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New England Division

USACE Contract No. DACW33-94-D-0002

FOSTER WHEELER ENVIRONMENTAL CORPORATION

USACE CONTRACT NO. DACW33-94-D-0002
TASK ORDER NO. 017
TOTAL ENVIRONMENTAL RESTORATION CONTRACT

GEOTECHNICAL DATA REPORT FOR DESIGN OF CONFINED DISPOSAL FACILITY (CDF) B FOR OPERABLE UNIT #1 NEW BEDFORD HARBOR SUPERFUND SITE

New Bedford, Massachusetts

March 2001

Prepared for
U.S. Army Corps of Engineers
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1.0 INTRODUCTION

1.1 Purpose

The purpose of this data report is to present the results of the geotechnical subsurface investigation program conducted in support of the design of Confined Disposal Facility (CDF) B at the New Bedford Harbor Superfund Site in New Bedford, Massachusetts.

1.2 Background

As shown on Figure 1-1, the New Bedford Harbor Superfund Site, located in Bristol County, extends from the shallow northern reaches of the Acushnet River estuary (the Upper Harbor) south through the commercial port of New Bedford Harbor (the Lower Harbor) and adjacent areas of Buzzards Bay (the Outer Harbor). The sediments in New Bedford Harbor are contaminated with polychlorinated biphenyls (PCBs) and, to a lesser degree, other organic compounds and heavy metals. The remedy for the site originally involved dredging and excavation of contaminated sediments to Record of Decision (ROD) action levels and placing the sediments in four shoreline CDFs (A, B, C, and D) to be designed and constructed as part of the overall remedy. The approximate areas of contamination to be dredged, and the conceptual locations of the CDFs (based on the ROD), are shown on Figure 1-2.

1.3 Site Description

The CDF B site is located on the western shore of the Acushnet River, between CDFs A and C, as shown on Figure 1-2. The CDF B site borders existing manufacturing complexes which are immediately adjacent to the existing shoreline of the river. A topographic plan of the site is depicted on Figure 1-3. The site consists of an onshore portion (including an intertidal area) and an offshore portion. The ground surface elevation in the onshore portion ranges from approximately El. 8* feet adjacent to the buildings to El. 2.4 (mean high tide). The intertidal area is between El. 2.4 and El. -1.3 (mean low tide). Offshore, the mudline decreases from El. -1.3 to approximately El. -6 at the east side of the site.

1.4 Project Description

The conceptual design of CDF B, as defined in the ROD, consists of a lined perimeter dike constructed in the water, and a lined sheet pile wall installed along the shoreline. Sediments contaminated with PCBs are to be dredged from the harbor bottom and disposed of in the CDF. The conceptual design also includes a cap system to be constructed above the dredged sediments, which, in conjunction with the liner and low permeability bottom sediments, will isolate the PCB contamination from the public and the marine environment. In support of the design of CDF B, a geotechnical investigation was conducted to provide data on the thickness, classification, and engineering properties of the subsurface strata, as well as the nature of the bedrock beneath the overburden.

2.0 FIELD INVESTIGATION

The geotechnical investigation program was developed by Foster Wheeler Environmental Corporation (Foster Wheeler) and included advancement of onshore and offshore borings, and installation of groundwater observation and monitoring wells. In situ testing, including borehole permeability testing

* Elevations in this report are in feet and refer to National Geodetic Vertical Datum (NGVD)

and field vane shear testing, was also conducted to provide an estimation of in situ engineering parameters.

2.1 Boring Program

The onshore boring program consisted of advancement of thirteen borings (FB-1 through FB-8, FB-10, and CSO-B1 through CSO-B4), installation of seven observation wells (OW-B1 through OW-B7), and installation of four monitoring wells (MW-B1, MW-B2(S), MW-B2(D), and MW-B3). The offshore boring program consisted of advancement of twenty-four borings (FB-11 through FB-17, FB-19, FB-20, FB-22 through FB-31, and FB-V1 through FB-V5) and installation of two monitoring wells (MW-B4 and MW-B5). All drilling work was performed by Atlantic Testing Laboratories, Limited (ATL) of Canton, New York, between July 15, 1999 and November 4, 1999. Drilling and sampling activities were overseen by Nobis Engineering, Inc. (Nobis) geologists of Concord, New Hampshire.

Global positioning system (GPS) survey equipment and a predetermined set of coordinates (northings and eastings) were used by Foster Wheeler to lay out the locations of the borings and wells. The as-built coordinates and elevations, determined by Foster Wheeler GPS survey and referenced to NGVD, were recorded and are presented in Table 2-1. The locations of the borings and wells are shown on Figure 1-3.

Three drill rigs were used for the exploration program: a truck rig, an all terrain vehicle (ATV) rig, and a barge-mounted water rig. Borings were advanced using either rotary wash or hollow stem auger equipment. In general, a combination of casing and drilling fluid (bentonite or polymer slurry) was used with the rotary wash equipment to prevent collapse of the borehole. Split-spoon samples were taken at approximately 2-foot intervals in loose material, at standard 5-foot intervals in denser material, and at observed changes in strata. In selected borings, Osterberg (Shelby tube) samples were collected from the organic clay layer.

Boring logs, prepared by Nobis, are provided in Appendix A. Observation and monitoring well construction logs, also prepared by Nobis, have been included in Appendix B. Classifications on the boring logs are consistent with ASTM D 2488 – Standard Practice for Description and Identification of Soils (Visual-Manual Procedure). Soil classifications which were edited based on particle size analysis results and Atterberg limits determinations are consistent with ASTM D 2487 – Standard Classification of Soils for Engineering Purposes (Unified Soil Classification System).

2.2 In Situ Testing

2.2.1 Borehole Permeability Tests

Borehole permeability tests were performed at four offshore boring locations at various depths within the organic clay and underlying interbedded sands strata. A total of eight borehole permeability tests were performed at CDF B: four tests in the organic clay and four tests in the interbedded sands. Borehole permeability testing was conducted using the falling head method to provide an indication of the in situ permeability of the organic clay and sand strata. These tests were performed as either flush-bottom, from which a mean coefficient of permeability was estimated, or open-hole (wick), from which a horizontal coefficient of permeability was estimated.

Based on the borehole permeability tests, the coefficient of permeability for the organic clay ranges from 2.91×10^{-6} to 2.91×10^{-4} cm/sec, and the coefficient of permeability for the interbedded sands ranges from 4.92×10^{-6} to 8.45×10^{-5} cm/sec. The estimated permeabilities (particularly in the organic clay) were impacted by the limitations of the testing, which was complicated by tidal variation and the

inability of the clay to support the weight of the casing. These factors should be considered when interpreting the test data. Details of the test procedures, calculation method, and test results, as well as the borehole permeability test logs, are contained in Appendix C.

2.2.2 Field Vane Shear Tests

Field vane shear tests (FVSTs) were performed at CDF B in accordance with ASTM D 2573 at 2-foot intervals throughout the entire thickness of the organic clay layer at five offshore locations. The rectangular stainless steel vane, provided by the USACE, was 4 inches in diameter and 8 inches in height. The vane was welded onto a ½-inch diameter vane rod which was then attached to standard (AW sized) drill rod for applying torque to the vane. Torque was applied by hand with a torque wrench.

The in situ undrained shear strengths, both undisturbed and remoulded, estimated from the FVSTs are provided in Appendix D. Test procedures were complicated by certain limitations. Details of the test procedures, limitations, calculation method, and test results, as well as the field vane shear test logs, are contained in Appendix D.

2.3 Summary of Subsurface Conditions

The subsurface conditions at the site vary both onshore and offshore. The onshore portion of the site is, in general, characterized by fill overlying organic clay which is underlain by interbedded sands. In three borings, however, fill overlying interbedded sands was encountered. The offshore portion of the site is generally characterized by organic soil overlying interbedded sands. The subsurface conditions for the onshore and offshore portions of the site are described in detail below. Summaries of strata thicknesses are included in Tables 2-2 and 2-3.

Subsurface profiles of the centerline of the dike and the sheet pile wall alignment are presented as Figures 2-1 and 2-2, respectively. Profiles corresponding to cross-section locations shown on Figure 1-3 are presented as Figures 2-3 to 2-4. The general notes and legend for the subsurface profiles are included on Figure 2-5. Subsurface conditions were observed only at the boring locations. The strata boundary lines on the profiles are based on interpolation between borings and are shown only to provide visual continuity. The actual strata boundaries between borings may vary substantially from the lines shown on the profiles.

2.3.1 Soil and Rock Conditions

2.3.1.1 Onshore Portion of Site

FILL: The fill encountered in the onshore borings ranges from 2 to approximately 17 feet in depth. The fill is mostly granular in nature and consists of poorly graded sands with varying amounts of silts and gravels. Other components include brick, concrete, wood, ash, slag, asphalt, and organic matter. Petroleum odors were sometimes noted. In two instances, boulders were encountered in the fill stratum.

ORGANIC CLAY: Organic clay was encountered in many onshore borings. Where encountered, this stratum ranges from 4.5 to 14.5 feet in depth where fully penetrated, lies directly beneath the fill. The borings indicate that the stratum generally consists of very soft to soft organic clay or organic silt containing varying amounts of fine sand and shell fragments. The color was found to range from gray to black, and in some instances strong organic or petroleum odors were noted.

SANDS: The interbedded sands encountered in the onshore borings generally consist of poorly graded sand with varying amounts of silt and gravel. In a few instances the samples were largely silt or largely gravel. Based on standard penetration tests, the sands are generally medium dense to dense, although some loose and very dense sands were encountered. Where the sand stratum was fully penetrated, the thickness ranges from approximately 7.5 to 33 feet, with the average thickness being 17 feet.

GLACIAL TILL: Glacial till was encountered in six onshore borings. The thickness of the stratum ranges from 2 to 11 feet, with an average thickness of approximately 5 feet. The material was classified as poorly graded gravel with sand, silty gravel with sand, poorly graded sand with silt and gravel, and silty sand with gravel. Based on standard penetration tests, the material was generally medium dense to dense.

BEDROCK: Bedrock was cored in seven onshore borings. The rock consists of fresh to weathered aphanitic gneiss. The rock quality designation (RQD) noted on the boring logs ranged from poor to very good, but was generally fair to good.

2.3.1.2 Offshore Portion of Site

ORGANIC CLAY: Organic clay was encountered at all offshore borings, including monitoring well and field vane shear test locations, and ranges from 8 to 18.5 feet in depth. The stratum consists of very soft organic clay or organic silt containing varying amounts of fine to medium sand (approximately 5 to 25% by weight) and shell fragments. The color was generally recorded as dark gray to black, and an organic odor was sometimes noted.

SANDS: The interbedded sands encountered offshore generally consist of both well graded and poorly graded sand with varying amounts of silts and gravels. In some instances the samples were largely silt or largely gravel. Based on standard penetration tests, the sands are predominately medium dense to dense, although some loose and very dense sands were encountered. Where the sand stratum was fully penetrated, the thickness ranges from 15 to 30 feet, with the average thickness being approximately 21 feet.

GLACIAL TILL: Glacial till was encountered in seven offshore borings. The thickness of the stratum ranges from approximately 1.5 to 9 feet, with the average thickness being just under 4 feet. The material was classified as poorly graded, well graded, silty, or clayey sand with varying amounts of silt and gravel. Based on standard penetration tests, the material is generally dense to very dense. Cobbles and boulders were encountered overlying or within the glacial till stratum. A loss of drilling fluid above the bedrock in boring FB-26 indicates a possible nested bolder condition.

BEDROCK: Bedrock was cored in five offshore borings. The rock consists of fresh to weathered aphanitic gneiss. The rock quality designation (RQD) noted on the boring logs generally ranged from fair to good.

2.3.2 Groundwater

Seven observation wells and four monitoring wells were installed at the site, and weekly groundwater level measurements were taken for a period of two months thereafter (refer to Appendix E). Groundwater elevations were influenced by tidal fluctuations, with mean tides ranging from approximately El. -1.3 to El. 2.4. Depending on well location, groundwater elevations could vary as much as 2.9 feet between low tide and high tide. As shown in Table 2-4, average groundwater elevations ranged from El. 1.0 in observation well OW-B2 to El. 3.1 in observation well OW-B5.

3.0 LABORATORY TESTING

3.1 General

A geotechnical laboratory testing program was performed to assist in classification of soils and estimation of engineering parameters necessary for design of the CDF. Index testing, including moisture content, specific gravity, particle size, and Atterberg limits determinations, was conducted on samples of fill, organic clay, interbedded sands, and glacial till. Triaxial compression tests, one-dimensional consolidation tests, and flexible wall permeability tests were performed on Shelby tube samples of the organic clay. Laboratory testing was performed by GeoTesting Express, Inc. (GTX) of Boxborough, Massachusetts. Laboratory results are contained in Appendices F through L.

3.2 Index Testing

3.2.1 Moisture Content

The moisture, or water, contents of twenty-two samples were determined in accordance with ASTM D 2216. The results are contained in Table 3-1 and Appendix F. Natural water contents determined in conjunction with Atterberg limits testing (see Section 3.2.4) are contained in Appendix H.

3.2.2 Specific Gravity

A total of eleven specific gravity tests were performed on representative samples of subsurface materials at CDF B, including six on the organic clay and five on the interbedded sands. All tests were conducted in accordance with ASTM D 854, and the results are contained in Table 3-1 and Appendix F.

3.2.3 Particle Size Analysis

A total of nineteen particle size analyses were performed on representative samples of subsurface materials at CDF B, including seven on the organic clay, ten on the interbedded sands, two on the glacial till. All analyses were conducted in accordance with ASTM D 421 and D 422. Soil classifications are contained in Table 3-1. Results of the particle size analyses (both sieve and hydrometer) are also contained in Appendix G.

3.2.4 Atterberg Limits

The Atterberg limits of nine soil samples representative of the fine-grained materials encountered in the test borings were determined in accordance with ASTM D 4318. Each liquid limit test sample was prepared by the wet method of sample preparation, and the liquid limit was determined by Method A (the multipoint liquid limit test). Upon determination of the plastic limit of a sample, its plasticity index was calculated as the difference between the liquid limit and the plastic limit. Values of liquid limit versus plasticity index were then plotted on the plasticity chart. Based on where a sample plots, soil classification could be determined. The results, which are contained in Appendix H, along with the information contained in the boring logs, indicate that six of the samples are high plasticity organic clay, one sample is low plasticity organic clay, and two samples are inorganic silt. Soil classifications are contained in Table 3-1.

3.3 One-dimensional Consolidation Testing

One-dimensional consolidation tests were performed on five organic clay samples in accordance with ASTM D 2435. The consolidation curves for these tests are presented as percent vertical strain vs. log of vertical effective stress, and are contained in Appendix I. The coefficient of consolidation (c_v) was computed for each increment of load and plotted against log of vertical effective stress for each of the five tests. These plots are also contained in Appendix I.

For the organic clay, the virgin compression ratio (CR) ranges from approximately 0.170 to 0.266, and the recompression ratio (RR) ranges from approximately 0.013 to 0.034. All results are contained in Table 3-1.

3.4 Triaxial Compression Testing

3.4.1 Unconsolidated-undrained Triaxial Compression Tests

Twenty-four unconsolidated-undrained triaxial compression (Q) tests were performed on samples of organic clay collected from both the onshore and offshore portions of the site. Based on natural water contents, Q tests may have been performed on samples having very high sand and gravel contents.

The Q tests were conducted in accordance with the test procedures contained in the U.S. Army Corps of Engineers Engineer Manual 1110-2-1906. The tests were to be performed using cell pressures equal to the estimated in situ vertical effective stress on each sample. Due to laboratory error, however, tests were performed using cell pressures 1.8 to 3.5 times higher than the estimated in situ vertical effective stress on each sample. Samples which were not 100 percent saturated (three samples were less than 90% saturated) may have been consolidated when the confining pressure was applied and during shear. Additional material was obtained from two of the three tube samples (FB-27 UO-7 and FB-29 UO-4) and the tests were rerun using the correct cell pressures.

The results of the tests are summarized in Table 3-1 and included in Appendix J. The peak deviator stress ranges from 65 to 483 psf for the organic clay present in the top 14 feet of the harbor. For samples of organic clay collected onshore, the peak deviator stress ranges from 171 to 776 psf.

3.4.2 Consolidated-undrained Triaxial Compression Tests

Six consolidated-undrained triaxial compression (R) tests were performed on samples of organic clay collected from the harbor. R tests were conducted in accordance with the procedures contained in the U.S. Army Corps of Engineers Engineer Manual 1110-2-1906. The results of the tests are summarized in Table 3-1 and contained in Appendix K. The consolidation stress ranges from 497 to 991 psf, and the peak shear stress ranges from 213 to 474 psf for the samples tested.

3.5 Flexible Wall Permeability Testing

Three constant gradient, or constant head, flexible wall permeability tests were performed in accordance with ASTM D 5084 to determine the coefficient of permeability of the organic clay. The results of the tests are contained in Appendix L. Based on the laboratory tests, the coefficient of permeability for the samples of organic clay ranges from 3.2×10^{-7} to 9.7×10^{-7} cm/sec.

Review of the test data from the samples of organic clay indicates that the samples were somewhat consolidated during the back pressure saturation phase of the test. Also note that seepage pressures

associated with large hydraulic gradients can consolidate soft, compressible samples and reduce their permeability. Thus, it is usually necessary to use smaller hydraulic gradients (<10) for testing such samples. In the case of the organic clay, hydraulic gradients of 13.8 to 18.2 were used by the laboratory. The test data should, therefore, be interpreted in consideration of the consolidation that occurred both during the back pressure saturation phase of the test and due to the high hydraulic gradient used.

TABLES

Table 2-1
GPS As-built Coordinates and Elevations

Boring/Well	Northing	Easting	Elevation (ft)
FB-1	2704983.3	814885.1	2.30
FB-2	2704792.0	814894.6	3.30
FB-3	2704571.9	814903.8	0.30
FB-4	2704356.1	814907.9	2.20
FB-5	2704207.0	814934.5	4.80
FB-6	2703986.4	814946.0	5.16
FB-6A	2703979.7	814948.6	5.24
FB-6B	2703982.6	814947.7	5.29
FB-7	2703786.1	814956.0	5.42
FB-8	2703587.3	814969.8	6.70
FB-10	2703242.9	815061.8	7.46
FB-11	2704908.9	814967.9	-2.28
FB-12	2704734.5	814995.0	-3.85
FB-13	2704520.5	815002.0	-4.20
FB-14	2704320.0	815024.4	-3.70
FB-15	2704122.1	815017.2	-3.61
FB-16	2703924.2	815035.6	-3.60
FB-17	2703702±10	815043±10	-2.74
FB-19	2704914.8	815170.9	-4.88
FB-20	2704767.6	815118.9	-5.17
FB-22	2704620.1	815106.9	-4.23
FB-23	2704428.1	815106.9	-5.19
FB-24	2704330.5	815178.2	-5.56
FB-25	2704227.0	815102.4	-5.80
FB-26	2704018.4	815120.5	-4.15
FB-27	2703919.0	815179.8	-6.49
FB-28	2703767.6	815117.5	-3.26
FB-29	2703600.5	815110.4	-4.17
FB-30	2703521.1	815181.4	-3.85
FB-31	2703401.5	815093.4	-3.30
CSO-B1/OW-B1	2703308.7	814998.1	7.81
CSO-B2	2703467.5	814952.6	6.95
CSO-B3	2703671.9	814911.3	7.28
CSO-B4	2703763.3	814906.0	7.07
OW-B2	2704974.8	814883.6	2.10
OW-B3	2704653.4	814704.2	5.24
OW-B4	2704352.2	814899.4	2.50
OW-B5	2704189.7	814719.5	5.72
OW-B6	2703791.2	814957.9	5.54
OW-B7	2703765.6	814768.4	7.40
MW-B1	2704803.1	814792.3	5.08
MW-B2(S)	2704199.2	814810.2	5.30
MW-B2(D)	2704190.9	814826.5	5.20
MW-B3	2703608.3	814893.2	7.20
MW-B4	2704625.2	815115.3	-4.30
MW-B5	2703769.1	815119.5	-3.21
FB-V1	2704502.5	815188.4	-4.7
FB-V2	2704099.9	815185.5	-6.4
FB-V3	2704971.8	815019.2	-2.2
FB-V4	2703511.0	815052.5	-3.3
FB-V5	2703356.1	815146.4	-3.4

Table 2-2
Summary of Subsurface Conditions
Ohshore Borings and Wells

Boring	Elevation (ft)	Total Depth (ft)	Strata Thickness (ft)				EL. Top of Rock or Refusal (ft)
			Fill	Organic Clay	Sands & Gravels	Glacial Till	
FB-1	2.3	43	6.0	9.0	16.8	NE	-29.5
FB-2	3.3	30	15.0	4.5	10.3	NE	-26.5 (R)
FB-3	0.3	43.5	10.0	6.0	14.0	2.0	-31.7
FB-4	2.2	33.5	11.0	9.5	10.5	2.5	-31.3 (R)
FB-5	4.8	43.5	10.5	14.5	7.5	NE	-27.7
FB-6	5.2	46	10.5	8.0	11.5	4.3	-29.1
FB-7	5.4	43	17.0	NE	8.0	3.5	-23.1
FB-8	6.7	63.5	10.0	NE	33.0	11.0	-47.3
FB-10	7.5	62	11.5	NE	31.5	9.0	-44.5
CSO-B1/OW-B1	7.8	25	11.0	NE	14*	NE	NE
CSO-B2	7.0	25	8.0	NE	17*	NE	NE
CSO-B3	7.3	27	4.0	NE	23*	NE	NE
CSO-B4	7.1	27	12.0	NE	15*	NE	NE
OW-A2†	2.1	19	6.0	9.0	4*	NE	NE
OW-B3	5.2	19	6.0	NE	13*	NE	NE
OW-A4†	2.5	19	11.0	8*	NE	NE	NE
OW-B5	5.7	19	5.0	NE	14*	NE	NE
OW-A6†	5.5	19	17.0	NE	2*	NE	NE
OW-B7	7.4	19	2.0	NE	17*	NE	NE
MW-B1	5.1	19	7.0	12*	NE	NE	NE
MW-B2(S)†	5.3	19	6.5	NE	12.5*	NE	NE
MW-B2(D)	5.2	34.3	6.5	NE	26.8	NE	-28.1 (R)
MW-B3	7.2	19	5.0	NE	14*	NE	NE

Notes: 1. Elevations are in feet and refer to National Geodetic Vertical Datum (NGVD)
2. NE indicates strata not encountered
3. (R) indicates refusal (rock not cored)
* Strata not fully penetrated
† Strata thicknesses based on adjacent boring

Table 2-3
Summary of Subsurface Conditions
Offshore Borings and Wells

Boring	Mudline Elevation (ft)	Total Depth (ft)	Strata Thickness (ft)			EL. Top of Rock or Refusal (ft)
			Organic Clay	Sands & Gravels	Glacial Till	
FB-11	-2.3	36.6	12.0	15.0	9.1	-38.4 (R)
FB-12	-3.9	34.5	10.5	20.1	NE	-34.5 (R)
FB-13	-4.2	20.7	13.7	7*	NE	NE
FB-14	-3.7	31.5	10.0	20.5	NE	-34.2 (R)
FB-15	-3.6	21.5	14.5	7*	NE	NE
FB-16	-3.6	32.7	14.5	17.3	NE	-35.4 (R)
FB-17	-2.7	20.7	18.5	2.2*	NE	NE
FB-19	-4.9	40.0	15.0	15.0	1.5	-36.4
FB-20	-5.2	44.0	13.5	20.0	NE	-38.7
FB-22	-4.2	32.0	14.8	17.2*	NE	NE
FB-23	-5.2	49.0	10.0	26.5	2.5	-44.2
FB-24	-5.6	41.7	13.0	28.7	NE	-47.3 (R)
FB-25	-5.8	31.0	14.0	17*	NE	NE
FB-26	-4.2	45.0	14.0	16.0	4.5	-38.7
FB-27	-6.5	31.0	13.3	17.7*	NE	NE
FB-28	-3.3	34.0	16.5	17.5*	NE	NE
FB-29	-4.2	49.5	12.5	30.0	NE	-46.7
FB-30	-3.9	36.8	16.5	18.5	1.8	-40.7 (R)
FB-31	-3.3	25.0	8.0	17*	NE	NE
MW-B4	-4.3	28.0	15.3	12.7*	NE	NE
MW-B5	-3.2	30.0	17.0	13*	NE	NE
FB-V1	-4.7	16.0	14.0	2*	NE	NE
FB-V2	-6.4	14.5	12.5	2*	NE	NE
FB-V3	-2.2	11.0	9.0	2*	NE	NE
FB-V4	-3.3	18.5	16.5	2*	NE	NE
FB-V5	-3.4	17.0	16.5	0.5*	NE	NE

Notes: 1. Elevations are in feet and refer to National Geodetic Vertical Datum (NGVD)
2. NE indicates strata not encountered
3. (R) indicates refusal (rock not cored)
* Strata not fully penetrated

Table 2-4
Average Groundwater Elevations

Well Number	Avg. Groundwater Elevation (ft)
OW-B1	2.0
OW-B2	1.0
OW-B3	2.4
OW-B4	N/A
OW-B5	3.1
OW-B6	2.0
OW-B7	2.1
MW-B1	1.8
MW-B2(S)	2.6
MW-B2(D)	2.6
MW-B3	2.0

Notes:
1. Elevations are in feet and refer to National Geodetic Vertical Datum (NGVD).
2. Average groundwater elevation reflects the average elevation based on readings obtained over a two-month monitoring period. Readings may be tidally influenced. Refer to Appendix E for detailed data.

Table 3-1
Summary of Laboratory Test Results

			Index Testing							Consolidation Test					Q Test (UU Triaxial Test)			R Test (CU Triaxial Test)			
Boring	Sample	Depth (ft)	Natural w (%)	LL	PL	PI	Classification	Specific Gravity	Grain Size Fig. No.	Appendix	e_0	w_o (%)	CR	RR	Appendix	Water Content (%)	Peak Deviator Stress (psf)	Appendix	Effective Consolidation Stress (psf)	Water Content after Consolidation (%)	Peak Shear Stress (psf)
FB-4	UO-5	11-13	88.7	95.1	40.9	54.1	OH	2.62	1						J	74.0	171.4				
FB-4	UO-6	13-15													J	74.5	483.8				
FB-4	UO-7	15-17								I	2.09	75.3	0.262	0.018	J	74.2	776.2				
FB-4	UO-8	17-19													J	85.5	277.9				
FB-4	UO-9	19-21													J	72.3	368.6				
FB-5	S-7A	25-27	25.0				SP-SM	2.67	2												
FB-10	S-5	20-22	12.2				SP	2.65	3												
FB-11	UO-1	0-2													J	189.4	70.6				
FB-11	UO-2	3-5													J	131.2	103.7				
FB-11	UO-3	6-8													J	138.3	151.2				
FB-11	UO-4	9-11	33.7	54.9	27.1	27.8	OH	2.61							J	40.1	207.4				
FB-11	S-2	17-19	34.3	27.4	24.0	3.4	ML	2.80	4												
FB-11	S-4	27-29	10.8				SM		5												
FB-12	S-1A	8-10	111.7	119.2	45.3	74.0	OH		6												
FB-12	S-2	13-15	34.7	25.8	22.8	3.0	ML		7												
FB-13	UO-1	0-2	214.0	108.0	79.7	28.3	OH	2.29	8	I	2.54	101.1	0.209	0.021	J	182.8	64.8				
FB-14	S-1A	7-9	97.3				OH		9												
FB-14	S-4	14-16	9.8				GW-GM		10												
FB-16	S-1	3-5	87.4				OH		11												
FB-16	S-7	15-17	11.0				SP-SM	2.69	12												
FB-17	UO-1	0-2								I	2.26	82.8	0.170	0.013							
FB-17	S-2	7-9	90.3				OH		13												
FB-17	S-5	19-21	7.9				SW-SM		14												
FB-20	UO-1	3-5																K	497.0	91.1	235.2
																		K	686.8	91.0	333.3
FB-20	UO-2	6-8					OH											K	905.1	94.6	427.6
																		K	990.6	66.4	473.9
FB-23	UO-1	3-5													J	110.1	175.7				
FB-23	UO-2	6-8													J	63.9	93.6				
FB-23	UO-3	9-11													J	34.0	453.6				
FB-25	UO-1	0-2								I	5.08	197.2	0.266	0.034	J	193.4	70.6				
FB-26	S-3	25-27	8.2				GP-GM		15												
FB-26	S-4	30-32	8.2				SW-SM		16												
FB-27	UO-1	0-2	204.5	98.2	62.1	36.1	OH	2.28	17						J	180.2	400.3				

Table 3-1
Summary of Laboratory Test Results

			Index Testing							Consolidation Test					Q Test (UU Triaxial Test)			R Test (CU Triaxial Test)			
Boring	Sample	Depth (ft)	Natural w (%)	LL	PL	PI	Classifi-cation	Specific Gravity	Grain Size Fig. No.	Appen-dix	e_0	w_o (%)	CR	RR	Appen-dix	Water Content (%)	Peak Deviator Stress (psf)	Appen-dix	Effective Consoli-dation Stress (psf)	Water Content after Consolidation (%)	Peak Shear Stress (psf)
FB-27	UO-3	4-6													J	82.8	112.3				
FB-27	UO-5	8-10	39.9	38.8	20.4	18.5	OL	2.64		I	2.41	87.2	0.230	0.017	J	28.7	220.3				
FB-27	UO-7	12-14													J	39.8	204.5				
															J	39.5	393.1				
FB-28	UO-1	0-2					OH											K	592.0	59.1	213.3
																		K	794.8	65.9	307.3
FB-29	UO-1	3-5													J	109.6	194.4				
FB-29	UO-2	6-8	93.5	89.8	35.3	54.5	OH	2.62							J	83.7	275.0				
FB-29	UO-3	9-11													J	85.6	283.7				
FB-29	UO-4	12-14													J	38.6	410.4				
															J	38.7	482.7				
FB-29	S-1	14-16	12.3				SP-SM	2.67	18												
FB-29	S-4A	30-32	25.7				ML		19												

FIGURES

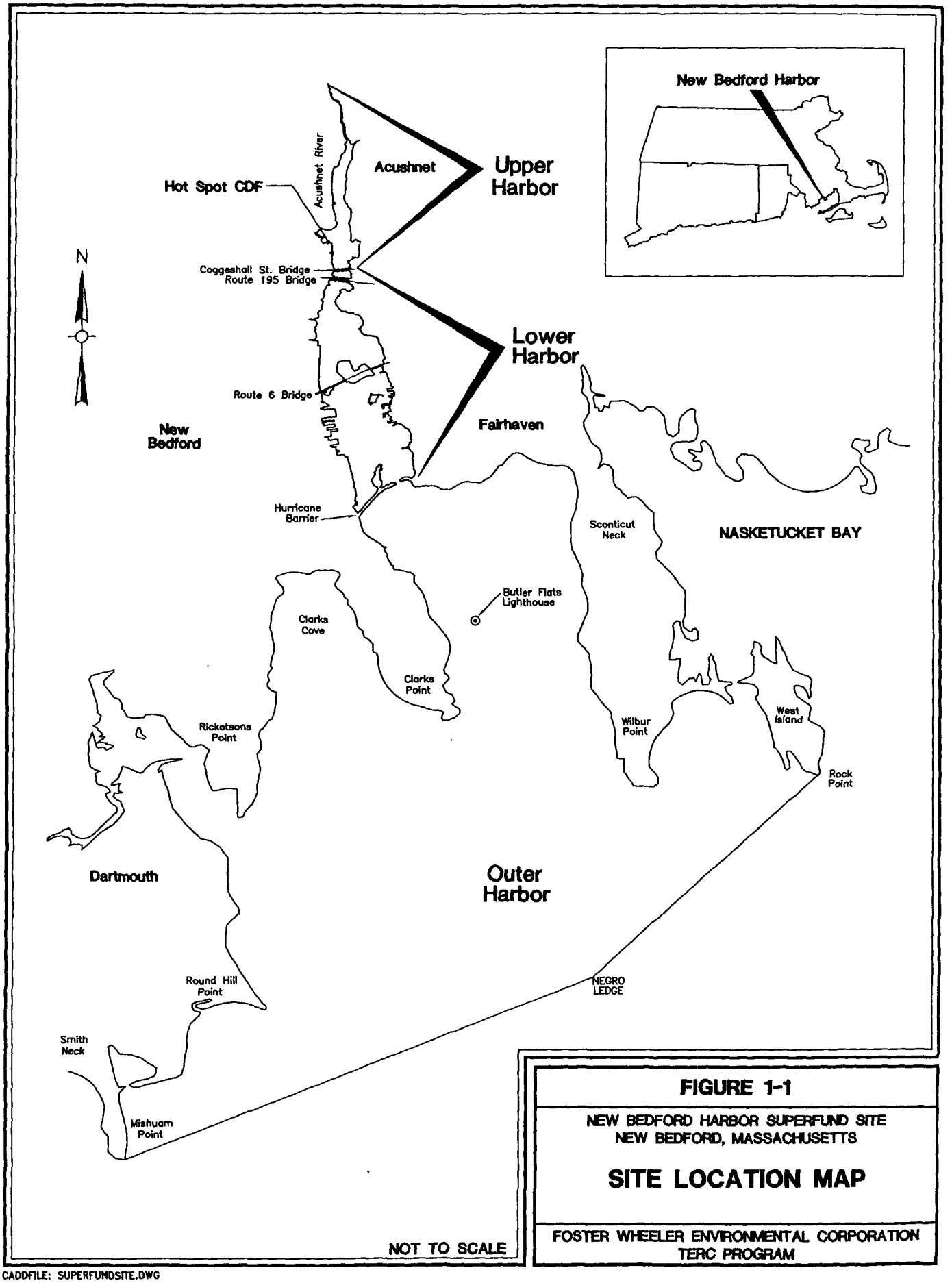


FIGURE 1-1

NEW BEDFORD HARBOR SUPERFUND SITE
NEW BEDFORD, MASSACHUSETTS

SITE LOCATION MAP

FOSTER WHEELER ENVIRONMENTAL CORPORATION
TERC PROGRAM

CADDFILE: SUPERFUNDSITE.DWG

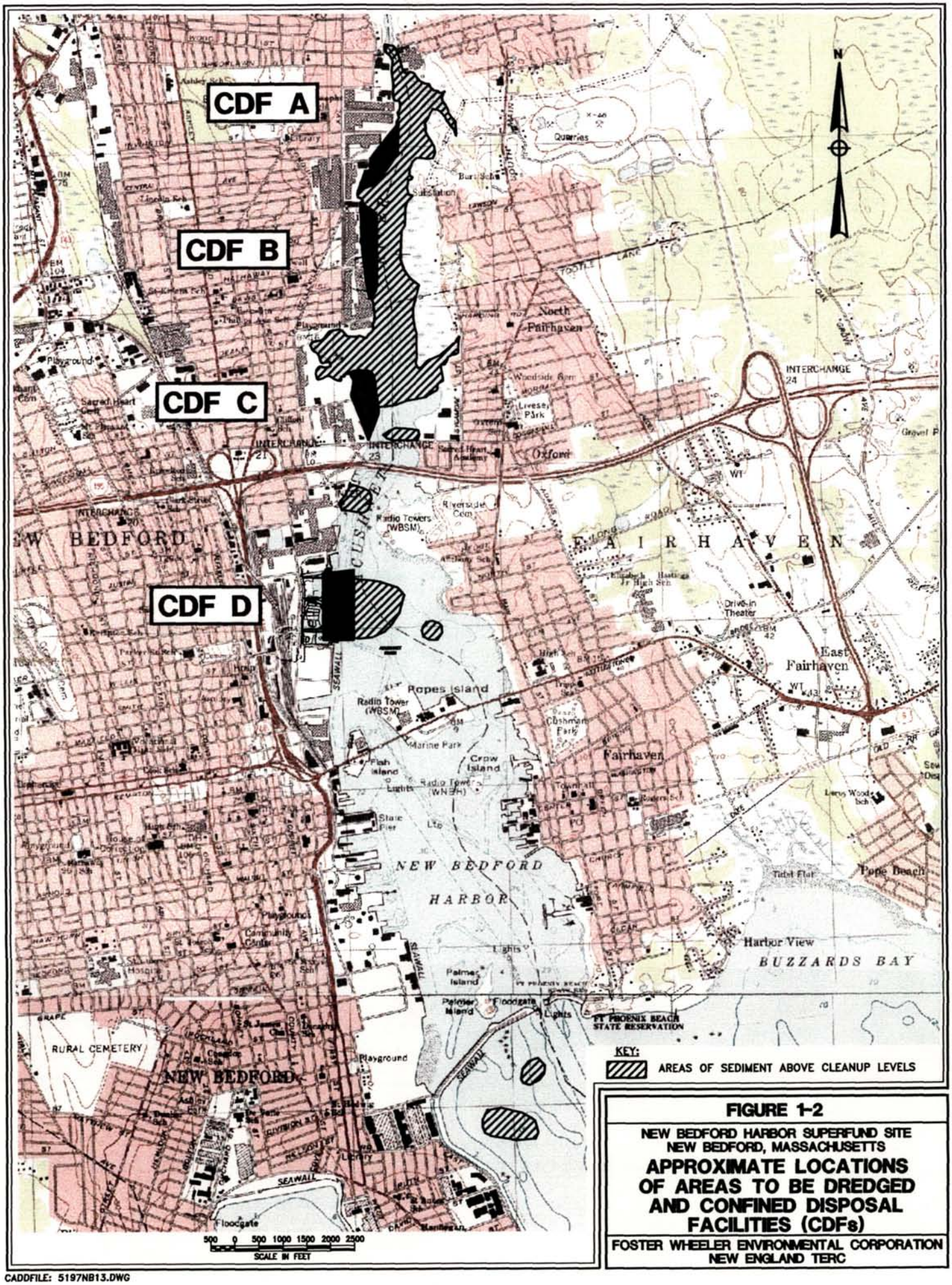


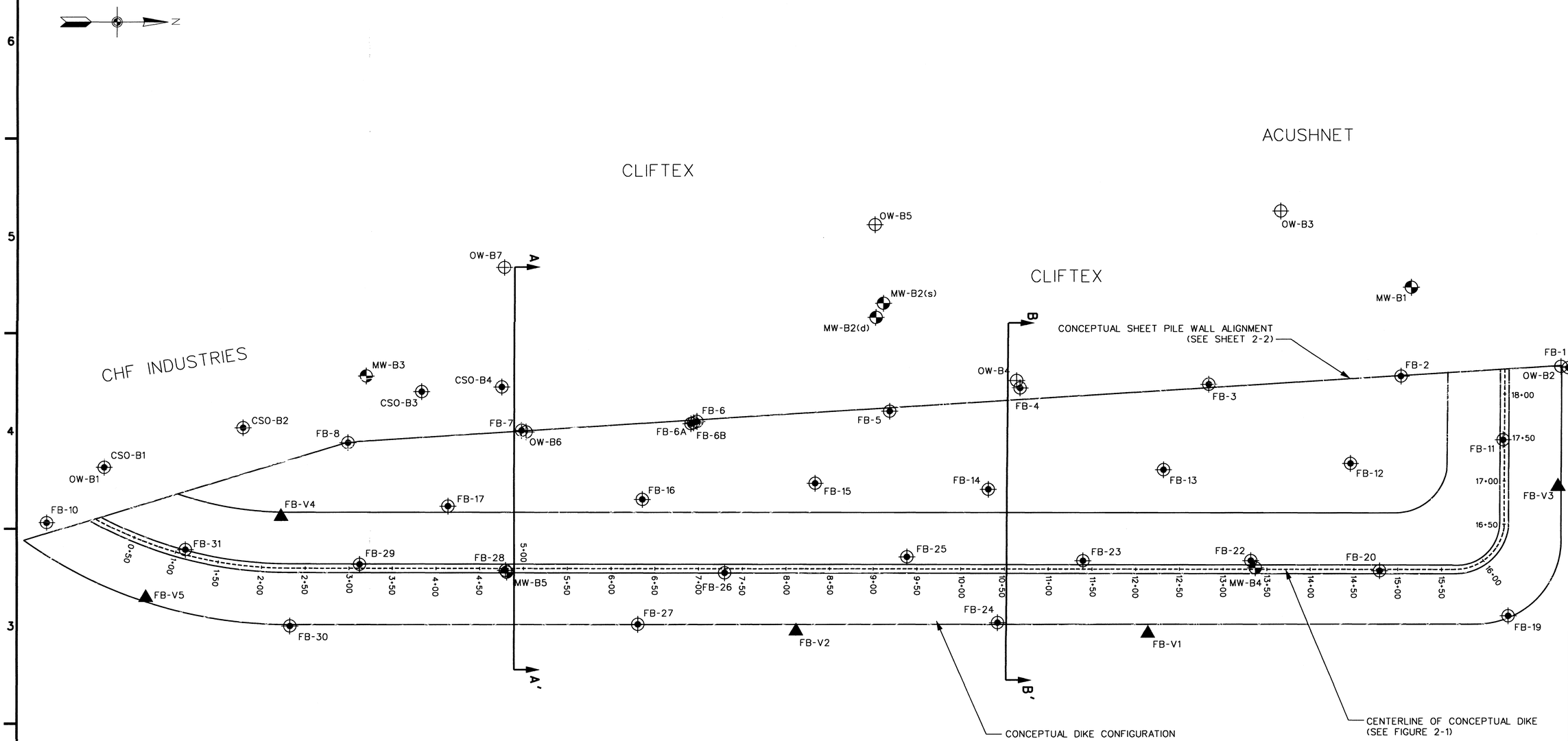
FIGURE 1-2

NEW BEDFORD HARBOR SUPERFUND SITE
NEW BEDFORD, MASSACHUSETTS

APPROXIMATE LOCATIONS OF AREAS TO BE DREDGED AND CONFINED DISPOSAL FACILITIES (CDFs)

FOSTER WHEELER ENVIRONMENTAL CORPORATION
NEW ENGLAND TERC

CADDFILE: 5197NB13.DWG



NOTES:

1. ELEVATIONS ARE IN FEET AND REFER TO NATIONAL GEODETIC VERTICAL DATUM (NGVD).
2. 1999 EXPLORATION LOCATIONS AND ELEVATIONS WERE DETERMINED BY GLOBAL POSITIONING SYSTEM (GPS) SURVEY CONDUCTED BY FOSTER WHEELER ENVIRONMENTAL CORPORATION.
3. EXISTING CONDITIONS AND TOPOGRAPHIC CONTOURS ARE BASED ON PHOTOGRAMMETRIC SURVEY CONDUCTED BY JAMES W. SEWELL COMPANY ON DECEMBER 2, 1998. BATHYMETRY IS BASED ON HYDROGRAPHIC SURVEY CONDUCTED BY THE U.S. ARMY CORPS OF ENGINEERS IN FEBRUARY AND MARCH 1999 AND REFERS TO DEPTH BELOW 0 NGVD.
4. LOCATION AND CONFIGURATION OF PROPOSED CONSTRUCTION IS CONCEPTUAL ONLY.

LEGEND:

- TEST BORING LOCATION (1999)
- OBSERVATION WELL LOCATION (1999)
- MONITORING WELL LOCATION (1999)
- FIELD VANE SHEAR TEST LOCATION (1999)
- CROSS SECTION LOCATION (SEE FIGURES 2-3 AND 2-4)

30 0 60 120 180 FEET
SCALE 1"= 60'

US Army Corps of Engineers
New England District

Symbol	Description	Date	Appr.	Symbol	Description	Date	Appr.

Rev.
Dates:
Design file no. 11EL010.DGN
Drawing code:
File name:
Plot date:
Plot scale:
Designed by:
Drawn by:
Reviewed by:
Submitted by:

U.S. ARMY ENGINEER DISTRICT
CORPS OF ENGINEERS
CONCORD, MASSACHUSETTS

FOSTER WHEELER ENVIRONMENTAL CORP.
133 FEDERAL STREET
BOSTON, MASSACHUSETTS

NEW BEDFORD HARBOR SUPER FUND SITE
NEW BEDFORD, MASSACHUSETTS

CDF-B
SUBSURFACE EXPLORATION
LOCATION PLAN

FIGURE
1-3

FOSTER WHEELER ENVIRONMENTAL CORPORATION

May 22, 2001
2001-017-0168
No Response Required

Mr. Robert Simeone
Technical Manager
U.S. Army Corps of Engineers
New England District
696 Virginia Road
Concord, MA 01742-2751

Subject: USACE CONTRACT NO. DACW-33-94-D-0002
TOTAL ENVIRONMENTAL RESTORATION CONTRACT (TERC)
TASK ORDER NO. 017 – NEW BEDFORD HARBOR SUPERFUND SITE OU-1
FINAL GEOTECHNICAL DATA REPORTS FOR DESIGN OF CONFINED DISPOSAL FACILITIES (CDFs) A AND B

Dear Mr. Simeone:

Enclosed are four (4) copies of responses to USACE comments on the draft "Geotechnical Data Report for Design of Confined Disposal Facility (CDF) B", dated March 2001. These comments and responses apply to the Geotechnical Data Reports for both CDFs A and B. The draft reports submitted in March are considered final with submittal of these responses to comments.

If you have any questions or comments on these responses to comments, please contact me at (617) 457-8234. Thank you.

Sincerely,

Allen J. Ikalainen

Allen J. Ikalainen, P.E.
Project Engineer

cc: M. Beaudoin, USACE (1)
D. Dickerson, EPA (1) with full reports
J. Brown, EPA (1) with full reports
G. Willant (1)
R. Francisco (1)
E. Griffin (1)
A. Tognon (1)
M. Otten (1)

File: PM 1.1
D.O. #17, 1.1, 14.5.2

133 FEDERAL STREET, 6TH FLOOR, BOSTON, MA 02110
TEL: 617-457-8200 FAX: 617-457-8498/8499

FOSTER WHEELER ENVIRONMENTAL CORPORATION
TOTAL ENVIRONMENTAL RESTORATION CONTRACT (TERC)
CONTRACT NO. DACW33-94-D-0002, TASK ORDER NO. 017
NEW BEDFORD HARBOR SUPERFUND SITE – NEW BEDFORD, MA

ANNOTATED RESPONSES TO REVIEW COMMENTS ON THE GEOTECHNICAL DATA REPORTS FOR DESIGN OF CONFINED DISPOSAL FACILITIES (CDFs) A AND B

The following are responses to U.S. Army Corps of Engineers (USACE) review comments on the draft "Geotechnical Data Report for Design of Confined Disposal Facility (CDF) B", dated March 2001. The USACE comments are provided in italic type followed by Foster Wheeler's responses in bold type. These comments and responses apply to the Geotechnical Data Reports for both CDFs A and B. The draft reports submitted in March are considered final.

Reviewer: Erik Matthews (USACE) Date: May 16, 2001

Comment 1: *Section 2.2.2, page 3 – Please summarize the "certain limitations" that complicated the FVSTs in this section.*

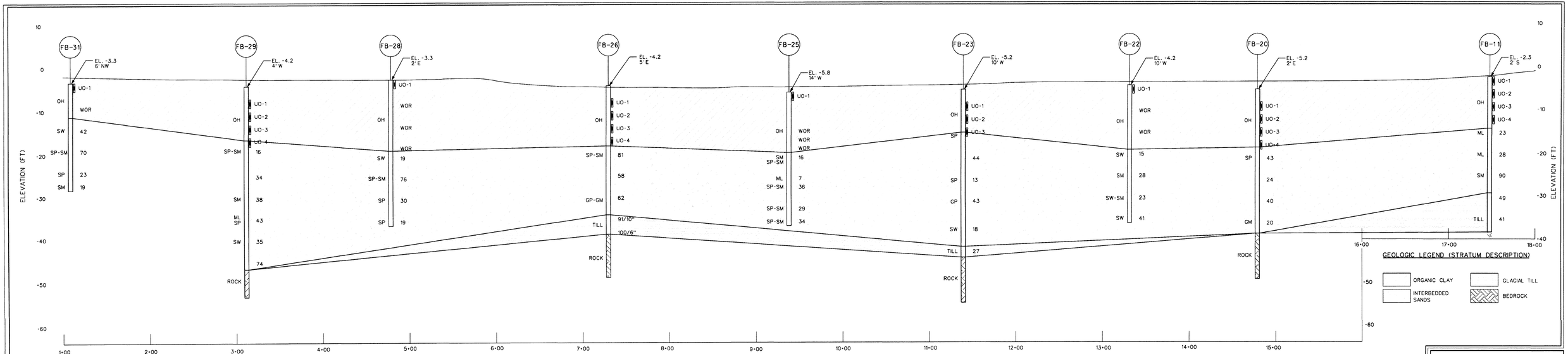
Response 1: **Because the torque applied to the rods was by hand with a torque wrench rather than with a geared drive apparatus, the failure rate was likely in excess of the ASTM-recommended failure rate of 0.1 degree per second. This resulted in relatively quick times to failure and may have led to higher than actual shear strength values. In addition, maximum torque value could only be recorded in 5 inch-pound increments (i.e., the maximum applied torque was read to the nearest 5 inch-pounds) which would have had a relatively negligible effect on calculated undrained shear strength values (a 1 to 2 psf difference).**

Comment 2: *Section 3.2.3, page 5 – The particle size analysis information is also included on the boring logs in Appendix A. This should be stated in this section.*

Response 2: **The last sentence of Section 3.3.2 should be changed to read the following: Results of the particle size analyses (both sieve and hydrometer) are also contained in Appendix G and have been included on the boring logs in Appendix A.**

Comment 3: *Section D.2, page D-1 – Why was a torque wrench used instead of the geared mechanism? Please discuss.*

Response 3: **There were additional limitations to applying torque with the geared drive. Because the FVST conducted in undisturbed material could take up to 20 minutes, and the AW sized drill rod was attached to the geared drive apparatus which was fixed to the barge, the tide cycle had an effect on the test procedure. If the test were performed during a rising tide, the resultant movement on the vane would be upward into relatively undisturbed material (with the exception of the material disturbed by the vane's advancement). If the test were performed on a falling tide, the resultant movement on the vane would be downward into undisturbed material.**



NOTES:
1. SEE FIGURE 2-5 FOR GENERAL NOTES AND LEGEND.
2. SEE FIGURE 1-3 FOR PLAN VIEW OF SUBSURFACE PROFILE AND BORING LOCATIONS.

HORIZONTAL SCALE 1"=50'

25 0 50 100 150 FEET

5 0 10 20 30

VERTICAL SCALE 1"=10'

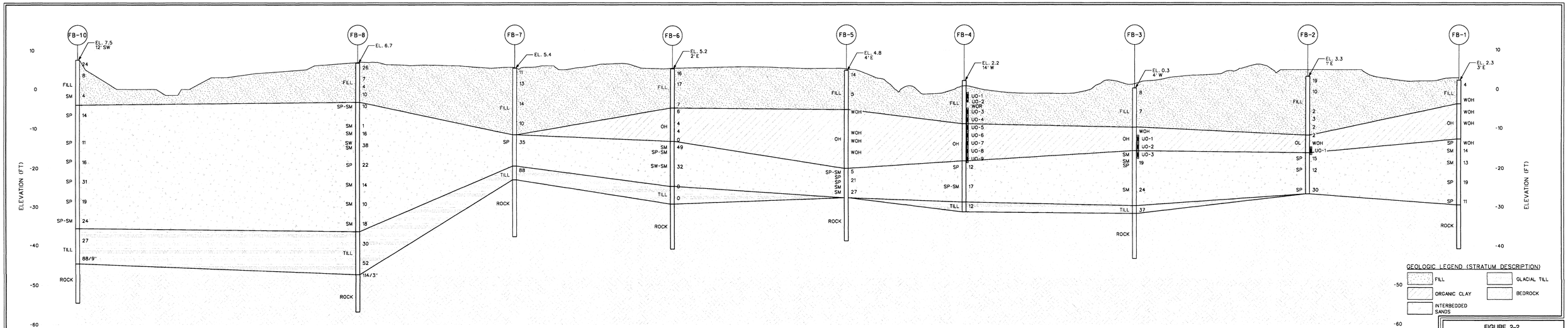
FIGURE 2-1

NEW BEDFORD HARBOR SUPERFUND SITE
NEW BEDFORD, MASSACHUSETTS

CDF B
SUBSURFACE PROFILE
CENTERLINE OF DIKE

SCALE: NOTED

171.1027..dgn



NOTES:
1. SEE FIGURE 2-5 FOR GENERAL NOTES AND LEGEND.
2. SEE FIGURE 1-3 FOR PLAN VIEW OF SUBSURFACE PROFILE AND BORING LOCATIONS.

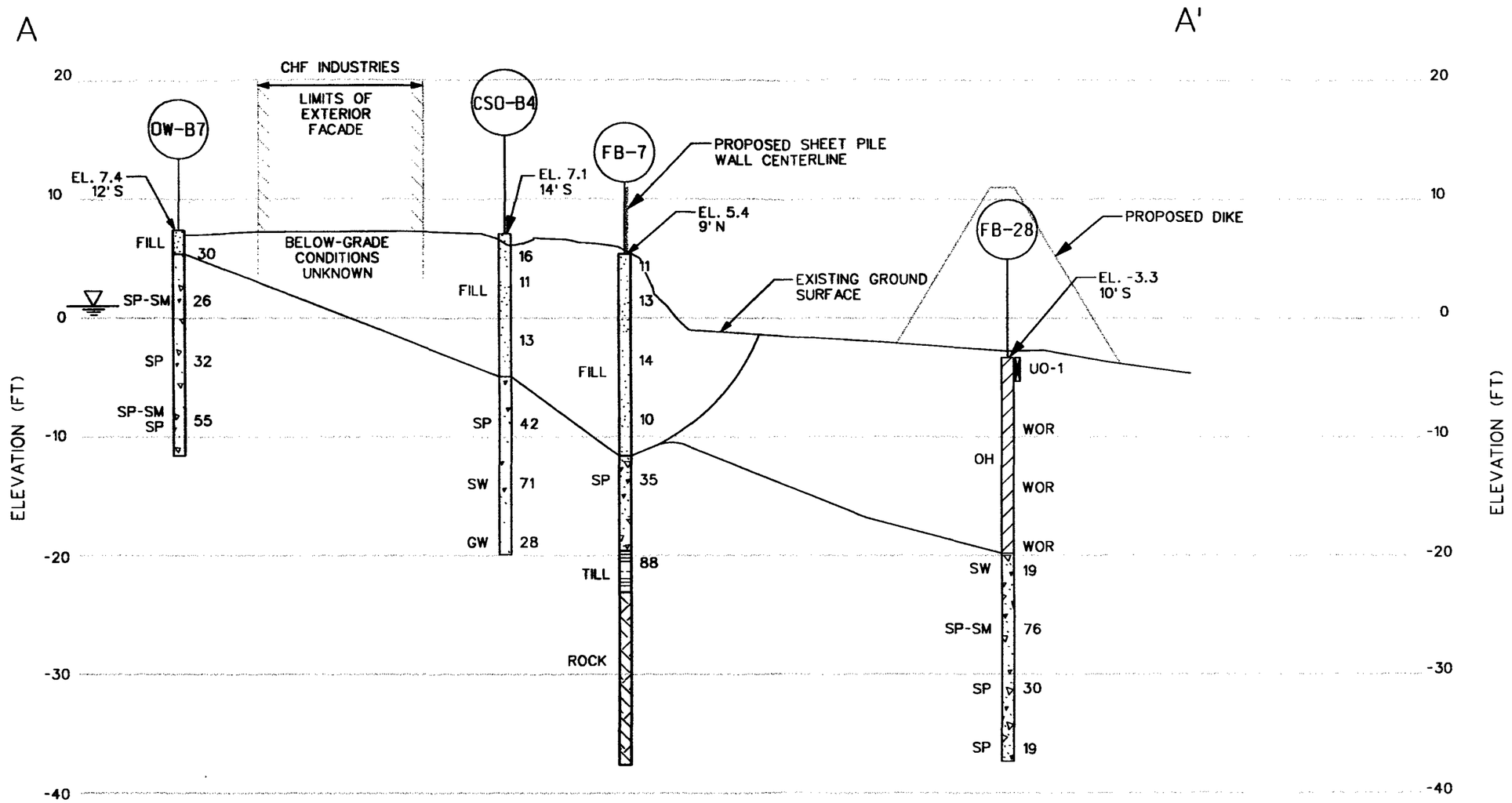
FIGURE 2-2

NEW BEDFORD HARBOR SUPERFUND SITE
NEW BEDFORD, MASSACHUSETTS

CDF B
SUBSURFACE PROFILE
SHEET PILE WALL ALIGNMENT

SCALE: NOTED

17J923F.dgn



GEOLOGIC LEGEND (STRATUM DESCRIPTION)

- FILL
- INTERBEDDED SANDS
- ORGANIC CLAY
- GLACIAL TILL
- BEDROCK

NOTES:

1. SEE FIGURE 2-5 FOR GENERAL NOTES AND LEGEND.
2. SEE FIGURE 1-3 FOR PLAN VIEW OF SUBSURFACE SECTION AND BORING LOCATIONS.

HORIZONTAL SCALE 1"=50'

25 0 50 100 150 FEET

5 0 10 20 30

VERTICAL SCALE 1"=10'

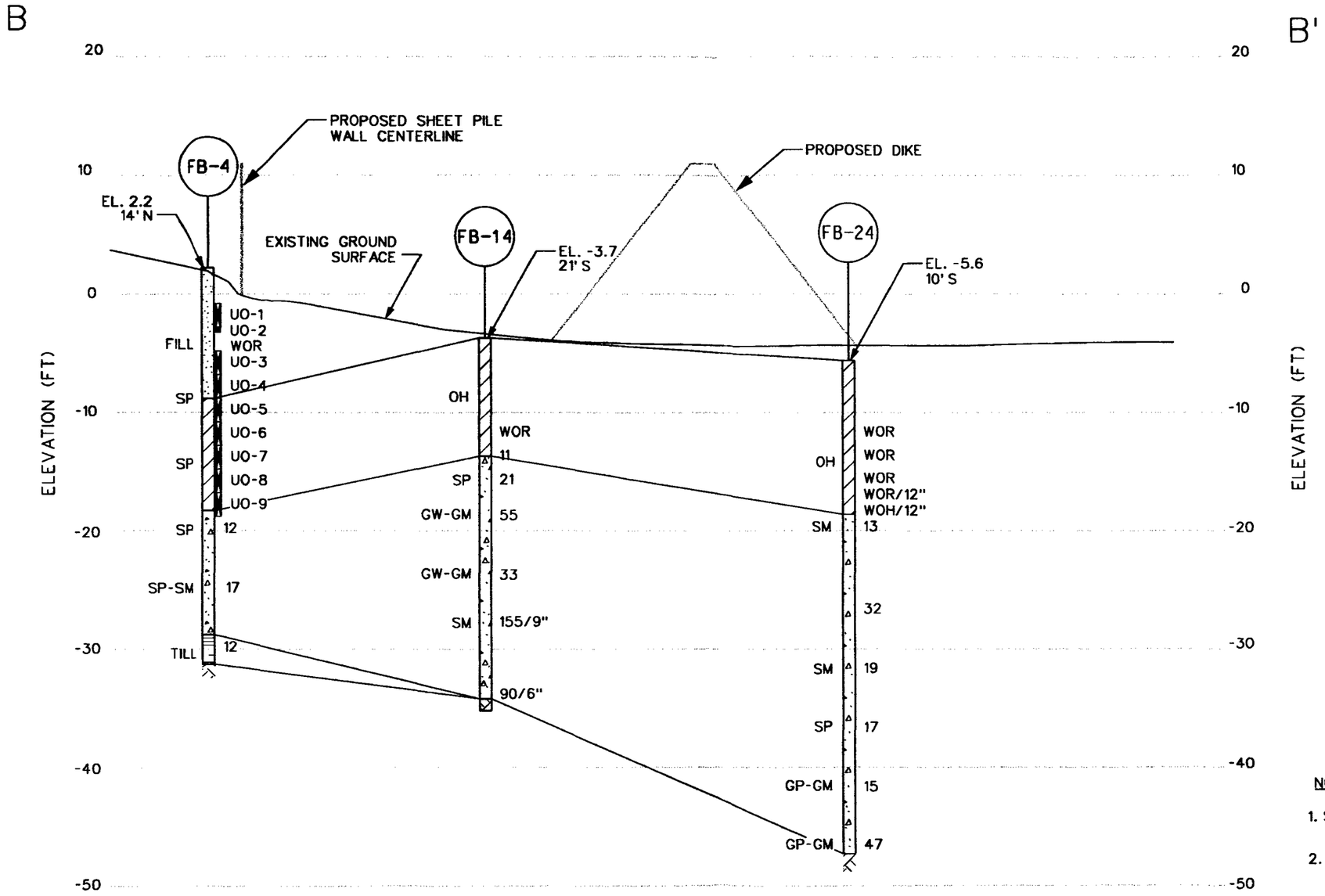
FIGURE 2-3

NEW BEDFORD HARBOR SUPERFUND SITE
NEW BEDFORD, MASSACHUSETTS

CDF B
SUBSURFACE SECTION
A – A'

SCALE: NOTED

17L104F.dgn



NOTES:

1. SEE FIGURE 2-5 FOR GENERAL NOTES AND LEGEND.
2. SEE FIGURE 1-3 FOR PLAN VIEW OF SUBSURFACE SECTION AND BORING LOCATIONS.

GEOLOGIC LEGEND (STRATUM DESCRIPTION)

- FILL
- INTERBEDDED SANDS
- ORGANIC CLAY
- GLACIAL TILL
- BEDROCK

HORIZONTAL SCALE 1"=50'

25 0 50 100 150 FEET

5 0 10 20 30

VERTICAL SCALE 1"=10'

FIGURE 2-4

NEW BEDFORD HARBOR SUPERFUND SITE
NEW BEDFORD, MASSACHUSETTS

CDF B
SUBSURFACE SECTION
B-B'

SCALE: NOTED

17L105F.dgn

GENERAL NOTES:

1. ELEVATIONS ARE IN FEET AND REFER TO NATIONAL GEODETIC VERTICAL DATUM (NGVD).
2. BORING LOCATIONS AND SUFACE ELEVATIONS AT TEST BORINGS WERE DETERMINED BY GLOBAL POSITIONING SYSTEM (GPS) SURVEY PERFORMED BY FOSTER WHEELER ENVIRONMENTAL CORPORATION.
3. GROUND SURFACE ELEVATION PROFILE IS BASED ON PHOTOGRAMMETRIC SURVEY CONDUCTED BY JAMES W. SEWALL COMPANY ON DECEMBER 2, 1998. MUDLINE ELEVATION PROFILE IS BASED ON HYDROGRAPHIC SURVEY CONDUCTED BY THE U.S. ARMY CORPS OF ENGINEERS IN FEBRUARY AND MARCH 1999.
4. STRATIFICATIONS SHOWN DEPICT INTERPOLATIONS BETWEEN BORINGS AND MAY NOT REPRESENT ACTUAL SUBSURFACE CONDITIONS. PROJECT BORINGS HAVE BEEN GIVEN PRECEDENCE OVER PREVIOUS BORINGS WITH REGARD TO STRATIFICATION.
5. BORING LOCATIONS ARE SHOWN IN PLAN VIEW ON FIGURE 1-3.
6. PROJECT BORING LOGS ARE CONTAINED IN APPENDIX A.
7. LOCATION AND CONFIGURATION OF PROPOSED CONSTRUCTION IS CONCEPTUAL ONLY.

BORING LEGEND:

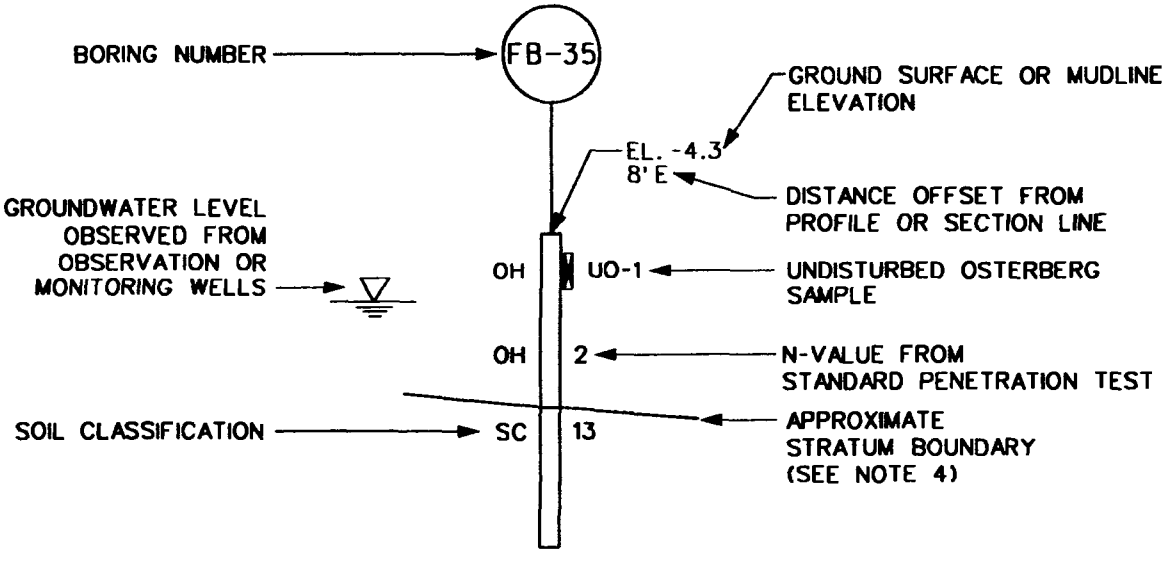


FIGURE 2-5

NEW BEDFORD HARBOR SUPERFUND SITE
NEW BEDFORD, MASSACHUSETTS

CDF B
GENERAL NOTES AND LEGEND FOR SUBSURFACE PROFILES AND SECTIONS

NOT TO SCALE | 17L106F.DGN

APPENDICES

A

APPENDIX A

Boring Logs

Nobis Engineering PO Box 2890 Concord, New Hampshire 03302	PROJECT Remedial Design For Operable Unit 01 New Bedford Harbor Superfund Site New Bedford, Massachusetts	BORING NO. FB-1 SHEET 1 of 3 FILE NO. 48138.07 CHKD. BY C. Thunberg / J. Trottier

Boring Co.	Atlantic Testing Laboratories, Limited	Boring Location	northing 2704983.3 easting 814885.1		
Driller	M. Childs	Ground Surface El.	2.30	Datum	NGVD
Logged By	E. Paddleford	Date Start	7/27/99	Date End	7/29/99

Sampler: 2-inch O.D. split-barrel sampler driven 24 inches with a 140 lb. automatic hammer free falling from a height of 30 inches.
Drill Rig: CME 850 ATV
Drilling Method: 4" I.D. (HW) flush joint casing, 3-7/8" roller bit. Mud rotary.

Groundwater Readings (from ground surface)

Date	Time	Depth	Elev.	Stabilization Time

DEPTH	Casing Blows (ft)	SAMPLE INFORMATION Type & No.	PEN/REC (inches)	DEPTH (feet)	BLOWS PER 6 INCHES	SPT N-Value	SAMPLE DESCRIPTION	STRATUM DESCRIPTION	REMARKS
		S-1	24/16	0-2	1-2-2-2	4	Well-graded sand (SW); wet, very loose, 30% coarse sand, 40% medium sand, 20%	FILL	
1	spin						fine sand, 5% silt, 5% gravel, brown to black rounded brick fragments. (FILL)		
							Advance HW drill casing from 0 to 4 ft.		
2	spin						Advance 3-7/8 in. roller bit to 4 ft.		
3	spin								
4	spin								
		S-2	24/0	4-6	3- WOH/18"	~	No Recovery.		
5	spin						Advance 3-7/8 in. roller bit to 6 ft.		
6	spin						Estimated strata change at 6 ft.		
		S-3	24/4	6-8	WOH/21" - 1/3"	~	Sandy organic soil (OH); wet, 50% organic silt, 30% coarse sand, 10% fine sand,	OH	
7	spin						5% gravel, 5% shell fragments, slag and brick, gray-green.		
							Advance HW drill casing to 8 ft.		
8	spin						Advance 3-7/8 in. roller bit to 10 ft.		
9	spin								
10	spin								
		S-4	24/16	10-12	WOH/24"	~	Organic soil (OH); wet, 70% organic silt, 30% organic clay, dark gray,	OH	
11	spin						organic odor.		
							Advance HW drill casing to 13 ft.		
12	spin						Advance 3-7/8 in. roller bit to 15 ft.		
13	spin								
14	spin								
15	spin								
		S-5	24/2	15-17	WOH/18" - 4	~	Poorly graded sand (SP); wet, 5% coarse sand, 60% medium sand,	SP	
16	spin						25% fine sand, 5% silt, 5% gravel, gray.		
							Switch to mud rotary drilling technique at 15 ft.		
17	spin						Advance 3-7/8 in. roller bit to 17 ft.		
		S-6	24/12	17-19	5-6-8-9	14	Silty sand (SM); wet, medium dense, 5% coarse sand, 15% medium sand,	SM	
18	spin						60% fine sand, 15% silt, 5% gravel, gray.		
							Advance HW drill casing to 18 ft.		
19	spin						Advance 3-7/8 in. roller bit to 20 ft.		
20	spin								

0 to 4 - Very Loose	0 to 2 - Very Soft	1. S denotes split-barrel sampler.	7. PID denotes Photoionization Detector
5 to 10 - Loose	3 to 4 - Soft	2. U denotes 3-inch O.D. undisturbed sample.	8. PPM denotes parts per million.
11 to 30 - Medium Dense	5 to 8 - Medium Stiff	3. UO denotes 3-inch Osterberg undisturbed sample.	9. PP denotes Pocket Penetrometer.
31 to 50 - Dense	9 to 15 - Stiff	4. PEN denotes penetration length of sampler.	10. FVST denotes field vane shear test.
Over 50 - Very Dense	16 to 30 - Very Stiff	5. REC denotes recovered length of sample.	11. RQD denotes Rock Quality Designation.
	Over 30 - Hard	6. SPT denotes Standard Penetration Test.	12. R denotes core run number.

REMARKS:
1)
2)
3)
4)

Nobis Engineering PO Box 2890 Concord, New Hampshire 03302	PROJECT Remedial Design For Operable Unit 01 New Bedford Harbor Superfund Site New Bedford, Massachusetts	BORING NO. FB-1 SHEET 2 of 3 FILE NO. 48138.07 CHKD. BY C. Thunberg / J. Trottier

Boring Co.	Atlantic Testing Laboratories, Limited	Boring Location	northing 2704983.3	easting 814885.1	
Driller	M. Childs	Ground Surface El.	2.30	Datum	NGVD
Logged By	E. Paddleford	Date Start	7/27/99	Date End	7/29/99

Sampler: 2-inch O.D. split-barrel sampler driven 24 inches with a 140 lb. automatic hammer free falling from a height of 30 inches.
Drill Rig: CME 850 ATV
Drilling Method: 4" I.D. (HW) flush joint casing, 3-7/8" roller bit. Mud rotary.

Groundwater Readings (from ground surface)				
Date	Time	Depth	Elev.	Stabilization Time

DEPTH	Casing Blows (ft)	SAMPLE INFORMATION Type & No.	PEN/REC (inches)	DEPTH (feet)	BLOWS PER 6 INCHES	SPT N-Value	SAMPLE DESCRIPTION	STRATUM DESCRIPTION
		S-7	24/20	20-22	5-6-7-8	13	Silty sand (SM); wet, medium dense, 5% coarse sand, 10% medium sand, 60% fine sand,	SM
21	spin						20% silt, 5% gravel, brown-gray.	
							Advance HW drill casing to 23 ft.	
22	spin						Advance 3-7/8 in. roller bit to 25 ft.	
23	spin							
24	spin							
25	spin							
		S-8	24/14	25-27	7-9-10-11	19	Poorly graded sand (SP); wet, medium dense, 5% coarse sand, 50% medium sand,	SP
26	spin						35% fine sand, 5% silt, 5% gravel, brown.	
							Advance HW drill casing to 28 ft.	
27	spin						Advance 3-7/8 in. roller bit to 30 ft.	
28	spin							
29	spin							
30	spin							
		S-9	18/9	30-31.5	6-5-6-25/0"	11	Poorly graded sand with gravel (SP); wet, medium dense, 10% coarse sand, 25% medium	SP
31	spin						sand, 40% fine sand, 20% gravel, 5% silt, weathered, iron staining, possible weathered	
							bedrock, brown.	
32	spin						Refusal at 31.5 ft. Bedrock at 31.8 ft.	
			CORE		CORE		Advance 3-7/8 in. roller bit to 33 ft.	
33	spin		INTERVAL		TIME		Advance HW drill casing to 33 ft.	
		R-1	33-34		4 min		Begin NX rock core at 33 ft.	
34							R-1: 33 - 38 ft. Recovery = 87.5% RQD = 43%	BEDROCK
			34-35		6 min		Fresh, moderately hard, gray, aphanitic GNEISS with low angle, close, smooth, planar,	
35							fresh, open joints.	
			35-36		8 min			
36								
			36-37		8.5 min			
37								
			37-38		14 min			
38								
		R-2	38-39		2 min		R-2: 38 - 43 ft. Recovery = 91% RQD = 81%	
39							Fresh, moderately hard, gray, aphanitic GNEISS with low angle, close, rough, planar,	
			39-40		2 min		fresh, open joints. Secondary jointing moderately dipping, moderate spacing, rough,	
40							undulating, fresh and open.	

0 to 4 - Very Loose	0 to 2 - Very Soft	1. S denotes split-barrel sampler.	7. PID denotes Photoionization Detector
5 to 10 - Loose	3 to 4 - Soft	2. U denotes 3-inch O.D. undisturbed sample.	8. PPM denotes parts per million.
11 to 30 - Medium Dense	5 to 8 - Medium Stiff	3. UO denotes 3-inch Osterberg undisturbed sample.	9. PP denotes Pocket Penetrometer.
31 to 50 - Dense	9 to 15 - Stiff	4. PEN denotes penetration length of sampler.	10. FVST denotes field vane shear test.
Over 50 - Very Dense	16 to 30 - Very Stiff	5. REC denotes recovered length of sample.	11. RQD denotes Rock Quality Designation.
	Over 30 - Hard	6. SPT denotes Standard Penetration Test.	12. R denotes core run number.

REMARKS:
1)
2)
3)
4)

Nobis Engineering PO Box 2890 Concord, New Hampshire 03302	PROJECT Remedial Design For Operable Unit 01 New Bedford Harbor Superfund Site New Bedford, Massachusetts	BORING NO. FB-1 SHEET 3 of 3 FILE NO. 48138.07 CHKD. BY C. Thunberg / J. Trottier

Boring Co.	Atlantic Testing Laboratories, Limited	Boring Location	northing 2704983.3 easting 814885.1		
Driller	M. Childs	Ground Surface El.	2.30	Datum	NGVD
Logged By	E. Paddleford	Date Start	7/27/99	Date End	7/29/99

Sampler: 2-inch O.D. split-barrel sampler driven 24 inches with a 140 lb. automatic hammer free falling from a height of 30 inches.
Drill Rig: CME 850 ATV
Drilling Method: 4" I.D. (HW) flush joint casing, 3-7/8" roller bit. Mud rotary.

Groundwater Readings (from ground surface)				
Date	Time	Depth	Elev.	Stabilization Time

DEPTH	Casing Blows (ft)	SAMPLE INFORMATION Type & No.	PEN/REC (inches)	DEPTH (feet)	BLOWS PER 6 INCHES	SPT N-Value	SAMPLE DESCRIPTION	STRATUM DESCRIPTION	REMKS
			40-41		3 min				
41									
			41-42		3.5 min				
42								BEDROCK	
			42-43		8 min				
43									
44							Boring terminated in bedrock at 43 ft.		
45									
46									
47									
48									
49									
50									
51									
52									
53									
54									
55									
56									
57									
58									
59									
60									

0 to 4 - Very Loose	0 to 2 - Very Soft	1. S denotes split-barrel sampler.	7. PID denotes Photoionization Detector
5 to 10 - Loose	3 to 4 - Soft	2. U denotes 3-inch O.D. undisturbed sample.	8. PPM denotes parts per million.
11 to 30 - Medium Dense	5 to 8 - Medium Stiff	3. UO denotes 3-inch Osterberg undisturbed sample.	9. PP denotes Pocket Penetrometer.
31 to 50 - Dense	9 to 15 - Stiff	4. PEN denotes penetration length of sampler.	10. FVST denotes field vane shear test.
Over 50 - Very Dense	16 to 30 - Very Stiff	5. REC denotes recovered length of sample.	11. RQD denotes Rock Quality Designation.
	Over 30 - Hard	6. SPT denotes Standard Penetration Test.	12. R denotes core run number.

REMARKS:
1)
2)
3)
4)

Nobis Engineering PO Box 2890 Concord, New Hampshire 03302	**PROJECT** Remedial Design For Operable Unit 01 New Bedford Harbor Superfund Site New Bedford, Massachusetts	BORING NO. FB-2 SHEET 1 of 2 FILE NO. 48138.07 CHKD. BY C. Thunberg / J. Trottier

Boring Co.	Atlantic Testing Laboratories, Limited	Boring Location	northing 2704792.0 easting 814894.6		
Driller	R. Pryce	Ground Surface El.	3.30	Datum	NGVD
Logged By	R. Chase	Date Start	8/16/99	Date End	8/16/99

Sampler: 2-inch O.D. split-barrel sampler driven 24 inches with a 140 lb safety hammer free falling from a height of 30 inches.
Drill Rig: CME 75 truck mount
Drilling Method: 4" I.D. (HW) flush joint casing, 3 7/8" roller bit. Spin & wash.

Groundwater Readings (from ground surface)				
Date	Time	Depth	Elev.	Stabilization Time

DEPTH	Casing Blows (ft)	Type & No.	PEN/REC (inches)	DEPTH (feet)	BLOWS PER 6 INCHES	SPT N-Value	SAMPLE DESCRIPTION	STRATUM DESCRIPTION	REMKS
		S-1	24/16	0-2	4-8-11-6	19	Poorly graded sand (SP); dry, medium dense, 70% fine sand, 10% gravel, 5%		
1	spin						medium sand, 5% coarse sand, 5% silt, 5% root matter, brown-black. Traces of		
							ash noted in sample. (FILL)		
2	spin						Advance HW drill casing from 0 to 3 ft.		
3	spin								
		S-2	24/14	3-5	8-5-5-3	10	Poorly graded sand with gravel (SP); wet, loose, 40% fine sand, 20% medium sand,		
4	spin						20% coarse sand, 15% fine gravel, 5% silt, dark brown - black. (FILL)		
							Advance HW drill casing to 8 ft.		
5	spin								
6	spin								
7	spin								
8	spin							FILL	
		S-3	24/7	8-10	1-1-1-1	2	Poorly graded sand (SP); wet, very loose, 20% fine sand, 50% medium sand,		
9	spin						15% coarse sand, 10% gravel, 5% silt, black, oily sheen. (FILL)		
10	spin								
		S-4	24/8	10-12	1-1-2-2	3	Silty sand with gravel (SM); wet, very loose, 10% fine sand, 25% coarse sand, 15%		
11	spin						medium sand, 30% gravel, 15% silt, 5% ash and cinders, black oily sheen. (FILL)		
							Advance HW drill casing to 12 ft.		
12	spin								
		S-5	24/4	12-14	1-1-1-1	2	Poorly graded sand with silt (SP-SM); wet, very loose, 15% fine sand, 35% coarse		
13	spin						sand, 30% medium sand,10% gravel, 10% silt, black oily sheen. (FILL)		
14	spin								
		S-6	24/6	14-16	WOH-1-1-2	2	3 in: Poorly graded sand (SP); similar to S-5. (FILL)		
15	spin						3 in: Organic soil (OL); wet, very soft, 100% organic silt/clay, gray.		
							Advance HW drill casing to 16 ft.	OL	
16	spin						Estimated strata change at 15 ft.		
		S-7	24/13	16-18	WOH/24"	--	Organic soil (OL); wet, 100% organic silt/clay, gray.	OL	
17	spin						Advance 3-7/8 in. roller bit to 18 ft.		
18	spin								
		UO-1/	24/19	18-20	--	--	Organic soil (OL); wet, 100% organic silt/clay, gray.	OL	
19	spin	S-8					Bottom 5 inches of shelby tube empty. Sand and gravel noted in bottom of tube.		
20	spin								

0 to 4 - Very Loose	0 to 2 - Very Soft	1. S denotes split-barrel sampler.	7. PID denotes Photoionization Detector
5 to 10 - Loose	3 to 4 - Soft	2. U denotes 3-inch O.D. undisturbed sample.	8. PPM denotes parts per million.
11 to 30 - Medium Dense	5 to 8 - Medium Stiff	3. UO denotes 3-inch Osterberg undisturbed sample.	9. PP denotes Pocket Penetrometer.
31 to 50 - Dense	9 to 15 - Stiff	4. PEN denotes penetration length of sampler.	10. FVST denotes field vane shear test.
Over 50 - Very Dense	16 to 30 - Very Stiff	5. REC denotes recovered length of sample.	11. RQD denotes Rock Quality Designation.
	Over 30 - Hard	6. SPT denotes Standard Penetration Test.	12. R denotes core run number.

REMARKS:
1) Boring grouted from 0 to 30 ft.
2)
3)
4)

Nobis Engineering PO Box 2890 Concord, New Hampshire 03302	**PROJECT** Remedial Design For Operable Unit 01 New Bedford Harbor Superfund Site New Bedford, Massachusetts	BORING NO. FB-2 SHEET 2 of 2 FILE NO. 48138.07 CHKD. BY C. Thunberg / J. Trottie

Boring Co.	Atlantic Testing Laboratories, Limited	Boring Location	northing 2704792.0	easting 814894.6	
Driller	R. Pryce	Ground Surface El.	3.30	Datum	NGVD
Logged By	R. Chase	Date Start	8/16/99	Date End	8/16/99

Sampler: 2-inch O.D. split-barrel sampler driven 24 inches with a 140 lb safety hammer free falling from a height of 30 inches.
Drill Rig: CME 75 truck mount
Drilling Method 4" I.D. (HW) flush joint casing, 3 7/8" roller bit. Spin & wash.

Groundwater Readings (from ground surface)				
Date	Time	Depth	Elev.	Stabilization Time

DEPTH	Casing Blows (ft)	SAMPLE INFORMATION Type & No.	PEN/REC (inches)	DEPTH (feet)	BLOWS PER 6 INCHES	SPT N-Value	SAMPLE DESCRIPTION	STRATUM DESCRIPTION
		S-9	24/16	20-22	7-6-9-10	15	Poorly graded sand (SP); wet, medium dense, 60% fine sand, 15% coarse sand,	SP
21	spin						10% medium sand, 10% fine gravel, 5% silt, gray.	
22	spin							
23	spin							
		S-10	24/7	23-25	7-6-6-5	12	Similar to S-9.	SP
24	spin						Advance HW drill casing to 28 ft.	
25	spin							
26	spin							
27	spin							
28	spin							SP
		S-11	21/13	28-29.8	15-14-16-50/3"	30	Poorly graded sand (SP); wet, dense, 65% fine sand, 15% medium sand, 10% fine	
29							gravel, 5% coarse sand, 5% silt.	
							Probable bedrock at 29.8 ft.	
30							Advance 3-7/8 in. roller bit to 30 ft.	
							Bottom of exploration at 30 ft.; probable bedrock.	PROBABLE BEDROCK
31								
32								
33								
34								
35								
36								
37								
38								
39								
40								

0 to 4 - Very Loose	0 to 2 - Very Soft	1. S denotes split-barrel sampler.	7. PID denotes Photoionization Detector
5 to 10 - Loose	3 to 4 - Soft	2. U denotes 3-inch O.D. undisturbed sample.	8. PPM denotes parts per million.
11 to 30 - Medium Dense	5 to 8 - Medium Stiff	3. UO denotes 3-inch Osterberg undisturbed sample.	9. PP denotes Pocket Penetrometer.
31 to 50 - Dense	9 to 15 - Stiff	4. PEN denotes penetration length of sampler.	10. FVST denotes field vane shear test.
Over 50 - Very Dense	16 to 30 - Very Stiff	5. REC denotes recovered length of sample.	11. RQD denotes Rock Quality Designation.
	Over 30 - Hard	6. SPT denotes Standard Penetration Test.	12. R denotes core run number.

REMARKS:
1) Boring grouted from 0 to 30 ft.
2)
3)
4)

Nobis Engineering PO Box 2890 Concord, New Hampshire 03302	PROJECT Remedial Design For Operable Unit 01 New Bedford Harbor Superfund Site New Bedford, Massachusetts	BORING NO. FB-3 SHEET 1 of 3 FILE NO. 48138.07 CHKD. BY C. Thunberg / J. Trottier

Boring Co.	Atlantic Testing Laboratories, Limited	Boring Location	northing 2704571.9 easting 814903.8		
Driller	M. Childs	Ground Surface El.	0.30	Datum	NGVD
Logged By	E. Paddleford / S. Harding	Date Start	7/30/99	Date End	8/3/99

Sampler: 2-inch O.D. split-barrel sampler driven 24 inches with a 140 lb. automatic hammer free falling from a height of 30 inches.
Drill Rig: CME 850 ATV
Drilling Method: 4" I.D. (HW) flush joint casing, 3 7/8" roller bit. Mud rotary.

Groundwater Readings (from ground surface)				
Date	Time	Depth	Elev.	Stabilization Time

DEPTH	Casing Blows (ft)	Type & No.	PEN/REC (inches)	DEPTH (feet)	BLOWS PER 6 INCHES	SPT N-Value	SAMPLE DESCRIPTION	STRATUM DESCRIPTION	REMARKS
		S-1	24/6	0-2	6-5-3-2	8	Debris/rubble at ground surface.		
1	spin						Wood, brick fragments, organic matter, piece of foam. (FILL)		
							Advance HW drill casing from 0 to 3 ft.		
2	spin						Advance 3-7/8 in. roller bit to 5 ft.		
3	spin								
4	spin								
5	spin							FILL	
		S-2	24/9	5-7	21-5-2-5	7	5 in: debris/rubble, brick fragments (FILL)		
6	spin						4 in: ash, gravel, and debris. (FILL)		
							Advance 3-7/8 in. roller bit to 8 ft.		
7	spin						Hole collapsing. Switch to mud rotary drilling technique at 3 ft.		
8	spin								
		S-3	0/0	8	25/0"	–	Spoon refusal, possible boulder.		
9	spin						Advance HW drill casing to 7 ft.		
							Advance 3-7/8 in. roller bit to 10 ft.		
10	spin								
		S-4	24/9	10-12	WOH/24"	–	Organic soil (OH); 60% organic silt, 30% organic clay, 5% fine sand,	OH	1
11	spin						5% gravel.		
12	spin								
		UO-1	24/0	12-14	–	–	No recovery.		
13	spin						Advance HW drill casing to 12 ft.		
							Advance 3-7/8 in. roller bit to 14 ft.		
14	spin								
		UO-2	24/20	14-16	–	–	Organic soil (OH); wet, 60% organic silt, 30% organic clay, 5% fine sand,	OH	
15	spin						5% gravel, dark gray to black.		
16	spin								
		UO-3	24/6	16-18	–	–	Silty sand with gravel (SM); wet, 25% medium sand, 30% fine sand, 25% gravel, 20% silt,	SM	
17	spin						dark gray to black. Pieces of wood noted in sample. (jar sample)		
							Advance HW drill casing to 17 ft.		
18	spin						Switch to mud rotary drilling techniques at 18 ft.		
		S-5	24/12	18-20	5-10-9-15	19	Advance 3-7/8 in. roller bit to 18 ft.	SM	
19	spin						S-5: 9 in. Silty sand (SM); wet, medium dense, 80% fine sand, 20% silt, gray.	SP	
							S-5: 3 in. Poorly graded sand with gravel (SP); wet, medium dense, 20% coarse sand,		
20	spin						30% medium sand, 10% fine sand, 35% gravel, 5% silt, brown to gray.		

0 to 4 - Very Loose	0 to 2 - Very Soft	1. S denotes split-barrel sampler.	7. PID denotes Photoionization Detector
5 to 10 - Loose	3 to 4 - Soft	2. U denotes 3-inch O.D. undisturbed sample.	8. PPM denotes parts per million.
11 to 30 - Medium Dense	5 to 8 - Medium Stiff	3. UO denotes 3-inch Osterberg undisturbed sample.	9. PP denotes Pocket Penetrometer.
31 to 50 - Dense	9 to 15 - Stiff	4. PEN denotes penetration length of sampler.	10. FVST denotes field vane shear test.
Over 50 - Very Dense	16 to 30 - Very Stiff	5. REC denotes recovered length of sample.	11. RQD denotes Rock Quality Designation.
	Over 30 - Hard	6. SPT denotes Standard Penetration Test.	12. R denotes core run number.

REMARKS:
1) Switched rig geologist to S. Harding at 10 ft.
2) NR = Not recorded
3)
4)

Nobis Engineering PO Box 2890 Concord, New Hampshire 03302	PROJECT Remedial Design For Operable Unit 01 New Bedford Harbor Superfund Site New Bedford, Massachusetts	BORING NO. FB-3 SHEET 2 of 3 FILE NO. 48138.07 CHKD. BY C. Thunberg / J. Trottier

Boring Co.	Atlantic Testing Laboratories, Limited	Boring Location	northing 2704571.9 easting 814903.8
Driller	M. Childs	Ground Surface El.	0.30 Datum NGVD
Logged By	E. Paddleford / S. Harding	Date Start	7/30/99 Date End 8/3/99

Sampler: 2-inch O.D. split-barrel sampler driven 24 inches with a 140 lb. automatic hammer free falling from a height of 30 inches.
Drill Rig: CME 850 ATV
Drilling Method 4" I.D. (HW) flush joint casing, 3 7/8" roller bit. Mud rotary.

Groundwater Readings (from ground surface)				
Date	Time	Depth	Elev.	Stabilization Time

DEPTH	Casing Blows (ft)	SAMPLE INFORMATION Type & No.	PEN/REC (inches)	DEPTH (feet)	BLOWS PER 6 INCHES	SPT N-Value	SAMPLE DESCRIPTION	STRATUM DESCRIPTION
							Advance HW drill casing to 22 ft.	
21	spin						Advance 3-7/8 in. roller bit to 25 ft.	
22	spin							
23	spin							
24	spin							
25	spin							
		S-6	24/10	25-27	9-12-12-17	24	Silty sand with gravel (SM); wet, medium dense, 40% fine sand, 30% medium sand,	SM
26	spin						15% silt, 15% gravel, gray.	
							Advance HW drill casing to 27 ft.	
27	spin						Advance 3-7/8 in. roller bit to 30 ft.	
							Loss of drilling mud noted between 25 to 30 ft.	
28	spin							
29	spin							
30	spin						First attempt: run-in sands at 30 ft. Wash out casing and re-sample.	
		S-7	24/14	30-32	9-16-21-32	37	Poorly graded gravel with sand (GP); wet, dense, 70% gravel, 20% coarse sand,	
31	spin						5% medium sand, 5% fine sand, gray. (GLACIAL TILL)	GLACIAL TILL
							Split-spoon refusal at 32 ft.	
32	spin		CORE		CORE		Advance HW drill casing to 32 ft.	
			INTERVAL		TIME		Advance 3-7/8 in. roller bit to 33 ft.	BEDROCK
33	spin						Advance HW drill casing to 33 ft.	
		R-1	33-34		7 min.		Begin NX rock core at 33 ft.	
34							R-1: 33-38 ft. Recovery = 98% RQD = 67%	
			34-35		3 min.		Fresh, medium hard, aphanitic GNEISS with low angle, close to moderately spaced,	
35							rough, planar, open joints.	
			35-36		4 min.			
36								
			36-37		6 min.			
37								
			37-38		4 min.			
38								
		R-2	38-39		3 min.		R-2: 38 - 40.5 ft. Recovery = 100% RQD = NR	
39							Fresh, medium hard, aphanitic GNEISS, with low angle, close to moderately spaced,	
			39-40		2.5 min.		rough, stepped joints.	
40							R-2 cored 2.5 ft. - core bit damaged.	

0 to 4 - Very Loose	0 to 2 - Very Soft	1. S denotes split-barrel sampler.	7. PID denotes Photoionization Detector
5 to 10 - Loose	3 to 4 - Soft	2. U denotes 3-inch O.D. undisturbed sample.	8. PPM denotes parts per million.
11 to 30 - Medium Dense	5 to 8 - Medium Stiff	3. UO denotes 3-inch Osterberg undisturbed sample.	9. PP denotes Pocket Penetrometer.
31 to 50 - Dense	9 to 15 - Stiff	4. PEN denotes penetration length of sampler.	10. FVST denotes field vane shear test.
Over 50 - Very Dense	16 to 30 - Very Stiff	5. REC denotes recovered length of sample.	11. RQD denotes Rock Quality Designation.
	Over 30 - Hard	6. SPT denotes Standard Penetration Test.	12. R denotes core run number.

REMARKS:
1) Switched rig geologist to S. Harding at 10 ft.
2) NR = Not recorded
3)
4)

Nobis Engineering PO Box 2890 Concord, New Hampshire 03302	PROJECT Remedial Design For Operable Unit 01 New Bedford Harbor Superfund Site New Bedford, Massachusetts	BORING NO. FB-3 SHEET 3 of 3 FILE NO. 48138.07 CHKD. BY C. Thunberg / J. Trottier

Boring Co.	Atlantic Testing Laboratories, Limited	Boring Location	northing 2704571.9 easting 814903.8
Driller	M. Childs	Ground Surface El.	0.30 Datum NGVD
Logged By	E. Paddleford / S. Harding	Date Start	7/30/99 Date End 8/3/99

Sampler: 2-inch O.D. split-barrel sampler driven 24 inches with a 140 lb. automatic hammer free falling from a height of 30 inches.
Drill Rig: CME 850 ATV
Drilling Method: 4" I.D. (HW) flush joint casing, 3 7/8" roller bit. Mud rotary.

Groundwater Readings (from ground surface)				
Date	Time	Depth	Elev.	Stabilization Time

DEPTH	Casing Blows (R)	SAMPLE INFORMATION Type & No.	PEN/REC (inches)	DEPTH (feet)	BLOWS PER 6 INCHES	SPT N-Value	SAMPLE DESCRIPTION	STRATUM DESCRIPTION	REMKS
			40-40.5		3.5 min		Advance 3-7/8 in. roller bit to 40.5 ft.		
41		R-3	40.5-41		1.5 min		R-3: 40.5 - 43.5 ft. Recovery = 75% RQD = NR		
							Fresh, medium hard, aphanitic GNEISS, with low angle, close to moderately spaced,	BEDROCK	2
42			41-42		4 min		rough, planar joints.		
43			42-43		3 min				
44			43-43.5		2 min		Boring terminated in bedrock at 43.5 ft.		
45									
46									
47									
48									
49									
50									
51									
52									
53									
54									
55									
56									
57									
58									
59									
60									

0 to 4 - Very Loose	*0 to 2 - Very Soft*	*1. S denotes split-barrel sampler.*	*7. PID denotes Photoionization Detector*
5 to 10 - Loose	3 to 4 - Soft	2. U denotes 3-inch O.D. undisturbed sample.	8. PPM denotes parts per million.
11 to 30 - Medium Dense	5 to 8 - Medium Stiff	3. UO denotes 3-inch Osterberg undisturbed sample.	9. PP denotes Pocket Penetrometer.
31 to 50 - Dense	9 to 15 - Stiff	4. PEN denotes penetration length of sampler.	10. FVST denotes field vane shear test.
Over 50 - Very Dense	16 to 30 - Very Stiff	5. REC denotes recovered length of sample.	11. RQD denotes Rock Quality Designation.
	Over 30 - Hard	6. SPT denotes Standard Penetration Test.	12. R denotes core run number.

REMARKS:
1) Switched rig geologist to S. Harding at 10 ft.
2) NR = Not recorded
3)
4)

Nobis Engineering PO Box 2890 Concord, New Hampshire 03302	PROJECT Remedial Design For Operable Unit 01 New Bedford Harbor Superfund Site New Bedford, Massachusetts	BORING NO. FB-4 SHEET 1 of 2 FILE NO. 48138.07 CHKD. BY C. Thunberg / J. Trottier

Boring Co.	Atlantic Testing Laboratories, Limited	Boring Location	northing 2704356.1 easting 814907.9
Driller	P. Davis	Ground Surface El.	2.20 Datum NGVD
Logged By	E. Paddleford	Date Start	8/11/99 Date End 8/12/99

Sampler: 2-inch O.D. split-barrel sampler driven 24 inches with a 140 lb. automatic hammer free falling from a height of 30 inches.
Drill Rig: CME 850 ATV
Drilling Method: 4" I.D. (HW) flush joint casing, 3 7/8" roller bit. Mud rotary.

Groundwater Readings (from ground surface)				
Date	Time	Depth	Elev.	Stabilization Time

DEPTH	Casing Blows (ft)	SAMPLE INFORMATION Type & No.	PEN/REC (inches)	DEPTH (feet)	BLOWS PER 6 INCHES	SPT N-Value	SAMPLE DESCRIPTION	STRATUM DESCRIPTION	REMARKS
							Advance HW drill casing from 0 to 3 ft.		
1	spin						Advance 3-7/8 in. roller bit to 3 ft.		
							Gravel and debris noted in first 2.5 ft, while washing casing.	FILL	
2	spin								
3	spin								
		UO-1	0/0	3-5	--	--	Attempted shelby tube sample. Could not advance sampler. Possible gravel or boulder. (FILL)		
4	spin						Advance HW drill casing to 5 ft.		
							Advance 3-7/8 in. roller bit to 5 ft.		
5	spin	UO-2	0/0	5-7	--	--	Attempted shelby tube sample. Could not advance sampler.		
		S-1	24/0	5-7	WOR/12"-1:3	--	Piece of wood in tip of split spoon sampler. Appears embedded in silt and clay layer. (FILL)		
6	spin						Advance HW drill casing to 7 ft.		
							Advance 3-7/8 in. roller bit to 7 ft.		
7	spin								
		UO-3	24/0	7-9	--	--	No Recovery.		
8	spin						Advance HW drill casing to 9 ft.		
							Advance 3-7/8 in. roller bit to 9 ft.		
9	spin								
	Hyd.	UO-4	24/4	9-11	--	--	Pulled up tube, capped bottom, mud pushed through bottom, put sample in jar. (FILL)		
10	Push						Advance HW drill casing to 11 ft. (hydraulic push)		
	Hyd.						Advance 3-7/8 in. roller bit to 11 ft.		
11	Push						Estimated strata change at 11 ft.		
	Hyd.	UO-5	24/18	11-13	--	--	Organic silt (OH); 91% organic silt, 6% fine sand, 2% medium sand, 1% coarse sand,	OH	1
12	Push						dark gray. Piece of wood noted in sample.		
	Hyd.						Advance HW drill casing to 13 ft. (hydraulic push)		
13	Push						Advance 3-7/8 in. roller bit to 13 ft.		
	Hyd.	UO-6	24/17	13-15	--	--	Organic soil (OH); organic clay noted in tip of sample.	OH	
14	Push						Advance HW drill casing to 15 ft. (hydraulic push)		
	Hyd.						Advance 3-7/8 in. roller bit to 15 ft.		
15	Push								
	Hyd.	UO-7	24/20	15-17	--	--	Similar to UO-6.	OH	
16	Push						Advance HW drill casing to 17 ft. (hydraulic push)		
	Hyd.						Advance 3-7/8 in. roller bit to 17 ft.		
17	Push								
	Hyd.	UO-8	24/18	17-19	--	--	Similar to UO-7.	OH	
18	Push						Advance HW drill casing to 19 ft. (hydraulic push)		
	Hyd.						Advance 3-7/8 in. roller bit to 19 ft.		
19	Push								
		UO-9	24/20	19-21	--	--	Top: Similar to UO-8.	OH	
20	spin						Bottom: Poorly graded sand (SP); medium to fine sand.		

0 to 4 - Very Loose	0 to 2 - Very Soft	1. S denotes split-barrel sampler.	7. PID denotes Photoionization Detector
5 to 10 - Loose	3 to 4 - Soft	2. U denotes 3-inch O.D. undisturbed sample.	8. PPM denotes parts per million.
11 to 30 - Medium Dense	5 to 8 - Medium Stiff	3. UO denotes 3-inch Osterberg undisturbed sample.	9. PP denotes Pocket Penetrometer.
31 to 50 - Dense	9 to 15 - Stiff	4. PEN denotes penetration length of sampler.	10. FVST denotes field vane shear test.
Over 50 - Very Dense	16 to 30 - Very Stiff	5. REC denotes recovered length of sample.	11. RQD denotes Rock Quality Designation.
	Over 30 - Hard	6. SPT denotes Standard Penetration Test.	12. R denotes core run number.

REMARKS:
1) Sample description based on laboratory test data and ASTM D2487. Refer to Test Report No. 5, prepared by GeoTesting Express, dated November 29, 1999.
2)
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Nobis Engineering PO Box 2890 Concord, New Hampshire 03302	PROJECT Remedial Design For Operable Unit 01 New Bedford Harbor Superfund Site New Bedford, Massachusetts	BORING NO. FB-4 SHEET 2 of 2 FILE NO. 48138.07 CHKD. BY C. Thunberg / J. Trottier

Boring Co.	Atlantic Testing Laboratories, Limited	Boring Location	northing 2704356.1 easting 814907.9
Driller	P. Davis	Ground Surface El. 2.20	Datum NGVD
Logged By	E. Paddleford	Date Start 8/11/99	Date End 8/12/99

Sampler: 2-inch O.D. split-barrel sampler driven 24 inches with a 140 lb. automatic hammer free falling from a height of 30 inches.
Drill Rig: CME 850 ATV
Drilling Method 4" I.D. (HW) flush joint casing, 3 7/8" roller bit. Mud rotary.

Groundwater Readings (from ground surface)				
Date	Time	Depth	Elev.	Stabilization Time

DEPTH	Casing Blows (ft)	SAMPLE INFORMATION Type & No.	PEN/REC (inches)	DEPTH (feet)	BLOWS PER 6 INCHES	SPT N-Value	SAMPLE DESCRIPTION	STRATUM DESCRIPTION
							Estimated strata change at 20.5 ft.	OH
21	spin							
		S-2	24/20	21-23	2-5-7-8	12	Poorly graded sand (SP); wet, medium dense, 50% medium sand, 30% fine sand,	SP
22	spin						15% coarse sand, 5% silt, gray.	
							Advance HW drill casing to 24 ft.	
23	spin						Advance 3-7/8 in. roller bit to 26 ft.	
24	spin							
25	spin							
26	spin							
		S-3	24/16	26-28	9-9-8-9	17	Poorly graded sand with silt and gravel (SP-SM); wet, medium dense, 40% fine sand,	SP-SM
27	spin						20% medium sand, 15% coarse sand, 15% gravel, 10% silt, olive green.	
							Advance HW drill casing to 29 ft.	
28	spin						Advance 3-7/8 in. roller bit to 31 ft.	
29	spin							
30								
31								
		S-4	24/14	31-33	5-4-8-18	12	Poorly graded sand with silt (SP-SM); wet, medium dense, 40% medium sand,	GLACIAL TILL
32							30% fine sand, 20% coarse sand, 10% silt, gray, (GLACIAL TILL)	
							Advance 3-7/8 in. roller bit to 33.5 ft.	
33								
34							Probable bedrock encountered at 33.5 ft.	
							Bottom of exploration at 33.5 ft.; probable bedrock.	PROBABLE BEDROCK
35								
36								
37								
38								
39								
40								

0 to 4 - Very Loose	0 to 2 - Very Soft	1. S denotes split-barrel sampler.	7. PID denotes Photoionization Detector
5 to 10 - Loose	3 to 4 - Soft	2. U denotes 3-inch O.D. undisturbed sample.	8. PPM denotes parts per million.
11 to 30 - Medium Dense	5 to 8 - Medium Stiff	3. UO denotes 3-inch Osterberg undisturbed sample.	9. PP denotes Pocket Penetrometer.
31 to 50 - Dense	9 to 15 - Stiff	4. PEN denotes penetration length of sampler.	10. FVST denotes field vane shear test.
Over 50 - Very Dense	16 to 30 - Very Stiff	5. REC denotes recovered length of sample.	11. RQD denotes Rock Quality Designation.
	Over 30 - Hard	6. SPT denotes Standard Penetration Test.	12. R denotes core run number.

REMARKS:
1) Sample description based on laboratory test data and ASTM D2487. Refer to Test Report No. 5, prepared by GeoTesting Express, dated November 29, 1999.
2)
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Nobis Engineering PO Box 2890 Concord, New Hampshire 03302	PROJECT Remedial Design For Operable Unit 01 New Bedford Harbor Superfund Site New Bedford, Massachusetts	BORING NO. FB-5 SHEET 1 of 3 FILE NO. 48138.07 CHKD. BY C. Thunberg / J. Trottier

Boring Co.	Atlantic Testing Laboratories, Limited	Boring Location	northing 2704207.0	easting 814934.5	
Driller	M. Childs	Ground Surface El.	4.80	Datum	NGVD
Logged By	C. Thunberg / E. Paddleford	Date Start	7/23/99	Date End	7/27/99

Sampler: 2-inch O.D. split-barrel sampler driven 24 inches with a 140 lb. automatic hammer free falling from a height of 30 inches.
Drill Rig: CME 850 ATV
Drilling Method 4" I.D. (HW) flush joint casing, 3 7/8" roller bit. Spin & wash.

Groundwater Readings (from ground surface)

Date	Time	Depth	Elev.	Stabilization Time
7/26	11:38	3.3 ft.	1.50	During drilling
7/27	7:56	2.5 ft.	2.30	During drilling

DEPTH	Casing Blows (ft)	SAMPLE INFORMATION Type & No.	PEN/REC (inches)	DEPTH (feet)	BLOWS PER 6 INCHES	SPT N-Value	SAMPLE DESCRIPTION	STRATUM DESCRIPTION	REMKS
		S-1	24/12	0-2	5-8-6-6	14	Sandy topsoil & vegetation. (3 in.)		1
1	spin						S-1: pulverized concrete/brick rubble, medium dense. (FILL)		
							Wash water black on return.	FILL	
2	spin								
3	spin								
4	spin								
5	spin								
		S-2	24/12	5-7	6-3-2-2	5	S-2A: Similar to lower portion of S-1, except loose.		
6	spin						S-2B: Black wood and muck, loose. Pungent organic odor. Probable creosote. (FILL)		
							Advanced HW drill casing to 8 ft.		
7	spin						Advanced 3-7/8 in. roller bit to 10 ft.		
8	spin								
9	spin								
10	spin								
		S-3	24/18	10-12	WOH/24"	--	2 in: layer with some brick fragments. (FILL)		2
11	spin						16 in: Organic soil (OH); wet, 95% organic silt, 5% fine sand, dark gray-black,	OH	
							strong petroleum odor.		
12	spin						Estimated strata change at 10.5 ft.		
							Advanced HW drill casing to 13 ft.		
13	spin						Advanced 3-7/8 in. roller bit to 15 ft.		
14	spin								
15	spin								
		S-4	24/0	15-17	WOH/24"	--	No recovery.		
16	spin						Advanced 3-7/8 in. roller bit to 17 ft.		
17	spin								
		S-5	24/24	17-19	WOH/24"	--	Organic soil (OH); wet, 60% organic silt, 40% organic clay,	OH	
18	spin						dark gray-black, strong organic odor.		
							Change out drill fluid.		
19	spin						Advance 3-7/8 inch button bit to 19 feet.		
							Attempted FVST at 19.8 to 20.5 ft.; maximum torque applied > 450 in.-pounds		
20	spin						Advance HW drill casing to 18 ft.		

0 to 4 - Very Loose	0 to 2 - Very Soft	1. S denotes split-barrel sampler.	7. PID denotes Photoionization Detector
5 to 10 - Loose	3 to 4 - Soft	2. U denotes 3-inch O.D. undisturbed sample.	8. PPM denotes parts per million.
11 to 30 - Medium Dense	5 to 8 - Medium Stiff	3. UO denotes 3-inch Osterberg undisturbed sample.	9. PP denotes Pocket Penetrometer.
31 to 50 - Dense	9 to 15 - Stiff	4. PEN denotes penetration length of sampler.	10. FVST denotes field vane shear test.
Over 50 - Very Dense	16 to 30 - Very Stiff	5. REC denotes recovered length of sample.	11. RQD denotes Rock Quality Designation.
	Over 30 - Hard	6. SPT denotes Standard Penetration Test.	12. R denotes core run number.

REMARKS:
1) Rubble noted at ground surface.
2) Changed rig geologist to E. Paddleford at 10 ft.
3) Sample description based on laboratory test data and ASTM D2487. Refer to Test Report No. 5, prepared by GeoTesting Express, dated November 29, 1999.
4)

Nobis Engineering PO Box 2890 Concord, New Hampshire 03302	PROJECT Remedial Design For Operable Unit 01 New Bedford Harbor Superfund Site New Bedford, Massachusetts	BORING NO. FB-5 SHEET 2 of 3 FILE NO. 48138.07 CHKD. BY C. Thunberg / J. Trottier

Boring Co.	Atlantic Testing Laboratories, Limited	Boring Location	northing 2704207.0	easting 814934.5	
Driller	M. Childs	Ground Surface El.	4.80	Datum	NGVD
Logged By	C. Thunberg / E. Paddleford	Date Start	7/23/99	Date End	7/27/99

Sampler: 2-inch O.D. split-barrel sampler driven 24 inches with a 140 lb. automatic hammer free falling from a height of 30 inches.
Drill Rig: CME 850 ATV
Drilling Method 4" I.D. (HW) flush joint casing, 3 7/8" roller bit. Spin & wash.

Groundwater Readings (from ground surface)

Date	Time	Depth	Elev.	Stabilization Time
7/26	11:38	3.3 ft.	1.50	During drilling
7/27	7:56	2.5 ft.	2.30	During drilling

DEPTH	Casing Blows (ft)	Type & No.	PEN/REC (inches)	DEPTH (feet)	BLOWS PER 6 INCHES	SPT N-Value	SAMPLE DESCRIPTION	STRATUM DESCRIPTION
		S-6	24/18	20-22	WOH/24"	–	Organic soil (OH); 60% organic clay, 40% organic silt.	OH
21	spin						Advance HW drill casing to 23 ft.	
							Advance 3-7/8 in. roller bit to 25 ft.	
22	spin							
23	spin							
24	spin							
25	spin							
		S-7	24/13	25-27	WOH/6"-1-4-8	5	8 in: Poorly graded sand with silt (SP-SM); wet, loose, 80% fine sand, 14% medium sand,	SP-SM
26	spin						1% coarse sand, 5% silt, gray.	SP
							5 in: Poorly graded sand with gravel (SP); wet, loose, 45% gravel, 30% coarse	
27	spin						sand, 15% medium sand, 5% fine sand, 5% silt, brown.	
		S-8	24/12	27-29	6-10-11-22	21	6 in: Poorly graded sand (SP); wet, medium dense, 60% medium sand, 20% fine	SP
28	spin						sand, 10% coarse sand, 5% silt, 5% gravel, gray.	SM
							6 in: Silty Sand (SM); wet, medium dense, 60% fine sand, 10% medium sand,	
29	spin						5% coarse sand, 20% silt., 5% gravel, greenish-gray.	
							Advance HW drill casing to 28 ft.	
30	spin						Advance 3-7/8 in. roller bit to 30 ft.	
		S-9	24/8	30-32	6-14-13-13	27	Silty Sand (SM); wet, medium dense, 55% fine sand, 15% medium sand, 5% coarse	SM
31	spin						sand, 20% silt, 5% gravel, greenish gray-brown.	
							Advance HW drill casing to 32.5 ft.	
32	spin						Bedrock at 32.5 ft.	
							Advance 3-7/8 in. roller bit to 33.5 ft.	
33	spin						Advance HW drill casing to 33.5 ft.	BEDROCK
	spin	S-10	0/0	33.5	25/0"	–	No recovery.	
34			CORE		CORE		Begin NX rock core at 33.5 ft.	
			INTERVAL		TIME		R-1: 33.5 - 38.5 ft. Recovery = 100% RQD = 63% (fair)	
35		R1	33.5-34.5		5 min		Slightly discolored, moderately hard, gray, fine grained GNEISS, with primary low angle,	
							very close to close spacing, rough, undulating, discolored, open joints. Secondary jointing	
36			34.5-35.5		5 min		high angle, widely spaced, rough, planar, discolored, tight. Solution cavities noted at	
							36.5 to 37.5 ft. Pit to vog. Secondary mineralization noted at 34.5 ft.	
37			35.5-36.5		6 min			
38			36.5-37.5		5 min			
39			37.5-38.5		6.5 min			
40		R2	38.5-39.5		6 min		R-2: 38.5 - 43.5 ft. Recovery = 100% RQD = 42%	

0 to 4 - Very Loose	0 to 2 - Very Soft	1. S denotes split-barrel sampler.	7. PID denotes Photoionization Detector
5 to 10 - Loose	3 to 4 - Soft	2. U denotes 3-inch O.D. undisturbed sample.	8. PPM denotes parts per million.
11 to 30 - Medium Dense	5 to 8 - Medium Stiff	3. UO denotes 3-inch Osterberg undisturbed sample.	9. PP denotes Pocket Penetrometer.
31 to 50 - Dense	9 to 15 - Stiff	4. PEN denotes penetration length of sampler.	10. FVST denotes field vane shear test.
Over 50 - Very Dense	16 to 30 - Very Stiff	5. REC denotes recovered length of sample.	11. RQD denotes Rock Quality Designation.
	Over 30 - Hard	6. SPT denotes Standard Penetration Test.	12. R denotes core run number.

REMARKS:
1) Rubble noted at ground surface.
2) Changed rig geologist to E. Paddleford at 10 ft.
3) Sample description based on laboratory test data and ASTM D2487. Refer to Test Report No. 5, prepared by GeoTesting Express, dated November 29, 1999.
4)

Nobis Engineering PO Box 2890 Concord, New Hampshire 03302	PROJECT Remedial Design For Operable Unit 01 New Bedford Harbor Superfund Site New Bedford, Massachusetts	BORING NO. FB-5 SHEET 3 of 3 FILE NO. 48138.07 CHKD. BY C. Thunberg / J. Trottier

Boring Co.	Atlantic Testing Laboratories, Limited	Boring Location	northing 2704207.0 easting 814934.5		
Driller	M. Childs	Ground Surface El.	4.80	Datum	NGVD
Logged By	C. Thunberg / E. Paddleford	Date Start	7/23/99	Date End	7/27/99

Sampler: 2-inch O.D. split-barrel sampler driven 24 inches with a 140 lb. automatic hammer free falling from a height of 30 inches.
Drill Rig: CME 850 ATV
Drilling Method 4" I.D. (HW) flush joint casing, 3 7/8" roller bit. Spin & wash.

Groundwater Readings (from ground surface)

Date	Time	Depth	Elev.	Stabilization Time
7/26	11:38	3.3 ft.	1.50	During drilling
7/27	7:56	2.5 ft.	2.30	During drilling

DEPTH	Casing Blows (ft)	SAMPLE INFORMATION Type & No.	PEN/REC (inches)	DEPTH (feet)	BLOWS PER 6 INCHES	SPT N-Value	SAMPLE DESCRIPTION	STRATUM DESCRIPTION	REMKS
41			39.5-40.5		6 min		Fresh, moderately hard, gray, aphanitic GNEISS with low angle closely spaced, smooth, planar, discolored tight jointing. Some joint filling noted at 39.5 to 40.5ft.; 42.5ft.	BEDROCK	
42			40.5-41.5		7 min				
43			41.5-42.5		6.5 min				
44			42.5-43.5		5.5 min		Boring terminated in bedrock at 43.5 ft.		
45									
46									
47									
48									
49									
50									
51									
52									
53									
54									
55									
56									
57									
58									
59									
60									

0 to 4 - Very Loose	0 to 2 - Very Soft	1. S denotes split-barrel sampler.	7. PID denotes Photoionization Detector
5 to 10 - Loose	3 to 4 - Soft	2. U denotes 3-inch O.D. undisturbed sample.	8. PPM denotes parts per million.
11 to 30 - Medium Dense	5 to 8 - Medium Stiff	3. UO denotes 3-inch Osterberg undisturbed sample.	9. PP denotes Pocket Penetrometer.
31 to 50 - Dense	9 to 15 - Stiff	4. PEN denotes penetration length of sampler.	10. FVST denotes field vane shear test.
Over 50 - Very Dense	16 to 30 - Very Stiff	5. REC denotes recovered length of sample.	11. RQD denotes Rock Quality Designation.
	Over 30 - Hard	6. SPT denotes Standard Penetration Test.	12. R denotes core run number.

REMARKS:
1) Rubble noted at ground surface.
2) Changed rig geologist to E. Paddleford at 10 ft.
3) Sample description based on laboratory test data and ASTM D2487. Refer to Test Report No. 5, prepared by GeoTesting Express, dated November 29, 1999.
4)

Nobis Engineering PO Box 2890 Concord, New Hampshire 03302	PROJECT Remedial Design For Operable Unit 01 New Bedford Harbor Superfund Site New Bedford, Massachusetts	BORING NO. FB-6 SHEET 1 of 3 FILE NO. 48138.07 CHKD. BY C. Thunberg / J. Trottier

Boring Co.	Atlantic Testing Laboratories, Limited	Boring Location	northing 2703986.4 easting 814946.0		
Driller	R. Pryce	Ground Surface El.	5.16	Datum	NGVD
Logged By	S. Bonis	Date Start	9/23/99	Date End	9/27/99

Sampler: 2-inch O.D. split-barrel sampler driven 24 inches with a 140 lb. safety hammer free falling from a height of 30 inches.
Drill Rig: CME 75 truck mount
Drilling Method: 4" I.D. (HW) flush joint casing, 3 7/8" roller bit. Mud rotary.

Groundwater Readings (from ground surface)				
Date	Time	Depth	Elev.	Stabilization Time

DEPTH	Casing Blows (ft)	SAMPLE INFORMATION Type & No.	PEN/REC (inches)	DEPTH (feet)	BLOWS PER 6 INCHES	SPT N-Value	SAMPLE DESCRIPTION	STRATUM DESCRIPTION	REMKS
		S-1	24/15	0-2	5-9-7-8	16	4 in: medium dense, topsoil and vegetation.		
1	spin						6 in: Silty sand (SM); medium dense, 40% fine sand, 30% medium sand, 25% silt, 5% gravel, brick fragments, dark brown. (FILL)		
2	spin						5 in: Silty sand (SM); medium dense, 40% fine sand, 35% medium sand, 25% silt, black/brown, slight petroleum odor. (FILL)		
3	spin						Advance HW drill casing to 3 ft.		
		S-2	24/1	3-5	9-9-8-5	17	Medium dense, saturated, 90% wood, 10% sandy silt, dark brown. (FILL)		
4	spin						Advance HW drill casing to 8 ft.		
5	spin						Advance 3-7/8 in. roller bit to 8 ft.		
6	spin							FILL	
7	spin								
8	spin								
		S-3	24/0	8-10	15-4-3-2	7	No recovery. Suspected pushing wood.		
9	spin								
10	spin								
		S-4	24/1	10-12	3-3-3-2	6	Silty sand (SM); loose, 60% fine sand, 40% silt with brick fragments,		
11	spin						wood particles, petroleum odor, black-brown. (FILL).	OH	
12	spin						Pushed 2 additional spoons at same depth - zero recovery with first spoon. Pushed 3 in. spoon, 22 in. recovery. Blow counts not recorded.		
13	spin						Organic soil (OH); 50% organic silt, 40% organic clay, 10% fine sand, organic odor, dark olive gray.		
		S-5	24/12	13-15	4-2-2-2	4	Estimated strata change at 10.5 ft.	OH	
14	spin						Advance HW drill casing to 13 ft.		
15	spin						Advance 3-7/8 in. roller bit to 13 ft. S-5: Organic soil (OH); soft, 70% organic silt, 30% organic clay, organic odor,		
		S-6	24/10	15-17	3-2-2-2	4	with shell fragments.	OH	
16	spin						S-6: Organic soil (OH); soft, 65% organic silt, 20% organic clay, 10% fine sand, 5% shell fragments and slag.		
17	spin						Switch to mud rotary drill techniques at 13 ft.		
		S-7	24/20	17-19	WOR-WOR-4-3	--	Advance 3-7/8 in. roller bit to 17 ft.	OH	
18	spin						S-7: 15 in: Organic soil with sand (OH); 60% organic silt, 25% fine sand, 15% organic clay.		
19	spin						S-7: 5 in: Silty sand (SM); 70% fine sand, 25% silt, 5% clay.	SM	
		S-8	24/19	19-21	16-22-27-49	49	14 in: Silty sand (SM); dense, 70% fine sand, 25% silt, 5% gravel, dark gray.	SM	
20	spin						4 in: Poorly graded sand with silt (SP-SM); dense, 40% medium sand, 30% fine sand,		

0 to 4 - Very Loose	0 to 2 - Very Soft	1. S denotes split-barrel sampler.	7. PID denotes Photoionization Detector
5 to 10 - Loose	3 to 4 - Soft	2. U denotes 3-inch O.D. undisturbed sample.	8. PPM denotes parts per million.
11 to 30 - Medium Dense	5 to 8 - Medium Stiff	3. UO denotes 3-inch Osterberg undisturbed sample.	9. PP denotes Pocket Penetrometer.
31 to 50 - Dense	9 to 15 - Stiff	4. PEN denotes penetration length of sampler.	10. FVST denotes field vane shear test.
Over 50 - Very Dense	16 to 30 - Very Stiff	5. REC denotes recovered length of sample.	11. RQD denotes Rock Quality Designation.
	Over 30 - Hard	6. SPT denotes Standard Penetration Test.	12. R denotes core run number.

REMARKS:
1)
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Nobis Engineering PO Box 2890 Concord, New Hampshire 03302	PROJECT Remedial Design For Operable Unit 01 New Bedford Harbor Superfund Site New Bedford, Massachusetts	BORING NO. FB-6 SHEET 2 of 3 FILE NO. 48138.07 CHKD. BY C. Thunberg / J. Trottier

Boring Co.	Atlantic Testing Laboratories, Limited	Boring Location	northing 2703986.4 easting 814946.0
Driller	R. Pryce	Ground Surface El.	5.16 Datum NGVD
Logged By	S. Bonis	Date Start	9/23/99 Date End 9/27/99

Sampler: 2-inch O.D. split-barrel sampler driven 24 inches with a 140 lb. safety hammer free falling from a height of 30 inches.
Drill Rig: CME 75 truck mount
Drilling Method: 4" I.D. (HW) flush joint casing, 3 7/8" roller bit. Mud rotary.

Groundwater Readings (from ground surface)

Date	Time	Depth	Elev.	Stabilization Time

DEPTH	Casing Blows (ft)	SAMPLE INFORMATION Type & No.	PEN/REC (inches)	DEPTH (feet)	BLOWS PER 6 INCHES	SPT N-Value	SAMPLE DESCRIPTION	STRATUM DESCRIPTION
							10% coarse sand, 10% gravel, 10% silt, dark gray.	SP-SM
21	spin						1 in: Poorly graded sand with silt (SP-SM); dense, 60% medium sand, 30% fine sand, 10% silt, brown.	
22	spin						Advance 3-7/8 in. roller bit to 24 ft.	
23	spin							
24	spin							
		S-9	24/11	24-26	16-15-17-19	32	Well-graded sand with silt and gravel (SW-SM); dense, 30% coarse sand,	SW-SM
25	spin						30% medium sand, 10% fine sand, 10% silt, 20% gravel, sub-angular clasts.	
26	spin						Advance 3-7/8 in. roller bit to 29 ft. Advance HW drill casing to 27.5 ft.	
27	spin							
28	spin						Advance 3-7/8 in. roller bit to 30 ft.	
29	spin							
30	spin							
		S-10	17/6	30-31.4	32-46-100/5"	–	Silty sand with gravel (SM); 60% fine sand, 25% silt, 15% angular gravel,	GLACIAL TILL
31	spin						light gray/ brown. (GLACIAL TILL)	
32	spin						Advance 3-7/8 in. roller bit to 31 ft. Advance HW drill casing to 31 ft.	
33	spin						Advance 3-7/8 in. roller bit to 33 ft.	
		S-11	16/6	33-34.3	34-25-50/4"	–	Similar to S-10. (GLACIAL TILL)	
34	spin						Advance 3-7/8 in. roller bit to 36 ft.	
35	spin						Advance HW drill casing to 34.5 ft. Advance 3-7/8 in. roller bit to 36 ft.	BEDROCK
36			CORE INTERVAL		CORE TIME			
37		R-1		36-37	10 min		R-1: 36-41 ft. Recovery = 97% RQD = 88% (good)	
38				37-38	5.5 min		Fresh, moderately hard, fine to medium grained, light gray GNEISS, moderately dipping foliation. Primary joints moderately dipping, very close, discolored, partly open.	
39				38-39	6 min			
40				39-40	6.5 min			

0 to 4 - Very Loose	0 to 2 - Very Soft	1. S denotes split-barrel sampler.	7. PID denotes Photoionization Detector
5 to 10 - Loose	3 to 4 - Soft	2. U denotes 3-inch O.D. undisturbed sample.	8. PPM denotes parts per million.
11 to 30 - Medium Dense	5 to 8 - Medium Stiff	3. UO denotes 3-inch Osterberg undisturbed sample.	9. PP denotes Pocket Penetrometer.
31 to 50 - Dense	9 to 15 - Stiff	4. PEN denotes penetration length of sampler.	10. FVST denotes field vane shear test.
Over 50 - Very Dense	16 to 30 - Very Stiff	5. REC denotes recovered length of sample.	11. RQD denotes Rock Quality Designation.
	Over 30 - Hard	6. SPT denotes Standard Penetration Test.	12. R denotes core run number.

REMARKS:
1)
2)
3)
4)

Nobis Engineering PO Box 2890 Concord, New Hampshire 03302	PROJECT Remedial Design For Operable Unit 01 New Bedford Harbor Superfund Site New Bedford, Massachusetts	BORING NO. FB-6 SHEET 3 of 3 FILE NO. 48138.07 CHKD. BY C. Thunberg / J. Trottier

Boring Co.	Atlantic Testing Laboratories, Limited	Boring Location	northing 2703986.4 easting 814946.0
Driller	R. Pryce	Ground Surface El.	5.16 Datum NGVD
Logged By	S. Bonis	Date Start	9/23/99 Date End 9/27/99

Sampler: 2-inch O.D. split-barrel sampler driven 24 inches with a 140 lb. safety hammer free falling from a height of 30 inches.
Drill Rig: CME 75 truck mount
Drilling Method: 4" I.D. (HW) flush joint casing, 3 7/8" roller bit. Mud rotary.

Groundwater Readings (from ground surface)				
Date	Time	Depth	Elev.	Stabilization Time

DEPTH	Casing Blows (ft)	SAMPLE INFORMATION Type & No.	PEN/REC (inches)	DEPTH (feet)	BLOWS PER 6 INCHES	SPT N-Value	SAMPLE DESCRIPTION	STRATUM DESCRIPTION	REMKS
				40-41	8 min				
41									
		R-2		41-42	6 min		R-2: 41-46 ft. Recovery = 100% RQD = 80% (good)		
42							Light gray, fresh, moderately hard, fine to medium grained GNEISS		
				42-43	5.5 min		Foliation, moderately dipping. Primary joints: low angle to moderately dipping, closely	BEDROCK	
43							spaced, discolored, and partly open.		
				43-44	5.75 min				
44									
				44-45	7 min				
45									
				45-46	7.5 min				
46									
							Boring terminated in bedrock at 46 ft.		
47									
48									
49									
50									
51									
52									
53									
54									
55									
56									
57									
58									
59									
60									

0 to 4 - Very Loose	0 to 2 - Very Soft	1. S denotes split-barrel sampler.	7. PID denotes Photoionization Detector
5 to 10 - Loose	3 to 4 - Soft	2. U denotes 3-inch O.D. undisturbed sample.	8. PPM denotes parts per million.
11 to 30 - Medium Dense	5 to 8 - Medium Stiff	3. UO denotes 3-inch Osterberg undisturbed sample.	9. PP denotes Pocket Penetrometer.
31 to 50 - Dense	9 to 15 - Stiff	4. PEN denotes penetration length of sampler.	10. FVST denotes field vane shear test.
Over 50 - Very Dense	16 to 30 - Very Stiff	5. REC denotes recovered length of sample.	11. RQD denotes Rock Quality Designation.
	Over 30 - Hard	6. SPT denotes Standard Penetration Test.	12. R denotes core run number.

REMARKS:
1)
2)
3)
4)

Nobis Engineering PO Box 2890 Concord, New Hampshire 03302	PROJECT Remedial Design For Operable Unit 01 New Bedford Harbor Superfund Site New Bedford, Massachusetts	BORING NO. FB-6A SHEET 1 of 1 FILE NO. 48138.07 CHKD. BY C. Thunberg / J. Trottier

Boring Co.	Atlantic Testing Laboratories, Limited	Boring Location	northing 2703979.7	easting 814948.6	
Driller	R. Pryce	Ground Surface El.	5.24	Datum	NGVD
Logged By	S. Bonis	Date Start	9/27/99	Date End	9/27/99

Sampler: 2-inch O.D. split-barrel sampler driven 24 inches with a 140 lb. safety hammer free falling from a height of 30 inches.
Drill Rig: CME 75 truck mount
Drilling Method: 5" I.D. (PW) flush joint casing, 4 7/8" roller bit. Spin & wash.

Groundwater Readings (from ground surface)				
Date	Time	Depth	Elev.	Stabilization Time

DEPTH	Casing Blows (ft)	SAMPLE INFORMATION Type & No.	PEN/REC (inches)	DEPTH (feet)	BLOWS PER 6 INCHES	SPT N-Value	SAMPLE DESCRIPTION	STRATUM DESCRIPTION	REMKS
							Advance HW drill casing to 8 ft.		
1	spin						Advance 4-7/8 in. roller bit to 8 ft.		
2	spin								
3	spin								
4	spin								
5	spin							FILL	
6	spin								
7	spin								
8	spin								
	hyd.	UO-1	24/0	8-10	–	–	No recovery - still in fill material.		
9	push						Advance 4-7/8 in. roller bit to 10 ft.		
	hyd.						Seems to be drilling through wood.		
10	push						Advance 4-7/8 in. roller bit to 13 ft.		
11									
12									
13							Seems to be drilling in wood.		
14							Bottom of exploration at 13 ft.; no refusal.		
15									
16									
17									
18									
19									
20									

0 to 4 - Very Loose	0 to 2 - Very Soft	1. S denotes split-barrel sampler.	7. PID denotes Photoionization Detector
5 to 10 - Loose	3 to 4 - Soft	2. U denotes 3-inch O.D. undisturbed sample.	8. PPM denotes parts per million.
11 to 30 - Medium Dense	5 to 8 - Medium Stiff	3. UO denotes 3-inch Osterberg undisturbed sample.	9. PP denotes Pocket Penetrometer.
31 to 50 - Dense	9 to 15 - Stiff	4. PEN denotes penetration length of sampler.	10. FVST denotes field vane shear test.
Over 50 - Very Dense	16 to 30 - Very Stiff	5. REC denotes recovered length of sample.	11. RQD denotes Rock Quality Designation.
	Over 30 - Hard	6. SPT denotes Standard Penetration Test.	12. R denotes core run number.

REMARKS:
1)
2)
3)
4)

Nobis Engineering PO Box 2890 Concord, New Hampshire 03302	PROJECT Remedial Design For Operable Unit 01 New Bedford Harbor Superfund Site New Bedford, Massachusetts	BORING NO. FB-6B SHEET 1 of 1 FILE NO. 48138.07 CHKD. BY C. Thunberg / J. Trottier

Boring Co.	Atlantic Testing Laboratories, Limited	Boring Location	northing 2703982.6 easting 814947.7		
Driller	R. Pryce	Ground Surface El.	5.29	Datum	NGVD
Logged By	S. Bonis	Date Start	9/27/99	Date End	9/27/99

Sampler: 2-inch O.D. split-barrel sampler driven 24 inches with a 140 lb. safety hammer free falling from a height of 30 inches.
Drill Rig: CME 75 truck mount
Drilling Method: 5" I.D. (PW) flush joint casing, 4 7/8" roller bit. Spin & wash.

Groundwater Readings Not Applicable Offshore				
Date	Time	Depth	Elev.	Stabilization Time

DEPTH	Casing Blows (ft)	SAMPLE INFORMATION Type & No.	PEN/REC (inches)	DEPTH (feet)	BLOWS PER 6 INCHES	SPT N-Value	SAMPLE DESCRIPTION	STRATUM DESCRIPTION	REMKS
							Advance HW drill casing to 8 ft.		
1	spin						Advance 4-7/8 in. roller bit to 9 ft.		
2	spin								
3	spin								
4	spin								
5	spin								
6	spin							FILL	
7	spin								
8	spin								
9	spin								
10	hyd. push	UO-2	12/12	9-10	--	--	Recovered material mostly slag in fine grained matrix. (sample not retained)		
11	hyd. push								
12	hyd push	UO-3	24/8	11-13	--	--	Poorly graded sand (SP); 75% fine sand, 20% coarse sand, 5% silt petroleum stain/sheen and odor. (FILL) Sample not retained.		
13	hyd. push						Advance HW drill casing to 13 ft. Advance 4-7/8 in. roller bit to 13 ft.		
14		UO-4	24/19	13-15	--	--	Organic soil (OH); dark, olive gray Advance 4-7/8 in. roller bit to 15 ft.	OH	
15									
16		UO-5	24/21	15-17	--	--	Similar to UO-4. Advance 4-7/8 in. roller bit to 17 ft.	OH	
17									
18		UO-6	24/24	17-19	--	--	Similar to UO-5.	OH	
19									
20							Bottom of exploration at 19 ft.; no refusal.		

0 to 4 - Very Loose	0 to 2 - Very Soft	1. S denotes split-barrel sampler.	7. PID denotes Photoionization Detector
5 to 10 - Loose	3 to 4 - Soft	2. U denotes 3-inch O.D. undisturbed sample.	8. PPM denotes parts per million.
11 to 30 - Medium Dense.	5 to 8 - Medium Stiff	3. UO denotes 3-inch Osterberg undisturbed sample.	9. PP denotes Pocket Penetrometer.
31 to 50 - Dense	9 to 15 - Stiff	4. PEN denotes penetration length of sampler.	10. FVST denotes field vane shear test.
Over 50 - Very Dense	16 to 30 - Very Stiff	5. REC denotes recovered length of sample.	11. RQD denotes Rock Quality Designation.
	Over 30 - Hard	6. SPT denotes Standard Penetration Test.	12. R denotes core run number.

REMARKS:
1)
2)
3)
4)

Nobis Engineering PO Box 2890 Concord, New Hampshire 03302	PROJECT Remedial Design For Operable Unit 01 New Bedford Harbor Superfund Site New Bedford, Massachusetts	BORING NO. FB-7 SHEET 1 of 3 FILE NO. 48138.07 CHKD. BY C. Thunberg / J. Trottier

Boring Co.	Atlantic Testing Laboratories, Limited	Boring Location	northing 2703786.1 easting 814956.0		
Driller	R. Pryce	Ground Surface El.	5.42	Datum	NGVD
Logged By	R. Chase	Date Start	7/19/99	Date End	7/20/99

Sampler: 2-inch O.D. split-barrel sampler driven 24 inches with a 140 lb. safety hammer free falling from a height of 30 inches.
Drill Rig: CME 75 truck mount
Drilling Method: 4" I.D. (HW) flush joint casing, 3 7/8" roller bit. Mud rotary.

Groundwater Readings (from ground surface)				
Date	Time	Depth	Elev.	Stabilization Time

DEPTH	Casing Blows (ft)	SAMPLE INFORMATION Type & No.	PEN/REC (inches)	DEPTH (feet)	BLOWS PER 6 INCHES	SPT N-Value	SAMPLE DESCRIPTION	STRATUM DESCRIPTION	REMKS
		S-1	24/8	0-2	1-5-6-7	11	Poorly graded sand with silt (SP-SM); dry, medium dense, 60% fine sand, 15% medium		
1	spin						sand, <5% coarse sand, 10% fine gravel, <10% silt, brown. (FILL)		
							Advance HW drill casing to 3 ft.		
2	spin								
3	spin								
		S-2	24/7	3-5	6-7-6-6	13	Poorly graded gravel with sand (GP); wet, medium dense, 80% fine gravel,		
4	spin						10% fine sand, 5% medium sand, <5% silt, <5% brick, gray. (FILL)		
							Advance HW drill casing to 8 ft.		
5	spin								
6	spin							FILL	
7	spin								
8	spin								
		S-3	24/6	8-10	9-6-8-5	14	Concrete and brick fragments. (FILL)		
9	spin						Advance HW drill casing to 13 ft.		
10	spin								
11	spin								
12	spin								
13	spin								
		S-4	24/7	13-15	4-4-6-5	10	Silty sand (SM); loose, 80% fine sand, 15% silt, <5% brick, gray. (FILL)		
14	spin						Advance HW drill casing to 18 ft.		
15	spin								
16	spin								
17	spin								
							Estimated strata change at 17 ft.		
18	spin								
		S-5	24/8	18-20	9-11-24-22	35	Poorly graded sand with gravel (SP); dense, 60% fine sand, 10% medium sand,	SP	
19	spin						10% coarse sand, 15% fine gravel, 5% silt, gray.		
							Switch to mud rotary drilling techniques at 18 ft.		
20	spin						Advance HW drill casing to 23 ft.		

0 to 4 - Very Loose	0 to 2 - Very Soft	1. S denotes split-barrel sampler.	7. PID denotes Photoionization Detector
5 to 10 - Loose	3 to 4 - Soft	2. U denotes 3-inch O.D. undisturbed sample.	8. PPM denotes parts per million.
11 to 30 - Medium Dense	5 to 8 - Medium Stiff	3. UO denotes 3-inch Osterberg undisturbed sample.	9. PP denotes Pocket Penetrometer.
31 to 50 - Dense	9 to 15 - Stiff	4. PEN denotes penetration length of sampler.	10. FVST denotes field vane shear test.
Over 50 - Very Dense	16 to 30 - Very Stiff	5. REC denotes recovered length of sample.	11. RQD denotes Rock Quality Designation.
	Over 30 - Hard	6. SPT denotes Standard Penetration Test.	12. R denotes core run number.

REMARKS:
1) Boring grouted from 0 to 43 ft.
2)
3)
4)

Nobis Engineering PO Box 2890 Concord, New Hampshire 03302	PROJECT Remedial Design For Operable Unit 01 New Bedford Harbor Superfund Site New Bedford, Massachusetts	BORING NO. FB-7 SHEET 2 of 3 FILE NO. 48138.07 CHKD. BY C. Thunberg / J. Trottier

Boring Co.	Atlantic Testing Laboratories, Limited	Boring Location	northing 2703786.1 easting 814956.0		
Driller	R. Pryce	Ground Surface El.	5.42	Datum	NGVD
Logged By	R. Chase	Date Start	7/19/99	Date End	7/20/99

Sampler: 2-inch O.D. split-barrel sampler driven 24 inches with a 140 lb. safety hammer free falling from a height of 30 inches.
Drill Rig: CME 75 truck mount
Drilling Method 4" I.D. (HW) flush joint casing, 3 7/8" roller bit. Mud rotary.

Groundwater Readings (from ground surface)				
Date	Time	Depth	Elev.	Stabilization Time

DEPTH	Casing Blows (ft)	SAMPLE INFORMATION Type & No.	PEN/REC (inches)	DEPTH (feet)	BLOWS PER 6 INCHES	SPT N-Value	SAMPLE DESCRIPTION	STRATUM DESCRIPTION
							Advance 3-7/8 in. roller bit to 25 ft.	
21	spin							
22	spin							
23	spin							
24	spin							
25	spin							
		S-6	24/9	25-27	26-41-47-35	88	Poorly graded gravel with sand (GP); very dense, 75% fine gravel, 5% fine sand,	
26	spin						10% medium sand, 5% coarse sand, <5% silt, gray (GLACIAL TILL)	GLACIAL TILL
							Advance 3-7/8 in. roller bit to 30 ft.	
27	spin							
28	spin							
29	spin						Difficult drilling from 28.5 to 31 ft. Possible boulder.	
							Advance HW drill casing to 28 ft.	BEDROCK
30	spin						Advance 3-7/8 in. roller bit to 33 ft.	
							Advance HW drill casing to 31.7 ft.	
31	spin						Advance 3-7/8 in. roller bit to 33 ft.	
32	spin							
33			CORE INTERVAL		CORE TIME			
		R-1		33-34	5 min		Begin NX rock core at 33 ft.	
34							R-1: 33-38 ft. Recovery = 100% RQD = 100%	
				34-35	6.5 min		Fresh, medium hard, gray, aphanitic GNEISS with low angle, close to moderately	
35							spaced, rough, planar, fresh, open joints.	
				35-36	3.5 min			
36								
				36-37	4.5 min			
37								
				37-38	4.25 min			
38								
		R-2		38-39	4.5 min		R-2: 38-43 ft. Recovery = 98% RQD = 71%	
39							Similar to R-1.	
				39-40	5.75 min			
40								

0 to 4 - Very Loose	0 to 2 - Very Soft	1. S denotes split-barrel sampler.	7. PID denotes Photoionization Detector
5 to 10 - Loose	3 to 4 - Soft	2. U denotes 3-inch O.D. undisturbed sample.	8. PPM denotes parts per million.
11 to 30 - Medium Dense	5 to 8 - Medium Stiff	3. UO denotes 3-inch Osterberg undisturbed sample.	9. PP denotes Pocket Penetrometer.
31 to 50 - Dense	9 to 15 - Stiff	4. PEN denotes penetration length of sampler.	10. FVST denotes field vane shear test.
Over 50 - Very Dense	16 to 30 - Very Stiff	5. REC denotes recovered length of sample.	11. RQD denotes Rock Quality Designation.
	Over 30 - Hard	6. SPT denotes Standard Penetration Test.	12. R denotes core run number.

REMARKS:
1) Boring grouted from 0 to 43 ft.
2)
3)
4)

Nobis Engineering PO Box 2890 Concord, New Hampshire 03302	PROJECT Remedial Design For Operable Unit 01 New Bedford Harbor Superfund Site New Bedford, Massachusetts	BORING NO. FB-7 SHEET 3 of 3 FILE NO. 48138.07 CHKD. BY C. Thunberg / J. Trottier

Boring Co.	Atlantic Testing Laboratories, Limited	Boring Location	northing 2703786.1 easting 814956.0
Driller	R. Pryce	Ground Surface El.	5.42 Datum NGVD
Logged By	R. Chase	Date Start	7/19/99 Date End 7/20/99

Sampler: 2-inch O.D. split-barrel sampler driven 24 inches with a 140 lb. safety hammer free falling from a height of 30 inches.
Drill Rig: CME 75 truck mount
Drilling Method: 4" I.D. (HW) flush joint casing, 3 7/8" roller bit. Mud rotary.

Groundwater Readings (from ground surface)				
Date	Time	Depth	Elev.	Stabilization Time

DEPTH	Casing Blows (ft)	SAMPLE INFORMATION Type & No.	PEN/REC (inches)	DEPTH (feet)	BLOWS PER 6 INCHES	SPT N-Value	SAMPLE DESCRIPTION	STRATUM DESCRIPTION	REMKS
				40-41	5 min				
41									
				41-42	5.75 min			BEDROCK	
42									
				42-43	6.25 min				
43									
44							Boring terminated in bedrock at 43 ft.		1
45									
46									
47									
48									
49									
50									
51									
52									
53									
54									
55									
56									
57									
58									
59									
60									

0 to 4 - Very Loose	0 to 2 - Very Soft	1. S denotes split-barrel sampler.	7. PID denotes Photoionization Detector
5 to 10 - Loose	3 to 4 - Soft	2. U denotes 3-inch O.D. undisturbed sample.	8. PPM denotes parts per million.
11 to 30 - Medium Dense	5 to 8 - Medium Stiff	3. UO denotes 3-inch Osterberg undisturbed sample.	9. PP denotes Pocket Penetrometer.
31 to 50 - Dense	9 to 15 - Stiff	4. PEN denotes penetration length of sampler.	10. FVST denotes field vane shear test.
Over 50 - Very Dense	16 to 30 - Very Stiff	5. REC denotes recovered length of sample.	11. RQD denotes Rock Quality Designation.
	Over 30 - Hard	6. SPT denotes Standard Penetration Test.	12. R denotes core run number.

REMARKS:
1) Boring grouted from 0 to 43 ft.
2)
3)
4)

Nobis Engineering PO Box 2890 Concord, New Hampshire 03302	PROJECT Remedial Design For Operable Unit 01 New Bedford Harbor Superfund Site New Bedford, Massachusetts	BORING NO. FB-8 SHEET 1 of 4 FILE NO. 48138.07 CHKD. BY C. Thunberg / J. Trottier

Boring Co.	Atlantic Testing Laboratories, Limited	Boring Location	northing 2703587.3	easting 814969.8	
Driller	M. Childs	Ground Surface El.	6.70	Datum	NGVD
Logged By	C. Thunberg	Date Start	7/19/99	Date End	7/20/99

Sampler: 2-inch O.D. split-barrel sampler driven 24 inches with a 140 lb. automatic hammer free falling from a height of 30 inches.
Drill Rig: CME 850 ATV
Drilling Method: 4" I.D. (HW) flush joint casing, 3 7/8" roller bit. Mud rotary.

Groundwater Readings (from ground surface)

Date	Time	Depth	Elev.	Stabilization Time
7/19	—	5 ft.	1.70	While drilling

DEPTH	Casing Blows (ft)	Type & No.	PEN/REC (inches)	DEPTH (feet)	BLOWS PER 6 INCHES	SPT N-Value	SAMPLE DESCRIPTION	STRATUM DESCRIPTION	REMKS
1	spin	S-1	24/12	0-2	4-16-10-6	26	Silty sand (SM); dry, medium dense, 70% fine sand, 5% gravel, 20% silt, 5% organics, dark brown. 3 in. layer of black ash in bottom of sampler. (FILL)		
2	spin								
3	spin								
4	spin	S-2	24/5	3-5	7-4-3-WOH	7	Well-graded sand (SW); dry, loose, 40% coarse sand, 40% medium sand, 10% fine sand, 10% gravel, dark gray. (FILL)		
5	spin							FILL	
6	spin	S-3	24/8	5-7	1-2-2-1	4	Well-graded sand with silt and gravel (SW-SM); wet, very loose, 25% coarse sand, 25% medium sand, 25% fine sand, 15% gravel, 10% silt, dark brown. Organics and traces of brick noted in tip of sampler. (FILL)		
7	spin								
8	spin	S-4	24/1	7-9	12-5-5-3	10	Poor recovery. Gravel and broken concrete fragments. (FILL)		
9	spin								
10	spin						Estimated strata change at 10 ft.		
11	spin	S-5	24/18	10-12	2-4-6-6	10	Poorly graded sand with silt (SP-SM); loose, 90% fine sand, 10% silt, brown. Begin mud rotary drilling technique at 10 ft. Advance HW drill casing to 11 ft.	SP-SM	
12	spin								
13	spin								
14	spin								
15	spin								
16	spin	S-6	24/22	15-17	1-0-1-5	1	Silty sand (SM); very loose, 50% fine sand, 50% silt, brown.	SM	
17	spin								
18	spin	S-7	24/18	17-19	4-6-10-10	16	Silty sand (SM); medium dense, 70% fine sand, 20% silt, 10% medium sand, brown. Advance HW drill casing to 16 ft.	SM	
19	spin								
20	spin								

0 to 4 - Very Loose	0 to 2 - Very Soft	1. S denotes split-barrel sampler.	7. PID denotes Photoionization Detector
5 to 10 - Loose	3 to 4 - Soft	2. U denotes 3-inch O.D. undisturbed sample.	8. PPM denotes parts per million.
11 to 30 - Medium Dense	5 to 8 - Medium Stiff	3. UO denotes 3-inch Osterberg undisturbed sample.	9. PP denotes Pocket Penetrometer.
31 to 50 - Dense	9 to 15 - Stiff	4. PEN denotes penetration length of sampler.	10. FVST denotes field vane shear test.
Over 50 - Very Dense	16 to 30 - Very Stiff	5. REC denotes recovered length of sample.	11. RQD denotes Rock Quality Designation.
	Over 30 - Hard	6. SPT denotes Standard Penetration Test.	12. R denotes core run number.

REMARKS:
1) Could not advance core barrel back to 59 ft., begin R-2 at 58.5 ft.
2)
3)
4)

Nobis Engineering PO Box 2890 Concord, New Hampshire 03302	PROJECT Remedial Design For Operable Unit 01 New Bedford Harbor Superfund Site New Bedford, Massachusetts	BORING NO. FB-8 SHEET 2 of 4 FILE NO. 48138.07 CHKD. BY C. Thunberg / J. Trottier

Boring Co.	Atlantic Testing Laboratories, Limited	Boring Location	northing 2703587.3 easting 814969.8		
Driller	M. Childs	Ground Surface El.	6.70	Datum	NGVD
Logged By	C. Thunberg	Date Start	7/19/99	Date End	7/20/99

Sampler: 2-inch O.D. split-barrel sampler driven 24 inches with a 140 lb. automatic hammer free falling from a height of 30 inches.
Drill Rig: CME 850 ATV
Drilling Method: 4" I.D. (HW) flush joint casing, 3 7/8" roller bit. Mud rotary.

Groundwater Readings (from ground surface)

Date	Time	Depth	Elev.	Stabilization Time
7/19	—	5 ft.	1.70	While drilling

DEPTH	Casing Blows (ft)	SAMPLE INFORMATION Type & No.	PEN/REC (inches)	DEPTH (feet)	BLOWS PER 6 INCHES	SPT N-Value	SAMPLE DESCRIPTION	STRATUM DESCRIPTION	REMKS
		S-8	24/14	20-22	10-17-21-19	38	S-8A: Well-graded sand (SW); wet, dense, 15% coarse sand, 35% medium sand, 35% fine	SW	
21	spin						sand, 10% gravel, 5% silt, brown.		
							S-8B: Silty sand with gravel (SM); wet, 15% medium sand, 40% fine sand, 30% gravel,	SM	
22	spin						15% silt, black. Highly oxidized or possibly contaminated.		
							Advance HW drill casing to 21 ft.		
23	spin								
24	spin								
25	spin								
		S-9	24/10	25-27	7-15-7-4	22	Poorly graded sand with gravel (SP); medium dense, 85% coarse sand,	SP	
26	spin						15% gravel, brown		
							Advance HW drill casing to 25 ft.		
27	spin						Loss of drilling fluid while advancing roller bit.		
28	spin								
29	spin								
30	spin								
		S-10	24/10	30-32	6-9-5-5	14	Silty sand (SM); wet, medium dense, 30% coarse sand, 30% medium sand, 15% fine sand,	SM	
31	spin						10% gravel, 15% silt, light brown. Piece of gravel in tip of sampler.		
							Advance HW drill casing to 30 ft.		
32	spin						Lost drilling fluid.		
33	spin								
34	spin								
35	spin								
		S-11	24/10	35-37	6-5-5-7	10	Similar to S-10, except loose.	SM	
36	spin						Advance HW drill casing to 35 ft.		
37	spin								
38	spin								
39	spin								
40	spin								

0 to 4 - Very Loose	0 to 2 - Very Soft	1. S denotes split-barrel sampler.	7. PID denotes Photoionization Detector
5 to 10 - Loose	3 to 4 - Soft	2. U denotes 3-inch O.D. undisturbed sample.	8. PPM denotes parts per million.
11 to 30 - Medium Dense	5 to 8 - Medium Stiff	3. UO denotes 3-inch Osterberg undisturbed sample.	9. PP denotes Pocket Penetrometer.
31 to 50 - Dense	9 to 15 - Stiff	4. PEN denotes penetration length of sampler.	10. FVST denotes field vane shear test.
Over 50 - Very Dense	16 to 30 - Very Stiff	5. REC denotes recovered length of sample.	11. RQD denotes Rock Quality Designation.
	Over 30 - Hard	6. SPT denotes Standard Penetration Test.	12. R denotes core run number.

REMARKS:
1) Could not advance core barrel back to 59 ft., begin R-2 at 58.5 ft.
2)
3)
4)

Nobis Engineering PO Box 2890 Concord, New Hampshire 03302	PROJECT Remedial Design For Operable Unit 01 New Bedford Harbor Superfund Site New Bedford, Massachusetts	BORING NO. FB-8 SHEET 3 of 4 FILE NO. 48138.07 CHKD. BY C. Thunberg / J. Trottier

Boring Co.	Atlantic Testing Laboratories, Limited	Boring Location	northing 2703587.3 easting 814969.8		
Driller	M. Childs	Ground Surface El.	6.70	Datum	NGVD
Logged By	C. Thunberg	Date Start	7/19/99	Date End	7/20/99

Sampler: 2-inch O.D. split-barrel sampler driven 24 inches with a 140 lb. automatic hammer free falling from a height of 30 inches.
Drill Rig: CME 850 ATV
Drilling Method: 4" I.D. (HW) flush joint casing, 3 7/8" roller bit. Mud rotary.

Groundwater Readings (from ground surface)

Date	Time	Depth	Elev.	Stabilization Time
7/19	—	5 ft.	1.70	While drilling

DEPTH	Casing Blows (ft)	SAMPLE INFORMATION Type & No.	PEN/REC (inches)	DEPTH (feet)	BLOWS PER 6 INCHES	SPT N-Value	SAMPLE DESCRIPTION	STRATUM DESCRIPTION	REMKS
		S-12	24/8	40-42	8-9-9-8	18	Silty sand (SM); wet, medium dense, 30% coarse sand, 30% medium sand, 15% fine sand,	SM	
41	spin						10% gravel, 15% silt, light brown.		
							Advance HW drill casing to 40 ft.		
42	spin						Lost entire tub of drilling mud.		
43	spin								
							Estimated strata change at 43 ft.		
44	spin								
45	spin								
		S-13	24/6	45-47	9-16-14-12	30	Silty gravel with sand (GM); wet, medium dense, 60% angular gravel, 20% fine sand,	GLACIAL TILL	
46	spin						20% silt, gray-brown. (GLACIAL TILL)		
							Advance HW drill casing to 45 ft.		
47	spin						Lost significant amount of drilling fluid.		
48	spin								
49	spin								
50	spin								
		S-14	24/12	50-52	9-21-31-27	52	Silty sand with gravel (SM); wet, very dense, 50% fine sand, 30% angular gravel, 20% silt,		
51	spin						gray-brown. 3 in. layer of pulverized rock in center of sample, probable		
							cobble. (GLACIAL TILL)		
52	spin						Advance 3-7/8 in. roller bit to 54 ft., roller bit refusal.		
53									
54									
		S-15	3/0	54-54.3	14/3"-100/0"	–	Attempted split spoon sample, 5 ft of cave-in at bottom.		
55			CORE INTERVAL		CORE TIME		Advance HW drill casing to 52 ft.	BEDROCK	
		R-1	54-55		6 min		Attempted second split spoon sample. No recovery.		
56							Begin NX rock core at 54 ft.		
			55-56		6 min		R-1: 54-59 ft. Recovery = 88% RQD = 66%		
57							Slightly weathered, hard, gray, fine-grained GNEISS, low angle joints, moderately		
			56-57		5 min		spaced, many fresh breaks attributed to drilling.		
58									
			57-58		3 min				
59									
			58-59		7 min				
60									

0 to 4 - Very Loose	0 to 2 - Very Soft	1. S denotes split-barrel sampler.	7. PID denotes Photoionization Detector
5 to 10 - Loose	3 to 4 - Soft	2. U denotes 3-inch O.D. undisturbed sample.	8. PPM denotes parts per million.
11 to 30 - Medium Dense	5 to 8 - Medium Stiff	3. UO denotes 3-inch Osterberg undisturbed sample.	9. PP denotes Pocket Penetrometer.
31 to 50 - Dense	9 to 15 - Stiff	4. PEN denotes penetration length of sampler.	10. FVST denotes field vane shear test.
Over 50 - Very Dense	16 to 30 - Very Stiff	5. REC denotes recovered length of sample.	11. RQD denotes Rock Quality Designation.
	Over 30 - Hard	6. SPT denotes Standard Penetration Test.	12. R denotes core run number.

REMARKS:
1) Could not advance core barrel back to 59 ft., begin R-2 at 58.5 ft.
2)
3)
4)

Nobis Engineering PO Box 2890 Concord, New Hampshire 03302	PROJECT Remedial Design For Operable Unit 01 New Bedford Harbor Superfund Site New Bedford, Massachusetts	BORING NO. FB-8 SHEET 4 of 4 FILE NO. 48138.07 CHKD. BY C. Thunberg / J. Trottier

Boring Co.	Atlantic Testing Laboratories, Limited	Boring Location	northing 2703587.3 easting 814969.8
Driller	M. Childs	Ground Surface El.	6.70 Datum NGVD
Logged By	C. Thunberg	Date Start	7/19/99 Date End 7/20/99

Sampler: 2-inch O.D. split-barrel sampler driven 24 inches with a 140 lb. automatic hammer free falling from a height of 30 inches.
Drill Rig: CME 850 ATV
Drilling Method: 4" I.D. (HW) flush joint casing, 3 7/8" roller bit. Mud rotary.

Groundwater Readings (from ground surface)

Date	Time	Depth	Elev.	Stabilization Time
7/19	—	5 ft.	1.70	While drilling

DEPTH	Casing Blows (ft)	SAMPLE INFORMATION Type & No.	PEN/REC (inches)	DEPTH (feet)	BLOWS PER 6 INCHES	SPT N-Value	SAMPLE DESCRIPTION	STRATUM DESCRIPTION	REMKS
61									
62		R-2	58.5-59.5		6 min		R-2: 58.5 to 63.5 ft. Recovery = 100% RQD = 83% Similar to R-1.	BEDROCK	1
63			59.5-60.5		7 min				
64			60.5-61.5		7 min				
65			61.5-62.5		7 min				
66			62.5-63.5		4 min		Boring terminated in bedrock at 63.5 ft.		
67									
68									
69									
70									
71									
72									
73									
74									
75									
76									
77									
78									
79									
80									

0 to 4 - Very Loose	0 to 2 - Very Soft	1. S denotes split-barrel sampler.	7. PID denotes Photoionization Detector
5 to 10 - Loose	3 to 4 - Soft	2. U denotes 3-inch O.D. undisturbed sample.	8. PPM denotes parts per million.
11 to 30 - Medium Dense	5 to 8 - Medium Stiff	3. UO denotes 3-inch Osterberg undisturbed sample.	9. PP denotes Pocket Penetrometer.
31 to 50 - Dense	9 to 15 - Stiff	4. PEN denotes penetration length of sampler.	10. FVST denotes field vane shear test.
Over 50 - Very Dense	16 to 30 - Very Stiff	5. REC denotes recovered length of sample.	11. RQD denotes Rock Quality Designation.
	Over 30 - Hard	6. SPT denotes Standard Penetration Test.	12. R denotes core run number.

REMARKS:
1) Could not advance core barrel back to 59 ft., begin R-2 at 58.5 ft.
2)
3)
4)

Nobis Engineering PO Box 2890 Concord, New Hampshire 03302	PROJECT Remedial Design For Operable Unit 01 New Bedford Harbor Superfund Site New Bedford, Massachusetts	BORING NO. FB-10 SHEET 1 of 4 FILE NO. 48138.07 CHKD. BY C. Thunberg / J. Trottier

Boring Co.	Atlantic Testing Laboratories, Limited	Boring Location	northing 2703242.9 easting 815061.8		
Driller	M. Childs	Ground Surface El.	7.46	Datum	NGVD
Logged By	C. Thunberg	Date Start	7/21/99	Date End	7/22/99

Sampler: 2-inch O.D. split-barrel sampler driven 24 inches with a 140 lb automatic hammer free falling from a height of 30 inches.
Drill Rig: CME 850 ATV
Drilling Method 4" I.D. (HW) flush joint casing, 3-7/8" roller bit. Mud rotary.

Groundwater Readings (from ground surface)				
Date	Time	Depth	Elev.	Stabilization Time

DEPTH	Casing Blows (ft)	SAMPLE INFORMATION Type & No.	PEN/REC (inches)	DEPTH (feet)	BLOWS PER 6 INCHES	SPT N-Value	SAMPLE DESCRIPTION	STRATUM DESCRIPTION	REMKS
1	spin	S-1	24/18	0-2	3-10-14-22	24	3 in: Topsoil with vegetation. 15 in. Silty sand (SM); dry, medium dense, 70% fine sand, 25% silt, 5% organics. (FILL) *Asphalt in tip of split spoon sampler.*		
2	spin								
3	spin								
4	spin	S-2	24/8	3-5	27-4-4-6	8	Asphalt; moist, black. (FILL) Wash water black on return.	FILL	
5	spin								
6	spin								
7	spin								
8	spin								
9	spin	S-3	24/7	8-10	8-3-1-1	4	Poorly graded sand (SP); wet, very loose, 40% medium sand, 30% fine sand, 30% asphalt fragments, distinct odor, black. (FILL) (2.7 ppm headspace)		
10	spin								
11	spin								
12	spin						Estimated strata change at 11.5 ft.		
13	spin								
14	spin	S-4	24/16	13-15	10-7-7-10	14	Silty sand (SM); wet, medium dense, 85% fine sand, 15% non-plastic silt, organic odor, dark brown.	SM	
15	spin								
16	spin								
17	spin								
18	spin								
19	spin								
20	spin								

0 to 4 - Very Loose	0 to 2 - Very Soft	1. S denotes split-barrel sampler.	7. PID denotes Photoionization Detector
5 to 10 - Loose	3 to 4 - Soft	2. U denotes 3-inch O.D. undisturbed sample.	8. PPM denotes parts per million.
11 to 30 - Medium Dense	5 to 8 - Medium Stiff	3. UO denotes 3-inch Osterberg undisturbed sample.	9. PP denotes Pocket Penetrometer.
31 to 50 - Dense	9 to 15 - Stiff	4. PEN denotes penetration length of sampler.	10. FVST denotes field vane shear test.
Over 50 - Very Dense	16 to 30 - Very Stiff	5. REC denotes recovered length of sample.	11. RQD denotes Rock Quality Designation.
	Over 30 - Hard	6. SPT denotes Standard Penetration Test.	12. R denotes core run number.

