ATTACHMENT 5

Shaw®

CQA REPORT & CERTIFICATION
TEST LINER - TISKILWA TILL

CLINTON LANDFILL, INC.
CLINTON, ILLINOIS

IEPA Permit No. 2005-070-LF
IEPA Site No. 0390055036

Prepared For
Clinton Landfill, Inc.
4700 North Sterling Avenue
Peoria, Illinois 61615

Prepared By
SKS Engineers, Inc.
2900 North Martin Luther King Jr. Dr.
Decatur, Illinois 62526

SKS Project No. 610337
March 2007

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2 ENGINEERING CERTIFICATION

3 AS-BUILT DRAWING

4 FIELD TEST DATA

5 LABORATORY TEST DATA

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SECTION 1

INTRODUCTION

Illinois
Environmental
Protection Agency

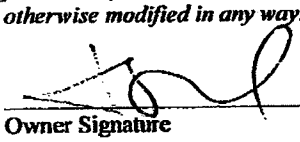
Bureau of Land
1021 North Grand Avenue East
Box 19276
Springfield, IL 62794-9276

Certification of Authenticity of Official Forms

This form must accompany any application submitted to the Illinois EPA Bureau of Land, Division of Land Pollution Control, Permit Section on forms other than the official copy printed and provided by the Illinois EPA. The only allowed changes to the form are in spacing, fonts, and the addition of the information provided. Any additions must be underlined. The forms would not be considered identical if there is any change to, addition or deletion of words on the form or to the language of the form.

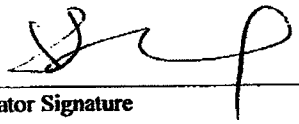
The same individuals that sign the application form it accompanies must sign the following certification.

I hereby certify under penalty of law that I have personally examined, and am familiar with the application form or forms and all included supplemental information submitted to the Illinois EPA herewith, and that the official Illinois Environmental Protection Agency application form or forms used herein is or are identical in all respects to the official form or forms provided by the Illinois EPA Bureau of Land Permit Section, and has not or have not been altered, amended, or otherwise modified in any way. I further certify under penalty of law that any attached or included electronic data version of the application form or forms complies with the official Illinois EPA's Electronic version thereof, and is or are identical in all respects to the official electronically downloadable form or forms provided by the Illinois EPA Bureau of Land Permit Section, and has not or have not been altered, amended or otherwise modified in any way.



Owner Signature — 3/20/07 (date)

Vice-President
Title



Operator Signature — 3/20/07 (date)

Vice-President
Title

Engineer Signature
(if necessary) — 3/23/07 (date)

Subscribed and Sworn to Before Me,
a Notary Public in and for the
above-mentioned County and State.

OFFICIAL SEAL
DARA L REEDER
NOTARY PUBLIC - STATE OF ILLINOIS
MY COMMISSION EXPIRES:03/24/09

Notary Public

My Commission Expires: 03-24-09 [Notary Seal]

jab\043432i.doc

Illinois
Environmental
Protection Agency

Bureau of Land
1021 North Grand Avenue East
Box 19276
Springfield, IL 62794-9276

GENERAL APPLICATION FOR PERMIT (LPC-PA1)

This form must be used for any application for permit, except for landscape waste composting or hazardous waste management facilities regulated in accordance with RCRA, Subtitle C from the Bureau of Land. One original and two (2) photocopies, or three (3) if applicable, of all permit application forms must be submitted. Attach the original and appropriate number of copies of any necessary plans, specifications, reports, etc. to fully support and describe the activities or modifications being proposed. Attach sufficient information to demonstrate compliance with all applicable regulatory requirements. Incomplete applications will be rejected. Please refer to the instructions for further guidance.

Note: Permit applications which are hand-delivered to the Bureau of Land, Permit Section must be delivered to 1021 North Grand Avenue East between the hours of 8:30 a.m. to 5:00 p.m., Monday through Friday (excluding State holidays).

Please type or print legibly.

I. SITE IDENTIFICATION

Name: Clinton Landfill No. 3 Site # (Illinois EPA): 0390055036

Physical Site Location (street, road, etc.): Route 51 South

City, Zip Code: Clinton, 61727 County: DeWitt

Existing DE/OP Permit Nos. (if applicable): Clinton 61727

II. OWNER/OPERATOR IDENTIFICATION

	OWNER	OPERATOR
Name:	Clinton Landfill , Inc.	Clinton Landfill, Inc.
Address:	P.O. Box 907	P.O. Box 9071
	Peoria, IL 61612-9071	Peoria, IL 61612-9071
Contact Name:	Ron L. Edwards	Ron L. Edwards
Phone #:	(309) 676-4893	(309) 676-4893

III. PERMIT APPLICATION IDENTIFICATION

TYPE SUBMISSION/REVIEW PERIOD:
- ☐ New Landfill/180 days (35 IAC Part 813)
- ☐ Landfill Expansion/180 days (35 IAC Part 813)
- ☒ Sign. Mod to Operate/90 days (35 IAC Part 813)
- ☐ Other Sign. Mod/90 days (35 IAC Part 813)
- ☐ Renewal of Landfill 90 days (35 IAC Part 813)
- ☐ Developmental/90 days (35 IAC Part 807)
- ☐ Operating/45 days (35 IAC Part 807)
- ☐ Supplemental/90 days (35 IAC Part 807)
- ☐ Permit Transfer/90 days (35 IAC Part 807)
- ☐ Renewal of Experimental Permit (35 IAC Part 807)

TYPE FACILITY:
- ☒ Landfill
- ☐ Land Treatment
- ☐ Transfer Station
- ☐ Treatment
- ☐ Storage
- ☐ Incinerator
- ☐ Composting
- ☐ Recycling/Reclamation
- ☐ Other (Specify)

TYPE WASTE:
- ☒ General Municipal Refuse
- ☐ Hazardous
- ☒ Special (Non-hazardous)
- ☐ Chemical Only (exc. putrescible)
- ☐ Inert Only (exc. chemical and putrescible)
- ☐ Used Oil
- ☐ Potentially Infectious Medical Waste
- ☐ Landscape Waste
- ☐ Other (Specify)

DESCRIPTION OF THIS PERMIT REQUEST: (Include a brief narrative description here.)

CQA Report and Engineering Certification for Test Liner

IV. COMPLETENESS REQUIREMENTS

The following items must be checked Yes, No or N/A. Each item will be reviewed by the log clerk. Blank items will result in rejection of the application. Please refer to the instructions for further guidance.

1.	Have all required public notice letters been mailed in accordance with the LPC-PA16 instructions? (If so, provide a list of those recipients of the required public notice letters for Illinois EPA retention.) Such retention shall not imply any Illinois EPA review and/or confirmation of the list.)	☒ Yes	☐ No	☐ N/A
2. a.	Is the Siting Certification Form (LPC-PA8) completed and enclosed?	☐ Yes	☐ No	☒ N/A
b.	Is siting approval currently under litigation?	☐ Yes	☒ No	☐ N/A
3. a.	Is a closure, and if necessary a post closure, plan covering these activities being submitted, or	☐ Yes	☐ No	☒ N/A
b.	has one already been approved? (Provide permit number _____.)	☐ Yes	☐ No	☒ N/A
4. a.	For waste disposal sites only: Has any employee, owner, operator, officer or director of the owner or operator had a prior conduct certification denied, canceled or revoked?	☐ Yes	☒ No	☐ N/A
b.	Have you included a demonstration of how you comply or intend to comply with 35 Ill. Adm. Code Part 745?	☐ Yes	☐ No	☒ N/A
5. a.	Is land ownership held in beneficial trust?	☐ Yes	☒ No	☐ N/A
b.	If yes, is a beneficial trust certification form (LPC-PA9) completed and enclosed?	☐ Yes	☐ No	☒ N/A
6. a.	Does the application contain information or proposals regarding the hydrogeology; groundwater monitoring, modeling or classification; a groundwater impact assessment; or vadose zone monitoring for which you are requesting approval?	☐ Yes	☒ No	☐ N/A
b.	If yes, have you submitted a third (3rd) copy of the application (4 total) and supporting documents?			

V. SIGNATURES (Original signatures required. Signature stamps or applications transmitted electronically or by facsimile are not acceptable.)

All applications shall be signed by the person designated below as a duly authorized representative of the owner and/or operator.
Corporation - By a principal executive officer of at least the level of vice-president.
Partnership or Sole Proprietorship - By a general partner or the proprietor, respectively.
Government - By either a principal executive officer or a ranking elected official.

A person is a duly authorized representative of the owner and operator only if:
1. They meet the criteria above or the authorization has been granted in writing by a person described above; and
2. is submitted with this application (a copy of a previously submitted authorization can be used).

I hereby affirm that all information contained in this Application is true and accurate to the best of my knowledge and belief.

I do herein swear that I am a duly authorized representative of owner/operator and I am authorized to sign this permit application form.

Owner Signature: _____ Title: Vice-President Date: 3/20/07
Owner FEIN or S.S. Number: 37-1223747

Operator Signature: _____ Title: Vice-President Date: 3/20/07
Operator FEIN or S.S. Number: 37-1223747

Notary: Subscribe and sworn before me this 20 day of MARCH, 07.
Notary Signature: Dara L. Reeder Notary Seal:
My commission expires on: 03-24-09

OFFICIAL SEAL
DARA L REEDER
NOTARY PUBLIC - STATE OF ILLINOIS
MY COMMISSION EXPIRES:03/24/09

Engineer Signature: _____ Title: President Date: 3/23/07
Engineer Address: SKS Engineers
2900 N. Martin Luther King, Jr. Drive
Decatur, Illinois 62526
Engineer Seal:

JERREL L. SHAFFER
36442
REGISTERED
PROFESSIONAL
ENGINEER
ILLINOIS

Engineer Phone No. (217) 877-2100

All information submitted as part of the Application is available to the public except those specifically designated by the Applicant to be treated confidentially as a trade secret or secret process in accordance with Section 7(a) of the Environmental Protection Act, applicable Rules and Regulations of the Illinois Pollution Control Board and applicable Illinois EPA rules and guidelines.

Illinois
Environmental
Protection Agency

Bureau of Land
1021 North Grand Avenue East
Box 19276
Springfield, IL 62794-9276

APPLICATION FOR OPERATING PERMIT (LPC-PA4)

I. Facility Identification:

Name of Facility: Clinton Landfill No. 3

Site Number: 0390055036

Developmental Permit Number: 2005-070-LF Date Issued: March 2, 2007

II.A. Applicant Identification:

Operator	Owner
Name: Clinton Landfill, Inc.	Name: Clinton Landfill, Inc.
Phone Number: (309) 676-4893	Phone Number: (309) 676-4893

Agency correspondence mailed to: ☒ Owner ☐ Operator ☐ (Other Explain)

B. Site Ownership:

☒ Presently Owned by Applicant
☐ Presently Owned by Trust
☐ Presently Owned by Corporation
☐ To be Leased by Applicant for _____ years
☐ Years of Lease Remaining: _____
☐ Beginning Date of Lease: _____
☐ Expiration Date of Lease: _____

Operated by: ☒ Illinois Corporation ☐ Partnership ☐ Government ☐ Individual ☐ Trust ☐ Other: _____

III. Location Information:

Attach a copy of the United States Geological Survey (USGS) quadrangle map.

Describe the exact area or unit which is being requested to operate: Test Liner

This Agency is authorized to require this information under Illinois Revised Statutes, 1979, Chapter 111 1/2, Section 1039. Disclosure of this information is required under that Section. Failure to do so may prevent this form from being processed and could result in your application being denied. This form has been approved by the Forms Management Center.

IV. Financial Assurance:

Are financial assurance documents included? ☐ Yes ☐ No ☒ N/A
(Use **Original** Agency Forms).

V. Documentation

Are all necessary reports and information required in the Developmental permit(s) provided? ☐ Yes ☐ No ☒ N/A

VI. Certification

I hereby certify that the facility has been developed in accordance with IEPA Development Permit No. 2005-070-LF and any applicable supplement permit(s).

Engineers

Name: SKS Engineers

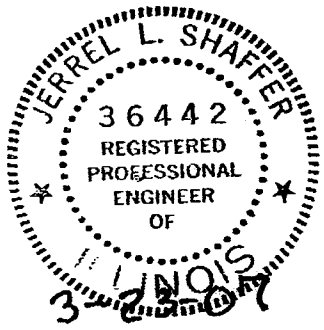
Address: 2900 N. Martin Luther King, Jr. Drive

Decatur, IL 62526

Phone No.: (217) 877-2100

Signature:

Seal:



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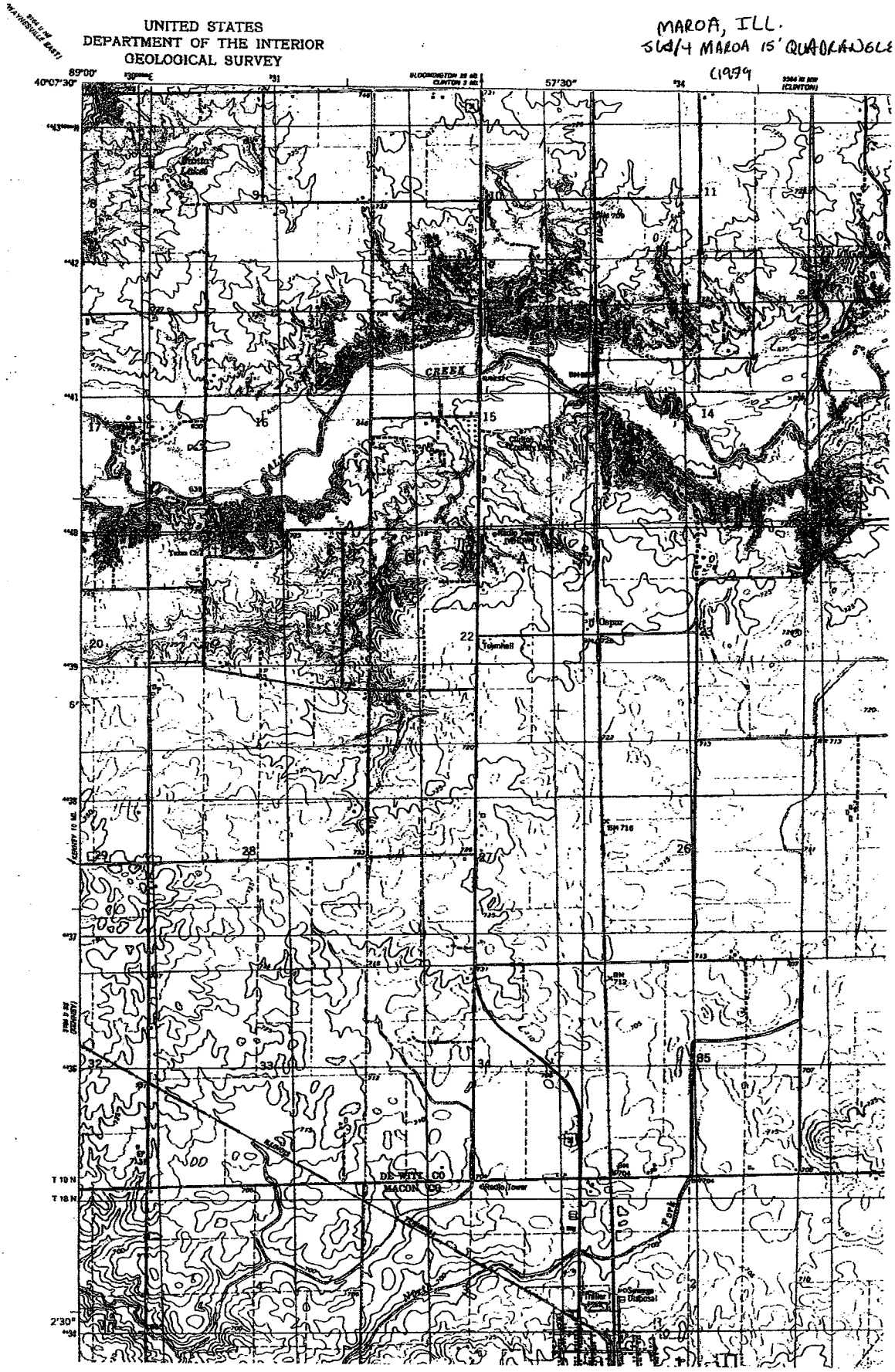

UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY
MAROA, ILL.
SW/4 MAROA 15' QUADRANGLE
(1979
89°00'
40°07'30"
57'30"
CREEK
DE WITT CO
MACON CO
T 19 N
T 18 N

SKS ENGINEERS, INC.
CONSULTING ENGINEERS
2900 N. MARTIN LUTHER KING, JR. DRIVE • DECATUR, ILLINOIS 62526
217-877-2100 • FAX 217-877-4816
www.sksengineers.com

VERIFICATION OF NOTIFICATION

CLINTON LANDFILL No. 3
DeWitt County
Site No. 0390055036

A copy of the attached Notice of Application for Permit to Manage Waste (LP-PA-16) has been mailed to the following:

ILLINOIS STATE SENATOR

The Honorable Bill Brady
Senate District 44
2203 Eastland Drive, Suite 3
Bloomington, IL 61704

ILLINOIS STATE REPRESENTATIVE

The Honorable Bill Mitchell
Representative District 87
332 West Marion, Suite N-1
Forsyth, IL 62535

STATE'S ATTORNEY

Jerry Johnson
DeWitt County Courthouse
201 W. Washington Street
Post Office Box 439
Clinton, IL 61727-0439

COUNTY BOARD CHAIRMAN

Duane Harris
DeWitt County Courthouse
201 W. Washington Street
Post Office Box 439
Clinton, IL 61727-0439

CITY CLERK

Clinton City Clerk
118 W. Washington Street
Clinton, IL 61727

By: _____

Date March 23, 2007

P:\2006\610337\CQA Report\07Mar23.Notif.verific.doc

Illinois
Environmental
Protection Agency

Bureau of Land
1021 North Grand Avenue East
Box 19276
Springfield, IL 62794-9276

NOTICE OF APPLICATION FOR PERMIT TO MANAGE WASTE (LPC-PA16)

Date: March 19, 2007

To Elected Officials and Concerned Citizens:

The purpose of this notice is to inform you that a permit application has been submitted to the IEPA, Bureau of Land, for a solid waste project described below. You are not obligated to respond to this notice, however, if you have any comments, please submit them in writing to the address below, or call the Permit Section at 217/524-3300, within twenty-one (21) days.

Illinois Environmental Protection Agency
Bureau of Land, Permit Section (#33)
1021 North Grand Avenue East, Post Office Box 19276
Springfield, Illinois 62794-9276

The permit application, which is identified below, is for a project described at the bottom of this page.

SITE IDENTIFICATION

Site Name: Clinton Landfill, Inc.

Site # (IEPA): 0390055036

Address: Route 51 South

City: Clinton

County: DeWitt

TYPE PERMIT SUBMISSIONS:		TYPE FACILITY:		TYPE WASTE:	
New Landfill	☐	Landfill	☒	General Municipal Refuse	☒
Landfill Expansion	☐	Land Treatment	☐	Hazardous	☐
First Significant Modification	☐	Transfer Station	☐	Special (Non-Hazardous)	☒
Significant Modification to Operate	☒	Treatment Facility	☐	Chemical Only (exec. putrescible)	☐
Other Significant Modification	☐	Storage	☐	Inert Only (exec. chem. & putrescible)	☐
Renewal of Landfill	☐	Incinerator	☐	Used Oil	☐
Development	☐	Composting	☐	Solvents	☐
Operating	☐	Recycling/Reclamation	☐	Landscape/Yard Waste	☐
Supplemental	☐	Other	☐	Other (Specify ____)	☐
Transfer	☐				
Name Change	☐				
Generic	☐				

DESCRIPTION OF PROJECT:

CQA Report and Engineering Certification for Test Liner

Please retain a copy for your own use.

jab\002711i.doc
IL 532 0334
LPC 040 Rev. Feb. 03

This Agency is authorized to require this information under Illinois Revised Statutes, 1979, Chapter 111 1/2, Section 1039. Disclosure of this information is required under that Section. Failure to do so may prevent this form from being processed and could result in your application being denied. This form has been approved by the Forms Management Center.

INTRODUCTION

SKS Engineers, Inc. was retained by Clinton Landfill, Inc. to provide Construction Quality Assurance Services (CQA), as defined in the IEPA Permit No. 2005-070-LF, for Clinton Landfill No. 3. (IEPA Site No. 0390055036).

Jerrel L. Shaffer, Registered Professional Engineer, Illinois, No. 36442, was appointed to act as CQA Officer on behalf of the firm. This is the report of construction activities supervised by our firm during construction of the area described above, following the issuance of the IEPA permit. This report contains the CQA documents required by the Construction Quality Assurance Plan, along with the required engineering certifications.

Clinton Landfill, Inc. informed the CQA officer that they planned on using Tiskilwa Till in the construction of the earth liner fill at Clinton Landfill No. 3. The following is a narrative of the CQA program activities and construction of the test liner.

Construction activities began with sampling of the Tiskilwa Till from test holes near project coordinates N5000, E8000 at approximate elevation 690 within the proposed borrow area (CLI #3 Phase 1 excavations). Three (3) proctor samples were acquired and taken to the soil laboratory for testing as per CQA plan requirements. The test results from these samples are found in Section 5 of this report. Upon completion of laboratory testing, Mike Smith, CQA Officer-in-Absentia laid out the limits of construction for the test liner. The area laid out to construct the test liner was outside of the waste boundary of CLI #3 and will not be incorporated into any of the full scale liner of CLI #3. The test liner construction area had sufficient length to ensure suitable acceleration /deceleration areas for compaction equipment to reach operational speed throughout the test liner construction.

A plan view drawing showing the test liner layout is provided in Section 3 of this report. Sallenger, Inc., project contractor, began construction by preparing the subgrade on which the test liner was to be placed.. CQA personnel observed proof-rolling of subgrade with a loaded *CATERPILLAR* 740 truck, and approved the subgrade to initiate test liner construction. Documentation of proof roll of subgrade is provided in Section 7, CQA Daily Report No. 610337-02 of this report. The contractor then began placing and compacting a

Locations of the Shelby tube samples were surveyed using GPS equipment and northing, easting and elevations were recorded and reported, These Shelby tube samples were tested in the laboratory in accordance with the CQA plan. The results of the testing of these samples are found in Section 5 of this report. Laboratory permeability test results ranged from 1.11×10^{-8} to 5.98×10^{-8} cm/sec, which meets the 1×10^{-7} cm/sec permeability requirements.

CQA personnel began field permeability testing by establishing location/area for Two-Stage Boutwell Permeameter testing. This was done by dividing the test liner and randomly selecting which quarter to test. Upon random selection of test area, testing began with CQA personnel installing three (3) Two-stage Boutwell Permeameter units: Unit Nos. 1, 3, and 4; and one (1) TEG (Temperature Effect Gauge) Unit No. 2 at the newly constructed test liner. Field permeability testing was then conducted and observed by CQA personnel in accordance with the CQA plan. Results of the field permeability testing are in Section 4 of this report. Field permeability test results ranged from 4.41×10^{-9} to 2.26×10^{-8} cm/sec, which meets the 1×10^{-7} cm/sec permeability requirements.

Upon completion of the CQA plan-required testing of permeability, both the in-field and laboratory testing, the data was compared and a statistical correlation was established. Results of this comparison may be found in Section 6 of this report.

Although not required in the CQA Plan for Test Liners, Design Engineers and CQA personnel were in agreement to have additional laboratory testing conducted on the proctor samples to ensure earth liner material met or exceeded specified undrained shear strengths of 3 tons. Results of these tests can be found in Section 5 of this report, which demonstrates the undrained shear strength of 3 tons was met or exceeded.

mixture of weathered and unweathered Tiskilwa tills from the approved borrow area in 9 inch loose lifts, compacted to a 6 inch maximum thickness. Elevations of each lift thickness were controlled and monitored by GPS survey equipment. After six (6) passes with a CATERPILLAR 815B self-propelled sheepsfoot roller, required compaction testing was performed by CQA personnel.

Locations for nuclear density tests were selected using the CQA Plan Statistical Sampling Program. A 20' x 20' grid was established and numbered and a computer-generated random number selected the site of each test. Each test was laid out using site coordinates with GPS survey equipment. Following preparation of test locations, each test location was surveyed with GPS equipment and northing, easting and elevation was recorded. The completed density tests are found in Section 4 of this report. The nuclear moisture density test data showed fill materials were at or above optimum moisture; therefore, no moisture conditioning or admixtures were used during construction of the test liner. Nuclear moisture density tests showed an average compaction of 98.9% at or above optimum moisture contents. The contractor completed construction after a minimum of 3 feet of earth liner fill was in place.

CQA personnel, using the above referenced CQA Plan's Statistical Sampling Program obtained the locations for sampling test liner for laboratory permeability in three (3) locations and pushed three (3) sets of shelby tubes vertically and horizontally into the earth liner fill, obtained one (1) sample from each, and delivered these six (6) samples to the soils laboratory. A slight discrepancy between the CQA Plan and the method used to determine the horizontal permeability was the acquiring of horizontal permeability samples for laboratory testing. Horizontal permeability tests are not required during full scale liner construction. However, to fulfill the requirements of the test liner, specifically Section 4.5, last paragraph, "The laboratory hydraulic conductivity test results will be compared with the field hydraulic conductivity test results to determine whether a statistical correlation exists." SKS conducted horizontal laboratory hydraulic conductivity tests to compare the horizontal permeability results with the field permeability tests to establish a statistical correlation. This method of sampling will only be needed during construction of new and additional test liners.

SECTION 2

ENGINEERING CERTIFICATION

ENGINEERING CERTIFICATION

CLINTON LANDFILL No. 3
Test Liner - Tiskilwa Till

The test liner generally designated as "Test Liner - Tiskilwa Till," was constructed on December 18, 2006. It is defined by the facility coordinate system as being bounded by the following coordinates:

N5262, E7868; N5414, E7865; N5419, E7923 & N5262, E7932

The work was done under my general supervision as Construction Quality Assurance Officer and under the direct supervision of Mr. Mike Smith, as the Construction Quality Assurance Officer In-Absentia. The Construction Quality Assurance work for the project consisted of the following:

1. Inspection and testing of the construction of the test liner to confirm, prior to full-scale liner construction that the full scale liner will meet the construction specifications and regulatory requirements using the planned soil types.

Based on the contents of this report and observations of Mr. Smith, I hereby certify that the test liner was constructed, monitored and tested with the approved Construction Quality Assurance Plan (November 2006). These test results demonstrate that the soil materials within the Tiskilwa Till are suitable for the compacted clay fill (CCF) and earth liner construction and the construction techniques are suitable to achieve the CCF and Earth Liner specifications.

JERREL L. SHAFFER
36442
REGISTERED
PROFESSIONAL
ENGINEER
OF
ILLINOIS

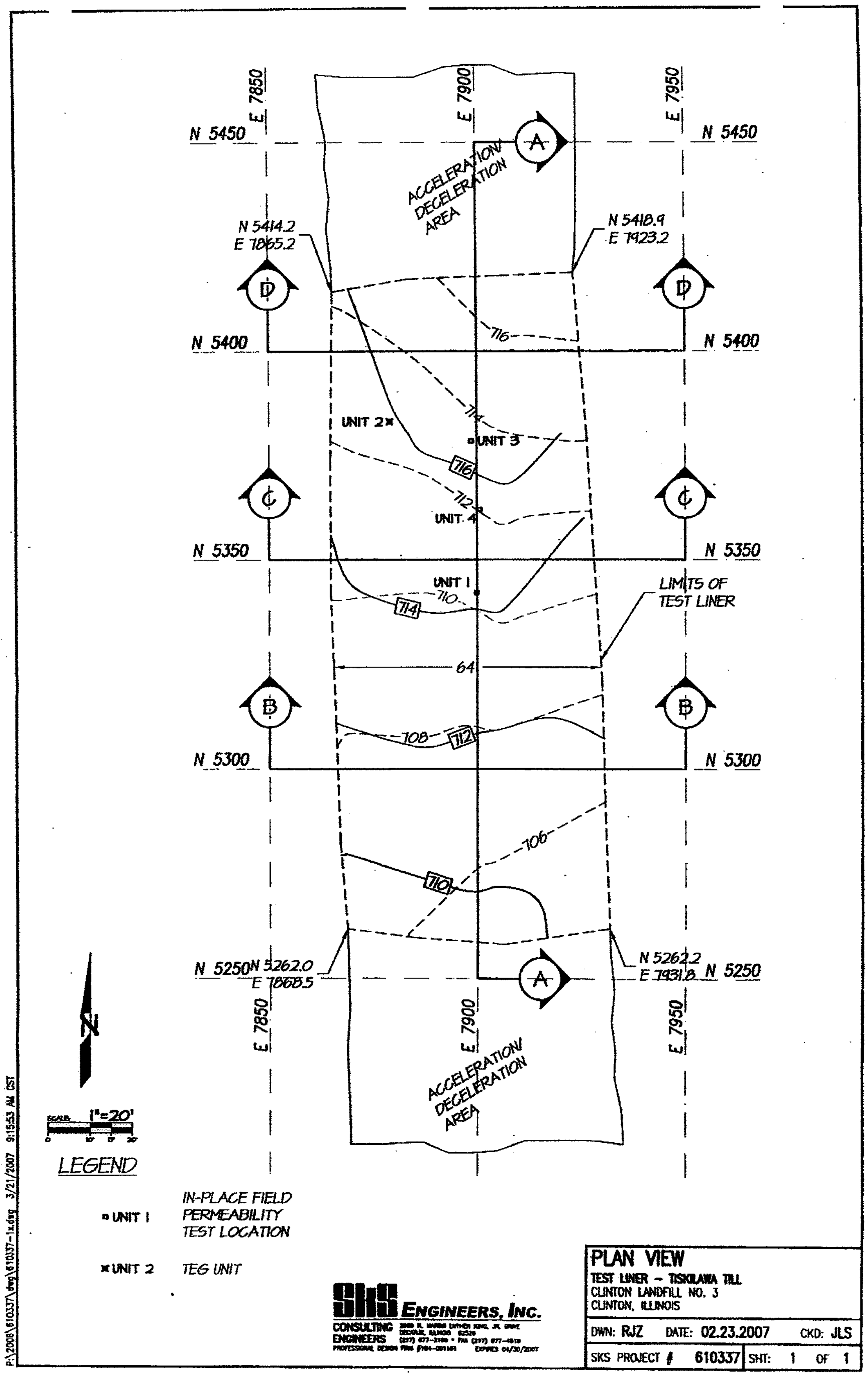
Jerrel L. Shaffer, P.E.
Construction Quality Assurance Officer

