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December 8, 2008

Mr. Ke Yang
CH2M Hill
15010 Conference Center Drive
Suite 200
Chantilly, VA 20151

Re: L-08122
Laboratory Testing
Dundalk Marine Terminal
Baltimore, Maryland

Dear Mr. Yang:

Enclosed are the results of laboratory testing performed at your request on fourteen each soil samples delivered to our laboratory on October 27, 2008 for the above referenced project. Results include:

1.	Natural Moisture Content ASTM D2216 Laboratory I.D. #'s 23742 - 23755	14 Each
2.	Sieve Analysis ASTM D422 & D1140 Laboratory I.D. #'s 23742 - 23755	14 Each
3.	Hydrometer Analysis ASTM D422 Laboratory I.D. #'s 23742 - 23755	14 Each
4.	Atterberg Limits ASTM D4318 Laboratory I.D. #'s 23742 - 23755	14 Each
5.	Bulk (Natural) Soil Density – Corps of Engineers EM-1110-2-1906 Appendix II, Displacement Method Laboratory I.D. #'s 23742-23745, 23747-23749, 23752-23754	10 Each
6.	Hydraulic Conductivity – Flexible Wall ASTM D5084 Laboratory I.D. #'s 23742-23745, 23747-23749, 23752-23754	10 Each
7.	Photographs on CD-ROM (3 Shelby Tube Samples)	1 Set

All requested tests have been completed on the previously received sample(s) for the above project. All sample remains are scheduled to be disposed of on January 8, 2009. Please notify PW Laboratories, Inc. by letter or telephone prior to January 8, 2009 if you would prefer to pick up the sample(s) or that the sample(s) be retained by PW Laboratories, Inc. for an additional period of time.

Thank you for this opportunity to work with you.

Very truly yours,

PW LABORATORIES, INC.

Virginia J. Thoma

Virginia J. Thoma
Manager - Laboratory Services
VJT/bll
Encs:

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December 5, 2008

L-08122
Laboratory Testing
Honeywell
Dundalk Marine Terminal
Baltimore, Maryland

NATURAL MOISTURE CONTENT
ASTM D2216

Lab I.D. #	Sample #	Depth (feet)	Moisture Content as a Percent of Dry Weight
23742	DMT-79M	110.0 - 118.5	11.8
23743	DMT-80M	127.0 - 138.5	11.2
23744	DMT-78M	87.0 - 99.0	21.3
23745	DMT-81D	147.0 - 159.0	12.8
23746	DMT-81D	74.0 - 77.0	12.3
23747	DMT-77M	147.0 - 159.0	15.6
23748	DMT-83D	157.0 - 169.0	11.7
23749	DMT-81D	177.0 - 189.0	11.9
23750	DMT-82D	97.0 - 107.0	18.3
23751	DMT-83D	177.0 - 187.0	16.0
23752	DMT-83D	257.0 - 269.0	17.2
23753	DMT-82D	230.0 - 239.0	11.8
23754	DMT-82D	207.0 - 217.0	15.9
23755	DMT-82D	157.0 - 166.0	15.4

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SIEVE ANALYSIS OF SOIL / AGGREGATE

Project Title: Laboratory Testing
Honeywell
Dundalk Marine Terminal
Baltimore, Maryland

Project #: L-08122
Test Method: ASTM D422 & D1140

Report #: 1
Report Date: December 5, 2008

			Sieve Size - Percent Passing Sieve													
Lab I.D. #	Sample #	Depth (feet)	3/4"	1/2"	3/8"	1/4"	#4	#10	#30	#40	#60	#100	#200			
23742	DMT-79M	110.0 - 118.5	--	--	--	--	--	100	99.9	99.8	99.3	97.7	90.5			
23743	DMT-80M	127.0 - 138.5	--	--	--	--	--	100	99.8	99.5	96.1	84.1	69.7			
23744	DMT-78M	87.0 - 99.0	--	--	--	--	--	100	99.9	99.8	99.6	99.4	98.8			
23745	DMT-81D	147.0 - 159.0	--	--	--	--	--	100	99.7	99.3	96.7	83.1	67.9			
23746	DMT-81D	74.0 - 77.0	--	--	100	99.8	99.3	98.1	94.2	87.8	75.8	67.4	57.1			
23747	DMT-77M	147.0 - 159.0	--	--	--	--	--	--	--	100	99.1	94.7	83.4			
23748	DMT-83D	157.0 - 169.0	--	--	--	--	--	100	99.8	99.0	91.0	76.1	63.8			
23749	DMT-81D	177.0 - 189.0	--	--	--	--	--	100	99.4	97.8	96.4	81.4	59.6			
23750	DMT-82D	97.0 - 107.0	--	--	--	--	--	100	99.0	97.8	96.8	94.1	79.4			

Sample mass, as received, meets minimum mass requirements of test method: Yes ____ No X

Prewashed: Yes X No ____

Remarks:

Performed By: TC, SP & PE

Checked By: V.J. Thoma

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SIEVE ANALYSIS OF SOIL / AGGREGATE

Project Title: Laboratory Testing
Honeywell
Dundalk Marine Terminal
Baltimore, Maryland

Project #: L-08122
Test Method: ASTM D422 & D1140

Report #: 1
Report Date: December 5, 2008

			Sieve Size - Percent Passing Sieve													
Lab I.D. #	Sample #	Depth (feet)	3/4"	1/2"	3/8"	1/4"	#4	#10	#30	#40	#60	#100	#200			
23751	DMT-83D	177.0 - 187.0	--	--	--	--	--	--	--	100	99.0	82.8	64.4			
23752	DMT-83D	257.0 - 269.0	100	99.3	98.8	98.2	97.6	96.5	95.2	94.9	94.3	93.3	90.7			
23753	DMT-82D	230.0 - 239.0	--	--	--	--	100	99.7	98.1	97.3	95.9	94.7	92.4			
23754	DMT-82D	207.0 - 217.0	--	--	--	--	--	100	99.4	97.0	88.2	79.1	67.8			
23755	DMT-82D	157.0 - 166.0	--	--	--	--	--	--	100	99.8	98.6	95.5	81.1			

Sample mass, as received, meets minimum mass requirements of test method: Yes ____ No X

Prewashed: Yes X No ____

Remarks:

Performed By: TC, SP & PE

Checked By: V.J. Thoma

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December 5, 2008

L-08122
Laboratory Testing
Honeywell
Dundalk Marine Terminal
Baltimore, Maryland

ATTERBERG LIMITS
ASTM D4318

Lab ID #	Sample #	Depth (feet)	Plastic Limit	Liquid Limit	Plasticity Index
23742	DMT-79M	110.0 - 118.5	21	30	9
23743	DMT-80M	127.0 - 138.5	16	26	10
23744	DMT-78M	87.0 - 99.0	26	62	36
23745	DMT-81D	147.0 - 159.0	15	24	9
23746	DMT-81D	74.0 - 77.0	15	23	8
23747	DMT-77M	147.0 - 159.0	17	26	9
23748	DMT-83D	157.0 - 169.0	16	25	9
23749	DMT-81D	177.0 - 189.0	18	30	12
23750	DMT-82D	97.0 - 107.0	19	31	12
23751	DMT-83D	177.0 - 187.0	17	21	4
23752	DMT-83D	257.0 - 269.0	24	48	24
23753	DMT-82D	230.0 - 239.0	21	36	15
23754	DMT-82D	207.0 - 217.0	16	22	7
23755	DMT-82D	157.0 - 166.0	22	29	7

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December 5, 2008

L-08122
Laboratory Testing
Honeywell
Dundalk Marine Terminal
Baltimore, Maryland

BULK (NATURAL) SOIL DENSITY(PCF)
CORPS OF ENGINEERS EM-1110-2-1906
APPENDIX II, DISPLACEMENT METHOD

Lab I.D. #	Sample I.D.	Depth (feet)	Bulk (Natural) Soil Density (PCF)		
			Moist Density		Dry Density
23742	DMT-79M	110.0 - 118.5	132.9		113.6
23743	DMT-80M	127.0 - 138.5	132.1		113.0
23744	DMT-78M	87.0 - 99.0	127.1		102.3
23745	DMT-81D	147.0 - 159.0	132.8		113.6
23747	DMT-77M	147.0 - 159.0	131.9		113.0
23748	DMT-83D	157.0 - 169.0	134.8		115.5
23749	DMT-81D	177.0 - 189.0	141.8		121.7
23752	DMT-83D	257.0 - 269.0	127.4		144.1
23753	DMT-82D	230.0 - 239.0	129.9		144.2
23754	DMT-82D	207.0 - 217.0	123.0		136.4