REMARKS:
1) Sample description based on laboratory test data and ASTM D2487. Refer to Test Report No. 5, prepared by GeoTesting Express, dated November 29, 1999.
2) NR = Not recorded.
3)
4)

Nobis Engineering PO Box 2890 Concord, New Hampshire 03302	PROJECT Remedial Design For Operable Unit 01 New Bedford Harbor Superfund Site New Bedford, Massachusetts	BORING NO. FB-10 SHEET 2 of 4 FILE NO. 48138.07 CHKD. BY C. Thunberg / J. Trottier

Boring Co.	Atlantic Testing Laboratories, Limited	Boring Location	northing 2703242.9	easting 815061.8	
Driller	M. Childs	Ground Surface El.	7.46	Datum	NGVD
Logged By	C. Thunberg	Date Start	7/21/99	Date End	7/22/99

Sampler: 2-inch O.D. split-barrel sampler driven 24 inches with a 140 lb automatic hammer free falling from a height of 30 inches.
Drill Rig: CME 850 ATV
Drilling Method 4" I.D. (HW) flush joint casing, 3-7/8" roller bit. Mud rotary.

Groundwater Readings (from ground surface)				
Date	Time	Depth	Elev.	Stabilization Time

DEPTH	Casing Blows (ft)	SAMPLE INFORMATION Type & No.	PEN/REC (inches)	DEPTH (feet)	BLOWS PER 6 INCHES	SPT N-Value	SAMPLE DESCRIPTION	STRATUM DESCRIPTION	REMKS
		S-5	24/8	20-22	5-6-5-8	11	Poorly graded sand with gravel (SP); wet, medium dense, 48% medium sand, 17%	SP	1
21	spin						coarse sand, 12% fine sand, 19% gravel, 4% silt, brown.		
							Advance HW drill casing to 20 ft.		
22	spin								
23	spin								
24	spin								
25	spin						3 ft of run-in sands at 25 ft. Thicken drilling mud, clean-out sands.		
		S-6	24/12	25-27	7-8-8-10	16	Poorly graded sand (SP); medium dense, 50% fine sand, 40% medium sand,	SP	
26	spin						10% coarse sand, trace silt, reddish brown.		
							Advance HW drill casing to 25 ft.		
27	spin								
28	spin								
29	spin								
30	spin								
		S-7	24/4	30-32	10-13-18-9	31	Silty sand with gravel (SM); dense, 70% sand, 15% gravel, 15% silt, reddish brown,	SM	
31	spin						sub-angular gravel.		
							Advance HW drill casing to 30 ft.		
32	spin								
33	spin								
34	spin								
35	spin								
		S-8	24/8	35-37	5-7-12-9	19	Poorly graded sand with gravel (SP); medium dense, 50% medium sand,	SP	
36	spin						35% coarse sand, 15% gravel, brown.		
							Advance HW drill casing to 35 ft.		
37	spin								
38	spin								
39	spin								
40	spin						2 ft. of run-in sands at 40 ft.		

0 to 4 - Very Loose	0 to 2 - Very Soft	1. S denotes split-barrel sampler.	7. PID denotes Photoionization Detector
5 to 10 - Loose	3 to 4 - Soft	2. U denotes 3-inch O.D. undisturbed sample.	8. PPM denotes parts per million.
11 to 30 - Medium Dense	5 to 8 - Medium Stiff	3. UO denotes 3-inch Osterberg undisturbed sample.	9. PP denotes Pocket Penetrometer.
31 to 50 - Dense	9 to 15 - Stiff	4. PEN denotes penetration length of sampler.	10. FVST denotes field vane shear test.
Over 50 - Very Dense	16 to 30 - Very Stiff	5. REC denotes recovered length of sample.	11. RQD denotes Rock Quality Designation.
	Over 30 - Hard	6. SPT denotes Standard Penetration Test.	12. R denotes core run number.

REMARKS:
1) Sample description based on laboratory test data and ASTM D2487. Refer to Test Report No. 5, prepared by GeoTesting Express, dated November 29, 1999.
2) NR = Not recorded.
3)
4)

Nobis Engineering PO Box 2890 Concord, New Hampshire 03302	PROJECT Remedial Design For Operable Unit 01 New Bedford Harbor Superfund Site New Bedford, Massachusetts	BORING NO. FB-10 SHEET 3 of 4 FILE NO. 48138.07 CHKD. BY C. Thunberg / J. Trottier

Boring Co.	Atlantic Testing Laboratories, Limited	Boring Location	northing 2703242.9 easting 815061.8		
Driller	M. Childs	Ground Surface El.	7.46	Datum	NGVD
Logged By	C. Thunberg	Date Start	7/21/99	Date End	7/22/99

Sampler: 2-inch O.D. split-barrel sampler driven 24 inches with a 140 lb automatic hammer free falling from a height of 30 inches.
Drill Rig: CME 850 ATV
Drilling Method 4" I.D. (HW) flush joint casing, 3-7/8" roller bit. Mud rotary.

Groundwater Readings (from ground surface)				
Date	Time	Depth	Elev.	Stabilization Time

DEPTH	Casing Blows (ft)	SAMPLE INFORMATION Type & No.	PEN/REC (inches)	DEPTH (feet)	BLOWS PER 6 INCHES	SPT N-Value	SAMPLE DESCRIPTION	STRATUM DESCRIPTION	REMKS
		S-9	24/4	40-42	7-10-14-12	24	Poorly graded sand with silt and gravel (SP-SM); medium dense, 75% medium to	SP-SM	
41	spin						coarse sand, 10% silt, 15% sub-angular gravel.		
							Advance HW drill casing to 40 ft.		
42	spin						Difficulty encountered withdrawing roller bit. Thickened drilling mud.		
							Advance 3-7/8 in. roller bit to 45 ft.		
43	spin								
							Estimated strata change at 43 ft.		
44	spin								
45	spin								
		S-10	24/8	45-47	3-14-13-16	27	Silty sand with gravel (SM); medium dense, 60% fine to coarse sand,	GLACIAL TILL	
46	spin						15% silt, 25% angular gravel. Piece of coarse gravel lodged in tip of sampler.		
							(GLACIAL TILL)		
47	spin						Advance HW drill casing to 45 ft		
48	spin								
49	spin								
50	spin								
		S-11	15/NR	50-51.3	29-38-50/3"	--	Silty sand with gravel (SM); very dense, 50% fine to coarse sand, 15% silt, 35%		2
51	spin						angular gravel, brown. (GLACIAL TILL)		
			CORE		CORE		Advance 3-7/8 in. roller bit to 52 ft.; refusal.		
52	spin		INTERVAL		TIME		Begin NX rock core at 52 ft.		
		R-1	52-53		7 min		R-1: 52 - 57 ft. Recovery = 90% RQD = 30%		
53							Highly weathered, moderately hard, pinkish gray, medium grained, felsic GNEISS with		
			53-54		7 min		greenish quartz intrusions. Primary joint set at 45°, secondary joint set vertical,		
54							planar fractures, much pulverized rock in lower portion.	BEDROCK	
			54-55		7 min				
55									
			55-56		6 min				
56									
			56-57		7 min				
57									
		R-2	57-58		7 min		R-2: 57 - 62 ft. Recovery = 100% RQD = 40%		
58							Highly weathered, moderately hard, pinkish gray, medium grained, felsic GNEISS with		
			58-59		6 min		greenish quartz intrusions. Primary joint set at 45°, secondary joint set vertical,		
59							planar fractures.		
			59-60		8 min				
60									

0 to 4 - Very Loose	0 to 2 - Very Soft	1. S denotes split-barrel sampler.	7. PID denotes Photoionization Detector
5 to 10 - Loose	3 to 4 - Soft	2. U denotes 3-inch O.D. undisturbed sample.	8. PPM denotes parts per million.
11 to 30 - Medium Dense	5 to 8 - Medium Stiff	3. UO denotes 3-inch Osterberg undisturbed sample.	9. PP denotes Pocket Penetrometer.
31 to 50 - Dense	9 to 15 - Stiff	4. PEN denotes penetration length of sampler.	10. FVST denotes field vane shear test.
Over 50 - Very Dense	16 to 30 - Very Stiff	5. REC denotes recovered length of sample.	11. RQD denotes Rock Quality Designation.
	Over 30 - Hard	6. SPT denotes Standard Penetration Test.	12. R denotes core run number.

REMARKS:
1) Sample description based on laboratory test data and ASTM D2487. Refer to Test Report No. 5, prepared by GeoTesting Express, dated November 29, 1999.
2) NR = Not recorded.
3)
4)

Nobis Engineering PO Box 2890 Concord, New Hampshire 03302	PROJECT Remedial Design For Operable Unit 01 New Bedford Harbor Superfund Site New Bedford, Massachusetts	BORING NO. FB-10 SHEET 4 of 4 FILE NO. 48138.07 CHKD. BY C. Thunberg / J. Trottier

Boring Co.	Atlantic Testing Laboratories, Limited	Boring Location	northing 2703242.9 easting 815061.8		
Driller	M. Childs	Ground Surface El.	7.46	Datum	NGVD
Logged By	C. Thunberg	Date Start	7/21/99	Date End	7/22/99

Sampler: 2-inch O.D. split-barrel sampler driven 24 inches with a 140 lb automatic hammer free falling from a height of 30 inches.
Drill Rig: CME 850 ATV
Drilling Method 4" I.D. (HW) flush joint casing, 3-7/8" roller bit. Mud rotary.

Groundwater Readings (from ground surface)

Date	Time	Depth	Elev.	Stabilization Time

DEPTH	Casing Blows (ft)	SAMPLE INFORMATION Type & No.	PEN/REC (inches)	DEPTH (feet)	BLOWS PER 6 INCHES	SPT N-Value	SAMPLE DESCRIPTION	STRATUM DESCRIPTION	REMKS
			60-61		6 min			BEDROCK	
61									
			61-62		NR				2
62									
63							Boring terminated in bedrock at 62 ft.		
64									
65									
66									
67									
68									
69									
70									
71									
72									
73									
74									
75									
76									
77									
78									
79									
80									

0 to 4 - Very Loose	0 to 2 - Very Soft	1. S denotes split-barrel sampler.	7. PID denotes Photoionization Detector
5 to 10 - Loose	3 to 4 - Soft	2. U denotes 3-inch O.D. undisturbed sample.	8. PPM denotes parts per million.
11 to 30 - Medium Dense	5 to 8 - Medium Stiff	3. UO denotes 3-inch Osterberg undisturbed sample.	9. PP denotes Pocket Penetrometer.
31 to 50 - Dense	9 to 15 - Stiff	4. PEN denotes penetration length of sampler.	10. FVST denotes field vane shear test.
Over 50 - Very Dense	16 to 30 - Very Stiff	5. REC denotes recovered length of sample.	11. RQD denotes Rock Quality Designation.
	Over 30 - Hard	6. SPT denotes Standard Penetration Test.	12. R denotes core run number.

REMARKS:
1) Sample description based on laboratory test data and ASTM D2487. Refer to Test Report No. 5, prepared by GeoTesting Express, dated November 29, 1999.
2) NR = Not recorded.
3)
4)

Nobis Engineering PO Box 2890 Concord, New Hampshire 03302	PROJECT Remedial Design For Operable Unit 01 New Bedford Harbor Superfund Site New Bedford, Massachusetts	BORING NO. FB - 11 SHEET 1 of 2 FILE NO. 48138.07 CHKD. BY C. Thunberg / J. Trottier

Boring Co.	Atlantic Testing Laboratories, Limited	Boring Location	northing 2704908.9 easting 814967.9		
Driller	P. Davis/M. Childs	Mudline El.	-2.28	Datum	NGVD
Logged By	E. Paddleford	Date Start	10/8/99	Date End	10/11/99

Sampler: 2-inch O.D. split-barrel sampler driven 24 inches with a 140 lb safety hammer free falling from a height of 30 inches.
Drill Rig: CME 55 skid mount
Drilling Method: 4" I.D. (HW) flush joint casing, 3-7/8" roller bit. Mud rotary.
All casing driven with a 300 lb. hammer free falling from a height of 24-inches.

Groundwater Readings Not Applicable for Offshore Borings				
Date	Time	Depth	Elev.	Stabilization Time

DEPTH	Casing Blows (ft)	SAMPLE INFORMATION Type & No.	PEN/REC (inches)	DEPTH (feet)	BLOWS PER 6 INCHES	SPT N-Value	SAMPLE DESCRIPTION	STRATUM DESCRIPTION	REMKS
	Hyd.	UO-1	24/24	0-2	–	–	Organic soil (OH); 95% organic silt/clay, 5% shell fragments,	OH	
1	Push						strong organic odor, sheen visible on sample surface.		
	Hyd.						Advance HW drill casing from 0 to 3 ft.		
2	Push						Advance 3-7/8 in. roller bit to 3 ft.		
	Hyd.								
3	Push								
	Hyd.	UO-2	24/24	3-5	–	–	Similar to UO-1, noted from tip of sample.	OH	
4	Push						Advance HW drill casing to 6 ft.		
	Hyd.						Advance 3-7/8 in. roller bit to 6 ft.		
5	Push								
	Hyd.								
6	Push								
	Hyd.	UO-3	24/12	6-8	–	–	Similar to UO-2 as noted from sample tip.	OH	
7	Push						Advance HW drill casing to 9 ft.		
	Hyd.						Advance 3-7/8 in. roller bit to 9 ft.		
8	Push								
	Hyd.								
9	Push								
	Hyd.	UO-4	24/24	9-11	–	–	Organic clay (OH); dark gray.	OH	1
10	Push						Advance HW drill casing to 12 ft.		
	Hyd.						Advance 3-7/8 in. roller bit to 12 ft.		
11	Push								
	Hyd.								
12	Push	UO-5	24/0	12-14	–	–	No Recovery - difficult advancing UO-5 from 12 to 14 ft.		
	drop	S-1	24/13	12-14	7-9-14-18	23	4 in: Sandy silt (ML); very stiff, 50% silt, 20% medium sand, 20% fine sand, 10%	ML	
13	Push						coarse sand, gray.		
	Hyd.						9 in: Silt (ML); very stiff, 90% silt, 10 % fine sand, light gray.		
14	Push						Switch to mud rotary drilling technique at 12 ft.		
	Hyd.						Advance 3-7/8 inch roller bit to 17 ft.		
15	Push						HW drill casing dropped to 12.5 ft.		
	Hyd.								
16	Push								
	Hyd.								
17	Push								
		S-2	24/14	17-19	8-14-14-17	28	Silt (ML); very stiff, 93% silt, 5% fine sand, 1% coarse sand, 1% medium sand, light	ML	2
18	drop						gray.		
	Hyd.						Advance HW drill casing to 17 ft.		
19	Push						Advance 3-7/8 in. roller bit to 22 ft.		
	Hyd.								
20	Push								

0 to 4 - Very Loose	0 to 2 - Very Soft	1. S denotes split-barrel sampler.	7. PID denotes Photoionization Detector
5 to 10 - Loose	3 to 4 - Soft	2. U denotes 3-inch O.D. undisturbed sample.	8. PPM denotes parts per million.
11 to 30 - Medium Dense	5 to 8 - Medium Stiff	3. UO denotes 3-inch Osterberg undisturbed sample.	9. PP denotes Pocket Penetrometer.
31 to 50 - Dense	9 to 15 - Stiff	4. PEN denotes penetration length of sampler.	10. FVST denotes field vane shear test.
Over 50 - Very Dense	16 to 30 - Very Stiff	5. REC denotes recovered length of sample.	11. RQD denotes Rock Quality Designation.
	Over 30 - Hard	6. SPT denotes Standard Penetration Test.	12. R denotes core run number.

REMARKS:
1) Sample description based on Atterberg Limits laboratory test data. Refer to Test Report No. 5, prepared by GeoTesting Express, dated November 29, 1999.
2) Sample description based on laboratory test data and ASTM D2487. Refer to Test Report No. 5, prepared by GeoTesting Express, dated November 29, 1999.
3)
4)

Nobis Engineering PO Box 2890 Concord, New Hampshire 03302	PROJECT Remedial Design For Operable Unit 01 New Bedford Harbor Superfund Site New Bedford, Massachusetts	BORING NO. FB - 11 SHEET 2 of 2 FILE NO. 48138.07 CHKD. BY C. Thunberg / J. Trottier

Boring Co.	Atlantic Testing Laboratories, Limited	Boring Location	northing 2704908.9 easting 814967.9		
Driller	P. Davis/M. Childs	Mudline El.	-2.28	Datum	NGVD
Logged By	E. Paddleford	Date Start	10/8/99	Date End	10/11/99

Sampler: 2-inch O.D. split-barrel sampler driven 24 inches with a 140 lb safety hammer free falling from a height of 30 inches.
Drill Rig: CME 55 skid mount
Drilling Method: 4" I.D. (HW) flush joint casing, 3-7/8" roller bit. Mud rotary.
All casing driven with a 300 lb. hammer free falling from a height of 24-inches.

Groundwater Readings Not Applicable for Offshore Borings				
Date	Time	Depth	Elev.	Stabilization Time

DEPTH	Casing Blows (ft)	SAMPLE INFORMATION Type & No.	PEN/REC (inches)	DEPTH (feet)	BLOWS PER 6 INCHES	SPT N-Value	SAMPLE DESCRIPTION	STRATUM DESCRIPTION	REMKS
	Hyd.								
21	Push								
	Push								
22	46								
		S-3	24/18	22-24	17-46-44-39	90	Silty sand (SM); very dense, 35% fine sand, 30% medium sand, 20% silt, 10% coarse sand	SM	
23	76						5% gravel, brown.		
							HW drill casing dropped 0.9 ft while driving sampler.		
24	86						Advance HW drill casing to 22 ft.		
							Mix additional bentonite drilling mud.		
25	91						Advance 3-7/8 in. roller bit to 27 ft.		
26	101								
27	81								
		S-4	24/11	27-29	18-21-28-32	49	Silty sand with gravel (SM); dense, 22% fine sand, 19% medium sand,		2
28	109						9% coarse sand, 28% gravel, 22% silt, light brown. (GLACIAL TILL)		
							Advance HW drill casing to 27 ft.		
29	98						Advance 3-7/8 in. roller bit to 32 ft.		
							Losing small amount of mud to hole.		
30	112								
31	96								
							Difficult roller bitting at 31 ft. Probable cobbles.	GLACIAL TILL	
32	83								
		S-5	24/3	32-34	27-22-19-24	41	Mainly wash material, not a true sample.		
33	96						Advance HW drill casing to 33 ft.		
							Advance 3-7/8 in. roller bit to 36.1 ft.		
34									
35									
36							Estimated top-of-bedrock at 36.1 ft.		
							Advance 3-7/8 in. roller bit 6 in. into bedrock.	PROBABLE BEDROCK	
37							Boring terminated in probable bedrock at 36.6 ft		
38									
39									
40									

0 to 4 - Very Loose	0 to 2 - Very Soft	1. S denotes split-barrel sampler.	7. PID denotes Photoionization Detector
5 to 10 - Loose	3 to 4 - Soft	2. U denotes 3-inch O.D. undisturbed sample.	8. PPM denotes parts per million.
11 to 30 - Medium Dense	5 to 8 - Medium Stiff	3. UO denotes 3-inch Osterberg undisturbed sample.	9. PP denotes Pocket Penetrometer.
31 to 50 - Dense	9 to 15 - Stiff	4. PEN denotes penetration length of sampler.	10. FVST denotes field vane shear test.
Over 50 - Very Dense	16 to 30 - Very Stiff	5. REC denotes recovered length of sample.	11. RQD denotes Rock Quality Designation.
	Over 30 - Hard	6. SPT denotes Standard Penetration Test.	12. R denotes core run number.

REMARKS:
1) Sample description based on Atterberg Limits laboratory test data. Refer to Test Report No. 5, prepared by GeoTesting Express, dated November 29, 1999.
2) Sample description based on laboratory test data and ASTM D2487. Refer to Test Report No. 5, prepared by GeoTesting Express, dated November 29, 1999.
3)
4)

Nobis Engineering PO Box 2890 Concord, New Hampshire 03302	PROJECT Remedial Design For Operable Unit 01 New Bedford Harbor Superfund Site New Bedford, Massachusetts	BORING NO. FB-12 SHEET 1 of 2 FILE NO. 48138.07 CHKD. BY C. Thunberg / J. Trottier

Boring Co.	Atlantic Testing Laboratories, Limited	Boring Location	northing 2704734.5 easting 814995.0
Driller	P. Davis	Mudline El. -3.85	Datum NGVD
Logged By	E. Paddleford	Date Start 8/24/99	Date End 8/25/99

Sampler: 2-inch O.D. split-barrel sampler driven 24 inches with a 140 lb. safety hammer free falling from a height of 30 inches.
Drill Rig: CME 55 skid mount
Drilling Method: 4" I.D. (HW) flush joint casing, 3-7/8" roller bit. Mud rotary.
All casing driven with a 300 lb. hammer free falling from a height of 24-inches.

Groundwater Readings Not Applicable for Offshore Borings

Date	Time	Depth	Elev.	Stabilization Time

DEPTH	Casing Blows (ft)	SAMPLE INFORMATION Type & No.	PEN/REC (inches)	DEPTH (feet)	BLOWS PER 6 INCHES	SPT N-Value	SAMPLE DESCRIPTION	STRATUM DESCRIPTION	REMKS
	hyd.						Advance HW drill casing from 0 to 5 ft.		
1	push						Advance 3-7/8 in. roller bit to 7 ft.		
	hyd.								
2	push								
	hyd.								
3	push								
	hyd.								
4	push								
	hyd.								
5	push								
	hyd.								
6	push								
	hyd.								
7	push						Perform borehole permeability test at 7 ft., test unsuccessful.		
	hyd.						Advance HW drill casing to 7 ft.		
8	push						Advance 3-7/8 in. roller bit to 8 ft.		
	hyd.						Perform borehole permeability test at 8 ft., test unsuccessful.	OH	
9	push						Advance HW drill casing to 8 ft.		
	hyd.	S-1	24/22	9-11	WOH/12" - 6-7	–	Advance 3-7/8 in. roller bit to 9 ft.		
10	push						Perform borehole permeability test at 9 ft.		
							S-1: 16 in: Organic clay with sand (OH); 80% organic clay, 8% coarse sand,		1
11	31						6% medium sand, 6% fine sand, dark gray.	SM	
							6 in: Silty sand (SM); 40% medium sand, 20% fine sand,		
12	drop						15% coarse sand, 15% silt, 10% gravel, gray.		
							Advance HW drill casing to 11 ft.		
13	36						Advance 3-7/8 in. roller bit to 12 ft.		
		S-2	24/18	13-15	25-22-29-33	51	Perform borehole permeability test at 12 ft., test unsuccessful.	ML	
14	drop						HW drill casing dropped to 12 ft.		
							Advance HW drill casing to 13 ft.		
15	15						Perform borehole permeability test at 13 ft.		
							S-2: Silt (ML); hard, 95% silt, 4% fine sand, 1% medium sand, gray.		1
16	17						Advance 3-7/8 in. roller bit to 18 ft.		
17	27								
18	35								
		S-3	24/10	18-20	15-12-22-24	34	Poorly graded sand (SP); dense, 50% medium sand, 30% fine sand,	SP	
19	32						15% coarse sand, 5% silt, gray.		
							Advance HW drill casing to 20 ft.		
20	28						Advance 3-7/8 in. roller bit to 25 ft.		

0 to 4 - Very Loose	0 to 2 - Very Soft	1. S denotes split-barrel sampler.	7. PID denotes Photoionization Detector
5 to 10 - Loose	3 to 4 - Soft	2. U denotes 3-inch O.D. undisturbed sample.	8. PPM denotes parts per million.
11 to 30 - Medium Dense	5 to 8 - Medium Stiff	3. UO denotes 3-inch Osterberg undisturbed sample.	9. PP denotes Pocket Penetrometer.
31 to 50 - Dense	9 to 15 - Stiff	4. PEN denotes penetration length of sampler.	10. FVST denotes field vane shear test.
Over 50 - Very Dense	16 to 30 - Very Stiff	5. REC denotes recovered length of sample.	11. RQD denotes Rock Quality Designation.
	Over 30 - Hard	6. SPT denotes Standard Penetration Test.	12. R denotes core run number.

REMARKS:
1) Sample description based on laboratory test data and ASTM D2487. Refer to Test Report No. 5, prepared by GeoTesting Express, dated November 29, 1999.
2)
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Nobis Engineering PO Box 2890 Concord, New Hampshire 03302	PROJECT Remedial Design For Operable Unit 01 New Bedford Harbor Superfund Site New Bedford, Massachusetts	BORING NO. FB-12 SHEET 2 of 2 FILE NO. 48138.07 CHKD. BY C. Thunberg / J. Trottier

Boring Co.	Atlantic Testing Laboratories, Limited	Boring Location	northing 2704734.5 easting 814995.0
Driller	P. Davis	Mudline El.	-3.85 Datum NGVD
Logged By	E. Paddleford	Date Start	8/24/99 Date End 8/25/99

Sampler: 2-inch O.D. split-barrel sampler driven 24 inches with a 140 lb. safety hammer free falling from a height of 30 inches.
Drill Rig: CME 55 skid mount
Drilling Method: 4" I.D. (HW) flush joint casing, 3-7/8" roller bit. Mud rotary.
All casing driven with a 300 lb. hammer free falling from a height of 24-inches.

Groundwater Readings Not Applicable for Offshore Borings				
Date	Time	Depth	Elev.	Stabilization Time

DEPTH	Casing Blows (ft)	SAMPLE INFORMATION Type & No.	PEN/REC (inches)	DEPTH (feet)	BLOWS PER 6 INCHES	SPT N-Value	SAMPLE DESCRIPTION	STRATUM DESCRIPTION
21	37							
22	24							
23	33							
24	29							
25	33							
26		S-4	24/2	25-27	13-12-6-9	18	Well-graded sand (SW); medium dense, 45% medium sand, 30% fine sand, 15% coarse sand, 5% gravel, 5% silt, gray.	SW
27							Advance HW drill casing to 25 ft. Advance 3-7/8 in. roller bit to 30 ft.	
28								
29								
30								
31		S-5	5/0	30-30.4	100/5"	–	No recovery. Split spoon refusal at 30.6 ft. Advance 3-7/8 in. roller bit to 34.5 ft.	PROBABLE WEATHERED BEDROCK
32							Rough roller bitting to 33.8 ft. Probable weathered bedrock.	
33								
34							Smooth roller bitting at 33.8 ft. Inferred competent bedrock depth.	PROBABLE BEDROCK
35							Bottom of exploration at 34.5 ft, probable bedrock.	
36								
37								
38								
39								
40								

0 to 4 - Very Loose	0 to 2 - Very Soft	1. S denotes split-barrel sampler.	7. PID denotes Photoionization Detector
5 to 10 - Loose	3 to 4 - Soft	2. U denotes 3-inch O.D. undisturbed sample.	8. PPM denotes parts per million.
11 to 30 - Medium Dense	5 to 8 - Medium Stiff	3. UO denotes 3-inch Osterberg undisturbed sample.	9. PP denotes Pocket Penetrometer.
31 to 50 - Dense	9 to 15 - Stiff	4. PEN denotes penetration length of sampler.	10. FVST denotes field vane shear test.
Over 50 - Very Dense	16 to 30 - Very Stiff	5. REC denotes recovered length of sample.	11. RQD denotes Rock Quality Designation.
	Over 30 - Hard	6. SPT denotes Standard Penetration Test.	12. R denotes core run number.

REMARKS:
1) Sample description based on laboratory test data and ASTM D2487. Refer to Test Report No. 5, prepared by GeoTesting Express, dated November 29, 1999.
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4)

Nobis Engineering PO Box 2890 Concord, New Hampshire 03302	PROJECT Remedial Design For Operable Unit 01 New Bedford Harbor Superfund Site New Bedford, Massachusetts	BORING NO. FB - 13 SHEET 1 of 1 FILE NO. 48138.07 CHKD. BY C. Thunberg / J. Trottier

Boring Co.	Atlantic Testing Laboratories, Limited	Boring Location	northing 2704520.5 easting 815002.0		
Driller	P. Davis	Mudline El.	-4.20	Datum	NGVD
Logged By	E. Paddleford	Date Start	10/13/99	Date End	10/13/99

Sampler: 2-inch O.D. split-barrel sampler driven 24 inches with a 140 lb safety hammer free falling from a height of 30 inches.
Drill Rig: CME 55 skid mount
Drilling Method 4" I.D. (HW) flush joint casing, 3-7/8" roller bit. Mud rotary.
All casing driven with a 300 lb. hammer free falling from a height of 24-inches.

Groundwater Readings Not Applicable for Offshore Borings				
Date	Time	Depth	Elev.	Stabilization Time

DEPTH	Casing Blows (ft)	SAMPLE INFORMATION Type & No.	PEN/REC (inches)	DEPTH (feet)	BLOWS PER 6 INCHES	SPT N-Value	SAMPLE DESCRIPTION	STRATUM DESCRIPTION	REMKS
1	Hyd. Push	UO-1	24/24	0-2	–	–	Organic silt (OH); 89% organic silt, 6% fine sand, 3% medium sand, 2% coarse sand, dark gray. Traces of shells noted in sample. Sheen visible on sample surface.	OH	1
2	Hyd. Push						Advance HW drill casing from 0 to 5 ft. Advance 3-7/8 in. roller bit to 5 ft.		
3	Hyd. Push								
4	Hyd. Push								
5	Hyd. Push								
6	Hyd. Push	S-1	24/10	5-7	WOR/24"	–	Organic soil (OH); 90% organic silt/clay, 5% fine sand, 5% shell fragments, dark gray.	OH	
7	Hyd. Push						Advance HW drill casing to 10 ft. Advance 3-7/8 in. roller bit to 10 ft.		
8	Hyd. Push								
9	Hyd. Push								
10	Hyd. Push								
11	Hyd. Push	S-2	24/22	10-12	WOR/24"	–	Organic soil (OH); 95% organic clay/silt, 5% fine sand, gray. Advance HW drill casing to 13.7 ft (sand and clay interface).	OH	
12	Hyd. Push						No longer able to push casing due to sand layer encounter. Advance 3-7/8 in. roller bit to 13.7 ft.		
13	Hyd. Push								
14	Push 22	S-3	24/14	13.7-15.7	11-12-16-14	28	Well-graded sand (SW); medium dense, 40% medium sand, 35% fine sand, 15% coarse sand, 5% gravel, 5% silt, gray.	SW	
15							Advance HW drill casing to 14.7 ft. Switch to mud rotary drilling technique at 14.7 ft.		
16							Advance 3-7/8 in. roller bit to 18.7 ft. Losing small amount of mud to hole.		
17									
18									
19		S-4	24/8	18.7-20.7	14-18-12-10	30	Poorly graded sand with gravel (SP); medium dense, 45% medium sand, 20% fine sand, 15% coarse sand, 15% gravel, 5% silt, gray.	SP	
20							Bottom of exploration at 20.7 ft.; no refusal.		

0 to 4 - Very Loose	0 to 2 - Very Soft	1. S denotes split-barrel sampler.	7. PID denotes Photoionization Detector
5 to 10 - Loose	3 to 4 - Soft	2. U denotes 3-inch O.D. undisturbed sample.	8. PPM denotes parts per million.
11 to 30 - Medium Dense	5 to 8 - Medium Stiff	3. UO denotes 3-inch Osterberg undisturbed sample.	9. PP denotes Pocket Penetrometer.
31 to 50 - Dense	9 to 15 - Stiff	4. PEN denotes penetration length of sampler.	10. FVST denotes field vane shear test.
Over 50 - Very Dense	16 to 30 - Very Stiff	5. REC denotes recovered length of sample.	11. RQD denotes Rock Quality Designation.
	Over 30 - Hard	6. SPT denotes Standard Penetration Test.	12. R denotes core run number.

REMARKS:
1) Sample description based on laboratory test data and ASTM D2487. Refer to Test Report No. 5, prepared by GeoTesting Express, dated November 29, 1999.
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Nobis Engineering PO Box 2890 Concord, New Hampshire 03302	PROJECT Remedial Design For Operable Unit 01 New Bedford Harbor Superfund Site New Bedford, Massachusetts	BORING NO. FB-14 SHEET 1 of 2 FILE NO. 48138.07 CHKD. BY C. Thunberg / J. Trottier

Boring Co.	Atlantic Testing Laboratories, Limited	Boring Location	northing 2704320.0	easting 815024.4	
Driller	P. Davis	Mudline El.	-3.70	Datum	NGVD
Logged By	E. Paddleford	Date Start	8/24/99	Date End	8/24/99

Sampler: 2-inch O.D. split-barrel sampler driven 24 inches with a 140 lb. safety hammer free falling from a height of 30 inches.
Drill Rig: CME 55 skid mount
Drilling Method 4" I.D. (HW) flush joint casing, 3 7/8" roller bit. Mud rotary.
All casing driven with a 300 lb. hammer free falling from a height of 24-inches.

Groundwater Readings Not Applicable for Offshore Borings				
Date	Time	Depth	Elev.	Stabilization Time

DEPTH	Casing Blows (ft)	SAMPLE INFORMATION Type & No.	PEN/REC (inches)	DEPTH (feet)	BLOWS PER 6 INCHES	SPT N-Value	SAMPLE DESCRIPTION	STRATUM DESCRIPTION	REMKS
	hyd						Advance HW drill casing from 0 to 3 ft.		
1	push						Advance 3-7/8 in. roller bit to 3 ft.		
	hyd						Perform borehole permeability test at 3 ft., not holding water.		
2	push						Advance HW drill casing to 4 ft. (hydraulic push)		
	hyd						Advance 3-7/8 in. roller bit to 4 ft.		
3	push								
	hyd								
4	push						Perform borehole permeability test at 4 ft., not holding water.		
	hyd						Advance HW drill casing to 7 ft.		
5	push						Advance 3-7/8 in. roller bit to 7 ft.		
	hyd								
6	push								
	hyd								
7	push						Perform borehole permeability test at 7 ft.		
	hyd	S-1	24/9	7-9	WOR/24"	--	Organic clay (OH); 76% organic clay/silt, 9% medium sand, 8% fine sand, 5% coarse sand,	OH	1
8	push						2% gravel, moderate organic odor, dark gray to black. Shell fragments noted in sample.		
	hyd						Advance HW drill casing to 9 ft. (hydraulic push)		
9	push						Advance 3-7/8 in. roller bit to 9 ft.		
		S-2	24/11	9-11	WOR/12"-11-7	--	Organic soil with sand (OH); 50% organic clay, 30% organic silt, 10% fine sand,	OH	
10	11						5% coarse sand (rounded), 5% shell fragments, moderate organic odor, dark gray to black.		
							Advance 3-7/8 in. roller bit to 11 ft.		
11	21								
		S-3	24/12	11-13	7-11-10-17	21	Poorly graded sand (SP); medium dense, 40% fine sand, 35% medium sand, 10% coarse	SP	
12	36						sand, 5% gravel, 5% silt, 5% shell fragments, gray.		
							Advance HW drill casing to 14 ft.		
13	50						Advance 3-7/8 in. roller bit to 14 ft.		
							HW drill casing pulled to 13.3 ft. while retrieving roller bit.		
14	50						Perform borehole permeability test at 13.3 ft.		
		S-4	24/7	14-16	16-28-27-14	55	Well-graded gravel with silt and sand (GW-GM); very dense, 51% gravel, 16% coarse sand,	GW-GM	1
15	18						16% medium sand, 10% fine sand, 7% silt, gray.		
							Switch to mud rotary drilling techniques at 13.3 ft.		
16	24						Advance 3-7/8 in. roller bit to 19 ft.		
17	17								
18	27								
19	34								
		S-5	24/2	19-21	20-15-18-18	33	Similar to S-4, except dense.	GW-GM	
20	6						Advance HW drill casing to 19 ft.		

0 to 4 - Very Loose	0 to 2 - Very Soft	1. S denotes split-barrel sampler.	7. PID denotes Photoionization Detector
5 to 10 - Loose	3 to 4 - Soft	2. U denotes 3-inch O.D. undisturbed sample.	8. PPM denotes parts per million.
11 to 30 - Medium Dense	5 to 8 - Medium Stiff	3. UO denotes 3-inch Osterberg undisturbed sample.	9. PP denotes Pocket Penetrometer.
31 to 50 - Dense	9 to 15 - Stiff	4. PEN denotes penetration length of sampler.	10. FVST denotes field vane shear test.
Over 50 - Very Dense	16 to 30 - Very Stiff	5. REC denotes recovered length of sample.	11. RQD denotes Rock Quality Designation.
	Over 30 - Hard	6. SPT denotes Standard Penetration Test.	12. R denotes core run number.

REMARKS:
1) Sample description based on laboratory test data and ASTM D2487. Refer to Test Report No. 5, prepared by GeoTesting Express, dated November 29, 1999.
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Nobis Engineering PO Box 2890 Concord, New Hampshire 03302	PROJECT Remedial Design For Operable Unit 01 New Bedford Harbor Superfund Site New Bedford, Massachusetts	BORING NO. FB-14 SHEET 2 of 2 FILE NO. 48138.07 CHKD. BY C. Thunberg / J. Trottier

Boring Co.	Atlantic Testing Laboratories, Limited	Boring Location	northing 2704320.0	easting 815024.4	
Driller	P. Davis	Mudline El.	-3.70	Datum	NGVD
Logged By	E. Paddleford	Date Start	8/24/99	Date End	8/24/99

Sampler: 2-inch O.D. split-barrel sampler driven 24 inches with a 140 lb. safety hammer free falling from a height of 30 inches.
Drill Rig: CME 55 skid mount
Drilling Method 4" I.D. (HW) flush joint casing, 3 7/8" roller bit. Mud rotary.
All casing driven with a 300 lb. hammer free falling from a height of 24-inches.

Groundwater Readings Not Applicable for Offshore Borings				
Date	Time	Depth	Elev.	Stabilization Time

DEPTH	Casing Blows (ft)	SAMPLE INFORMATION Type & No.	PEN/REC (inches)	DEPTH (feet)	BLOWS PER 6 INCHES	SPT N-Value	SAMPLE DESCRIPTION	STRATUM DESCRIPTION	REMKS
							Mix additional bentonite drilling mud.		
21	5						Advance 3-7/8 in. roller bit to 24 ft.		
22	3								
23	3								
24	20								
25		S-6	24/10	24-25.3	31-55-100/3"	–	Silty sand with gravel (SM); very dense, 30% medium sand, 20% coarse sand, 20% fine sand, 15% gravel, 15% silt, olive green. Weathered rock in tip of split-spoon sampler.	SM	
26							Split-spoon refusal at 25.3 ft, probable boulder. Advance HW drill casing to 24 ft.		
27							Advance 3-7/8 in. roller bit to 29 ft.		
28									
29									
30		S-7	12/0	29-30	41-90-100/0"	–	No recovery. Probable bedrock at 30.5 ft. Advance 3-7/8 in. roller bit to 31.5 ft.		
31								PROBABLE BEDROCK	
32							Bottom of exploration at 31.5 ft.; probable bedrock.		
33									
34									
35									
36									
37									
38									
39									
40									

0 to 4 - Very Loose	0 to 2 - Very Soft	1. S denotes split-barrel sampler.	7. PID denotes Photoionization Detector
5 to 10 - Loose	3 to 4 - Soft	2. U denotes 3-inch O.D. undisturbed sample.	8. PPM denotes parts per million.
11 to 30 - Medium Dense	5 to 8 - Medium Stiff	3. UO denotes 3-inch Osterberg undisturbed sample.	9. PP denotes Pocket Penetrometer.
31 to 50 - Dense	9 to 15 - Stiff	4. PEN denotes penetration length of sampler.	10. FVST denotes field vane shear test.
Over 50 - Very Dense	16 to 30 - Very Stiff	5. REC denotes recovered length of sample.	11. RQD denotes Rock Quality Designation.
	Over 30 - Hard	6. SPT denotes Standard Penetration Test.	12. R denotes core run number.

REMARKS:
1) Sample description based on laboratory test data and ASTM D2487. Refer to Test Report No. 5, prepared by GeoTesting Express, dated November 29, 1999.
2)
3)
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Nobis Engineering PO Box 2890 Concord, New Hampshire 03302	PROJECT Remedial Design For Operable Unit 01 New Bedford Harbor Superfund Site New Bedford, Massachusetts	BORING NO. FB - 15 SHEET 1 of 2 FILE NO. 48138.07 CHKD. BY C. Thunberg / J. Trottier

Boring Co.	Atlantic Testing Laboratories, Limited	Boring Location	northing 2704122.1 easting 815017.2
Driller	P. Davis	Mudline El.	-3.61 Datum NGVD
Logged By	E. Paddleford	Date Start	10/12/99 Date End 10/12/99

Sampler: 2-inch O.D. split-barrel sampler driven 24 inches with a 140 lb safety hammer free falling from a height of 30 inches.
Drill Rig: CME 55 skid mount
Drilling Method 4" I.D. (HW) flush joint casing, 3 7/8" roller bit. Mud rotary.
All casing driven with a 300 lb. hammer free falling from a height of 24-inches.

Groundwater Readings Not Applicable for Offshore Borings				
Date	Time	Depth	Elev.	Stabilization Time

DEPTH	Casing Blows (ft)	Type & No.	PEN/REC (inches)	DEPTH (feet)	BLOWS PER 6 INCHES	SPT N-Value	SAMPLE DESCRIPTION	STRATUM DESCRIPTION	REMKS
	Hyd.	UO-1	24/24	0-2	--	--	Organic soil (OH); 90% organic clay/silt, 5% fine sand, 5% shell fragments,	OH	
1	Push						dark gray. As noted from tip of sample tube.		
	Hyd.						Advance HW drill casing from 0 to 5 ft.		
2	Push						Advance 3-7/8 in. roller bit to 5 ft.		
	Hyd.								
3	Push								
	Hyd.								
4	Push								
	Hyd.								
5	Push								
	Hyd.	S-1	24/16	5-7	WOR/24"	--	Organic soil (OH); 90% organic clay/silt, 5% fine sand, 5% shell fragments,	OH	
6	Push						dark gray.		
	Hyd.						Advance HW drill casing to 10 ft.		
7	Push						Advance 3-7/8 in. roller bit to 10 ft.		
	Hyd.								
8	Push								
	Hyd.								
9	Push								
	Hyd.								
10	Push								
	Hyd.	S-2	24/20	10-12	WOR/4"-	--	Similar to S-1.	OH	
11	Push				WOH/20"		Advance HW drill casing to 14.5 ft. (hydraulic push)		
	Hyd.						Could not be pushed any further, probable sand/clay interface.		
12	Push						Advance 3-7/8 in. roller bit to 14.5 ft.		
	Hyd.								
13	Push								
	Hyd.								
14	Push								
	Push								
15		S-3	24/12	14.5-16.5	6-9-6-7	15	Poorly graded sand (SP); medium dense, 40% fine sand, 30% medium sand,	SP	
							20% coarse sand, 5% gravel, 5% silt, gray.		
16							Switch to mud rotary drilling technique at 14.5 ft.		
							Advance 3-7/8 in. roller bit to 19.5 ft.		
17									
18									
19									
20		S-4	24/NR	19.5-21.5	11-20-15-19	35	Poorly graded sand with gravel (SP); dense, 35% medium sand, 30% coarse sand,	SP	1

0 to 4 - Very Loose	0 to 2 - Very Soft	1. S denotes split-barrel sampler.	7. PID denotes Photoionization Detector
5 to 10 - Loose	3 to 4 - Soft	2. U denotes 3-inch O.D. undisturbed sample.	8. PPM denotes parts per million.
11 to 30 - Medium Dense	5 to 8 - Medium Stiff	3. UO denotes 3-inch Osterberg undisturbed sample.	9. PP denotes Pocket Penetrometer.
31 to 50 - Dense	9 to 15 - Stiff	4. PEN denotes penetration length of sampler.	10. FVST denotes field vane shear test.
Over 50 - Very Dense	16 to 30 - Very Stiff	5. REC denotes recovered length of sample.	11. RQD denotes Rock Quality Designation.
	Over 30 - Hard	6. SPT denotes Standard Penetration Test.	12. R denotes core run number.

REMARKS:
1) NR = Not recorded.
2)
3)
4)

Nobis Engineering PO Box 1890 Concord, New Hampshire 03302	PROJECT Remedial Design For Operable Unit 01 New Bedford Harbor Superfund Site New Bedford, Massachusetts	BORING NO. FB - 15 SHEET 2 of 2 FILE NO. 48138.07 CHKD. BY C. Thunberg / J. Trottier

Boring Co.	Atlantic Testing Laboratories, Limited	Boring Location	northing 2704122.1	easting 815017.2	
Driller	P. Davis	Mudline El.	-3.61	Datum	NGVD
Logged By	E. Paddleford	Date Start	10/12/99	Date End	10/12/99

Sampler: 2-inch O.D. split-barrel sampler driven 24 inches with a 140 lb safety hammer free falling from a height of 30 inches.
Drill Rig: CME 55 skid mount
Drilling Method: 4" I.D. (HW) flush joint casing, 3 7/8" roller bit. Mud rotary.
All casing driven with a 300 lb. hammer free falling from a height of 24-inches.

Groundwater Readings Not Applicable for Offshore Borings				
Date	Time	Depth	Elev.	Stabilization Time

DEPTH	Casing Blows (ft)	SAMPLE INFORMATION Type & No.	PEN/REC (inches)	DEPTH (feet)	BLOWS PER 6 INCHES	SPT N-Value	SAMPLE DESCRIPTION	STRATUM DESCRIPTION	REMARKS
21							20% gravel, 15% fine sand, gray.		
22							Bottom of exploration at 21.5 ft.; no refusal.		
23									
24									
25									
26									
27									
28									
29									
30									
31									
32									
33									
34									
35									
36									
37									
38									
39									
40									

0 to 4 - Very Loose	0 to 2 - Very Soft	1. S denotes split-barrel sampler.	7. PID denotes Photoionization Detector
5 to 10 - Loose	3 to 4 - Soft	2. U denotes 3-inch O.D. undisturbed sample.	8. PPM denotes parts per million.
11 to 30 - Medium Dense	5 to 8 - Medium Stiff	3. UO denotes 3-inch Osterberg undisturbed sample.	9. PP denotes Pocket Penetrometer.
31 to 50 - Dense	9 to 15 - Stiff	4. PEN denotes penetration length of sampler.	10. FVST denotes field vane shear test.
Over 50 - Very Dense	16 to 30 - Very Stiff	5. REC denotes recovered length of sample.	11. RQD denotes Rock Quality Designation.
	Over 30 - Hard	6. SPT denotes Standard Penetration Test.	12. R denotes core run number.

REMARKS:
1) NR = Not recorded.
2)
3)
4)

Nobis Engineering PO Box 2890 Concord, New Hampshire 03302	PROJECT Remedial Design For Operable Unit 01 New Bedford Harbor Superfund Site New Bedford, Massachusetts	BORING NO. FB-16 SHEET 1 of 2 FILE NO. 48138.07 CHKD. BY C. Thunberg / J. Trottier

Boring Co.	Atlantic Testing Laboratories, Limited	Boring Location	northing 2703924.2 easting 815035.6		
Driller	P. Davis	Mudline El.	-3.60	Datum	NGVD
Logged By	E. Paddleford	Date Start	8/19/99	Date End	8/23/99

Sampler: 2-inch O.D. split-barrel sampler driven 24 inches with a 140 lb. safety hammer free falling from a height of 30 inches.
Drill Rig: CME 55 skid mount
Drilling Method: 4" I.D. (HW) flush joint casing, 3 7/8" roller bit. Mud rotary.
All casing driven with a 300 lb. hammer free falling from a height of 24-inches.

Groundwater Readings Not Applicable for Offshore Borings				
Date	Time	Depth	Elev.	Stabilization Time

DEPTH	Casing Blows (ft)	SAMPLE INFORMATION Type & No.	PEN/REC (inches)	DEPTH (feet)	BLOWS PER 6 INCHES	SPT N-Value	SAMPLE DESCRIPTION	STRATUM DESCRIPTION	REMKS
	Hyd.						Advance drill casing from 0 to 3 ft.		
1	Push						Advance 3-7/8 in. roller bit to 3 ft.		
	Hyd.						Perform borehole permeability test at 3 ft.		
2	Push								
	Hyd.								
3	Push								
	Hyd.	S-1	24/10	3-5	WOR/24"	--	Organic clay (OH); 74% organic clay/silt, 17% fine sand, 4% medium sand, 1% coarse	OH	1
4	Push						sand, 4% gravel, moderate organic odor, dark gray to black.		
	Hyd.						Advance HW drill casing to 5 ft.		
5	Push						Advance 3-7/8 in. roller bit to 5 ft.		
	Hyd.	S-2	24/8	5-7	WOR/24"	--	Similar to S-1.	OH	
6	Push						Advance 3-7/8 in. roller bit to 7 ft.		
	Hyd.								
7	Push								
	Hyd.	S-3	24/11	7-9	WOR/24"	--	Similar to S-2 , except some shell fragments.	OH	
8	Push						Advance 3-7/8 in. roller bit to 9 ft.		
	Hyd.								
9	Push								
	Hyd.	S-4	24/8	9-11	WOR/24"	--	Similar to S-2.	OH	
10	Push						Advance HW drill casing to 10 ft.		
	Hyd.						Advance 3-7/8 in. roller bit to 11 ft.		
11	Push								
	Hyd.	S-5	24/10	11-13	WOR/24"	--	Similar to S-2.	OH	
12	Push						Advance 3-7/8 in. roller bit to 13 ft.		
	Hyd.								
13	Push								
	Hyd.	S-6	24/12	13-15	WOR/12"-	--	8 in: Organic soil with sand (OH); 60% organic clay, 20% organic silt, 20% sand, dark	OH	
14	Push				WOH/6" -14		gray to black.		
	Hyd.						4 in: Poorly graded sand with gravel (SP); 45% coarse sand, 30% medium sand		
15	Push						20% gravel, 5% fine sand.	SP	
		S-7	24/8	15-17	33-18-12-10	30	Advance HW drill casing to 15 ft.	SP-SM	
16	3						Advance 3-7/8 in. roller bit to 15 ft.		
							Perform bore hole permeability test at 15 ft..		
17	3						S-7: Poorly graded sand with silt and gravel (SP-SM); medium dense, 22% fine sand,		1
							21% medium sand, 14% coarse sand, 35% gravel, 8% silt, dark brown.		
18	9						Switch to mud rotary drilling technique at 15 ft.		
							Advance 3-7/8 in. roller bit to 20 ft.		
19	15								
20	54								

0 to 4 - Very Loose	0 to 2 - Very Soft	1. S denotes split-barrel sampler.	7. PID denotes Photoionization Detector
5 to 10 - Loose	3 to 4 - Soft	2. U denotes 3-inch O.D. undisturbed sample.	8. PPM denotes parts per million.
11 to 30 - Medium Dense	5 to 8 - Medium Stiff	3. UO denotes 3-inch Osterberg undisturbed sample.	9. PP denotes Pocket Penetrometer.
31 to 50 - Dense	9 to 15 - Stiff	4. PEN denotes penetration length of sampler.	10. FVST denotes field vane shear test.
Over 50 - Very Dense	16 to 30 - Very Stiff	5. REC denotes recovered length of sample.	11. RQD denotes Rock Quality Designation.
	Over 30 - Hard	6. SPT denotes Standard Penetration Test.	12. R denotes core run number.

REMARKS:
1) Sample description based on laboratory test data and ASTM D2487. Refer to Test Report No. 5, prepared by GeoTesting Express, dated November 29, 1999.
2)
3)
4)

Nobis Engineering PO Box 2890 Concord, New Hampshire 03302	PROJECT Remedial Design For Operable Unit 01 New Bedford Harbor Superfund Site New Bedford, Massachusetts	BORING NO. FB-16 SHEET 2 of 2 FILE NO. 48138.07 CHKD. BY C. Thunberg / J. Trottier

Boring Co.	Atlantic Testing Laboratories, Limited	Boring Location	northing 2703924.2 easting 815035.6		
Driller	P. Davis	Mudline El.	-3.60	Datum	NGVD
Logged By	E. Paddleford	Date Start	8/19/99	Date End	8/23/99

Sampler: 2-inch O.D. split-barrel sampler driven 24 inches with a 140 lb. safety hammer free falling from a height of 30 inches.
Drill Rig: CME 55 skid mount
Drilling Method: 4" I.D. (HW) flush joint casing, 3 7/8" roller bit. Mud rotary.
All casing driven with a 300 lb. hammer free falling from a height of 24-inches.

Groundwater Readings Not Applicable for Offshore Borings				
Date	Time	Depth	Elev.	Stabilization Time

DEPTH	Casing Blows (ft)	SAMPLE INFORMATION Type & No.	PEN/REC (inches)	DEPTH (feet)	BLOWS PER 6 INCHES	SPT N-Value	SAMPLE DESCRIPTION	STRATUM DESCRIPTION
		S-8	24/8	20-22	23-27-46-47	73	Silty sand with gravel (SM); very dense, 40% fine sand, 10% medium sand, 5% coarse	SM
21	59						sand, 30% gravel, 15% silt, brown.	
							Advance HW drill casing to 20 ft.	
22	36						Advance 3-7/8 in. roller bit to 25 ft.	
							Mix additional bentonite drilling mud.	
23	43							
24	52							
25	75							
		S-9	24/14	25-27	67-37-67-61	104	Silty sand with gravel (SM); wet, very dense, 25% coarse sand, 5% medium sand,	SM
26							15% fine sand, 35% gravel, 20% silt, brown.	
							Advance HW drill casing to 25 ft.	
27							Advance 3-7/8 in. roller bit to 30 ft.	
28								
29								
30								
		S-10	16/12	30-31.3	94-119-102/4"	–	Poorly graded sand with silt and gravel (SP-SM); 30% medium sand, 30% coarse	SP-SM
31							sand, 20% gravel, 10% fine sand, 10% silt, brown.	
							Refusal at 31.3 ft.	
32							Advance 3-7/8 in. roller bit to 33.5 ft.	
							Probable bedrock at 32.7 ft as noted by roller bit smoothness. Broken up probable	
33							weathered bedrock from 31.8 to 32.7 ft.	PROBABLE
							Bottom of exploration at 32.7 ft.; probable bedrock.	BEDROCK
34								
35								
36								
37								
38								
39								
40								

0 to 4 - Very Loose	0 to 2 - Very Soft	1. S denotes split-barrel sampler.	7. PID denotes Photoionization Detector
5 to 10 - Loose	3 to 4 - Soft	2. U denotes 3-inch O.D. undisturbed sample.	8. PPM denotes parts per million.
11 to 30 - Medium Dense	5 to 8 - Medium Stiff	3. UO denotes 3-inch Osterberg undisturbed sample.	9. PP denotes Pocket Penetrometer.
31 to 50 - Dense	9 to 15 - Stiff	4. PEN denotes penetration length of sampler.	10. FVST denotes field vane shear test.
Over 50 - Very Dense	16 to 30 - Very Stiff	5. REC denotes recovered length of sample.	11. RQD denotes Rock Quality Designation.
	Over 30 - Hard	6. SPT denotes Standard Penetration Test.	12. R denotes core run number.

REMARKS:
1) Sample description based on laboratory test data and ASTM D2487. Refer to Test Report No. 5, prepared by GeoTesting Express, dated November 29, 1999.
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3)
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Nobis Engineering PO Box 2890 Concord, New Hampshire 03302	PROJECT Remedial Design For Operable Unit 01 New Bedford Harbor Superfund Site New Bedford, Massachusetts	BORING NO. FB - 17 SHEET 1 of 2 FILE NO. 48138.07 CHKD. BY C. Thunberg / J. Trottier

Boring Co.	Atlantic Testing Laboratories, Limited	Boring Location [1]	northing 2703702 easting 815043		
Driller	M. Childs	Mudline El.	-2.74	Datum	NGVD
Logged By	E. Paddleford	Date Start	10/6/99	Date End	10/6/99

Sampler: 2-inch O.D. split-barrel sampler driven 24 inches with a 140 lb safety hammer free falling from a height of 30 inches.
Drill Rig: CME 55 skid mount
Drilling Method 4" I.D. (HW) flush joint casing, 3 7/8" roller bit. Wash & drive.
All casing driven with a 300 lb. hammer free falling from a height of 24-inches.

Groundwater Readings Not Applicable for Offshore Borings				
Date	Time	Depth	Elev.	Stabilization Time

DEPTH	Casing Blows (ft)	SAMPLE INFORMATION Type & No.	PEN/REC (inches)	DEPTH (feet)	BLOWS PER 6 INCHES	SPT N-Value	SAMPLE DESCRIPTION	STRATUM DESCRIPTION	REMKS
	Hyd.	UO-	24/20	0-2	--	--	Organic soil (OH); organic silt/clay with shell fragments as noted in tip	OH	
1	Push						of sample tube. 2 in. of sample slid out bottom of tube.		
	Hyd.						Advance HW drill casing from 0 to 5 ft.		
2	Push						Advance 3-7/8 in. roller bit to 5 ft.		
	Hyd.						Perform borehole permeability test at 5 ft.; test unsuccessful.		
3	Push								
	Hyd.								
4	Push								
	Hyd.								
5	Push								
	Hyd.	S-1	24/10	5-7	WOR/6" -	--	Organic soil (OH); 80% organic clay, 15% organic silt, 5% shell	OH	
6	Push				WOH/18"		fragments, dark gray.		
	Hyd.						Advance HW drill casing to 7 ft.		
7	Push						Advance 3-7/8 in. roller bit to 7 ft.		
	Hyd.	S-2	24/10	7.3-9.3	WOR/24"	--	Perform borehole permeability test at 7.3 ft.	OH	
8	Push						S-2: Organic clay (OH); 83% organic clay/silt, 11% fine sand, 3% medium sand,		2
	Hyd.						2% coarse sand, 1% gravel, dark gray.		
9	Push						Advance HW drill casing to 12 ft.		
	Hyd.						Advance HW 3-7/8 in. roller bit to 12 ft.		
10	Push								
	Hyd.								
11	Push								
	Hyd.								
12	Push								
	Hyd.	S-3	24/12	12-14	WOR/24"	--	Organic soil (OH); 80% organic clay, 15% organic silt, 5% fine sand,	OH	
13	Push						dark gray.		
	Hyd.						Advance HW drill casing to 17 ft.		
14	Push						Advance 3-7/8 in. roller bit to 17 ft.		
	Hyd.								
15	Push								
	Hyd.								
16	Push								
	Hyd.								
17	Push								
	Hyd.	S-4	24/13	17-19	WOR/18" -	--	9 in: Similar to S-3.	OH	
18	Push				3/6"		4 in: Clayey sand (SC); 85% fine sand, 10% clay, 5% silt.		
	Hyd.						Advance HW drill casing to 19 ft.		
19	Push						Advance 3-7/8 in. roller bit to 19 ft.	SC	
		S-5	24/10	19-21	21-19-13-14	32	Well-graded sand with silt and gravel (SW-SM); dense, 25% medium sand, 17% coarse	SW-SM	2
20	12						sand, 13% fine sand, 34% gravel, 11% silt, brown.		

0 to 4 - Very Loose	0 to 2 - Very Soft	1. S denotes split-barrel sampler.	7. PID denotes Photoionization Detector
5 to 10 - Loose	3 to 4 - Soft	2. U denotes 3-inch O.D. undisturbed sample.	8. PPM denotes parts per million.
11 to 30 - Medium Dense	5 to 8 - Medium Stiff	3. UO denotes 3-inch Osterberg undisturbed sample.	9. PP denotes Pocket Penetrometer.
31 to 50 - Dense	9 to 15 - Stiff	4. PEN denotes penetration length of sampler.	10. FVST denotes field vane shear test.
Over 50 - Very Dense	16 to 30 - Very Stiff	5. REC denotes recovered length of sample.	11. RQD denotes Rock Quality Designation.
	Over 30 - Hard	6. SPT denotes Standard Penetration Test.	12. R denotes core run number.

REMARKS:
1) Boring was drilled within 10 +/- feet of the northing and easting coordinates presented here.
2) Sample description based on laboratory test data and ASTM D2487. Refer to Test Report No. 5, prepared by GeoTesting Express, dated November 29, 1999.
3)
4)

Nobis Engineering PO Box 2890 Concord, New Hampshire 03302	PROJECT Remedial Design For Operable Unit 01 New Bedford Harbor Superfund Site New Bedford, Massachusetts	BORING NO. FB - 17 SHEET 2 of 2 FILE NO. 48138.07 CHKD. BY C. Thunberg / J. Trottier

Boring Co.	Atlantic Testing Laboratories, Limited	Boring Location [1]	northing 2703702 easting 815043		
Driller	M. Childs	Mudline El.	-2.74	Datum	NGVD
Logged By	E. Paddleford	Date Start	10/6/99	Date End	10/6/99

Sampler: 2-inch O.D. split-barrel sampler driven 24 inches with a 140 lb safety hammer free falling from a height of 30 inches.
Drill Rig: CME 55 skid mount
Drilling Method: 4" I.D. (HW) flush joint casing, 3 7/8" roller bit. Wash & drive.
All casing driven with a 300 lb. hammer free falling from a height of 24-inches.

Groundwater Readings Not Applicable for Offshore Borings				
Date	Time	Depth	Elev.	Stabilization Time

DEPTH	Casing Blows (ft)	SAMPLE INFORMATION Type & No.	PEN/REC (inches)	DEPTH (feet)	LOWS PER 6 INCHE	SPT N-Value	SAMPLE DESCRIPTION	STRATUM DESCRIPTION	REMKS
							Advance HW drill casing to 20.7 ft.		
21	24						Advance 3-7/8 in. roller bit to 20.7 ft.		
							Perform borehole permeability test at 20.7 ft.		
22							Bottom of exploration at 20.7 ft., no refusal.		
23									
24									
25									
26									
27									
28									
29									
30									
31									
32									
33									
34									
35									
36									
37									
38									
39									
40									

0 to 4 - Very Loose	0 to 2 - Very Soft	1. S denotes split-barrel sampler.	7. PID denotes Photoionization Detector
5 to 10 - Loose	3 to 4 - Soft	2. U denotes 3-inch O.D. undisturbed sample.	8. PPM denotes parts per million.
11 to 30 - Medium Dense	5 to 8 - Medium Stiff	3. UO denotes 3-inch Osterberg undisturbed sample.	9. PP denotes Pocket Penetrometer.
31 to 50 - Dense	9 to 15 - Stiff	4. PEN denotes penetration length of sampler.	10. FVST denotes field vane shear test.
Over 50 - Very Dense	16 to 30 - Very Stiff	5. REC denotes recovered length of sample.	11. RQD denotes Rock Quality Designation.
	Over 30 - Hard	6. SPT denotes Standard Penetration Test.	12. R denotes core run number.

REMARKS:
1) Boring was drilled within 10 +/- feet of the northing and easting coordinates presented here.
2) Sample description based on laboratory test data and ASTM D2487. Refer to Test Report No. 5, prepared by GeoTesting Express, dated November 29, 1999.
3)
4)

Nobis Engineering PO Box 2890 Concord, New Hampshire 03302	PROJECT Remedial Design For Operable Unit 01 New Bedford Harbor Superfund Site New Bedford, Massachusetts	BORING NO. FB - 19 SHEET 1 of 2 FILE NO. 48138.07 CHKD. BY C. Thunberg / J. Trottier

Boring Co.	Atlantic Testing Laboratories, Limited	Boring Location	northing 2704914.8 easting 815170.9
Driller	P. Davis	Mudline El.	-4.88 Datum NGVD
Logged By	E. Paddleford	Date Start	8/3/99 Date End 8/3/99

Sampler: 2-inch O.D. split-barrel sampler driven 24 inches with a 140 lb safety hammer free falling from a height of 30 inches.
Drill Rig: CME 55 skid mount
Drilling Method: 4" I.D. (HW) flush joint casing, 3 7/8" roller bit. Mud rotary.
All casing driven with a 300 lb. hammer free falling from a height of 24-inches.

Groundwater Readings Not Applicable for Offshore Borings				
Date	Time	Depth	Elev.	Stabilization Time

DEPTH	Casing Blows (ft)	SAMPLE INFORMATION Type & No.	PEN/REC (inches)	DEPTH (feet)	BLOWS PER 6 INCHES	SPT N-Value	SAMPLE DESCRIPTION	STRATUM DESCRIPTION	REMKS
	Hyd						Advance HW drill casing from 0 to 3 ft.		
1	Push						Advance 3-7/8 in. roller bit to 3 ft.		
	Hyd								
2	Push								
	Hyd								
3	Push								
	Hyd	UO-1	24/21	3-5	–	–	Organic soil (OH), gray, noted in tip of sample.	OH	
4	Push						Advance HW drill casing to 6 ft.		
	Hyd						Advance 3-7/8 in. roller bit to 6 ft.		
5	Push								
	Hyd								
6	Push								
	Hyd	UO-2	24/20	6-8	–	–	Organic soil (OH), gray, noted in tip of sample.	OH	
7	Push						Advance HW drill casing to 9 ft.		
	Hyd						Advance 3-7/8 in. roller bit to 9 ft.		
8	Push								
	Hyd								
9	Push								
	Hyd	UO-3	24/19	9-11	–	–	Organic soil (OH), gray, noted in tip of sample.	OH	
10	Push						Advance HW drill casing to 12 ft.		
	Hyd						Advance 3-7/8 in. roller bit to 12 ft.		
11	Push								
	Hyd								
12	Push								
	Hyd	UO-4	24/21	12-14	–	–	Organic soil (OH), gray, noted in tip of sample.	OH	
13	Push						Advance HW drill casing to 15 ft.		
	Hyd						Advance 3-7/8 in. roller bit to 15 ft.		
14	Push								
	Hyd								
15	Push								
		UO-5	24/6	15-17	–	–	High back pressure when pushing UO-5, probable sand interface.	SP	
16	6						Sand in tip, poor recovery, sand fell out of tube upon retrieval.		
							Advance 3-7/8 in. roller bit to 20 ft.		
17	7								
18	7								
19	8								
20	12								

0 to 4 - Very Loose	0 to 2 - Very Soft	1. S denotes split-barrel sampler.	7. PID denotes Photoionization Detector
5 to 10 - Loose	3 to 4 - Soft	2. U denotes 3-inch O.D. undisturbed sample.	8. PPM denotes parts per million.
11 to 30 - Medium Dense	5 to 8 - Medium Stiff	3. UO denotes 3-inch Osterberg undisturbed sample.	9. PP denotes Pocket Penetrometer.
31 to 50 - Dense	9 to 15 - Stiff	4. PEN denotes penetration length of sampler.	10. FVST denotes field vane shear test.
Over 50 - Very Dense	16 to 30 - Very Stiff	5. REC denotes recovered length of sample.	11. RQD denotes Rock Quality Designation.
	Over 30 - Hard	6. SPT denotes Standard Penetration Test.	12. R denotes core run number.

REMARKS:
1) NR = Not recorded.
2)
3)
4)

Nobis Engineering PO Box 2890 Concord, New Hampshire 03302	PROJECT Remedial Design For Operable Unit 01 New Bedford Harbor Superfund Site New Bedford, Massachusetts	BORING NO. FB - 19 SHEET 2 of 2 FILE NO. 48138.07 CHKD. BY C. Thunberg / J. Trottier

Boring Co.	Atlantic Testing Laboratories, Limited	Boring Location	northing 2704914.8	easting 815170.9	
Driller	P. Davis	Mudline El.	-4.88	Datum	NGVD
Logged By	E. Paddleford	Date Start	8/3/99	Date End	8/3/99

Sampler: 2-inch O.D. split-barrel sampler driven 24 inches with a 140 lb safety hammer free falling from a height of 30 inches.
Drill Rig: CME 55 skid mount
Drilling Method: 4" I.D. (HW) flush joint casing, 3 7/8" roller bit. Mud rotary.
All casing driven with a 300 lb. hammer free falling from a height of 24-inches.

Groundwater Readings Not Applicable for Offshore Borings				
Date	Time	Depth	Elev.	Stabilization Time

DEPTH	Casing Blows (ft)	Type & No.	PEN/REC (inches)	DEPTH (feet)	BLOWS PER 6 INCHES	SPT N-Value	SAMPLE DESCRIPTION	STRATUM DESCRIPTION
		S-1	24/6	20-22	12-14-12-13	26	Poorly graded sand (SP); medium dense, 90% fine sand, 5% silt,	SP
21	2						5% rounded fine gravel, gray.	
							Advance HW drill casing to 20 ft.	
22	3						Advance 3-7/8 in. roller bit to 25 ft.	
23	5							
24	5							
25	16							
		S-2	24/8	25-27	8-10-13-13	23	Poorly graded sand with gravel (SP); medium dense, 80% medium sand,	SP
26	22						20% rounded fine gravel, gray.	
							Advance HW drill casing to 25 ft.	
27	30						Advance 3-7/8 in. roller bit to 30 ft.	
28	12							
29	20							
30	36							
		S-3	24/7	30-31.5	24-32-15-50/0"	47	Clayey sand with gravel (SC);dense, 60% medium sand, 20% gravel,	GLACIAL TILL
31	94		CORE		CORE		20% clay, gray. (GLACIAL TILL)	
	NR		INTERVAL		TIME		Split spoon refusal at 31.5 ft.	
32		R-1	31.5-32.5		8.5 min		Advance HW drill casing to 31.5 feet.	BEDROCK
							Casing refusal at 31.5 ft.	
33			32.5-33.5		8 min		Begin NX rock core at 31.5 ft.	
							R-1: 31.5 - 36.5 ft. Recovery = 80% RQD = 70%	
34			33.5-34.5		8 min		Fresh, moderately hard, gray, fine grained to aphanitic GNEISS with low angle,	
							close, rough, undulating, partly open joints.	
35			34.5-35.5		4 mins./6"		Core barrel dropped 7 in.; no wash water return (34.5-35.5 ft.)	
							Little wash water return (35.5-36.5 ft.).	
36			35.5-36.5		6 mins./11"			
37		R-2	36.5-37.5		6 min		R-2: 36.5 - 40.0 ft. Recovery = 83% RQD = 60%	
							Fresh, moderately hard, gray, fine grained to aphanitic GNEISS with low angle,	
38			37.5-38.5		8.5 min		closed, rough, stepped, tight joints.	
							Stopped at 40 ft. core barrel clogged, trouble pulling barrel out casing pulled up,	
39			38.5-39.5		NR		try to re-drive casing, refusal. Attempt to advance roller bit several times.	
40			39.5-40		NR		Boring terminated in bedrock at 40 ft.	

0 to 4 - Very Loose	0 to 2 - Very Soft	1. S denotes split-barrel sampler.	7. PID denotes Photoionization Detector
5 to 10 - Loose	3 to 4 - Soft	2. U denotes 3-inch O.D. undisturbed sample.	8. PPM denotes parts per million.
11 to 30 - Medium Dense	5 to 8 - Medium Stiff	3. UO denotes 3-inch Osterberg undisturbed sample.	9. PP denotes Pocket Penetrometer.
31 to 50 - Dense	9 to 15 - Stiff	4. PEN denotes penetration length of sampler.	10. FVST denotes field vane shear test.
Over 50 - Very Dense	16 to 30 - Very Stiff	5. REC denotes recovered length of sample.	11. RQD denotes Rock Quality Designation.
	Over 30 - Hard	6. SPT denotes Standard Penetration Test.	12. R denotes core run number.

REMARKS:
1) NR = Not recorded.
2)
3)
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Nobis Engineering PO Box 2890 Concord, New Hampshire 03302	PROJECT Remedial Design For Operable Unit 01 New Bedford Harbor Superfund Site New Bedford, Massachusetts	BORING NO. FB - 20 SHEET 1 of 3 FILE NO. 48138.07 CHKD. BY C. Thunberg / J. Trottier

Boring Co.	Atlantic Testing Laboratories, Limited	Boring Location	northing 2704767.6 easting 815118.9		
Driller	P. Davis	Mudline El.	-5.17	Datum	NGVD
Logged By	E. Paddleford	Date Start	8/4/99	Date End	8/4/99

Sampler: 2-inch O.D. split-barrel sampler driven 24 inches with a 140 lb safety hammer free falling from a height of 30 inches.
Drill Rig: CME 55 skid mount
Drilling Method 4" I.D. (HW) flush joint casing, 3 7/8" roller bit. Mud rotary.
All casing driven with a 300 lb. hammer free falling from a height of 24-inches.

Groundwater Readings Not Applicable for Offshore Borings				
Date	Time	Depth	Elev.	Stabilization Time

DEPTH	Casing Blows (ft)	SAMPLE INFORMATION Type & No.	PEN/REC (inches)	DEPTH (feet)	BLOWS PER 6 INCHES	SPT N-Value	SAMPLE DESCRIPTION	STRATUM DESCRIPTION	REMKS
	Hyd						Advance HW drill casing from 0 to 3 ft.		
1	Push						Advance 3-7/8 in. roller bit to 3 ft.		
	Hyd								
2	Push								
	Hyd								
3	Push								
	Hyd	UO-1	24/20	3-5	--	--	Organic soil (OH) noted in tip of sample, gray.	OH	
4	Push						Advance HW drill casing to 6 ft.		
	Hyd						Advance 3-7/8 in. roller bit to 6 ft.		
5	Push								
	Hyd								
6	Push								
	Hyd	UO-2	24/19	6-8	--	--	Organic clay (OH); organic clay, dark gray.	OH	1
7	Push						Advance HW drill casing to 9 ft.		
	Hyd						Advance 3-7/8 in. roller bit to 9 ft.		
8	Push								
	Hyd								
9	Push								
	Hyd	UO-3	24/22	9-11	--	--	Organic soil (OH) noted in tip of sample.	OH	
10	Push						Advance HW drill casing to 12 ft.		
	Hyd						Advance 3-7/8 in. roller bit to 12 ft.		
11	Push								
	Hyd								
12	Push								
		UO-4	24/15	12-14	--	--	Organic soil (OH).	OH	
13	8						6 inch sand layer in tip of sampler not recovered upon retrieval.		
							Sand encountered at 13.5 ft.		
14	4						Advance 3-7/8 in. roller bit to 15 ft.		
15	18								
		S-1	24/9	15-17	11-21-22-24	43	Poorly graded sand with gravel (SP); dense, 80% medium sand, 20% rounded	SP	
16	34						gravel, gray.		
							Advance HW drill casing to 17 ft.		
17	50						Advance 3-7/8 in. roller bit to 20 ft.		
18	9								
19	10								
20	20								

0 to 4 - Very Loose	0 to 2 - Very Soft	1. S denotes split-barrel sampler.	7. PID denotes Photoionization Detector
5 to 10 - Loose	3 to 4 - Soft	2. U denotes 3-inch O.D. undisturbed sample.	8. PPM denotes parts per million.
11 to 30 - Medium Dense	5 to 8 - Medium Stiff	3. UO denotes 3-inch Osterberg undisturbed sample.	9. PP denotes Pocket Penetrometer.
31 to 50 - Dense	9 to 15 - Stiff	4. PEN denotes penetration length of sampler.	10. FVST denotes field vane shear test.
Over 50 - Very Dense	16 to 30 - Very Stiff	5. REC denotes recovered length of sample.	11. RQD denotes Rock Quality Designation.
	Over 30 - Hard	6. SPT denotes Standard Penetration Test.	12. R denotes core run number.

REMARKS:
1) Sample description based on Atterberg Limits laboratory test data. Refer to Test Report No. 7, prepared by GeoTesting Express, dated January 24, 2000.
2) NR = Not recorded.
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Nobis Engineering PO Box 2890 Concord, New Hampshire 03302	PROJECT Remedial Design For Operable Unit 01 New Bedford Harbor Superfund Site New Bedford, Massachusetts	BORING NO. FB - 20 SHEET 2 of 3 FILE NO. 48138.07 CHKD. BY C. Thunberg / J. Trottier

Boring Co.	Atlantic Testing Laboratories, Limited	Boring Location	northing 2704767.6 easting 815118.9		
Driller	P. Davis	Mudline El.	-5.17	Datum	NGVD
Logged By	E. Paddleford	Date Start	8/4/99	Date End	8/4/99

Sampler: 2-inch O.D. split-barrel sampler driven 24 inches with a 140 lb safety hammer free falling from a height of 30 inches.
Drill Rig: CME 55 skid mount
Drilling Method: 4" I.D. (HW) flush joint casing, 3 7/8" roller bit. Mud rotary.
All casing driven with a 300 lb. hammer free falling from a height of 24-inches.

Groundwater Readings Not Applicable for Offshore Borings				
Date	Time	Depth	Elev.	Stabilization Time

DEPTH	Casing Blows (ft)	SAMPLE INFORMATION Type & No.	PEN/REC (inches)	DEPTH (feet)	BLOWS PER 6 INCHES	SPT N-Value	SAMPLE DESCRIPTION	STRATUM DESCRIPTION
		S-2	24/3	20-22	7-11-13-15	24	Poor recovery. Washed sample.	
21	12						Advance HW drill casing to 20 ft.	
							Advance 3-7/8 in. roller bit to 25 ft.	
22	8							
23	10							
24	10							
25	24							
		S-3	24/0	25-27	11-17-23-13	40	No recovery, small amount of gravel.	
26	12						Advance HW drill casing to 25 ft.	
							Advance 3-7/8 in. roller bit to 30 ft.	
27	19							
28	28							
29	22							
30	41							
		S-4	24/NR	30-32	22-7-13-15	20	Silty gravel with sand (GM); medium dense, 60% angular gravel, 20% fine sand,	GM
31	23						20% silt, brown.	
							Advance HW drill casing to 30 ft.	
32	41						Advance 3-7/8 in. roller bit to 34 feet, probable bedrock.	
							Advance HW drill casing to 33.5 ft. (refusal).	
33	50		CORE		CORE			
	NR		INTERVAL		TIME			
34							Begin NX rock core at 34 ft.	BEDROCK
		R-1	34-35		10 min		R-1: 34-39 ft. Recovery = 99% RQD = 99%	
35							Fresh, moderately hard, gray, aphanitic GNEISS with primary low angle, close,	
			35-36		10.5 min		rough, stepped, partly open joints. Secondary high angle, wide, rough, planar, partly	
36							open joints. Feldspar banding.	
			36-37		8 min			
37								
			37-38		9.5 min			
38								
			38-39		8.5 min			
39							R-2: 39-44 ft. Recovery = 89% RQD = 86%	
		R-2	39-40		7 min		Fresh, moderately hard, gray, aphanitic GNEISS with low angle, close, rough,	
40							stepped, closed joints.	

0 to 4 - Very Loose	0 to 2 - Very Soft	1. S denotes split-barrel sampler.	7. PID denotes Photoionization Detector
5 to 10 - Loose	3 to 4 - Soft	2. U denotes 3-inch O.D. undisturbed sample.	8. PPM denotes parts per million.
11 to 30 - Medium Dense	5 to 8 - Medium Stiff	3. UO denotes 3-inch Osterberg undisturbed sample.	9. PP denotes Pocket Penetrometer.
31 to 50 - Dense	9 to 15 - Stiff	4. PEN denotes penetration length of sampler.	10. FVST denotes field vane shear test.
Over 50 - Very Dense	16 to 30 - Very Stiff	5. REC denotes recovered length of sample.	11. RQD denotes Rock Quality Designation.
	Over 30 - Hard	6. SPT denotes Standard Penetration Test.	12. R denotes core run number.

REMARKS:
1) Sample description based on Atterberg Limits laboratory test data. Refer to Test Report No. 7, prepared by GeoTesting Express, dated January 24, 2000.
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Nobis Engineering PO Box 2890 Concord, New Hampshire 03302	PROJECT Remedial Design For Operable Unit 01 New Bedford Harbor Superfund Site New Bedford, Massachusetts	BORING NO. FB - 20 SHEET 3 of 3 FILE NO. 48138.07 CHKD. BY C. Thunberg / J. Trottier

Boring Co.	Atlantic Testing Laboratories, Limited	Boring Location	northing 2704767.6 easting 815118.9		
Driller	P. Davis	Mudline El.	-5.17	Datum	NGVD
Logged By	E. Paddleford	Date Start	8/4/99	Date End	8/4/99

Sampler: 2-inch O.D. split-barrel sampler driven 24 inches with a 140 lb safety hammer free falling from a height of 30 inches.
Drill Rig: CME 55 skid mount
Drilling Method: 4" I.D. (HW) flush joint casing, 3 7/8" roller bit. Mud rotary.
All casing driven with a 300 lb. hammer free falling from a height of 24-inches.

Groundwater Readings Not Applicable for Offshore Borings				
Date	Time	Depth	Elev.	Stabilization Time

DEPTH	Casing Blows (ft)	SAMPLE INFORMATION Type & No.	PEN/REC (inches)	DEPTH (feet)	BLOWS PER 6 INCHES	SPT N-Value	SAMPLE DESCRIPTION	STRATUM DESCRIPTION	REMKS
41				40-41	8.5 min			BEDROCK	
42				41-42	8.5 min				
43				42-43	8 min				
44				43-44	8.5 min				
45							Boring terminated in bedrock at 44 ft.		
46									
47									
48									
49									
50									
51									
52									
53									
54									
55									
56									
57									
58									
59									
60									

0 to 4 - Very Loose	0 to 2 - Very Soft	1. S denotes split-barrel sampler.	7. PID denotes Photoionization Detector
5 to 10 - Loose	3 to 4 - Soft	2. U denotes 3-inch O.D. undisturbed sample.	8. PPM denotes parts per million.
11 to 30 - Medium Dense	5 to 8 - Medium Stiff	3. UO denotes 3-inch Osterberg undisturbed sample.	9. PP denotes Pocket Penetrometer.
31 to 50 - Dense	9 to 15 - Stiff	4. PEN denotes penetration length of sampler.	10. FVST denotes field vane shear test.
Over 50 - Very Dense	16 to 30 - Very Stiff	5. REC denotes recovered length of sample.	11. RQD denotes Rock Quality Designation.
	Over 30 - Hard	6. SPT denotes Standard Penetration Test.	12. R denotes core run number.

REMARKS:
1) Sample description based on Atterberg Limits laboratory test data. Refer to Test Report No. 7, prepared by GeoTesting Express, dated January 24, 2000.
2) NR = Not recorded.
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Nobis Engineering PO Box 2890 Concord, New Hampshire 03302	PROJECT Remedial Design For Operable Unit 01 New Bedford Harbor Superfund Site New Bedford, Massachusetts	BORING NO. FB - 22 SHEET 1 of 2 FILE NO. 48138.07 CHKD. BY C. Thunberg / J. Trottier

Boring Co.	Atlantic Testing Laboratories, Limited	Boring Location	northing 2704620.1 easting 815106.9		
Driller	P. Davis	Mudline El.	-4.23	Datum	NGVD
Logged By	E. Paddleford	Date Start	10/11/99	Date End	10/11/99

Sampler: 2-inch O.D. split-barrel sampler driven 24 inches with a 140 lb safety hammer free falling from a height of 30 inches.
Drill Rig: CME 55 skid mount
Drilling Method: 4" I.D. (HW) flush joint casing, 3 7/8" roller bit. Mud rotary.
All casing driven with a 300 lb. hammer free falling from a height of 24-inches.

Groundwater Readings Not Applicable for Offshore Borings

Date	Time	Depth	Elev.	Stabilization Time

DEPTH	Casing Blows (ft)	SAMPLE INFORMATION Type & No.	PEN/REC (inches)	DEPTH (feet)	BLOWS PER 6 INCHES	SPT N-Value	SAMPLE DESCRIPTION	STRATUM DESCRIPTION	REMKS
	Hyd.	UO-1	24/24	0-2	--	--	Organic soil (OH).	OH	
1	Push						Advance HW drill casing from 0 to 5 ft.		
	Hyd.						Advance 3-7/8 in. roller bit to 5 ft. Strong organic odor and black wash water return.		
2	Push								
	Hyd.								
3	Push								
	Hyd.								
4	Push								
	Hyd.								
5	Push								
	Hyd.	S-1	24/8	5-7	WOR/24"	--	Organic soil (OH); 95% organic silt/clay, 5% fine sand, trace shell	OH	
6	Push						fragments.		
	Hyd.						Advance HW drill casing to 10 ft.		
7	Push						Advance 3-7/8 in. roller bit to 10 ft.		
	Hyd.								
8	Push								
	Hyd.								
9	Push								
	Hyd.								
10	Push								
	Hyd.	S-2	24/14	10-12	WOR/24"	--	Organic soil with sand (OH); 75% organic silt/clay, 25% fine sand.	OH	
11	Push						Advance HW drill casing to 15 ft.		
	Hyd.						Advance 3-7/8 in. roller bit to 15 ft.		
12	Push								
	Hyd.								
13	Push								
	Hyd.								
14	Push								
	Hyd.								
15	Push						Estimated strata change at 14.8 ft.		
		S-3	24/12	15-17	5-6-9-15	15	Well-graded sand (SW); medium dense, 45% medium sand, 35% fine sand,	SW	
16	15						15% coarse sand, 5% gravel, gray.		
							Switch to mud rotary drilling technique at 15 ft.		
17	15						Advance 3-7/8 in. roller bit to 20 ft.		
18	17								
19	26								
	19								
20	7								

0 to 4 - Very Loose	0 to 2 - Very Soft	1. S denotes split-barrel sampler.	7. PID denotes Photoionization Detector
5 to 10 - Loose	3 to 4 - Soft	2. U denotes 3-inch O.D. undisturbed sample.	8. PPM denotes parts per million.
11 to 30 - Medium Dense	5 to 8 - Medium Stiff	3. UO denotes 3-inch Osterberg undisturbed sample.	9. PP denotes Pocket Penetrometer.
31 to 50 - Dense	9 to 15 - Stiff	4. PEN denotes penetration length of sampler.	10. FVST denotes field vane shear test.
Over 50 - Very Dense	16 to 30 - Very Stiff	5. REC denotes recovered length of sample.	11. RQD denotes Rock Quality Designation.
	Over 30 - Hard	6. SPT denotes Standard Penetration Test.	12. R denotes core run number.

REMARKS:
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Nobis Engineering PO Box 2890 Concord, New Hampshire 03302	PROJECT Remedial Design For Operable Unit 01 New Bedford Harbor Superfund Site New Bedford, Massachusetts	BORING NO. FB - 22 SHEET 2 of 2 FILE NO. 48138.07 CHKD. BY C. Thunberg / J. Trottier

Boring Co.	Atlantic Testing Laboratories, Limited	Boring Location	northing 2704620.1 easting 815106.9
Driller	P. Davis	Mudline El.	-4.23 Datum NGVD
Logged By	E. Paddleford	Date Start	10/11/99 Date End 10/11/99

Sampler: 2-inch O.D. split-barrel sampler driven 24 inches with a 140 lb safety hammer free falling from a height of 30 inches.
Drill Rig: CME 55 skid mount
Drilling Method: 4" I.D. (HW) flush joint casing, 3 7/8" roller bit. Mud rotary.
All casing driven with a 300 lb. hammer free falling from a height of 24-inches.

Groundwater Readings Not Applicable for Offshore Borings

Date	Time	Depth	Elev.	Stabilization Time

DEPTH	Casing Blows (ft)	Type & No.	PEN/REC (inches)	DEPTH (feet)	BLOWS PER 6 INCHES	SPT N-Value	SAMPLE DESCRIPTION	STRATUM DESCRIPTION
		S-4	24/15	20-22	14-16-12-15	28	Silty sand (SM); medium dense, 60% fine sand, 40% silt, gray.	SM
21	9						Advance HW drill casing to 19.5 ft.	
							Advance 3-7/8 in. roller bit to 25 ft.	
22	21							
23	33							
24	40							
	26							
25	drop							
		S-5	24/11	25-27	13-11-12-10	23	Well-graded sand with silt and gravel (SW-SM); medium dense, 35% fine sand,	SW-SM
26							25% medium sand, 15% coarse sand, 15% gravel, 10% silt.	
							Advance HW drill casing to 24.5 ft.	
27							Advance 3-7/8 in. roller bit to 30 ft.	
							Casing dropped 0.5 ft while advancing roller bit to 30 ft.	
28								
29								
30								
		S-6	24/9	30-32	9-15-26-17	41	Well-graded sand (SW); dense, 35% medium sand, 30% fine sand,	SW
31							20% coarse sand, 10% gravel, 5% silt, brown.	
							Lost casing drive shoe in hole; boring terminated.	
32								
							Bottom of exploration at 32 ft.; no refusal.	
33								
34								
35								
36								
37								
38								
39								
40								

0 to 4 - Very Loose	0 to 2 - Very Soft	1. S denotes split-barrel sampler.	7. PID denotes Photoionization Detector
5 to 10 - Loose	3 to 4 - Soft	2. U denotes 3-inch O.D. undisturbed sample.	8. PPM denotes parts per million.
11 to 30 - Medium Dense	5 to 8 - Medium Stiff	3. UO denotes 3-inch Osterberg undisturbed sample.	9. PP denotes Pocket Penetrometer.
31 to 50 - Dense	9 to 15 - Stiff	4. PEN denotes penetration length of sampler.	10. FVST denotes field vane shear test.
Over 50 - Very Dense	16 to 30 - Very Stiff	5. REC denotes recovered length of sample.	11. RQD denotes Rock Quality Designation.
	Over 30 - Hard	6. SPT denotes Standard Penetration Test.	12. R denotes core run number.

REMARKS:
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Nobis Engineering PO Box 2890 Concord, New Hampshire 03302	PROJECT Remedial Design For Operable Unit 01 New Bedford Harbor Superfund Site New Bedford, Massachusetts	BORING NO. FB-23 SHEET 1 of 3 FILE NO. 48138.07 CHKD. BY C. Thunberg / J. Trottier

Boring Co.	Atlantic Testing Laboratories, Limited	Boring Location	northing 2704428.1 easting 815106.9
Driller	P. Davis	Mudline El.	-5.19 Datum NGVD
Logged By	E. Paddleford	Date Start	8/9/99 Date End 8/10/99

Sampler: 2-inch O.D. split-barrel sampler driven 24 inches with a 140 lb. safety hammer free falling from a height of 30 inches.
Drill Rig: CME 55 skid mount
Drilling Method: 4" I.D. (HW) flush joint casing, 3 7/8" roller bit. Mud rotary.
All casing driven with a 300 lb. hammer free falling from a height of 24-inches.

Groundwater Readings Not Applicable for Offshore Boring

Date	Time	Depth	Elev.	Stabilization Time

DEPTH	Casing Blows (ft)	SAMPLE INFORMATION Type & No.	PEN/REC (inches)	DEPTH (feet)	BLOWS PER 6 INCHES	SPT N-Value	SAMPLE DESCRIPTION	STRATUM DESCRIPTION	REMARKS
	hyd.						Advance HW drill casing from 0 to 3 ft.		
1	push						Advance 3-7/8 in. roller bit to 3 ft.		
	hyd.								
2	push								
	hyd.								
3	push								
	hyd.	UO-1	24/20	3-5	–	–	Organic soil (OH); 60% organic silt, 40% organic clay, as noted from tip of sample.	OH	
4	push						Advance HW drill casing to 6 ft.		
	hyd.						Advance 3-7/8 in. roller bit to 6 ft.		
5	push								
	hyd.								
6	push								
	hyd.	UO-2	24/21	6-8	–	–	Similar to UO-1.	OH	
7	push						Advance HW drill casing to 9 ft.		
	hyd.						Advance 3-7/8 in. roller bit to 9 ft.		
8	push								
	hyd.								
9	push								
		UO-3	24/12	9-11	–	–	12 in.: Similar to UO-2	OH	
10	3						12 in of poorly graded sand (SP) fell out of bottom of sample tube.		
							Switch to mud rotary drilling technique at 9 ft.	SP	
11	2						Advance 3-7/8 in. roller bit to 15 feet.		
12	6								
13	12								
14	20								
15	34								
		S-1	24/0	15-17	15-20-24-24	44	No recovery.		
16	21						Advance HW drill casing to 15 ft.		
							Advance 3-7/8 in. roller bit to 20 ft.		
17	21								
18	28								
19	33								
20	54								

0 to 4 - Very Loose	0 to 2 - Very Soft	1. S denotes split-barrel sampler.	7. PID denotes Photoionization Detector
5 to 10 - Loose	3 to 4 - Soft	2. U denotes 3-inch O.D. undisturbed sample.	8. PPM denotes parts per million.
11 to 30 - Medium Dense	5 to 8 - Medium Stiff	3. UO denotes 3-inch Osterberg undisturbed sample.	9. PP denotes Pocket Penetrometer.
31 to 50 - Dense	9 to 15 - Stiff	4. PEN denotes penetration length of sampler.	10. FVST denotes field vane shear test.
Over 50 - Very Dense	16 to 30 - Very Stiff	5. REC denotes recovered length of sample.	11. RQD denotes Rock Quality Designation.
	Over 30 - Hard	6. SPT denotes Standard Penetration Test.	12. R denotes core run number.

REMARKS:
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Nobis Engineering PO Box 2890 Concord, New Hampshire 03302	PROJECT Remedial Design For Operable Unit 01 New Bedford Harbor Superfund Site New Bedford, Massachusetts	BORING NO. FB-23 SHEET 2 of 3 FILE NO. 48138.07 CHKD. BY C. Thunberg / J. Trottier

Boring Co.	Atlantic Testing Laboratories, Limited	Boring Location	northing 2704428.1 easting 815106.9
Driller	P. Davis	Mudline El.	-5.19 Datum NGVD
Logged By	E. Paddleford	Date Start	8/9/99 Date End 8/10/99

Sampler: 2-inch O.D. split-barrel sampler driven 24 inches with a 140 lb. safety hammer free falling from a height of 30 inches.
Drill Rig: CME 55 skid mount
Drilling Method: 4" I.D. (HW) flush joint casing, 3 7/8" roller bit. Mud rotary.
All casing driven with a 300 lb. hammer free falling from a height of 24-inches.

Groundwater Readings Not Applicable for Offshore Boring				
Date	Time	Depth	Elev.	Stabilization Time

DEPTH	Casing Blows (ft)	SAMPLE INFORMATION Type & No.	PEN/REC (inches)	DEPTH (feet)	BLOWS PER 6 INCHES	SPT N-Value	SAMPLE DESCRIPTION	STRATUM DESCRIPTION	REMARKS
		S-2	24/10	20-22	7-6-7-10	13	Poorly graded sand with gravel (SP); medium dense, 15% coarse sand, 50% medium	SP	
21	20						sand, 15% fine sand, 5% silt, 15% gravel, gray.		
							Advance HW drill casing to 20 ft.		
22	25						Advance 3-7/8 in. roller bit to 25 ft.		
23	48								
24	40								
25	90								
		S-3	24/8	25-27	19-19-24-43	43	Poorly graded gravel with sand (GP); dense, 70% gravel, 30% fine to coarse sand, brown.	GP	
26	61						Advance HW drill casing to 25 ft.		
							Advance 3-7/8 in. roller bit to 30 ft.		
27	86						Advance HW drill casing to 30 ft.		
28	72								
29	39								
30	47								
							Encountered probable boulder at 30 ft.		
31	49						Advance 3-7/8 in. roller bit through probable boulder to 31.5 ft.		
32	40	S-4	24/20	31.5-33.5	5-6-12-11	18	Well-graded sand (SW); medium dense, 70% medium sand, 15% coarse sand,	SW	
							10% fine sand, 5% gravel, brown.		
33	36						Advance HW drill casing to 34 ft.		
							Advance 3-7/8 in. roller bit to 36.5 ft.		
34	27								
35	30								
36	45								
37	218	S-5	24/10	36.5-38.5	9-8-19-23	27	Well-graded sand with silt (SW-SM); medium dense, 40% medium sand, 35% fine	GLACIAL TILL	
							sand, 10% coarse sand, 10% silt, 5% gravel, gray. (GLACIAL TILL)		
38	166						Advance HW drill casing to 37 ft.		
							Advance 3-7/8 in. roller bit to 38 ft. Hole collapsed.		
39	98						Advance HW drill casing to 39.3 ft.		
	292						Advance 3-7/8 in. roller bit to 39.3 ft.	BEDROCK	
40	/4"						Begin NX rock core at 39 ft.		

0 to 4 - Very Loose	0 to 2 - Very Soft	1. S denotes split-barrel sampler.	7. PID denotes Photoionization Detector
5 to 10 - Loose	3 to 4 - Soft	2. U denotes 3-inch O.D. undisturbed sample.	8. PPM denotes parts per million.
11 to 30 - Medium Dense	5 to 8 - Medium Stiff	3. UO denotes 3-inch Osterberg undisturbed sample.	9. PP denotes Pocket Penetrometer.
31 to 50 - Dense	9 to 15 - Stiff	4. PEN denotes penetration length of sampler.	10. FVST denotes field vane shear test.
Over 50 - Very Dense	16 to 30 - Very Stiff	5. REC denotes recovered length of sample.	11. RQD denotes Rock Quality Designation.
	Over 30 - Hard	6. SPT denotes Standard Penetration Test.	12. R denotes core run number.

REMARKS:
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Nobis Engineering PO Box 2890 Concord, New Hampshire 03302	PROJECT Remedial Design For Operable Unit 01 New Bedford Harbor Superfund Site New Bedford, Massachusetts	BORING NO. FB-23 SHEET 3 of 3 FILE NO. 48138.07 CHKD. BY C. Thunberg / J. Trottier

Boring Co.	Atlantic Testing Laboratories, Limited	Boring Location	northing 2704428.1	easting 815106.9	
Driller	P. Davis	Mudline El.	-5.19	Datum	NGVD
Logged By	E. Paddleford	Date Start	8/9/99	Date End	8/10/99

Sampler: 2-inch O.D. split-barrel sampler driven 24 inches with a 140 lb. safety hammer free falling from a height of 30 inches.
Drill Rig: CME 55 skid mount
Drilling Method: 4" I.D. (HW) flush joint casing, 3 7/8" roller bit. Mud rotary.
All casing driven with a 300 lb. hammer free falling from a height of 24-inches.

Groundwater Readings Not Applicable for Offshore Boring				
Date	Time	Depth	Elev.	Stabilization Time

DEPTH	Casing Blows (R)	SAMPLE INFORMATION Type & No.	PEN/REC (inches)	DEPTH (feet)	BLOWS PER 6 INCHES	SPT N-Value	SAMPLE DESCRIPTION	STRATUM DESCRIPTION	REMARKS
			CORE		CORE				
41			INTERVAL		TIME				
		R-1	39-40		14 min		R-1: 39 - 44 ft. Recovery = 100% RQD = 82%		
42							Fresh, moderately hard, gray, aphanitic GNEISS with low angle, close, rough,	BEDROCK	
			40-41		13 min		undulating, fresh, partly open joints.		
43									
			41-42		12 min				
44									
			42-43		10.5 min				
45									
			43-44		11 min				
46									
		R-2	44-45		12 min		R-2: 44 - 49 ft. Recovery = 100% RQD = 68%		
47							Fresh, moderately hard, gray, aphanitic GNEISS with primary low angle, close,		
			45-46		11 min		rough, undulating, fresh, partly open joints. One secondary high angle, close,		
48							rough, stepped, fresh, partly open joint.		
			46-47		12 min		8 in. layer or inclusion of feldspar at 48 ft. This feldspar mineralization layer		
49							shows signs of weathering, including external weathered cracks and slight pitting.		
			47-48		14 min				
50									
			48-49		13.5 min				
51							Boring terminated in bedrock at 49 ft.		
52									
53									
54									
55									
56									
57									
58									
59									
60									

0 to 4 - Very Loose	0 to 2 - Very Soft	1. S denotes split-barrel sampler.	7. PID denotes Photoionization Detector
5 to 10 - Loose	3 to 4 - Soft	2. U denotes 3-inch O.D. undisturbed sample.	8. PPM denotes parts per million.
11 to 30 - Medium Dense	5 to 8 - Medium Stiff	3. UO denotes 3-inch Osterberg undisturbed sample.	9. PP denotes Pocket Penetrometer.
31 to 50 - Dense	9 to 15 - Stiff	4. PEN denotes penetration length of sampler.	10. FVST denotes field vane shear test.
Over 50 - Very Dense	16 to 30 - Very Stiff	5. REC denotes recovered length of sample.	11. RQD denotes Rock Quality Designation.
	Over 30 - Hard	6. SPT denotes Standard Penetration Test.	12. R denotes core run number.

REMARKS:
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Nobis Engineering PO Box 2890 Concord, New Hampshire 03302	PROJECT Remedial Design For Operable Unit 01 New Bedford Harbor Superfund Site New Bedford, Massachusetts	BORING NO. FB - 24 SHEET 1 of 3 FILE NO. 48138.07 CHKD. BY C. Thunberg / J. Trottier

Boring Co.	Atlantic Testing Laboratories, Limited	Boring Location	northing 2704330.5 easting 815178.2		
Driller	P. Davis	Mudline El.	-5.56	Datum	NGVD
Logged By	E. Paddleford	Date Start	8/5/99	Date End	8/5/99

Sampler: 2-inch O.D. split-barrel sampler driven 24 inches with a 140 lb safety hammer free falling from a height of 30 inches.
Drill Rig: CME 55 skid mount
Drilling Method 4" I.D. (HW) flush joint casing, 3 7/8" roller bit, Mud rotary.
All casing driven with a 300 lb. hammer free falling from a height of 24-inches.

Groundwater Readings Not Applicable for Offshore Boring				
Date	Time	Depth	Elev.	Stabilization Time

DEPTH	Casing Blows (ft)	SAMPLE INFORMATION Type & No.	PEN/REC (inches)	DEPTH (feet)	BLOWS PER 6 INCHES	SPT N-Value	SAMPLE DESCRIPTION	STRATUM DESCRIPTION	REMARKS
	Hyd						Advance HW drill casing from 0 to 5 ft.		
1	Push						Advance 3-7/8 in. roller bit to 5 ft.		
	Hyd								
2	Push								
	Hyd								
3	Push								
	Hyd								
4	Push								
	Hyd								
5	Push								
	Hyd	S-1	24/5	5-7	WOR/24"	–	Organic soil with gravel (OH); wet, very soft, 80% organic clay/silt, 5% coarse sand,	OH	
6	Push						15% gravel, dark gray.		
	Hyd						Advance HW drill casing to 7 ft.		
7	Push						Advance 3-7/8 in. roller bit to 7 ft.		
	Hyd	S-2	24/20	7-9	WOR/24"	–	Organic soil with sand (OH); wet, very soft, 75% organic clay/silt, 25% fine sand, slight	OH	
8	Push						organic odor, dark gray.		
	Hyd						Advance HW drill casing to 9 ft.		
9	Push						Advance 3-7/8 in. roller bit to 9 ft.		
	Hyd	S-3	24/18	9-11	WOR/24"	–	Similar to S-2.	OH	
10	Push						Advance HW drill casing to 11 ft.		
	Hyd						Advance 3-7/8 in. roller bit to 11 ft.		
11	Push								
	Hyd	S-4	24/10	11-13	WOR/12"	–	Organic soil with sand (OH); 45% organic silt, 30% organic clay, 25% fine sand.	OH	
12	Push				WOH/12"		Advance HW drill casing to 13 ft.		
	Hyd						Advance 3-7/8 in. roller bit to 13 ft.		
13	Push								
		S-5	24/19	13-15	3-5-8-8	13	Silty sand (SM); medium dense, 15% fine sand, 45% medium sand, 10% fine gravel,	SM	
14	8						30% silt, gray.		
							Advance 3-7/8 in. roller bit to 20 ft.		
15	6								
16	15								
17	16								
18	22								
19	21								
20	16								

0 to 4 - Very Loose	0 to 2 - Very Soft	1. S denotes split-barrel sampler.	7. PID denotes Photoionization Detector
5 to 10 - Loose	3 to 4 - Soft	2. U denotes 3-inch O.D. undisturbed sample.	8. PPM denotes parts per million.
11 to 30 - Medium Dense	5 to 8 - Medium Stiff	3. UO denotes 3-inch Osterberg undisturbed sample.	9. PP denotes Pocket Penetrometer.
31 to 50 - Dense	9 to 15 - Stiff	4. PEN denotes penetration length of sampler.	10. FVST denotes field vane shear test.
Over 50 - Very Dense	16 to 30 - Very Stiff	5. REC denotes recovered length of sample.	11. RQD denotes Rock Quality Designation.
	Over 30 - Hard	6. SPT denotes Standard Penetration Test.	12. R denotes core run number.

REMARKS:
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Nobis Engineering PO Box 2890 Concord, New Hampshire 03302	PROJECT Remedial Design For Operable Unit 01 New Bedford Harbor Superfund Site New Bedford, Massachusetts	BORING NO. FB - 24 SHEET 2 of 3 FILE NO. 48138.07 CHKD. BY C. Thunberg / J. Trottier

Boring Co.	Atlantic Testing Laboratories, Limited	Boring Location	northing 2704330.5	easting 815178.2	
Driller	P. Davis	Mudline El.	-5.56	Datum	NGVD
Logged By	E. Paddleford	Date Start	8/5/99	Date End	8/5/99

Sampler: 2-inch O.D. split-barrel sampler driven 24 inches with a 140 lb safety hammer free falling from a height of 30 inches.
Drill Rig: CME 55 skid mount
Drilling Method 4" I.D. (HW) flush joint casing, 3 7/8" roller bit. Mud rotary.
All casing driven with a 300 lb. hammer free falling from a height of 24-inches.

Groundwater Readings Not Applicable for Offshore Boring				
Date	Time	Depth	Elev.	Stabilization Time

DEPTH	Casing Blows (ft)	SAMPLE INFORMATION Type & No.	PEN/REC (inches)	DEPTH (feet)	BLOWS PER 6 INCHES	SPT N-Value	SAMPLE DESCRIPTION	STRATUM DESCRIPTION	REMARKS
		S-6	24/0	20-22	4-17-15-17	32	No recovery.		
21	6						Advance HW drill casing to 20 ft.		
							Advance 3-7/8 in. roller bit to 25 ft.		
22	12								
23	12								
24	10								
25	16								
		S-7	24/8	25-27	10-9-10-18	19	Silty sand (SM); medium dense, 70% fine sand, 20% silt, 10% clay, gray.	SM	
26	19						Advance HW drill casing to 25 ft.		
							Advance 3-7/8 in. roller bit to 30 ft.		
27	41						Two ft. of material in hole.		
							Advance HW drill casing to 28 ft.		
28	32								
29	35								
30	48								
		S-8	24/15	30-32	10-9-8-8	17	Poorly graded sand with gravel (SP); medium dense, 70% medium sand,	SP	
31	23						25% gravel, 5% silt, brown.		
							Advance HW drill casing to 30 ft.		
32	22						Hole collapsing.		
							Advance HW drill casing to 33 ft.		
33	35								
34	16								
35	14								
		S-9	24/3	35-37	9-8-7-11	15	Poorly graded gravel with silt and sand (GP-GM); medium dense, 50%	GP-GM	
36	13						rounded gravel, 40% medium sand, 10% silt, gray-brown.		
							Advance HW drill casing to 37 ft.		
37	15						Advance 3-7/8 in. roller bit to 40 ft.		
38									
39									
40									

0 to 4 - Very Loose	0 to 2 - Very Soft	1. S denotes split-barrel sampler.	7. PID denotes Photoionization Detector
5 to 10 - Loose	3 to 4 - Soft	2. U denotes 3-inch O.D. undisturbed sample.	8. PPM denotes parts per million.
11 to 30 - Medium Dense	5 to 8 - Medium Stiff	3. UO denotes 3-inch Osterberg undisturbed sample.	9. PP denotes Pocket Penetrometer.
31 to 50 - Dense	9 to 15 - Stiff	4. PEN denotes penetration length of sampler.	10. FVST denotes field vane shear test.
Over 50 - Very Dense	16 to 30 - Very Stiff	5. REC denotes recovered length of sample.	11. RQD denotes Rock Quality Designation.
	Over 30 - Hard	6. SPT denotes Standard Penetration Test.	12. R denotes core run number.

REMARKS:
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Nobis Engineering PO Box 2890 Concord, New Hampshire 03302	PROJECT Remedial Design For Operable Unit 01 New Bedford Harbor Superfund Site New Bedford, Massachusetts	BORING NO. FB - 24 SHEET 3 of 3 FILE NO. 48138.07 CHKD. BY C. Thunberg / J. Trottier

Boring Co.	Atlantic Testing Laboratories, Limited	Boring Location	northing 2704330.5 easting 815178.2		
Driller	P. Davis	Mudline El.	-5.56	Datum	NGVD
Logged By	E. Paddleford	Date Start	8/5/99	Date End	8/5/99

Sampler: 2-inch O.D. split-barrel sampler driven 24 inches with a 140 lb safety hammer free falling from a height of 30 inches.
Drill Rig: CME 55 skid mount
Drilling Method: 4" I.D. (HW) flush joint casing, 3 7/8" roller bit. Mud rotary.
All casing driven with a 300 lb. hammer free falling from a height of 24-inches.

Groundwater Readings Not Applicable for Offshore Boring				
Date	Time	Depth	Elev.	Stabilization Time

DEPTH	Casing Blows (ft)	SAMPLE INFORMATION Type & No.	PEN/REC (inches)	DEPTH (feet)	BLOWS PER 6 INCHES	SPT N-Value	SAMPLE DESCRIPTION	STRATUM DESCRIPTION	REMKS
		S-10	20/2	40-41.7	25-23-24-28/2"	47	Poorly graded gravel with silt and sand (GP-GM); dense, 50% rounded gravel, 40% medium sand, 10% silt, brown.	GP-GM	
41							Bottom of exploration at 41.7 ft.; spoon refusal on probable bedrock.		
42								PROBABLE BEDROCK	
43									
44									
45									
46									
47									
48									
49									
50									
51									
52									
53									
54									
55									
56									
57									
58									
59									
60									

0 to 4 - Very Loose	0 to 2 - Very Soft	1. S denotes split-barrel sampler.	7. PID denotes Photoionization Detector
5 to 10 - Loose	3 to 4 - Soft	2. U denotes 3-inch O.D. undisturbed sample.	8. PPM denotes parts per million.
11 to 30 - Medium Dense	5 to 8 - Medium Stiff	3. UO denotes 3-inch Osterberg undisturbed sample.	9. PP denotes Pocket Penetrometer.
31 to 50 - Dense	9 to 15 - Stiff	4. PEN denotes penetration length of sampler.	10. FVST denotes field vane shear test.
Over 50 - Very Dense	16 to 30 - Very Stiff	5. REC denotes recovered length of sample.	11. RQD denotes Rock Quality Designation.
	Over 30 - Hard	6. SPT denotes Standard Penetration Test.	12. R denotes core run number.

REMARKS:
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Nobis Engineering PO Box 2890 Concord, New Hampshire 03302	PROJECT Remedial Design For Operable Unit 01 New Bedford Harbor Superfund Site New Bedford, Massachusetts	BORING NO. FB - 25 SHEET 1 of 2 FILE NO. 48138.07 CHKD. BY C. Thunberg / J. Trottier

Boring Co.	Atlantic Testing Laboratories, Limited	Boring Location	northing 2704227.0 easting 815102.4
Driller	M. Childs	Mudline El.	-5.80 Datum NGVD
Logged By	E. Thibodeau / E. Paddleford	Date Start	10/4/99 Date End 10/5/99

Sampler: 2-inch O.D. split-barrel sampler driven 24 inches with a 140 lb safety hammer free falling from a height of 30 inches.
Drill Rig: CME 55 skid mount
Drilling Method 4" I.D. (HW) flush joint casing, 3 7/8" roller bit. Wash & drive.
All casing driven with a 300 lb. hammer free falling from a height of 24-inches.

Groundwater Readings Not Applicable for Offshore Boring

Date	Time	Depth	Elev.	Stabilization Time

DEPTH	Casing Blows (ft)	SAMPLE INFORMATION Type & No.	PEN/REC (inches)	DEPTH (feet)	BLOWS PER 6 INCHES	SPT N-Value	SAMPLE DESCRIPTION	STRATUM DESCRIPTION	REMARKS
1	Hyd. Push	UO-1	24/24	0-2	–	–	Organic soil with sand (OH); wet, 55% organic clay/silt, 30% organic matter, 15% fine sand, strong organic odor, slight sheen, black.	OH	
2	Hyd. Push						Advance HW drill casing from 0 to 2 ft. (hydraulic push) Driller dropped drill string down casing to 8 ft.		
3	Hyd. Push						Advance HW drill casing to 8 ft. (hydraulic push) Advance 3-7/8 in. roller bit to 8 ft.		
4	Hyd. Push								
5	Hyd. Push								
6	Hyd. Push								
7	Hyd. Push								
8	Hyd. Push								
9	Hyd. Push	S-1	24/4	8-10	WOR/24"	–	Organic soil with sand (OH); wet, 75% organic clay/silt, 20% fine sand, 5% shells, strong organic odor, dark gray.	OH	
10	Hyd. Push						Advance HW drill casing to 10 ft. (hydraulic push) Advance 3-7/8 in. roller bit to 10 ft.		
11	Hyd. Push	S-2	24/0	10-12	WOR/24"	–	No recovery. Advance HW drill casing to 12 ft. (hydraulic push)		
12	Hyd. Push						Advance 3-7/8 in. roller bit to 12 ft.		
13	Hyd. Push	S-3	24/3	12-14	WOR/24"	–	Silty sand (SM); 70% fine sand, 25% silt, 5% shell fragments, dark gray. Advance HW drill casing to 14 ft.		1
14	Hyd. Push						Advance 3-7/8 in. roller bit to 14 ft. Estimated strata change at 14 ft. based on recovery from S-3.		
15	43	S-4	24/10	14-16	5-5-11-12	16	Poorly graded sand with silt (SP-SM); medium dense, 60% fine sand, 25% medium sand, 10% silt, 5% shell fragments, gray.	SM SP-SM	
16	31						Advance HW drill casing to 19 ft. Advance 3-7/8 in. roller bit to 19 ft.		
17	17								
18	17								
19	13								
20	20	S-5	24/6	19-21	9-4-3-3	7	Silt (ML): medium stiff, 90% silt, 10% fine sand, gray. Advance HW drill casing to 21 ft.	ML	

0 to 4 - Very Loose	0 to 2 - Very Soft	1. S denotes split-barrel sampler.	7. PID denotes Photoionization Detector
5 to 10 - Loose	3 to 4 - Soft	2. U denotes 3-inch O.D. undisturbed sample.	8. PPM denotes parts per million.
11 to 30 - Medium Dense	5 to 8 - Medium Stiff	3. UO denotes 3-inch Osterberg undisturbed sample.	9. PP denotes Pocket Penetrometer.
31 to 50 - Dense	9 to 15 - Stiff	4. PEN denotes penetration length of sampler.	10. FVST denotes field vane shear test.
Over 50 - Very Dense	16 to 30 - Very Stiff	5. REC denotes recovered length of sample.	11. RQD denotes Rock Quality Designation.
	Over 30 - Hard	6. SPT denotes Standard Penetration Test.	12. R denotes core run number.

REMARKS:
1) Switch rig geologist to E. Paddleford at 12 ft.
2)
3)
4)

Nobis Engineering PO Box 2890 Concord, New Hampshire 03302	PROJECT Remedial Design For Operable Unit 01 New Bedford Harbor Superfund Site New Bedford, Massachusetts	BORING NO. FB - 25 SHEET 2 of 2 FILE NO. 48138.07 CHKD. BY C. Thunberg / J. Trottier

Boring Co.	Atlantic Testing Laboratories, Limited	Boring Location	northing 2704227.0 easting 815102.4		
Driller	M. Childs	Mudline El.	-5.80	Datum	NGVD
Logged By	E. Thibodeau / E. Paddleford	Date Start	10/4/99	Date End	10/5/99

Sampler: 2-inch O.D. split-barrel sampler driven 24 inches with a 140 lb safety hammer free falling from a height of 30 inches.
Drill Rig: CME 55 skid mount
Drilling Method: 4" I.D. (HW) flush joint casing, 3 7/8" roller bit. Wash & drive.
All casing driven with a 300 lb. hammer free falling from a height of 24-inches.

Groundwater Readings Not Applicable for Offshore Boring

Date	Time	Depth	Elev.	Stabilization Time

DEPTH	Casing Blows (ft)	SAMPLE INFORMATION Type & No.	PEN/REC (inches)	DEPTH (feet)	BLOWS PER 6 INCHES	SPT N-Value	SAMPLE DESCRIPTION	STRATUM DESCRIPTION	REMARKS
							Advance 3-7/8 in. roller bit to 21 ft.		
21	33								
		S-6	24/8	21-23	37-22-14-18	36	Poorly graded sand with silt (SP-SM); dense, 85% fine sand, 10% silt,	SP-SM	
22	30						5% coarse sand, gray.		
							Advance HW drill casing to 26 ft.		
23	33						Advance 3-7/8 in. roller bit from to 26 ft.		
24	87								
25	120								
26	115								
		S-7	24/6	26-28	10-12-17-12	29	Poorly graded sand with silt (SP-SM); medium dense, 40% fine sand,	SP-SM	
27	96						35% medium sand, 10% coarse sand, 10% silt, 5% gravel, brown.		
							Advance HW drill casing to 29 ft.		
28	162						Advance 3-7/8 in. roller bit to 29 ft.		
29	220								
		S-8	24/9	29-31	17-23-11-18	34	Poorly graded sand with silt and gravel (SP-SM); dense, 35% medium sand, 25% fine	SP-SM	
30							sand, 15% coarse sand, 15% gravel, 10% silt, brown.		
31									
							Bottom of exploration at 31 ft.; no refusal.		
32									
33									
34									
35									
36									
37									
38									
39									
40									

0 to 4 - Very Loose	0 to 2 - Very Soft	1. S denotes split-barrel sampler.	7. PID denotes Photoionization Detector
5 to 10 - Loose	3 to 4 - Soft	2. U denotes 3-inch O.D. undisturbed sample.	8. PPM denotes parts per million.
11 to 30 - Medium Dense	5 to 8 - Medium Stiff	3. UO denotes 3-inch Osterberg undisturbed sample.	9. PP denotes Pocket Penetrometer.
31 to 50 - Dense	9 to 15 - Stiff	4. PEN denotes penetration length of sampler.	10. FVST denotes field vane shear test.
Over 50 - Very Dense	16 to 30 - Very Stiff	5. REC denotes recovered length of sample.	11. RQD denotes Rock Quality Designation.
	Over 30 - Hard	6. SPT denotes Standard Penetration Test.	12. R denotes core run number.

REMARKS:
1) Switch rig geologist to E. Paddleford at 12 ft.
2)
3)
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Nobis Engineering PO Box 2890 Concord, New Hampshire 03302	PROJECT Remedial Design For Operable Unit 01 New Bedford Harbor Superfund Site New Bedford, Massachusetts	BORING NO. FB-26 SHEET 1 of 3 FILE NO. 48138.07 CHKD. BY C. Thunberg / J. Trottier

Boring Co.	Atlantic Testing Laboratories, Limited	Boring Location	northing 2704018.4	easting 815120.5	
Driller	P. Davis	Mudline El.	-4.15	Datum	NGVD
Logged By	E. Paddleford	Date Start	8/18/99	Date End	8/19/99

Sampler: 2-inch O.D. split-barrel sampler driven 24 inches with a 140 lb. safety hammer free falling from a height of 30 inches.
Drill Rig: CME 55 skid mount
Drilling Method: 4" I.D. (HW) flush joint casing, 3 7/8" roller bit. Mud rotary.
All casing driven with a 300 lb. hammer free falling from a height of 24-inches.

Groundwater Readings Not Applicable for Offshore Borings

Date	Time	Depth	Elev.	Stabilization Time

DEPTH	Casing Blows (ft)	SAMPLE INFORMATION Type & No.	PEN/REC (inches)	DEPTH (feet)	BLOWS PER 6 INCHES	SPT N-Value	SAMPLE DESCRIPTION	STRATUM DESCRIPTION	REMKS
	Hyd.						Advance HW drill casing from 0 to 3 ft. (hydraulic push)		
1	Push						Advance 3-7/8 in. roller bit to 3 ft.		
	Hyd.						Wash water clean upon return.		
2	Push								
	Hyd.								
3	Push								
	Hyd.	UO-1	24/23	3-5	--	--	Organic soil (OH); organic silt/clay, noted in tip of sample tube, gray.	OH	
4	Push						Strong organic ordor, gravel noted on top end of sample tube.		
	Hyd.						Advance HW drill casing to 6 ft. (hydraulic push)		
5	Push						Advance 3-7/8 in. roller bit to 6 ft.		
	Hyd.						Wash water black upon return.		
6	Push								
	Hyd.	UO-2	24/24	6-8	--	--	Organic soil (OH); organic silt/clay noted in tip of sample tube.	OH	
7	Push						Some shell fragments, organic ordor.		
	Hyd.						Advance HW drill casing to 9 ft. (hydraulic push)		
8	Push						Advance 3-7/8 in. roller bit to 9 ft.		
	Hyd.								
9	Push								
	Hyd.	UO-3	24/24	9-11	--	--	Similar to UO-1.	OH	
10	Push						Advance HW drill casing to 12 ft. (hydraulic push)		
	Hyd.						Advance 3-7/8 in. roller bit to 12 ft.		
11	Push								
	Hyd.								
12	Push								
	Hyd.	UO-4	24/18	12-14	--	--	Organic soil (OH); 95% organic silt/clay, 5% fine sand, shell fragments.	OH	
13	Push						Advance HW drill casing to 14 ft. (hydraulic push)		
	Hyd.								
14	Push								
							Advance HW drill casing to 15 ft.		
15	31								
		S-1	24/8	15-17	44-40-41-47	81	Poorly graded sand with silt and gravel (SP-SM); very dense, 40% medium	SP-SM	
16	drop						sand, 30% fine sand, 15% gravel, 10% silt, 5% coarse sand, gray.		
							Advance 3-7/8 in. roller bit to 20 ft.		
17	31						Encounter probable boulder at 19 ft., roller bit rate approx. 1 in. per minute.		
							Boulder size approx 8 in.		
18	30								
19	105								
20	79								

0 to 4 - Very Loose	0 to 2 - Very Soft	1. S denotes split-barrel sampler.	7. PID denotes Photoionization Detector
5 to 10 - Loose	3 to 4 - Soft	2. U denotes 3-inch O.D. undisturbed sample.	8. PPM denotes parts per million.
11 to 30 - Medium Dense	5 to 8 - Medium Stiff	3. UO denotes 3-inch Osterberg undisturbed sample.	9. PP denotes Pocket Penetrometer.
31 to 50 - Dense	9 to 15 - Stiff	4. PEN denotes penetration length of sampler.	10. FVST denotes field vane shear test.
Over 50 - Very Dense	16 to 30 - Very Stiff	5. REC denotes recovered length of sample.	11. RQD denotes Rock Quality Designation.
	Over 30 - Hard	6. SPT denotes Standard Penetration Test.	12. R denotes core run number.

REMARKS:
1) Sample description based on laboratory test data and ASTM D2487. Refer to Test Report No. 5, prepared by GeoTesting Express, dated November 29, 1999.
2)
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Nobis Engineering PO Box 2890 Concord, New Hampshire 03302	PROJECT Remedial Design For Operable Unit 01 New Bedford Harbor Superfund Site New Bedford, Massachusetts	BORING NO. FB-26 SHEET 2 of 3 FILE NO. 48138.07 CHKD. BY C. Thunberg / J. Trottier

Boring Co.	Atlantic Testing Laboratories, Limited	Boring Location	northing 2704018.4 easting 815120.5		
Driller	P. Davis	Mudline El.	-4.15	Datum	NGVD
Logged By	E. Paddleford	Date Start	8/18/99	Date End	8/19/99

Sampler: 2-inch O.D. split-barrel sampler driven 24 inches with a 140 lb. safety hammer free falling from a height of 30 inches.
Drill Rig: CME 55 skid mount
Drilling Method: 4" I.D. (HW) flush joint casing, 3 7/8" roller bit. Mud rotary.
All casing driven with a 300 lb. hammer free falling from a height of 24-inches.

Groundwater Readings Not Applicable for Offshore Borings				
Date	Time	Depth	Elev.	Stabilization Time

DEPTH	Casing Blows (ft)	SAMPLE INFORMATION Type & No.	PEN/REC (inches)	DEPTH (feet)	BLOWS PER 6 INCHES	SPT N-Value	SAMPLE DESCRIPTION	STRATUM DESCRIPTION	REMKS
		S-2	24/0	20-22	14-25-33-22	58	No Recovery - Probable gravelly sand.		
21	45						Casing dropped 15 to 16 ft while driving spoon.		
							Advance HW drill casing to 20 ft.		
22	54						Mix additional bentonite drilling mud.		
							Seems to have pushed boulder down with casing.		
23	55						Roller bit through boulder at 20.5 ft. roller bit rate approx. 2 in. per minute.		
							Lost approximately 2/3 tub of drill mud rapidly.		
24	110						Boulder size approximately 8 in. (probably same boulder encountered at 19 ft).		
							Mix additional bentonite mud.		
25	184						Advance 3-7/8 in. roller bit to 25 ft.		
		S-3	24/8	25-27	26-26-36-10	62	Poorly graded gravel with silt and sand (GP-GM); very dense, 63% gravel, 11% coarse	GP-GM	1
26	50						sand, 10% medium sand, 8% fine sand, 8% silt, olive green.		
	210/						Advance HW drill casing to 25 ft.		
27	10"						Casing is open, still driving boulder down with casing.		
							Roller bit into boulder at 25 ft.		
28	59						Roller bit through boulder, losing mud quickly, lost 2/3 tub		
							Mix additional bentonite mud.		
29	8						Advance 3-7/8 in. roller bit to 27 ft.		
							Encounter boulder at 27 ft.		
30	16						Advance HW drill casing to 26.8 ft, (refusal).		
		S-4	16/10	30-31.3	39-41-50/4"	–	Switch to new 3-7/8 in. roller bit.		
31	82						Mix additional bentonite mud.	GLACIAL TILL	
							Advance 3-7/8 in. roller bit to 29 ft.		
32	66						Advance HW drill casing to 28.2 ft.		
							Advance 3-7/8 in. roller bit to 30 ft.		
33	51						S-4: Well-graded sand with silt and gravel (SW-SM); 22% medium sand, 14% coarse		1
							sand, 9% fine sand, 44% gravel, 11% silt, gray. (GLACIAL TILL)		
34	121/	S-5	6/0	34-34.5	100/6"	–	Spoon refusal at 31.3 ft, possible boulder or bedrock.		
	4"		CORE		CORE		Advance HW drill casing to 31.3 ft, (refusal).		
35			INTERVAL		TIME		Begin NX rock core at 31.3 ft.	BEDROCK	
		R-1	35-36		11 min		Core barrel advanced 0.5 ft then dropped 1.5 ft (boulder).		
36							Mix additional bentonite mud.		
			36-37		11 min		Advance 3-7/8 in. roller bit to 34 ft.		
37							S-5: No Recovery - spoon refusal.		
			37-38		13 min		Advance HW drill casing to 34.5 ft.		
38							Advance 3-7/8 in. roller bit to 35 ft.		
			38-39		12 min		Begin NX rock core at 35 ft.		
39							R-1: 35-40 ft. Recovery = 100% RQD = 78%		
			39-40		13 min		Fresh, moderately hard, gray, aphanitic GNEISS with low angle, close, rough,		
40							stepped, fresh, partly open joints. Feldspar inclusion at 1.5 ft.		

0 to 4 - Very Loose	0 to 2 - Very Soft	1. S denotes split-barrel sampler.	7. PID denotes Photoionization Detector
5 to 10 - Loose	3 to 4 - Soft	2. U denotes 3-inch O.D. undisturbed sample.	8. PPM denotes parts per million.
11 to 30 - Medium Dense	5 to 8 - Medium Stiff	3. UO denotes 3-inch Osterberg undisturbed sample.	9. PP denotes Pocket Penetrometer.
31 to 50 - Dense	9 to 15 - Stiff	4. PEN denotes penetration length of sampler.	10. FVST denotes field vane shear test.
Over 50 - Very Dense	16 to 30 - Very Stiff	5. REC denotes recovered length of sample.	11. RQD denotes Rock Quality Designation.
	Over 30 - Hard	6. SPT denotes Standard Penetration Test.	12. R denotes core run number.

REMARKS:
1) Sample description based on laboratory test data and ASTM D2487. Refer to Test Report No. 5, prepared by GeoTesting Express, dated November 29, 1999.
2)
3)
4)

Nobis Engineering PO Box 2890 Concord, New Hampshire 03302	PROJECT Remedial Design For Operable Unit 01 New Bedford Harbor Superfund Site New Bedford, Massachusetts	BORING NO. FB-26 SHEET 3 of 3 FILE NO. 48138.07 CHKD. BY C. Thunberg / J. Trottier

Boring Co.	Atlantic Testing Laboratories, Limited	Boring Location	northing 2704018.4 easting 815120.5		
Driller	P. Davis	Mudline El.	-4.15	Datum	NGVD
Logged By	E. Paddleford	Date Start	8/18/99	Date End	8/19/99

Sampler: 2-inch O.D. split-barrel sampler driven 24 inches with a 140 lb. safety hammer free falling from a height of 30 inches.
Drill Rig: CME 55 skid mount
Drilling Method 4" I.D. (HW) flush joint casing, 3 7/8" roller bit. Mud rotary.
All casing driven with a 300 lb. hammer free falling from a height of 24-inches.

Groundwater Readings Not Applicable for Offshore Borings				
Date	Time	Depth	Elev.	Stabilization Time

DEPTH	Casing Blows (ft)	SAMPLE INFORMATION Type & No.	PEN/REC (inches)	DEPTH (feet)	BLOWS PER 6 INCHES	SPT N-Value	SAMPLE DESCRIPTION	STRATUM DESCRIPTION	REMKS
41		R-2	40-41		14 min		R-2: 40 - 45 ft. Recovery = 100% RQD = 93% Fresh, moderately hard, gray, aphanitic GNEISS with low angle, close to moderately spaced, rough, stepped, fresh, tight to partly open joints.	BEDROCK	
42			41-42		14 min				
43			42-43		13 min				
44			43-44		5 min				
45			44-45		5 min				
46							Boring terminated in bedrock at 45 ft.		
47									
48									
49									
50									
51									
52									
53									
54									
55									
56									
57									
58									
59									
60									

0 to 4 - Very Loose	0 to 2 - Very Soft	1. S denotes split-barrel sampler.	7. PID denotes Photoionization Detector
5 to 10 - Loose	3 to 4 - Soft	2. U denotes 3-inch O.D. undisturbed sample.	8. PPM denotes parts per million.
11 to 30 - Medium Dense	5 to 8 - Medium Stiff	3. UO denotes 3-inch Osterberg undisturbed sample.	9. PP denotes Pocket Penetrometer.
31 to 50 - Dense	9 to 15 - Stiff	4. PEN denotes penetration length of sampler.	10. FVST denotes field vane shear test.
Over 50 - Very Dense	16 to 30 - Very Stiff	5. REC denotes recovered length of sample.	11. RQD denotes Rock Quality Designation.
	Over 30 - Hard	6. SPT denotes Standard Penetration Test.	12. R denotes core run number.

REMARKS:
1) Sample description based on laboratory test data and ASTM D2487. Refer to Test Report No. 5, prepared by GeoTesting Express, dated November 29, 1999.
2)
3)
4)

Nobis Engineering PO Box 2890 Concord, New Hampshire 03302	PROJECT Remedial Design For Operable Unit 01 New Bedford Harbor Superfund Site New Bedford, Massachusetts	BORING NO. FB - 27 SHEET 1 of 2 FILE NO. 48138.07 CHKD. BY C. Thunberg / J. Trottier

Boring Co.	Atlantic Testing Laboratories, Limited	Boring Location	northing 2703919.0 easting 815179.8		
Driller	M. Childs	Mudline El.	-6.49	Datum	NGVD
Logged By	E. Paddleford	Date Start	10/7/99	Date End	10/8/99

Sampler: 2-inch O.D. split-barrel sampler driven 24 inches with a 140 lb safety hammer free falling from a height of 30 inches.
Drill Rig: CME 55 skid mount
Drilling Method: 4" I.D. (HW) flush joint casing, 3 7/8" roller bit. Mud rotary.
All casing driven with a 300 lb. hammer free falling from a height of 24-inches.

Groundwater Readings Not Applicable for Offshore Borings				
Date	Time	Depth	Elev.	Stabilization Time

DEPTH	Casing Blows (ft)	SAMPLE INFORMATION Type & No.	PEN/REC (inches)	DEPTH (feet)	BLOWS PER 6 INCHES	SPT N-Value	SAMPLE DESCRIPTION	STRATUM DESCRIPTION	REMKS
	Hyd.	UO-1	24/24	0-2	--	--	Organic silt with sand (OH); 83% organic silt, 15% fine sand, 2% medium sand, trace	OH	1
1	Push						shell fragments, black. Piece of plastic noted in tip of tube (clear plastic sheet).		
	Hyd.						Advance HW drill casing from 0 to 2 ft.		
2	Push						Advance 3-7/8 in. roller bit to 2 ft.		
	Hyd.	UO-2	24/0	2-4	--	--	No recovery - sample fell out of tube while bringing tube to surface.		
3	Push						Advance HW drill casing to 4 ft.		
	Hyd.						Advance 3-7/8 in. roller bit to 4 ft.		
4	Push								
	Hyd.	UO-3	24/21	4-6	--	--	Organic soil (OH); 90% organic clay/silt, 10% fine sand, dark gray,	OH	
5	Push						as noted from tip of sample tube.		
	Hyd.						Advance HW drill casing to 6 ft.		
6	Push						Advance 3-7/8 in. roller bit to 6 ft.		
	Hyd.	UO-4	24/0	6-8	--	--	No recovery - material fell out of tube upon retrieval.		
7	Push						Advance HW drill casing to 8 ft.		
	Hyd.						Advance 3-7/8 in. roller bit to 8 ft.		
8	Push								
	Hyd.	UO-5	24/24	8-10	--	--	Organic clay (OL); 90% organic clay, 10% fine sand, dark gray.	OL	2
9	Push						Advance HW drill casing to 10 ft.		
	Hyd.								
10	Push								
	Hyd.	UO-6	24/0	10-12	--	--	No recovery- material fell out upon retrieval of tube.		
11	Push	S-1	24/5	10-12	WOR/24"	--	Possible fine sand on outside of tube.		
	Hyd.						S-1: Organic soil (OH); 90% organic clay/silt, 10% fine sand, dark gray.		
12	Push						Advance HW drill casing to 12 ft.	OH	
	Hyd.	UO-7	24/17	12-14	--	--	Advance 3-7/8 in. roller bit to 12 ft.		
13	Push						UO-7: Organic soil (OH); organic clay with gravel and fine sand noted in tip.		
	54/						Sand interface at 13.3 ft, casing no longer able to be pushed.		
14	9"						Advance HW drill casing to 14 ft.		
		S-2	24/10	14-16	24-45-26-20	71	S-2A: 6 in: Well-graded sand with silt and gravel (SW-SM); very dense,	SW-SM	
15	17						30% medium sand, 30% fine sand, 15% gravel, 15% coarse sand, 10% silt, gray.	SM	
							S-2B: 4 in: Silty sand (SM); very dense, 80% fine sand, 20% silt, gray.		
16	24						Switch to mud rotary drilling technique at 14 ft.		
							Advance 3-7/8 in. roller bit to 19 ft.		
17	21								
18	20								
19	18								
		S-3	24/14	19-21	6-7-12-11	19	Silt (ML); very stiff, 95% silt, 5% fine sand, gray.	ML	
20	Drop						Advance HW drill casing to 19 ft.		

0 to 4 - Very Loose	0 to 2 - Very Soft	1. S denotes split-barrel sampler.	7. PID denotes Photoionization Detector
5 to 10 - Loose	3 to 4 - Soft	2. U denotes 3-inch O.D. undisturbed sample.	8. PPM denotes parts per million.
11 to 30 - Medium Dense	5 to 8 - Medium Stiff	3. UO denotes 3-inch Osterberg undisturbed sample.	9. PP denotes Pocket Penetrometer.
31 to 50 - Dense	9 to 15 - Stiff	4. PEN denotes penetration length of sampler.	10. FVST denotes field vane shear test.
Over 50 - Very Dense	16 to 30 - Very Stiff	5. REC denotes recovered length of sample.	11. RQD denotes Rock Quality Designation.
	Over 30 - Hard	6. SPT denotes Standard Penetration Test.	12. R denotes core run number.

REMARKS:
1) Sample description based on laboratory test data and ASTM D2487. Refer to Test Report No. 5, prepared by GeoTesting Express, dated November 29, 1999.
2) Sample description based on Atterberg Limits laboratory test data. Refer to Test Report No. 5, prepared by GeoTesting Express, dated November 29, 1999.
3)
4)

Nobis Engineering PO Box 2890 Concord, New Hampshire 03302	PROJECT Remedial Design For Operable Unit 01 New Bedford Harbor Superfund Site New Bedford, Massachusetts	BORING NO. FB - 27 SHEET 2 of 2 FILE NO. 48138.07 CHKD. BY C. Thunberg / J. Trottier

Boring Co.	Atlantic Testing Laboratories, Limited	Boring Location	northing 2703919.0 easting 815179.8		
Driller	M. Childs	Mudline El.	-6.49	Datum	NGVD
Logged By	E. Paddleford	Date Start	10/7/99	Date End	10/8/99

Sampler: 2-inch O.D. split-barrel sampler driven 24 inches with a 140 lb safety hammer free falling from a height of 30 inches.
Drill Rig: CME 55 skid mount
Drilling Method: 4" I 4" I.D. (HW) flush joint casing, 3 7/8" roller bit. Mud rotary.
All casing driven with a 300 lb. hammer free falling from a height of 24-inches.

Groundwater Readings Not Applicable for Offshore Borings				
Date	Time	Depth	Elev.	Stabilization Time

DEPTH	Casing Blows (ft)	SAMPLE INFORMATION Type & No.	PEN/REC (inches)	DEPTH (feet)	BLOWS PER 6 INCHES	SPT N-Value	SAMPLE DESCRIPTION	STRATUM DESCRIPTION
							Mix additional bentonite and EZ mud drilling mud.	
21	Drop						Advance 3-7/8 in. roller bit to 24 ft.	
							Casing dropped to 20.2 ft. while advancing 3-7/8 in. roller bit to 24 ft..	
22	Drop						Rods/roller bit getting stuck in casing while trying to remove.	
	Drop						Casing dropped to 22.4 ft. while removing rods/drill bit.	
23							Hole filled in to 22.1 ft.	
							Casing still dropping.	
24							Lift casing back up to 22 ft and clamp in-place.	
		S-4	24/12	24-26	18-25-35-35	60	Advance 3-7/8 in. roller bit to 24 ft.	SP-SM
25							S-4: Poorly graded sand with silt (SP-SM); very dense, 75% fine sand, 10% medium	
							sand, 10% silt, 5% coarse sand, gray.	
26							Advance 3-7/8 in. roller bit to 29 ft.	
27								
28								
29								
		S-5	24/7	29-31	14-13-11-16	24	Poorly graded sand with silt (SP-SM); medium dense, 35% fine sand, 35%	SP-SM
30							medium sand, 15% coarse sand, 10% silt, 5% gravel, gray.	
31								
							Bottom of exploration at 31 ft.; no refusal.	
32								
33								
34								
35								
36								
37								
38								
39								
40								

0 to 4 - Very Loose	0 to 2 - Very Soft	1. S denotes split-barrel sampler.	7. PID denotes Photoionization Detector
5 to 10 - Loose	3 to 4 - Soft	2. U denotes 3-inch O.D. undisturbed sample.	8. PPM denotes parts per million.
11 to 30 - Medium Dense	5 to 8 - Medium Stiff	3. UO denotes 3-inch Osterberg undisturbed sample.	9. PP denotes Pocket Penetrometer.
31 to 50 - Dense	9 to 15 - Stiff	4. PEN denotes penetration length of sampler.	10. FVST denotes field vane shear test.
Over 50 - Very Dense	16 to 30 - Very Stiff	5. REC denotes recovered length of sample.	11. RQD denotes Rock Quality Designation.
	Over 30 - Hard	6. SPT denotes Standard Penetration Test.	12. R denotes core run number.

REMARKS:
1) Sample description based on laboratory test data and ASTM D2487. Refer to Test Report No. 5, prepared by GeoTesting Express, dated November 29, 1999.
2) Sample description based on Atterberg Limits laboratory test data. Refer to Test Report No. 5, prepared by GeoTesting Express, dated November 29, 1999.
3)
4)

Nobis Engineering PO Box 2890 Concord, New Hampshire 03302	PROJECT Remedial Design For Operable Unit 01 New Bedford Harbor Superfund Site New Bedford, Massachusetts	BORING NO. FB - 28 SHEET 1 of 2 FILE NO. 48138.07 CHKD. BY C. Thunberg / J. Trottier

Boring Co.	Atlantic Testing Laboratories, Limited	Boring Location	northing 2703767.6 easting 815117.5		
Driller	P. Davis	Mudline El.	-3.26	Datum	NGVD
Logged By	E. Paddleford	Date Start	10/12/99	Date End	10/12/99

Sampler: 2-inch O.D. split-barrel sampler driven 24 inches with a 140 lb safety hammer free falling from a height of 30 inches.
Drill Rig: CME 55 skid mount
Drilling Method: 4" I.D. (HW) flush joint casing, 3 7/8" roller bit. Mud rotary.
All casing driven with a 300 lb. hammer free falling from a height of 24-inches.

Groundwater Readings Not Applicable for Offshore Borings				
Date	Time	Depth	Elev.	Stabilization Time

DEPTH	Casing Blows (ft)	SAMPLE INFORMATION Type & No.	PEN/REC (inches)	DEPTH (feet)	BLOWS PER 6 INCHES	SPT N-Value	SAMPLE DESCRIPTION	STRATUM DESCRIPTION	REMKS
	Hyd.	UO-1	24/21	0-2	--	--	Organic clay (OH); 95% organic clay, 5% shell fragments, black.	OH	1
1	Push						Advance HW drill casing from 0 to 5 ft.		
	Hyd.						Advance 3-7/8 in. roller bit to 5 ft.		
2	Push								
	Hyd.								
3	Push								
	Hyd.								
4	Push								
	Hyd.								
5	Push								
	Hyd.	S-1	24/8	5-7	WOR/24"	--	Organic soil (OH); 95% organic clay/silt, 5% shell fragments.	OH	
6	Push						Advance HW drill casing to 10 ft.		
	Hyd.						Advance 3-7/8 in. roller bit to 10 ft.		
7	Push								
	Hyd.								
8	Push								
	Hyd.								
9	Push								
	Hyd.								
10	Push								
	Hyd.	S-2	24/24	10-12	WOR/24"	--	Organic soil (OH); 95% organic clay/silt, 5% fine sand.	OH	
11	Push						Advance HW drill casing to 15 ft.		
	Hyd.						Advance 3-7/8 in. roller bit to 15 ft.		
12	Push								
	Hyd.								
13	Push								
	Hyd.								
14	Push								
	Hyd.								
15	Push								
	Hyd.	S-3	24/20	15-17	WOR/18" -6	--	Similar to S-2.	OH	
16	Push						No sand in sample, however due to blows, suspect sand/clay interface at 16.5 ft.		
	Hyd.						Advance HW drill casing to 17 ft.		
17	Push						Difficult push at 16.5 ft.		
		S-4	24/16	17-19	8-7-12-25	19	Advance 3-7/8 in. roller bit to 17 ft.	SW	
18	15						S-4: Well-graded sand (SW); medium dense, 35% medium sand, 30% fine sand,		
							25% coarse sand, 5% silt, 5% gravel, gray.		
19	15						3 in. layer of iron stained sand in last 6 in. of sample.		
							Switch to mud rotary drilling technique at 17 ft.		
20	10								

0 to 4 - Very Loose	0 to 2 - Very Soft	1. S denotes split-barrel sampler.	7. PID denotes Photoionization Detector
5 to 10 - Loose	3 to 4 - Soft	2. U denotes 3-inch O.D. undisturbed sample.	8. PPM denotes parts per million.
11 to 30 - Medium Dense	5 to 8 - Medium Stiff	3. UO denotes 3-inch Osterberg undisturbed sample.	9. PP denotes Pocket Penetrometer.
31 to 50 - Dense	9 to 15 - Stiff	4. PEN denotes penetration length of sampler.	10. FVST denotes field vane shear test.
Over 50 - Very Dense	16 to 30 - Very Stiff	5. REC denotes recovered length of sample.	11. RQD denotes Rock Quality Designation.
	Over 30 - Hard	6. SPT denotes Standard Penetration Test.	12. R denotes core run number.

REMARKS:
1) Sample description based on Atterberg Limits laboratory test data. Refer to Test Report No. 7, prepared by GeoTesting Express, dated January 24, 2000.
2)
3)
4)

Nobis Engineering PO Box 2890 Concord, New Hampshire 03302	PROJECT Remedial Design For Operable Unit 01 New Bedford Harbor Superfund Site New Bedford, Massachusetts	BORING NO. FB - 28 SHEET 2 of 2 FILE NO. 48138.07 CHKD. BY C. Thunberg / J. Trottier

Boring Co.	Atlantic Testing Laboratories, Limited	Boring Location	northing 2703767.6 easting 815117.5		
Driller	P. Davis	Mudline El.	-3.26	Datum	NGVD
Logged By	E. Paddleford	Date Start	10/12/99	Date End	10/12/99

Sampler: 2-inch O.D. split-barrel sampler driven 24 inches with a 140 lb safety hammer free falling from a height of 30 inches.
Drill Rig: CME 55 skid mount
Drilling Method: 4" I.D. (HW) flush joint casing, 3 7/8" roller bit. Mud rotary.
All casing driven with a 300 lb. hammer free falling from a height of 24-inches.

Groundwater Readings Not Applicable for Offshore Borings				
Date	Time	Depth	Elev.	Stabilization Time

DEPTH	Casing Blows (ft)	SAMPLE INFORMATION Type & No.	PEN/REC (inches)	DEPTH (feet)	BLOWS PER 6 INCHES	SPT N-Value	SAMPLE DESCRIPTION	STRATUM DESCRIPTION
							Advance 3-7/8 in. roller bit to 22 ft.	
21	23							
22	53							
		S-5	24/0	22-24	31-41-35-32	76	No recovery - approximately 3 in. of wash material.	SP-SM
23	drop	S-6	24/4	22-24	14-6-7-41	13	Hole filled in 2 ft.	
	drop						Advance 3-7/8 in. roller bit to 22 ft.	
24	41						S-6: Poorly graded sand with silt and gravel (SP-SM); very dense, 40% fine sand,	
							20% medium sand, 15% coarse sand, 15% gravel, 10% silt, light gray.	
25	51						Advance HW drill casing to 22 ft.	
							Mix additional bentonite drilling mud.	
26	drop						Advance 3-7/8 in. roller bit to 27 ft.	
27	drop						Casing dropped approximately 1 ft and roller bit becoming stuck inside casing.	
		S-7	24/12	27-29	11-14-16-18	30	Casing being pulled up and down while trying to remove roller bit.	SP
28	drop						Lost about 1/4 tub of drilling mud.	
							Following removal of 3-7/8 in. roller bit, casing is at 22.7 ft.	
29	drop						Mix additional bentonite drilling mud.	
							Advance roller bit back down casing, losing mud and roller bit getting stuck.	
30							Use 2/3 tub of mud, mix additional bentonite drilling mud, roller bit getting stuck.	
							Casing dropped to 23.7 ft.	
31							Gravely material, not able to completely wash out the casing.	
							Still losing mud.	
32							Casing at 23.3 ft.	
		S-8	24/14	32-34	7-7-12-16	19	Advance HW drill casing to 25 ft.	SP
33							Mix additional bentonite drilling mud.	
							Advance 3-7/8 in. roller bit to 27 ft.	
34							S-7: Poorly graded sand (SP); medium dense, 60% fine sand, 30% medium sand,	
							5% coarse sand, 5% silt, gray-brown.	
35							Casing dropped to 27 ft.	
							Advance 3-7/8 in. roller bit to 32 ft.	
36							Casing dropped to 29 ft.	
							S-8: Poorly graded sand (SP); medium dense, 55% fine sand, 20% medium sand,	
37							15% coarse sand, 5% gravel, 5% silt, brown.	
							Bottom of exploration at 34 ft.; no refusal.	
38								
39								
40								

0 to 4 - Very Loose	0 to 2 - Very Soft	1. S denotes split-barrel sampler.	7. PID denotes Photoionization Detector
5 to 10 - Loose	3 to 4 - Soft	2. U denotes 3-inch O.D. undisturbed sample.	8. PPM denotes parts per million.
11 to 30 - Medium Dense	5 to 8 - Medium Stiff	3. UO denotes 3-inch Osterberg undisturbed sample.	9. PP denotes Pocket Penetrometer.
31 to 50 - Dense	9 to 15 - Stiff	4. PEN denotes penetration length of sampler.	10. FVST denotes field vane shear test.
Over 50 - Very Dense	16 to 30 - Very Stiff	5. REC denotes recovered length of sample.	11. RQD denotes Rock Quality Designation.
	Over 30 - Hard	6. SPT denotes Standard Penetration Test.	12. R denotes core run number.

REMARKS:
1) Sample description based on Atterberg Limits laboratory test data. Refer to Test Report No. 7, prepared by GeoTesting Express, dated January 24, 2000.
2)
3)
4)

Nobis Engineering PO Box 2890 Concord, New Hampshire 03302	PROJECT Remedial Design For Operable Unit 01 New Bedford Harbor Superfund Site New Bedford, Massachusetts	BORING NO. FB-29 SHEET 1 of 3 FILE NO. 48138.07 CHKD. BY C. Thunberg / J. Trottier

Boring Co.	Atlantic Testing Laboratories, Limited	Boring Location	northing 2703600.5 easting 815110.4		
Driller	P. Davis	Mudline El.	-4.17	Datum	NGVD
Logged By	E. Paddleford	Date Start	8/16/99	Date End	8/17/99

Sampler: 2-inch O.D. split-barrel sampler driven 24 inches with a 140 lb. safety hammer free falling from a height of 30 inches.
Drill Rig: CME 55 skid mount
Drilling Method 4" I.D. (HW) flush joint casing, 3 7/8" roller bit. Mud rotary.
All casing driven with a 300 lb. hammer free falling from a height of 24-inches.

Groundwater Readings Not Applicable for Offshore Borings				
Date	Time	Depth	Elev.	Stabilization Time

DEPTH	Casing Blows (ft)	SAMPLE INFORMATION Type & No.	PEN/REC (inches)	DEPTH (feet)	BLOWS PER 6 INCHES	SPT N-Value	SAMPLE DESCRIPTION	STRATUM DESCRIPTION	REMKS
	Hyd.						Advance HW drill casing from 0 to 3 ft. (hydraulic push)		
1	Push						Advance 3-7/8 in. roller bit to 3 ft.		
	Hyd.								
2	Push								
	Hyd.								
3	Push								
	Hyd.	UO-1	24/24	3-5	--	--	Organic soil (OH); organic clay noted in tip of sample tube.	OH	
4	Push						Advance HW drill casing to 6 ft. (hydraulic push)		
	Hyd.						Advance 3-7/8 in. roller bit to 6 ft.		
5	Push								
	Hyd.								
6	Push								
	Hyd.	UO-2	24/23	6-8	--	--	Organic clay (OH); organic clay, dark gray.	OH	1
7	Push						Advance HW drill casing to 9 ft. (hydraulic push)		
	Hyd.						Advance 3-7/8 in. roller bit to 9 ft.		
8	Push								
	Hyd.								
9	Push								
	Hyd.	UO-3	24/20	9-11	--	--	Similar to UO-2 as noted from tip of sample tube.	OH	
10	Push						Advance HW drill casing to 12 ft. (hydraulic push)		
	Hyd.						Advance 3-7/8 in. roller bit to 12 ft.		
11	Push								
	Hyd.								
12	Push								
		UO-4	15/15	12-13.3	--	--	5 in: Similar to UO-3.	OH	
13	15						10 in: Sands, most of which had fallen out of the sample tube upon removal.		
							Sampler did not fully extend, probable sand encounter.		
14	20								
		S-1	24/12	14-16	7-6-10-8	16	Poorly graded sand with silt and gravel (SP-SM); medium dense, 30% medium sand,	SP-SM	2
15	34						23% fine sand, 17% coarse sand, 22% gravel, 8% silt, brown.		
							Switch to mud rotary drilling technique at 12 ft.		
16	30						Advance HW drilling casing to 16 ft.		
							Advance 3-7/8 in. roller bit to 20 ft.		
17	drop						1 ft cave-in at 20 ft.		
							Mix additional bentonite drilling mud.		
18	drop						Advance 3-7/8 in. roller bit, roller bit bound in casing at 19 ft.		
							HW drill casing dropped to 19.5 ft.		
19	drop								
	drop								
20	10								

0 to 4 - Very Loose	0 to 2 - Very Soft	1. S denotes split-barrel sampler.	7. PID denotes Photoionization Detector
5 to 10 - Loose	3 to 4 - Soft	2. U denotes 3-inch O.D. undisturbed sample.	8. PPM denotes parts per million.
11 to 30 - Medium Dense	5 to 8 - Medium Stiff	3. UO denotes 3-inch Osterberg undisturbed sample.	9. PP denotes Pocket Penetrometer.
31 to 50 - Dense	9 to 15 - Stiff	4. PEN denotes penetration length of sampler.	10. FVST denotes field vane shear test.
Over 50 - Very Dense	16 to 30 - Very Stiff	5. REC denotes recovered length of sample.	11. RQD denotes Rock Quality Designation.
	Over 30 - Hard	6. SPT denotes Standard Penetration Test.	12. R denotes core run number.

REMARKS:
1) Sample description based on Atterberg Limits laboratory test data. Refer to Test Report No. 5, prepared by GeoTesting Express, dated November 29, 1999.
2) Sample description based on laboratory test data and ASTM D2487. Refer to Test Report No. 5, prepared by GeoTesting Express, dated November 29, 1999.
3)
4)

Nobis Engineering PO Box 2890 Concord, New Hampshire 03302	PROJECT Remedial Design For Operable Unit 01 New Bedford Harbor Superfund Site New Bedford, Massachusetts	BORING NO. FB-29 SHEET 2 of 3 FILE NO. 48138.07 CHKD. BY C. Thunberg / J. Trottier

Boring Co.	Atlantic Testing Laboratories, Limited	Boring Location	northing 2703600.5 easting 815110.4		
Driller	P. Davis	Mudline El.	-4.17	Datum	NGVD
Logged By	E. Paddleford	Date Start	8/16/99	Date End	8/17/99

Sampler: 2-inch O.D. split-barrel sampler driven 24 inches with a 140 lb. safety hammer free falling from a height of 30 inches.
Drill Rig: CME 55 skid mount
Drilling Method: 4" I.D. (HW) flush joint casing, 3 7/8" roller bit. Mud rotary.
All casing driven with a 300 lb. hammer free falling from a height of 24-inches.

Groundwater Readings Not Applicable for Offshore Borings				
Date	Time	Depth	Elev.	Stabilization Time

DEPTH	Casing Blows (ft)	SAMPLE INFORMATION Type & No.	PEN/REC (inches)	DEPTH (feet)	BLOWS PER 6 INCHES	SPT N-Value	SAMPLE DESCRIPTION	STRATUM DESCRIPTION	REMKS
		S-2	24/0	20-22	23-23-11-20	34	No recovery.		
21	20						Advance HW drill casing to 23 ft.		
							Mix more bentonite mud.		
22	21						Advance 3-7/8 in. roller bit to 25 ft.		
23	15								
24	4								
25	10								
		S-3	24/1	25-27	13-16-22-26	38	Silty sand (SM); dense, 75% fine sand, 20% silt, 5% medium sand, brown.	SM	
26	24						Advance HW drill casing to 26 ft.		
							Advance 3-7/8 in. roller bit to 30 ft.		
27	8								
28	6								
29	2								
30	13								
		S-4	24/14	30-32	20-18-25-26	43	10 in: Silt (ML); hard, 85% silt, 11% fine sand, 1% coarse sand, 1% medium sand,	ML	2
31	40						2% gravel, gray	SP	
							4 in: Poorly graded sand (SP); 50% medium sand, 30% fine sand, 10%		
32	28						coarse sand, 5% gravel, 5% silt, brown.		
							Advance HW drill casing to 30 ft.		
33	26						Advance 3-7/8 in. roller bit to 35 ft.		
34	53								
35	72								
		S-5	24/12	35-37	14-19-16-25	35	Well-graded sand (SW); dense, 40% fine sand, 30% medium sand, 20%	SW	
36	34						coarse sand, 5% gravel, 5% silt, olive green.		
							Advance HW drill casing to 35 ft.		
37	42						Advance 3-7/8 in. roller bit to 40 ft.		
							Roller bit through possible boulder at approximately 39 ft.		
38	103								
39	121								
40	110								

0 to 4 - Very Loose	0 to 2 - Very Soft	1. S denotes split-barrel sampler.	7. PID denotes Photoionization Detector
5 to 10 - Loose	3 to 4 - Soft	2. U denotes 3-inch O.D. undisturbed sample.	8. PPM denotes parts per million.
11 to 30 - Medium Dense	5 to 8 - Medium Stiff	3. UO denotes 3-inch Osterberg undisturbed sample.	9. PP denotes Pocket Penetrometer.
31 to 50 - Dense	9 to 15 - Stiff	4. PEN denotes penetration length of sampler.	10. FVST denotes field vane shear test.
Over 50 - Very Dense	16 to 30 - Very Stiff	5. REC denotes recovered length of sample.	11. RQD denotes Rock Quality Designation.
	Over 30 - Hard	6. SPT denotes Standard Penetration Test.	12. R denotes core run number.

REMARKS:
1) Sample description based on Atterberg Limits laboratory test data. Refer to Test Report No. 5, prepared by GeoTesting Express, dated November 29, 1999.
2) Sample description based on laboratory test data and ASTM D2487. Refer to Test Report No. 5, prepared by GeoTesting Express, dated November 29, 1999.
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4)

Nobis Engineering PO Box 2890 Concord, New Hampshire 03302	PROJECT Remedial Design For Operable Unit 01 New Bedford Harbor Superfund Site New Bedford, Massachusetts	BORING NO. FB-29 SHEET 3 of 3 FILE NO. 48138.07 CHKD. BY C. Thunberg / J. Trottier

Boring Co.	Atlantic Testing Laboratories, Limited	Boring Location	northing 2703600.5 easting 815110.4		
Driller	P. Davis	Mudline El.	-4.17	Datum	NGVD
Logged By	E. Paddleford	Date Start	8/16/99	Date End	8/17/99

Sampler: 2-inch O.D. split-barrel sampler driven 24 inches with a 140 lb. safety hammer free falling from a height of 30 inches.
Drill Rig: CME 55 skid mount
Drilling Method 4" I.D. (HW) flush joint casing, 3 7/8" roller bit. Mud rotary.
All casing driven with a 300 lb. hammer free falling from a height of 24-inches.

Groundwater Readings Not Applicable for Offshore Borings				
Date	Time	Depth	Elev.	Stabilization Time

DEPTH	Casing Blows (ft)	SAMPLE INFORMATION Type & No.	PEN/REC (inches)	DEPTH (feet)	BLOWS PER 6 INCHES	SPT N-Value	SAMPLE DESCRIPTION	STRATUM DESCRIPTION	REMARKS
		S-6	24/0	40-42	28-24-50-75	74	No recovery		
41							Advance HW drill casing to 40 ft.		
			CORE		CORE		Advance 3-7/8 in. roller bit to 43 ft.		
42			INTERVAL		TIME		Encountered bedrock at 42.5 ft.		
							Begin NX rock core at 42.5 ft.		
43		R-1	42.5-43.5		7 min		R-1: 42.5 - 47.5 ft, Recovery = 77% RQD = 55%.		
							Fresh, moderately hard, aphanitic GNEISS with low angle, close, rough, stepped,		
44			43.5-44.5		5 min		fresh, partly open joints. Top 12 in. of core broken up.	BEDROCK	
							Some jointing visible in the upper 3 in., also pit sized solution cavitites noted in		
45			44.5-45.5		6 min		this upper 3 in. section with quartz and feldspar mireralization.		
							Core barrel dropped 6 in. at 44 ft, void space.		
46			45.5-46.5		8 min				
47			46.5-47.5		9 min				
48		R-2	47.5-48.5		17 min		R-2: 47.5 - 49.5 ft, Recovery = 90% RQD = 90%.		
							Fresh, moderately hard, gray aphanitic GNEISS with low angle, close, rough,		
49			48.5-49.5		20 min		stepped, fresh, closed to partly open joints.		
							Core barrel became plugged, retrieved approximately 2 ft. of bedrock.		
50							Put core barrel back down hole to finish the run.		
							Core hole filled in with gravel and fractured rock.		
51							Not possible to finish out the core run.		
							Boring terminated in bedrock at 49.5 ft.		
52									
53									
54									
55									
56									
57									
58									
59									
60									

0 to 4 - Very Loose	0 to 2 - Very Soft	1. S denotes split-barrel sampler.	7. PID denotes Photoionization Detector
5 to 10 - Loose	3 to 4 - Soft	2. U denotes 3-inch O.D. undisturbed sample.	8. PPM denotes parts per million.
11 to 30 - Medium Dense	5 to 8 - Medium Stiff	3. UO denotes 3-inch Osterberg undisturbed sample.	9. PP denotes Pocket Penetrometer.
31 to 50 - Dense	9 to 15 - Stiff	4. PEN denotes penetration length of sampler.	10. FVST denotes field vane shear test.
Over 50 - Very Dense	16 to 30 - Very Stiff	5. REC denotes recovered length of sample.	11. RQD denotes Rock Quality Designation.
	Over 30 - Hard	6. SPT denotes Standard Penetration Test.	12. R denotes core run number.

