COMMONWEALTH OF MASSACHUSETTS
THE TRIAL COURT
SUFFOLK SUPERIOR COURT

Suffolk, ss

COMMONWEALTH OF MASSACHUSETTS, Plaintiff	§ § §	
V.	§ §	CA # SUCV2006-00790
NEW VENTURES ASSOCIATES, LLC, Defendant	§ §	

EXHIBIT "D"

REPORT ON ADDITIONAL GEOTECHNICAL FIELD AND LABORATORY INVESTIGATIONS

Crow Lane Landfill
Newburyport, Massachusetts

by

GEOCOMP Corporation
Boxborough, Massachusetts

for

New Ventures Associates LLC

June 16, 2009

1. INTRODUCTION

1.1 GENERAL

New Ventures Associates, LLC (New Ventures) as part of a Corrective Action Design, is constructing a berm around the perimeter of the landfill to establish a system of swales to convey storm water from the landfill to two (2) detention basins. The berm is to also provide a stable base for regrading the landfill. Existing waste was pushed back from wetlands abutting the landfill, so that the edge of waste is within the limits defined by the berm.

The maximum height of the berm will be 43 feet. The average outboard slope was originally designed as relatively steep (1H: 1V) and would have armored slope protection. The berm was to be constructed using structural fill consisting of processed crushed concrete (3-inch max. size) or crushed rock (6-inch max. size). Soft, organic soils that existed in the abutting wetlands were removed from beneath the proposed berm footprint area prior to berm construction.

Currently the berm is partially complete. Geocomp Corporation and Sitec Engineering are preparing a final design for completion of the perimeter berm. At the present time the design consists of flattening all berms slopes to 1.5 Horizontal: 1 Vertical. Where there is not sufficient area to flatten the slope to 1.5:1 the top of the slope will be buttressed with a boulder wall. The current design for all increases in height of the perimeter berm from the existing elevations includes Mechanically Stabilized Earth (MSE) construction.

The proposed design assumed competent granular foundation soils. Further, the existing berm was assumed to consist of processed crushed concrete systematically placed and compacted in controlled lifts, as encountered in test pits excavated and observed by Geocomp on 3 April, 2006 and documented in a letter report from Geocomp to Sitec Environmental dated 12 June 2006. A letter report from Geocomp to Site Engineering dated 31 August 2007 presented construction observations by New Ventures personal that supported the assumption that organic soils beneath the existing berms had been over excavated and replaced with granular fill. However, the exact locations and dates of the observations were not conclusive. Therefore, a boring program was established and performed to determine actual foundation conditions.

This report presents the geotechnical data collected from the recent exploration program and comments on the impact of conditions encountered on the proposed perimeter berm design for the Crow Lane Landfill in Newburyport, Massachusetts. Figure 1 of this report shows the location map for the landfill.

1.2 PURPOSE AND SCOPE

Based on the field investigations and laboratory testing conducted, this report includes the following items:

1. Results of test borings drilled in the area of the existing and proposed perimeter berm. The purpose of the borings was to ascertain and verify the conditions and materials within and below the perimeter berm along the southwest and northwest portions of the berm.
2. Results of test pits excavated at the base of the existing perimeter berm.
3. Results of laboratory testing performed on undisturbed samples collected from the borings.
4. Assessment of the new information to evaluate the validity of the following design assumptions:
    a. Dense coarse-grained soils within the berm.
    b. Below the berm the soil strength represented by a friction angle of 35 degrees.
5. Description of any modifications to the proposed perimeter berm design that may be required as a result of conditions encountered.

2. BORING AND SAMPLING PROTOCOL

The original agreed upon protocol established required soils to be sampled at 6 boring locations designated B-1 through B-6, as shown on the attached plan prepared by Sitec. Split-spoon samples were collected from each boring at 5 foot intervals through the berm to a depth of 2 feet above the expected base of the berm. From this depth to refusal (defined in the following sections), the soils were to be sampled continuously. Due to the underlying deposits of relatively soft cohesive soils that were encountered, the protocol was modified as follows.

- The original 6 berm borings were terminated when they encountered refusal or natural materials.
- An additional 7 borings designated B-7 through B-13 were added at the toe of the berm, to sample the soft cohesive soils. All 7 of these borings were drilled into the underlying dense gravel or bedrock.

The protocol also required that, if soft soils were discovered in the berm, the lateral extent of these soils would be probed using borings spaced to either side. Further, as discussed in the following section, Boring B-5 encountered organic soils within the berm itself. As a result, additional borings (B-5A, B, C, D, E and boring B-4A) were drilled to probe the lateral extent of the organic zone.

The subsurface conditions encountered in the borings are presented in the boring logs in Appendix A.

Six Test pits were also excavated opposite each boring at the base of the berm, as shown in the location plan (Figure 1). Observations from the Test Pits are documented in Appendix B. All the test pits penetrated through loamy soils and previously placed granular soils during removal of organic soil. All the tests pits terminated in either the top of the fine sand/silt/clay strata or on bedrock.

Sampling was performed using the Split-barrel sampler used in conjunction with the Standard Penetration Test (SPT), as specified in ASTM D1586. The sampler provided disturbed samples representing the 2 foot length that the sampler is driven.

The fine grained or organic soils were sampled using a Thin-Walled Shelby Tube sampler. In general, one Shelby tube sample was collected of the underlying silt and clay strata from each boring.

3. LABORATORY TESTING

Laboratory Sieve Analysis (ASTM D422) or Hydrometer (ASTM 422) tests were performed on samples from each distinctive layer. The purpose of these tests is to document and classify the materials.

Table 1 presents a summary of the laboratory testing performed. The results of the laboratory testing are presented in Appendix C.

Table 1: Summary of laboratory Tests

Sample Id	Grain Size (ASTM D 422)	Triaxial Shear (ASTM D 4767)	Organic Content (ASTM D 2794)
Boring 1 S-3 8-10 ft	Sieve Only		
Boring 1 S-6 2-21.5 ft	Sieve Only		
Boring 2 S-3 8-10 ft	Sieve Only		
Boring 2 S-9 29-31 ft	Sieve Only		
Boring 3E S-4 10-12 ft	Sieve Only		
Boring 4 S-3 10-12 ft	Sieve Only		
Boring 4 T-1 39.0 ft	Sieve Only		
Boring 5 S-3 8-10 ft	Sieve Only		
Boring 5 S-5 17-19 ft	Sieve Only		
Boring 6 S-3 8-10 ft	Sieve Only		
Boring 6 S-6 22-24 ft	Sieve Only		
Boring 2 T-3 47 ft	Hydro	33 psi	
Boring 4 T-2 42.5 ft	Hydro	30 psi	
Boring 7 T-1 19.0 ft	Hydro	8.5 psi	
Boring 9 T-1 19.0 ft	Hydro	8.5 psi	
Boring 10 T-1 29.0 ft	Sample is highly disturbed not tested		
Boring 11 T-1 21.0 ft	Hydro	16.2 psi	

4. GEOTECHNICAL CONDITIONS

4.1 Subsurface Conditions

Subsurface conditions are summarized in the profile along the berm presented in Figure 2. Section AA is a critical section that was used in the re-analysis of the proposed berm design.

The generalized stratigraphy encountered in the explorations is summarized as follows:

1. The upper 8 feet of the berm is very dense processed construction debris, consisting of crushed concrete, bricks, asphalt grindings, sand gravel, and occasional boulders
2. The lower sections of the berm contain less boulder size fragments and a higher silt and sand content.
3. The granular berm materials overlay, an additional 3 to 8 feet of granular sand, gravel and cobble materials. , Some silt fill, with thin (less than 6 inch) discontinuous organic materials were sporadically encountered. This stratum represents the excavated and replaced organic soils that were documented in a letter report from Geocomp to Sitec Engineering, dated 08/31/2007
4. Between Borings B-5 towards B-4 (See Figure 2) a maximum 8 ft. thick zone of decomposing wood fiber and organic material was encountered within the existing berm.
5. Underlying the excavated and replaced organic soils is a fine sand, silt, and clay (relatively soft) stratum ranging in excess of 40 ft. in thickness.

4.2 Geotechnical Design Parameters

The revised geotechnical design parameters are presented in Table 3. The strength parameters for the berm are unchanged from the current design assumption. The basis for this strength is discussed in section 5.2 of this report. However this strength does not apply to the section of the berm that contains a significant layer of organic fill as shown in Figure 2. This organic berm material between boring B-5A and B-4A are to be strengthened with stabilization or removed as discussed in section 5.3 of this report.

Figure 4 presents the undrained strength versus elevation for the silt and clay layer strata in the berm foundations. The strength of the clay below the berm is significantly higher than the strength at the toe of the berm. This corresponds with the known behavior that clay gains strength with consolidation. We have therefore recommended lower bound clay strength for the clay outside the existing berm, and higher clay strength for the clay below the berm. The design values are shown on the strength plot (figure 4) and are summarized in Table 3.

Table 3: Summary of Geotechnical Design Parameters

Stratum	Unit Weight (pcf)	Cohesion (psf)	Friction Angle (degrees)
Existing Berm Materials	120	0	40
Natural Silt and Clay Foundation Soils	120	Varies from 875 at berm toe to 1,850 below landfill proper	0
Zone of Organic Materials within Berm	To be removed or stabilized in-situ		

4.2 Ground Water

The groundwater level observed in the test pits is approximately 3 feet below the toe of the berm. The groundwater elevation is not significantly different than that used in the current design.

Sample Id	Grain Size (ASTM D 422)	Triaxial Shear (ASTM D 4767)	Organic Content (ASTM D 2794)
Boring 12 T-1 14.0 ft	Hydro	10.0 psi	
Test Pit 3 T-1 3.5 ft	Hydro	2.3 psi	
Boring 5A 17-19 ft	No Sample		
Boring 5B S-5 15-17 ft			Organic
Boring 5C S-4 20-22 ft			Organic
Boring 5D S-4 14-16 ft			Organic

Strength of coarse grained soils is determined using standard methods employing the SPT-N Values measured during the sampling. Figure 3 presents a plot of the SPT N-values versus elevation for the material encountered in and immediately below the berm.

Strength of the silt and clay layer was determined from consolidated undrained laboratory triaxial compression tests (ASTM D4767) on Shelby tube samples. The samples were isotropicaly consolidated to the effective vertical stress corresponding to the existing conditions. Figure 3 presents laboratory strength results for the silt clay layer versus elevation.

Table 2 presents a summary of the undrained strength of the silt and clay layer. This data is presented in Figure 4 as strength versus depth.

Table 2: Summary of laboratory Tests

Boring	Surface El	Tube	Test	Depth (feet)	Elevation (feet)	Su (psf)	Sigma3 (psf)
B-02	52.9	T-3	CU-4	46.0	6.9	1852	4752
B-04	58.6	T-2	CU-5	42.5	16.1	1355	4319
B-07	34.6	T-1	CU-3	18.0	16.6	897	1224
B-09	38.1	T-1	CU-2	21.0	17.1	876	1223
B-11	38.0	T-1	CU-7	21.0	17.0	1416	2328
B-12	37.0	T-1	CU-6	14.0	23.0	1412	1440
TP-3	33.2	T-1	CU-1	3.5	29.7	1062	331

5. BERM DESIGN IMPACTS

5.1 Introduction

The revised design for the perimeter berm assumed: a) a frictional strength of 40 degrees for the existing berm materials, and (b) granular foundation soils with a strength represented by a friction angle of 30 degrees.

Based on the results of the field and laboratory investigations, the following deviations from the previously assumed conditions were identified:

1. Between Boring B-5 towards B-4 (See Figure 2) a maximum 8 ft. thick zone of organic material was encountered within the existing berm.
2. SPT-N Values within the berm proper suggest that the berm materials below the depth of the 2006 tests pits are somewhat less dense.
3. Within the limits indicated on Figure 2, the berm and landfill waste are underlain by a stratum of silt and relatively soft clay.

The impacts of these conditions are discussed in the following sections.

5.2 Berm Strength

A plot of SPT-N value versus depth is presented in Figure 3. Based on the variation in SPT-N Values, empirical correlations suggest strength friction angles might vary from approximately 25 to 40 degrees.

The laboratory strength, based on a composite sample collected from the 2006 test pits, was 43 degrees. As stated in our 12 June 2006 letter report:

> "The shear tests were performed at three different stress levels to measure the strength over a range of stresses computed for the design. A large scale shear test is required because the soils contain such a high percentage of gravel. The results for the compaction and direct shear test are attached. The degree of compaction in the shear test is very conservative (83%), and conservatively represents the berm strength. The measured strength is represented by a friction angle of 43 degrees. Furthermore the measured strength is exactly what would be expected on samples collected from a berms standing on a 45 degree slope. Our design uses a more conservative strength of 40 degrees. We believe this is a reasonable strength for these soils."

The berm strength used in the current design is represented by a friction angle of 40 degrees.

Based on the foregoing, we believe that the frictional strength assumed in the current design (40 degrees) is appropriate, and does not warrant being reduced on the basis of the recorded SPT-N Values.

5.3 Organic Zone within Berm

As shown on Figure 2, a zone of organic material was encountered within the existing berm between Borings B-4 and B-5. While the existing berm itself appears to be stable, future loading from construction of the MSE berm section could be problematic. We recommend that the organic material within this zone either be stabilized in-situ or removed.

5.4 Silt/ Clay Layer

The presence of the silt/ clay foundation layer represents a departure from the conditions assumed in the current design. Accordingly, revised design strengths were adopted for these foundation soils based on the results of the laboratory strength tests presented in this report. The recommended design values are presented in Table I.

Preliminary stability analyses were performed for the above conditions using the computer code ReSSA. The minimum calculated factor of safety is 1.31 (Bishop circular failure mode) and 1.54 (Spencer 3-part wedge failure mode), which are greater than the prescribed value of 1.30. Therefore, in our opinion, the current proposed design is adequate.

6. SUMMARY AND CONCLUSIONS

Based on the additional field investigations and laboratory tests performed, we have concluded the following:

1. The currently proposed berm redesign is appropriate for the conditions encountered in the field explorations, provided that:
    a. The organic zone located between Borings B-5A and B-4A (See Figure 2) are stabilized in-situ or removed.
    b. The relatively thin loamy and organic soils that exist on the surface at the toe of the berms, in the berm extension areas, are scraped off prior to placing the compacted granular fill. This was assumed in the current design and specifications for construction and does not represent a change in conditions.

2. The berm is expected to experience some settlement due to consolidation of the silt / clay stratum under the weight of the future MSE berm section, but this will result in an increase in shear strength of this stratum and a further improvement in the factor safety against global instability. Provisions will be made to surface drainage features along the top of berm to accommodate the anticipated settlement.

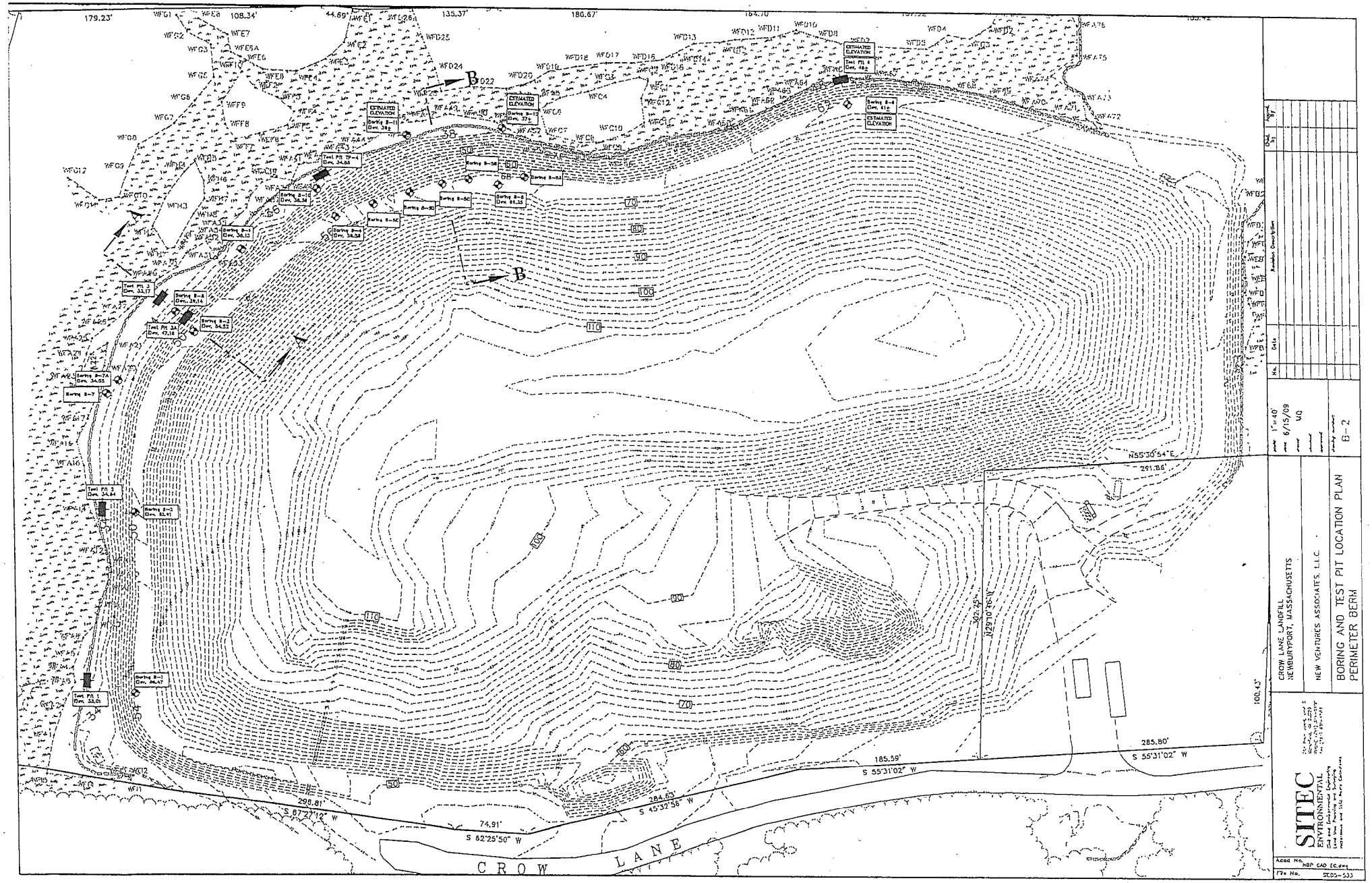
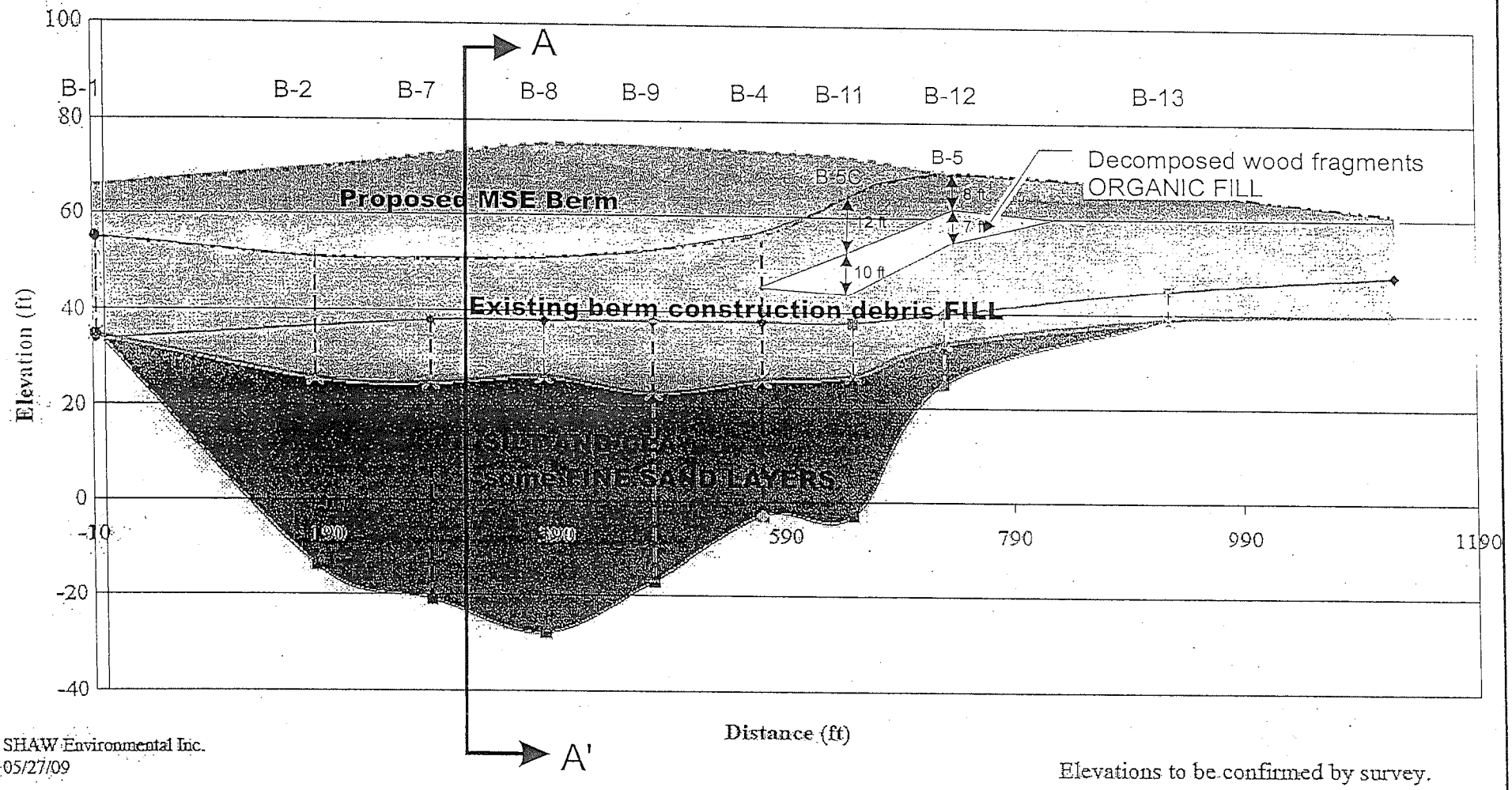

CROW LANE LANDFILL
NEWBURYPORT, MASSACHUSETTS
NEW VENTURES ASSOCIATES, L.L.C.
BORING AND TEST PIT LOCATION PLAN
PERIMETER BERM
SITEC ENVIRONMENTAL
1"=40'
6/15/09
MO
B-2
CROW LANE
S 87°27'12" W
298.81'
S 82°25'50" W
74.91'
S 45°37'56" W
284.63'
S 55°31'02" W
185.59'
285.80'
S 55°31'02" W
N55°30'54"E
291.86'
N29°10'56"W
302.75'
100.43'
179.23'
108.34'
44.69'
135.37'
180.67'
164.70'
A
B
50
60
70
80
90
100
110
120

Figure 1



SHAW Environmental Inc.
05/27/09

Elevations to be confirmed by survey.

Notes:

1. Section along perimeter berm

2. Based on drawings prepared by Shaw Environmental Inc. dated 05/27/09

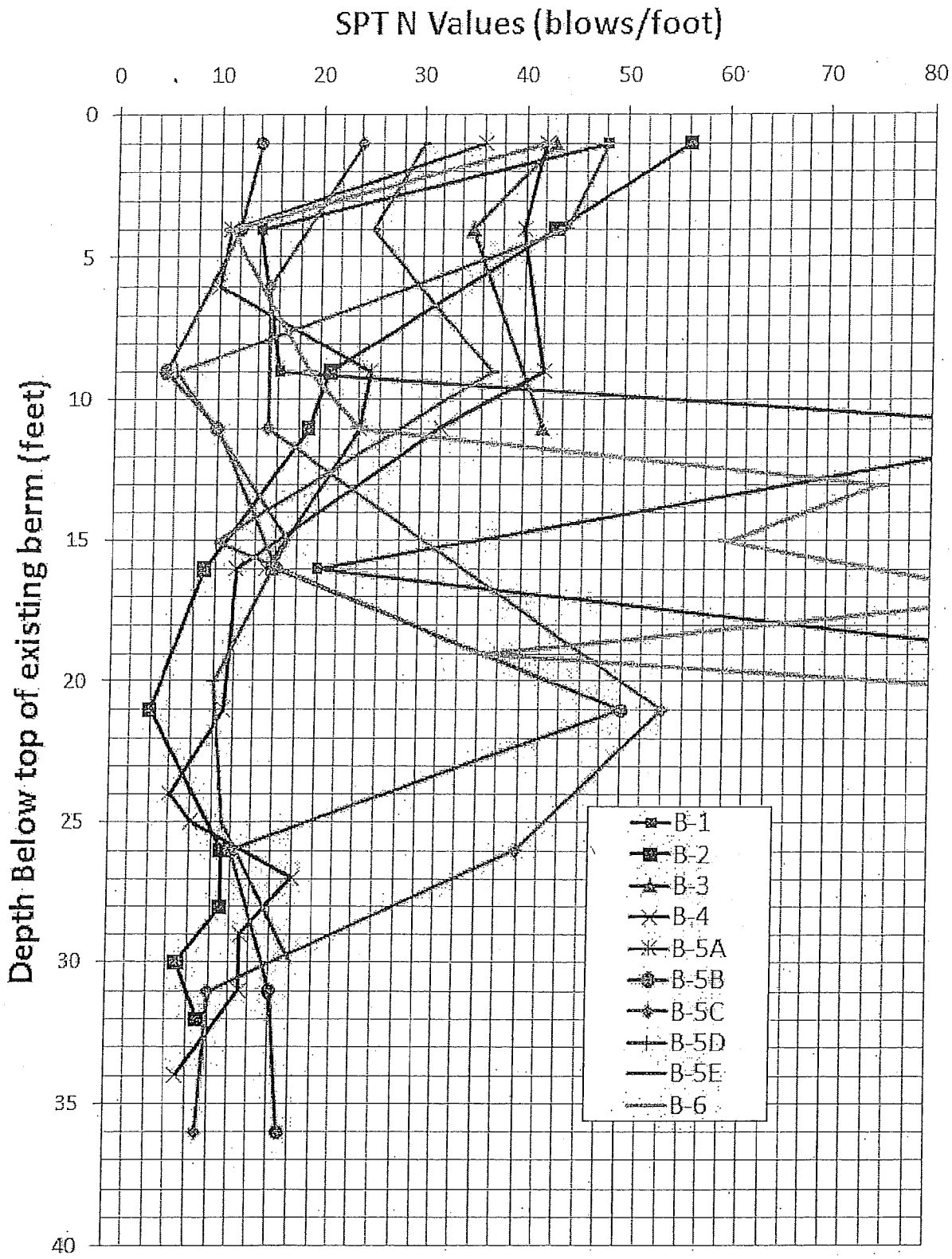
Geocomp CORPORATION

Crow Lane landfill

Subsurface Profile along Perimeter Berm

June 2009

Figure 2



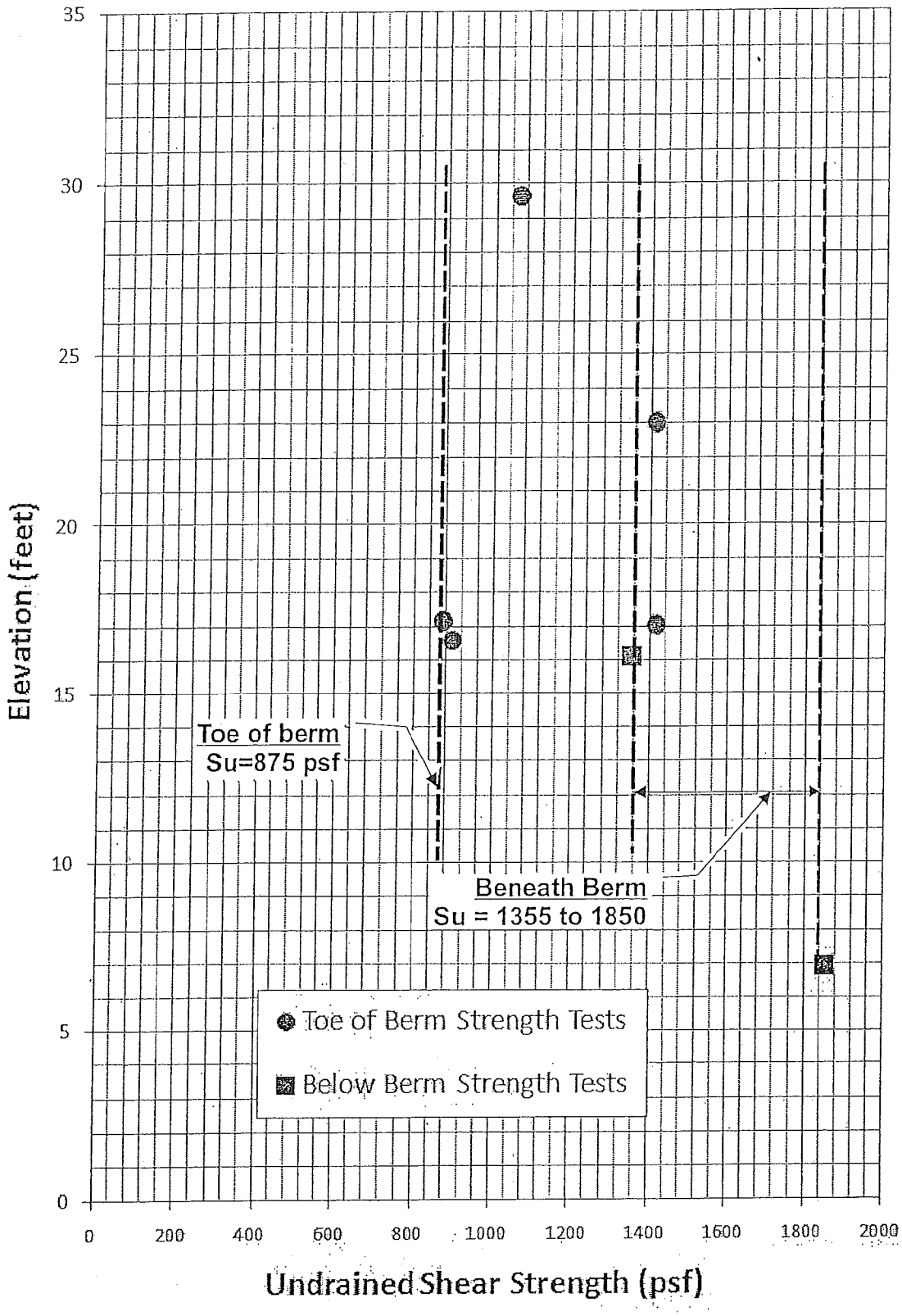
Geocomp CORPORATION

Crow Lane landfill
Corrective Action Design

SPT-N Values Versus Depth for Existing Berm only

June 2009

Figure 3



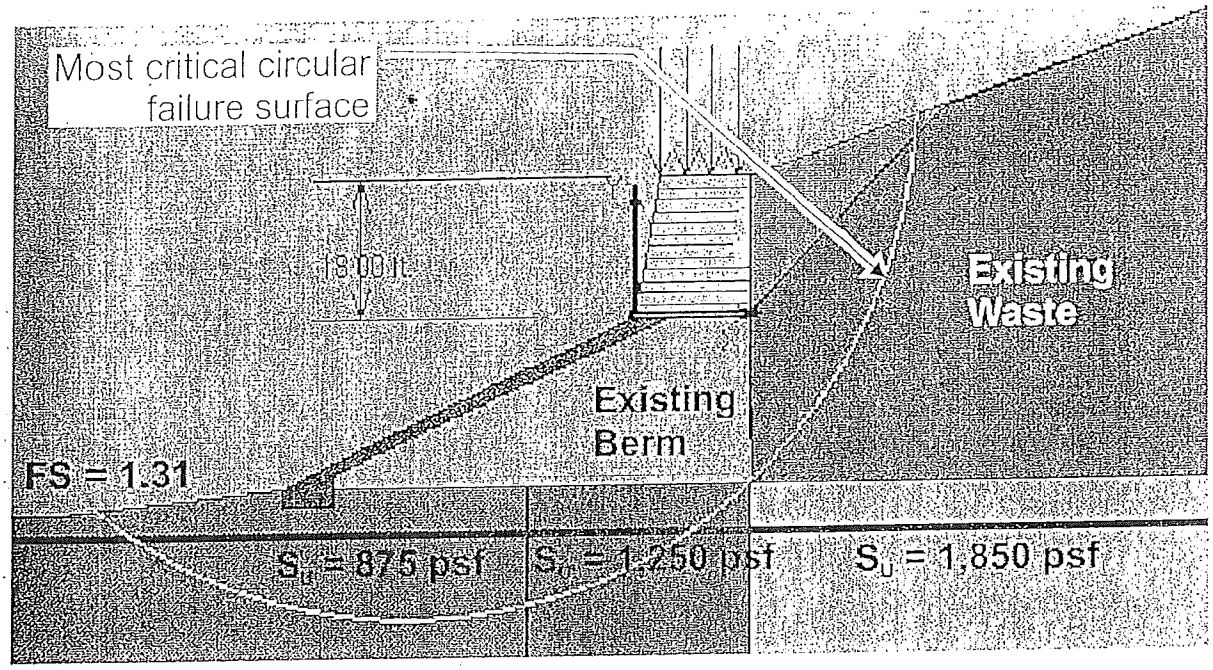
Geocomp CORPORATION

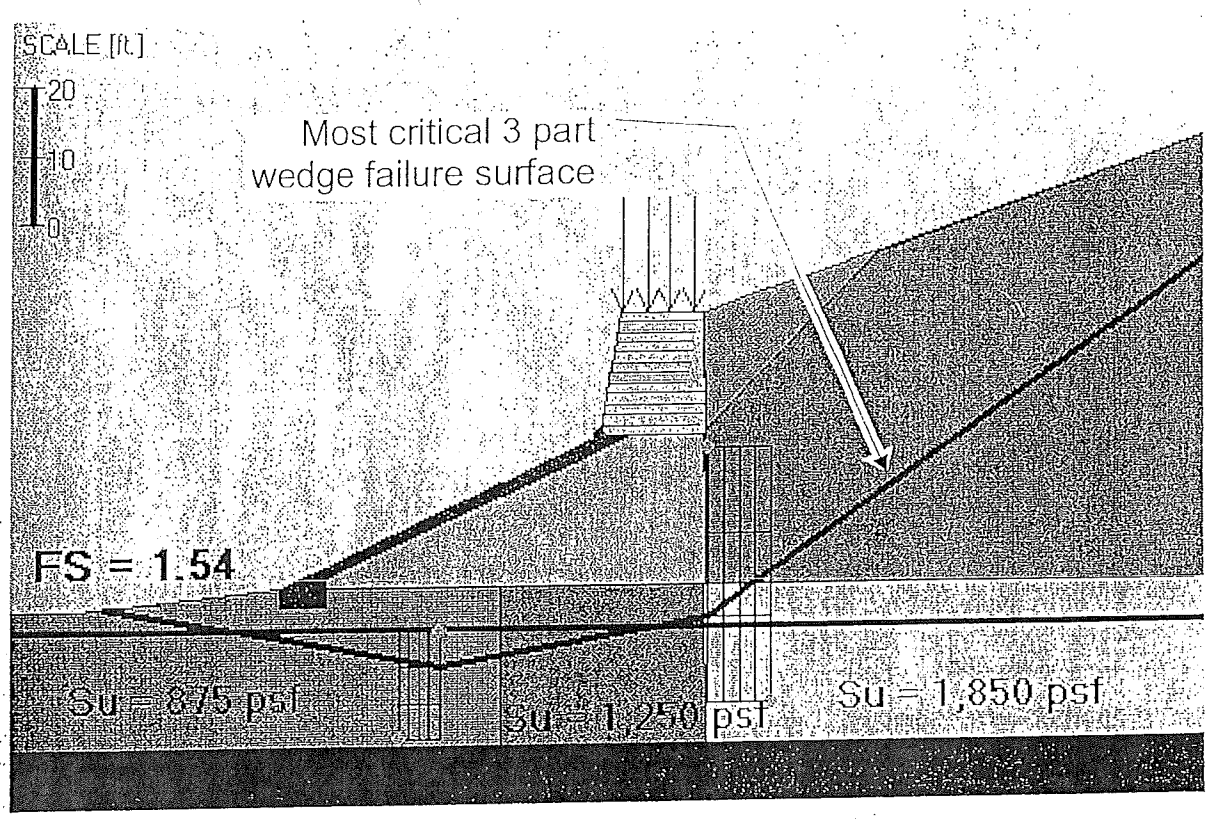
Crow Lane landfill
Corrective Action Design

Undrained Shear Strength
Versus Elevation
Silt/Clay Foundation Stratum

June 2009

Figure 4





Notes:

1. Location of section shown on Figure 1
2. Analysis performed using the computer code ReSSa

Geocomp CORPORATION

Crow Lane landfill
Corrective Action Design

Stability Assessment
Critical Section A-A'

June 2009

Figure 5

Appendix "A"

Boring Logs

Borings drilled by Geosearch, Fitchburg, MA. Between the 5th and 19th of May, 2009

Observed and logged by Geocomp Corporation, Boxborough, MA.

Geocomp CORPORATION

Geocomp Corporation
1145 Massachusetts Avenue
Boxborough, MA 01719
Telephone: 978-635-0012

TEST BORING REPORT

Boring No. B-1
SHEET 1 OF 1

PROJECT NAME: Crow Lane Landfill
CLIENT: New Ventures Associates, L.L.C.
CONTRACTOR: Geosearch

	Casing	Sampler	Barrel	Drilling Equipment and Procedures
Type	Auger	SS	-	Rig Make & Model: CME 750 Truck
Inside Diam.(in.)	5 1/4	3/8	3	Bit Type: -
Hammer Wt. (lb.)	-	140	Push	Drill Mud: No Casing: Auger
Hammer Fall (in.)	-	30	-	Hoist/Hammer: -

Project Number: 20211
Project Location: Newburyport, Mass.
Start: 5/11/09
Finish: 5/11/09
Driller: Joe Kennan
Geocomp Rep: Martin Hawkes
Elevation/Datum:

DEPTH (ft)	Sample No.	Blow Counts per 6" 0-6"	6-12"	12-18"	18-24"	Blow Counts (N Value)	Recovery (in.)	Sample Depth(ft.)	MATERIAL DESCRIPTION
0									
	S-1	21	25	20	12	45	18	0 - 2	Dry black SAND, gravel and asphalt grindings.
	S-2	6	6	8	10	14	14	3 - 5	Top 4" asphalt. Moist, tan SAND and GRAVEL, brick fragments and some cobbles. -FILL-
5									
	S-3	6	10	6	14	16	10	8 - 10	Moist, olive gray SILT, SAND, GRAVEL. Cobble near tip, little black organic.
10									
	S-4	44	40	56	16	96	18	10 - 12	Top 4" wet, olive SILT SAND, some gravel. Rest SAND, GRAVEL, cored concrete, cobble.
15									
	S-5	20	11	9	11	20		15 - 17	Auger obstruction at 14 ft. Moist, gray to dark gray, SILT, SAND, GRAVEL and concrete fragments. -FILL-
20									
	S-6	39	40	100		140		20 - 21.5	Wet, gray SAND, some fine gravel, 3" black rock fragment. -ROCK-
25									Boring terminated at 21.5 feet.
30									
35									

Notes:
Warm, sunny, breezy.