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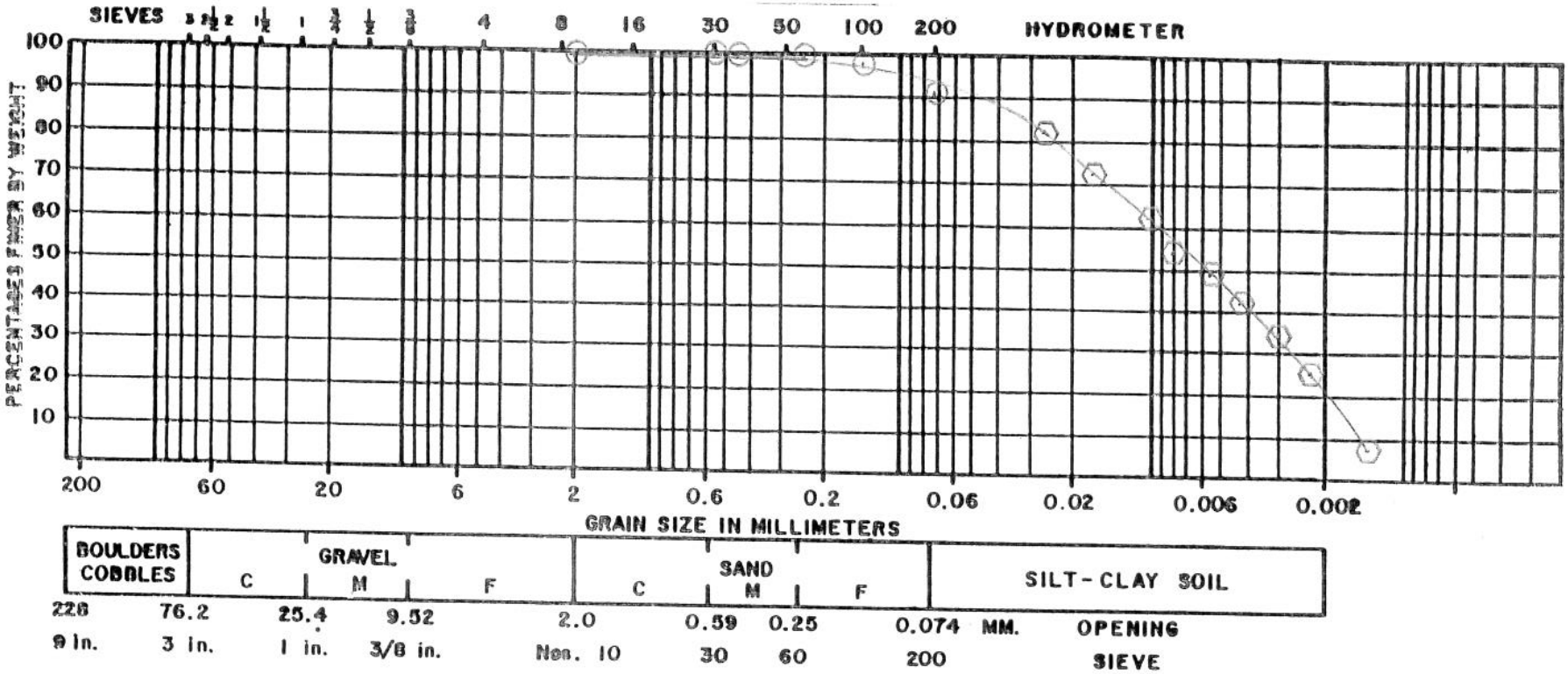
Job No.: L-08122
Report No: 1
Date: December 1, 2008

GRAIN SIZE ANALYSIS



L-08122		Lab I.D. #:	23742
Laboratory Testing		Sample #:	DMT-79 M
Honeywell		Depth (feet):	110.0 - 118.5
Dundalk Marine Terminal			
Baltimore, Maryland			

⊙ Sieve Analysis ASTM D422 & D1140
⊙ Hydrometer Analysis ASTM D422

C:_Clients_Jobs\CH2M Hill, Inc\2008\L-08122 Laboratory Testing\Hydrometer Graphs\Hydrometer Graph #23742

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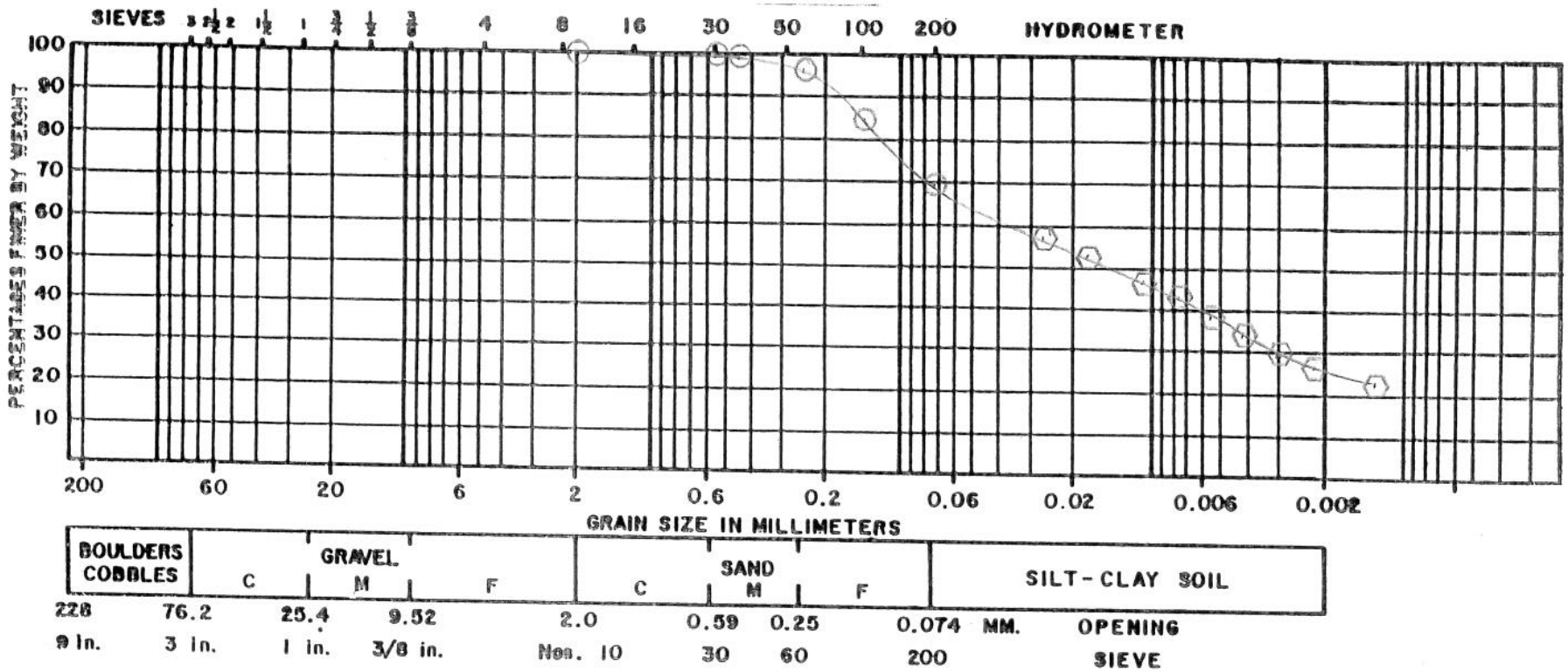
Job No.:	L-08122
Report No:	2
Date:	December 1, 2008

GRAIN SIZE ANALYSIS



L-08122	Lab I.D. #:	23743
Laboratory Testing	Sample #:	DMT-80 M
Honeywell	Depth (feet):	127.0 - 138.5
Dundalk Marine Terminal		
Baltimore, Maryland		

⊙ Sieve Analysis ASTM D422 & D1140

⬡ Hydrometer Analysis ASTM D422

C:_Clients_Jobs\CH2M Hill, Inc\2008\L-08122 Laboratory Testing\Hydrometer Graphs\Hydrometer Graph #23743

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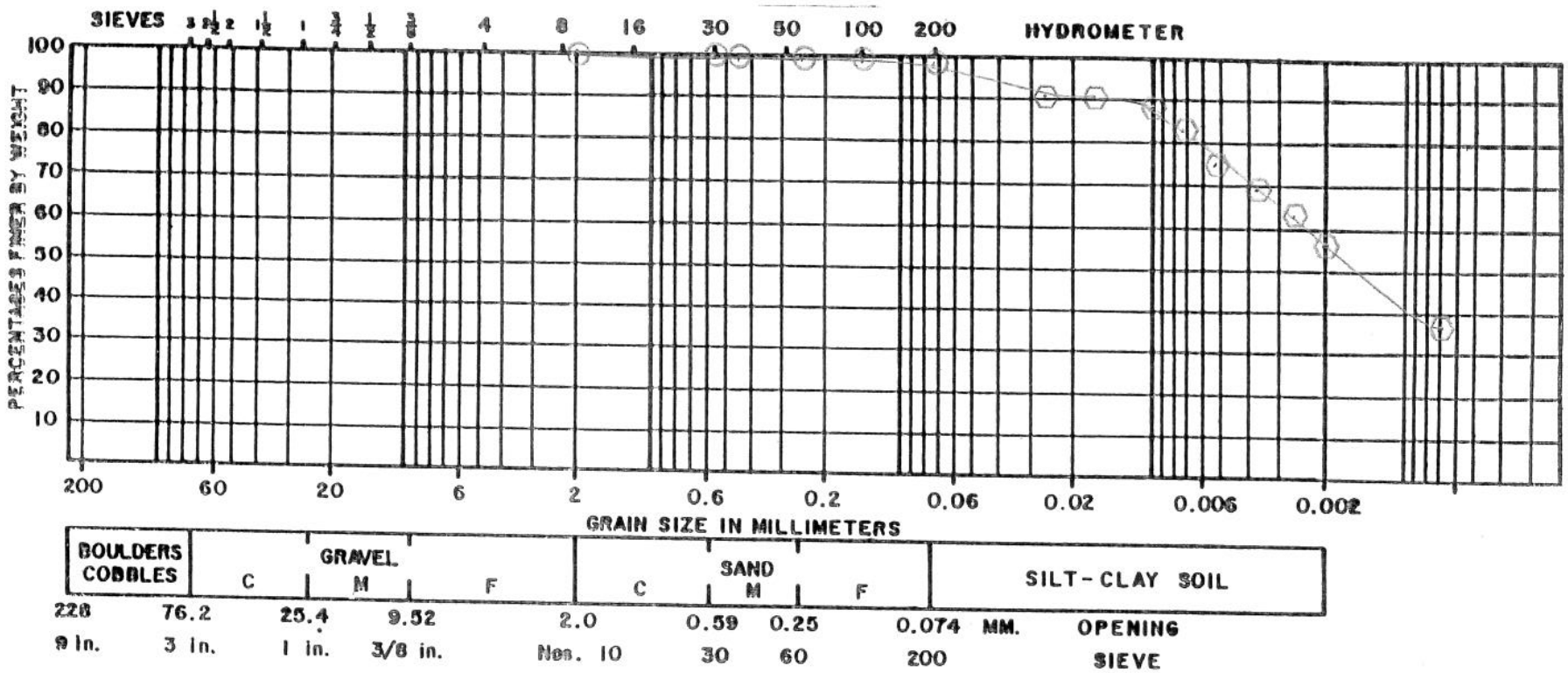
Job No.:	L-08122
Report No:	3
Date:	December 1, 2008