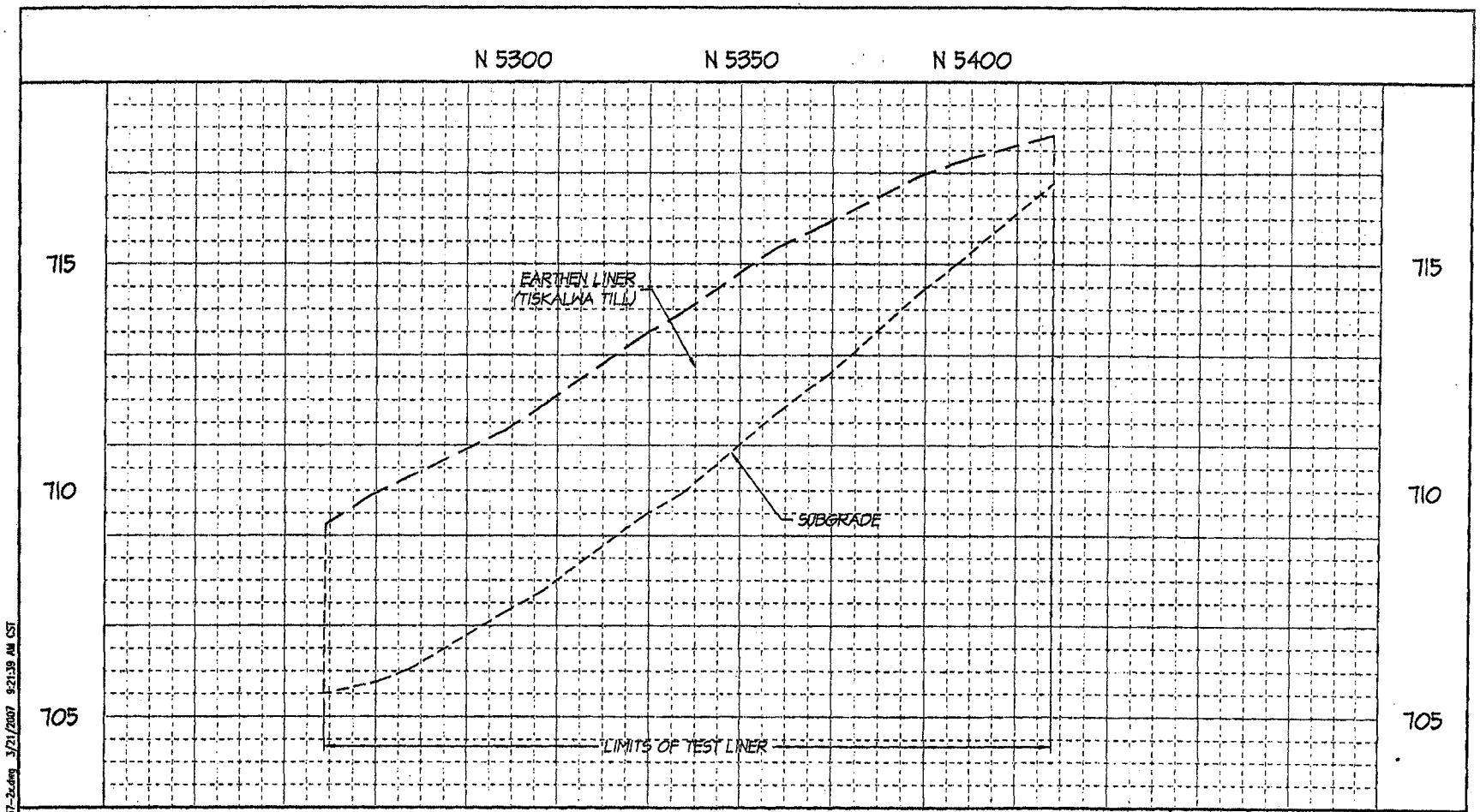
March 19, 2007
Date

p:\2006\610337\cqa report\engin certif.doc

SECTION 3

AS-BUILT DRAWING


E 7850
E 7900
E 7950
N 5450
N 5450
A
ACCELERATION/
DECELERATION
AREA
N 5414.2
E 7865.2
N 5418.9
E 7923.2
D
D
716
N 5400
N 5400
714
UNIT 2
UNIT 3
716
C
C
712
UNIT 4
N 5350
N 5350
UNIT 1
710
714
LIMITS OF
TEST LINER
64
B
B
708
712
N 5300
N 5300
706
710
N 5250
N 5262.0
E 7868.5
N 5262.2
E 7931.8
N 5250
A
E 7850
E 7900
E 7950
ACCELERATION/
DECELERATION
AREA
N
SCALE 1"=20'
0 10' 15' 20'
LEGEND
UNIT 1 IN-PLACE FIELD PERMEABILITY TEST LOCATION
UNIT 2 TEG UNIT
SKS ENGINEERS, INC.
CONSULTING ENGINEERS
PLAN VIEW
TEST LINER – TISKILAWA TILL
CLINTON LANDFILL NO. 3
CLINTON, ILLINOIS
DWN: RJZ
DATE: 02.23.2007
CKD: JLS
SKS PROJECT # 610337
SHT: 1 OF 1
P:\2006\610337\dwg\610337-1x.dwg 3/21/2007 9:15:53 AM CST



SKS ENGINEERS, INC.
CONSULTING ENGINEERS
3200 S. MARSH LUTHER KING JR. DRIVE
DECATUR, ILLINOIS 62521
(217) 877-2100 • FAX (217) 877-4515
PROFESSIONAL DESIGN FIRM #184-001101 EXPIRES 04/30/2008

SECTION A-A

N 5250 - N 5450

SCALE:
H: 1"=20'
V: 1"=2'

SECTION A-A
TEST LINER
CLINTON LANDFILL NO. 3
CLINTON, ILLINOIS

DWN: RJZ | DATE: 02.23.2007 | CKD: JLS
SKS PROJECT # 610337 | SHT: 1 OF 2

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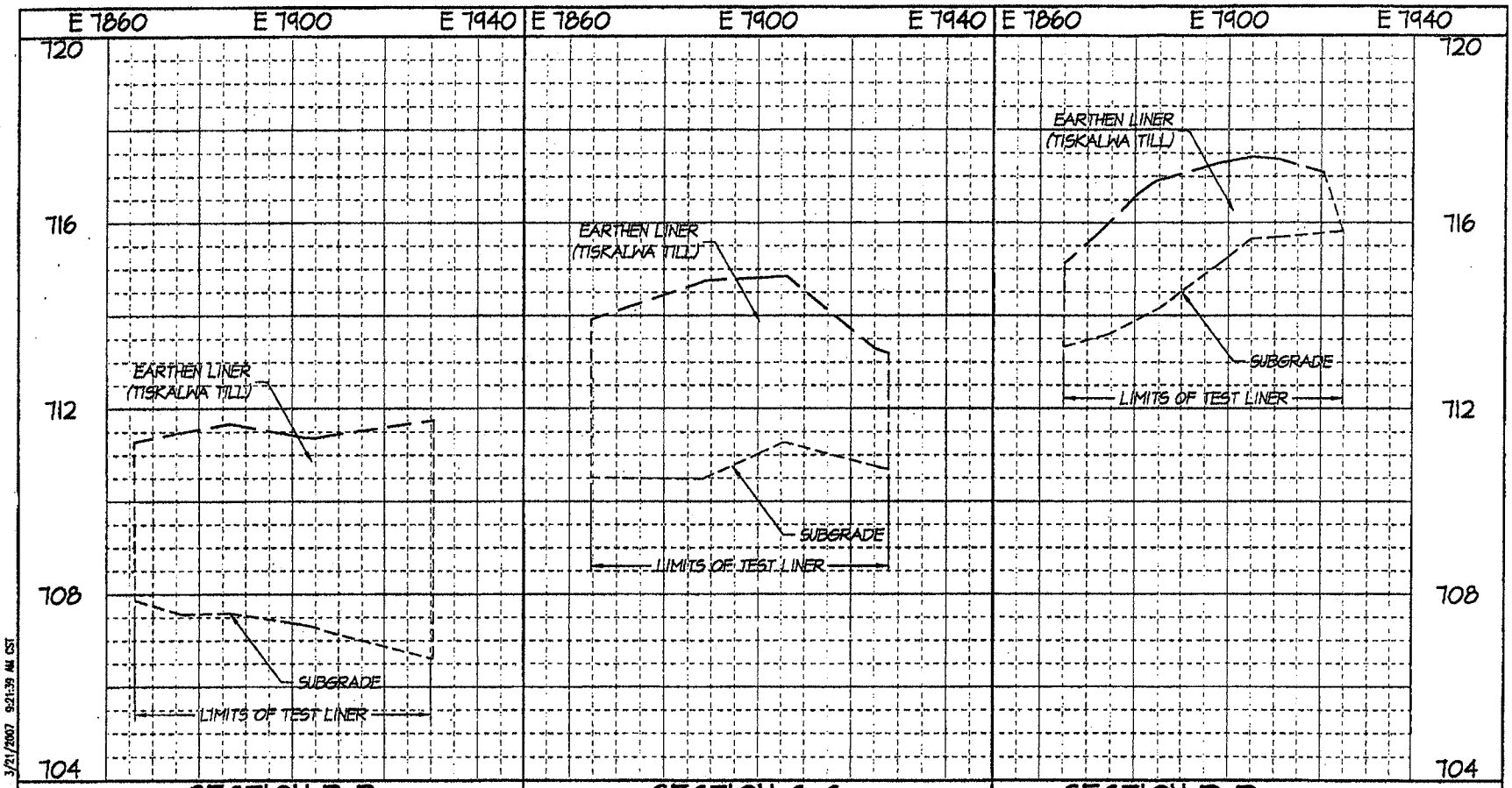

SECTION B-B

N 5300

SECTION C-C

N 5350

SECTION D-D

N 5400

SKS ENGINEERS, INC.
CONSULTING ENGINEERS

SCALE:
H: 1"=20'
V: 1"=2'

SECTIONS B-B, C-C, & D-D
TEST LINER
CLINTON LANDFILL NO. 3
CLINTON, ILLINOIS

DWN: RJZ DATE: 02.23.2007 CKD: JLS
SKS PROJECT # 610337 SHT: 2 OF 2

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SECTION 4

FIELD TEST DATA

SKS ENGINEERS, INC.
CONSULTING ENGINEERS
2900 N. MARTIN LUTHER KING, JR. DRIVE • DECATUR, ILLINOIS 62526
217-877-2100 • FAX 217-877-4816
www.sksengineers.com

March 20, 2007

Project No. 610337

PDC Technical Services, Inc.
P.O. Box 9071
Peoria, IL 61612-9071

ATTN: Mr. George Armstrong

RE: **Test Fill Clinton Landfill No.3**

SOIL COMPACTION TEST RESULTS

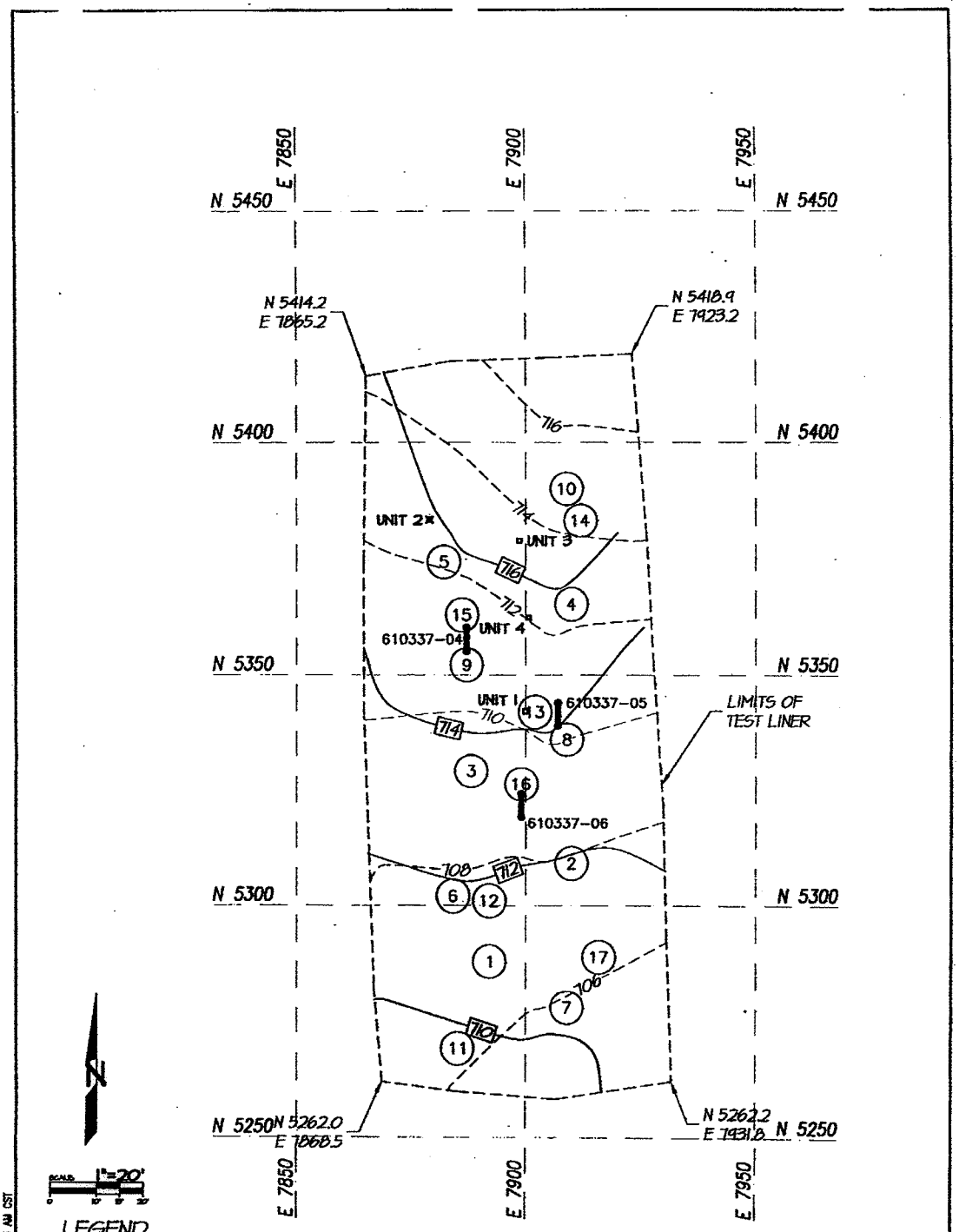
Contractor: **Sallenger, Inc.**

Report Identification: **610337-01**

Test No.	Test Date	Test Location	Test Elevation	Dry Density [Lbs./Cu.Ft.]		Moisture Content [Percent]		Percent Compaction
				Field	Maximum	Field	Optimum	
1	18-Dec-06	Earth Liner N5288 E7892	708.0	122.1	123.4	11.8	11.8	98.9%
2	18-Dec-06	N5309 E7910	708.8	121.3	123.4	12.0	11.8	98.3%
3	18-Dec-06	N5329 E7888	710.0	123.7	123.4	12.5	11.8	100.2%
4	18-Dec-06	N5365 E7910	713.5	123.6	123.4	12.0	11.8	100.2%
5	18-Dec-06	N5374 E7882	713.3	122.4	123.4	11.9	11.8	99.2%
6	18-Dec-06	N5302 E7884	709.7	121.5	123.4	12.8	11.8	98.5%
7	18-Dec-06	N5278 E7909	707.8	123.5	123.4	12.6	11.8	100.1%
8	18-Dec-06	N5336 E7909	712.0	119.2	121.7	13.1	12.0	97.9%
9	18-Dec-06	N5357 E7888	713.0	122.2	123.4	12.0	11.8	99.0%
10	18-Dec-06	N5390 E7909	716.2	119.9	121.7	12.3	12.0	98.5%
11	18-Dec-06	N5269 E7885	708.4	118.1	121.7	12.0	12.0	97.0%
12	18-Dec-06	N5301 E7892	710.7	123.4	123.4	11.9	11.8	100.0%
13	18-Dec-06	N5342 E7902	713.3	123.0	123.4	11.8	11.8	99.7%
14	18-Dec-06	N5383 E7912	716.0	122.8	123.4	11.9	11.8	99.5%
15	18-Dec-06	N5360 E7887	714.9	122.0	123.4	12.0	11.8	98.9%
16	18-Dec-06	N5324 E7899	713.1	118.9	121.7	12.5	12.0	97.7%
17	18-Dec-06	N5289 E7916	710.0	119.6	121.7	12.7	12.0	98.3%

NOTES: Specifications require a compaction to a minimum of 95 percent of the maximum dry density. The maximum laboratory dry density is determined in accordance with ASTM D-698. Type of material tested: Tiskilwa Till.

