New Jersey ACCUTEST Laboratories

GEO-TECH

08/24/07

Technical Report for

Honeywell International Inc.

CMHLLVA: Dundalk Marine Terminal, Balitmore, MD

Accutest Job Number: J68930X

Sampling Dates: 08/13/07 - 08/14/07

RECEIVED AUG 28 2007 By NS

Report to:

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

ATTN: Mark Stinnett

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

This report shall not be reproduced, except in its entirety, without the written approval of Accutest Laboratories.
Test results relate only to samples analyzed.

Accutest Laboratories

Sample Summary

Honeywell International Inc.

Job No: J68930X

CMHLLVA: Dundalk Marine Terminal, Balitmore, MD

Sample Number	Collected Date	Time By	Received	Matrix Code	Type	Client Sample ID
J68930-1X	08/13/07	09:15	08/14/07	SO	Soil	DMT-52US-SOI-200220-G
J68930-2X	08/14/07	10:20	08/14/07	SO	Soil	DMT-51US-SOI-300320-G

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

SO

X

J68930

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

Honeywell

Chain Of Custody / Analysis Request

AESI Ref:	39306.59893
COC#	37825-081407-ACTD-1G
Lab Proj # (SDG):	
Lab ID	ACTD
Site ID	Dundalk
Lab Job #	
Authorized User:	Honeywell

Text & Excel File Drive | Excel & Text File Order

Copyright AESI: Version 5.0 Unauthorized use strictly prohibited.

Privileged & Confidential		Site Name:	Dundalk Marine Terminal
Phase:	RI	Sampling Program	COPR Investigation Phase 2
Location of Site:	BALTIMORE, MD		
Sampling Co.:	CH2MHILL	EDD To:	John.Mitchell@ch2m.com
Sampler:	John Rogers	PO #	
Analysis Turnaround Time (TAT):	28	Consultant	CH2M
Full Report TAT:	28		

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

	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 D1498-ORP	Sampling Method (code)	Lab Sample Numbers
	Location ID	Start Depth (ft)	End Depth (ft)	Field Sample ID							Units															
1	DMT-52US	20.0	22.0	-1 DMT-52US-SOI-200220-G	8/13/2007	9:15	SOI	SOIL	REG	1	grab	N	X	X	X	X						X	X		Shelby Tube	
2	DMT-51US	30.0	32.0	-2 DMT-51US-SOI-300320-G	8/14/2007	10:20	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	CH2M HILL Company	CH2M HILL	Received by	Pacor Company		Condition	Custody Seals Intact
	8/14/07 Date/Time 16:30		Steven Fessler	8/14/07 Date/Time 4:35 PM		Cooler Temp.	
Relinquished by	Company		Received by	Company		Condition	Custody Seals Intact
	8/14/07 Date/Time 19:10		PDO	8/14/07 Date/Time 19:10	24.4°C	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

CC

CHAIN OF CUSTODY

ACCUTEST

Fresh Ponds Corporate Village, Building B
2235 Route 130, Dayton, NJ 08810
908-329-0200 FAX: 908-329-3499/3480

Accutest Job #:

Accutest Quote #:

Client Information

Accutest

Name: 2235 Route 130

Address: Dayton NJ 08810

City: #REF! State: Zip:

Send Report to:
Phone #: (732) 329-0200 X-214

Facility Information

Project Name: DMT, Baltimore, MD

Location:

Project No.: J68930X

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- % Moist	ASTM D854-Specific Gravity ASTM D2937-Bulk Density	ASTM D422-Grain Size ASTM D2434-Permeability	ASTM D4318-Atterburg Limits			
J68930X -1	8/13/07			Soil							X	X	X	X			
-2	8/14/07			Soil							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
- ☒ NJ Full
- ☐ FULL CLP
- ☐ Disk Deliverable
- ☐ Other (Specify)
- ☐ Commercial "A"
- ☐ Commercial "B"
- ☐ State Forms

