New Jersey
ACCUTEST
Laboratories

08/13/07

Technical Report for

Honeywell International Inc.

CMHLLVA: Dundalk Marine Terminal, Balitmore, MD

COPR Investigation Phase 2

Accutest Job Number: J67727X

Sampling Dates: 07/24/07 - 07/26/07

Report to:

CH2M Hill
3011 S.W. Williston Road
Gainesville, FL 32608-3928

ATTN: Mark Stinnett

RECEIVED
AUG 16 2007
By

Total number of pages in report:

ACCREDITED IN ACCORDANCE WITH nelac

Test results contained within this data package meet the requirements of the National Environmental Laboratory Accreditation Conference and/or state specific certification programs as applicable.

Vincent J. Pugliese
President

Client Service contact: Nadine Yakes 732-329-0200

Certifications: NJ(12129), NY(10983), CA, CT, DE, FL, IL, IN, KS, KY, LA, MA, MD, MI, MT, NC, PA, RI, SC, TN, VA, WV

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Test results relate only to samples analyzed.

Accutest Laboratories

Sample Summary

Honeywell International Inc.

Job No: J67727X

CMHLLVA: Dundalk Marine Terminal, Balitmore, MD
Project No: COPR Investigation Phase 2

Sample Number	Collected Date	Time By	Received	Matrix Code	Type	Client Sample ID
J67727-1X	07/24/07	09:00 LC	08/01/07	SO	Soil	DMT-48US-SOI-240260-G
J67727-2X	07/26/07	16:00 LC	08/01/07	SO	Soil	DMT-53US-SOI-100120-G

Soil samples reported on a dry weight basis unless otherwise indicated on result page.

SOL

Accutest Labs
2235 ROUTE 130
Dayton, NJ 8810
732-329-0200

Honeywell

Chain Of Custody / Analysis Request

J67727

AESI Ref: 39295.3629
COC#: 37825-0801 ACTD-1G

Privileged & Confidential		Site Name:	Dundalk Marine Terminal
EDD To:	John.Mitchell@ch2m.com	Location of Site:	BALTIMORE, MD
Sampler:	Lisa Carter	Phase:	RI
PO #		Sampling Program	COPR Investigation Phase 2
Analysis Turnaround Time (TAT):	28	Lab Proj # (SDG):	
Consultant	CH2M	Lab ID	ACTD
Full Report TAT:	28	Site ID	Dundalk
		Lab Job #	
		Authorized User:	Honeywe
		Text & Excel File Drive	Excel & Text Order

Sampling Co.: CH2MHILL

Client Contact: (name, co., address)
Bill Soukup
HydroQual, Inc
1200 MacArthur Blvd. Mahwah, NJ 07430

Preliminary Data To: Mark.Stinnet@ch2m.com,John.Mitchell@ch2m.com
Sample Receipt Acknowledgement To: Mark.Stinnet@ch2m.com,John.Mitchell@ch2m.com
Hard Copy To: Amy Klopper, Christina Jensen
Invoice To: Honeywell

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	Sample Identification				Sample Date	Sample Time	Sample Type	Sample Matrix	Sample Purpose	# of Cont.	Composite/Grab	Field Filtered Sample ?	ASTM D2216-Moisture	ASTM D854-Specific Gravity	ASTM D422-Grain Size	ASTM D4318-Atterberg Limits	ASTM D2435-Consolidation Test	ASTM D2166-Compression	ASTM D4767-CU Strength	ASTM D3080-04-Direct Shear	ASTM D5084-Hydraulic Conductivity	ASTM D2937-Bulk Density	ASTM D2434-Permeability	ASTM D1496-ORP	Sampling Method (code)	Lab Samp Numbers
	Location ID	Start Depth (ft)	End Depth (ft)	Field Sample ID							Units															
1	DMT-49US -1	24.0	26.0	DMT-49US-SOI-240260-G	7/24/2007	9:00	SOI	SOIL	REG	1	grab	N	X	X	X	X						X	X		Shelby Tube	
2	DMT-53US -2	10.0	12.0	DMT-53US-SOI-100120-G	7/26/2007	16:00	SOI	SOIL	REG	1	grab	N	X	X	X	X						X	X		Shelby Tube	
3																										
4																									SUB	
5																										
6																										
7																										
8																										
9																										
10																										
11																										
12																										

Relinquished by: [signature]	CH2M HILL Company	CH2M HILL	Received by:	Priority Company		Condition	Custody Seals Intact
	8/1/07 – 10:00 Date/Time		6422 M.G.	8/1/07 1030 Date/Time		Cooler Temp.	
Relinquished by: 6422 M.G.	8/1/07 1320 Date/Time		Received by: [signature]	8/1/07 13:20 Date/Time		Condition	Custody Seals Intact
						Cooler Temp.	

