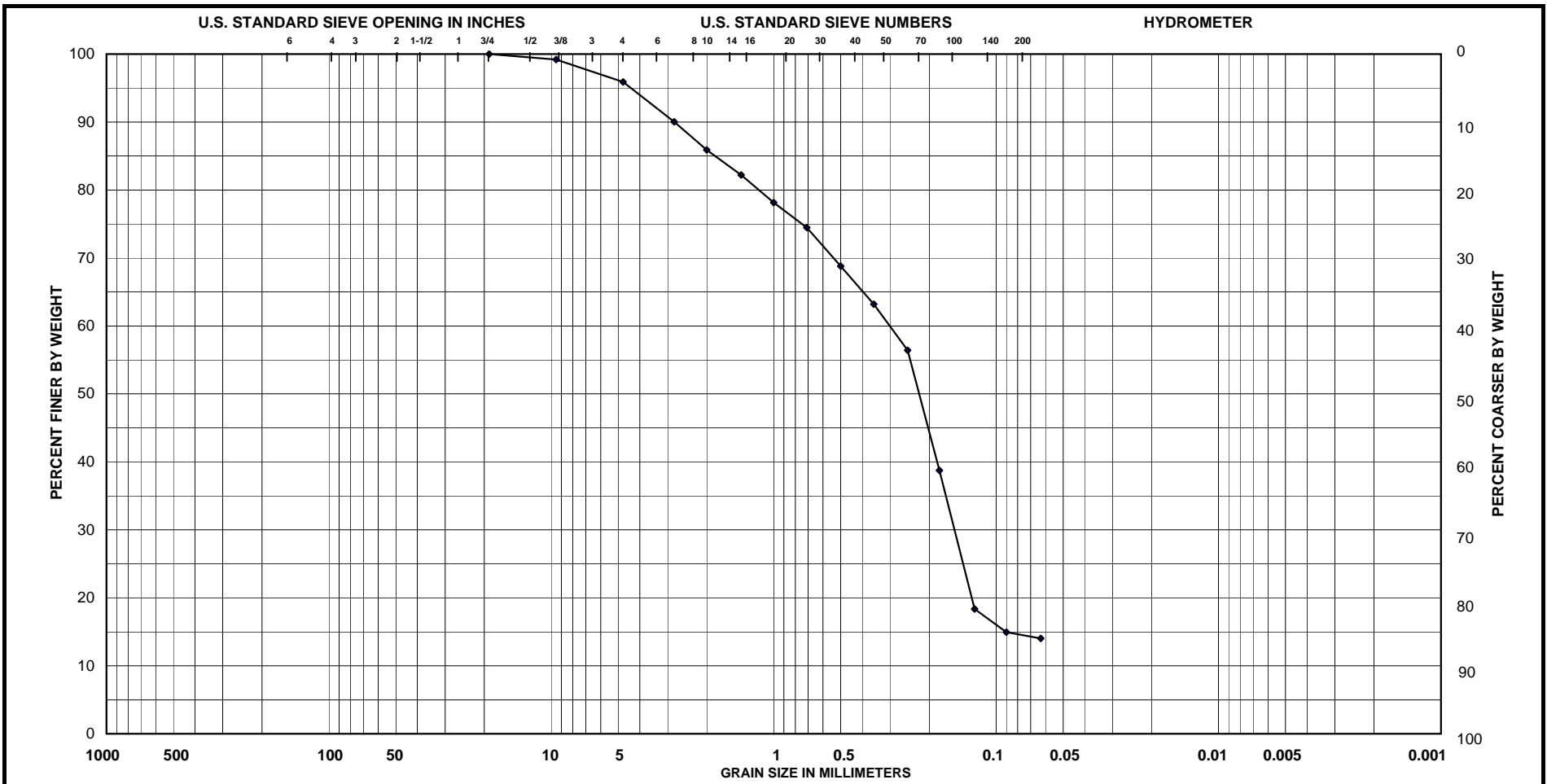
### GRAIN SIZE AND VISUAL SHELL CONTENT

Project:	<b>Topsail Beach, Surf City &amp; North Topsail</b>	Depth:	<b>46.1-46.6</b>
Project No.:	<b>1584-01-40</b>	Date:	<b>9/26/2003</b>
Boring No.:	<b>T1-03-V-201</b>		
Sample No.:	<b>1</b>		
Description:	<b>SAND, silty, mostly fine-grained quartz, little coarse to medium-grained carbonate, few fragmented limestone, trace fine gravel-size carbonate,</b>		

Tare Weight, (g):	<b>50.37</b>	
Dry Wt. Before Washing (g):	<b>178.24</b>	(with tare)
Dry Weight After Washing (g):	<b>160.45</b>	(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	1.04	99.19	100	1.04
#4	4.750	4.18	95.92	100	4.18
#7	2.800	7.51	90.04	90	6.76
#10	2.000	5.29	85.91	85	4.50
#14	1.400	4.74	82.20	70	3.32
#18	1.000	5.19	78.14	80	4.15
#25	0.710	4.69	74.47	75	3.52
#35	0.500	7.25	68.80	70	5.08
#45	0.355	7.14	63.22	30	2.14
#60	0.250	8.68	56.43	15	1.30
#80	0.180	22.61	38.75	5	1.13
#120	0.125	26.05	18.38	3	0.78
#170	0.090	4.39	14.94	1	0.04
#230	0.063	1.19	14.01	1	0.01

**Total Shell Content:** **30** %



COBBLES	GRAVEL		SAND			SILT OR CLAY
	COARSE	FINE	COARSE	MEDIUM	FINE	

Sample No.	Elev. Or Depth	Classification	% CO <sub>3</sub>	G <sub>s</sub>	Nat w%	LL	PL	PI	
♦ 1	46.1-46.6	SAND, silty, mostly fine-grained quartz, little coarse to medium-grained carbonate, few fragmented limestone, trace fine gravel-size carbonate, dark greenish gray (SM)	30						<b>Project</b> Topsail Beach, Surf City & North Topsail
									<b>Area</b>
									<b>Boring No.</b> T1-03-V-201
									<b>Date</b> 9/26/2003

**GRADATION CURVES**



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## VISUAL SHELL CONTENT

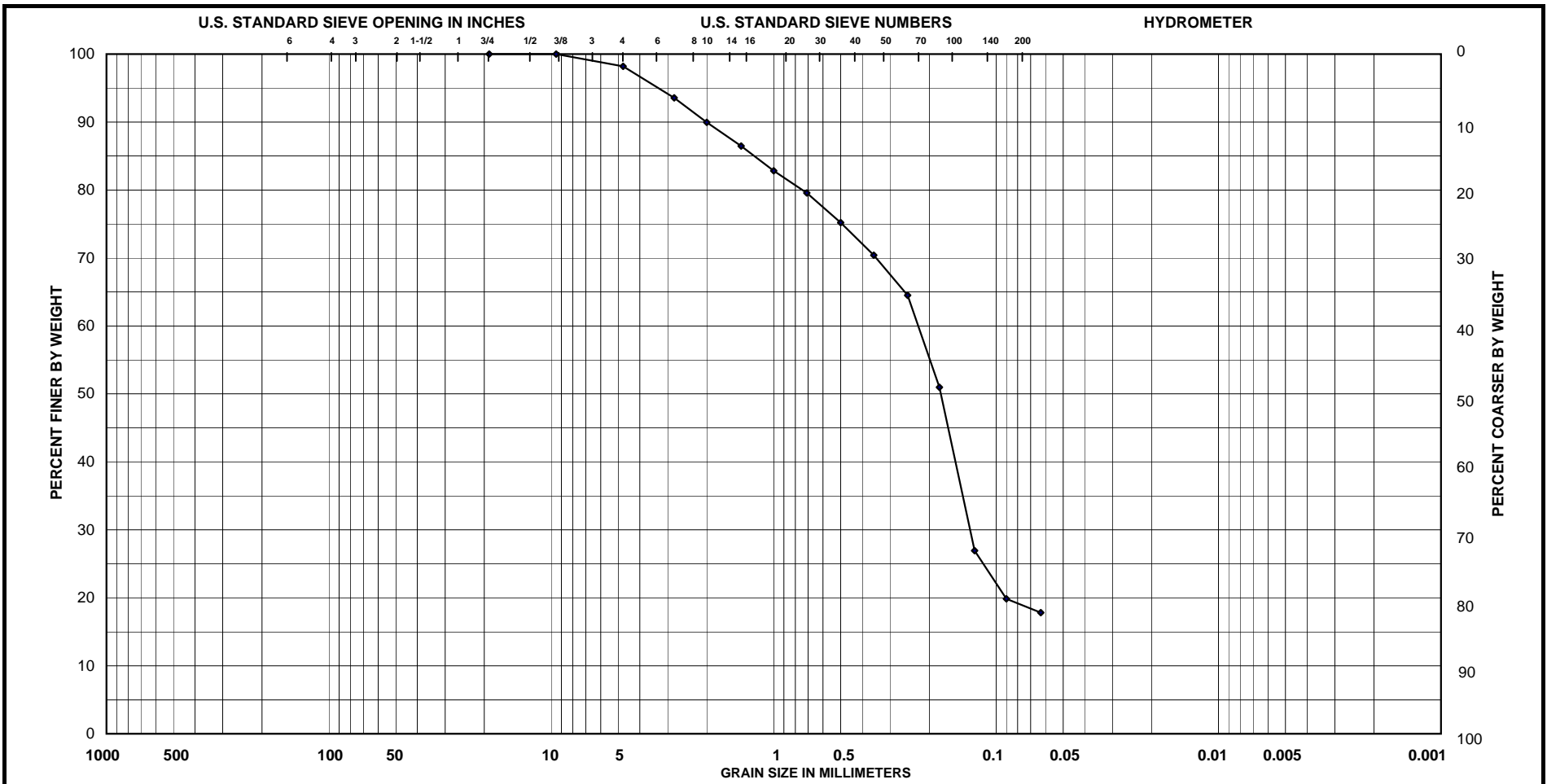
### GRAIN SIZE AND VISUAL SHELL CONTENT

Project:	<b>Topsail Beach, Surf City &amp; North Topsail</b>	Depth:	<b>48.1-48.6</b>
Project No.:	<b>1584-01-40</b>	Date:	<b>9/26/2003</b>
Boring No.:	<b>T1-03-V-201</b>		
Sample No.:	<b>2</b>		
Description:	<b>SAND, silty, mostly fine-grained quartz, little coarse to medium-grained carbonate, few fragmented limestone, greenish gray (SM)</b>		

Tare Weight, (g):	<b>50.26</b>	
Dry Wt. Before Washing (g):	<b>176.1</b>	(with tare)
Dry Weight After Washing (g):	<b>154.07</b>	(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	2.28	98.19	100	2.28
#7	2.800	5.83	93.56	100	5.83
#10	2.000	4.55	89.94	90	4.10
#14	1.400	4.39	86.45	80	3.51
#18	1.000	4.55	82.84	45	2.05
#25	0.710	4.10	79.58	45	1.85
#35	0.500	5.51	75.20	40	2.20
#45	0.355	6.03	70.41	25	1.51
#60	0.250	7.42	64.51	10	0.74
#80	0.180	17.02	50.99	3	0.51
#120	0.125	30.27	26.93	1	0.30
#170	0.090	8.91	19.85	1	0.09
#230	0.063	2.53	17.84	1	0.03

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



COBBLES	GRAVEL		SAND			SILT OR CLAY
	COARSE	FINE	COARSE	MEDIUM	FINE	

Sample No.	Elev. Or Depth	Classification	% CO <sub>3</sub>	G <sub>s</sub>	Nat w%	LL	PL	PI	Project
♦ 2	48.1-48.6	SAND, silty, mostly fine-grained quartz, little coarse to medium-grained carbonate, few fragmented limestone, greenish gray (SM)	20						Topsail Beach, Surf City & North Topsail
									Area
									Boring No. T1-03-V-201
									Date 9/26/2003

**GRADATION CURVES**



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## VISUAL SHELL CONTENT

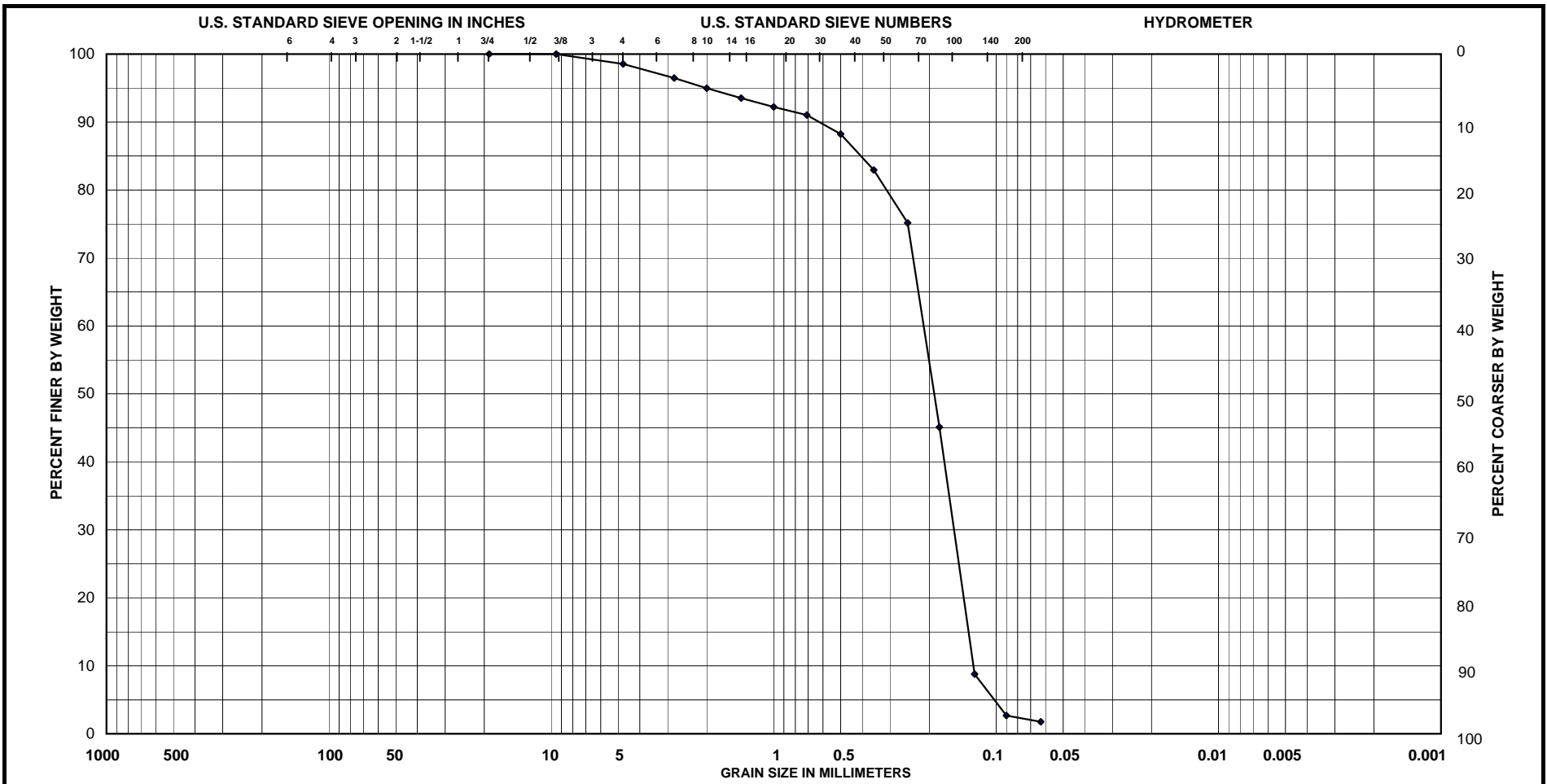
### GRAIN SIZE AND VISUAL SHELL CONTENT

Project:	<b>Topsail Beach, Surf City &amp; North Topsail</b>	Depth:	<b>46.3-46.8</b>
Project No.:	<b>1584-01-40</b>	Date:	<b>9/26/2003</b>
Boring No.:	<b>T1-03-V-202</b>		
Sample No.:	<b>1</b>		
Description:	<b>SAND, poorly-graded, mostly fine-grained quartz, few carbonate, few fragmented limestone, dark gray (SP)</b>		

Tare Weight, (g):	<b>50.44</b>	
Dry Wt. Before Washing (g):	<b>179.6</b>	(with tare)
Dry Weight After Washing (g):	<b>177.24</b>	(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	1.90	98.53	100	1.90
#7	2.800	2.66	96.47	90	2.39
#10	2.000	1.91	94.99	75	1.43
#14	1.400	1.90	93.52	65	1.24
#18	1.000	1.70	92.20	50	0.85
#25	0.710	1.49	91.05	45	0.67
#35	0.500	3.64	88.23	20	0.73
#45	0.355	6.81	82.96	10	0.68
#60	0.250	10.05	75.18	3	0.30
#80	0.180	38.82	45.12	1	0.39
#120	0.125	46.96	8.76	1	0.47
#170	0.090	7.85	2.69	1	0.08
#230	0.063	1.19	1.77	1	0.01

**Total Shell Content:** **9** %



COBBLES	GRAVEL		SAND			SILT OR CLAY
	COARSE	FINE	COARSE	MEDIUM	FINE	

Sample No.	Elev. Or Depth	Classification	% CO <sub>3</sub>	G <sub>s</sub>	Nat w%	LL	PL	PI	Project
1	46.3-46.8	SAND, poorly-graded, mostly fine-grained quartz, few carbonate, few fragmented limestone, dark gray (SP)	9						Topsail Beach, Surf City & North Topsail
									Area
									Boring No. T1-03-V-202
									Date 9/26/2003

**GRADATION CURVES**



# WOLF TECHNOLOGIES, INC.

3047-4 St. Johns Bluff Road S.  
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(904) 997-1400 (Tel) • (904) 997-9150 (Fax)

## VISUAL SHELL CONTENT

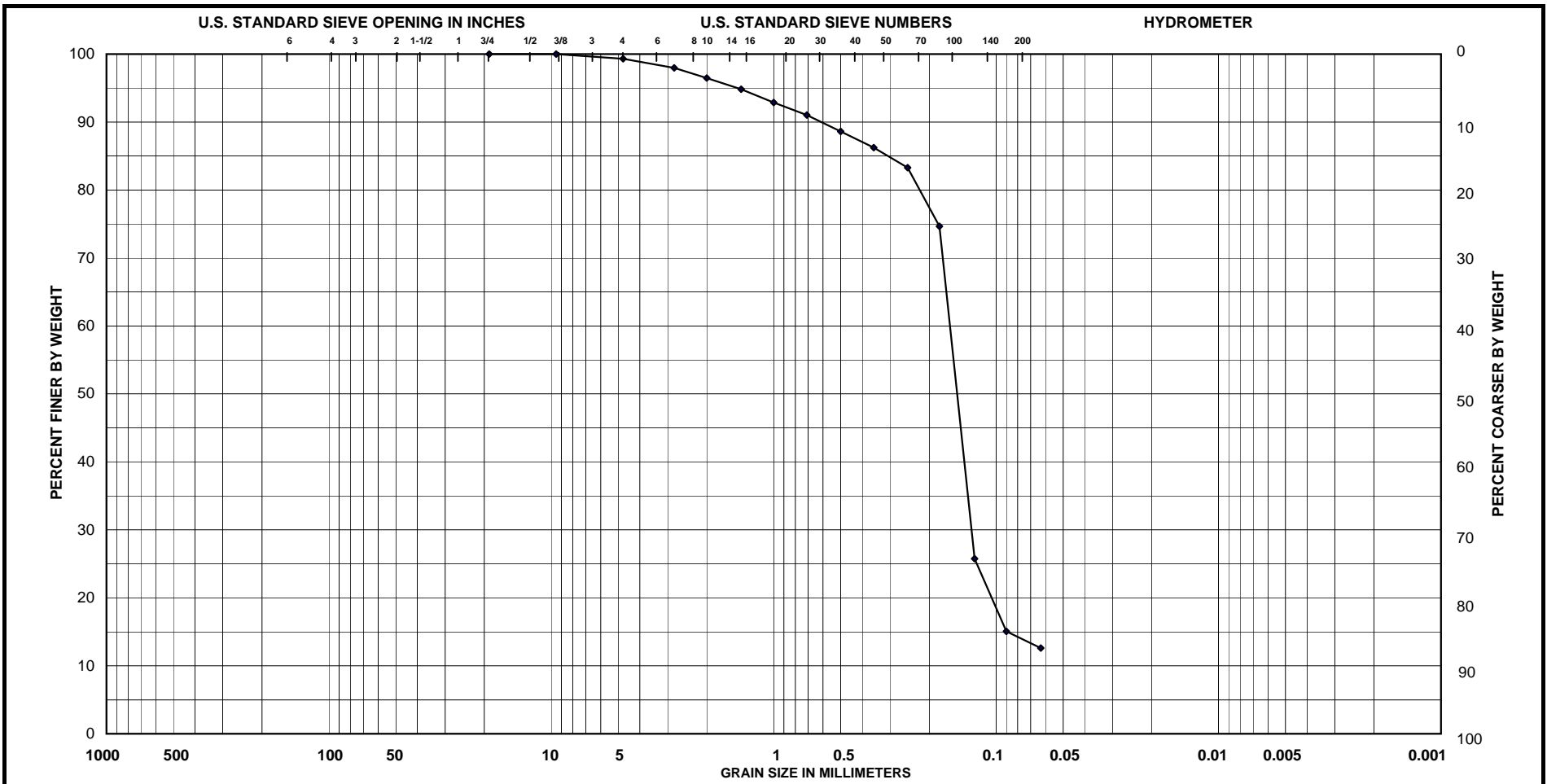
### GRAIN SIZE AND VISUAL SHELL CONTENT

Project:	<b>Topsail Beach, Surf City &amp; North Topsail</b>	Depth:	<b>48.0-48.5</b>
Project No.:	<b>1584-01-40</b>	Date:	<b>9/26/2003</b>
Boring No.:	<b>T1-03-V-202</b>		
Sample No.:	<b>2</b>		
Description:	<b>SAND, poorly-graded with silt, mostly fine-grained quartz, few carbonate, trace fragmented limestone, dark greenish gray (SP-SM)</b>		

Tare Weight, (g):	<b>50.11</b>	
Dry Wt. Before Washing (g):	<b>176.14</b>	(with tare)
Dry Weight After Washing (g):	<b>160.51</b>	(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	0.88	99.30	100	0.88
#7	2.800	1.67	97.98	90	1.50
#10	2.000	1.90	96.47	70	1.33
#14	1.400	2.09	94.81	70	1.46
#18	1.000	2.43	92.88	65	1.58
#25	0.710	2.34	91.03	45	1.05
#35	0.500	3.04	88.61	40	1.22
#45	0.355	2.99	86.24	25	0.75
#60	0.250	3.72	83.29	20	0.74
#80	0.180	10.87	74.66	3	0.33
#120	0.125	61.64	25.76	1	0.62
#170	0.090	13.47	15.07	1	0.13
#230	0.063	3.11	12.60	1	0.03

**Total Shell Content:** **9** %



COBBLES	GRAVEL		SAND			SILT OR CLAY
	COARSE	FINE	COARSE	MEDIUM	FINE	

Sample No.	Elev. Or Depth	Classification	% CO <sub>3</sub>	G <sub>s</sub>	Nat w%	LL	PL	PI	Project
♦ 2	48.0-48.5	SAND, poorly-graded with silt, mostly fine-grained quartz, few carbonate, trace fragmented limestone, dark greenish gray (SP-SM)	9						Topsail Beach, Surf City & North Topsail
									Area
									Boring No. T1-03-V-202
									Date 9/26/2003

**GRADATION CURVES**





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## VISUAL SHELL CONTENT

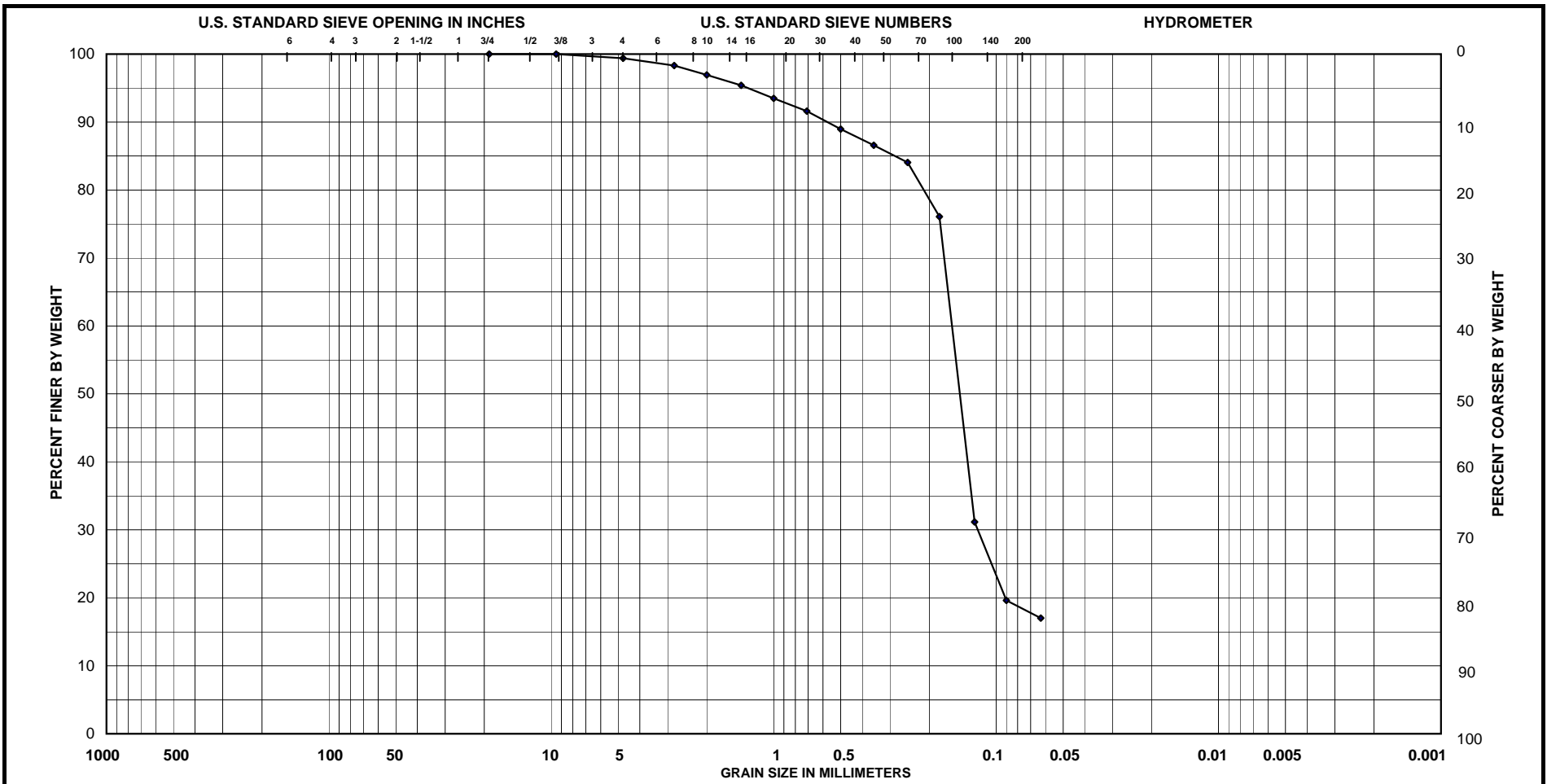
### GRAIN SIZE AND VISUAL SHELL CONTENT

Project:	<b>Topsail Beach, Surf City &amp; North Topsail</b>	Depth:	<b>50.0-50.5</b>
Project No.:	<b>1584-01-40</b>	Date:	<b>9/26/2003</b>
Boring No.:	<b>T1-03-V-202</b>		
Sample No.:	<b>3</b>		
Description:	<b>SAND, silty, mostly fine-grained quartz, few carbonate, trace fragmented limestone, dark greenish gray (SM)</b>		

Tare Weight, (g):	<b>50.25</b>	
Dry Wt. Before Washing (g):	<b>176.89</b>	(with tare)
Dry Weight After Washing (g):	<b>155.75</b>	(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	99.38	100	0.79
#7	2.800	1.36	98.30	100	1.36
#10	2.000	1.72	96.94	90	1.55
#14	1.400	1.95	95.40	75	1.46
#18	1.000	2.45	93.47	70	1.72
#25	0.710	2.38	91.59	70	1.67
#35	0.500	3.31	88.98	60	1.99
#45	0.355	3.01	86.60	30	0.90
#60	0.250	3.20	84.07	15	0.48
#80	0.180	10.10	76.10	3	0.30
#120	0.125	56.92	31.15	1	0.57
#170	0.090	14.58	19.64	1	0.15
#230	0.063	3.33	17.01	1	0.03

**Total Shell Content:** **10** %





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## VISUAL SHELL CONTENT

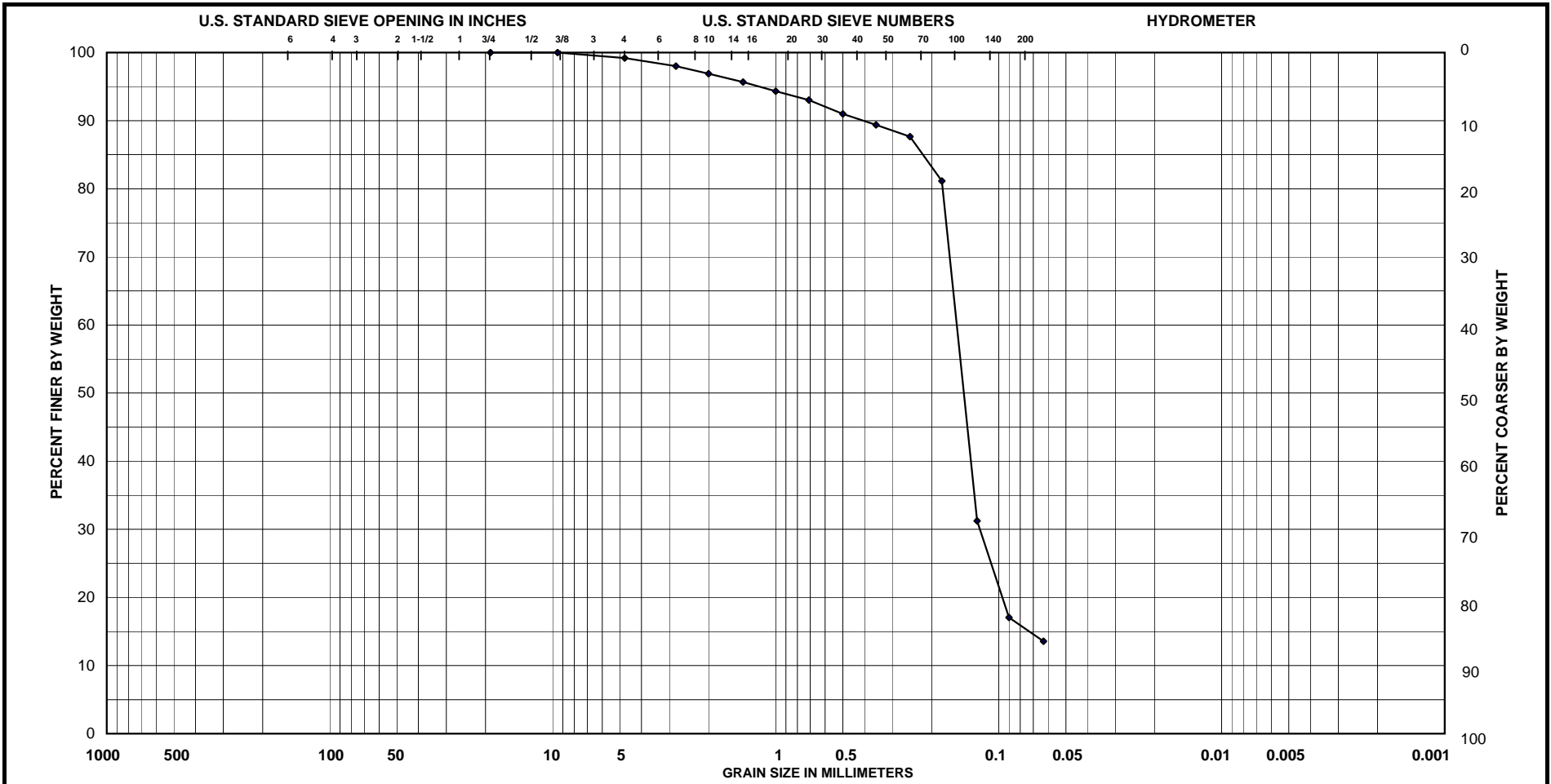
### GRAIN SIZE AND VISUAL SHELL CONTENT

Project:	<b>Topsail Beach, Surf City &amp; North Topsail</b>	Depth:	<b>52.0-52.5</b>
Project No.:	<b>1584-01-40</b>	Date:	<b>9/26/2003</b>
Boring No.:	<b>T1-03-V-202</b>		
Sample No.:	<b>4</b>		
Description:	<b>SAND, silty, mostly fine-grained quartz, few carbonate, trace fragmented limestone, dark greenish gray (SM)</b>		

Tare Weight, (g):	<b>50.15</b>	
Dry Wt. Before Washing (g):	<b>170.17</b>	(with tare)
Dry Weight After Washing (g):	<b>154.23</b>	(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	0.97	99.19	100	0.97
#7	2.800	1.41	98.02	100	1.41
#10	2.000	1.33	96.91	90	1.20
#14	1.400	1.50	95.66	85	1.28
#18	1.000	1.61	94.32	70	1.13
#25	0.710	1.57	93.01	70	1.10
#35	0.500	2.40	91.01	60	1.44
#45	0.355	1.94	89.39	40	0.78
#60	0.250	2.06	87.68	10	0.21
#80	0.180	7.84	81.14	3	0.24
#120	0.125	59.91	31.23	1	0.60
#170	0.090	17.01	17.06	1	0.17
#230	0.063	4.18	13.57	1	0.04

**Total Shell Content:** **9** %



COBBLES	GRAVEL		SAND			SILT OR CLAY
	COARSE	FINE	COARSE	MEDIUM	FINE	

Sample No.	Elev. Or Depth	Classification	% CO <sub>3</sub>	G <sub>s</sub>	Nat w%	LL	PL	PI	Project
4	52.0-52.5	SAND, silty, mostly fine-grained quartz, few carbonate, trace fragmented limestone, dark greenish gray (SM)	9						Topsail Beach, Surf City & North Topsail
									Area
									Boring No. T1-03-V-202
									Date 9/26/2003

**GRADATION CURVES**



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## VISUAL SHELL CONTENT

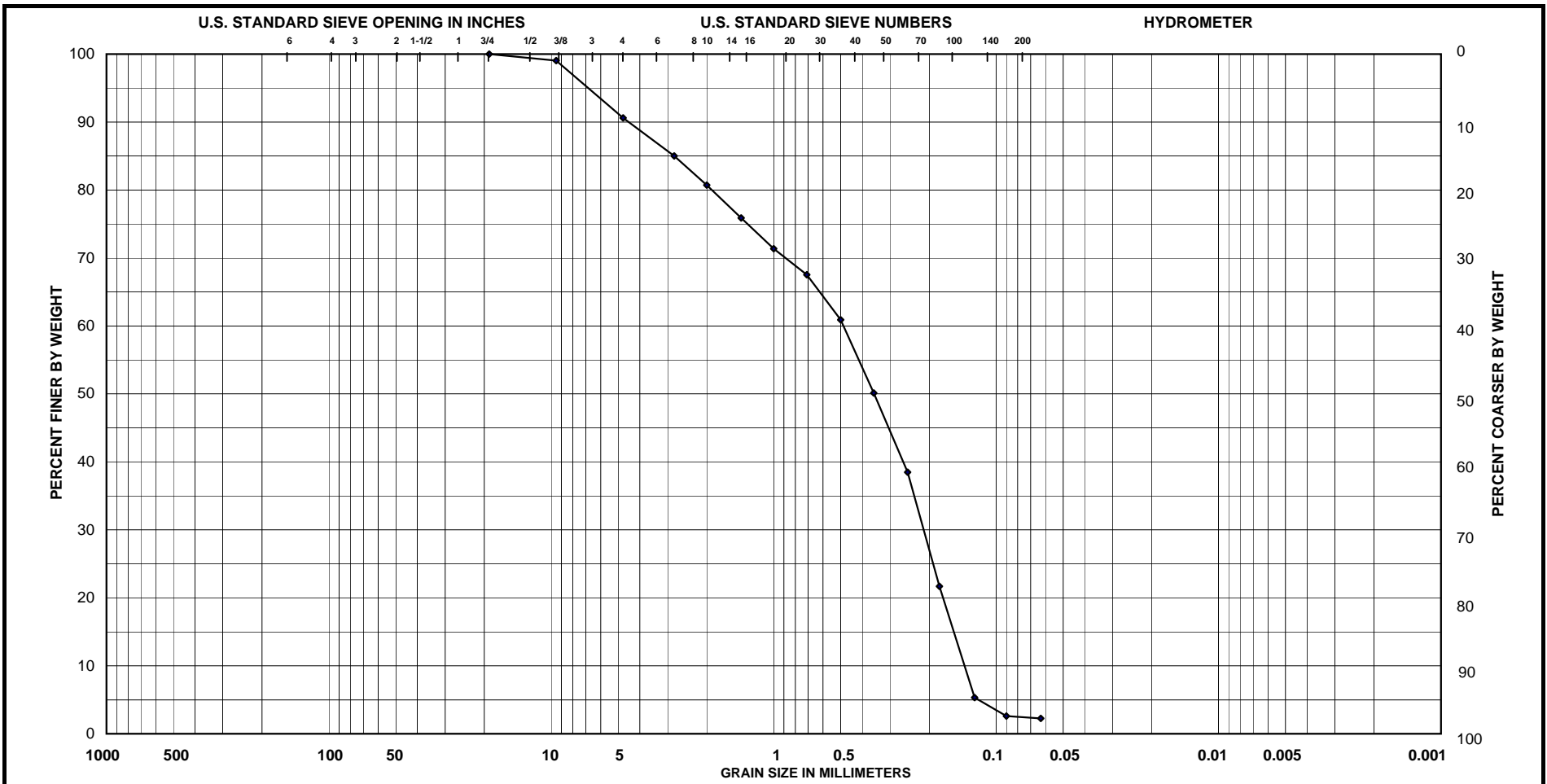
### GRAIN SIZE AND VISUAL SHELL CONTENT

Project:	<b>Topsail Beach, Surf City &amp; North Topsail</b>	Depth:	<b>43.4-43.9</b>
Project No.:	<b>1584-01-40</b>	Date:	<b>9/26/2003</b>
Boring No.:	<b>T1-03-V-203</b>		
Sample No.:	<b>1</b>		
Description:	<b>SAND, poorly-graded, mostly medium to fine-grained quartz, little coarse to medium-grained carbonate, few fine gravel-size carbonate,</b>		

Tare Weight, (g):	<b>50.11</b>	
Dry Wt. Before Washing (g):	<b>175.26</b>	(with tare)
Dry Weight After Washing (g):	<b>173.12</b>	(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	1.21	99.03	100	1.21
#4	4.750	10.55	90.60	75	7.91
#7	2.800	7.00	85.01	85	5.95
#10	2.000	5.37	80.72	80	4.30
#14	1.400	6.06	75.88	70	4.24
#18	1.000	5.66	71.35	40	2.26
#25	0.710	4.78	67.53	35	1.67
#35	0.500	8.28	60.92	20	1.66
#45	0.355	13.51	50.12	10	1.35
#60	0.250	14.56	38.49	3	0.44
#80	0.180	21.01	21.70	1	0.21
#120	0.125	20.51	5.31	1	0.21
#170	0.090	3.37	2.62	1	0.03
#230	0.063	0.43	2.28	1	0.00

**Total Shell Content:** **25** %



COBBLES	GRAVEL		SAND			SILT OR CLAY
	COARSE	FINE	COARSE	MEDIUM	FINE	

Sample No.	Elev. Or Depth	Classification	% CO <sub>3</sub>	G <sub>s</sub>	Nat w%	LL	PL	PI	Project	
♦ 1	43.4-43.9	SAND, poorly-graded, mostly medium to fine-grained quartz, little coarse to medium-grained carbonate, few fine gravel-size carbonate, few fragmented limestone, dark greenish gray (SP)	25						Topsail Beach, Surf City & North Topsail	
									Area	
									Boring No. T1-03-V-203	
									Date 9/26/2003	

**GRADATION CURVES**



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## VISUAL SHELL CONTENT

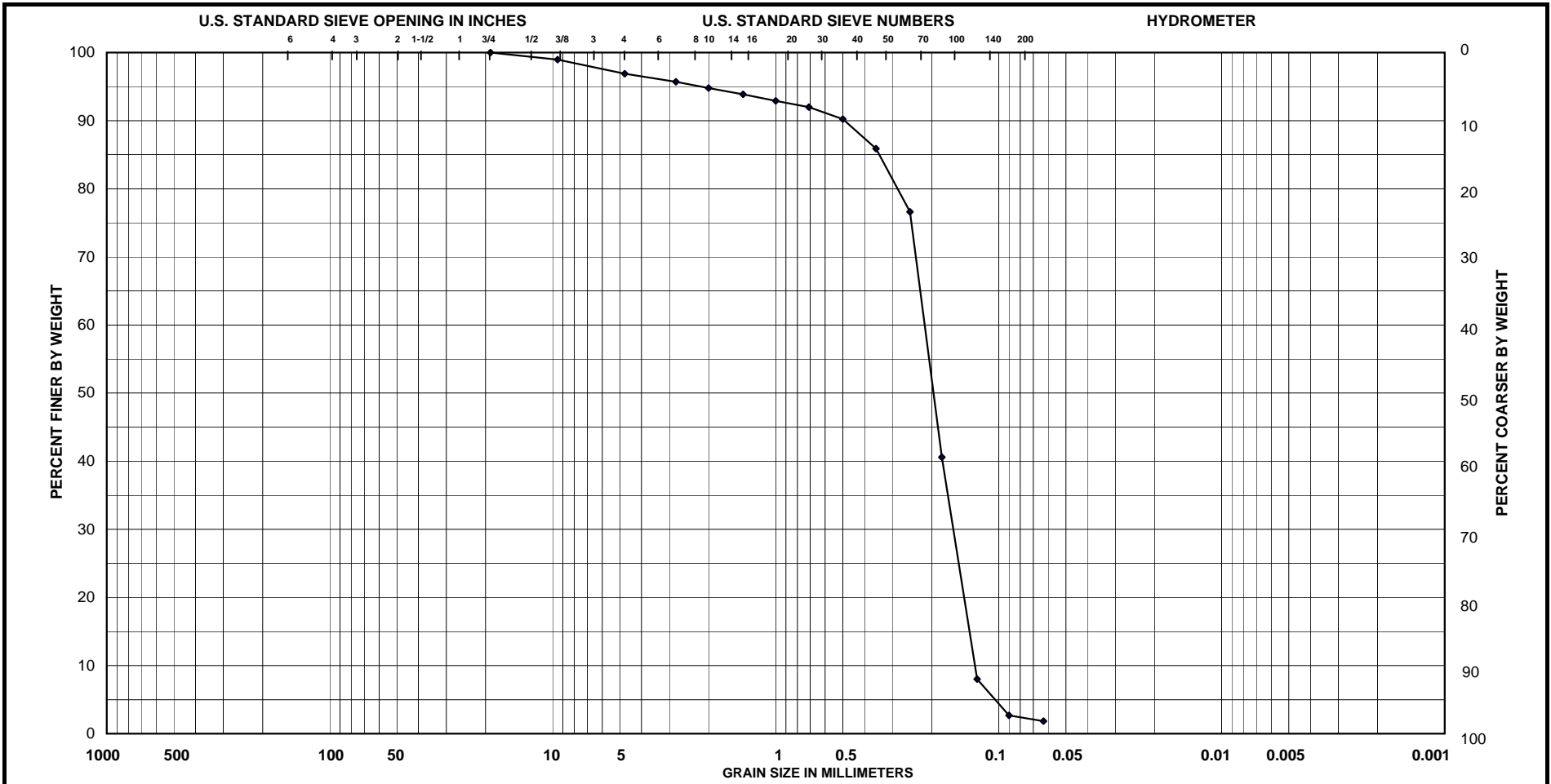
### GRAIN SIZE AND VISUAL SHELL CONTENT

Project:	<b>Topsail Beach, Surf City &amp; North Topsail</b>	Depth:	<b>45.5-46.0</b>
Project No.:	<b>1584-01-40</b>	Date:	<b>9/26/2003</b>
Boring No.:	<b>T1-03-V-203</b>		
Sample No.:	<b>2</b>		
Description:	<b>SAND, poorly-graded, mostly fine-grained quartz, few carbonate, trace fragmented limestone, greenish gray (SP)</b>		

Tare Weight, (g):	<b>49.33</b>	
Dry Wt. Before Washing (g):	<b>172.57</b>	(with tare)
Dry Weight After Washing (g):	<b>170.35</b>	(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	1.27	98.97	100	1.27
#4	4.750	2.56	96.89	100	2.56
#7	2.800	1.46	95.71	100	1.46
#10	2.000	1.15	94.77	75	0.86
#14	1.400	1.11	93.87	85	0.94
#18	1.000	1.19	92.91	80	0.95
#25	0.710	1.15	91.98	75	0.86
#35	0.500	2.17	90.21	55	1.19
#45	0.355	5.32	85.90	15	0.80
#60	0.250	11.43	76.62	3	0.34
#80	0.180	44.43	40.57	1	0.44
#120	0.125	40.13	8.01	1	0.40
#170	0.090	6.56	2.69	1	0.07
#230	0.063	1.04	1.84	1	0.01

**Total Shell Content:** **10** %



COBBLES	GRAVEL		SAND			SILT OR CLAY
	COARSE	FINE	COARSE	MEDIUM	FINE	

Sample No.	Elev. Or Depth	Classification	% CO <sub>3</sub>	G <sub>s</sub>	Nat w%	LL	PL	PI	Project
♦ 2	45.5-46.0	SAND, poorly-graded, mostly fine-grained quartz, few carbonate, trace fragmented limestone, greenish gray (SP)	10						Topsail Beach, Surf City & North Topsail
									Area
									Boring No. T1-03-V-203
									Date 9/26/2003

**GRADATION CURVES**





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## VISUAL SHELL CONTENT

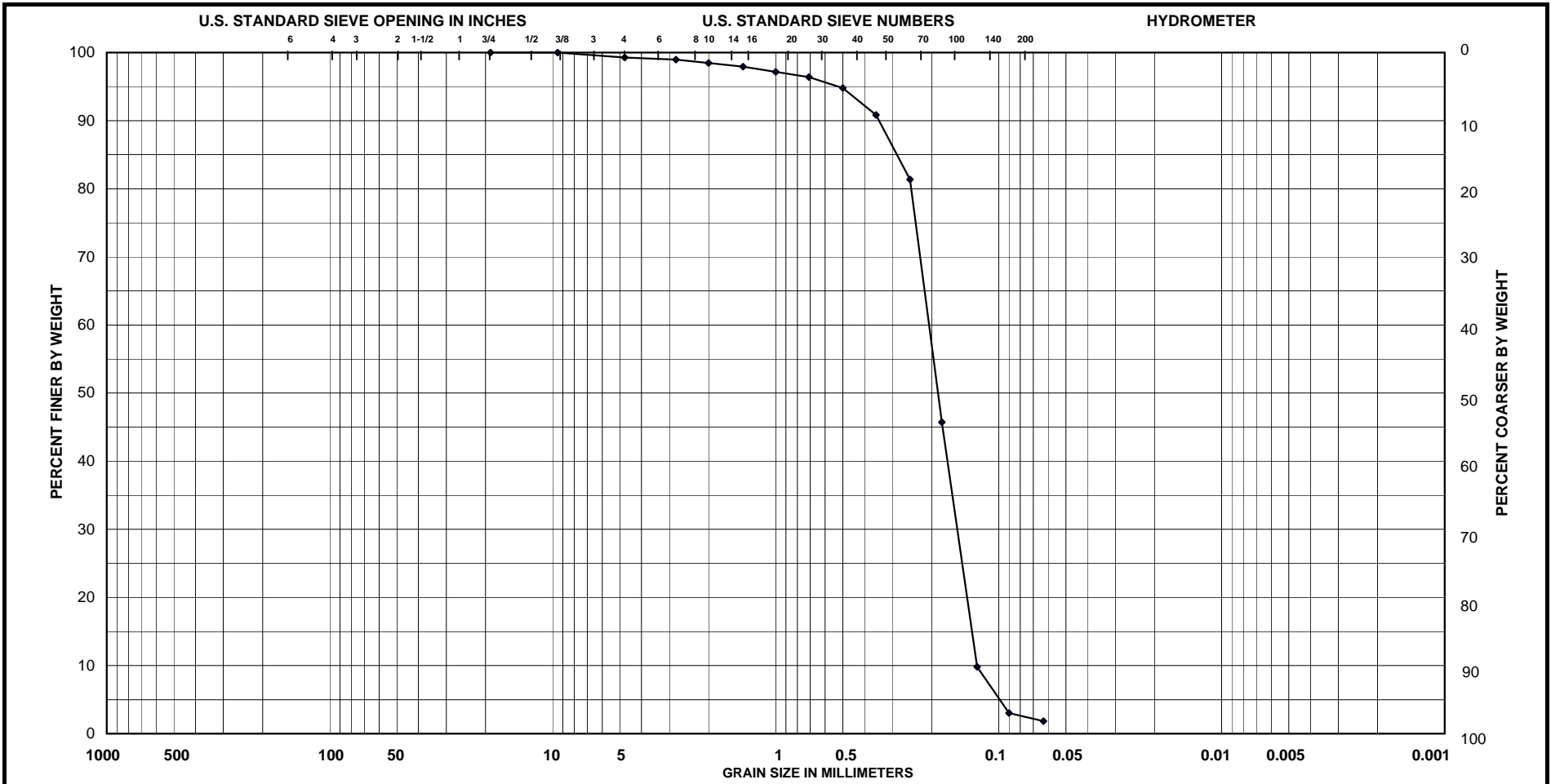
### GRAIN SIZE AND VISUAL SHELL CONTENT

Project:	<b>Topsail Beach, Surf City &amp; North Topsail</b>	Depth:	<b>43.6-44.1</b>
Project No.:	<b>1584-01-40</b>	Date:	<b>9/26/2003</b>
Boring No.:	<b>T1-03-V-204</b>		
Sample No.:	<b>1</b>		
Description:	<b>SAND, poorly-graded, mostly fine-grained quartz, few carbonate, trace fragmented limestone, greenish gray (SP)</b>		

Tare Weight, (g):	<b>50.65</b>	
Dry Wt. Before Washing (g):	<b>178.37</b>	(with tare)
Dry Weight After Washing (g):	<b>176.59</b>	(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	0.91	99.29	100	0.91
#7	2.800	0.39	98.98	100	0.39
#10	2.000	0.64	98.48	60	0.38
#14	1.400	0.70	97.93	40	0.28
#18	1.000	0.96	97.18	30	0.29
#25	0.710	1.01	96.39	70	0.71
#35	0.500	2.04	94.79	40	0.82
#45	0.355	5.03	90.85	20	1.01
#60	0.250	12.11	81.37	3	0.36
#80	0.180	45.52	45.73	1	0.46
#120	0.125	45.89	9.80	1	0.46
#170	0.090	8.64	3.04	1	0.09
#230	0.063	1.55	1.82	1	0.02

**Total Shell Content:** **5** %



COBBLES	GRAVEL		SAND			SILT OR CLAY
	COARSE	FINE	COARSE	MEDIUM	FINE	

Sample No.	Elev. Or Depth	Classification	% CO <sub>3</sub>	G <sub>s</sub>	Nat w%	LL	PL	PI	Project
♦ 1	43.6-44.1	SAND, poorly-graded, mostly fine-grained quartz, few carbonate, trace fragmented limestone, greenish gray (SP)	5						Topsail Beach, Surf City & North Topsail
									Area
									Boring No. T1-03-V-204
									Date 9/26/2003

**GRADATION CURVES**



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## VISUAL SHELL CONTENT

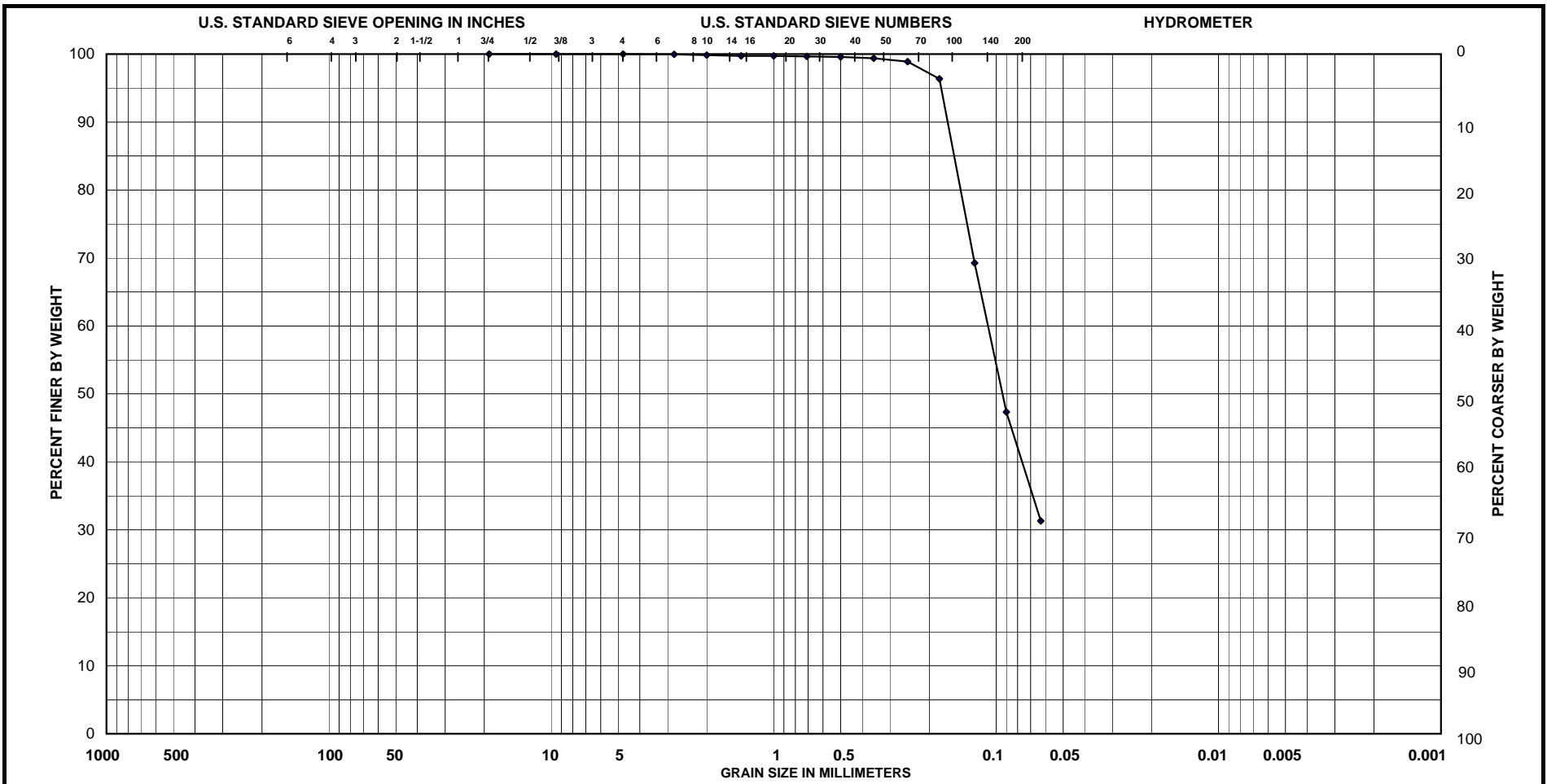
### GRAIN SIZE AND VISUAL SHELL CONTENT

<b>Project:</b>	<b>Topsail Beach, Surf City &amp; North Topsail</b>	<b>Depth:</b>	<b>45.0-45.5</b>
<b>Project No.:</b>	<b>1584-01-40</b>	<b>Date:</b>	<b>9/26/2003</b>
<b>Boring No.:</b>	<b>T1-03-V-204</b>		
<b>Sample No.:</b>	<b>2</b>		
<b>Description:</b>	<b>SAND, clayey, mostly fine-grained quartz, some clay, trace carbonate, dark greenish gray (SC)</b>		

Tare Weight, (g):	49.73	
Dry Wt. Before Washing (g):	165.79	(with tare)
Dry Weight After Washing (g):	133.05	(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	0.00	100.00	0	0.00
#4	4.750	0.00	100.00	0	0.00
#7	2.800	0.04	99.97	100	0.04
#10	2.000	0.14	99.84	5	0.01
#14	1.400	0.11	99.75	5	0.01
#18	1.000	0.03	99.72	5	0.00
#25	0.710	0.09	99.65	10	0.01
#35	0.500	0.06	99.60	5	0.00
#45	0.355	0.25	99.38	5	0.01
#60	0.250	0.58	98.88	3	0.02
#80	0.180	2.91	96.37	1	0.03
#120	0.125	31.46	69.27	1	0.31
#170	0.090	25.46	47.33	1	0.25
#230	0.063	18.57	31.33	1	0.19

**Total Shell Content:** 1 %



COBBLES	GRAVEL		SAND			SILT OR CLAY
	COARSE	FINE	COARSE	MEDIUM	FINE	

Sample No.	Elev. Or Depth	Classification	% CO <sub>3</sub>	G <sub>s</sub>	Nat w%	LL	PL	PI	Project	
♦ 2	45.0-45.5	SAND, clayey, mostly fine-grained quartz, some clay, trace carbonate, dark greenish gray (SC)	1						Topsail Beach, Surf City & North Topsail	
			Area							
			Boring No. T1-03-V-204							
			Date 9/26/2003							

**GRADATION CURVES**



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## VISUAL SHELL CONTENT

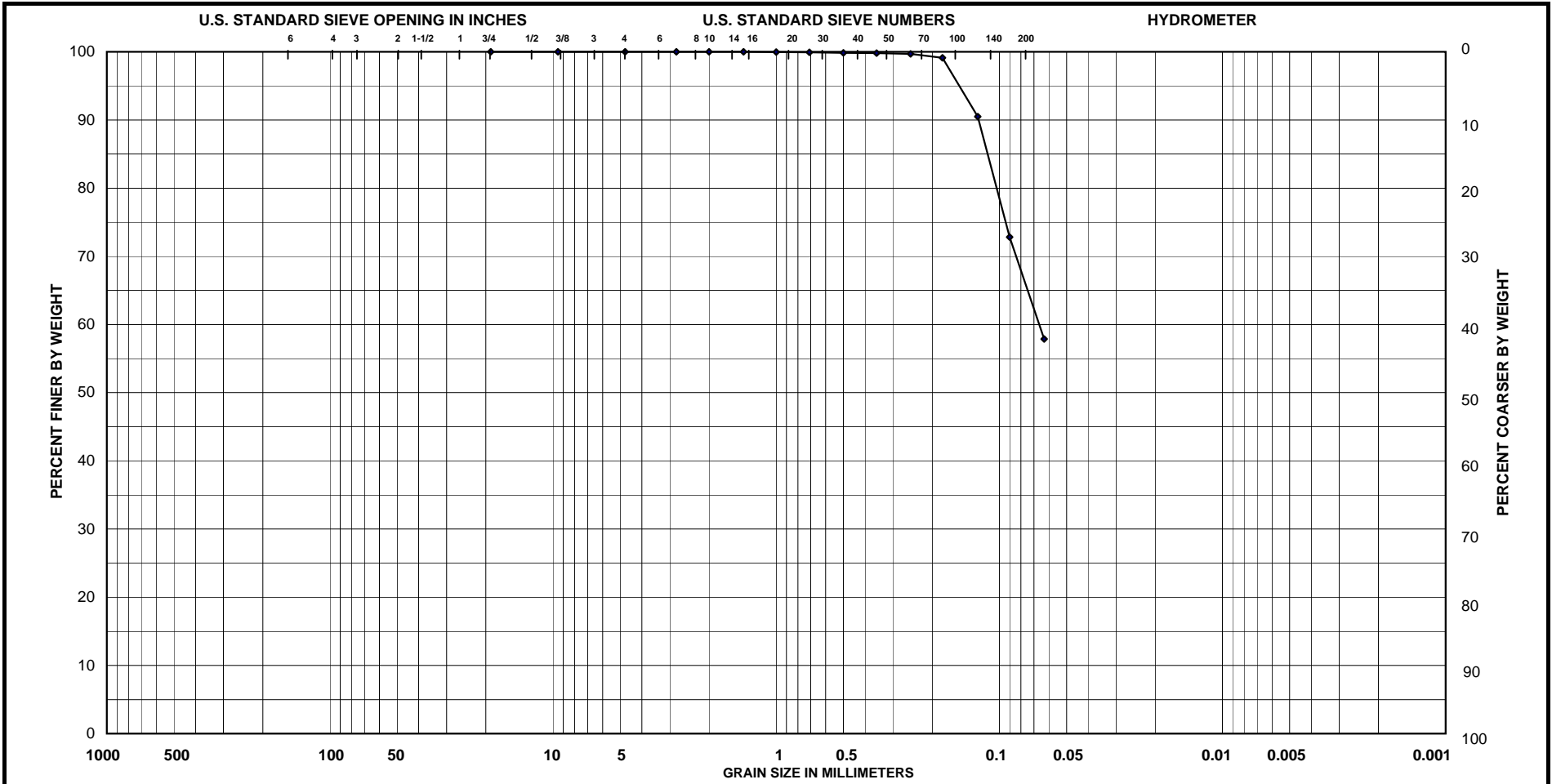
### GRAIN SIZE AND VISUAL SHELL CONTENT

Project:	<b>Topsail Beach, Surf City &amp; North Topsail</b>	Depth:	<b>47.6-48.1</b>
Project No.:	<b>1584-01-40</b>	Date:	<b>9/26/2003</b>
Boring No.:	<b>T1-03-V-204</b>		
Sample No.:	<b>3</b>		
Description:	<b>CLAY, inorganic-H, some fine-grained quartz sand, very dark greenish gray (CH)</b>		

Tare Weight, (g):	<b>50.04</b>	
Dry Wt. Before Washing (g):	<b>143.4</b>	(with tare)
Dry Weight After Washing (g):	<b>91.5</b>	(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	0.00	100.00	0	0.00
#14	1.400	0.01	99.99	25	0.00
#18	1.000	0.02	99.97	3	0.00
#25	0.710	0.04	99.93	3	0.00
#35	0.500	0.06	99.86	3	0.00
#45	0.355	0.05	99.81	1	0.00
#60	0.250	0.10	99.70	1	0.00
#80	0.180	0.55	99.11	1	0.01
#120	0.125	8.06	90.48	1	0.08
#170	0.090	16.48	72.83	1	0.16
#230	0.063	13.96	57.87	1	0.14

**Total Shell Content:** **0** %



COBBLES	GRAVEL		SAND			SILT OR CLAY
	COARSE	FINE	COARSE	MEDIUM	FINE	

Sample No.	Elev. Or Depth	Classification	% CO <sub>3</sub>	G <sub>s</sub>	Nat w%	LL	PL	PI	Project	
♦ 3	47.6-48.1	CLAY, inorganic-H, some fine-grained quartz sand, very dark greenish gray (CH)	0						Topsail Beach, Surf City & North Topsail	
									Area	
									Boring No. T1-03-V-204	
									Date 9/26/2003	

**GRADATION CURVES**



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## VISUAL SHELL CONTENT

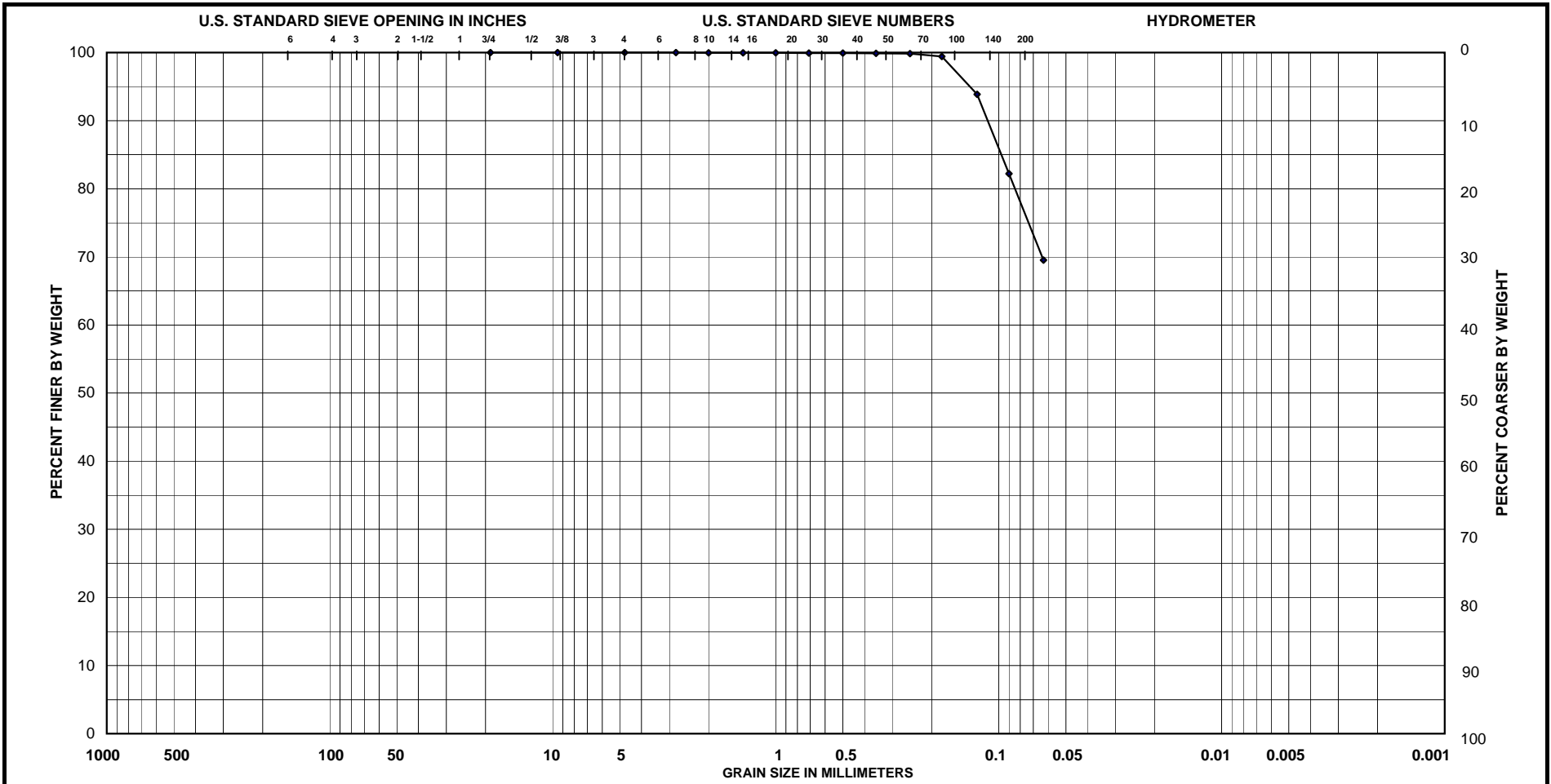
### GRAIN SIZE AND VISUAL SHELL CONTENT

Project:	<b>Topsail Beach, Surf City &amp; North Topsail</b>	Depth:	<b>50.5-51.0</b>
Project No.:	<b>1584-01-40</b>	Date:	<b>9/26/2003</b>
Boring No.:	<b>T1-03-V-204</b>		
Sample No.:	<b>4</b>		
Description:	<b>CLAY, inorganic-H, some fine-grained quartz sand, very dark greenish gray (CH)</b>		

Tare Weight, (g):	<b>50.25</b>	
Dry Wt. Before Washing (g):	<b>139.53</b>	(with tare)
Dry Weight After Washing (g):	<b>79.93</b>	(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	0	0.00
#14	1.400	0.01	99.97	0	0.00
#18	1.000	0.02	99.94	3	0.00
#25	0.710	0.02	99.92	1	0.00
#35	0.500	0.01	99.91	0	0.00
#45	0.355	0.02	99.89	1	0.00
#60	0.250	0.02	99.87	0	0.00
#80	0.180	0.38	99.44	0	0.00
#120	0.125	4.99	93.85	1	0.05
#170	0.090	10.40	82.20	0	0.00
#230	0.063	11.31	69.53	0	0.00

**Total Shell Content:** **0** %



COBBLES	GRAVEL		SAND			SILT OR CLAY
	COARSE	FINE	COARSE	MEDIUM	FINE	

Sample No.	Elev. Or Depth	Classification	% CO <sub>3</sub>	G <sub>s</sub>	Nat w%	LL	PL	PI	Project	
4	50.5-51.0	CLAY, inorganic-H, some fine-grained quartz sand, very dark greenish gray (CH)	0						Topsail Beach, Surf City & North Topsail	
									Area	
									Boring No. T1-03-V-204	
									Date 9/26/2003	

**GRADATION CURVES**





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## VISUAL SHELL CONTENT

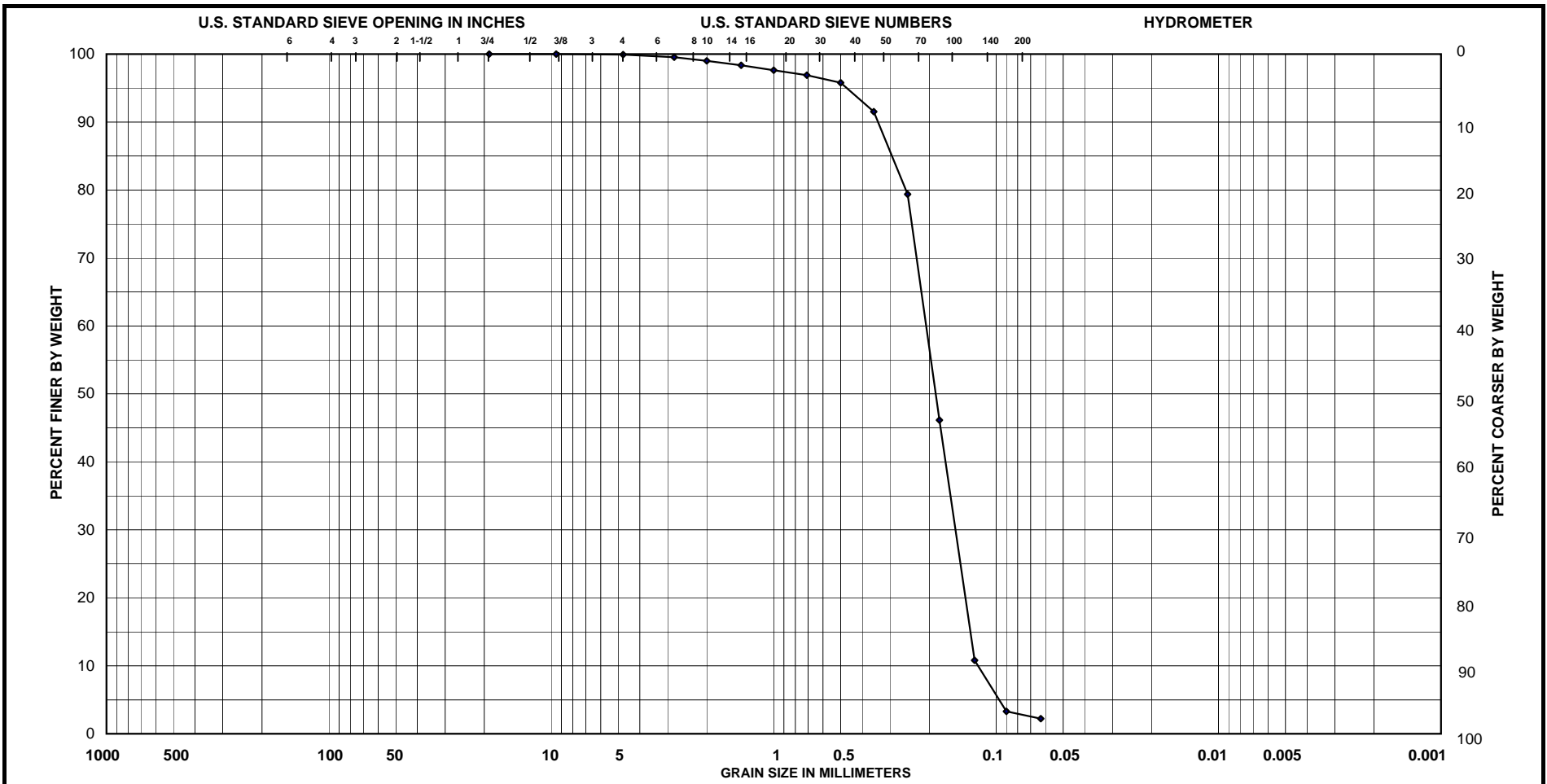
### GRAIN SIZE AND VISUAL SHELL CONTENT

Project:	<b>Topsail Beach, Surf City &amp; North Topsail</b>	Depth:	<b>43.2-43.7</b>
Project No.:	<b>1584-01-40</b>	Date:	<b>9/26/2003</b>
Boring No.:	<b>T1-03-V-205</b>		
Sample No.:	<b>1</b>		
Description:	<b>SAND, poorly-graded, mostly fine-grained quartz, few carbonate, dark greenish gray (SP)</b>		