Comments / Remarks

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	8/16/07 1700	1 FedX	2		2
3		3	4		4
5		5	Seal #	Preserved where applicable ☐	On Ice ☐

Accutest
Subcontractor Order

Date/Time:	8/15/07 10:28 AM	**Sub Lab:**	Golder
Accutest Job No.	J68930X	**Address:**	3730 Chamblee - Tucker Road
Client Project:	DMT, Baltimore, MD		Atlanta Ga 30341
CSR:	DJM	**Contact:**	Henry Mack
		Phone:	770-492-8280

Sample #:	Analyses
J68930X - 1	ASTM D2216- % Moist / / /
2	ASTM D2216- % Moist / / /
Turn Around	28

Sample Managment receipt: _____ **Date:** 8/16/07

(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	Unit Weight		Permeability	Additional Tests Conducted
					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 %		(g/ml)	Moisture %	Dry (lb/cuft)	(cm/sec)	(See Notes)
J68930X-1	UD	-	SM	83.9	83	45	38	1.01	83.5	45.3	-	-	-	2.59	0.13	83.9	51.4	1.6E-08	-
J68930X-2	UD	-	SC-SM	34.4	23	18	5	3.53	94.4	18.1	-	-	-	2.66	0.85	34.4	88.2	7.7E-08	-

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

Reviewer _____
Review Date 8/23/07

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

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

J68930X

BULK DENSITY
ASTM D 2937 modified

PROJECT TITLE	ACCUTEST/DMT, BALTIMORE, MD/NJ
PROJECT NUMBER	073-90241-001
PROJECT NUMBER	J368930X
REMARKS	

Sample Number	J68930X-1	J68930X-2			
Moisture Content (%)	83.86	34.37			
Solids (%)	0.161	0.656			
Volume (ml)	50.00	50.00			
Weight of Solids (gm)	41.69	64.90			
Bulk Density (g/ml)	**0.13**	**0.85**			
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)					

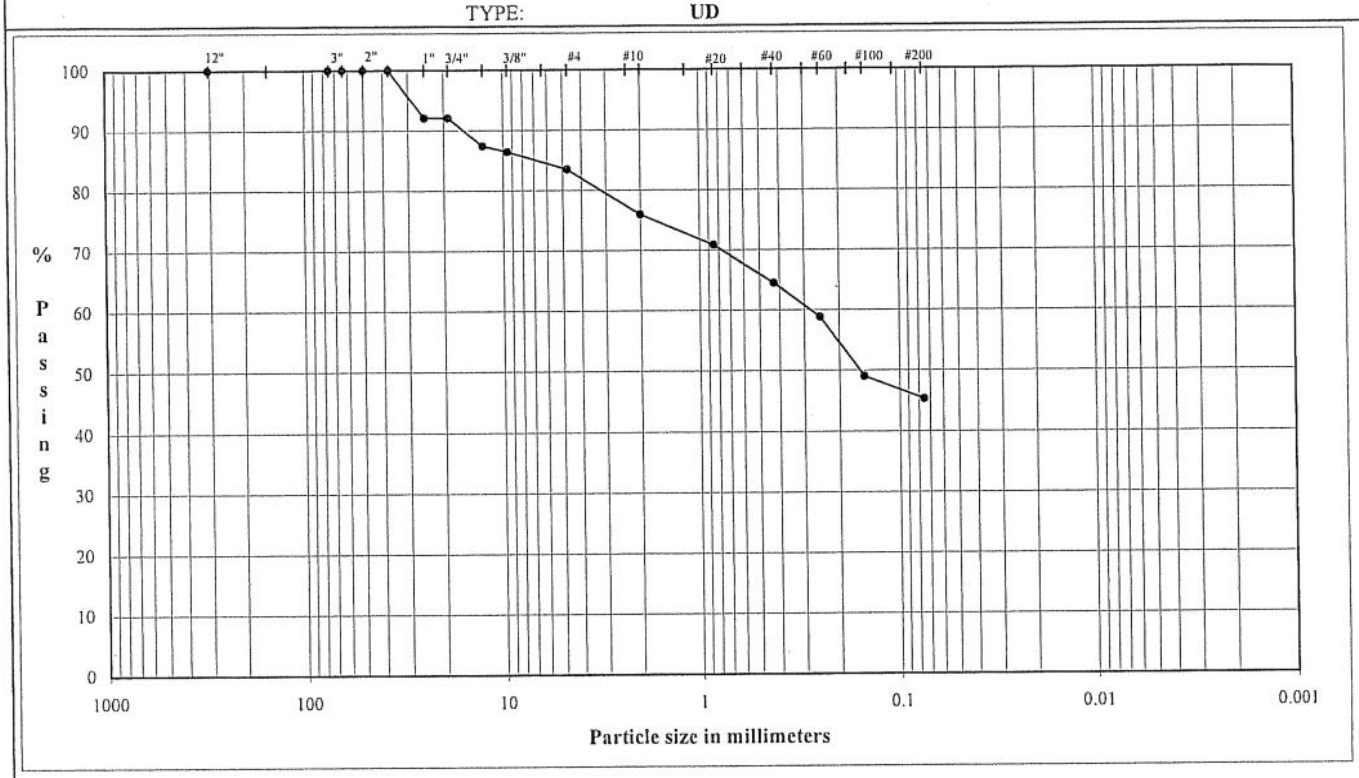
TECH	CA
DATE	8/19/2007
CHECK	DA
REVIEW	AK