Preservatives: (Other; Specify):

0 (none); 1 (4 Deg C); 2 (HCl pH<2); 3 (HNO3 pH<2); 4 (H2SO4 pH<2); 5 (NaOH pH>12); 6 (NaOH, Zn Acetate); 7 (H2SO4 (pH<2), 4 Deg C)); 8 (HCl pH<2); 9 (HCl 4 Deg C); 10 (HNO3 (pH<2), 4Deg C); 11 (4C NaOH (pH>12) & Ascorbic Acid); 12 (4C H2SO4 (pH<2) & Na2S2O3); 13 (Zn Acetate); sp (special instructions)

2B

CHAIN OF CUSTODY

ACCUTEST

Fresh Ponds Corporate Village, Building B
2235 Route 130, Dayton, NJ 08810
732-329-0200 FAX: 732-329-3499/3480

Accutest Job #:

Accutest Quote #:

Client Information

Name: Accutest Laboratories

Address: 2235 Route 130

Dayton, NJ 08810

Send Report to: Nadine Yakes

Phone #: 732-329-0200 x226

Facility Information

Project Name: DMT, Baltimore, MD

Location:

Project No.: J67727X

FAX #: (732) 329-3499

Analytical Information

Field ID / Point of Collection	Collection Date	Collection Time	Sampled By	Matrix	# of bottles	Preservation HCL	NaOH	HNO3	H2So4	None	ASTM D2216- % Moisture	ASTM D854-Specific Gravity	ASTM D422-Grain Size	ASTM D4318-Atterberg Limits	ASTM D2937- Bulk Density	ASTM D2434-Permeability
-1	7/24	9:00		Soil	1						X	X	X	X	X	X
-2	7/28	16:00		Soil	1						X	X	X	X	X	X

Turnaround Information

- [ ] 21 Day Standard — Approved By:
- [ ] 14 Day
- [ ] 7 Days *EMERGENCY*
- [ ] Other 28 (Days)

21 Day Turnaround Hardcopy, Emergency or RUSH is FAX Data unless previously approved.

Data Deliverable Information

- [ ] NJ Reduced
- [X] NJ Full
- [ ] FULL CLP
- [ ] Disk Deliverable
- [ ] Other (Specify)
- [ ] Commercial "A"
- [ ] Commercial "B"
- [ ] State Forms

Comments / Remarks

Samples are in Shelby Tubes

Sample Custody must be documented below each time samples change possesion, including courier delivery.

Relinquished by Sampler:	Date Time:	Received By:	Relinquished By:	Date Time:	Received By:
1	8/1/07 1700	1 Fedx	2		2
3		3	4		4
5		5	Seal #	Preserved where applicable ☐	On Ice ☐

Accutest
Subcontractor Order

Date/Time:	8/1/07 2:55 PM	**Sub Lab:**	Golder
Accutest Job No.	J67727X	**Address:**	3730 Chamblee Tucker Road
Client Project:	DMT, Baltimore, MD		Atlanta GA 30341
CSR:		**Contact:**	Sample Management
		Phone:	(770) 492-8280

Sample #:	Analyses
1	ASTM D2216- % Moisture / ASTM D854-Specific Gr
2	ASTM D2216- % Moisture / ASTM D854-Specific Gr
0	
0	
0	
0	
0	
0	
0	
0	
Turn Around	28

Sample Managment receipt: _____ **Date:** 8/1/07

(Print form and sign/date. Submit this form to Login Dept. with the SUB COC.)