REMARKS:
1) Sample description based on Atterberg Limits laboratory test data. Refer to Test Report No. 5, prepared by GeoTesting Express, dated November 29, 1999.
2) Sample description based on laboratory test data and ASTM D2487. Refer to Test Report No. 5, prepared by GeoTesting Express, dated November 29, 1999.
3)
4)

Nobis Engineering PO Box 2890 Concord, New Hampshire 03302	PROJECT Remedial Design For Operable Unit 01 New Bedford Harbor Superfund Site New Bedford, Massachusetts	BORING NO. FB-30 SHEET 1 of 2 FILE NO. 48138.07 CHKD. BY C. Thunberg / J. Trottier

Boring Co.	Atlantic Testing Laboratories, Limited	Boring Location	northing 2703521.1 easting 815181.4		
Driller	P. Davis	Mudline El.	-3.85	Datum	NGVD
Logged By	E. Paddleford	Date Start	8/10/99	Date End	8/16/99

Sampler: 2-inch O.D. split-barrel sampler driven 24 inches with a 140 lb. safety hammer free falling from a height of 30 inches.
Drill Rig: CME 55 skid mount
Drilling Method: 4" I.D. (HW) flush joint casing, 3 7/8" roller bit. Mud rotary.
All casing driven with a 300 lb. hammer free falling from a height of 24-inches.

Groundwater Readings Not Applicable for Offshore Borings				
Date	Time	Depth	Elev.	Stabilization Time

DEPTH	Casing Blows (ft)	SAMPLE INFORMATION Type & No.	PEN/REC (inches)	DEPTH (feet)	BLOWS PER 6 INCHES	SPT N-Value	SAMPLE DESCRIPTION	STRATUM DESCRIPTION	REMKS
	Hyd.						Advance HW drill casing to 5 ft. (hydraulic push)		
1	Push						Advance 3-7/8 in. roller bit from 0 to 5 ft.		
	Hyd.								
2	Push								
	Hyd.								
3	Push								
	Hyd.								
4	Push								
	Hyd.								
5	Push								
	Hyd.	S-1	24/10	5-7	WOR/24"	--	Organic soil (OH); 60% organic clay, 40% organic silt, moderate organic odor, shell	OH	
6	Push						fragments, dark gray.		
	Hyd.						Advance HW drill casing to 10 ft. (hydraulic push)		
7	Push						Advance 3-7/8 in. roller bit to 10 ft.		
	Hyd.								
8	Push								
	Hyd.								
9	Push								
	Hyd.								
10	Push								
	Hyd.	S-2	24/24	10-12	WOR/24"	--	Organic soil (OH); 60% organic clay, 35% organic silt, 5% fine sand, moderate organic	OH	
11	Push						odor, shell fragments, gray.		
	Hyd.						Advance HW drill casing to 15 ft. (hydraulic push)		
12	Push						Advance 3-7/8 in. roller bit to 15 ft.		
	Hyd.								
13	Push								
	Hyd.								
14	Push								
	Hyd.								
15	Push								
		S-3	24/20	15-17	WOR/12" -	--	16 in: Similar to S-2.	OH	
16	11				WOH/12"		4 in: Poorly graded sand (SP); 60% medium sand, 20% fine sand, 15% coarse		
							sand, 5% silt, gray.		
17	6						Switch to mud rotary drilling techniques at 15 ft.	SP	
							Advance 3-7/8 in. roller bit to 20 ft.		
18	10								
19	19								
20	53								

0 to 4 - Very Loose	0 to 2 - Very Soft	1. S denotes split-barrel sampler.	7. PID denotes Photoionization Detector
5 to 10 - Loose	3 to 4 - Soft	2. U denotes 3-inch O.D. undisturbed sample.	8. PPM denotes parts per million.
11 to 30 - Medium Dense	5 to 8 - Medium Stiff	3. UO denotes 3-inch Osterberg undisturbed sample.	9. PP denotes Pocket Penetrometer.
31 to 50 - Dense	9 to 15 - Stiff	4. PEN denotes penetration length of sampler.	10. FVST denotes field vane shear test.
Over 50 - Very Dense	16 to 30 - Very Stiff	5. REC denotes recovered length of sample.	11. RQD denotes Rock Quality Designation.
	Over 30 - Hard	6. SPT denotes Standard Penetration Test.	12. R denotes core run number.

REMARKS:
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Nobis Engineering PO Box 2890 Concord, New Hampshire 03302	PROJECT Remedial Design For Operable Unit 01 New Bedford Harbor Superfund Site New Bedford, Massachusetts	BORING NO. FB-30 SHEET 2 of 2 FILE NO. 48138.07 CHKD. BY C. Thunberg / J. Trottier

Boring Co.	Atlantic Testing Laboratories, Limited	Boring Location	northing 2703521.1 easting 815181.4		
Driller	P. Davis	Mudline El.	-3.85	Datum	NGVD
Logged By	E. Paddleford	Date Start	8/10/99	Date End	8/16/99

Sampler: 2-inch O.D. split-barrel sampler driven 24 inches with a 140 lb. safety hammer free falling from a height of 30 inches.
Drill Rig: CME 55 skid mount
Drilling Method: 4" I.D. (HW) flush joint casing, 3 7/8" roller bit. Mud rotary.
All casing driven with a 300 lb. hammer free falling from a height of 24-inches.

Groundwater Readings Not Applicable for Offshore Borings				
Date	Time	Depth	Elev.	Stabilization Time

DEPTH	Casing Blows (ft)	SAMPLE INFORMATION Type & No.	PEN/REC (inches)	DEPTH (feet)	BLOWS PER 6 INCHES	SPT N-Value	SAMPLE DESCRIPTION	STRATUM DESCRIPTION	REMKS
		S-4	24/12	20-22	12-22-16-28	38	Poorly graded sand (SP); dense, 45% medium sand, 35% fine sand,	SP	
21	8						10% coarse sand, 5% gravel, 5% silt, olive green.		
							Advance HW drill casing to 20 ft.		
22	8						Mix additional bentonite drilling mud.		
							Advance 3-7/8 in. roller bit to 25 ft.		
23	6								
24	10								
25	10								
		S-5	24/10	25-27	8-10-9-10	19	Poorly graded sand (SP); medium dense, 60% medium sand, 25% fine sand,	SP	
26	12						10% coarse sand, 5% silt, olive green.		
							Advance HW drill casing to 25 ft.		
27	6						Advance 3-7/8 in. roller bit to 30 ft.		
							Mix additional bentonite drilling mud.		
28	10								
29	17								
30	20								
		S-6	24/2	30-32	15-15-8-8	23	Silty sand (SM); wet, medium dense, 5% coarse sand, 15% medium sand, 50% fine	SM	
31							sand, 5% gravel, 25% silt, brown.		
							Advance HW drill casing to 30 ft.		
32							Advance 3-7/8 in. roller bit to 35 ft.		
33									
34									
35									
		S-7	22/8	35-36.8	29-44-47-100/4"	91	Poorly graded sand with silt (SP-SM); very dense , 40% fine sand, 30% medium	GLACIAL TILL	
36							sand, 10% gravel, 10% silt, 10% coarse sand, brown, angular gravel (GLACIAL TILL).		
37							Spoon refusal at 36.8 ft, probable bedrock.		
38								PROBABLE BEDROCK	
39									
40									

0 to 4 - Very Loose	0 to 2 - Very Soft	1. S denotes split-barrel sampler.	7. PID denotes Photoionization Detector
5 to 10 - Loose	3 to 4 - Soft	2. U denotes 3-inch O.D. undisturbed sample.	8. PPM denotes parts per million.
11 to 30 - Medium Dense	5 to 8 - Medium Stiff	3. UO denotes 3-inch Osterberg undisturbed sample.	9. PP denotes Pocket Penetrometer.
31 to 50 - Dense	9 to 15 - Stiff	4. PEN denotes penetration length of sampler.	10. FVST denotes field vane shear test.
Over 50 - Very Dense	16 to 30 - Very Stiff	5. REC denotes recovered length of sample.	11. RQD denotes Rock Quality Designation.
	Over 30 - Hard	6. SPT denotes Standard Penetration Test.	12. R denotes core run number.

REMARKS:
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Nobis Engineering PO Box 1890 Concord, New Hampshire 03302	PROJECT Remedial Design For Operable Unit 01 New Bedford Harbor Superfund Site New Bedford, Massachusetts	BORING NO. FB - 31 SHEET 1 of 2 FILE NO. 48138.07 CHKD. BY C. Thunberg / J. Trottier

Boring Co.	Atlantic Testing Laboratories, Limited	Boring Location	northing 2703401.5 easting 815093.4		
Driller	M. Childs	Mudline El.	-3.30	Datum	NGVD
Logged By	E. Paddleford	Date Start	10/5/99	Date End	10/6/99

Sampler: 2-inch O.D. split-barrel sampler driven 24 inches with a 140 lb safety hammer free falling from a height of 30 inches.
Drill Rig: CME 55 skid mount
Drilling Method 4" I.D. (HW) flush joint casing, 3 7/8" roller bit. Mud rotary.
All casing driven with a 300 lb. hammer free falling from a height of 24-inches.

Groundwater Readings Not Applicable for Offshore Borings				
Date	Time	Depth	Elev.	Stabilization Time

DEPTH	Casing Blows (ft)	SAMPLE INFORMATION Type & No.	PEN/REC (inches)	DEPTH (feet)	BLOWS PER 6 INCHES	SPT N-Value	SAMPLE DESCRIPTION	STRATUM DESCRIPTION	REMKS
	Hyd.	UO-1	24/21	0-2	–	–	Sheen visible on top of shelby tube sample.		
1	Push						Advance HW drill casing from 0 to 5 ft.		
	Hyd.						Advance 3-7/8 in. roller bit from 0 to 5 ft.		
2	Push						Wash water black upon return. Strong organic odor.		
	Hyd.								
3	Push								
	Hyd.								
4	Push								
	Hyd.								
5	Push								
	Hyd.	S-1	24/4	5-7	WOR/24"	–	Organic soil (OH); 80% organic clay, 10% organic silt, 10% shell	OH	
6	Push						fragments, dark gray.		
	Hyd.						Advance HW drill casing to 10 ft.		
7	Push						Advance 3-7/8 in. roller bit to 10 ft.		
	Hyd.						Encounter sand layer at 8 ft, must drive casing.		
8	Push								
9	62								
10	50								
		S-2	24/12	10-12	19-21-21-22	42	Well-graded sand (SW); dense, 35% medium sand, 35% fine sand, 20%	SW	
11	25						coarse sand, 5% silt, 5% gravel, brown.		
							Advance HW drill casing to 15 ft.		
12	46						Advance 3-7/8 in. roller bit to 15 ft.		
13	42								
14	83								
15	116								
		S-3	24/12	15-17	21-34-36-37	70	Poorly graded sand with silt (SP-SM); very dense, 40% medium sand, 30%	SP-SM	
16	93						fine sand, 10% coarse sand, 10% silt, 10% gravel, brown.		
							Advance HW drill casing to 20 ft.		
17	103						Advance 3-7/8 in. roller bit to 20 ft.		
18	116								
19	88								
20	69								

0 to 4 - Very Loose	0 to 2 - Very Soft	1. S denotes split-barrel sampler.	7. PID denotes Photoionization Detector
5 to 10 - Loose	3 to 4 - Soft	2. U denotes 3-inch O.D. undisturbed sample.	8. PPM denotes parts per million.
11 to 30 - Medium Dense	5 to 8 - Medium Stiff	3. UO denotes 3-inch Osterberg undisturbed sample.	9. PP denotes Pocket Penetrometer.
31 to 50 - Dense	9 to 15 - Stiff	4. PEN denotes penetration length of sampler.	10. FVST denotes field vane shear test.
Over 50 - Very Dense	16 to 30 - Very Stiff	5. REC denotes recovered length of sample.	11. RQD denotes Rock Quality Designation.
	Over 30 - Hard	6. SPT denotes Standard Penetration Test.	12. R denotes core run number.

REMARKS:
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Nobis Engineering PO Box 2890 Concord, New Hampshire 03302	PROJECT Remedial Design For Operable Unit 01 New Bedford Harbor Superfund Site New Bedford, Massachusetts	BORING NO. FB - 31 SHEET 2 of 2 FILE NO. 48138.07 CHKD. BY C. Thunberg / J. Trottier

Boring Co.	Atlantic Testing Laboratories, Limited	Boring Location	northing 2703401.5 easting 815093.4		
Driller	M. Childs	Mudline El.	-3.30	Datum	NGVD
Logged By	E. Paddleford	Date Start	10/5/99	Date End	10/6/99

Sampler: 2-inch O.D. split-barrel sampler driven 24 inches with a 140 lb safety hammer free falling from a height of 30 inches.
Drill Rig: CME 55 skid mount
Drilling Method: 4" I.D. (HW) flush joint casing, 3 7/8" roller bit. Mud rotary.
All casing driven with a 300 lb. hammer free falling from a height of 24-inches.

Groundwater Readings Not Applicable for Offshore Borings				
Date	Time	Depth	Elev.	Stabilization Time

DEPTH	Casing Blows (ft)	SAMPLE INFORMATION Type & No.	PEN/REC (inches)	DEPTH (feet)	BLOWS PER 6 INCHES	SPT N-Value	SAMPLE DESCRIPTION	STRATUM DESCRIPTION
		S-4	24/3	20-22	10-10-13-12	23	Poorly graded sand (SP); medium dense, 50% fine sand, 30% medium sand,	SP
21							15% coarse sand, 5% silt, brown.	
							Switch to mud rotary drilling techniques at 20 ft.	
22							Advance 3-7/8 in. roller bit to 23 ft.	
23								
		S-5	24/0	23-25	13-10-9-17	19	S-5: No recovery. Re-sample.	
24		S-6	24/9	23-25	10-10-7-7	17	S-6: Silty sand (SM); medium dense, 60% fine sand, 30% silt, 10% coarse sand,	SM
25							gray.	
							Bottom of exploration at 25 ft.; no refusal.	
26								
27								
28								
29								
30								
31								
32								
33								
34								
35								
36								
37								
38								
39								
40								

0 to 4 - Very Loose	0 to 2 - Very Soft	1. S denotes split-barrel sampler.	7. PID denotes Photoionization Detector
5 to 10 - Loose	3 to 4 - Soft	2. U denotes 3-inch O.D. undisturbed sample.	8. PPM denotes parts per million.
11 to 30 - Medium Dense	5 to 8 - Medium Stiff	3. UO denotes 3-inch Osterberg undisturbed sample.	9. PP denotes Pocket Penetrometer.
31 to 50 - Dense	9 to 15 - Stiff	4. PEN denotes penetration length of sampler.	10. FVST denotes field vane shear test.
Over 50 - Very Dense	16 to 30 - Very Stiff	5. REC denotes recovered length of sample.	11. RQD denotes Rock Quality Designation.
	Over 30 - Hard	6. SPT denotes Standard Penetration Test.	12. R denotes core run number.

REMARKS:
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Nobis Engineering PO Box 2890 Concord, New Hampshire 03302	PROJECT Remedial Design For Operable Unit 01 New Bedford Harbor Superfund Site New Bedford, Massachusetts	BORING NO. FB-V1 SHEET 1 of 1 FILE NO. 48138.07 CHKD. BY C. Thunberg / J. Trottier

Boring Co.	Atlantic Testing Laboratories, Limited	Boring Location	northing 2704502.5	easting 815188.4	
Driller	P. Davis	Mudline El.	-4.70	Datum	NGVD
Logged By	E. Thibodeau	Date Start	11/3/99	Date End	11/3/99

Sampler: 2-inch O.D. split-barrel sampler driven 24 inches with a 140 lb. safety hammer free falling from a height of 30 inches.
Drill Rig: CME 55 skid mount
Drilling Method: 4" I.D. (HW) flush joint casing, 3 7/8" roller bit. Wash and drive.

Groundwater Readings Not Applicable for Offshore Borings

Date	Time	Depth	Elev.	Stabilization Time

DEPTH	Casing Blows (ft)	SAMPLE INFORMATION Type & No.	PEN/REC (inches)	DEPTH (feet)	BLOWS PER 6 INCHES	SPT N-Value	SAMPLE DESCRIPTION	STRATUM DESCRIPTION	REMKS
	hyd						Advance HW drill casing to 14 ft. (hydraulic push)		
1	push						Advance 3-7/8 in. roller bit from 0 to 14 ft.		
	hyd								
2	push								
	hyd								
3	push								
	hyd								
4	push								
	hyd								
5	push							OH	
	hyd								
6	push								
	hyd								
7	push								
	hyd								
8	push								
	hyd								
9	push								
	hyd								
10	push								
	hyd								
11	push								
	hyd								
12	push								
	hyd								
13	push								
	hyd								
14	push						Difficult push at 14 ft.		
		S-1	24/10	14-16	18-17-15-10	32	Silty sand with gravel (SM); wet, dense, 40% gravel, 20% fine sand, 20% silt, 15% medium sand,	SM	
15							5% coarse sand, gray.		
16									
							Bottom of exploration at 16 ft; no refusal.		
17									
18									
19									
20									

0 to 4 - Very Loose	0 to 2 - Very Soft	1. S denotes split-barrel sampler.	7. PID denotes Photoionization Detector
5 to 10 - Loose	3 to 4 - Soft	2. U denotes 3-inch O.D. undisturbed sample.	8. PPM denotes parts per million.
11 to 30 - Medium Dense	5 to 8 - Medium Stiff	3. UO denotes 3-inch Osterberg undisturbed sample.	9. PP denotes Pocket Penetrometer.
31 to 50 - Dense	9 to 15 - Stiff	4. PEN denotes penetration length of sampler.	10. FVST denotes field vane shear test.
Over 50 - Very Dense	16 to 30 - Very Stiff	5. REC denotes recovered length of sample.	11. RQD denotes Rock Quality Designation.
	Over 30 - Hard	6. SPT denotes Standard Penetration Test.	12. R denotes core run number.

REMARKS:
1)
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Nobis Engineering PO Box 2890 Concord, New Hampshire 03302	PROJECT Remedial Design For Operable Unit 01 New Bedford Harbor Superfund Site New Bedford, Massachusetts	BORING NO. FB-V2 SHEET 1 of 1 FILE NO. 48138.07 CHKD. BY C. Thunberg / J. Trottier

Boring Co.	Atlantic Testing Laboratories, Limited	Boring Location	northing 2704099.9	easting 815185.5	
Driller	P. Davis	Mudline El.	-6.40	Datum	NGVD
Logged By	E. Thibodeau	Date Start	11/3/99	Date End	11/3/99

Sampler: 2-inch O.D. split-barrel sampler driven 24 inches with a 140 lb. safety hammer free falling from a height of 30 inches.
Drill Rig: CME 55 skid mount
Drilling Method: 4" I.D. (HW) flush joint casing, 3 7/8" roller bit. Wash and drive.

Groundwater Readings Not Applicable for Offshore Borings				
Date	Time	Depth	Elev.	Stabilization Time

DEPTH	Casing Blows (ft)	SAMPLE INFORMATION Type & No.	PEN/REC (inches)	DEPTH (feet)	BLOWS PER 6 INCHES	SPT N-Value	SAMPLE DESCRIPTION	STRATUM DESCRIPTION	REMKS
	hyd						Advance HW drill casing from 0 to 12.5 ft. (hydraulic push)		
1	push						Advance 3-7/8 in. roller bit from 0 to 12.5 ft.		
	hyd								
2	push								
	hyd								
3	push								
	hyd								
4	push								
	hyd								
5	push							OH	
	hyd								
6	push								
	hyd								
7	push								
	hyd								
8	push								
	hyd								
9	push								
	hyd								
10	push								
	hyd								
11	push								
	hyd								
12	push								
	push						Difficult push at 12.5 ft.		
13		S-1	24/18	12.5-	23-24-24-24	48	Silty gravel with sand (GM); wet, dense, 45% gravel, 15% medium sand, 10% coarse sand,	GM	
				14.5			10% fine sand, 20% silt, gray.		
14									
15							Bottom of exploration at 14.5 ft; no refusal.		
16									
17									
18									
19									
20									

0 to 4 - Very Loose	0 to 2 - Very Soft	1. S denotes split-barrel sampler.	7. PID denotes Photoionization Detector
5 to 10 - Loose	3 to 4 - Soft	2. U denotes 3-inch O.D. undisturbed sample.	8. PPM denotes parts per million.
11 to 30 - Medium Dense	5 to 8 - Medium Stiff	3. UO denotes 3-inch Osterberg undisturbed sample.	9. PP denotes Pocket Penetrometer.
31 to 50 - Dense	9 to 15 - Stiff	4. PEN denotes penetration length of sampler.	10. FVST denotes field vane shear test.
Over 50 - Very Dense	16 to 30 - Very Stiff	5. REC denotes recovered length of sample.	11. RQD denotes Rock Quality Designation.
	Over 30 - Hard	6. SPT denotes Standard Penetration Test.	12. R denotes core run number.

REMARKS:
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Nobis Engineering PO Box 2890 Concord, New Hampshire 03302	PROJECT Remedial Design For Operable Unit 01 New Bedford Harbor Superfund Site New Bedford, Massachusetts	BORING NO. FB-V3 SHEET 1 of 1 FILE NO. 48138.07 CHKD. BY C. Thunberg / J. Trottier

Boring Co.	Atlantic Testing Laboratories, Limited	Boring Location	northing 2704971.8	easting 815019.2	
Driller	P. Davis	Mudline El.	-2.20	Datum	NGVD
Logged By	E. Thibodeau	Date Start	11/3/99	Date End	11/3/99

Sampler: 2-inch O.D. split-barrel sampler driven 24 inches with a 140 lb. safety hammer free falling from a height of 30 inches.
Drill Rig: CME 55 skid mount
Drilling Method: 4" I.D. (HW) flush joint casing, 3 7/8" roller bit. Wash and drive.

Groundwater Readings Not Applicable for Offshore Borings				
Date	Time	Depth	Elev.	Stabilization Time

DEPTH	Casing Blows (ft)	SAMPLE INFORMATION Type & No.	PEN/REC (inches)	DEPTH (feet)	BLOWS PER 6 INCHES	SPT N-Value	SAMPLE DESCRIPTION	STRATUM DESCRIPTION	REMKS
	hyd						Advance HW drill casing to 9 ft. (hydraulic push)		
1	push						Advance 3-7/8 in. roller bit from 0 to 9 ft.		
	hyd							OH	
2	push								
	hyd								
3	push								
	hyd								
4	push								
	hyd								
5	push								
	hyd								
6	push								
	hyd								
7	push								
	hyd								
8	push								
	hyd								
9	push						Difficult push at 9 ft.		
		S-1	24/18	9-11	11-33-31-34	64	Silty gravel with sand (GM); wet, very dense, 40% gravel, 20% fine sand, 10% coarse, 5% medium sand,	GM	
10							25% silt, dark brown. Traces of peat noted throughout sample.		
11									
12							Bottom of exploration at 11 ft; no refusal.		
13									
14									
15									
16									
17									
18									
19									
20									

0 to 4 - Very Loose	0 to 2 - Very Soft	1. S denotes split-barrel sampler.	7. PID denotes Photoionization Detector
5 to 10 - Loose	3 to 4 - Soft	2. U denotes 3-inch O.D. undisturbed sample.	8. PPM denotes parts per million.
11 to 30 - Medium Dense	5 to 8 - Medium Stiff	3. UO denotes 3-inch Osterberg undisturbed sample.	9. PP denotes Pocket Penetrometer.
31 to 50 - Dense	9 to 15 - Stiff	4. PEN denotes penetration length of sampler.	10. FVST denotes field vane shear test.
Over 50 - Very Dense	16 to 30 - Very Stiff	5. REC denotes recovered length of sample.	11. RQD denotes Rock Quality Designation.
	Over 30 - Hard	6. SPT denotes Standard Penetration Test.	12. R denotes core run number.

REMARKS:
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Nobis Engineering PO Box 2890 Concord, New Hampshire 03302	PROJECT Remedial Design For Operable Unit 01 New Bedford Harbor Superfund Site New Bedford, Massachusetts	BORING NO. FB-V4 SHEET 1 of 1 FILE NO. 48138.07 CHKD. BY C. Thunberg / J. Trottier

Boring Co.	Atlantic Testing Laboratories, Limited	Boring Location	northing 2703511.0	easting 815052.5	
Driller	P. Davis	Mudline El.	-3.3	Datum	NGVD
Logged By	E. Thibodeau	Date Start	11/3/99	Date End	11/3/99

Sampler: 2-inch O.D. split-barrel sampler driven 24 inches with a 140 lb. safety hammer free falling from a height of 30 inches.
Drill Rig: CME 55 skid mount
Drilling Method: 4" I.D. (HW) flush joint casing, 3 7/8" roller bit. Wash and drive.

Groundwater Readings (from ground surface)				
Date	Time	Depth	Elev.	Stabilization Time

DEPTH	Casing Blows (ft)	SAMPLE INFORMATION Type & No.	PEN/REC (inches)	DEPTH (feet)	BLOWS PER 6 INCHES	SPT N-Value	SAMPLE DESCRIPTION	STRATUM DESCRIPTION	REMKS
	hyd						Advance HW casing to 16.5 ft. (hydraulic push)		
1	push						Advance 3-7/8 in. roller bit from 0 to 16.5 ft.		
	hyd							OH	
2	push								
	hyd								
3	push								
	hyd								
4	pus								
	hyd								
5	push								
	hyd								
6	push								
	hyd								
7	push								
	hyd								
8	push								
	hyd								
9	push								
	hyd								
10	push								
	hyd								
11	push								
	hyd								
12	push								
	hyd								
13	push								
	hyd								
14	push								
	hyd								
15	push								
	hyd								
16	push								
	push						Difficult push at 16.5 feet.		
17		S-1	24/14	16.5-	21-10-12-19	22	4 in: Silty sand (SM); wet, medium dense, 60% fine sand, 35% silt,	SM	
				18.5			5% medium sand, gray.		
18							10 in: Poorly graded sand with silt (SP-SM); wet, medium dense, 40% fine sand,	SP-SM	
							40% medium sand, 10% silt, 5% coarse sand, 5% gravel, reddish-brown.		
19							Bottom of exploration at 18.5 ft. No refusal.		
20									

0 to 4 - Very Loose	0 to 2 - Very Soft	1. S denotes split-barrel sampler.	7. PID denotes Photoionization Detector
5 to 10 - Loose	3 to 4 - Soft	2. U denotes 3-inch O.D. undisturbed sample.	8. PPM denotes parts per million.
11 to 30 - Medium Dense	5 to 8 - Medium Stiff	3. UO denotes 3-inch Osterberg undisturbed sample.	9. PP denotes Pocket Penetrometer.
31 to 50 - Dense	9 to 15 - Stiff	4. PEN denotes penetration length of sampler.	10. FVST denotes field vane shear test.
Over 50 - Very Dense	16 to 30 - Very Stiff	5. REC denotes recovered length of sample.	11. RQD denotes Rock Quality Designation.
	Over 30 - Hard	6. SPT denotes Standard Penetration Test.	12. R denotes core run number.

REMARKS:
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Nobis Engineering PO Box 2890 Concord, New Hampshire 03302	PROJECT Remedial Design For Operable Unit 01 New Bedford Harbor Superfund Site New Bedford, Massachusetts	BORING NO. FB-V5 SHEET 1 of 1 FILE NO. 48138.07 CHKD. BY C. Thunberg / J. Trottier

Boring Co.	Atlantic Testing Laboratories, Limited	Boring Location	northing 2703356.1 easting 815146.4		
Driller	P. Davis	Mudline El.	-3.40	Datum	NGVD
Logged By	E. Thibodeau	Date Start	11/4/99	Date End	11/4/99

Sampler: 2-inch O.D. split-barrel sampler driven 24 inches with a 140 lb. safety hammer free falling from a height of 30 inches.
Drill Rig: CME 55 skid mount
Drilling Method: 4" I.D. (HW) flush joint casing, 3 7/8" roller bit. Wash and drive.

Groundwater Readings Not Applicable for Offshore Borings				
Date	Time	Depth	Elev.	Stabilization Time

DEPTH	Casing Blows (ft)	SAMPLE INFORMATION Type & No.	PEN/REC (inches)	DEPTH (feet)	BLOWS PER 6 INCHES	SPT N-Value	SAMPLE DESCRIPTION	STRATUM DESCRIPTION	REMKS
1	Hyd. Push						Advance HW drill casing to 12 ft. (hydraulic push) Advance 3-7/8 in. roller bit from 0 to 12 ft.		
2	Hyd. Push								
3	Hyd. Push							OH	
4	Hyd. Push								
5	Hyd. Push								
6	Hyd. Push								
7	Hyd. Push								
8	Hyd. Push								
9	Hyd. Push								
10	Hyd. Push								
11	Hyd. Push								
12	Hyd. Push						Difficult push at 11.5 ft.		
13	Hyd. Push	S-1	24/18	12-14	WOH/24"	--	Organic soil with sand (OH); wet, 75% organic clay/silt, 20% fine sand, 5% medium sand, gray. Pocket Penetrometer: Undrained shear strength Su=0.1 - 0.15 ksf.		1
14	Hyd. Push						Advance HW drill casing to 15 ft. (hydraulic push)		
15	Hyd. Push						Advance 3-7/8 in. roller bit to 15 ft.		
16		S-2	24/24	15-17	2-3-7-18	10	18 in: Sandy organic soil (OH); wet, stiff, 60% organic clay/silt, 35% fine sand, 5% medium sand, gray.		
17							6 in: Silty sand with gravel (SM); wet, 30% silt, 30% fine sand, 25% gravel, 10% medium sand, 5% coarse sand, gray.	SM	
18							Bottom of exploration at 17 ft.; no refusal.		
19									
20									

0 to 4 - Very Loose	0 to 2 - Very Soft	1. S denotes split-barrel sampler.	7. PID denotes Photoionization Detector
5 to 10 - Loose	3 to 4 - Soft	2. U denotes 3-inch O.D. undisturbed sample.	8. PPM denotes parts per million.
11 to 30 - Medium Dense	5 to 8 - Medium Stiff	3. UO denotes 3-inch Osterberg undisturbed sample.	9. PP denotes Pocket Penetrometer.
31 to 50 - Dense	9 to 15 - Stiff	4. PEN denotes penetration length of sampler.	10. FVST denotes field vane shear test.
Over 50 - Very Dense	16 to 30 - Very Stiff	5. REC denotes recovered length of sample.	11. RQD denotes Rock Quality Designation.
	Over 30 - Hard	6. SPT denotes Standard Penetration Test.	12. R denotes core run number.

REMARKS:
1) Sampler was overdriven approximately 12 in.; therefore, casing advanced to 15 ft. for next sample.
2)
3)
4)

Nobis Engineering PO Box 2890 Concord, New Hampshire 03302	PROJECT Remedial Design For Operable Unit 01 New Bedford Harbor Superfund Site New Bedford, Massachusetts	BORING NO. CSO-B1 SHEET 1 of 2 FILE NO. 48138.07 CHKD. BY C. Thunberg / J. Trottier

Boring Co.	Atlantic Testing Laboratories, Limited	Boring Location	northing 2703308.7 easting 814998.1
Driller	R. Pryce	Ground Surface El	7.81 Datum NGVD
Logged By	R. Chase	Date Start	7/15/99 Date End 7/15/99

Sampler: 2-inch O.D. split-barrel sampler driven 24 inches with a 140 lb safety hammer free falling from a height of 30 inches.
Drill Rig: CME 75 truck mount
Drilling Method: 6" I.D. (SW) flush joint casing, 5-3/8" roller bit. Spin and wash.

Groundwater Readings (from ground surface)

Date	Time	Depth	Elev.	Stabilization Time
7/15/99	--	4.50 ft	3.31	During drilling
7/15/99	--	5.90 ft.	1.91	Upon completion of drilling

DEPTH	Casing Blows (ft)	Type & No.	PEN/REC (inches)	DEPTH (feet)	BLOWS PER 6 INCHES	SPT N-Value	SAMPLE DESCRIPTION	STRATUM DESCRIPTION	REMKS
1		S-1	24/12	0-2	13-23-10-9	33	Poorly graded gravel (GP); dense, dry, 90% fine gravel, 5% fine to medium sand, <5% silt, gray. (FILL).		
2									
3									
4		S-2	24/18	3-5	12-12-12-12	24	Poorly graded sand with gravel (SP); wet, medium dense, 25% fine sand, 45% medium sand, 20% fine gravel, <5% silt, 5% ash, gray-black. (FILL)		1
5								FILL	
6									
7									
8									
9		S-3	24/13	8-10	5-5-5-5	10	Poorly graded sand with gravel (SP); loose, 15% fine sand, 35% medium sand, 20% coarse sand, 20% fine gravel, <5% silt, <5% ash, gray-black. (FILL)		
10									
11							Estimated strata change at 11 ft.		
12									
13									
14		S-4	24/14	13-15	6-8-7-7	15	Poorly graded sand with silt (SP-SM); medium dense, 90% fine sand, 10% silt.	SP-SM	
15									
16									
17									
18									
19		S-5	24/22	18-20	5-6-7-9	13	Silt with sand (ML); stiff, 75% silt, 25% fine sand, gray-brown. Many lenses (<1/8 in.) of iron stained fine sand.	ML	
20									

0 to 4 - Very Loose	0 to 2 - Very Soft	1. S denotes split-barrel sampler.	7. PID denotes Photoionization Detector
5 to 10 - Loose	3 to 4 - Soft	2. U denotes 3-inch O.D. undisturbed sample.	8. PPM denotes parts per million.
11 to 30 - Medium Dense	5 to 8 - Medium Stiff	3. UO denotes 3-inch Osterberg undisturbed sample.	9. PP denotes Pocket Penetrometer.
31 to 50 - Dense	9 to 15 - Stiff	4. PEN denotes penetration length of sampler.	10. FVST denotes field vane shear test.
Over 50 - Very Dense	16 to 30 - Very Stiff	5. REC denotes recovered length of sample.	11. RQD denotes Rock Quality Designation.
	Over 30 - Hard	6. SPT denotes Standard Penetration Test.	12. R denotes core run number.

REMARKS:
1) Groundwater encountered at approximately 4.5 feet.
2) Installed 2-inch PVC groundwater observation well in completed borehole at 23 ft.
3)
4)

Nobis Engineering PO Box 2890 Concord, New Hampshire 03302	PROJECT Remedial Design For Operable Unit 01 New Bedford Harbor Superfund Site New Bedford, Massachusetts	BORING NO. CSO-B1 SHEET 2 of 2 FILE NO. 48138.07 CHKD. BY C. Thunberg / J. Trottie

Boring Co.	Atlantic Testing Laboratories, Limited	Boring Location	northing 2703308.7 easting 814998.1		
Driller	R. Pryce	Ground Surface El.	7.81	Datum	NGVD
Logged By	R. Chase	Date Start	7/15/99	Date End	7/15/99

Sampler: 2-inch O.D. split-barrel sampler driven 24 inches with a 140 lb safety hammer free falling from a height of 30 inches.
Drill Rig: CME 75 truck mount
Drilling Method: 6" I.D. (SW) flush joint casing, 5-3/8" roller bit. Spin and wash.

Groundwater Readings (from ground surface)

Date	Time	Depth	Elev.	Stabilization Time
7/15/99	–	4.50 ft	3.31	During drilling
7/15/99	–	5.90 ft.	1.91	Upon completion of drilling

DEPTH	Casing Blows (ft)	SAMPLE INFORMATION Type & No.	PEN/REC (inches)	DEPTH (feet)	BLOWS PER 6 INCHES	SPT N-Value	SAMPLE DESCRIPTION	STRATUM DESCRIPTION
21								
22								
23								
24		S-6	24/14	23-25	6-6-7-7	13	Silty sand (SM); medium dense, 75% fine sand, 25% silt.	SM
25								
26							Bottom of exploration at 25 ft.; no refusal.	
27								
28								
29								
30								
31								
32								
33								
34								
35								
36								
37								
38								
39								
40								

0 to 4 - Very Loose	0 to 2 - Very Soft	1. S denotes split-barrel sampler.	7. PID denotes Photoionization Detector
5 to 10 - Loose	3 to 4 - Soft	2. U denotes 3-inch O.D. undisturbed sample.	8. PPM denotes parts per million.
11 to 30 - Medium Dense	5 to 8 - Medium Stiff	3. UO denotes 3-inch Osterberg undisturbed sample.	9. PP denotes Pocket Penetrometer.
31 to 50 - Dense	9 to 15 - Stiff	4. PEN denotes penetration length of sampler.	10. FVST denotes field vane shear test.
Over 50 - Very Dense	16 to 30 - Very Stiff	5. REC denotes recovered length of sample.	11. RQD denotes Rock Quality Designation.
	Over 30 - Hard	6. SPT denotes Standard Penetration Test.	12. R denotes core run number.

REMARKS:
1) Groundwater encountered at approximately 4.5 feet.
2) Installed 2-inch PVC groundwater observation well in completed borehole at 23 ft.
3)
4)

Nobis Engineering PO Box 2890 Concord, New Hampshire 03302	PROJECT Remedial Design For Operable Unit 01 New Bedford Harbor Superfund Site New Bedford, Massachusetts	BORING NO. CSO-B2 SHEET 1 of 2 FILE NO. 48138.07 CHKD. BY C. Thunberg / J. Trottier

Boring Co.	Atlantic Testing Laboratories, Limited	Boring Location	northing 2703467.5 easting 814952.6
Driller	R. Pryce	Ground Surface El.	6.95 Datum NGVD
Logged By	R. Chase	Date Start	7/15/99 Date End 7/15/99

Sampler: 2-inch O.D. split-barrel sampler driven 24 inches with a 140 lb safety hammer free falling from a height of 30 inches.
Drill Rig: CME 75 truck mount
Drilling Method: 4" I.D. (HW) flush joint casing, 3-7/8" roller bit. Spin & wash.

Groundwater Readings (from ground surface)

Date	Time	Depth	Elev.	Stabilization Time

DEPTH	Casing Blows (ft)	SAMPLE INFORMATION Type & No.	PEN/REC (inches)	DEPTH (feet)	BLOWS PER 6 INCHES	SPT N-Value	SAMPLE DESCRIPTION	STRATUM DESCRIPTION	REMARKS
1									
2		S-1	24/10	1-3	15-24-22-9	46	Poorly graded sand with gravel (SP); dense, dry, 60% fine sand, 10% medium sand, 20% fine gravel, <5% silt, 5% brick, gray. (FILL)		
3									
4		S-2	24/10	3-5	8-9-16-7	25	100% brick, red. (FILL)	FILL	
5									
6									
7									
8									
9		S-3	24/12	8-10	7-5-7-7	12	Poorly graded sand with silt (SP-SM); wet, medium dense, 55% fine sand, 30% medium sand, 10% silt, gray, 5% brick at top of spoon. Estimated strata change at 8 ft.	SP-SM	
10									
11									
12									
13									
14		S-4	24/10	13-15	5-6-6-8	12	Silty sand (SM); medium dense, 85% fine sand, 15% silt, gray.	SM	
15									
16									
17									
18									
19		S-5	24/17	18-20	7-5-7-8	12	Silty sand (SM); medium dense, 60% fine sand, 40% silt, gray-brown.	SM	
20									

0 to 4 - Very Loose	0 to 2 - Very Soft	1. S denotes split-barrel sampler.	7. PID denotes Photoionization Detector
5 to 10 - Loose	3 to 4 - Soft	2. U denotes 3-inch O.D. undisturbed sample.	8. PPM denotes parts per million.
11 to 30 - Medium Dense	5 to 8 - Medium Stiff	3. UO denotes 3-inch Osterberg undisturbed sample.	9. PP denotes Pocket Penetrometer.
31 to 50 - Dense	9 to 15 - Stiff	4. PEN denotes penetration length of sampler.	10. FVST denotes field vane shear test.
Over 50 - Very Dense	16 to 30 - Very Stiff	5. REC denotes recovered length of sample.	11. RQD denotes Rock Quality Designation.
	Over 30 - Hard	6. SPT denotes Standard Penetration Test.	12. R denotes core run number.

REMARKS:
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Nobis Engineering PO Box 2890 Concord, New Hampshire 03302	PROJECT Remedial Design For Operable Unit 01 New Bedford Harbor Superfund Site New Bedford, Massachusetts	BORING NO. CSO-B2 SHEET 2 of 2 FILE NO. 48138.07 CHKD. BY C. Thunberg / J. Trottier

Boring Co.	Atlantic Testing Laboratories, Limited	Boring Location	northing 2703467.5 easting 814952.6
Driller	R. Pryce	Ground Surface El.	6.95 Datum NGVD
Logged By	R. Chase	Date Start	7/15/99 Date End 7/15/99

Sampler: 2-inch O.D. split-barrel sampler driven 24 inches with a 140 lb safety hammer free falling from a height of 30 inches.
Drill Rig: CME 75 truck mount
Drilling Method: 4" I.D. (HW) flush joint casing, 3-7/8" roller bit. Spin & wash.

Groundwater Readings (from ground surface)				
Date	Time	Depth	Elev.	Stabilization Time

DEPTH	Casing Blows (ft)	SAMPLE INFORMATION Type & No.	PEN/REC (inches)	DEPTH (feet)	BLOWS PER 6 INCHES	SPT N-Value	SAMPLE DESCRIPTION	STRATUM DESCRIPTION
21								
22								
23								
24		S-6	24/20	23-25	6-7-8-8	15	Silty sand (SM); medium dense, 60% fine sand, 40% silt, gray.	SM
25								
26							Bottom of exploration at 25 ft.; no refusal.	
27								
28								
29								
30								
31								
32								
33								
34								
35								
36								
37								
38								
39								
40								

0 to 4 - Very Loose	0 to 2 - Very Soft	1. S denotes split-barrel sampler.	7. PID denotes Photoionization Detector
5 to 10 - Loose	3 to 4 - Soft	2. U denotes 3-inch O.D. undisturbed sample.	8. PPM denotes parts per million.
11 to 30 - Medium Dense	5 to 8 - Medium Stiff	3. UO denotes 3-inch Osterberg undisturbed sample.	9. PP denotes Pocket Penetrometer.
31 to 50 - Dense	9 to 15 - Stiff	4. PEN denotes penetration length of sampler.	10. FVST denotes field vane shear test.
Over 50 - Very Dense	16 to 30 - Very Stiff	5. REC denotes recovered length of sample.	11. RQD denotes Rock Quality Designation.
	Over 30 - Hard	6. SPT denotes Standard Penetration Test.	12. R denotes core run number.

REMARKS:
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Nobis Engineering PO Box 2890 Concord, New Hampshire 03302	PROJECT Remedial Design For Operable Unit 01 New Bedford Harbor Superfund Site New Bedford, Massachusetts	BORING NO. CSO-B3 SHEET 1 of 2 FILE NO. 48138.07 CHKD. BY C. Thunberg / J. Trottier

Boring Co.	Atlantic Testing Laboratories, Limited	Boring Location	northing 2703671.9 easting 814911.3
Driller	R. Pryce	Ground Surface El.	7.28 Datum NGVD
Logged By	R. Chase	Date Start	7/16/99 Date End 7/16/99

Sampler: 2-inch O.D. split-barrel sampler driven 24 inches with a 140 lb safety hammer free falling from a height of 30 inches.
Drill Rig: CME 75 truck mount
Drilling Method: 4" I.D. (HW) flush joint casing, 3-7/8" roller bit. Mud rotary.

Groundwater Readings (from ground surface)

Date	Time	Depth	Elev.	Stabilization Time

DEPTH	Casing Blows (ft)	SAMPLE INFORMATION Type & No.	PEN/REC (inches)	DEPTH (feet)	BLOWS PER 6 INCHES	SPT N-Value	SAMPLE DESCRIPTION	STRATUM DESCRIPTION	REMKS
1	spin							ASPHALT	
2	spin	S-1	24/15	1-3	4-8-10-12	18	Poorly graded sand (SP); dry, medium dense, 15% fine sand, 55% medium sand, 10% gravel, 5% silt, 10% black ash, 5% brick, black. (FILL)	FILL	
3	spin								
4	spin	S-2	24/20	3-5	8-7-8-11	15	10 in. Poorly graded sand (SP); medium dense, 60% medium sand, 10% coarse sand, 10% gravel, 5% silt, 15% black ash. (FILL)		
5	spin						10 in. Poorly graded sand (SP); medium dense, 95% medium sand, 5% silt, brown. Estimated strata change at 4 ft. Advance HW drill casing to 8 ft.	SP	
6	spin								
7	spin								
8	spin								
9		S-3	24/10	8-10	5-8-8-7	16	Silty sand (SM); medium dense, wet, 80% fine sand, 20% silt, gray. Switch to mud rotary drilling technique at 8 ft. Advance 3-7/8 in. roller bit to 15 ft.	SM	
10									
11									
12									
13									
14									
15									
16		S-4	24/15	15-17	5-7-7-8	14	Similar to S-3, except brown. Advance 3-7/8 in. roller bit to 20 ft.	SM	
17									
18									
19									
20									

0 to 4 - Very Loose	0 to 2 - Very Soft	1. S denotes split-barrel sampler.	7. PID denotes Photoionization Detector
5 to 10 - Loose	3 to 4 - Soft	2. U denotes 3-inch O.D. undisturbed sample.	8. PPM denotes parts per million.
11 to 30 - Medium Dense	5 to 8 - Medium Stiff	3. UO denotes 3-inch Osterberg undisturbed sample.	9. PP denotes Pocket Penetrometer.
31 to 50 - Dense	9 to 15 - Stiff	4. PEN denotes penetration length of sampler.	10. FVST denotes field vane shear test.
Over 50 - Very Dense	16 to 30 - Very Stiff	5. REC denotes recovered length of sample.	11. RQD denotes Rock Quality Designation.
	Over 30 - Hard	6. SPT denotes Standard Penetration Test.	12. R denotes core run number.

REMARKS:
1) Boring grouted from 0 to 27 ft.
2)
3)
4)

Nobis Engineering PO Box 2890 Concord, New Hampshire 03302	PROJECT Remedial Design For Operable Unit 01 New Bedford Harbor Superfund Site New Bedford, Massachusetts	BORING NO. CSO-B3 SHEET 2 of 2 FILE NO. 48138.07 CHKD. BY C. Thunberg / J. Trottier

Boring Co.	Atlantic Testing Laboratories, Limited	Boring Location	northing 2703671.9 easting 814911.3
Driller	R. Pryce	Ground Surface El.	7.28 Datum - NGVD
Logged By	R. Chase	Date Start	7/16/99 Date End 7/16/99

Sampler: 2-inch O.D. split-barrel sampler driven 24 inches with a 140 lb safety hammer free falling from a height of 30 inches.
Drill Rig: CME 75 truck mount
Drilling Method: 4" I.D. (HW) flush joint casing, 3-7/8" roller bit, Mud rotary.

Groundwater Readings (from ground surface)				
Date	Time	Depth	Elev.	Stabilization Time

DEPTH	Casing Blows (ft)	SAMPLE INFORMATION Type & No.	PEN/REC (inches)	DEPTH (feet)	BLOWS PER 6 INCHES	SPT N-Value	SAMPLE DESCRIPTION	STRATUM DESCRIPTION
		S-5	24/20	20-22	6-6-7-7	13	Silty sand (SM); medium dense, wet, 80% fine sand, 20% silt, brown.	SM
21							Several lenses of orange fine sand noted in sample.	
							Advance 3-7/8 in. roller bit to 25 ft.	
22								
23								
24								
25								
		S-6	24/16	25-27	12-15-14-17	29	Silty sand (SM); medium dense, wet, 80% fine sand, 20% silt, brown.	SM
26								
27								
							Bottom of exploration at 27 ft.; no refusal.	1
28								
29								
30								
31								
32								
33								
34								
35								
36								
37								
38								
39								
40								

0 to 4 - Very Loose	0 to 2 - Very Soft	1. S denotes split-barrel sampler.	7. PID denotes Photoionization Detector
5 to 10 - Loose	3 to 4 - Soft	2. U denotes 3-inch O.D. undisturbed sample.	8. PPM denotes parts per million.
11 to 30 - Medium Dense	5 to 8 - Medium Stiff	3. UO denotes 3-inch Osterberg undisturbed sample.	9. PP denotes Pocket Penetrometer.
31 to 50 - Dense	9 to 15 - Stiff	4. PEN denotes penetration length of sampler.	10. FVST denotes field vane shear test.
Over 50 - Very Dense	16 to 30 - Very Stiff	5. REC denotes recovered length of sample.	11. RQD denotes Rock Quality Designation.
	Over 30 - Hard	6. SPT denotes Standard Penetration Test.	12. R denotes core run number.

REMARKS:
1) Boring grouted from 0 to 27 ft.
2)
3)
4)

Nobis Engineering PO Box 2890 Concord, New Hampshire 03302	PROJECT Remedial Design For Operable Unit 01 New Bedford Harbor Superfund Site New Bedford, Massachusetts	BORING NO. CSO-B4 SHEET 1 of 2 FILE NO. 48138.07 CHKD. BY C. Thunberg / J. Trottier

Boring Co.	Atlantic Testing Laboratories, Limited	Boring Location	northing 2703763.3 easting 814906.0
Driller	R. Pryce	Ground Surface El.	7.07 Datum NGVD
Logged By	R. Chase	Date Start	7/16/99 Date End 7/19/99

Sampler: 2-inch O.D. split-barrel sampler driven 24 inches with a 140 lb safety hammer free falling from a height of 30 inches.
Drill Rig: CME 75 truck mount
Drilling Method: 4" I.D. (HW) flush joint casing, 3-7/8" roller bit. Mud rotary.

Groundwater Readings (from ground surface)

Date	Time	Depth	Elev.	Stabilization Time

DEPTH	Casing Blows (ft)	SAMPLE INFORMATION Type & No	PEN/REC (inches)	DEPTH (feet)	BLOWS PER 6 INCHES	SPT N-Value	SAMPLE DESCRIPTION	STRATUM DESCRIPTION	REMKS
								ASPHALT	
1	spin								
		S-1	24/13	1-3	4-7-9-8	16	*Poorly graded sand (SP); medium dense, 60% fine sand, 20% medium sand,*		
2	spin						10% fine gravel, <5% silt, <5% glass, traces of ash, black. (FILL)		
3	spin								
		S-2	24/14	3-5	7-6-5-5	11	Poorly graded sand (SP); medium dense, 60% fine sand, 20% medium sand, 10% fine		
4	spin						gravel, <5% silt, 5% brick, traces of ash, black. (FILL)		
							Advance HW drill casing to 8 ft.		
5	spin						Advance 3-7/8 in. roller bit to 8 ft.		
6	spin							FILL	
7	spin								
8	spin								
		S-3	24/14	8-10	5-5-8-8	13	Poorly graded sand with gravel (SP); wet, medium dense, 35% fine sand,		
9							20% medium sand, 10% coarse sand, 20% gravel, 5% silt, 5% brick,		
10							5% wood, slag. (FILL)		
							Switch to mud rotary drilling technique at 8 ft..		
11							Advance 3-7/8 in. roller bit to 15 ft.		
12							Estimated strata change at 12 ft.		
13									
14									
15									
		S-4	24/13	15-17	15-19-23-23	42	Poorly graded sand with gravel (SP); dense, 25% fine sand, 30% medium	SP	
16							sand, 15% coarse sand, 25% fine gravel, 5% silt.		
							Advance 3-7/8 in. roller bit to 20 ft.		
17									
18									
19									
20									

0 to 4 - Very Loose	0 to 2 - Very Soft	1. S denotes split-barrel sampler.	7. PID denotes Photoionization Detector
5 to 10 - Loose	3 to 4 - Soft	2. U denotes 3-inch O.D. undisturbed sample.	8. PPM denotes parts per million.
11 to 30 - Medium Dense	5 to 8 - Medium Stiff	3. UO denotes 3-inch Osterberg undisturbed sample.	9. PP denotes Pocket Penetrometer.
31 to 50 - Dense	9 to 15 - Stiff	4. PEN denotes penetration length of sampler.	10. FVST denotes field vane shear test.
Over 50 - Very Dense	16 to 30 - Very Stiff	5. REC denotes recovered length of sample.	11. RQD denotes Rock Quality Designation.
	Over 30 - Hard	6. SPT denotes Standard Penetration Test.	12. R denotes core run number.

REMARKS:
1)
2)
3)
4)

Nobis Engineering PO Box 2890 Concord, New Hampshire 03302	PROJECT Remedial Design For Operable Unit 01 New Bedford Harbor Superfund Site New Bedford, Massachusetts	BORING NO. CSO-B4 SHEET 2 of 2 FILE NO. 48138.07 CHKD. BY C. Thunberg / J. Trottier

Boring Co.	Atlantic Testing Laboratories, Limited	Boring Location	northing 2703763.3 easting 814906.0
Driller	R. Pryce	Ground Surface El.	7.07 Datum NGVD
Logged By	R. Chase	Date Start	7/16/99 Date End 7/19/99

Sampler: 2-inch O.D. split-barrel sampler driven 24 inches with a 140 lb safety hammer free falling from a height of 30 inches.
Drill Rig: CME 75 truck mount
Drilling Method: 4" I.D. (HW) flush joint casing, 3-7/8" roller bit, Mud rotary.

Groundwater Readings (from ground surface)				
Date	Time	Depth	Elev.	Stabilization Time

DEPTH	Casing Blows (ft)	SAMPLE INFORMATION Type & No.	PEN/REC (inches)	DEPTH (feet)	BLOWS PER 6 INCHES	SPT N-Value	SAMPLE DESCRIPTION	STRATUM DESCRIPTION	REMARKS
21		S-5	24/14	20-22	23-33-38-46	71	Well-graded sand with gravel (SW); very dense, 15% fine sand, 20% medium sand, 15% coarse sand, 45% fine gravel, 5% silt, gray.	SW	
22							Advance 3-7/8 in. roller bit to 25 ft.		
23									
24									
25									
26		S-6	24/4	25-27	13-15-13-22	28	Well-graded gravel with sand (GW); medium dense, 60% gravel, 10% fine sand, 15% medium sand, 10% coarse sand, 5% silt, gray.	GW	
27									
28							Bottom of exploration at 27 ft.; no refusal.		
29									
30									
31									
32									
33									
34									
35									
36									
37									
38									
39									
40									

0 to 4 - Very Loose	0 to 2 - Very Soft	1. S denotes split-barrel sampler.	7. PID denotes Photoionization Detector
5 to 10 - Loose	3 to 4 - Soft	2. U denotes 3-inch O.D. undisturbed sample.	8. PPM denotes parts per million.
11 to 30 - Medium Dense	5 to 8 - Medium Stiff	3. UO denotes 3-inch Osterberg undisturbed sample.	9. PP denotes Pocket Penetrometer.
31 to 50 - Dense	9 to 15 - Stiff	4. PEN denotes penetration length of sampler.	10. FVST denotes field vane shear test.
Over 50 - Very Dense	16 to 30 - Very Stiff	5. REC denotes recovered length of sample.	11. RQD denotes Rock Quality Designation.
	Over 30 - Hard	6. SPT denotes Standard Penetration Test.	12. R denotes core run number.

REMARKS:
1)
2)
3)
4)

Nobis Engineering PO Box 2890 Concord, New Hampshire 03302	PROJECT Remedial Design For Operable Unit 01 New Bedford Harbor Superfund Site New Bedford, Massachusetts	BORING NO. OW-B1 SHEET 1 of 2 FILE NO. 48138.07 CHKD. BY C. Thunberg / J. Trottier

Boring Co.	Atlantic Testing Laboratories, Limited	Boring Location	northing 2703308.7 easting 814998.1		
Driller	R. Pryce	Ground Surface El.	7.81	Datum	NGVD
Logged By	R. Chase	Date Start	7/15/99	Date End	7/15/99

Sampler: 2-inch O.D. split-barrel sampler driven 24 inches with a 140 lb. safety hammer free falling from a height of 30 inches.
Drill Rig: CME 75 truck mount
Drilling Method: 6" I.D. (SW) flush joint casing, 5-3/8" roller bit. Spin and wash.

Groundwater Readings (from ground surface)

Date	Time	Depth	Elev.	Stabilization Time
7/15/99	–	5.9 ft.	1.91	Upon completion of drilling

DEPTH	Casing Blows (ft)	SAMPLE INFORMATION Type & No.	PEN/REC (inches)	DEPTH (feet)	BLOWS PER 6 INCHES	SPT N-Value	SAMPLE DESCRIPTION	STRATUM DESCRIPTION	REMKS
1									
2							Refer to Boring Log CSO-B1 (0-25 ft.) Advance SW drill casing to 23 ft.		
3									
4									
5									
6									
7									
8									
9									
10									
11									
12									
13									
14									
15									
16									
17									
18									
19									
20									

0 to 4 - Very Loose	0 to 2 - Very Soft	1. S denotes split-barrel sampler.	7. PID denotes Photoionization Detector
5 to 10 - Loose	3 to 4 - Soft	2. U denotes 3-inch O.D. undisturbed sample.	8. PPM denotes parts per million.
11 to 30 - Medium Dense	5 to 8 - Medium Stiff	3. UO denotes 3-inch Osterberg undisturbed sample.	9. PP denotes Pocket Penetrometer.
31 to 50 - Dense	9 to 15 - Stiff	4. PEN denotes penetration length of sampler.	10. FVST denotes field vane shear test.
Over 50 - Very Dense	16 to 30 - Very Stiff	5. REC denotes recovered length of sample.	11. RQD denotes Rock Quality Designation.
	Over 30 - Hard	6. SPT denotes Standard Penetration Test.	12. R denotes core run number.

REMARKS:
1) Installed 2-inch PVC groundwater observation well in completed borehole at 23 ft.
2)
3)
4)

Nobis Engineering PO Box 2890 Concord, New Hampshire 03302	PROJECT Remedial Design For Operable Unit 01 New Bedford Harbor Superfund Site New Bedford, Massachusetts	BORING NO. OW-B1 SHEET 2 of 2 FILE NO. 48138.07 CHKD. BY C. Thunberg / J. Trottier

Boring Co.	Atlantic Testing Laboratories, Limited	Boring Location	northing 2703308.7 easting 814998.1		
Driller	R. Pryce	Ground Surface El.	7.81	Datum	NGVD
Logged By	R. Chase	Date Start	7/15/99	Date End	7/15/99

Sampler: 2-inch O.D. split-barrel sampler driven 24 inches with a 140 lb. safety hammer free falling from a height of 30 inches.
Drill Rig: CME 75 truck mount
Drilling Method: 6" I.D. (SW) flush joint casing, 5-3/8" roller bit. Spin and wash.

Groundwater Readings (from ground surface)				
Date	Time	Depth	Elev.	Stabilization Time
7/15/99	–	5.9 ft.	1.91	Upon completion of drilling

DEPTH	Casing Blows (ft)	SAMPLE INFORMATION Type & No.	PEN/REC (inches)	DEPTH (feet)	BLOWS PER 6 INCHES	SPT N-Value	SAMPLE DESCRIPTION	STRATUM DESCRIPTION
21								
22								
23								
24								
25								
26							Bottom of exploration at 25 ft; no refusal.	
27								
28								
29								
30								
31								
32								
33								
34								
35								
36								
37								
38								
39								
40								

0 to 4 - Very Loose	0 to 2 - Very Soft	1. S denotes split-barrel sampler.	7. PID denotes Photoionization Detector
5 to 10 - Loose	3 to 4 - Soft	2. U denotes 3-inch O.D. undisturbed sample.	8. PPM denotes parts per million.
11 to 30 - Medium Dense	5 to 8 - Medium Stiff	3. UO denotes 3-inch Osterberg undisturbed sample.	9. PP denotes Pocket Penetrometer.
31 to 50 - Dense	9 to 15 - Stiff	4. PEN denotes penetration length of sampler.	10. FVST denotes field vane shear test.
Over 50 - Very Dense	16 to 30 - Very Stiff	5. REC denotes recovered length of sample.	11. RQD denotes Rock Quality Designation.
	Over 30 - Hard	6. SPT denotes Standard Penetration Test.	12. R denotes core run number.

REMARKS:
1) Installed 2-inch PVC groundwater observation well in completed borehole at 23 ft.
2)
3)
4)

Nobis Engineering PO Box 2890 Concord, New Hampshire 03302	PROJECT Remedial Design For Operable Unit 01 New Bedford Harbor Superfund Site New Bedford, Massachusetts	BORING NO. OW-B2 SHEET 1 of 1 FILE NO. 48138.07 CHKD. BY C. Thunberg / J. Trottier

Boring Co.	Atlantic Testing Laboratories, Limited	Boring Location	northing 2704974.8 easting 814883.6		
Driller	R. Pryce	Ground Surface El.	2.10	Datum	NGVD
Logged By	R. Chase	Date Start	7/29/99	Date End	7/29/99

Sampler: 2-inch O.D. split-barrel sampler driven 24 inches with a 140 lb. safety hammer free falling from a height of 30 inches.
Drill Rig: CME 75 truck mount
Drilling Method: 4-1/4 inch I.D. (HSA) hollow stem auger.

Groundwater Readings (from ground surface)				
Date	Time	Depth	Elev.	Stabilization Time

DEPTH	Casing Blows (ft)	SAMPLE INFORMATION Type & No.	PEN/REC (inches)	DEPTH (feet)	BLOWS PER 6 INCHES	SPT N-Value	SAMPLE DESCRIPTION	STRATUM DESCRIPTION	REMKS
1									
2							Refer to Boring Log FB - 1 (0-20 ft.) Advance HSA to 19 ft.		
3									
4									
5									
6									
7									
8									
9									
10									
11									
12									
13									
14									
15									
16									
17									
18									
19									
20							Bottom of exploration at 19 ft; no refusal.		1

0 to 4 - Very Loose	0 to 2 - Very Soft	1. S denotes split-barrel sampler.	7. PID denotes Photoionization Detector
5 to 10 - Loose	3 to 4 - Soft	2. U denotes 3-inch O.D. undisturbed sample.	8. PPM denotes parts per million.
11 to 30 - Medium Dense	5 to 8 - Medium Stiff	3. UO denotes 3-inch Osterberg undisturbed sample.	9. PP denotes Pocket Penetrometer.
31 to 50 - Dense	9 to 15 - Stiff	4. PEN denotes penetration length of sampler.	10. FVST denotes field vane shear test.
Over 50 - Very Dense	16 to 30 - Very Stiff	5. REC denotes recovered length of sample.	11. RQD denotes Rock Quality Designation.
	Over 30 - Hard	6. SPT denotes Standard Penetration Test.	12. R denotes core run number.

REMARKS:
1) Installed 2-inch PVC groundwater observation well in completed boring.
2)
3)
4)

Nobis Engineering PO Box 2890 Concord, New Hampshire 03302	PROJECT Remedial Design For Operable Unit 01 New Bedford Harbor Superfund Site New Bedford, Massachusetts	BORING NO. OW-B3 SHEET 1 of 1 FILE NO. 48138.07 CHKD. BY C. Thunberg / J. Trotlier

Boring Co.	Atlantic Testing Laboratories, Limited	Boring Location	northing 2704653.4 easting 814704.2		
Driller	R. Pryce	Ground Surface El.	5.24	Datum	NGVD
Logged By	S. Bonis	Date Start	9/14/99	Date End	9/14/99

Sampler: 2-inch O.D. split-barrel sampler driven 24 inches with a 140 lb. safety hammer free falling from a height of 30 inches.
Drill Rig: CME 75 truck mount
Drilling Method: 4-1/4 inch I.D. (HSA) hollow stem auger.

Groundwater Readings (from ground surface)

Date	Time	Depth	Elev.	Stabilization Time
9/14	–	5 ft	0.24	Upon completion

DEPTH	Casing Blows (ft)	SAMPLE INFORMATION Type & No.	PEN/REC (inches)	DEPTH (feet)	BLOWS PER 6 INCHES	SPT N-Value	SAMPLE DESCRIPTION	STRATUM DESCRIPTION	REMKS
1							2 in: Asphalt pavement		
2		S-1	24/20	1-3	13-11-7-5	18	Poorly graded sand with gravel (SP); moist, medium dense, 85% medium sand, 15% gravel, thin layer of apparent coal fragments. (FILL)		
3							Easy drilling.	FILL	
4									
5									
6		S-2	24/18	5-7	5-8-6-7	14	12 in. Poorly graded sand (SP); wet, medium dense, 90% medium sand, 10% gravel, trace brick fragments. (FILL)		
7							6 in. Silty sand (SM); wet, medium dense, 85% medium sand, 15% silt. Estimated strata change at 6 ft.	SM	
8							Easy drilling.		
9									
10									
11		S-3	24/14	10-12	11-10-9-11	19	Poorly graded sand with gravel (SP); wet, medium dense, 75% coarse sand, 25% gravel.	SP	
12									
13									
14									
15							Run-in sands. Drove first spoon to clean hole. Drove second spoon to collect 15-17 ft. sample.		
16		S-4	24/15	15-17	9-14-14-14	28	Similar to S-3 except, slight petroleum odor. Advance HSA to 19 ft.	SP	
17									
18									
19									
20							Bottom of exploration at 19 ft; no refusal.		1

0 to 4 - Very Loose	0 to 2 - Very Soft	1. S denotes split-barrel sampler.	7. PID denotes Photoionization Detector
5 to 10 - Loose	3 to 4 - Soft	2. U denotes 3-inch O.D. undisturbed sample.	8. PPM denotes parts per million.
11 to 30 - Medium Dense	5 to 8 - Medium Stiff	3. UO denotes 3-inch Osterberg undisturbed sample.	9. PP denotes Pocket Penetrometer.
31 to 50 - Dense	9 to 15 - Stiff	4. PEN denotes penetration length of sampler.	10. FVST denotes field vane shear test.
Over 50 - Very Dense	16 to 30 - Very Stiff	5. REC denotes recovered length of sample.	11. RQD denotes Rock Quality Designation.
	Over 30 - Hard	6. SPT denotes Standard Penetration Test.	12. R denotes core run number.

REMARKS:
1) Installed 2-inch PVC groundwater observation well in completed boring.
2)
3)
4)

Nobis Engineering PO Box 2890 Concord, New Hampshire 03302	PROJECT Remedial Design For Operable Unit 01 New Bedford Harbor Superfund Site New Bedford, Massachusetts	BORING NO. OW-B4 SHEET 1 of 1 FILE NO. 48138.07 CHKD. BY C. Thunberg / J. Trottier

Boring Co.	Atlantic Testing Laboratories, Limited	Boring Location	northing 2704352.2 easting 814899.4		
Driller	R. Pryce	Ground Surface El.	2.50	Datum	NGVD
Logged By	R. Chase	Date Start	8/11/99	Date End	8/12/99

Sampler: 2-inch O.D. split-barrel sampler driven 24 inches with a 140 lb. safety hammer free falling from a height of 30 inches.
Drill Rig: CME 75 truck mount
Drilling Method: 4-1/4 inch I.D. (HSA) hollow stem auger.

Groundwater Readings (from ground surface)				
Date	Time	Depth	Elev.	Stabilization Time

DEPTH	Casing Blows (ft)	SAMPLE INFORMATION Type & No.	PEN/REC (inches)	DEPTH (feet)	BLOWS PER 6 INCHES	SPT N-Value	SAMPLE DESCRIPTION	STRATUM DESCRIPTION	REMKS
1									
2							Refer to Boring Log FB - 4 (0-19 ft.) Advance HSA to 19 ft.		
3									
4									
5									
6									
7									
8									
9									
10									
11									
12									
13									
14									
15									
16									
17									
18									
19									
20							Bottom of exploration at 19 ft; no refusal.		1

0 to 4 - Very Loose	0 to 2 - Very Soft	1. S denotes split-barrel sampler.	7. PID denotes Photoionization Detector
5 to 10 - Loose	3 to 4 - Soft	2. U denotes 3-inch O.D. undisturbed sample.	8. PPM denotes parts per million.
11 to 30 - Medium Dense	5 to 8 - Medium Stiff	3. UO denotes 3-inch Osterberg undisturbed sample.	9. PP denotes Pocket Penetrometer.
31 to 50 - Dense	9 to 15 - Stiff	4. PEN denotes penetration length of sampler.	10. FVST denotes field vane shear test.
Over 50 - Very Dense	16 to 30 - Very Stiff	5. REC denotes recovered length of sample.	11. RQD denotes Rock Quality Designation.
	Over 30 - Hard	6. SPT denotes Standard Penetration Test.	12. R denotes core run number.

REMARKS:
1) Installed 2-inch PVC groundwater observation well in completed boring.
2)
3)
4)

Nobis Engineering PO Box 2890 Concord, New Hampshire 03302	PROJECT Remedial Design For Operable Unit 01 New Bedford Harbor Superfund Site New Bedford, Massachusetts	BORING NO. OW-B5 SHEET 1 of 1 FILE NO. 48138.07 CHKD. BY C. Thunberg / J. Trottier

Boring Co.	Atlantic Testing Laboratories, Limited	Boring Location	northing 2704189.7	easting 814719.5	
Driller	R. Pryce	Ground Surface El.	5.72	Datum	NGVD
Logged By	S. Bonis	Date Start	9/14/99	Date End	9/14/99

Sampler: 2-inch O.D. split-barrel sampler driven 24 inches with a 140 lb. safety hammer free falling from a height of 30 inches.
Drill Rig: CME 75 truck mount
Drilling Method: 4-1/4 inch I.D. (HSA) hollow stem auger.

Groundwater Readings (from ground surface)

Date	Time	Depth	Elev.	Stabilization Time
9/14	–	5 ft.	0.72	Upon completion

DEPTH	Casing Blows (ft)	SAMPLE INFORMATION Type & No.	PEN/REC (inches)	DEPTH (feet)	BLOWS PER 6 INCHES	SPT N-Value	SAMPLE DESCRIPTION	STRATUM DESCRIPTION	REMARKS
		S-1	24/20	0-2	8-8-9-8	17	2 in: Topsoil.		
1							2 in: Silty sand (SM); medium dense, 75% fine sand, 25% silt. (FILL)		
							8 in: Silty sand (SM): medium dense, 85% fine sand, 15% silt, petroleum odor, black. (FILL)		
2							8 in: Well-graded sand with gravel (SW); moist, medium dense, 75% well graded sand,		
							15% gravel, 10% fine sand, wood fragments. (FILL)	FILL	
3									
4									
5							Estimated strata change at 5 ft.		
		S-2	24/20	5-7	15-16-16-17	32	14 in: Poorly graded sand (SP); dense, 80% medium sand, 10% fine sand,	SP	
6							10% coarse sand, brown-gray.		
							6 in: Poorly graded sand with silt (SP-SM); wet, dense, 90% fine sand, 10% silt,	SP-SM	
7							light gray.		
							Water coming up as spoon was driven.		
8							Soil cuttings very wet while drilling from 5-10 ft.		
9									
10									
		S-3	24/20	10-12	13-19-23-29	42	10 in: Poorly graded sand (SP); wet, dense, 90% fine sand, 10% gravel, light gray.	SP	
11							10 in: Silty sand (SM); dense, 80% fine sand, 20% silt, hydrogen sulfide odor,	SM	
							olive gray to light gray.		
12									
13									
14									
15							Run-in sands. Drove first spoon to clean.		
		S-4	24/20	15-17	11-25-24-27	49	Well-graded sand with silt and gravel (SW-SM); dense, 25% fine sand, 25% medium	SW-SM	
16							sand, 25% coarse sand, 15% gravel, 10% silt, slight petroleum odor.		
							Advance HSA to 19 ft.		
17									
18									
19									
20							Bottom of exploration at 19 ft; no refusal.		1

0 to 4 - Very Loose	0 to 2 - Very Soft	1. S denotes split-barrel sampler.	7. PID denotes Photoionization Detector
5 to 10 - Loose	3 to 4 - Soft	2. U denotes 3-inch O.D. undisturbed sample.	8. PPM denotes parts per million.
11 to 30 - Medium Dense	5 to 8 - Medium Stiff	3. UO denotes 3-inch Osterberg undisturbed sample.	9. PP denotes Pocket Penetrometer.
31 to 50 - Dense	9 to 15 - Stiff	4. PEN denotes penetration length of sampler.	10. FVST denotes field vane shear test.
Over 50 - Very Dense	16 to 30 - Very Stiff	5. REC denotes recovered length of sample.	11. RQD denotes Rock Quality Designation.
	Over 30 - Hard	6. SPT denotes Standard Penetration Test.	12. R denotes core run number.

REMARKS:
1) Installed 2-inch PVC groundwater observation well in completed boring.
2)
3)
4)

Nobis Engineering PO Box 2890 Concord, New Hampshire 03302	PROJECT Remedial Design For Operable Unit 01 New Bedford Harbor Superfund Site New Bedford, Massachusetts	BORING NO. OW-B6 SHEET 1 of 1 FILE NO. 48138.07 CHKD. BY C. Thunberg / J. Trottier

Boring Co.	Atlantic Testing Laboratories, Limited	Boring Location	northing 2703791.2 easting 814957.9		
Driller	R. Pryce	Ground Surface El.	5.54	Datum	NGVD
Logged By	R. Chase	Date Start	7/20/99	Date End	7/20/99

Sampler: 2-inch O.D. split-barrel sampler driven 24 inches with a 140 lb. safety hammer free falling from a height of 30 inches.
Drill Rig: CME 75 truck mount
Drilling Method: 4-1/4 inch I.D. (HSA) hollow stem auger.

Groundwater Readings (from ground surface)

Date	Time	Depth	Elev.	Stabilization Time

DEPTH	Casing Blows (ft)	SAMPLE INFORMATION Type & No.	PEN/REC (inches)	DEPTH (feet)	BLOWS PER 6 INCHES	SPT N-Value	SAMPLE DESCRIPTION	STRATUM DESCRIPTION	REMKS
1									
2							Refer to Boring Log FB - 7 (0-20 ft.) Advance HSA to 19 ft.		
3									
4									
5									
6									
7									
8									
9									
10									
11									
12									
13									
14									
15									
16									
17									
18									
19									
20							Bottom of exploration at 19 ft; no refusal.		1

0 to 4 - Very Loose	0 to 2 - Very Soft	1. S denotes split-barrel sampler.	7. PID denotes Photoionization Detector
5 to 10 - Loose	3 to 4 - Soft	2. U denotes 3-inch O.D. undisturbed sample.	8. PPM denotes parts per million.
11 to 30 - Medium Dense	5 to 8 - Medium Stiff	3. UO denotes 3-inch Osterberg undisturbed sample.	9. PP denotes Pocket Penetrometer.
31 to 50 - Dense	9 to 15 - Stiff	4. PEN denotes penetration length of sampler.	10. FVST denotes field vane shear test.
Over 50 - Very Dense	16 to 30 - Very Stiff	5. REC denotes recovered length of sample.	11. RQD denotes Rock Quality Designation.
	Over 30 - Hard	6. SPT denotes Standard Penetration Test.	12. R denotes core run number.

REMARKS:
1) Installed 2-inch PVC groundwater observation well in completed boring.
2)
3)
4)

Nobis Engineering PO Box 2890 Concord, New Hampshire 03302	PROJECT Remedial Design For Operable Unit 01 New Bedford Harbor Superfund Site New Bedford, Massachusetts	BORING NO. OW-B7 SHEET 1 of 1 FILE NO. 48138.07 CHKD. BY C. Thunberg / J. Trottier

Boring Co.	Atlantic Testing Laboratories, Limited	Boring Location	northing 2703765.6 easting 814768.4		
Driller	R. Pryce	Ground Surface El.	7.40	Datum	NGVD
Logged By	R. Chase	Date Start	7/21/99	Date End	7/21/99

Sampler: 2-inch O.D. split-barrel sampler driven 24 inches with a 140 lb. safety hammer free falling from a height of 30 inches.
Drill Rig: CME 75 truck mount
Drilling Method: 4-1/4 inch I.D. (HSA) hollow stem auger.

Groundwater Readings (from ground surface)

Date	Time	Depth	Elev.	Stabilization Time
7/21	--	6.0 ft.	1.40	While drilling
7/21	12:15	6.3 ft.	1.10	Upon completion of drilling

DEPTH	Casing Blows (ft)	SAMPLE INFORMATION Type & No.	PEN/REC (inches)	DEPTH (feet)	BLOWS PER 6 INCHES	SPT N-Value	SAMPLE DESCRIPTION	STRATUM DESCRIPTION	REMKS
1									
2		S - 1	24/18	1 - 3	7 - 17 - 13 - 12	30	9 in. Poorly graded sand (SP); dry, medium dense, 50% fine sand, 30% medium sand, 10% coarse sand, 5% silt, 5% ash, black. (FILL)	FILL	
3							9 in. Poorly graded sand with silt (SP-SM); dry, medium dense, 90% fine sand, 10% silt, brown	SP-SM	
4							Estimated strata change at 2 ft.		
5									
6		S - 2	24/15	5-7	5 -10 -16 -16	26	Similar to lower half of S-1, except wet at 6 ft.	SP-SM	1
7									
8									
9									
10									
11		S - 3	24/16	10 -12	5 - 15 - 17 - 17	32	Poorly graded sand (SP); dense, 10% fine sand, 85% medium sand, <5% silt, brown.	SP	
12									
13									
14									
15									
16		S - 4	24/20	15 - 17	9 - 27 - 28 - 21	55	3 in. Poorly graded sand with silt (SP-SM); very dense, 90% fine sand, 10% silt, brown	SP-SM	
17							17 in. Poorly graded sand (SP); very dense, 80% medium sand, 10% fine sand, 5% gravel, 5% silt, brown.	SP	
18							Advance HSA to 19 ft.		
19									
20							Bottom of exploration at 19 ft; no refusal.		2

0 to 4 - Very Loose	0 to 2 - Very Soft	1. S denotes split-barrel sampler.	7. PID denotes Photoionization Detector
5 to 10 - Loose	3 to 4 - Soft	2. U denotes 3-inch O.D. undisturbed sample.	8. PPM denotes parts per million.
11 to 30 - Medium Dense	5 to 8 - Medium Stiff	3. UO denotes 3-inch Osterberg undisturbed sample.	9. PP denotes Pocket Penetrometer.
31 to 50 - Dense	9 to 15 - Stiff	4. PEN denotes penetration length of sampler.	10. FVST denotes field vane shear test.
Over 50 - Very Dense	16 to 30 - Very Stiff	5. REC denotes recovered length of sample.	11. RQD denotes Rock Quality Designation.
	Over 30 - Hard	6. SPT denotes Standard Penetration Test.	12. R denotes core run number.

REMARKS:
1) Groundwater first noted at approximately 6 ft. below the ground surface.
2) Installed 2-inch PVC groundwater observation well in completed boring.
3)
4)

Nobis Engineering PO Box 2890 Concord, New Hampshire 03302	PROJECT Remedial Design For Operable Unit 01 New Bedford Harbor Superfund Site New Bedford, Massachusetts	BORING NO. MW-B1 SHEET 1 of 1 FILE NO. 48138.07 CHKD. BY C. Thunberg / J. Trottier

Boring Co.	Atlantic Testing Laboratories, Limited	Boring Location	northing 2704803.1 easting 814792.3		
Driller	R. Pryce	Ground Surface El.	5.08	Datum	NGVD
Logged By	S. Bonis	Date Start	9/13/99	Date End	9/13/99

Sampler: 2-inch O.D. split-barrel sampler driven 24 inches with a 140 lb. safety hammer free falling from a height of 30 inches.
Drill Rig: CME 75 truck mount
Drilling Method: 4-1/4 inch I.D. (HSA) hollow stem auger.

Groundwater Readings (from ground surface)				
Date	Time	Depth	Elev.	Stabilization Time

DEPTH	Casing Blows (ft)	SAMPLE INFORMATION Type & No.	PEN/REC (inches)	DEPTH (feet)	BLOWS PER 6 INCHES	SPT N-Value	SAMPLE DESCRIPTION	STRATUM DESCRIPTION	REMARKS
1							2 in: Asphalt. 6 in: Concrete.		
2		S-1	3/2	1-1.25	50/3"	--	Poorly graded gravel (GP); dry, 90% gravel, 10% medium sand. (FILL)		
3								FILL	
4									
5							Difficult drilling.		
6		S-2	24/1	5-7	52-8-7-6	15	Poor recovery. Large piece of wood in sampler. (FILL)		
7									
8		S-3	24/4	7-9	6-5-9-7	14	Silty sand with gravel (SM); medium dense, 40% fine sand, 25% organic silt, 30% angular gravel, 5% wood and shell fragments.	SM	
9							Estimated strata change at 7 ft.		
10									
11		S-4	24/10	10-12	3-3-4-3	7	Organic soil with sand (OH); medium stiff, 70% organic silt/clay, 25% fine sand, 5% wood and shell fragments.	OH	
12									
13									
14									
15									
16		S-5	24/24	15-17	3-3-3-4	6	Organic soil (OH); medium stiff, 90% organic silt, 10% fine sand. Advance HSA to 19 ft.	OH	
17									
18									
19									
20							Bottom of exploration at 19 ft.; no refusal.		1

0 to 4 - Very Loose	0 to 2 - Very Soft	1. S denotes split-barrel sampler.	7. PID denotes Photoionization Detector
5 to 10 - Loose	3 to 4 - Soft	2. U denotes 3-inch O.D. undisturbed sample.	8. PPM denotes parts per million.
11 to 30 - Medium Dense	5 to 8 - Medium Stiff	3. UO denotes 3-inch Osterberg undisturbed sample.	9. PP denotes Pocket Penetrometer.
31 to 50 - Dense	9 to 15 - Stiff	4. PEN denotes penetration length of sampler.	10. FVST denotes field vane shear test.
Over 50 - Very Dense	16 to 30 - Very Stiff	5. REC denotes recovered length of sample.	11. RQD denotes Rock Quality Designation.
	Over 30 - Hard	6. SPT denotes Standard Penetration Test.	12. R denotes core run number.

REMARKS:
1) Installed 2-inch PVC monitoring well in completed boring.
2)
3)
4)

Nobis Engineering PO Box 2890 Concord, New Hampshire 03302	PROJECT Remedial Design For Operable Unit 01 New Bedford Harbor Superfund Site New Bedford, Massachusetts	BORING NO. MW-B2S SHEET 1 of 1 FILE NO. 48138.07 CHKD. BY C. Thunberg / J. Trottier

Boring Co.	Atlantic Testing Laboratories, Limited	Boring Location	northing 2704199.2 easting 814810.2		
Driller	R. Pryce	Ground Surface El.	5.30	Datum	NGVD
Logged By	R. Chase	Date Start	7/27/99	Date End	7/27/99

Sampler: 2-inch O.D. split-barrel sampler driven 24 inches with a 140 lb. safety hammer free falling from a height of 30 inches.
Drill Rig: CME 75 truck mount
Drilling Method: 4-1/4 inch I.D. (HSA) hollow stem auger.

Groundwater Readings (from ground surface)				
Date	Time	Depth	Elev.	Stabilization Time
7/27	11:40	3.6 ft	1.70	Upon completion of drilling

DEPTH	Casing Blows (ft)	SAMPLE INFORMATION Type & No.	PEN/REC (inches)	DEPTH (feet)	BLOWS PER 6 INCHES	SPT N-Value	SAMPLE DESCRIPTION	STRATUM DESCRIPTION	REMKS
1									
2							Refer to Boring Log MW-B2D (0-20 ft.) Advance HSA to 19 ft.		
3									
4									
5									
6									
7									
8									
9									
10									
11									
12									
13									
14									
15									
16									
17									
18									
19									
20							Bottom of exploration at 19 ft.; no refusal.		1

0 to 4 - Very Loose	0 to 2 - Very Soft	1. S denotes split-barrel sampler.	7. PID denotes Photoionization Detector
5 to 10 - Loose	3 to 4 - Soft	2. U denotes 3-inch O.D. undisturbed sample.	8. PPM denotes parts per million.
11 to 30 - Medium Dense	5 to 8 - Medium Stiff	3. UO denotes 3-inch Osterberg undisturbed sample.	9. PP denotes Pocket Penetrometer.
31 to 50 - Dense	9 to 15 - Stiff	4. PEN denotes penetration length of sampler.	10. FVST denotes field vane shear test.
Over 50 - Very Dense	16 to 30 - Very Stiff	5. REC denotes recovered length of sample.	11. RQD denotes Rock Quality Designation.
	Over 30 - Hard	6. SPT denotes Standard Penetration Test.	12. R denotes core run number.

REMARKS:
1) Installed 2-inch PVC monitoring well in completed boring.
2)

Nobis Engineering PO Box 2890 Concord, New Hampshire 03302	PROJECT Remedial Design For Operable Unit 01 New Bedford Harbor Superfund Site New Bedford, Massachusetts	BORING NO. MW-B2D SHEET 1 of 2 FILE NO. 48138.07 CHKD. BY C. Thunberg / J. Trottier

Boring Co.	Atlantic Testing Laboratories, Limited	Boring Location	northing 2704190.9	easting 814826.5	
Driller	R. Pryce	Ground Surface El.	5.20	Datum	NGVD
Logged By	R. Chase	Date Start	7/23/99	Date End	7/26/99

Sampler: 2-inch O.D. split-barrel sampler driven 24 inches with a 140 lb. safety hammer free falling from a height of 30 inches.
Drill Rig: CME 75 truck mount
Drilling Method: 6" I.D. (SW) flush joint casing, 5 3/8" roller bit. Spin and wash.

Groundwater Readings (from ground surface)				
Date	Time	Depth	Elev.	Stabilization Time

DEPTH	Casing Blows (ft)	SAMPLE INFORMATION Type & No.	PEN/REC (inches)	DEPTH (feet)	BLOWS PER 6 INCHES	SPT N-Value	SAMPLE DESCRIPTION	STRATUM DESCRIPTION	REMKS
1	spin								
2	spin	S-1	24/16	1-3	11-20-24-27	44	Poorly graded sand (SP); dry, dense, 50% fine sand, 20% medium sand, 10% coarse sand, 5% silt, 10% brick, 5% ash, black. (FILL)	FILL	
3	spin								
4	spin	S-2	24/6	3-5	9-7-7-6	14	Poorly graded sand (SP); medium dense, 55% fine sand, 20% medium sand, 15% coarse sand, 10% ash, black. (FILL)		
							Advance SW drill casing to 8 ft.		
5	spin								
6	spin								
							Estimated strata change at 6.5 ft.		
7	spin								
8	spin								
9	spin	S-3	24/1	8-10	5-4-3-3	7	Poorly graded sand with silt (SP-SM); wet, loose, 20% fine sand, 60% medium sand, 10% coarse sand, <10% silt, gray.	SP-SM	
10	spin								
11	spin	S-4	24/15	10-12	3-8-13-15	21	Poorly graded sand with silt (SP-SM); medium dense, 60% fine sand, 20% medium sand, 10% coarse sand, 10% silt, gray.	SP-SM	
							Advance SW drill casing to 13 ft.		
12	spin								
13	spin								
14	spin	S-5	24/2	13-15	9-12-18-18	30	Poorly graded sand (SP); moist, medium dense, 5% medium sand, 90% fine sand, 5% silt, brown. Pieces of fractured rock noted in sample.	SP	
							Advance SW drill casing to 18 ft.		
15	spin								
16	spin								
17	spin								
18	spin								
19	spin	S-6	24/12	18-20	6-8-12-12	20	Poorly graded sand (SP); medium dense, 70% fine sand, 10% medium sand, 10% coarse sand, 5% fine gravel, 5% silt, gray.	SP	
							Advance SW drill casing to 23 ft.		
20	spin								

0 to 4 - Very Loose	0 to 2 - Very Soft	1. S denotes split-barrel sampler.	7. PID denotes Photoionization Detector
5 to 10 - Loose	3 to 4 - Soft	2. U denotes 3-inch O.D. undisturbed sample.	8. PPM denotes parts per million.
11 to 30 - Medium Dense	5 to 8 - Medium Stiff	3. UO denotes 3-inch Osterberg undisturbed sample.	9. PP denotes Pocket Penetrometer.
31 to 50 - Dense	9 to 15 - Stiff	4. PEN denotes penetration length of sampler.	10. FVST denotes field vane shear test.
Over 50 - Very Dense	16 to 30 - Very Stiff	5. REC denotes recovered length of sample.	11. RQD denotes Rock Quality Designation.
	Over 30 - Hard	6. SPT denotes Standard Penetration Test.	12. R denotes core run number.

REMARKS:
1) Encountered rock at approximately 33.3 ft.
2) Installed 2-inch PVC groundwater monitoring well in completed boring.

Nobis Engineering PO Box 2890 Concord, New Hampshire 03302	PROJECT Remedial Design For Operable Unit 01 New Bedford Harbor Superfund Site New Bedford, Massachusetts	BORING NO. MW-B2D SHEET 2 of 2 FILE NO. 48138.07 CHKD. BY C. Thunberg / J. Trottier

Boring Co.	Atlantic Testing Laboratories, Limited	Boring Location	northing 2704190.9	easting 814826.5	
Driller	R. Pryce	Ground Surface El.	5.20	Datum	NGVD
Logged By	R. Chase	Date Start	7/23/99	Date End	7/26/99

Sampler: 2-inch O.D. split-barrel sampler driven 24 inches with a 140 lb. safety hammer free falling from a height of 30 inches.
Drill Rig: CME 75 truck mount
Drilling Method: 6" I.D. (SW) flush joint casing, 5 3/8" roller bit. Spin and wash.

Groundwater Readings (from ground surface)				
Date	Time	Depth	Elev.	Stabilization Time

DEPTH	Casing Blows (ft)	SAMPLE INFORMATION Type & No.	PEN/REC (inches)	DEPTH (feet)	BLOWS PER 6 INCHES	SPT N-Value	SAMPLE DESCRIPTION	STRATUM DESCRIPTION	REMKS
21	spin								
22	spin								
23	spin								
24	spin	S-7	24/8	23-25	20-14-12-15	26	Well-graded gravel with sand (GW); medium dense, 70% gravel, 5% fine sand, 10% medium sand, 10% coarse sand, 5% silt, brown. Advance SW drill casing to 28 ft.	GW	
25	spin								
26	spin								
27	spin								
28	spin								
29	spin	S-8	12/12	28-29	66-105/6"	–	10 in: Poorly graded sand (SP); 85% fine sand, 10% medium sand, 5% silt, brown. 2 in: Poorly graded sand with silt (SP-SM); 80% fine sand, 10% medium sand, 10% silt, gray. Advance SW drill casing to 33 ft.	SP SP-SM	
30	spin								
31	spin								
32	spin								
33	spin								
34		S-9	3/3	33-33.3	100/3"	–	Poorly graded sand (SP); 65% fine sand, 20% medium sand, 10% coarse sand, <5% silt.	SP	1
35		S-10	0/0	34.3	100/0"	–	Advance 5-3/8 in. roller bit to 34.3 ft. S-10: No recovery. Bottom of exploration at 34.3 ft.; refusal on probable bedrock.	PROBABLE BEDROCK	2
36									
37									
38									
39									
40									

0 to 4 - Very Loose	0 to 2 - Very Soft	1. S denotes split-barrel sampler.	7. PID denotes Photoionization Detector
5 to 10 - Loose	3 to 4 - Soft	2. U denotes 3-inch O.D. undisturbed sample.	8. PPM denotes parts per million.
11 to 30 - Medium Dense	5 to 8 - Medium Stiff	3. UO denotes 3-inch Osterberg undisturbed sample.	9. PP denotes Pocket Penetrometer.
31 to 50 - Dense	9 to 15 - Stiff	4. PEN denotes penetration length of sampler.	10. FVST denotes field vane shear test.
Over 50 - Very Dense	16 to 30 - Very Stiff	5. REC denotes recovered length of sample.	11. RQD denotes Rock Quality Designation.
	Over 30 - Hard	6. SPT denotes Standard Penetration Test.	12. R denotes core run number.

REMARKS:
1) Encountered rock at approximately 33.3 ft.
2) Installed 2-inch PVC groundwater monitoring well in completed boring.

Nobis Engineering PO Box 2890 Concord, New Hampshire 03302	PROJECT Remedial Design For Operable Unit 01 New Bedford Harbor Superfund Site New Bedford, Massachusetts	BORING NO. MW-B3 SHEET 1 of 1 FILE NO. 48138.07 CHKD. BY C. Thunberg / J. Trottier

Boring Co.	Atlantic Testing Laboratories, Limited	Boring Location	northing 2703608.3 easting 814893.2		
Driller	R. Pryce	Ground Surface El.	7.20	Datum	NGVD
Logged By	R. Chase	Date Start	7/14/99	Date End	7/14/99

Sampler: 2-inch O.D. split-barrel sampler driven 24 inches with a 140 lb. safety hammer free falling from a height of 30 inches.
Drill Rig: CME 75 truck mount
Drilling Metho 4-1/4 inch I.D. (HSA) hollow stem auger.

Groundwater Readings (from ground surface)

Date	Time	Depth	Elev.	Stabilization Time
7/14	--	6.0 ft	1.20	During drilling
7/14	13:20	7.4 ft	-0.20	Upon completion of drilling

DEPTH	Casing Blows (ft)	Type & No.	PEN/REC (inches)	DEPTH (feet)	BLOWS PER 6 INCHES	SPT N-Value	SAMPLE DESCRIPTION	STRATUM DESCRIPTION	REMKS
1								ASPHALT	
2		S-1	24/18	1 - 3	3-4-9-13	13	9 in: Silty sand (SM); dry, medium dense, 80% fine sand, 20% silt, brown. (FILL) 9 in: Poorly graded sand (SP); dry, medium dense, 75% fine sand, 20% medium sand, <5% silt, traces of ash, black. (FILL)	FILL	
3									
4		S-2	24/11	3 - 5	6 - 6 - 4 - 4	10	Poorly graded sand (SP); loose, 75% fine sand, 5% medium sand, 5% fine gravel, <5% silt, 10% brick, red-brown. (FILL) Advance HSA to 5 ft.		
5									
6		S-3	24/19	5 - 7	2 - 2 - 3 - 2	5	Silty sand (SM); wet, loose, 85% fine sand, 15% silt, brown. Advance HSA to 10 ft.	SM	1
7									
8									
9									
10									
11		S-4	24/15	10 -12	5 - 9 - 11 - 14	20	Similar to S - 3, except becomes medium dense.	SM	
12									
13									
14									
15									
16		S-5	24/18	15 - 17	6 - 7 - 7 - 7	14	Silt (ML); stiff, 90% silt, 10% fine sand. Advance HSA to 19 ft.	ML	
17									
18									
19									
20							Bottom of exploration at 19 ft.; no refusal.		2

0 to 4 - Very Loose	0 to 2 - Very Soft	1. S denotes split-barrel sampler.	7. PID denotes Photoionization Detector
5 to 10 - Loose	3 to 4 - Soft	2. U denotes 3-inch O.D. undisturbed sample.	8. PPM denotes parts per million.
11 to 30 - Medium Dense	5 to 8 - Medium Stiff	3. UO denotes 3-inch Osterberg undisturbed sample.	9. PP denotes Pocket Penetrometer.
31 to 50 - Dense	9 to 15 - Stiff	4. PEN denotes penetration length of sampler.	10. FVST denotes field vane shear test.
Over 50 - Very Dense	16 to 30 - Very Stiff	5. REC denotes recovered length of sample.	11. RQD denotes Rock Quality Designation.
	Over 30 - Hard	6. SPT denotes Standard Penetration Test.	12. R denotes core run number.

REMARKS:
1) Groundwater encountered at approximately 6 ft.
2) Installed 2-inch PVC monitoring well in completed boring.
3)
4)

Nobis Engineering PO Box 2890 Concord, New Hampshire 03302	PROJECT Remedial Design For Operable Unit 01 New Bedford Harbor Superfund Site New Bedford, Massachusetts	BORING NO. MW-B4 SHEET 1 of 2 FILE NO. 48138.07 CHKD. BY C. Thunberg / J. Trottier

Boring Co.	Atlantic Testing Laboratories, Limited	Boring Location	northing 2704625.2 easting 815115.3		
Driller	P. Davis	Mudline El.	-4.30	Datum	NGVD
Logged By	E. Thibodeau	Date Start	9/29/99	Date End	9/30/99

Sampler: 2-inch O.D. split-barrel sampler driven 24 inches with a 140 lb. safety hammer free falling from a height of 30 inches.
Drill Rig: CME 55 skid mount
Drilling Method: 5-inch I.D. PW flush-joint casing, 4-7/8" roller bit. Wash & drive.
All casing driven with a 300 lb. hammer free falling from a height of 24-inches.

Groundwater Readings Not Applicable for Offshore Borings

Date	Time	Depth	Elev.	Stabilization Time

DEPTH	Casing Blows (ft)	Type & No.	PEN/REC (inches)	DEPTH (feet)	BLOWS PER 6 INCHES	SPT N-Value	SAMPLE DESCRIPTION	STRATUM DESCRIPTION	REMKS
	hyd.						Advance PW drill casing to 8 ft. (hydraulic push)		
1	push						Advance 4-7/8 inch roller bit from 0 to 8 ft.		
	hyd.								
2	push								
	hyd.								
3	push								
	hyd.								
4	push								
	hyd.								
5	push								
	hyd.								
6	push							OH	
	hyd.								
7	push								
	hyd.								
8	push								
	hyd.						Advance PW drill casing to 14 ft. (hydraulic push)		
9	push						Advance 4-7/8 inch roller bit to 14 ft.		
	hyd.								
10	push								
	hyd.								
11	push								
	hyd.								
12	push								
	hyd.								
13	push								
	hyd.								
14	push								
	hyd.						Advance PW drill casing to 15.3 ft. (hydraulic push)		
15	push						Very difficult push at 15.3 ft; presumed clay/sand interface.		
	push						Advance 4-7/8 inch roller bit to 15.3 ft.		
16	5	S-1	24/14	15.3 -	5-8-15-23	23	Well-graded sand with silt and gravel (SW-SM); wet, medium dense, 30%	SW-SM	
				17.3			medium sand, 30% fine sand, 15% coarse sand, 15% gravel, 10% silt, traces of		
17	69						shell fragments, gray.		
							Advance PW drill casing to 18 ft.		
18	72						Advance 4-7/8 inch roller bit to 18 ft.		
							Advance PW drill casing to 23 ft.		
19	17						Advance 4-7/8 inch roller bit to 23 ft.		
20	44								

0 to 4 - Very Loose	0 to 2 - Very Soft	1. S denotes split-barrel sampler.	7. PID denotes Photoionization Detector
5 to 10 - Loose	3 to 4 - Soft	2. U denotes 3-inch O.D. undisturbed sample.	8. PPM denotes parts per million.
11 to 30 - Medium Dense	5 to 8 - Medium Stiff	3. UO denotes 3-inch Osterberg undisturbed sample.	9. PP denotes Pocket Penetrometer.
31 to 50 - Dense	9 to 15 - Stiff	4. PEN denotes penetration length of sampler.	10. FVST denotes field vane shear test.
Over 50 - Very Dense	16 to 30 - Very Stiff	5. REC denotes recovered length of sample.	11. RQD denotes Rock Quality Designation.
	Over 30 - Hard	6. SPT denotes Standard Penetration Test.	12. R denotes core run number.

REMARKS:
1) Installed 2-inch PVC monitoring well in completed boring.
2)
3)
4)

Nobis Engineering PO Box 2890 Concord, New Hampshire 03302	PROJECT Remedial Design For Operable Unit 01 New Bedford Harbor Superfund Site New Bedford, Massachusetts	BORING NO. MW-B4 SHEET 2 of 2 FILE NO. 48138.07 CHKD. BY C. Thunberg / J. Trottier

Boring Co.	Atlantic Testing Laboratories, Limited	Boring Location	northing 2704625.2 easting 815115.3		
Driller	P. Davis	Mudline El.	-4.30	Datum	NGVD
Logged By	E. Thibodeau	Date Start	9/29/99	Date End	9/30/99

Sampler: 2-inch O.D. split-barrel sampler driven 24 inches with a 140 lb. safety hammer free falling from a height of 30 inches.
Drill Rig: CME 55 skid mount
Drilling Method: 5-inch I.D. PW flush-joint casing, 4-7/8" roller bit. Wash & drive.
All casing driven with a 300 lb. hammer free falling from a height of 24-inches.

Groundwater Readings Not Applicable for Offshore Borings				
Date	Time	Depth	Elev.	Stabilization Time

DEPTH	Casing Blows (ft)	SAMPLE INFORMATION Type & No.	PEN/REC (inches)	DEPTH (feet)	BLOWS PER 6 INCHES	SPT N-Value	SAMPLE DESCRIPTION	STRATUM DESCRIPTION	REMKS
21	120								
22	160								
23	197								
							Advance PW drill casing to 28 ft.		
24	43						Advance 4-7/8 inch roller bit to 28 ft.		
25	87								
26	162								
27	191								
28	216								
29							Bottom of exploration at 28.0 ft.; no refusal.		1
30									
31									
32									
33									
34									
35									
36									
37									
38									
39									
40									

0 to 4 - Very Loose	0 to 2 - Very Soft	1. S denotes split-barrel sampler.	7. PID denotes Photoionization Detector
5 to 10 - Loose	3 to 4 - Soft	2. U denotes 3-inch O.D. undisturbed sample.	8. PPM denotes parts per million.
11 to 30 - Medium Dense	5 to 8 - Medium Stiff	3. UO denotes 3-inch Osterberg undisturbed sample.	9. PP denotes Pocket Penetrometer.
31 to 50 - Dense	9 to 15 - Stiff	4. PEN denotes penetration length of sampler.	10. FVST denotes field vane shear test.
Over 50 - Very Dense	16 to 30 - Very Stiff	5. REC denotes recovered length of sample.	11. RQD denotes Rock Quality Designation.
	Over 30 - Hard	6. SPT denotes Standard Penetration Test.	12. R denotes core run number.

REMARKS:
1) Installed 2-inch PVC monitoring well in completed boring.
2)
3)
4)

Nobis Engineering PO Box 2890 Concord, New Hampshire 03302	PROJECT Remedial Design For Operable Unit 01 New Bedford Harbor Superfund Site New Bedford, Massachusetts	BORING NO. MW-B5 SHEET 1 of 2 FILE NO. 48138.07 CHKD. BY C. Thunberg / J. Trottier

Boring Co.	Atlantic Testing Laboratories, Limited	Boring Location	northing 2703769.1 easting 815119.5		
Driller	P. Davis	Mudline El.	-3.21	Datum	NGVD
Logged By	E. Paddleford	Date Start	10/13/99	Date End	10/13/99

Sampler: 2-inch O.D. split-barrel sampler driven 24 inches with a 140 lb. safety hammer free falling from a height of 30 inches.
Drill Rig: CME 55 skid mount
Drilling Method: 5-inch I.D. PW flush-joint casing, 4-7/8" roller bit. Wash & drive.
All casing driven with a 300 lb. hammer free falling from a height of 24-inches.

Groundwater Readings Not Applicable for Offshore Borings				
Date	Time	Depth	Elev.	Stabilization Time

DEPTH	Casing Blows (ft)	SAMPLE INFORMATION Type & No.	PEN/REC (inches)	DEPTH (feet)	BLOWS PER 6 INCHES	SPT N-Value	SAMPLE DESCRIPTION	STRATUM DESCRIPTION	REMKS
	hyd.						Advance PW drill casing to 17 ft. (hydraulic push)		
1	push						Advance 4-7/8 in. roller bit from 0 to 17 ft.		
	hyd.								
2	push								
	hyd.								
3	push								
	hyd.								
4	push								
	hyd.								
5	push								
	hyd.								
6	push							OH	
	hyd.								
7	push								
	hyd.								
8	push								
	hyd.								
9	push								
	hyd.								
10	push								
	hyd.								
11	push								
	hyd.								
12	push								
	hyd.								
13	push								
	hyd.								
14	push								
	hyd.								
15	push								
	hyd.								
16	push								
	hyd.								
17	push								
		S-1	24/14	17-19	5-8-15-23	23	Well-graded sand (SW); medium dense, 35% medium sand, 30% fine sand,	SW	
18	NR						25% coarse sand, 5% silt, 5% gravel, gray.		1
							Advance PW drill casing to 22 ft.		
19	NR						Advance 4-7/8 in. roller bit to 22 ft.		
20	NR								

0 to 4 - Very Loose	0 to 2 - Very Soft	1. S denotes split-barrel sampler.	7. PID denotes Photoionization Detector
5 to 10 - Loose	3 to 4 - Soft	2. U denotes 3-inch O.D. undisturbed sample.	8. PPM denotes parts per million.
11 to 30 - Medium Dense	5 to 8 - Medium Stiff	3. UO denotes 3-inch Osterberg undisturbed sample.	9. PP denotes Pocket Penetrometer.
31 to 50 - Dense	9 to 15 - Stiff	4. PEN denotes penetration length of sampler.	10. FVST denotes field vane shear test.
Over 50 - Very Dense	16 to 30 - Very Stiff	5. REC denotes recovered length of sample.	11. RQD denotes Rock Quality Designation.
	Over 30 - Hard	6. SPT denotes Standard Penetration Test.	12. R denotes core run number.

REMARKS:
1) NR = Not recorded.
2) Installed 2-inch PVC monitoring well in completed boring.
3)
4)

Nobis Engineering PO Box 2890 Concord, New Hampshire 03302	PROJECT Remedial Design For Operable Unit 01 New Bedford Harbor Superfund Site New Bedford, Massachusetts	BORING NO. MW-B5 SHEET 2 of 2 FILE NO. 48138.07 CHKD. BY C. Thunberg / J. Trottier

Boring Co.	Atlantic Testing Laboratories, Limited	Boring Location	northing 2703769.1 easting 815119.5		
Driller	P. Davis	Mudline El.	-3.21	Datum	NGVD
Logged By	E. Paddleford	Date Start	10/13/99	Date End	10/13/99

Sampler: 2-inch O.D. split-barrel sampler driven 24 inches with a 140 lb. safety hammer free falling from a height of 30 inches.
Drill Rig: CME 55 skid mount
Drilling Method: 5-inch I.D. PW flush-joint casing, 4-7/8" roller bit. Wash & drive.
All casing driven with a 300 lb. hammer free falling from a height of 24-inches.

Groundwater Readings Not Applicable for Offshore Borings				
Date	Time	Depth	Elev.	Stabilization Time

DEPTH	Casing Blows (ft)	SAMPLE INFORMATION Type & No.	PEN/REC (inches)	DEPTH (feet)	BLOWS PER 6 INCHES	SPT N-Value	SAMPLE DESCRIPTION	STRATUM DESCRIPTION	REMKS
21	NR								
22	NR								
							Advance PW drill casing to 27 ft.		
23	NR						Advance 4-7/8 in. roller bit to 27 ft.		
24	NR								
25	NR								
26	NR								
27	NR								
							Advance PW drill casing to 30 ft.		
28	NR						Advance 4-7/8 in. roller bit to 30 ft.		
29	NR								
30	NR								
							Bottom of exploration at 30 ft.; no refusal.		2
31									
32									
33									
34									
35									
36									
37									
38									
39									
40									

0 to 4 - Very Loose	0 to 2 - Very Soft	1. S denotes split-barrel sampler.	7. PID denotes Photoionization Detector
5 to 10 - Loose	3 to 4 - Soft	2. U denotes 3-inch O.D. undisturbed sample.	8. PPM denotes parts per million.
11 to 30 - Medium Dense	5 to 8 - Medium Stiff	3. UO denotes 3-inch Osterberg undisturbed sample.	9. PP denotes Pocket Penetrometer.
31 to 50 - Dense	9 to 15 - Stiff	4. PEN denotes penetration length of sampler.	10. FVST denotes field vane shear test.
Over 50 - Very Dense	16 to 30 - Very Stiff	5. REC denotes recovered length of sample.	11. RQD denotes Rock Quality Designation.
	Over 30 - Hard	6. SPT denotes Standard Penetration Test.	12. R denotes core run number.

REMARKS:
1) NR = Not recorded.
2) Installed 2-inch PVC monitoring well in completed boring.
3)
4)

B

APPENDIX B

Well Construction Logs

OBSERVATION WELL CONSTRUCTION LOG

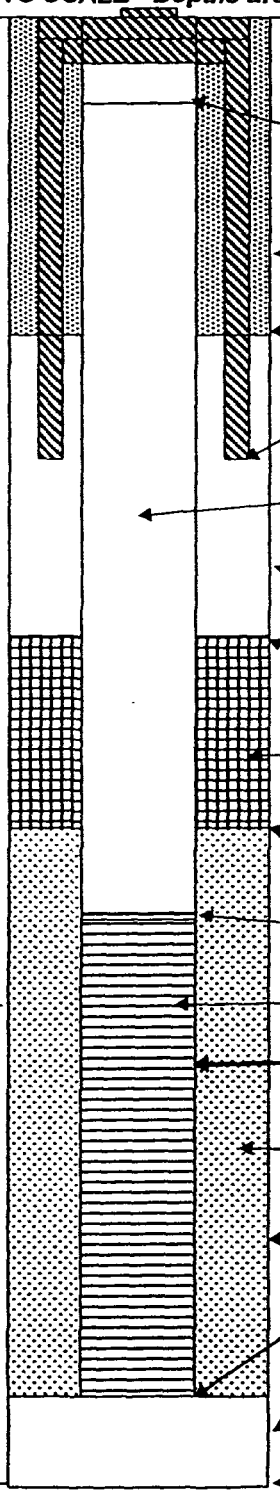
Nobis Engineering, Inc.
P.O. Box 2890 Concord, NH

PROJECT:	New Bedford Harbor	WELL:	OW-B1
LOCATION:	New Bedford, Mass.	DATE:	7/15/99
PROJECT #:	48138.07	PREPARED BY:	R. Chase
CLIENT:	Foster Wheeler Env.	CONTRACTOR:	Atlantic Testing Labs
SURVEY DATUM:	NGVD	FOREMAN:	R. Pryce
Northing: 2703308.7			
Easting: 814998.1			

NOT TO SCALE - Depths are below ground surface (bgs)

GROUNDWATER OBSERVATIONS
(below ground surface)

DEPTH FT	DATE
5.9 ft	7/15/99



GROUND SURFACE ELEVATION:	7.92 (NGVD)
FLUSH MOUNTED PROTECTIVE CASING	
DEPTH TO TOP OF RISER PIPE	0.36 ft (bgs)
TYPE OF SURFACE SEAL:	CONCRETE
DIAMETER OF SURFACE SEAL:	36 in.
DEPTH TO TOP OF SAND DRAIN LAYER	6 in. (bgs)
DEPTH OF BOTTOM OF PROTECTIVE CASING:	1.0 ft (bgs)
MATERIAL/DIAMETER OF RISER PIPE:	PVC / 2-1/4 in. O.D., 2 in. I.D.
TYPE OF BACKFILL ABOVE SEAL:	2040 SAND FILTER
DEPTH OF TOP OF SEAL:	1.5 ft (bgs)
TYPE OF SEAL ABOVE FILTER MATERIAL:	3/8 in. BENTONITE CHIPS
DEPTH OF TOP OF FILTER MATERIAL:	2.5 ft (bgs)
DEPTH OF TOP OF WELL SCREEN:	3 ft (bgs)
WELL SCREEN SLOT SIZE:	.010 in.
MATERIAL/DIAMETER OF WELL SCREEN:	PVC / 2-1/4 in. O.D., 2 in. I.D.
TYPE OF FILTER MATERIAL:	2040 SAND FILTER
DIAMETER BOREHOLE:	6-1/2 in.
DEPTH OF WELL SCREEN:	18 ft (bgs)
TYPE OF BACKFILL BELOW WELL SCREEN:	2040 SAND FILTER
DEPTH OF BOREHOLE	23.0 ft (bgs)

OBSERVATION WELL CONSTRUCTION LOG

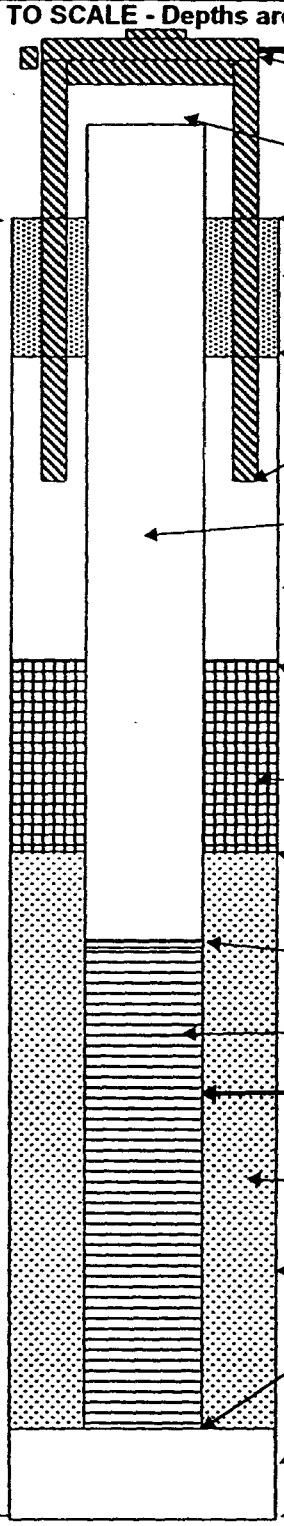
Nobis Engineering, Inc.
P.O. Box 2890 Concord, NH

PROJECT:	New Bedford Harbor	WELL:	OW-B2
LOCATION:	New Bedford, Mass.	DATE:	7/29/99
PROJECT #:	48138.07	PREPARED BY:	E. Paddleford
CLIENT:	Foster Wheeler Env.	CONTRACTOR:	Atlantic Testing Labs
SURVEY DATUM:	NGVD	FOREMAN:	M. Childs
Northing:	2704974.8		
Easting:	814883.6		

NOT TO SCALE - Depths are below ground surface (bgs)

GROUNDWATER OBSERVATIONS
(below ground surface)

DEPTH FT	DATE
3.48 ft	8/18/99



PROTECTIVE CASING	
RISER PIPE ELEVATION	4.92 (NGVD)
GROUND SURFACE ELEVATION:	2.49 (NGVD)
TYPE OF SURFACE SEAL:	CONCRETE
DIAMETER OF SURFACE SEAL:	36 in.
DEPTH TO TOP OF SAND DRAIN LAYER	6 in. (bgs)
DEPTH OF BOTTOM OF PROTECTIVE CASING:	2 ft (bgs)
MATERIAL/DIAMETER OF RISER PIPE:	PVC / 2-1/4 in. O.D., 2 in. I.D.
TYPE OF BACKFILL ABOVE SEAL:	3/8 in. BENTONITE CHIPS
DEPTH OF TOP OF SEAL:	0.5 ft (bgs)
TYPE OF SEAL ABOVE FILTER MATERIAL:	3/8 in. BENTONITE CHIPS
DEPTH OF TOP OF FILTER MATERIAL:	2.5 ft (bgs)
DEPTH OF TOP OF WELL SCREEN:	3 ft (bgs)
WELL SCREEN SLOT SIZE:	.010 in.
MATERIAL/DIAMETER OF WELL SCREEN:	PVC / 2-1/4 in. O.D., 2 in. I.D.
TYPE OF FILTER MATERIAL:	2040 SAND FILTER
DIAMETER BOREHOLE:	7-5/8 in.
DEPTH OF WELL SCREEN:	18 ft (bgs)
TYPE OF BACKFILL BELOW WELL SCREEN:	FORMATION MATERIAL
DEPTH OF BOREHOLE	19 ft. (bgs)

OBSERVATION WELL CONSTRUCTION LOG

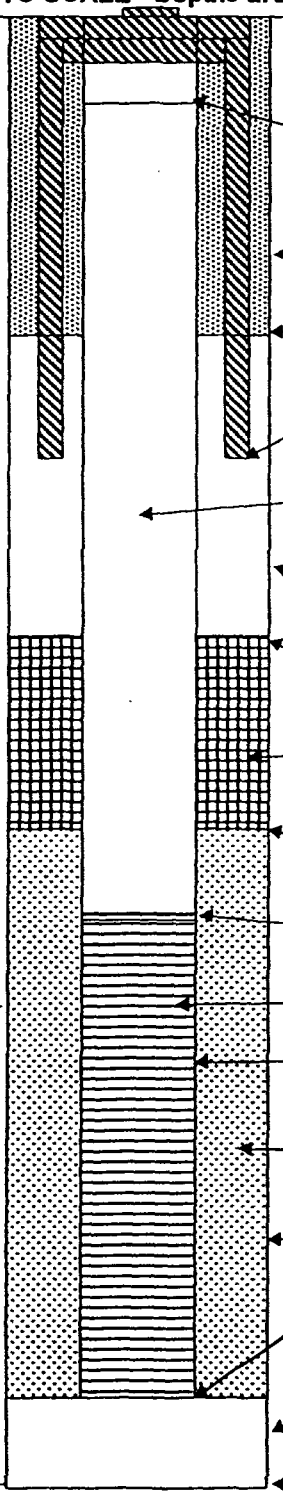
Nobis Engineering, Inc.
P.O. Box 2890 Concord, NH

PROJECT:	New Bedford Harbor	WELL:	OW-B3
LOCATION:	New Bedford, Mass.	DATE:	9/14/99
PROJECT #:	48138.07	PREPARED BY:	S. Bonis
CLIENT:	Foster Wheeler Env.	CONTRACTOR:	Atlantic Testing Labs
SURVEY DATUM:	NGVD	FOREMAN:	R. Pryce
Northing: 2704653.4			
Easting: 814704.2			

NOT TO SCALE - Depths are below ground surface (bgs)

GROUNDWATER OBSERVATIONS
(below ground surface)

DEPTH FT	DATE
2.77 ft	10/4/99



GROUND SURFACE ELEVATION: FLUSH MOUNTED PROTECTIVE CASING	5.54 (NGVD)
DEPTH TO TOP OF RISER PIPE	0.46 ft (bgs)
TYPE OF SURFACE SEAL:	CONCRETE
DIAMETER OF SURFACE SEAL:	36 in.
DEPTH TO TOP OF SAND DRAIN LAYER	6 in. (bgs)
DEPTH OF BOTTOM OF PROTECTIVE CASING:	1.1 ft (bgs)
MATERIAL/DIAMETER OF RISER PIPE:	PVC / 2-1/4 in. O.D., 2 in. I.D.
TYPE OF BACKFILL ABOVE SEAL:	2040 SAND FILTER
DEPTH OF TOP OF SEAL:	1.5 ft (bgs)
TYPE OF SEAL ABOVE FILTER MATERIAL:	3/8 in. BENTONITE CHIPS
DEPTH OF TOP OF FILTER MATERIAL:	2.5 ft (bgs)
DEPTH OF TOP OF WELL SCREEN:	3 ft (bgs)
WELL SCREEN SLOT SIZE:	.010 in.
MATERIAL/DIAMETER OF WELL SCREEN:	PVC / 2-1/4 in. O.D., 2 in. I.D.
TYPE OF FILTER MATERIAL:	2040 SAND FILTER
DIAMETER BOREHOLE:	7-5/8 in.
DEPTH OF WELL SCREEN:	18 ft (bgs)
TYPE OF BACKFILL BELOW WELL SCREEN:	2040 SAND FILTER
DEPTH OF BOREHOLE	19.0 ft (bgs)

OBSERVATION WELL CONSTRUCTION LOG

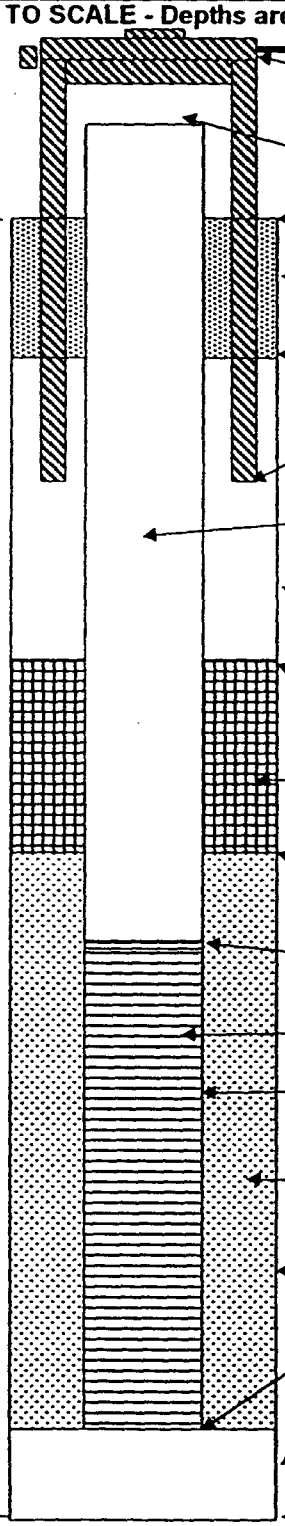
Nobis Engineering, Inc.
P.O. Box 2890 Concord, NH

PROJECT:	New Bedford Harbor	WELL:	OW-B4
LOCATION:	New Bedford, Mass.	DATE:	8/12/99
PROJECT #:	48138.07	PREPARED BY:	E. Paddleford
CLIENT:	Foster Wheeler Env.	CONTRACTOR:	Atlantic Testing Labs
SURVEY DATUM:	NGVD	FOREMAN:	P. Davis
Northing: 2704352.2			
Easting: 814899.4			

NOT TO SCALE - Depths are below ground surface (bgs)

GROUNDWATER OBSERVATIONS
(below ground surface)

DEPTH FT	DATE
4.55 ft	8/18/99



PROTECTIVE CASING	
RISER PIPE ELEVATION	5.71 (NGVD)
GROUND SURFACE ELEVATION:	2.83 (NGVD)
TYPE OF SURFACE SEAL:	CONCRETE
DIAMETER OF SURFACE SEAL:	36 in.
DEPTH TO TOP OF SAND DRAIN LAYER	6 in.
DEPTH OF BOTTOM OF PROTECTIVE CASING:	2 ft (bgs)
MATERIAL/DIAMETER OF RISER PIPE:	PVC / 2-1/4 in. O.D., 2 in. I.D.
TYPE OF BACKFILL ABOVE SEAL:	3/8 in. BENTONITE CHIPS
DEPTH OF TOP OF SEAL:	0.5 ft (bgs)
TYPE OF SEAL ABOVE FILTER MATERIAL:	3/8 in. BENTONITE CHIPS
DEPTH OF TOP OF FILTER MATERIAL:	2.5 ft (bgs)
DEPTH OF TOP OF WELL SCREEN:	3 ft (bgs)
WELL SCREEN SLOT SIZE:	.010 in.
MATERIAL/DIAMETER OF WELL SCREEN:	PVC / 2-1/4 in. O.D., 2 in. I.D.
TYPE OF FILTER MATERIAL:	2040 SAND FILTER
DIAMETER BOREHOLE:	7-5/8 in.
DEPTH OF WELL SCREEN:	18 ft (bgs)
TYPE OF BACKFILL BELOW WELL SCREEN:	FORMATION MATERIAL
DEPTH OF BOREHOLE	19 ft. (bgs)

OBSERVATION WELL CONSTRUCTION LOG

Nobis

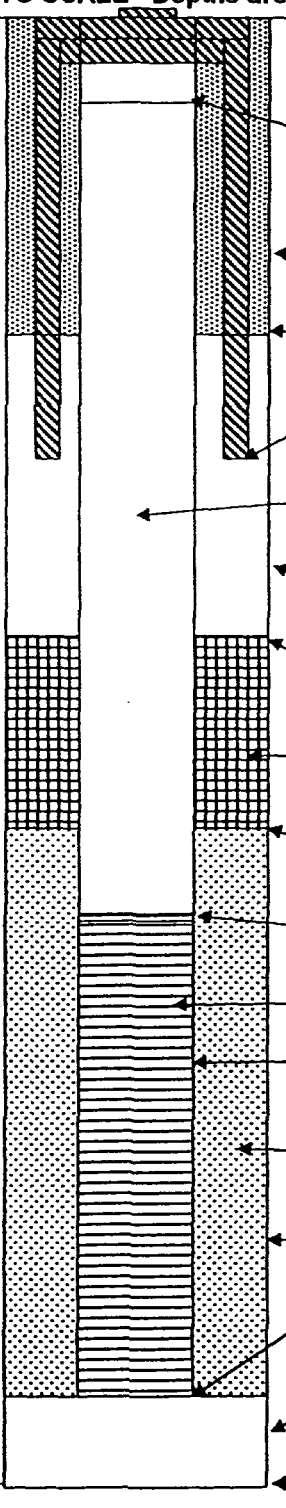
Nobis Engineering, Inc.
P.O. Box 2890 Concord, NH

PROJECT:	New Bedford Harbor	WELL:	OW-B5
LOCATION:	New Bedford, Mass.	DATE:	9/14/99
PROJECT #:	48138.07	PREPARED BY:	S. Bonis
CLIENT:	Foster Wheeler Env.	CONTRACTOR:	Atlantic Testing Labs
SURVEY DATUM:	NGVD	FOREMAN:	R. Pryce
Northing: 2704189.7			
Easting: 814719.5			

NOT TO SCALE - Depths are below ground surface (bgs)

GROUNDWATER OBSERVATIONS
(below ground surface)

DEPTH FT	DATE
2.46 ft	10/5/99



GROUND SURFACE ELEVATION:	6.08 (NGVD)
FLUSH MOUNTED PROTECTIVE CASING	
DEPTH TO TOP OF RISER PIPE	0.55 ft (bgs)
TYPE OF SURFACE SEAL:	CONCRETE
DIAMETER OF SURFACE SEAL:	36 in.
DEPTH TO TOP OF SAND DRAIN LAYER	6 in. (bgs)
DEPTH OF BOTTOM OF PROTECTIVE CASING:	1.1 ft (bgs)
MATERIAL/DIAMETER OF RISER PIPE:	PVC / 2-1/4 in. O.D., 2 in. I.D.
TYPE OF BACKFILL ABOVE SEAL:	2040 SAND FILTER
DEPTH OF TOP OF SEAL:	1.5 ft (bgs)
TYPE OF SEAL ABOVE FILTER MATERIAL:	3/8 in. BENTONITE CHIPS
DEPTH OF TOP OF FILTER MATERIAL:	2.5 ft (bgs)
DEPTH OF TOP OF WELL SCREEN:	3 ft (bgs)
WELL SCREEN SLOT SIZE:	.010 in.
MATERIAL/DIAMETER OF WELL SCREEN:	PVC / 2-1/4 in. O.D., 2 in. I.D.
TYPE OF FILTER MATERIAL:	2040 SAND FILTER
DIAMETER BOREHOLE:	7-5/8 in.
DEPTH OF WELL SCREEN:	18 ft (bgs)
TYPE OF BACKFILL BELOW WELL SCREEN:	2040 SAND FILTER
DEPTH OF BOREHOLE	19.0 ft (bgs)

OBSERVATION WELL CONSTRUCTION LOG

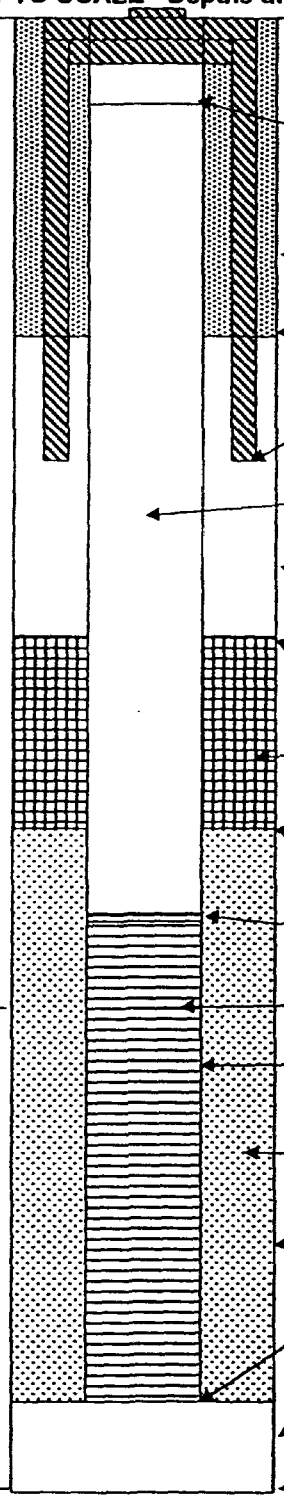
Nobis Engineering, Inc.
P.O. Box 2890 Concord, NH

PROJECT:	New Bedford Harbor	WELL:	OW-B6
LOCATION:	New Bedford, Mass.	DATE:	7/20/99
PROJECT #:	48138.07	PREPARED BY:	R. Chase
CLIENT:	Foster Wheeler Env.	CONTRACTOR:	Atlantic Testing Labs
SURVEY DATUM:	NGVD	FOREMAN:	R. Pryce
Northing: 2703791.2			
Easting: 814957.9			

NOT TO SCALE - Depths are below ground surface (bgs)

GROUNDWATER OBSERVATIONS
(below ground surface)

DEPTH FT	DATE
4.22 ft	8/5/99



GROUND SURFACE ELEVATION:	5.8 (NGVD)
FLUSH MOUNTED PROTECTIVE CASING	
DEPTH TO TOP OF RISER PIPE	0.52 ft (bgs)
TYPE OF SURFACE SEAL:	CONCRETE
DIAMETER OF SURFACE SEAL:	36 in.
DEPTH TO TOP OF SAND DRAIN LAYER	6 in. (bgs)
DEPTH OF BOTTOM OF PROTECTIVE CASING:	1.0 ft (bgs)
MATERIAL/DIAMETER OF RISER PIPE:	PVC / 2-1/4 in. O.D., 2 in. I.D.
TYPE OF BACKFILL ABOVE SEAL:	2040 SAND FILTER
DEPTH OF TOP OF SEAL:	1.5 ft (bgs)
TYPE OF SEAL ABOVE FILTER MATERIAL:	3/8 in. BENTONITE CHIPS
DEPTH OF TOP OF FILTER MATERIAL:	2.5 ft (bgs)
DEPTH OF TOP OF WELL SCREEN:	3 ft (bgs)
WELL SCREEN SLOT SIZE:	.010 in.
MATERIAL/DIAMETER OF WELL SCREEN:	PVC / 2-1/4 in. O.D., 2 in. I.D.
TYPE OF FILTER MATERIAL:	2040 SAND FILTER
DIAMETER BOREHOLE:	7-5/8 in.
DEPTH OF WELL SCREEN:	18 ft (bgs)
TYPE OF BACKFILL BELOW WELL SCREEN:	2040 SAND FILTER
DEPTH OF BOREHOLE	19.0 ft (bgs)

OBSERVATION WELL CONSTRUCTION LOG

Nobis

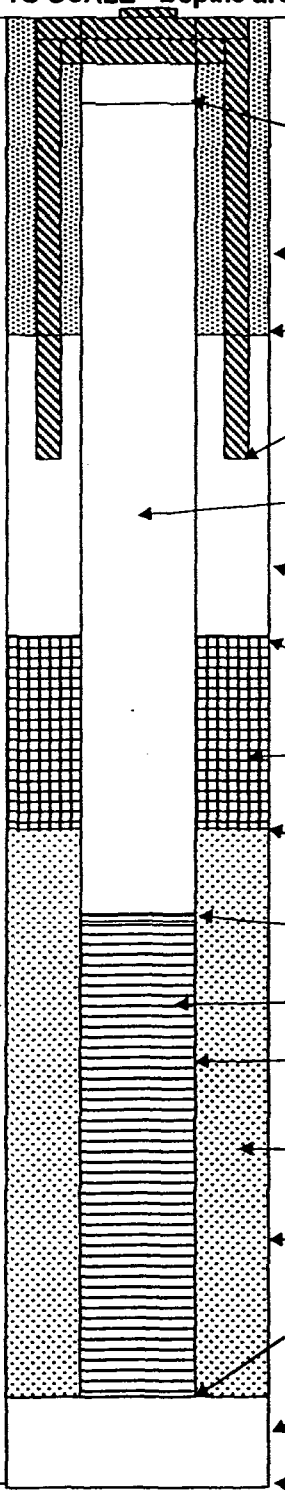
Nobis Engineering, Inc.
P.O. Box 2890 Concord, NH

PROJECT:	New Bedford Harbor	WELL:	OW-B7
LOCATION:	New Bedford, Mass.	DATE:	7/21/99
PROJECT #:	48138.07	PREPARED BY:	R. Chase
CLIENT:	Foster Wheeler Env.	CONTRACTOR:	Atlantic Testing Labs
SURVEY DATUM:	NGVD	FOREMAN:	R. Pryce
Northing: 2703765.6			
Easting: 814768.4			

NOT TO SCALE - Depths are below ground surface (bgs)

GROUNDWATER OBSERVATIONS
(below ground surface)

DEPTH FT	DATE
6.3 ft	7/21/99



GROUND SURFACE ELEVATION: FLUSH MOUNTED PROTECTIVE CASING	7.74 (NGVD)
DEPTH TO TOP OF RISER PIPE	0.29 ft (bgs)
TYPE OF SURFACE SEAL:	CONCRETE
DIAMETER OF SURFACE SEAL:	36 in.
DEPTH TO TOP OF SAND DRAIN LAYER	6 in. (bgs)
DEPTH OF BOTTOM OF PROTECTIVE CASING:	1.0 ft (bgs)
MATERIAL/DIAMETER OF RISER PIPE:	PVC / 2-1/4 in. O.D., 2 in. I.D.
TYPE OF BACKFILL ABOVE SEAL:	2040 SAND FILTER
DEPTH OF TOP OF SEAL:	1.5 ft (bgs)
TYPE OF SEAL ABOVE FILTER MATERIAL:	3/8 in. BENTONITE CHIPS
DEPTH OF TOP OF FILTER MATERIAL:	2.5 ft (bgs)
DEPTH OF TOP OF WELL SCREEN:	3 ft (bgs)
WELL SCREEN SLOT SIZE:	.010 in.
MATERIAL/DIAMETER OF WELL SCREEN:	PVC / 2-1/4 in. O.D., 2 in. I.D.
TYPE OF FILTER MATERIAL:	2040 SAND FILTER
DIAMETER BOREHOLE:	7-5/8 in.
DEPTH OF WELL SCREEN:	18 ft (bgs)
TYPE OF BACKFILL BELOW WELL SCREEN:	2040 SAND FILTER
DEPTH OF BOREHOLE	19.0 ft (bgs)

MONITORING WELL CONSTRUCTION LOG

New Bedford Harbor Superfund Site

Remedial Design for Operable Unit 01

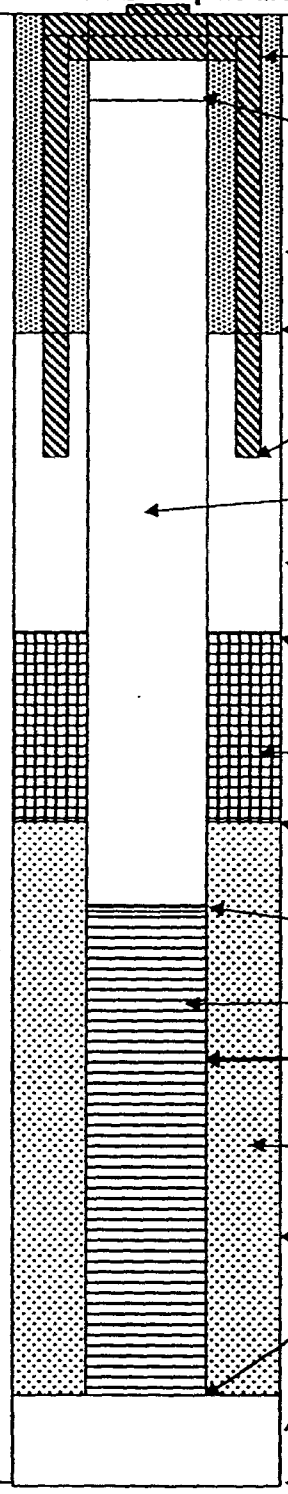
Nobis Engineering, Inc.
P.O. Box 2890 Concord, NH

PROJECT:	New Bedford Harbor	**WELL:**	MW-B1
LOCATION:	New Bedford, Mass.	**DATE:**	9/13/99
PROJECT #:	48138.07	**PREPARED BY:**	S. Bonis
CLIENT:	Foster Wheeler Env.	**CONTRACTOR:**	Atlantic Testing Labs
SURVEY DATUM:	NGVD	**FOREMAN:**	R. Pryce
Northing:	2704803.1		
Easting:	814792.3		

NOT TO SCALE - Depths are below ground surface (bgs)

GROUNDWATER OBSERVATIONS
(below ground surface)

DEPTH FT	DATE
3.02 ft	9/15/99



GROUND SURFACE ELEVATION:	5.40 (NGVD)
FLUSH MOUNTED PROTECTIVE CASING	
DEPTH TO TOP OF RISER PIPE	0.35 ft (bgs)
TYPE OF SURFACE SEAL:	CONCRETE
DIAMETER OF SURFACE SEAL:	36 in.
DEPTH TO TOP OF SAND DRAIN LAYER	6 in. (bgs)
DEPTH OF BOTTOM OF PROTECTIVE CASING:	1.10 ft. (bgs)
MATERIAL/DIAMETER OF RISER PIPE:	PVC / 2-1/4 in. O.D., 2 in. I.D.
TYPE OF BACKFILL ABOVE SEAL:	2040 SAND FILTER
DEPTH OF TOP OF SEAL:	2.0 ft. (bgs)
TYPE OF SEAL ABOVE FILTER MATERIAL:	3/8 in. BENTONITE CHIPS
DEPTH OF TOP OF FILTER MATERIAL:	2.5 ft (bgs)
DEPTH OF TOP OF WELL SCREEN:	3 ft (bgs)
WELL SCREEN SLOT SIZE:	.010 in.
MATERIAL/DIAMETER OF WELL SCREEN:	PVC / 2-1/4 in. O.D., 2 in. I.D.
TYPE OF FILTER MATERIAL:	2040 SAND FILTER
DIAMETER BOREHOLE:	7-5/8 in.
DEPTH OFWELL SCREEN:	18 ft (bgs)
TYPE OF BACKFILL BELOW WELL SCREEN:	2040 SAND FILTER
DEPTH OF BOREHOLE	19 ft (bgs)

MONITORING WELL CONSTRUCTION LOG

New Bedford Harbor Superfund Site

Remedial Design for Operable Unit 01

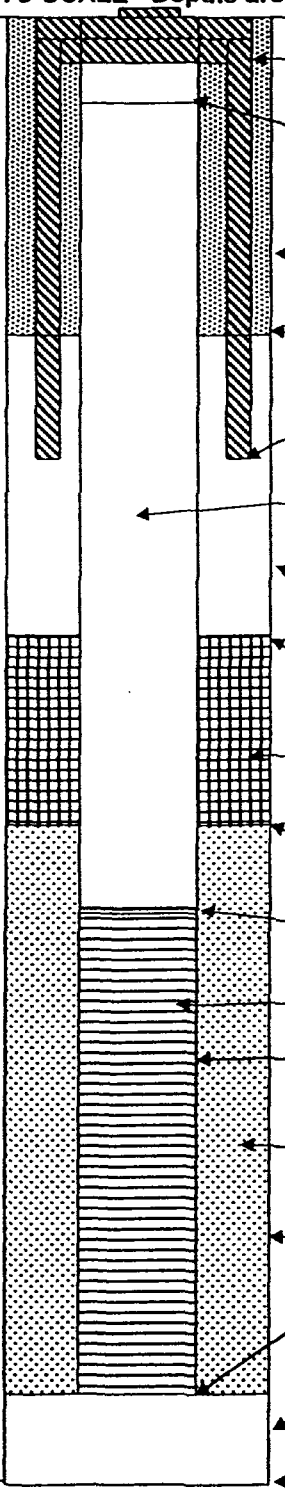
Nobis Engineering, Inc.
P.O. Box 2890 Concord, NH

PROJECT:	New Bedford Harbor	**WELL:**	MW-B2S
LOCATION:	New Bedford, Mass.	**DATE:**	7/27/99
PROJECT #:	48138.07	**PREPARED BY:**	R. Chase
CLIENT:	Foster Wheeler Env.	**CONTRACTOR:**	Atlantic Testing Labs
SURVEY DATUM:	NGVD	**FOREMAN:**	R. Pryce
Northing:	2704199.2		
Easting:	814810.2		

NOT TO SCALE - Depths are below ground surface (bgs)

GROUNDWATER OBSERVATIONS
(below ground surface)

DEPTH FT	DATE
3.6 ft	7/27/99



GROUND SURFACE ELEVATION:	5.73 (NGVD)
FLUSH MOUNTED PROTECTIVE CASING	
DEPTH TO TOP OF RISER PIPE	0.39 ft (bgs)
TYPE OF SURFACE SEAL:	CONCRETE
DIAMETER OF SURFACE SEAL:	36 in.
DEPTH TO TOP OF SAND DRAIN LAYER	6 in. (bgs)
DEPTH OF BOTTOM OF PROTECTIVE CASING:	1.10 ft. (bgs)
MATERIAL/DIAMETER OF RISER PIPE:	PVC / 2-1/4 in. O.D., 2 in. I.D.
TYPE OF BACKFILL ABOVE SEAL:	2040 SAND FILTER
DEPTH OF TOP OF SEAL:	1.5 ft. (bgs)
TYPE OF SEAL ABOVE FILTER MATERIAL:	3/8 in. BENTONITE CHIPS
DEPTH OF TOP OF FILTER MATERIAL:	2.5 ft (bgs)
DEPTH OF TOP OF WELL SCREEN:	3 ft (bgs)
WELL SCREEN SLOT SIZE:	.010 in.
MATERIAL/DIAMETER OF WELL SCREEN:	PVC / 2-1/4 in. O.D., 2 in. I.D.
TYPE OF FILTER MATERIAL:	2040 SAND FILTER
DIAMETER BOREHOLE:	7-5/8 in.
DEPTH OFWELL SCREEN:	18 ft (bgs)
TYPE OF BACKFILL BELOW WELL SCREEN:	2040 SAND FILTER
DEPTH OF BOREHOLE	19 ft (bgs)

MONITORING WELL CONSTRUCTION LOG

New Bedford Harbor Superfund Site

Remedial Design for Operable Unit 01

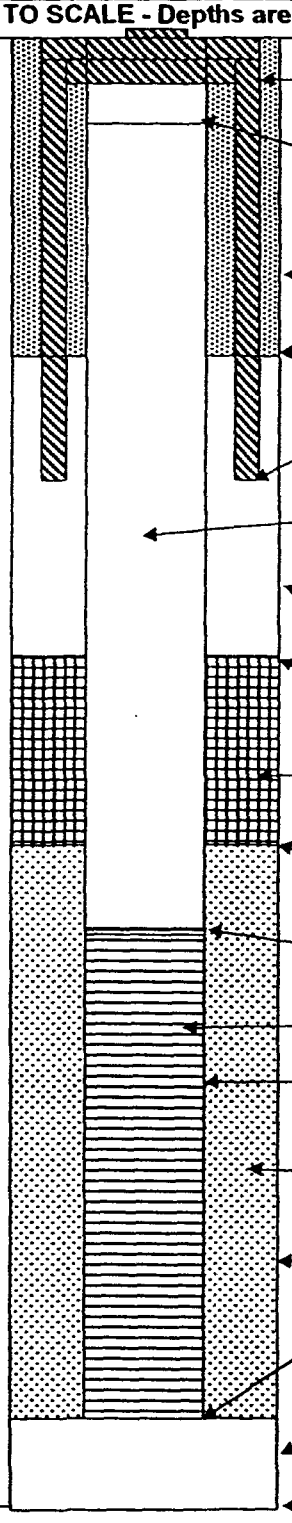
Nobis Engineering, Inc.
P.O. Box 2890 Concord, NH

PROJECT:	New Bedford Harbor	**WELL:**	MW-B2D
LOCATION:	New Bedford, Mass.	**DATE:**	7/26/99
PROJECT #:	48138.07	**PREPARED BY:**	R. Chase
CLIENT:	Foster Wheeler Env.	**CONTRACTOR:**	Atlantic Testing Labs
SURVEY DATUM:	NGVD	**FOREMAN:**	R. Pryce
Northing: 2704190.9			
Easting: 814826.5			

NOT TO SCALE - Depths are below ground surface (bgs)

GROUNDWATER OBSERVATIONS
(below ground surface)

DEPTH FT	DATE
3.22 ft	8/2/99



GROUND SURFACE ELEVATION:	5.58 (NGVD)
FLUSH MOUNTED PROTECTIVE CASING	
DEPTH TO TOP OF RISER PIPE	0.38 ft (bgs)
TYPE OF SURFACE SEAL:	CONCRETE
DIAMETER OF SURFACE SEAL:	36 in.
DEPTH TO TOP OF SAND DRAIN LAYER	6 in. (bgs)
DEPTH OF BOTTOM OF PROTECTIVE CASING:	1.10 ft. (bgs)
MATERIAL/DIAMETER OF RISER PIPE:	PVC / 2-1/4 in. O.D., 2 in. I.D.
TYPE OF BACKFILL ABOVE SEAL:	BENTONITE GROUT
DEPTH OF TOP OF SEAL:	2.0 ft. (bgs)
TYPE OF SEAL ABOVE FILTER MATERIAL:	3/8 in. BENTONITE CHIPS
DEPTH OF TOP OF FILTER MATERIAL:	20.5 ft (bgs)
DEPTH OF TOP OF WELL SCREEN:	23 ft (bgs)
WELL SCREEN SLOT SIZE:	.010 in.
MATERIAL/DIAMETER OF WELL SCREEN:	PVC / 2-1/4 in. O.D., 2 in. I.D.
TYPE OF FILTER MATERIAL:	2040 SAND FILTER
DIAMETER BOREHOLE:	6-1/2 in.
DEPTH OFWELL SCREEN:	33 ft (bgs)
TYPE OF BACKFILL BELOW WELL SCREEN:	2040 SAND FILTER
DEPTH OF BOREHOLE	34.3 ft (bgs)

MONITORING WELL CONSTRUCTION LOG

New Bedford Harbor Superfund Site

Remedial Design for Operable Unit 01

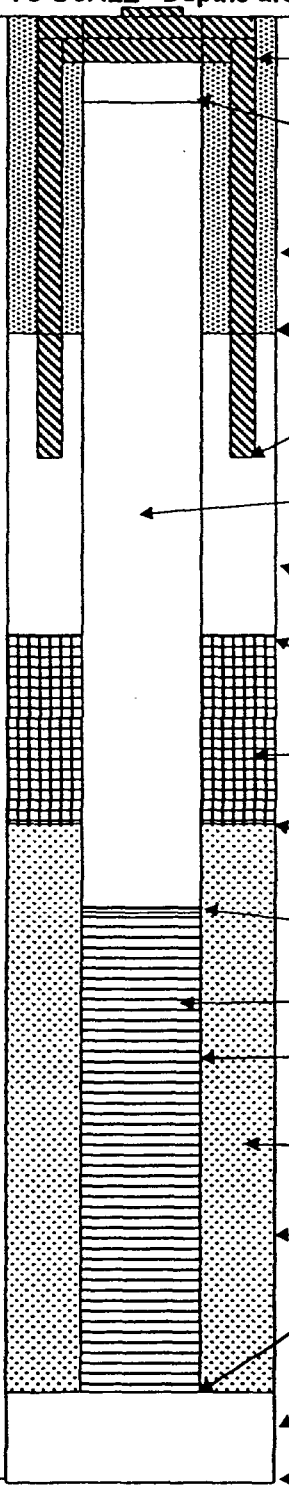
Nobis Engineering, Inc.
P.O. Box 2890 Concord, NH

PROJECT:	New Bedford Harbor	**WELL:**	MW-B3
LOCATION:	New Bedford, Mass.	**DATE:**	7/14/99
PROJECT #:	48138.07	**PREPARED BY:**	R. Chase
CLIENT:	Foster Wheeler Env.	**CONTRACTOR:**	Atlantic Testing Labs
SURVEY DATUM:	NGVD	**FOREMAN:**	R. Pryce
Northing:	2703608.3		
Easting:	814893.2		

NOT TO SCALE - Depths are below ground surface (bgs)

GROUNDWATER OBSERVATIONS
(below ground surface)

DEPTH FT	DATE
6.26 ft	7/28/99



GROUND SURFACE ELEVATION:	8.26 (NGVD)
FLUSH MOUNTED PROTECTIVE CASING	
DEPTH TO TOP OF RISER PIPE	0.33 ft (bgs)
TYPE OF SURFACE SEAL:	CONCRETE
DIAMETER OF SURFACE SEAL:	36 in.
DEPTH TO TOP OF SAND DRAIN LAYER	6 in. (bgs)
DEPTH OF BOTTOM OF PROTECTIVE CASING:	1.10 ft. (bgs)
MATERIAL/DIAMETER OF RISER PIPE:	PVC / 2-1/4 in. O.D., 2 in. I.D.
TYPE OF BACKFILL ABOVE SEAL:	2040 SAND FILTER
DEPTH OF TOP OF SEAL:	1.5 ft. (bgs)
TYPE OF SEAL ABOVE FILTER MATERIAL:	3/8 in. BENTONITE CHIPS
DEPTH OF TOP OF FILTER MATERIAL:	2.5 ft (bgs)
DEPTH OF TOP OF WELL SCREEN:	3 ft (bgs)
WELL SCREEN SLOT SIZE:	.010 in.
MATERIAL/DIAMETER OF WELL SCREEN:	PVC / 2-1/4 in. O.D., 2 in. I.D.
TYPE OF FILTER MATERIAL:	2040 SAND FILTER
DIAMETER BOREHOLE:	7-5/8 in.
DEPTH OFWELL SCREEN:	18 ft (bgs)
TYPE OF BACKFILL BELOW WELL SCREEN:	2040 SAND FILTER
DEPTH OF BOREHOLE	19 ft (bgs)

MONITORING WELL CONSTRUCTION LOG

New Bedford Harbor Superfund Site

Remedial Design for Operable Unit 01

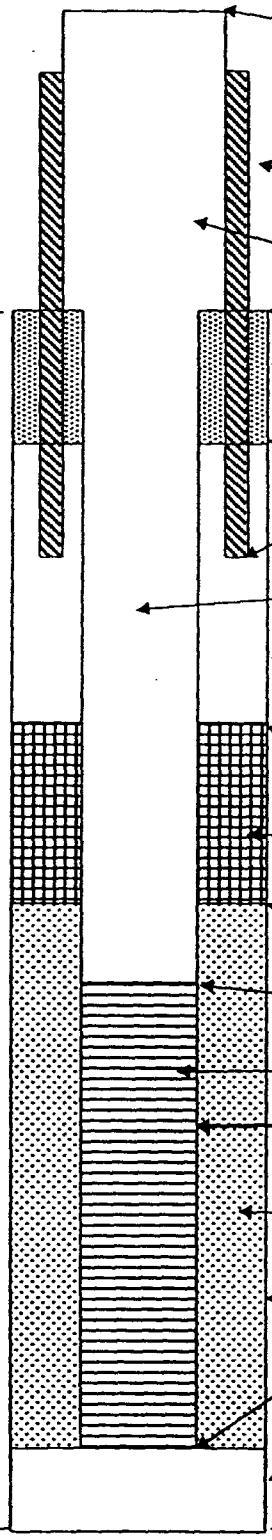
Nobis Engineering, Inc.
P.O. Box 2890 Concord, NH

PROJECT:	New Bedford Harbor	WELL:	MW-B4
LOCATION:	New Bedford, Mass.	DATE:	9/30/99
PROJECT #:	48138.07	PREPARED BY:	E. Thibodeau
CLIENT:	Foster Wheeler Env.	CONTRACTOR:	Atlantic Testing Labs
SURVEY DATUM:	NGVD	FOREMAN:	P. Davis
Northing: 2704625.2			
Easting: 815115.3			

NOT TO SCALE - Depths are below mudline surface (bms)

GROUNDWATER OBSERVATIONS
(below mudline)

DEPTH FT	DATE
NOT RECORDED	



RISER PIPE ELEVATION	7.85 (NGVD)
HEIGHT OF PROTECTIVE CASING ABOVE MUDLINE	11.61 ft.
LENGTH OF RISER PIPE ABOVE MUDLINE	12.15 ft.
MUDLINE SURFACE ELEVATION:	-4.3 (NGVD)
TYPE OF SURFACE SEAL:	BENTONITE GROUT
DIAMETER OF SURFACE SEAL:	5.5 in.
DEPTH TO TOP OF SAND DRAIN LAYER	NONE
DEPTH OF BOTTOM OF PROTECTIVE CASING:	3.39 ft (bms)
MATERIAL/DIAMETER OF RISER PIPE:	PVC / 2-1/4 in. O.D., 2 in. I.D.
TYPE OF BACKFILL ABOVE SEAL:	BENTONITE GROUT
DEPTH OF TOP OF SEAL:	13.5 ft (bms)
TYPE OF SEAL ABOVE FILTER MATERIAL:	3/8 in. BENTONITE CHIPS
DEPTH OF TOP OF FILTER MATERIAL:	15.5 ft (bms)
DEPTH OF TOP OF WELL SCREEN:	16.0 ft (bms)
WELL SCREEN SLOT SIZE:	.010 in.
MATERIAL/DIAMETER OF WELL SCREEN:	PVC / 2-1/4 in. O.D., 2 in. I.D.
TYPE OF FILTER MATERIAL:	2040 SAND FILTER
DIAMETER BOREHOLE:	5-1/2 in.
DEPTH OF WELL SCREEN:	26.0 ft (bms)
TYPE OF BACKFILL BELOW WELL SCREEN:	2040 SAND FILTER
DEPTH OF BOREHOLE	28.0 ft (bms)

MONITORING WELL CONSTRUCTION LOG

New Bedford Harbor Superfund Site

Remedial Design for Operable Unit 01

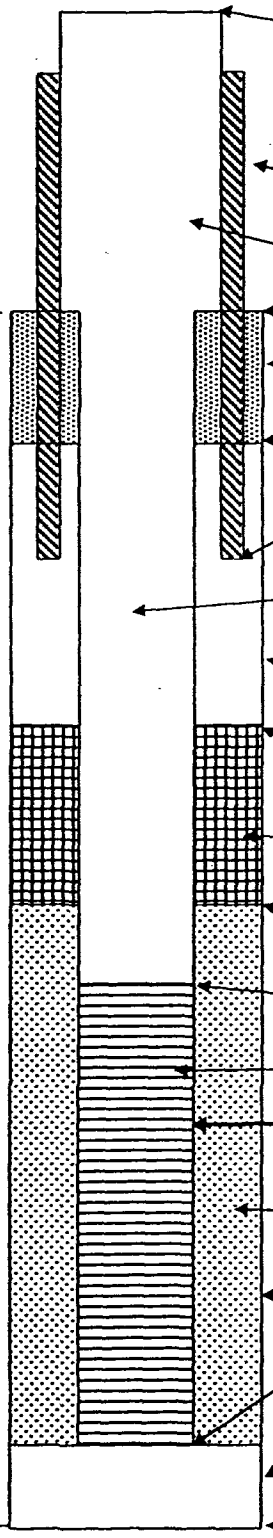
Nobis Engineering, Inc.
P.O. Box 2890 Concord, NH

PROJECT:	New Bedford Harbor	WELL:	MW-B5
LOCATION:	New Bedford, Mass.	DATE:	10/13/99
PROJECT #:	48138.07	PREPARED BY:	E. Paddleford
CLIENT:	Foster Wheeler Env.	CONTRACTOR:	Atlantic Testing Labs
SURVEY DATUM:	NGVD	FOREMAN:	P. Davis
Northing:	2703769.1		
Easting:	815119.5		

NOT TO SCALE - Depths are below mudline surface (bms)

GROUNDWATER OBSERVATIONS
(below mudline)

DEPTH FT	DATE
	NOT RECORDED



RISER PIPE ELEVATION	8.34 (NGVD)
HEIGHT OF PROTECTIVE CASING ABOVE MUDLINE	8.96 ft.
LENGTH OF RISER PIPE ABOVE MUDLINE	11.55 ft.
MUDLINE SURFACE ELEVATION:	-3.21 (NGVD)
TYPE OF SURFACE SEAL:	BENTONITE GROUT
DIAMETER OF SURFACE SEAL:	5.5 in.
DEPTH TO TOP OF SAND DRAIN LAYER	NONE
DEPTH OF BOTTOM OF PROTECTIVE CASING:	6.04 ft (bms)
MATERIAL/DIAMETER OF RISER PIPE:	PVC / 2-1/4 in. O.D., 2 in. I.D.
TYPE OF BACKFILL ABOVE SEAL:	BENTONITE GROUT
DEPTH OF TOP OF SEAL:	15.5 ft (bms)
TYPE OF SEAL ABOVE FILTER MATERIAL:	3/8 in. BENTONITE CHIPS
DEPTH OF TOP OF FILTER MATERIAL:	16.5 ft (bms)
DEPTH OF TOP OF WELL SCREEN:	17.5 ft (bms)
WELL SCREEN SLOT SIZE:	.010 in.
MATERIAL/DIAMETER OF WELL SCREEN:	PVC / 2-1/4 in. O.D., 2 in. I.D.
TYPE OF FILTER MATERIAL:	2040 SAND FILTER
DIAMETER BOREHOLE:	5-1/2 in.
DEPTH OF WELL SCREEN:	27.5 ft (bms)
TYPE OF BACKFILL BELOW WELL SCREEN:	FORMATION MATERIALS
DEPTH OF BOREHOLE	30.0 ft (bms)

C

APPENDIX C

Borehole Permeability Testing

C.1 Test Procedures

For the flush-bottom tests, the casing was advanced to the desired test depth, just below the point of maximum penetration of either a split spoon or an Osterberg sample, and then cleaned out thoroughly with water to form a flush bottom. For the open-hole (wick) test, the casing was: (i) advanced to a desired depth based on knowledge of the thickness of the organic clay layer; (ii) cleaned out thoroughly with water; (iii) filled with a predetermined amount of clean sand; and (iv) extracted a certain distance based on the quantity of sand introduced.

After either a flush-bottom or a sand wick was established, the casing was filled with water which was then allowed to seep into the surrounding soil. The rate of drop of the water level in the casing was recorded by measuring the depth of the water surface below the top of the casing at 0.5, 1, 2, and 5 minutes after the start of the test, and at 5 minute intervals thereafter, for a period of 90 minutes. Other data which was recorded for each test includes the following: the inside diameter of the casing; the height of the casing above the harbor water surface; the depth to the bottom of the casing below the mudline surface; the length of the wick; and a description of the material being tested.

C.2 Calculation Method

For each borehole permeability test, head was plotted as a function of time for the duration of the test (refer to Figures C-1 through C-10). Permeability was calculated based on the straight-line portion of the curve, or where the rate of head loss was constant. If there were more than one straight-line portion of the curve, the best estimate was chosen and that permeability was reported.

Calculation of permeability for the flush-bottom falling head test is as follows:

$$k_m = \frac{\pi \cdot D}{11 \cdot (t_2 - t_1)} \ln\left(\frac{H_1}{H_2}\right) \qquad \text{for } d = D$$

k_m = mean coefficient of permeability (cm/sec)
D = diameter of intake sample (cm)
d = diameter of standpipe (cm)
t = time (sec)
H_1 = piezometric head for $t = t_1$ (ft)
H_2 = piezometric head for $t = t_2$ (ft)

Calculation of permeability for the open-hole (wick) falling head test is as follows:

$$k_h = \frac{d^2 \cdot \ln\left(\frac{2mL}{D}\right)}{8 \cdot L \cdot (t_2 - t_1)} \ln\left(\frac{H_1}{H_2}\right) \qquad \text{for } \frac{mL}{D} > 4$$

$$m = \sqrt{\frac{k_h}{k_v}} \text{ (assumed to be 1)}$$

k_h = horizontal coefficient of permeability (cm/sec)
k_v = vertical coefficient of permeability (cm/sec)
m = transformation ratio
D = diameter of intake sample (cm)
d = diameter of standpipe (cm)
L = length of intake sample (cm)
t = time (sec)
H_1 = piezometric head for $t = t_1$ (ft)
H_2 = piezometric head for $t = t_2$ (ft)

C.3 Test Results

The results of the borehole permeability tests were affected by the tide cycle occurring over the course of each 90-minute test. Because of the soft nature of the organic clay, the casing could not stand on its own in the soil and had to be attached to the barge while the borehole permeability tests were performed. This resulted in the casing moving vertically with the tides and laterally with the waves, which affected the test and the calculated permeabilities. The interbedded sands could support the weight of the casing, so that the casing was left free standing while the borehole permeability tests were performed within the sand strata.

Borehole Permeability Tests in the Organic Clay:

During a falling tide, the casing was being pushed past the test interval, deeper into the clay. For this case, the calculated mean coefficient of permeability is likely more influenced by the vertical component of the permeability rather than the horizontal component (although the two are assumed to be equal). It should also be noted that both the barge and the casing fell with the tide, while the water level inside the casing either remained at the same elevation or decreased due to seepage effects. This may result in slightly lower calculated permeabilities than actual.

During a rising tide, the casing was being pulled up from the test interval, which usually resulted in the seal being lost and the rate of head drop increasing dramatically. Data recorded after the seal failed was not used. It should also be noted that both the barge and the casing rose with the tide, while the water level inside the casing either remained at the same elevation or decreased due to seepage effects. This may result in higher calculated permeabilities than actual.

Table C-1 provides a summary of the calculated borehole permeabilities for the organic clay stratum. Note that both the percentage of sand and the presence of sand seams in the organic clay affect the calculated borehole permeabilities.

Borehole Permeability Tests in the Interbedded Sands:

During a falling tide, the height of the casing above the water's surface increased, as did the head on the sample. For the purposes of calculating the permeability, the head was estimated based on the water level in the casing. The tidal fluctuation was not accounted for. The calculated permeability for a test occurring during a falling tide may, therefore, be higher than the actual permeability.

During a rising tide, the height of the casing above the water's surface decreased, as did the head on the sample. Tidal fluctuation was not accounted for in the permeability calculation, therefore, the calculated permeability for a test occurring during a rising tide may be lower than the actual permeability.

Table C-1
Summary of Borehole Permeability Test Results

Boring & Test #	Test Depth	Wick Length	Soil Type	Permeability (cm/sec)	Tide Cycle
ORGANIC CLAY					
FB-12 #2	8.0 ft	1 ft	OH	2.91×10^{-6}	falling
FB-14 #1	7.0 ft	N/A	OH	2.91×10^{-4}	falling
FB-16 #1 [1]	3.0 ft	N/A	OH	3.86×10^{-6}	rising
FB-17 #1	7.3 ft	N/A	OH	6.12×10^{-5}	falling 41 min rising 49 min
INTERBEDDED SANDS					
FB-12 #3	13 ft	N/A	ML	4.92×10^{-6}	falling
FB-14 #2	13.3 ft	N/A	SP	8.45×10^{-5}	falling 47 min rising 43 min
FB-16 #2	15.0 ft	N/A	SP-SM	1.41×10^{-5}	rising
FB-17 #2	20.7 ft	N/A	SW-SM	3.49×10^{-5}	rising

Notes: [1] Borehole permeability test performed offset from FB-16 boring location.