Tare Weight, (g):	<b>50.13</b>	
Dry Wt. Before Washing (g):	<b>172.2</b>	(with tare)
Dry Weight After Washing (g):	<b>169.87</b>	(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	0.11	99.91	100	0.11
#7	2.800	0.46	99.53	100	0.46
#10	2.000	0.65	99.00	100	0.65
#14	1.400	0.81	98.34	100	0.81
#18	1.000	0.88	97.62	100	0.88
#25	0.710	0.90	96.88	90	0.81
#35	0.500	1.35	95.77	60	0.81
#45	0.355	5.17	91.54	20	1.03
#60	0.250	14.84	79.38	3	0.45
#80	0.180	40.56	46.15	1	0.41
#120	0.125	43.13	10.82	1	0.43
#170	0.090	9.20	3.29	1	0.09
#230	0.063	1.31	2.21	1	0.01

**Total Shell Content:** **6** %



COBBLES	GRAVEL		SAND			SILT OR CLAY
	COARSE	FINE	COARSE	MEDIUM	FINE	

Sample No.	Elev. Or Depth	Classification	% CO <sub>3</sub>	G <sub>s</sub>	Nat w%	LL	PL	PI	Project
1	43.2-43.7	SAND, poorly-graded, mostly fine-grained quartz, few carbonate, dark greenish gray (SP)	6						Topsail Beach, Surf City & North Topsail
									Area
									Boring No. T1-03-V-205
									Date 9/26/2003

**GRADATION CURVES**



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## VISUAL SHELL CONTENT

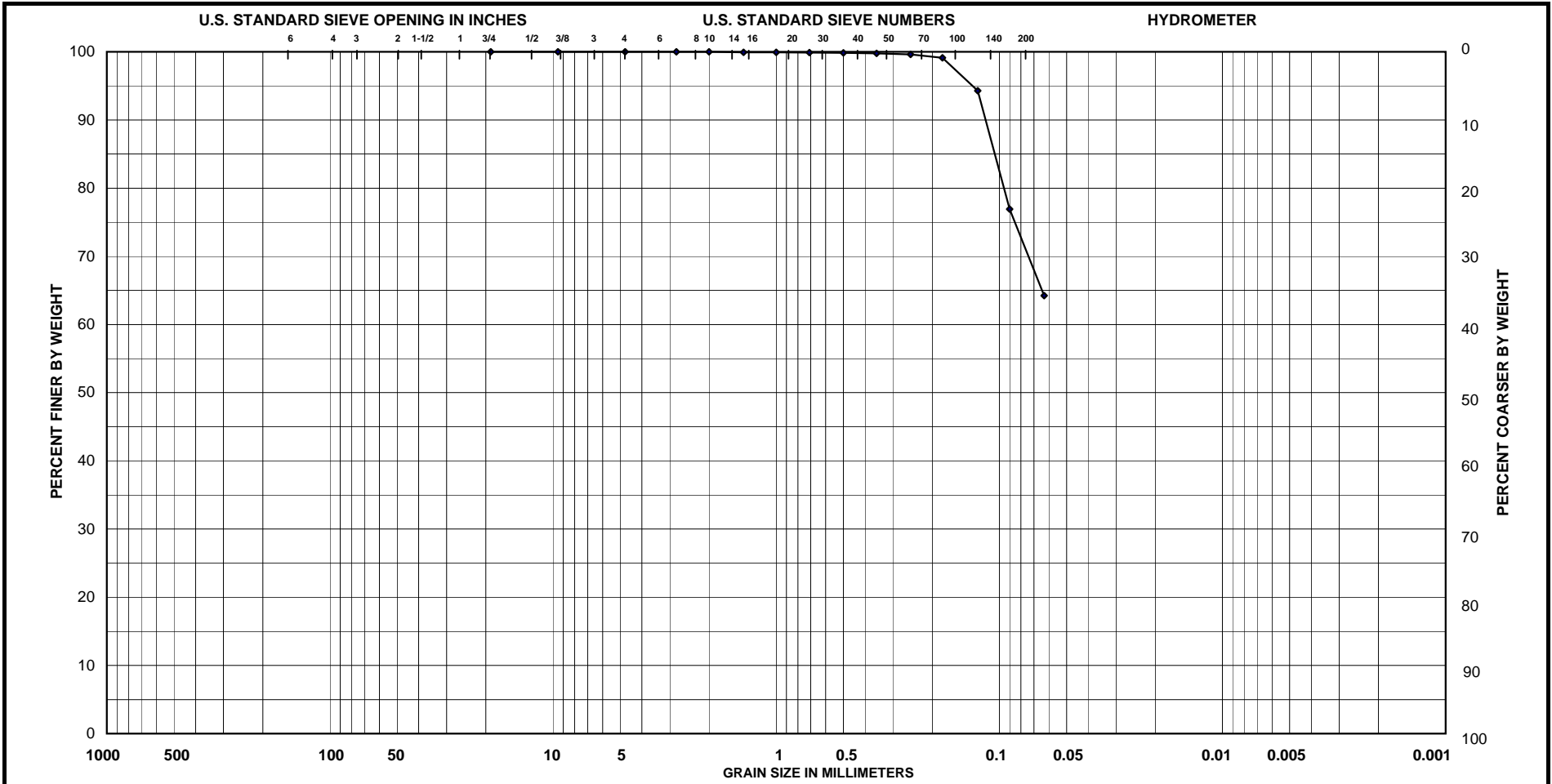
### GRAIN SIZE AND VISUAL SHELL CONTENT

Project:	<b>Topsail Beach, Surf City &amp; North Topsail</b>	Depth:	<b>45.2-45.7</b>
Project No.:	<b>1584-01-40</b>	Date:	<b>9/26/2003</b>
Boring No.:	<b>T1-03-V-205</b>		
Sample No.:	<b>2</b>		
Description:	<b>CLAY, inorganic-H, some fine-grained quartz sand, dark greenish gray (CH)</b>		

Tare Weight, (g):	<b>50.06</b>	
Dry Wt. Before Washing (g):	<b>145.98</b>	(with tare)
Dry Weight After Washing (g):	<b>86.72</b>	(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	0.00	100.00	0	0.00
#14	1.400	0.06	99.94	0	0.00
#18	1.000	0.03	99.91	0	0.00
#25	0.710	0.02	99.89	10	0.00
#35	0.500	0.04	99.84	20	0.01
#45	0.355	0.07	99.77	30	0.02
#60	0.250	0.16	99.60	20	0.03
#80	0.180	0.47	99.11	5	0.02
#120	0.125	4.62	94.30	1	0.05
#170	0.090	16.65	76.94	1	0.17
#230	0.063	12.20	64.22	1	0.12

**Total Shell Content:** **0** %



COBBLES	GRAVEL		SAND			SILT OR CLAY
	COARSE	FINE	COARSE	MEDIUM	FINE	

Sample No.	Elev. Or Depth	Classification	% CO <sub>3</sub>	G <sub>s</sub>	Nat w%	LL	PL	PI	Project	
♦ 2	45.2-45.7	CLAY, inorganic-H, some fine-grained quartz sand, dark greenish gray (CH)	0						Topsail Beach, Surf City & North Topsail	
									Area	
									Boring No. T1-03-V-205	
									Date 9/26/2003	

**GRADATION CURVES**



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## VISUAL SHELL CONTENT

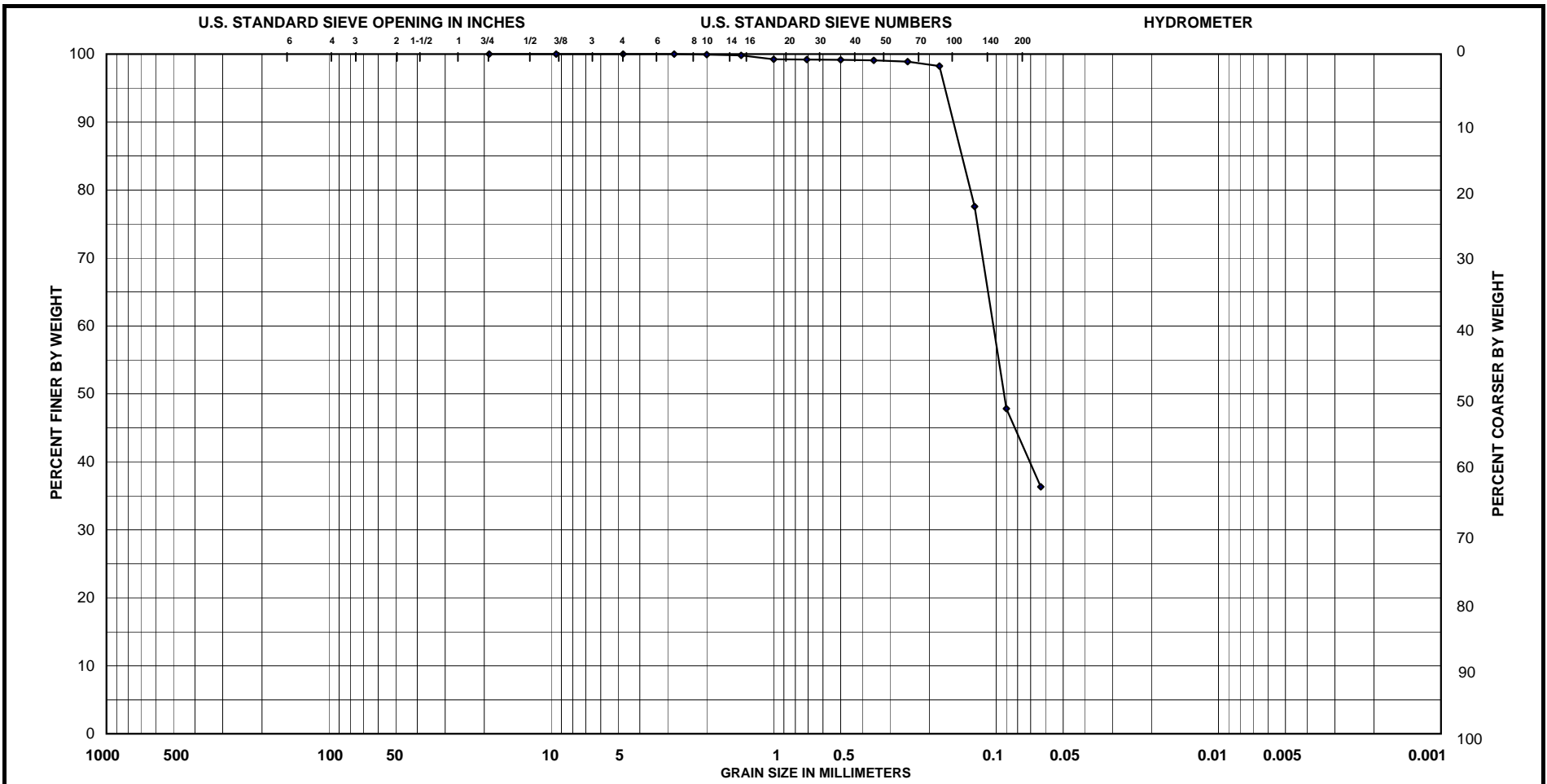
### GRAIN SIZE AND VISUAL SHELL CONTENT

Project:	<b>Topsail Beach, Surf City &amp; North Topsail</b>	Depth:	<b>47.2-47.7</b>
Project No.:	<b>1584-01-40</b>	Date:	<b>9/26/2003</b>
Boring No.:	<b>T1-03-V-205</b>		
Sample No.:	<b>3</b>		
Description:	<b>SAND, clayey, mostly fine-grained quartz, some clay, trace carbonate, trace organic matter, very dark greenish gray (SC)</b>		

Tare Weight, (g):	<b>50.26</b>	
Dry Wt. Before Washing (g):	<b>155.6</b>	(with tare)
Dry Weight After Washing (g):	<b>199.93</b>	(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	0.08	99.92	20	0.02
#14	1.400	0.13	99.80	20	0.03
#18	1.000	0.60	99.23	50	0.30
#25	0.710	0.05	99.18	30	0.02
#35	0.500	0.04	99.15	30	0.01
#45	0.355	0.08	99.07	20	0.02
#60	0.250	0.19	98.89	20	0.04
#80	0.180	0.67	98.25	20	0.13
#120	0.125	21.78	77.58	2	0.44
#170	0.090	31.33	47.84	1	0.31
#230	0.063	12.11	36.34	1	0.12

**Total Shell Content:** **1** %



COBBLES	GRAVEL		SAND			SILT OR CLAY
	COARSE	FINE	COARSE	MEDIUM	FINE	

Sample No.	Elev. Or Depth	Classification	% CO <sub>3</sub>	G <sub>s</sub>	Nat w%	LL	PL	PI	Project	
3	47.2-47.7	SAND, clayey, mostly fine-grained quartz, some clay, trace carbonate, trace organic matter, very dark greenish gray (SC)	1						Topsail Beach, Surf City & North Topsail	
									Area	
									Boring No. T1-03-V-205	
									Date 9/26/2003	

**GRADATION CURVES**



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## VISUAL SHELL CONTENT

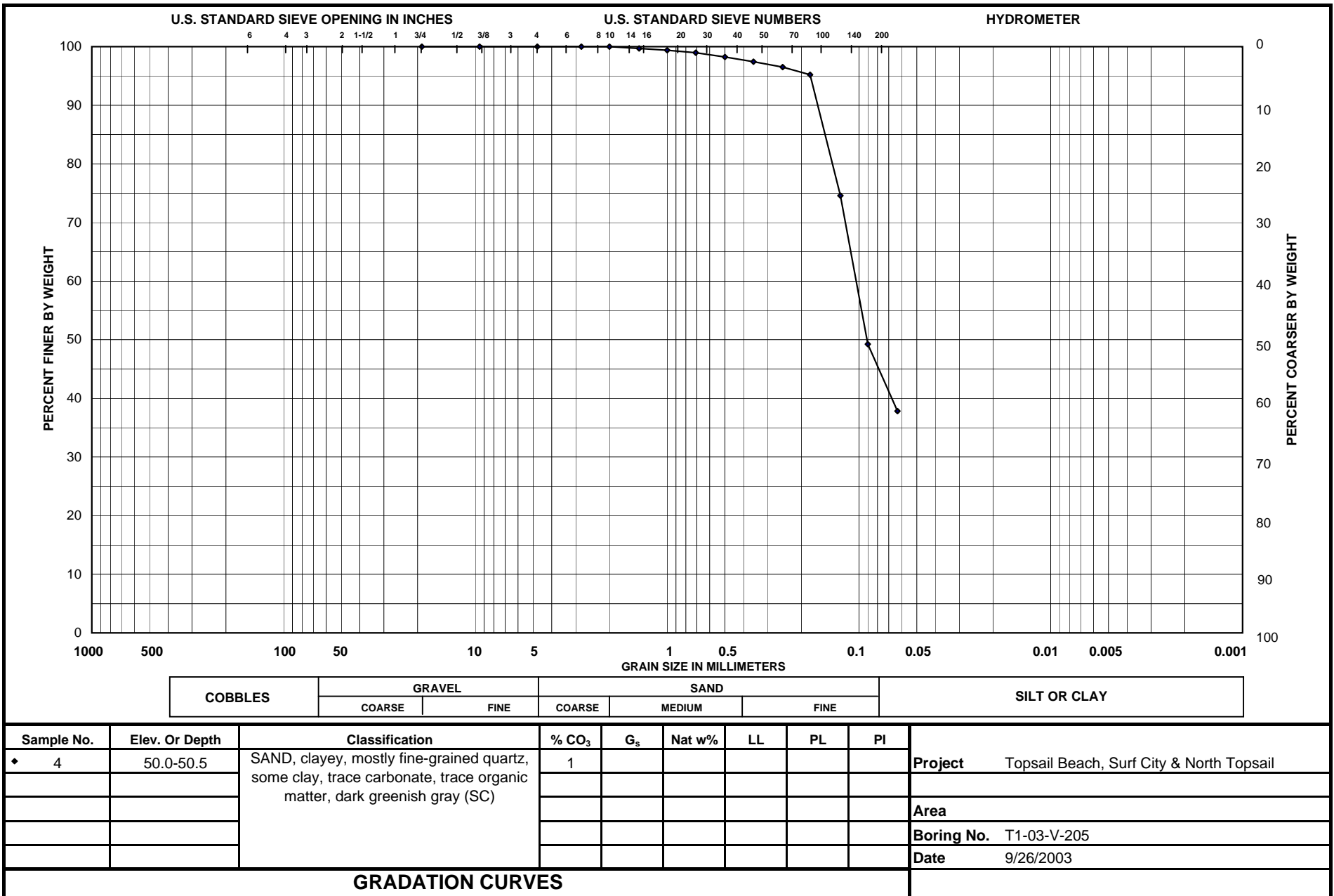
### GRAIN SIZE AND VISUAL SHELL CONTENT

<b>Project:</b>	<b>Topsail Beach, Surf City &amp; North Topsail</b>	<b>Depth:</b>	<b>50.0-50.5</b>
<b>Project No.:</b>	<b>1584-01-40</b>	<b>Date:</b>	<b>9/26/2003</b>
<b>Boring No.:</b>	<b>T1-03-V-205</b>		
<b>Sample No.:</b>	<b>4</b>		
<b>Description:</b>	<b>SAND, clayey, mostly fine-grained quartz, some clay, trace carbonate, trace organic matter, dark greenish gray (SC)</b>		

Tare Weight, (g):	50.23	
Dry Wt. Before Washing (g):	156.6	(with tare)
Dry Weight After Washing (g):	118.92	(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	0.00	100.00	0	0.00
#10	2.000	0.00	100.00	0	0.00
#14	1.400	0.34	99.68	20	0.07
#18	1.000	0.30	99.40	20	0.06
#25	0.710	0.48	98.95	10	0.05
#35	0.500	0.75	98.24	5	0.04
#45	0.355	0.87	97.42	5	0.04
#60	0.250	0.98	96.50	2	0.02
#80	0.180	1.38	95.21	2	0.03
#120	0.125	21.95	74.57	1	0.22
#170	0.090	26.94	49.24	1	0.27
#230	0.063	12.14	37.83	1	0.12

**Total Shell Content:** 1 %



**GRADATION CURVES**





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## VISUAL SHELL CONTENT

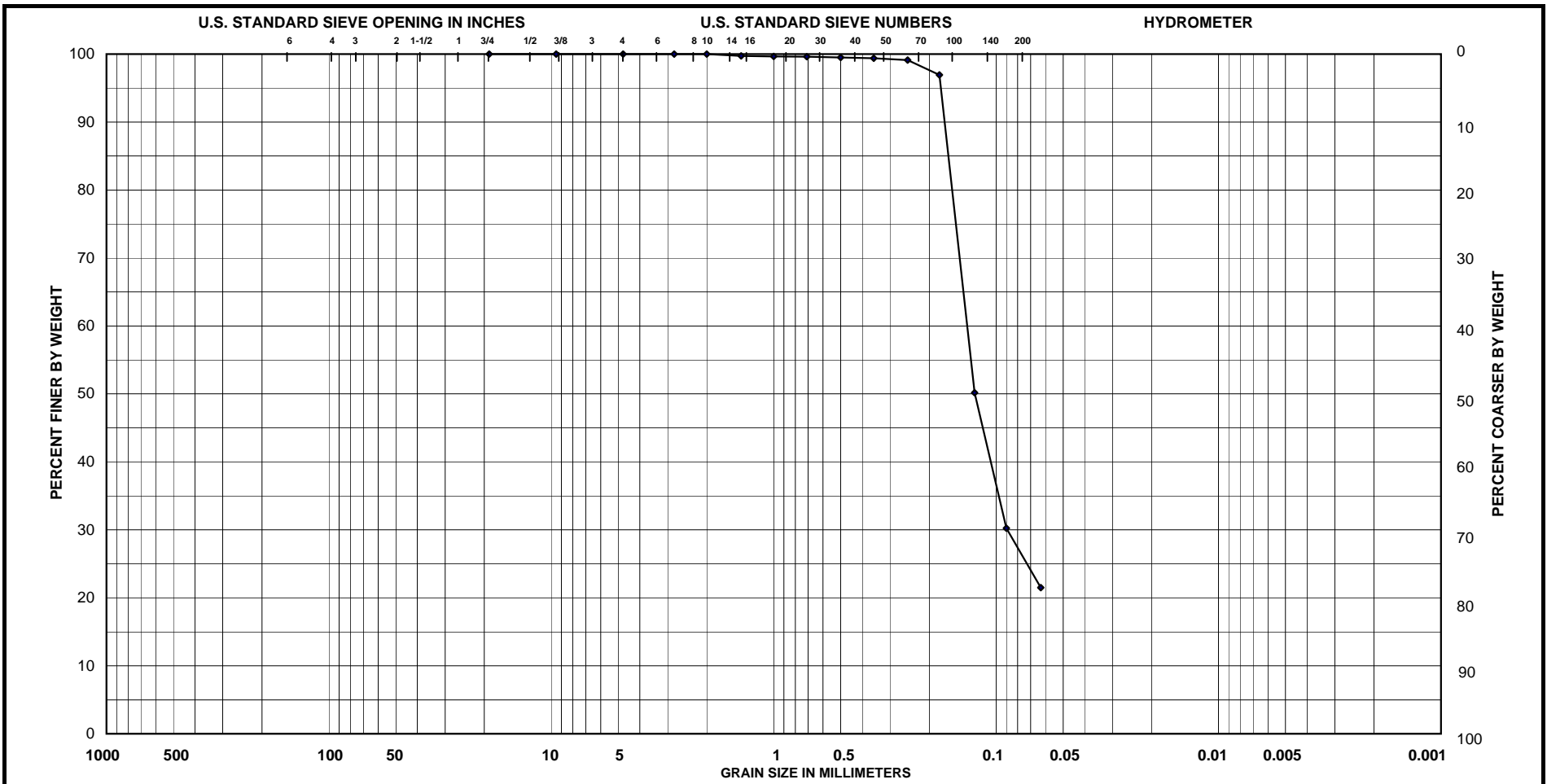
### GRAIN SIZE AND VISUAL SHELL CONTENT

Project:	<b>Topsail Beach, Surf City &amp; North Topsail</b>	Depth:	<b>53.0-53.5</b>
Project No.:	<b>1584-01-40</b>	Date:	<b>9/26/2003</b>
Boring No.:	<b>T1-03-V-205</b>		
Sample No.:	<b>5</b>		
Description:	<b>SAND, clayey, mostly fine-grained quartz, little clay, trace carbonate, dark greenish gray (SC)</b>		

Tare Weight, (g):	<b>49.34</b>	
Dry Wt. Before Washing (g):	<b>170.08</b>	(with tare)
Dry Weight After Washing (g):	<b>146.73</b>	(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	0.00	100.00	0	0.00
#14	1.400	0.32	99.73	10	0.03
#18	1.000	0.08	99.67	5	0.00
#25	0.710	0.08	99.60	5	0.00
#35	0.500	0.12	99.50	10	0.01
#45	0.355	0.15	99.38	10	0.02
#60	0.250	0.30	99.13	10	0.03
#80	0.180	2.64	96.94	5	0.13
#120	0.125	56.49	50.16	1	0.56
#170	0.090	24.05	30.24	1	0.24
#230	0.063	10.56	21.49	1	0.11

**Total Shell Content:** **1** %



COBBLES	GRAVEL		SAND			SILT OR CLAY
	COARSE	FINE	COARSE	MEDIUM	FINE	

Sample No.	Elev. Or Depth	Classification	% CO <sub>3</sub>	G <sub>s</sub>	Nat w%	LL	PL	PI	Project	
5	53.0-53.5	SAND, clayey, mostly fine-grained quartz, little clay, trace carbonate, dark greenish gray (SC)	1						Topsail Beach, Surf City & North Topsail	
									Area	
									Boring No. T1-03-V-205	
									Date 9/26/2003	

**GRADATION CURVES**



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## VISUAL SHELL CONTENT

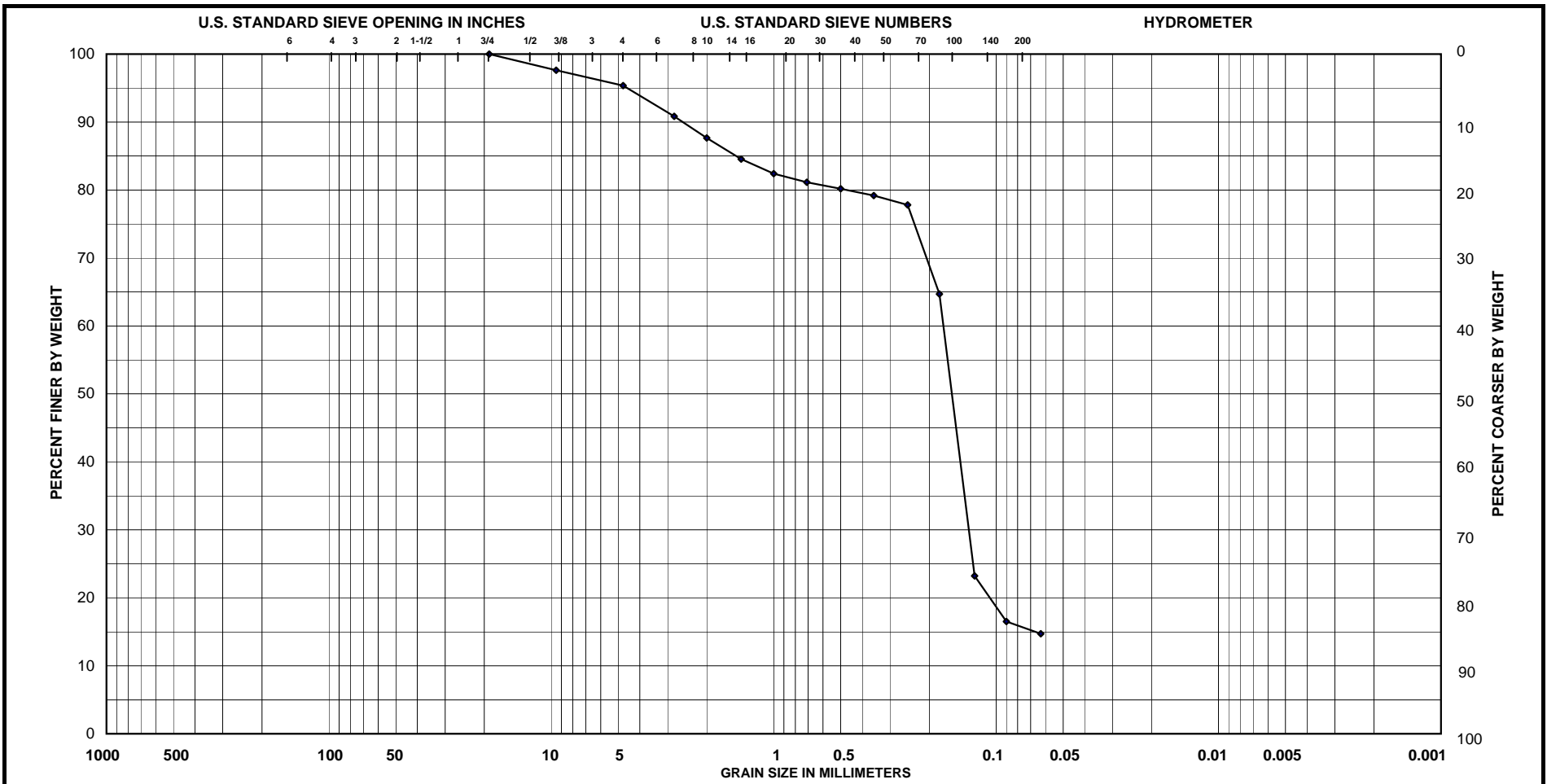
### GRAIN SIZE AND VISUAL SHELL CONTENT

Project:	<b>Topsail Beach, Surf City &amp; North Topsail</b>	Depth:	<b>44.2-44.7</b>
Project No.:	<b>1584-01-40</b>	Date:	<b>9/26/2003</b>
Boring No.:	<b>T1-03-V-206</b>		
Sample No.:	<b>1</b>		
Description:	<b>SAND, silty, mostly fine-grained quartz, little silt, few carbonate, few fragmented limestone, olive gray (SM)</b>		

Tare Weight, (g):	<b>49.80</b>	
Dry Wt. Before Washing (g):	<b>181.88</b>	(with tare)
Dry Weight After Washing (g):	<b>162.94</b>	(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	3.15	97.62	50	1.58
#4	4.750	3.00	95.34	100	3.00
#7	2.800	5.94	90.85	70	4.16
#10	2.000	4.19	87.67	50	2.10
#14	1.400	4.14	84.54	40	1.66
#18	1.000	2.80	82.42	30	0.84
#25	0.710	1.69	81.14	30	0.51
#35	0.500	1.26	80.19	30	0.38
#45	0.355	1.32	79.19	10	0.13
#60	0.250	1.81	77.82	5	0.09
#80	0.180	17.32	64.70	1	0.17
#120	0.125	54.78	23.23	1	0.55
#170	0.090	8.87	16.51	1	0.09
#230	0.063	2.38	14.71	1	0.02

**Total Shell Content:** **12** %



COBBLES	GRAVEL		SAND			SILT OR CLAY
	COARSE	FINE	COARSE	MEDIUM	FINE	

Sample No.	Elev. Or Depth	Classification	% CO <sub>3</sub>	G <sub>s</sub>	Nat w%	LL	PL	PI	Project
♦ 1	44.2-44.7	SAND, silty, mostly fine-grained quartz, little silt, few carbonate, few fragmented limestone, olive gray (SM)	12						Topsail Beach, Surf City & North Topsail
									Area
									Boring No. T1-03-V-206
									Date 9/26/2003

**GRADATION CURVES**



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## VISUAL SHELL CONTENT

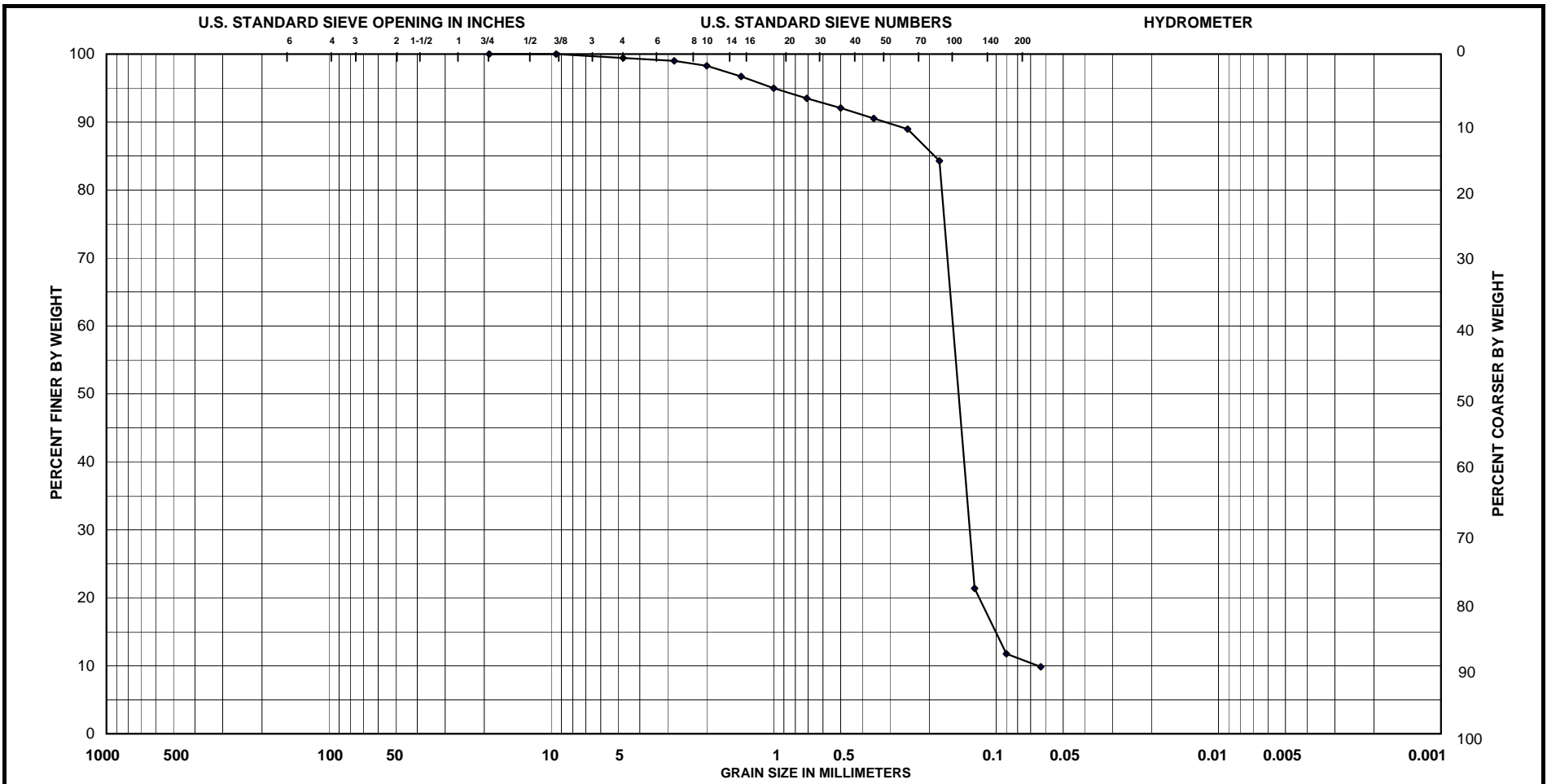
### GRAIN SIZE AND VISUAL SHELL CONTENT

Project:	<b>Topsail Beach, Surf City &amp; North Topsail</b>	Depth:	<b>46.2-46.7</b>
Project No.:	<b>1584-01-40</b>	Date:	<b>9/26/2003</b>
Boring No.:	<b>T1-03-V-207</b>		
Sample No.:	<b>1</b>		
Description:	<b>SAND, poorly-graded with silt, mostly fine-grained quartz, few silt, few carbonate, trace fragmented limestone, olive gray (SP-SM)</b>		

Tare Weight, (g):	<b>50.41</b>	
Dry Wt. Before Washing (g):	<b>168.66</b>	(with tare)
Dry Weight After Washing (g):	<b>157.43</b>	(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	0.67	99.43	100	0.67
#7	2.800	0.50	99.01	90	0.45
#10	2.000	0.87	98.27	90	0.78
#14	1.400	1.88	96.68	90	1.69
#18	1.000	2.03	94.97	80	1.62
#25	0.710	1.77	93.47	70	1.24
#35	0.500	1.65	92.08	40	0.66
#45	0.355	1.84	90.52	20	0.37
#60	0.250	1.83	88.97	10	0.18
#80	0.180	5.55	84.28	2	0.11
#120	0.125	74.39	21.37	1	0.74
#170	0.090	11.34	11.78	1	0.11
#230	0.063	2.28	9.85	1	0.02

**Total Shell Content:** **7** %



COBBLES	GRAVEL		SAND			SILT OR CLAY
	COARSE	FINE	COARSE	MEDIUM	FINE	

Sample No.	Elev. Or Depth	Classification	% CO <sub>3</sub>	G <sub>s</sub>	Nat w%	LL	PL	PI	Project
♦ 1	46.2-46.7	SAND, poorly-graded with silt, mostly fine-grained quartz, few silt, few carbonate, trace fragmented limestone, olive gray (SP-SM)	7						Topsail Beach, Surf City & North Topsail
									Area
									Boring No. T1-03-V-207
									Date 9/26/2003

**GRADATION CURVES**



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## VISUAL SHELL CONTENT

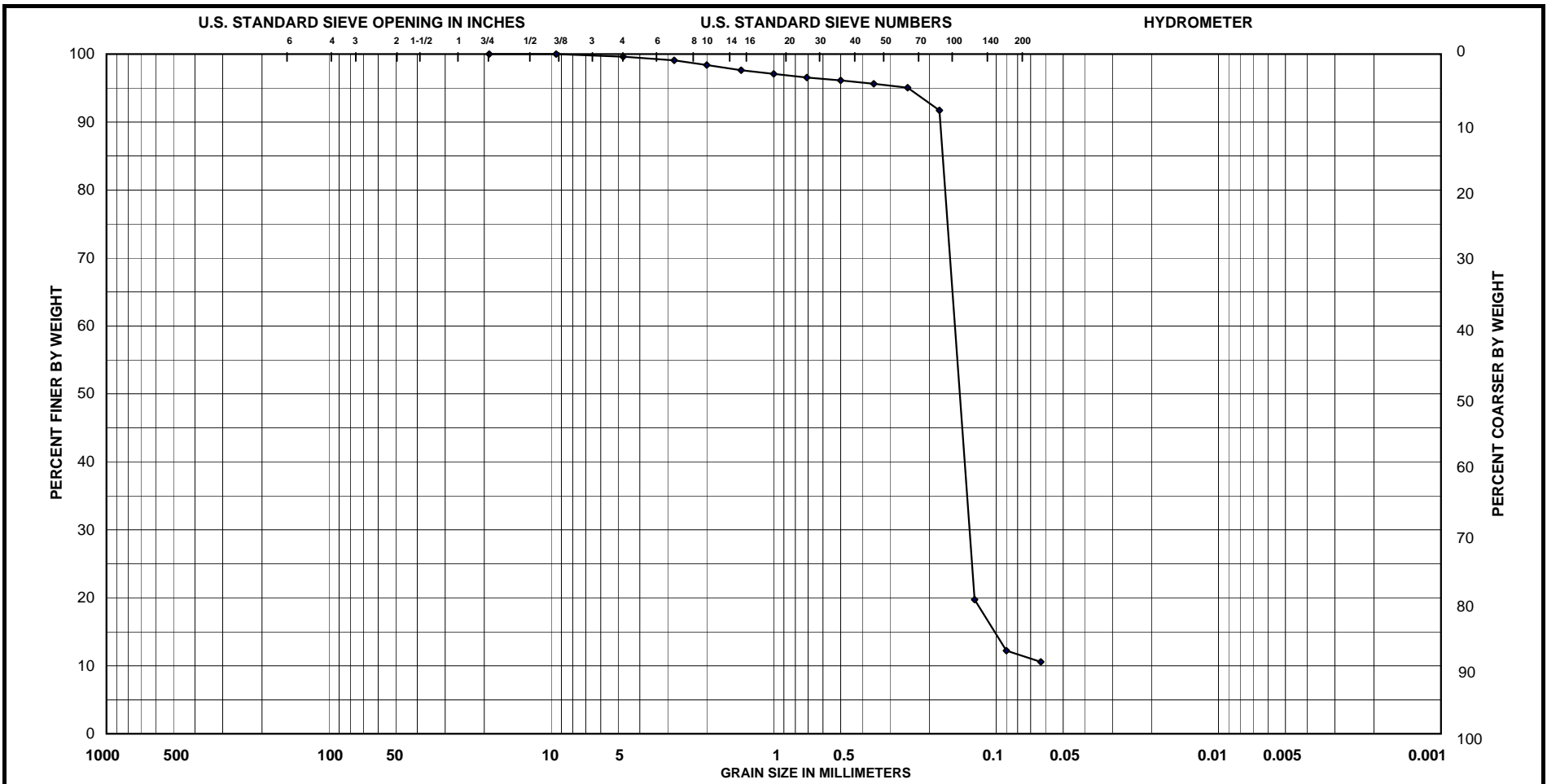
### GRAIN SIZE AND VISUAL SHELL CONTENT

<b>Project:</b>	<b>Topsail Beach, Surf City &amp; North Topsail</b>	<b>Depth:</b>	<b>48.0-48.5</b>
<b>Project No.:</b>	<b>1584-01-40</b>	<b>Date:</b>	<b>9/26/2003</b>
<b>Boring No.:</b>	<b>T1-03-V-207</b>		
<b>Sample No.:</b>	<b>2</b>		
<b>Description:</b>	<b>SAND, poorly-graded with silt, mostly fine-grained quartz, few silt, trace carbonate, trace fragmented limestone, olive gray (SP-SM)</b>		

Tare Weight, (g):	50.10	
Dry Wt. Before Washing (g):	170.89	(with tare)
Dry Weight After Washing (g):	158.6	(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	0.48	99.60	0	0.00
#7	2.800	0.64	99.07	50	0.32
#10	2.000	0.84	98.38	70	0.59
#14	1.400	0.90	97.63	70	0.63
#18	1.000	0.66	97.09	60	0.40
#25	0.710	0.65	96.55	30	0.20
#35	0.500	0.49	96.14	10	0.05
#45	0.355	0.60	95.65	10	0.06
#60	0.250	0.72	95.05	5	0.04
#80	0.180	4.04	91.70	2	0.08
#120	0.125	86.91	19.75	1	0.87
#170	0.090	9.08	12.24	1	0.09
#230	0.063	2.00	10.58	1	0.02

**Total Shell Content:** 3 %



COBBLES	GRAVEL		SAND			SILT OR CLAY
	COARSE	FINE	COARSE	MEDIUM	FINE	

Sample No.	Elev. Or Depth	Classification	% CO <sub>3</sub>	G <sub>s</sub>	Nat w%	LL	PL	PI	Project	
♦ 2	48.0-48.5	SAND, poorly-graded with silt, mostly fine-grained quartz, few silt, trace carbonate, trace fragmented limestone, olive gray (SP-SM)	3						Topsail Beach, Surf City & North Topsail	
									Area	
									Boring No. T1-03-V-207	
									Date 9/26/2003	

**GRADATION CURVES**





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## VISUAL SHELL CONTENT

### GRAIN SIZE AND VISUAL SHELL CONTENT

Project:	<b>Topsail Beach, Surf City &amp; North Topsail</b>	Depth:	<b>49.0-49.5</b>
Project No.:	<b>1584-01-40</b>	Date:	<b>9/26/2003</b>
Boring No.:	<b>T1-03-V-208</b>		
Sample No.:	<b>1</b>		
Description:	<b>SAND, poorly-graded, mostly fine-grained quartz, few carbonate, trace fragmented limestone, very dark greenish gray (SP)</b>		

Tare Weight, (g):	<b>50.42</b>	
Dry Wt. Before Washing (g):	<b>162.17</b>	(with tare)
Dry Weight After Washing (g):	<b>157.53</b>	(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	0.40	99.64	80	0.32
#7	2.800	0.75	98.97	90	0.68
#10	2.000	0.82	98.24	70	0.57
#14	1.400	0.87	97.46	70	0.61
#18	1.000	0.90	96.65	70	0.63
#25	0.710	0.90	95.85	70	0.63
#35	0.500	0.99	94.96	70	0.69
#45	0.355	1.32	93.78	60	0.79
#60	0.250	2.82	91.26	30	0.85
#80	0.180	25.64	68.31	3	0.77
#120	0.125	59.28	15.27	1	0.59
#170	0.090	10.25	6.09	1	0.10
#230	0.063	1.66	4.61	1	0.02

**Total Shell Content:** **6** %





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## VISUAL SHELL CONTENT

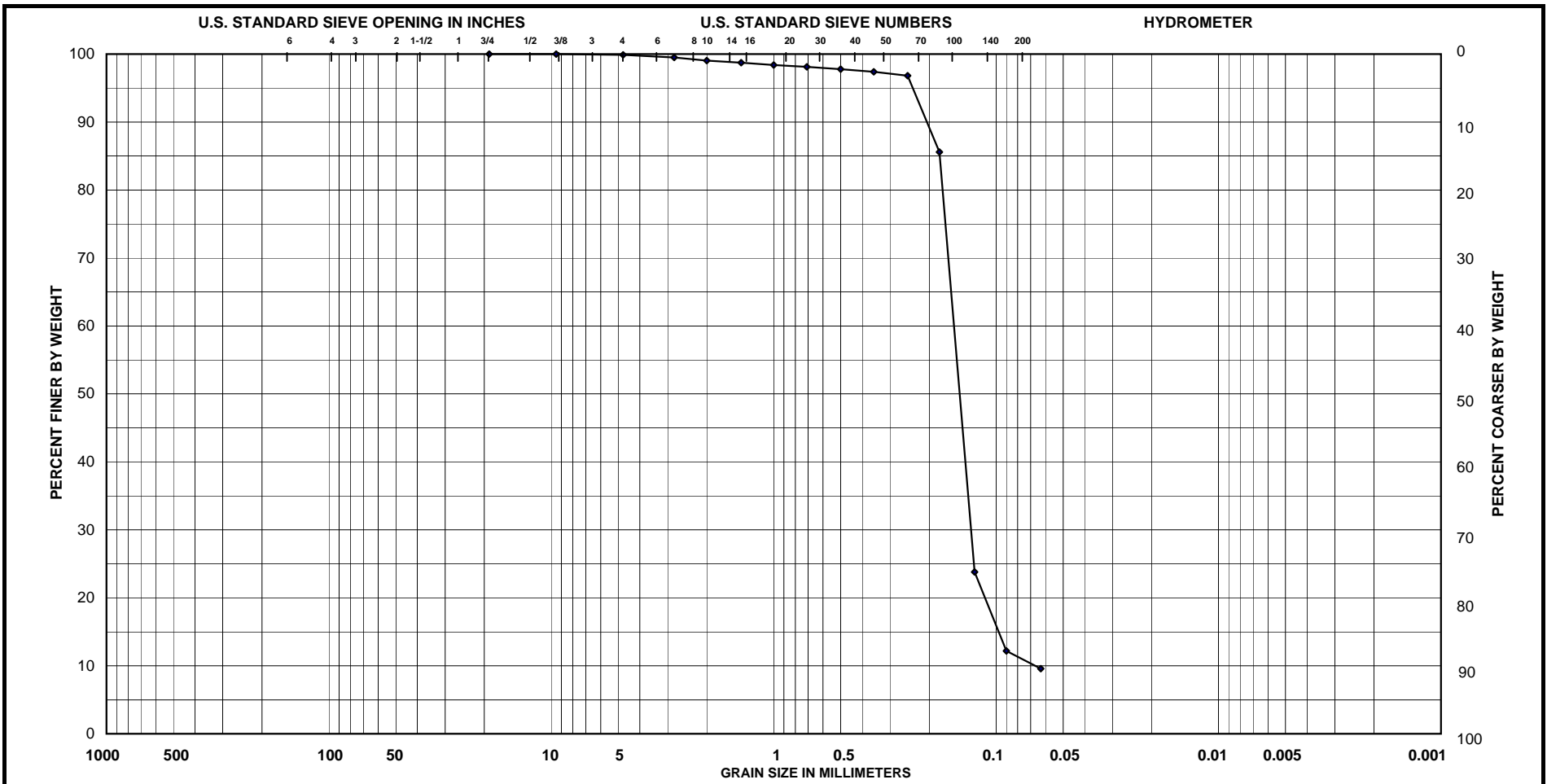
### GRAIN SIZE AND VISUAL SHELL CONTENT

Project:	<b>Topsail Beach, Surf City &amp; North Topsail</b>	Depth:	<b>51.0-51.5</b>
Project No.:	<b>1584-01-40</b>	Date:	<b>9/26/2003</b>
Boring No.:	<b>T1-03-V-208</b>		
Sample No.:	<b>2</b>		
Description:	<b>SAND, poorly-graded with silt, mostly fine-grained quartz, few silt, trace carbonate, olive gray (SP-SM)</b>		

Tare Weight, (g):	<b>50.56</b>	
Dry Wt. Before Washing (g):	<b>171.91</b>	(with tare)
Dry Weight After Washing (g):	<b>160.89</b>	(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	0.12	99.90	100	0.12
#7	2.800	0.49	99.50	90	0.44
#10	2.000	0.53	99.06	90	0.48
#14	1.400	0.41	98.72	80	0.33
#18	1.000	0.40	98.39	80	0.32
#25	0.710	0.35	98.10	80	0.28
#35	0.500	0.40	97.78	60	0.24
#45	0.355	0.45	97.40	40	0.18
#60	0.250	0.70	96.83	20	0.14
#80	0.180	13.63	85.60	2	0.27
#120	0.125	74.98	23.81	1	0.75
#170	0.090	14.11	12.18	1	0.14
#230	0.063	3.16	9.58	1	0.03

**Total Shell Content:** **3** %



COBBLES	GRAVEL		SAND			SILT OR CLAY
	COARSE	FINE	COARSE	MEDIUM	FINE	

Sample No.	Elev. Or Depth	Classification	% CO <sub>3</sub>	G <sub>s</sub>	Nat w%	LL	PL	PI	Project	
♦ 2	51.0-51.5	SAND, poorly-graded with silt, mostly fine-grained quartz, few silt, trace carbonate, olive gray (SP-SM)	3						Topsail Beach, Surf City & North Topsail	
									Area	
									Boring No. T1-03-V-208	
									Date 9/26/2003	

**GRADATION CURVES**



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## VISUAL SHELL CONTENT

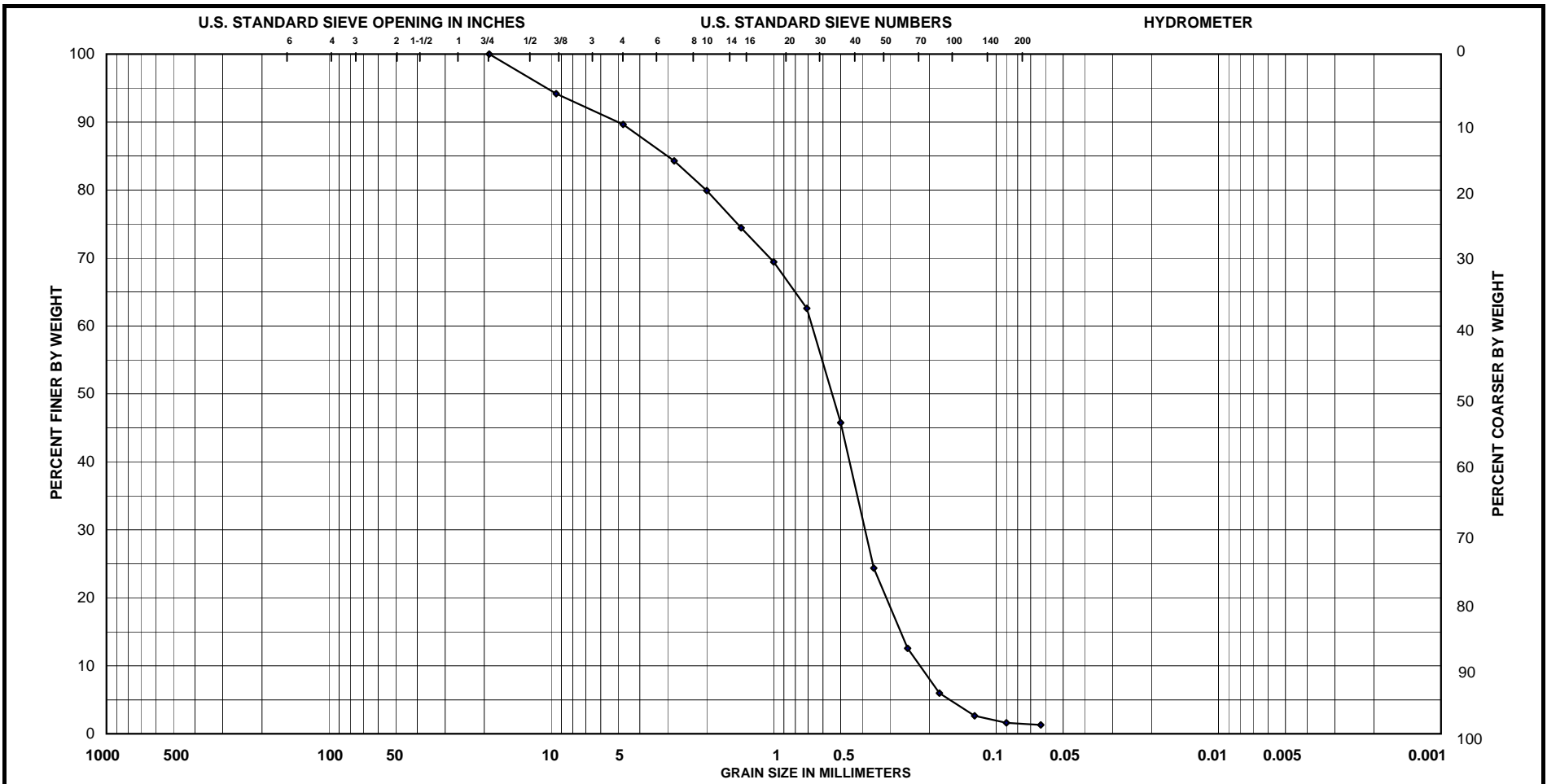
### GRAIN SIZE AND VISUAL SHELL CONTENT

Project:	<b>Topsail Beach, Surf City &amp; North Topsail</b>	Depth:	<b>47.3-47.8</b>
Project No.:	<b>1584-01-40</b>	Date:	<b>9/26/2003</b>
Boring No.:	<b>T1-03-V-210</b>		
Sample No.:	<b>1</b>		
Description:	<b>SAND, poorly-graded, mostly medium to fine-grained quartz, few fine gravel-size carbonate, few coarse-grained carbonate, trace fragmented</b>		

Tare Weight, (g):	<b>50.52</b>	
Dry Wt. Before Washing (g):	<b>179.42</b>	(with tare)
Dry Weight After Washing (g):	<b>177.91</b>	(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	7.50	94.18	70	5.25
#4	4.750	5.82	89.67	70	4.07
#7	2.800	6.95	84.27	60	4.17
#10	2.000	5.62	79.91	60	3.37
#14	1.400	7.06	74.44	60	4.24
#18	1.000	6.50	69.39	50	3.25
#25	0.710	8.78	62.58	40	3.51
#35	0.500	21.68	45.76	20	4.34
#45	0.355	27.55	24.39	5	1.38
#60	0.250	15.23	12.58	2	0.30
#80	0.180	8.51	5.97	1	0.09
#120	0.125	4.31	2.63	1	0.04
#170	0.090	1.33	1.60	1	0.01
#230	0.063	0.39	1.30	1	0.00

**Total Shell Content:** **26** %



COBBLES	GRAVEL		SAND			SILT OR CLAY
	COARSE	FINE	COARSE	MEDIUM	FINE	

Sample No.	Elev. Or Depth	Classification	% CO <sub>3</sub>	G <sub>s</sub>	Nat w%	LL	PL	PI	Project	
♦ 1	47.3-47.8	SAND, poorly-graded, mostly medium to fine-grained quartz, few fine gravel-size carbonate, few coarse-grained carbonate, trace fragmented limestone, olive gray (SP)	26						Topsail Beach, Surf City & North Topsail	
									Area	
									Boring No. T1-03-V-210	
									Date 9/26/2003	

**GRADATION CURVES**



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## VISUAL SHELL CONTENT

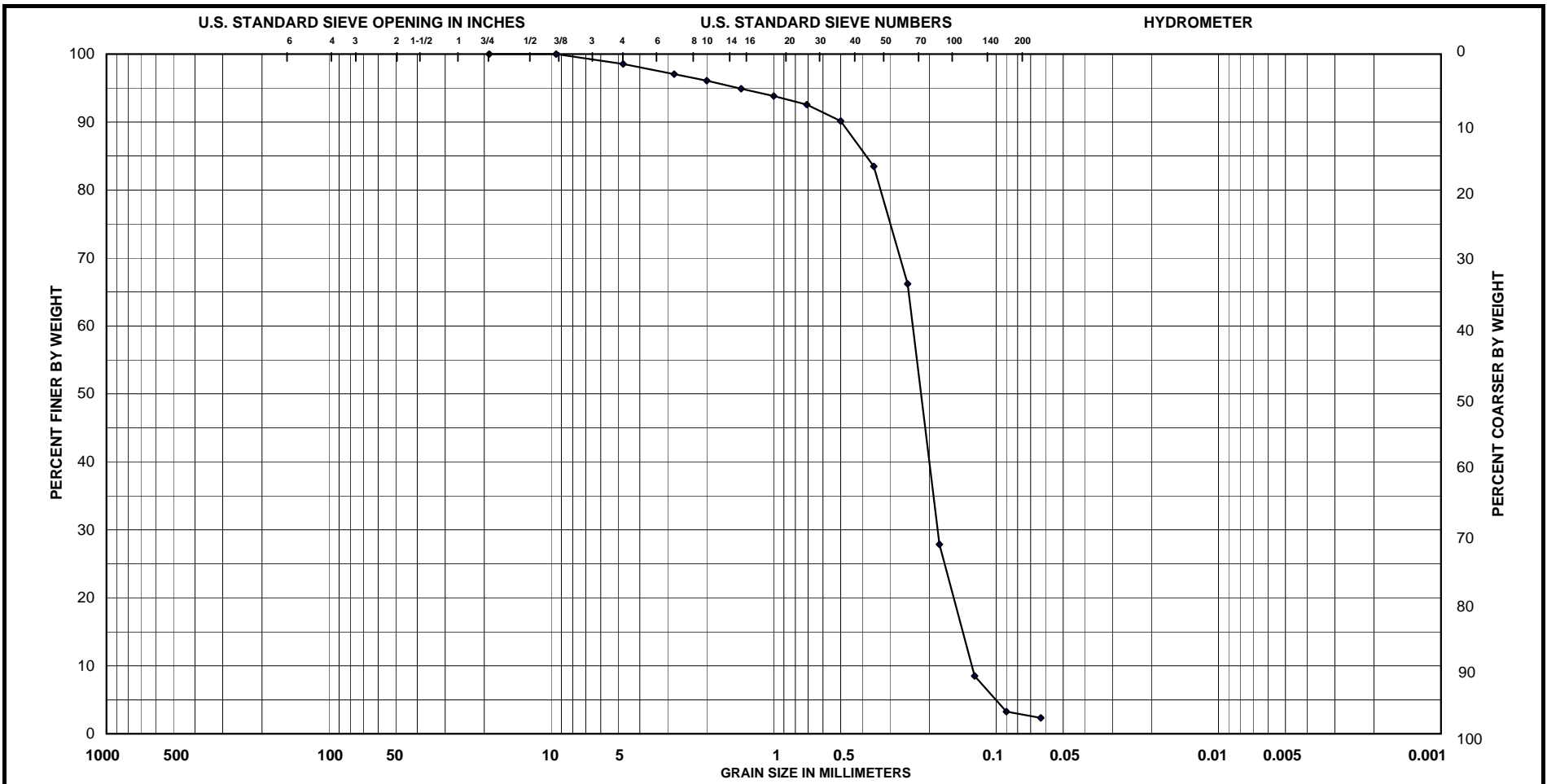
### GRAIN SIZE AND VISUAL SHELL CONTENT

Project:	<b>Topsail Beach, Surf City &amp; North Topsail</b>	Depth:	<b>49.1-49.6</b>
Project No.:	<b>1584-01-40</b>	Date:	<b>9/26/2003</b>
Boring No.:	<b>T1-03-V-211</b>		
Sample No.:	<b>1</b>		
Description:	<b>SAND, poorly-graded, mostly fine-grained quartz, few carbonate, olive gray (SP)</b>		

Tare Weight, (g):	<b>49.88</b>	
Dry Wt. Before Washing (g):	<b>173.91</b>	(with tare)
Dry Weight After Washing (g):	<b>171.3</b>	(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	1.79	98.56	90	1.61
#7	2.800	1.85	97.07	80	1.48
#10	2.000	1.23	96.07	80	0.98
#14	1.400	1.47	94.89	90	1.32
#18	1.000	1.32	93.82	80	1.06
#25	0.710	1.58	92.55	70	1.11
#35	0.500	2.98	90.15	40	1.19
#45	0.355	8.26	83.49	20	1.65
#60	0.250	21.44	66.20	3	0.64
#80	0.180	47.57	27.85	1	0.48
#120	0.125	24.01	8.49	1	0.24
#170	0.090	6.49	3.26	1	0.06
#230	0.063	1.13	2.35	1	0.01

**Total Shell Content:** **10** %



COBBLES	GRAVEL		SAND			SILT OR CLAY
	COARSE	FINE	COARSE	MEDIUM	FINE	

Sample No.	Elev. Or Depth	Classification	% CO <sub>3</sub>	G <sub>s</sub>	Nat w%	LL	PL	PI	Project
♦ 1	49.1-49.6	SAND, poorly-graded, mostly fine-grained quartz, few carbonate, olive gray (SP)	10						Topsail Beach, Surf City & North Topsail
									Area
									Boring No. T1-03-V-211
									Date 9/26/2003

**GRADATION CURVES**





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## VISUAL SHELL CONTENT

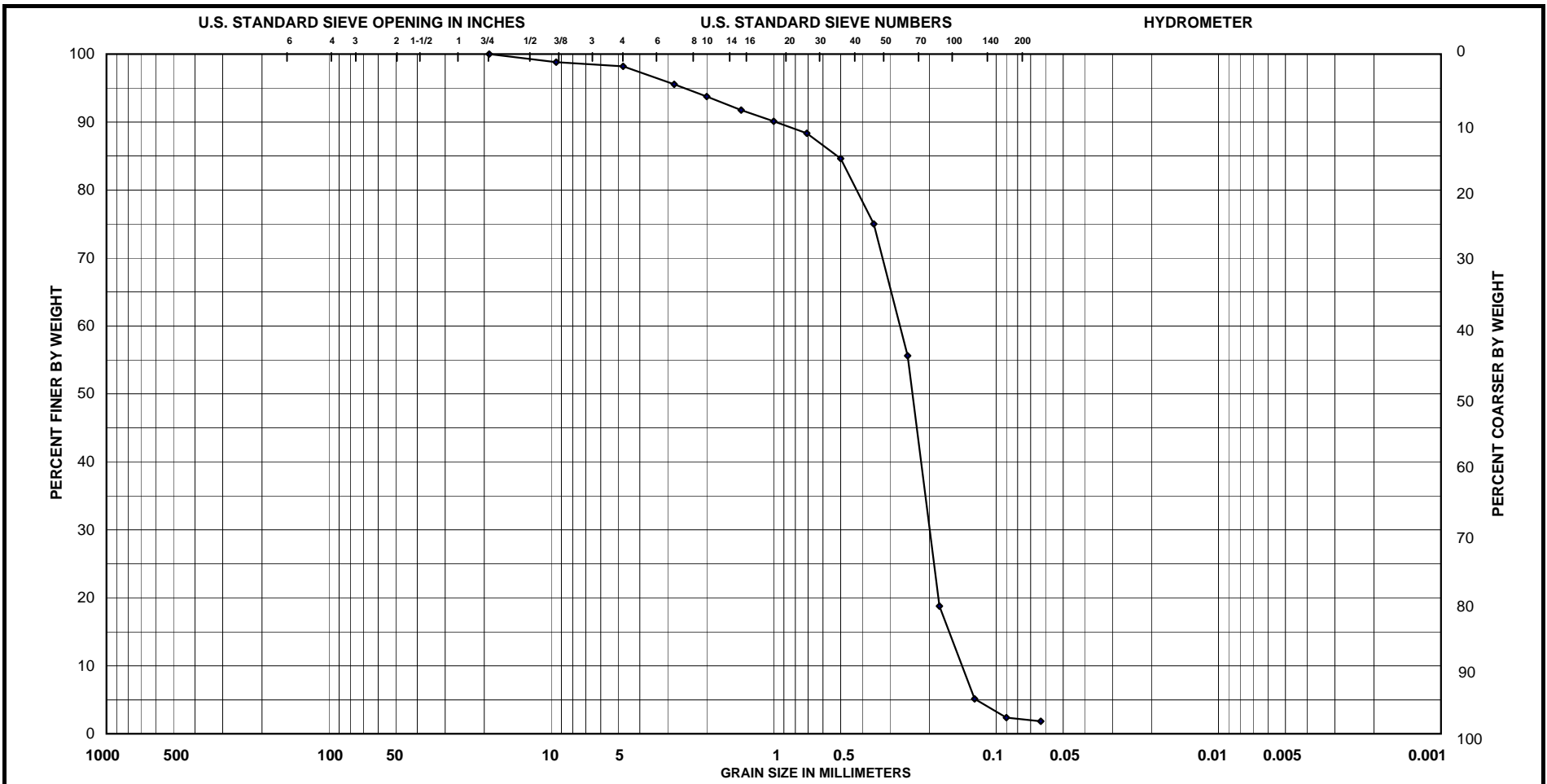
### GRAIN SIZE AND VISUAL SHELL CONTENT

Project:	<b>Topsail Beach, Surf City &amp; North Topsail</b>	Depth:	<b>49.7-50.2</b>
Project No.:	<b>1584-01-40</b>	Date:	<b>9/26/2003</b>
Boring No.:	<b>T1-03-V-212A</b>		
Sample No.:	<b>1</b>		
Description:	<b>SAND, poorly-graded, mostly fine-grained quartz, few carbonate, very dark greenish gray (SP)</b>		

Tare Weight, (g):	<b>50.51</b>	
Dry Wt. Before Washing (g):	<b>187.75</b>	(with tare)
Dry Weight After Washing (g):	<b>185.84</b>	(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	1.63	98.81	100	1.63
#4	4.750	0.86	98.19	100	0.86
#7	2.800	3.63	95.54	100	3.63
#10	2.000	2.46	93.75	95	2.34
#14	1.400	2.75	91.74	80	2.20
#18	1.000	2.24	90.11	70	1.57
#25	0.710	2.41	88.36	60	1.45
#35	0.500	5.10	84.64	30	1.53
#45	0.355	13.22	75.01	10	1.32
#60	0.250	26.61	55.62	3	0.80
#80	0.180	50.56	18.78	1	0.51
#120	0.125	18.70	5.15	1	0.19
#170	0.090	3.82	2.37	1	0.04
#230	0.063	0.72	1.84	1	0.01

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



COBBLES	GRAVEL		SAND			SILT OR CLAY
	COARSE	FINE	COARSE	MEDIUM	FINE	

Sample No.	Elev. Or Depth	Classification	% CO <sub>3</sub>	G <sub>s</sub>	Nat w%	LL	PL	PI	Project
♦ 1	49.7-50.2	SAND, poorly-graded, mostly fine-grained quartz, few carbonate, very dark greenish gray (SP)	13						Topsail Beach, Surf City & North Topsail
									Area
									Boring No. T1-03-V-212A
									Date 9/26/2003

**GRADATION CURVES**



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## VISUAL SHELL CONTENT

### GRAIN SIZE AND VISUAL SHELL CONTENT

Project:	<b>Topsail Beach, Surf City &amp; North Topsail</b>	Depth:	<b>51.2-51.7</b>
Project No.:	<b>1584-01-40</b>	Date:	<b>9/26/2003</b>
Boring No.:	<b>T1-03-V-212A</b>		
Sample No.:	<b>2</b>		
Description:	<b>SAND, silty, mostly fine-grained quartz, little silt, trace carbonate, trace fragmented limestone, dark greenish gray (SM)</b>		

Tare Weight, (g):	<b>50.47</b>	
Dry Wt. Before Washing (g):	<b>170.22</b>	(with tare)
Dry Weight After Washing (g):	<b>153.63</b>	(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	0.35	99.71	100	0.35
#7	2.800	0.06	99.66	100	0.06
#10	2.000	0.15	99.53	100	0.15
#14	1.400	0.20	99.37	90	0.18
#18	1.000	0.28	99.13	90	0.25
#25	0.710	0.43	98.77	80	0.34
#35	0.500	0.73	98.16	60	0.44
#45	0.355	1.32	97.06	30	0.40
#60	0.250	2.41	95.05	10	0.24
#80	0.180	7.46	88.82	5	0.37
#120	0.125	59.91	38.79	1	0.60
#170	0.090	18.69	23.18	1	0.19
#230	0.063	8.79	15.84	1	0.09

**Total Shell Content:** **3** %





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## VISUAL SHELL CONTENT

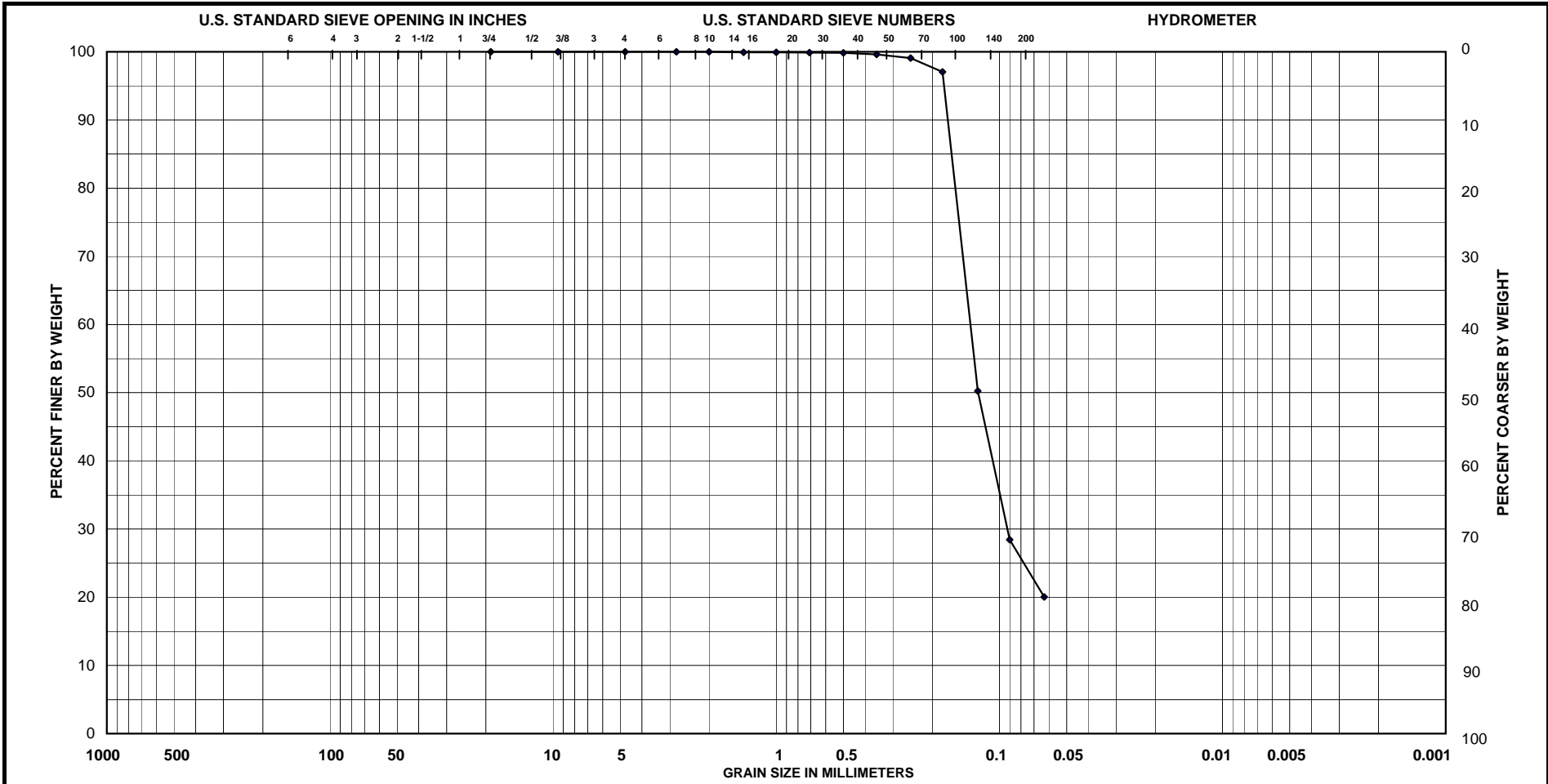
### GRAIN SIZE AND VISUAL SHELL CONTENT

Project:	<b>Topsail Beach, Surf City &amp; North Topsail</b>	Depth:	<b>53.0-53.5</b>
Project No.:	<b>1584-01-40</b>	Date:	<b>9/26/2003</b>
Boring No.:	<b>T1-03-V-212A</b>		
Sample No.:	<b>3</b>		
Description:	<b>SAND, silty, mostly fine-grained quartz, little silt, trace carbonate, trace organic matter, dark greenish gray (SM)</b>		