e/sop_new/subform

SUBCONTRACT DATA

ACCUTEST/DMT, BALTIMORE, MD/NJ
SUMMARY OF SOIL DATA

Sample Identification	Sample Type	Sample Depth	Soil Classification	Natural Moisture %	Atterberg Limits				Grain Size Distribution			Compaction		Gs	Bulk Density (g/ml)	Unit Weight		Permeability (cm/sec)	Additional Tests Conducted (See Notes)
					L.L.	P.L.	P.I.	L.I.	% Finer No. 4 Sieve	% Finer No. 200 Sieve	% Finer .005 mm	Maximum Dry Density (lb/cuft)	Optimum Moisture %			Moisture %	Dry (lb/cuft)		
J67727X-1	UD	-	MH	113.4	84	49	35	1.85	99.6	80.0	-	-	-	2.66	0.26	113.4	40.3	3.6E-08	-
J67727X-2	UD	-	CL	21.3	30	19	11	0.18	100.0	99.6	-	-	-	2.82	1.06	21.3	106.4	6.7E-07	-

ABBREVIATIONS: LIQUID LIMIT (LL)
PLASTIC LIMIT (PL)
PLASTICITY INDEX (PI)
LIQUIDITY INDEX (LI)
SPECIFIC GRAVITY (Gs)
MOISTURE (Mc)

This Report Has Been
Spot-Check Reviewed By
The Accutest QA Staff.

Reviewer _____
Review Date 8/10/07

NOTES: T = TRIAXIAL TEST
U = UNCONFINED COMPRESSION TEST
C = CONSOLIDATION TEST
DS = DIRECT SHEAR TEST
O = ORGANIC CONTENT
P = pH

J67727X

Golder Associates Inc.

BULK DENSITY
ASTM D 2937 modified

PROJECT TITLE	ACCUTEST/DMT, BALTIMORE, MD/NJ
PROJECT NUMBER	073-90241
REMARKS	

Sample Number	J67727X-1	J67727X-2			
Moisture Content (%)	115.00	21.27			
Solids (%)	0.282	0.787			
Volume (ml)	50.00	50.00			
Weight of Solids (gm)	45.58	67.26			
Bulk Density (g/ml)	**0.26**	**1.06**			
Sample Number					
Moisture Content (%)					
Solids (%)					
Volume (ml)					
Weight of Solids (gm)					
Bulk Density (g/ml)					
Sample Number					
Moisture Content (%)					
Solids (%)					
Volume (ml)					
Weight of Solids (gm)					
Bulk Density (g/ml)					

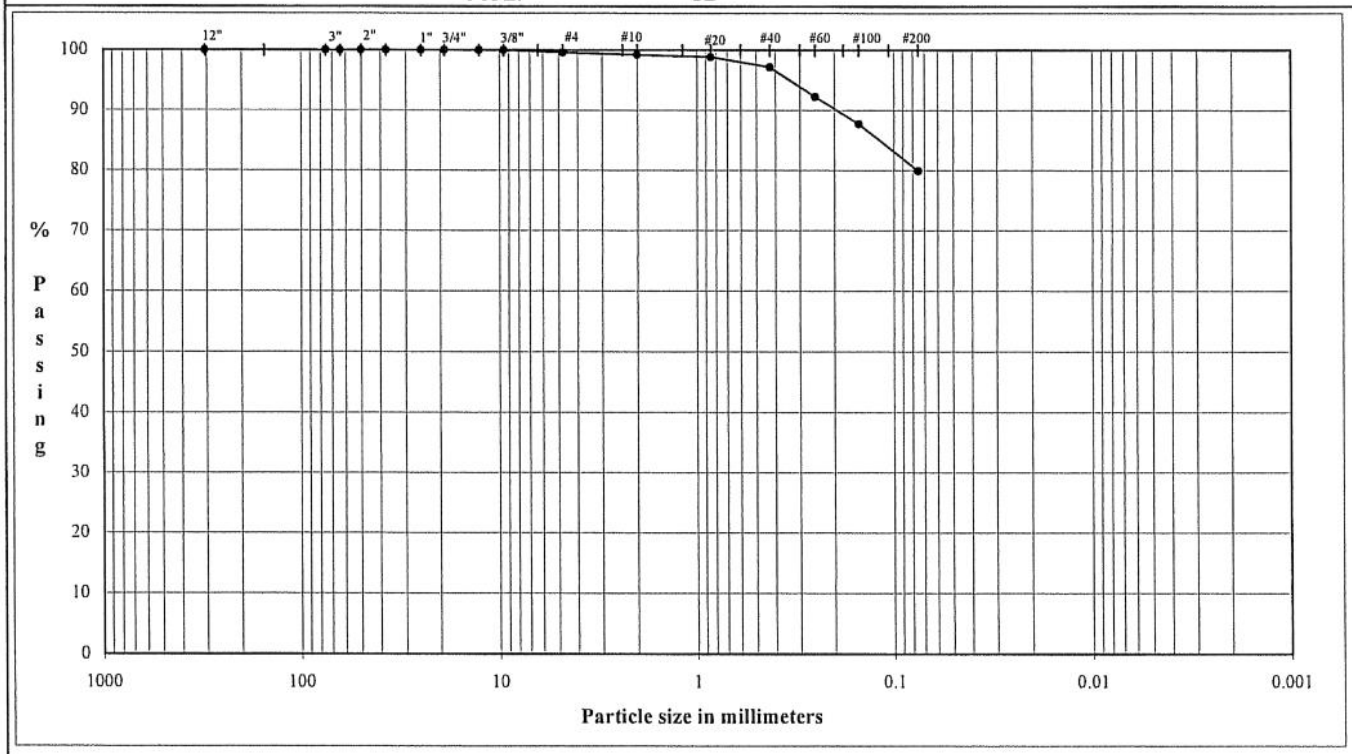
TECH	AK/CA
DATE	8/5/2007
CHECK	AK
REVIEW	[illegible]