Table C-1 provides a summary of the calculated borehole permeabilities for the interbedded sands stratum. Note that the percentages of both fines and gravels in the interbedded sands affect the calculated borehole permeabilities.

C.4 References

Winterkorn, Hans F. and Hsai-Yang Fang. *Foundation Engineering Handbook*, Van Nostrand Reinhold Company, New York, 1975.

Figure C-1
Borehole Permeability Tests in the Organic Clay

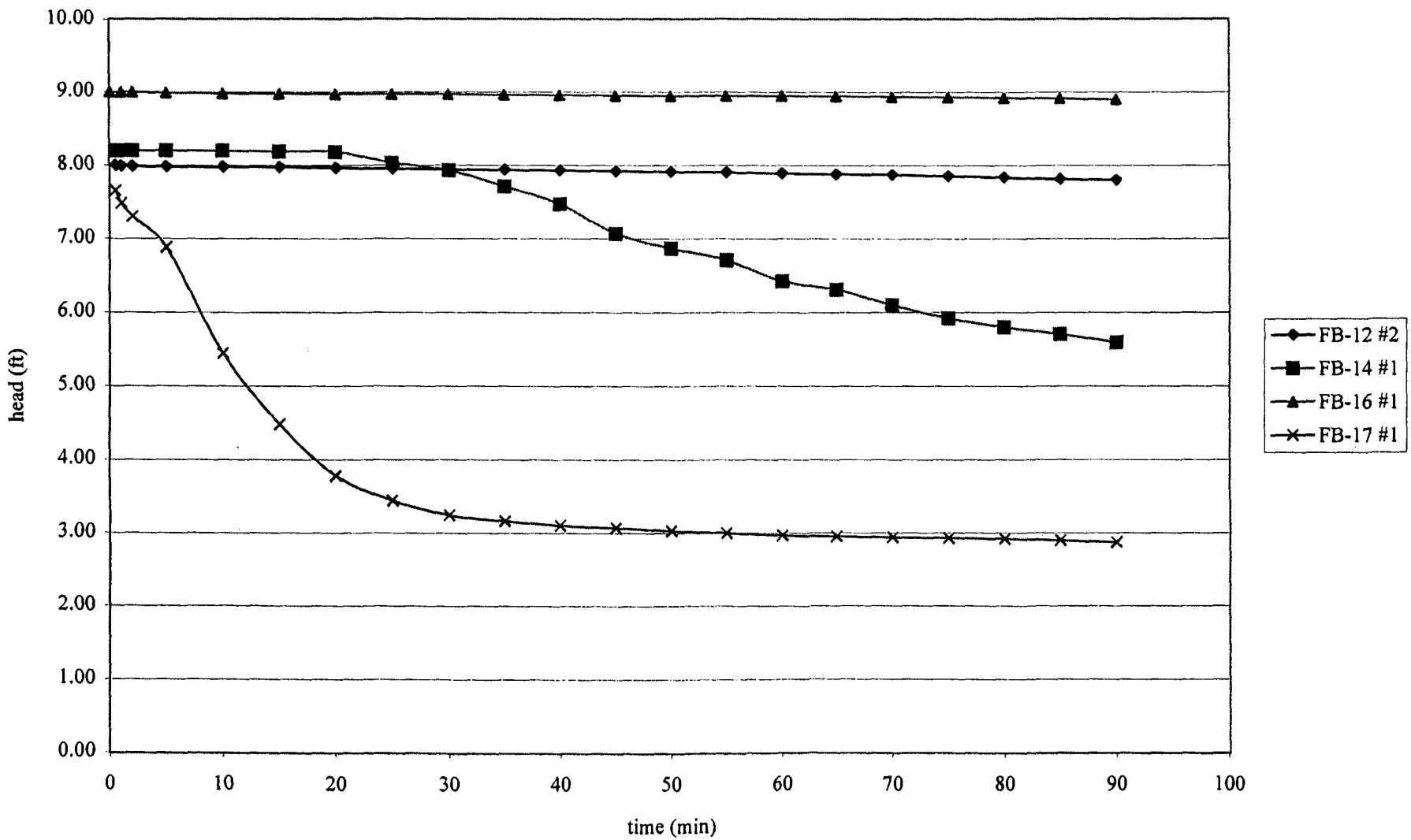


Figure C-2
FB-12 #2 (OH)

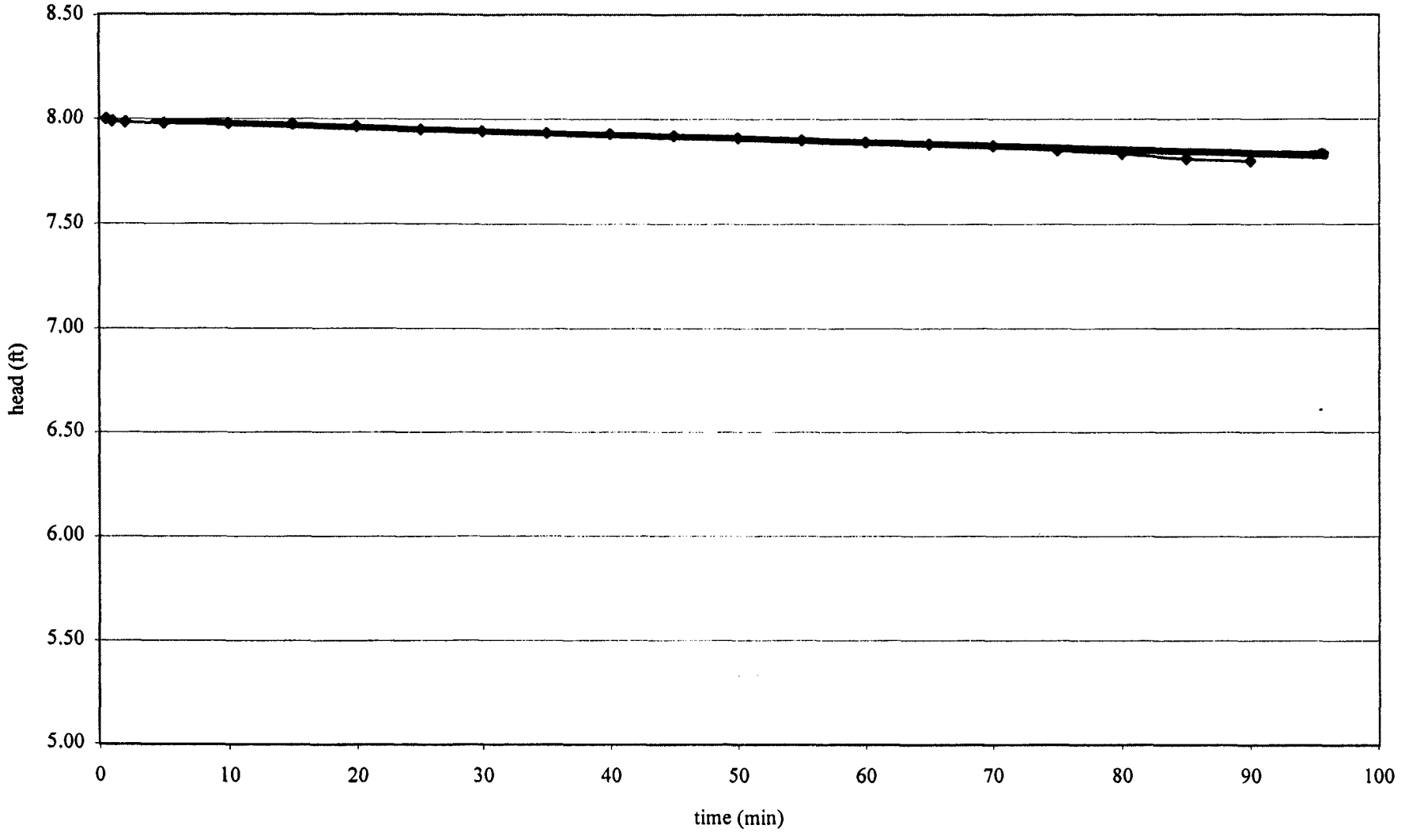


Figure C-3
FB-14 #1 (OH)

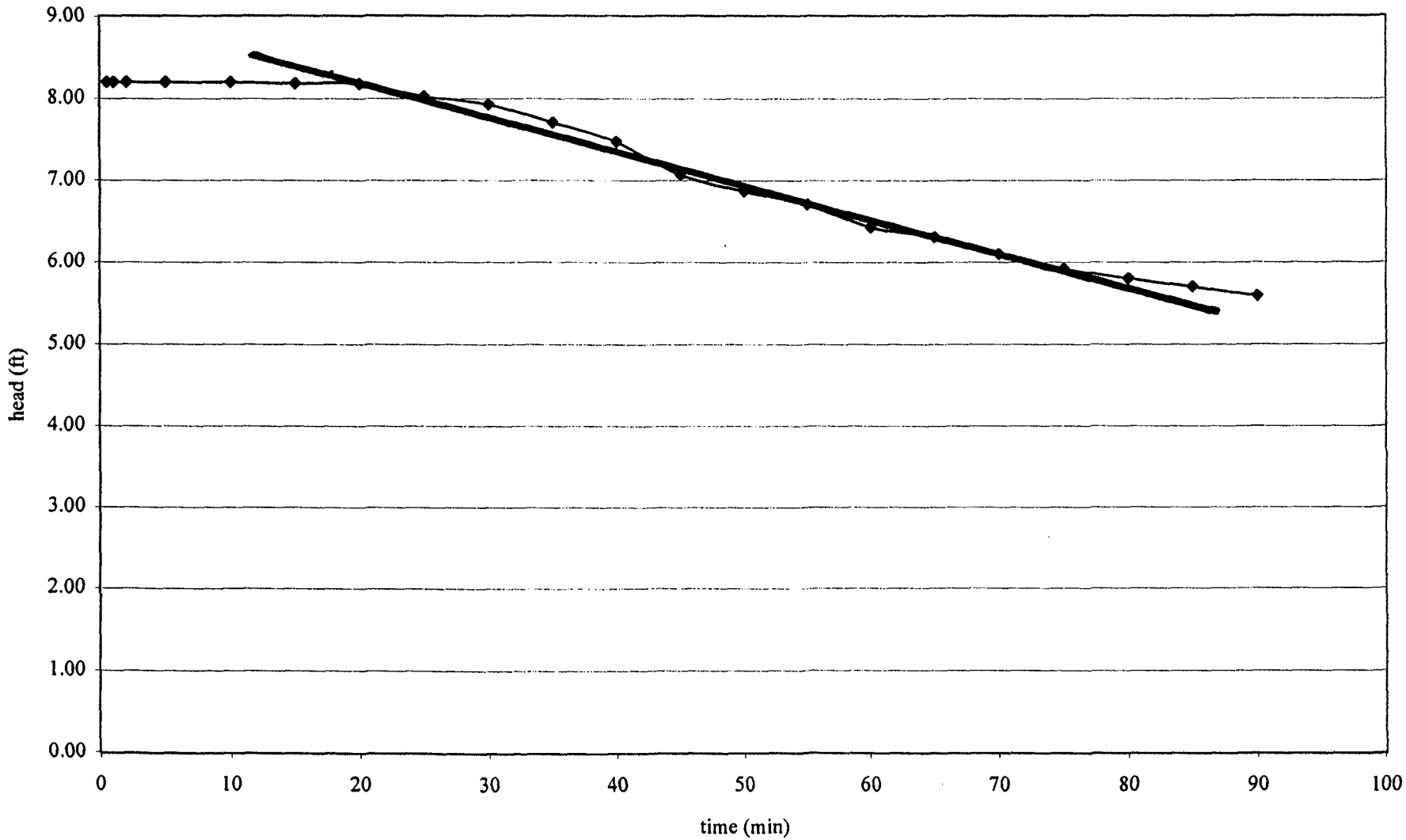


Figure C-4
FB-16 #1 (OH)

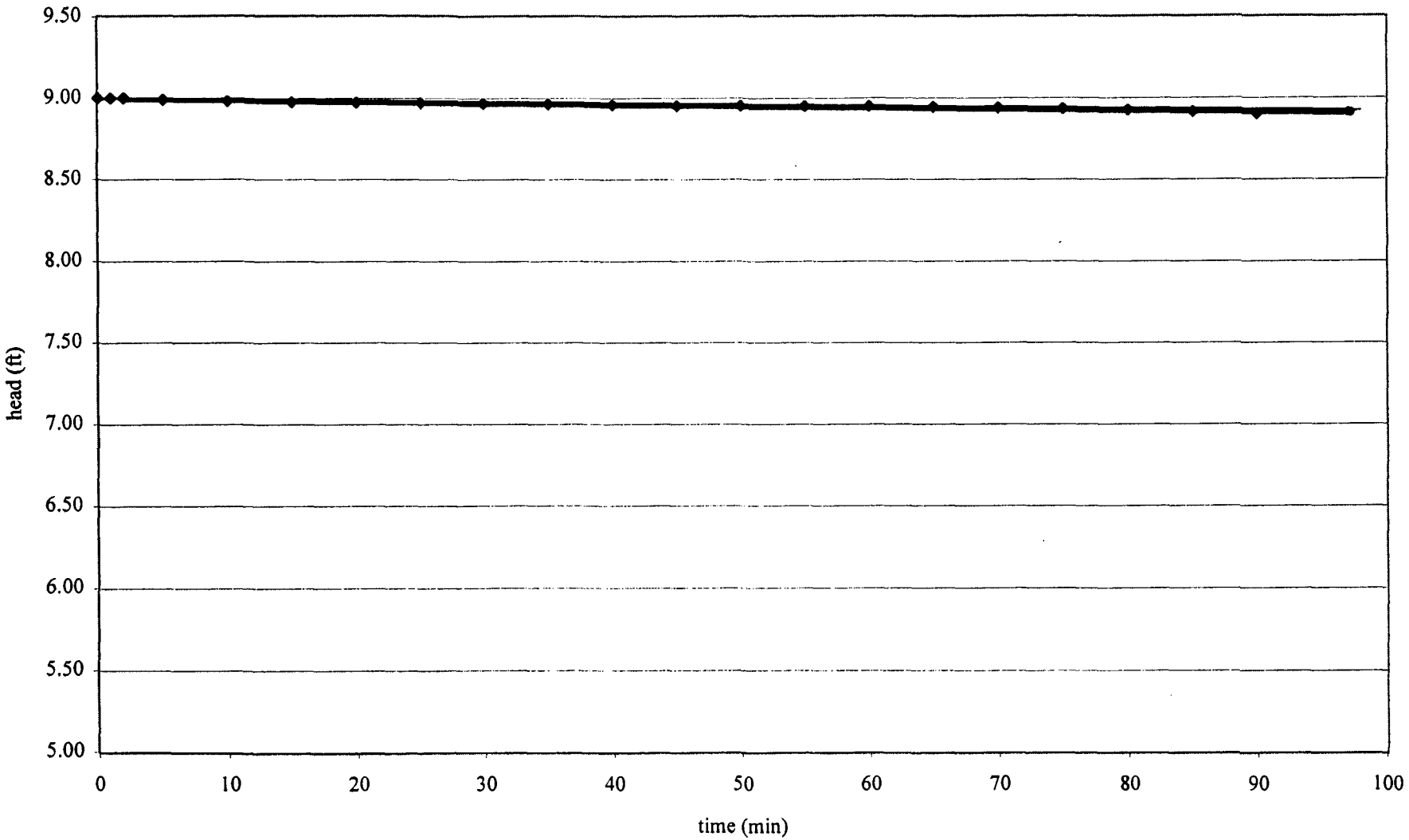


Figure C-5
FB-17 #1 (OH)

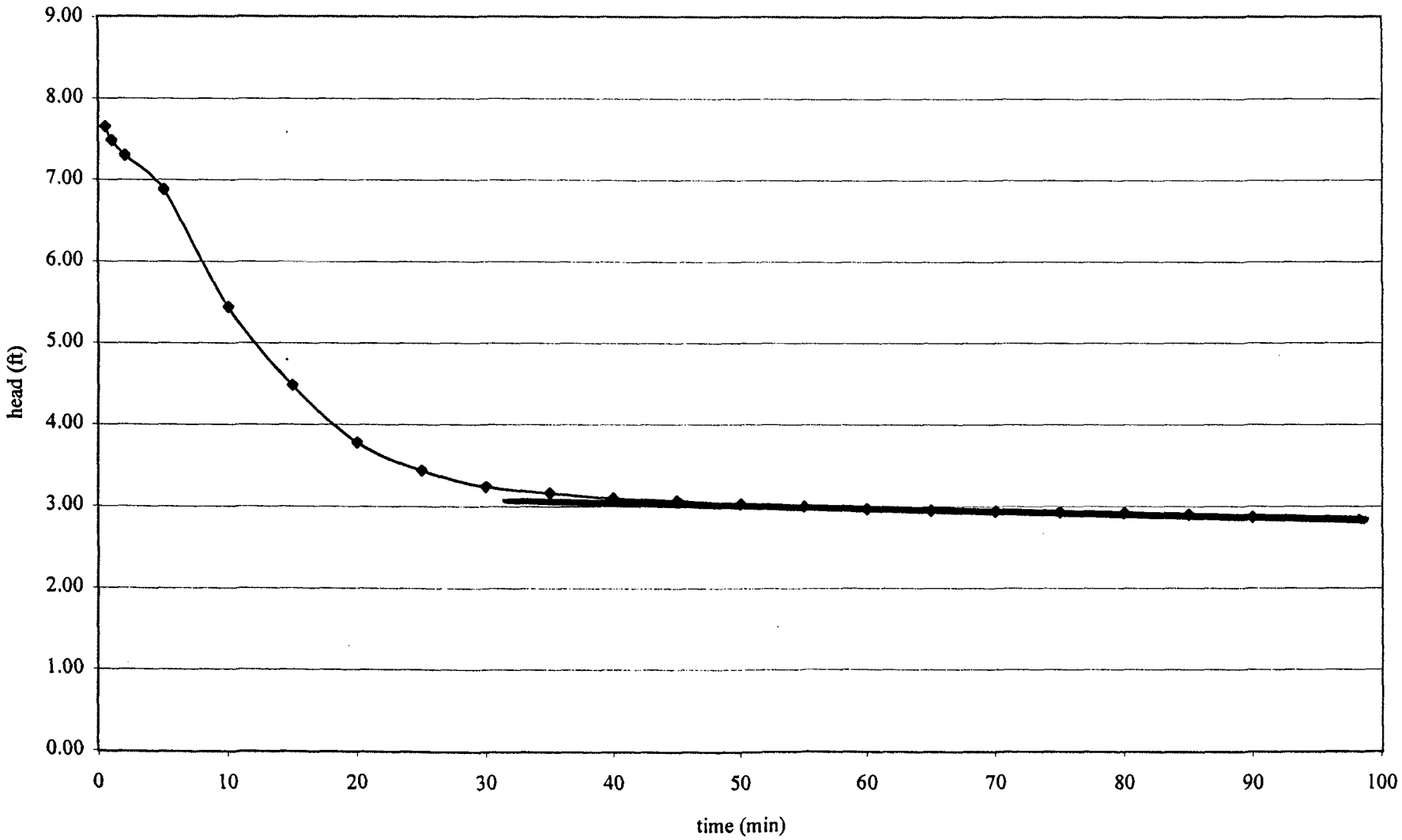


Figure C-6
Borehole Permeability Tests in the Interbedded Sands

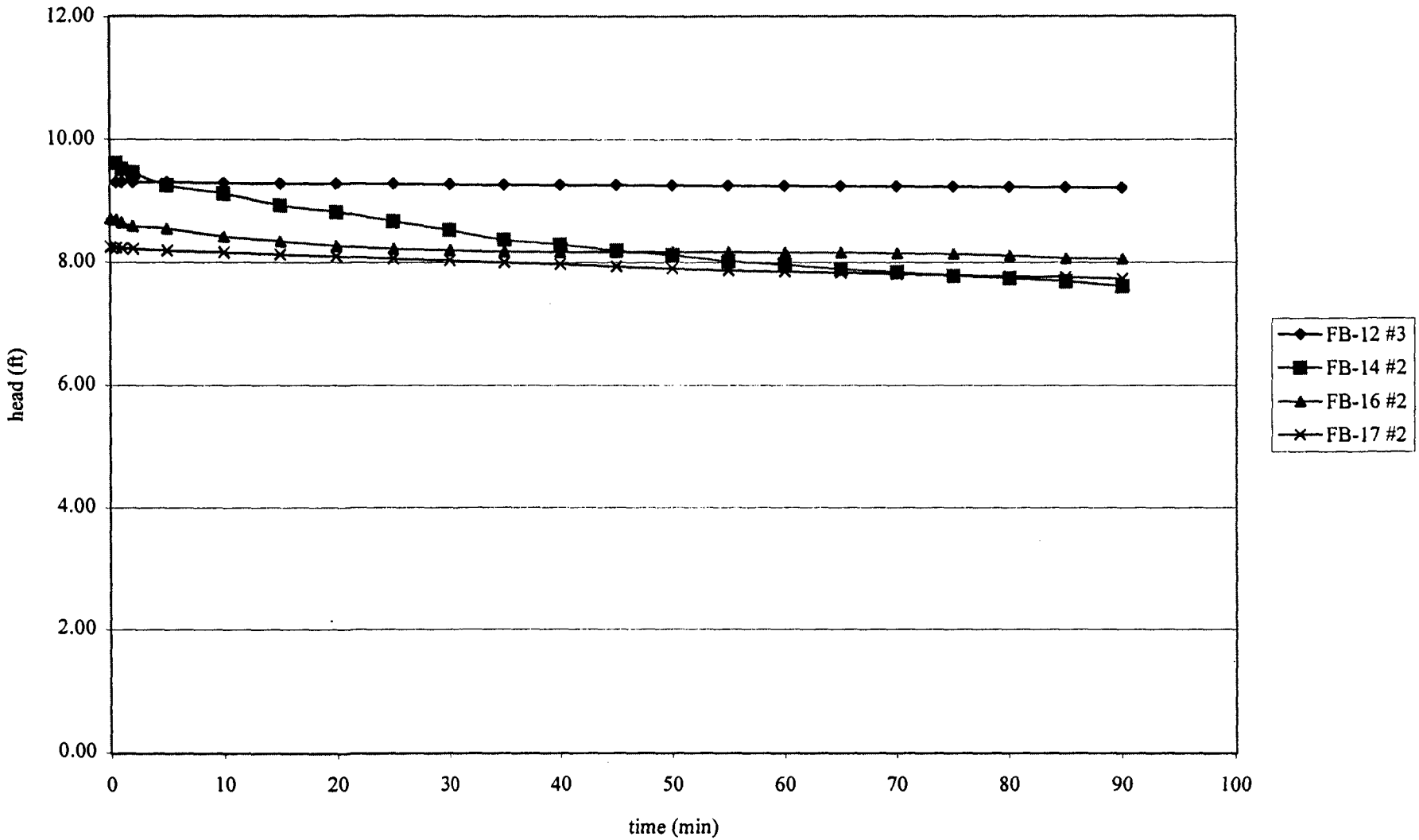


Figure C-7
FB-12 #3 (ML)

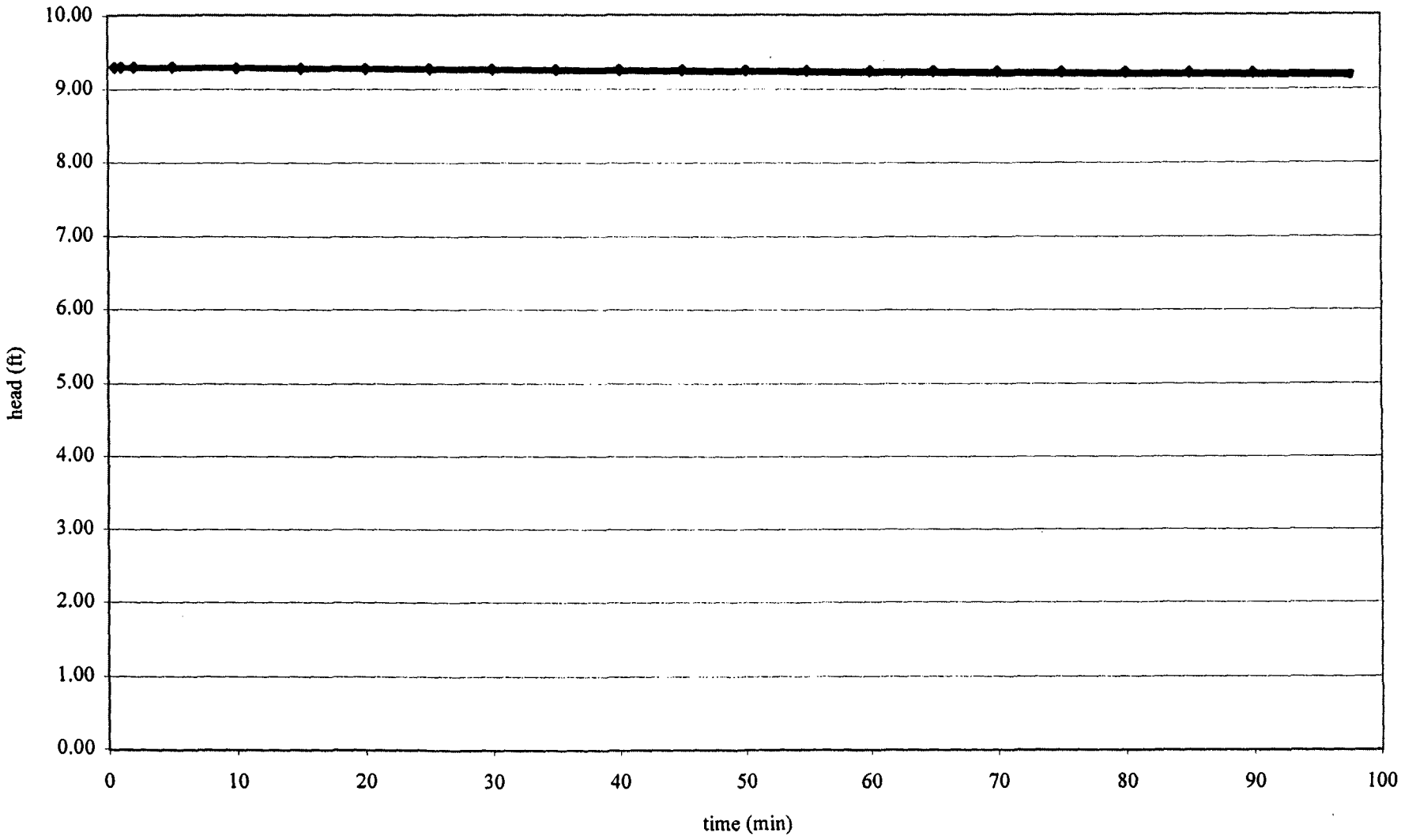


Figure C-8
FB-14 #2 (SP)

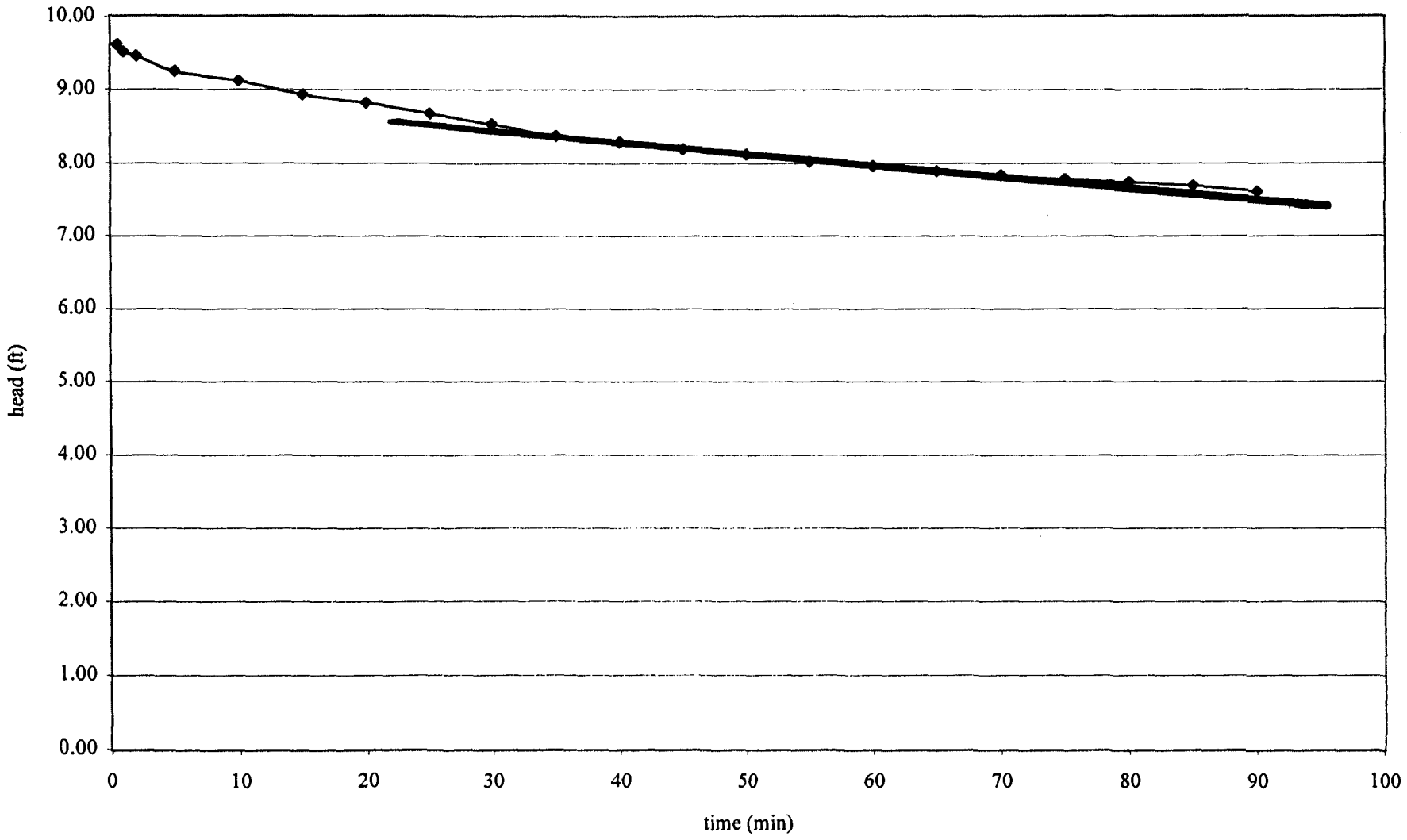


Figure C-9
FB16 #2 (SP-SM)

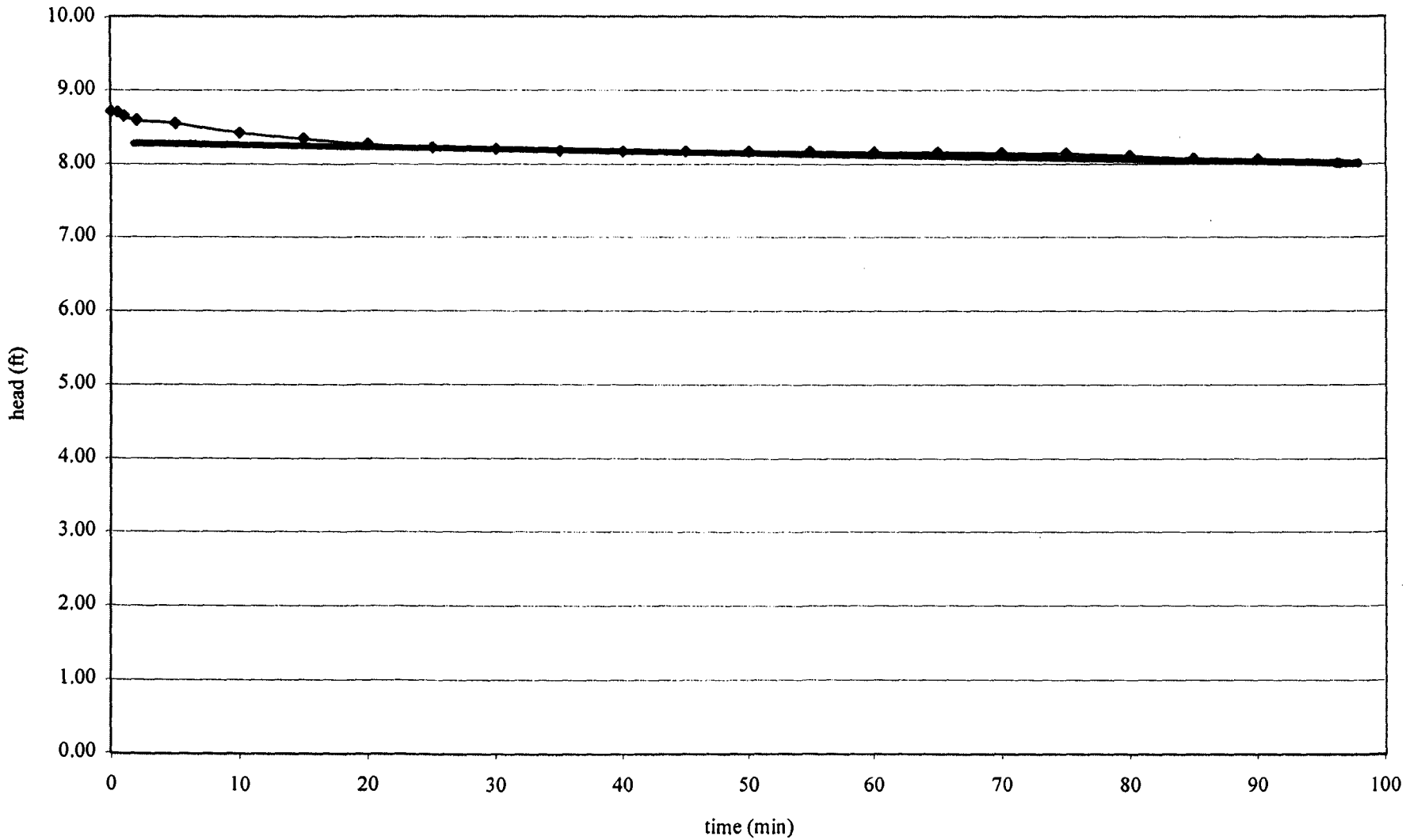
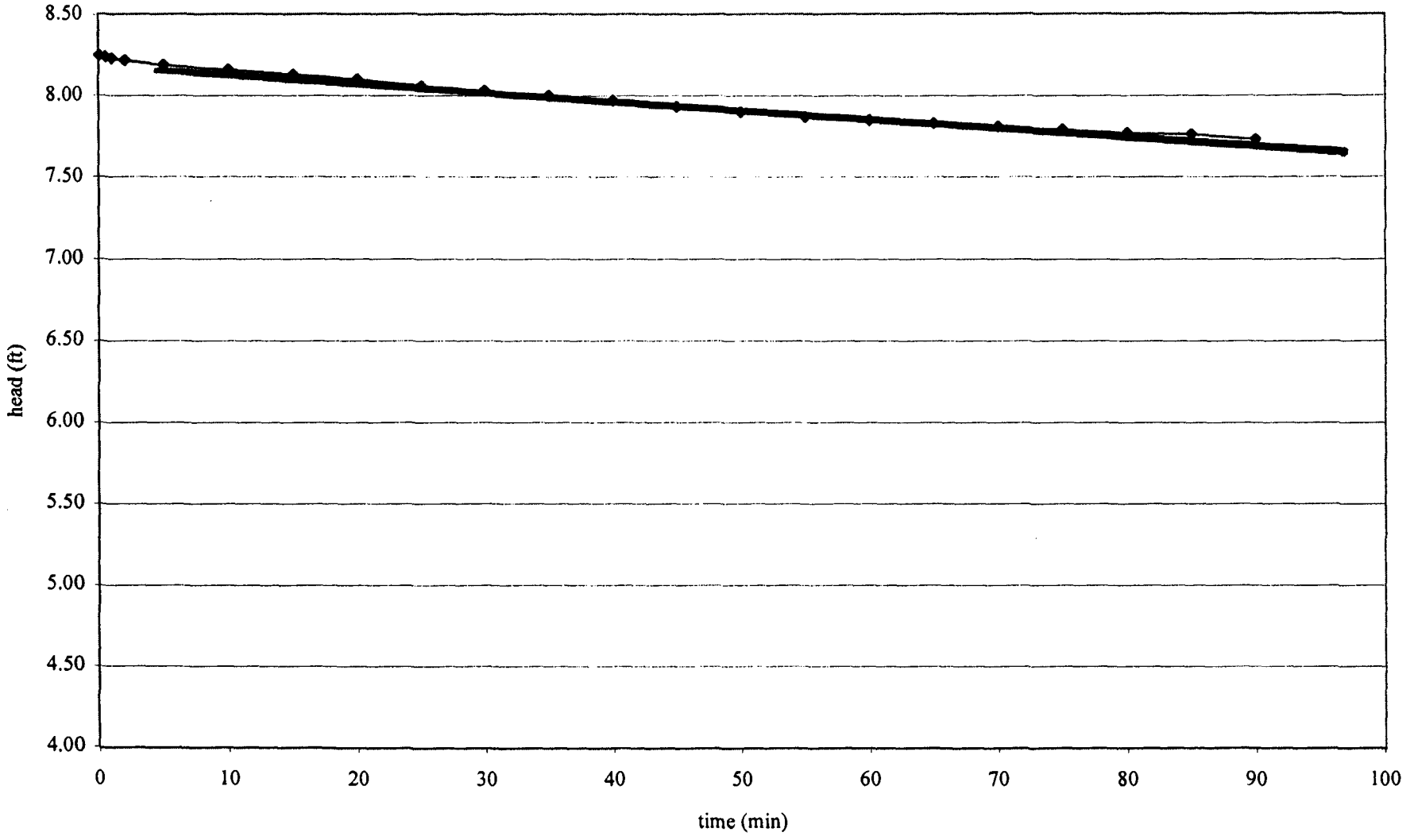


Figure C-10
FB-17 #2 (SW-SM)



Borehole Permeability Test

Nobis Engineering
PO Box 2890
Concord, New Hampshire 03302

PROJECT

Remedial Design for Operable Unit 01
New Bedford Harbor Superfund Site
New Bedford, Massachusetts

Test Location	FB - 12
Sheet	1 of 3
File No.	48138.07
Checked By	J. Trottier

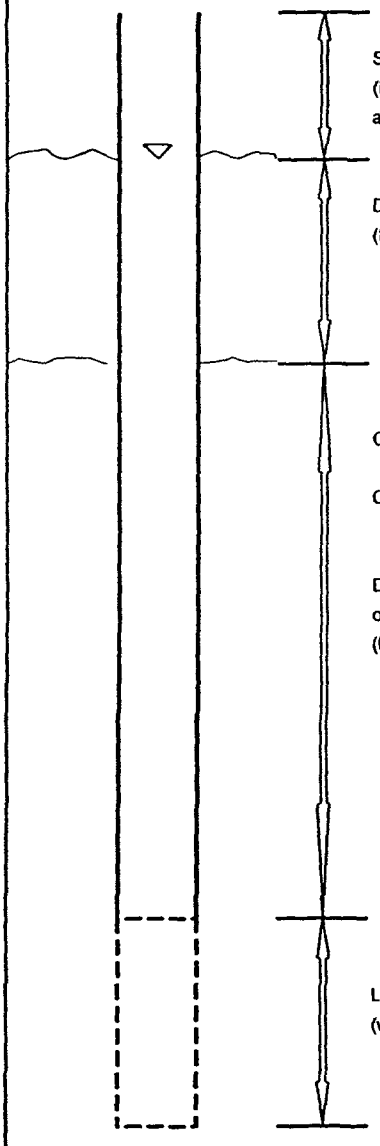
Boring Co. Atlantic Testing Laboratories, Limited
Driller P. Davis
Logged by: E. Paddleford

Test Information

Test Number: 1
Sample Number: N/A
Boring Location: CDF B Offshore
Date of test: 8/24/99

Time

Beginning test preperation: 17:15
Test completion: 17:40
Total time (min.): 25



Stickout: 10.1 ft.
(Height of casing above water surface)

Depth to mudline: 4.8 ft.
(from water surface)

Casing I.D. 4.0 in.

Casing O.D. 4.5 in.

Depth to bottom of casing 7.0 ft.
(from mudline)

Length of intake 1.0 ft.
(wick)

Time(min.) Actual	Time(min.) Elapsed	Depth (ft.) to water level	Time (min.) Actual	Time (min.) Elapsed	Depth (ft.) to water level
17:15:30	0.5	0.06			
17:16	1	0.07			
17:17	2	0.09			
17:20	5	0.10			
17:25	10	0.18			
17;30	15	0.28			
17:35	20	0.39			
17:40	25				

Remarks:
1) Wick backfill is silica sand #0.
2) Depth to water level is from top of stickout.
3) Test terminated after 25 minutes due to loss of casing seal.
4)

Borehole Permeability Test

Nobis Engineering
PO Box 2890
Concord, New Hampshire 03302

PROJECT

Remedial Design for Operable Unit 01
New Bedford Harbor Superfund Site
New Bedford, Massachusetts

Test Location	FB - 12
Sheet	2 of 3
File No.	48138.07
Checked By	J. Trottier

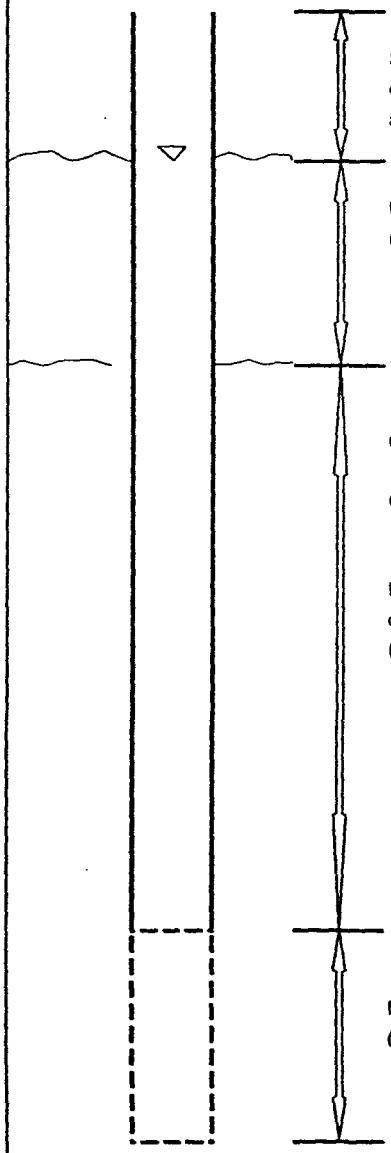
Boring Co.	Atlantic Testing Laboratories, Limited
Driller	P. Davis
Logged by:	E. Paddleford

Test Information

Test Number:	2
Sample Number:	S-1
Boring Location:	CDF B Offshore
Date of test:	8/25/99

Time

Beginning test preperation:	7:35
Test completion:	9:05
Total time (min.):	90



Stickout: 8.0 ft.
(Height of casing above water surface)

Depth to mudline: 5.7 ft.
(from water surface)

Casing I.D. 4.0 in.

Casing O.D. 4.5 in.

Depth to bottom of casing: 8.0 ft.
(from mudline)

Length of intake: 1.0 ft.
(wick)

Falling Head Test | **Rising Head Test**

Time(min.) Actual	Time(min.) Elapsed	Depth (ft.) to water level	Time (min.) Actual	Time (min.) Elapsed	Depth (ft.) to water level
7:35:30	0.5	0.00			
7:36	1	0.01			
7:37	2	0.015			
7:40	5	0.02			
7:45	10	0.023			
7:50	15	0.025			
7:55	20	0.035			
8:00	25	0.050			
8:05	30	0.057			
8:10	35	0.065			
8:15	40	0.070			
8:20	45	0.080			
8:25	50	0.090			
8:30	55	0.100			
8:35	60	0.110			
8:40	65	0.120			
8:45	70	0.127			
8:50	75	0.149			
8:55	80	0.165			
9:00	85	0.190			
9:05	90	0.200			

Remarks:
1) Wick backfill is silica sand #0.
2) Depth to water level is from top of stickout.
3)
4)

Borehole Permeability Test

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PROJECT

Remedial Design for Operable Unit 01
New Bedford Harbor Superfund Site
New Bedford, Massachusetts

Test Location	FB - 12
Sheet	3 of 3
File No.	48138.07
Checked By	J. Trottier

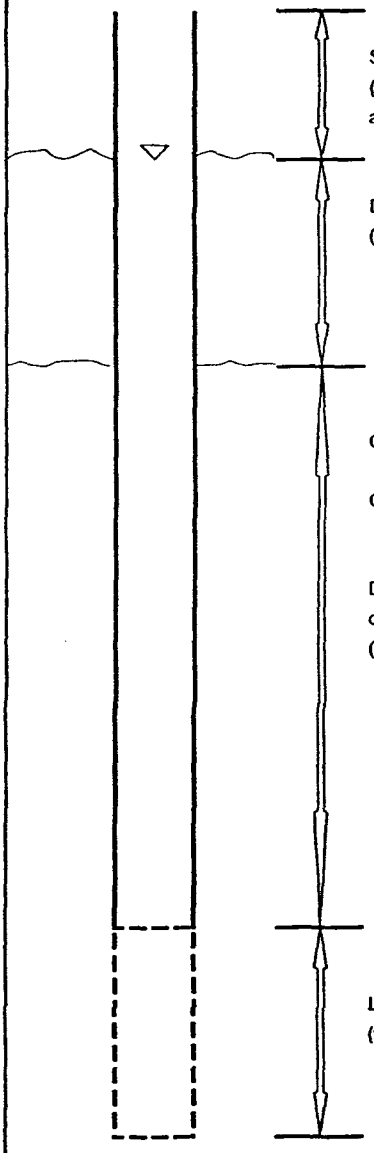
Boring Co. Atlantic Testing Laboratories, Limited
Driller P. Davis
Logged by: E. Paddleford

Test Information

Test Number: 3
Sample Number: S-2
Boring Location: CDF B Offshore
Date of test: 8/25/99

Time

Beginning test preperation: 10:20
Test completion: 11:50
Total time (min.): 90



Stickout: 9.3 ft.
(Height of casing above water surface)

Depth to mudline: 5.6 ft.
(from water surface)

Casing I.D. 4.0 in.

Casing O.D. 4.5 in.

Depth to bottom of casing 13.0 ft.
(from mudline)

Length of intake (wick) 0 ft.

Falling Head Test

Time(min.) Actual	Time(min.) Elapsed	Depth (ft.) to water level
10:20:30	0.5	0.00
10:21	1	0.00
10:22	2	0.00
10:25	5	0.00
10:30	10	0.015
10:35	15	0.018
10:40	20	0.020
10:45	25	0.025
10:50	30	0.030
10:55	35	0.034
11:00	40	0.038
11:05	45	0.041
11:10	50	0.048
11:15	55	0.052
11:20	60	0.055
11:25	65	0.060
11:30	70	0.063
11:35	75	0.070
11:40	80	0.073
11:45	85	0.079
11:50	90	0.084

Rising Head Test

Time (min.) Actual	Time (min.) Elapsed	Depth (ft.) to water level

Remarks:
1) Test performed with a flush bottom; no wick used.
2) Depth to water level is from top of stickout.
3)
4)

Borehole Permeability Test

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PO Box 1890
Concord, New Hampshire 03302

PROJECT

Remedial Design for Operable Unit 01
New Bedford Harbor Superfund Site
New Bedford, Massachusetts

Test Location	FB - 14
Sheet	1 of 2
File No.	48138.07
Checked By	J. Trottier

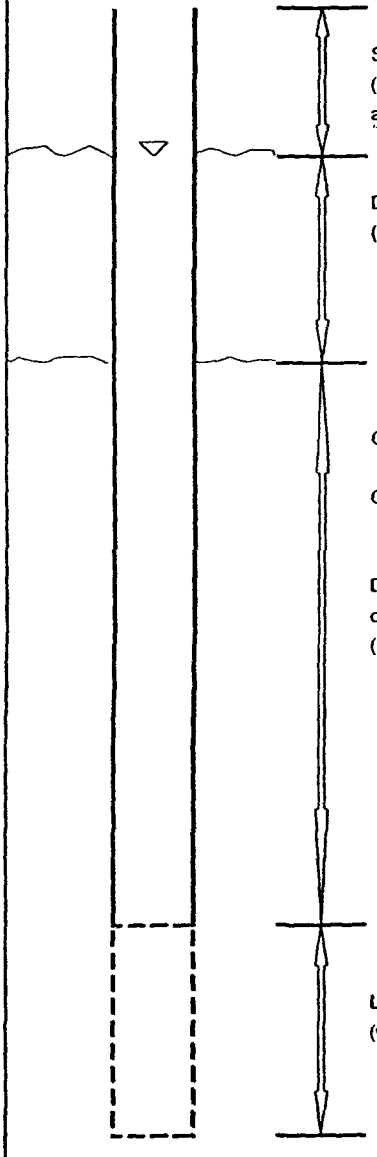
Boring Co. Atlantic Testing Laboratories, Limited
Driller P. Davis
Logged by: E. Paddleford

Test Information

Test Number: 1
Sample Number: S-1
Boring Location: CDF B Offshore
Date of test: 8/24/99

Time

Beginning test preperation: 8:15
Test completion: 9:45
Total time (min.): 90



Stickout: 8.2 ft.
(Height of casing above water surface)

Depth to mudline: 5.7 ft.
(from water surface)

Casing I.D. 4.0 in.

Casing O.D. 4.5 in.

Depth to bottom of casing: 7.0 ft.
(from mudline)

Length of intake: 0 ft.
(wick)

Falling Head Test

Time(min.) Actual	Time(min.) Elapsed	Depth (ft.) to water level
8:15:30	0.5	0.00
8:16	1	0.00
8:17	2	0.00
8:20	5	0.00
8:25	10	0.00
8:30	15	0.015
8:35	20	0.017
8:40	25	0.17
8:45	30	0.27
8:50	35	0.49
8:55	40	0.73
9:00	45	1.13
9:05	50	1.33
9:10	55	1.49
9:15	60	1.77
9:20	65	1.89
9:25	70	2.1
9:30	75	2.28
9:35	80	2.4
9:40	85	2.5
9:45	90	2.61

Rising Head Test

Time (min.) Actual	Time (min.) Elapsed	Depth (ft.) to water level

Remarks:
1) Test performed with a flush bottom; no wick used.
2) Depth to water level is from top of stickout.
3)
4)

Borehole Permeability Test

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Concord, New Hampshire 03302

PROJECT

Remedial Design for Operable Unit 01
New Bedford Harbor Superfund Site
New Bedford, Massachusetts

Test Location	FB - 14
Sheet	2 of 2
File No.	48138.07
Checked By	J. Trottier

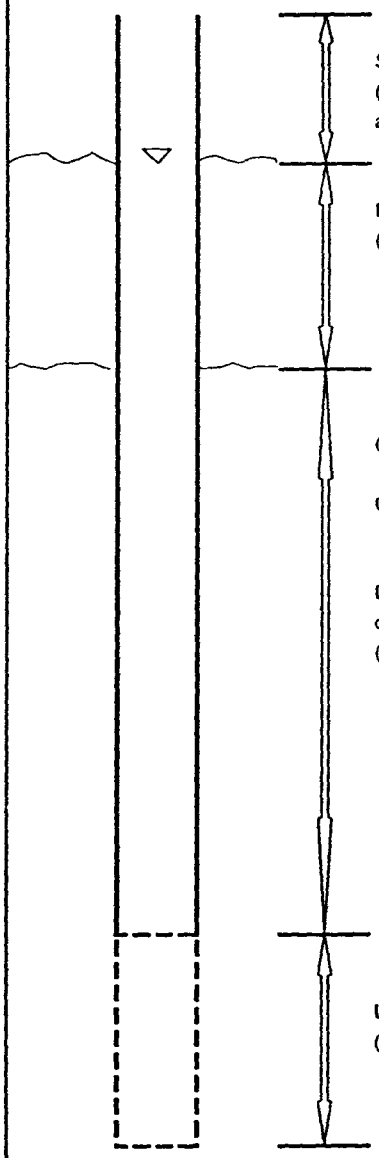
Boring Co. Atlantic Testing Laboratories, Limited
Driller P. Davis
Logged by: E. Paddleford

Test Information

Test Number: 2
Sample Number: S-4
Boring Location: CDF B Offshore
Date of test: 8/24/99

Time

Beginning test preperation: 11:08
Test completion: 12:38
Total time: 90



Stickout: 10.1 ft.
(Height of casing above water surface)

Depth to mudline: 3.7 ft.
(from water surface)

Casing I.D. 4.0 in.

Casing O.D. 4.5 in.

Depth to bottom of casing 13.3 ft.
(from mudline)

Length of intake (wick) 0 ft.

Falling Head Test

Time(min.) Actual	Time(min.) Elapsed	Depth (ft.) to water level
11:08:30	0.5	0.48
11:09	1	0.58
11:10	2	0.64
11:13	5	0.85
11:18	10	0.98
11:23	15	1.17
11:28	20	1.28
11:33	25	1.43
11:38	30	1.57
11:43	35	1.73
11:48	40	1.81
11:53	45	1.91
11:58	50	1.98
12:03	55	2.08
12:08	60	2.14
12:13	65	2.21
12:18	70	2.26
12:23	75	2.32
12:28	80	2.36
12:33	85	2.41
12:38	90	2.49

Rising Head Test

Time (min.) Actual	Time (min.) Elapsed	Depth (ft.) to water level

Remarks:
1) Test performed with a flush bottom; no wick used.
2) Depth to water level is from top of stickout.
3)
4)

Borehole Permeability Test

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Concord, New Hampshire 03302

PROJECT

Remedial Design for Operable Unit 01
New Bedford Harbor Superfund Site
New Bedford, Massachusetts

Test Location	FB - 16
Sheet	1 of 2
File No.	48138.07
Checked By	J. Trottier

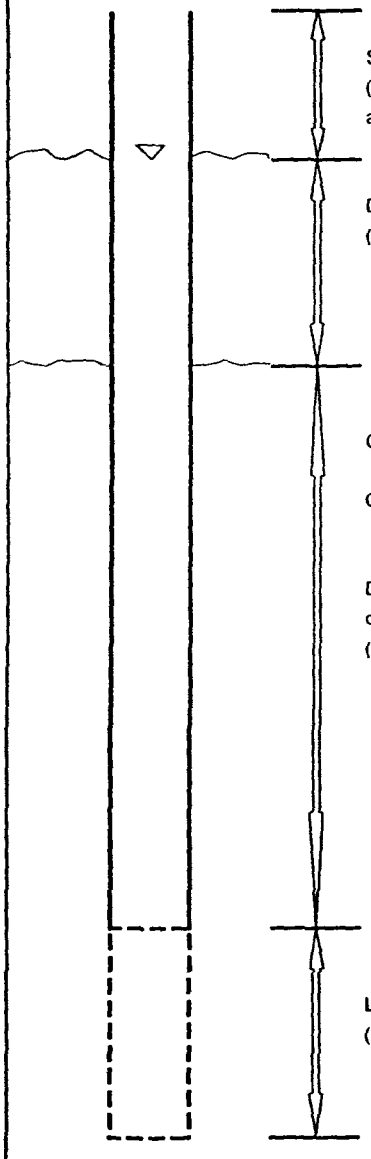
Boring Co. Atlantic Testing Laboratories, Limited
Driller P. Davis
Logged by: E. Paddleford

Test Information

Test Number: 1
Sample Number: S-1
Boring Location: CDF B Offshore
Date of test: 8/19/99

Time

Beginning test preperation: 12:50
Test completion: 14:20
Total time (min.): 90



Stickout: 9.0 ft.
(Height of casing above water surface)

Depth to mudline: 4.0 ft.
(from water surface)

Casing I.D. 4.0 in.

Casing O.D. 4.5 in.

Depth to bottom of casing 3.0 ft.
(from mudline)

Length of intake 0.0 ft.
(wick)

Time(min.) Actual	Time(min.) Elapsed	Depth (ft.) to water level	Time (min.) Actual	Time (min.) Elapsed	Depth (ft.) to water level
12:50:00	0	0.00			
12:51	1	0.00			
12:52	2	0.00			
12:55	5	0.01			
13:00	10	0.02			
13:05	15	0.025			
13:10	20	0.028			
13:15	25	0.03			
13:20	30	0.032			
13:25	35	0.038			
13:30	40	0.042			
13:35	45	0.048			
13:40	50	0.05			
13:45	55	0.05			
13:50	60	0.051			
13:55	65	0.056			
14:00	70	0.06			
14:05	75	0.067			
14:10	80	0.075			
14:15	85	0.086			
14:20	90	0.099			

Remarks:
1) Test performed with a flush bottom; no wick used.
2) Depth to water surface is from top of stickout.
3)
4)

Borehole Permeability Test

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Concord, New Hampshire 03302

PROJECT

Remedial Design for Operable Unit 01
New Bedford Harbor Superfund Site
New Bedford, Massachusetts

Test Location	FB - 16
Sheet	2 of 2
File No.	48138.07
Checked By	J. Trottier

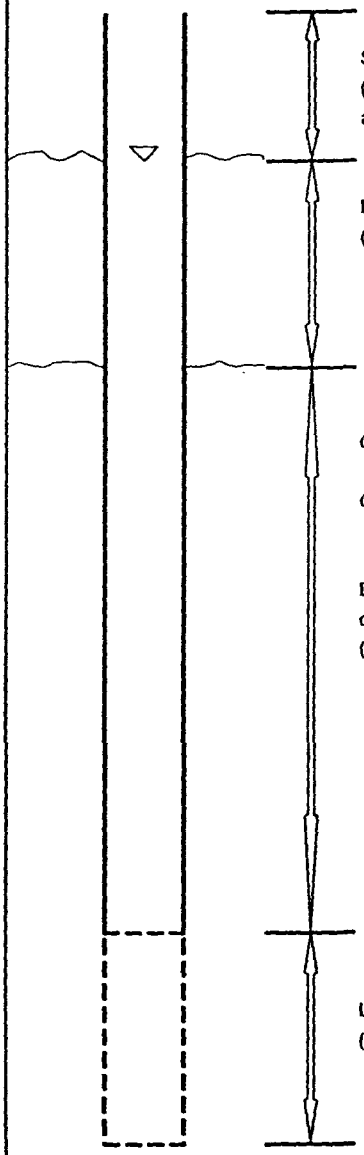
Boring Co: Atlantic Testing Laboratories, Limited
Driller: P. Davis
Logged by: E. Paddleford

Test Information

Test Number: 2
Sample Number: S-7
Boring Location: CDF B Offshore
Date of test: 8/23/99

Time

Beginning test preperation: 11:00
Test completion: 12:30
Total time (min.): 90



Stickout: 8.8 ft. (Height of casing above water surface)

Depth to mudline: 2.5 ft. (from water surface)

Casing I.D. 4.0 in.

Casing O.D. 4.5 in.

Depth to bottom of casing: 15.0 ft. (from mudline)

Length of intake: 0.0 ft. (wick)

Test Data

Time(min.) Actual	Time(min.) Elapsed	Depth (ft.) to water level	Time (min.) Actual	Time (min.) Elapsed	Depth (ft.) to water level
11:00:00	0	0.09			
11:00:30	0.5	0.10			
11:01	1	0.15			
11:02	2	0.21			
11:05	5	0.25			
11:10	10	0.38			
11:15	15	0.46			
11:20	20	0.53			
11:25	25	0.58			
11:30	30	0.60			
11:35	35	0.62			
11:40	40	0.63			
11:45	45	0.63			
11:50	50	0.63			
11:55	55	0.63			
12:00	60	0.64			
12:05	65	0.64			
12:10	70	0.65			
12:15	75	0.66			
12:20	80	0.69			
12:25	85	0.73			
12:30	90	0.74			

Remarks:
1) Test performed with a flush bottom; no wick used.
2) Depth to water surface is from top of stickout.
3)
4)

Borehole Permeability Test

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PROJECT

Remedial Design for Operable Unit 01
New Bedford Harbor Superfund Site
New Bedford, Massachusetts

Test Location	FB - 17
Sheet	1 of 2
File No.	48138.07
Checked By	J. Trottier

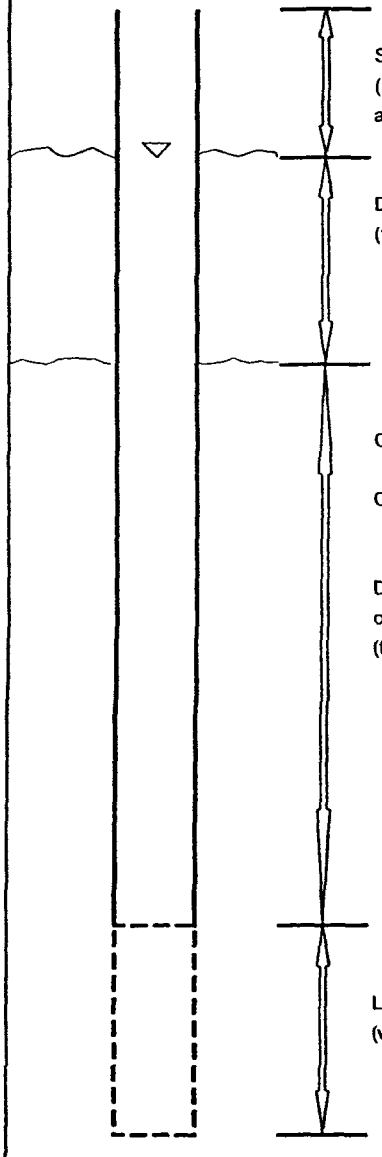
Boring Co. Atlantic Testing Laboratories, Limited
Driller P. Davis
Logged by: E. Paddleford

Test Information

Test Number: 1
Sample Number: S-2
Boring Location: CDF B Offshore
Date of test: 10/6/99

Time

Beginning test preperation: 11:58
Test completion: 13:28
Total time (min.): 90



Stickout: 7.8 ft.
(Height of casing above water surface)

Depth to mudline: 1.9 ft.
(from water surface)

Casing I.D. 4.0 in.

Casing O.D. 4.5 in.

Depth to bottom of casing 7.3 ft.
(from mudline)

Length of intake 0.0 ft.
(wick)

Time(min.) Actual	Time(min.) Elapsed	Depth (ft.) to water level	Time (min.) Actual	Time (min.) Elapsed	Depth (ft.) to water level
11:58:30	0.5	0.15			
11:59	1	0.32			
12:00	2	0.50			
12:03	5	0.92			
12:08	10	2.36			
12:13	15	3.32			
12:18	20	4.02			
12:23	25	4.36			
12:28	30	4.56			
12:33	35	4.64			
12:38	40	4.70			
12:43	45	4.73			
12:48	50	4.77			
12:53	55	4.80			
12:58	60	4.83			
13:03	65	4.85			
13:08	70	4.86			
12:13	75	4.87			
13:18	80	4.88			
13:23	85	4.90			
13:28	90	4.93			

Remarks:
1) Test performed with a flush bottom; no wick used.
2) Depth to water level is from top of stickout.
3)
4)

Borehole Permeability Test

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PROJECT

Remedial Design for Operable Unit 01
New Bedford Harbor Superfund Site
New Bedford, Massachusetts

Test Location	FB - 17
Sheet	2 of 2
File No.	48138.07
Checked By	J. Trottier

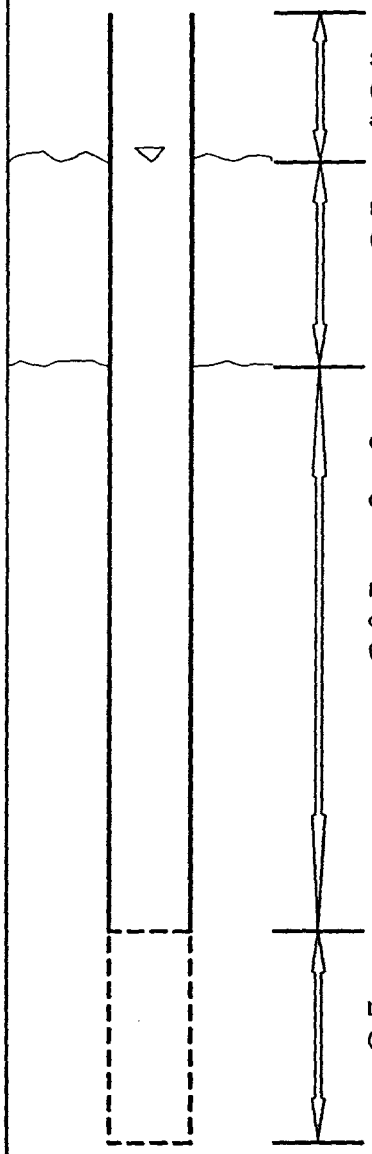
Boring Co. Atlantic Testing Laboratories, Limited
Driller P. Davis
Logged by: E. Paddleford

Test Information

Test Number: 2
Sample Number: S-5
Boring Location: CDF B Offshore
Date of test: 10/6/99

Time

Beginning test preperation: 15:45
Test completion: 17:15
Total time (min.): 90



Stickout: 8.3 ft.
(Height of casing above water surface)

Depth to mudline: 3.5 ft.
(from water surface)

Casing I.D. 4.0 in.

Casing O.D. 4.5 in.

Depth to bottom of casing: 20.7 ft.
(from mudline)

Length of intake: 0.0 ft.
(wick)

Falling Head Test | **Constant Head Test**

Time(min.) Actual	Time(min.) Elapsed	Depth (ft.) to water level	Time (min.) Actual	Time (min.) Elapsed	Depth (ft.) to water level
15:45	0	0.05			
15:45:30	0.5	0.06			
15:46	1	0.07			
15:47	2	0.08			
15:50	5	0.11			
15:55	10	0.14			
16:00	15	0.17			
16:05	20	0.20			
16:10	25	0.24			
16:15	30	0.27			
16:20	35	0.30			
16:25	40	0.33			
16:30	45	0.37			
16:35	50	0.40			
16:40	55	0.43			
16:45	60	0.45			
16:50	65	0.47			
16:55	70	0.49			
17:00	75	0.51			
17:05	80	0.53			
17:10	85	0.54			
17:15	90	0.57			

Remarks:
1) Test performed with a flush bottom; no wick used.
2) Depth to water level is from top of stickout.
3)
4)

D

APPENDIX D

Field Vane Shear Testing

D.1 Test Description

The field vane shear test (FVST) is commonly used to estimate the in situ undrained shear strength of soft, saturated, cohesive soils. The vane shear apparatus consists of a four-bladed vane fastened to the bottom of a vertical rod. The vane and the rod are pushed into the soil to the desired test depth, and then the assembly is rotated by applying torque to the rod until the cylinder of soil defined by the vane perimeter shears. If the dimensions of the vane are known, and the torque required to shear the soil is measured, then the shearing resistance of the cylindrical surface can be calculated. From this, the undrained shear strength at the test interval can be estimated. If the vane is rotated rapidly through several revolutions, the soil becomes remoulded and a remoulded shear strength can be determined.

Factors influencing undrained shear strengths calculated from FVSTs include the method of installation or amount of disturbance, vane geometry and dimensions, rate of advancement of the vane, mode of failure, and inhomogeneities of soil layers (such as sand seams, stones, or shells). The data obtained from the FVST is typically corrected to account for friction between the soil and the vane rod. The data is also corrected by applying a reduction factor proposed by Bjerrum (1972) as a function of plasticity.

D.2 Test Procedures

FVSTs were performed generally in accordance with ASTM D 2573 at 2-foot intervals throughout the entire thickness of the organic clay layer. The rectangular stainless steel vane, provided by the USACE, was 4 inches in diameter and 8 inches in height. The vane was welded onto a ½-inch diameter vane rod which was then attached to standard (AW sized) drill rod for applying torque to the vane. Torque was applied directly by hand with a torque wrench.

The procedure for conducting the FVST using a torque wrench was as follows:

i. The vane was advanced in a single thrust to the depth at which the test was to be conducted. Care was taken to avoid applying torsion to the rods.
ii. With the vane in position at a fixed elevation, torque was applied to the rods with the torque wrench.
iii. The maximum torque required to shear the clay was recorded.
iv. Following the determination of the maximum torque, the vane was rotated rapidly through a minimum of 10 revolutions, and the determination of the remoulded strength was started within 1 minute after completion of rapid rotation.
v. The friction between the soil and the torque rods was determined by means of a series of torque tests conducted on similar rods at similar depths with no vane attached.

D.3 Calculation Method

$$T = s \cdot K$$

$$K = \pi \cdot D^2 \cdot \frac{H}{2}\left[1 + \frac{D}{3H}\right]$$

$$H = 2D$$

$$K = 1.167\pi D^3$$

$$s = \frac{T}{1.167\pi D^3} \cdot \mu$$

T = torque (ft-lbf)
s = shear strength of clay (lbf/ft^2)
K = shape constant (ft^3)
D = diameter of vane (ft)
H = height of vane (ft)
μ = correction factor based on plasticity index (Bjerrum, 1972)

D.4 Test Results

The procedure for conducting the FVST using a torque wrench was generally in conformance with ASTM D 2573 except that the rate of application of torque to the rods was in excess of 0.1 degree per second. This resulted in a relatively quick time to failure. In addition, maximum torque value could only be recorded in 5 inch-pound increments which affects the accuracy of the test.

The results of the FVSTs are summarized in Table D-1, and are shown graphically on Figure D-1. A reduction factor of 0.87 was also applied to the both the undisturbed and remoulded shear strength values based on the organic clay having an average plasticity index of 37. The overall trend in the FVST data did indicate an increase in strength with increasing depth.

D.5 References

Bowles, Joseph E. *Physical and Geotechnical Properties of Soils*, McGraw-Hill Book Company, New York, 1979.

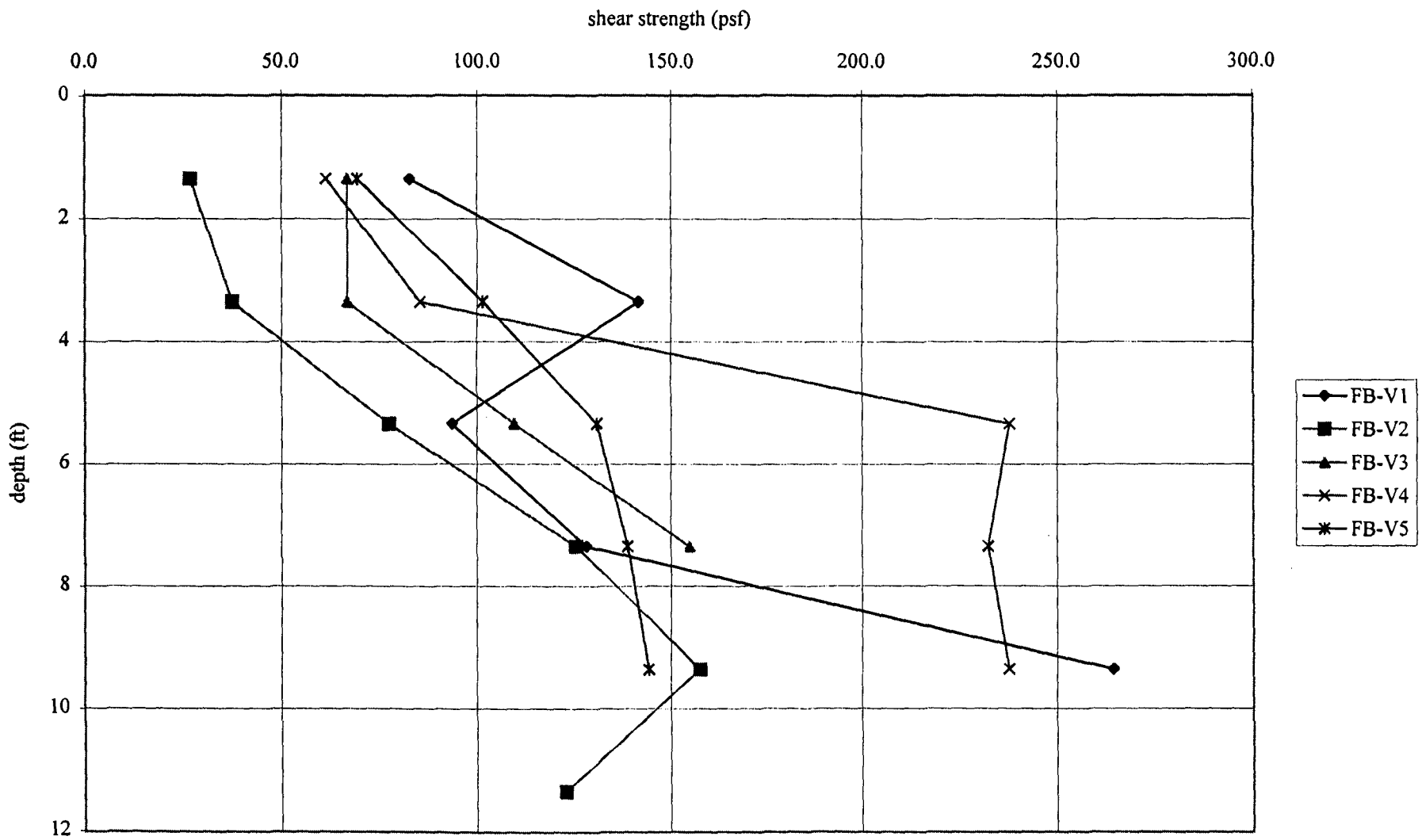
Peck, Ralph B., Walter E. Hanson, and Thomas H. Thornburn. *Foundation Engineering*, John Wiley & Sons, New York, 1974.

Table D-1
Field Vane Shear Test Results

Boring Location	Depth (ft)	Undisturbed Shear Strength				Residual Shear Strength			
		Maximum Applied Torque (ft-lb)	Measured Rod Friction (ft-lb)	Corrrected Max Applied Torque (ft-lb)	Peak Shear Strength (psf)*	Maximum Applied Torque (ft-lb)	Measured Rod Friction (ft-lb)	Corrrected Max Applied Torque (ft-lb)	Peak Residual Shear Strength (psf)*
FB-V1	1 to 1.7	13.8	0.8	12.9	82.8	1.7	0.0	1.7	10.7
	3 to 3.7	25.0	2.9	22.1	141.6	2.5	1.7	0.8	5.3
	5 to 5.7	19.2	4.6	14.6	93.5	2.1	2.1	0.0	0.0
	7 to 7.7	25.8	5.8	20.0	128.2	4.2	3.3	0.8	5.3
	9 to 9.7	48.3	7.1	41.3	264.4	8.3	4.6	3.8	24.0
	11 to 11.7	>50	6.7	>43	>278	N/A	4.2	N/A	N/A
FB-V2	1 to 1.7	5.0	0.8	4.2	26.7	1.7	0.0	1.7	10.7
	3 to 3.7	7.5	1.7	5.8	37.4	3.3	1.3	2.1	13.4
	5 to 5.7	14.6	2.5	12.1	77.5	2.5	2.5	0.0	0.0
	7 to 7.7	23.3	3.8	19.6	125.5	4.6	3.8	0.8	5.3
	9 to 9.7	29.6	5.0	24.6	157.6	5.8	4.2	1.7	10.7
	11 to 11.7	24.6	5.4	19.2	122.9	N/A	4.6	N/A	N/A
FB-V3	1 to 1.7	11.3	0.8	10.4	66.8	1.3	0.0	1.3	8.0
	3 to 3.7	12.5	2.1	10.4	66.8	2.1	0.8	1.3	8.0
	5 to 5.7	19.6	2.5	17.1	109.5	3.3	1.7	1.7	10.7
	7 to 7.7	28.8	4.6	24.2	154.9	5.0	3.3	1.7	10.7
FB-V4	1 to 1.7	10.4	0.8	9.6	61.4	2.1	0.2	1.9	12.3
	3 to 3.7	15.8	2.5	13.3	85.5	2.5	1.7	0.8	5.3
	5 to 5.7	42.5	5.4	37.1	237.7	3.3	3.3	0.0	0.0
	7 to 7.7	42.9	6.7	36.3	232.4	4.2	4.2	0.0	0.0
	9 to 9.7	47.1	10.0	37.1	237.7	5.0	7.5	0.0	0.0
	11 to 11.7	>50	15.8	>34	>219	N/A	10.0	N/A	N/A
FB-V5	1 to 1.7	13.3	2.5	10.8	69.4	1.7	0.8	0.8	5.3
	3 to 3.7	18.8	2.9	15.8	101.5	2.9	1.3	1.7	10.7
	5 to 5.7	25.4	5.0	20.4	130.9	3.8	2.9	0.8	5.3
	7 to 7.7	28.3	6.7	21.7	138.9	4.6	5.0	0.0	0.0
	9 to 9.7	32.5	10.0	22.5	144.2	6.7	7.5	0.0	0.0
	11 to 11.7	>50	10.8	>39	>251	N/A	7.5	N/A	N/A

* correction factor of 0.87 has been applied based on an average PI of 37 (Bjerrum, 1972)

Figure D-1
In Situ Undrained Shear Strength



Field Vane Shear Test Log (ASTM D2573)

Nobis Engineering
PO Box 2890
Concord, New Hampshire 03302

PROJECT

Remedial Design for Operable Unit 01
New Bedford Harbor Superfund Site
New Bedford, Massachusetts

Test Location	FB-V1
Sheet	1 of 1
File No.	48138.07
Checked By	J. Trottier

Boring Co.	Atlantic Testing Laboratories, Limited
Driller	P. Davis
Engineer	E. Thibodeau

Vane Type	Rectangular	Test Apparatus	Torque wrench method
Vane Dimensions	4 in. X 8 in.	Torque Wrench Manufacturer	Consolidated Devices, Inc.
Vane Manufacturer	U.S. Army Corps of Engineers	Method of Vane Advancement	Open Hole, No Casing

Northing	2704502.5	Easting	815188.4	Northing	2704512.8	Easting	815176.8
Mud Line El.	-4.7 feet	Datum	NGVD	Mud Line El.	N/A	Datum	NGVD
Date Start	11/3/99	Date End	11/3/99	Date Start	11/4/99	Date End	11/4/99

	Maximum Applied Torque (in.-lbs.)			Maximum Applied Torque (in.-lbs.)	
Test Interval (feet):	Undisturbed	Remoulded	Test Interval (feet):	Undisturbed	Remoulded
1.0 - 1.7	165	20	0 - 1.0	10	0
3.0 - 3.7	300	30	0 - 3.0	35	20
5.0 - 5.7	230	25	0 - 5.0	55	25
7.0 - 7.7	310	50	0 - 7.0	70	40
9.0 - 9.7	580	100	0 - 9.0	85	55
11.0 - 11.7	>600	NA [1]	0 - 11.0	80	50

Depth to Mudline from barge surface:		Depth to Mudline from barge surface:	
before test:	5.9 feet	before test:	4.4 feet
after test:	5.5 feet	after test:	4.5 feet
difference:	0.4 feet	difference:	0.1 feet

Remarks:
1) Did not shear with torque wrench or pipe wrench in fear of deforming field vane.
2)
3)
4)

Field Vane Shear Test Log (ASTM D2573)

Nobis Engineering
PO Box 2890
Concord, New Hampshire 03302

PROJECT

Remedial Design for Operable Unit 01
New Bedford Harbor Superfund Site
New Bedford, Massachusetts

Test Location	FB-V2
Sheet	1 of 1
File No.	48138.07
Checked By	J. Trottier

Boring Co.	Atlantic Testing Laboratories, Limited
Driller	P. Davis
Engineer	E. Thibodeau

Vane Type	Rectangular	Test Apparatus	Torque wrench method
Vane Dimensions	4 in. X 8 in.	Torque Wrench Manufacturer	Consolidated Devices, Inc.
Vane Manufacturer	U.S. Army Corps of Engineers	Method of Vane Advancement	Open Hole, No Casing

Northing	2704099.9	Easting	815185.5	Northing	2704099.9	Easting	815184.2
Mud Line El.	-6.4 feet	Datum	NGVD	Mud Line El.	-6.0 feet	Datum	NGVD
Date Start	11/3/99	Date End	11/3/99	Date Start	11/9/99	Date End	11/9/99

	Maximum Applied Torque (in.-lbs.)			Maximum Applied Torque (in.-lbs.)	
Test Interval (feet):	Undisturbed	Remoulded	Test Interval (feet):	Undisturbed	Remoulded
1.0 - 1.7	60	15	0 - 1.0	10	5
3.0 - 3.7	90	20	0 - 3.0	20	10
5.0 - 5.7	175	35	0 - 5.0	30	20
7.0 - 7.7	280	55	0 - 7.0	45	30
9.0 - 9.7	355	65	0 - 9.0	60	40
11.0 - 11.7	295	70	0 - 11.0	65	50

Depth to Mudline from barge surface:		**Depth to Mudline from barge surface:**	
before test:	8.3 feet	before test:	7.4 feet
after test:	8.5 feet	after test:	7.4 feet
difference:	0.2 feet	difference:	0 feet

Remarks:
1)
2)
3)
4)

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Field Vane Shear Test Log (ASTM D2573)

Nobis Engineering
PO Box 2890
Concord, New Hampshire 03302

PROJECT

Remedial Design for Operable Unit 01
New Bedford Harbor Superfund Site
New Bedford, Massachusetts

Test Location	FB-V3
Sheet	1 of 1
File No.	48138.07
Checked By	J. Trottier

Boring Co.	Atlantic Testing Laboratories, Limited
Driller	P. Davis
Engineer	E. Thibodeau

Vane Type	Rectangular	Test Apparatus	Torque wrench method
Vane Dimensions	4 in. X 8 in.	Torque Wrench Manufacturer	Consolidated Devices, Inc.
Vane Manufacturer	U.S. Army Corps of Engineers	Method of Vane Advancement	Open Hole, No Casing

Northing	2704971.8	Easting	815019.2	Northing	2704981.8	Easting	815014.8
Mud Line El.	-2.2 feet	Datum	NGVD	Mud Line El.	-3.5 feet	Datum	NGVD
Date Start	11/3/99	Date End	11/3/99	Date Start	11/9/99	Date End	11/9/99

	Maximum Applied Torque (in.-lbs.)			Maximum Applied Torque (in.-lbs.)	
Test Interval (feet):	Undisturbed	Remoulded	Test Interval (feet):	Undisturbed	Remoulded
1.0 - 1.7	135	15	0 - 1.0	10	0
3.0 - 3.7	150	25	0 - 3.0	25	10
5.0 - 5.7	235	40	0 - 5.0	30	20
7.0 - 7.7	345	65	0 - 7.0	55	40

Depth to Mudline from barge surface:		**Depth to Mudline from barge surface:**	
before test:	5.3 feet	before test:	4 feet
after test:	5.1 feet	after test:	4 feet
difference:	0.2 feet	difference:	0 feet

Remarks:
1)
2)
3)
4)

Field Vane Shear Test Log (ASTM D2573)

Nobis Engineering
PO Box 2890
Concord, New Hampshire 03302

PROJECT

Remedial Design for Operable Unit 01
New Bedford Harbor Superfund Site
New Bedford, Massachusetts

Test Location	FB-V4
Sheet	1 of 1
File No.	48138.07
Checked By	J. Trottier

Boring Co.	Atlantic Testing Laboratories, Limited
Driller	P. Davis
Engineer	E. Thibodeau

Vane Type	Rectangular	Test Apparatus	Torque wrench method
Vane Dimensions	4 in. X 8 in.	Torque Wrench Manufacturer	Consolidated Devices, Inc.
Vane Manufacturer	U.S. Army Corps of Engineers	Method of Vane Advancement	Open Hole, No Casing

Northing	2703511.0	Easting	815052.5	Northing	N/A	Easting	N/A
Mud Line El.	-3.3 feet	Datum	NGVD	Mud Line El.	N/A	Datum	N/A
Date Start	11/3/99	Date End	11/3/99	Date Start	11/3/99	Date End	11/3/99

	Maximum Applied Torque (in.-lbs.)			Maximum Applied Torque (in.-lbs.)	
Test Interval (feet):	Undisturbed	Remoulded	Test Interval (feet):	Undisturbed	Remoulded
1.0 - 1.7	125	25	0 - 1.0	10	2
3.0 - 3.7	190	30	0 - 3.0	30	20
5.0 - 5.7	510	40	0 - 5.0	65	40
7.0 - 7.7	515	50	0 - 7.0	80	50
9.0 - 9.7	565	60	0 - 9.0	120	90
11.0 - 11.7	>600	NA [2]	0 - 11.0	190	120

Depth to Mudline from barge surface:		Depth to Mudline from barge surface:	
before test:	6.4 feet	before test:	7.2 feet
after test:	7.1 feet	after test:	7 feet
difference:	0.7 feet	difference:	0.2 feet

Remarks:
1) Rod friction test performed within 10 feet of field vane shear test location.
2) Did not shear with torque wrench or pipe wrench in fear of deforming field vane.
3)
4)

Field Vane Shear Test Log (ASTM D2573)

Nobis Engineering
PO Box 2890
Concord, New Hampshire 03302

PROJECT

Remedial Design for Operable Unit 01
New Bedford Harbor Superfund Site
New Bedford, Massachusetts

Test Location	FB-V5
Sheet	1 of 1
File No.	48138.07
Checked By	J. Trottier

Boring Co.	Atlantic Testing Laboratories, Limited
Driller	P. Davis
Engineer	E. Thibodeau

Vane Information

Vane Type	Rectangular
Vane Dimensions	4 in. X 8 in.
Vane Manufacturer	U.S. Army Corps of Engineers

Test Parameter

Test Apparatus	Torque wrench method
Torque Wrench Manufacturer	Consolidated Devices, Inc.
Method of Vane Advancement	Open Hole, No Casing

Test Location Information (Field Vane)

Northing	2703356.1	Easting	815146.4
Mud Line El.	-3.4 feet	Datum	NGVD
Date Start	11/4/99	Date End	11/4/99

Test Location Information (Rod Friction 1)

Northing	N/A	Easting	N/A
Mud Line El.	N/A	Datum	N/A
Date Start	11/4/99	Date End	11/4/99

Field Vane

	Maximum Applied Torque (in.-lbs.)	
Test Interval (feet):	Undisturbed	Remoulded
1.0 - 1.7	160	20
3.0 - 3.7	225	35
5.0 - 5.7	305	45
7.0 - 7.7	340	55
9.0 - 9.7	390	80
11.0 - 11.7	>600	NA [2]

Rod Friction

	Maximum Applied Torque (in.-lbs.)	
Test Interval (feet):	Undisturbed	Remoulded
0 - 1.0	30	10
0 - 3.0	35	15
0 - 5.0	60	35
0 - 7.0	80	60
0 - 9.0	120	90
0 - 11.0	130	90

Post Vane Shear Test

Depth to Mudline from barge surface:

before test:	4.8 feet
after test:	4.3 feet
difference:	0.5 feet

Post Rod Friction Test

Depth to Mudline from barge surface:

before test:	3.3 feet
after test:	3.1 feet
difference:	0.2 feet

Remarks:
1) Rod friction test performed within 10 feet of field vane shear test location.
2) Did not shear with torque wrench or pipe wrench in fear of deforming field vane.
3)
4)

E

APPENDIX E

Groundwater Monitoring Reports

FOSTER WHEELER				Groundwater Monitoring Report	
Project:	New Bedford Harbor Superfund Site				
Well Number:	OW-B1	**Northing:**	2703308.7	**Ground Surface Elevation:**	7.92 ft
Page Number:	1 of 1	**Easting:**	814998.1	**Elevation of Top of PVC:**	7.56 ft

Date	Time	Water Level (ft)	Groundwater Elevation (ft)	Remarks	Read By
1-Oct	13:56	5.44	2.12	tides: low@08:12, high@13:33	Sununu/Anderson
14-Oct	12:30	4.95	2.61	tides: high@11:44, low@16:49	Gray
28-Oct	9:00	5.61	1.95	tides: high@11:16, low@17:01	Gray
11-Nov	12:15	5.79	1.77	tides: high@09:30, low@14:47	Sununu/Gray
1-Dec	11:10	6.03	1.53	tides: low@09:24, high@14:49	Sununu/Gray

FOSTER WHEELER				Groundwater Monitoring Report	
Project:	New Bedford Harbor Superfund Site				
Well Number:	OW-B2	**Northing:**	2704974.8	**Ground Surface Elevation:**	2.49 ft
Page Number:	1 of 1	**Easting:**	814883.6	**Elevation of Top of PVC:**	4.92 ft

Date	Time	Water Level (ft)	Groundwater Elevation (ft)	Remarks	Read By
1-Oct	14:17	4.10	0.82	tides: low@08:12, high@13:33	Sununu/Anderson
14-Oct	14:04	5.90	-0.98	tides: high@11:44, low@16:49	Gray
28-Oct	15:20	3.10	1.82	tides: high@11:16, low@17:01	Gray
11-Nov	12:00	2.98	1.94	tides: high@09:30, low@14:47	Sununu/Gray
1-Dec	10:55	3.76	1.16	tides: low@09:24, high@14:49	Sununu/Gray

FOSTER WHEELER				Groundwater Monitoring Report	
Project:	New Bedford Harbor Superfund Site				
Well Number:	OW-B3	**Northing:**	2704653.4	**Ground Surface Elevation:**	5.54 ft
Page Number:	1 of 1	**Easting:**	814704.2	**Elevation of Top of PVC:**	5.08 ft

Date	Time	Water Level (ft)	Groundwater Elevation (ft)	Remarks	Read By
1-Oct	14:43	2.77	2.31	tides: low@08:12, high@13:33	Sununu/Anderson
14-Oct	14:21	2.85	2.23	tides: high@11:44, low@16:49	Gray
28-Oct	10:04	2.60	2.48	tides: high@11:16, low@17:01	Gray
11-Nov	11:55	2.76	2.32	tides: high@09:30, low@14:47	Sununu/Gray
1-Dec	10:50	2.30	2.78	tides: low@09:24, high@14:49	Sununu/Gray

FOSTER WHEELER				Groundwater Monitoring Report	
Project:	New Bedford Harbor Superfund Site				
Well Number:	OW-B4	**Northing:**	2704352.2	**Ground Surface Elevation:**	2.83 ft
Page Number:	1 of 1	**Easting:**	814899.4	**Elevation of Top of PVC:**	5.71 ft
Date	**Time**	**Water Level (ft)**	**Groundwater Elevation (ft)**	**Remarks**	**Read By**
1-Oct	N/A	N/A	N/A	floating product, unable to get accurate depth measurement	Sununu/Anderson
14-Oct	N/A	N/A	N/A	floating product, unable to get accurate depth measurement	Gray
28-Oct	N/A	N/A	N/A	floating product, unable to get accurate depth measurement	Gray
11-Nov	N/A	N/A	N/A	floating product, unable to get accurate depth measurement	Sununu/Gray
1-Dec	N/A	N/A	N/A	floating product, unable to get accurate depth measurement	Sununu/Gray

FOSTER WHEELER				Groundwater Monitoring Report	
Project:	New Bedford Harbor Superfund Site				
Well Number:	OW-B5	**Northing:**	2704189.7	**Ground Surface Elevation:**	6.08 ft
Page Number:	1 of 1	**Easting:**	814719.5	**Elevation of Top of PVC:**	5.53 ft
Date	**Time**	**Water Level (ft)**	**Groundwater Elevation (ft)**	**Remarks**	**Read By**
1-Oct	15:03	2.93	2.60	tides: low@08:12, high@13:33	Sununu/Anderson
14-Oct	13:41	2.06	3.47	tides: high@11:44, low@16:49	Gray
28-Oct	9:52	2.33	3.20	tides: high@11:16, low@17:01	Gray
1-Dec	10:40	2.44	3.09	tides: low@09:24, high@14:49	Sununu/Gray

FOSTER WHEELER				Groundwater Monitoring Report	
Project:	New Bedford Harbor Superfund Site				
Well Number:	OW-B6	**Northing:**	2703791.2	**Ground Surface Elevation:**	5.80 ft
Page Number:	1 of 1	**Easting:**	814957.9	**Elevation of Top of PVC:**	5.28 ft
Date	**Time**	**Water Level (ft)**	**Groundwater Elevation (ft)**	**Remarks**	**Read By**
1-Oct	13:49	2.34	2.94	tides: low@08:12, high@13:33	Sununu/Anderson
14-Oct	12:55	3.07	2.21	tides: high@11:44, low@16:49	Gray
28-Oct	9:12	3.55	1.73	tides: high@11:16, low@17:01	Gray
11-Nov	12:23	3.45	1.83	tides: high@09:30, low@14:47	Sununu/Gray
1-Dec	11:22	4.18	1.10	tides: low@09:24, high@14:49	Sununu/Gray

FOSTER WHEELER				Groundwater Monitoring Report	
Project:	New Bedford Harbor Superfund Site				
Well Number:	OW-B7	**Northing:**	2703765.6	**Ground Surface Elevation:**	7.74 ft
Page Number:	1 of 1	**Easting:**	814768.4	**Elevation of Top of PVC:**	7.45 ft
Date	**Time**	**Water Level (ft)**	**Groundwater Elevation (ft)**	**Remarks**	**Read By**
1-Oct	14:04	5.25	2.20	tides: low@08:12, high@13:33	Sununu/Anderson
14-Oct	13:05	5.28	2.17	tides: high@11:44, low@16:49	Gray
28-Oct	9:20	5.31	2.14	tides: high@11:16, low@17:01	Gray
11-Nov	12:27	5.44	2.01	tides: high@09:30, low@14:47	Sununu/Gray
1-Dec	11:05	5.66	1.79	tides: low@09:24, high@14:49	Sununu/Gray

FOSTER WHEELER				Groundwater Monitoring Report	
Project:	New Bedford Harbor Superfund Site				
Well Number:	MW-B1	**Northing:**	2704803.1	**Ground Surface Elevation:**	5.40 ft
Page Number:	1 of 1	**Easting:**	814792.3	**Elevation of Top of PVC:**	5.05 ft

Date	Time	Water Level (ft)	Groundwater Elevation (ft)	Remarks	Read By
1-Oct	14:35	3.07	1.98	tides: low@08:12, high@13:33	Sununu/Anderson
14-Oct	13:52	4.23	0.82	tides: high@11:44, low@16:49	Gray
28-Oct	10:10	2.66	2.39	tides: high@11:16, low@17:01	Gray
11-Nov	12:06	2.95	2.10	tides: high@09:30, low@14:47	Sununu/Gray
1-Dec	11:00	3.35	1.70	tides: low@09:24, high@14:49	Sununu/Gray

FOSTER WHEELER				Groundwater Monitoring Report	
Project:	New Bedford Harbor Superfund Site				
Well Number:	MW-B2(S)	**Northing:**	2704199.2	**Ground Surface Elevation:**	5.73 ft
Page Number:	1 of 1	**Easting:**	814810.2	**Elevation of Top of PVC:**	5.34 ft
Date	**Time**	**Water Level (ft)**	**Groundwater Elevation (ft)**	**Remarks**	**Read By**
1-Oct	14:48	2.83	2.51	tides: low@08:12, high@13:33	Sununu/Anderson
14-Oct	13:25	2.51	2.83	tides: high@11:44, low@16:49	Gray
28-Oct	9:40	2.69	2.65	tides: high@11:16, low@17:01	Gray
1-Dec	10:35	3.02	2.32	tides: low@09:24, high@14:49	Sununu/Gray

FOSTER WHEELER				Groundwater Monitoring Report	
Project:	New Bedford Harbor Superfund Site				
Well Number:	MW-B2(D)	**Northing:**	2704190.9	**Ground Surface Elevation:**	5.58 ft
Page Number:	1 of 1	**Easting:**	814826.5	**Elevation of Top of PVC:**	5.20 ft

Date	Time	Water Level (ft)	Groundwater Elevation (ft)	Remarks	Read By
1-Oct	14:51	2.63	2.57	tides: low@08:12, high@13:33	Sununu/Anderson
14-Oct	13:22	2.40	2.80	tides: high@11:44, low@16:49	Gray
28-Oct	9:35	2.53	2.67	tides: high@11:16, low@17:01	Gray
1-Dec	10:30	3.00	2.20	tides: low@09:24, high@14:49	Sununu/Gray

FOSTER WHEELER				Groundwater Monitoring Report	
Project:	New Bedford Harbor Superfund Site				
Well Number:	MW-B3	**Northing:**	2703608.3	**Ground Surface Elevation:**	8.26 ft
Page Number:	1 of 1	**Easting:**	814893.2	**Elevation of Top of PVC:**	7.93 ft

Date	Time	Water Level (ft)	Groundwater Elevation (ft)	Remarks	Read By
1-Oct	13:42	5.80	2.13	tides: low@08:12, high@13:33	Sununu/Anderson
14-Oct	12:45	5.85	2.08	tides: high@11:44, low@16:49	Gray
28-Oct	9:05	5.78	2.15	tides: high@11:16, low@17:01	Gray
11-Nov	12:20	6.02	1.91	tides: high@09:30, low@14:47	Sununu/Gray
1-Dec	11:20	6.18	1.75	tides: low@09:24, high@14:49	Sununu/Gray

F

APPENDIX F

Moisture Content and Specific Gravity Results

Specific Gravity of Soils by ASTM D 854

Client: Nobis Engineering
Project Name: New Bedford Harbor Superfund Site
Project Location: New Bedford, MA

GTX #: 2409
Test Date: 11/13/99
Tested By: swj
Checked By: gtt

Boring #	Sample ID	Depth, ft	Visual Description	Specific Gravity @ 20° C
FB-5	S-7A	25-27	Moist, gray sand with some silt	2.67
FB-10	S-5	20-22	Moist, brown sand with gravel, some silt	2.65
FB-11	S-2	17-19	Moist, gray silt	2.80
FB-16	S-7	15-17	Moist, brown sand with gravel, some silt	2.69
FB-29	S-1	14-16	Moist, grayish brown sand with gravel and silt	2.67
FB-4	UO-5	11-13	Moist, dark gray organic silt	2.62
FB-11	UO-4	9-11	Moist, dark gray organic silt	2.61
FB-13	UO-1	0-2	Moist, black organic silt	2.29
FB-27	UO-1	0-2	Moist, black organic silt with sand	2.28
FB-27	UO-5	8-10	Moist, dark gray organic silt with gravel	2.64
FB-29	UO-2	6-8	Moist, dark gray organic silt	2.62

Notes: Specific gravity performed by using method B (moist specimens) of ASTM D 854

Notes: These results apply only to the sample tested for the specific test conditions. The test procedures employed follow accepted industry practice and the indicated test method. GeoTesting Express has no specific knowledge as to conditioning, origin,

GEOTECHNICAL LABORATORY TEST DATA

Project : New Bedford Harbor Superfund Site
Project No. : GTX-2409 Depth : 25-27 ft
Boring No. : FB-5 Test Date : 11/03/99
Sample No. : S-7A (25-27) Test Method : ASTM D 2216
Location : New Bedford, MA
Soil Description : Moist, gray sand with some silt
Remarks : Hydrometer not required, fines < 15%

Filename : FB5S7A
Elevation : ---
Tested by : gsg
Checked by : gtt

Natural Moisture Content

	Moisture Content ID	Mass of Container (gm)	Mass of Container and Moist Soil (gm)	Mass of Container and Dried Soil (gm)	Moisture Content (%)
1)	chewl	9.04	175.10	141.91	24.98

Average Moisture Content = 24.98

GEOTECHNICAL LABORATORY TEST DATA

Project : New Bedford Harbor Superfund Site
Project No. : GTX-2409
Boring No. : FB-10
Sample No. : S-5 (20-22)
Location : New Bedford, MA
Depth : 20-22 ft
Test Date : 11/03/99
Test Method : ASTM D 2216
Filename : FB10S5
Elevation : ---
Tested by : gsg
Checked by : gtt
Soil Description : Moist, brown sand with gravel, some silt
Remarks : Hydrometer not required, fines < 15%

Natural Moisture Content

	Moisture Content ID	Mass of Container (gm)	Mass of Container and Moist Soil (gm)	Mass of Container and Dried Soil (gm)	Moisture Content (%)
1)	1155	9.00	170.69	153.14	12.18

Average Moisture Content = 12.18

GEOTECHNICAL LABORATORY TEST DATA

Project : New Bedford Harbor Superfund Site
Project No. : GTX-2409
Boring No. : FB-11
Sample No. : S-2 (17-19)
Location : New Bedford, MA
Soil Description : Moist, gray silt
Remarks : ---

Depth : 17-19 ft
Test Date : 11/03/99
Test Method : ASTM D 2216

Filename : FB11S2
Elevation : ---
Tested by : gsg
Checked by : gtt

Natural Moisture Content

Moisture Content ID	Mass of Container (gm)	Mass of Container and Moist Soil (gm)	Mass of Container and Dried Soil (gm)	Moisture Content (%)
1) kt9	8.92	100.17	76.85	34.33

Average Moisture Content = 34.33

GEOTECHNICAL LABORATORY TEST DATA

Project : New Bedford Harbor Superfund Site
Project No. : GTX-2409
Boring No. : FB-11
Sample No. : S-4 (27-29)
Location : New Bedford, MA
Soil Description : Moist, light brown silty sand with gravel
Remarks : ---

Depth : 27-29 ft
Test Date : 11/03/99
Test Method : ASTM D 2216

Filename : FB11S4
Elevation : ---
Tested by : gsg
Checked by : gtt

Natural Moisture Content

	Moisture Content ID	Mass of Container (gm)	Mass of Container and Moist Soil (gm)	Mass of Container and Dried Soil (gm)	Moisture Content (%)
1)	geo77	8.88	172.15	156.27	10.77

Average Moisture Content = 10.77

GEOTECHNICAL LABORATORY TEST DATA

Project : New Bedford Harbor Superfund Site
Project No. : GTX-2409
Boring No. : FB-12
Sample No. : S-1A (8-10)
Location : New Bedford, MA
Soil Description : Moist, dark gray organic clay with sand
Remarks : ---

Depth : 8-10 ft
Test Date : 11/03/99
Test Method : ASTM D 2216

Filename : FB12S1A
Elevation : ---
Tested by : gsg
Checked by : gtt

Natural Moisture Content

Moisture Content ID	Mass of Container (gm)	Mass of Container and Moist Soil (gm)	Mass of Container and Dried Soil (gm)	Moisture Content (%)
1) a24	9.45	94.41	49.58	111.71

Average Moisture Content = 111.71

GEOTECHNICAL LABORATORY TEST DATA

Project : New Bedford Harbor Superfund Site
Project No. : GTX-2409
Boring No. : FB-12
Sample No. : S-2 (13-15)
Location : New Bedford, MA
Soil Description : Moist, gray silt
Remarks : ---

Depth : 13-15 ft
Test Date : 11/03/99
Test Method : ASTM D 2216

Filename : FB12S2
Elevation : ---
Tested by : gsg
Checked by : gtt

Natural Moisture Content

Moisture Content ID	Mass of Container (gm)	Mass of Container and Moist Soil (gm)	Mass of Container and Dried Soil (gm)	Moisture Content (%)
1) efk	9.23	68.16	52.98	34.70

Average Moisture Content = 34.70

GEOTECHNICAL LABORATORY TEST DATA

Project : New Bedford Harbor Superfund Site
Project No. : GTX-2409
Boring No. : FB-14
Sample No. : S-1 (7-9)
Location : New Bedford, MA
Depth : 7-9 ft
Test Date : 11/03/99
Test Method : ASTM D 2216
Filename : FB14S1
Elevation : ---
Tested by : gsg
Checked by : gtt
Soil Description : Moist, very dark gray organic silt with sand
Remarks : ---

Natural Moisture Content

Moisture Content ID	Mass of Container (gm)	Mass of Container and Moist Soil (gm)	Mass of Container and Dried Soil (gm)	Moisture Content (%)
1) hg6	8.99	70.30	40.06	97.33

Average Moisture Content = 97.33

GEOTECHNICAL LABORATORY TEST DATA

Project : New Bedford Harbor Superfund Site
Project No. : GTX-2409
Boring No. : FB-14
Sample No. : S-4 (14-16)
Location : New Bedford, MA
Depth : 14-16 ft
Test Date : 11/03/99
Test Method : ASTM D 2216
Filename : FB14S4
Elevation : ---
Tested by : gsg
Checked by : gtt
Soil Description : Moist, dark grayish brown sand with gravel, silt
Remarks : Hydrometer not required, fines < 15%

Natural Moisture Content

Moisture Content ID	Mass of Container (gm)	Mass of Container and Moist Soil (gm)	Mass of Container and Dried Soil (gm)	Moisture Content (%)
1) mm45	9.00	109.02	100.13	9.76

Average Moisture Content = 9.76

GEOTECHNICAL LABORATORY TEST DATA

Project : New Bedford Harbor Superfund Site
Project No. : GTX-2409
Boring No. : FB-16
Sample No. : S-1 (3-5)
Location : New Bedford, MA
Soil Description : Moist, very dark gray organic silt with sand
Remarks : ---

Depth : 3-5 ft
Test Date : 11/03/99
Test Method : ASTM D 2216

Filename : FB16S1
Elevation : ---
Tested by : gsg
Checked by : gtt

Natural Moisture Content

Moisture Content ID	Mass of Container (gm)	Mass of Container and Moist Soil (gm)	Mass of Container and Dried Soil (gm)	Moisture Content (%)
1) math	9.07	73.94	43.69	87.38

Average Moisture Content = 87.38

GEOTECHNICAL LABORATORY TEST DATA

Project : New Bedford Harbor Superfund Site
Project No. : GTX-2409
Boring No. : FB-16
Sample No. : S-7 (15-17)
Location : New Bedford, MA
Soil Description : Moist, brown sand with gravel, some silt
Remarks : Hydrometer not required, fines < 15%

Depth : 15-17 ft
Test Date : 11/03/99
Test Method : ASTM D 2216

Filename : FB16S7
Elevation : ---
Tested by : gsg
Checked by : gtt

Natural Moisture Content

Moisture Content ID	Mass of Container (gm)	Mass of Container and Moist Soil (gm)	Mass of Container and Dried Soil (gm)	Moisture Content (%)
1) a135	9.19	194.00	175.63	11.04

Average Moisture Content = 11.04

GEOTECHNICAL LABORATORY TEST DATA

Project : New Bedford Harbor Superfund Site
Project No. : GTX-2409
Boring No. : FB-17
Sample No. : S-2 (7-9)
Location : New Bedford, MA
Soil Description : Moist, dark gray organic silt with sand
Remarks : ---

Depth : 7-9 ft
Test Date : 11/03/99
Test Method : ASTM D 2216

Filename : FB17S2
Elevation : ---
Tested by : gsg
Checked by : gtt

Natural Moisture Content

Moisture Content ID	Mass of Container (gm)	Mass of Container and Moist Soil (gm)	Mass of Container and Dried Soil (gm)	Moisture Content (%)
1) mm37	8.90	90.85	51.97	90.27

Average Moisture Content = 90.27

GEOTECHNICAL LABORATORY TEST DATA

Project : New Bedford Harbor Superfund Site
Project No. : GTX-2409
Boring No. : FB-17
Sample No. : S-5 (19-21)
Location : New Bedford, MA
Depth : 19-21 ft
Test Date : 11/03/99
Test Method : ASTM D 2216
Filename : FB17S5
Elevation : ---
Tested by : gsg
Checked by : gtt
Soil Description : Moist, grayish brown sand with gravel and silt
Remarks : Hydrometer not required, fines < 15%

Natural Moisture Content

Moisture Content ID	Mass of Container (gm)	Mass of Container and Moist Soil (gm)	Mass of Container and Dried Soil (gm)	Moisture Content (%)
1) a64	9.39	119.21	111.13	7.94

Average Moisture Content = 7.94

GEOTECHNICAL LABORATORY TEST DATA

Project : New Bedford Harbor Superfund Site
Project No. : GTX-2409
Boring No. : FB-26
Sample No. : S-3 (25-27)
Location : New Bedford, MA
Soil Description : Moist, brown sand with gravel, some silt
Remarks : Hydrometer not required, fines < 15%

Depth : 25-27 ft
Test Date : 11/03/99
Test Method : ASTM D 2216

Filename : FB26S3
Elevation : ---
Tested by : gsg
Checked by : gtt

Natural Moisture Content

Moisture Content ID	Mass of Container (gm)	Mass of Container and Moist Soil (gm)	Mass of Container and Dried Soil (gm)	Moisture Content (%)
1) bs6	9.29	142.00	132.00	8.15

Average Moisture Content = 8.15

GEOTECHNICAL LABORATORY TEST DATA

Project : New Bedford Harbor Superfund Site
Project No. : GTX-2409
Boring No. : FB-26
Sample No. : S-4 (30-32)
Location : New Bedford, MA
Depth : 30-32 ft
Test Date : 11/03/99
Test Method : ASTM D 2216
Filename : FB26S4
Elevation : ---
Tested by : gsg
Checked by : gtt
Soil Description : Moist, light brown sand with gravel and silt
Remarks : Hydrometer not required, fines < 15%

Natural Moisture Content

Moisture Content ID	Mass of Container (gm)	Mass of Container and Moist Soil (gm)	Mass of Container and Dried Soil (gm)	Moisture Content (%)
1) cj51	9.36	154.82	143.76	8.23

Average Moisture Content = 8.23

GEOTECHNICAL LABORATORY TEST DATA

Project : New Bedford Harbor Superfund Site
Project No. : GTX-2409
Boring No. : FB-29
Sample No. : S-1 (14-16)
Location : New Bedford, MA
Depth : 14-16 ft
Test Date : 11/03/99
Test Method : ASTM D 2216
Filename : FB29S1
Elevation : ---
Tested by : gsg
Checked by : gtt
Soil Description : Moist, grayish brown sand with gravel and silt
Remarks : Hydrometer not required, fines < 15%

Natural Moisture Content

	Moisture Content ID	Mass of Container (gm)	Mass of Container and Moist Soil (gm)	Mass of Container and Dried Soil (gm)	Moisture Content (%)
1)	sm32	9.07	161.94	145.24	12.26

Average Moisture Content = 12.26

GEOTECHNICAL LABORATORY TEST DATA

Project : New Bedford Harbor Superfund Site
Project No. : GTX-2409
Boring No. : FB-29
Sample No. : S-4A (30-32)
Location : New Bedford, MA
Soil Description : Moist, light brown silt with sand
Remarks : ---

Depth : 30-32 ft
Test Date : 11/03/99
Test Method : ASTM D 2216

Filename : FB29S4A
Elevation : ---
Tested by : gsg
Checked by : gtt

Natural Moisture Content

Moisture Content ID	Mass of Container (gm)	Mass of Container and Moist Soil (gm)	Mass of Container and Dried Soil (gm)	Moisture Content (%)
1) is10	8.93	119.07	96.54	25.72

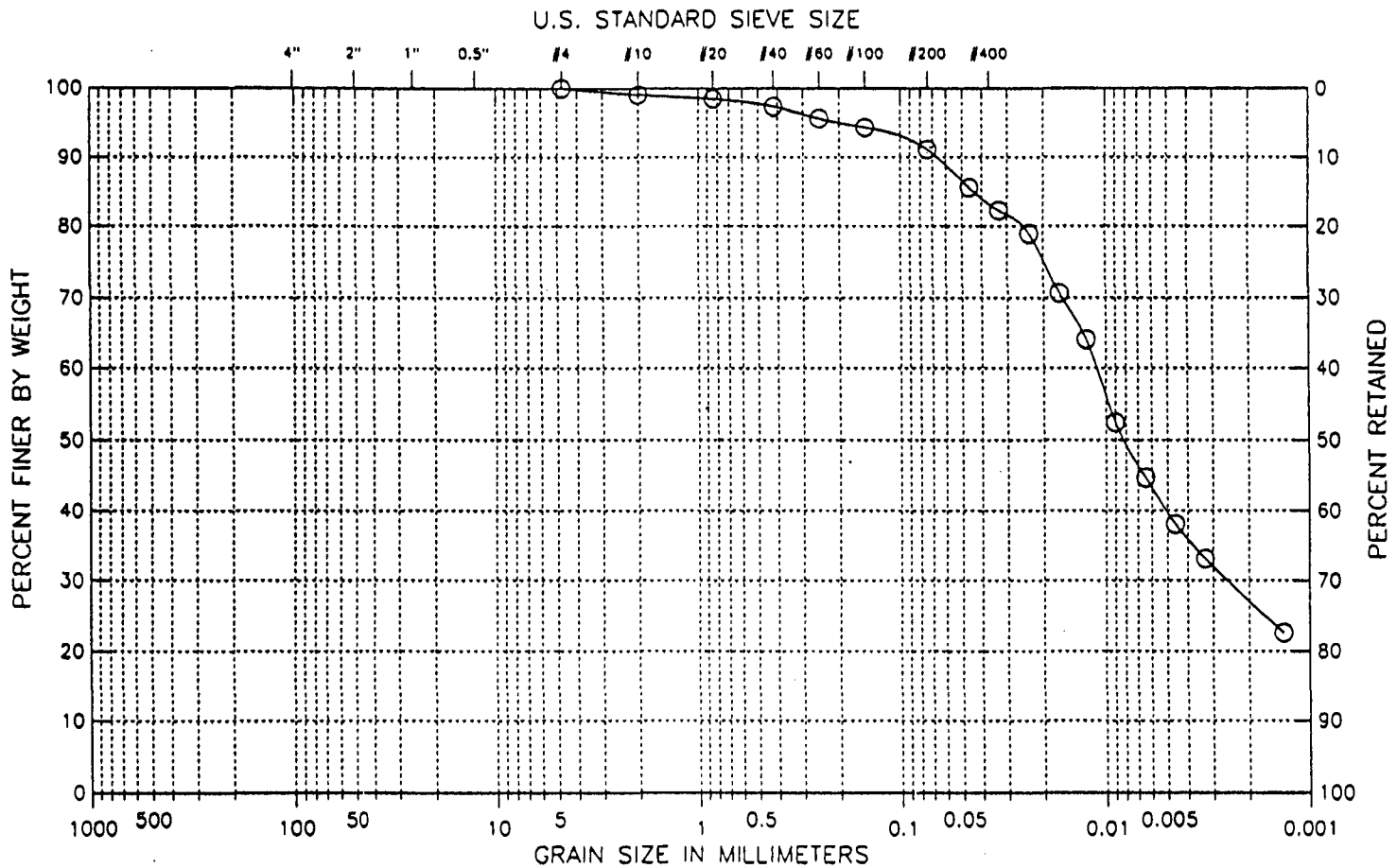
Average Moisture Content = 25.72

G

APPENDIX G

Particle Size Analysis Results

Boring No. : FB-4 Sample No: UO-5 (11-13) Test Method ASTM D 422 Filename : FB4U05	Project : New Bedford Harbor Superfund Site Project No.: GTX-2409 Location: New Bedford, MA Date : Thu Nov 18 1999



COBBLES	GRAVEL		SAND			SILT OR CLAY
	COARSE	FINE	COARSE	MEDIUM	FINE	

Classification :
(OH) organic silt
Visual Description :
Moist, dark gray organic silt

Remarks :

Figure 1

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GEOTECHNICAL LABORATORY TEST DATA

Project : New Bedford Harbor Superfund Site
Project No. : GTX-2409
Boring No. : FB-4
Sample No. : UO-5 (11-13)
Location : New Bedford, MA
Soil Description : Moist, dark gray organic silt
Remarks : ---

Depth : 11-13 ft
Test Date : 11/05/99
Test Method : ASTM D 422

Filename : FB4UO5
Elevation : ---
Tested by : gsg
Checked by : gtt

HYDROMETER

Hydrometer ID : 257525
Weight of air-dried soil = 30.14 gm
Specific Gravity = 2.62

Hydroscopic Moisture Content :
Weight of Wet Soil = 0 gm
Weight of Dry Soil = 0 gm
Moisture Content = 0

Elapsed Time (min)	Reading	Temperature (deg. C)	Corrected Reading	Particle Size (mm)	Percent Finer (%)	Adjusted Particle Size
1.00	30.00	20.50	25.84	0.046	86	0.046
2.00	29.00	20.50	24.84	0.033	82	0.033
4.00	28.00	20.50	23.84	0.023	79	0.023
8.00	25.50	20.50	21.34	0.017	71	0.017
15.00	23.50	20.50	19.34	0.012	64	0.012
30.00	20.00	20.50	15.84	0.009	52	0.009
60.00	17.50	21.00	13.50	0.006	45	0.006
120.00	15.50	21.00	11.50	0.005	38	0.005
240.00	14.00	21.00	10.00	0.003	33	0.003
1483.00	11.00	20.50	6.84	0.001	23	0.001

FINE SIEVE SET

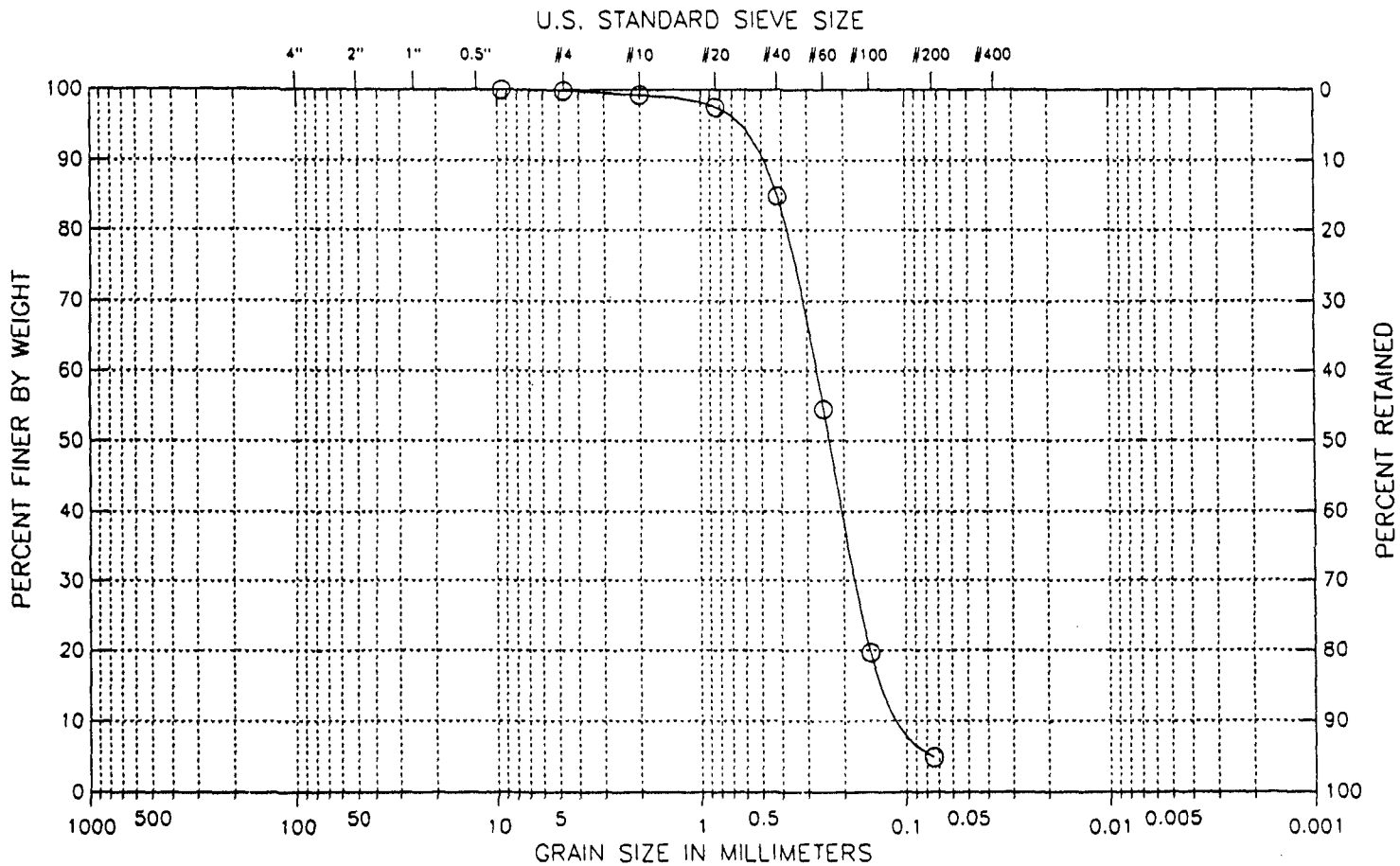
Sieve Mesh	Sieve Openings Inches	Millimeters	Weight Retained (gm)	Cumulative Weight Retained (gm)	Percent Finer (%)
#4	0.187	4.75	0.00	0.00	100
#10	0.079	2.00	0.28	0.28	99
#20	0.033	0.84	0.18	0.46	98
#40	0.017	0.42	0.34	0.80	97
#60	0.010	0.25	0.52	1.32	96
#100	0.006	0.15	0.40	1.72	94
#200	0.003	0.07	0.97	2.69	91
Pan			27.73	30.42	0

Total Dry Weight of Sample = 39.49

D85 : 0.0435 mm
D60 : 0.0111 mm
D50 : 0.0081 mm
D30 : 0.0025 mm
D15 : N/A
D10 : N/A

Soil Classification
ASTM Group Symbol : OH
ASTM Group Name : organic silt
AASHTO Group Symbol : A-7-5(67)
AASHTO Group Name : Clayey Soils

Boring No. : FB-5 Sample No.: S-7A (25-27) Test Method ASTM D 422 Filename : FB5S7A	Project : New Bedford Harbor Superfund Site Project No.: GTX-2409 Location: New Bedford, MA Date : Thu Nov 18 1999



COBBLES	GRAVEL		SAND			SILT OR CLAY
	COARSE	FINE	COARSE	MEDIUM	FINE	

Classification :
(SP) Poorly graded sand
Visual Description :
Moist, gray sand with some silt

Remarks :
Hydrometer not required, fines < 15%

Figure 2

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GEOTECHNICAL LABORATORY TEST DATA

Project : New Bedford Harbor Superfund Site
Project No. : GTX-2409
Boring No. : FB-5
Sample No. : S-7A (25-27)
Location : New Bedford, MA
Soil Description : Moist, gray sand with some silt
Remarks : Hydrometer not required, fines < 15%

Depth : 25-27 ft
Test Date : 11/03/99
Test Method : ASTM D 422

Filename : FB5S7A
Elevation : ---
Tested by : gsg
Checked by : gtt

FINE SIEVE SET

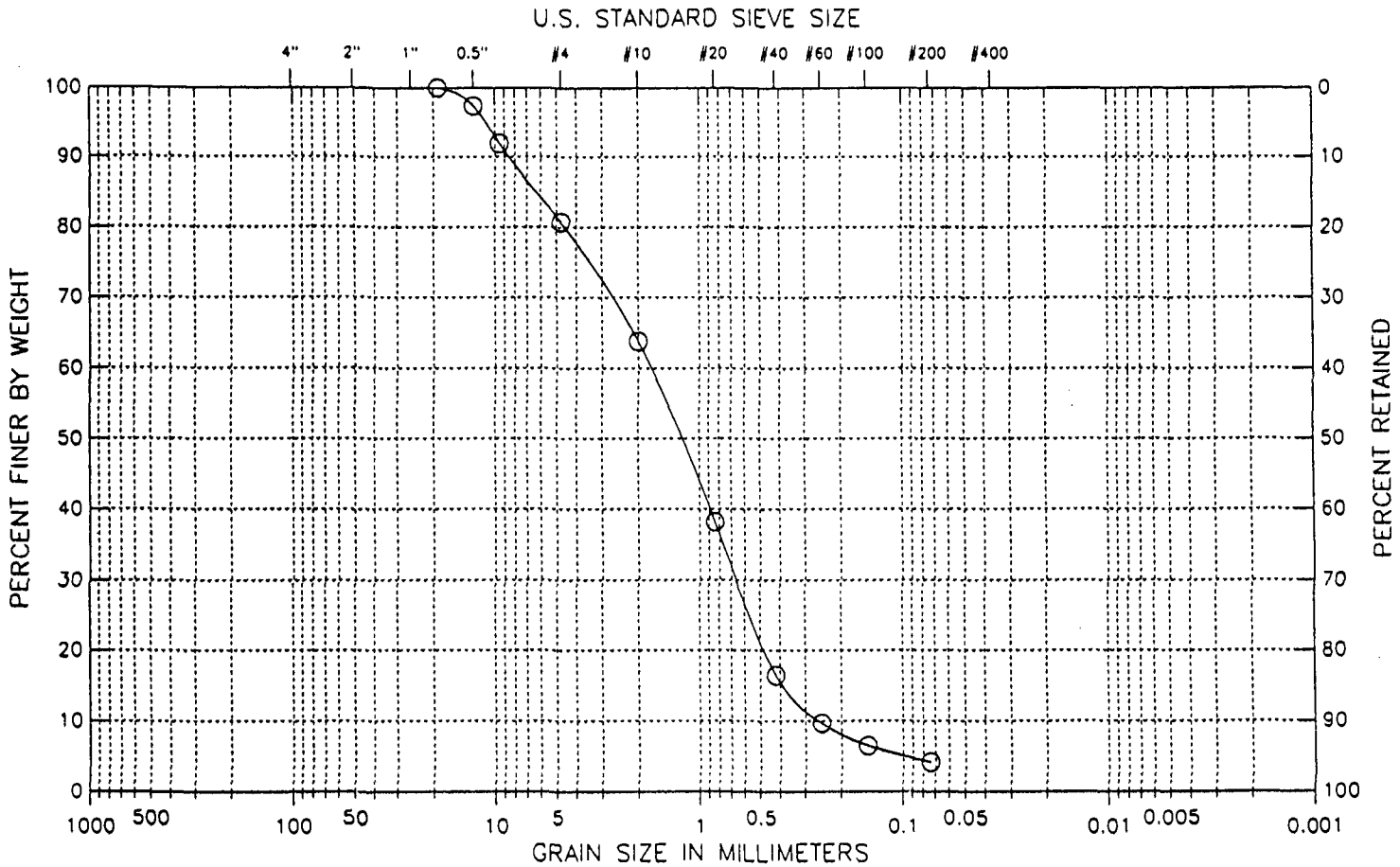
Sieve Mesh	Sieve Openings Inches	Millimeters	Weight Retained (gm)	Cumulative Weight Retained (gm)	Percent Finer (%)
0.375"	0.374	9.51	0.00	0.00	100
#4	0.187	4.75	0.17	0.17	100
#10	0.079	2.00	0.83	1.00	99
#20	0.033	0.84	2.30	3.30	98
#40	0.017	0.42	16.75	20.05	85
#60	0.010	0.25	40.43	60.48	54
#100	0.006	0.15	46.27	106.75	20
#200	0.003	0.07	19.75	126.50	5
Pan			6.37	132.87	0

Total Dry Weight of Sample = 141.91

D85 : 0.4221 mm
D60 : 0.2747 mm
D50 : 0.2339 mm
D30 : 0.1738 mm
D15 : 0.1197 mm
D10 : 0.0946 mm

Soil Classification
ASTM Group Symbol : SP
ASTM Group Name : Poorly graded sand
AASHTO Group Symbol : A-3(0)
AASHTO Group Name : Fine Sand

Boring No. : FB-10 Sample No.: S-5 (20-22) Test Method ASTM D 422 Filename : FB10S5	Project : New Bedford Harbor Superfund Site Project No.: GTX-2409 Location: New Bedford, MA Date : Thu Nov 18 1999



COBBLES	GRAVEL		SAND			SILT OR CLAY
	COARSE	FINE	COARSE	MEDIUM	FINE	

Classification :
(SP) Poorly graded sand with gravel
Visual Description :
Moist, brown sand with gravel, some silt

Remarks :
Hydrometer not required, fines < 15%

Figure 3

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GEOTECHNICAL LABORATORY TEST DATA

Project : New Bedford Harbor Superfund Site
Project No. : GTX-2409
Boring No. : FB-10
Sample No. : S-5 (20-22)
Location : New Bedford, MA
Soil Description : Moist, brown sand with gravel, some silt
Remarks : Hydrometer not required, fines < 15%

Depth : 20-22 ft
Test Date : 11/03/99
Test Method : ASTM D 422

Filename : FB10S5
Elevation : ---
Tested by : gsg
Checked by : gtt

FINE SIEVE SET

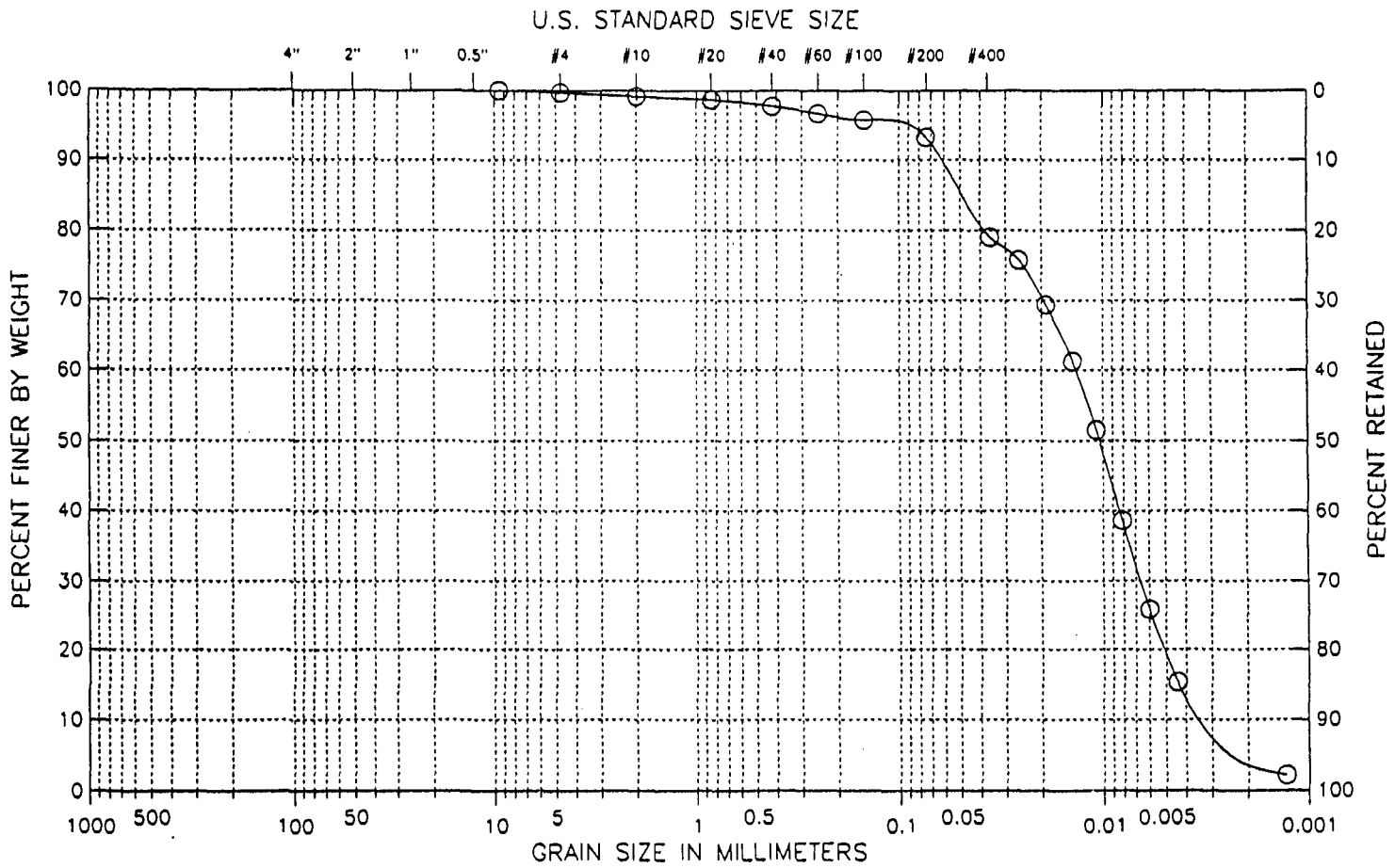
Sieve Mesh	Sieve Openings Inches	Sieve Openings Millimeters	Weight Retained (gm)	Cumulative Weight Retained (gm)	Percent Finer (%)
0.75"	0.748	19.00	0.00	0.00	100
0.5"	0.500	12.70	3.80	3.80	97
0.375"	0.374	9.51	7.88	11.68	92
#4	0.187	4.75	16.12	27.80	81
#10	0.079	2.00	24.43	52.23	64
#20	0.033	0.84	36.89	89.12	38
#40	0.017	0.42	31.32	120.44	16
#60	0.010	0.25	9.78	130.22	10
#100	0.006	0.15	4.60	134.82	6
#200	0.003	0.07	3.36	138.18	4
Pan			5.96	144.14	0

Total Dry Weight of Sample = 153.14

D85 : 6.1981 mm
D60 : 1.7607 mm
D50 : 1.2551 mm
D30 : 0.6477 mm
D15 : 0.3761 mm
D10 : 0.2566 mm

Soil Classification
ASTM Group Symbol : SP
ASTM Group Name : Poorly graded sand with gravel
AASHTO Group Symbol : A-1-b(0)
AASHTO Group Name : Stone Fragments, Gravel and Sand

Boring No. : FB-11 Sample No.: S-2 (17-19) Test Method ASTM D 422 Filename : FB11S2	Project : New Bedford Harbor Superfund Site Project No.: GTX-2409 Location: New Bedford, MA Date : Thu Nov 18 1999



COBBLES	GRAVEL		SAND			SILT OR CLAY
	COARSE	FINE	COARSE	MEDIUM	FINE	

Classification :
(ML) silt
Visual Description :
Moist, gray silt

Remarks :

Figure 4

GEOTECHNICAL LABORATORY TEST DATA

Project : New Bedford Harbor Superfund Site
Project No. : GTX-2409
Boring No. : FB-11
Sample No. : S-2 (17-19)
Location : New Bedford, MA
Soil Description : Moist, gray silt
Remarks : ---

Depth : 17-19 ft
Test Date : 11/03/99
Test Method : ASTM D 422

Filename : FB11S2
Elevation : ---
Tested by : gsg
Checked by : gtt

HYDROMETER

Hydrometer ID : 257525
Weight of air-dried soil = 59.43 gm
Specific Gravity = 2.8

Hydroscopic Moisture Content :
Weight of Wet Soil = 0 gm
Weight of Dry Soil = 0 gm
Moisture Content = 0

Elapsed Time (min)	Reading	Temperature (deg. C)	Corrected Reading	Particle Size (mm)	Percent Finer (%)	Adjusted Particle Size
1.00	53.00	20.50	48.84	0.036	79	0.036
2.00	51.00	20.50	46.84	0.026	76	0.026
4.00	47.00	20.50	42.84	0.019	69	0.019
8.00	42.00	20.50	37.84	0.014	61	0.014
15.00	36.00	20.50	31.84	0.011	52	0.011
30.00	28.00	20.50	23.84	0.008	39	0.008
60.00	20.00	21.00	16.00	0.006	26	0.006
120.00	13.50	21.00	9.50	0.004	15	0.004
1537.00	5.50	20.50	1.34	0.001	2	0.001

FINE SIEVE SET

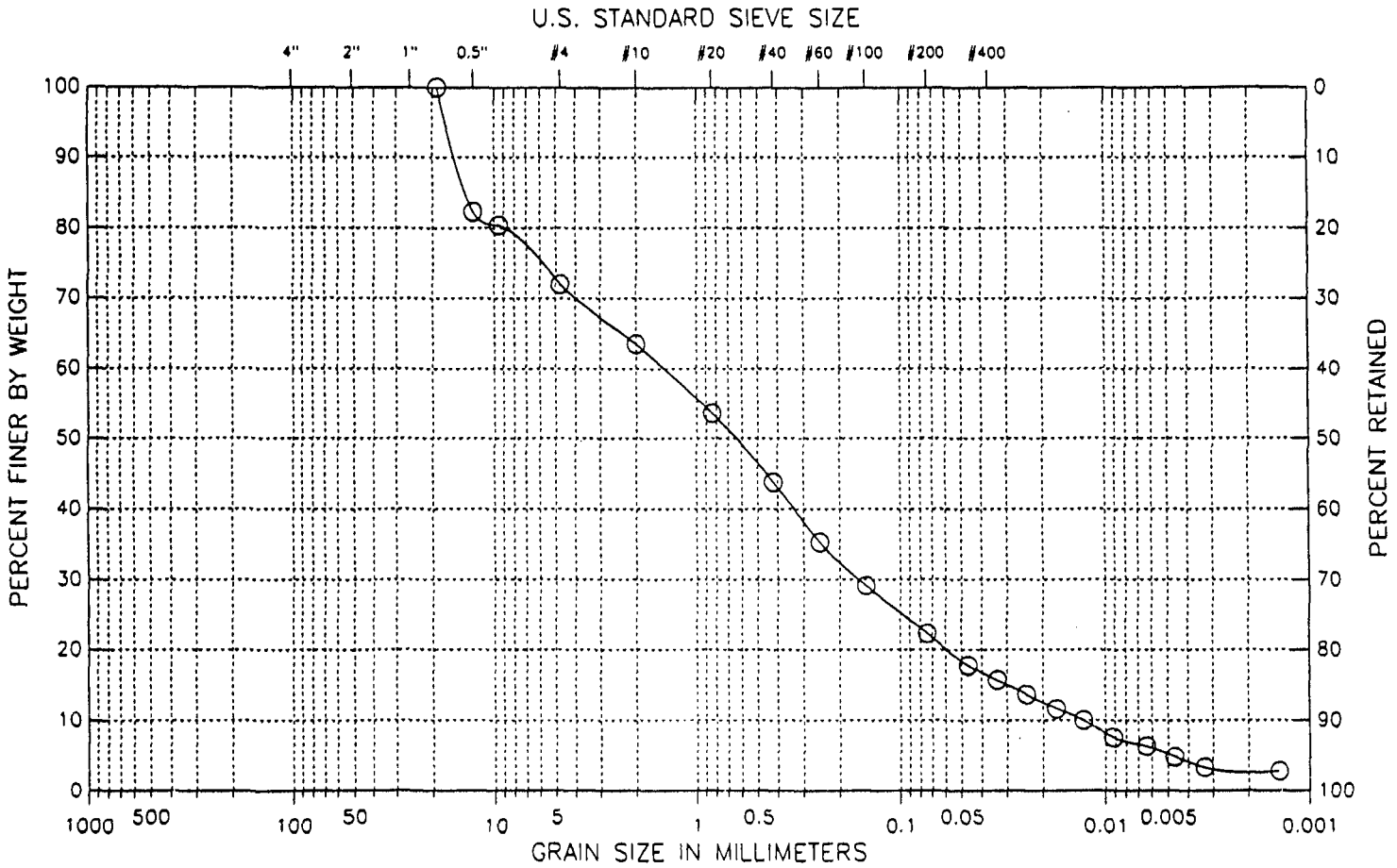
Sieve Mesh	Sieve Openings Inches	Millimeters	Weight Retained (gm)	Cumulative Weight Retained (gm)	Percent Finer (%)
0.375"	0.374	9.51	0.00	0.00	100
#4	0.187	4.75	0.18	0.18	100
#10	0.079	2.00	0.32	0.50	99
#20	0.033	0.84	0.29	0.79	99
#40	0.017	0.42	0.55	1.34	98
#60	0.010	0.25	0.65	1.99	97
#100	0.006	0.15	0.55	2.54	96
#200	0.003	0.07	1.49	4.03	93
Pan			55.90	59.93	0

Total Dry Weight of Sample = 69.09

D85 : 0.0486 mm
D60 : 0.0136 mm
D50 : 0.0105 mm
D30 : 0.0066 mm
D15 : 0.0043 mm
D10 : 0.0027 mm

Soil Classification
ASTM Group Symbol : ML
ASTM Group Name : silt
AASHTO Group Symbol : A-4(2)
AASHTO Group Name : Silty Soils

Boring No. : FB-11 Sample No.: S-4 (27-29) Test Method ASTM D 422 Filename : FB11S4	Project : New Bedford Harbor Superfund Site Project No.: GTX-2409 Location: New Bedford, MA Date : Thu Nov 18 1999



COBBLES	GRAVEL		SAND			SILT OR CLAY
	COARSE	FINE	COARSE	MEDIUM	FINE	

Classification :

Remarks :

Visual Description :
Moist, light brown silty sand with gravel

Figure 5

GEOTECHNICAL LABORATORY TEST DATA

Project : New Bedford Harbor Superfund Site
Project No. : GTX-2409
Boring No. : FB-11
Sample No. : S-4 (27-29)
Location : New Bedford, MA
Soil Description : Moist, light brown silty sand with gravel
Remarks : ---

Depth : 27-29 ft
Test Date : 11/03/99
Test Method : ASTM D 422

Filename : FB11S4
Elevation : ---
Tested by : gsg
Checked by : gtt

HYDROMETER

Hydrometer ID : 257525
Weight of air-dried soil = 76.83 gm
Specific Gravity = 2.7

Hydroscopic Moisture Content :
Weight of Wet Soil = 0 gm
Weight of Dry Soil = 0 gm
Moisture Content = 0

Elapsed Time (min)	Reading	Temperature (deg. C)	Corrected Reading	Particle Size (mm)	Percent Finer (%)	Adjusted Particle Size
1.00	26.00	20.00	21.68	0.047	18	0.047
2.00	23.50	20.00	19.18	0.034	16	0.034
4.00	21.00	20.00	16.68	0.024	14	0.024
8.00	18.50	20.00	14.18	0.017	12	0.017
15.00	16.50	20.00	12.18	0.013	10	0.013
30.00	13.50	20.00	9.18	0.009	8	0.009
63.00	12.00	20.00	7.68	0.006	6	0.006
120.00	10.00	20.50	5.84	0.005	5	0.005
240.00	8.00	21.00	4.00	0.003	3	0.003
1343.00	7.50	20.50	3.34	0.001	3	0.001

FINE SIEVE SET

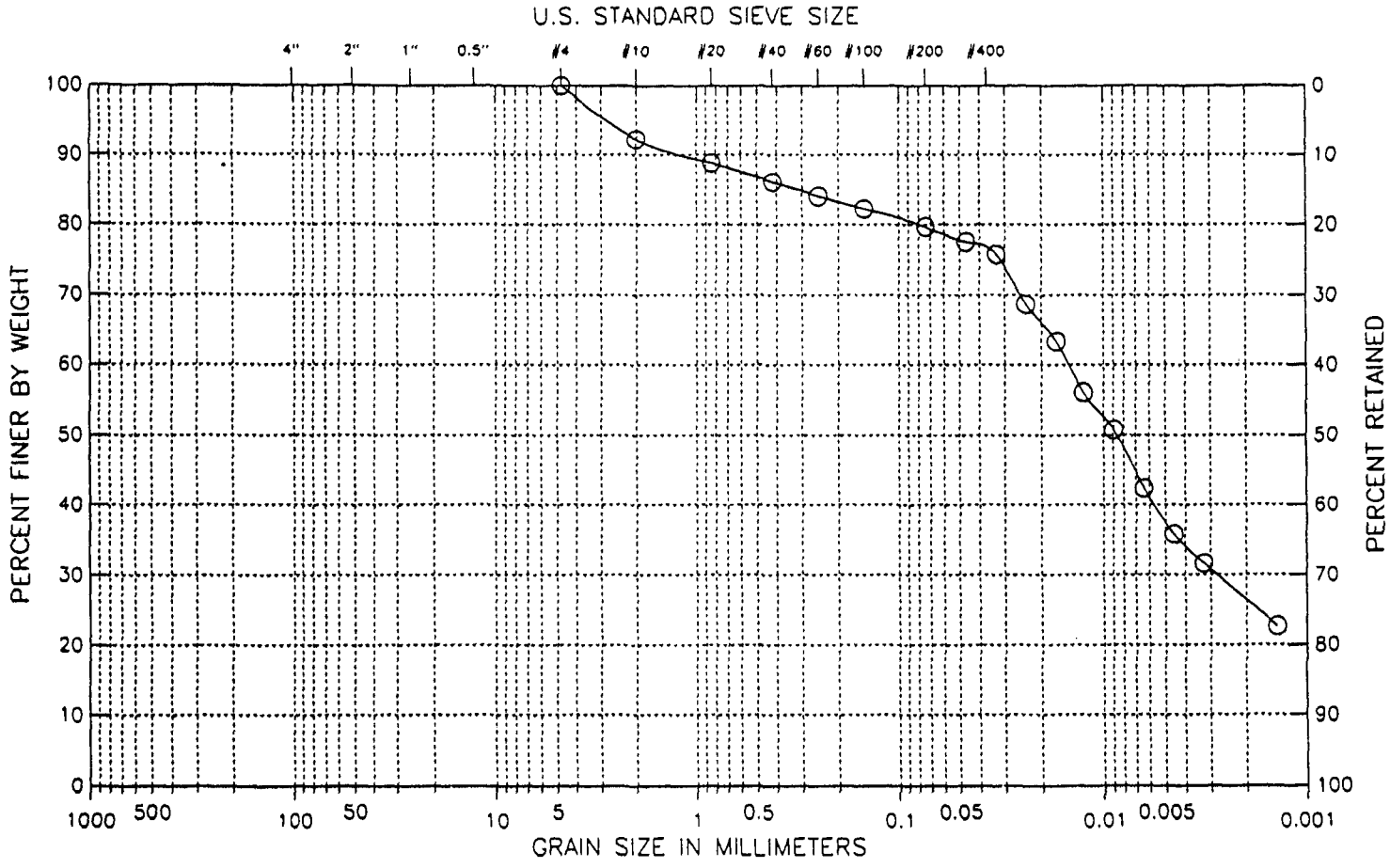
Sieve Mesh	Sieve Openings Inches	Sieve Openings Millimeters	Weight Retained (gm)	Cumulative Weight Retained (gm)	Percent Finer (%)
0.75"	0.748	19.00	0.00	0.00	100
0.5"	0.500	12.70	21.43	21.43	82
0.375"	0.374	9.51	2.28	23.71	80
#4	0.187	4.75	10.23	33.94	72
#10	0.079	2.00	10.28	44.22	63
#20	0.033	0.84	11.95	56.17	54
#40	0.017	0.42	11.85	68.02	44
#60	0.010	0.25	10.32	78.34	35
#100	0.006	0.15	7.49	85.83	29
#200	0.003	0.07	8.33	94.16	22
Pan			26.89	121.05	0

Total Dry Weight of Sample = 130.2

D85 : 13.5058 mm
D60 : 1.4750 mm
D50 : 0.6516 mm
D30 : 0.1607 mm
D15 : 0.0299 mm
D10 : 0.0129 mm

Soil Classification
ASTM Group Symbol : N/A
ASTM Group Name : N/A
AASHTO Group Symbol : A-1-b(0)
AASHTO Group Name : Stone Fragments, Gravel and Sand

Boring No. : FB-12 Sample No.: S-1A (8-10) Test Method ASTM D 422 Filename : FB12S1A	Project : New Bedford Harbor Superfund Site Project No.: GTX-2409 Location: New Bedford, MA Date : Thu Nov 18 1999



COBBLES	GRAVEL		SAND			SILT OR CLAY
	COARSE	FINE	COARSE	MEDIUM	FINE	

Classification :
(OH) organic clay with sand
Visual Description :
Moist, dark gray organic clay with sand

Remarks :

Figure 6

GEOTECHNICAL LABORATORY TEST DATA

Project : New Bedford Harbor Superfund Site
Project No. : GTX-2409
Boring No. : FB-12
Sample No. : S-1A (8-10)
Location : New Bedford, MA
Soil Description : Moist, dark gray organic clay with sand
Remarks : ---

Depth : 8-10 ft
Test Date : 11/03/99
Test Method : ASTM D 422

Filename : FB12S1A
Elevation : ---
Tested by : gsg
Checked by : gtt

HYDROMETER

Hydrometer ID : 257525
Weight of air-dried soil = 25.55 gm
Specific Gravity = 2.7

Hydroscopic Moisture Content :
Weight of Wet Soil = 0 gm
Weight of Dry Soil = 0 gm
Moisture Content = 0

Elapsed Time (min)	Reading	Temperature (deg. C)	Corrected Reading	Particle Size (mm)	Percent Finer (%)	Adjusted Particle Size
1.00	26.00	20.00	21.68	0.047	78	0.047
2.00	25.50	20.00	21.18	0.033	76	0.033
4.00	23.50	20.00	19.18	0.024	69	0.024
8.00	22.00	20.00	17.68	0.017	63	0.017
15.00	20.00	20.00	15.68	0.013	56	0.013
30.00	18.50	20.00	14.18	0.009	51	0.009
60.00	16.00	20.50	11.84	0.006	42	0.006
120.00	14.00	21.00	10.00	0.005	36	0.005
240.00	13.00	20.50	8.84	0.003	32	0.003
1310.00	10.50	20.50	6.34	0.001	23	0.001

FINE SIEVE SET

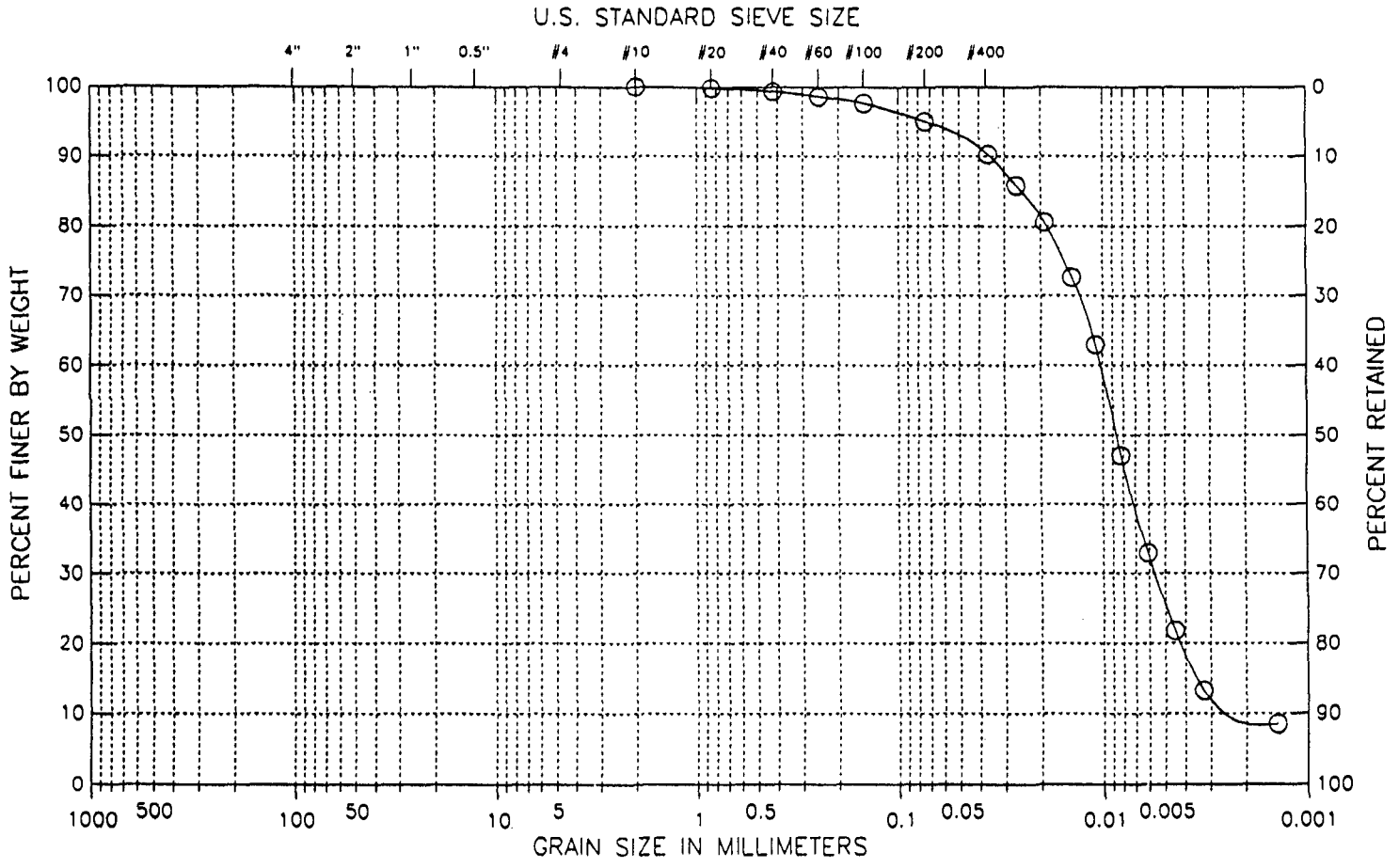
Sieve Mesh	Sieve Openings Inches	Millimeters	Weight Retained (gm)	Cumulative Weight Retained (gm)	Percent Finer (%)
#4	0.187	4.75	0.00	0.00	100
#10	0.079	2.00	2.06	2.06	92
#20	0.033	0.84	0.92	2.98	89
#40	0.017	0.42	0.72	3.70	86
#60	0.010	0.25	0.55	4.25	84
#100	0.006	0.15	0.48	4.73	82
#200	0.003	0.07	0.68	5.41	80
Pan			21.20	26.61	0

Total Dry Weight of Sample = 35.76

D85 : 0.3190 mm
D60 : 0.0148 mm
D50 : 0.0087 mm
D30 : 0.0028 mm
D15 : N/A
D10 : N/A

Soil Classification
ASTM Group Symbol : OH
ASTM Group Name : organic clay with sand
AASHTO Group Symbol : A-7-5(78)
AASHTO Group Name : Clayey Soils

Boring No. : FB-12 Sample No.: S-2 (13-15) Test Method ASTM D 422 Filename : FB12S2	Project : New Bedford Harbor Superfund Site Project No.: GTX-2409 Location: New Bedford, MA Date : Thu Nov 18 1999



COBBLES	GRAVEL		SAND			SILT OR CLAY
	COARSE	FINE	COARSE	MEDIUM	FINE	

Classification :
(ML) silt
Visual Description :
Moist, gray silt

Remarks :

Figure 7

GEOTECHNICAL LABORATORY TEST DATA

Project : New Bedford Harbor Superfund Site
Project No. : GTX-2409
Boring No. : FB-12
Sample No. : S-2 (13-15)
Location : New Bedford, MA
Soil Description : Moist, gray silt
Remarks : ---

Depth : 13-15 ft
Test Date : 11/03/99
Test Method : ASTM D 422

Filename : FB12S2
Elevation : ---
Tested by : gsg
Checked by : gtt

HYDROMETER

Hydrometer ID : 257525
Weight of air-dried soil = 56.18 gm
Specific Gravity = 2.7

Hydroscopic Moisture Content :
Weight of Wet Soil = 0 gm
Weight of Dry Soil = 0 gm
Moisture Content = 0

Elapsed Time (min)	Reading	Temperature (deg. C)	Corrected Reading	Particle Size (mm)	Percent Finer (%)	Adjusted Particle Size
1.00	55.50	20.00	51.18	0.036	90	0.036
2.00	53.00	20.00	48.68	0.026	86	0.026
4.00	50.00	20.00	45.68	0.019	81	0.019
8.00	45.50	20.00	41.18	0.014	73	0.014
15.00	40.00	20.00	35.68	0.011	63	0.011
30.00	31.00	20.00	26.68	0.008	47	0.008
61.00	23.00	20.00	18.68	0.006	33	0.006
120.00	16.50	20.50	12.34	0.004	22	0.004
240.00	11.50	21.00	7.50	0.003	13	0.003
1332.00	9.00	20.50	4.84	0.001	9	0.001

FINE SIEVE SET

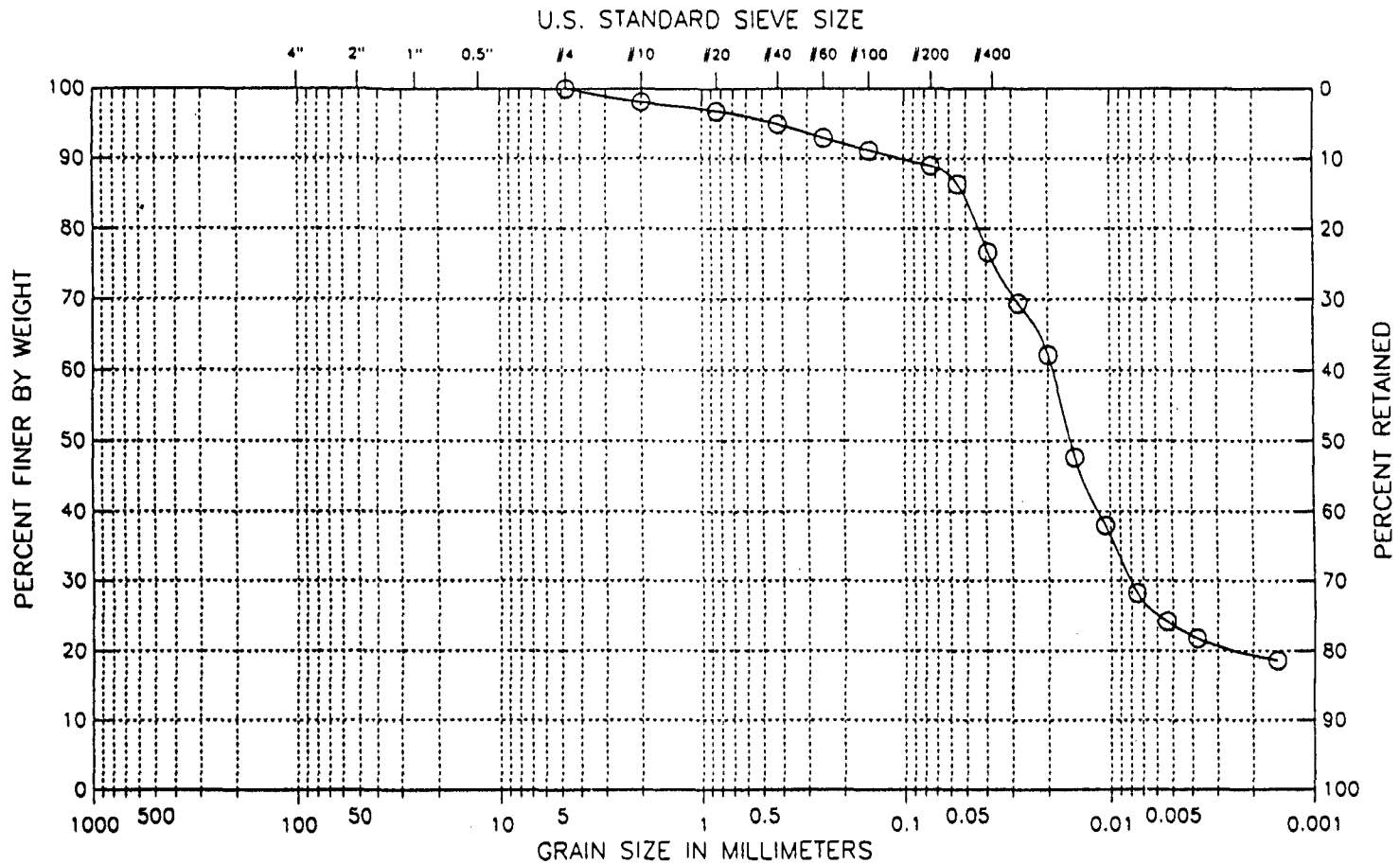
Sieve Mesh	Sieve Openings Inches	Sieve Openings Millimeters	Weight Retained (gm)	Cumulative Weight Retained (gm)	Percent Finer (%)
#10	0.079	2.00	0.00	0.00	100
#20	0.033	0.84	0.10	0.10	100
#40	0.017	0.42	0.27	0.37	99
#60	0.010	0.25	0.42	0.79	99
#100	0.006	0.15	0.53	1.32	98
#200	0.003	0.07	1.48	2.80	95
Pan			53.38	56.18	0

Total Dry Weight of Sample = 65.18

D85 : 0.0249 mm
D60 : 0.0103 mm
D50 : 0.0087 mm
D30 : 0.0056 mm
D15 : 0.0035 mm
D10 : 0.0018 mm

Soil Classification
ASTM Group Symbol : ML
ASTM Group Name : silt
AASHTO Group Symbol : A-4(1)
AASHTO Group Name : Silty Soils

Boring No. : FB-13 Sample No.: UO-1 (0-2) Test Method ASTM D 422 Filename : FB13U01	Project : New Bedford Harbor Superfund Site Project No.: GTX-2409 Location: New Bedford, MA Date : Thu Nov 18 1999



Classification :
(OH) organic silt
Visual Description :
Moist, black organic silt

Remarks :

Figure 8

GEOTECHNICAL LABORATORY TEST DATA

Project : New Bedford Harbor Superfund Site
Project No. : GTX-2409 Depth : 0-2 ft
Boring No. : FB-13 Test Date : 11/05/99
Sample No. : UO-1 (0-2) Test Method : ASTM D 422
Location : New Bedford, MA
Soil Description : Moist, black organic silt
Remarks : ---

Filename : FB13U01
Elevation : ---
Tested by : gsg
Checked by : gtt

HYDROMETER

Hydrometer ID : 257525
Weight of air-dried soil = 21.82 gm
Specific Gravity = 2.29

Hydroscopic Moisture Content :
Weight of Wet Soil = 0 gm
Weight of Dry Soil = 0 gm
Moisture Content = 0

Elapsed Time (min)	Reading	Temperature (deg. C)	Corrected Reading	Particle Size (mm)	Percent Finer (%)	Adjusted Particle Size
1.00	22.00	20.50	17.84	0.055	86	0.055
2.00	20.00	20.50	15.84	0.039	77	0.039
4.00	18.50	20.50	14.34	0.028	69	0.028
8.00	17.00	20.50	12.84	0.020	62	0.020
15.00	14.00	20.50	9.84	0.015	48	0.015
30.00	12.00	20.50	7.84	0.011	38	0.011
61.00	10.00	20.50	5.84	0.008	28	0.008
120.00	9.00	21.00	5.00	0.005	24	0.005
240.00	8.50	21.00	4.50	0.004	22	0.004
1519.00	8.00	20.50	3.84	0.002	19	0.002