WATER LEVEL DATA				
DATE:	TIME:	Depth (ft.) to: BOT. OF CASING	BOT. OF HOLE	WATER

SAMPLE IDENTIFICATION
O OPEN END ROD
T THIN WALL TUBE
U UNDISTURBED SAMPLE
SS SPLIT SPOON

SUMMARY
OVERBURDEN (FT): DATUM:
ROCK CORED (LIN FT):
SAMPLES:
G.S. ELEVATION:

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Geocomp CORPORATION

Geocomp Corporation
1145 Massachusetts Avenue
Boxborough, MA 01719
Telephone: 978-635-0012

TEST BORING REPORT

Boring No. B-2

PROJECT NAME: Crow Lane Landfill
CLIENT: New Ventures Associates, L.L.C.
CONTRACTOR: Geosearch

	Casing	Sampler	Barrel	Drilling Equipment and Procedures
Type	Auger	SS	-	Rig Make & Model: CME 750 Truck
Inside Diam.(in.)	5 1/4	3/8	3	Bit Type: -
Hammer Wt. (lb.)	-	140	Push	Drill Mud: No Casing: Auger
Hammer Fall (in.)	-	30	-	Hoist/Hammer: -

Project Number: 20211
Project Location: Newburyport, Mass.
Start: 5/8/09
Finish: 5/8/09
Driller: Joe Kennan
Geocomp Rep: Martin Hawkes
Elevation/Datum:

DEPTH (ft)	Sample No.	Blow Counts per 6" 0-6"	6-12"	12-18"	18-24"	Blow Counts (N Value)	Recovery (in.)	Sample Depth(ft.)	MATERIAL DESCRIPTION
0	S-1	28	28	28	28	56	18	0 - 2	Dry dark brown to brown SAND, some gravel, asphalt.
5	S-2	19	23	20	19	43	18	3 - 5	Similar to S-1. Dry, red brick and cobble, more gravel, less asphalt.
10	S-3	8	10	11	9	21	20	8 - 10	Similar to S-2. Crushed concrete, asphalt, brick. Auger resistance at 7 ft.
	S-4	9	9	10	11	19	10	10 - 12	Dark brownish black SAND, gravel, some cobbles, organics.
15	S-5	10	5	4	9	9	14	15 - 17	Wet to dry, dark brown SILT, SAND, GRAVEL, slight organic odor.
20	S-6	5	2	2	3	4	8	20 - 22	Wet, dark brown to black SAND, some silt, trace of organics.
25								24 - 24	-FILL-
	S-7	3	4	7	10	11	8	25 - 27	Blueish gray to olive SILT and CLAY, little fine sand.
	S-8	7	7	4	5	11	24	27 - 29	Similar to S-7.
30	S-9	5	4	3	3	7	24	29 - 31	Gray SILT and FINE SAND, top 6" mottled tan.
	S-10	4	4	5	3	9	6	31 - 33	Gray SILT and FINE SAND, some clay.
35	T-1						0	-	

Notes:
4.5 ft from edge.

WATER LEVEL DATA				
DATE:	TIME:	Depth (ft.) to: BOT. OF CASING	BOT. OF HOLE	WATER

SAMPLE IDENTIFICATION
O OPEN END ROD
T THIN WALL TUBE
U UNDISTURBED SAMPLE
SS SPLIT SPOON

SUMMARY
OVERBURDEN (FT): DATUM:
ROCK CORED (LIN FT):
SAMPLES:
G.S. ELEVATION:

(Continued Next Page)

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Geocomp CORPORATION

Geocomp Corporation
1145 Massachusetts Avenue
Boxborough, MA 01719
Telephone: 978-635-0012

TEST BORING REPORT

Boring No. B-2
SHEET 2 OF 2

PROJECT NAME: Crow Lane Landfill
CLIENT: New Ventures Associates, L.L.C.
CONTRACTOR: Geosearch

	Casing	Sampler	Barrel
Type	Auger	SS	-
Inside Diam.(in.)	5 1/4	3/8	3
Hammer Wt. (lb.)	-	140	Push
Hammer Fall (in.)	-	30	-

Drilling Equipment and Procedures
Rig Make & Model: CME 750 Truck
Bit Type: -
Drill Mud: No
Casing: Auger
Hoist/Hammer: -

Project Number: 20211
Project Location: Newburyport, Mass.
Start: 5/8/09
Finish: 5/8/09
Driller: Joe Kennan
Geocomp Rep: Martin Hawkes
Elevation/Datum:

DEPTH (ft)	Sample No.	Blow Counts per 6" 0-6"	6-12"	12-18"	18-24"	Blow Counts (N Value)	Recovery (in.)	Sample Depth(ft.)	MATERIAL DESCRIPTION
35									Olive gray SILT and CLAY.
	S-11	2	2	2	2	4	18	35 - 37	
	S-12	2	2	2	2	4	0	37 - 39	
40	T-2						0	39 - 41	
45									SILT and CLAY. -SILT & CLAY-
	T-3						18	45 - 47	
50									
55									
60								60 - 60	-SAND-
65	S-13	20	32	44	50	76		65 - 67	Gray fine to coarse SAND, rock in base. -ROCK-
									Boring terminated at 67.0 feet.
70									
75									

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Geocomp CORPORATION

Geocomp Corporation
1145 Massachusetts Avenue
Boxborough, MA 01719
Telephone: 978-635-0012

TEST BORING REPORT

Boring No. B-3

SHEET 1 OF 1

PROJECT NAME: Crow Lane Landfill
CLIENT: New Ventures Associates, L.L.C.
CONTRACTOR: Geosearch

	Casing	Sampler	Barrel
Type	Auger	SS	-
Inside Diam.(in.)	5 1/4	3/8	3
Hammer Wt. (lb.)	-	140	Push
Hammer Fall (in.)	-	30	-

Drilling Equipment and Procedures
Rig Make & Model: CME 750 Truck
Bit Type: -
Drill Mud: No
Casing: Auger
Hoist/Hammer: -

Project Number: 20211
Project Location: Newburyport, Mass.
Start: 5/7/09
Finish: 5/7/09
Driller: Joe Kennan
Geocomp Rep: Martin Hawkes
Elevation/Datum:

DEPTH (ft)	Sample No.	Blow Counts per 6" 0-6"	6-12"	12-18"	18-24"	Blow Counts (N Value)	Recovery (in.)	Sample Depth(ft.)	MATERIAL DESCRIPTION
0									
	S-1	37	23	20	40	43	20	0 - 2	Black to white SAND, gravel, cobbles, some brick and concrete debris.
	S-2	12	20	15	29	35		3 - 5	Similar to S-1. Wet, brick in tip. -FILL-
5									
								7 - 7.5	Auger resistance.
								8 - 8.5	Auger refusal.
10									Boring terminated at 8.5 feet.
15									
20									
25									
30									
35									

Notes:

WATER LEVEL DATA				
DATE:	TIME:	Depth (ft.) to: BOT. OF CASING	BOT. OF HOLE	WATER

SAMPLE IDENTIFICATION
O OPEN END ROD
T THIN WALL TUBE
U UNDISTURBED SAMPLE
SS SPLIT SPOON

SUMMARY
OVERBURDEN (FT): DATUM:
ROCK CORED (LIN FT):
SAMPLES:
G.S. ELEVATION:

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Telephone: 978-635-0012

TEST BORING REPORT

Boring No. B-3A

PROJECT NAME: Crow Lane Landfill
CLIENT: New Ventures Associates, L.L.C.
CONTRACTOR: Geosearch

	Casing	Sampler	Barrel	Drilling Equipment and Procedures
Type	Auger	SS	-	Rig Make & Model: CME 750 Truck
Inside Diam.(in.)	5,1/4	3/8	3	Bit Type: -
Hammer Wt. (lb.)	-	140	Push	Drill Mud: No Casing: Auger
Hammer Fall (in.)	-	30	-	Hoist/Hammer: -

Project Number: 20211
Project Location: Newburyport, Mass.
Start: 5/07/09
Finish: 5/07/09
Driller: Joe Kennan
Geocomp Rep: Martin Hawkes
Elevation/Datum:

DEPTH (ft)	Sample No.	Blow Counts per 6" 0-6"	6-12"	12-18"	18-24"	Blow Counts (N Value)	Recovery (in.)	Sample Depth(ft.)	MATERIAL DESCRIPTION
0									
5									
								7 - 7	Auger refusal at 7ft. Boring terminated at 7.0 feet.
10									
15									
20									
25									
30									
35									

Notes:
Relocated 5 ft North of B-3.

WATER LEVEL DATA				
DATE:	TIME:	Depth (ft.) to: BOT. OF CASING :	BOT. OF HOLE :	WATER :

SAMPLE IDENTIFICATION
O OPEN END ROD
T THIN WALL TUBE
U UNDISTURBED SAMPLE
SS SPLIT SPOON

SUMMARY
OVERBURDEN (FT): DATUM:
ROCK CORED (LIN FT):
SAMPLES:
G.S. ELEVATION:

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TEST BORING REPORT

Boring No. B-3B

SHEET 1 OF 1

PROJECT NAME: Crow Lane Landfill
CLIENT: New Ventures Associates, L.L.C.
CONTRACTOR: Geosearch

	Casing	Sampler	Barrel
Type	Auger	SS	-
Inside Diam.(in.)	5 1/4	3/8	3
Hammer Wt. (lb.)	-	140	Push
Hammer Fall (in.)	-	30	-

Drilling Equipment and Procedures
Rig Make & Model: CME 750 Truck
Bit Type: -
Drill Mud: No
Casing: Auger
Hoist/Hammer: -

Project Number: 20211
Project Location: Newburyport, Mass.
Start: 5/07/09
Finish: 5/07/09
Driller: Joe Kennan
Geocomp Rep: Martin Hawkes
Elevation/Datum:

DEPTH (ft)	Sample No.	Blow Counts per 6" 0-6"	6-12"	12-18"	18-24"	Blow Counts (N Value)	Recovery (in.)	Sample Depth(ft.)	MATERIAL DESCRIPTION
0									
5									
10									
	S-1	17	30	78	53	108	12	10 - 12	Tan to dark brown SAND, GRAVEL, some silt. Bottom cored cobble, trace of organics.
								12 - 12.5	Auger resistance.
								13 - 13.5	Auger refusal. Boring terminated at 13.5 feet.
15									
20									
25									
30									
35									

Notes:
Relocated 20 ft North of B-3.

WATER LEVEL DATA				
DATE:	TIME:	Depth (ft.) to: BOT. OF CASING	BOT. OF HOLE	WATER

SAMPLE IDENTIFICATION
O OPEN END ROD
T THIN WALL TUBE
U UNDISTURBED SAMPLE
SS SPLIT SPOON

SUMMARY
OVERBURDEN (FT): DATUM:
ROCK CORED (LIN FT):
SAMPLES:
G.S. ELEVATION:

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TEST BORING REPORT

Boring No. B-3C

SHEET 1 OF 1

PROJECT NAME: Crow Lane Landfill
CLIENT: New Ventures Associates, L.L.C.
CONTRACTOR: Geosearch

	Casing	Sampler	Barrel	Drilling Equipment and Procedures
Type	Auger	SS	-	Rig Make & Model: CME 750 Truck
Inside Diam.(in.)	5 1/4	3/8	3	Bit Type: -
Hammer Wt. (lb.)	-	140	Push	Drill Mud: NO Casing: Auger
Hammer Fall (in.)	-	30	-	Hoist/Hammer: -

Project Number: 20211
Project Location: Newburyport, Mass.
Start: 5/07/09
Finish: 5/07/09
Driller: Joe Kennan
Geocomp Rep: Martin Hawkes
Elevation/Datum:

DEPTH (ft)	Sample No.	Blow Counts per 6" 0-6"	6-12"	12-18"	18-24"	Blow Counts (N Value)	Recovery (in.)	Sample Depth(ft.)	MATERIAL DESCRIPTION
0									
5									
								7 - 7.5	Auger refusal.
									Boring terminated at 7.5 feet.
10									
15									
20									
25									
30									
35									

Notes:
Located 5 ft south of B-3.

WATER LEVEL DATA				
		Depth (ft.) to:		
DATE:	TIME:	BOT. OF CASING	BOT. OF HOLE	WATER

SAMPLE IDENTIFICATION
O OPEN END ROD
T THIN WALL TUBE
U UNDISTURBED SAMPLE
SS SPLIT SPOON

SUMMARY
OVERBURDEN (FT): DATUM:
ROCK CORED (LIN FT):
SAMPLES:
G.S. ELEVATION:

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TEST BORING REPORT

Boring No. B-3D

SHEET 1 OF 1

PROJECT NAME: Crow Lane Landfill
CLIENT: New Ventures Associates, L.L.C.
CONTRACTOR: Geosearch

	Casing	Sampler	Barrel
Type	Auger	SS	-
Inside Diam.(in.)	5 1/4	3/8	3
Hammer Wt. (lb.)	-	140	Push
Hammer Fall (in.)	-	30	-

Drilling Equipment and Procedures
Rig Make & Model: CME 750 Truck
Bit Type: -
Drill Mud: No
Casing: Auger
Hoist/Hammer: -

Project Number: 20211
Project Location: Newburyport, Mass.
Start: 5/08/09
Finish: 5/08/09
Driller: Joe Kennan
Geocomp Rep: Martin Hawkes
Elevation/Datum:

DEPTH (ft)	Sample No.	Blow Counts per 6" 0-6"	6-12"	12-18"	18-24"	Blow Counts (N Value)	Recovery (in.)	Sample Depth(ft.)	MATERIAL DESCRIPTION
0									
5									
								7 - 7	Auger refusal at 7 ft. Boring terminated at 7.0 feet.
10									
15									
20									
25									
30									
35									

Notes:
Relocated 5 ft south of B-3.

WATER LEVEL DATA				
DATE:	TIME:	Depth (ft.) to: BOT. OF CASING	BOT. OF HOLE	WATER

SAMPLE IDENTIFICATION
O OPEN END ROD
T THIN WALL TUBE
U UNDISTURBED SAMPLE
SS SPLIT SPOON

SUMMARY
OVERBURDEN (FT): DATUM:
ROCK CORED (LIN FT):
SAMPLES:
G.S. ELEVATION:

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TEST BORING REPORT

Boring No. B-3E

SHEET 1 OF 1

PROJECT NAME: Crow Lane Landfill
CLIENT: New Ventures Associates, L.L.C.
CONTRACTOR: Geosearch

	Casing	Sampler	Barrel	Drilling Equipment and Procedures
Type	Auger	SS	-	Rig Make & Model: CME 750 Truck
Inside Diam.(in.)	5 1/4	3/8	3	Bit Type: -
Hammer Wt. (lb.)	-	140	Push	Drill Mud: No Casing: Auger
Hammer Fall (in.)	-	30	-	Hoist/Hammer: -

Project Number: 20211
Project Location: Newburyport, Mass.
Start: 5/08/09
Finish: 5/08/09
Driller: Joe Kennan
Geocomp Rep: Martin Hawkes
Elevation/Datum:

DEPTH (ft)	Sample No.	Blow Counts per 6" 0-6"	6-12"	12-18"	18-24"	Blow Counts (N Value)	Recovery (in.)	Sample Depth(ft.)	MATERIAL DESCRIPTION
0									
5									
10									
	S-1	6	14	28	40	42	18	10 - 12	Tan to brown, SAND, GRAVEL, cored cobbles, some silt, 3" band of brick fragments, granite fragments, with organic odor.
									Obstruction at 12.5.
								12 - 13	Boring terminated at 13.0 feet.
15									
20									
25									
30									
35									

Notes:
Relocated 5 ft South of B-3D.

WATER LEVEL DATA				
DATE:	TIME:	Depth (ft.) to: BOT. OF CASING:	BOT. OF HOLE:	WATER:

SAMPLE IDENTIFICATION
O OPEN END ROD
T THIN WALL TUBE
U UNDISTURBED SAMPLE
SS SPLIT SPOON

SUMMARY
OVERBURDEN (FT): DATUM:
ROCK CORED (LIN FT):
SAMPLES:
G.S. ELEVATION:

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TEST BORING REPORT

Boring No. B-4

PROJECT NAME: Crow Lane Landfill
CLIENT: New Ventures Associates, L.L.C.
CONTRACTOR: Geosearch

	Casing	Sampler	Barrel	Drilling Equipment and Procedures
Type	Auger	SS	-	Rig Make & Model: CME 750 Truck
Inside Diam.(in.)	5 1/4	3/8	3	Bit Type: -
Hammer Wt. (lb.)	-	140	Push	Drill Mud: No Casing: Auger
Hammer Fall (in.)	-	30	-	Hoist/Hammer: -

Project Number: 20211
Project Location: Newburyport, Mass.
Start: 5/6/09
Finish: 5/7/09
Driller: Joe Kennan
Geocomp Rep: Geoff Webster
Elevation/Datum:

DEPTH (ft)	Sample No.	Blow Counts per 6" 0-6"	6-12"	12-18"	18-24"	Blow Counts (N Value)	Recovery (in.)	Sample Depth(ft.)	MATERIAL DESCRIPTION
0									
	S-1	11	20	22	22	42		0 - 2	Granular CONSTRUCTION DEBRIS, crushed concrete, crushed brick. -FILL-
5	S-2	20	23	17	24	40		3 - 5	First 6" brown medium grain SAND, crushed construction material, rock, sand, stone. -FILL-
10	S-3	10	22	20	21	42		8 - 10	CONCRETE, brick, some black organic material in last 6", strong odor. -FILL-
	S-4	11	16	16	16	32	6	10 - 12	6" crushed STONE, black organic material with wood shards, strong odor. -FILL-
15									
	S-5	3	5	7	5	12		15 - 17	No sample recovered.
	S-6							17 - 19	Saturated gray SILTY SAND. -FILL-
20									
	S-7	6	6	5	6	11	6	20 - 22	Saturated SILT with broken weathered rock. -FILL-
	S-8	3	3	3	3	6		22 - 24	1st try, no sample recovered. 2nd try, pinned shelly tube into soil. Tube withdrawn, bent, saturated gray SILTY SAND WITH ROCK. -FILL-
25	S-9	3	3	5	9	8	8	24 - 26	Gray SILTY SAND with trace of debris. -FILL-
	S-10	5	9	9	10	18		26 - 28	Old landfill debris with trace of crushed glass, CLAYEY SAND at bottom. -FILL-
30	S-11	3	6	7	18	13		28 - 30	Organics end at top, 18" orange gray SILTY SAND. -FILL-
	S-12	5	6	7	7	13		30 - 32	Gray and tan mottled fine SILTY SAND. -FILL-
35	S-13	3	3	4	3	7		33 - 35	18" tan SILTY SAND, 6" gray very fine silty sand. -FILL-

Notes:
4 ft from edge, sunny and warm.

WATER LEVEL DATA				
DATE:	TIME:	Depth (ft.) to: BOT. OF CASING	BOT. OF HOLE	WATER

SAMPLE IDENTIFICATION
O OPEN END ROD
T THIN WALL TUBE
U UNDISTURBED SAMPLE
SS SPLIT SPOON

SUMMARY
OVERBURDEN (FT): DATUM:
ROCK CORED (LIN FT):
SAMPLES:
G.S. ELEVATION:

(Continued Next Page)

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TEST BORING REPORT

Boring No. B-4

PROJECT NAME: Crow Lane Landfill
CLIENT: New Ventures Associates, L.L.C.
CONTRACTOR: Geosearch

	Casing	Sampler	Barrel
Type	Auger	SS	-
Inside Diam.(in.)	5 1/4	3/8	3
Hammer Wt. (lb.)	-	140	Push
Hammer Fall (in.)	-	30	-

Drilling Equipment and Procedures
Rig Make & Model: CME 750 Truck
Bit Type: -
Drill Mud: No
Casing: Auger
Hoist/Hammer: -

Project Number: 20211
Project Location: Newburyport, Mass.
Start: 5/6/09
Finish: 5/7/09
Driller: Joe Kennan
Geocomp Rep: Geoff Webster
Elevation/Datum:

DEPTH (ft)	Sample No.	Blow Counts per 6" 0-6"	6-12"	12-18"	18-24"	Blow Counts (N Value)	Recovery (in.)	Sample Depth(ft.)	MATERIAL DESCRIPTION
35									
	S-14	2						35 - 37	12" gray very fine SILTY SAND, 12" gray LEAN CLAY. -FILL-
	T-1						28	38 - 40.5	Top: SILT and FINE SAND. Bottom: wet, gray CLAY.
40									
	T-2						24	40.5 - 42.5	Pushed shelby tube. Moist, olive gray, SILTY and CLAY.
	S-15	3	3	3	3	6		43 - 45	Similar to T-2, some silt parting.
45									
	T-3						24	45 - 47	Similar to T-2.
50									
	T-4						24	50 - 52	Similar to T-2.
55									Boring terminated at 52.0 feet.
60									
65									
70									
75									

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TEST BORING REPORT

Boring No. B-4A
SHEET 1 OF 1

PROJECT NAME: Crow Lane Landfill
CLIENT: New Ventures Associates, L.L.C.
CONTRACTOR: Geosearch

	Casing	Sampler	Barrel	Drilling Equipment and Procedures
Type	Auger	SS	-	Rig Make & Model: CME 750 Truck
Inside Diam.(in.)	5 1/4	3/8	3	Bit Type: -
Hammer Wt. (lb.)	-	140	Push	Drill Mud: No Casing: Auger
Hammer Fall (in.)	-	30	-	Hoist/Hammer: -

Project Number: 20211
Project Location: Newburyport, Mass.
Start: 5/19/09 1:00 PM
Finish: 5/19/09 2:00 PM
Driller: Joe Kennan
Geocomp Rep: Martin Hawkes
Elevation/Datum:

DEPTH (ft)	Sample No.	Blow Counts per 6" 0-6"	6-12"	12-18"	18-24"	Blow Counts (N Value)	Recovery (in.)	Sample Depth(ft.)	MATERIAL DESCRIPTION
0									
5									
10	S-1	68	67	4	19	71	20	8 - 10	Dry, brown, SAND and GRAVEL, trace of silt, concrete and brick fragments. Tip black asphalt grindings, trace of wood chips.
15	S-2	4	30	31	15	61	6	14 - 17	Tan to black SAND and GRAVEL, some silt, concrete fragments in tip. Auger resistance at 16ft. Auger refusal at 17ft.
20									Boring terminated at 17.0 feet.
25									
30									
35									

Notes:
40 ft south of B-4.

WATER LEVEL DATA				
DATE:	TIME:	Depth (ft.) to: BOT. OF CASING:	BOT. OF HOLE:	WATER:

SAMPLE IDENTIFICATION
O OPEN END ROD
T THIN WALL TUBE
U UNDISTURBED SAMPLE
SS SPLIT SPOON

SUMMARY
OVERBURDEN (FT): DATUM:
ROCK CORED (LIN FT):
SAMPLES:
G.S. ELEVATION:

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TEST BORING REPORT

Boring No. B-5
SHEET 1 OF 1

PROJECT NAME: Crow Lane Landfill
CLIENT: New Ventures Associates, L.L.C.
CONTRACTOR: Geosearch

	Casing	Sampler	Barrel	Drilling Equipment and Procedures
Type	Auger	SS	-	Rig Make & Model: CME 750 Truck
Inside Diam.(in.)	5 1/4	3/8	3	Bit Type: -
Hammer Wt. (lb.)	-	140	Push	Drill Mud: No Casing: Auger
Hammer Fall (in.)	-	30	-	Hoist/Hammer: -

Project Number: 20211
Project Location: Newburyport, Mass.
Start: 5/6/09
Finish: 5/6/09
Driller: Joe Kennan
Geocomp Rep: Geoff Webster
Elevation/Datum:

DEPTH (ft)	Sample No.	Blow Counts per 6" 0-6"	6-12"	12-18"	18-24"	Blow Counts (N Value)	Recovery (in.)	Sample Depth(ft.)	MATERIAL DESCRIPTION
0	S-1	13	13	13	10	26		0 - 2	Crushed rock, concrete, sand, fine gravel. -FILL-
	S-2	3	2	3	3	5		3 - 5	Wet, brown granular medium grain. -FILL-
5									
	S-3	3	5	6	6	11		8 - 10	
10	S-4	8	6	6	11	12	9	10 - 12	9" of black SILTY ORGANIC soil with wood shrads. -FILL-
	S-5							12 - 15	A layer of wet, black loose SILTY ORGANIC SOIL. -ORGANIC-
15	S-6	8	10	20	20	30		15 - 17	Black SILTY ORGANIC SOIL with wood shards. -ORGANIC-
	S-7	43	35	23	18	58		17 - 19	Saturated BLACK ORGANIC SOIL with wood shards. -ORGANIC-
20									Boring terminated at 19.0 feet.
25									
30									
35									

Notes:
4 ft from edge of berm.

WATER LEVEL DATA				
DATE:	TIME:	Depth (ft.) to: BOT. OF CASING:	BOT. OF HOLE:	WATER:

SAMPLE IDENTIFICATION
O OPEN END ROD
T THIN WALL TUBE
U UNDISTURBED SAMPLE
SS SPLIT SPOON

SUMMARY
OVERBURDEN (FT): DATUM:
ROCK CORED (LIN FT):
SAMPLES:
G.S. ELEVATION:

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TEST BORING REPORT

Boring No. B-5A
SHEET 1 OF 1

PROJECT NAME: Crow Lane Landfill
CLIENT: New Ventures Associates, L.L.C.
CONTRACTOR: Geosearch

	Casing	Sampler	Barrel	Drilling Equipment and Procedures
Type	Auger	SS	-	Rig Make & Model: CME 750 Truck
Inside Diam.(in.)	5 1/4	3/8	3	Bit Type: -
Hammer Wt. (lb.)	-	140	Push	Drill Mud: No Casing: Auger
Hammer Fall (in.)	-	30	-	Hoist/Hammer: -

Project Number: 20211
Project Location: Newburyport, Mass.
Start: 5/6/09
Finish: 5/6/09
Driller: Joe Kennan
Geocomp Rep: Geoff Webster
Elevation/Datum:

DEPTH (ft)	Sample No.	Blow Counts per 6" 0-6"	6-12"	12-18"	18-24"	Blow Counts (N Value)	Recovery (in.)	Sample Depth(ft.)	MATERIAL DESCRIPTION
0	S-1	11	19	17	12	36		0 - 2	Crushed rock, granular SAND. -FILL-
5	S-2	4	5	6	8	11	0	3 - 5	No sample recovered.
	S-3	3	7	3	7	10	0	5 - 7	No sample recovered.
10	S-4	7	9	16	11	25	14	8 - 10	8" crushed ROCK AND SAND, 3" of wood and organic soil, 3" of stone and rock. -FILL-
	S-5	10	12	12	12	24	22	10 - 12	8" of brown ROCK AND STONE, 4" of black rock and stone, 10" of brown medium grains, no stone. -FILL-
15	S-6	4	5	10	14	15		15 - 17	Black decomposing wood. -ORGANIC-
20	S-7	14	70					20 - 21	Black organic, rock granular material. -FILL-
25									Boring terminated at 21.0 feet.
30									
35									

Notes:
4 ft from edge of berm, 20 ft east of B-5.

WATER LEVEL DATA					SAMPLE IDENTIFICATION	SUMMARY
DATE:	TIME:	Depth (ft.) to: BOT. OF CASING	BOT. OF HOLE	WATER	O OPEN END ROD T THIN WALL TUBE U UNDISTURBED SAMPLE SS SPLIT SPOON	OVERBURDEN (FT): DATUM: ROCK CORED (LIN FT): SAMPLES: G.S. ELEVATION:

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TEST BORING REPORT

Boring No. B-5B

PROJECT NAME: Crow Lane Landfill
CLIENT: New Ventures Associates, L.L.C.
CONTRACTOR: Geosearch

	Casing	Sampler	Barrel	Drilling Equipment and Procedures
Type	Auger	SS	-	Rig Make & Model: CME 750 Truck
Inside Diam.(in.)	5 1/4	3/8	3	Bit Type: -
Hammer Wt. (lb.)	-	140	Push	Drill Mud: No
Hammer Fall (in.)	-	30	-	Casing: Auger
				Hoist/Hammer: -

Project Number: 20211
Project Location: Newburyport, Mass.
Start: 5/11/09 11:00 AM
Finish: 5/11/09 1:45 PM
Driller: Joe Kennan
Geocomp Rep: Martin Hawkes
Elevation/Datum:

DEPTH (ft)	Sample No.	Blow Counts per 6" 0-6"	6-12"	12-18"	18-24"	Blow Counts (N Value)	Recovery (in.)	Sample Depth(ft.)	MATERIAL DESCRIPTION
0									
	S-1	16	13	13	13	26	14	0 - 2	Dry, dark brown SAND, GRAVEL and concrete fragments.
	S-2	8	6	6	5	12	14	3 - 5	Dark brown SAND, GRAVEL, some silt, little organic material. Bottom 5" moist, olive SILT and SAND, some gravel, trace of organics.
5									
	S-3	4	3	2	2	5	8	8 - 10	Dark brown SAND, GRAVEL, some silt, cored wood in tip.
10									
	S-4	7	5	5	6	10	1	10 - 12	Asphalt. -FILL-
								13 - 13.5	
15									
	S-5	8	8	8	9	16	13	15 - 17	Olive gray to black SILT, SAND and wood fibers, some organics.
								18 - 18.5	-ORGANIC-
20									
	S-6	38	28	22	42	50	20	20 - 22	Black to olive gray SAND, GRAVEL, some silt intermixed with black wood fibers and organics. -FILL-
25									
	S-7	7	6	6	7	12	20	25 - 27	Olive gray FINE SAND, some silt with thin layers of organics fibers, little gravel.
30									
	S-8	7	6	10	22	16	20	30 - 32	Similar to S-6. Organic odor.
35									

Notes:
24 ft south along berm from B-5.

WATER LEVEL DATA				
DATE:	TIME:	Depth (ft.) to: BOT. OF CASING	BOT. OF HOLE	WATER

SAMPLE IDENTIFICATION
O OPEN END ROD
T THIN WALL TUBE
U UNDISTURBED SAMPLE
SS SPLIT SPOON

SUMMARY
OVERBURDEN (FT): DATUM:
ROCK CORED (LIN FT):
SAMPLES:
G.S. ELEVATION:

(Continued Next Page)

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Geocomp CORPORATION

Geocomp Corporation
1145 Massachusetts Avenue
Boxborough, MA 01719
Telephone: 978-635-0012

TEST BORING REPORT

Boring No. B-5B

PROJECT NAME: Crow Lane Landfill
CLIENT: New Ventures Associates, L.L.C.
CONTRACTOR: Geosearch

	Casing	Sampler	Barrel	Drilling Equipment and Procedures
Type	Auger	SS	-	Rig Make & Model: CME 750 Truck
Inside Diam.(in.)	5 1/4	3/8	3	Bit Type: -
Hammer Wt. (lb.)	-	140	Push	Drill Mud: No Casing: Auger
Hammer Fall (in.)	-	30	-	Hoist/Hammer: -

Project Number: 20211
Project Location: Newburyport, Mass.
Start: 5/11/09 11:00 AM
Finish: 5/11/09 1:45 PM
Driller: Joe Kennan
Geocomp Rep: Martin Hawkes
Elevation/Datum:

DEPTH (ft)	Sample No.	Blow Counts per 6" 0-6"	6-12"	12-18"	18-24"	Blow Counts (N Value)	Recovery (in.)	Sample Depth(ft.)	MATERIAL DESCRIPTION
35									
	S-9	13	7	10	15	17	4	35 - 37	Black organic debris, strong organic and septic odor.
40									
	S-10	100						40 - 42	SAND, GRAVEL, rock fragments, some silt, strong organic odor.
									Boring terminated at 42.0 feet.
45									
50									
55									
60									
65									
70									
75									

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Telephone: 978-635-0012

TEST BORING REPORT

Boring No. B-5C

PROJECT NAME: Crow Lane Landfill
CLIENT: New Ventures Associates, L.L.C.
CONTRACTOR: Geosearch

	Casing	Sampler	Barrel	Drilling Equipment and Procedures
Type	Auger	SS	-	Rig Make & Model: CME 750 Truck
Inside Diam.(in.)	5 1/4	3/8	3	Bit Type: -
Hammer Wt. (lb.)	-	140	Push	Drill Mud: No Casing: Auger
Hammer Fall (in.)	-	30	-	Hoist/Hammer: -

Project Number: 20211
Project Location: Newburyport, Mass.
Start: 5/8/09
Finish: 5/8/09
Driller: Joe Kennan
Geocomp Rep: Martin Hawkes
Elevation/Datum:

DEPTH (ft)	Sample No.	Blow Counts per 6" 0-6"	6-12"	12-18"	18-24"	Blow Counts (N Value)	Recovery (in.)	Sample Depth(ft.)	MATERIAL DESCRIPTION
0									
	S-1	23	12	12	25	24	14	0 - 2	Top 3" Asphalt grindings. SAND, GRAVEL, some silt and cobbles.
5									
	S-2	10	7	8	8	15	17	5 - 7	Dark brown, SAND, GRAVEL, SILT, some concrete and brick fragments.
10									-GRANULAR FILL-
	S-3	11	10	5	6	15	0	10 - 12	
15									
20									
	S-4	23	36	18	15	54	20	20 - 22	Wet, olive gray to black SILT, SAND, GRAVEL, wood debris on top 12". Bottom 8" some cobbles. -ORGANIC FILL-
25									
	S-5	36	20	20	28	40	16	25 - 27	Moist, dark brown, SAND, GRAVEL, some cobbles, fine sand, some silt in tip.
30									
	S-6	5	5	5	5	10	12	30 - 32	Olive gray to black, FINE SAND AND SILT, some organics, asphalt grindings in tip. -GRANULAR FILL-
35									

Notes:
40 ft south west of B-5b.

WATER LEVEL DATA

DATE:	TIME:	Depth (ft.) to: BOT. OF CASING	BOT. OF HOLE	WATER

SAMPLE IDENTIFICATION
O OPEN END ROD
T THIN WALL TUBE
U UNDISTURBED SAMPLE
SS SPLIT SPOON

SUMMARY
OVERBURDEN (FT): DATUM:
ROCK CORED (LIN FT):
SAMPLES:
G.S. ELEVATION:

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TEST BORING REPORT

Boring No. B-5C
SHEET 2 OF 2

PROJECT NAME: Crow Lane Landfill
CLIENT: New Ventures Associates, L.L.C.
CONTRACTOR: Geosearch

	Casing	Sampler	Barrel
Type	Auger	SS	-
Inside Diam.(in.)	5 1/4	3/8	3
Hammer Wt. (lb.)	-	140	Push
Hammer Fall (in.)	-	30	-

Drilling Equipment and Procedures
Rig Make & Model: CME 750 Truck
Bit Type: -
Drill Mud: No
Casing: Auger
Hoist/Hammer: -

Project Number: 20211
Project Location: Newburyport, Mass.
Start: 5/8/09
Finish: 5/8/09
Driller: Joe Kennan
Geocomp Rep: Martin Hawkes
Elevation/Datum:

DEPTH (ft)	Sample No.	Blow Counts per 6" 0-6"	6-12"	12-18"	18-24"	Blow Counts (N Value)	Recovery (in.)	Sample Depth(ft.)	MATERIAL DESCRIPTION
35									
	S-7	16	4	5	12	9		35 - 37	Wet, olive gray SILT AND FINE SAND, wood chips. -FILL-
40									
	S-8	9	7	7	7	14	0	40 - 42	
	S-9	6	6	6	6	12	12	41 - 41 42 - 44	Top 9" fibers of wood, wet silt and fine sand. Bottom 8" olive tan, SILT AND FINE SAND, some clay.
45									Boring terminated at 44.0 feet.
50									
55									
60									
65									
70									
75									

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TEST BORING REPORT

Boring No. B-5D

PROJECT NAME: Crow Lane Landfill
CLIENT: New Ventures Associates, L.L.C.
CONTRACTOR: Geosearch

	Casing	Sampler	Barrel
Type	Auger	SS	-
Inside Diam.(in.)	5 1/4	3/8	3
Hammer Wt. (lb.)	-	140	Push
Hammer Fall (in.)	-	30	-

Drilling Equipment and Procedures
Rig Make & Model: CME 750 Truck
Bit Type: -
Drill Mud: No
Casing: Auger
Hoist/Hammer: -

Project Number: 20211
Project Location: Newburyport, Mass.
Start: 5/19/09
Finish: 5/19/09
Driller: Joe Kennan
Geocomp Rep: Martin Hawkes
Elevation/Datum:

DEPTH (ft)	Sample No.	Blow Counts per 6" 0-6"	6-12"	12-18"	18-24"	Blow Counts (N Value)	Recovery (in.)	Sample Depth(ft.)	MATERIAL DESCRIPTION
0									
	S-1	19	22	26	18	48	24	0 - 2	Dry, black, brown, white SAND, GRAVEL, concrete cobbles, asphalt grindings.
	S-2	12	25	19	11	44	18	3 - 5	Similar to S-1. Less asphalt.
5									
	S-3	2	3	3	22	6	10	8 - 10	Moist, brown and tan SAND, GRAVEL, concrete fragments, little black organics. -GRANULAR FILL-
10									
15	S-4	5	6	11	13	17	6	14 - 16	Wet, black organic wood fibers.
20	S-5	8	7	3	4	10	8	19 - 21	Top 2" similar to S-4. Rest wet, olive gray SAND, some silt, brick fragments. -ORGANIC WOOD FIBERS-
								20 - 20	
25	S-6	5	6	5	6	11		24 - 26	Wet, black SAND, GRAVEL, some organic, trace of silts.
								28 - 28	-GRANULAR FILL-
30	S-7	33	14	4	6	18		29 - 31	Sythetic fibers and plastic sheets, trace of black silt and sand.
35									

Notes:
Sunny and warm.