By: 



SKS ENGINEERS, INC.
CONSULTING ENGINEERS

TEST LOCATIONS
TEST LINER – TISKILAWA TILL
CLINTON LANDFILL NO. 3
CLINTON, ILLINOIS

DWN: RJZ DATE: 02.23.2007 CKD: JLS
SKS PROJECT # 610337 SHT: 1 OF 1

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FIELD PERMEABILITY
CALCULATIONS
CLINTON LANDFILL NO. 3

SKS #610337

FIELD PERMEABILITY TEST AT LOCATION 1

$K1 := 1.16 \times 10^{-8} \cdot \frac{cm}{sec}$

$K2 := 0.23 \times 10^{-8} \cdot \frac{cm}{sec}$

$\frac{K2}{K1} = 0.198$

Note: The K1 and K2 values are the average of the last three computed values in the attached table

K2/K1 < 0.4 So Use P = 20

From Graph Use m = 0.4 $m := 0.4$

TEST DATA

$D1 := 10.16 \cdot cm$

$b1 := 78 \cdot cm$

$$Kv := \frac{\left(\frac{1}{m}\right) \cdot \left(\left(1 - \frac{D1}{4 \cdot m \cdot b1}\right)\right) \cdot K1}{\left(1 - \frac{D1}{4 \cdot b1}\right)} \qquad Kv = 2.754 \times 10^{-8} \frac{cm}{sec}$$

$$Kh := m^2 \cdot Kv \qquad Kh = 4.406 \times 10^{-9} \frac{cm}{sec}$$

FIELD PERMEABILITY TEST AT LOCATION 3

$K1 := 1.81 \times 10^{-8} \cdot \frac{cm}{sec}$

$K2 := 2.19 \times 10^{-9} \cdot \frac{cm}{sec}$

$\frac{K2}{K1} = 0.121$

Note: The K1 and K2 values are the average of the last three computed values in the attached table

K2/K1 < 0.4 So Use P = 20

From Graph Use m = 0.2 $m := 0.2$

TEST DATA

$D1 := 10.16 \cdot cm$

$b1 := 60 \cdot cm$

$$Kv := \frac{\left(\frac{1}{m}\right) \cdot \left(\left(1 - \frac{D1}{4 \cdot m \cdot b1}\right)\right) \cdot K1}{\left(1 - \frac{D1}{4 \cdot b1}\right)} \qquad Kv = 7.45 \times 10^{-8} \frac{cm}{sec}$$

$$Kh := m^2 \cdot Kv \qquad Kh = 2.98 \times 10^{-9} \frac{cm}{sec}$$

FIELD PERMEABILITY
CALCULATIONS
CLINTON LANDFILL NO. 3

SKS #610337

FIELD PERMEABILITY
TEST AT LOCATION 4

$K1 := 1.48 \times 10^{-8} \cdot \frac{cm}{sec}$

$K2 := 0.18 \times 10^{-8} \cdot \frac{cm}{sec}$

$\frac{K2}{K1} = 0.122$

Note: The K1 and K2 values are the average of the last three computed values in the attached table

K2/K1 < 0.4 So Use P = 20

From Graph Use m = 0.2 $m := 0.2$

TEST DATA

$D1 := 10.16 \cdot cm$

$b1 := 60 \cdot cm$

$$Kv := \frac{\left(\frac{1}{m}\right) \cdot \left(\left(1 - \frac{D1}{4 \cdot m \cdot b1}\right)\right) \cdot K1}{\left(1 - \frac{D1}{4 \cdot b1}\right)} \qquad Kv = 6.092 \times 10^{-8} \frac{cm}{sec}$$

$Kh := m^2 \cdot Kv$ $\qquad Kh = 2.437 \times 10^{-9} \frac{cm}{sec}$

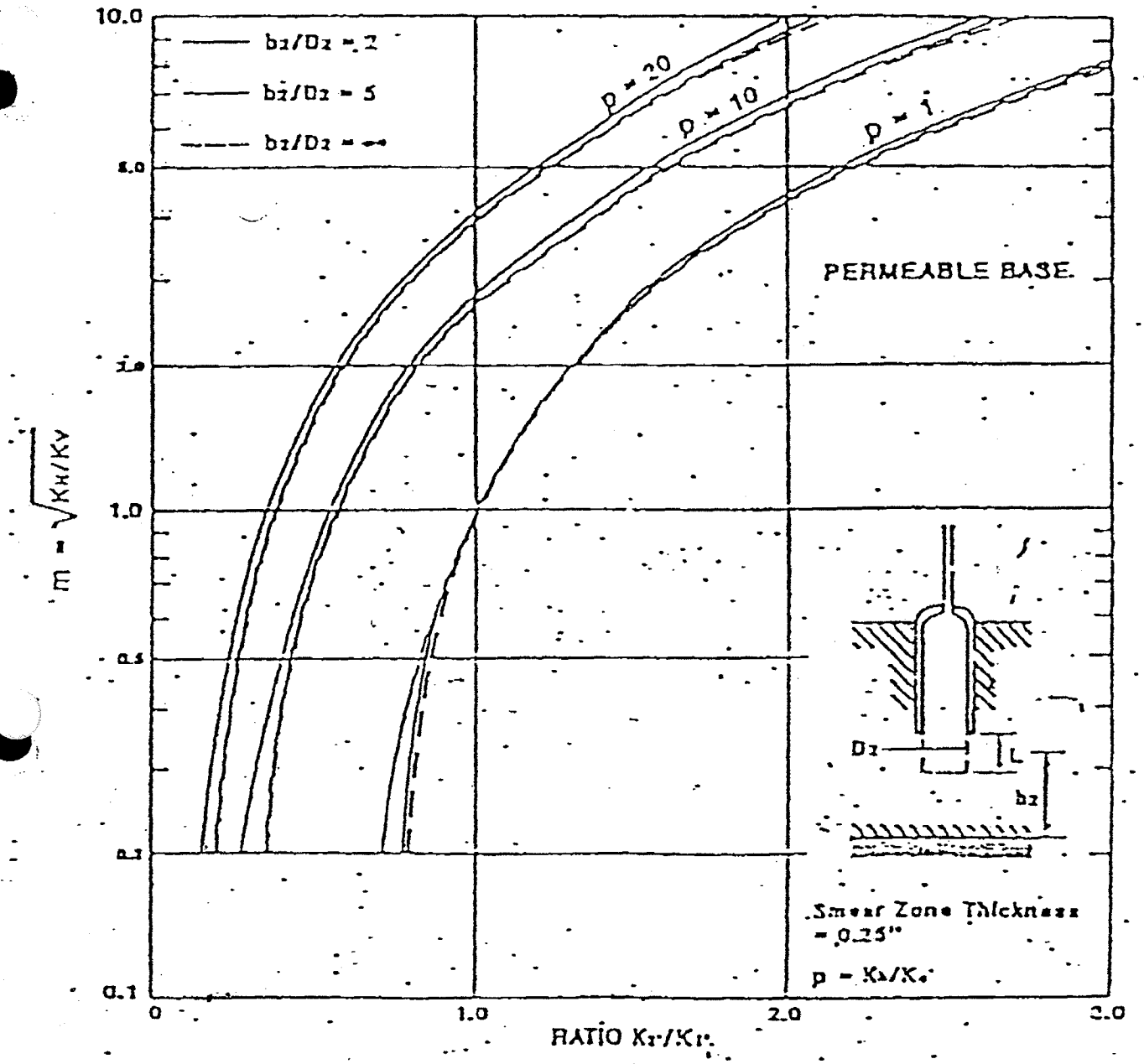


FIGURE 7
GRAPH FOR (m) - (L/D=1.5)

K2'/K1'	p
>1.1	1
0.9 - 1.1	1,2
0.8 - 0.9	2,5
0.7 - 0.8	5,10
0.6 - 0.7	10,20
0.4 - 0.6	15,20
0.4>	*

* Use Stage 1 Only Approach - Paragraph (4.1.3).

BOTWELL FIELD PREMEABILITY TESTING DATA
CLINTON LANDFILL NO. 3

TEST PAD LOCATION #1 - K1

READING	TIME	TEMP	READING	H1 (cm)	H2 (cm)	K1 (cm/sec)
		48	0			
1 TO 2	150	56	3	210	203	2.08E-07
2 TO 3	270	62	4	208	204	7.45E-08
3 TO 4	1020	56	15	208	205	1.14E-08
4 TO 5	1710	69	11	201	196	1.66E-08
5 TO 6	1170	58	30	204	201	1.08E-08
6 TO 7	1440	48	44	193	190	1.03E-08
7 TO 8	1020	55	41	185	182	1.37E-08

TEST PAD LOCATION #1 - K2

READING	TIME	TEMP	READING	H1 (cm)	H2 (cm)	K2 (cm/sec)
		46	0			
1 TO 2	360	54	6	210	202	1.65E-08
2 TO 3	1080	50	17	207	203	2.47E-09
3 TO 4	1440	56	25	200	192	4.27E-09
4 TO 5	1440	50	39	196	192	2.19E-09
5 TO 6	2880	44	55	188	182	1.46E-09
6 TO 7	1440	46	63	179	173	3.33E-09

TEST PAD LOCATIOI #3-K1

READING	TIME	TEMP	READING	H1 (cm)	H2 (cm)	K1 (cm/sec)
		63	0			
1 TO 2	110	56	17	210	205	2.22E-07
2 TO 3	150	52	24	200	199	4.74E-08
3 TO 4	150	50	29	196	195	6.21E-08
4 TO 5	960	53	32	193	190	1.87E-08
5 TO 6	240	54	37	192	188	7.30E-08
6 TO 7	240	60	38	189	185	9.25E-08
7 TO 8	960	48	65	188	180	4.25E-08
		48	0			
8 TO 9	210	56	0	210	205	1.10E-07
9 TO 10	270	62	5	210	203	1.13E-07
10 TO 11	1020	58	17	207	204	1.40E-08
11 TO 12	1710	69	20	200	190	2.63E-08
12 TO 13	1110	56	39	199	196	1.27E-08
13 TO 14	1500	48	55	188	184	1.33E-08

TEST PAD LOCATION#3 - K2

READING	TIME	TEMP	READING	H1 (cm)	H2 (cm)	K2 (cm/sec)
		46	0			
1 TO 2	360	54	3	210	203	1.31E-08
2 TO 3	1080	50	8	208	208	2.21E-10
3 TO 4	1440	56	12	205	199	3.01E-09
4 TO 5	1440	50	25	203	200	1.82E-09
5 TO 6	2880	44	42	196	190	1.55E-09
6 TO 7	1440	46	50	186	180	3.20E-09

TEST PAD LOCATION #4-K1

READING	TIME	TEMP	READING	H1 (cm)	H2 (cm)	K1 (cm/sec)
		63	0			
1 TO 2	110	56	19	210	204	2.71E-07
2 TO 3	150	52	26	199	198	4.77E-08
3 TO 4	150	50	33	195	192	9.01E-08
		50	0			
4 TO 5	962	53	2	210	207	1.44E-08
5 TO 6	240	54	3	209	208	2.29E-08
6 TO 7	240	60	2	208	205	6.18E-08
7 TO 8	960	48	16	209	208	2.18E-09
8 TO 9	240	56	8	201	200	9.06E-09
9 TO 10	240	62	3	205	205	1.77E-08
10 TO11	960	56	16	208	205	1.76E-08

TEST PAD LOCATION #4 - K2

READING	TIME	TEMP	READING	H1 (cm)	H2 (cm)	K2 (cm/sec)
		46	0			
1 TO 2	360	54	2	210	204	1.20E-08
2 TO 3	1080	50	7	209	209	2.20E-10
3 TO 4	1440	56	12	208	199	3.28E-09
4 TO 5	1440	50	23	203	201	1.25E-09
5 TO 6	2880	44	39	197	192	1.39E-09
6 TO 7	1440	46	46	188	183	2.85E-09

SECTION 5

LABORATORY TEST DATA

Lab Samples: Tiskilwa Test Fill **Clinton Landfill No. 3** **SKS No. 610337**

SAMPLE NO.	SAMPLE TYPE	LOCATION	ELEVATION
610337-01	Proctor	Borrow Area	
610337-02	Proctor	Borrow Area	
610337-03	Proctor	Borrow Area	
610337-04 H & V	Shelby Tube	N5360, E7887	714.9±
610337-05 H & V	Shelby Tube	N5344, E7907	714.4±
610337-06 H & V	Shelby Tube	N5324, E7899	713.1±