FINE SIEVE SET

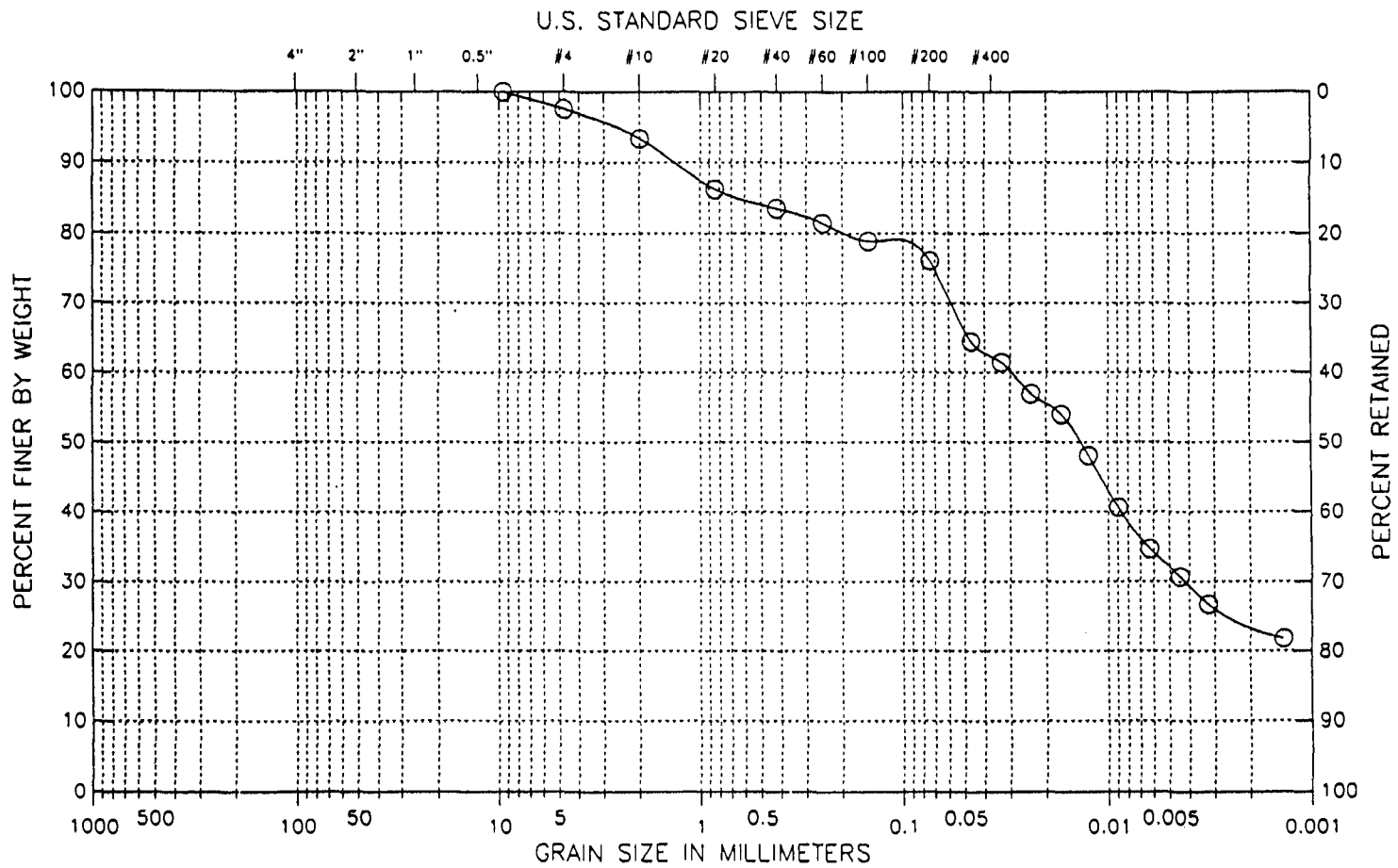
Sieve Mesh	Sieve Openings Inches	Millimeters	Weight Retained (gm)	Cumulative Weight Retained (gm)	Percent Finer (%)
#4	0.187	4.75	0.00	0.00	100
#10	0.079	2.00	0.37	0.37	98
#20	0.033	0.84	0.25	0.62	97
#40	0.017	0.42	0.36	0.98	95
#60	0.010	0.25	0.38	1.36	93
#100	0.006	0.15	0.34	1.70	91
#200	0.003	0.07	0.42	2.12	89
Pan			17.07	19.19	0

Total Dry Weight of Sample = 28.25

D85 : 0.0522 mm
D60 : 0.0191 mm
D50 : 0.0156 mm
D30 : 0.0080 mm
D15 : N/A
D10 : N/A

Soil Classification
ASTM Group Symbol : OH
ASTM Group Name : organic silt
AASHTO Group Symbol : A-7-5(45)
AASHTO Group Name : Clayey Soils

Boring No. : FB-14 Sample No.: S-1 (7-9) Test Method ASTM D 422 Filename : FB14S1	Project : New Bedford Harbor Superfund Site Project No.: GTX-2409 Location: New Bedford, MA Date : Thu Nov 18 1999



Classification :

Remarks :

Visual Description :
Moist, very dark gray organic silt with sand

Figure 9

GEOTECHNICAL LABORATORY TEST DATA

Project : New Bedford Harbor Superfund Site
Project No. : GTX-2409
Boring No. : FB-14
Sample No. : S-1 (7-9)
Location : New Bedford, MA
Soil Description : Moist, very dark gray organic silt with sand
Remarks : ---

Depth : 7-9 ft
Test Date : 11/03/99
Test Method : ASTM D 422

Filename : FB14S1
Elevation : ---
Tested by : gsg
Checked by : gtt

HYDROMETER

Hydrometer ID : 257525
Weight of air-dried soil = 31.16 gm
Specific Gravity = 2.7

Hydroscopic Moisture Content :
Weight of Wet Soil = 0 gm
Weight of Dry Soil = 0 gm
Moisture Content = 0

Elapsed Time (min)	Reading	Temperature (deg. C)	Corrected Reading	Particle Size (mm)	Percent Finer (%)	Adjusted Particle Size
1.00	26.00	20.00	21.68	0.047	64	0.047
2.00	25.00	20.00	20.68	0.033	61	0.033
4.00	23.50	20.00	19.18	0.024	57	0.024
8.00	22.50	20.00	18.18	0.017	54	0.017
15.00	20.50	20.00	16.18	0.012	48	0.012
30.00	18.00	20.00	13.68	0.009	41	0.009
63.00	16.00	20.00	11.68	0.006	35	0.006
125.00	14.50	20.50	10.34	0.004	31	0.004
240.00	13.00	21.00	9.00	0.003	27	0.003
1354.00	11.50	20.50	7.34	0.001	22	0.001

FINE SIEVE SET

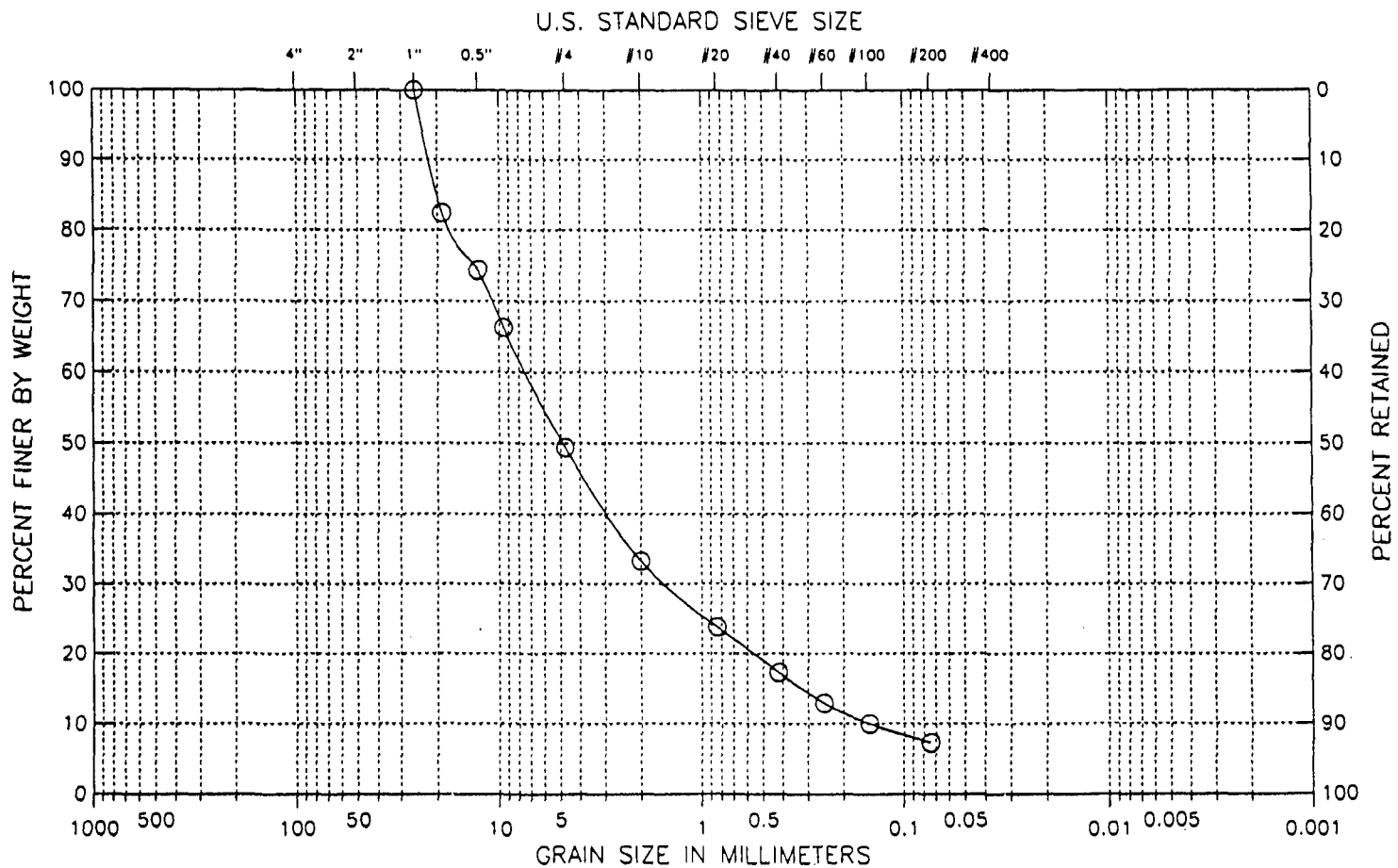
Sieve Mesh	Sieve Openings Inches	Millimeters	Weight Retained (gm)	Cumulative Weight Retained (gm)	Percent Finer (%)
0.375"	0.374	9.51	0.00	0.00	100
#4	0.187	4.75	0.80	0.80	98
#10	0.079	2.00	1.40	2.20	93
#20	0.033	0.84	2.40	4.60	86
#40	0.017	0.42	0.89	5.49	84
#60	0.010	0.25	0.69	6.18	81
#100	0.006	0.15	0.85	7.03	79
#200	0.003	0.07	0.95	7.98	76
Pan			25.38	33.36	0

Total Dry Weight of Sample = 42.58

D85 : 0.6136 mm
D60 : 0.0298 mm
D50 : 0.0138 mm
D30 : 0.0042 mm
D15 : N/A
D10 : N/A

Soil Classification
ASTM Group Symbol : N/A
ASTM Group Name : N/A
AASHTO Group Symbol : A-4(0)
AASHTO Group Name : Silty Soils

Boring No. : FB-14 Sample No.: S-4 (14-16) Test Method ASTM D 422 Filename : FB14S4	Project : New Bedford Harbor Superfund Site Project No.: GTX-2409 Location: New Bedford, MA Date : Thu Nov 18 1999



Classification :

Remarks :
Hydrometer not required, fines < 15%

Visual Description :
Moist, dark grayish brown sand with gravel, silt

Figure 10

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GEOTECHNICAL LABORATORY TEST DATA

Project : New Bedford Harbor Superfund Site
Project No. : GTX-2409
Boring No. : FB-14
Sample No. : S-4 (14-16)
Location : New Bedford, MA
Depth : 14-16 ft
Test Date : 11/03/99
Test Method : ASTM D 422
Filename : FB14S4
Elevation : ---
Tested by : gsg
Checked by : gtt
Soil Description : Moist, dark grayish brown sand with gravel, silt
Remarks : Hydrometer not required, fines < 15%

FINE SIEVE SET

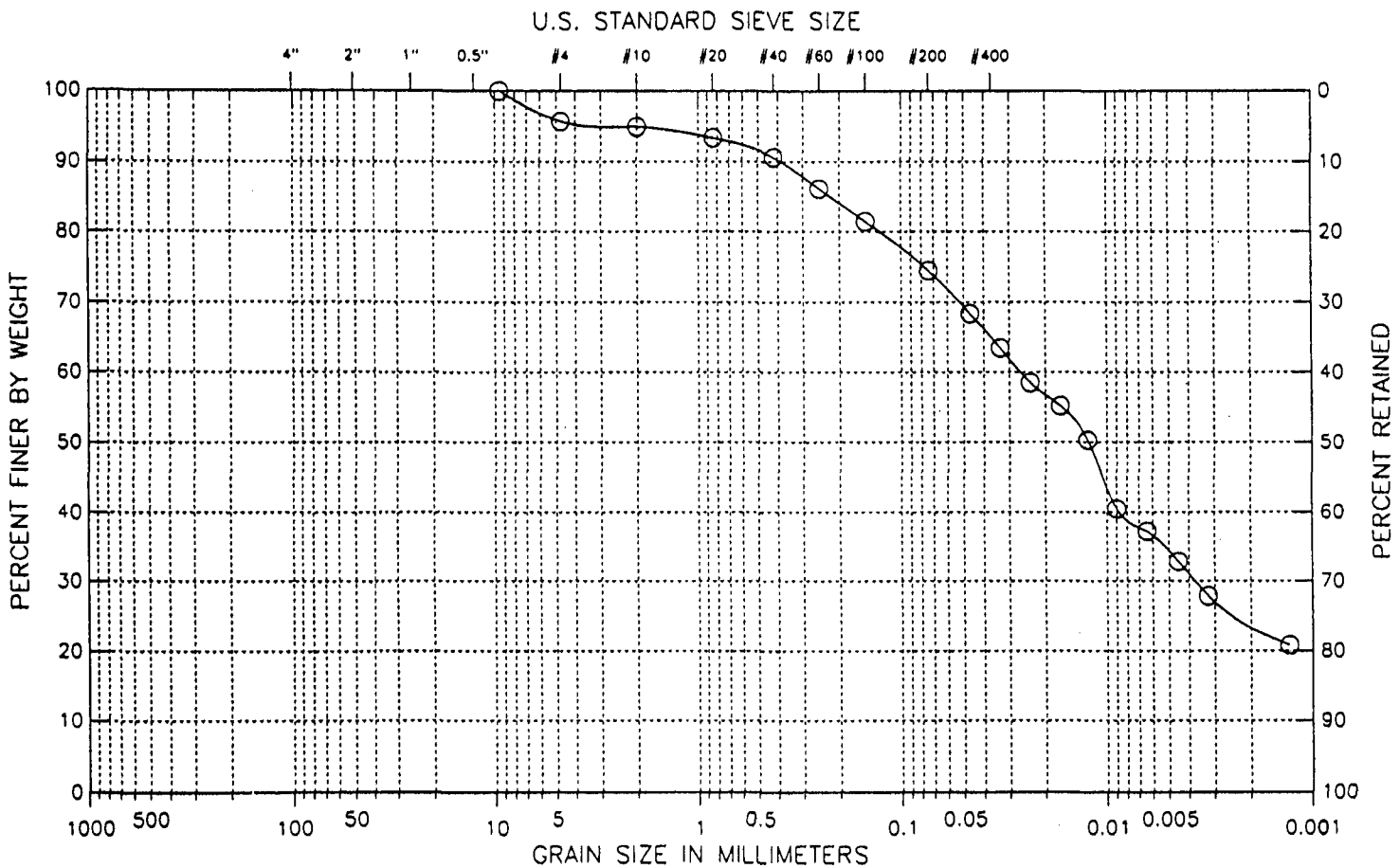
Sieve Mesh	Sieve Openings Inches	Millimeters	Weight Retained (gm)	Cumulative Weight Retained (gm)	Percent Finer (%)
1"	1.012	25.70	0.00	0.00	100
0.75"	0.748	19.00	16.00	16.00	82
0.5"	0.500	12.70	7.32	23.32	74
0.375"	0.374	9.51	7.45	30.77	66
#4	0.187	4.75	15.33	46.10	49
#10	0.079	2.00	14.76	60.86	33
#20	0.033	0.84	8.57	69.43	24
#40	0.017	0.42	5.92	75.35	17
#60	0.010	0.25	4.00	79.35	13
#100	0.006	0.15	2.69	82.04	10
#200	0.003	0.07	2.46	84.50	7
Pan			6.63	91.13	0

Total Dry Weight of Sample = 100.13

D85 : 19.8546 mm
D60 : 7.3525 mm
D50 : 4.8665 mm
D30 : 1.4872 mm
D15 : 0.3194 mm
D10 : 0.1497 mm

Soil Classification
ASTM Group Symbol : N/A
ASTM Group Name : N/A
AASHTO Group Symbol : A-1-a(0)
AASHTO Group Name : Stone Fragments, Gravel and Sand

	Boring No. : FB-16 Sample No.: S-1 (3-5) Test Method ASTM D 422 Filename : FB16S1	Project : New Bedford Harbor Superfund Site Project No.: GTX-2409 Location: New Bedford, MA Date : Thu Nov 18 1999



Classification :

Remarks :

Visual Description :
Moist, very dark gray organic silt with sand

Figure 11

GEOTECHNICAL LABORATORY TEST DATA

Project : New Bedford Harbor Superfund Site
Project No. : GTX-2409
Boring No. : FB-16
Sample No. : S-1 (3-5)
Location : New Bedford, MA
Soil Description : Moist, very dark gray organic silt with sand
Remarks : ---

Depth : 3-5 ft
Test Date : 11/03/99
Test Method : ASTM D 422

Filename : FB16S1
Elevation : ---
Tested by : gsg
Checked by : gtt

HYDROMETER

Hydrometer ID : 257525
Weight of air-dried soil = 28.69 gm
Specific Gravity = 2.7

Hydroscopic Moisture Content :
Weight of Wet Soil = 0 gm
Weight of Dry Soil = 0 gm
Moisture Content = 0

Elapsed Time (min)	Reading	Temperature (deg. C)	Corrected Reading	Particle Size (mm)	Percent Finer (%)	Adjusted Particle Size
1.00	25.00	20.50	20.84	0.047	68	0.047
2.00	23.50	20.50	19.34	0.033	63	0.033
4.00	22.00	20.50	17.84	0.024	58	0.024
8.00	21.00	20.50	16.84	0.017	55	0.017
15.00	19.50	20.50	15.34	0.012	50	0.012
30.00	16.50	20.50	12.34	0.009	40	0.009
60.00	15.50	20.50	11.34	0.006	37	0.006
121.00	14.00	21.00	10.00	0.005	33	0.005
240.00	12.50	21.00	8.50	0.003	28	0.003
1528.00	10.50	20.50	6.34	0.001	21	0.001

FINE SIEVE SET

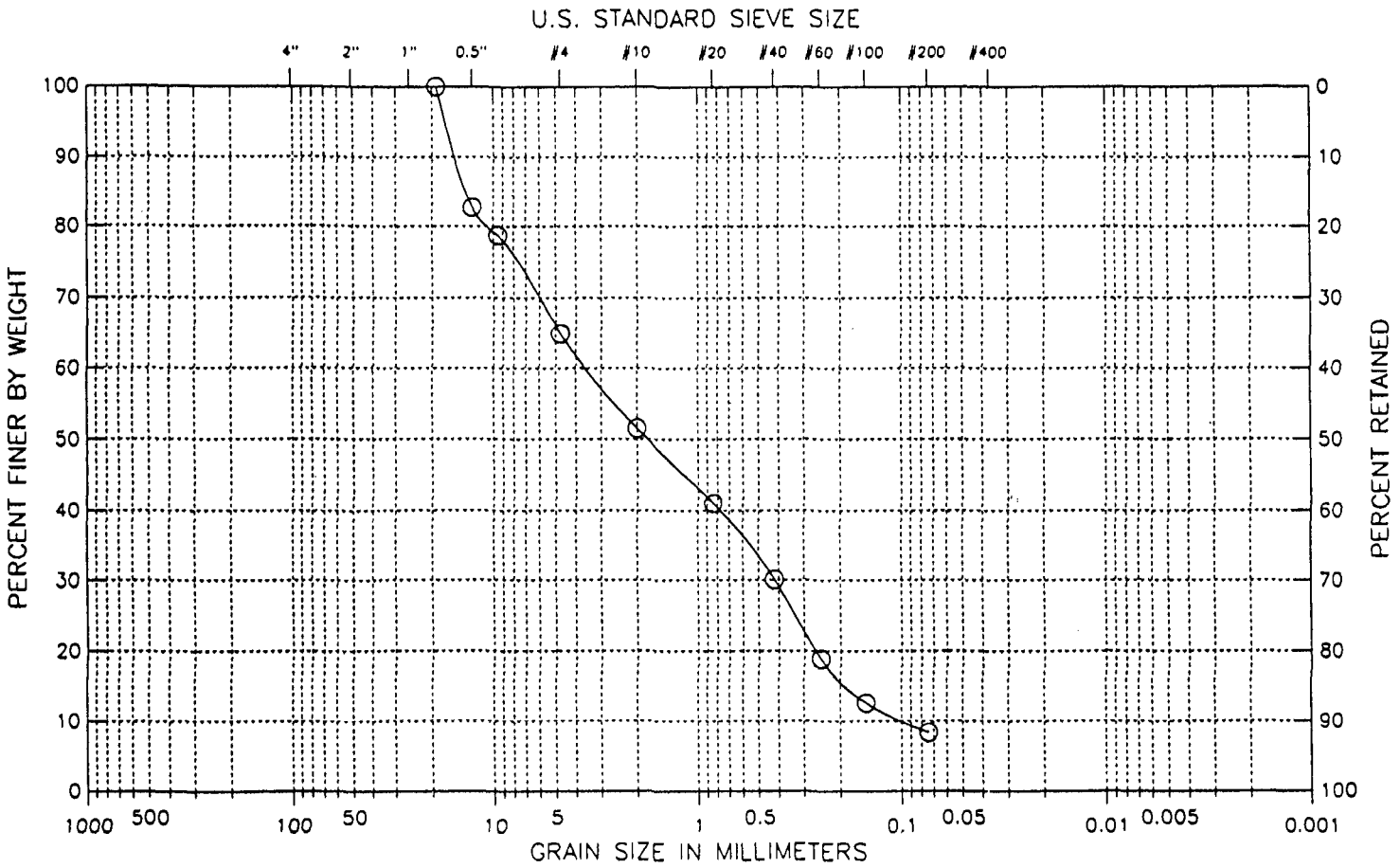
Sieve Mesh	Sieve Openings Inches	Millimeters	Weight Retained (gm)	Cumulative Weight Retained (gm)	Percent Finer (%)
0.375"	0.374	9.51	0.00	0.00	100
#4	0.187	4.75	1.30	1.30	96
#10	0.079	2.00	0.23	1.53	95
#20	0.033	0.84	0.47	2.00	93
#40	0.017	0.42	0.83	2.83	91
#60	0.010	0.25	1.35	4.18	86
#100	0.006	0.15	1.43	5.61	81
#200	0.003	0.07	2.11	7.72	74
Pan			22.50	30.22	0

Total Dry Weight of Sample = 39.24

D85 : 0.2200 mm
D60 : 0.0264 mm
D50 : 0.0124 mm
D30 : 0.0037 mm
D15 : N/A
D10 : N/A

Soil Classification
ASTM Group Symbol : N/A
ASTM Group Name : N/A
AASHTO Group Symbol : A-4(0)
AASHTO Group Name : Silty Soils

Boring No. : FB-16 Sample No.: S-7 (15-17) Test Method ASTM D 422 Filename : FB16S7	Project : New Bedford Harbor Superfund Site Project No.: GTX-2409 Location: New Bedford, MA Date : Thu Nov 18 1999



Classification :

Remarks :
Hydrometer not required, fines < 15%

Visual Description :
Moist, brown sand with gravel, some silt

Figure 12

GEOTECHNICAL LABORATORY TEST DATA

Project : New Bedford Harbor Superfund Site
Project No. : GTX-2409
Boring No. : FB-16
Sample No. : S-7 (15-17)
Location : New Bedford, MA
Soil Description : Moist, brown sand with gravel, some silt
Remarks : Hydrometer not required, fines < 15%

Depth : 15-17 ft
Test Date : 11/03/99
Test Method : ASTM D 422

Filename : FB16S7
Elevation : ---
Tested by : gsg
Checked by : gtt

FINE SIEVE SET

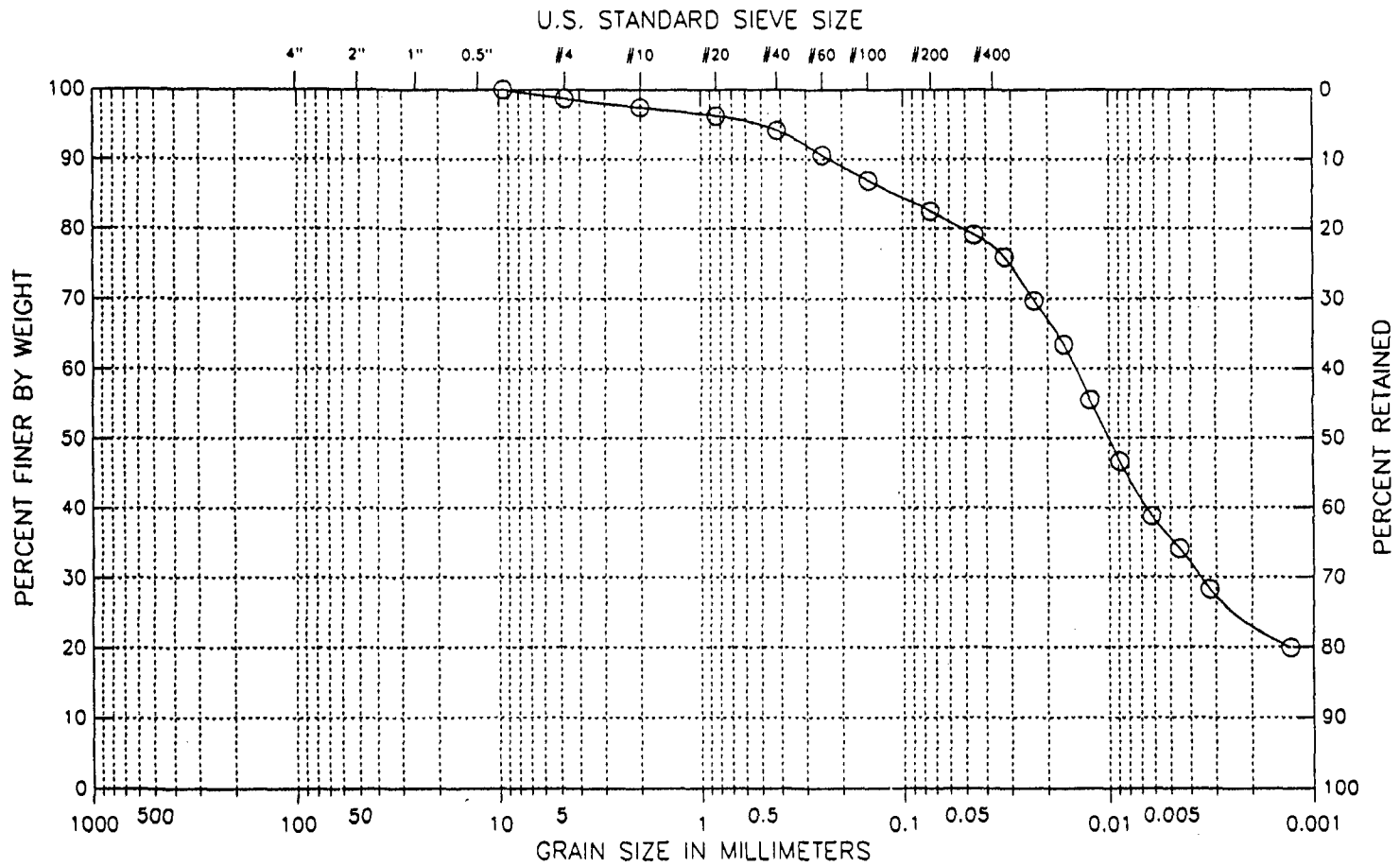
Sieve Mesh	Sieve Openings Inches	Sieve Openings Millimeters	Weight Retained (gm)	Cumulative Weight Retained (gm)	Percent Finer (%)
0.75"	0.748	19.00	0.00	0.00	100
0.5"	0.500	12.70	24.88	24.88	83
0.375"	0.374	9.51	5.81	30.69	79
#4	0.187	4.75	19.85	50.54	65
#10	0.079	2.00	19.31	69.85	51
#20	0.033	0.84	15.05	84.90	41
#40	0.017	0.42	15.78	100.68	30
#60	0.010	0.25	16.13	116.81	19
#100	0.006	0.15	9.08	125.89	13
#200	0.003	0.07	6.16	132.05	8
Pan			11.94	143.99	0

Total Dry Weight of Sample = 153.01

D85 : 13.3930 mm
D60 : 3.4628 mm
D50 : 1.7677 mm
D30 : 0.4185 mm
D15 : 0.1819 mm
D10 : 0.0979 mm

Soil Classification
ASTM Group Symbol : N/A
ASTM Group Name : N/A
AASHTO Group Symbol : A-1-b(0)
AASHTO Group Name : Stone Fragments, Gravel and Sand

Boring No. : FB-17 Sample No.: S-2 (7-9) Test Method ASTM D 422 Filename : FB17S2	Project : New Bedford Harbor Superfund Site Project No.: GTX-2409 Location: New Bedford, MA Date : Thu Nov 18 1999



Classification :

Remarks :

Visual Description :
Moist, dark gray organic silt with sand

Figure 13

GEOTECHNICAL LABORATORY TEST DATA

Project : New Bedford Harbor Superfund Site
Project No. : GTX-2409
Boring No. : FB-17
Sample No. : S-2 (7-9)
Location : New Bedford, MA
Soil Description : Moist, dark gray organic silt with sand
Remarks : ---

Depth : 7-9 ft
Test Date : 11/03/99
Test Method : ASTM D 422

Filename : FB17S2
Elevation : ---
Tested by : gsg
Checked by : gtt

HYDROMETER

Hydrometer ID : 257525
Weight of air-dried soil = 30.73 gm
Specific Gravity = 2.7

Hydroscopic Moisture Content :
Weight of Wet Soil = 0 gm
Weight of Dry Soil = 0 gm
Moisture Content = 0

Elapsed Time (min)	Reading	Temperature (deg. C)	Corrected Reading	Particle Size (mm)	Percent Finer (%)	Adjusted Particle Size
1.00	29.50	20.00	25.18	0.046	79	0.046
2.00	28.50	20.00	24.18	0.032	76	0.032
4.00	26.50	20.00	22.18	0.023	70	0.023
8.00	24.50	20.00	20.18	0.017	63	0.017
15.00	22.00	20.00	17.68	0.012	56	0.012
30.00	19.00	20.50	14.84	0.009	47	0.009
63.00	16.50	20.50	12.34	0.006	39	0.006
120.00	15.00	20.50	10.84	0.005	34	0.005
240.00	13.00	21.00	9.00	0.003	28	0.003
1555.00	10.50	20.50	6.34	0.001	20	0.001

FINE SIEVE SET

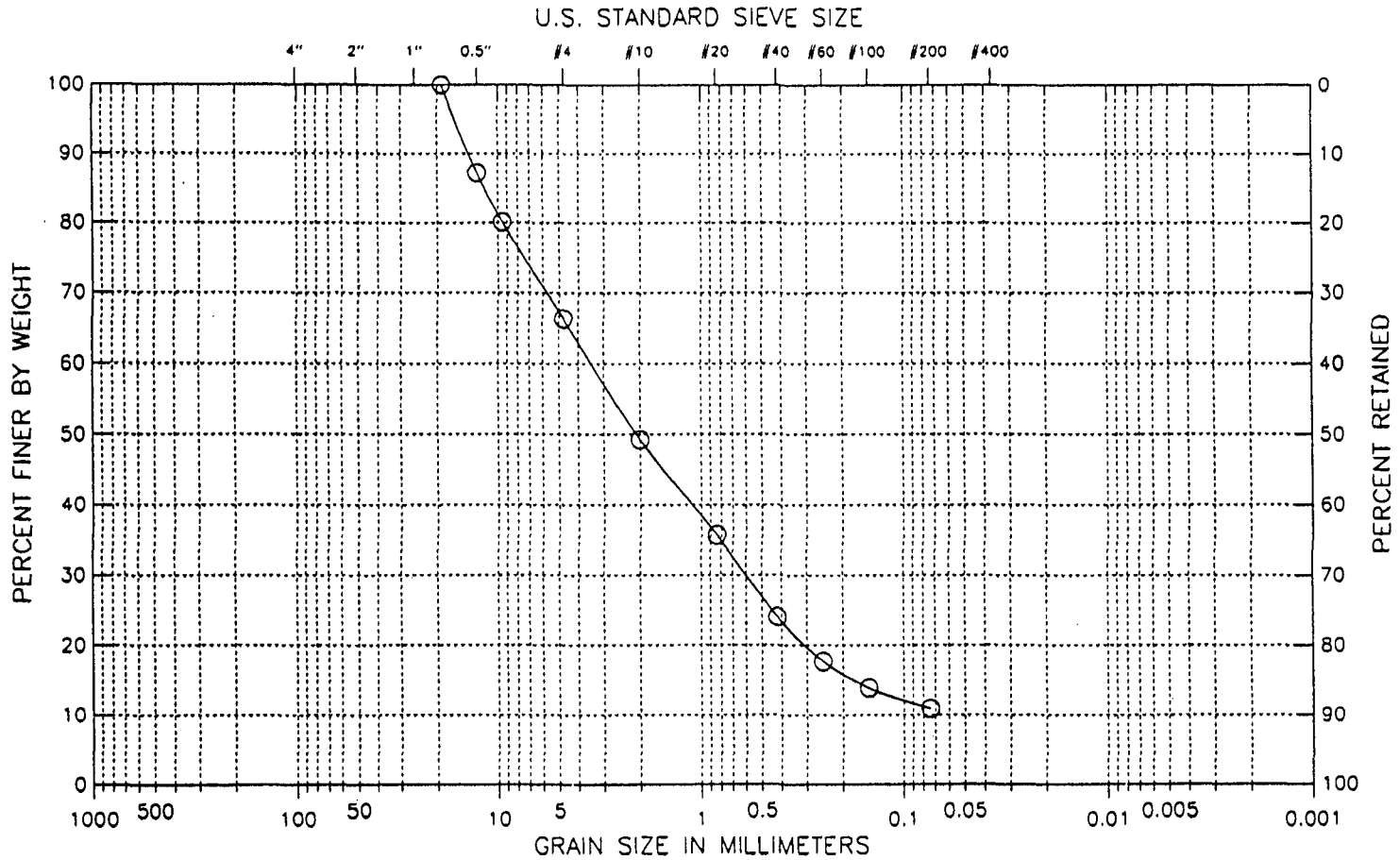
Sieve Mesh	Sieve Openings Inches	Millimeters	Weight Retained (gm)	Cumulative Weight Retained (gm)	Percent Finer (%)
0.375"	0.374	9.51	0.00	0.00	100
#4	0.187	4.75	0.41	0.41	99
#10	0.079	2.00	0.40	0.81	97
#20	0.033	0.84	0.38	1.19	96
#40	0.017	0.42	0.66	1.85	94
#60	0.010	0.25	1.11	2.96	91
#100	0.006	0.15	1.15	4.11	87
#200	0.003	0.07	1.40	5.51	83
Pan			26.02	31.53	0

Total Dry Weight of Sample = 40.61

D85 : 0.1093 mm
D60 : 0.0146 mm
D50 : 0.0100 mm
D30 : 0.0036 mm
D15 : N/A
D10 : N/A

Soil Classification
ASTM Group Symbol : N/A
ASTM Group Name : N/A
AASHTO Group Symbol : A-4(0)
AASHTO Group Name : Silty Soils

Boring No. : FB-17 Sample No.: S-5 (19-21) Test Method ASTM D 422 Filename : FB17S5	Project : New Bedford Harbor Superfund Site Project No.: GTX-2409 Location: New Bedford, MA Date : Thu Nov 18 1999



COBBLES	GRAVEL		SAND			SILT OR CLAY
	COARSE	FINE	COARSE	MEDIUM	FINE	

Classification :

Remarks :
Hydrometer not required, fines < 15%

Visual Description :
Moist, grayish brown sand with gravel and silt

Figure 14

GEOTECHNICAL LABORATORY TEST DATA

Project : New Bedford Harbor Superfund Site
Project No. : GTX-2409
Boring No. : FB-17
Sample No. : S-5 (19-21)
Location : New Bedford, MA
Soil Description : Moist, grayish brown sand with gravel and silt
Remarks : Hydrometer not required, fines < 15%

Depth : 19-21 ft
Test Date : 11/03/99
Test Method : ASTM D 422

Filename : FB17S5
Elevation : ---
Tested by : gsg
Checked by : gtt

FINE SIEVE SET

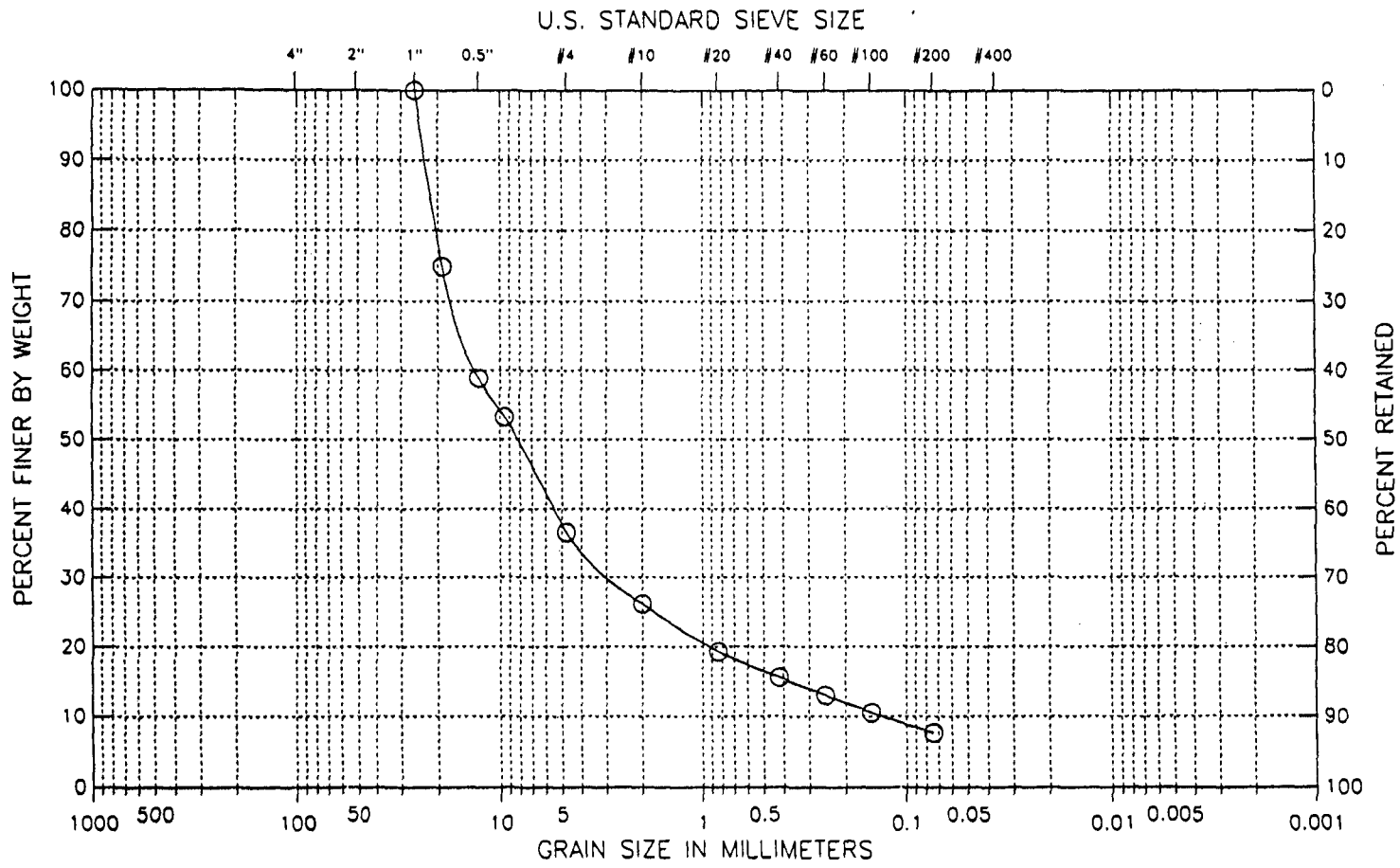
Sieve Mesh	Sieve Openings Inches	Sieve Openings Millimeters	Weight Retained (gm)	Cumulative Weight Retained (gm)	Percent Finer (%)
0.75"	0.748	19.00	0.00	0.00	100
0.5"	0.500	12.70	12.53	12.53	87
0.375"	0.374	9.51	6.94	19.47	80
#4	0.187	4.75	13.51	32.98	66
#10	0.079	2.00	16.74	49.72	49
#20	0.033	0.84	13.29	63.01	36
#40	0.017	0.42	11.43	74.44	24
#60	0.010	0.25	6.17	80.61	18
#100	0.006	0.15	3.76	84.37	14
#200	0.003	0.07	2.95	87.32	11
Pan			10.67	97.99	0

Total Dry Weight of Sample = 107.01

D85 : 11.6025 mm
D60 : 3.4451 mm
D50 : 2.0763 mm
D30 : 0.5991 mm
D15 : 0.1728 mm
D10 : 0.0602 mm

Soil Classification
ASTM Group Symbol : N/A
ASTM Group Name : N/A
AASHTO Group Symbol : A-1-a(0)
AASHTO Group Name : Stone Fragments, Gravel and Sand

Boring No. : FB-26 Sample No.: S-3 (25-27) Test Method ASTM D 422 Filename : FB26S3	Project : New Bedford Horbor Superfund Site Project No.: GTX-2409 Location: New Bedford, MA Date : Thu Nov 18 1999



COBBLES	GRAVEL		SAND			SILT OR CLAY
	COARSE	FINE	COARSE	MEDIUM	FINE	

Classification :

Remarks :
Hydrometer not required, fines < 15%

Visual Description :
Moist, brown sand with gravel, some silt

Figure 15

GEOTECHNICAL LABORATORY TEST DATA

Project : New Bedford Harbor Superfund Site
Project No. : GTX-2409
Boring No. : FB-26
Sample No. : S-3 (25-27)
Location : New Bedford, MA
Soil Description : Moist, brown sand with gravel, some silt
Remarks : Hydrometer not required, fines < 15%

Depth : 25-27 ft
Test Date : 11/03/99
Test Method : ASTM D 422

Filename : FB26S3
Elevation : ---
Tested by : gsg
Checked by : gtt

FINE SIEVE SET

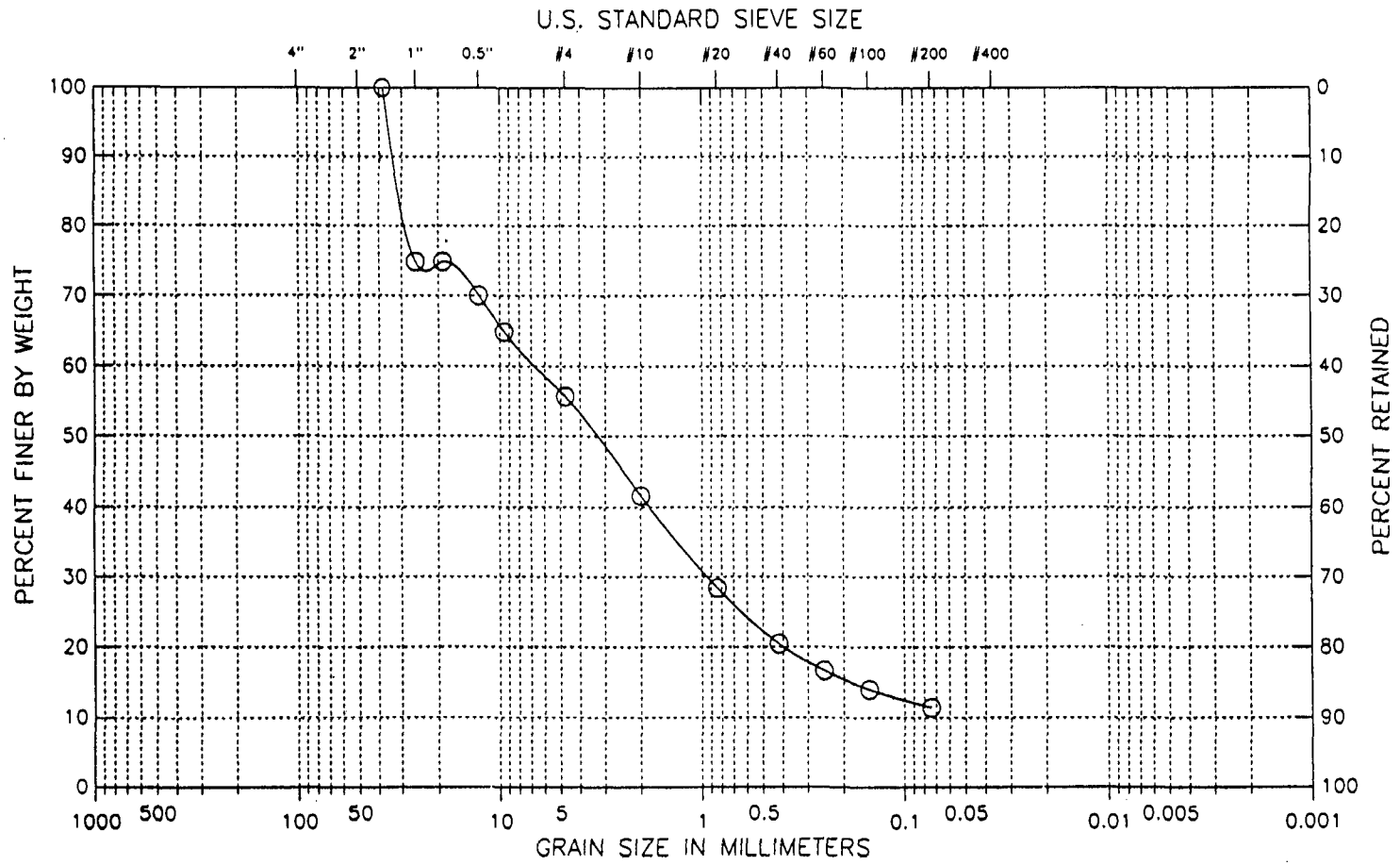
Sieve Mesh	Sieve Openings Inches	Sieve Openings Millimeters	Weight Retained (gm)	Cumulative Weight Retained (gm)	Percent Finer (%)
1"	1.012	25.70	0.00	0.00	100
0.75"	0.748	19.00	30.81	30.81	75
0.5"	0.500	12.70	19.66	50.47	59
0.375"	0.374	9.51	6.89	57.36	53
#4	0.187	4.75	20.45	77.81	37
#10	0.079	2.00	12.84	90.65	26
#20	0.033	0.84	8.37	99.02	19
#40	0.017	0.42	4.57	103.59	16
#60	0.010	0.25	3.15	106.74	13
#100	0.006	0.15	3.05	109.79	11
#200	0.003	0.07	3.55	113.34	8
Pan			9.37	122.71	0

Total Dry Weight of Sample = 132

D85 : 21.4567 mm
D60 : 13.0658 mm
D50 : 8.3039 mm
D30 : 2.7548 mm
D15 : 0.3734 mm
D10 : 0.1311 mm

Soil Classification
ASTM Group Symbol : N/A
ASTM Group Name : N/A
AASHTO Group Symbol : A-1-a(0)
AASHTO Group Name : Stone Fragments, Gravel and Sand

Boring No. : FB-26 Sample No.: S-4 (30-32) Test Method ASTM D 422 Filename : FB26S4	Project : New Bedford Harbor Superfund Site Project No.: GTX-2409 Location: New Bedford, MA Date : Thu Nov 18 1999



COBBLES	GRAVEL		SAND			SILT OR CLAY
	COARSE	FINE	COARSE	MEDIUM	FINE	

Classification :

Remarks :
Hydrometer not required, fines < 15%

Visual Description :
Moist, light brown sand with gravel and silt

Figure 16

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GEOTECHNICAL LABORATORY TEST DATA

Project : New Bedford Harbor Superfund Site
Project No. : GTX-2409
Boring No. : FB-26
Sample No. : S-4 (30-32)
Location : New Bedford, MA
Soil Description : Moist, light brown sand with gravel and silt
Remarks : Hydrometer not required, fines < 15%

Depth : 30-32 ft
Test Date : 11/03/99
Test Method : ASTM D 422

Filename : FB26S4
Elevation : ---
Tested by : gsg
Checked by : gtt

FINE SIEVE SET

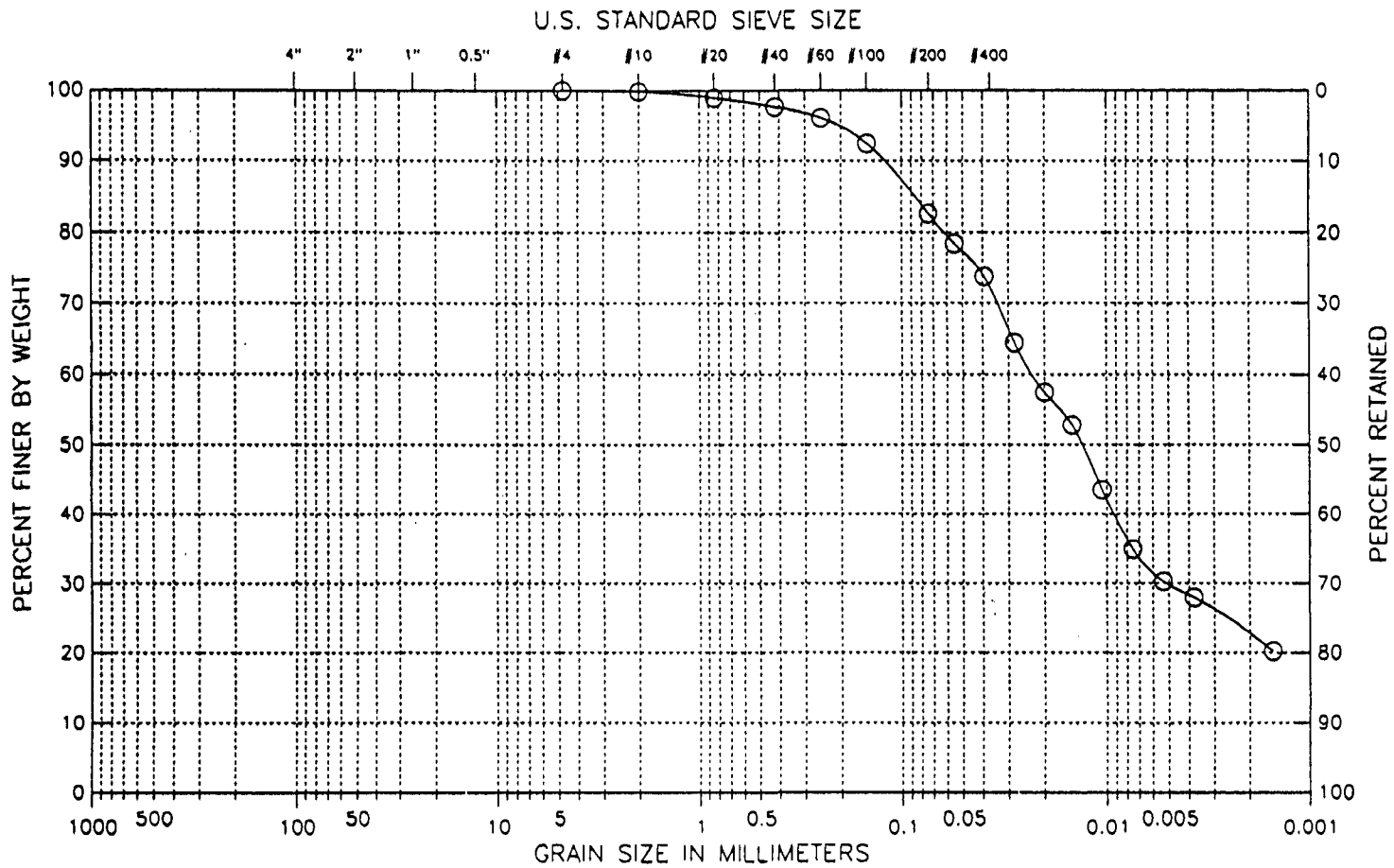
Sieve Mesh	Sieve Openings Inches	Sieve Openings Millimeters	Weight Retained (gm)	Cumulative Weight Retained (gm)	Percent Finer (%)
1.5"	1.500	38.10	0.00	0.00	100
1"	1.012	25.70	33.38	33.38	75
0.75"	0.748	19.00	0.00	33.38	75
0.5"	0.500	12.70	6.42	39.80	70
0.375"	0.374	9.51	6.86	46.66	65
#4	0.187	4.75	12.20	58.86	56
#10	0.079	2.00	18.71	77.57	42
#20	0.033	0.84	17.58	95.15	28
#40	0.017	0.42	10.56	105.71	20
#60	0.010	0.25	5.05	110.76	17
#100	0.006	0.15	3.50	114.26	14
#200	0.003	0.07	3.45	117.71	11
Pan			15.15	132.86	0

Total Dry Weight of Sample = 141.88

D85 : 30.1188 mm
D60 : 6.5758 mm
D50 : 3.3474 mm
D30 : 0.9349 mm
D15 : 0.1814 mm
D10 : 0.0507 mm

Soil Classification
ASTM Group Symbol : N/A
ASTM Group Name : N/A
AASHTO Group Symbol : A-1-a(0)
AASHTO Group Name : Stone Fragments, Gravel and Sand

Boring No. : FB-27 Sample No.: UO-1 (0-2) Test Method ASTM D 422 Filename : FB27U01	Project : New Bedford Harbor Superfund Site Project No.: GTX-2409 Location: New Bedford, MA Date : Thu Nov 18 1999



Classification :
(OH) organic silt with sand
Visual Description :
Moist, black organic silt with sand

Remarks :

Figure 17

GEOTECHNICAL LABORATORY TEST DATA

Project : New Bedford Harbor Superfund Site
Project No. : GTX-2409
Boring No. : FB-27
Sample No. : UO-1 (0-2)
Location : New Bedford, MA
Soil Description : Moist, black organic silt with sand
Remarks : ---

Depth : 0-2 ft
Test Date : 11/05/99
Test Method : ASTM D 422

Filename : FB27UO1
Elevation : ---
Tested by : gsg
Checked by : gtt

HYDROMETER

Hydrometer ID : 257525
Weight of air-dried soil = 23.13 gm
Specific Gravity = 2.28

Hydroscopic Moisture Content :
Weight of Wet Soil = 0 gm
Weight of Dry Soil = 0 gm
Moisture Content = 0

Elapsed Time (min)	Reading	Temperature (deg. C)	Corrected Reading	Particle Size (mm)	Percent Finer (%)	Adjusted Particle Size
1.00	21.00	20.50	16.84	0.055	78	0.055
2.00	20.00	20.50	15.84	0.039	74	0.039
4.00	18.00	20.50	13.84	0.028	64	0.028
8.00	16.50	20.50	12.34	0.020	57	0.020
15.00	15.50	20.50	11.34	0.015	53	0.015
30.00	13.50	20.50	9.34	0.011	43	0.011
60.00	11.50	21.00	7.50	0.007	35	0.007
120.00	10.50	21.00	6.50	0.005	30	0.005
240.00	10.00	21.00	6.00	0.004	28	0.004
1492.00	8.50	20.50	4.34	0.002	20	0.002

FINE SIEVE SET

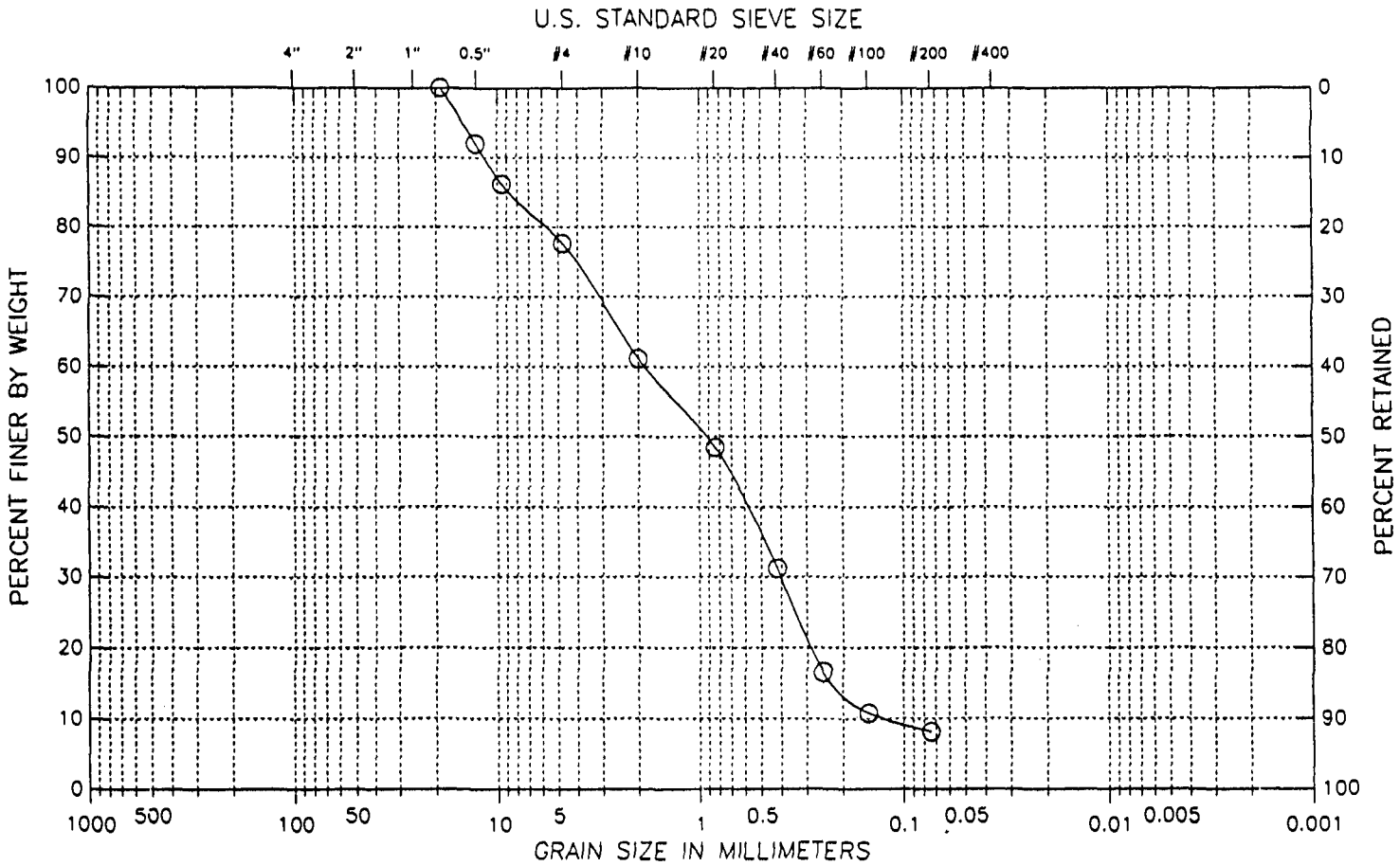
Sieve Mesh	Sieve Openings Inches	Sieve Openings Millimeters	Weight Retained (gm)	Cumulative Weight Retained (gm)	Percent Finer (%)
#4	0.187	4.75	0.00	0.00	100
#10	0.079	2.00	0.03	0.03	100
#20	0.033	0.84	0.19	0.22	99
#40	0.017	0.42	0.27	0.49	98
#60	0.010	0.25	0.34	0.83	96
#100	0.006	0.15	0.77	1.60	92
#200	0.003	0.07	2.07	3.67	83
Pan			17.49	21.16	0

Total Dry Weight of Sample = 30.31

D85 : 0.0875 mm
D60 : 0.0227 mm
D50 : 0.0133 mm
D30 : 0.0051 mm
D15 : N/A
D10 : N/A

Soil Classification
ASTM Group Symbol : OH
ASTM Group Name : organic silt with sand
AASHTO Group Symbol : A-7-5(45)
AASHTO Group Name : Clayey Soils

Boring No. : FB-29 Sample No.: S-1 (14-16) Test Method ASTM D 422 Filename : FB29S1	Project : New Bedford Harbor Superfund Site Project No.: GTX-2409 Location: New Bedford, MA Date : Thu Nov 18 1999



COBBLES	GRAVEL		SAND			SILT OR CLAY
	COARSE	FINE	COARSE	MEDIUM	FINE	

Classification :

Remarks :
Hydrometer not required, fines < 15%

Visual Description :
Moist, grayish brown sand with gravel and silt

Figure 18

GEOTECHNICAL LABORATORY TEST DATA

Project : New Bedford Harbor Superfund Site
Project No. : GTX-2409 Depth : 14-16 ft
Boring No. : FB-29 Test Date : 11/03/99
Sample No. : S-1 (14-16) Test Method : ASTM D 422
Location : New Bedford, MA
Soil Description : Moist, grayish brown sand with gravel and silt
Remarks : Hydrometer not required, fines < 15%

Filename : FB29S1
Elevation : ---
Tested by : gsg
Checked by : gtt

FINE SIEVE SET

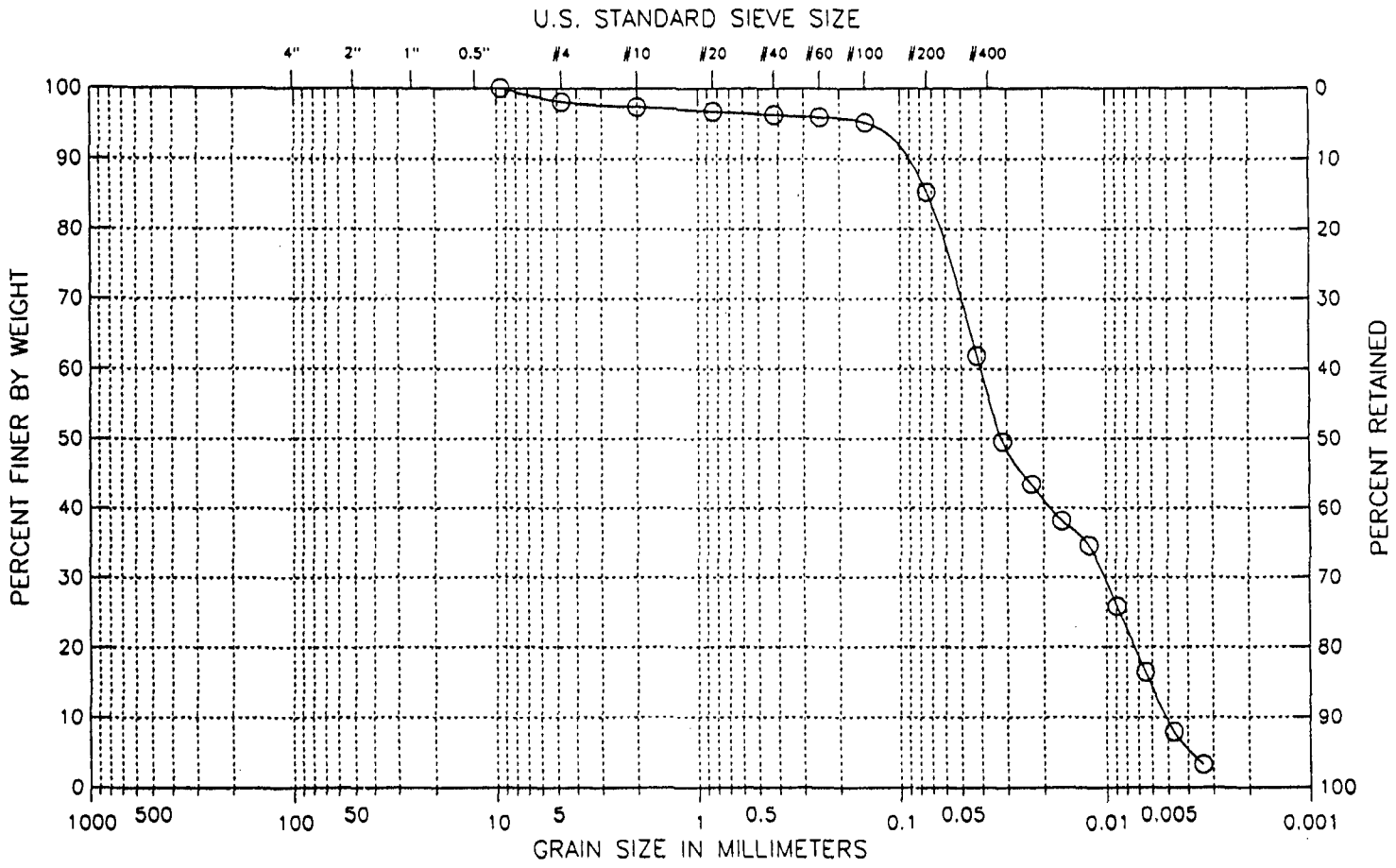
Sieve Mesh	Sieve Openings Inches	Sieve Openings Millimeters	Weight Retained (gm)	Cumulative Weight Retained (gm)	Percent Finer (%)
0.75"	0.748	19.00	0.00	0.00	100
0.5"	0.500	12.70	9.08	9.08	92
0.375"	0.374	9.51	6.52	15.60	86
#4	0.187	4.75	9.72	25.32	78
#10	0.079	2.00	18.78	44.10	61
#20	0.033	0.84	14.40	58.50	48
#40	0.017	0.42	19.57	78.07	31
#60	0.010	0.25	16.61	94.68	17
#100	0.006	0.15	6.54	101.22	11
#200	0.003	0.07	3.02	104.24	8
Pan			9.19	113.43	0

Total Dry Weight of Sample = 122.48

D85 : 8.5962 mm
D60 : 1.8527 mm
D50 : 0.9363 mm
D30 : 0.4029 mm
D15 : 0.2179 mm
D10 : 0.1219 mm

Soil Classification
ASTM Group Symbol : N/A
ASTM Group Name : N/A
AASHTO Group Symbol : A-1-b(0)
AASHTO Group Name : Stone Fragments, Gravel and Sand

Boring No. : FB-29 Sample No.: S-4A (30-32) Test Method ASTM D 422 Filename : FB29S4A	Project : New Bedford Harbor Superfund Site Project No.: GTX-2409 Location: New Bedford, MA Date : Thu Nov 18 1999



COBBLES	GRAVEL		SAND			SILT OR CLAY
	COARSE	FINE	COARSE	MEDIUM	FINE	

Classification :

Remarks :

Visual Description :
Moist, light brown silt with sand

Figure 19

GEOTECHNICAL LABORATORY TEST DATA

Project : New Bedford Harbor Superfund Site
Project No. : GTX-2409 Depth : 30-32 ft
Boring No. : FB-29 Test Date : 11/03/99
Sample No. : S-4A (30-32) Test Method : ASTM D 422
Location : New Bedford, MA
Soil Description : Moist, light brown silt with sand
Remarks : ---

Filename : FB29S4A
Elevation : ---
Tested by : gsg
Checked by : gtt

HYDROMETER

Hydrometer ID : 257525
Weight of air-dried soil = 54.86 gm
Specific Gravity = 2.7

Hydroscopic Moisture Content :
Weight of Wet Soil = 0 gm
Weight of Dry Soil = 0 gm
Moisture Content = 0

Elapsed Time (min)	Reading	Temperature (deg. C)	Corrected Reading	Particle Size (mm)	Percent Finer (%)	Adjusted Particle Size
1.00	39.50	20.00	35.18	0.042	62	0.042
2.00	32.50	20.00	28.18	0.031	50	0.031
4.00	29.00	20.00	24.68	0.023	43	0.023
8.00	26.00	20.00	21.68	0.016	38	0.016
15.00	24.00	20.00	19.68	0.012	35	0.012
30.00	19.00	20.00	14.68	0.009	26	0.009
60.00	13.50	20.50	9.34	0.006	16	0.006
120.00	8.50	21.00	4.50	0.005	8	0.005
240.00	6.00	20.50	1.84	0.003	3	0.003

FINE SIEVE SET

Sieve Mesh	Sieve Openings Inches	Sieve Openings Millimeters	Weight Retained (gm)	Cumulative Weight Retained (gm)	Percent Finer (%)
0.375"	0.374	9.51	0.00	0.00	100
#4	0.187	4.75	1.08	1.08	98
#10	0.079	2.00	0.41	1.49	97
#20	0.033	0.84	0.36	1.85	97
#40	0.017	0.42	0.27	2.12	96
#60	0.010	0.25	0.17	2.29	96
#100	0.006	0.15	0.43	2.72	95
#200	0.003	0.07	5.54	8.26	85
Pan			48.09	56.35	0

Total Dry Weight of Sample = 65.6

D85 : 0.0734 mm
D60 : 0.0403 mm
D50 : 0.0318 mm
D30 : 0.0104 mm
D15 : 0.0061 mm
D10 : 0.0051 mm

Soil Classification
ASTM Group Symbol : N/A
ASTM Group Name : N/A
AASHTO Group Symbol : A-4(0)
AASHTO Group Name : Silty Soils

H

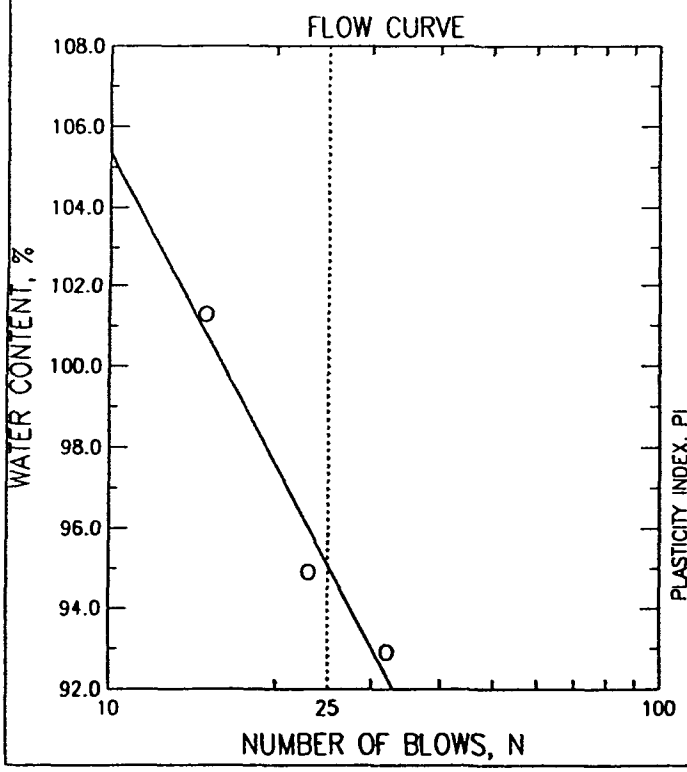
APPENDIX H

Atterberg Limits Results

ATTERBERG LIMITS

PROJECT	PROJECT NUMBER	TESTED BY	BORING NUMBER
New Bedford Harbor Superfund Site	GTX-2409	gsg	FB-4
LOCATION		CHECKED BY	SAMPLE NUMBER
New Bedford, MA		gtt	U0-5 (11-13)
SAMPLE DESCRIPTION		DATE	FILENAME
Moist, dark gray organic silt		Thu Nov 18 1999	FB4U05

LIQUID LIMIT DETERMINATIONS					
CONTAINER NUMBER	bk16	bk19	bk14		
WT. WET SOIL + TARE	35.66	35.72	35.52		
WT. DRY SOIL + TARE	32.65	32.55	32.37		
WT. WATER	3.01	3.17	3.15		
TARE WT.	29.41	29.21	29.26		
WT. DRY SOIL	3.24	3.34	3.11		
WATER CONTENT, W_N (%)	92.90	94.91	101.29		
NUMBER OF BLOWS, N	32	23	15		
ONE-POINT LIQUID LIMIT, LL	95.72	93.96	95.22		
PLASTIC LIMIT DETERMINATIONS					
CONTAINER NUMBER	bk136	bk126			
WT. WET SOIL + TARE	34.07	32.22			
WT. DRY SOIL + TARE	32.76	31.04			
WT. WATER	1.31	1.18			
TARE WT.	29.57	28.15			
WT. DRY SOIL	3.19	2.89			
WATER CONTENT (%)	41.07	40.83			



SUMMARY OF RESULTS	
NATURAL WATER CONTENT, W (%)	88.7
LIQUID LIMIT, LL	95.1
PLASTIC LIMIT, PL	40.9
PLASTICITY INDEX, PI	54.1
LIQUIDITY INDEX, LI*	0.88

*LI = (W - PL)/PI

PLASTICITY CHART

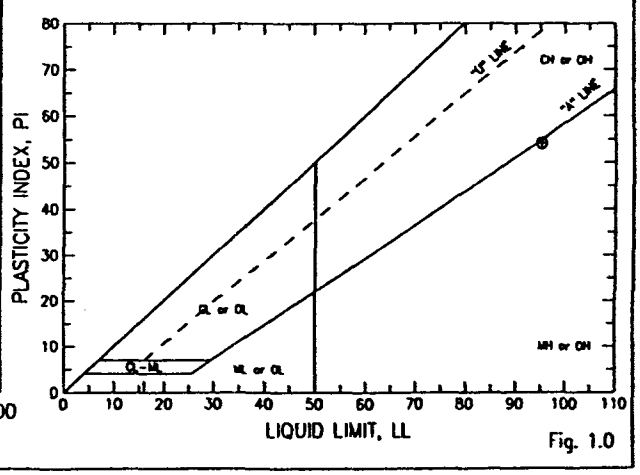
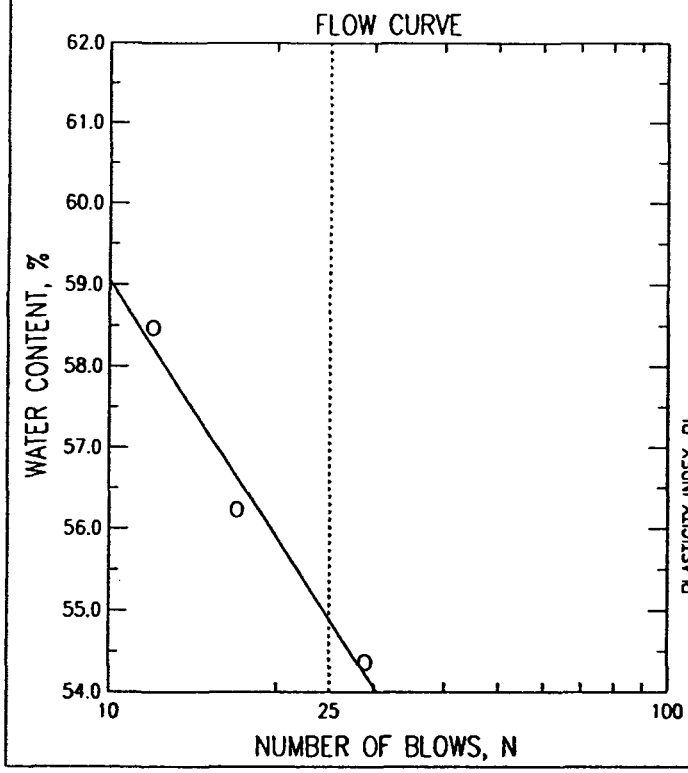


Fig. 1.0

ATTERBERG LIMITS

PROJECT	PROJECT NUMBER	TESTED BY	BORING NUMBER
New Bedford Harbor Superfund Site	GTX-2409	gsg	FB-11
LOCATION		CHECKED BY	SAMPLE NUMBER
New Bedford, MA		gtt	U0-4 (9-11)
SAMPLE DESCRIPTION		DATE	FILENAME
Moist, dark gray organic silt		Thu Nov 18 1999	FB11U04

LIQUID LIMIT DETERMINATIONS					
CONTAINER NUMBER	bk92	bk105	bk68		
WT. WET SOIL + TARE	35.7	35.86	36.68		
WT. DRY SOIL + TARE	33.46	33.72	34.47		
WT. WATER	2.24	2.14	2.21		
TARE WT.	29.34	30.06	30.54		
WT. DRY SOIL	4.12	3.66	3.93		
WATER CONTENT, W_N (%)	54.37	58.47	56.23		
NUMBER OF BLOWS, N	29	12	17		
ONE-POINT LIQUID LIMIT, LL	55.35	53.50	53.67		
PLASTIC LIMIT DETERMINATIONS					
CONTAINER NUMBER	bk110	bk123			
WT. WET SOIL + TARE	36.41	35.7			
WT. DRY SOIL + TARE	34.63	34.38			
WT. WATER	1.78	1.32			
TARE WT.	28.05	29.53			
WT. DRY SOIL	6.58	4.85			
WATER CONTENT (%)	27.05	27.22			



SUMMARY OF RESULTS	
NATURAL WATER CONTENT, W (%)	33.7
LIQUID LIMIT, LL	54.9
PLASTIC LIMIT, PL	27.1
PLASTICITY INDEX, PI	27.8
LIQUIDITY INDEX, LI*	0.24

*LI = (W - PL)/PI

PLASTICITY CHART

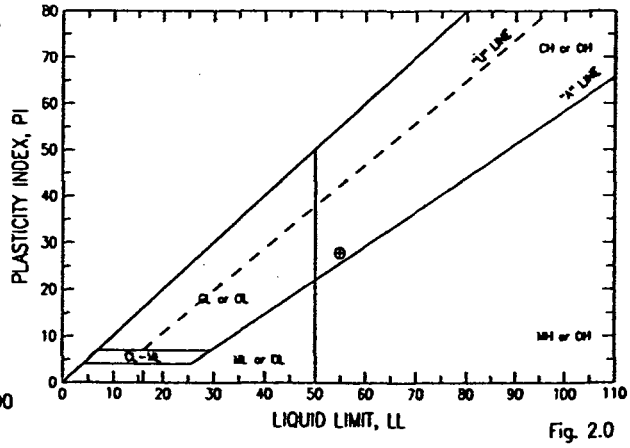


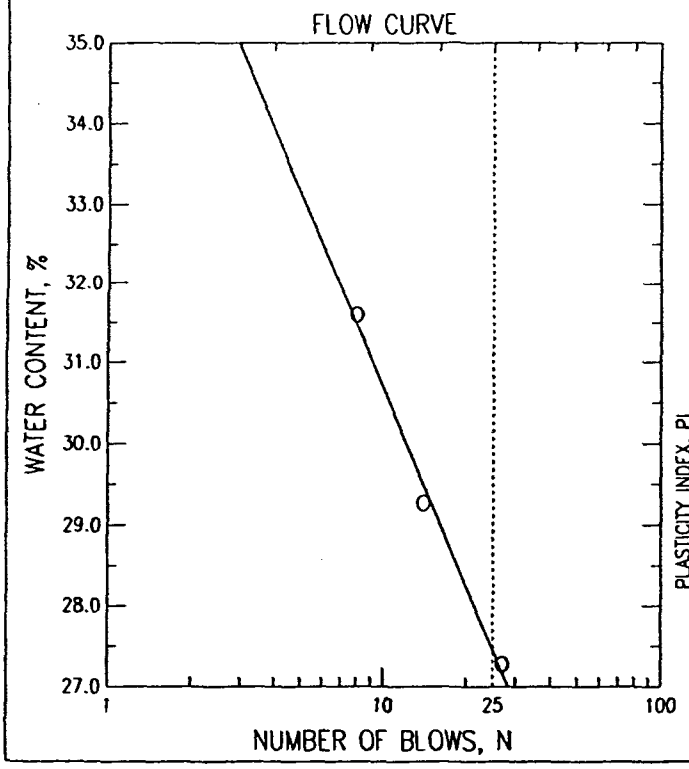
Fig. 2.0

ATTERBERG LIMITS

PROJECT	PROJECT NUMBER	TESTED BY	BORING NUMBER
New Bedford Harbor Superfund Site	GTX-2409	gsg	FB-11
LOCATION		CHECKED BY	SAMPLE NUMBER
New Bedford, MA		gtt	S-2 (17-19)
SAMPLE DESCRIPTION		DATE	FILENAME
Moist, gray silt		Thu Nov 18 1999	FB11S2

LIQUID LIMIT DETERMINATIONS					
CONTAINER NUMBER	bk207	bk14	bk69		
WT. WET SOIL + TARE	41.34	41.22	39.26		
WT. DRY SOIL + TARE	38.76	38.51	37.08		
WT. WATER	2.58	2.71	2.18		
TARE WT.	29.3	29.25	30.18		
WT. DRY SOIL	9.46	9.26	6.9		
WATER CONTENT, W_N (%)	27.27	29.27	31.59		
NUMBER OF BLOWS, N	27	14	8		
ONE-POINT LIQUID LIMIT, LL	27.53	27.28	27.53		

PLASTIC LIMIT DETERMINATIONS					
CONTAINER NUMBER	bk16	bk136			
WT. WET SOIL + TARE	36.9	37.43			
WT. DRY SOIL + TARE	35.38	35.98			
WT. WATER	1.52	1.45			
TARE WT.	29.39	29.58			
WT. DRY SOIL	5.99	6.4			
WATER CONTENT (%)	25.38	22.66			



SUMMARY OF RESULTS	
NATURAL WATER CONTENT, W (%)	34.3
LIQUID LIMIT, LL	27.4
PLASTIC LIMIT, PL	24.0
PLASTICITY INDEX, PI	3.4
LIQUIDITY INDEX, LI*	3.01

*LI = (W − PL)/PI

PLASTICITY CHART

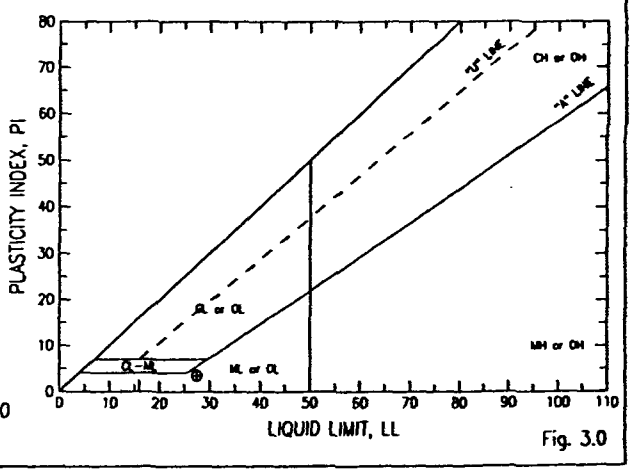
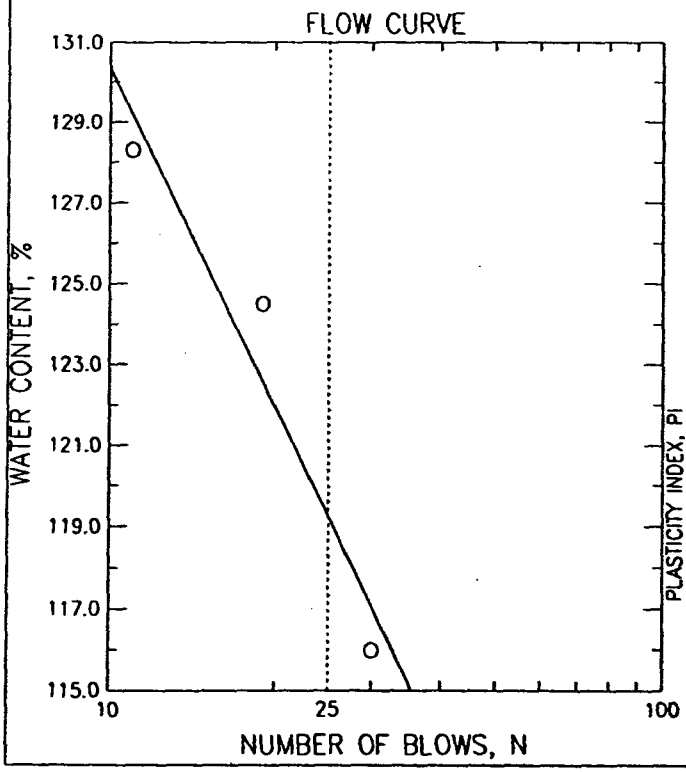


Fig. 3.0

ATTERBERG LIMITS

PROJECT	PROJECT NUMBER	TESTED BY	BORING NUMBER
New Bedford Harbor Superfund Site	GTX-2409	gsg	FB-12
LOCATION		CHECKED BY	SAMPLE NUMBER
New Bedford, MA		gtt	S-1A (8-10)
SAMPLE DESCRIPTION		DATE	FILENAME
Moist, dark gray organic clay with sand		Thu Nov 18 1999	FB12S1A

LIQUID LIMIT DETERMINATIONS					
CONTAINER NUMBER	bk21	bk119	bk3		
WT. WET SOIL + TARE	35.87	33.29	34.99		
WT. DRY SOIL + TARE	32.75	30.19	32.27		
WT. WATER	3.12	3.1	2.72		
TARE WT.	30.06	27.7	30.15		
WT. DRY SOIL	2.69	2.49	2.12		
WATER CONTENT, W_N (%)	115.99	124.50	128.30		
NUMBER OF BLOWS, N	30	19	11		
ONE-POINT LIQUID LIMIT, LL	118.57	120.43	116.17		
PLASTIC LIMIT DETERMINATIONS					
CONTAINER NUMBER	bk99	bk10			
WT. WET SOIL + TARE	34.35	34.2			
WT. DRY SOIL + TARE	32.24	32.67			
WT. WATER	2.11	1.53			
TARE WT.	27.65	29.24			
WT. DRY SOIL	4.59	3.43			
WATER CONTENT (%)	45.97	44.61			



SUMMARY OF RESULTS	
NATURAL WATER CONTENT, W (%)	111.7
LIQUID LIMIT, LL	119.2
PLASTIC LIMIT, PL	45.3
PLASTICITY INDEX, PI	74.0
LIQUIDITY INDEX, LI*	0.90

*LI = (W - PL)/PI

PLASTICITY CHART

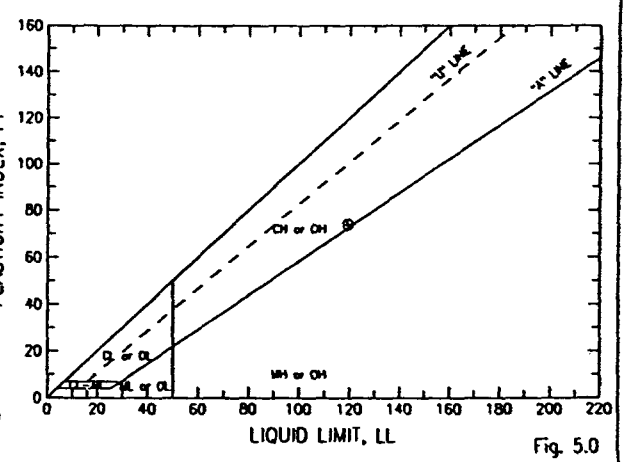
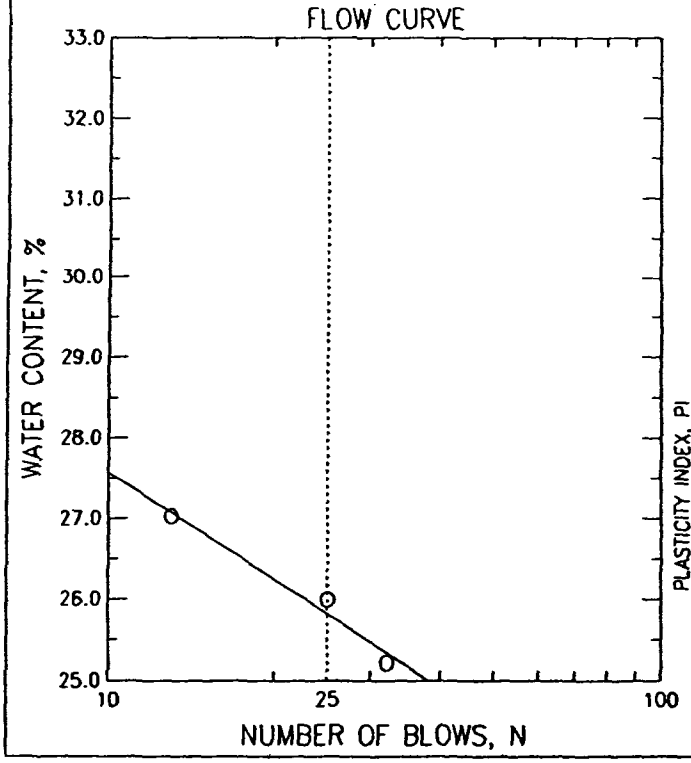


Fig. 5.0

ATTERBERG LIMITS

PROJECT	PROJECT NUMBER	TESTED BY	BORING NUMBER
New Bedford Harbor Superfund Site	GTX-2409	gsg	FB-12
LOCATION		CHECKED BY	SAMPLE NUMBER
New Bedford, MA		gtt	S-2 (13-15)
SAMPLE DESCRIPTION		DATE	FILENAME
Moist, gray silt		Thu Nov 18 1999	FB12S2

LIQUID LIMIT DETERMINATIONS					
CONTAINER NUMBER	bk131	bk144	bk19		
WT. WET SOIL + TARE	41.82	36.97	43.53		
WT. DRY SOIL + TARE	39.47	35.4	40.57		
WT. WATER	2.35	1.57	2.96		
TARE WT.	30.15	29.59	29.18		
WT. DRY SOIL	9.32	5.81	11.39		
WATER CONTENT, W_N (%)	25.21	27.02	25.99		
NUMBER OF BLOWS, N	32	13	25		
ONE-POINT LIQUID LIMIT, LL	25.98	24.97	25.99		
PLASTIC LIMIT DETERMINATIONS					
CONTAINER NUMBER	bk120	bk126			
WT. WET SOIL + TARE	37.08	35.95			
WT. DRY SOIL + TARE	35.7	34.53			
WT. WATER	1.38	1.42			
TARE WT.	29.62	28.32			
WT. DRY SOIL	6.08	6.21			
WATER CONTENT (%)	22.70	22.87			



SUMMARY OF RESULTS	
NATURAL WATER CONTENT, W (%)	34.7
LIQUID LIMIT, LL	25.8
PLASTIC LIMIT, PL	22.8
PLASTICITY INDEX, PI	3.0
LIQUIDITY INDEX, LI*	3.93

*LI = (W − PL)/PI

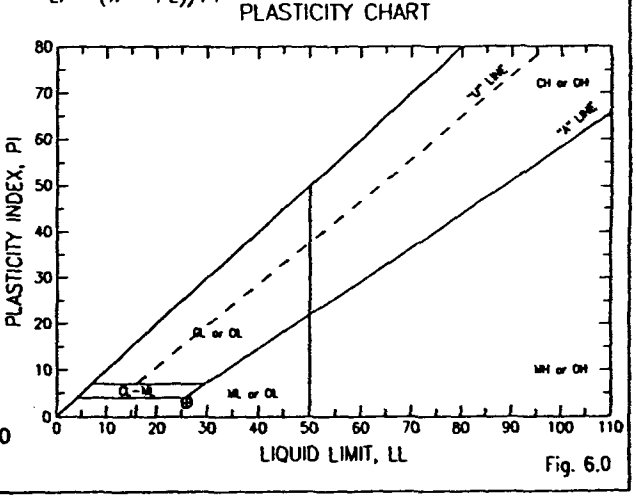


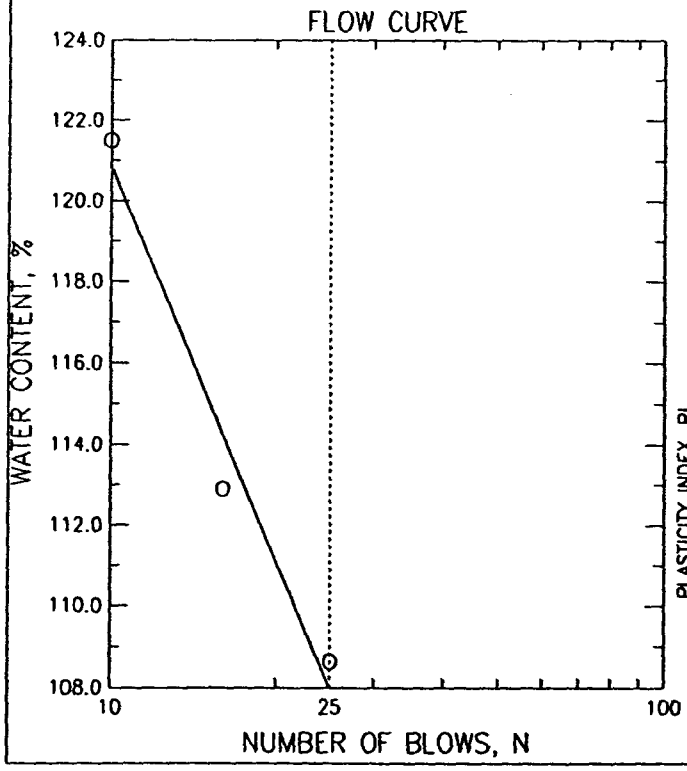
Fig. 6.0

ATTERBERG LIMITS

PROJECT	PROJECT NUMBER	TESTED BY	BORING NUMBER
New Bedford Harbor Superfund Site	GTX-2409	gsg	FB-13
LOCATION		CHECKED BY	SAMPLE NUMBER
New Bedford, MA		gtt	UO-1 (0-2)
SAMPLE DESCRIPTION		DATE	FILENAME
Moist, black organic silt		Thu Nov 18 1999	FB13U01

LIQUID LIMIT DETERMINATIONS					
CONTAINER NUMBER	bk207	bk14	bk114		
WT. WET SOIL + TARE	35.11	35.22	33.17		
WT. DRY SOIL + TARE	32.09	32.07	30.23		
WT. WATER	3.02	3.15	2.94		
TARE WT.	29.31	29.28	27.81		
WT. DRY SOIL	2.78	2.79	2.42		
WATER CONTENT, W_N (%)	108.63	112.90	121.49		
NUMBER OF BLOWS, N	25	16	10		
ONE-POINT LIQUID LIMIT, LL	108.63	106.97	108.74		

PLASTIC LIMIT DETERMINATIONS					
CONTAINER NUMBER	bk36	bk10			
WT. WET SOIL + TARE	34.49	36.28			
WT. DRY SOIL + TARE	32.14	33.18			
WT. WATER	2.35	3.1			
TARE WT.	29.22	29.25			
WT. DRY SOIL	2.92	3.93			
WATER CONTENT (%)	80.48	78.88			



SUMMARY OF RESULTS	
NATURAL WATER CONTENT, W (%)	214.0
LIQUID LIMIT, LL	108.0
PLASTIC LIMIT, PL	79.7
PLASTICITY INDEX, PI	28.3
LIQUIDITY INDEX, LI*	4.75

*LI = (W - PL)/PI

PLASTICITY CHART

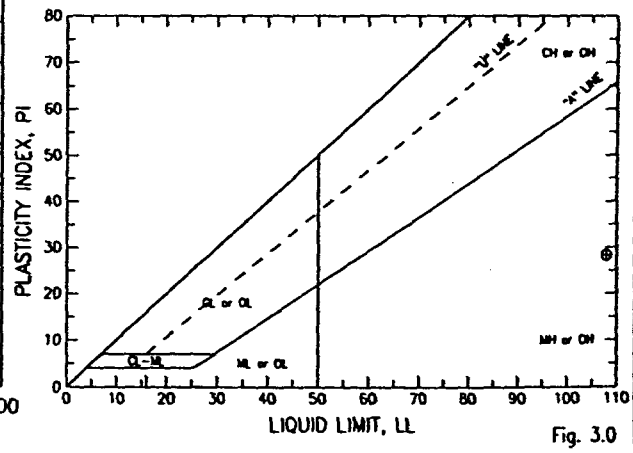


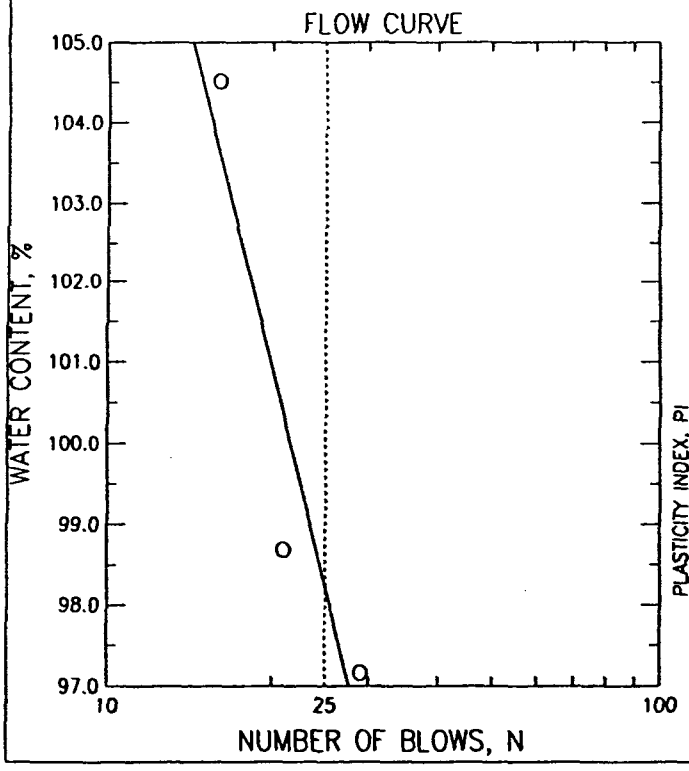
Fig. 3.0

ATTERBERG LIMITS

PROJECT	PROJECT NUMBER	TESTED BY	BORING NUMBER
New Bedford Harbor Superfund Site	GTX-2409	gsg	FB-27
LOCATION		CHECKED BY	SAMPLE NUMBER
New Bedford, MA		gtt	U0-1 (0-2)
SAMPLE DESCRIPTION		DATE	FILENAME
Moist, black organic silt with sand		Thu Nov 18 1999	FB27U01

LIQUID LIMIT DETERMINATIONS					
CONTAINER NUMBER	bk21	bk19	bk16		
WT. WET SOIL + TARE	36.32	35.26	35.37		
WT. DRY SOIL + TARE	33.24	32.26	32.36		
WT. WATER	3.08	3	3.01		
TARE WT.	30.07	29.22	29.48		
WT. DRY SOIL	3.17	3.04	2.88		
WATER CONTENT, W_N (%)	97.16	98.68	104.51		
NUMBER OF BLOWS, N	29	21	16		
ONE-POINT LIQUID LIMIT, LL	98.92	96.62	99.02		

PLASTIC LIMIT DETERMINATIONS					
CONTAINER NUMBER	bk99	bk136			
WT. WET SOIL + TARE	34.95	36.28			
WT. DRY SOIL + TARE	32.14	33.73			
WT. WATER	2.81	2.55			
TARE WT.	27.65	29.59			
WT. DRY SOIL	4.49	4.14			
WATER CONTENT (%)	62.58	61.59			



SUMMARY OF RESULTS	
NATURAL WATER CONTENT, W (%)	204.5
LIQUID LIMIT, LL	98.2
PLASTIC LIMIT, PL	62.1
PLASTICITY INDEX, PI	36.1
LIQUIDITY INDEX, LI*	3.94

*LI = (W – PL)/PI

PLASTICITY CHART

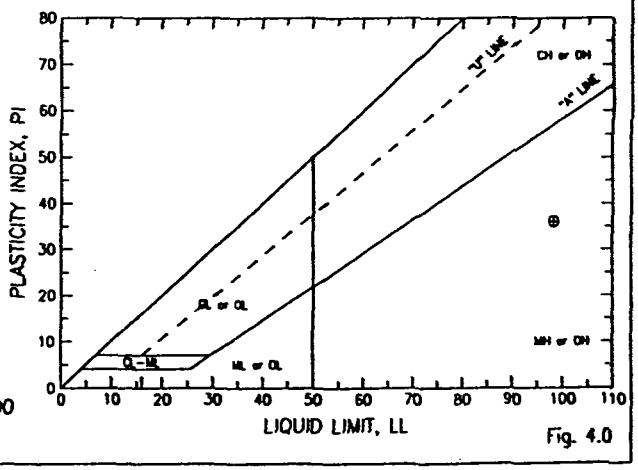
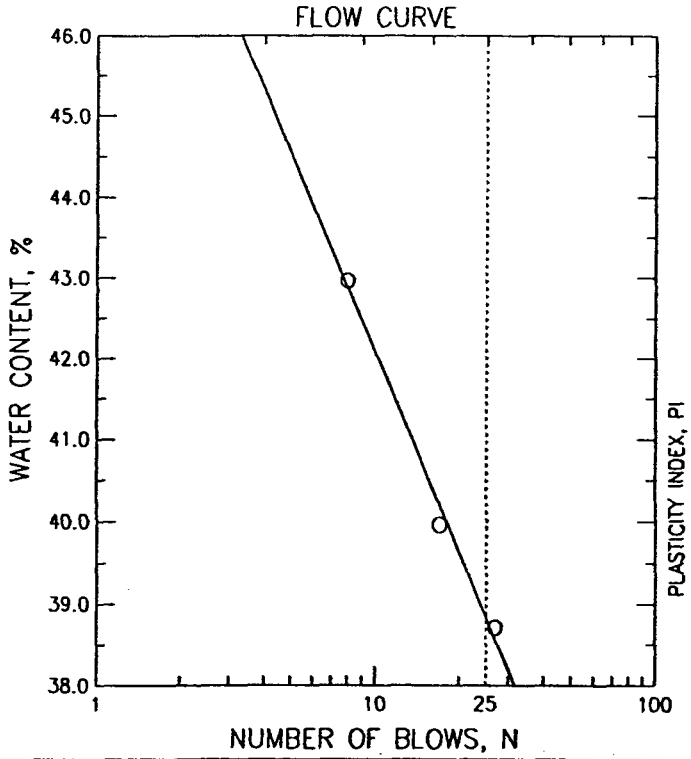


Fig. 4.0

ATTERBERG LIMITS

PROJECT	PROJECT NUMBER	TESTED BY	BORING NUMBER
New Bedford Harbor Superfund Site	GTX-2409	gsg	FB-27
LOCATION		CHECKED BY	SAMPLE NUMBER
New Bedford, MA		gtt	U0-5 (8-10)
SAMPLE DESCRIPTION		DATE	FILENAME
Moist, dark gray organic silt with gravel		Thu Nov 18 1999	FB27U05

LIQUID LIMIT DETERMINATIONS					
CONTAINER NUMBER	bk69	bk144	bk124		
WT. WET SOIL + TARE	37.93	36.36	38.11		
WT. DRY SOIL + TARE	35.77	34.43	35.76		
WT. WATER	2.16	1.93	2.35		
TARE WT.	30.19	29.6	30.29		
WT. DRY SOIL	5.58	4.83	5.47		
WATER CONTENT, W_N (%)	38.71	39.96	42.96		
NUMBER OF BLOWS, N	27	17	8		
ONE-POINT LIQUID LIMIT, LL	39.07	38.14	37.43		
PLASTIC LIMIT DETERMINATIONS					
CONTAINER NUMBER	bk17	bk3			
WT. WET SOIL + TARE	36.23	36.26			
WT. DRY SOIL + TARE	35.06	35.24			
WT. WATER	1.17	1.02			
TARE WT.	29.38	30.18			
WT. DRY SOIL	5.68	5.06			
WATER CONTENT (%)	20.60	20.16			



SUMMARY OF RESULTS	
NATURAL WATER CONTENT, W (%)	39.9
LIQUID LIMIT, LL	38.8
PLASTIC LIMIT, PL	20.4
PLASTICITY INDEX, PI	18.5
LIQUIDITY INDEX, LI*	1.06

*LI = (W − PL)/PI

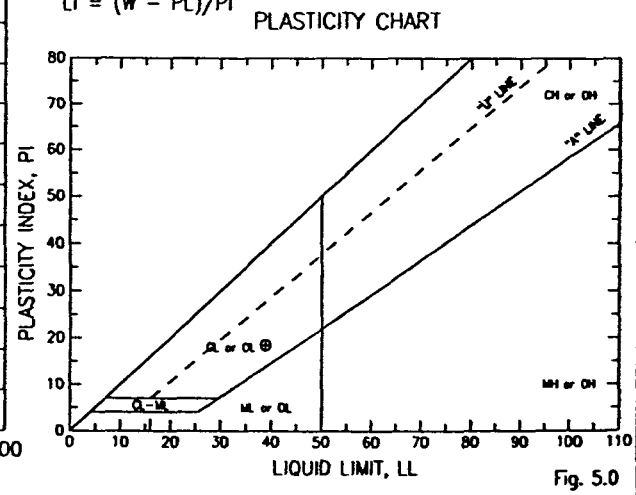
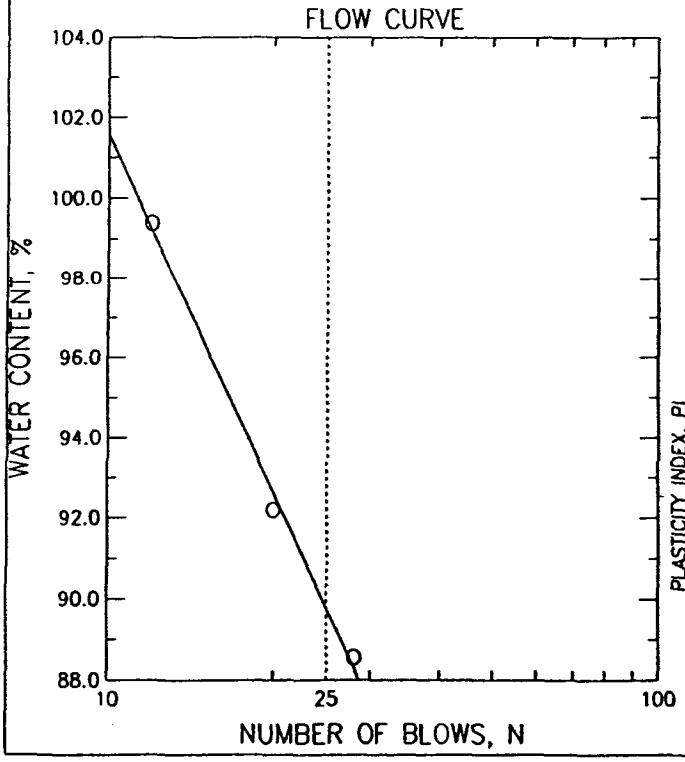


Fig. 5.0

ATTERBERG LIMITS

PROJECT	PROJECT NUMBER	TESTED BY	BORING NUMBER
New Bedford Harbor Superfund Site	GTX-2409	gsg	FB-29
LOCATION		CHECKED BY	SAMPLE NUMBER
New Bedford, MA		gtt	UO-2 (6-8)
SAMPLE DESCRIPTION		DATE	FILENAME
Moist, dark gray organic silt		Thu Nov 18 1999	FB29U02

LIQUID LIMIT DETERMINATIONS					
CONTAINER NUMBER	bk69	bk36	bk120		
WT. WET SOIL + TARE	37.11	35.6	36.09		
WT. DRY SOIL + TARE	33.86	32.53	32.87		
WT. WATER	3.25	3.07	3.22		
TARE WT.	30.19	29.2	29.63		
WT. DRY SOIL	3.67	3.33	3.24		
WATER CONTENT, W_N (%)	88.56	92.19	99.38		
NUMBER OF BLOWS, N	28	20	12		
ONE-POINT LIQUID LIMIT, LL	89.78	89.74	90.94		
PLASTIC LIMIT DETERMINATIONS					
CONTAINER NUMBER	bk3	bk99			
WT. WET SOIL + TARE	35.87	35.2			
WT. DRY SOIL + TARE	34.41	33.2			
WT. WATER	1.46	2			
TARE WT.	30.18	27.65			
WT. DRY SOIL	4.23	5.55			
WATER CONTENT (%)	34.52	36.04			



SUMMARY OF RESULTS	
NATURAL WATER CONTENT, W (%)	93.5
LIQUID LIMIT, LL	89.8
PLASTIC LIMIT, PL	35.3
PLASTICITY INDEX, PI	54.5
LIQUIDITY INDEX, LI*	1.07

*LI = (W - PL)/PI

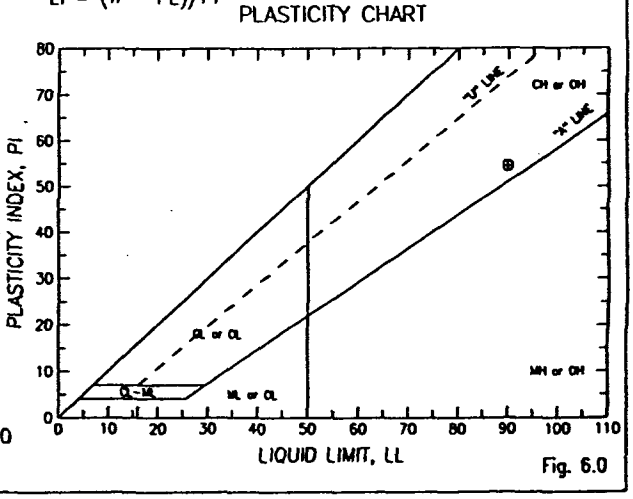


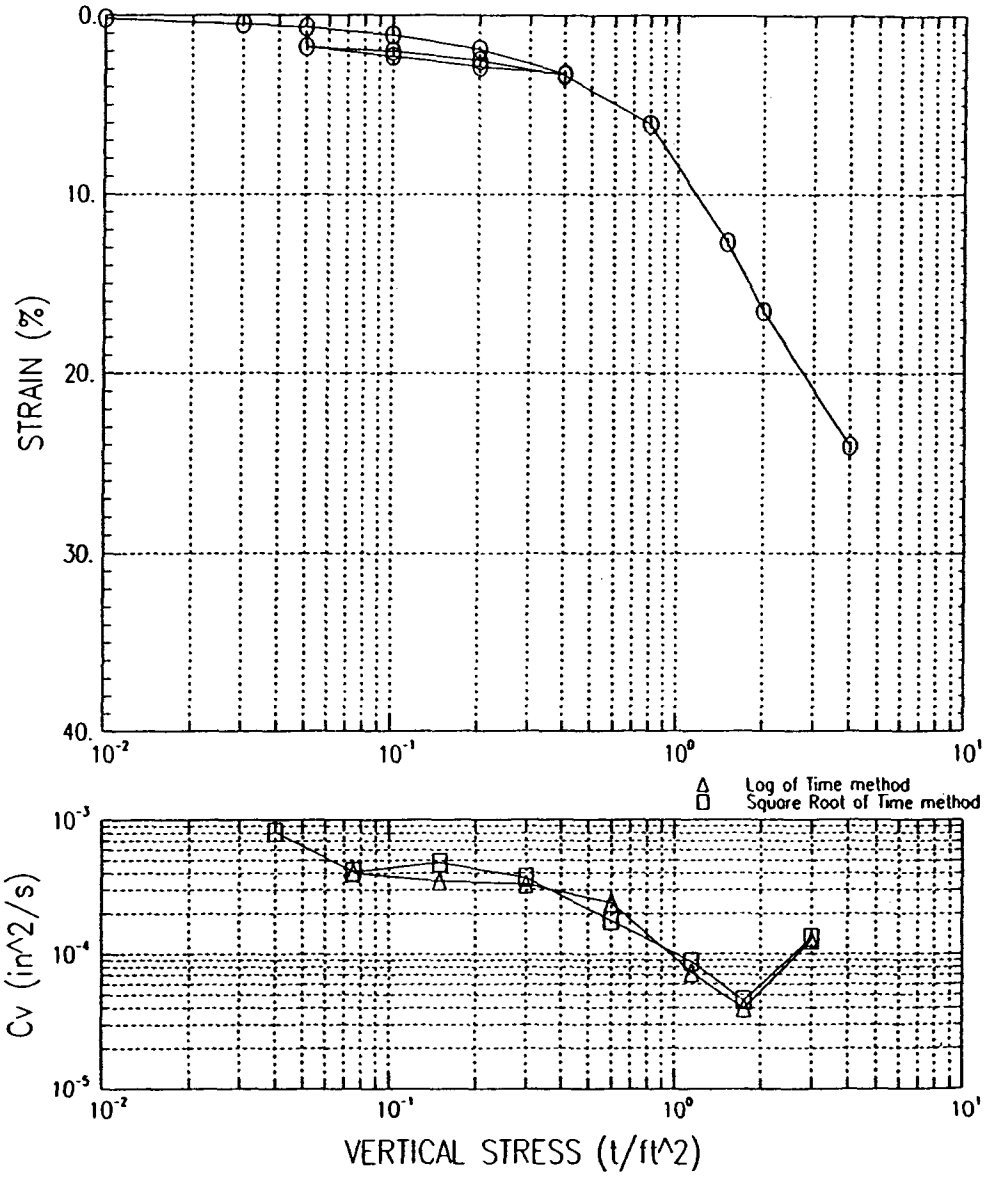
Fig. 6.0

APPENDIX I

One-dimensional Consolidation Test Results

CONSOLIDATION TEST

SUMMARY REPORT



GeoTesting Express
Project Name : New Bedford Harbor Superfund Site
Project No : GTX-2409 Boring No : FB-4 Sample No : UO-7
Test Date : 11/18/99 Test No : CON14 Depth : 15-17 feet
Description : Moist, gray clay with little organic
Remarks : ---

CONSOLIDATION TEST DATA

Project : New Bedford Harbor Superfund Site Location : New Bedford, MA Project No.: GTX-2409
Boring No.: FB-4 Tested by : fy Checked by : rh
Sample No.: UO-7 Test Date : 11/18/99 Depth : 15-17 feet
Test No. : CON14 Sample Type: Tube

Soil Description : Moist, gray clay with little organic
Remarks : ---

Specific Gravity : 2.67 Liquid Limit : 0 Initial Height : 1.02 (in)
Initial Void Ratio : 2.09 Plastic Limit : 0 Sample Diameter : 2.50 (in)
Final Void Ratio : 1.35 Plasticity Index : 0

	BEFORE CONSOLIDATION		AFTER CONSOLIDATION	
	TRIMMINGS	SPECIMEN + RING	SPECIMEN + RING	TRIMMINGS
CONTAINER NO.	jgb58	RING	RING	fbkz
WT CONTAINER + WET SOIL (gm)	295.37	332.94	315.41	115.50
WT CONTAINER + DRY SOIL (gm)	173.39	279.77	279.77	79.92
WT CONTAINER (gm)	9.04	209.18	209.18	9.44
WT DRY SOIL (gm)	164.35	70.59	70.59	70.48
WATER CONTENT (%)	74.22	75.31	50.48	50.48
VOID RATIO	------	2.09	1.35	------
DEGREE OF SATURATION (%)	------	96.17	100.00	------
DRY DENSITY (lb/ft^3)	------	53.93	71.00	------

CONSOLIDATION TEST DATA

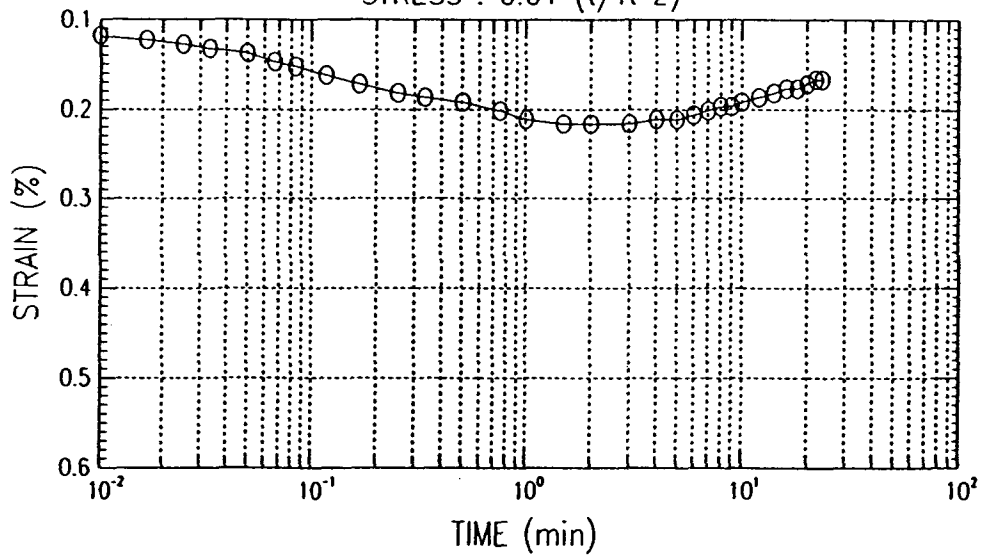
Project : New Bedford Harbor Superfund Site Location : New Bedford, MA Project No.: GTX-2409
Boring No.: FB-4 Tested by : fy Checked by : rh
Sample No.: UO-7 Test Date : 11/18/99 Depth : 15-17 feet
Test No. : CON14 Sample Type: Tube

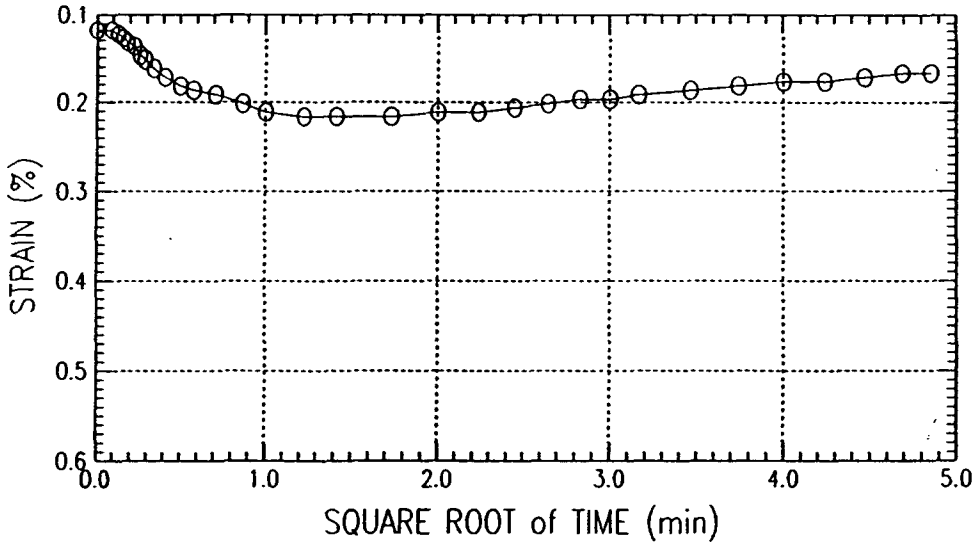
Soil Description : Moist, gray clay with little organic
Remarks : ---

	APPLIED PRESSURE (t/ft^2)	FINAL DISPLACEMENT (in)	VOID RATIO	STRAIN AT END (%)	FITTING T50 TIME (min) SQ.RT.	LOG	COEFFICIENT OF CONSOLIDATION (in^2/s) SQ.RT.	LOG	AVE
1)	0.01	0.002	2.086	0.17	0.0	0.0	0.00E+000	0.00E+000	0.00E+000
2)	0.03	0.005	2.077	0.48	0.0	0.0	0.00E+000	0.00E+000	0.00E+000
3)	0.05	0.007	2.071	0.66	1.0	0.0	8.13E-004	0.00E+000	8.13E-004
4)	0.10	0.011	2.058	1.09	2.0	2.1	4.11E-004	4.02E-004	4.07E-004
5)	0.20	0.019	2.033	1.89	1.7	2.4	4.80E-004	3.50E-004	4.15E-004
6)	0.40	0.033	1.991	3.25	2.2	2.4	3.71E-004	3.32E-004	3.52E-004
7)	0.20	0.029	2.003	2.88	0.0	0.0	0.00E+000	0.00E+000	0.00E+000
8)	0.10	0.023	2.021	2.29	0.0	0.0	0.00E+000	0.00E+000	0.00E+000
9)	0.05	0.018	2.037	1.76	0.0	0.0	0.00E+000	0.00E+000	0.00E+000
10)	0.10	0.020	2.030	2.00	0.0	0.0	0.00E+000	0.00E+000	0.00E+000
11)	0.20	0.026	2.013	2.54	0.0	0.0	0.00E+000	0.00E+000	0.00E+000
12)	0.40	0.034	1.988	3.35	0.0	0.0	0.00E+000	0.00E+000	0.00E+000
13)	0.80	0.062	1.904	6.06	4.4	3.2	1.77E-004	2.41E-004	2.09E-004
14)	1.50	0.129	1.700	12.68	8.0	9.7	8.72E-005	7.24E-005	7.98E-005
15)	2.00	0.168	1.581	16.50	13.7	15.7	4.53E-005	3.96E-005	4.25E-005
16)	4.00	0.245	1.348	24.05	4.1	4.3	1.33E-004	1.27E-004	1.30E-004

CONSOLIDATION TEST

TIME CURVES (STEP 1 OF 16)
STRESS : 0.01 (t/ft^2)

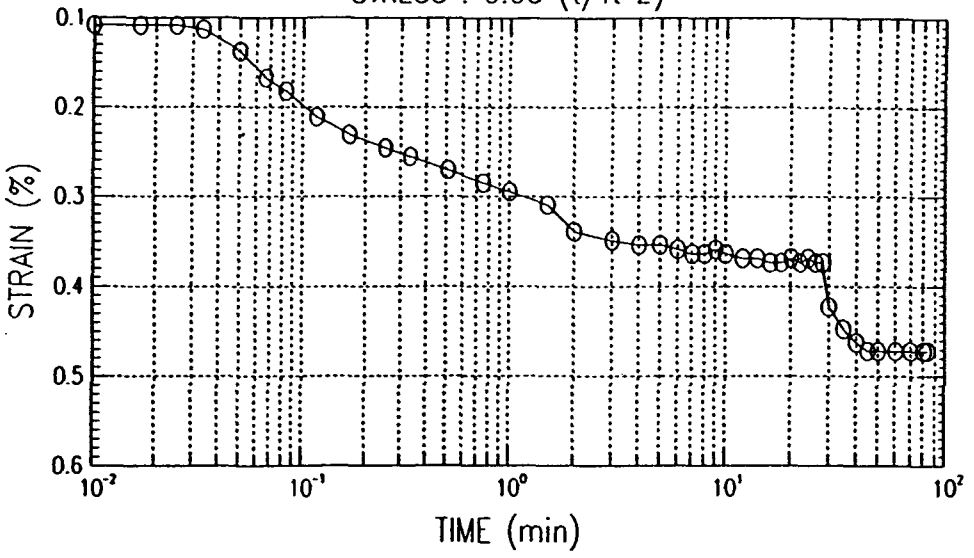


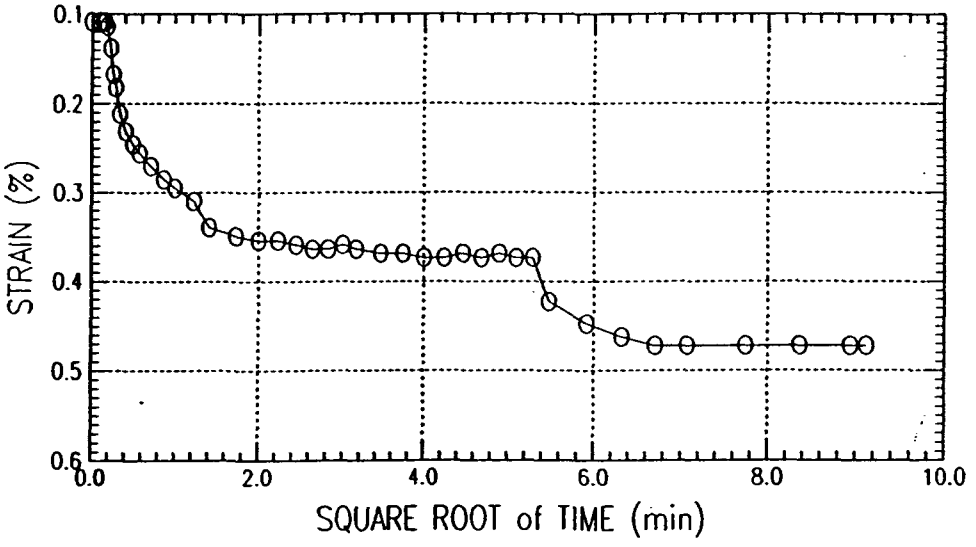


GeoTesting Express
Project Name : New Bedford Harbor Superfund Site
Project No : GTX-2409 Boring No : FB-4 Sample No : UO-7
Test Date : 11/18/99 Test No : CON14 Depth : 15-17 feet
Description : Moist, gray clay with little organic
Remarks : ---

CONSOLIDATION TEST

TIME CURVES (STEP 2 OF 16)
STRESS : 0.03 (t/ft^2)

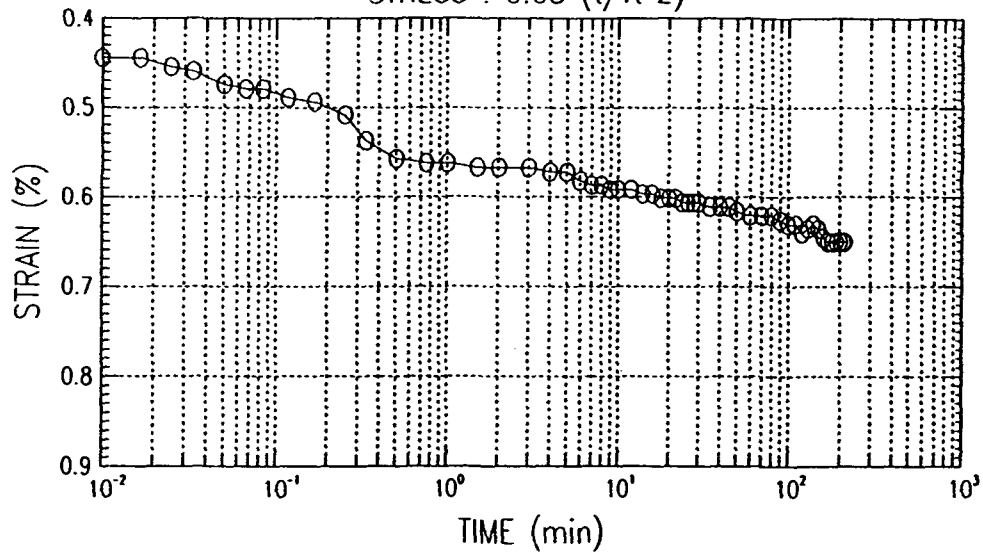


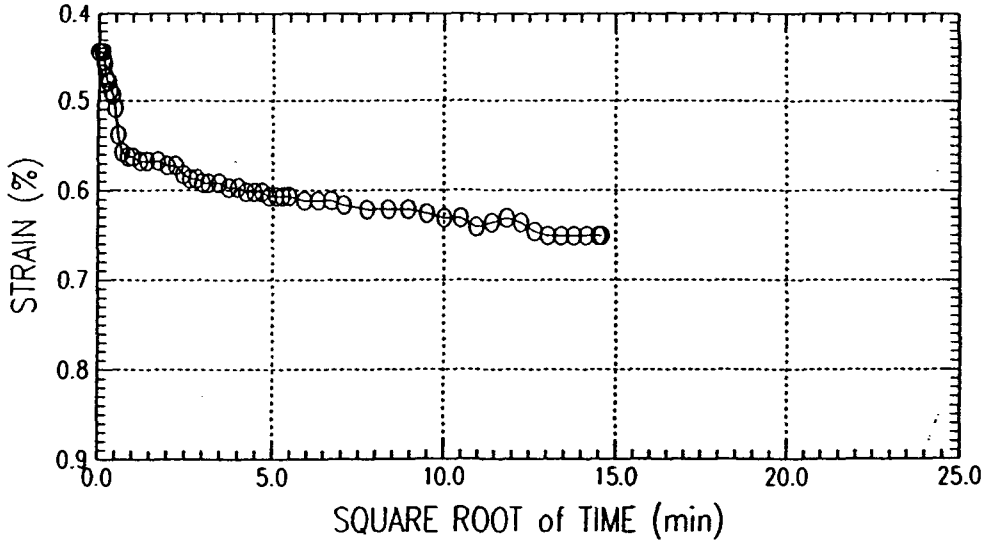


GeoTesting Express
Project Name : New Bedford Harbor Superfund Site
Project No : GTX-2409 Boring No : FB-4 Sample No : UO-7
Test Date : 11/18/99 Test No : CON14 Depth : 15-17 feet
Description : Moist, gray clay with little organic
Remarks : ---

CONSOLIDATION TEST

TIME CURVES (STEP 3 OF 16)
STRESS : 0.05 (t/ft^2)

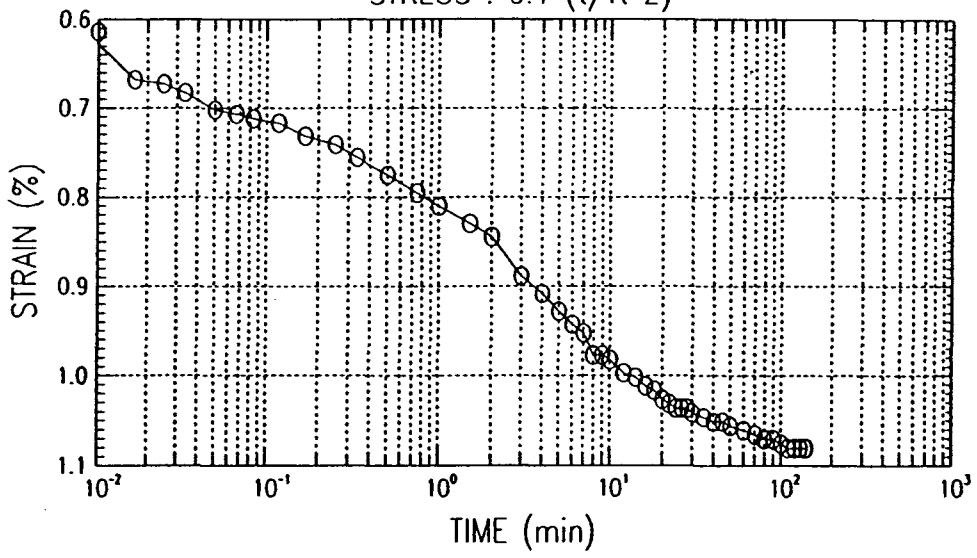


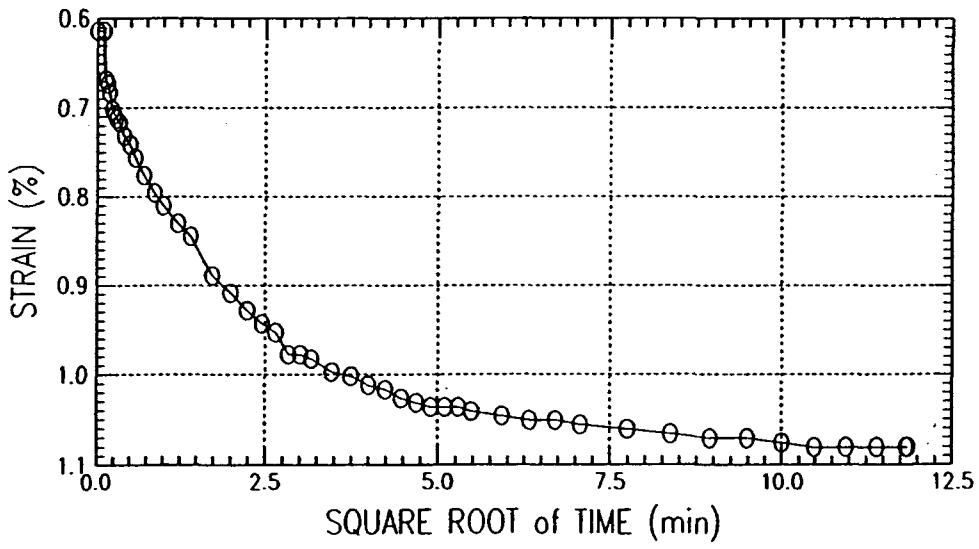


GeoTesting Express
Project Name : New Bedford Harbor Superfund Site
Project No : GTX-2409 Boring No : FB-4 Sample No : UO-7
Test Date : 11/18/99 Test No : CON14 Depth : 15-17 feet
Description : Moist, gray clay with little organic
Remarks : ---

CONSOLIDATION TEST

TIME CURVES (STEP 4 OF 16)
STRESS : 0.1 (t/ft^2)

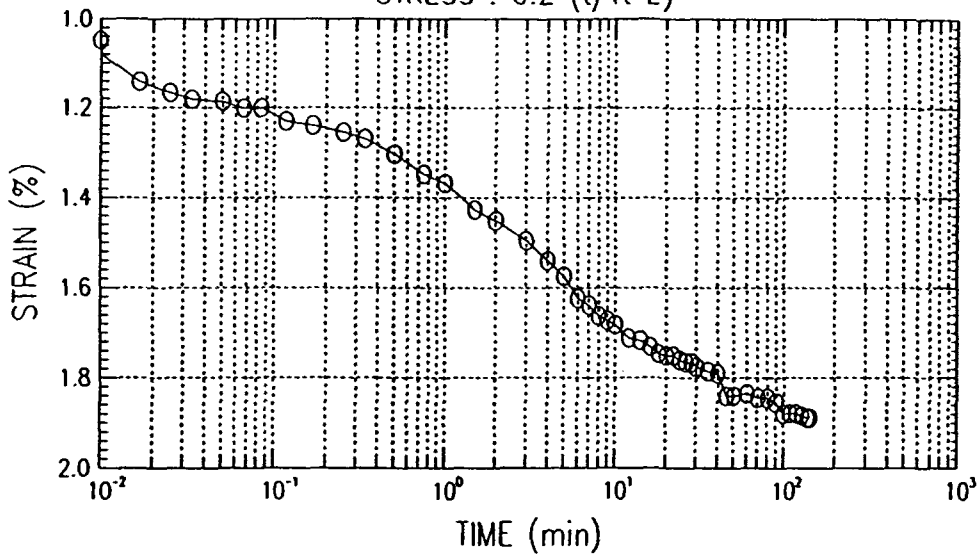


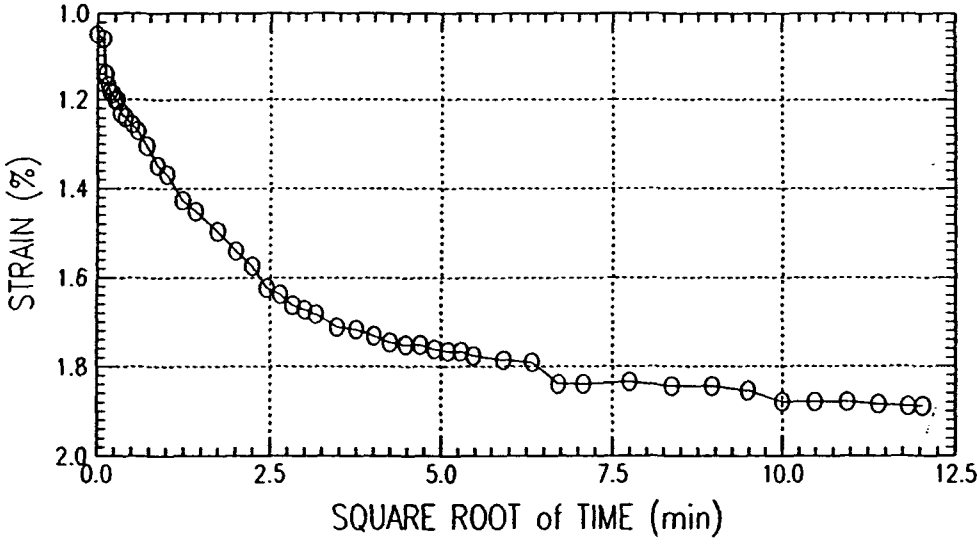


GeoTesting Express
Project Name : New Bedford Harbor Superfund Site
Project No : GTX-2409 Boring No : FB-4 Sample No : U0-7
Test Date : 11/18/99 Test No : CON14 Depth : 15-17 feet
Description : Moist, gray clay with little organic
Remarks : ---

CONSOLIDATION TEST

TIME CURVES (STEP 5 OF 16)
STRESS : 0.2 (t/ft^2)

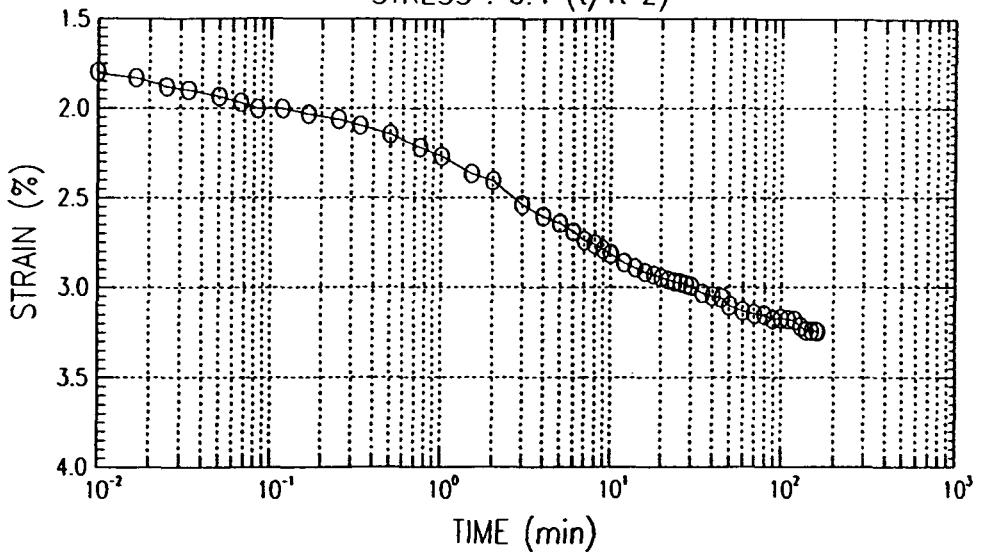


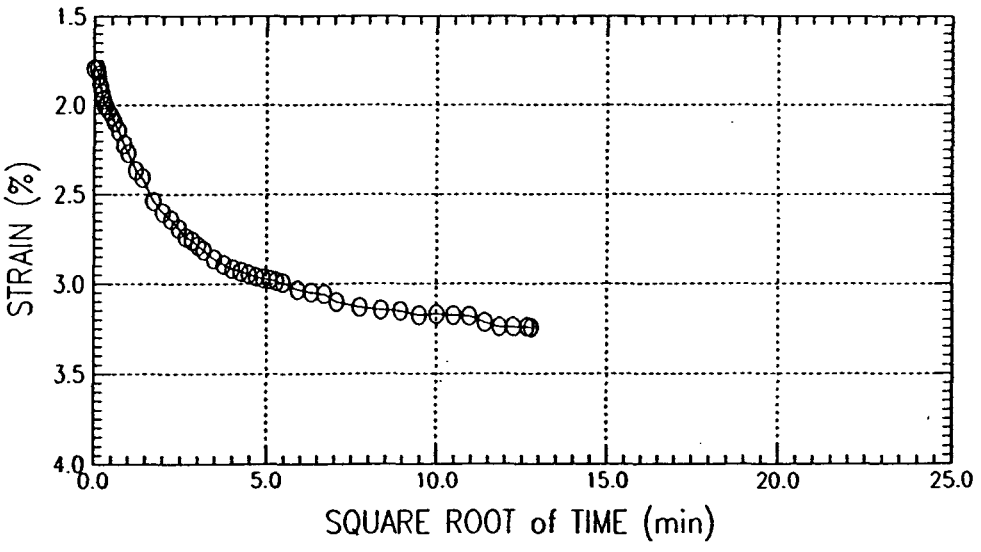


GeoTesting Express
Project Name : New Bedford Harbor Superfund Site
Project No : GTX-2409 Boring No : FB-4 Sample No : UO-7
Test Date : 11/18/99 Test No : CON14 Depth : 15-17 feet
Description : Moist, gray clay with little organic
Remarks : ---

CONSOLIDATION TEST

TIME CURVES (STEP 6 OF 16)
STRESS : 0.4 (t/ft^2)

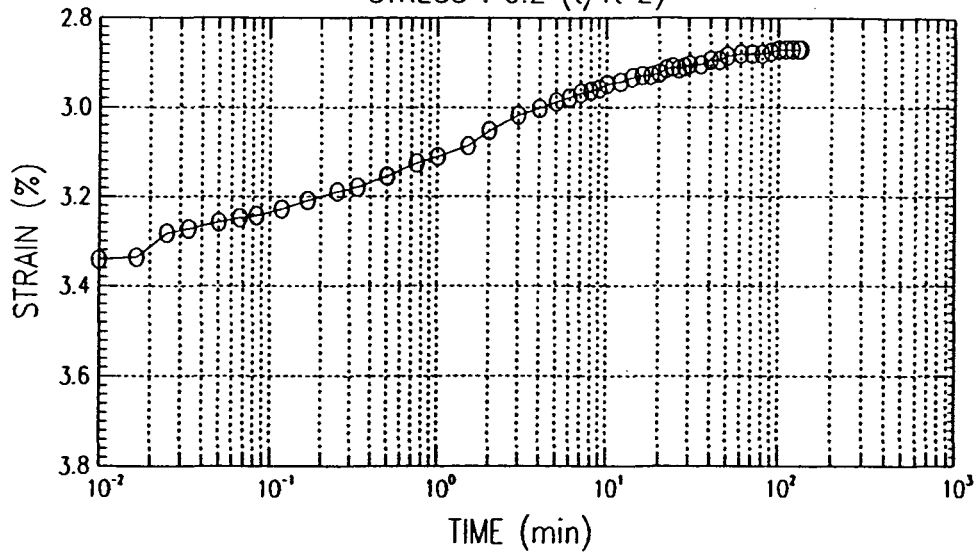


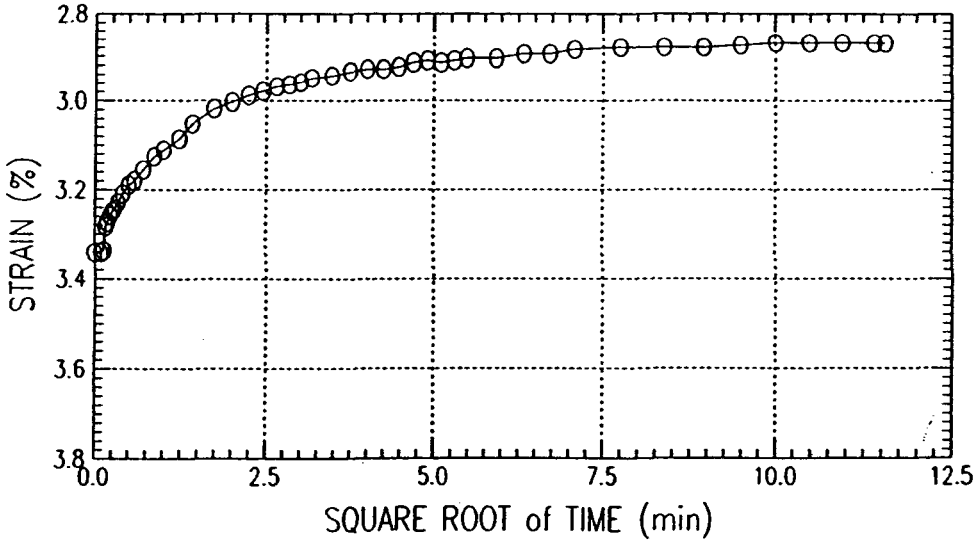


GeoTesting Express
Project Name : New Bedford Harbor Superfund Site
Project No : GTX-2409 Boring No : FB-4 Sample No : UO-7
Test Date : 11/18/99 Test No : CON14 Depth : 15-17 feet
Description : Moist, gray clay with little organic
Remarks : ---

CONSOLIDATION TEST

TIME CURVES (STEP 7 OF 16)
STRESS : 0.2 (t/ft^2)

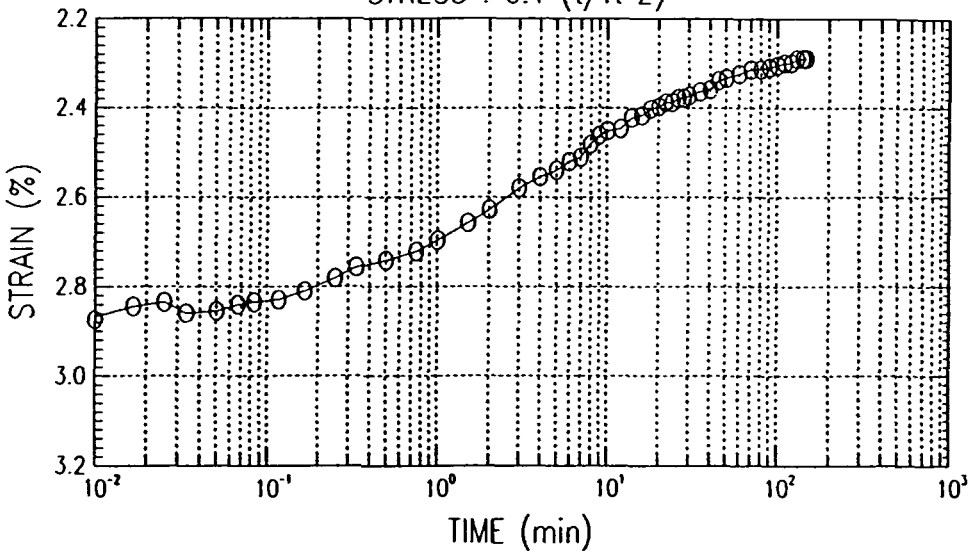


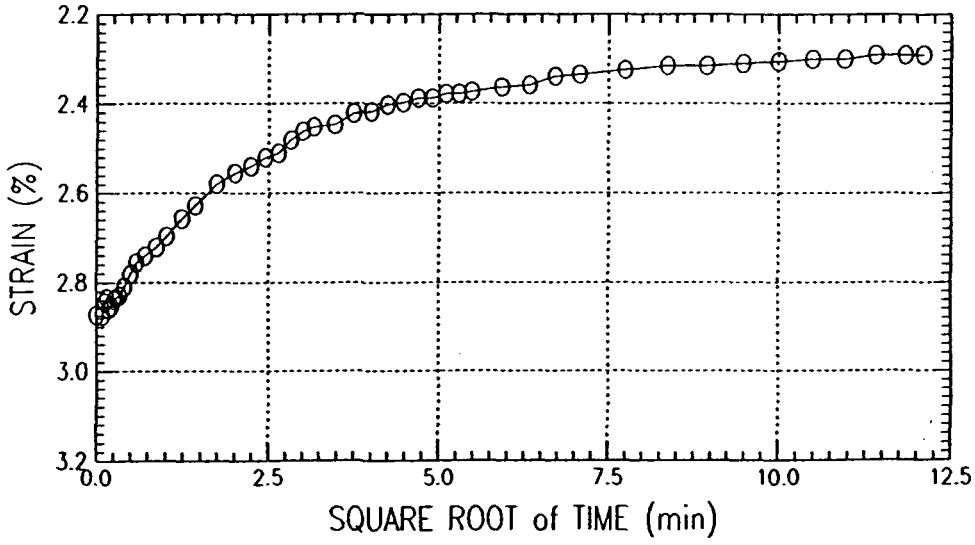


GeoTesting Express
Project Name : New Bedford Harbor Superfund Site
Project No : GTX-2409 Boring No : FB-4 Sample No : UO-7
Test Date : 11/18/99 Test No : CON14 Depth : 15-17 feet
Description : Moist, gray clay with little organic
Remarks : ---

CONSOLIDATION TEST

TIME CURVES (STEP 8 OF 16)
STRESS : 0.1 (t/ft^2)

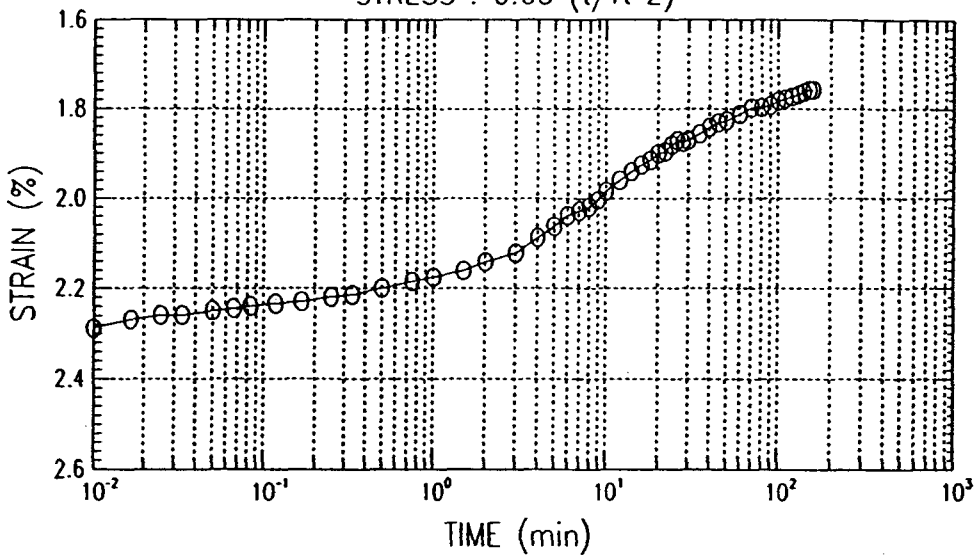


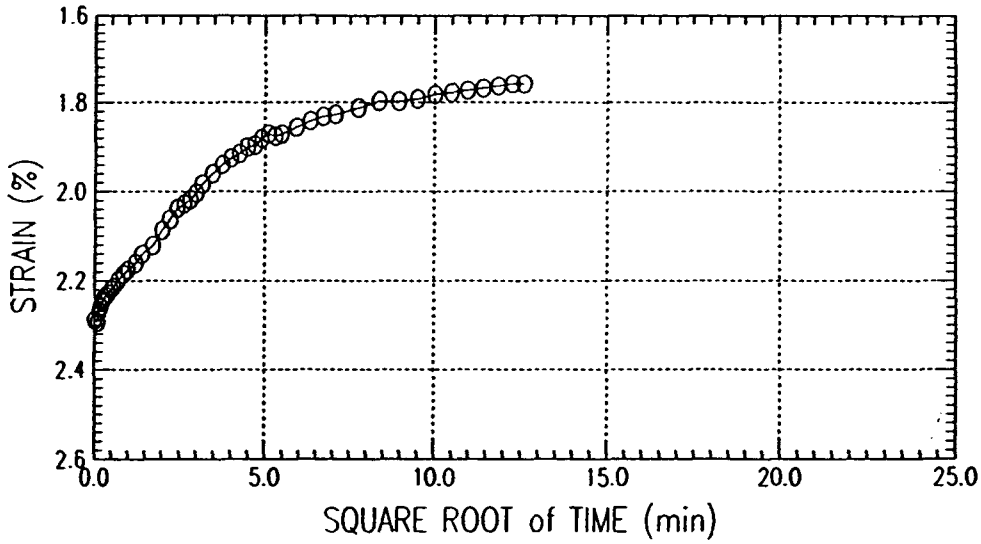


GeoTesting Express
Project Name : New Bedford Harbor Superfund Site
Project No : GTX-2409 Boring No : FB-4 Sample No : UO-7
Test Date : 11/18/99 Test No : CON14 Depth : 15-17 feet
Description : Moist, gray clay with little organic
Remarks : ---

CONSOLIDATION TEST

TIME CURVES (STEP 9 OF 16)
STRESS : 0.05 (t/ft^2)

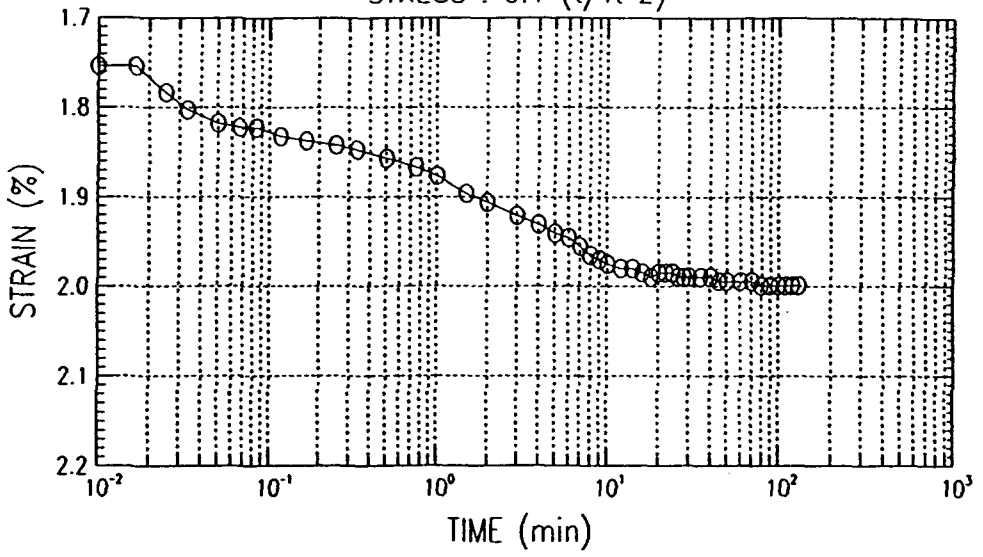


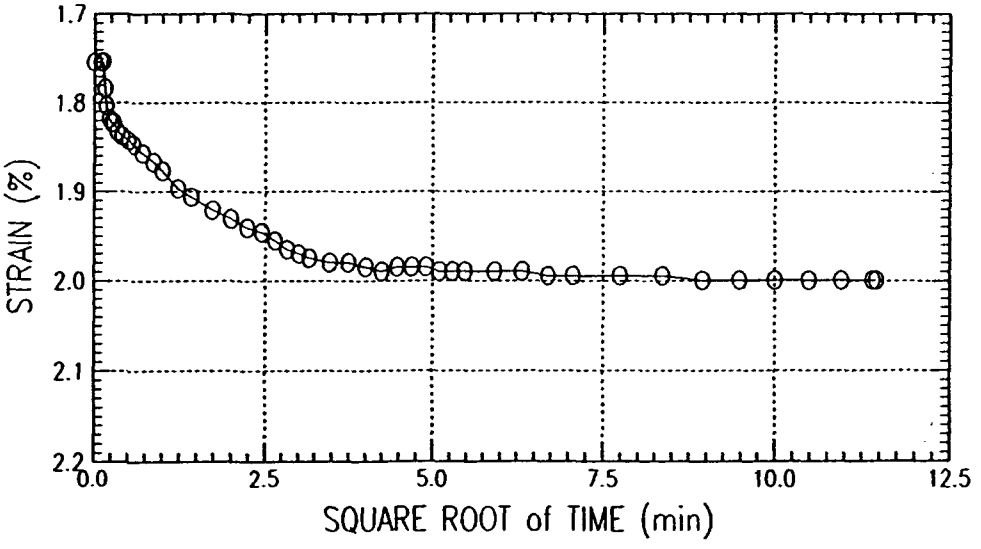


GeoTesting Express
Project Name : New Bedford Harbor Superfund Site
Project No : GTX-2409 Boring No : FB-4 Sample No : UO-7
Test Date : 11/18/99 Test No : CON14 Depth : 15-17 feet
Description : Moist, gray clay with little organic
Remarks : ---

CONSOLIDATION TEST

TIME CURVES (STEP 10 OF 16)
STRESS : 0.1 (t/ft^2)

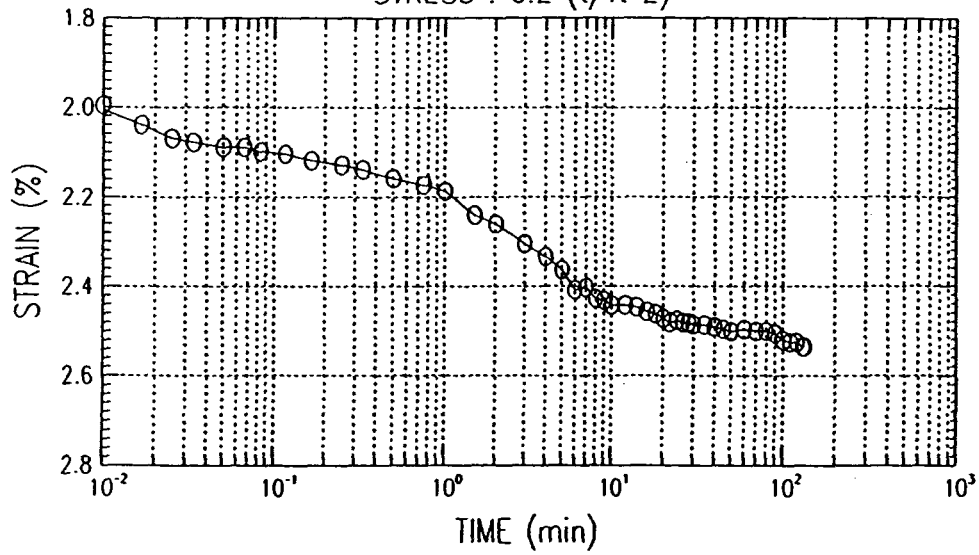


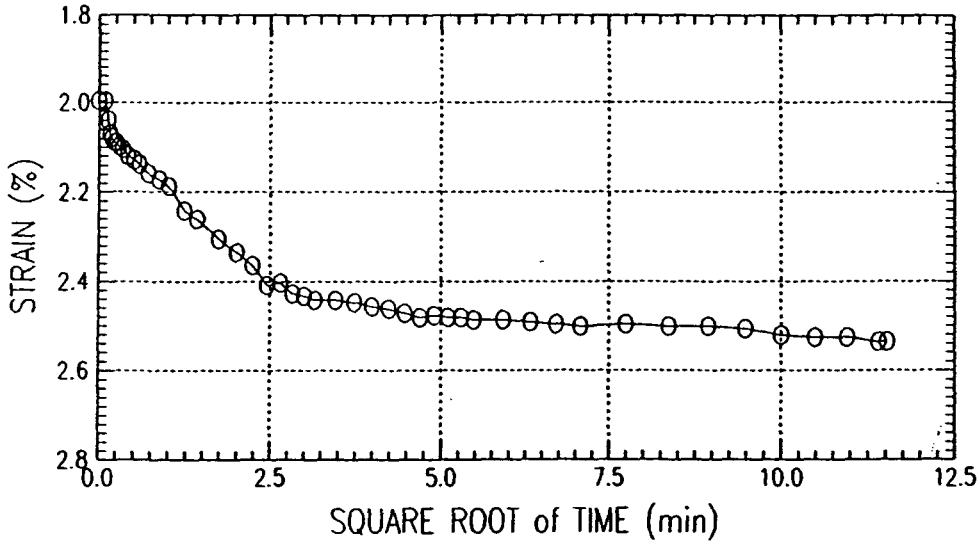


GeoTesting Express
Project Name : New Bedford Harbor Superfund Site
Project No : GTX-2409 Boring No : FB-4 Sample No : U0-7
Test Date : 11/18/99 Test No : CON14 Depth : 15-17 feet
Description : Moist, gray clay with little organic
Remarks : ---

CONSOLIDATION TEST

TIME CURVES (STEP 11 OF 16)
STRESS : 0.2 (t/ft^2)

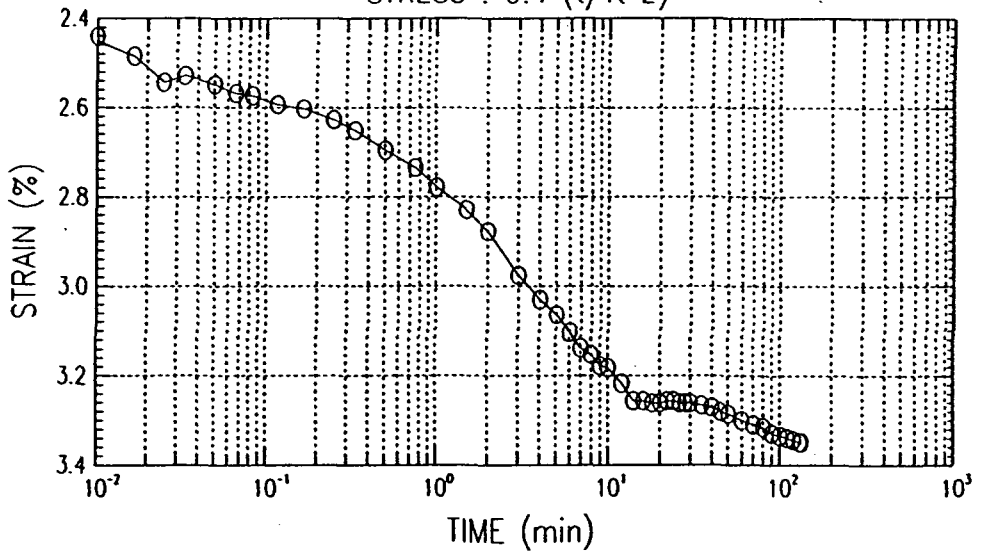


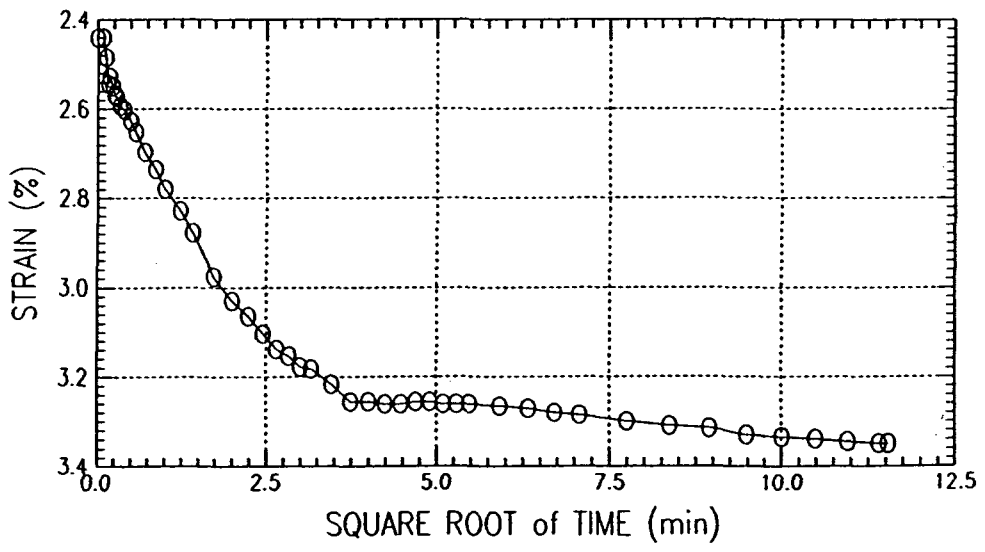


GeoTesting Express
Project Name : New Bedford Harbor Superfund Site
Project No : GTX-2409 Boring No : FB-4 Sample No : U0-7
Test Date : 11/18/99 Test No : CON14 Depth : 15-17 feet
Description : Moist, gray clay with little organic
Remarks : ---