Tare Weight, (g):	<b>50.37</b>	
Dry Wt. Before Washing (g):	<b>165.92</b>	(with tare)
Dry Weight After Washing (g):	<b>145.58</b>	(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	0.00	100.00	0	0.00
#14	1.400	0.07	99.94	10	0.01
#18	1.000	0.02	99.92	50	0.01
#25	0.710	0.03	99.90	80	0.02
#35	0.500	0.06	99.84	80	0.05
#45	0.355	0.25	99.63	70	0.18
#60	0.250	0.63	99.08	60	0.38
#80	0.180	2.36	97.04	40	0.94
#120	0.125	54.05	50.26	2	1.08
#170	0.090	25.23	28.43	1	0.25
#230	0.063	9.69	20.04	1	0.10

**Total Shell Content:** **3** %



COBBLES	GRAVEL		SAND			SILT OR CLAY
	COARSE	FINE	COARSE	MEDIUM	FINE	

Sample No.	Elev. Or Depth	Classification	% CO <sub>3</sub>	G <sub>s</sub>	Nat w%	LL	PL	PI	Project	
3	53.0-53.5	SAND, silty, mostly fine-grained quartz, little silt, trace carbonate, trace organic matter, dark greenish gray (SM)	3						Topsail Beach, Surf City & North Topsail	
									Area	
									Boring No. T1-03-V-212A	
									Date 9/26/2003	

**GRADATION CURVES**



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## VISUAL SHELL CONTENT

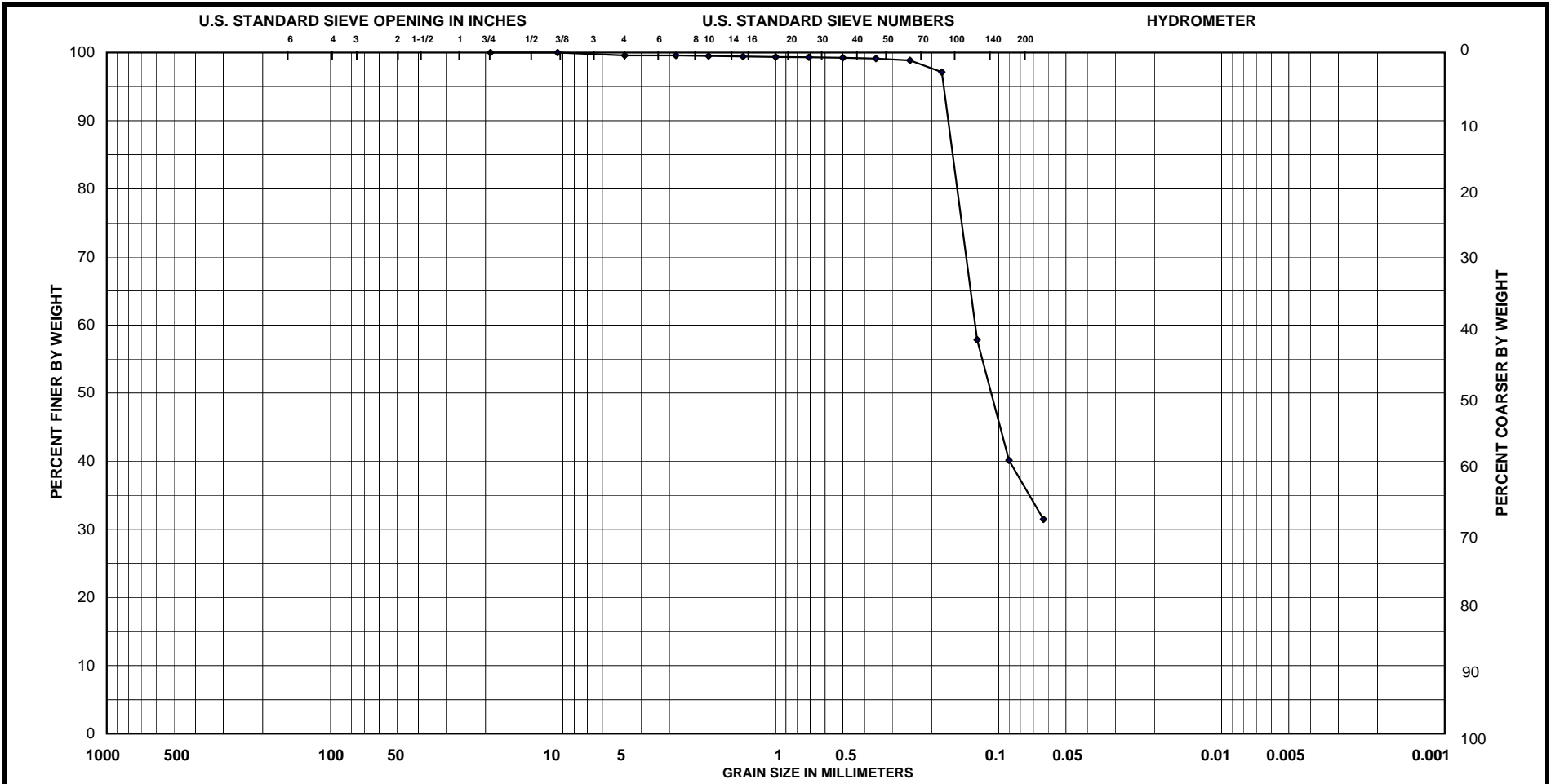
### GRAIN SIZE AND VISUAL SHELL CONTENT

Project:	<b>Topsail Beach, Surf City &amp; North Topsail</b>	Depth:	<b>56.0-56.5</b>
Project No.:	<b>1584-01-40</b>	Date:	<b>9/26/2003</b>
Boring No.:	<b>T1-03-V-212A</b>		
Sample No.:	<b>4</b>		
Description:	<b>SAND, silty, mostly fine-grained quartz, some silt, trace carbonate, trace organic matter, dark greenish gray (SM)</b>		

Tare Weight, (g):	<b>50.32</b>	
Dry Wt. Before Washing (g):	<b>159.06</b>	(with tare)
Dry Weight After Washing (g):	<b>127.21</b>	(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	0.46	99.58	100	0.46
#7	2.800	0.00	99.58	0	0.00
#10	2.000	0.08	99.50	20	0.02
#14	1.400	0.09	99.42	40	0.04
#18	1.000	0.08	99.35	80	0.06
#25	0.710	0.06	99.29	90	0.05
#35	0.500	0.06	99.24	80	0.05
#45	0.355	0.11	99.14	70	0.08
#60	0.250	0.31	98.85	50	0.16
#80	0.180	1.86	97.14	30	0.56
#120	0.125	42.73	57.84	2	0.85
#170	0.090	19.26	40.13	1	0.19
#230	0.063	9.42	31.47	1	0.09

**Total Shell Content:** **2** %



COBBLES	GRAVEL		SAND			SILT OR CLAY
	COARSE	FINE	COARSE	MEDIUM	FINE	

Sample No.	Elev. Or Depth	Classification	% CO <sub>3</sub>	G <sub>s</sub>	Nat w%	LL	PL	PI	Project	
4	56.0-56.5	SAND, silty, mostly fine-grained quartz, some silt, trace carbonate, trace organic matter, dark greenish gray (SM)	2						Topsail Beach, Surf City & North Topsail	
									Area	
									Boring No. T1-03-V-212A	
									Date 9/26/2003	

**GRADATION CURVES**





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## VISUAL SHELL CONTENT

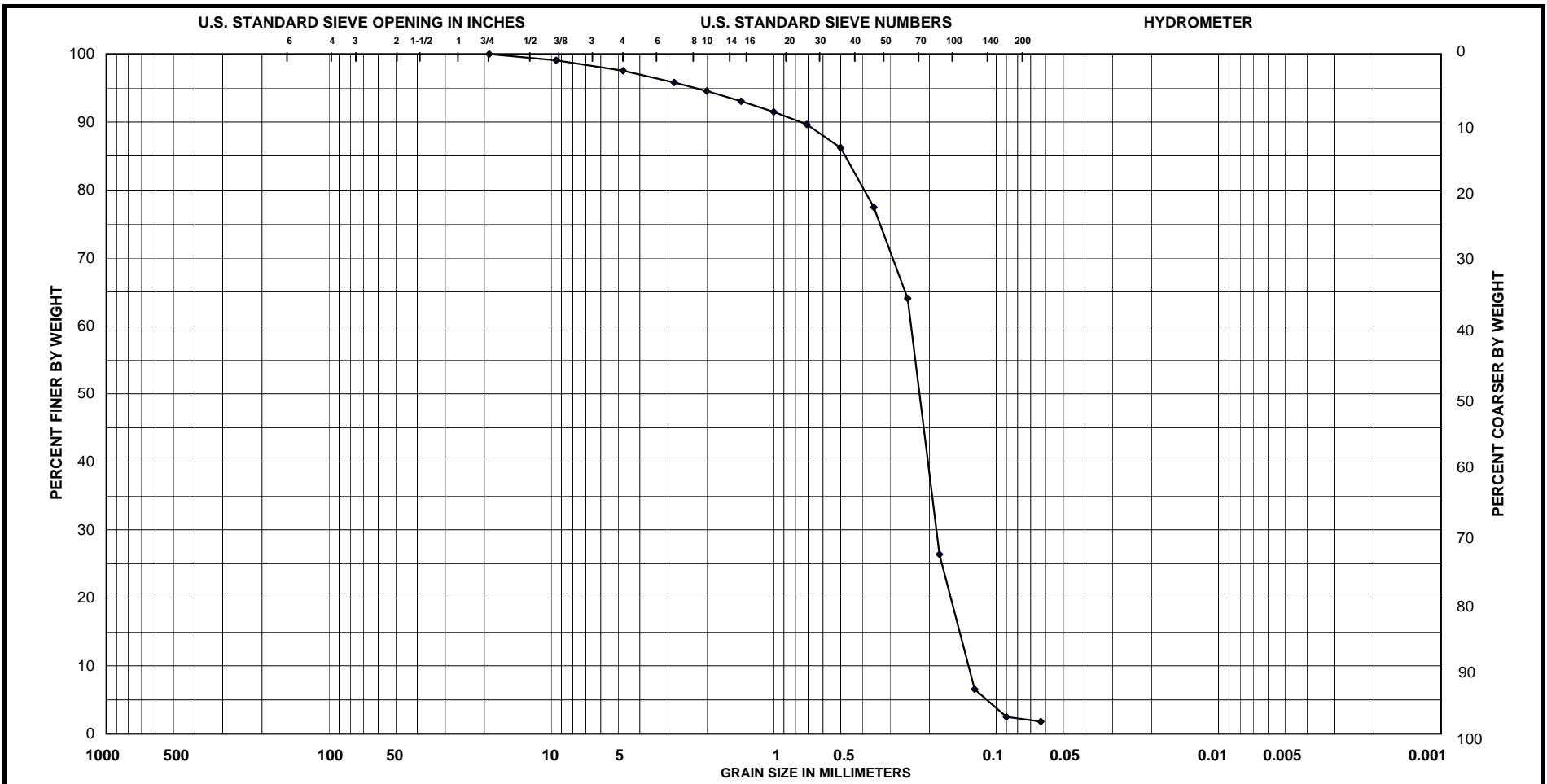
### GRAIN SIZE AND VISUAL SHELL CONTENT

Project:	<b>Topsail Beach, Surf City &amp; North Topsail</b>	Depth:	<b>49.9-50.4</b>
Project No.:	<b>1584-01-40</b>	Date:	<b>9/26/2003</b>
Boring No.:	<b>T1-03-V-213</b>		
Sample No.:	<b>1</b>		
Description:	<b>SAND, poorly-graded, mostly fine-grained quartz, little coarse to medium-grained carbonate, olive gray (SP)</b>		

Tare Weight, (g):	<b>49.89</b>	
Dry Wt. Before Washing (g):	<b>178.25</b>	(with tare)
Dry Weight After Washing (g):	<b>176.04</b>	(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	1.19	99.07	100	1.19
#4	4.750	1.94	97.56	100	1.94
#7	2.800	2.21	95.84	100	2.21
#10	2.000	1.66	94.55	90	1.49
#14	1.400	1.92	93.05	90	1.73
#18	1.000	2.01	91.48	80	1.61
#25	0.710	2.37	89.64	70	1.66
#35	0.500	4.41	86.20	40	1.76
#45	0.355	11.22	77.46	20	2.24
#60	0.250	17.20	64.06	5	0.86
#80	0.180	48.31	26.42	1	0.48
#120	0.125	25.52	6.54	1	0.26
#170	0.090	5.19	2.50	1	0.05
#230	0.063	0.91	1.79	1	0.01

**Total Shell Content:** **14** %



COBBLES	GRAVEL		SAND			SILT OR CLAY
	COARSE	FINE	COARSE	MEDIUM	FINE	

Sample No.	Elev. Or Depth	Classification	% CO <sub>3</sub>	G <sub>s</sub>	Nat w%	LL	PL	PI	Project
♦ 1	49.9-50.4	SAND, poorly-graded, mostly fine-grained quartz, little coarse to medium-grained carbonate, olive gray (SP)	14						Topsail Beach, Surf City & North Topsail
									Area
									Boring No. T1-03-V-213
									Date 9/26/2003

**GRADATION CURVES**



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## VISUAL SHELL CONTENT

### GRAIN SIZE AND VISUAL SHELL CONTENT

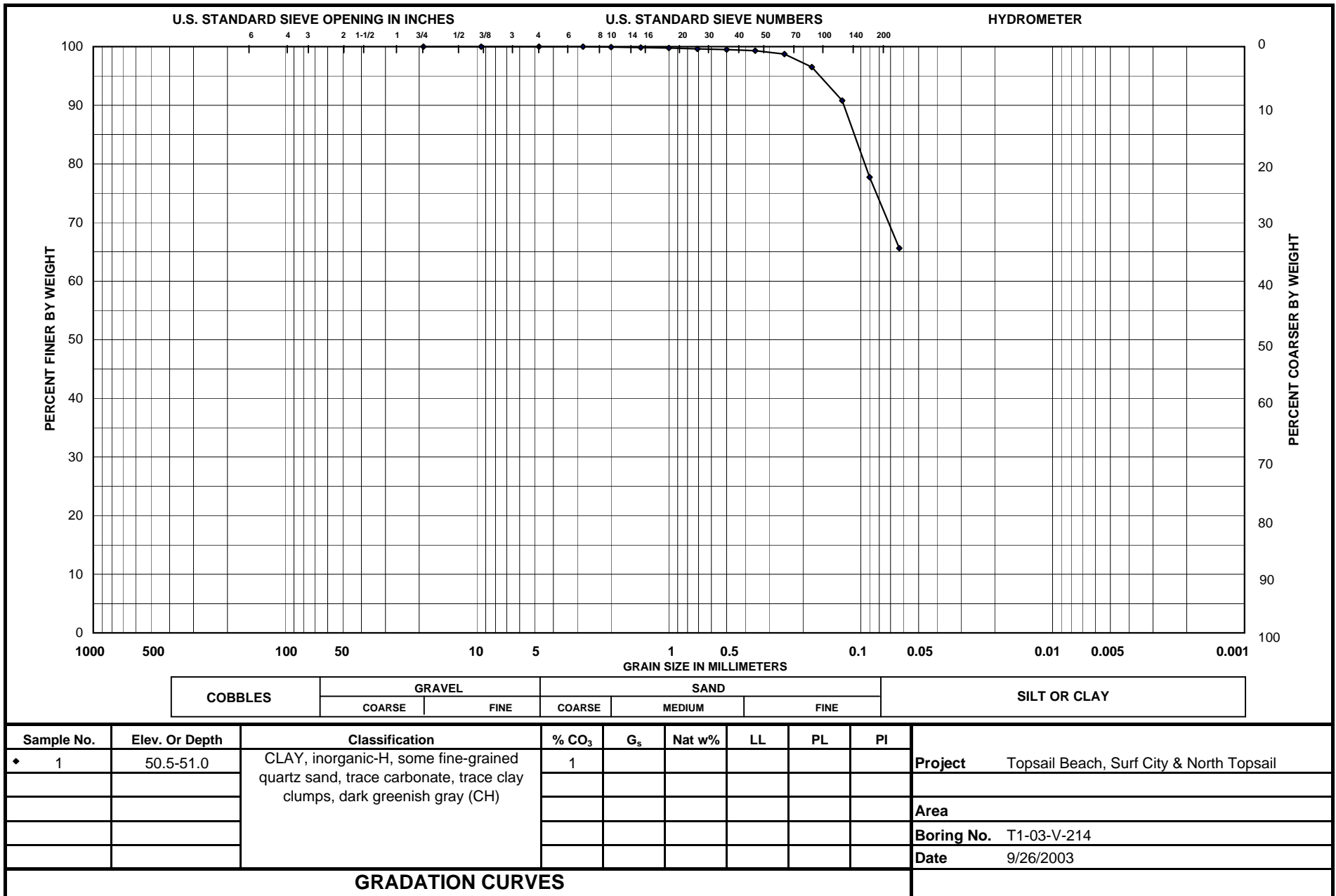
Project:	<b>Topsail Beach, Surf City &amp; North Topsail</b>	Depth:	<b>50.5-51.0</b>
Project No.:	<b>1584-01-40</b>	Date:	<b>9/26/2003</b>
Boring No.:	<b>T1-03-V-214</b>		
Sample No.:	<b>1</b>		
Description:	<b>CLAY, inorganic-H, some fine-grained quartz sand, trace carbonate, trace clay clumps, dark greenish gray (CH)</b>		

Tare Weight, (g):	<b>50.19</b>	
Dry Wt. Before Washing (g):	<b>139.59</b>	(with tare)
Dry Weight After Washing (g):	<b>82.68</b>	(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	99.92	20	0.01
#14	1.400	0.08	99.83	50	0.04
#18	1.000	0.07	99.75	50	0.04
#25	0.710	0.11	99.63	40	0.04
#35	0.500	0.12	99.50	40	0.05
#45	0.355	0.18	99.30	40	0.07
#60	0.250	0.50	98.74	20	0.10
#80	0.180	1.99	96.51	3	0.06
#120	0.125	5.09	90.82	1	0.05
#170	0.090	11.70	77.73	1	0.12
#230	0.063	10.84	65.60	1	0.11

**Total Shell Content:**

<b>1</b>	<b>%</b>
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## VISUAL SHELL CONTENT

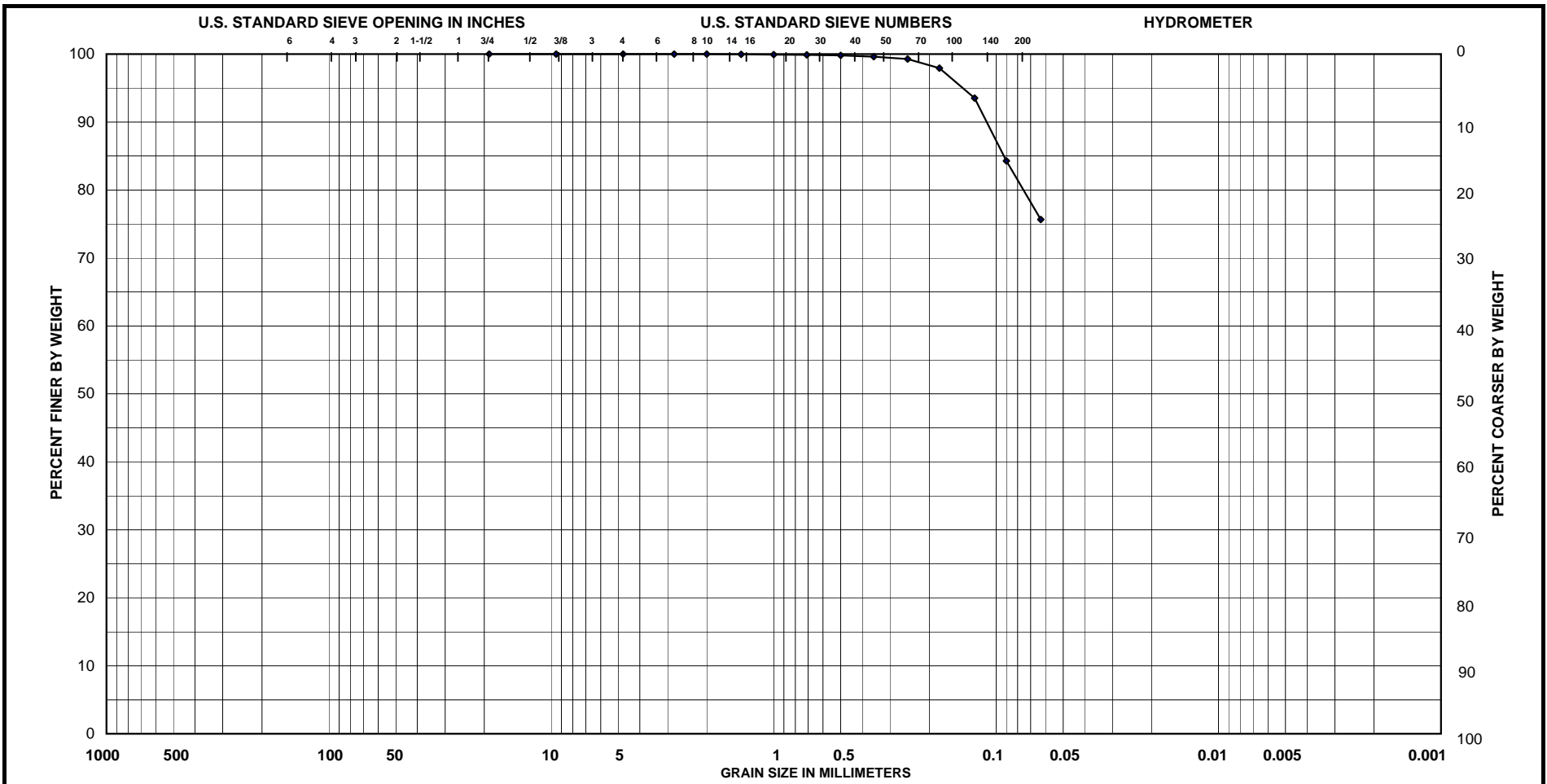
### GRAIN SIZE AND VISUAL SHELL CONTENT

Project:	<b>Topsail Beach, Surf City &amp; North Topsail</b>	Depth:	<b>52.5-53.0</b>
Project No.:	<b>1584-01-40</b>	Date:	<b>9/26/2003</b>
Boring No.:	<b>T1-03-V-214</b>		
Sample No.:	<b>2</b>		
Description:	<b>CLAY, inorganic-H, little fine-grained quartz sand, trace clay clumps, dark greenish gray (CH)</b>		

Tare Weight, (g):	<b>50.35</b>	
Dry Wt. Before Washing (g):	<b>137.93</b>	(with tare)
Dry Weight After Washing (g):	<b>72.76</b>	(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	0.00	100.00	0	0.00
#14	1.400	0.04	99.95	20	0.01
#18	1.000	0.04	99.91	40	0.02
#25	0.710	0.03	99.87	40	0.01
#35	0.500	0.06	99.81	50	0.03
#45	0.355	0.15	99.63	40	0.06
#60	0.250	0.31	99.28	20	0.06
#80	0.180	1.17	97.94	3	0.04
#120	0.125	3.86	93.54	1	0.04
#170	0.090	8.11	84.28	1	0.08
#230	0.063	7.55	75.66	1	0.08

**Total Shell Content:** **0** %



COBBLES	GRAVEL		SAND			SILT OR CLAY
	COARSE	FINE	COARSE	MEDIUM	FINE	

Sample No.	Elev. Or Depth	Classification	% CO <sub>3</sub>	G <sub>s</sub>	Nat w%	LL	PL	PI	Project
♦ 2	52.5-53.0	CLAY, inorganic-H, little fine-grained quartz sand, trace clay clumps, dark greenish gray (CH)	0						Topsail Beach, Surf City & North Topsail
									Area
									Boring No. T1-03-V-214
									Date 9/26/2003

**GRADATION CURVES**



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## VISUAL SHELL CONTENT

### GRAIN SIZE AND VISUAL SHELL CONTENT

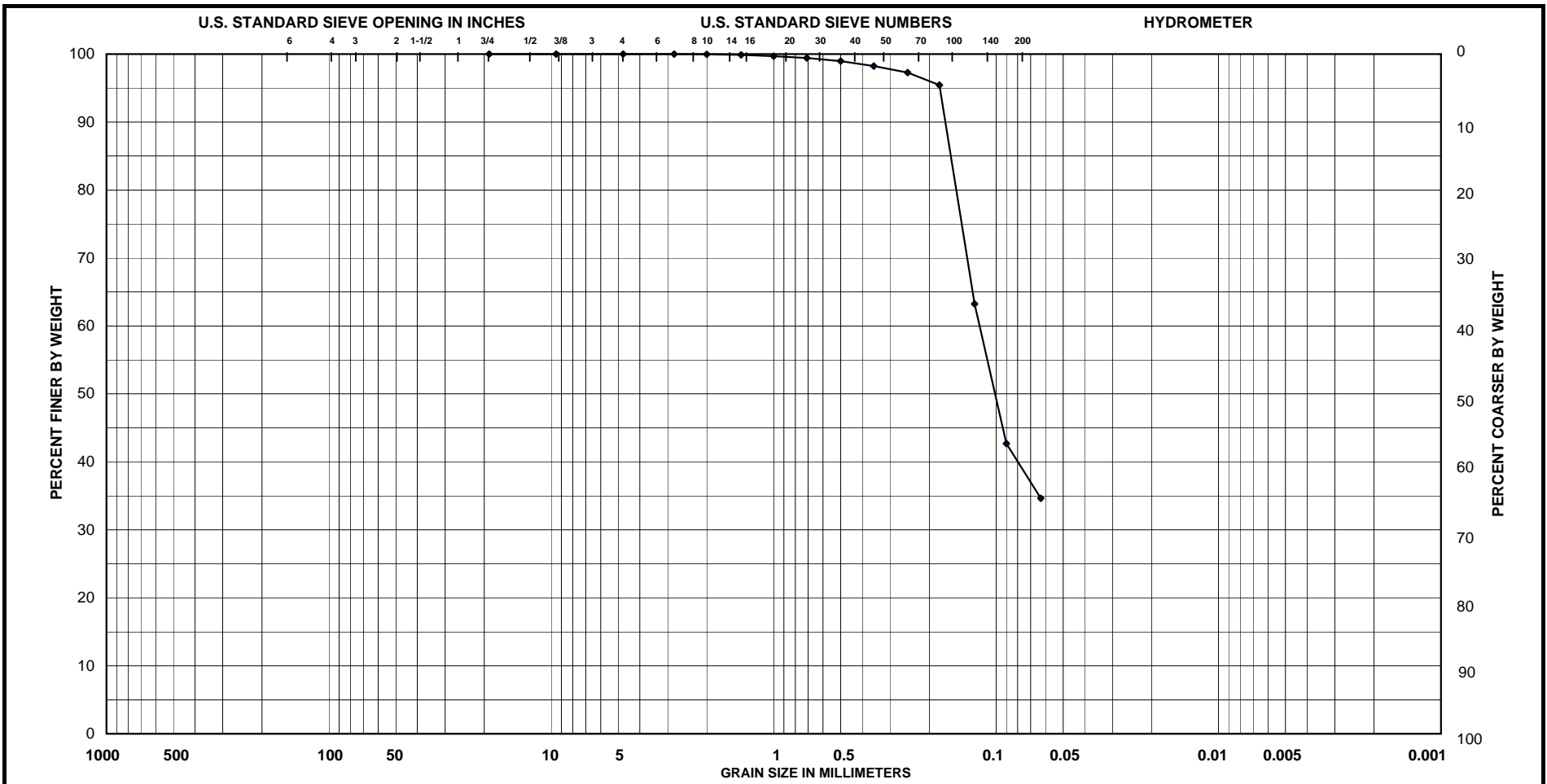
Project:	<b>Topsail Beach, Surf City &amp; North Topsail</b>	Depth:	<b>54.5-55.0</b>
Project No.:	<b>1584-01-40</b>	Date:	<b>9/26/2003</b>
Boring No.:	<b>T1-03-V-214</b>		
Sample No.:	<b>3</b>		
Description:	<b>SAND, clayey, mostly fine-grained quartz, some clay, trace carbonate, dark greenish gray (SC)</b>		

Tare Weight, (g):	<b>50.48</b>	
Dry Wt. Before Washing (g):	<b>154.41</b>	(with tare)
Dry Weight After Washing (g):	<b>119.96</b>	(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	0.04	99.96	40	0.02
#14	1.400	0.07	99.89	20	0.01
#18	1.000	0.20	99.70	20	0.04
#25	0.710	0.27	99.44	10	0.03
#35	0.500	0.50	98.96	10	0.05
#45	0.355	0.77	98.22	5	0.04
#60	0.250	0.98	97.28	5	0.05
#80	0.180	1.92	95.43	5	0.10
#120	0.125	33.46	63.23	1	0.33
#170	0.090	21.34	42.70	1	0.21
#230	0.063	8.35	34.67	1	0.08

**Total Shell Content:**

<b>1</b>	<b>%</b>
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COBBLES	GRAVEL		SAND			SILT OR CLAY
	COARSE	FINE	COARSE	MEDIUM	FINE	

Sample No.	Elev. Or Depth	Classification	% CO <sub>3</sub>	G <sub>s</sub>	Nat w%	LL	PL	PI	Project	
♦ 3	54.5-55.0	SAND, clayey, mostly fine-grained quartz, some clay, trace carbonate, dark greenish gray (SC)	1						Topsail Beach, Surf City & North Topsail	
									Area	
									Boring No. T1-03-V-214	
									Date 9/26/2003	

**GRADATION CURVES**





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## VISUAL SHELL CONTENT

### GRAIN SIZE AND VISUAL SHELL CONTENT

Project:	<b>Topsail Beach, Surf City &amp; North Topsail</b>	Depth:	<b>55.7-56.2</b>
Project No.:	<b>1584-01-40</b>	Date:	<b>9/26/2003</b>
Boring No.:	<b>T1-03-V-214</b>		
Sample No.:	<b>4</b>		
Description:	<b>SAND, clayey, mostly fine-grained quartz, some clay, trace carbonate, dark greenish gray (SC)</b>		

Tare Weight, (g):	<b>48.62</b>	
Dry Wt. Before Washing (g):	<b>163.38</b>	(with tare)
Dry Weight After Washing (g):	<b>129.96</b>	(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	0.13	99.89	100	0.13
#10	2.000	0.08	99.82	90	0.07
#14	1.400	0.22	99.63	60	0.13
#18	1.000	0.20	99.45	40	0.08
#25	0.710	0.28	99.21	30	0.08
#35	0.500	0.49	98.78	20	0.10
#45	0.355	0.85	98.04	20	0.17
#60	0.250	1.37	96.85	10	0.14
#80	0.180	4.37	93.04	3	0.13
#120	0.125	40.14	58.06	1	0.40
#170	0.090	24.77	36.48	1	0.25
#230	0.063	7.29	30.12	1	0.07

**Total Shell Content:** **2** %





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## VISUAL SHELL CONTENT

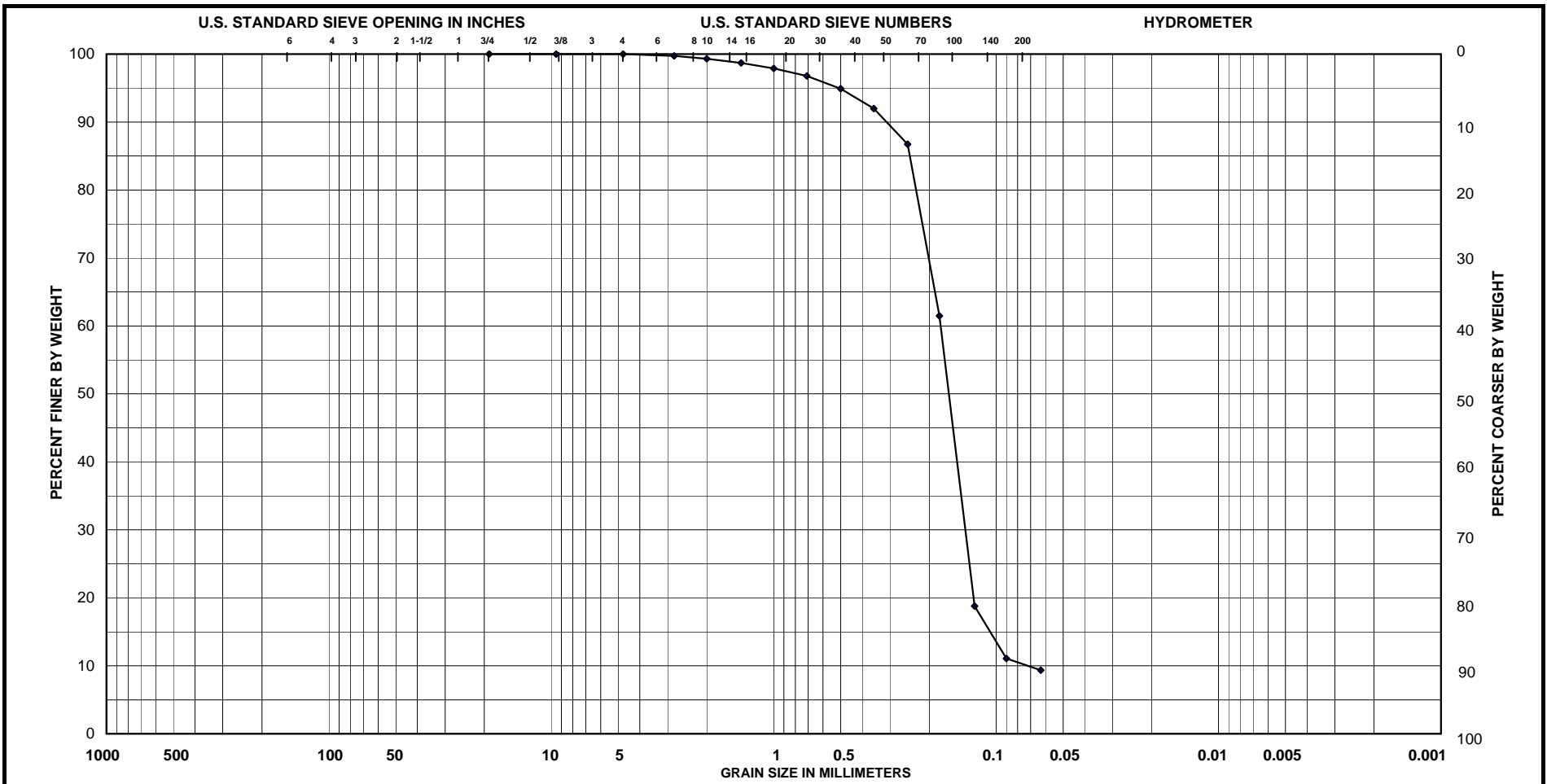
### GRAIN SIZE AND VISUAL SHELL CONTENT

Project:	<b>Topsail Beach, Surf City &amp; North Topsail</b>	Depth:	<b>49.4-49.9</b>
Project No.:	<b>1584-01-40</b>	Date:	<b>9/26/2003</b>
Boring No.:	<b>T1-03-V-215</b>		
Sample No.:	<b>1</b>		
Description:	<b>SAND, poorly-graded with silt, mostly fine-grained quartz, few silt, trace carbonate, trace fragmented limestone, olive gray (SP-SM)</b>		

Tare Weight, (g):	<b>49.82</b>	
Dry Wt. Before Washing (g):	<b>164.6</b>	(with tare)
Dry Weight After Washing (g):	<b>154.28</b>	(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	0.29	99.75	90	0.26
#10	2.000	0.51	99.30	70	0.36
#14	1.400	0.68	98.71	70	0.48
#18	1.000	0.92	97.91	60	0.55
#25	0.710	1.29	96.79	40	0.52
#35	0.500	2.18	94.89	20	0.44
#45	0.355	3.34	91.98	5	0.17
#60	0.250	6.01	86.74	2	0.12
#80	0.180	29.01	61.47	1	0.29
#120	0.125	49.01	18.77	1	0.49
#170	0.090	8.81	11.09	1	0.09
#230	0.063	2.00	9.35	1	0.02

**Total Shell Content:** **3** %



COBBLES	GRAVEL		SAND			SILT OR CLAY
	COARSE	FINE	COARSE	MEDIUM	FINE	

Sample No.	Elev. Or Depth	Classification	% CO <sub>3</sub>	G <sub>s</sub>	Nat w%	LL	PL	PI	Project	
♦ 1	49.4-49.9	SAND, poorly-graded with silt, mostly fine-grained quartz, few silt, trace carbonate, trace fragmented limestone, olive gray (SP-SM)	3						Topsail Beach, Surf City & North Topsail	
									Area	
									Boring No. T1-03-V-215	
									Date 9/26/2003	

**GRADATION CURVES**



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## VISUAL SHELL CONTENT

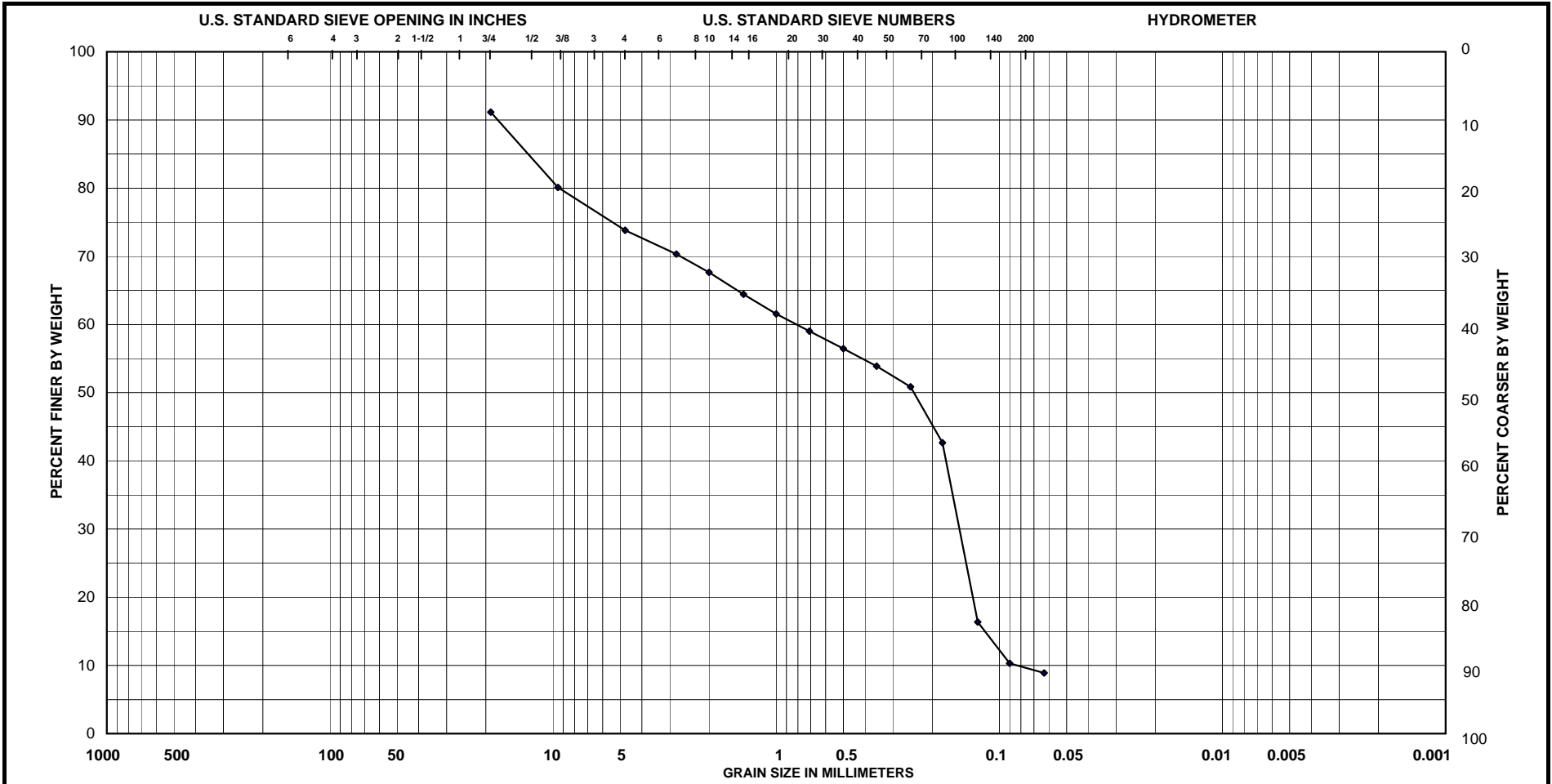
### GRAIN SIZE AND VISUAL SHELL CONTENT

Project:	<b>Topsail Beach, Surf City &amp; North Topsail</b>	Depth:	<b>50.6-51.1</b>
Project No.:	<b>1584-01-40</b>	Date:	<b>9/26/2003</b>
Boring No.:	<b>T1-03-V-215</b>		
Sample No.:	<b>2</b>		
Description:	<b>SAND, poorly-graded with silt, some fine-grained quartz, little coarse to fine gravel-size fragmented limestone, little coarse toe medium-grained</b>		

Tare Weight, (g):	<b>50.57</b>	
Dry Wt. Before Washing (g):	<b>174.81</b>	(with tare)
Dry Weight After Washing (g):	<b>164.58</b>	(with tare)

Sieve Size (Name)	Sieve Size (mm)	Weight Retained (g)	% Passing	Approx. Visual Shell %	Approx. Visual Shell Wt. (g)
3/4"	19.000	10.99	91.15	0	0.00
3/8"	9.500	13.72	80.11	10	1.37
#4	4.750	7.82	73.82	10	0.78
#7	2.800	4.31	70.35	30	1.29
#10	2.000	3.34	67.66	40	1.34
#14	1.400	4.01	64.43	20	0.80
#18	1.000	3.55	61.57	20	0.71
#25	0.710	3.18	59.01	10	0.32
#35	0.500	3.19	56.45	5	0.16
#45	0.355	3.19	53.88	5	0.16
#60	0.250	3.76	50.85	2	0.08
#80	0.180	10.19	42.65	1	0.10
#120	0.125	32.65	16.37	1	0.33
#170	0.090	7.55	10.29	1	0.08
#230	0.063	1.75	8.89	1	0.02

**Total Shell Content:** **6** %



COBBLES	GRAVEL		SAND			SILT OR CLAY
	COARSE	FINE	COARSE	MEDIUM	FINE	

Sample No.	Elev. Or Depth	Classification	% CO <sub>3</sub>	G <sub>s</sub>	Nat w%	LL	PL	PI	Project	
♦ 2	50.6-51.1	SAND, poorly-graded with silt, some fine-grained quartz, little coarse to fine gravel-size fragmented limestone, little coarse to medium-grained fragmented limestone, few carbonate, few silt, olive gray (SP-SM)	6						Topsail Beach, Surf City & North Topsail	
									Area	
									Boring No. T1-03-V-215	
									Date 9/26/2003	

**GRADATION CURVES**



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## VISUAL SHELL CONTENT

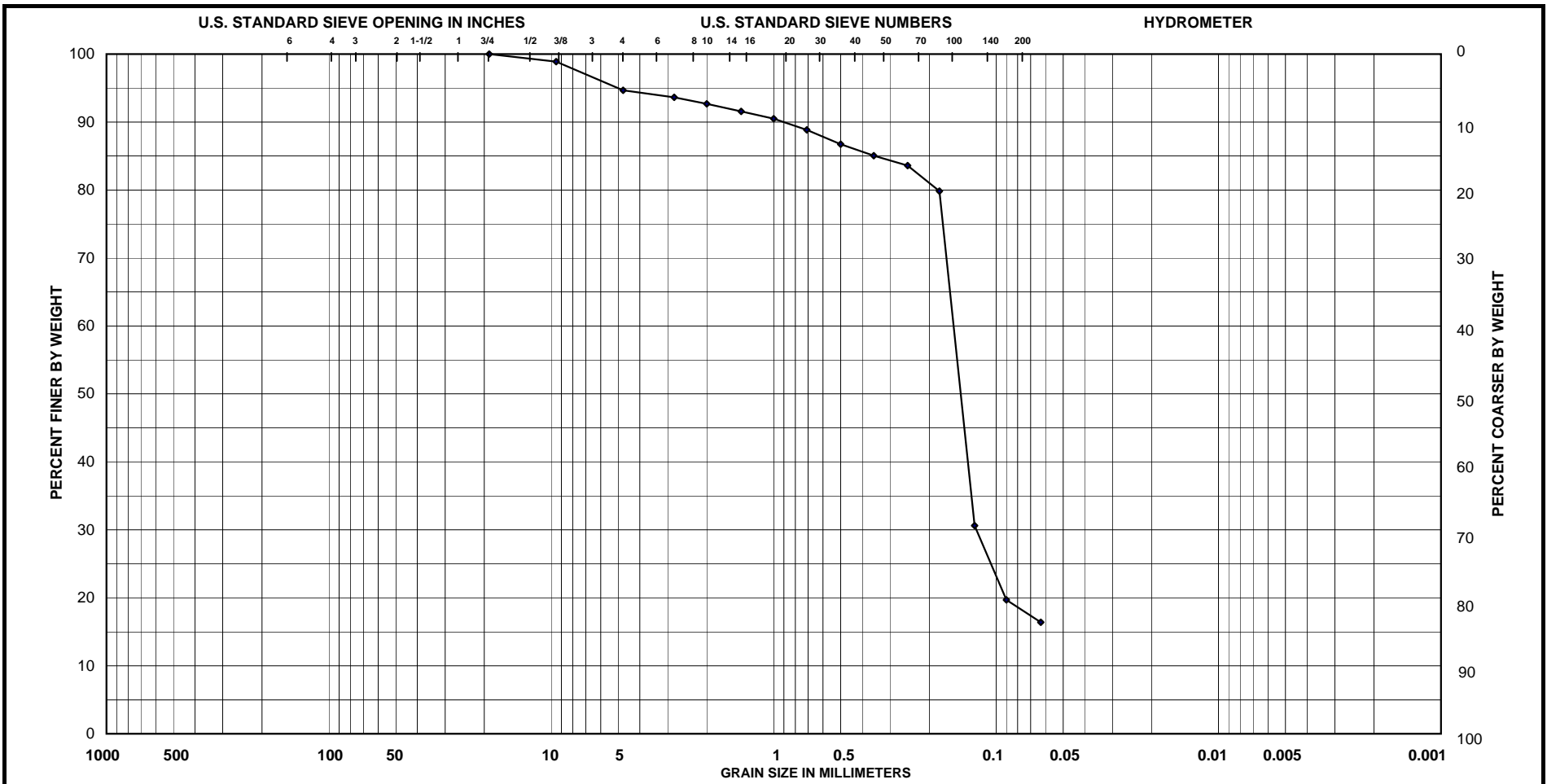
### GRAIN SIZE AND VISUAL SHELL CONTENT

Project:	<b>Topsail Beach, Surf City &amp; North Topsail</b>	Depth:	<b>51.7-52.2</b>
Project No.:	<b>1584-01-40</b>	Date:	<b>9/26/2003</b>
Boring No.:	<b>T1-03-V-215</b>		
Sample No.:	<b>3</b>		
Description:	<b>SAND, silty, mostly fine-grained quartz, little silt, few fragmented limestone, trace carbonate, olive gray (SM)</b>		

Tare Weight, (g):	<b>50.28</b>	
Dry Wt. Before Washing (g):	<b>175.92</b>	(with tare)
Dry Weight After Washing (g):	<b>156.13</b>	(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	1.41	98.88	0	0.00
#4	4.750	5.28	94.68	0	0.00
#7	2.800	1.32	93.62	20	0.26
#10	2.000	1.20	92.67	20	0.24
#14	1.400	1.38	91.57	10	0.14
#18	1.000	1.36	90.49	10	0.14
#25	0.710	2.07	88.84	5	0.10
#35	0.500	2.65	86.73	3	0.08
#45	0.355	2.12	85.04	2	0.04
#60	0.250	1.81	83.60	1	0.02
#80	0.180	4.75	79.82	1	0.05
#120	0.125	61.82	30.62	1	0.62
#170	0.090	13.73	19.69	1	0.14
#230	0.063	4.14	16.40	1	0.04

**Total Shell Content:** **1** %



COBBLES	GRAVEL		SAND			SILT OR CLAY
	COARSE	FINE	COARSE	MEDIUM	FINE	

Sample No.	Elev. Or Depth	Classification	% CO <sub>3</sub>	G <sub>s</sub>	Nat w%	LL	PL	PI	Project
3	51.7-52.2	SAND, silty, mostly fine-grained quartz, little silt, few fragmented limestone, trace carbonate, olive gray (SM)	1						Topsail Beach, Surf City & North Topsail
									Area
									Boring No. T1-03-V-215
									Date 9/26/2003

**GRADATION CURVES**





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## VISUAL SHELL CONTENT

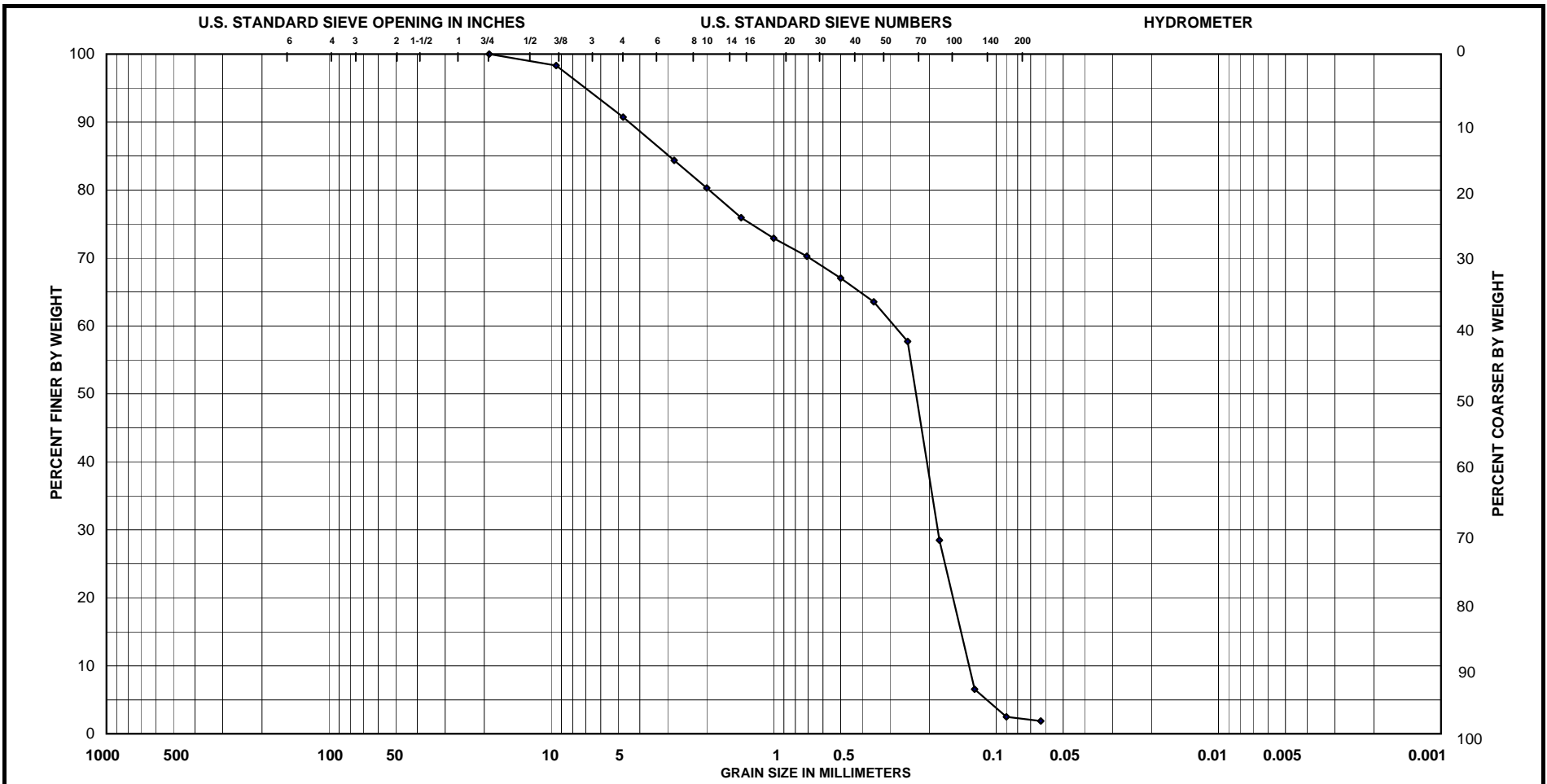
### GRAIN SIZE AND VISUAL SHELL CONTENT

Project:	<b>Topsail Beach, Surf City &amp; North Topsail</b>	Depth:	<b>48.2-48.7</b>
Project No.:	<b>1584-01-40</b>	Date:	<b>9/26/2003</b>
Boring No.:	<b>T1-03-V-216</b>		
Sample No.:	<b>1</b>		
Description:	<b>SAND, poorly-graded, mostly fine-grained quartz, few fine gravel-size carbonate, few coarse-grained carbonate, trace fragmented limestone,</b>		

Tare Weight, (g):	<b>50.39</b>	
Dry Wt. Before Washing (g):	<b>173.25</b>	(with tare)
Dry Weight After Washing (g):	<b>171.1</b>	(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	2.06	98.32	100	2.06
#4	4.750	9.33	90.73	90	8.40
#7	2.800	7.83	84.36	80	6.26
#10	2.000	4.97	80.31	80	3.98
#14	1.400	5.39	75.92	70	3.77
#18	1.000	3.73	72.89	50	1.87
#25	0.710	3.21	70.28	30	0.96
#35	0.500	3.96	67.05	10	0.40
#45	0.355	4.29	63.56	5	0.21
#60	0.250	7.19	57.71	1	0.07
#80	0.180	35.93	28.46	1	0.36
#120	0.125	26.94	6.54	1	0.27
#170	0.090	4.95	2.51	1	0.05
#230	0.063	0.75	1.90	1	0.01

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



COBBLES	GRAVEL		SAND			SILT OR CLAY
	COARSE	FINE	COARSE	MEDIUM	FINE	

Sample No.	Elev. Or Depth	Classification	% CO <sub>3</sub>	G <sub>s</sub>	Nat w%	LL	PL	PI	Project	
♦ 1	48.2-48.7	SAND, poorly-graded, mostly fine-grained quartz, few fine gravel-size carbonate, few coarse-grained carbonate, trace fragmented limestone, very dark greenish gray (SP)	23						Topsail Beach, Surf City & North Topsail	
									Area	
									Boring No. T1-03-V-216	
									Date 9/26/2003	

**GRADATION CURVES**



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## VISUAL SHELL CONTENT

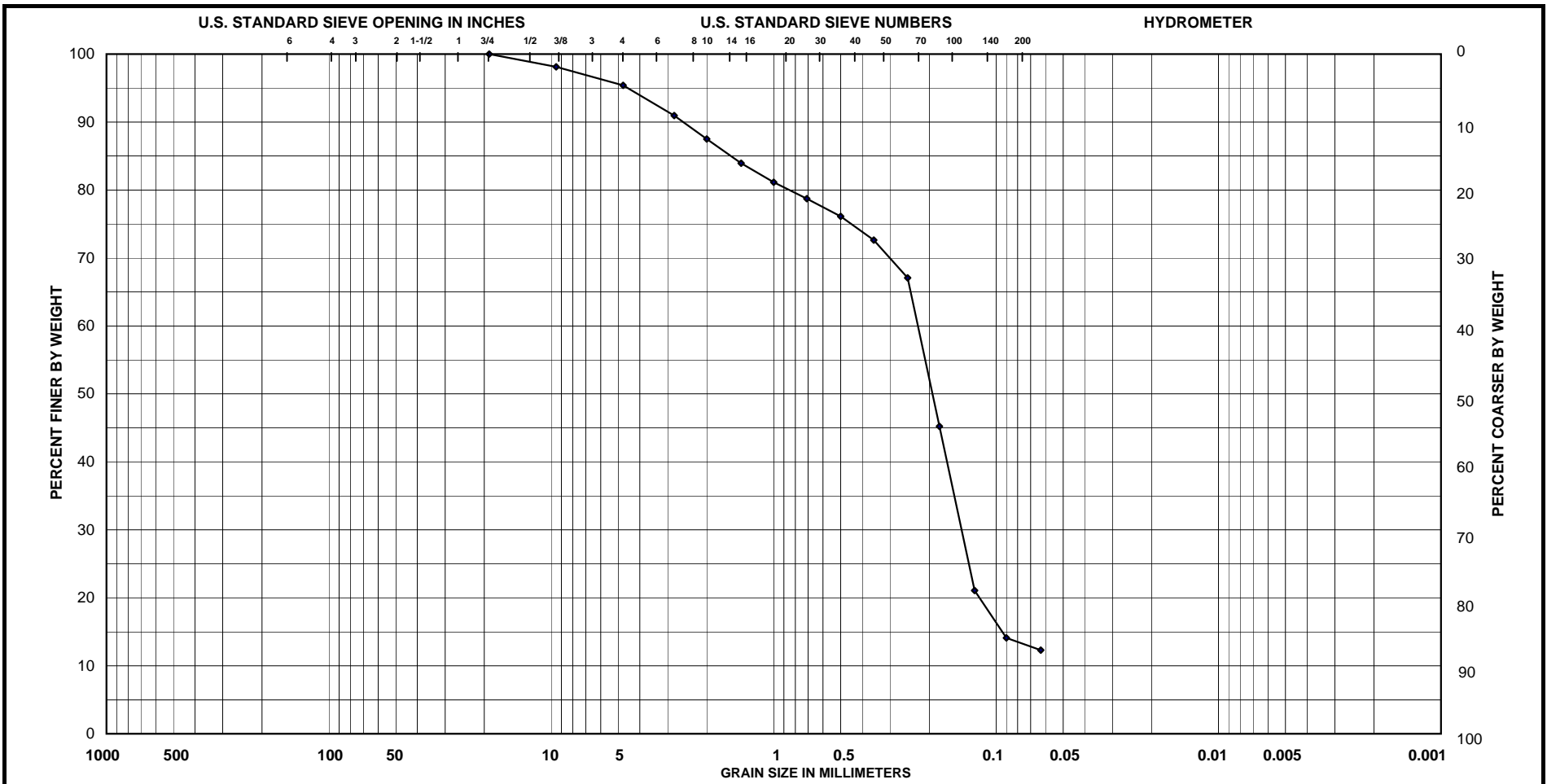
### GRAIN SIZE AND VISUAL SHELL CONTENT

<b>Project:</b>	<b>Topsail Beach, Surf City &amp; North Topsail</b>	<b>Depth:</b>	<b>49.0-49.5</b>
<b>Project No.:</b>	<b>1584-01-40</b>	<b>Date:</b>	<b>9/26/2003</b>
<b>Boring No.:</b>	<b>T1-03-V-216</b>		
<b>Sample No.:</b>	<b>2</b>		
<b>Description:</b>	<b>SAND, poorly-graded with silt, mostly fine-grained quartz, few fine gravel-size carbonate, few coarse to medium-grained carbonate, few</b>		

Tare Weight, (g):	50.56	
Dry Wt. Before Washing (g):	174.83	(with tare)
Dry Weight After Washing (g):	159.96	(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	2.32	98.13	0	0.00
#4	4.750	3.39	95.41	90	3.05
#7	2.800	5.51	90.97	90	4.96
#10	2.000	4.29	87.52	90	3.86
#14	1.400	4.43	83.95	90	3.99
#18	1.000	3.50	81.14	80	2.80
#25	0.710	3.00	78.72	60	1.80
#35	0.500	3.23	76.12	20	0.65
#45	0.355	4.35	72.62	10	0.44
#60	0.250	6.89	67.08	5	0.34
#80	0.180	27.16	45.22	2	0.54
#120	0.125	29.98	21.10	1	0.30
#170	0.090	8.69	14.11	1	0.09
#230	0.063	2.26	12.29	1	0.02

**Total Shell Content:** 18 %



COBBLES	GRAVEL		SAND			SILT OR CLAY
	COARSE	FINE	COARSE	MEDIUM	FINE	

Sample No.	Elev. Or Depth	Classification	% CO <sub>3</sub>	G <sub>s</sub>	Nat w%	LL	PL	PI	Project
♦ 2	49.0-49.5	SAND, poorly-graded with silt, mostly fine-grained quartz, few fine gravel-size carbonate, few coarse to medium-grained carbonate, few silt, trace fragmented limestone, dark greenish gray (SP-SM)	18						Topsail Beach, Surf City & North Topsail
									Area
									Boring No. T1-03-V-216
									Date 9/26/2003

**GRADATION CURVES**



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## VISUAL SHELL CONTENT

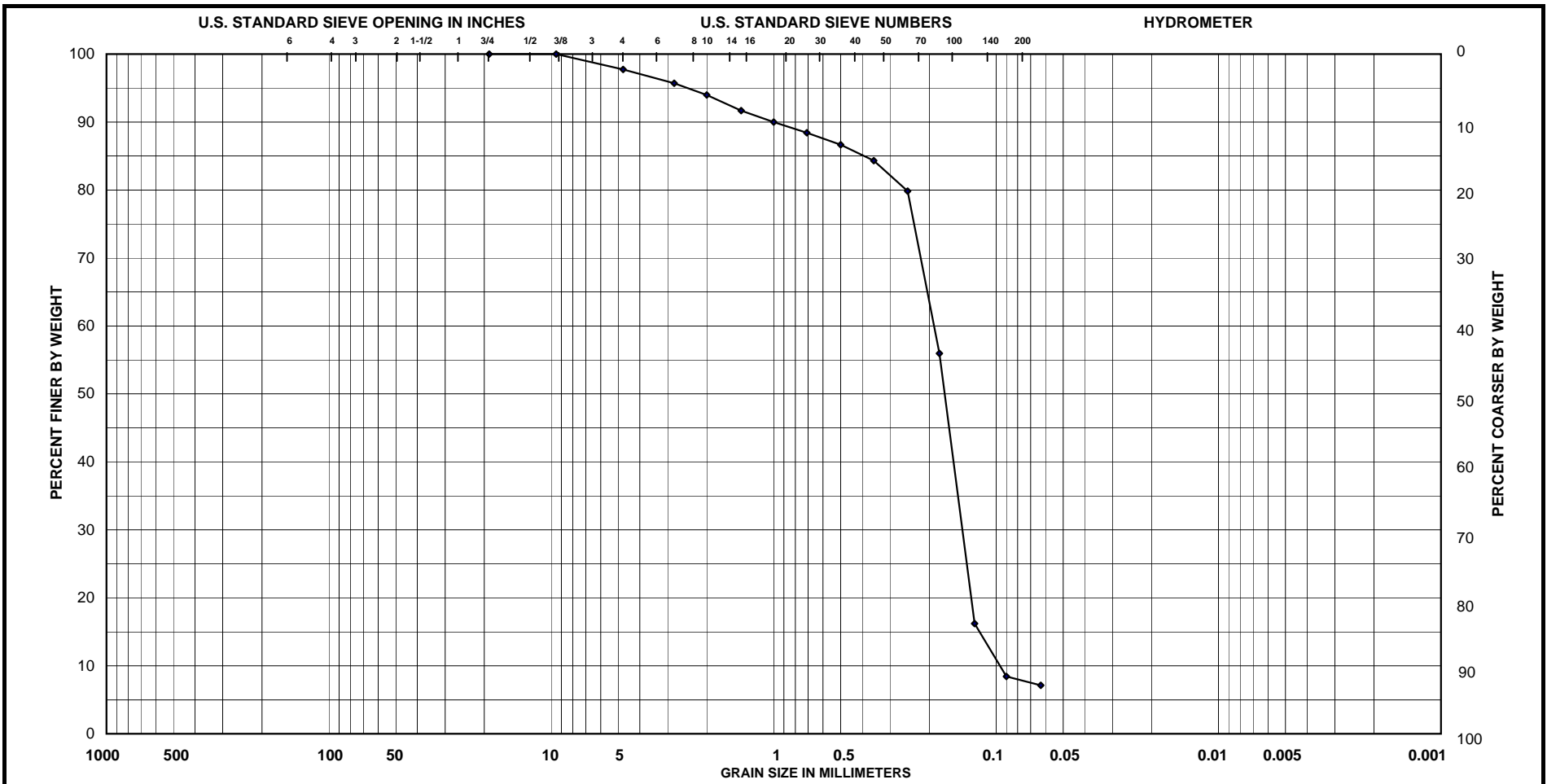
### GRAIN SIZE AND VISUAL SHELL CONTENT

Project:	<b>Topsail Beach, Surf City &amp; North Topsail</b>	Depth:	<b>45.3-45.8</b>
Project No.:	<b>1584-01-40</b>	Date:	<b>9/26/2003</b>
Boring No.:	<b>T1-03-V-218</b>		
Sample No.:	<b>1</b>		
Description:	<b>SAND, poorly-graded with silt, mostly fine-grained quartz, few silt, few carbonate, olive gray (SP-SM)</b>		

Tare Weight, (g):	<b>50.40</b>	
Dry Wt. Before Washing (g):	<b>175.64</b>	(with tare)
Dry Weight After Washing (g):	<b>166.83</b>	(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	2.85	97.72	80	2.28
#7	2.800	2.53	95.70	90	2.28
#10	2.000	2.18	93.96	90	1.96
#14	1.400	2.85	91.69	80	2.28
#18	1.000	2.10	90.01	80	1.68
#25	0.710	1.97	88.44	70	1.38
#35	0.500	2.24	86.65	50	1.12
#45	0.355	2.89	84.34	30	0.87
#60	0.250	5.65	79.83	10	0.57
#80	0.180	29.88	55.97	1	0.30
#120	0.125	49.79	16.22	1	0.50
#170	0.090	9.77	8.42	1	0.10
#230	0.063	1.63	7.11	1	0.02

**Total Shell Content:** **12** %



COBBLES	GRAVEL		SAND			SILT OR CLAY
	COARSE	FINE	COARSE	MEDIUM	FINE	

Sample No.	Elev. Or Depth	Classification	% CO <sub>3</sub>	G <sub>s</sub>	Nat w%	LL	PL	PI	Project
♦ 1	45.3-45.8	SAND, poorly-graded with silt, mostly fine-grained quartz, few silt, few carbonate, olive gray (SP-SM)	12						Topsail Beach, Surf City & North Topsail
									Area
									Boring No. T1-03-V-218
									Date 9/26/2003

**GRADATION CURVES**



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## VISUAL SHELL CONTENT

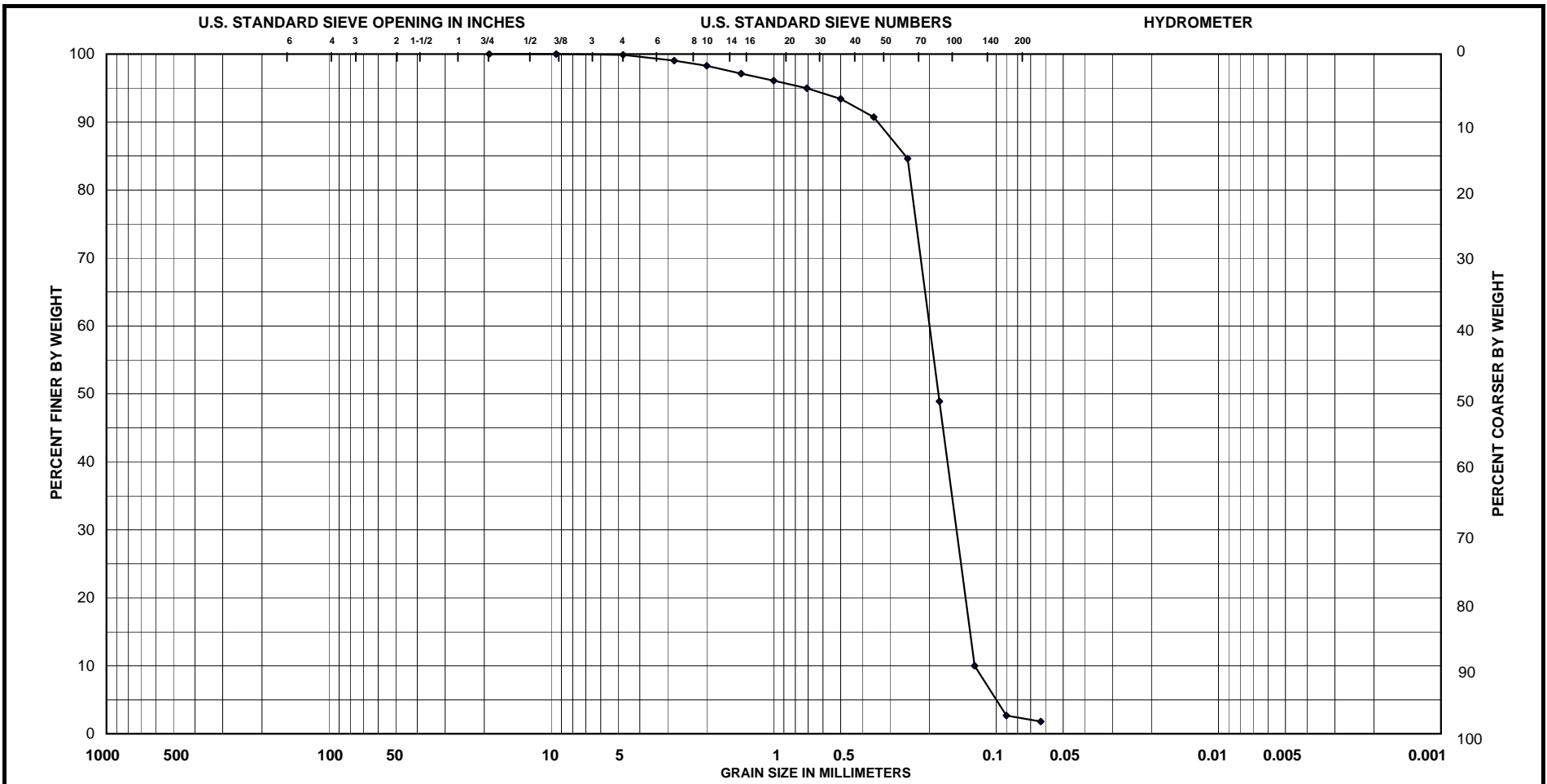
### GRAIN SIZE AND VISUAL SHELL CONTENT

Project:	<b>Topsail Beach, Surf City &amp; North Topsail</b>	Depth:	<b>42.7-43.5</b>
Project No.:	<b>1584-01-40</b>	Date:	<b>9/26/2003</b>
Boring No.:	<b>T1-03-V-219</b>		
Sample No.:	<b>1</b>		
Description:	<b>SAND, poorly-graded, mostly fine-grained quartz, few carbonate, dark greenish gray (SP)</b>		

Tare Weight, (g):	<b>49.73</b>	
Dry Wt. Before Washing (g):	<b>169.26</b>	(with tare)
Dry Weight After Washing (g):	<b>167.41</b>	(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	0.16	99.87	100	0.16
#7	2.800	1.00	99.03	100	1.00
#10	2.000	0.89	98.28	100	0.89
#14	1.400	1.37	97.14	100	1.37
#18	1.000	1.25	96.09	90	1.13
#25	0.710	1.34	94.97	80	1.07
#35	0.500	1.88	93.40	60	1.13
#45	0.355	3.21	90.71	30	0.96
#60	0.250	7.27	84.63	5	0.36
#80	0.180	42.69	48.92	1	0.43
#120	0.125	46.50	10.01	1	0.47
#170	0.090	8.76	2.69	1	0.09
#230	0.063	1.05	1.81	1	0.01

**Total Shell Content:** **8** %



COBBLES	GRAVEL		SAND			SILT OR CLAY
	COARSE	FINE	COARSE	MEDIUM	FINE	

Sample No.	Elev. Or Depth	Classification	% CO <sub>3</sub>	G <sub>s</sub>	Nat w%	LL	PL	PI	Project
1	42.7-43.5	SAND, poorly-graded, mostly fine-grained quartz, few carbonate, dark greenish gray (SP)	8						Topsail Beach, Surf City & North Topsail
									Area
									Boring No. T1-03-V-219
									Date 9/26/2003