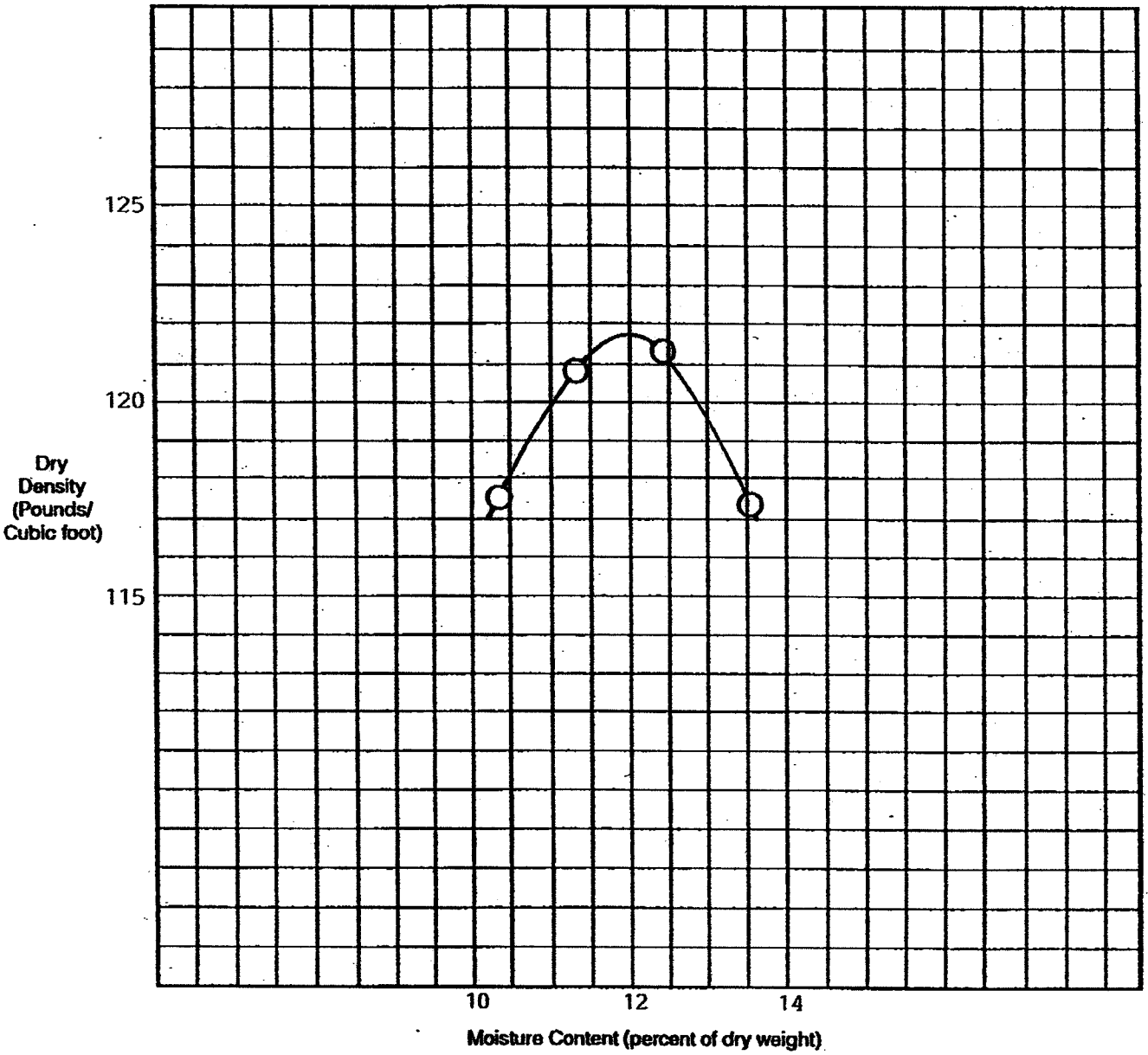
Project Number 610337

Date December 18, 2006

Test Method ASTM D-698

Source Borrow Area - 610337-01

MOISTURE DENSITY RELATIONSHIP



Maximum Dry Density (Lbs./Cu.Ft.) 121.7

Optimum Moisture Content (%) 12.0

Type of Material: Sandy Lean Clay - Gray, low plasticity, trace gravel

Earth Liner - Test Fill

Clinton Landfill #3

PDC Technical Services, Inc.

SIS ENGINEERS, INC.
CONSULTING ENGINEERS
2900 N. MARTIN LUTHER KING, JR. DRIVE
DECATUR, ILLINOIS 62526

SKS ENGINEERS, INC.

CONSULTING ENGINEERS

2900 N. MARTIN LUTHER KING, JR. DRIVE • DECATUR, ILLINOIS 62526

217-877-2100 • FAX 217-877-4816
www.sksengineers.com

December 29, 2006

Project No. 10337

PDC Technical Services
P.O. Box 9071
Peoria, IL 61612-9071

ATTN: Mr. John Berry

RE: **Test Fill Clinton Landfill No.3**

PERMEABILITY TEST RESULTS

ASTM D-5084

Sample and Classification Data

Sample Identification: 610337-01
Sample Obtained By: SKS
Sample Depth/Elevation: 0.0
Description: SANDY LEAN CLAY - Gray, low plasticity, trace gravel
USCS Classification: CL
Natural Moisture Content: 12.2%
Liquid Limit: 25.0
Plasticity Index: 11.0
Soil Particle Sizes: Gravel 3.10% Silt 28.80% Sand 32.50% Clay 35.60%

Test Specimen Data

Specimen Type: FLEXIBLE WALL
Diameter: 7.28 cm.
Length: 7.75 cm.
Area: 41.62 sq. cm.
Volume: 322.59 cu. cm.
Wet Weight Before Test: 710.2 gm.
Wet Weight After Test: 712.5 gm.
Dry Weight: 632.5 gm.
Initial Moisture: 12.3%
Final Moisture: 12.6%
Dry Density: 1.96 gm./cc.
Void Ratio: 0.34
Initial Saturation: 97.13%

Testing Data and Results

Test Apparatus: GEOTEST

Cell Confining Pressure	30.0	psi =	2,110.20	cm of H_2O
Back Pressure	25.0	psi =	1,758.50	cm of H_2O
Driving Pressure	2.0	psi =	140.68	cm of H_2O

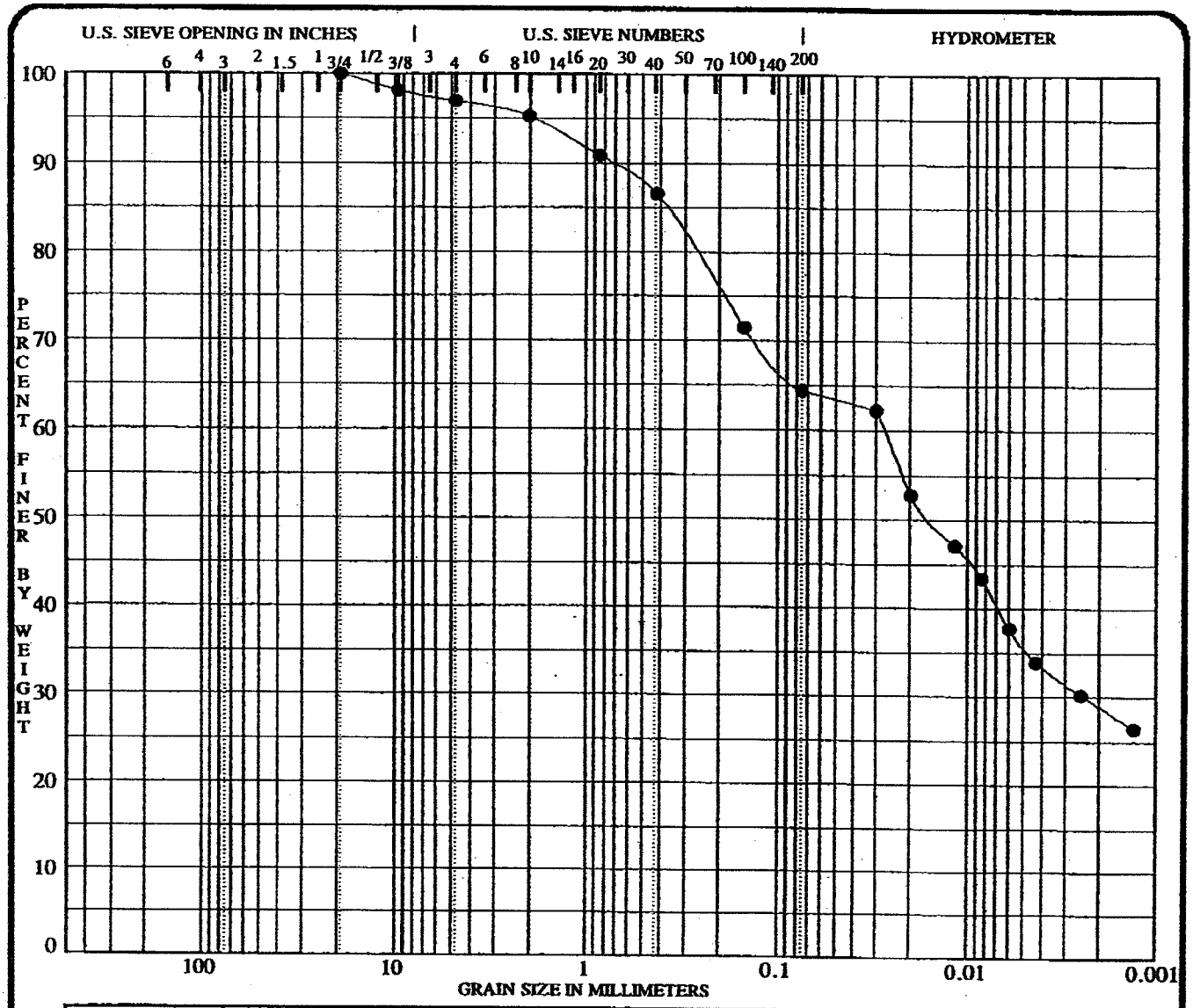
Hydraulic Gradient: 18.15
Time Req'd. for Saturation: 24 hours Amount of Flow 11.255 ml
Time for Permeability Test: 166.6 hours Amount of Flow 10.49 ml

Permeant Liquid: 0.005 N $CaSO_4$
Temperature: 24.0 °C
Temperature Correction Factor: 0.91

Permeability: (k) = 2.16E-08 cm/sec

Remarks:

By: Albert Wright



COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

Specimen Identification		Classification	MC%	LL	PL	PI	Cc	Cu
● 10337-01	0.0	SANDY LEAN CLAY CL	12	25	14	11		

ASTM D-4318
Atterberg Limits

Specimen Identification		D100	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
● 10337-01	0.0	19.10	0.03	0.002		3.1	32.5	28.8	35.6

ASTM D-422
Soil Grain Size

NOTE: % Silt and % Clay based on ASTM Classification (0.005mm)

PROJECT Test Fill - Clinton Landfill No. 3

JOB NO. 610377

DATE December 29, 2006

GRADATION CURVES

SKS ENGINEERS, INC.

Decatur, IL

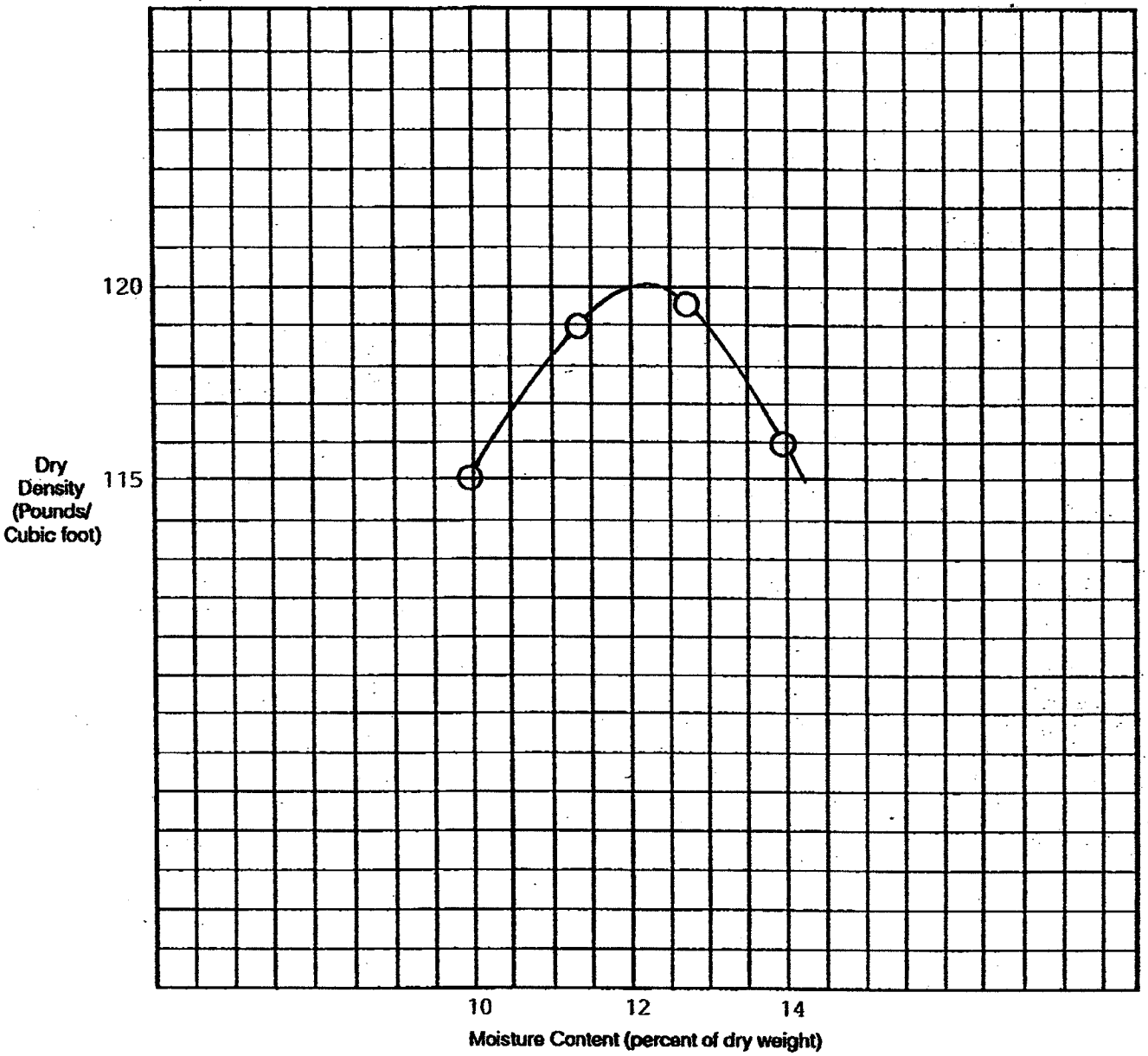
Project Number 610337

Date December 19, 2006

Test Method ASTM D-698

Source 610337-02

MOISTURE DENSITY RELATIONSHIP



Maximum Dry Density (Lbs./Cu.Ft.) 120.1

Optimum Moisture Content (%) 12.3

Type of Material: Sandy Lean Clay - Gray, low plasticity, trace gravel

Earth Liner - Test Fill

Clinton Landfill #3

PDC Technical Services, Inc.

SHS ENGINEERS, INC.
CONSULTING ENGINEERS
2900 N. MARTIN LUTHER KING, JR. DRIVE
DECATUR, ILLINOIS 62526

SKS ENGINEERS, INC.