CONSOLIDATION TEST

TIME CURVES (STEP 12 OF 16)
STRESS : 0.4 (t/ft^2)

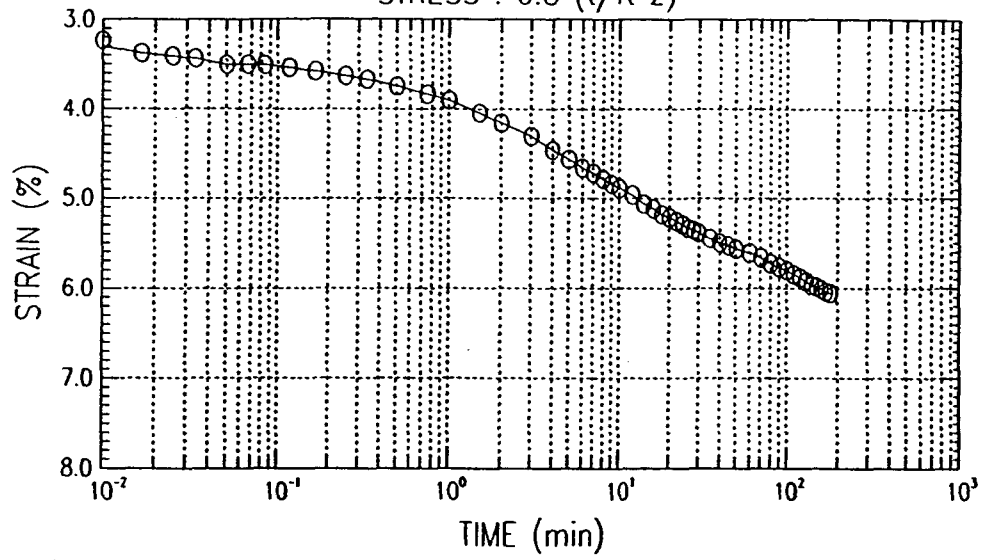


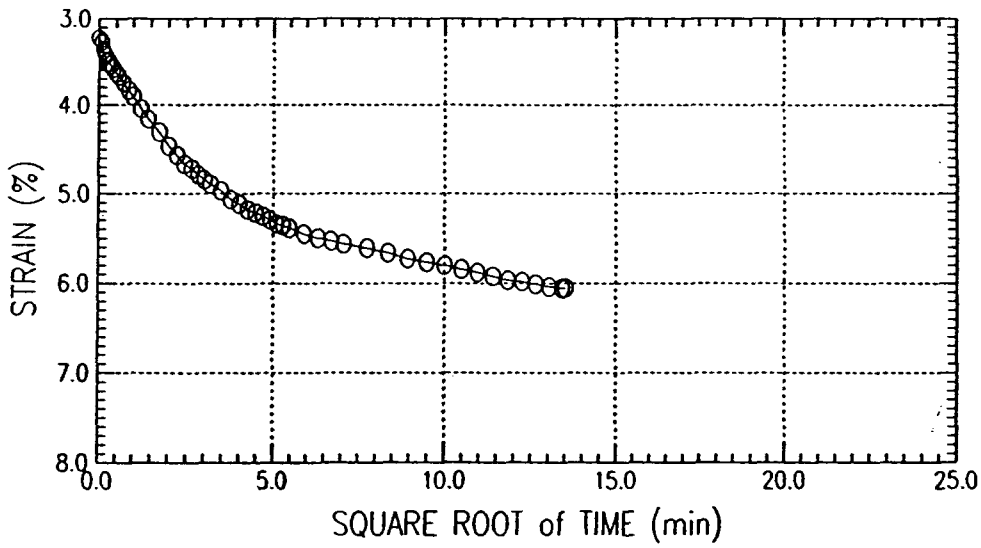


GeoTesting Express
Project Name : New Bedford Harbor Superfund Site
Project No : GTX-2409 Boring No : FB-4 Sample No : UO-7
Test Date : 11/18/99 Test No : CON14 Depth : 15-17 feet
Description : Moist, gray clay with little organic
Remarks : ---

CONSOLIDATION TEST

TIME CURVES (STEP 13 OF 16)
STRESS : 0.8 (t/ft^2)



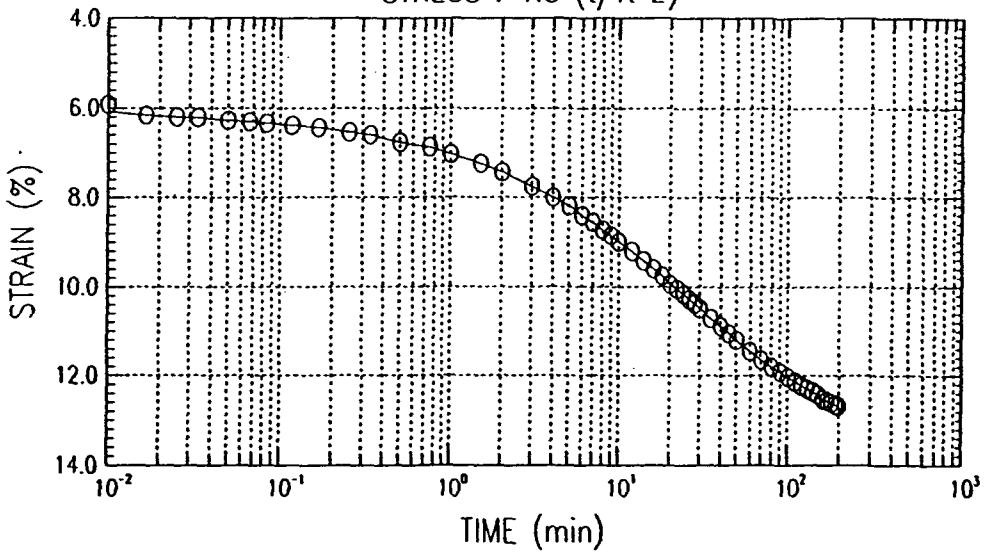


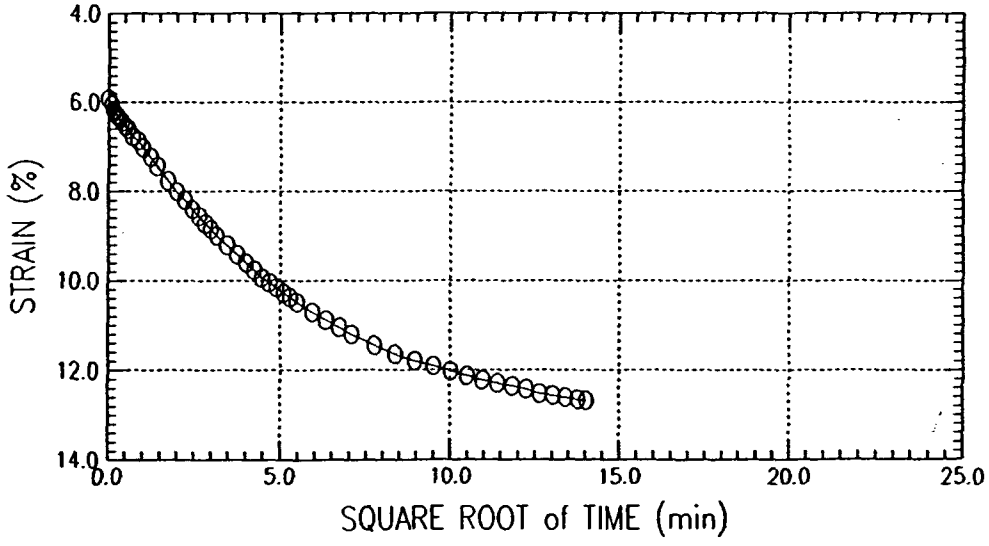
GeoTesting Express
Project Name : New Bedford Harbor Superfund Site
Project No : GTX-2409 Boring No : FB-4 Sample No : UO-7
Test Date : 11/18/99 Test No : CON14 Depth : 15-17 feet
Description : Moist, gray clay with little organic
Remarks : ---

CONSOLIDATION TEST

TIME CURVES (STEP 14 OF 16)

STRESS : 1.5 (t/ft^2)

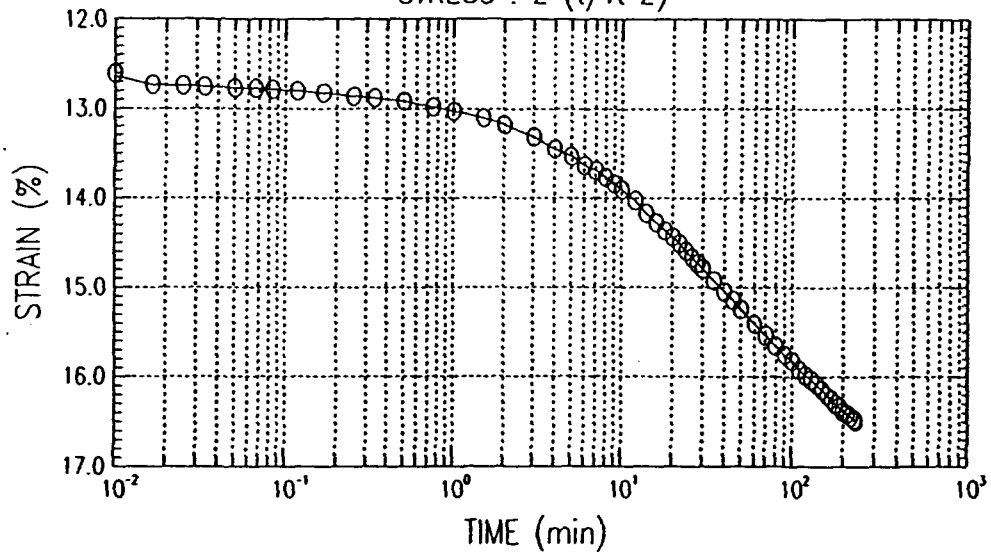


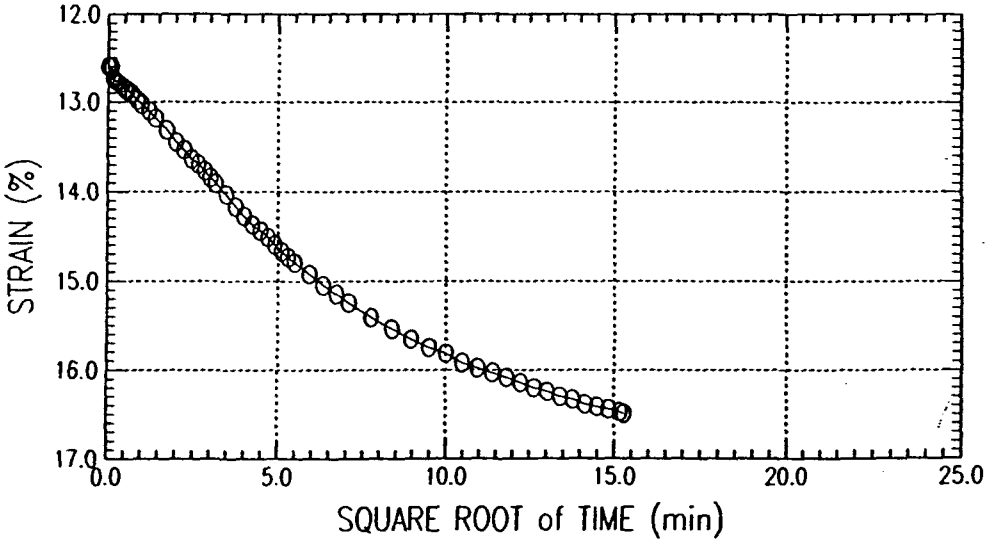


GeoTesting Express
Project Name : New Bedford Harbor Superfund Site
Project No : GTX-2409 Boring No : FB-4 Sample No : UO-7
Test Date : 11/18/99 Test No : CON14 Depth : 15-17 feet
Description : Moist, gray clay with little organic
Remarks : ---

CONSOLIDATION TEST

TIME CURVES (STEP 15 OF 16)
STRESS : 2 (t/ft^2)

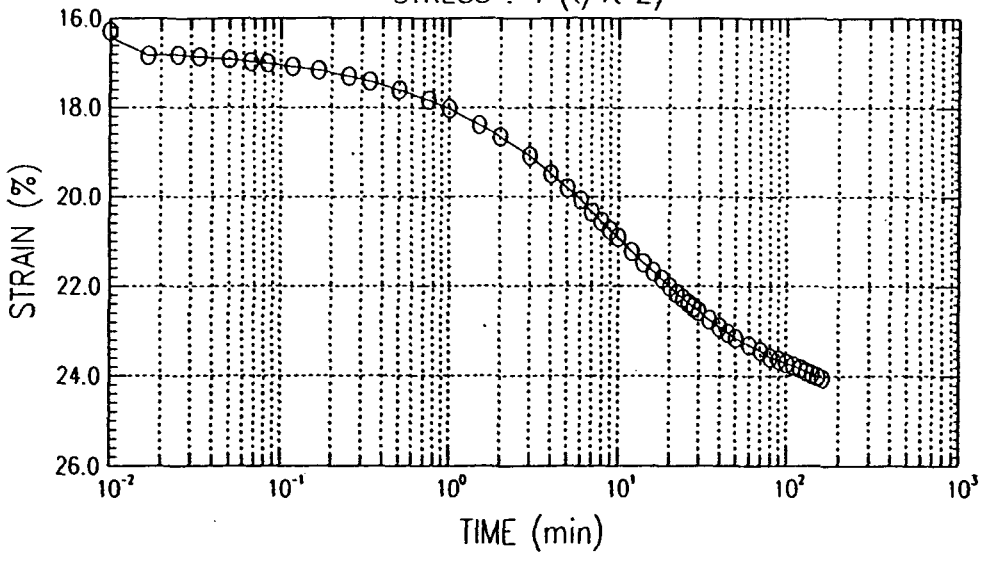


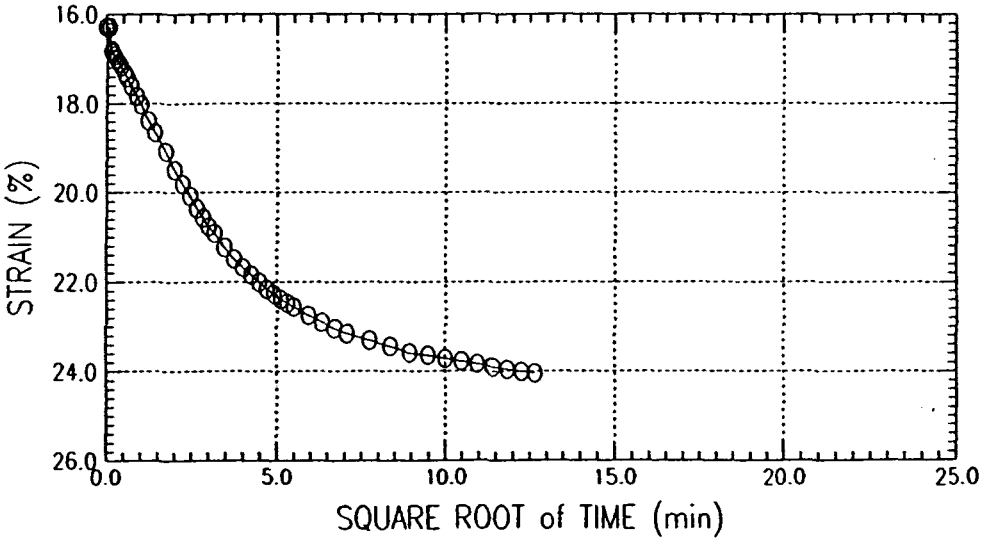


GeoTesting Express
Project Name : New Bedford Harbor Superfund Site
Project No : GTX-2409 Boring No : FB-4 Sample No : UO-7
Test Date : 11/18/99 Test No : CON14 Depth : 15-17 feet
Description : Moist, gray clay with little organic
Remarks : ---

CONSOLIDATION TEST

TIME CURVES (STEP 16 OF 16)
STRESS : 4 (t/ft^2)

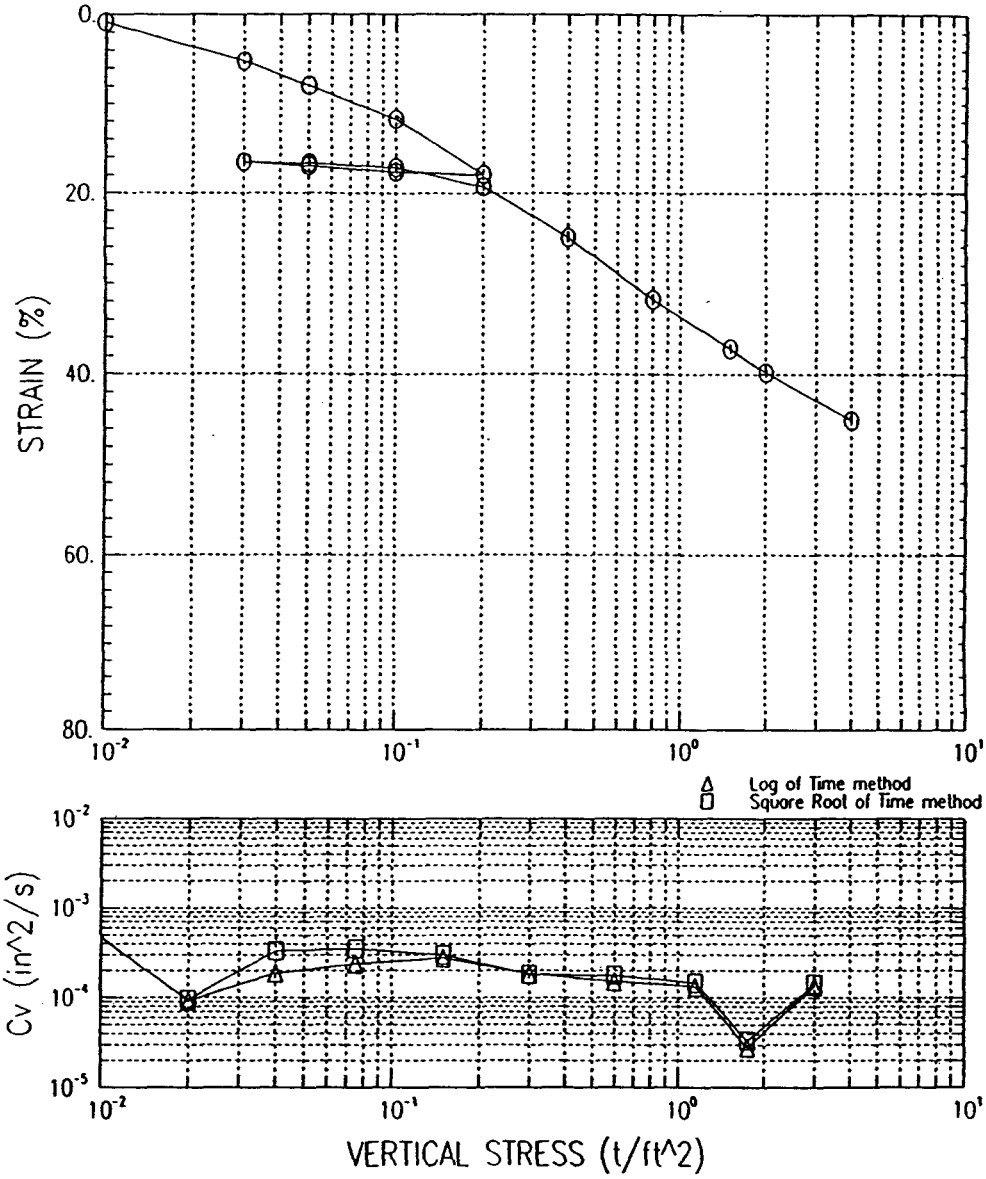




GeoTesting Express
Project Name : New Bedford Harbor Superfund Site
Project No : GTX-2409 Boring No : FB-4 Sample No : UO-7
Test Date : 11/18/99 Test No : CON14 Depth : 15-17 feet
Description : Moist, gray clay with little organic
Remarks : ---

CONSOLIDATION TEST

SUMMARY REPORT



GeoTesting Express
Project Name : New Bedford Harbor Superfund Site
Project No : GTX-2409 Boring No : FB-13 Sample No : UO-1
Test Date : 11/21/99 Test No : CON10 Depth : 0-2 feet
Description : Moist, black organic silt
Remarks : ---

CONSOLIDATION TEST DATA

Project : New Bedford Harbor Superfund Site Location : New Bedford, MA Project No.: GTX-2409
Boring No.: FB-13 Tested by : FY Checked by : RH
Sample No.: UO-1 Test Date : 11/21/99 Depth : 0-2 feet
Test No. : CON10 Sample Type: Tube

Soil Description : Moist, black organic silt
Remarks : ---

Specific Gravity : 2.29 Liquid Limit : 108 Initial Height : 1.05 (in)
Initial Void Ratio : 2.54 Plastic Limit : 79.7 Sample Diameter : 2.49 (in)
Final Void Ratio : 0.95 Plasticity Index : 28.3

	BEFORE CONSOLIDATION		AFTER CONSOLIDATION	
	TRIMMINGS	SPECIMEN + RING	SPECIMEN + RING	TRIMMINGS
CONTAINER NO.		RING	RING	jgb113
WT CONTAINER + WET SOIL (gm)	205.00	323.80	295.00	78.21
WT CONTAINER + DRY SOIL (gm)	106.14	269.02	269.02	55.82
WT CONTAINER (gm)	9.07	214.83	214.83	9.11
WT DRY SOIL (gm)	97.07	54.19	54.19	46.71
WATER CONTENT (%)	101.84	101.08	47.93	47.93
VOID RATIO	------	2.54	1.02	------
DEGREE OF SATURATION (%)	------	91.11	107.43	------
DRY DENSITY (lb/ft^3)	------	40.38	70.71	------

CONSOLIDATION TEST DATA

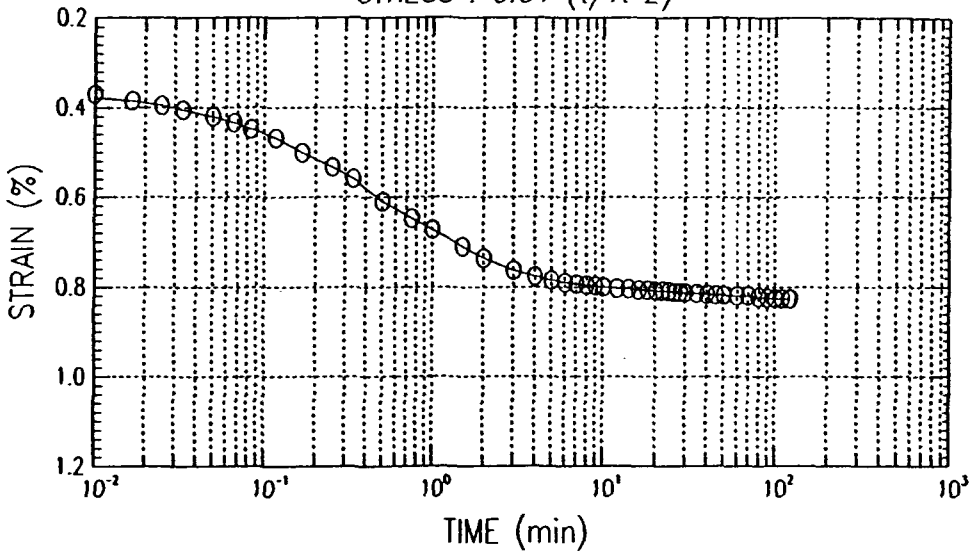
Project : New Bedford Harbor Superfund Site Location : New Bedford, MA Project No.: GTX-2409
Boring No.: FB-13 Tested by : FY Checked by : RH
Sample No.: UO-1 Test Date : 11/21/99 Depth : 0-2 feet
Test No. : CON10 Sample Type: Tube

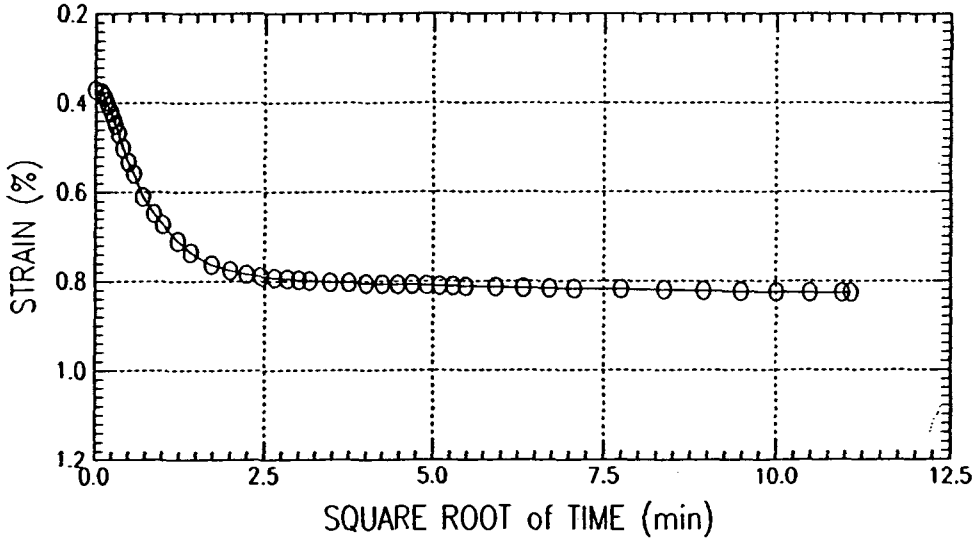
Soil Description : Moist, black organic silt
Remarks : ---

	APPLIED PRESSURE (t/ft^2)	FINAL DISPLACEMENT (in)	VOID RATIO	STRAIN AT END (%)	FITTING T50 TIME (min) SQ.RT.	LOG	COEFFICIENT OF CONSOLIDATION (in^2/s) SQ.RT.	LOG	AVE
1)	0.01	0.009	2.510	0.87	0.4	0.4	2.21E-003	2.49E-003	2.35E-003
2)	0.03	0.055	2.355	5.23	8.9	9.3	9.53E-005	9.19E-005	9.36E-005
3)	0.05	0.084	2.258	7.99	2.4	4.2	3.33E-004	1.87E-004	2.60E-004
4)	0.10	0.123	2.125	11.73	2.1	3.1	3.52E-004	2.38E-004	2.95E-004
5)	0.20	0.188	1.905	17.95	2.2	2.4	2.99E-004	2.77E-004	2.88E-004
6)	0.10	0.185	1.916	17.63	0.0	0.0	0.00E+000	0.00E+000	0.00E+000
7)	0.05	0.178	1.939	16.99	0.0	0.0	0.00E+000	0.00E+000	0.00E+000
8)	0.03	0.174	1.955	16.54	0.0	0.0	0.00E+000	0.00E+000	0.00E+000
9)	0.05	0.175	1.950	16.67	0.0	0.0	0.00E+000	0.00E+000	0.00E+000
10)	0.10	0.180	1.935	17.11	0.0	0.0	0.00E+000	0.00E+000	0.00E+000
11)	0.20	0.203	1.857	19.31	0.0	0.0	0.00E+000	0.00E+000	0.00E+000
12)	0.40	0.262	1.657	24.95	3.0	3.0	1.82E-004	1.83E-004	1.83E-004
13)	0.80	0.334	1.414	31.81	2.6	3.1	1.77E-004	1.51E-004	1.64E-004
14)	1.50	0.390	1.225	37.15	2.7	2.9	1.46E-004	1.33E-004	1.40E-004
15)	2.00	0.418	1.131	39.80	10.2	12.2	3.35E-005	2.81E-005	3.08E-005
16)	4.00	0.473	0.946	45.05	2.1	2.2	1.42E-004	1.35E-004	1.38E-004

CONSOLIDATION TEST

TIME CURVES (STEP 1 OF 16)
STRESS : 0.01 (t/ft^2)

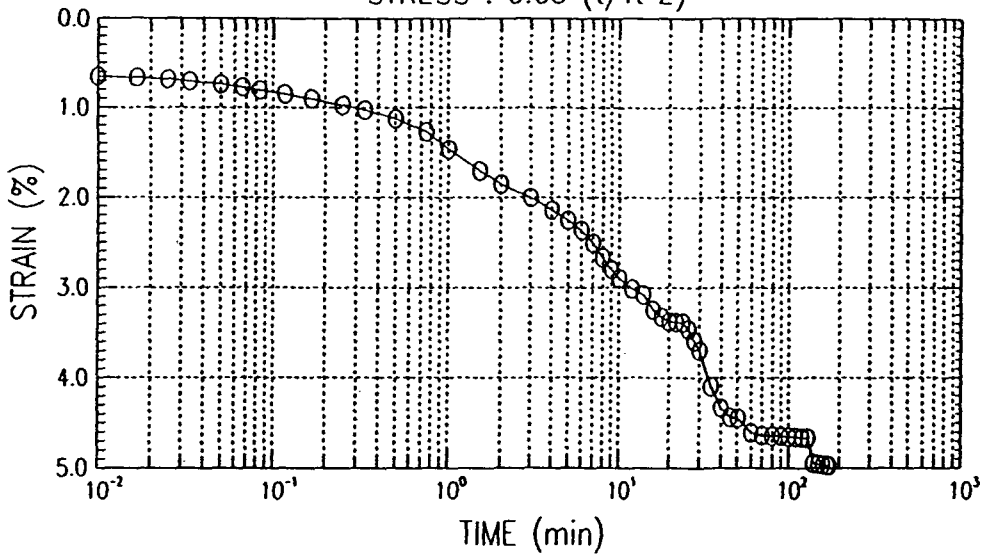


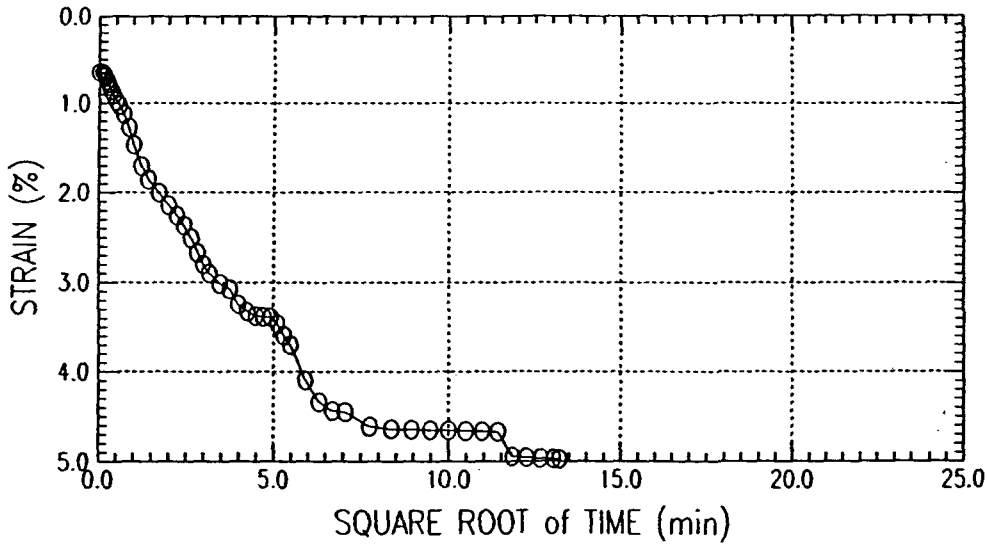


GeoTesting Express
Project Name : New Bedford Harbor Superfund Site
Project No : GTX-2409 Boring No : FB-13 Sample No : UO-1
Test Date : 11/21/99 Test No : CON10 Depth : 0-2 feet
Description : Moist, black organic silt
Remarks : ---

CONSOLIDATION TEST

TIME CURVES (STEP 2 OF 16)
STRESS : 0.03 (t/ft^2)

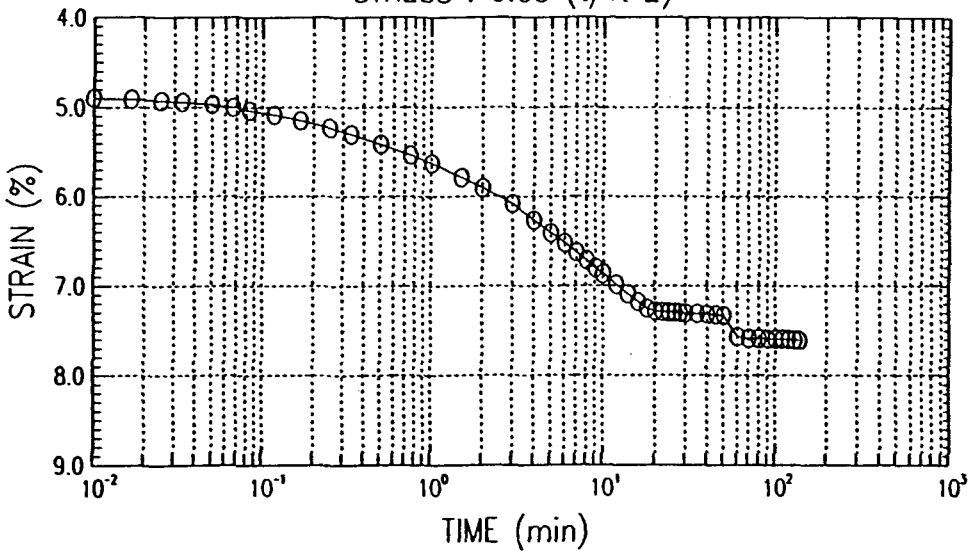


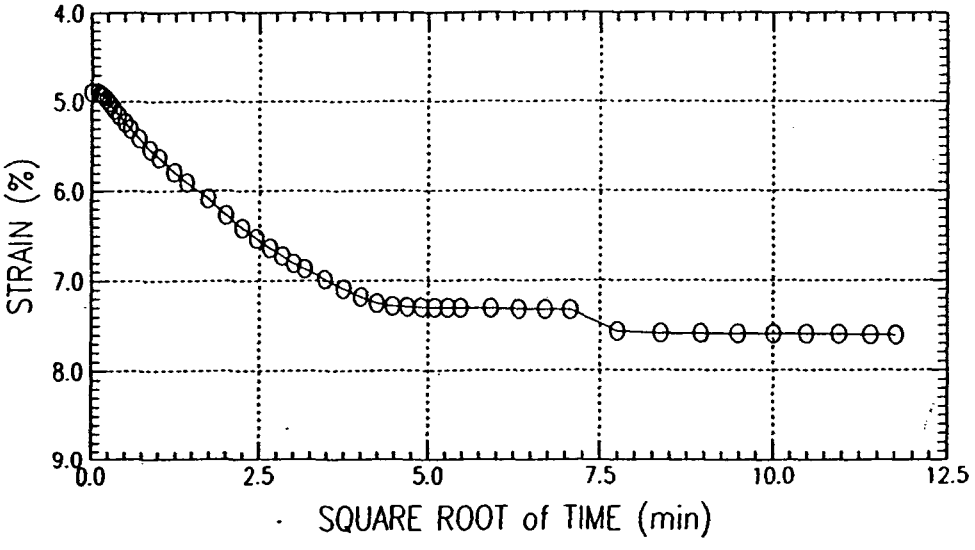


GeoTesting Express
Project Name : New Bedford Harbor Superfund Site
Project No : GTX-2409 Boring No : FB-13 Sample No : UO-1
Test Date : 11/21/99 Test No : CON10 Depth : 0-2 feet
Description : Moist, black organic silt
Remarks : ---

CONSOLIDATION TEST

TIME CURVES (STEP 3 OF 16)
STRESS : 0.05 (t/ft^2)

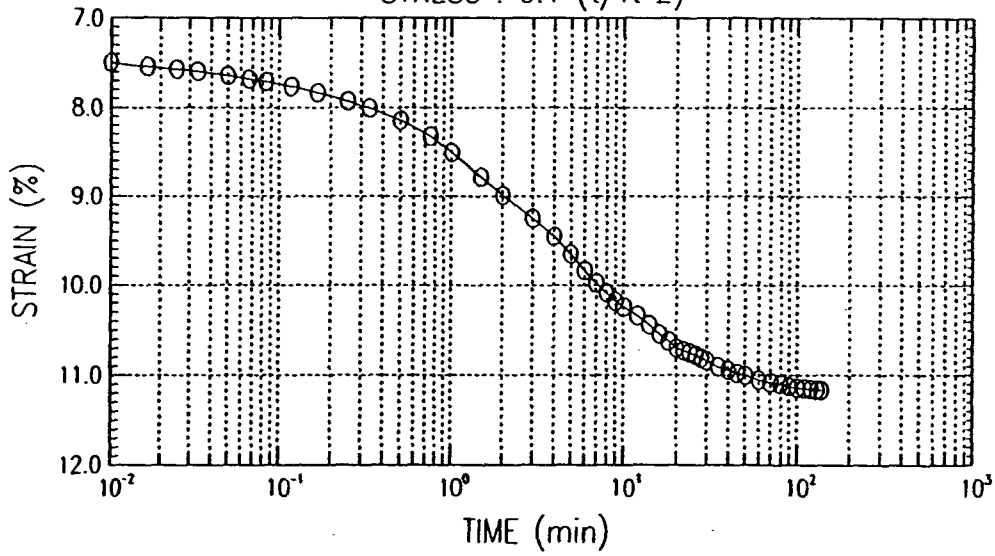


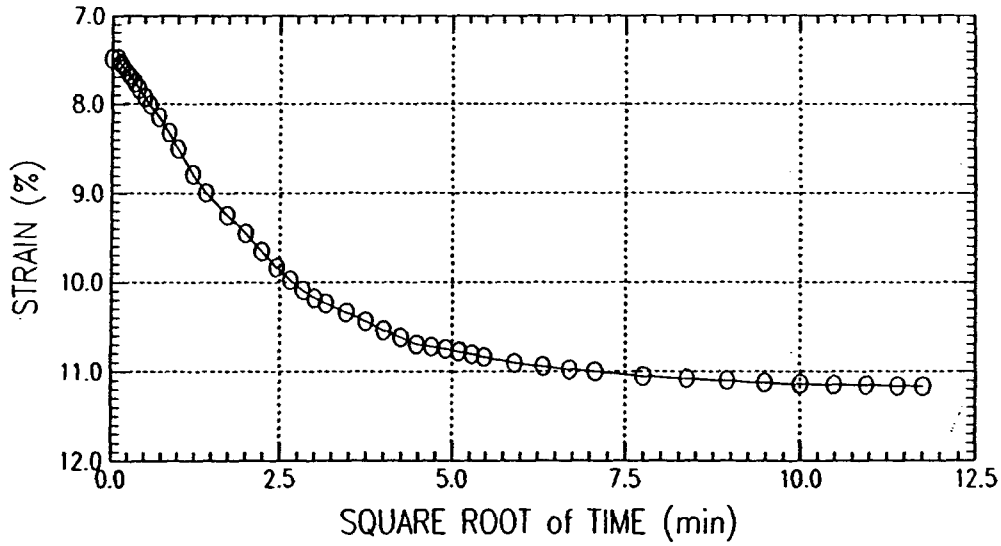


GeoTesting Express
Project Name : New Bedford Harbor Superfund Site
Project No : GTX-2409 Boring No : FB-13 Sample No : UO-1
Test Date : 11/21/99 Test No : CON10 Depth : 0-2 feet
Description : Moist, black organic silt
Remarks : ---

CONSOLIDATION TEST

TIME CURVES (STEP 4 OF 16)
STRESS : 0.1 (t/ft^2)



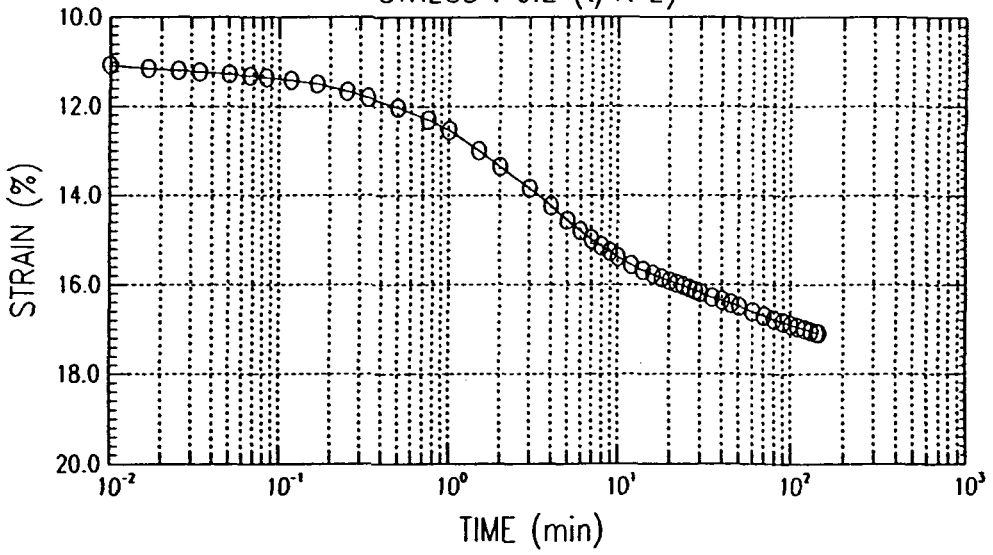


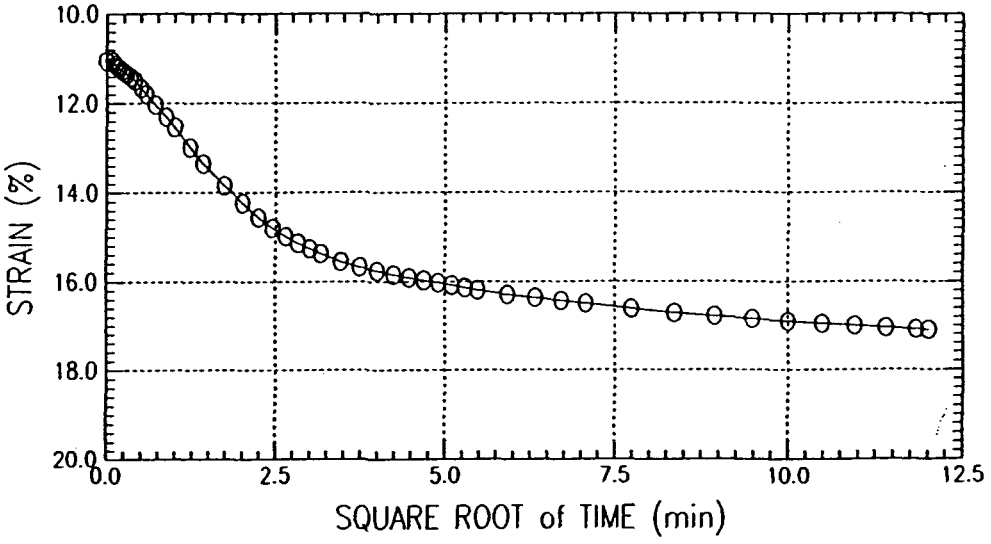
GeoTesting Express
Project Name : New Bedford Harbor Superfund Site
Project No : GTX-2409 Boring No : FB-13 Sample No : U0-1
Test Date : 11/21/99 Test No : CON10 Depth : 0-2 feet
Description : Moist, black organic silt
Remarks : ---

CONSOLIDATION TEST

TIME CURVES (STEP 5 OF 16)

STRESS : 0.2 (t/ft^2)

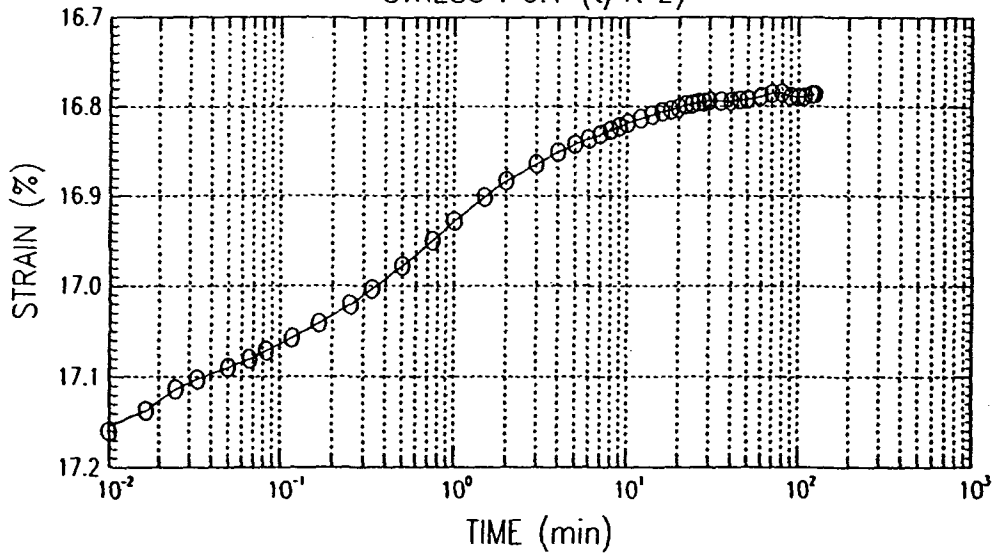


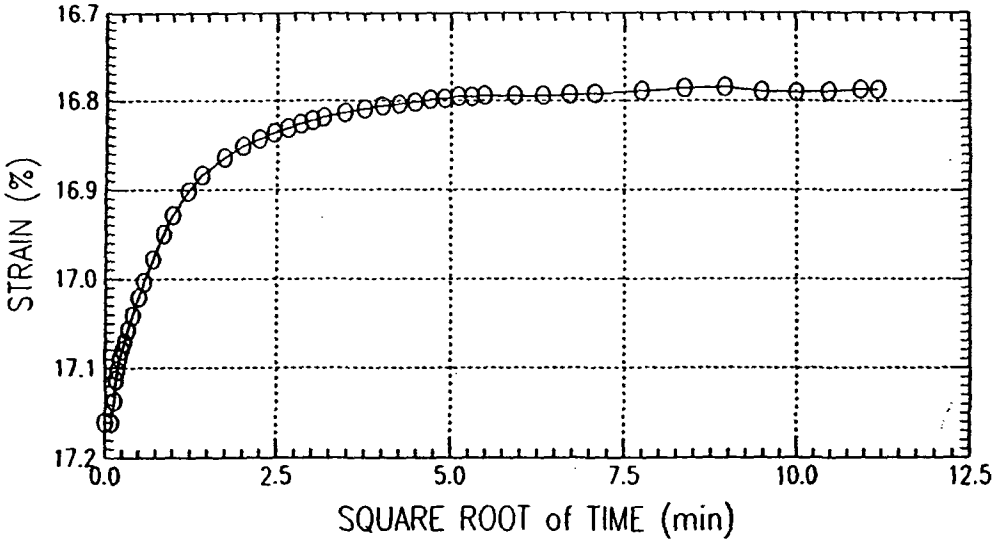


GeoTesting Express
Project Name : New Bedford Harbor Superfund Site
Project No : GTX-2409 Boring No : FB-13 Sample No : UO-1
Test Date : 11/21/99 Test No : CON10 Depth : 0-2 feet
Description : Moist, black organic silt
Remarks : ---

CONSOLIDATION TEST

TIME CURVES (STEP 6 OF 16)
STRESS : 0.1 (t/ft^2)

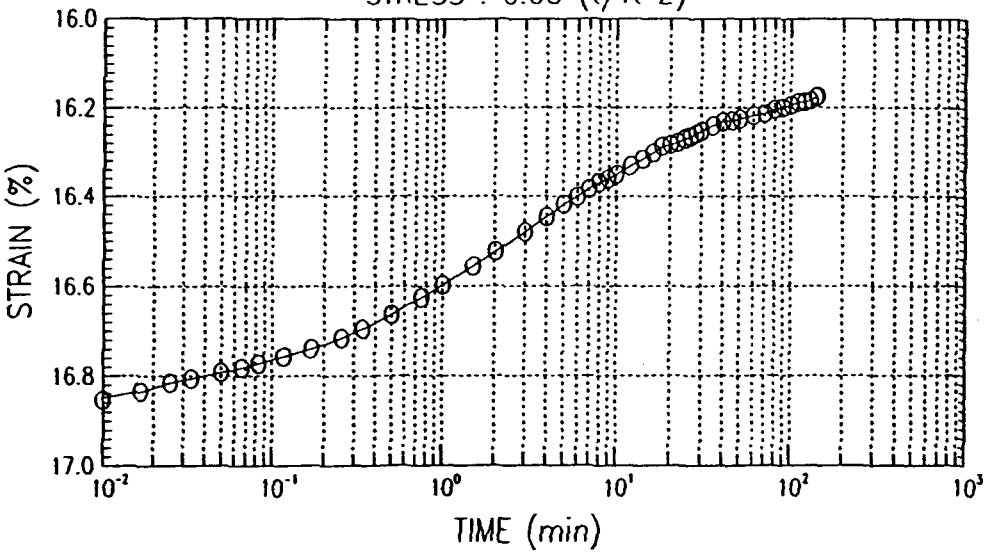


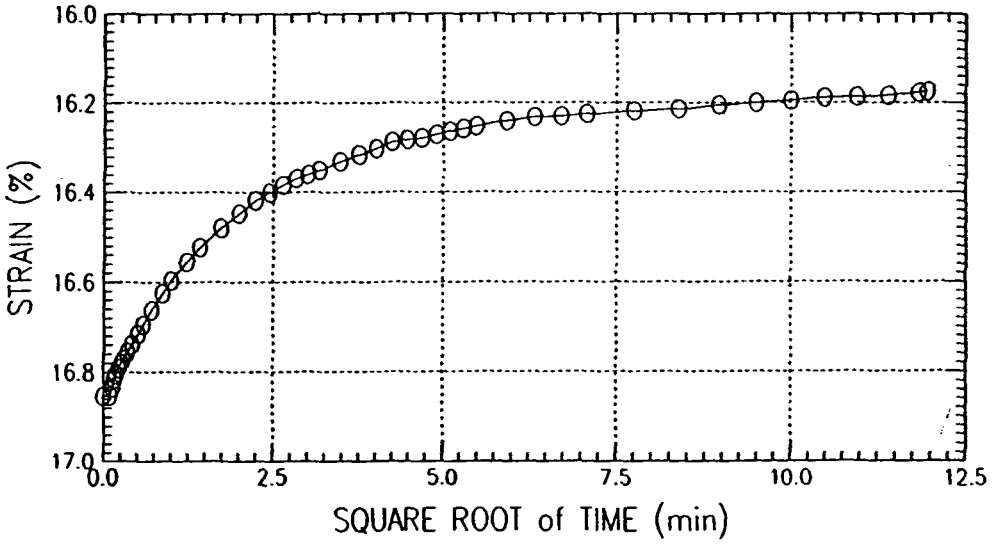


GeoTesting Express
Project Name : New Bedford Harbor Superfund Site
Project No : GTX-2409 Boring No : FB-13 Sample No : U0-1
Test Date : 11/21/99 Test No : CON10 Depth : 0-2 feet
Description : Moist, black organic silt
Remarks : ---

CONSOLIDATION TEST

TIME CURVES (STEP 7 OF 16)
STRESS : 0.05 (t/ft^2)

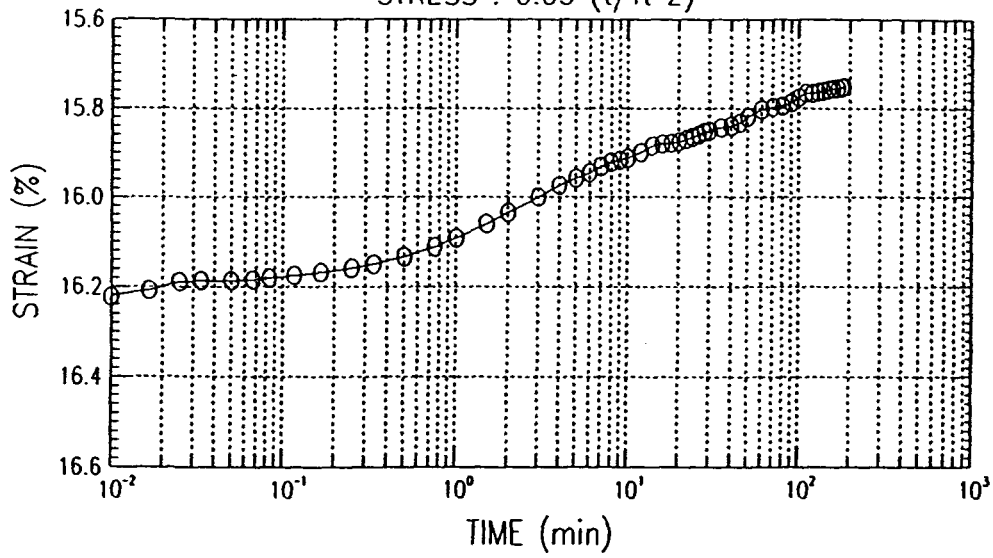


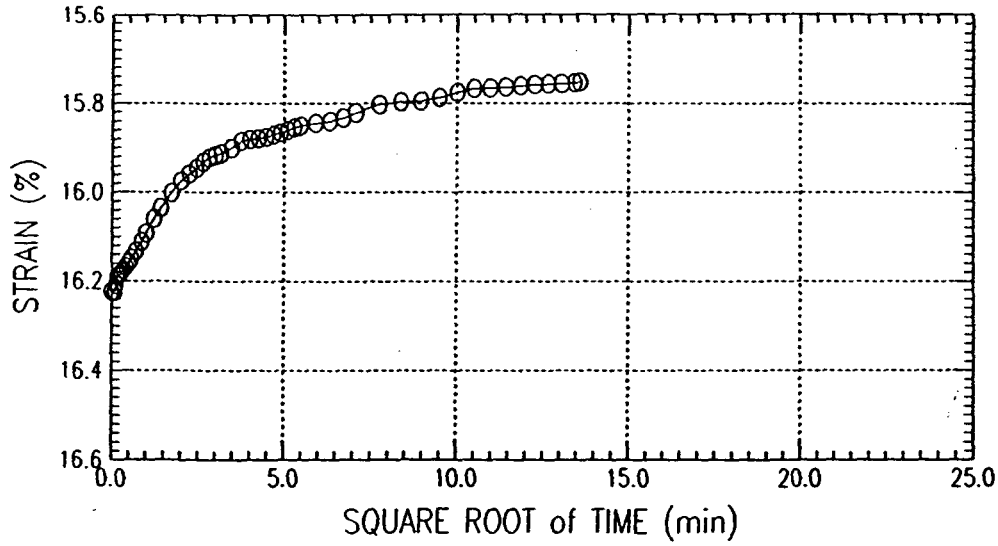


GeoTesting Express
Project Name : New Bedford Harbor Superfund Site
Project No : GTX-2409 Boring No : FB-13 Sample No : UO-1
Test Date : 11/21/99 Test No : CON10 Depth : 0-2 feet
Description : Moist, black organic silt
Remarks : ---

CONSOLIDATION TEST

TIME CURVES (STEP 8 OF 16)
STRESS : 0.03 (t/ft^2)

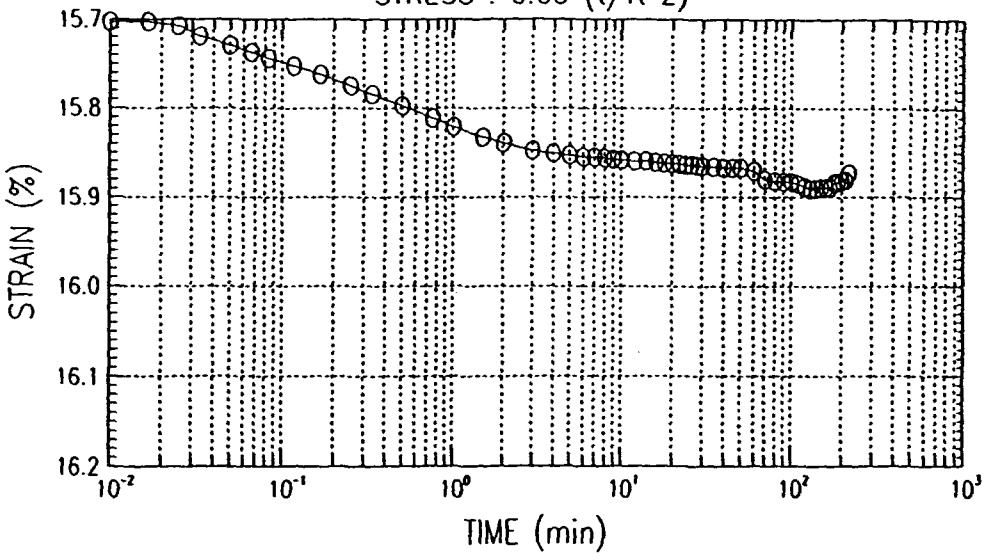


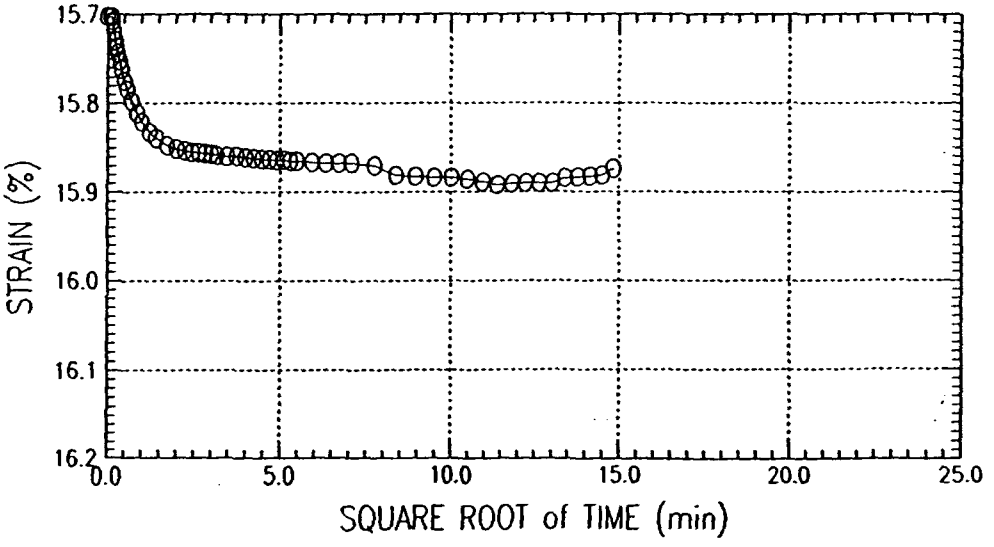


GeoTesting Express
Project Name : New Bedford Harbor Superfund Site
Project No : GTX-2409 Boring No : FB-13 Sample No : UO-1
Test Date : 11/21/99 Test No : CON10 Depth : 0-2 feet
Description : Moist, black organic silt
Remarks : ---

CONSOLIDATION TEST

TIME CURVES (STEP 9 OF 16)
STRESS : 0.05 (t/ft^2)

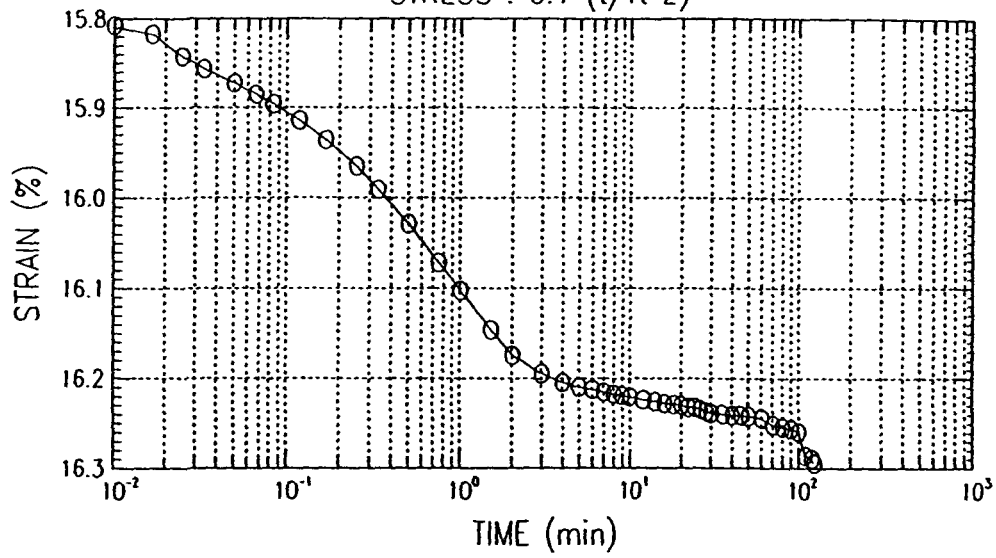


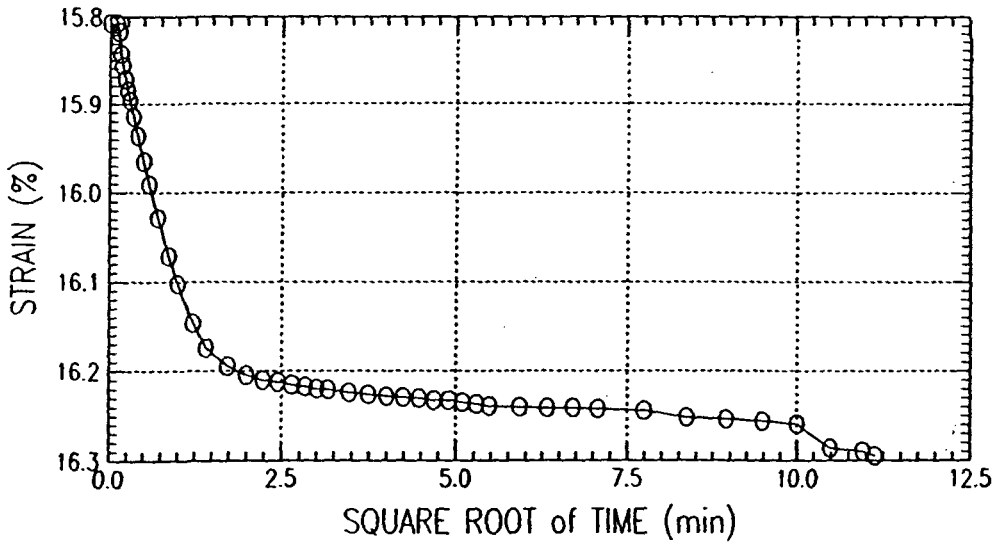


GeoTesting Express
Project Name : New Bedford Harbor Superfund Site
Project No : GTX-2409 Boring No : FB-13 Sample No : UO-1
Test Date : 11/21/99 Test No : CON10 Depth : 0-2 feet
Description : Moist, black organic silt
Remarks : ---

CONSOLIDATION TEST

TIME CURVES (STEP 10 OF 16)
STRESS : 0.1 (t/ft^2)



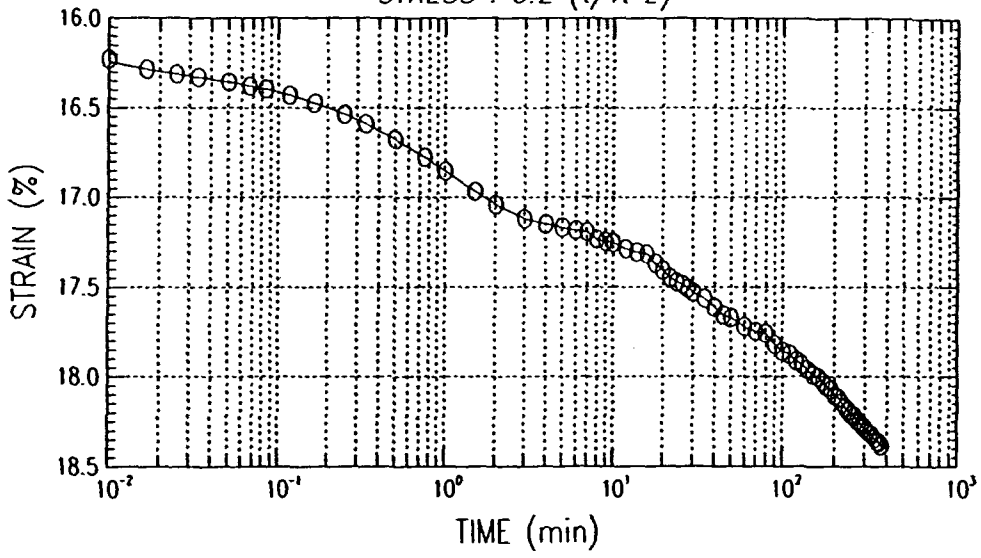


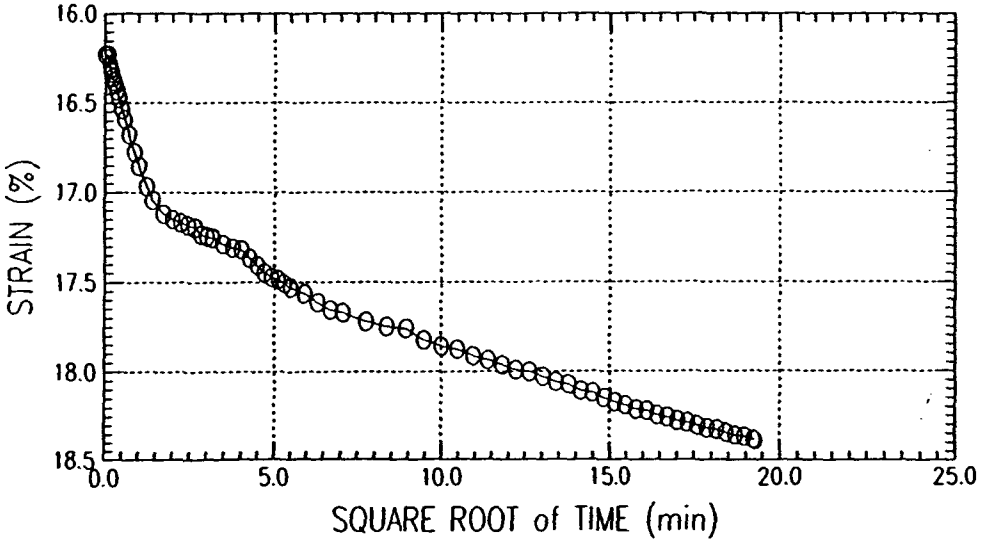
GeoTesting Express
Project Name : New Bedford Harbor Superfund Site
Project No : GTX-2409 Boring No : FB-13 Sample No : UO-1
Test Date : 11/21/99 Test No : CON10 Depth : 0-2 feet
Description : Moist, black organic silt
Remarks : ---

CONSOLIDATION TEST

TIME CURVES (STEP 11 OF 16)

STRESS : 0.2 (t/ft^2)

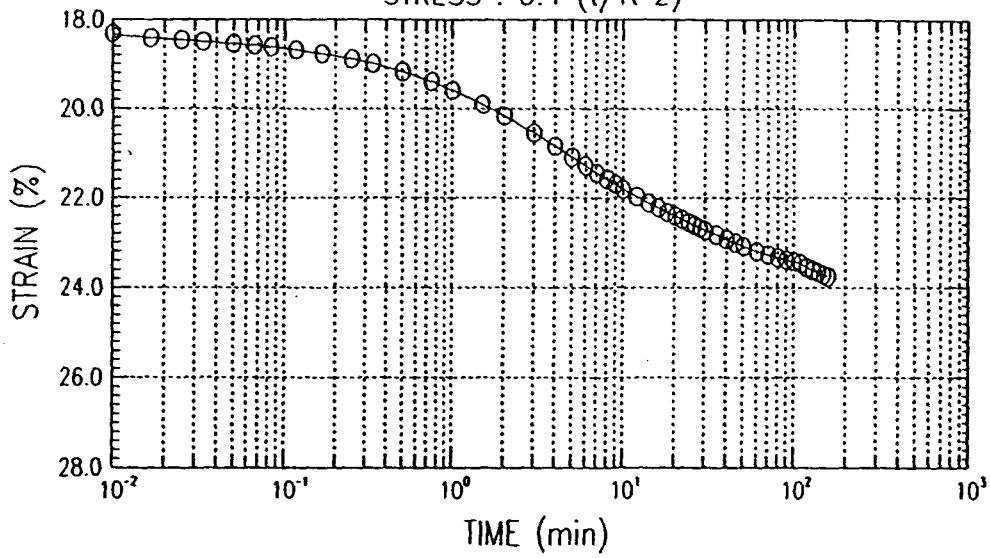


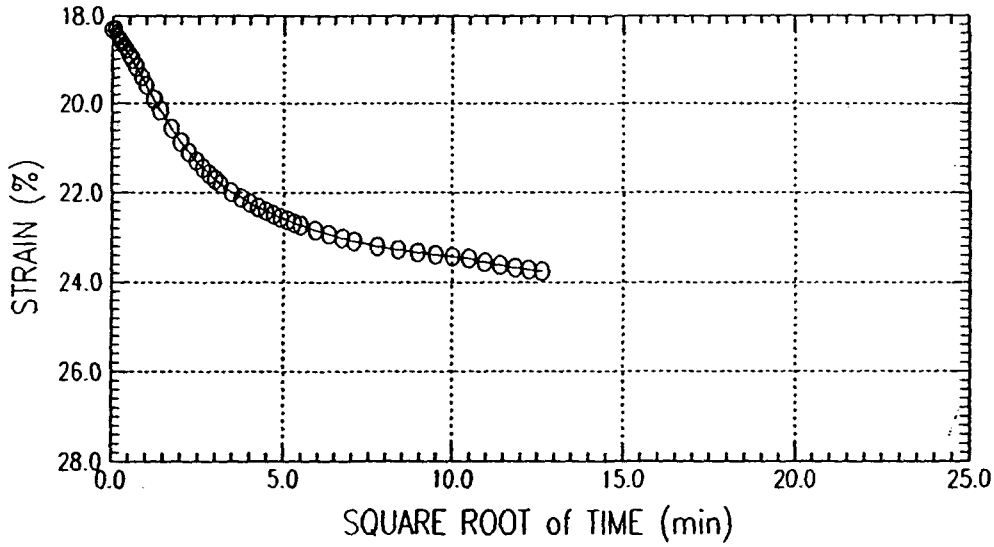


GeoTesting Express
Project Name : New Bedford Harbor Superfund Site
Project No : GTX-2409 Boring No : FB-13 Sample No : UO-1
Test Date : 11/21/99 Test No : CON10 Depth : 0-2 feet
Description : Moist, black organic silt
Remarks : ---

CONSOLIDATION TEST

TIME CURVES (STEP 12 OF 16)
STRESS : 0.4 (t/ft^2)

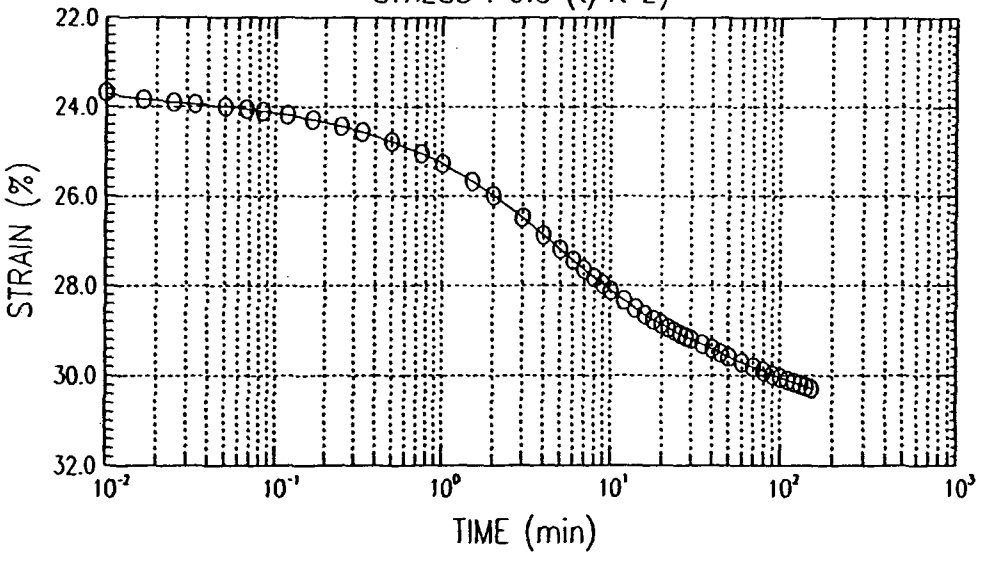


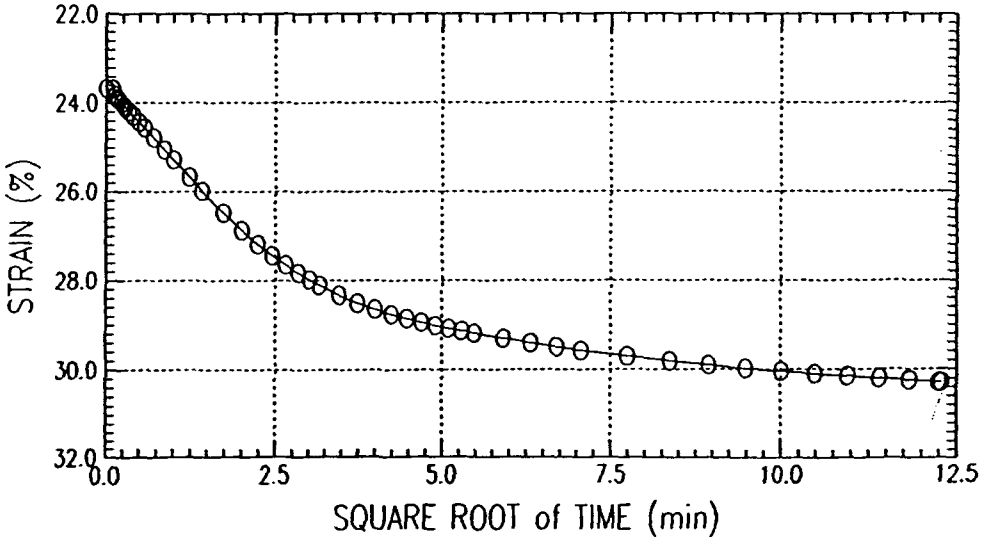


GeoTesting Express
Project Name : New Bedford Harbor Superfund Site
Project No : GTX-2409 Boring No : FB-13 Sample No : UO-1
Test Date : 11/21/99 Test No : CON10 Depth : 0-2 feet
Description : Moist, black organic silt
Remarks : ---

CONSOLIDATION TEST

TIME CURVES (STEP 13 OF 16)
STRESS : 0.8 (t/ft^2)



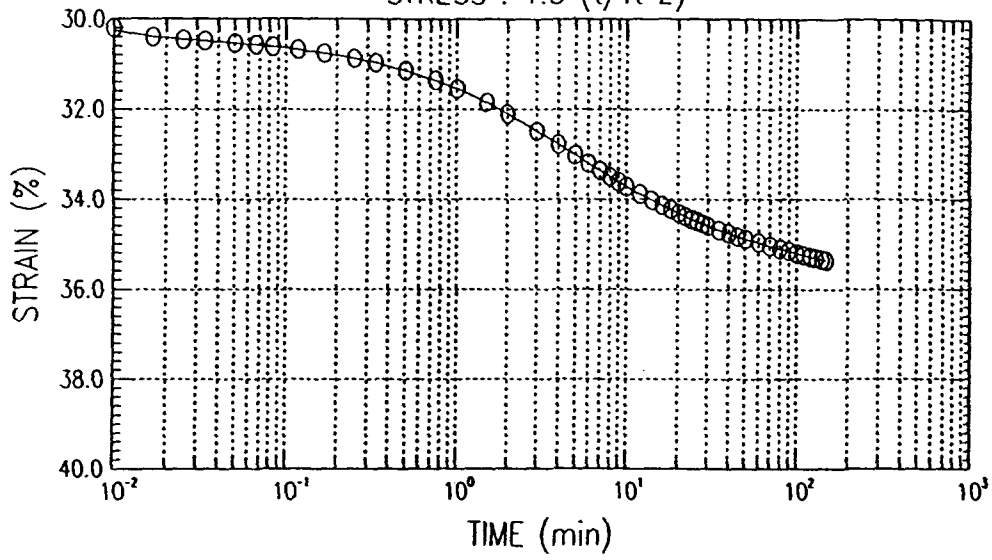


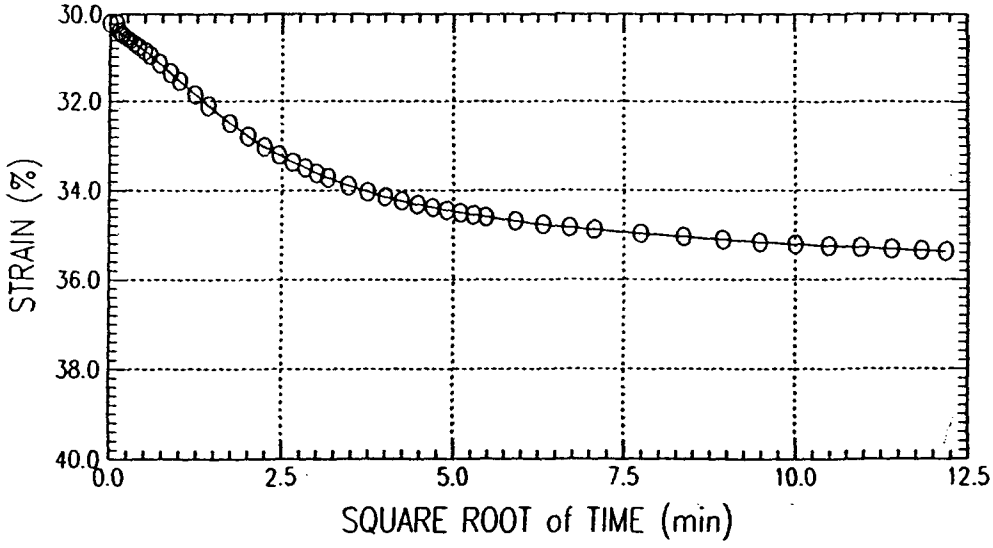
GeoTesting Express
Project Name : New Bedford Harbor Superfund Site
Project No : GTX-2409 Boring No : FB-13 Sample No : UO-1
Test Date : 11/21/99 Test No : CON10 Depth : 0-2 feet
Description : Moist, black organic silt
Remarks : ---

CONSOLIDATION TEST

TIME CURVES (STEP 14 OF 16)

STRESS : 1.5 (t/ft^2)

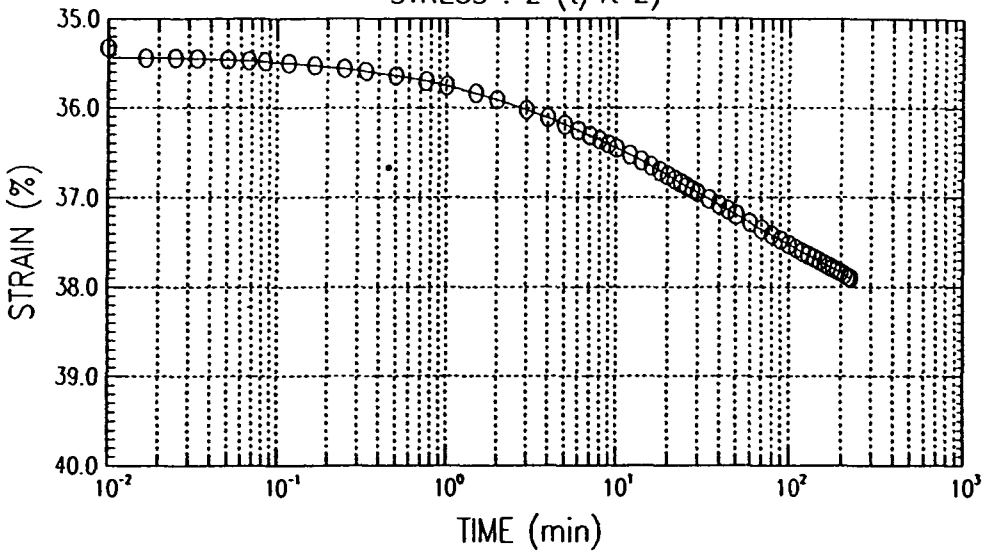


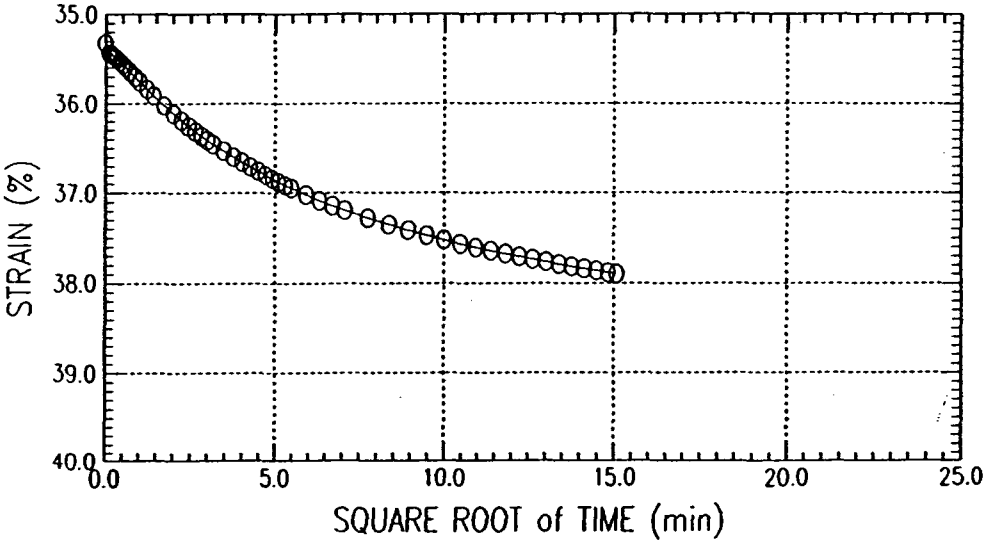


GeoTesting Express
Project Name : New Bedford Harbor Superfund Site
Project No : GTX-2409 Boring No : FB-13 Sample No : U0-1
Test Date : 11/21/99 Test No : CON10 Depth : 0-2 feet
Description : Moist, black organic silt
Remarks : ---

CONSOLIDATION TEST

TIME CURVES (STEP 15 OF 16)
STRESS : 2 (t/ft^2)

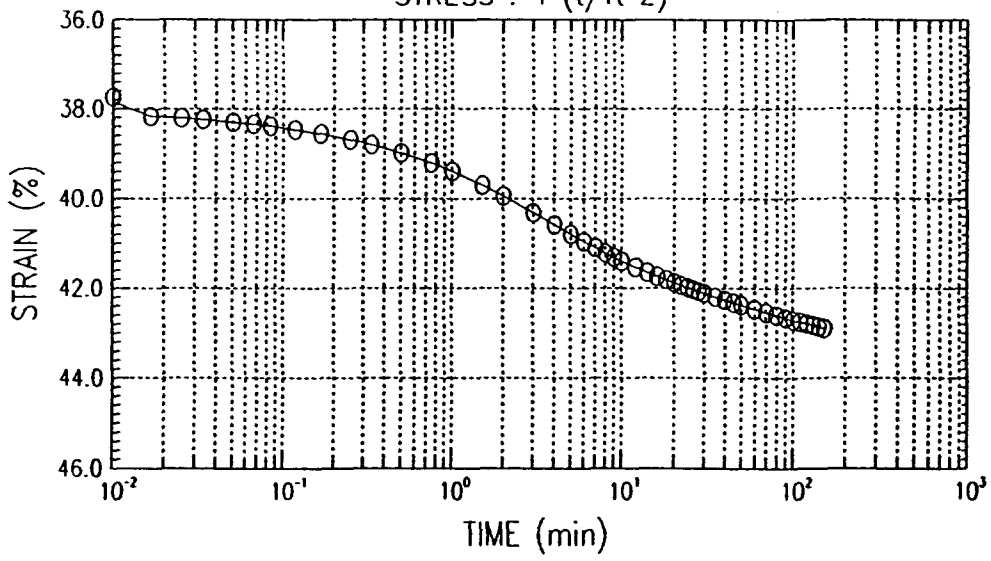


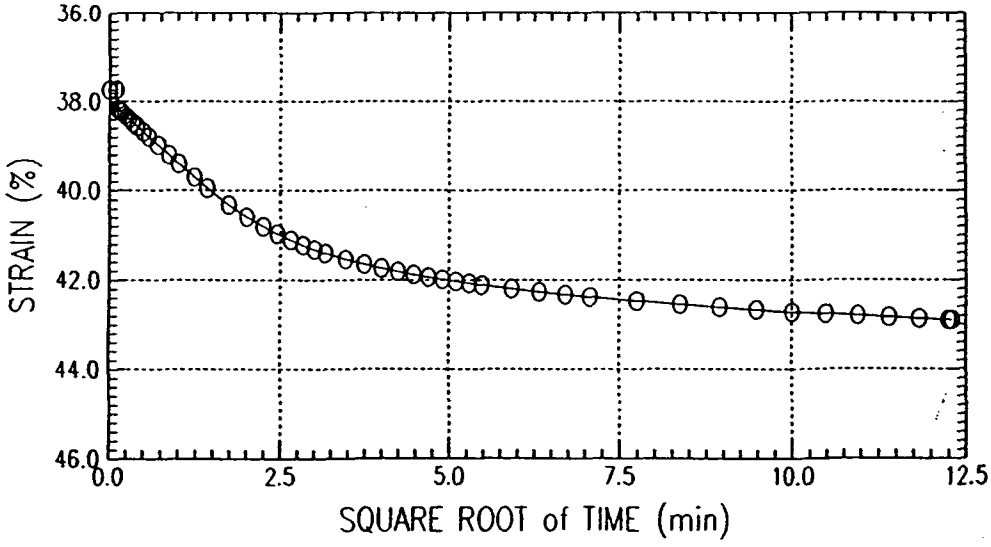


GeoTesting Express
Project Name : New Bedford Harbor Superfund Site
Project No : GTX-2409 Boring No : FB-13 Sample No : UO-1
Test Date : 11/21/99 Test No : CON10 Depth : 0-2 feet
Description : Moist, black organic silt
Remarks : ---

CONSOLIDATION TEST

TIME CURVES (STEP 16 OF 16)
STRESS : 4 (t/ft^2)

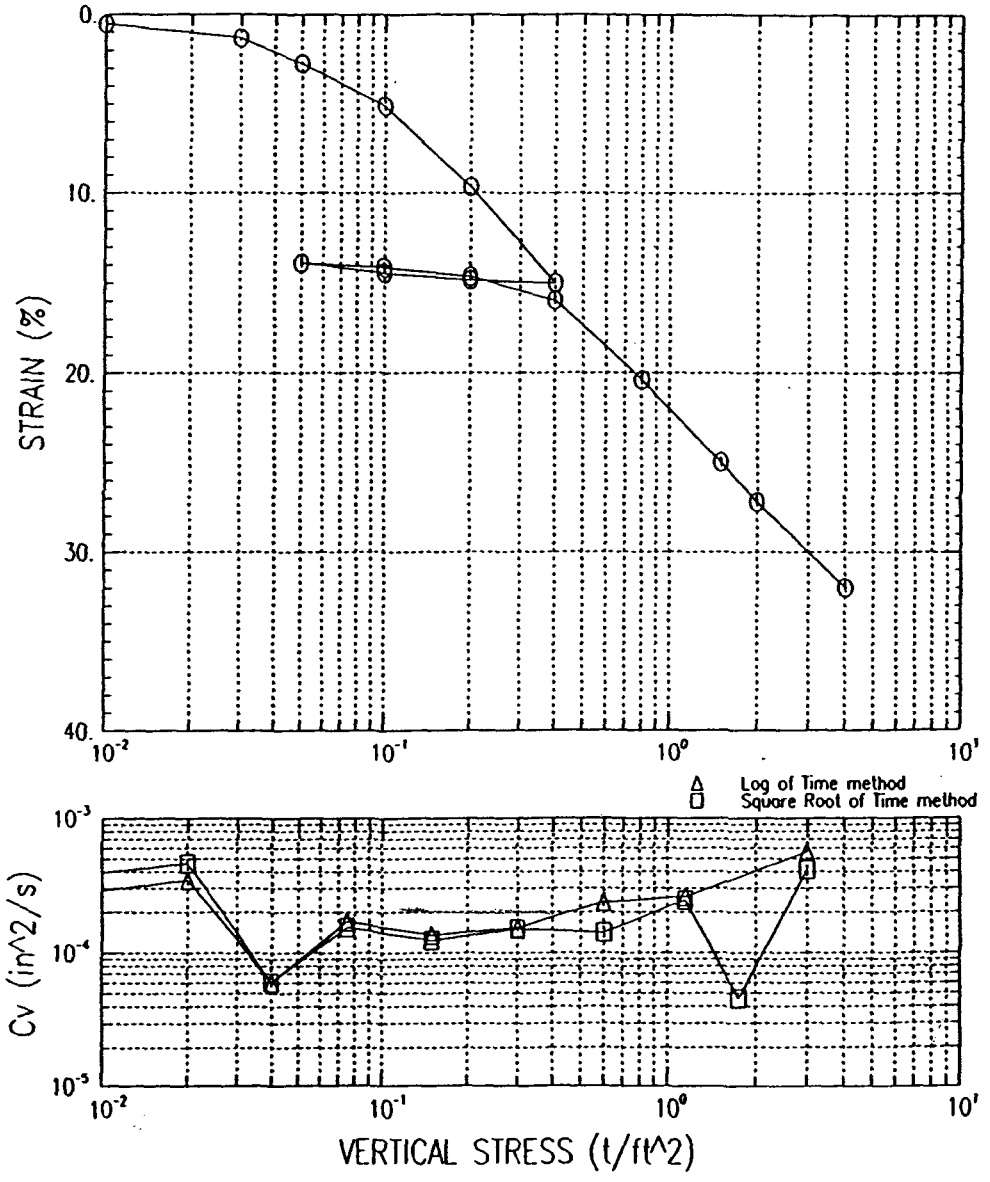




GeoTesting Express
Project Name : New Bedford Harbor Superfund Site
Project No : GTX-2409 Boring No : FB-13 Sample No : UO-1
Test Date : 11/21/99 Test No : CON10 Depth : 0-2 feet
Description : Moist, black organic silt
Remarks : ---

CONSOLIDATION TEST

SUMMARY REPORT



GeoTesting Express
Project Name : New Bedford Harbor Superfund Site
Project No : GTX-2409 Boring No : FB-17 Sample No : UO-1
Test Date : 11/21/99 Test No : CON11 Depth : 0-2 feet
Description : Moist, gray clay with organic
Remarks : ---

CONSOLIDATION TEST DATA

Project : New Bedford Harbor Superfund Site Location : New Bedford, MA Project No.: GTX-2409
Boring No.: FB-17 Tested by : fy Checked by : rh
Sample No.: UO-1 Test Date : 11/21/99 Depth : 0-2 feet
Test No. : CON11 Sample Type: Tube

Soil Description : Moist, gray clay with organic
Remarks : ---

Specific Gravity : 2.65 Liquid Limit : 0 Initial Height : 1.00 (in)
Initial Void Ratio : 2.26 Plastic Limit : 0 Sample Diameter : 2.49 (in)
Final Void Ratio : 1.21 Plasticity Index : 0

	BEFORE CONSOLIDATION		AFTER CONSOLIDATION	
	TRIMMINGS	SPECIMEN + RING	SPECIMEN + RING	TRIMMINGS
CONTAINER NO.	ee4	RING	RING	jgb122
WT CONTAINER + WET SOIL (gm)	325.00	330.91	307.00	99.09
WT CONTAINER + DRY SOIL (gm)	181.60	277.23	277.23	70.79
WT CONTAINER (gm)	9.39	212.40	212.40	9.15
WT DRY SOIL (gm)	172.21	64.83	64.83	61.64
WATER CONTENT (%)	83.27	82.79	45.91	45.91
VOID RATIO	------	2.26	1.21	------
DEGREE OF SATURATION (%)	------	97.08	100.00	------
DRY DENSITY (lb/ft^3)	------	50.72	74.58	------

CONSOLIDATION TEST DATA

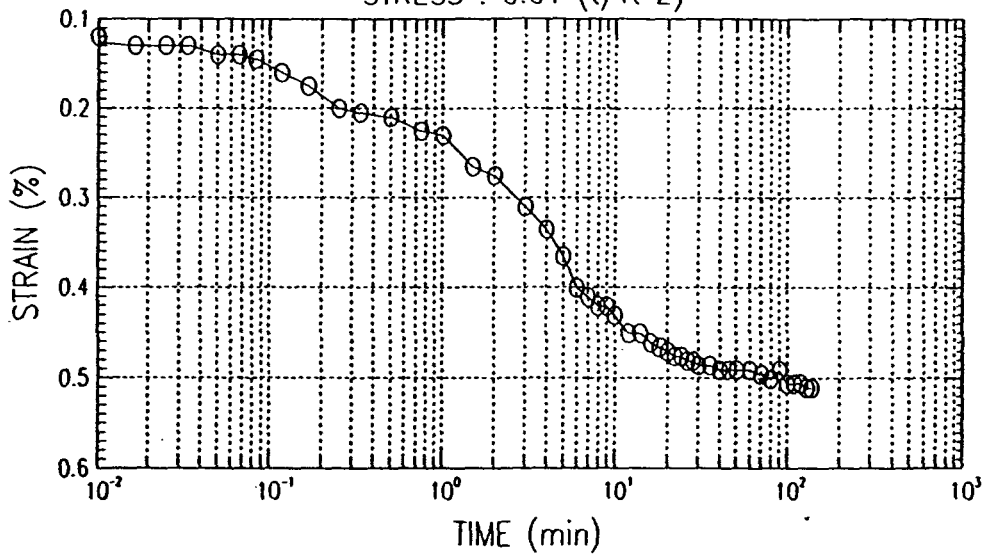
Project : New Bedford Harbor Superfund Site Location : New Bedford, MA Project No.: GTX-2409
Boring No.: FB-17 Tested by : fy Checked by : rh
Sample No.: UO-1 Test Date : 11/21/99 Depth : 0-2 feet
Test No. : CON11 Sample Type: Tube

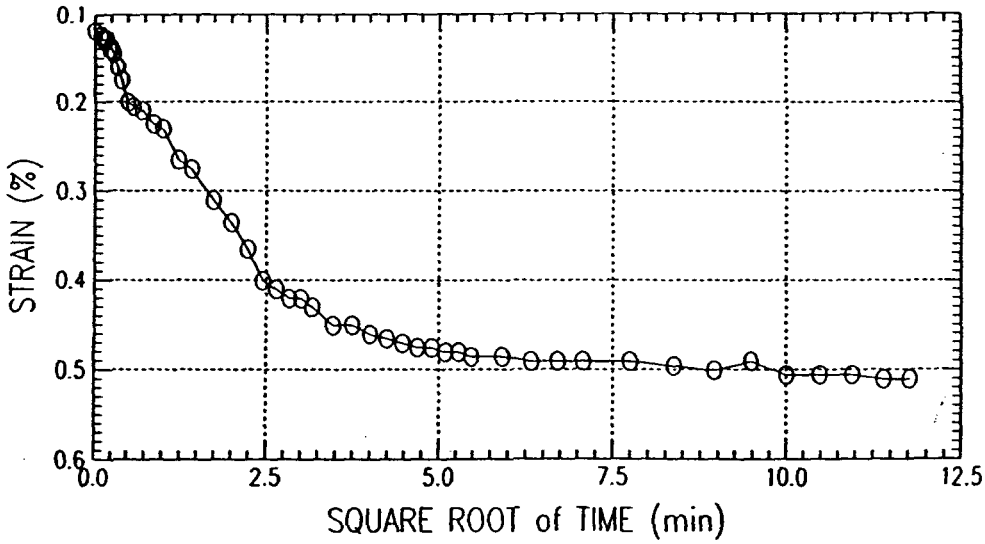
Soil Description : Moist, gray clay with organic
Remarks : ---

	APPLIED PRESSURE (t/ft^2)	FINAL DISPLACEMENT (in)	VOID RATIO	STRAIN AT END (%)	FITTING T50 TIME (min) SQ.RT.	FITTING T50 TIME (min) LOG	COEFFICIENT OF CONSOLIDATION (in^2/s) SQ.RT.	COEFFICIENT OF CONSOLIDATION (in^2/s) LOG	COEFFICIENT OF CONSOLIDATION (in^2/s) AVE
1)	0.01	0.005	2.239	0.52	2.4	3.4	3.40E-004	2.42E-004	2.91E-004
2)	0.03	0.014	2.212	1.35	1.7	2.3	4.60E-004	3.46E-004	4.03E-004
3)	0.05	0.027	2.167	2.74	13.1	13.0	6.01E-005	6.05E-005	6.03E-005
4)	0.10	0.051	2.090	5.12	4.9	4.4	1.55E-004	1.70E-004	1.62E-004
5)	0.20	0.097	1.941	9.67	5.7	5.2	1.24E-004	1.35E-004	1.30E-004
6)	0.40	0.150	1.768	15.01	4.2	4.1	1.50E-004	1.53E-004	1.51E-004
7)	0.20	0.149	1.772	14.86	0.0	0.0	0.00E+000	0.00E+000	0.00E+000
8)	0.10	0.145	1.785	14.46	0.0	0.0	0.00E+000	0.00E+000	0.00E+000
9)	0.05	0.139	1.803	13.91	0.0	0.0	0.00E+000	0.00E+000	0.00E+000
10)	0.10	0.142	1.796	14.15	0.0	0.0	0.00E+000	0.00E+000	0.00E+000
11)	0.20	0.147	1.779	14.66	0.0	0.0	0.00E+000	0.00E+000	0.00E+000
12)	0.40	0.160	1.736	15.97	0.0	0.0	0.00E+000	0.00E+000	0.00E+000
13)	0.80	0.204	1.592	20.39	3.9	2.3	1.41E-004	2.36E-004	1.89E-004
14)	1.50	0.250	1.443	24.99	2.0	1.9	2.45E-004	2.60E-004	2.53E-004
15)	2.00	0.272	1.371	27.20	9.8	0.0	4.57E-005	0.00E+000	4.57E-005
16)	4.00	0.320	1.215	31.99	1.0	0.7	4.13E-004	5.62E-004	4.87E-004

CONSOLIDATION TEST

TIME CURVES (STEP 1 OF 16)
STRESS : 0.01 (t/ft^2)

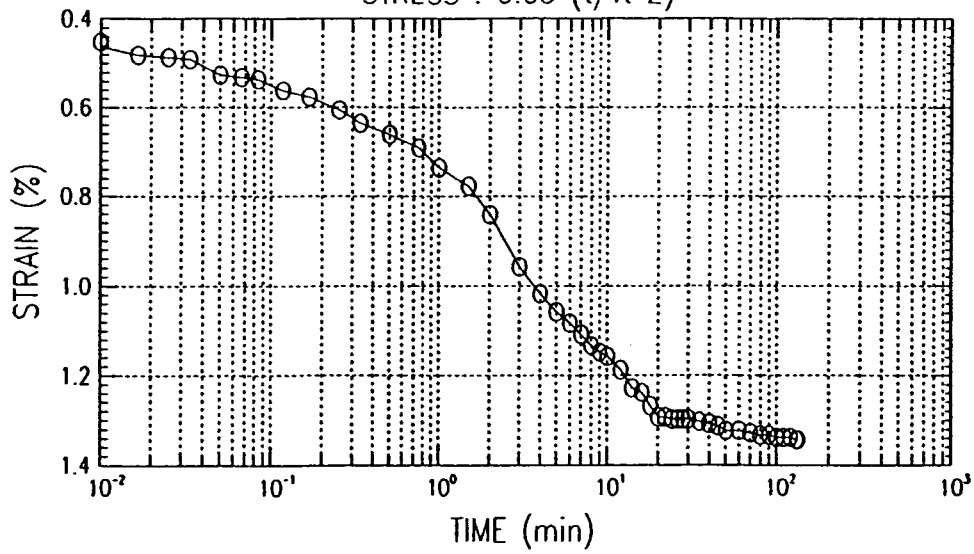


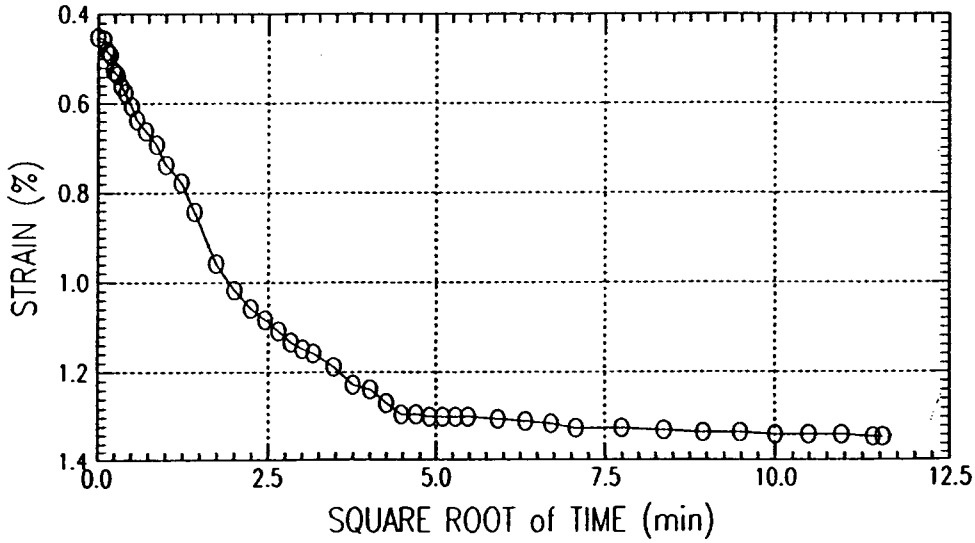


GeoTesting Express
Project Name : New Bedford Harbor Superfund Site
Project No : GTX-2409 Boring No : FB-17 Sample No : UO-1
Test Date : 11/21/99 Test No : CON11 Depth : 0-2 feet
Description : Moist, gray clay with organic
Remarks : ---

CONSOLIDATION TEST

TIME CURVES (STEP 2 OF 16)
STRESS : 0.03 (t/ft^2)

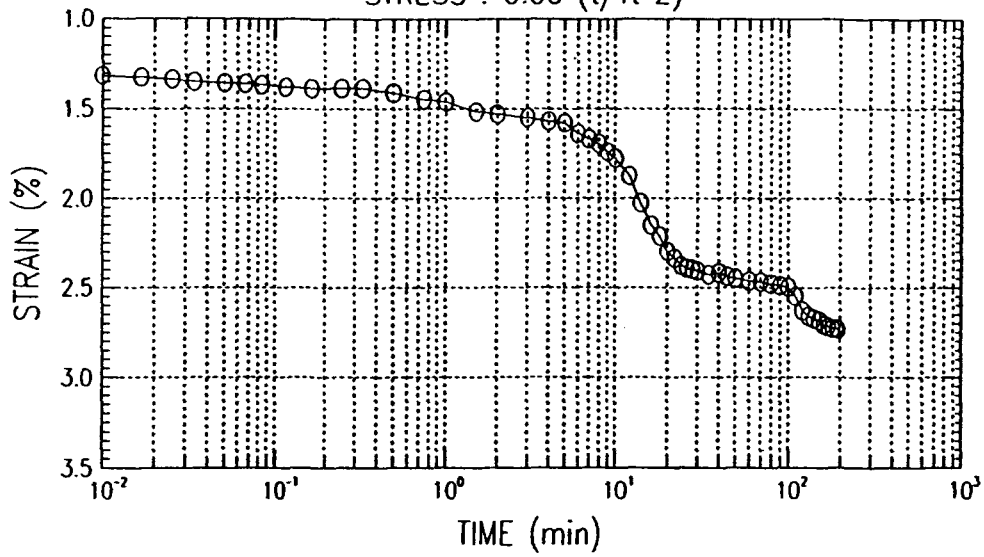


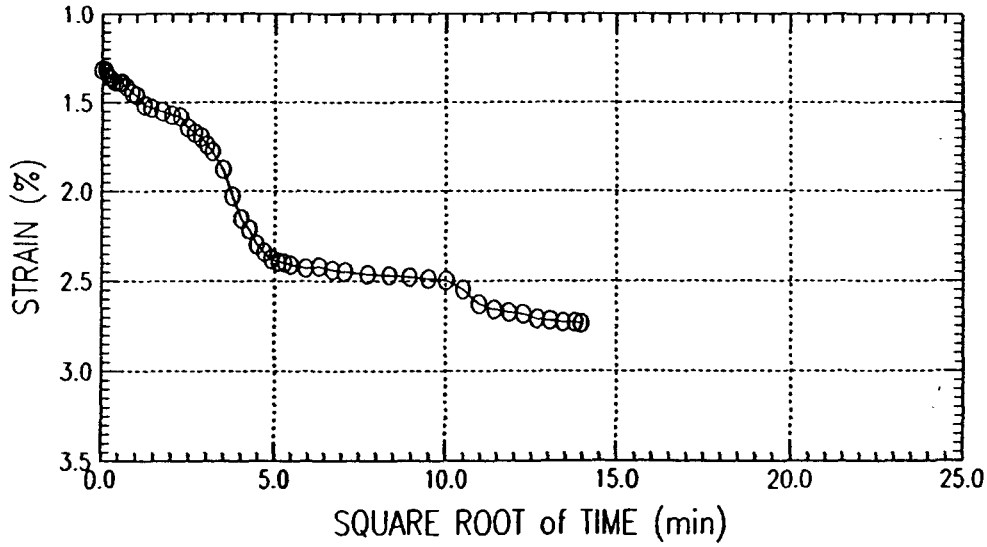


GeoTesting Express
Project Name : New Bedford Harbor Superfund Site
Project No : GTX-2409 Boring No : FB-17 Sample No : UO-1
Test Date : 11/21/99 Test No : CON11 Depth : 0-2 feet
Description : Moist, gray clay with organic
Remarks : ---

CONSOLIDATION TEST

TIME CURVES (STEP 3 OF 16)
STRESS : 0.05 (t/ft^2)

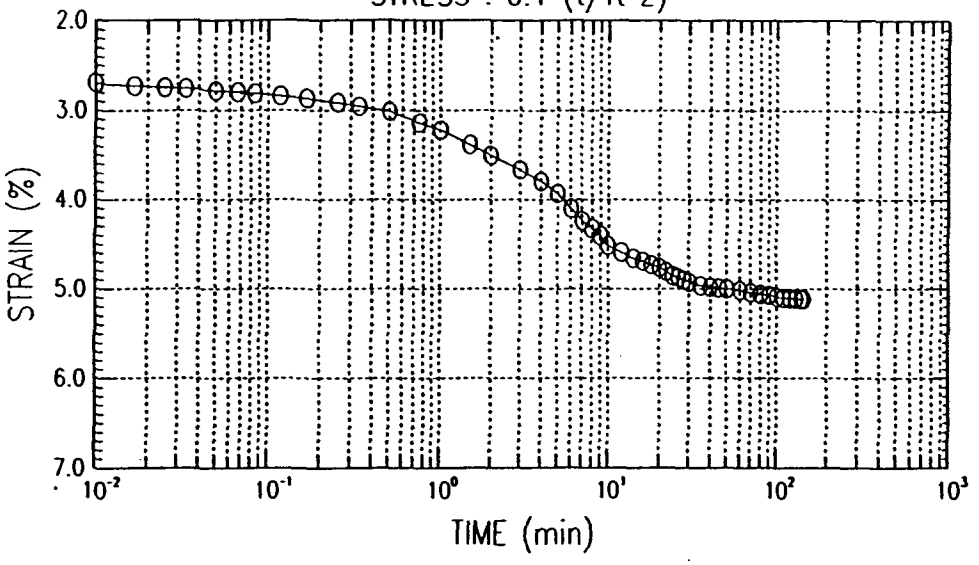


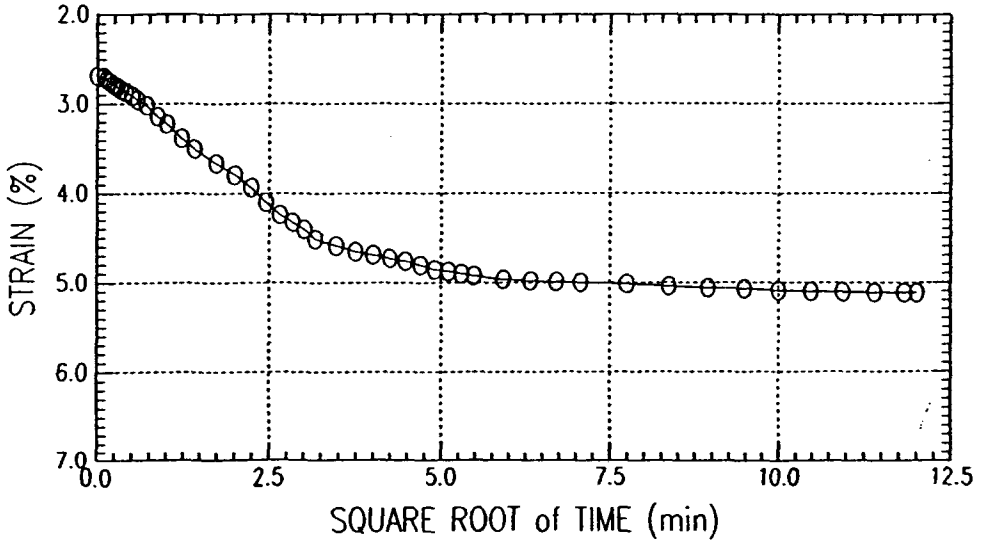


GeoTesting Express
Project Name : New Bedford Harbor Superfund Site
Project No : GTX-2409 Boring No : FB-17 Sample No : UO-1
Test Date : 11/21/99 Test No : CON11 Depth : 0-2 feet
Description : Moist, gray clay with organic
Remarks : ---

CONSOLIDATION TEST

TIME CURVES (STEP 4 OF 16)
STRESS : 0.1 (t/ft^2)

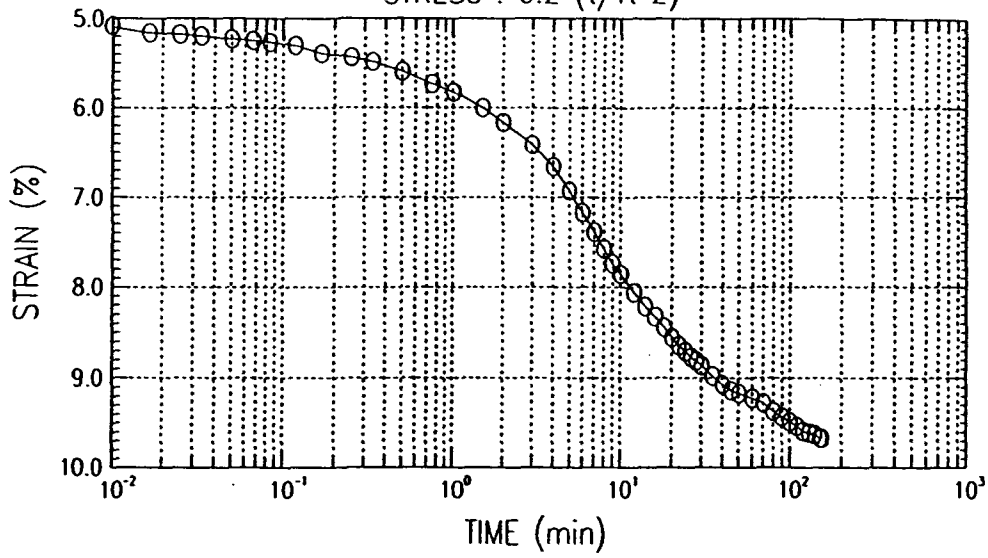


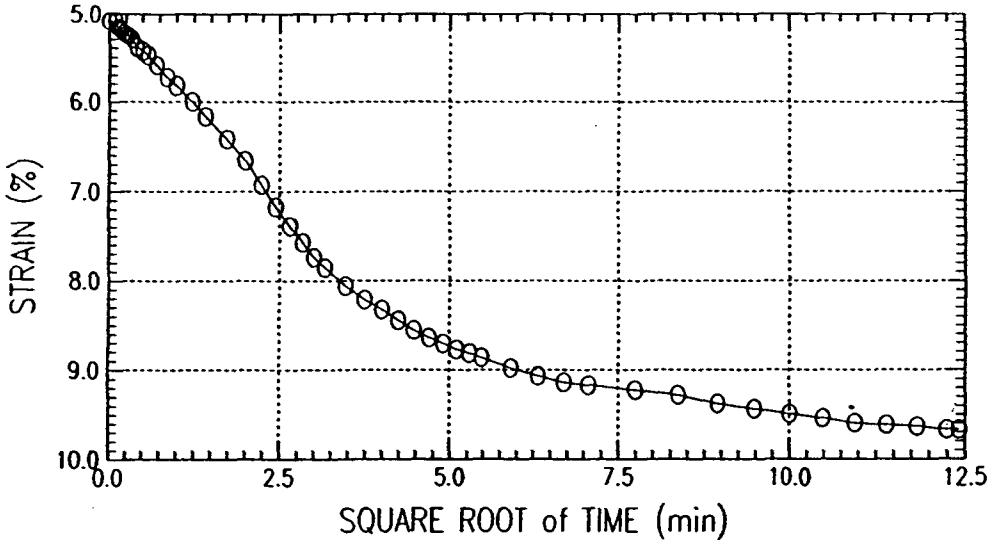


GeoTesting Express
Project Name : New Bedford Harbor Superfund Site
Project No : GTX-2409 Boring No : FB-17 Sample No : UO-1
Test Date : 11/21/99 Test No : CON11 Depth : 0-2 feet
Description : Moist, gray clay with organic
Remarks : ---

CONSOLIDATION TEST

TIME CURVES (STEP 5 OF 16)
STRESS : 0.2 (t/ft^2)

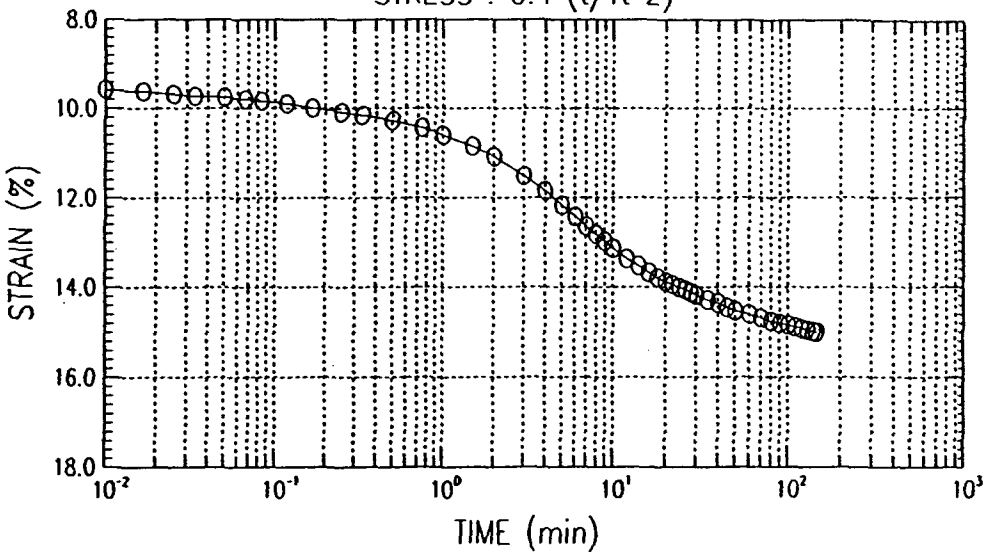


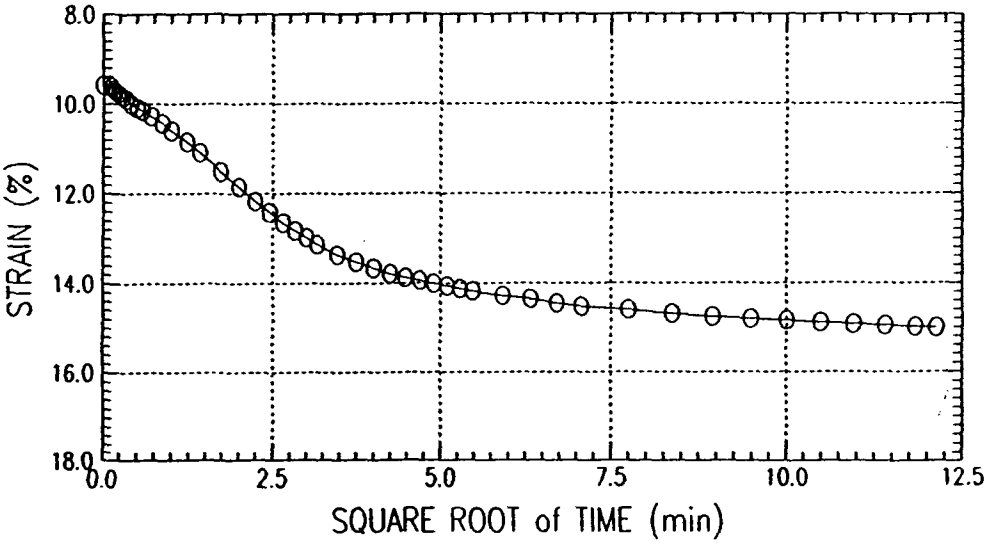


GeoTesting Express
Project Name : New Bedford Harbor Superfund Site
Project No : GTX-2409 Boring No : FB-17 Sample No : UO-1
Test Date : 11/21/99 Test No : CON11 Depth : 0-2 feet
Description : Moist, gray clay with organic
Remarks : ---

CONSOLIDATION TEST

TIME CURVES (STEP 6 OF 16)
STRESS : 0.4 (t/ft^2)

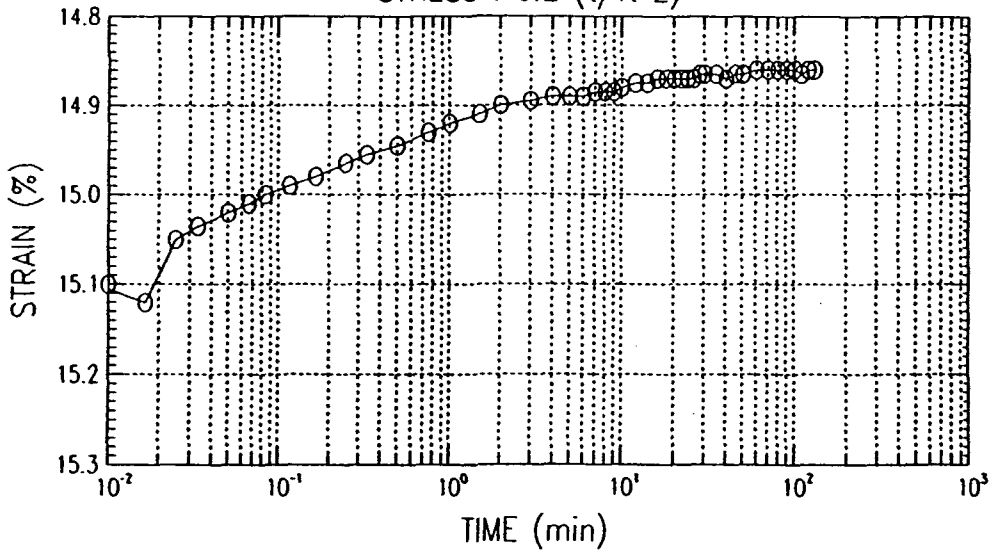


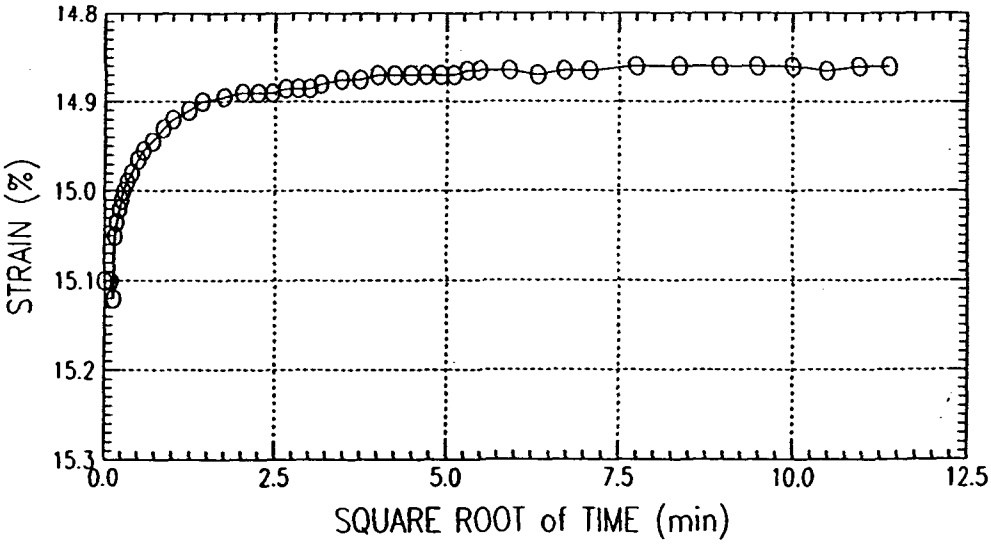


GeoTesting Express
Project Name : New Bedford Harbor Superfund Site
Project No : GTX-2409 Boring No : FB-17 Sample No : UO-1
Test Date : 11/21/99 Test No : CON11 Depth : 0-2 feet
Description : Moist, gray clay with organic
Remarks : ---

CONSOLIDATION TEST

TIME CURVES (STEP 7 OF 16)
STRESS : 0.2 (t/ft^2)

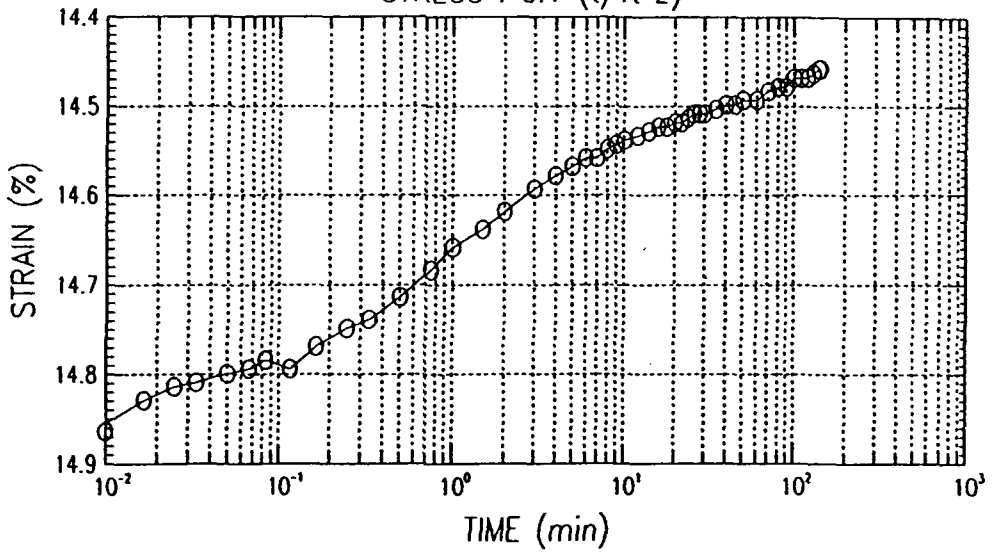


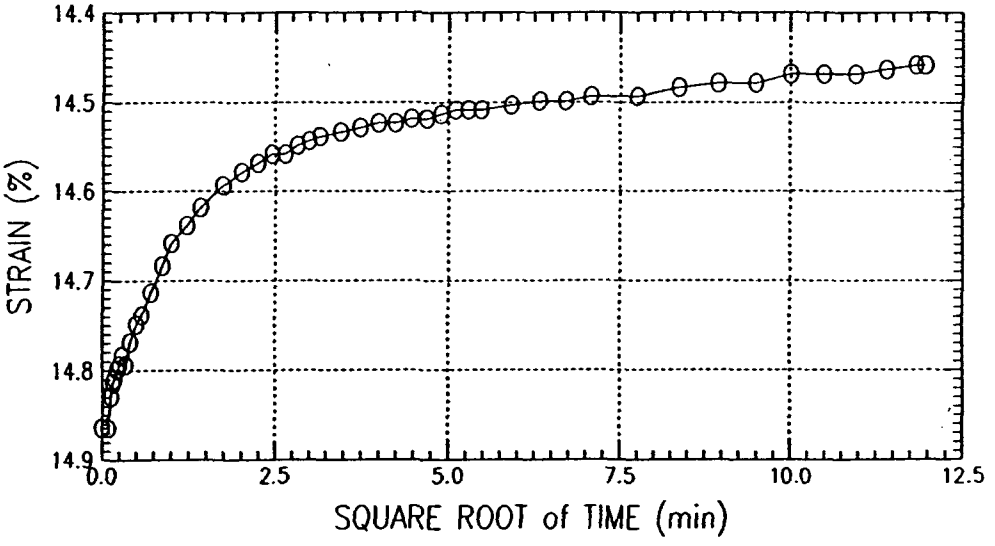


GeoTesting Express
Project Name : New Bedford Harbor Superfund Site
Project No : GTX-2409 Boring No : FB-17 Sample No : UO-1
Test Date : 11/21/99 Test No : CON11 Depth : 0-2 feet
Description : Moist, gray clay with organic
Remarks : ---

CONSOLIDATION TEST

TIME CURVES (STEP 8 OF 16)
STRESS : 0.1 (t/ft^2)

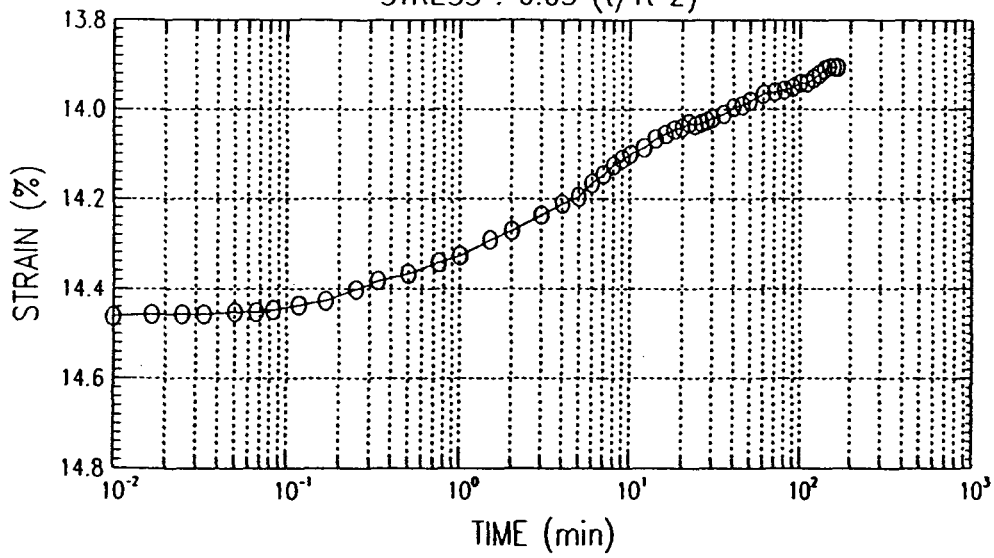


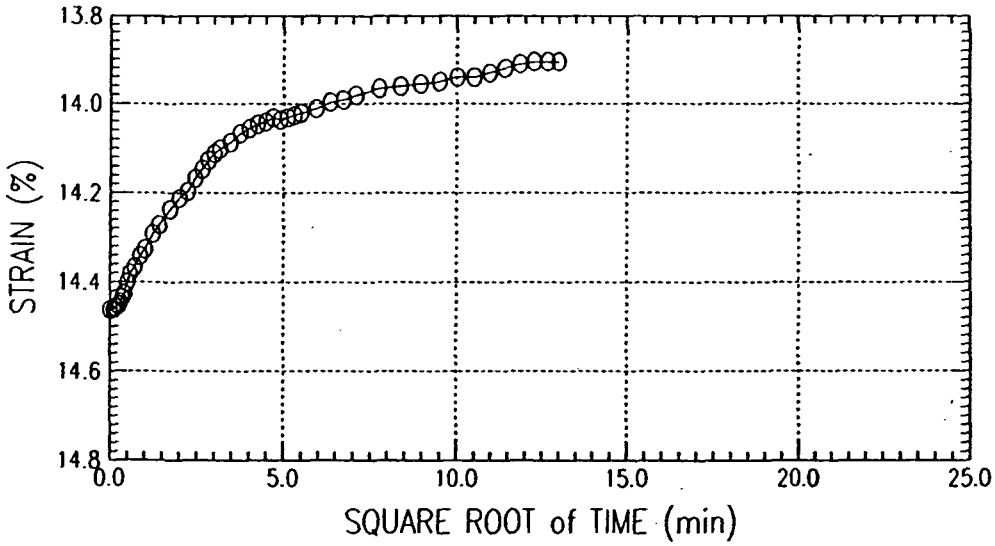


GeoTesting Express
Project Name : New Bedford Harbor Superfund Site
Project No : GTX-2409 Boring No : FB-17 Sample No : U0-1
Test Date : 11/21/99 Test No : CON11 Depth : 0-2 feet
Description : Moist, gray clay with organic
Remarks : ---

CONSOLIDATION TEST

TIME CURVES (STEP 9 OF 16)
STRESS : 0.05 (t/ft^2)

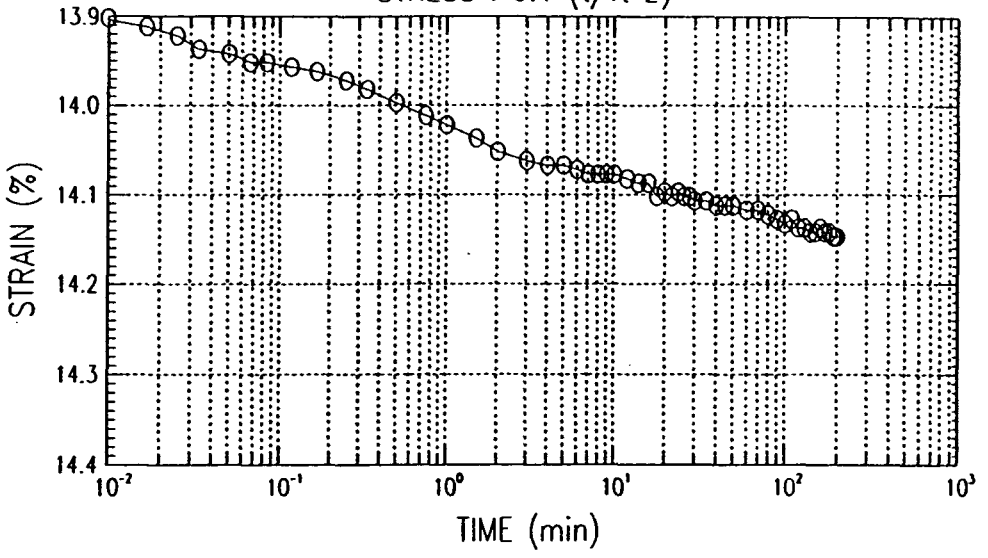


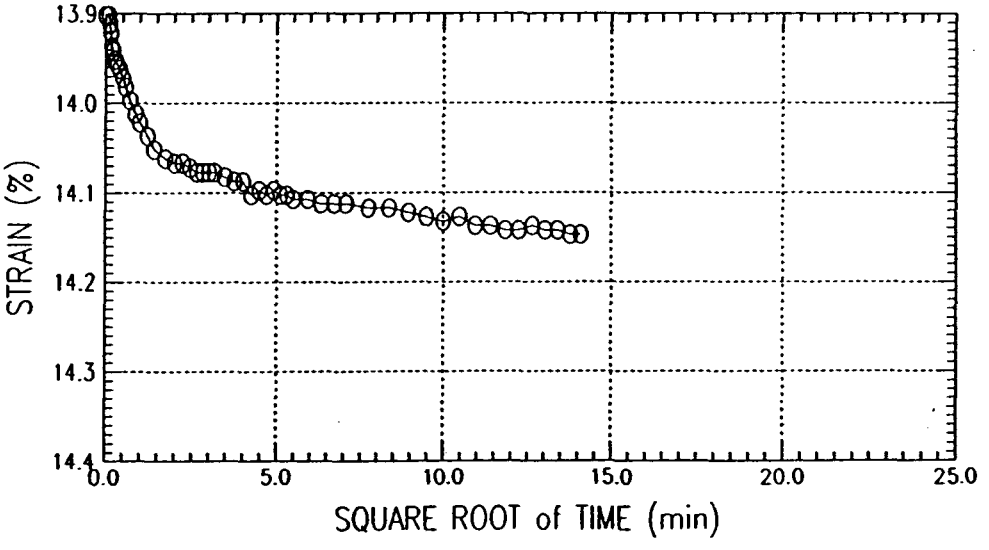


GeoTesting Express
Project Name : New Bedford Harbor Superfund Site
Project No : GTX-2409 Boring No : FB-17 Sample No : U0-1
Test Date : 11/21/99 Test No : CON11 Depth : 0-2 feet
Description : Moist, gray clay with organic
Remarks : ---

CONSOLIDATION TEST

TIME CURVES (STEP 10 OF 16)
STRESS : 0.1 (t/ft^2)

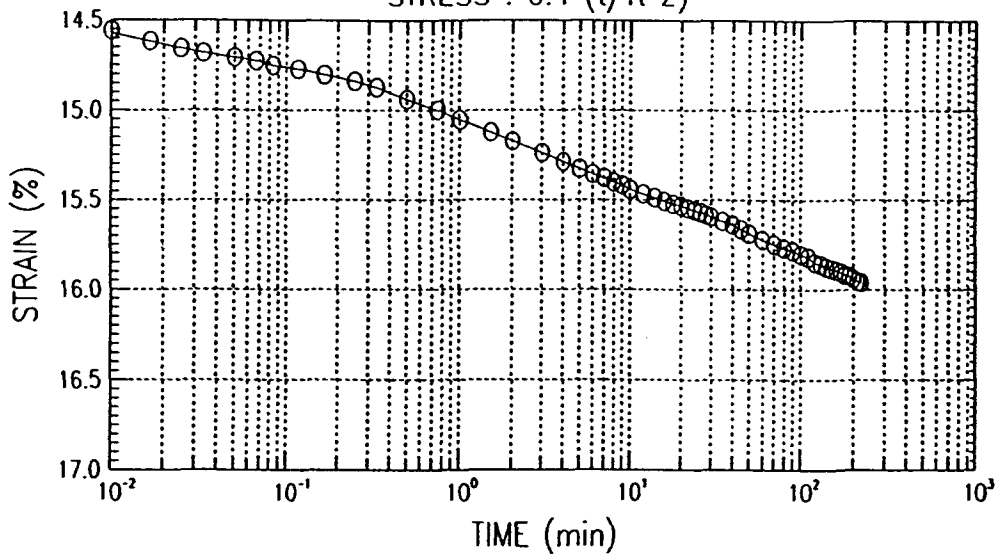


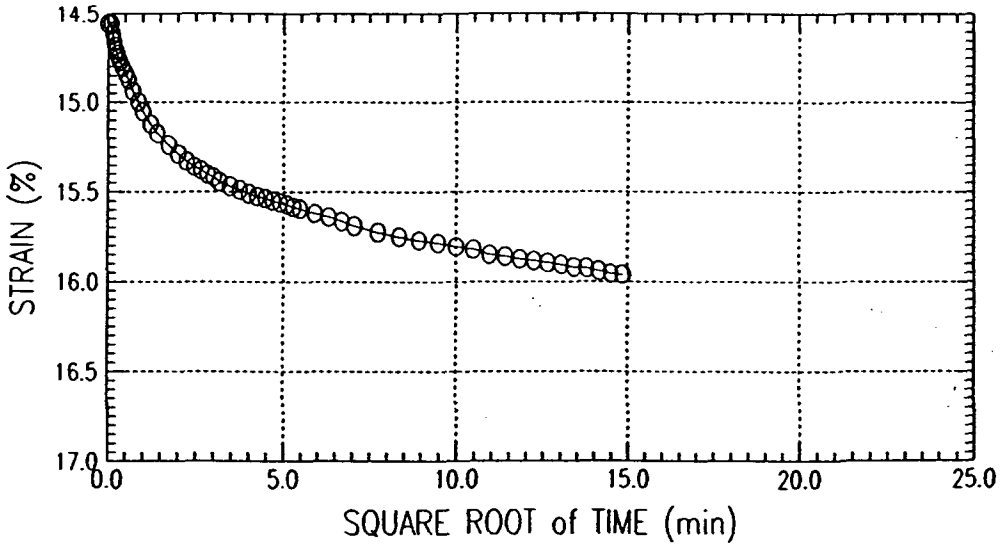


GeoTesting Express
Project Name : New Bedford Harbor Superfund Site
Project No : GTX-2409 Boring No : FB-17 Sample No : UO-1
Test Date : 11/21/99 Test No : CON11 Depth : 0-2 feet
Description : Moist, gray clay with organic
Remarks : ---

CONSOLIDATION TEST

TIME CURVES (STEP 12 OF 16)
STRESS : 0.4 (t/ft^2)

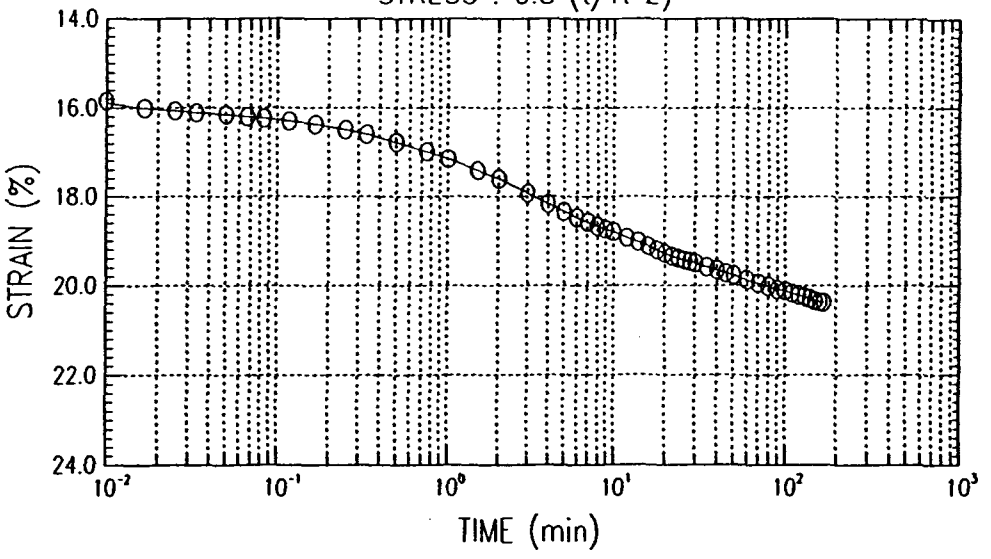


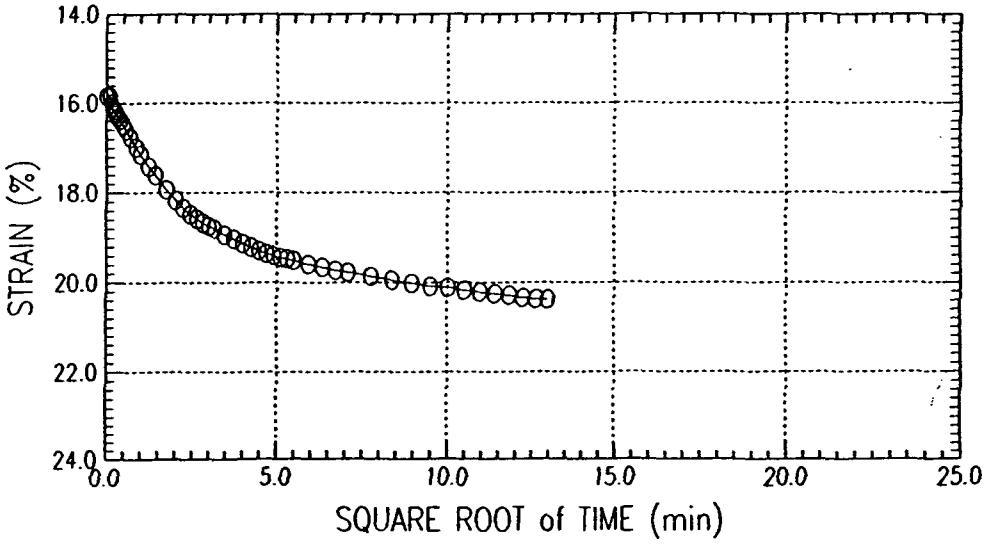


GeoTesting Express
Project Name : New Bedford Harbor Superfund Site
Project No : GTX-2409 Boring No : FB-17 Sample No : UO-1
Test Date : 11/21/99 Test No : CON11 Depth : 0-2 feet
Description : Moist, gray clay with organic
Remarks : ---

CONSOLIDATION TEST

TIME CURVES (STEP 13 OF 16)
STRESS : 0.8 (t/ft^2)

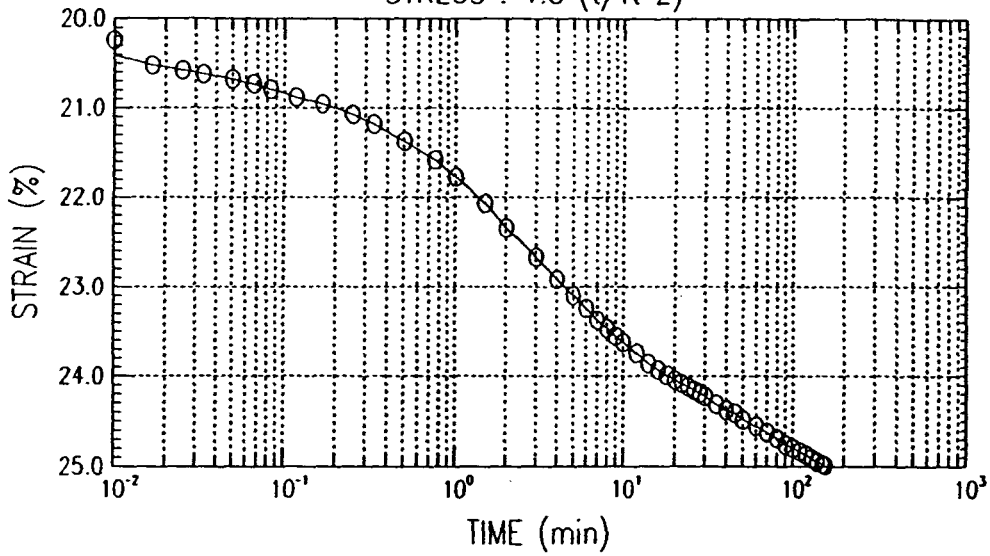


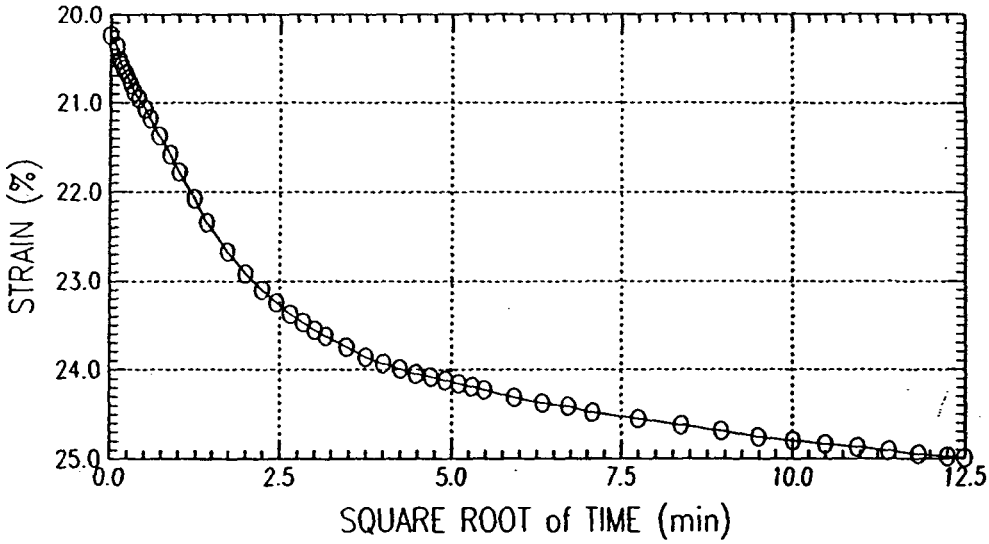


GeoTesting Express
Project Name : New Bedford Harbor Superfund Site
Project No : GTX-2409 Boring No : FB-17 Sample No : UO-1
Test Date : 11/21/99 Test No : CON11 Depth : 0-2 feet
Description : Moist, gray clay with organic
Remarks : ---

CONSOLIDATION TEST

TIME CURVES (STEP 14 OF 16)
STRESS : 1.5 (t/ft^2)

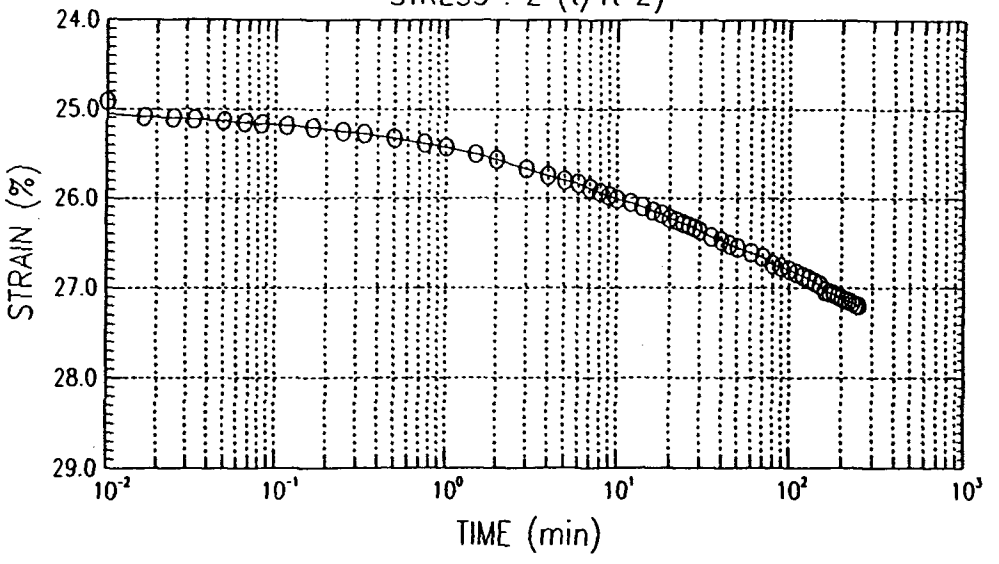


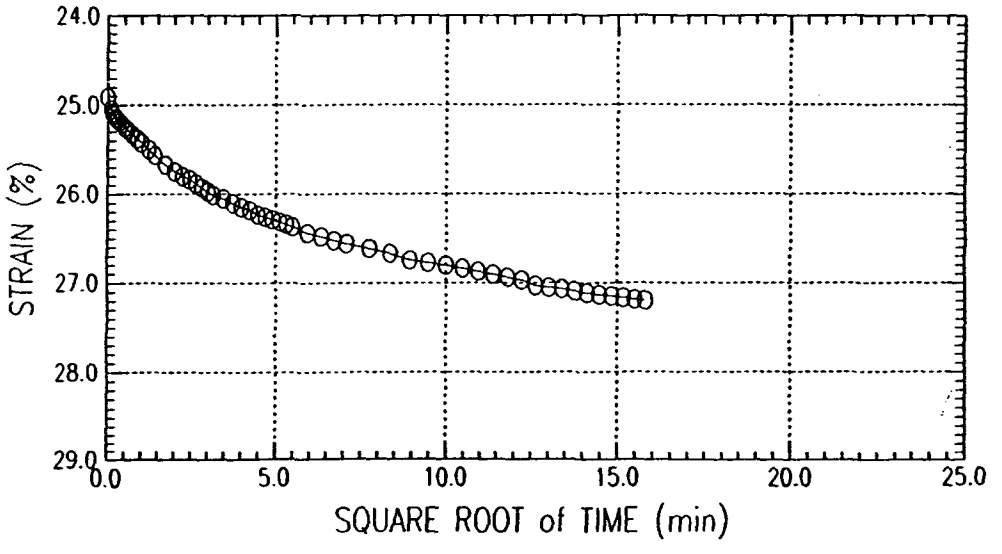


GeoTesting Express
Project Name : New Bedford Harbor Superfund Site
Project No : GTX-2409 Boring No : FB-17 Sample No : UO-1
Test Date : 11/21/99 Test No : CON11 Depth : 0-2 feet
Description : Moist, gray clay with organic
Remarks : ---

CONSOLIDATION TEST

TIME CURVES (STEP 15 OF 16)
STRESS : 2 (t/ft^2)

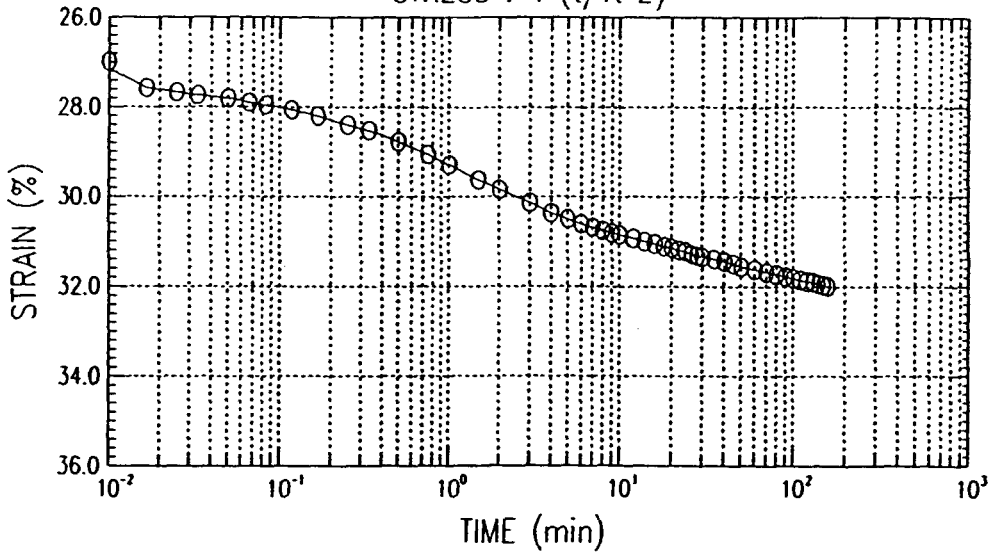


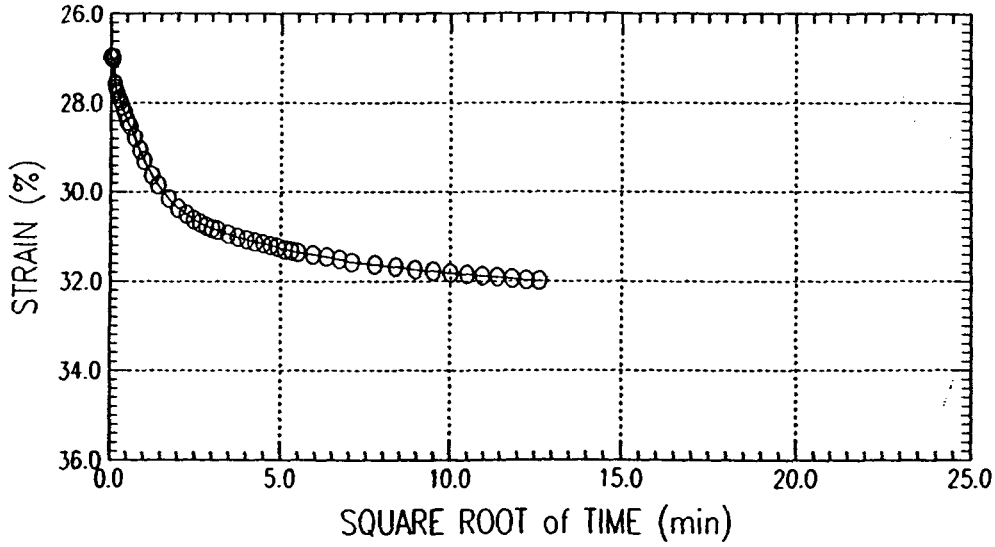


GeoTesting Express
Project Name : New Bedford Harbor Superfund Site
Project No : GTX-2409 Boring No : FB-17 Sample No : UO-1
Test Date : 11/21/99 Test No : CON11 Depth : 0-2 feet
Description : Moist, gray clay with organic
Remarks : ---

CONSOLIDATION TEST

TIME CURVES (STEP 16 OF 16)
STRESS : 4 (t/ft^2)

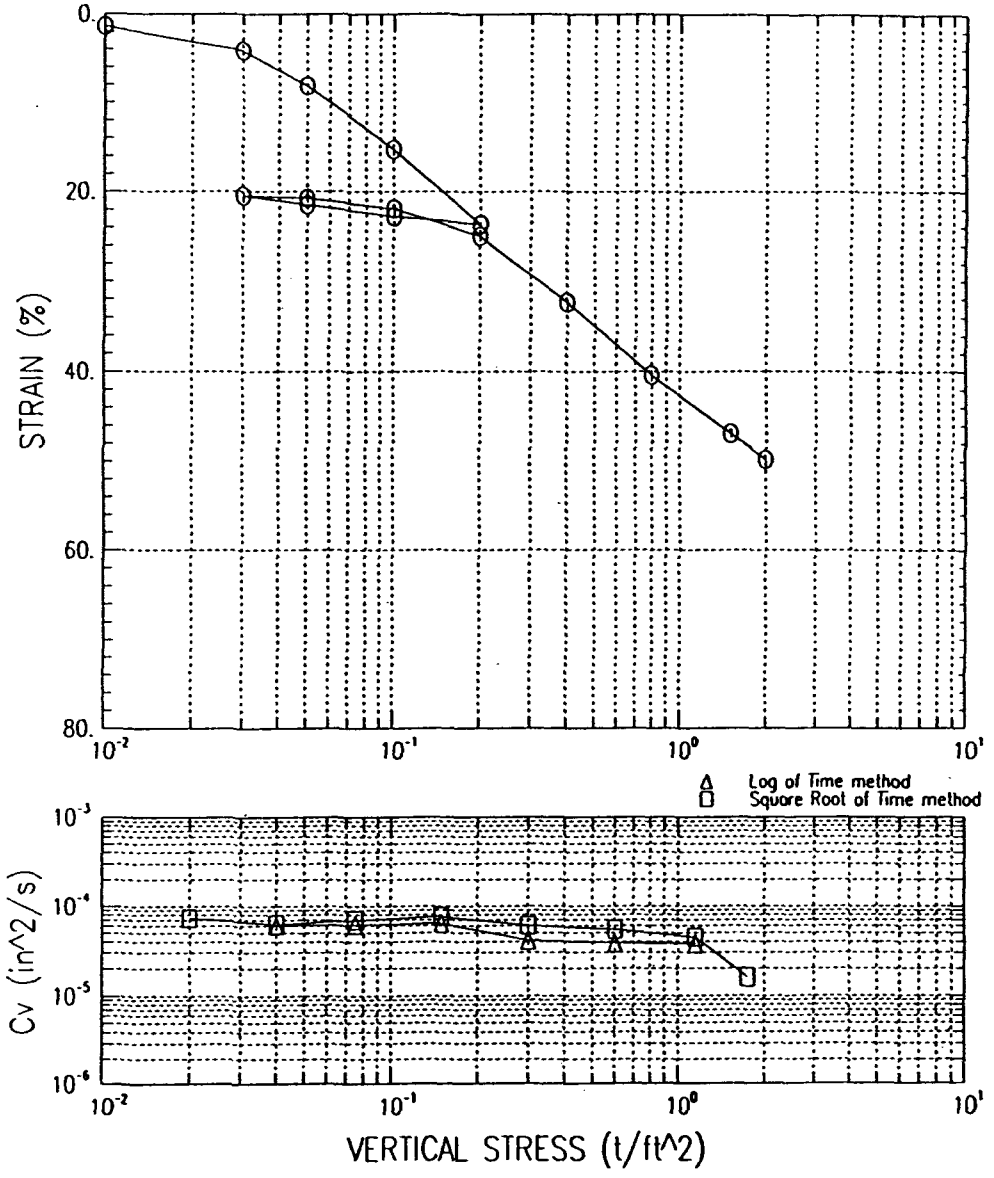




GeoTesting Express
Project Name : New Bedford Harbor Superfund Site
Project No : GTX-2409 Boring No : FB-17 Sample No : UO-1
Test Date : 11/21/99 Test No : CON11 Depth : 0-2 feet
Description : Moist, gray clay with organic
Remarks : ---

CONSOLIDATION TEST

SUMMARY REPORT



GeoTesting Express
Project Name : New Bedford Harbor Superfund Site
Project No : GTX-2409 Boring No : FB-25 Sample No : UO-1
Test Date : 11/16/99 Test No : CON12 Depth : 0-2 feet
Description : Moist, black oily clay with volatile organic
Remarks : ---

CONSOLIDATION TEST DATA

Project : New Bedford Harbor Superfund Site Location : New Bedford, MA Project No.: GTX-2409
Boring No.: FB-25 Tested by : fy Checked by : rh
Sample No.: UO-1 Test Date : 11/16/99 Depth : 0-2 feet
Test No. : CON12 Sample Type: Tube

Soil Description : Moist, black oily clay with volatile organic
Remarks : ---

Specific Gravity : 2.56 Liquid Limit : 0 Initial Height : 1.00 (in)
Initial Void Ratio : 5.08 Plastic Limit : 0 Sample Diameter : 2.48 (in)
Final Void Ratio : 2.05 Plasticity Index : 0

	BEFORE CONSOLIDATION		AFTER CONSOLIDATION	
	TRIMMINGS	SPECIMEN + RING	SPECIMEN + RING	TRIMMINGS
CONTAINER NO.	jeff	RING	RING	jgb-112
WT CONTAINER + WET SOIL (gm)	266.00	313.68	274.70	68.24
WT CONTAINER + DRY SOIL (gm)	95.26	247.99	247.99	41.93
WT CONTAINER (gm)	8.79	214.68	214.68	9.11
WT DRY SOIL (gm)	86.47	33.31	33.31	32.82
WATER CONTENT (%)	197.46	197.17	80.16	80.16
VOID RATIO	------	5.08	2.05	------
DEGREE OF SATURATION (%)	------	99.32	100.00	------
DRY DENSITY (lb/ft^3)	------	26.27	52.35	------

Note: Specific Gravity and Void Ratios are calculated assuming the degree of saturation equals 100% at the end of the test. Therefore values may not represent actual values for the specimen.