AUGUST 2007 073-90241

PARTICLE SIZE DISTRIBUTION & ATTERBERG LIMITS

ASTM D421, D422, D4318

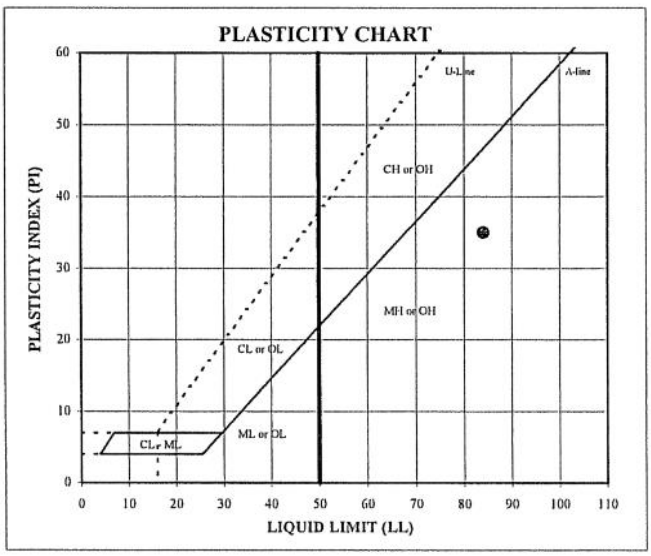
PROJECT NAME: **ACCUTEST/DMT, BALTIMORE,MD/NJ**
SAMPLE ID: **J67727-1** Depth: -
TYPE: **UD**



	Coarse	Fine	Coarse	Medium	Fine	Silt or Clay
COBBLES	GRAVEL		SAND			FINES

U.S. Standard Sieves Sizes and Numbers

	Particle Size (mm)	% Passing	Particle Size Classification	Percentage
12.0"	304.8	100.0		
3.0"	75.0	100.0	Cobbles	0.00
2.5"	63.5	100.0		
2.0"	50.0	100.0		
1.5"	37.5	100.0		
1.0"	25.0	100.0		
0.75"	19.0	100.0	Coarse Gravel	0.00
0.50"	12.7	100.0		
0.375"	9.5	100.0		
#4	4.8	99.6	Fine Gravel	0.42
#10	2.00	99.2	Coarse Sand	0.37
#20	0.85	98.9		
#40	0.43	97.2	Medium Sand	2.05
#60	0.25	92.3		
#100	0.15	87.8		
#200	0.075	80.0	Fine Sand	17.20
			Fines	79.96



ATTERBERG LIMITS
Method -B (Dry preparation)

M_c	LL	PL	PI	LI
113.4	84	49	35	1.85

DESCRIPTION: Dark Gray, CLAYEY SILT, some medium to fine sand, trace fine gravel.
USCS: MH

LL (oven-dried) < 0.75 = ORGANIC (OL/OH)

TECH	CA/RF
DATE	08/02/07
CHECK	AK
REVIEW	[illegible]