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217-877-2100 • FAX 217-877-4816
www.sksengineers.com

December 29, 2006

Project No. 10337

PDC Technical Services
P.O. Box 9071
Peoria, IL 61612-9071

ATTN: Mr. John Berry

RE: **Test Fill Clinton Landfill No.3**

PERMEABILITY TEST RESULTS

ASTM D-5084

Sample and Classification Data

Sample Identification:	610337-02			Sample Obtained By:	SKS		
Sample Depth/Elevation:	0.0						
Description:	SANDY LEAN CLAY - Gray, low plasticity, trace ggravel						
USCS Classification:	CL						
Natural Moisture Content:	13.6%	Liquid Limit:	25.0	Soil Particle Sizes: Gravel	2.70%	Silt	26.70%
		Plasticity Index:	10.0	Sand	32.50%	Clay	38.10%

Test Specimen Data

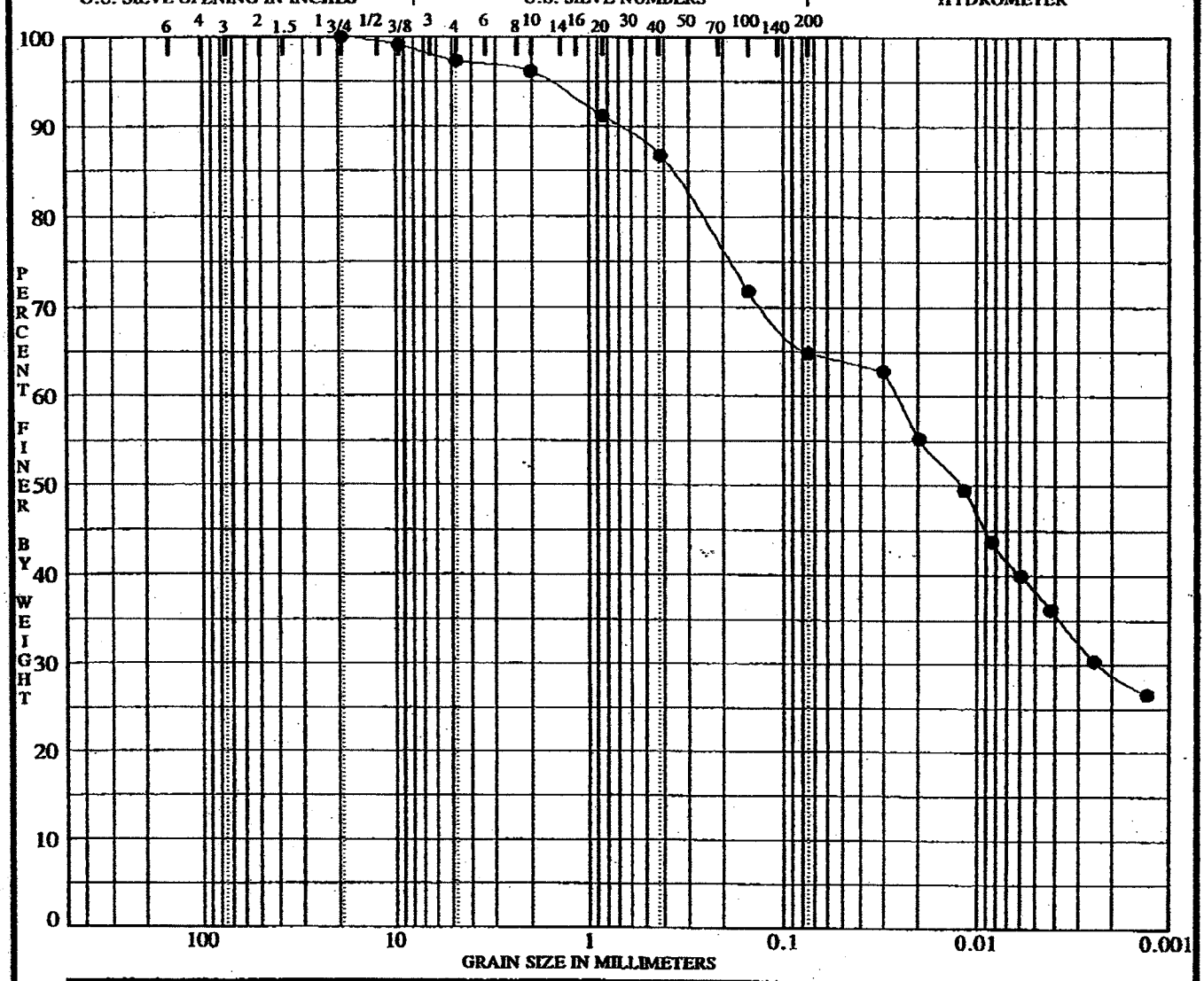
Specimen Type:	FLEXIBLE WALL			Initial Moisture:	13.7%
Diameter:	7.14 cm.			Final Moisture:	13.8%
Length:	8.25 cm.	Wet Weight Before Test:	753.6 gm.	Dry Density:	2.01 gm./cc.
Area:	40.04 sq. cm.	Wet Weight After Test:	753.8 gm.	Void Ratio:	0.36
Volume:	330.32 cu. cm.	Dry Weight:	662.6 gm.	Initial Saturation:	99.78%

Testing Data and Results

Test Apparatus:	GEOTEST				
Cell Confining Pressure	30.0 psi =	2,110.20 cm of H_2O		Permeant Liquid:	0.005 N $CaSO_4$
Back Pressure	25.0 psi =	1,758.50 cm of H_2O			
Driving Pressure	2.0 psi =	140.68 cm of H_2O		Temperature:	24.0 °C
Hydraulic Gradient:	17.05			Temperature Correction Factor:	0.91
Time Req'd. for Saturation:	24 hours	Amount of Flow	7.505 ml		
Time for Permeability Test:	166.6 hours	Amount of Flow	6.95 ml	Permeability: (k) =	1.58E-08 cm/sec

Remarks:

By: Robert Wright



COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

Specimen Identification		Classification	MC%	LL	PL	PI	Cc	Cu
● 10337-02	0.0	SANDY LEAN CLAY CL	12	25	14	10		

ASTM D-4318
Atterberg Limits

Specimen Identification		D100	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
● 10337-02	0.0	19.10	0.03	0.002		2.7	32.5	26.7	38.1

ASTM D-422
Soil Grain Size

NOTE: % Silt and % Clay based on ASTM Classification (0.005mm)

PROJECT Test Fill - Clinton Landfill No. 3

JOB NO. 610337
DATE December 29, 2006

GRADATION CURVES

SKS ENGINEERS, INC.
Decatur, IL

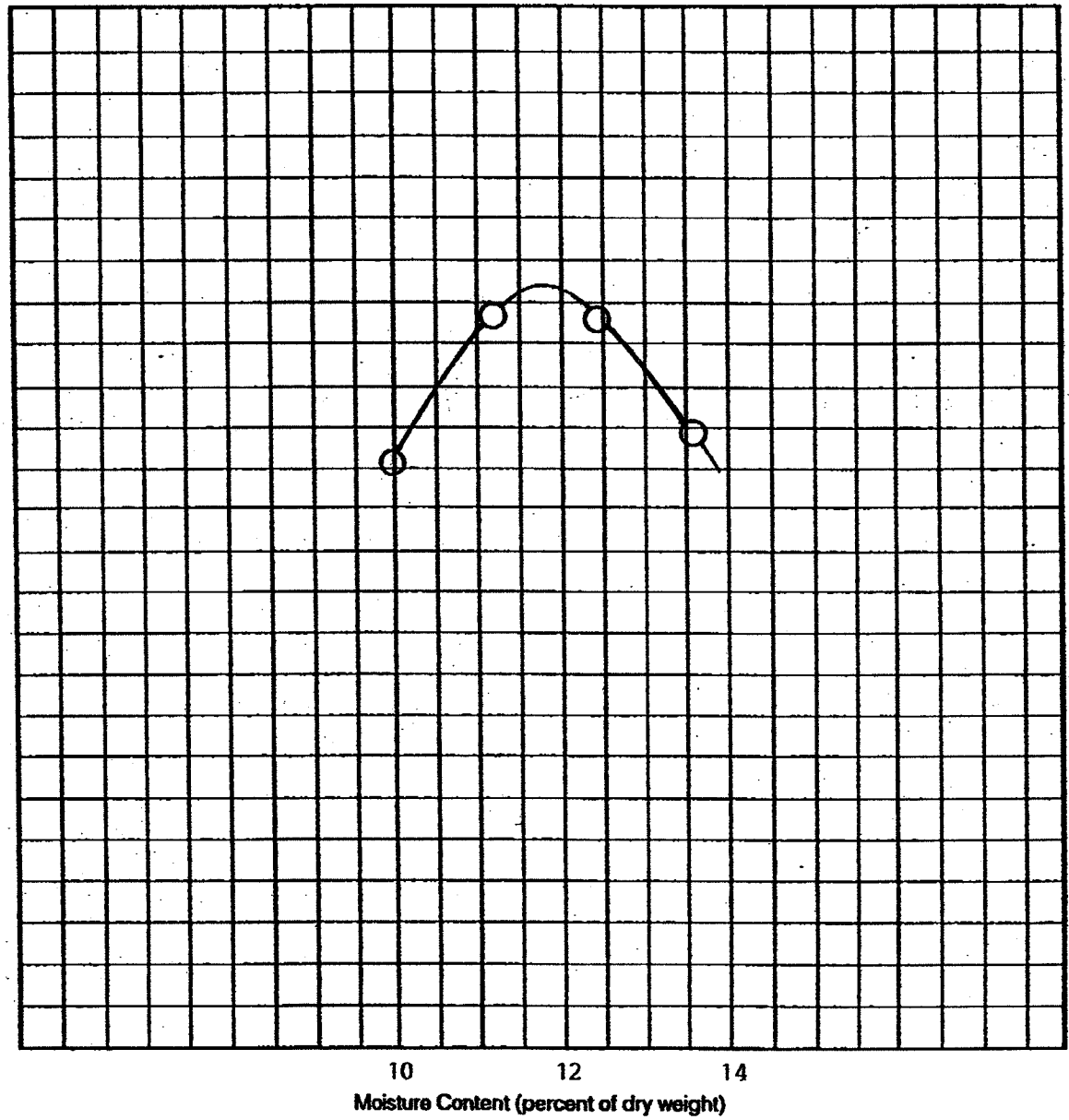
Project Number 610337

Date December 19, 2006

Test Method ASTM D-698

Source 610337-03

MOISTURE DENSITY RELATIONSHIP



Maximum Dry Density (Lbs./Cu.Ft.) 123.4

Optimum Moisture Content (%) 11.8

Type of Material: Sandy Lean Clay - Gray, low plasticity, trace gravel

Earth Liner - Test Fill

Clinton Landfill #3

PDC Technical Services, Inc.

SKS ENGINEERS, INC.
CONSULTING ENGINEERS
2300 N. MARTIN LUTHER KING, JR. DRIVE
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www.sksengineers.com

December 29, 2006

Project No. 10337

PDC Technical Services
P.O. Box 9071
Peoria, IL 61612-9071

ATTN: Mr. John Berry

RE: **Test Fill Clinton Landfill No.3**

PERMEABILITY TEST RESULTS
ASTM D-5084

Sample and Classification Data

Sample Identification: 610337-03
Sample Obtained By: SKS
Sample Depth/Elevation: 0.0
Description: SANDY LEAN CLAY - Gray, low plasticity, trace gravel
USCS Classification: CL
Natural Moisture Content: 13.5%
Liquid Limit: 24.0
Plasticity Index: 10.0
Soil Particle Sizes: Gravel 3.10% Silt 29.00% Sand 32.30% Clay 35.60%

Test Specimen Data

Specimen Type: FLEXIBLE WALL
Diameter: 7.23 cm.
Length: 8.2 cm.
Area: 41.06 sq. cm.
Volume: 336.65 cu. cm.
Wet Weight Before Test: 754.8 gm.
Wet Weight After Test: 754.5 gm.
Dry Weight: 665.7 gm.
Initial Moisture: 13.4%
Final Moisture: 13.3%
Dry Density: 1.98 gm./cc.
Void Ratio: 0.35
Initial Saturation: 100.34%

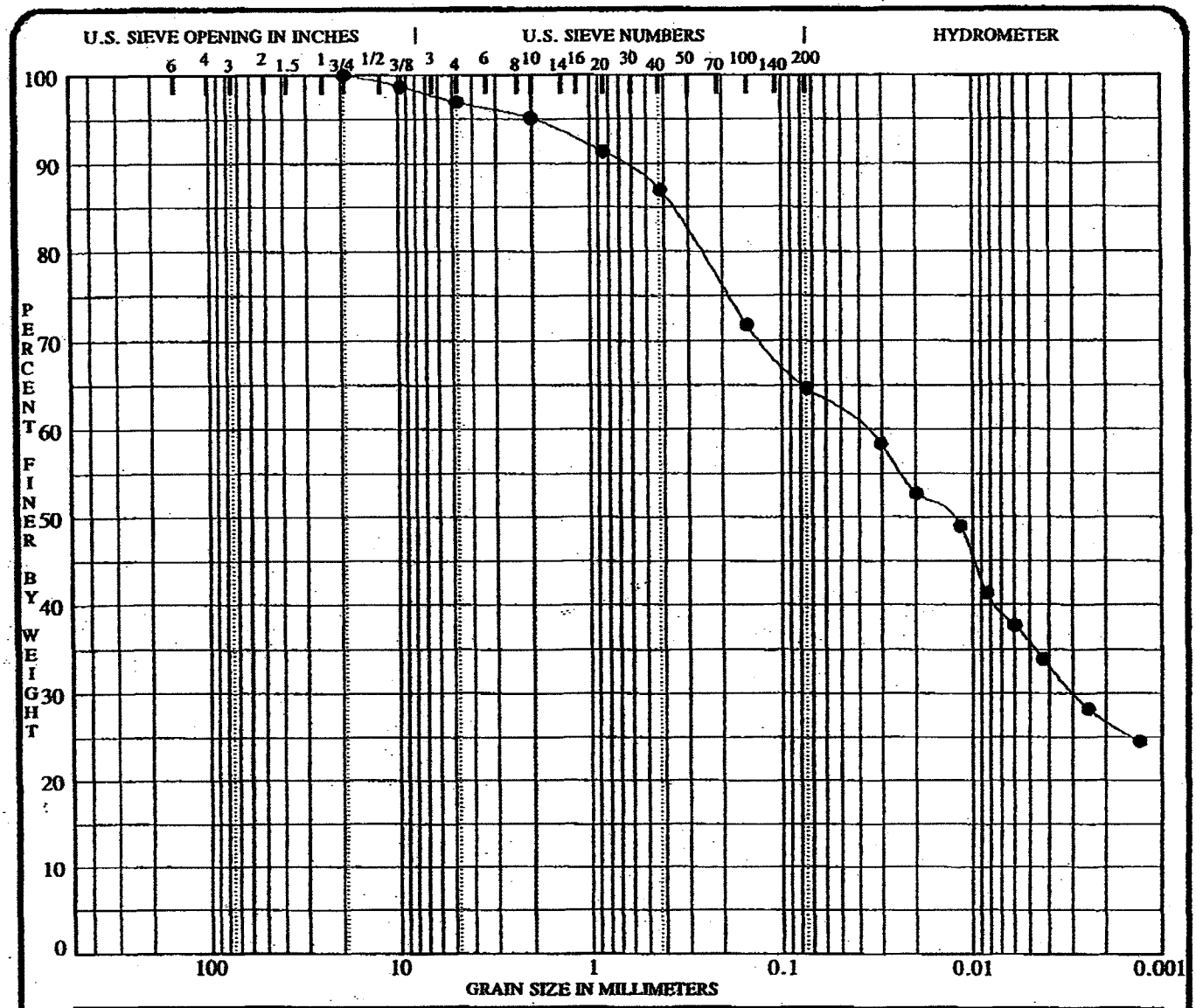
Testing Data and Results

Test Apparatus: GEOTEST

Cell Confining Pressure	30.0 psi =	2,110.20 cm of H_2O	Permeant Liquid:	0.005 N $CaSO_4$
Back Pressure	25.0 psi =	1,758.50 cm of H_2O		
Driving Pressure	2.0 psi =	140.68 cm of H_2O	Temperature:	24.0 °C
Hydraulic Gradient:	17.16		Temperature Correction Factor:	0.91
Time Req'd. for Saturation:	24 hours	Amount of Flow 7.3525 ml		
Time for Permeability Test:	166.6 hours	Amount of Flow 7.05 ml	Permeability: (k) =	1.55E-08 cm/sec

Remarks:

By: Robert Wright



COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

	Specimen Identification		Classification	MC%	LL	PL	PI	Cc	Cu
●	10337-03	0.0	SANDY LEAN CLAY CL	12	24	15	10		

ASTM D-4318
Atterberg Limits

	Specimen Identification		D100	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
●	10337-03	0.0	19.10	0.04	0.003		3.1	32.3	29.0	35.6

ASTM D-422
Soil Grain Size

NOTE: % Silt and % Clay based on ASTM Classification (0.005mm)

PROJECT Test Fill - Clinton Landfill No. 3 JOB NO. 610337
DATE December 29, 2006

GRADATION CURVES

SKS ENGINEERS, INC.
Decatur, IL

Clinton Landfill No. 3 qus07Jan31.xls
PDC Technical Services, Inc.