GRAIN SIZE ANALYSIS



L-08122	Lab I.D. #:	23744
Laboratory Testing	Sample #:	DMT-78 M
Honeywell	Depth (feet):	87.0 - 99.0
Dundalk Marine Terminal		
Baltimore, Maryland		

⊙ Sieve Analysis ASTM D422 & D1140

⊗ Hydrometer Analysis ASTM D422

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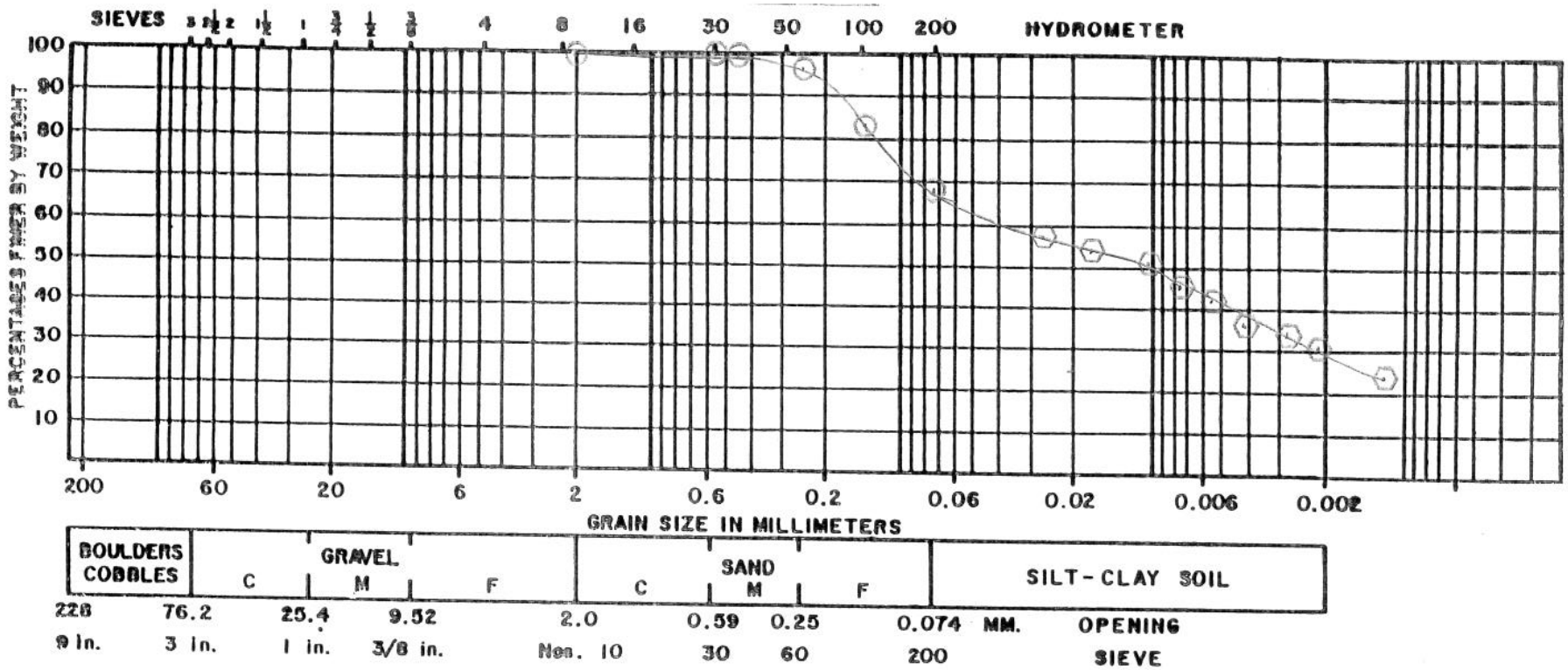
Job No.:	L-08122
Report No:	4
Date:	December 1, 2008

GRAIN SIZE ANALYSIS



L-08122	Lab I.D. #:	23745
Laboratory Testing	Sample #:	DMT-81 D
Honeywell	Depth (feet):	147.0 - 159.0
Dundalk Marine Terminal		
Baltimore, Maryland		

⊙ Sieve Analysis ASTM D422 & D1140

⟨·⟩ Hydrometer Analysis ASTM D422

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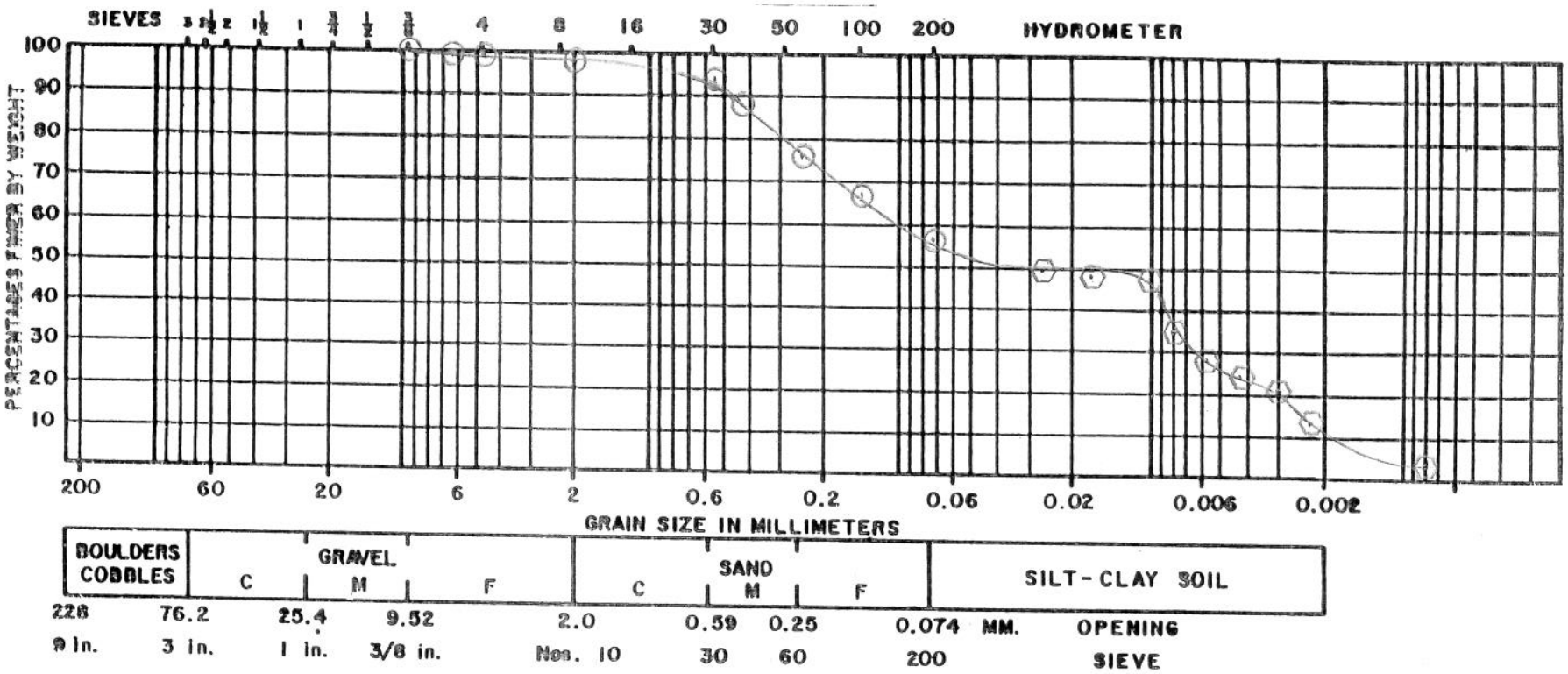
Job No.: L-08122
Report No: 5
Date: December 1, 2008

GRAIN SIZE ANALYSIS



L-08122	Lab I.D. #:	23746
Laboratory Testing	Sample #:	DMT-81 D
Honeywell	Depth (feet):	74.0 - 77.0
Dundalk Marine Terminal		
Baltimore, Maryland		

⊙ Sieve Analysis ASTM D422 & D1140
⬡ Hydrometer Analysis ASTM D422

C:_Clients_Jobs\CH2M Hill, Inc\2008\L-08122 Laboratory Testing\Hydrometer Graphs\Hydrometer Graph #23746