WATER LEVEL DATA

DATE:	TIME:	Depth (ft.) to: BOT. OF CASING	BOT. OF HOLE	WATER

SAMPLE IDENTIFICATION
O OPEN END ROD
T THIN WALL TUBE
U UNDISTURBED SAMPLE
SS SPLIT SPOON

SUMMARY
OVERBURDEN (FT): DATUM:
ROCK CORED (LIN FT):
SAMPLES:
G.S. ELEVATION:

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TEST BORING REPORT

Boring No. B-5D
SHEET 2 OF 2

PROJECT NAME: Crow Lane Landfill
CLIENT: New Ventures Associates, L.L.C.
CONTRACTOR: Geosearch

	Casing	Sampler	Barrel	Drilling Equipment and Procedures
Type	Auger	SS	-	Rig Make & Model: CME 750 Truck
Inside Diam.(in.)	5 1/4	3/8	3	Bit Type: -
Hammer Wt. (lb.)	-	140	Push	Drill Mud: No
Hammer Fall (in.)	-	30	-	Casing: Auger
				Hoist/Hammer: -

Project Number: 20211
Project Location: Newburyport, Mass.
Start: 5/19/09
Finish: 5/19/09
Driller: Joe Kennan
Geocomp Rep: Martin Hawkes
Elevation/Datum:

DEPTH (ft)	Sample No.	Blow Counts per 6" 0-6"	6-12"	12-18"	18-24"	Blow Counts (N Value)	Recovery (in.)	Sample Depth(ft.)	MATERIAL DESCRIPTION
35	S-8	4	5	10	1	15	4	34 - 36	Top 2" similar to S-7. Rest olive gray mottled tan, SILT and FINE SAND. *(continued)*
									Boring terminated at 36.0 feet.
40									
45									
50									
55									
60									
65									
70									
75									

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TEST BORING REPORT

Boring No. B-5E

SHEET 1 OF 1

PROJECT NAME: Crow Lane Landfill
CLIENT: New Ventures Associates, L.L.C.
CONTRACTOR: Geosearch

	Casing	Sampler	Barrel
Type	Auger	SS	-
Inside Diam.(in.)	5 1/4	3/8	3
Hammer Wt. (lb.)	-	140	Push
Hammer Fall (in.)	-	30	-

Drilling Equipment and Procedures
Rig Make & Model: CME 750 Truck
Bit Type: -
Drill Mud: No
Casing: Auger
Hoist/Hammer: -

Project Number: 20211
Project Location: Newburyport, Mass.
Start: 5/19/09 11:00 AM
Finish: 5/19/09 12:30 PM
Driller: Joe Kennan
Geocomp Rep: Martin Hawkes
Elevation/Datum:

DEPTH (ft)	Sample No.	Blow Counts per 6" 0-6"	6-12"	12-18"	18-24"	Blow Counts (N Value)	Recovery (in.)	Sample Depth(ft.)	MATERIAL DESCRIPTION
0									
	S-1	18	13	17	20	30	18	0 - 2	Dry, brown SAND, GRAVEL, some concrete and brick fragments.
	S-2	9	15	12	12	25	18	3 - 5	Similar to S-1. Cored green plastic in tip. Auger resistance at 5 ft.
5									
	S-3	14	14	23	38	37	18	8 - 10	Top 6" brown SAND, fine to medium GRAVEL, trace of silt. Middle 4" wet, black, some organics. Rest SAND, GRAVEL, concrete and brick fragments.
10									
15	S-4	7	4	6	6	10	6	14 - 16	Olive gray and black FINE SAND, SILT, trace of wood fibers. -GRANULAR FILL-
20	S-5	9	20	23	13	43	14	19 - 21	Top 3" wet, black SAND, GRAVEL, trace of organics. Rest olive gray, SILT, SAND, GRAVEL, brick fragments.
25									Boring terminated at 21.0 feet.
30									
35									

Notes:
40 ft north of B-5D

WATER LEVEL DATA

DATE:	TIME:	Depth (ft.) to: BOT. OF CASING	BOT. OF HOLE	WATER

SAMPLE IDENTIFICATION
O OPEN END ROD
T THIN WALL TUBE
U UNDISTURBED SAMPLE
SS SPLIT SPOON

SUMMARY
OVERBURDEN (FT):
DATUM:
ROCK CORED (LIN FT):
SAMPLES:
G.S. ELEVATION:

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TEST BORING REPORT

Boring No. B-6
SHEET 1 OF 1

PROJECT NAME: Crow Lane Landfill
CLIENT: New Ventures Associates, L.L.C.
CONTRACTOR: Geosearch

	Casing	Sampler	Barrel	Drilling Equipment and Procedures
Type	Auger	SS	-	Rig Make & Model: CME 750 Truck
Inside Diam.(in.)	5 1/4	3/8	3	Bit Type: -
Hammer Wt. (lb.)	-	140	Push	Drill Mud: No Casing: Auger
Hammer Fall (in.)	-	30	-	Hoist/Hammer: -

Project Number: 20211
Project Location: Newburyport, Mass.
Start: 5/6/09 8:30 AM
Finish: 5/6/09 11:00 AM
Driller: Joe Kennan
Geocomp Rep: Geoff Webster
Elevation/Datum:

DEPTH (ft)	Sample No.	Blow Counts per 6" 0-6"	6-12"	12-18"	18-24"	Blow Counts (N Value)	Recovery (in.)	Sample Depth(ft.)	MATERIAL DESCRIPTION
0									
	S-1	20	23	19	15	42		0 - 2	Granular GRAVEL, SAND. -FILL-
	S-2	4	6	5	7	11		3 - 5	6" black SILTY ORGANIC and few wood shrads, crushed concrete. -FILL-
5									
	S-3	8	8	11	16	19		8 - 10	Gray, small grained SANDY ROCK. -FILL-
10									
	S-4	6	12	12	21	24		10 - 12	Gray, well graded mix, medium grain GRAVEL(angular) and crushed ROCK. -FILL-
	S-5	16	25	50	43	75		12 - 14	Top 6" Similar to S-4. Rest: construction debris, medium grain SAND. -FILL-
15	S-6	44	46	14	48	60		14 - 16	Ledge, brick and gray medium grain SAND. -FILL-
	S-7	44	50	40	40	90		16 - 18	Top 6" Similar S-6. Rest: crushed rock. -FILL-
	S-8	37	18	18	18	36		18 - 20	Wet, weathered natural rock (fine to coarse rock).
20									
	S-9	15	60	60	75	120		20 - 22	SAND AND GRAVEL, 2" thin layer of silty soil, weathered crushed rock.
	S-10	60	75	100		175		22 - 24	Weathered natural rock, auger refusal at 23 ft.
25									Boring terminated at 24.0 feet.
30									
35									

Notes:
Cloudy cool, rain. Water table at 17 ft.

WATER LEVEL DATA				
		Depth (ft.) to:		
DATE:	TIME:	BOT. OF CASING	BOT. OF HOLE	WATER

SAMPLE IDENTIFICATION
O OPEN END ROD
T THIN WALL TUBE
U UNDISTURBED SAMPLE
SS SPLIT SPOON

SUMMARY
OVERBURDEN (FT): DATUM:
ROCK CORED (LIN FT):
SAMPLES:
G.S. ELEVATION:

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TEST BORING REPORT

Boring No. B-7
SHEET 1 OF 2

PROJECT NAME: Crow Lane Landfill
CLIENT: New Ventures Associates, L.L.C.
CONTRACTOR: Geosearch

	Casing	Sampler	Barrel
Type	Wash	SS	-
Inside Diam.(in.)	5	1 3/8	-
Hammer Wt. (lb.)	-	130	-
Hammer Fall (in.)	-	30	-

Drilling Equipment and Procedures
Rig Make & Model: CME 850 Truck
Bit Type: -
Drill Mud: Yes
Casing: Wash
Hoist/Hammer: -

Project Number: 20211
Project Location: Newburyport, Mass.
Start: 5/14/09 9:00 AM
Finish: 5/14/09 12:00 PM
Driller: Joe Kennan
Geocomp Rep: Martin Hawkes
Elevation/Datum:

DEPTH (ft)	Sample No.	Blow Counts per 6" 0-6"	6-12"	12-18"	18-24"	Blow Counts (N Value)	Recovery (in.)	Sample Depth(ft.)	MATERIAL DESCRIPTION
0									
5	S-1	7	13	12	16	25	10	5 - 7	Moist, brown to dark brown, SAND, GRAVEL, some silt, brick and concrete fragments, black wood fibers in tip.
								9 - 9	-GRANULAR FILL-
10	S-2	3	2	2	2	4	8	10 - 12	Wet, dark brown, SAND, SILT.
15	S-3	1	1	1	1	2	24	15 - 17	Top 4" fine SAND, SILT. Rest olive gray CLAY, some silt. -SAND & SILT-
	T-1						24	17 - 19	Olive gray SILT and CLAY.
20									
25	S-4						24	25 - 27	Moist, olive gray, SILT and CLAY.
30									
35									

Notes:
Warm, sunny.

WATER LEVEL DATA

DATE:	TIME:	Depth (ft.) to: BOT. OF CASING	BOT. OF HOLE	WATER

SAMPLE IDENTIFICATION
O OPEN END ROD
T THIN WALL TUBE
U UNDISTURBED SAMPLE
SS SPLIT SPOON

SUMMARY
OVERBURDEN (FT): DATUM:
ROCK CORED (LIN FT):
SAMPLES:
G.S. ELEVATION:

(Continued Next Page)

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TEST BORING REPORT

Boring No. B-7
SHEET 2 OF 2

PROJECT NAME: Crow Lane Landfill
CLIENT: New Ventures Associates, L.L.C.
CONTRACTOR: Geosearch

	Casing	Sampler	Barrel
Type	Wash	SS	-
Inside Diam.(in.)	5	1 3/8	-
Hammer Wt. (lb.)	-	130	-
Hammer Fall (in.)	-	30	-

Drilling Equipment and Procedures
Rig Make & Model: CME 850 Truck
Bit Type: -
Drill Mud: Yes
Casing: Wash
Hoist/Hammer: -

Project Number: 20211
Project Location: Newburyport, Mass.
Start: 5/14/09 9:00 AM
Finish: 5/14/09 12:00 PM
Driller: Joe Kennan
Geocomp Rep: Martin Hawkes
Elevation/Datum:

DEPTH (ft)	Sample No.	Blow Counts per 6" 0-6"	6-12"	12-18"	18-24"	Blow Counts (N Value)	Recovery (in.)	Sample Depth(ft.)	MATERIAL DESCRIPTION
35									
	S-5				2		24	35 - 37	Moist, olive gray, SILT and CLAY. 8" layer of fine sand and silt, some clay.
40									
45									
	S-6			2	2		24	45 - 47	Similar to S-5.
50									
55									
	S-7	6	6	5	5	11	24	55 - 57	Similar to S-5.
60									Boring terminated at 57.0 feet.
65									
70									
75									

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TEST BORING REPORT

Boring No. B-7A
SHEET 1 OF 2

PROJECT NAME: Crow Lane Landfill
CLIENT: New Ventures Associates, L.L.C.
CONTRACTOR: Geosearch

	Casing	Sampler	Barrel	Drilling Equipment and Procedures
Type	Wash	SS	-	Rig Make & Model: CME 850 Truck
Inside Diam.(in.)	5	1 3/8	-	Bit Type: -
Hammer Wt. (lb.)	-	130	-	Drill Mud: Yes
Hammer Fall (in.)	-	30	-	Casing: Wash
				Hoist/Hammer: -

Project Number: 20211
Project Location: Newburyport, Mass.
Start: 5/18/09 2:30 PM
Finish: 5/18/09 4:10 PM
Driller: Joe Kennan
Geocomp Rep: Martin Hawkes
Elevation/Datum:

DEPTH (ft)	Sample No.	Blow Counts per 6" 0-6"	6-12"	12-18"	18-24"	Blow Counts (N Value)	Recovery (in.)	Sample Depth(ft.)	MATERIAL DESCRIPTION
0									
5									
10									
15									
20									
25									
30									
35									

Notes:
10 ft north of B-6.

WATER LEVEL DATA				
		Depth (ft.) to:		
DATE:	TIME:	BOT. OF CASING	BOT. OF HOLE	WATER

SAMPLE IDENTIFICATION
O OPEN END ROD
T THIN WALL TUBE
U UNDISTURBED SAMPLE
SS SPLIT SPOON

SUMMARY
OVERBURDEN (FT): DATUM:
ROCK CORED (LIN FT):
SAMPLES:
G.S. ELEVATION:

(Continued Next Page)

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TEST BORING REPORT

Boring No. B-7A

PROJECT NAME: Crow Lane Landfill
CLIENT: New Ventures Associates, L.L.C.
CONTRACTOR: Geosearch

	Casing	Sampler	Barrel
Type	Wash	SS	-
Inside Diam.(in.)	5	1 3/8	-
Hammer Wt. (lb.)	-	130	-
Hammer Fall (in.)	-	30	-

Drilling Equipment and Procedures
Rig Make & Model: CME 850 Truck
Bit Type: -
Drill Mud: Yes
Casing: Wash
Hoist/Hammer: -

Project Number: 20211
Project Location: Newburyport, Mass.
Start: 5/18/09 2:30 PM
Finish: 5/18/09 4:10 PM
Driller: Joe Kennan
Geocomp Rep: Martin Hawkes
Elevation/Datum:

DEPTH (ft)	Sample No.	Blow Counts per 6" 0-6"	6-12"	12-18"	18-24"	Blow Counts (N Value)	Recovery (in.)	Sample Depth(ft.)	MATERIAL DESCRIPTION
35									
40									
45									
50									
55									
60	S-1	17	40	40	30	80	20	59 - 61	Top 12" wet, olive gray, SILT and CLAY. 8" of rock fragments.
									Boring terminated at 61.0 feet.
65									
70									
75									

Geocomp CORPORATION

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TEST BORING REPORT

Boring No. B-8

PROJECT NAME: Crow Lane Landfill
CLIENT: New Ventures Associates, L.L.C.
CONTRACTOR: Geosearch

	Casing	Sampler	Barrel	Drilling Equipment and Procedures
Type	Wash	SS	-	Rig Make & Model: CME 850 Truck
Inside Diam.(in.)	5	1 3/8	-	Bit Type: -
Hammer Wt. (lb.)	-	130	-	Drill Mud: Yes
Hammer Fall (in.)	-	30	-	Casing: Wash
				Hoist/Hammer: -

Project Number: 20211
Project Location: Newburyport, Mass.
Start: 5/18/09
Finish: 5/18/09
Driller: Joe Kennan
Geocomp Rep: Martin Hawkes
Elevation/Datum:

DEPTH (ft)	Sample No.	Blow Counts per 6" 0-6"	6-12"	12-18"	18-24"	Blow Counts (N Value)	Recovery (in.)	Sample Depth(ft.)	MATERIAL DESCRIPTION
0									
5									
10	S-1	42	32	19	9	51	18	9.5 - 11.5	Moist, brown to white, SAND, GRAVEL, little silt, concrete bricks with 1" olive gray mottle tan SILT and FINE SAND in tip. -GRANULAR FILL-
15									
20	T-1						24	19 - 21	Shelby tube. SILT and CLAY. -SILT & CLAY-
25									
30	S-2						24	29 - 31	Moist, olive gray CLAY, some silt.
35									

Notes:
At toe below B-3. Half way between B-3 and TP-3.

WATER LEVEL DATA				
DATE:	TIME:	Depth (ft.) to: BOT. OF CASING	BOT. OF HOLE	WATER

SAMPLE IDENTIFICATION
O OPEN END ROD
T THIN WALL TUBE
U UNDISTURBED SAMPLE
SS SPLIT SPOON

SUMMARY
OVERBURDEN (FT): DATUM:
ROCK CORED (LIN FT):
SAMPLES:
G.S. ELEVATION:

(Continued Next Page)

GEOTECH - GINT STD US.GDT - 6/3/09 22:40 - C:\PROGRAM FILES\GINT\PROJECTS\CROW LANE LANDFILL.GPJ

Geocomp Corporation
1145 Massachusetts Avenue
Boxborough, MA 01719
Telephone: 978-635-0012

TEST BORING REPORT

Boring No. B-8
SHEET 2 OF 2

PROJECT NAME: Crow Lane Landfill
CLIENT: New Ventures Associates, L.L.C.
CONTRACTOR: Geosearch

	Casing	Sampler	Barrel	Drilling Equipment and Procedures
Type	Wash	SS	-	Rig Make & Model: CME 850 Truck
Inside Diam.(in.)	5	1 3/8	-	Bit Type: -
Hammer Wt. (lb.)	-	130	-	Drill Mud: Yes Casing: Wash
Hammer Fall (in.)	-	30	-	Hoist/Hammer: -

Project Number: 20211
Project Location: Newburyport, Mass.
Start: 5/18/09
Finish: 5/18/09
Driller: Joe Kennan
Geocomp Rep: Martin Hawkes
Elevation/Datum:

DEPTH (ft)	Sample No.	Blow Counts per 6" 0-6"	6-12"	12-18"	18-24"	Blow Counts (N Value)	Recovery (in.)	Sample Depth(ft.)	MATERIAL DESCRIPTION
35									
40	S-3	3	2	2	1		24	39 - 41	Similar to S-2. Top 3" FINE SAND, little silt.
45									
50	S-4		12	2	3	14	24	49 - 51	Wet, olive gray SILT and CLAY, fine sand in tip. 2" SILT and FINE SAND layer in the center.
55									
60	S-5		6		12			59 - 61	Similar to S-4. Less silt.
65								66 - 66	-GRAVEL AND ROCK-
70	S-6	22	27	28	50	55	10	69 - 71	Wet, olive gray SILT and CLAY mixed with gravel, rock fragments.
75									Boring terminated at 71.0 feet.

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Telephone: 978-635-0012

TEST BORING REPORT

Boring No. B-9
SHEET 1 OF 2

PROJECT NAME: Crow Lane Landfill
CLIENT: New Ventures Associates, L.L.C.
CONTRACTOR: Geosearch

	Casing	Sampler	Barrel
Type	Wash	SS	-
Inside Diam.(in.)	5	1 3/8	-
Hammer Wt. (lb.)	-	130	-
Hammer Fall (in.)	-	30	-

Drilling Equipment and Procedures
Rig Make & Model: CME 850 Truck
Bit Type: -
Drill Mud: Yes
Casing: Wash
Hoist/Hammer: -

Project Number: 20211
Project Location: Newburyport, Mass.
Start: 5/15/09 1:30 PM
Finish: 5/15/09 4:45 PM
Driller: Joe Kennan
Geocomp Rep: Martin Hawkes
Elevation/Datum:

DEPTH (ft)	Sample No.	Blow Counts per 6" 0-6"	6-12"	12-18"	18-24"	Blow Counts (N Value)	Recovery (in.)	Sample Depth(ft.)	MATERIAL DESCRIPTION
0									
5									
10	S-1	10	11	7	4	18	8	9.5 - 11.5	Black SILT, SAND, GRAVEL, some organic. -GRANULAR FILL-
15								15 - 15	
20	T-1						24	19 - 21	Shelby Tube Gray, SILT and CLAY. -SILT & CLAY-
25									
30	S-2						24	29 - 31	Moist, olive gray, CLAY, some silt.
35									

Notes:
Between B-3 and B-4.

WATER LEVEL DATA

DATE:	TIME:	Depth (ft.) to: BOT. OF CASING	BOT. OF HOLE	WATER

SAMPLE IDENTIFICATION
O OPEN END ROD
T THIN WALL TUBE
U UNDISTURBED SAMPLE
SS SPLIT SPOON

SUMMARY
OVERBURDEN (FT): DATUM:
ROCK CORED (LIN FT):
SAMPLES:
G.S. ELEVATION:

(Continued Next Page)

GEOTECH - GINT STD US.GDT - 6/3/09 22:40 - C:\PROGRAM FILES\GINT\PROJECTS\CROW LANE LANDFILL.GPJ

Geocomp CORPORATION

Geocomp Corporation
1145 Massachusetts Avenue
Boxborough, MA 01719
Telephone: 978-635-0012

TEST BORING REPORT

Boring No. B-9

PROJECT NAME: Crow Lane Landfill
CLIENT: New Ventures Associates, L.L.C.
CONTRACTOR: Geosearch

	Casing	Sampler	Barrel
Type	Wash	SS	-
Inside Diam.(in.)	5	1 3/8	-
Hammer Wt. (lb.)	-	130	-
Hammer Fall (in.)	-	30	-

Drilling Equipment and Procedures
Rig Make & Model: CME 850 Truck
Bit Type: -
Drill Mud: Yes
Casing: Wash
Hoist/Hammer: -

Project Number: 20211
Project Location: Newburyport, Mass.
Start: 5/15/09 1:30 PM
Finish: 5/15/09 4:45 PM
Driller: Joe Kennan
Geocomp Rep: Martin Hawkes
Elevation/Datum:

DEPTH (ft)	Sample No.	Blow Counts per 6" 0-6"	6-12"	12-18"	18-24"	Blow Counts (N Value)	Recovery (in.)	Sample Depth(ft.)	MATERIAL DESCRIPTION
35									
40	S-3	3	7	7	5	14	24	39 - 41	Top 6" Wet, olive, CLAY and SILT, grading into a wet olive FINE SAND at the bottom.
45									
50	S-4	1	1	1	2	2	24	49 - 51	Top 2" moist, olive gray, FINE SAND and SILT. Rest olive gray, SILT and CLAY.
55	S-5	20	24	50		74	6	55 - 56.5	Top 3" olive gray, SILT and CLAY, rest rock, granite fragments. -ROCK-
									Boring terminated at 56.5 feet.
60									
65									
70									
75									

GEOTECH - GINT STD US.GDT - 6/3/09 22:40 - C:\PROGRAM FILES\GINT\PROJECTS\CROW LANE LANDFILL.GPJ

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Telephone: 978-635-0012

TEST BORING REPORT

Boring No. B-10
SHEET 1 OF 2

PROJECT NAME: Crow Lane Landfill
CLIENT: New Ventures Associates, L.L.C.
CONTRACTOR: Geosearch

	Casing	Sampler	Barrel	Drilling Equipment and Procedures
Type	Wash	SS	-	Rig Make & Model: CME 850 Truck
Inside Diam.(in.)	5	1 3/8	-	Bit Type: -
Hammer Wt. (lb.)	-	130	-	Drill Mud: Yes
Hammer Fall (in.)	-	30	-	Casing: Wash
				Hoist/Hammer: -

Project Number: 20211
Project Location: Newburyport, Mass.
Start: 5/15/09 9:00 AM
Finish:
Driller: Joe Kennan
Geocomp Rep: Martin Hawkes
Elevation/Datum:

DEPTH (ft)	Sample No.	Blow Counts per 6" 0-6"	6-12"	12-18"	18-24"	Blow Counts (N Value)	Recovery (in.)	Sample Depth(ft.)	MATERIAL DESCRIPTION
0									
5									
10	S-1	19	17	12	10	29	7	10 - 12	Moist, white to brown, SAND and GRAVEL, little silt and concrete fragments. -GRANULAR FILL-
15								15 - 15	
20	S-2	2	1	1	1	2	24	20 - 22	Moist, gray, SILT and CLAY, some silt partings. -SILT & CLAY-
25									
30	T-1						12	29 - 31	Olive gray, SILT and CLAY.
35									

Notes:
Partly cludy, breezy. Toe of slope at B-6.

WATER LEVEL DATA				
DATE:	TIME:	Depth (ft.) to: BOT. OF CASING	BOT. OF HOLE	WATER

SAMPLE IDENTIFICATION
O OPEN END ROD
T THIN WALL TUBE
U UNDISTURBED SAMPLE
SS SPLIT SPOON

SUMMARY
OVERBURDEN (FT): DATUM:
ROCK CORED (LIN FT):
SAMPLES:
G.S. ELEVATION:

(Continued Next Page)

GEOTECH - GINT STD US.GDT - 6/3/09 22:45 - C:\PROGRAM FILES\GINT\PROJECTS\CROW LANE LANDFILL.GPJ

Geocomp CORPORATION

Geocomp Corporation
1145 Massachusetts Avenue
Boxborough, MA 01719
Telephone: 978-635-0012

TEST BORING REPORT

Boring No. B-10
SHEET 2 OF 2

PROJECT NAME: Crow Lane Landfill
CLIENT: New Ventures Associates, L.L.C.
CONTRACTOR: Geosearch

	Casing	Sampler	Barrel	Drilling Equipment and Procedures
Type	Wash	SS	-	Rig Make & Model: CME 850 Truck
Inside Diam.(in.)	5	1 3/8	-	Bit Type: -
Hammer Wt. (lb.)	-	130	-	Drill Mud: Yes
Hammer Fall (in.)	-	30	-	Casing: Wash
				Hoist/Hammer: -

Project Number: 20211
Project Location: Newburyport, Mass.
Start: 5/15/09 9:00 AM
Finish:
Driller: Joe Kennan
Geocomp Rep: Martin Hawkes
Elevation/Datum:

DEPTH (ft)	Sample No.	Blow Counts per 6" 0-6"	6-12"	12-18"	18-24"	Blow Counts (N Value)	Recovery (in.)	Sample Depth(ft.)	MATERIAL DESCRIPTION
35									
40	S-3	63					6	39 - 39.5	Auger resistance at 39 ft. Gray clay, silt, some rock fragments in tip. -ROCK- Boring terminated at 39.5 feet.
45									
50									
55									
60									
65									
70									
75									

GEOTECH - GINT STD US.GDT - 6/3/09 22:45 - C:\PROGRAM FILES\GINT\PROJECTS\CROW LANE LANDFILL.GPJ

Geocomp CORPORATION

Geocomp Corporation
1145 Massachusetts Avenue
Boxborough, MA 01719
Telephone: 978-635-0012

TEST BORING REPORT

Boring No. B-11
SHEET 1 OF 2

PROJECT NAME: Crow Lane Landfill
CLIENT: New Ventures Associates, L.L.C.
CONTRACTOR: Geosearch

	Casing	Sampler	Barrel
Type	Wash	SS	-
Inside Diam.(in.)	5	1 3/8	-
Hammer Wt. (lb.)	-	130	-
Hammer Fall (in.)	-	30	-

Drilling Equipment and Procedures
Rig Make & Model: CME 850 Truck
Bit Type: -
Drill Mud: Yes
Casing: Wash
Hoist/Hammer: -

Project Number: 20211
Project Location: Newburyport, Mass.
Start: 5/14/09 3:45 PM
Finish: 5/14/09 5:45 pm
Driller: Joe Kennan
Geocomp Rep: Martin Hawkes
Elevation/Datum:

DEPTH (ft)	Sample No.	Blow Counts per 6" 0-6"	6-12"	12-18"	18-24"	Blow Counts (N Value)	Recovery (in.)	Sample Depth(ft.)	MATERIAL DESCRIPTION
0									
5									
10	S-1	3	2	3	3	5	22	9 - 11	Top 2" olive gray, silt and fine sand, some organics. Middle olive gray and yellow gray, SILT, FINE SAND, some clay. Bottom 6" gray, FINE SAND, little silt.
15									
20	T-1						24	19 - 21	Tip gray, SILT and CLAY.
25									
30	S-2		1	1	2	2	24	29 - 31	Top 10" olive gray, SILT and CLAY. Bottom 14" FINE SAND, some silt.
35									

Notes:
Warm, sunny.

WATER LEVEL DATA				
DATE:	TIME:	Depth (ft.) to: BOT. OF CASING:	BOT. OF HOLE:	WATER:

SAMPLE IDENTIFICATION
O OPEN END ROD
T THIN WALL TUBE
U UNDISTURBED SAMPLE
SS SPLIT SPOON

SUMMARY
OVERBURDEN (FT): DATUM:
ROCK CORED (LIN FT):
SAMPLES:
G.S. ELEVATION:

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GEOTECH - GINT STD US.GDT - 6/3/09 22:40 - C:\PROGRAM FILES\GINT\PROJECTS\CROW LANE LANDFILL.GPJ

Geocomp CORPORATION

Geocomp Corporation
1145 Massachusetts Avenue
Boxborough, MA 01719
Telephone: 978-635-0012

TEST BORING REPORT

Boring No. B-11
SHEET 2 OF 2

PROJECT NAME: Crow Lane Landfill
CLIENT: New Ventures Associates, L.L.C.
CONTRACTOR: Geosearch

	Casing	Sampler	Barrel
Type	Wash	SS	-
Inside Diam.(in.)	5	1 3/8	-
Hammer Wt. (lb.)	-	130	-
Hammer Fall (in.)	-	30	-

Drilling Equipment and Procedures
Rig Make & Model: CME 850 Truck
Bit Type: -
Drill Mud: Yes
Casing: Wash
Hoist/Hammer: -

Project Number: 20211
Project Location: Newburyport, Mass.
Start: 5/14/09 3:45 PM
Finish: 5/14/09 5:45 pm
Driller: Joe Kennan
Geocomp Rep: Martin Hawkes
Elevation/Datum:

DEPTH (ft)	Sample No.	Blow Counts per 6" 0-6"	6-12"	12-18"	18-24"	Blow Counts (N Value)	Recovery (in.)	Sample Depth(ft.)	MATERIAL DESCRIPTION
35									
40	S-3	6	8	20	24	28	24	39 - 41	Top 8" olive gray, SILT and CLAY Middle 12" tan, FINE SAND, some silt Bottom 4" Argillite rock fragments. -ROCK-
45									Boring terminated at 41.0 feet.
50									
55									
60									
65									
70									
75									

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Geocomp CORPORATION

Geocomp Corporation
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Boxborough, MA 01719
Telephone: 978-635-0012

TEST BORING REPORT

Boring No. B-12

SHEET 1 OF 1

PROJECT NAME: Crow Lane Landfill
CLIENT: New Ventures Associates, L.L.C.
CONTRACTOR: Geosearch

	Casing	Sampler	Barrel
Type	Wash	SS	-
Inside Diam.(in.)	5	1 3/8	-
Hammer Wt. (lb.)	-	130	-
Hammer Fall (in.)	-	30	-

Drilling Equipment and Procedures
Rig Make & Model: CME 850 Truck
Bit Type: -
Drill Mud: Yes
Casing: Wash
Hoist/Hammer: -

Project Number: 20211
Project Location: Newburyport, Mass.
Start: 5/14/09 2:00 PM
Finish: 5/14/09 3:45 PM
Driller: Joe Kennan
Geocomp Rep: Martin Hawkes
Elevation/Datum:

DEPTH (ft)	Sample No.	Blow Counts per 6" 0-6"	6-12"	12-18"	18-24"	Blow Counts (N Value)	Recovery (in.)	Sample Depth(ft.)	MATERIAL DESCRIPTION
0									
5	S-1	0	0	0	2		3	4 - 6	Wet, brown, SILT and SAND, some wood fibers. -GRANULAR FILL-
								8 - 8	
10	S-2	0	2	2	2	4	24	9 - 11	Moist, olive gray to yellowish gray, SILT and CLAY, some very thin silt layer. -SILT & CLAY-
15	T-1						10		Shelby Tube.
	S-3	12	13	13	10	26	20	14 - 14.8	Moist, olive gray, SILT, some fine sand and yellowish gray mottling.
								-	Top 6" olive gray, SILT and CLAY.
								14.8 - 16.8	Middle 6" yellowish brown, fine SAND, some silt. Bottom 4" weathered rock fragments, some silt.
20									Boring terminated at 16.8 feet.
25									
30									
35									

Notes:
At toe of berm below B-5.

WATER LEVEL DATA

DATE:	TIME:	Depth (ft.) to: BOT. OF CASING	BOT. OF HOLE	WATER

SAMPLE IDENTIFICATION
O OPEN END ROD
T THIN WALL TUBE
U UNDISTURBED SAMPLE
SS SPLIT SPOON

SUMMARY
OVERBURDEN (FT):
DATUM:
ROCK CORED (LIN FT):
SAMPLES:
G.S. ELEVATION:

GEOTECH - GINT STD US.GDT - 6/3/09 22:40 - C:\PROGRAM FILES\GINT\PROJECTS\CROW LANE LANDFILL.GPJ

Geocomp CORPORATION

Geocomp Corporation
1145 Massachusetts Avenue
Boxborough, MA 01719
Telephone: 978-635-0012

TEST BORING REPORT

Boring No. B-13
SHEET 1 OF 1

PROJECT NAME: Crow Lane Landfill
CLIENT: New Ventures Associates, L.L.C.
CONTRACTOR: Geosearch

	Casing	Sampler	Barrel
Type	Wash	SS	-
Inside Diam.(in.)	5	1 3/8	-
Hammer Wt. (lb.)	-	130	-
Hammer Fall (in.)	-	30	-

Drilling Equipment and Procedures
Rig Make & Model: CME 850 Truck
Bit Type: -
Drill Mud: Yes
Casing: Wash
Hoist/Hammer: -

Project Number: 20211
Project Location: Newburyport, Mass.
Start: 5/14/09 1:00 PM
Finish: 5/14/09
Driller: Joe Kennan
Geocomp Rep: Martin Hawkes
Elevation/Datum:

DEPTH (ft)	Sample No.	Blow Counts per 6" 0-6"	6-12"	12-18"	18-24"	Blow Counts (N Value)	Recovery (in.)	Sample Depth(ft.)	MATERIAL DESCRIPTION
0									
5	S-1	19	16	13	50	29	17	4.5 - 6.5	Top 6" weathered rock. Rest: wet, olive gray, SILT and CLAY, mixed with angular rock fragments, last 3" all rock.
								6.5 - 8	Weathered rock.
									Boring terminated at 8.0 feet.
10									
15									
20									
25									
30									
35									

Notes:

WATER LEVEL DATA				
		Depth (ft.) to:		
DATE:	TIME:	BOT. OF CASING:	BOT. OF HOLE:	WATER:

SAMPLE IDENTIFICATION
O OPEN END ROD
T THIN WALL TUBE
U UNDISTURBED SAMPLE
SS SPLIT SPOON

SUMMARY
OVERBURDEN (FT): DATUM:
ROCK CORED (LIN FT):
SAMPLES:
G.S. ELEVATION:

GEOTECH - GINT STD US.GDT - 6/3/09 22:40 - C:\PROGRAM FILES\GINT\PROJECTS\CROW LANE LANDFILL.GPJ

Appendix "B"

Test Pit Logs

Test Pits Dug by New Ventures Associates, Newburyport, MA. on the 7th and 8th of May, 2009

Observed and logged by Geocomp Corporation, Boxborough, MA.

Geocomp
CORPORATION

Project No.: 20113
Project Name: Crow Lane Landfill
Task: Geotechnical Data Report

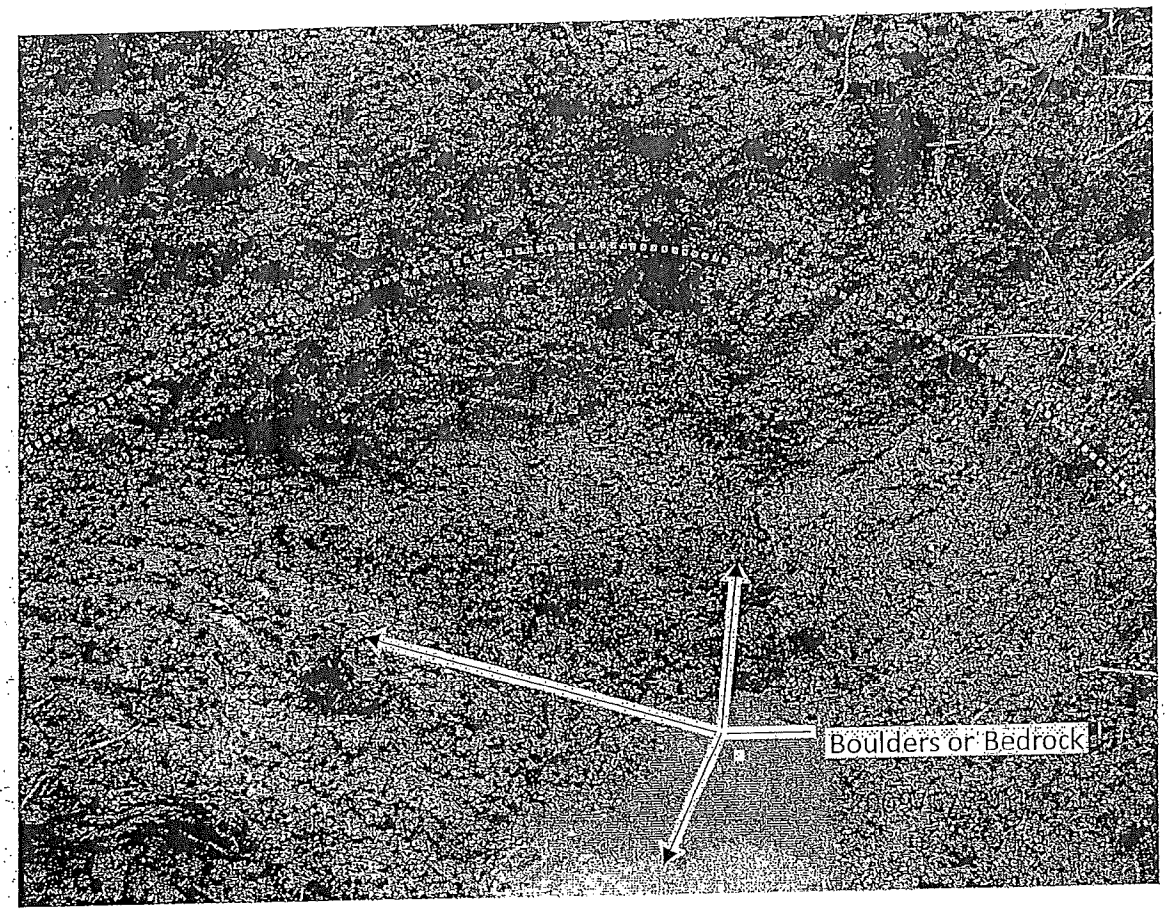
Date: June 12, 2009
Prepared by: M. Hawkes
Reviewed by: D. Stulgis

Test Pit 1

Excavated 15:45 05/07/07
Located at toe of berm below boring B-1
Depth 4.0 feet

0.0 ft
Wet, dark brown and black SAND AND GRAVEL some cobbles, trace silt and bricks FILL

2.5 ft



4.0 ft

Rounded rock BOULDERS AND BEDROCK?