		610337-01			610337-02		
610337-01 & 610337-02	**Units**	**S-1 1**	**S-1 2**	**S-1 3**	**S-2 1**	**S-2 2**	**S-3 3**
Soil Wet + Tare Wt.	grams	436.00	436.00	436.00	431.20	431.20	431.20
Soil Dry + Tare Wt.	grams	389.30	389.30	389.30	384.00	384.00	384.00
Tare Wt.	grams	0.00	0.00	0.00	0.00	0.00	0.00
Soil Dry Weight	grams	389.30	389.30	389.30	384.00	384.00	384.00
Per Cent Moisture	%	12.00	12.00	12.00	12.29	12.29	12.29
Sample Height	inches	4.00	4.00	4.00	4.00	4.00	4.00
Sample Diameter	inches	2.00	2.00	2.00	2.00	2.00	2.00
Strain Gage	inches	0.24	0.22	0.23	0.33	0.32	0.33
Load Gage	inches	0.051	0.053	0.074	0.072	0.070	0.077
Load	pounds	159.90	164.60	163.00	251.70	239.90	247.80
Unconfined Comp. Strength	psf	6898.67	7129.73	7041.75	10585.24	10116.49	10421.23
610337-03	**Units**	**S-3 1**	**S-3 2**	**S-3 3**			
Soil Wet + Tare Wt.	grams	441.60	441.60	441.60			
Soil Dry + Tare Wt.	grams	394.00	394.00	394.00			
Tare Wt.	grams	0.00	0.00	0.00			
Soil Dry Weight	grams	394.00	394.00	394.00			
Per Cent Moisture	%	12.08	12.08	12.08			
Sample Height	inches	4.00	4.00	4.00			
Sample Diameter	inches	2.00	2.00	2.00			
Strain Gage	inches	0.48	0.46	0.47			
Load Gage	inches	0.051	0.053	0.074			
Load	pounds	263.50	251.70	327.00			
Unconfined Comp. Strength	psf	10628.57	10210.29	13227.39			

Unconfined Compressive Strength of Cohesive Soils
ASTM D-2166

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January 3, 2007

Project No. 10337

PDC Technical Services
P.O. Box 9071
Peoria, IL 61612-9071

ATTN: Mr. John Berry

RE: **Test Fill Clinton Landfill No.3**

PERMEABILITY TEST RESULTS
ASTM D-5084

Sample and Classification Data

Sample Identification: 610337-04/N5360E7887
Sample Obtained By: SKS
Sample Depth/Elevation: 714.9
Description: SANDY LEAN CLAY - Gray, low plasticity, trace gravel
USCS Classification: CL
Natural Moisture Content: 11.7%
Liquid Limit: 23.0
Plasticity Index: 12.0
Soil Particle Sizes: Gravel 1.50% Silt 24.00% Sand 34.80% Clay 39.70%

Test Specimen Data

Specimen Type: FLEXIBLE WALL
Diameter: 7.28 cm.
Length: 6.7 cm.
Area: 41.62 sq. cm.
Volume: 278.89 cu. cm.
Wet Weight Before Test: 636.7 gm.
Wet Weight After Test: 638.2 gm.
Dry Weight: 564.7 gm.
Initial Moisture: 12.8%
Final Moisture: 13.0%
Dry Density: 2.02 gm./cc.
Void Ratio: 0.34
Initial Saturation: 97.96%

Testing Data and Results

Test Apparatus: GEOTEST

Cell Confining Pressure	30.0 psi =	2,110.20 cm of H_2O	Permeant Liquid:	0.005 N $CaSO_4$
Back Pressure	25.0 psi =	1,758.50 cm of H_2O		
Driving Pressure	2.0 psi =	140.68 cm of H_2O	Temperature:	24.0 °C
Hydraulic Gradient:	21.00		Temperature Correction Factor:	0.91
Time Req'd. for Saturation:	2.5 hours	Amount of Flow 31.83 ml		
Time for Permeability Test:	166.6 hours	Amount of Flow 30.913 ml	Permeability: (k) =	5.49E-08 cm/sec

Remarks:

By: Robert Wright

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March 12, 2007

Project No. 10337

PDC Technical Services
P.O. Box 9071
Peoria, IL 61612-9071

ATTN: Mr. John Berry

RE: **Test Fill - CLI #3**

PERMEABILITY TEST RESULTS
ASTM D-5084

Sample and Classification Data

Sample Identification: 610337-04H N5360 E7887
Sample Obtained By: SKS
Sample Depth/Elevation: 714.0
Description: SANDY LEAN CLAY - Gray, low plasticity, trace gravel
USCS Classification: CL
Natural Moisture Content: -4.6%
Liquid Limit: 25.0
Plasticity Index: 11.0
Soil Particle Sizes: Gravel 3.10% Silt 28.80% Sand 32.50% Clay 35.60%

Test Specimen Data

Specimen Type: FLEXIBLE WALL
Diameter: 7.28 cm.
Length: 7 cm.
Area: 41.62 sq. cm.
Volume: 291.37 cu. cm.
Wet Weight Before Test: 656.7 gm.
Wet Weight After Test: gm.
Dry Weight: gm.
Initial Moisture:
Final Moisture:
Dry Density: gm./cc.
Void Ratio:
Initial Saturation:

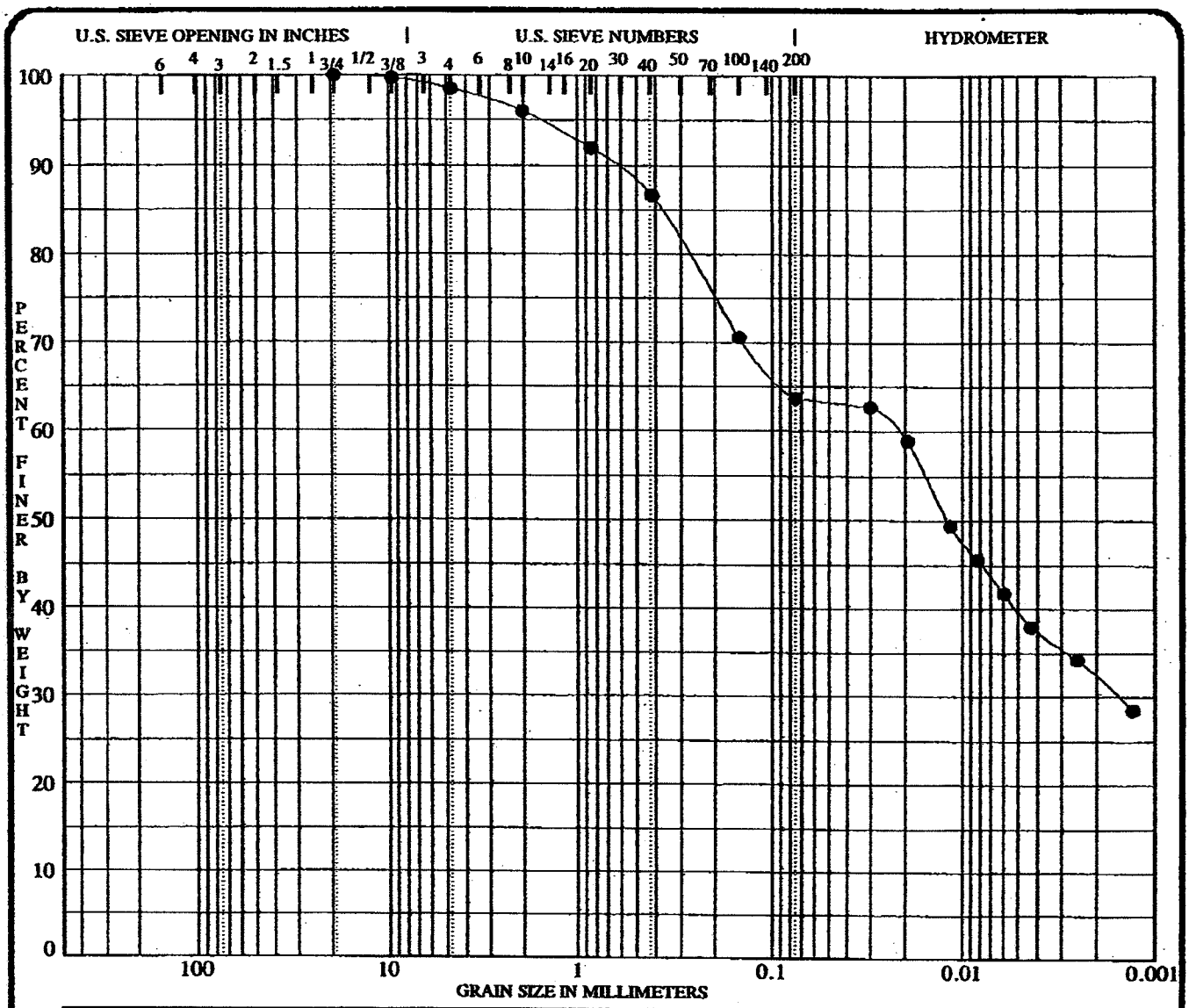
Testing Data and Results

Test Apparatus: GEOTEST
Cell Confining Pressure 30.0 psi = 2,110.20 cm of H_2O
Back Pressure 25.0 psi = 1,758.50 cm of H_2O
Driving Pressure 2.0 psi = 140.68 cm of H_2O
Hydraulic Gradient: 20.10
Time Req'd. for Saturation: 5 hours Amount of Flow 34.095 ml
Time for Permeability Test: 166.6 hours Amount of Flow 32.245 ml
Permeant Liquid: 0.005 N $CaSO_4$
Temperature: 24.0 °C
Temperature Correction Factor: 0.91

Permeability: (k) = 5.98E-08 cm/sec

Remarks:

By:



COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

Specimen Identification	Classification	MC%	LL	PL	PI	Cc	Cu
● 10337-04 714.9	SANDY LEAN CLAY CL	11	23	11	12		

ASTM D-4318
Atterberg Limits

Specimen Identification	D100	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
● 10337-04 714.9	19.10	0.02	0.002		1.5	34.8	24.0	39.7

ASTM D-422
Soil Grain Size

NOTE: % Silt and % Clay based on ASTM Classification (0.005mm)

PROJECT Test Fill - Clinton Landfill No. 3

JOB NO. 610337
DATE January 2, 2007

GRADATION CURVES

SKS ENGINEERS, INC.
Decatur, IL

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March 21, 2007

Project No. 10337

PDC Technical Services
P.O. Box 9071
Peoria, IL 61612-9071

ATTN: Mr. John Berry

RE: **Test Fill - CLI #3**

PERMEABILITY TEST RESULTS

ASTM D-5084

Sample and Classification Data

Sample Identification: 610337-05/N5344 E7907
Sample Obtained By: SKS
Sample Depth/Elevation: 713.8
Description: SANDY LEAN CLAY - Gray, low plasticity, trace gravel
USCS Classification: CL
Natural Moisture Content: 12.1%
Liquid Limit: 25.0
Plasticity Index: 10.0
Soil Particle Sizes: Gravel 2.70% Sand 32.50% Silt 26.70% Clay 38.10%

Test Specimen Data

Specimen Type: FLEXIBLE WALL
Diameter: 7.28 cm.
Length: 9.05 cm.
Area: 41.62 sq. cm.
Volume: 376.70 cu. cm.
Wet Weight Before Test: 838.8 gm.
Wet Weight After Test: 843.2 gm.
Dry Weight: 751.0 gm.
Initial Moisture: 11.7%
Final Moisture: 12.3%
Dry Density: 1.99 gm./cc.
Void Ratio: 0.33
Initial Saturation: 95.23%

Testing Data and Results

Test Apparatus: GEOTEST

Cell Confining Pressure	30.0 psi =	2,110.20 cm of H_2O		
Back Pressure	25.0 psi =	1,758.50 cm of H_2O		
Driving Pressure	2.0 psi =	140.68 cm of H_2O		
Hydraulic Gradient:	15.54			
Time Req'd. for Saturation:	22 hours	Amount of Flow	8.1 ml	
Time for Permeability Test:	166.6 hours	Amount of Flow	5.45 ml	

Permeant Liquid: 0.005 N $CaSO_4$
Temperature: 24.0 °C
Temperature Correction Factor: 0.91

Permeability: (k) = 1.31E-08 cm/sec

Remarks:

By: Robert Wright

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March 11, 2007

Project No. 10337

PDC Technical Services
P.O. Box 9071
Peoria, IL 61612-9071

ATTN: Mr. John Berry

RE: **Test Fill Clinton Landfill No.3**

PERMEABILITY TEST RESULTS
ASTM D-5084

Sample and Classification Data

Sample Identification: 610337-05H N5344 E7907
Sample Obtained By: SKS
Sample Depth/Elevation: 714.4
Description: SANDY LEAN CLAY - Gray, low plasticity, trace gravel
USCS Classification: CL
Natural Moisture Content: 12.5%
Liquid Limit: 22.0
Plasticity Index: 10.0
Soil Particle Sizes: Gravel 3.00% Silt 25.50% Sand 34.30% Clay 37.20%

Test Specimen Data

Specimen Type: FLEXIBLE WALL
Diameter: 7.28 cm.
Length: 8 cm.
Area: 41.62 sq. cm.
Volume: 333.00 cu. cm.
Wet Weight Before Test: 768.6 gm.
Wet Weight After Test: 768.2 gm.
Dry Weight: 682.7 gm.
Initial Moisture: 12.6%
Final Moisture: 12.5%
Dry Density: 2.05 gm./cc.
Void Ratio: 0.33
Initial Saturation: 100.47%