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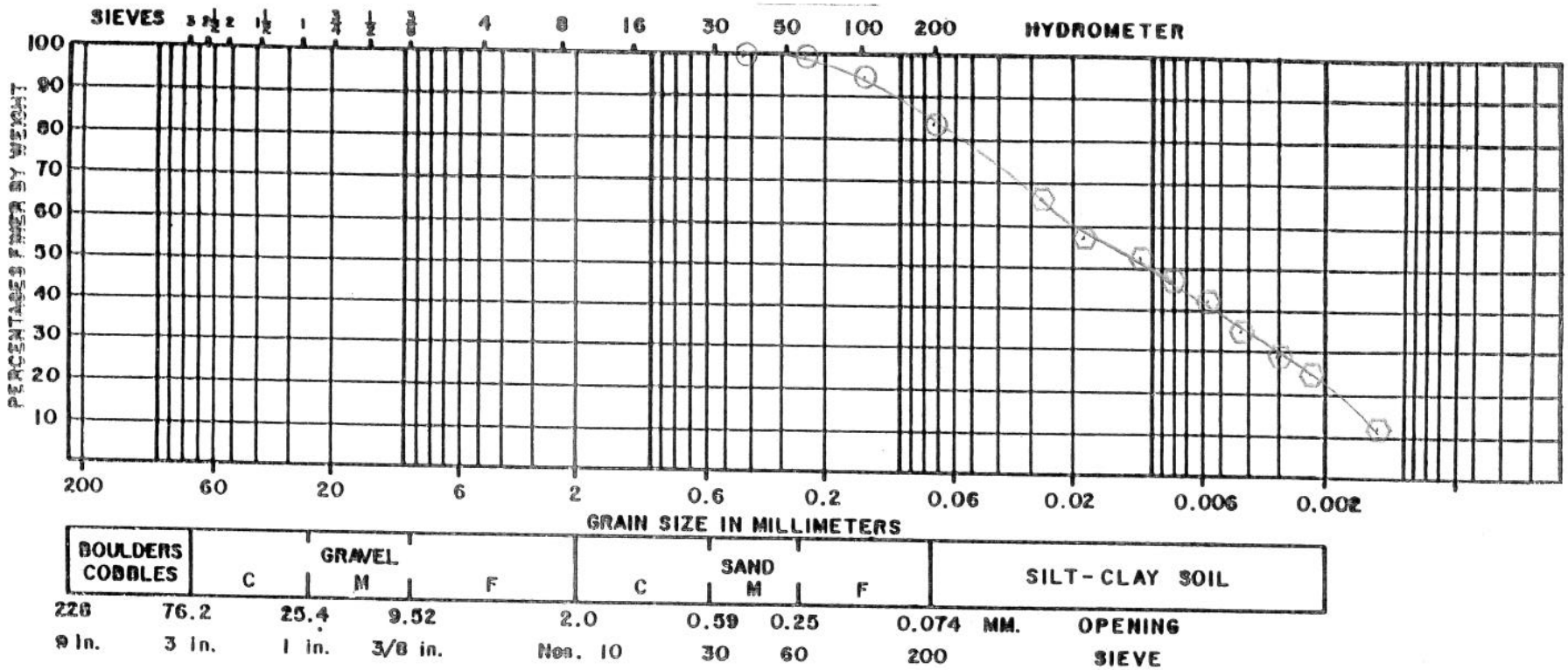
Job No.:	L-08122
Report No:	6
Date:	December 1, 2008

GRAIN SIZE ANALYSIS



L-08122	Lab I.D. #:	23747
Laboratory Testing	Sample #:	DMT-77 M
Honeywell	Depth (feet):	147.0 - 159.0
Dundalk Marine Terminal		
Baltimore, Maryland		

⊙ Sieve Analysis ASTM D422 & D1140
⊙ Hydrometer Analysis ASTM D422

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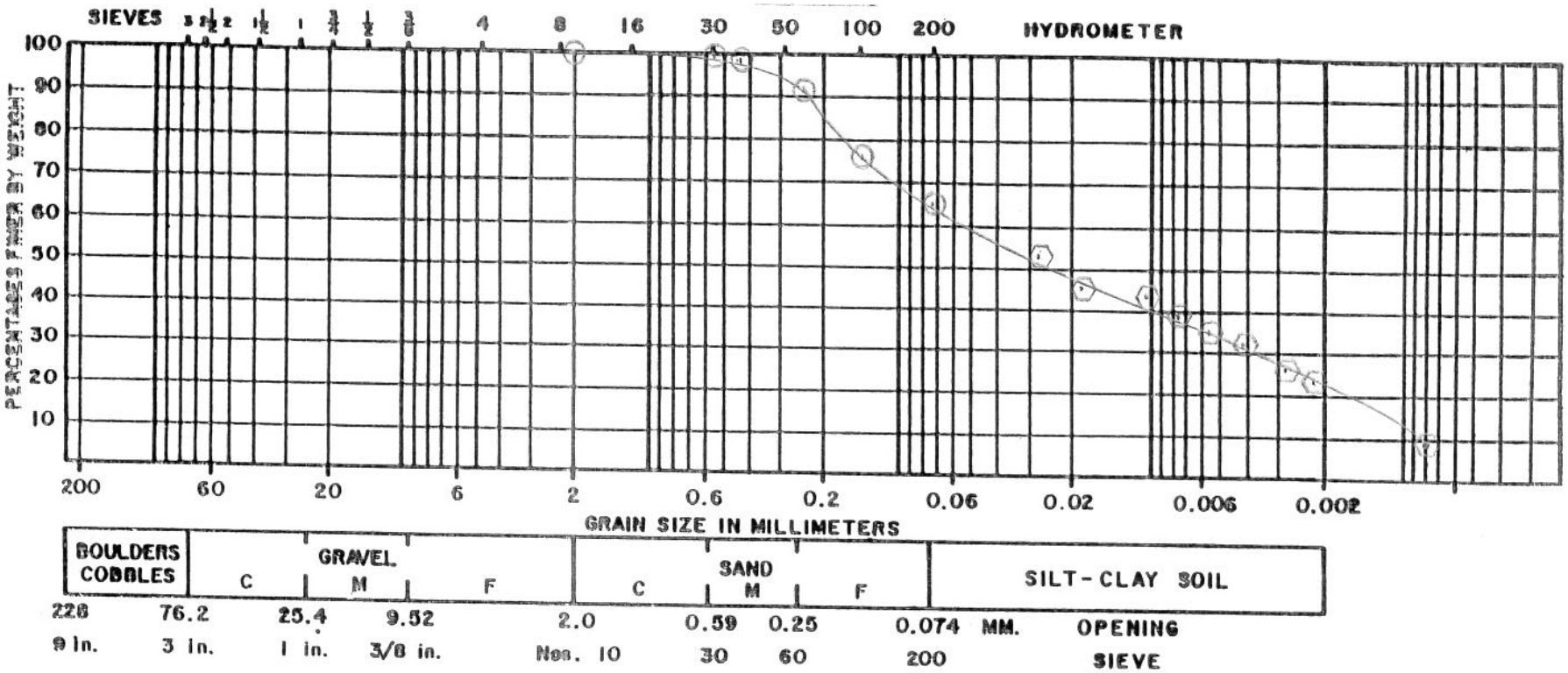
Job No.: L-08122
Report No: 7
Date: December 1, 2008

GRAIN SIZE ANALYSIS



L-08122	Lab I.D. #:	23748
Laboratory Testing	Sample #:	DMT-83 D
Honeywell	Depth (feet):	157.0 - 169.0
Dundalk Marine Terminal		
Baltimore, Maryland		

⊙ Sieve Analysis ASTM D422 & D1140
⊙ Hydrometer Analysis ASTM D422

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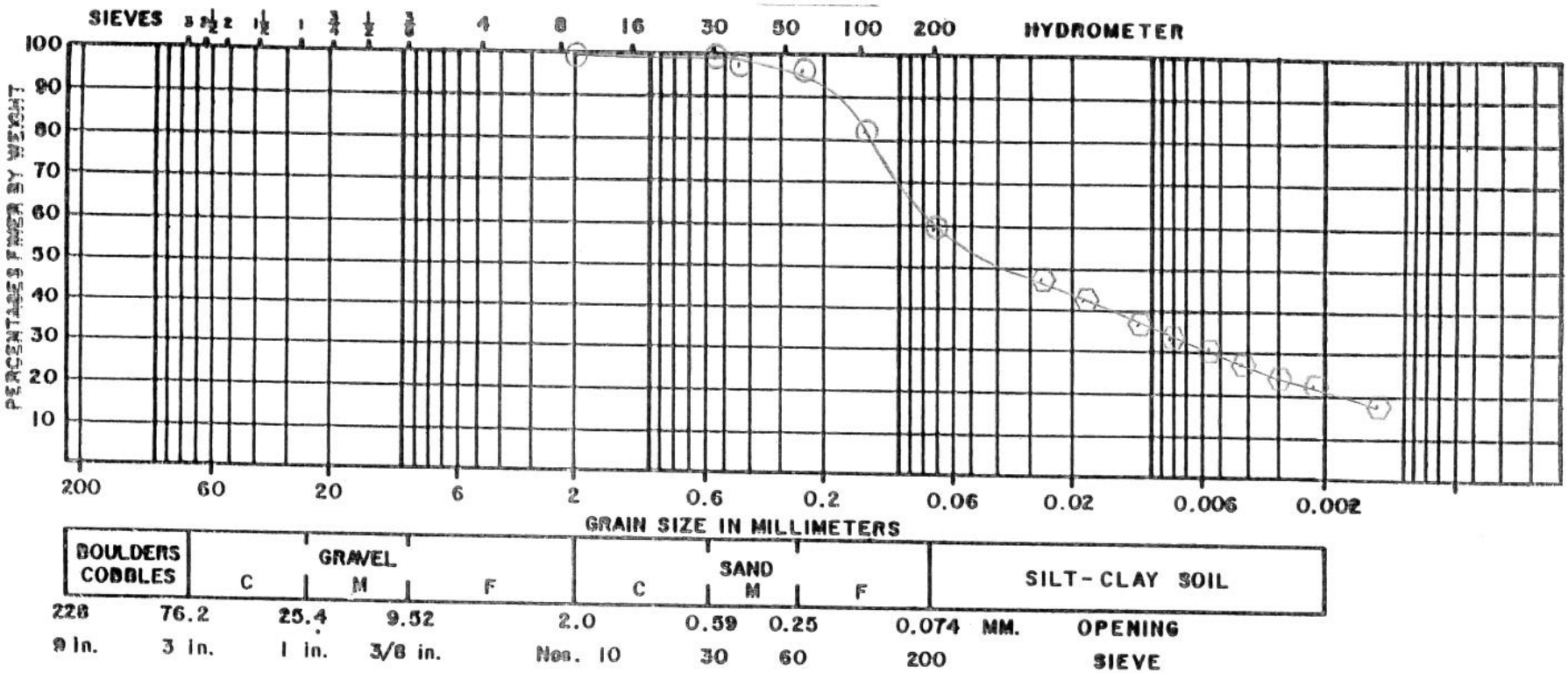
Job No.:	L-08122
Report No:	8
Date:	December 1, 2008