**GRADATION CURVES**





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## VISUAL SHELL CONTENT

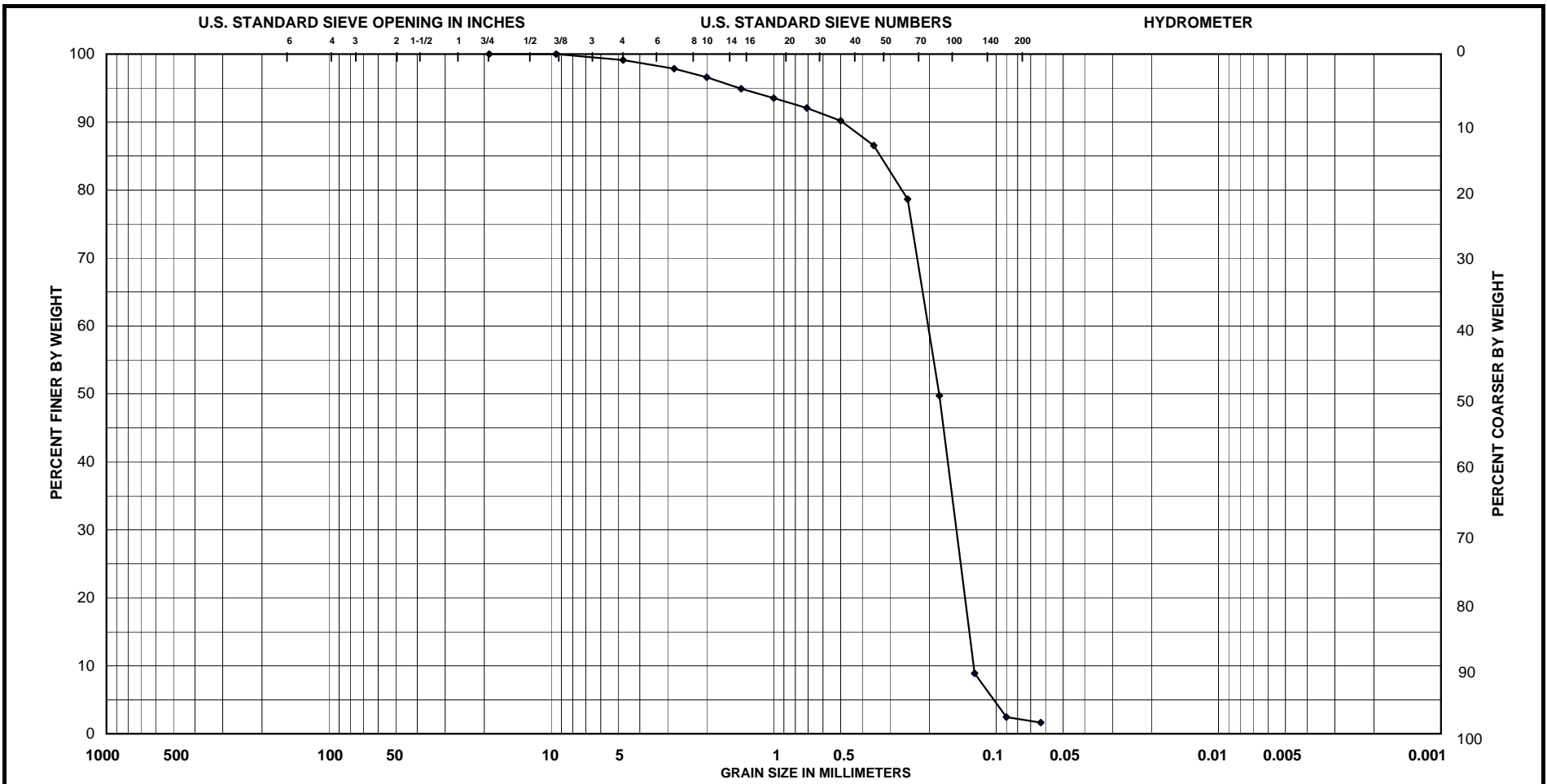
### GRAIN SIZE AND VISUAL SHELL CONTENT

Project:	<b>Topsail Beach, Surf City &amp; North Topsail</b>	Depth:	<b>44.2-44.7</b>
Project No.:	<b>1584-01-40</b>	Date:	<b>9/26/2003</b>
Boring No.:	<b>T1-03-V-220</b>		
Sample No.:	<b>1</b>		
Description:	<b>SAND, poorly-graded, mostly fine-grained quartz, few carbonate, dark greenish gray (SP)</b>		

Tare Weight, (g):	<b>50.30</b>	
Dry Wt. Before Washing (g):	<b>171.58</b>	(with tare)
Dry Weight After Washing (g):	<b>169.87</b>	(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	1.08	99.11	80	0.86
#7	2.800	1.53	97.85	80	1.22
#10	2.000	1.54	96.58	90	1.39
#14	1.400	2.03	94.90	90	1.83
#18	1.000	1.67	93.53	80	1.34
#25	0.710	1.75	92.08	70	1.23
#35	0.500	2.28	90.20	40	0.91
#45	0.355	4.43	86.55	10	0.44
#60	0.250	9.59	78.64	5	0.48
#80	0.180	35.05	49.74	1	0.35
#120	0.125	49.55	8.89	1	0.50
#170	0.090	7.82	2.44	1	0.08
#230	0.063	0.95	1.66	1	0.01

**Total Shell Content:** **9** %



COBBLES	GRAVEL		SAND			SILT OR CLAY
	COARSE	FINE	COARSE	MEDIUM	FINE	

Sample No.	Elev. Or Depth	Classification	% CO <sub>3</sub>	G <sub>s</sub>	Nat w%	LL	PL	PI	Project
♦ 1	44.2-44.7	SAND, poorly-graded, mostly fine-grained quartz, few carbonate, dark greenish gray (SP)	9						Topsail Beach, Surf City & North Topsail
									Area
									Boring No. T1-03-V-220
									Date 9/26/2003

**GRADATION CURVES**



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## VISUAL SHELL CONTENT

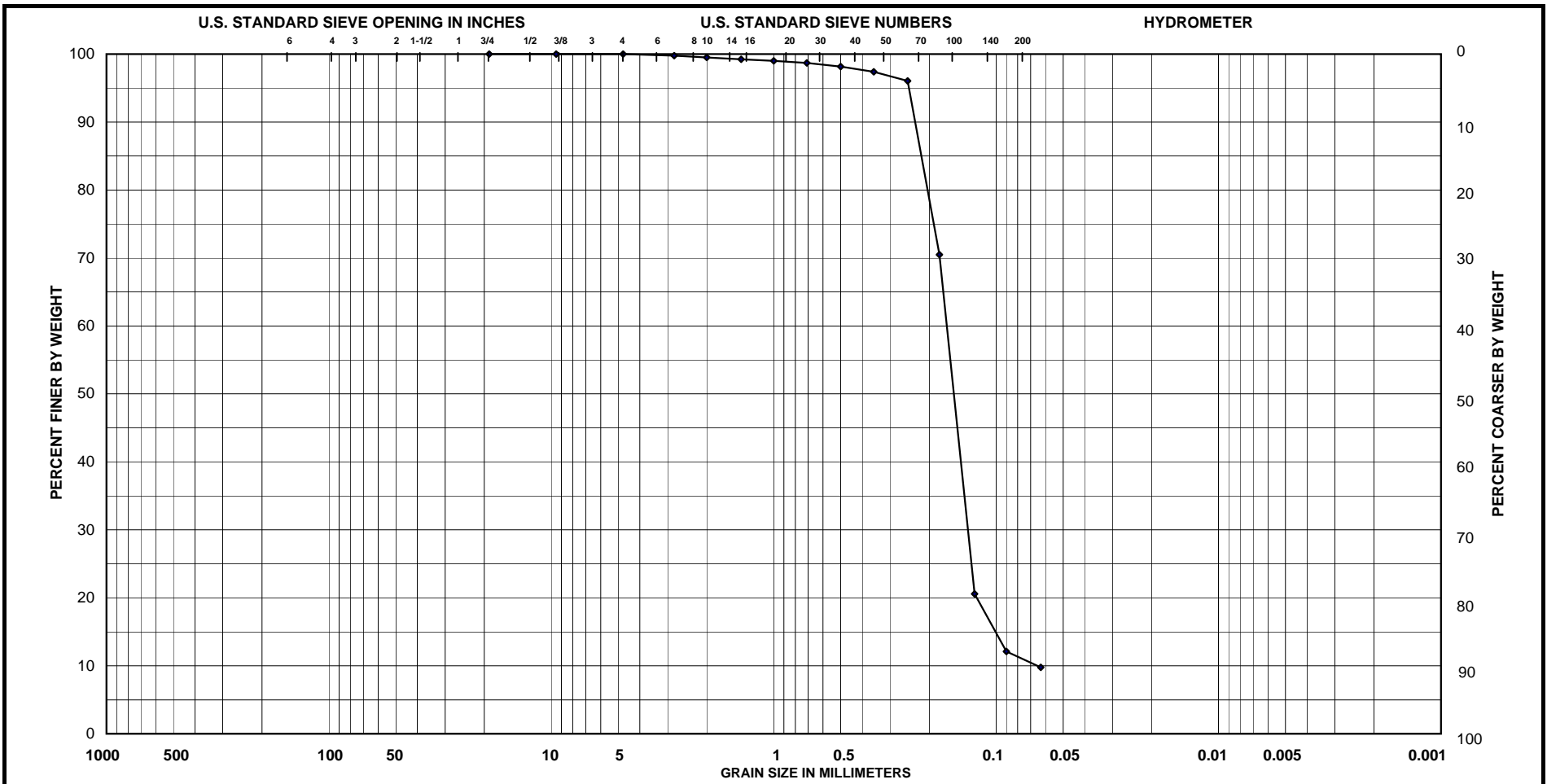
### GRAIN SIZE AND VISUAL SHELL CONTENT

<b>Project:</b>	<b>Topsail Beach, Surf City &amp; North Topsail</b>	<b>Depth:</b>	<b>46.0-46.5</b>
<b>Project No.:</b>	<b>1584-01-40</b>	<b>Date:</b>	<b>9/26/2003</b>
<b>Boring No.:</b>	<b>T1-03-V-220</b>		
<b>Sample No.:</b>	<b>2</b>		
<b>Description:</b>	<b>SAND, poorly-graded with silt, mostly fine-grained quartz, few silt, trace carbonate, olive gray (SP-SM)</b>		

Tare Weight, (g):	49.98	
Dry Wt. Before Washing (g):	174.32	(with tare)
Dry Weight After Washing (g):	162.64	(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	0.29	99.77	100	0.29
#10	2.000	0.31	99.52	100	0.31
#14	1.400	0.35	99.24	90	0.32
#18	1.000	0.29	99.00	90	0.26
#25	0.710	0.40	98.68	90	0.36
#35	0.500	0.63	98.17	80	0.50
#45	0.355	0.96	97.40	50	0.48
#60	0.250	1.67	96.06	30	0.50
#80	0.180	31.80	70.48	2	0.64
#120	0.125	62.05	20.58	1	0.62
#170	0.090	10.54	12.10	1	0.11
#230	0.063	2.92	9.76	1	0.03

**Total Shell Content:** 4 %



COBBLES	GRAVEL		SAND			SILT OR CLAY
	COARSE	FINE	COARSE	MEDIUM	FINE	

Sample No.	Elev. Or Depth	Classification	% CO <sub>3</sub>	G <sub>s</sub>	Nat w%	LL	PL	PI	Project	
♦ 2	46.0-46.5	SAND, poorly-graded with silt, mostly fine-grained quartz, few silt, trace carbonate, olive gray (SP-SM)	4						Topsail Beach, Surf City & North Topsail	
									Area	
									Boring No. T1-03-V-220	
									Date 9/26/2003	

**GRADATION CURVES**



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## VISUAL SHELL CONTENT

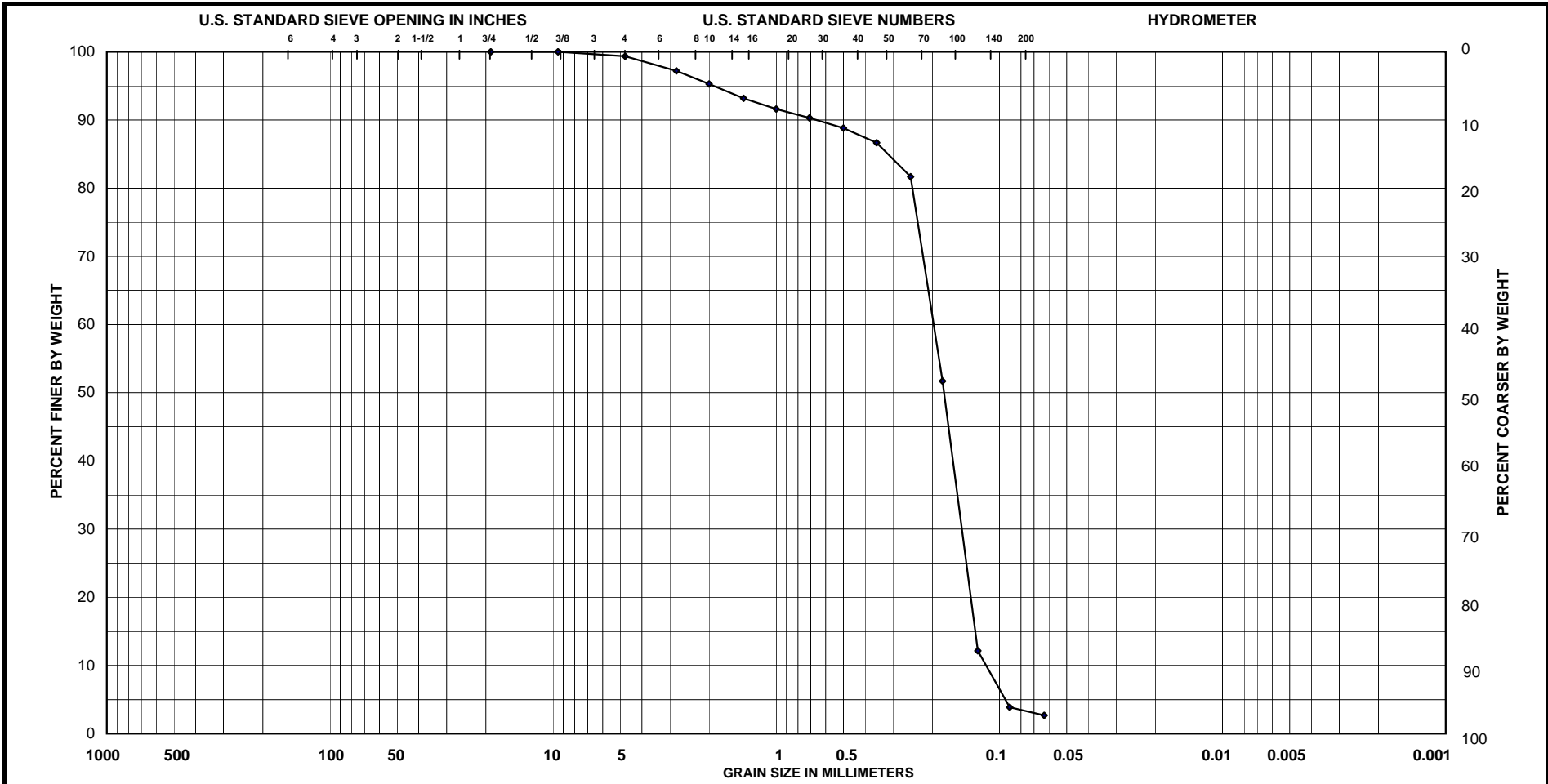
### GRAIN SIZE AND VISUAL SHELL CONTENT

Project:	<b>Topsail Beach, Surf City &amp; North Topsail</b>	Depth:	<b>46.7-47.2</b>
Project No.:	<b>1584-01-40</b>	Date:	<b>9/26/2003</b>
Boring No.:	<b>T1-03-V-221</b>		
Sample No.:	<b>1</b>		
Description:	<b>SAND, poorly-graded, mostly fine-grained quartz, few carbonate, trace fragmented limestone, dark greenish gray (SP)</b>		

Tare Weight, (g):	<b>50.66</b>	
Dry Wt. Before Washing (g):	<b>173.4</b>	(with tare)
Dry Weight After Washing (g):	<b>170.17</b>	(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	99.34	100	0.81
#7	2.800	2.61	97.21	100	2.61
#10	2.000	2.35	95.30	80	1.88
#14	1.400	2.59	93.19	80	2.07
#18	1.000	1.95	91.60	80	1.56
#25	0.710	1.61	90.29	80	1.29
#35	0.500	1.83	88.80	70	1.28
#45	0.355	2.62	86.66	40	1.05
#60	0.250	6.13	81.67	10	0.61
#80	0.180	36.78	51.70	2	0.74
#120	0.125	48.56	12.14	1	0.49
#170	0.090	10.16	3.86	1	0.10
#230	0.063	1.47	2.66	1	0.01

**Total Shell Content:** **12** %



COBBLES	GRAVEL		SAND			SILT OR CLAY
	COARSE	FINE	COARSE	MEDIUM	FINE	

Sample No.	Elev. Or Depth	Classification	% CO <sub>3</sub>	G <sub>s</sub>	Nat w%	LL	PL	PI	Project	
♦ 1	46.7-47.2	SAND, poorly-graded, mostly fine-grained quartz, few carbonate, trace fragmented limestone, dark greenish gray (SP)	12						Topsail Beach, Surf City & North Topsail	
									Area	
									Boring No.	T1-03-V-221
									Date	9/26/2003

**GRADATION CURVES**



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## VISUAL SHELL CONTENT

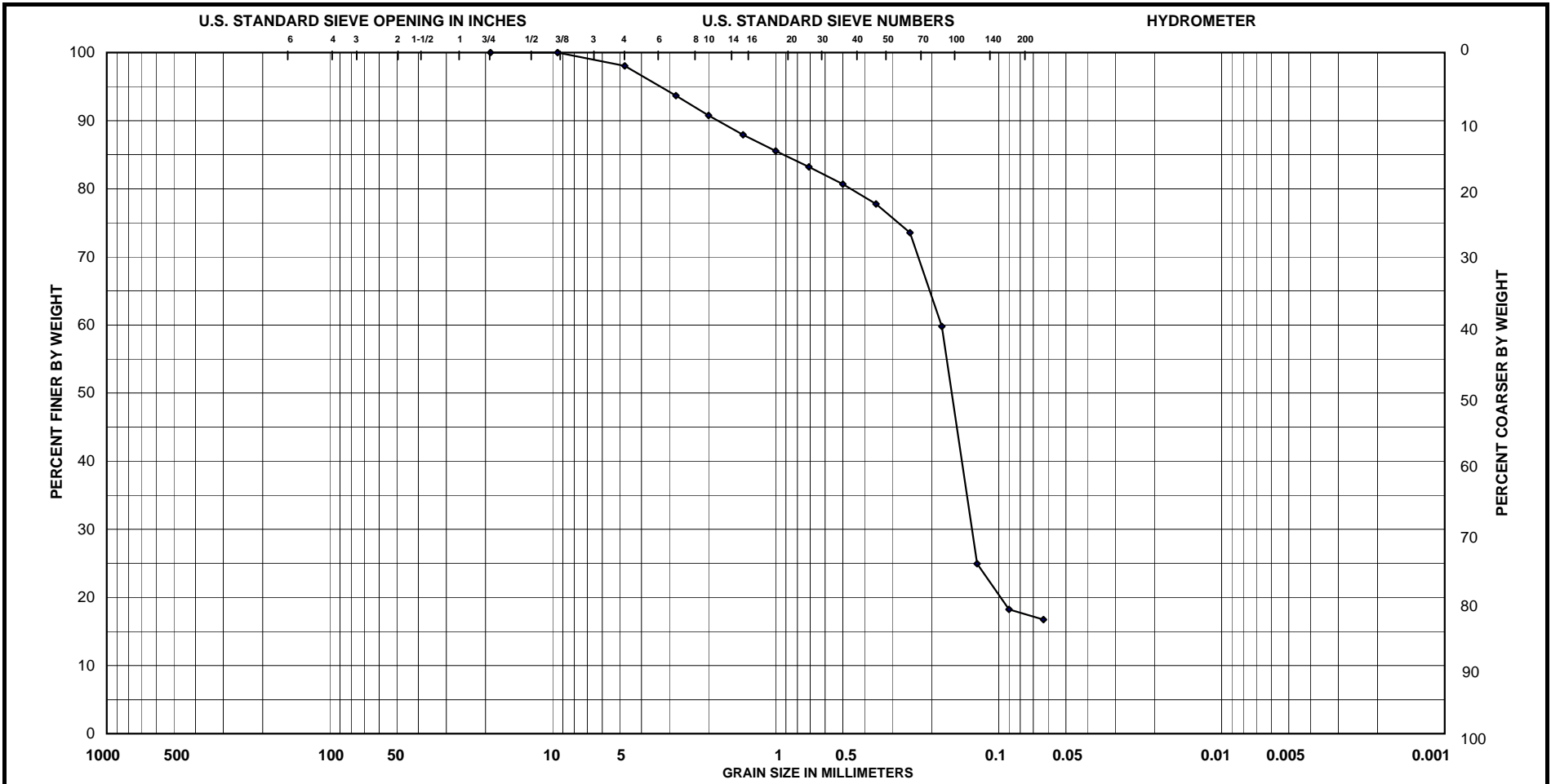
### GRAIN SIZE AND VISUAL SHELL CONTENT

Project:	<b>Topsail Beach, Surf City &amp; North Topsail</b>	Depth:	<b>48.5-49.0</b>
Project No.:	<b>1584-01-40</b>	Date:	<b>9/26/2003</b>
Boring No.:	<b>T1-03-V-221</b>		
Sample No.:	<b>2</b>		
Description:	<b>SAND, silty, mostly fine-grained quartz, little coarse to medium-grained carbonate, little silt, dark greenish gray (SM)</b>		

Tare Weight, (g):	<b>50.05</b>	
Dry Wt. Before Washing (g):	<b>167.92</b>	(with tare)
Dry Weight After Washing (g):	<b>148.13</b>	(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	2.29	98.06	95	2.18
#7	2.800	5.16	93.68	100	5.16
#10	2.000	3.42	90.78	95	3.25
#14	1.400	3.35	87.94	95	3.18
#18	1.000	2.79	85.57	95	2.65
#25	0.710	2.80	83.19	90	2.52
#35	0.500	2.94	80.70	70	2.06
#45	0.355	3.45	77.77	40	1.38
#60	0.250	4.97	73.56	20	0.99
#80	0.180	16.22	59.79	2	0.32
#120	0.125	41.05	24.97	1	0.41
#170	0.090	7.91	18.26	1	0.08
#230	0.063	1.78	16.75	1	0.02

**Total Shell Content:** **21** %



COBBLES	GRAVEL		SAND			SILT OR CLAY
	COARSE	FINE	COARSE	MEDIUM	FINE	

Sample No.	Elev. Or Depth	Classification	% CO <sub>3</sub>	G <sub>s</sub>	Nat w%	LL	PL	PI	Project
♦ 2	48.5-49.0	SAND, silty, mostly fine-grained quartz, little coarse to medium-grained carbonate, little silt, dark greenish gray (SM)	21						Topsail Beach, Surf City & North Topsail
									Area
									Boring No. T1-03-V-221
									Date 9/26/2003

**GRADATION CURVES**





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## VISUAL SHELL CONTENT

### GRAIN SIZE AND VISUAL SHELL CONTENT

Project:	<b>Topsail Beach, Surf City &amp; North Topsail</b>	Depth:	<b>45.4-45.9</b>
Project No.:	<b>1584-01-40</b>	Date:	<b>9/26/2003</b>
Boring No.:	<b>T1-03-V-222</b>		
Sample No.:	<b>1</b>		
Description:	<b>SAND, poorly-graded, mostly fine-grained quartz, few carbonate, olive gray (SP)</b>		

Tare Weight, (g):	<b>50.62</b>	
Dry Wt. Before Washing (g):	<b>170.42</b>	(with tare)
Dry Weight After Washing (g):	<b>168.34</b>	(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	1.62	98.65	100	1.62
#7	2.800	3.73	95.53	90	3.36
#10	2.000	2.45	93.49	90	2.21
#14	1.400	2.82	91.14	90	2.54
#18	1.000	2.07	89.41	80	1.66
#25	0.710	1.79	87.91	60	1.07
#35	0.500	3.11	85.32	30	0.93
#45	0.355	7.38	79.16	10	0.74
#60	0.250	16.85	65.09	2	0.34
#80	0.180	48.27	24.80	1	0.48
#120	0.125	22.97	5.63	1	0.23
#170	0.090	4.03	2.26	1	0.04
#230	0.063	0.45	1.89	1	0.00

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





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## VISUAL SHELL CONTENT

### GRAIN SIZE AND VISUAL SHELL CONTENT

Project:	<b>Topsail Beach, Surf City &amp; North Topsail</b>	Depth:	<b>47.0-47.5</b>
Project No.:	<b>1584-01-40</b>	Date:	<b>9/26/2003</b>
Boring No.:	<b>T1-03-V-222</b>		
Sample No.:	<b>2</b>		
Description:	<b>SAND, poorly-graded, mostly fine-grained quartz, little coarse to medium-grained fragmented limestone, few fine gravel-size carbonate,</b>		

Tare Weight, (g):	<b>50.29</b>	
Dry Wt. Before Washing (g):	<b>174.46</b>	(with tare)
Dry Weight After Washing (g):	<b>170.37</b>	(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	9.88	92.04	70	6.92
#4	4.750	13.71	81.00	50	6.86
#7	2.800	10.83	72.28	50	5.42
#10	2.000	6.03	67.42	50	3.02
#14	1.400	5.64	62.88	50	2.82
#18	1.000	3.79	59.83	50	1.90
#25	0.710	2.76	57.61	30	0.83
#35	0.500	2.82	55.34	10	0.28
#45	0.355	4.76	51.50	5	0.24
#60	0.250	8.85	44.37	2	0.18
#80	0.180	26.05	23.40	1	0.26
#120	0.125	18.42	8.56	1	0.18
#170	0.090	5.33	4.27	1	0.05
#230	0.063	1.07	3.41	1	0.01

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



COBBLES	GRAVEL		SAND			SILT OR CLAY
	COARSE	FINE	COARSE	MEDIUM	FINE	

Sample No.	Elev. Or Depth	Classification	% CO <sub>3</sub>	G <sub>s</sub>	Nat w%	LL	PL	PI	Project	
♦ 2	47.0-47.5	SAND, poorly-graded, mostly fine-grained quartz, little coarse to medium-grained fragmented limestone, few fine gravel-size carbonate, few coarse to medium-grained limestone, olive gray (SP)	23						Topsail Beach, Surf City & North Topsail	
									Area	
									Boring No. T1-03-V-222	
									Date 9/26/2003	

**GRADATION CURVES**



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## VISUAL SHELL CONTENT

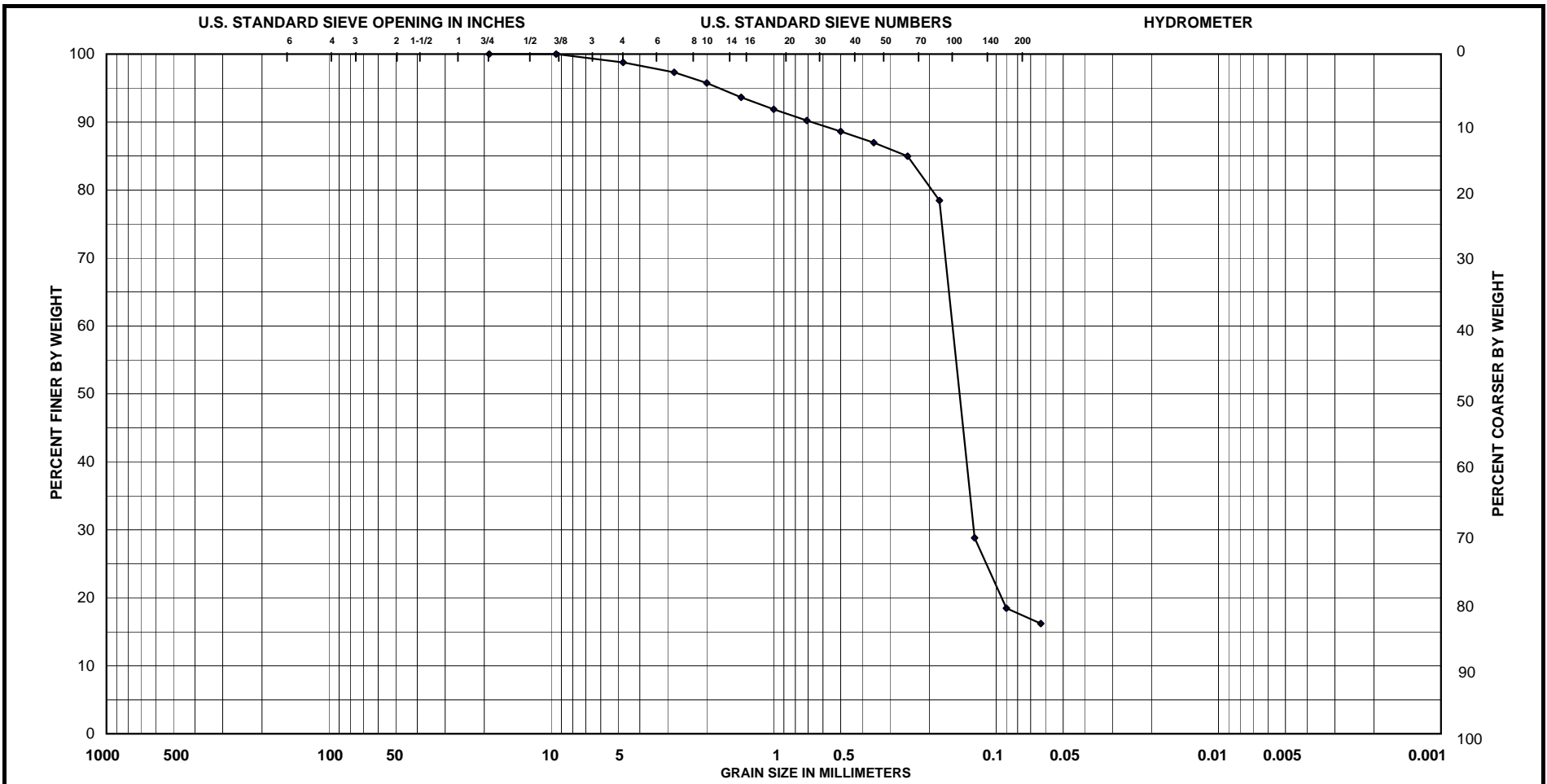
### GRAIN SIZE AND VISUAL SHELL CONTENT

Project:	<b>Topsail Beach, Surf City &amp; North Topsail</b>	Depth:	<b>48.4-48.9</b>
Project No.:	<b>1584-01-40</b>	Date:	<b>9/26/2003</b>
Boring No.:	<b>T1-03-V-222</b>		
Sample No.:	<b>3</b>		
Description:	<b>SAND, silty, mostly fine-grained quartz, few silt, few carbonate, olive gray (SM)</b>		

Tare Weight, (g):	<b>50.13</b>	
Dry Wt. Before Washing (g):	<b>163.58</b>	(with tare)
Dry Weight After Washing (g):	<b>145.45</b>	(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	1.41	98.76	100	1.41
#7	2.800	1.64	97.31	100	1.64
#10	2.000	1.77	95.75	100	1.77
#14	1.400	2.41	93.63	100	2.41
#18	1.000	2.00	91.86	100	2.00
#25	0.710	1.87	90.22	90	1.68
#35	0.500	1.83	88.60	70	1.28
#45	0.355	1.85	86.97	40	0.74
#60	0.250	2.25	84.99	20	0.45
#80	0.180	7.39	78.48	2	0.15
#120	0.125	56.34	28.81	1	0.56
#170	0.090	11.72	18.48	1	0.12
#230	0.063	2.59	16.20	1	0.03

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



COBBLES	GRAVEL		SAND			SILT OR CLAY
	COARSE	FINE	COARSE	MEDIUM	FINE	

Sample No.	Elev. Or Depth	Classification	% CO <sub>3</sub>	G <sub>s</sub>	Nat w%	LL	PL	PI	Project
3	48.4-48.9	SAND, silty, mostly fine-grained quartz, few silt, few carbonate, olive gray (SM)	13						Topsail Beach, Surf City & North Topsail
									Area
									Boring No. T1-03-V-222
									Date 9/26/2003

**GRADATION CURVES**



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## VISUAL SHELL CONTENT

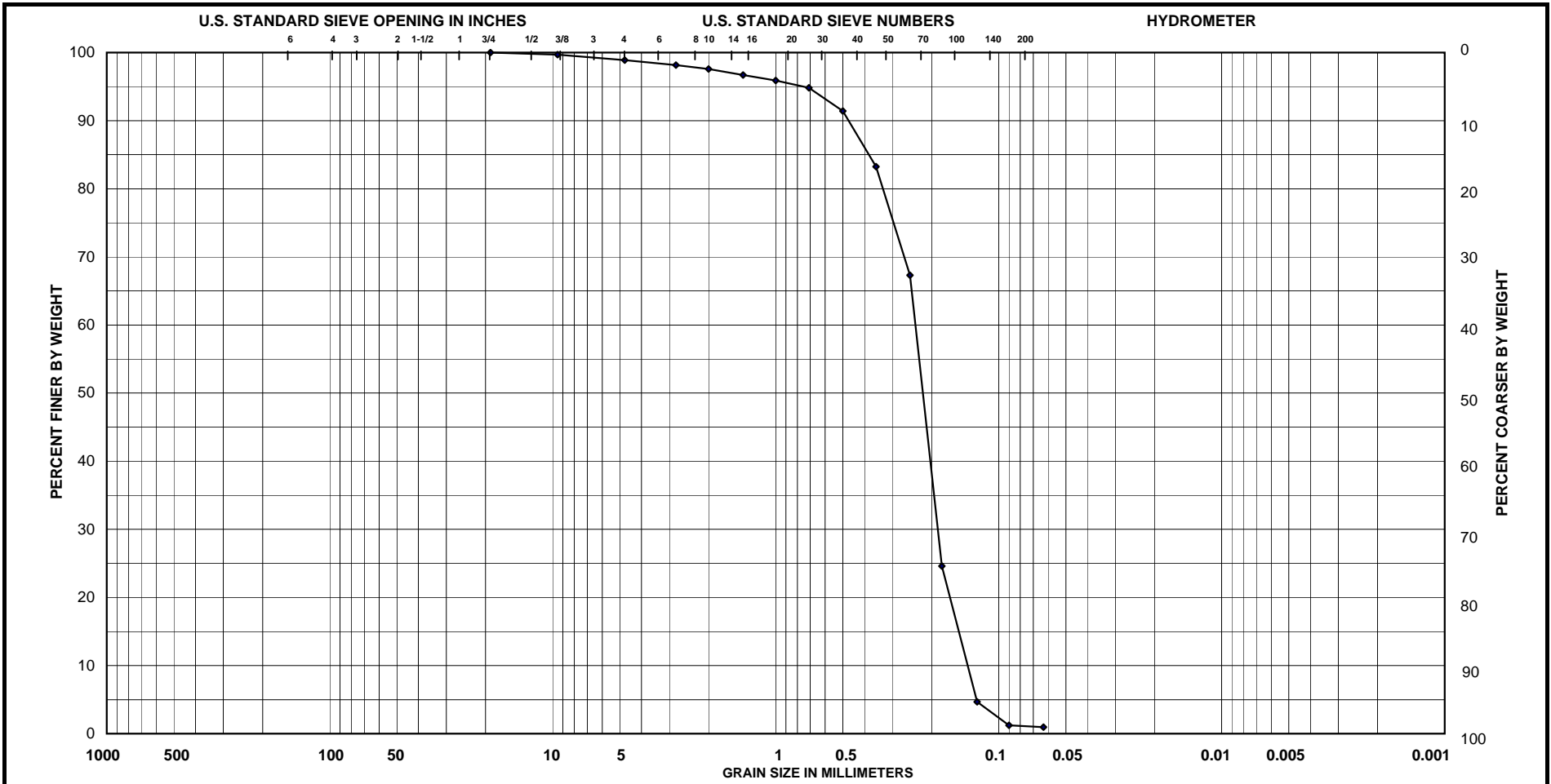
### GRAIN SIZE AND VISUAL SHELL CONTENT

Project:	<b>Topsail Beach, Surf City &amp; North Topsail</b>	Depth:	<b>43.5-44.0</b>
Project No.:	<b>1584-01-40</b>	Date:	<b>9/26/2003</b>
Boring No.:	<b>T1-03-V-223</b>		
Sample No.:	<b>1</b>		
Description:	<b>SAND, poorly-graded, mostly fine-grained quartz, few carbonate, olive gray (SP)</b>		

Tare Weight, (g):	<b>49.76</b>	
Dry Wt. Before Washing (g):	<b>173.63</b>	(with tare)
Dry Weight After Washing (g):	<b>172.25</b>	(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	0.36	99.71	100	0.36
#4	4.750	1.00	98.90	100	1.00
#7	2.800	0.94	98.14	100	0.94
#10	2.000	0.69	97.59	100	0.69
#14	1.400	1.08	96.71	100	1.08
#18	1.000	0.99	95.92	100	0.99
#25	0.710	1.34	94.83	90	1.21
#35	0.500	4.22	91.43	40	1.69
#45	0.355	10.13	83.25	10	1.01
#60	0.250	19.73	67.32	2	0.39
#80	0.180	52.93	24.59	1	0.53
#120	0.125	24.67	4.67	1	0.25
#170	0.090	4.27	1.23	1	0.04
#230	0.063	0.35	0.94	1	0.00

**Total Shell Content:** **8** %



COBBLES	GRAVEL		SAND			SILT OR CLAY
	COARSE	FINE	COARSE	MEDIUM	FINE	

Sample No.	Elev. Or Depth	Classification	% CO <sub>3</sub>	G <sub>s</sub>	Nat w%	LL	PL	PI	Project
♦ 1	43.5-44.0	SAND, poorly-graded, mostly fine-grained quartz, few carbonate, olive gray (SP)	8						Topsail Beach, Surf City & North Topsail
									Area
									Boring No. T1-03-V-223
									Date 9/26/2003

**GRADATION CURVES**





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## VISUAL SHELL CONTENT

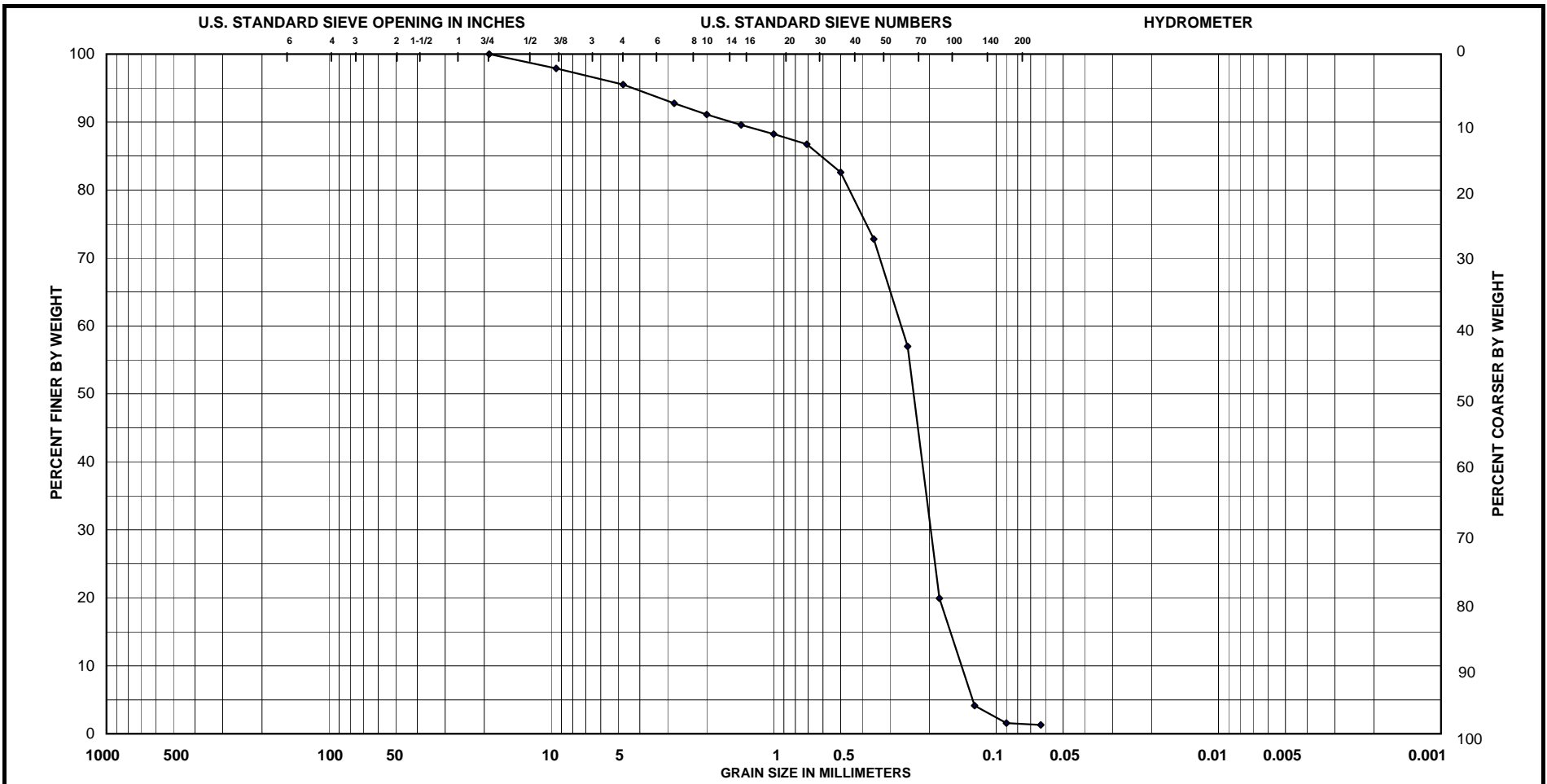
### GRAIN SIZE AND VISUAL SHELL CONTENT

Project:	<b>Topsail Beach, Surf City &amp; North Topsail</b>	Depth:	<b>45.0-45.5</b>
Project No.:	<b>1584-01-40</b>	Date:	<b>9/26/2003</b>
Boring No.:	<b>T1-03-V-223</b>		
Sample No.:	<b>2</b>		
Description:	<b>SAND, poorly-graded, mostly fine-grained quartz, few coarse to medium-grained carbonate, few fine gravel-size carbonate, olive gray</b>		

Tare Weight, (g):	<b>49.92</b>	
Dry Wt. Before Washing (g):	<b>178.14</b>	(with tare)
Dry Weight After Washing (g):	<b>176.66</b>	(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	2.71	97.89	100	2.71
#4	4.750	3.05	95.51	100	3.05
#7	2.800	3.52	92.76	100	3.52
#10	2.000	2.13	91.10	100	2.13
#14	1.400	1.96	89.57	100	1.96
#18	1.000	1.72	88.23	100	1.72
#25	0.710	1.92	86.73	80	1.54
#35	0.500	5.32	82.58	30	1.60
#45	0.355	12.55	72.80	10	1.26
#60	0.250	20.27	56.99	2	0.41
#80	0.180	47.53	19.92	1	0.48
#120	0.125	20.24	4.13	1	0.20
#170	0.090	3.29	1.57	1	0.03
#230	0.063	0.36	1.29	1	0.00

**Total Shell Content:** **16** %



COBBLES	GRAVEL		SAND			SILT OR CLAY
	COARSE	FINE	COARSE	MEDIUM	FINE	

Sample No.	Elev. Or Depth	Classification	% CO <sub>3</sub>	G <sub>s</sub>	Nat w%	LL	PL	PI	Project	
♦ 2	45.0-45.5	SAND, poorly-graded, mostly fine-grained quartz, few coarse to medium-grained carbonate, few fine gravel-size carbonate, olive gray (SP)	16						Topsail Beach, Surf City & North Topsail	
									Area	
									Boring No. T1-03-V-223	
									Date 9/26/2003	

**GRADATION CURVES**



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## VISUAL SHELL CONTENT

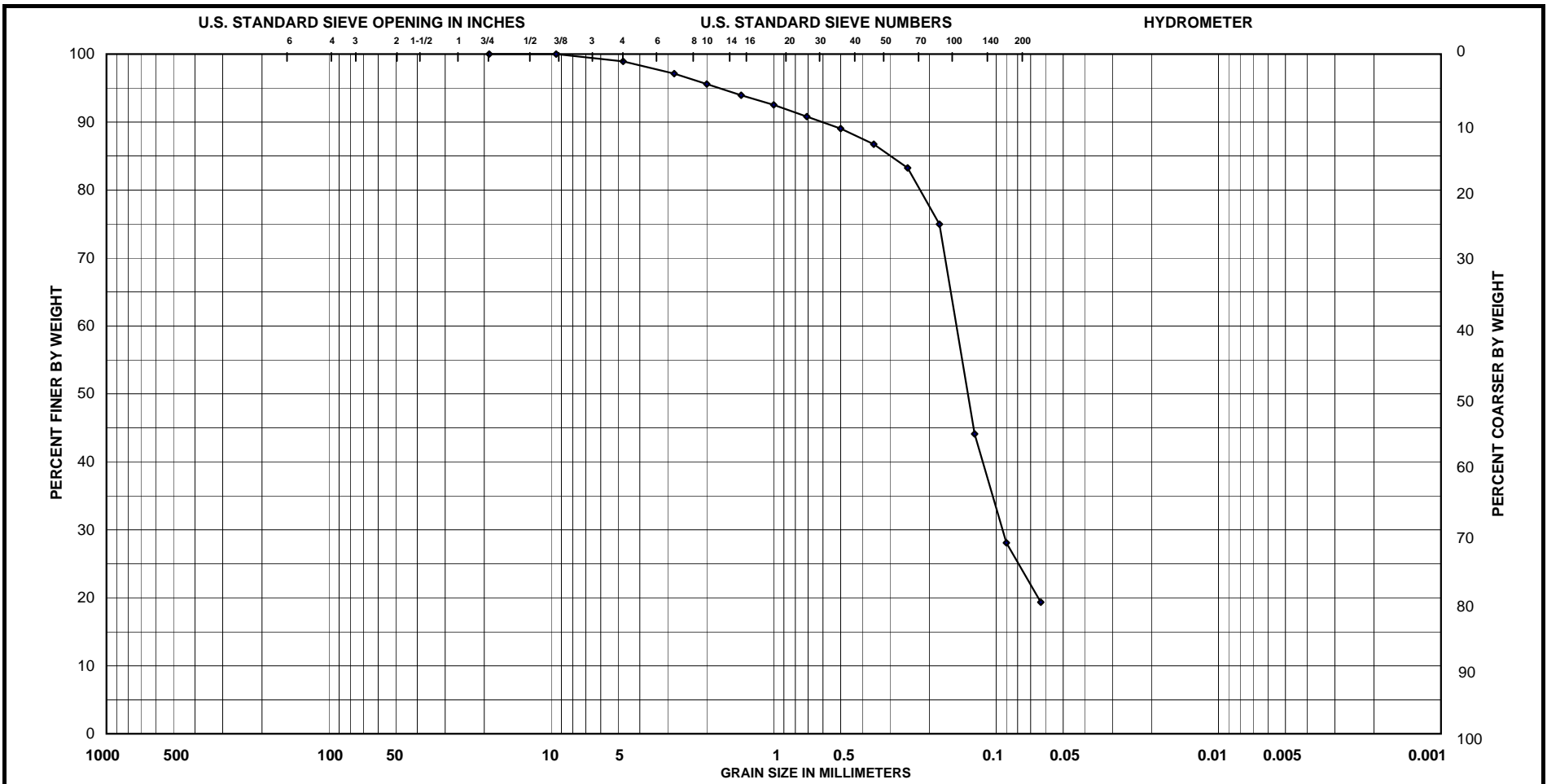
### GRAIN SIZE AND VISUAL SHELL CONTENT

Project:	<b>Topsail Beach, Surf City &amp; North Topsail</b>	Depth:	<b>46.5-47.0</b>
Project No.:	<b>1584-01-40</b>	Date:	<b>9/26/2003</b>
Boring No.:	<b>T1-03-V-223</b>		
Sample No.:	<b>3</b>		
Description:	<b>SAND, silty, mostly fine-grained quartz, little silt, few carbonate, trace fragmented limestone, olive gray (SM)</b>		

Tare Weight, (g):	<b>49.50</b>	
Dry Wt. Before Washing (g):	<b>172</b>	(with tare)
Dry Weight After Washing (g):	<b>149.49</b>	(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	1.32	98.92	100	1.32
#7	2.800	2.20	97.13	90	1.98
#10	2.000	1.90	95.58	90	1.71
#14	1.400	2.01	93.93	70	1.41
#18	1.000	1.73	92.52	50	0.87
#25	0.710	2.09	90.82	40	0.84
#35	0.500	2.19	89.03	20	0.44
#45	0.355	2.82	86.73	10	0.28
#60	0.250	4.24	83.27	5	0.21
#80	0.180	10.14	74.99	1	0.10
#120	0.125	37.81	44.12	1	0.38
#170	0.090	19.62	28.11	1	0.20
#230	0.063	10.71	19.36	1	0.11

**Total Shell Content:** **8** %



COBBLES	GRAVEL		SAND			SILT OR CLAY
	COARSE	FINE	COARSE	MEDIUM	FINE	

Sample No.	Elev. Or Depth	Classification	% CO <sub>3</sub>	G <sub>s</sub>	Nat w%	LL	PL	PI	Project
3	46.5-47.0	SAND, silty, mostly fine-grained quartz, little silt, few carbonate, trace fragmented limestone, olive gray (SM)	8						Topsail Beach, Surf City & North Topsail
									Area
									Boring No. T1-03-V-223
									Date 9/26/2003

**GRADATION CURVES**



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## VISUAL SHELL CONTENT

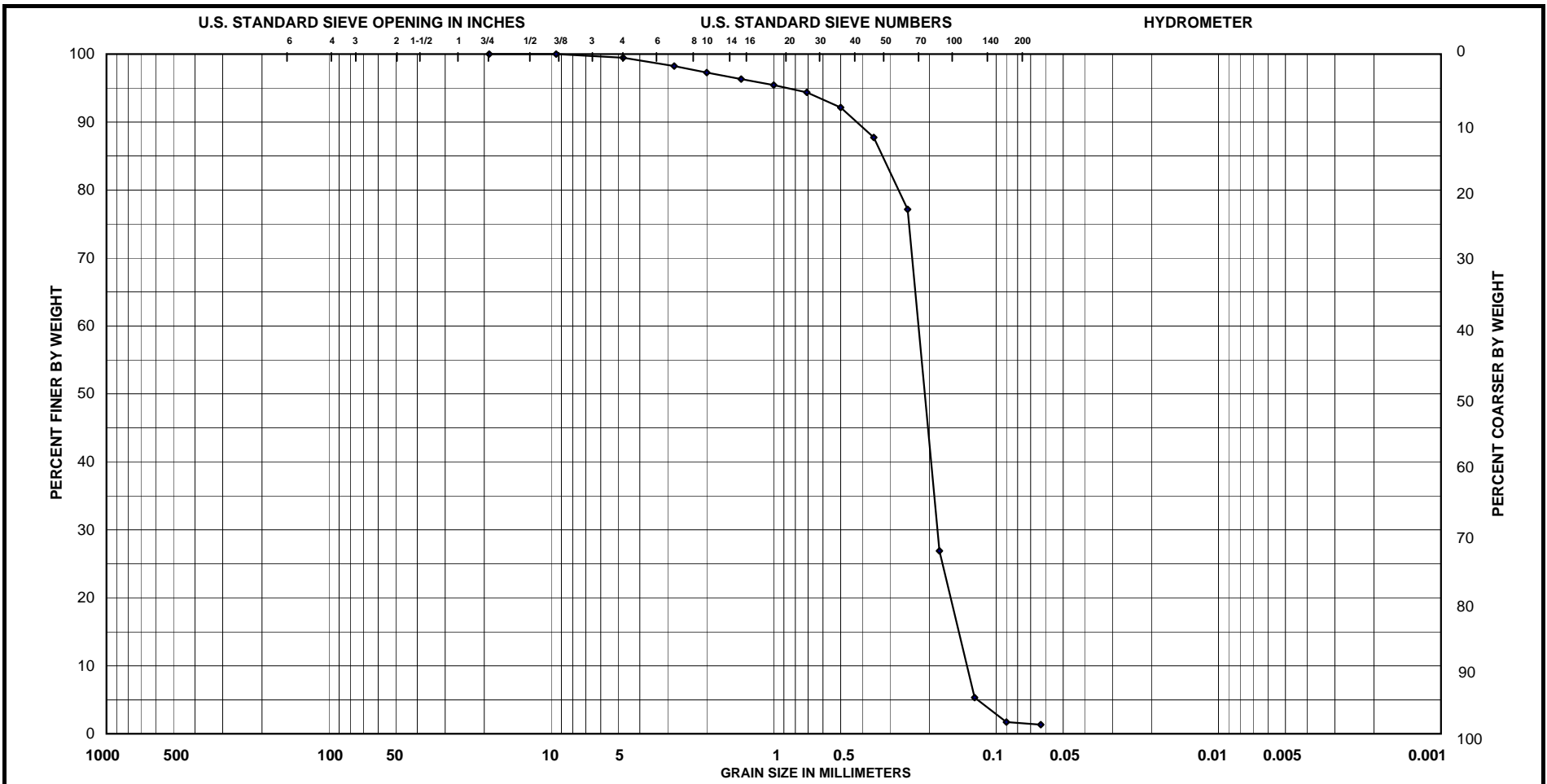
### GRAIN SIZE AND VISUAL SHELL CONTENT

Project:	<b>Topsail Beach, Surf City &amp; North Topsail</b>	Depth:	<b>46.4-46.9</b>
Project No.:	<b>1584-01-40</b>	Date:	<b>9/26/2003</b>
Boring No.:	<b>T1-03-V-224</b>		
Sample No.:	<b>1</b>		
Description:	<b>SAND, poorly-graded, mostly fine-grained quartz, few carbonate, very dark greenish gray (SP)</b>		

Tare Weight, (g):	<b>48.30</b>	
Dry Wt. Before Washing (g):	<b>167.46</b>	(with tare)
Dry Weight After Washing (g):	<b>165.83</b>	(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	0.66	99.45	100	0.66
#7	2.800	1.45	98.23	100	1.45
#10	2.000	1.11	97.30	90	1.00
#14	1.400	1.18	96.31	90	1.06
#18	1.000	1.02	95.45	80	0.82
#25	0.710	1.31	94.35	70	0.92
#35	0.500	2.65	92.13	30	0.80
#45	0.355	5.24	87.73	5	0.26
#60	0.250	12.60	77.16	2	0.25
#80	0.180	59.88	26.91	1	0.60
#120	0.125	25.69	5.35	1	0.26
#170	0.090	4.33	1.71	1	0.04
#230	0.063	0.43	1.35	1	0.00

**Total Shell Content:** **7** %



<b>COBBLES</b>	<b>GRAVEL</b>		<b>SAND</b>			<b>SILT OR CLAY</b>
	COARSE	FINE	COARSE	MEDIUM	FINE	

Sample No.	Elev. Or Depth	Classification	% CO <sub>3</sub>	G <sub>s</sub>	Nat w%	LL	PL	PI	
1	46.4-46.9	SAND, poorly-graded, mostly fine-grained quartz, few carbonate, very dark greenish gray (SP)	7						Project: Topsail Beach, Surf City & North Topsail
									Area:
									Boring No. T1-03-V-224
									Date: 9/26/2003

**GRADATION CURVES**



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## VISUAL SHELL CONTENT

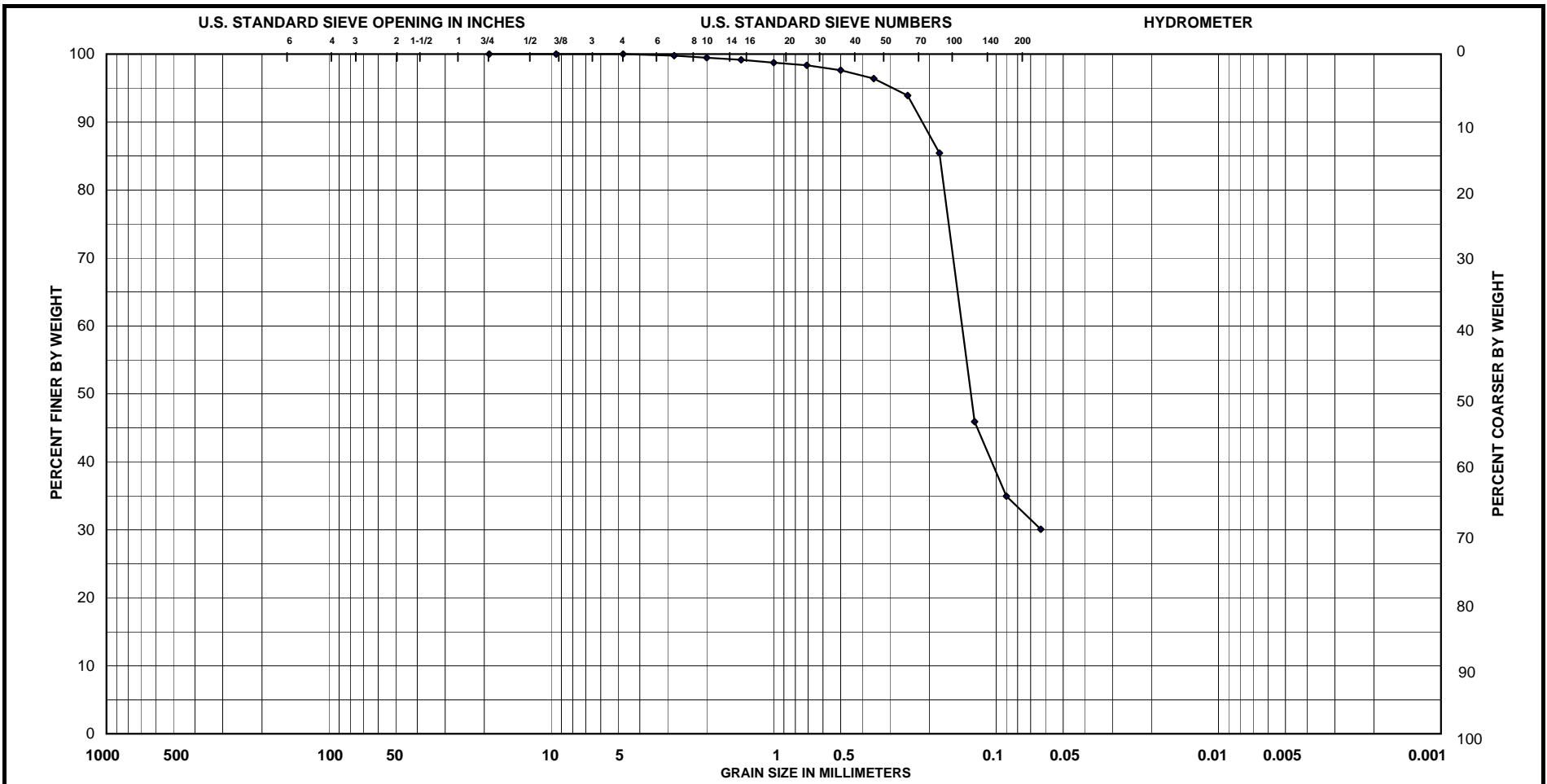
### GRAIN SIZE AND VISUAL SHELL CONTENT

Project:	<b>Topsail Beach, Surf City &amp; North Topsail</b>	Depth:	<b>48.4-48.9</b>
Project No.:	<b>1584-01-40</b>	Date:	<b>9/26/2003</b>
Boring No.:	<b>T1-03-V-224</b>		
Sample No.:	<b>2</b>		
Description:	<b>SAND, silty, mostly fine-grained quartz, some silt, trace carbonate, olive gray (SM)</b>		

Tare Weight, (g):	<b>50.03</b>	
Dry Wt. Before Washing (g):	<b>176.34</b>	(with tare)
Dry Weight After Washing (g):	<b>139.23</b>	(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	0.27	99.79	80	0.22
#10	2.000	0.41	99.46	40	0.16
#14	1.400	0.40	99.14	20	0.08
#18	1.000	0.51	98.74	40	0.20
#25	0.710	0.50	98.35	40	0.20
#35	0.500	0.91	97.62	20	0.18
#45	0.355	1.56	96.39	5	0.08
#60	0.250	3.14	93.90	2	0.06
#80	0.180	10.68	85.45	1	0.11
#120	0.125	49.94	45.91	1	0.50
#170	0.090	13.84	34.95	1	0.14
#230	0.063	6.16	30.08	1	0.06

**Total Shell Content:** **2** %



COBBLES	GRAVEL		SAND			SILT OR CLAY
	COARSE	FINE	COARSE	MEDIUM	FINE	

Sample No.	Elev. Or Depth	Classification	% CO <sub>3</sub>	G <sub>s</sub>	Nat w%	LL	PL	PI	Project	
♦ 2	48.4-48.9	SAND, silty, mostly fine-grained quartz, some silt, trace carbonate, olive gray (SM)	2						Topsail Beach, Surf City & North Topsail	
									Area	
									Boring No. T1-03-V-224	
									Date 9/26/2003	

**GRADATION CURVES**





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## VISUAL SHELL CONTENT

### GRAIN SIZE AND VISUAL SHELL CONTENT

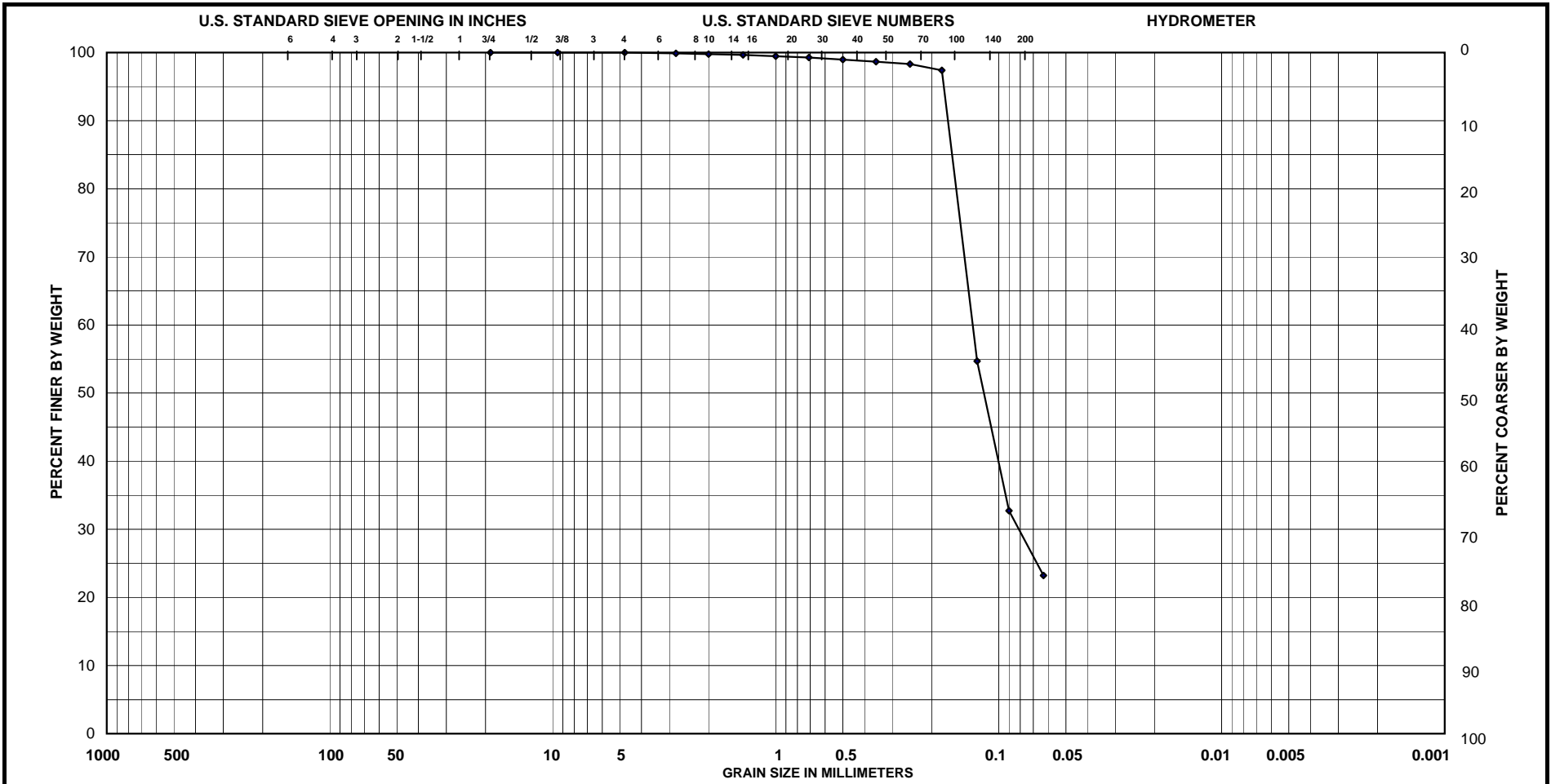
Project:	<b>Topsail Beach, Surf City &amp; North Topsail</b>	Depth:	<b>50.5-51.0</b>
Project No.:	<b>1584-01-40</b>	Date:	<b>9/26/2003</b>
Boring No.:	<b>T1-03-V-224</b>		
Sample No.:	<b>3</b>		
Description:	<b>SAND, silty, mostly fine-grained quartz, few silt, trace carbonate, trace fragmented limestone, olive gray (SM)</b>		

Tare Weight, (g):	<b>50.11</b>	
Dry Wt. Before Washing (g):	<b>174.53</b>	(with tare)
Dry Weight After Washing (g):	<b>147.2</b>	(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	0.14	99.89	75	0.11
#10	2.000	0.15	99.77	75	0.11
#14	1.400	0.16	99.64	60	0.10
#18	1.000	0.20	99.48	55	0.11
#25	0.710	0.25	99.28	30	0.08
#35	0.500	0.38	98.97	10	0.04
#45	0.355	0.41	98.64	3	0.01
#60	0.250	0.39	98.33	1	0.00
#80	0.180	1.14	97.41	1	0.01
#120	0.125	53.13	54.71	1	0.53
#170	0.090	27.32	32.75	1	0.27
#230	0.063	11.85	23.23	1	0.12

**Total Shell Content:**

<b>1</b>	<b>%</b>
----------	----------



COBBLES	GRAVEL		SAND			SILT OR CLAY
	COARSE	FINE	COARSE	MEDIUM	FINE	

Sample No.	Elev. Or Depth	Classification	% CO <sub>3</sub>	G <sub>s</sub>	Nat w%	LL	PL	PI	Project	
3	50.5-51.0	SAND, silty, mostly fine-grained quartz, few silt, trace carbonate, trace fragmented limestone, olive gray (SM)	1						Topsail Beach, Surf City & North Topsail	
									Area	
									Boring No. T1-03-V-224	
									Date 9/26/2003	

**GRADATION CURVES**



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## VISUAL SHELL CONTENT

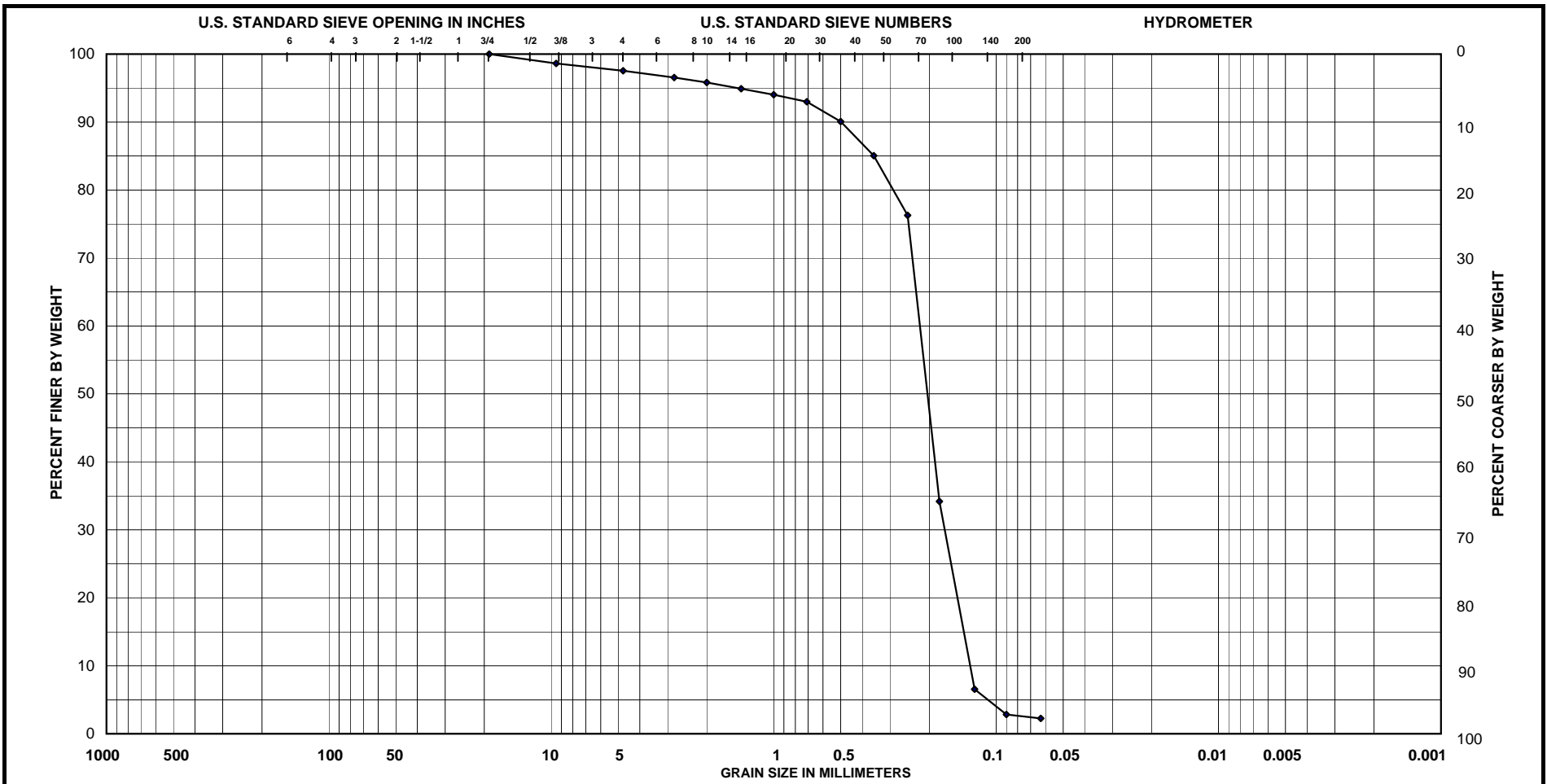
### GRAIN SIZE AND VISUAL SHELL CONTENT

Project:	<b>Topsail Beach, Surf City &amp; North Topsail</b>	Depth:	<b>46.8-47.3</b>
Project No.:	<b>1584-01-40</b>	Date:	<b>9/26/2003</b>
Boring No.:	<b>T1-03-V-225b</b>		
Sample No.:	<b>1</b>		
Description:	<b>SAND, poorly-graded, mostly fine-grained quartz, few carbonate, trace fragmented limestone, very dark greenish gray (SP)</b>		

Tare Weight, (g):	<b>49.73</b>	
Dry Wt. Before Washing (g):	<b>174.79</b>	(with tare)
Dry Weight After Washing (g):	<b>172.07</b>	(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	1.74	98.61	100	1.74
#4	4.750	1.31	97.56	100	1.31
#7	2.800	1.26	96.55	90	1.13
#10	2.000	0.93	95.81	90	0.84
#14	1.400	1.13	94.91	70	0.79
#18	1.000	1.12	94.01	65	0.73
#25	0.710	1.26	93.00	40	0.50
#35	0.500	3.67	90.07	25	0.92
#45	0.355	6.27	85.06	20	1.25
#60	0.250	10.96	76.29	3	0.33
#80	0.180	52.64	34.20	1	0.53
#120	0.125	34.59	6.54	1	0.35
#170	0.090	4.64	2.83	1	0.05
#230	0.063	0.70	2.27	1	0.01