FLEXIBLE WALL PERMEABILITY
ASTM D 5084
METHOD D, CONSTANT RATE OF FLOW

PROJECT TITLE	ACCUTEST/DMT, BALTIMORE,MD/NJ	Board #	6
PROJECT NUMBER	073-90241	Flow Pump	2
SAMPLE ID	J67727-1	Flow Pump Speed	10
SAMPLE TYPE	UD	Technician	SDM

COMMENTS

Sample Data, Initial			
Height, inches	2.955	B-Value, f	1.00
Diameter, inches	2.850	Cell Pres.	95.0
Area, cm²	41.16	Bot. Pres.	80.0
Volume, cm³	308.91	Top Pres.	80.0
Mass, g	426.00	Tot. B.P.	80.0
Moisture Content, %	113.36	Head, max.	120.28
Dry Density, pcf	40.33	Head, min.	120.28
Spec. Gravity	2.660	Max. Grad.	17.19
Volume Solids, cm³	75.06	Min. Grad.	17.19
Volume Voids, cm³	233.85		
Void Ratio	3.12		
Saturation, %	96.8%		

Sample Data, Final	
Height, inches	2.755
Diameter, inches	2.674
Area, cm²	36.23
Volume, cm³	253.53
Mass, g	372.31
Moisture Content, %	86.47
Dry Density, pcf	49.14
Volume Solids, cm³	75.06
Volume Voids, cm³	178.47
Void Ratio	2.38
Saturation, %	96.7%

WATER CONTENTS		Sample Initial	Sample Final
Wt Soil & Tare, i	g	426.00	380.80
Wt Soil & Tare, f	g	199.66	208.22
Wt Tare	g	0.00	8.64
Wt Moisture Lost	g	226.34	172.58
Wt Dry Soil	g	199.66	199.58
Water Content	%	113.36%	86.47%

DESCRIPTION

Dark Gray, CLAYEY SILT, some medium to fine sand, trace fine gravel.

Flow Pump Rate 2.25E-05 cm³/sec

USCS MH

TIME FUNCTIONS, SECONDS								dP				
DATE	DAY	HOUR	MIN	TEMP (°C)	dt (min)	dt,acc (min)	dt (sec)	dt,acc (sec)	Reading (psi)	Head (cm)	Gradient	Permeability (cm/sec)
08/06/07	39300	9	20	20.8	0	0	0	0	1.71	120.28	17.19	3.6E-08
08/06/07	39300	9	25	20.8	5	5	300	300	1.71	120.28	17.19	3.6E-08
08/06/07	39300	9	30	20.8	5	10	300	600	1.71	120.28	17.19	3.6E-08
08/06/07	39300	9	35	20.8	5	15	300	900	1.71	120.28	17.19	3.6E-08 *
08/06/07	39300	9	40	20.8	5	20	300	1200	1.71	120.28	17.19	3.6E-08 *
08/06/07	39300	9	45	20.8	5	25	300	1500	1.71	120.28	17.19	3.6E-08 *
08/06/07	39300	9	50	20.8	5	30	300	1800	1.71	120.28	17.19	3.6E-08 *

*TRANSCRIBED FROM ORIGINAL DATA SHEETS

PERMEABILITY REPORTED AS ** 3.6E-08 cm/sec **

PERMEANT: Deaired Tap Water

DATE	8/6/2007
CHECK	AK
REVIEW	[illegible]

SPECIFIC GRAVITY OF SOILS
ASTM D-854
PYCNOMETER METHOD

PROJECT TITLE	ACCUTEST/DMT, BALTIMORE,MD/NJ		
PROJECT NUMBER	073-90241	**SAMPLE ID**	J67727-1
		SAMPLE TYPE	Bag
TESTED FOR	Gs	**SAMPLE DEPTH**	24.0-26.0'

MOISTURE CONTENT OF MATERIAL PASSING THE #4 SIEVE

Weight Soil and Tare, Initial (gm)	45.57
Weight Soil and Tare, Final (gm)	44.43
Weight Of Tare (gm)	8.36
Weight Of Moisture (gm)	1.14
Weight Of Dry Soil (gm)	36.07
Hygroscopic Moisture In (%)	3.2%