GRAIN SIZE ANALYSIS



L-08122	Lab I.D. #:	23749
Laboratory Testing	Sample #:	DMT-81 D
Honeywell	Depth (feet):	177.0 - 189.0
Dundalk Marine Terminal		
Baltimore, Maryland		

⊙ Sieve Analysis ASTM D422 & D1140

⊙ Hydrometer Analysis ASTM D422

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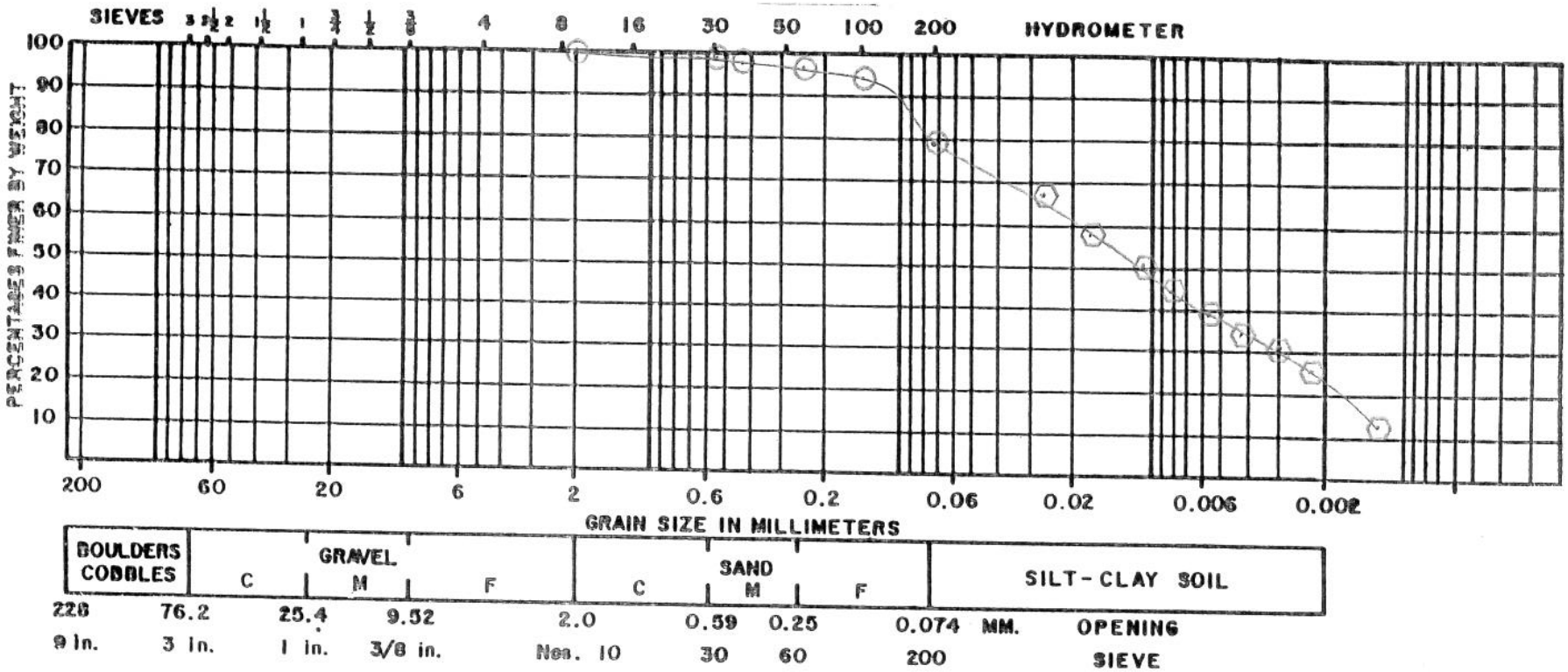
Job No.:	L-08122
Report No:	9
Date:	December 1, 2008

GRAIN SIZE ANALYSIS



L-08122	Lab I.D. #:	23750
Laboratory Testing	Sample #:	DMT-82 D
Honeywell	Depth (feet):	97.0 - 107.0
Dundalk Marine Terminal		
Baltimore, Maryland		

⊙ Sieve Analysis ASTM D422 & D1140

⟨·⟩ Hydrometer Analysis ASTM D422

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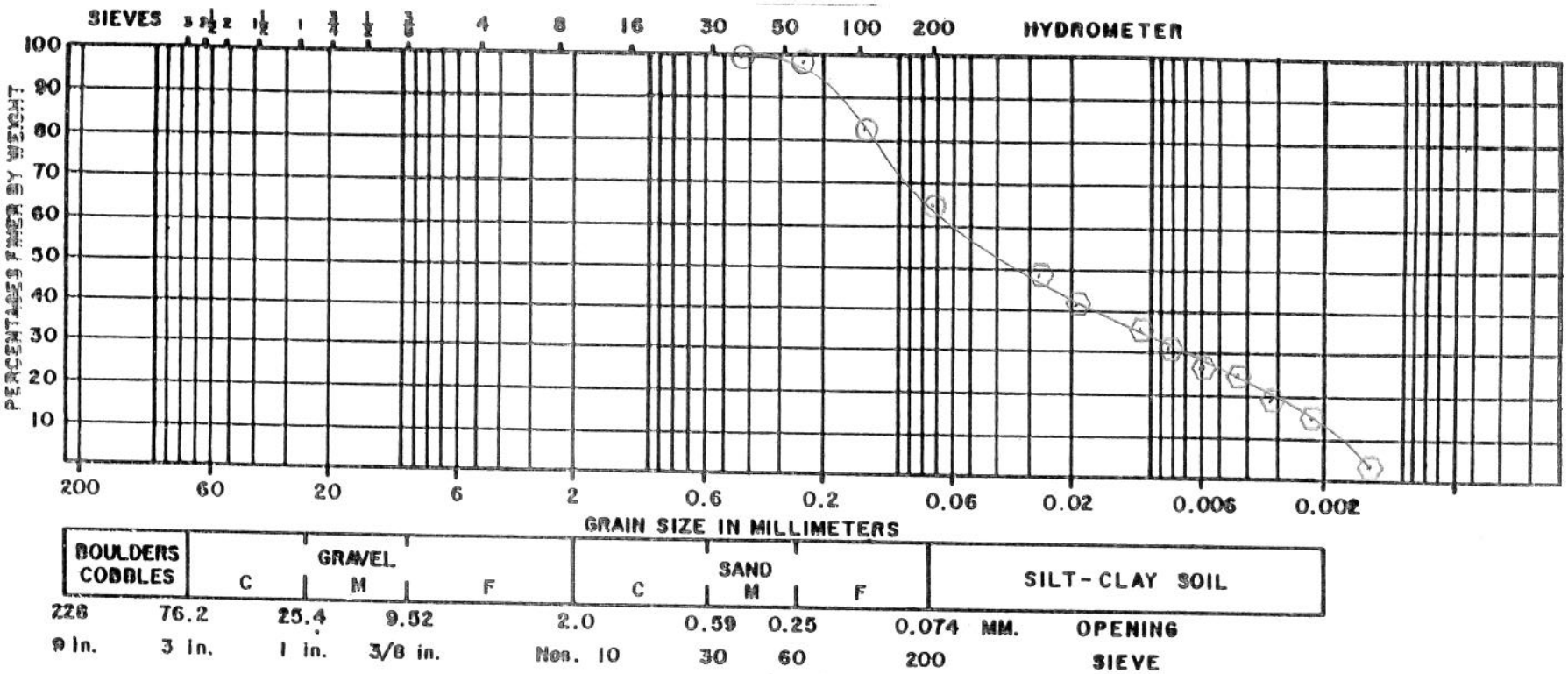
Job No.:	L-08122
Report No:	10
Date:	December 1, 2008

GRAIN SIZE ANALYSIS



L-08122	Lab I.D. #:	23751
Laboratory Testing	Sample #:	DMT-83 D
Honeywell	Depth (feet):	177.0 - 187.0
Dundalk Marine Terminal		
Baltimore, Maryland		