Geocomp
CORPORATION

Project No.: 20113
Project Name: Crow Lane Landfill
Task: Geotechnical Data Report

Date: June 12, 2009
Prepared by: M. Hawkes
Reviewed by: D. Stulgis

Test Pit 2

Excavated 14:45 05/07/07
Located at toe of berm below boring B-2
Depth 8.6 feet

0.0 ft

Moist sandy LOAM

1.3 ft

Wet, brown SAND AND GRAVEL some cobbles little silt

5.2 ft

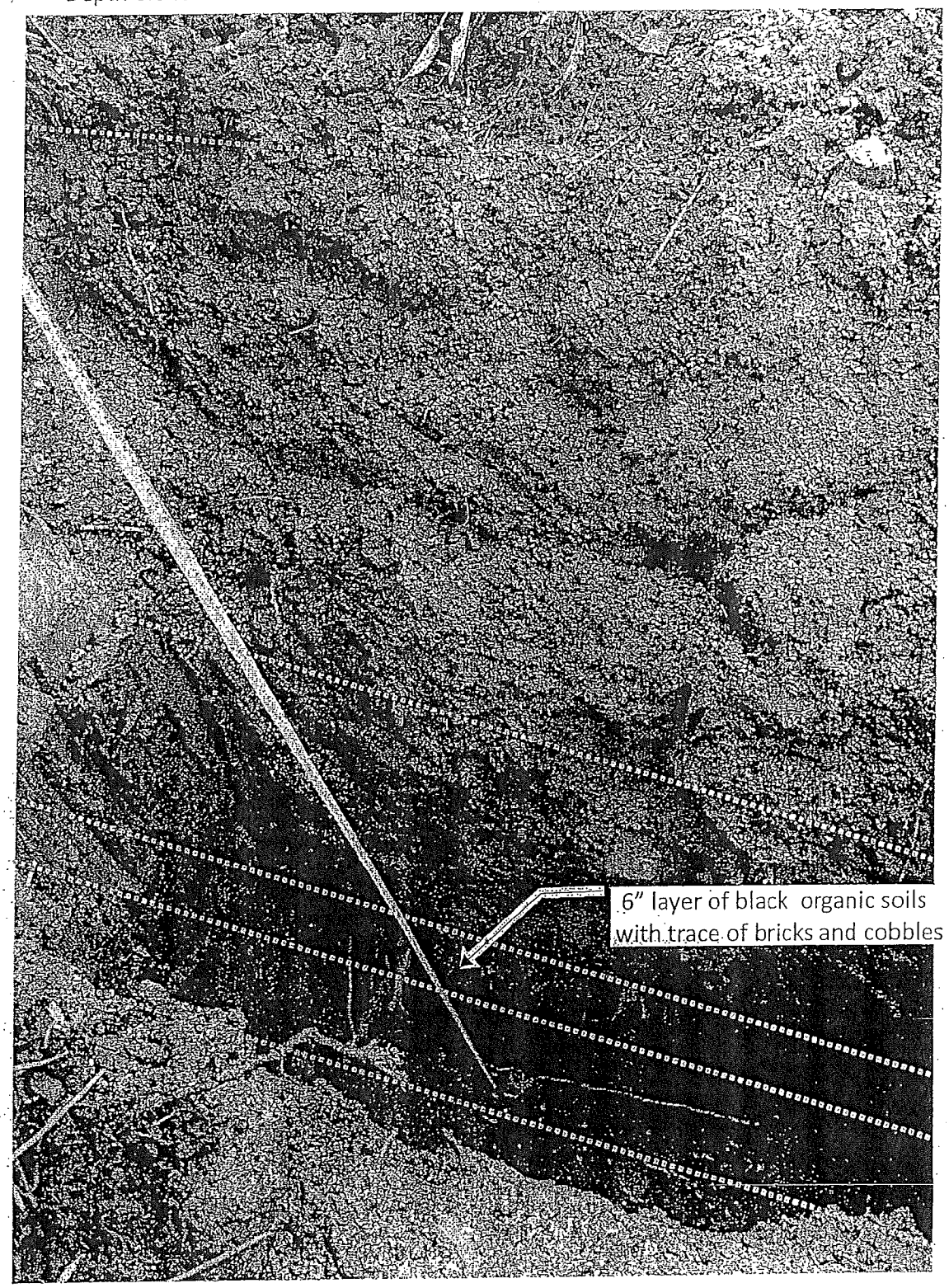
Moist olive gray FINE SAND AND SILT (disturbed)

6.4 ft

6.9 ft

Moist, olive gray FINE SAND AND SILT

8.6 feet



Geocomp
CORPORATION

Project No.: 20113
Project Name: Crow Lane Landfill
Task: Geotechnical Data Report

Date: June 12, 2009
Prepared by: M. Hawkes
Reviewed by: D. Stulgis

Test Pit 3

Excavated 13:45 05/07/07
Located at toe of berm below boring B-3
Depth 3.5 feet sampled to 5.5 feet

0.0 ft

Moist sandy LOAM

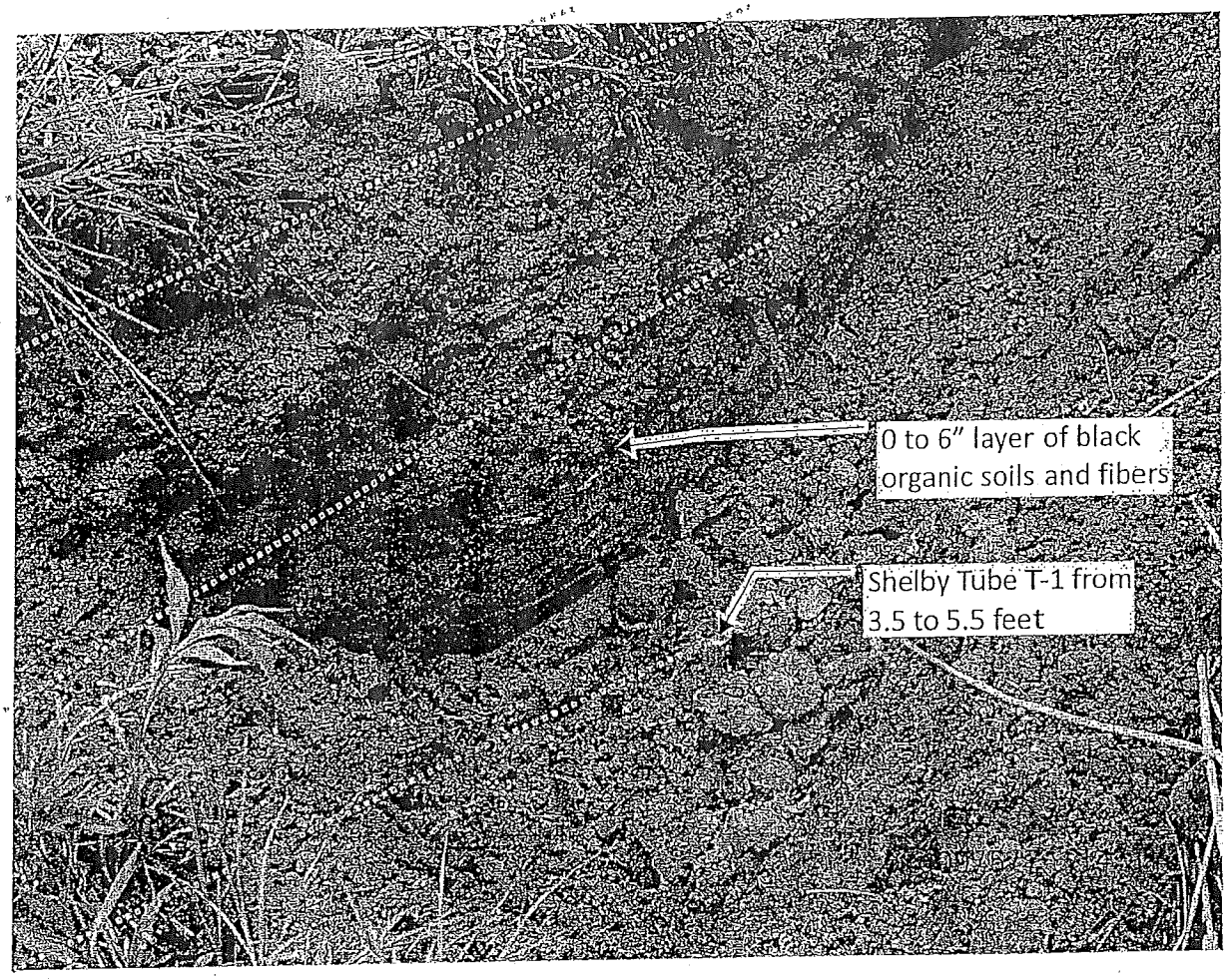
1.2 ft

Wet, dark brown
SAND AND GRAVEL
some cobbles and
silt

3.5 ft

Moist, olive gray FINE
SAND, little silt

5.5 ft



Geocomp
CORPORATION

Project No.:	20113	Date:	June 12, 2009
Project Name:	Crow Lane Landfill	Prepared by:	M. Hawkes
Task:	Geotechnical Data Report	Reviewed by:	D. Stulgis

Test Pit 4

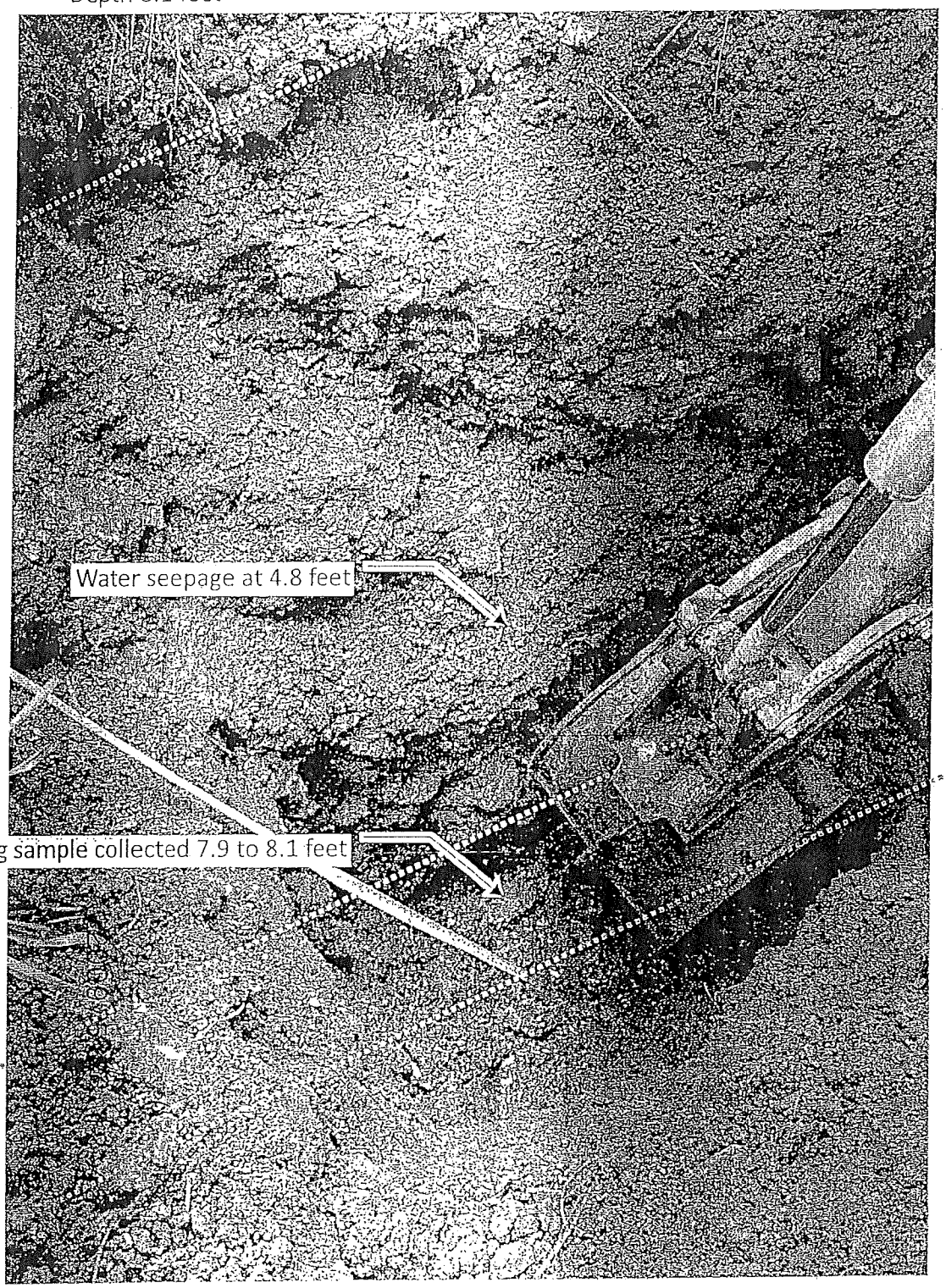
Excavated 12:30 050707
Located at toe of berm below [illegible]
Depth 8.1 feet

0.0 ft

Moist sandy LOAM

1.4 ft

moist, dark brown SAND AND GRAVEL some cobbles and silt, trace small boulders



7.1 ft

Moist, olive to blueish gray with tan mottling SILT some clay

8.1 feet

Geocomp
CORPORATION

Project No.:	20113	Date:	June 12, 2009
Project Name:	Crow Lane Landfill	Prepared by:	M. Hawkes
Task:	Geotechnical Data Report	Reviewed by:	D. Stulgis

Test Pit 5

Excavated 11:30 05/08/07
Located at toe of berm below boring B-5
Depth 8.2 feet

0.0 ft

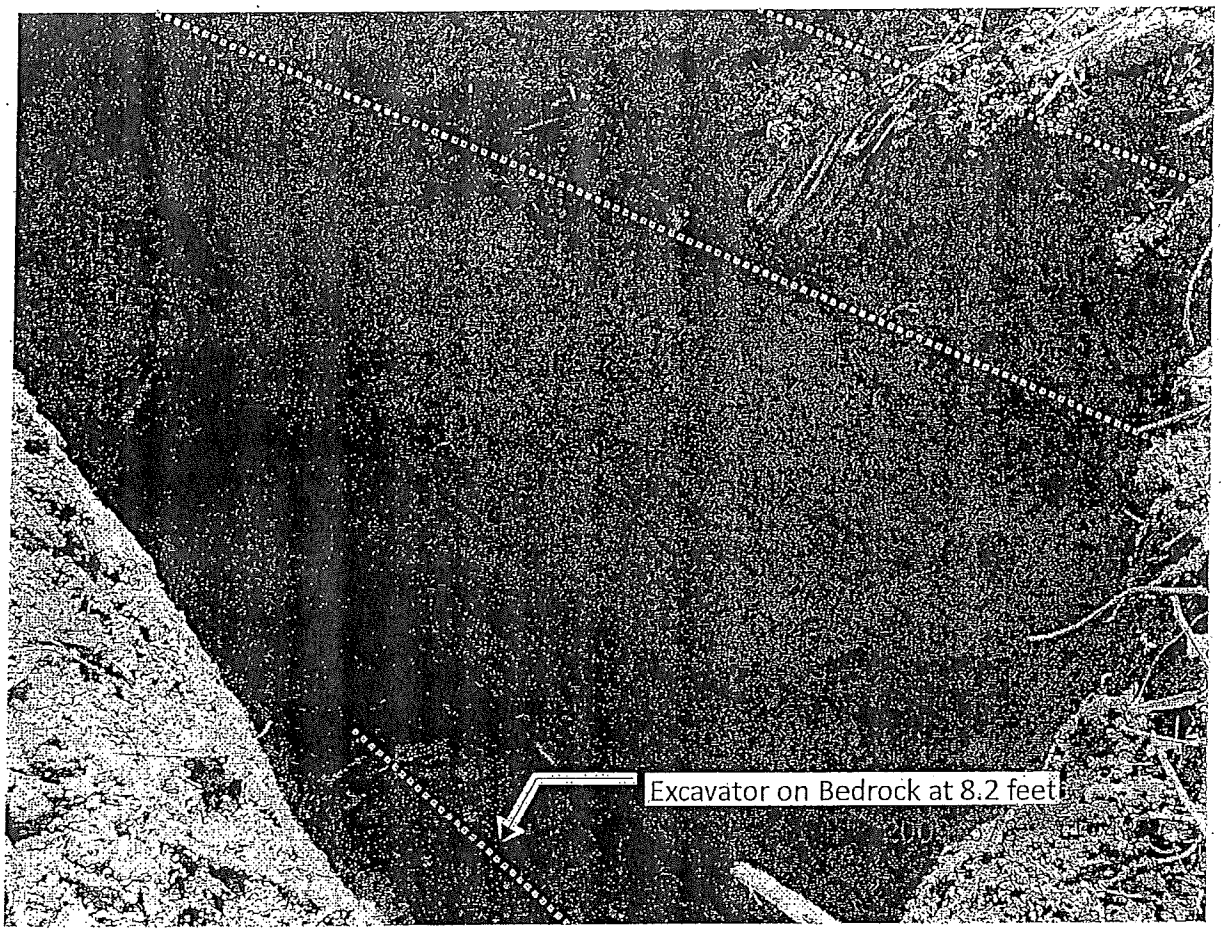
Moist sandy LOAM

1.5 ft

Moist mottled yellowish tan SILT AND FINE SAND

3.0 ft

Moist olive gray SILT AND FINE SAND



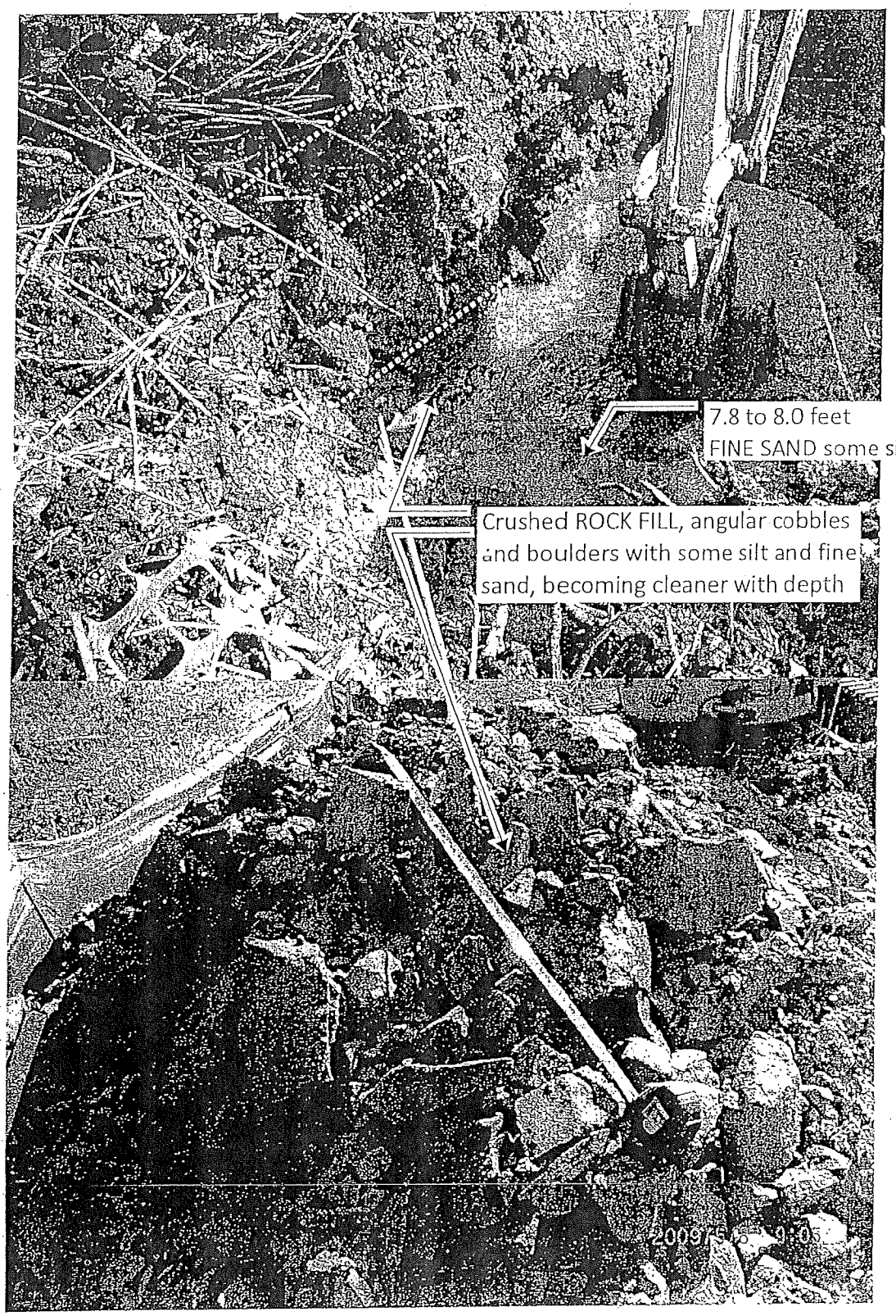
8.2 ft

Geocomp
CORPORATION

Project No.:	20113	Date:	June 12, 2007
Project Name:	Crow Lane Landfill	Prepared by:	M. Hawkes
Task:	Geotechnical Data Report	Reviewed by:	D. Stulgis

Test Pit 6

Excavated 8:30 05/08/07
Located at toe of berm below boring B-6
Depth 8.0 feet

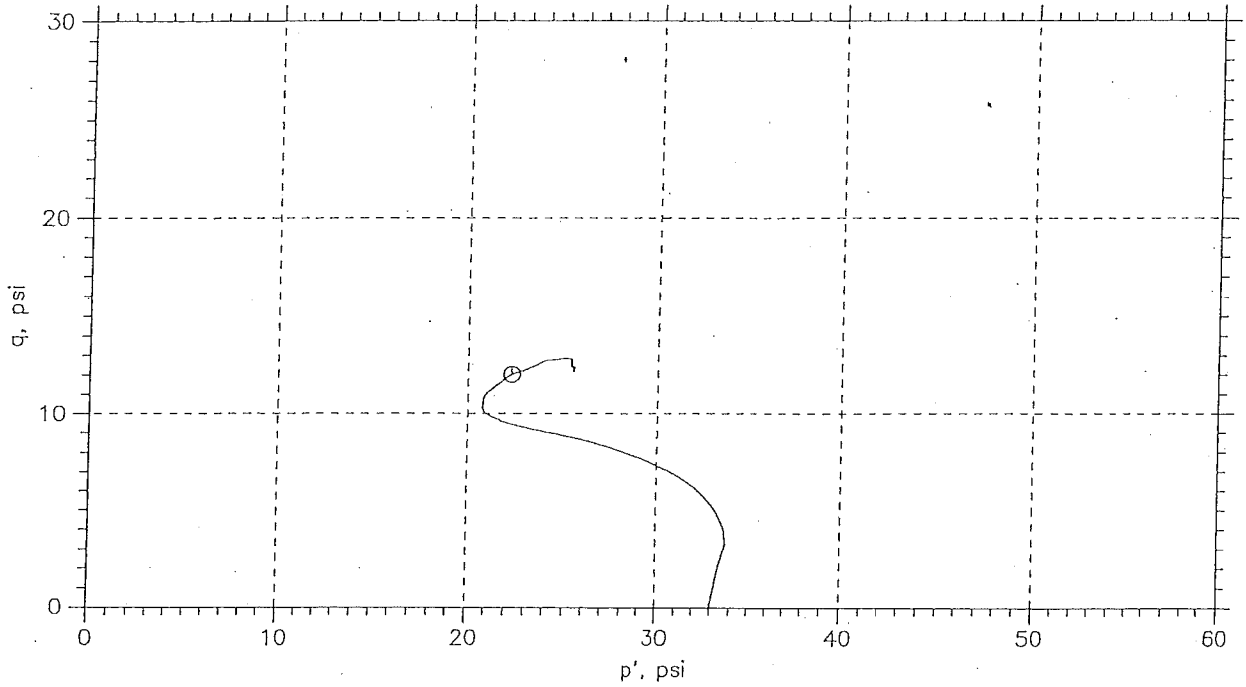


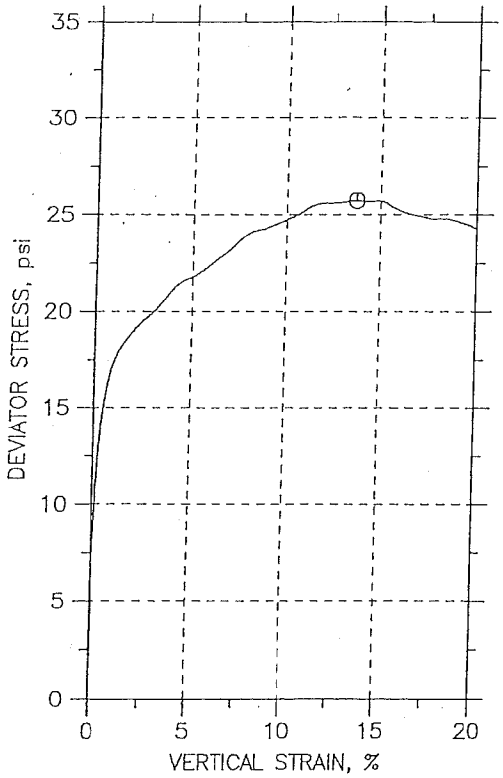
Appendix "C"

Laboratory data

Laboratory Tests performed by GeoTesting Express a subsidiary of Geocomp Corporation, Boxborough, MA.

CONSOLIDATED UNDRAINED TRIAXIAL TEST by ASTM D4767





Symbol		⦶			
Sample No.		T-3			
Test No.		CU-4			
Depth		45-47			
Initial	Diameter, in	2.86			
	Height, in	5.66			
	Water Content, %	35.0			
	Dry Density, pcf	86.72			
	Saturation, %	100.0			
	Void Ratio	0.944			
Before Shear	Water Content, %	27.2			
	Dry Density, pcf	97.22			
	Saturation*, %	100.0			
	Void Ratio	0.734			
	Back Press., psi	28.			
Ver. Eff. Cons. Stress, psi		33.			
Shear Strength, psi		12.86			
Strain at Failure, %		13.8			
Strain Rate, %/min		0.016			
B-Value		1.			
Estimated Specific Gravity		2.7			
Liquid Limit		---			
Plastic Limit		---			

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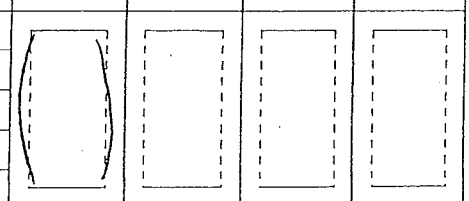
Project: Crow Lane LF
Location: Newburyport, MA
Project No.: GTX-9054
Boring No.: B-2
Sample Type: tube
Description: Wet, gray clay
Remarks: System Q



Phase calculations based on start and end of test.
* Saturation is set to 100% for phase calculations.

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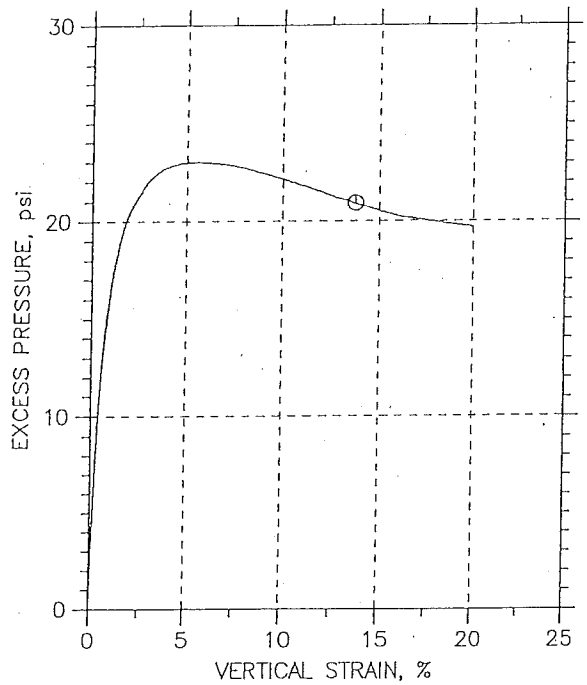
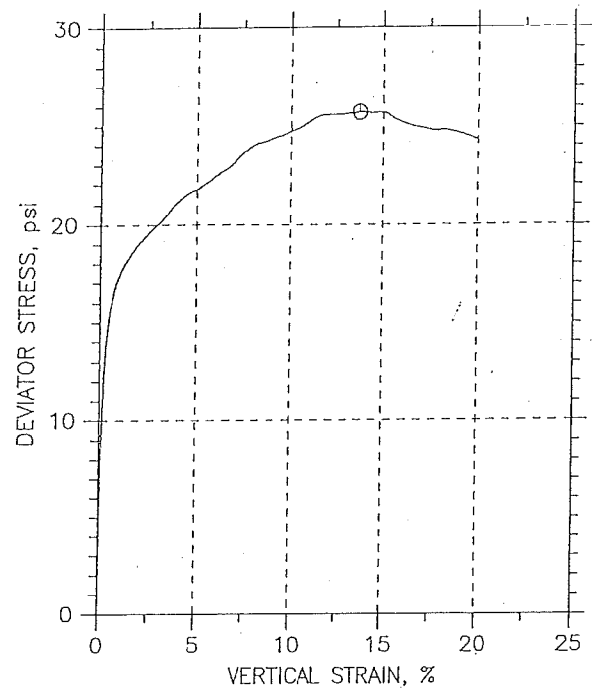
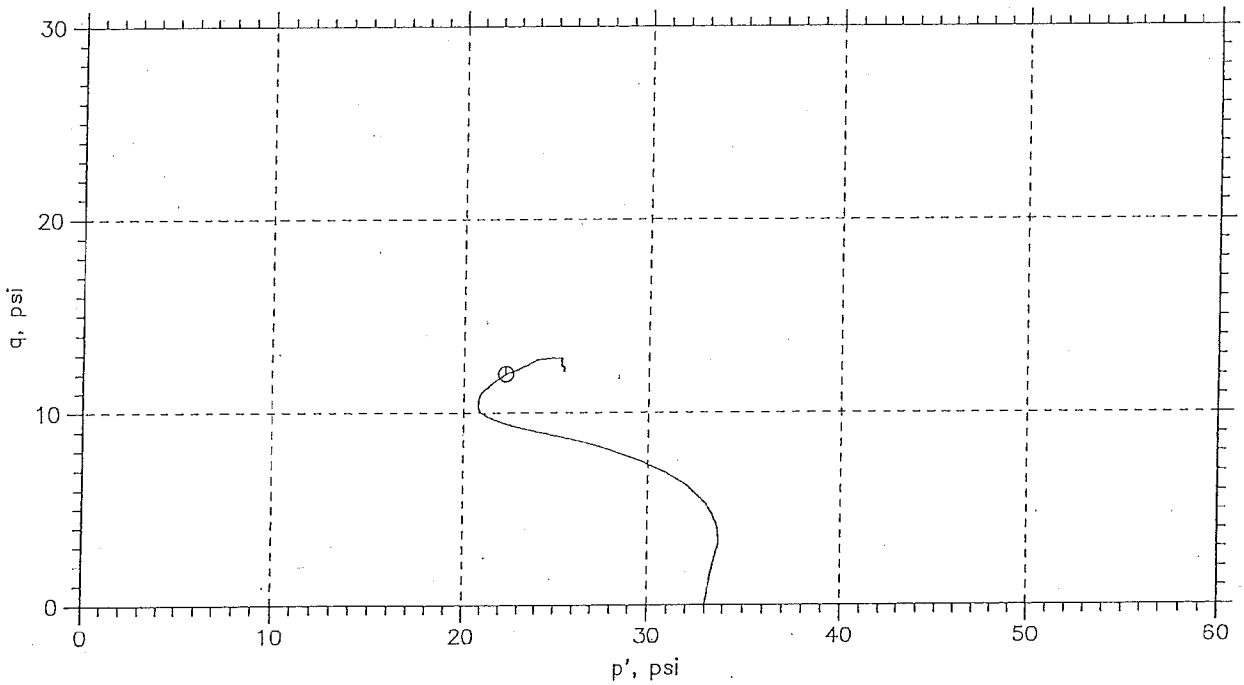
CONSOLIDATED UNDRAINED TRIAXIAL TEST by ASTM D4767







	Sample No.	Test No.	Depth	Tested By	Test Date	Checked By	Check Date	Test File
⊕	T-3	CU-4	45-47	njh	06/12/09	jdt		9054-CU-4n.dat

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Project: Crow Lane LF	Location: Newburyport, MA	Project No.: GTX-9054
Boring No.: B-2	Sample Type: tube	
Description: Wet, gray clay		
Remarks: System Q		

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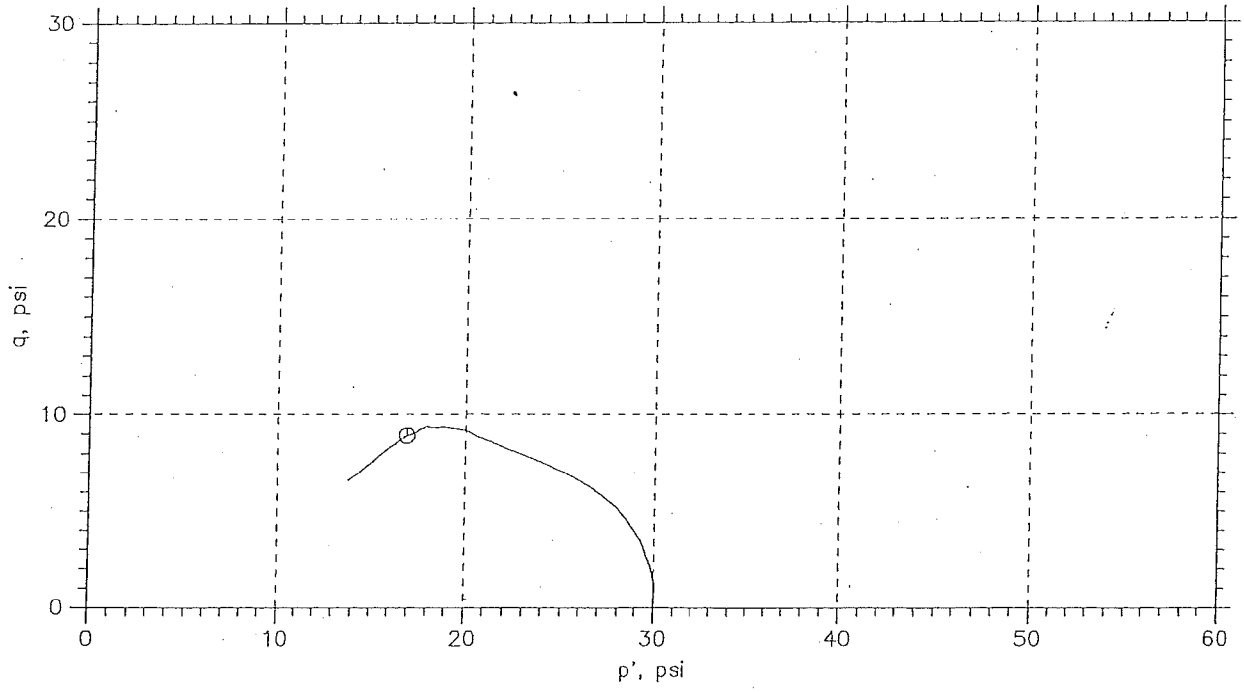
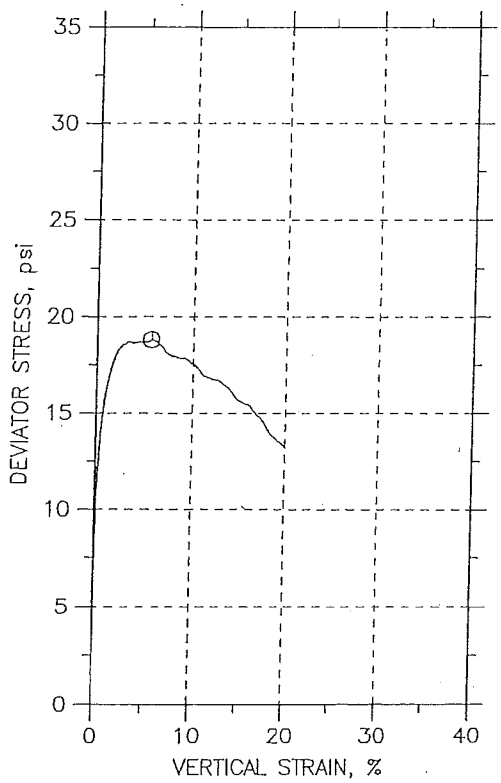
CONSOLIDATED UNDRAINED TRIAXIAL TEST by ASTM D4767





Symbol		⊙			
Sample No.		T-2			
Test No.		CU-5			
Depth		42.5			
Initial	Diameter, in	2.75			
	Height, in	5.85			
	Water Content, %	37.3			
	Dry Density, pcf	81.31			
	Saturation, %	93.8			
	Void Ratio	1.07			
Before Shear	Water Content, %	33.1			
	Dry Density, pcf	89.04			
	Saturation*, %	100.0			
	Void Ratio	0.893			
	Back Press., psi	112.			
Ver. Eff. Cons. Stress, psi		29.99			
Shear Strength, psi		9.413			
Strain at Failure, %		5.5			
Strain Rate, %/min		0.016			
B-Value		0.95			
Estimated Specific Gravity		2.7			
Liquid Limit		---			
Plastic Limit		---			

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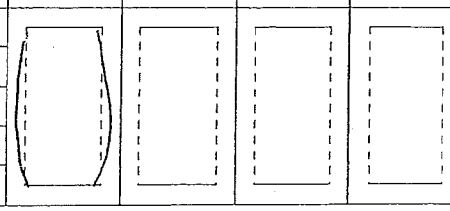
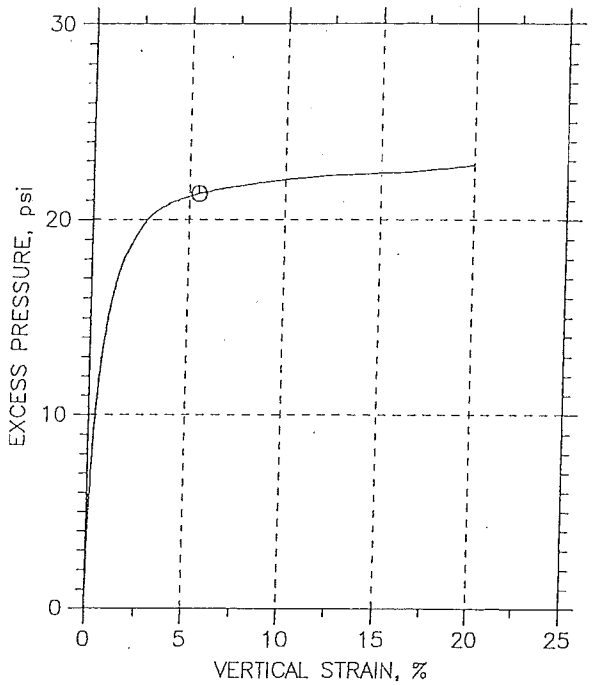
Project: Crow Lane LF
Location: Newburyport, MA
Project No.: GTX-9054
Boring No.: B-4
Sample Type: tube
Description: Moist, gray silty clay
Remarks: System U

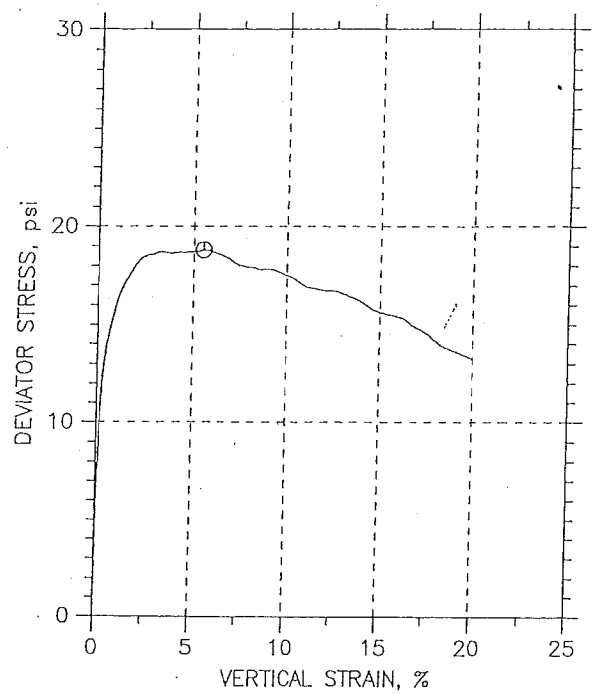


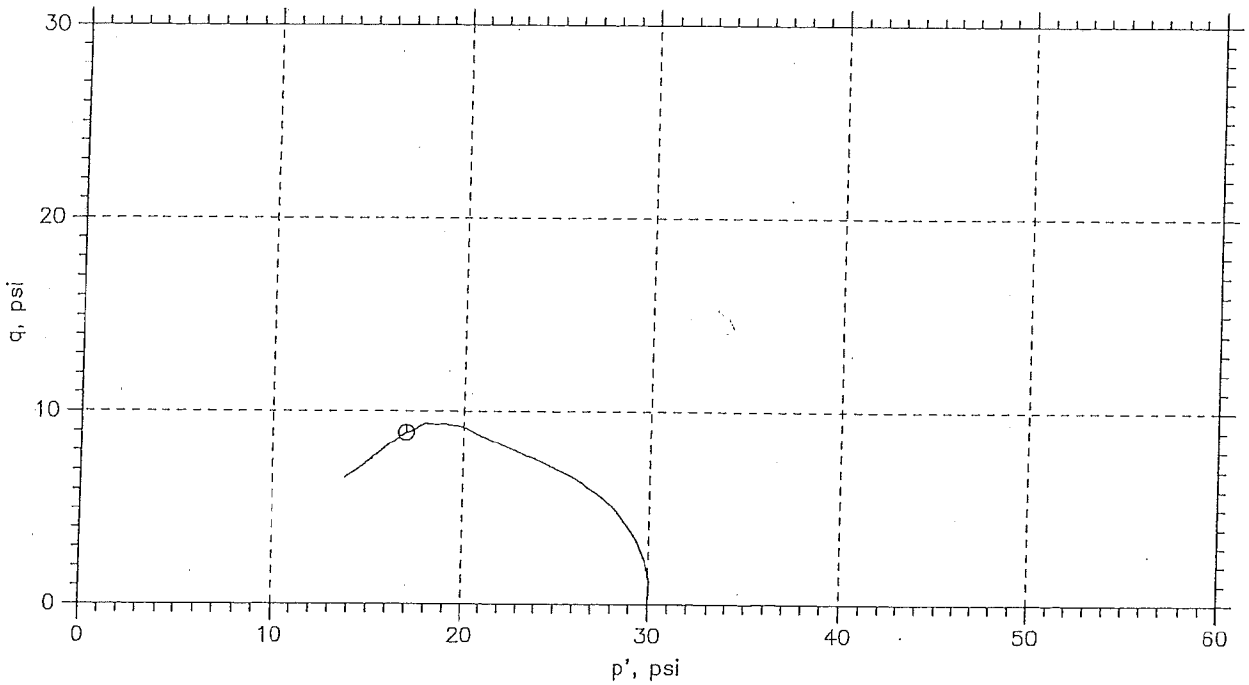
Phase calculations based on start and end of test.

16-JUN-2009 11:15:08

CONSOLIDATED UNDRAINED TRIAXIAL TEST by ASTM D4767







	Sample No.	Test No.	Depth	Tested By	Test Date	Checked By	Check Date	Test File
⦶	T-2	CU-5	42.5	njh	06/13/09	jdt		9054-Cu-5n.dat

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Project: Crow Lane LF	Location: Newburyport, MA	Project No.: GTX-9054
Boring No.: B-4	Sample Type: tube	
Description: Moist, gray silty clay		
Remarks: System U		

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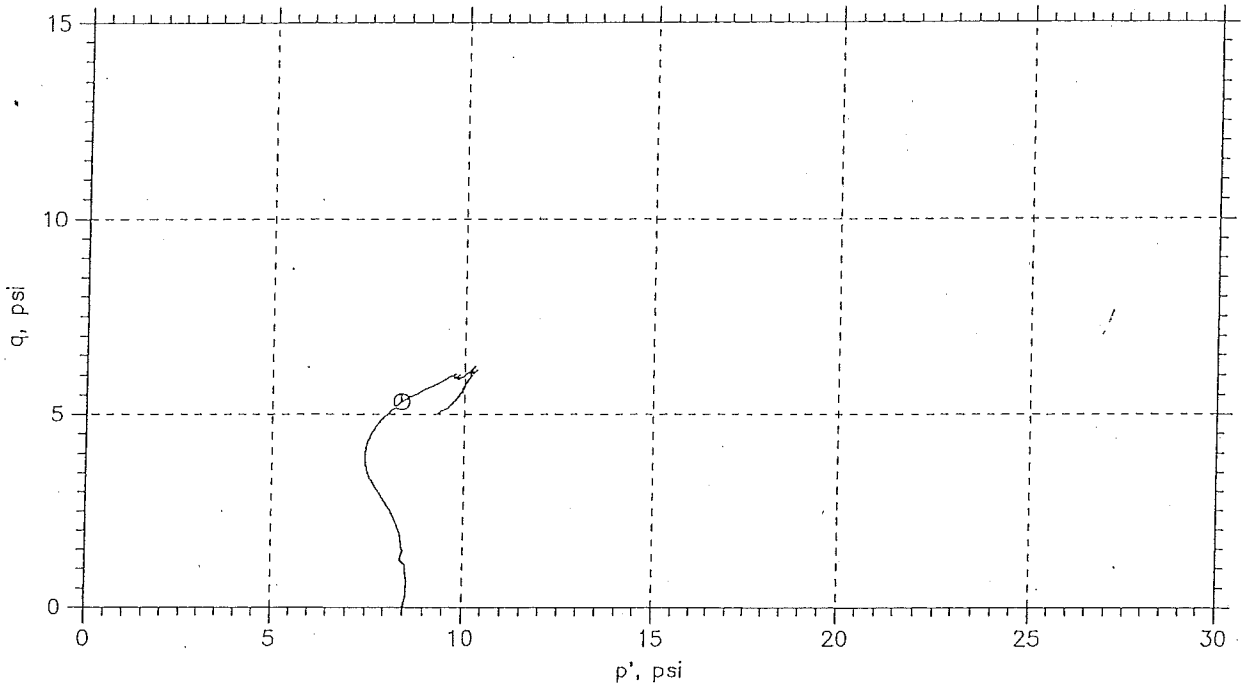
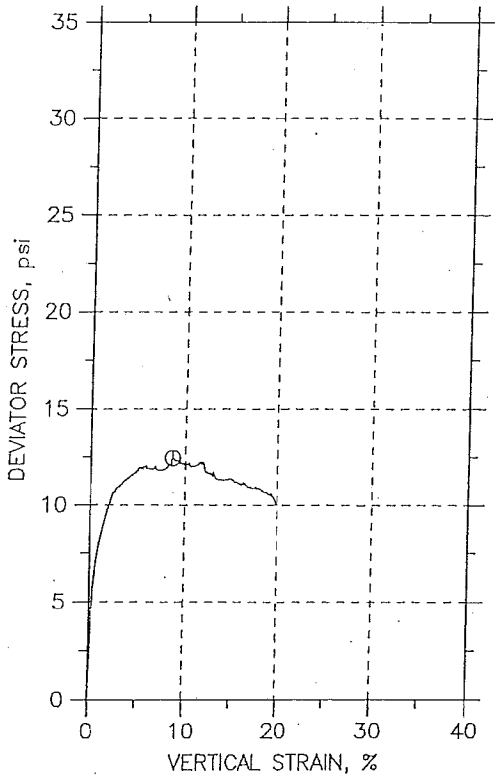
CONSOLIDATED UNDRAINED TRIAXIAL TEST by ASTM D4767





Symbol		⦶			
Sample No.		T-1			
Test No.		CU-3			
Depth		17-19			
Initial	Diameter, in	2.86			
	Height, in	6.08			
	Water Content, %	30.5			
	Dry Density, pcf	92.48			
	Saturation, %	100.0			
	Void Ratio	0.823			
Before Shear	Water Content, %	27.2			
	Dry Density, pcf	97.11			
	Saturation*, %	100.0			
	Void Ratio	0.736			
	Back Press., psi	28.			
Ver. Eff. Cons. Stress, psi		8.497			
Shear Strength, psi		6.227			
Strain at Failure, %		8.65			
Strain Rate, %/min		0.016			
B-Value		0.95			
Estimated Specific Gravity		2.7			
Liquid Limit		---			
Plastic Limit		---			

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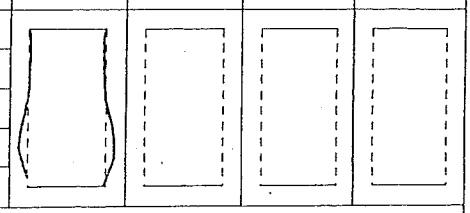
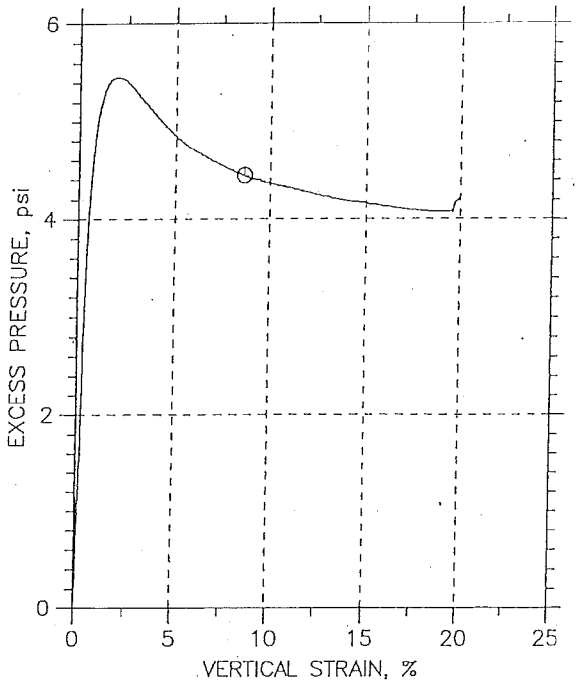
Project: Crow Lane LF
Location: Newburyport, MA
Project No.: GTX-9054
Boring No.: B-7
Sample Type: tube
Description: Moist, gray clay
Remarks: System R

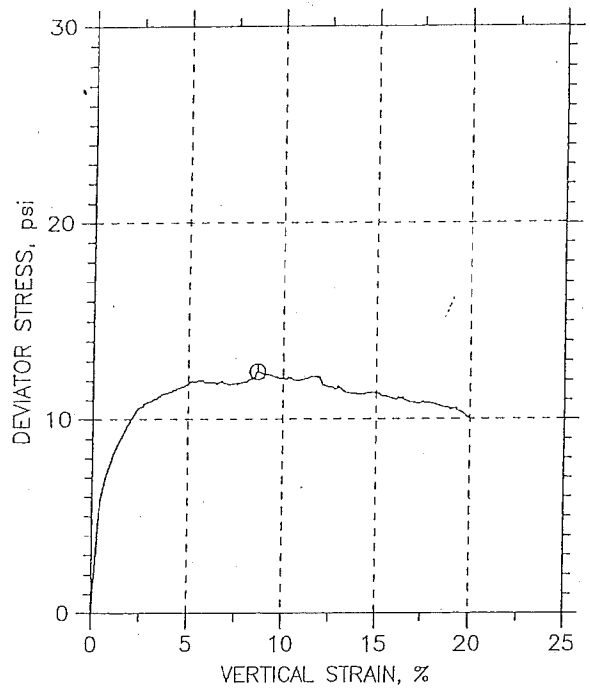


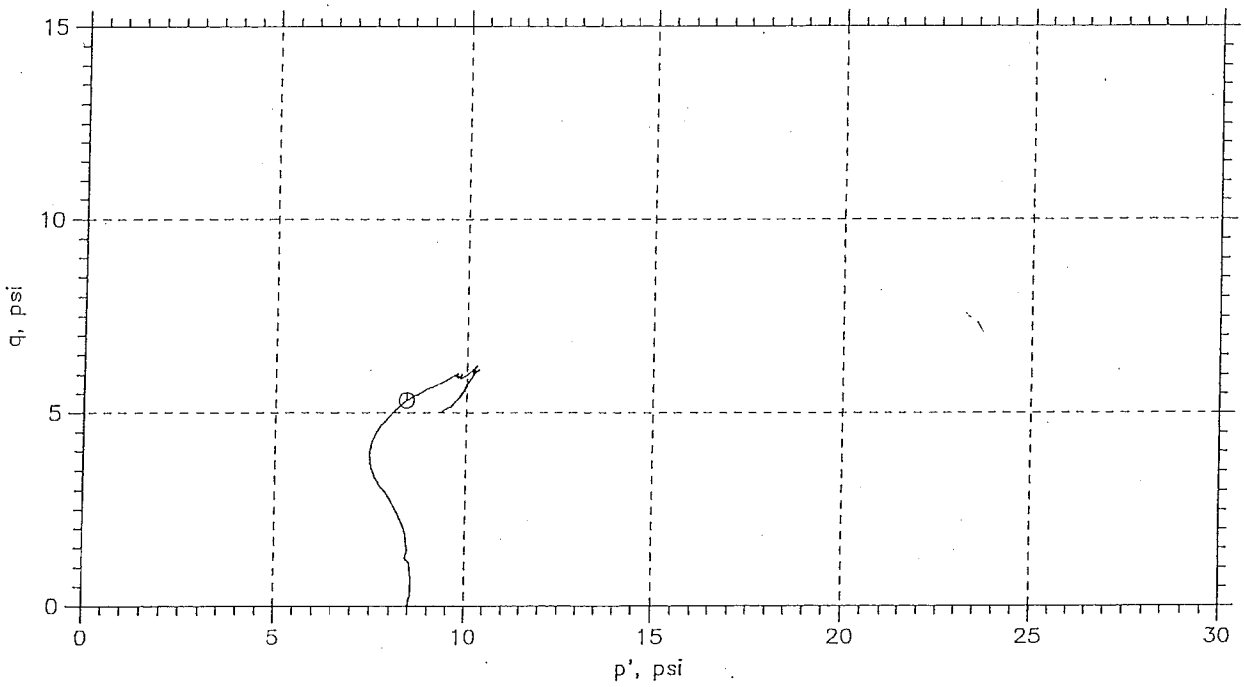
Phase calculations based on start and end of test.

16-JUN-2009 09:33:56

CONSOLIDATED UNDRAINED TRIAXIAL TEST by ASTM D4767







	Sample No.	Test No.	Depth	Tested By	Test Date	Checked By	Check Date	Test File
⊖	T-1	CU-3	17-19	njh	06/12/09	jdt		9054-CU-3n.dat

GeoTesting express a subsidiary of Geocomp Corporation	Project: Crow Lane LF	Location: Newburyport, MA	Project No.: GTX-9054
	Boring No.: B-7	Sample Type: tube	
	Description: Moist, gray clay		
	Remarks: System R		

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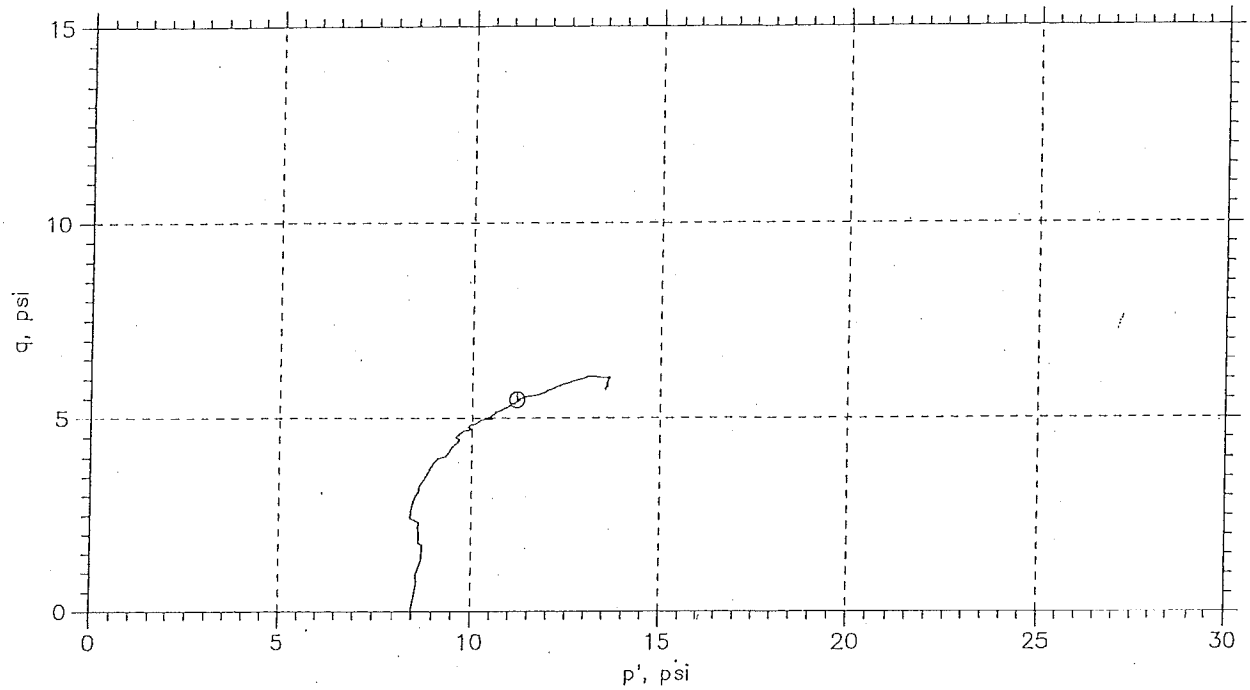
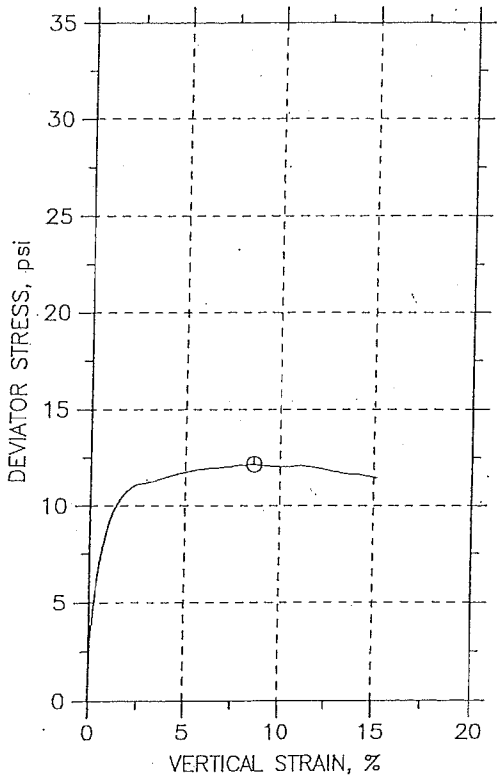
CONSOLIDATED UNDRAINED TRIAXIAL TEST by ASTM D4767





Symbol		⊖			
Sample No.		T-1			
Test No.		CU-2			
Depth		19-21			
Initial	Diameter, in	2.85			
	Height, in	5.93			
	Water Content, %	26.7			
	Dry Density, pcf	97.95			
	Saturation, %	99.9			
	Void Ratio	0.721			
Before Shear	Water Content, %	28.8			
	Dry Density, pcf	94.84			
	Saturation*, %	100.0			
	Void Ratio	0.777			
	Back Press., psi	85.01			
Ver. Eff. Cons. Stress, psi		8.492			
Shear Strength, psi		6.086			
Strain at Failure, %		8.63			
Strain Rate, %/min		0.03			
B-Value		0.95			
Estimated Specific Gravity		2.7			
Liquid Limit		---			
Plastic Limit		---			

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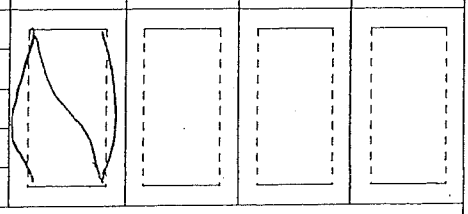
Project: Crow Lane LF
Location: Newburyport, MA
Project No.: GTX-9054
Boring No.: B-9
Sample Type: tube
Description: Moist, gray clay
Remarks: System 0



Phase calculations based on start and end of test.

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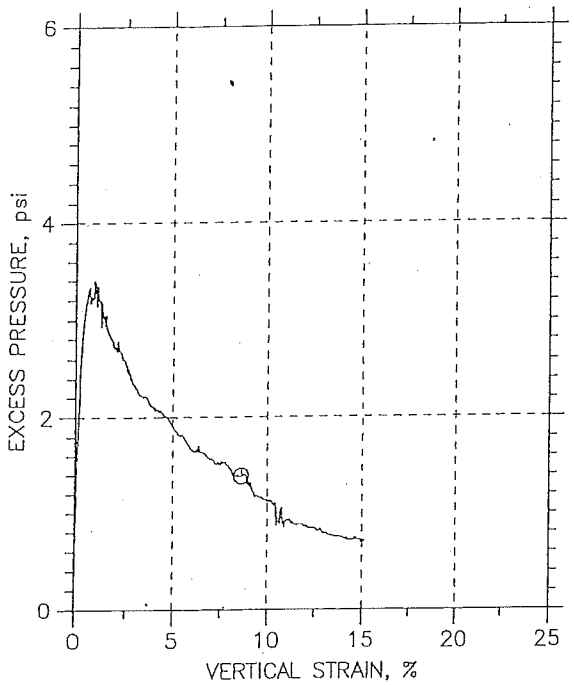
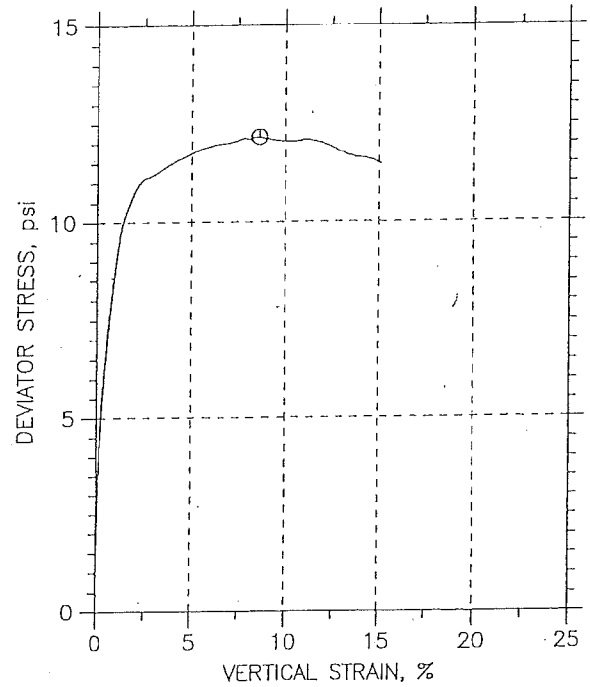
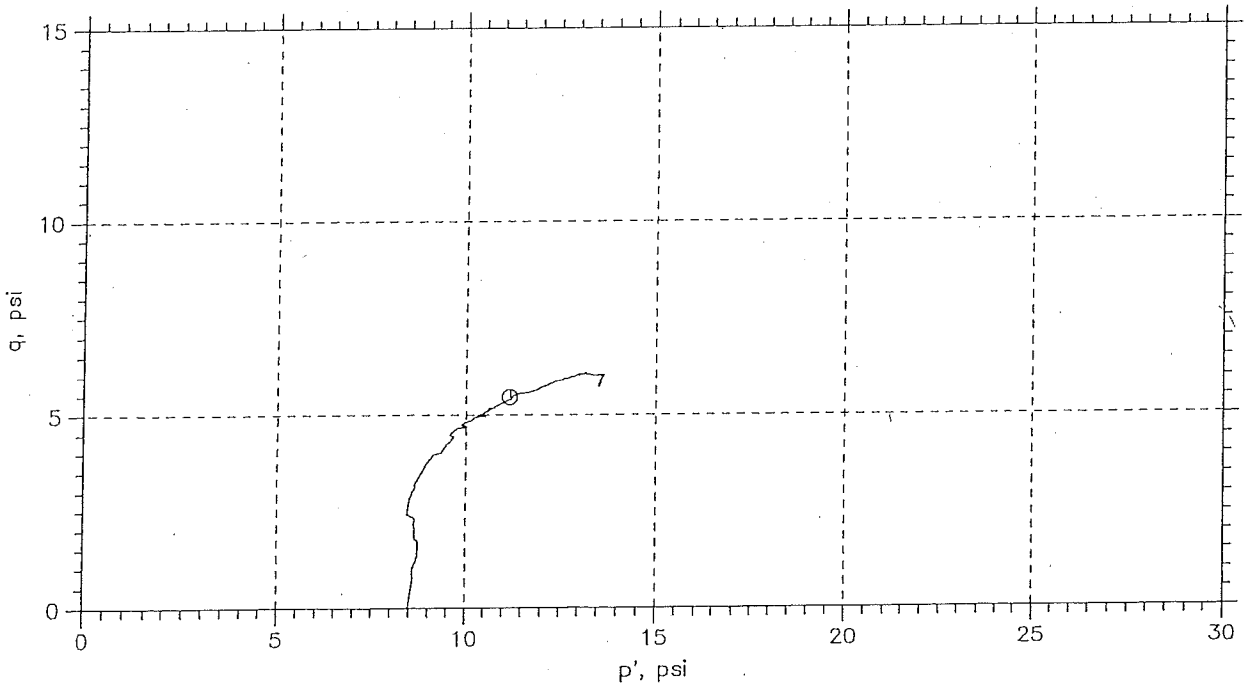
CONSOLIDATED UNDRAINED TRIAXIAL TEST by ASTM D4767







	Sample No.	Test No.	Depth	Tested By	Test Date	Checked By	Check Date	Test File
⊕	T-1	CU-2	19-21	njh	06/11/09	jdt		9054-CU-2n.dat

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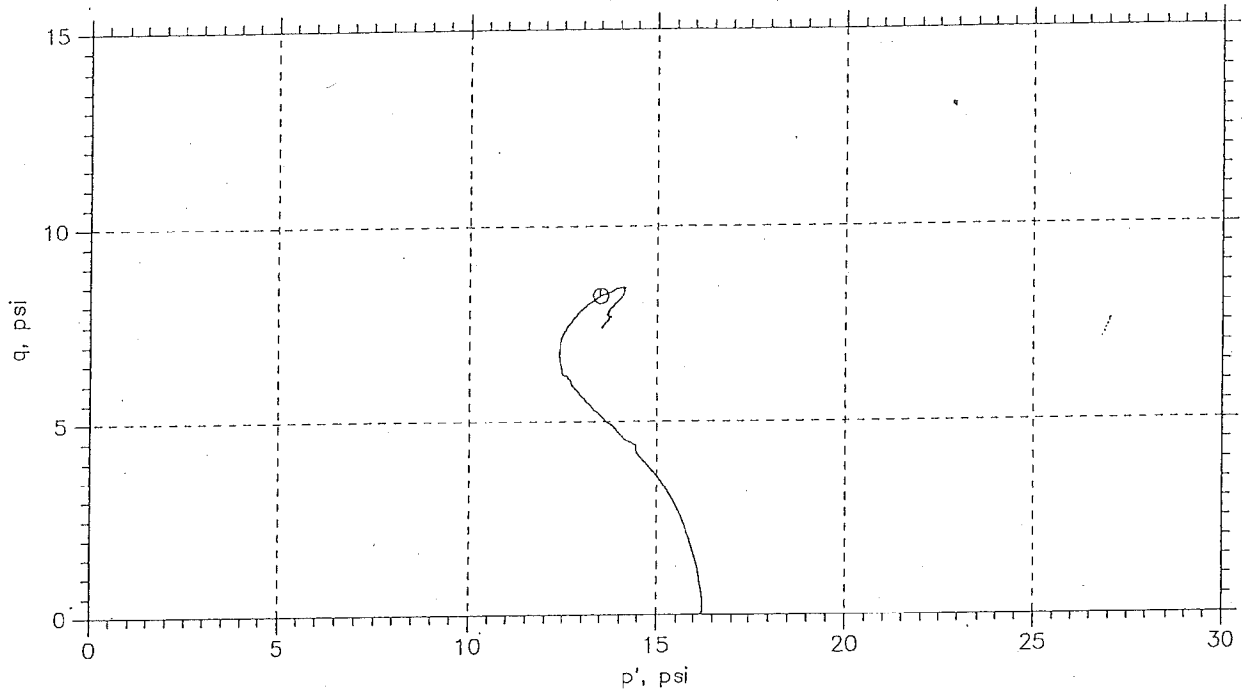
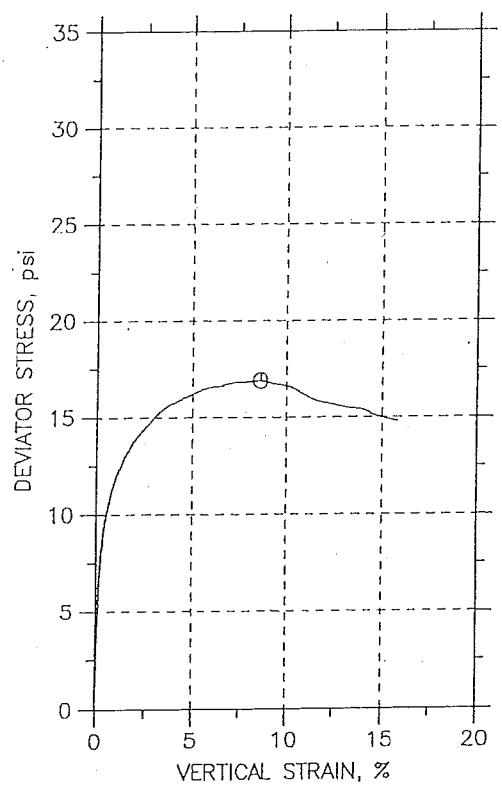
Project: Crow Lane LF	Location: Newburyport, MA	Project No.: GTX-9054
Boring No.: B-9	Sample Type: tube	
Description: Moist, gray clay		
Remarks: System 0		

CONSOLIDATED UNDRAINED TRIAXIAL TEST by ASTM D4767





Symbol		⊙			
Sample No.		T-1			
Test No.		CU-7			
Depth		21			
Initial	Diameter, in	2.02			
	Height, in	4			
	Water Content, %	34.0			
	Dry Density, pcf	87.87			
	Saturation, %	100.0			
	Void Ratio	0.918			
Before Shear	Water Content, %	32.3			
	Dry Density, pcf	90.05			
	Saturation*, %	100.0			
	Void Ratio	0.872			
	Back Press., psi	43.			
Ver. Eff. Cons. Stress, psi		16.17			
Shear Strength, psi		8.448			
Strain at Failure, %		8.63			
Strain Rate, %/min		0.016			
B-Value		0.95			
Estimated Specific Gravity		2.7			
Liquid Limit		---			
Plastic Limit		---			

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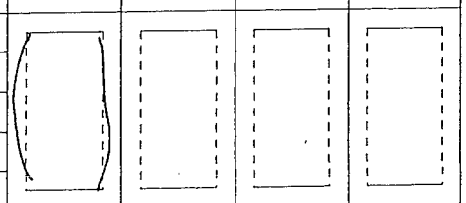
Project: Crow Lane LF
Location: Newburyport, MA
Project No.: GTX-9054
Boring No.: B-11
Sample Type: tube
Description: Wet, gray clay
Remarks: System K



Phase calculations based on start and end of test.

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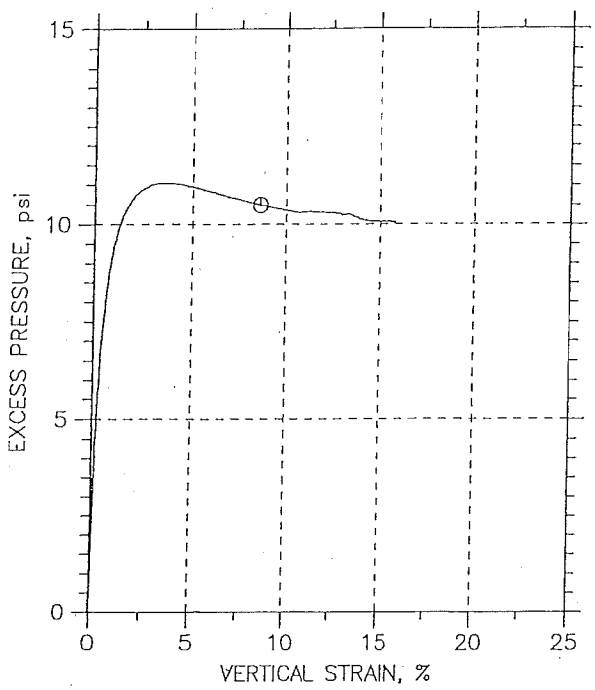
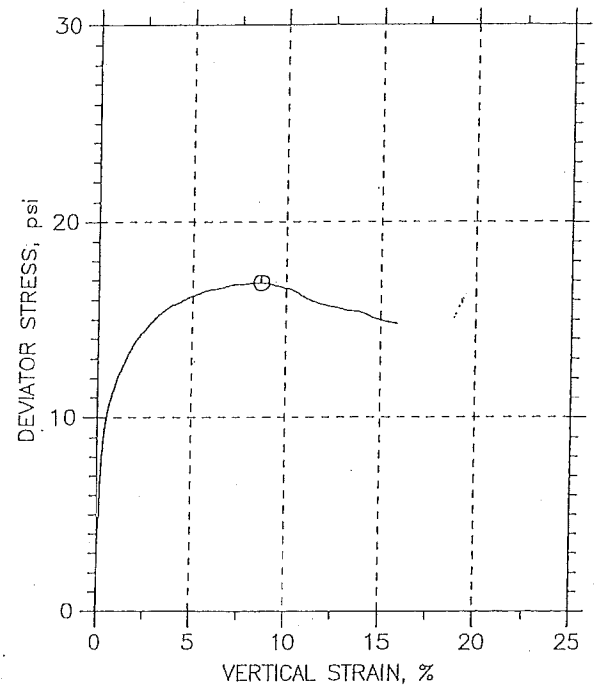
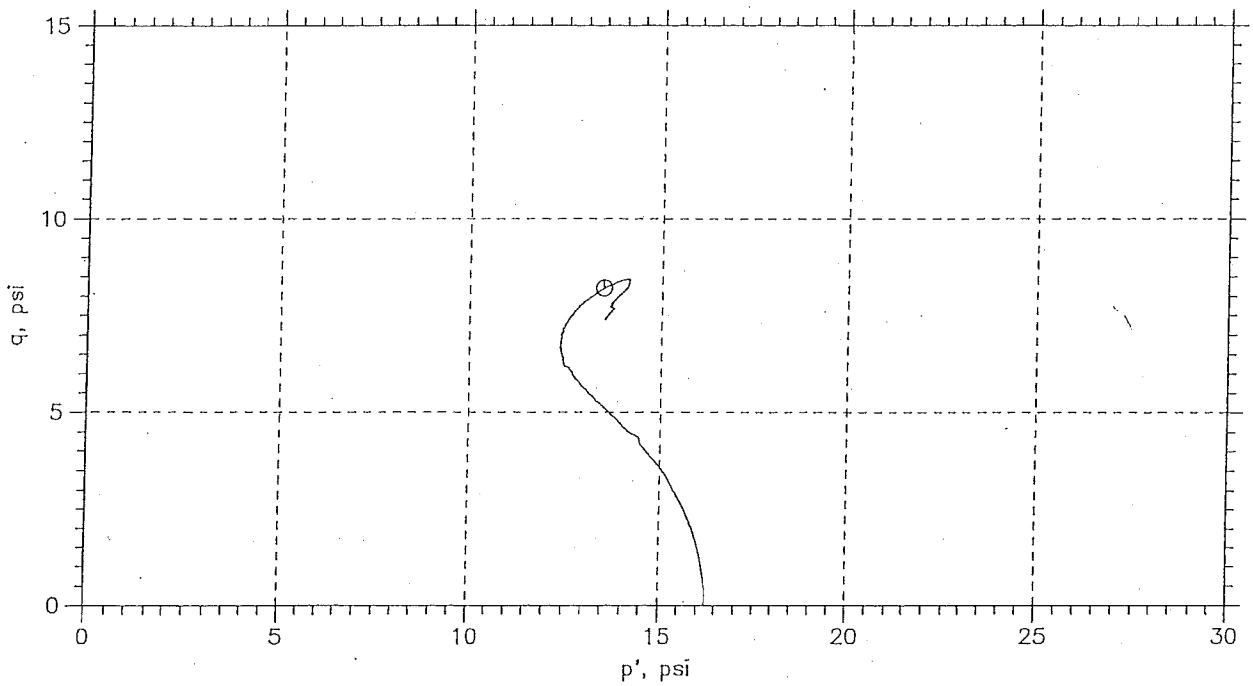
CONSOLIDATED UNDRAINED TRIAXIAL TEST by ASTM D4767







	Sample No.	Test No.	Depth	Tested By	Test Date	Checked By	Check Date	Test File
⊖	T-1	CU-7	21	njh	06/13/09	jdt		9054-CU-7n.dat

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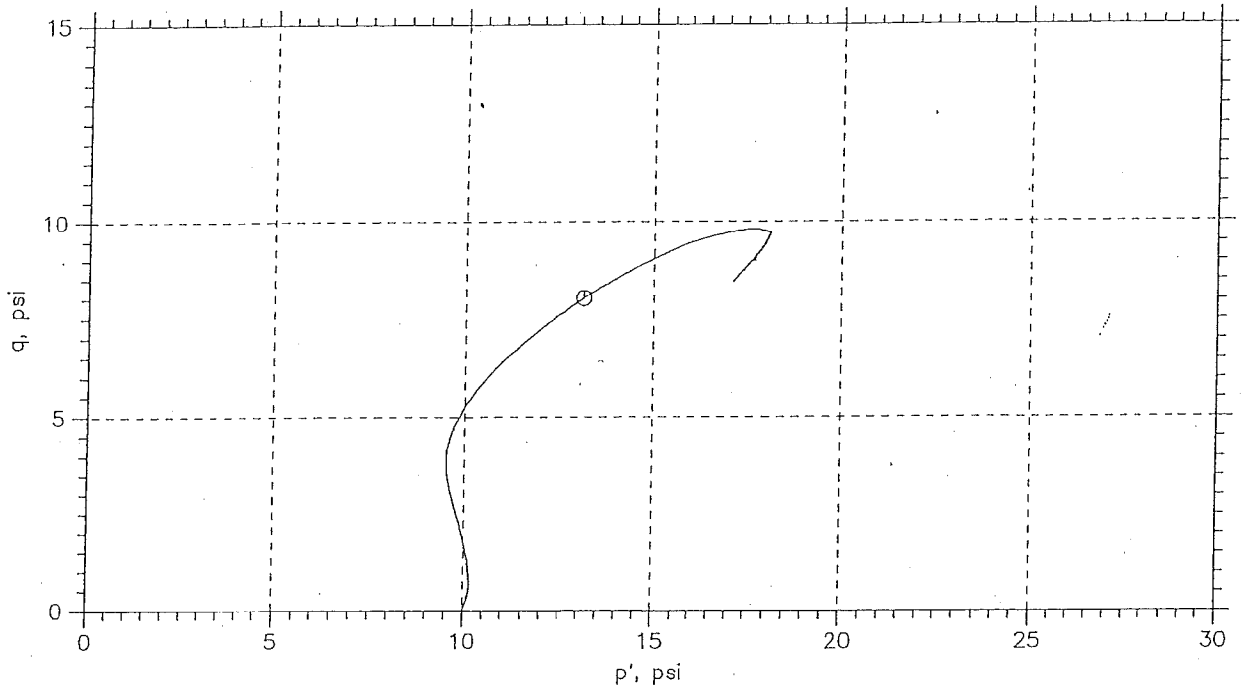
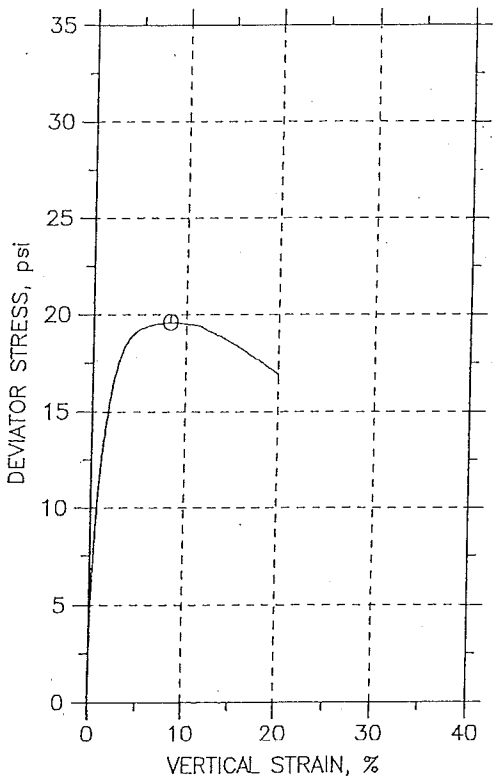
Project: Crow Lane LF	Location: Newburyport, MA	Project No.: GTX-9054
Boring No.: B-11	Sample Type: tube	
Description: Wet, gray clay		
Remarks: System K		

CONSOLIDATED UNDRAINED TRIAXIAL TEST by ASTM D4767





Symbol		⊙			
Sample No.		T-1			
Test No.		CU-6			
Depth		14			
Initial	Diameter, in	2.87			
	Height, in	5.94			
	Water Content, %	23.5			
	Dry Density, pcf	101.3			
	Saturation, %	95.6			
	Void Ratio	0.664			
Before Shear	Water Content, %	24.7			
	Dry Density, pcf	101.2			
	Saturation*, %	100.0			
	Void Ratio	0.666			
	Back Press., psi	130.			
Ver. Eff. Cons. Stress, psi		9.998			
Shear Strength, psi		9.806			
Strain at Failure, %		8.31			
Strain Rate, %/min		0.016			
B-Value		0.94			
Estimated Specific Gravity		2.7			
Liquid Limit		---			
Plastic Limit		---			

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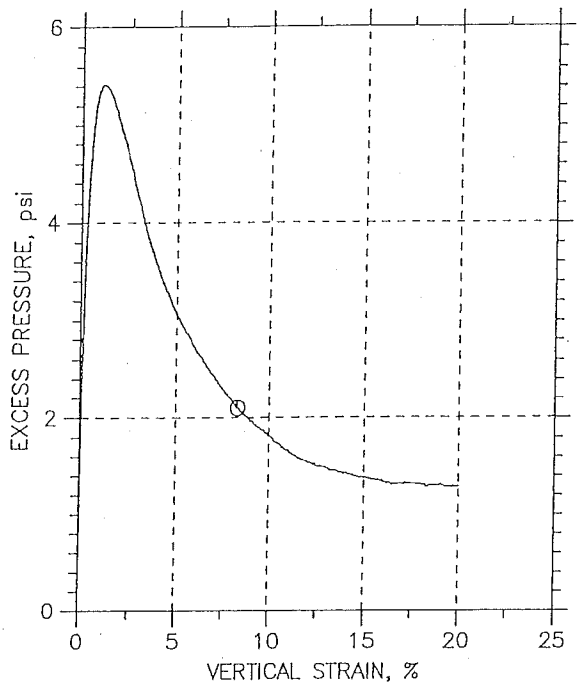
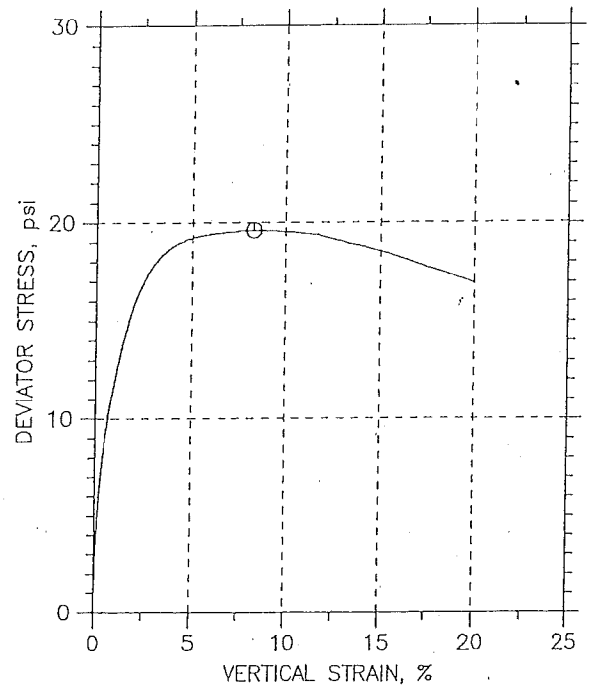
Project: Crow Lane LF
Location: Newburyport, MA
Project No.: GTX-9054
Boring No.: B-12
Sample Type: tube
Description: Moist, olive clay
Remarks: System K

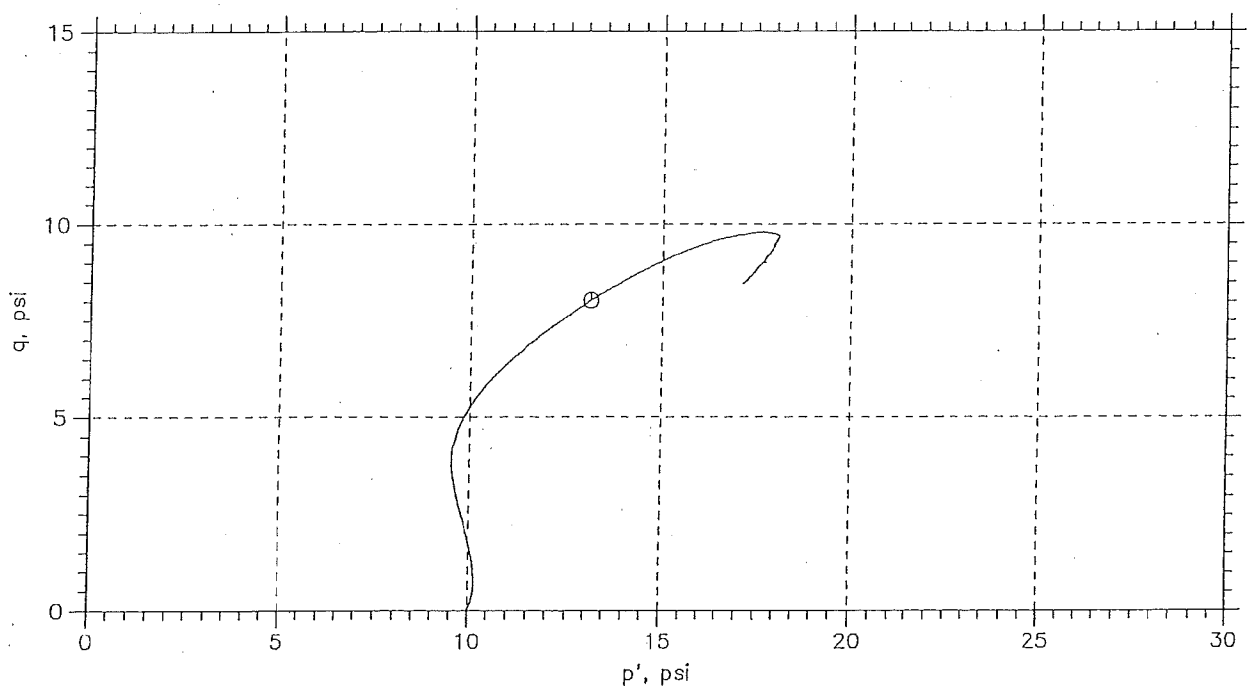
Phase calculations based on start and end of test.

16-JUN-2009 10:57:47

CONSOLIDATED UNDRAINED TRIAXIAL TEST by ASTM D4767







	Sample No.	Test No.	Depth	Tested By	Test Date	Checked By	Check Date	Test File
⊙	T-1	CU-6	14	njh	06/13/09	jdt		9054-CU-6n.dat

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Project: Crow Lane LF	Location: Newburyport, MA	Project No.: GTX-9054
Boring No.: B-12	Sample Type: tube	
Description: Moist, olive clay		
Remarks: System K		

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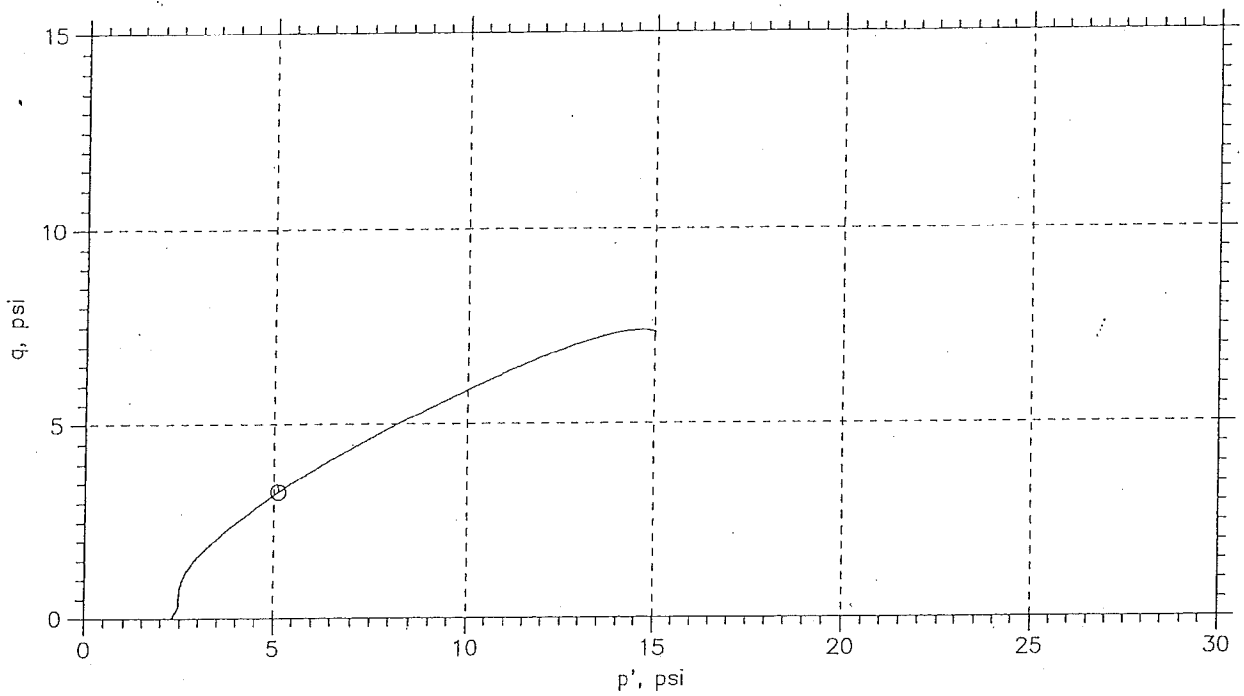
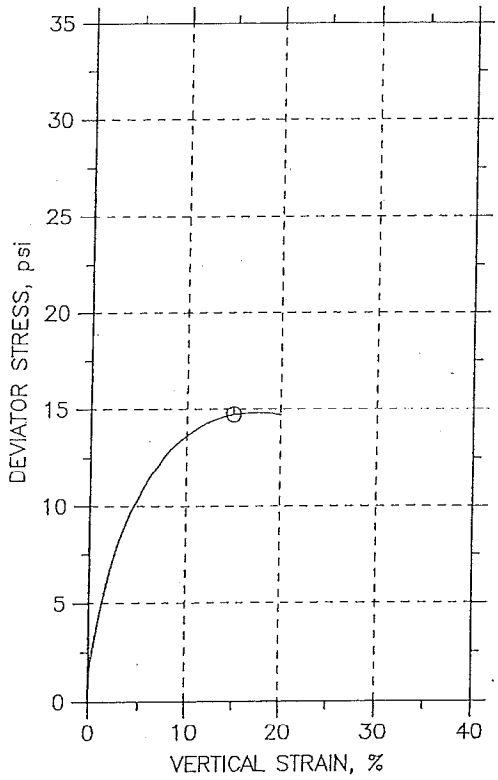
CONSOLIDATED UNDRAINED TRIAXIAL TEST by ASTM D4767





Symbol		⊕			
Sample No.		T-1			
Test No.		CU-1			
Depth		3.5			
Initial	Diameter, in	2.84			
	Height, in	5.92			
	Water Content, %	21.1			
	Dry Density, pcf	102.8			
	Saturation, %	89.2			
	Void Ratio	0.639			
Before Shear	Water Content, %	23.8			
	Dry Density, pcf	102.6			
	Saturation*, %	100.0			
	Void Ratio	0.643			
	Back Press., psi	119.			
Ver. Eff. Cons. Stress, psi		2.299			
Shear Strength, psi		7.373			
Strain at Failure, %		15			
Strain Rate, %/min		0.016			
B-Value		0.96			
Estimated Specific Gravity		2.7			
Liquid Limit		---			
Plastic Limit		---			

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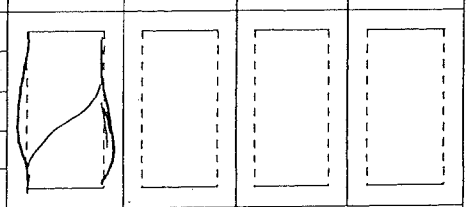
Project: Crow Lane LF
Location: Newburyport, MA
Project No.: GTX-9054
Boring No.: TP-3
Sample Type: tube
Description: Moist, mottled brown, gray and grayish brown silty clay
Remarks: System S



Phase calculations based on start and end of test.

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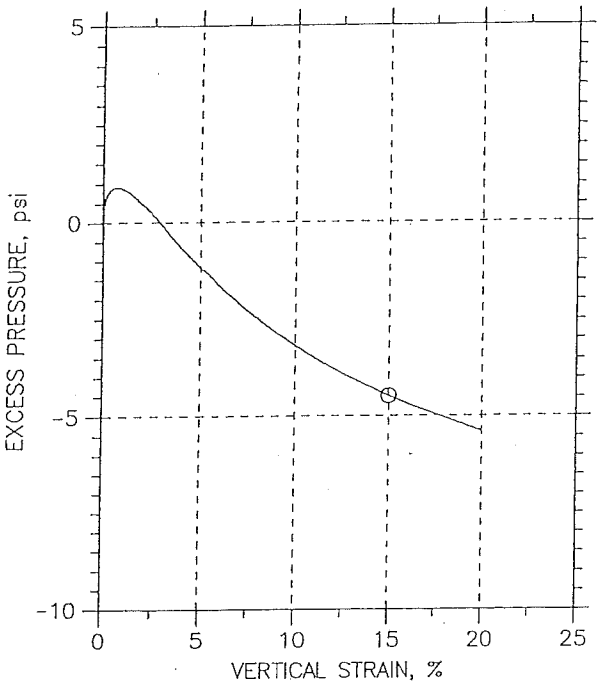
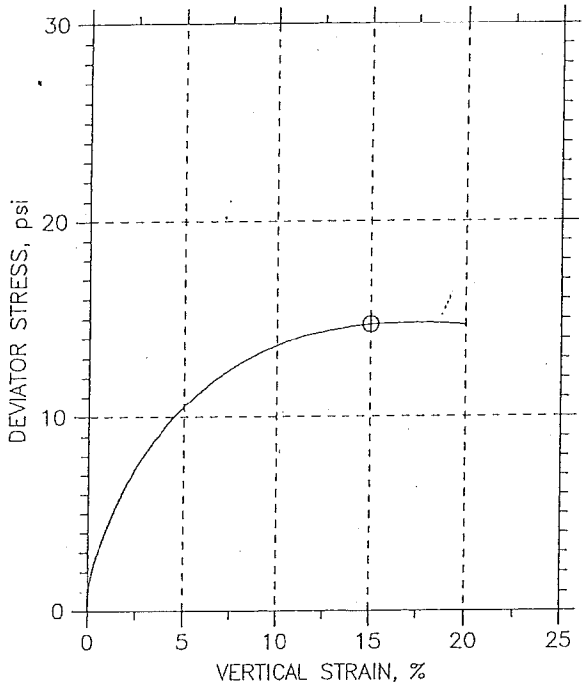
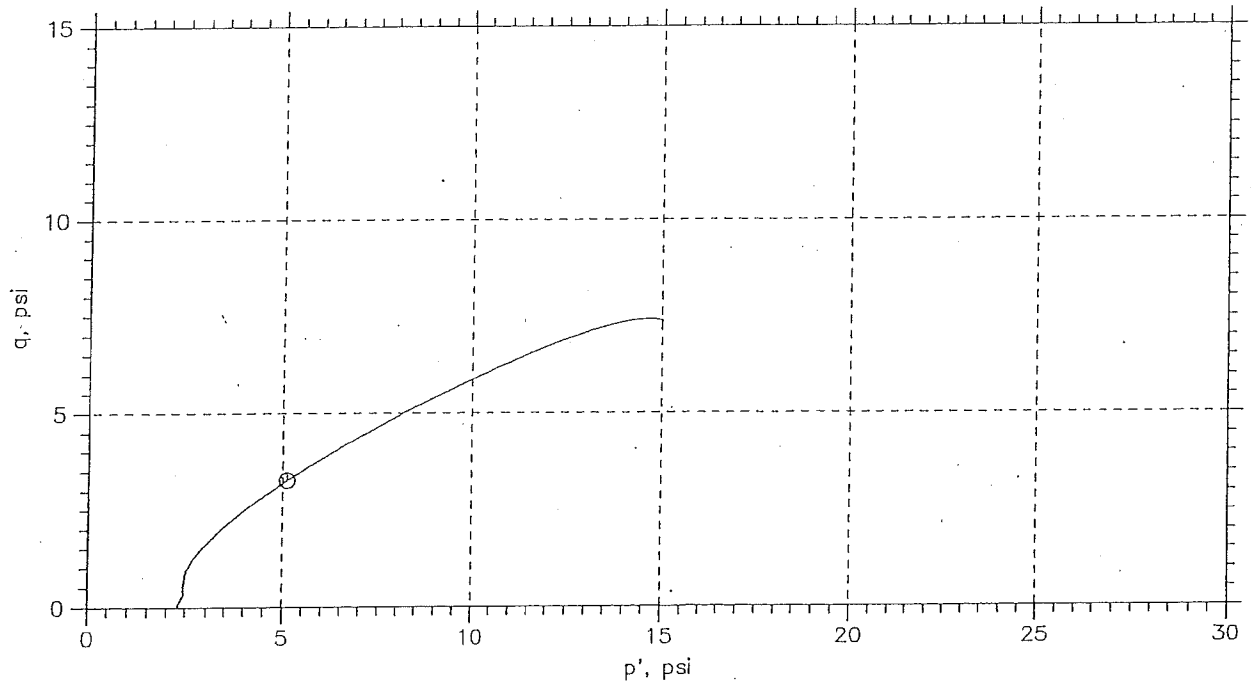
CONSOLIDATED UNDRAINED TRIAXIAL TEST by ASTM D4767







	Sample No.	Test No.	Depth	Tested By	Test Date	Checked By	Check Date	Test File
⏲	T-1	CU-1	3.5	njh	06/11/09	jdt		9054-CU-1n.dat

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Project: Crow Lane LF	Location: Newburyport, MA	Project No.: GTX-9054
Boring No.: TP-3	Sample Type: tube	
Description: Moist, mottled brown, gray and grayish brown silty clay		
Remarks: System S		

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GeoTesting express
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Client:	Geocomp Consulting Inc.				
Project:	Crow Lane Landfill				
Location:	Newburyport, MA			Project No:	GTX-9054
Boring ID:	---	Sample Type:	---	Tested By:	mmd
Sample ID:	---	Test Date:	06/12/09	Checked By:	jdt
Depth :	---	Test Id:	154317		

Moisture, Ash, and Organic Matter - ASTM D 2974

Boring ID	Sample ID	Depth	Description	Moisture Content, %	Ash Content, %	Organic Matter, %
B-5B	S-5	15.0-17.0 ft	Moist, brown clayey sand	27	89.4	10.6
B-5C	S-4	20.0-22.0 ft	Moist, brown gravel with sand	11	97.8	2.2
B-5D	S-4	14.0-16.0 ft	Moist, brown sandy gravel	30	89.9	10.1

Notes: Moisture content determined by Method A and reported as a percentage of oven-dried mass; dried to a constant mass at temperature of 110° C
Ash content and organic matter determined by Method C; dried to constant mass at temperature 440° C

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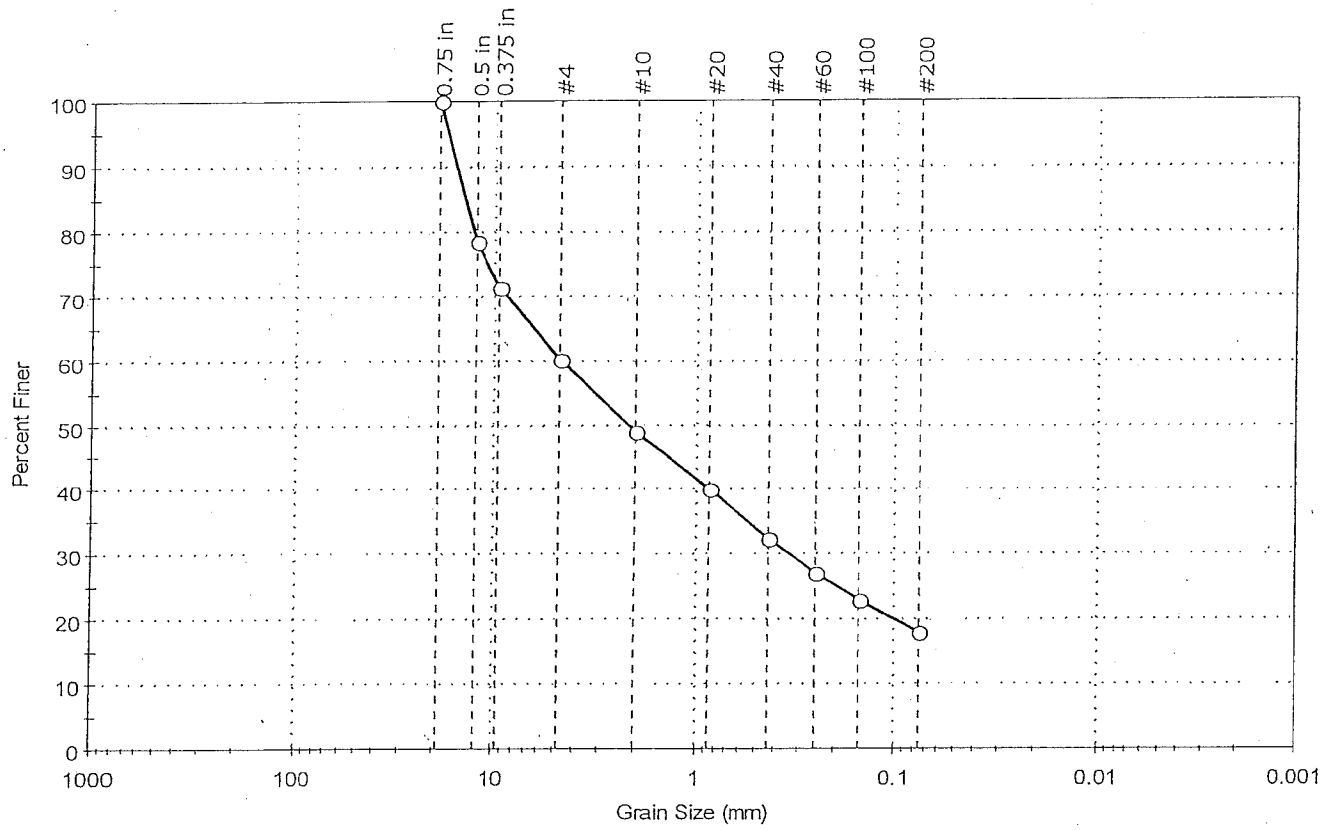
Client:	Geocomp Consulting Inc.		
Project:	Crow Lane Landfill		
Location:	Newburyport, MA	Project No:	GTX-9054
Boring ID: B-1	Sample Type: jar	Tested By:	jbr
Sample ID:S-3	Test Date: 06/12/09	Checked By:	n/a
Depth : 8.0-10.0 ft	Test Id: 154295		
Test Comment:	---		
Sample Description:	Moist, brown silty sand with gravel		
Sample Comment:	---		

Particle Size Analysis - ASTM D 422-63 (reapproved 2002)



% Cobble	% Gravel	% Sand	% Silt & Clay Size
—	39.8	42.3	17.9

Sieve Name	Sieve Size, mm	Percent Finer	Spec. Percent	Complies
0.75 in	19.00	100		
0.5 in	12.50	78		
0.375 in	9.50	71		
#4	4.75	60		
#10	2.00	49		
#20	0.85	40		
#40	0.42	32		
#60	0.25	27		
#100	0.15	23		
#200	0.075	18		

Coefficients

D_{85} = 14.2190 mm	D_{30} = 0.3319 mm
D_{60} = 4.6926 mm	D_{15} = N/A
D_{50} = 2.1802 mm	D_{10} = N/A
C_u = N/A	C_c = N/A

Classification

ASTM N/A

AASHTO Stone Fragments, Gravel and Sand (A-1-b (0))

Sample/Test Description

Sand/Gravel Particle Shape : ANGULAR

Sand/Gravel Hardness : HARD

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GeoTesting express
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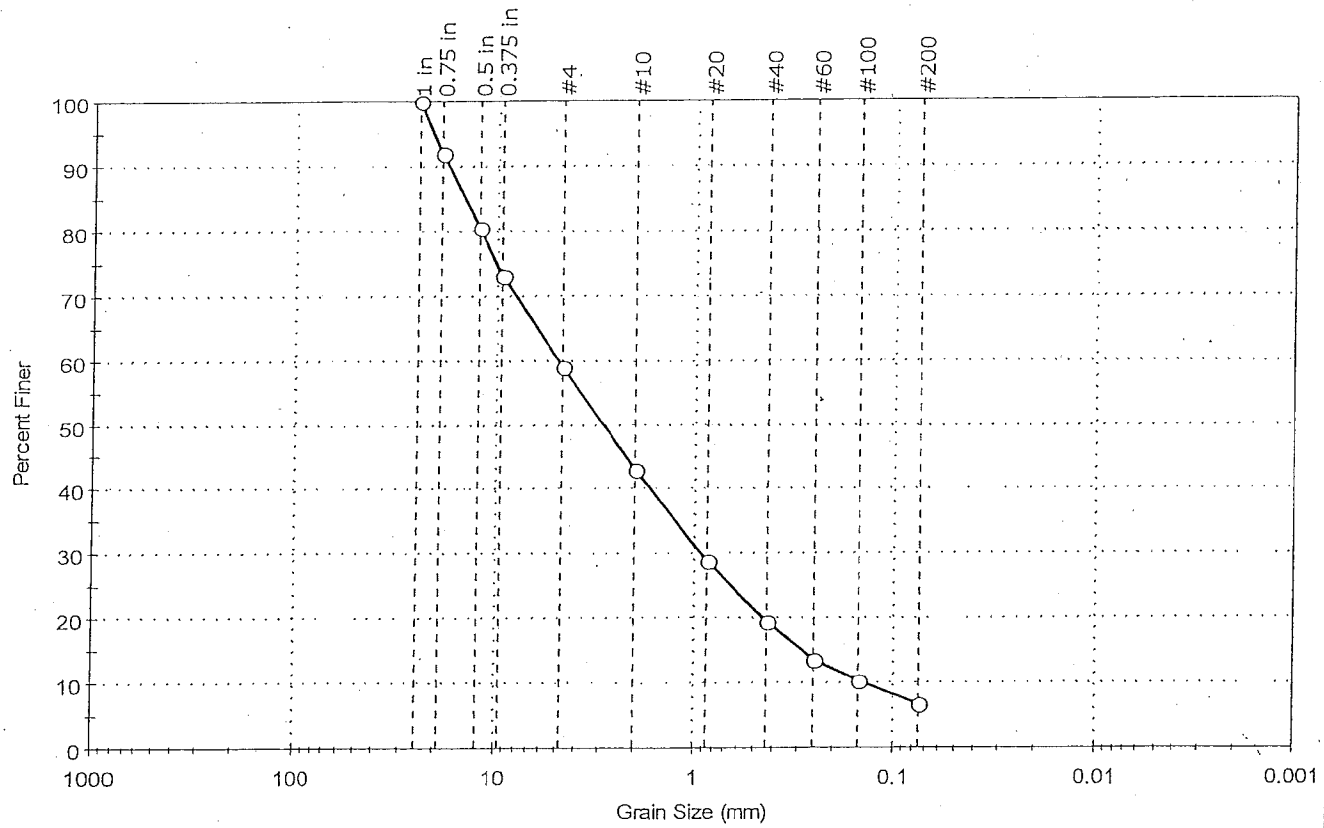
Client:	Geocomp Consulting Inc.		
Project:	Crow Lane Landfill		
Location:	Newburyport, MA	Project No:	GTX-9054
Boring ID: B-1	Sample Type: jar	Tested By:	jbr
Sample ID:S-6	Test Date: 06/15/09	Checked By:	n/a
Depth : 20.0-21.5 ft	Test Id: 154296		
Test Comment:	---		
Sample Description:	Moist, brown sand with silt and gravel		
Sample Comment:	---		

Particle Size Analysis - ASTM D 422-63 (reapproved 2002)



% Cobble	% Gravel	% Sand	% Silt & Clay Size
—	41.1	52.1	6.8

Sieve Name	Sieve Size, mm	Percent Finer	Spec. Percent	Complies
1 in	25.00	100		
0.75 in	19.00	92		
0.5 in	12.50	80		
0.375 in	9.50	73		
#4	4.75	59		
#10	2.00	43		
#20	0.85	29		
#40	0.42	19		
#60	0.25	14		
#100	0.15	10		
#200	0.075	7		

Coefficients

D_{85} = 14.7723 mm	D_{30} = 0.9047 mm
D_{60} = 5.0130 mm	D_{15} = 0.2825 mm
D_{50} = 2.9333 mm	D_{10} = 0.1429 mm
C_u = 35.080	C_c = 1.143

Classification

ASTM N/A

AASHTO Stone Fragments, Gravel and Sand (A-1-a (0))

Sample/Test Description

Sand/Gravel Particle Shape : ANGULAR

Sand/Gravel Hardness : HARD

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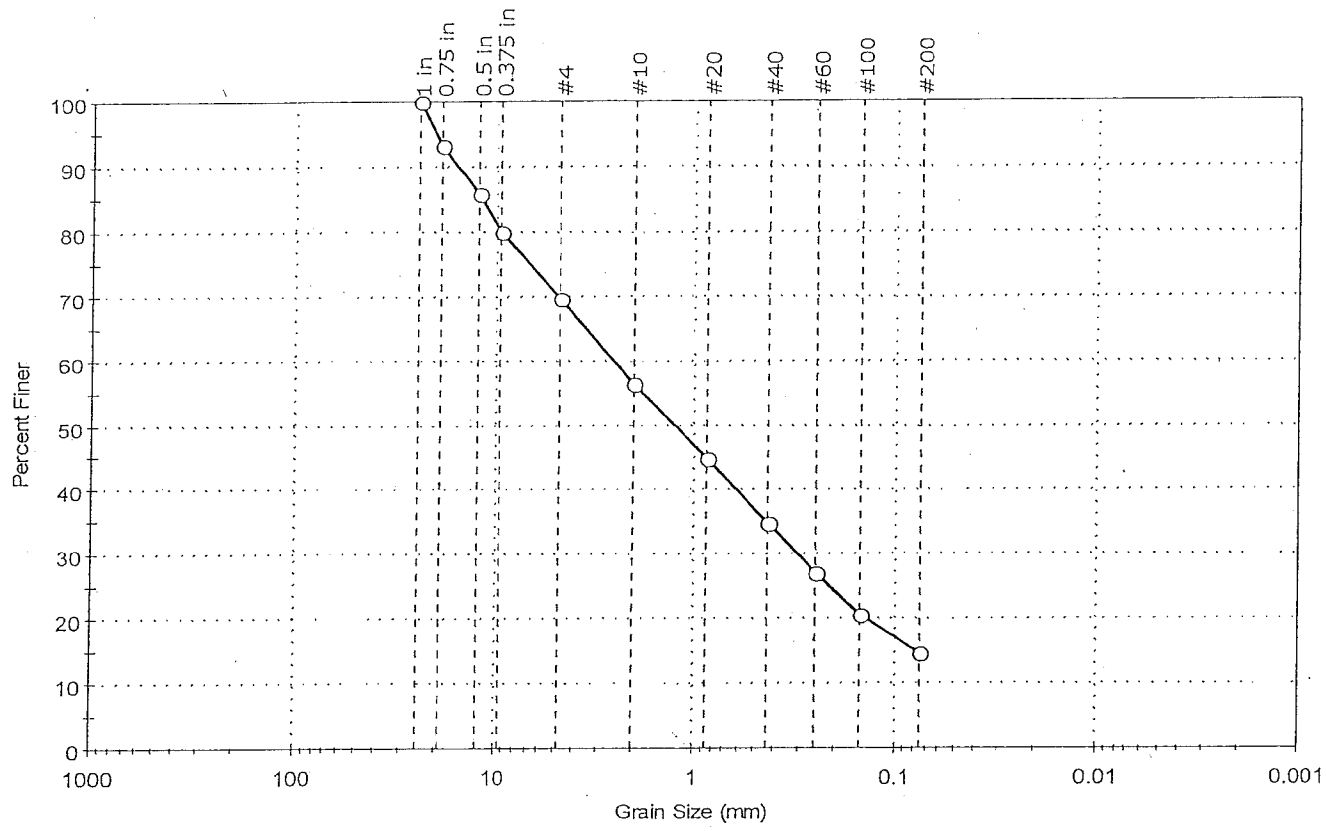
GeoTesting express
a subsidiary of Geocomp Corporation

Client:	Geocomp Consulting Inc.		
Project:	Crow Lane Landfill		
Location:	Newburyport, MA	Project No:	GTX-9054
Boring ID: B-2	Sample Type: jar	Tested By:	jbr
Sample ID:S-3	Test Date: 06/11/09	Checked By:	jdt
Depth : 8.0-10.0 ft	Test Id: 154297		
Test Comment:	---		
Sample Description:	Moist, brown silty sand with gravel		
Sample Comment:	sample contains organics		

Particle Size Analysis - ASTM D 422-63 (reapproved 2002)



% Cobble	% Gravel	% Sand	% Silt & Clay Size
—	30.5	54.8	14.7

Sieve Name	Sieve Size, mm	Percent Finer	Spec. Percent	Complies
1 in	25.00	100		
0.75 in	19.00	93		
0.5 in	12.50	86		
0.375 in	9.50	80		
#4	4.75	70		
#10	2.00	56		
#20	0.85	45		
#40	0.42	35		
#60	0.25	27		
#100	0.15	21		
#200	0.075	15		

Coefficients

D_{85} = 12.0406 mm D_{30} = 0.3048 mm
D_{60} = 2.5401 mm D_{15} = 0.0777 mm
D_{50} = 1.2461 mm D_{10} = 0.0432 mm
C_u = N/A C_c = N/A

Classification

ASTM N/A

AASHTO Stone Fragments, Gravel and Sand (A-1-b (0))

Sample/Test Description

Sand/Gravel Particle Shape : ANGULAR

Sand/Gravel Hardness : HARD

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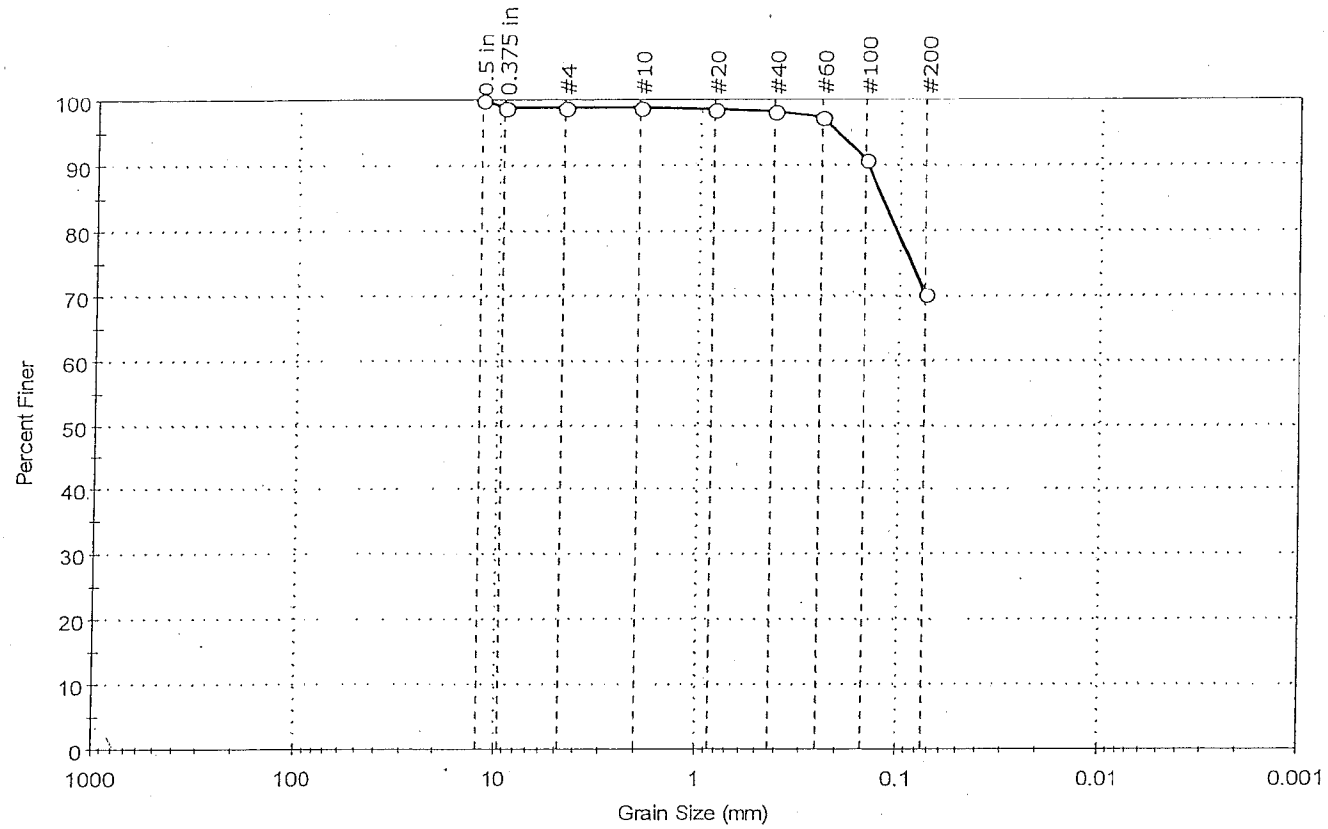
GeoTesting express
a subsidiary of Geocomp Corporation

Client:	Geocomp Consulting Inc.		
Project:	Crow Lane Landfill		
Location:	Newburyport, MA	Project No:	GTX-9054
Boring ID: B-2	Sample Type: jar	Tested By:	jbr
Sample ID:S-9	Test Date: 06/11/09	Checked By:	n/a
Depth : 29.0-31.0 ft	Test Id: 154298		
Test Comment: ---			
Sample Description:	Moist, olive yellow silt with sand		
Sample Comment: ---			

Particle Size Analysis - ASTM D 422-63 (reapproved 2002)



% Cobble	% Gravel	% Sand	% Silt & Clay Size
—	1.1	28.6	70.3

Sieve Name	Sieve Size, mm	Percent Finer	Spec. Percent	Complies
0.5 in	12.50	100		
0.375 in	9.50	99		
#4	4.75	99		
#10	2.00	99		
#20	0.85	98		
#40	0.42	98		
#60	0.25	97		
#100	0.15	91		
#200	0.075	70		

Coefficients

D_{85} =0.1236 mm	D_{30} =N/A
D_{60} =N/A	D_{15} =N/A
D_{50} =N/A	D_{10} =N/A
C_u =N/A	C_c =N/A

Classification

ASTM N/A

AASHTO Silty Soils (A-4 (0))

Sample/Test Description

Sand/Gravel Particle Shape : ---

Sand/Gravel Hardness : ---

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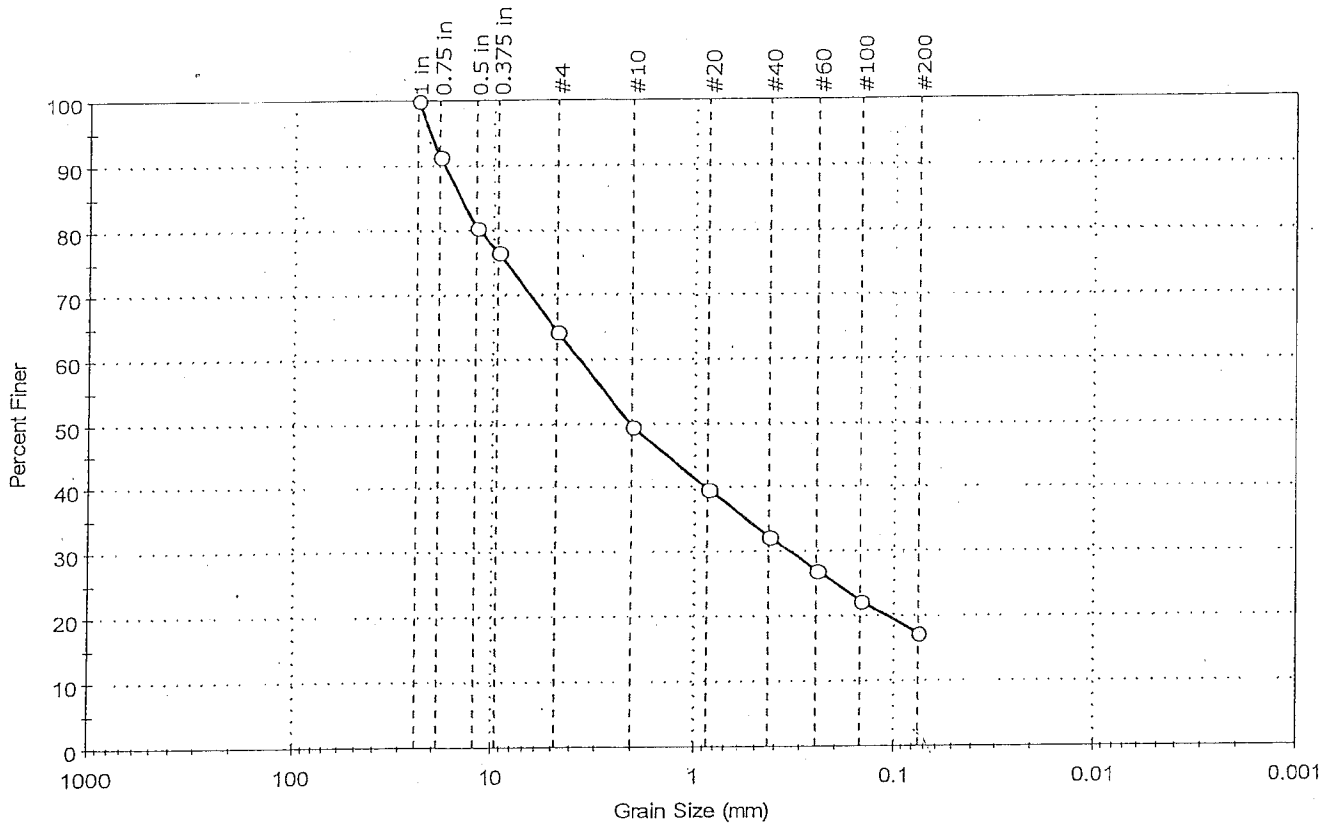
GeoTesting express
a subsidiary of Geocomp Corporation