CONSOLIDATION TEST DATA

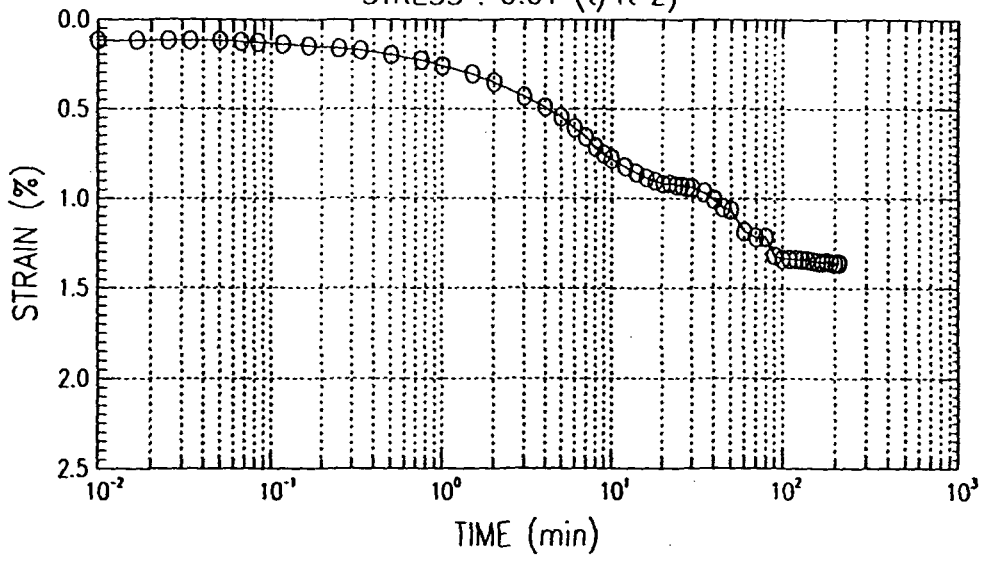
Project : New Bedford Harbor Superfund Site Location : New Bedford, MA Project No.: GTX-2409
Boring No.: ~~FB~~B-25 Tested by : fy Checked by : rh
Sample No.: UO-1 Test Date : 11/16/99 Depth : 0-2 feet
Test No. : CON12 Sample Type: Tube

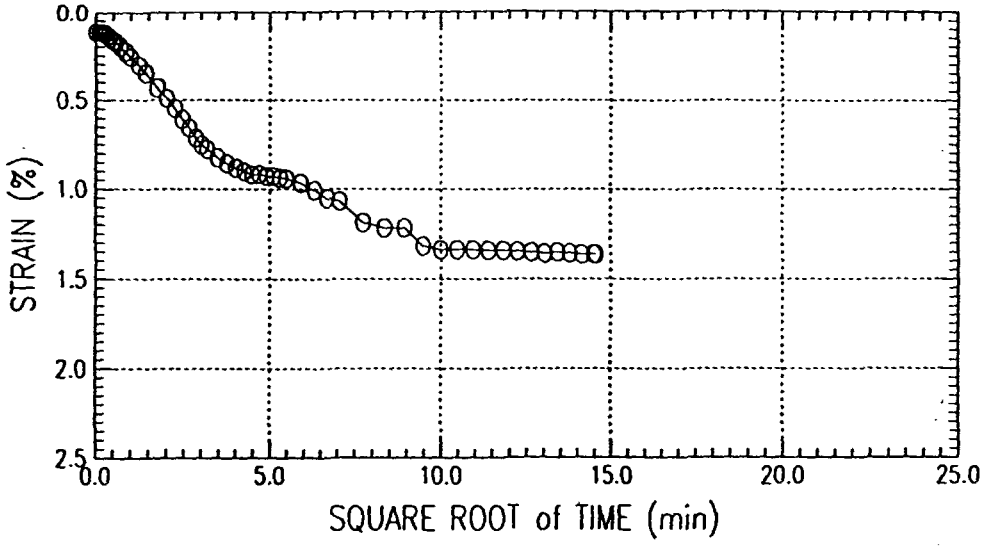
Soil Description : Moist, black oily clay with volatile organic
Remarks : ---

	APPLIED PRESSURE (t/ft^2)	FINAL DISPLACEMENT (in)	VOID RATIO	STRAIN AT END (%)	FITTING T50 TIME (min) SQ.RT.	LOG	COEFFICIENT OF CONSOLIDATION (in^2/s) SQ.RT.	LOG	AVE
1)	0.01	0.014	4.996	1.37	0.0	0.0	0.00E+000	0.00E+000	0.00E+000
2)	0.03	0.042	4.825	4.18	10.5	0.0	7.37E-005	0.00E+000	7.37E-005
3)	0.05	0.082	4.583	8.15	11.6	11.9	6.24E-005	6.06E-005	6.15E-005
4)	0.10	0.153	4.150	15.28	9.2	10.3	6.96E-005	6.19E-005	6.57E-005
5)	0.20	0.237	3.640	23.67	6.9	8.3	7.68E-005	6.39E-005	7.04E-005
6)	0.10	0.228	3.692	22.81	0.0	0.0	0.00E+000	0.00E+000	0.00E+000
7)	0.05	0.215	3.772	21.49	0.0	0.0	0.00E+000	0.00E+000	0.00E+000
8)	0.03	0.205	3.833	20.49	0.0	0.0	0.00E+000	0.00E+000	0.00E+000
9)	0.05	0.208	3.817	20.76	0.0	0.0	0.00E+000	0.00E+000	0.00E+000
10)	0.10	0.220	3.743	21.97	0.0	0.0	0.00E+000	0.00E+000	0.00E+000
11)	0.20	0.250	3.562	24.95	0.0	0.0	0.00E+000	0.00E+000	0.00E+000
12)	0.40	0.324	3.109	32.41	6.9	10.1	6.07E-005	4.14E-005	5.10E-005
13)	0.80	0.404	2.622	40.42	6.1	8.6	5.46E-005	3.85E-005	4.66E-005
14)	1.50	0.469	2.228	46.90	5.9	6.9	4.44E-005	3.77E-005	4.10E-005
15)	2.00	0.498	2.050	49.82	13.7	0.0	1.60E-005	0.00E+000	1.60E-005

CONSOLIDATION TEST

TIME CURVES (STEP 1 OF 15)
STRESS : 0.01 (t/ft^2)

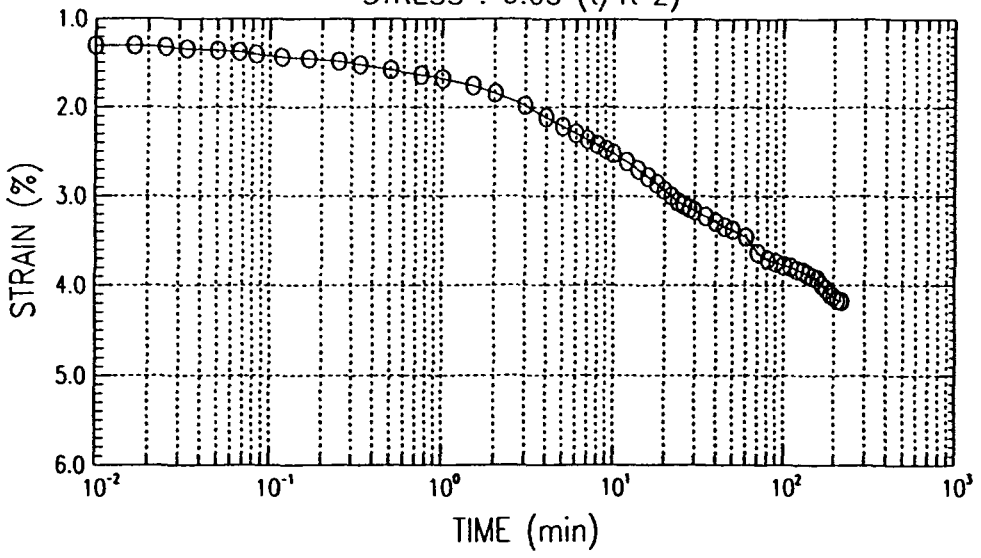


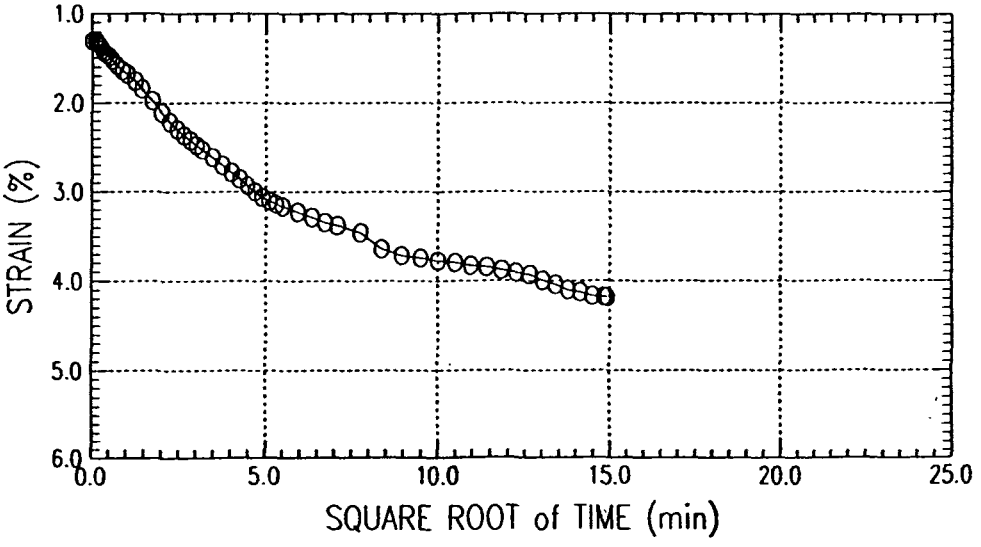


GeoTesting Express
Project Name : New Bedford Harbor Superfund Site
Project No : GTX-2409 Boring No : FB-25 Sample No : UO-1
Test Date : 11/16/99 Test No : CON12 Depth : 0-2 feet
Description : Moist, black oily clay with volatile organic
Remarks : ---

CONSOLIDATION TEST

TIME CURVES (STEP 2 OF 15)
STRESS : 0.03 (t/ft^2)

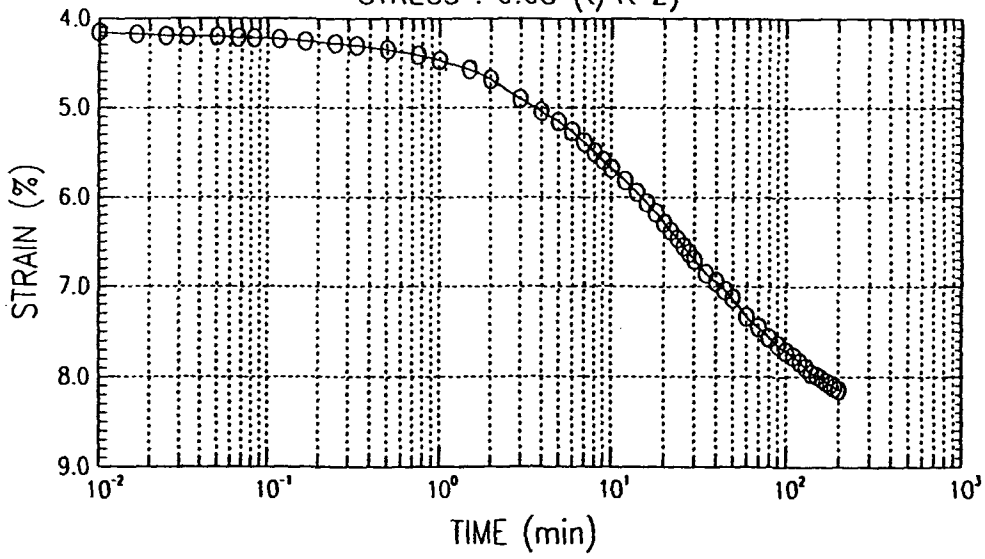


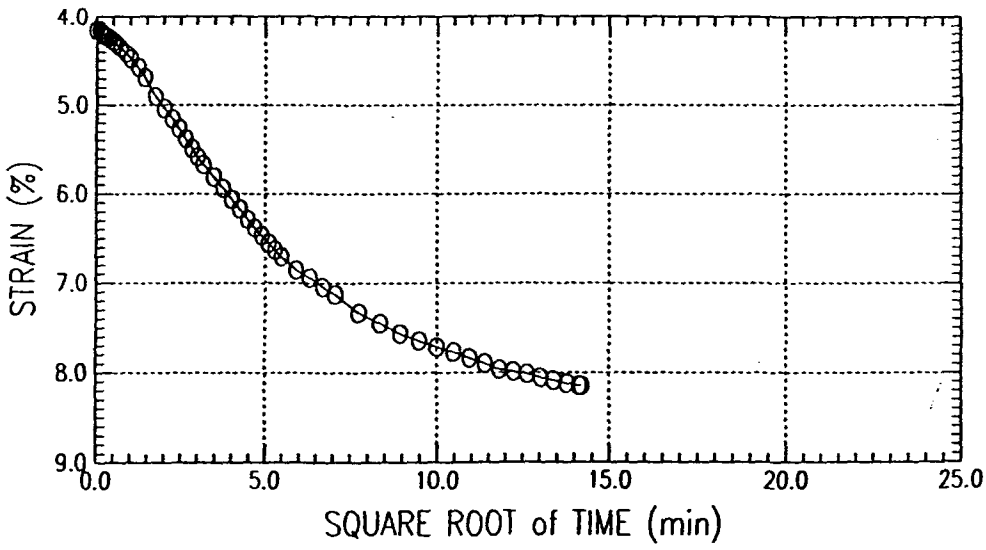


GeoTesting Express
Project Name : New Bedford Harbor Superfund Site
Project No : GTX-2409 Boring No : FB-25 Sample No : UO-1
Test Date : 11/16/99 Test No : CON12 Depth : 0-2 feet
Description : Moist, black oily clay with volatile organic
Remarks : ---

CONSOLIDATION TEST

TIME CURVES (STEP 3 OF 15)
STRESS : 0.05 (t/ft^2)

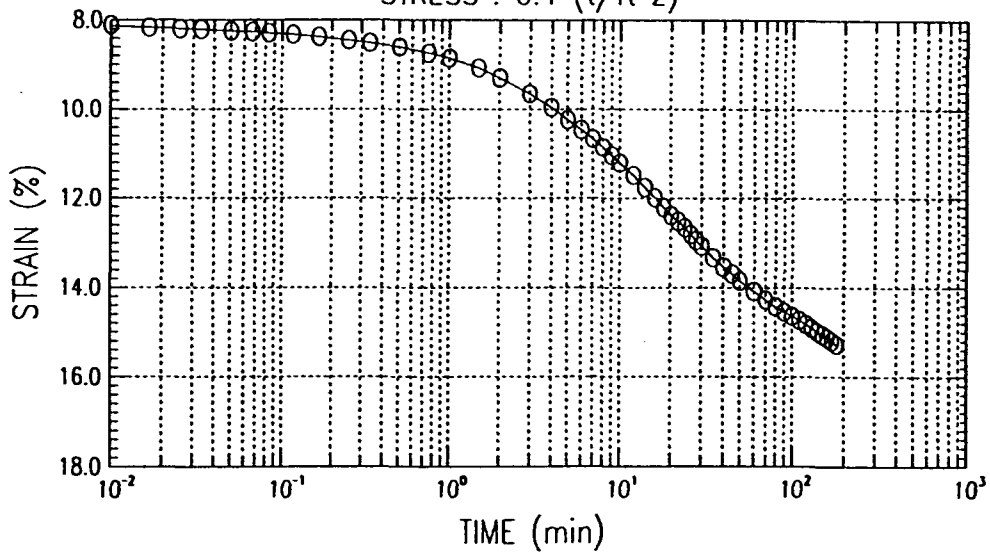


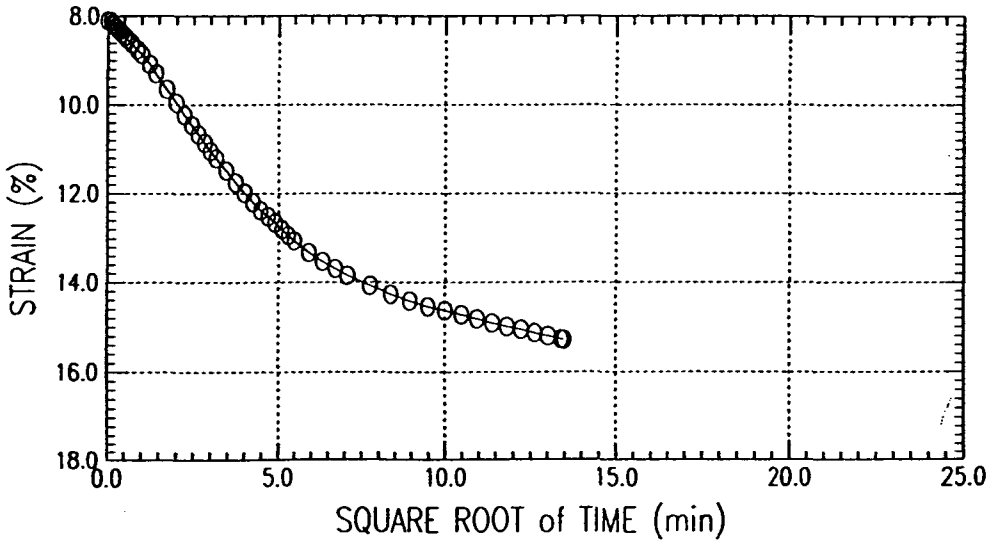


GeoTesting Express
Project Name : New Bedford Harbor Superfund Site
Project No : GTX-2409 Boring No : FD-25 Sample No : U0-1
Test Date : 11/16/99 Test No : CON12 Depth : 0-2 feet
Description : Moist, black oily clay with volatile organic
Remarks : ---

CONSOLIDATION TEST

TIME CURVES (STEP 4 OF 15)
STRESS : 0.1 (t/ft^2)

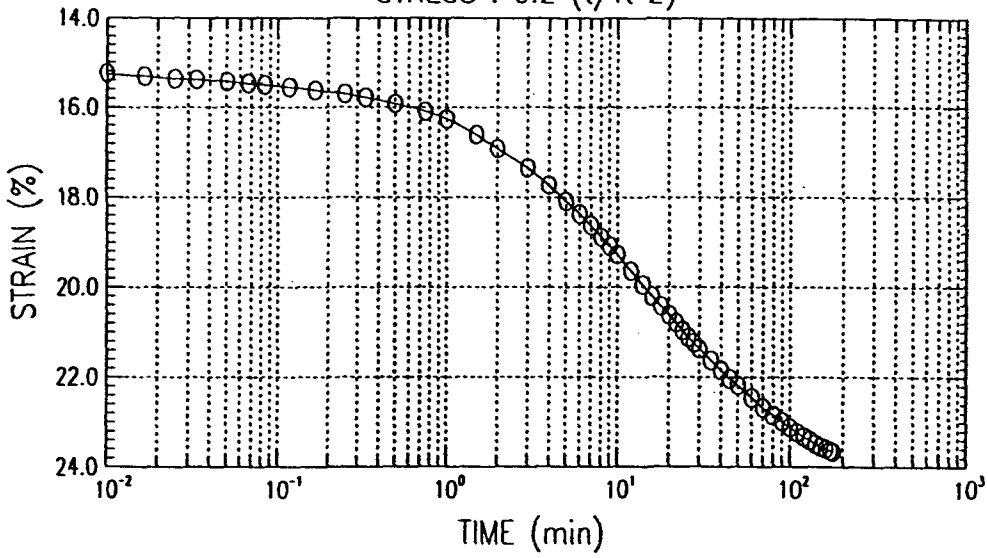


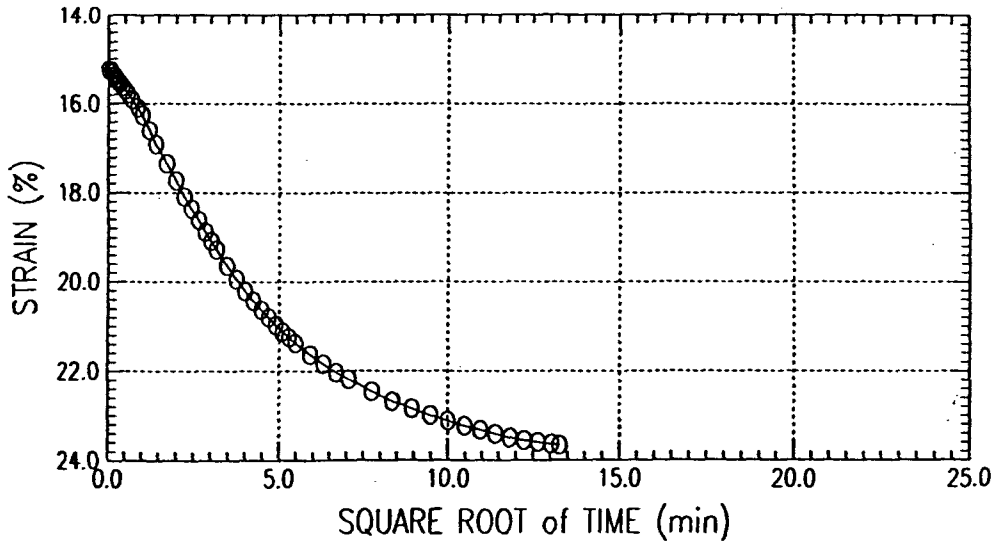


GeoTesting Express
Project Name : New Bedford Harbor Superfund Site
Project No : GTX-2409 Boring No : F~~Ø~~B-25 Sample No : UO-1
Test Date : 11/16/99 Test No : CON12 Depth : 0-2 feet
Description : Moist, black oily clay with volatile organic
Remarks : ---

CONSOLIDATION TEST

TIME CURVES (STEP 5 OF 15)
STRESS : 0.2 (t/ft^2)

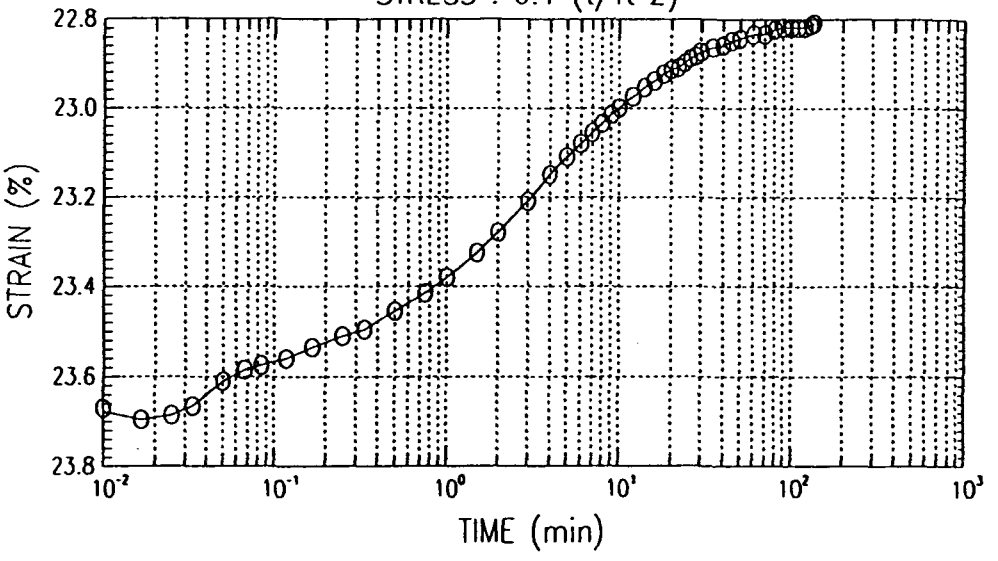


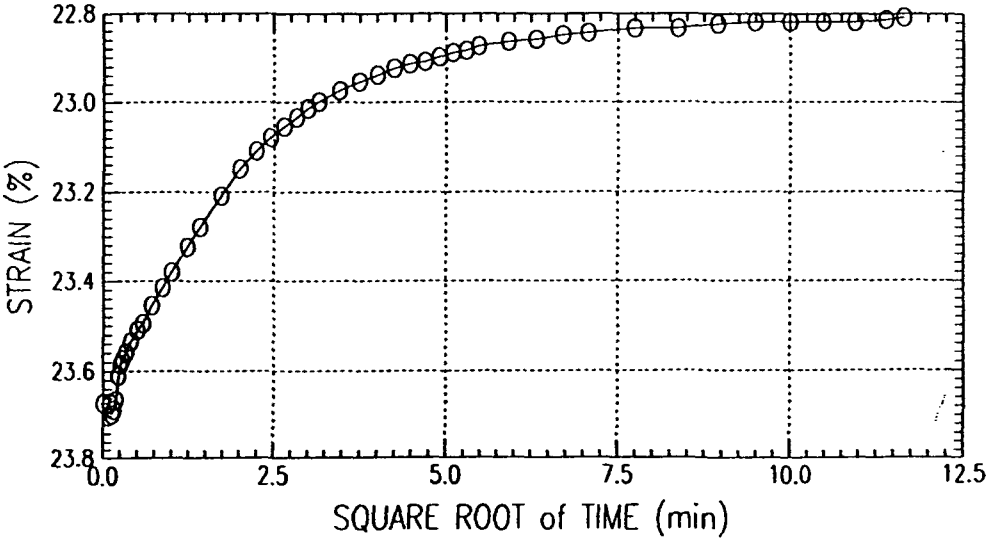


GeoTesting Express
Project Name : New Bedford Harbor Superfund Site
Project No : GTX-2409 Boring No : FP-25 Sample No : UO-1
Test Date : 11/16/99 Test No : CON12 Depth : 0-2 feet
Description : Moist, black oily clay with volatile organic
Remarks : ---

CONSOLIDATION TEST

TIME CURVES (STEP 6 OF 15)
STRESS : 0.1 (t/ft^2)

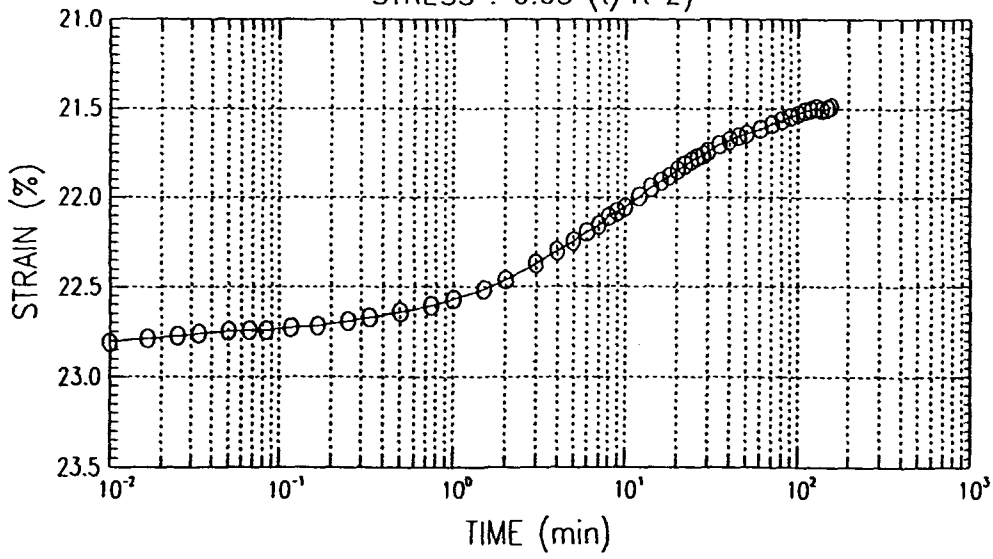


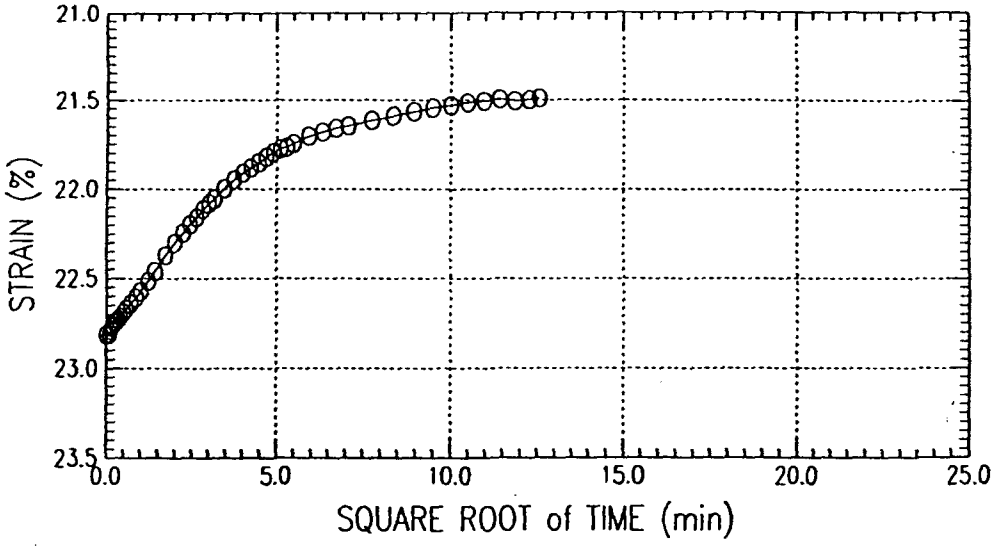


GeoTesting Express
Project Name : New Bedford Harbor Superfund Site
Project No : GTX-2409 Boring No : FB-25 Sample No : UO-1
Test Date : 11/16/99 Test No : CON12 Depth : 0-2 feet
Description : Moist, black oily clay with volatile organic
Remarks : ---

CONSOLIDATION TEST

TIME CURVES (STEP 7 OF 15)
STRESS : 0.05 (t/ft^2)

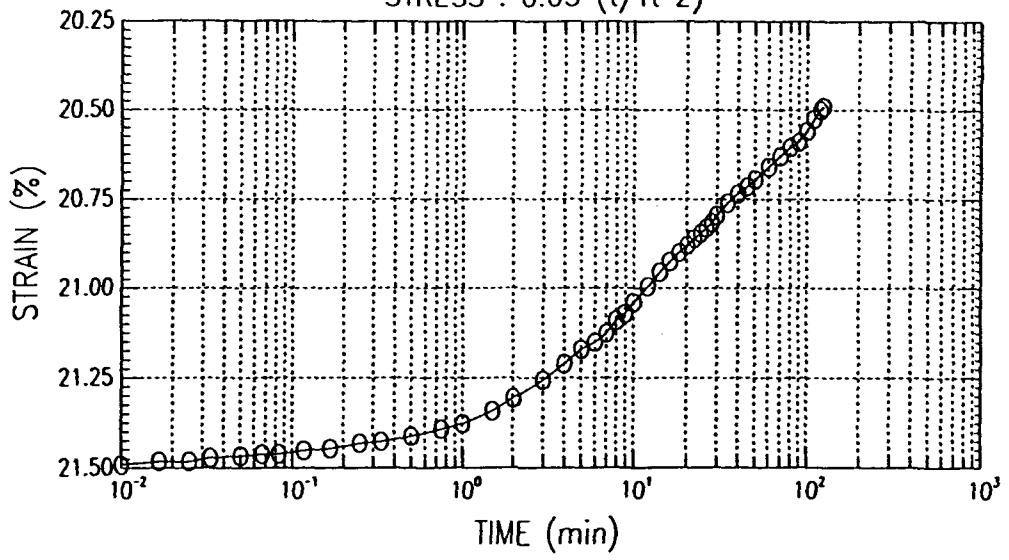


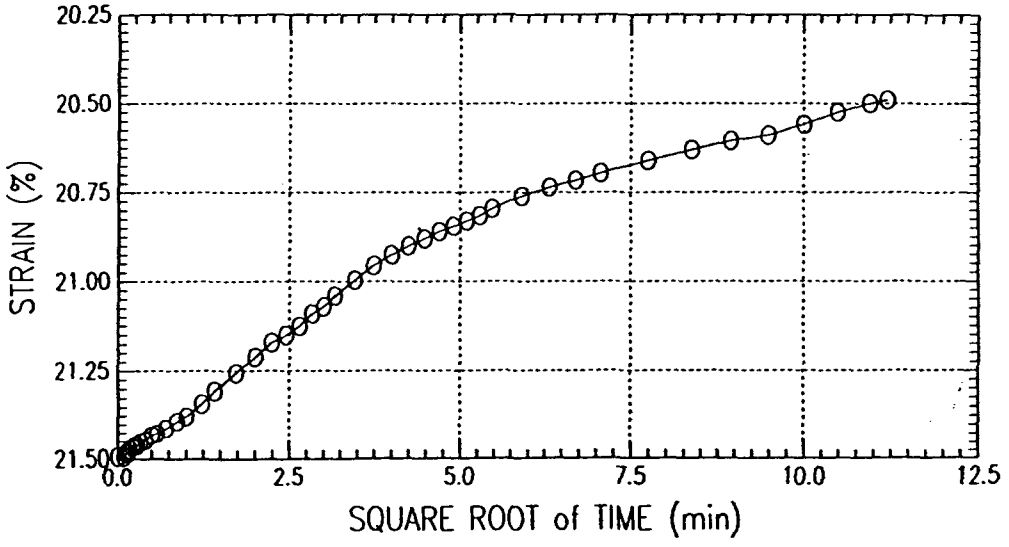


GeoTesting Express
Project Name : New Bedford Harbor Superfund Site
Project No : GTX-2409 Boring No : FB-25 Sample No : UO-1
Test Date : 11/16/99 Test No : CON12 Depth : 0-2 feet
Description : Moist, black oily clay with volatile organic
Remarks : ---

CONSOLIDATION TEST

TIME CURVES (STEP 8 OF 15)
STRESS : 0.03 (t/ft^2)

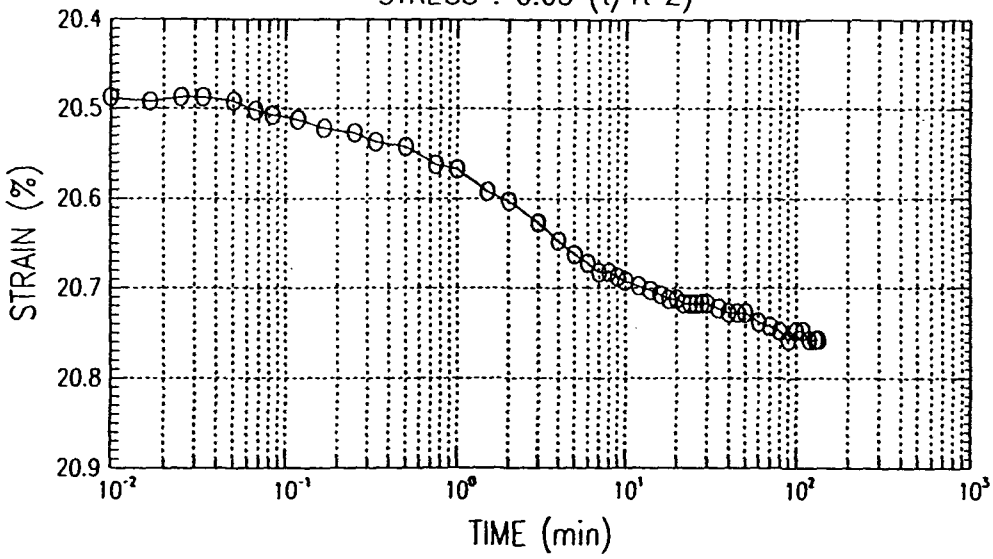


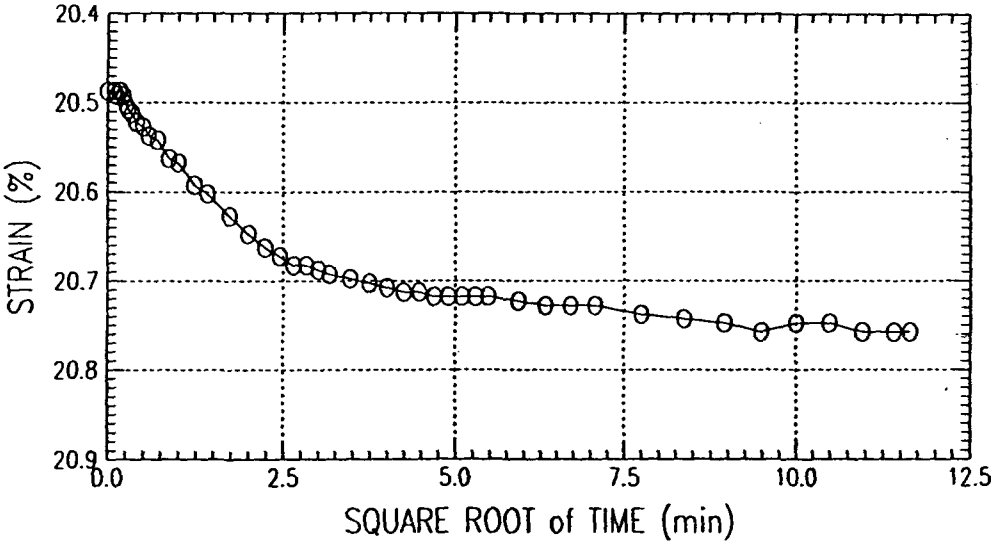


GeoTesting Express
Project Name : New Bedford Harbor Superfund Site
Project No : GTX-2409 Boring No : FB-25 Sample No : UO-1
Test Date : 11/16/99 Test No : CON12 Depth : 0-2 feet
Description : Moist, black oily clay with volatile organic
Remarks : ---

CONSOLIDATION TEST

TIME CURVES (STEP 9 OF 15)
STRESS : 0.05 (t/ft^2)

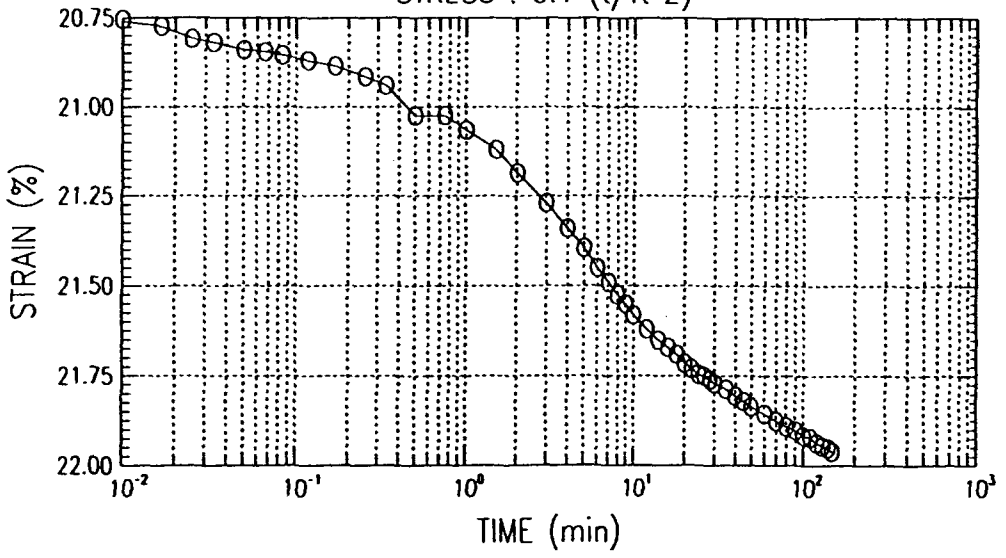


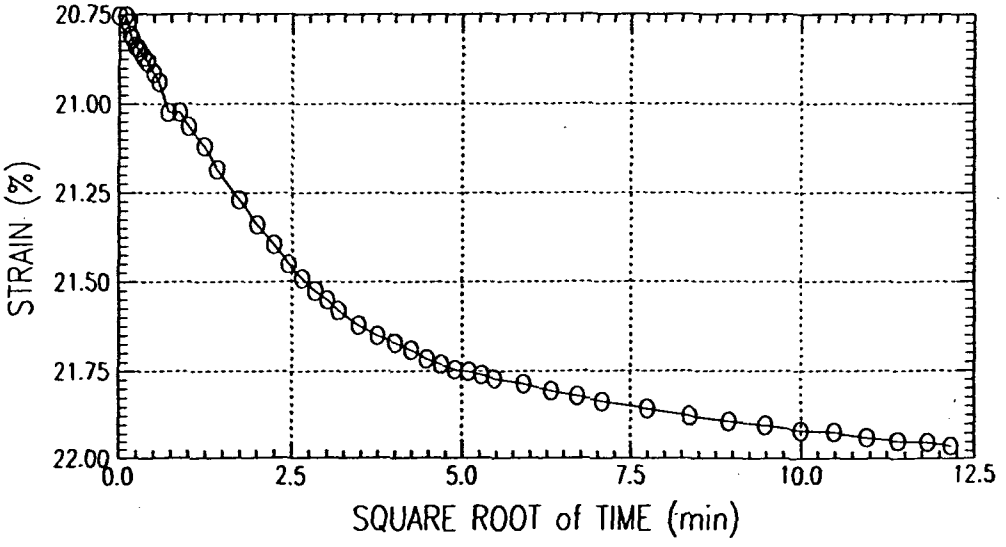


GeoTesting Express
Project Name : New Bedford Harbor Superfund Site
Project No : GTX-2409 Boring No : FB-25 Sample No : UO-1
Test Date : 11/16/99 Test No : CON12 Depth : 0-2 feet
Description : Moist, black oily clay with volatile organic
Remarks : ---

CONSOLIDATION TEST

TIME CURVES (STEP 10 OF 15)
STRESS : 0.1 (t/ft^2)

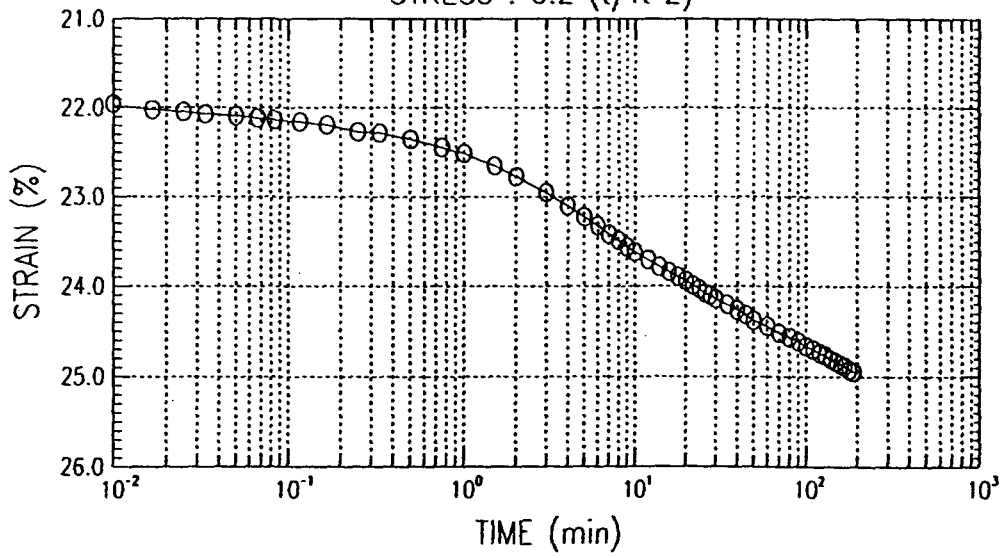


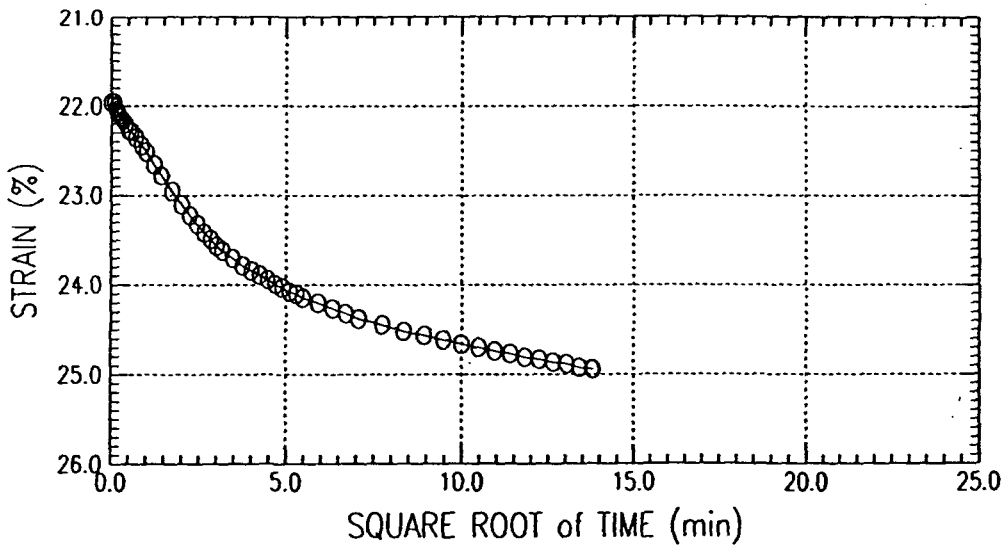


GeoTesting Express
Project Name : New Bedford Harbor Superfund Site
Project No : GTX-2409 Boring No : FB-25 Sample No : UO-1
Test Date : 11/16/99 Test No : CON12 Depth : 0-2 feet
Description : Moist, black oily clay with volatile organic
Remarks : ---

CONSOLIDATION TEST

TIME CURVES (STEP 11 OF 15)
STRESS : 0.2 (t/ft^2)

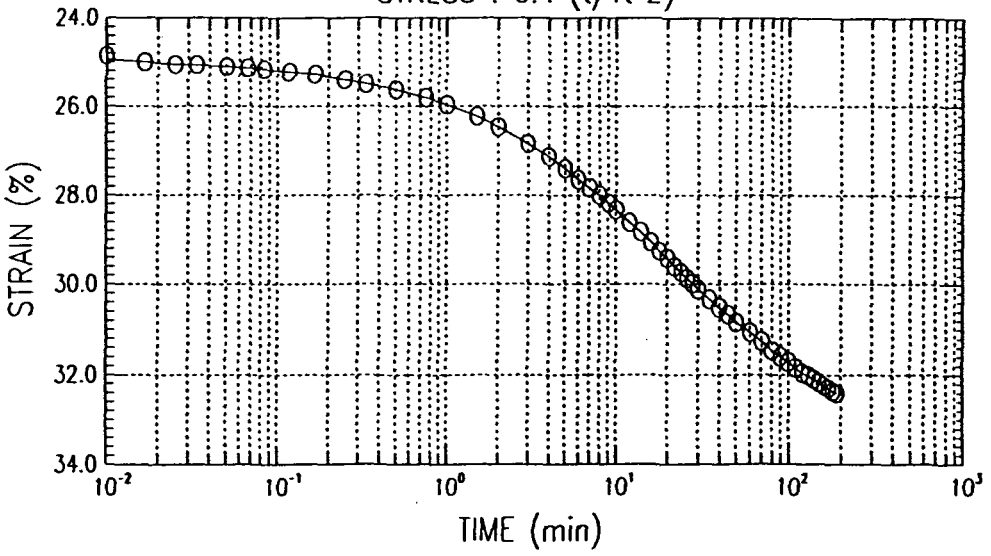


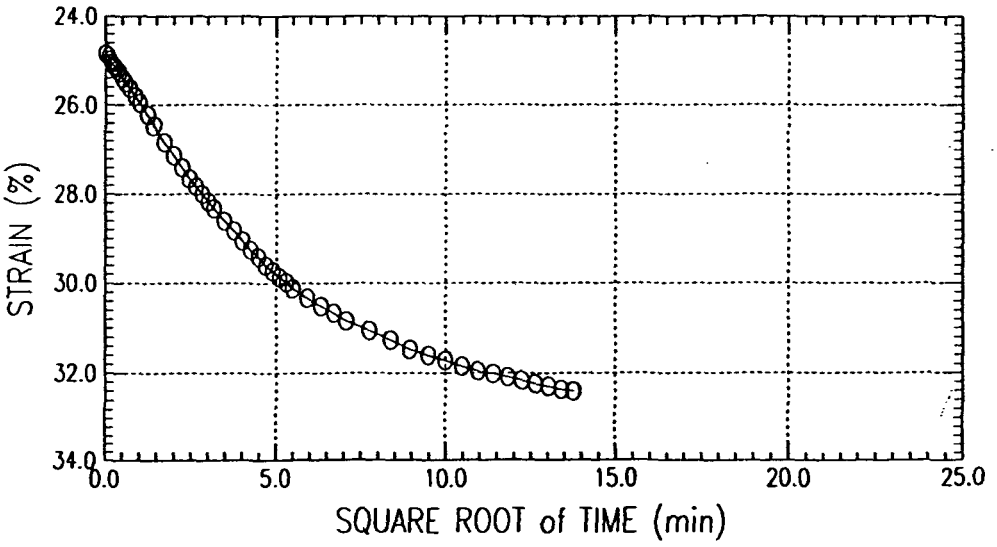


GeoTesting Express
Project Name : New Bedford Harbor Superfund Site
Project No : GTX-2409 Boring No : FB-25 Sample No : UO-1
Test Date : 11/16/99 Test No : CON12 Depth : 0-2 feet
Description : Moist, black oily clay with volatile organic
Remarks : ---

CONSOLIDATION TEST

TIME CURVES (STEP 12 OF 15)
STRESS : 0.4 (t/ft^2)

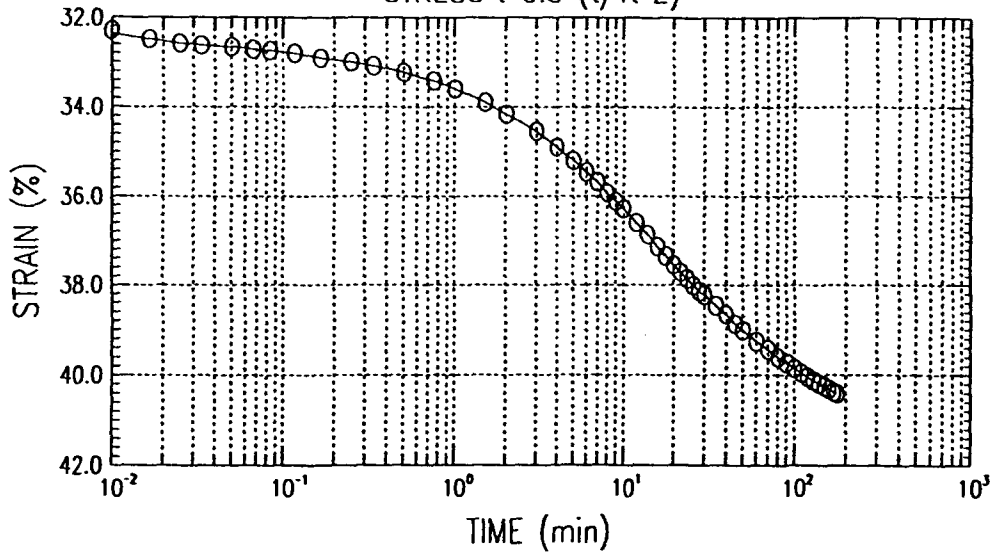


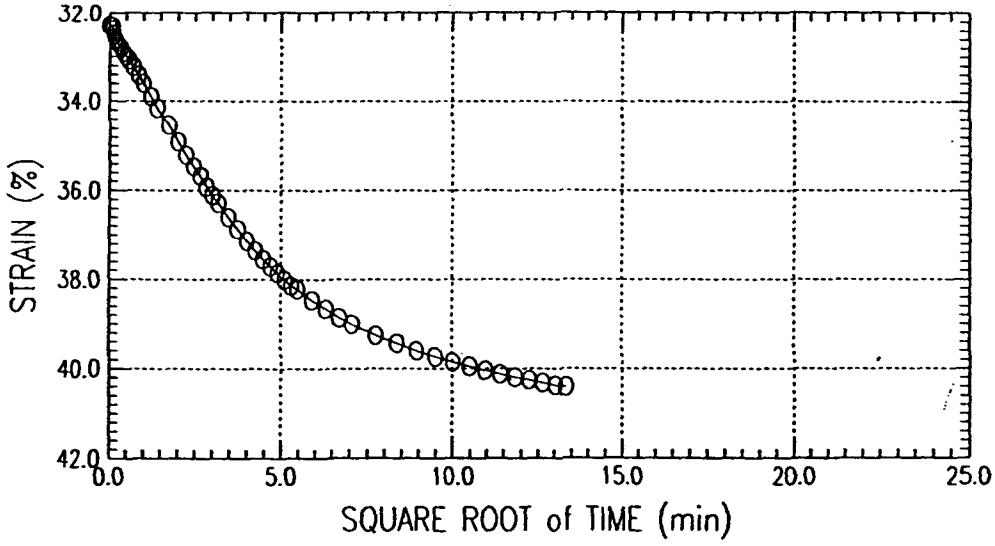


GeoTesting Express
Project Name : New Bedford Harbor Superfund Site
Project No : GTX-2409 Boring No : FD-25 Sample No : UO-1
Test Date : 11/16/99 Test No : CON12 Depth : 0-2 feet
Description : Moist, black oily clay with volatile organic
Remarks : ---

CONSOLIDATION TEST

TIME CURVES (STEP 13 OF 15)
STRESS : 0.8 (t/ft^2)

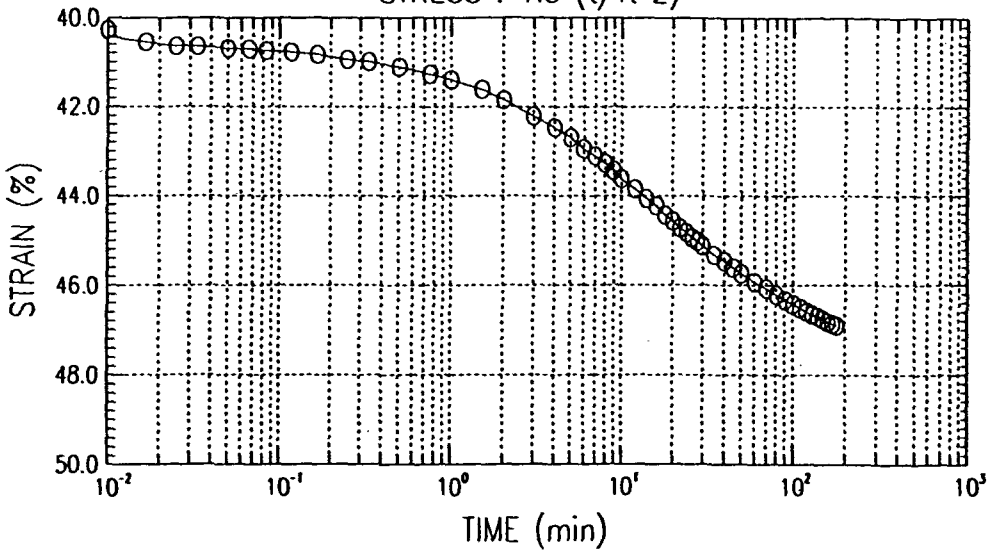


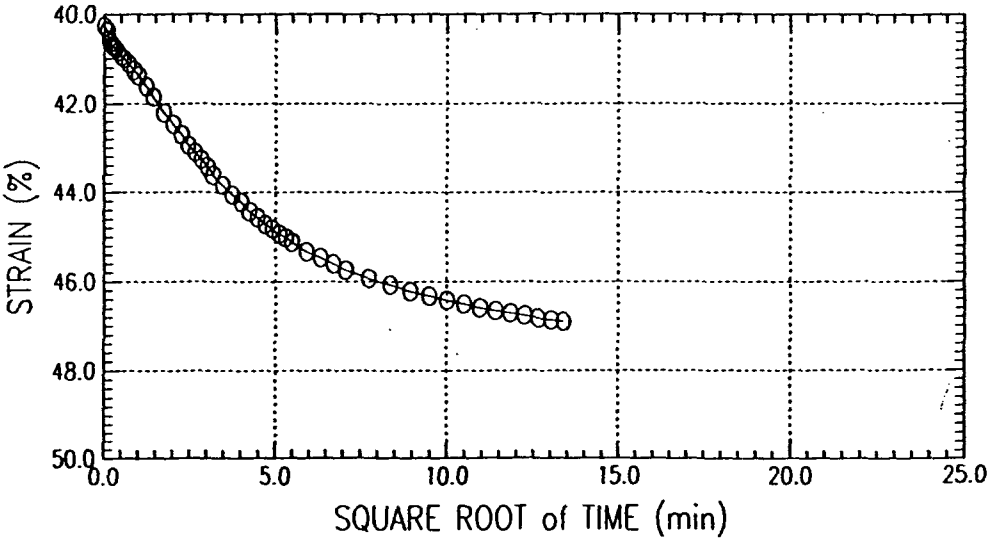


GeoTesting Express
Project Name : New Bedford Harbor Superfund Site
Project No : GTX-2409 Boring No : FB-25 Sample No : UO-1
Test Date : 11/16/99 Test No : CON12 Depth : 0-2 feet
Description : Moist, black oily clay with volatile orgonic
Remarks : ---

CONSOLIDATION TEST

TIME CURVES (STEP 14 OF 15)
STRESS : 1.5 (t/ft^2)

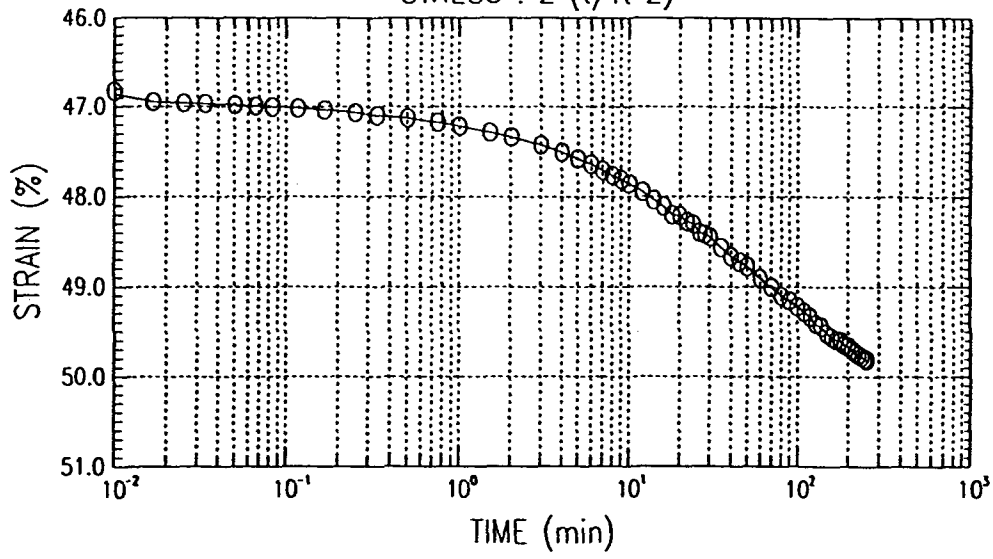


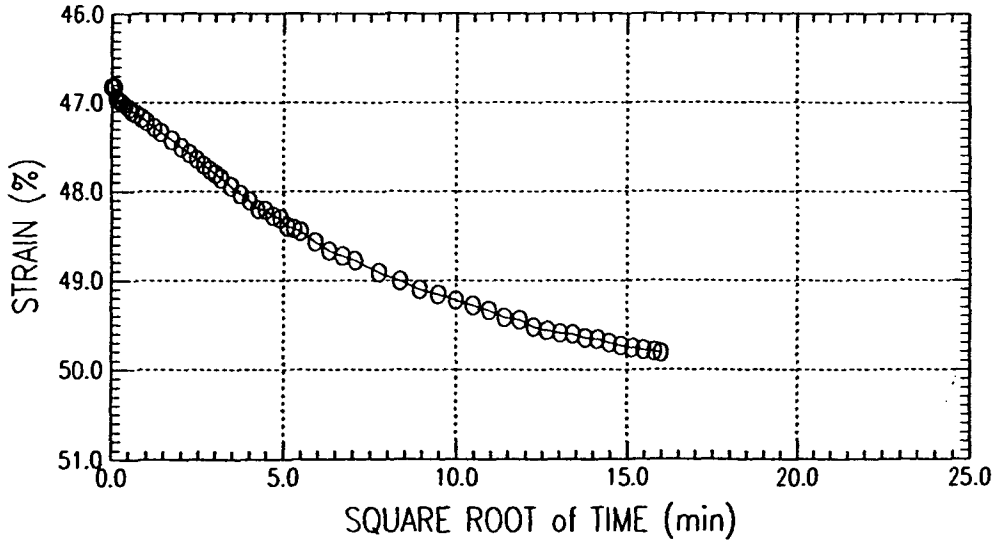


GeoTesting Express
Project Name : New Bedford Harbor Superfund Site
Project No : GTX-2409 Boring No : FB-25 Sample No : UO-1
Test Date : 11/16/99 Test No : CON12 Depth : 0-2 feet
Description : Moist, black oily clay with volatile organic
Remarks : ---

CONSOLIDATION TEST

TIME CURVES (STEP 15 OF 15)
STRESS : 2 (t/ft^2)

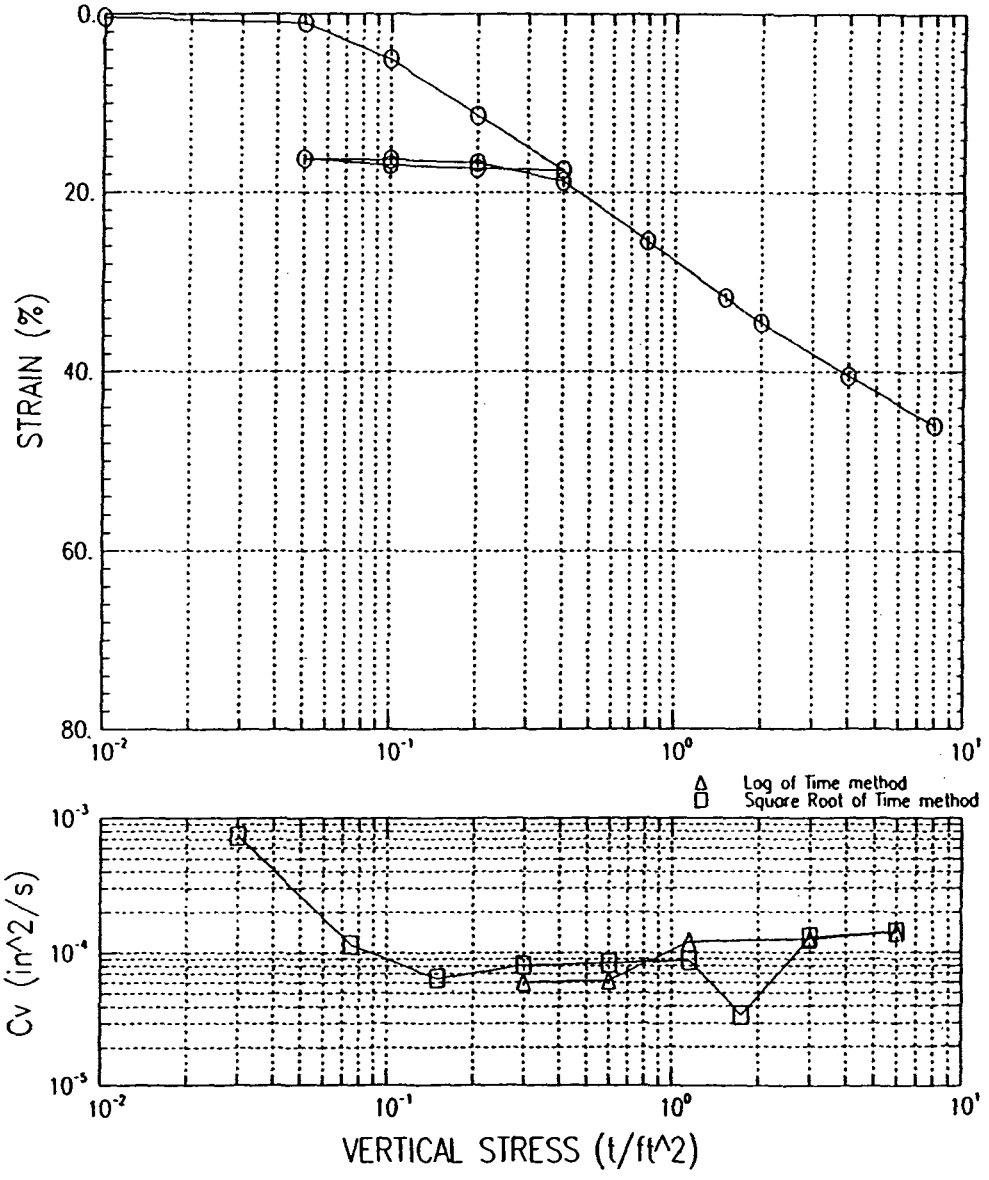




GeoTesting Express
Project Name : New Bedford Harbor Superfund Site
Project No : GTX-2409 Boring No : FP-25 Sample No : UO-1
Test Date : 11/16/99 Test No : CON12 Depth : 0-2 feet
Description : Moist, black oily clay with volatile organic
Remarks : ---

CONSOLIDATION TEST

SUMMARY REPORT



GeoTesting Express
Project Name : New Bedford Harbor Superfund Site
Project No : GTX-2409 Boring No : FB-27 Sample No : UO-5
Test Date : 11/18/99 Test No : CON13 Depth : 8-10 feet
Description : Moist, dark gray organic silt with gravel
Remarks : ---

CONSOLIDATION TEST DATA

Project : New Bedford Harbor Superfund Site Location : New Bedford, MA Project No.: GTX-2409
Boring No.: FB-27 Tested by : FY Checked by : RH
Sample No.: UO-5 Test Date : 11/18/99 Depth : 8-10 feet
Test No. : CON13 Sample Type: Tube

Soil Description : Moist, dark gray organic silt with gravel
Remarks : ---

Specific Gravity : 2.64 Liquid Limit : 38.8 Initial Height : 1.03 (in)
Initial Void Ratio : 2.41 Plastic Limit : 20.4 Sample Diameter : 2.49 (in)
Final Void Ratio : 0.84 Plasticity Index : 18.4

	BEFORE CONSOLIDATION		AFTER CONSOLIDATION	
	TRIMMINGS	SPECIMEN + RING	SPECIMEN + RING	TRIMMINGS
CONTAINER NO.	my9	RING	RING	eco59
WT CONTAINER + WET SOIL (gm)	187.51	333.88	300.65	87.54
WT CONTAINER + DRY SOIL (gm)	104.09	278.44	278.44	67.24
WT CONTAINER (gm)	9.07	214.83	214.83	9.09
WT DRY SOIL (gm)	95.02	63.61	63.61	58.15
WATER CONTENT (%)	87.79	87.15	34.91	34.91
VOID RATIO	------	2.41	0.89	------
DEGREE OF SATURATION (%)	------	95.42	103.92	------
DRY DENSITY (lb/ft^3)	------	48.32	87.35	------

CONSOLIDATION TEST DATA

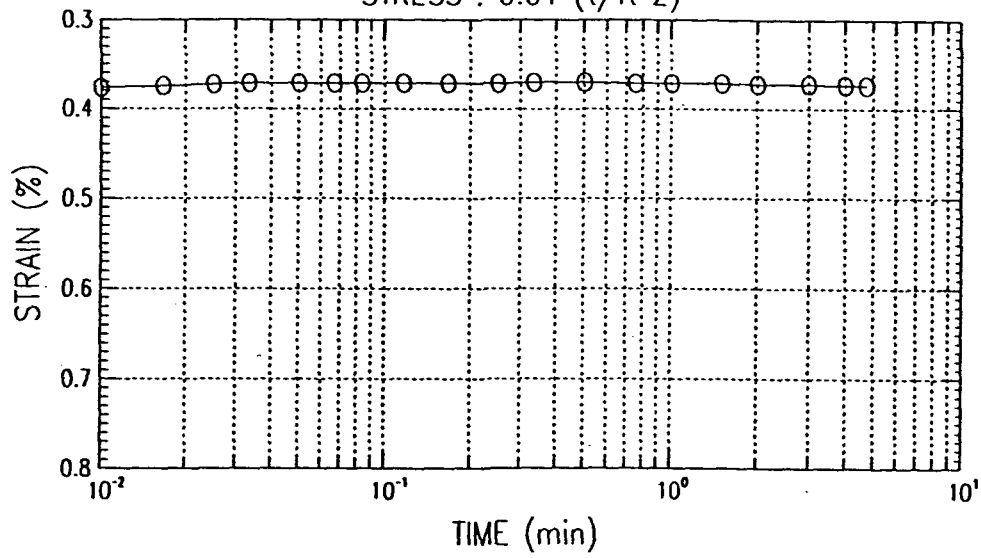
Project : New Bedford Harbor Superfund Site Location : New Bedford, MA Project No.: GTX-2409
Boring No.: FB-27 Tested by : FY Checked by : RH
Sample No.: UO-5 Test Date : 11/18/99 Depth : 8-10 feet
Test No. : CON13 Sample Type: Tube

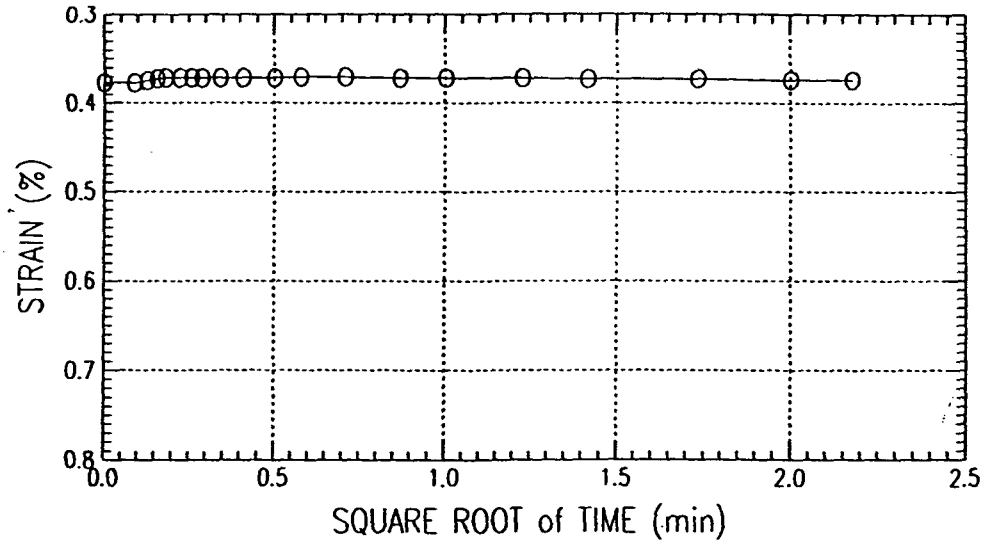
Soil Description : Moist, dark gray organic silt with gravel
Remarks : ---

	APPLIED PRESSURE (t/ft^2)	FINAL DISPLACEMENT (in)	VOID RATIO	STRAIN AT END (%)	FITTING T50 TIME (min) SQ.RT.	LOG	COEFFICIENT OF CONSOLIDATION (in^2/s) SQ.RT.	LOG	AVE
1)	0.01	0.004	2.398	0.39	0.0	0.0	0.00E+000	0.00E+000	0.00E+000
2)	0.05	0.010	2.378	0.98	1.2	0.0	7.41E-004	0.00E+000	7.41E-004
3)	0.10	0.052	2.239	5.03	7.2	0.0	1.15E-004	0.00E+000	1.15E-004
4)	0.20	0.117	2.024	11.36	11.4	0.0	6.45E-005	0.00E+000	6.45E-005
5)	0.40	0.180	1.816	17.45	7.9	10.5	8.08E-005	6.08E-005	7.08E-005
6)	0.20	0.178	1.821	17.31	0.0	0.0	0.00E+000	0.00E+000	0.00E+000
7)	0.10	0.174	1.835	16.90	0.0	0.0	0.00E+000	0.00E+000	0.00E+000
8)	0.05	0.167	1.858	16.22	0.0	0.0	0.00E+000	0.00E+000	0.00E+000
9)	0.10	0.168	1.856	16.28	0.0	0.0	0.00E+000	0.00E+000	0.00E+000
10)	0.20	0.171	1.844	16.62	0.0	0.0	0.00E+000	0.00E+000	0.00E+000
11)	0.40	0.193	1.771	18.76	0.0	0.0	0.00E+000	0.00E+000	0.00E+000
12)	0.80	0.262	1.543	25.45	6.3	8.5	8.37E-005	6.19E-005	7.28E-005
13)	1.50	0.328	1.326	31.81	5.1	3.7	8.75E-005	1.20E-004	1.04E-004
14)	2.00	0.356	1.231	34.59	11.4	0.0	3.42E-005	0.00E+000	3.42E-005
15)	4.00	0.417	1.030	40.48	2.6	2.7	1.30E-004	1.25E-004	1.28E-004
16)	8.00	0.474	0.841	46.03	2.0	2.0	1.43E-004	1.40E-004	1.41E-004

CONSOLIDATION TEST

TIME CURVES (STEP 1 OF 16)
STRESS : 0.01 (t/ft^2)

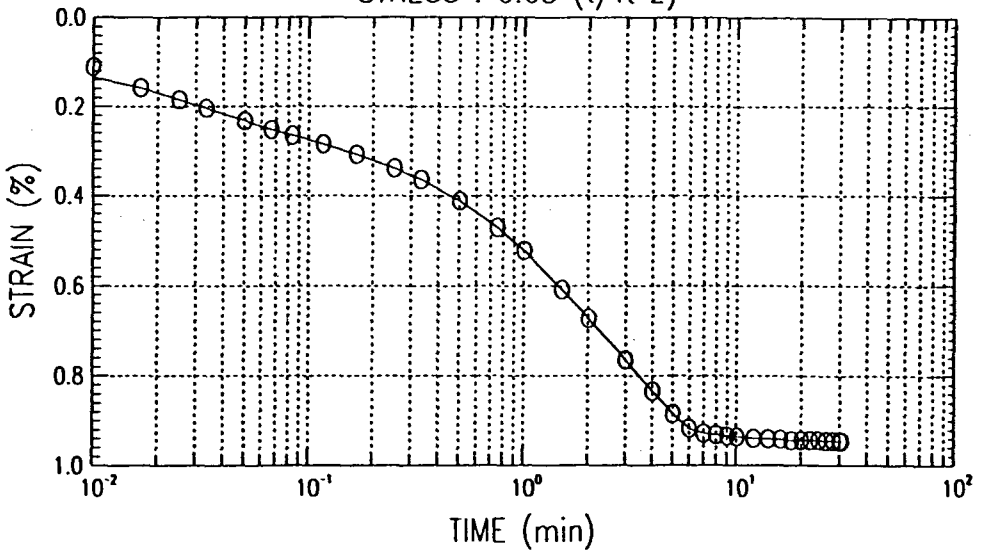


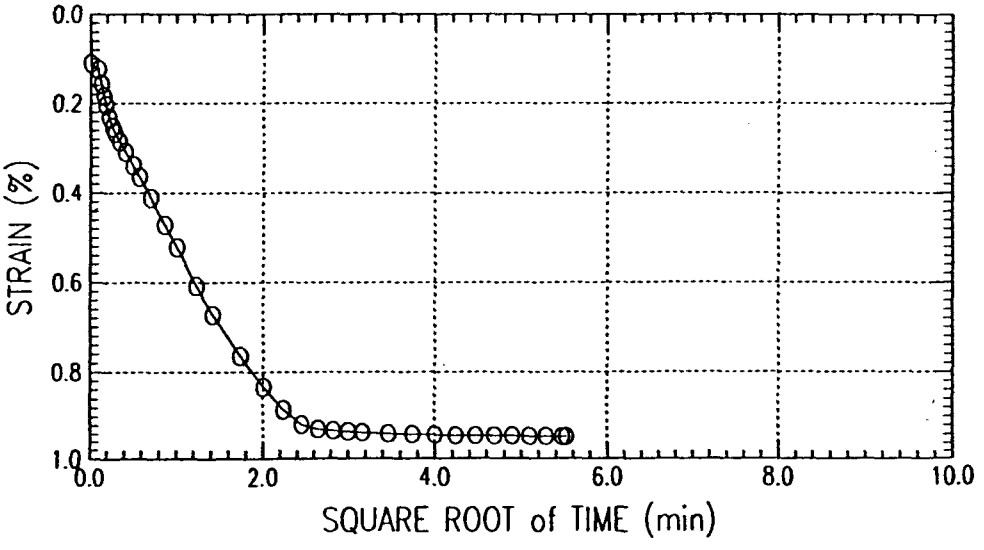


GeoTesting Express
Project Name : New Bedford Harbor Superfund Site
Project No : GTX-2409 Boring No : FB-27 Sample No : U0-5
Test Date : 11/18/99 Test No : CON13 Depth : 8-10 feet
Description : Moist, dark gray organic silt with gravel
Remarks : ---

CONSOLIDATION TEST

TIME CURVES (STEP 2 OF 16)
STRESS : 0.05 (t/ft^2)

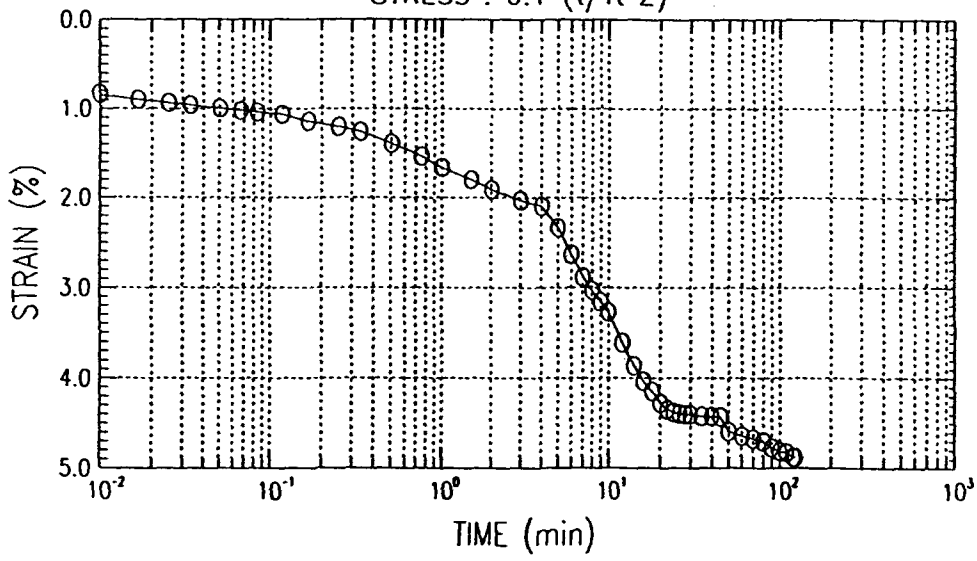


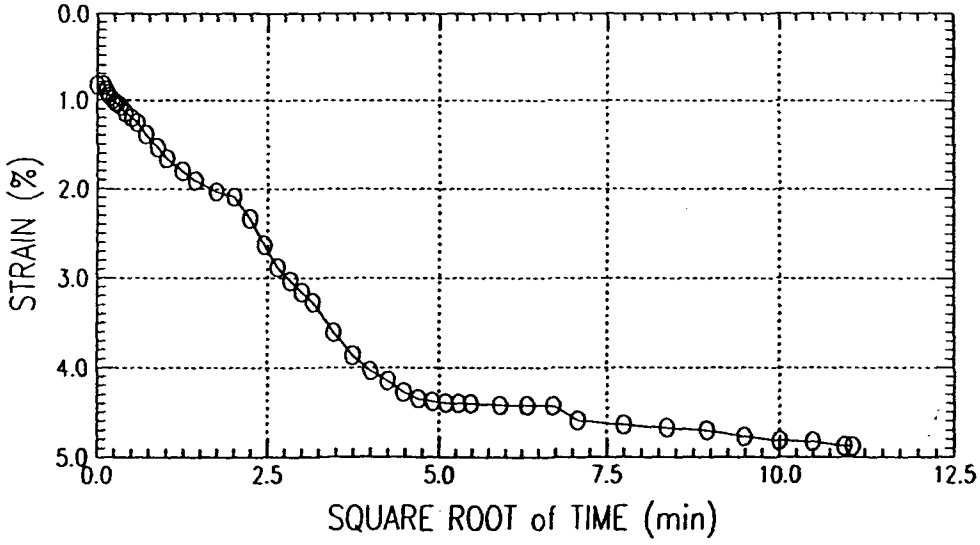


GeoTesting Express
Project Name : New Bedford Harbor Superfund Site
Project No : GTX-2409 Boring No : FB-27 Sample No : UO-5
Test Date : 11/18/99 Test No : CON13 Depth : 8-10 feet
Description : Moist, dark gray organic silt with gravel
Remarks : ---

CONSOLIDATION TEST

TIME CURVES (STEP 3 OF 16)
STRESS : 0.1 (t/ft^2)

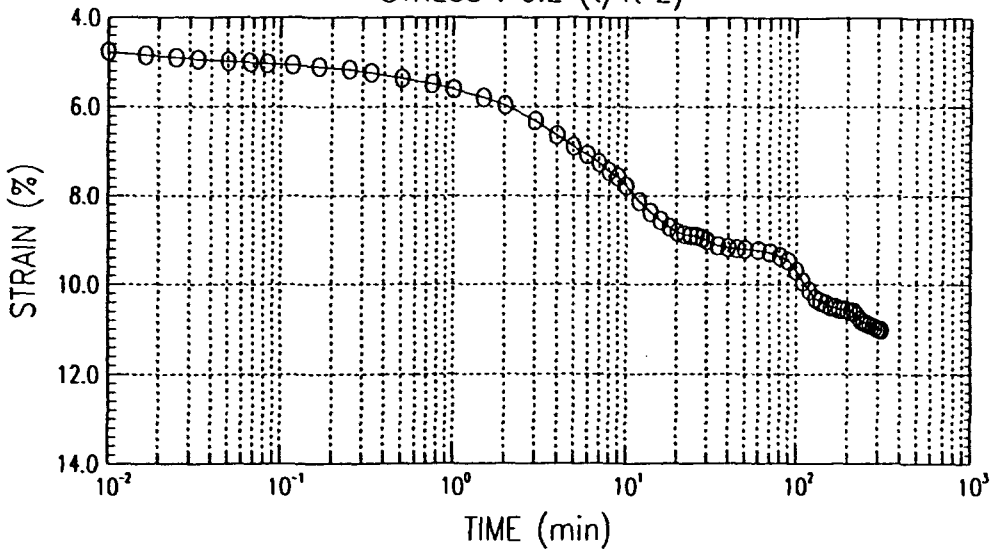


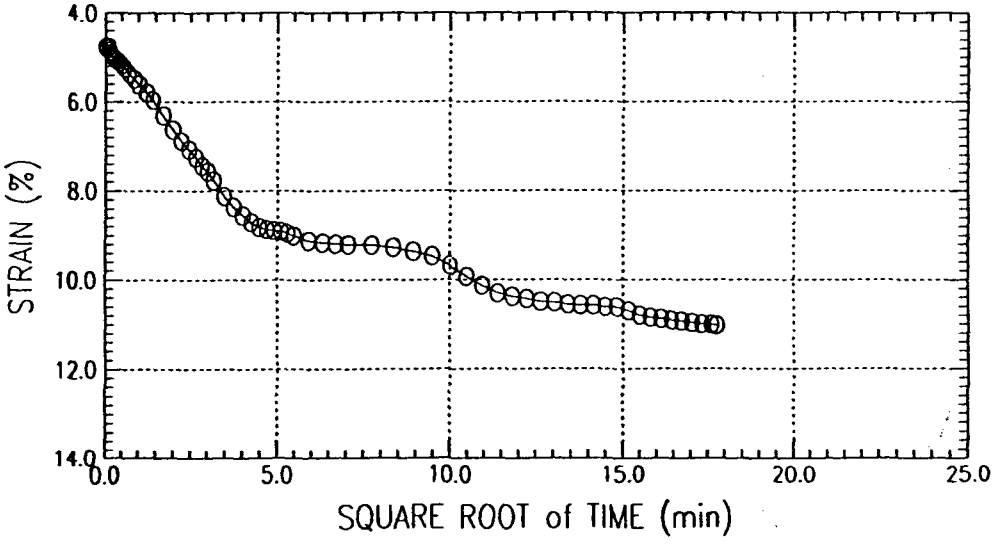


GeoTesting Express
Project Name : New Bedford Harbor Superfund Site
Project No : GTX-2409 Boring No : FB-27 Sample No : UO-5
Test Date : 11/18/99 Test No : CON13 Depth : 8-10 feet
Description : Moist, dark gray organic silt with gravel
Remarks : ---

CONSOLIDATION TEST

TIME CURVES (STEP 4 OF 16)
STRESS : 0.2 (t/ft^2)

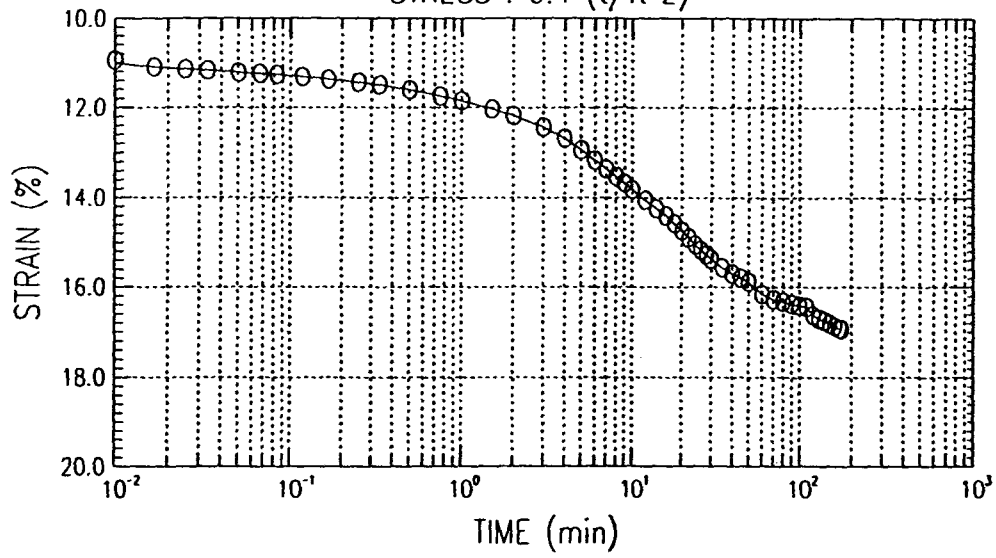


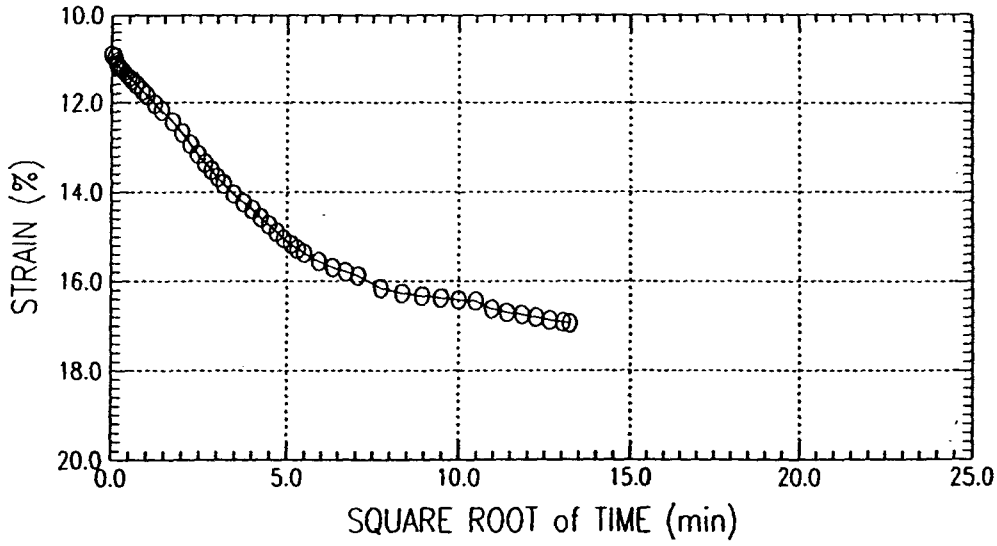


GeoTesting Express
Project Name : New Bedford Harbor Superfund Site
Project No : GTX-2409 Boring No : FB-27 Sample No : UO-5
Test Date : 11/18/99 Test No : CON13 Depth : 8-10 feet
Description : Moist, dark gray organic silt with gravel
Remarks : ---

CONSOLIDATION TEST

TIME CURVES (STEP 5 OF 16)
STRESS : 0.4 (t/ft^2)

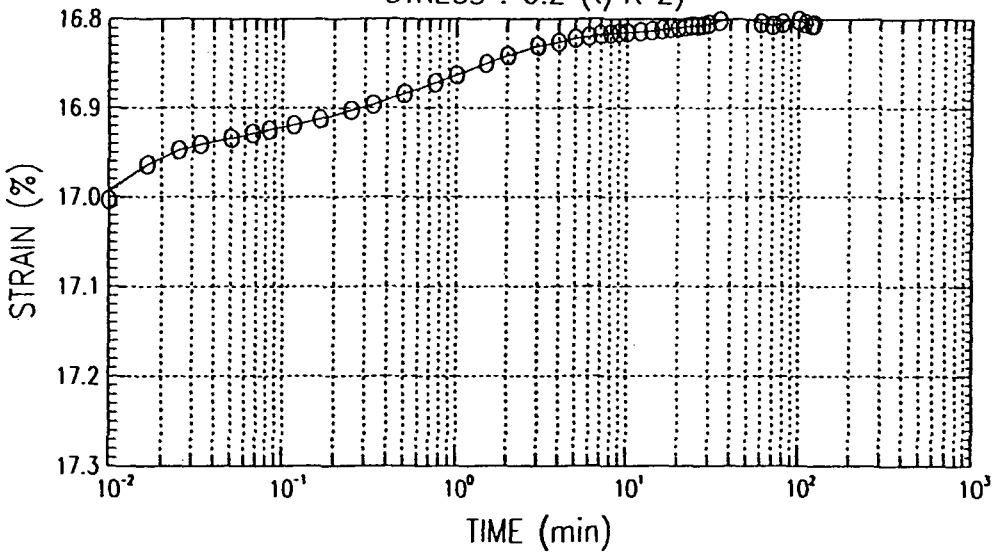


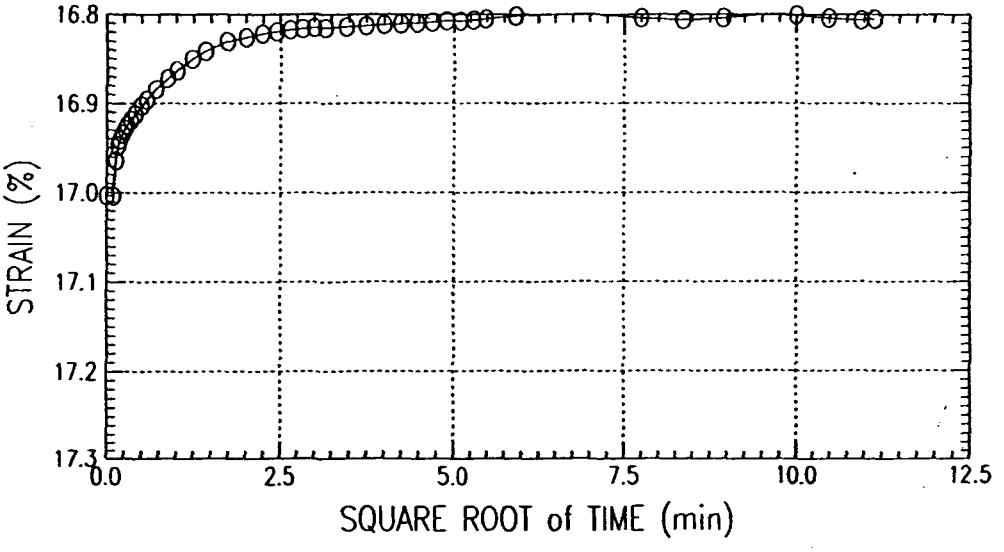


GeoTesting Express
Project Name : New Bedford Harbor Superfund Site
Project No : GTX-2409 Boring No : FB-27 Sample No : UO-5
Test Date : 11/18/99 Test No : CON13 Depth : 8-10 feet
Description : Moist, dark gray organic silt with gravel
Remarks : ---

CONSOLIDATION TEST

TIME CURVES (STEP 6 OF 16)
STRESS : 0.2 (t/ft^2)

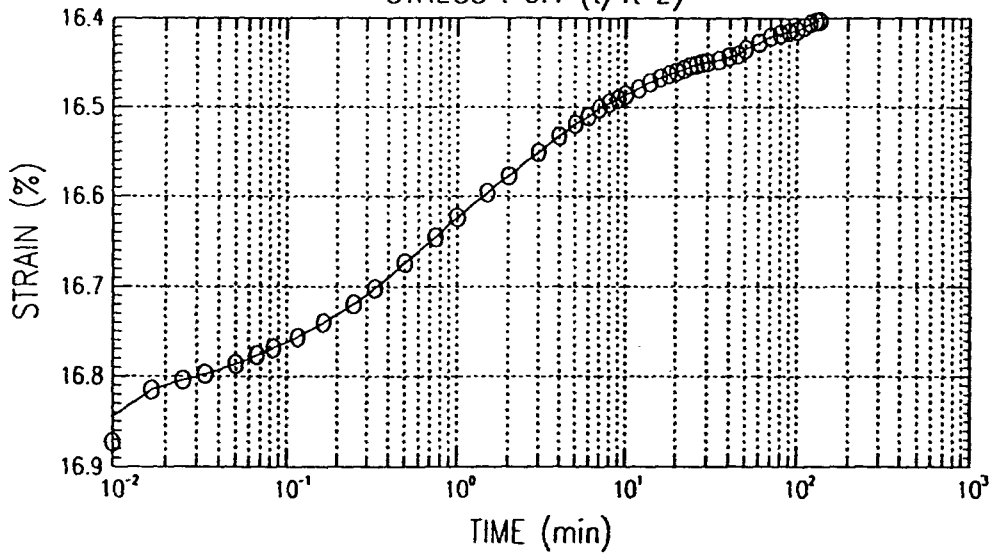


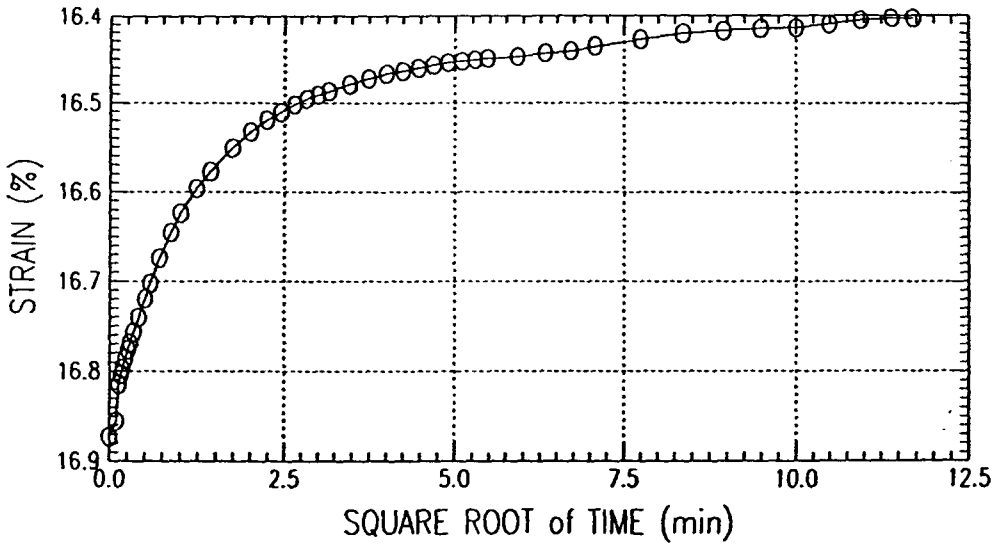


GeoTesting Express
Project Name : New Bedford Harbor Superfund Site
Project No : GTX-2409 Boring No : FB-27 Sample No : UO-5
Test Date : 11/18/99 Test No : CON13 Depth : 8-10 feet
Description : Moist, dark gray organic silt with gravel
Remarks : ---

CONSOLIDATION TEST

TIME CURVES (STEP 7 OF 16)
STRESS : 0.1 (t/ft^2)

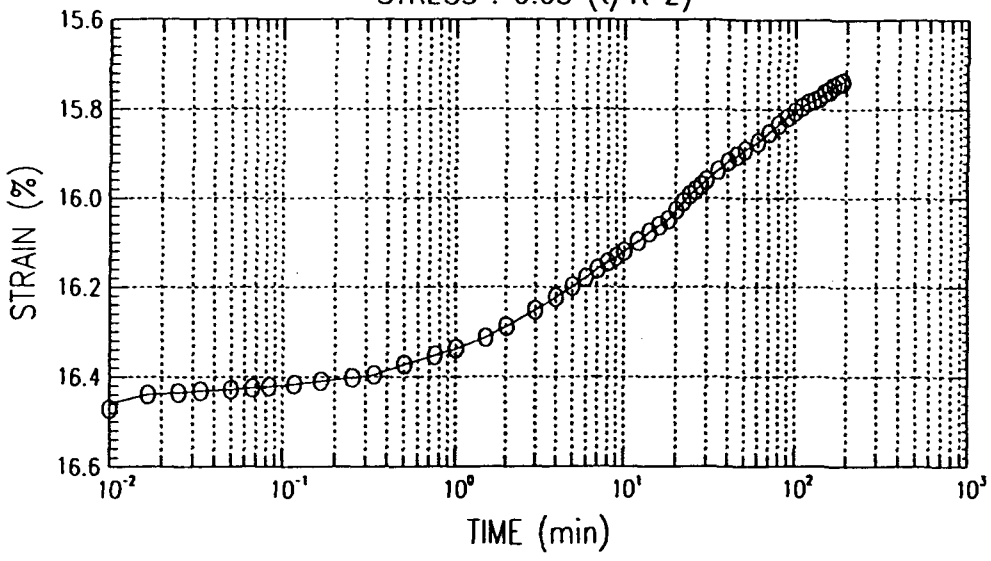


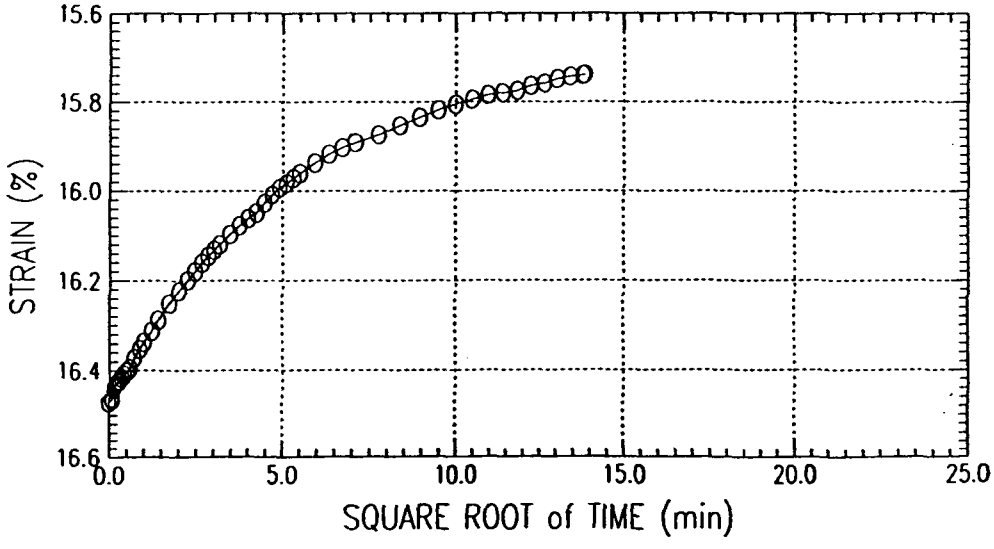


GeoTesting Express
Project Name : New Bedford Harbor Superfund Site
Project No : GTX-2409 Boring No : FB-27 Sample No : U0-5
Test Date : 11/18/99 Test No : CON13 Depth : 8-10 feet
Description : Moist, dark gray organic silt with gravel
Remarks : ---

CONSOLIDATION TEST

TIME CURVES (STEP 8 OF 16)
STRESS : 0.05 (t/ft^2)

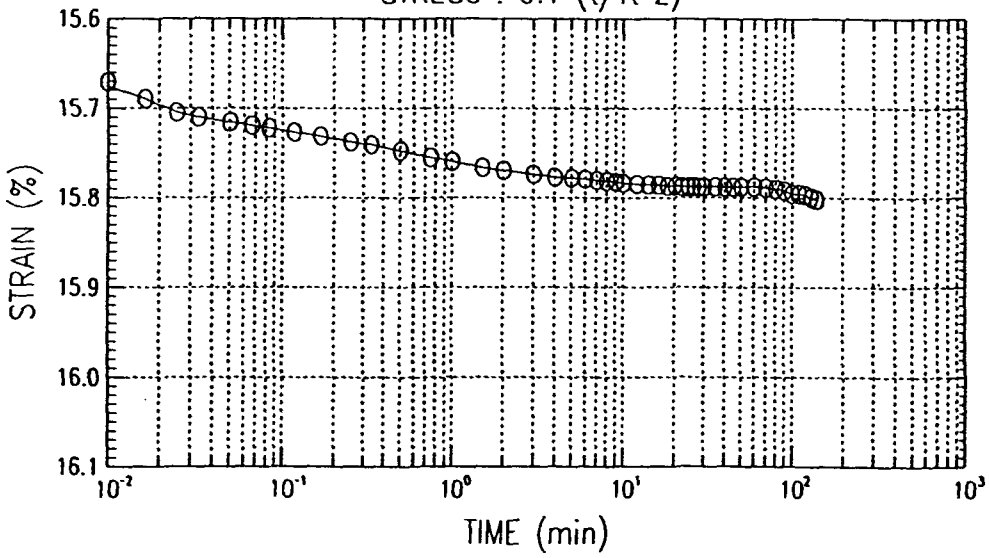


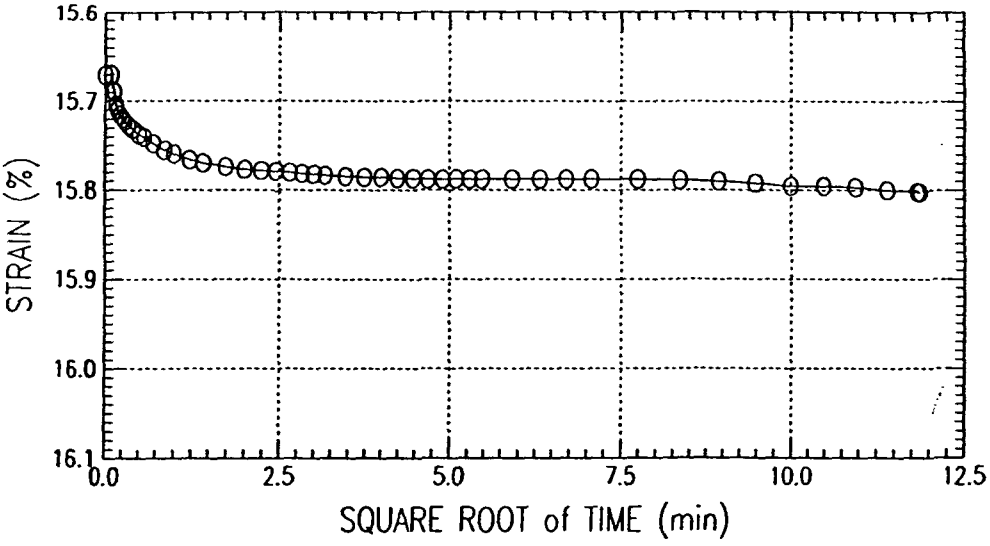


GeoTesting Express
Project Name : New Bedford Harbor Superfund Site
Project No : GTX-2409 Boring No : FB-27 Sample No : UO-5
Test Date : 11/18/99 Test No : CON13 Depth : 8-10 feet
Description : Moist, dark gray organic silt with gravel
Remarks : ---

CONSOLIDATION TEST

TIME CURVES (STEP 9 OF 16)
STRESS : 0.1 (t/ft^2)

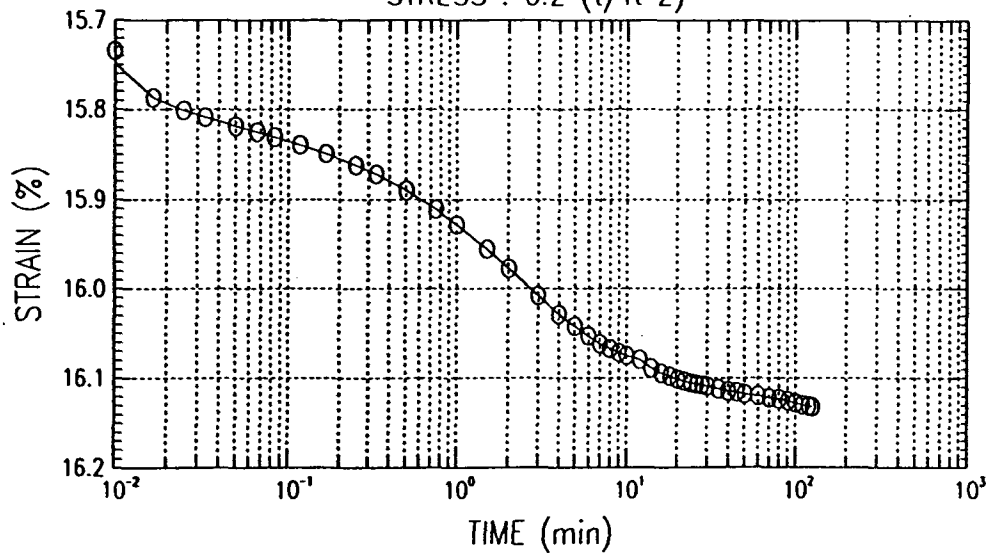


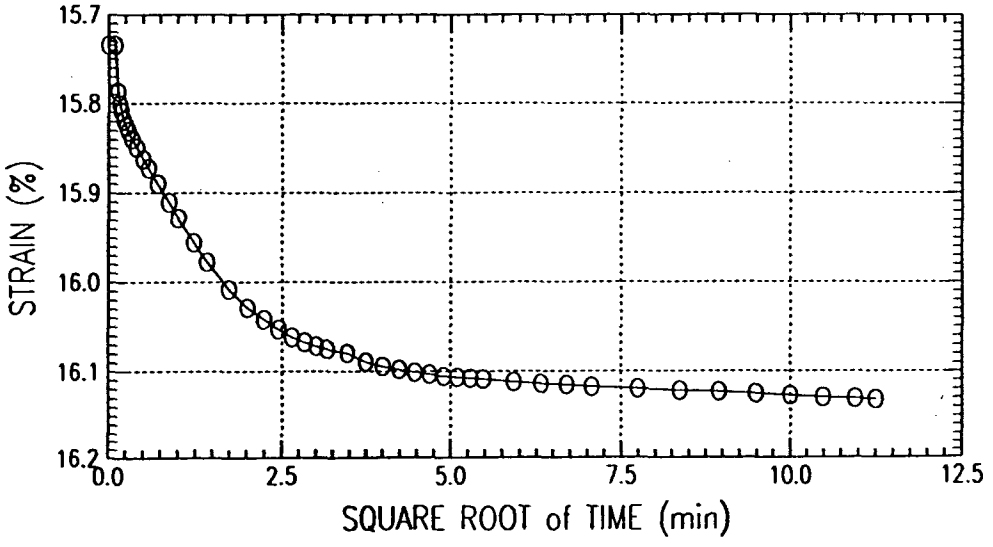


GeoTesting Express
Project Name : New Bedford Harbor Superfund Site
Project No : GTX-2409 Boring No : FB-27 Sample No : UO-5
Test Date : 11/18/99 Test No : CON13 Depth : 8-10 feet
Description : Moist, dark gray organic silt with gravel
Remarks : ---

CONSOLIDATION TEST

TIME CURVES (STEP 10 OF 16)
STRESS : 0.2 (t/ft^2)

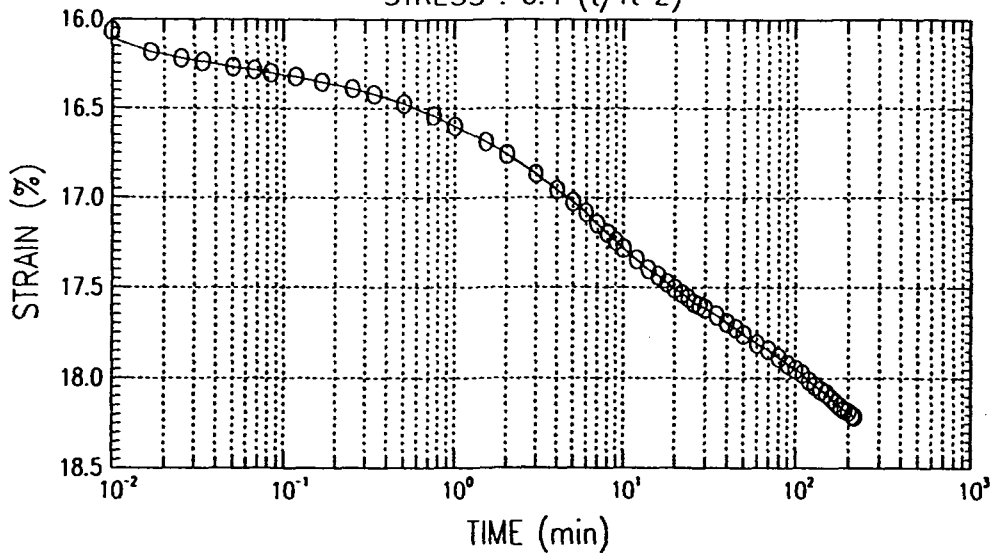


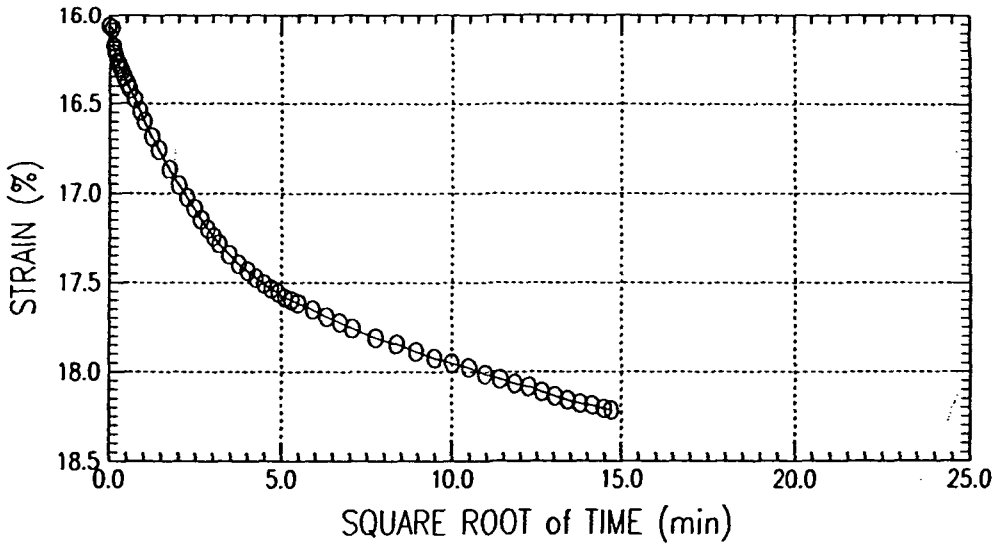


GeoTesting Express
Project Name : New Bedford Harbor Superfund Site
Project No : GTX-2409 Boring No : FB-27 Sample No : UO-5
Test Date : 11/18/99 Test No : CON13 Depth : 8-10 feet
Description : Moist, dark gray organic silt with gravel
Remarks : ---

CONSOLIDATION TEST

TIME CURVES (STEP 11 OF 16)
STRESS : 0.4 (t/ft^2)

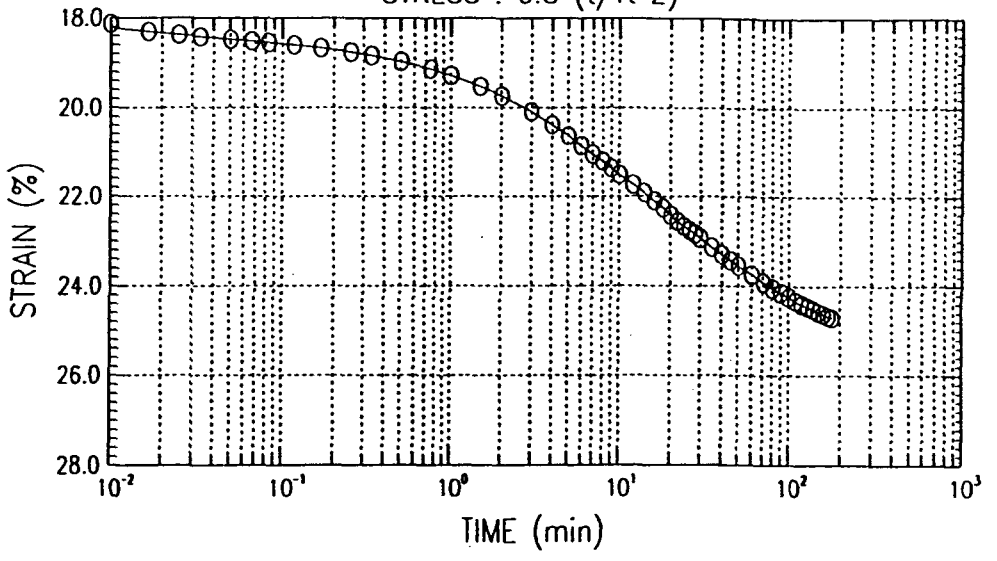


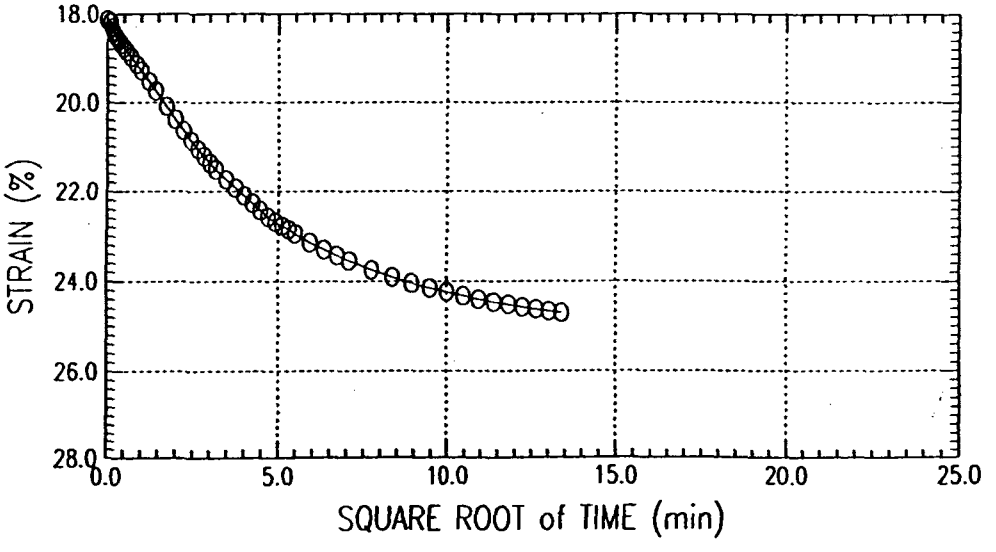


GeoTesting Express
Project Name : New Bedford Harbor Superfund Site
Project No : GTX-2409 Boring No : FB-27 Sample No : UO-5
Test Date : 11/18/99 Test No : CON13 Depth : 8-10 feet
Description : Moist, dark gray organic silt with gravel
Remarks : ---

CONSOLIDATION TEST

TIME CURVES (STEP 12 OF 16)
STRESS : 0.8 (t/ft^2)

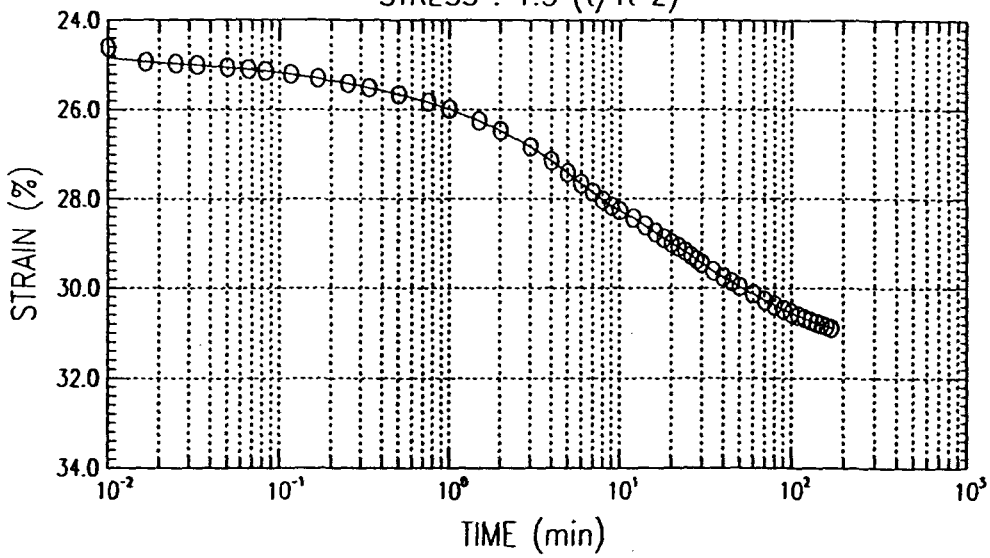


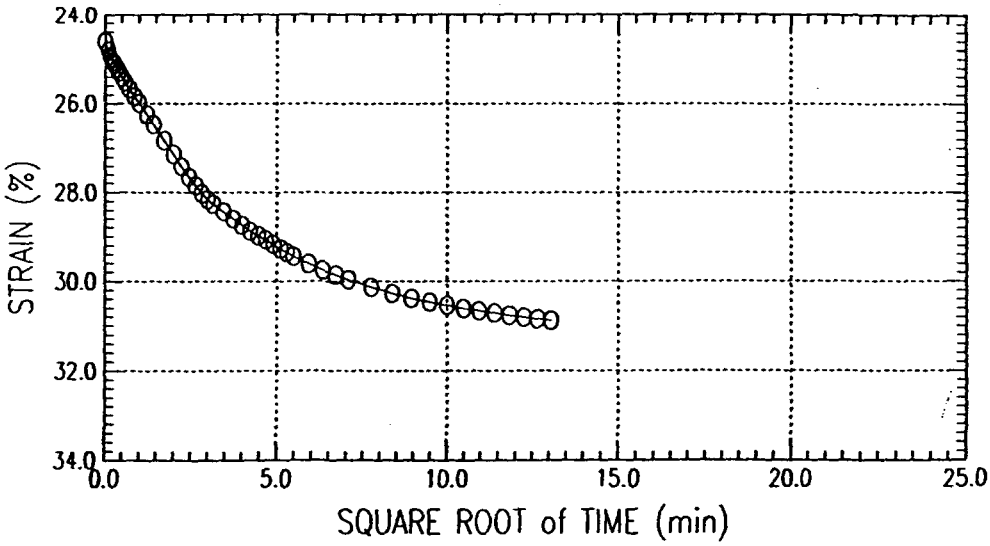


GeoTesting Express
Project Name : New Bedford Harbor Superfund Site
Project No : GTX-2409 Boring No : FB-27 Sample No : U0-5
Test Date : 11/18/99 Test No : CON13 Depth : 8-10 feet
Description : Moist, dark gray organic silt with gravel
Remarks : ---

CONSOLIDATION TEST

TIME CURVES (STEP 13 OF 16)
STRESS : 1.5 (t/ft^2)

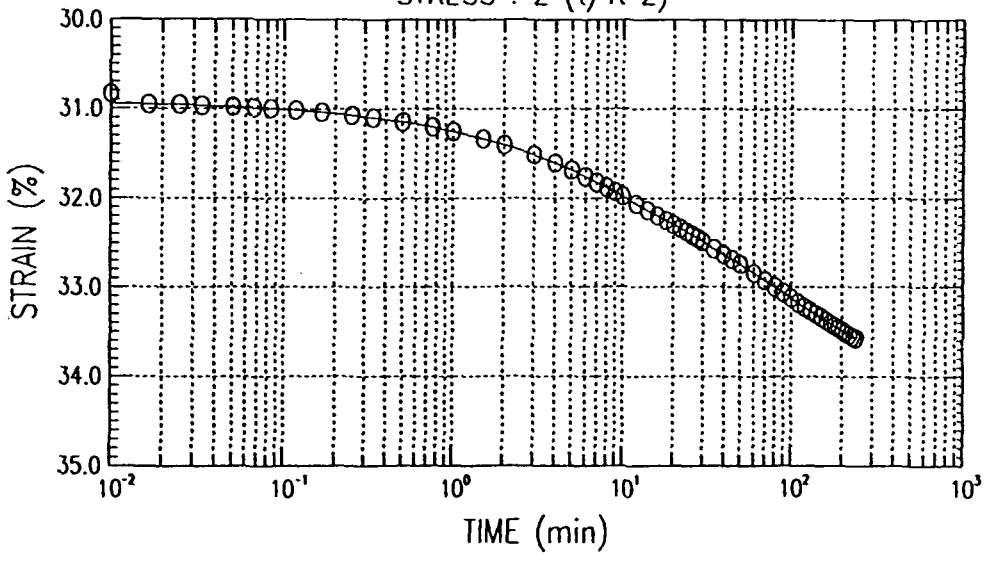


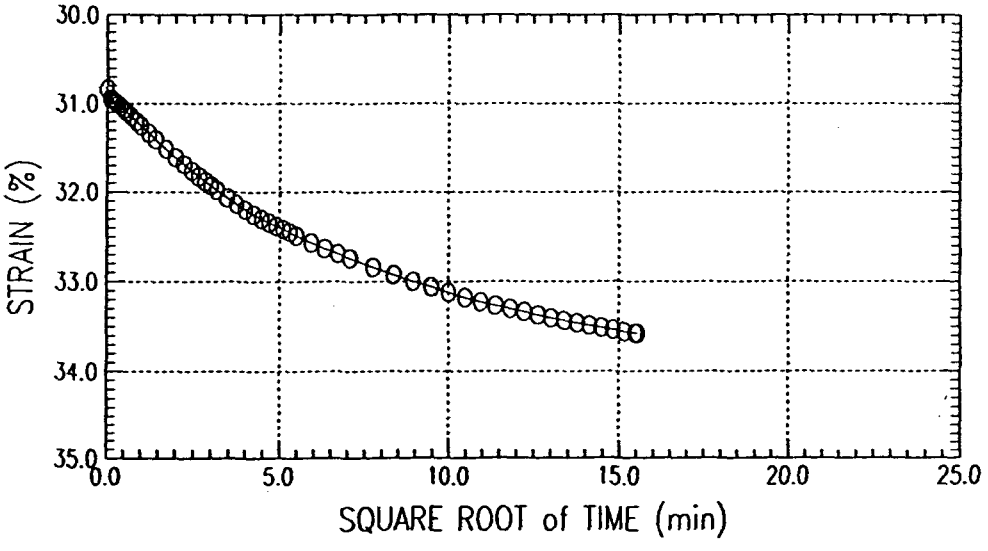


GeoTesting Express
Project Name : New Bedford Harbor Superfund Site
Project No : GTX-2409 Boring No : FB-27 Sample No : UO-5
Test Date : 11/18/99 Test No : CON13 Depth : 8-10 feet
Description : Moist, dark gray organic silt with gravel
Remarks : ---

CONSOLIDATION TEST

TIME CURVES (STEP 14 OF 16)
STRESS : 2 (t/ft^2)

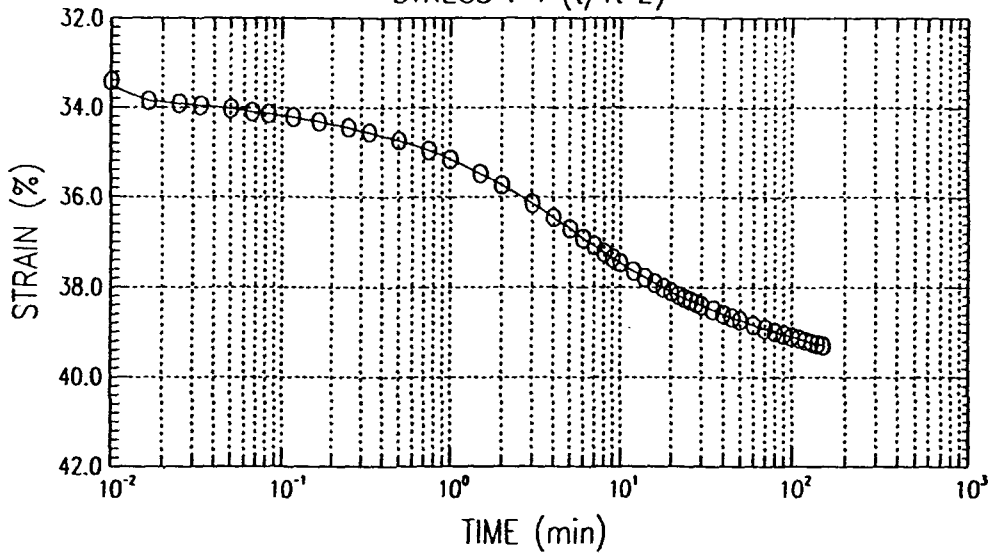


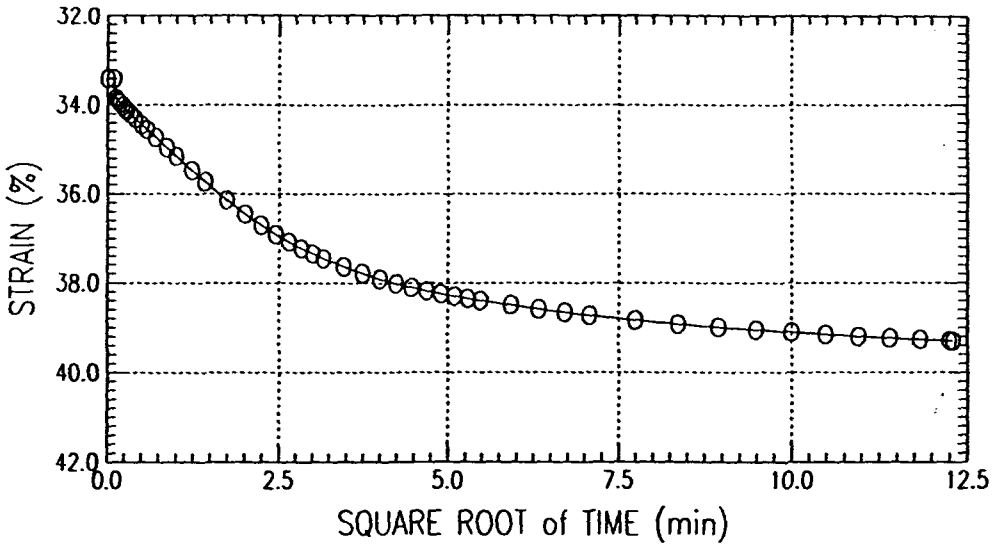


GeoTesting Express
Project Name : New Bedford Harbor Superfund Site
Project No : GTX-2409 Boring No : FB-27 Sample No : UO-5
Test Date : 11/18/99 Test No : CON13 Depth : 8-10 feet
Description : Moist, dark gray organic silt with gravel
Remarks : ---

CONSOLIDATION TEST

TIME CURVES (STEP 15 OF 16)
STRESS : 4 (t/ft^2)

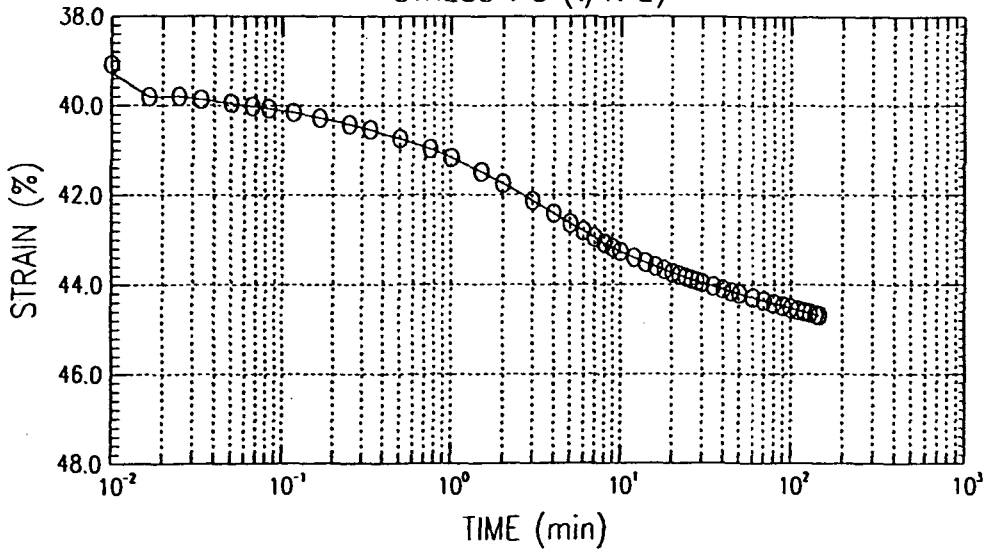


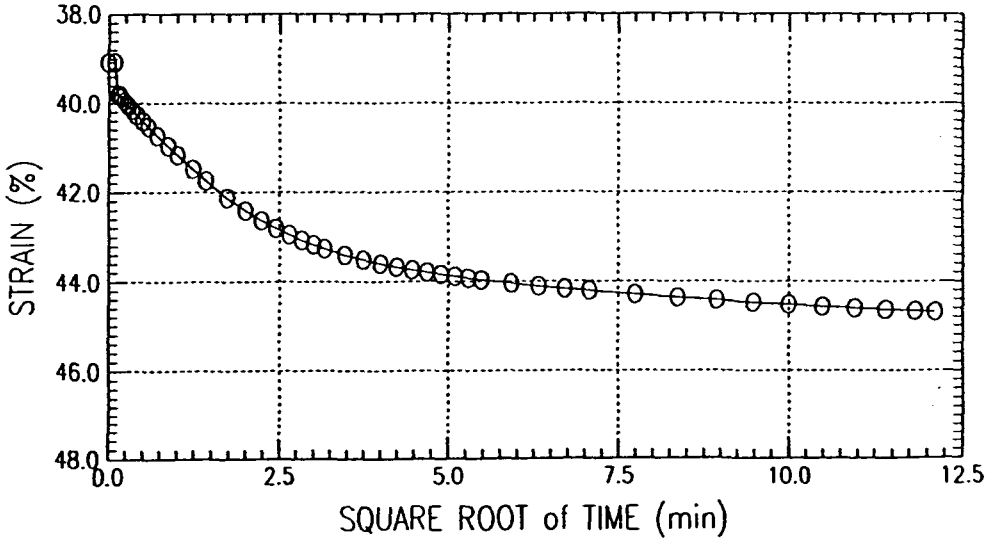


GeoTesting Express
Project Name : New Bedford Harbor Superfund Site
Project No : GTX-2409 Boring No : FB-27 Sample No : UO-5
Test Date : 11/18/99 Test No : CON13 Depth : 8-10 feet
Description : Moist, dark gray organic silt with gravel
Remarks : ---

CONSOLIDATION TEST

TIME CURVES (STEP 16 OF 16)
STRESS : 8 (t/ft^2)





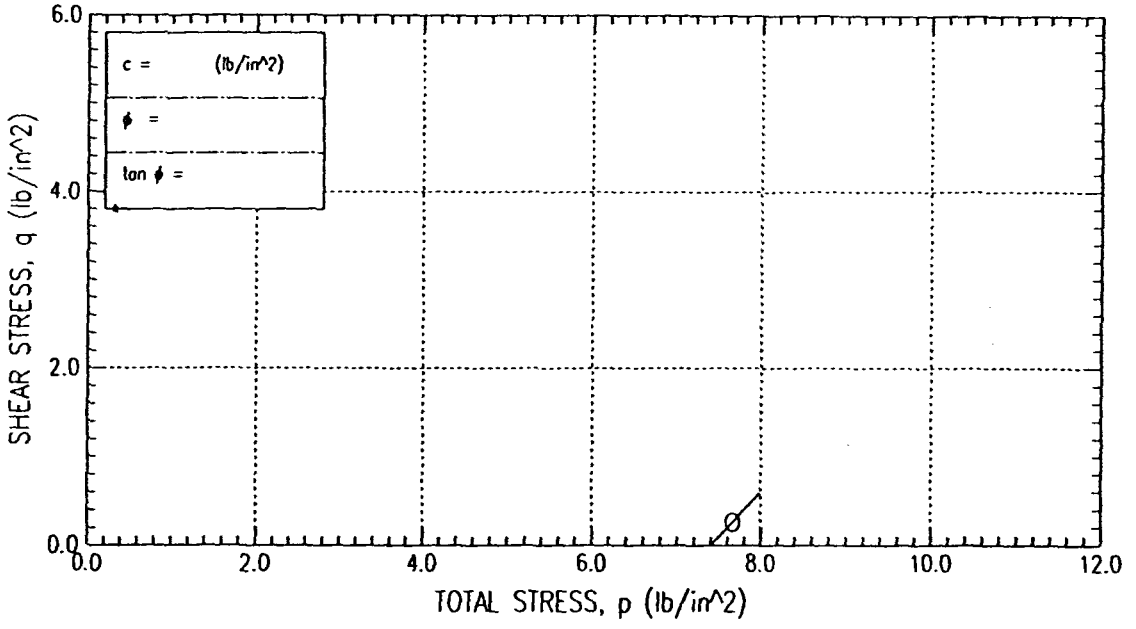
GeoTesting Express
Project Name : New Bedford Harbor Superfund Site
Project No : GTX-2409 Boring No : FB-27 Sample No : UO-5
Test Date : 11/18/99 Test No : CON13 Depth : 8-10 feet
Description : Moist, dark gray organic silt with gravel
Remarks : ---

J

APPENDIX J

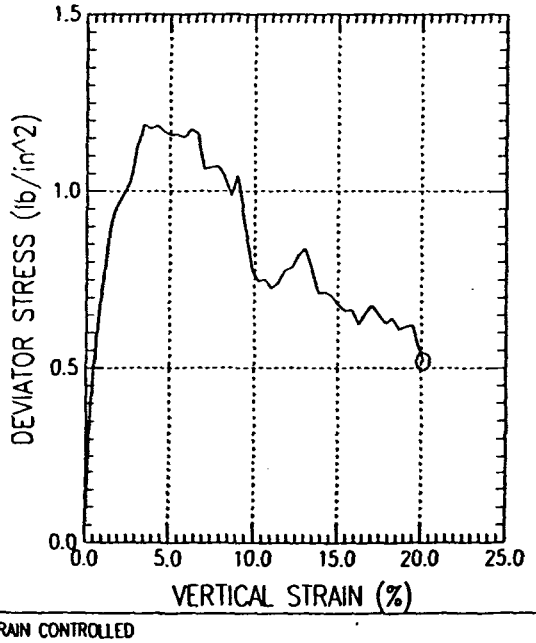
Triaxial Compression Testing – Q Test Results

UU Triaxial Test by ASTM D2850/T297



FAILURE SKETCHES

UU44



SYMBOL		O			
TEST NO.		UU44			
INITIAL	WATER CONTENT (%)	74.03			
	DRY DENSITY (lb/ft^3)	52.84			
	SATURATION (%)	92.63			
	VOID RATIO	2.094			
BEFORE SHEAR	WATER CONTENT (%)	74.03			
	DRY DENSITY (lb/ft^3)	52.84			
	SATURATION (%)	92.63			
	VOID RATIO	2.094			
	BACK PRESS. (lb/in^2)	0.00			
MINOR PRIN. STRESS (lb/in^2)		7.40			
MAX. DEV. STRESS (lb/in^2)		1.19			
TIME TO FAILURE (min)		4.06			
RATE OF STRAIN INCR (%/min)		1.00			
INITIAL DIAMETER (in)		2.87			
INITIAL HEIGHT (in)		6.00			
B-VALUE		0.00			

STRAIN CONTROLLED

DESCRIPTION OF SPECIMENS:

1) Moist dark gray organic silt

LL 95.10	PL 40.90	PI 54.20	GS 2.62	TYPE OF SPECIMEN Tube	TYPE OF TEST UU (Q)

REMARKS:

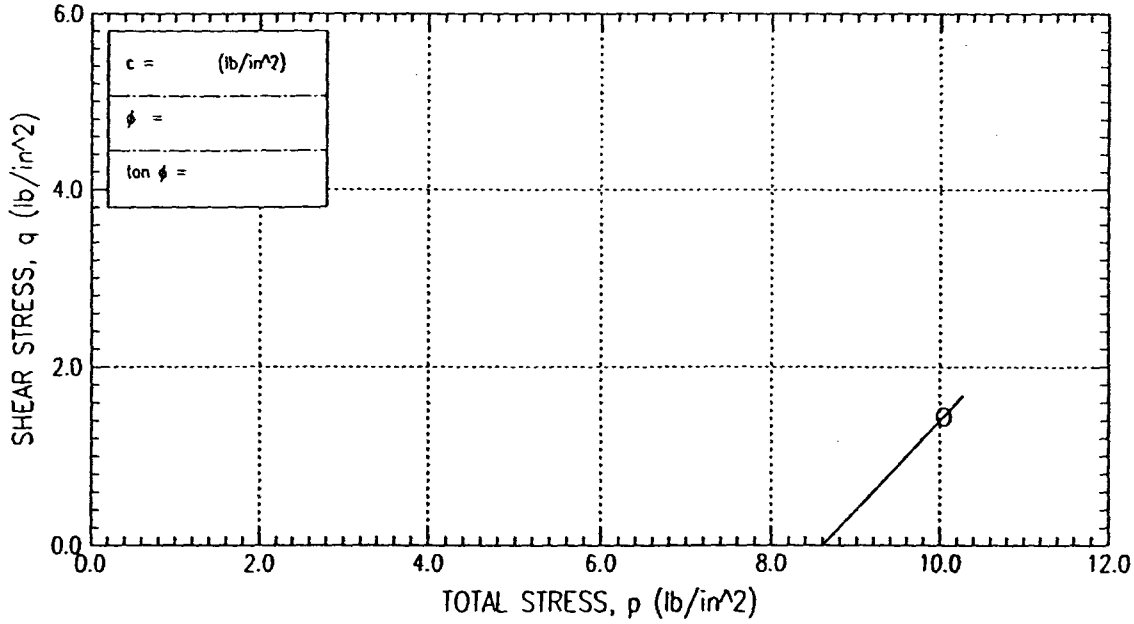
1) Sample Condition=Good

PROJECT New Bedford Harbor Superfund Site					
PROJECT NO.GTX-2409					
BORING NO. FB-4	SAMPLE NO.	UO-5			
TECH. FY	DEPTH/ELEV	11-13 feet			
LABORATORY	DATE	11/22/99			

TRIAXIAL COMPRESSION TEST REPORT

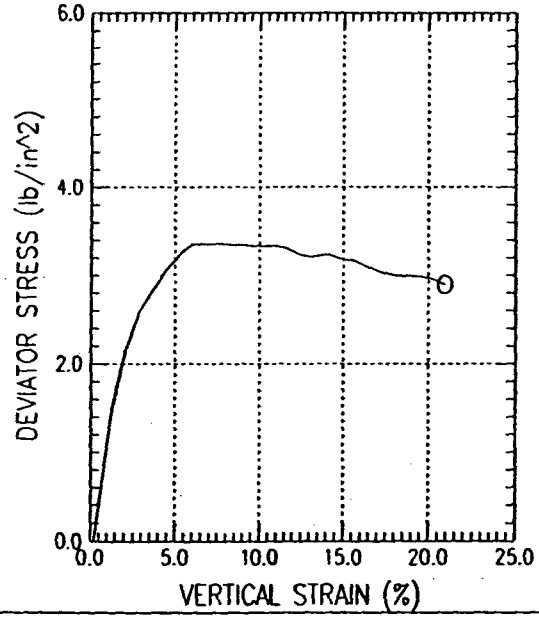
Wed 11-24-99, 15:29:35

UU Triaxial Test by ASTM D2850/T297



FAILURE SKETCHES

UU45



SYMBOL		O				
TEST NO.		UU45				
INITIAL	WATER CONTENT (%)	74.53				
	DRY DENSITY (lb/ft^3)	54.69				
	SATURATION (%)	98.55				
	VOID RATIO	1.966				
BEFORE SHEAR	WATER CONTENT (%)	74.53				
	DRY DENSITY (lb/ft^3)	54.69				
	SATURATION (%)	98.55				
	VOID RATIO	1.966				
	BACK PRESS. (lb/in^2)	0.00				
MINOR PRIN. STRESS (lb/in^2)		8.60				
MAX. DEV. STRESS (lb/in^2)		3.36				
TIME TO FAILURE (min)		8.73				
RATE OF STRAIN INCR (%/min)		1.00				
INITIAL DIAMETER (in)		2.84				
INITIAL HEIGHT (in)		5.96				
B-VALUE		0.00				

STRAIN CONTROLLED

DESCRIPTION OF SPECIMENS:

1) Moist very dark brown silty organic clay

LL	PL	PI	GS 2.60	TYPE OF SPECIMEN Tube	TYPE OF TEST UU (Q)

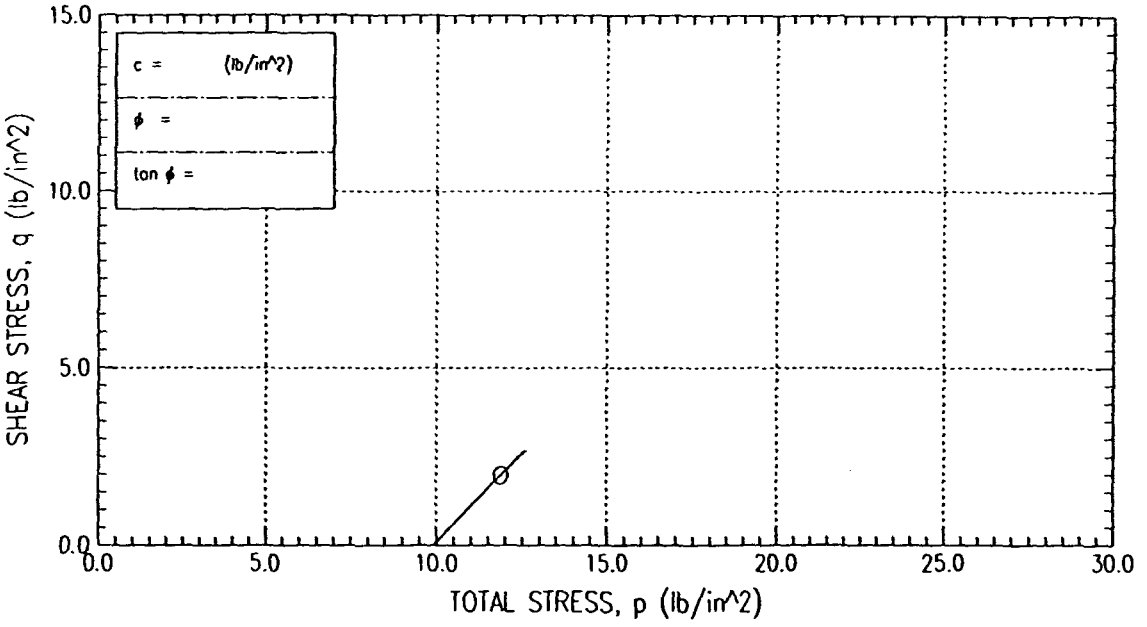
REMARKS:

1)

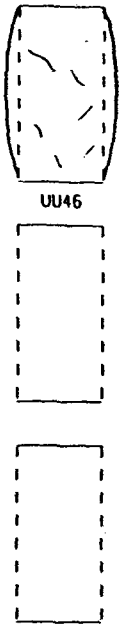
PROJECT New Bedford Harbor Superfund Site					
PROJECT NO.GTX-2409					
BORING NO. FB-4	SAMPLE NO.	UO-6			
TECH. FY	DEPTH/ELEV	13-15 feet			
LABORATORY	DATE	11/23/99			
TRIAXIAL COMPRESSION TEST REPORT					

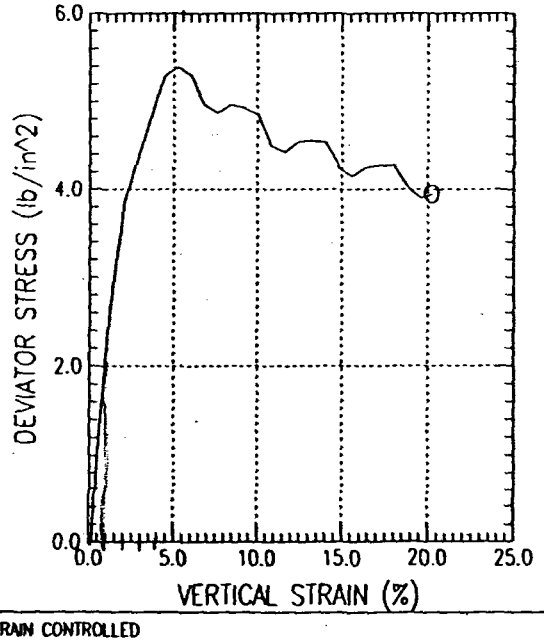
Mon 11-29-99, 11:20:13

UU Triaxial Test by ASTM D2850/T297



FAILURE SKETCHES





SYMBOL		O			
TEST NO.		UU46			
INITIAL	WATER CONTENT (%)	74.20			
	DRY DENSITY (lb/ft^3)	54.03			
	SATURATION (%)	96.33			
	VOID RATIO	2.003			
BEFORE SHEAR	WATER CONTENT (%)	74.20			
	DRY DENSITY (lb/ft^3)	54.03			
	SATURATION (%)	96.33			
	VOID RATIO	2.003			
	BACK PRESS. (lb/in^2)	0.00			
MINOR PRIN. STRESS (lb/in^2)		9.90			
MAX. DEV. STRESS (lb/in^2)		5.39			
TIME TO FAILURE (min)		6.24			
RATE OF STRAIN INCR (%/min)		1.00			
INITIAL DIAMETER (in)		2.87			
INITIAL HEIGHT (in)		6.15			
B-VALUE		0.00			

STRAIN CONTROLLED

DESCRIPTION OF SPECIMENS:

1) Moist, dark gray silty clay

LL	PL	PI	GS 2.60	TYPE OF SPECIMEN Tube	TYPE OF TEST UU (Q)

REMARKS:

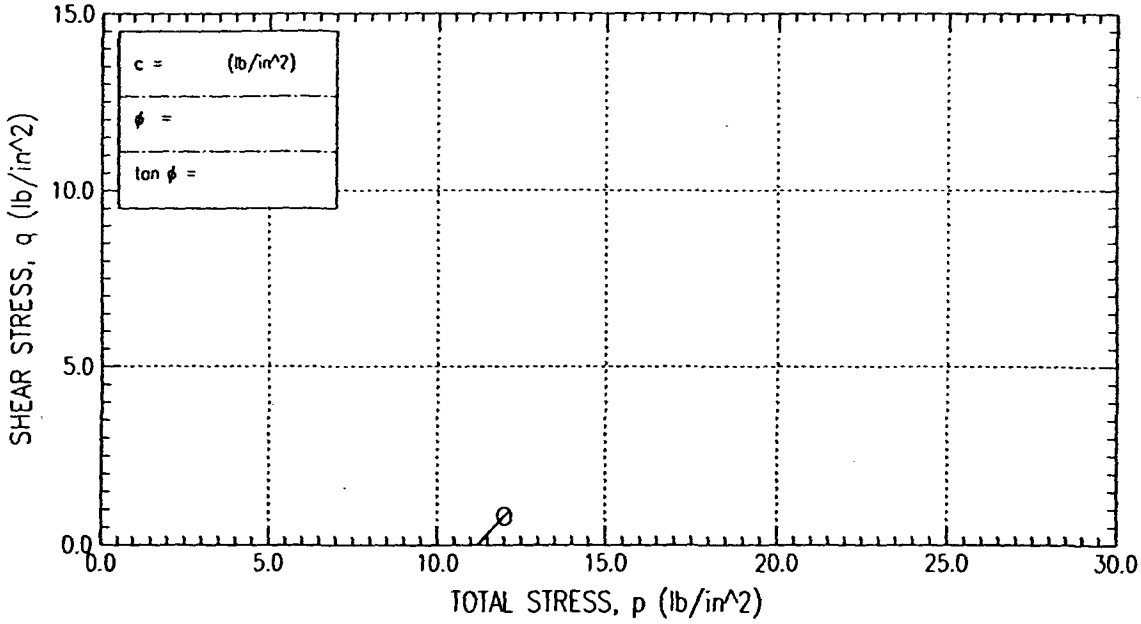
1) Sample Condition=Good

PROJECT	New Bedford Harbor Superfund Site		
PROJECT NO.	GTX-2409		
BORING NO.	FB-4	SAMPLE NO.	UO-7
TECH.	FY	DEPTH/ELEV	15-17 feet
LABORATORY		DATE	11/18/99

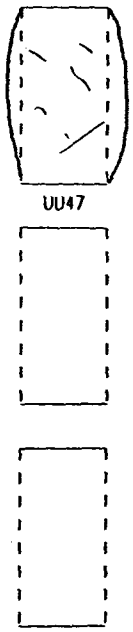
TRIAXIAL COMPRESSION TEST REPORT

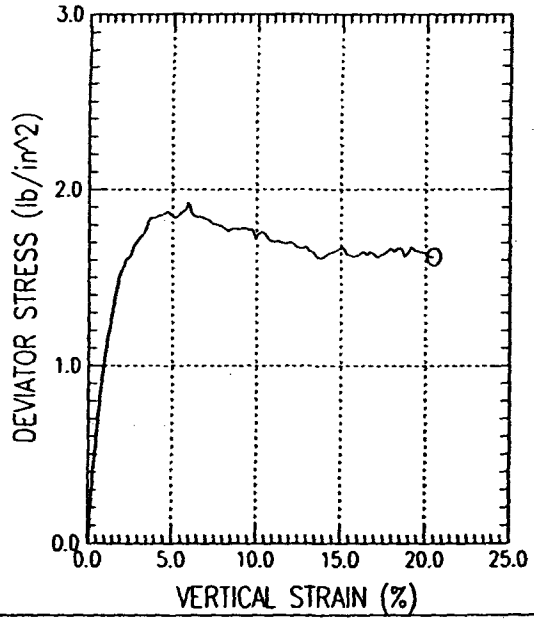
Mon 11-29-99, 11:15:06

UU Triaxial Test by ASTM D2850/T297



FAILURE SKETCHES





SYMBOL		O				
TEST NO.		UU47				
INITIAL	WATER CONTENT (%)	85.53				
	DRY DENSITY (lb/ft^3)	47.39				
	SATURATION (%)	91.77				
	VOID RATIO	2.423				
BEFORE SHEAR	WATER CONTENT (%)	85.53				
	DRY DENSITY (lb/ft^3)	47.39				
	SATURATION (%)	91.77				
	VOID RATIO	2.423				
	BACK PRESS. (lb/in^2)	0.00				
MINOR PRIN. STRESS (lb/in^2)		11.20				
MAX. DEV. STRESS (lb/in^2)		1.93				
TIME TO FAILURE (min)		6.72				
RATE OF STRAIN INCR (%/min)		1.00				
INITIAL DIAMETER (in)		2.90				
INITIAL HEIGHT (in)		6.10				
B-VALUE		0.00				

STRAIN CONTROLLED

DESCRIPTION OF SPECIMENS:

1) Moist dark greenish grey organic clay

LL	PL	PI	GS 2.60	TYPE OF SPECIMEN Tube	TYPE OF TEST UU (Q)

REMARKS:

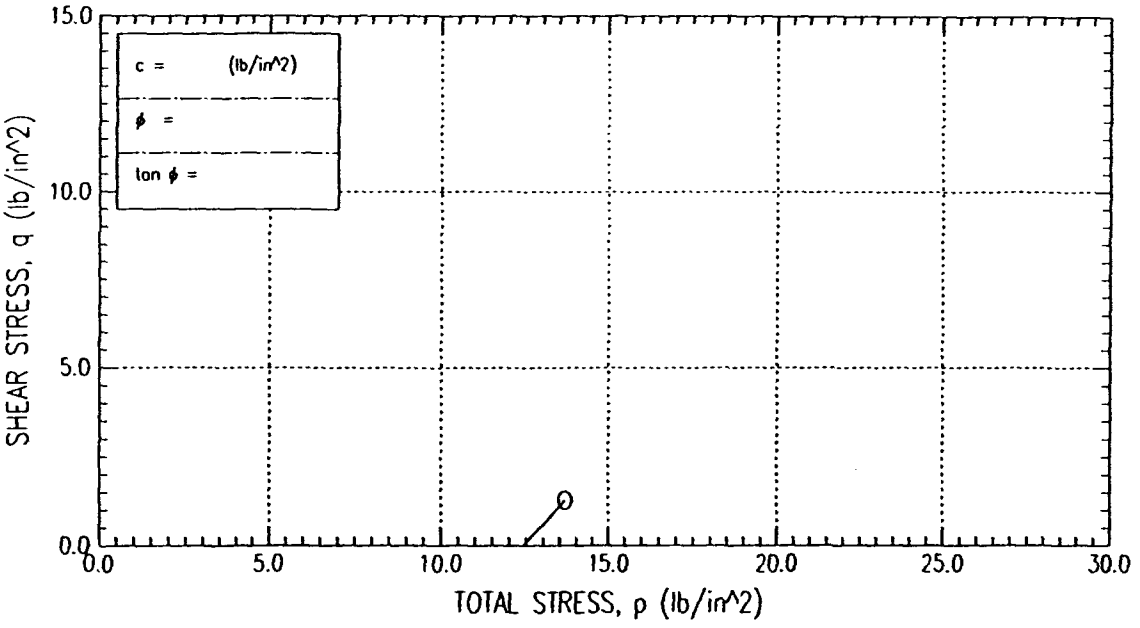
1) Sample Condition=Good

PROJECT New Bedford Harbor Superfund Site					
PROJECT NO.GTX-2409					
BORING NO. FB-4	SAMPLE NO.	UO-8			
TECH. FY	DEPTH/ELEV	17-19 feet			
LABORATORY	DATE	11/23/99			

TRIAXIAL COMPRESSION TEST REPORT

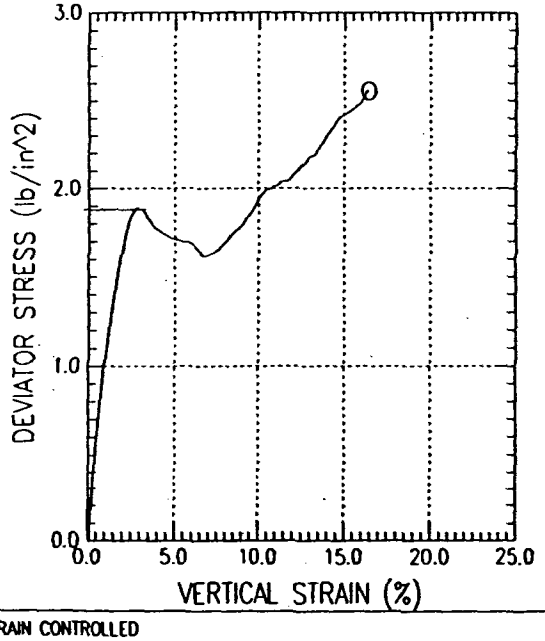
Mon 11-29-99, 11:15:40

UU Triaxial Test by ASTM D2850/T297



FAILURE SKETCHES

UU48



SYMBOL		O				
TEST NO.		UU48				
INITIAL	WATER CONTENT (%)	72.27				
	DRY DENSITY (lb/ft^3)	53.83				
	SATURATION (%)	93.30				
	VOID RATIO	2.014				
BEFORE SHEAR	WATER CONTENT (%)	72.27				
	DRY DENSITY (lb/ft^3)	53.83				
	SATURATION (%)	93.30				
	VOID RATIO	2.014				
	BACK PRESS. (lb/in^2)	0.00				
MINOR PRIN. STRESS (lb/in^2)		12.40				
MAX. DEV. STRESS (lb/in^2)		2.56				
TIME TO FAILURE (min)		16.63				
RATE OF STRAIN INCR (%/min)		1.00				
INITIAL DIAMETER (in)		2.87				
INITIAL HEIGHT (in)		6.09				
B-VALUE		0.00				

STRAIN CONTROLLED

DESCRIPTION OF SPECIMENS:

1) Moist, dark grey clay with organics

LL	PL	PI	GS 2.60	TYPE OF SPECIMEN Tube	TYPE OF TEST UU (Q)

REMARKS:

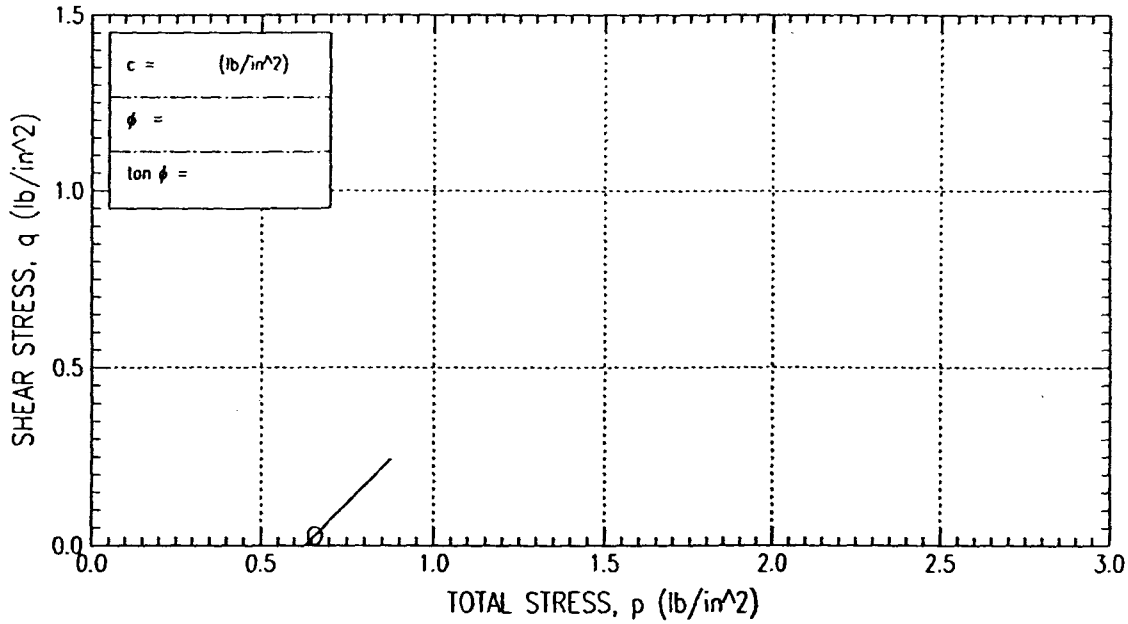
1) Sample Condition=Good

PROJECT	New Bedford Harbor Superfund Site		
PROJECT NO.	GTX-2409		
BORING NO.	FB-4	SAMPLE NO.	UO-9
TECH.	fy	DEPTH/ELEV	19-21 feet
LABORATORY		DATE	11/23/99

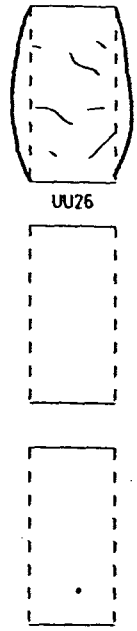
TRIAXIAL COMPRESSION TEST REPORT

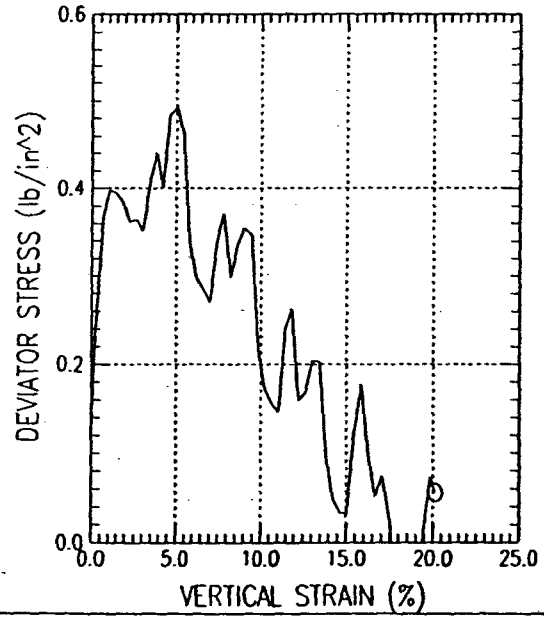
Mon 11-29-99, 11:16:32

UU Triaxial Test by ASTM D2850/T297



FAILURE SKETCHES





SYMBOL		O			
TEST NO.		UU26			
INITIAL	WATER CONTENT (%)	189.39			
	DRY DENSITY (lb/ft^3)	25.51			
	SATURATION (%)	91.86			
	VOID RATIO	5.361			
BEFORE SHEAR	WATER CONTENT (%)	189.39			
	DRY DENSITY (lb/ft^3)	25.51			
	SATURATION (%)	91.86			
	VOID RATIO	5.361			
	BACK PRESS. (lb/in^2)	0.00			
MINOR PRIN. STRESS (lb/in^2)		0.63			
MAX. DEV. STRESS (lb/in^2)		0.49			
TIME TO FAILURE (min)		5.52			
RATE OF STRAIN INCR (%/min)		1.00			
INITIAL DIAMETER (in)		2.81			
INITIAL HEIGHT (in)		6.20			
B-VALUE		0.00			

STRAIN CONTROLLED

DESCRIPTION OF SPECIMENS:

1) Moist black oily odorous organics clay

LL	PL	PI	GS 2.60	TYPE OF SPECIMEN Tube	TYPE OF TEST UU (0)

REMARKS:

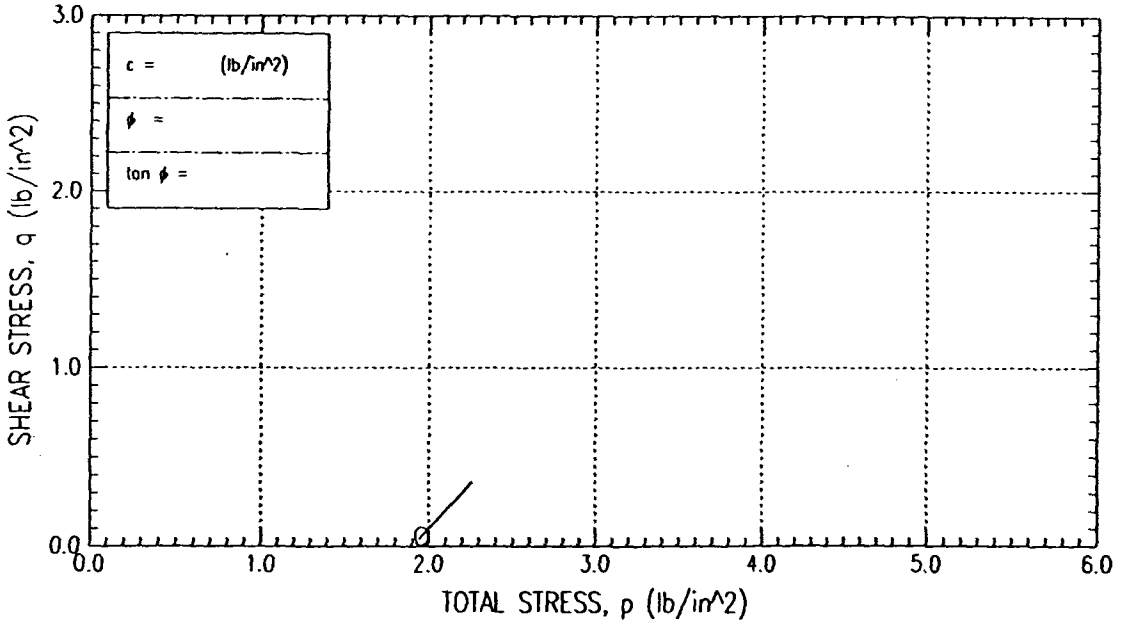
1) Sample Condition=Fair

PROJECT New Bedford Harbor Superfund Site			
PROJECT NO.GTX-2409			
BORING NO. FB-11	SAMPLE NO.	UO-1	
TECH. FY	DEPTH/ELEV	0-2 feet	
LABORATORY	DATE	11/23/99	