AUGUST 2007 073-90241

PARTICLE SIZE DISTRIBUTION & ATTERBERG LIMITS

ASTM D421, D422, D4318

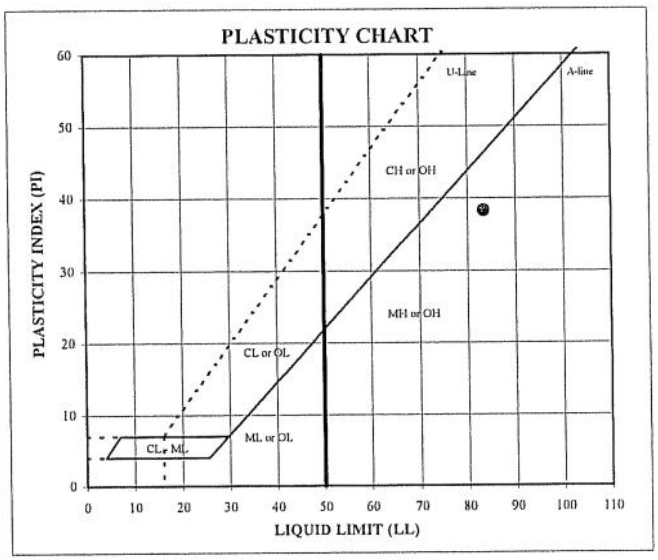
PROJECT NAME: **ACCUTEST/DMT, BALTIMORE,MD/NJ**
SAMPLE ID: **J68930X-1** Depth: -
TYPE: **UD**



	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	92.1		
0.75"	19.0	92.1	Coarse Gravel	7.92
0.50"	12.7	87.4		
0.375"	9.5	86.4		
#4	4.8	83.5	Fine Gravel	8.57
#10	2.00	76.0	Coarse Sand	7.52
#20	0.85	70.9		
#40	0.43	64.5	Medium Sand	11.48
#60	0.25	58.9		
#100	0.15	49.1		
#200	0.075	45.3	Fine Sand	19.17
			Fines	45.34



ATTERBERG LIMITS
Method -B (Dry preparation)

M_c	LL	PL	PI	LI
83.9	83	45	38	1.01

DESCRIPTION: Black, COARSE TO FINE SAND, and clayey silt, some coarse to fine gravel.

USCS: SM

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

TECH	CA/TJ
DATE	08/17/07
CHECK	DA
REVIEW	AK

NOTE: Insufficient sample received to perform in accordance with ASTM Standards

Golder Associates Inc.

FLEXIBLE WALL PERMEABILITY

ASTM D 5084

METHOD D, CONSTANT RATE OF FLOW

PROJECT TITLE	ACCUTEST/DMT, BALTIMORE,MD/NJ	Board #	3	COMMENTS	
PROJECT NUMBER	073-90241	Flow Pump	1		
SAMPLE ID	J68930X-1	Flow Pump Speed	11		
SAMPLE TYPE	UD	Technician	CA		

Sample Data, Initial				Sample Data, Final	
Height, inches	2.883	B-Value, f	0.99	Height, inches	2.816
Diameter, inches	2.838	Cell Pres.	92.5	Diameter, inches	2.776
Area, cm²	40.81	Bot. Pres.	80.0	Area, cm²	39.05
Volume, cm³	298.85	Top Pres.	80.0	Volume, cm³	279.29
Mass, g	452.48	Tot. B.P.	80.0	Mass, g	430.77
Moisture Content, %	83.86	Head, max.	144.20	Moisture Content, %	75.04
Dry Density, pcf	51.38	Head, min.	144.20	Dry Density, pcf	54.98
Spec. Gravity	2.585	Max. Grad.	20.16	Volume Solids, cm³	95.20
Volume Solids, cm³	95.20	Min. Grad.	20.16	Volume Voids, cm³	184.09
Volume Voids, cm³	203.65			Void Ratio	1.93
Void Ratio	2.14			Saturation, %	100.3%
Saturation, %	101.3%				

WATER CONTENTS		Sample Initial	Sample Final
Wt Soil & Tare, i	g	452.48	438.99
Wt Soil & Tare, f	g	246.10	254.38
Wt Tare	g	0.00	8.36
Wt Moisture Lost	g	206.38	184.61
Wt Dry Soil	g	246.10	246.02
Water Content	%	83.86%	75.04%

Flow Pump Rate 1.27E-05 cm³/sec

USCS SM

DESCRIPTION

Black, COARSE TO FINE SAND, and clayey silt, some coarse to fine gravel.

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)	
08/22/07	39316	8	40	20.9	0	0	0	0	2.05	144.20	20.16	1.6E-08	
08/22/07	39316	8	45	20.9	5	5	300	300	2.05	144.20	20.16	1.6E-08	
08/22/07	39316	8	50	20.9	5	10	300	600	2.05	144.20	20.16	1.6E-08	
08/22/07	39316	8	55	20.9	5	15	300	900	2.05	144.20	20.16	1.6E-08	*
08/22/07	39316	9	0	20.9	5	20	300	1200	2.05	144.20	20.16	1.6E-08	*
08/22/07	39316	9	5	20.9	5	25	300	1500	2.05	144.20	20.16	1.6E-08	*
08/22/07	39316	9	10	20.9	5	30	300	1800	2.05	144.20	20.16	1.6E-08	*

*TRANSCRIBED FROM ORIGINAL DATA SHEETS

PERMEABILITY REPORTED AS ** 1.6E-08 cm/sec **

PERMEANT: Deaired Tap Water

DATE 8/22/2007

CHECK DA

REVIEW AK

SPECIFIC GRAVITY OF SOILS
ASTM D-854
PYCNOMETER METHOD

PROJECT TITLE	ACCUTEST/DMT, BALTIMORE,MD/NJ		
PROJECT NUMBER	073-90241-001	SAMPLE ID	J68930X-1
		SAMPLE TYPE	UD
TESTED FOR	Gs	SAMPLE DEPTH	-

MOISTURE CONTENT OF MATERIAL PASSING THE #4 SIEVE

Weight Soil and Tare, Initial (gm)	18.40
Weight Soil and Tare, Final (gm)	18.16
Weight Of Tare (gm)	8.23
Weight Of Moisture (gm)	0.24
Weight Of Dry Soil (gm)	9.93
Hygroscopic Moisture In (%)	2.4%

Test Method		**Method - B**
Pycnometer Number		28
Weight Pycnometer Empty (gm)		173.88
Volume of Pycnometer (gm)		499.32
Weight Pycnometer and Water (gm)		671.97
Mass of Pycnometer and Water at the test Temperture	(A)	671.69
Observed Temperature (Tb), for (Mb) In Degrees C		25.30
Weight of Soil, Water & Pycnometer (gm)	(B)	**693.36**
Temperature, C		**25.30**
Density of water @ tested temperature (g/ml)		1.00
Tare Number		-
Weight of Dry Soil Slurry plus Tare		**149.11**
Weight of Tare		**113.79**
Weight of Dry Soil (gm)	(C)	35.32
Temperature Coefficient		0.9988
SPECIFIC GRAVITY (G) G @ 20° C = [C/(A-(B - C))]*(K)		**2.585**

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

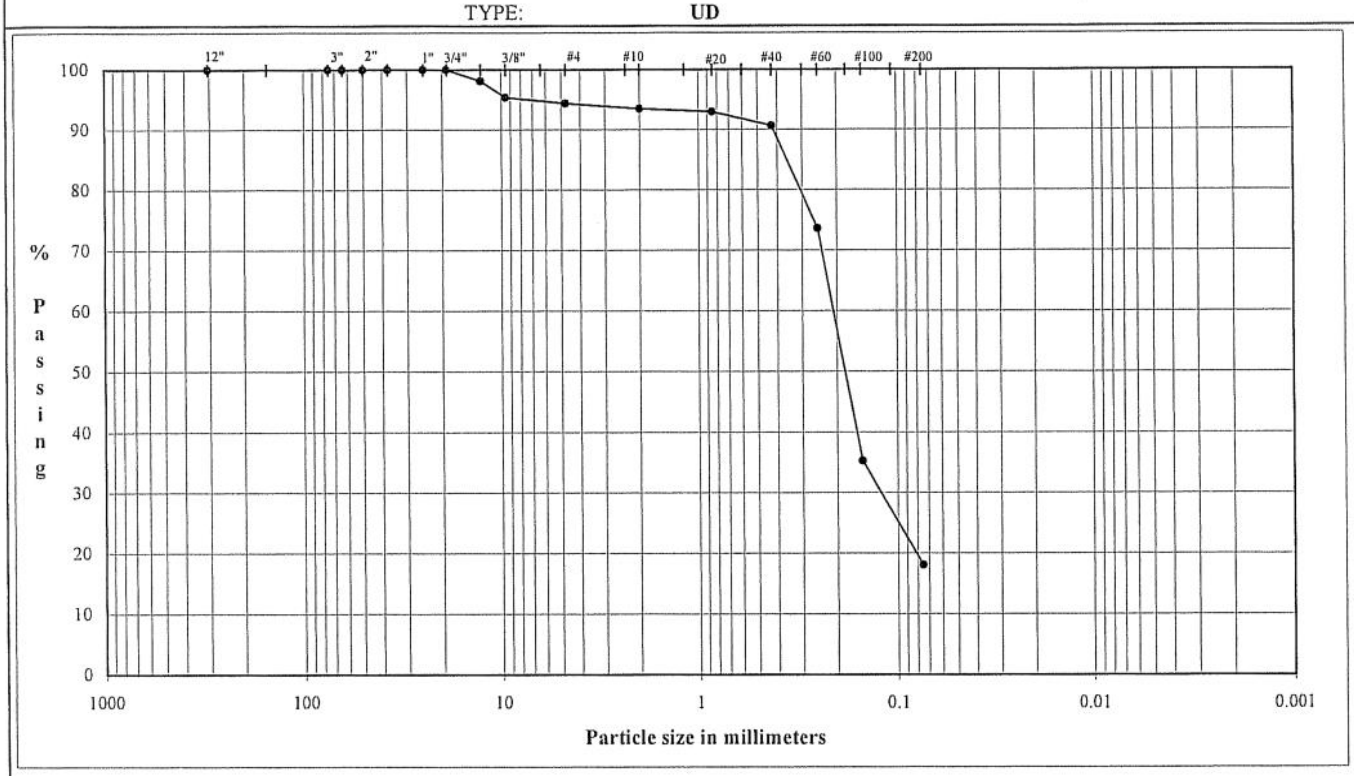
TECH	CA
DATE	8/19/2007
CHECK	DA
REVIEW	AW

AUGUST 2007 073-90241

PARTICLE SIZE DISTRIBUTION & ATTERBERG LIMITS

ASTM D421, D422, D4318

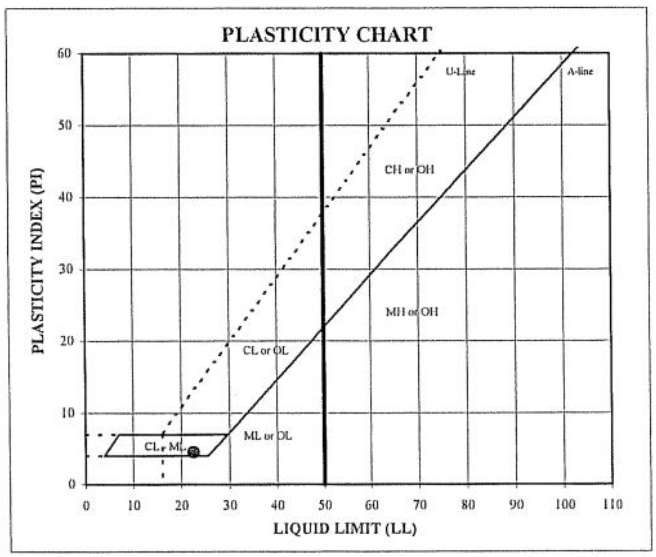
PROJECT NAME: **ACCUTEST/DMT, BALTIMORE,MD/NJ**
SAMPLE ID: **J68930X-2** Depth: -
TYPE: **UD**



	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	98.1		
0.375"	9.5	95.4		
#4	4.8	94.4	Fine Gravel	5.61
#10	2.00	93.5	Coarse Sand	0.89
#20	0.85	93.0		
#40	0.43	90.7	Medium Sand	2.84
#60	0.25	73.6		
#100	0.15	35.3		
#200	0.075	18.0	Fine Sand	72.62
			Fines	18.05



ATTERBERG LIMITS
Method -B (Dry preparation)

M_c	LL	PL	PI	LI
34.4	23	18	5	3.53

DESCRIPTION: Gray, FINE SAND, some silty clay, little fine gravel.
USCS: SC-SM

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

TECH	CA/TJ
DATE	08/17/07
CHECK	DA
REVIEW	AK

Golder Associates Inc.

FLEXIBLE WALL PERMEABILITY

ASTM D 5084

METHOD D, CONSTANT RATE OF FLOW

PROJECT TITLE	ACCUTEST/DMT, BALTIMORE,MD/NJ	Board #	14
PROJECT NUMBER	073-90241	Flow Pump	2
SAMPLE ID	J68930X-2	Flow Pump Speed	9
SAMPLE TYPE	UD	Technician	CA

COMMENTS

Sample Data, Initial			
Height, inches	2.940	B-Value, f	1.00
Diameter, inches	2.854	Cell Pres.	95.5
Area, cm^2	41.27	Bot. Pres.	80.0
Volume, cm^3	308.21	Top Pres.	80.0
Mass, g	585.44	Tot. B.P.	80.0
Moisture Content, %	34.37	Head, max.	91.44
Dry Density, pcf	88.21	Head, min.	91.44
Spec. Gravity	2.659	Max. Grad.	12.39
Volume Solids, cm^3	163.86	Min. Grad.	12.39
Volume Voids, cm^3	144.35		
Void Ratio	0.88		
Saturation, %	103.7%		

Sample Data, Final	
Height, inches	2.906
Diameter, inches	2.821
Area, cm^2	40.32
Volume, cm^3	297.64
Mass, g	568.62
Moisture Content, %	30.51
Dry Density, pcf	91.34
Volume Solids, cm^3	163.86
Volume Voids, cm^3	133.79
Void Ratio	0.82
Saturation, %	99.4%

WATER CONTENTS		Sample Initial	Sample Final
Wt Soil & Tare, i	g	585.44	576.79
Wt Soil & Tare, f	g	435.69	443.89
Wt Tare	g	0.00	8.29
Wt Moisture Lost	g	149.75	132.90
Wt Dry Soil	g	435.69	435.60
Water Content	%	34.37%	30.51%

DESCRIPTION

Gray, FINE SAND, some silty clay, little fine gravel.

Flow Pump Rate 4.26E-05 cm^3/sec

USCS SC-SM

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)	
08/21/07	39315	10	50	24.0	0	0	0	0	1.30	91.44	12.39	7.7E-08	
08/21/07	39315	10	55	24.0	5	5	300	300	1.30	91.44	12.39	7.7E-08	
08/21/07	39315	11	0	24.0	5	10	300	600	1.30	91.44	12.39	7.7E-08	
08/21/07	39315	11	5	24.0	5	15	300	900	1.30	91.44	12.39	7.7E-08	*
08/21/07	39315	11	10	24.0	5	20	300	1200	1.30	91.44	12.39	7.7E-08	*
08/21/07	39315	11	15	24.0	5	25	300	1500	1.30	91.44	12.39	7.7E-08	*
08/21/07	39315	11	20	24.0	5	30	300	1800	1.30	91.44	12.39	7.7E-08	*

*TRANSCRIBED FROM ORIGINAL DATA SHEETS

PERMEABILITY REPORTED AS ** 7.7E-08 cm/sec **

PERMEANT: Deaired Tap Water

DATE 8/21/2007

CHECK DA

REVIEW AV

SPECIFIC GRAVITY OF SOILS
ASTM D-854
PYCNOMETER METHOD

PROJECT TITLE	ACCUTEST/DMT, BALTIMORE,MD/NJ		
PROJECT NUMBER	073-90241-001	SAMPLE ID	J68930X-2
		SAMPLE TYPE	UD
TESTED FOR	Gs	SAMPLE DEPTH	-

MOISTURE CONTENT OF MATERIAL PASSING THE #4 SIEVE

Weight Soil and Tare, Initial (gm)	120.09
Weight Soil and Tare, Final (gm)	119.66
Weight Of Tare (gm)	8.35
Weight Of Moisture (gm)	0.43
Weight Of Dry Soil (gm)	111.31
Hygroscopic Moisture In (%)	0.4%

Test Method		**Method - B**
Pycnometer Number		22
Weight Pycnometer Empty (gm)		182.79
Volume of Pycnometer (gm)		499.69
Weight Pycnometer and Water (gm)		681.27
Mass of Pycnometer and Water at the test Temperture	(A)	681.03
Observed Temperature (Tb), for (Mb) In Degrees C		24.80
Weight of Soil, Water & Pycnometer (gm)	(B)	730.58
Temperature, C		24.80
Density of water @ tested temperature (g/ml)		1.00
Tare Number		-
Weight of Dry Soil Slurry plus Tare		188.57
Weight of Tare		109.21
Weight of Dry Soil (gm)	(C)	79.36
Temperature Coefficient		0.9989
SPECIFIC GRAVITY (G)		2.659

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	CA
DATE	8/19/2007
CHECK	DA
REVIEW	AK