Client:	Geocomp Consulting Inc.		
Project:	Crow Lane Landfill		
Location:	Newburyport, MA	Project No:	GTX-9054
Boring ID: B-3E	Sample Type: jar	Tested By:	jbr
Sample ID:S-4	Test Date: 06/12/09	Checked By:	jdt
Depth : 10.0-12.0 ft	Test Id: 154299		
Test Comment: ---			
Sample Description:	Moist, brown silty sand with gravel		
Sample Comment:	---		

Particle Size Analysis - ASTM D 422-63 (reapproved 2002)



% Cobble	% Gravel	% Sand	% Silt & Clay Size
—	35.7	47.0	17.3

Sieve Name	Sieve Size, mm	Percent Finer	Spec. Percent	Complies
1 in	25.00	100		
0.75 in	19.00	91		
0.5 in	12.50	80		
0.375 in	9.50	77		
#4	4.75	64		
#10	2.00	49		
#20	0.85	40		
#40	0.42	32		
#60	0.25	27		
#100	0.15	23		
#200	0.075	17		

Coefficients

D_{85} = 14.8714 mm	D_{30} = 0.3314 mm
D_{60} = 3.6946 mm	D_{15} = N/A
D_{50} = 2.0647 mm	D_{10} = N/A
C_u = N/A	C_c = N/A

Classification

ASTM N/A

AASHTO Stone Fragments, Gravel and Sand (A-1-b (0))

Sample/Test Description

Sand/Gravel Particle Shape : ANGULAR

Sand/Gravel Hardness : HARD

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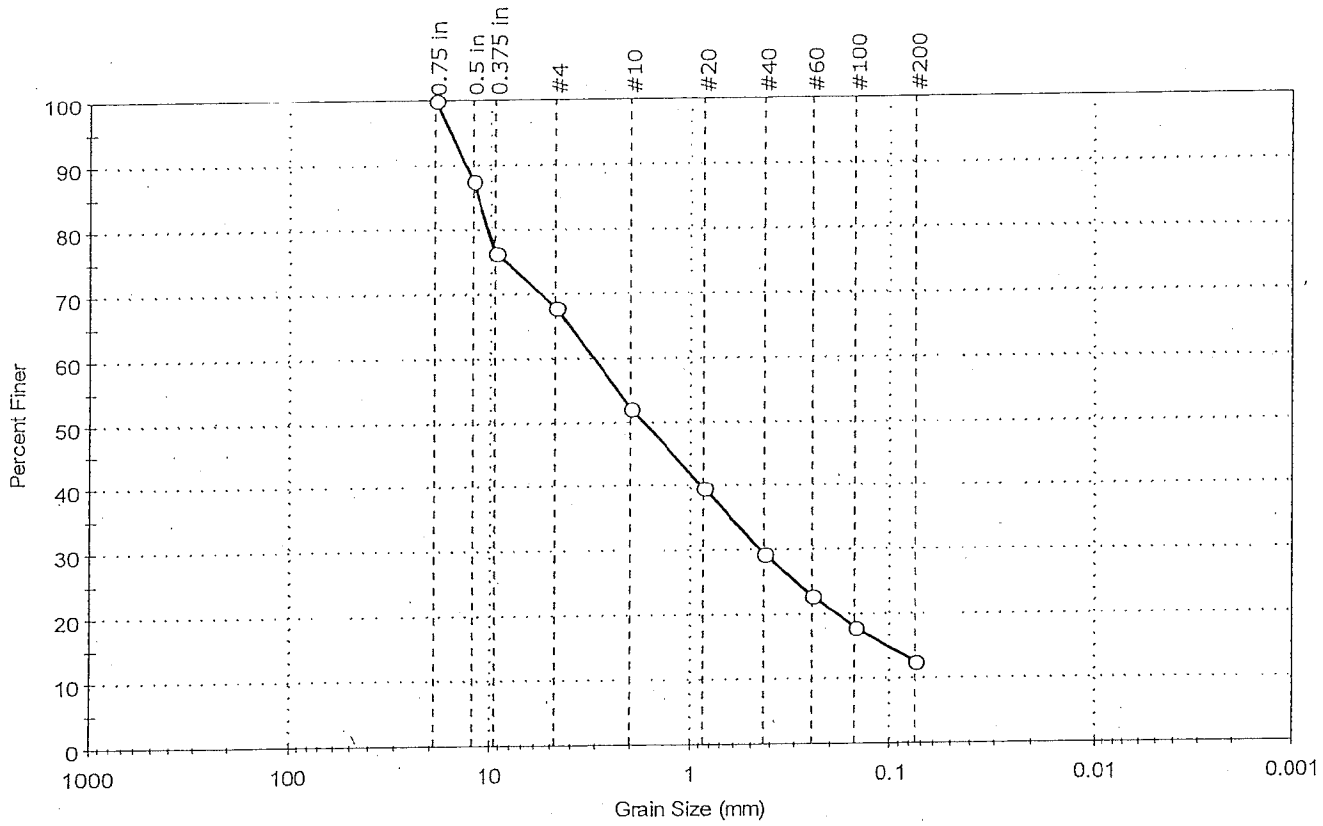
GeoTesting express
a subsidiary of Geocomp Corporation

Client:	Geocomp Consulting Inc.		
Project:	Crow Lane Landfill		
Location:	Newburyport, MA	Project No:	GTX-9054
Boring ID: B-4	Sample Type: jar	Tested By:	jbr
Sample ID:S-3	Test Date: 06/11/09	Checked By:	jdt
Depth : 10.0-12.0 ft	Test Id: 154300		
Test Comment:	---		
Sample Description:	Moist, brown silty sand with gravel		
Sample Comment:	sample contains organics		

Particle Size Analysis - ASTM D 422-63 (reapproved 2002)



% Cobble	% Gravel	% Sand	% Silt & Clay Size
—	32.3	55.2	12.5

Sieve Name	Sieve Size, mm	Percent Finer	Spec. Percent	Complies
0.75 in	19.00	100		
0.5 in	12.50	88		
0.375 in	9.50	76		
#4	4.75	68		
#10	2.00	52		
#20	0.85	40		
#40	0.42	30		
#60	0.25	23		
#100	0.15	18		
#200	0.075	13		

Coefficients

D_{85} = 11.7542 mm D_{30} = 0.4355 mm
D_{60} = 3.0856 mm D_{15} = 0.1025 mm
D_{50} = 1.7154 mm D_{10} = 0.0542 mm
C_u = N/A C_c = N/A

Classification

ASTM N/A

AASHTO Stone Fragments, Gravel and Sand (A-1-b (0))

Sample/Test Description

Sand/Gravel Particle Shape : ANGULAR

Sand/Gravel Hardness : HARD

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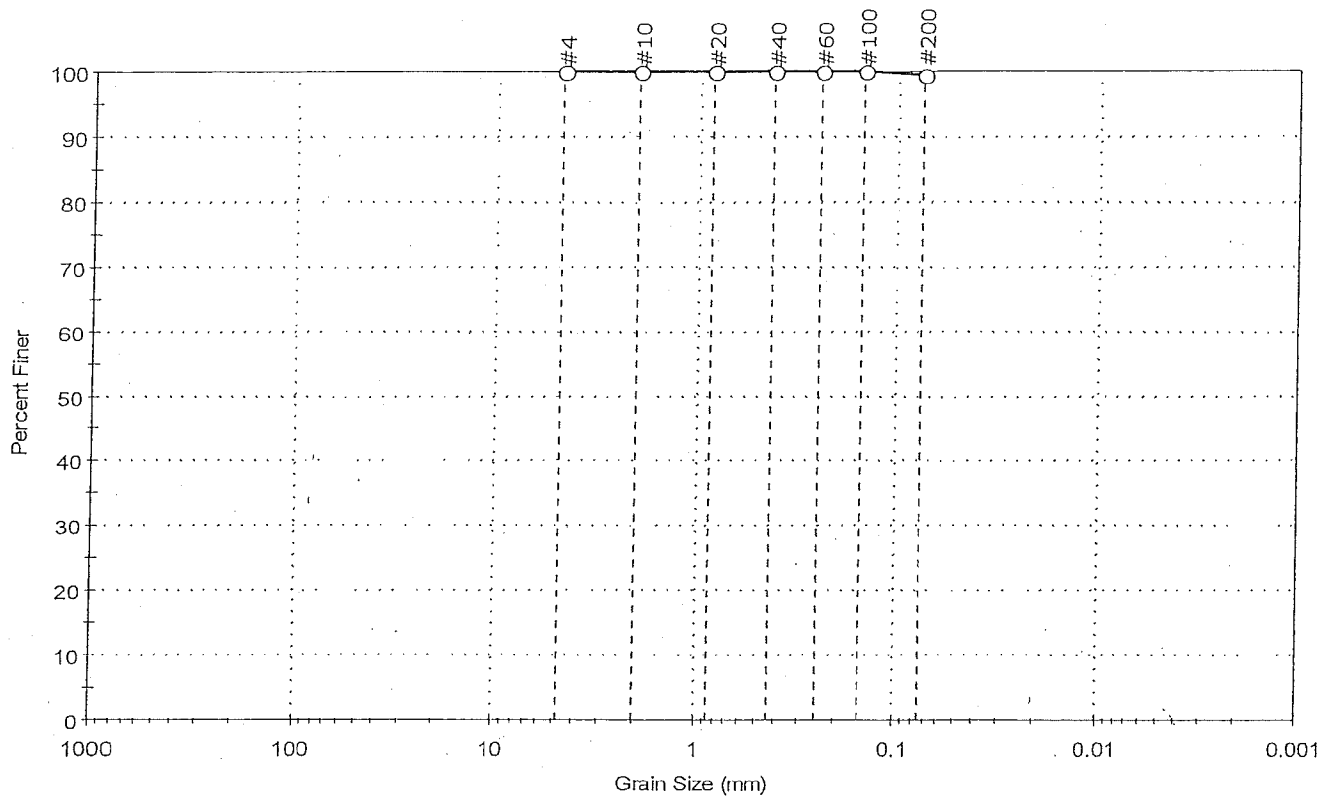
GeoTesting express
a subsidiary of Geocomp Corporation

Client:	Geocomp Consulting Inc.		
Project:	Crow Lane Landfill		
Location:	Newburyport, MA	Project No:	GTX-9054
Boring ID: B-4	Sample Type: tube	Tested By:	jbr
Sample ID: T-1	Test Date: 06/11/09	Checked By:	n/a
Depth : 39.0 ft	Test Id: 154301		
Test Comment: ---			
Sample Description:	Moist, gray clay		
Sample Comment:	---		

Particle Size Analysis - ASTM D 422-63 (reapproved 2002)



% Cobble	% Gravel	% Sand	% Silt & Clay Size
—	0.0	0.5	99.5

Sieve Name	Sieve Size, mm	Percent Finer	Spec. Percent	Complies
#4	4.75	100		
#10	2.00	100		
#20	0.85	100		
#40	0.42	100		
#60	0.25	100		
#100	0.15	100		
#200	0.075	99		

Coefficients

D_{85} = N/A D_{30} = N/A
D_{60} = N/A D_{15} = N/A
D_{50} = N/A D_{10} = N/A
C_u = N/A C_c = N/A

Classification

ASTM N/A

AASHTO Silty Soils (A-4 (0))

Sample/Test Description

Sand/Gravel Particle Shape : ---

Sand/Gravel Hardness : ---

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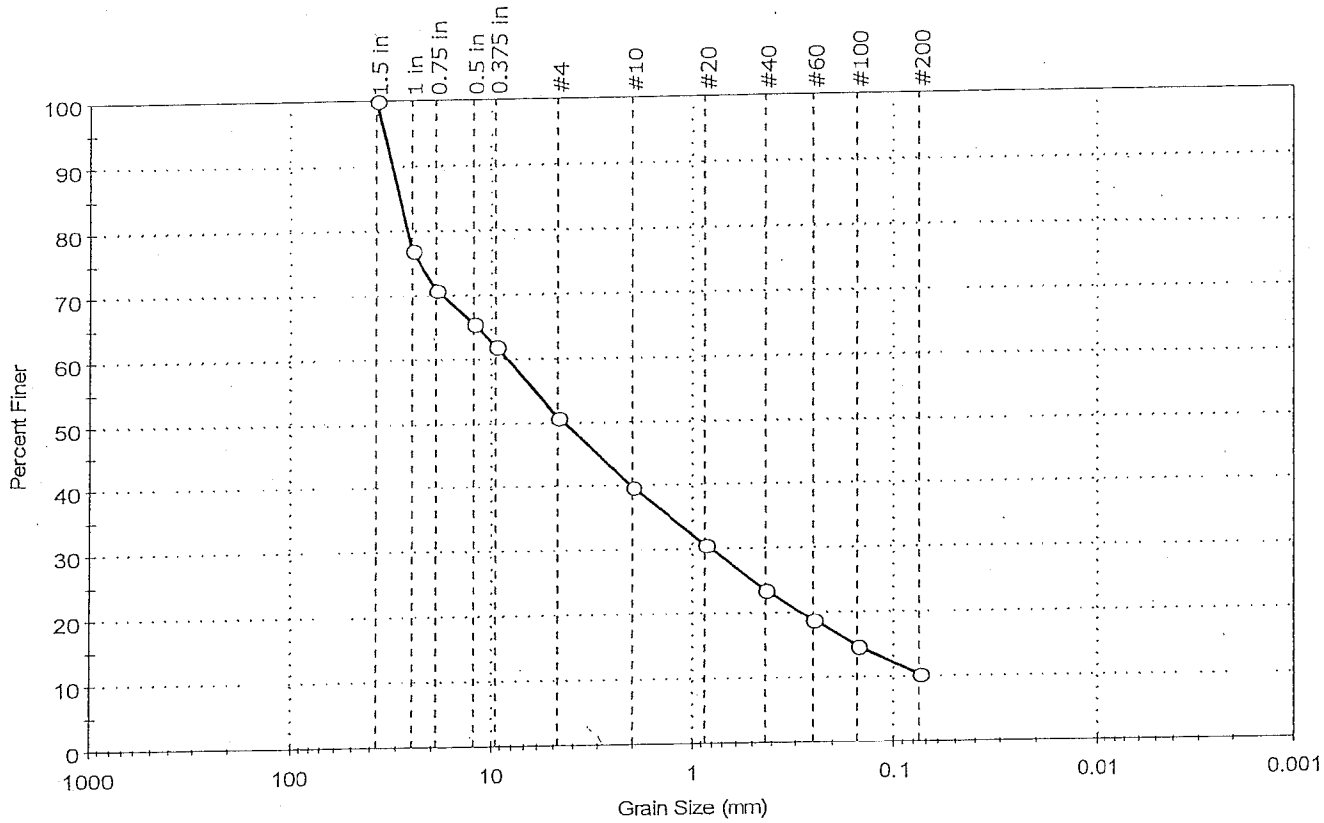
GeoTesting express
a subsidiary of Geocomp Corporation

Client:	Geocomp Consulting Inc.		
Project:	Crow Lane Landfill	Project No:	GTX-9054
Location:	Newburyport, MA		
Boring ID: B-5	Sample Type: jar	Tested By:	jbr
Sample ID:S-3	Test Date: 06/11/09	Checked By:	n/a
Depth : 8.0-10.0 ft	Test Id: 154302		
Test Comment:	---		
Sample Description:	Moist, dark gray gravel with silt and sand		
Sample Comment:	sample contains organics		

Particle Size Analysis - ASTM D 422-63 (reapproved 2002)



% Cobble	% Gravel	% Sand	% Silt & Clay Size
—	49.2	40.3	10.5

Sieve Name	Sieve Size, mm	Percent Finer	Spec. Percent	Compliles
1.5 in	37.50	100		
1 in	25.00	77		
0.75 in	19.00	71		
0.5 in	12.50	66		
0.375 in	9.50	62		
#4	4.75	51		
#10	2.00	40		
#20	0.85	31		
#40	0.42	24		
#60	0.25	19		
#100	0.15	15		
#200	0.075	10		

Coefficients

D_{85} =28.7616 mm D_{30} =0.7984 mm
D_{60} =8.4621 mm D_{15} =0.1551 mm
D_{50} =4.4782 mm D_{10} =0.0697 mm
C_u =121.407 C_c =1.081

Classification

ASTM N/A

AASHTO Stone Fragments, Gravel and Sand (A-1-a (0))

Sample/Test Description

Sand/Gravel Particle Shape : ANGULAR

Sand/Gravel Hardness : HARD

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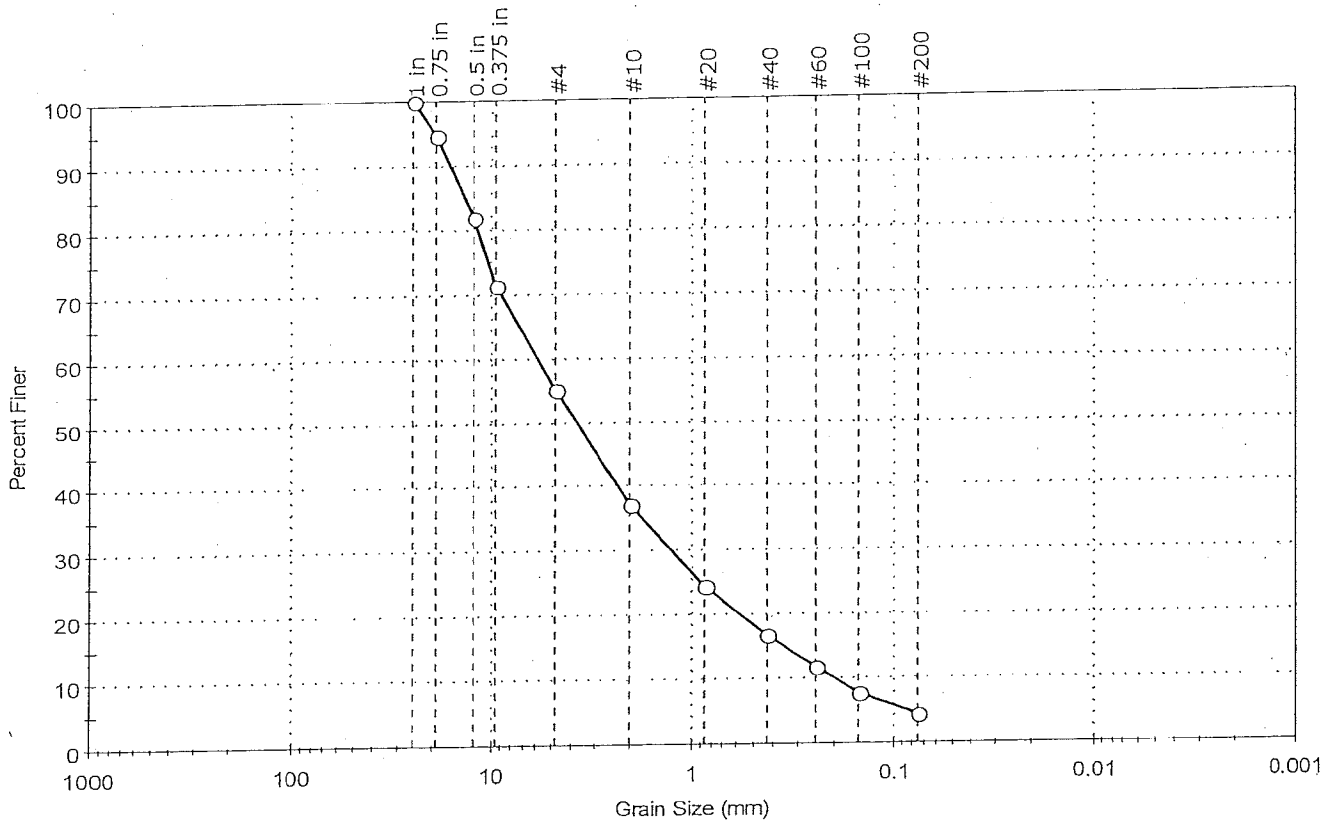
GeoTesting express
a subsidiary of Geocomp Corporation

Client:	Geocomp Consulting Inc.		
Project:	Crow Lane Landfill	Project No:	GTX-9054
Location:	Newburyport, MA		
Boring ID: B-5	Sample Type: jar	Tested By:	jbr
Sample ID: S-5	Test Date: 06/15/09	Checked By:	jdt
Depth : 17.0-19.0 ft	Test Id: 154303		
Test Comment: ---			
Sample Description:	Moist, brown sand with gravel		
Sample Comment:	sample contains organics		

Particle Size Analysis - ASTM D 422-63 (reapproved 2002)



% Cobble	% Gravel	% Sand	% Silt & Clay Size
—	44.9	50.7	4.4

Sieve Name	Sieve Size, mm	Percent Finer	Spec. Percent	Complies
1 in	25.00	100		
0.75 in	19.00	95		
0.5 in	12.50	82		
0.375 in	9.50	71		
#4	4.75	55		
#10	2.00	37		
#20	0.85	24		
#40	0.42	17		
#60	0.25	12		
#100	0.15	8		
#200	0.075	4		

Coefficients

D_{85} = 13.7598 mm D_{30} = 1.2399 mm
D_{60} = 5.8749 mm D_{15} = 0.3534 mm
D_{50} = 3.7320 mm D_{10} = 0.1983 mm
C_u = 29.626 C_c = 1.320

Classification

ASTM Well-graded sand with gravel (SW)

AASHTO Stone Fragments, Gravel and Sand (A-1-a (0))

Sample/Test Description

Sand/Gravel Particle Shape : ANGULAR

Sand/Gravel Hardness : HARD

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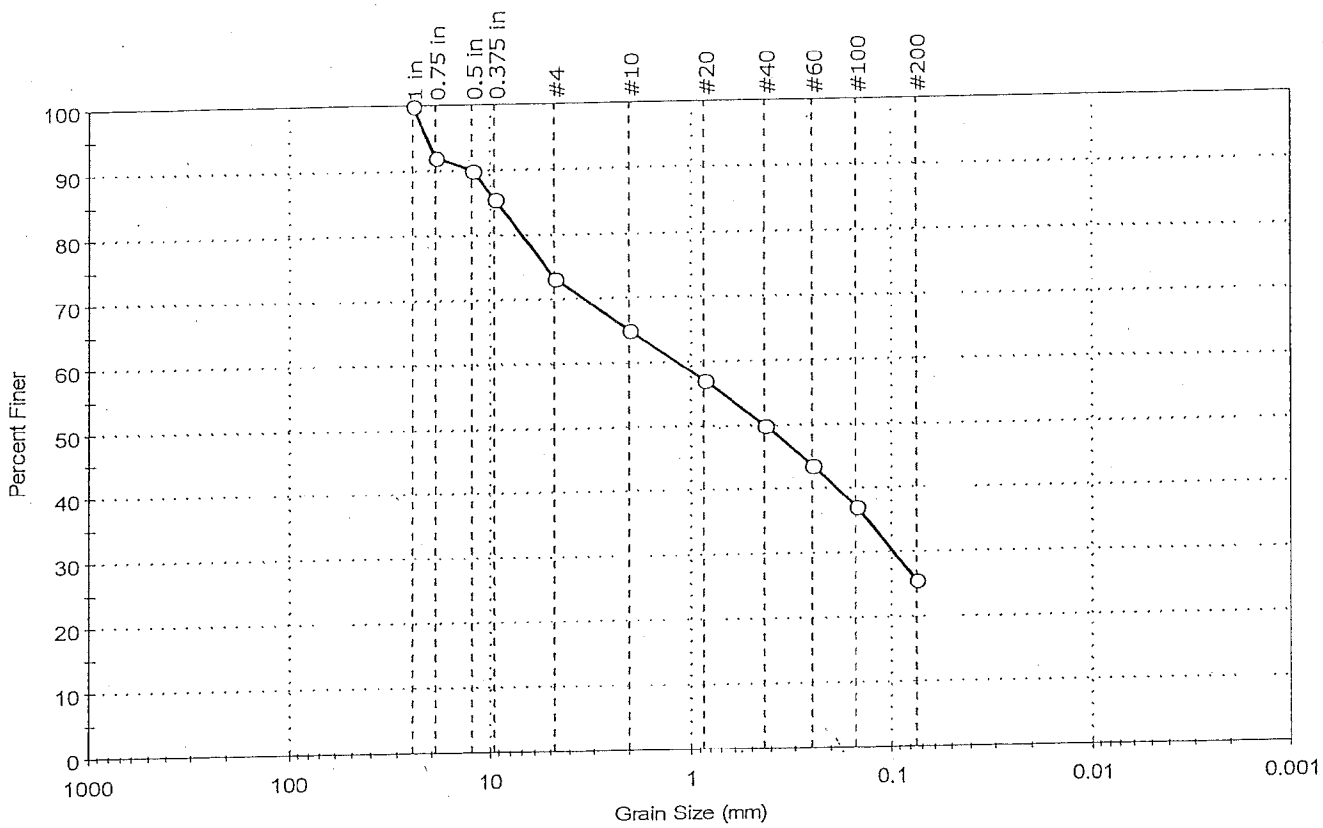
GeoTesting express
a subsidiary of Geocomp Corporation

Client:	Geocomp Consulting Inc.		
Project:	Crow Lane Landfill	Project No:	GTX-9054
Location:	Newburyport, MA		
Boring ID: B-6	Sample Type: jar	Tested By:	jbr
Sample ID:S-3	Test Date: 06/11/09	Checked By:	jdt
Depth : 8.0-10.0 ft	Test Id: 154304		
Test Comment:	---		
Sample Description:	Moist, brown silty sand with gravel		
Sample Comment:	sample contains organics		

Particle Size Analysis - ASTM D 422-63 (reapproved 2002)



% Cobble	% Gravel	% Sand	% Silt & Clay Size
—	26.9	47.3	25.8

Sieve Name	Sieve Size, mm	Percent Finer	Spec. Percent	Complies
1 in	25.00	100		
0.75 in	19.00	92		
0.5 in	12.50	90		
0.375 in	9.50	85		
#4	4.75	73		
#10	2.00	65		
#20	0.85	57		
#40	0.42	50		
#60	0.25	44		
#100	0.15	37		
#200	0.075	26		

Coefficients

D_{85} = 9.2864 mm D_{30} = 0.0970 mm
D_{60} = 1.1792 mm D_{15} = N/A
D_{50} = 0.4367 mm D_{10} = N/A
C_u = N/A C_c = N/A

Classification

ASTM N/A

AASHTO Silty Gravel and Sand (A-2-4 (0))

Sample/Test Description

Sand/Gravel Particle Shape : ANGULAR

Sand/Gravel Hardness : HARD

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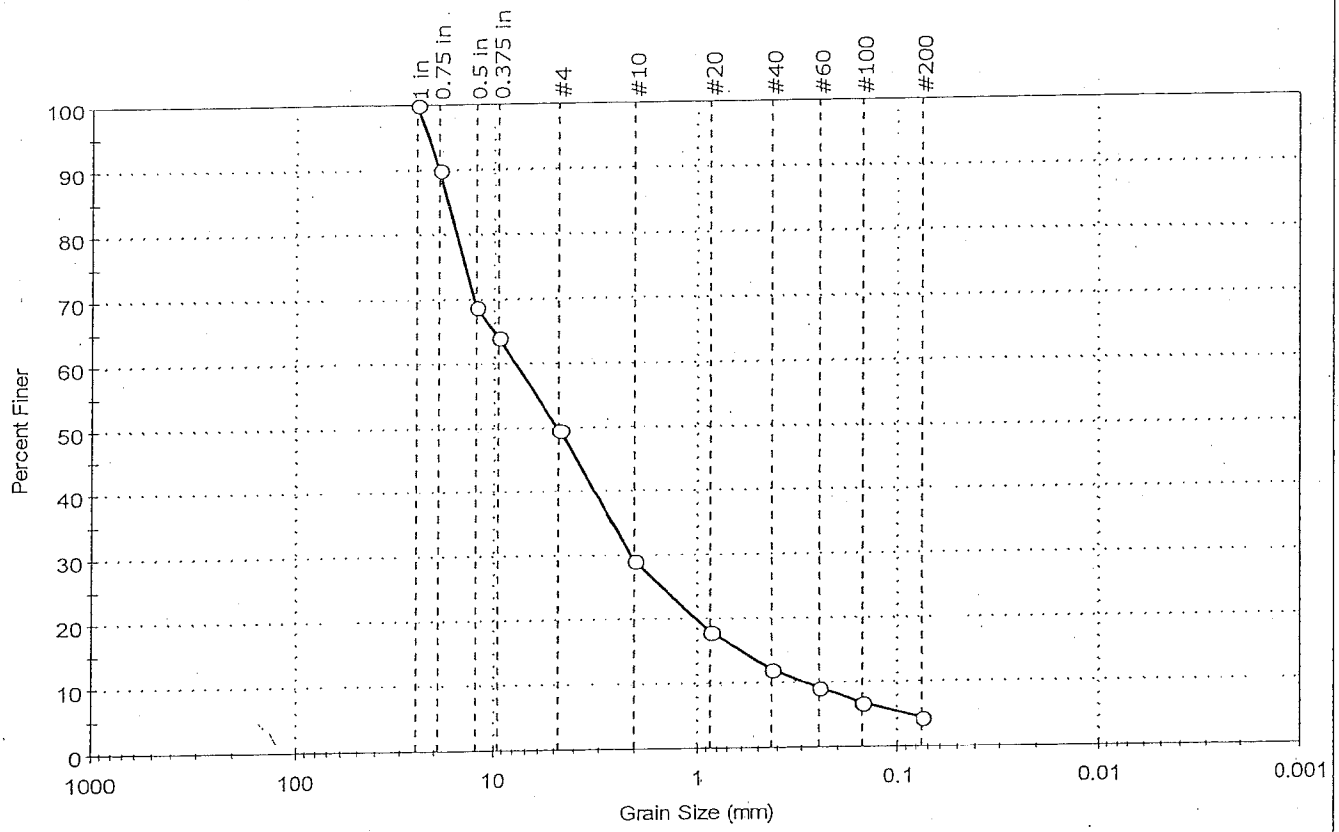
GeoTesting express
a subsidiary of Geocomp Corporation

Client:	Geocomp Consulting Inc.		
Project:	Crow Lane Landfill	Project No:	GTX-9054
Location:	Newburyport, MA		
Boring ID: B-6	Sample Type: jar	Tested By:	jbr
Sample ID:S-6	Test Date: 06/11/09	Checked By:	jdt
Depth : 22.0-24.0 ft	Test Id: 154305		
Test Comment: ---			
Sample Description:	Moist, olive brown gravel with sand		
Sample Comment: ---			

Particle Size Analysis - ASTM D 422-63 (reapproved 2002)



% Cobble	% Gravel	% Sand	% Silt & Clay Size
—	50.3	45.1	4.6

Sieve Name	Sieve Size, mm	Percent Finer	Spec. Percent	Compliles
1 in	25.00	100		
0.75 in	19.00	90		
0.5 in	12.50	69		
0.375 in	9.50	64		
#4	4.75	50		
#10	2.00	29		
#20	0.85	18		
#40	0.42	12		
#60	0.25	9		
#100	0.15	7		
#200	0.075	5		

Coefficients

D_{85} =17.1847 mm	D_{30} =2.0745 mm
D_{60} =7.8055 mm	D_{15} =0.5896 mm
D_{50} =4.8202 mm	D_{10} =0.2931 mm
C_u =26.631	C_c =1.881

Classification

ASTM Well-graded gravel with sand (GW)

AASHTO Stone Fragments, Gravel and Sand (A-1-a (0))

Sample/Test Description

Sand/Gravel Particle Shape : ANGULAR

Sand/Gravel Hardness : HARD

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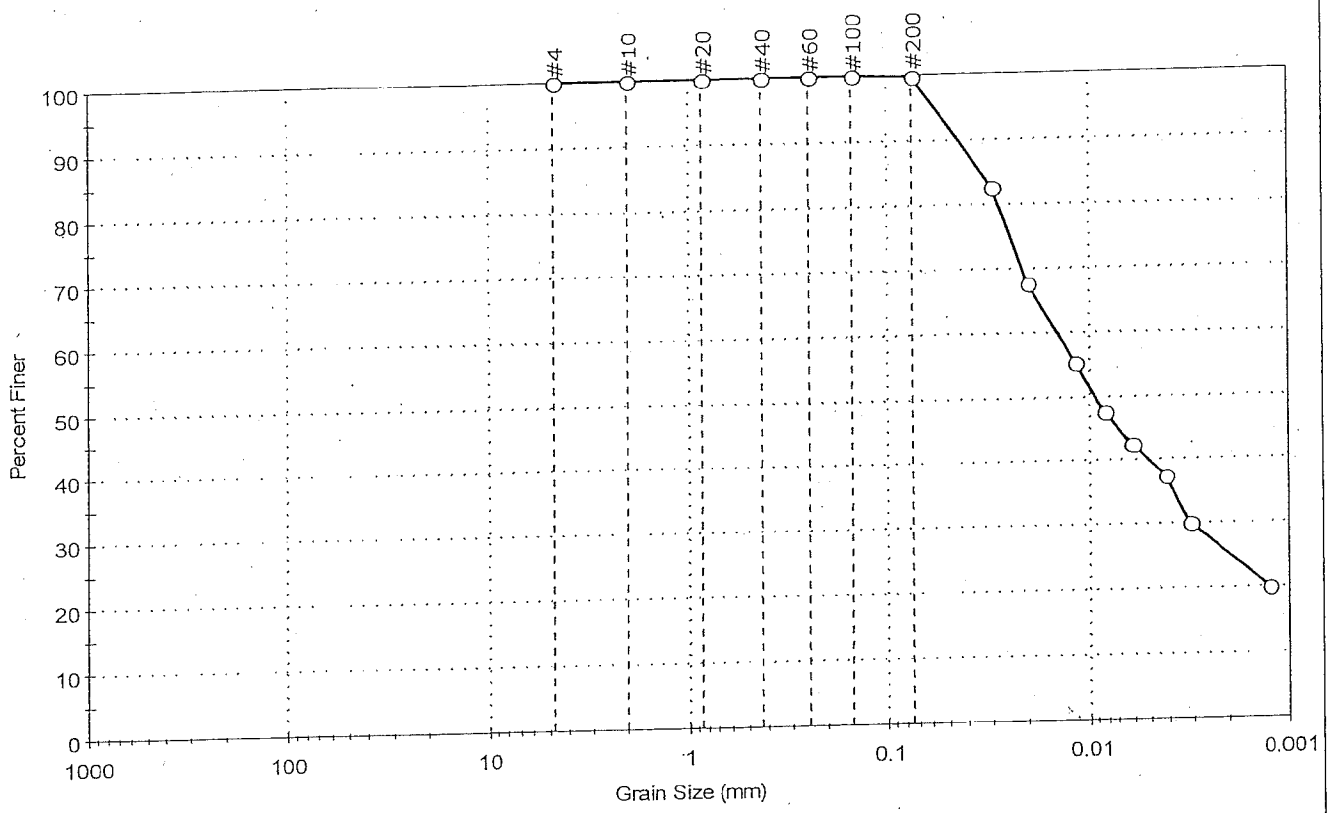
Client:	Geocomp Consulting Inc.		
Project:	Crow Lane Landfill	Project No:	GTX-9054
Location:	Newburyport, MA		
Boring ID: B-9	Sample Type: tube	Tested By:	jbr
Sample ID: T-1	Test Date: 06/15/09	Checked By:	jdt
Depth : 19.0 ft	Test Id: 154288		
Test Comment:	---		
Sample Description:	Moist, gray clay		
Sample Comment:	---		

Particle Size Analysis - ASTM D 422-63 (reapproved 2002)



% Cobble	% Gravel	% Sand	% Silt & Clay Size
—	0.0	0.3	99.7

Sieve Name	Sieve Size, mm	Percent Finer	Spec. Percent	Complies
#4	4.75	100		
#10	2.00	100		
#20	0.85	100		
#40	0.42	100		
#60	0.25	100		
#100	0.15	100		
#200	0.075	100		
	Particle Size (mm)	Percent Finer	Spec. Percent	Complies
---	0.0302	83		
---	0.0201	68		
---	0.0118	55		
---	0.0083	48		
---	0.0062	43		
---	0.0042	38		
---	0.0032	30		
---	0.0013	20		

Coefficients

D_{85} = 0.0341 mm D_{30} = 0.0032 mm
D_{60} = 0.0145 mm D_{15} = N/A
D_{50} = 0.0093 mm D_{10} = N/A
C_u = N/A C_c = N/A

Classification

ASTM N/A

AASHTO Silty Soils (A-4 (0))