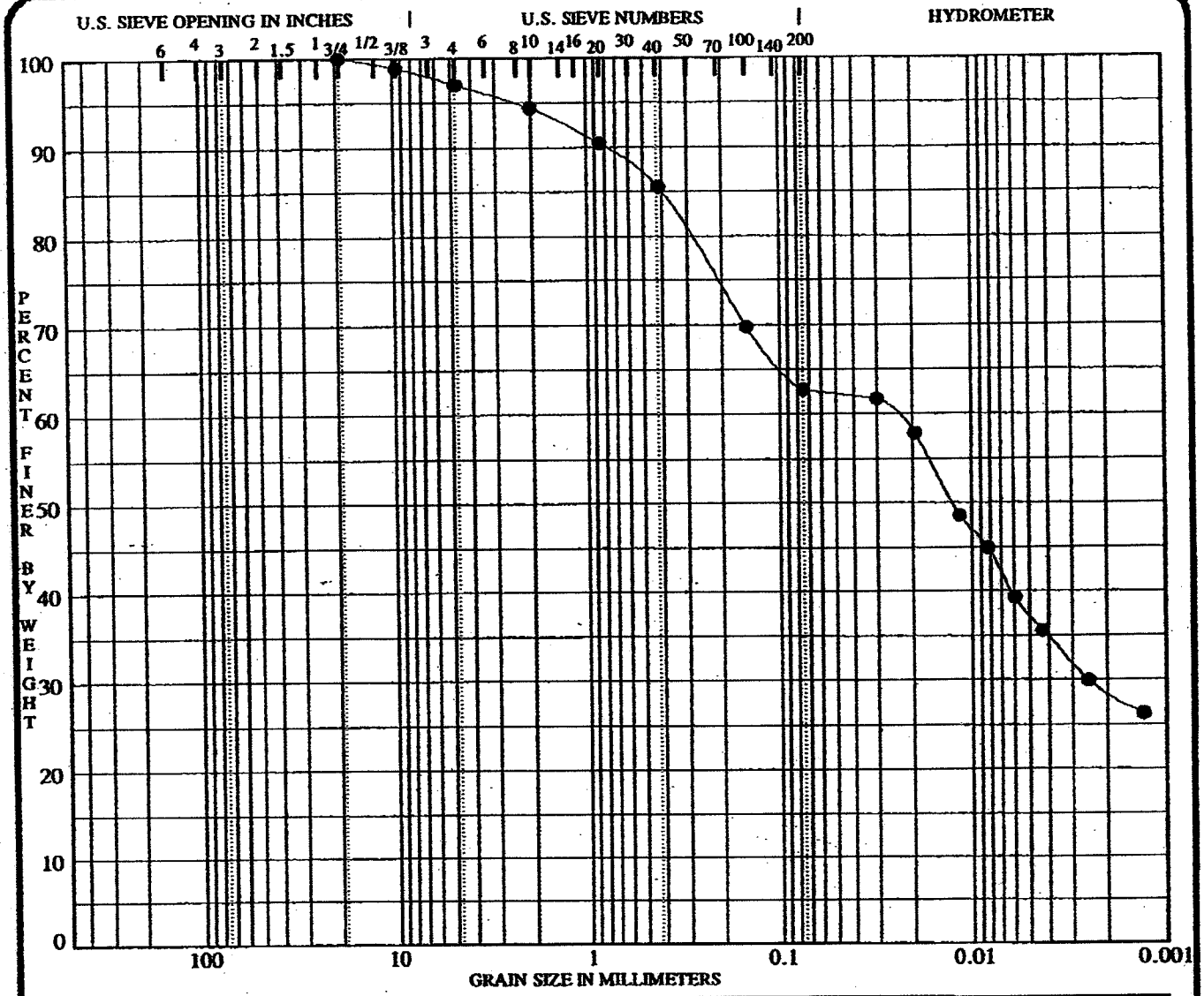
Testing Data and Results

Test Apparatus: GEOTEST
Cell Confining Pressure 30.0 psi = 2,110.20 cm of H_2O
Back Pressure 25.0 psi = 1,758.50 cm of H_2O
Driving Pressure 2.0 psi = 140.68 cm of H_2O
Hydraulic Gradient: 17.59
Time Req'd. for Saturation: 2.5 hours Amount of Flow 5.345 ml
Time for Permeability Test: 166.6 hours Amount of Flow 5.215 ml
Permeant Liquid: 0.005 N $CaSO_4$
Temperature: 24.0 °C
Temperature Correction Factor: 0.91

Permeability: (k) = 1.11E-08 cm/sec

Remarks:

By: Robert Wright



COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

	Specimen Identification	Classification	MC%	LL	PL	PI	Cc	Cu
●	10337-05 714.4	SANDY LEAN CLAY CL	12	22	12	10		

ASTM D-4318
Atterberg Limits

	Specimen Identification	D100	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
●	10337-05 714.4	19.10	0.02	0.003		3.0	34.3	25.5	37.2

ASTM D-422
Soil Grain Size

NOTE: % Silt and % Clay based on ASTM Classification (0.005mm)

PROJECT Test Fill - Clinton Landfill No. 3 JOB NO. 610337

DATE January 2, 2007

GRADATION CURVES

SKS ENGINEERS, INC.

Decatur, IL

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January 3, 2007

Project No. 10337

PDC Technical Services
P.O. Box 9071
Peoria, IL 61612-9071

ATTN: Mr. John Berry

RE: **Test Fill Clinton Landfill No.3**

PERMEABILITY TEST RESULTS

ASTM D-5084

Sample and Classification Data

Sample Identification: 610337-06/N5324E7899
Sample Obtained By: SKS
Sample Depth/Elevation: 713.1
Description: SANDY LEAN CLAY - Gray, low plasticity, trace gravel
USCS Classification: CL
Natural Moisture Content: 11.4%
Liquid Limit: 23.0
Plasticity Index: 12.0
Soil Particle Sizes: Gravel 21.00% Silt 22.60% Sand 34.60% Clay 40.70%

Test Specimen Data

Specimen Type: FLEXIBLE WALL
Diameter: 7.28 cm.
Length: 8.18 cm.
Area: 41.62 sq. cm.
Volume: 340.49 cu. cm.
Wet Weight Before Test: 756.0 gm.
Wet Weight After Test: 757.0 gm.
Dry Weight: 674.1 gm.
Initial Moisture: 12.1%
Final Moisture: 12.3%
Dry Density: 1.98 gm./cc.
Void Ratio: 0.33
Initial Saturation: 98.79%

Testing Data and Results

Test Apparatus: GEOTEST
Cell Confining Pressure 30.0 psi = 2,110.20 cm of H_2O
Back Pressure 25.0 psi = 1,758.50 cm of H_2O
Driving Pressure 2.0 psi = 140.68 cm of H_2O
Hydraulic Gradient: 17.20
Time Req'd. for Saturation: 2.5 hours Amount of Flow 6.4 ml
Time for Permeability Test: 166.6 hours Amount of Flow 6.195 ml
Permeant Liquid: 0.005 N $CaSO_4$
Temperature: 24.0 °C
Temperature Correction Factor: 0.91

Permeability: (k) = 1.34E-08 cm/sec

Remarks:

By: Robert Wright

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March 11, 2007

Project No. 10337

PDC Technical Services
P.O. Box 9071
Peoria, IL 61612-9071

ATTN: Mr. John Berry

RE: **Test Fill - CLI #3**

PERMEABILITY TEST RESULTS
ASTM D-5084

Sample and Classification Data

Sample Identification: 610337-06H N5324 E7899
Sample Obtained By: SKS
Sample Depth/Elevation: 712.5
Description: SANDY LEAN CLAY - Gray, low plasticity, trace gravel
USCS Classification: CL
Natural Moisture Content: 11.0%
Liquid Limit: 24.0
Plasticity Index: 10.0
Soil Particle Sizes: Gravel 3.10% Silt 29.00% Sand 32.30% Clay 35.60%

Test Specimen Data

Specimen Type: FLEXIBLE WALL
Diameter: 7.2 cm.
Length: 7.05 cm.
Area: 40.72 sq. cm.
Volume: 287.04 cu. cm.
Wet Weight Before Test: 637.5 gm.
Wet Weight After Test: 645.5 gm.
Dry Weight: 574.4 gm.
Initial Moisture: 11.0%
Final Moisture: 12.4%
Dry Density: 2.00 gm./cc.
Void Ratio: 0.33
Initial Saturation: 88.75%

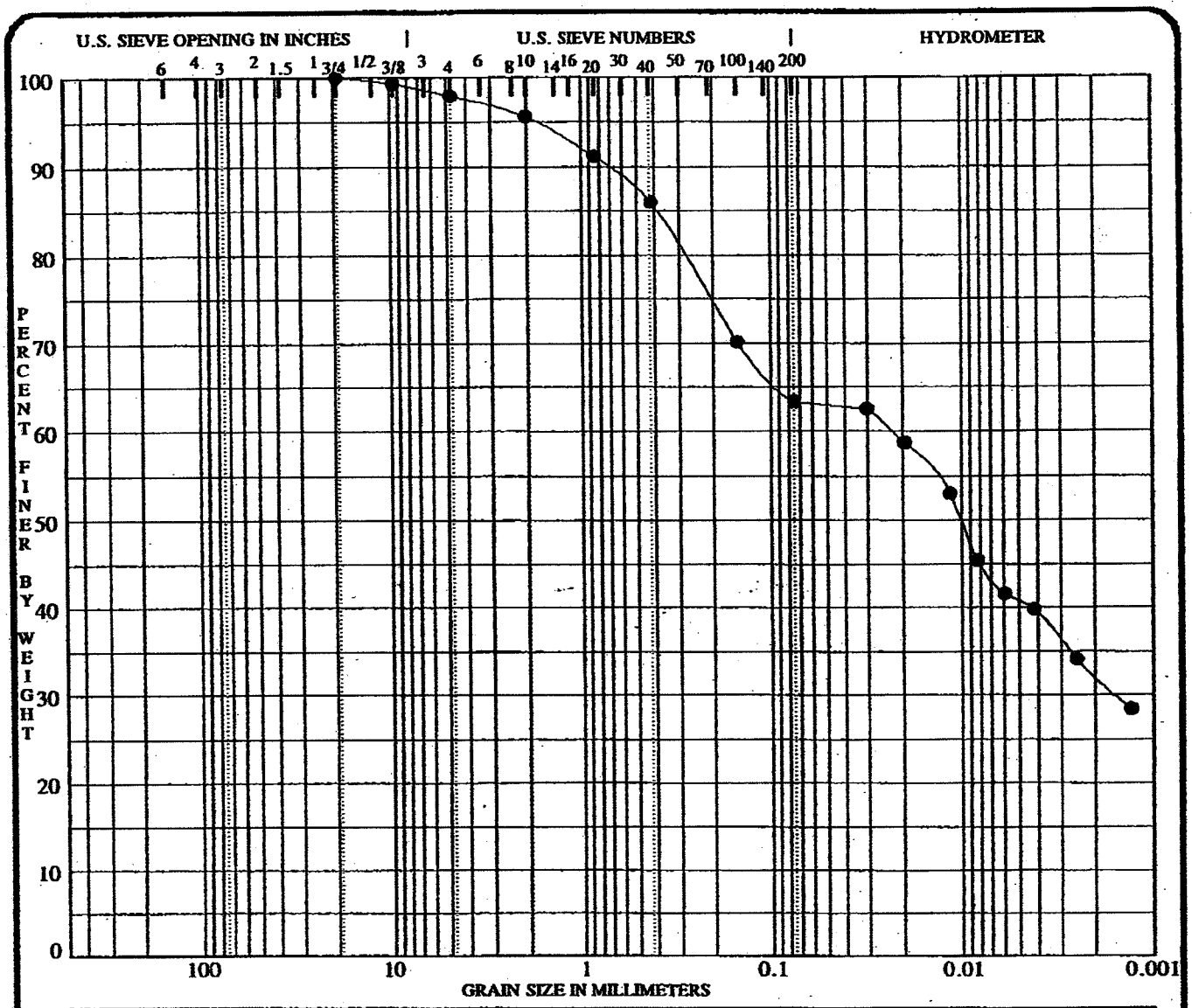
Testing Data and Results

Test Apparatus: GEOTEST
Cell Confining Pressure 30.0 psi = 2,110.20 cm of H_2O
Back Pressure 25.0 psi = 1,758.50 cm of H_2O
Driving Pressure 2.0 psi = 140.68 cm of H_2O
Hydraulic Gradient: 19.95
Time Req'd. for Saturation: 22 hours Amount of Flow 15.505 ml
Time for Permeability Test: 166.6 hours Amount of Flow 9.065 ml
Permeant Liquid: 0.005 N $CaSO_4$
Temperature: 24.0 °C
Temperature Correction Factor: 0.91

Permeability: (k) = 1.73E-08 cm/sec

Remarks:

By: Robert Wright



COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

	Specimen Identification	Classification	MC%	LL	PL	PI	Cc	Cu
●	10337-06 713.1	SANDY LEAN CLAY CL	280	23	11	12		

ASTM D-4318
Atterberg Limits

	Specimen Identification	D100	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
●	10337-06 713.1	19.10	0.02	0.002		2.1	34.6	22.6	40.7

ASTM D-422
Soil Grain Size

NOTE: % Silt and % Clay based on ASTM Classification (0.005mm)

PROJECT Test Fill - Clinton Landfill No. 3 JOB NO. 610337

DATE January 2, 2007

GRADATION CURVES

SKS ENGINEERS, INC.

Decatur, IL

SECTION 6

PERMEABILITY COMPARISON

BOUTWELL FIELD PERMEABILITY RESULTS TO LABORATORY PERMEABILITY RESULTS COMPARISON

	Boutwell Field Permeability Results		Laboratory Permeability Results
Unit #1	2.75×10^{-8} vertically	610337-04	5.49×10^{-8} vertically
	4.41×10^{-9} horizontally	610337-04H	5.98×10^{-8} horizontally
Unit #3	7.45×10^{-8} vertically	610337-05	1.31×10^{-8} vertically
	2.26×10^{-8} horizontally	610337-05H	1.11×10^{-8} horizontally
Unit #4	6.09×10^{-8} vertically	610337-06	1.34×10^{-8} vertically
	2.44×10^{-9} horizontally	610337-06H	1.73×10^{-8} horizontally

Average Permeability Results

Field Permeability	Laboratory Permeability
5.43×10^{-8} V	2.71×10^{-8} V 2.00 Multiplier
3.28×10^{-9} H	2.94×10^{-8} H 1.11 Multiplier
	Avg. 1.58 Multiplier

Conclusion

Field permeability results are approximately two (2) times more permeable than the laboratory permeability test results when pushed vertically; and the laboratory permeability results are essentially equal to the permeability when the samples are pushed horizontally.

Example

If laboratory permeability results were: 2.0×10^{-8} vertically and 4.0×10^{-8} horizontally.

The comparison above, using calculated multiplier, would result in actual numbers, in the field, of:

4.00×10^{-8} vertically and 4.40×10^{-8} horizontally