Test Method		**Method - B**
Pycnometer Number		**20**
Weight Pycnometer Empty (gm)		162.69
Volume of Pycnometer (gm)		499.57
Weight Pycnometer and Water (gm)		661.26
Mass of Pycnometer and Water at the test Temperture	(A)	660.97
Observed Temperature (Tb), for (Mb) In Degrees C		23.50
Weight of Soil, Water & Pycnometer (gm)	(B)	**693.11**
Temperature, C		**23.50**
Density of water @ tested temperature (g/ml)		1.00
Tare Number		-
Weight of Dry Soil Slurry plus Tare		**237.14**
Weight of Tare		**185.66**
Weight of Dry Soil (gm)	(C)	51.48
Temperature Coefficient		0.9992

SPECIFIC GRAVITY (G) **2.660**

G @ 20° C = [C/(A-(B - C))]*(K)

METHOD - A	WET METHOD	METHOD OF AIR REMOVAL
METHOD - B	OVEN-DRIED METHOD	VACUUM

Recommended Mass for Test Specimen

Soil Type	Specimen Dry Mass when using 500 ml Pycnometer
SP, SP-SM	100
SP-SC, SM , SC	75
SILT OR CLAY	50

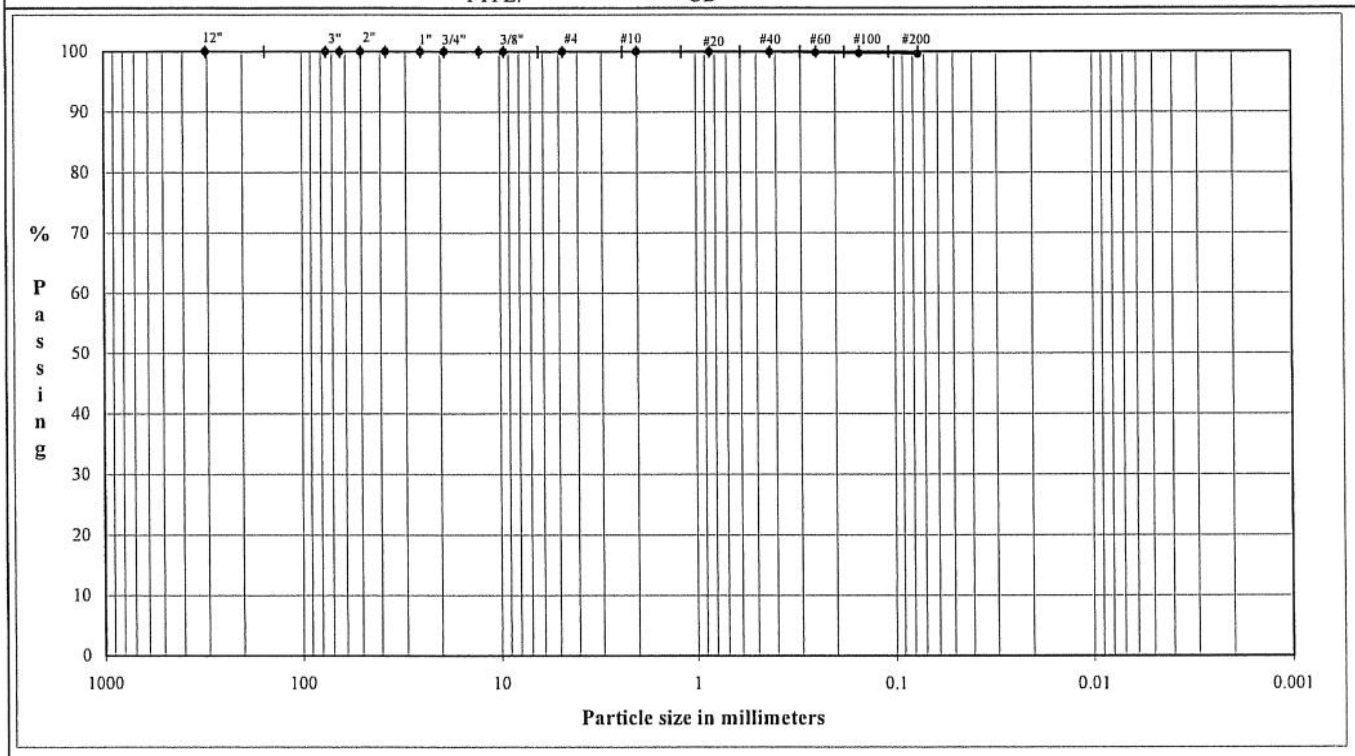
TECH	JD/TJ
DATE	8/7/2007
CHECK	AW
REVIEW	[illegible]