⊙ Sieve Analysis ASTM D422 & D1140

⊙ Hydrometer Analysis ASTM D422

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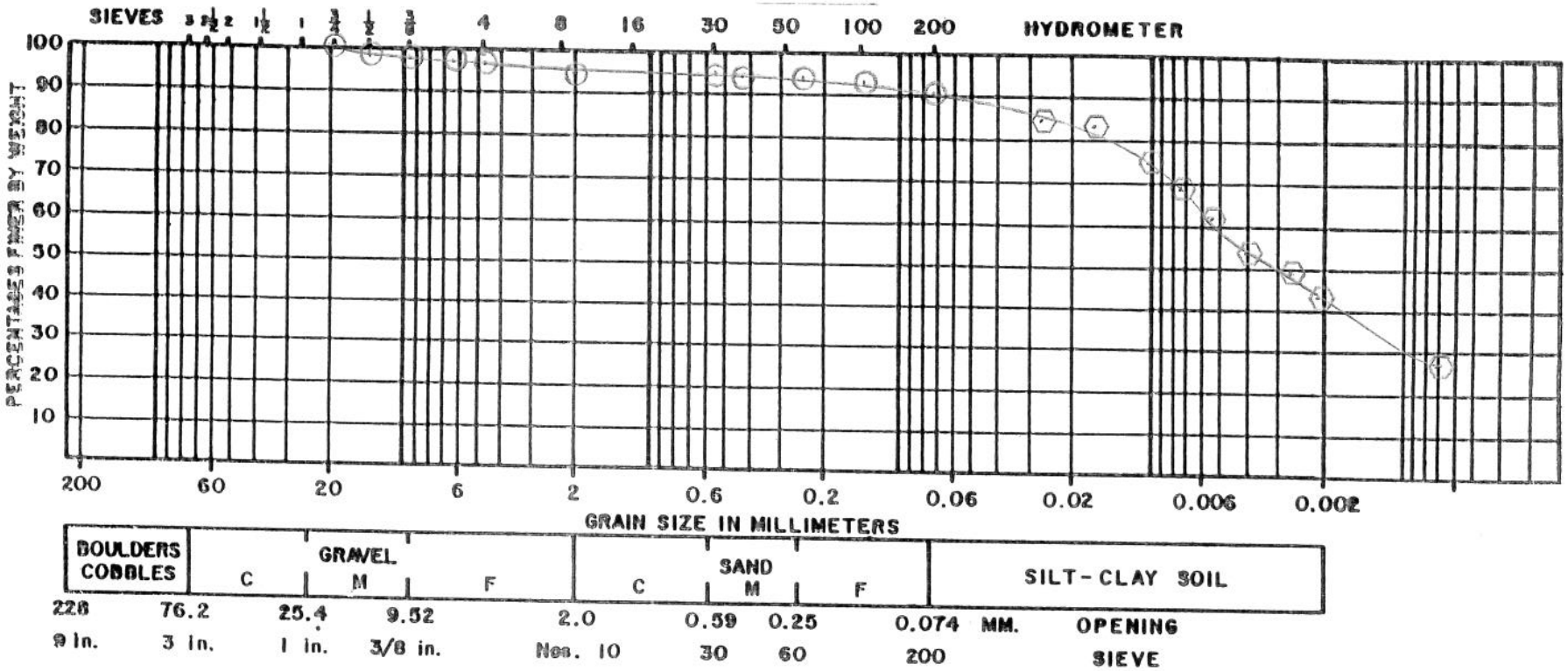
Job No.:	L-08122
Report No:	11
Date:	December 1, 2008

GRAIN SIZE ANALYSIS



L-08122	Lab I.D. #:	23752
Laboratory Testing	Sample #:	DMT-83 D
Honeywell	Depth (feet):	257.0 - 269.0
Dundalk Marine Terminal		
Baltimore, Maryland		

⊙ Sieve Analysis ASTM D422 & D1140
⊙ Hydrometer Analysis ASTM D422

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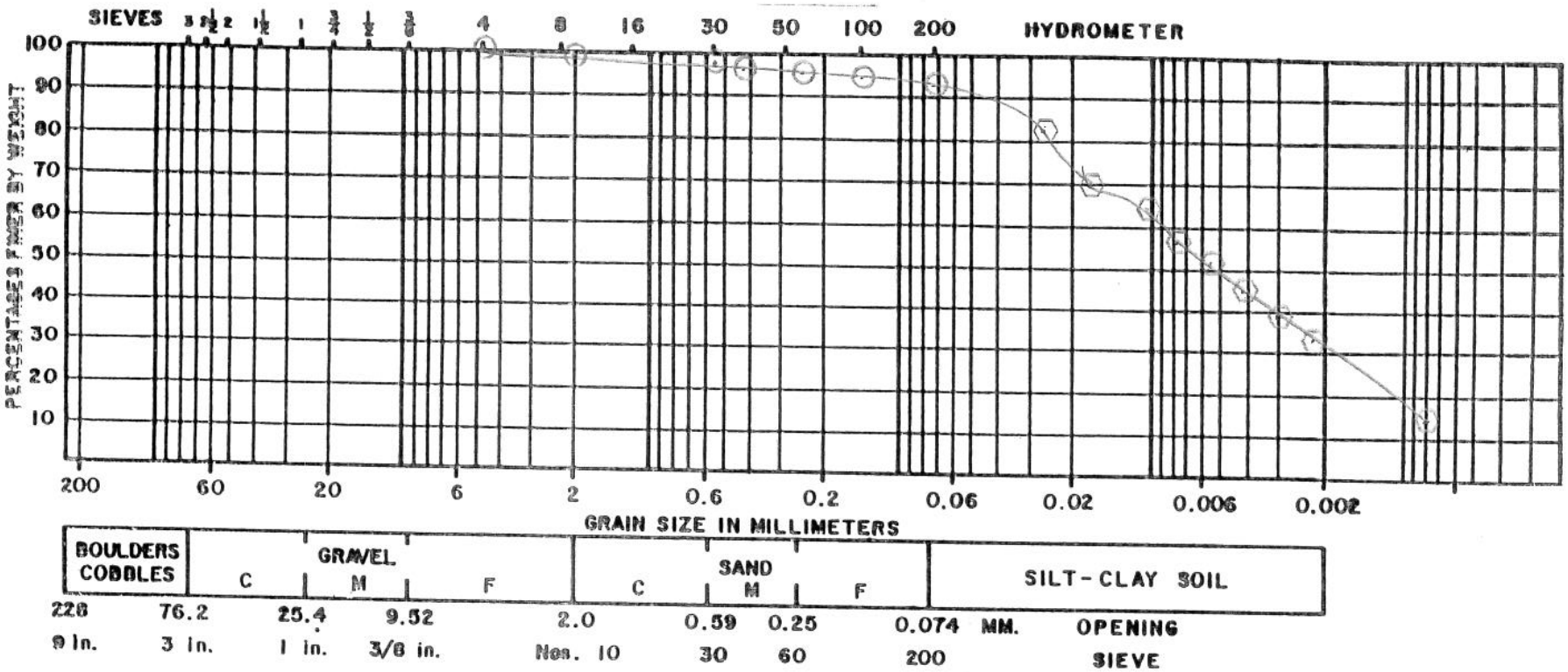
Job No.: L-08122
Report No: 12
Date: December 1, 2008

GRAIN SIZE ANALYSIS



L-08122	Lab I.D. #:	23753
Laboratory Testing	Sample #:	DMT-82 D
Honeywell	Depth (feet):	230.0 - 239.0
Dundalk Marine Terminal		
Baltimore, Maryland		

⊙ Sieve Analysis ASTM D422 & D1140
⬡ Hydrometer Analysis ASTM D422

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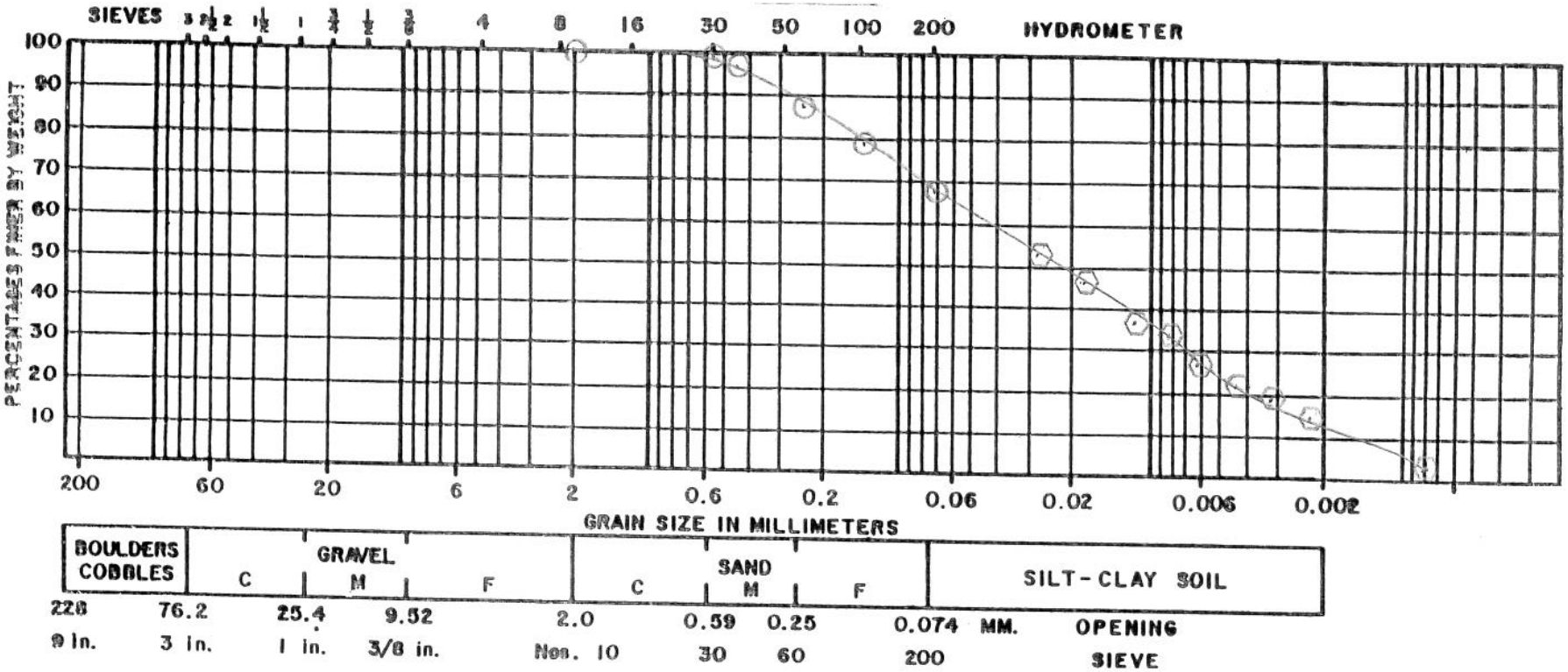
Job No.:	L-08122
Report No:	13
Date:	December 1, 2008

GRAIN SIZE ANALYSIS



L-08122	Lab I.D. #:	23754
Laboratory Testing	Sample #:	DMT-82 D
Honeywell	Depth (feet):	207.0 - 217.0
Dundalk Marine Terminal		
Baltimore, Maryland		