TRIAXIAL COMPRESSION TEST REPORT

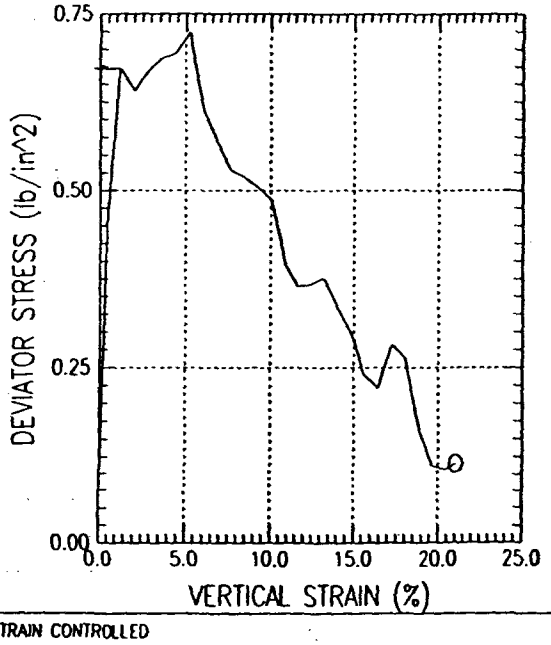
Mon 11-29-99, 11:05:34

UU Triaxial Test by ASTM D2850/T297



FAILURE SKETCHES

UU27



SYMBOL		O			
TEST NO.		UU27			
INITIAL	WATER CONTENT (%)	131.24			
	DRY DENSITY (lb/ft^3)	35.37			
	SATURATION (%)	95.12			
	VOID RATIO	3.587			
BEFORE SHEAR	WATER CONTENT (%)	131.24			
	DRY DENSITY (lb/ft^3)	35.37			
	SATURATION (%)	95.12			
	VOID RATIO	3.587			
	BACK PRESS. (lb/in^2)	0.00			
MINOR PRIN. STRESS (lb/in^2)		1.90			
MAX. DEV. STRESS (lb/in^2)		0.72			
TIME TO FAILURE (min)		6.25			
RATE OF STRAIN INCR (%/min)		1.00			
INITIAL DIAMETER (in)		2.85			
INITIAL HEIGHT (in)		5.90			
B-VALUE		0.00			

STRAIN CONTROLLED

DESCRIPTION OF SPECIMENS:

1) Moist black oily clay with trace organics

LL	PL	PI	GS 2.60	TYPE OF SPECIMEN Tube	TYPE OF TEST UU (Q)

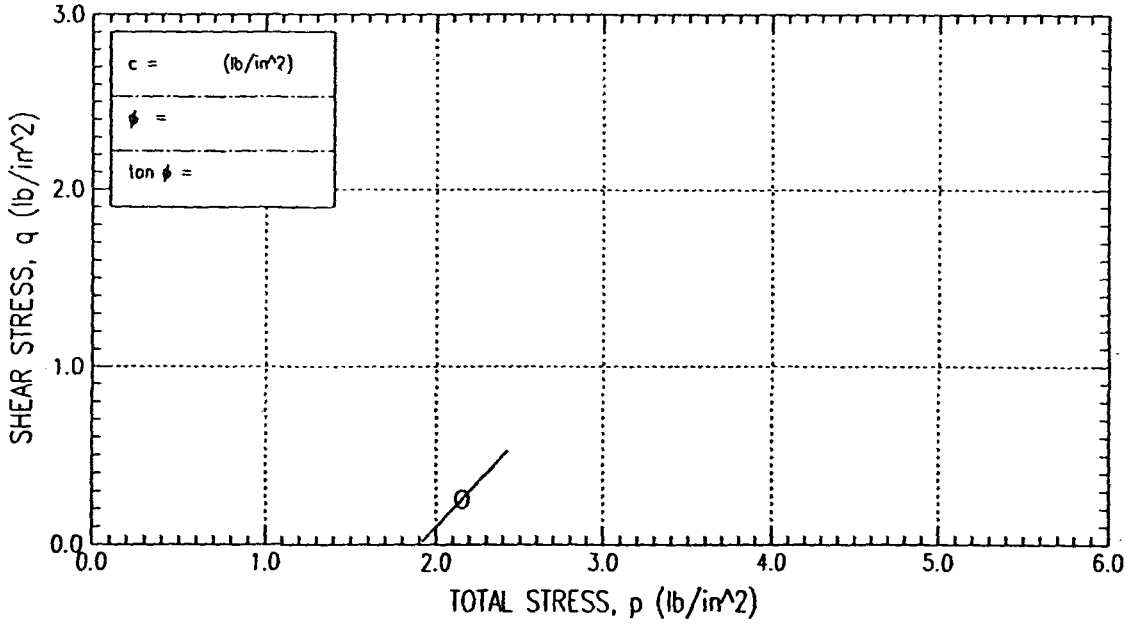
REMARKS:

1) Sample Condition=Fair

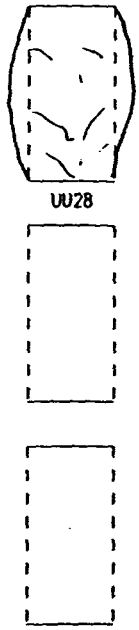
PROJECT New Bedford Harbor Superfund Site					
PROJECT NO.GTX-2409					
BORING NO. FB-11	SAMPLE NO.	UO-2			
TECH. FY	DEPTH/ELEV	3-5 feet			
LABORATORY	DATE	11/23/99			
TRIAXIAL COMPRESSION TEST REPORT					

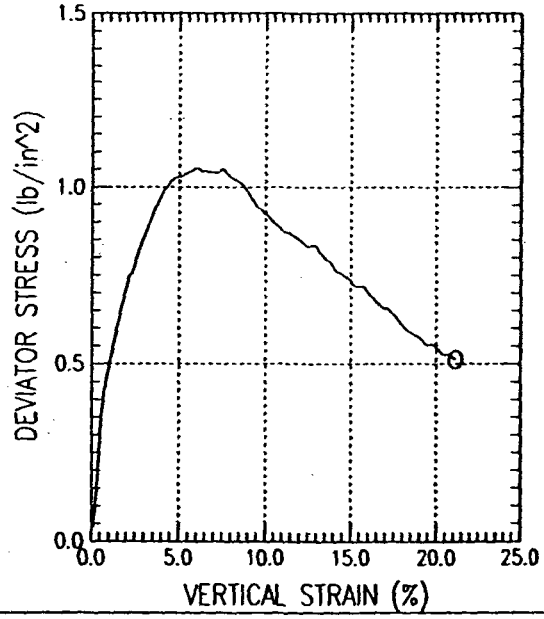
Mon 11-29-99, 11:06:50

UU Triaxial Test by ASTM D2850/T297



FAILURE SKETCHES





SYMBOL		O
TEST NO.		UU28
INITIAL	WATER CONTENT (%)	138.32
	DRY DENSITY (lb/ft^3)	35.21
	SATURATION (%)	99.68
	VOID RATIO	3.608
BEFORE SHEAR	WATER CONTENT (%)	138.32
	DRY DENSITY (lb/ft^3)	35.21
	SATURATION (%)	99.68
	VOID RATIO	3.608
	BACK PRESS. (lb/in^2)	0.00
MINOR PRIN. STRESS (lb/in^2)		1.90
MAX. DEV. STRESS (lb/in^2)		1.05
TIME TO FAILURE (min)		6.54
RATE OF STRAIN INCR (%/min)		1.00
INITIAL DIAMETER (in)		2.85
INITIAL HEIGHT (in)		5.90
B-VALUE		0.00

STRAIN CONTROLLED

DESCRIPTION OF SPECIMENS:

1) Moist dark greenish grey brown clay

LL	PL	PI	GS 2.60

TYPE OF SPECIMEN Tube

TYPE OF TEST UU (Q)

REMARKS:

1) Sample Condition=Good

PROJECT New Bedford Harbor Superfund Site

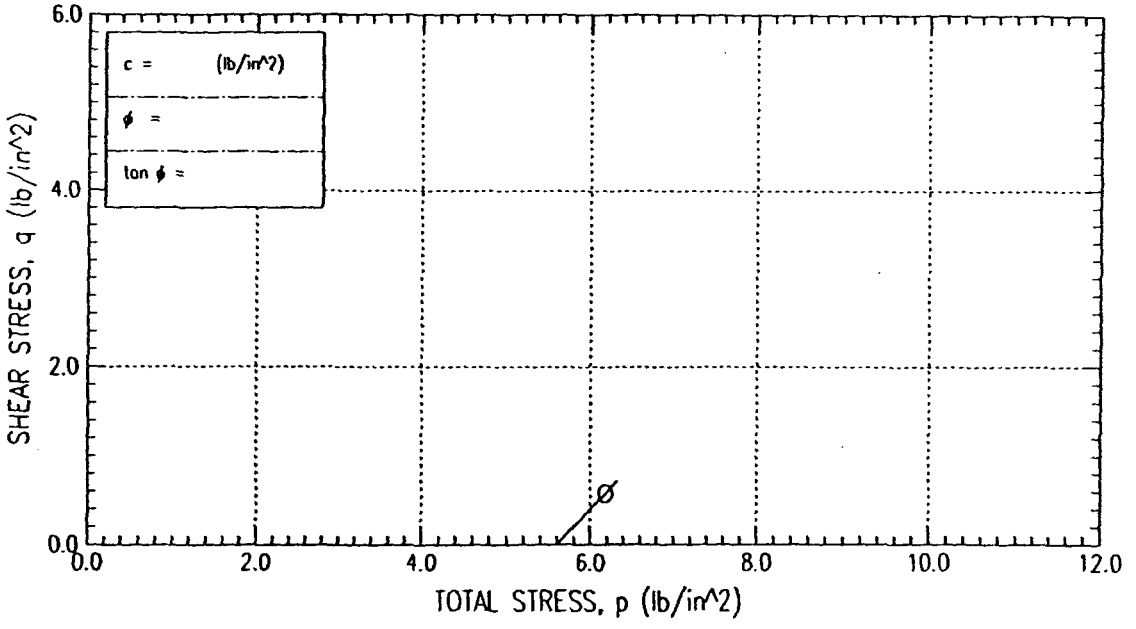
PROJECT NO.GTX-2409

BORING NO. FB-11	SAMPLE NO.	UO-3	
TECH. FY	DEPTH/ELEV	6-8 feet	
LABORATORY	DATE	11/23/99	

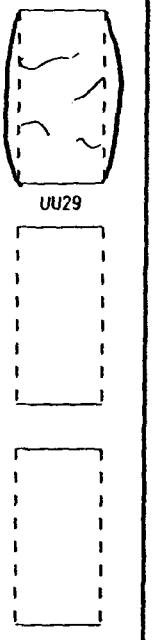
TRIAXIAL COMPRESSION TEST REPORT

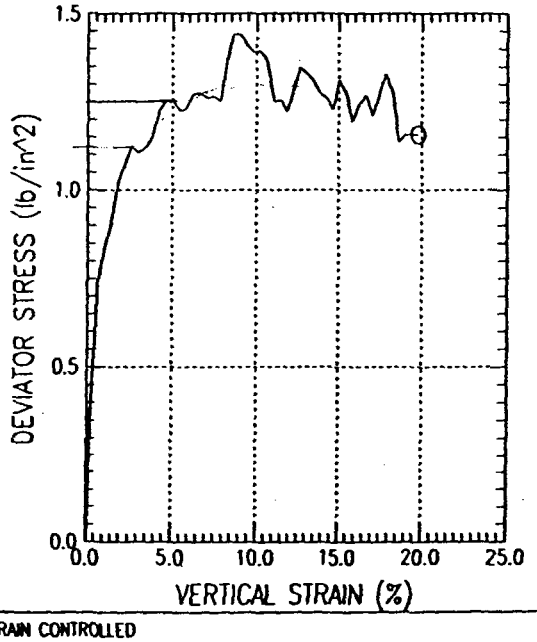
Mon 11-29-99, 11:08:06

UU Triaxial Test by ASTM D2850/T297



FAILURE SKETCHES





SYMBOL		O			
TEST NO.		UU29			
INITIAL	WATER CONTENT (%)	40.09			
	DRY DENSITY (lb/ft^3)	76.05			
	SATURATION (%)	91.67			
	VOID RATIO	1.141			
BEFORE SHEAR	WATER CONTENT (%)	40.09			
	DRY DENSITY (lb/ft^3)	76.05			
	SATURATION (%)	91.67			
	VOID RATIO	1.141			
	BACK PRESS. (lb/in^2)	0.00			
MINOR PRIN. STRESS (lb/in^2)		5.60			
MAX. DEV. STRESS (lb/in^2)		1.44			
TIME TO FAILURE (min)		9.38			
RATE OF STRAIN INCR (%/min)		1.00			
INITIAL DIAMETER (in)		2.93			
INITIAL HEIGHT (in)		6.30			
B-VALUE		0.00			

STRAIN CONTROLLED

DESCRIPTION OF SPECIMENS:

1) Moist, dark gray organic silt

LL 54.90	PL 27.10	PI 27.80	GS 2.61

TYPE OF SPECIMEN Tube

TYPE OF TEST UU (0)

REMARKS:

1) Sample Condition=Good

PROJECT New Bedford Harbor Superfund Site

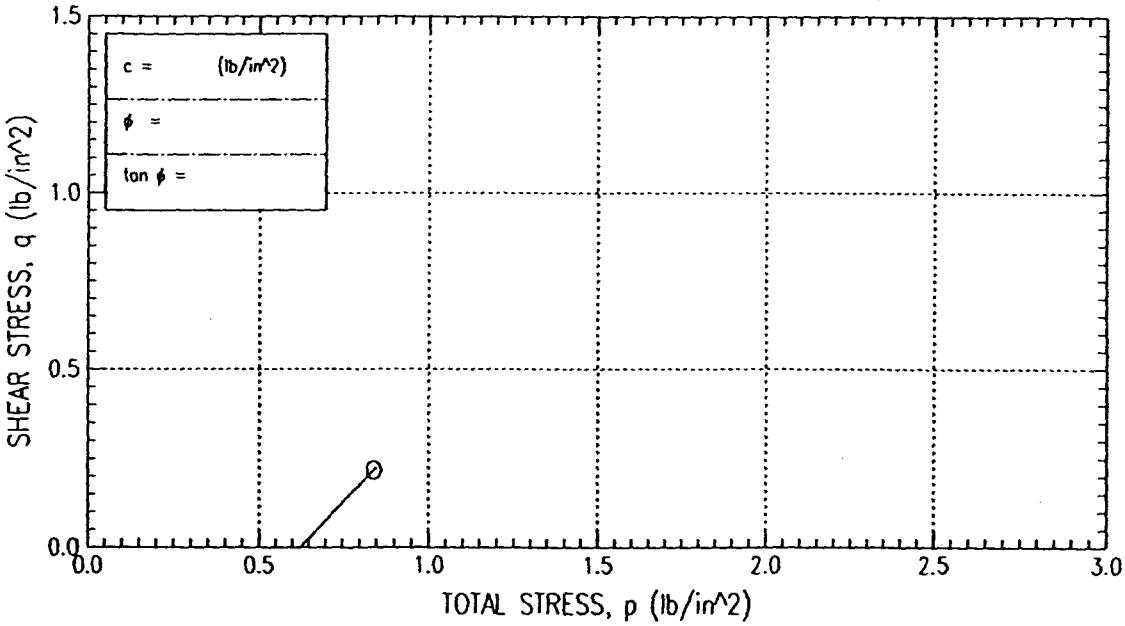
PROJECT NO.GTX-2409

BORING NO. FB-11	SAMPLE NO.	UO-4	
TECH. FY	DEPTH/ELEV	9-11 feet	
LABORATORY	DATE	11/18/99	

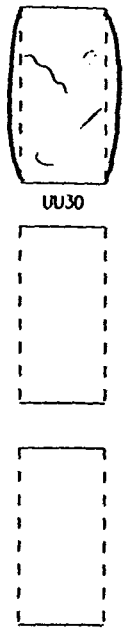
TRIAXIAL COMPRESSION TEST REPORT

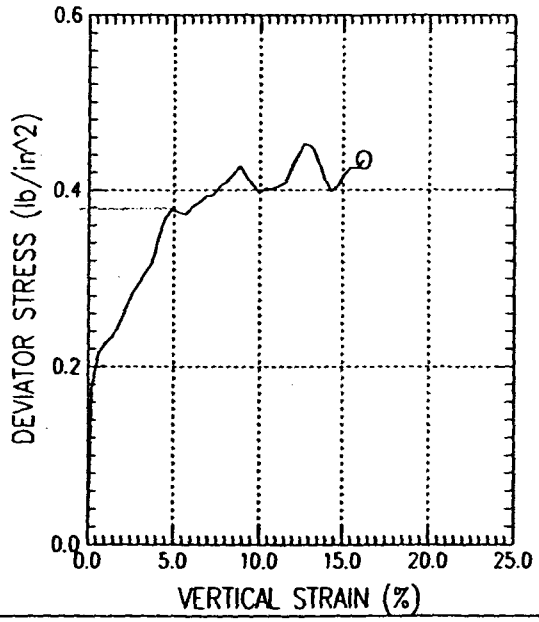
Wed 11-24-99, 16:35:45

UU Triaxial Test by ASTM D2850/T297



FAILURE SKETCHES





SYMBOL		O				
TEST NO.		UU30				
INITIAL	WATER CONTENT (%)	182.78				
	DRY DENSITY (lb/ft^3)	27.32				
	SATURATION (%)	98.93				
	VOID RATIO	4.231				
BEFORE SHEAR	WATER CONTENT (%)	182.78				
	DRY DENSITY (lb/ft^3)	27.32				
	SATURATION (%)	98.93				
	VOID RATIO	4.231				
	BACK PRESS. (lb/in^2)	0.00				
MINOR PRIN. STRESS (lb/in^2)		0.62				
MAX. DEV. STRESS (lb/in^2)		0.45				
TIME TO FAILURE (min)		13.38				
RATE OF STRAIN INCR (%/min)		1.00				
INITIAL DIAMETER (in)		2.89				
INITIAL HEIGHT (in)		6.15				
B-VALUE		0.00				

STRAIN CONTROLLED

DESCRIPTION OF SPECIMENS:

1) Moist, black organic silt

LL 108.00	PL 79.70	PI 28.30	GS 2.29	TYPE OF SPECIMEN Tube	TYPE OF TEST UU (Q)

REMARKS:

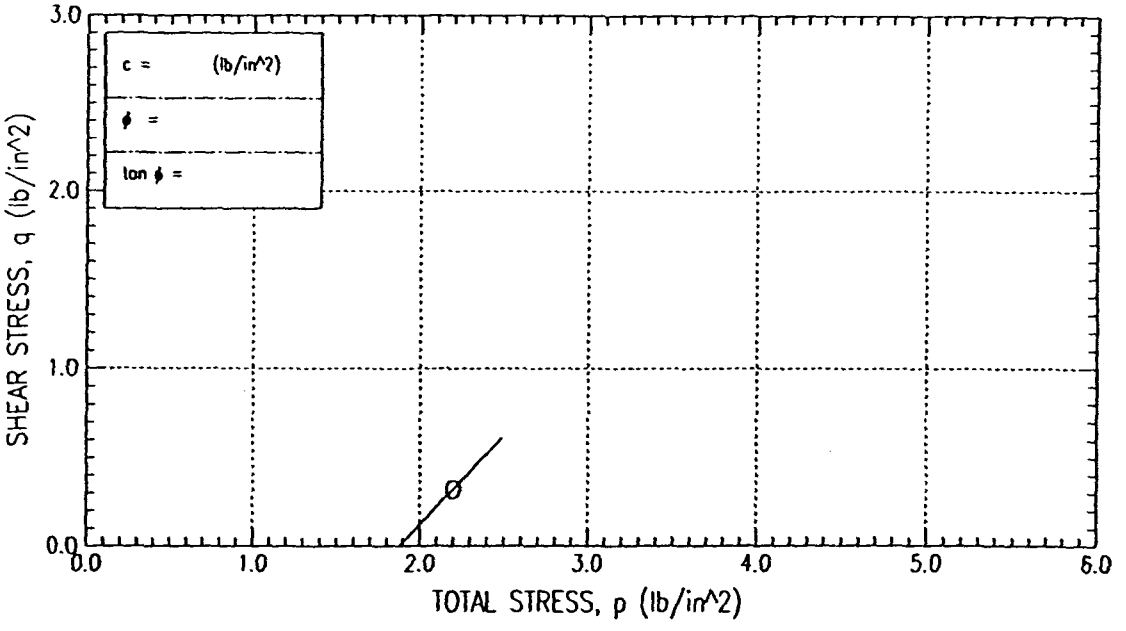
1) Sample Condition=Fair

PROJECT	New Bedford Harbor Superfund Site				
PROJECT NO.	GTX-2409				
BORING NO.	FB-13	SAMPLE NO.	UO-1		
TECH.	fy	DEPTH/ELEV	0-2 feet		
LABORATORY		DATE	11/05/99		

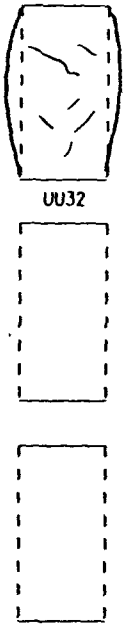
TRIAXIAL COMPRESSION TEST REPORT

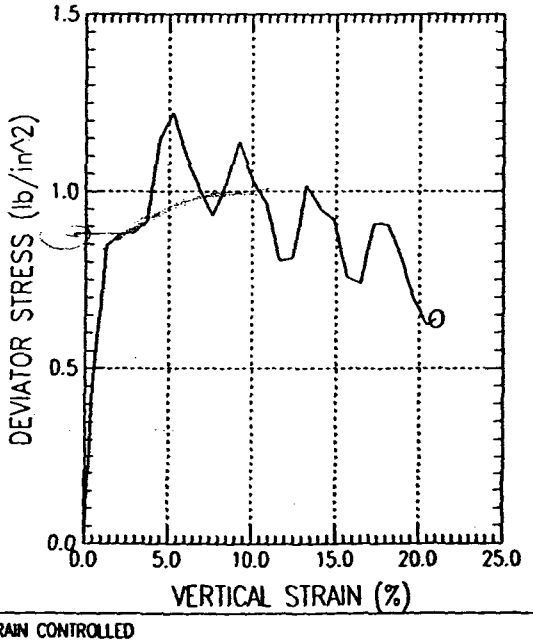
Wed 11-24-99, 16:33:57

UU Triaxial Test by ASTM D2850/T297



FAILURE SKETCHES





SYMBOL		O			
TEST NO.		UU32			
INITIAL	WATER CONTENT (%)	110.07			
	DRY DENSITY (lb/ft^3)	41.82			
	SATURATION (%)	99.38			
	VOID RATIO	2.880			
BEFORE SHEAR	WATER CONTENT (%)	110.07			
	DRY DENSITY (lb/ft^3)	41.82			
	SATURATION (%)	99.38			
	VOID RATIO	2.880			
	BACK PRESS. (lb/in^2)	0.00			
MINOR PRIN. STRESS (lb/in^2)		1.88			
MAX. DEV. STRESS (lb/in^2)		1.22			
TIME TO FAILURE (min)		6.22			
RATE OF STRAIN INCR (%/min)		1.00			
INITIAL DIAMETER (in)		2.86			
INITIAL HEIGHT (in)		5.90			
B-VALUE		0.00			

STRAIN CONTROLLED

DESCRIPTION OF SPECIMENS:

1) Moist dark clay with trace shells

LL	PL	PI	GS 2.60	TYPE OF SPECIMEN Tube	TYPE OF TEST UU (Q)

REMARKS:

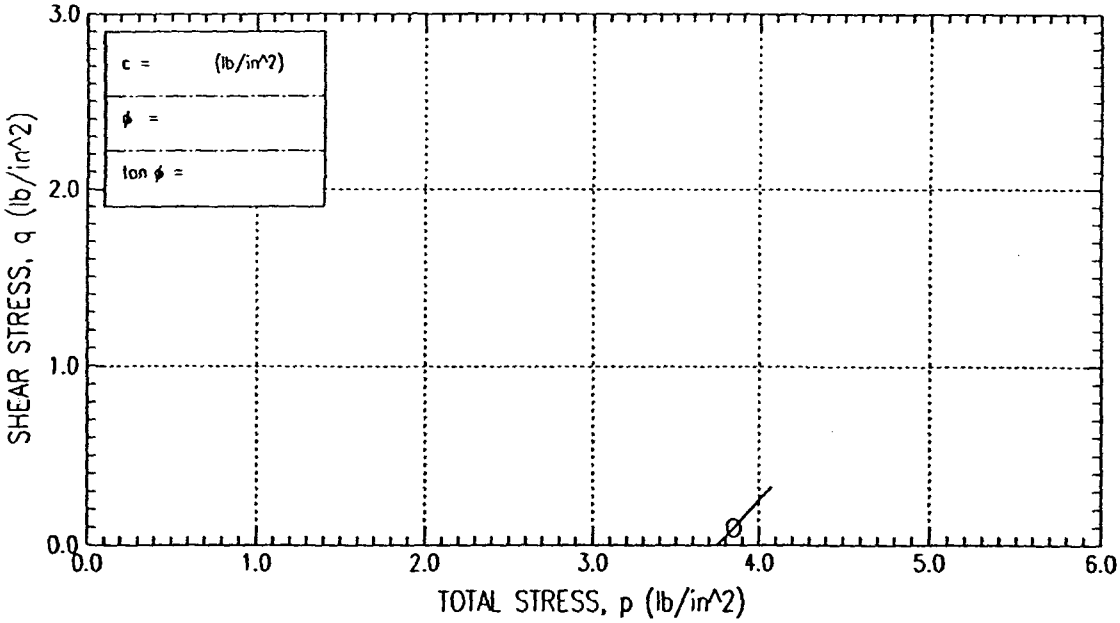
1) Sample Condition=Good

PROJECT New Bedford Harbor Superfund Site					
PROJECT NO.GTX-2409					
BORING NO. FB-23	SAMPLE NO.	UO-1			
TECH. FY	DEPTH/ELEV	3-5 feet			
LABORATORY	DATE	11/23/99			

TRIAXIAL COMPRESSION TEST REPORT

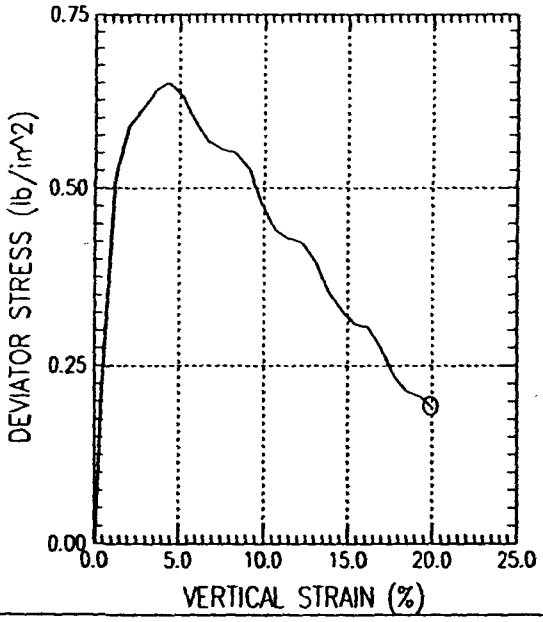
Mon 11-29-99, 11:09:46

UU Triaxial Test by ASTM D2850/T297



FAILURE SKETCHES

UU33



SYMBOL		O				
TEST NO.		UU33				
INITIAL	WATER CONTENT (%)	63.90				
	DRY DENSITY (lb/ft^3)	61.20				
	SATURATION (%)	100.64				
	VOID RATIO	1.651				
BEFORE SHEAR	WATER CONTENT (%)	63.90				
	DRY DENSITY (lb/ft^3)	61.20				
	SATURATION (%)	100.64				
	VOID RATIO	1.651				
	BACK PRESS. (lb/in^2)	0.00				
MINOR PRIN. STRESS (lb/in^2)		3.75				
MAX. DEV. STRESS (lb/in^2)		0.65				
TIME TO FAILURE (min)		5.13				
RATE OF STRAIN INCR (%/min)		1.00				
INITIAL DIAMETER (in)		2.90				
INITIAL HEIGHT (in)		6.25				
B-VALUE		0.00				

STRAIN CONTROLLED

DESCRIPTION OF SPECIMENS:

1) Moist dark gray silty clay with trace shells

LL	PL	PI	GS 2.60	TYPE OF SPECIMEN Tube	TYPE OF TEST UU (Q)

REMARKS:

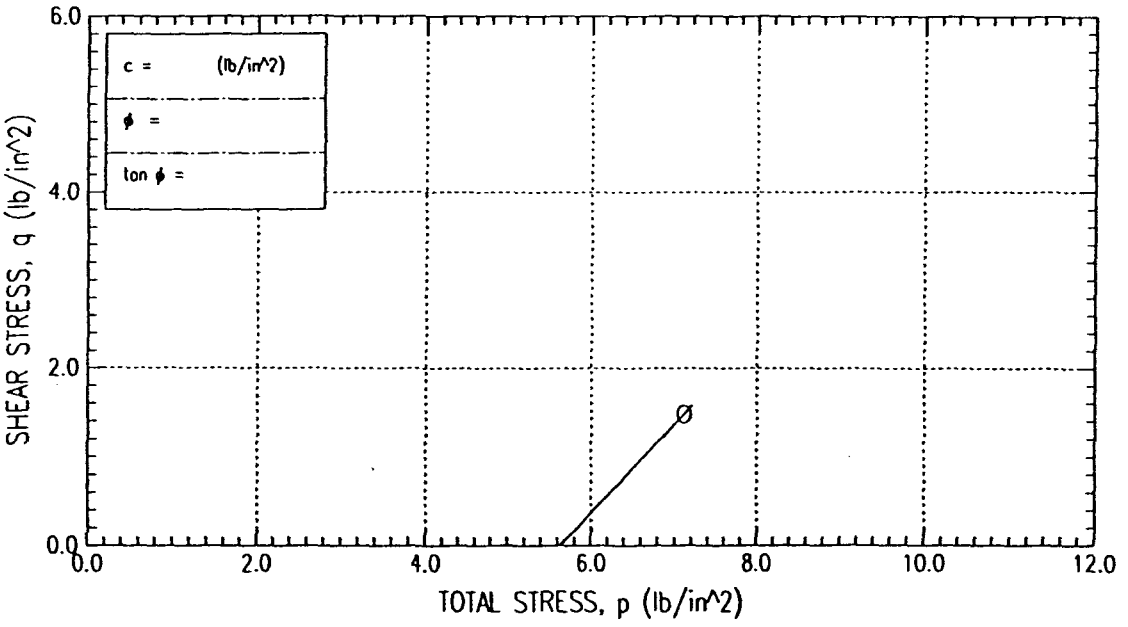
1) Sample Condition=Good

PROJECT New Bedford Harbor Superfund Site					
PROJECT NO.GTX-2409					
BORING NO. FB-23	SAMPLE NO.	UO-2			
TECH. FY	DEPTH/ELEV	6-8 feet			
LABORATORY	DATE	11/23/99			

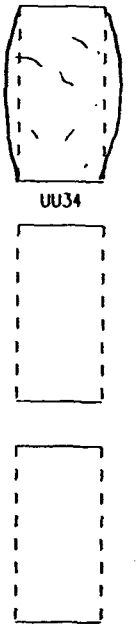
TRIAXIAL COMPRESSION TEST REPORT

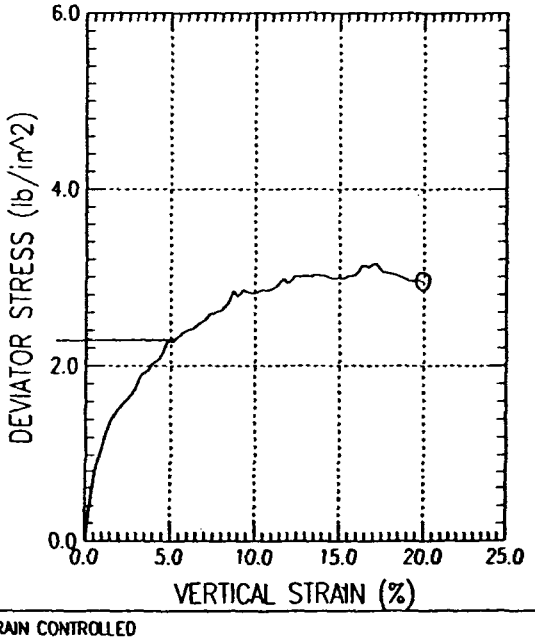
Mon 11-29-99, 11:10:49

UU Triaxial Test by ASTM D2850/T297



FAILURE SKETCHES





SYMBOL		O				
TEST NO.		UU34				
INITIAL	WATER CONTENT (%)	34.04				
	DRY DENSITY (lb/ft^3)	78.12				
	SATURATION (%)	82.21				
	VOID RATIO	1.077				
BEFORE SHEAR	WATER CONTENT (%)	34.04				
	DRY DENSITY (lb/ft^3)	78.12				
	SATURATION (%)	82.21				
	VOID RATIO	1.077				
	BACK PRESS. (lb/in^2)	0.00				
MINOR PRIN. STRESS (lb/in^2)		5.63				
MAX. DEV. STRESS (lb/in^2)		3.15				
TIME TO FAILURE (min)		17.75				
RATE OF STRAIN INCR (%/min)		1.00				
INITIAL DIAMETER (in)		2.89				
INITIAL HEIGHT (in)		6.25				
B-VALUE		0.00				

STRAIN CONTROLLED

DESCRIPTION OF SPECIMENS:

1) Moist dark grey silty clay

LL	PL	PI	GS 2.60	TYPE OF SPECIMEN Tube	TYPE OF TEST UU (Q)

REMARKS:

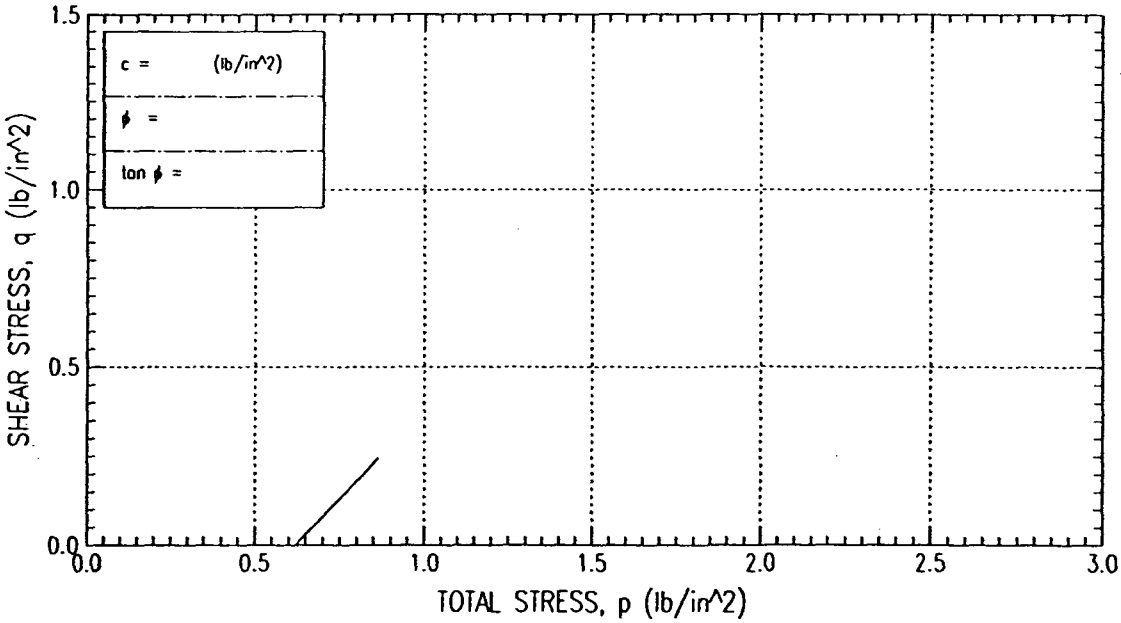
1) Sample Condition=Good

PROJECT New Bedford Harbor Superfund Site					
PROJECT NO.GTX-2403					
BORING NO. FB-23	SAMPLE NO.	UO-3			
TECH. FY	DEPTH/ELEV	9-11 feet			
LABORATORY	DATE	11/23/99			

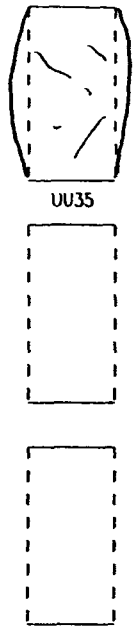
TRIAXIAL COMPRESSION TEST REPORT

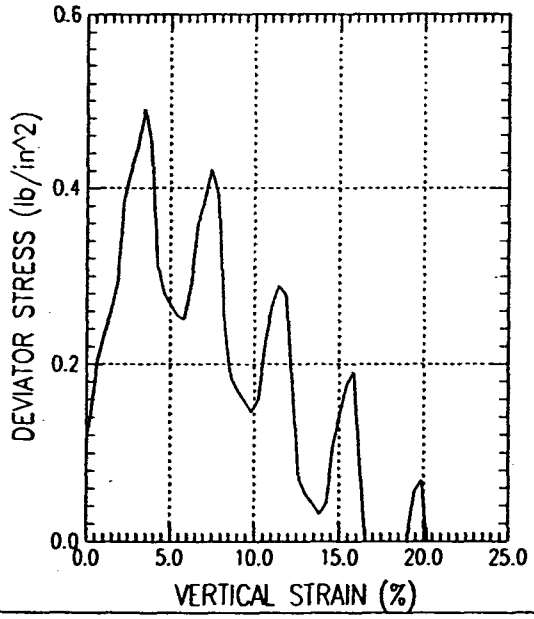
Mon 11-29-99, 11:13:05

UU Triaxial Test by ASTM D2850/T297



FAILURE SKETCHES





SYMBOL		O			
TEST NO.		UU35			
INITIAL	WATER CONTENT (%)	193.40			
	DRY DENSITY (lb/ft^3)	25.95			
	SATURATION (%)	95.76			
	VOID RATIO	5.251			
BEFORE SHEAR	WATER CONTENT (%)	193.40			
	DRY DENSITY (lb/ft^3)	25.95			
	SATURATION (%)	95.76			
	VOID RATIO	5.251			
	BACK PRESS. (lb/in^2)	0.00			
MINOR PRIN. STRESS (lb/in^2)		0.62			
MAX. DEV. STRESS (lb/in^2)		0.49			
TIME TO FAILURE (min)		3.76			
RATE OF STRAIN INCR (%/min)		1.00			
INITIAL DIAMETER (in)		2.90			
INITIAL HEIGHT (in)		6.12			
B-VALUE		0.00			

STRAIN CONTROLLED

DESCRIPTION OF SPECIMENS:

1) Moist black oily organic silty clay

LL	PL	PI	GS 2.60	TYPE OF SPECIMEN Tube	TYPE OF TEST UU (Q)

REMARKS:

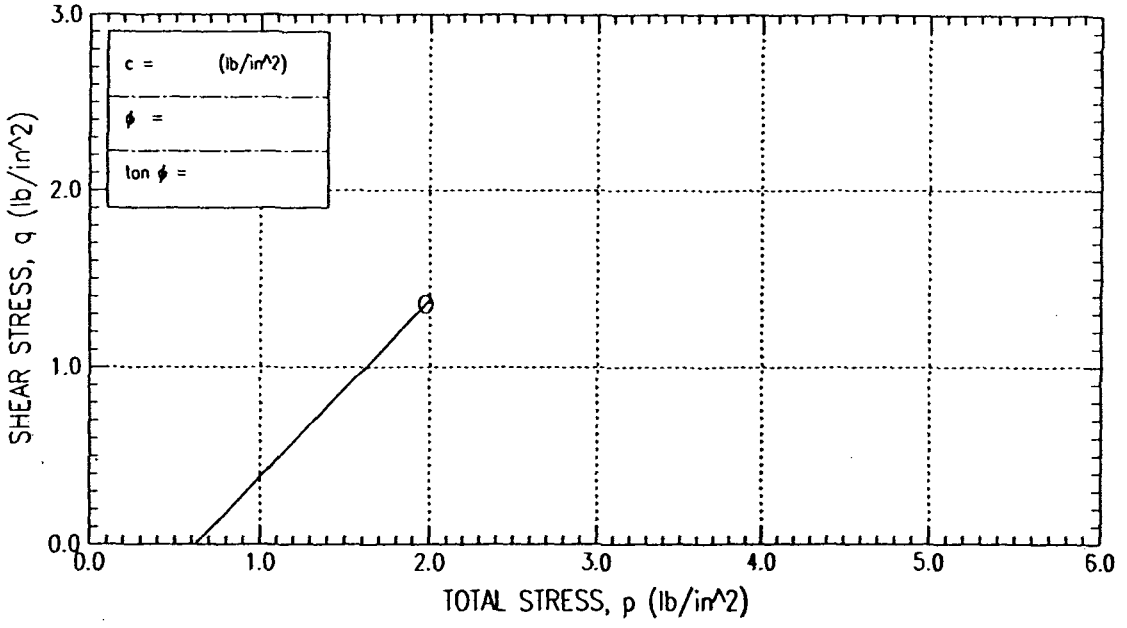
1) Sample Condition=Fair

PROJECT	New Bedford Harbor Superfund Site				
PROJECT NO.	GTX-2409				
BORING NO.	FB-25	SAMPLE NO.	U0-1		
TECH.	FY	DEPTH/ELEV	0-2 feet		
LABORATORY		DATE	11/24/99		

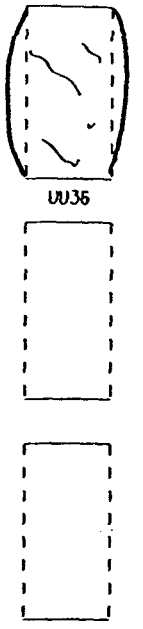
TRIAXIAL COMPRESSION TEST REPORT

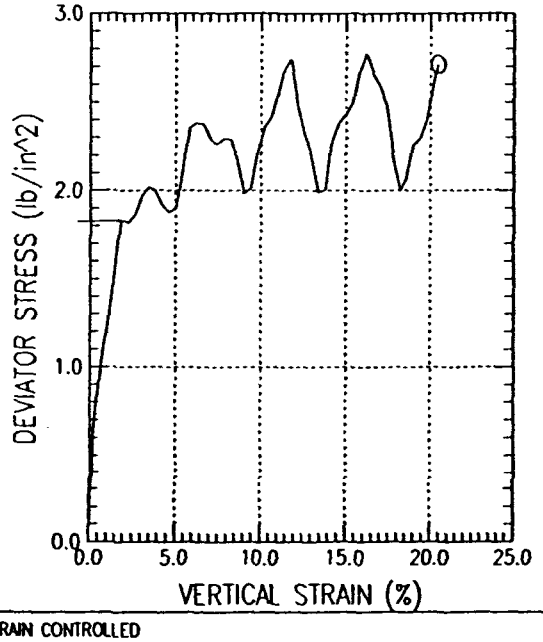
Mon 11-29-99, 11:19:29

UU Triaxial Test by ASTM D2850/T297



FAILURE SKETCHES





SYMBOL		O				
TEST NO.		UU36				
INITIAL	WATER CONTENT (%)	180.20				
	DRY DENSITY (lb/ft^3)	27.27				
	SATURATION (%)	97.41				
	VOID RATIO	4.218				
BEFORE SHEAR	WATER CONTENT (%)	180.20				
	DRY DENSITY (lb/ft^3)	27.27				
	SATURATION (%)	97.41				
	VOID RATIO	4.218				
	BACK PRESS. (lb/in^2)	0.00				
MINOR PRIN. STRESS (lb/in^2)		0.62				
MAX. DEV. STRESS (lb/in^2)		2.78				
TIME TO FAILURE (min)		17.14				
RATE OF STRAIN INCR (%/min)		1.00				
INITIAL DIAMETER (in)		2.95				
INITIAL HEIGHT (in)		5.80				
B-VALUE		0.00				

STRAIN CONTROLLED

DESCRIPTION OF SPECIMENS:

1) Moist, black organic silt with sand

LL 98.20	PL 62.10	PI 36.10	GS 2.28	TYPE OF SPECIMEN Tube	TYPE OF TEST UU (Q)

REMARKS:

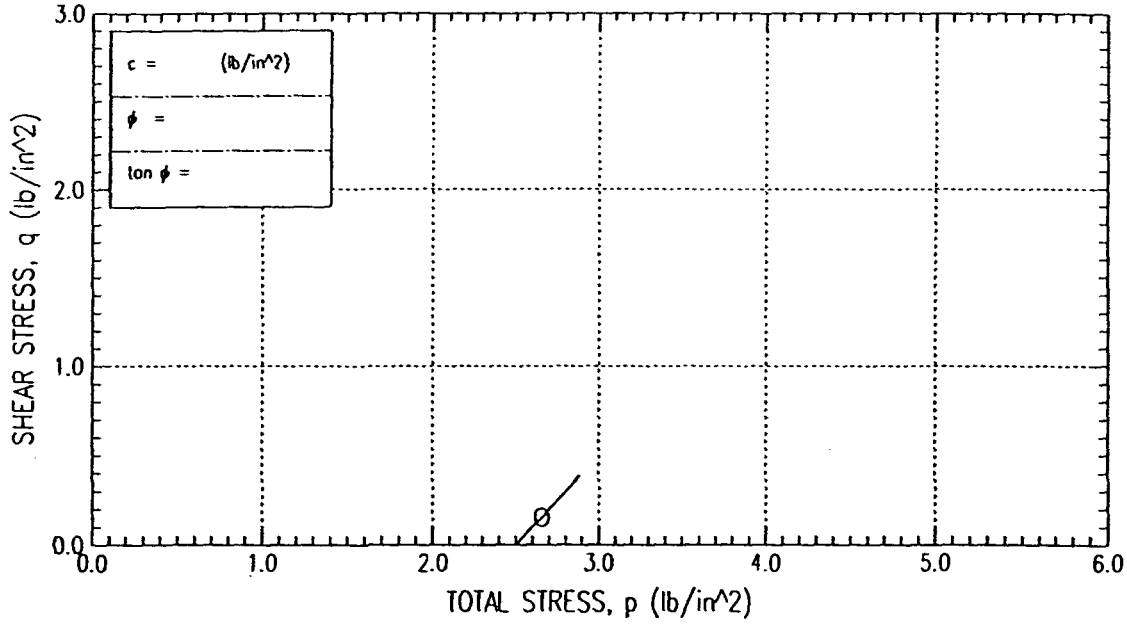
1) Sample Condition=Good

PROJECT	New Bedford Harbor Superfund Site		
PROJECT NO.	GTX-2409		
BORING NO.	FB-27	SAMPLE NO.	UO-1
TECH.	FY	DEPTH/ELEV	0-2 feet
LABORATORY		DATE	11/18/99

TRIAXIAL COMPRESSION TEST REPORT

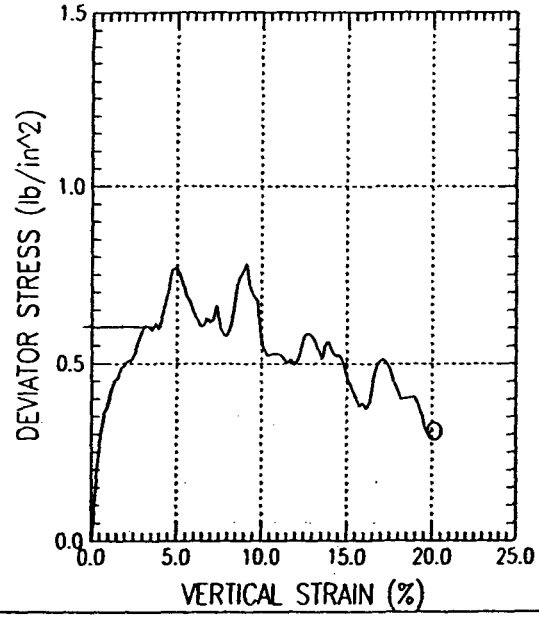
Wed 11-24-99, 16:39:08

UU Triaxial Test by ASTM D2850/T297



FAILURE SKETCHES

UU37



SYMBOL		O			
TEST NO.		UU37			
INITIAL	WATER CONTENT (%)	82.78			
	DRY DENSITY (lb/ft^3)	48.67			
	SATURATION (%)	92.22			
	VOID RATIO	2.334			
BEFORE SHEAR	WATER CONTENT (%)	82.78			
	DRY DENSITY (lb/ft^3)	48.67			
	SATURATION (%)	92.22			
	VOID RATIO	2.334			
	BACK PRESS. (lb/in^2)	0.00			
MINOR PRIN. STRESS (lb/in^2)		2.50			
MAX. DEV. STRESS (lb/in^2)		0.78			
TIME TO FAILURE (min)		9.73			
RATE OF STRAIN INCR (%/min)		1.00			
INITIAL DIAMETER (in)		2.85			
INITIAL HEIGHT (in)		6.21			
B-VALUE		0.00			

STRAIN CONTROLLED

DESCRIPTION OF SPECIMENS:

1) Moist dark grey silty clay with shells

LL	PL	PI	GS 2.60	TYPE OF SPECIMEN Tube	TYPE OF TEST UU (Q)

REMARKS:

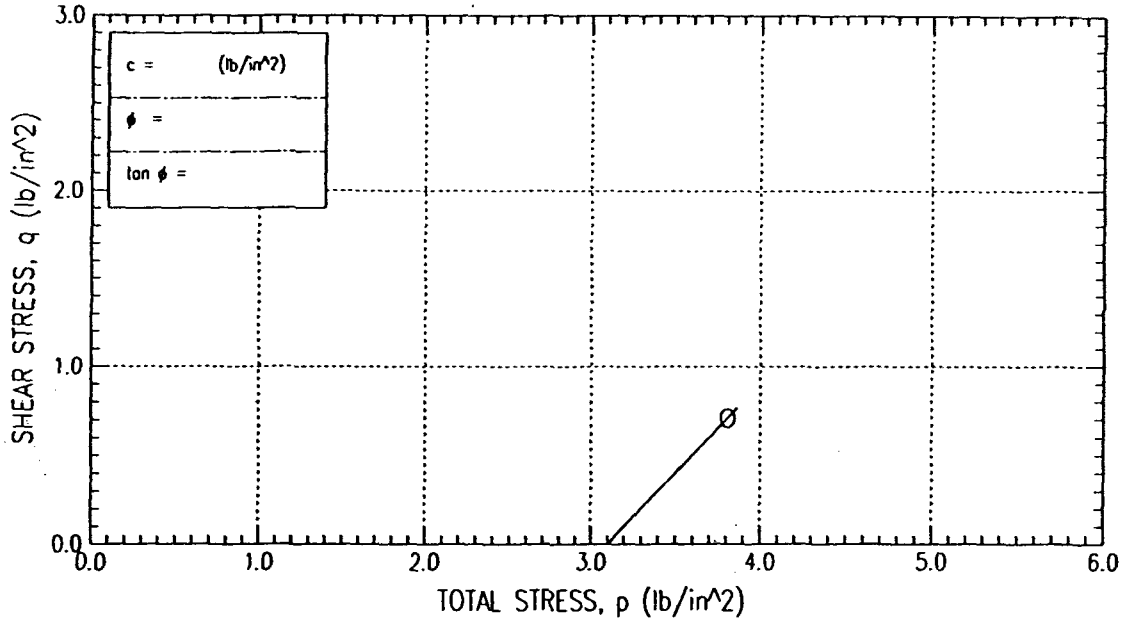
1) Sample Condition=Good

PROJECT	New Bedford Harbor Superfund Site				
PROJECT NO.	GTX-2409				
BORING NO.	FB-27	SAMPLE NO.	UO-3		
TECH.	FY	DEPTH/ELEV	4-6 feet		
LABORATORY		DATE	11/24/99		

TRIAXIAL COMPRESSION TEST REPORT

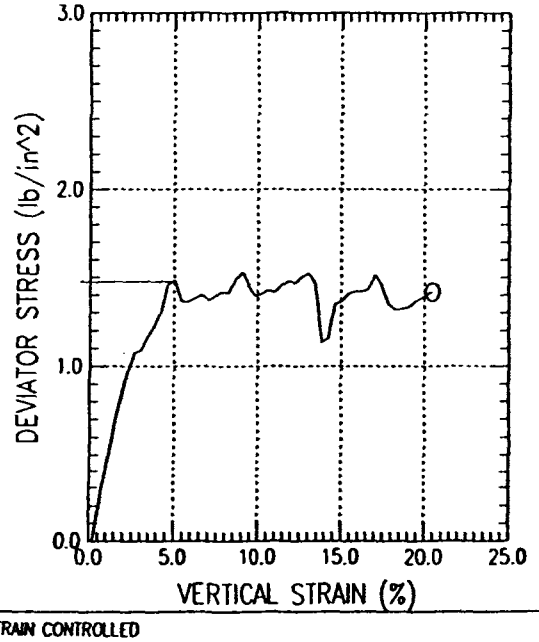
Mon 11-29-99, 11:23:05

UU Triaxial Test by ASTM D2850/T297



FAILURE SKETCHES

UU38



SYMBOL		O			
TEST NO.		UU38			
INITIAL	WATER CONTENT (%)	28.73			
	DRY DENSITY (lb/ft^3)	89.99			
	SATURATION (%)	91.32			
	VOID RATIO	0.831			
BEFORE SHEAR	WATER CONTENT (%)	28.73			
	DRY DENSITY (lb/ft^3)	89.99			
	SATURATION (%)	91.32			
	VOID RATIO	0.831			
	BACK PRESS. (lb/in^2)	0.00			
MINOR PRIN. STRESS (lb/in^2)		3.10			
MAX. DEV. STRESS (lb/in^2)		1.53			
TIME TO FAILURE (min)		9.54			
RATE OF STRAIN INCR (%/min)		1.00			
INITIAL DIAMETER (in)		2.87			
INITIAL HEIGHT (in)		6.10			
B-VALUE		0.00			

STRAIN CONTROLLED

DESCRIPTION OF SPECIMENS:

1) Moist dark gray organic silt with gravel

LL 38.80	PL 20.40	PI 18.40	GS 2.64	TYPE OF SPECIMEN Tube	TYPE OF TEST UU (Q)

REMARKS:

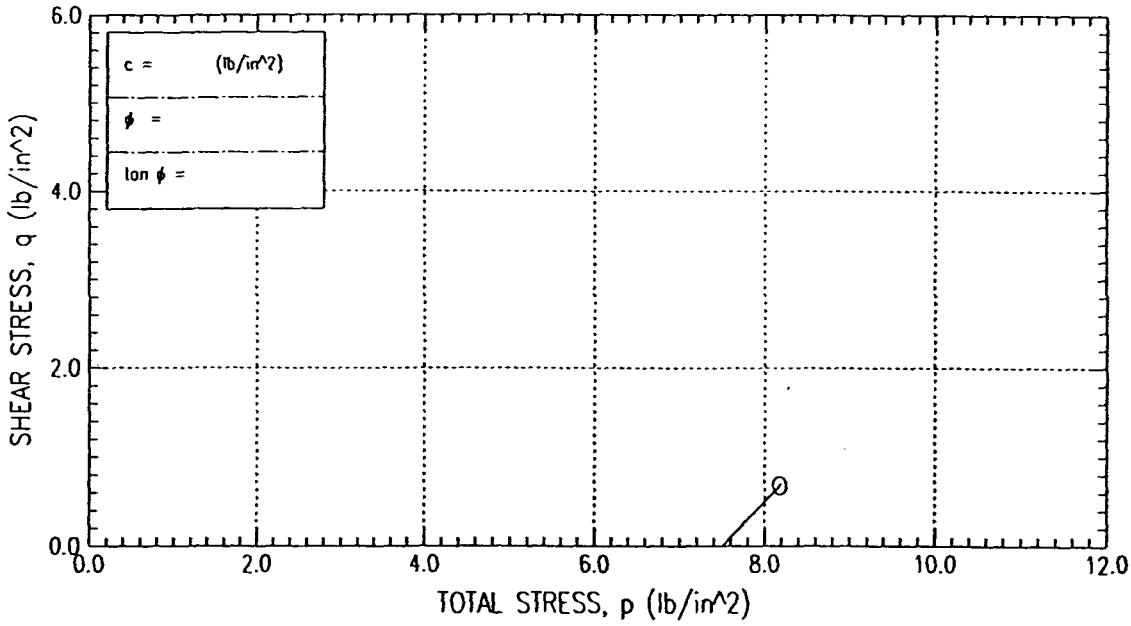
1) Sample Condition=Good

PROJECT New Bedford Harbor Superfund Site					
PROJECT NO.GTX-2409					
BORING NO. FB-27	SAMPLE NO.	UO-5			
TECH. FY	DEPTH/ELEV	8-10 feet			
LABORATORY	DATE	11/22/99			

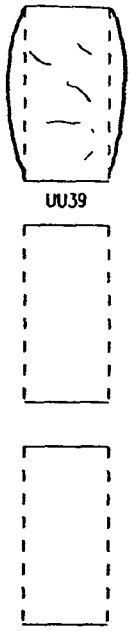
TRIAXIAL COMPRESSION TEST REPORT

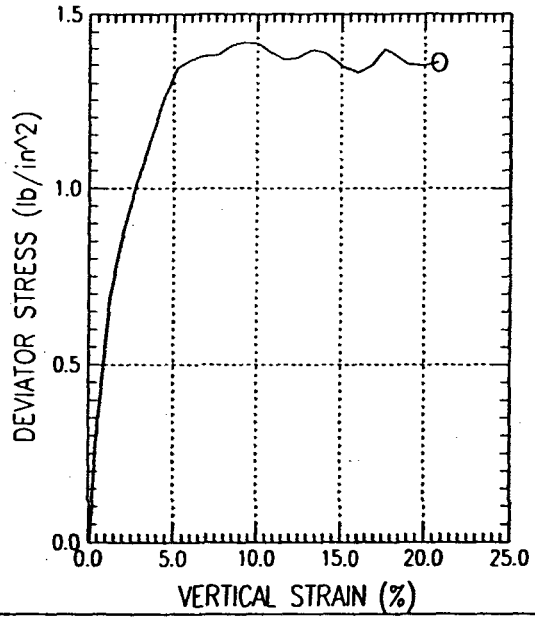
Wed 11-24-99, 15:40:46

UU Triaxial Test by ASTM D2850/T297



FAILURE SKETCHES





SYMBOL		O			
TEST NO.		UU39			
INITIAL	WATER CONTENT (%)	39.81			
	DRY DENSITY (lb/ft^3)	72.84			
	SATURATION (%)	84.34			
	VOID RATIO	1.227			
BEFORE SHEAR	WATER CONTENT (%)	39.81			
	DRY DENSITY (lb/ft^3)	72.84			
	SATURATION (%)	84.34			
	VOID RATIO	1.227			
	BACK PRESS. (lb/in^2)	0.00			
MINOR PRIN. STRESS (lb/in^2)		7.50			
MAX. DEV. STRESS (lb/in^2)		1.42			
TIME TO FAILURE (min)		10.50			
RATE OF STRAIN INCR (%/min)		1.00			
INITIAL DIAMETER (in)		2.92			
INITIAL HEIGHT (in)		5.91			
B-VALUE		0.00			

STRAIN CONTROLLED

DESCRIPTION OF SPECIMENS:

1) Moist dark grey silty organic

LL	PL	PI	GS 2.60	TYPE OF SPECIMEN Tube	TYPE OF TEST UU (0)

REMARKS:

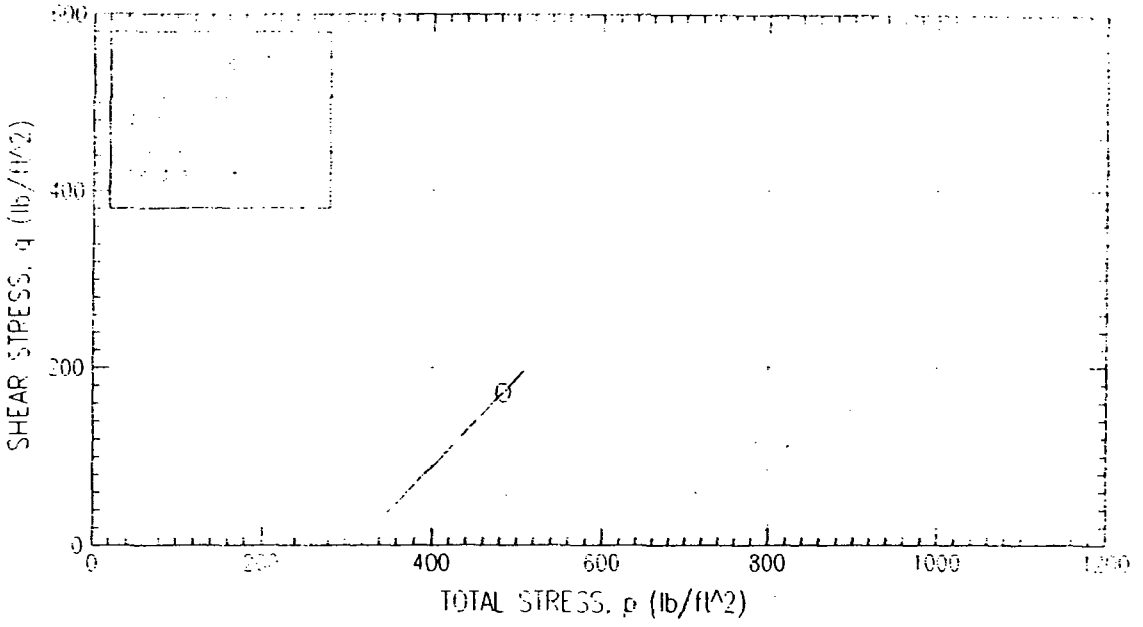
1) Sample Condition=Good

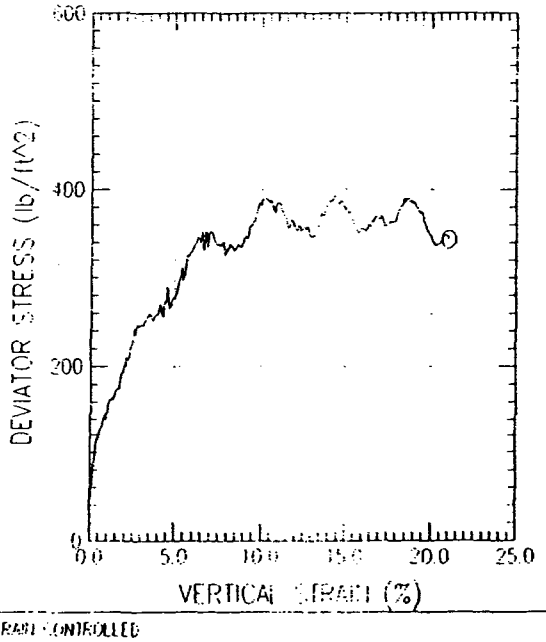
PROJECT	New Bedford Harbor Superfund Site		
PROJECT NO.	GTX-2409		
BORING NO.	FB-27	SAMPLE NO.	U0-7
TECH.	FY	DEPTH/ELEV	12-14 feet
LABORATORY		DATE	11/24/99

TRIAXIAL COMPRESSION TEST REPORT

Mon 11-29-99, 11:22:33

UU Triaxial Test by ASTM D2850/T297





SYMBOL		O
TEST NO.		UU39A
INITIAL	WATER CONTENT (%)	39.48
	DRY DENSITY (lb/ft^3)	76.56
	SATURATION (%)	88.79
	VOID RATIO	1.201
BEFORE SHEAR	WATER CONTENT (%)	39.48
	DRY DENSITY (lb/ft^3)	76.56
	SATURATION (%)	88.79
	VOID RATIO	1.201
	BACK PRESS. (lb/ft^2)	0.00
MINOR PRIN. STRESS (lb/ft^2)		312.00
MAX. DEV. STRESS (lb/ft^2)		393.07
TIME TO FAILURE (min)		14.86
RATE OF STRAIN INCR (%/min)		1.00
INITIAL DIAMETER (in)		2.87
INITIAL HEIGHT (in)		5.95
B-VALUE		0.00

STRAIN CONTROLLED

DESCRIPTION OF SPECIMENS:

1) Med. dark brown peat with grass

U	PI	PI	270

REMARKS:

1) Sample Condition: Good

TYPE OF SPECIMEN: Tube

TYPE OF TEST: UU (G)

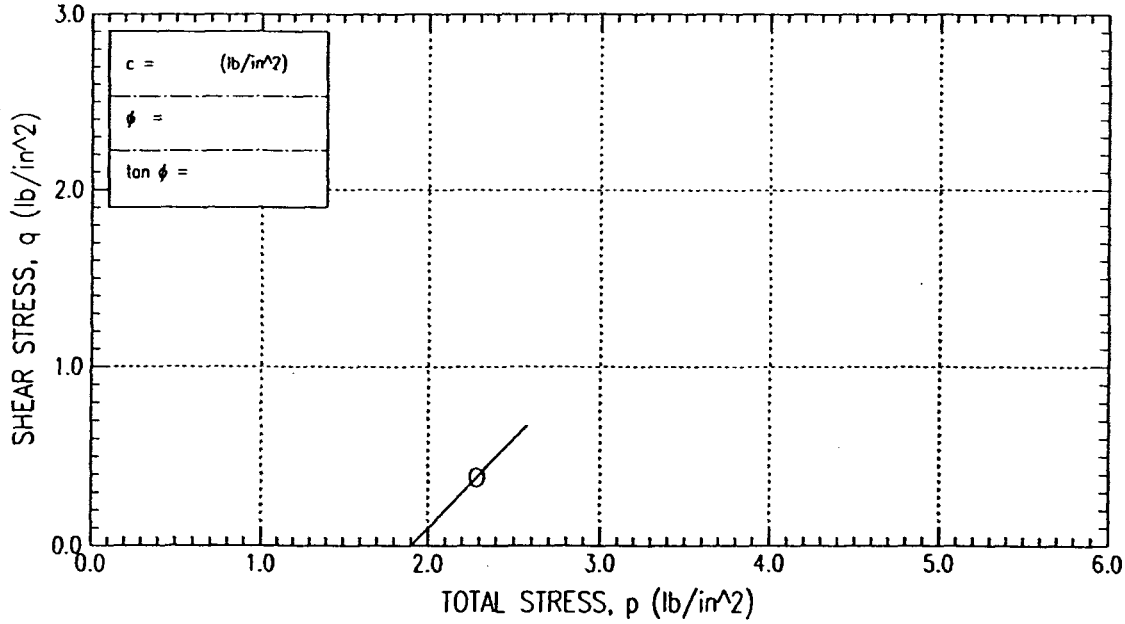
PROJECT: New Bedford Harbor Superfund Site

PROJECT NO: CLX 2409

BORING NO.	27	SAMPLE NO.	UU-7
HOLE	17	DEPTH/ELEV	12-14 feet
LABORATORY		DATE	05/11/00

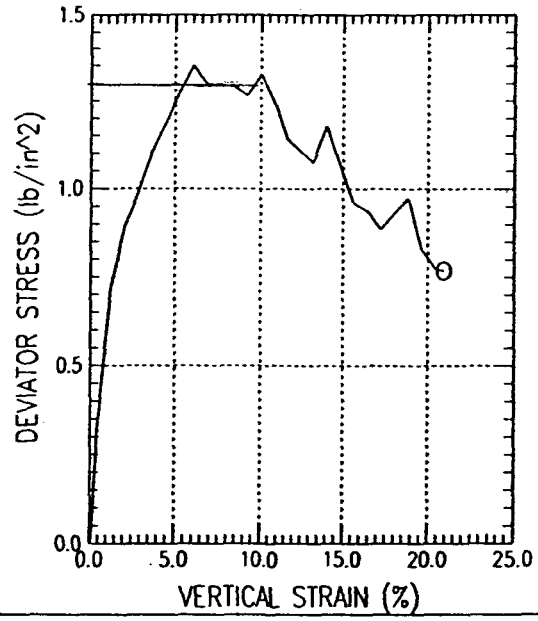
TRIAXIAL COMPRESSION TEST REPORT

UU Triaxial Test by ASTM D2850/T297



FAILURE SKETCHES

UU40



SYMBOL		O			
TEST NO.		UU40			
INITIAL	WATER CONTENT (%)	109.55			
	DRY DENSITY (lb/ft^3)	42.20			
	SATURATION (%)	100.13			
	VOID RATIO	2.845			
BEFORE SHEAR	WATER CONTENT (%)	109.55			
	DRY DENSITY (lb/ft^3)	42.20			
	SATURATION (%)	100.13			
	VOID RATIO	2.845			
	BACK PRESS. (lb/in^2)	0.00			
MINOR PRIN. STRESS (lb/in^2)		1.90			
MAX. DEV. STRESS (lb/in^2)		1.35			
TIME TO FAILURE (min)		6.75			
RATE OF STRAIN INCR (%/min)		1.00			
INITIAL DIAMETER (in)		2.89			
INITIAL HEIGHT (in)		5.97			
B-VALUE		0.00			

STRAIN CONTROLLED

DESCRIPTION OF SPECIMENS:

1) Moist grey organic silty clay

LL	PL	PI	GS 2.60	TYPE OF SPECIMEN Tube	TYPE OF TEST UU (Q)

REMARKS:

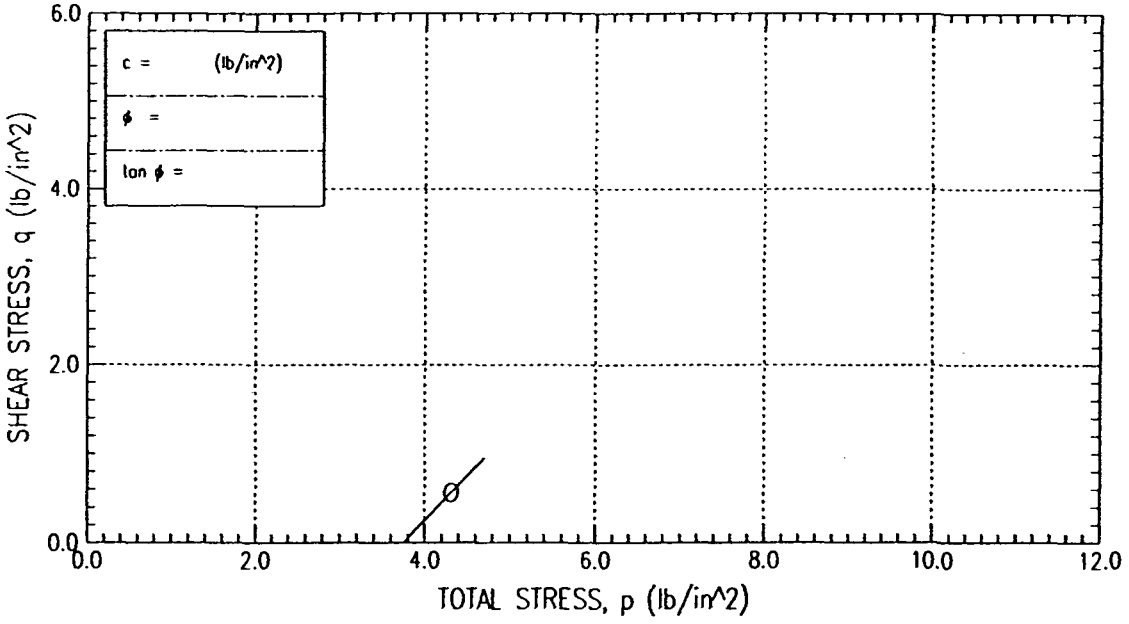
1) Sample Condition=Good

PROJECT	New Bedford Harbor Superfund Site				
PROJECT NO.	GTX-2409				
BORING NO.	FB-29	SAMPLE NO.	UO-1		
TECH.	FY	DEPTH/ELEV	3-5 feet		
LABORATORY		DATE	11/24/99		

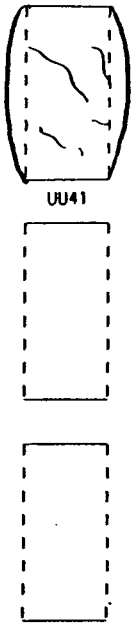
TRIAXIAL COMPRESSION TEST REPORT

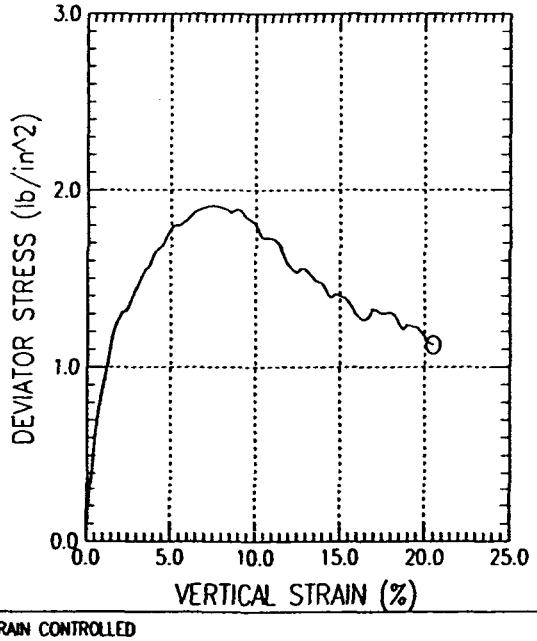
Mon 11-29-99, 11:21:53

UU Triaxial Test by ASTM D2850/T297



FAILURE SKETCHES





SYMBOL		O				
TEST NO.		UU41				
INITIAL	WATER CONTENT (%)	83.74				
	DRY DENSITY (lb/ft^3)	50.61				
	SATURATION (%)	98.37				
	VOID RATIO	2.230				
BEFORE SHEAR	WATER CONTENT (%)	83.74				
	DRY DENSITY (lb/ft^3)	50.61				
	SATURATION (%)	98.37				
	VOID RATIO	2.230				
	BACK PRESS. (lb/in^2)	0.00				
MINOR PRIN. STRESS (lb/in^2)		3.75				
MAX. DEV. STRESS (lb/in^2)		1.91				
TIME TO FAILURE (min)		8.19				
RATE OF STRAIN INCR (%/min)		1.00				
INITIAL DIAMETER (in)		2.82				
INITIAL HEIGHT (in)		6.10				
B-VALUE		0.00				

STRAIN CONTROLLED

DESCRIPTION OF SPECIMENS:

1) Moist dark gray organic silt

LL 89.80	PL 35.30	PI 54.50	GS 2.62

REMARKS:

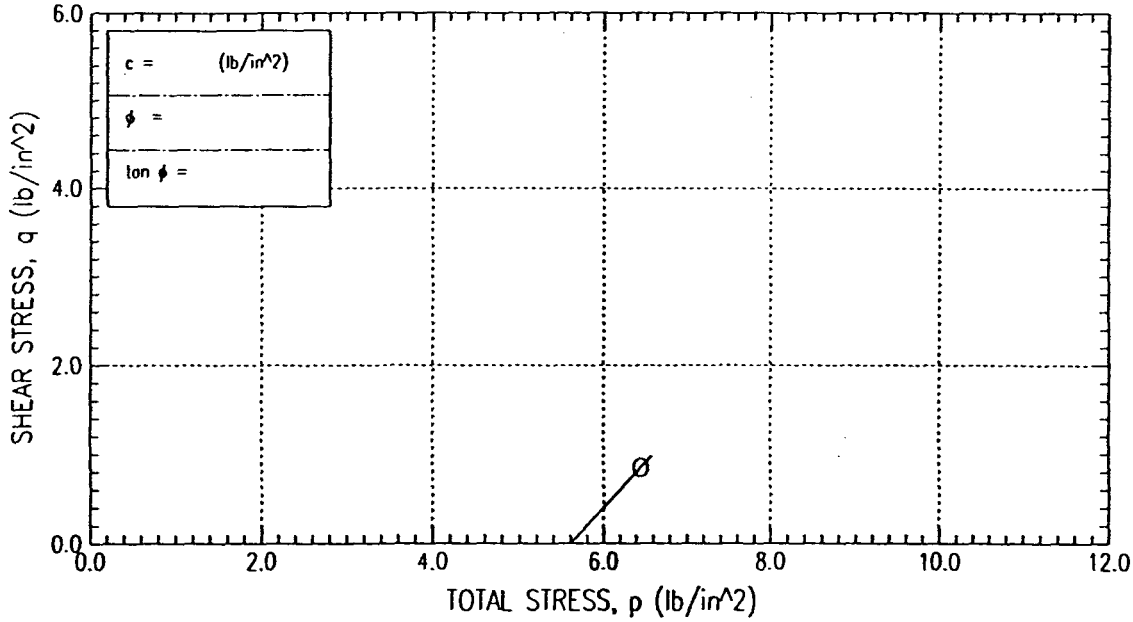
1) Sample Condition=Good

TYPE OF SPECIMEN Tube		TYPE OF TEST UU (Q)			
PROJECT New Bedford Harbor Superfund Site					
PROJECT NO.GTX-2409					
BORING NO. FB-29	SAMPLE NO.	UO-2			
TECH. FY	DEPTH/ELEV	6-8 feet			
LABORATORY	DATE	11/22/99			

TRIAXIAL COMPRESSION TEST REPORT

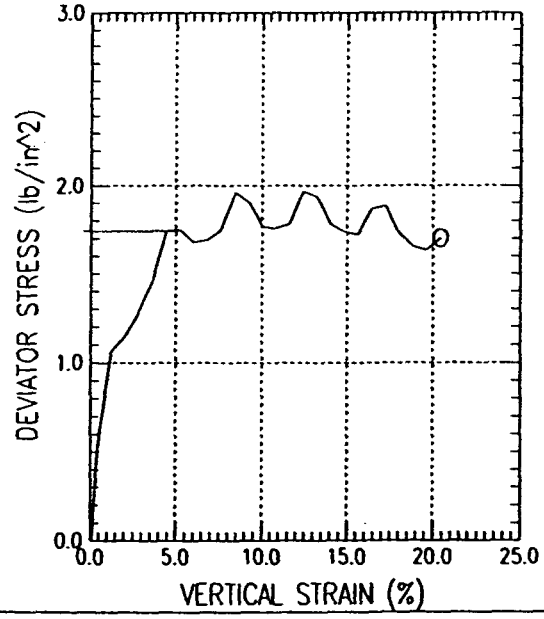
Wed 11-24-99, 15:32:31

UU Triaxial Test by ASTM D2850/T297



FAILURE SKETCHES

UU42



SYMBOL		O			
TEST NO.		UU42			
INITIAL	WATER CONTENT (%)	85.57			
	DRY DENSITY (lb/ft^3)	50.23			
	SATURATION (%)	99.77			
	VOID RATIO	2.230			
BEFORE SHEAR	WATER CONTENT (%)	85.57			
	DRY DENSITY (lb/ft^3)	50.23			
	SATURATION (%)	99.77			
	VOID RATIO	2.230			
	BACK PRESS. (lb/in^2)	0.00			
MINOR PRIN. STRESS (lb/in^2)		5.60			
MAX. DEV. STRESS (lb/in^2)		1.97			
TIME TO FAILURE (min)		13.76			
RATE OF STRAIN INCR (%/min)		1.00			
INITIAL DIAMETER (in)		2.86			
INITIAL HEIGHT (in)		6.05			
B-VALUE		0.00			

STRAIN CONTROLLED

DESCRIPTION OF SPECIMENS:

1) Moist grey odorous clay

LL	PL	PI	GS 2.60	TYPE OF SPECIMEN Tube	TYPE OF TEST UU (Q)

REMARKS:

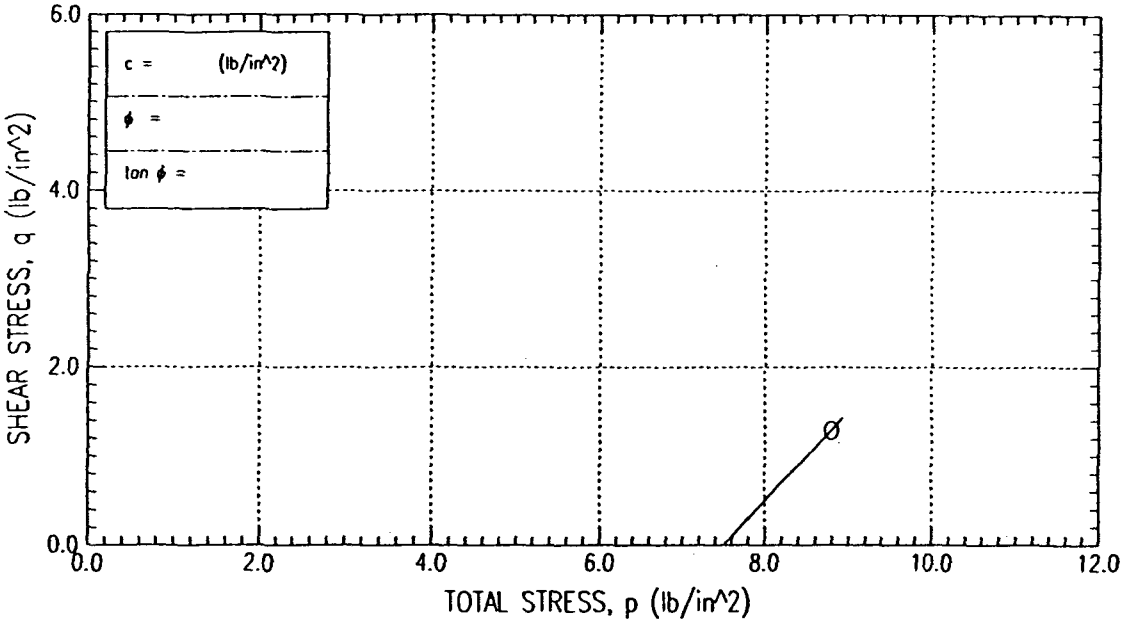
1) Sample Condition=Good

PROJECT	New Bedford Harbor Superfund Site				
PROJECT NO.	GTX-2409				
BORING NO.	FB-29	SAMPLE NO.	UO-3		
TECH.	FY	DEPTH/ELEV	9-11 feet		
LABORATORY		DATE	11/24/99		

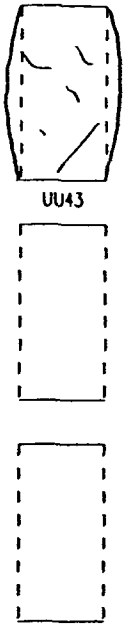
TRIAXIAL COMPRESSION TEST REPORT

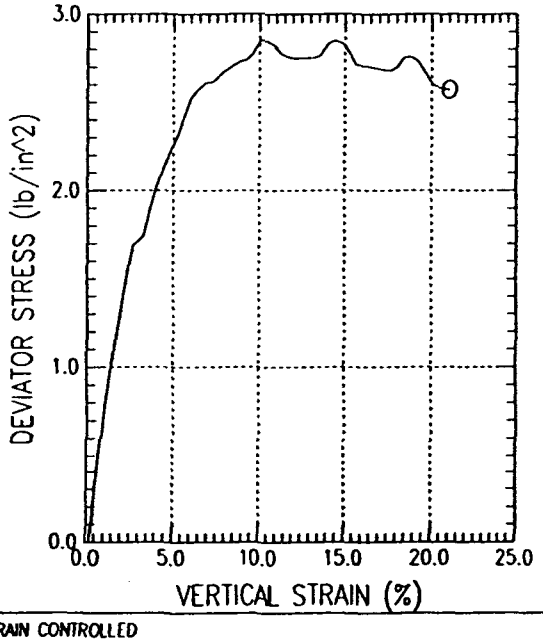
Mon 11-29-99, 11:21:20

UU Triaxial Test by ASTM D2850/T297



FAILURE SKETCHES





SYMBOL		O			
TEST NO.		UU43			
INITIAL	WATER CONTENT (%)	38.55			
	DRY DENSITY (lb/ft^3)	73.60			
	SATURATION (%)	83.22			
	VOID RATIO	1.204			
BEFORE SHEAR	WATER CONTENT (%)	38.55			
	DRY DENSITY (lb/ft^3)	73.60			
	SATURATION (%)	83.22			
	VOID RATIO	1.204			
	BACK PRESS. (lb/in^2)	0.00			
MINOR PRIN. STRESS (lb/in^2)		7.50			
MAX. DEV. STRESS (lb/in^2)		2.85			
TIME TO FAILURE (min)		15.56			
RATE OF STRAIN INCR (%/min)		1.00			
INITIAL DIAMETER (in)		2.85			
INITIAL HEIGHT (in)		5.95			
B-VALUE		0.00			

STRAIN CONTROLLED

DESCRIPTION OF SPECIMENS:

1) Moist dark grey silty sandy clay

LL	PL	PI	GS 2.60	TYPE OF SPECIMEN Tube	TYPE OF TEST UU (Q)

REMARKS:

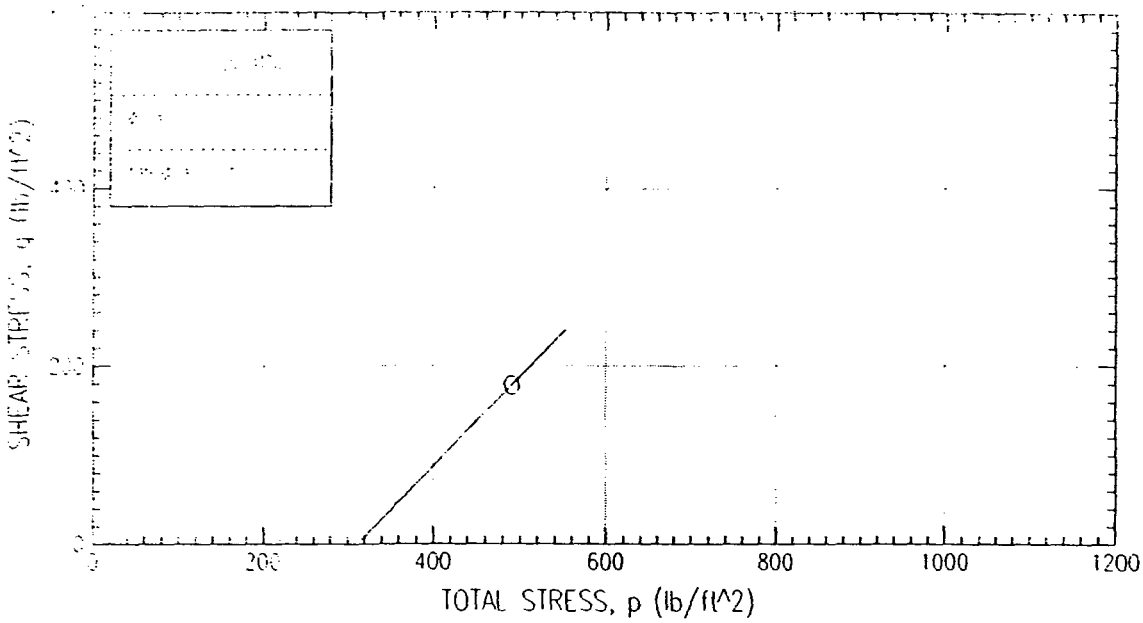
1) Sample Condition=Good

PROJECT	New Bedford Harbor Superfund Site		
PROJECT NO.	GTX-2409		
BORING NO.	FB-29	SAMPLE NO.	UO-4
TECH.	FY	DEPTH/ELEV	12-14 feet
LABORATORY		DATE	11/23/99

TRIAXIAL COMPRESSION TEST REPORT

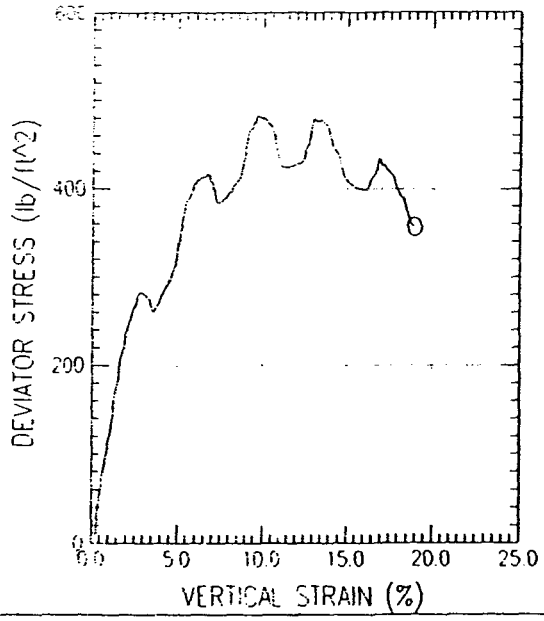
Mon 11-29-99, 11:20:43

UU Triaxial Test by ASTM D2850/T297



FAILURE SKETCHES

UU43A



SYMBOL		○			
TEST NO.		UU43A			
INITIAL	WATER CONTENT (%)	38.65			
	DRY DENSITY (lb/ft^3)	42.47			
	SATURATION (%)	35.18			
	VOID RATIO	2.967			
BEFORE SHEAR	WATER CONTENT (%)	38.65			
	DRY DENSITY (lb/ft^3)	42.47			
	SATURATION (%)	35.18			
	VOID RATIO	2.967			
	BACK PRESS. (lb/ft^2)	0.00			
MINOR PRIN. STRESS (lb/ft^2)		312.00			
MAX. DEV. STRESS (lb/ft^2)		482.70			
TIME TO FAILURE (min)		10.17			
RATE OF STRAIN INCR (%/min)		1.00			
INITIAL DIAMETER (in)		2.87			
INITIAL HEIGHT (in)		6.60			
B-VALUE		0.00			

STRAIN CONTROLLED

DESCRIPTION OF SPECIMEN:

1) Moist, dark brown sandy peat

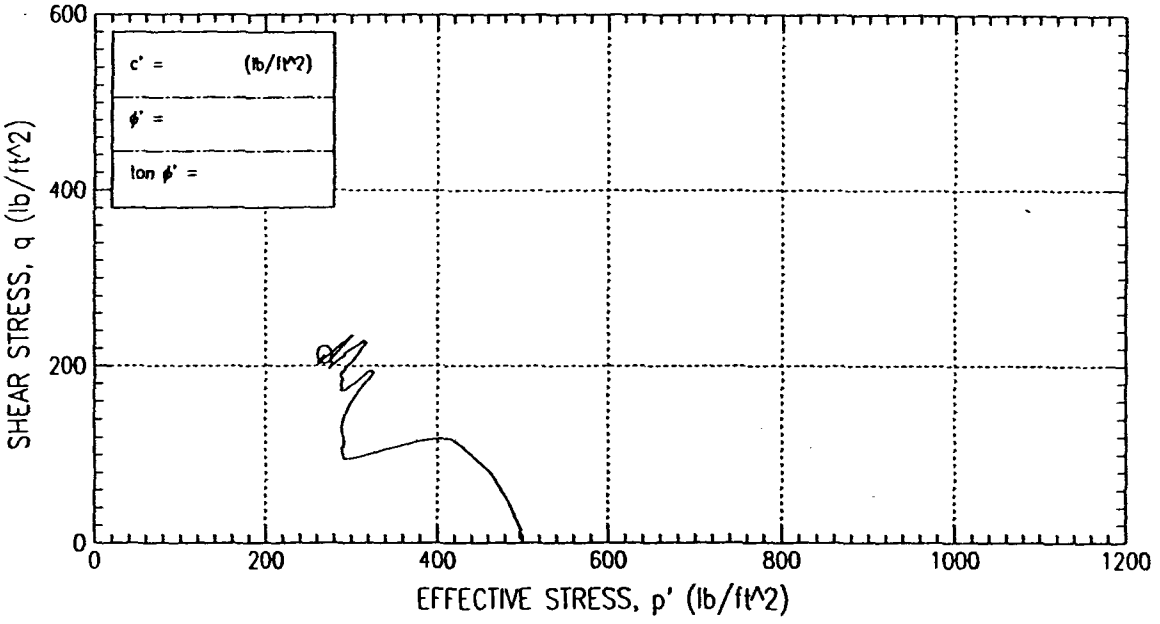
LL	PL	PI	GS 2.70	TYPE OF SPECIMEN Tube	TYPE OF TEST UU (0)	
REMARKS				PROJECT New Bedford Harbor Superfund Site		
1) Sample Condition: Fair				PROJECT NO. GTX-2409		
				BORING NO. FB-29	SAMPLE NO. UO-4	
				TECH. FY	DEPTH/ELEV 12.14 feet	
				LABORATORY	DATE 05/11/00	
				TRIAXIAL COMPRESSION TEST REPORT		

K

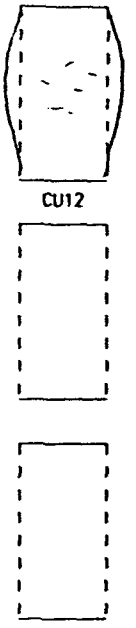
APPENDIX K

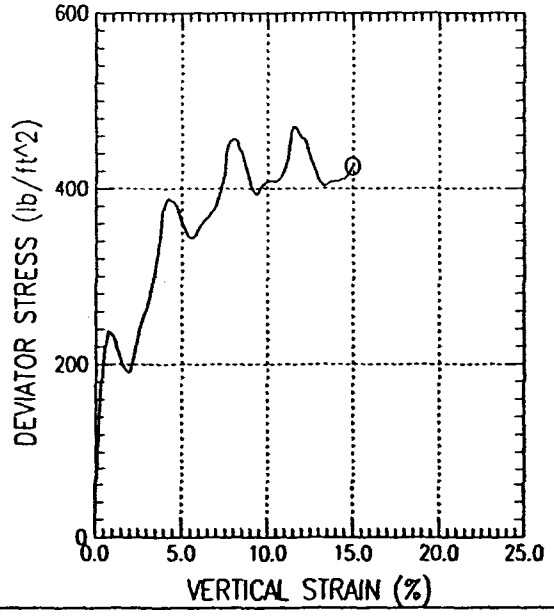
Triaxial Compression Testing – R Test Results

Consolidated Undrained Triaxial Test By ASTM D4767



FAILURE SKETCHES





SYMBOL		O			
TEST NO.		CU12			
INITIAL	WATER CONTENT (%)	103.85			
	DRY DENSITY (lb/ft^3)	42.73			
	SATURATION (%)	97.22			
	VOID RATIO	2.724			
BEFORE SHEAR	WATER CONTENT (%)	91.08			
	DRY DENSITY (lb/ft^3)	47.81			
	SATURATION (%)	99.78			
	VOID RATIO	2.328			
	BACK PRESS. (lb/ft^2)	5040.29			
MINOR PRIN. STRESS (lb/ft^2)		497.01			
MAX. DEV. STRESS (lb/ft^2)		470.45			
TIME TO FAILURE (min)		1548.07			
RATE OF STRAIN INCR (%/min)		0.02			
INITIAL DIAMETER (in)		2.85			
INITIAL HEIGHT (in)		6.41			
B-VALUE		0.95			

STRAIN CONTROLLED

DESCRIPTION OF SPECIMENS:

1) Moist, dark gray silty clay

LL	PL	PI	GS 2.55	TYPE OF SPECIMEN Tube	TYPE OF TEST CU (R)

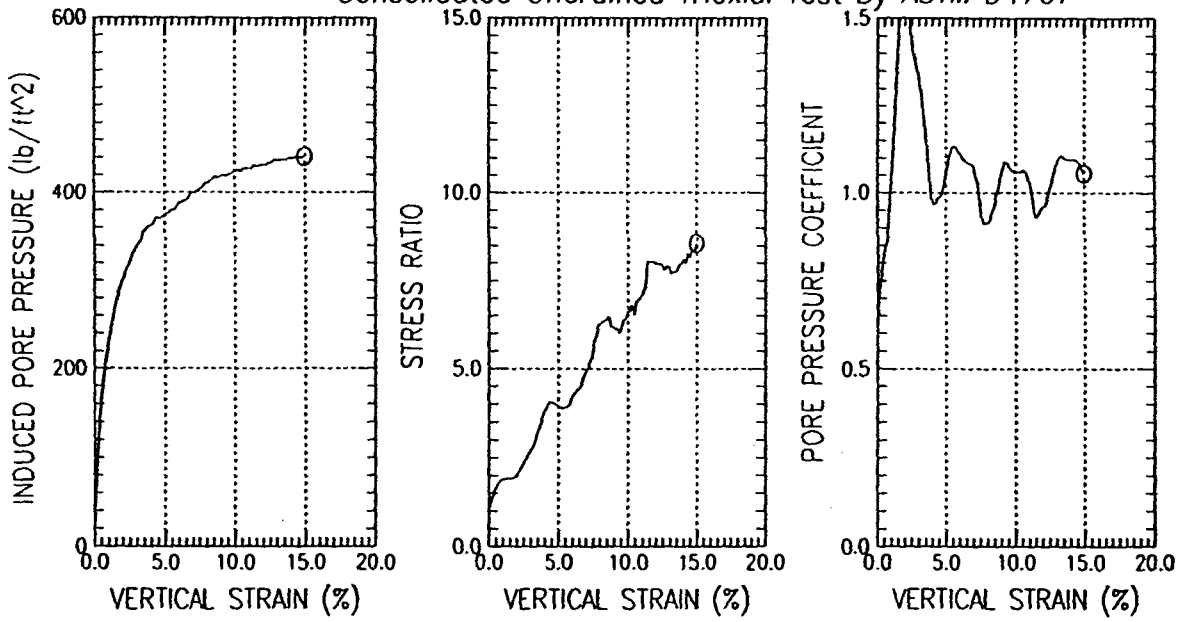
REMARKS:

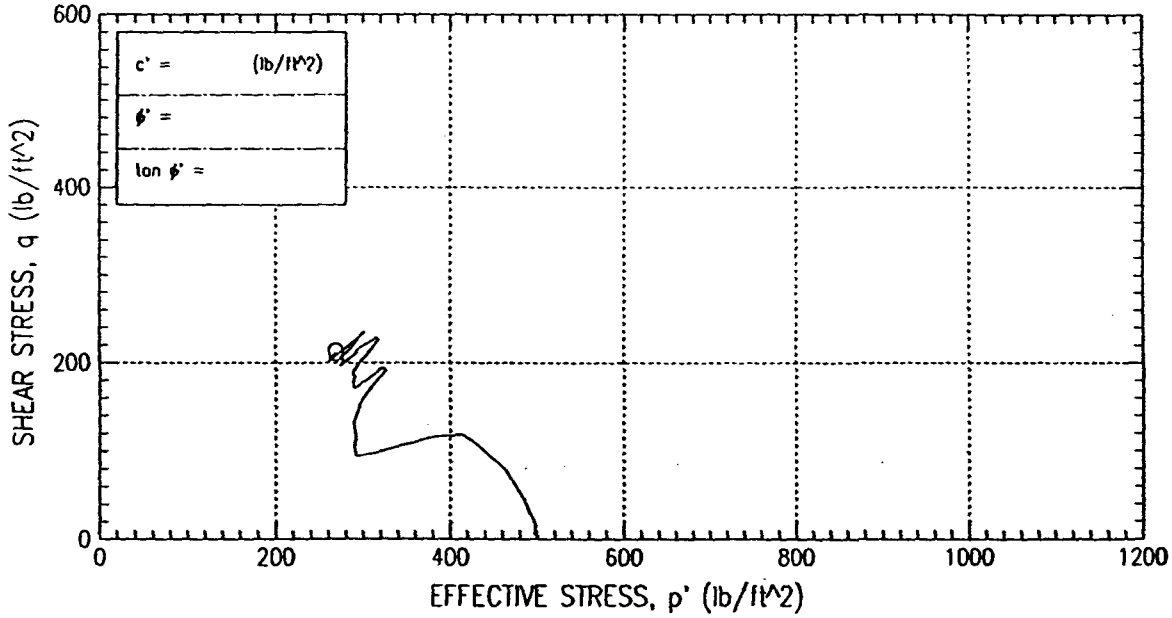
1) Sample Condition=Very Soft(use ave. value for GS)

PROJECT	New Bedford Harbor Superfund Site		
PROJECT NO.	GTX-2409		
BORING NO.	FB-20	SAMPLE NO.	UO-1
TECH.	FY	DEPTH/ELEV	3-5 feet
LABORATORY		DATE	01/19/00

TRIAXIAL COMPRESSION TEST REPORT

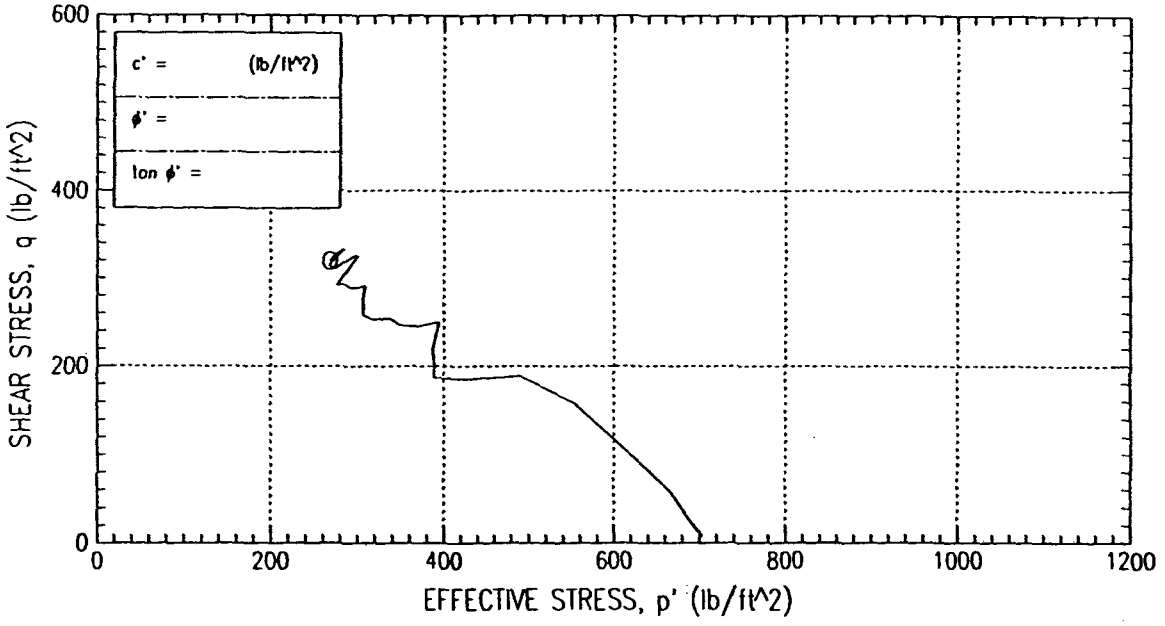
Consolidated Undrained Triaxial Test By ASTM D4767



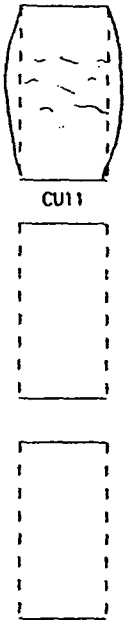


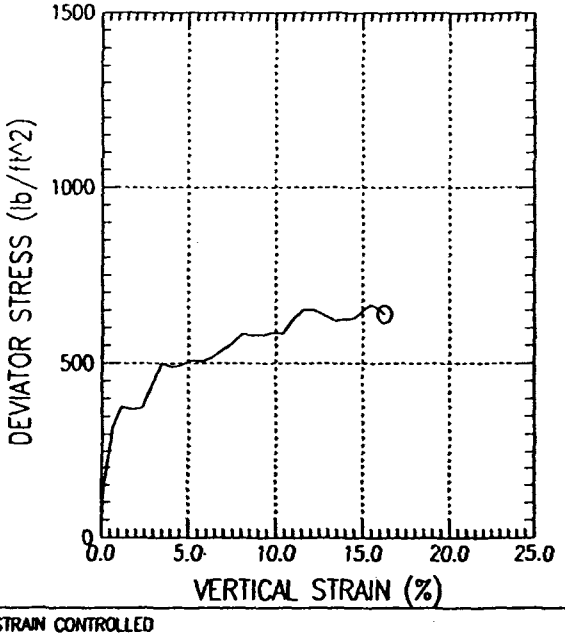
GeoTesting Express
Project Name : New Bedford Harbor Superfund Site
Project No : GTX-2409 Boring No : FB-20 Sample No : UO-1
Test Date : 01/19/00 Test No : CU12 Depth : 3-5 feet
Description : Moist, dark gray silty clay
Remarks : Sample Condition=Very Soft(use ave. value for GS)

Consolidated Undrained Triaxial Test By ASTM D4767



FAILURE SKETCHES





SYMBOL		O			
TEST NO.		CU11			
INITIAL	WATER CONTENT (%)	109.60			
	DRY DENSITY (lb/ft^3)	41.30			
	SATURATION (%)	97.96			
	VOID RATIO	2.853			
BEFORE SHEAR	WATER CONTENT (%)	91.01			
	DRY DENSITY (lb/ft^3)	47.88			
	SATURATION (%)	99.90			
	VOID RATIO	2.323			
	BACK PRESS. (lb/ft^2)	3433.22			
MINOR PRIN. STRESS (lb/ft^2)		686.78			
MAX. DEV. STRESS (lb/ft^2)		666.68			
TIME TO FAILURE (min)		2122.47			
RATE OF STRAIN INCR (%/min)		0.02			
INITIAL DIAMETER (in)		2.87			
INITIAL HEIGHT (in)		6.15			
B-VALUE		0.95			

STRAIN CONTROLLED

DESCRIPTION OF SPECIMENS:

1) Moist, dark gray clay

LL	PL	PI	GS 2.55	TYPE OF SPECIMEN Tube	TYPE OF TEST CU (R)

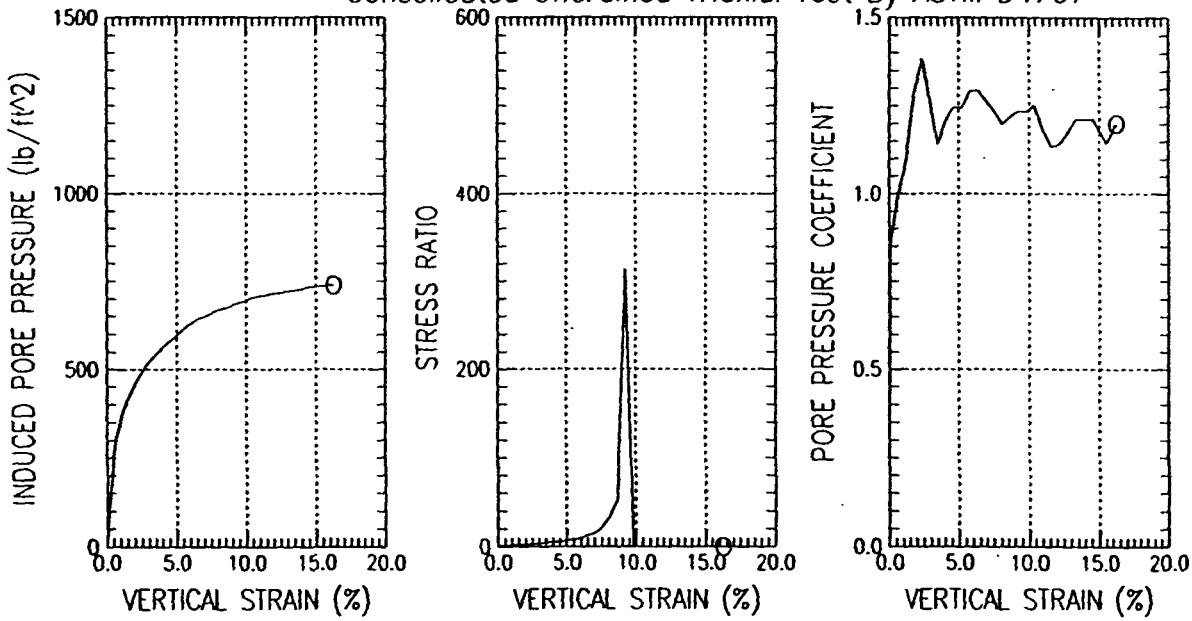
REMARKS:

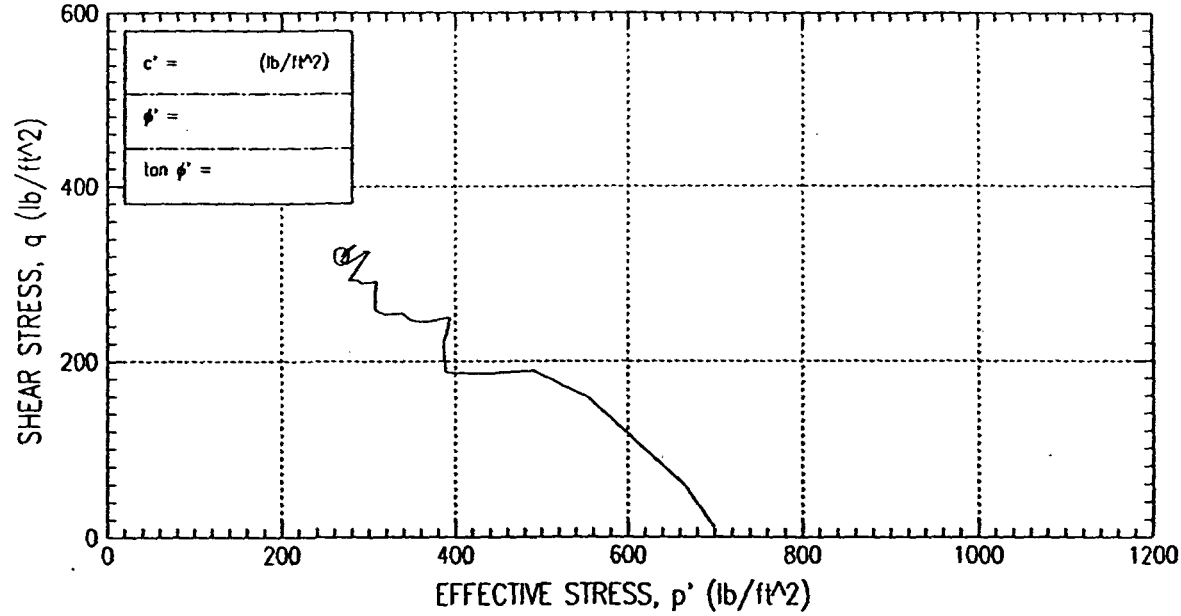
1) Sample Condition=Very Soft(use ave. value for GS)

PROJECT	New Bedford Harborfund Site		
PROJECT NO.	GTX-2409		
BORING NO.	FB-20	SAMPLE NO.	U0-1
TECH.	FY	DEPTH/ELEV	3-5 feet
LABORATORY		DATE	12/27/99

TRIAXIAL COMPRESSION TEST REPORT

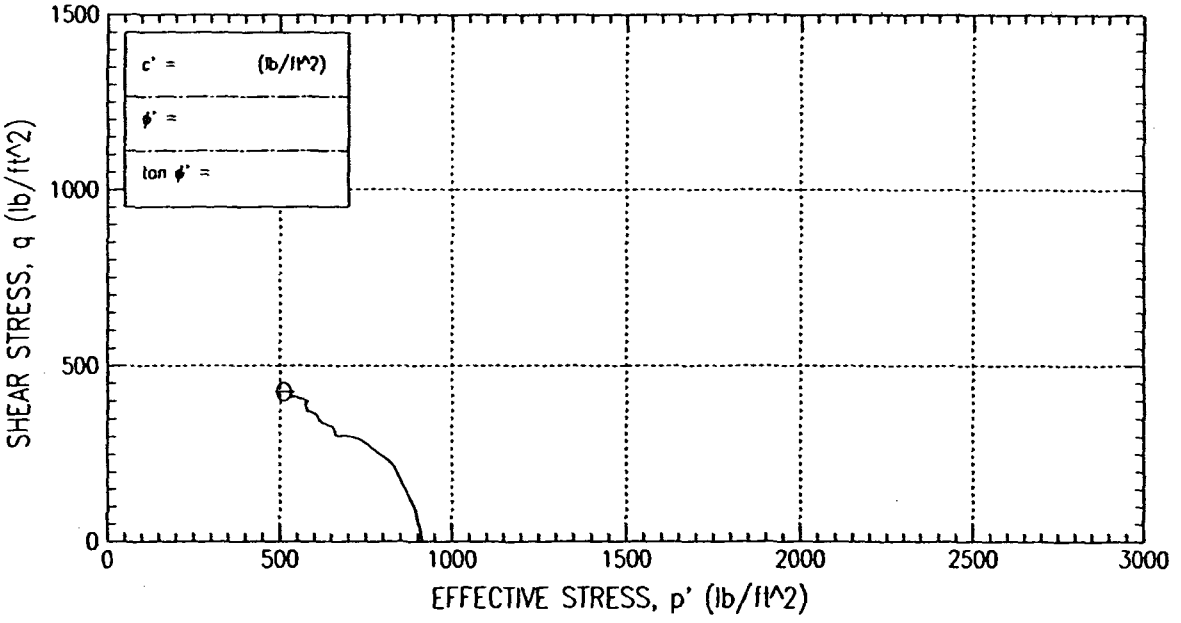
Consolidated Undrained Triaxial Test By ASTM D4767



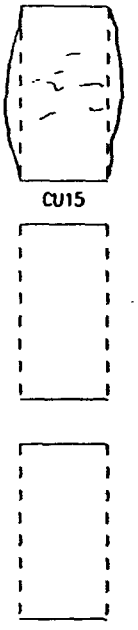


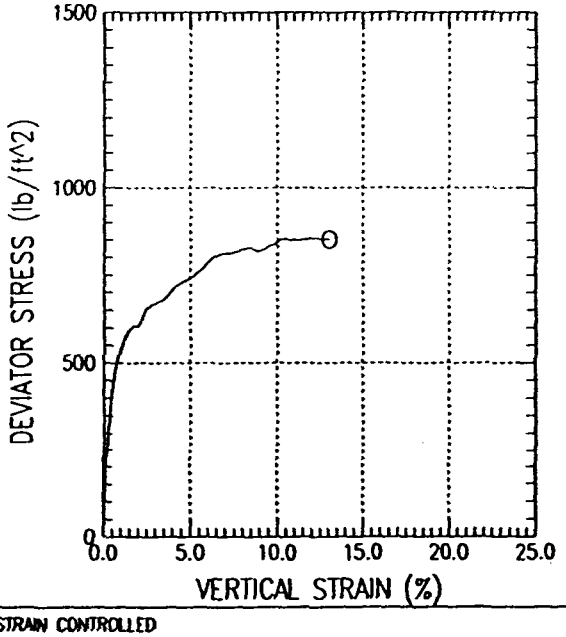
GeoTesting Express
Project Name : New Bedford Harborfund Site
Project No : GTX-2409 Boring No : FB-20 Sample No : UO-1
Test Date : 12/27/99 Test No : CU11 Depth : 3-5 feet
Description : Moist, dark gray clay
Remarks : Sample Condition=Very Soft(use ave. value for GS)

Consolidated Undrained Triaxial Test By ASTM D4767



FAILURE SKETCHES





SYMBOL		O			
TEST NO.		CU15			
INITIAL	WATER CONTENT (%)	111.65			
	DRY DENSITY (lb/ft^3)	39.36			
	SATURATION (%)	94.07			
	VOID RATIO	2.979			
BEFORE SHEAR	WATER CONTENT (%)	94.59			
	DRY DENSITY (lb/ft^3)	46.36			
	SATURATION (%)	99.81			
	VOID RATIO	2.379			
	BACK PRESS. (lb/ft^2)	1714.89			
MINOR PRIN. STRESS (lb/ft^2)		905.11			
MAX. DEV. STRESS (lb/ft^2)		855.26			
TIME TO FAILURE (min)		3540.60			
RATE OF STRAIN INCR (%/min)		0.02			
INITIAL DIAMETER (in)		2.85			
INITIAL HEIGHT (in)		6.10			
B-VALUE		0.95			

STRAIN CONTROLLED

DESCRIPTION OF SPECIMENS:

1) Moist, dark gray organic clay

LL 129.30	PL 48.00	PI 81.30	GS 2.51	TYPE OF SPECIMEN Tube	TYPE OF TEST CU (R)

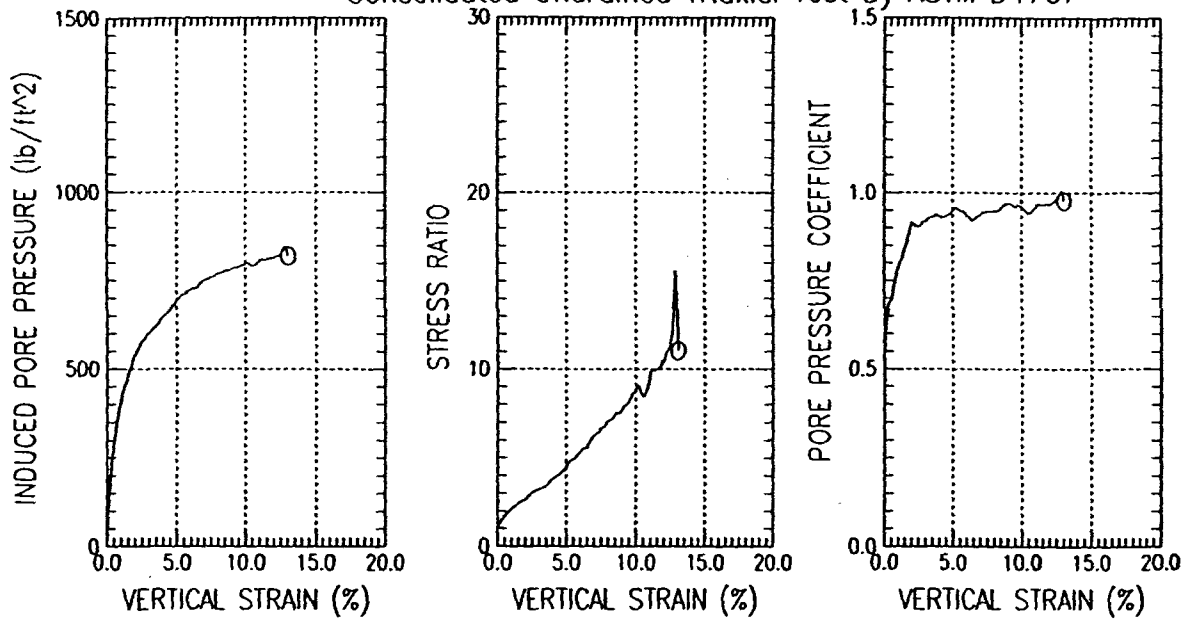
REMARKS:

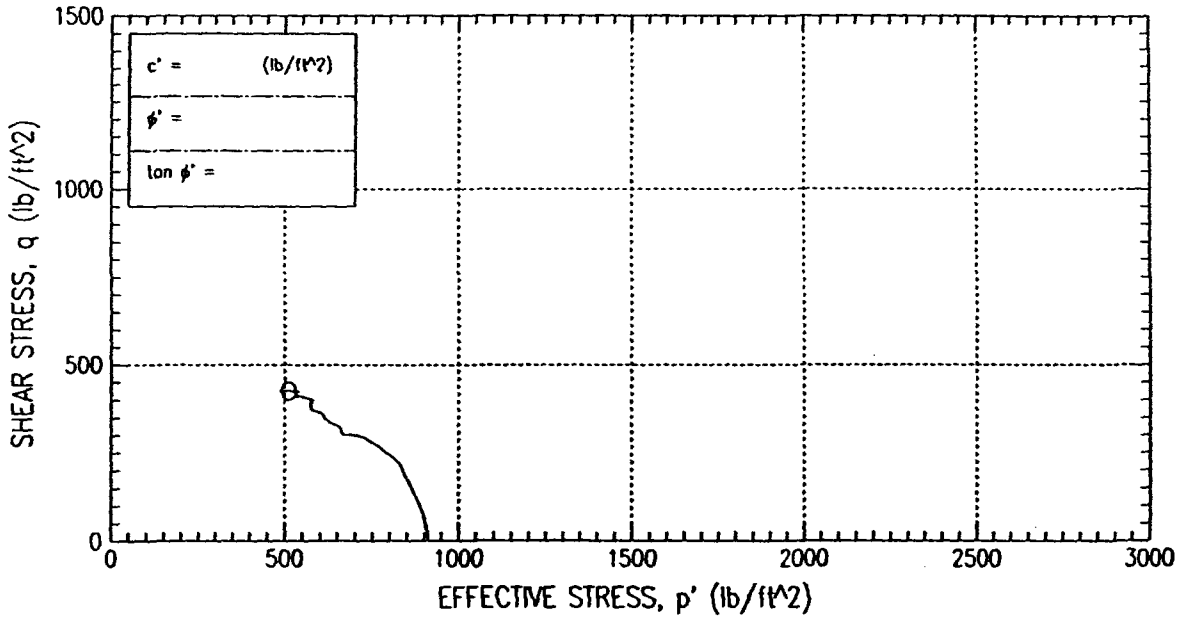
1) Sample Condition=Soft

PROJECT	New Bedford Harbor Superfund Site		
PROJECT NO.	GTX-2409		
BORING NO.	FB-20	SAMPLE NO.	UO-2
TECH.	FY	DEPTH/ELEV	6-8 feet
LABORATORY		DATE	01/13/00

TRIAXIAL COMPRESSION TEST REPORT

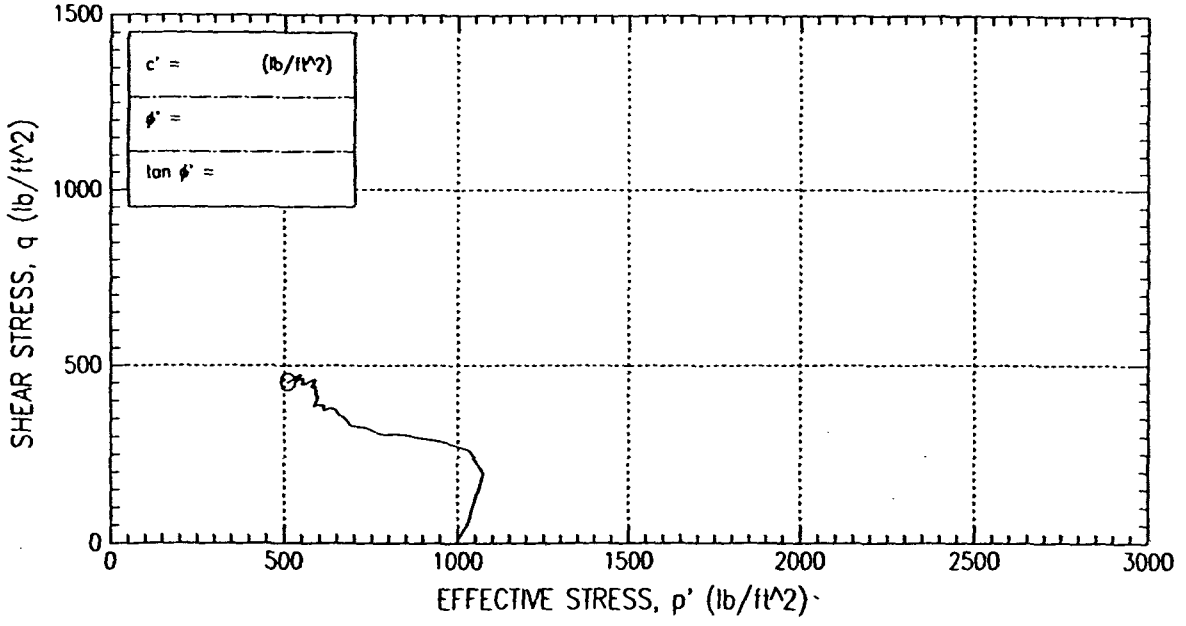
Consolidated Undrained Triaxial Test By ASTM D4767



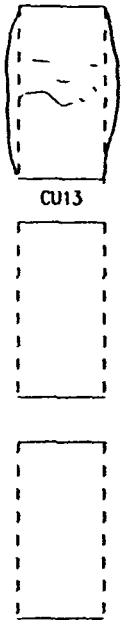


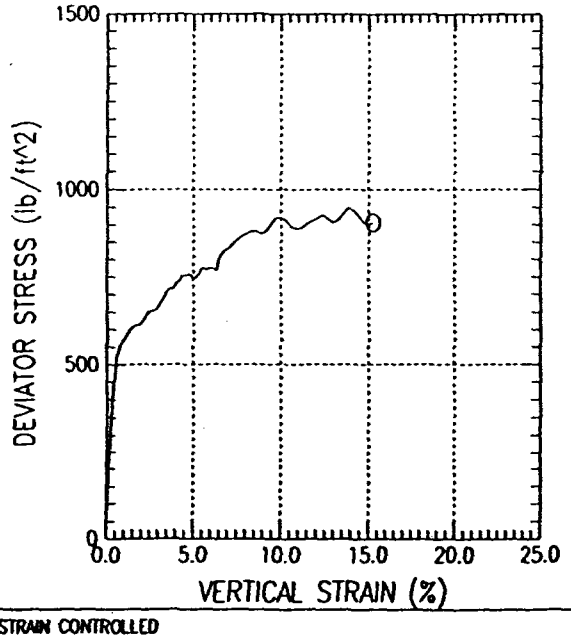
GeoTesting Express
Project Name : New Bedford Harbor Superfund Site
Project No : GTX-2409 Boring No : FB-20 Sample No : UO-2
Test Date : 01/13/00 Test No : CU15 Depth : 6-8 feet
Description : Moist, dark gray organic clay
Remarks : Sample Condition=Soft

Consolidated Undrained Triaxial Test By ASTM D4767



FAILURE SKETCHES





SYMBOL		O			
TEST NO.		CU13			
INITIAL	WATER CONTENT (%)	71.92			
	DRY DENSITY (lb/ft^3)	51.07			
	SATURATION (%)	87.33			
	VOID RATIO	2.067			
BEFORE SHEAR	WATER CONTENT (%)	66.40			
	DRY DENSITY (lb/ft^3)	58.50			
	SATURATION (%)	99.37			
	VOID RATIO	1.677			
	BACK PRESS. (lb/ft^2)	60.85			
MINOR PRIN. STRESS (lb/ft^2)		990.55			
MAX. DEV. STRESS (lb/ft^2)		947.70			
TIME TO FAILURE (min)		4617.35			
RATE OF STRAIN INCR (%/min)		0.02			
INITIAL DIAMETER (in)		2.87			
INITIAL HEIGHT (in)		6.03			
B-VALUE		0.95			

STRAIN CONTROLLED

DESCRIPTION OF SPECIMENS:

1) Moist, dark gray organic clay

LL	PL	PI	GS 2.51	TYPE OF SPECIMEN Tube	TYPE OF TEST CU (R)

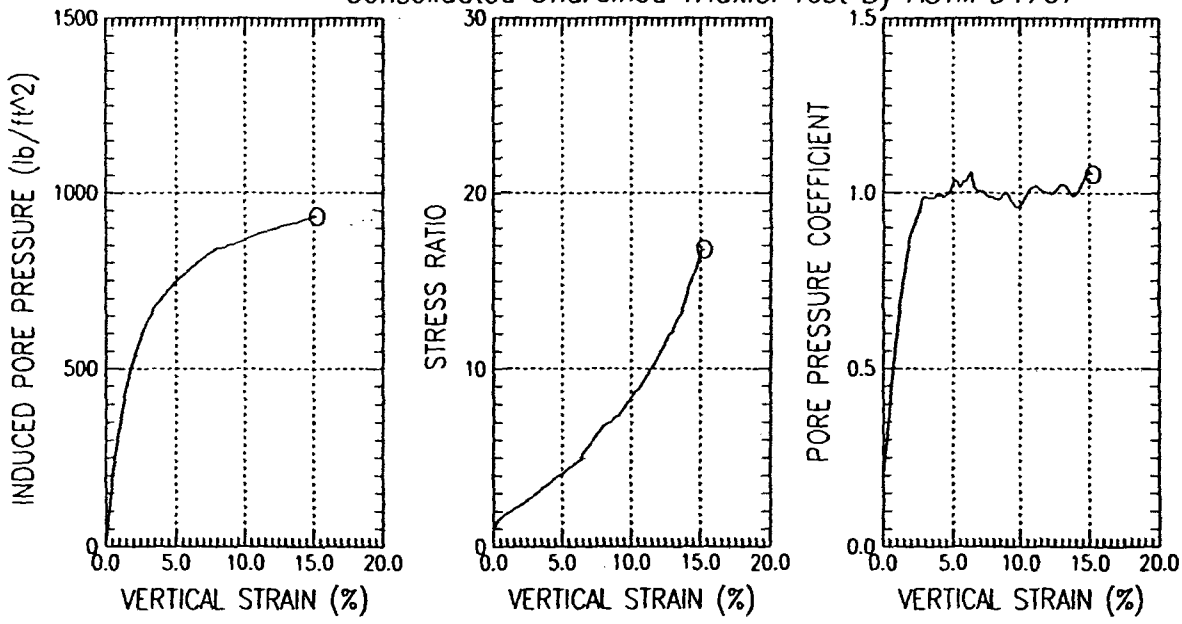
REMARKS:

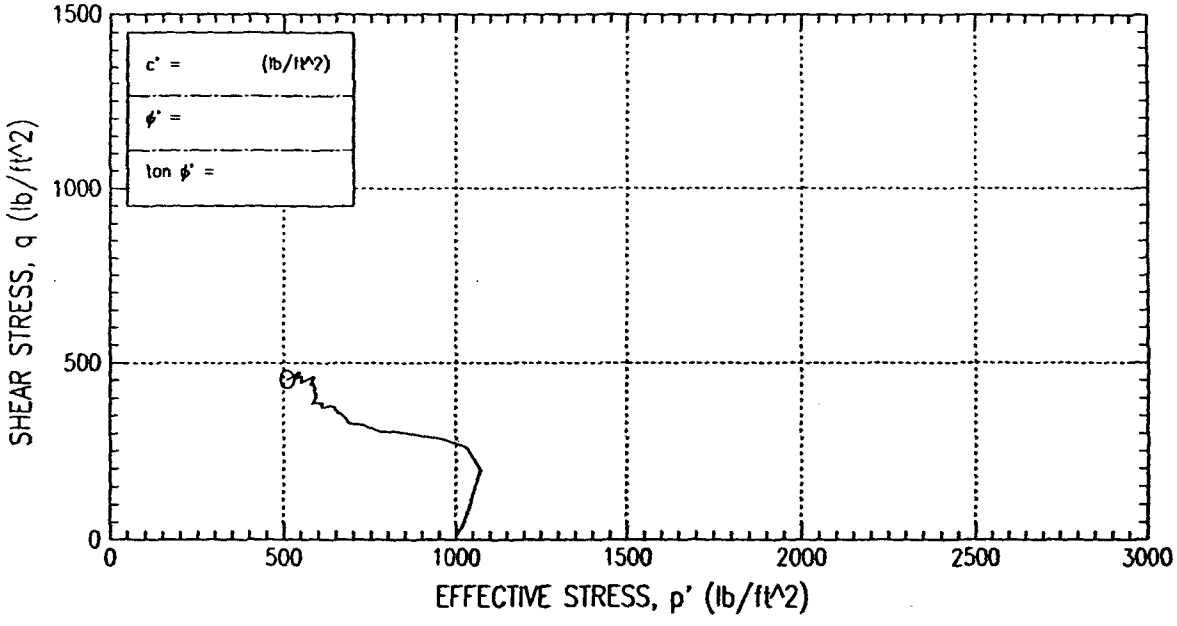
1) Sample Condition=Soft

PROJECT	New Bedford Harbor Superfund Site		
PROJECT NO.	GTX-2409		
BORING NO.	FB-20	SAMPLE NO.	UO-2
TECH.	FY	DEPTH/ELEV	6-8 feet
LABORATORY		DATE	01/09/00

TRIAXIAL COMPRESSION TEST REPORT

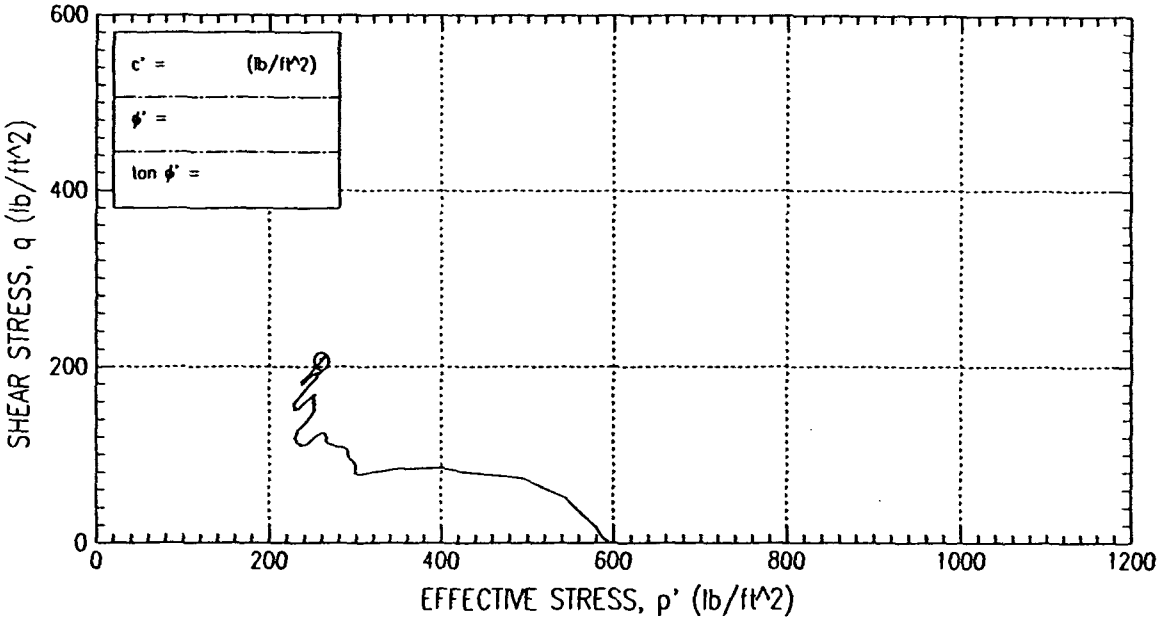
Consolidated Undrained Triaxial Test By ASTM D4767



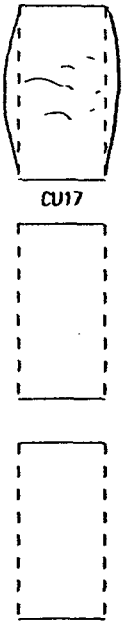


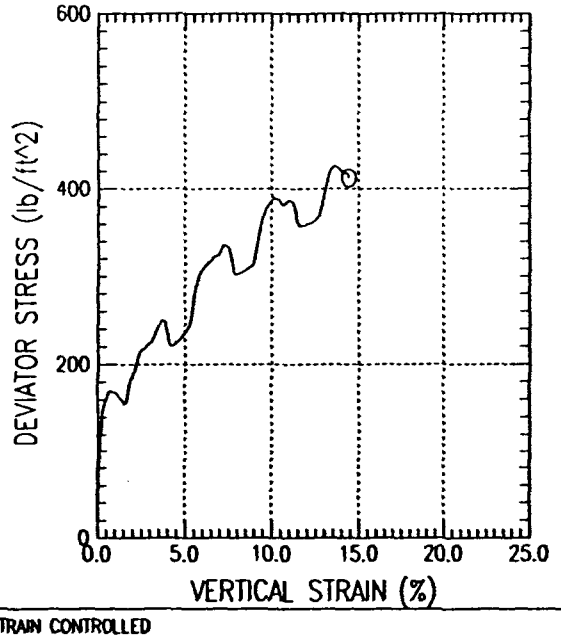
GeoTesting Express
Project Name : New Bedford Harbor Superfund Site
Project No : GTX-2409 Boring No : FB-20 Sample No : UO-2
Test Date : 01/09/00 Test No : CU13 Depth : 6-8 feet
Description : Moist, dark gray organic clay
Remarks : Sample Condition=Soft

Consolidated Undrained Triaxial Test By ASTM D4767



FAILURE SKETCHES





SYMBOL		O			
TEST NO.		CU17			
INITIAL	WATER CONTENT (%)	89.51			
	DRY DENSITY (lb/ft^3)	46.51			
	SATURATION (%)	96.95			
	VOID RATIO	2.207			
BEFORE SHEAR	WATER CONTENT (%)	59.08			
	DRY DENSITY (lb/ft^3)	61.80			
	SATURATION (%)	99.90			
	VOID RATIO	1.413			
	BACK PRESS. (lb/ft^2)	4175.16			
MINOR PRIN. STRESS (lb/ft^2)		592.02			
MAX. DEV. STRESS (lb/ft^2)		426.69			
TIME TO FAILURE (min)		1414.68			
RATE OF STRAIN INCR (%/min)		0.02			
INITIAL DIAMETER (in)		2.85			
INITIAL HEIGHT (in)		6.45			
B-VALUE		0.95			

STRAIN CONTROLLED

DESCRIPTION OF SPECIMENS:

1) Wet, black organic clay

LL 102.90	PL 40.30	PI 62.60	GS 2.39

TYPE OF SPECIMEN Tube

TYPE OF TEST CU (R)

REMARKS:

1) Sample Condition=Soft

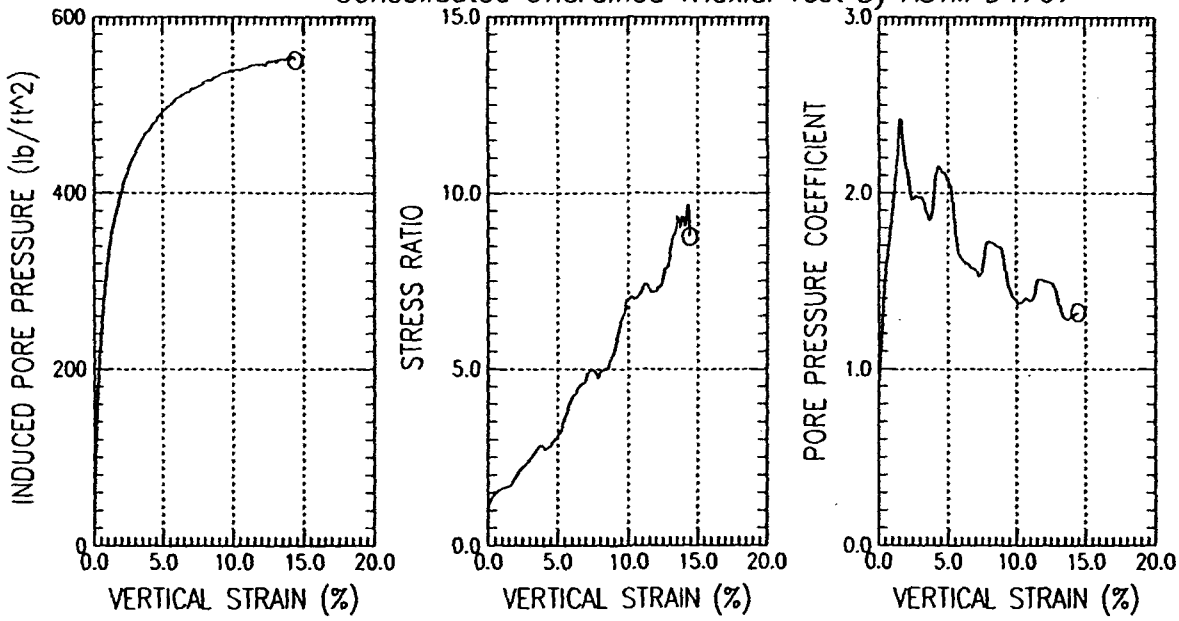
PROJECT New Bedford Harbor Superfund Site

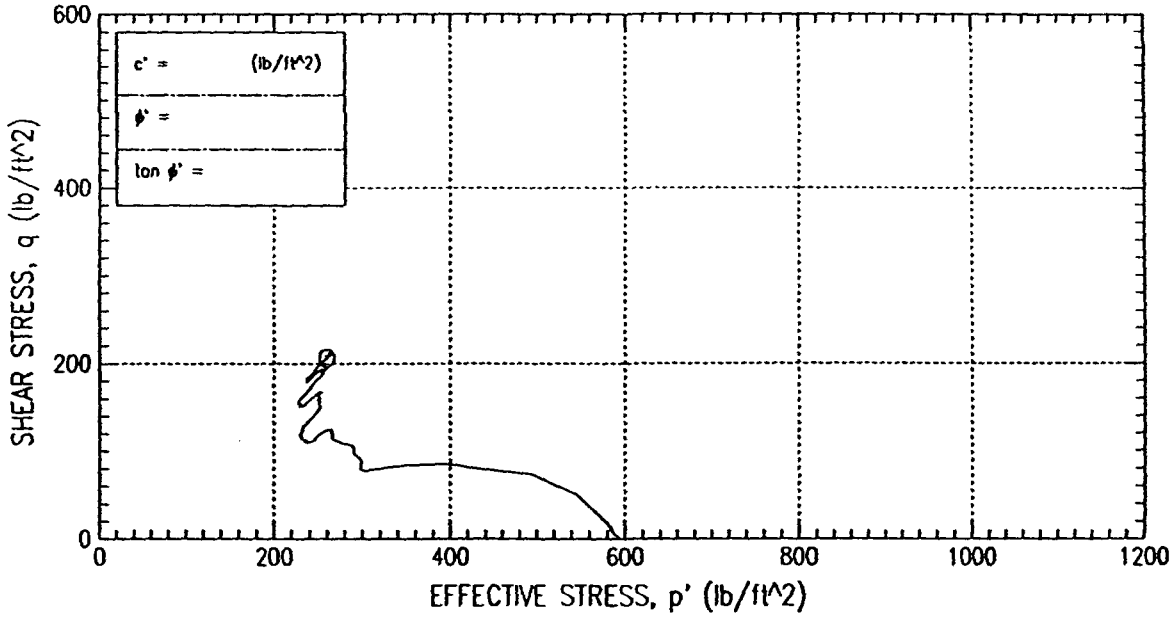
PROJECT NO.GTX-2409

BORING NO. FB-28	SAMPLE NO.	UO-1	
TECH. FY	DEPTH/ELEV	0-2 feet	
LABORATORY	DATE	01/14/00	

TRIAXIAL COMPRESSION TEST REPORT

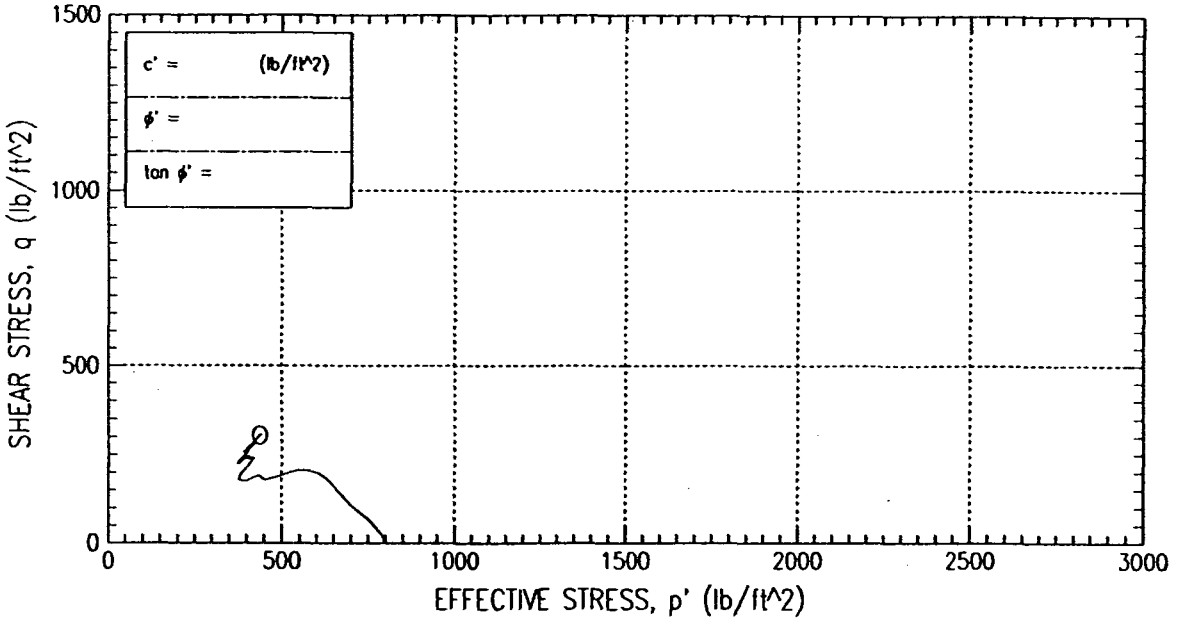
Consolidated Undrained Triaxial Test By ASTM D4767



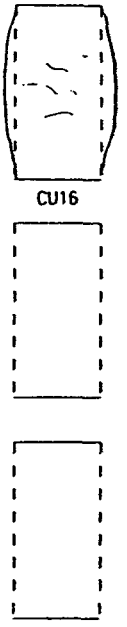


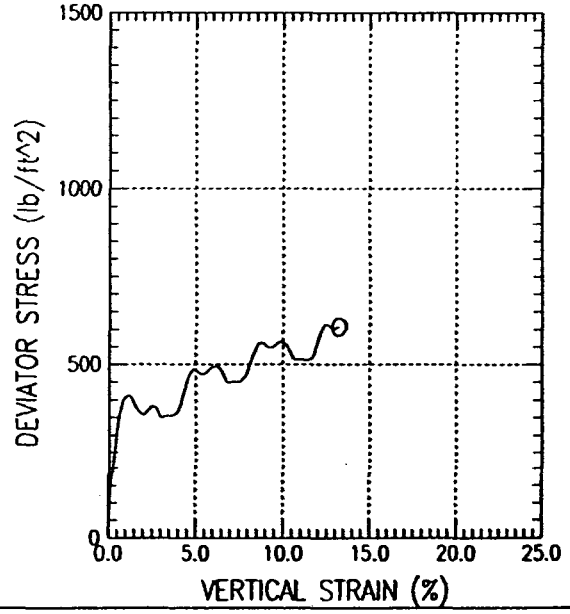
GeoTesting Express
Project Name : New Bedford Harbor Superfund Site
Project No : GTX-2409 Boring No : FB-28 Sample No : UO-1
Test Date : 01/14/00 Test No : CU17 Depth : 0-2 feet
Description : Wet, black organic clay
Remarks : Sample Condition=Soft

Consolidated Undrained Triaxial Test By ASTM D4767



FAILURE SKETCHES





SYMBOL		O			
TEST NO.		CU16			
INITIAL	WATER CONTENT (%)	104.32			
	DRY DENSITY (lb/ft^3)	42.25			
	SATURATION (%)	98.57			
	VOID RATIO	2.530			
BEFORE SHEAR	WATER CONTENT (%)	65.87			
	DRY DENSITY (lb/ft^3)	57.59			
	SATURATION (%)	99.04			
	VOID RATIO	1.590			
	BACK PRESS. (lb/ft^2)	4320.92			
MINOR PRIN. STRESS (lb/ft^2)		794.81			
MAX. DEV. STRESS (lb/ft^2)		614.68			
TIME TO FAILURE (min)		1355.50			
RATE OF STRAIN INCR (%/min)		0.02			
INITIAL DIAMETER (in)		2.91			
INITIAL HEIGHT (in)		6.25			
B-VALUE		0.95			

STRAIN CONTROLLED

DESCRIPTION OF SPECIMENS:

1) Moist, black organic clay

LL 102.90	PL 40.30	PI 62.60	GS 2.39

TYPE OF SPECIMEN Tube

TYPE OF TEST CU (R)

REMARKS:

1) Sample Condition=Soft

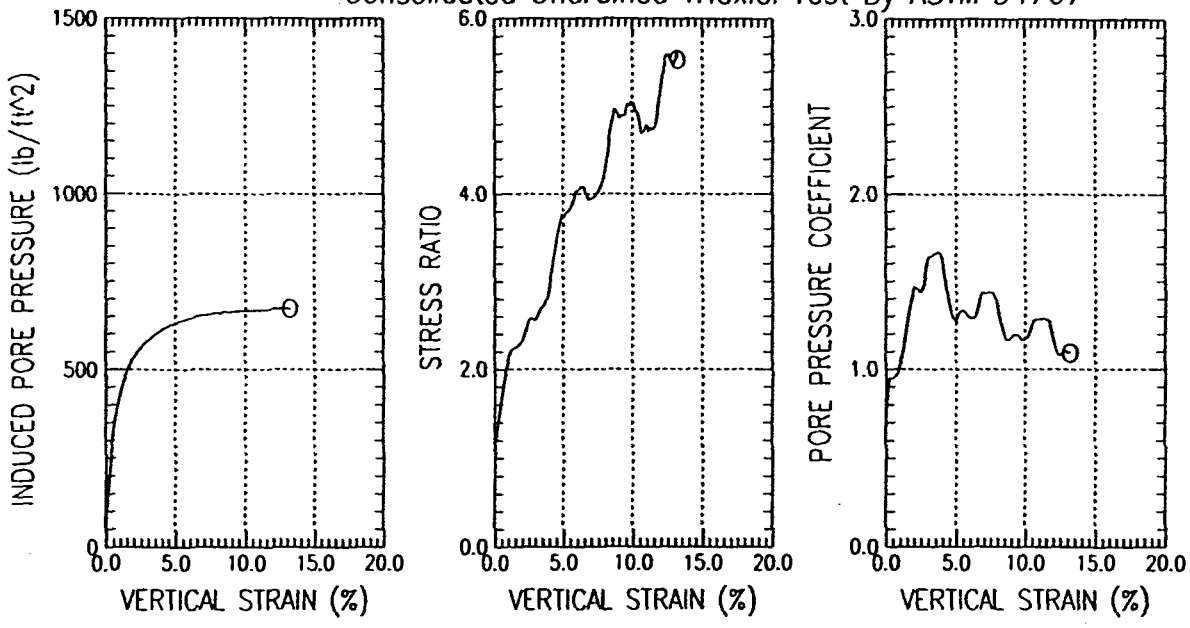
PROJECT New Bedford Harbor Superfund Site

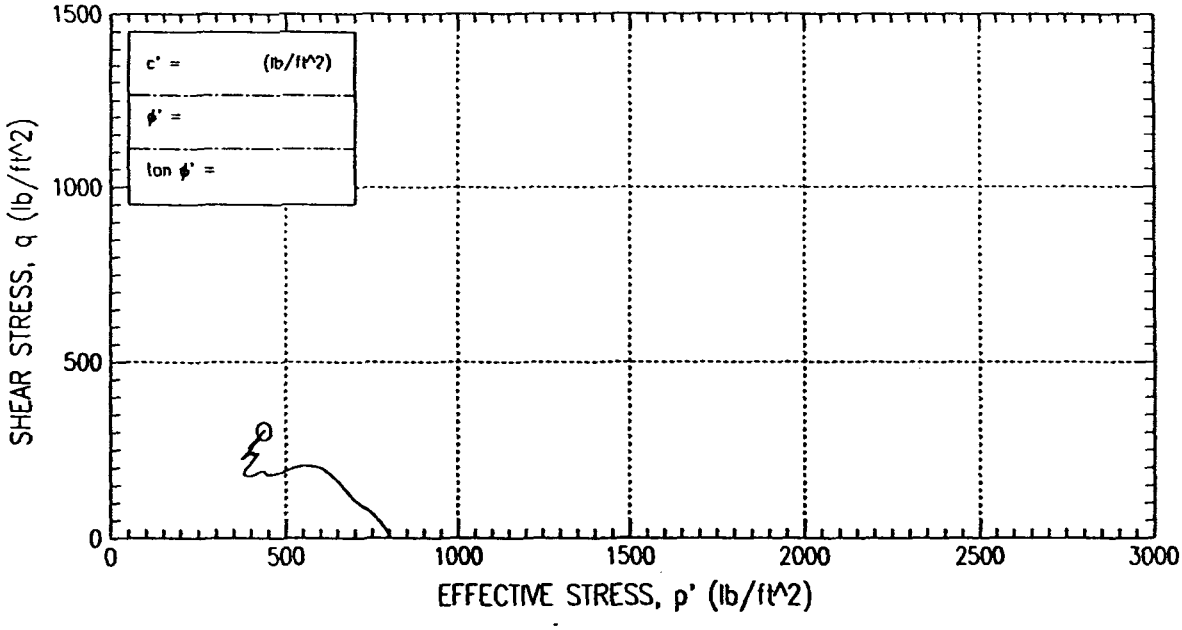
PROJECT NO.CTX-2409

BORING NO. FB-28	SAMPLE NO.	U0-1	
TECH. FY	DEPTH/ELEV	0-2 feet	
LABORATORY	DATE	01/13/00	

TRIAXIAL COMPRESSION TEST REPORT

Consolidated Undrained Triaxial Test By ASTM D4767





GeoTesting Express
Project Name : New Bedford Harbor Superfund Site
Project No : GTX-2409 Boring No : FB-28 Sample No : UO-1
Test Date : 01/13/00 Test No : CU16 Depth : 0-2 feet
Description : Moist, black organic clay
Remarks : Sample Condition=Soft

L

APPENDIX L

Flexible Wall Permeability Test Results

Hydraulic Conductivity of Saturated Porous Materials Using a Flexible Wall Permeameter by ASTM D 5084

Constant Gradient

Client:	Nobis Engineering	**Start Date:**	02/01/00
Project Name:	New Bedford Harbor Superfund Site	**End Date:**	2/4/00
Project Location:	New Bedford, MA	**Tested By:**	SWJ
GTX #:	2409	**Checked By:**	GTT
Boring #:	FB-15	**Sample Type:**	Undisturbed
Sample #:	UO-1	**Orientation:**	Vertical
Depth:	0-2 ft	**Test #:**	K8
Visual Description:	Moist, dark gray organic silt		

Sample Preparation: Extruded from Shelby tube, cut, trimmed and placed into permeameter at as received density and moisture content; trimmings moisture content = 121%

Permeant Fluid: de-aired tap water **Cell #:** —

Parameter	Initial	Final
Height, in	3.22	3.04
Diameter, in	2.90	2.71
Area, in^2	6.61	5.77
Volume, in^3	21.27	17.53
Mass, g	454	406
Bulk Density, pcf	81.1	88.0
Moisture Content, %	110	87.6
Dry Density, pcf	38.7	46.9

B COEFFICIENT DETERMINATION

Cell Pressure, psi:	27.9	**Press. Increment, psi:**	5
Sample Pressure, psi:	25.9	**B Coefficient:**	0.96

FLOW DATA

Date	Elapsed Time, sec	Cell Pressure, psi	Inlet Pressure, psi	Outlet Pressure, psi	Grad-ient	Inflow V, cc	Outflow V, cc	Δ Inflow V, cc	Δ Outflow V, cc	Temp, °C	R_t	Permeability K @ 20 °C, cm/sec
02/03	—	27.9	26.9	24.9	18.2	10.20	14.95	—	—	—	—	—
02/03	11280	27.9	26.9	24.9	18.2	14.80	10.15	4.60	4.80	20	1.000	6.15E-07
02/03	—	27.9	26.9	24.9	18.2	11.30	14.10	—	—	—	—	—
02/03	5160	27.9	26.9	24.9	18.2	13.40	11.90	2.10	2.20	20	1.000	6.15E-07
02/04	—	27.9	26.9	24.9	18.2	9.80	15.55	—	—	—	—	—
02/04	12480	27.9	26.9	24.9	18.2	15.10	10.40	5.30	5.15	20	1.000	6.18E-07
02/04	—	27.9	26.9	24.9	18.2	10.95	14.00	—	—	—	—	—
02/04	10560	27.9	26.9	24.9	18.2	15.10	9.80	4.15	4.20	20	1.000	5.83E-07

PERMEABILITY AT 20 °C: 6.1 x 10^{-7} cm/sec (@ 2 psi effective stress)

Note: These results apply only to the sample tested for the specific test conditions. The test procedures employed follow accepted industry practice and the indicated test method. GeoTesting Express has no specific knowledge as to conditioning, origin, sampling procedure or intended use of the material.

Hydraulic Conductivity of Saturated Porous Materials Using a Flexible Wall Permeameter by ASTM D 5084

Constant Gradient

Client:	Nobis Engineering	**Start Date:**	01/06/00
Project Name:	New Bedford Harbor Superfund Site	**End Date:**	1/17/00
Project Location:	New Bedford, MA	**Tested By:**	SWJ
GTX #:	2409	**Checked By:**	GTT
Boring #:	FB-26	**Sample Type:**	Undisturbed
Sample #:	UO-1	**Orientation:**	Vertical
Depth:	3-5 ft	**Test #:**	K9
Visual Description:	Moist, soft, dark gray organic silt with shells		

Sample Preparation: Extruded from Shelby tube, cut, trimmed and placed into permeameter at as received density and moisture content; trimmings moisture content = 122%

Permeant Fluid: de-aired tap water **Cell #:** —

Parameter	Initial	Final
Height, in	4.16	4.01
Diameter, in	2.84	2.67
Area, in^2	6.33	5.60
Volume, in^3	26.35	22.45
Mass, g	577	513
Bulk Density, pcf	83.2	86.9
Moisture Content, %	119	95.0
Dry Density, pcf	37.9	44.5

B COEFFICIENT DETERMINATION

Cell Pressure, psi:	21.3	**Press. Increment, psi:**	5
Sample Pressure, psi:	19.2	**B Coefficient:**	0.98

FLOW DATA

Date	Elapsed Time, sec	Cell Pressure, psi	Inlet Pressure, psi	Outlet Pressure, psi	Grad-ient	Inflow V, cc	Outflow V, cc	Δ Inflow V, cc	Δ Outflow V, cc	Temp, °C	R_t	Permeability K @ 20 °C, cm/sec
01/14	—	21.1	20.1	18.1	13.8	10.40	14.70	—	—	—	—	—
01/14	8940	21.1	20.1	18.1	13.8	14.70	10.60	4.30	4.10	20	1.000	9.42E-07
01/15	—	21.1	20.1	18.1	13.8	10.00	15.10	—	—	—	—	—
01/15	8220	21.1	20.1	18.1	13.8	14.00	10.95	4.00	4.15	20	1.000	9.94E-07
01/17	—	21.1	20.1	18.1	13.8	11.55	13.35	—	—	—	—	—
01/17	6840	21.1	20.1	18.1	13.8	14.90	10.00	3.35	3.35	20	1.000	9.82E-07
01/17	—	21.1	20.1	18.1	13.8	10.60	14.85	—	—	—	—	—
01/17	7680	21.1	20.1	18.1	13.8	14.35	11.10	3.75	3.75	20	1.000	9.79E-07

PERMEABILITY AT 20 °C: 9.7×10^{-7} cm/sec (@ 2 psi effective stress)

Note: These results apply only to the sample tested for the specific test conditions. The test procedures employed follow accepted industry practice and the indicated test method. GeoTesting Express has no specific knowledge as to conditioning, origin, sampling procedure or intended use of the material.

Hydraulic Conductivity of Saturated Porous Materials Using a Flexible Wall Permeameter by ASTM D 5084

Constant Gradient

Client:	Nobis Engineering	**Start Date:**	01/17/00
Project Name:	New Bedford Harbor Superfund Site	**End Date:**	1/29/00
Project Location:	New Bedford, MA	**Tested By:**	SWJ
GTX #:	2409	**Checked By:**	GTT
Boring #:	FB-26	**Sample Type:**	Undisturbed
Sample #:	UO-2	**Orientation:**	Vertical
Depth:	6-8 ft	**Test #:**	K10

Visual Description: Moist, soft, dark grayish brown organic silt with shells

Sample Preparation: Extruded from Shelby tube, cut, trimmed and placed into permeameter at as received density and moisture content; trimmings moisture content = 122%

Permeant Fluid: de-aired tap water **Cell #:** bottom 7

Parameter	Initial	Final
Height, in	4.10	3.99
Diameter, in	2.84	2.70
Area, in^2	6.31	5.73
Volume, in^3	25.88	22.84
Mass, g	598	544
Bulk Density, pcf	87.8	90.5
Moisture Content, %	106	87.4
Dry Density, pcf	42.6	48.3

B COEFFICIENT DETERMINATION

Cell Pressure, psi:	16.3	**Press. Increment, psi:**	5
Sample Pressure, psi:	14.3	**B Coefficient:**	1

FLOW DATA

Date	Elapsed Time, sec	Cell Pressure, psi	Inlet Pressure, psi	Outlet Pressure, psi	Grad-ient	Inflow V, cc	Outflow V, cc	Δ Inflow V, cc	Δ Outflow V, cc	Temp, °C	R_t	Permeability K @ 20 °C, cm/sec
01/26	—	16.3	15.3	13.3	13.9	6.20	19.00	—	—	—	—	—
01/27	58680	16.3	15.3	13.3	13.9	15.80	8.80	9.60	10.20	20	1.000	3.29E-07
01/27	—	16.3	15.3	13.3	13.9	11.30	14.05	—	—	—	—	—
01/27	25140	16.3	15.3	13.3	13.9	15.30	9.70	4.00	4.35	20	1.000	3.24E-07
01/27	—	16.3	15.3	13.3	13.9	8.30	17.80	—	—	—	—	—
01/28	59280	16.3	15.3	13.3	13.9	17.60	8.60	9.30	9.20	20	1.000	3.04E-07
01/28	—	16.3	15.3	13.3	13.9	11.00	14.40	—	—	—	—	—
01/28	20940	16.3	15.3	13.3	13.9	14.45	10.85	3.45	3.55	20	1.000	3.26E-07

PERMEABILITY AT 20 °C: 3.2×10^{-7} cm/sec (@ 2 psi effective stress)

Note: These results apply only to the sample tested for the specific test conditions. The test procedures employed follow accepted industry practice and the indicated test method. GeoTesting Express has no specific knowledge as to conditioning, origin, sampling procedure or intended use of the material.