AUGUST 2007 073-90241

PARTICLE SIZE DISTRIBUTION & ATTERBERG LIMITS

ASTM D421, D422, D4318

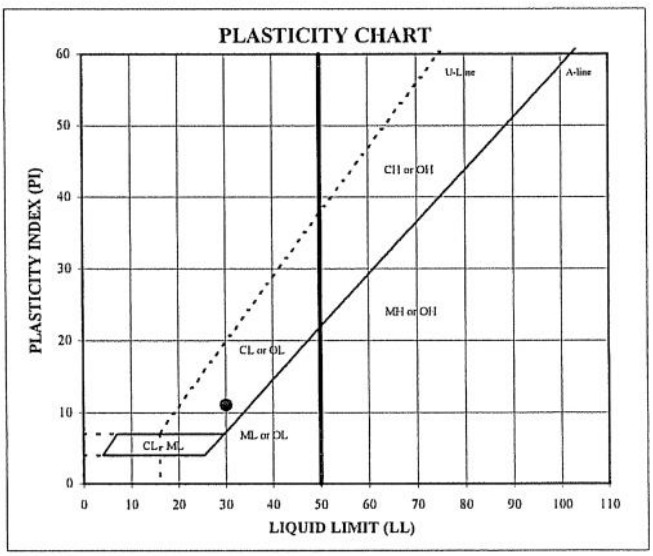
PROJECT NAME: **ACCUTEST/DMT, BALTIMORE,MD/NJ**
SAMPLE ID: **J67727X-2** Depth: -
TYPE: **UD**



	Coarse	Fine	Coarse	Medium	Fine	Silt or Clay
COBBLES	GRAVEL		SAND			FINES

U.S. Standard Sieves Sizes and Numbers

	Particle Size (mm)	% Passing	Particle Size Classification	Percentage
12.0"	304.8	100.0		
3.0"	75.0	100.0	Cobbles	0.00
2.5"	63.5	100.0		
2.0"	50.0	100.0		
1.5"	37.5	100.0		
1.0"	25.0	100.0		
0.75"	19.0	100.0	Coarse Gravel	0.00
0.50"	12.7	100.0		
0.375"	9.5	100.0		
#4	4.8	100.0	Fine Gravel	0.00
#10	2.00	100.0	Coarse Sand	0.01
#20	0.85	100.0		
#40	0.43	99.9	Medium Sand	0.06
#60	0.25	99.9		
#100	0.15	99.7		
#200	0.075	99.6	Fine Sand	0.30
			Fines	99.63



ATTERBERG LIMITS
Method -B (Dry preparation)

M_c	LL	PL	PI	LI
21.3	30	19	11	0.18

LL (oven-dried) < 0.75 = ORGANIC (OL/OH)

DESCRIPTION: Light Gray and Brown, SILTY CLAY, trace fine sand.
USCS: CL

TECH	CA/RF
DATE	08/02/07
CHECK	AJL
REVIEW	[illegible]

Golder Associates Inc.

FLEXIBLE WALL PERMEABILITY
ASTM D 5084
METHOD D, CONSTANT RATE OF FLOW

PROJECT TITLE	ACCUTEST/DMT, BALTIMORE,MD/NJ	Board #	5	COMMENTS	
PROJECT NUMBER	073-90241	Flow Pump	1		
SAMPLE ID	J67727X-2	Flow Pump Speed	7		
SAMPLE TYPE	UD	Technician	DA		

Sample Data, Initial				Sample Data, Final	
Height, inches	2.952	B-Value, f	0.99	Height, inches	2.940
Diameter, inches	2.860	Cell Pres.	89.0	Diameter, inches	2.866
Area, cm²	41.45	Bot. Pres.	80.0	Area, cm²	41.62
Volume, cm³	310.77	Top Pres.	80.0	Volume, cm³	310.81
Mass, g	642.46	Tot. B.P.	80.0	Mass, g	645.79
Moisture Content, %	21.27	Head, max.	66.12	Moisture Content, %	21.90
Dry Density, pcf	106.37	Head, min.	66.12	Dry Density, pcf	106.36
Spec. Gravity	2.820	Max. Grad.	8.85	Volume Solids, cm³	187.86
Volume Solids, cm³	187.86	Min. Grad.	8.85	Volume Voids, cm³	122.95
Volume Voids, cm³	122.91			Void Ratio	0.65
Void Ratio	0.65			Saturation, %	94.4%
Saturation, %	91.7%				