**Total Shell Content:** **8** %



COBBLES	GRAVEL		SAND			SILT OR CLAY
	COARSE	FINE	COARSE	MEDIUM	FINE	

Sample No.	Elev. Or Depth	Classification	% CO <sub>3</sub>	G <sub>s</sub>	Nat w%	LL	PL	PI	Project
♦ 1	46.8-47.3	SAND, poorly-graded, mostly fine-grained quartz, few carbonate, trace fragmented limestone, very dark greenish gray (SP)	8						Topsail Beach, Surf City & North Topsail
									Area
									Boring No. T1-03-V-225b
									Date 9/26/2003

**GRADATION CURVES**



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## VISUAL SHELL CONTENT

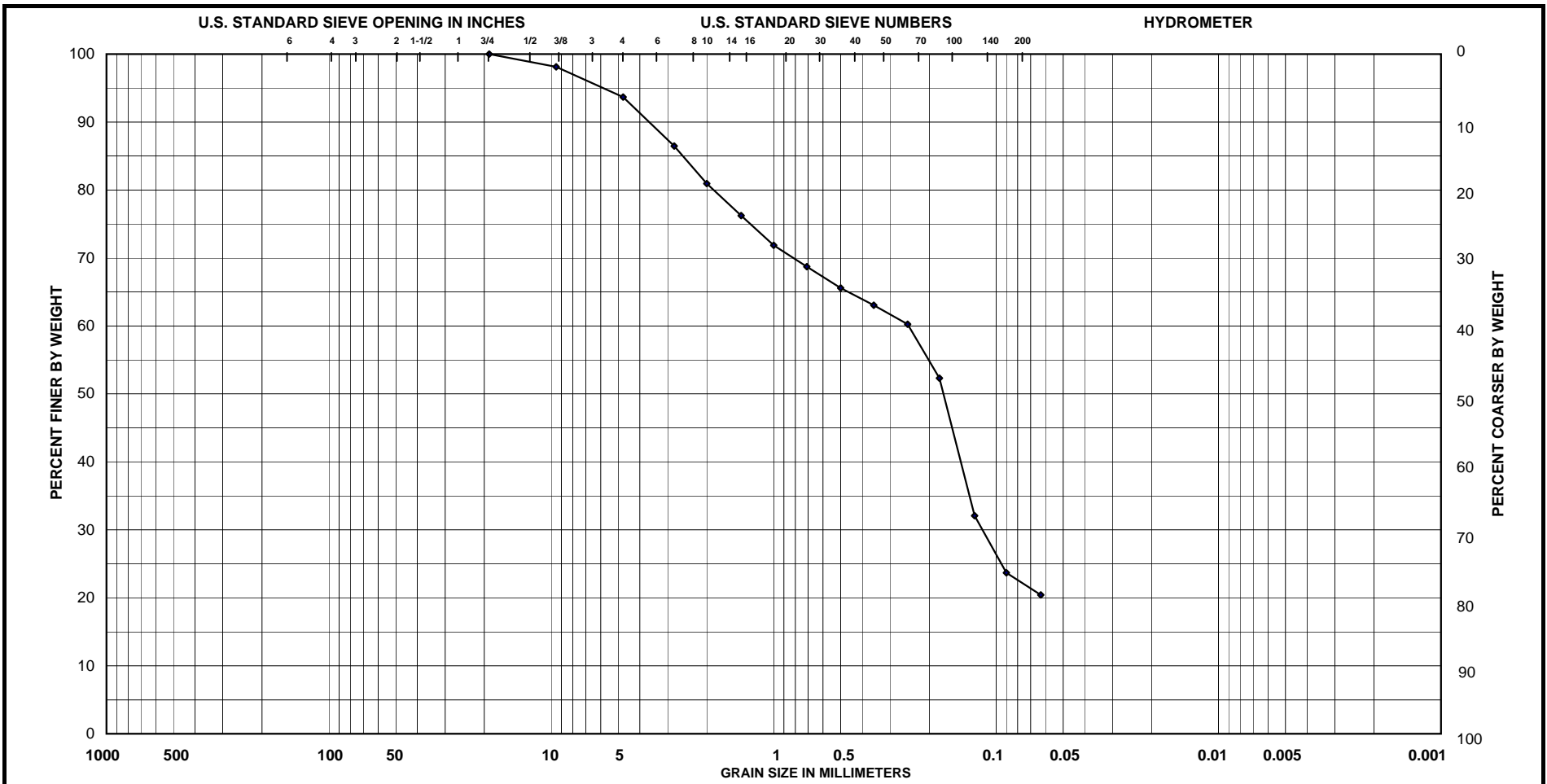
### GRAIN SIZE AND VISUAL SHELL CONTENT

Project:	<b>Topsail Beach, Surf City &amp; North Topsail</b>	Depth:	<b>48.6-49.1</b>
Project No.:	<b>1584-01-40</b>	Date:	<b>9/26/2003</b>
Boring No.:	<b>T1-03-V-225b</b>		
Sample No.:	<b>2</b>		
Description:	<b>SAND, silty, some coarse to fine-grained fragmented limestone, some fine-grained quartz, few fine gravel-size fragmented limestone,</b>		

Tare Weight, (g):	<b>50.36</b>	
Dry Wt. Before Washing (g):	<b>173.02</b>	(with tare)
Dry Weight After Washing (g):	<b>149.04</b>	(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	2.30	98.12	0	0.00
#4	4.750	5.47	93.67	0	0.00
#7	2.800	8.82	86.47	0	0.00
#10	2.000	6.79	80.94	0	0.00
#14	1.400	5.76	76.24	1	0.06
#18	1.000	5.38	71.86	1	0.05
#25	0.710	3.85	68.72	3	0.12
#35	0.500	3.85	65.58	1	0.04
#45	0.355	3.08	63.07	1	0.03
#60	0.250	3.45	60.26	0	0.00
#80	0.180	9.72	52.33	0	0.00
#120	0.125	24.85	32.07	0	0.00
#170	0.090	10.29	23.68	0	0.00
#230	0.063	4.01	20.41	0	0.00

**Total Shell Content:** **0** %



COBBLES	GRAVEL		SAND			SILT OR CLAY
	COARSE	FINE	COARSE	MEDIUM	FINE	

Sample No.	Elev. Or Depth	Classification	% CO <sub>3</sub>	G <sub>s</sub>	Nat w%	LL	PL	PI	Project
♦ 2	48.6-49.1	SAND, silty, some coarse to fine-grained fragmented limestone, some fine-grained quartz, few fine gravel-size fragmented limestone, greenish gray (SM)	0						Topsail Beach, Surf City & North Topsail
									Area
									Boring No. T1-03-V-225b
									Date 9/26/2003

**GRADATION CURVES**



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## VISUAL SHELL CONTENT

### GRAIN SIZE AND VISUAL SHELL CONTENT

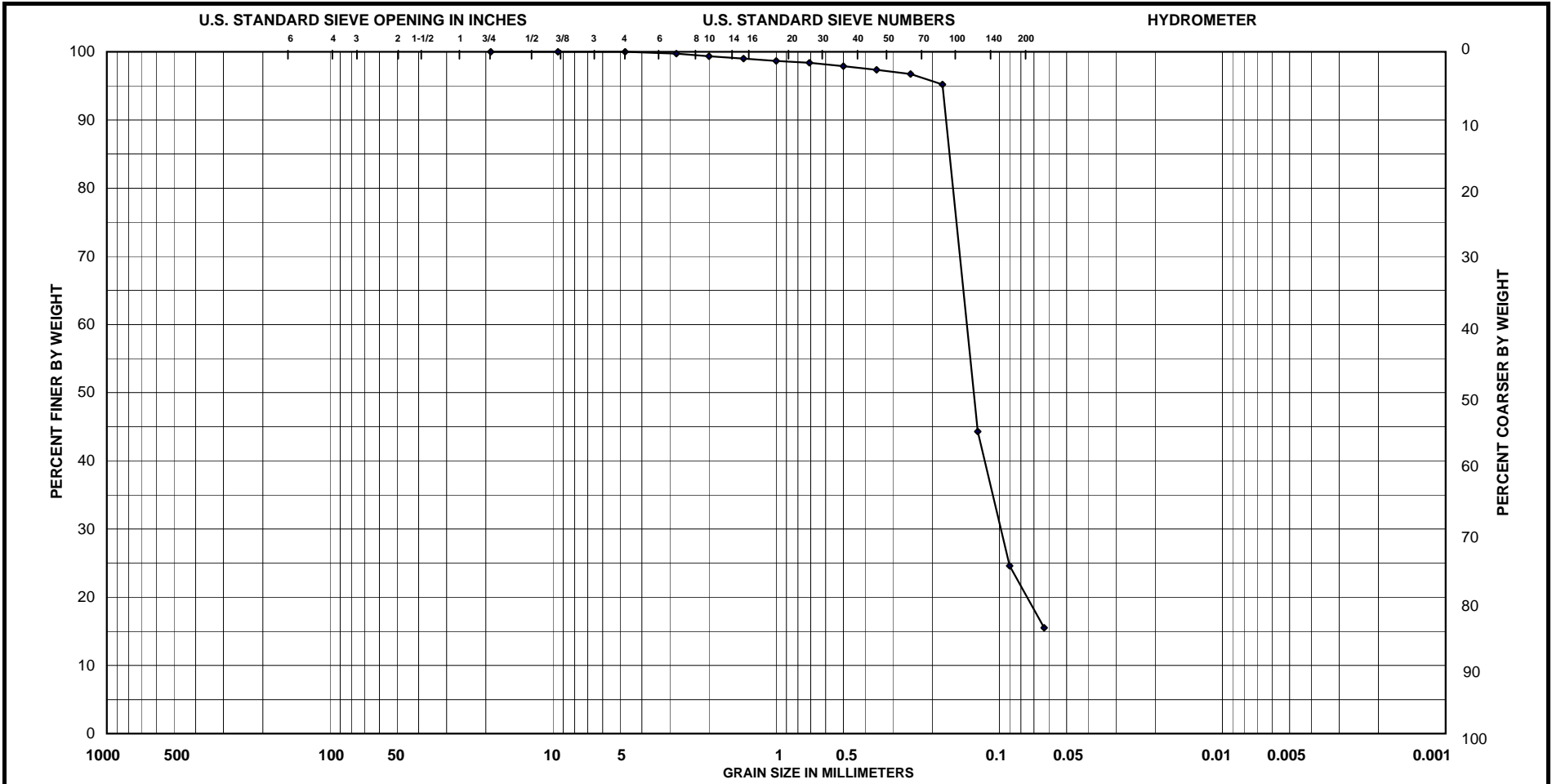
Project:	<b>Topsail Beach, Surf City &amp; North Topsail</b>	Depth:	<b>50.5-51.0</b>
Project No.:	<b>1584-01-40</b>	Date:	<b>9/26/2003</b>
Boring No.:	<b>T1-03-V-225b</b>		
Sample No.:	<b>3</b>		
Description:	<b>SAND, silty, mostly fine-grained quartz, little silt, trace carbonate, trace fragmented limestone, olive gray (SM)</b>		

Tare Weight, (g):	<b>50.16</b>	
Dry Wt. Before Washing (g):	<b>172.52</b>	(with tare)
Dry Weight After Washing (g):	<b>155.05</b>	(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	0.35	99.71	100	0.35
#10	2.000	0.44	99.35	80	0.35
#14	1.400	0.41	99.02	40	0.16
#18	1.000	0.44	98.66	20	0.09
#25	0.710	0.34	98.38	15	0.05
#35	0.500	0.58	97.91	10	0.06
#45	0.355	0.66	97.37	3	0.02
#60	0.250	0.77	96.74	1	0.01
#80	0.180	1.88	95.20	1	0.02
#120	0.125	62.28	44.30	1	0.62
#170	0.090	24.10	24.61	1	0.24
#230	0.063	11.10	15.54	1	0.11

**Total Shell Content:**

<b>2</b>	<b>%</b>
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COBBLES	GRAVEL		SAND			SILT OR CLAY
	COARSE	FINE	COARSE	MEDIUM	FINE	

Sample No.	Elev. Or Depth	Classification	% CO <sub>3</sub>	G <sub>s</sub>	Nat w%	LL	PL	PI	Project
♦ 3	50.5-51.0	SAND, silty, mostly fine-grained quartz, little silt, trace carbonate, trace fragmented limestone, olive gray (SM)	2						Topsail Beach, Surf City & North Topsail
									Area
									Boring No. T1-03-V-225b
									Date 9/26/2003

**GRADATION CURVES**





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## VISUAL SHELL CONTENT

### GRAIN SIZE AND VISUAL SHELL CONTENT

Project:	<b>Topsail Beach, Surf City &amp; North Topsail</b>	Depth:	<b>47.8-48.3</b>
Project No.:	<b>1584-01-40</b>	Date:	<b>9/26/2003</b>
Boring No.:	<b>T1-03-V-226</b>		
Sample No.:	<b>1</b>		
Description:	<b>SAND, poorly-graded, mostly fine-grained quartz, few carbonate, trace fragmented limestone, olive gray (SP)</b>		

Tare Weight, (g):	<b>50.33</b>	
Dry Wt. Before Washing (g):	<b>172.03</b>	(with tare)
Dry Weight After Washing (g):	<b>169</b>	(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	1.92	98.42	100	1.92
#4	4.750	0.36	98.13	100	0.36
#7	2.800	0.96	97.34	100	0.96
#10	2.000	0.71	96.75	80	0.57
#14	1.400	1.03	95.91	75	0.77
#18	1.000	1.02	95.07	65	0.66
#25	0.710	1.18	94.10	60	0.71
#35	0.500	2.55	92.00	35	0.89
#45	0.355	3.89	88.81	25	0.97
#60	0.250	8.10	82.15	3	0.24
#80	0.180	49.60	41.40	1	0.50
#120	0.125	41.22	7.53	1	0.41
#170	0.090	5.24	3.22	1	0.05
#230	0.063	0.76	2.60	1	0.01

**Total Shell Content:** **7** %





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## VISUAL SHELL CONTENT

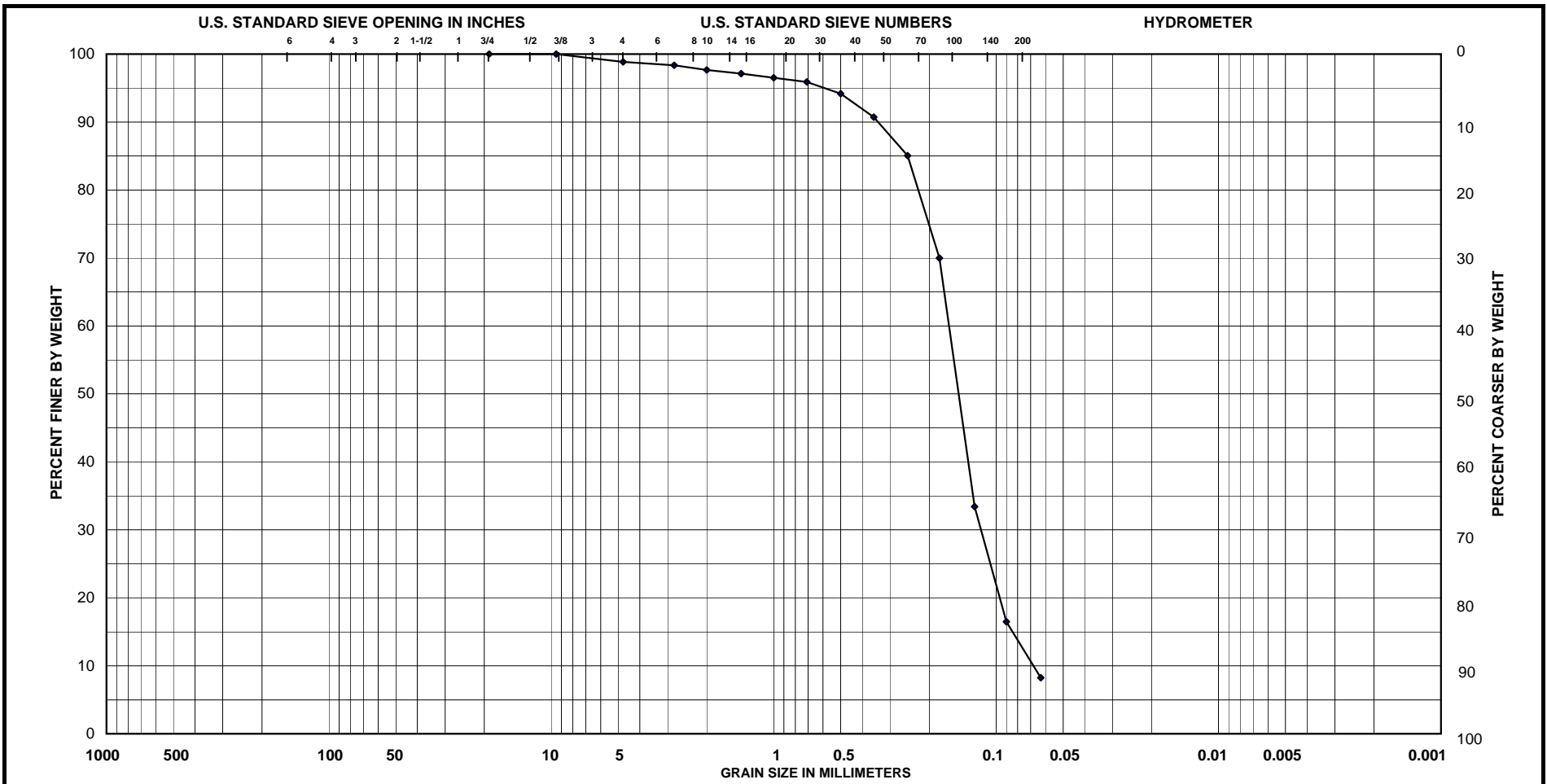
### GRAIN SIZE AND VISUAL SHELL CONTENT

Project:	<b>Topsail Beach, Surf City &amp; North Topsail</b>	Depth:	<b>47.7-48.2</b>
Project No.:	<b>1584-01-40</b>	Date:	<b>9/26/2003</b>
Boring No.:	<b>T1-03-V-227</b>		
Sample No.:	<b>1</b>		
Description:	<b>SAND, poorly-graded with silt, mostly fine-grained quartz, few silt, few carbonate, trace fragmented limestone, dark greenish gray (SP-SM)</b>		

Tare Weight, (g):	<b>50.22</b>	
Dry Wt. Before Washing (g):	<b>171.18</b>	(with tare)
Dry Weight After Washing (g):	<b>162.83</b>	(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	1.41	98.83	100	1.41
#7	2.800	0.58	98.35	100	0.58
#10	2.000	0.85	97.65	70	0.60
#14	1.400	0.65	97.11	70	0.46
#18	1.000	0.71	96.53	60	0.43
#25	0.710	0.77	95.89	55	0.42
#35	0.500	2.08	94.17	30	0.62
#45	0.355	4.15	90.74	10	0.42
#60	0.250	6.90	85.04	3	0.21
#80	0.180	18.18	70.01	3	0.55
#120	0.125	44.24	33.43	1	0.44
#170	0.090	20.52	16.47	1	0.21
#230	0.063	9.93	8.26	1	0.10

**Total Shell Content:** **5** %





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## VISUAL SHELL CONTENT

### GRAIN SIZE AND VISUAL SHELL CONTENT

Project:	<b>Topsail Beach, Surf City &amp; North Topsail</b>	Depth:	<b>49.5-50.0</b>
Project No.:	<b>1584-01-40</b>	Date:	<b>9/26/2003</b>
Boring No.:	<b>T1-03-V-227</b>		
Sample No.:	<b>2</b>		
Description:	<b>SAND, silty, mostly fine-grained quartz, little silt, trace carbonate, trace fragmented limestone, dark greenish gray (SP-SM)</b>		

Tare Weight, (g):	<b>50.46</b>	
Dry Wt. Before Washing (g):	<b>163.07</b>	(with tare)
Dry Weight After Washing (g):	<b>152.95</b>	(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	0.02	99.97	60	0.01
#14	1.400	0.09	99.89	30	0.03
#18	1.000	0.14	99.77	15	0.02
#25	0.710	0.16	99.63	3	0.00
#35	0.500	0.32	99.34	5	0.02
#45	0.355	0.40	98.99	3	0.01
#60	0.250	0.91	98.18	1	0.01
#80	0.180	4.07	94.57	1	0.04
#120	0.125	39.82	59.20	1	0.40
#170	0.090	32.97	29.93	1	0.33
#230	0.063	20.64	11.60	1	0.21

**Total Shell Content:**

<b>1</b>	<b>%</b>
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## VISUAL SHELL CONTENT

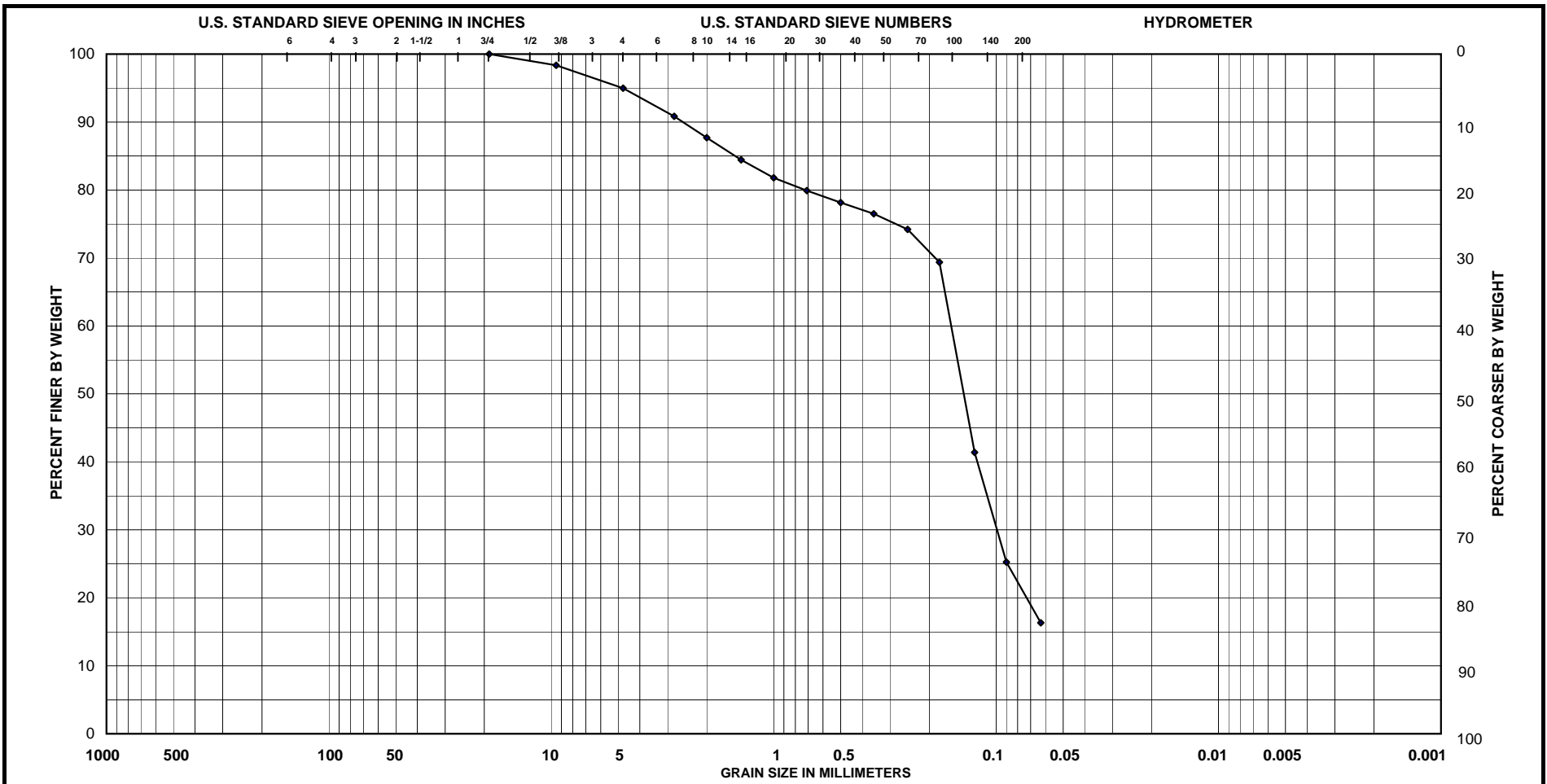
### GRAIN SIZE AND VISUAL SHELL CONTENT

Project:	<b>Topsail Beach, Surf City &amp; North Topsail</b>	Depth:	<b>52.6-53.1</b>
Project No.:	<b>1584-01-40</b>	Date:	<b>9/26/2003</b>
Boring No.:	<b>T1-03-V-227</b>		
Sample No.:	<b>3</b>		
Description:	<b>SAND, silty, some fine-grained quartz, little coarse to fine-grained fragmented limestone, little silt, few fine gravel-size fragmented</b>		

Tare Weight, (g):	<b>49.99</b>	
Dry Wt. Before Washing (g):	<b>177.08</b>	(with tare)
Dry Weight After Washing (g):	<b>157.68</b>	(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	2.09	98.36	0	0.00
#4	4.750	4.27	95.00	0	0.00
#7	2.800	5.30	90.83	5	0.27
#10	2.000	4.00	87.68	10	0.40
#14	1.400	4.14	84.42	3	0.12
#18	1.000	3.36	81.78	3	0.10
#25	0.710	2.35	79.93	1	0.02
#35	0.500	2.28	78.13	1	0.02
#45	0.355	2.05	76.52	3	0.06
#60	0.250	2.92	74.22	1	0.03
#80	0.180	6.15	69.38	1	0.06
#120	0.125	35.55	41.41	1	0.36
#170	0.090	20.53	25.26	1	0.21
#230	0.063	11.34	16.33	1	0.11

**Total Shell Content:** **1** %



COBBLES	GRAVEL		SAND			SILT OR CLAY
	COARSE	FINE	COARSE	MEDIUM	FINE	

Sample No.	Elev. Or Depth	Classification	% CO <sub>3</sub>	G <sub>s</sub>	Nat w%	LL	PL	PI	Project
♦ 3	52.6-53.1	SAND, silty, some fine-grained quartz, little coarse to fine-grained fragmented limestone, little silt, few fine gravel-size fragmented limestone, olive gray (SM)	1						Topsail Beach, Surf City & North Topsail
									Area
									Boring No. T1-03-V-227
									Date 9/26/2003

**GRADATION CURVES**





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## VISUAL SHELL CONTENT

### GRAIN SIZE AND VISUAL SHELL CONTENT

Project:	<b>Topsail Beach, Surf City &amp; North Topsail</b>	Depth:	<b>46.9-47.4</b>
Project No.:	<b>1584-01-40</b>	Date:	<b>9/26/2003</b>
Boring No.:	<b>T1-03-V-228</b>		
Sample No.:	<b>1</b>		
Description:	<b>SAND, poorly-graded, mostly fine-grained quartz, few carbonate, trace fragmented limestone, dark greenish gray (SP)</b>		

Tare Weight, (g):	<b>50.29</b>	
Dry Wt. Before Washing (g):	<b>169.2</b>	(with tare)
Dry Weight After Washing (g):	<b>167.73</b>	(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	0.61	99.49	100	0.61
#7	2.800	1.26	98.43	100	1.26
#10	2.000	1.11	97.49	90	1.00
#14	1.400	1.22	96.47	85	1.04
#18	1.000	1.34	95.34	45	0.60
#25	0.710	1.45	94.12	30	0.44
#35	0.500	4.55	90.30	20	0.91
#45	0.355	10.11	81.79	5	0.51
#60	0.250	18.76	66.02	3	0.56
#80	0.180	48.54	25.20	1	0.49
#120	0.125	24.77	4.36	1	0.25
#170	0.090	3.02	1.82	1	0.03
#230	0.063	0.30	1.57	1	0.00

**Total Shell Content:** **6** %





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## VISUAL SHELL CONTENT

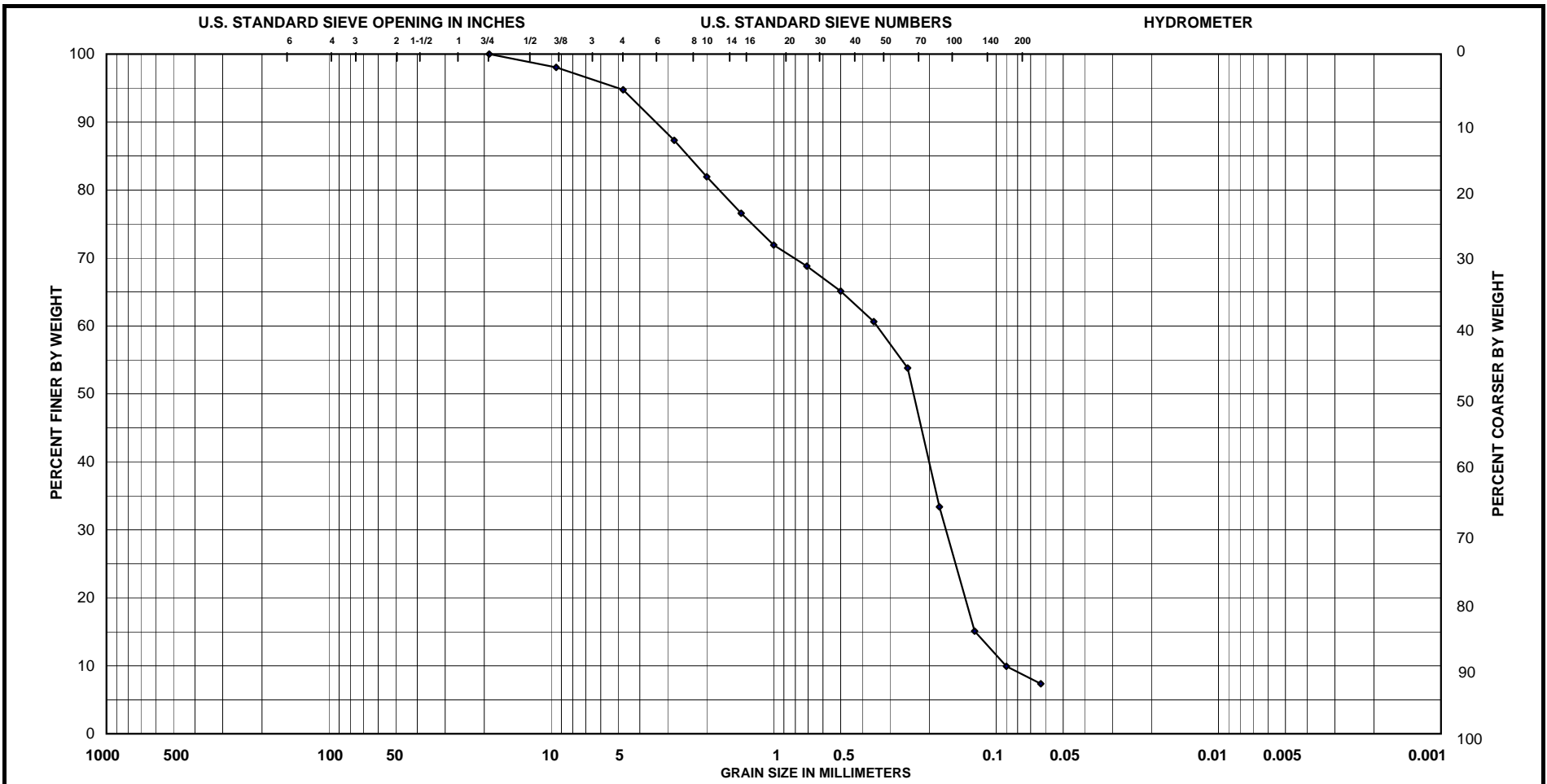
### GRAIN SIZE AND VISUAL SHELL CONTENT

Project:	<b>Topsail Beach, Surf City &amp; North Topsail</b>	Depth:	<b>47.9-48.4</b>
Project No.:	<b>1584-01-40</b>	Date:	<b>9/26/2003</b>
Boring No.:	<b>T1-03-V-228</b>		
Sample No.:	<b>2</b>		
Description:	<b>SAND, poorly-graded with silt, mostly fine-grained quartz, few coarse to medium-grained carbonate, few coarse to fine-grained fragmented</b>		

Tare Weight, (g):	<b>50.10</b>	
Dry Wt. Before Washing (g):	<b>172.95</b>	(with tare)
Dry Weight After Washing (g):	<b>164.4</b>	(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	2.38	98.06	100	2.38
#4	4.750	4.05	94.77	70	2.84
#7	2.800	9.15	87.32	60	5.49
#10	2.000	6.59	81.95	60	3.95
#14	1.400	6.59	76.59	50	3.30
#18	1.000	5.77	71.89	30	1.73
#25	0.710	3.78	68.82	20	0.76
#35	0.500	4.52	65.14	10	0.45
#45	0.355	5.52	60.64	5	0.28
#60	0.250	8.37	53.83	3	0.25
#80	0.180	25.14	33.37	1	0.25
#120	0.125	22.43	15.11	1	0.22
#170	0.090	6.35	9.94	1	0.06
#230	0.063	3.15	7.37	1	0.03

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



COBBLES	GRAVEL		SAND			SILT OR CLAY
	COARSE	FINE	COARSE	MEDIUM	FINE	

Sample No.	Elev. Or Depth	Classification	% CO <sub>3</sub>	G <sub>s</sub>	Nat w%	LL	PL	PI	Project
♦ 2	47.9-48.4	SAND, poorly-graded with silt, mostly fine-grained quartz, few coarse to medium-grained carbonate, few coarse to fine-grained fragmented limestone, few silt, few fine gravel-size carbonate, dark greenish gray (SP-SM)	18						Topsail Beach, Surf City & North Topsail
									Area
									Boring No. T1-03-V-228
									Date 9/26/2003

**GRADATION CURVES**



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## VISUAL SHELL CONTENT

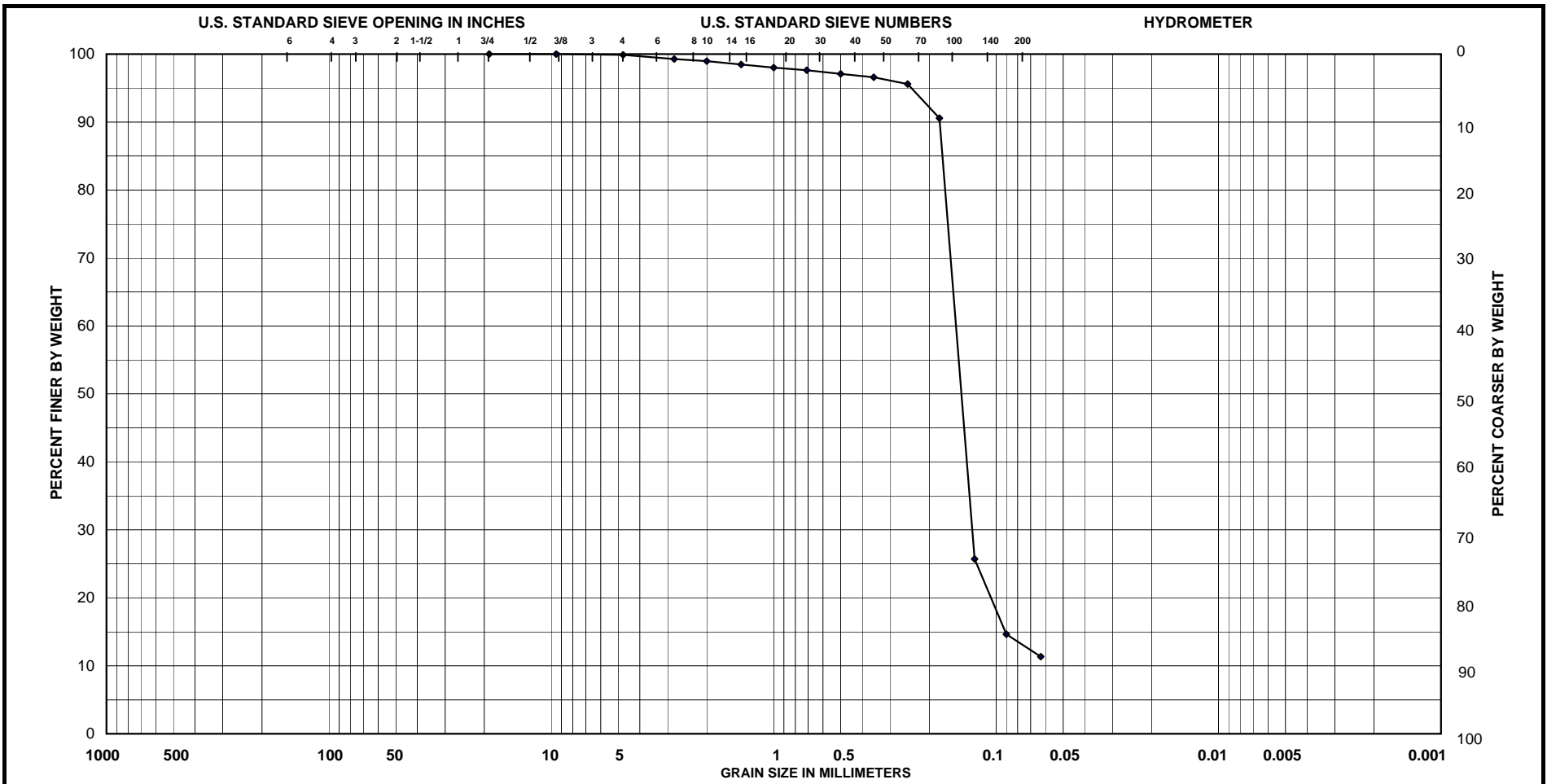
### GRAIN SIZE AND VISUAL SHELL CONTENT

Project:	<b>Topsail Beach, Surf City &amp; North Topsail</b>	Depth:	<b>50.6-51.1</b>
Project No.:	<b>1584-01-40</b>	Date:	<b>9/26/2003</b>
Boring No.:	<b>T1-03-V-228</b>		
Sample No.:	<b>3</b>		
Description:	<b>SAND, silty, mostly fine-grained quartz, little silt, trace carbonate, trace fragmented limestone, olive gray (SP-SM)</b>		

Tare Weight, (g):	<b>49.96</b>	
Dry Wt. Before Washing (g):	<b>170.83</b>	(with tare)
Dry Weight After Washing (g):	<b>157.78</b>	(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	0.13	99.89	100	0.13
#7	2.800	0.73	99.29	100	0.73
#10	2.000	0.41	98.95	100	0.41
#14	1.400	0.56	98.49	60	0.34
#18	1.000	0.59	98.00	55	0.32
#25	0.710	0.47	97.61	50	0.24
#35	0.500	0.61	97.10	20	0.12
#45	0.355	0.63	96.58	10	0.06
#60	0.250	1.21	95.58	5	0.06
#80	0.180	6.07	90.56	3	0.18
#120	0.125	78.39	25.71	1	0.78
#170	0.090	13.36	14.65	1	0.13
#230	0.063	4.02	11.33	1	0.04

**Total Shell Content:** **3** %



COBBLES	GRAVEL		SAND			SILT OR CLAY
	COARSE	FINE	COARSE	MEDIUM	FINE	

Sample No.	Elev. Or Depth	Classification	% CO <sub>3</sub>	G <sub>s</sub>	Nat w%	LL	PL	PI	
3	50.6-51.1	SAND, silty, mostly fine-grained quartz, little silt, trace carbonate, trace fragmented limestone, olive gray (SP-SM)	3						<b>Project</b> Topsail Beach, Surf City & North Topsail
									<b>Area</b>
									<b>Boring No.</b> T1-03-V-228
									<b>Date</b> 9/26/2003

**GRADATION CURVES**



# WOLF TECHNOLOGIES, INC.

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

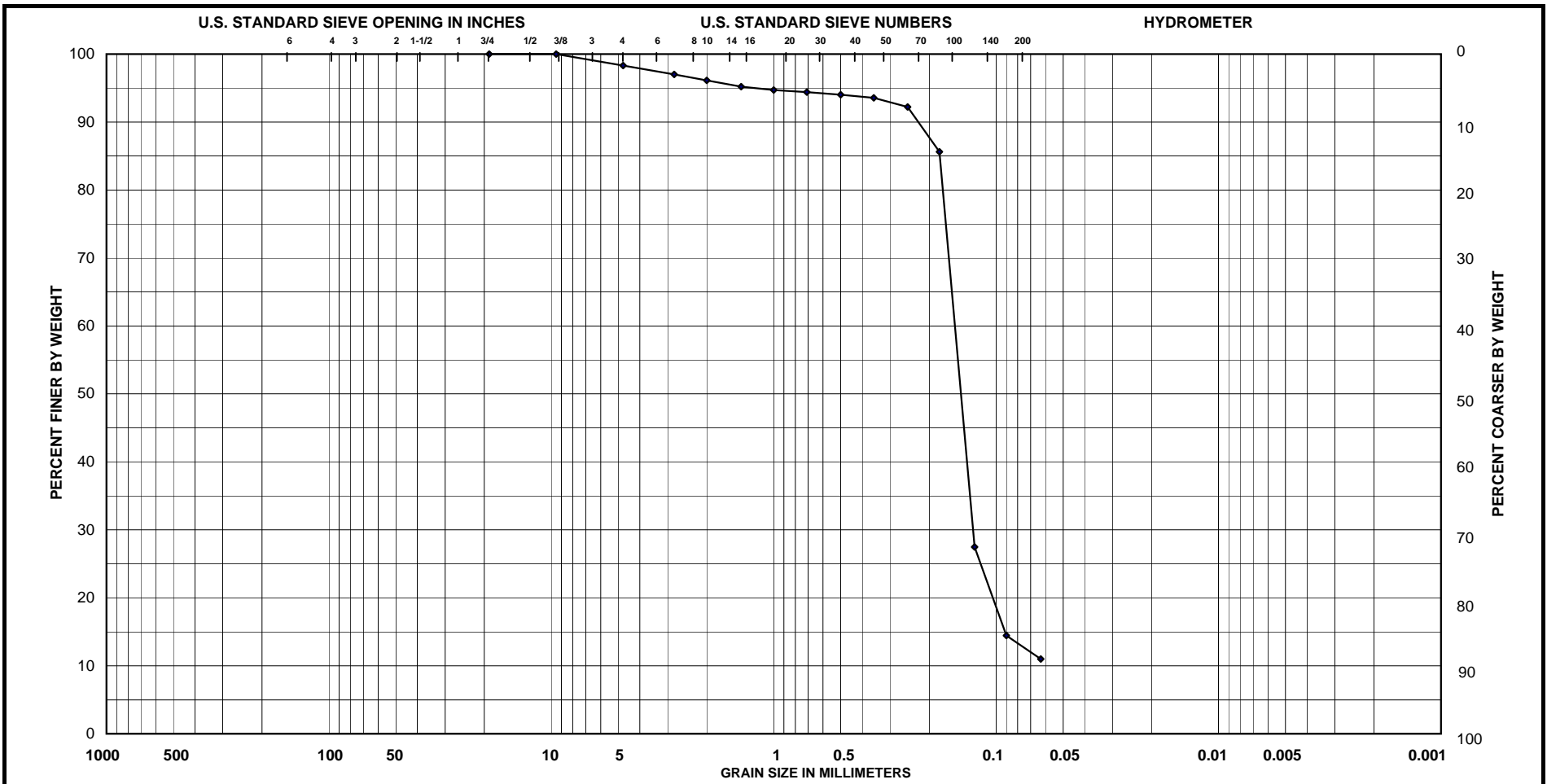
### GRAIN SIZE AND VISUAL SHELL CONTENT

Project:	<b>Topsail Beach, Surf City &amp; North Topsail</b>	Depth:	<b>52.5-53.0</b>
Project No.:	<b>1584-01-40</b>	Date:	<b>9/26/2003</b>
Boring No.:	<b>T1-03-V-228</b>		
Sample No.:	<b>4</b>		
Description:	<b>SAND, poorly-graded with silt, mostly fine-grained quartz, few silt, few carbonate, trace fragmented limestone, olive gray (SP-SM)</b>		

Tare Weight, (g):	<b>49.22</b>	
Dry Wt. Before Washing (g):	<b>171.51</b>	(with tare)
Dry Weight After Washing (g):	<b>158.79</b>	(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	2.05	98.32	90	1.85
#7	2.800	1.61	97.01	10	0.16
#10	2.000	1.08	96.12	100	1.08
#14	1.400	1.11	95.22	75	0.83
#18	1.000	0.64	94.69	70	0.45
#25	0.710	0.36	94.40	65	0.23
#35	0.500	0.44	94.04	60	0.26
#45	0.355	0.58	93.56	45	0.26
#60	0.250	1.66	92.21	20	0.33
#80	0.180	8.05	85.62	3	0.24
#120	0.125	71.09	27.49	1	0.71
#170	0.090	15.97	14.43	1	0.16
#230	0.063	4.21	10.99	1	0.04

**Total Shell Content:** **5** %



COBBLES	GRAVEL		SAND			SILT OR CLAY
	COARSE	FINE	COARSE	MEDIUM	FINE	

Sample No.	Elev. Or Depth	Classification	% CO <sub>3</sub>	G <sub>s</sub>	Nat w%	LL	PL	PI	Project
4	52.5-53.0	SAND, poorly-graded with silt, mostly fine-grained quartz, few silt, few carbonate, trace fragmented limestone, olive gray (SP-SM)	5						Topsail Beach, Surf City & North Topsail
									Area
									Boring No. T1-03-V-228
									Date 9/26/2003

**GRADATION CURVES**





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## VISUAL SHELL CONTENT

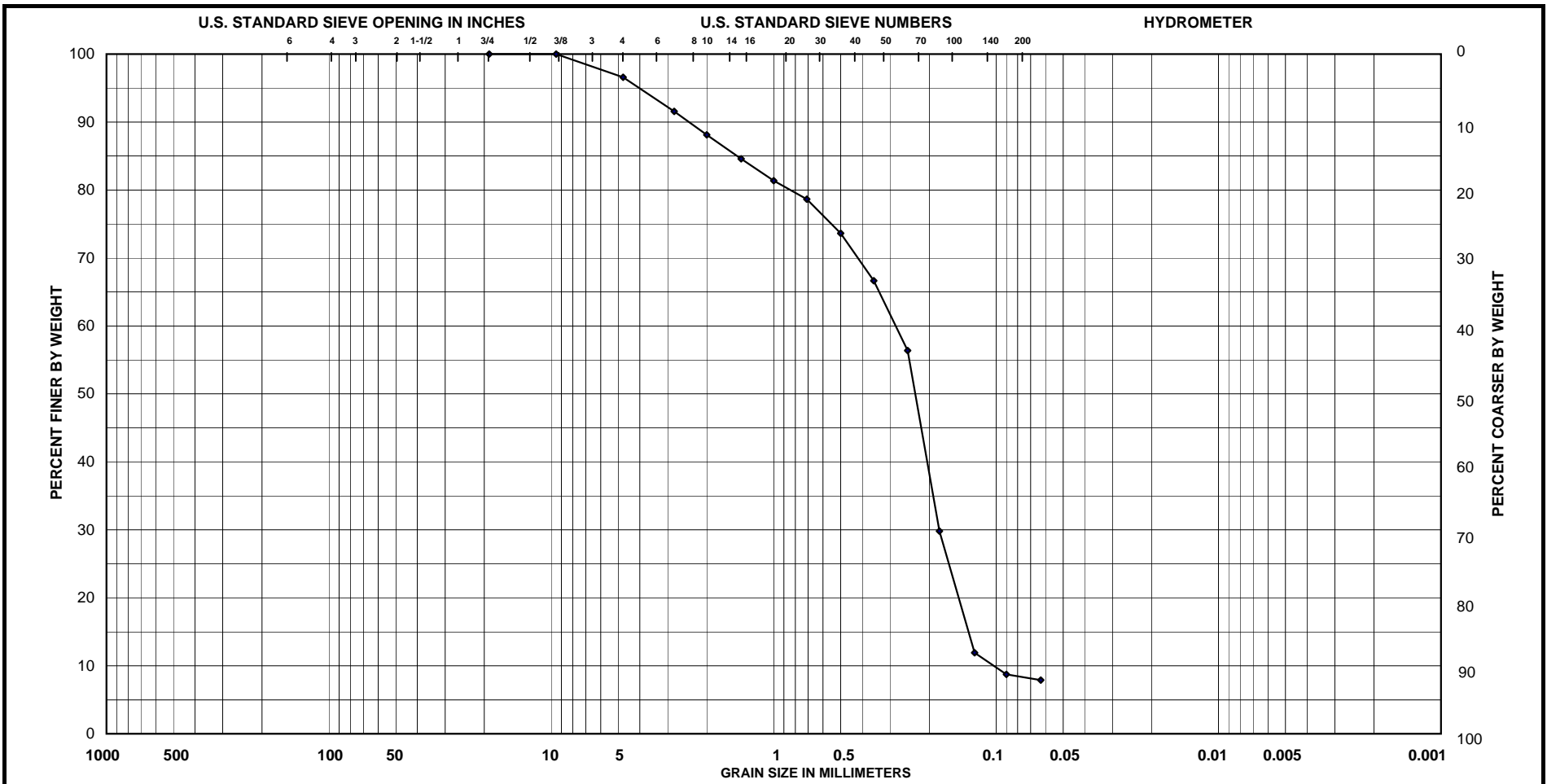
### GRAIN SIZE AND VISUAL SHELL CONTENT

Project:	<b>Topsail Beach, Surf City &amp; North Topsail</b>	Depth:	<b>48.5-49.0</b>
Project No.:	<b>1584-01-40</b>	Date:	<b>9/26/2003</b>
Boring No.:	<b>T1-03-V-229</b>		
Sample No.:	<b>1</b>		
Description:	<b>SAND, poorly-graded with silt, mostly medium to fine-grained quartz, little coarse to medium-grained carbonate, few fragmented limestone,</b>		

Tare Weight, (g):	<b>50.01</b>	
Dry Wt. Before Washing (g):	<b>175.61</b>	(with tare)
Dry Weight After Washing (g):	<b>166.14</b>	(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	4.28	96.59	100	4.28
#7	2.800	6.31	91.57	85	5.36
#10	2.000	4.33	88.12	75	3.25
#14	1.400	4.41	84.61	70	3.09
#18	1.000	4.05	81.39	45	1.82
#25	0.710	3.43	78.65	30	1.03
#35	0.500	6.32	73.62	20	1.26
#45	0.355	8.77	66.64	10	0.88
#60	0.250	12.89	56.38	5	0.64
#80	0.180	33.37	29.81	3	1.00
#120	0.125	22.49	11.90	1	0.22
#170	0.090	3.95	8.76	1	0.04
#230	0.063	1.07	7.91	1	0.01

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



COBBLES	GRAVEL		SAND			SILT OR CLAY
	COARSE	FINE	COARSE	MEDIUM	FINE	

Sample No.	Elev. Or Depth	Classification	% CO <sub>3</sub>	G <sub>s</sub>	Nat w%	LL	PL	PI	Project	
♦ 1	48.5-49.0	SAND, poorly-graded with silt, mostly medium to fine-grained quartz, little coarse to medium-grained carbonate, few fragmented limestone, trace fine gravel-size carbonate, dark greenish gray (SP-SM)	18						Topsail Beach, Surf City & North Topsail	
									Area	
									Boring No. T1-03-V-229	
									Date 9/26/2003	

**GRADATION CURVES**



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## VISUAL SHELL CONTENT

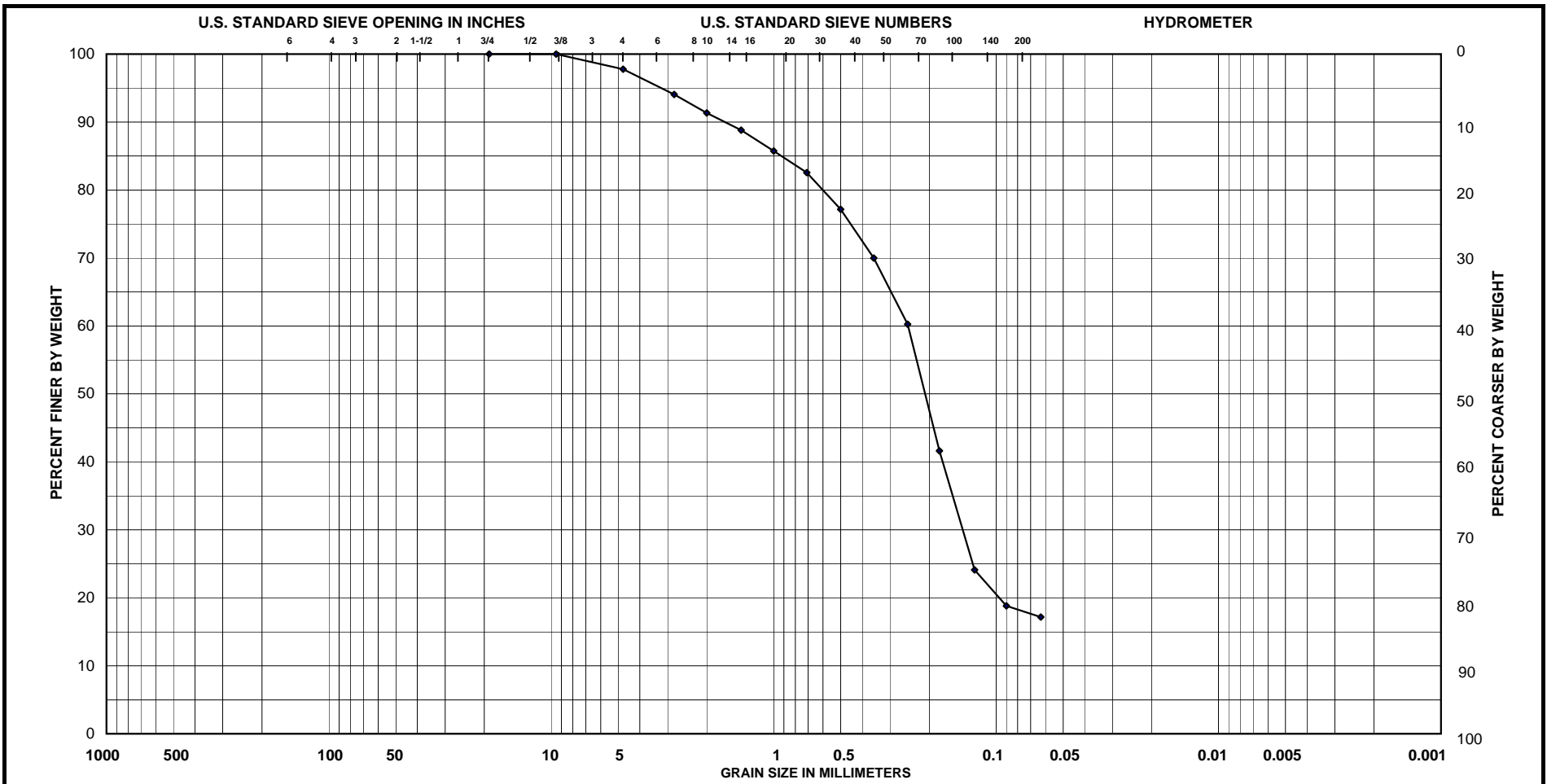
### GRAIN SIZE AND VISUAL SHELL CONTENT

Project:	<b>Topsail Beach, Surf City &amp; North Topsail</b>	Depth:	<b>49.7-50.2</b>
Project No.:	<b>1584-01-40</b>	Date:	<b>9/26/2003</b>
Boring No.:	<b>T1-03-V-229</b>		
Sample No.:	<b>2</b>		
Description:	<b>SAND, clayey, mostly fine-grained quartz, little coarse to medium-grained carbonate, little silt, trace fragmented limestone, trace fine</b>		

Tare Weight, (g):	<b>49.54</b>	
Dry Wt. Before Washing (g):	<b>180.3</b>	(with tare)
Dry Weight After Washing (g):	<b>158.32</b>	(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	2.89	97.79	70	2.02
#7	2.800	4.89	94.05	85	4.16
#10	2.000	3.53	91.35	75	2.65
#14	1.400	3.32	88.81	70	2.32
#18	1.000	3.99	85.76	55	2.19
#25	0.710	4.16	82.58	25	1.04
#35	0.500	7.11	77.14	20	1.42
#45	0.355	9.33	70.01	15	1.40
#60	0.250	12.74	60.26	3	0.38
#80	0.180	24.35	41.64	3	0.73
#120	0.125	22.95	24.09	1	0.23
#170	0.090	6.88	18.83	1	0.07
#230	0.063	2.16	17.18	1	0.02

**Total Shell Content:** **14** %





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## VISUAL SHELL CONTENT

### GRAIN SIZE AND VISUAL SHELL CONTENT

Project:	<b>Topsail Beach, Surf City &amp; North Topsail</b>	Depth:	<b>52.0-52.5</b>
Project No.:	<b>1584-01-40</b>	Date:	<b>9/26/2003</b>
Boring No.:	<b>T1-03-V-229</b>		
Sample No.:	<b>3</b>		
Description:	<b>SAND, clayey, mostly fine-grained quartz, little clay, few carbonate, few fragmented limestone, olive gray (SC)</b>		

Tare Weight, (g):	<b>50.22</b>	
Dry Wt. Before Washing (g):	<b>167.72</b>	(with tare)
Dry Weight After Washing (g):	<b>144.56</b>	(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	2.00	98.30	70	1.40
#7	2.800	2.82	95.90	80	2.26
#10	2.000	1.91	94.27	75	1.43
#14	1.400	1.98	92.59	65	1.29
#18	1.000	2.30	90.63	40	0.92
#25	0.710	2.30	88.67	30	0.69
#35	0.500	3.58	85.63	15	0.54
#45	0.355	4.34	81.93	5	0.22
#60	0.250	5.87	76.94	3	0.18
#80	0.180	9.43	68.91	1	0.09
#120	0.125	33.19	40.66	1	0.33
#170	0.090	13.72	28.99	1	0.14
#230	0.063	9.33	21.05	1	0.09

**Total Shell Content:** **8** %



COBBLES	GRAVEL		SAND			SILT OR CLAY
	COARSE	FINE	COARSE	MEDIUM	FINE	

Sample No.	Elev. Or Depth	Classification	% CO <sub>3</sub>	G <sub>s</sub>	Nat w%	LL	PL	PI	Project	
3	52.0-52.5	SAND, clayey, mostly fine-grained quartz, little clay, few carbonate, few fragmented limestone, olive gray (SC)	8						Topsail Beach, Surf City & North Topsail	
									Area	
									Boring No. T1-03-V-229	
									Date 9/26/2003	

**GRADATION CURVES**



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## VISUAL SHELL CONTENT

### GRAIN SIZE AND VISUAL SHELL CONTENT

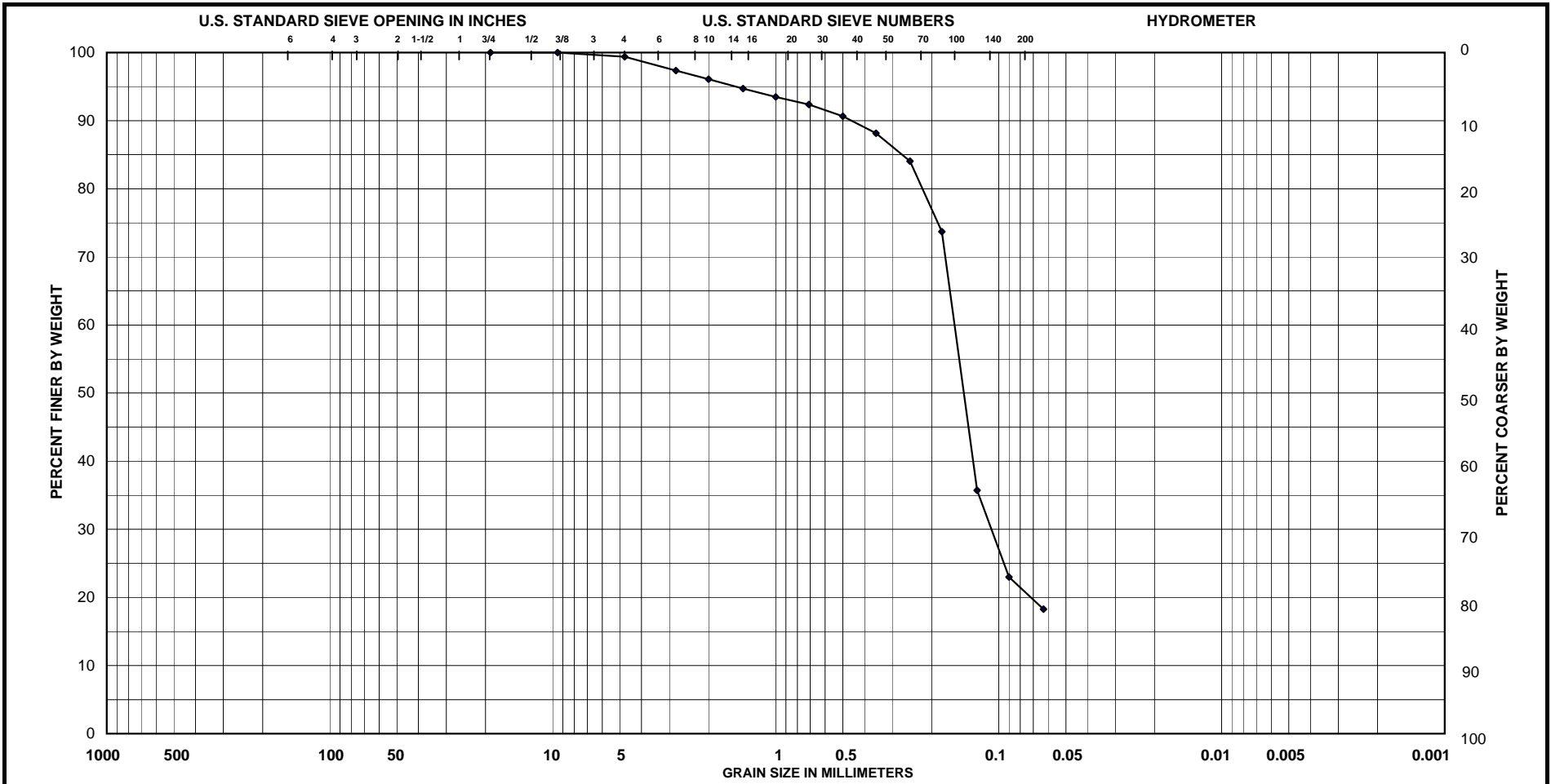
Project:	<b>Topsail Beach, Surf City &amp; North Topsail</b>	Depth:	<b>54.0-54.5</b>
Project No.:	<b>1584-01-40</b>	Date:	<b>9/26/2003</b>
Boring No.:	<b>T1-03-V-229</b>		
Sample No.:	<b>4</b>		
Description:	<b>SAND, silty, mostly fine-grained quartz, little silt, few carbonate, few fragmented limestone, olive gray (SM)</b>		

Tare Weight, (g):	<b>49.53</b>	
Dry Wt. Before Washing (g):	<b>175.26</b>	(with tare)
Dry Weight After Washing (g):	<b>151.98</b>	(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	0.76	99.40	100	0.76
#7	2.800	2.58	97.34	80	2.06
#10	2.000	1.58	96.09	75	1.19
#14	1.400	1.72	94.72	65	1.12
#18	1.000	1.53	93.50	60	0.92
#25	0.710	1.43	92.36	50	0.72
#35	0.500	2.14	90.66	40	0.86
#45	0.355	3.13	88.17	25	0.78
#60	0.250	5.18	84.05	5	0.26
#80	0.180	13.01	73.71	3	0.39
#120	0.125	47.77	35.71	1	0.48
#170	0.090	15.99	22.99	1	0.16
#230	0.063	5.93	18.28	1	0.06

**Total Shell Content:**

<b>8</b>	<b>%</b>
----------	----------



COBBLES	GRAVEL		SAND			SILT OR CLAY
	COARSE	FINE	COARSE	MEDIUM	FINE	

Sample No.	Elev. Or Depth	Classification	% CO <sub>3</sub>	G <sub>s</sub>	Nat w%	LL	PL	PI	Project
4	54.0-54.5	SAND, silty, mostly fine-grained quartz, little silt, few carbonate, few fragmented limestone, olive gray (SM)	8						Topsail Beach, Surf City & North Topsail
									Area
									Boring No. T1-03-V-229
									Date 9/26/2003

**GRADATION CURVES**





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## VISUAL SHELL CONTENT

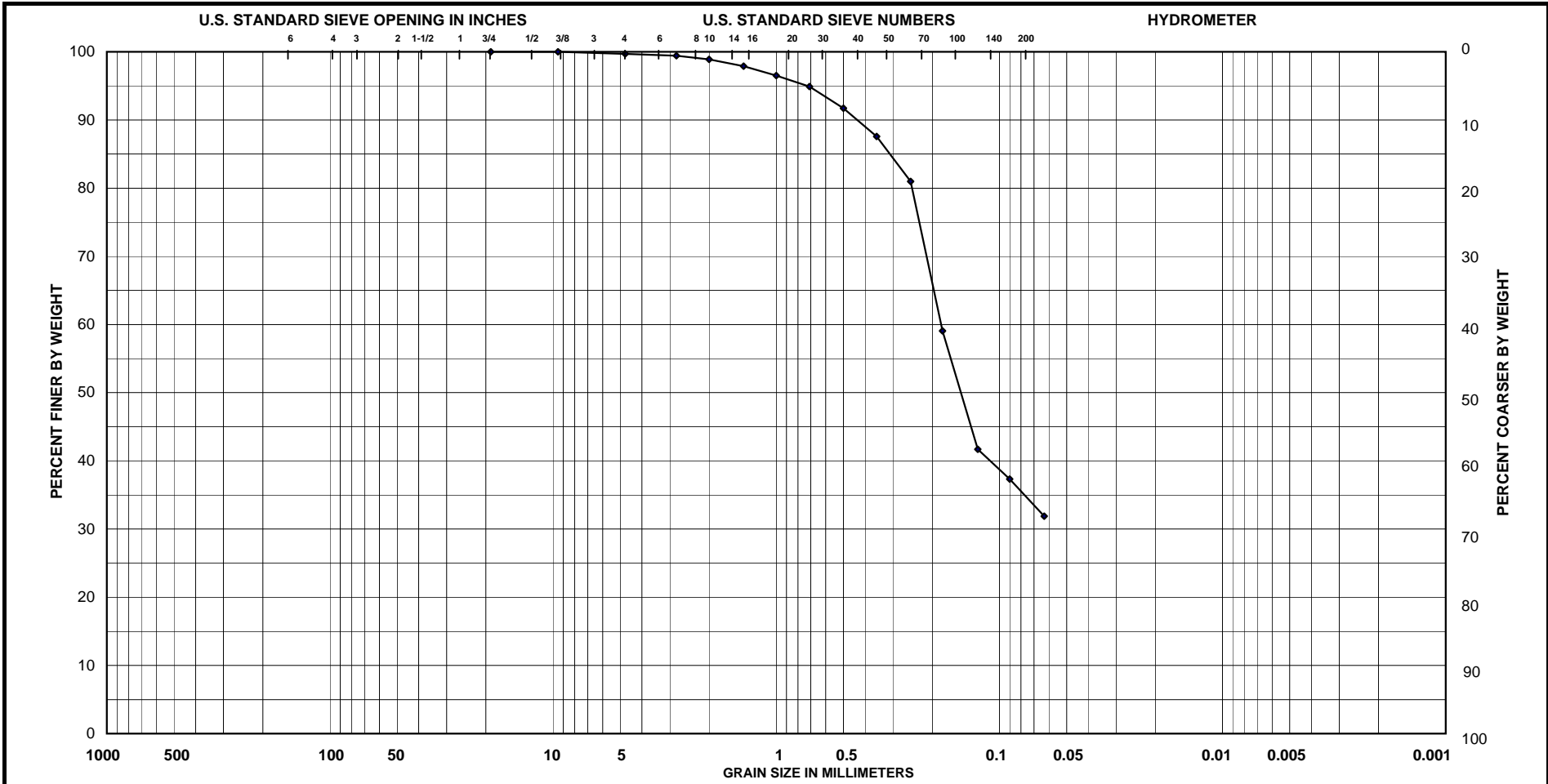
### GRAIN SIZE AND VISUAL SHELL CONTENT

Project:	<b>Topsail Beach, Surf City &amp; North Topsail</b>	Depth:	<b>48.3-48.8</b>
Project No.:	<b>1584-01-40</b>	Date:	<b>9/26/2003</b>
Boring No.:	<b>T1-03-V-230</b>		
Sample No.:	<b>1</b>		
Description:	<b>SAND, clayey, mostly fine-grained quartz, some clay, trace carbonate, trace fragmented limestone, dark greenish gray (SC)</b>		

Tare Weight, (g):	<b>49.78</b>	
Dry Wt. Before Washing (g):	<b>164.52</b>	(with tare)
Dry Weight After Washing (g):	<b>129.06</b>	(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	0.34	99.70	100	0.34
#7	2.800	0.31	99.43	100	0.31
#10	2.000	0.63	98.88	70	0.44
#14	1.400	1.13	97.90	60	0.68
#18	1.000	1.58	96.52	40	0.63
#25	0.710	1.85	94.91	30	0.56
#35	0.500	3.65	91.73	10	0.37
#45	0.355	4.78	87.56	5	0.24
#60	0.250	7.55	80.98	3	0.23
#80	0.180	25.14	59.07	1	0.25
#120	0.125	19.92	41.71	1	0.20
#170	0.090	5.04	37.32	1	0.05
#230	0.063	6.21	31.91	1	0.06

**Total Shell Content:** **4** %



COBBLES	GRAVEL		SAND			SILT OR CLAY
	COARSE	FINE	COARSE	MEDIUM	FINE	

Sample No.	Elev. Or Depth	Classification	% CO <sub>3</sub>	G <sub>s</sub>	Nat w%	LL	PL	PI	Project
♦ 1	48.3-48.8	SAND, clayey, mostly fine-grained quartz, some clay, trace carbonate, trace fragmented limestone, dark greenish gray (SC)	4						Topsail Beach, Surf City & North Topsail
									Area
									Boring No. T1-03-V-230
									Date 9/26/2003

**GRADATION CURVES**



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## VISUAL SHELL CONTENT

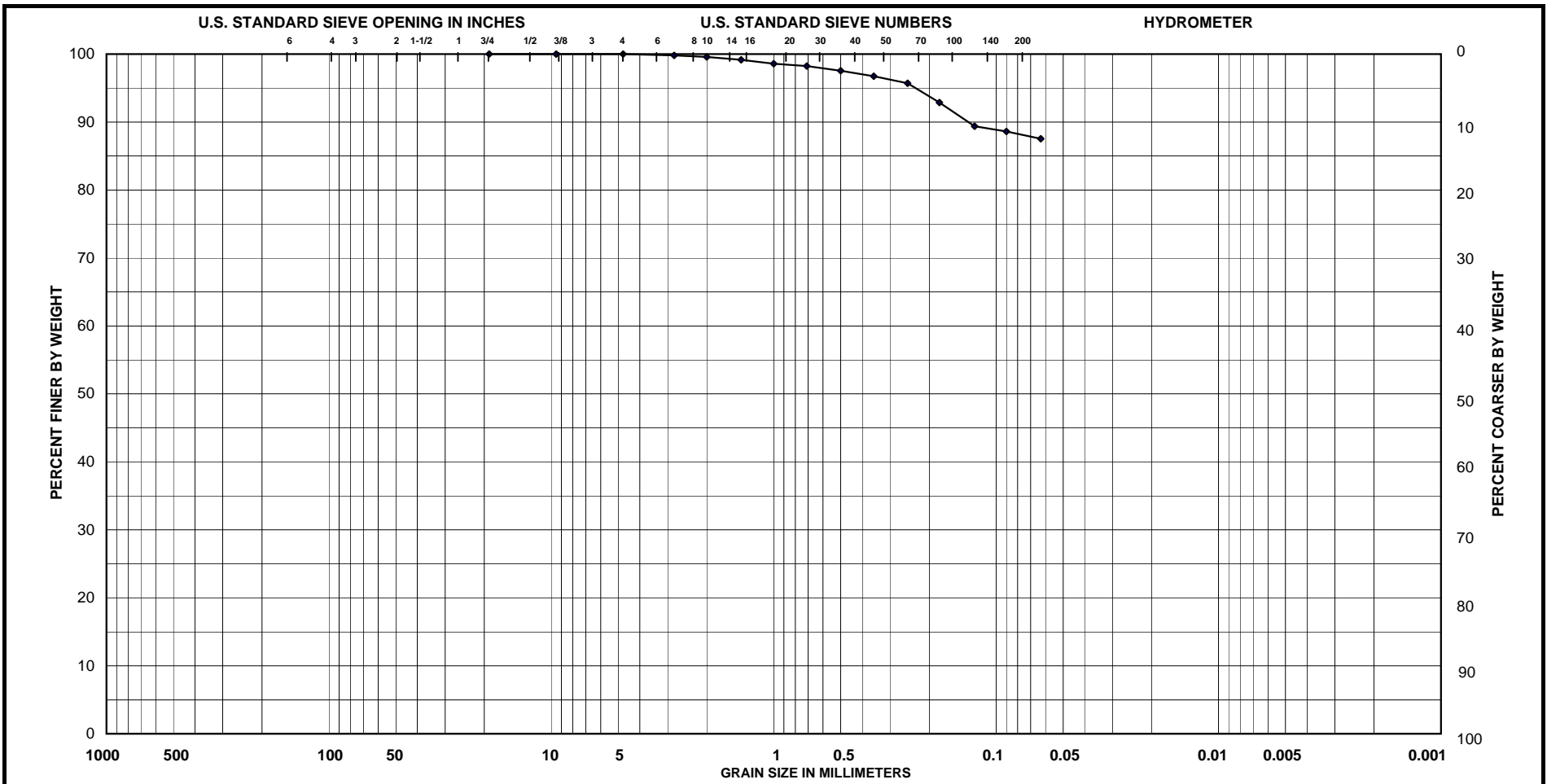
### GRAIN SIZE AND VISUAL SHELL CONTENT

Project:	<b>Topsail Beach, Surf City &amp; North Topsail</b>	Depth:	<b>50.8-51.3</b>
Project No.:	<b>1584-01-40</b>	Date:	<b>9/26/2003</b>
Boring No.:	<b>T1-03-V-230</b>		
Sample No.:	<b>2</b>		
Description:	<b>CLAY, inorganic-H, few fine-grained quartz sand, trace carbonate, dark greenish gray (CH)</b>		

Tare Weight, (g):	<b>50.82</b>	
Dry Wt. Before Washing (g):	<b>119.4</b>	(with tare)
Dry Weight After Washing (g):	<b>59.68</b>	(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	0.12	99.83	100	0.12
#10	2.000	0.17	99.58	60	0.10
#14	1.400	0.29	99.15	30	0.09
#18	1.000	0.40	98.57	10	0.04
#25	0.710	0.24	98.22	10	0.02
#35	0.500	0.46	97.55	10	0.05
#45	0.355	0.55	96.75	5	0.03
#60	0.250	0.71	95.71	3	0.02
#80	0.180	1.95	92.87	1	0.02
#120	0.125	2.38	89.40	1	0.02
#170	0.090	0.53	88.63	1	0.01
#230	0.063	0.74	87.55	1	0.01

**Total Shell Content:** **1** %



COBBLES	GRAVEL		SAND			SILT OR CLAY
	COARSE	FINE	COARSE	MEDIUM	FINE	

Sample No.	Elev. Or Depth	Classification	% CO <sub>3</sub>	G <sub>s</sub>	Nat w%	LL	PL	PI	Project	
♦ 2	50.8-51.3	CLAY, inorganic-H, few fine-grained quartz sand, trace carbonate, dark greenish gray (CH)	1						Topsail Beach, Surf City & North Topsail	
									Area	
									Boring No. T1-03-V-230	
									Date 9/26/2003	

**GRADATION CURVES**



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## VISUAL SHELL CONTENT

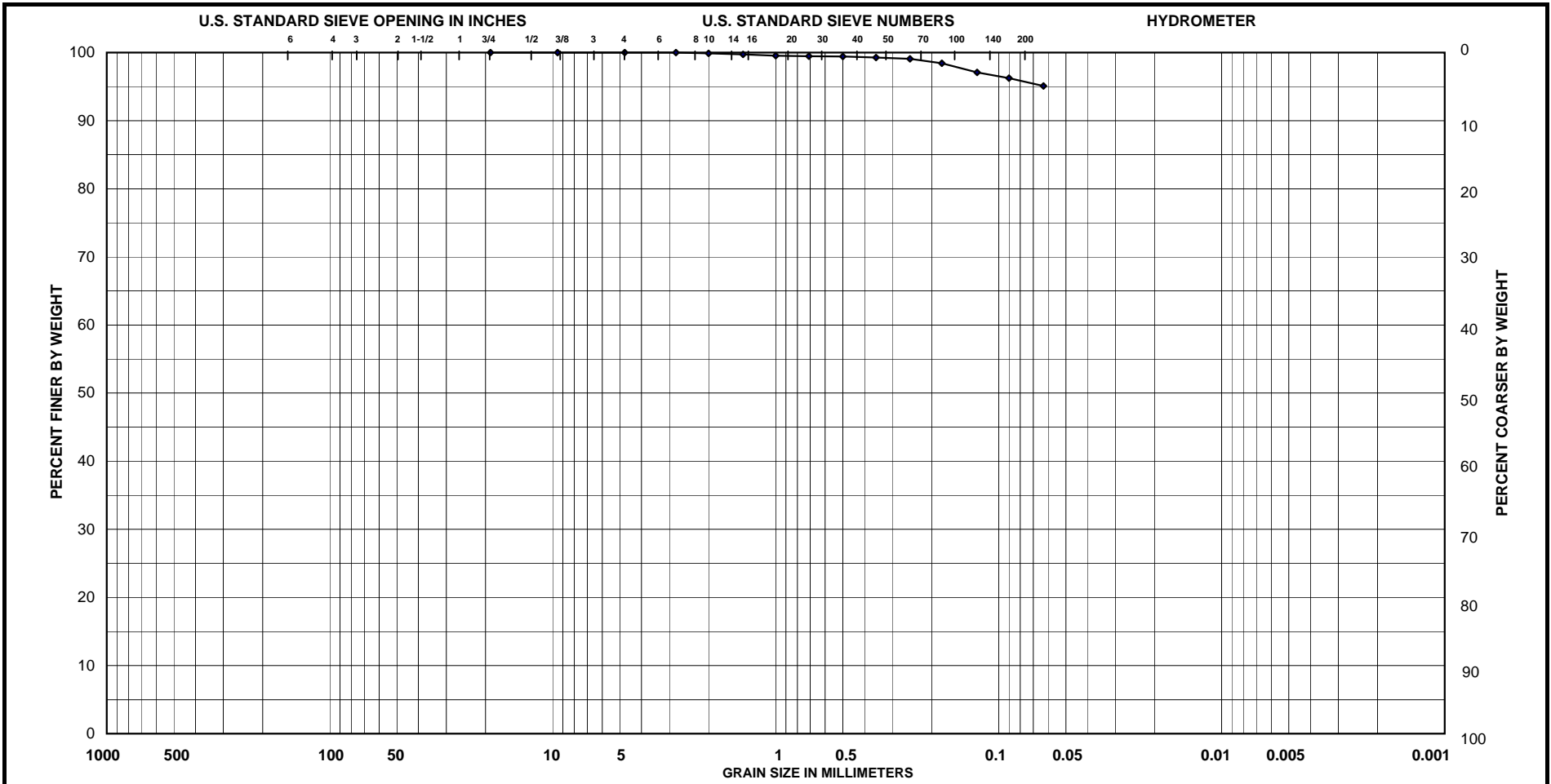
### GRAIN SIZE AND VISUAL SHELL CONTENT

Project:	<b>Topsail Beach, Surf City &amp; North Topsail</b>	Depth:	<b>54.0-54.5</b>
Project No.:	<b>1584-01-40</b>	Date:	<b>9/26/2003</b>
Boring No.:	<b>T1-03-V-230</b>		
Sample No.:	<b>3</b>		
Description:	<b>CLAY, inorganic-H, few fine-grained quartz sand, dark greenish gray (CH)</b>		

Tare Weight, (g):	<b>49.47</b>	
Dry Wt. Before Washing (g):	<b>112.38</b>	(with tare)
Dry Weight After Washing (g):	<b>52.23</b>	(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	99.89	0	0.00
#14	1.400	0.10	99.73	0	0.00
#18	1.000	0.13	99.52	0	0.00
#25	0.710	0.04	99.46	0	0.00
#35	0.500	0.02	99.43	0	0.00
#45	0.355	0.10	99.27	0	0.00
#60	0.250	0.12	99.08	0	0.00
#80	0.180	0.42	98.41	0	0.00
#120	0.125	0.84	97.08	0	0.00
#170	0.090	0.52	96.25	0	0.00
#230	0.063	0.73	95.09	0	0.00

**Total Shell Content:** **0** %



COBBLES	GRAVEL		SAND			SILT OR CLAY
	COARSE	FINE	COARSE	MEDIUM	FINE	

Sample No.	Elev. Or Depth	Classification	% CO <sub>3</sub>	G <sub>s</sub>	Nat w%	LL	PL	PI	Project
♦ 3	54.0-54.5	CLAY, inorganic-H, few fine-grained quartz sand, dark greenish gray (CH)	0						Topsail Beach, Surf City & North Topsail
									Area
									Boring No. T1-03-V-230
									Date 9/26/2003

**GRADATION CURVES**



# WOLF TECHNOLOGIES, INC.

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## VISUAL SHELL CONTENT

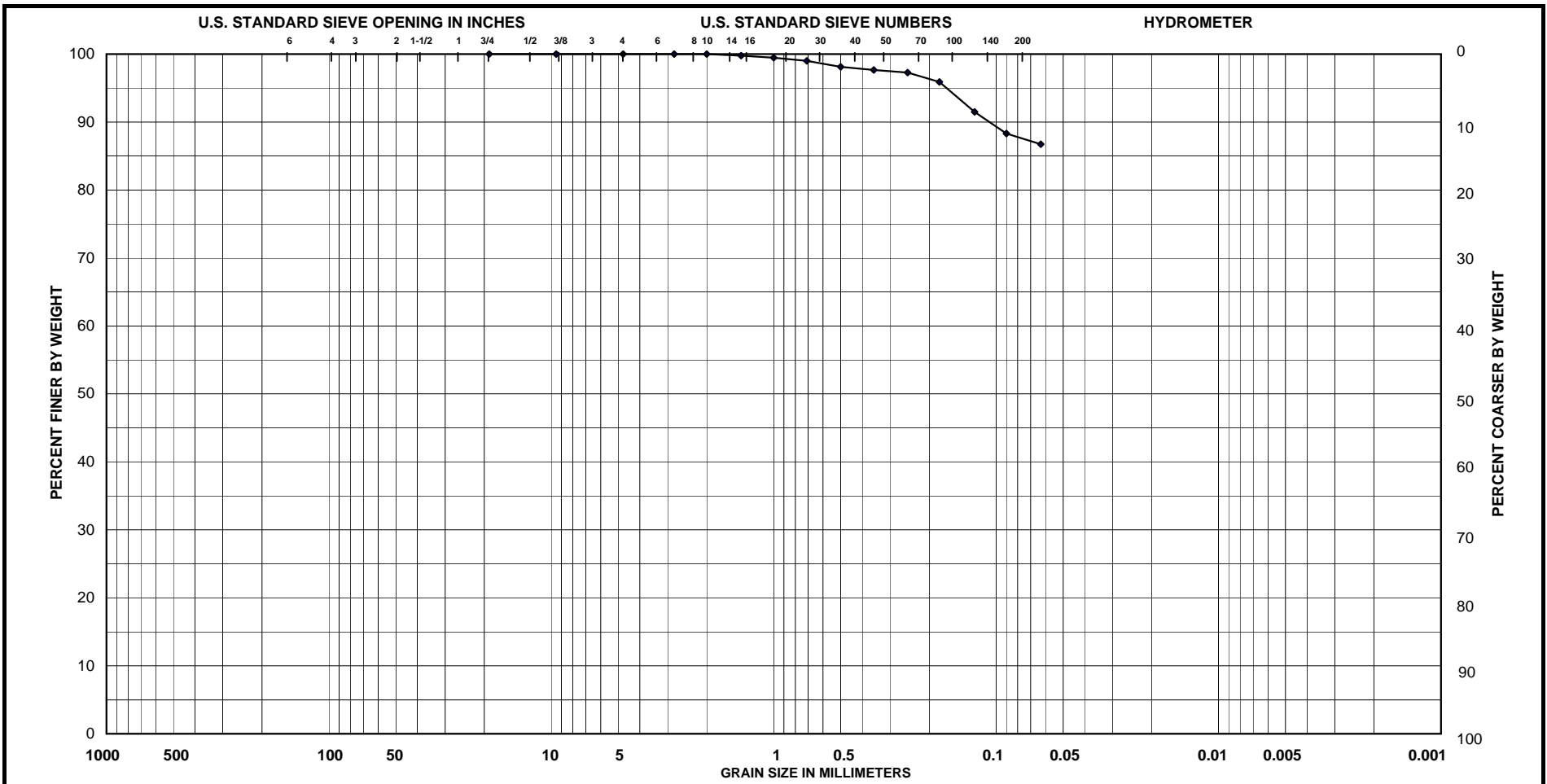
### GRAIN SIZE AND VISUAL SHELL CONTENT

Project:	<b>Topsail Beach, Surf City &amp; North Topsail</b>	Depth:	<b>56.0-57.5</b>
Project No.:	<b>1584-01-40</b>	Date:	<b>9/26/2003</b>
Boring No.:	<b>T1-03-V-230</b>		
Sample No.:	<b>4</b>		
Description:	<b>CLAY, inorganic-H, few fine-grained quartz sand, very dark greenish gray (CH)</b>		

Tare Weight, (g):	<b>50.37</b>	
Dry Wt. Before Washing (g):	<b>120.58</b>	(with tare)
Dry Weight After Washing (g):	<b>59.67</b>	(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	0.00	100.00	0	0.00
#14	1.400	0.17	99.76	3	0.01
#18	1.000	0.22	99.44	3	0.01
#25	0.710	0.32	98.99	5	0.02
#35	0.500	0.61	98.12	5	0.03
#45	0.355	0.31	97.68	5	0.02
#60	0.250	0.29	97.27	3	0.01
#80	0.180	0.96	95.90	1	0.01
#120	0.125	3.10	91.48	1	0.03
#170	0.090	2.23	88.31	1	0.02
#230	0.063	1.09	86.75	1	0.01

**Total Shell Content:** **0** %



COBBLES	GRAVEL		SAND			SILT OR CLAY
	COARSE	FINE	COARSE	MEDIUM	FINE	

Sample No.	Elev. Or Depth	Classification	% CO <sub>3</sub>	G <sub>s</sub>	Nat w%	LL	PL	PI	Project
4	56.0-57.5	CLAY, inorganic-H, few fine-grained quartz sand, very dark greenish gray (CH)	0						Topsail Beach, Surf City & North Topsail
									Area
									Boring No. T1-03-V-230
									Date 9/26/2003

**GRADATION CURVES**





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## VISUAL SHELL CONTENT

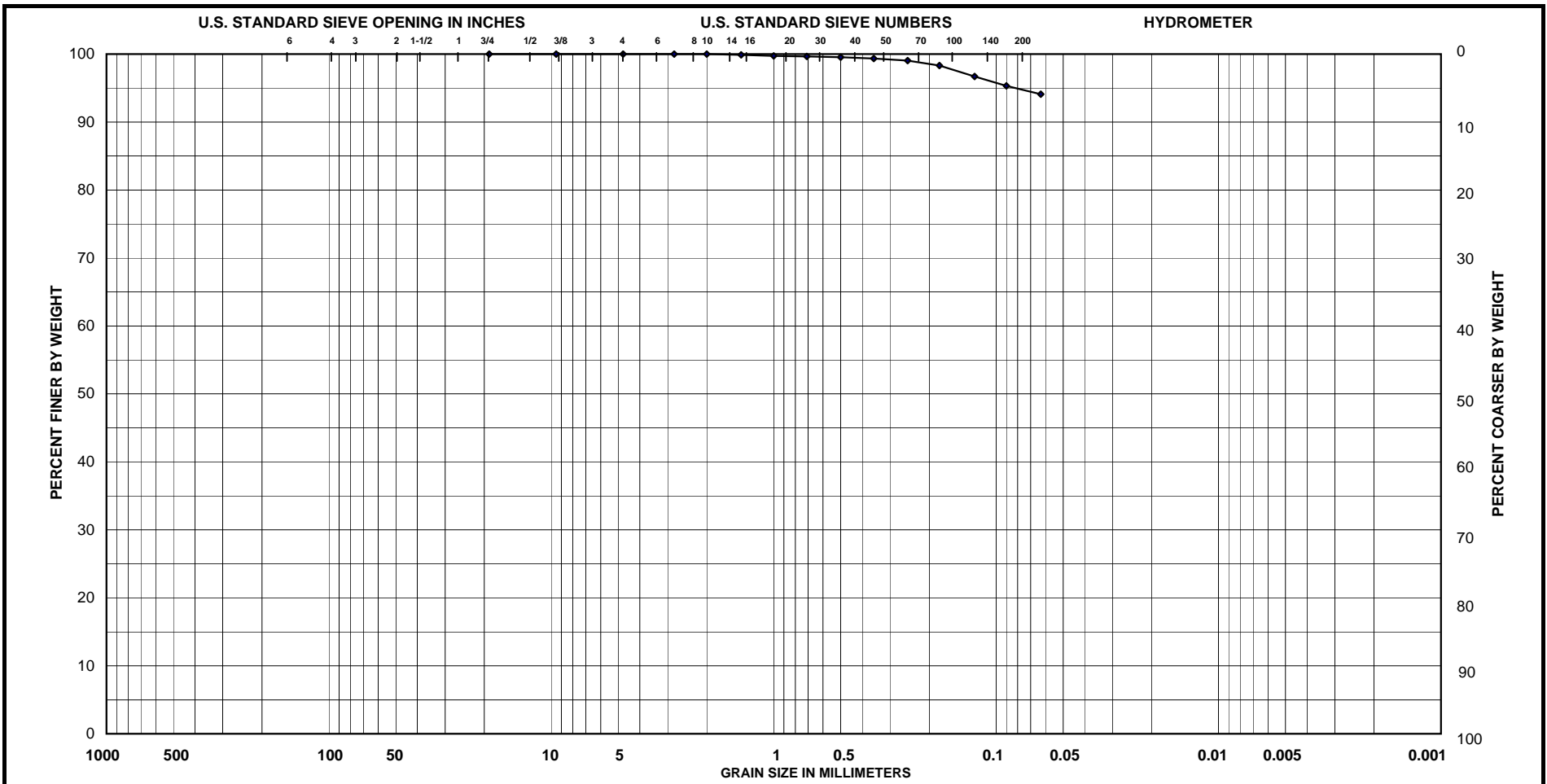
### GRAIN SIZE AND VISUAL SHELL CONTENT

Project:	<b>Topsail Beach, Surf City &amp; North Topsail</b>	Depth:	<b>59.0-59.5</b>
Project No.:	<b>1584-01-40</b>	Date:	<b>9/26/2003</b>
Boring No.:	<b>T1-03-V-230</b>		
Sample No.:	<b>5</b>		
Description:	<b>CLAY, inorganic-H, few fine-grained quartz sand, very dark greenish gray (CH)</b>		

Tare Weight, (g):	<b>50.16</b>	
Dry Wt. Before Washing (g):	<b>116.18</b>	(with tare)
Dry Weight After Washing (g):	<b>53.83</b>	(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	0.00	100.00	0	0.00
#14	1.400	0.07	99.89	0	0.00
#18	1.000	0.10	99.74	3	0.00
#25	0.710	0.05	99.67	3	0.00
#35	0.500	0.09	99.53	5	0.00
#45	0.355	0.11	99.36	5	0.01
#60	0.250	0.22	99.03	3	0.01
#80	0.180	0.48	98.30	1	0.00
#120	0.125	1.06	96.70	1	0.01
#170	0.090	0.91	95.32	1	0.01
#230	0.063	0.81	94.09	1	0.01

**Total Shell Content:** **0** %



COBBLES	GRAVEL		SAND			SILT OR CLAY
	COARSE	FINE	COARSE	MEDIUM	FINE	

Sample No.	Elev. Or Depth	Classification	% CO <sub>3</sub>	G <sub>s</sub>	Nat w%	LL	PL	PI	Project
5	59.0-59.5	CLAY, inorganic-H, few fine-grained quartz sand, very dark greenish gray (CH)	0						Topsail Beach, Surf City & North Topsail
									Area
									Boring No. T1-03-V-230
									Date 9/26/2003

**GRADATION CURVES**



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## VISUAL SHELL CONTENT

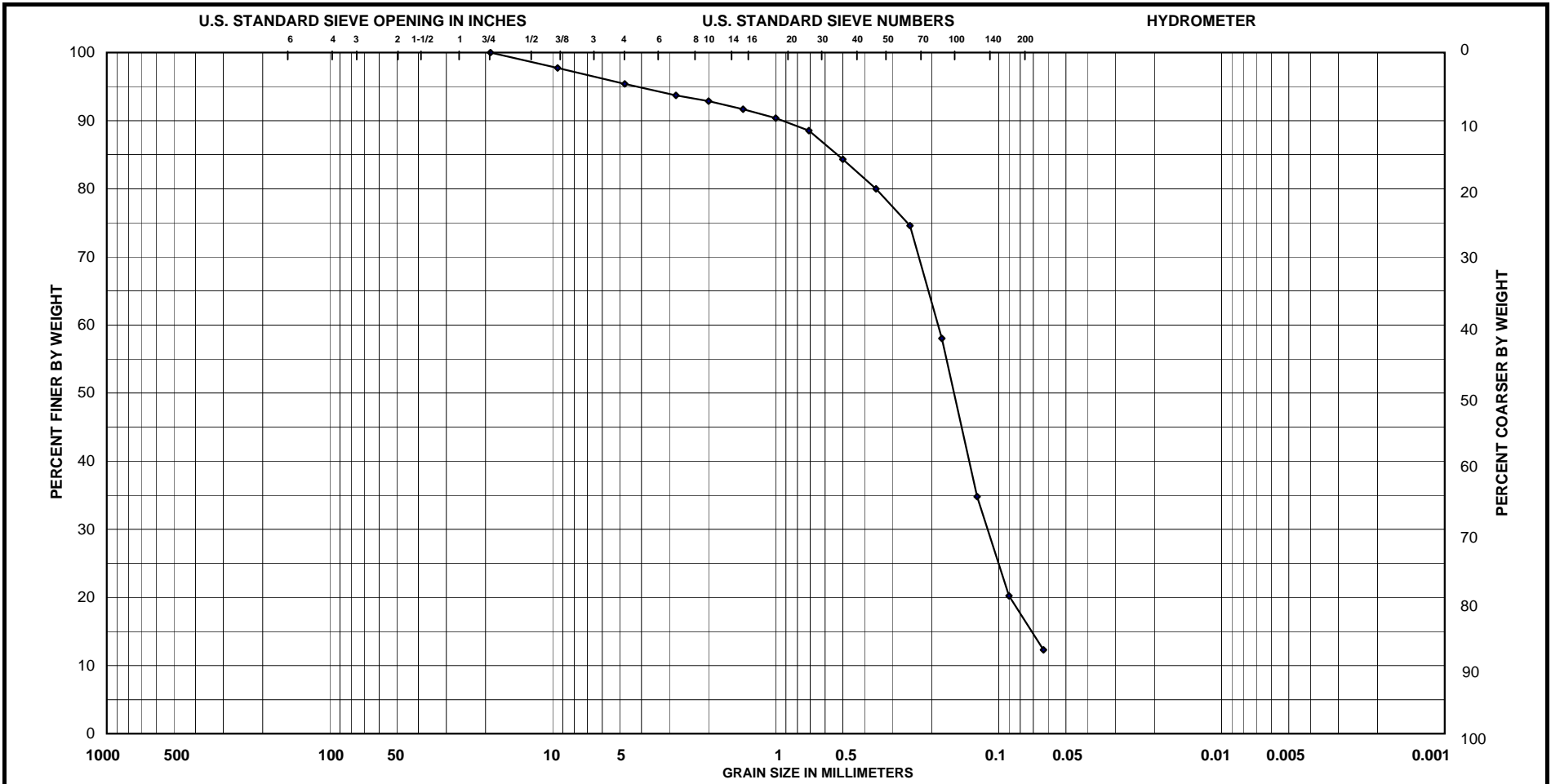
### GRAIN SIZE AND VISUAL SHELL CONTENT

Project:	<b>Topsail Beach, Surf City &amp; North Topsail</b>	Depth:	<b>48.0-48.5</b>
Project No.:	<b>1584-01-40</b>	Date:	<b>9/26/2003</b>
Boring No.:	<b>T1-03-V-231</b>		
Sample No.:	<b>1</b>		
Description:	<b>SAND, poorly-graded with silt, mostly fine-grained quartz, little silt, few carbonate, trace fragmented limestone, dark greenish gray (SP-SM)</b>		

Tare Weight, (g):	<b>50.13</b>	
Dry Wt. Before Washing (g):	<b>171.7</b>	(with tare)
Dry Weight After Washing (g):	<b>158.16</b>	(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	2.73	97.75	100	2.73
#4	4.750	2.84	95.42	100	2.84
#7	2.800	2.09	93.70	60	1.25
#10	2.000	1.01	92.87	70	0.71
#14	1.400	1.45	91.68	65	0.94
#18	1.000	1.56	90.39	50	0.78
#25	0.710	2.23	88.56	25	0.56
#35	0.500	5.16	84.31	10	0.52
#45	0.355	5.25	80.00	5	0.26
#60	0.250	6.57	74.59	3	0.20
#80	0.180	20.15	58.02	1	0.20
#120	0.125	28.24	34.79	1	0.28
#170	0.090	17.71	20.22	1	0.18
#230	0.063	9.62	12.31	1	0.10

**Total Shell Content:** **9** %



COBBLES	GRAVEL		SAND			SILT OR CLAY
	COARSE	FINE	COARSE	MEDIUM	FINE	

Sample No.	Elev. Or Depth	Classification	% CO <sub>3</sub>	G <sub>s</sub>	Nat w%	LL	PL	PI	Project
♦ 1	48.0-48.5	SAND, poorly-graded with silt, mostly fine-grained quartz, little silt, few carbonate, trace fragmented limestone, dark greenish gray (SP-SM)	9						Topsail Beach, Surf City & North Topsail
									Area
									Boring No. T1-03-V-231
									Date 9/26/2003

**GRADATION CURVES**



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## VISUAL SHELL CONTENT

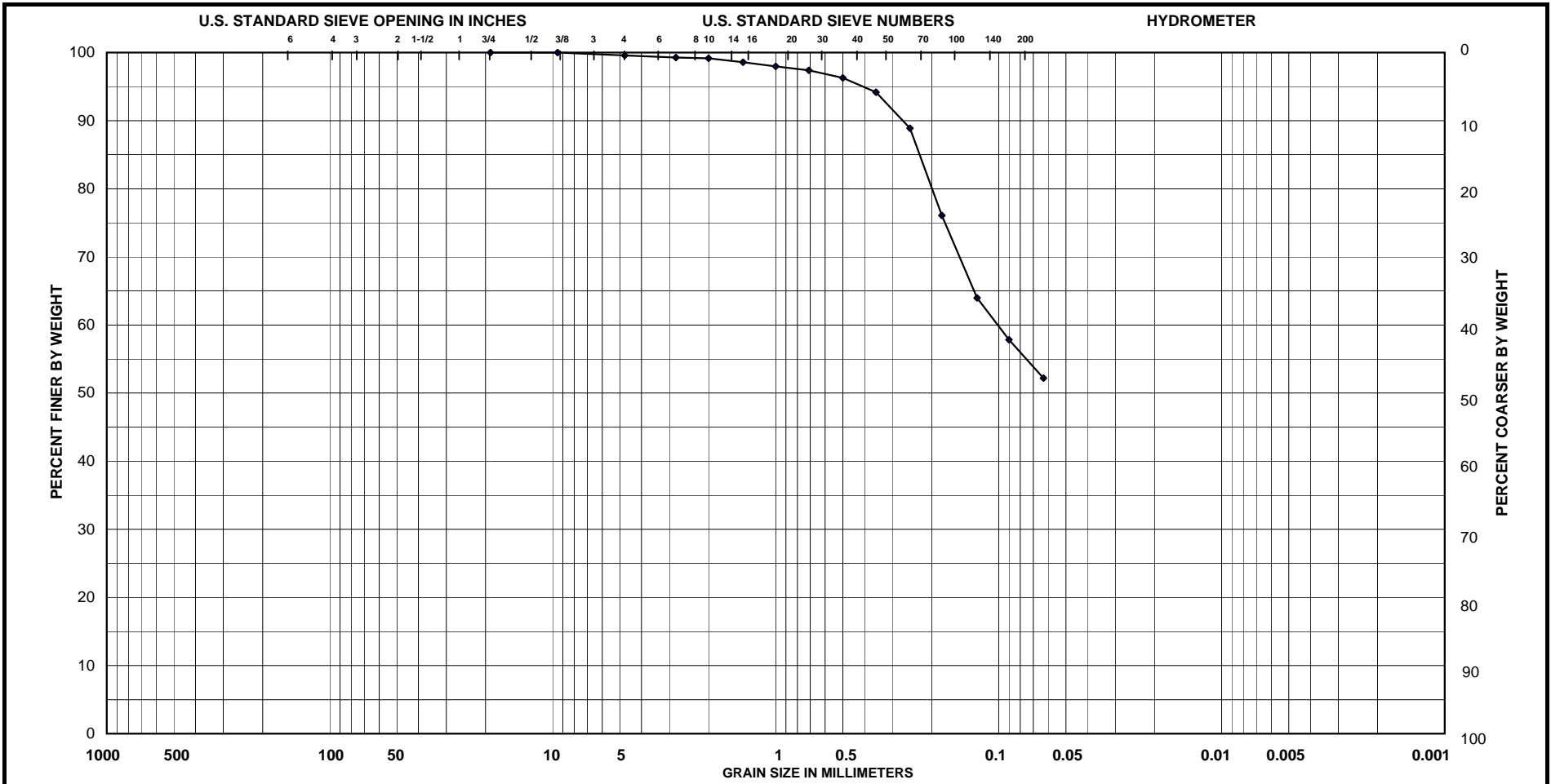
### GRAIN SIZE AND VISUAL SHELL CONTENT

Project:	<b>Topsail Beach, Surf City &amp; North Topsail</b>	Depth:	<b>50.7-51.2</b>
Project No.:	<b>1584-01-40</b>	Date:	<b>9/26/2003</b>
Boring No.:	<b>T1-03-V-231</b>		
Sample No.:	<b>2</b>		
Description:	<b>CLAY, inorganic-H, some fine-grained quartz sand, trace carbonate, very dark greenish gray (CH)</b>		

Tare Weight, (g):	<b>50.02</b>	
Dry Wt. Before Washing (g):	<b>148.11</b>	(with tare)
Dry Weight After Washing (g):	<b>97.97</b>	(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	0.42	99.57	100	0.42
#7	2.800	0.29	99.28	100	0.29
#10	2.000	0.12	99.15	70	0.08
#14	1.400	0.56	98.58	30	0.17
#18	1.000	0.59	97.98	25	0.15
#25	0.710	0.58	97.39	15	0.09
#35	0.500	1.09	96.28	10	0.11
#45	0.355	2.05	94.19	3	0.06
#60	0.250	5.20	88.89	1	0.05
#80	0.180	12.55	76.09	1	0.13
#120	0.125	11.88	63.98	1	0.12
#170	0.090	6.01	57.86	1	0.06
#230	0.063	5.56	52.19	1	0.06

**Total Shell Content:** **2** %



COBBLES	GRAVEL		SAND			SILT OR CLAY
	COARSE	FINE	COARSE	MEDIUM	FINE	

Sample No.	Elev. Or Depth	Classification	% CO <sub>3</sub>	G <sub>s</sub>	Nat w%	LL	PL	PI	Project	
♦ 2	50.7-51.2	CLAY, inorganic-H, some fine-grained quartz sand, trace carbonate, very dark greenish gray (CH)	2						Topsail Beach, Surf City & North Topsail	
									Area	
									Boring No. T1-03-V-231	
									Date 9/26/2003	

**GRADATION CURVES**



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## VISUAL SHELL CONTENT

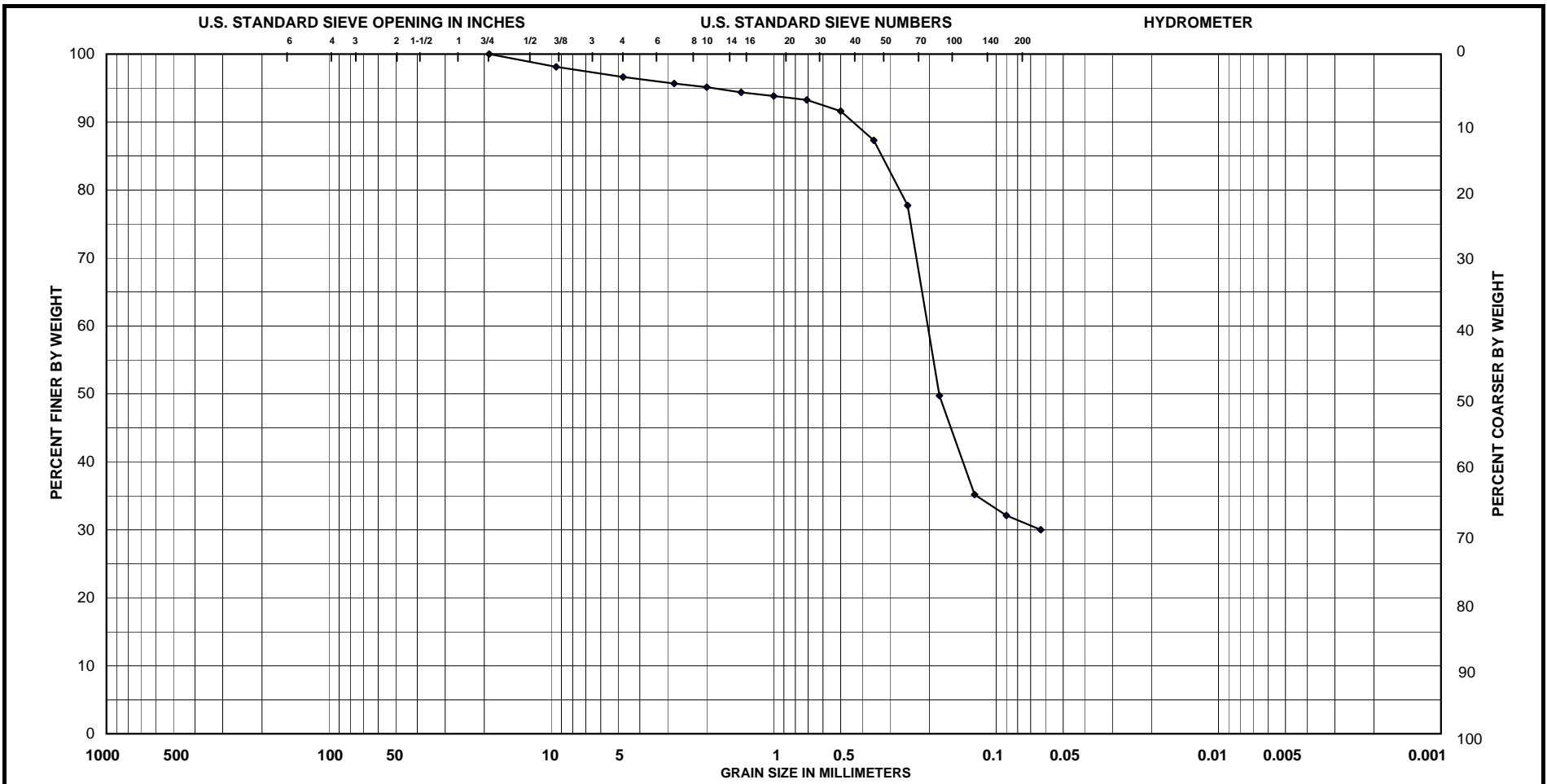
### GRAIN SIZE AND VISUAL SHELL CONTENT

Project:	<b>Topsail Beach, Surf City &amp; North Topsail</b>	Depth:	<b>51.8-52.3</b>
Project No.:	<b>1584-01-40</b>	Date:	<b>9/26/2003</b>
Boring No.:	<b>T1-03-V-231</b>		
Sample No.:	<b>3</b>		
Description:	<b>SAND, silty, mostly fine-grained quartz, some silt, few carbonate, trace fragmented limestone, very dark greenish gray (SM)</b>		

Tare Weight, (g):	<b>50.87</b>	
Dry Wt. Before Washing (g):	<b>167.51</b>	(with tare)
Dry Weight After Washing (g):	<b>132.83</b>	(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	2.20	98.11	100	2.20
#4	4.750	1.74	96.62	100	1.74
#7	2.800	1.11	95.67	85	0.94
#10	2.000	0.63	95.13	80	0.50
#14	1.400	0.90	94.36	65	0.59
#18	1.000	0.62	93.83	65	0.40
#25	0.710	0.65	93.27	60	0.39
#35	0.500	1.93	91.62	35	0.68
#45	0.355	5.01	87.32	10	0.50
#60	0.250	11.18	77.73	3	0.34
#80	0.180	32.66	49.73	3	0.98
#120	0.125	16.96	35.19	1	0.17
#170	0.090	3.59	32.12	1	0.04
#230	0.063	2.46	30.01	1	0.02

**Total Shell Content:** **8** %



COBBLES	GRAVEL		SAND			SILT OR CLAY
	COARSE	FINE	COARSE	MEDIUM	FINE	

Sample No.	Elev. Or Depth	Classification	% CO <sub>3</sub>	G <sub>s</sub>	Nat w%	LL	PL	PI	Project
♦ 3	51.8-52.3	SAND, silty, mostly fine-grained quartz, some silt, few carbonate, trace fragmented limestone, very dark greenish gray (SM)	8						Topsail Beach, Surf City & North Topsail
									Area
									Boring No. T1-03-V-231
									Date 9/26/2003

**GRADATION CURVES**





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## VISUAL SHELL CONTENT

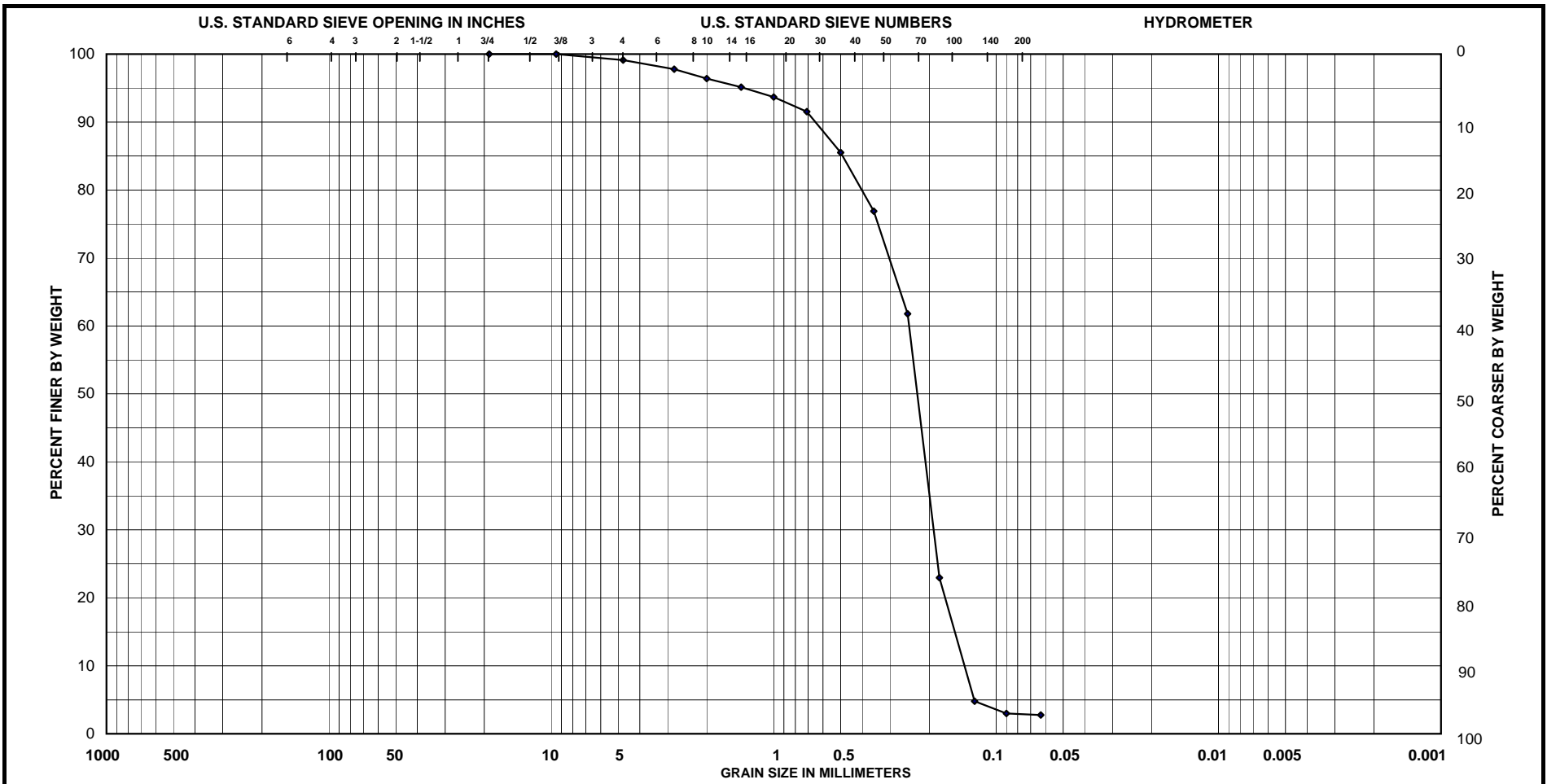
### GRAIN SIZE AND VISUAL SHELL CONTENT

Project:	<b>Topsail Beach, Surf City &amp; North Topsail</b>	Depth:	<b>48.3-48.8</b>
Project No.:	<b>1584-01-40</b>	Date:	<b>9/26/2003</b>
Boring No.:	<b>T1-03-V-232</b>		
Sample No.:	<b>1</b>		
Description:	<b>SAND, poorly-graded, mostly fine-grained quartz, few carbonate, dark gray (SP)</b>		

Tare Weight, (g):	<b>49.78</b>	
Dry Wt. Before Washing (g):	<b>176.37</b>	(with tare)
Dry Weight After Washing (g):	<b>173.45</b>	(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	1.11	99.12	100	1.11
#7	2.800	1.72	97.76	85	1.46
#10	2.000	1.71	96.41	80	1.37
#14	1.400	1.62	95.13	70	1.13
#18	1.000	1.86	93.66	65	1.21
#25	0.710	2.72	91.52	35	0.95
#35	0.500	7.60	85.51	15	1.14
#45	0.355	10.94	76.87	3	0.33
#60	0.250	19.09	61.79	3	0.57
#80	0.180	49.14	22.97	1	0.49
#120	0.125	23.01	4.80	1	0.23
#170	0.090	2.28	2.99	1	0.02
#230	0.063	0.32	2.74	1	0.00

**Total Shell Content:** **8** %





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## VISUAL SHELL CONTENT

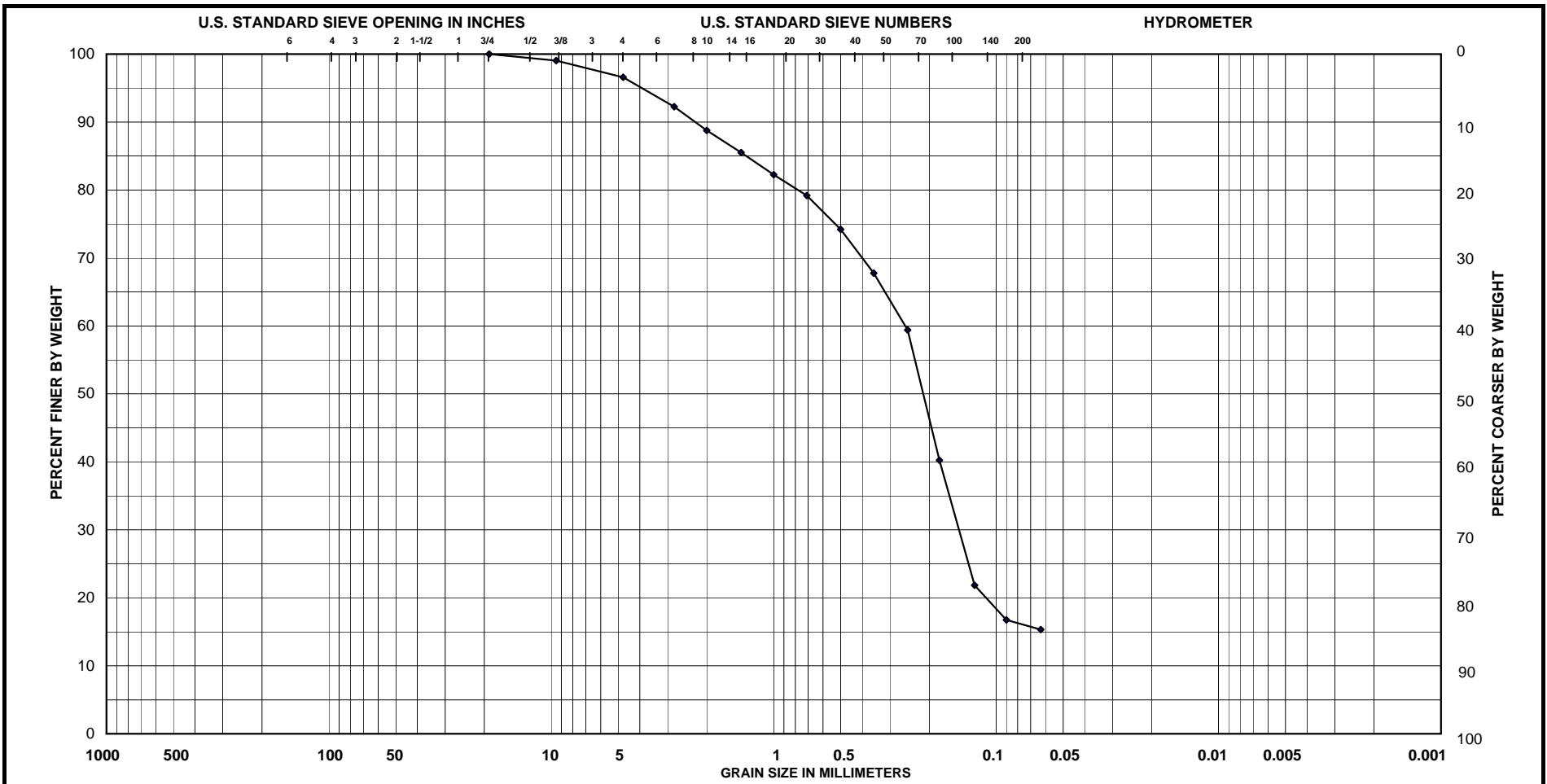
### GRAIN SIZE AND VISUAL SHELL CONTENT

Project:	<b>Topsail Beach, Surf City &amp; North Topsail</b>	Depth:	<b>50.1-50.6</b>
Project No.:	<b>1584-01-40</b>	Date:	<b>9/26/2003</b>
Boring No.:	<b>T1-03-V-232</b>		
Sample No.:	<b>2</b>		
Description:	<b>SAND, silty, mostly fine-grained quartz, little coarse to medium-grained carbonate, trace fine gravel-size carbonate, trace fragmented</b>		

Tare Weight, (g):	<b>50.33</b>	
Dry Wt. Before Washing (g):	<b>176.17</b>	(with tare)
Dry Weight After Washing (g):	<b>157.65</b>	(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	1.19	99.05	100	1.19
#4	4.750	3.10	96.59	100	3.10
#7	2.800	5.47	92.24	80	4.38
#10	2.000	4.36	88.78	75	3.27
#14	1.400	4.12	85.51	70	2.88
#18	1.000	4.09	82.26	60	2.45
#25	0.710	3.88	79.17	60	2.33
#35	0.500	6.25	74.21	45	2.81
#45	0.355	8.11	67.76	20	1.62
#60	0.250	10.51	59.41	5	0.53
#80	0.180	24.12	40.24	3	0.72
#120	0.125	23.15	21.85	1	0.23
#170	0.090	6.41	16.75	1	0.06
#230	0.063	1.80	15.32	1	0.02

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



COBBLES	GRAVEL		SAND			SILT OR CLAY
	COARSE	FINE	COARSE	MEDIUM	FINE	

Sample No.	Elev. Or Depth	Classification	% CO <sub>3</sub>	G <sub>s</sub>	Nat w%	LL	PL	PI	Project
♦ 2	50.1-50.6	SAND, silty, mostly fine-grained quartz, little coarse to medium-grained carbonate, trace fine gravel-size carbonate, trace fragmented limestone, dark gray (SM)	20						Topsail Beach, Surf City & North Topsail
									Area
									Boring No. T1-03-V-232
									Date 9/26/2003

**GRADATION CURVES**



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## VISUAL SHELL CONTENT

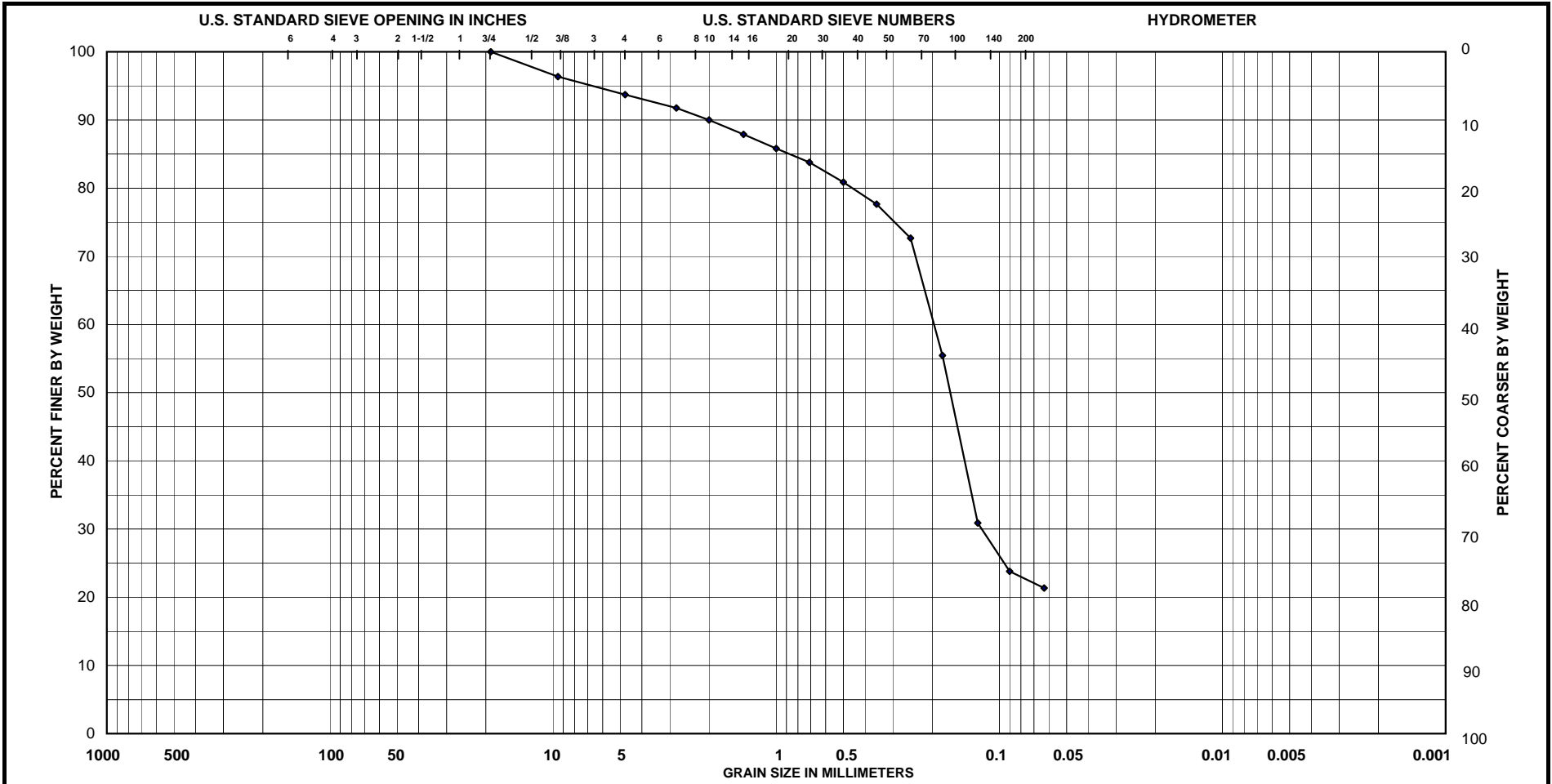
### GRAIN SIZE AND VISUAL SHELL CONTENT

Project:	<b>Topsail Beach, Surf City &amp; North Topsail</b>	Depth:	<b>51.1-51.6</b>
Project No.:	<b>1584-01-40</b>	Date:	<b>9/26/2003</b>
Boring No.:	<b>T1-03-V-232</b>		
Sample No.:	<b>3</b>		
Description:	<b>SAND, silty, mostly fine-grained quartz, little coarse to medium-grained fragmented limestone, few fine gravel-size fragmented limestone, trace</b>		

Tare Weight, (g):	<b>50.15</b>	
Dry Wt. Before Washing (g):	<b>174.05</b>	(with tare)
Dry Weight After Washing (g):	<b>148.42</b>	(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	4.52	96.35	0	0.00
#4	4.750	3.25	93.73	0	0.00
#7	2.800	2.42	91.78	10	0.24
#10	2.000	2.22	89.98	15	0.33
#14	1.400	2.61	87.88	5	0.13
#18	1.000	2.55	85.82	5	0.13
#25	0.710	2.52	83.79	3	0.08
#35	0.500	3.59	80.89	3	0.11
#45	0.355	4.03	77.64	3	0.12
#60	0.250	6.15	72.67	0	0.00
#80	0.180	21.32	55.46	0	0.00
#120	0.125	30.46	30.88	0	0.00
#170	0.090	8.77	23.80	0	0.00
#230	0.063	3.06	21.33	0	0.00

**Total Shell Content:** **1** %



COBBLES	GRAVEL		SAND			SILT OR CLAY
	COARSE	FINE	COARSE	MEDIUM	FINE	

Sample No.	Elev. Or Depth	Classification	% CO <sub>3</sub>	G <sub>s</sub>	Nat w%	LL	PL	PI	Project
♦ 3	51.1-51.6	SAND, silty, mostly fine-grained quartz, little coarse to medium-grained fragmented limestone, few fine gravel-size fragmented limestone, trace carbonate, olive gray (SM)	1						Topsail Beach, Surf City & North Topsail
									Area
									Boring No. T1-03-V-232
									Date 9/26/2003

**GRADATION CURVES**



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## VISUAL SHELL CONTENT

### GRAIN SIZE AND VISUAL SHELL CONTENT

Project:	<b>Topsail Beach, Surf City &amp; North Topsail</b>	Depth:	<b>48.5-49.0</b>
Project No.:	<b>1584-01-40</b>	Date:	<b>9/26/2003</b>
Boring No.:	<b>T1-03-V-233</b>		
Sample No.:	<b>1</b>		
Description:	<b>SAND, silty, mostly fine-grained quartz, little coarse to medium-grained fragmented limestone, little silt, few carbonate, dark greenish gray</b>		

Tare Weight, (g):	<b>50.66</b>	
Dry Wt. Before Washing (g):	<b>175.58</b>	(with tare)
Dry Weight After Washing (g):	<b>156.11</b>	(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	1.38	98.90	30	0.41
#7	2.800	3.39	96.18	55	1.86
#10	2.000	2.86	93.89	50	1.43
#14	1.400	3.69	90.94	45	1.66
#18	1.000	3.77	87.92	40	1.51
#25	0.710	4.62	84.22	30	1.39
#35	0.500	8.31	77.57	15	1.25
#45	0.355	8.85	70.49	5	0.44
#60	0.250	10.13	62.38	3	0.30
#80	0.180	29.12	39.07	1	0.29
#120	0.125	21.50	21.85	1	0.22
#170	0.090	4.68	18.11	1	0.05
#230	0.063	2.25	16.31	1	0.02

**Total Shell Content:** **9** %







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## VISUAL SHELL CONTENT

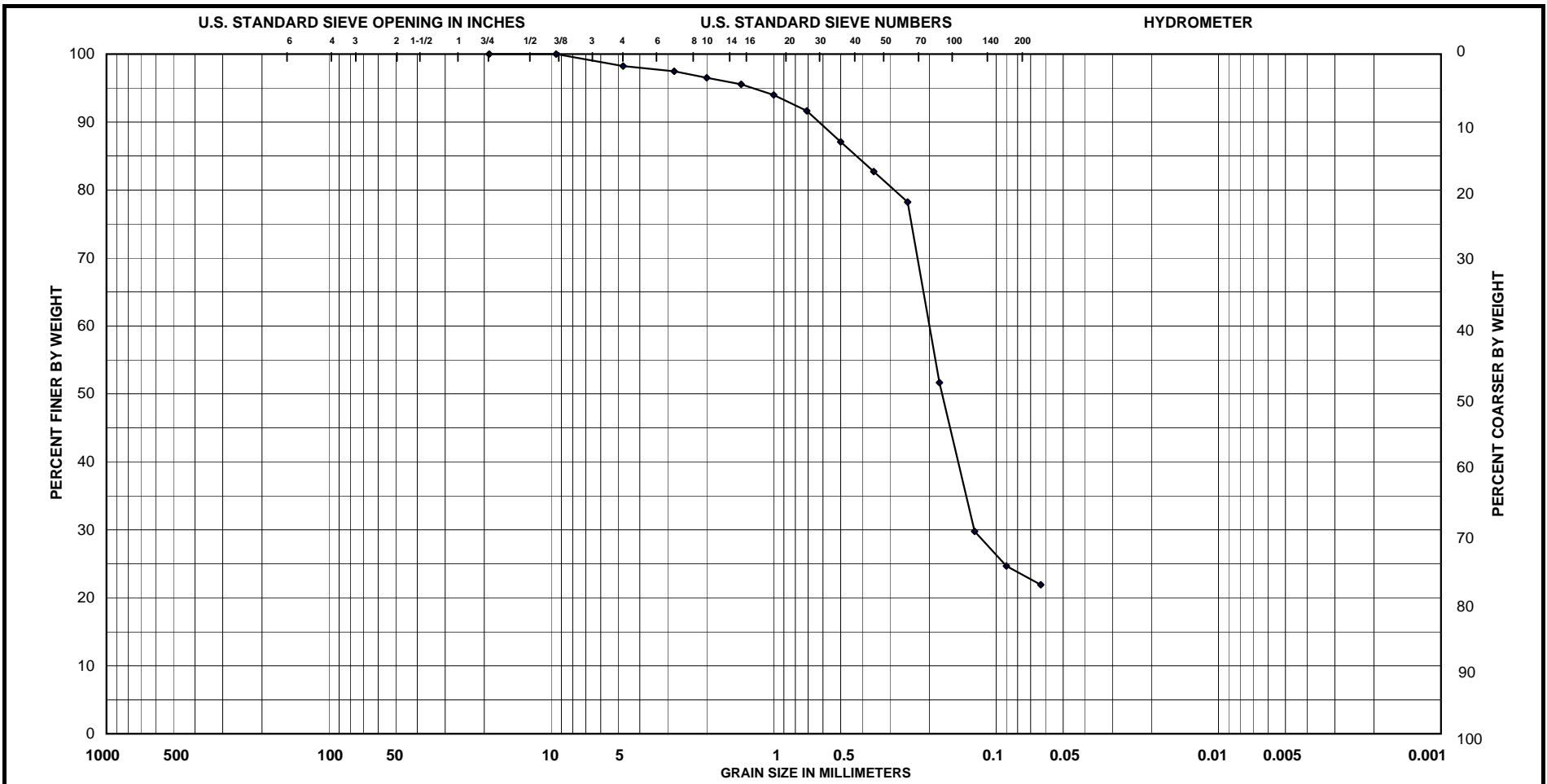
### GRAIN SIZE AND VISUAL SHELL CONTENT

Project:	<b>Topsail Beach, Surf City &amp; North Topsail</b>	Depth:	<b>50.5-51.0</b>
Project No.:	<b>1584-01-40</b>	Date:	<b>9/26/2003</b>
Boring No.:	<b>T1-03-V-233</b>		
Sample No.:	<b>2</b>		
Description:	<b>SAND, silty, mostly fine-grained quartz, little coarse to medium-grained fragmented limestone, trace fine gravel-size fragmented limestone,</b>		

Tare Weight, (g):	<b>50.48</b>	
Dry Wt. Before Washing (g):	<b>173.72</b>	(with tare)
Dry Weight After Washing (g):	<b>147.57</b>	(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	2.15	98.26	0	0.00
#7	2.800	0.98	97.46	0	0.00
#10	2.000	1.16	96.52	3	0.03
#14	1.400	1.21	95.54	3	0.04
#18	1.000	1.92	93.98	2	0.04
#25	0.710	2.89	91.63	3	0.09
#35	0.500	5.61	87.08	1	0.06
#45	0.355	5.39	82.71	1	0.05
#60	0.250	5.52	78.23	0	0.00
#80	0.180	32.73	51.67	0	0.00
#120	0.125	26.97	29.79	0	0.00
#170	0.090	6.28	24.69	0	0.00
#230	0.063	3.39	21.94	0	0.00

**Total Shell Content:** **0** %



COBBLES	GRAVEL		SAND			SILT OR CLAY
	COARSE	FINE	COARSE	MEDIUM	FINE	

Sample No.	Elev. Or Depth	Classification	% CO <sub>3</sub>	G <sub>s</sub>	Nat w%	LL	PL	PI	Project
♦ 2	50.5-51.0	SAND, silty, mostly fine-grained quartz, little coarse to medium-grained fragmented limestone, trace fine gravel-size fragmented limestone, olive gray (SM)	0						Topsail Beach, Surf City & North Topsail
									Area
									Boring No. T1-03-V-233
									Date 9/26/2003

**GRADATION CURVES**



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## VISUAL SHELL CONTENT

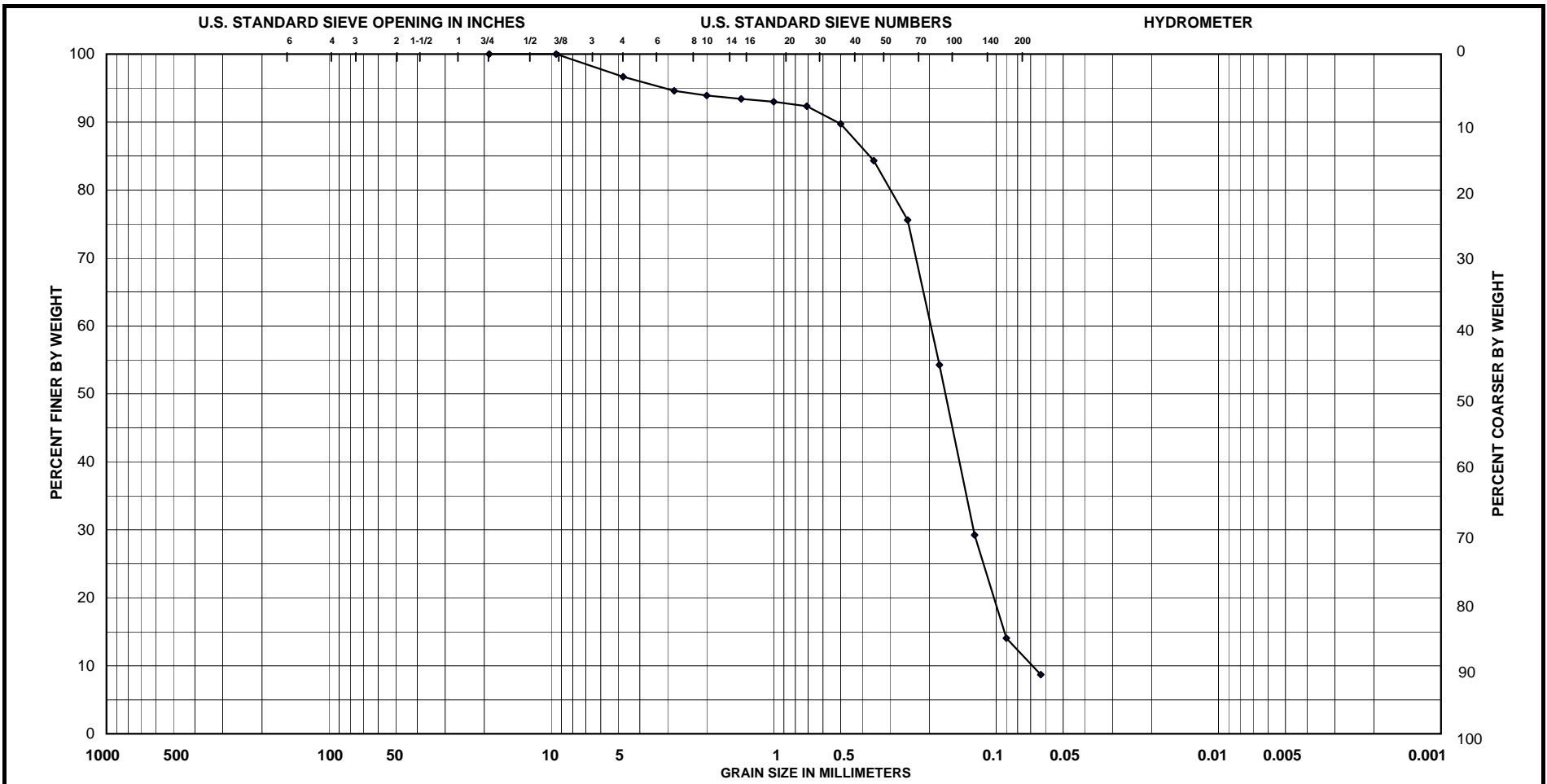
### GRAIN SIZE AND VISUAL SHELL CONTENT

Project:	<b>Topsail Beach, Surf City &amp; North Topsail</b>	Depth:	<b>48.3-48.8</b>
Project No.:	<b>1584-01-40</b>	Date:	<b>9/26/2003</b>
Boring No.:	<b>T1-03-V-234</b>		
Sample No.:	<b>1</b>		
Description:	<b>SAND, poorly-graded with silt, mostly fine-grained quartz, few silt, few fragmented limestone, trace carbonate, olive gray (SP-SM)</b>		

Tare Weight, (g):	<b>50.29</b>	
Dry Wt. Before Washing (g):	<b>179.66</b>	(with tare)
Dry Weight After Washing (g):	<b>170.87</b>	(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	4.29	96.68	0	0.00
#7	2.800	2.71	94.59	10	0.27
#10	2.000	0.86	93.92	40	0.34
#14	1.400	0.68	93.40	30	0.20
#18	1.000	0.54	92.98	40	0.22
#25	0.710	0.85	92.32	30	0.26
#35	0.500	3.38	89.71	10	0.34
#45	0.355	6.96	84.33	3	0.21
#60	0.250	11.32	75.58	3	0.34
#80	0.180	27.59	54.26	1	0.28
#120	0.125	32.34	29.26	1	0.32
#170	0.090	19.64	14.08	1	0.20
#230	0.063	6.93	8.72	1	0.07

**Total Shell Content:** **2** %



COBBLES	GRAVEL		SAND			SILT OR CLAY
	COARSE	FINE	COARSE	MEDIUM	FINE	

Sample No.	Elev. Or Depth	Classification	% CO <sub>3</sub>	G <sub>s</sub>	Nat w%	LL	PL	PI	Project
♦ 1	48.3-48.8	SAND, poorly-graded with silt, mostly fine-grained quartz, few silt, few fragmented limestone, trace carbonate, olive gray (SP-SM)	2						Topsail Beach, Surf City & North Topsail
									Area
									Boring No. T1-03-V-234
									Date 9/26/2003

**GRADATION CURVES**



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## VISUAL SHELL CONTENT

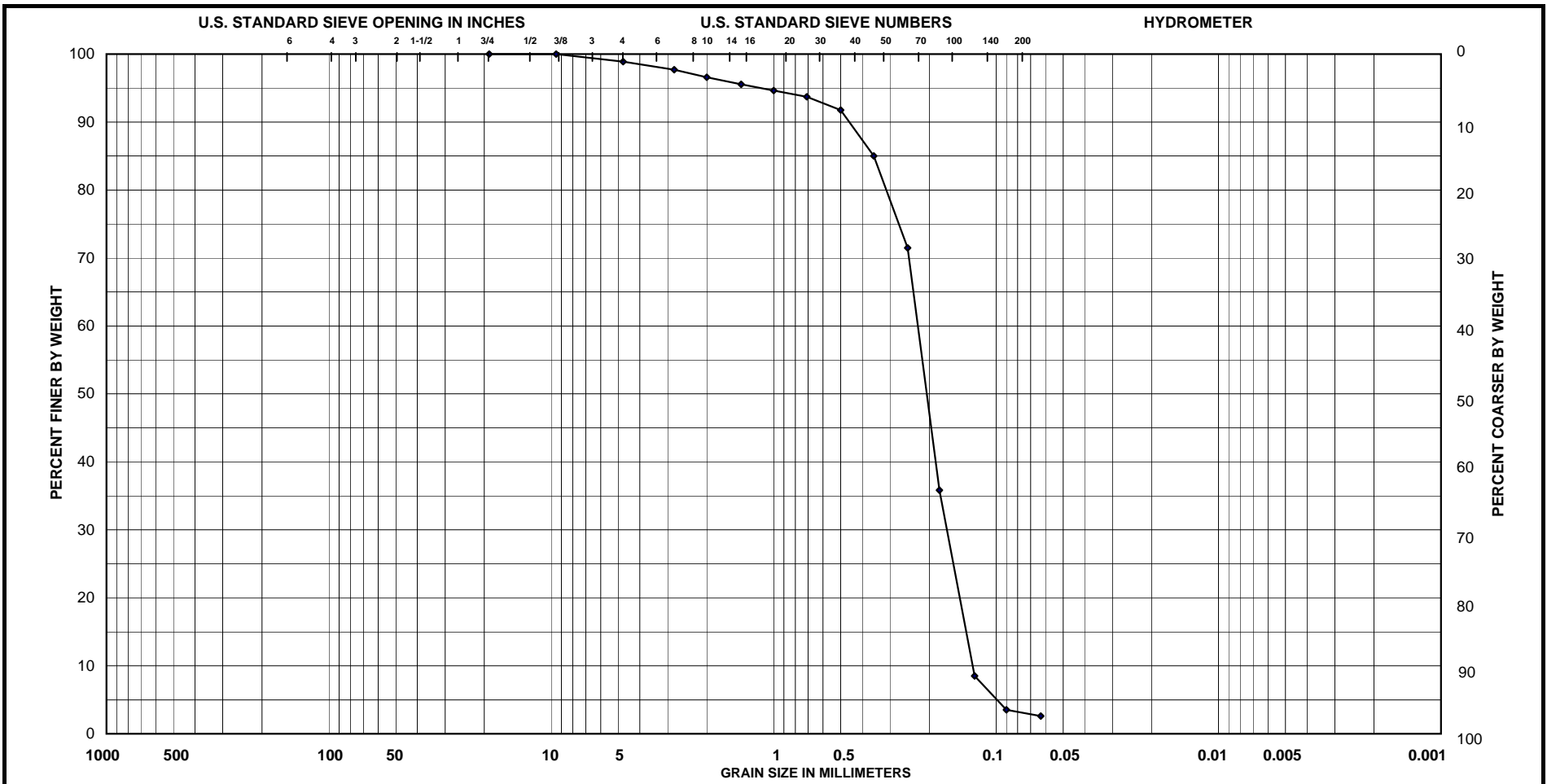
### GRAIN SIZE AND VISUAL SHELL CONTENT

Project:	<b>Topsail Beach, Surf City &amp; North Topsail</b>	Depth:	<b>45.8-46.3</b>
Project No.:	<b>1584-01-40</b>	Date:	<b>9/26/2003</b>
Boring No.:	<b>T1-03-V-235</b>		
Sample No.:	<b>1</b>		
Description:	<b>SAND, poorly-graded, mostly fine-grained quartz, few carbonate, trace fragmented limestone, olive gray (SP)</b>		