⊙ Sieve Analysis ASTM D422 & D1140
⊙ Hydrometer Analysis ASTM D422

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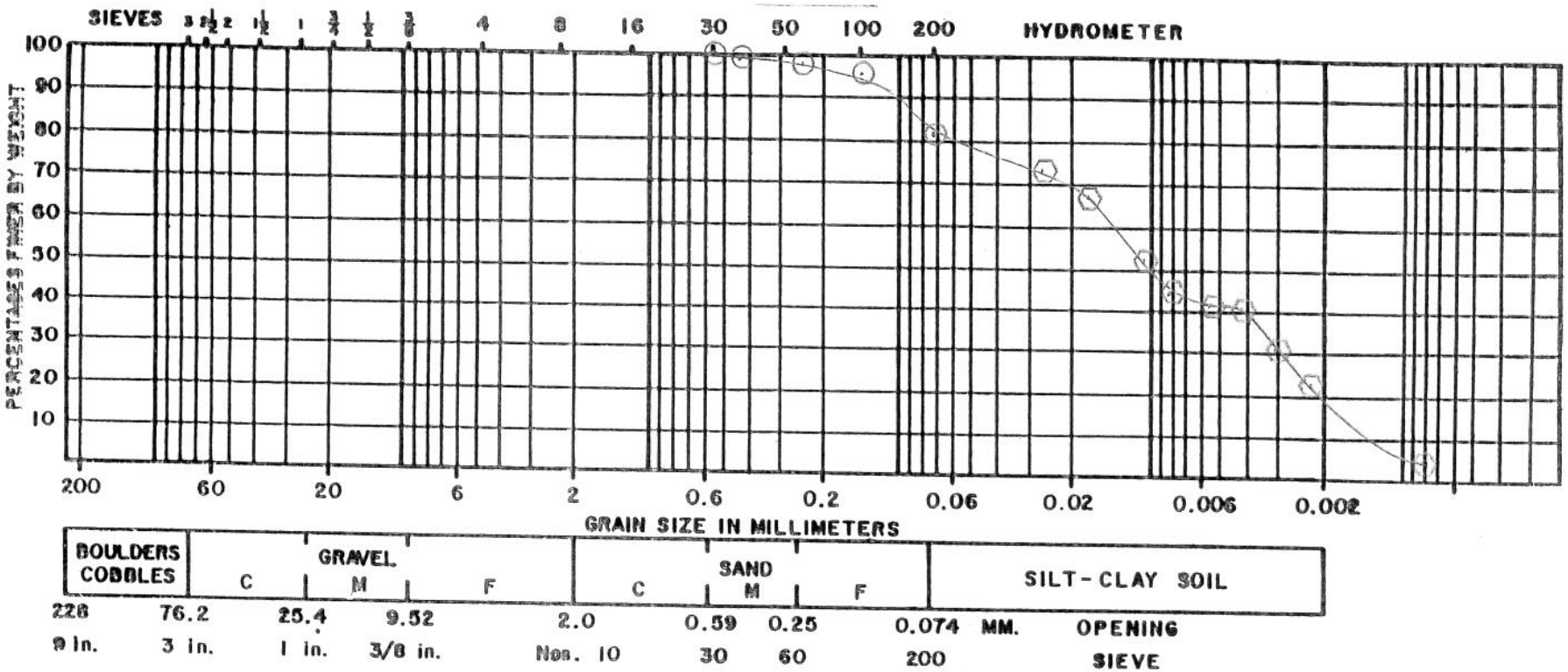
Job No.:	L-08122
Report No:	14
Date:	December 1, 2008

GRAIN SIZE ANALYSIS



L-08122	Lab I.D. #:	23755
Laboratory Testing	Sample #:	DMT-82 D
Honeywell	Depth (feet):	157.0 - 166.0
Dundalk Marine Terminal		
Baltimore, Maryland		

⊙ Sieve Analysis ASTM D422 & D1140

⟐ Hydrometer Analysis ASTM D422

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Measurement of Hydraulic Conductivity of Saturated Porous Materials Using a Flexible Wall Permeameter

ASTM D5084

Report Date:	December 5, 2008	Test Start Date:	November 12, 2008
Project No.	L-08122	Project Title:	Laboratory Testing - Dundalk Marine Terminal
Test Sample Location	DMT-79M	Lab I.D. #	23742
ST No	--	Depth/Lift/Elev:	117.5' - 118.0'
Method of Compaction	--	Type of Sample: Undisturbed	X
		Remolded	--
Percent Compaction	--	Moisture Content (% of Dry Weight)	
Initial Degree of Saturation (B Value) (%)	--	Optimum	--
		Initial	17.0
Final Degree of Saturation (B Value) (%)	96	Dry Unit Weight (PCF)	
Permeant Liquid Used	Deaired Deionized H_2O	Maximum	--
		Initial	130.1
Final Moisture Content (% of Dry Weight)	16.7	Final Dry Unit Weight (PCF)	133.4

Confining Pressure (PSI)	71.0	Test (head) Pressure (PSI)	68.0	Tail (back) Pressure (PSI)	64.0
Initial Gradient	24.99	Initial Height (cm)	11.26	Initial Diameter (cm)	5.58
Final Gradient	25.35	Final Height (cm)	11.10	Final Diameter (cm)	5.55

Final Four Determinations k (cm/sec)

1.58×10^{-7}	1.61×10^{-7}
1.59×10^{-7}	1.66×10^{-7}

Mean Value of Final Four Consecutive Determinations: Coefficient of Permeability k (cm/sec): 1.61×10^{-7}

Project Specfications --

Notes:

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Measurement of Hydraulic Conductivity of Saturated Porous Materials Using a Flexible Wall Permeameter

ASTM D5084

Report Date:	December 5, 2008	Test Start Date:	November 19, 2008
Project No.	L-08122	Project Title:	Laboratory Testing - Dundalk Marine Terminal
Test Sample Location	DMT-80M	Lab I.D. #	23743
ST No	--	Depth/Lift/Elev:	137.5' - 138.0'

Type of Sample:

Method of Compaction	--	Undisturbed	X	Remolded	--
Percent Compaction	--				

Moisture Content (% of Dry Weight)

Initial Degree of Saturation (B Value) (%)	--	Optimum	--	Initial	18.6
Final Degree of Saturation (B Value) (%)	98				

Dry Unit Weight (PCF)

Permeant Liquid Used	Deaired Deionized H_2O	Maximum	--	Initial	113.9
Final Moisture Content (% of Dry Weight)	18.2	Final Dry Unit Weight (PCF)	115.5		

Confining Pressure (PSI)	71.0	Test (head) Pressure (PSI)	68.0	Tail (back) Pressure (PSI)	64.0

Initial Gradient	26.08	Initial Height (cm)	10.79	Initial Diameter (cm)	6.05
Final Gradient	26.27	Final Height (cm)	10.71	Final Diameter (cm)	6.03

Final Four Determinations k (cm/sec)

1.09×10^{-7}	1.09×10^{-7}
1.09×10^{-7}	1.09×10^{-7}

Mean Value of Final Four Consecutive Determinations: Coefficient of Permeability k (cm/sec): 1.09×10^{-7}

Project Specfications --

Notes:

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Measurement of Hydraulic Conductivity of Saturated Porous Materials Using a Flexible Wall Permeameter

ASTM D5084

Report Date: December 8, 2008 | Test Start Date: October 31, 2008

Project No. L-08122 | Project Title: Laboratory Testing - Dundalk Marine Terminal

Test Sample Location: DMT-78M | Lab I.D. #: 23744

ST No: -- | Depth/Lift/Elev: 97.0' - 99.0' | Type of Sample:

Method of Compaction: -- | Undisturbed: X | Remolded: --

Percent Compaction: --

Moisture Content (% of Dry Weight)

Initial Degree of Saturation (B Value) (%): -- | *Optimum*: -- | *Initial*: 21.5

Final Degree of Saturation (B Value) (%): 96

Dry Unit Weight (PCF)

Permeant Liquid Used: Deaired Deionized H_2O | *Maximum*: -- | *Initial*: 111.6

Final Moisture Content (% of Dry Weight): 25.1 | Final Dry Unit Weight (PCF): 108.8

Confining Pressure (PSI)	71.0	Test (head) Pressure (PSI)	68.0	Tail (back) Pressure (PSI)	64.0

Initial Gradient	26.52	Initial Height (cm)	10.61	Initial Diameter (cm)	6.10
Final Gradient	25.69	Final Height (cm)	10.95	Final Diameter (cm)	6.08

Final Four Determinations k (cm/sec)

1.59×10^{-8}	1.44×10^{-8}
1.52×10^{-8}	1.63×10^{-8}

Mean Value of Final Four Consecutive Determinations: Coefficient of Permeability k (cm/sec): 1.55×10^{-8}

Project Specfications: --

Notes:

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Measurement of Hydraulic Conductivity of Saturated Porous Materials Using a Flexible Wall Permeameter

ASTM D5084

Report Date: December 5, 2008 | Test Start Date: November 19, 2008

Project No. L-08122 | Project Title: Laboratory Testing - Dundalk Marine Terminal

Test Sample Location: DMT-81D | Lab I.D. #: 23745

ST No: -- | Depth/Lift/Elev: 157.0' - 157.5' | Type of Sample:

Method of Compaction: -- | Undisturbed: X | Remolded: --

Percent Compaction: -- | Moisture Content (% of Dry Weight)

Initial Degree of Saturation (B Value) (%): -- | Optimum: -- | Initial: 33.8

Final Degree of Saturation (B Value) (%): 96 | Dry Unit Weight (PCF)

Permeant Liquid Used: Deaired Deionized H_2O | Maximum: -- | Initial: 101.1

Final Moisture Content (% of Dry Weight): 18.1 | Final Dry Unit Weight (PCF): 102.5

Confining Pressure (PSI)	71.0	Test (head) Pressure (PSI)	68.0	Tail (back) Pressure (PSI)	64.0

Initial Gradient	26.72	Initial Height (cm)	10.53	Initial Diameter (cm)	6.08
Final Gradient	26.82	Final Height (cm)	10.49	Final Diameter (cm)	6.05

Final Four Determinations k (cm/sec)