Sample/Test Description

Sand/Gravel Particle Shape : ---

Sand/Gravel Hardness : ---

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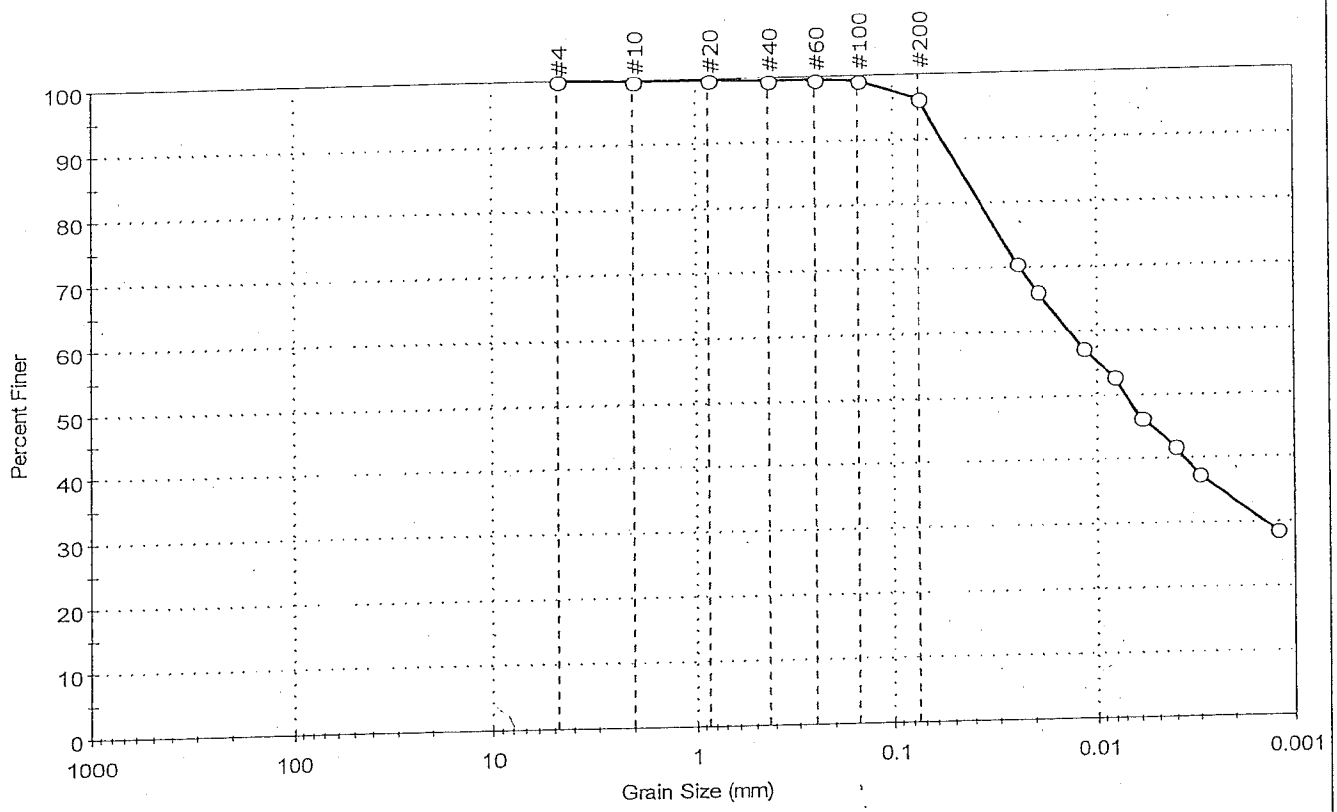
Client:	Geocomp Consulting Inc.		
Project:	Crow Lane Landfill	Project No:	GTX-9054
Location:	Newburyport, MA		
Boring ID: TP-3	Sample Type: tube	Tested By:	jbr
Sample ID: T-1	Test Date: 06/11/09	Checked By:	n/a
Depth : 3.5 ft	Test Id: 154287		
Test Comment:	---		
Sample Description:	Moist, mottled brown, gray and grayish brown silty clay		
Sample Comment:	---		

Particle Size Analysis - ASTM D 422-63 (reapproved 2002)



% Cobble	% Gravel	% Sand	% Silt & Clay Size
—	0.0	3.7	96.3

Sieve Name	Sieve Size, mm	Percent Finer	Spec. Percent	Complies
#4	4.75	100		
#10	2.00	100		
#20	0.85	100		
#40	0.42	99		
#60	0.25	99		
#100	0.15	99		
#200	0.075	96		
	Particle Size (mm)	Percent Finer	Spec. Percent	Complies?
---	0.0248	71		
---	0.0198	66		
---	0.0115	57		
---	0.0081	53		
---	0.0060	46		
---	0.0041	42		
---	0.0031	38		
---	0.0012	29		

Coefficients

D_{85} = 0.0461 mm D_{30} = 0.0014 mm
D_{60} = 0.0136 mm D_{15} = N/A
D_{50} = 0.0071 mm D_{10} = N/A
C_u = N/A C_c = N/A

Classification

ASTM N/A

AASHTO Silty Soils (A-4 (0))

Sample/Test Description

Sand/Gravel Particle Shape : ---

Sand/Gravel Hardness : ---

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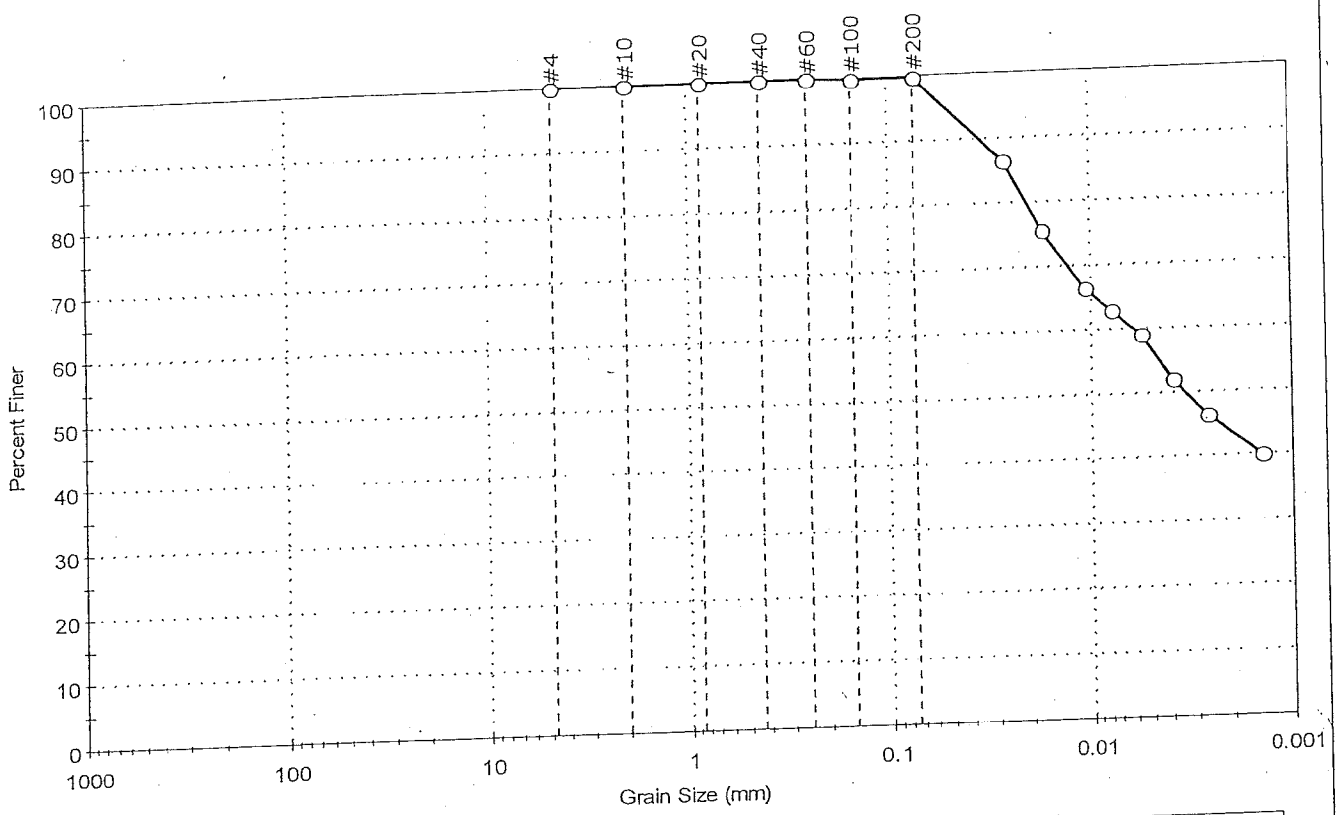
Client:	Geocomp Consulting Inc.		
Project:	Crow Lane Landfill	Project No:	GTX-9054
Location:	Newburyport, MA		
Boring ID: B-11	Sample Type: tube	Tested By:	jbr
Sample ID:T-1	Test Date: 06/15/09	Checked By:	jdt
Depth : 21.0 ft	Test Id: 154292		
Test Comment:	---		
Sample Description:	Wet, gray clay		
Sample Comment:	---		

Particle Size Analysis - ASTM D 422-63 (reapproved 2002)



% Cobble	% Gravel	% Sand	% Silt & Clay Size
—	0.0	0.4	99.6

Sieve Name	Sieve Size, mm	Percent Finer	Spec. Percent	Complies
#4	4.75	100		
#10	2.00	100		
#20	0.85	100		
#40	0.42	100		
#60	0.25	100		
#100	0.15	100		
#200	0.075	100		

	Particle Size (mm)	Percent Finer	Spec. Percent	Complies
---	0.0273	86		
---	0.0175	76		
---	0.0105	66		
---	0.0077	63		
---	0.0055	59		
---	0.0039	52		
---	0.0027	46		
---	0.0014	40		

Coefficients

D_{85} = 0.0257 mm D_{30} = N/A
D_{60} = 0.0060 mm D_{15} = N/A
D_{50} = 0.0034 mm D_{10} = N/A
C_u = N/A C_c = N/A

Classification

ASTM N/A

AASHTO Silty Soils (A-4 (0))

Sample/Test Description

Sand/Gravel Particle Shape : ---

Sand/Gravel Hardness : ---

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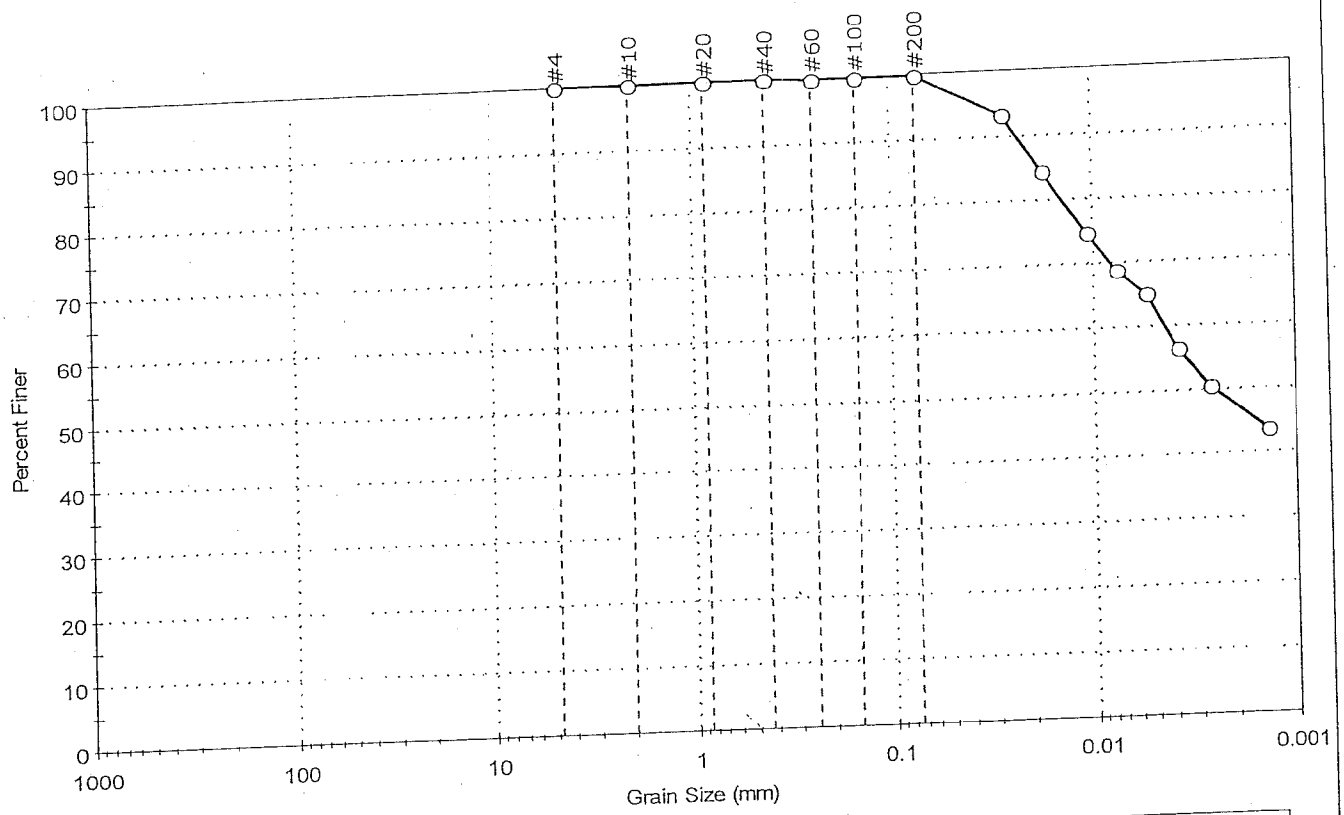
Client:	Geocomp Consulting Inc.		
Project:	Crow Lane Landfill	Project No:	GTX-9054
Location:	Newburyport, MA		
Boring ID: B-4	Sample Type: tube	Tested By:	jbr
Sample ID: T-2	Test Date: 06/15/09	Checked By:	n/a
Depth : 42.5 ft	Test Id: 154294		
Test Comment:	---		
Sample Description:	Moist, gray clay		
Sample Comment:	---		

Particle Size Analysis - ASTM D 422-63 (reapproved 2002)



% Cobble	% Gravel	% Sand	% Silt & Clay Size
—	0.0	0.4	99.6

Sieve Name	Sieve Size, mm	Percent Finer	Spec. Percent	Complies
#4	4.75	100		
#10	2.00	100		
#20	0.85	100		
#40	0.42	100		
#60	0.25	100		
#100	0.15	100		
#200	0.075	100		
	Particle Size (mm)	Percent Finer	Spec. Percent	Complies
---	0.0273	93		
---	0.0175	84		
---	0.0106	75		
---	0.0076	69		
---	0.0055	65		
---	0.0038	56		
---	0.0027	50		
---	0.0014	44		

Coefficients

D_{85} = 0.0180 mm D_{30} = N/A
D_{60} = 0.0045 mm D_{15} = N/A
D_{50} = 0.0026 mm D_{10} = N/A
C_u = N/A C_c = N/A

Classification

ASTM N/A

AASHTO Silty Soils (A-4 (0))

Sample/Test Description

Sand/Gravel Particle Shape : ---

Sand/Gravel Hardness : ---

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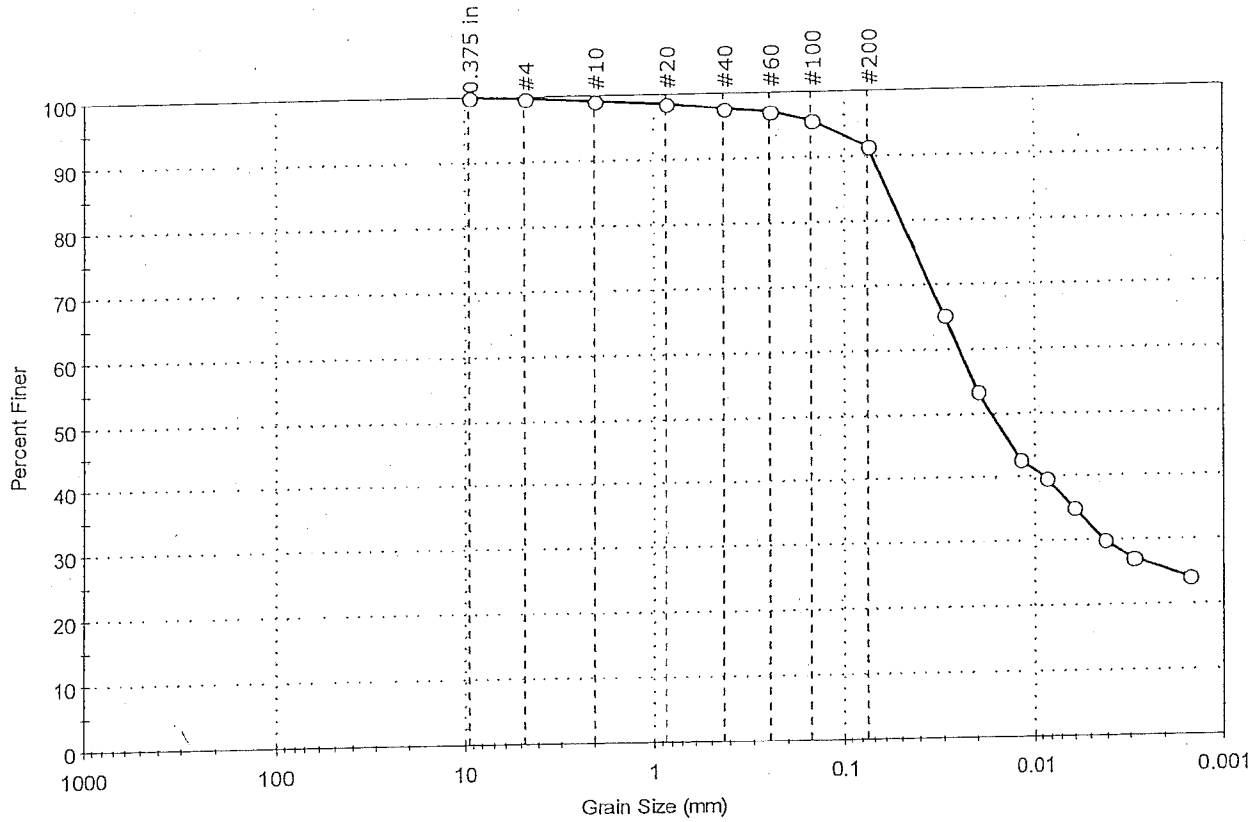
Client:	Geocomp Consulting Inc.		
Project:	Crow Lane Landfill	Project No:	GTX-9054
Location:	Newburyport, MA		
Boring ID: B-12	Sample Type: tube	Tested By:	jbr
Sample ID:T-1	Test Date: 06/16/09	Checked By:	jdt
Depth : 14.0 ft	Test Id: 154293		
Test Comment:	---		
Sample Description:	Moist, olive gray clay		
Sample Comment:	---		

Particle Size Analysis - ASTM D 422-63 (reapproved 2002)



% Cobble	% Gravel	% Sand	% Silt & Clay Size
—	0.4	8.1	91.5

Sieve Name	Sieve Size (mm)	Percent Finer	Spec. Percent	Complies
0.375 in	9.50	100		
#4	4.75	100		
#10	2.00	99		
#20	0.85	98		
#40	0.42	98		
#60	0.25	97		
#100	0.15	96		
#200	0.075	92		

Particle Size (mm)	Percent Finer	Spec. Percent	Complies
---	0.0305	65	
---	0.0202	53	
---	0.0120	43	
---	0.0086	40	
---	0.0062	35	
---	0.0042	30	
---	0.0029	27	
---	0.0015	24	

Coefficients

D_{85} = 0.0600 mm D_{30} = 0.0042 mm
D_{60} = 0.0255 mm D_{15} = N/A
D_{50} = 0.0171 mm D_{10} = N/A
C_u = N/A C_c = N/A

Classification

ASTM N/A

AASHTO Silty Soils (A-4 (0))

Sample/Test Description

Sand/Gravel Particle Shape : ---

Sand/Gravel Hardness : ---

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Appendix "D"

Ressa Stability Analysis

CROW LANE LANDFILL

Report created by ReSSA(3.0): Copyright (c) 2001-2008, ADAMA Engineering, Inc.

PROJECT IDENTIFICATION

Title: CROW LANE LANDFILL
Project Number: 20211 -
Client: Sitec Environmetal Inc.
Designer: Stulgis
Station Number: SECTION A-A

Description:
Evaluate impact of clay foundation soil.

Company's information:

Name: Geocomp Corporation
Street:

Telephone #:
Fax #:
E-Mail:

Original file path and name: C:\Users\D ..... on A-A Profile, Vary Clay Strength, 15 Jun 09.MSE
Original date and time of creating this file: 15 June 2009

PROGRAM MODE: Analysis of a General Slope using GEOSYNTHETIC as reinforcing material.

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INPUT DATA (EXCLUDING REINFORCEMENT LAYOUT)

SOIL DATA

Soil Layer #:	Unit weight, γ [lb/ft ^{3}]	Internal angle of friction, ϕ [deg.]	Cohesion, c [lb/ft ^{2}]
....1.....Reinforced Fill Top.....	116.5	40.0	0.0
....2.....Cover Liner.....	5.0	20.0	0.0
....3.....Landfill Waste.....	70.0	25.0	100.0
....4.....(Reinforced) Structural Fill.....	116.5	40.0	0.0
....5.....Stone Rip Rap and Toe Key.....	130.0	50.0	0.0
....6.....Structural Fill.....	116.5	40.0	0.0
....7.....Upper Clay.....	115.0	0.0	1850.0
....8.....Lower Clay.....	115.0	0.0	1250.0
....9.....	115.0	0.0	875.0
....10.....	127.3	28.0	0.0

REINFORCEMENT

Reinforcement Type #	Geosynthetic Designated Name	Ultimate Strength, Tult [lb/ft]	Reduction Factor for Installation Damage, RFid	Reduction Factor for Durability, RFd	Reduction Factor for Creep, RFc	Coverage Ratio, Rc
1	Geogrid Type 1	2500.00	1.20	1.10	1.67	1.00

Interaction Parameters Type #	Geosynthetic Designated Name	== Direct Sliding == Cds-phi	Cds-c	==== Pullout ==== Ci	Alpha
1	Geogrid Type 1	0.80	0.00	0.80	0.80

Relative Orientation of Reinforcement Force, ROR = 1.00. Assigned Factor of Safety to resist pullout, Fs-po = 1.50
Design method for Global Stability: AASHTO/FHWA Bishop.

WATER

Unit weight of water = 62.45 [lb/ft ^{3}]
Water ponding is defined by 'phreatic surface' in Total Stress Analysis.

SEISMICITY

Not Applicable

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DRAWING OF SPECIFIED GEOMETRY - COMPLEX - Quick Input

-- Problem geometry is defined along sections selected by user at x,y coordinates.
-- X1,Y1 represents the coordinates of soil surface. X2,Y2 represent the coordinates of the end of soil layer 1 and start of soil layer 2, and so on.
-- Xw,Yw represents the coordinates of phreatic surface.

GEOMETRY

Soil profile contains 10 layers (see details in next page)

WATER GEOMETRY

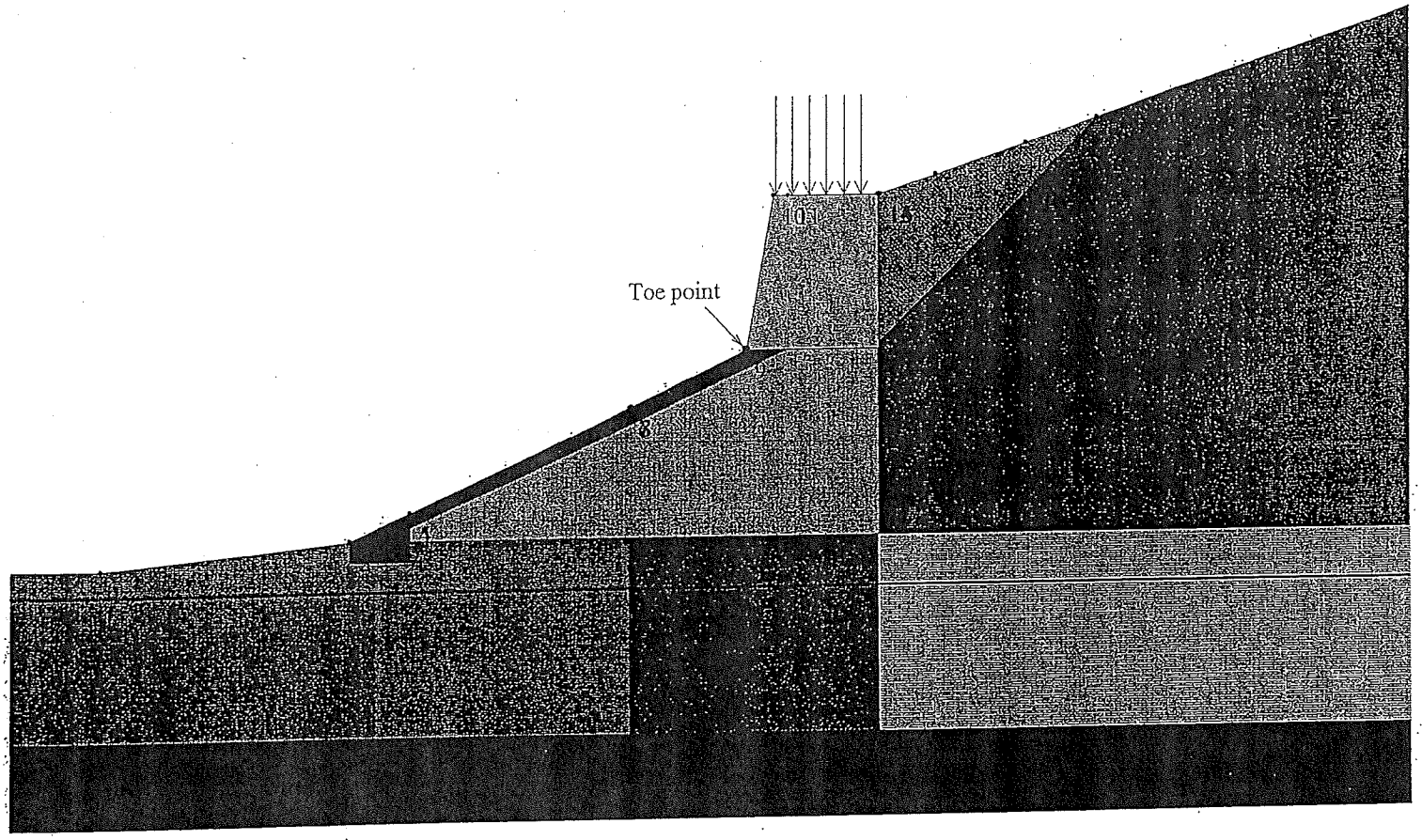
Phreatic line was specified.

UNIFORM SURCHARGE

Load Q1 = 250.00 [lb/ft²] inclined from verical at 0.00 degrees, starts at X1s = 81.00 and ends at X1e = 93.00 [ft].
Surcharge load, Q2.....None
Surcharge load, Q3.....None

STRIP LOAD

.....None.....



SCALE:

0 5 10 15 20 25 30 [ft]

CROW LANE LANDFILL
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TABULATED DETAILS OF QUICK SPECIFIED GEOMETRY

Soil profile contains 10 layers. Coordinates in [ft.]
Water was described by phreatic line.

	#	Xi	Yi
Top of Layer 1	1	0.00	40.00
	2	30.00	43.00
	3	77.50	65.00
	4	80.75	83.00
	5	93.30	83.00
	6	183.30	113.00
Top of Layer 2	7	0.00	40.00
	8	30.00	43.00
	9	77.50	65.00
	10	80.75	83.00
	11	93.30	83.00
	12	93.40	65.60
	13	110.70	83.00
	14	119.40	91.69
	15	183.30	113.00
Top of Layer 3	16	0.00	40.00
	17	30.00	43.00
	18	77.50	65.00
	19	80.75	83.00
	20	93.30	83.00
	21	93.40	65.40
	22	110.70	82.80
	23	119.40	91.50
	24	183.30	113.00
Top of Layer 4	25	0.00	40.00
	26	30.00	43.00
	27	77.50	65.00
	28	80.75	83.00
	29	93.30	83.00
	30	93.50	43.00
Top of Layer 5	31	0.00	40.00
	32	30.00	43.00
	33	77.50	65.00
	34	93.30	65.00
	35	93.50	43.00
Top of Layer 6	36	0.00	40.00
	37	30.00	43.00
	38	30.01	40.50
	39	37.00	40.50
	40	37.01	44.50
	41	82.50	65.00
	42	93.30	65.00
	43	93.50	43.00
Top of Layer 7	44	0.00	40.00
	45	30.00	43.00
	46	30.01	40.50
	47	37.00	40.50
	48	37.01	43.00
	49	93.30	43.00
Top of Layer 8	50	0.00	40.00
	51	30.00	43.00
	52	30.01	40.50
	53	37.00	40.50
	54	37.01	43.00
	55	93.30	43.00
	56	93.40	20.00
Top of Layer 9	57	0.00	40.00
	58	30.00	43.00
	59	30.01	40.50
	60	37.00	40.50
	61	37.01	43.00
	62	63.00	43.00
	63	63.10	20.00
Top of Layer 10	64	0.00	20.00
	65	63.30	20.00
Top of Phreatic Line	67	0.00	37.00
	68	100.00	37.00

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TABULATED DETAILS OF SPECIFIED GEOMETRY

Soil profile contains 10 layers. Coordinates in [ft.]
Water was described by phreatic line. Y values are tabulated in the right most column.

#	X	Y1	Y2	Y3	Y4	Y5	Y6	Y7	Y8	Y9	Y10	(phreatic) Yw
1	0.00	40.00	40.00	40.00	40.00	40.00	40.00	40.00	40.00	40.00	20.00	37.00
2	30.00	43.00	43.00	43.00	43.00	43.00	43.00	43.00	43.00	43.00	20.00	37.00
3	30.01	43.00	43.00	43.00	43.00	43.00	40.50	40.50	40.50	40.50	20.00	37.00
4	37.00	46.24	46.24	46.24	46.24	46.24	40.50	40.50	40.50	40.50	20.00	37.00
5	37.01	46.25	46.25	46.25	46.25	46.25	44.50	43.00	43.00	43.00	20.00	37.00
6	63.00	58.28	58.28	58.28	58.28	58.28	56.21	43.00	43.00	43.00	20.00	37.00
7	63.10	58.33	58.33	58.33	58.33	58.33	56.26	43.00	43.00	20.00	20.00	37.00
8	63.30	58.42	58.42	58.42	58.42	58.42	56.35	43.00	43.00	20.00	20.00	37.00
9	77.50	65.00	65.00	65.00	65.00	65.00	62.75	43.00	43.00	20.00	20.00	37.00
10	80.75	83.00	83.00	83.00	83.00	65.00	64.21	43.00	43.00	20.00	20.00	37.00
11	82.50	83.00	83.00	83.00	83.00	65.00	65.00	43.00	43.00	20.00	20.00	37.00
12	93.30	83.00	83.00	83.00	83.00	65.00	65.00	43.00	43.00	20.00	20.00	37.00
13	93.30	83.00	83.00	83.00	83.00	65.00	65.00	43.00	43.00	20.00	20.00	37.00
14	93.40	83.03	65.60	65.40	63.00	54.00	54.00	43.00	20.00	20.00	20.00	37.00
15	93.40	83.03	65.60	65.40	63.00	54.00	54.00	43.00	20.00	20.00	20.00	37.00
16	93.50	83.07	65.70	65.50	43.00	43.00	43.00	43.00	20.00	20.00	20.00	37.00
17	100.00	85.23	72.24	72.04	43.00	43.00	43.00	43.00	20.00	20.00	20.00	37.00
18	110.70	88.80	83.00	82.80	43.00	43.00	43.00	43.00	20.00	20.00	20.00	37.00
19	119.40	91.70	91.69	91.50	43.00	43.00	43.00	43.00	20.00	20.00	20.00	37.00
20	183.30	113.00	113.00	113.00	43.00	43.00	43.00	43.00	20.00	20.00	20.00	37.00
21	183.30	113.00	113.00	113.00	43.00	43.00	43.00	43.00	20.00	20.00	20.00	37.00

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RESULTS OF ROTATIONAL STABILITY ANALYSIS

Results in the tables below represent critical circles identified between specified points on entry and exit. (Theta-exit set to 50.00 deg.)
The most critical circle is obtained from a search considering all the combinations of input entry and exit points.

Critical circles for each entry point (considering all specified exit points)

Entry Point #	Entry Point (X, Y) [ft]		Exit Point (X, Y) [ft]		Critical Circle (Xc, Yc, R) [ft]			Fs	STATUS
1	81.00	83.00	-4.55	40.15	27.25	83.49	53.76	3.10	
2	85.36	83.00	77.47	64.97	60.65	83.07	24.70	2.26	
3	89.71	83.00	77.45	64.96	49.67	97.02	42.42	1.80	
4	94.06	83.25	63.52	58.70	65.38	87.66	29.02	1.47	
5	98.41	84.70	54.65	54.46	52.12	104.91	50.51	1.42	
6	102.77	86.16	49.96	52.33	41.45	123.75	71.92	1.46	
7	107.12	87.61	-0.31	40.48	43.06	87.62	64.06	1.39	
8	111.47	89.06	-5.31	40.95	43.12	89.16	68.35	1.31	
9	115.82	90.51	4.17	40.94	47.67	93.49	68.22	1.31	OK
10	120.18	91.96	-0.33	40.40	44.83	101.46	75.94	1.32	
11	124.53	93.41	3.58	41.24	47.34	106.07	78.22	1.33	
12	128.88	94.86	-0.94	40.72	44.68	114.05	86.36	1.35	
13	133.23	96.31	-0.58	40.45	44.67	120.26	91.74	1.37	
14	137.59	97.76	-0.21	40.23	44.49	126.95	97.57	1.39	
15	141.94	99.21	0.16	40.03	44.10	134.18	103.90	1.41	
16	146.29	100.66	3.68	40.93	46.49	138.83	106.85	1.42	
17	150.64	102.11	-0.74	40.40	43.74	147.81	116.25	1.44	
18	155.00	103.56	9.07	41.01	48.86	149.66	115.71	1.46	
19	159.35	105.02	4.59	40.53	45.77	159.63	126.03	1.47	
20	163.70	106.47	3.11	41.02	45.65	166.38	132.38	1.49	

Note: In the 'Status' column, OK means the critical circle was identified within the specified search domain. 'On extreme X-entry' means that the critical result is on the edge of the search domain; a lower Fs may result if the search domain is expanded.

****

Results in the tables below represent critical circles identified between specified points on entry and exit. (Theta-exit set to 50.00 deg.)
The most critical circle is obtained from a search considering all the combinations of input entry and exit points.

Critical circles for each exit point (considering all specified entry points)

Exit Point #	Exit Point (X, Y) [ft]		Entry Point (X, Y) [ft]		Critical Circle (Xc, Yc, R) [ft]			Fs	STATUS
1	-9.34	40.38	115.82	90.51	40.62	96.97	75.48	1.33	
2	-5.31	40.95	111.47	89.06	43.12	89.16	68.35	1.31	
3	-0.70	40.78	115.82	90.51	45.47	93.98	70.44	1.31	
4	4.17	40.94	115.82	90.51	47.67	93.49	68.22	1.31	OK
5	9.16	41.03	115.82	90.51	49.90	92.91	65.97	1.32	
6	13.12	41.95	115.82	90.51	52.70	91.13	63.13	1.32	
7	17.46	42.48	120.18	91.96	54.94	96.03	65.37	1.34	
8	22.84	42.35	120.18	91.96	57.82	94.02	62.39	1.35	
9	27.31	42.86	120.18	91.96	60.17	93.08	60.02	1.37	
10	31.53	43.93	115.82	90.51	30.25	145.81	101.89	1.43	
11	36.57	46.04	115.82	90.51	36.57	138.90	92.86	1.41	
12	41.12	48.15	115.82	90.51	41.12	135.20	87.05	1.39	
13	45.67	50.26	115.82	90.51	45.67	131.52	81.26	1.40	
14	49.58	52.38	115.82	90.51	51.50	125.66	73.30	1.40	
15	54.17	54.48	115.82	90.51	55.95	122.21	67.75	1.42	
16	58.98	56.55	98.41	84.70	56.12	102.26	45.80	1.43	
17	63.83	58.68	98.41	84.70	61.09	98.32	39.73	1.46	
18	68.18	60.79	94.06	83.25	68.85	86.16	25.38	1.51	
19	72.63	62.80	98.41	84.70	61.85	101.62	40.29	1.56	
20	77.29	64.86	98.41	84.70	27.76	138.74	88.94	1.56	

Note: In the 'Status' column, OK means the critical circle was identified within the specified search domain. 'On extreme X-exit' means that the critical result is on the edge of the search domain; a lower Fs may result if the search domain is expanded.

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CRITICAL RESULTS OF ROTATIONAL AND TRANSLATIONAL STABILITY ANALYSES

Rotational (Circular Arc; Bishop) Stability Analysis

Minimum Factor of Safety = 1.31

Critical Circle: Xc = 47.67[ft], Yc = 93.49[ft], R = 68.22[ft]. (Number of slices used = 68)

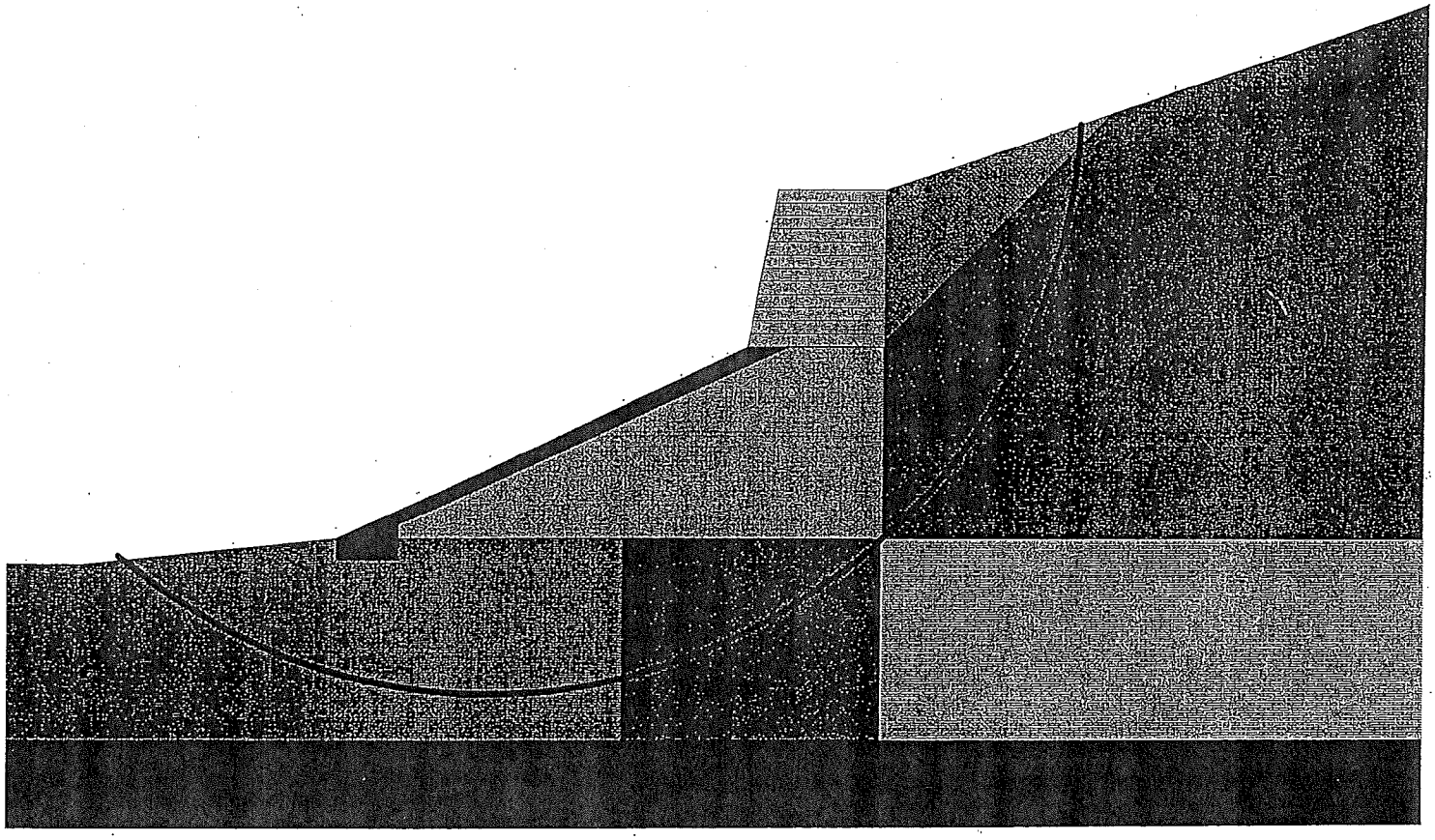
Translational (2-Part Wedge; Spencer), Direct Sliding, Stability Analysis

NOT CONDUCTED

Three-Part Wedge Stability Analysis

NOT CONDUCTED

REINFORCEMENT LAYOUT: DRAWING



SCALE:

0 5 10 15 20 25 30 [ft]

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