Tare Weight, (g):	<b>50.19</b>	
Dry Wt. Before Washing (g):	<b>177.3</b>	(with tare)
Dry Weight After Washing (g):	<b>174.5</b>	(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	1.40	98.90	100	1.40
#7	2.800	1.53	97.69	90	1.38
#10	2.000	1.40	96.59	70	0.98
#14	1.400	1.31	95.56	70	0.92
#18	1.000	1.19	94.63	55	0.65
#25	0.710	1.16	93.71	40	0.46
#35	0.500	2.48	91.76	25	0.62
#45	0.355	8.60	85.00	15	1.29
#60	0.250	17.20	71.47	3	0.52
#80	0.180	45.28	35.84	1	0.45
#120	0.125	34.73	8.52	1	0.35
#170	0.090	6.37	3.51	1	0.06
#230	0.063	1.13	2.62	1	0.01

**Total Shell Content:** **7** %



COBBLES	GRAVEL		SAND			SILT OR CLAY
	COARSE	FINE	COARSE	MEDIUM	FINE	

Sample No.	Elev. Or Depth	Classification	% CO <sub>3</sub>	G <sub>s</sub>	Nat w%	LL	PL	PI	Project
♦ 1	45.8-46.3	SAND, poorly-graded, mostly fine-grained quartz, few carbonate, trace fragmented limestone, olive gray (SP)	7						Topsail Beach, Surf City & North Topsail
									Area
									Boring No. T1-03-V-235
									Date 9/26/2003

**GRADATION CURVES**



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## VISUAL SHELL CONTENT

### GRAIN SIZE AND VISUAL SHELL CONTENT

Project:	<b>Topsail Beach, Surf City &amp; North Topsail</b>	Depth:	<b>47.3-47.8</b>
Project No.:	<b>1584-01-40</b>	Date:	<b>9/26/2003</b>
Boring No.:	<b>T1-03-V-235</b>		
Sample No.:	<b>2</b>		
Description:	<b>SAND, silty, mostly fine-grained quartz, little silt, trace carbonate, trace fragmented limestone, olive gray (SM)</b>		

Tare Weight, (g):	<b>48.35</b>	
Dry Wt. Before Washing (g):	<b>176.57</b>	(with tare)
Dry Weight After Washing (g):	<b>147.08</b>	(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	0.42	99.67	100	0.42
#7	2.800	0.67	99.15	70	0.47
#10	2.000	0.45	98.80	70	0.32
#14	1.400	0.58	98.35	40	0.23
#18	1.000	0.58	97.89	50	0.29
#25	0.710	0.48	97.52	50	0.24
#35	0.500	1.01	96.73	20	0.20
#45	0.355	1.40	95.64	10	0.14
#60	0.250	2.04	94.05	3	0.06
#80	0.180	8.84	87.15	1	0.09
#120	0.125	56.94	42.75	1	0.57
#170	0.090	17.47	29.12	1	0.17
#230	0.063	6.47	24.08	1	0.06

**Total Shell Content:** **3** %







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## VISUAL SHELL CONTENT

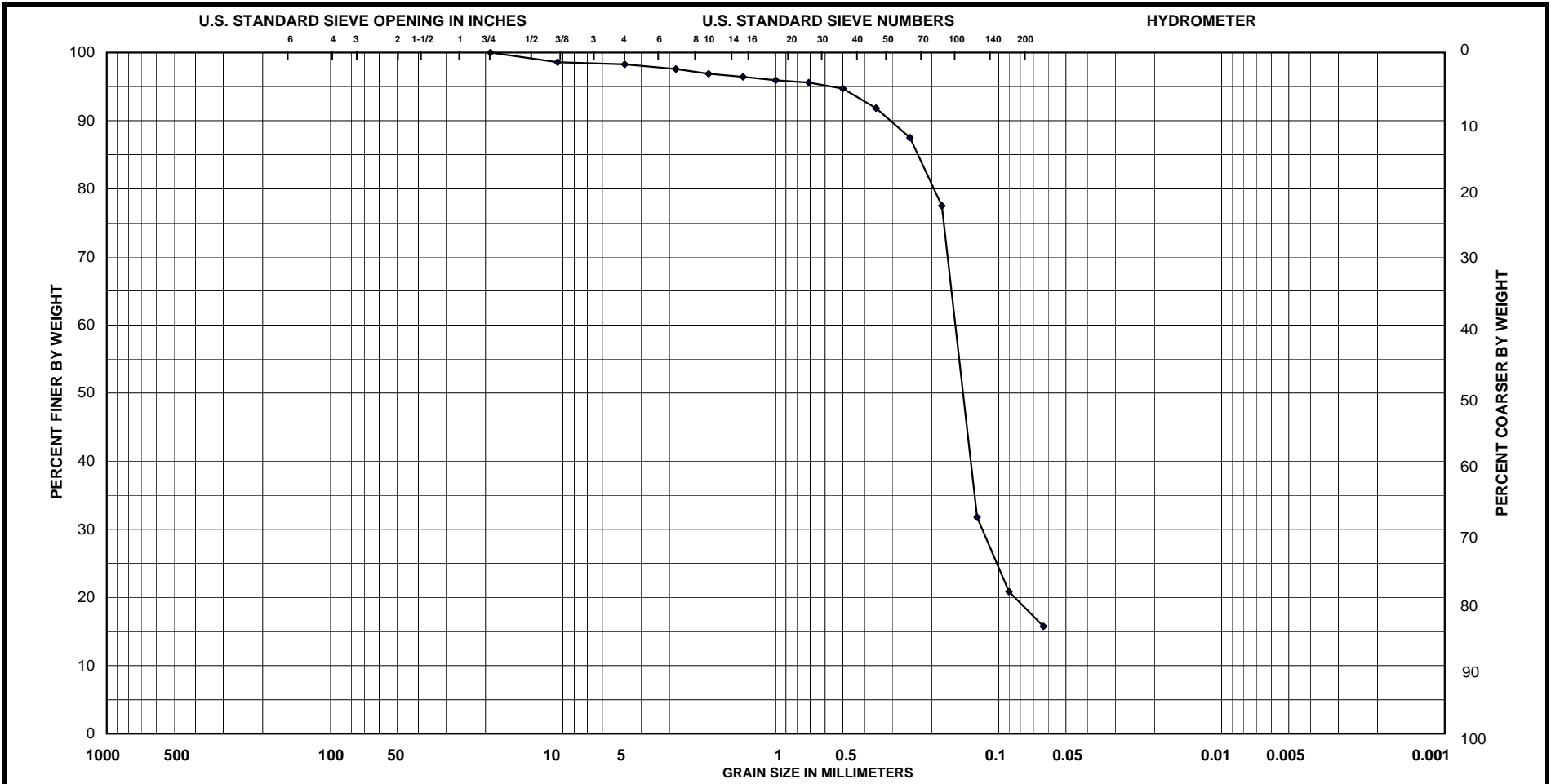
### GRAIN SIZE AND VISUAL SHELL CONTENT

Project:	<b>Topsail Beach, Surf City &amp; North Topsail</b>	Depth:	<b>46.8-47.3</b>
Project No.:	<b>1584-01-40</b>	Date:	<b>9/26/2003</b>
Boring No.:	<b>T1-03-V-236</b>		
Sample No.:	<b>1</b>		
Description:	<b>SAND, silty, mostly fine-grained quartz, little silt, trace carbonate, olive gray (SM)</b>		

Tare Weight, (g):	<b>50.51</b>	
Dry Wt. Before Washing (g):	<b>172.77</b>	(with tare)
Dry Weight After Washing (g):	<b>155.52</b>	(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	1.75	98.57	100	1.75
#4	4.750	0.34	98.29	50	0.17
#7	2.800	0.86	97.59	70	0.60
#10	2.000	0.84	96.90	40	0.34
#14	1.400	0.59	96.42	30	0.18
#18	1.000	0.60	95.93	20	0.12
#25	0.710	0.42	95.58	40	0.17
#35	0.500	1.07	94.71	30	0.32
#45	0.355	3.49	91.85	15	0.52
#60	0.250	5.34	87.49	3	0.16
#80	0.180	12.22	77.49	1	0.12
#120	0.125	55.91	31.76	1	0.56
#170	0.090	13.33	20.86	1	0.13
#230	0.063	6.25	15.75	1	0.06

**Total Shell Content:** **4** %



COBBLES	GRAVEL		SAND			SILT OR CLAY
	COARSE	FINE	COARSE	MEDIUM	FINE	

Sample No.	Elev. Or Depth	Classification	% CO <sub>3</sub>	G <sub>s</sub>	Nat w%	LL	PL	PI	Project
♦ 1	46.8-47.3	SAND, silty, mostly fine-grained quartz, little silt, trace carbonate, olive gray (SM)	4						Topsail Beach, Surf City & North Topsail
									Area
									Boring No. T1-03-V-236
									Date 9/26/2003

**GRADATION CURVES**



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## VISUAL SHELL CONTENT

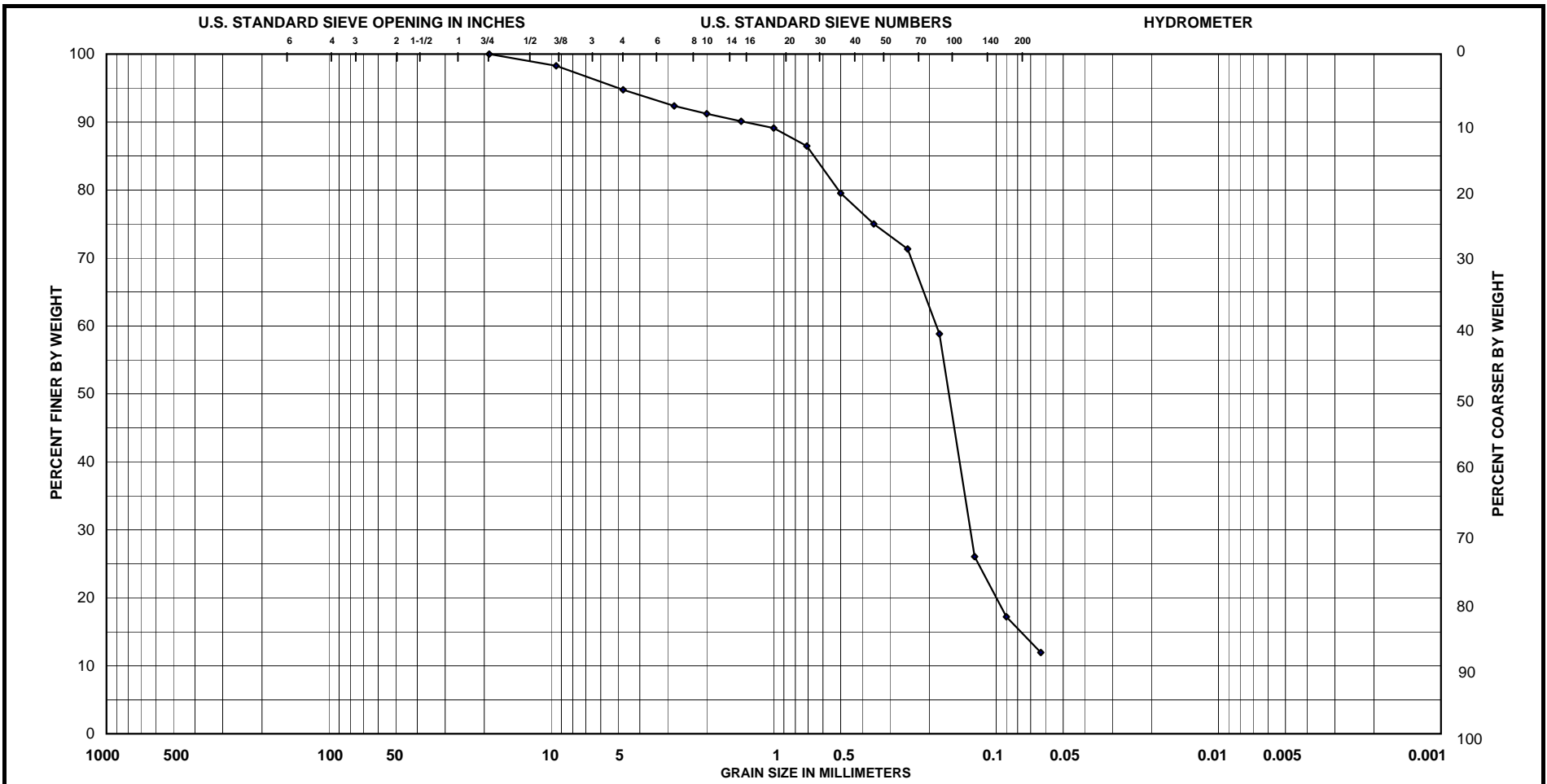
### GRAIN SIZE AND VISUAL SHELL CONTENT

Project:	<b>Topsail Beach, Surf City &amp; North Topsail</b>	Depth:	<b>49.1-49.6</b>
Project No.:	<b>1584-01-40</b>	Date:	<b>9/26/2003</b>
Boring No.:	<b>T1-03-V-237</b>		
Sample No.:	<b>1</b>		
Description:	<b>SAND, poorly-graded with silt, mostly fine-grained quartz, little silt, few carbonate, trace fragmented limestone, olive gray (SP-SM)</b>		

Tare Weight, (g):	<b>49.98</b>	
Dry Wt. Before Washing (g):	<b>178.32</b>	(with tare)
Dry Weight After Washing (g):	<b>165.8</b>	(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	2.21	98.28	100	2.21
#4	4.750	4.53	94.75	90	4.08
#7	2.800	3.07	92.36	75	2.30
#10	2.000	1.44	91.23	70	1.01
#14	1.400	1.43	90.12	70	1.00
#18	1.000	1.27	89.13	60	0.76
#25	0.710	3.40	86.48	30	1.02
#35	0.500	8.94	79.52	10	0.89
#45	0.355	5.78	75.01	3	0.17
#60	0.250	4.71	71.34	3	0.14
#80	0.180	16.03	58.85	1	0.16
#120	0.125	42.09	26.06	1	0.42
#170	0.090	11.36	17.20	1	0.11
#230	0.063	6.75	11.94	1	0.07

**Total Shell Content:** **11** %



COBBLES	GRAVEL		SAND			SILT OR CLAY
	COARSE	FINE	COARSE	MEDIUM	FINE	

Sample No.	Elev. Or Depth	Classification	% CO <sub>3</sub>	G <sub>s</sub>	Nat w%	LL	PL	PI	Project
1	49.1-49.6	SAND, poorly-graded with silt, mostly fine-grained quartz, little silt, few carbonate, trace fragmented limestone, olive gray (SP-SM)	11						Topsail Beach, Surf City & North Topsail
									Area
									Boring No. T1-03-V-237
									Date 9/26/2003

**GRADATION CURVES**



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## VISUAL SHELL CONTENT

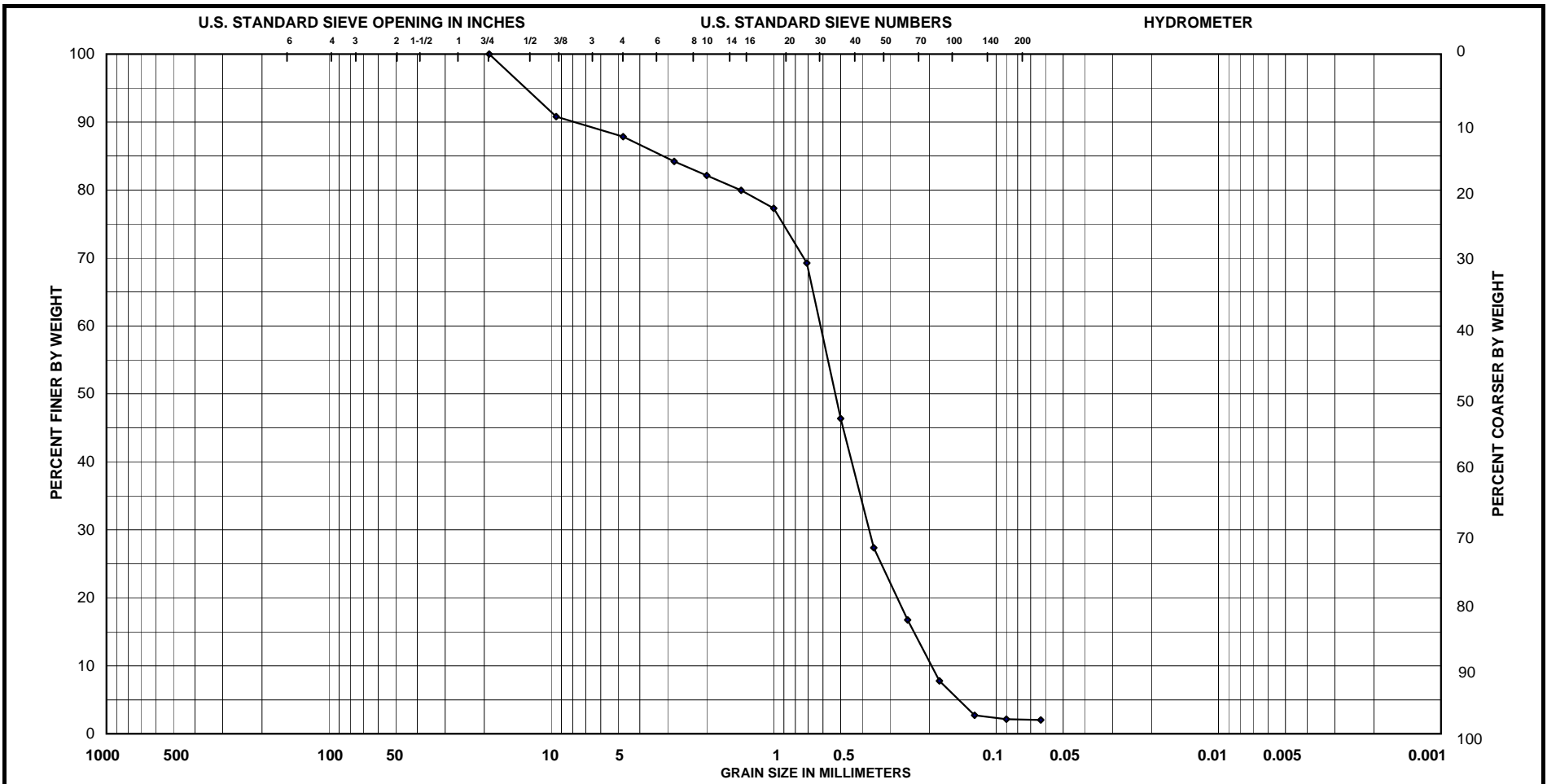
### GRAIN SIZE AND VISUAL SHELL CONTENT

<b>Project:</b>	<b>Topsail Beach, Surf City &amp; North Topsail</b>	<b>Depth:</b>	<b>48.3-48.8</b>
<b>Project No.:</b>	<b>1584-01-40</b>	<b>Date:</b>	<b>9/26/2003</b>
<b>Boring No.:</b>	<b>T1-03-V-238</b>		
<b>Sample No.:</b>	<b>1</b>		
<b>Description:</b>	<b>SAND, poorly-graded, mostly medium to fine-grained quartz, few fine gravel-size carbonate, few coarse to medium-grained carbonate, trace</b>		

Tare Weight, (g):	50.12	
Dry Wt. Before Washing (g):	182.43	(with tare)
Dry Weight After Washing (g):	181.32	(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	12.19	90.79	100	12.19
#4	4.750	3.91	87.83	80	3.13
#7	2.800	4.81	84.20	80	3.85
#10	2.000	2.72	82.14	70	1.90
#14	1.400	2.91	79.94	60	1.75
#18	1.000	3.50	77.30	40	1.40
#25	0.710	10.62	69.27	15	1.59
#35	0.500	30.27	46.39	3	0.91
#45	0.355	25.18	27.36	1	0.25
#60	0.250	14.05	16.74	1	0.14
#80	0.180	11.86	7.78	1	0.12
#120	0.125	6.67	2.74	1	0.07
#170	0.090	0.79	2.14	1	0.01
#230	0.063	0.14	2.03	1	0.00

**Total Shell Content:** 21 %



COBBLES	GRAVEL		SAND			SILT OR CLAY
	COARSE	FINE	COARSE	MEDIUM	FINE	

Sample No.	Elev. Or Depth	Classification	% CO <sub>3</sub>	G <sub>s</sub>	Nat w%	LL	PL	PI	Project	
♦ 1	48.3-48.8	SAND, poorly-graded, mostly medium to fine-grained quartz, few fine gravel-size carbonate, few coarse to medium-grained carbonate, trace fragmented limestone, olive gray (SP)	21						Topsail Beach, Surf City & North Topsail	
									Area	
									Boring No. T1-03-V-238	
									Date 9/26/2003	

**GRADATION CURVES**



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## VISUAL SHELL CONTENT

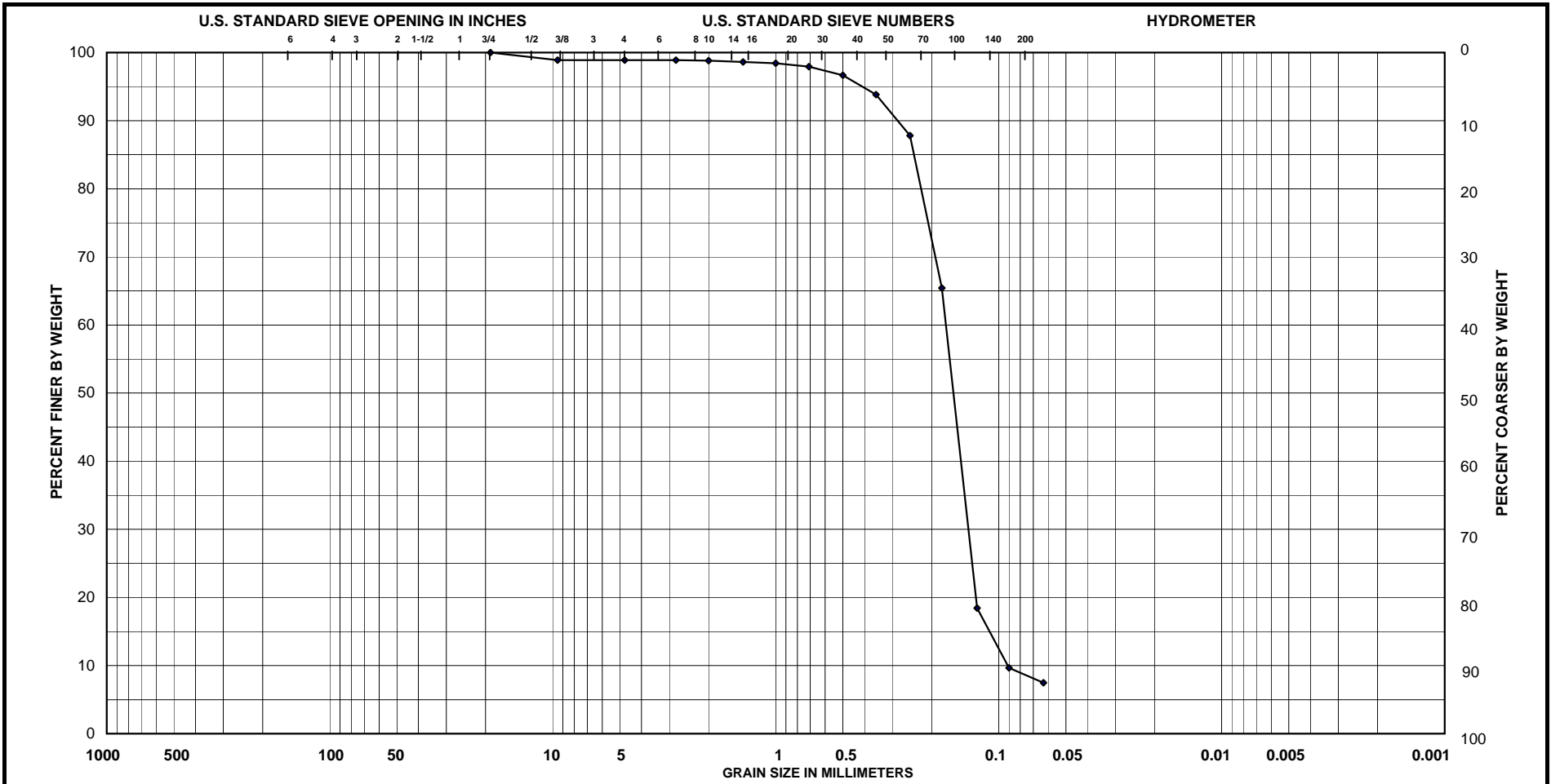
### GRAIN SIZE AND VISUAL SHELL CONTENT

Project:	<b>Topsail Beach, Surf City &amp; North Topsail</b>	Depth:	<b>49.4-49.9</b>
Project No.:	<b>1584-01-40</b>	Date:	<b>9/26/2003</b>
Boring No.:	<b>T1-03-V-238</b>		
Sample No.:	<b>2</b>		
Description:	<b>SAND, poorly-graded with silt, mostly fine-grained quartz, few silt, trace carbonate, dark gray (SP-SM)</b>		

Tare Weight, (g):	<b>50.18</b>	
Dry Wt. Before Washing (g):	<b>178.32</b>	(with tare)
Dry Weight After Washing (g):	<b>170</b>	(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	1.40	98.91	100	1.40
#4	4.750	0.00	98.91	0	0.00
#7	2.800	0.02	98.89	100	0.02
#10	2.000	0.11	98.81	80	0.09
#14	1.400	0.24	98.62	80	0.19
#18	1.000	0.25	98.42	40	0.10
#25	0.710	0.65	97.92	15	0.10
#35	0.500	1.62	96.65	5	0.08
#45	0.355	3.61	93.83	3	0.11
#60	0.250	7.70	87.83	1	0.08
#80	0.180	28.68	65.44	1	0.29
#120	0.125	60.26	18.42	1	0.60
#170	0.090	11.21	9.67	1	0.11
#230	0.063	2.82	7.47	1	0.03

**Total Shell Content:** **2** %



COBBLES	GRAVEL		SAND			SILT OR CLAY
	COARSE	FINE	COARSE	MEDIUM	FINE	

Sample No.	Elev. Or Depth	Classification	% CO <sub>3</sub>	G <sub>s</sub>	Nat w%	LL	PL	PI	Project	
♦ 2	49.4-49.9	SAND, poorly-graded with silt, mostly fine-grained quartz, few silt, trace carbonate, dark gray (SP-SM)	2						Topsail Beach, Surf City & North Topsail	
									Area	
									Boring No. T1-03-V-238	
									Date 9/26/2003	

**GRADATION CURVES**





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## VISUAL SHELL CONTENT

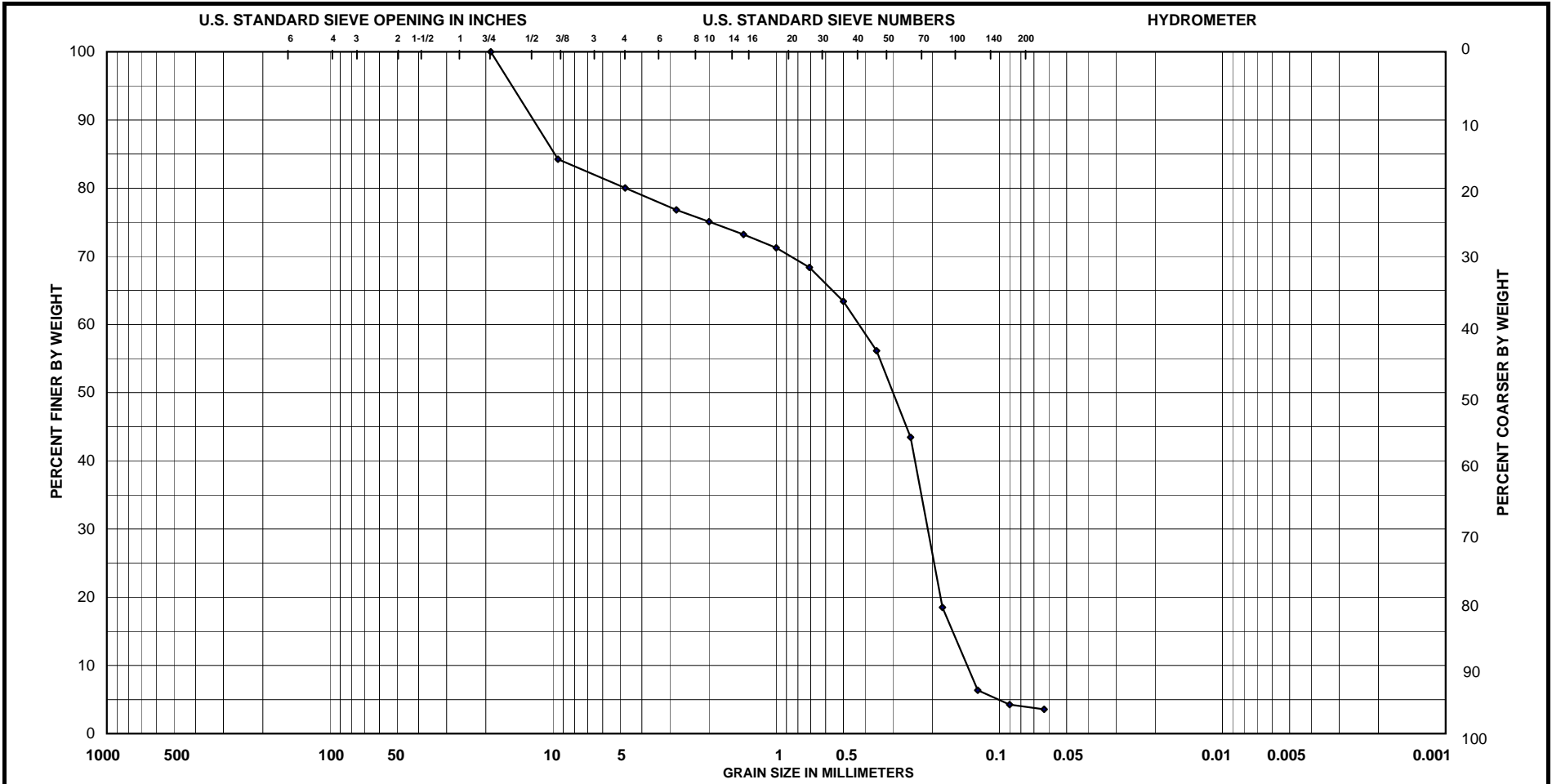
### GRAIN SIZE AND VISUAL SHELL CONTENT

Project:	<b>Topsail Beach, Surf City &amp; North Topsail</b>	Depth:	<b>48.1-48.6</b>
Project No.:	<b>1584-01-40</b>	Date:	<b>9/26/2003</b>
Boring No.:	<b>T1-03-V-239</b>		
Sample No.:	<b>1</b>		
Description:	<b>SAND, poorly-graded, mostly fine-grained quartz, little fine gravel-size fragmented limestone, few coarse to medium-grained fragmented</b>		

Tare Weight, (g):	<b>49.75</b>	
Dry Wt. Before Washing (g):	<b>183.62</b>	(with tare)
Dry Weight After Washing (g):	<b>179.66</b>	(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	21.10	84.24	35	7.39
#4	4.750	5.63	80.03	60	3.38
#7	2.800	4.30	76.82	65	2.80
#10	2.000	2.33	75.08	40	0.93
#14	1.400	2.50	73.21	25	0.63
#18	1.000	2.61	71.26	30	0.78
#25	0.710	3.88	68.36	10	0.39
#35	0.500	6.67	63.38	3	0.20
#45	0.355	9.68	56.15	3	0.29
#60	0.250	16.99	43.46	1	0.17
#80	0.180	33.39	18.52	1	0.33
#120	0.125	16.27	6.36	1	0.16
#170	0.090	2.82	4.26	1	0.03
#230	0.063	0.94	3.56	1	0.01

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



COBBLES	GRAVEL		SAND			SILT OR CLAY
	COARSE	FINE	COARSE	MEDIUM	FINE	

Sample No.	Elev. Or Depth	Classification	% CO <sub>3</sub>	G <sub>s</sub>	Nat w%	LL	PL	PI	Project	
♦ 1	48.1-48.6	SAND, poorly-graded, mostly fine-grained quartz, little fine gravel-size fragmented limestone, few coarse to medium-grained fragmented limestone, few carbonate, olive gray (SP)	13						Topsail Beach, Surf City & North Topsail	
									Area	
									Boring No. T1-03-V-239	
									Date 9/26/2003	

**GRADATION CURVES**



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## VISUAL SHELL CONTENT

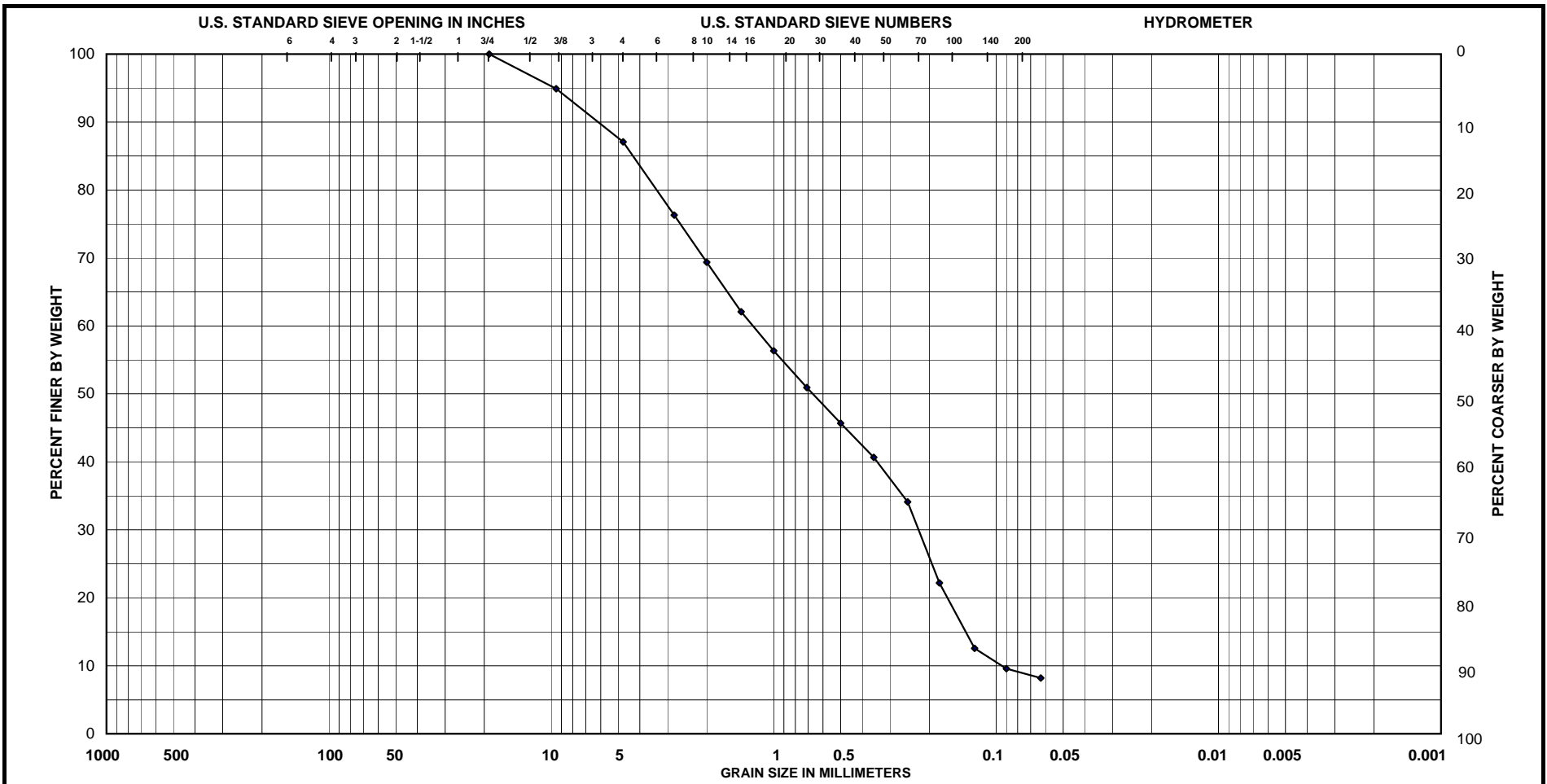
### GRAIN SIZE AND VISUAL SHELL CONTENT

Project:	<b>Topsail Beach, Surf City &amp; North Topsail</b>	Depth:	<b>49.6-50.1</b>
Project No.:	<b>1584-01-40</b>	Date:	<b>9/26/2003</b>
Boring No.:	<b>T1-03-V-239</b>		
Sample No.:	<b>2</b>		
Description:	<b>SAND, poorly-graded with silt, mostly coarse to fine-grained fragmented limestone, little fine-grained fragmented limestone, little</b>		

Tare Weight, (g):	<b>49.17</b>	
Dry Wt. Before Washing (g):	<b>177.15</b>	(with tare)
Dry Weight After Washing (g):	<b>167.3</b>	(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	6.50	94.92	35	2.28
#4	4.750	10.04	87.08	5	0.50
#7	2.800	13.76	76.32	3	0.41
#10	2.000	8.89	69.38	3	0.27
#14	1.400	9.34	62.08	3	0.28
#18	1.000	7.36	56.33	2	0.15
#25	0.710	6.90	50.94	1	0.07
#35	0.500	6.70	45.70	1	0.07
#45	0.355	6.46	40.65	1	0.06
#60	0.250	8.37	34.11	1	0.08
#80	0.180	15.24	22.21	1	0.15
#120	0.125	12.32	12.58	1	0.12
#170	0.090	3.85	9.57	1	0.04
#230	0.063	1.77	8.19	1	0.02

**Total Shell Content:** **4** %



COBBLES	GRAVEL		SAND			SILT OR CLAY
	COARSE	FINE	COARSE	MEDIUM	FINE	

Sample No.	Elev. Or Depth	Classification	% CO <sub>3</sub>	G <sub>s</sub>	Nat w%	LL	PL	PI	Project	
♦ 2	49.6-50.1	SAND, poorly-graded with silt, mostly coarse to fine-grained fragmented limestone, little fine-grained fragmented limestone, little fine gravel-size fragmented limestone, few silt, trace carbonate, olive gray (SP-SM)	4						Topsail Beach, Surf City & North Topsail	
									Area	
									Boring No. T1-03-V-239	
									Date 9/26/2003	

**GRADATION CURVES**



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## VISUAL SHELL CONTENT

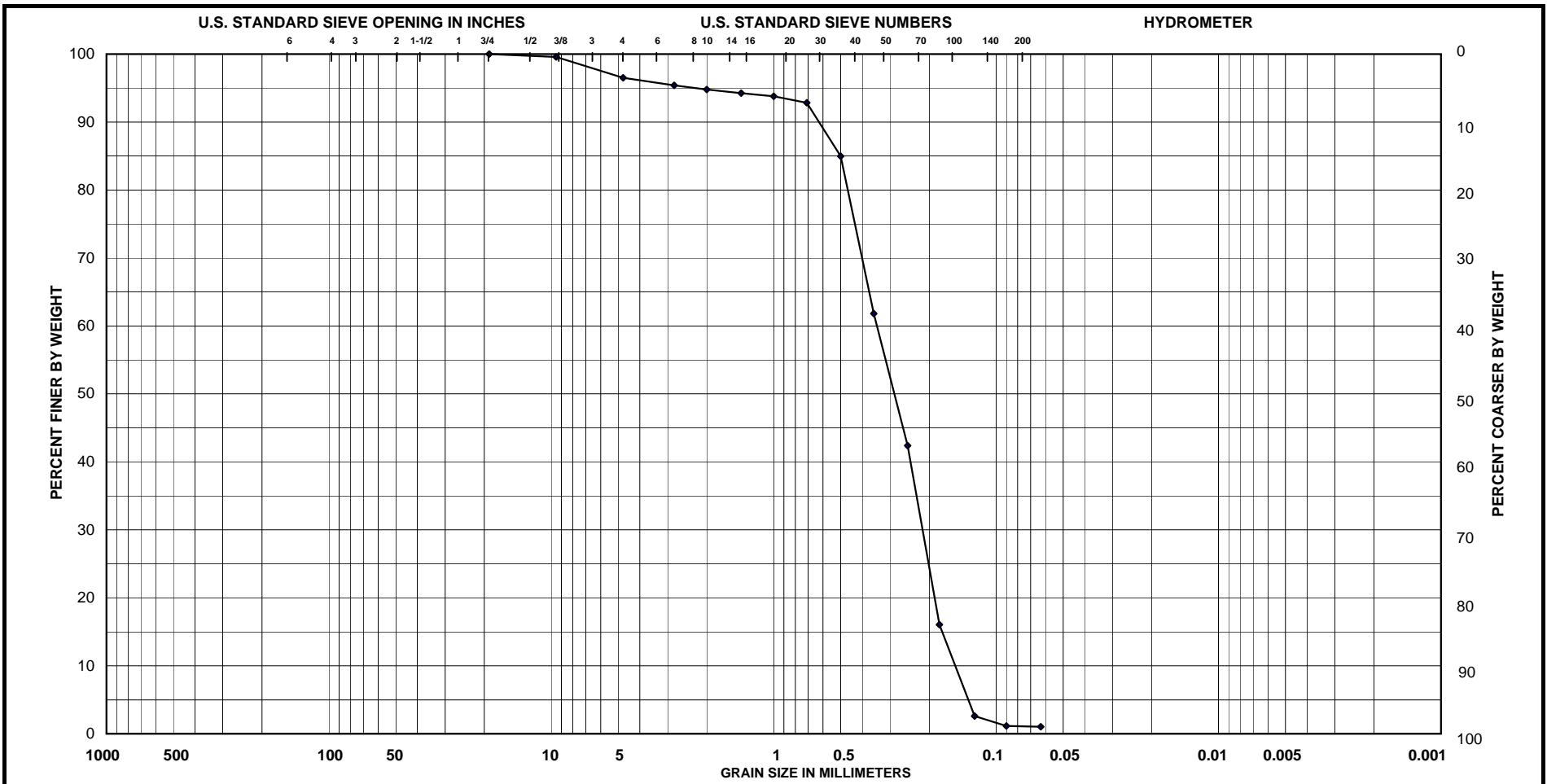
### GRAIN SIZE AND VISUAL SHELL CONTENT

Project:	<b>Topsail Beach, Surf City &amp; North Topsail</b>	Depth:	<b>50.0-50.5</b>
Project No.:	<b>1584-01-40</b>	Date:	<b>9/26/2003</b>
Boring No.:	<b>T1-03-V-240</b>		
Sample No.:	<b>1</b>		
Description:	<b>SAND, poorly-graded, mostly fine-grained quartz, few carbonate, olive gray (SP)</b>		

Tare Weight, (g):	<b>50.33</b>	
Dry Wt. Before Washing (g):	<b>181.55</b>	(with tare)
Dry Weight After Washing (g):	<b>180.35</b>	(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	0.56	99.57	100	0.56
#4	4.750	4.01	96.52	100	4.01
#7	2.800	1.46	95.40	100	1.46
#10	2.000	0.80	94.80	100	0.80
#14	1.400	0.72	94.25	80	0.58
#18	1.000	0.62	93.77	80	0.50
#25	0.710	1.22	92.84	45	0.55
#35	0.500	10.32	84.98	10	1.03
#45	0.355	30.40	61.81	5	1.52
#60	0.250	25.48	42.39	3	0.76
#80	0.180	34.57	16.05	1	0.35
#120	0.125	17.63	2.61	1	0.18
#170	0.090	1.90	1.17	1	0.02
#230	0.063	0.19	1.02	1	0.00

**Total Shell Content:** **9** %



COBBLES	GRAVEL		SAND			SILT OR CLAY
	COARSE	FINE	COARSE	MEDIUM	FINE	

Sample No.	Elev. Or Depth	Classification	% CO <sub>3</sub>	G <sub>s</sub>	Nat w%	LL	PL	PI	Project
♦ 1	50.0-50.5	SAND, poorly-graded, mostly fine-grained quartz, few carbonate, olive gray (SP)	9						Topsail Beach, Surf City & North Topsail
									Area
									Boring No. T1-03-V-240
									Date 9/26/2003

**GRADATION CURVES**



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## VISUAL SHELL CONTENT

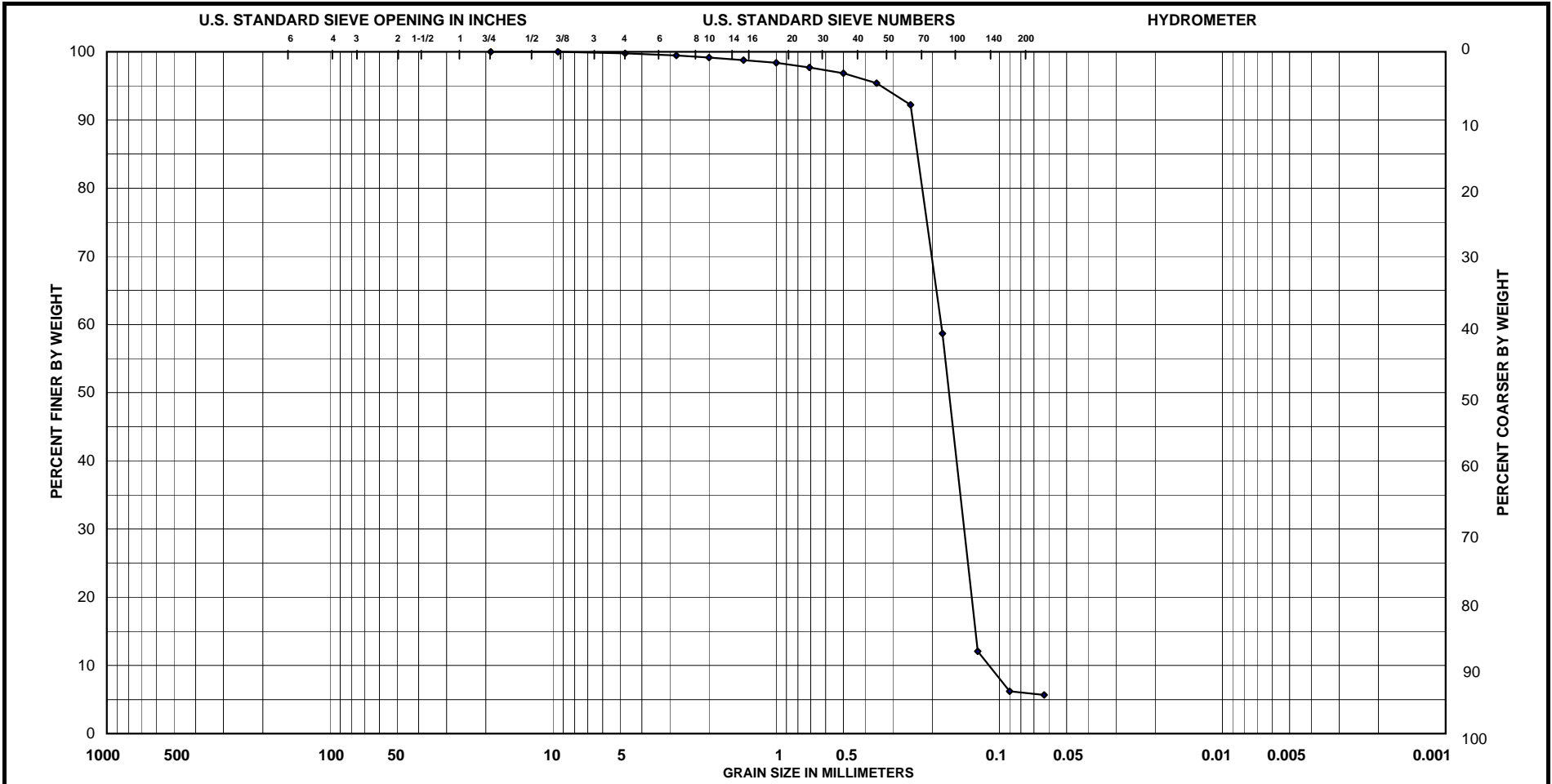
### GRAIN SIZE AND VISUAL SHELL CONTENT

Project:	<b>Topsail Beach, Surf City &amp; North Topsail</b>	Depth:	<b>52.0-52.5</b>
Project No.:	<b>1584-01-40</b>	Date:	<b>9/26/2003</b>
Boring No.:	<b>T1-03-V-240</b>		
Sample No.:	<b>2</b>		
Description:	<b>SAND, poorly-graded with silt, mostly fine-grained quartz, few silt, trace carbonate, trace fragmented limestone, olive gray (SP-SM)</b>		

Tare Weight, (g):	<b>50.49</b>	
Dry Wt. Before Washing (g):	<b>173.54</b>	(with tare)
Dry Weight After Washing (g):	<b>166.67</b>	(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	99.79	30	0.08
#7	2.800	0.39	99.47	100	0.39
#10	2.000	0.40	99.15	90	0.36
#14	1.400	0.47	98.76	70	0.33
#18	1.000	0.48	98.37	60	0.29
#25	0.710	0.82	97.71	45	0.37
#35	0.500	1.03	96.87	10	0.10
#45	0.355	1.79	95.42	5	0.09
#60	0.250	3.92	92.23	1	0.04
#80	0.180	41.29	58.68	1	0.41
#120	0.125	57.36	12.06	1	0.57
#170	0.090	7.22	6.19	1	0.07
#230	0.063	0.66	5.66	1	0.01

**Total Shell Content:** **3** %



COBBLES	GRAVEL		SAND			SILT OR CLAY
	COARSE	FINE	COARSE	MEDIUM	FINE	

Sample No.	Elev. Or Depth	Classification	% CO <sub>3</sub>	G <sub>s</sub>	Nat w%	LL	PL	PI	Project
♦ 2	52.0-52.5	SAND, poorly-graded with silt, mostly fine-grained quartz, few silt, trace carbonate, trace fragmented limestone, olive gray (SP-SM)	3						Topsail Beach, Surf City & North Topsail
									Area
									Boring No. T1-03-V-240
									Date 9/26/2003

**GRADATION CURVES**





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## VISUAL SHELL CONTENT

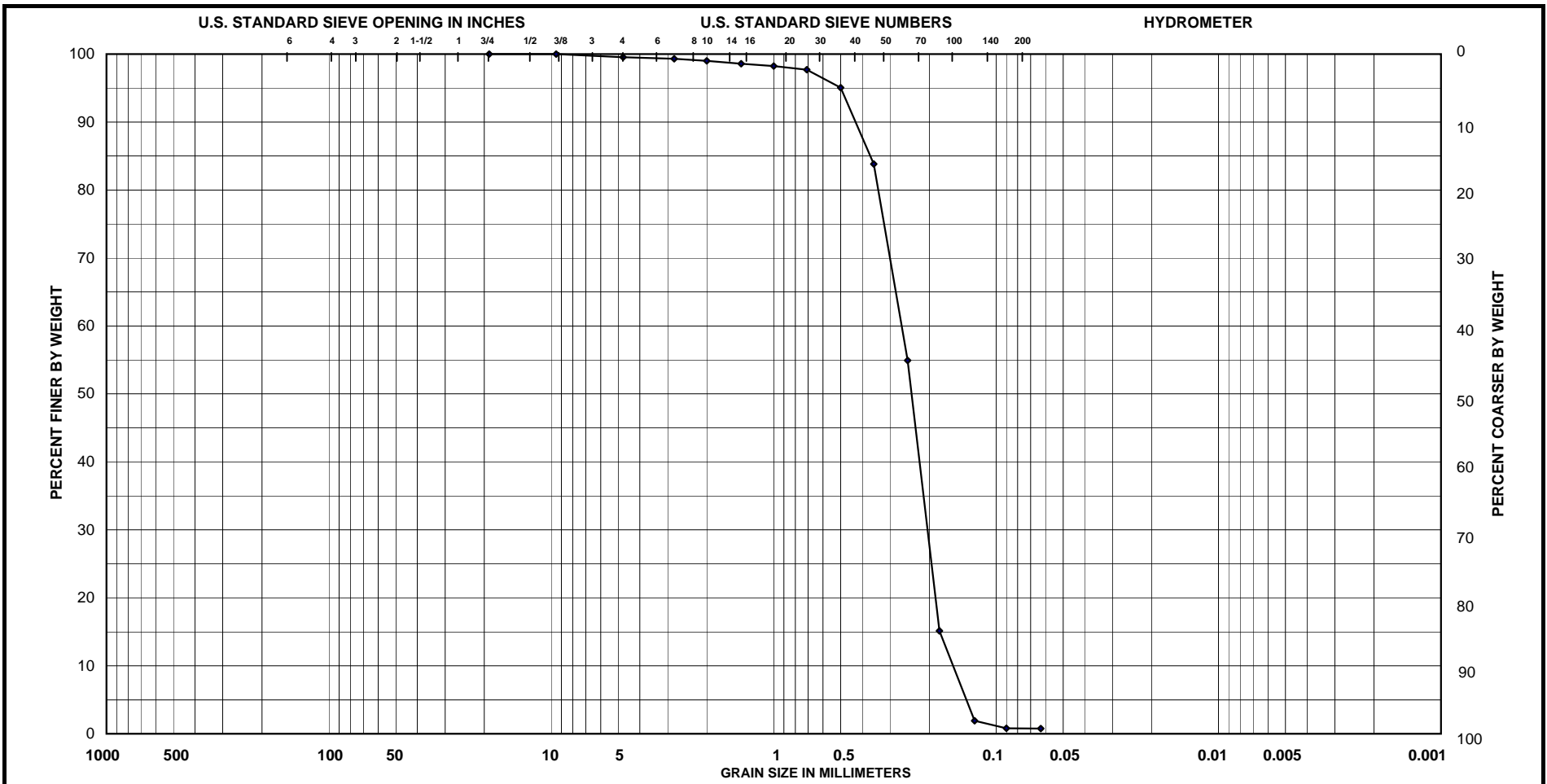
### GRAIN SIZE AND VISUAL SHELL CONTENT

Project:	<b>Topsail Beach, Surf City &amp; North Topsail</b>	Depth:	<b>49.0-49.5</b>
Project No.:	<b>1584-01-40</b>	Date:	<b>9/26/2003</b>
Boring No.:	<b>T1-03-V-241</b>		
Sample No.:	<b>1</b>		
Description:	<b>SAND, poorly-graded, mostly fine-grained quartz, trace carbonate, trace fragmented limestone, olive gray (SP)</b>		

Tare Weight, (g):	<b>50.77</b>	
Dry Wt. Before Washing (g):	<b>179.64</b>	(with tare)
Dry Weight After Washing (g):	<b>178.29</b>	(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	0.61	99.53	75	0.46
#7	2.800	0.28	99.31	80	0.22
#10	2.000	0.38	99.01	80	0.30
#14	1.400	0.55	98.59	70	0.39
#18	1.000	0.45	98.24	60	0.27
#25	0.710	0.67	97.72	60	0.40
#35	0.500	3.45	95.04	20	0.69
#45	0.355	14.47	83.81	5	0.72
#60	0.250	37.23	54.92	3	1.12
#80	0.180	51.29	15.12	1	0.51
#120	0.125	17.03	1.91	1	0.17
#170	0.090	1.40	0.82	1	0.01
#230	0.063	0.08	0.76	1	0.00

**Total Shell Content:** **4** %



COBBLES	GRAVEL		SAND			SILT OR CLAY
	COARSE	FINE	COARSE	MEDIUM	FINE	

Sample No.	Elev. Or Depth	Classification	% CO <sub>3</sub>	G <sub>s</sub>	Nat w%	LL	PL	PI	Project
♦ 1	49.0-49.5	SAND, poorly-graded, mostly fine-grained quartz, trace carbonate, trace fragmented limestone, olive gray (SP)	4						Topsail Beach, Surf City & North Topsail
									Area
									Boring No. T1-03-V-241
									Date 9/26/2003

**GRADATION CURVES**



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## VISUAL SHELL CONTENT

### GRAIN SIZE AND VISUAL SHELL CONTENT

Project:	<b>Topsail Beach, Surf City &amp; North Topsail</b>	Depth:	<b>51.2-51.7</b>
Project No.:	<b>1584-01-40</b>	Date:	<b>9/26/2003</b>
Boring No.:	<b>T1-03-V-241</b>		
Sample No.:	<b>2</b>		
Description:	<b>SAND, poorly-graded with silt, mostly fine-grained quartz, few silt, trace carbonate, dark gray (SP-SM)</b>		

Tare Weight, (g):	<b>50.63</b>	
Dry Wt. Before Washing (g):	<b>169.31</b>	(with tare)
Dry Weight After Washing (g):	<b>160.37</b>	(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	0.06	99.95	100	0.06
#7	2.800	0.56	99.48	100	0.56
#10	2.000	0.31	99.22	100	0.31
#14	1.400	0.55	98.75	100	0.55
#18	1.000	0.40	98.42	90	0.36
#25	0.710	0.54	97.96	80	0.43
#35	0.500	1.27	96.89	30	0.38
#45	0.355	2.92	94.43	10	0.29
#60	0.250	6.15	89.25	2	0.12
#80	0.180	38.05	57.19	1	0.38
#120	0.125	50.70	14.47	1	0.51
#170	0.090	6.90	8.65	1	0.07
#230	0.063	1.20	7.64	1	0.01

**Total Shell Content:** **3** %





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## VISUAL SHELL CONTENT

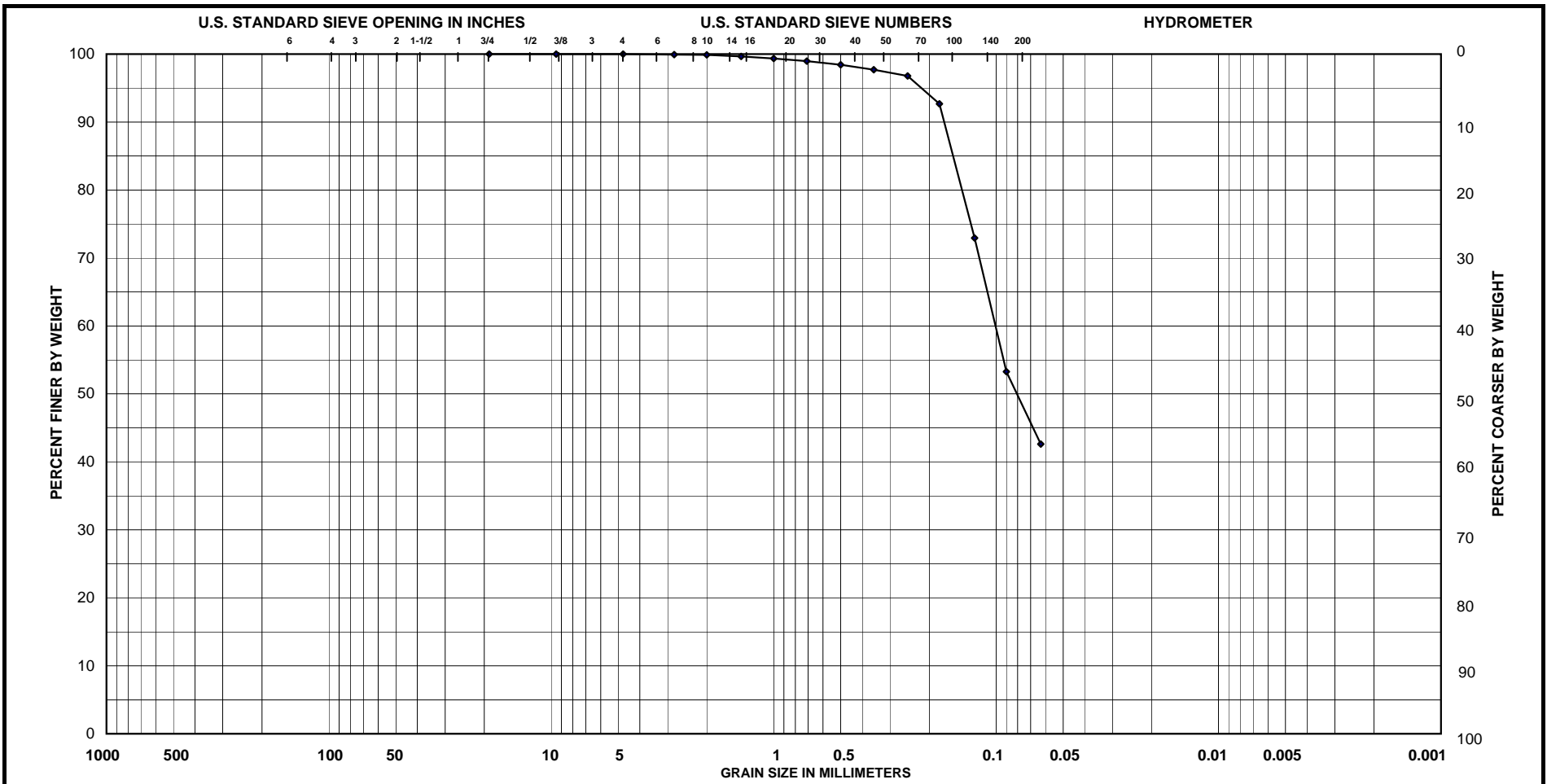
### GRAIN SIZE AND VISUAL SHELL CONTENT

Project:	<b>Topsail Beach, Surf City &amp; North Topsail</b>	Depth:	<b>53.0-53.5</b>
Project No.:	<b>1584-01-40</b>	Date:	<b>9/26/2003</b>
Boring No.:	<b>T1-03-V-241</b>		
Sample No.:	<b>3</b>		
Description:	<b>SAND, clayey, mostly fine-grained quartz, some clay, trace carbonate, dark greenish gray (SC)</b>		

Tare Weight, (g):	<b>50.37</b>	
Dry Wt. Before Washing (g):	<b>155.48</b>	(with tare)
Dry Weight After Washing (g):	<b>112.84</b>	(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	99.92	100	0.08
#10	2.000	0.06	99.87	60	0.04
#14	1.400	0.24	99.64	60	0.14
#18	1.000	0.29	99.36	60	0.17
#25	0.710	0.42	98.96	40	0.17
#35	0.500	0.58	98.41	20	0.12
#45	0.355	0.73	97.72	10	0.07
#60	0.250	1.00	96.77	5	0.05
#80	0.180	4.30	92.67	2	0.09
#120	0.125	20.75	72.93	1	0.21
#170	0.090	20.68	53.26	1	0.21
#230	0.063	11.17	42.63	1	0.11

**Total Shell Content:** **1** %



COBBLES	GRAVEL		SAND			SILT OR CLAY
	COARSE	FINE	COARSE	MEDIUM	FINE	

Sample No.	Elev. Or Depth	Classification	% CO <sub>3</sub>	G <sub>s</sub>	Nat w%	LL	PL	PI	Project	
3	53.0-53.5	SAND, clayey, mostly fine-grained quartz, some clay, trace carbonate, dark greenish gray (SC)	1						Topsail Beach, Surf City & North Topsail	
									Area	
									Boring No. T1-03-V-241	
									Date 9/26/2003	

**GRADATION CURVES**



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## VISUAL SHELL CONTENT

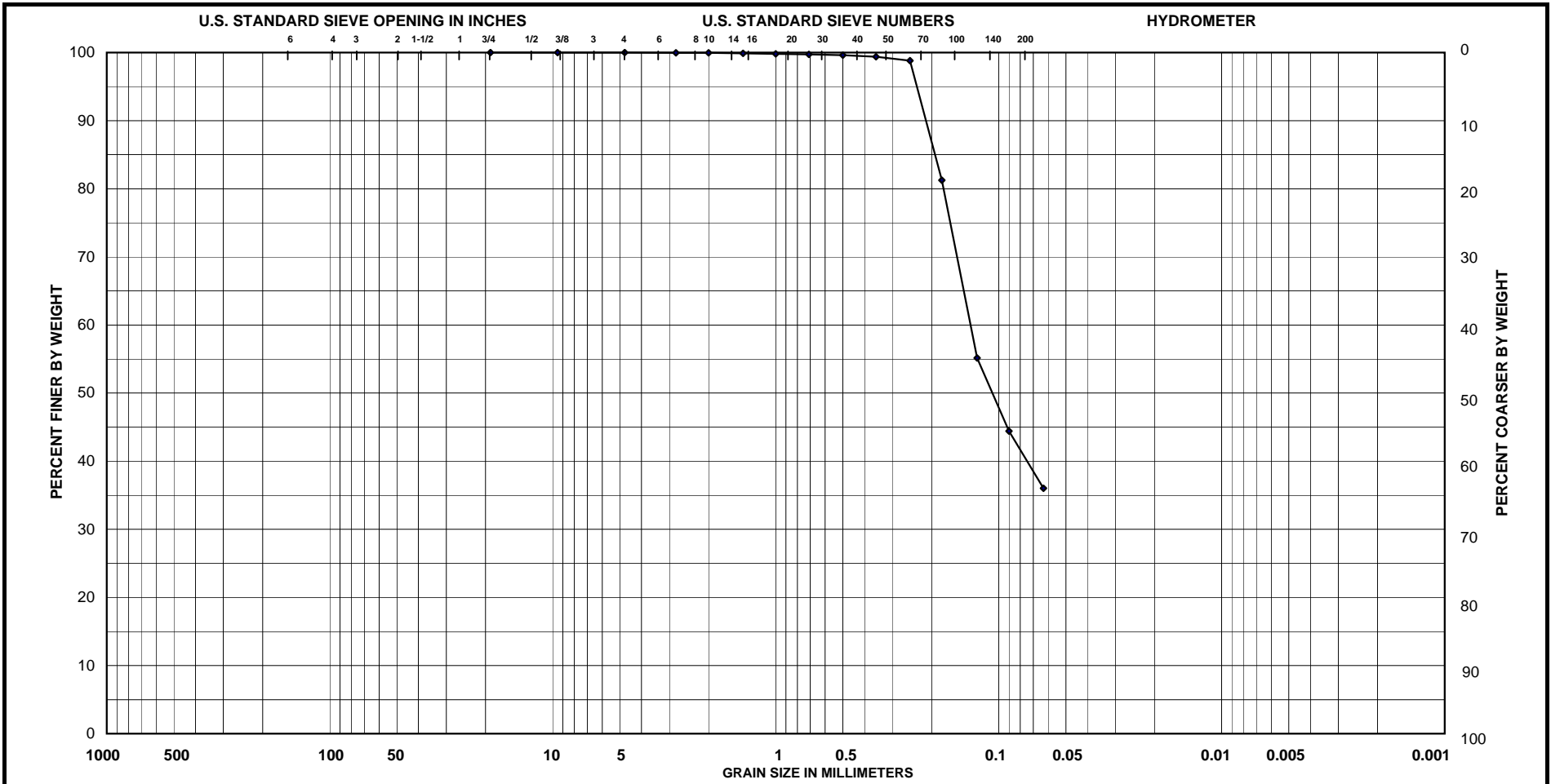
### GRAIN SIZE AND VISUAL SHELL CONTENT

Project:	<b>Topsail Beach, Surf City &amp; North Topsail</b>	Depth:	<b>54.0-54.5</b>
Project No.:	<b>1584-01-40</b>	Date:	<b>9/26/2003</b>
Boring No.:	<b>T1-03-V-241</b>		
Sample No.:	<b>4</b>		
Description:	<b>SAND, clayey, mostly fine-grained quartz, some clay, trace carbonate, dark greenish gray (SC)</b>		

Tare Weight, (g):	<b>50.05</b>	
Dry Wt. Before Washing (g):	<b>159.6</b>	(with tare)
Dry Weight After Washing (g):	<b>121.6</b>	(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	0.04	99.96	100	0.04
#10	2.000	0.02	99.95	100	0.02
#14	1.400	0.05	99.90	100	0.05
#18	1.000	0.10	99.81	90	0.09
#25	0.710	0.07	99.74	80	0.06
#35	0.500	0.12	99.63	70	0.08
#45	0.355	0.27	99.39	50	0.14
#60	0.250	0.63	98.81	20	0.13
#80	0.180	19.23	81.26	2	0.38
#120	0.125	28.59	55.16	1	0.29
#170	0.090	11.77	44.42	1	0.12
#230	0.063	9.17	36.05	1	0.09

**Total Shell Content:** **1** %



COBBLES	GRAVEL		SAND			SILT OR CLAY
	COARSE	FINE	COARSE	MEDIUM	FINE	

Sample No.	Elev. Or Depth	Classification	% CO <sub>3</sub>	G <sub>s</sub>	Nat w%	LL	PL	PI	Project	
4	54.0-54.5	SAND, clayey, mostly fine-grained quartz, some clay, trace carbonate, dark greenish gray (SC)	1						Topsail Beach, Surf City & North Topsail	
									Area	
									Boring No. T1-03-V-241	
									Date 9/26/2003	

**GRADATION CURVES**





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## VISUAL SHELL CONTENT

### GRAIN SIZE AND VISUAL SHELL CONTENT

Project:	<b>Topsail Beach, Surf City &amp; North Topsail</b>	Depth:	<b>47.2-47.7</b>
Project No.:	<b>1584-01-40</b>	Date:	<b>9/26/2003</b>
Boring No.:	<b>T1-03-V-245</b>		
Sample No.:	<b>1</b>		
Description:	<b>SAND, poorly-graded, mostly medium to fine-grained quartz, few coarse to medium-grained fragmented limestone, few coarse to</b>		

Tare Weight, (g):	<b>50.27</b>	
Dry Wt. Before Washing (g):	<b>180.34</b>	(with tare)
Dry Weight After Washing (g):	<b>177.91</b>	(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	8.54	93.43	40	3.42
#7	2.800	6.09	88.75	70	4.26
#10	2.000	6.41	83.82	50	3.21
#14	1.400	9.39	76.60	40	3.76
#18	1.000	12.57	66.94	30	3.77
#25	0.710	17.72	53.32	20	3.54
#35	0.500	22.05	36.37	5	1.10
#45	0.355	16.29	23.84	2	0.33
#60	0.250	11.84	14.74	1	0.12
#80	0.180	10.93	6.34	1	0.11
#120	0.125	4.71	2.71	1	0.05
#170	0.090	0.81	2.09	1	0.01
#230	0.063	0.33	1.84	1	0.00

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



COBBLES	GRAVEL		SAND			SILT OR CLAY
	COARSE	FINE	COARSE	MEDIUM	FINE	

Sample No.	Elev. Or Depth	Classification	% CO <sub>3</sub>	G <sub>s</sub>	Nat w%	LL	PL	PI	Project	
♦ 1	47.2-47.7	SAND, poorly-graded, mostly medium to fine-grained quartz, few coarse to medium-grained fragmented limestone, few coarse to medium-grained carbonate, trace fine gravel-size fragmented limestone, trace fine gravel-size carbonate, olive gray (SP)	18						Topsail Beach, Surf City & North Topsail	
									Area	
									Boring No. T1-03-V-245	
									Date 9/26/2003	

**GRADATION CURVES**



# WOLF TECHNOLOGIES, INC.

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## VISUAL SHELL CONTENT

### GRAIN SIZE AND VISUAL SHELL CONTENT

Project:	<b>Topsail Beach, Surf City &amp; North Topsail</b>	Depth:	<b>48.5-49.0</b>
Project No.:	<b>1584-01-40</b>	Date:	<b>9/26/2003</b>
Boring No.:	<b>T1-03-V-245</b>		
Sample No.:	<b>2</b>		
Description:	<b>SAND, poorly-graded, mostly fine-grained quartz, few coarse to medium-grained carbonate, few fine gravel-size carbonate, trace</b>		

Tare Weight, (g):	<b>50.66</b>	
Dry Wt. Before Washing (g):	<b>174.76</b>	(with tare)
Dry Weight After Washing (g):	<b>173.23</b>	(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	7.26	94.15	100	7.26
#4	4.750	2.72	91.96	90	2.45
#7	2.800	3.30	89.30	90	2.97
#10	2.000	2.31	87.44	80	1.85
#14	1.400	2.34	85.55	90	2.11
#18	1.000	2.24	83.75	80	1.79
#25	0.710	3.21	81.16	70	2.25
#35	0.500	5.71	76.56	20	1.14
#45	0.355	9.79	68.67	2	0.20
#60	0.250	17.51	54.56	1	0.18
#80	0.180	40.31	22.08	1	0.40
#120	0.125	22.91	3.62	1	0.23
#170	0.090	2.48	1.62	1	0.02
#230	0.063	0.32	1.36	1	0.00

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



COBBLES	GRAVEL		SAND			SILT OR CLAY
	COARSE	FINE	COARSE	MEDIUM	FINE	

Sample No.	Elev. Or Depth	Classification	% CO <sub>3</sub>	G <sub>s</sub>	Nat w%	LL	PL	PI	Project	
♦ 2	48.5-49.0	SAND, poorly-graded, mostly fine-grained quartz, few coarse to medium-grained carbonate, few fine gravel-size carbonate, trace fragmented limestone, gray (SP)	18						Topsail Beach, Surf City & North Topsail	
									Area	
									Boring No. T1-03-V-245	
									Date 9/26/2003	