3.38×10^{-8}	3.39×10^{-8}
3.39×10^{-8}	3.39×10^{-8}

Mean Value of Final Four Consecutive Determinations: | Coefficient of Permeability k (cm/sec): 3.39×10^{-8}

Project Specfications: --

Notes:

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Measurement of Hydraulic Conductivity of Saturated Porous Materials Using a Flexible Wall Permeameter

ASTM D5084

Report Date:	December 5, 2008	Test Start Date:	November 19, 2008
Project No.	L-08122	Project Title:	Laboratory Testing - Dundalk Marine Terminal
Test Sample Location	DMT-77M	Lab I.D. #	23747
ST No	--	Depth/Lift/Elev:	157.0' - 159.0'
Type of Sample:			
Method of Compaction	--	Undisturbed	X
Remolded	--		
Percent Compaction	--		
Moisture Content (% of Dry Weight)			
Initial Degree of Saturation (B Value) (%)	--	Optimum	--
Initial	16.8		
Final Degree of Saturation (B Value) (%)	100		
Dry Unit Weight (PCF)			
Permeant Liquid Used	Deaired Deionized H_2O	Maximum	--
Initial	129.7		
Final Moisture Content (% of Dry Weight)	15.2	Final Dry Unit Weight (PCF)	119.5

Confining Pressure (PSI)	71.0	Test (head) Pressure (PSI)	68.0	Tail (back) Pressure (PSI)	64.0

Initial Gradient	31.30	Initial Height (cm)	8.99	Initial Diameter (cm)	5.78
Final Gradient	29.84	Final Height (cm)	9.43	Final Diameter (cm)	5.88

Final Four Determinations k (cm/sec)

3.61×10^{-7}	3.67×10^{-7}
3.64×10^{-7}	3.70×10^{-7}

Mean Value of Final Four Consecutive Determinations: Coefficient of Permeability k (cm/sec): 3.65×10^{-7}

Project Specfications --

Notes:

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Measurement of Hydaulic Conductivity of Saturated Porous Materials Using a Flexible Wall Permeameter

ASTM D5084

Report Date:	December 5, 2008	Test Start Date:	November 19, 2008
Project No.	L-08122	Project Title:	Laboratory Testing - Dundalk Marine Terminal
Test Sample Location	DMT-83D	Lab I.D. #	23748
ST No	--	Depth/Lift/Elev:	167.0' - 169.0'
Method of Compaction	--	Type of Sample: Undisturbed	X
		Remolded	--
Percent Compaction	--	Moisture Content (% of Dry Weight)	
Initial Degree of Saturation (B Value) (%)	--	Optimum	--
		Initial	14.0
Final Degree of Saturation (B Value) (%)	98	Dry Unit Weight (PCF)	
Permeant Liquid Used	Deaired Deionized H_2O	Maximum	--
		Initial	125.8
Final Moisture Content (% of Dry Weight)	18.2	Final Dry Unit Weight (PCF)	117.7

Confining Pressure (PSI)	71.0	Test (head) Pressure (PSI)	68.0	Tail (back) Pressure (PSI)	64.0
Initial Gradient	27.72	Initial Height (cm)	10.15	Initial Diameter (cm)	6.05
Final Gradient	26.80	Final Height (cm)	10.50	Final Diameter (cm)	6.15

Final Four Determinations k (cm/sec)

3.44×10^{-8}	3.45×10^{-8}
3.44×10^{-8}	3.45×10^{-8}

Mean Value of Final Four Consecutive Determinations: Coefficient of Permeability k (cm/sec): 3.46×10^{-8}

Project Specfications --

Notes:

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Measurement of Hydraulic Conductivity of Saturated Porous Materials Using a Flexible Wall Permeameter

ASTM D5084

Report Date:	December 5, 2008	Test Start Date:	November 19, 2008
Project No.	L-08122	Project Title:	Laboratory Testing - Dundalk Marine Terminal
Test Sample Location	DMT-81D	Lab I.D. #	23749
ST No	--	Depth/Lift/Elev:	177.0' - 189.0'
Method of Compaction	--	Type of Sample: Undisturbed	X
		Remolded	--
Percent Compaction	--	Moisture Content (% of Dry Weight)	
Initial Degree of Saturation (B Value) (%)	--	Optimum	--
		Initial	16.6
Final Degree of Saturation (B Value) (%)	96	Dry Unit Weight (PCF)	
Permeant Liquid Used	Deaired Deionized H_2O	Maximum	--
		Initial	123.0
Final Moisture Content (% of Dry Weight)	19.2	Final Dry Unit Weight (PCF)	116.5

Confining Pressure (PSI)	71.0	Test (head) Pressure (PSI)	68.0	Tail (back) Pressure (PSI)	64.0

Initial Gradient	28.28	Initial Height (cm)	9.95	Initial Diameter (cm)	6.10
Final Gradient	27.50	Final Height (cm)	10.23	Final Diameter (cm)	6.18

Final Four Determinations k (cm/sec)

1.64×10^{-8}	1.65×10^{-8}
1.63×10^{-8}	1.58×10^{-8}

Mean Value of Final Four Consecutive Determinations: Coefficient of Permeability k (cm/sec): 1.63×10^{-8}

Project Specfications --

Notes:

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Measurement of Hydraulic Conductivity of Saturated Porous Materials Using a Flexible Wall Permeameter

ASTM D5084

Report Date:	December 8, 2008	Test Start Date:	December 1, 2008
Project No.	L-08122	Project Title:	Laboratory Testing - Dundalk Marine Terminal
Test Sample Location	DMT-82D	Lab I.D. #	23753
ST No	--	Depth/Lift/Elev:	237.0' - 239.0'
Method of Compaction	--	Type of Sample: Undisturbed	X
		Remolded	--
Percent Compaction	--	Moisture Content (% of Dry Weight)	
Initial Degree of Saturation (B Value) (%)	--	Optimum	--
		Initial	11.2
Final Degree of Saturation (B Value) (%)	96	Dry Unit Weight (PCF)	
Permeant Liquid Used	Deaired Deionized H_2O	Maximum	--
		Initial	133.5
Final Moisture Content (% of Dry Weight)	16.4	Final Dry Unit Weight (PCF)	130.0

Confining Pressure (PSI)	71.0	Test (head) Pressure (PSI)	68.0	Tail (back) Pressure (PSI)	64.0
Initial Gradient	31.76	Initial Height (cm)	8.86	Initial Diameter (cm)	5.98
Final Gradient	30.92	Final Height (cm)	9.10	Final Diameter (cm)	5.98

Final Four Determinations k (cm/sec)

4.42×10^{-8}	4.58×10^{-8}
4.56×10^{-8}	4.59×10^{-8}

Mean Value of Final Four Consecutive Determinations: Coefficient of Permeability k (cm/sec): 4.54×10^{-8}

Project Specfications --

Notes:

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Measurement of Hydaulic Conductivity of Saturated Porous Materials Using a Flexible Wall Permeameter

ASTM D5084

Report Date:	December 8, 2008	Test Start Date:	December 1, 2008
Project No.	L-08122	Project Title:	Laboratory Testing - Dundalk Marine Terminal
Test Sample Location	DMT-82D	Lab I.D. #	23754
ST No	--	Depth/Lift/Elev:	207.0' - 209.0'
Method of Compaction	--	Type of Sample: Undisturbed	X
		Remolded	--
Percent Compaction	--	Moisture Content (% of Dry Weight)	
Initial Degree of Saturation (B Value) (%)	--	Optimum	--
		Initial	9.5
Final Degree of Saturation (B Value) (%)	98	Dry Unit Weight (PCF)	
Permeant Liquid Used	Deaired Deionized H_2O	Maximum	--
		Initial	134.0
Final Moisture Content (% of Dry Weight)	16.9	Final Dry Unit Weight (PCF)	124.9

Confining Pressure (PSI)	71.0	Test (head) Pressure (PSI)	68.0	Tail (back) Pressure (PSI)	64.0

Initial Gradient	28.53	Initial Height (cm)	9.86	Initial Diameter (cm)	5.85
Final Gradient	27.34	Final Height (cm)	10.29	Final Diameter (cm)	5.93

Final Four Determinations k (cm/sec)

1.28×10^{-7}	1.29×10^{-7}
1.28×10^{-7}	1.23×10^{-7}

Mean Value of Final Four Consecutive Determinations: Coefficient of Permeability k (cm/sec): 1.27×10^{-7}

Project Specfications --

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ASTM D5084

Report Date:	December 8, 2008	Test Start Date:	December 1, 2008
Project No.	L-08122	Project Title:	Laboratory Testing - Dundalk Marine Terminal
Test Sample Location	DMT-83D	Lab I.D. #	23752
ST No	--	Depth/Lift/Elev:	267.0' - 269.0'
Method of Compaction	--	Type of Sample: Undisturbed	X
		Remolded	--
Percent Compaction	--	Moisture Content (% of Dry Weight)	
Initial Degree of Saturation (B Value) (%)	--	Optimum	--
		Initial	15.0
Final Degree of Saturation (B Value) (%)	96	Dry Unit Weight (PCF)	
Permeant Liquid Used	Deaired Deionized H_2O	Maximum	--
		Initial	124.4
Final Moisture Content (% of Dry Weight)	17.6	Final Dry Unit Weight (PCF)	120.2

Confining Pressure (PSI)	71.0	Test (head) Pressure (PSI)	68.0	Tail (back) Pressure (PSI)	64.0
Initial Gradient	36.63	Initial Height (cm)	7.68	Initial Diameter (cm)	6.05
Final Gradient	36.35	Final Height (cm)	7.74	Final Diameter (cm)	6.13

Final Four Determinations k (cm/sec)

1.23×10^{-8}	1.23×10^{-8}
1.23×10^{-8}	1.24×10^{-8}

Mean Value of Final Four Consecutive Determinations: Coefficient of Permeability k (cm/sec): 1.23×10^{-8}

Project Specfications --

Notes: