New Jersey
ACCUTEST
Laboratories

02/21/07

Technical Report for

Honeywell International Inc.

CMHLLVA: Dundalk Marine Terminal, Balitmore, MD

COPR Investigation 4th QTR 2006

Accutest Job Number: J50706X

Sampling Date: 01/03/07

Report to:

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

ATTN: Mark Stinnet

Total number of pages in report:

ACCREDITED IN ACCORDANCE WITH nela

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

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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Honeywell International Inc.

CMHLLVA: Dundalk Marine Terminal, Balitmore, MD

COPR Investigation 4th QTR 2006

Accutest Job Number: J50706X

Sampling Date: 01/03/07

Report to:

Validata, LLC
3346 NE 178th Street
Seattle, WA 98155

ATTN: Christina Jensen

Total number of pages in report:

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Sample Summary

Honeywell International Inc.

Job No: J50706X

CMHLLVA: Dundalk Marine Terminal, Balitmore, MD
Project No: COPR Investigation 4th QTR 2006

Sample Number	Collected Date	Time By	Received	Matrix Code	Type	Client Sample ID
J50706-12X	01/03/07	14:50 LC	01/04/07	SO	Soil	DMT-37M-SOI-7986
J50706-13X	01/03/07	10:30 LC	01/04/07	SO	Soil	DMT-37M-SOI-5962
J50706-14X	01/03/07	08:45 LC	01/04/07	SO	Soil	DMT-37M-SOI-4952

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

so, fB

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

Honeywell — Chain Of Custody / Analysis Request

J50706

AESI Ref:	39086.87325		
COC#	37825-010407-ACTD-1		
Lab Proj # (SDG):			
Lab ID	ACTD		
Site ID	Dundalk		
Lab Job #			
Authorized User:	Honeywell		

Privileged & Confidential	Y	Site Name:	Dundalk Marine Terminal
Phase:	RI		
Sampling Co.:	CH2MHILL	EDD To:	Stefanie.Eggermann@ch2m.com
Location of Site:	Baltimore, MD	Sampling Program	COPR Investigation 4th QTR 2006
Client Contact: (name, co., address)	Chris.French@Honeywell.com	Sampler:	Lisa Carter
PO #			
Analysis Turnaround Time (TAT):	28	Consultant	CH2M
Preliminary Data To	Mary Simile@ch2m.com		
Sample Receipt Acknowledgement To	Mary Simile@ch2m.com; Stefanie.Eggermann@ch2m.com		
Hard Copy To	Amy Klopper, Christina Jensen	Full Report TAT:	28
Invoice To:	Honeywell		

Text & Excel File Drive: Excel & Text File Code

Copyright AESI: Version 8.0 Unauthorized use strictly prohibited.

	Sample Identification: Location ID	Start Depth (ft)	End Depth (ft)	Field Sample ID	Sample Date	Sample Time	Sample Type	Sample Matrix	Sample Purpose	# of Cont.	Composite/Grab	Field Filtered Sample ?	SW6010-Metals	SW6020-Total Chromium - s	SW7199-Chromium VI	SW9045-pH - s	SW9056-Sulfate - s	SM 2320B-Carbonate	SW9060-TOC & TIC	SW6010-Total Chromium - w	E150.1-pH - w	E300.0-Sulfate - w	ASTM D1498-ORP	ASTM D2216-Moisture	Sampling Method (code)	Lab Sample Numbers
											Units															
1	DMT-37M	13.0	14.0	DMT-37M-SOI-1314	12/2/2006	13:15	SOI	SOIL	REG	1	comp	N	X	~~X~~	~~X~~	~~X~~	~~X~~	~~X~~	~~X~~			RWW ~~X~~		–	COMPOSITE	EX50
2	DMT-37M	23.0	24.2	DMT-37M-SOI-2324	12/2/2006	13:45	SOI	SOIL	REG	1	comp	N	X	~~X~~	~~X~~	~~X~~	~~X~~	~~X~~	~~X~~			RWW ~~X~~		–	COMPOSITE	AMET9
3	DMT-37M	47.0	49.0	DMT-37M-SOI-4749	1/2/2007	15:50	SOI	SOIL	REG	1	comp	N	X	X	X	X	X	X	X				X	–	COMPOSITE	MET7
4	DMT-37M	57.0	59.0	DMT-37M-SOI-5759	1/3/2007	9:25	SOI	SOIL	REG	1	comp	N	X	X	X	X	X	X	X				X	–	COMPOSITE	WC43
5	DMT-37M	67.0	69.0	DMT-37M-SOI-6769	1/3/2007	11:15	SOI	SOIL	REG	1	comp	N	X	X	X	X	X	X	X				X	–	COMPOSITE	WC1
6	DMT-37M	77.0	79.0	DMT-37M-SOI-7779	1/3/2007	14:05	SOI	SOIL	REG	1	comp	N	X	X	X	X	X	X	X				X	–	COMPOSITE	SUB
7	DMT-37M	87.0	87.5	DMT-37M-SOI-8789	1/3/2007	15:50	SOI	SOIL	REG	1	comp	N	X	X	X	X	X	X	X				X	–	COMPOSITE	
8	DMT-37M	97.0	97.8	DMT-37M-SOI-9799	1/3/2007	16:30	SOI	SOIL	REG	1	comp	N	X	X	X	X	X	X	X				X	–	COMPOSITE	
9	DMT-37M	107.0	108.0	DMT-37M-SOI-107109	1/4/2007	9:30	SOI	SOIL	REG	1	comp	N	X	X	X	X	X	X	X				X	–	COMPOSITE	
10	DMT-37M	112.0	113.1	DMT-37M-SOI-112114	1/4/2007	12:10	SOI	SOIL	REG	1	comp	N	X	X	X	X	X	X	X				X	–	COMPOSITE	
11	Field QC			DMT-EB-010407	1/4/2007	12:30	SOI	SOIL	REG	5	comp	N	X		X				X	X	X	X		–	GRAB	pH=5.20
12																										1/4/07

Relinquished by	Company	Date/Time	Received by	Company	Date/Time	Condition	Cooler Temp.	Custody Seals Intact
Kim Thompson		1-4-07 16:07	[signature] 1/4/07		1600			• pH out of hold 1/4/07
Relinquished by	Company	Date/Time	Received by	Company	Date/Time	Condition	Cooler Temp.	Custody Seals Intact
[signature]		1-4-07 18:30	POD		1/4/07 19:20			

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)

– also rec'd not on CoC
3 tubes of soil

-12 – DMT-37M-SOI-7787 @ 14:50 1/3/07 2.8°C
-13 – DMT-37M-SOI-6962 1/3/07 @ 10:30
-14 – DMT-37M-SOI-4952 1/3/07 @ 8:45

1/4/07 PWD

AF

fB VERIFIED, SAMPLES -12-2 RUN METALS ONLY; SNELBY TUBES ON OTHER COC? PWD 1-8-07

ALL SAMPLES RECEIVED PRESERVED AS APPLICABLE

PWD

FRENCH & PARRELLO
ASSOCIATES, P.A., CONSULTING ENGINEERS

SUMMARY OF LABORATORY TESTING

AASHTO Accreditated Laboratory

PROJECT: Accutest - Honeywell - Dundalk Marine Terminal (J50706X) **PROJECT #:** 06L017A **DATE:** 2/07

Boring & Sample Number	Depth (ft)	Classification	Natural Water Content %	Atterberg Limits		Unconfined Compression		Unit Dry Weight PCF	Specific Gravity	Permeability cm/sec @ 20 deg C	Compaction	Grain Size	Consolidation	Triaxial	CBR	pH	Organic Content %
				Liquid Limit	Plastic Limit	Stress TSF	Strain %										
12X	79' - 81'	Grey Silty CLAY	47	74	37			74.7		5.6×10^{-8}		*					
13X	59' - 62'	Grey Silty CLAY, trace f Sand	55	83	46			67.3		9.7×10^{-8}		*					
14X	49' - 52'	Grey CLAY	65	92	42			61.7		9.7×10^{-8}		*					

RECD IN FULL VIA EMAIL
2/21/07 NBV.

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

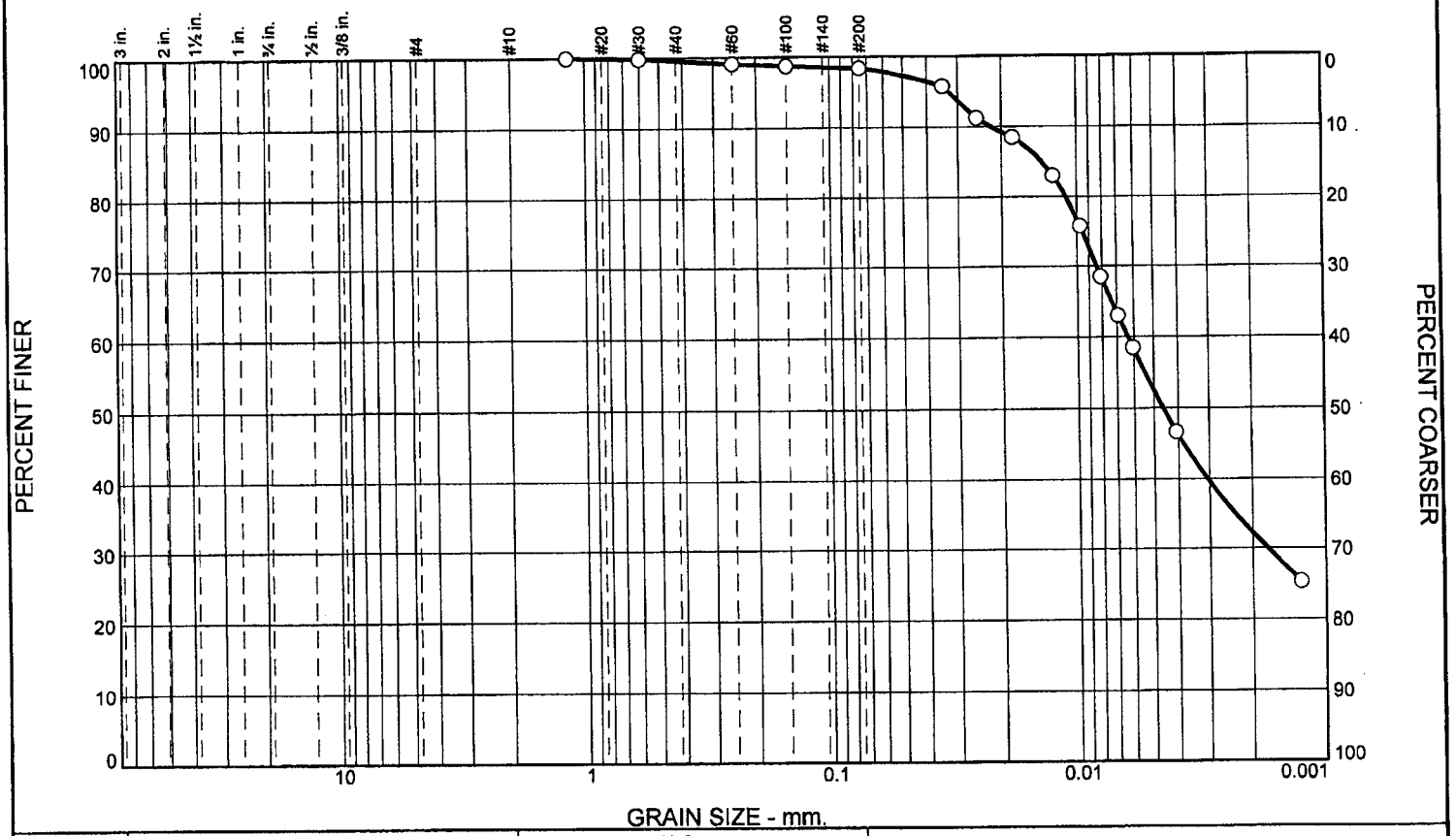
Reviewer [signature]

Review Date 9/21/07

J50706X

* SEE TEST CURVES

Particle Size Distribution Report



% +3"	% Gravel			% Sand			% Fines
	Coarse	Medium	Fine	Coarse	Medium	Fine	
0.0	0.0	0.0	0.0	0.2	0.7	0.7	98.4

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
#16	100.0		
#30	99.8		
#60	99.1		
#100	98.7		
#200	98.4		

* (no specification provided)

Material Description

Grey Silty CLAY

Atterberg Limits

PL= 37 LL= 74 PI= 37

Coefficients

D_{85}= 0.0137 D_{60}= 0.0063 D_{50}= 0.0046
D_{30}= 0.0017 D_{15}= D_{10}=
C_u= C_c=

Classification

USCS= MH AASHTO= A-7-5(46)

Remarks

Sample Number: 12X
Source of Sample: J50706X **Depth:** 79' - 81' **Date:** 2/8/07

FRENCH & PARRELLO ASSOCIATES, P.A.
CONSULTING ENGINEERS
Wall, NJ

Client: Accutest Laboratories
Project: Accutest - Honeywell - Dundalk
Project No: 06L017A **Figure**

Tested By: CK **Checked By:** RT

GRAIN SIZE DISTRIBUTION TEST DATA

2/20/2007

Client: Accutest Laboratories
Project: Accutest - Honeywell - Dundalk
Project Number: 06L017A
Location: J50706X
Depth: 79' - 81'
Sample Number: 12X
Material Description: Grey Silty CLAY
Date: 2/8/07
PL: 37
LL: 74
PI: 37
USCS Classification: MH
AASHTO Classification: A-7-5(46)
Tested by: CK
Checked by: RT
Sieve opening list: FPA Default

Sieve Test Data

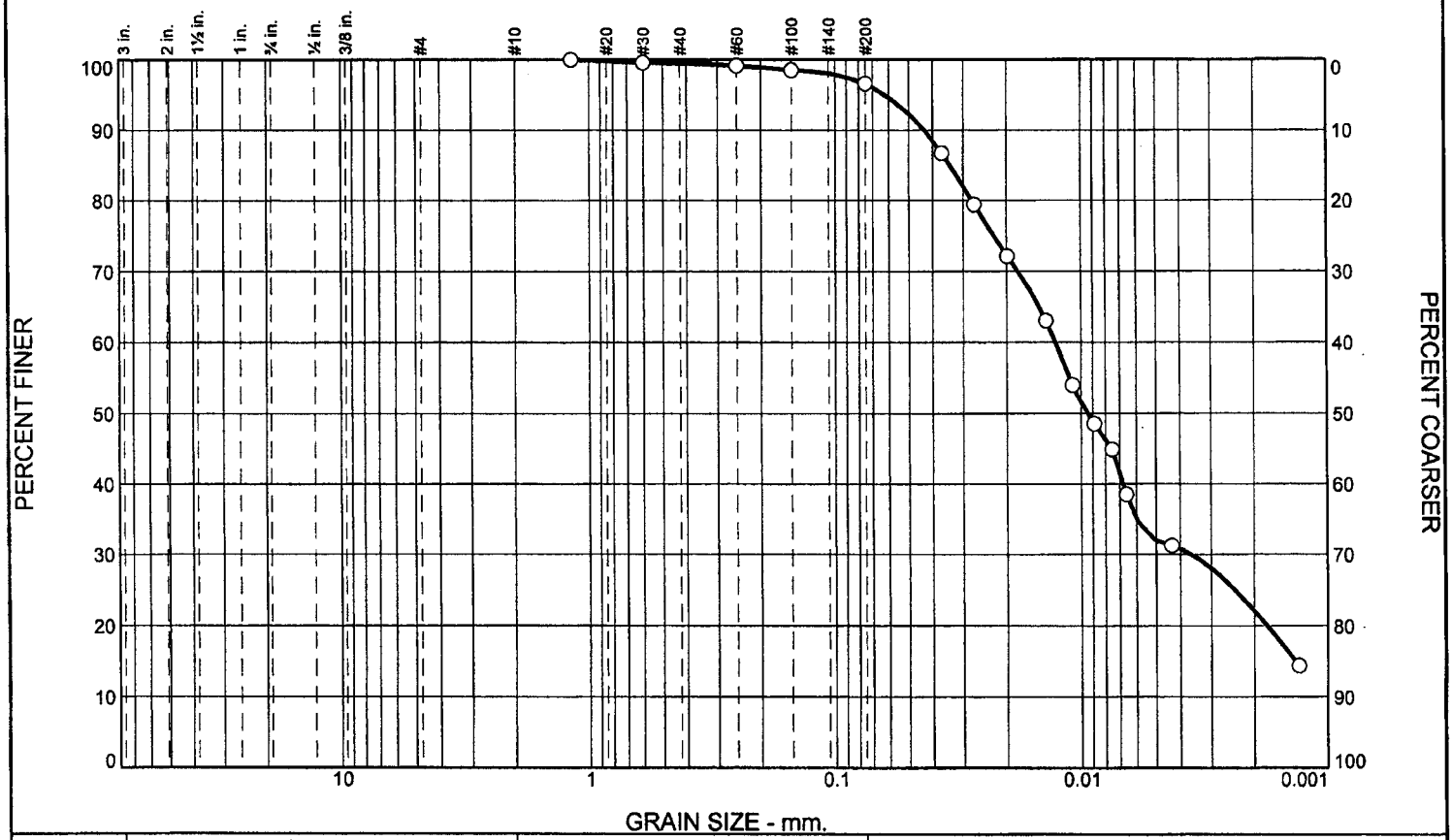
Dry Sample and Tare (grams)	Tare (grams)	Cumulative Pan Tare Weight (grams)	Sieve Opening Size	Cumulative Weight Retained (grams)	Percent Finer
55.00	0.00	0.00	#16	0.00	100.0
			#30	0.11	99.8
			#60	0.50	99.1
			#100	0.69	98.7
			#200	0.88	98.4

Hydrometer Test Data

Hydrometer test uses material passing #4
Percent passing #4 based upon complete sample = 100.0
Weight of hydrometer sample =55
Automatic temperature correction
Composite correction (fluid density and meniscus height) at 20 deg. C = -6
Meniscus correction only = 1.0
Specific gravity of solids = 2.65
Hydrometer type = 152H
Hydrometer effective depth equation: L = 16.294964 - 0.164 **x Rm**

Elapsed Time (min.)	Temp. (deg. C.)	Actual Reading	Corrected Reading	K	Rm	Eff. Depth	Diameter (mm.)	Percent Finer
1.00	21.0	58.5	52.7	0.0135	59.5	6.5	0.0345	95.8
2.00	21.0	56.0	50.2	0.0135	57.0	6.9	0.0251	91.2
4.00	21.0	54.5	48.7	0.0135	55.5	7.2	0.0181	88.5
9.00	21.0	51.5	45.7	0.0135	52.5	7.7	0.0125	83.0
16.00	21.0	47.5	41.7	0.0135	48.5	8.3	0.0097	75.8
25.00	21.0	43.5	37.7	0.0135	44.5	9.0	0.0081	68.5
36.00	21.0	40.5	34.7	0.0135	41.5	9.5	0.0069	63.0
49.00	21.0	38.0	32.2	0.0135	39.0	9.9	0.0061	58.5
120.00	21.0	31.5	25.7	0.0135	32.5	11.0	0.0041	46.7
1440.00	22.0	19.5	13.9	0.0133	20.5	12.9	0.0013	25.3

Particle Size Distribution Report



% +3"	% Gravel			% Sand			% Fines
	Coarse	Medium	Fine	Coarse	Medium	Fine	
0.0	0.0	0.0	0.0	0.4	0.5	2.5	96.6

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
#16	100.0		
#30	99.6		
#60	99.1		
#100	98.5		
#200	96.6		

* (no specification provided)

Material Description

Grey Silty CLAY, trace f Sand

Atterberg Limits

PL= 46 LL= 83 PI= 37

Coefficients

D_{85}= 0.0339 D_{60}= 0.0127 D_{50}= 0.0095
D_{30}= 0.0036 D_{15}= 0.0014 D_{10}=
C_u= C_c=

Classification

USCS= MH AASHTO= A-7-5(48)

Remarks

Sample Number: 13X
Source of Sample: J50706X **Depth:** 59' - 62' **Date:** 2/8/07

FRENCH & PARRELLO ASSOCIATES, P.A.
CONSULTING ENGINEERS
Wall, NJ

Client: Accutest Laboratories
Project: Accutest - Honeywell - Dundalk
Project No: 06L017A **Figure**

Tested By: CK **Checked By:** RT

GRAIN SIZE DISTRIBUTION TEST DATA

2/20/2007

Client: Accutest Laboratories
Project: Accutest - Honeywell - Dundalk
Project Number: 06L017A
Location: J50706X
Depth: 59' - 62' **Sample Number:** 13X
Material Description: Grey Silty CLAY, trace f Sand
Date: 2/8/07 **PL:** 46 **LL:** 83 **PI:** 37
USCS Classification: MH **AASHTO Classification:** A-7-5(48)
Tested by: CK **Checked by:** RT
Sieve opening list: FPA Default

Sieve Test Data

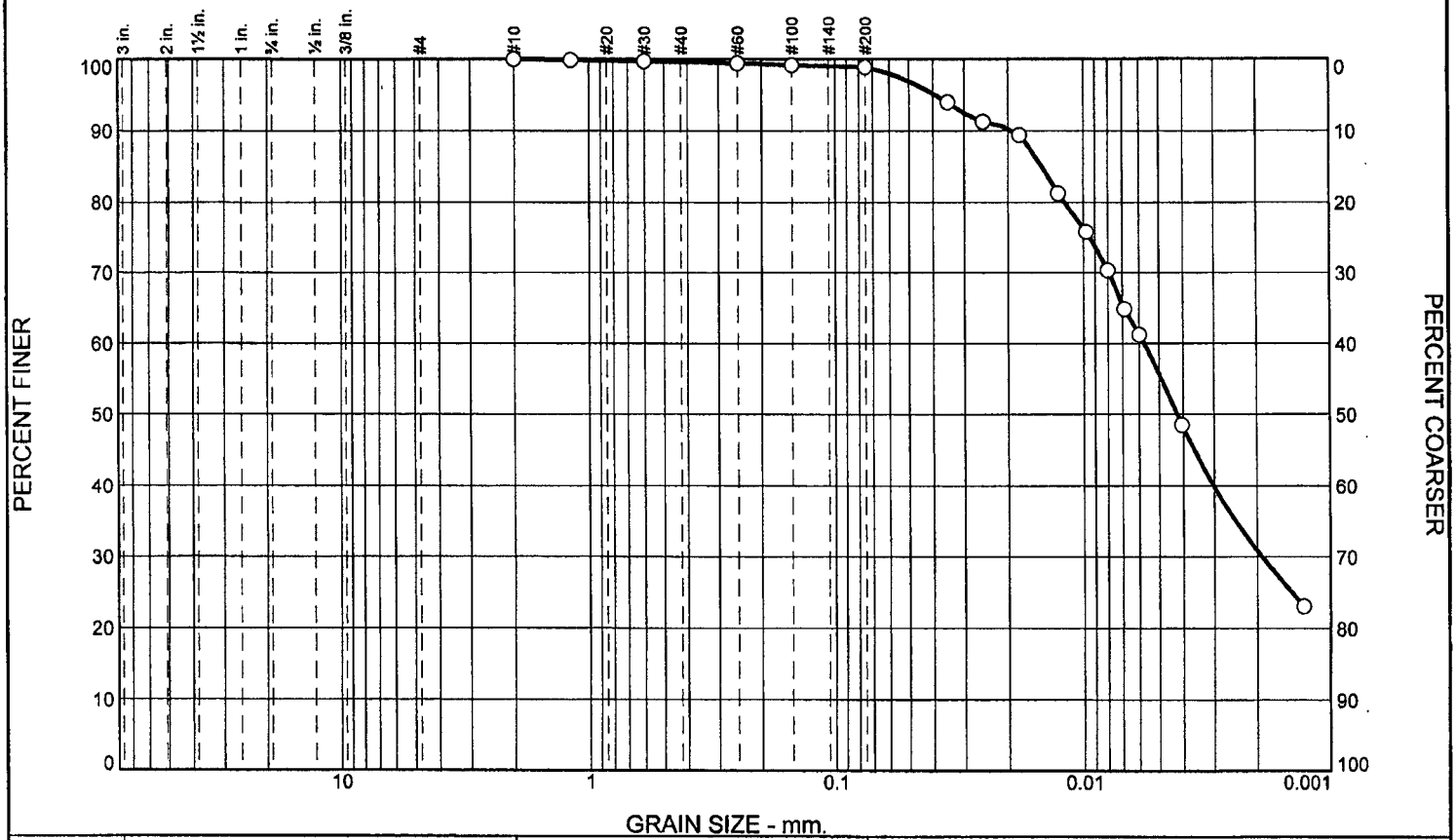
Dry Sample and Tare (grams)	Tare (grams)	Cumulative Pan Tare Weight (grams)	Sieve Opening Size	Cumulative Weight Retained (grams)	Percent Finer
55.00	0.00	0.00	#16	0.00	100.0
			#30	0.23	99.6
			#60	0.47	99.1
			#100	0.82	98.5
			#200	1.87	96.6

Hydrometer Test Data

Hydrometer test uses material passing #4
Percent passing #4 based upon complete sample = 100.0
Weight of hydrometer sample =55.00
Automatic temperature correction
Composite correction (fluid density and meniscus height) at 20 deg. C = -6
Meniscus correction only = 1.0
Specific gravity of solids = 2.65
Hydrometer type = 152H
Hydrometer effective depth equation: L = 16.294964 - 0.164 **x Rm**

Elapsed Time (min.)	Temp. (deg. C.)	Actual Reading	Corrected Reading	K	Rm	Eff. Depth	Diameter (mm.)	Percent Finer
1.00	21.0	53.5	47.7	0.0135	54.5	7.4	0.0366	86.7
2.00	21.0	49.5	43.7	0.0135	50.5	8.0	0.0270	79.4
4.00	21.0	45.5	39.7	0.0135	46.5	8.7	0.0198	72.1
9.00	21.0	40.5	34.7	0.0135	41.5	9.5	0.0138	63.0
16.00	21.0	35.5	29.7	0.0135	36.5	10.3	0.0108	54.0
25.00	21.0	32.5	26.7	0.0135	33.5	10.8	0.0089	48.5
36.00	21.0	30.5	24.7	0.0135	31.5	11.1	0.0075	44.9
49.00	21.0	27.0	21.2	0.0135	28.0	11.7	0.0066	38.5
120.00	21.0	23.0	17.2	0.0135	24.0	12.4	0.0043	31.2
1440.00	22.0	13.5	7.9	0.0133	14.5	13.9	0.0013	14.4

Particle Size Distribution Report



% +3"	% Gravel			% Sand			% Fines
	Coarse	Medium	Fine	Coarse	Medium	Fine	
0.0	0.0	0.0	0.0	0.3	0.3	0.5	98.9

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
#10	100.0		
#16	99.9		
#30	99.7		
#60	99.4		
#100	99.1		
#200	98.9		

* (no specification provided)

Material Description

Grey CLAY

Atterberg Limits

PL= 42 LL= 92 PI= 50

Coefficients

D_{85}= 0.0146 D_{60}= 0.0057 D_{50}= 0.0042
D_{30}= 0.0019 D_{15}= D_{10}=
C_u= C_c=

Classification

USCS= MH AASHTO= A-7-5(63)

Remarks

Sample Number: 14X
Source of Sample: J50706X **Depth:** 49' - 52' **Date:** 2/15/07

FRENCH & PARRELLO ASSOCIATES, P.A.
CONSULTING ENGINEERS
Wall, NJ

Client: Accutest Laboratories
Project: Accutest - Honeywell - Dundalk
Project No: 06L017A **Figure**

Tested By: RH **Checked By:** RT

GRAIN SIZE DISTRIBUTION TEST DATA

2/20/2007

Client: Accutest Laboratories
Project: Accutest - Honeywell - Dundalk
Project Number: 06L017A
Location: J50706X
Depth: 49' - 52'
Sample Number: 14X
Material Description: Grey CLAY
Date: 2/15/07 **PL:** 42 **LL:** 92 **PI:** 50
USCS Classification: MH
AASHTO Classification: A-7-5(63)
Tested by: RH
Checked by: RT
Sieve opening list: FPA Default

Sieve test data

Dry Sample and Tare (grams)	Tare (grams)	Cumulative Pan Tare Weight (grams)	Sieve Opening Size	Cumulative Weight Retained (grams)	Percent Finer
55.00	0.00	0.00	#10	0.00	100.0
			#16	0.07	99.9
			#30	0.18	99.7
			#60	0.33	99.4
			#100	0.48	99.1
			#200	0.62	98.9

Hydrometer test data

Hydrometer test uses material passing #4
Percent passing #4 based upon complete sample = 100.0
Weight of hydrometer sample =55.00
Automatic temperature correction
Composite correction (fluid density and meniscus height) at 20 deg. C = -6
Meniscus correction only = 1.0
Specific gravity of solids = 2.65
Hydrometer type = 152H
Hydrometer effective depth equation: L = 16.294964 - 0.164 x **Rm**

Elapsed Time (min.)	Temp. (deg. C.)	Actual Reading	Corrected Reading	K	Rm	Eff. Depth	Diameter (mm.)	Percent Finer
1.00	21.0	57.5	51.7	0.0135	58.5	6.7	0.0349	94.0
2.00	21.0	56.0	50.2	0.0135	57.0	6.9	0.0251	91.2
4.00	21.0	55.0	49.2	0.0135	56.0	7.1	0.0180	89.4
9.00	21.0	50.5	44.7	0.0135	51.5	7.8	0.0126	81.2
16.00	21.0	47.5	41.7	0.0135	48.5	8.3	0.0097	75.8
25.00	21.0	44.5	38.7	0.0135	45.5	8.8	0.0080	70.3
36.00	21.0	41.5	35.7	0.0135	42.5	9.3	0.0069	64.9
49.00	21.0	39.5	33.7	0.0135	40.5	9.7	0.0060	61.2
120.00	21.0	32.5	26.7	0.0135	33.5	10.8	0.0040	48.5
1440.00	21.0	18.5	12.7	0.0135	19.5	13.1	0.0013	23.0

ATTERBERG LIMITS

SOIL SAMPLE Dk Gray clay

LOCATION

BORING No. DEPTH 79-81

SAMPLE No. 12x

SPECIFIC GRAVITY

PROJECT Accutest J 50706X

FILE No. 06L017A

TEST No.

DATE 2-8-07

TESTED BY RH

CHECKED BY

PLASTIC LIMIT

DETERMINATION No.	1	2	3
CONTAINER No.	CH-5	A-7	
WT. CONTAINER & WET SOIL IN g	12.10	12.14	
WT CONTAINER & DRY SOIL IN g	15.48	15.49	
WT. WATER IN g			
WT. CONTAINER IN g	11.06	11.00	
WT. DRY SOIL IN g			
WATER CONTENT IN %	36.65	36.75	

NATURAL WATER CONTENT

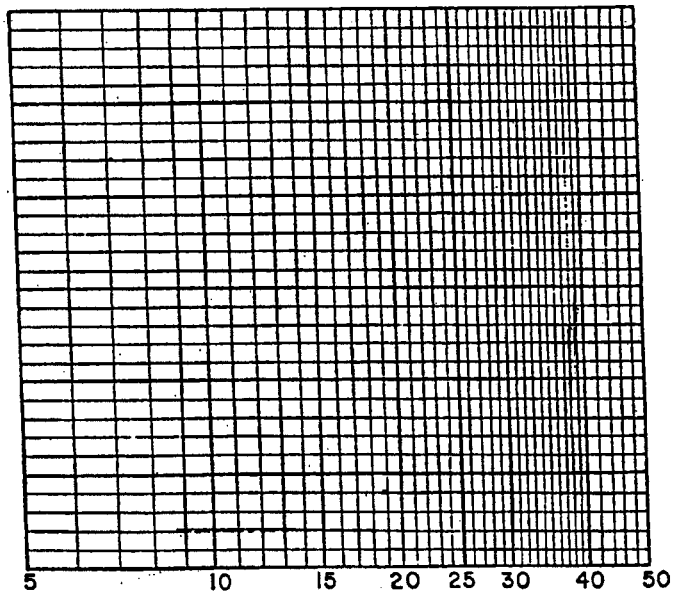
1	2	3
CC-10		
49.07		
36.55		
10.95		
48.91		

LIQUID LIMIT

DETERMINATION No.						
No. OF BLOWS	16					
CONTAINER No.	A502					
WT. CONTAINER & WET SOIL IN g	27.18					
WT. CONTAINER & DRY SOIL IN g	20.13					
WT. WATER IN g						
WT. CONTAINER IN g	11.07					
WT. DRY SOIL IN g						
WATER CONTENT IN %	77.81					

74@25

FLOW CURVE



RESULTS SUMMARY

NATURAL WATER CONTENT, w,

LIQUID LIMIT, wℓ, 74

PLASTIC LIMIT, wp, 37

PLASTICITY INDEX 37

FLOW INDEX

WATER–PLASTICITY RATIO $\frac{w-wp}{wℓ-wp}$

REMARKS

Silty Clay

ATTERBERG LIMITS

SOIL SAMPLE Dark Gray

LOCATION

BORING No. DEPTH

SAMPLE No. 13X

SPECIFIC GRAVITY

PROJECT Accutest

FILE No. 061012A J

TEST No.

DATE 2-21

TESTED BY

CHECKED BY

PLASTIC LIMIT

DETERMINATION No.	1	2	3
CONTAINER No.	A-502	CH-5	
WT. CONTAINER & WET SOIL IN g	17.65	18.07	
WT CONTAINER & DRY SOIL IN g	15.60	15.86	
WT. WATER IN g			
WT. CONTAINER IN g	11.09	11.06	
WT. DRY SOIL IN g			
WATER CONTENT IN %	45.45	46.04	

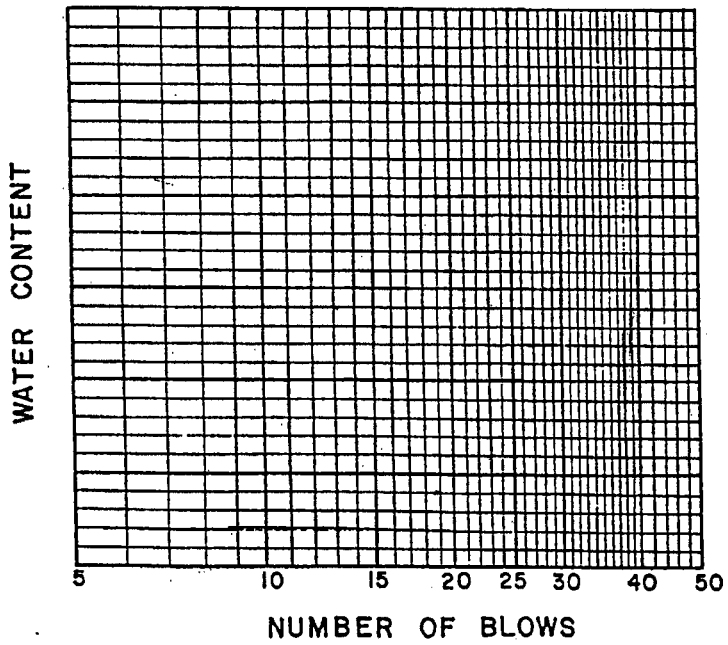
NATURAL WATER CONTENT

1	2	3
CC13		
32.38		
24.84		
11.24		
55.44		

LIQUID LIMIT

DETERMINATION No.						
No. OF BLOWS	25					
CONTAINER No.	A-7					
WT. CONTAINER & WET SOIL IN g	26.78					
WT. CONTAINER & DRY SOIL IN g	19.61					
WT. WATER IN g						
WT. CONTAINER IN g	10.96					
WT. DRY SOIL IN g						
WATER CONTENT IN %	82.89					

FLOW CURVE



RESULTS SUMMARY

NATURAL WATER CONTENT, w, —

LIQUID LIMIT, w_ℓ, 83

PLASTIC LIMIT, w_p, 46

PLASTICITY INDEX 37

FLOW INDEX

WATER–PLASTICITY RATIO $\frac{w-w_p}{w_\ell-w_p}$

REMARKS

ATTERBERG LIMITS

SOIL SAMPLE pk Gray

LOCATION

BORING No. DEPTH 49-52

SAMPLE No. 14X

SPECIFIC GRAVITY

PROJECT Acutest J50706X

FILE No. 06L017A

TEST No.

DATE 2-15-07

TESTED BY

CHECKED BY

PLASTIC LIMIT

DETERMINATION No.	1	2	3
CONTAINER No.	CC-10	CC-13	
WT. CONTAINER & WET SOIL IN g	16.95	17.64	
WT. CONTAINER & DRY SOIL IN g	15.17	15.77	
WT. WATER IN g			
WT. CONTAINER IN g	10.95	11.25	
WT. DRY SOIL IN g			
WATER CONTENT IN %	42.18	41.37	

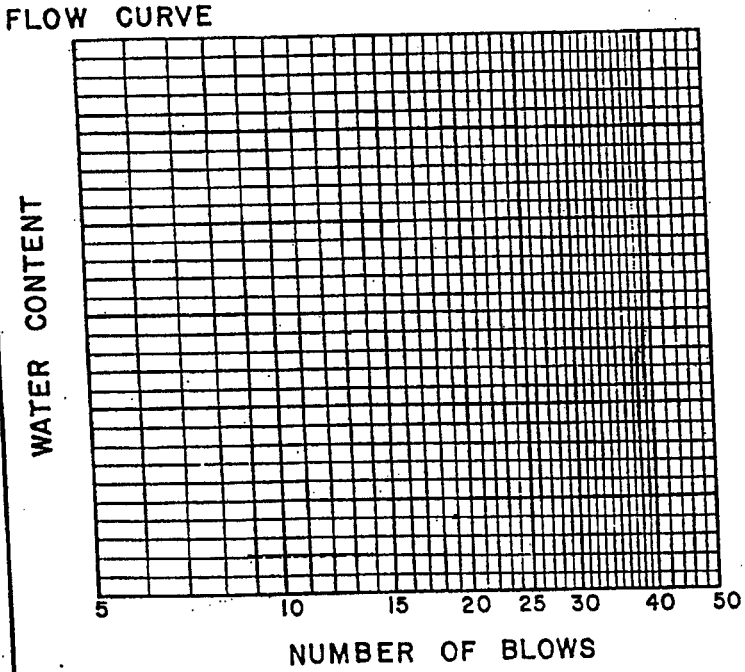
NATURAL WATER CONTENT

1	2	3
A-512		
37.23		
26.86		
10.83		
64.69		

LIQUID LIMIT

DETERMINATION No.						
No. OF BLOWS	30					
CONTAINER No.	A-507					
WT. CONTAINER & WET SOIL IN g	25.71					
WT. CONTAINER & DRY SOIL IN g	18.53					
WT. WATER IN g						
WT. CONTAINER IN g	10.58					
WT. DRY SOIL IN g						
WATER CONTENT IN %	90.31 92.25					

FLOW CURVE



RESULTS SUMMARY

NATURAL WATER CONTENT, w, -

LIQUID LIMIT, w_ℓ, 92

PLASTIC LIMIT, w_p, 42

PLASTICITY INDEX 50

FLOW INDEX

WATER–PLASTICITY RATIO $\frac{w-w_p}{w_\ell-w_p}$

REMARKS

Clay

FRENCH & PARRELLO
ASSOCIATES, P.A., CONSULTING ENGINEERS

Particle-Size Analysis of Soil
ASTM D 422

Soil Sample	Water Content	Project: Accutest - J50706X
Description: Grey CLAY	Container # A-5	Project # 061017A
	Wt. Container: 8.87	Date: 2/8/07
Location:	Wt. Cont. & Wet Soil: 211.77	Tested By: CK
Boring #	Wt. Cont. & Dry Soil: 147.82	Checked By: RT
Sample # 12x	Wt. Water:	Dry Sieve
Depth:	Wt. Dry Soil:	Wash Sieve
Specific Gravity:	Water Content in % 46.02	Combined X

Soil Sample	Hydrometer Data	
Wt. Cont. & Wet Soil:	Excess A-5	Correction: 6 Specif. Grav.
Wt. Cont.	Wt. Cont. & Wet Soil:	Deflocculant Agent: 5 Hex
Wt. Wet Soil:	Wt. Cont.	Beaker # Temp.
Wt. Dry Soil:	Wt. Dry Soil: 55.00	Hydrometer # 3

Total Sample			Hydrometer Data				
U.S. Standard Sieve No.	Cumulative Wt. of Soil Retained	Total Sample % Finer by Wt.	Date/Time	Elapsed Time in Minutes	Hydrometer Reading	Particle Diameter	Percent Finer
			12:07 70°	0.5	–		
3"			21	1.0	58.5		
2 1/2"				1.5	57		
2"				2.0	56		
1 1/2"				4.0	54.5		
1				9.0	51.5		
3/4"				16.0	47.5		
3/8"				25.0	43.5		
#4				36.0	40.5		
Total Sample Dry Wt.				49.0	38		
			% Coarse Gravel 70°	120.0	31.5		
Split Sample			22 71°	1440	19.5		
U.S. Standard Sieve No.	Cumulative Wt. of Soil Retained	Total Sample % Finer by Wt.	% Medium Gravel				
#10	0		% Fine Gravel				
#16	0						
#30	0.11		% Coarse Sand	Total Gravel %			
#60	0.50		.2	0			
#100	0.69		% Medium Sand	Total Sand %			
#200	0.88		.7	1.6			
Pan			% Fine Sand	Total Silt/Clay %			
			0.7	98.4			

FRENCH & PARRELLO
ASSOCIATES, P.A., CONSULTING ENGINEERS

Particle-Size Analysis of Soil
ASTM D 422

Soil Sample	Water Content	Project: Accutest. J50706 X
Description: Grey Silty Clay	Container # A-12	Project # 061017A
	Wt. Container: 8.83	Date: 2/8/07
Location:	Wt. Cont. & Wet Soil: 168.25	Tested By: CK
Boring #	Wt. Cont. & Dry Soil: 112.21	Checked By: RT
Sample # 13 X	Wt. Water:	Dry Sieve
Depth:	Wt. Dry Soil:	Wash Sieve
Specific Gravity:	Water Content in % 54.21	Combined X

Soil Sample	Hydrometer Data	
Wt. Cont. & Wet Soil:	Excess A12	Correction: 6 Specif. Grav.
Wt. Cont.	Wt. Cont. & Wet Soil:	Defloculant Agent: SHX
Wt. Wet Soil:	Wt. Cont.	Beaker # Temp.
Wt. Dry Soil:	Wt. Dry Soil: 55 g	Hydrometer # 1

Total Sample

U.S. Standard Sieve No.	Cumulative Wt. of Soil Retained	Total Sample % Finer by Wt.
3"		
2 1/2"		
2"		
1 1/2"		
1		
3/4"		
3/8"		
#4		
Total Sample Dry Wt.		

Split Sample

U.S. Standard Sieve No.	Cumulative Wt. of Soil Retained	Total Sample % Finer by Wt.
#10	0	
#16	0	
#30	.23	
#60	.47	
#100	.82	
#200	1.87	
Pan		

Hydrometer Data

Date/Time	Elapsed Time in Minutes	Hydrometer Reading	Particle Diameter	Percent Finer
11:57 20°	0.5	—		
	1.0	53.5		
	1.5	51.5		
	2.0	49.5		
	4.0	45.5		
	9.0	40.5		
	16.0	35.5		
	25.0	32.5		
	36.0	30.5		
	49.0	27		
% Coarse Gravel 70°	120.0	23		
71°	1440	13.5		
% Medium Gravel				
% Fine Gravel				

% Coarse Sand	Total Gravel %
.4	0
% Medium Sand	Total Sand %
.5	3.4
% Fine Sand	Total Silt/Clay %
2.5	96.6

FRENCH & PARRELLO
ASSOCIATES, P.A., CONSULTING ENGINEERS

Particle-Size Analysis of Soil
ASTM D 422

Soil Sample	Water Content	Project: Accutest
Description: Gray Silt	Container # M-4	Project # 060174
	Wt. Container: 8.99	Date: 2/15/07
Location:	Wt. Cont. & Wet Soil: 236.06	Tested By: RT
Boring # J 50706X	Wt. Cont. & Dry Soil: 145.11	Checked By: RH
Sample # -14X	Wt. Water:	Dry Sieve
Depth:	Wt. Dry Soil:	Wash Sieve
Specific Gravity:	Water Content in % 66.82	Combined X

Soil Sample	Hydrometer Data	
Wt. Cont. & Wet Soil:	Excess M-4	Correction: 6.5 Specif. Grav.
Wt. Cont.	Wt. Cont. & Wet Soil:	Deflocculant Agent:
Wt. Wet Soil:	Wt. Cont.	Beaker # Temp.
Wt. Dry Soil:	Wt. Dry Soil: 55.00	Hydrometer # 1

Total Sample

U.S. Standard Sieve No.	Cumulative Wt. of Soil Retained	Total Sample % Finer by Wt.
3"		
2 1/2"		
2"		
1 1/2"		
1		
3/4"		
3/8"		
#4		
Total Sample Dry Wt.		

Split Sample

U.S. Standard Sieve No.	Cumulative Wt. of Soil Retained	Total Sample % Finer by Wt.
#10	0	
#16	.07	
#30	.18	
#60	.33	
#100	.48	
#200	.62	
Pan		

Hydrometer Data

Date/Time 2/16/07	Elapsed Time in Minutes	Hydrometer Reading	Particle Diameter	Percent Finer
12:05 69°	0.5	-		
21	1.0	52.5		
	1.5	56.5		
	2.0	56		
	4.0	55		
	9.0	50.5		
	16.0	47.5		
	25.0	44.5		
	36.0	41.5		
	49.0	39.5		
% Coarse Gravel	69° 120.0	32.5		
	1440	18.5		
% Medium Gravel				
% Fine Gravel				
% Coarse Sand	Total Gravel %			
.3	0			
% Medium Sand	Total Sand %			
.3	1.1			
% Fine Sand	Total Silt/Clay %			
.5	98.9			

PROJECT: Accutest J50706X JOB No. 06L017A DATE: 2/8/07

SAMPLE DESIGNATION 12X LOCATION 79-81' UNIT No. PC-7

	Before In.	Before Cm.	After In.	After Cm.
Sample Dia.	2.8585	7.2606	2.8213	7.2931
Sample Length	1.5128	3.8425	1.5324	3.8923
Volume		159.20		162.6000
Weight	280.17 WET / 190.64 DRY			187.693
Unit Weight	74.72			72.03
Area		41.4032		41.7748

Water Content

	Before	After
Tare No.		R-1
Wet wt. Sample & Tare		337.54
Dry wt. Sample & Tare		243.62
Wt. of Water		
Wt. of Tare		52.98
Wt. of Dry Soil		190.64
Water Content %	46.96	49.27

STAGE-BACK PRESSURE INFORMATION

Date	Time	CHAMBER σ_c	CHAMBER Buret.	PEDESTAL σ_{B1}	PEDESTAL Buret.	TOP CAP σ_{B2}	TOP CAP Buret	Remarks
2/8/07	4:30pm	0	0.0	0	5.0	0	7.0	
2-9	10:15	17	4.4	15	5.5	15	8.7	
	11:45AM	32	6.6	30	6.0	30	9.3	
	12:45pm	62	11.0	60	6.1	60	9.8	
	2:30pm	92	14.8	90	6.3	90	10.2	

Response Check: σ_c = u_B = $\Delta\sigma_c$ =

t	u_b	%	t	u_b	%

K 5.6 x 10^-8

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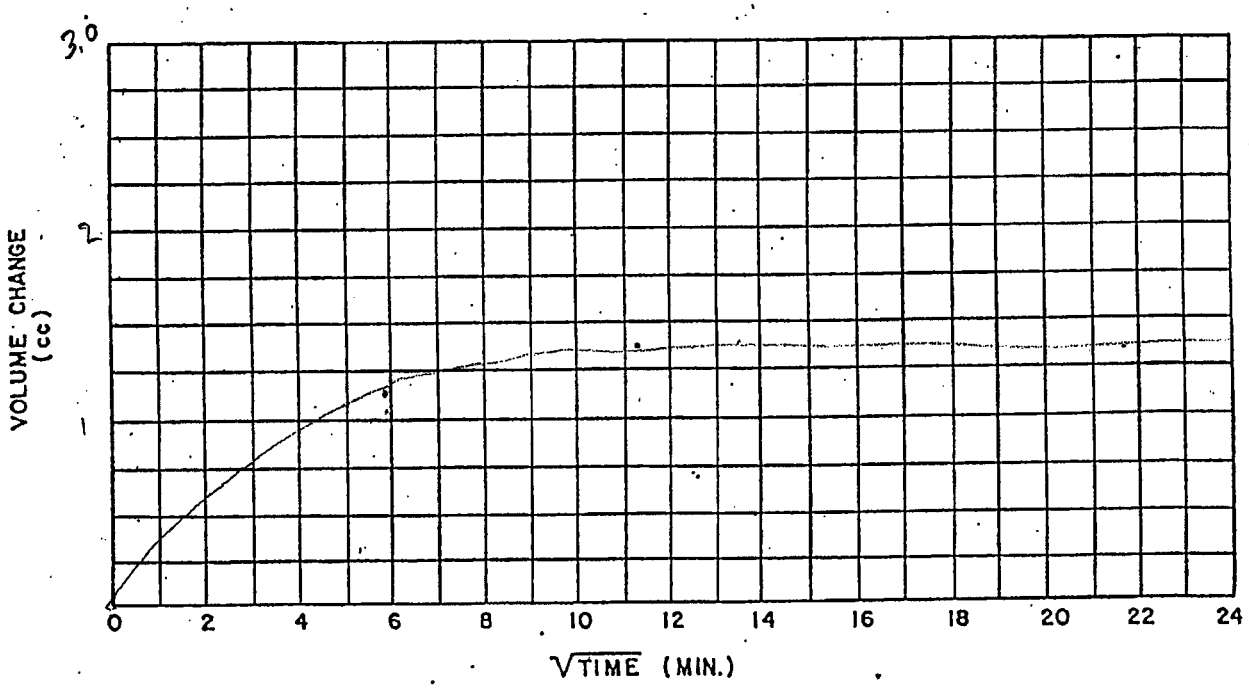
PC-7

CONSOLIDATION TEST:

SAMPLE DESIGNATION 12X JOB NO. 061017A DATE: 2/9/07

σ_{Co} 92 → σ_I 94 σ_{Bo} 90 σ_B 90 $\bar{\sigma}$ 4

DATE	TIME	ELAPSED TIME	CHAMBER BURET	PEDESTAL BURET	TOP CAP BURET	VOLUME CHANGE	REMARKS
2/9/07	2:40pm	0	0.0	10.0	12.0	0	
		35min	1.3	9.5	11.4	1.1	
		126min	1.6	9.3 ?	11.3 ?	1.4	
		180min	1.8	9.3 ?	11.3 ?	1.4	
2-10		1300	2.4	9.3	11.3	1.4	



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SAMPLE DESIGNATION: 12X TEST UNIT PC-7

Chamber Pressure 94.0 TEMP. 20

	DATE:	TIME:	ELAPSED TIME:	HEAD PRESSURE	HEAD BURET	TAIL PRESSURE	TAIL BURET	ΔV (cc)
	2-10	12:26	0	90	0.0	90	25.0	0
9×10^{-8}	2-11		1440		1.3	22.4	23.7	
	2-11	12:28	0	90	0.0	90	25.0	0
5.4×10^{-8}	2-12		1255		1.0	22.9	23.9	
	2-12	9:26	0	90	0.0	90	25.0	0
8×10^{-8}	2-12		435		.4	24.2	24.6	
	2-12	16:53	0	90	0.0	90	25.0	0
$.4\times10^{-8}$	2-13		1069		0.9	23.2	24.1	
	$K=5.6\times10^{-8}$							

PROJECT: Accutest -J50706X JOB No. 06L017A DATE: 2/8/07

SAMPLE DESIGNATION: 13X LOCATION 59-62' UNIT No. PC-8

	Before In.	Before Cm.	After In.	After Cm.
Sample Dia.	2.8715	7.2936	2.8953	7.3541
Sample Length	1.4675	3.7275	1.4723	3.7396
Volume	155.7372		158.8436	
Weight	260.82 WET / 168.0325 DRY		164.597	
Unit Weight	67.33		64.66	
Area	41.7806		42.4761	

Water Content

	Before	After
Tare No.		X1
Wet wt. Sample & Tare		318.98
Dry wt. Sample & Tare		220.75
Wt. of Water		
Wt. of Tare		52.72
Wt. of Dry Soil		168.03
Water Content %	55.22	58.4%

STAGE-BACK PRESSURE INFORMATION

Date	Time	CHAMBER σ_c	CHAMBER Buret.	PEDESTAL σ_{B1}	PEDESTAL Buret.	TOP CAP σ_{B2}	TOP CAP Buret	Remarks
2/8/07	6:30pm	0.0	0	0	5.0	0	7.0	
2-9	10:15	17	3.2	15	7.0	15	10.3	
	11:45AM	32	11.3 Shared	30	7.5	30	10.7	
	12:45pm	62	13.2 Shared	60	7.5	60	10.9	
	2:30pm	92	14.5 Shared	90	8.6	90	11.7	

Response Check: σ_c = u_B = $\Delta\sigma_c$ =

t	u_b	%	t	u_b	%

$K = 9.7 \times 10^{-8}$

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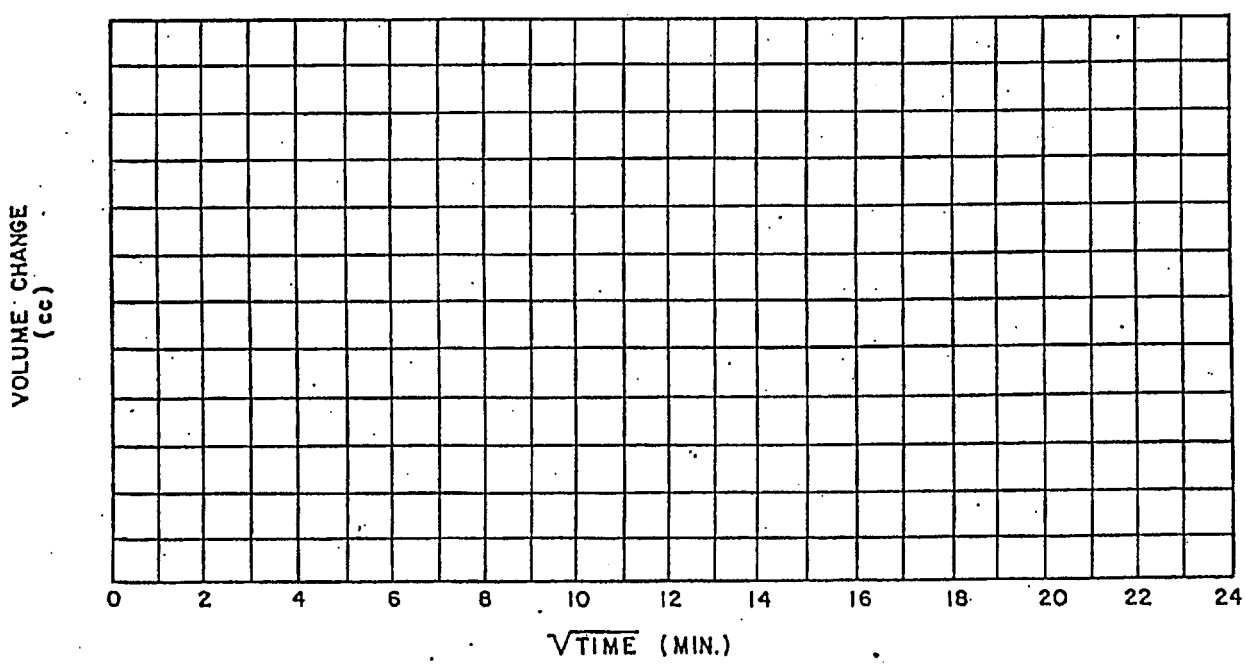
PC-8

CONSOLIDATION TEST:

SAMPLE DESIGNATION 13X JOB NO. 066017A DATE: 2/9/07

σ_{Co} 90 → σ_I 94 σ_{Bo} 90 σ_B 90 $\bar{\sigma}$ 4

DATE	TIME	ELAPSED TIME	CHAMBER BURET	PEDESTAL BURET	TOP CAP BURET	VOLUME CHANGE	REMARKS
2/9/07	2:40pm	0	0.0	10.0	12.0	0	
		0:35	0.6	9.5 5	11.4 6	1.1	
		126 min	0.6	9.4 5	11.4 6	1.1	
		180	0.6	9.5 5	11.4 6	1.1	
2-10		1300	0.8	9.6 6	11.4 6	1.2	



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SAMPLE DESIGNATION: 13X TEST UNIT P.C.-8

Chamber Pressure 94 TEMP. 20

	DATE:	TIME:	ELAPSED TIME:	HEAD PRESSURE	HEAD BURET	TAIL PRESSURE	TAIL BURET	ΔV (cc)
	2-10	12:26	0	90	0.0	90	25.0	0
$.5\times10^{-7}$ 1.9×10^{-8}	2-11		1440		2.2	20.6	22.8	
	2-11	12:28	0	90	0.0	90	25.0	0
$.8\times10^{-8}$ 1.6	2-12		1255		1.9	21.3	23.1	
	2-12	9:26	0	90	0.0	90	25.0	0
$.8\times10^{-8}$ 1.7	2-12		435		.7	23.6	24.3	
	2-12	16:53	0	90	0.0	90	25.0	0
5×10^{-8} 1.9			1069		1.6	21.8	23.4	
	K= 9.8×10^{-8}							
	9.7×10^{-8}							

PROJECT: Accutest J50706X 14X 49-52 JOB No. 66L012A DATE: 2-15-07

SAMPLE DESIGNATION 14X LOCATION UNIT No. PC-7

	Before In.	Before Cm.	After In.	After Cm.
Sample Dia.	2.87	7.2898	2.8748	7.3020
Sample Length	1.506	3.8252	1.4971	3.8027
Volume	159.6524			
Weight	257.9 WET / 157.8432 DRY			
Unit Weight	61.69			
Area	41.7370		41.8767	

Water Content	Before	After
Tare No.		R-16
Wet wt. Sample & Tare		312.47
Dry wt. Sample & Tare		208.88
Wt. of Water		
Wt. of Tare		51.04
Wt. of Dry Soil		157.84
Water Content %	63.39	65.63

STAGE-BACK PRESSURE INFORMATION

Date	Time	CHAMBER σ_c	CHAMBER Buret.	PEDESTAL σ_{B1}	PEDESTAL Buret.	TOP CAP σ_{B2}	TOP CAP Buret	Remarks
2-15-07	12:03pm	0	0.0	0	5.0	0	7.0	
	1:07pm	17	0.2	15	6.6	15	10.0	
	2:30	32	0.6	30	7.1	30	10.9	
	15:20	62	1.4	60	7.3	60	11.3	
	16:39	92		90	7.5	90	11.5	

Response Check: σ_c = u_B = $\Delta\sigma_c$ =

t	u_b	%	t	u_b	%

$K = 9.7 \times 10^{-8}$

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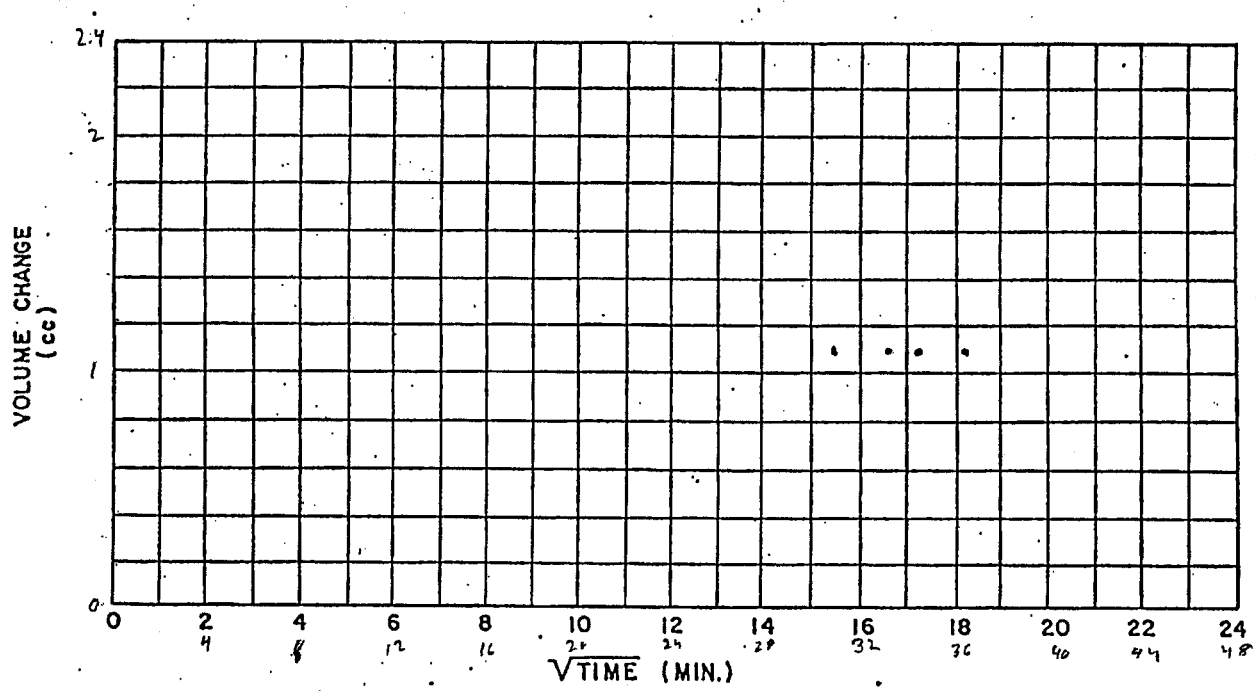
CONSOLIDATION TEST:

SAMPLE DESIGNATION J50706x 14x 49-52 JOB NO. 06L017A DATE: 2-15-07

σ_{Co} 92 → σ_I 94 σ_{Bo} 90 σ_B 90 $\bar{\sigma}$ 4

DATE	TIME	ELAPSED TIME	CHAMBER BURET	PEDESTAL BURET	TOP CAP BURET	VOLUME CHANGE	REMARKS
2-15	16:42	0	3.0	5.0	7.0	0	
2-16		1022	3.4	4.5 .5	6.4 .6	1.1	
2-16		1109	3.4	4.5 .5	6.4 .6	1.1	
2-16		1173	3.4	4.5 .5	6.4 .6	1.1	
2-16		1309	3.4	4.5 .5	6.4 .6	1.1	



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SAMPLE DESIGNATION: J50706X 14X TEST UNIT PC-5

Chamber Pressure 94 TEMP. 20

	DATE:	TIME:	ELAPSED TIME:	HEAD PRESSURE	HEAD BURET	TAIL PRESSURE	TAIL BURET	ΔV (cc)
	2-16	~~14:48~~	0	90	0.0	90	25.0	0
$\times 10^{-7}$	2-16		9		0.3	24.5	24.8	
	2-16	16:21	0	90	0.0	90	25.0	0
$\times 10^{-8}$ 1.8	2-17		1200		1.8	21.4	23.2	
	2-17	12:23	0	90	0.0	90	25.0	0
$\times 10^{-7}$	2-18		1433		2.1	20.7	22.8	
	2-18	12:18	0	90	0.0	90	25.0	0
$\times 10^{-8}$ 7.4	2-19		1360		2.0	21.1	23.1	
	2-19	11:01	0	90	0.0	90	25.0	0
$\times 10^{-8}$ 7.6	2-20		1342		2.0	21.1	23.1	
	$\cancel{7.8} \times 10^{-8}$							
	9.7×10^{-8}							