WATER CONTENTS		Sample Initial	Sample Final
Wt Soil & Tare, i	g	642.46	654.27
Wt Soil & Tare, f	g	529.76	538.27
Wt Tare	g	0.00	8.64
Wt Moisture Lost	g	112.70	116.00
Wt Dry Soil	g	529.76	529.63
Water Content	%	21.27%	21.90%

Flow Pump Rate 2.53E-04 cm³/sec

USCS CL

DESCRIPTION
Light Gray and Brown, SILTY CLAY, trace fine sand.

TIME FUNCTIONS, SECONDS								dP				
DATE	DAY	HOUR	MIN	TEMP (°C)	dt (min)	dt,acc (min)	dt (sec)	dt,acc (sec)	Reading (psi)	Head (cm)	Gradient	Permeability (cm/sec)
08/04/07	39298	12	35	21.3	0	0	0	0	0.94	66.12	8.85	6.7E-07
08/04/07	39298	12	40	21.3	5	5	300	300	0.94	66.12	8.85	6.7E-07
08/04/07	39298	12	45	21.3	5	10	300	600	0.94	66.12	8.85	6.7E-07
08/04/07	39298	12	50	21.3	5	15	300	900	0.94	66.12	8.85	6.7E-07 *
08/04/07	39298	12	55	21.3	5	20	300	1200	0.94	66.12	8.85	6.7E-07 *
08/04/07	39298	13	0	21.3	5	25	300	1500	0.94	66.12	8.85	6.7E-07 *
08/04/07	39298	13	5	21.3	5	30	300	1800	0.94	66.12	8.85	6.7E-07 *

*TRANSCRIBED FROM ORIGINAL DATA SHEETS

PERMEABILITY REPORTED AS ** 6.7E-07 cm/sec **

PERMEANT: Deaired Tap Water

DATE	8/4/2007
CHECK	AK
REVIEW	RWM

SPECIFIC GRAVITY OF SOILS
ASTM D-854
PYCNOMETER METHOD

PROJECT TITLE	ACCUTEST/DMT, BALTIMORE,MD/NJ		
PROJECT NUMBER	073-90241	**SAMPLE ID**	J67727X-2
		SAMPLE TYPE	Bag
TESTED FOR	Gs	**SAMPLE DEPTH**	-

MOISTURE CONTENT OF MATERIAL PASSING THE #4 SIEVE

Weight Soil and Tare, Initial (gm)	245.01
Weight Soil and Tare, Final (gm)	241.78
Weight Of Tare (gm)	8.40
Weight Of Moisture (gm)	3.23
Weight Of Dry Soil (gm)	233.38
Hygroscopic Moisture In (%)	1.4%

Test Method		**Method - B**
Pycnometer Number		4
Weight Pycnometer Empty (gm)		183.64
Volume of Pycnometer (gm)		499.55
Weight Pycnometer and Water (gm)		681.97
Mass of Pycnometer and Water at the test Temperture	(A)	681.90
Observed Temperature (Tb), for (Mb) In Degrees C		23.50
Weight of Soil, Water & Pycnometer (gm)	(B)	**714.47**
Temperature, C		**23.50**
Density of water @ tested temperature (g/ml)		1.00
Tare Number		-
Weight of Dry Soil Slurry plus Tare		**230.31**
Weight of Tare		**179.86**
Weight of Dry Soil (gm)	(C)	50.45
Temperature Coefficient		0.9992

SPECIFIC GRAVITY (G) **2.820**

G @ 20° C = [C/(A-(B - C))]*(K)

METHOD - A	WET METHOD	METHOD OF AIR REMOVAL
METHOD - B	OVEN-DRIED METHOD	VACUUM

Recommended Mass for Test Specimen

Soil Type	Specimen Dry Mass when using 500 ml Pycnometer
SP, SP-SM	100
SP-SC, SM , SC	75
SILT OR CLAY	50

TECH	JD/TJ
DATE	8/7/2007
CHECK	AC
REVIEW	[illegible]