**GRADATION CURVES**



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## VISUAL SHELL CONTENT

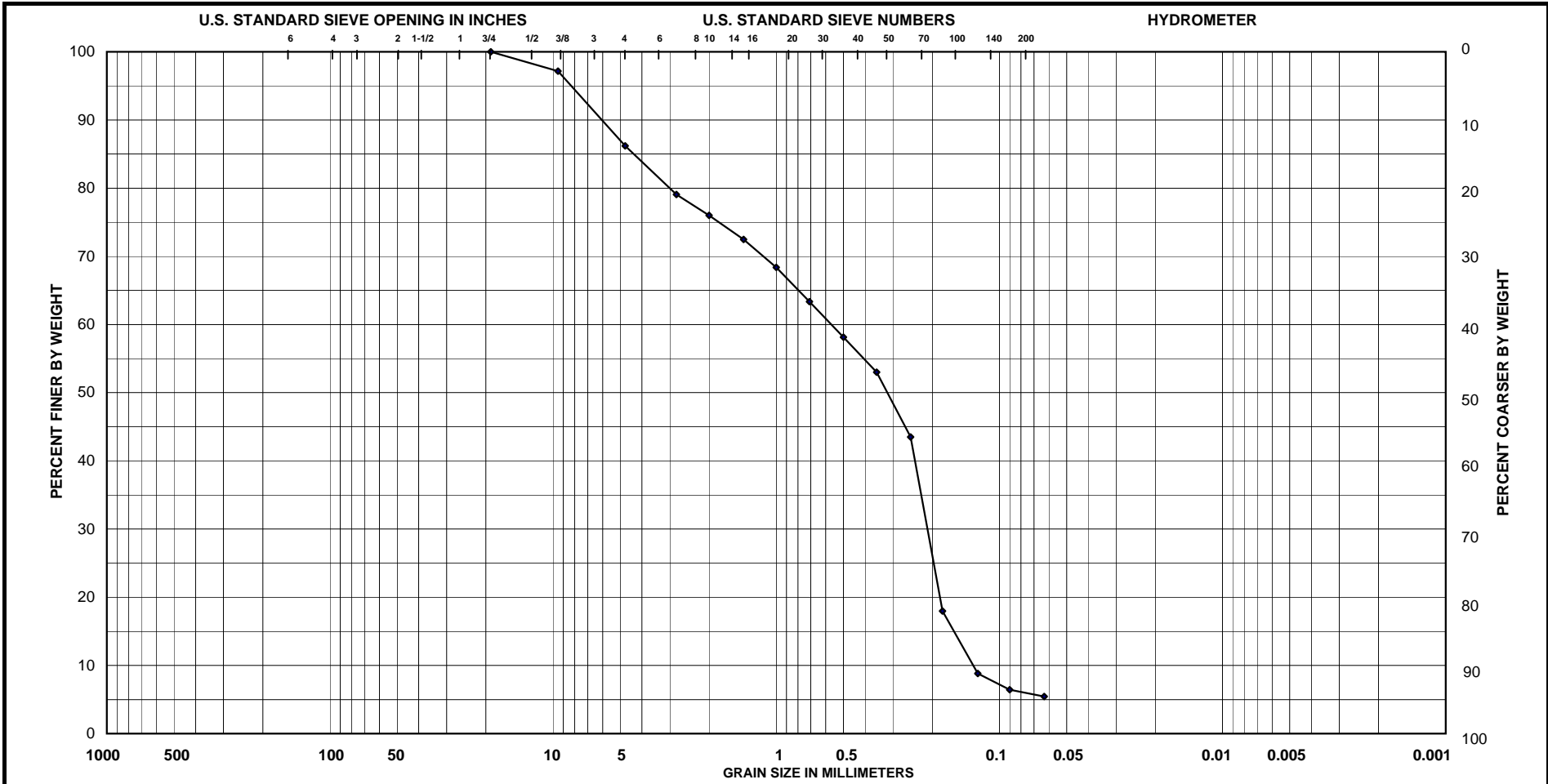
### GRAIN SIZE AND VISUAL SHELL CONTENT

Project:	<b>Topsail Beach, Surf City &amp; North Topsail</b>	Depth:	<b>48.0-48.5</b>
Project No.:	<b>1584-01-40</b>	Date:	<b>9/26/2003</b>
Boring No.:	<b>T1-03-V-246</b>		
Sample No.:	<b>1</b>		
Description:	<b>SAND, poorly-graded with silt, mostly fine-grained quartz, little coarse to medium-grained fragmented limestone, few coarse to medium-</b>		

Tare Weight, (g):	<b>49.90</b>	
Dry Wt. Before Washing (g):	<b>169.2</b>	(with tare)
Dry Weight After Washing (g):	<b>162.97</b>	(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	3.37	97.18	0	0.00
#4	4.750	13.08	86.21	30	3.92
#7	2.800	8.53	79.06	30	2.56
#10	2.000	3.66	75.99	30	1.10
#14	1.400	4.19	72.48	30	1.26
#18	1.000	4.90	68.37	20	0.98
#25	0.710	5.97	63.37	20	1.19
#35	0.500	6.25	58.13	10	0.63
#45	0.355	6.13	52.99	5	0.31
#60	0.250	11.32	43.50	2	0.23
#80	0.180	30.47	17.96	1	0.30
#120	0.125	10.91	8.82	1	0.11
#170	0.090	2.86	6.42	1	0.03
#230	0.063	1.18	5.43	1	0.01

**Total Shell Content:** **11** %



COBBLES	GRAVEL		SAND			SILT OR CLAY
	COARSE	FINE	COARSE	MEDIUM	FINE	

Sample No.	Elev. Or Depth	Classification	% CO <sub>3</sub>	G <sub>s</sub>	Nat w%	LL	PL	PI	Project	
♦ 1	48.0-48.5	SAND, poorly-graded with silt, mostly fine-grained quartz, little coarse to medium-grained fragmented limestone, few coarse to medium-grained carbonate, few fine gravel-size fragmented limestone, few silt, trace fine gravel-size carbonate, gray (SP-	11						Topsail Beach, Surf City & North Topsail	
									Area	
									Boring No. T1-03-V-246	
									Date 9/26/2003	

**GRADATION CURVES**



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## VISUAL SHELL CONTENT

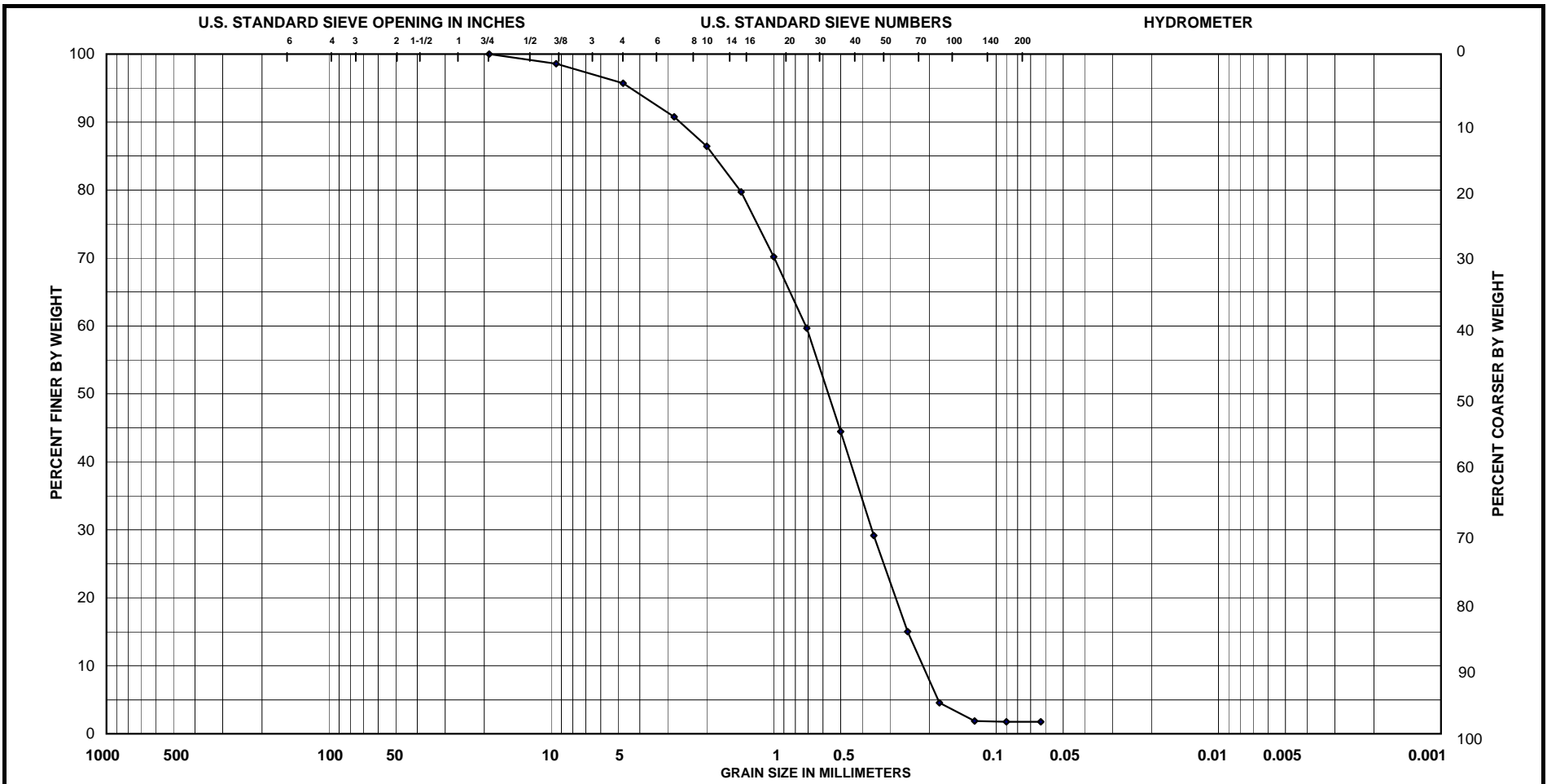
### GRAIN SIZE AND VISUAL SHELL CONTENT

Project:	<b>Topsail Beach, Surf City &amp; North Topsail</b>	Depth:	<b>9.8-10.3</b>
Project No.:	<b>1584-01-40</b>	Date:	<b>9/26/2003</b>
Boring No.:	<b>T1-03-V-263</b>		
Sample No.:	<b>1</b>		
Description:	<b>SAND, poorly-graded, mostly medium to fine-grained quartz, little coarse to medium-grained carbonate, trace fine gravel-size carbonate,</b>		

Tare Weight, (g):	<b>47.93</b>	
Dry Wt. Before Washing (g):	<b>172.66</b>	(with tare)
Dry Weight After Washing (g):	<b>171.75</b>	(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	1.79	98.56	100	1.79
#4	4.750	3.56	95.71	100	3.56
#7	2.800	6.19	90.75	75	4.64
#10	2.000	5.38	86.43	70	3.77
#14	1.400	8.35	79.74	65	5.43
#18	1.000	11.92	70.18	55	6.56
#25	0.710	13.09	59.69	40	5.24
#35	0.500	18.99	44.46	20	3.80
#45	0.355	19.08	29.17	5	0.95
#60	0.250	17.64	15.02	3	0.53
#80	0.180	13.07	4.55	1	0.13
#120	0.125	3.31	1.89	1	0.03
#170	0.090	0.14	1.78	1	0.00
#230	0.063	0.02	1.76	1	0.00

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



COBBLES	GRAVEL		SAND			SILT OR CLAY
	COARSE	FINE	COARSE	MEDIUM	FINE	

Sample No.	Elev. Or Depth	Classification	% CO <sub>3</sub>	G <sub>s</sub>	Nat w%	LL	PL	PI	Project	
♦ 1	9.8-10.3	SAND, poorly-graded, mostly medium to fine-grained quartz, little coarse to medium-grained carbonate, trace fine gravel-size carbonate, trace fragmented limestone, gray (SP)	29						Topsail Beach, Surf City & North Topsail	
									Area	
									Boring No. T1-03-V-263	
									Date 9/26/2003	

**GRADATION CURVES**





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## VISUAL SHELL CONTENT

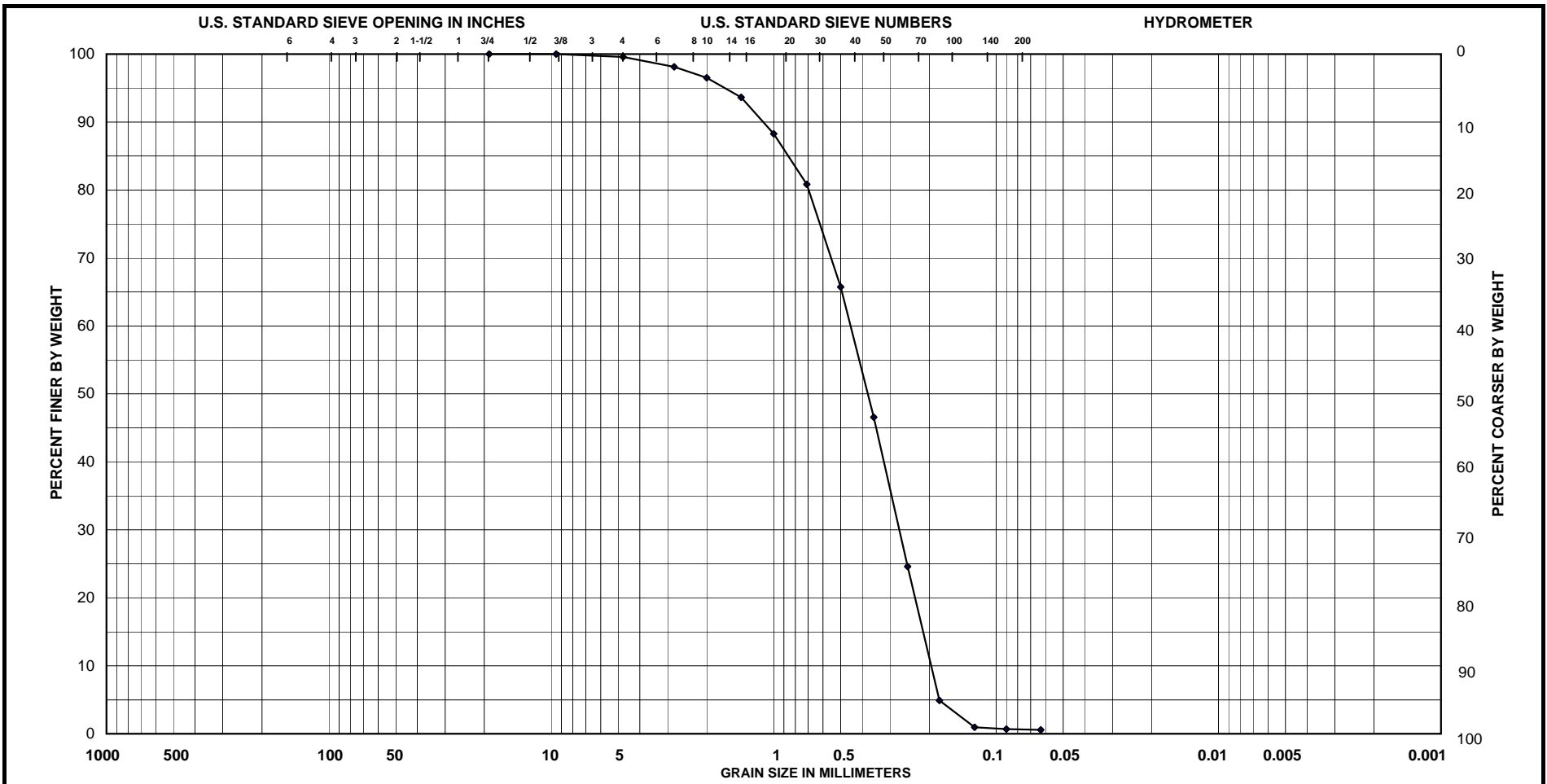
### GRAIN SIZE AND VISUAL SHELL CONTENT

Project:	<b>Topsail Beach, Surf City &amp; North Topsail</b>	Depth:	<b>11.3-11.8</b>
Project No.:	<b>1584-01-40</b>	Date:	<b>9/26/2003</b>
Boring No.:	<b>T1-03-V-263</b>		
Sample No.:	<b>2</b>		
Description:	<b>SAND, poorly-graded, mostly medium to fine-grained quartz, little coarse to medium-grained carbonate, trace fragmented limestone, gray</b>		

Tare Weight, (g):	<b>50.15</b>	
Dry Wt. Before Washing (g):	<b>179.9</b>	(with tare)
Dry Weight After Washing (g):	<b>178.9</b>	(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	0.54	99.58	100	0.54
#7	2.800	1.92	98.10	90	1.73
#10	2.000	2.06	96.52	80	1.65
#14	1.400	3.75	93.63	80	3.00
#18	1.000	6.96	88.26	70	4.87
#25	0.710	9.66	80.82	65	6.28
#35	0.500	19.56	65.74	35	6.85
#45	0.355	24.86	46.58	10	2.49
#60	0.250	28.50	24.62	3	0.86
#80	0.180	25.58	4.90	1	0.26
#120	0.125	5.10	0.97	1	0.05
#170	0.090	0.37	0.69	1	0.00
#230	0.063	0.16	0.56	1	0.00

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



COBBLES	GRAVEL		SAND			SILT OR CLAY
	COARSE	FINE	COARSE	MEDIUM	FINE	

Sample No.	Elev. Or Depth	Classification	% CO <sub>3</sub>	G <sub>s</sub>	Nat w%	LL	PL	PI	Project	
♦ 2	11.3-11.8	SAND, poorly-graded, mostly medium to fine-grained quartz, little coarse to medium-grained carbonate, trace fragmented limestone, gray (SP)	22						Topsail Beach, Surf City & North Topsail	
									Area	
									Boring No. T1-03-V-263	
									Date 9/26/2003	

**GRADATION CURVES**



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## VISUAL SHELL CONTENT

### GRAIN SIZE AND VISUAL SHELL CONTENT

Project:	<b>Topsail Beach, Surf City &amp; North Topsail</b>	Depth:	<b>18.9-19.4</b>
Project No.:	<b>1584-01-40</b>	Date:	<b>12/6/2003</b>
Boring No.:	<b>T1-03-V-363</b>		
Sample No.:	<b>1</b>		
Description:	<b>SAND, poorly-graded, mostly fine-grained quartz, trace carbonate, trace silt, light gray (SP)</b>		

Tare Weight, (g):	<b>50.38</b>	
Dry Wt. Before Washing (g):	<b>139.97</b>	(with tare)
Dry Weight After Washing (g):	<b>138.94</b>	(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	0.08	99.91	100	0.08
#14	1.400	0.05	99.85	100	0.05
#18	1.000	0.07	99.78	100	0.07
#25	0.710	0.07	99.70	100	0.07
#35	0.500	0.07	99.62	80	0.06
#45	0.355	0.22	99.37	60	0.13
#60	0.250	1.65	97.53	10	0.17
#80	0.180	31.53	62.34	1	0.32
#120	0.125	49.05	7.59	1	0.49
#170	0.090	5.51	1.44	1	0.06
#230	0.063	0.36	1.04	1	0.00

**Total Shell Content:** **2** %





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## VISUAL SHELL CONTENT

### GRAIN SIZE AND VISUAL SHELL CONTENT

Project:	<b>Topsail Beach, Surf City &amp; North Topsail</b>	Depth:	<b>21.0-21.5</b>
Project No.:	<b>1584-01-40</b>	Date:	<b>12/6/2003</b>
Boring No.:	<b>T1-03-V-363</b>		
Sample No.:	<b>2</b>		
Description:	<b>SAND, poorly-graded, mostly fine-grained quartz, trace carbonate, trace silt, light gray (SP)</b>		

Tare Weight, (g):	<b>50.49</b>	
Dry Wt. Before Washing (g):	<b>161.13</b>	(with tare)
Dry Weight After Washing (g):	<b>160.01</b>	(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	0.11	99.90	100	0.11
#10	2.000	0.04	99.86	30	0.01
#14	1.400	0.19	99.69	90	0.17
#18	1.000	0.19	99.52	60	0.11
#25	0.710	0.40	99.16	80	0.32
#35	0.500	0.71	98.52	50	0.36
#45	0.355	1.65	97.03	20	0.33
#60	0.250	7.57	90.18	5	0.38
#80	0.180	62.71	33.51	1	0.63
#120	0.125	32.80	3.86	1	0.33
#170	0.090	3.11	1.05	1	0.03
#230	0.063	0.22	0.85	1	0.00

**Total Shell Content:** **3** %





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## VISUAL SHELL CONTENT

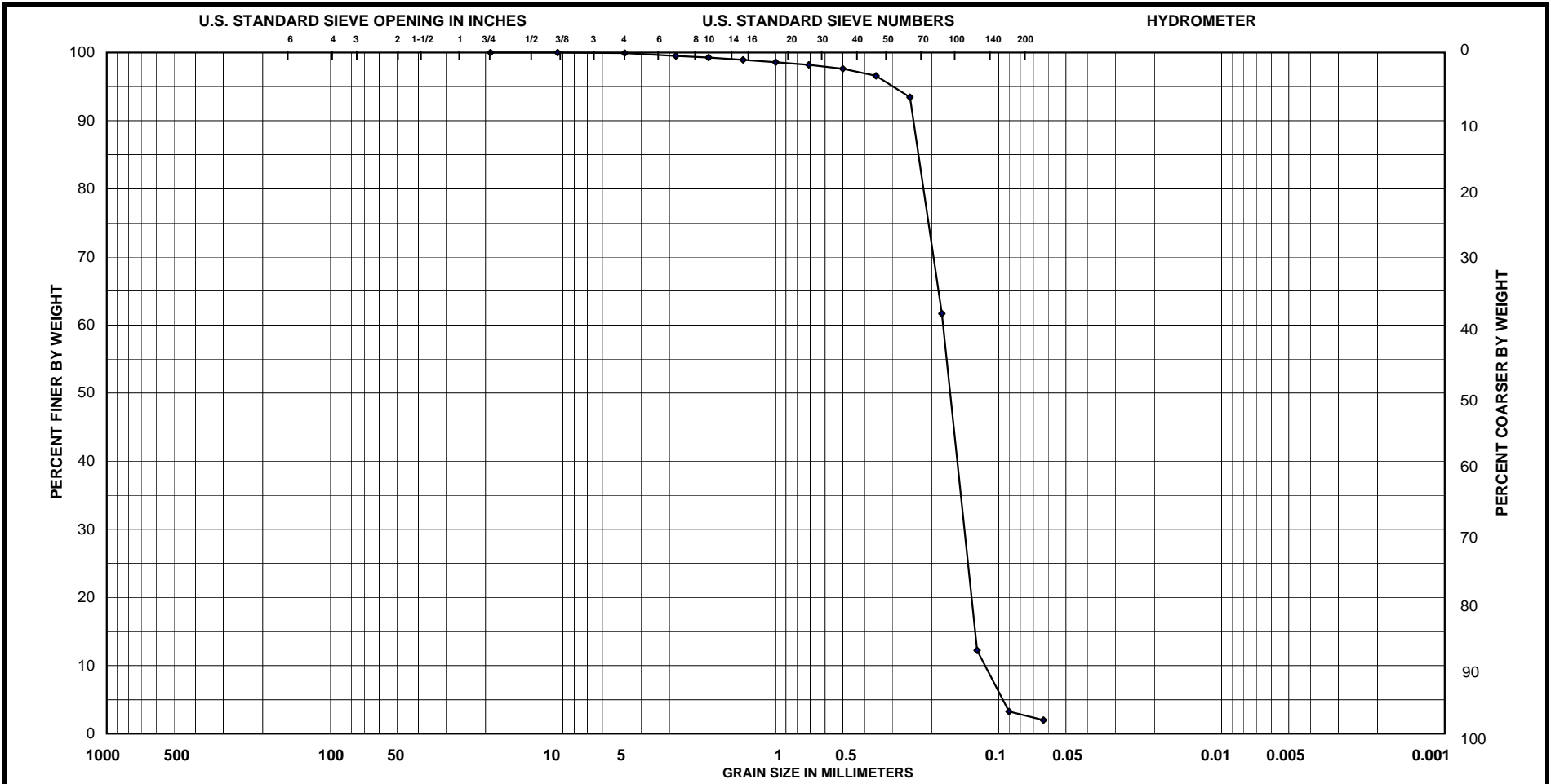
### GRAIN SIZE AND VISUAL SHELL CONTENT

Project:	<b>Topsail Beach, Surf City &amp; North Topsail</b>	Depth:	<b>23.8-24.3</b>
Project No.:	<b>1584-01-40</b>	Date:	<b>12/6/2003</b>
Boring No.:	<b>T1-03-V-364</b>		
Sample No.:	<b>1</b>		
Description:	<b>SAND, poorly-graded, mostly fine-grained quartz, trace carbonate, trace silt, gray (SP)</b>		

Tare Weight, (g):	<b>50.39</b>	
Dry Wt. Before Washing (g):	<b>154.84</b>	(with tare)
Dry Weight After Washing (g):	<b>152.8</b>	(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	0.08	99.92	100	0.08
#7	2.800	0.44	99.50	100	0.44
#10	2.000	0.25	99.26	100	0.25
#14	1.400	0.36	98.92	90	0.32
#18	1.000	0.34	98.59	90	0.31
#25	0.710	0.40	98.21	70	0.28
#35	0.500	0.62	97.62	60	0.37
#45	0.355	1.08	96.58	30	0.32
#60	0.250	3.26	93.46	10	0.33
#80	0.180	33.20	61.68	1	0.33
#120	0.125	51.64	12.24	1	0.52
#170	0.090	9.36	3.27	1	0.09
#230	0.063	1.33	2.00	1	0.01

**Total Shell Content:** **4** %



COBBLES	GRAVEL		SAND			SILT OR CLAY
	COARSE	FINE	COARSE	MEDIUM	FINE	

Sample No.	Elev. Or Depth	Classification	% CO <sub>3</sub>	G <sub>s</sub>	Nat w%	LL	PL	PI	Project
♦ 1	23.8-24.3	SAND, poorly-graded, mostly fine-grained quartz, trace carbonate, trace silt, gray (SP)	4						Topsail Beach, Surf City & North Topsail
									Area
									Boring No. T1-03-V-364
									Date 12/6/2003

**GRADATION CURVES**





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## VISUAL SHELL CONTENT

### GRAIN SIZE AND VISUAL SHELL CONTENT

Project:	<b>Topsail Beach, Surf City &amp; North Topsail</b>	Depth:	<b>25.5-26.0</b>
Project No.:	<b>1584-01-40</b>	Date:	<b>12/6/2003</b>
Boring No.:	<b>T1-03-V-364</b>		
Sample No.:	<b>2</b>		
Description:	<b>SAND, poorly-graded, mostly fine-grained quartz, trace carbonate, trace silt, gray (SP)</b>		

Tare Weight, (g):	<b>49.85</b>	
Dry Wt. Before Washing (g):	<b>154.17</b>	(with tare)
Dry Weight After Washing (g):	<b>152.23</b>	(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	0.08	99.92	100	0.08
#14	1.400	0.14	99.79	100	0.14
#18	1.000	0.10	99.69	100	0.10
#25	0.710	0.14	99.56	90	0.13
#35	0.500	0.21	99.36	70	0.15
#45	0.355	0.43	98.95	50	0.22
#60	0.250	1.55	97.46	20	0.31
#80	0.180	30.48	68.24	1	0.30
#120	0.125	55.81	14.74	1	0.56
#170	0.090	11.78	3.45	1	0.12
#230	0.063	1.54	1.97	1	0.02

**Total Shell Content:** **2** %





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## VISUAL SHELL CONTENT

### GRAIN SIZE AND VISUAL SHELL CONTENT

Project:	<b>Topsail Beach, Surf City &amp; North Topsail</b>	Depth:	<b>27.5-28.0</b>
Project No.:	<b>1584-01-40</b>	Date:	<b>12/6/2003</b>
Boring No.:	<b>T1-03-V-364</b>		
Sample No.:	<b>3</b>		
Description:	<b>SAND, poorly-graded, mostly fine-grained quartz, trace carbonate, trace silt, gray (SP)</b>		

Tare Weight, (g):	<b>49.87</b>	
Dry Wt. Before Washing (g):	<b>162.19</b>	(with tare)
Dry Weight After Washing (g):	<b>159.15</b>	(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	0.13	99.88	100	0.13
#14	1.400	0.07	99.81	100	0.07
#18	1.000	0.09	99.73	100	0.09
#25	0.710	0.11	99.63	90	0.10
#35	0.500	0.18	99.47	70	0.13
#45	0.355	0.33	99.18	60	0.20
#60	0.250	1.13	98.17	40	0.45
#80	0.180	29.07	72.29	1	0.29
#120	0.125	67.77	11.96	1	0.68
#170	0.090	9.26	3.71	1	0.09
#230	0.063	1.13	2.71	1	0.01

**Total Shell Content:** **2** %



COBBLES	GRAVEL		SAND			SILT OR CLAY
	COARSE	FINE	COARSE	MEDIUM	FINE	

Sample No.	Elev. Or Depth	Classification	% CO <sub>3</sub>	G <sub>s</sub>	Nat w%	LL	PL	PI	Project
3	27.5-28.0	SAND, poorly-graded, mostly fine-grained quartz, trace carbonate, trace silt, gray (SP)	2						Topsail Beach, Surf City & North Topsail
									Area
									Boring No. T1-03-V-364
									Date 12/6/2003

**GRADATION CURVES**



# WOLF TECHNOLOGIES, INC.

3047-4 St. Johns Bluff Road S.  
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## VISUAL SHELL CONTENT

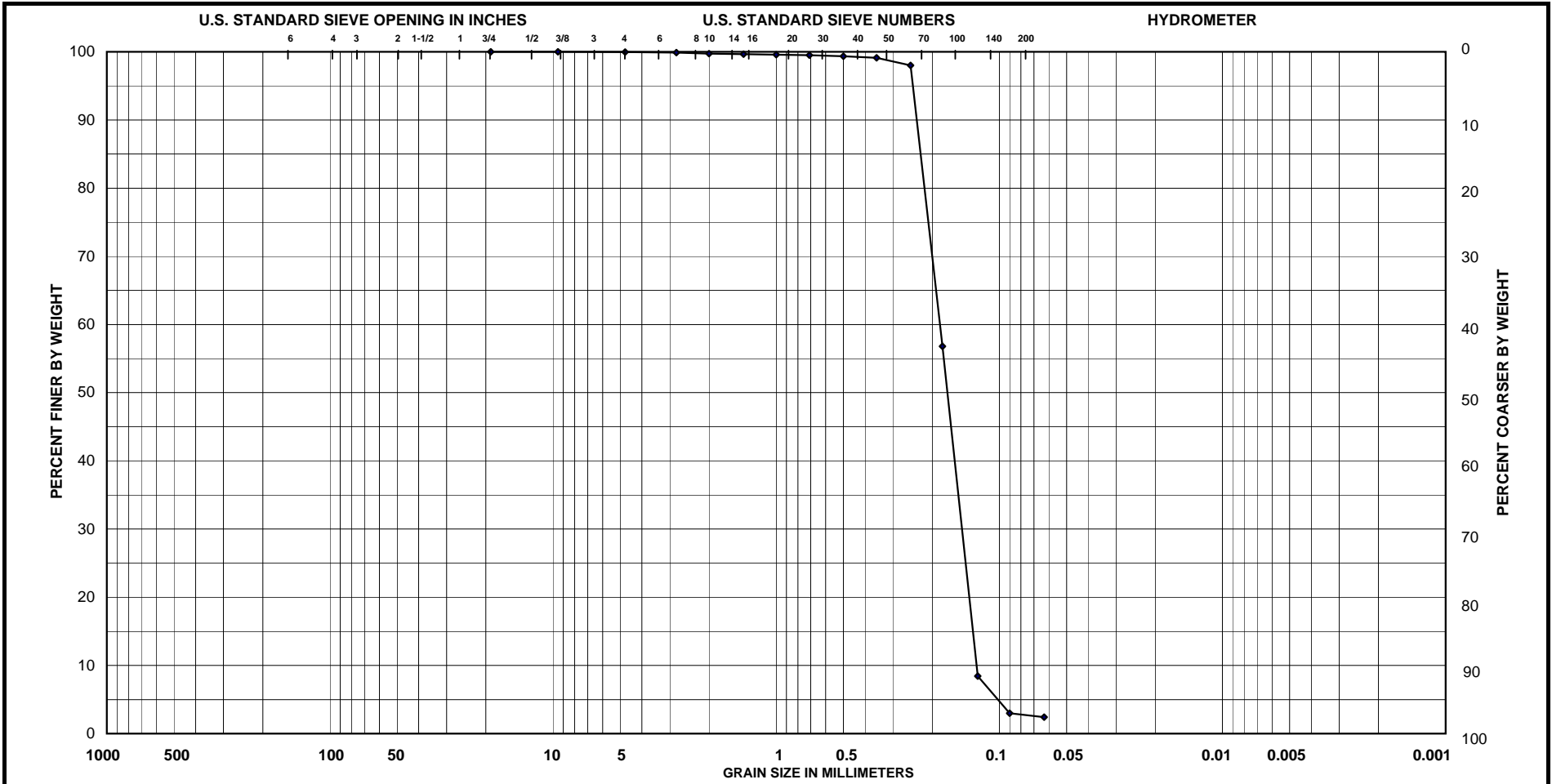
### GRAIN SIZE AND VISUAL SHELL CONTENT

Project:	<b>Topsail Beach, Surf City &amp; North Topsail</b>	Depth:	<b>29.5-30.0</b>
Project No.:	<b>1584-01-40</b>	Date:	<b>12/6/2003</b>
Boring No.:	<b>T1-03-V-364</b>		
Sample No.:	<b>4</b>		
Description:	<b>SAND, poorly-graded, mostly fine-grained quartz, trace carbonate, trace silt, gray (SP)</b>		

Tare Weight, (g):	<b>50.29</b>	
Dry Wt. Before Washing (g):	<b>149.9</b>	(with tare)
Dry Weight After Washing (g):	<b>147.26</b>	(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	0.03	99.97	100	0.03
#7	2.800	0.09	99.88	100	0.09
#10	2.000	0.13	99.75	100	0.13
#14	1.400	0.11	99.64	100	0.11
#18	1.000	0.07	99.57	90	0.06
#25	0.710	0.07	99.50	70	0.05
#35	0.500	0.15	99.35	60	0.09
#45	0.355	0.24	99.11	40	0.10
#60	0.250	1.11	97.99	20	0.22
#80	0.180	41.03	56.80	1	0.41
#120	0.125	48.17	8.44	1	0.48
#170	0.090	5.45	2.97	1	0.05
#230	0.063	0.54	2.43	1	0.01

**Total Shell Content:** **2** %



COBBLES	GRAVEL		SAND			SILT OR CLAY
	COARSE	FINE	COARSE	MEDIUM	FINE	

Sample No.	Elev. Or Depth	Classification	% CO <sub>3</sub>	G <sub>s</sub>	Nat w%	LL	PL	PI	Project
4	29.5-30.0	SAND, poorly-graded, mostly fine-grained quartz, trace carbonate, trace silt, gray (SP)	2						Topsail Beach, Surf City & North Topsail
									Area
									Boring No. T1-03-V-364
									Date 12/6/2003

**GRADATION CURVES**



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## VISUAL SHELL CONTENT

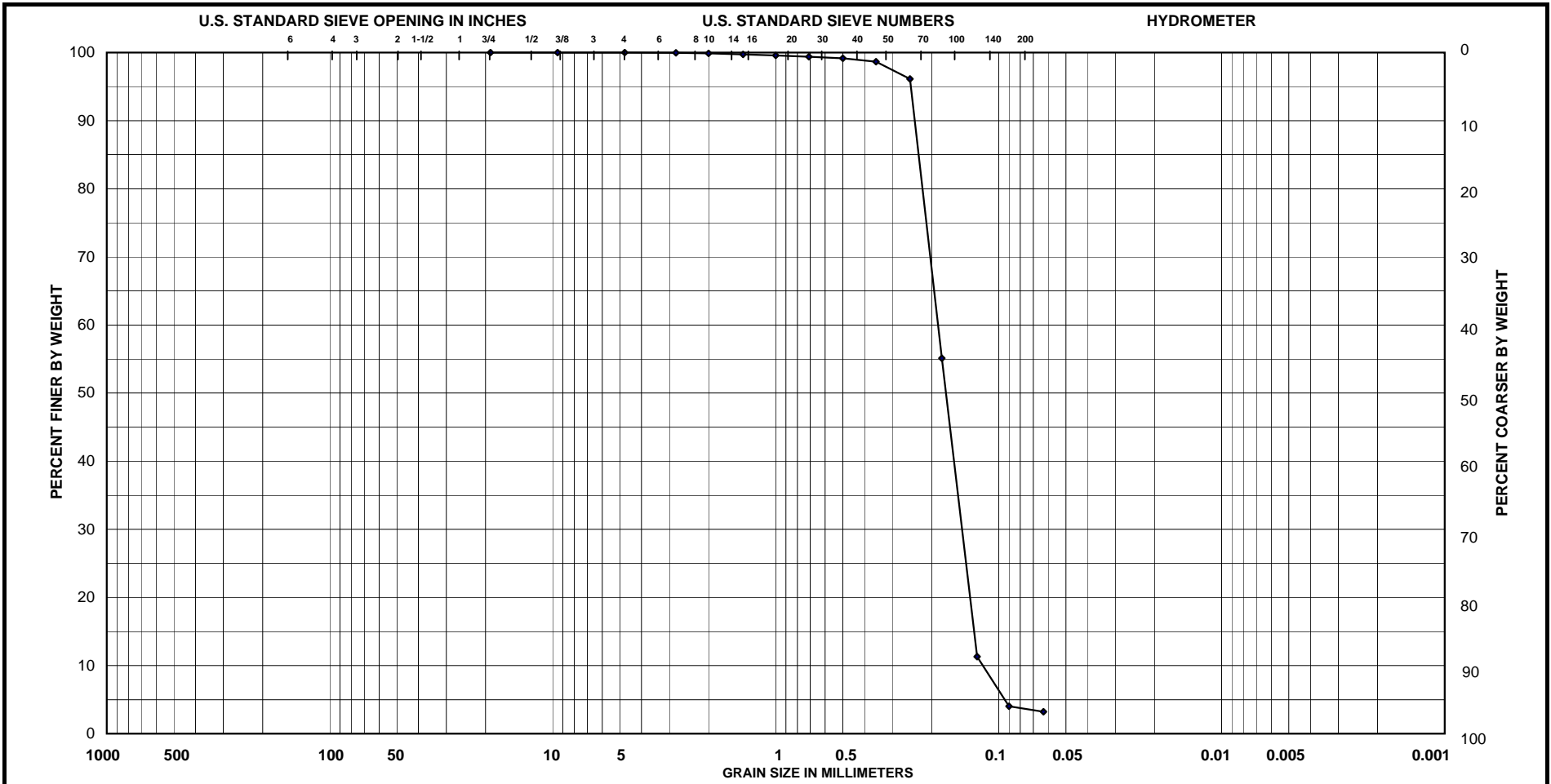
### GRAIN SIZE AND VISUAL SHELL CONTENT

Project:	<b>Topsail Beach, Surf City &amp; North Topsail</b>	Depth:	<b>31.8-32.3</b>
Project No.:	<b>1584-01-40</b>	Date:	<b>12/6/2003</b>
Boring No.:	<b>T1-03-V-364</b>		
Sample No.:	<b>5</b>		
Description:	<b>SAND, poorly-graded, mostly fine-grained quartz, trace carbonate, trace silt, gray (SP)</b>		

Tare Weight, (g):	<b>50.16</b>	
Dry Wt. Before Washing (g):	<b>141.02</b>	(with tare)
Dry Weight After Washing (g):	<b>138.05</b>	(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	0.03	99.97	100	0.03
#10	2.000	0.07	99.89	100	0.07
#14	1.400	0.13	99.75	90	0.12
#18	1.000	0.14	99.59	90	0.13
#25	0.710	0.17	99.41	90	0.15
#35	0.500	0.24	99.14	60	0.14
#45	0.355	0.44	98.66	50	0.22
#60	0.250	2.28	96.15	10	0.23
#80	0.180	37.27	55.13	1	0.37
#120	0.125	39.83	11.29	1	0.40
#170	0.090	6.62	4.01	1	0.07
#230	0.063	0.72	3.21	1	0.01

**Total Shell Content:** **2** %



COBBLES	GRAVEL		SAND			SILT OR CLAY
	COARSE	FINE	COARSE	MEDIUM	FINE	

Sample No.	Elev. Or Depth	Classification	% CO <sub>3</sub>	G <sub>s</sub>	Nat w%	LL	PL	PI	Project
5	31.8-32.3	SAND, poorly-graded, mostly fine-grained quartz, trace carbonate, trace silt, gray (SP)	2						Topsail Beach, Surf City & North Topsail
									Area
									Boring No. T1-03-V-364
									Date 12/6/2003

**GRADATION CURVES**





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## VISUAL SHELL CONTENT

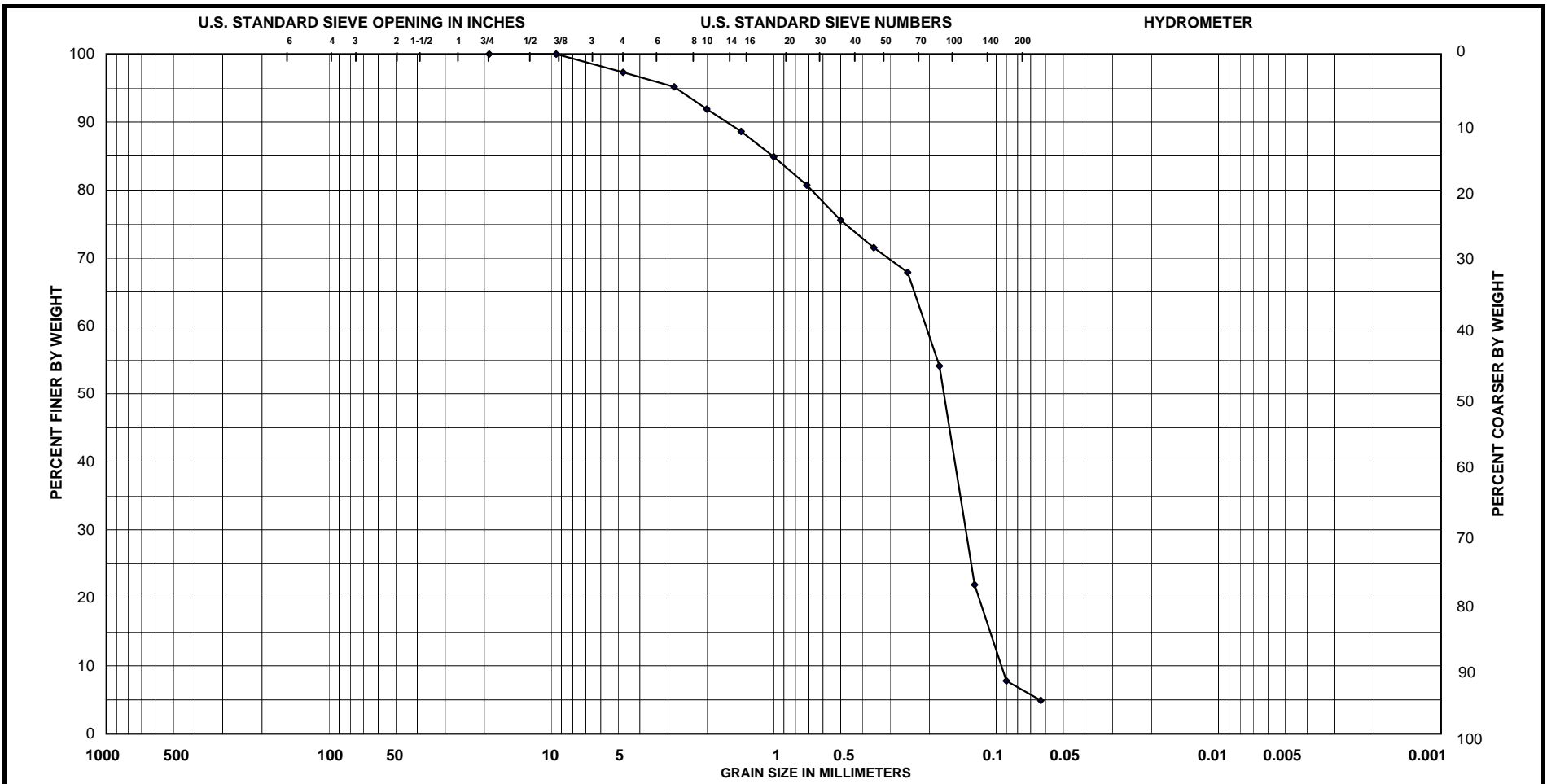
### GRAIN SIZE AND VISUAL SHELL CONTENT

Project:	<b>Topsail Beach, Surf City &amp; North Topsail</b>	Depth:	<b>34.0-34.5</b>
Project No.:	<b>1584-01-40</b>	Date:	<b>12/6/2003</b>
Boring No.:	<b>T1-03-V-364</b>		
Sample No.:	<b>6</b>		
Description:	<b>SAND, poorly-graded with silt, mostly fine-grained quartz, little carbonate, few silt, gray (SP-SM)</b>		

Tare Weight, (g):	<b>49.86</b>	
Dry Wt. Before Washing (g):	<b>149.92</b>	(with tare)
Dry Weight After Washing (g):	<b>145.02</b>	(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	2.70	97.30	100	2.70
#7	2.800	2.14	95.16	100	2.14
#10	2.000	3.24	91.92	100	3.24
#14	1.400	3.31	88.62	100	3.31
#18	1.000	3.71	84.91	90	3.34
#25	0.710	4.19	80.72	70	2.93
#35	0.500	5.19	75.53	40	2.08
#45	0.355	4.01	71.53	20	0.80
#60	0.250	3.65	67.88	5	0.18
#80	0.180	13.76	54.13	1	0.14
#120	0.125	32.21	21.94	1	0.32
#170	0.090	14.17	7.78	1	0.14
#230	0.063	2.86	4.92	1	0.03

**Total Shell Content:** **21** %



COBBLES	GRAVEL		SAND			SILT OR CLAY
	COARSE	FINE	COARSE	MEDIUM	FINE	

Sample No.	Elev. Or Depth	Classification	% CO <sub>3</sub>	G <sub>s</sub>	Nat w%	LL	PL	PI	Project
6	34.0-34.5	SAND, poorly-graded with silt, mostly fine-grained quartz, little carbonate, few silt, gray (SP-SM)	21						Topsail Beach, Surf City & North Topsail
									Area
									Boring No. T1-03-V-364
									Date 12/6/2003

**GRADATION CURVES**



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## VISUAL SHELL CONTENT

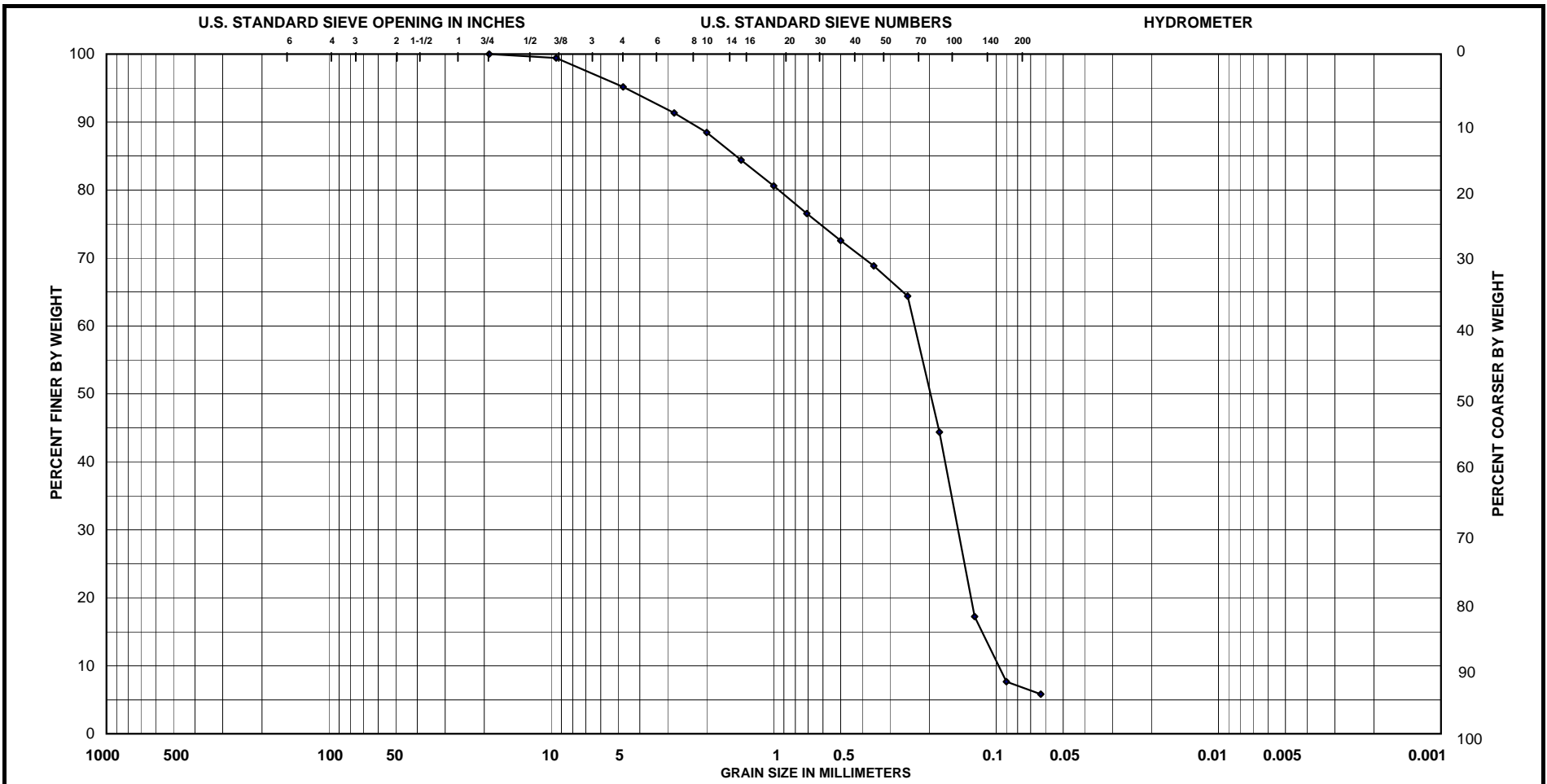
### GRAIN SIZE AND VISUAL SHELL CONTENT

<b>Project:</b>	<b>Topsail Beach, Surf City &amp; North Topsail</b>	<b>Depth:</b>	<b>35.5-36.0</b>
<b>Project No.:</b>	<b>1584-01-40</b>	<b>Date:</b>	<b>12/6/2003</b>
<b>Boring No.:</b>	<b>T1-03-V-365</b>		
<b>Sample No.:</b>	<b>1</b>		
<b>Description:</b>	<b>SAND, poorly-graded with silt, mostly fine-grained quartz, little carbonate, few silt, gray (SP-SM)</b>		

Tare Weight, (g):	50.14	
Dry Wt. Before Washing (g):	186.18	(with tare)
Dry Weight After Washing (g):	178.34	(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	0.80	99.41	100	0.80
#4	4.750	5.77	95.17	100	5.77
#7	2.800	5.24	91.32	100	5.24
#10	2.000	3.90	88.45	100	3.90
#14	1.400	5.52	84.39	90	4.97
#18	1.000	5.13	80.62	70	3.59
#25	0.710	5.55	76.54	40	2.22
#35	0.500	5.44	72.54	30	1.63
#45	0.355	5.05	68.83	10	0.51
#60	0.250	6.06	64.38	5	0.30
#80	0.180	27.20	44.38	1	0.27
#120	0.125	36.91	17.25	1	0.37
#170	0.090	13.02	7.68	1	0.13
#230	0.063	2.51	5.84	1	0.03

**Total Shell Content:** 22 %



COBBLES	GRAVEL		SAND			SILT OR CLAY
	COARSE	FINE	COARSE	MEDIUM	FINE	

Sample No.	Elev. Or Depth	Classification	% CO <sub>3</sub>	G <sub>s</sub>	Nat w%	LL	PL	PI	Project	
♦ 1	35.5-36.0	SAND, poorly-graded with silt, mostly fine-grained quartz, little carbonate, few silt, gray (SP-SM)	22						Topsail Beach, Surf City & North Topsail	
									Area	
									Boring No. T1-03-V-365	
									Date 12/6/2003	

**GRADATION CURVES**



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## VISUAL SHELL CONTENT

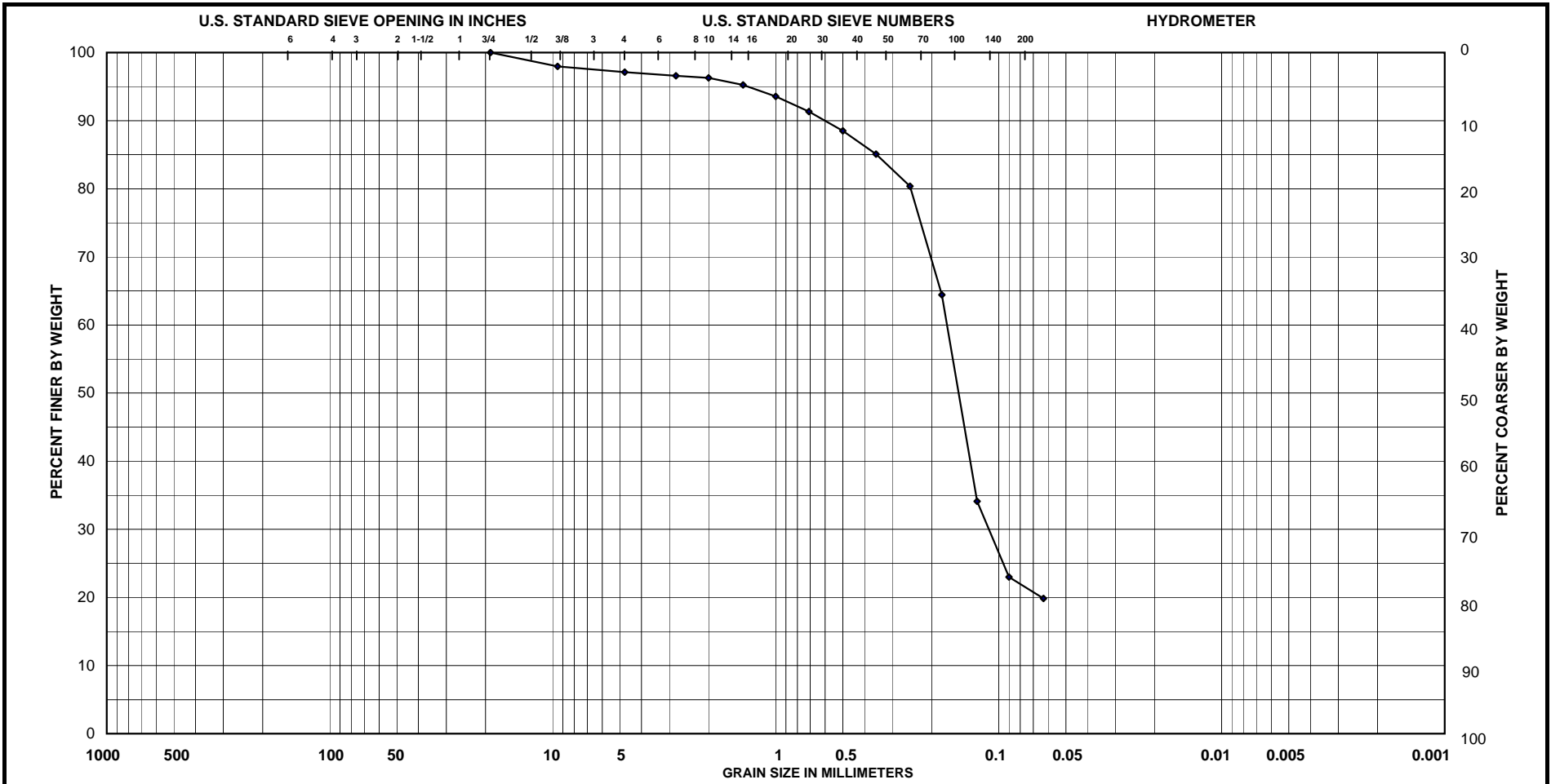
### GRAIN SIZE AND VISUAL SHELL CONTENT

Project:	<b>Topsail Beach, Surf City &amp; North Topsail</b>	Depth:	<b>37.5-38.0</b>
Project No.:	<b>1584-01-40</b>	Date:	<b>12/6/2003</b>
Boring No.:	<b>T1-03-V-365</b>		
Sample No.:	<b>2</b>		
Description:	<b>SAND, silty, mostly fine-grained quartz, little silt, few carbonate, trace limestone fragments, gray (SM)</b>		

Tare Weight, (g):	<b>49.31</b>	
Dry Wt. Before Washing (g):	<b>160.95</b>	(with tare)
Dry Weight After Washing (g):	<b>139.18</b>	(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	2.26	97.98	0	0.00
#4	4.750	0.95	97.12	0	0.00
#7	2.800	0.59	96.60	70	0.41
#10	2.000	0.33	96.30	80	0.26
#14	1.400	1.18	95.24	50	0.59
#18	1.000	1.87	93.57	50	0.94
#25	0.710	2.49	91.34	30	0.75
#35	0.500	3.18	88.49	30	0.95
#45	0.355	3.80	85.09	20	0.76
#60	0.250	5.26	80.37	10	0.53
#80	0.180	17.81	64.42	2	0.36
#120	0.125	33.83	34.12	1	0.34
#170	0.090	12.42	22.99	1	0.12
#230	0.063	3.49	19.87	1	0.03

**Total Shell Content:** **5** %



COBBLES	GRAVEL		SAND			SILT OR CLAY
	COARSE	FINE	COARSE	MEDIUM	FINE	

Sample No.	Elev. Or Depth	Classification	% CO <sub>3</sub>	G <sub>s</sub>	Nat w%	LL	PL	PI	Project
♦ 2	37.5-38.0	SAND, silty, mostly fine-grained quartz, little silt, few carbonate, trace limestone fragments, gray (SM)	5						Topsail Beach, Surf City & North Topsail
									Area
									Boring No. T1-03-V-365
									Date 12/6/2003

**GRADATION CURVES**



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## VISUAL SHELL CONTENT

### GRAIN SIZE AND VISUAL SHELL CONTENT

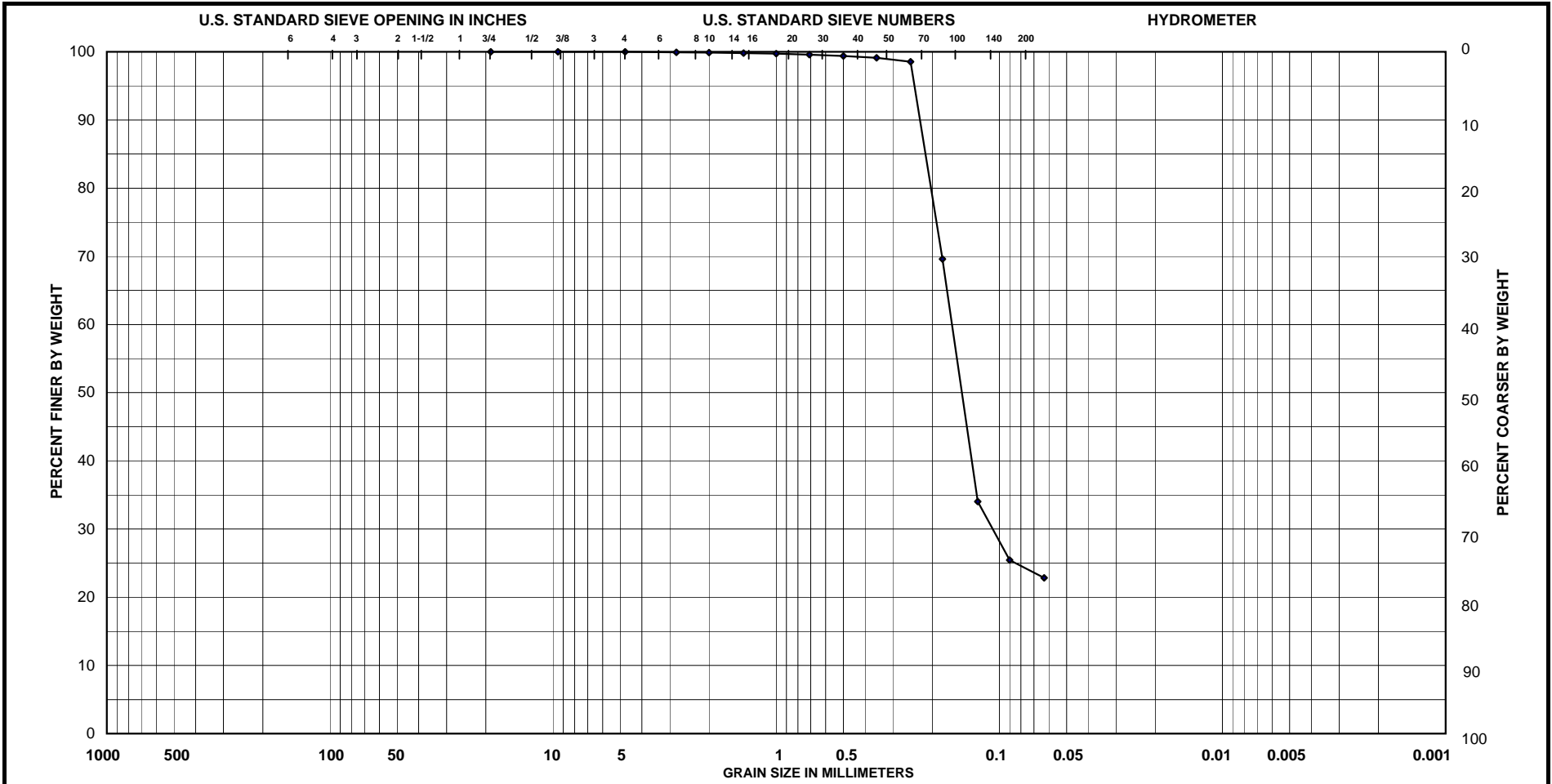
Project:	<b>Topsail Beach, Surf City &amp; North Topsail</b>	Depth:	<b>39.5-40.0</b>
Project No.:	<b>1584-01-40</b>	Date:	<b>12/6/2003</b>
Boring No.:	<b>T1-03-V-365</b>		
Sample No.:	<b>3</b>		
Description:	<b>SAND, silty, mostly fine-grained quartz, little silt, trace carbonate, brown (SM)</b>		

Tare Weight, (g):	<b>50.38</b>	
Dry Wt. Before Washing (g):	<b>183.74</b>	(with tare)
Dry Weight After Washing (g):	<b>153.07</b>	(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	99.94	0	0.00
#10	2.000	0.09	99.87	50	0.05
#14	1.400	0.09	99.81	80	0.07
#18	1.000	0.11	99.72	80	0.09
#25	0.710	0.17	99.60	50	0.09
#35	0.500	0.26	99.40	30	0.08
#45	0.355	0.38	99.12	5	0.02
#60	0.250	0.78	98.53	1	0.01
#80	0.180	38.57	69.61	1	0.39
#120	0.125	47.45	34.03	1	0.47
#170	0.090	11.44	25.45	1	0.11
#230	0.063	3.47	22.85	1	0.03

**Total Shell Content:**

<b>1</b>	<b>%</b>
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COBBLES	GRAVEL		SAND			SILT OR CLAY
	COARSE	FINE	COARSE	MEDIUM	FINE	

Sample No.	Elev. Or Depth	Classification	% CO <sub>3</sub>	G <sub>s</sub>	Nat w%	LL	PL	PI	Project
♦ 3	39.5-40.0	SAND, silty, mostly fine-grained quartz, little silt, trace carbonate, brown (SM)	1						Topsail Beach, Surf City & North Topsail
									Area
									Boring No. T1-03-V-365
									Date 12/6/2003

**GRADATION CURVES**





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## VISUAL SHELL CONTENT

### GRAIN SIZE AND VISUAL SHELL CONTENT

Project:	<b>Topsail Beach, Surf City &amp; North Topsail</b>	Depth:	<b>41.5-42.0</b>
Project No.:	<b>1584-01-40</b>	Date:	<b>12/6/2003</b>
Boring No.:	<b>T1-03-V-365</b>		
Sample No.:	<b>4</b>		
Description:	<b>SAND, silty, mostly fine-grained quartz, some silt, trace carbonate, brown (SM)</b>		

Tare Weight, (g):	<b>50.56</b>	
Dry Wt. Before Washing (g):	<b>173.76</b>	(with tare)
Dry Weight After Washing (g):	<b>129.26</b>	(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	0.00	100.00	0	0.00
#14	1.400	0.07	99.94	0	0.00
#18	1.000	0.03	99.92	0	0.00
#25	0.710	0.04	99.89	20	0.01
#35	0.500	0.15	99.76	10	0.02
#45	0.355	0.34	99.49	1	0.00
#60	0.250	0.62	98.99	1	0.01
#80	0.180	21.41	81.61	1	0.21
#120	0.125	41.76	47.71	1	0.42
#170	0.090	11.78	38.15	1	0.12
#230	0.063	2.24	36.33	1	0.02

**Total Shell Content:** **1** %





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## VISUAL SHELL CONTENT

### GRAIN SIZE AND VISUAL SHELL CONTENT

Project:	<b>Topsail Beach, Surf City &amp; North Topsail</b>	Depth:	<b>43.5-44.0</b>
Project No.:	<b>1584-01-40</b>	Date:	<b>12/6/2003</b>
Boring No.:	<b>T1-03-V-365</b>		
Sample No.:	<b>5</b>		
Description:	<b>SAND, silty, mostly fine-grained quartz, some silt, trace carbonate, brown (SM)</b>		

Tare Weight, (g):	<b>50.16</b>	
Dry Wt. Before Washing (g):	<b>177.69</b>	(with tare)
Dry Weight After Washing (g):	<b>140.76</b>	(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	0.00	100.00	0	0.00
#14	1.400	0.00	100.00	0	0.00
#18	1.000	0.05	99.96	50	0.03
#25	0.710	0.08	99.90	10	0.01
#35	0.500	0.22	99.73	5	0.01
#45	0.355	0.40	99.41	1	0.00
#60	0.250	0.68	98.88	1	0.01
#80	0.180	39.65	67.79	1	0.40
#120	0.125	39.84	36.55	1	0.40
#170	0.090	6.70	31.29	1	0.07
#230	0.063	2.38	29.43	1	0.02

**Total Shell Content:** **1** %





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## VISUAL SHELL CONTENT

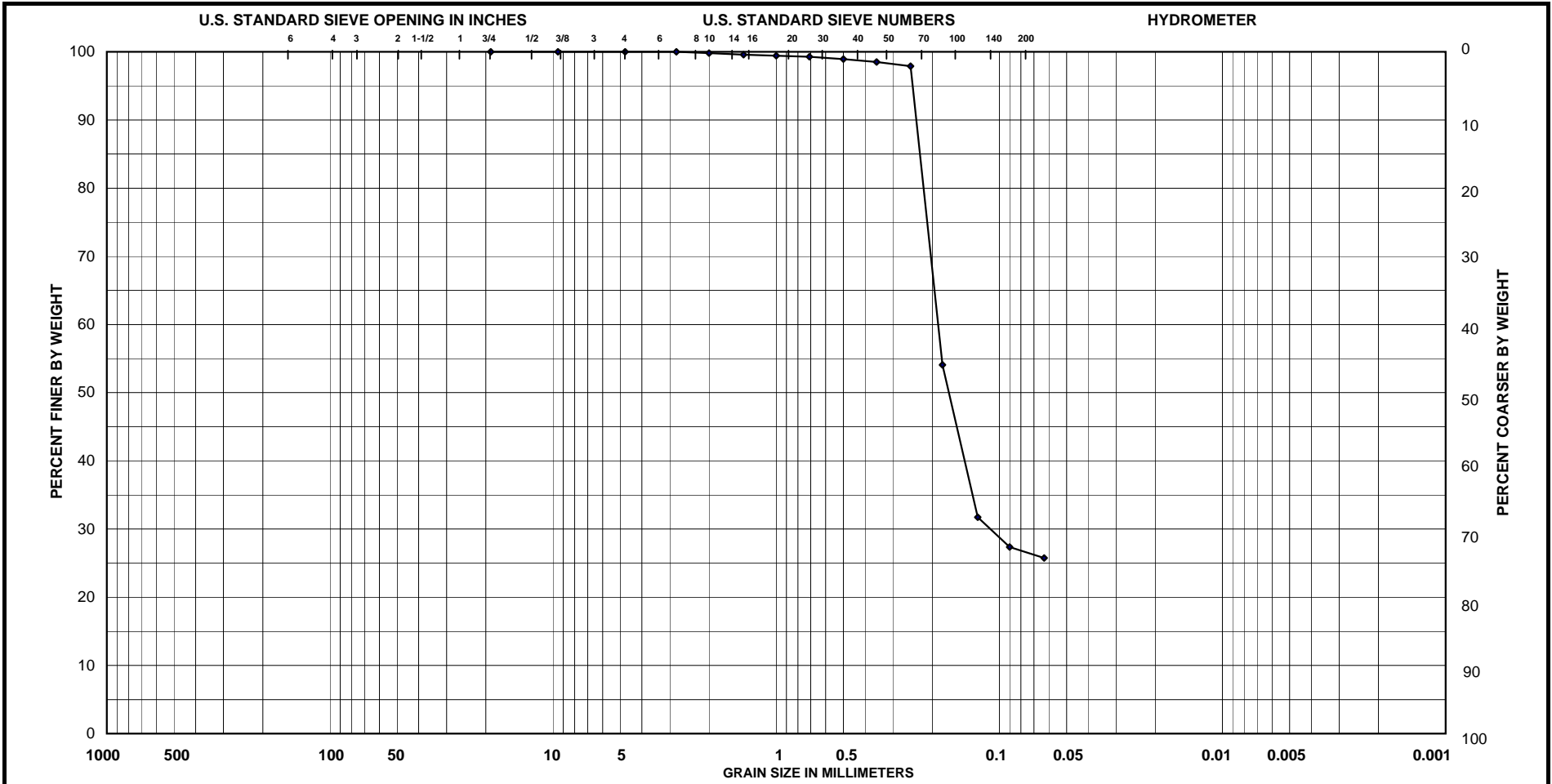
### GRAIN SIZE AND VISUAL SHELL CONTENT

Project:	<b>Topsail Beach, Surf City &amp; North Topsail</b>	Depth:	<b>45.5-46.0</b>
Project No.:	<b>1584-01-40</b>	Date:	<b>12/6/2003</b>
Boring No.:	<b>T1-03-V-365</b>		
Sample No.:	<b>6</b>		
Description:	<b>SAND, silty, mostly fine-grained quartz, little silt, brown (SM)</b>		

Tare Weight, (g):	<b>50.25</b>	
Dry Wt. Before Washing (g):	<b>191.11</b>	(with tare)
Dry Weight After Washing (g):	<b>155.24</b>	(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	99.99	0	0.00
#10	2.000	0.25	99.81	0	0.00
#14	1.400	0.30	99.60	0	0.00
#18	1.000	0.23	99.43	0	0.00
#25	0.710	0.24	99.26	0	0.00
#35	0.500	0.48	98.92	1	0.00
#45	0.355	0.60	98.49	1	0.01
#60	0.250	0.84	97.90	0	0.00
#80	0.180	61.74	54.07	0	0.00
#120	0.125	31.48	31.72	0	0.00
#170	0.090	6.15	27.35	0	0.00
#230	0.063	2.26	25.75	0	0.00

**Total Shell Content:** **0** %



COBBLES	GRAVEL		SAND			SILT OR CLAY
	COARSE	FINE	COARSE	MEDIUM	FINE	

Sample No.	Elev. Or Depth	Classification	% CO <sub>3</sub>	G <sub>s</sub>	Nat w%	LL	PL	PI	Project
6	45.5-46.0	SAND, silty, mostly fine-grained quartz, little silt, brown (SM)	0						Topsail Beach, Surf City & North Topsail
									Area
									Boring No. T1-03-V-365
									Date 12/6/2003

**GRADATION CURVES**