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SDMS DocID 000214288

Total Environmental Restoration Contract

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) A 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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2001-017-0071
03/19/01

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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) A 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 proposed CDF A site is located on the western shore of the Acushnet River at the northern (upstream) end of the New Bedford Harbor Superfund Site, as shown on Figure 1-2. The CDF A site borders the existing Titleist Foot Joy and Fibre Leather Manufacturing Corporation 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 and an offshore portion (including an intertidal area). The ground surface elevation ranges from approximately El. 8* adjacent to the buildings to El. 2.4 (mean high tide). The intertidal area is between El. 2.4 and -1.3 (mean low tide). Farther offshore, the mudline decreases to approximately El. -5 at the east side of the site.

1.4 Project Description

The conceptual design of CDF A, 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 A, 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 seven test borings (FA-1 through FA-3 and FA-5 through FA-8), installation of seven observation wells (OW-A1 through OW-A7), and installation of three monitoring wells (MW-A1, MW-A2(S), and MW-A3). The offshore boring program consisted of advancement of twenty-five borings (FA-9, FA-12 through FA-28, FA-1, FA-V4 through FA-V8, and FA-V10) and installation of two monitoring wells (MW-A4 and MW-A5). All drilling work was performed by Atlantic Testing Laboratories, Limited (ATL) of Canton, New York, between July 28, 1999 and November 9, 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 and peat layers.

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 A: 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 7.86×10^{-7} to 1.04×10^{-5} cm/sec, and the coefficient of permeability for the interbedded sands ranges from 7.04×10^{-5} to 3.85×10^{-4} 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 A in accordance with ASTM D 2573 at 2-foot intervals throughout the entire thickness of the organic clay layer at six 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 interbedded sands, with the exception of three borings where fill overlying organic soil 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 2-5. The general notes and legend for the subsurface profiles are included on Figure 2-6. 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 2.5 to approximately 13 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, and organic matter. In two instances, boulders were encountered in the fill stratum.

ORGANIC CLAY: Organic clay was encountered in three onshore borings. Where encountered, this stratum ranges from 4 to 6.5 feet in depth and lies directly beneath the fill. The borings indicate that the stratum consists of very soft to stiff organic clay or organic silt containing varying amounts of sand and organic matter. The color was found to range from gray to brown, and in one instance a strong organic odor was noted.

SANDS: The interbedded sands encountered in the onshore borings generally consist of poorly graded sand with varying amounts of silt and gravel. In some 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 6 to 29 feet, with the average thickness being 14 feet.

GLACIAL TILL: Glacial till was encountered in three onshore borings. The thickness of the stratum ranges from approximately 4.5 to 8 feet, with an average thickness of 6.5 feet. The material was classified as both silty sand, and well graded gravel with silt and sand. Based on standard penetration tests, the material was generally dense to very dense.

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

2.3.1.2 Offshore Portion of Site

FILL: Fill was encountered overlying the organic clay at one offshore boring location (FA-28). The material is approximately 2 feet thick and consists of loose sand and debris. It is likely that the fill material at this location has been deposited from the onshore portion of the site over time.

ORGANIC CLAY: Organic clay was encountered at all offshore borings, including monitoring well and field vane shear test locations, and ranges from 2 to 15 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 40% by weight) and shell fragments. The color was generally recorded as dark gray to black, and an organic odor was often noted.

SANDS: The interbedded sands encountered offshore generally consist of poorly graded sand with varying amounts of silts and gravels. In some instances the samples were 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 5.5 to 20.5 feet, with the average thickness being 13 feet.

GLACIAL TILL: Glacial till was encountered in seven offshore borings. The thickness of the stratum ranges from approximately 1 foot to 7 feet, with the average thickness being just over 4 feet. The material was generally classified as poorly graded sand with varying amounts of silt and gravel, although a poorly graded gravel with silt and sand was noted as being glacial till. Based on standard penetration tests, the material is generally dense to very dense. In two instances, cobbles were encountered either overlying or within the glacial till stratum.

BEDROCK: Bedrock was cored in ten 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. Voids in the bedrock were noted at several boring locations.

2.3.2 Groundwater

Seven observation wells and three 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 2.7 feet between low tide and high tide. As shown in Table 2-4, average groundwater elevations ranged from El. 1.8 in monitoring wells MW-A1 and MW-A2(S) to El. 3.4 in monitoring well MW-A3.

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 and peat. 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 thirty-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 seventeen specific gravity tests were performed on representative samples of subsurface materials at CDF A, including nine on the organic clay and eight 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 twenty-five particle size analyses were performed on representative samples of subsurface materials at CDF A, including three on the fill, three on the organic clay, thirteen on the interbedded sands, four on the glacial till, one on the material at an organic clay and sand interface, and one on material largely consisting of organic matter. 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 fourteen soil samples representative of the generally fine-grained materials present below the mudline were determined in accordance with ASTM D 4318. One sample selected for testing was determined to be largely sand (FA-9 UO-1). The Atterberg limits of the fines portion of this sample was determined. 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, along with the ratio of its liquid limit

before and after oven-drying, soil classification could be determined. The results, which are contained in Appendix H, indicate that eleven of the samples are high plasticity organic clay, one sample is low plasticity organic clay, and one sample is elastic silt. The results of the one sand sample indicate that the fines portion is silt. Soil classifications are contained in Table 3-1.

3.3 One-dimensional Consolidation Testing

One-dimensional consolidation tests were performed on three organic clay samples, one peat sample, and one sample consisting largely of organic matter, 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 0.164 to 0.246, and the recompression ratio (RR) ranges from approximately 0.013 to 0.035. For the peat sample, CR is approximately 0.449 and RR is approximately 0.060. For the sample consisting largely of organic matter, CR is approximately 0.628 and RR is approximately 0.039. All results are contained in Table 3-1.

3.4 Triaxial Compression Testing

3.4.1 Unconsolidated-undrained Triaxial Compression Tests

Seventeen unconsolidated-undrained triaxial compression (Q) tests were performed on samples collected from the offshore portion of the site: sixteen tests on samples of organic clay and one test on a sample of clayey sand. Note that the Q tests performed on sample UO-2 from test boring FA-27 may have been performed on the sand portion of the sample, as shown by the water content of the test specimen.

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 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 the tube samples (FA-23 UO-1, FA-23 UO-3, FA-27 UO-2) 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 generally ranges from approximately 32 to 346 psf for the organic clay present in the top 12 feet of the harbor. Sample FA-23 UO-3 exhibited a peak deviator stress of approximately 716 psf the second time it was tested, most likely a result of the presence of a large shell within the sample.

3.4.2 Consolidated-undrained Triaxial Compression Tests

Five 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 approximately 198 to 482 psf, and the peak shear stress ranges from approximately 177 to 283 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. Note that one of these samples (FA-9 UO-1) was collected at the organic clay and sand interface. 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 9.1×10^{-8} to 2.7×10^{-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 16.1 and 16.2 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)
FA-1	2706560.0	815394.8	4.5
FA-2	2706395.7	815259.3	7.0
FA-3	2706263.4	815162.9	6.3
FA-5	2706004.8	815042.1	5.1
FA-6	2705852.0	814935.8	5.6
FA-7	2705666.6	814872.5	5.15
FA-8	2705439.4	814797.3	5.1
FA-9	2705746.8	815060.7	-2.82
FA-12	2706120.2	815190.6	-0.73
FA-13	2706086.8	815279.3	-1.80
FA-14	2706262.0	815280.9	-0.20
FA-15	2706254.4	815390.0	-2.42
FA-16	2706434.6	815400.8	-2.30
FA-17	2706445.0	815623.1	-2.97
FA-18	2706454.0	815495.6	-2.3
FA-19	2706326.3	815556.1	-3.24
FA-20	2706212.5	815611.8	-3.75
FA-21	2706109.9	815466.0	-4.35
FA-22	2706001.6	815473.9	-5.34
FA-23	2705942.2	815343.0	-4.04
FA-24	2705798.2	815325.1	-3.81
FA-25	2705787.7	815242.1	-2.30
FA-26	2705634.8	815134.5	-3.70
FA-27	2705546.0	815073.5	-2.94
FA-28	2705569.1	814944.4	-1.90
OW-A1	2706392.3	815256.8	6.9
OW-A2	2705969.3	815188.8	5.7
OW-A3	2706321.5	814973.2	7.9
OW-A4	2706076.9	814770.6	8.4
OW-A5	2706007.0	815045.8	5.6
OW-A6	2705435.2	814800.3	5.2
OW-A7	2705687.7	814711.3	8.18
MW-A1	2706613.8	815363.8	5.2
MW-A2(S)	2706171.0	815006.8	5.9
MW-A3	2705830.0	814873.4	5.7
MW-A4	2705794	815246	-2.30
MW-A5	2706278.5	815562.2	-3.38
FA-V1	2706530.5	815495.8	-2.4
FA-V4	2706101.9	815534.7	-4.7
FA-V5	2706055.6	815355.5	-3.6
FA-V6	2705897.2	815398.5	-4.6
FA-V7	2705763.0	815130.8	-2.5
FA-V8	2705649.0	815229.0	-4.1
FA-V10	2705492.4	814940.8	-2.5

Table 2-2
Summary of Subsurface Conditions
Onshore 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	
FA-1	4.5	42	7.5	6.5	19	NE	-28.5
FA-2	7.0	41	NE	NE	28.8	NE	-21.8
FA-3	6.3	32	7.1	NE	5.9	7.8	-14.5
FA-5	5.1	24	13.1	NE	NE	NE	-8.0
FA-6	5.6	32	2.5	NE	10.5	7.2	-14.6
FA-7	5.2	31	5	NE	11	4.5	-15.3
FA-8	5.1	41	13	NE	17.2	NE	-25.1
OW-A1†	7.2	19	NE	NE	19*	NE	NE
OW-A2	5.7	19	12	NE	7*	NE	NE
OW-A3	7.9	16.2	8.5	NE	7.7	NE	-8.3 (R)
OW-A4	8.4	19	3	NE	15.3	NE	-9.9 (R)
OW-A5†	5.6	12.8	12.8	NE	NE	NE	-7.2 (R)
OW-A6†	5.2	19	13	NE	6*	NE	NE
OW-A7	8.2	19	5	NE	14*	NE	NE
MW-A1	5.2	19	10	4	5*	NE	NE
MW-A2(S)	5.9	22	7	5	10	NE	-16.1 (R)
MW-A3	5.7	19	5	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)
			Fill	Organic Clay	Peat	Sands & Gravels	Glacial Till	
FA-9	-2.8	20.7	NE	2.0†	NE	13.0	4.7	-22.5 (R)
FA-12	-0.7	27.0	NE	10.0	NE	9.0	7.2	-26.9 (R)
FA-13	-1.8	22.5	NE	10.5	NE	9.5	NE	-21.8 (R)
FA-14	-0.2	23.5	NE	4.0	NE	18.5	NE	-22.7 (R)
FA-15	-2.4	19.0	NE	11.0	NE	6.7	NE	-20.1 (R)
FA-16	-2.3	25.5	NE	6.0	NE	19.0	NE	-27.3 (R)
FA-17	-3.0	36.2	NE	9.0	NE	15.0	2.4	-29.4
FA-18	-2.3	38.8	NE	8.5	NE	20.5	NE	-31.3
FA-19	-3.2	42.7	NE	10.5	NE	20.5	1.6	-35.8
FA-20	-3.8	32.0	NE	10.5	NE	14.5	7*	NE
FA-21	-4.4	36.0	NE	11.5	NE	14.3	NE	-30.2
FA-22	-5.3	32.0	NE	13.0	NE	10.7	NE	-29.0
FA-23	-4.0	35.0	NE	12.0	NE	13.0	NE	-29.0
FA-24	-3.8	23.3	NE	13.7	NE	8.3	0.9	-26.7 (R)
FA-25	-2.3	29.0	NE	6.5	NE	5.5	6.6	-20.9
FA-26	-3.7	35.8	NE	6.0	NE	20.3	NE	-30.0
FA-27	-2.9	30.9	NE	8.0	1.0	11.9	NE	-23.8
FA-28	-1.9	27.0	2.0	3.0	NE	11.6	NE	-18.5
MW-A4	-2.3	18.5	NE	6.5	NE	12*	NE	NE
MW-A5	-3.4	25.4	NE	12.6	NE	12.8*	NE	NE
FA-V1	-2.4	10.0	NE	8.0	NE	2*	NE	NE
FA-V4	-4.7	14.0	NE	12.5	NE	1.5*	NE	NE
FA-V5	-3.6	17.0	NE	15.0	NE	2*	NE	NE
FA-V6	-4.6	16.0	NE	14.0	NE	2*	NE	NE
FA-V7	-2.5	7.0	NE	5.0	NE	2*	NE	NE
FA-V8	-4.1	9.0	NE	7.0	NE	2*	NE	NE
FA-V10	-2.5	8.0	NE	6.0	NE	2*	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)
† Estimation
* Strata not fully penetrated

Table 2-4
Average Groundwater Elevations

Well Number	Avg. Groundwater Elevation (ft)
OW-A1	2.0
OW-A2	2.1
OW-A3	2.0
OW-A4	3.3
OW-A5	2.8
OW-A6	1.9
OW-A7	2.9
MW-A1	1.8
MW-A2(S)	1.8
MW-A3	3.4

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)
FA-1	S-1	0-2	13.7				SM		1												
FA-1	UO-1	11-13	480.6				ML		2	I	8.45	339.1	0.628	0.039							
FA-1	S-6	30-32					SM		3												
FA-3	S-5	19-21	6.6				GW-GM		4												
FA-6	S-1	0-2	3.2				SP-SM		5												
FA-6	S-4	13-15	10.2				SM		6												
FA-8	S-4	13-15	27.0				ML	2.68	7												
FA-9	UO-1	2-4	30.4	49.8	33.7	16.0	OH/SM	2.62	8	I	3.18	109.6	0.246	0.035							
FA-9	S-1	5-7	16.1				SP-SM		9												
FA-12	UO-1	1-3								I	1.78	67.9	0.164	0.013	J	77.1	56.1				
FA-12	UO-2	4-6	71.1	68.5	29.2	39.3	OH	2.59	10						J	98.6	224.8				
FA-12	UO-3	7-9	85.3	65.9	41.9	24.0	MH								J	83.7	285.9				
FA-12	UO-4	10-12	13.2												J	30.8	219.3				
FA-12	S-1	12-14	10.6				SP-SM		11												
FA-14	S-1	3-5	85.4				ML		12												
FA-15	UO-1	1-3	103.0	95.2	31.1	64.1	OH											K	197.7	77.2	229.3
																		K	290.0	95.1	176.9
FA-15	UO-2	4-6	113.6	138.7	45.4	93.3	OH	2.53	13									K	391.3	69.3	232.7
																		K	482.0	77.6	283.0
FA-15	UO-3	7-9	90.1	87.6	33.0	54.6	OH	2.60	14												
FA-15	S-1	12-14	9.3				SP-SM	2.64	15												
FA-15	S-2	15-17					SM		16												
FA-18	UO-1	0-2	120.5	106.4	43.3	63.1	OH	2.45										K	291.5	86.9	239.8
FA-19	UO-1	1-3								I	2.93	103.2	0.197	0.024	J	104.4	32.3				
FA-19	UO-2	4-6	79.9	79.8	33.5	46.3	OH	2.61							J	79.2	345.7				
FA-19	UO-3	7-9													J	70.8	257.1				
FA-19	S-1	11.5-13.5					SP		17												
FA-19	S-3	20-22	10.9				SP-SM	2.67	18												
FA-19	S-5	30-31	9.2				SW-SM	2.73	19												
FA-23	UO-1	3-5	88.6	87.2	35.1	52.0	OH	2.59							J	84.3	168.7				
															J	85.3	338.7				
FA-23	UO-2	6-8													J	96.1	249.7				
FA-23	UO-3	9-11	109.1	93.4	51.3	42.1	OH	2.54							J	106.2	82.1				
															J	91.4	715.5				

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)
FA-23	S-2	17-19	14.6				SM	2.66	20												
FA-25	UO-1	0-2	103.7	119.0	38.4	80.6	OH	2.57							J	110.8	75.1				
FA-25	UO-2	2-4													J	77.2	234.1				
FA-25	UO-3	5-7	25.0	38.2	23.6	14.6	OL														
FA-25	S-2	12-14	7.6				GP-GM		21												
FA-26	UO-1	3-5	138.0	108.4	34.8	73.6	OH/Pt			I	16.17	577.0	0.449	0.060							
FA-26	S-1	7.5-9.5	8.6				GP-GM	2.68	22												
FA-26	S-3	18-20	17.7				SP-SM	2.65	23												
FA-27	UO-1	3-5	101.6	105.8	35.7	70.2	OH	2.63							J	103.3	173.1				
FA-27	UO-2	6-8													J	39.2	216.5				
															J	41.2	259.3				
FA-28	S-1B	5-7					SW-SM		24												
MW-A2(S)	S-1	1-2	8.4				SM		25												

FIGURES

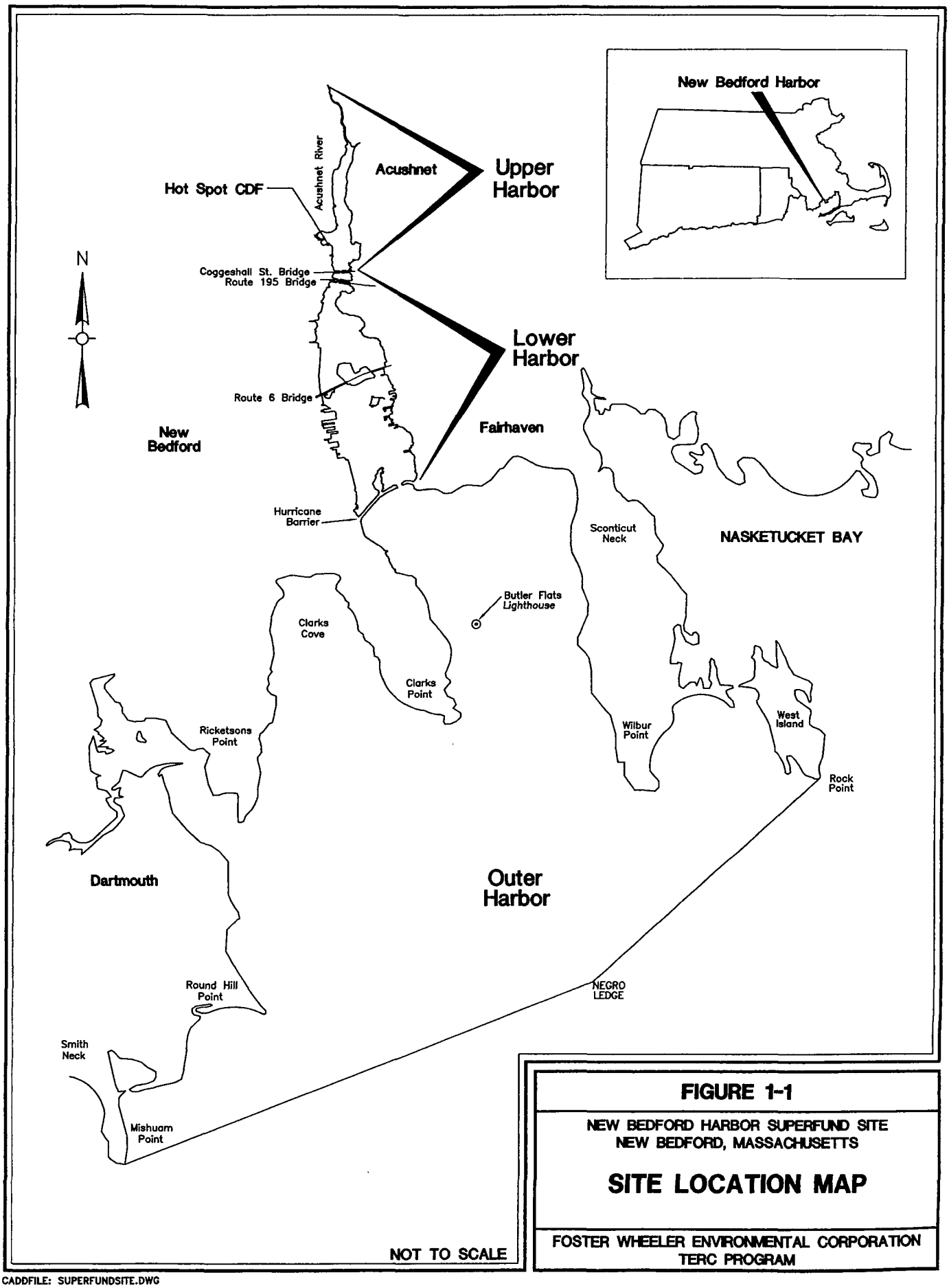


FIGURE 1-1

NEW BEDFORD HARBOR SUPERFUND SITE
NEW BEDFORD, MASSACHUSETTS

SITE LOCATION MAP

FOSTER WHEELER ENVIRONMENTAL CORPORATION
TERC PROGRAM

CADDFILE: SUPERFUNDSITE.DWG

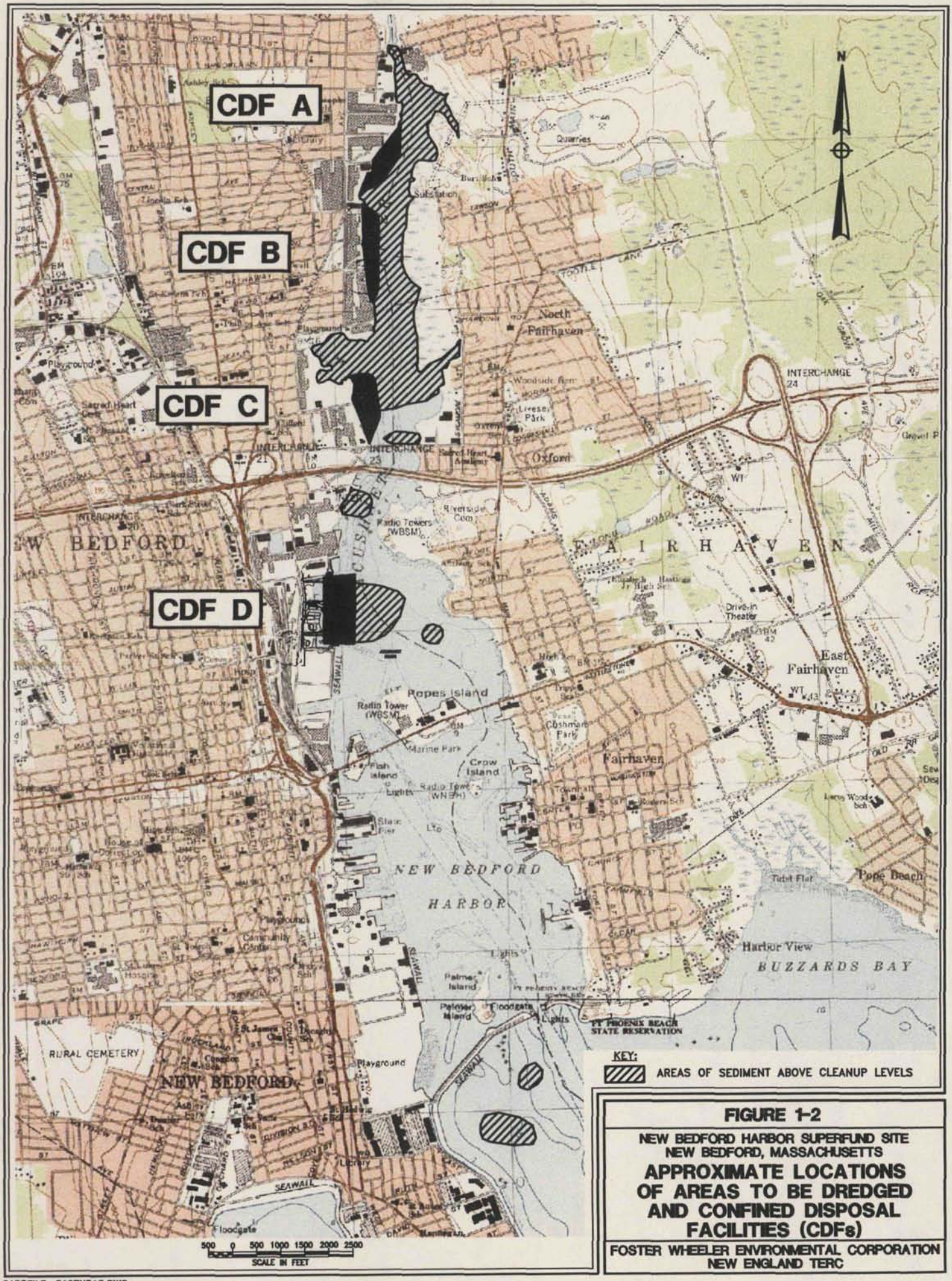


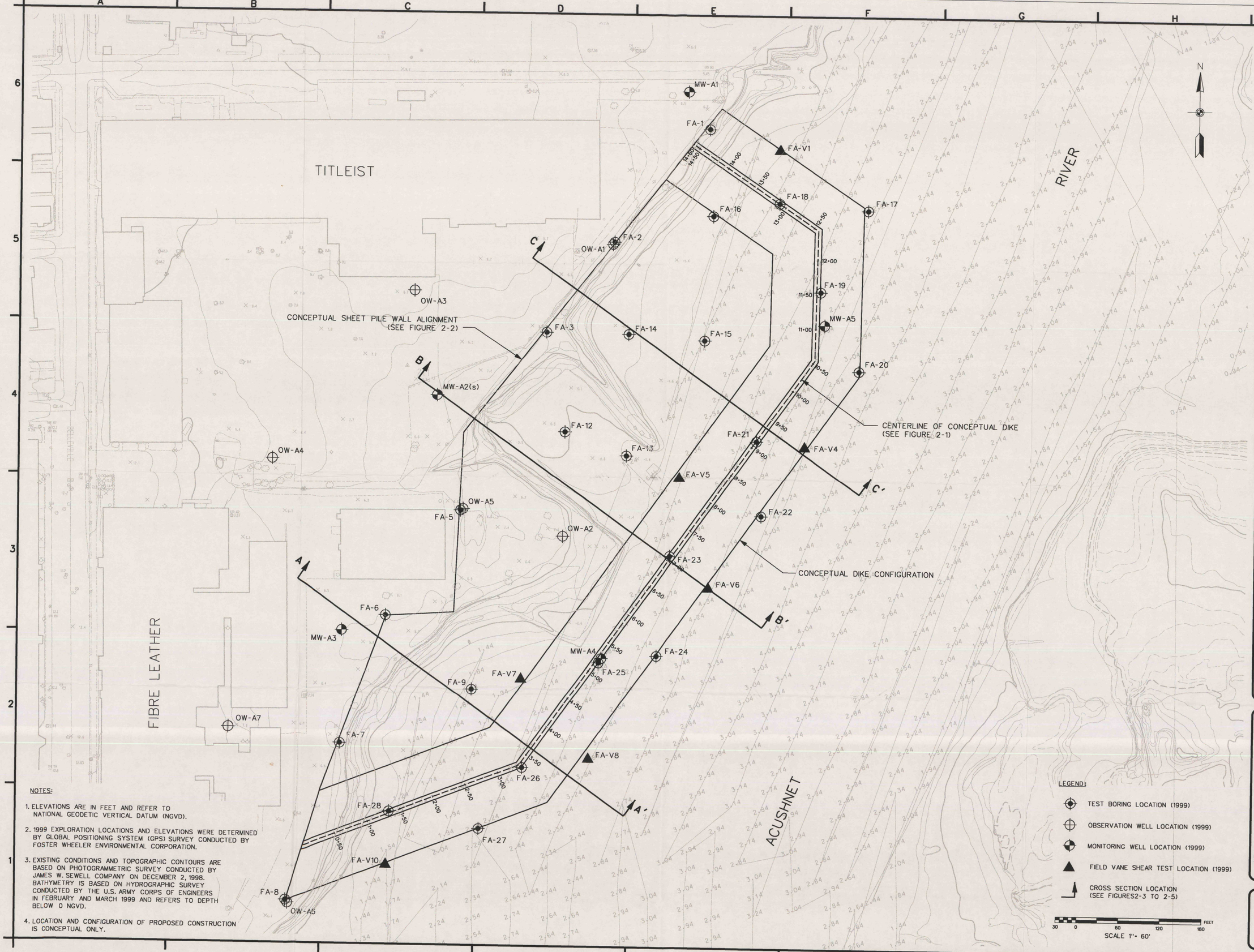
FIGURE 1-2

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.

US Army Corps of Engineers
New England District

Symbol	Description	Date	Appr.	Symbol	Description	Date	Appr.

Dates: Rev.
Designed by: Design file no. 17.0210.00N
Drawn by: Drawing code:
Reviewed by: File name:
Submitted by: Plot date: Plot scale:

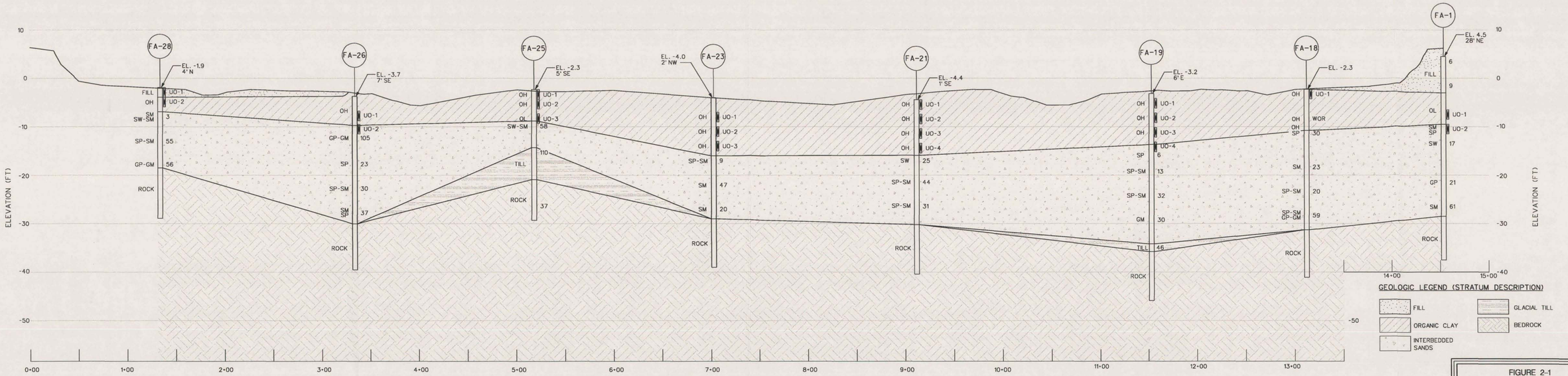
U.S. ARMY ENGINEER DISTRICT
CORPS OF ENGINEERS
CONCORD, MASSACHUSETTS

FOSTER WHEELER ENVIRONMENTAL CORP.
133 FEDERAL STREET,
BOSTON, MASACHUSETTS

NEW BEDFORD HARBOR SUPER FUND SITE
NEW BEDFORD, MASSACHUSETTS

CDF-A
SUBSURFACE EXPLORATION
LOCATION PLAN

FIGURE
1-3



NOTES:
1. SEE FIGURE 2-6 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'

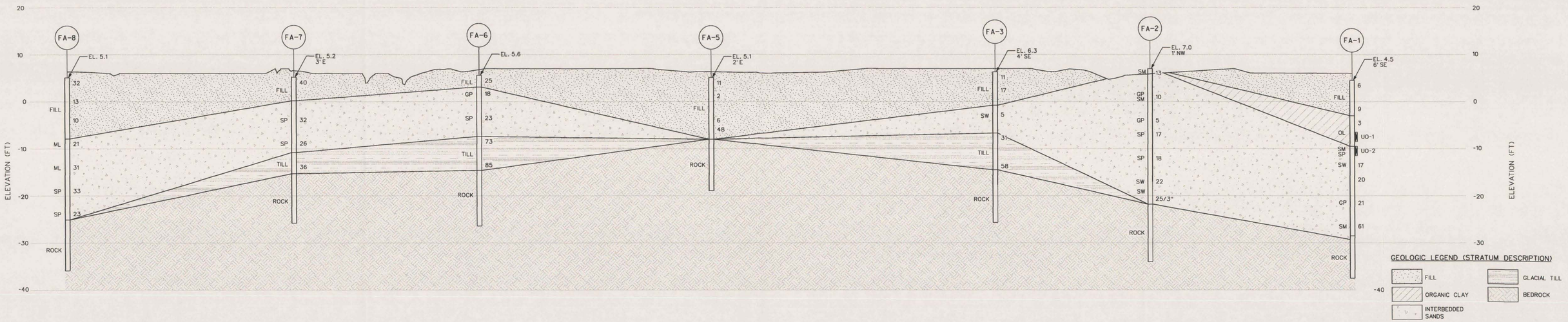
FIGURE 2-1

NEW BEDFORD HARBOR SUPERFUND SITE
NEW BEDFORD, MASSACHUSETTS

CDF A
SUBSURFACE PROFILE
CENTERLINE OF DIKE

SCALE: NOTED

17J102F.dgn



GEOLOGIC LEGEND (STRATUM DESCRIPTION)

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

NOTES:
1. SEE FIGURE 2-6 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'

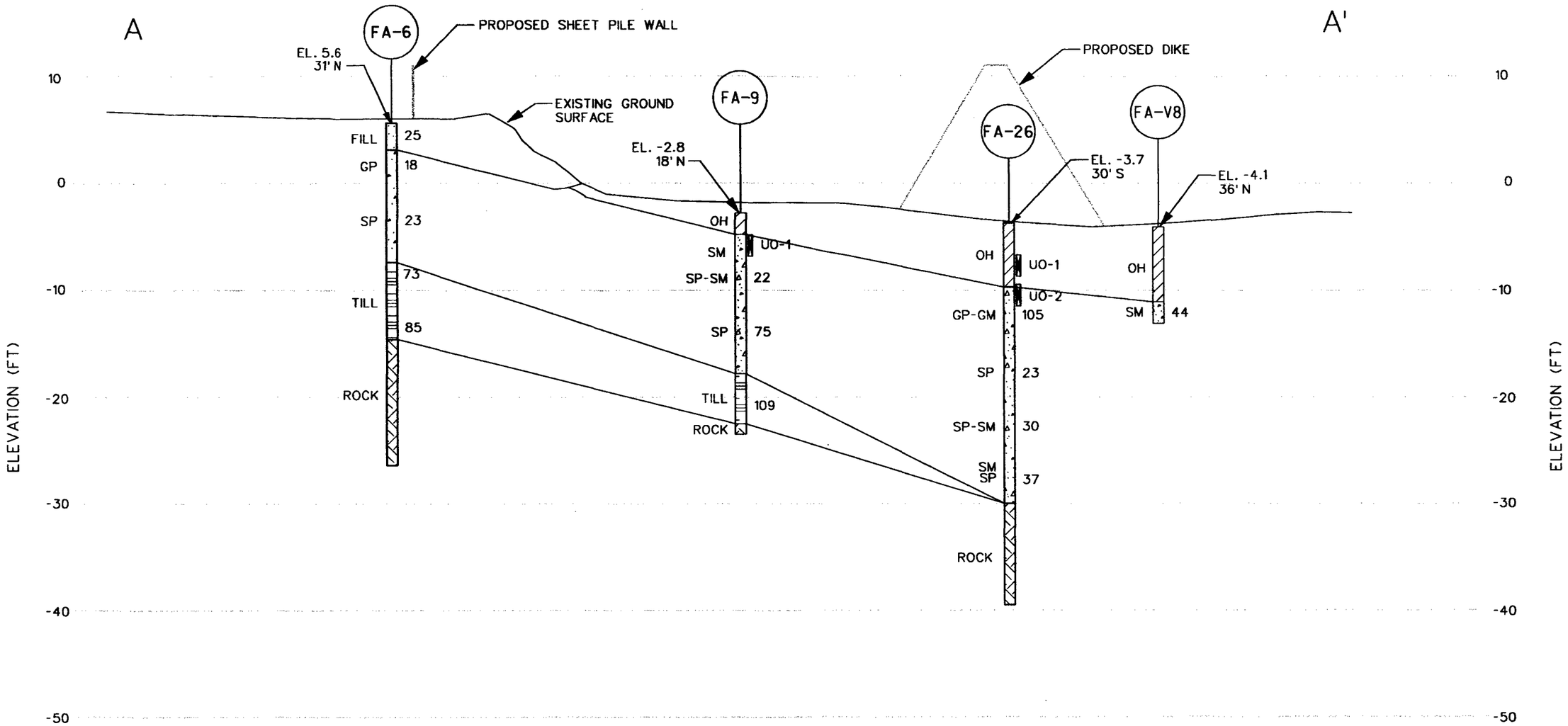
FIGURE 2-2

NEW BEDFORD HARBOR SUPERFUND SITE
NEW BEDFORD, MASSACHUSETTS

CDF A
SUBSURFACE PROFILE
SHEET PILE WALL ALIGNMENT

SCALE: NOTED

17J103F.dgn



NOTES:

1. SEE FIGURE 2-6 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'

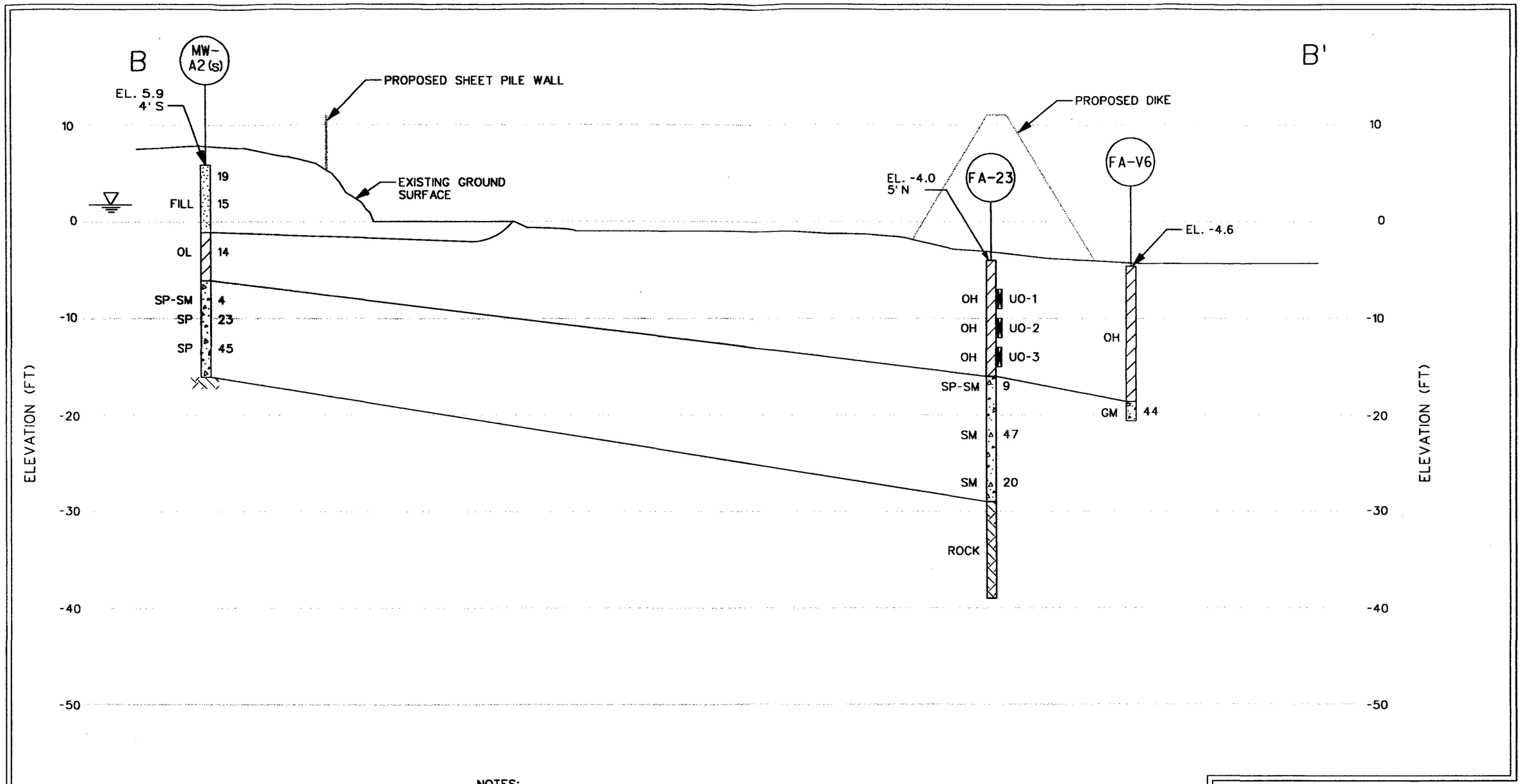
FIGURE 2-3

NEW BEDFORD HARBOR SUPERFUND SITE
NEW BEDFORD, MASSACHUSETTS

CDF A
SUBSURFACE SECTION
A – A'

SCALE: NOTED

17J104F.dgn



GEOLOGIC LEGEND (STRATUM DESCRIPTION)

- FILL
- INTERBEDDED SANDS
- ORGANIC CLAY
- BEDROCK

NOTES:

1. SEE FIGURE 2-6 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'

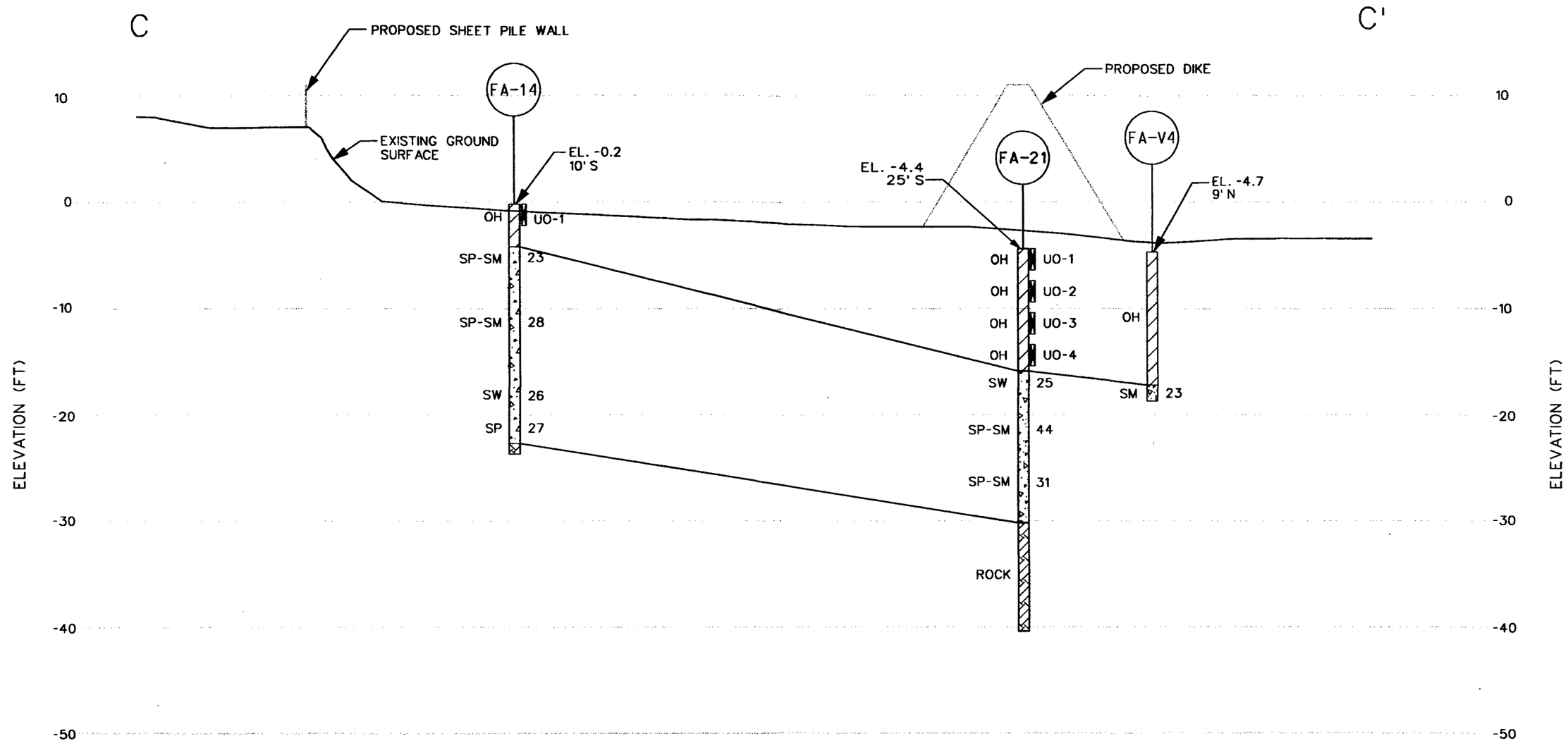
FIGURE 2-4

NEW BEDFORD HARBOR SUPERFUND SITE
NEW BEDFORD, MASSACHUSETTS

CDF A
SUBSURFACE SECTION
B – B'

SCALE: NOTED

17J105F.dgn



GEOLOGIC LEGEND (STRATUM DESCRIPTION)

- ORGANIC CLAY
- BEDROCK
- INTERBEDDED SANDS

NOTES:

1. SEE FIGURE 2-6 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 2-5

NEW BEDFORD HARBOR SUPERFUND SITE
NEW BEDFORD, MASSACHUSETTS

CDF A
SUBSURFACE SECTION
C – C'

SCALE: NOTED

17J106F.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:

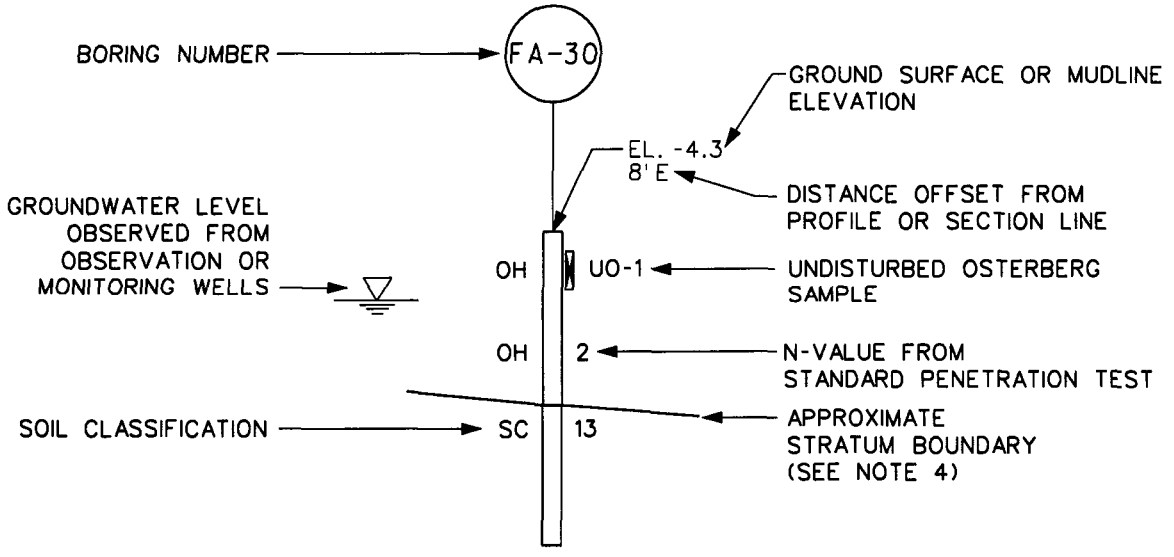


FIGURE 2-6

NEW BEDFORD HARBOR SUPERFUND SITE
NEW BEDFORD, MASSACHUSETTS

CDF A
GENERAL NOTES AND LEGEND FOR SUBSURFACE PROFILES AND SECTIONS

NOT TO SCALE

17j101f.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. FA - 1 SHEET 1 of 3 FILE NO. 48138.07 CHKD. BY C. Thunberg / J.Trottier

Boring Co.	Atlantic Testing Laboratories, Limited	Boring Location	northing 2706560.0	easting 815394.8	
Driller	M. Childs	Ground Surface El.	4.50	Datum	NGVD
Logged By	S. Harding	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 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-1	24/0	0-2	3-2-4-2	6	No recovery, re-sampled.		
1	spin	S-1	24/10	0-2	2-3-3-2	6	3 in Topsoil with piece of concrete (FILL)		
							7 in. Silty sand (SM); loose, 37% fine sand, 21% medium sand, 8% coarse sand, 9%		1
2	spin						gravel, 25% silt. (FILL)		
							Advance HW drill casing to 3 ft.	FILL	
3	spin						Advance 3-7/8 in. roller bit to 5 ft.		
4	spin								
5	spin								
		S-2	24/2	5-7	5-4-5-5	9	Poorly graded gravel with sand (GP); loose, 80% gravel, 10% fine sand, 10% medium		
6	spin						sand. (FILL)		
							Advance HW drill casing to 7 ft.		
7	spin						Advance 3-7/8 in. roller bit to 8 ft.		
							Estimated strata change at 7.5 ft.		
8	spin								
		S-3	24/14	8-10	2-1-2-2	3	Organic soil (OL); wet, soft, 60% organic silt, 35% root matter, 5% fine sand, strong	OL	
9	spin						organic odor, brown.		
							Advance 3-7/8 in. roller bit to 11 ft for piston sample.		
10	spin						2 ft of cave-in at 11 ft.		
							Advance HW drill casing to 10 ft.		
11	spin						Advance 3-7/8 in. roller bit to 11 ft for second attempt.		
		UO-1	24/24	11-13	–	–	Sandy silt (ML); wet, 52% non-plastic silt, 22% medium sand, 17% fine sand, 9% coarse	ML	1
12	spin						sand, root matter, brown.		
							Advance HW drill casing to 13 ft.		
13	spin						Advance 3-7/8 inch roller bit to 14 ft.		
14	spin								
		UO-2	24/16	14-16	–	–	UO-2A: Silty sand (SM); moist, 5% coarse sand, 10% medium sand, 55% fine sand,	SM	
15	spin						5% gravel, 20% silt, 5% root matter, dark brown. (8 in.)		
							UO-2B: Poorly graded sand with gravel (SP); wet, 10% coarse sand, 20% medium sand,	SP	
16	spin						50% fine sand, 20% gravel, brown. (8 in.)		
							Switch to mud rotary drilling techniques at 16 ft.		
17	spin						Advance HW drill casing to 16 ft.		
		S-4	24/12	17-19	6-8-9-9	17	Advance 3-7/8 in. roller bit to 17 ft.	SW	
18	spin						S-4: Well-graded sand with gravel (SW); wet, medium dense, 30% coarse sand, 25% gravel,		
							20% fine sand, 20% medium sand, 5% silt, gray.		
19	spin						Advance HW drill casing to 23 ft.		
							Advance 3-78 in. roller bit to 25 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) Sample description based on laboratory test data and ASTM D2487. Refer to Test Report No. 7, prepared by GeoTesting Express, dated January 24, 2000.
2) Substantial water/mud loss at 30 to 32 ft.
3) Substantial water loss during coring from 33 to 37 ft.
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. FA - 1 SHEET 2 of 3 FILE NO. 48138.07 CHKD. BY C. Thunberg / J.Trottier

Boring Co.	Atlantic Testing Laboratories, Limited	Boring Location	northing 2706560.0	easting 815394.8	
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Logged By	S. Harding	Date Start	8/4/99	Date End	8/4/99

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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
21	spin								
22	spin								
23	spin								
24	spin								
25	spin								
26	spin	S-5	24/4	25-27	10-7-14-17	21	Poorly graded gravel (GP); wet, medium dense, 85% gravel, 10% fine sand, 5% silt, gray.	GP	
27	spin						Advance HW drill casing to 28 ft. Advance 3-7/8 in. roller bit to 30 ft.		
28	spin								
29	spin								
30	spin								
31	spin	S-6	24/12	30-32	18-22-39-35	61	Silty sand with gravel (SM); wet, very dense, 18% medium sand, 15% coarse sand, 15% fine sand, 38% gravel, 14% silt, gray. Possible weathered rock.	SM	1, 2
32	spin		CORE		CORE		Advance HW drill casing to 33 ft. Advance 3-7/8 in. roller bit to 33 ft.		
33	spin		INTERVAL		TIME		Refusal at 33 ft. Begin NX rock core at 33 ft.		
34	spin	R-1	33-34		4 min		R-1: 33-37 ft: Recovery = 42% RQD = 16% Non-competent material, weathered, rough, undulating, pieces of rock.	BEDROCK	3
35	spin		34-35		3 min		Problems at 37 ft., losing water/core refusal. Pull out core barrel - tip damaged - switched core barrels.		
36	spin		35-36		3 min		Fresh, medium hard, aphanitic GNEISS, low angle, close to moderately spaced, rough, planar, open joints.		
37	spin		36-37		4 min		Advance HW drill casing to 37 ft. Advance 3-7/8 in. roller bit to 37 ft.		
38		R-2	37-38		2 min		R-2: 37 - 42 ft: Recovery = 100% RQD = 85% Similar to R-1.		
39			38-39		2 min				
40			39-40		2 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) Sample description based on laboratory test data and ASTM D2487. Refer to Test Report No. 7, prepared by GeoTesting Express, dated January 24, 2000.
2) Substantial water/mud loss at 30 to 32 ft.
3) Substantial water loss during coring from 33 to 37 ft.
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. FA - 1 SHEET 3 of 3 FILE NO. 48138.07 CHKD. BY C. Thunberg / J.Trottier

Boring Co.	Atlantic Testing Laboratories, Limited	Boring Location	northing 2706560.0	easting 815394.8	
Driller	M. Childs	Ground Surface El.	4.50	Datum	NGVD
Logged By	S. Harding	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 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								BEDROCK	
			41-42		3 min				
42									
43							Boring terminated in bedrock at 42 ft.		
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:
1) Sample description based on laboratory test data and ASTM D2487. Refer to Test Report No. 7, prepared by GeoTesting Express, dated January 24, 2000.
2) Substantial water/mud loss at 30 to 32 ft.
3) Substantial water loss during coring from 33 to 37 ft.
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. FA - 2 SHEET 1 of 3 FILE NO. 48138.07 CHKD. BY C. Thunberg / J.Trottier

Boring Co.	Atlantic Testing Laboratories, Limited	Boring Location	northing 2706395.7	easting 815259.3	
Driller	M. Childs	Ground Surface El.	7.00	Datum	NGVD
Logged By	S. Harding	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 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

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	2-6-7-6	13	6 in. Topsoil, roots organic material.		
1	spin						2 in: Silty sand with gravel (SM); dry, medium dense, 60% fine sand, 20%	SM	
							silt, 20% gravel, brown.		
2	spin						Advance HW drill casing to 3 ft.		
							Advance 3-7/8 in. roller bit to 5 ft.		
3	spin								
4	spin								
5	spin								
		S-2	24/4	5-7	3-6-4-3	10	2 in: Poorly graded gravel (GP); loose, 90% gravel, 10% fine sand.	GP	
6	spin						2 in: Silty sand (SM); wet, 80% fine sand, 20% silt, red-brown.	SM	
							Advance HW drill casing to 8 ft.		
7	spin						Advance 3-7/8 in. roller bit to 10 ft.		
8	spin								
9	spin								
10	spin								
		S-3	24/2	10-12	2-3-2-8	5	Poorly graded gravel (GP); wet, loose, 90% gravel, 5% medium sand, 5% coarse	GP	1
11	spin						sand, gray-brown.		
							Advance HW drill casing to 12 ft.		
12	spin						Advance 3-7/8 in. roller bit to 13 ft.		
13	spin								
		S-4	24/8	13-15	3-7-10-13	17	Poorly graded sand (SP); wet, medium dense, 90% fine sand,	SP	
14	spin						5% medium sand, 5% coarse sand, gray-brown.		
							Advance HW drill casing to 17 ft.		
15	spin						Advance 3-7/8 in. roller bit to 18 ft.		
16	spin								
17	spin								
18	spin								
		S-5	24/12	18-20	5-8-10-13	18	Poorly graded sand (SP); medium dense, 95% fine sand, 5% medium sand.	SP	2,3
19	spin						Advance HW drill casing to 18.5 ft.		
							Advance 3-7/8 in. roller bit 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) Did not observe any evidence of silt, clays, peat or other organic soils.
2) Continued sampling at 18 ft even though N >10 at S-4 to avoid 5 ft gap in sampling from 15 to 20 ft.
3) Continued at 5 ft sampling intervals from 13 ft.
4) Minimal loss of drilling water - appears to be a good seal.

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. FA - 2 SHEET 2 of 3 FILE NO. 48138.07 CHKD. BY C. Thunberg / J.Trottier

Boring Co.	Atlantic Testing Laboratories, Limited	Boring Location	northing 2706395.7	easting 815259.3	
Driller	M. Childs	Ground Surface El.	7.00	Datum	NGVD
Logged By	S. Harding	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 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

DEPTH	Casing Blows (ft)	Type & No.	PEN/REC (inches)	DEPTH (feet)	BLOWS PER 6 INCHES	SPT N-Value	SAMPLE DESCRIPTION	STRATUM DESCRIPTION	REMARKS
21	spin								
22	spin								
23	spin								
24	spin	S-6	24/12	23-25	13-13-9-9	22	Well-graded sand with gravel (SW); wet, medium dense, 40% gravel, 30% coarse sand, 20% medium sand, 10% fine sand, brown.	SW	
							Advance HW drill casing to 27.5 ft.		
25	spin						Advance 3-7/8 in. roller bit to 28 ft.		
26	spin								
27	spin								
28	spin								
29	spin	S-7	9/4	28-28.8	4-25/3 "	–	Well-graded sand with gravel (SW); 40% fine sand, 30% medium sand, 20% gravel, 10% coarse sand. (apparent crushed bedrock)	SW	
							Advance HW drill casing to 30 ft.		
30	spin						Advance 3-7/8 in. roller bit to 31 ft.	BEDROCK	
31			CORE INTERVAL		CORE TIME		Begin NX rock core at 31 ft.		
32		R-1	31-32		4 min		R-1: 31-36 ft Recovery = 58% RQD = 77% Fresh, moderately hard GNEISS, fine grained, low angle, rough,		4
33			32-33		3 min		fresh, planar, open joints.		
34			33-34		3 min				
35			34-35		2 min				
36			35-36		4 min				
37		R-2	36-37		3 min		R-2: 36 - 41 ft Recovery = 100% RQD = 90% Similar to R-1.		
38			37-38		3 min				
39			38-39		4 min				
40			39-40		4 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) Did not observe any evidence of silt, clays, peat or other organic soils.
2) Continued sampling at 18 ft even though N >10 at S-4 to avoid 5 ft gap in sampling from 15 to 20 ft.
3) Continued at 5 ft sampling intervals from 13 ft.
4) Minimal loss of drilling water - appears to be a good seal.

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. FA - 2 SHEET 3 of 3 FILE NO. 48138.07 CHKD. BY C. Thunberg / J.Trottier

Boring Co.	Atlantic Testing Laboratories, Limited	Boring Location	northing 2706395.7	easting 815259.3	
Driller	M. Childs	Ground Surface El.	7.00	Datum	NGVD
Logged By	S. Harding	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 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

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								BEDROCK	
42							Boring terminated in bedrock at 41 ft		
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:
1) Did not observe any evidence of silt, clays, peat or other organic soils.
2) Continued sampling at 18 ft even though N >10 at S-4 to avoid 5 ft gap in sampling from 15 to 20 ft.
3) Continued at 5 ft sampling intervals from 13 ft.
4) Minimal loss of drilling water - appears to be a good seal.

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. FA-3 SHEET 1 of 2 FILE NO. 48138.07 CHKD. BY C. Thunberg / J.Trottier

Boring Co.	Atlantic Testing Laboratories, Limited	Boring Location	northing 2706263.4	easting 815162.9	
Driller	R. Pryce	Ground Surface El.	6.30	Datum	NGVD
Logged By	R. Chase	Date Start	8/17/99	Date End	8/17/99

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

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	2-4-7-6	11	Poorly graded gravel with silt and sand (GP-GM); dry, medium dense,		
1	spin						50% fine gravel, 40% fine sand, 10% silt. (FILL)		
							Advance HW drill casing to 3 ft.		
2	spin								
3	spin								
		S-2	24/6	3-5	12-11-6-7	17	Similar to S-1, except wet.	FILL	
4	spin						Advance HW drill casing to 8 ft.		
5	spin								
6	spin								
							Encountered probable boulder from 6 to 7.1 ft		
7	spin						Estimated strata change at 7.1 ft.		
8	spin								
		S-3	24/4	8-10	6-4-1-1	5	Well-graded sand with gravel (SW); wet, loose, 40% fine sand, 25% medium sand,	SW	
9	spin						15% coarse sand, 15% fine gravel, 5% silt, gray.		
							Advance HW drill casing to 13 ft.		
10	spin								
11	spin								
12	spin								
13	spin								
		S-4	24/12	13-15	13-13-18-20	31	Silty sand (SM); wet, dense, 70% fine sand, 20% silt, 5% medium sand,	GLACIAL TILL	
14	spin						5% coarse sand, gray. (GLACIAL TILL)		
							Advance HW drill casing to 19 ft.		
15	spin								
16	spin								
17	spin								
18	spin								
19	spin								
		S-5	20/10	19-20.7	12-30-28-50/2"	58	Well-graded gravel with silt and sand (GW-GM); wet, very dense, 47% gravel, 17%		1
20	spin						medium sand, 14% fine sand, 11% coarse sand, 11% silt, gray. Bedrock noted in tip		

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. 7, prepared by GeoTesting Express, dated January 24, 2000.
2) Boring grouted from 0 to 32 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. FA-3 SHEET 2 of 2 FILE NO. 48138.07 CHKD. BY C. Thunberg / J.Trottier

Boring Co.	Atlantic Testing Laboratories, Limited	Boring Location	northing 2706263.4	easting 815162.9	
Driller	R. Pryce	Ground Surface El.	6.30	Datum	NGVD
Logged By	R. Chase	Date Start	8/17/99	Date End	8/17/99

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

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
							of sampler. (GLACIAL TILL)	GLACIAL TILL	
21	spin						Top of bedrock at 20.8 ft.		
			CORE		CORE		Advance 3-7/8 in. roller bit to 22.0 ft.	BEDROCK	
22	spin		INTERVAL		TIME		Advance HW drill casing to 21.5 ft.		
		R-1	22-23		10 min		Begin NX rock core at 22 ft.		
23							R-1: 22 - 27 ft: Recovery = 98% RQD = 90%		
			23-24		7 min		Fresh medium hard; gray, aphanitic, GNEISS with low angle, very close spacing,		
24							rough, planar, fresh open joints.		
			24-25		6.5 min				
25									
			25-26		8.75 min				
26									
			26-27		7.75 min				
27									
		R-2	27-28		6 min		R-2: 27 - 32 ft: Recovery = 97% RQD = 100%		
28							Similar to R-1.		
			28-29		7 min				
29									
			29-30		7 min				
30									
			30-31		7.25 min				
31									
			31-32		8.3 min				
32									
							Boring terminated in bedrock at 32 ft.		2
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. 7, prepared by GeoTesting Express, dated January 24, 2000.
2) Boring grouted from 0 to 32 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. FA-5 SHEET 1 of 2 FILE NO. 48138.07 CHKD. BY C. Thunberg / J.Trottier

Boring Co.	Atlantic Testing Laboratories, Limited	Boring Location	northing 2706004.8 easting 815042.1
Driller	R. Pryce	Ground Surface El.	5.10 Datum NGVD
Logged By	R. Chase	Date Start	8/11/99 Date End 8/11/99

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 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	REMKS
		S-1	24/5	0-2	3-4-7-5	11	Poorly graded sand with silt (SP-SM); dry, medium dense, 50% fine sand, 40% brick,		
1	spin						10% silt (FILL)		
							Advance HW drill casing to 3 ft.		
2	spin								
								FILL	
3	spin								
		S-2	24/7	3-5	2-1-1-3	2	Poorly graded sand (SP); wet, very loose, 25% fine sand, 20% medium sand,		
4	spin						25% coarse sand, 20% wood, 10% concrete, brown. (FILL).		
5	spin								
6	spin								
7	spin								
8	spin								
		S-3	24/16	8-10	2-1-5-8	6	Silty sand (SM); wet, loose, 60% fine sand, 10% medium sand, 20% silt, 10% root matter,		
9	spin						brown. (FILL)		
10	spin								
		S-4	24/24	10-12	17-19-29-25	48	Silty sand with gravel (SM); wet, dense, 40% fine sand, 10% medium sand, 20% gravel,		
11	spin						20% silt, 5% root matter, 5% concrete. (FILL)		
12	spin								
13	spin								
		S-5	2/1	13-13.2	50/2"	–	Poorly graded gravel (GP); wet, very dense, 60% gravel, 10% coarse sand,		
14			CORE		CORE		30% concrete. (FILL)	BEDROCK	
			INTERVAL		TIME		Estimated strata change at 13.1 ft. Top of bedrock at 13.1 ft.		
15		R-1	14-15		9.5 min		Advance 3-7/8 in. roller bit to 14 ft.		
							Begin NX rock core at 14 ft.		
16			15-16		7.0 min				
							R-1: 14 - 19 ft. Recovery = 100% RQD = 52%		
17			16-17		7.5 min		Slightly weathered, medium hard, gray, aphanitic GNEISS with low angle, close spacing,		
							rough planar to undulating, decomposed to fresh, open joints.		
18			17-18		10.0 min				
19			18-19		11.5 min				
20		R-2	19-20		9.5 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) Boring grouted from 0 to 24 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. FA-5 SHEET 2 of 2 FILE NO. 48138.07 CHKD. BY C. Thunberg / J.Trottier

Boring Co.	Atlantic Testing Laboratories, Limited	Boring Location	northing 2706004.8 easting 815042.1
Driller	R. Pryce	Ground Surface El.	5.10 Datum NGVD
Logged By	R. Chase	Date Start	8/11/99 Date End 8/11/99

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 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	REMKS
21			20-21		8 min		R-2: 19 - 24 ft. Recovery = 100% RQD = 83% Fresh, medium hard, gray, aphanitic GNEISS with low angle, very close to close spacing, rough, planar, fresh, open joints.	BEDROCK	
22			21-22		7.83 min				
23			22-23		9.5 min				
24			23-24		9 min				
25							Boring terminated in bedrock at 24 ft.		1
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 grouted from 0 to 24 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. FA-6 SHEET 1 of 2 FILE NO. 48138.07 CHKD. BY C. Thunberg / J.Trottier

Boring Co.	Atlantic Testing Laboratories, Limited	Boring Location	northing 2705852.0 easting 814935.8		
Driller	R. Pryce	Ground Surface El.	5.60	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" 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	19/10	0-1.6	5-9-16-50/1"	25	Poorly graded sand with silt and gravel (SP-SM); dry, medium dense, 19% fine sand, 16%		1
1	spin						medium sand, 11% coarse sand, 45% gravel, 9% silt, gray. Traces of wood noted in		
							sample. (FILL)	FILL	
2	spin						Advance HW casing to 3 ft.		
							Estimated strata change at 2.5 ft.		
3	spin								
		S-2	24/2	3-5	12-9-9-6	18	Poorly graded gravel with sand (GP); wet, medium dense, 80% fine gravel, 5% fine sand,	GP	
4	spin						15% medium sand, gray.		
							Advance HW drill casing to 8 ft.		
5	spin								
6	spin								
7	spin								
8	spin								
		S-3	24/9	8-10	8-8-15-19	23	Poorly graded sand with gravel (SP); medium dense, 50% fine sand, 20% medium sand,	SP	2
9	spin						25% fine gravel, 5% silt, gray.		
							Switch to mud rotary drilling techniques at 8 ft.		
10	spin						Advance 3-7/8 in. roller bit to 13 ft.		
11	spin								
12	spin								
13	spin						Approx. 1 ft. of run-in sands at 13 ft.		
		S-4	24/12	13-15	16-38-35-29	73	Advance HW drill casing to 13 ft.	GLACIAL	3
14	spin						S-4: Silty sand (SM); very dense, 24% fine sand, 16% medium sand, 5% coarse sand, 7%	TILL	1
							gravel, 48% silt, gray. (GLACIAL TILL)		
15	spin						Resume mud rotary drilling techniques at 13 ft		
							Advance 3-7/8 in. roller bit to 18 ft.		
16	spin								
17	spin								
18	spin								
		S-5	24/11	18-20	22-27-58-38	85	Similar to S-4. (GLACIAL TILL)		
19	spin						Advance 3-7/8 in. roller bit to 22 ft.		
							Probable bedrock encountered at 20.2 ft.		
20	spin						Advance HW drill casing to 22 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. 7, prepared by GeoTesting Express, dated January 24, 2000.
2) Began mud rotary drilling techniques at 8 ft. Mud didn't work
3) Restart mud rotary drilling techniques at 13 ft.
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. FA-6 SHEET 2 of 2 FILE NO. 48138.07 CHKD. BY C. Thunberg / J.Trottier

Boring Co.	Atlantic Testing Laboratories, Limited	Boring Location	northing 2705852.0 easting 814935.8
Driller	R. Pryce	Ground Surface El.	5.60 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" 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
21	spin								
			Core		Core				
22	spin		Interval		Time		Begin NX rock core at 22 ft.		
		R-1	22-23		7 min		R-1: 22-27 ft. Recovery = 100% RQD = 73%	BEDROCK	
23							Fresh, medium hard, gray, aphanitic GNEISS with low angle close spacing, rough,		
			23-24		5.5 min		planar, fresh, open joints.		
24									
			24-25		5.5 min				
25									
			25-26		5.5 min				
26									
			26-27		6.25 min				
27									
		R-2	27-28		4.75 min		R-2: 27-32 ft. Recovery = 100% RQD = 85%		
28							Similar to R-1.		
			28-29		5 min				
29									
			29-30		5.75 min				
30									
			30-31		4.25 min				
31									
			31-32		5 min				
32									
							Boring terminated in bedrock at 32 ft.		
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. 7, prepared by GeoTesting Express, dated January 24, 2000.
2) Began mud rotary drilling techniques at 8 ft. Mud didn't work
3) Restart mud rotary drilling techniques at 13 ft.
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. FA-7 SHEET 1 of 2 FILE NO. 48138.07 CHKD. BY C. Thunberg / J.Trottier

Boring Co.	Atlantic Testing Laboratories, Limited	Boring Location	northing 2705666.6 easting 814872.5		
Driller	R. Pryce	Ground Surface El.	5.15	Datum	NGVD
Logged By	R. Chase	Date Start	8/12/99	Date End	8/18/99

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

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	24/18	0-2	29-25-15-15	40	Poorly graded sand (SP); dry, dense, 75% fine sand, 15% medium sand, 5% coarse		1
1	spin						sand, <5% silt, trace ash noted in sample, dark gray. (FILL)		
							Advance HW drill casing to 3 ft.		
2	spin							FILL	
3	spin								
		S-2	5/5	3-3.4	50/5"	–	Poorly graded sand (SP); wet, 70% fine sand, 10% medium sand,		
4	spin						10% fine gravel, 5% coarse sand, <5% silt, trace ash, black. (FILL)		
							Advance HW drill casing to 8 ft.		
5	spin						Probable boulder encountered from 3.5 to 5 ft.		
							Estimated strata change at 5 ft.		
6	spin								
7	spin								
8	spin								
		S-3	24/6	8-10	10-25-7-11	32	Poorly graded sand with gravel (SP); wet, dense, 50% fine sand, 30% fine gravel,	SP	
9	spin						10% coarse sand, 5% medium sand, 5% silt, gray.		
							Advance HW drill casing to 13 ft.		
10	spin								
11	spin								
12	spin								
13	spin								
		S-4	24/13	13-15	26-11-15-18	26	Poorly graded sand (SP); wet, medium dense, 85% fine sand, 5% medium sand,	SP	
14	spin						5% coarse sand, 5% silt, brown.		
							Advance HW drill casing to 18 ft.		
15	spin								
16	spin								
17	spin								
18	spin								
		S-5	24/15	18-20	11-18-18-21	36	Silty sand (SM); wet, dense, 85% fine sand, 15% silt, gray. (GLACIAL TILL)	GLACIAL TILL	
19	spin						Advance HW drill casing to 21 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) 0 to 3 ft. performed with CME 75 truck mount using 4" I.D. (HW) flush joint casing, 3- 7/8" roller bit. Spin & wash.
2) Boring grouted from 0 to 31 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. FA-7 SHEET 2 of 2 FILE NO. 48138.07 CHKD. BY C. Thunberg / J.Trottier

Boring Co.	Atlantic Testing Laboratories, Limited	Boring Location	northing 2705666.6 easting 814872.5
Driller	R. Pryce	Ground Surface El.	5.15 Datum NGVD
Logged By	R. Chase	Date Start	8/12/99 Date End 8/18/99

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

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
			CORE		CORE		Top of bedrock at 20.5 ft.		
21	spin		INTERVAL		TIME		Begin NX rock core at 21.0 ft.	BEDROCK	
		R-1	21-22		7 min				
22							R-1: 21-26 ft. Recovery = 93%, RQD = 84%		
			22-23		8.5 min		Fresh, medium hard, aphanitic, GNEISS with low angle close to moderately spaced,		
23							rough, planar, fresh to decomposed open joints.		
			23-24		11 min		Quartz intrusions.		
24									
			24-25		10.75 min				
25									
			25-26		11.25 min				
26									
		R-2	26-27		12 min		R-2: 26 - 31 ft. Recovery = 98%, RQD = 71%		
27							Similar to R-1, except, feldspar intrusions.		
			27-28		9 min				
28									
			28-29		9 min				
29									
			29-30		12 min				
30									
			30-31		15 min				
31									
							Boring terminated in bedrock at 31 ft.		2
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) 0 to 3 ft. performed with CME 75 truck mount using 4" I.D. (HW) flush joint casing, 3- 7/8" roller bit. Spin & wash.
2) Boring grouted from 0 to 31 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. FA - 8 SHEET 1 of 3 FILE NO. 48138.07 CHKD. BY C. Thunberg / J.Trottier

Boring Co.	Atlantic Testing Laboratories, Limited	Boring Location	northing 2705439.4 easting 814797.3		
Driller	R. Pryce	Ground Surface El.	5.10	Datum	NGVD
Logged By	R. Chase	Date Start	7/30/99	Date End	8/2/99

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	24/12	0-2	4-15-17-9	32	Poorly graded sand (SP); dense, dry, 80% fine sand, 10% medium sand,		
1	spin						5% coarse sand, 5% silt, brown. (FILL)		
							Advance HW drill casing to 4 ft.		
2	spin								
3	spin								
							Drilled through probable boulder from 3 to 4 ft.		
4	spin								
		S-2	24/9	4-6	6-7-6-6	13	Poorly graded sand with silt (SP-SM); medium dense, 70% fine sand,		
5	spin						10% medium sand, 10% silt, 10% brick, gray-red. (FILL)		
							Advance HW drill casing to 8 ft.		
6	spin								
7	spin							FILL	
8	spin								
		S-3	24/4	8-10	13-6-4-5	10	Poorly graded sand (SP); loose, 75% fine sand, 10% medium sand, 5% coarse		
9	spin						sand, 5% fine gravel, 5% silt, brown. (FILL)		
							Advance HW drill casing to 13 ft.		
10	spin								
11	spin								
12	spin								
13	spin								
		S-4	24/17	13-15	12-10-11-12	21	Silt with sand (ML); very stiff, 82% silt, 17% fine sand, 1% medium sand, gray.	ML	1
14	spin						Switch to mud rotary drilling techniques at 13 ft.		
							Estimated strata change at 13 ft.		
15	spin						Advance 3-7/8 in. roller bit to 18 ft.		
16	spin								
17	spin								
18	spin								
		S-5	24/13	18-20	11-16-15-18	31	Similar to S-4, except becomes dense.	ML	
19	spin						4 in. layer of iron stained fine sand noted, gray-orange.		
							Advance 3-7/8 in. roller bit 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) Sample description based on laboratory test data and ASTM D2487. Refer to Test Report No. 7, prepared by GeoTesting Express, dated January 24, 2000.
2) Boring grouted from 0 to 41 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. FA - 8 SHEET 2 of 3 FILE NO. 48138.07 CHKD. BY C. Thunberg / J.Trottier

Boring Co.	Atlantic Testing Laboratories, Limited	Boring Location	northing 2705439.4 easting 814797.3
Driller	R. Pryce	Ground Surface El.	5.10 Datum NGVD
Logged By	R. Chase	Date Start	7/30/99 Date End 8/2/99

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
21	spin								
22	spin								
23	spin								
24	spin	S-6	24/15	23-25	16-13-20-21	33	Poorly graded sand with gravel (SP); dense, 50% fine sand, 25% fine gravel, 10% medium sand, 10% coarse sand, 5% silt, gray.	SP	
25	spin						Advance 3-7/8 in. roller bit to 28 ft.		
26	spin								
27	spin								
28	spin						Borehole collapsed. Advance HW drill casing to 28 ft.		
29	spin	S-7	24/7	28-30	22-13-10-10	23	Poorly graded sand (SP); medium dense, 45% medium sand, 40% coarse sand, 5% fine sand, 5% fine gravel, <5% silt, brown.	SP	
30	spin						Advance HW drill casing to 30 ft.		
31							Top of bedrock at 30.2 ft. Advance 3-7/8 in. roller bit to 31 ft.	BEDROCK	
32		S-8	0/0	31	50/0"	–	No recovery.		
			CORE		CORE		Begin NX rock core at 31 ft.		
			INTERVAL		TIME				
33		R-1	31-32		8 MIN		R-1: 31 - 36 ft. Recovery = 100%, RQD = 95%		
34			32-33		6 min		2.1 ft., fresh, medium hard, gray, aphanitic GNEISS with low angle, close, spacing, rough, planar, fresh, open joints.		
35			33-34		6.5 min		2.9 ft., fresh, medium hard, pink, medium grained GRANITE with low angle, close spacing, rough, planar, fresh, open joints.		
36			34-35		10.5 min				
37			35-36		18 min				
38		R-2	36-37		12 min		R-1: 36 - 41 ft. Recovery = 100%, RQD = 100%		
39			37-38		5.5 min		7 in., fresh, medium, hard, pink, medium grained GRANITE with low angle, close spacing, rough, planar, fresh, very tight joints.		
40			38-39		6 min		53 in, fresh, medium hard, gray, aphanitic GNEISS with low angle, close to moderate spacing, rough, planar, fresh, open 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 laboratory test data and ASTM D2487. Refer to Test Report No. 7, prepared by GeoTesting Express, dated January 24, 2000.
2) Boring grouted from 0 to 41 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. FA - 8 SHEET 3 of 3 FILE NO. 48138.07 CHKD. BY C. Thunberg / J.Trottier

Boring Co.	Atlantic Testing Laboratories, Limited	Boring Location	northing 2705439.4 easting 814797.3		
Driller	R. Pryce	Ground Surface El.	5.10	Datum	NGVD
Logged By	R. Chase	Date Start	7/30/99	Date End	8/2/99

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
			39-40		5.5 min				
41									
			40-41		6 min				
42							Boring terminated in bedrock at 41 ft.		2
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:
1) Sample description based on laboratory test data and ASTM D2487. Refer to Test Report No. 7, prepared by GeoTesting Express, dated January 24, 2000.
2) Boring grouted from 0 to 41 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. FA-9 SHEET 1 of 1 FILE NO. 48138.07 CHKD. BY C. Thunberg / J.Trottier

Boring Co.	Atlantic Testing Laboratories, Limited	Boring Location	northing 2705746.8 easting 815060.7
Driller	P. Davis	Mudline El.	-2.82 Datum NGVD
Logged By	E. Paddleford	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 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 2 ft.		
1	Push						Advance 3-7/8 in. roller bit from 0 to 2 ft.		
	Hyd								
2	Push								
	Hyd	UO-1	24/24	2-4	–	–	Silty sand with gravel (SM); 25% fine sand, 18% medium sand, 8% coarse sand, 21%	SM	1
3	Push						gravel, 28% silt, organic odor, dark gray. Shell fragments noted in tip of sample tube,		
	Hyd						Advance HW drill casing to 4 ft.		
4	Push						Advance 3-7/8 in. roller bit to 4 ft.		
	Hyd						Perform borehole permeability test at 4.2 ft.		
5	Push						Advance HW drill casing to 5 ft.		
		UO-2	24/0	5-7	–	–	Advance 3-7/8 in. roller bit to 5 ft.	SP-SM	
6	13	S-1	24/12	5-7	18-6-16-33	22	UO-2: No recovery.		
							S-1: Poorly graded sand with silt (SP-SM); medium dense, 47% medium sand, 22% coarse		1
7	38						sand, 21% fine sand, 5% gravel, 5% silt, brown.		
							Advance HW drill casing to 7 ft.		
8	Drop						Advance 3-7/8 in. roller bit to 7 ft.		
							Perform borehole permeability test at 7.4 ft.		
9	Drop						Switch to mud rotary drilling techniques at 7 ft.		
							Advance 3-7/8 in. roller bit to 10 ft.		
10	Drop								
		S-2	24/16	10-12	37-37-38-51	75	Poorly graded sand (SP); very dense, 75% fine sand, 10% coarse sand,	SP	
11	7						5% medium sand, 5% gravel, 5% silt, olive gray.		
							Mix additional bentonite and EZ mud drilling mud.		
12	20						Advance 3-7/8 in. roller bit to 15 ft.		
13	37								
14	24								
15	58								
		S-3	24/12	15-17	54-80-29-25	109	Poorly graded sand with silt (SP-SM); very dense, 65% fine sand, 10% coarse	GLACIAL	
16							sand, 10% gravel, 10% silt, 5% medium sand, olive gray. (GLACIAL TILL)	TILL	
							HW drill casing dropped to 10 ft. under its own weight		
17							Advance HW drill casing to 15 ft.		
							Advance 3-7/8 in. roller bit to 20.7 ft.		
18							Losing water to borehole.		
19									
							Probable bedrock at 19.7 ft. Roller bit 1 ft into rock.		
20							Bottom of exploration at 20.7 ft. Boring terminated in probable bedrock.	BEDROCK	

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. 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. FA-12 SHEET 1 of 2 FILE NO. 48138.07 CHKD. BY C. Thunberg / J.Trottier

Boring Co.	Atlantic Testing Laboratories, Limited	Boring Location	northing 2706120.2 easting 815190.6
Driller	P. Davis	Mudline El.	-0.73 Datum NGVD
Logged By	E. Paddleford	Date Start	9/15/99 Date End 9/16/99

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 from 0 to 1 ft.		
1	push						Advance 3-7/8 in. roller bit from 0 to 1 ft. Wash water black, organic odor.		
	hyd	UO-1	24/24	1-3	--	--	Organic soil (OH); organic silt and clay, trace shell fragments, trace fine sand noted	OH	
2	push						in tip of sample tube.		
	hyd						Advance HW drill casing to 4 ft. (hydraulic push)		
3	push						Advance 3-7/8 in. roller bit to 4 ft.		
	hyd						Perform borehole permeability test at 3.9 ft.		
4	push								
	hyd	UO-2	24/24	4-6	--	--	Sandy organic clay (OH); 59% organic clay, 24% fine sand, 9% medium sand, 3% coarse	OH	1
5	push						sand, 5% gravel, black.		
	hyd						Advance HW drill casing to 7 ft. (hydraulic push)		
6	push						Advance 3-7/8 in. roller bit to 7 ft.		
	hyd								
7	push								
	hyd	UO-3	24/24	7-9	--	--	Elastic silt (MH); moist, silt with organics, dark gray.	MH	2
8	push						Advance HW drill casing to 10 ft. (hydraulic push)		
	hyd						Advance 3-7/8 in. roller bit to 10 ft.		
9	push								
	hyd								
10	push						Estimated strata change at 10 ft. based on laboratory test data.		
		UO-4	24/24	10-12	--	--	Moist, dark gray sand. (non-plastic)		2
11	9								
12	14								
		S-1	24/10	12-14	2-8-16-20	24	Poorly graded sand with silt and gravel (SP-SM); medium dense, 31% medium sand, 14%	SP-SM	1
13	16						fine sand, 9% coarse sand, 40% gravel, 6% silt, gray-green.		
							Advance HW drill casing to 14 ft.		
14	57						Advance 3-7/8 in. roller bit to 14 ft.		
							Perform borehole permeability test at 14.3 ft.		
15	18						Switch to mud rotary drilling techniques at 14 ft.		
							Advance 3-7/8 in. roller bit to 19 ft.		
16	23								
17	78								
18	82								
19	47								
		S-2	24/9	19-21	19-18-22-17	40	Silty sand (SM); dense, 35% fine sand, 25% coarse sand, 20% silt, 10% gravel,	GLACIAL TILL	
20							10% medium sand, gray. (GLACIAL TILL)		

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. 7, prepared by GeoTesting Express, dated January 24, 2000.
2) Sample description based on Atterberg Limits laboratory test data. Refer to Test Report No. 7, prepared by GeoTesting Express, dated January 24, 2000.
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. FA-12 SHEET 2 of 2 FILE NO. 48138.07 CHKD. BY C. Thunberg / J.Trottier

Boring Co.	Atlantic Testing Laboratories, Limited	Boring Location	northing 2706120.2	easting 815190.6	
Driller	P. Davis	Mudline El.	-0.73	Datum	NGVD
Logged By	E. Paddleford	Date Start	9/15/99	Date End	9/16/99

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
21							Advance HW drill casing to 19 ft. Mix additional EZ mud to drilling mud mixture.		
22							Advance 3-7/8 in. roller bit to 24 ft.	GLACIAL TILL	
23									
24									
25		S-3	15/10	24-25.3	22-62-100/3"	–	Poorly graded sand (SP); 50% fine sand, 30% medium sand, 15% coarse sand, 5% silt, olive-green. Weathered rock in bottom 4 in. of sampler. (GLACIAL TILL)		
26							Advance 3-7/8 in. roller bit to 27 ft. Probable bedrock encountered at 26.2 ft.		
27								PROBABLE BEDROCK	
28							Bottom of exploration at 27 ft; boring terminated in probable bedrock.		
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) Sample description based on laboratory test data and ASTM D2487. Refer to Test Report No. 7, prepared by GeoTesting Express, dated January 24, 2000.
2) Sample description based on Atterberg Limits laboratory test data. Refer to Test Report No. 7, prepared by GeoTesting Express, dated January 24, 2000.
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. FA-13 SHEET 1 of 2 FILE NO. 48138.07 CHKD. BY C. Thunberg / J.Trottier

Boring Co.	Atlantic Testing Laboratories, Limited	Boring Location	northing 2706086.8	easting 815279.3	
Driller	P. Davis	Mudline El.	-1.80	Datum	NGVD
Logged By	E. Paddleford	Date Start	11/2/99	Date End	11/2/99

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); 90% organic clay/silt, 5% shell fragments, 5% fine sand,	OH	
1	Push						dark gray. Sample description from tip of tube.		
	Hyd.						Advance HW drill casing from 0 to 5 ft.		
2	Push						Advance 3-7/8 in. roller bit from 0 to 5 ft.		
	Hyd.								
3	Push								
	Hyd.								
4	Push								
	Hyd.								
5	Push								
	Hyd.	S-1	24/14	5-7	WOR/24"	--	Organic soil (OH), 90% organic clay/silt, 10% fine sand, dark gray.	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	24/12	10-12	WOH-10-12-8	22	S-2A 6 in: Organic soil (OH); 85% organic clay/silt, 15% fine sand, dark gray	OH	
11	Push						S-2B 6 in: Well-graded sand (SW); medium dense, 40% fine sand, 30%		
							medium sand, 15% coarse sand, 10% gravel, 5% silt.	SW	
12	21						Estimated strata change at 10.5 ft.		
							Switch to mud rotary drilling techniques at 10 ft.		
13	25						Advance 3-7/8 in. roller bit to 15 ft. Drilling effort easy, possible cobbles.		
14	34								
15	45								
		S-3	24/4	15-17	14-23-19-17	42	Poorly graded sand with silt (SP-SM), dense, 55% fine sand, 20% medium sand,	SP-SM	
16							10% coarse sand, 10% silt, 5% gravel, gray-green.		
							Advance HW drill casing to 15 ft		
17							Advance 3-7/8 in. roller bit to 20 ft.		
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)
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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. FA-13 SHEET 2 of 2 FILE NO. 48138.07 CHKD. BY C. Thunberg / J.Trottier

Boring Co.	Atlantic Testing Laboratories, Limited	Boring Location	northing 2706086.8	easting 815279.3	
Driller	P. Davis	Mudline El.	-1.80	Datum	NGVD
Logged By	E. Paddleford	Date Start	11/2/99	Date End	11/2/99

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	24/18	20-22	87-73-53-64	126	Very weathered bedrock material.	PROBABLE BEDROCK	
21							Top of weathered bedrock at 20 ft.		
							Advance 3-7/8 in. roller bit to 22.5 ft.		
22									
23							Bedrock becomes more competent at 22.5 ft.		
							Bottom of exploration at 22.5 ft., boring terminated in probable bedrock.		
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)
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. FA-14 SHEET 1 of 2 FILE NO. 48138.07 CHKD. BY C. Thunberg / J.Trottier

Boring Co.	Atlantic Testing Laboratories, Limited	Boring Location	northing 2706262.0	easting 815280.9	
Driller	P. Davis	Mudline El.	-0.20	Datum	NGVD
Logged By	S. Bonis	Date Start	10/27/99	Date End	10/27/99

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 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
	Hyd.	UO-1	24/23.5	0-2	–	–	Organic soil (OH); organic clay/silt.	OH	
1	Push						Advance HW drill casing from 0 to 3 ft.		
	Hyd.						Advance 3-7/8 in. roller bit from 0 to 3 ft.		
2	Push								
	Hyd.								
3	Push						Perform borehole permeability test at 3.3 ft.		
	Hyd.	S-1	12/10	3-4	WOR/12"	–	Organic clay with sand (OH); very soft, 79% organic clay/silt, 9% fine sand, 8% medium	OH	1
4	Push						sand, 3% coarse sand, 1% gravel, olive.		
	Hyd.	S-2	24/12	4-6	14-17-6-8	23	Advance HW drill casing to 3.8 ft.		
5	Push						1 in: Organic soil (OH); organic clay/silt.	SP-SM	
							11 in: Poorly graded sand with silt (SP-SM); medium dense,		
6	13						60% medium sand, 30% fine sand, 10% silt.		
							Attempted advancing 3-7/8 in. roller bit by mud rotary drilling method.		
7	WOC						Could not achieve seal at bottom of casing. Lost considerable amount of drilling fluid.		
							Advance HW drill casing to 5 ft.		
8	3						Switch to mud rotary drilling techniques at 5 ft.		
							Advance 3-7/8 in. roller bit to 10 ft.		
9	3								
10	2								
		S-3	24/14	10-12	11-13-15-13	28	Poorly graded sand with silt (SP-SM); medium dense, 60% fine sand,	SP-SM	
11	14						25% medium sand, 5% coarse sand in layer,10% silt.		
							Advance HW drill casing to 12 ft (note: casing blows not accurate with respect to		
12	4						depth).		
							Advance 3-7/8 in. roller bit to 17 ft		
13	4								
14	4								
15	4								
16	20								
17	46								
		S-4	24/8	17-19	22-14-12-12	26	Well-graded sand with gravel (SW); medium dense, 40% medium sand, 20% fine	SW	
18	NR						sand, 20% gravel, 15% coarse sand, 5% silt.		2
							Advance HW drill casing to 17 ft.		
19	NR						Advance 3-7/8 in. roller bit to 20 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) Sample description based on visual description, laboratory test data, and ASTM D2487. Refer to Test Report No. 7, prepared by GeoTesting Express, dated January 24, 2000.
2) NR= Not Recorded
3)

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. FA-14 SHEET 2 of 2 FILE NO. 48138.07 CHKD. BY C. Thunberg / J.Trottier

Boring Co.	Atlantic Testing Laboratories, Limited	Boring Location	northing 2706262.0	easting 815280.9	
Driller	P. Davis	Mudline El.	-0.20	Datum	NGVD
Logged By	S. Bonis	Date Start	10/27/99	Date End	10/27/99

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 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
21		S-5	24/3	20-22	29-18-9-26	27	Poorly graded sand (SP); medium dense, 70% medium sand, 20% fine sand, 5% coarse sand, 5% gravel.	SP	
22							Advance HW drill casing to 20 ft.		
23							Advance 3-7/8 in. roller bit to 23.5 ft		
24							Probable bedrock encountered at 22.5 ft.	PROBABLE BEDROCK	
25							Bottom of exploration at 23.5 ft; boring terminated in probable bedrock.		
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) Sample description based on visual description, laboratory test data, and ASTM D2487. Refer to Test Report No. 7, prepared by GeoTesting Express, dated January 24, 2000.
2) NR= Not Recorded
3)

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. FA-15 SHEET 1 of 1 FILE NO. 48138.07 CHKD. BY C. Thunberg / J.Trottier

Boring Co.	Atlantic Testing Laboratories, Limited	Boring Location	northing 2706254.4 easting 815390.0
Driller	P. Davis	Mudline El.	-2.42 Datum NGVD
Logged By	E. Paddleford	Date Start	9/10/99 Date End 9/10/99

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 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 from 0 to 1 ft.		
2	Hyd Push	UO-1	24/24	1-3	--	--	Organic clay (OH); organic clay, some shell fragments visible, some gravel noted in sample tube.	OH	1
3	Hyd Push						Advance HW drill casing to 4 ft. (hydraulic push) Advance 3-7/8 in. roller bit to 4 ft.		
4	Hyd Push						Hydraulic push easier than in previous borings.		
5	Hyd Push	UO-2	24/21	4-6	--	--	Organic clay (OH); 88% organic clay, 5% fine sand, 4% medium sand, 3% coarse sand, dark gray. Shell fragments noted.	OH	2
6	Hyd Push						Perform borehole permeability test at 6.0 ft. Advance HW drill casing to 7 ft. (hydraulic push)		
7	Hyd Push						Advance 3-7/8 in. roller bit to 7 ft.		
8	Hyd Push	UO-3	24/23	7-9	--	--	Organic clay (OH); 88% organic clay, 6% fine sand, 5% medium sand, 1% coarse sand, dark gray. Shell fragments noted.	OH	2
9	Hyd Push						Advance HW drill casing to 10 ft. (hydraulic push) Advance 3-7/8 in. roller bit to 10 ft.		
10	Hyd Push								
11	Drop	UO-4	24/10	10-12	--	--	10 in: Similar to UO-3. 14 in: Sands.	OH	
12	4						Lower portion of sample fell out of tube upon retrieval.		
13	13	S-1	24/9	12-14	4-10-30-21	40	Poorly graded sand with silt and gravel (SP-SM); dense, 20% medium sand, 15% fine sand, 12% coarse sand, 46% gravel, 7% silt, brown.	SP-SM	2
14	38						Switch to mud rotary drilling techniques at 10 ft. Advance 3-7/8 in. roller bit to 15 ft.		
15	34								
16		S-2	24/12	15-17	21-20-23-31	43	Silty sand (SM); dense, 28% medium sand, 26% fine sand, 10% coarse sand, 10% gravel, 26% silt, brown.	SM	2
17							Advance HW drill casing to 15 ft. Mix additional bentonite drilling mud.		
18							Advance 3-7/8 in. roller bit to 19 ft. Probable bedrock encountered at 17.7 ft.	PROBABLE BEDROCK	
19									
20							Bottom of exploration at 19 ft.; boring terminated in probable bedrock.		

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) Sample description based on laboratory test data and ASTM D2487. Refer to Test Report No. 7, prepared by GeoTesting Express, dated January 24, 2000.
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. FA-16 SHEET 1 of 2 FILE NO. 48138.07 CHKD. BY C. Thunberg / J.Trottier

Boring Co.	Atlantic Testing Laboratories, Limited	Boring Location	northing 2706434.6	easting 815400.8	
Driller	P. Davis	Mudline El.	-2.30	Datum	NGVD
Logged By	S. Bonis	Date Start	10/26/99	Date End	10/26/99

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 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.	U0-1	24/22	0-2	–	–	Organic soil (OH); organic clay/silt, black/dark gray.	OH	
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								
	Hyd.								
3	Push								
	Hyd.								
4	Push								
	Hyd.								
5	Push								
		S-1	12/12	5-6	WOR/12"	–	10 in: Organic soil (OH); very soft, organic clay/silt.	OH	
6	4						2 in: Poorly graded sand with silt (SP-SM); 50% fine sand, 40% medium sand, 10% silt.		
		S-2	24/14	6-8	13-10-13-16	23	Advance HW drill casing to 6 ft.	SP	
7	4						S-2: Poorly graded sand (SP); medium dense, 60% medium sand,		
							20% fine sand, 10% coarse sand, 10% gravel, dark brown.		
8	4						Switch to mud rotary drilling techniques at 6 ft.		
							Advance 3-7/8 in. roller bit to 10 ft.		
9	2								
10	2								
		S-3	24/13	10-12	8-8-10-11	18	Poorly graded sand with silt (SP-SM); medium dense, 60% medium sand,	SP-SM	
11	8						30% fine sand, 10% silt.		
							Advance HW drill casing to 10 ft.		
12	3						Advance 3-7/8 in. roller bit to 15 ft.		
13	3								
14	4								
15	4								
		S-4	24/12	15-17	7-8-7-9	15	Poorly graded sand with silt (SP-SM); medium dense, 70% fine sand,	SP-SM	
16	10						20% medium sand, 10% silt.		
							Advance HW drill casing to 15 ft.		
17	7						Advance 3-7/8 in. roller bit to 20 ft.		
18	8								
19	12								
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:
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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. FA-16 SHEET 2 of 2 FILE NO. 48138.07 CHKD. BY C. Thunberg / J.Trottier

Boring Co.	Atlantic Testing Laboratories, Limited	Boring Location	northing 2706434.6	easting 815400.8	
Driller	P. Davis	Mudline El.	-2.30	Datum	NGVD
Logged By	S. Bonis	Date Start	10/26/99	Date End	10/26/99

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 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-5	24/10	20-22	8-7-8-11	15	Poorly graded sand (SP); medium dense, 70% medium sand, 20% coarse sand, 10%	SP	
21	15						fine sand.		
							Advance HW drill casing to 20 ft.		
22	16						Advance 3-7/8 in. roller bit to 25 ft.		
23	32								
24	42								
25	30								
		S-6	0/0	25	97/0"	–	No recovery.	PROBABLE BEDROCK	
26							Advance HW drill casing to 25 ft.		
							Advance 3-7/8 in. roller bit to 25.5 ft.		
27							Encountered probable bedrock at 25 ft.		
							Bottom of exploration at 25.5 ft.; boring terminated in probable bedrock.		
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. FA-17 SHEET 1 of 2 FILE NO. 48138.07 CHKD. BY C. Thunberg / J.Trottier

Boring Co.	Atlantic Testing Laboratories, Limited	Boring Location	northing 2706445.0	easting 815623.1	
Driller	P. Davis	Mudline El.	-2.97	Datum	NGVD
Logged By	E. Paddleford	Date Start	8/31/99	Date End	8/31/99

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 from 0 to 3 ft.		
	Hyd.							OH	
2	Push								
	Hyd.								
3	Push								
	Hyd.	UO-1	24/24	3-5	--	--	Organic soil (OH); organic clay and silt with shell fragments noted in tip of sample		
4	Push						tube, dark gray. Water level rising quickly up 1.5 ft since casing first pushed to 3 ft.		
	Hyd.						Most likely obtained from 1.5 to 3.5 ft.		
5	Push						Advance HW drill casing to 5 ft.		
	Hyd.	UO-2	24/24	5-7	--	--	Advance 3-7/8 inch roller bit to 5 ft.	OH	
6	Push						UO-2: Similar to UO-1.		
	Hyd.						Advance HW drill casing to 8 ft.		
7	Push						Advance 3-7/8 in. roller bit to 8 ft.		
	Hyd.								
8	Push								
		UO-3	24/24	8-10	--	--	Organic soil (OH); organic clay and silt noted on top end of sample tube,	OH	
9	5						medium to fine sand noted in bottom end of sample tube.		
10	8								
		S-1	24/22	10-12	13-23-27-33	50	Poorly graded sand (SP); dense, 45% medium sand, 30% fine sand, 15% coarse	SP	
11	9						sand, 5% gravel, 5% silt, gray.		
							Advance HW drill casing to 10 ft.		
12	20						Switch to mud rotary drilling techniques at 10 ft.		
							Advance 3-7/8 in. roller bit to 15 ft.		
13	63								
14	45								
15	39								
		S-2	24/14	15-17	10-16-16-16	32	Poorly graded sand with silt (SP-SM); dense, 40% medium sand, 35% fine sand,	SP-SM	
16	5						10% silt, 10% coarse sand, 5% gravel, brown.		
							Advance HW drill casing to 15 ft.		
17	17						Advance 3-7/8 in. roller bit to 20 ft.		
18	24								
19	63								
20	63								

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. FA-17 SHEET 2 of 2 FILE NO. 48138.07 CHKD. BY C. Thunberg / J.Trottier

Boring Co.	Atlantic Testing Laboratories, Limited	Boring Location	northing 2706445.0	easting 815623.1	
Driller	P. Davis	Mudline El.	-2.97	Datum	NGVD
Logged By	E. Paddleford	Date Start	8/31/99	Date End	8/31/99

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-3	24/4	20-22	19-25-17-25	42	Poorly graded sand with silt (SP-SM); dense, 40% medium sand, 35% fine sand,	SP-SM	
21	drop						10% coarse sand, 10% silt, 5% gravel, brown.		
							Advance HW drill casing to 20 ft.		
22	15						Advance 3-7/8 in. roller bit to 26 ft.		
							Casing appears to have dropped after measurement. Sample taken at 26 ft.		
23	19								
24	65								
25	90							GLACIAL TILL	
26	90								
	58/	S-4	5/8	26-26.4	100/5"		Poorly graded sand with silt (SP-SM); 35% medium sand, 30% coarse sand, 15% fine		
27	2in.						sand, 10% silt, 10% gravel, brown. Angular gravel, weathered material. (GLACIAL TILL)		
			CORE INTERVAL		CORE TIME		Advance 3-7/8 in. roller bit to 26.7 ft.		
28		R-1	26.7-27.7		15 min		Advance HW drill casing to 26.7 ft.	BEDROCK	
							Begin NX rock core at 26.7 ft.		
29			27.7-28.7		10 min		R-1: 26.7 - 29.2 Recovery = 96% RQD = 44%		
							Fresh, moderately hard, gray, aphanitic GNEISS with low and high angle, close, rough		
30			28.7-29.2		10 min		planar, fresh to discolored, open joints. Pit size solution cavities and joint filler		
							material noted in upper 1 ft section of core. Core barrel plugged at 29.2 feet.		
31		R-2	29.2-30.2		9 min		R-2: 29.2 - 32.2 Recovery = 83% RQD = 32%		
							Core barrel dropped 6 in. at 29.5 ft (void). Core barrel plugged. Remove at		
32			30.2-31.2		7.5 min		32.2 ft. Similar to R-1 with no solution cavities noted.		
33			31.2-32.2		15 min		R-3: 32.2 - 36.2 ft Recovery = 91% RQD = 50%		
							Fresh, moderately hard, dark gray, aphanitic GNEISS with low and high angle, close,		
34		R-3	32.2-33.2		12 min		rough, undulating, fresh to discolored, open joints. Some joint filling material		
							noted in high angle joints.		
35			33.2-34.2		9.5 min				
36			34.2-35.2		8 min				
37			35.2-36.2		12 min				
							Boring terminated in bedrock at 36.2 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. FA-18 SHEET 1 of 2 FILE NO. 48138.07 CHKD. BY C. Thunberg / J.Trottier

Boring Co.	Atlantic Testing Laboratories, Limited	Boring Location	northing 2706454.0	easting 815495.6	
Driller	P. Davis	Mudline El.	-2.30	Datum	NGVD
Logged By	S. Bonis	Date Start	10/27/99	Date End	10/28/99

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 clay (OH); organic clay.	OH	1
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								
	Hyd.								
3	Push								
	Hyd.								
4	Push								
	Hyd.								
5	Push								
	Hyd.	S-1	24/10	5-7	WOR/24"	--	Organic soil (OH); organic clay/silt	OH	
6	Push						Advance HW drill casing to 8 ft.		
	Hyd.						Advance 3-7/8 in. roller bit to 8 ft.		
7	Push								
	Hyd.								
8	Push								
	Hyd.	S-2	24/14	8-10	14-14-16-21	30	1 in: Organic soil (OH); organic clay/silt.		
9	Push						6 in: Poorly graded sand with silt (SP-SM); medium dense, 60% fine sand, 20% medium		
	Hyd.						sand, 10% silt, 10% organics.		
10	Push						7 in: Poorly graded sand with silt (SP-SM); medium dense, 70% fine sand, 15% medium sand	SP-SM	
							10% silt, 5% gravel.		
11	3						Advance HW drill casing to 10 ft.		
							Switch to mud rotary drilling techniques at 10 ft.		
12	3						Advance 3-7/8 in. roller bit to 15 ft.		
13	6								
14	7								
15	20								
		S-3	24/18	15-17	12-12-11-15	23	Silty sand (SM); medium dense, 80% fine sand, 15% silt,	SM	
16	6						5% medium sand, stratified.		
							Advance HW drill casing to 15 ft.		
17	6						Advance 3-7/8 in. roller bit to 20 ft.		
18	6								
19	5								
20	21								

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. FA-18 SHEET 2 of 2 FILE NO. 48138.07 CHKD. BY C. Thunberg / J.Trottier

Boring Co.	Atlantic Testing Laboratories, Limited	Boring Location	northing 2706454.0	easting 815495.6	
Driller	P. Davis	Mudline El.	-2.30	Datum	NGVD
Logged By	S. Bonis	Date Start	10/27/99	Date End	10/28/99

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	24/10	20-22	12-9-11-15	20	2 in: Poorly graded sand with silt (SP-SM); medium dense, 80% fine sand,	SP-SM	
21	16						10% medium sand, 10% silt, iron stained.		
							8 in: Poorly graded sand with silt (SP-SM); 50% fine sand,		
22	21						40% medium sand,10% silt.		
							Advance HW drill casing to 20 ft.		
23	29						Advance 3-7/8 in. roller bit to 25 ft.		
24	63								
25	127								
		S-5	24/6	25-27	25-32-27-24	59	4 in: Poorly graded sand with silt (SP-SM); very dense, 50% medium sand,	SP-SM	
26	128						40% fine sand, 10% silt, iron stained.		
							2 in: Poorly graded gravel with silt and sand (GP-GM); very dense, 60% gravel, 15%	GP-GM	
27	109						coarse sand, 15% medium sand, 10% silt.		
							Advance HW drill casing to 25 ft.		
28	113						Advance 3-7/8 in. roller bit to 29 ft.		
							Encountered bedrock at 29 ft.		
29	225		CORE INTERVAL		CORE TIME		Advance HW drill casing to 29 ft.		
		R-1		29-30	9 min		Begin NX rock core at 29 ft.	BEDROCK	
30							R-1: 29 - 34 ft. Recovery = 68% RQD = 38%		
				30-31	8.5 min		Fresh, moderately hard, medium gray, coarse grained GNEISS, moderately dipping		
31							foliation. Primary joints; low angle, extremely close, discolored, and open.		
				31-32	6 min		Secondary joints, steeply dipping, extremely close, discolored, and open.		
32							Void at 31.5 to 32 ft. and 33 to 33.5 ft (lost water).		
				32-33	3.75 min				
33									
				33-34	2.5 min				
34									
		R-2		34-35	6 min		R-2: 34 - 38.75 ft. Recovery = 73% RQD = 30%		
35							Medium gray, moderately hard, coarse grained, GNEISS, moderately dipping		
				35-36	5 min		foliation. Primary and secondary joints, low angle to steeply dipping, extremely close,		
36							discolored, and open.		
				36-37	5 min		Highly fractured from 34 to 37 ft.		
37							Lost water at 35 to 36 ft. Return water 37 to 38 ft.		
				37-38	16 min		End run approximately at 0.25 ft short. At 38.75 ft, believe barrel is clogged.		
38									
				38-38.75	30 min				
39							Boring terminated at 38.75 ft. in bedrock.		
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. FA-19 SHEET 1 of 3 FILE NO. 48138.07 CHKD. BY C. Thunberg / J.Trottier

Boring Co.	Atlantic Testing Laboratories, Limited	Boring Location	northing 2706326.3	easting 815556.1	
Driller	P. Davis	Mudline El.	-3.24	Datum	NGVD
Logged By	E. Paddleford	Date Start	9/8/99	Date End	9/9/99

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 1 ft. (hydraulic push)		
1	Push								
	Hyd.	UO-1	24/24	1-3	–	–	Organic soil (OH); organic clay/silt, some shell fragments, sheen visible on surface	OH	
2	Push						of sample tube.		
	Hyd.						Wash water black with organic odor.		
3	Push						Advance HW drill casing to 4 ft. (hydraulic push)		
	Hyd.						Advance 3-7/8 in. roller bit to 4 ft.		
4	Push								
	Hyd.	UO-2	24/24	4-6	–	–	Organic clay (OH); organic clay, some shell fragments.	OH	1
5	Push						Advance HW drill casing to 7 ft. (hydraulic push)		
	Hyd.						Advance 3-7/8 in. roller bit to 7 ft.		
6	Push								
	Hyd.								
7	Push								
	Hyd.	UO-3	24/24	7-9	–	–	Organic soil (OH); organic clay/silt as noted in tip of sample tube.	OH	
8	Push						Advance HW drill casing to 10 ft. (hydraulic push)		
	Hyd.						Advance 3-7/8 in. roller bit to 10 ft.		
9	Push								
	Hyd.								
10	Push								
		UO-4	18/5	10-11.5	–	–	Tube could only be pushed 1.5 ft due to sand layer encounter.		
11	Drop						Clay and sand at top of sample tube with all sand noted in the bottom of tube.		
	Drop						Poor recovery, sample placed in jar.		
12	Push	S-1	24/8	11.5-13.5	1-1-5-17	6	Poorly graded sand (SP); loose, 63% fine sand, 14% medium sand, 6% coarse sand,	SP	2
	Hyd.						13% gravel, 4% silt, gray.		
13	Push						Advance HW drill casing to 13 ft.		
							Switch to mud rotary drilling techniques at 13 ft.		
14	12						Advance 3-7/8 in. roller bit to 15 ft.		
15	26								
		S-2	24/3	15-17	11-8-5-2	13	Poorly graded sand with silt (SP-SM); medium dense, 40% medium sand, 35%	SP-SM	
16	5						fine sand, 15% coarse sand, 10% silt, gray.		
							Advance HW drill casing to 15 ft.		
17	11						Advance 3-7/8 in. roller bit to 20 ft.		
							Add additional EZ mud to drilling mud mixture.		
18	22								
19	31								
20	37								

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) Sample description based on laboratory test data and ASTM D2487. Refer to Test Report No. 7, prepared by GeoTesting Express, dated January 24, 2000.
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. FA-19 SHEET 2 of 3 FILE NO. 48138.07 CHKD. BY C. Thunberg / J.Trottier

Boring Co.	Atlantic Testing Laboratories, Limited	Boring Location	northing 2706326.3	easting 815556.1	
Driller	P. Davis	Mudline El.	-3.24	Datum	NGVD
Logged By	E. Paddleford	Date Start	9/8/99	Date End	9/9/99

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-3	24/10	20-22	14-16-16-12	32	Poorly graded sand with silt and gravel (SP-SM); dense, 26% medium sand, 13%	SP-SM	2
21	Drop						coarse sand, 13% fine sand, 43% gravel, 5% silt, olive gray.		
							Advance HW drill casing to 20 ft.		
22	9						Advance 3-7/8 in. roller bit to 25 ft.		
							Roller bit bound inside casing, casing spun, raised, and lowered.		
23	10						Difficulty washing out casing.		
							Mix additional bentonite into mud mixture.		
24	28						HW drill casing dropped to 20.7 ft.		
25	34								
		S-4	24/6	25-27	8-16-14-14	30	Silty gravel with sand (GM); medium dense, 45% gravel, 15% coarse sand, 15%	GM	
26	46						silt, 15% fine sand, 10% medium sand, olive gray.		
							Advance 3-7/8 in. roller bit to 28.6 ft.		
27	55						Possible bedrock at 27.8 ft.		
			CORE INTERVAL		CORE TIME		Advance HW drill casing to 28 ft.		
28	121		28.6-29.6		13 min		Material seems to be very weathered.		
							Begin NX rock core at 28.6 ft.		
29	55		29.6-30.6		15 min		Core barrel clogged. Abandoned rock coring.		
							Core barrel clogged with sand, piece of clay and 3 in. rock, no bedrock.		
30	79						Advance HW drill casing to 30 ft.		
							Advance 3-7/8 in. roller bit to 31.3 ft.		
31	185								
	100/	S-5	19/8	31-32.6	37-18-28-100/1"	46	Well-graded sand with silt and gravel (SW-SM); dense, 19% medium sand, 16% coarse	GLACIAL TILL	2
32	4in.						sand, 15% fine sand, 39% gravel, 11% silt, brown. (GLACIAL TILL)		
			CORE INTERVAL		CORE TIME		Advance HW drill casing to 32 ft.		
33		R-1	32.7-33.7		12 min		Advance 3-7/8 in. roller bit to 32.7 ft.		
							Begin NX rock core at 32.7 ft.	BEDROCK	
34			33.7-34.7		13 min		R-1: 32.7 - 37.7 ft. Recovery = 98% RQD = 65%		
							Upper 1.5 ft. slightly weathered. Moderately hard, gray aphanitic GNEISS		
35			34.7-35.7		12 min		with primary moderately dipping, close, rough, planar, fresh, tight to partly open		
							joints. Secondary jointing; high to vertical angle, rough, planar, discolored,		
36			35.7-36.7		13 min		open, noted in upper weathered section. Light green filling material noted in some		
							joints.		
37			36.7-37.7		12.5 min				
							Core barrel immediately plugged when attempting R-2. Second attempt successful.		
38		R-2	37.7-38.7		11.5 min		R-2: 37.7 - 42.7 ft. Recovery = 100%, RQD = 88%		
							Fresh, moderately hard, gray, aphanitic GNEISS with primary moderately dipping,		
39			38.7-39.7		13 min		close to very close, rough, planar, fresh to discolored, partly open joints.		
							Secondary low angle joint noted at 2 ft interval, rough, undulating, fresh, open.		
40			39.7-40.7		14 min		Filling material noted in joint at 1 ft interval, light green material, slightly weathered		

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) Sample description based on laboratory test data and ASTM D2487. Refer to Test Report No. 7, prepared by GeoTesting Express, dated January 24, 2000.
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. FA-19 SHEET 3 of 3 FILE NO. 48138.07 CHKD. BY C. Thunberg / J.Trottier

Boring Co.	Atlantic Testing Laboratories, Limited	Boring Location	northing 2706326.3	easting 815556.1	
Driller	P. Davis	Mudline El.	-3.24	Datum	NGVD
Logged By	E. Paddleford	Date Start	9/8/99	Date End	9/9/99

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
							outer appearance noted in this interval.		
41			40.7-41.7		13.5 min			BEDROCK	
42			41.7-42.7		14 min				
43							Boring terminated in bedrock at 42.7 ft.		
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:
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) Sample description based on laboratory test data and ASTM D2487. Refer to Test Report No. 7, prepared by GeoTesting Express, dated January 24, 2000.
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. FA-20 SHEET 1 of 2 FILE NO. 48138.07 CHKD. BY C. Thunberg / J.Trottier

Boring Co.	Atlantic Testing Laboratories, Limited	Boring Location	northing 2706212.5	easting 815611.8	
Driller	P. Davis	Mudline El.	-3.75	Datum	NGVD
Logged By	E. Paddleford	Date Start	10/22/99	Date End	10/25/99

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	REMARKS
1	Hyd. Push	U0-1	24/24	0-2	–	–	Organic soil (OH); 90% organic silt/clay, 5% fine sand, 5% shell fragments, dark gray.	OH	
2	Hyd. Push						Advance HW drill casing from 0 to 5 ft. Advance 3-7/8 in. roller bit from 0 to 5 ft.		
3	Hyd. Push								
4	Hyd. Push								
5	Hyd. Push								
6	Hyd. Push	S-1	24/8	5-7	WOR/24"	–	Organic soil (OH); 90% organic silt/clay, 5% fine sand, 5% shell fragments, trace of organic matter (root fibers decaying wood particles), dark gray.	OH	
7	Hyd. Push						Advance HW drill casing to 10 ft. Advance 3-7/8 in. roller bit to10 ft.		
8	Hyd. Push								
9	Hyd. Push								
10	Hyd. Push								
11	4	S-2	24/18	10-12	WOH-24-22-29	46	7 in: Similar to S-1 except, 10% fine sand, and no shell fragments, dark gray.	OH	
							11 in: Poorly graded sand (SP); dense, 45% medium sand, 30% fine sand, 15% coarse sand, 5% silt, 5% gravel, gray.	SP	
12	24						Switch to mud rotary drilling techniques at 10 ft.		
13	103						Advance 3-7/8 in. roller bit to 15 ft. Lose mud to hole, very gravelly material 50% mud return.		
14	73						Lose 2/3 of mud from tub, Mix additional mud. Gravel/cobble zone at approximately 13.5 to 14.5 ft.		
15	70								
16	10	S-3	24/9	15-17	26-45-38-37	83	Well-graded sand with gravel and silt (SW-SM); very dense, 35% fine sand, 25% medium sand, 15% coarse sand, 15% gravel, 10% silt, brown-gray.	SW-SM	
17	6						Advance HW drill casing to 15 ft. Mix additional bentonite drilling mud.		
18	12						Used roughly 2 tubs of mud to this point. Advance 3-7/8 in. roller bit to 20 ft.		
19	12						Very difficult keeping hole open, large gravel and cobbles, hole collapsing roller bit becoming struck inside casing.		
20	28						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) Switched rig geologist to S. Bonis at 20 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. FA-20 SHEET 2 of 2 FILE NO. 48138.07 CHKD. BY C. Thunberg / J.Trottier

Boring Co.	Atlantic Testing Laboratories, Limited	Boring Location	northing 2706212.5	easting 815611.8	
Driller	P. Davis	Mudline El.	-3.75	Datum	NGVD
Logged By	E. Paddleford	Date Start	10/22/99	Date End	10/25/99

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
		S-4	24/3	20-22	26-25-26-26	51	Wash, angular gravel.		1
21	79						Advance HW drill casing to 20 ft.		
							Hole not staying open, casing spinning.		
22	97						Advance HW drill casing to 22 ft.		
							Advance 3-7/8 in. roller bit to 25 ft.		
23	26								
24	45								
25	55								
		S-5	24/3	25-27	14-27-89-48	116	Poorly graded gravel with silt (GP-GM): very dense, 80% gravel (angular),	GLACIAL TILL	
26	61						10% coarse sand, 10% silt. (GLACIAL TILL)		
							Advance HW drill casing to 25 ft.		
27	79						Advance 3-7/8 in. roller bit to 30 ft.		
28	73								
29	120								
30									
		S-6	24/6	30-32	30-32-30-38	62	2 in: Poorly graded sand with silt and gravel (SP-SM); very dense, 10% coarse		
31							sand, 40% medium sand, 25% fine sand, 15% gravel, 10% silt. (GLACIAL TILL)		
							4 in: Silty sand (SM); very dense, 85% fine sand, 15% silt. (GLACIAL TILL)		
32							Advance HW drill casing to 29 ft.		
							Advancing roller bit by mud rotary, encountered difficult drilling at a depth		
33							inconsistent with other borings.		
							Advanced 3-7/8 in. roller bit with little progress, when roller bit was pulled it was damaged -		
34							believe drive shoe was lost from casing and roller bit was running on drive shoe -		
							confirmed when casing was pulled.		
35							Bottom of exploration at 32 ft.; no refusal.		
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) Switched rig geologist to S. Bonis at 20 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. FA-21 SHEET 1 of 2 FILE NO. 48138.07 CHKD. BY C. Thunberg / J.Trottier

Boring Co.	Atlantic Testing Laboratories, Limited	Boring Location	northing 2706109.9 easting 815466.0
Driller	P. Davis	Mudline El.	-4.35 Datum NGVD
Logged By	E. Paddleford	Date Start	10/14/99 Date End 10/14/99

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 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.	U0-1	24/24	0-2	--	--	Organic soil (OH); 90% organic clay/silt, 5% fine sand, 5% shell fragments, dark	OH	
1	Push						gray.		
	Hyd.						Advance HW drill casing from 0 to 3 ft.		
2	Push						Advance 3-7/8 in. roller bit from 0 to 3 ft.		
	Hyd.								
3	Push								
	Hyd.	UO-2	24/24	3-5	--	--	Similar to UO-1, 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-3	24/24	6-8	--	--	Similar to UO-2, as noted from 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-4	24/24	9-11	--	--	Organic soil (OH); 90% organic clay/silt, 10% fine sand, gray.	OH	
10	Push						Advance HW drill casing to 11.5 ft.		
	Hyd.						Could no longer advance casing by hydraulic push, probable sand/clay interference.		
11	Push						Advance 3-7/8 in. roller bit to 11.5 ft.		
	Push								
12	8	S-1	24/12	11.5-13.5	11-12-13-20	25	Well-graded sand (SW); medium dense, 35% medium sand, 30% fine sand,	SW	
							25% coarse sand, 5% gravel, 5% silt, gray.		
13	19						Advance HW drill casing to 13 ft.		
							Switch to mud rotary drilling techniques at 11.5 ft.		
14	10						Advance 3-7/8 in. roller bit to 16 ft.		
15	19								
16	36								
		S-2	24/8	16-18	21-22-22-17	44	Poorly graded sand with silt (SP-SM); dense, 30% fine sand, 30% medium sand,	SP-SM	
17	10						20% coarse sand, 10% gravel, 10% silt.		
							Advance HW drill casing to 16 ft.		
18	17						Mix additional bentonite drilling mud.		
							Advance 3-7/8 in. roller bit to 21 ft.		
19	106								
20	83								

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. FA-21 SHEET 2 of 2 FILE NO. 48138.07 CHKD. BY C. Thunberg / J.Trottier

Boring Co.	Atlantic Testing Laboratories, Limited	Boring Location	northing 2706109.9 easting 815466.0
Driller	P. Davis	Mudline El.	-4.35 Datum NGVD
Logged By	E. Paddleford	Date Start	10/14/99 Date End 10/14/99

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 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	REMARKS
21	52								
22	14	S-3	24/8	21-23	11-16-15-17	31	Poorly graded sand with silt and gravel (SP-SM); dense, 40% coarse sand, 20% medium sand, 15% fine sand, 15% gravel, 10% silt, gray.	SP-SM	
23	75						Advance HW drill casing to 21 ft. Advance 3-7/8 in. roller bit to 26.1 ft.		
24	165						Difficult roller biting at 24 ft, probable gravel/cobble layer. Losing some mud to hole. Mix additional bentonite drilling mud.		
25	193		CORE		CORE		Advance HW drill casing to 25 ft.		
26			INTERVAL		TIME		Top of bedrock at 25.8 ft. Begin NX rock core at 26 ft.		
27		R-1		26-27	10.5 min		R-1: 26-31 ft. Recovery = 92% RQD = 34% Fresh, moderately hard, gray, aphanitic GNEISS with moderately dipping, close to very close, smooth, planar, discolored, tight to partly open joints. Some joint surfaces containing filling material, possible chlorite (green) material. In first foot of R-1, 5 in. layer of quartz/feldspar white to pink colored mineralization. Jointing along foliation.	BEDROCK	
28				27-28	7 min				
29				28-29	5 min				
30				29-30	5 min				
31				30-31	6 min				
32		R-2		31-32	6.5 min		R-2: 31-36 ft. Recovery = 90% RQD = 58% Fresh, moderately hard, gray, aphanitic GNEISS with moderately dipping, close to very close rough, planar, fresh, partly open joints. Lower 2 ft of R2 jointing becomes more broken. Filling material noted in some of the joints. Upper 9 in. of core white mineralization, quartz.		
33				32-33	5.5 min				
34				33-34	7 min				
35				34-35	7.5 min				
36				35-36	6.5 min				
37							Boring terminated in bedrock at 36 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. FA-22 SHEET 1 of 2 FILE NO. 48138.07 CHKD. BY C. Thunberg / J.Trottier

Boring Co.	Atlantic Testing Laboratories, Limited	Boring Location	northing 2706001.6	easting 815473.9	
Driller	P. Davis	Mudline El.	-5.34	Datum	NGVD
Logged By	E. Paddleford	Date Start	9/1/99	Date End	9/1/99

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
1	Hyd. Push						Advance HW drill casing from 0 to 5 ft. (hydraulic push) Advance 3-7/8 in. roller bit from 0 to 5 ft.		
2	Hyd. Push								
3	Hyd. Push								
4	Hyd. Push								
5	Hyd. Push								
6	Hyd. Push	S-1	24/14	5-7	WOR/24"	–	Organic soil (OH); 70% organic clay, 20% organic silt, 5% fine sand, 5% shell fragments, dark gray.	OH	
7	Hyd. Push						Advance HW drill casing to 8 ft. (hydraulic push) Advance 3-7/8 in. roller bit to 8 ft.		
8	Hyd. Push								
9	Hyd. Push	S-2	24/8	8-10	WOR/24"	–	Organic soil with sand (OH); 70% organic clay, 10% organic silt, 15% fine sand, 5% shell fragments, dark gray.	OH	
10	Hyd. Push						Advance HW drill casing to 11 ft. (hydraulic push) Advance 3-7/8 in. roller bit to 11 ft.		
11	Hyd. Push								
12	Hyd. Push	S-3	24/12	11-13	WOR/6"-WOH/18"	–	Organic soil with sand (OH); 65% organic clay, 10% organic silt, 20% fine sand, 5% coarse sand (rounded).	OH	
13	Hyd. Push						Advance HW drill casing to 14 ft. Advance 3-7/8 in. roller bit to 14 ft.		
14	24								
15	13	S-4	24/8	14-16	9-7-6-9	13	Poorly graded sand (SP); medium dense, 45% fine sand, 40% medium sand, 10% coarse sand, 5% silt, gray.	SP	
16	19						Switch to mud rotary drilling techniques at 14 ft. Advance 3-7/8 in. roller bit to 19 ft.		
17	29								
18	44								
19	73								
20	17	S-5	24/23	19-21	21-22-12-7	34	Poorly graded sand with silt (SP-SM); medium dense, 15% fine sand, 35% medium sand, 30% coarse sand, 10% gravel, 10% silt, gray.	SP-SM	

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. FA-22 SHEET 2 of 2 FILE NO. 48138.07 CHKD. BY C. Thunberg / J.Trottier

Boring Co.	Atlantic Testing Laboratories, Limited	Boring Location	northing 2706001.6 easting 815473.9
Driller	P. Davis	Mudline El.	-5.34 Datum NGVD
Logged By	E. Paddleford	Date Start	9/1/99 Date End 9/1/99

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
							Advance HW drill casing to 19 ft.		
21	14						Advance 3-7/8 in. roller bit to 23.7 ft.		
							Encountered probable bedrock at 23.7 ft.	SP-SM	
22	35						Advance HW drill casing to 23.2 ft.		
23	38		CORE		CORE				
			INTERVAL		TIME		Start NX rock core at 23.7 ft.		
24	66	R-1	23.7-24.7		6.5 min		R-1: 23.7-28.2 ft. Recovery = 78% RQD = 20%		
25			24.7-25.7		2 min		Fresh, moderately hard, gray to pink, aphanitic GNEISS with low and high angle, close, rough, undulating, fresh, partly open to open joints. Weak intrusion layer of pink rock (feldspar some quartz), extremely to very close joints ranging from low angle		
26			25.7-26.7		6 min		to vertical in orientation. Some solution pits also noted in this layer as well as below this layer in the GNEISS.		
27			26.7-27.7		8 min		Core into 6 in. void at 24.5 ft. 24.7-25.7 ft. fast coring. Void or weathered material. Losing some water. Barrel seems to be plugged at 28.2 ft.		
28			27.7-28.2		9 min		Having trouble getting barrel back down corehole due to weak rock layer.	BEDROCK	
							R-2: 28.2-32.0 ft. Recovery = 100% RQD = 80%		
29		R-2	28.2-29.2		7.5 min		Fresh, moderately hard, light gray, aphanitic GNEISS with horizontal to low angle, close, rough, stepped, fresh to discolored, partly open joints. Some filling material		
30			29.2-30.2		7 min		noted in last joint of run (white mineralization).		
							Lose approximately 1/2 water while coring R-2. Core barrel clogged at 32 ft.		
31			30.2-31.2		10.5 min		Remove core barrel.		
32			31.2-32.0		18 min				
33		R-3		Abandoned			R-3: 32.0-34.0 ft. Two attempts to core final 2 ft. Hole filling in cleaned out twice. Ebb tide,		
34							casing coming up not enough stroke to get final 2 ft. Abandon hole.		
35							Boring terminated in bedrock at 32 ft.		
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. FA-23 SHEET 1 of 2 FILE NO. 48138.07 CHKD. BY C. Thunberg / J.Trottier

Boring Co.	Atlantic Testing Laboratories, Limited	Boring Location	northing 2705942.2	easting 815343.0	
Driller	P. Davis	Mudline El.	-4.04	Datum	NGVD
Logged By	E. Paddleford	Date Start	8/30/99	Date End	8/30/99

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: 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	WOC						Advance HW drill casing from 0 to 3 ft. (weight of casing) Advance 3-7/8 in. roller bit from 0 to 3 ft.		
2	WOC								
3	WOC								
4	Hyd. Push	UO-1	24/24	3-5	–	–	Organic clay (OH); organic clay, strong organic odor. Sheen noted on water in tube. Advance HW drill casing to 6 ft. (hydraulic push)	OH	1
5	Hyd. Push						Advance 3-7/8 in. roller bit to 6 ft.		
6	Hyd. Push								
7	Hyd. Push	UO-2	24/24	6-8	–	–	Similar to UO-1. No sheen noted, organic odor. Advance HW drill casing to 9 ft. (hydraulic push)	OH	
8	Hyd. Push						Advance 3-7/8 in. roller bit to 9 ft.		
9	Hyd. Push								
10	Hyd. Push	UO-3	24/24	9-11	–	–	Organic silt (OH); organic silt, dark gray. Advance HW drill casing to 12 ft. (hydraulic push)	OH	1
11	Hyd. Push						Advance 3-7/8 in. roller bit to 12 ft.		
12	Hyd. Push								
13	5	S-1	24/8	12-14	WOR/12"-9-14	–	Poorly graded sand with silt (SP-SM); 40% fine sand, 30% medium sand, 10% coarse sand, 10% gravel, 10% silt, gray. Switch to mud rotary drilling techniques at 12 ft.	SP-SM	
14	23						Advance 3-7/8 in. roller bit to 17 ft.		
15	51								
16	30								
17	30								
18	10	S-2	24/16	17-19	19-16-31-19	47	Silty sand (SM); dense, 50% fine sand, 17% medium sand, 4% coarse sand, 12% gravel, 17% silt, olive green. Advance HW drill casing to 17 ft.	SM	2
19	11						Advance 3-7/8 in. roller bit to 21.1 ft. Mix additional bentonite drilling mud.		
20	14								

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) Sample description based on laboratory test data and ASTM D2487. Refer to Test Report No. 7, prepared by GeoTesting Express, dated January 24, 2000.
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. FA-23 SHEET 2 of 2 FILE NO. 48138.07 CHKD. BY C. Thunberg / J.Trottier

Boring Co.	Atlantic Testing Laboratories, Limited	Boring Location	northing 2705942.2	easting 815343.0	
Driller	P. Davis	Mudline El.	-4.04	Datum	NGVD
Logged By	E. Paddleford	Date Start	8/30/99	Date End	8/30/99

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: 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
21	137						Encounter probable boulder at 21.1 ft. Advance HW drill casing to 21 ft.	SM	
22	33						Advance 3-7/8 in. roller bit to 22 ft.		
23	51	S-3	24/0	22-24	17-13-7-10	20	No recovery. Advance HW drill casing to 24 ft.		
24	89						Advance 3-7/8 in. roller bit to 25 ft.		
25			INTERVAL		TIME		Begin NX rock core at 25 ft.		
26		R-1		25-26	9 min		R-1: 25 - 30 ft. Recovery = 96% RQD = 92% Encounter 2 in. void at 27.5 ft.; lose water return to void.	BEDROCK	
27				26-27	10 min		Fresh, moderately hard, gray, aphanitic GNEISS with primary low angle, close to moderately spaced, rough, undulating, partly open to open joints and secondary high angle, widely spaced, rough, undulating, tight joints. Secondary feldspar mineralization in upper 10 in. of core, approximately 0.5 in. wide band.		
28				27-28	9 min				
29				28-29	12 min				
30				29-30	13 min				
31		R-2		30-31	10 min		R-2: 30 - 35 ft. Recovery = 100% RQD = 36% Fresh, moderately hard, gray, aphanitic GNEISS with primary low angle, closely spaced, rough, undulating, partly open joints and secondary high angle, very close, rough, planar, partly open to open joints. 2 in. void at 31 ft. clay-like material in void, also extremely weathered rock noted in this interval. Minimal water return noted during coring activities.		
32				31-32	10 min				
33				32-33	10.5 min				
34				33-34	10 min				
35				34-35	10 min				
36							Boring terminated in bedrock at 35 ft.		
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 Atterberg Limits laboratory test data. Refer to Test Report No. 7, prepared by GeoTesting Express, dated January 24, 2000.
2) Sample description based on laboratory test data and ASTM D2487. Refer to Test Report No. 7, prepared by GeoTesting Express, dated January 24, 2000.
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. FA - 24 SHEET 1 of 2 FILE NO. 48138.07 CHKD. BY C. Thunberg / J.Trottier

Boring Co.	Atlantic Testing Laboratories, Limited	Boring Location	northing 2705798.2	easting 815325.1	
Driller	P. Davis	Mudline El.	-3.81	Datum	NGVD
Logged By	E. Paddleford	Date Start	10/21/99	Date End	10/21/99

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 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); 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 from 0 to 5 ft.		
	Hyd.								
3	Push								
	Hyd.								
4	Push								
	Hyd.								
5	Push								
	Hyd.	S-1	24/4	5-7	WOR/24"	--	Organic soil (OH); 95% organic clay/silt, 5% fine sand, dark gray.	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	24/10	10-12	WOR/8"-	--	Similar to S-1.	OH	
11	Push				WOH/16"		Advance HW drill casing to 13.7 ft.		
	Hyd.						Advance 3-7/8 in. roller bit to 13.7 ft.		
12	Push								
	Hyd.								
13	Push								
	Push								
14		S-3	24/12	13.7-15.7	11-10-10-10	20	Well-graded sand with silt and gravel (SW-SM); medium dense, 40% fine	SW-SM	
	drop						sand, 20% medium sand, 15% coarse sand, 15% gravel, 10% silt, gray.		
15	3						Switch to mud rotary drilling techniques at 13.7 ft.		
							Advance 3-7/8 in. roller bit to 16.5 ft.		
16	9						Rough roller bitting at 16 ft, probable cobbles. Loosing mud to borehole approximately		
	21						2/3 tub. Mix additional bentonite drilling mud.		
17	11						Feels like large gravel, cobbles, unable to keep hole open.		
							Losing most of drilling fluid to formation, very little water return.		
18	54	S-4	24/6	17.6-19.6	29-19-11-12	30	Lose another 2/3 tub, 16 to 16.5 ft feels like zone of cobbles, collapsing		
							and filling in hole.		
19	33						Casing drops to 14.7 ft (1 ft. drop).		
							Advance HW drill casing to 16.6 ft., casing advancement very difficult.		
20	72						Mix additional bentonite drilling mud.		

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. FA - 24 SHEET 2 of 2 FILE NO. 48138.07 CHKD. BY C. Thunberg / J.Trottier

Boring Co.	Atlantic Testing Laboratories, Limited	Boring Location	northing 2705798.2 easting 815325.1
Driller	P. Davis	Mudline El.	-3.81 Datum NGVD
Logged By	E. Paddleford	Date Start	10/21/99 Date End 10/21/99

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 55 skid mount
Drilling Method 4" I.D. (HW) flush joint casing, 3-7/8" roller bit. Mud rota 10/21/99
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
							Advance 3-7/8 in. roller bit to 17.5 ft.		
21	86						Difficulty advancing roller bit through cobble zone.		
							S-4: Wash; large angular gravel.		
22	102						Advance HW drill casing to 19 ft.		
		S-5	13/8	22-23.1	18-14-50/1"	–	Advance 3-7/8 in. roller bit to 22 ft.	GLACIAL TILL	
23							S-5: Poorly graded sand with silt (SP-SM); 50% fine sand, 25%		
							medium sand, 15% coarse sand, 10% silt, brown. (GLACIAL TILL)	PROBABLE BEDROCK	
24							Advance HW drill casing to 22 ft.		
							Advance 3-7/8 in. roller bit to 23.3 ft.		
25							Encountered probable bedrock at 22.9 ft.		
							Bottom of exploration at 23.3 ft., boring terminated in probable bedrock.		
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)
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. FA-25 SHEET 1 of 2 FILE NO. 48138.07 CHKD. BY C. Thunberg / J.Trottier

Boring Co.	Atlantic Testing Laboratories, Limited	Boring Location	northing 2705787.7 easting 815242.1
Driller	P. Davis	Mudline El.	-2.30 Datum NGVD
Logged By	E. Paddleford	Date Start	10/18/99 Date End 10/19/99

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.	UO-1	24/24	0-2	--	--	Organic clay (OH); 90% organic clay, 5% fine sand, 5% shell fragments, dark gray.	OH	1
1	Push						Advance HW drill casing from 0 to 2 ft.		
	Hyd.						Advance 3-7/8 inch roller bit from 0 to 2 ft.		
2	Push								
	Hyd.	UO-2	24/24	2-4	--	--	Similar to UO-1, lighter gray in color.	OH	
3	Push						Advance HW drill casing to 5 ft.		
	Hyd.						Advance 3-7/8 in. roller bit to 5 ft.		
4	Push								
	Hyd.								
5	Push								
	Hyd.	UO-3	24/18	5-7	--	--	Top of tube: Organic clay (OL); organic clay, light gray.	OL	1
6	Push						Bottom of tube: Sand. Some sand fell out of bottom of tube upon retrieval.		
	Push						Sand/clay interface at 6.5 ft.		
7		S-1	24/20	6.5-8.5	59-28-30-31	58	Advance HW drill casing to 6.5 ft.	SW-SM	
	Drop						Advance 3-7/8 in. roller bit to 6.5 ft.		
8	5						S-1: Well-graded sand with silt and gravel (SW-SM); very dense, 40% medium sand,		
							20% fine sand, 15% coarse sand, 15% gravel, 10% silt, gray.		
9	21						High initial blow count due to cobble found at top of sample.		
							Switch to mud rotary drilling techniques at 6.5 ft.		
10	22						Casing dropped to 7 ft overnight.		
							Advance 3-7/8 in. roller bit to 12 ft.		
11	56								
12	110								
		S-2	24/18	12-14	86-64-46-48	110	Poorly graded gravel with silt and sand (GP-GM); very dense, 52% gravel, 18% fine sand,	GLACIAL TILL	2
13	5						12% medium sand, 10% coarse sand, 8% silt, gray. (GLACIAL TILL)		
							While driving spoon, casing dropped to 7.7 ft.		
14	12						Advance HW drill casing to 12 ft.		
							Mix additional bentonite drilling mud.		
15	5						Advance 3-7/8 in. roller bit to 17 ft.		
16	12								
17	45								
	53	S-3	15/2	17-18.3	17-54-100/3"	--	Mainly wash material, cobble in bottom of sample and tip of spoon.		
18							Advance HW drill casing to 17 ft.		
							Advance 3-7/8 in. roller bit to 18.6 ft.		
19							At 18.6 ft, losing mud to possible bedrock interface. Mix additional bentonite mud to		
							advance roller bit further into possible bedrock.	BEDROCK	
20							Advance HW drill casing to 17.5 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 Atterberg Limits laboratory test data. Refer to Test Report No. 7, prepared by GeoTesting Express, dated January 24, 2000.
2) Sample description based on laboratory test data and ASTM D2487. Refer to Test Report No. 7, prepared by GeoTesting Express, dated January 24, 2000.
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. FA-25 SHEET 2 of 2 FILE NO. 48138.07 CHKD. BY C. Thunberg / J.Trottier

Boring Co.	Atlantic Testing Laboratories, Limited	Boring Location	northing 2705787.7	easting 815242.1	
Driller	P. Davis	Mudline El.	-2.30	Datum	NGVD
Logged By	E. Paddleford	Date Start	10/18/99	Date End	10/19/99

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	REMARKS
			CORE		CORE		Advance 3-7/8 in. roller bit to 19 ft.		
21			INTERVAL		TIME				
							Begin NX rock core at 19 ft.		
22		R-1	19-20		10 min		R-1: 19-24 ft. Recovery = 82% RQD = 74%		
							Void encountered at 23.2 ft, approximately 0.7 ft. Lost significant amount of water.		
23			20-21		9 min		Sandy material observed in water return, water color change to reddish brown from the	BEDROCK	
							normal gray of the rock cuttings.		
24			21-22		9.5 min		Fresh, moderately hard, gray, aphanitic GNEISS with low angle to moderately dipping,		
							moderately spaced, rough, stepped, fresh to discolored, partly open joints. Void space		
25			22-23		8 min		from 23 to 23.7 ft.		
26			23-24		1 min				
27		R-2	24-25		7 min		R-2: 24-29 ft. Recovery = 100% RQD = 35%		
							Fresh, moderately hard, gray aphanitic GNEISS, primary jointing low angle, very close		
28			25-26		8.5 min		to close, rough, undulating, fresh to discolored, partly open. Secondary jointing high		
							angle to vertical, close, rough, stepped, discolored, and partly open. Filling material on		
29			26-27		9 min		secondary joint surfaces (quartz, calcite). Iron staining also noted on secondary		
							joint surfaces . These high angle and vertical joints are present in the		
30			27-28		7 min		lower 2.5 ft of R-2. Primary jointing occurs throughout the run. Last 4 in. of R-2 is of		
							differing rock type (quartz, feldspar-kspar), white and pink in color, surficial jointing		
31			28-29		7.5 min		visible in this last 4 in. section (lines of weakness). This type of superficial weakness		
							jointing noted throughout core run. Mainly along foliation direction, but also		
32							randomly as well.		
							Boring terminated in bedrock at 29 ft.		
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 Atterberg Limits laboratory test data. Refer to Test Report No. 7, prepared by GeoTesting Express, dated January 24, 2000.
2) Sample description based on laboratory test data and ASTM D2487. 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. FA-26 SHEET 1 of 2 FILE NO. 48138.07 CHKD. BY C. Thunberg / J.Trottier

Boring Co.	Atlantic Testing Laboratories, Limited	Boring Location	northing 2705634.8	easting 815134.5	
Driller	P. Davis	Mudline El.	-3.70	Datum	NGVD
Logged By	E. Paddleford	Date Start	8/25/99	Date End	8/26/99

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 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 from 0 to 3 ft.		
	Hyd.								
2	Push								
	Hyd.								
3	Push								
	Hyd.	UO-1	24/24	3-5	–	–	Organic clay (OH); 90% organic clay,10% fine sand, strong organic odor, gray/black.	OH	1
4	Push						Trace wood debris noted in tip 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.								
6	Push								
	Hyd.	UO-2	18/10	6-7.5	–	–	Medium sand and silt with trace wood debris noted in tip of sample tube.		
7	Push								
	Push								
8		S-1	24/14	7.5-9.5	36-61-44-34	105	Poorly graded gravel with silt and sand (GP-GM); very dense, 47% gravel, 19%	GP-GM	2
	Drop						medium sand, 16% fine sand, 11% coarse sand, 7% silt, olive gray.		
9	18						Advance HW drill casing to 7.5 ft. (hydraulic push)		
							Advance 3-7/8 in. roller bit to 8 ft.		
10	45						Roller bit getting hung-up on casing.		
							Casing dropped to 8.5 ft.		
11	5						Advance HW drill casing to 10 ft.		
							Switch to mud rotary drilling techniques at 8.5 ft.		
12	9						Advance 3-7/8 in. roller bit to 13 ft.		
13	11								
		S-2	24/10	13-15	15-12-11-10	23	Poorly graded sand (SP); medium dense, 40% medium sand, 30% coarse sand,	SP	
14	3						20% fine sand, 5% silt, 5% gravel, gray.		
							Advance HW drill casing to 13 ft.		
15	4						Advance 3-7/8 in. roller bit to 18 ft.		
16	22								
17	39								
18	28								
		S-3	24/10	18-20	20-15-15-17	30	Poorly graded sand with silt (SP-SM); medium dense, 44% medium sand, 37% fine	SP-SM	2
19	Drop						sand, 7% coarse sand, 7% gravel, 5% silt, gray.		
							Advance HW drill casing to 18 ft.		
20	45						Advance 3-7/8 in. roller bit 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) Sample description based on Atterberg Limits laboratory test data. Refer to Test Report No. 7, prepared by GeoTesting Express, dated January 24, 2000.
2) Sample description based on laboratory test data and ASTM D2487. Refer to Test Report No. 7, prepared by GeoTesting Express, dated January 24, 2000.
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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. FA-26 SHEET 2 of 2 FILE NO. 48138.07 CHKD. BY C. Thunberg / J.Trottier

Boring Co.	Atlantic Testing Laboratories, Limited	Boring Location	northing 2705634.8	easting 815134.5	
Driller	P. Davis	Mudline El.	-3.70	Datum	NGVD
Logged By	E. Paddleford	Date Start	8/25/99	Date End	8/26/99

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 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
21	100								
22	107								
23	96								
24	Drop	S-4	24/12	23-25	27-22-15-22	37	6 in: Silty sand with gravel (SM); dense, 45% fine sand, 35% silt, 15% gravel, 5% coarse sand,olive gray.	SM	
25	234/6"						6 in: Poorly graded sand (SP); 50% medium sand, 30% fine sand, 10% coarse sand, 5% silt, 5% gravel, olive gray.	SP	
26							Advance HW drill casing to 23 ft. Casing dropped to 24 ft.		
			CORE		CORE		Advance 3-7/8 in. roller bit to 26.6 ft.		
			INTERVAL		TIME				
27		R-1	26.6-27.6		11 min		Top of bedrock at 26.3 ft. Advance HW drill casing to 24.7 ft.		
28			27.6-28.6		12.5 min		Begin NX rock core at 26.6 ft.	BEDROCK	
29			28.6-29.6		7 min		R-1: 26.6 - 31.6 ft. Recovery = 98% RQD = 59% Upper 1.3 ft of core slightly weathered. Lower 3.7 ft. fresh, moderately hard, gray,		
30			29.6-30.6		7 min		aphanitic GNEISS, primary jointing, low-angle, close to moderately spaced, rough, stepped, fresh, tight to partly open joints filled with quartz. Secondary jointing		
31			30.6-31.6		10.5 min		moderately dipping to high angle, moderately spaced, rough, undulating, fresh, and partly open. Secondary quartz mineralization at high angle to foliation plane.		
32		R-2	31.6-32.6		11.5 min		R-2: 31.6 - 35.8 ft. Recovery = 93% RQD = 86%		
33			32.6-33.6		9.5 min		Fresh, moderately hard, gray, aphanitic GNEISS with low angle to moderately dipping, rough, undulating, fresh, tight to partly open joints. Secondary mineralization		
34			33.6-34.6		13.5 min		noted in some joints (possible calcite or chlorite) white to lime green coloration. Large 0.5 to 0.7 in. quartz lenses along foliation direction.		
35			34.6-35.6		13.5 min		Core barrel stopped advancing at 35.8 ft. Terminated core run.		
36			35.6-35.8		>19 min				
37							Boring terminated in bedrock at 35.8 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. 7, prepared by GeoTesting Express, dated January 24, 2000.
2) Sample description based on laboratory test data and ASTM D2487. Refer to Test Report No. 7, prepared by GeoTesting Express, dated January 24, 2000.
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. FA-27 SHEET 1 of 2 FILE NO. 48138.07 CHKD. BY C. Thunberg / J.Trottier

Boring Co.	Atlantic Testing Laboratories, Limited	Boring Location	northing 2705546.0	easting 815073.5	
Driller	P Davis	Mudline El.	-2.94	Datum	NGVD
Logged By	E. Paddleford	Date Start	9/2/99	Date End	9/7/99

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 from 0 to 3 ft.		
	Hyd.								
2	Push								
	Hyd.								
3	Push								
	Hyd.	UO-1	24/24	3-5	--	--	Organic clay (OH); organic clay with some shell fragments.	OH	1
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							OH	
	Hyd.	UO-2	24/24	6-8	--	--	Similar to UO-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						Wood/organic material in water return.		
	Hyd.						Peat layer from 8 to 9 ft.	Pt	
9	Push								
		UO-3	24/20	9-11	11-31-43-33	74	UO-3: Unable to push tube.		
10	7	S-1					S-1: Poorly graded sand with silt (SP-SM); very dense, 40% medium sand, 25% fine	SP-SM	
							sand, 15% coarse sand, 10% silt, 10% gravel, dark brown.		
11	14						Switch to mud rotary drilling techniques at 9 ft.		
							Advance 3-7/8 in. roller bit to 13 ft.		
12	9								
13	22								
		S-2	24/10	13-15	22-29-27-29	56	Silty sand (SM); very dense, 60% fine sand, 20% silt, 10% medium sand,	SM	
14	Drop						10% coarse sand, gray.		
							Advance HW drill casing to 13 ft.		
15	Drop						Advance 3-7/8 in. roller bit to 18 ft.		
							Casing bound up on roller bit.		
16	Drop						Difficulty removing roller bit from casing.		
							Casing dropped to 14 ft.		
17	Drop						Casing has now fallen to 15.2 ft, and then to 16.2 ft.		
							Mix additional bentonite and EZ mud drilling mud. Casing dropped, to 17 ft.		
18	22								
		S-3	24/7	18-20	16-17-20-24	37	Silty sand (SM); dense, 50% fine sand, 30% silt, 10% medium sand, 10% coarse	SM	
19	12						sand, gray.		
							Advance HW drill casing to 18 ft.		
20	34						Advance 3-7/8 in. roller bit to 21.3 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 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. FA-27 SHEET 2 of 2 FILE NO. 48138.07 CHKD. BY C. Thunberg / J.Trottier

Boring Co.	Atlantic Testing Laboratories, Limited	Boring Location	northing 2705546.0 easting 815073.5
Driller	P Davis	Mudline El.	-2.94 Datum NGVD
Logged By	E. Paddleford	Date Start	9/2/99 Date End 9/7/99

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
			CORE INTERVAL		CORE TIME		Add more EZ mud to mixture while roller bitting this interval.		
21	82	R-1	20.9-21.9		7.5 min		Bedrock encountered at 20.9 ft.		
							Advance HW drill casing to 20.9 ft.		
22			21.9-22.9		8 min		Begin NX rock core at 20.9 ft.	BEDROCK	
							R-1: 20.9 - 25.9 ft. Recovery = 90% RQD = 80%		
23			22.9-23.9		9.5 min		Fresh, moderately hard, gray to dark gray, aphanitic GNEISS with low to moderate		
							angle, close to moderately spaced, rough, planar, fresh partly open joints. Greenish		
24			23.9-24.9		10 min		filling material noted in one of the joints.		
25			24.9-25.9		11 min				
26		R-2	25.9-26.9		8.5 min		R-2: 25.9 - 29.9 ft. Recovery = 85% RQD = 80%		
							Bottom ft. of core fell out of core barrel upon retrieval.		
27			26.9-27.9		8.5 min		Fresh, moderate to hard, gray to dark gray, aphanitic GNEISS with low to moderate		
							angle, closely spaced rough planar, partly open joint. Greenish filling material noted		
28			27.9-28.9		8 min		in joints.		
29		R-2/	28.9-29.9		9.5 min/		R-3: 28.9 - 30.9 ft. Recovery = 29%. Did not compute RQD due to short run.		
		R-3			4.5 min		Similar to R-2 in description.		
30			29.9-30.9		5.5 min				
31									
32							Boring terminated in bedrock at 30.9 ft.		
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 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. FA - 28 SHEET 1 of 2 FILE NO. 48138.07 CHKD. BY C. Thunberg / J.Trottier

Boring Co.	Atlantic Testing Laboratories, Limited	Boring Location	northing 2705569.1	easting 814944.4	
Driller	P. Davis	Mudline El.	-1.9	Datum	NGVD
Logged By	S. Bonis	Date Start	10/28/99	Date End	10/29/99

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 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	--	--	Recovered sample but lost during processing. Over 1.5 ft of fill material (brick fragments,		
1	Push						etc.). (FILL)	FILL	
	Hyd.						Advance HW drill casing from 0 to 2 ft. (hydraulic push)		
2	Push						Advance 3-7/8 in. roller bit from 0 to 2 ft.		
	Hyd.	UO-2	24/20	2-4	--	--	Top of tube: Similar to UO-1 (FILL)	OH	
3	Push						Bottom of tube: Organic soil (OH). Organic silt/clay		
	Hyd.						Advance HW drill casing to 5 ft. (hydraulic push)		
4	Push						Advance 3-7/8 in. roller bit to 5 ft.		
	Hyd.						Casing resistance indicates OH/sand transition at 5 ft.		
5	Push								
	Hyd.	S-1	24/14	5-7	1-1-2-4	3	S-1A: 2 in. Silty sand (SM); very loose, 70% fine sand, 30% silt, light gray.	SM	
6	Push						5 in. Silty sand (SM); very loose, 60% fine sand, 30% silt, 10% gravel, organic odor,		
	Hyd.						dark brown		
7	Push						S-1B: 7 in. Well-graded sand with silt and gravel (SW-SM); very loose, 46% medium	SW-SM	1
							sand, 20% fine sand, 12% coarse sand, 17% gravel, 5% silt, brown.		
8	NR						Advance HW drill casing to 7 ft. (hydraulic push)		2
							Switch to mud rotary drilling techniques at 7 ft.		
9	2						Advance 3-7/8 in. roller bit to 10 ft.		
10	3								
		S-2	24/10	10-12	15-28-27-21	55	Poorly graded sand with silt (SP-SM); very dense, 50% medium sand, 40% fine sand,	SP-SM	
11	4						10% silt.		
							Advance HW drill casing to 12 ft.		
12	6						Advance 3-7/8 in. roller bit to 15 ft.		
13	6								
14	12								
15	5								
		S-3	19/2	15-16.6	33-22-34-50/1"	56	Poorly graded gravel with silt (GP-GM); very dense, 80% gravel, 10% fine sand, 10% silt.	GP-GM	
16	7						Advance HW drill casing to 17 ft.		
			CORE		CORE		Advance 3-7/8 in. roller bit to 17 ft.		
17	30		INTERVAL		TIME		Begin NX rock core at 17 ft.		
		R-1	17 - 18		7 min		R-1: 17-22 ft. Recovery = 60% RQD = 88%		
18							Fresh, moderately hard, fine grained GNEISS, moderately dipping foliation,	BEDROCK	
			18 - 19		9.5 min		light gray. Primary joints, extremely close, low angle, discolored, and open.		
19									
			19 - 20		10 min				
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 laboratory test data and ASTM D2487. Refer to Test Report No. 7, prepared by GeoTesting Express, dated January 24, 2000.
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. FA - 28 SHEET 2 of 2 FILE NO. 48138.07 CHKD. BY C. Thunberg / J.Trottier

Boring Co.	Atlantic Testing Laboratories, Limited	Boring Location	northing 2705569.1	easting 814944.4	
Driller	P. Davis	Mudline El.	-1.9	Datum	NGVD
Logged By	S. Bonis	Date Start	10/28/99	Date End	10/29/99

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 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
21			20 -21		9.5 min			BEDROCK	
22			21 - 22		10 min				
23		R-2	22 - 23		7.5 min		R-2: 22 - 27 ft. Recovery = 100% RQD = 83%		
24			23 - 24		11 min		Fresh, moderately hard, fine grained GNEISS, moderately dipping foliation, light gray. Primary joints, very close, low angle, discolored, and open.		
25			24 - 25		11 min		Secondary joints, vertical, discolored, decomposed, and open.		
26			25 - 26		11 min				
27			26 - 27		18 min				
28							Boring terminated in bedrock at 27 ft.		
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) Sample description based on laboratory test data and ASTM D2487. Refer to Test Report No. 7, prepared by GeoTesting Express, dated January 24, 2000.
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. FA-V1 SHEET 1 of 1 FILE NO. 48138.07 CHKD. BY C. Thunberg / J.Trottier

Boring Co.	Atlantic Testing Laboratories, Limited	Boring Location	northing 2706530.5 easting 815495.8		
Driller	P. Davis	Mudline El.	-2.4	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 8 ft. (hydraulic push) Advance 3-7/8 in. roller bit from 0 to 8 ft.	OH	
2	Hyd. Push								
3	Hyd. Push								
4	Hyd. Push								
5	Hyd. Push								
6	Hyd. Push								
7	Hyd. Push								
8	Hyd. Push						Difficult push at 8 ft.		
9		S-1	24/6	8-10	8-7-4-4	11	Silty sand with gravel (SM); wet, medium dense, 40% silt, 25% gravel, 15% medium sand, 10% coarse sand, 10% fine sand, slight organic odor, dark brown. Traces of peat noted throughout sample.	SM	
10									
11							Bottom of exploration at 10 ft; no refusal.		
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:
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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. FA-V4 SHEET 1 of 1 FILE NO. 48138.07 CHKD. BY C. Thunberg / J.Trottier

Boring Co.	Atlantic Testing Laboratories, Limited	Boring Location	northing 2706101.9 easting 815534.7
Driller	P. Davis	Mudline El.	-4.7 Datum NGVD
Logged By	E. Thibodeau	Date Start	11/8/99 Date End 11/8/99

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. 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 to12 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								
13		S-1	24/12	12-14	WOR/8" - 3/4" -20-41	--	6 in: Sandy organic soil (OH); wet, 60% organic clay/silt, 35% fine sand, 5% medium sand, dark gray. PP: Undrained shear strength (Su) = 0.05 ksf.	SM	
14							6 in: Silty sand with gravel (SM); wet, medium dense, 30% fine sand, 25% gravel, 25% silt, 10% medium sand, 10% coarse sand, gray.		
15							Bottom of exploration at 14 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. FA-V5 SHEET 1 of 1 FILE NO. 48138.07 CHKD. BY C. Thunberg / J.Trottier

Boring Co.	Atlantic Testing Laboratories, Limited	Boring Location	northing 2706055.6 easting 815355.5
Driller	P. Davis	Mudline El.	-3.6 Datum NGVD
Logged By	E. Thibodeau	Date Start	11/9/99 Date End 11/9/99

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	REMARKS
	Hyd.						Advance HW drill casing to 12.5 ft. (hydraulic push)		
1	Push						Advance 3-7/8 in. roller bit from 0 to 12.5 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								
	Hyd.								
10	Push								
	Hyd.								
11	Push								
	Hyd.								
12	Push								
	Hyd.								
13	Push	S-1	30/7	12.5-15	2-1/24"	--	6 in: Sandy organic soil (OH); wet, 55% organic clay/silt, 30% fine		1
	Hyd.						sand, 10% medium sand, 5% coarse sand, moderate organic odor, dark gray.		
14	Push						1 in: Silty sand (SM); wet, 45% fine sand, 30% silt, 10% medium sand,		
	Hyd.						10% gravel, 5% coarse sand, gray.		
15	Push						Advance HW drill casing to 15 ft. (hydraulic push)		
		S-2	24/6	15-17	9-6-10-23	16	Advance 3-7/8 in. button bit to 15 ft.	SM	
16							S-2: Silty sand with gravel (SM); wet, medium dense, 30% gravel, 25% silt, 25% fine sand,		
							10% coarse sand, 10% medium sand, gray to dark brown.		
17									
							Bottom of exploration at 17 ft; no refusal.		
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) Sampler was overdriven approximately 6 in; therefore, drill casing was advanced to 15 ft. for the next sample.
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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. FA-V6 SHEET 1 of 1 FILE NO. 48138.07 CHKD. BY C. Thunberg / J.Trottier

Boring Co.	Atlantic Testing Laboratories, Limited	Boring Location	northing 2705897.2 easting 815398.5		
Driller	P. Davis	Mudline El.	-4.6	Datum	NGVD
Logged By	E. Thibodeau	Date Start	11/8/99	Date End	11/8/99

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. 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	REMARKS
1	Hyd. Push						Advance HW drill casing to14 ft. (hydraulic push) Advance 3-7/8 in. roller bit from 0 to 14 ft.		
2	Hyd. Push								
3	Hyd. Push								
4	Hyd. Push								
5	Hyd. Push								
6	Hyd. Push								
7	Hyd. Push							OH	
8	Hyd. Push								
9	Hyd. Push								
10	Hyd. Push								
11	Hyd. Push								
12	Hyd. Push								
13	Hyd. Push								
14	Hyd. Push						Difficult push at 14 ft.		
15		S-1	24/6	14-16	8-25-19-30	44	Silty gravel with sand (GM); wet, dense, 45% gravel, 20% silt, 15% coarse sand, 10% fine sand, 10% medium sand, gray.	GM	
16							Bottom 1 in. of material was black in color; slight odor, PID = 1.2 ppm.		
17							Bottom of exploration at 16 ft; no refusal.		
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. FA-V7 SHEET 1 of 1 FILE NO. 48138.07 CHKD. BY C. Thunberg / J.Trottier

Boring Co.	Atlantic Testing Laboratories, Limited	Boring Location	northing 2705763.0 easting 815130.8
Driller	P. Davis	Mudline El.	-2.50 Datum NGVD
Logged By	E. Thibodeau	Date Start	11/9/99 Date End 11/9/99

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	REMARKS
	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							OH	
	Hyd.								
3	Push								
	Hyd.								
4	Push								
	Hyd.								
5	Push						Difficult push at 5 ft.		
		S-1	24/14	5-7	22-39-42-31	81	Silty gravel with sand (GM); wet, very dense, 40% gravel, 25% silt, 15% fine sand,	GM	
6							10% coarse sand,10% medium sand, dark brown.		
7									
8							Bottom of exploration at 7 ft; no refusal.		
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)
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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. FA-V8 SHEET 1 of 1 FILE NO. 48138.07 CHKD. BY C. Thunberg / J.Trottier

Boring Co.	Atlantic Testing Laboratories, Limited	Boring Location	northing 2705649.0 easting 815229.0		
Driller	P. Davis	Mudline El.	-4.1	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	REMARKS
	Hyd.						Advance HW drill casing to 7 ft (hydraulic push).		
1	Push						Advance 3 7/8 in. roller bit from 0 to 7 ft.		
	Hyd.								
2	Push								
	Hyd.								
3	Push							OH	
	Hyd.								
4	Push								
	Hyd.								
5	Push								
	Hyd.								
6	Push								
	Hyd.								
7	Push						Difficult push at 7 ft.		
		S-1	24/15	7-9	16-23-21-41	44	Silty sand with gravel (SM); wet, dense, 35% fine sand, 30% gravel, 20% silt, 10%	SM	
8							medium sand, 5% coarse sand, gray.		
9									
10							Bottom of exploration at 9 ft; no refusal.		
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)
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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. FA-V10 SHEET 1 of 1 FILE NO. 48138.07 CHKD. BY C. Thunberg / J.Trottier

Boring Co.	Atlantic Testing Laboratories, Limited	Boring Location	northing 2705492.4 easting 814940.8		
Driller	P. Davis	Mudline El.	-2.5	Datum	NGVD
Logged By	E. Thibodeau	Date Start	11/5/99	Date End	11/5/99

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 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 6 ft. (hydraulic push) Advance 3-7/8 in. roller bit from 0 to 6 ft.	OH	
2	Hyd push								
3	Hyd push								
4	Hyd push								
5	Hyd push								
6	Hyd push						Difficult push at 6 ft.		
7		S-1	24/15	6-8	10-10-10-11	20	5 in: Silty sand (SM); wet, medium dense, 50% fine sand, 30% silt, 10% medium sand, 5% coarse sand, 5% gravel, slight organic odor, gray.	SM	
8							10 in: Silty sand with gravel (SM); wet, medium dense, 30% medium sand, 25% fine sand, 15% coarse sand, 15% gravel, 15% silt, reddish-brown.		
9							Bottom of exploration at 8 ft. No refusal.		
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)
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-A1 SHEET 1 of 1 FILE NO. 48138.07 CHKD. BY C. Thunberg / J.Trottier

Boring Co.	Atlantic Testing Laboratories, Limited	Boring Location	northing 2706392.3 easting 815256.8		
Driller	M. Childs	Ground Surface El.	7.17	Datum	NGVD
Logged By	S. Harding	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 850 ATV
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 FA-2 (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-A2 SHEET 1 of 1 FILE NO. 48138.07 CHKD. BY C. Thunberg / J.Trottier

Boring Co.	Atlantic Testing Laboratories, Limited	Boring Location	northing 2705969.3 easting 815188.8		
Driller	R. Pryce	Ground Surface El.	5.70	Datum	NGVD
Logged By	R. Chase	Date Start	8/12/99	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 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
		S-1	24/6	0-2	10-5-4-4	9	Poorly graded sand (SP); dry, loose, 70% fine sand, 10% medium sand, 5% coarse sand,		
1	spin						10% fine gravel, 5% silt, dark gray. (FILL)		
							Advance SW drill casing to 3 ft.		
2	spin								
								FILL	
3	spin								
		S-2	24/4	3-5	8-7-12-6	19	Poorly graded sand with gravel (SP); wet, medium dense, 40% fine sand,		
4	spin						10% medium sand, 10% coarse sand, 35% fine gravel, 5% silt, brown. (FILL)		
							Advance SW drill casing to 7.7 ft.		
5	spin						Advance 5-3/8 in. roller bit to 9 ft.		
6	spin								
7	spin								
8	spin								
9	spin								
		S-3	24/NR	9-11	6-5-4-4	9	Poorly graded sand (SP); wet, loose, 75% fine sand, 15% medium sand, 5% silt, 5% brick,		1
10	spin						gray-red. (FILL)		
							Advance SW drill casing to 13 ft.		
11	spin								
12	spin						Estimated strata change at 12 ft.		
13	spin								
		S-4	24/17	13-15	6-7-28-29	35	Poorly graded sand (SP); wet, dense, 85% fine sand, 5% medium sand, 5% fine gravel,	SP	
14	spin						5% silt, gray.		
							Advance SW drill casing to 19 ft.		
15	spin						Advance 5-3/8 in. roller bit to 19 ft.		
16	spin								
17	spin								
18	spin								
19	spin								
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) NR = Not recorded.
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. OW - A3 SHEET 1 of 1 FILE NO. 48138.07 CHKD. BY C. Thunberg / J.Trottier

Boring Co.	Atlantic Testing Laboratories, Limited	Boring Location	northing 2706321.5 easting 814973.2		
Driller	R. Pryce	Ground Surface E	7.90	Datum	NGVD
Logged By	R. Chase	Date Start	8/3/99	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 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
8/4	11:00	6.1 ft	1.80	During drilling

DEPTH	Casing Blows (ft)	Type & No.	PEN/REC (inches)	DEPTH (feet)	BLOWS PER 6 INCHES	SPT N-Value	SAMPLE DESCRIPTION	STRATUM DESCRIPTION	REMKS
							3 in. Asphalt.	ASPHALT	
1							Concrete to 1.7 ft.	CONCRETE	
		S-1	1/0	1-1.1	50/1".	--	No recovery.		
2							Advance HSA to 5 ft.		
3									
4									
5									
		S-2	24/19	5-7	5-3-4-4	7	Silty sand (SM); loose, 80% fine sand, 5% fine gravel, 15% silt, brown. (FILL)		
6							Advance HSA to 10 ft.	FILL	
7									
8									
9							Estimated strata change at 8.5 ft.		
10									
		S-3	24/21	10-12	10-15-27-36	42	Poorly graded sand (SP); dense, 80% fine sand, 5% medium sand, 5% coarse	SP	
11							sand, 5% fine gravel, 5% silt, brown.		
12							Advance HSA to 15 ft.		
13									
14									
15									
		S-4	13/13	15-16.1	32-39-50/1"	--	Poorly graded sand with silt (SP-SM); 80% fine sand, 10% silt,	SP-SM	
16							5% medium sand, 5% coarse sand, gray.		1
17							Advance HSA to 16.2 ft. Bottom of exploration at 16.2 ft, split-spoon and auger refusal.		
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 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 - A4 SHEET 1 of 1 FILE NO. 48138.07 CHKD. BY C. Thunberg / J.Trottier

Boring Co.	Atlantic Testing Laboratories, Limited	Boring Location	northing 2706076.9 easting 814770.6		
Driller	R. Pryce	Ground Surface El.	8.40	Datum	NGVD
Logged By	R. Chase	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 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
8/3	13:45	6.1ft	2.30	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		S-1	24/14	0.5-2.5	6-6-12-17	18	Poorly graded sand (SP); medium dense, dry, 75% fine sand, 10% medium sand, 5% coarse sand, 5% fine gravel, 5% silt, brown. (FILL)	FILL	
2							Advance HSA to 5 ft.		
3							Estimated strata change at 3 ft.		
4									
5									
6		S-2	24/17	5-7	26-28-22-23	50	Poorly graded sand (SP); dense, wet, 55% fine sand, 25% medium sand, 10% coarse sand, 5% fine gravel, 5% silt, brown.	SP	1
7							Advance HSA to 10 ft.		
8									
9									
10									
11		S-3	24/15	10-12	9-10-9-16	19	Poorly graded sand (SP); medium dense, 80% fine sand, 10% medium sand, 5% coarse sand, 5% silt, brown.	SP	
12							Advance HSA to 15 ft.		
13									
14									
15									
16		S-4	24/22	15-17	6-6-15-13	21	Poorly graded sand with gravel (SP); medium dense, 50% fine sand, 20% fine gravel, 15% medium sand, 10% coarse sand, 5% silt, brown.	SP	
17							Advance 3-7/8 in. roller bit to 19 ft.		
18									
19								PROBABLE BEDROCK	
20							Bottom of exploration at 19 ft, refusal at 18.3 ft.		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 5.5 ft. below the ground surface.
2) Installed 2-in. 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. OW - A5 SHEET 1 of 1 FILE NO. 48138.07 CHKD. BY C. Thunberg / J.Trottier

Boring Co.	Atlantic Testing Laboratories, Limited	Boring Location	northing 2706007.0 easting 815045.8		
Driller	R. Pryce	Ground Surface El.	5.60	Datum	NGVD
Logged By	R. Chase	Date Start	8/11/99	Date End	8/11/99

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 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
8/11	18:00	1.7 ft	3.90	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 FA-5 (0-12 ft). Advance HSA to 12.8 ft.		
3									
4									
5									
6									
7									
8									
9									
10									
11									
12									
13									1
14							Bottom of exploration at 12.8 ft, 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) Installed 2-in. 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 - A6 SHEET 1 of 1 FILE NO. 48138.07 CHKD. BY C. Thunberg / J.Trottier

Boring Co.	Atlantic Testing Laboratories, Limited	Boring Location	northing 2705435.2 easting 814800.3		
Driller	R. Pryce	Ground Surface El.	5.20	Datum	NGVD
Logged By	R. Chase	Date Start	8/2/99	Date End	8/2/99

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
8/2	18:15	3.1 ft	2.10	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							Refer to boring FA-8 (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-in. 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 - A7 SHEET 1 of 1 FILE NO. 48138.07 CHKD. BY C. Thunberg / J.Trottier

Boring Co.	Atlantic Testing Laboratories, Limited	Boring Location	northing 2705687.7 easting 814711.3		
Driller	R. Pryce	Ground Surface El.	8.18	Datum	NGVD
Logged By	S. Bonis	Date Start	9/15/99	Date End	9/15/99

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: 4-1/4 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							Approx. 2 in. asphalt pavement		
2		S-1	24/18	1-3	8-12-9-8	21	8 in: Poorly graded sand with silt (SP-SM); dry, medium dense, 90% fine sand, 10% silt, dark brown. (FILL)	FILL	
3							10 in: Poorly graded sand with silt (SP-SM); dry, medium dense, 80% fine sand, 10% gravel, 10% silt, light brown. (FILL)		
4									
5							Estimated strata change at 5 ft.		
6		S-2	24/13	5-7	22-16-20-28	36	Well-graded sand with silt and gravel (SW-SM); medium dense, 40% medium sand, 25% gravel, 15% coarse sand, 10% fine sand, 10% silt.	SW-SM	
7									
8									
9									
10									
11		S-3	24/18	10-12	14-10-13-14	23	Poorly graded sand with gravel (SP); wet, medium dense, 10% coarse sand, 40% medium sand, 25% fine sand, 20% gravel, 5% silt, brown.	SP	
12									
13									
14									
15									
16		S-4	24/12	15-17	11-11-9-10	20	Running sands, drove spoon to clear out hole. S-4: Well-graded sand with silt (SW-SM); wet, medium dense, 50% medium sand, 15% fine sand, 15% coarse sand, 10% gravel, 10% silt.	SW-SM	
17							Advance HSA to 19 ft.		
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-in. 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. MW-A1 SHEET 1 of 1 FILE NO. 48138.07 CHKD. BY C. Thunberg / J.Trottier

Boring Co.	Atlantic Testing Laboratories, Limited	Boring Location	northing 2706613.8 easting 815363.8		
Driller	R. Pryce	Ground Surface El.	5.20	Datum	NGVD
Logged By	R. Chase	Date Start	7/27/99	Date End	7/28/99

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
7/28	10:00	4.2 ft	1.00	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		S-1	24/14	0-2	4-7-9-8	16	Poorly graded sand with silt (SP-SM): dry, medium dense, 75% fine sand, 5% medium sand, 10% fine gravel, 10% silt, dark brown. (FILL)	FILL	
2									
3									
4									
5									
6		S-2	24/10	5-7	4-7-7-10	14	Poorly graded sand with silt (SP-SM); wet, medium dense, 85% fine sand, 5% fine gravel, 10% silt, brown. (FILL)		
7									
8									
9									
10							Estimated strata change at 10 ft.		
11		S-3	24/24	10-12	3-3-4-3	7	Organic soil (OL); medium stiff, 45% organic silt, 55% root matter, brown.	OL	
12									
13		S-4	24/24	12-14	4-5-5-7	10	Organic soil (OL); stiff, 60% organic silt, 40% root matter, brown.	OL	
14									
15		S-5	24/16	14-16	3-6-2-6	8	Silty Sand (SM); loose, 85% fine sand, 15% silt, brown, septic odor. Advance HSA to 19 ft.	SM	
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)
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-A2S SHEET 1 of 2 FILE NO. 48138.07 CHKD. BY C. Thunberg / J.Trottier

Boring Co.	Atlantic Testing Laboratories, Limited	Boring Location	northing 2706171.0 easting 815006.8		
Driller	R. Pryce	Ground Surface El.	5.90	Datum	NGVD
Logged By	R. Chase	Date Start	7/28/99	Date End	7/28/99

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	S-1	24/17	0-2	4-9-10-12	19	Silty sand with gravel (SM); dry, medium dense, 27% fine sand, 25% medium sand, 11% coarse sand, 21% gravel, 16% silt, brown. (FILL)	FILL	1
2	spin						Advance SW casing to 3 ft.		
3	spin								
4	spin	S-2	24/9	3-5	11-9-6-4	15	Poorly graded sand with gravel (SP); wet, medium dense, 60% fine sand, 10% medium sand, 5% coarse sand, 20% fine gravel, 5% silt, gray. (FILL)		
5	spin						Advance SW casing to 8 ft.		
6	spin								
7	spin						Estimated strata change at 7 ft.		
8	spin								
9	spin	S-3	24/6	8-10	40-7-7-8	14	Organic soil (OL); stiff, 80% organic silt/clay, 20% fine gravel, gray. Gravel located at the top of the sample.	OL	
10	spin						Advance SW drill casing to 13 ft.		
11	spin								
12	spin								
13	spin								
14	spin	S-4	24/16	13-15	1-2-2-2	4	Poorly graded sand with silt (SP-SM); very loose, 75% fine sand, 5% medium sand, 5% coarse sand, 5% fine gravel, 10% silt, gray.	SP-SM	
15	spin								
16	spin	S-5	24/24	15-17	12-12-11-16	23	Poorly graded sand (SP); medium dense, 75% fine sand, 5% medium sand, 10% coarse sand, 5% silt, 5% fine gravel, gray	SP	
17	spin						Advance SW drill casing to 18 ft.		2
18	spin								
19		S-6	24/9	18-20	17-20-25-20	45	Poorly graded sand (SP); dense, 80% fine sand, 5% medium sand, 5% coarse sand, 5% fine gravel, 5% silt, gray.	SP	
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 laboratory test data and ASTM D2487. Refer to Test Report No. 7, prepared by GeoTesting Express, dated January 24, 2000.
2) Pieces of wood slowed drilling - spin & wash.
3) Encountered rock at approximately 20.7 ft. Roller bitted 1.3 ft into rock.
4) Installed 2-inch PVC 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-A2S SHEET 2 of 2 FILE NO. 48138.07 CHKD. BY C. Thunberg / J.Trottier

Boring Co.	Atlantic Testing Laboratories, Limited	Boring Location	northing 2706171.0 easting 815006.8		
Driller	R. Pryce	Ground Surface El.	5.90	Datum	NGVD
Logged By	R. Chase	Date Start	7/28/99	Date End	7/28/99

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								PROBABLE BEDROCK	3
22									
23		S-7	0/0	22	50/0"	--	No Recovery. Bottom of exploration at 22 ft. Refusal.		4
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) Sample description based on laboratory test data and ASTM D2487. Refer to Test Report No. 7, prepared by GeoTesting Express, dated January 24, 2000.
2) Pieces of wood slowed drilling - spin & wash.
3) Encountered rock at approximately 20.7 ft. Roller bitted 1.3 ft into rock.
4) Installed 2-inch PVC 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-A3 SHEET 1 of 1 FILE NO. 48138.07 CHKD. BY C. Thunberg / J.Trottier

Boring Co.	Atlantic Testing Laboratories, Limited	Boring Location	northing 2705830.0 easting 814873.4		
Driller	R. Pryce	Ground Surface El.	5.70	Datum	NGVD
Logged By	R. Chase	Date Start	7/30/99	Date End	7/30/99

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 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
7/30	–	6 ft	-0.30	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
1		S-1	24/17	0-2	19-31-45-47	76	Poorly graded sand (SP); dry, very dense, 80% fine sand, 5% medium sand, 5% coarse sand, 5% fine gravel, 5% silt, gray. (FILL)		
2							Advance HSA to 5 ft.		
3								FILL	
4									
5							Estimated strata change at 5 ft.		
6		S-2	24/20	5-7	3-5-6-6	11	Silty sand (SM); wet, medium dense, 85% fine sand, 15% silt, brown.	SM	1
7									
8									
9									
10									
11		S-3	24/18	10-12	6-16-21-22	37	Poorly graded gravel (GP); dense, 85% gravel, 10% fine sand, 5% silt, gray.	GP	
12									
13									
14									
15									
16		S-4	24/20	15-17	21-27-29-26	56	Poorly graded sand (SP); very dense, 80% fine sand, 10% fine gravel, 5% medium sand, 5% silt, gray.	SP	
17							Advance HSA to 19 ft.		
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 first noted at approximately 6 ft. below the ground surface.
2) Installed 2-in. 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-A4
SHEET	1 of 1
FILE NO.	48138.07
CHKD. BY	C. Thunberg / J.Trottier

Boring Co.	Atlantic Testing Laboratories, Limited	Boring Location	northing 2705794 easting 815246		
Driller	P.Davis	Mudline El.	-2.30	Datum	NGVD
Logged By	E. Paddleford	Date Start	10/19/99	Date End	10/20/99

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 55 skid mount
Drilling Method: 5-inch I.D. (PW) flush-joint casing. Drive and wash.
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 6.5 ft. (hydraulic push)		
1	push						Advance 4-7/8 in. roller bit to 6.5 ft.		
	hyd							OH	
2	push								
	hyd								
3	push								
	hyd								
4	push								
	hyd								
5	push								
	hyd								
6	push								
	push								
7	27	S-1	24/20	6.5-8.5	50-25-25-30	50	Poorly graded sand with silt and gravel (SP-SM); very dense, 40% medium sand,	SP-SM	
							20% fine sand, 15% coarse sand, 15% gravel, 10% silt, gray.		
8	95						Advance PW drill casing to 10 ft.		
							Advance 4-7/8 in. roller bit to 10 ft.		
9	170								
10	75								
							Advance PW drill casing to 15 ft.		
11	160						Advance 4-7/8 in. roller bit to 15 ft.		
12	130								
13	125								
14	195								
15	200								
							Advance PW drill casing to 18.5 ft.		
16	120						Advance 4-7/8 in. roller bit to 18.5 ft.		
17	135								
18	120								
19	79						Bottom of exploration at 18.5 feet. No refusal.		1
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 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-A5 SHEET 1 of 2 FILE NO. 48138.07 CHKD. BY C. Thunberg / J. Trottier

Boring Co.	Atlantic Testing Laboratories, Limited	Boring Location	northing 2706278.5 easting 815562.2		
Driller	P. Davis	Mudline El.	-3.38	Datum	NGVD
Logged By	E. Paddleford	Date Start	11/1/99	Date End	11/2/99

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. Drive and wash.
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 5 ft. (hydraulic push)		
1	push						Advance 4-7/8 in. roller bit to 5 ft.		
	hyd								
2	push								
	hyd								
3	push								
	hyd								
4	push								
	hyd								
5	push								
	hyd						Advance PW drill casing to 10 ft. (hydraulic push)		
6	push						Advance 4-7/8 in. roller bit to 10 ft.	OH	
	hyd								
7	push								
	hyd								
8	push								
	hyd								
9	push								
	hyd								
10	push								
	hyd						Advance PW drill casing to 12.6 ft. (hydraulic push)		
11	push						Advance 4-7/8 in. roller bit to 12.6 ft.		
	hyd								
12	push								
	push								
13	NR	S-1	24/5	12.6 -	6-11-13-13	24	Poorly graded sand (SP); medium dense, 40% medium sand, 35% fine sand, 15% coarse sand,	SP	
				14.6			5% gravel, 5% silt, gray-brown.		
14	NR						Advance PW drill casing to 15 ft.		1
							Advance 4-7/8 in. roller bit to 15 ft.		
15	NR								
							Advance PW drill casing to 20 ft.		
16	NR						Advance 4-7/8 in. roller bit to 20 ft.		
17	NR								
18	NR								
19	NR								
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-A5 SHEET 2 of 2 FILE NO. 48138.07 CHKD. BY C. Thunberg / J. Trottier

Boring Co.	Atlantic Testing Laboratories, Limited	Boring Location	northing 2706278.5 easting 815562.2		
Driller	P. Davis	Mudline El.	-3.38	Datum	NGVD
Logged By	E. Paddleford	Date Start	11/1/99	Date End	11/2/99

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. Drive and wash.
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	R I S
							Advance PW drill casing to 25.4 ft. (hydraulic push)		
21	NR						Advance 4-7/8 in. roller bit to 25.4 ft.		
								SP	
22	NR								
23	NR								
24	NR								
25	NR								
	NR								
26							Bottom of exploration at 25.4 feet. No refusal.		2
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) Installed 2-inch PVC monitoring well in completed boring.
3)
4)

B

APPENDIX B

Well Construction Logs

OBSERVATION WELL CONSTRUCTION LOG

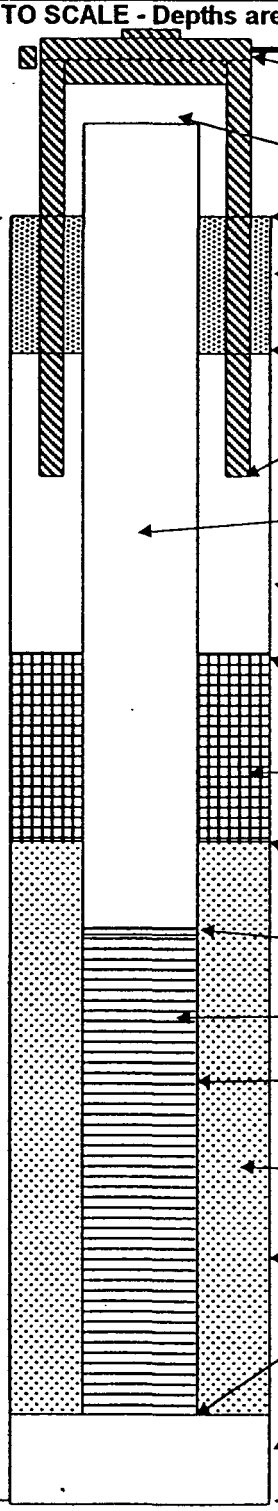
Nobis Engineering, Inc.
P.O. Box 2890 Concord, NH

PROJECT:	New Bedford Harbor	WELL:	OW-A1
LOCATION:	New Bedford, Mass.	DATE:	8/5/99
PROJECT #:	48138.07	PREPARED BY:	S. Harding
CLIENT:	Foster Wheeler Env.	CONTRACTOR:	Atlantic Testing Labs
SURVEY DATUM:	NGVD	FOREMAN:	M. Childs
Northing:	2706392.3		
Easting:	815256.8		

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

GROUNDWATER OBSERVATIONS
(below ground surface)

DEPTH FT	DATE
5.21 ft	8/18/99



PROTECTIVE CASING	
RISER PIPE ELEVATION	9.76 (NGVD)
GROUND SURFACE ELEVATION:	7.17 (NGVD)
TYPE OF SURFACE SEAL:	CONCRETE
DIAMETER OF SURFACE SEAL:	36 in.
DEPTH TO TOP OF SAND DRAIN LAYER	NONE
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:	NONE
DEPTH OF TOP OF SEAL:	1.0 ft (bgs)
TYPE OF SEAL ABOVE FILTER MATERIAL:	3/8 in. BENTONITE CHIPS
DEPTH OF TOP OF FILTER MATERIAL:	2.0 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

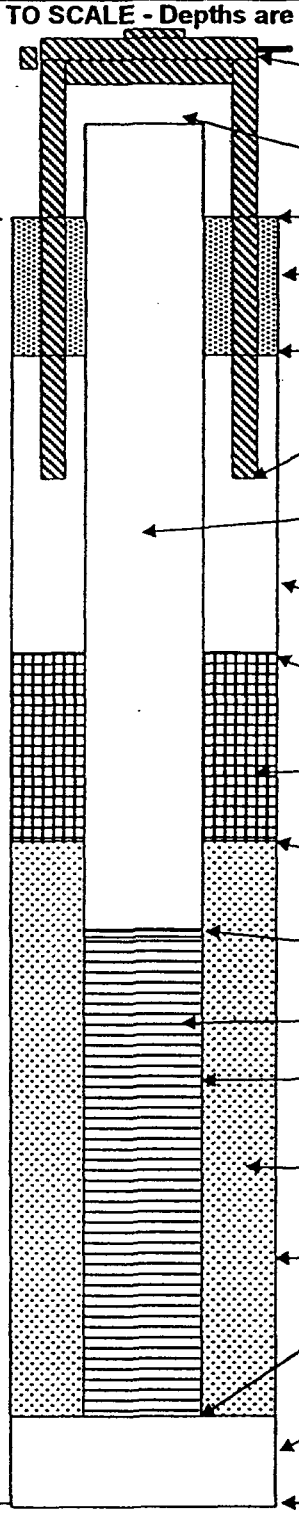
Nobis Engineering, Inc.
P.O. Box 2890 Concord, NH

PROJECT:	New Bedford Harbor	WELL:	OW-A2
LOCATION:	New Bedford, Mass.	DATE:	8/12/99
PROJECT #:	48138.07	PREPARED BY:	R. Chase
CLIENT:	Foster Wheeler Env.	CONTRACTOR:	Atlantic Testing Labs
SURVEY DATUM:	NGVD	FOREMAN:	R. Pryce
Northing:	2705969.3		
Easting:	815188.8		

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

GROUNDWATER OBSERVATIONS
(below ground surface)

DEPTH FT	DATE
6.79 ft	8/17/99



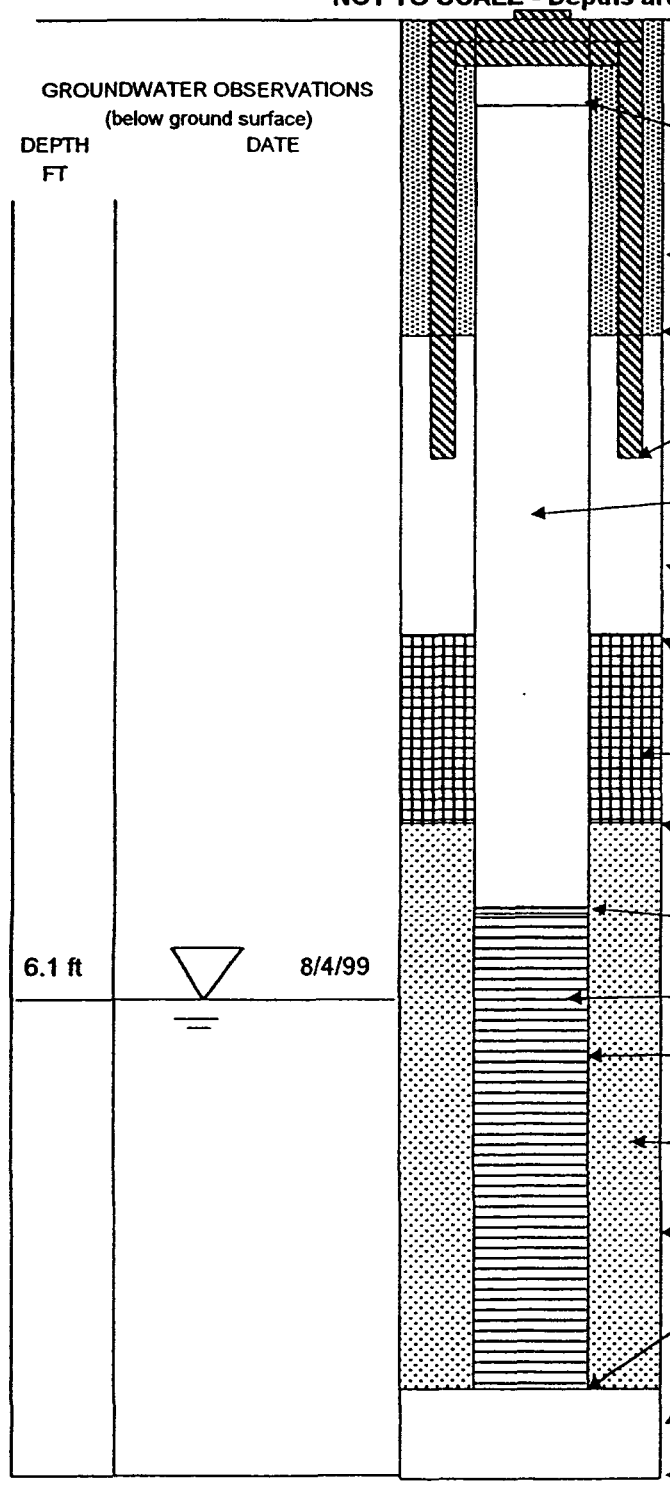
PROTECTIVE CASING	
RISER PIPE ELEVATION	8.19 (NGVD)
GROUND SURFACE ELEVATION:	5.95 (NGVD)
TYPE OF SURFACE SEAL:	CONCRETE
DIAMETER OF SURFACE SEAL:	36 in.
DEPTH TO TOP OF SAND DRAIN LAYER	NONE
DEPTH OF BOTTOM OF PROTECTIVE CASING:	2 ft (bgs)
MATERIAL/DIAMETER OF RISER PIPE:	PVC / 2-1/4 in. O.D., 2 in. I.D.
TYPE OF BACKFILL ABOVE SEAL:	2040 SAND FILTER
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:	6-1/2 in.
DEPTH OF WELL SCREEN:	18 ft (bgs)
TYPE OF BACKFILL BELOW WELL SCREEN:	2040 SAND FILTER
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-A3
LOCATION:	New Bedford, Mass.	DATE:	8/3/99
PROJECT #:	48138.07	PREPARED BY:	R. Chase
CLIENT:	Foster Wheeler Env.	CONTRACTOR:	Atlantic Testing Labs
SURVEY DATUM:	NGVD	FOREMAN:	R. Pryce
Northing:	2706321.5		
Easting:	814973.2		

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



GROUND SURFACE ELEVATION: 8.20 (NGVD)
FLUSH MOUNTED PROTECTIVE CASING

DEPTH TO TOP OF RISER PIPE: 0.51 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: 15 ft (bgs)

TYPE OF BACKFILL BELOW WELL SCREEN: 2040 SAND FILTER

DEPTH OF BOREHOLE: 16.2 ft (bgs)

OBSERVATION WELL CONSTRUCTION LOG

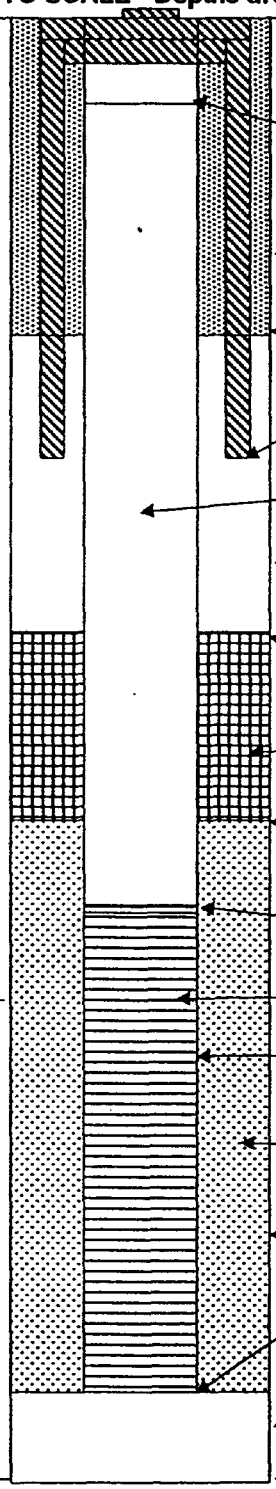
Nobis Engineering, Inc.
P.O. Box 2890 Concord, NH

PROJECT:	New Bedford Harbor	WELL:	OW-A4
LOCATION:	New Bedford, Mass.	DATE:	8/3/99
PROJECT #:	48138.07	PREPARED BY:	R. Chase
CLIENT:	Foster Wheeler Env.	CONTRACTOR:	Atlantic Testing Labs
SURVEY DATUM:	NGVD	FOREMAN:	R. Pryce
Northing: 2706076.9			
Easting: 814770.6			

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

GROUNDWATER OBSERVATIONS
(below ground surface)

DEPTH FT	DATE
6.1 ft	8/3/99



GROUND SURFACE ELEVATION: 8.69 (NGVD)
FLUSH MOUNTED PROTECTIVE CASING

DEPTH TO TOP OF RISER PIPE: 0.17 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 ft (bgs)

OBSERVATION WELL CONSTRUCTION LOG

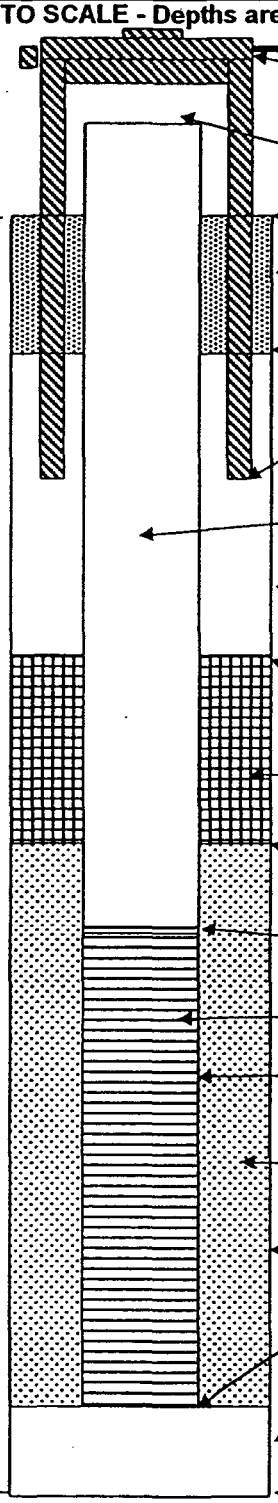
Nobis Engineering, Inc.
P.O. Box 2890 Concord, NH

PROJECT:	New Bedford Harbor	WELL:	OW-A5
LOCATION:	New Bedford, Mass.	DATE:	8/11/99
PROJECT #:	48138.07	PREPARED BY:	R. Chase
CLIENT:	Foster Wheeler Env.	CONTRACTOR:	Atlantic Testing Labs
SURVEY DATUM:	NGVD	FOREMAN:	R. Pryce
Northing:	2706007.0		
Easting:	815045.8		

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

GROUNDWATER OBSERVATIONS
(below ground surface)

DEPTH FT	DATE
1.7 ft	8/11/99



PROTECTIVE CASING	
RISER PIPE ELEVATION	8.24 (NGVD)
GROUND SURFACE ELEVATION:	5.45 (NGVD)
TYPE OF SURFACE SEAL:	CONCRETE
DIAMETER OF SURFACE SEAL:	36 in.
DEPTH TO TOP OF SAND DRAIN LAYER	0.5 ft (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:	NONE
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:	2.2 ft (bgs)
DEPTH OF TOP OF WELL SCREEN:	2.8 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:	12.8 ft (bgs)
TYPE OF BACKFILL BELOW WELL SCREEN:	NONE
DEPTH OF BOREHOLE	12.8 ft. (bgs)

OBSERVATION WELL CONSTRUCTION LOG

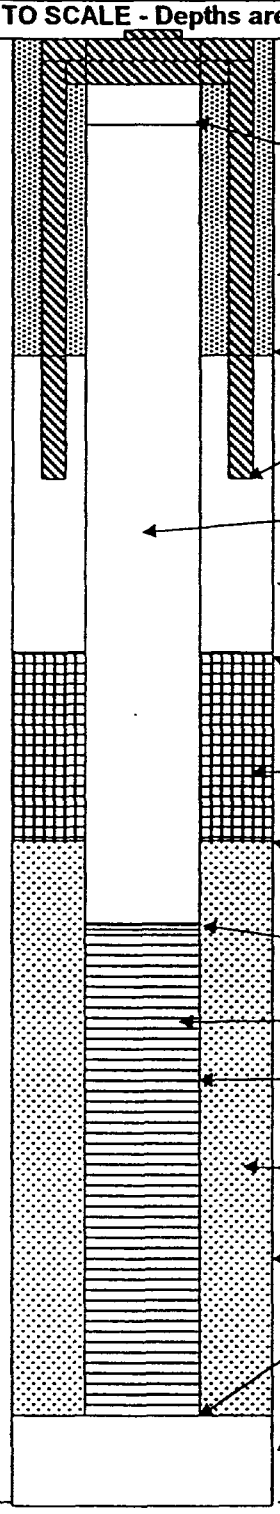
Nobis Engineering, Inc.
P.O. Box 2890 Concord, NH

PROJECT:	New Bedford Harbor	WELL:	OW-A6
LOCATION:	New Bedford, Mass.	DATE:	8/2/99
PROJECT #:	48138.07	PREPARED BY:	R. Chase
CLIENT:	Foster Wheeler Env.	CONTRACTOR:	Atlantic Testing Labs
SURVEY DATUM:	NGVD	FOREMAN:	R. Pryce
Northing:	2705435.2		
Easting:	814800.3		

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

GROUNDWATER OBSERVATIONS
(below ground surface)

DEPTH FT	DATE
3.1 ft	8/2/99



GROUND SURFACE ELEVATION: FLUSH MOUNTED PROTECTIVE CASING	5.32 (NGVD)
DEPTH TO TOP OF RISER PIPE	0.47 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 ft (bgs)

OBSERVATION WELL CONSTRUCTION LOG

Nobis

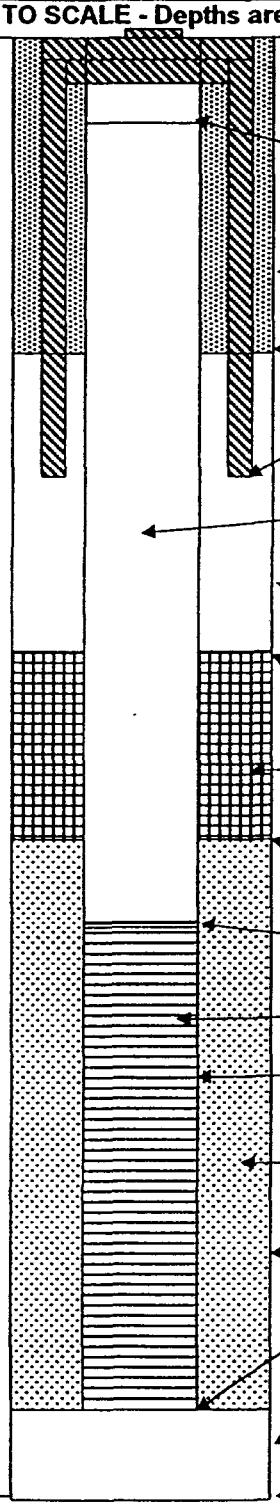
Nobis Engineering, Inc.
P.O. Box 2890 Concord, NH

PROJECT:	New Bedford Harbor	**WELL:**	OW-A7
LOCATION:	New Bedford, Mass.	**DATE:**	9/15/99
PROJECT #:	48138.07	**PREPARED BY:**	S. Bonis
CLIENT:	Foster Wheeler Env.	**CONTRACTOR:**	Atlantic Testing Labs
SURVEY DATUM:	NGVD	**FOREMAN:**	R. Pryce
Northing:	2705687.7		
Easting:	814711.3		

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

GROUNDWATER OBSERVATIONS
(below ground surface)

DEPTH FT	DATE
4.95 ft	10/5/99



GROUND SURFACE ELEVATION: FLUSH MOUNTED PROTECTIVE CASING	8.18 (NGVD)
DEPTH TO TOP OF RISER PIPE	0.37 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 ft (bgs)

MONITORING WELL CONSTRUCTION LOG

New Bedford Harbor Superfund Site

Remedial Design for Operable Unit 01

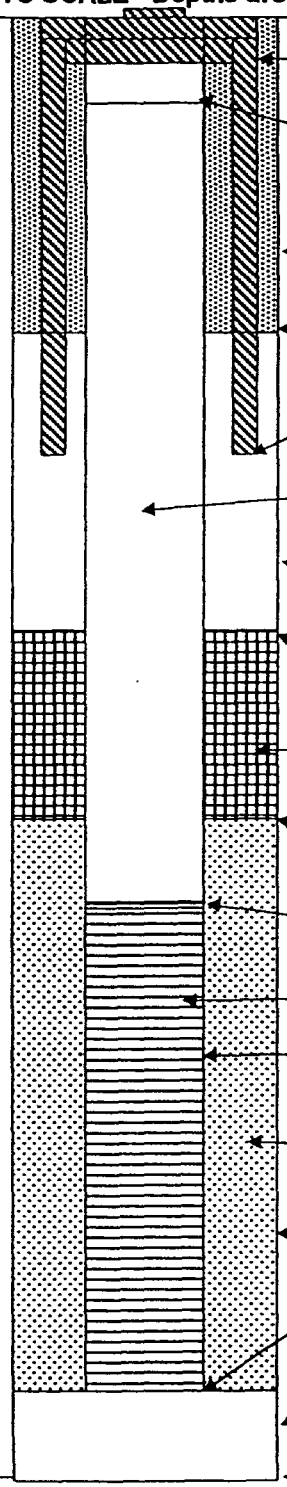
Nobis Engineering, Inc.
P.O. Box 2890 Concord, NH

PROJECT:	New Bedford Harbor	**WELL:**	MW-A1
LOCATION:	New Bedford, Mass.	**DATE:**	7/28/99
PROJECT #:	48138.07	**PREPARED BY:**	R. Chase
CLIENT:	Foster Wheeler Env.	**CONTRACTOR:**	Atlantic Testing Labs
SURVEY DATUM:	NGVD	**FOREMAN:**	R. Pryce
Northing:	2706613.8		
Easting:	815363.8		

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

GROUNDWATER OBSERVATIONS
(below ground surface)

DEPTH FT	DATE
4.2 ft	7/28/99



GROUND SURFACE ELEVATION:	5.82 (NGVD)
FLUSH MOUNTED PROTECTIVE CASING	
DEPTH TO TOP OF RISER PIPE	0.34 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:	1.50 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 ft (bgs)

MONITORING WELL CONSTRUCTION LOG

New Bedford Harbor Superfund Site

Remedial Design for Operable Unit 01

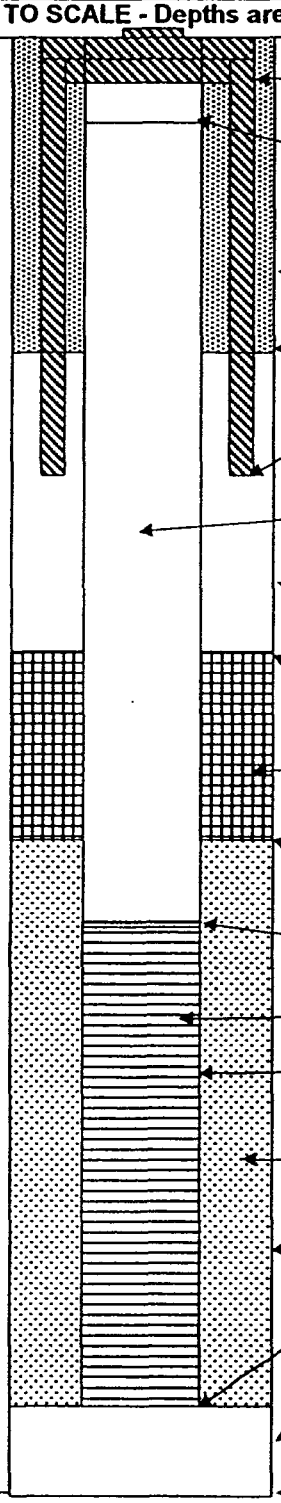
Nobis Engineering, Inc.
P.O. Box 2890 Concord, NH

PROJECT:	New Bedford Harbor	**WELL:**	MW-A2S
LOCATION:	New Bedford, Mass.	**DATE:**	7/28/99
PROJECT #:	48138.07	**PREPARED BY:**	R. Chase
CLIENT:	Foster Wheeler Env.	**CONTRACTOR:**	Atlantic Testing Labs
SURVEY DATUM:	NGVD	**FOREMAN:**	R. Pryce
Northing:	2706171.0		
Easting:	815006.8		

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

GROUNDWATER OBSERVATIONS
(below ground surface)

DEPTH FT	DATE
5.92 ft	8/3/99



GROUND SURFACE ELEVATION:	6.29 (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:	1.10 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:	1.50 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	22 ft (bgs)

MONITORING WELL CONSTRUCTION LOG

New Bedford Harbor Superfund Site

Remedial Design for Operable Unit 01

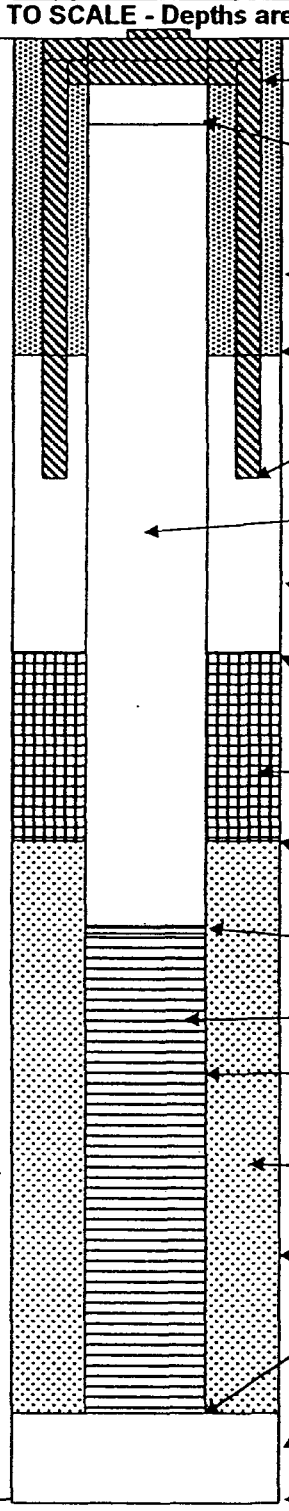
Nobis Engineering, Inc.
P.O. Box 2890 Concord, NH

PROJECT:	New Bedford Harbor	WELL:	MW-A3
LOCATION:	New Bedford, Mass.	DATE:	7/30/99
PROJECT #:	48138.07	PREPARED BY:	R. Chase
CLIENT:	Foster Wheeler Env.	CONTRACTOR:	Atlantic Testing Labs
SURVEY DATUM:	NGVD	FOREMAN:	R. Pryce
Northing:	2705830.0		
Easting:	814873.4		

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

GROUNDWATER OBSERVATIONS
(below ground surface)

DEPTH FT	DATE
6.0 ft	7/30/99



GROUND SURFACE ELEVATION:	5.92 (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:	1.10 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:	1.50 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 ft (bgs)

MONITORING WELL CONSTRUCTION LOG

New Bedford Harbor Superfund Site

Remedial Design for Operable Unit 01

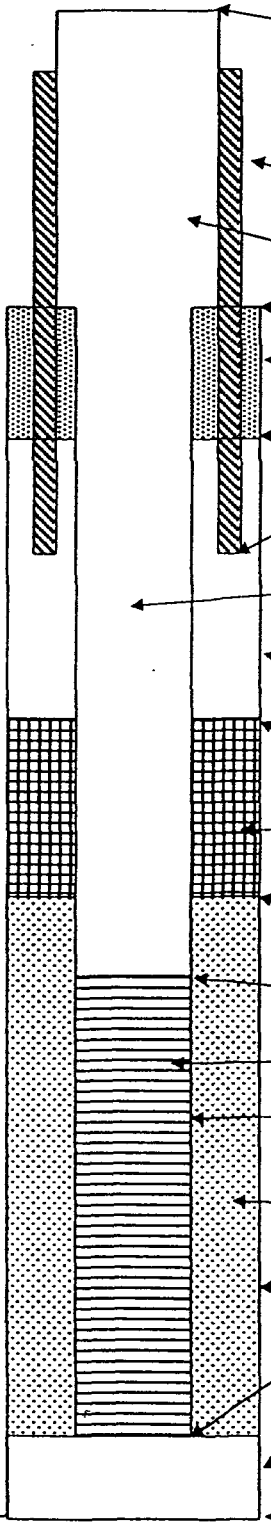
Nobis Engineering, Inc.
P.O. Box 2890 Concord, NH

PROJECT:	New Bedford Harbor	WELL:	MW-A4
LOCATION:	New Bedford, Mass.	DATE:	10/20/99
PROJECT #:	48138.07	PREPARED BY:	E. Paddleford
CLIENT:	Foster Wheeler Env.	CONTRACTOR:	Atlantic Testing Labs
SURVEY DATUM:	NGVD	FOREMAN:	P. Davis
Northing:	2705794.0		
Easting:	815246.0		

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

GROUNDWATER OBSERVATIONS
(below mudline)

DEPTH FT	DATE
NOT RECORDED	



RISER PIPE ELEVATION	6.3 (NGVD)
HEIGHT OF PROTECTIVE CASING ABOVE MUDLINE	8.47 ft.
LENGTH OF RISER PIPE ABOVE MUDLINE	8.60 ft.
MUDLINE SURFACE ELEVATION:	-2.30 (NGVD)
TYPE OF SURFACE SEAL:	BENTONITE GROUT
DIAMETER OF SURFACE SEAL:	5- 1/2 in.
DEPTH TO TOP OF SAND DRAIN LAYER	NONE
DEPTH OF BOTTOM OF PROTECTIVE CASING:	6.53 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:	5.5 ft (bms)
TYPE OF SEAL ABOVE FILTER MATERIAL:	3/8 in. BENTONITE CHIPS
DEPTH OF TOP OF FILTER MATERIAL:	7.5 ft (bms)
DEPTH OF TOP OF WELL SCREEN:	7.5 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:	17.5 ft (bms)
TYPE OF BACKFILL BELOW WELL SCREEN:	FORMATION MATERIAL
DEPTH OF BOREHOLE	18.5 ft (bms)

MONITORING WELL CONSTRUCTION LOG

New Bedford Harbor Superfund Site

Remedial Design for Operable Unit 01

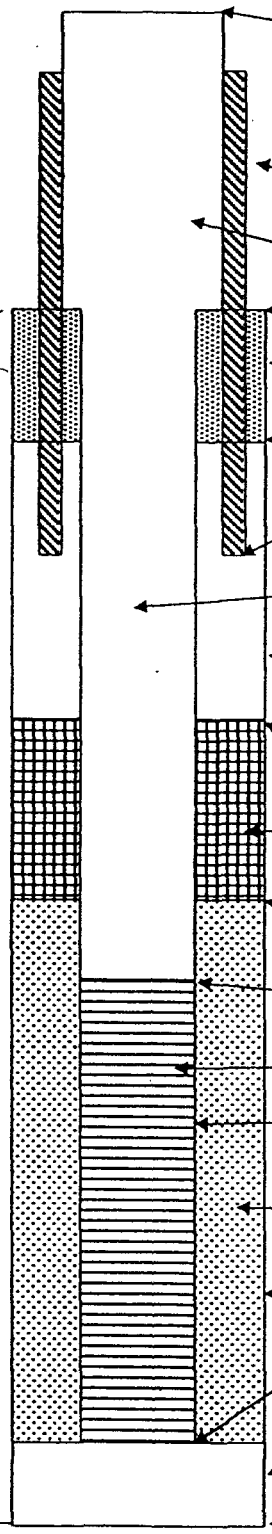
Nobis Engineering, Inc.
P.O. Box 2890 Concord, NH

PROJECT:	New Bedford Harbor	WELL:	MW-A5
LOCATION:	New Bedford, Mass.	DATE:	11/2/99
PROJECT #:	48138.07	PREPARED BY:	E. Paddleford
CLIENT:	Foster Wheeler Env.	CONTRACTOR:	Atlantic Testing Labs
SURVEY DATUM:	NGVD	FOREMAN:	P. Davis
Northing:	2706278.5		
Easting:	815562.2		

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

GROUNDWATER OBSERVATIONS
(below mudline)

DEPTH FT	DATE
NOT RECORDED	



RISER PIPE ELEVATION	4.9 (NGVD)
HEIGHT OF PROTECTIVE CASING ABOVE MUDLINE	7.58
LENGTH OF RISER PIPE ABOVE MUDLINE	8.28 ft.
MUDLINE SURFACE ELEVATION:	-3.38 (NGVD)
TYPE OF SURFACE SEAL:	BENTONITE GROUT
DIAMETER OF SURFACE SEAL:	5-1/2 in.
DEPTH TO TOP OF SAND DRAIN LAYER	NONE
DEPTH OF BOTTOM OF PROTECTIVE CASING:	7.42 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:	11.0 ft (bms)
TYPE OF SEAL ABOVE FILTER MATERIAL:	3/8 in. BENTONITE CHIPS
DEPTH OF TOP OF FILTER MATERIAL:	13.0 ft (bms)
DEPTH OF TOP OF WELL SCREEN:	13.7 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:	23.7 ft (bms)
TYPE OF BACKFILL BELOW WELL SCREEN:	FORMATION MATERIAL
DEPTH OF BOREHOLE	25.4 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:

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

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

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					
FA-12 #1	3.9 ft	N/A	OH	2.29×10^{-6}	falling
FA-14	3.3 ft	N/A	OH	7.48×10^{-7}	rising
FA-15 #1	6.0 ft	N/A	OH	1.04×10^{-5}	falling 40 min rising 40 min
FA-15 #2 (1)	6.0 ft	1 ft	OH	7.86×10^{-6}	rising 10 min falling 80 min
INTERBEDDED SANDS					
FA-9 #1	4.2 ft	N/A	SM	3.85×10^{-4}	rising 54 min falling 36 min
FA-9 #2	7.4 ft	N/A	SP-SM	1.95×10^{-4}	falling
FA-12 #2	14.3 ft	N/A	SP-SM	1.77×10^{-4}	falling
FA-15 #3 (1)	12.3 ft	N/A	SP-SM	7.04×10^{-5}	falling

Notes: [1] Borehole permeability test performed offset from FA-15 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

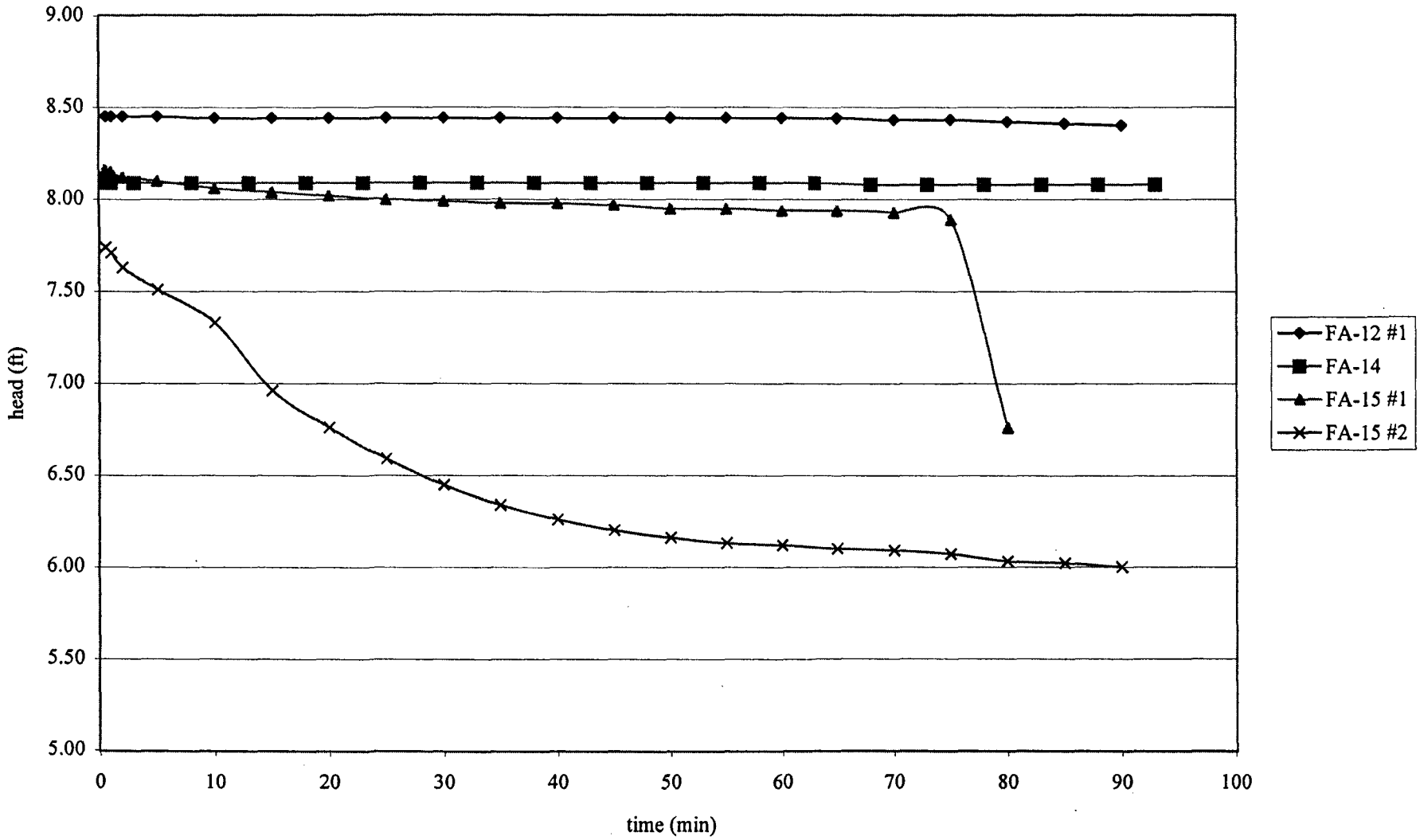


Figure C-2
FA-12 #1 (OH)

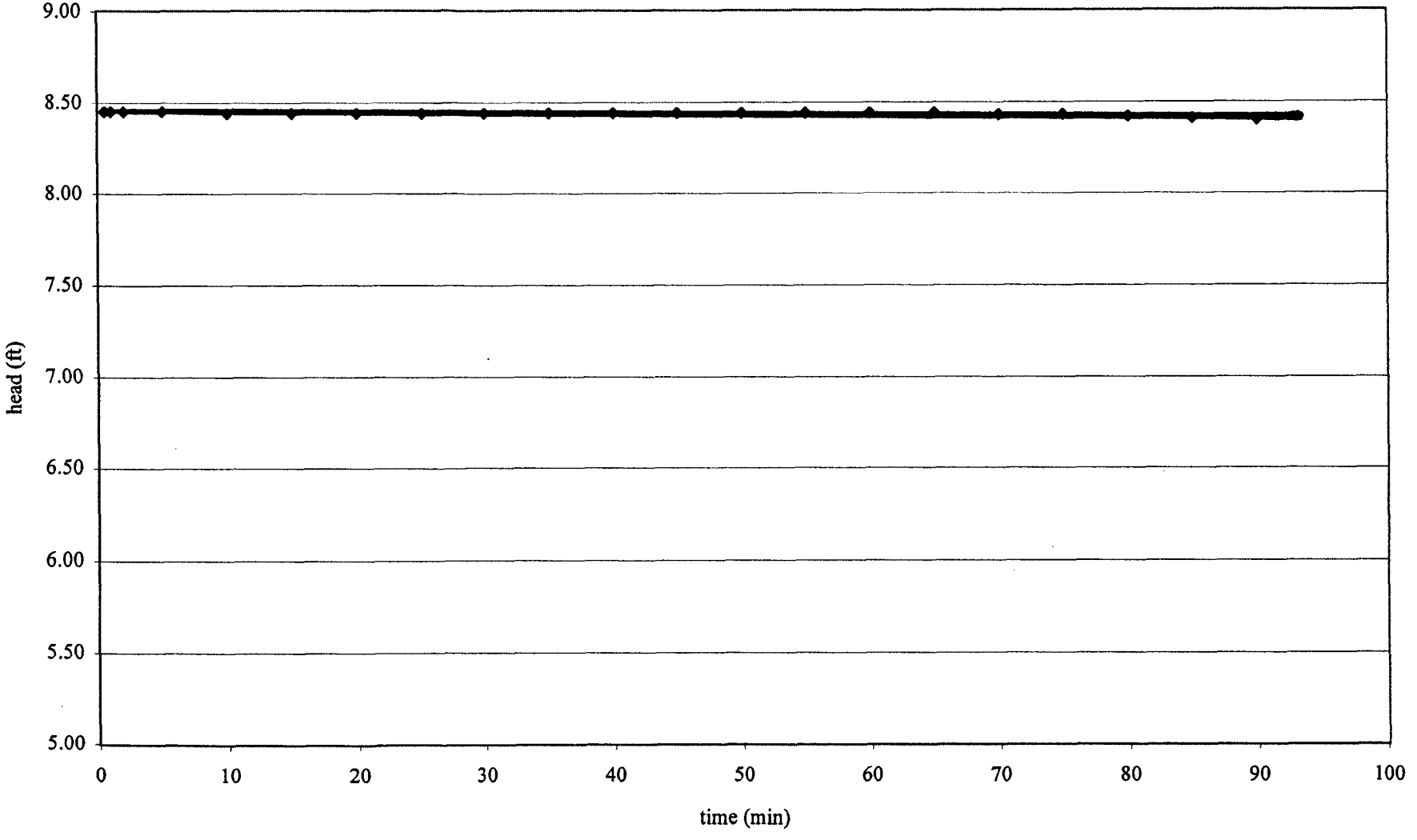


Figure C-3
FA-14 (OH)

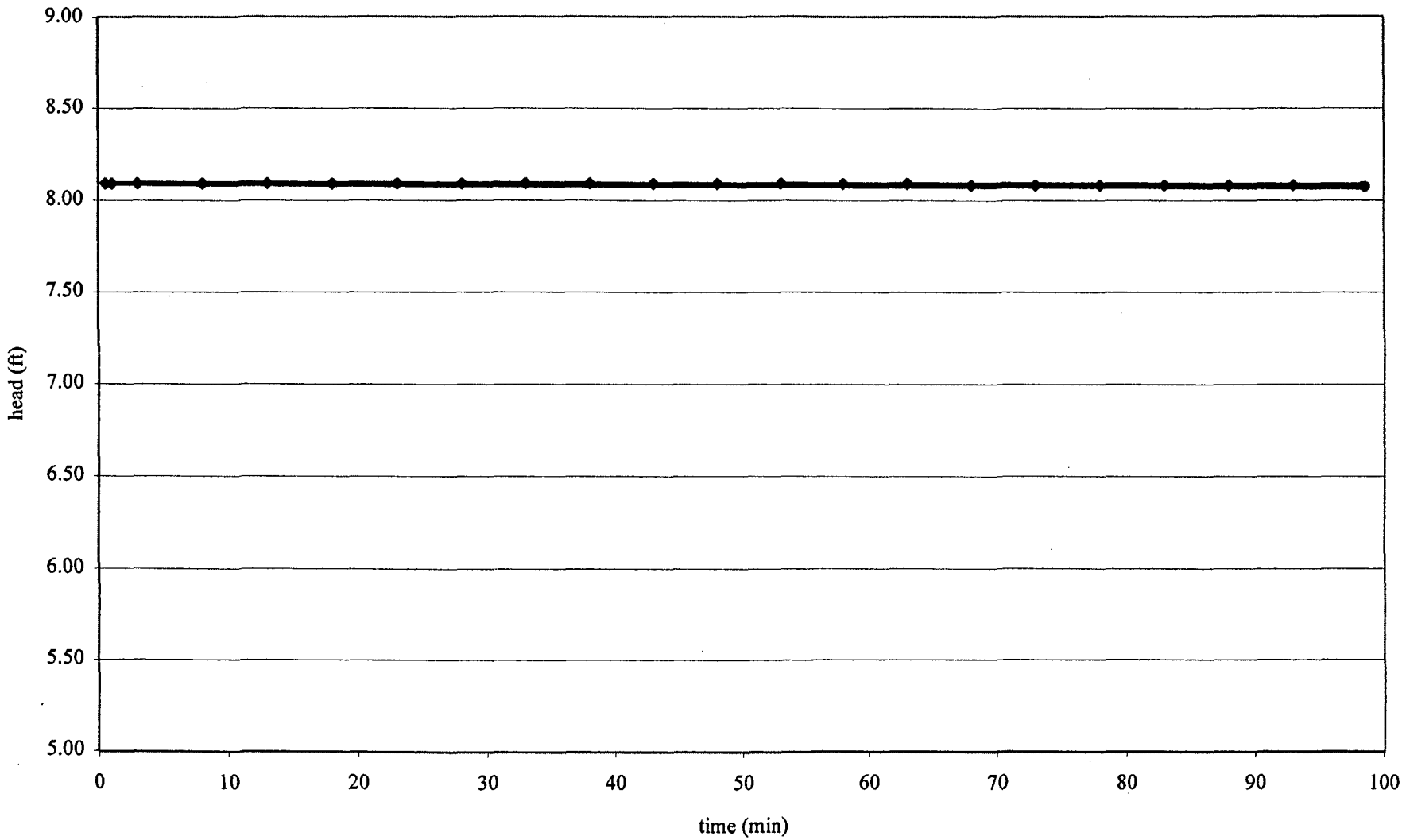


Figure C-4
FA-15 #1 (OH)

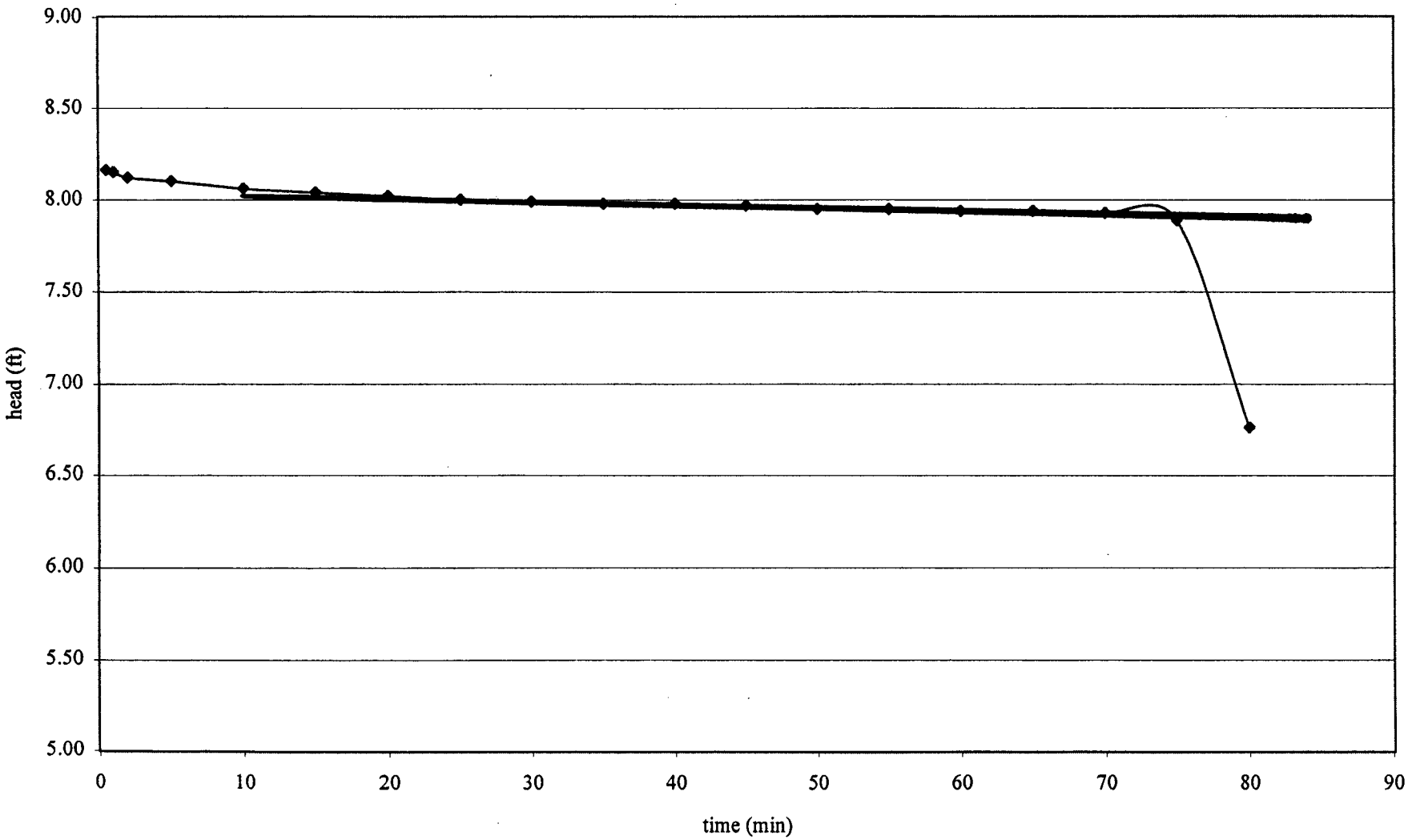


Figure C-5
FA-15 #2 (OH)

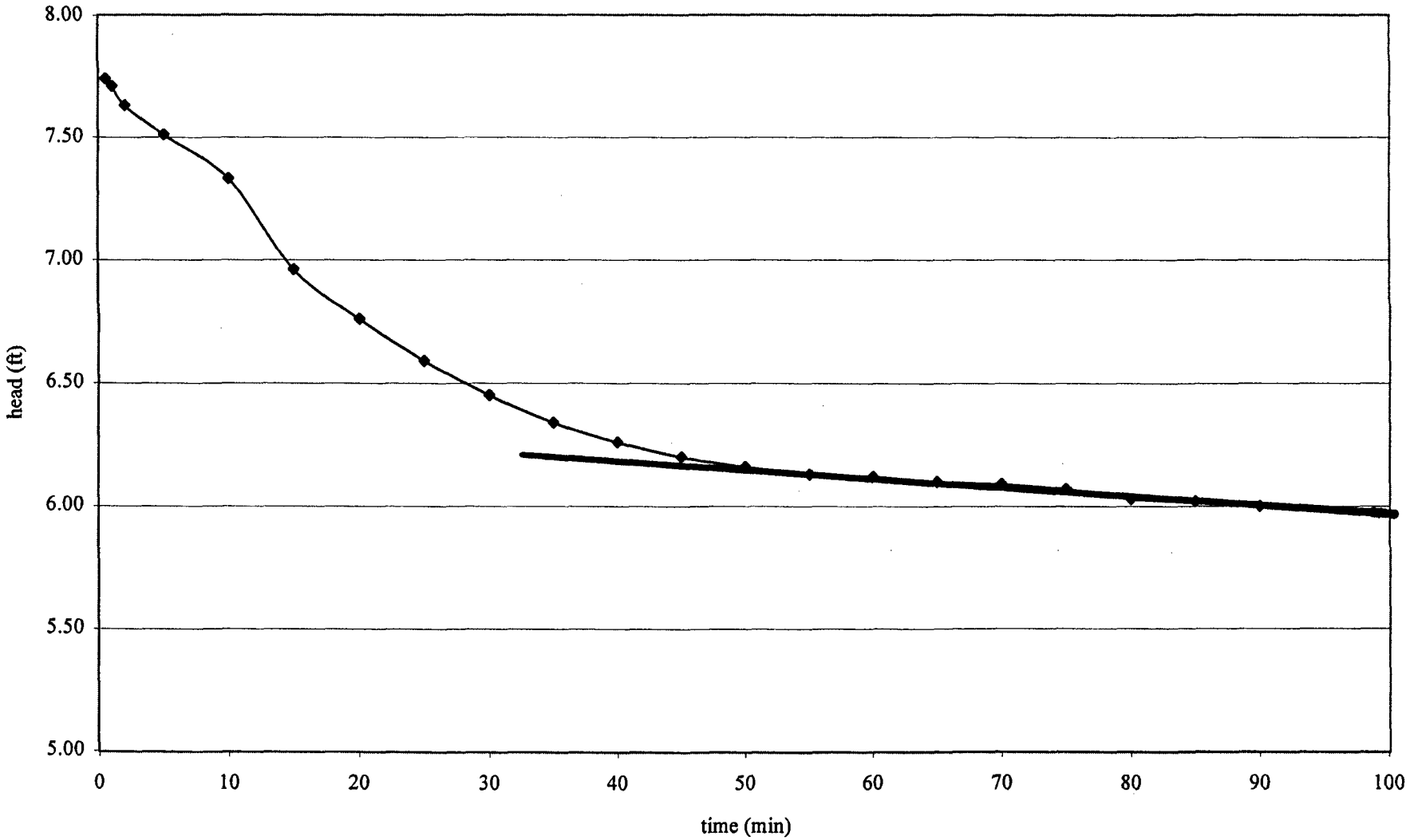


Figure C-6
Borehole Permeability Tests in the Interbedded Sands

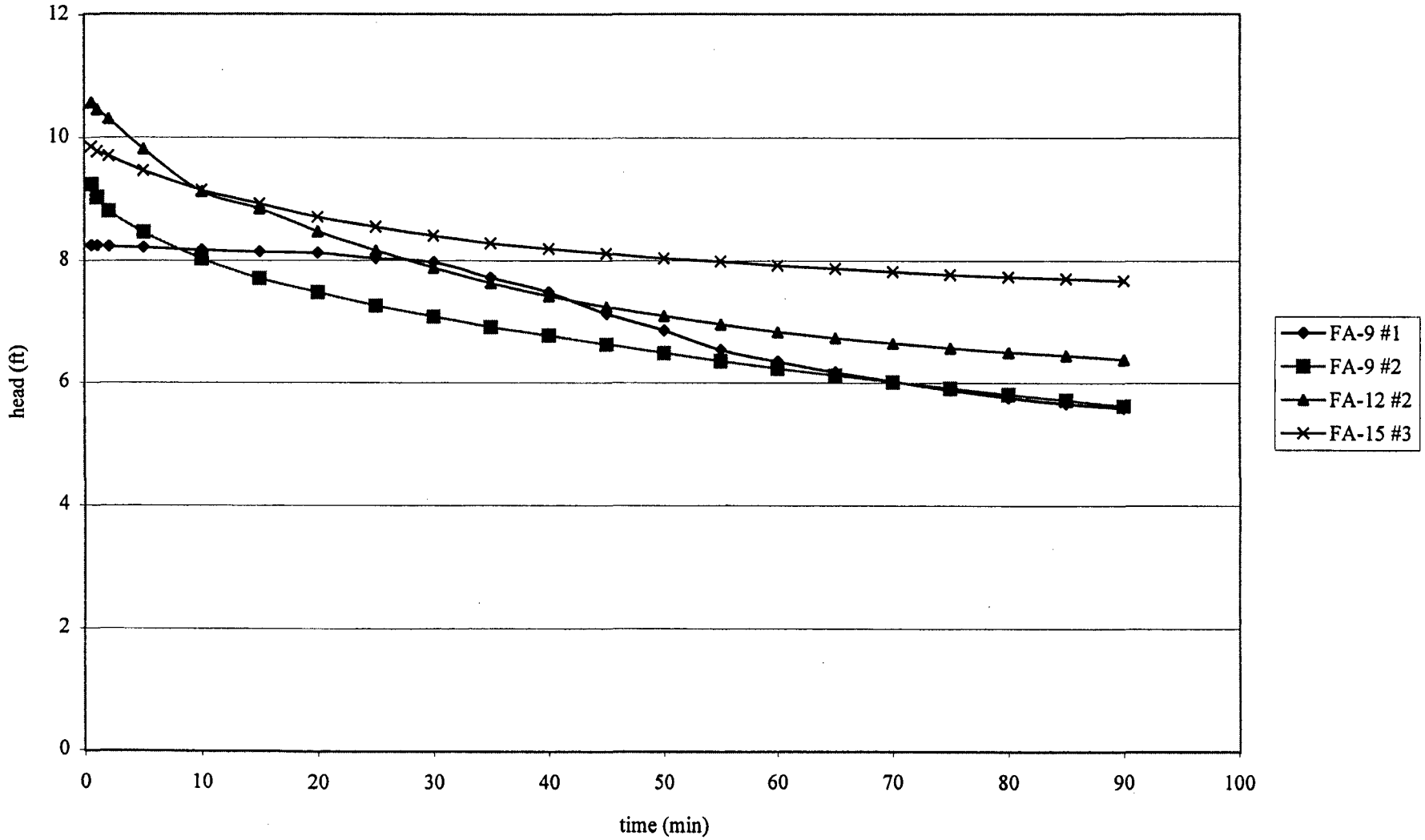


Figure C-7
FA-9 #1 (SM)

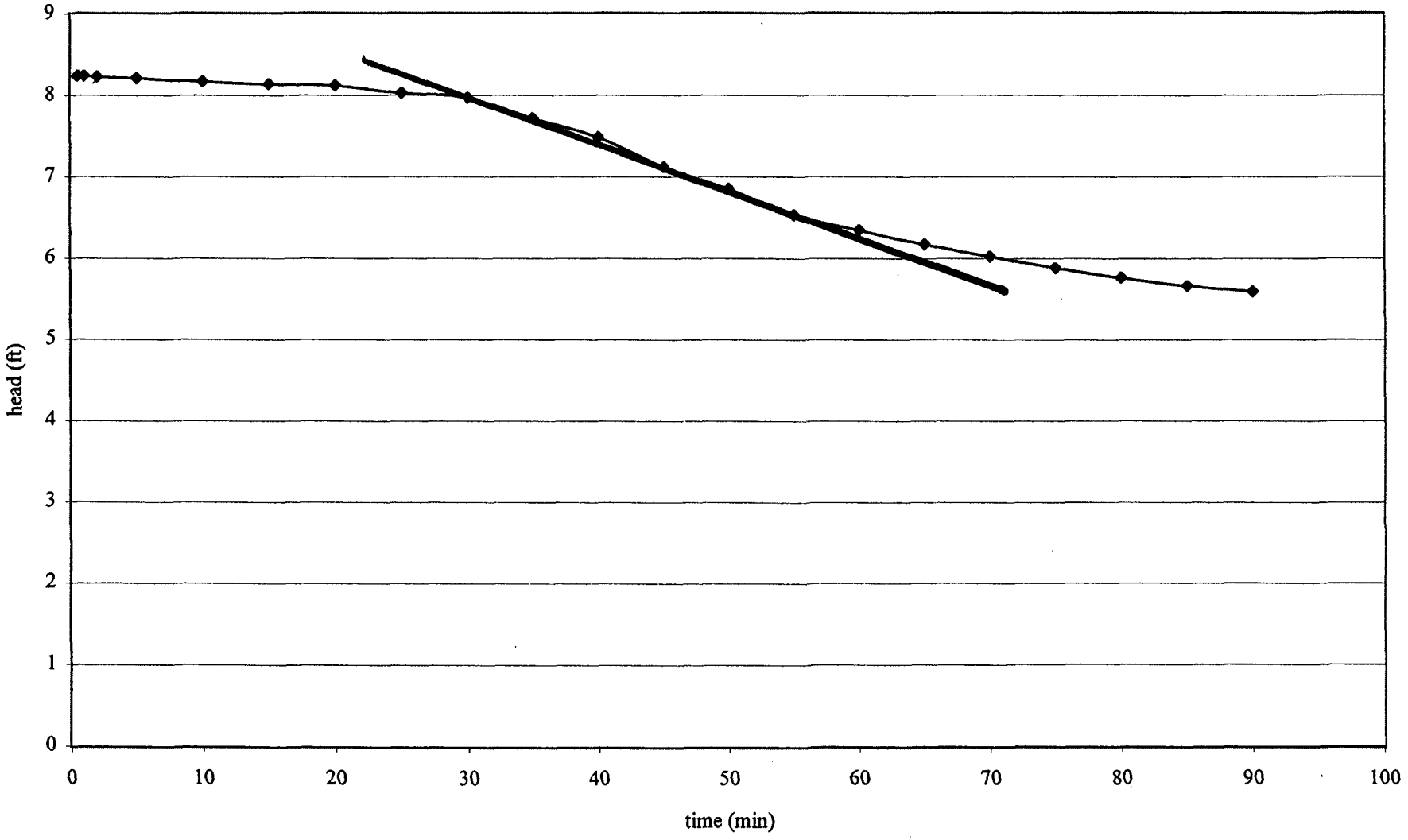


Figure C-8
FA-9 #2 (SP-SM)

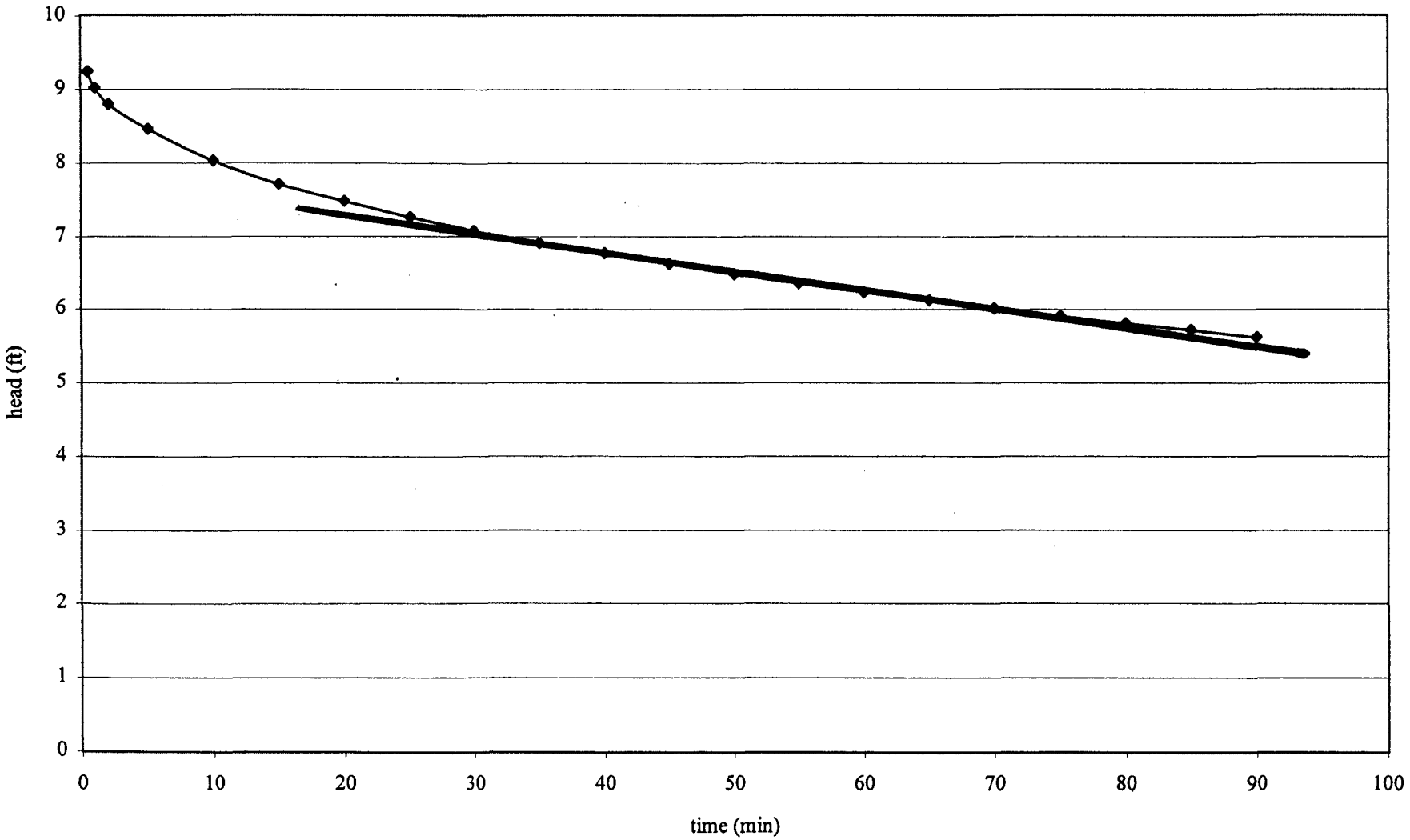


Figure C-9
FA-12 #2 (SP-SM)

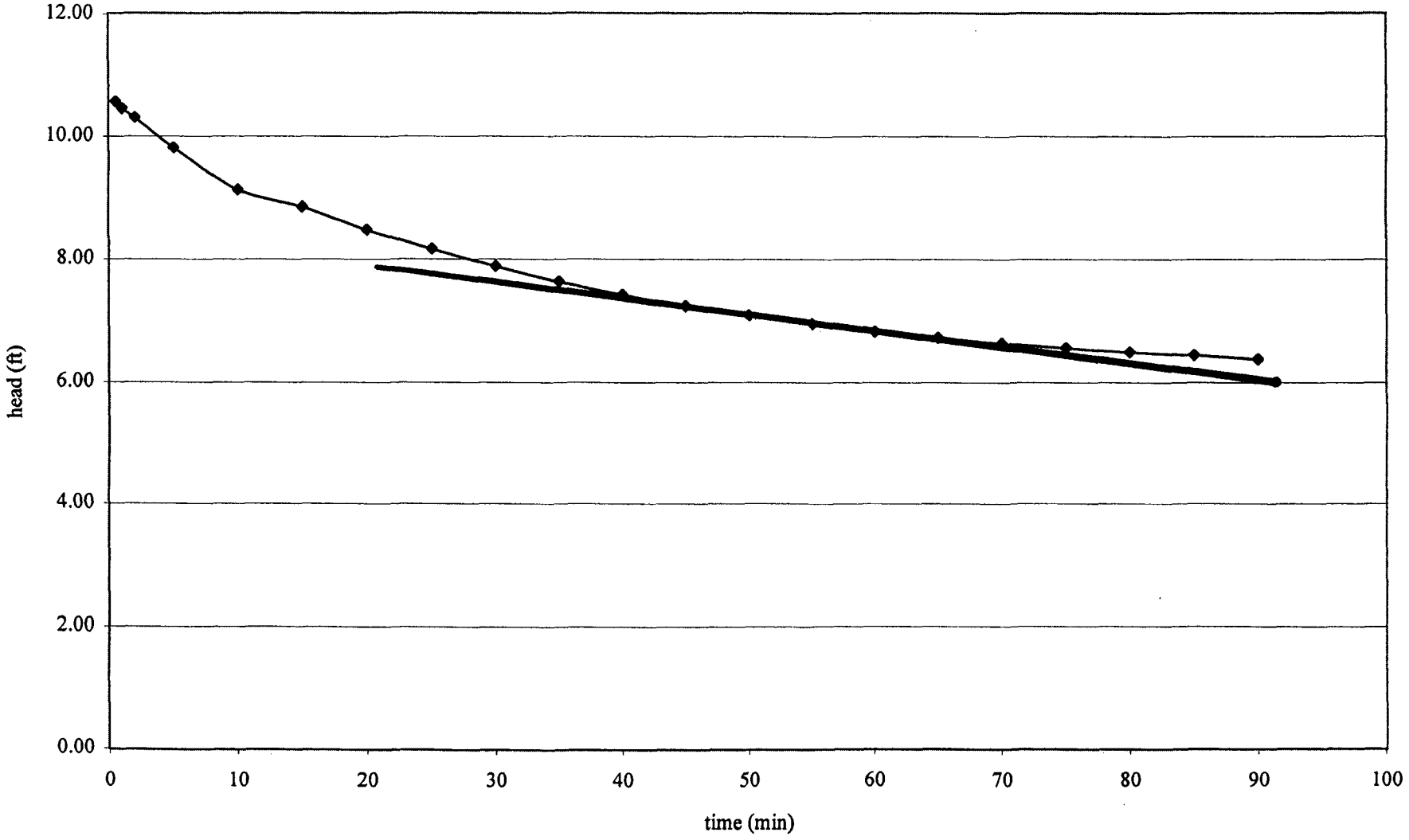
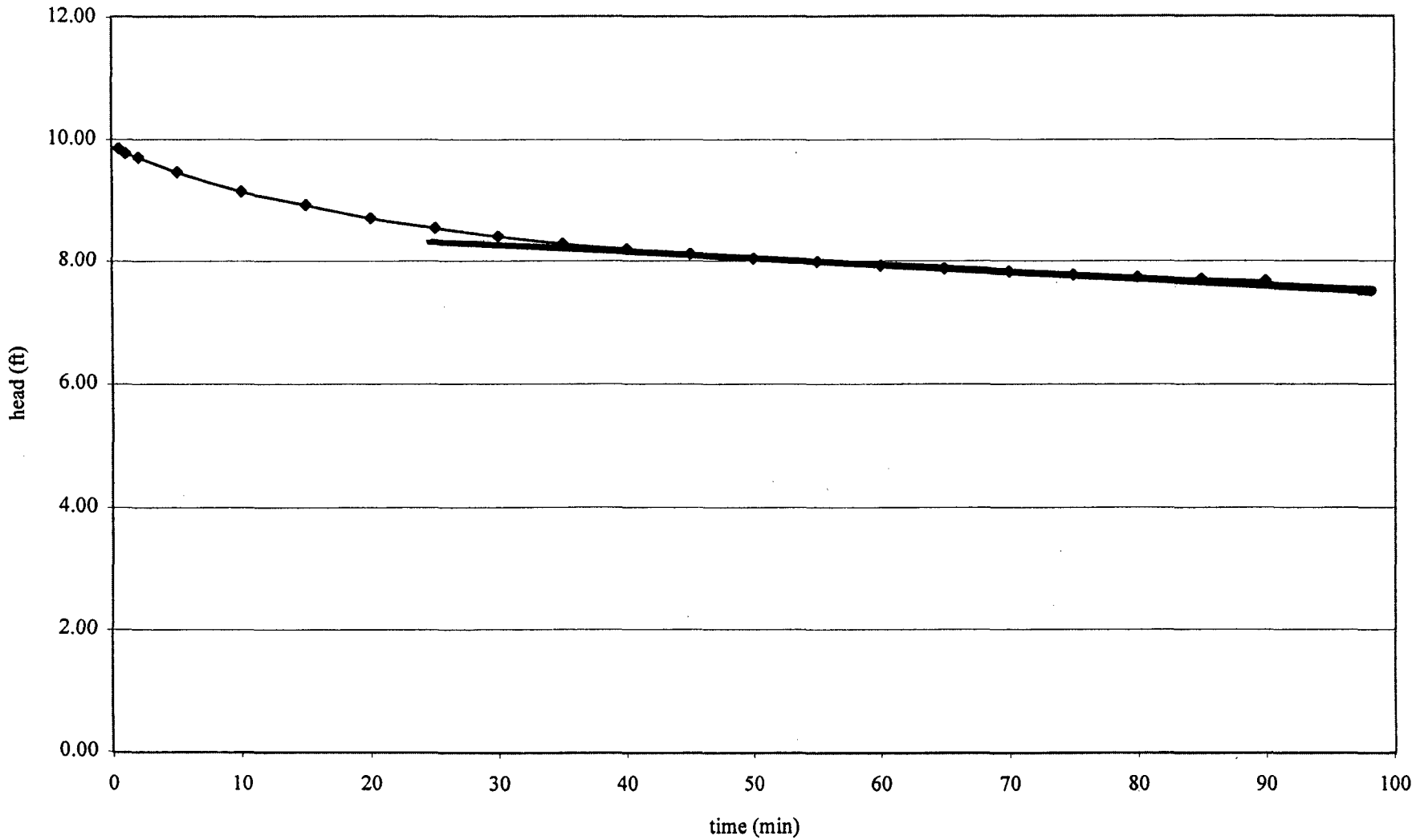


Figure C-10
FA-15 #3 (SP-SM)



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	FA - 9
Sheet	1 of 2
File No.	48138.07
Checked By	J. Trottier

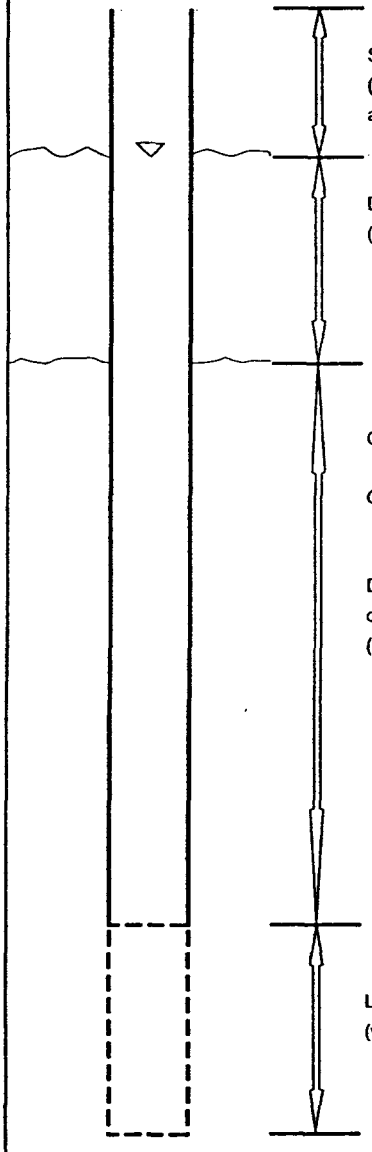
Boring Co. Atlantic Testing Laboratories, Limited
Driller P. Davis
Logged by: E. Paddleford

Test Information

Test Number: 1
Sample Number: S-1
Boring Location: CDF A Offshore
Date of test: 9/14/99

Time

Beginning test preperation: 10:40
Test completion: 12:10
Total time (min.): 90



Stickout: 8.3 ft.
(Height of casing above water surface)

Depth to mudline: 4.5 ft.
(from water surface)

Casing I.D. 4.0 in.

Casing O.D. 4.5 in.

Depth to bottom of casing 4.2 ft.
(from mudline)

Length of intake (wick) 0 ft.

Saturation 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
10:40:30	0.5	0.06			
10:41	1	0.06			
10:42	2	0.07			
10:45	5	0.09			
10:50	10	0.13			
10:55	15	0.16			
11:00	20	0.18			
11:05	25	0.27			
11:10	30	0.33			
11:15	35	0.58			
11:20	40	0.82			
11:25	45	1.18			
11:30	50	1.45			
11:35	55	1.77			
11:40	60	1.96			
11:45	65	2.13			
11:50	70	2.28			
11:55	75	2.42			
12:00	80	2.54			
12:05	85	2.64			
12:10	90	2.71			

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 2890
Concord, New Hampshire 03302

PROJECT

Remedial Design for Operable Unit 01
New Bedford Harbor Superfund Site
New Bedford, Massachusetts

Test Location	FA - 9
Sheet	2 of 2
File No.	48138.07
Checked By	J. Trottier

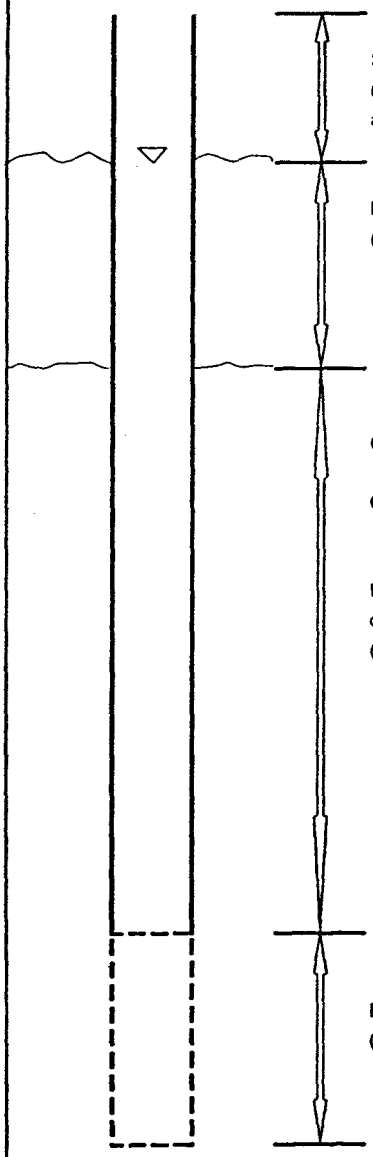
Boring Co. Atlantic Testing Laboratories, Limited
Driller P. Davis
Logged by: E. Paddleford

Test Information

Test Number: 2
Sample Number: S-1
Boring Location: CDF A Offshore
Date of test: 9/14/99

Time

Beginning test preperation: 12:56
Test completion: 14:26
Total time (min.): 90



Stickout: 9.7 ft.
(Height of casing above water surface)

Depth to mudline: 4.9 ft.
(from water surface)

Casing I.D. 4.0 in.

Casing O.D. 4.5 in.

Depth to bottom of casing 7.4 ft.
(from mudline)

Length of intake (wick) 0 ft.

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
12:56:30	0.5	0.46			
12:57	1	0.68			
12:58	2	0.90			
13:01	5	1.24			
13:06	10	1.67			
13:11	15	1.99			
13:16	20	2.22			
13:21	25	2.44			
13:26	30	2.62			
13:31	35	2.79			
13:36	40	2.93			
13:41	45	3.08			
13:46	50	3.22			
13:51	55	3.35			
13:56	60	3.47			
14:01	65	3.58			
14:06	70	3.69			
14:11	75	3.79			
14:16	80	3.89			
14:21	85	3.98			
14:26	90	4.08			

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

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	FA - 12
Sheet	1 of 2
File No.	48138.07
Checked By	J. Trottier

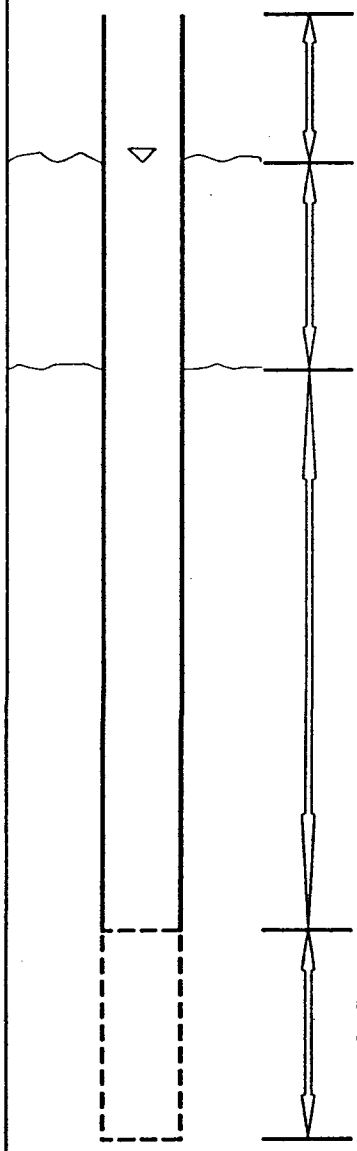
Boring Co: Atlantic Testing Laboratories, Limited
Driller: P. Davis
Logged by: E. Paddleford

Test Information

Test Number: 1
Sample Number: UO-2
Boring Location: CDF A Offshore
Date of test: 9/15/99

Time

Beginning test preperation: 12:40
Test completion: 14:10
Total time (min.): 90



Falling Head Test

Time(min.) Actual	Time(min.) Elapsed	Depth (ft.) to water level
12:40:30	0.5	0.05
12:41	1	0.05
12:42	2	0.05
12:45	5	0.05
12:50	10	0.06
12:55	15	0.06
13:00	20	0.06
13:05	25	0.06
13:10	30	0.06
13:15	35	0.06
13:20	40	0.06
13:25	45	0.06
13:30	50	0.06
13:35	55	0.06
13:40	60	0.06
13:45	65	0.06
13:50	70	0.07
13:55	75	0.07
14:00	80	0.08
14:05	85	0.09
14:10	90	0.10

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 2890
Concord, New Hampshire 03302

PROJECT

Remedial Design for Operable Unit 01
New Bedford Harbor Superfund Site
New Bedford, Massachusetts

Test Location	FA - 12
Sheet	2 of 2
File No.	48138.07
Checked By	J. Trottier

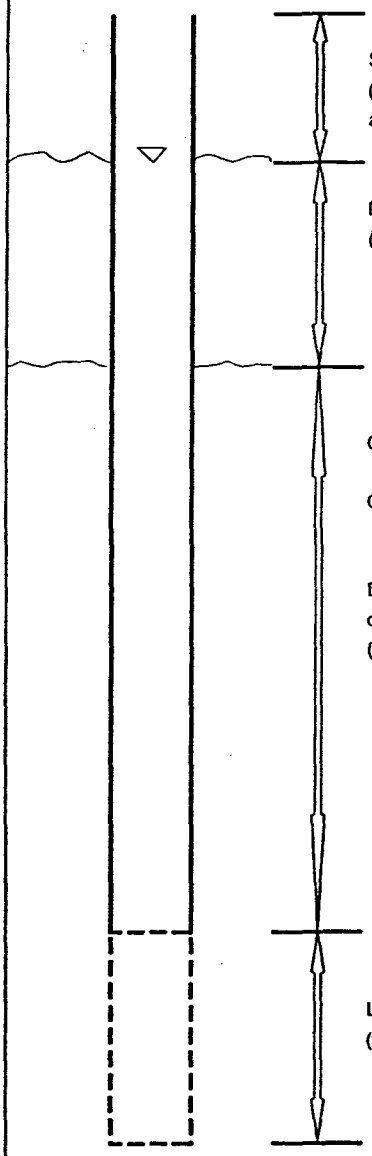
Boring Co. Atlantic Testing Laboratories, Limited
Driller P. Davis
Logged by: E. Paddleford

Test Information | **Time**

Test Number: 2
Sample Number: S-1
Boring Location: CDF A Offshore
Date of test: 9/15/99

Beginning test preperation: 15:57
Test completion: 17:27
Total time (min.): 90

Falling Head Test | **Rising Head Test**



Stickout: 10.7 ft.
(Height of casing above water surface)

Depth to mudline: 0.5 ft.
(from water surface)

Casing I.D. 4.0 in.

Casing O.D. 4.5 in.

Depth to bottom of casing 14.3 ft.
(from mudline)

Length of intake 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
15:57:30	0.5	0.13			
15:58	1	0.24			
15:59	2	0.39			
16:02	5	0.89			
16:07	10	1.58			
16:12	15	1.86			
16:17	20	2.23			
16:22	25	2.54			
16:27	30	2.82			
16:32	35	3.07			
16:37	40	3.28			
16:42	45	3.46			
16:47	50	3.61			
16:52	55	3.75			
16:57	60	3.87			
17:02	65	3.97			
17:07	70	4.06			
17:12	75	4.14			
17:17	80	4.21			
17:22	85	4.26			
17:27	90	4.32			

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 2890
Concord, New Hampshire 03302

PROJECT

Remedial Design for Operable Unit 01
New Bedford Harbor Superfund Site
New Bedford, Massachusetts

Test Location	FA - 14
Sheet	1 of 1
File No.	48138.07
Checked By	J. Trottier

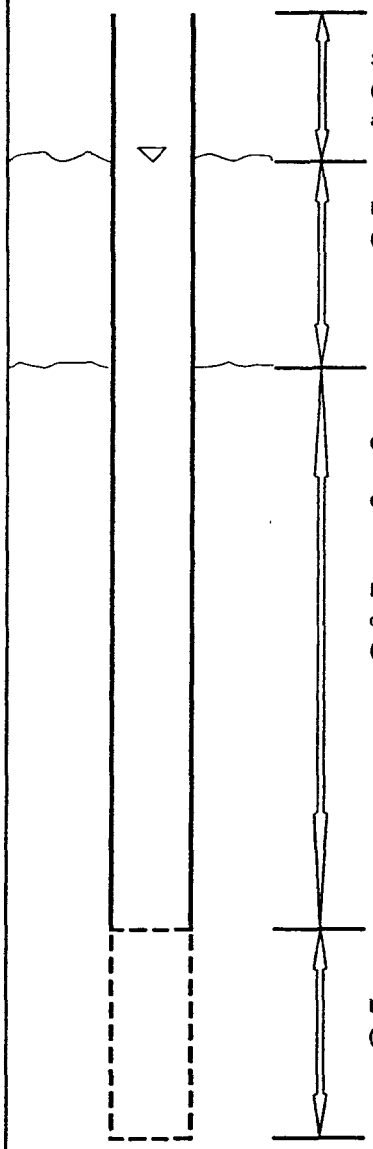
Boring Co.	Atlantic Testing Laboratories, Limited
Driller	P. Davis
Logged by:	S. Bonis

Test Information

Test Number:	1
Sample Number:	S-1
Boring Location:	CDF A Offshore
Date of test:	10/27/99

Time

Beginning test preperation:	8:45
Test completion:	10:18
Total time (min.):	93



Stickout: 8.1 ft.
(Height of casing above water surface)

Depth to mudline: 3.6 ft.
(from water surface)

Casing I.D. 4.0 in.

Casing O.D. 4.5 in.

Depth to bottom of casing 3.3 ft.
(from mudline)

Length of intake (wick) 0 ft.

Falling Head Test			Rising Head Test		
Time(min.) Actual	Elapsed	Depth (ft.) to water level	Time (min.) Actual	Elapsed	Depth (ft.) to water level
8:45:30	0.5	0.01			
8:46	1	0.01			
8:48	3	0.01			
8:53	8	0.01			
8:58	13	0.01			
9:03	18	0.01			
9:08	23	0.01			
9:13	28	0.01			
9:18	33	0.01			
9:23	38	0.01			
9:28	43	0.01			
9:33	48	0.01			
9:38	53	0.01			
9:43	58	0.01			
9:48	63	0.01			
9:53	68	0.02			
9:58	73	0.02			
10:03	78	0.02			
10:08	83	0.02			
10:13	88	0.02			
10:18	93	0.02			

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

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	FA - 15
Sheet	1 of 3
File No.	48138.07
Checked By	J. Trottier

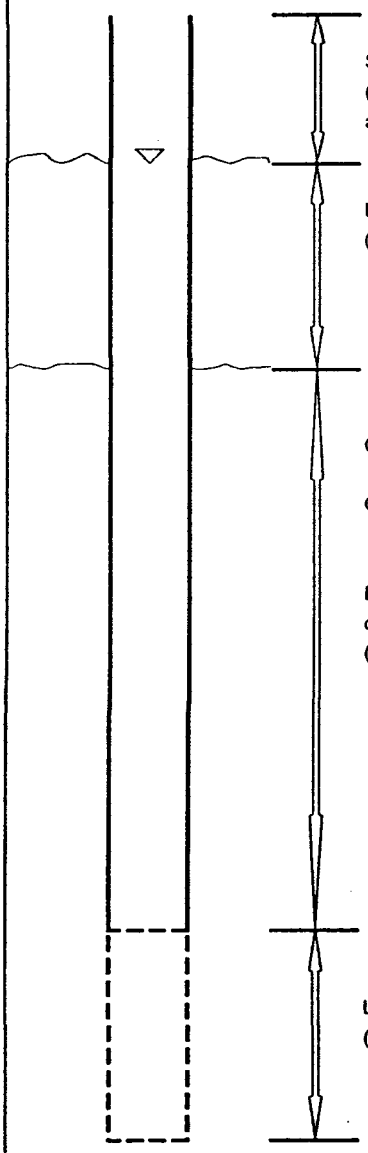
Boring Co. Atlantic Testing Laboratories, Limited
Driller P. Davis
Logged by: E. Paddleford

Test Information

Test Number: 1
Sample Number: UO-3
Boring Location: CDF A Offshore
Date of test: 9/10/99

Time

Beginning test preperation: 14:03
Test completion: 15:23
Total time (min.): 80



Stickout: 8.3 ft.
(Height of casing above water surface)

Depth to mudline: 1.5 ft.
(from water surface)

Casing I.D. 4.0 in.

Casing O.D. 4.5 in.

Depth to bottom of casing 6.0 ft.
(from mudline)

Length of intake (wick) 0 ft.

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
14:03:30	0.5	0.14			
14:04	1	0.15			
14:05	2	0.18			
14:08	5	0.20			
14:13	10	0.24			
14:18	15	0.26			
14:23	20	0.28			
14:28	25	0.30			
14:33	30	0.31			
14:38	35	0.32			
14:43	40	0.32			
14:48	45	0.33			
14:53	50	0.35			
14:58	55	0.35			
15:03	60	0.36			
15:08	65	0.36			
15:13	70	0.37			
15:18	75	0.41			
15:23	80	1.54			

Remarks:
1) Test performed with a flush bottom; no wick used.
2) Test terminated after 80-minutes due to loss of seal.
3) Depth to water level is from top of stickout.
4)

Borehole Permeability Test

Nobis

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	FA-15
Sheet	2 of 3
File No.	48138.07
Checked By	J. Trottier

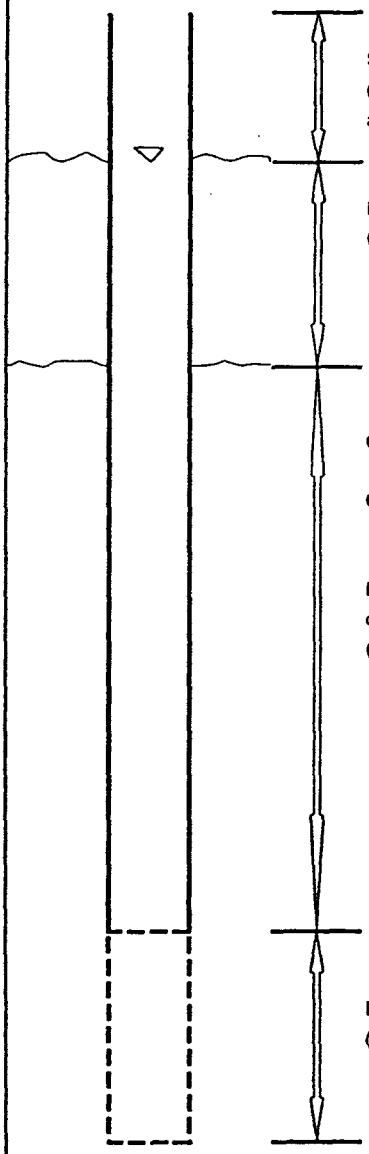
Boring Co. Atlantic Testing Laboratories, Limited
Driller P. Davis
Logged by: E. Paddleford

Test Information

Test Number: 2
Sample Number: UO-3
Boring Location: CDF A Offshore
Date of test: 9/13/99

Time

Beginning test preperation: 10:40
Test completion: 12:10
Total time (min.): 90



Stickout: 7.9 ft.
(Height of casing above water surface)

Depth to mudline: 4.9 ft.
(from water surface)

Casing I.D. 4.0 in.

Casing O.D. 4.5 in.

Depth to bottom of casing: 6.0 ft.
(from mudline)

Length of intake: 1.0 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
10:40:30	0.5	0.16			
10:41	1	0.19			
10:42	2	0.27			
10:45	5	0.39			
10:50	10	0.57			
10:55	15	0.94			
11:00	20	1.14			
11:05	25	1.31			
11:10	30	1.45			
11:15	35	1.56			
11:20	40	1.64			
11:25	45	1.70			
11:30	50	1.74			
11:35	55	1.77			
11:40	60	1.78			
11:45	65	1.8			
11:50	70	1.81			
11:55	75	1.83			
12:00	80	1.87			
12:05	85	1.88			
12:10	90	1.90			

Remarks:
1) Wick backfill is silica sand #0.
2) Depth to water level is from top of stickout.
3)
4)

Borehole Permeability Test

Nobis

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	FA - 15
Sheet	3 of 3
File No.	48138.07
Checked By	J. Trottier

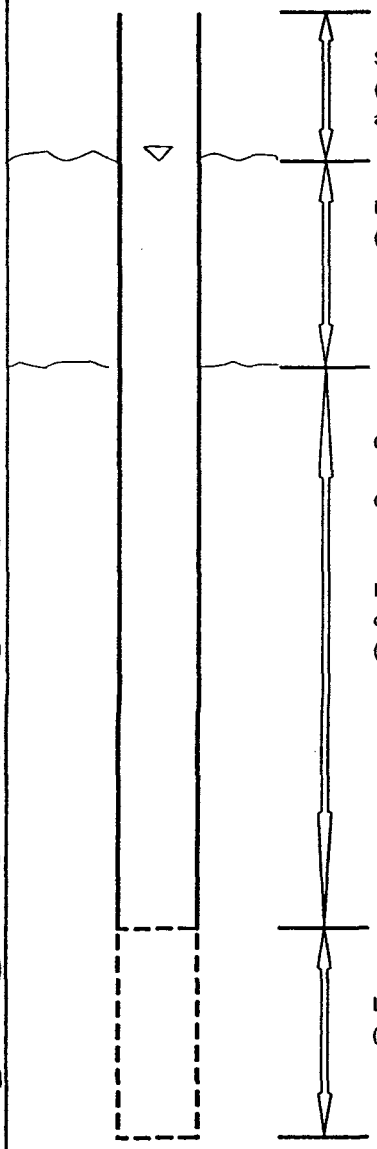
Boring Co.	Atlantic Testing Laboratories, Limited
Driller	P. Davis
Logged by:	E. Paddleford

Test Information

Test Number:	3
Sample Number:	S-1
Boring Location:	CDF A Offshore
Date of test:	9/13/99

Time

Beginning test preperation:	12:31
Test completion:	14:01
Total time (min.):	90



Stickout: 9.9 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 12.3 ft.
(from mudline)

Length of intake 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
12:31	0.5	0.05			
12:32	1	0.13			
12:33	2	0.20			
12:36	5	0.44			
12:41	10	0.76			
12:46	15	0.98			
12:51	20	1.20			
12:56	25	1.36			
13:01	30	1.50			
13:06	35	1.62			
13:11	40	1.71			
13:16	45	1.79			
13:21	50	1.87			
13:26	55	1.92			
13:31	60	1.98			
13:36	65	2.03			
13:41	70	2.08			
13:46	75	2.13			
13:51	80	2.17			
13:56	85	2.20			
14:01	90	2.23			

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 0.77 was also applied to the both the undisturbed and remoulded shear strength values based on the organic clay having an average plasticity index of 55. 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

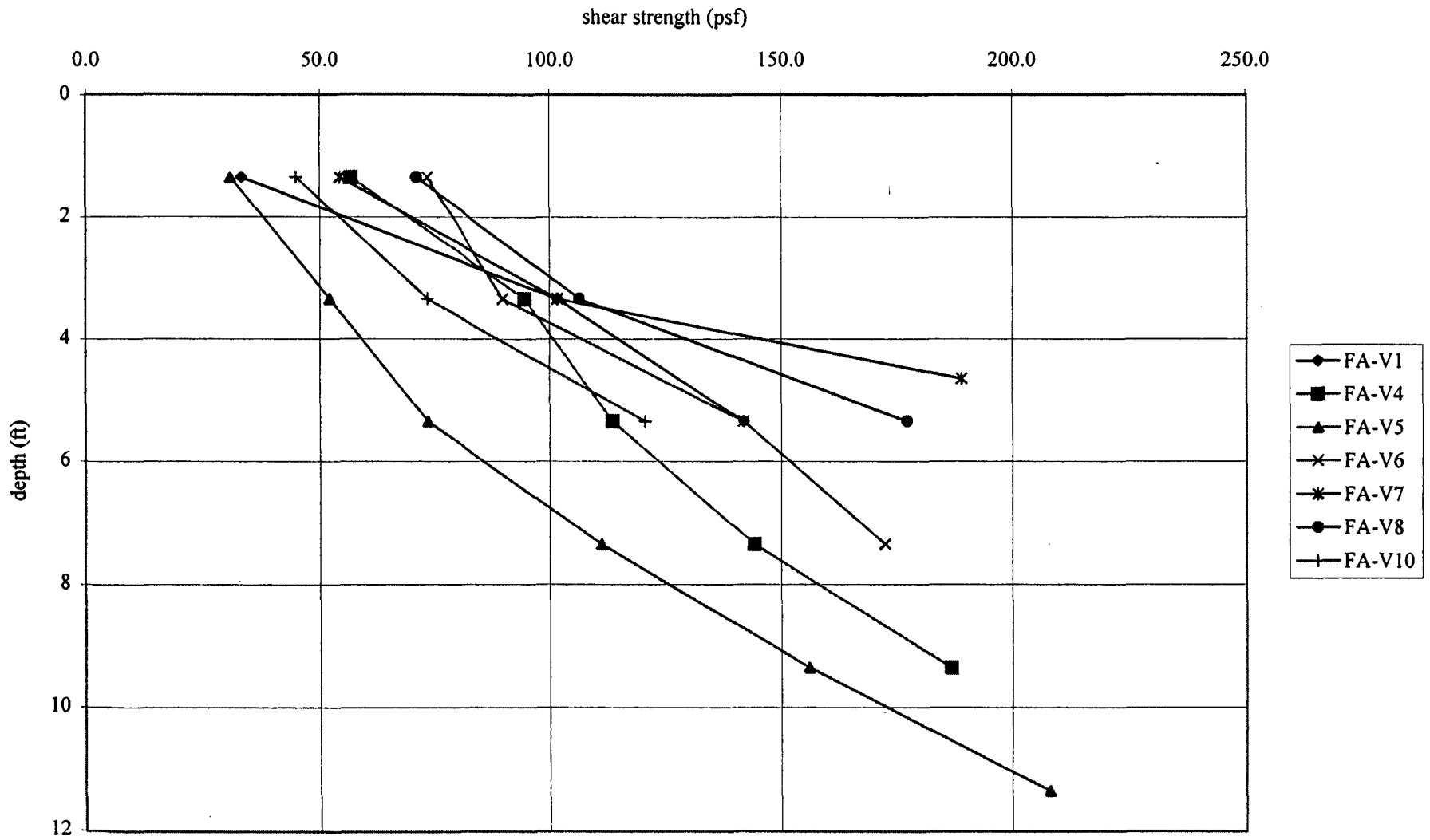
Boring Location	Depth (ft)	Undisturbed Shear Strength				Residual Shear Strength			
		Maximum Applied Torque (ft-lb)	Measured Rod Friction (ft-lb)	Corrrected Max Applied Torque (ft-lb)	Peak Shear Strength (psf)*	Maximum Applied Torque (ft-lb)	Measured Rod Friction (ft-lb)	Corrrected Max Applied Torque (ft-lb)	Peak Residual Shear Strength (psf)*
FA-V1	1 to 1.7	6.7	0.8	5.8	33.1	1.3	0.2	1.1	6.1
	3 to 3.7	20.8	2.9	17.9	101.7	2.5	1.7	0.8	4.7
	5 to 5.7	30.0	5.0	25.0	141.8	2.9	3.3	0.0	0.0
	7 to 7.7	>50	8.8	>41	>234	N/A	5.4	N/A	N/A
FA-V4	1 to 1.7	10.8	0.8	10.0	56.7	1.7	0.0	1.7	9.5
	3 to 3.7	20.8	4.2	16.7	94.6	3.3	1.3	2.1	11.8
	5 to 5.7	25.0	5.0	20.0	113.5	2.5	2.5	0.0	0.0
	7 to 7.7	32.5	7.1	25.4	144.2	4.6	3.8	0.8	4.7
	9 to 9.7	40.0	7.1	32.9	186.8	5.8	4.2	1.7	9.5
	11 to 11.7	>50	9.2	>41	>232	N/A	4.6	N/A	N/A
FA-V5	1 to 1.7	6.3	0.8	5.4	30.7	0.8	0.0	0.8	4.7
	3 to 3.7	11.3	2.1	9.2	52.0	1.7	0.8	0.8	4.7
	5 to 5.7	17.1	4.2	12.9	73.3	2.5	2.1	0.4	2.4
	7 to 7.7	25.0	5.4	19.6	111.1	3.3	3.3	0.0	0.0
	9 to 9.7	35.8	8.3	27.5	156.0	4.6	5.0	0.0	0.0
	11 to 11.7	46.7	10.0	36.7	208.0	5.4	5.4	0.0	0.0
FA-V6	1 to 1.7	15.0	2.1	12.9	73.3	2.1	0.8	1.3	7.1
	3 to 3.7	19.6	3.8	15.8	89.8	2.5	2.1	0.4	2.4
	5 to 5.7	30.0	5.0	25.0	141.8	3.3	3.3	0.0	0.0
	7 to 7.7	35.8	5.4	30.4	172.6	4.6	3.8	0.8	4.7
	9 to 9.7	>50	8.8	>41	>234	N/A	6.7	N/A	N/A
FA-V7	1 to 1.7	10.4	0.8	9.6	54.4	1.3	0.0	1.3	7.1
	3 to 3.7	20.0	2.1	17.9	101.7	1.3	0.8	0.4	2.4
	4.3 to 5	35.8	2.5	33.3	189.1	N/A	1.7	N/A	N/A
FA-V8	1 to 1.7	13.3	0.8	12.5	70.9	3.3	0.4	2.9	16.5
	3 to 3.7	22.5	3.8	18.8	106.4	1.7	1.7	0.0	0.0
	5 to 5.7	37.9	6.7	31.3	177.3	5.0	4.2	0.8	4.7

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)*
FA-V10	1 to 1.7	9.2	1.3	7.9	44.9	2.1	0.4	1.7	9.5
	3 to 3.7	15.8	2.9	12.9	73.3	2.1	1.7	0.4	2.4
	5 to 5.7	25.8	4.6	21.3	120.6	5.4	3.3	2.1	11.8

* correction factor of 0.77 has been applied based on an average PI of 55 (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	FA-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 Information

Vane Type	Rectangular
Vane Dimensions	4 in. X 8 in.
Vane Manufacturer	U.S. Army Corps of Engineers

Test Information

Test Apparatus	Torque wrench method
Torque Wrench Manufacturer	Consolidated Devices, Inc.
Method of Vane Advancement	Open Hole, No Casing

Field Vane Shear Test Location

Northing	2706530.5	Easting	815495.8
Mud Line El.	-2.4 feet	Datum	NGVD
Date Start	11/4/99	Date End	11/4/99

Rod Test Location

Northing	N/A	Easting	N/A
Mud Line El.	N/A	Datum	N/A
Date Start	11/5/99	Date End	11/5/99

Results

Test Interval (feet):	Maximum Applied Torque (in.-lbs.) Undisturbed	Maximum Applied Torque (in.-lbs.) Remoulded
1.0 - 1.7	80	15
3.0 - 3.7	250	30
5.0 - 5.7	360	35
7.0 - 7.7	>600	NA [2]

Rod Friction

Test Interval (feet):	Maximum Applied Torque (in.-lbs.) Undisturbed	Maximum Applied Torque (in.-lbs.) Remoulded
0 - 1.0	10	2
0 - 3.0	35	20
0 - 5.0	60	40
0 - 7.0	105	65

Vane Shear Test Location

Depth to Mudline from barge surface:

before test:	4.2 feet
after test:	4.3 feet
difference:	0.1 feet

Rod Friction Test Location

Depth to Mudline from barge surface:

before test:	5.4 feet
after test:	5.1 feet
difference:	0.3 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.

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	FA-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 Information

Vane Type	Rectangular
Vane Dimensions	4 in. X 8 in.
Vane Manufacturer	U.S. Army Corps of Engineers

Equipment Information

Test Apparatus	Torque wrench method
Torque Wrench Manufacturer	Consolidated Devices, Inc.
Method of Vane Advancement	Open Hole, No Casing

Test Location Information (Vane)

Northing	2706101.9	Easting	815534.7
Mud Line El.	-4.7 feet	Datum	NGVD
Date Start	11/8/99	Date End	11/8/99

Test Location Information (Rod Friction)

Northing	N/A	Easting	N/A
Mud Line El.	N/A	Datum	N/A
Date Start	11/8/99	Date End	11/8/99

Results (Vane)

	Maximum Applied Torque (in.-lbs.)	
Test Interval (feet):	Undisturbed	Remoulded
1.0 - 1.7	130	20
3.0 - 3.7[2]	250	40
5.0 - 5.7	300	30
7.0 - 7.7	390	55
9.0 - 9.7	480	70
11.0 - 11.7[3]	>600	NA[4]

Results (Rod Friction)

	Maximum Applied Torque (in.-lbs.)	
Test Interval (feet):	Undisturbed	Remoulded
0 - 1.0	10	0
0 - 3.0	50	15
0 - 5.0	60	30
0 - 7.0	85	45
0 - 9.0	85	50
0 - 11.0	110	55

Mudline Information (Vane)

Depth to Mudline from barge surface:

before test:	4.7 feet
after test:	4.5 feet
difference:	0.2 feet

Mudline Information (Rod Friction)

Depth to Mudline from barge surface:

before test:	4.8 feet
after test:	NA feet
difference:	feet

Remarks:
1) Rod friction test performed within 10 feet of field vane shear test location.
2) Barge moved east and west several times; encountered refusal at approximate same depth.
3) Difficult push; unable to advance vane beyond 11.7 feet. Advance HW drill casing to 12 feet for sample.
4) Did not shear with torque wrench or pipe wrench in fear of deforming field vane.

Field Vane Shear Test Log (ASTM D2573)

Nobis Engineering
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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	FA-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 Information

Test Apparatus	Torque wrench method
Torque Wrench Manufacturer	Consolidated Devices, Inc.
Method of Vane Advancement	Open Hole, No Casing

Vane Location Coordinates (NAD 1983)

Northing	2706055.6	Easting	815355.5
Mud Line El.	-3.6 feet	Datum	NGVD
Date Start	11/9/99	Date End	11/9/99

Rod Location Coordinates (NAD 1983)

Northing	N/A	Easting	N/A
Mud Line El.	N/A	Datum	N/A
Date Start	11/9/99	Date End	11/9/99

Field Vane

	Maximum Applied Torque (in.-lbs.)	
Test Interval (feet):	Undisturbed	Remoulded
1.0 - 1.7	75	10
3.0 - 3.7	135	20
5.0 - 5.7	205	30
7.0 - 7.7	300	40
9.0 - 9. 7	430	55
11.0 - 11.7 [2]	560	65

Rod Friction

	Maximum Applied Torque (in.-lbs.)	
Test Interval (feet):	Undisturbed	Remoulded
0 - 1.0	10	0
0 - 3.0	25	10
0 - 5.0	50	25
0 - 7.0	65	40
0 - 9.0	100	60
0 - 11.0	120	65

Vane Mudline Elevation

Depth to Mudline from barge surface:

before test:	6.8 feet
after test:	7.0 feet
difference:	0.2 feet

Rod Mudline Elevation

Depth to Mudline from barge surface:

before test:	7.1 feet
after test:	7.0 feet
difference:	0.1 feet

Remarks:
1) Rod friction test performed within 10 feet of field vane shear test location.
2) Difficult push; unable to advance vane beyond 12.5 feet. Advance HW drill casing to 12.5 feet for sample.

Field Vane Shear Test Log (ASTM D2573)

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PROJECT

Remedial Design for Operable Unit 01
New Bedford Harbor Superfund Site
New Bedford, Massachusetts

Test Location	FA-V6
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 Information

Test Apparatus	Torque wrench method
Torque Wrench Manufacturer	Consolidated Devices, Inc.
Method of Vane Advancement	Open Hole, No Casing

Test Location Information (Northing, etc.)

Northing	2705897.2	Easting	815398.5
Mud Line El.	-4.6 feet	Datum	NGVD
Date Start	11/8/99	Date End	11/8/99

Test Location Information (Rod Friction)

Northing	N/A	Easting	N/A
Mud Line El.	N/A	Datum	N/A
Date Start	11/8/99	Date End	11/8/99

Field Vane

	Maximum Applied Torque (in.-lbs.)	
Test Interval (feet):	Undisturbed	Remoulded
1.0 - 1.7	180	25
3.0 - 3.7	235	30
5.0 - 5.7	360	40
7.0 - 7.7	430	55
9.0 - 9.7 [2]	>600	NA [3]

Rod Friction

	Maximum Applied Torque (in.-lbs.)	
Test Interval (feet):	Undisturbed	Remoulded
0 - 1.0	25	10
0 - 3.0	45	25
0 - 5.0	60	40
0 - 7.0	65	45
0 - 9.0	105	80

Test Information (Vane)

Depth to Mudline from barge surface:

before test:	7.8 feet
after test:	7.1 feet
difference:	0.7 feet

Test Information (Rod)

Depth to Mudline from barge surface:

before test:	6.4 feet
after test:	5.7 feet
difference:	0.7 feet

Remarks:
1) Rod friction test performed within 10 feet of field vane shear test location.
2) Difficult push; unable to advance vane beyond 10.5 feet. Advance HW drill casing to 10.5 feet for sample.
3) Did not shear with torque wrench or pipe wrench in fear of deforming field vane.

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	FA-V7
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 Information

Test Apparatus	Torque wrench method
Torque Wrench Manufacturer	Consolidated Devices, Inc.
Method of Vane Advancement	Open Hole, No Casing

Test Location Information for Field Vane

Northing	2705763.0	Easting	815130.8
Mud Line El.	-2.5 feet	Datum	NGVD
Date Start	11/9/99	Date End	11/9/99

Rod Friction Test Location Information

Northing	N/A	Easting	N/A
Mud Line El.	N/A	Datum	N/A
Date Start	11/9/99	Date End	11/9/99

Test Vane

	Maximum Applied Torque (in.-lbs.)	
Test Interval (feet):	Undisturbed	Remoulded
1.0 - 1.7	125	15
3.0 - 3.7	240	15
4.3 - 5.0 [2]	430	NA [3]

Rod Friction

	Maximum Applied Torque (in.-lbs.)	
Test Interval (feet):	Undisturbed	Remoulded
0 - 1.0	10	0
0 - 3.0	25	10
0 - 4.3	30	20

Mudline Elevation

Depth to Mudline from barge surface:	
before test:	5.9 feet
after test:	5.7 feet
difference:	0.2 feet

Mudline Elevation

Depth to Mudline from barge surface:	
before test:	4.7 feet
after test:	4.5 feet
difference:	0.2 feet

Remarks:
1) Rod friction test performed within 10 feet of field vane shear test location.
2) Difficult push; unable to advance vane beyond 5 feet. Advance HW drill casing to 5 feet for sample.
3) Did not perform remold test in fear of deforming field vane.

Field Vane Shear Test Log (ASTM D2573)

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PO Box 2890
Concord, New Hampshire 03302

PROJECT

Remedial Design for Operable Unit 01
New Bedford Harbor Superfund Site
New Bedford, Massachusetts

Test Location	FA-V8
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		Test Information	
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

Test Location Information (Test Vane)				Test Location Information (Rod Friction)			
Northing	2705649.0	Easting	815229.0	Northing	N/A	Easting	N/A
Mud Line El.	-4.1	Datum	NGVD	Mud Line El.	N/A	Datum	N/A
Date Start	11/4/99	Date End	11/4/99	Date Start	11/4/99	Date End	11/4/99

Test Vane			Rod Friction		
	Maximum Applied Torque (in.-lbs.)			Maximum Applied Torque (in.-lbs.)	
Test Interval (feet):	Undisturbed	Remoulded	Test Interval (feet):	Undisturbed	Remoulded
1.0 - 1.7	160	40	0 - 1.0	10	5
3.0 - 3.7	270	20	0 - 3.0	45	20
5.0 - 5.7 [2]	455	60	0 - 5.0	80	50
7.0 - 7.7 [3]	NA	NA			

Test Vane Depth		Rod Friction Depth	
Depth to Mudline from barge surface:		Depth to Mudline from barge surface:	
before test:	5.2 feet	before test:	6.1 feet
after test:	5.4 feet	after test:	6.2 feet
difference:	0.2 feet	difference:	0.1 feet

Remarks:
1) Rod friction test performed within 10 feet of field vane shear test location.
2) Shells noted on field vane upon removal from hole.
3) Difficult push; unable to advance vane beyond 6.7 feet. Advance HW drill casing to 7 feet for sample.

Field Vane Shear Test Log (ASTM D2573)

Nobis

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	FA-V10
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 Information

Test Apparatus	Torque wrench method
Torque Wrench Manufacturer	Consolidated Devices, Inc.
Method of Vane Advancement	Open Hole, No Casing

Test Location Information (Vane Location)

Northing	2705492.4	Easting	814940.8
Mud Line El.	-2.5 feet	Datum	NGVD
Date Start	11/5/99	Date End	11/5/99

Test Location Information (Rod Location)

Northing	N/A	Easting	N/A
Mud Line El.	N/A	Datum	N/A
Date Start	11/5/99	Date End	11/5/99

Results

	Maximum Applied Torque (in.-lbs.)	
Test Interval (feet):	Undisturbed	Remoulded
1.0 - 1.7	110	25
3.0 - 3.7	190	25
5.0 - 5.7	310	65
7.0 - 7.7 [2]	NA	NA

Rod Friction

	Maximum Applied Torque (in.-lbs.)	
Test Interval (feet):	Undisturbed	Remoulded
0 - 1.0	15	5
0 - 3.0	35	20
0 - 5.0	55	40

Tide Information (Vane)

Depth to Mudline from barge surface:

before test:	4.6 feet
after test:	4.4 feet
difference:	0.2 feet

Tide Information (Rod)

Depth to Mudline from barge surface:

before test:	3.3 feet
after test:	3.2 feet
difference:	0.1 feet

Remarks:
1) Rod friction test performed within 10 feet of field vane shear test location.
2) Difficult push; unable to advance vane beyond 6.0 feet. Advance HW drill casing to 6 feet for sample.

E

APPENDIX E

Groundwater Monitoring Reports

FOSTER WHEELER				Groundwater Monitoring Report	
Project:	New Bedford Harbor Superfund Site				
Well Number:	OW-A1	**Northing:**	2706392.3	**Ground Surface Elevation:**	7.17 ft
Page Number:	1 of 1	**Easting:**	815256.8	**Elevation of Top of PVC:**	9.76 ft

Date	Time	Water Level (ft)	Groundwater Elevation (ft)	Remarks	Read By
1-Oct	15:41	7.16	2.60	tides: low@08:12, high@13:33	Sununu/Anderson
14-Oct	16:26	8.35	1.41	tides: high@11:44, low@16:49	Gray
28-Oct	11:11	6.94	2.82	tides: high@11:16, low@17:01	Gray
11-Nov	11:29	7.75	2.01	tides: high@09:30, low@14:47	Sununu/Gray
1-Dec	9:45	8.73	1.03	tides: low@09:24, high@14:49	Sununu/Gray

FOSTER WHEELER				Groundwater Monitoring Report	
Project:	New Bedford Harbor Superfund Site				
Well Number:	OW-A2	**Northing:**	2705969.3	**Ground Surface Elevation:**	5.95 ft
Page Number:	1 of 1	**Easting:**	815188.8	**Elevation of Top of PVC:**	8.19 ft

Date	Time	Water Level (ft)	Groundwater Elevation (ft)	Remarks	Read By
1-Oct	15:31	5.39	2.80	tides: low@08:12, high@13:33	Sununu/Anderson
14-Oct	16:23	6.20	1.99	tides: high@11:44, low@16:49	Gray
28-Oct	11:00	5.83	2.36	tides: high@11:16, low@17:01	Gray
11-Nov	15:35	6.35	1.84	tides: high@09:30, low@14:47	Sununu/Gray
1-Dec	10:22	6.80	1.39	tides: low@09:24, high@14:49	Sununu/Gray

FOSTER WHEELER				Groundwater Monitoring Report	
Project:	New Bedford Harbor Superfund Site				
Well Number:	OW-A3	**Northing:**	2706321.5	**Ground Surface Elevation:**	8.20 ft
Page Number:	1 of 1	**Easting:**	814973.2	**Elevation of Top of PVC:**	7.69 ft

Date	Time	Water Level (ft)	Groundwater Elevation (ft)	Remarks	Read By
1-Oct	16:22	5.55	2.14	tides: low@08:12, high@13:33	Sununu/Anderson
14-Oct	16:45	5.60	2.09	tides: high@11:44, low@16:49	Gray
28-Oct	11:20	5.47	2.22	tides: high@11:16, low@17:01	Gray
11-Nov	11:34	5.74	1.95	tides: high@09:30, low@14:47	Sununu/Gray
1-Dec	9:50	5.91	1.78	tides: low@09:24, high@14:49	Sununu/Gray

FOSTER WHEELER				Groundwater Monitoring Report	
Project:	New Bedford Harbor Superfund Site				
Well Number:	OW-A4	**Northing:**	2706076.9	**Ground Surface Elevation:**	8.69 ft
Page Number:	1 of 1	**Easting:**	814770.6	**Elevation of Top of PVC:**	8.52 ft

Date	Time	Water Level (ft)	Groundwater Elevation (ft)	Remarks	Read By
1-Oct	16:11	5.32	3.20	tides: low@08:12, high@13:33	Sununu/Anderson
14-Oct	16:35	5.04	3.48	tides: high@11:44, low@16:49	Gray
28-Oct	11:50	5.00	3.52	tides: high@11:16, low@17:01	Gray
11-Nov	11:42	5.24	3.28	tides: high@09:30, low@14:47	Sununu/Gray
1-Dec	10:00	5.28	3.24	tides: low@09:24, high@14:49	Sununu/Gray

FOSTER WHEELER				Groundwater Monitoring Report	
Project:	New Bedford Harbor Superfund Site				
Well Number:	OW-A5	**Northing:**	2706007.0	**Ground Surface Elevation:**	5.45 ft
Page Number:	1 of 1	**Easting:**	815045.8	**Elevation of Top of PVC:**	8.24 ft

Date	Time	Water Level (ft)	Groundwater Elevation (ft)	Remarks	Read By
1-Oct	15:47	4.62	3.62	tides: low@08:12, high@13:33	Sununu/Anderson
14-Oct	16:21	5.26	2.98	tides: high@11:44, low@16:49	Gray
28-Oct	11:02	5.66	2.58	tides: high@11:16, low@17:01	Gray
11-Nov	15:36	5.82	2.42	tides: high@09:30, low@14:47	Sununu/Gray
1-Dec	10:25	5.71	2.53	tides: low@09:24, high@14:49	Sununu/Gray

FOSTER WHEELER				Groundwater Monitoring Report	
Project:	New Bedford Harbor Superfund Site				
Well Number:	OW-A6	**Northing:**	2705435.2	**Ground Surface Elevation:**	5.32 ft
Page Number:	1 of 1	**Easting:**	814800.3	**Elevation of Top of PVC:**	4.85 ft

Date	Time	Water Level (ft)	Groundwater Elevation (ft)	Remarks	Read By
1-Oct	15:18	2.63	2.22	tides: low@08:12, high@13:33	Sununu/Anderson
14-Oct	15:55	3.01	1.84	tides: high@11:44, low@16:49	Gray
28-Oct	10:35	2.66	2.19	tides: high@11:16, low@17:01	Gray
11-Nov	15:19	3.16	1.69	tides: high@09:30, low@14:47	Sununu/Gray
1-Dec	10:05	3.29	1.56	tides: low@09:24, high@14:49	Sununu/Gray

FOSTER WHEELER				Groundwater Monitoring Report	
Project:	New Bedford Harbor Superfund Site				
Well Number:	OW-A7	**Northing:**	2705687.7	**Ground Surface Elevation:**	8.18 ft
Page Number:	1 of 1	**Easting:**	814711.3	**Elevation of Top of PVC:**	7.81 ft

Date	Time	Water Level (ft)	Groundwater Elevation (ft)	Remarks	Read By
1-Oct	15:53	4.93	2.88	tides: low@08:12, high@13:33	Sununu/Anderson
14-Oct	16:03	4.88	2.93	tides: high@11:44, low@16:49	Gray
28-Oct	10:43	4.69	3.12	tides: high@11:16, low@17:01	Gray
11-Nov	15:24	5.00	2.81	tides: high@09:30, low@14:47	Sununu/Gray
1-Dec	10:10	5.12	2.69	tides: low@09:24, high@14:49	Sununu/Gray

FOSTER WHEELER				Groundwater Monitoring Report	
Project:	New Bedford Harbor Superfund Site				
Well Number:	MW-A1	**Northing:**	2706613.8	**Ground Surface Elevation:**	5.82 ft
Page Number:	1 of 1	**Easting:**	815363.8	**Elevation of Top of PVC:**	5.48 ft

Date	Time	Water Level (ft)	Groundwater Elevation (ft)	Remarks	Read By
1-Oct	16:04	3.75	1.73	tides: low@08:12, high@13:33	Sununu/Anderson
28-Oct	12:22	2.99	2.49	tides: high@11:16, low@17:01	Gray
11-Nov	11:20	3.67	1.81	tides: high@09:30, low@14:47	Sununu/Gray
1-Dec	9:30	4.53	0.95	tides: low@09:24, high@14:49	Sununu/Gray

FOSTER WHEELER				Groundwater Monitoring Report	
Project:	New Bedford Harbor Superfund Site				
Well Number:	MW-A2(S)	**Northing:**	2706171.0	**Ground Surface Elevation:**	6.29 ft
Page Number:	1 of 1	**Easting:**	815006.8	**Elevation of Top of PVC:**	5.74 ft

Date	Time	Water Level (ft)	Groundwater Elevation (ft)	Remarks	Read By
1-Oct	16:18	3.74	2.00	tides: low@08:12, high@13:33	Sununu/Anderson
14-Oct	16:40	5.08	0.66	tides: high@11:44, low@16:49	Gray
28-Oct	11:40	2.37	3.37	tides: high@11:16, low@17:01	Gray
11-Nov	11:36	3.80	1.94	tides: high@09:30, low@14:47	Sununu/Gray
1-Dec	9:55	4.72	1.02	tides: low@09:24, high@14:49	Sununu/Gray

FOSTER WHEELER				Groundwater Monitoring Report	
Project:	New Bedford Harbor Superfund Site				
Well Number:	MW-A3	**Northing:**	2705830.0	**Ground Surface Elevation:**	5.92 ft
Page Number:	1 of 1	**Easting:**	814873.4	**Elevation of Top of PVC:**	5.56 ft

Date	Time	Water Level (ft)	Groundwater Elevation (ft)	Remarks	Read By
1-Oct	15:25	1.68	3.88	tides: low@08:12, high@13:33	Sununu/Anderson
14-Oct	16:12	1.58	3.98	tides: high@11:44, low@16:49	Gray
28-Oct	10:50	2.28	3.28	tides: high@11:16, low@17:01	Gray
11-Nov	15:29	2.99	2.57	tides: high@09:30, low@14:47	Sununu/Gray
1-Dec	10:17	2.27	3.29	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: 12/29/99
Tested By: SWJ
Checked By: GTT

Boring #	Sample ID	Depth, ft	Visual Description	Specific Gravity @ 20° C
FA-8	S-4	13-15	Moist, gray sandy silt	2.68
FA-15	S-1	12-14	Moist, light olive brown gravel with sand and silt	2.64
FA-19	S-3	20-22	Moist, olive gray gravel with sand, some silt	2.67
FA-19	S-5	30-31	Moist, olive brown sand with gravel, silt	2.73
FA-23	S-2	17-19	Moist, gray silty sand	2.66
FA-26	S-1	7.5-9.5	Moist, grayish brown gravel with sand and silt	2.68
FA-26	S-3	18-20	Moist, gray sand with some gravel	2.65

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,

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: 12/27/99
Tested By: SWJ
Checked By: GTT

Boring #	Sample ID	Depth, ft	Visual Description	Specific Gravity @ 20° C
FA-9	UO-1	2-4	Moist, brown silty sand with gravel, organics	2.62
FA-12	UO-2	4-6	Moist, black sandy organic clay	2.59
FA-15	UO-2	4-6	Moist, dark gray organic clay	2.53
FA-15	UO-3	7-9	Moist, dark gray organic clay	2.60
FA-18	UO-1	0-2	Moist, very dark gray organic clay	2.45
FA-19	UO-2	4-6	Moist, very dark gray organic clay	2.61
FA-23	UO-1	3-5	Moist, very dark gray organic clay	2.59
FA-23	UO-3	9-11	Moist, very dark gray organic clay	2.54
FA-25	UO-1	0-2	Moist, very dark gray organic clay	2.57
FA-27	UO-1	3-5	Moist, very dark gray organic clay with shells	2.63
FB-20	UO-2	6-8	Moist, dark gray organic clay	2.51
FB-28	UO-1	0-2	Wet, black organic clay	2.39

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
Boring No. : FA-1
Sample No. : S-1 (0-2)
Location : New Bedford, MA
Soil Description : Moist, brown silty sand with black organics
Remarks : ---

Depth : 0-2 ft
Test Date : 12/03/99
Test Method : ASTM D 2216

Filename : FA1S1
Elevation : ---
Tested by : AL
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) jc46	8.84	105.43	93.79	13.70

Average Moisture Content = 13.70

GEOTECHNICAL LABORATORY TEST DATA

Project : New Bedford Harbor Superfund Site
Project No. : GTX-2409 Depth : 19-21 ft
Boring No. : FA-3 Test Date : 12/03/99
Sample No. : S-5 (19-21) Test Method : ASTM D 2216
Location : New Bedford, MA
Soil Description : Moist, light gray gravel with silt and sand
Remarks : Hydrometer not required, fines < 15%

Filename : FA3S5
Elevation : ---
Tested by : AL
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) al2	9.13	161.60	152.22	6.56

Average Moisture Content = 6.56

GEOTECHNICAL LABORATORY TEST DATA

Project : New Bedford Harbor Superfund Site
Project No. : GTX-2409
Boring No. : FA-6
Sample No. : S-1 (0-2)
Location : New Bedford, MA
Soil Description : Dry, brown gravel with sand and silt
Remarks : Hydrometer not required, fines < 15%

Depth : 0-2 ft
Test Date : 12/03/99
Test Method : ASTM D 2216

Filename : FA6S1
Elevation : ---
Tested by : AL
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) nyg3	9.04	113.50	110.24	3.22

Average Moisture Content = 3.22

GEOTECHNICAL LABORATORY TEST DATA

Project : New Bedford Harbor Superfund Site
Project No. : GTX-2409
Boring No. : FA-6
Sample No. : S-4 (13-15)
Location : New Bedford, MA
Soil Description : Wet, gray silty sand
Remarks : ---

Depth : 13-15 ft
Test Date : 12/03/99
Test Method : ASTM D 2216

Filename : FA6S4
Elevation : ---
Tested by : AL
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) jc47	8.80	139.28	127.23	10.17

Average Moisture Content = 10.17

GEOTECHNICAL LABORATORY TEST DATA

Project : New Bedford Harbor Superfund Site
Project No. : GTX-2409
Boring No. : FA-8
Sample No. : S-4 (13-15)
Location : New Bedford, MA
Soil Description : Moist, gray sandy silt
Remarks : ---

Depth : 13-15 ft
Test Date : 12/03/99
Test Method : ASTM D 2216

Filename : FA8S4
Elevation : ---
Tested by : AL
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) tv2	9.35	114.21	91.91	27.01

Average Moisture Content = 27.01

GEOTECHNICAL LABORATORY TEST DATA

Project : New Bedford Harbor Superfund Site
Project No. : GTX-2409
Boring No. : FA-9
Sample No. : S-1 (5-7)
Location : New Bedford, MA
Soil Description : Wet, gray sand with silt
Remarks : Hydrometer not required, fines < 15%

Depth : 5-7 ft
Test Date : 12/03/99
Test Method : ASTM D 2216

Filename : FA9S1
Elevation : ---
Tested by : AL
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) xz14	9.10	192.59	167.16	16.09

Average Moisture Content = 16.09

GEOTECHNICAL LABORATORY TEST DATA

Project : New Bedford Harbor Superfund Site
Project No. : GTX-2409
Boring No. : PA-12
Sample No. : S-1 (12-14)
Location : New Bedford, MA
Soil Description : Wet, gray sand with gravel, silt
Remarks : Hydrometer not required, fines < 15%

Depth : 12-14 f
Test Date : 12/03/99
Test Method : ASTM D 2216

Filename : FA12S1
Elevation : ---
Tested by : AL
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) vy10	9.08	199.48	181.20	10.62

Average Moisture Content = 10.62

GEOTECHNICAL LABORATORY TEST DATA

Project : New Bedford Harbor Superfund Site
Project No. : GTX-2409
Boring No. : FA-14
Sample No. : S-1 (3-5)
Location : New Bedford, MA
Soil Description : Moist, black sandy silt
Remarks : ---

Depth : 3-5 ft
Test Date : 12/03/99
Test Method : ASTM D 2216

Filename : FA14S1
Elevation : ---
Tested by : AL
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) b163	9.18	110.78	63.97	85.44

Average Moisture Content = 85.44

GEOTECHNICAL LABORATORY TEST DATA

Project : New Bedford Harbor Superfund Site
Project No. : GTX-2409
Boring No. : FA-15
Sample No. : UO-3 (7-9)
Location : New Bedford, MA
Soil Description : Moist, dark gray organic clay
Remarks : ---

Depth : 7-9 ft
Test Date : 12/14/99
Test Method : ASTM D 2216

Filename : FA15UO3
Elevation : ---
Tested by : AL/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) bl45	9.17	124.97	70.34	89.31
2) vl2	9.65	182.52	100.22	90.87

Average Moisture Content = 90.09

GEOTECHNICAL LABORATORY TEST DATA

Project : New Bedford Harbor Superfund Site
Project No. : GTX-2409
Boring No. : FA-15
Sample No. : S-1 (12-14)
Location : New Bedford, MA
Depth : 12-14 ft
Test Date : 12/03/99
Test Method : ASTM D 2216
Filename : FA15S1
Elevation : ---
Tested by : AL
Checked by : GTT
Soil Description : Moist, light olive brown gravel with sand 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) sm47	9.14	162.25	149.27	9.26

Average Moisture Content = 9.26

GEOTECHNICAL LABORATORY TEST DATA

Project : New Bedford Harbor Superfund Site
Project No. : GTX-2409
Boring No. : FA-19
Sample No. : S-3 (20-22)
Location : New Bedford, MA
Depth : 20-22 ft
Test Date : 12/03/99
Test Method : ASTM D 2216
Filename : FA19S3
Elevation : ---
Tested by : AL
Checked by : GTT
Soil Description : Moist, olive gray gravel with sand, 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) hh3	7.74	196.49	177.93	10.91

Average Moisture Content = 10.91

GEOTECHNICAL LABORATORY TEST DATA

Project : New Bedford Harbor Superfund Site
Project No. : GTX-2409
Boring No. : FA-19
Sample No. : S-5 (30-31)
Location : New Bedford, MA
Soil Description : Moist, olive brown sand with gravel, silt
Remarks : Hydrometer not required, fines < 15%

Depth : 30-31 ft
Test Date : 12/03/99
Test Method : ASTM D 2216

Filename : FA19S5
Elevation : ---
Tested by : AL
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) jgb108	9.07	161.26	148.41	9.22

Average Moisture Content = 9.22

GEOTECHNICAL LABORATORY TEST DATA

Project : New Bedford Harbor Superfund Site
Project No. : GTX-2409
Boring No. : FA-23
Sample No. : S-2 (17-19)
Location : New Bedford, MA
Soil Description : Moist, gray silty sand
Remarks : ---

Depth : 17-19 ft
Test Date : 12/03/99
Test Method : ASTM D 2216

Filename : FA23S2
Elevation : ---
Tested by : AL
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) 8q	9.49	143.85	126.72	14.61

Average Moisture Content = 14.61

GEOTECHNICAL LABORATORY TEST DATA

Project : New Bedford Harbor Superfund Site
Project No. : GTX-2409
Boring No. : FA-25
Sample No. : S-2 (12-14)
Location : New Bedford, MA
Soil Description : Moist, gray gravel with sand, silt
Remarks : Hydrometer not required, fines < 15%

Depth : 12-14 ft
Test Date : 12/03/99
Test Method : ASTM D 2216

Filename : FA25S2
Elevation : ---
Tested by : AL
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)	11139	8.99	228.18	212.65	7.63

Average Moisture Content = 7.63

GEOTECHNICAL LABORATORY TEST DATA

Project : New Bedford Harbor Superfund Site
Project No. : GTX-2409
Boring No. : FA-26
Sample No. : S-1 (7.5-9.5)
Location : New Bedford, MA
Soil Description : Moist, grayish brown gravel with sand and silt
Remarks : Hydrometer not required, fines < 15%

Depth : 7.5-9.5 ft
Test Date : 12/03/99
Test Method : ASTM D 2216

Filename : PA26S1
Elevation : ---
Tested by : AL
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) jc25	8.93	232.17	214.53	8.58

Average Moisture Content = 8.58

GEOTECHNICAL LABORATORY TEST DATA

Project : New Bedford Harbor Superfund Site
Project No. : GTX-2409
Boring No. : FA-26
Sample No. : S-3 (18-20)
Location : New Bedford, MA
Soil Description : Moist, gray sand with some gravel
Remarks : Hydrometer not required, fines < 15%

Depth : 18-20 ft
Test Date : 12/03/99
Test Method : ASTM D 2216

Filename : FA26S3
Elevation : ---
Tested by : AL
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) kr7	9.23	165.22	141.78	17.68

Average Moisture Content = 17.68

GEOTECHNICAL LABORATORY TEST DATA

Project : New Bedford Harbor Superfund Site
Project No. : GTX-2409
Boring No. : MW-A25
Sample No. : S-1 (1-2)
Location : New Bedford, MA
Soil Description : Moist, dark grayish brown silty sand with gravel
Remarks : ---

Depth : 1-2 ft
Test Date : 12/03/99
Test Method : ASTM D 2216

Filename : MWA25S1
Elevation : ---
Tested by : AL
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) geo64	9.75	128.99	119.77	8.38

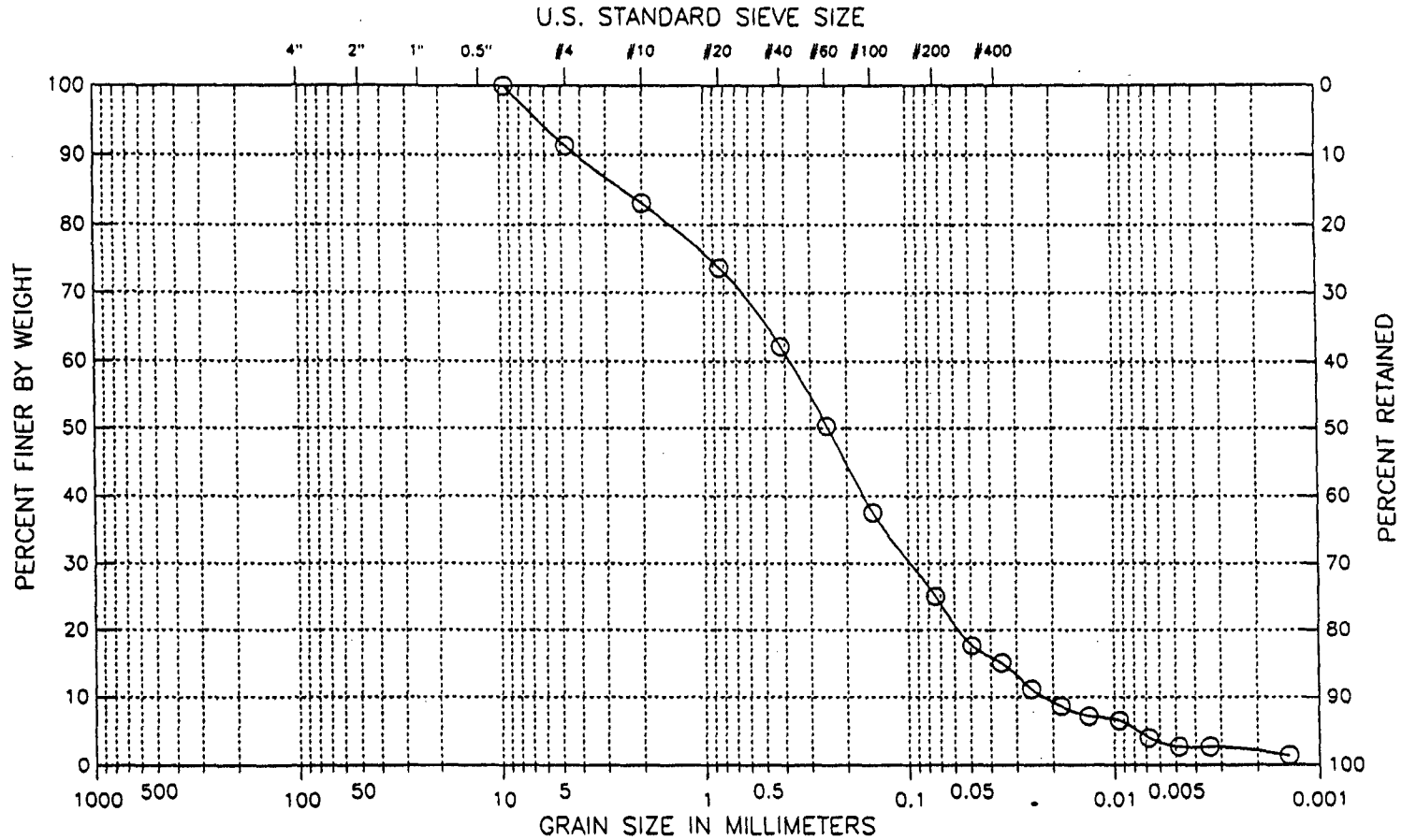
Average Moisture Content = 8.38

G

APPENDIX G

Particle Size Analysis Results

Boring No. : FA-1 Sample No: S-1 (0-2) Test Method ASTM D 422 Filename : FA1S1	Project : New Bedford Harbor Superfund Site Project No.: GTX-2409 Location: New Bedford, MA Date : Wed Jan 05 2000



COBBLES	GRAVEL		SAND			SILT OR CLAY
	COARSE	FINE	COARSE	MEDIUM	FINE	

Classification :

Remarks :

Visual Description :
Moist, brown silty sand with black organics

Figure 1

GEOTECHNICAL LABORATORY TEST DATA

Project : New Bedford Harbor Superfund Site
Project No. : GTX-2409
Boring No. : FA-1
Sample No. : S-1 (0-2)
Location : New Bedford, MA
Soil Description : Moist, brown silty sand with black organics
Remarks : ---

Depth : 0-2 ft
Test Date : 12/03/99
Test Method : ASTM D 422

Filename : FA1S1
Elevation : ---
Tested by : AL
Checked by : GTT

HYDROMETER

Hydrometer ID : 87130
Weight of air-dried soil = 65.01 gm
Specific Gravity = 2.65

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	20.00	19.50	13.72	0.050	18	0.050
2.00	18.00	19.50	11.72	0.035	15	0.035
4.00	15.00	19.50	8.72	0.026	11	0.026
8.00	13.00	19.50	6.72	0.018	9	0.018
15.00	11.50	20.00	5.58	0.013	7	0.013
30.00	11.00	20.00	5.08	0.009	7	0.009
60.00	9.00	20.00	3.08	0.007	4	0.007
120.00	8.00	20.00	2.08	0.005	3	0.005
240.00	8.00	20.00	2.08	0.003	3	0.003
1424.00	7.00	20.00	1.08	0.001	1	0.001

FINE SIEVE SET

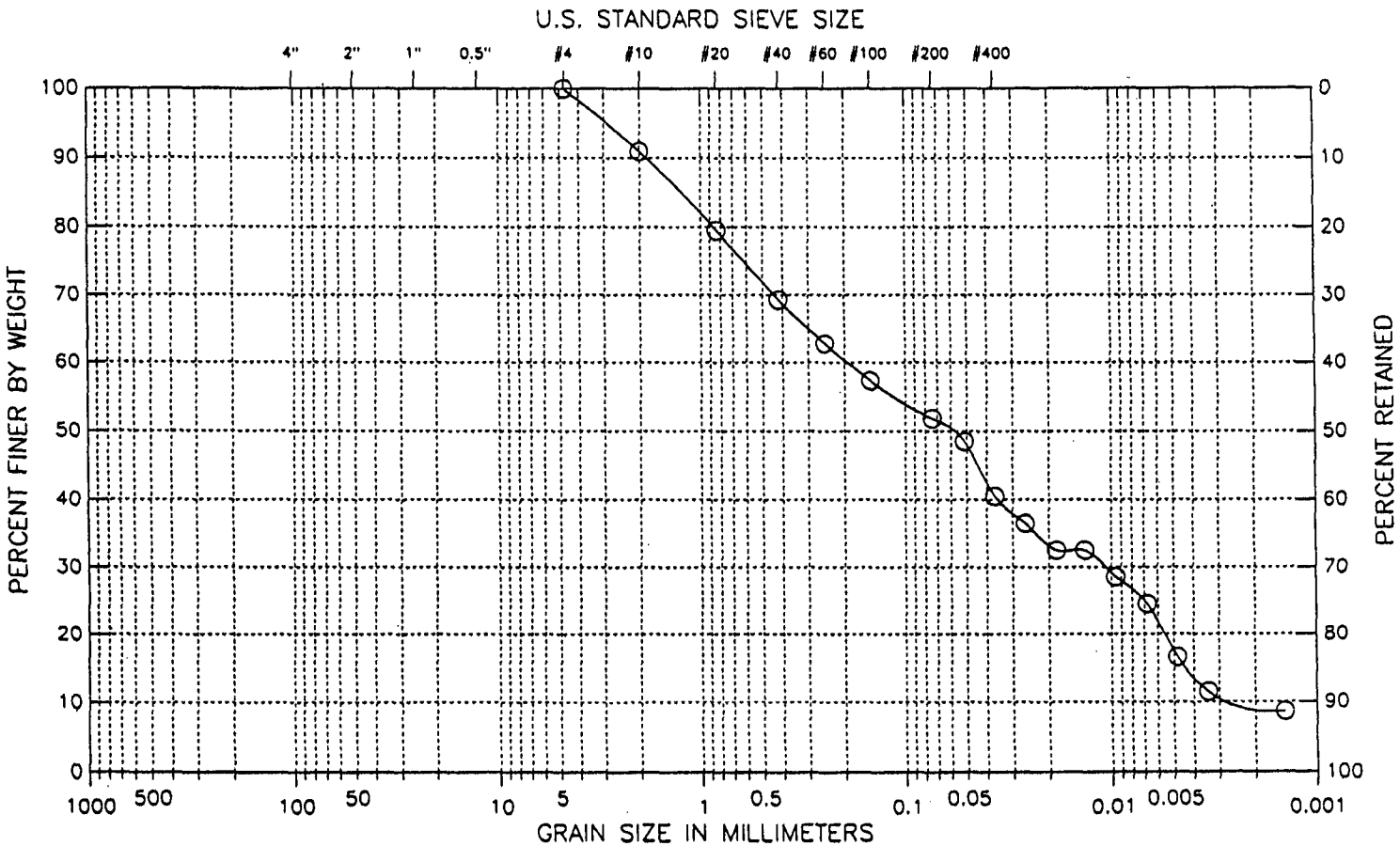
Sieve Mesh	Sieve Openings Inches	Millimeters	Weight Retained (gm)	Cumulative Weight Retained (gm)	Percent Finer (%)
0.375"	0.374	9.51	0.00	0.00	100
#4	0.187	4.75	6.79	6.79	91
#10	0.079	2.00	6.45	13.24	83
#20	0.033	0.84	7.39	20.63	74
#40	0.017	0.42	8.95	29.58	62
#60	0.010	0.25	9.29	38.87	50
#100	0.006	0.15	9.99	48.86	38
#200	0.003	0.07	9.76	58.62	25
Pan			19.63	78.25	0

Total Dry Weight of Sample = 87.24

D85 : 2.4465 mm
D60 : 0.3815 mm
D50 : 0.2467 mm
D30 : 0.0975 mm
D15 : 0.0355 mm
D10 : 0.0219 mm

Soil Classification
ASTM Group Symbol : N/A
ASTM Group Name : N/A
AASHTO Group Symbol : A-2-4(0)
AASHTO Group Name : Silty Gravel and Sand

Boring No. : FA-1 Sample No: UO-1 (11-13) Test Method ASTM D 422 Filename : FA1UO1	Project : New Bedford Harbor Superfund Site Project No.: GTX-2409 Location: New Bedford, MA Date : Wed Jan 05 2000



Classification :
(ML) Sandy silt
Visual Description :
Moist, dark brown sandy silt with organics

Remarks :

Figure 2

GEOTECHNICAL LABORATORY TEST DATA

Project : New Bedford Harbor Superfund Site
Project No. : GTX-2409
Boring No. : FA-1
Sample No. : UO-1 (11-13)
Location : New Bedford, MA
Depth : 11-13 ft
Test Date : 12/14/99
Test Method : ASTM D 422
Filename : FA1U01
Elevation : ---
Tested by : AL/GSG
Checked by : GTT
Soil Description : Moist, dark brown sandy silt with organics
Remarks : ---

HYDROMETER

Hydrometer ID : 87130
Weight of air-dried soil = 11.42 gm
Specific Gravity = 2.65

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	12.00	20.00	6.08	0.052	48	0.052
2.00	11.00	20.00	5.08	0.037	40	0.037
4.00	10.50	20.00	4.58	0.026	37	0.026
8.00	10.00	20.00	4.08	0.018	33	0.018
15.00	10.00	20.00	4.08	0.013	33	0.013
30.00	9.50	20.00	3.58	0.010	29	0.010
60.00	9.00	20.00	3.08	0.007	25	0.007
120.00	8.00	20.00	2.08	0.005	17	0.005
240.00	7.00	20.50	1.44	0.003	11	0.003
1365.00	7.00	20.00	1.08	0.001	9	0.001

FINE SIEVE SET

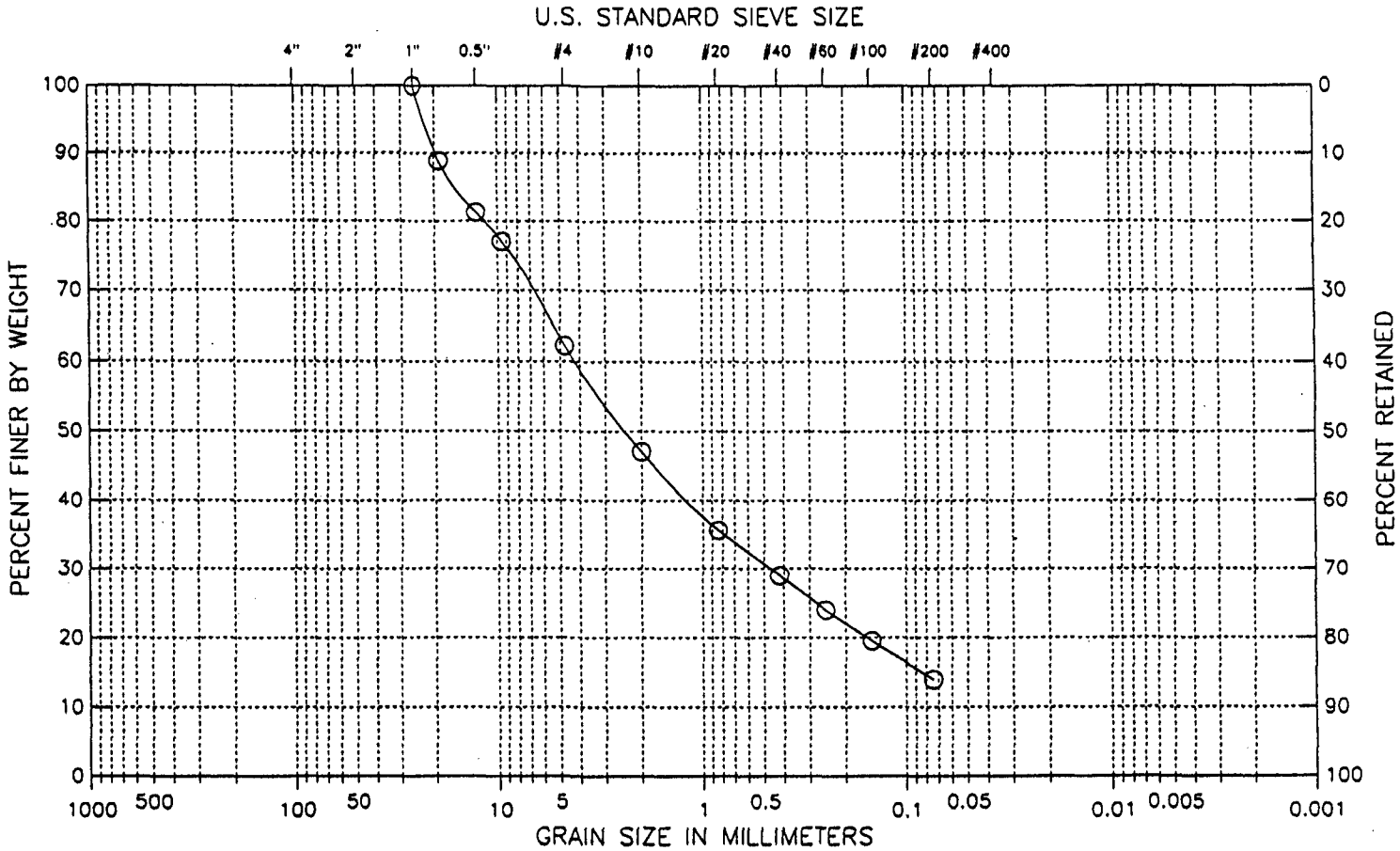
Sieve Mesh	Sieve Openings Inches	Millimeters	Weight Retained (gm)	Cumulative Weight Retained (gm)	Percent Finer (%)
#4	0.187	4.75	0.00	0.00	100
#10	0.079	2.00	1.14	1.14	91
#20	0.033	0.84	1.43	2.57	80
#40	0.017	0.42	1.28	3.85	69
#60	0.010	0.25	0.82	4.67	63
#100	0.006	0.15	0.69	5.36	57
#200	0.003	0.07	0.69	6.05	52
Pan			6.51	12.56	0

Total Dry Weight of Sample = 21.75

D85 : 1.2743 mm
D60 : 0.1917 mm
D50 : 0.0608 mm
D30 : 0.0108 mm
D15 : 0.0043 mm
D10 : 0.0022 mm

Soil Classification
ASTM Group Symbol : ML
ASTM Group Name : Sandy silt
AASHTO Group Symbol : A-4(0)
AASHTO Group Name : Silty Soils

Boring No. : FA-1 Sample No.: S-6 (30-32) Test Method ASTM D 422 Filename : FA1S6	Project : New Bedford Harbor Superfund Site Project No.: GTX-2409 Location: New Bedford, MA Date : Wed Jan 05 2000



COBBLES	GRAVEL		SAND			SILT OR CLAY
	COARSE	FINE	COARSE	MEDIUM	FINE	

Classification :

Remarks :
Hydrometer not required, fines < 15%

Visual Description :
Moist, olive gray gravel with silt and sand

Figure 3

GEOTECHNICAL LABORATORY TEST DATA

Project : New Bedford Harbor Superfund Site
Project No. : GTX-2409
Boring No. : FA-1
Sample No. : S-6 (30-32)
Location : New Bedford, MA
Soil Description : Moist, olive gray gravel with silt and sand
Remarks : Hydrometer not required, fines < 15%

Depth : 30-32 ft
Test Date : 12/03/99
Test Method : ASTM D 422

Filename : FA1S6
Elevation : ---
Tested by : AL
Checked by : GTT

FINE SIEVE SET

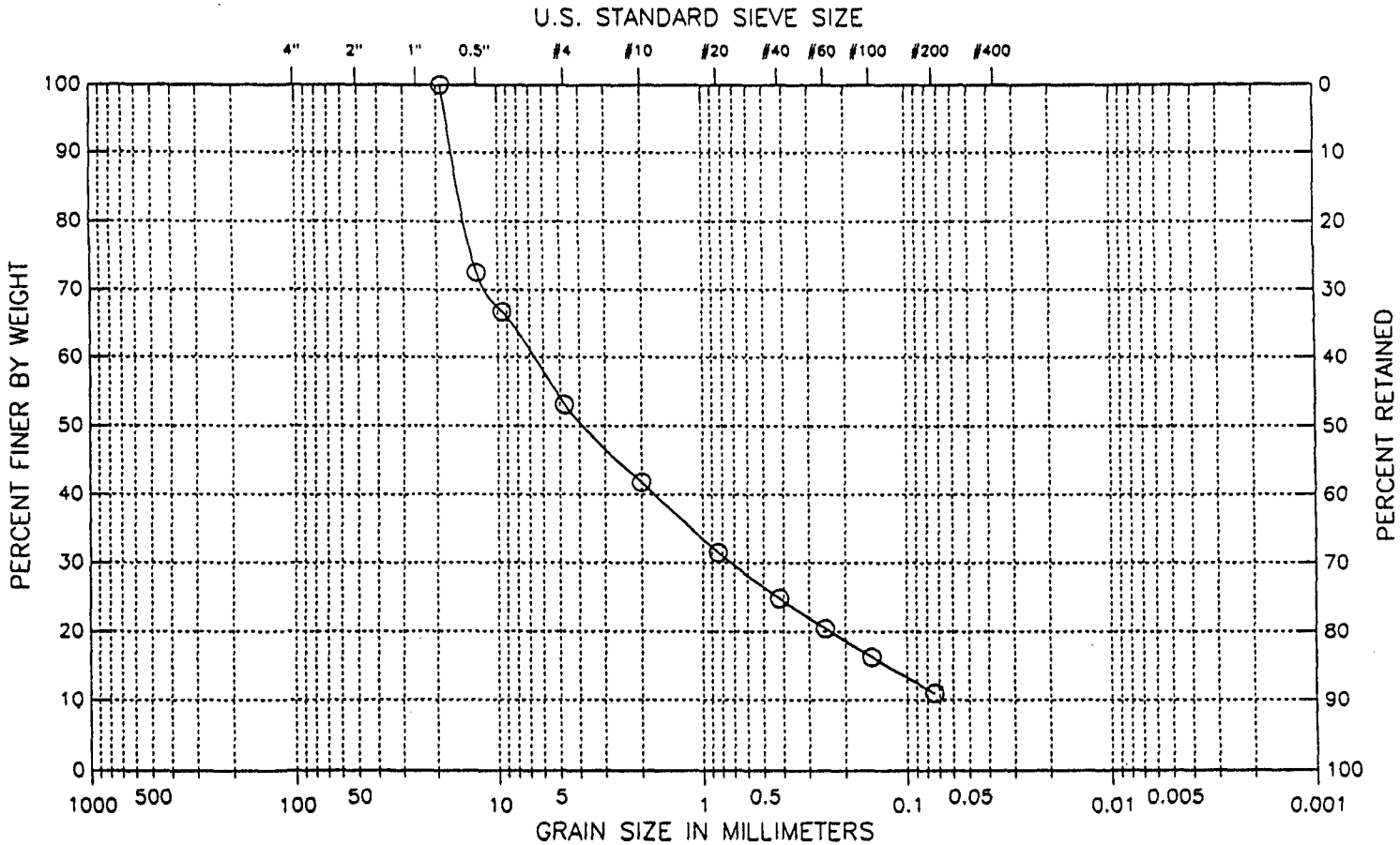
Sieve Mesh	Sieve Openings Inches	Millimeters	Weight Retained (gm)	Cumulative Weight Retained (gm)	Percent Finer (%)
1"	1.012	25.70	0.00	0.00	100
0.75"	0.748	19.00	12.87	12.87	89
0.5"	0.500	12.70	8.70	21.57	81
0.375"	0.374	9.51	4.89	26.46	77
#4	0.187	4.75	17.10	43.56	62
#10	0.079	2.00	17.47	61.03	47
#20	0.033	0.84	13.12	74.15	36
#40	0.017	0.42	7.63	81.78	29
#60	0.010	0.25	5.77	87.55	24
#100	0.006	0.15	5.16	92.71	20
#200	0.003	0.07	6.47	99.18	14
Pan			16.01	115.19	0

Total Dry Weight of Sample = 124.43

D85 : 15.4918 mm
D60 : 4.1936 mm
D50 : 2.3708 mm
D30 : 0.4662 mm
D15 : 0.0849 mm
D10 : 0.0455 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. : FA-3 Sample No.: S-5 (19-21) Test Method ASTM D 422 Filename : FA3S5	Project : New Bedford Harbor Superfund Site Project No.: GTX-2409 Location: New Bedford, MA Date : Wed Jan 05 2000



COBBLES	GRAVEL		SAND			SILT OR CLAY
	COARSE	FINE	COARSE	MEDIUM	FINE	

Classification :

Visual Description :
Moist, light gray gravel with silt and sand

Remarks :
Hydrometer not required, fines < 15%

Figure 4

GEOTECHNICAL LABORATORY TEST DATA

Project : New Bedford Harbor Superfund Site
Project No. : GTX-2409
Boring No. : FA-3
Sample No. : S-5 (19-21)
Location : New Bedford, MA
Soil Description : Moist, light gray gravel with silt and sand
Remarks : Hydrometer not required, fines < 15%

Depth : 19-21 ft
Test Date : 12/03/99
Test Method : ASTM D 422

Filename : FA3S5
Elevation : ---
Tested by : AL
Checked by : GTT

PINE SIEVE SET

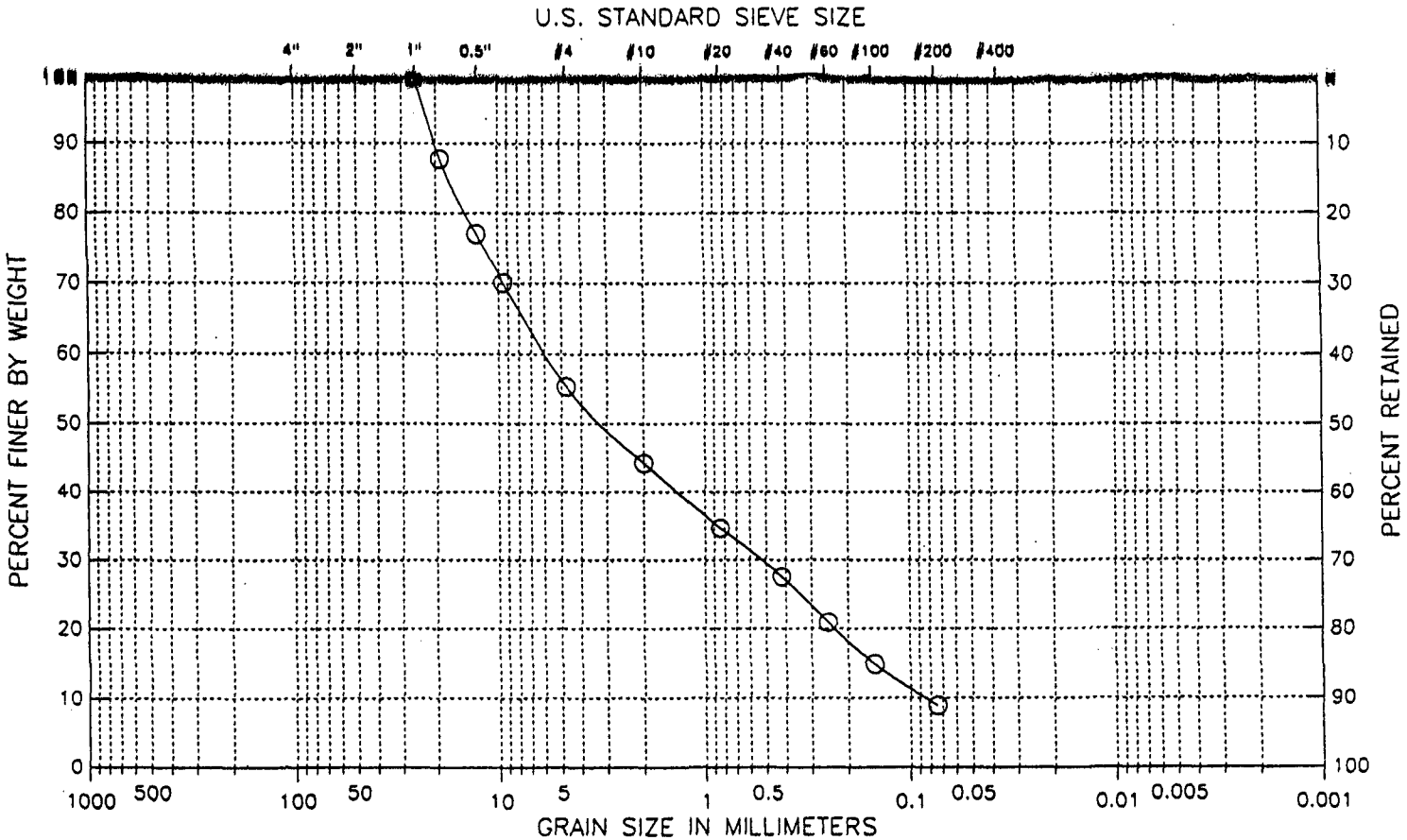
Sieve Mesh	Sieve Openings Inches	Millimeters	Weight Retained (gm)	Cumulative Weight Retained (gm)	Percent Finer (%)
0.75"	0.748	19.00	0.00	0.00	100
0.5"	0.500	12.70	28.66	28.66	73
0.375"	0.374	9.51	6.05	34.71	67
#4	0.187	4.75	14.21	48.92	53
#10	0.079	2.00	11.87	60.79	42
#20	0.033	0.84	10.71	71.50	31
#40	0.017	0.42	6.92	78.42	25
#60	0.010	0.25	4.59	83.01	20
#100	0.006	0.15	4.40	87.41	16
#200	0.003	0.07	5.50	92.91	11
Pan			11.45	104.36	0

Total Dry Weight of Sample = 113.47

D85 : 15.2474 mm
D60 : 6.7444 mm
D50 : 3.7456 mm
D30 : 0.7197 mm
D15 : 0.1263 mm
D10 : 0.0650 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. : FA-6 Sample No.: S-1 (0-2) Test Method ASTM D 422 Filename : FA6S1	Project : New Bedford Harbor Superfund Site Project No.: GTX-2409 Location: New Bedford, MA Date : Wed Jan 05 2000



COBBLES	GRAVEL		SAND			SILT OR CLAY
	COARSE	FINE	COARSE	MEDIUM	FINE	

Classification :

Remarks :
Hydrometer not required, fines < 15%

Visual Description :
Dry, brown gravel with sand and silt

Figure 5

GEOTECHNICAL LABORATORY TEST DATA

Project : New Bedford Harbor Superfund Site
Project No. : GTX-2409
Boring No. : FA-6
Sample No. : S-1 (0-2)
Location : New Bedford, MA
Soil Description : Dry, brown gravel with sand and silt
Remarks : Hydrometer not required, fines < 15%

Depth : 0-2 ft
Test Date : 12/03/99
Test Method : ASTM D 422

Filename : FA6S1
Elevation : ---
Tested by : AL
Checked by : GTT

FINE SIEVE SET

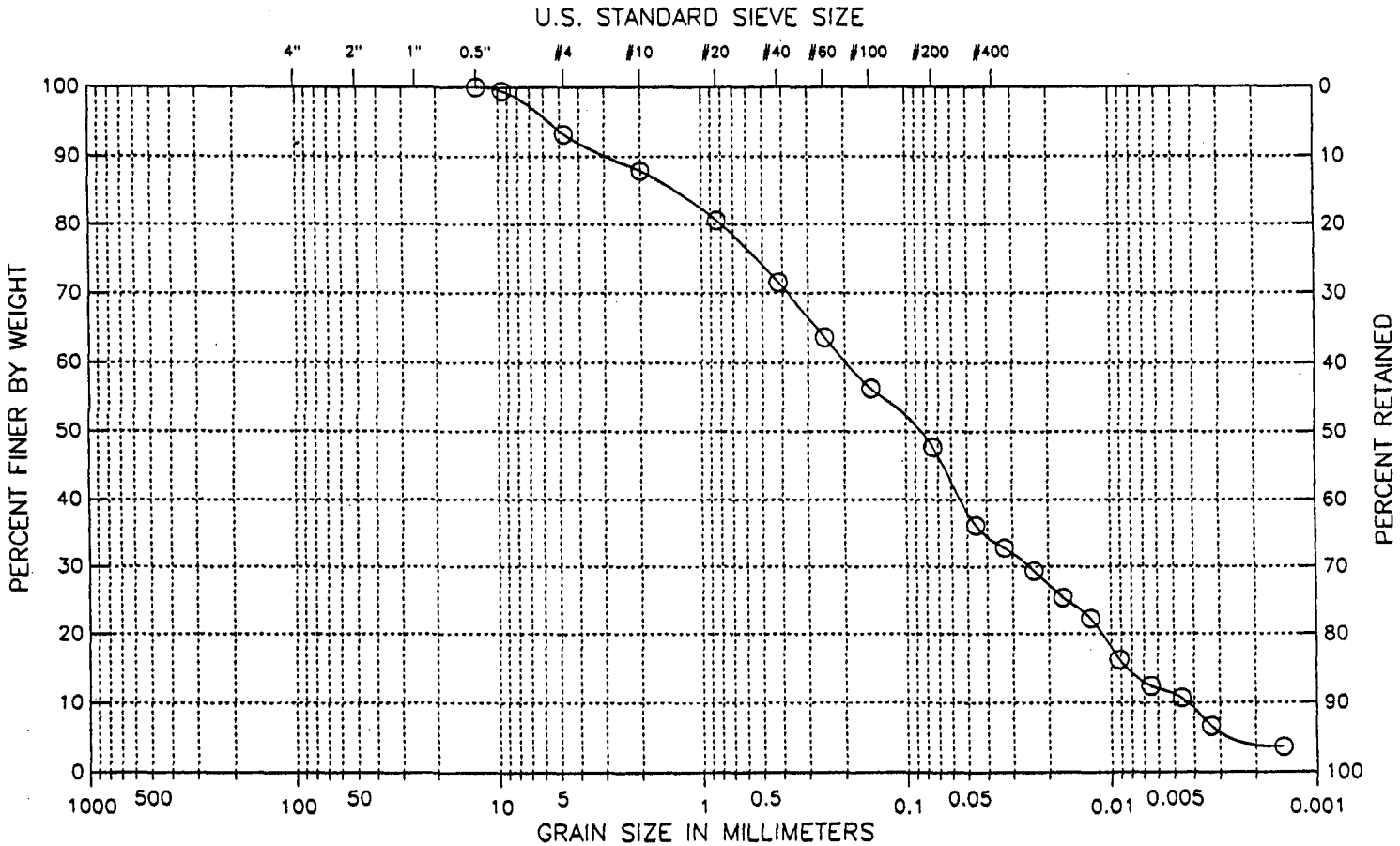
Sieve Mesh	Sieve Openings Inches	Sieve Openings Millimeters	Weight Retained (gm)	Cumulative Weight Retained (gm)	Percent Finer (%)
1"	1.012	25.70	0.00	0.00	100
0.75"	0.748	19.00	10.85	10.85	88
0.5"	0.500	12.70	9.59	20.44	77
0.375"	0.374	9.51	6.13	26.57	70
#4	0.187	4.75	13.07	39.64	55
#10	0.079	2.00	9.94	49.58	44
#20	0.033	0.84	8.58	58.16	35
#40	0.017	0.42	6.28	64.44	28
#60	0.010	0.25	5.90	70.34	21
#100	0.006	0.15	5.37	75.71	15
#200	0.003	0.07	5.26	80.97	9
Pan			7.94	88.91	0

Total Dry Weight of Sample = 98.57

D85 : 17.1156 mm
D60 : 5.8981 mm
D50 : 3.1241 mm
D30 : 0.5358 mm
D15 : 0.1510 mm
D10 : 0.0840 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. : FA-6 Sample No: S-4 (13-15) Test Method ASTM D 2216 Filename : FA6S4	Project : New Bedford Harbor Superfund Site Project No.: GTX-2409 Location: New Bedford, MA Date : Wed Jan 05 2000



Classification :

Remarks :

Visual Description :
Wet, gray silty sand

Figure 6

GEOTECHNICAL LABORATORY TEST DATA

Project : New Bedford Harbor Superfund Site
Project No. : GTX-2409
Boring No. : FA-6
Sample No. : S-4 (13-15)
Location : New Bedford, MA
Soil Description : Wet, gray silty sand
Remarks : ---

Depth : 13-15 ft
Test Date : 12/03/99
Test Method : ASTM D 422

Filename : FA6S4
Elevation : ---
Tested by : AL
Checked by : GTT

HYDROMETER

Hydrometer ID : 583901
Weight of air-dried soil = 65.3 gm
Specific Gravity = 2.65

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	34.00	18.50	26.80	0.046	36	0.046
2.00	31.50	18.50	24.30	0.033	33	0.033
4.00	29.00	18.50	21.80	0.024	29	0.024
8.00	26.00	18.50	18.80	0.017	25	0.017
15.00	23.50	19.00	16.52	0.013	22	0.013
30.00	19.00	19.00	12.02	0.009	16	0.009
60.00	15.50	20.50	9.18	0.006	12	0.006
120.00	14.00	21.00	7.90	0.005	11	0.005
240.00	11.00	21.00	4.90	0.003	7	0.003
1273.00	9.00	20.50	2.68	0.001	4	0.001

FINE SIEVE SET

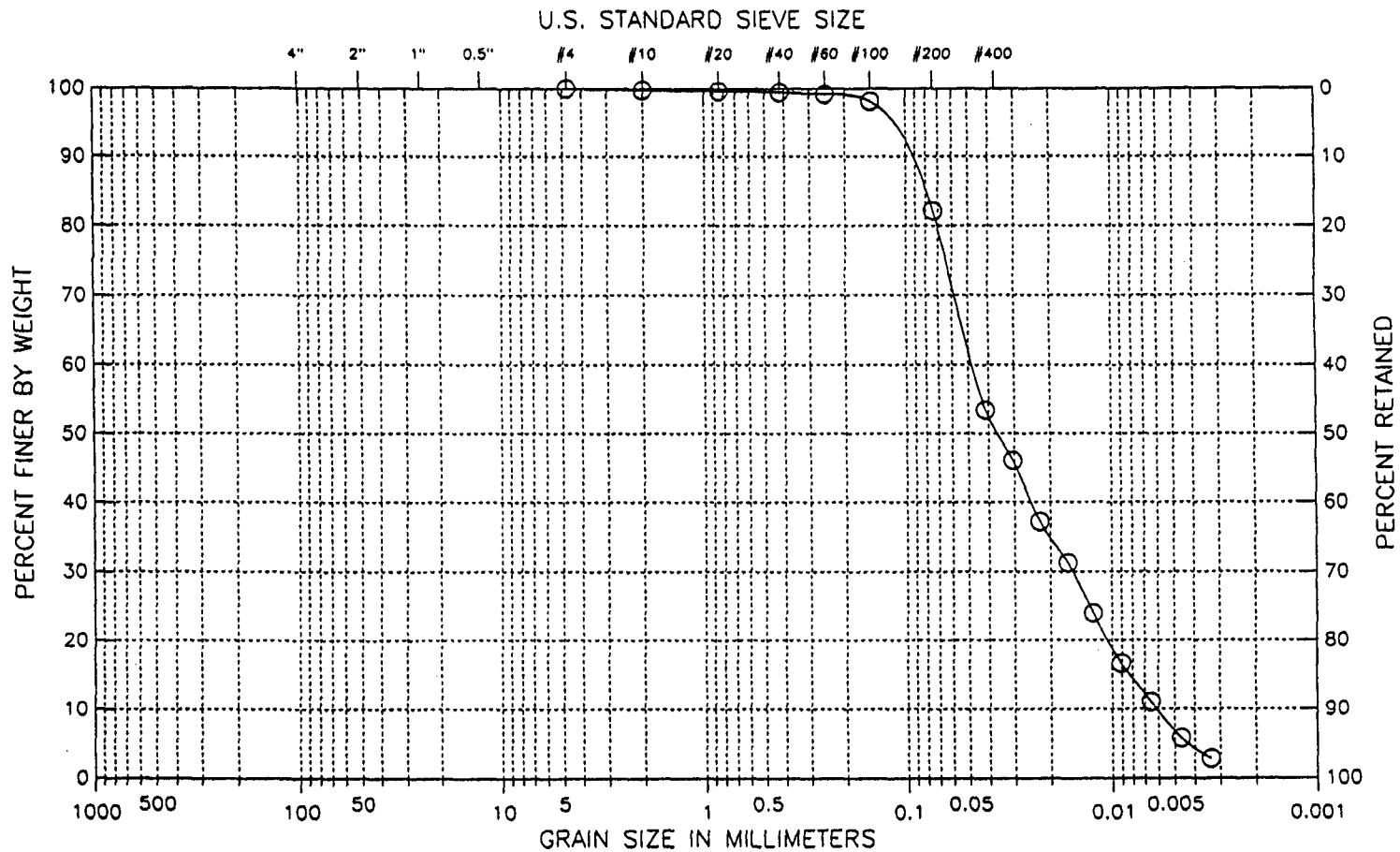
Sieve Mesh	Sieve Openings Inches	Millimeters	Weight Retained (gm)	Cumulative Weight Retained (gm)	Percent Finer (%)
0.5"	0.500	12.70	0.00	0.00	100
0.375"	0.374	9.51	0.42	0.42	99
#4	0.187	4.75	4.61	5.03	93
#10	0.079	2.00	4.00	9.03	88
#20	0.033	0.84	5.45	14.48	81
#40	0.017	0.42	6.69	21.17	72
#60	0.010	0.25	5.86	27.03	64
#100	0.006	0.15	5.44	32.47	56
#200	0.003	0.07	6.41	38.88	48
Pan			35.45	74.33	0

Total Dry Weight of Sample = 83.99

D85 : 1.4279 mm
D60 : 0.1933 mm
D50 : 0.0892 mm
D30 : 0.0251 mm
D15 : 0.0082 mm
D10 : 0.0044 mm

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. : FA-8 Sample No: S-4 (13-15) Test Method ASTM D 422 Filename : FA8S4	Project : New Bedford Harbor Superfund Site Project No.: GTX-2409 Location: New Bedford, MA Date : Wed Jan 05 2000



COBBLES	GRAVEL		SAND			SILT OR CLAY
	COARSE	FINE	COARSE	MEDIUM	FINE	

Classification :

Remarks :

Visual Description :
Moist, gray sandy silt

Figure 7

GEOTECHNICAL LABORATORY TEST DATA

Project : New Bedford Harbor Superfund Site
Project No. : GTX-2409
Boring No. : FA-8
Sample No. : S-4 (13-15)
Location : New Bedford, MA
Soil Description : Moist, gray sandy silt
Remarks : ---

Depth : 13-15 ft
Test Date : 12/03/99
Test Method : ASTM D 422

Filename : FA8S4
Elevation : ---
Tested by : AL
Checked by : GTT

HYDROMETER

Hydrometer ID : 583901
Weight of air-dried soil = 67.37 gm
Specific Gravity = 2.68

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	43.00	19.50	36.24	0.041	53	0.041
2.00	38.00	19.50	31.24	0.031	46	0.031
4.00	32.00	19.50	25.24	0.023	37	0.023
8.00	28.00	19.50	21.24	0.016	31	0.016
15.00	23.00	19.50	16.24	0.012	24	0.012
30.00	18.00	19.50	11.24	0.009	17	0.009
60.00	14.00	20.00	7.46	0.007	11	0.007
120.00	10.00	21.00	3.90	0.005	6	0.005
240.00	8.00	21.00	1.90	0.003	3	0.003

FINE SIEVE SET

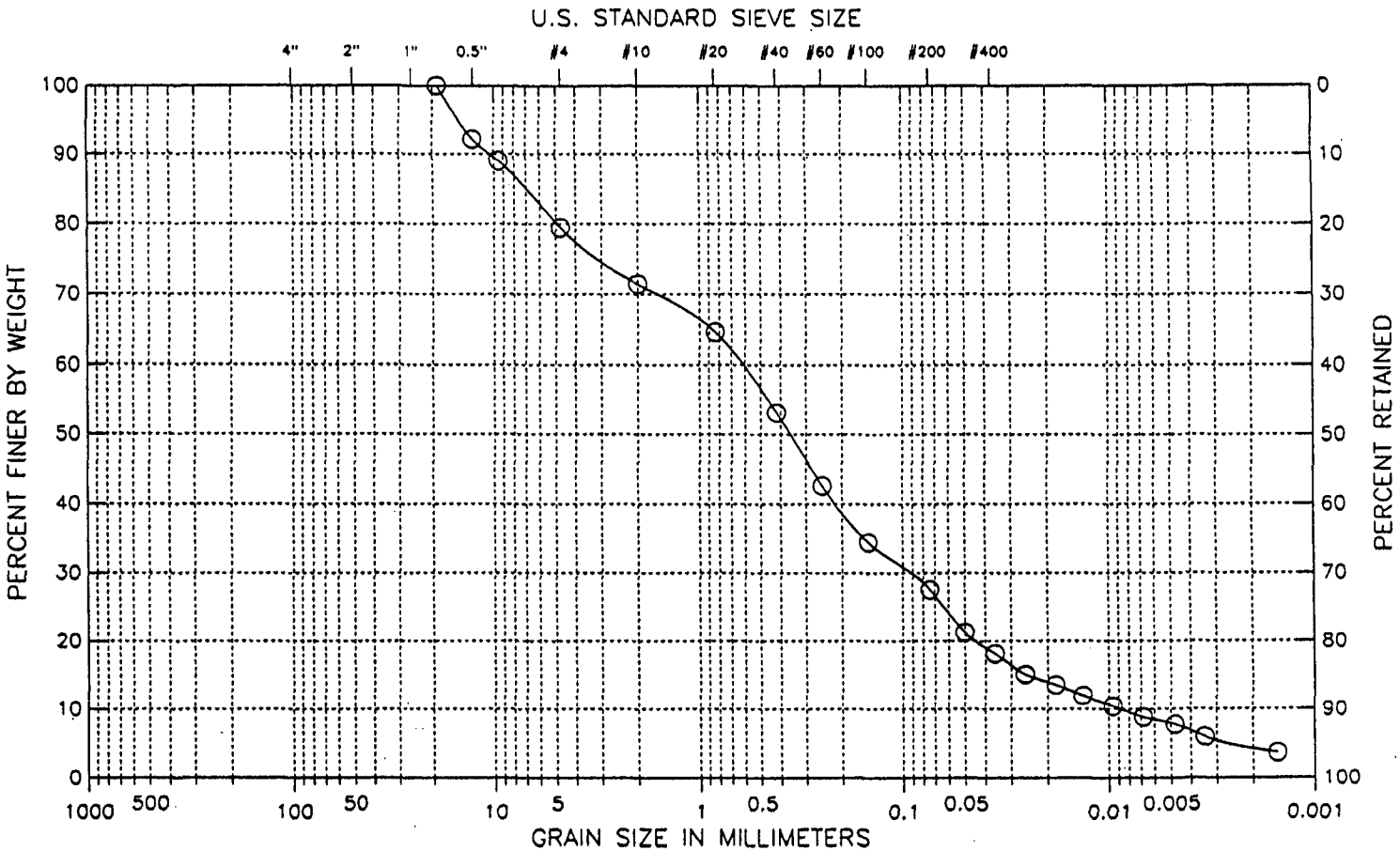
Sieve Mesh	Sieve Openings Inches	Sieve Openings Millimeters	Weight Retained (gm)	Cumulative Weight Retained (gm)	Percent Finer (%)
#4	0.187	4.75	0.00	0.00	100
#10	0.079	2.00	0.15	0.15	100
#20	0.033	0.84	0.11	0.26	100
#40	0.017	0.42	0.10	0.36	99
#60	0.010	0.25	0.18	0.54	99
#100	0.006	0.15	0.72	1.26	98
#200	0.003	0.07	10.80	12.06	82
Pan			55.46	67.52	0

Total Dry Weight of Sample = 77.14

D85 : 0.0839 mm
D60 : 0.0473 mm
D50 : 0.0360 mm
D30 : 0.0157 mm
D15 : 0.0083 mm
D10 : 0.0061 mm

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. : FA-9 Sample No.: UO-1 (2-4) Test Method ASTM D 422 Filename : FA9UO1	Project : New Bedford Harbor Superfund Site Project No.: GTX-2409 Location: New Bedford, MA Date : Wed Jan 05 2000



Classification :
(SM) Silty sand with gravel
Visual Description :
Moist, brown silty sand with gravel, organics

Remarks :

Figure 8

GEOTECHNICAL LABORATORY TEST DATA

Project : New Bedford Harbor Superfund Site
Project No. : GTX-2409
Boring No. : FA-9
Sample No. : UO-1 (2-4)
Location : New Bedford, MA
Soil Description : Moist, brown silty sand with gravel, organics
Remarks : ---

Depth : 2-4 ft
Test Date : 12/14/99
Test Method : ASTM D 422

Filename : FA9U01
Elevation : ---
Tested by : AL/GSG
Checked by : GTT

HYDROMETER

Hydrometer ID : 257525
Weight of air-dried soil = 46.36 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	18.00	20.00	13.68	0.050	21	0.050
2.00	16.00	20.00	11.68	0.036	18	0.036
4.00	14.00	20.00	9.68	0.026	15	0.026
8.00	13.00	20.00	8.68	0.018	13	0.018
15.00	12.00	20.00	7.68	0.013	12	0.013
30.00	11.00	20.00	6.68	0.010	10	0.010
60.00	10.00	20.00	5.68	0.007	9	0.007
120.00	9.00	21.00	5.00	0.005	8	0.005
240.00	8.00	20.50	3.84	0.003	6	0.003
1266.00	7.00	19.00	2.36	0.002	4	0.002

FINE SIEVE SET

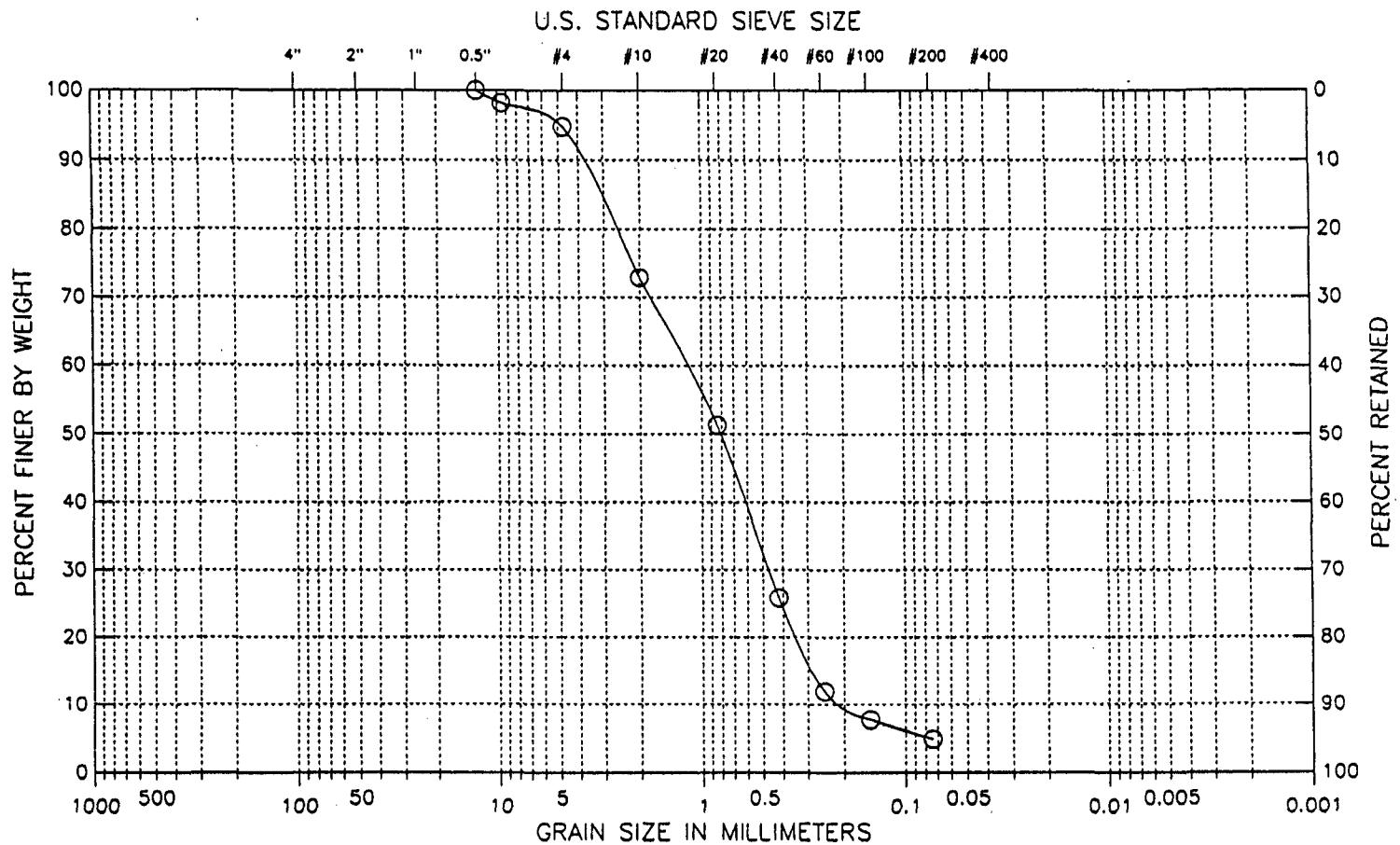
Sieve Mesh	Sieve Openings Inches	Millimeters	Weight Retained (gm)	Cumulative Weight Retained (gm)	Percent Finer (%)
0.75"	0.748	19.00	0.00	0.00	100
0.5"	0.500	12.70	5.08	5.08	92
0.375"	0.374	9.51	2.00	7.08	89
#4	0.187	4.75	6.25	13.33	79
#10	0.079	2.00	5.19	18.52	71
#20	0.033	0.84	4.40	22.92	65
#40	0.017	0.42	7.47	30.39	53
#60	0.010	0.25	6.86	37.25	43
#100	0.006	0.15	5.28	42.53	34
#200	0.003	0.07	4.46	46.99	28
Pan			17.89	64.88	0

Total Dry Weight of Sample = 182.06

D85 : 7.0836 mm
D60 : 0.6345 mm
D50 : 0.3597 mm
D30 : 0.0947 mm
D15 : 0.0256 mm
D10 : 0.0088 mm

Soil Classification
ASTM Group Symbol : SM
ASTM Group Name : Silty sand with gravel
AASHTO Group Symbol : A-2-7(2)
AASHTO Group Name : Clayey Gravel and Sand

Boring No. : FA-9 Sample No.: S-1 (5-7) Test Method ASTM D 422 Filename : FA9S1	Project : New Bedford Harbor Superfund Site Project No.: GTX-2409 Location: New Bedford, MA Date : Wed Jan 05 2000



COBBLES	GRAVEL		SAND			SILT OR CLAY
	COARSE	FINE	COARSE	MEDIUM	FINE	

Classification :
(SP) Poorly graded sand
Visual Description :
Wet, gray sand with silt

Remarks :
Hydrometer not required, fines < 15%

Figure 9

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GEOTECHNICAL LABORATORY TEST DATA

Project : New Bedford Harbor Superfund Site
Project No. : GTX-2409
Boring No. : FA-9
Sample No. : S-1 (5-7)
Location : New Bedford, MA
Soil Description : Wet, gray sand with silt
Remarks : Hydrometer not required, fines < 15%

Depth : 5-7 ft
Test Date : 12/03/99
Test Method : ASTM D 422

Filename : FA9S1
Elevation : ---
Tested by : AL
Checked by : GTT

FINE SIEVE SET

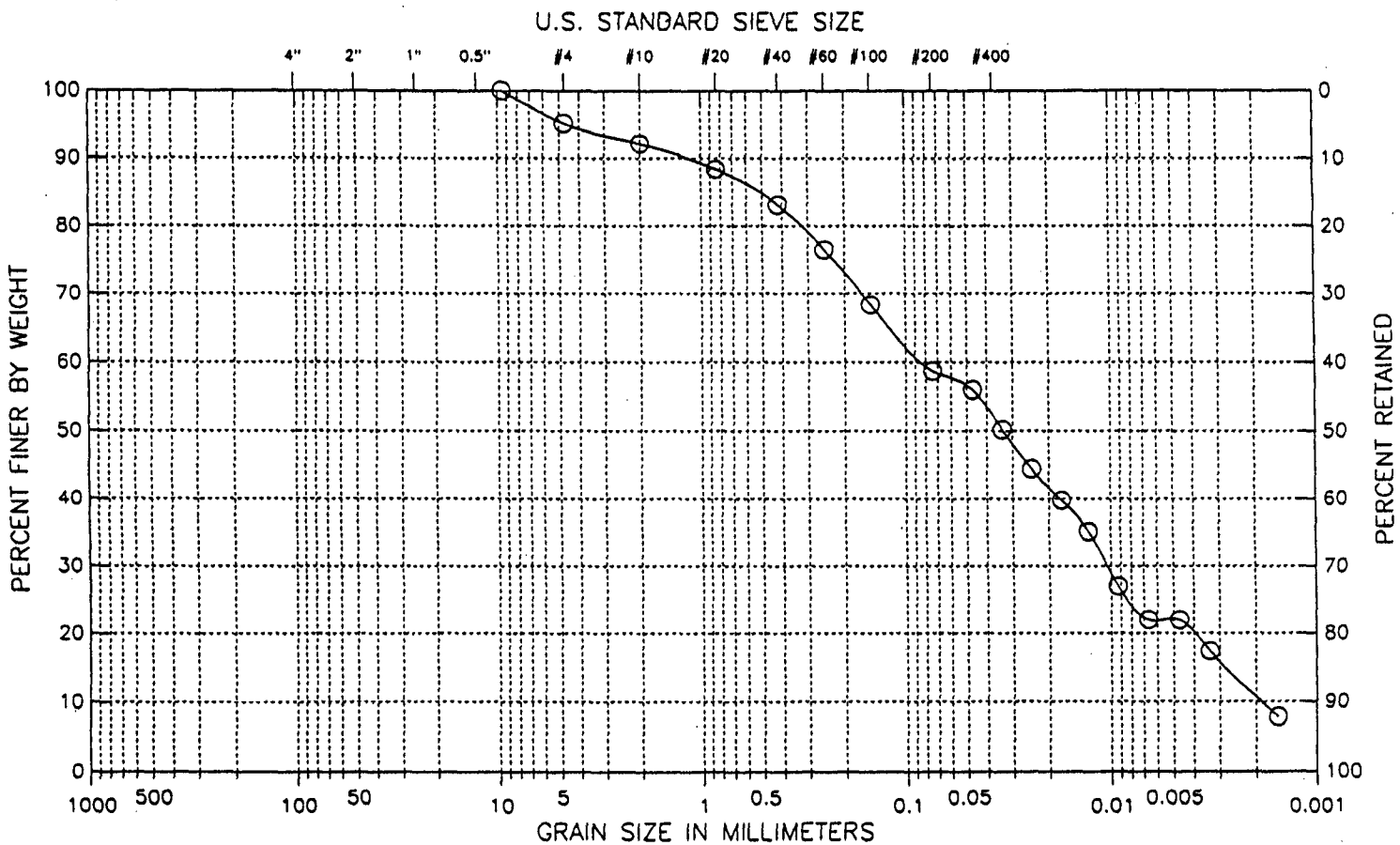
Sieve Mesh	Sieve Openings Inches	Millimeters	Weight Retained (gm)	Cumulative Weight Retained (gm)	Percent Finer (%)
0.5"	0.500	12.70	0.00	0.00	100
0.375"	0.374	9.51	2.78	2.78	98
#4	0.187	4.75	5.34	8.12	95
#10	0.079	2.00	34.74	42.86	73
#20	0.033	0.84	34.08	76.94	51
#40	0.017	0.42	40.31	117.25	26
#60	0.010	0.25	22.07	139.32	12
#100	0.006	0.15	6.52	145.84	8
#200	0.003	0.07	4.52	150.36	5
Pan			7.70	158.06	0

Total Dry Weight of Sample = 167.16

D85 : 3.2220 mm
D60 : 1.1918 mm
D50 : 0.8113 mm
D30 : 0.4706 mm
D15 : 0.2810 mm
D10 : 0.1981 mm

Soil Classification
ASTM Group Symbol : SP
ASTM Group Name : Poorly graded sand
AASHTO Group Symbol : A-1-b(0)
AASHTO Group Name : Stone Fragments, Gravel and Sand

Boring No. : FA-12 Sample No.: UO-2 (4-6) Test Method ASTM D 422 Filename : FA12UO2	Project : New Bedford Harbor Superfund Site Project No.: GTX-2409 Location: New Bedford, MA Date : Wed Jan 05 2000



COBBLES	GRAVEL		SAND			SILT OR CLAY
	COARSE	FINE	COARSE	MEDIUM	FINE	

Classification :
(OH) Sandy organic clay
Visual Description :
Moist, black sandy organic clay

Remarks :

Figure 10

GEOTECHNICAL LABORATORY TEST DATA

Project : New Bedford Harbor Superfund Site
Project No. : GTX-2409
Boring No. : FA-12
Sample No. : UO-2 (4-6)
Location : New Bedford, MA
Soil Description : Moist, black sandy organic clay
Remarks : ---

Depth : 4-6 ft
Test Date : 12/14/99
Test Method : ASTM D 422

Filename : FA12UO2
Elevation : ---
Tested by : AL/GSG
Checked by : GTT

HYDROMETER

Hydrometer ID : 87130
Weight of air-dried soil = 40.17 gm
Specific Gravity = 2.59

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	20.00	24.08	0.047	56	0.047
2.00	27.50	20.00	21.58	0.034	50	0.034
4.00	25.00	20.00	19.08	0.024	44	0.024
8.00	23.00	20.00	17.08	0.017	40	0.017
15.00	21.00	20.00	15.08	0.013	35	0.013
30.00	17.50	20.00	11.58	0.009	27	0.009
60.00	15.00	20.50	9.44	0.007	22	0.007
120.00	15.00	20.50	9.44	0.005	22	0.005
240.00	13.00	20.50	7.44	0.003	17	0.003
1198.00	10.00	19.00	3.36	0.002	8	0.002

FINE SIEVE SET

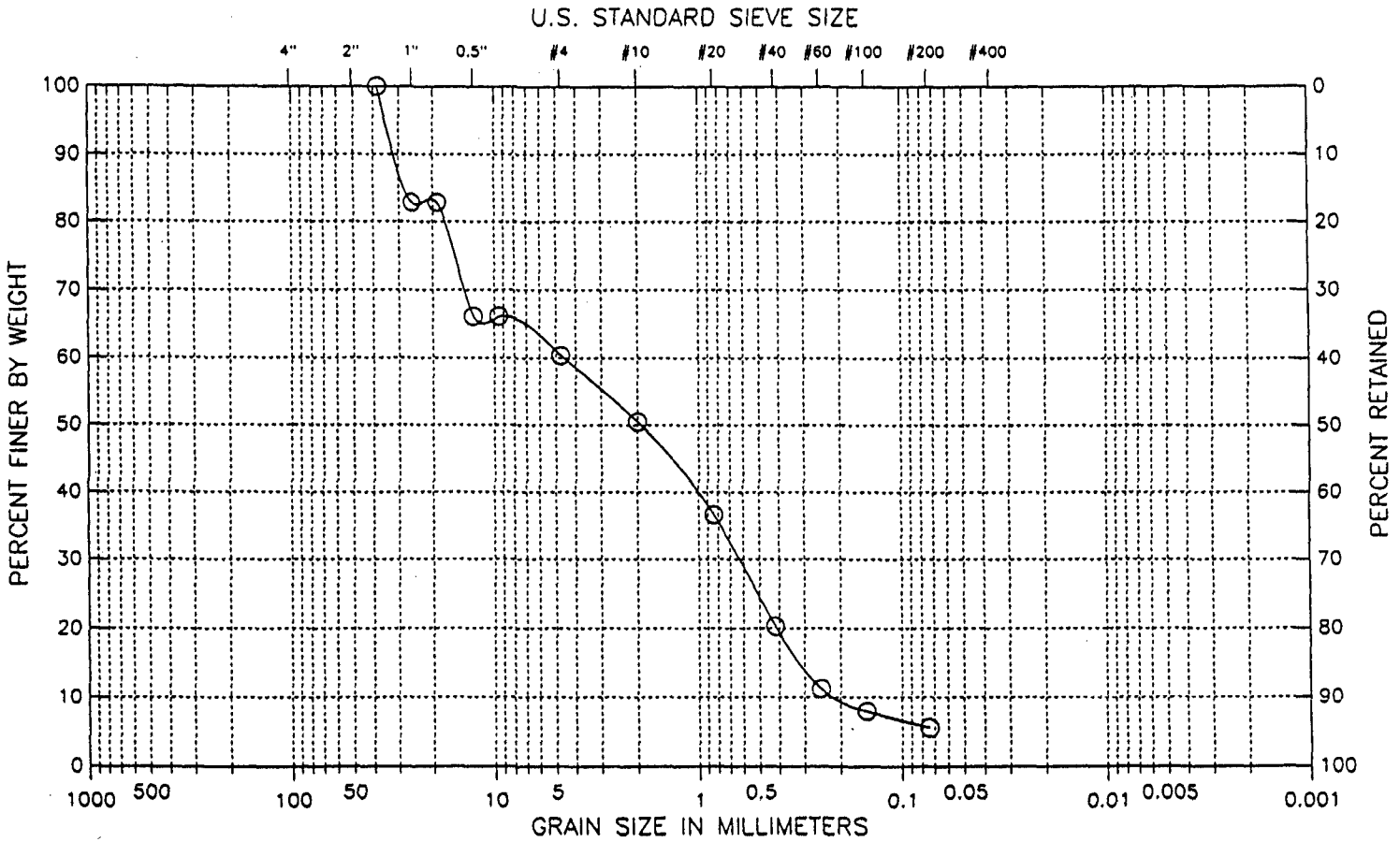
Sieve Mesh	Sieve Openings Inches	Millimeters	Weight Retained (gm)	Cumulative Weight Retained (gm)	Percent Finer (%)
0.375"	0.374	9.51	0.00	0.00	100
#4	0.187	4.75	2.09	2.09	95
#10	0.079	2.00	1.32	3.41	92
#20	0.033	0.84	1.66	5.07	88
#40	0.017	0.42	2.28	7.35	83
#60	0.010	0.25	2.88	10.23	77
#100	0.006	0.15	3.59	13.82	68
#200	0.003	0.07	4.16	17.98	59
Pan			25.60	43.58	0

Total Dry Weight of Sample = 52.67

D85 : 0.5380 mm
D60 : 0.0811 mm
D50 : 0.0334 mm
D30 : 0.0105 mm
D15 : 0.0028 mm
D10 : 0.0019 mm

Soil Classification
ASTM Group Symbol : OH
ASTM Group Name : Sandy organic clay
AASHTO Group Symbol : A-7-6(25)
AASHTO Group Name : Clayey Soils

Boring No. : FA-12 Sample No.: S-1 (12-14) Test Method ASTM D 422 Filename : FA12S1	Project : New Bedford Harbor Superfund Site Project No.: GTX-2409 Location: New Bedford, MA Date : Wed Jan 05 2000



COBBLES	GRAVEL		SAND			SILT OR CLAY
	COARSE	FINE	COARSE	MEDIUM	FINE	

Classification :

Visual Description :
Wet, gray sand with gravel, silt

Remarks :
Hydrometer not required, fines < 15%

Figure 11

GEOTECHNICAL LABORATORY TEST DATA

Project : New Bedford Harbor Superfund Site
Project No. : GTX-2409
Boring No. : FA-12
Sample No. : S-1 (12-14)
Location : New Bedford, MA
Soil Description : Wet, gray sand with gravel, silt
Remarks : Hydrometer not required, fines < 15%

Depth : 12-14 f
Test Date : 12/03/99
Test Method : ASTM D 422

Filename : FA12S1
Elevation : ---
Tested by : AL
Checked by : GTT

FINE SIEVE SET

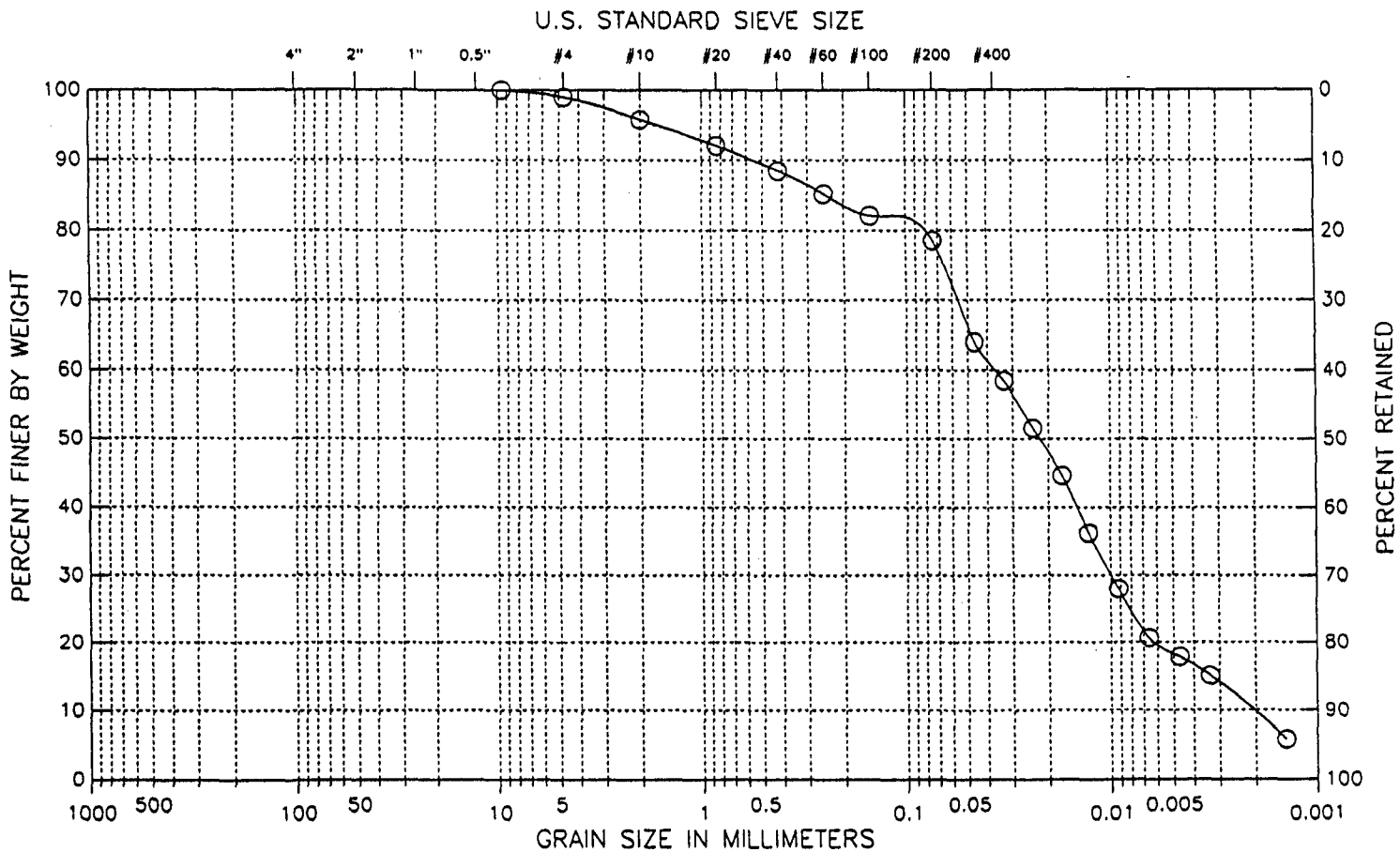
Sieve Mesh	Sieve Openings Inches	Millimeters	Weight Retained (gm)	Cumulative Weight Retained (gm)	Percent Finer (%)
1.5"	1.500	38.10	0.00	0.00	100
1"	1.012	25.70	29.50	29.50	83
0.75"	0.748	19.00	0.00	29.50	83
0.5"	0.500	12.70	28.79	58.29	66
0.375"	0.374	9.51	0.00	58.29	66
#4	0.187	4.75	9.88	68.17	60
#10	0.079	2.00	17.02	85.19	51
#20	0.033	0.84	23.94	109.13	37
#40	0.017	0.42	28.03	137.16	20
#60	0.010	0.25	15.65	152.81	11
#100	0.006	0.15	5.64	158.45	8
#200	0.003	0.07	4.16	162.61	6
Pan			9.51	172.12	0

Total Dry Weight of Sample = 181.2

D85 : 26.9945 mm
D60 : 4.5891 mm
D50 : 1.9380 mm
D30 : 0.6348 mm
D15 : 0.3102 mm
D10 : 0.2062 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. : FA-14 Sample No: S-1 (3-5) Test Method ASTM D 422 Filename : FA14S1	Project : New Bedford Harbor Superfund Site Project No.: GTX-2409 Location: New Bedford, MA Date : Wed Jan 05 2000



COBBLES	GRAVEL		SAND			SILT OR CLAY
	COARSE	FINE	COARSE	MEDIUM	FINE	

Classification :

Remarks :

Visual Description :
Moist, black sandy silt

Figure 12

GEOTECHNICAL LABORATORY TEST DATA

Project : New Bedford Harbor Superfund Site
Project No. : GTX-2409
Boring No. : FA-14
Sample No. : S-1 (3-5)
Location : New Bedford, MA
Soil Description : Moist, black sandy silt
Remarks : ---

Depth : 3-5 ft
Test Date : 12/03/99
Test Method : ASTM D 422

Filename : FA14S1
Elevation : ---
Tested by : AL
Checked by : GTT

HYDROMETER

Hydrometer ID : 87130
Weight of air-dried soil = 34.56 gm
Specific Gravity = 2.65

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	29.00	20.00	23.08	0.046	64	0.046
2.00	27.00	20.00	21.08	0.033	58	0.033
4.00	24.50	20.00	18.58	0.024	52	0.024
8.00	22.00	20.00	16.08	0.017	45	0.017
15.00	19.00	20.00	13.08	0.013	36	0.013
30.00	16.00	20.00	10.08	0.009	28	0.009
60.00	13.00	20.50	7.44	0.007	21	0.007
120.00	12.00	20.50	6.44	0.005	18	0.005
240.00	11.00	20.50	5.44	0.003	15	0.003
1379.00	8.00	20.00	2.08	0.001	6	0.001

FINE SIEVE SET

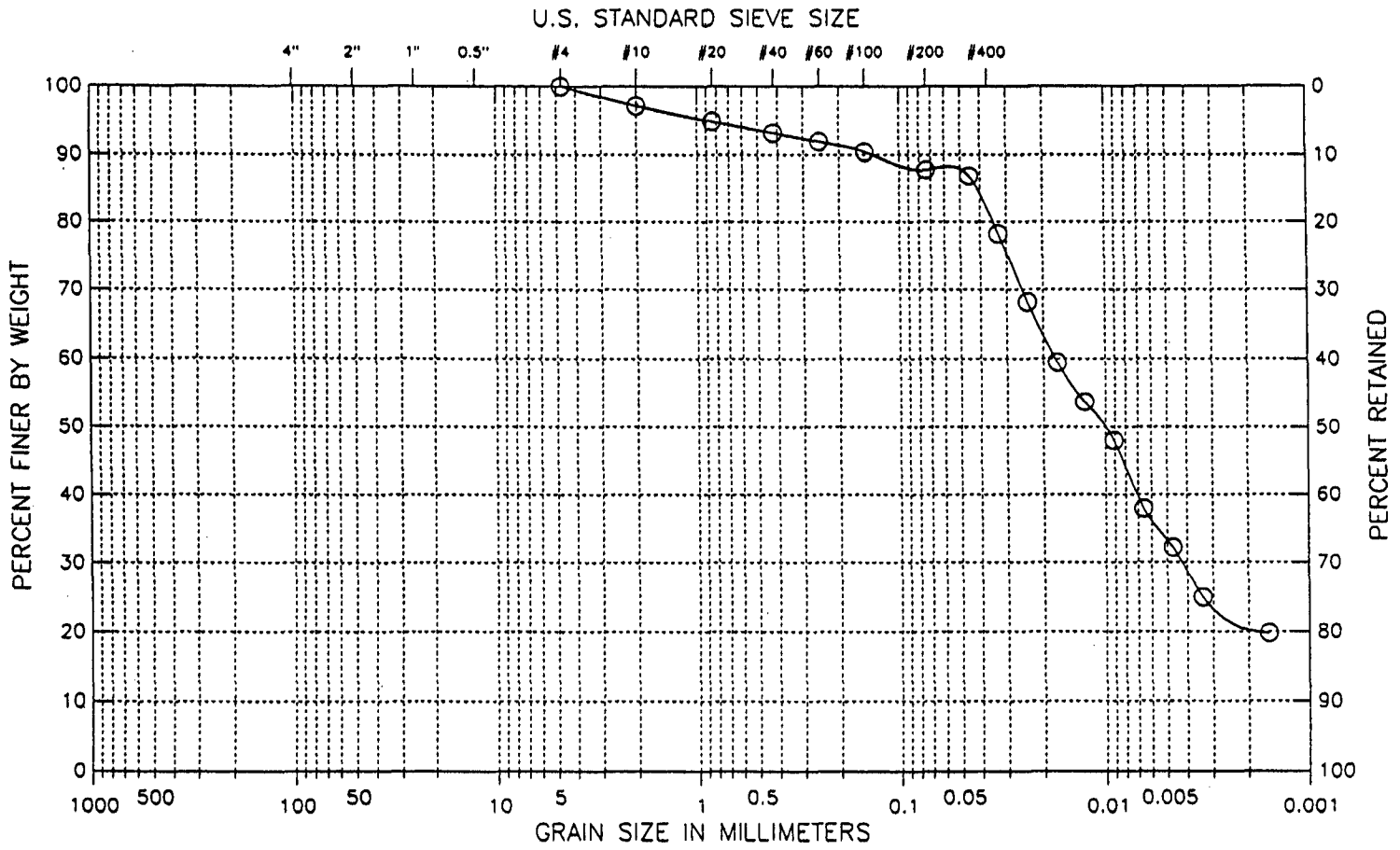
Sieve Mesh	Sieve Openings Inches	Sieve Openings Millimeters	Weight Retained (gm)	Cumulative Weight Retained (gm)	Percent Finer (%)
0.375"	0.374	9.51	0.00	0.00	100
#4	0.187	4.75	0.37	0.37	99
#10	0.079	2.00	1.16	1.53	96
#20	0.033	0.84	1.34	2.87	92
#40	0.017	0.42	1.30	4.17	88
#60	0.010	0.25	1.17	5.34	85
#100	0.006	0.15	1.13	6.47	82
#200	0.003	0.07	1.28	7.75	79
Pan			28.34	36.09	0

Total Dry Weight of Sample = 45.72

D85 : 0.2417 mm
D60 : 0.0364 mm
D50 : 0.0222 mm
D30 : 0.0100 mm
D15 : 0.0033 mm
D10 : 0.0021 mm

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. : FA-15 Sample No: UO-2 (4-6) Test Method ASTM D 422 Filename : FA15U02B	Project : New Bedford Harbor Superfund Site Project No.: GTX-2409 Location: New Bedford, MA Date : Wed Jan 05 2000



COBBLES	GRAVEL		SAND			SILT OR CLAY
	COARSE	FINE	COARSE	MEDIUM	FINE	

Classification :
(OH) organic clay
Visual Description :
Moist, dark gray organic clay

Remarks :

Figure 13

GEOTECHNICAL LABORATORY TEST DATA

Project : New Bedford Harbor Superfund Site
Project No. : GTX-2409
Boring No. : FA-15
Sample No. : UO-2 (4-6)
Location : New Bedford, MA
Soil Description : Moist, dark gray organic clay
Remarks : ---

Depth : 4-6 ft
Test Date : 12/14/99
Test Method : ASTM D 422

Filename : FA15UO2B
Elevation : ---
Tested by : AL/GSG
Checked by : GTT

HYDROMETER

Hydrometer ID : 257525
Weight of air-dried soil = 34.24 gm
Specific Gravity = 2.59

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	34.50	20.00	30.18	0.045	87	0.045
2.00	31.50	20.00	27.18	0.033	78	0.033
4.00	28.00	20.00	23.68	0.024	68	0.024
8.00	25.00	20.00	20.68	0.017	60	0.017
15.00	23.00	20.00	18.68	0.013	54	0.013
30.00	21.00	20.00	16.68	0.009	48	0.009
60.00	17.50	20.00	13.18	0.007	38	0.007
120.00	15.50	20.00	11.18	0.005	32	0.005
240.00	13.00	20.00	8.68	0.003	25	0.003
1125.00	11.50	19.00	6.86	0.002	20	0.002

FINE SIEVE SET

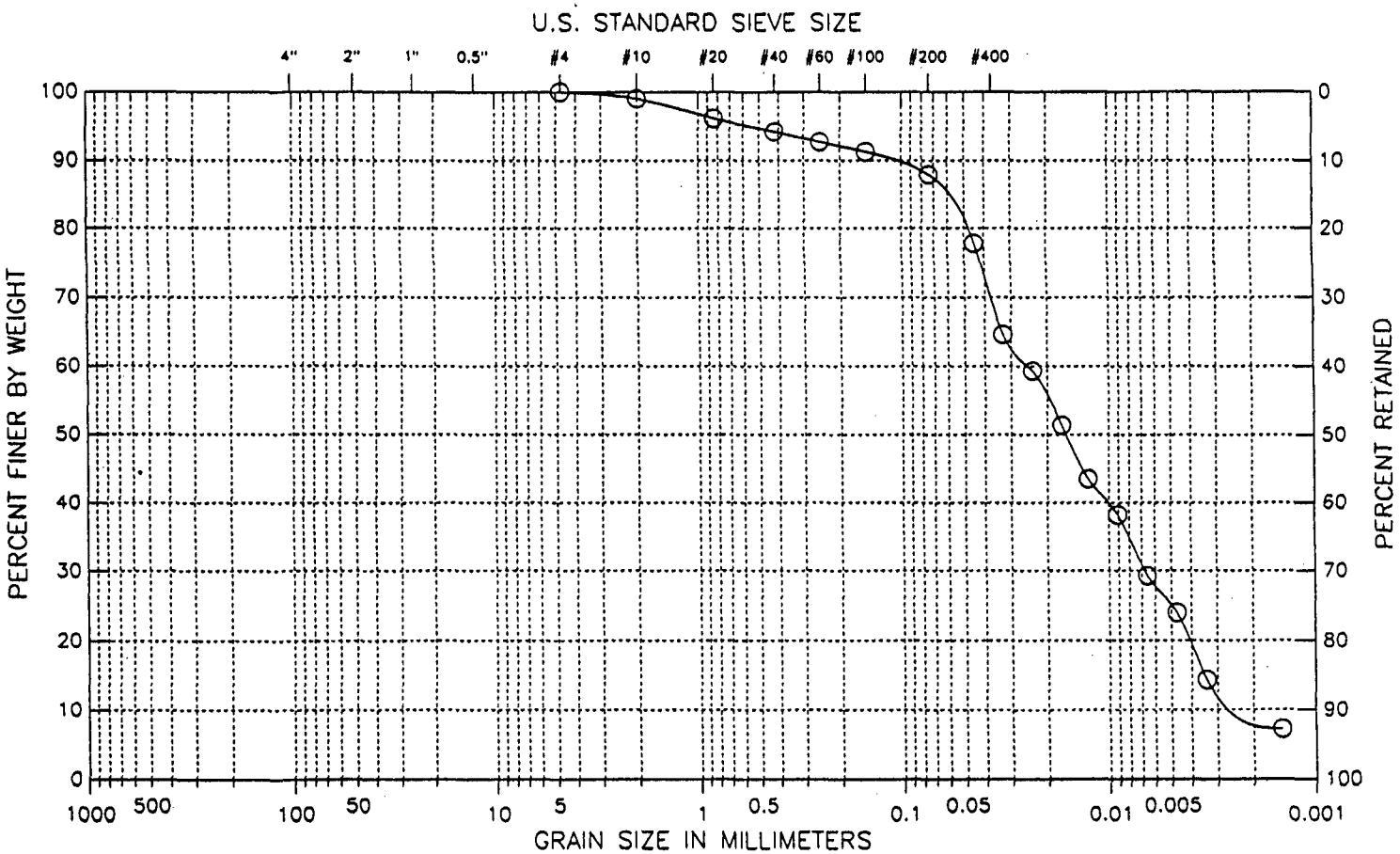
Sieve Mesh	Sieve Openings Inches	Millimeters	Weight Retained (gm)	Cumulative Weight Retained (gm)	Percent Finer (%)
#4	0.187	4.75	0.00	0.00	100
#10	0.079	2.00	0.99	0.99	97
#20	0.033	0.84	0.80	1.79	95
#40	0.017	0.42	0.60	2.39	93
#60	0.010	0.25	0.45	2.84	92
#100	0.006	0.15	0.53	3.37	90
#200	0.003	0.07	0.93	4.30	88
Pan			30.93	35.23	0

Total Dry Weight of Sample = 44.53

D85 : 0.0423 mm
D60 : 0.0175 mm
D50 : 0.0102 mm
D30 : 0.0043 mm
D15 : N/A
D10 : N/A

Soil Classification
ASTM Group Symbol : OH
ASTM Group Name : organic clay
AASHTO Group Symbol : A-7-5(110)
AASHTO Group Name : Clayey Soils

Boring No. : FA-15 Sample No.: UO-3 (7-9) Test Method ASTM D 422 Filename : FA15UO3	Project : New Bedford Harbor Superfund Site Project No.: GTX-2409 Location: New Bedford, MA Date : Wed Jan 05 2000



COBBLES	GRAVEL		SAND			SILT OR CLAY
	COARSE	FINE	COARSE	MEDIUM	FINE	

Classification :
(OH) organic clay
Visual Description :
Moist, dark gray organic clay

Remarks :

Figure 14

GEOTECHNICAL LABORATORY TEST DATA

Project : New Bedford Harbor Superfund Site
Project No. : GTX-2409
Boring No. : FA-15
Sample No. : UO-3 (7-9)
Location : New Bedford, MA
Soil Description : Moist, dark gray organic clay
Remarks : ---

Depth : 7-9 ft
Test Date : 12/14/99
Test Method : ASTM D 422

Filename : FA15UO3
Elevation : ---
Tested by : AL/GSG
Checked by : GTT

HYDROMETER

Hydrometer ID : 87130
Weight of air-dried soil = 37.91 gm
Specific Gravity = 2.6

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	35.00	20.50	29.44	0.045	78	0.045
2.00	30.00	20.50	24.44	0.033	65	0.033
4.00	28.00	20.50	22.44	0.024	59	0.024
8.00	25.00	20.50	19.44	0.017	51	0.017
15.00	22.00	20.50	16.44	0.013	43	0.013
30.00	20.00	20.50	14.44	0.009	38	0.009
60.00	17.00	20.00	11.08	0.007	29	0.007
120.00	15.00	20.00	9.08	0.005	24	0.005
240.00	11.00	20.50	5.44	0.003	14	0.003
1356.00	9.00	19.50	2.72	0.001	7	0.001

FINE SIEVE SET

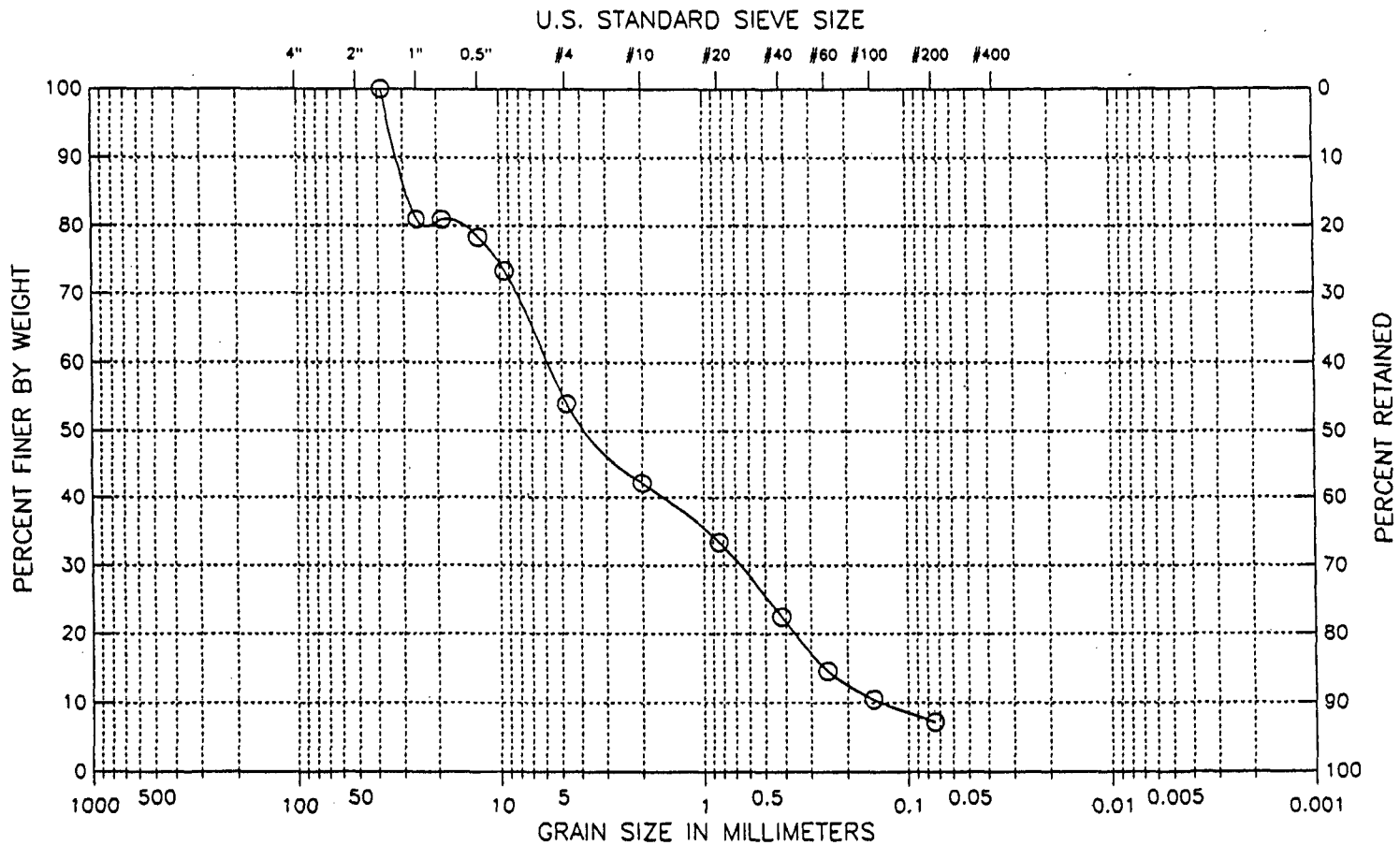
Sieve Mesh	Sieve Openings Inches	Millimeters	Weight Retained (gm)	Cumulative Weight Retained (gm)	Percent Finer (%)
#4	0.187	4.75	0.00	0.00	100
#10	0.079	2.00	0.38	0.38	99
#20	0.033	0.84	1.10	1.48	96
#40	0.017	0.42	0.74	2.22	94
#60	0.010	0.25	0.58	2.80	93
#100	0.006	0.15	0.55	3.35	91
#200	0.003	0.07	1.27	4.62	88
Pan			33.67	38.29	0

Total Dry Weight of Sample = 47.51

D85 : 0.0640 mm
D60 : 0.0246 mm
D50 : 0.0162 mm
D30 : 0.0067 mm
D15 : 0.0035 mm
D10 : 0.0020 mm

Soil Classification
ASTM Group Symbol : OH
ASTM Group Name : organic clay
AASHTO Group Symbol : A-7-5(62)
AASHTO Group Name : Clayey Soils

Boring No. : FA-15 Sample No: S-1 (12-14) Test Method ASTM D 422 Filename : FA15S1	Project : New Bedford Harbor Superfund Site Project No.: GTX-2409 Location: New Bedford, MA Date : Wed Jan 05 2000



COBBLES	GRAVEL		SAND			SILT OR CLAY
	COARSE	FINE	COARSE	MEDIUM	FINE	

Classification :

Remarks :
Hydrometer not required, fines < 15%

Visual Description :
Moist, light olive brown gravel with sand and silt

Figure 15

GEOTECHNICAL LABORATORY TEST DATA

Project : New Bedford Harbor Superfund Site
Project No. : GTX-2409
Boring No. : FA-15
Sample No. : S-1 (12-14)
Location : New Bedford, MA
Depth : 12-14 ft
Test Date : 12/03/99
Test Method : ASTM D 422
Filename : FA15S1
Elevation : ---
Tested by : AL
Checked by : GTT
Soil Description : Moist, light olive brown gravel with sand and silt
Remarks : Hydrometer not required, fines < 15%

FINE SIEVE SET

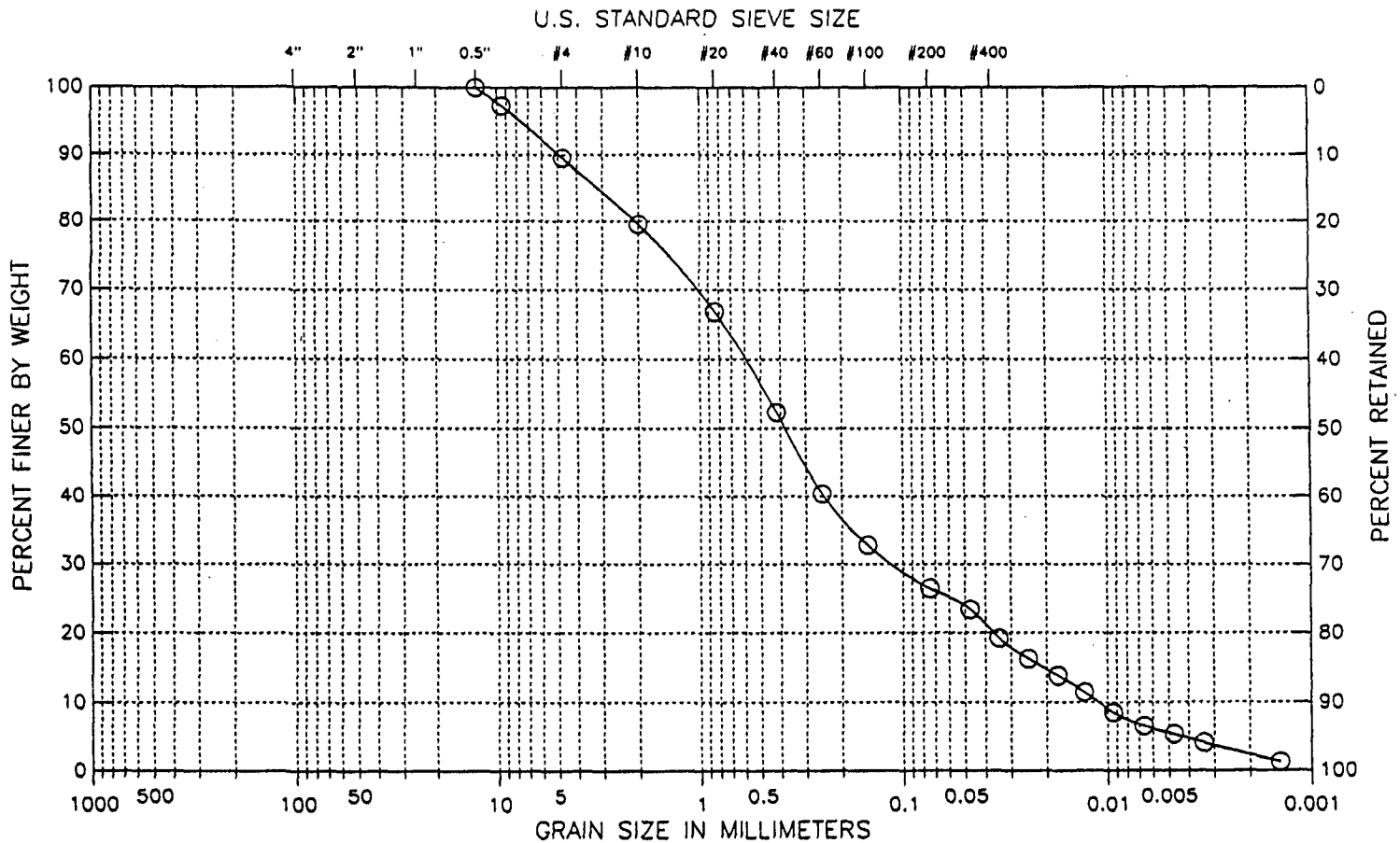
Sieve Mesh	Sieve Openings Inches	Sieve Openings Millimeters	Weight Retained (gm)	Cumulative Weight Retained (gm)	Percent Finer (%)
1.5"	1.500	38.10	0.00	0.00	100
1"	1.012	25.70	26.68	26.68	81
0.75"	0.748	19.00	0.00	26.68	81
0.5"	0.500	12.70	3.70	30.38	78
0.375"	0.374	9.51	7.01	37.39	73
#4	0.187	4.75	26.96	64.35	54
#10	0.079	2.00	16.73	81.08	42
#20	0.033	0.84	12.29	93.37	33
#40	0.017	0.42	15.33	108.70	22
#60	0.010	0.25	11.08	119.78	15
#100	0.006	0.15	5.67	125.45	10
#200	0.003	0.07	4.59	130.04	7
Pan			10.09	140.13	0

Total Dry Weight of Sample = 149.27

D85 : 27.9390 mm
D60 : 5.8815 mm
D50 : 3.5348 mm
D30 : 0.6791 mm
D15 : 0.2580 mm
D10 : 0.1346 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. : FA-15 Sample No: S-2 (15-17) Test Method ASTM D 422 Filename : FA15S2	Project : New Bedford Harbor Superfund Site Project No.: GTX-2409 Location: New Bedford, MA Date : Wed Jan 05 2000



COBBLES	GRAVEL		SAND			SILT OR CLAY
	COARSE	FINE	COARSE	MEDIUM	FINE	

Classification :

Remarks :

Visual Description :
Moist, light yellowish brown silty sand

Figure 16

GEOTECHNICAL LABORATORY TEST DATA

Project : New Bedford Harbor Superfund Site
Project No. : GTX-2409
Boring No. : FA-15
Sample No. : S-2 (15-17)
Location : New Bedford, MA
Soil Description : Moist, light yellowish brown silty sand
Remarks : ---

Depth : 15-17 ft
Test Date : 12/03/99
Test Method : ASTM D 422

Filename : FA15S2
Elevation : ---
Tested by : AL
Checked by : GTT

HYDROMETER

Hydrometer ID : 87130
Weight of air-dried soil = 66.68 gm
Specific Gravity = 2.65

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	25.50	20.00	19.58	0.048	23	0.048
2.00	22.00	20.00	16.08	0.034	19	0.034
4.00	19.50	20.00	13.58	0.025	16	0.025
8.00	17.50	20.00	11.58	0.018	14	0.018
15.00	15.50	20.00	9.58	0.013	11	0.013
30.00	13.00	20.00	7.08	0.009	8	0.009
60.00	11.00	20.50	5.44	0.007	6	0.007
120.00	10.00	20.50	4.44	0.005	5	0.005
241.00	9.00	20.50	3.44	0.003	4	0.003
1388.00	7.00	20.00	1.08	0.001	1	0.001

FINE SIEVE SET

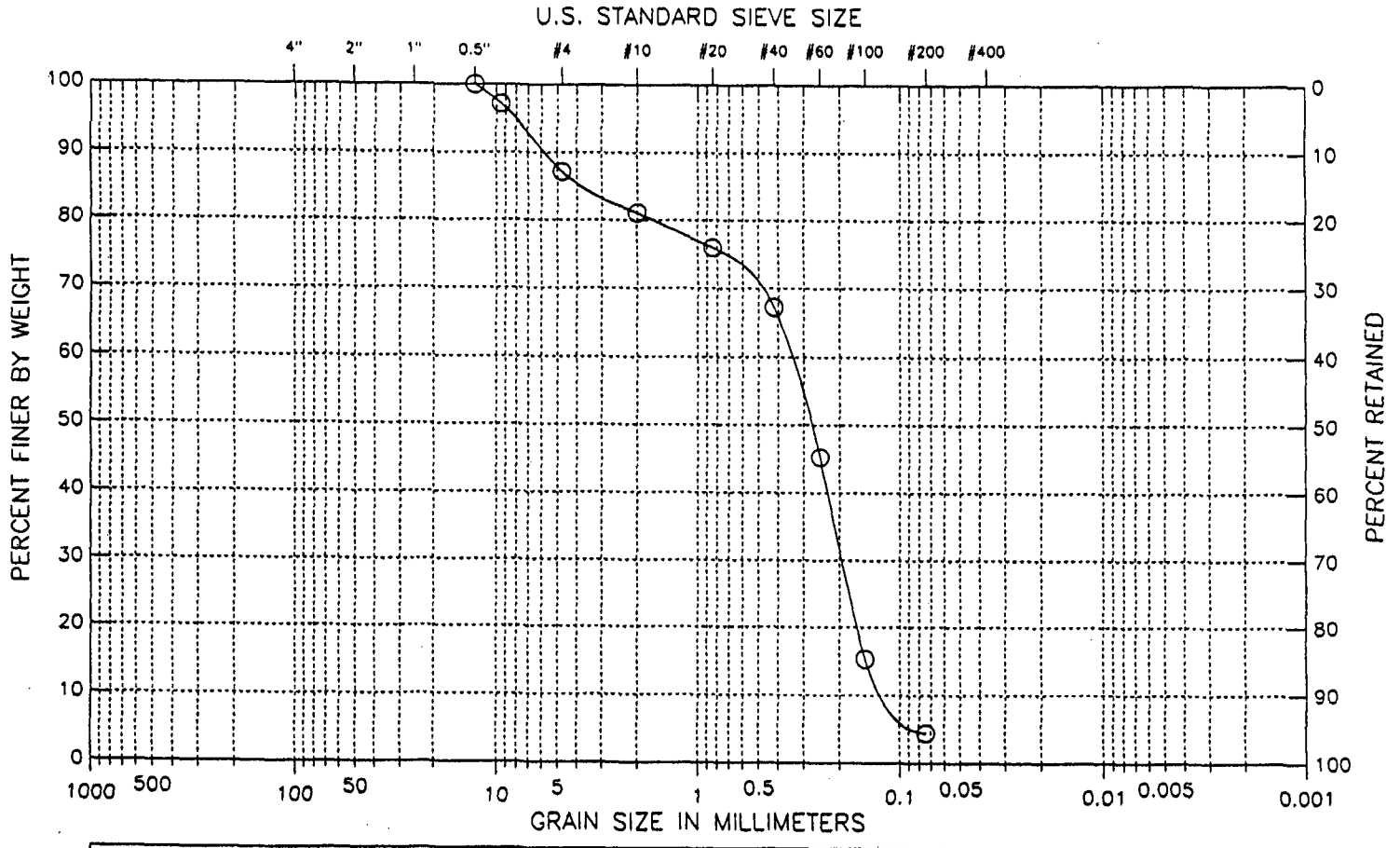
Sieve Mesh	Sieve Openings Inches	Sieve Openings Millimeters	Weight Retained (gm)	Cumulative Weight Retained (gm)	Percent Finer (%)
0.5"	0.500	12.70	0.00	0.00	100
0.375"	0.374	9.51	2.22	2.22	97
#4	0.187	4.75	6.53	8.75	90
#10	0.079	2.00	8.39	17.14	80
#20	0.033	0.84	10.68	27.82	67
#40	0.017	0.42	12.16	39.98	52
#60	0.010	0.25	10.02	50.00	40
#100	0.006	0.15	6.36	56.36	33
#200	0.003	0.07	5.28	61.64	26
Pan			22.18	83.82	0

Total Dry Weight of Sample = 92.89

D85 : 3.2027 mm
D60 : 0.6071 mm
D50 : 0.3801 mm
D30 : 0.1096 mm
D15 : 0.0208 mm
D10 : 0.0111 mm

Soil Classification
ASTM Group Symbol : N/A
ASTM Group Name : N/A
AASHTO Group Symbol : A-2-4(0)
AASHTO Group Name : Silty Gravel and Sand

Boring No. : FA-19 Sample No.: S-1 11.5-13.5 Test Method ASTM D 422 Filename : FA19S1	Project : New Bedford Harbor Superfund Site Project No.: GTX-2409 Location: New Bedford, MA Date : Wed Jan 05 2000



Classification :
(SP) Poorly graded sand
Visual Description :
Moist, light gray sand

Remarks :
Hydrometer not required, fines < 15%

Figure 17

GEOTECHNICAL LABORATORY TEST DATA

Project : New Bedford Harbor Superfund Site
Project No. : GTX-2409
Boring No. : FA-19
Sample No. : S-1 11.5-13.5
Location : New Bedford, MA
Soil Description : Moist, light gray sand
Remarks : Hydrometer not required, fines < 15%

Depth : 11.5-13.5 ft
Test Date : 12/03/99
Test Method : ASTM D 422

Filename : FA19S1
Elevation : ---
Tested by : AL
Checked by : GTT

FINE SIEVE SET

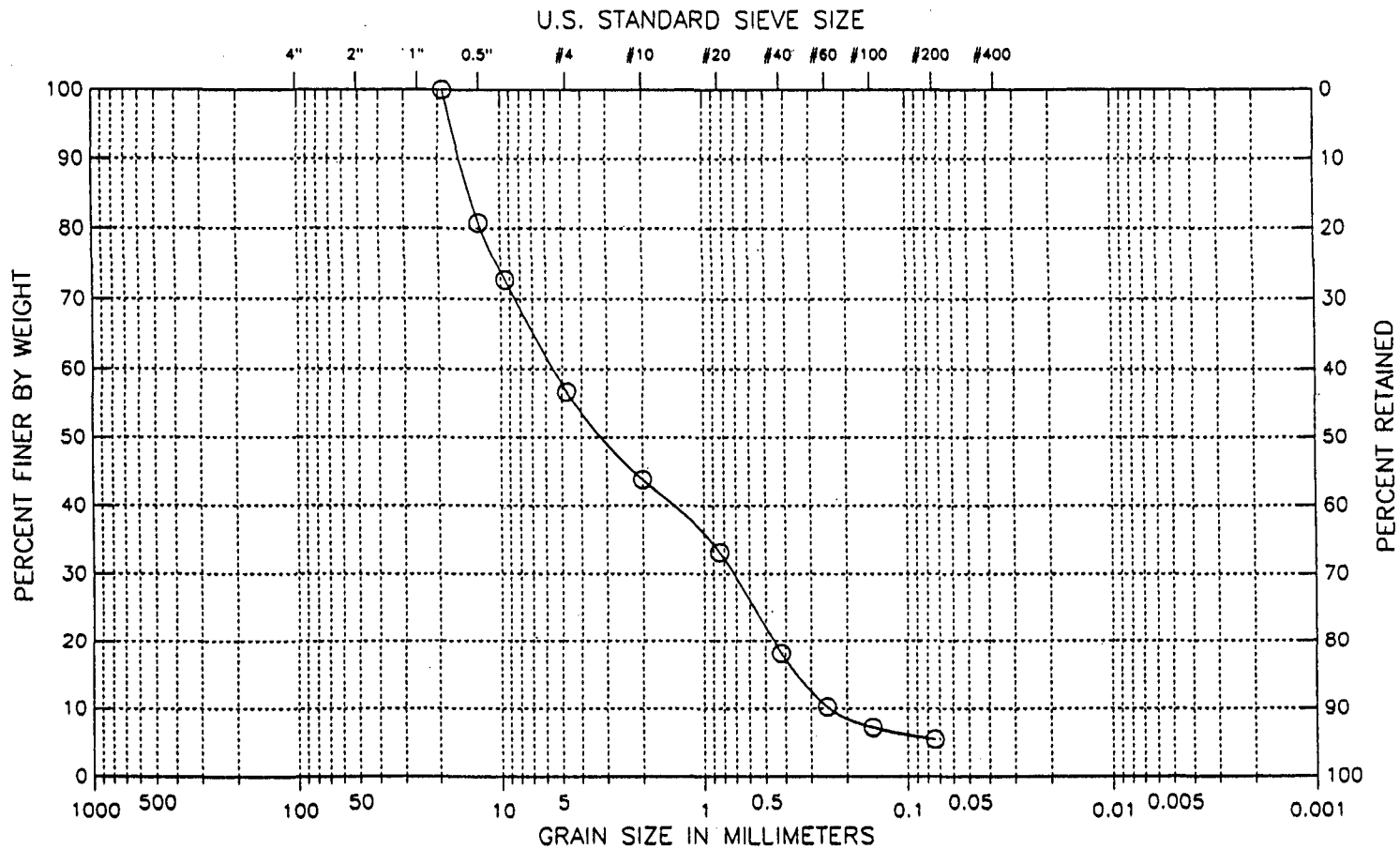
Sieve Mesh	Sieve Openings Inches	Sieve Openings Millimeters	Weight Retained (gm)	Cumulative Weight Retained (gm)	Percent Finer (%)
0.5"	0.500	12.70	0.00	0.00	100
0.375"	0.374	9.51	2.90	2.90	97
#4	0.187	4.75	10.25	13.15	87
#10	0.079	2.00	6.20	19.35	81
#20	0.033	0.84	5.21	24.56	76
#40	0.017	0.42	8.94	33.50	67
#60	0.010	0.25	22.41	55.91	45
#100	0.006	0.15	30.61	86.52	15
#200	0.003	0.07	11.15	97.67	4
Pan			4.44	102.11	0

Total Dry Weight of Sample = 111.05

D85 : 3.5109 mm
D60 : 0.3543 mm
D50 : 0.2797 mm
D30 : 0.1921 mm
D15 : 0.1465 mm
D10 : 0.1063 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. : FA-19 Sample No: S-3 (20-22) Test Method ASTM D 422 Filename : FA19S3	Project : New Bedford Harbor Superfund Site Project No.: GTX-2409 Location: New Bedford, MA Date : Wed Jan 05 2000



COBBLES	GRAVEL		SAND			SILT OR CLAY
	COARSE	FINE	COARSE	MEDIUM	FINE	

Classification :

Remarks :
Hydrometer not required, fines < 15%

Visual Description :
Moist, olive gray gravel with sand, some silt

Figure 18

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GEOTECHNICAL LABORATORY TEST DATA

Project : New Bedford Harbor Superfund Site
Project No. : GTX-2409
Boring No. : FA-19
Sample No. : S-3 (20-22)
Location : New Bedford, MA
Depth : 20-22 ft
Test Date : 12/03/99
Test Method : ASTM D 422
Filename : FA19S3
Elevation : ---
Tested by : AL
Checked by : GTT
Soil Description : Moist, olive gray gravel with sand, some silt
Remarks : Hydrometer not required, fines < 15%

FINE SIEVE SET

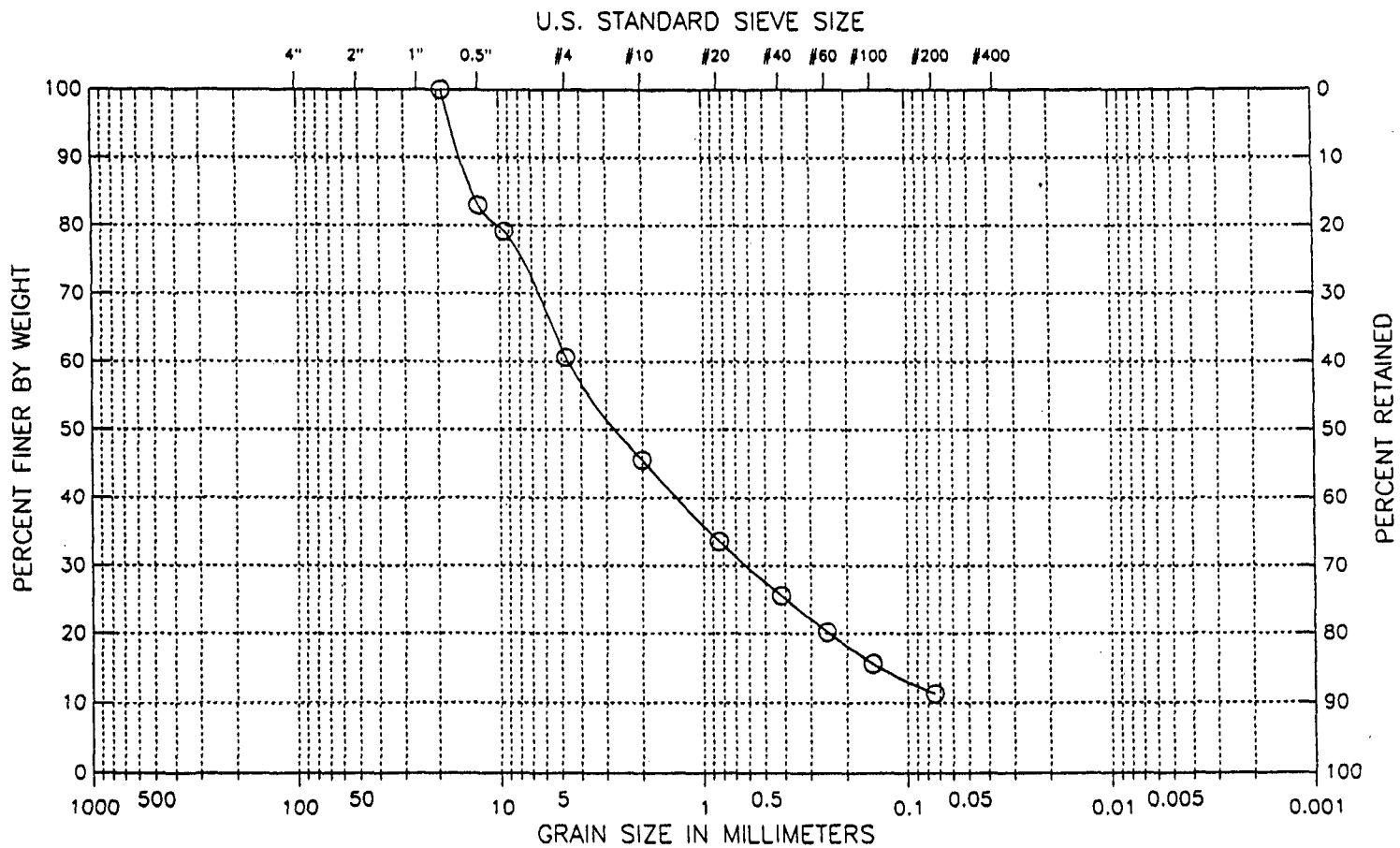
Sieve Mesh	Sieve Openings Inches	Millimeters	Weight Retained (gm)	Cumulative Weight Retained (gm)	Percent Finer (%)
0.75"	0.748	19.00	0.00	0.00	100
0.5"	0.500	12.70	32.75	32.75	81
0.375"	0.374	9.51	13.74	46.49	73
#4	0.187	4.75	27.15	73.64	57
#10	0.079	2.00	22.04	95.68	44
#20	0.033	0.84	18.11	113.79	33
#40	0.017	0.42	25.56	139.35	18
#60	0.010	0.25	13.46	152.81	10
#100	0.006	0.15	5.20	158.01	7
#200	0.003	0.07	2.93	160.94	5
Pan			9.25	170.19	0

Total Dry Weight of Sample = 177.93

D85 : 13.8797 mm
D60 : 5.4762 mm
D50 : 3.0300 mm
D30 : 0.7274 mm
D15 : 0.3422 mm
D10 : 0.2412 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. : FA-19 Sample No: S-5 (30-31) Test Method ASTM D 422 Filename : FA19S5	Project : New Bedford Harbor Superfund Site Project No.: GTX-2409 Location: New Bedford, MA Date : Wed Jan 05 2000



COBBLES	GRAVEL		SAND			SILT OR CLAY
	COARSE	FINE	COARSE	MEDIUM	FINE	

Classification :

Remarks :
Hydrometer not required, fines < 15%

Visual Description :
Moist, olive brown sand with gravel, silt

Figure 19

GEOTECHNICAL LABORATORY TEST DATA

Project : New Bedford Harbor Superfund Site
Project No. : GTX-2409
Boring No. : FA-19
Sample No. : S-5 (30-31)
Location : New Bedford, MA
Depth : 30-31 ft
Test Date : 12/03/99
Test Method : ASTM D 422
Filename : FA19S5
Elevation : ---
Tested by : AL
Checked by : GTT
Soil Description : Moist, olive brown sand with gravel, silt
Remarks : Hydrometer not required, fines < 15%

FINE SIEVE SET

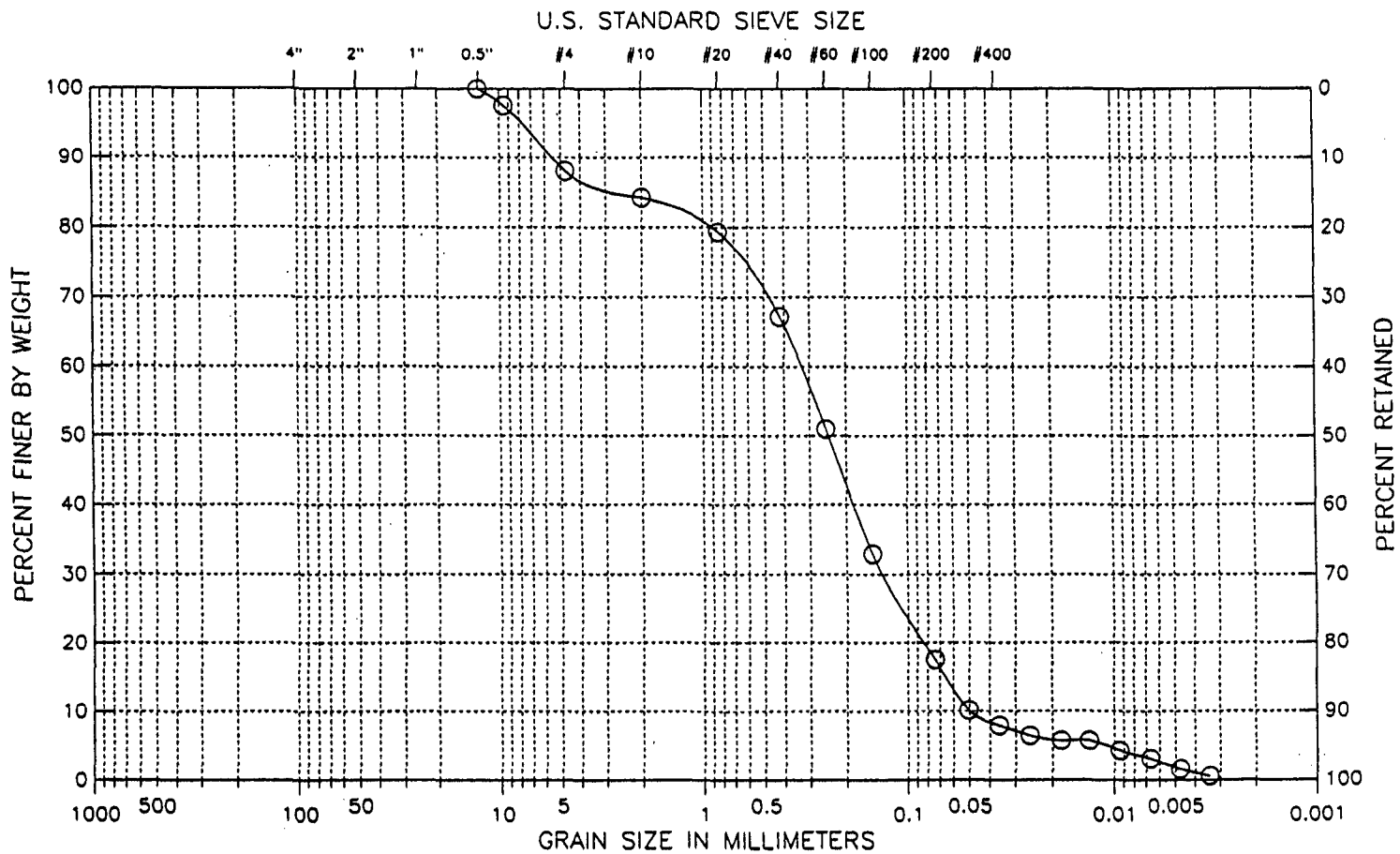
Sieve Mesh	Sieve Openings Inches	Sieve Openings Millimeters	Weight Retained (gm)	Cumulative Weight Retained (gm)	Percent Finer (%)
0.75"	0.748	19.00	0.00	0.00	100
0.5"	0.500	12.70	22.19	22.19	83
0.375"	0.374	9.51	4.93	27.12	79
#4	0.187	4.75	24.10	51.22	61
#10	0.079	2.00	19.69	70.91	45
#20	0.033	0.84	15.49	86.40	34
#40	0.017	0.42	10.50	96.90	26
#60	0.010	0.25	6.86	103.76	20
#100	0.006	0.15	5.99	109.75	16
#200	0.003	0.07	5.66	115.41	11
Pan			14.69	130.10	0

Total Dry Weight of Sample = 138.87

D85 : 13.3320 mm
D60 : 4.5819 mm
D50 : 2.5872 mm
D30 : 0.6176 mm
D15 : 0.1344 mm
D10 : 0.0601 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. : FA-23 Sample No: S-2 (17-19) Test Method ASTM D 422 Filename : FA23S2	Project : New Bedford Harbor Superfund Site Project No.: GTX-2409 Location: New Bedford, MA Date : Wed Jan 05 2000



Classification :

Remarks :

Visual Description :
Moist, gray silty sand

Figure 20

GEOTECHNICAL LABORATORY TEST DATA

Project : New Bedford Harbor Superfund Site
Project No. : GTX-2409
Boring No. : FA-23
Sample No. : S-2 (17-19)
Location : New Bedford, MA
Soil Description : Moist, gray silty sand
Remarks : ---

Depth : 17-19 ft
Test Date : 12/03/99
Test Method : ASTM D 422

Filename : FA23S2
Elevation : ---
Tested by : AL
Checked by : GTT

HYDROMETER

Hydrometer ID : 583901
Weight of air-dried soil = 57.28 gm
Specific Gravity = 2.66

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	13.00	21.00	6.90	0.051	10	0.051
2.00	11.50	21.00	5.40	0.036	8	0.036
4.00	10.50	21.00	4.40	0.026	6	0.026
8.00	10.00	21.00	3.90	0.018	6	0.018
15.00	10.00	21.00	3.90	0.013	6	0.013
30.00	9.00	21.00	2.90	0.009	4	0.009
60.00	8.00	21.50	2.10	0.007	3	0.007
120.00	7.00	21.50	1.10	0.005	2	0.005
240.00	6.50	21.00	0.40	0.003	1	0.003

FINE SIEVE SET

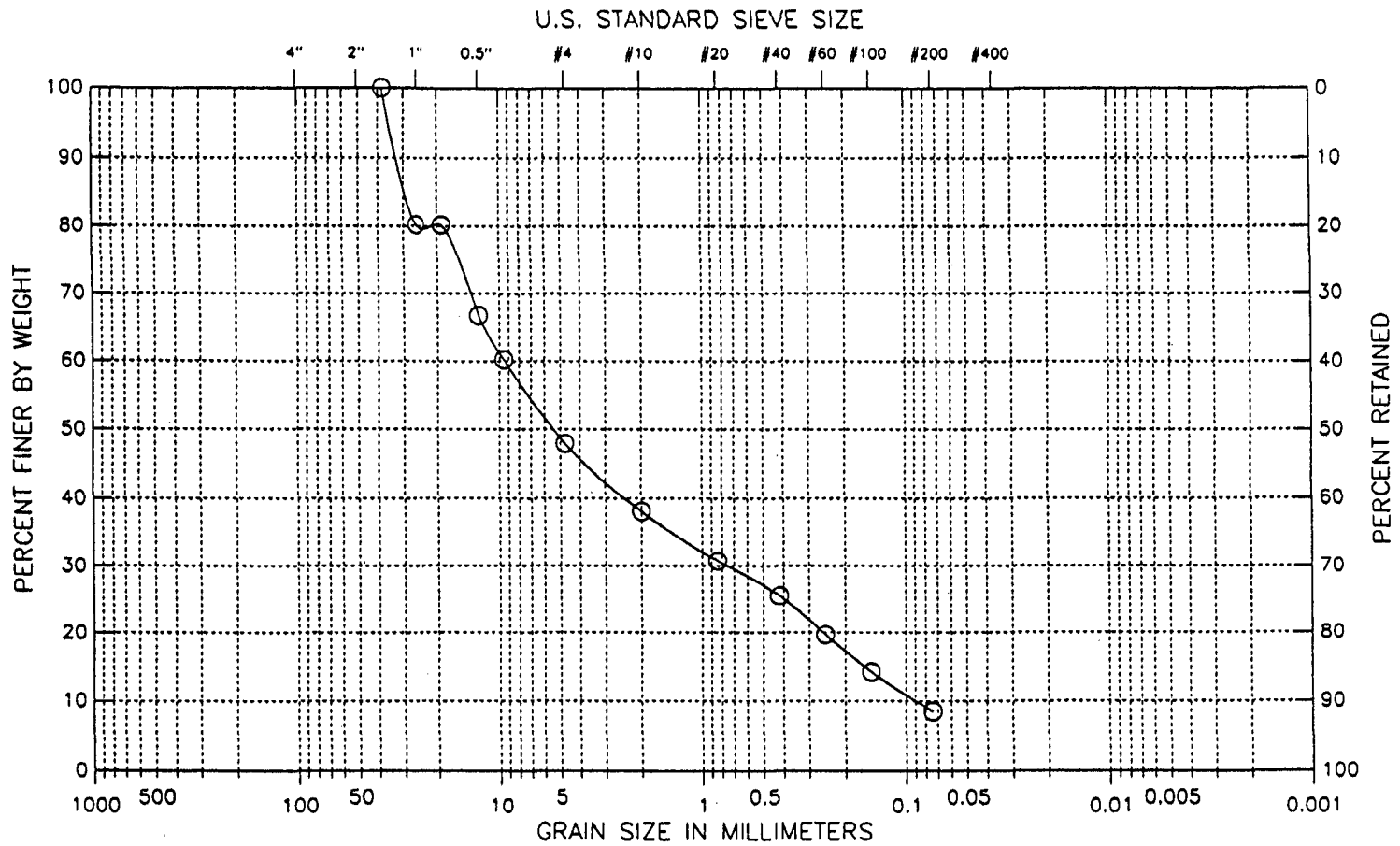
Sieve Mesh	Sieve Openings Inches	Millimeters	Weight Retained (gm)	Cumulative Weight Retained (gm)	Percent Finer (%)
0.5"	0.500	12.70	0.00	0.00	100
0.375"	0.374	9.51	1.65	1.65	98
#4	0.187	4.75	6.47	8.12	88
#10	0.079	2.00	2.60	10.72	84
#20	0.033	0.84	3.32	14.04	79
#40	0.017	0.42	8.26	22.30	67
#60	0.010	0.25	11.05	33.35	51
#100	0.006	0.15	12.27	45.62	33
#200	0.003	0.07	10.49	56.11	17
Pan			11.89	68.00	0

Total Dry Weight of Sample = 77.17

D85 : 2.3777 mm
D60 : 0.3337 mm
D50 : 0.2432 mm
D30 : 0.1306 mm
D15 : 0.0651 mm
D10 : 0.0495 mm

Soil Classification
ASTM Group Symbol : N/A
ASTM Group Name : N/A
AASHTO Group Symbol : A-2-4(0)
AASHTO Group Name : Silty Gravel and Sand

Boring No. : FA-25 Sample No.: S-2 (12-14) Test Method ASTM D 422 Filename : FA25S2	Project : New Bedford Harbor Superfund Site Project No.: GTX-2409 Location: New Bedford, MA Date : Wed Jan 05 2000



COBBLES	GRAVEL		SAND			SILT OR CLAY
	COARSE	FINE	COARSE	MEDIUM	FINE	

Classification :

Remarks :
Hydrometer not required, fines < 15%

Visual Description :
Moist, gray gravel with sand, silt

Figure 21

GEOTECHNICAL LABORATORY TEST DATA

Project : New Bedford Harbor Superfund Site
Project No. : GTX-2409
Boring No. : FA-25
Sample No. : S-2 (12-14)
Location : New Bedford, MA
Soil Description : Moist, gray gravel with sand, silt
Remarks : Hydrometer not required, fines < 15%

Depth : 12-14 ft
Test Date : 12/03/99
Test Method : ASTM D 422

Filename : FA25S2
Elevation : ---
Tested by : AL
Checked by : GTT

FINE SIEVE SET

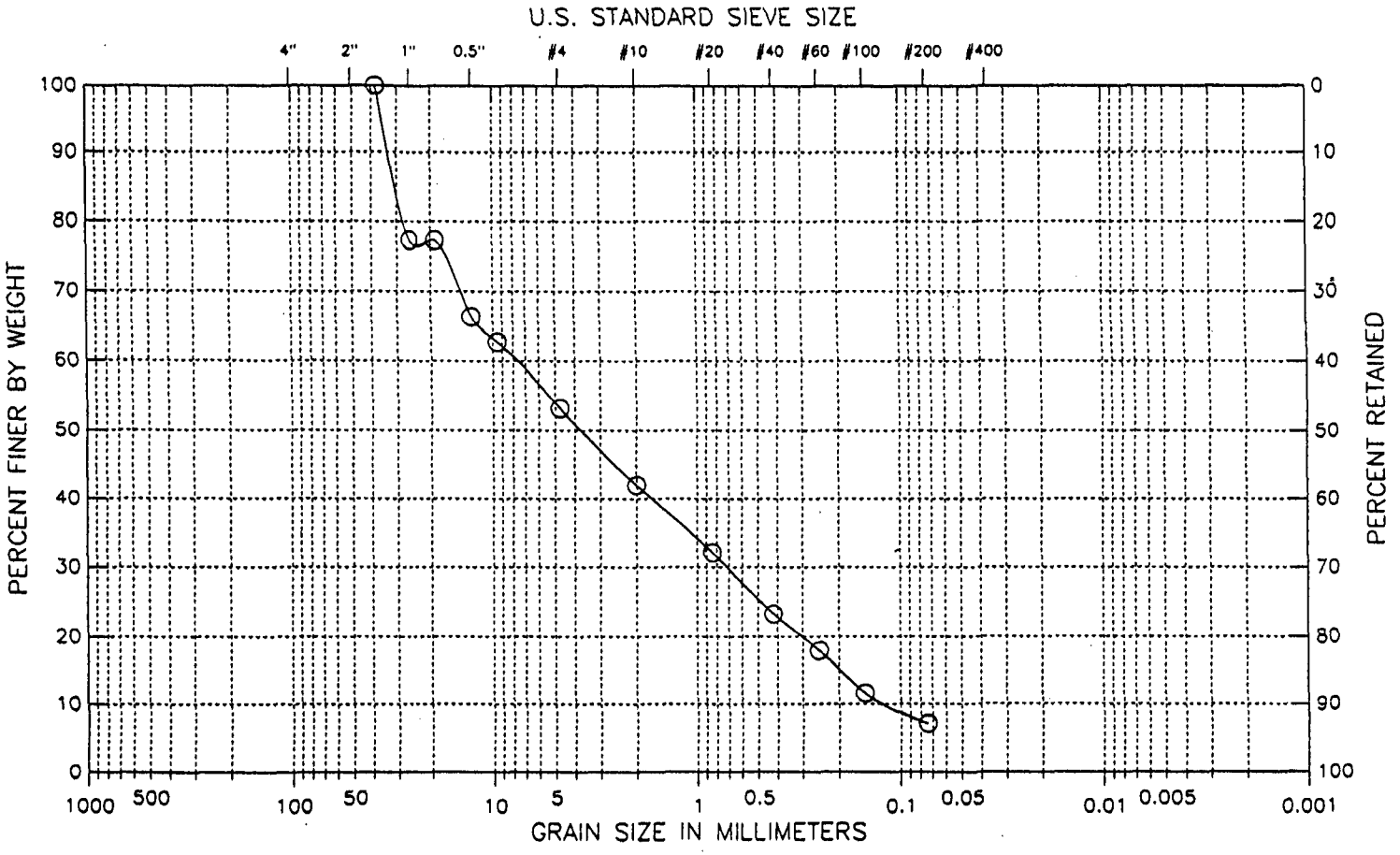
Sieve Mesh	Sieve Openings Inches	Sieve Openings Millimeters	Weight Retained (gm)	Cumulative Weight Retained (gm)	Percent Finer (%)
1.5"	1.500	38.10	0.00	0.00	100
1"	1.012	25.70	40.33	40.33	80
0.75"	0.748	19.00	0.00	40.33	80
0.5"	0.500	12.70	27.49	67.82	67
0.375"	0.374	9.51	13.17	80.99	60
#4	0.187	4.75	25.05	106.04	48
#10	0.079	2.00	20.06	126.10	38
#20	0.033	0.84	14.94	141.04	31
#40	0.017	0.42	10.62	151.66	26
#60	0.010	0.25	11.92	163.58	20
#100	0.006	0.15	11.17	174.75	14
#200	0.003	0.07	11.60	186.35	8
Pan			17.31	203.66	0

Total Dry Weight of Sample = 212.65

D85 : 28.2750 mm
D60 : 9.3859 mm
D50 : 5.3378 mm
D30 : 0.7613 mm
D15 : 0.1608 mm
D10 : 0.0890 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. : FA-26 Sample No.: S-1 (7.5-9.5) Test Method ASTM D 422 Filename : FA26S1	Project : New Bedford Harbor Superfund Site Project No.: GTX-2409 Location: New Bedford, MA Date : Wed Jan 05 2000



COBBLES	GRAVEL		SAND			SILT OR CLAY
	COARSE	FINE	COARSE	MEDIUM	FINE	

Classification :

Remarks :
Hydrometer not required, fines < 15%

Visual Description :
Moist, grayish brown gravel with sand and silt

Figure 22

GEOTECHNICAL LABORATORY TEST DATA

Project : New Bedford Harbor Superfund Site
Project No. : GTX-2409
Boring No. : FA-26
Sample No. : S-1 (7.5-9.5)
Location : New Bedford, MA
Depth : 7.5-9.5 ft
Test Date : 12/03/99
Test Method : ASTM D 422
Filename : FA26S1
Elevation : ---
Tested by : AL
Checked by : GTT
Soil Description : Moist, grayish brown gravel with sand and silt
Remarks : Hydrometer not required, fines < 15%

FINE SIEVE SET

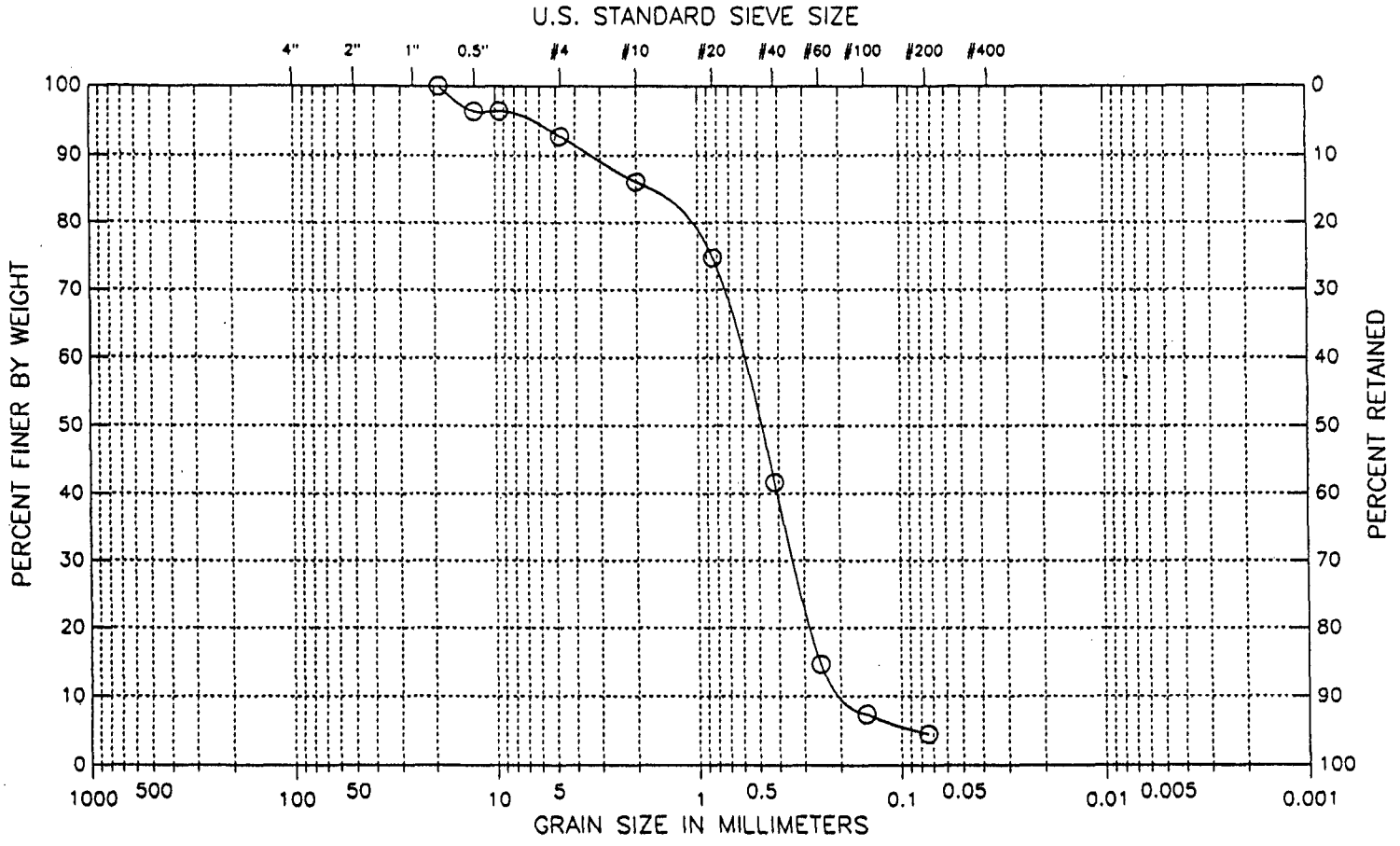
Sieve Mesh	Sieve Openings Inches	Millimeters	Weight Retained (gm)	Cumulative Weight Retained (gm)	Percent Finer (%)
1.5"	1.500	38.10	0.00	0.00	100
1"	1.012	25.70	46.49	46.49	77
0.75"	0.748	19.00	0.00	46.49	77
0.5"	0.500	12.70	22.57	69.06	66
0.375"	0.374	9.51	7.47	76.53	63
#4	0.187	4.75	19.58	96.11	53
#10	0.079	2.00	23.15	119.26	42
#20	0.033	0.84	20.39	139.65	32
#40	0.017	0.42	18.02	157.67	23
#60	0.010	0.25	11.04	168.71	18
#100	0.006	0.15	13.07	181.78	12
#200	0.003	0.07	9.31	191.09	7
Pan			14.51	205.60	0

Total Dry Weight of Sample = 214.53

D85 : 29.3423 mm
D60 : 7.7671 mm
D50 : 3.6994 mm
D30 : 0.7134 mm
D15 : 0.1967 mm
D10 : 0.1166 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. : FA-26 Sample No.: S-3 (18-20) Test Method ASTM D 422 Filename : FA26S3	Project : New Bedford Harbor Superfund Site Project No.: GTX-2409 Location: New Bedford, MA Date : Wed Jan 05 2000



Classification :
(SP) Poorly graded sand
Visual Description :
Moist, gray sand with some gravel

Remarks :
Hydrometer not required, fines < 15%

Figure 23

GEOTECHNICAL LABORATORY TEST DATA

Project : New Bedford Harbor Superfund Site
Project No. : GTX-2409
Boring No. : FA-26
Sample No. : S-3 (18-20)
Location : New Bedford, MA
Soil Description : Moist, gray sand with some gravel
Remarks : Hydrometer not required, fines < 15%

Depth : 18-20 ft
Test Date : 12/03/99
Test Method : ASTM D 422

Filename : FA26S3
Elevation : ---
Tested by : AL
Checked by : GTT

FINE SIEVE SET

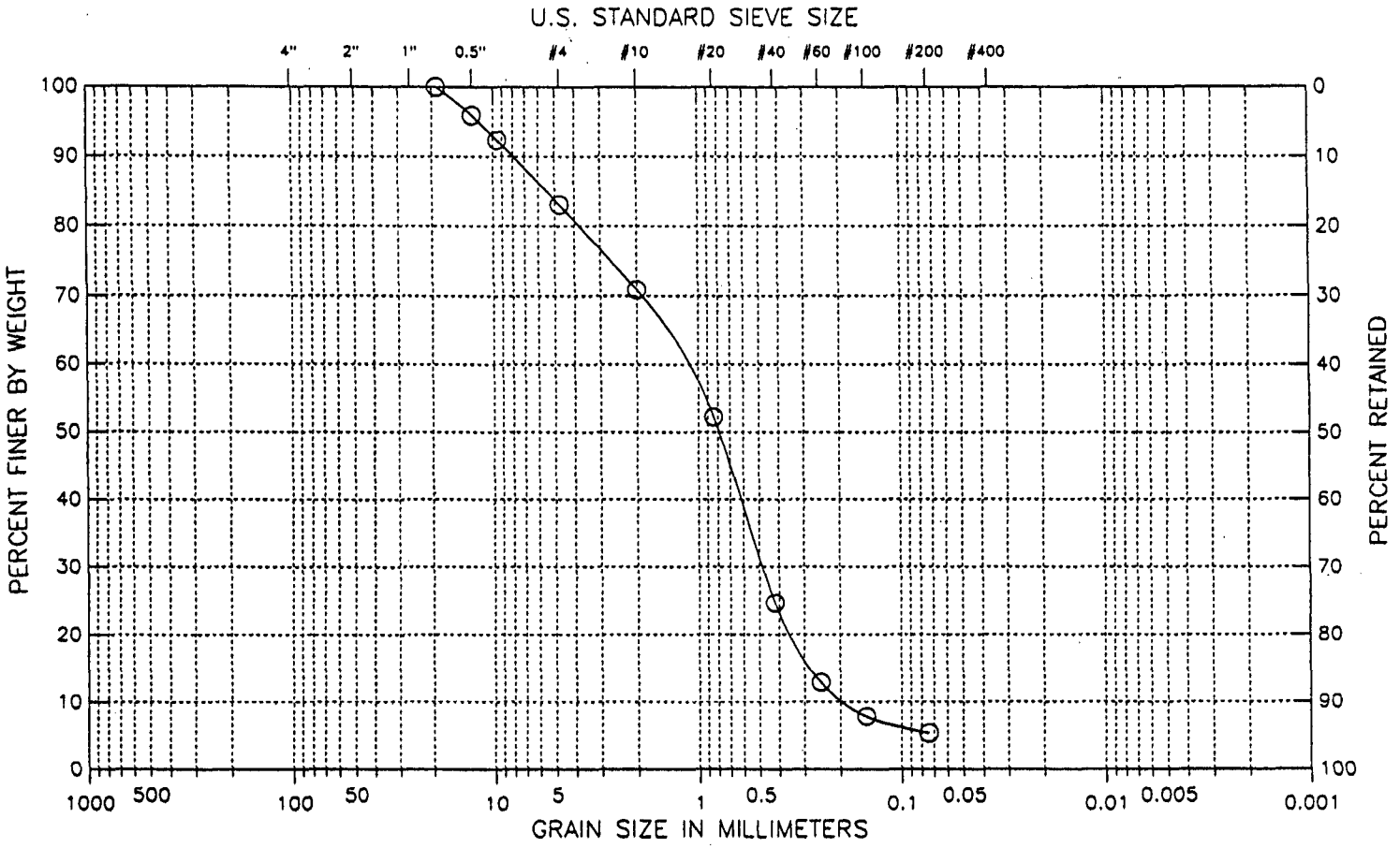
Sieve Mesh	Sieve Openings Inches	Sieve Openings Millimeters	Weight Retained (gm)	Cumulative Weight Retained (gm)	Percent Finer (%)
0.75"	0.748	19.00	0.00	0.00	100
0.5"	0.500	12.70	4.77	4.77	96
0.375"	0.374	9.51	0.00	4.77	96
#4	0.187	4.75	4.82	9.59	93
#10	0.079	2.00	8.86	18.45	86
#20	0.033	0.84	15.06	33.51	75
#40	0.017	0.42	43.81	77.32	42
#60	0.010	0.25	35.81	113.13	15
#100	0.006	0.15	9.61	122.74	7
#200	0.003	0.07	3.82	126.56	5
Pan			5.99	132.55	0

Total Dry Weight of Sample = 141.78

D85 : 1.8418 mm
D60 : 0.6173 mm
D50 : 0.5003 mm
D30 : 0.3357 mm
D15 : 0.2517 mm
D10 : 0.1794 mm

Soil Classification
ASTM Group Symbol : SP
ASTM Group Name : Poorly graded sand
AASHTO Group Symbol : A-1-b(0)
AASHTO Group Name : Stone Fragments, Gravel and Sand

Boring No. : FA-28 Sample No.: S-1B (5-7) Test Method ASTM D 422 Filename : FA28S1B	Project : New Bedford Harbor Superfund Site Project No.: GTX-2409 Location: New Bedford, MA Date : Wed Jan 05 2000



COBBLES	GRAVEL		SAND			SILT OR CLAY
	COARSE	FINE	COARSE	MEDIUM	FINE	

Classification :

Remarks :
Hydrometer not required, fines < 15%

Visual Description :
Wet, very dark grayish brown sand with gravel

Figure 24

GEOTECHNICAL LABORATORY TEST DATA

Project : New Bedford Harbor Superfund Site
Project No. : GTX-2409
Boring No. : FA-28
Sample No. : S-1B (5-7)
Location : New Bedford, MA
Depth : 5-7 ft
Test Date : 12/03/99
Test Method : ASTM D 422
Filename : FA28S1B
Elevation : ---
Tested by : AL
Checked by : GTT
Soil Description : Wet, very dark grayish brown sand with gravel
Remarks : Hydrometer not required, fines < 15%

FINE SIEVE SET

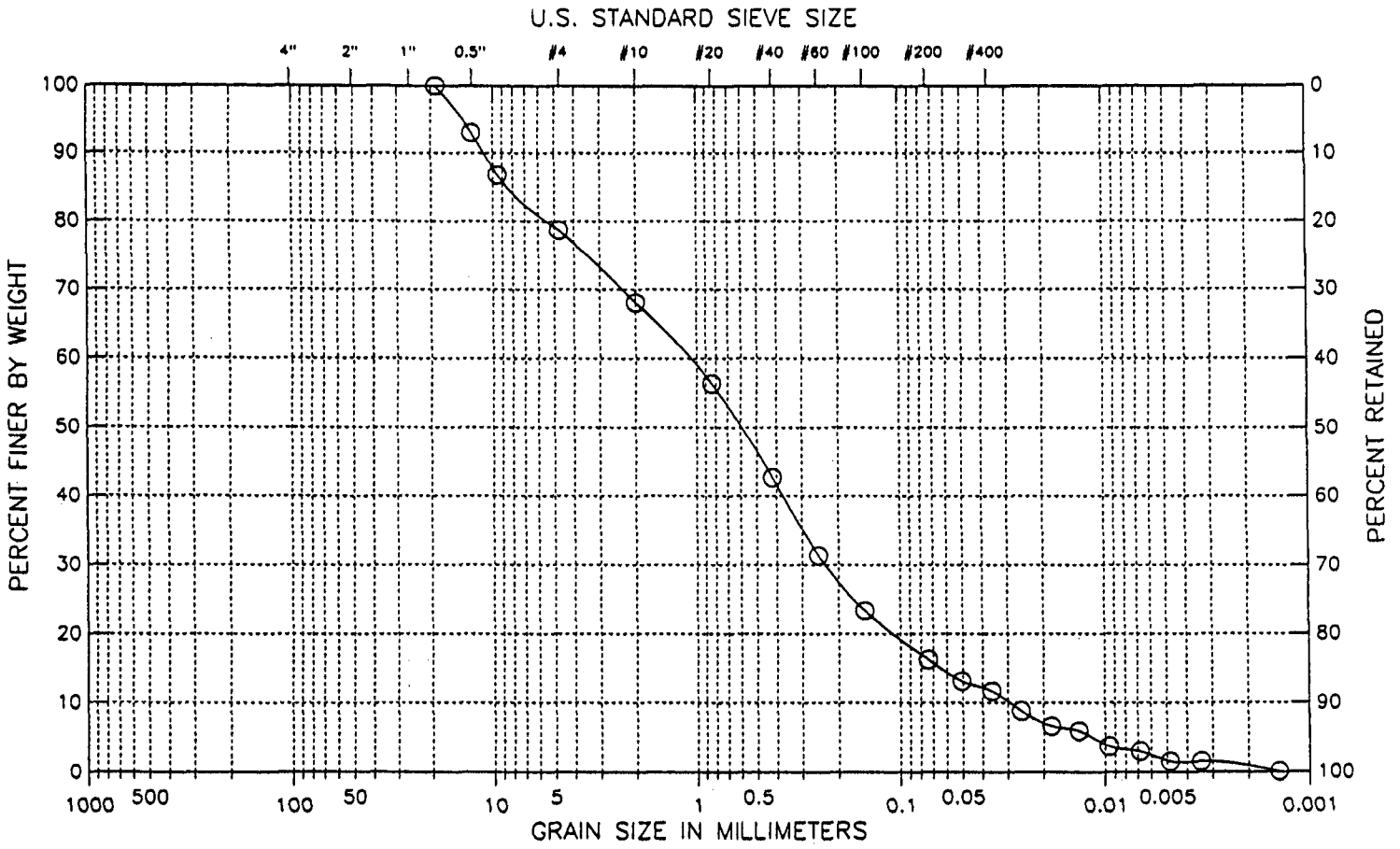
Sieve Mesh	Sieve Openings Inches	Millimeters	Weight Retained (gm)	Cumulative Weight Retained (gm)	Percent Finer (%)
0.75"	0.748	19.00	0.00	0.00	100
0.5"	0.500	12.70	4.30	4.30	96
0.375"	0.374	9.51	3.76	8.06	92
#4	0.187	4.75	9.80	17.86	83
#10	0.079	2.00	12.82	30.68	71
#20	0.033	0.84	19.70	50.38	52
#40	0.017	0.42	29.06	79.44	25
#60	0.010	0.25	12.39	91.83	13
#100	0.006	0.15	5.34	97.17	8
#200	0.003	0.07	2.65	99.82	5
Pan			5.60	105.42	0

Total Dry Weight of Sample = 114.44

D85 : 5.4912 mm
D60 : 1.2068 mm
D50 : 0.7955 mm
D30 : 0.4807 mm
D15 : 0.2744 mm
D10 : 0.1861 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. : MW-A25 Sample No.: S-1 (1-2) Test Method ASTM D 422 Filename : MWA25S1	Project : New Bedford Harbor Superfund Site Project No.: GTX-2409 Location: New Bedford, MA Date : Wed Jan 05 2000



COBBLES	GRAVEL		SAND			SILT OR CLAY
	COARSE	FINE	COARSE	MEDIUM	FINE	

Classification :

Remarks :

Visual Description :
Moist, dark grayish brown silty sand with gravel

Figure 25

GEOTECHNICAL LABORATORY TEST DATA

Project : New Bedford Harbor Superfund Site
Project No. : GTX-2409
Boring No. : MW-A25
Sample No. : S-1 (1-2)
Location : New Bedford, MA
Soil Description : Moist, dark grayish brown silty sand with gravel
Remarks : ---

Depth : 1-2 ft
Test Date : 12/03/99
Test Method : ASTM D 422

Filename : MWA25S1
Elevation : ---
Tested by : AL
Checked by : GTT

HYDROMETER

Hydrometer ID : 87130
Weight of air-dried soil = 47.07 gm
Specific Gravity = 2.65

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	15.00	20.00	9.08	0.051	13	0.051
2.00	14.00	20.00	8.08	0.036	12	0.036
4.00	12.00	20.00	6.08	0.026	9	0.026
8.00	10.50	20.00	4.58	0.018	7	0.018
15.00	10.00	20.00	4.08	0.013	6	0.013
30.00	8.50	20.00	2.58	0.010	4	0.010
60.00	8.00	20.00	2.08	0.007	3	0.007
120.00	7.00	20.00	1.08	0.005	2	0.005
240.00	7.00	20.00	1.08	0.003	2	0.003
1415.00	6.00	20.00	0.08	0.001	0	0.001

FINE SIEVE SET

Sieve Mesh	Sieve Openings Inches	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	4.83	4.83	93
0.375"	0.374	9.51	4.28	9.11	87
#4	0.187	4.75	5.63	14.74	79
#10	0.079	2.00	7.37	22.11	68
#20	0.033	0.84	8.06	30.17	56
#40	0.017	0.42	9.50	39.67	43
#60	0.010	0.25	7.80	47.47	31
#100	0.006	0.15	5.54	53.01	23
#200	0.003	0.07	4.92	57.93	16
Pan			11.25	69.18	0

Total Dry Weight of Sample = 78.36

D85 : 8.1345 mm
D60 : 1.1000 mm
D50 : 0.6088 mm
D30 : 0.2286 mm
D15 : 0.0635 mm
D10 : 0.0297 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

H

APPENDIX H

Atterberg Limits Results

ATTERBERG LIMITS

PROJECT New Bedford Harbor Superfund Site	PROJECT NUMBER GTX-2409	TESTED BY AL/GSG	BORING NUMBER FA-1
LOCATION New Bedford, MA		CHECKED BY GTT	SAMPLE NUMBER U0-1 (11-13)
SAMPLE DESCRIPTION Moist, dark brown sandy silt with organics		DATE Wed Jan 05 2000	FILENAME FA1U01

LIQUID LIMIT DETERMINATIONS					
CONTAINER NUMBER					
WT. WET SOIL + TARE					
WT. DRY SOIL + TARE					
WT. WATER					
TARE WT.					
WT. DRY SOIL					
WATER CONTENT, W_N (%)					
NUMBER OF BLOWS, N					
ONE-POINT LIQUID LIMIT, LL					
PLASTIC LIMIT DETERMINATIONS					
CONTAINER NUMBER					
WT. WET SOIL + TARE					
WT. DRY SOIL + TARE					
WT. WATER					
TARE WT.					
WT. DRY SOIL					
WATER CONTENT (%)					

Determined to be Non-Plastic.

SUMMARY OF RESULTS	
NATURAL WATER CONTENT, W (%)	480.6
LIQUID LIMIT, LL	
PLASTIC LIMIT, PL	
PLASTICITY INDEX, PI	
LIQUIDITY INDEX, LI*	

*LI = (W - PL)/PI

PLASTICITY CHART

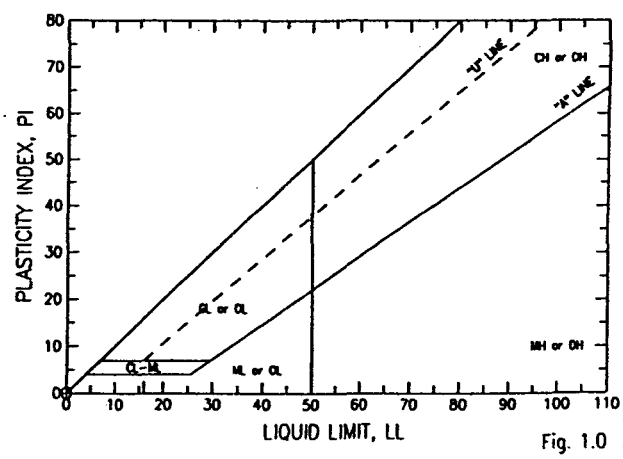
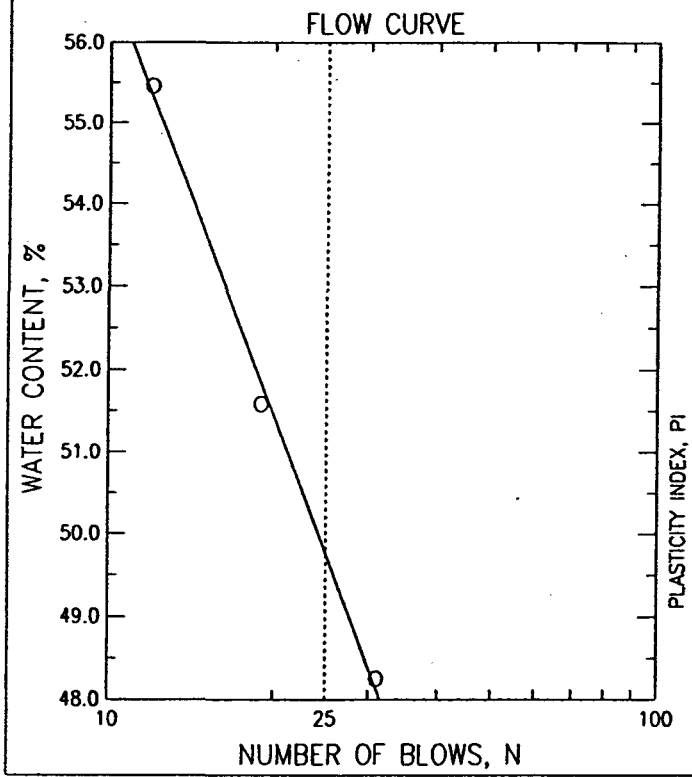


Fig. 1.0

ATTERBERG LIMITS

PROJECT	PROJECT NUMBER	TESTED BY	BORING NUMBER
New Bedford Harbor Superfund Site	GTX-2409	AL/GSG	FA-9
LOCATION		CHECKED BY	SAMPLE NUMBER
New Bedford, MA		GTT	UO-1 (2-4)
SAMPLE DESCRIPTION		DATE	FILENAME
Moist, brown silty sand with gravel, organics		Wed Jan 05 2000	FA9U01

LIQUID LIMIT DETERMINATIONS					
CONTAINER NUMBER	129	60	58		
WT. WET SOIL + TARE	33.72	35.08	35.66		
WT. DRY SOIL + TARE	31.79	33.45	33.78		
WT. WATER	1.93	1.63	1.88		
TARE WT.	27.79	30.29	30.39		
WT. DRY SOIL	4	3.16	3.39		
WATER CONTENT, W_N (%)	48.25	51.58	55.46		
NUMBER OF BLOWS, N	31	19	12		
ONE-POINT LIQUID LIMIT, LL	49.52	49.90	50.74		
PLASTIC LIMIT DETERMINATIONS					
CONTAINER NUMBER	2	44			
WT. WET SOIL + TARE	36.36	36.54			
WT. DRY SOIL + TARE	34.77	34.99			
WT. WATER	1.59	1.55			
TARE WT.	30.27	30.17			
WT. DRY SOIL	4.5	4.82			
WATER CONTENT (%)	35.33	32.16			



SUMMARY OF RESULTS	
NATURAL WATER CONTENT, W (%)	30.4
LIQUID LIMIT, LL	49.8
PLASTIC LIMIT, PL	33.7
PLASTICITY INDEX, PI	16.0
LIQUIDITY INDEX, LI*	-0.21

*LI = (W - PL)/PI

PLASTICITY CHART

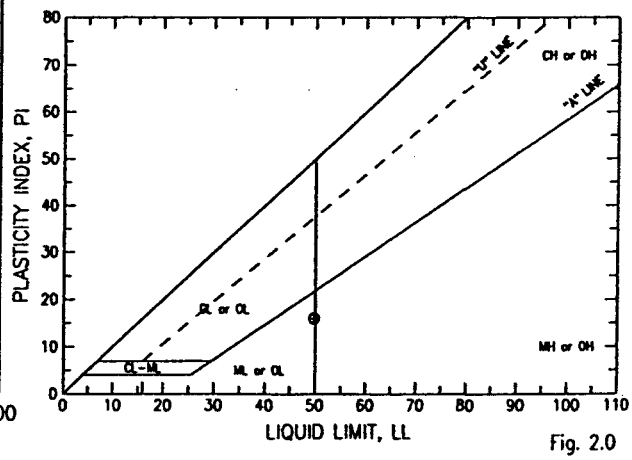


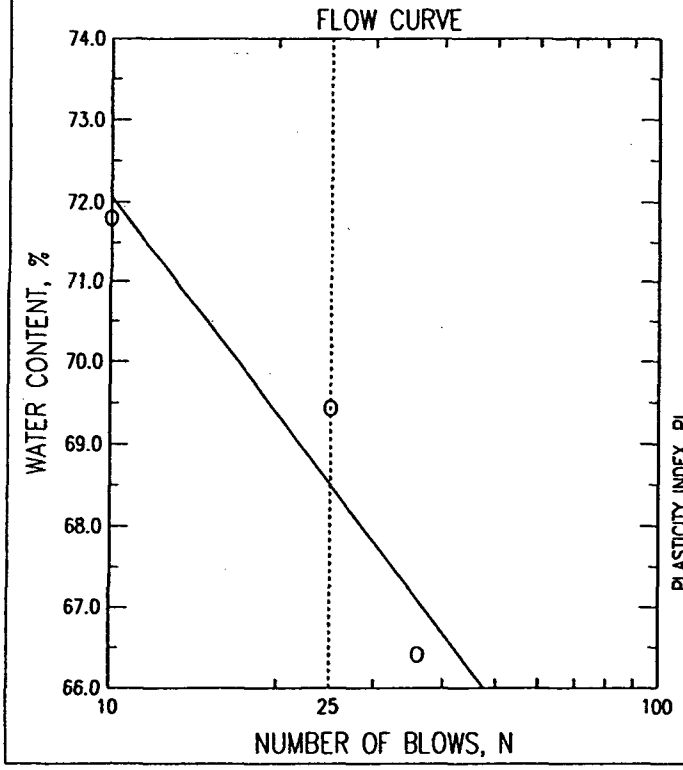
Fig. 2.0

ATTERBERG LIMITS

PROJECT	PROJECT NUMBER	TESTED BY	BORING NUMBER
New Bedford Harbor Superfund Site	GTX-2409	AL/GSG	FA-12
LOCATION		CHECKED BY	SAMPLE NUMBER
New Bedford, MA		GTT	UO-2 (4-6)
SAMPLE DESCRIPTION		DATE	FILENAME
Moist, black sandy organic clay		Wed Jan 05 2000	FA12UO2

LIQUID LIMIT DETERMINATIONS					
CONTAINER NUMBER	82	69	105		
WT. WET SOIL + TARE	36.06	35.88	35.98		
WT. DRY SOIL + TARE	33.45	33.54	33.51		
WT. WATER	2.61	2.34	2.47		
TARE WT.	29.52	30.17	30.07		
WT. DRY SOIL	3.93	3.37	3.44		
WATER CONTENT, W_N (%)	66.41	69.44	71.80		
NUMBER OF BLOWS, N	36	25	10		
ONE-POINT LIQUID LIMIT, LL	69.41	69.44	64.27		

PLASTIC LIMIT DETERMINATIONS					
CONTAINER NUMBER	6	119			
WT. WET SOIL + TARE	36.91	37.45			
WT. DRY SOIL + TARE	35.27	35.2			
WT. WATER	1.64	2.25			
TARE WT.	29.5	27.69			
WT. DRY SOIL	5.77	7.51			
WATER CONTENT (%)	28.42	29.96			



SUMMARY OF RESULTS	
NATURAL WATER CONTENT, W (%)	71.1
LIQUID LIMIT, LL	68.5
PLASTIC LIMIT, PL	29.2
PLASTICITY INDEX, PI	39.3
LIQUIDITY INDEX, LI*	1.07

*LI = (W − PL)/PI

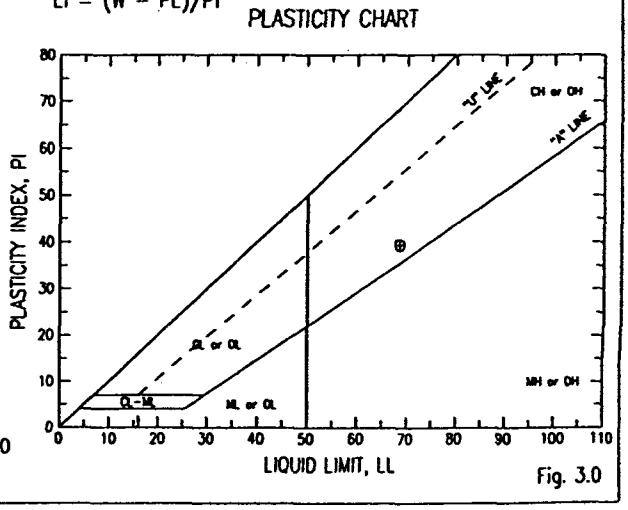


Fig. 3.0

GEOTECHNICAL LABORATORY TEST DATA

Project : New Bedford Harbor Superfund Site
Project No. : GTX-2409
Boring No. : FA-12
Sample No. : UO-2 (4-6)
Location : New Bedford, MA
Soil Description : Moist, black sandy organic clay
Remarks : ---

Depth : 4-6 ft
Test Date : 12/14/99
Test Method : ASTM D 4318

Filename : FA12U02
Elevation : ---
Tested by : AL/GSG
Checked by : GTT

Liquid Limit for Organic

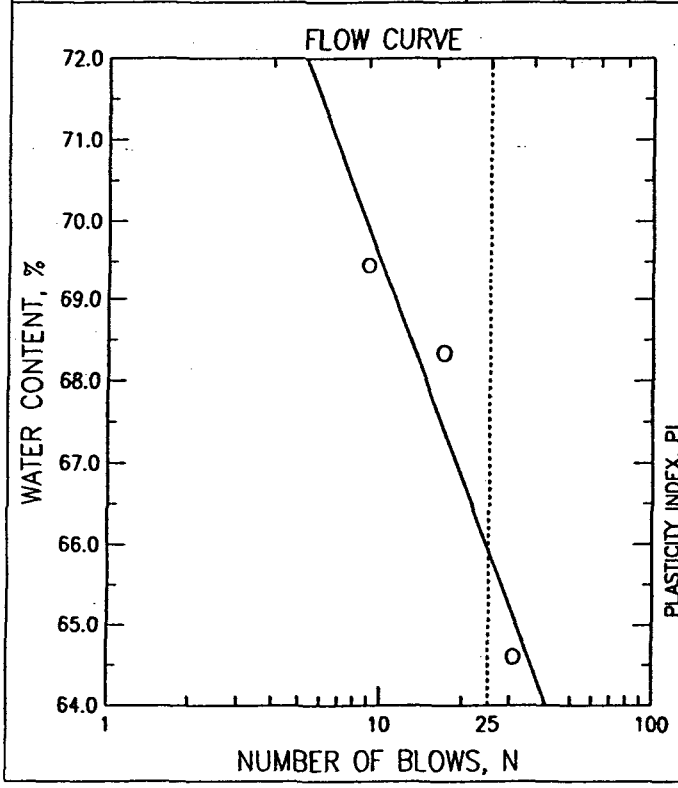
Moisture Content ID	Mass of Container (gm)	Mass of Container and Moist Soil (gm)	Mass of Container and Dried Soil (gm)	Number of Drops	Moisture Content (%)
1) 137	29.36	35.83	33.89	26	42.83
2) 37	29.67	34.92	33.32	15	43.84
3) 59	29.48	35.33	33.51	10	45.16

Liquid Limit = 42.83

ATTERBERG LIMITS

PROJECT	PROJECT NUMBER	TESTED BY	BORING NUMBER
New Bedford Harbor Superfund Site	GTX-2409	AL/GSG	FA-12
LOCATION		CHECKED BY	SAMPLE NUMBER
New Bedford, MA		GTT	U0-3 (7-9)
SAMPLE DESCRIPTION		DATE	FILENAME
Moist, dark gray silt with organics		Wed Jan 05 2000	FA12U03

LIQUID LIMIT DETERMINATIONS					
CONTAINER NUMBER	91	133	59		
WT. WET SOIL + TARE	35.72	31.95	34.12		
WT. DRY SOIL + TARE	33.53	30.18	32.21		
WT. WATER	2.19	1.77	1.91		
TARE WT.	30.14	27.59	29.46		
WT. DRY SOIL	3.39	2.59	2.75		
WATER CONTENT, W_N (%)	64.60	68.34	69.45		
NUMBER OF BLOWS, N	31	17	9		
ONE-POINT LIQUID LIMIT, LL	66.31	65.22	61.38		
PLASTIC LIMIT DETERMINATIONS					
CONTAINER NUMBER	64	112			
WT. WET SOIL + TARE	34.24	34.9			
WT. DRY SOIL + TARE	32.86	33.49			
WT. WATER	1.38	1.41			
TARE WT.	29.55	30.14			
WT. DRY SOIL	3.31	3.35			
WATER CONTENT (%)	41.69	42.09			



SUMMARY OF RESULTS	
NATURAL WATER CONTENT, W (%)	85.3
LIQUID LIMIT, LL	65.9
PLASTIC LIMIT, PL	41.9
PLASTICITY INDEX, PI	24.0
LIQUIDITY INDEX, LI*	1.81

*LI = (W − PL)/PI

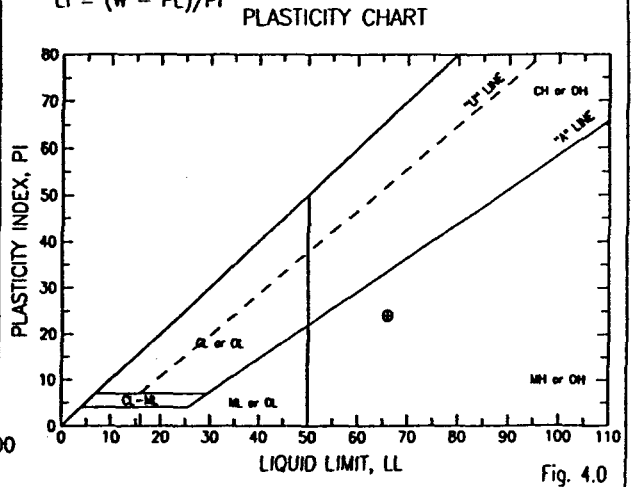


Fig. 4.0

GEOTECHNICAL LABORATORY TEST DATA

Project : New Bedford Harbor Superfund Site
Project No. : GTX-2409
Depth : 7-9 ft
Filename : FA12UO3
Elevation : ---
Boring No. : FA-12
Test Date : 12/14/99
Tested by : AL/GSG
Sample No. : UO-3 (7-9)
Test Method : ASTM D 4318
Checked by : GTT
Location : New Bedford, MA
Soil Description : Moist, dark gray silt with organics
Remarks : ---

Liquid Limit for Organic

Moisture Content ID	Mass of Container (gm)	Mass of Container and Moist Soil (gm)	Mass of Container and Dried Soil (gm)	Number of Drops	Moisture Content (%)
1) 69	30.16	36.11	33.95	35	56.99
2) 49	30.60	35.58	33.66	27	62.75
3) 98	27.49	33.50	31.10	12	66.48

Liquid Limit = 61.23

ATTERBERG LIMITS

PROJECT	PROJECT NUMBER	TESTED BY	BORING NUMBER
New Bedford Harbor Superfund Site	GTX-2409	AL/GSG	FA-12
LOCATION		CHECKED BY	SAMPLE NUMBER
New Bedford, MA		GTT	U0-4 (10-12)
SAMPLE DESCRIPTION		DATE	FILENAME
Moist, dark gray sand		Wed Jan 05 2000	FA12U04

LIQUID LIMIT DETERMINATIONS					
CONTAINER NUMBER					
WT. WET SOIL + TARE					
WT. DRY SOIL + TARE					
WT. WATER					
TARE WT.					
WT. DRY SOIL					
WATER CONTENT, W_N (%)					
NUMBER OF BLOWS, N					
ONE-POINT LIQUID LIMIT, LL					

PLASTIC LIMIT DETERMINATIONS					
CONTAINER NUMBER					
WT. WET SOIL + TARE					
WT. DRY SOIL + TARE					
WT. WATER					
TARE WT.					
WT. DRY SOIL					
WATER CONTENT (%)					

Determined to be Non-Plastic.

SUMMARY OF RESULTS	
NATURAL WATER CONTENT, W (%)	13.2
LIQUID LIMIT, LL	
PLASTIC LIMIT, PL	
PLASTICITY INDEX, PI	
LIQUIDITY INDEX, LI*	

*LI = (W – PL)/PI

PLASTICITY CHART

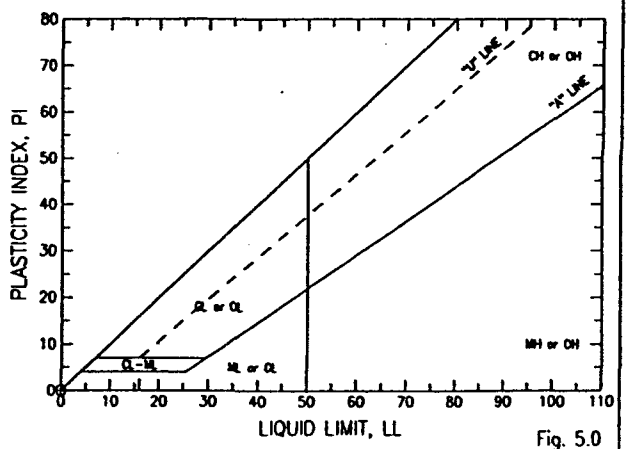


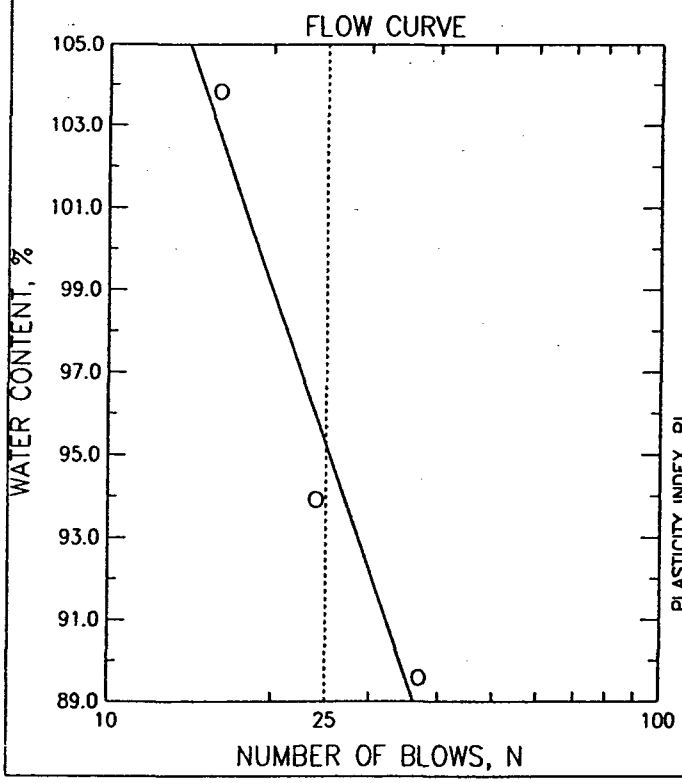
Fig. 5.0

ATTERBERG LIMITS

PROJECT	PROJECT NUMBER	TESTED BY	BORING NUMBER
New Bedford Harbor Superfund Site	GTX-2409	AL/GSG	FA-15
LOCATION		CHECKED BY	SAMPLE NUMBER
New Bedford, MA		GTT	UO-1 (1-3)
SAMPLE DESCRIPTION		DATE	FILENAME
Moist, dark gray organic silt		Wed Jan 05 2000	FA15UO1

LIQUID LIMIT DETERMINATIONS					
CONTAINER NUMBER	49	68	43		
WT. WET SOIL + TARE	34.04	35.09	34.54		
WT. DRY SOIL + TARE	32.34	32.94	32.37		
WT. WATER	1.7	2.15	2.17		
TARE WT.	30.53	30.54	30.28		
WT. DRY SOIL	1.81	2.4	2.09		
WATER CONTENT, W_N (%)	93.92	89.58	103.83		
NUMBER OF BLOWS, N	24	37	16		
ONE-POINT LIQUID LIMIT, LL	93.46	93.94	98.37		

PLASTIC LIMIT DETERMINATIONS					
CONTAINER NUMBER	69	6			
WT. WET SOIL + TARE	35.06	34.48			
WT. DRY SOIL + TARE	33.89	33.31			
WT. WATER	1.17	1.17			
TARE WT.	30.18	29.5			
WT. DRY SOIL	3.71	3.81			
WATER CONTENT (%)	31.54	30.71			



SUMMARY OF RESULTS	
NATURAL WATER CONTENT, W (%)	103.0
LIQUID LIMIT, LL	95.2
PLASTIC LIMIT, PL	31.1
PLASTICITY INDEX, PI	64.1
LIQUIDITY INDEX, LI*	1.12

*LI = (W − PL)/PI

PLASTICITY CHART

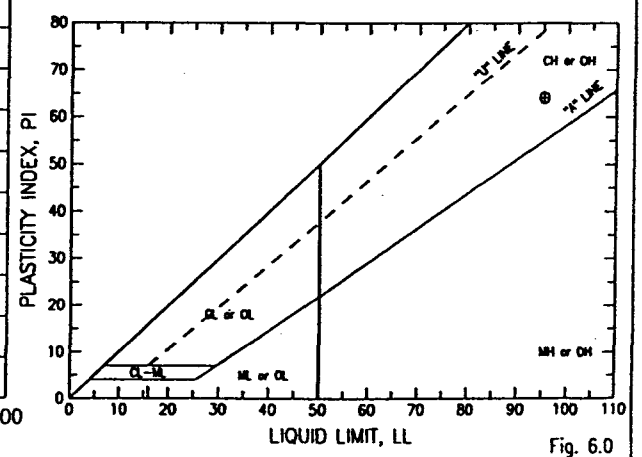


Fig. 6.0

GEOTECHNICAL LABORATORY TEST DATA

Project : New Bedford Harbor Superfund Site
Project No. : GTX-2409 Depth : 1-3 ft Filename : FA15UO1
Boring No. : FA-15 Test Date : 12/14/99 Elevation : ---
Sample No. : UO-1 (1-3) Test Method : ASTM D 4318 Tested by : AL/GSG
Location : New Bedford, MA Checked by : GTT
Soil Description : Moist, dark gray organic silt
Remarks : ---

Liquid Limit for Organic

Moisture Content ID	Mass of Container (gm)	Mass of Container and Moist Soil (gm)	Mass of Container and Dried Soil (gm)	Number of Drops	Moisture Content (%)
1) 49	30.50	38.66	35.70	40	56.92
2) 144	29.58	36.81	34.13	24	58.90
3) 137	29.43	36.24	33.63	15	62.14

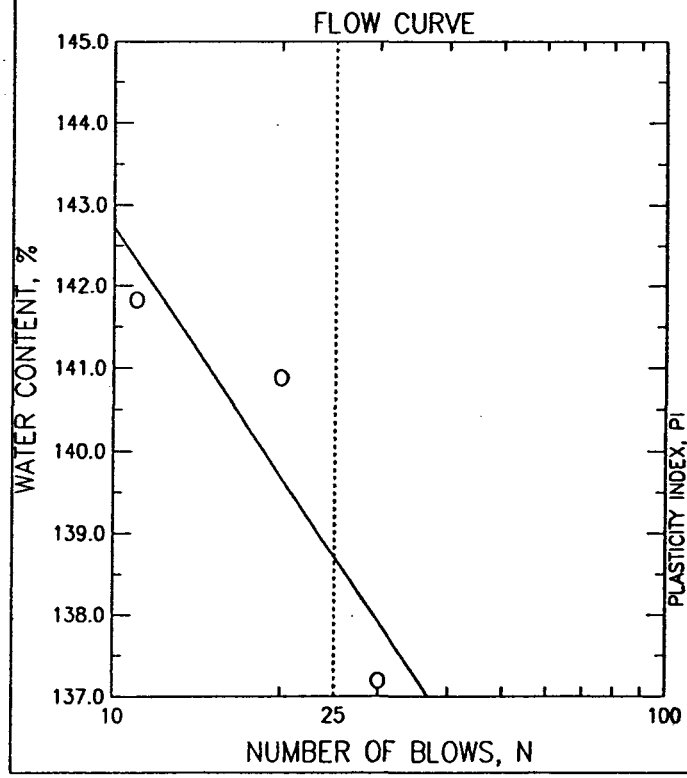
Liquid Limit = 59.18

ATTERBERG LIMITS

PROJECT	PROJECT NUMBER	TESTED BY	BORING NUMBER
New Bedford Harbor Superfund Site	GTX-2409	AL/CSG	FA-15
LOCATION		CHECKED BY	SAMPLE NUMBER
New Bedford, MA		GTT	UO-2 (4-6)
SAMPLE DESCRIPTION		DATE	FILENAME
Moist, dark gray organic clay		Wed Jan 05 2000	FA15UO2B

LIQUID LIMIT DETERMINATIONS					
CONTAINER NUMBER	3	87	123		
WT. WET SOIL + TARE	35.89	33.53	34.5		
WT. DRY SOIL + TARE	32.57	30.98	31.55		
WT. WATER	3.32	2.55	2.95		
TARE WT.	30.15	29.17	29.47		
WT. DRY SOIL	2.42	1.81	2.08		
WATER CONTENT, W_N (%)	137.19	140.88	141.83		
NUMBER OF BLOWS, N	30	20	11		
ONE-POINT LIQUID LIMIT, LL	140.25	137.13	128.42		

PLASTIC LIMIT DETERMINATIONS					
CONTAINER NUMBER	126	130			
WT. WET SOIL + TARE	33.51	33.15			
WT. DRY SOIL + TARE	31.81	31.44			
WT. WATER	1.7	1.71			
TARE WT.	28.11	27.62			
WT. DRY SOIL	3.7	3.82			
WATER CONTENT (%)	45.95	44.76			



SUMMARY OF RESULTS	
NATURAL WATER CONTENT, W (%)	113.6
LIQUID LIMIT, LL	138.7
PLASTIC LIMIT, PL	45.4
PLASTICITY INDEX, PI	93.3
LIQUIDITY INDEX, LI*	0.73

*LI = (W - PL)/PI

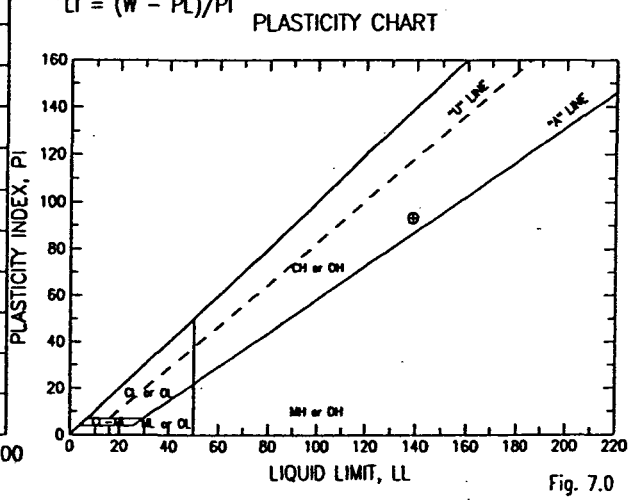


Fig. 7.0

GEOTECHNICAL LABORATORY TEST DATA

Project : New Bedford Harbor Superfund Site
Project No. : GTX-2409
Boring No. : FA-15
Sample No. : UO-2 (4-6)
Location : New Bedford, MA
Soil Description : Moist, dark gray organic clay
Remarks : ---

Depth : 4-6 ft
Test Date : 12/14/99
Test Method : ASTM D 4318

Filename : FA15UO2B
Elevation : ---
Tested by : AL/GSG
Checked by : GTT

Liquid Limit for Organic

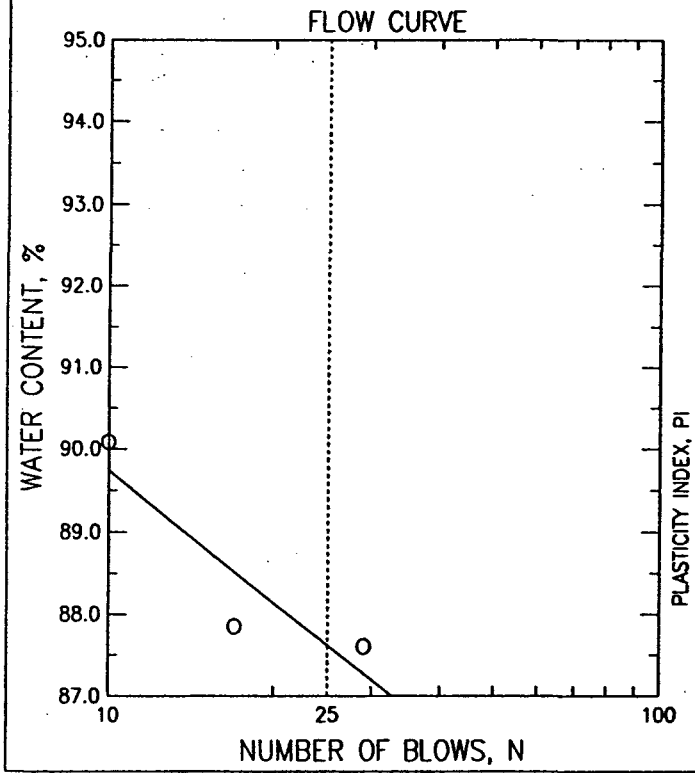
Moisture Content ID	Mass of Container (gm)	Mass of Container and Moist Soil (gm)	Mass of Container and Dried Soil (gm)	Number of Drops	Moisture Content (%)
1) 95	29.36	34.92	32.89	31	57.51
2) 84	30.38	35.88	33.83	17	59.42
3) 131	30.11	34.97	33.10	10	62.54

Liquid Limit = 58.22

ATTERBERG LIMITS

PROJECT New Bedford Harbor Superfund Site	PROJECT NUMBER GTX-2409	TESTED BY AL/GSG	BORING NUMBER FA-15
LOCATION New Bedford, MA		CHECKED BY GTT	SAMPLE NUMBER UO-3 (7-9)
SAMPLE DESCRIPTION Moist, dark gray organic clay		DATE Wed Jan 05 2000	FILENAME FA15U03

LIQUID LIMIT DETERMINATIONS					
CONTAINER NUMBER	130	87	92		
WT. WET SOIL + TARE	32.17	33.18	33.94		
WT. DRY SOIL + TARE	30.05	31.3	31.76		
WT. WATER	2.12	1.88	2.18		
TARE WT.	27.63	29.16	29.34		
WT. DRY SOIL	2.42	2.14	2.42		
WATER CONTENT, W_N (%)	87.60	87.85	90.08		
NUMBER OF BLOWS, N	29	17	10		
ONE-POINT LIQUID LIMIT, LL	89.19	83.85	80.63		
PLASTIC LIMIT DETERMINATIONS					
CONTAINER NUMBER	123	51			
WT. WET SOIL + TARE	37.07	36.02			
WT. DRY SOIL + TARE	35.19	34.54			
WT. WATER	1.88	1.48			
TARE WT.	29.49	30.05			
WT. DRY SOIL	5.7	4.49			
WATER CONTENT (%)	32.98	32.96			



SUMMARY OF RESULTS	
NATURAL WATER CONTENT, W (%)	90.1
LIQUID LIMIT, LL	87.6
PLASTIC LIMIT, PL	33.0
PLASTICITY INDEX, PI	54.6
LIQUIDITY INDEX, LI*	1.05

*LI = (W − PL)/PI

PLASTICITY CHART

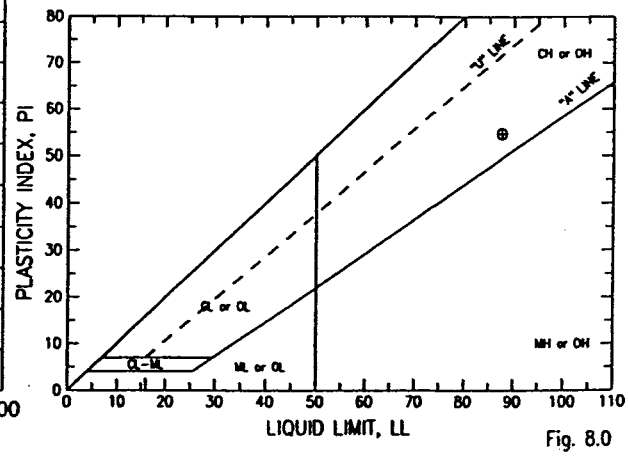


Fig. 8.0

GEOTECHNICAL LABORATORY TEST DATA

Project : New Bedford Harbor Superfund Site
Project No. : GTX-2409
Boring No. : FA-15
Sample No. : UO-3 (7-9)
Location : New Bedford, MA
Soil Description : Moist, dark gray organic clay
Remarks : ---

Depth : 7-9 ft
Test Date : 12/14/99
Test Method : ASTM D 4318

Filename : FA15U03
Elevation : ---
Tested by : AL/GSG
Checked by : GTT

Liquid Limit for Organic

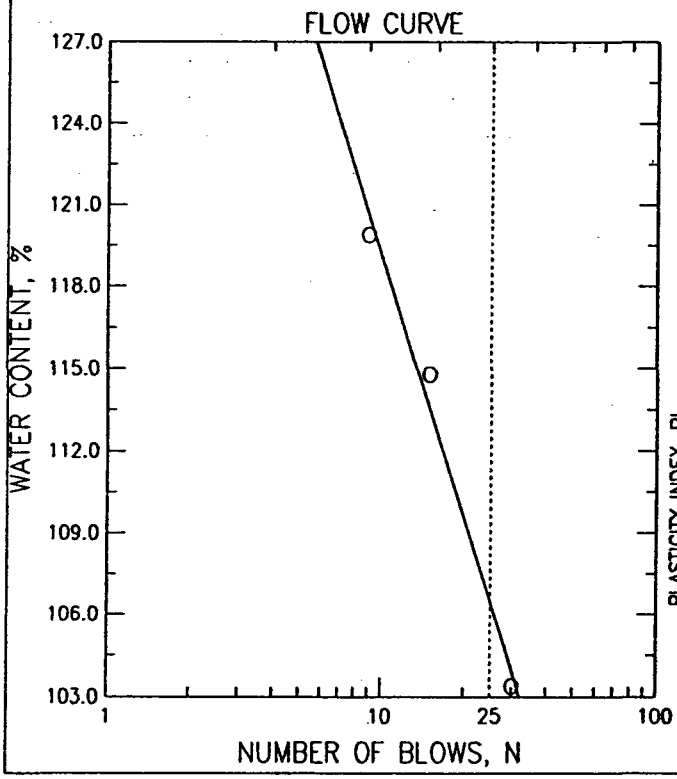
Moisture Content ID	Mass of Container (gm)	Mass of Container and Moist Soil (gm)	Mass of Container and Dried Soil (gm)	Number of Drops	Moisture Content (%)
1) 121	29.82	36.13	34.06	25	48.82
2) 61	30.63	36.28	34.40	21	49.87
3) 40	29.28	35.15	33.10	10	53.66
4) 96	29.69	38.01	35.55	36	41.98

Liquid Limit = 47.06

ATTERBERG LIMITS

PROJECT New Bedford Harbor Superfund Site	PROJECT NUMBER GTX-2409	TESTED BY AL/GSG	BORING NUMBER FA-18
LOCATION New Bedford, MA		CHECKED BY GTT	SAMPLE NUMBER UO-1 (0-2)
SAMPLE DESCRIPTION Moist, very dark gray organic clay		DATE Wed Jan 05 2000	FILENAME FA18UO1

LIQUID LIMIT DETERMINATIONS					
CONTAINER NUMBER	103	137	32		
WT. WET SOIL + TARE	36.9	35.97	34.09		
WT. DRY SOIL + TARE	33.33	32.61	31.92		
WT. WATER	3.57	3.36	2.17		
TARE WT.	30.22	29.36	30.11		
WT. DRY SOIL	3.11	3.25	1.81		
WATER CONTENT, W_N (%)	114.79	103.38	119.89		
NUMBER OF BLOWS, N	15	30	9		
ONE-POINT LIQUID LIMIT, LL	107.91	105.69	105.95		
PLASTIC LIMIT DETERMINATIONS					
CONTAINER NUMBER	92	144			
WT. WET SOIL + TARE	31.29	31.46			
WT. DRY SOIL + TARE	30.7	30.91			
WT. WATER	0.59	0.55			
TARE WT.	29.36	29.62			
WT. DRY SOIL	1.34	1.29			
WATER CONTENT (%)	44.03	42.64			



SUMMARY OF RESULTS	
NATURAL WATER CONTENT, W (%)	120.5
LIQUID LIMIT, LL	106.4
PLASTIC LIMIT, PL	43.3
PLASTICITY INDEX, PI	63.1
LIQUIDITY INDEX, LI*	1.22

*LI = (W − PL)/PI

PLASTICITY CHART

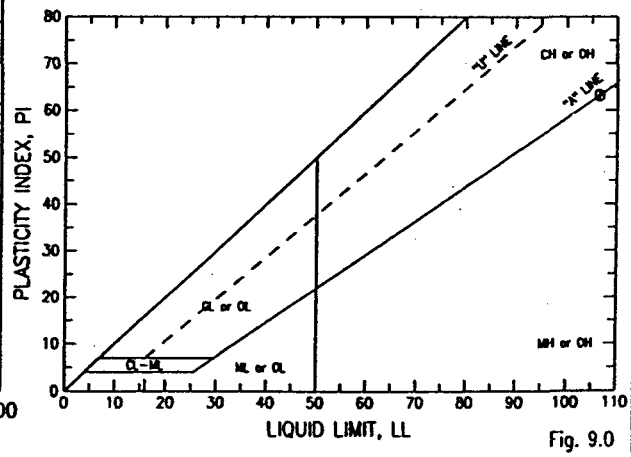


Fig. 9.0

GEOTECHNICAL LABORATORY TEST DATA

Project : New Bedford Harbor Superfund Site
Project No. : GTX-2409
Boring No. : FA-18
Sample No. : UO-1 (0-2)
Location : New Bedford, MA
Soil Description : Moist, very dark gray organic clay
Remarks : ---

Depth : 0-2 ft
Test Date : 12/14/99
Test Method : ASTM D 4318

Filename : FA18UO1
Elevation : ---
Tested by : AL/GSG
Checked by : GTT

Liquid Limit for Organic

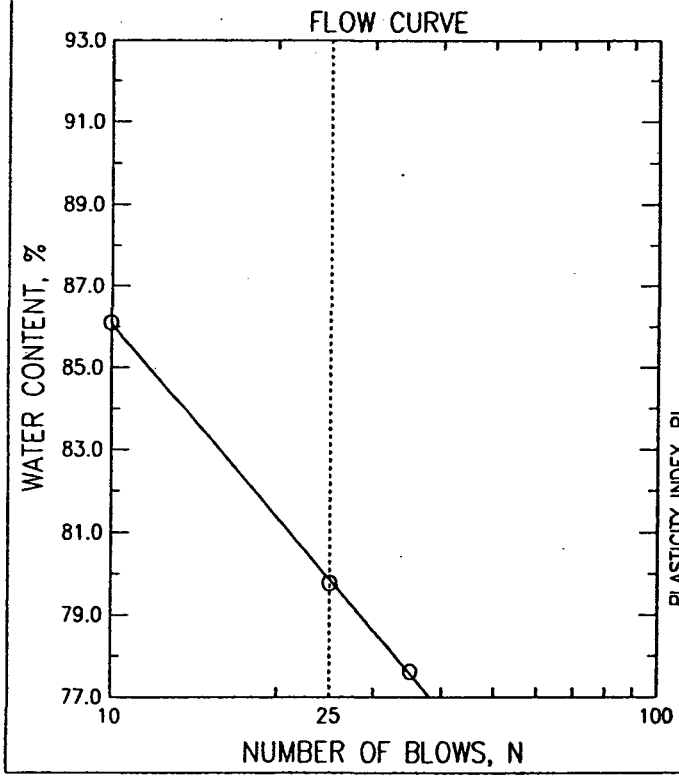
Moisture Content ID	Mass of Container (gm)	Mass of Container and Moist Soil (gm)	Mass of Container and Dried Soil (gm)	Number of Drops	Moisture Content (%)
1) 62	30.70	36.53	34.43	29	56.30
2) 116	29.89	35.90	33.71	20	57.33
3) 12	29.37	34.44	32.49	10	62.50

Liquid Limit = 56.72

ATTERBERG LIMITS

PROJECT	PROJECT NUMBER	TESTED BY	BORING NUMBER
New Bedford Harbor Superfund Site	GTX-2409	AL/GSG	FA-19
LOCATION		CHECKED BY	SAMPLE NUMBER
New Bedford, MA		GTT	UO-2 (4-6)
SAMPLE DESCRIPTION		DATE	FILENAME
Moist, very dark gray organic clay		Wed Jan 05 2000	FA19U02

LIQUID LIMIT DETERMINATIONS					
CONTAINER NUMBER	133	78	113		
WT. WET SOIL + TARE	32.53	36.72	37.12		
WT. DRY SOIL + TARE	30.38	33.96	33.9		
WT. WATER	2.15	2.76	3.22		
TARE WT.	27.61	30.5	30.16		
WT. DRY SOIL	2.77	3.46	3.74		
WATER CONTENT, W_N (%)	77.62	79.77	86.10		
NUMBER OF BLOWS, N	35	25	10		
ONE-POINT LIQUID LIMIT, LL	80.84	79.77	77.06		
PLASTIC LIMIT DETERMINATIONS					
CONTAINER NUMBER	13	68			
WT. WET SOIL + TARE	35.07	33.8			
WT. DRY SOIL + TARE	33.27	32.96			
WT. WATER	1.8	0.84			
TARE WT.	28.12	30.34			
WT. DRY SOIL	5.15	2.62			
WATER CONTENT (%)	34.95	32.06			



SUMMARY OF RESULTS	
NATURAL WATER CONTENT, W (%)	79.9
LIQUID LIMIT, LL	79.8
PLASTIC LIMIT, PL	33.5
PLASTICITY INDEX, PI	46.3
LIQUIDITY INDEX, LI*	1.00

*LI = (W - PL)/PI

PLASTICITY CHART

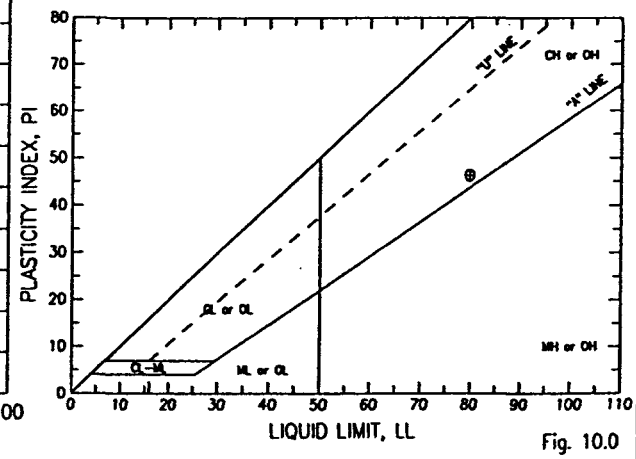


Fig. 10.0

GEOTECHNICAL LABORATORY TEST DATA

Project : New Bedford Harbor Superfund Site
Project No. : GTX-2409
Depth : 4-6 ft
Filename : FA19UO2
Elevation : ---
Boring No. : FA-19
Test Date : 12/14/99
Tested by : AL/GSG
Sample No. : UO-2 (4-6)
Test Method : ASTM D 4318
Checked by : GTT
Location : New Bedford, MA
Soil Description : Moist, very dark gray organic clay
Remarks : ---

Liquid Limit for Organic

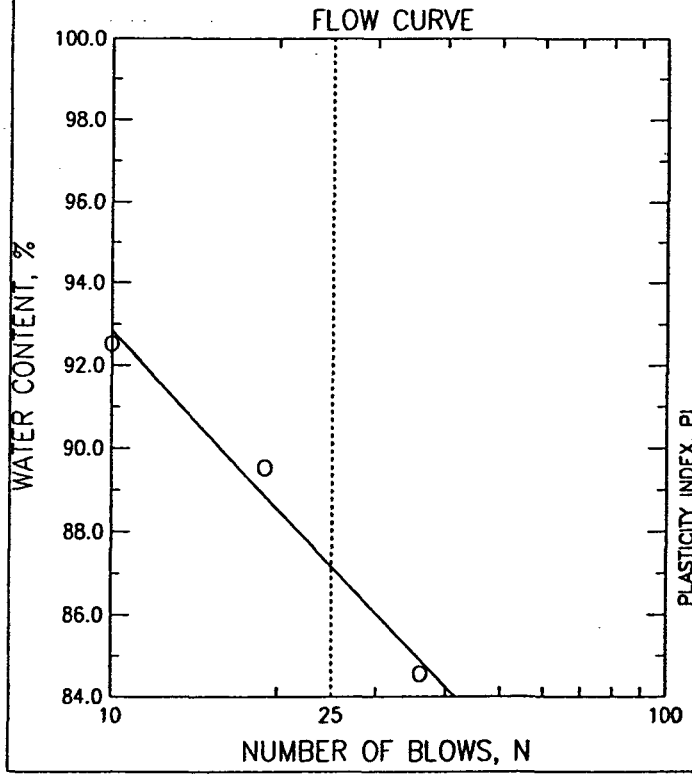
Moisture Content ID	Mass of Container (gm)	Mass of Container and Moist Soil (gm)	Mass of Container and Dried Soil (gm)	Number of Drops	Moisture Content (%)
1) 28	30.10	36.33	34.24	33	50.48
2) 76	29.17	35.68	33.44	18	52.46
3) 119	27.69	32.37	30.70	7	55.48

Liquid Limit = 51.39

ATTERBERG LIMITS

PROJECT	PROJECT NUMBER	TESTED BY	BORING NUMBER
New Bedford Harbor Superfund Site	GTX-2409	AL/GSG	FA-23
LOCATION		CHECKED BY	SAMPLE NUMBER
New Bedford, MA		GTT	UO-1 (3-5)
SAMPLE DESCRIPTION		DATE	FILENAME
Moist, very dark gray organic clay		Wed Jan 05 2000	FA23U01

LIQUID LIMIT DETERMINATIONS					
CONTAINER NUMBER	120	131	11		
WT. WET SOIL + TARE	33.94	34.65	35.01		
WT. DRY SOIL + TARE	31.97	32.51	32.66		
WT. WATER	1.97	2.14	2.35		
TARE WT.	29.64	30.12	30.12		
WT. DRY SOIL	2.33	2.39	2.54		
WATER CONTENT, W_N (%)	84.55	89.54	92.52		
NUMBER OF BLOWS, N	36	19	10		
ONE-POINT LIQUID LIMIT, LL	88.36	86.62	82.81		
PLASTIC LIMIT DETERMINATIONS					
CONTAINER NUMBER	84	134			
WT. WET SOIL + TARE	34.5	34.14			
WT. DRY SOIL + TARE	33.41	32.96			
WT. WATER	1.09	1.18			
TARE WT.	30.43	29.46			
WT. DRY SOIL	2.98	3.5			
WATER CONTENT (%)	36.58	33.71			



SUMMARY OF RESULTS	
NATURAL WATER CONTENT, W (%)	88.6
LIQUID LIMIT, LL	87.2
PLASTIC LIMIT, PL	35.1
PLASTICITY INDEX, PI	52.0
LIQUIDITY INDEX, LI*	1.03

*LI = (W - PL)/PI

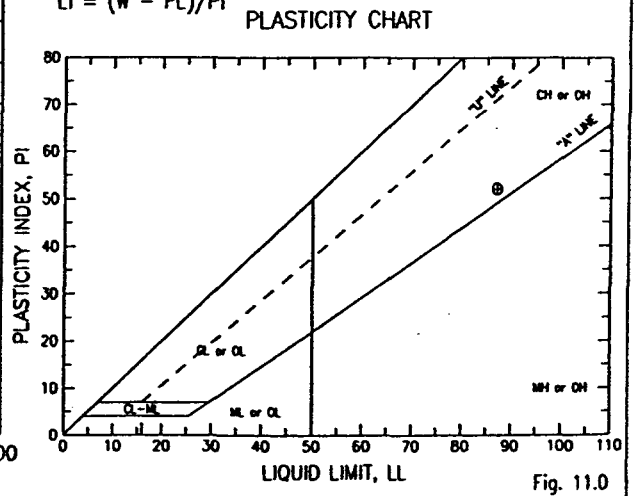


Fig. 11.0

GEOTECHNICAL LABORATORY TEST DATA

Project : New Bedford Harbor Superfund Site
Project No. : GTX-2409
Boring No. : FA-23
Sample No. : UO-1 (3-5)
Location : New Bedford, MA
Soil Description : Moist, very dark gray organic clay
Remarks : ---

Depth : 3-5 ft
Test Date : 12/14/99
Test Method : ASTM D 4318

Filename : FA23U01
Elevation : ---
Tested by : AL/GSG
Checked by : GTT

Liquid Limit for Organic

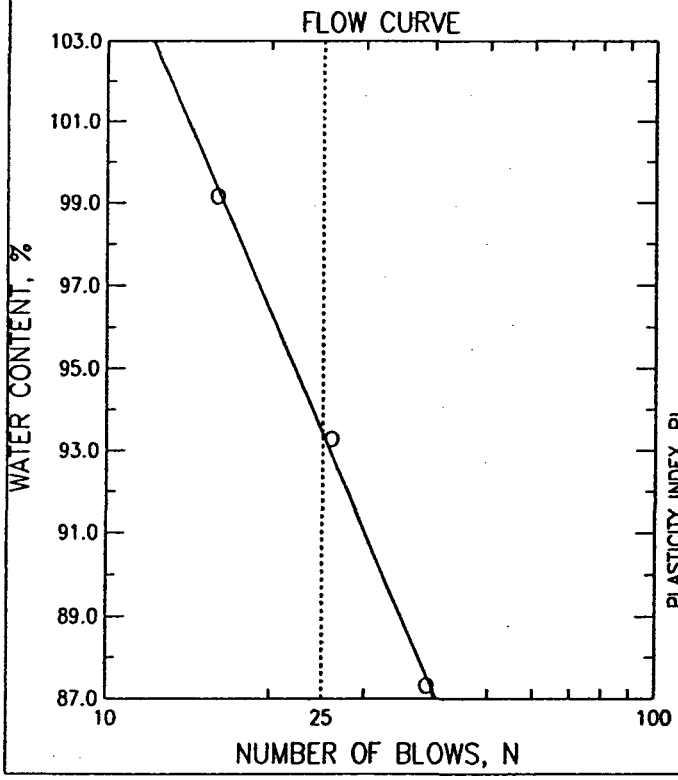
Moisture Content ID	Mass of Container (gm)	Mass of Container and Moist Soil (gm)	Mass of Container and Dried Soil (gm)	Number of Drops	Moisture Content (%)
1) 55	29.54	34.60	32.86	40	52.41
2) 4	29.40	35.43	33.31	25	54.22
3) 31	29.35	34.59	32.67	11	57.83

Liquid Limit = 54.33

ATTERBERG LIMITS

PROJECT	PROJECT NUMBER	TESTED BY	BORING NUMBER
New Bedford Harbor Superfund Site	GTX-2409	AL/GSG	FA-23
LOCATION		CHECKED BY	SAMPLE NUMBER
New Bedford, MA		GTT	U0-3 (9-11)
SAMPLE DESCRIPTION		DATE	FILENAME
Moist, very dark gray organic clay		Wed Jan 05 2000	FA23U03

LIQUID LIMIT DETERMINATIONS					
CONTAINER NUMBER	76	59	103		
WT. WET SOIL + TARE	33.03	32.38	34.91		
WT. DRY SOIL + TARE	31.24	30.99	32.57		
WT. WATER	1.79	1.39	2.34		
TARE WT.	29.19	29.5	30.21		
WT. DRY SOIL	2.05	1.49	2.36		
WATER CONTENT, W_N (%)	87.32	93.29	99.15		
NUMBER OF BLOWS, N	39	26	16		
ONE-POINT LIQUID LIMIT, LL	92.14	93.73	93.94		
PLASTIC LIMIT DETERMINATIONS					
CONTAINER NUMBER	119	49	82		
WT. WET SOIL + TARE	31.21	34.7	34.1		
WT. DRY SOIL + TARE	29.97	33.34	32.55		
WT. WATER	1.24	1.36	1.55		
TARE WT.	27.68	30.54	29.53		
WT. DRY SOIL	2.29	2.8	3.02		
WATER CONTENT (%)	54.15	48.57	51.32		



SUMMARY OF RESULTS	
NATURAL WATER CONTENT, W (%)	109.1
LIQUID LIMIT, LL	93.4
PLASTIC LIMIT, PL	51.3
PLASTICITY INDEX, PI	42.1
LIQUIDITY INDEX, LI*	1.37

*LI = (W - PL)/PI

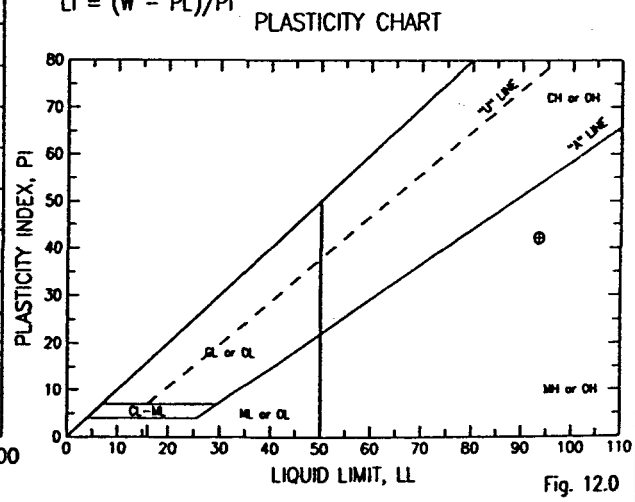


Fig. 12.0

GEOTECHNICAL LABORATORY TEST DATA

Project : New Bedford Harbor Superfund Site
Project No. : GTX-2409
Boring No. : FA-23
Sample No. : UO-3 (9-11)
Location : New Bedford, MA
Soil Description : Moist, very dark gray organic clay
Remarks : ---

Depth : 9-11 ft
Test Date : 12/14/99
Test Method : ASTM D 4318

Filename : FA23UO3
Elevation : ---
Tested by : AL/GSG
Checked by : GTT

Liquid Limit for Organic

	Moisture Content ID	Mass of Container (gm)	Mass of Container and Moist Soil (gm)	Mass of Container and Dried Soil (gm)	Number of Drops	Moisture Content (%)
1)	37	29.20	34.85	32.61	34	65.69
2)	112	30.16	36.27	33.79	19	68.32
3)	64	29.55	34.08	32.18	12	72.24

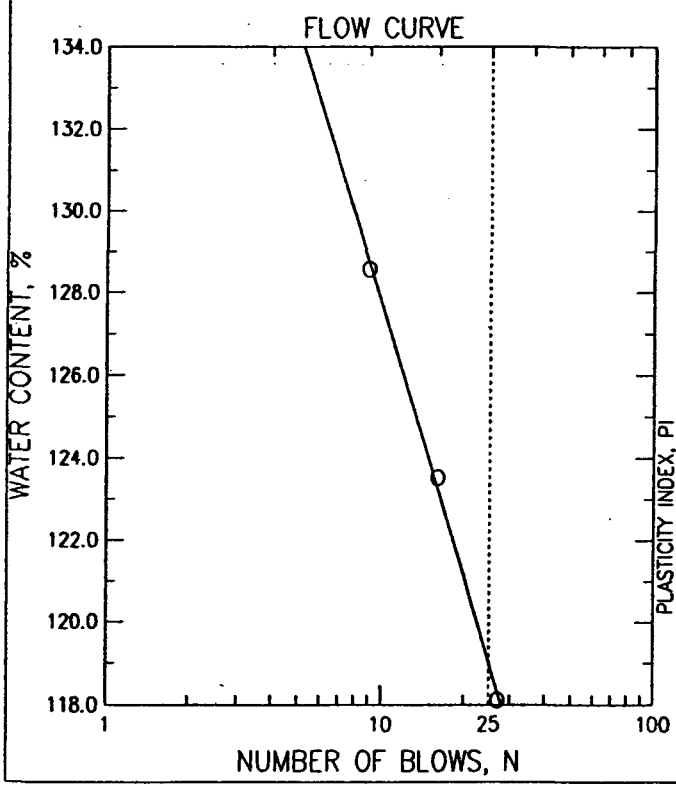
Liquid Limit = 67.30

ATTERBERG LIMITS

PROJECT	PROJECT NUMBER	TESTED BY	BORING NUMBER
New Bedford Harbor Superfund Site	GTX-2409	AL/GSG	FA-25
LOCATION		CHECKED BY	SAMPLE NUMBER
New Bedford, MA		GTT	UO-1 (0-2)
SAMPLE DESCRIPTION		DATE	FILENAME
Moist, very dark gray organic clay		Wed Jan 05 2000	FA25U01

LIQUID LIMIT DETERMINATIONS					
CONTAINER NUMBER	113	120	98		
WT. WET SOIL + TARE	35.91	33.45	32.3		
WT. DRY SOIL + TARE	32.78	31.35	29.6		
WT. WATER	3.13	2.1	2.7		
TARE WT.	30.13	29.65	27.5		
WT. DRY SOIL	2.65	1.7	2.1		
WATER CONTENT, W_N (%)	118.11	123.53	128.57		
NUMBER OF BLOWS, N	27	16	9		
ONE-POINT LIQUID LIMIT, LL	119.22	117.04	113.62		

PLASTIC LIMIT DETERMINATIONS					
CONTAINER NUMBER	95	11			
WT. WET SOIL + TARE	32.31	34.5			
WT. DRY SOIL + TARE	31.5	33.28			
WT. WATER	0.81	1.22			
TARE WT.	29.37	30.14			
WT. DRY SOIL	2.13	3.14			
WATER CONTENT (%)	38.03	38.85			



SUMMARY OF RESULTS	
NATURAL WATER CONTENT, W (%)	103.7
LIQUID LIMIT, LL	119.0
PLASTIC LIMIT, PL	38.4
PLASTICITY INDEX, PI	80.6
LIQUIDITY INDEX, LI*	0.81

*LI = (W - PL)/PI

PLASTICITY CHART

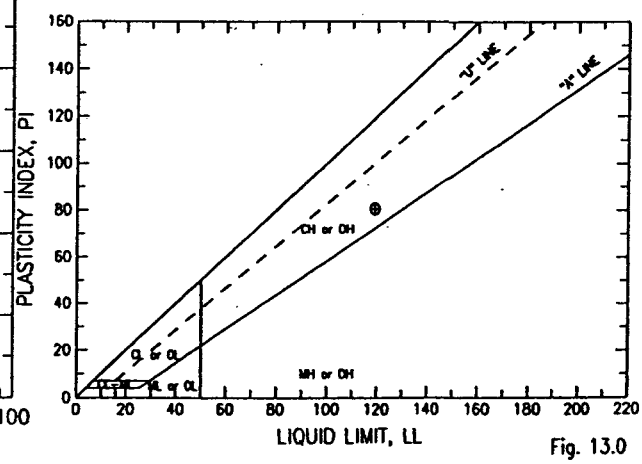


Fig. 13.0

GEOTECHNICAL LABORATORY TEST DATA

Project : New Bedford Harbor Superfund Site
Project No. : GTX-2409
Boring No. : FA-25
Sample No. : UO-1 (0-2)
Location : New Bedford, MA
Soil Description : Moist, very dark gray organic clay
Remarks : ---

Depth : 0-2 ft
Test Date : 12/14/99
Test Method : ASTM D 4318

Filename : FA25UO1
Elevation : ---
Tested by : AL/GSG
Checked by : GTT

Liquid Limit for Organic

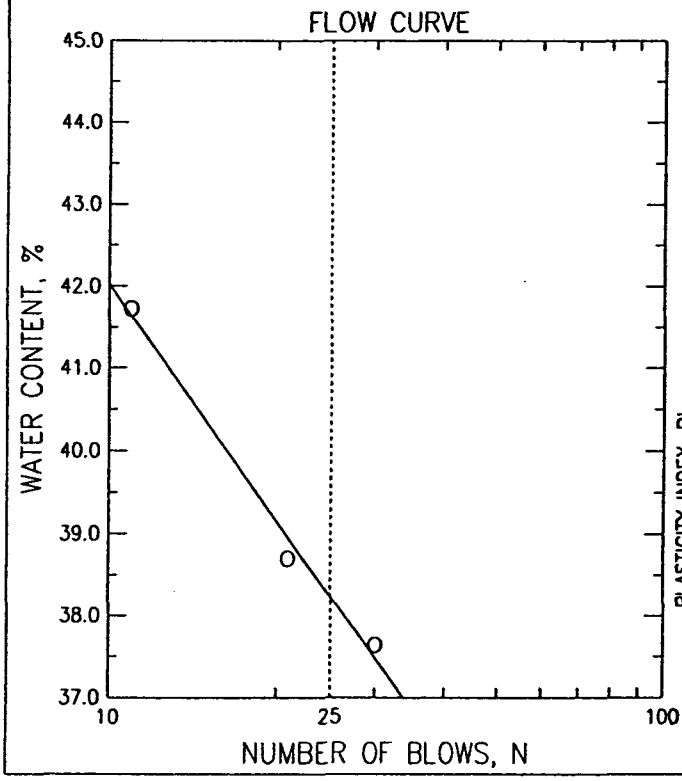
Moisture Content ID	Mass of Container (gm)	Mass of Container and Moist Soil (gm)	Mass of Container and Dried Soil (gm)	Number of Drops	Moisture Content (%)
1) 11	30.13	35.98	33.85	38	57.26
2) 125	28.24	34.35	32.12	25	57.47
3) 58	30.39	35.37	33.49	18	60.65

Liquid Limit = 58.59

ATTERBERG LIMITS

PROJECT	PROJECT NUMBER	TESTED BY	BORING NUMBER
New Bedford Harbor Superfund Site	GTX-2409	AL/GSG	FA-25
LOCATION		CHECKED BY	SAMPLE NUMBER
New Bedford, MA		GTT	UO-3 (5-7)
SAMPLE DESCRIPTION		DATE	FILENAME
Moist, very dark gray organic silt		Wed Jan 05 2000	FA25U03

LIQUID LIMIT DETERMINATIONS					
CONTAINER NUMBER	113	2	17		
WT. WET SOIL + TARE	36.28	35.59	35.61		
WT. DRY SOIL + TARE	34.62	34.1	33.77		
WT. WATER	1.66	1.49	1.84		
TARE WT.	30.21	30.25	29.36		
WT. DRY SOIL	4.41	3.85	4.41		
WATER CONTENT, W_N (%)	37.64	38.70	41.72		
NUMBER OF BLOWS, N	30	21	11		
ONE-POINT LIQUID LIMIT, LL	38.48	37.89	37.78		
PLASTIC LIMIT DETERMINATIONS					
CONTAINER NUMBER	144	92			
WT. WET SOIL + TARE	37.63	36.28			
WT. DRY SOIL + TARE	36.08	34.97			
WT. WATER	1.55	1.31			
TARE WT.	29.61	29.35			
WT. DRY SOIL	6.47	5.62			
WATER CONTENT (%)	23.96	23.31			



SUMMARY OF RESULTS	
NATURAL WATER CONTENT, W (%)	25.0
LIQUID LIMIT, LL	38.2
PLASTIC LIMIT, PL	23.6
PLASTICITY INDEX, PI	14.6
LIQUIDITY INDEX, LI*	0.09

*LI = (W − PL)/PI

PLASTICITY CHART

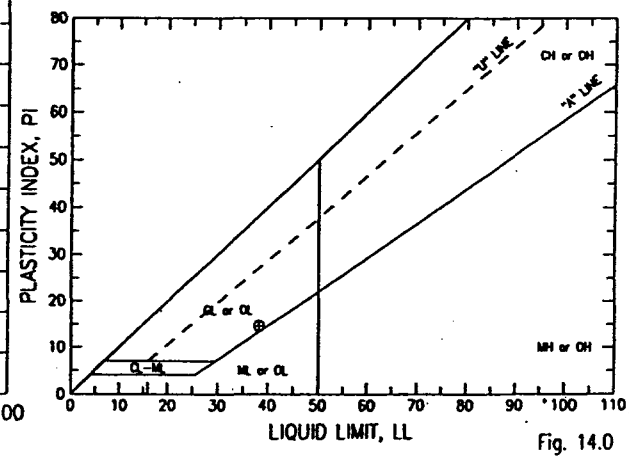


Fig. 14.0

GEOTECHNICAL LABORATORY TEST DATA

Project : New Bedford Harbor Superfund Site
Project No. : GTX-2409
Boring No. : FA-25
Sample No. : UO-3 (5-7)
Location : New Bedford, MA
Soil Description : Moist, very dark gray organic silt
Remarks : ---

Depth : 5-7 ft
Test Date : 12/14/99
Test Method : ASTM D 4318

Filename : FA25UO3
Elevation : ---
Tested by : AL/GSG
Checked by : GTT

Liquid Limit for Organic

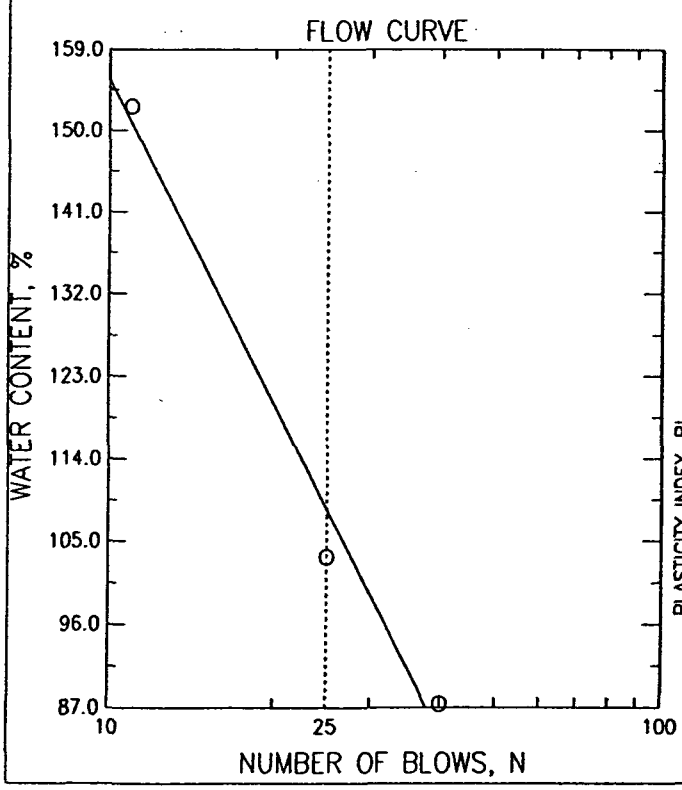
Moisture Content ID	Mass of Container (gm)	Mass of Container and Moist Soil (gm)	Mass of Container and Dried Soil (gm)	Number of Drops	Moisture Content (%)
1) 128	27.78	39.38	37.21	24	23.01
2) 126	28.14	36.07	34.54	15	23.91
3) 51	30.11	37.86	36.34	8	24.40

Liquid Limit = 23.08

ATTERBERG LIMITS

PROJECT	PROJECT NUMBER	TESTED BY	BORING NUMBER
New Bedford Harbor Superfund Site	GTX-2409	AL/GSG	FA-26
LOCATION		CHECKED BY	SAMPLE NUMBER
New Bedford, MA		GTT	UO-1 (3-5)
SAMPLE DESCRIPTION		DATE	FILENAME
Wet, black organic silt		Wed Jan 05 2000	FA26UO1

LIQUID LIMIT DETERMINATIONS					
CONTAINER NUMBER	97	78	131		
WT. WET SOIL + TARE	35.17	37.37	36.31		
WT. DRY SOIL + TARE	31.78	33.88	32.57		
WT. WATER	3.39	3.49	3.74		
TARE WT.	27.9	30.5	30.12		
WT. DRY SOIL	3.88	3.38	2.45		
WATER CONTENT, W_N (%)	87.37	103.25	152.65		
NUMBER OF BLOWS, N	40	25	11		
ONE-POINT LIQUID LIMIT, LL	92.48	103.25	138.22		
PLASTIC LIMIT DETERMINATIONS					
CONTAINER NUMBER	125	58			
WT. WET SOIL + TARE	35.51	36.41			
WT. DRY SOIL + TARE	33.64	34.85			
WT. WATER	1.87	1.56			
TARE WT.	28.23	30.39			
WT. DRY SOIL	5.41	4.46			
WATER CONTENT (%)	34.57	34.98			



SUMMARY OF RESULTS	
NATURAL WATER CONTENT, W (%)	138.0
LIQUID LIMIT, LL	108.4
PLASTIC LIMIT, PL	34.8
PLASTICITY INDEX, PI	73.6
LIQUIDITY INDEX, LI*	1.40

*LI = (W - PL)/PI

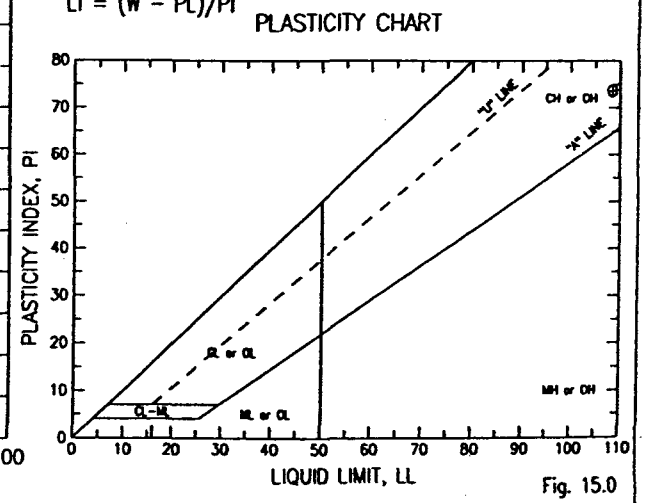
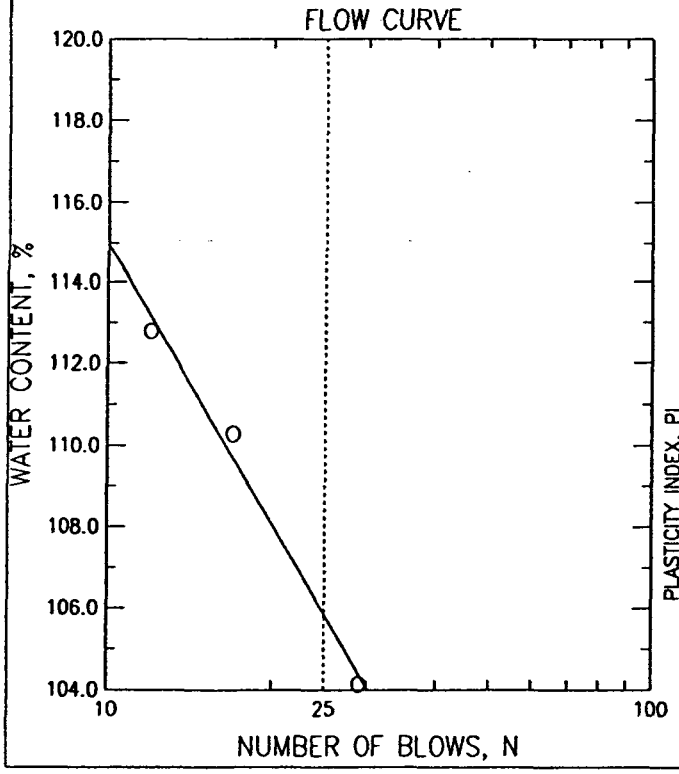


Fig. 15.0

ATTERBERG LIMITS

PROJECT	PROJECT NUMBER	TESTED BY	BORING NUMBER
New Bedford Harbor Superfund Site	GTX-2409	AL/GSG	FA-27
LOCATION		CHECKED BY	SAMPLE NUMBER
New Bedford, MA		GTT	U0-1 (3-5)
SAMPLE DESCRIPTION		DATE	FILENAME
Moist, very dark gray organic clay with shells		Wed Jan 05 2000	FA27U01

LIQUID LIMIT DETERMINATIONS					
CONTAINER NUMBER	59	3	95		
WT. WET SOIL + TARE	34.4	35.5	35.05		
WT. DRY SOIL + TARE	31.88	32.71	32.05		
WT. WATER	2.52	2.79	3		
TARE WT.	29.46	30.18	29.39		
WT. DRY SOIL	2.42	2.53	2.66		
WATER CONTENT, W_N (%)	104.13	110.28	112.78		
NUMBER OF BLOWS, N	29	17	12		
ONE-POINT LIQUID LIMIT, LL	106.02	105.25	103.20		
PLASTIC LIMIT DETERMINATIONS					
CONTAINER NUMBER	43	87			
WT. WET SOIL + TARE	31.65	30.25			
WT. DRY SOIL + TARE	31.29	29.97			
WT. WATER	0.36	0.28			
TARE WT.	30.31	29.16			
WT. DRY SOIL	0.98	0.81			
WATER CONTENT (%)	36.73	34.57			



SUMMARY OF RESULTS	
NATURAL WATER CONTENT, W (%)	101.6
LIQUID LIMIT, LL	105.8
PLASTIC LIMIT, PL	35.7
PLASTICITY INDEX, PI	70.2
LIQUIDITY INDEX, LI*	0.94

*LI = (W − PL)/PI

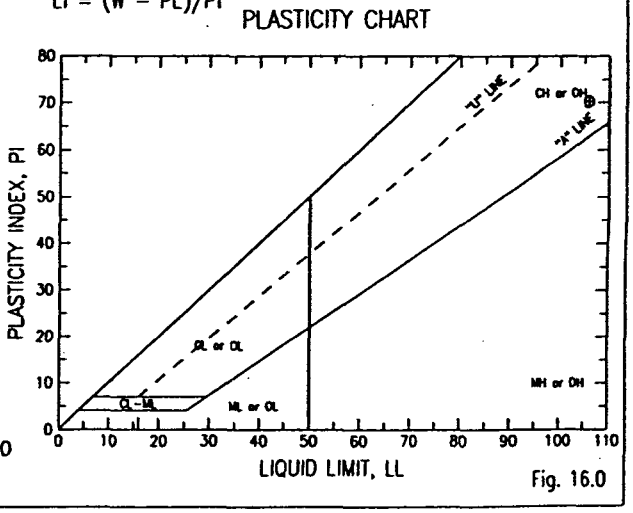


Fig. 16.0

GEOTECHNICAL LABORATORY TEST DATA

Project : New Bedford Harbor Superfund Site
Project No. : GTX-2409
Boring No. : FA-27
Sample No. : UO-1 (3-5)
Location : New Bedford, MA
Soil Description : Moist, very dark gray organic clay with shells
Remarks : ---

Depth : 3-5 ft
Test Date : 12/14/99
Test Method : ASTM D 4318

Filename : FA27U01
Elevation : ---
Tested by : AL/GSG
Checked by : GTT

Liquid Limit for Organic

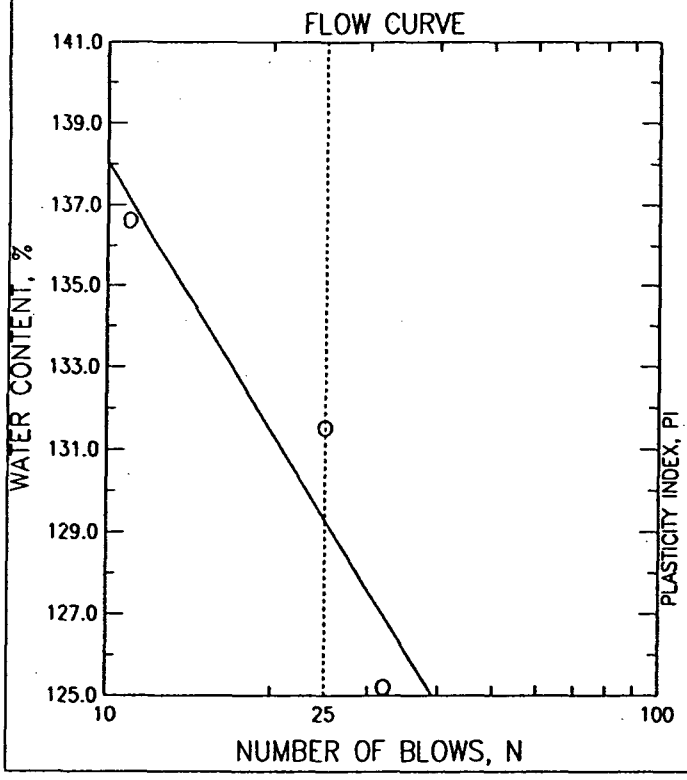
	Moisture Content ID	Mass of Container (gm)	Mass of Container and Moist Soil (gm)	Mass of Container and Dried Soil (gm)	Number of Drops	Moisture Content (%)
1)	90	30.73	36.30	34.26	30	57.79
2)	17	29.35	34.37	32.52	22	58.36
3)	79	29.61	33.52	32.03	11	61.57

Liquid Limit = 58.24

ATTERBERG LIMITS

PROJECT	PROJECT NUMBER	TESTED BY	BORING NUMBER
New Bedford Harbor Superfund Site	GTX-2409	AL/GSG	FB-20
LOCATION		CHECKED BY	SAMPLE NUMBER
New Bedford, MA		GTT	UO-2 (6-8)
SAMPLE DESCRIPTION		DATE	FILENAME
Moist, dark gray organic clay		Wed Jan 05 2000	FB20UO2

LIQUID LIMIT DETERMINATIONS					
CONTAINER NUMBER	79	90	33		
WT. WET SOIL + TARE	35.23	36.59	35.17		
WT. DRY SOIL + TARE	32.1	33.21	32.26		
WT. WATER	3.13	3.38	2.91		
TARE WT.	29.6	30.64	30.13		
WT. DRY SOIL	2.5	2.57	2.13		
WATER CONTENT, W_N (%)	125.20	131.52	136.62		
NUMBER OF BLOWS, N	32	25	11		
ONE-POINT LIQUID LIMIT, LL	129.00	131.52	123.70		
PLASTIC LIMIT DETERMINATIONS					
CONTAINER NUMBER	60	129			
WT. WET SOIL + TARE	35.38	33.16			
WT. DRY SOIL + TARE	33.72	31.4			
WT. WATER	1.66	1.76			
TARE WT.	30.26	27.74			
WT. DRY SOIL	3.46	3.66			
WATER CONTENT (%)	47.98	48.09			



SUMMARY OF RESULTS	
NATURAL WATER CONTENT, W (%)	112.2
LIQUID LIMIT, LL	129.3
PLASTIC LIMIT, PL	48.0
PLASTICITY INDEX, PI	81.2
LIQUIDITY INDEX, LI*	0.79

*LI = (W - PL)/PI

PLASTICITY CHART

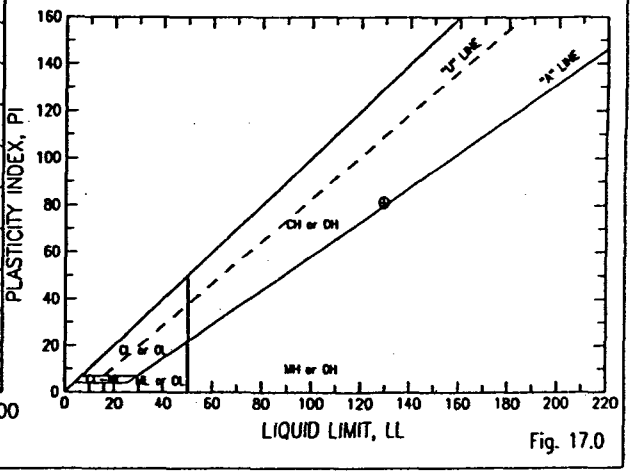


Fig. 17.0

GEOTECHNICAL LABORATORY TEST DATA

Project : New Bedford Harbor Superfund Site
Project No. : GTX-2409
Boring No. : FB-20
Sample No. : UO-2 (6-8)
Location : New Bedford, MA
Soil Description : Moist, dark gray organic clay
Remarks : ---

Depth : 6-8 ft
Test Date : 12/14/99
Test Method : ASTM D 4318

Filename : FB20UO2
Elevation : ---
Tested by : AL/GSG
Checked by : GTT

Liquid Limit for Organic

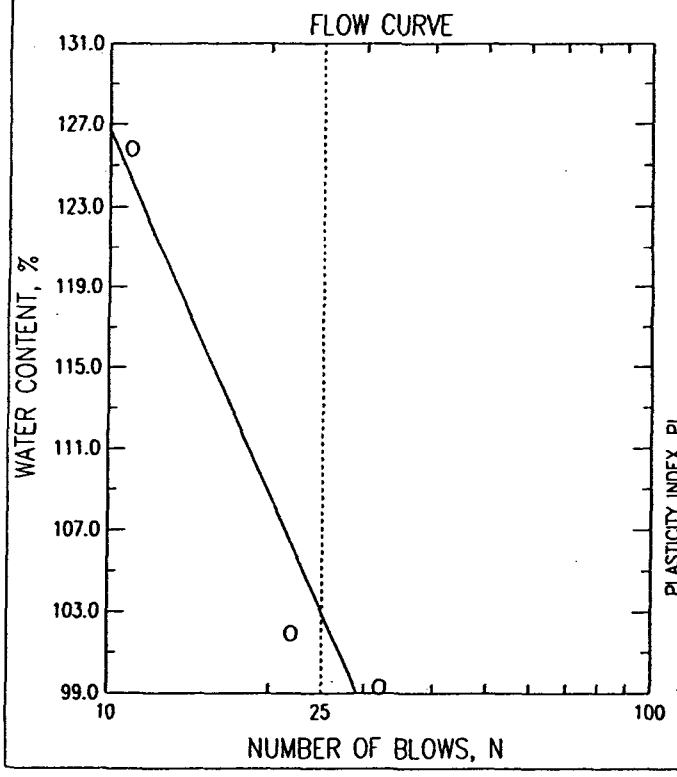
Moisture Content ID	Mass of Container (gm)	Mass of Container and Moist Soil (gm)	Mass of Container and Dried Soil (gm)	Number of Drops	Moisture Content (%)
1) 72	30.40	35.33	33.40	31	64.33
2) 129	27.75	32.79	30.77	21	66.89
3) 60	30.27	34.97	33.05	10	69.06

Liquid Limit = 65.59

ATTERBERG LIMITS

PROJECT	PROJECT NUMBER	TESTED BY	BORING NUMBER
New Bedford Harbor Superfund Site	GTX-2409	AL/GSG	FB-28
LOCATION		CHECKED BY	SAMPLE NUMBER
New Bedford, MA		GTT	UO-1 (0-2)
SAMPLE DESCRIPTION		DATE	FILENAME
Wet, black organic clay		Mon Jan 17 2000	FB28UO1

LIQUID LIMIT DETERMINATIONS					
CONTAINER NUMBER	33	54	58		
WT. WET SOIL + TARE	35.8	34.8	34.68		
WT. DRY SOIL + TARE	32.97	32.17	32.29		
WT. WATER	2.83	2.63	2.39		
TARE WT.	30.12	29.59	30.39		
WT. DRY SOIL	2.85	2.58	1.9		
WATER CONTENT, W_N (%)	99.30	101.94	125.79		
NUMBER OF BLOWS, N	32	22	11		
ONE-POINT LIQUID LIMIT, LL	102.31	100.37	113.89		
PLASTIC LIMIT DETERMINATIONS					
CONTAINER NUMBER	54	72			
WT. WET SOIL + TARE	36.47	36.58			
WT. DRY SOIL + TARE	34.5	34.8			
WT. WATER	1.97	1.78			
TARE WT.	29.6	30.39			
WT. DRY SOIL	4.9	4.41			
WATER CONTENT (%)	40.20	40.36			



SUMMARY OF RESULTS	
NATURAL WATER CONTENT, W (%)	120.8
LIQUID LIMIT, LL	102.9
PLASTIC LIMIT, PL	40.3
PLASTICITY INDEX, PI	62.6
LIQUIDITY INDEX, LI*	1.29

*LI = (W - PL)/PI

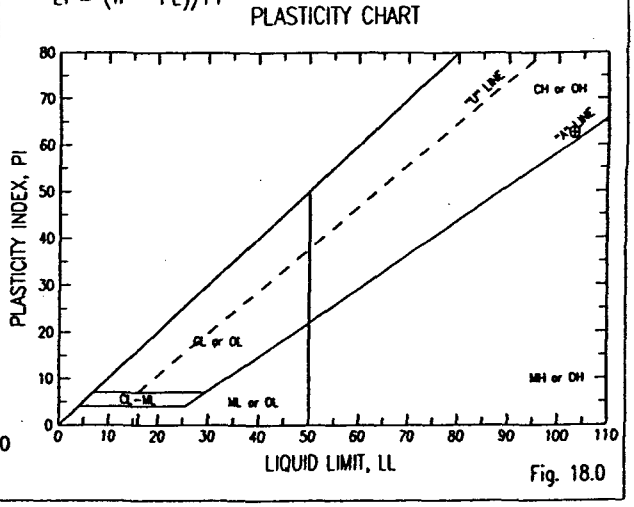


Fig. 18.0

GEOTECHNICAL LABORATORY TEST DATA

Project : New Bedford Harbor Superfund Site
Project No. : GTX-2409
Boring No. : FB-28
Sample No. : UO-1 (0-2)
Location : New Bedford, MA
Soil Description : Wet, black organic clay
Remarks : ---

Depth : 0-2 ft
Test Date : 12/14/99
Test Method : ASTM D 4318

Filename : FB28U01
Elevation : ---
Tested by : AL/GSG
Checked by : GTT

Liquid Limit for Organic

Moisture Content ID	Mass of Container (gm)	Mass of Container and Moist Soil (gm)	Mass of Container and Dried Soil (gm)	Number of Drops	Moisture Content (%)
1) 49	30.49	35.10	33.60	28	48.23
2) 2	30.25	35.67	33.84	20	50.97
3) 113	30.14	34.83	33.12	8	57.38

Liquid Limit = 49.18

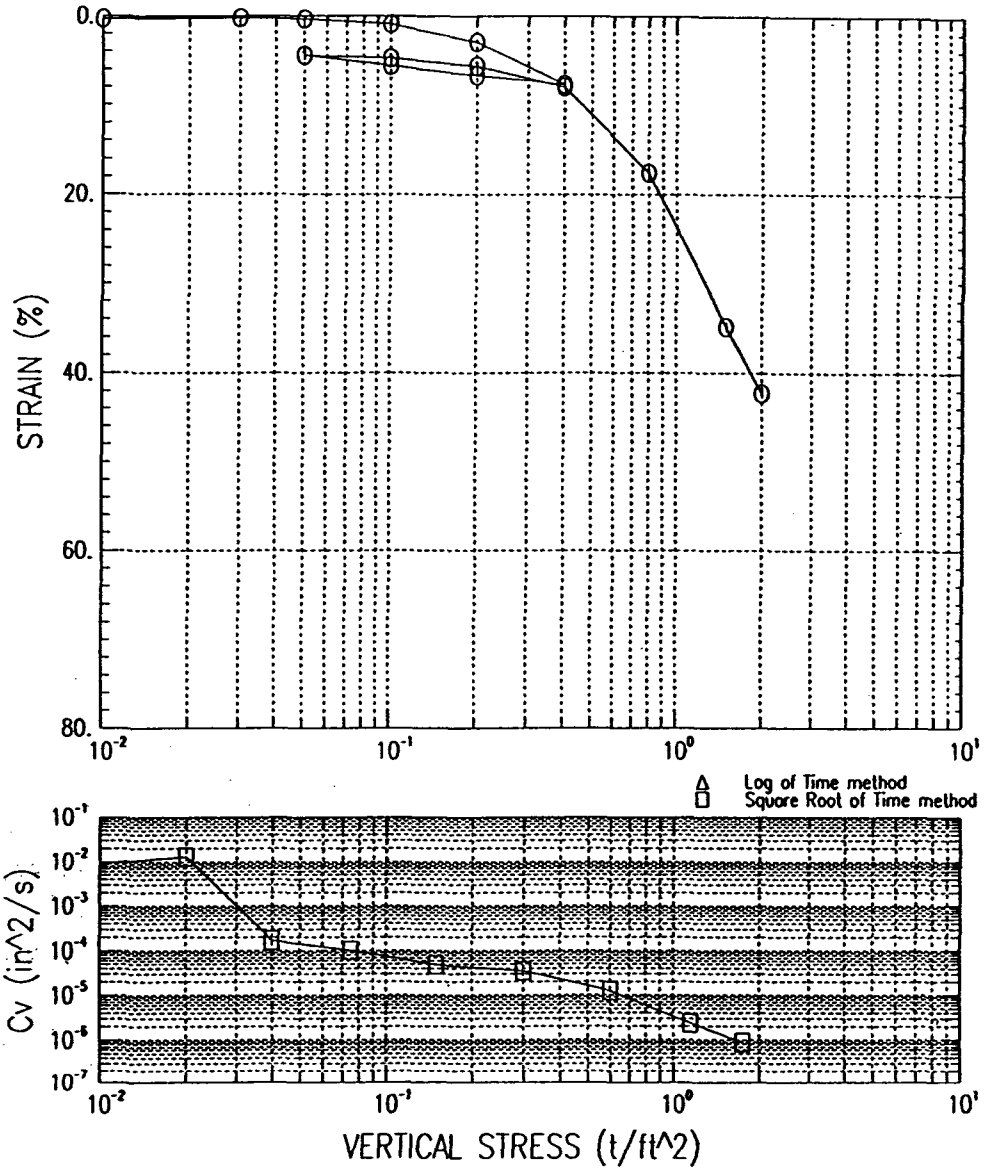
I

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 : FA-1 Sample No : UO-1
Test Date : 12/22/99 Test No : CON25 Depth : 11-13 feet
Description : Moist, very dark brown organics with some silt
Remarks : ---

CONSOLIDATION TEST DATA

Project : New Bedford Harbor Superfund Site Location : New Bedford, MA Project No.: GTX-2409
Boring No.: FA-1 Tested by : FY Checked by : RH
Sample No.: UO-1 Test Date : 12/22/99 Depth : 11-13 feet
Test No. : CON25 Sample Type: Tube

Soil Description : Moist, very dark brown organics with some silt
Remarks : ---

Specific Gravity : 2.39 Liquid Limit : 0 Initial Height : 1.00 (in)
Initial Void Ratio : 8.45 Plastic Limit : 0 Sample Diameter : 2.48 (in)
Final Void Ratio : 4.46 Plasticity Index : 0

	BEFORE CONSOLIDATION		AFTER CONSOLIDATION	
	TRIMMINGS	SPECIMEN + RING	SPECIMEN + RING	TRIMMINGS
CONTAINER NO.	953-a	RING	RING	hh20
WT CONTAINER + WET SOIL (gm)	325.16	298.60	268.00	57.43
WT CONTAINER + DRY SOIL (gm)	81.38	230.68	230.68	26.00
WT CONTAINER (gm)	9.53	210.65	210.65	9.13
WT DRY SOIL (gm)	71.85	20.03	20.03	16.87
WATER CONTENT (%)	339.29	339.07	186.31	186.31
VOID RATIO	------	8.45	4.46	------
DEGREE OF SATURATION (%)	------	95.95	100.00	------
DRY DENSITY (lb/ft^3)	------	15.80	27.37	------

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

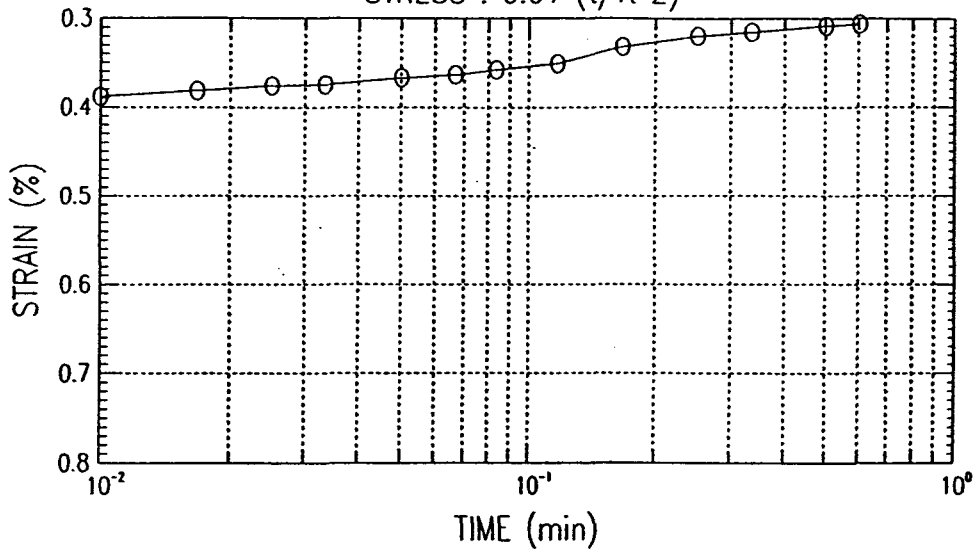
Project : New Bedford Harbor Superfund Site Location : New Bedford, MA Project No.: GTX-2409
Boring No.: FA-1 Tested by : FY Checked by : RH
Sample No.: UO-1 Test Date : 12/22/99 Depth : 11-13 feet
Test No. : CON25 Sample Type: Tube

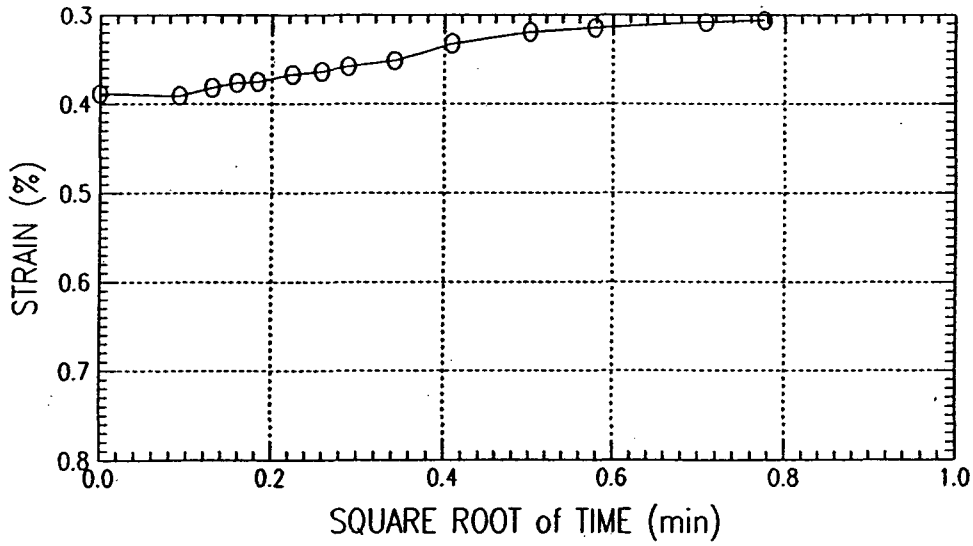
Soil Description : Moist, very dark brown organics with some silt
Remarks : ---

	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	0.003	8.425	0.31	0.1	0.1	6.75E-003	6.61E-003	6.68E-003
2)	0.03	0.002	8.433	0.23	0.1	0.0	1.30E-002	0.00E+000	1.30E-002
3)	0.05	0.004	8.421	0.36	4.8	0.0	1.72E-004	0.00E+000	1.72E-004
4)	0.10	0.009	8.371	0.89	7.9	0.0	1.02E-004	0.00E+000	1.02E-004
5)	0.20	0.030	8.175	2.96	16.4	0.0	4.82E-005	0.00E+000	4.82E-005
6)	0.40	0.077	7.728	7.69	21.1	0.0	3.49E-005	0.00E+000	3.49E-005
7)	0.20	0.067	7.823	6.68	0.0	0.0	0.00E+000	0.00E+000	2.28E-004
8)	0.10	0.056	7.925	5.60	0.0	0.0	0.00E+000	0.00E+000	8.83E-005
9)	0.05	0.045	8.032	4.47	0.0	0.0	0.00E+000	0.00E+000	2.91E-005
10)	0.10	0.048	8.003	4.78	0.0	0.0	0.00E+000	0.00E+000	1.14E-004
11)	0.20	0.056	7.923	5.62	0.0	0.0	0.00E+000	0.00E+000	1.33E-004
12)	0.40	0.080	7.697	8.01	0.0	0.0	0.00E+000	0.00E+000	5.85E-005
13)	0.80	0.176	6.793	17.58	50.8	0.0	1.23E-005	0.00E+000	1.23E-005
14)	1.50	0.349	5.156	34.89	188.2	0.0	2.37E-006	0.00E+000	2.37E-006
15)	2.00	0.423	4.457	42.28	349.3	0.0	8.86E-007	0.00E+000	8.86E-007

CONSOLIDATION TEST

TIME CURVES (STEP 1 OF 15)
STRESS : 0.01 (t/ft^2)

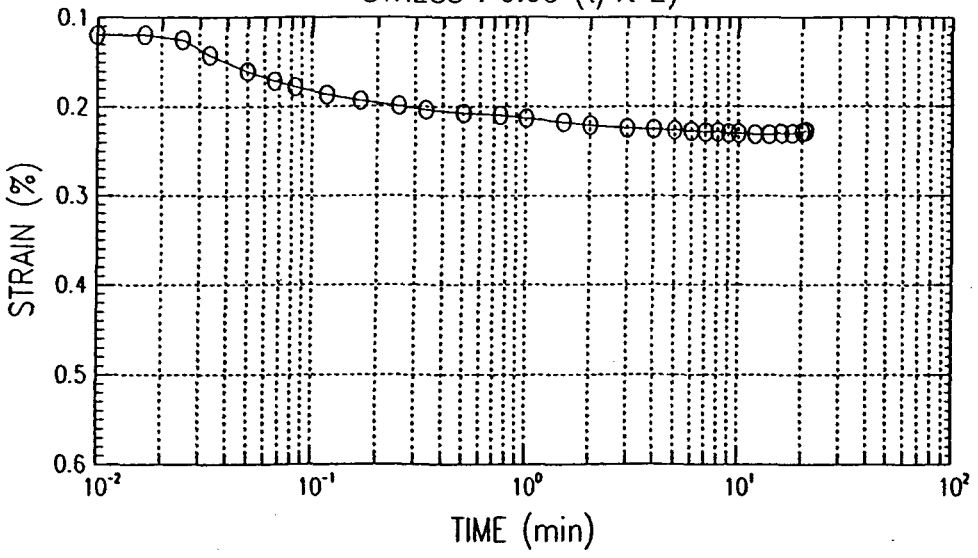


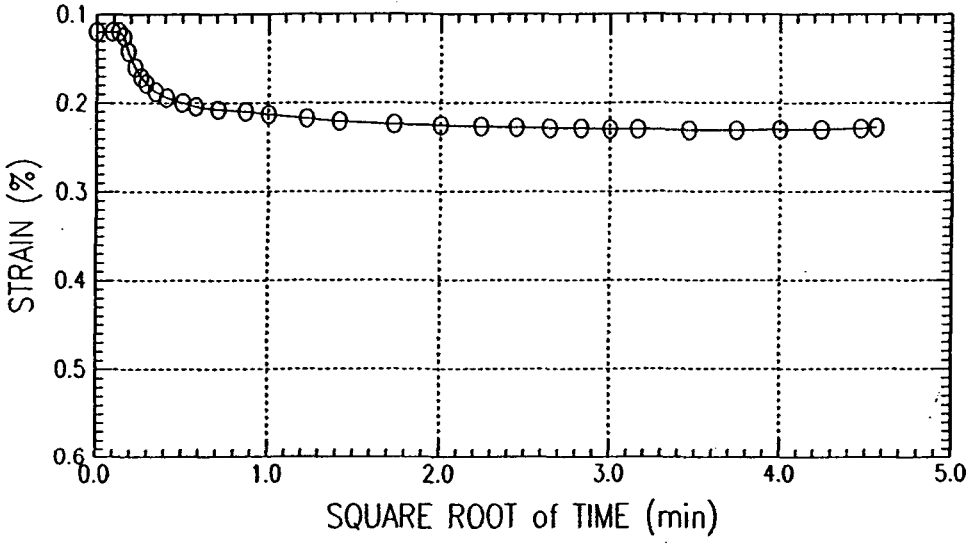


GeoTesting Express
Project Name : New Bedford Harbor Superfund Site
Project No : GTX-2409 Boring No : FA-1 Sample No : UO-1
Test Date : 12/22/99 Test No : CON25 Depth : 11-13 feet
Description : Moist, very dark brown organics with some silt
Remarks : ---

CONSOLIDATION TEST

TIME CURVES (STEP 2 OF 15)
STRESS : 0.03 (t/ft^2)

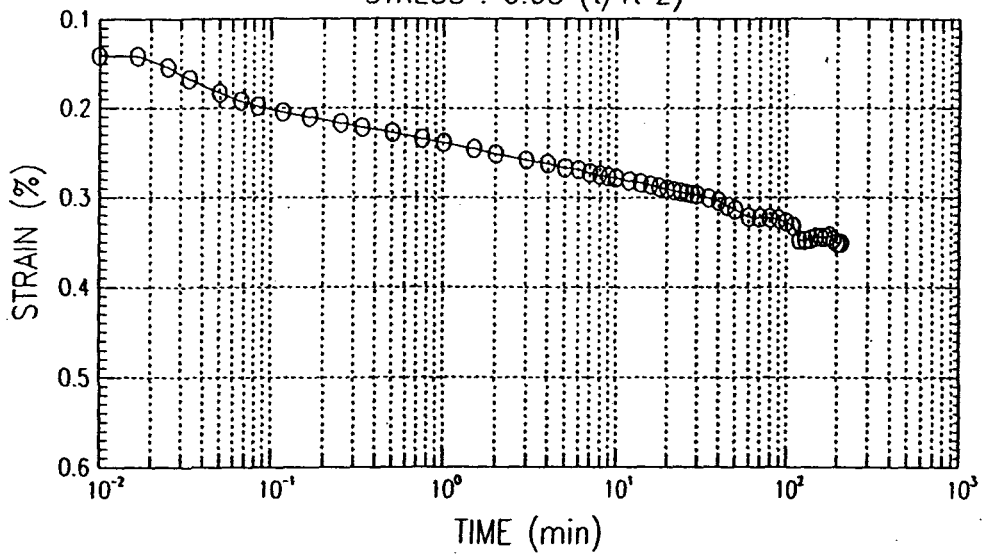


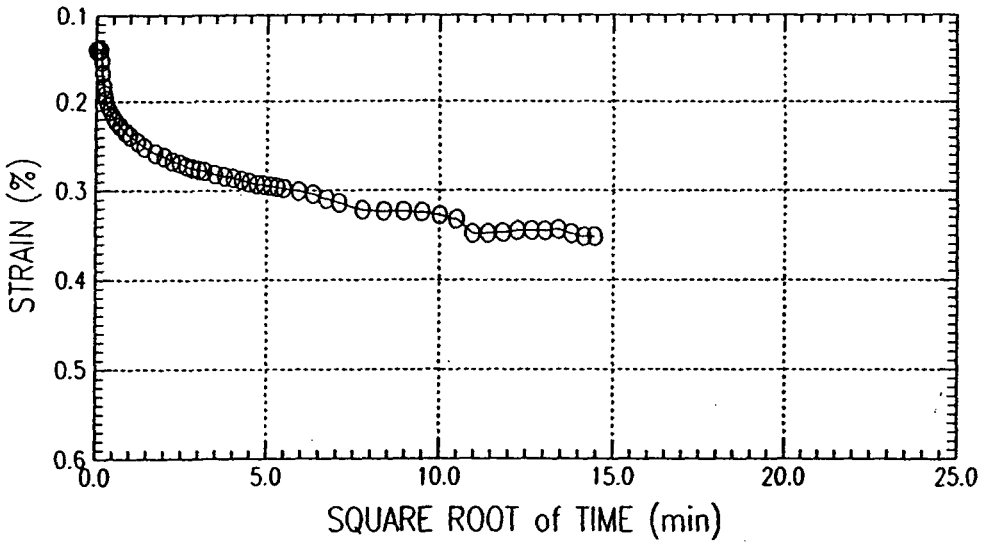


GeoTesting Express
Project Name : New Bedford Harbor Superfund Site
Project No : GTX-2409 Boring No : FA-1 Sample No : U0-1
Test Date : 12/22/99 Test No : CON25 Depth : 11-13 feet
Description : Moist, very dark brown organics with some silt
Remarks : ---

CONSOLIDATION TEST

TIME CURVES (STEP 3 OF 15)
STRESS : 0.05 (t/ft^2)

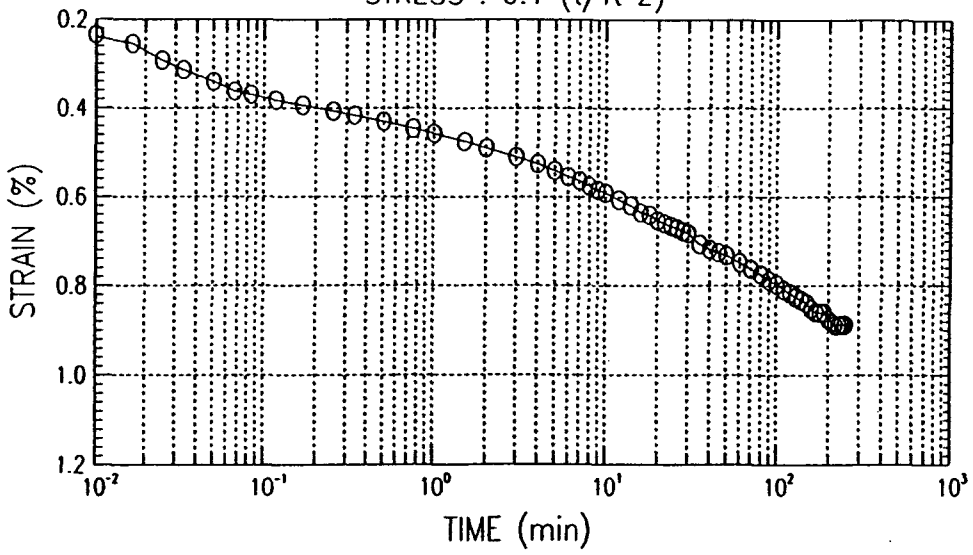


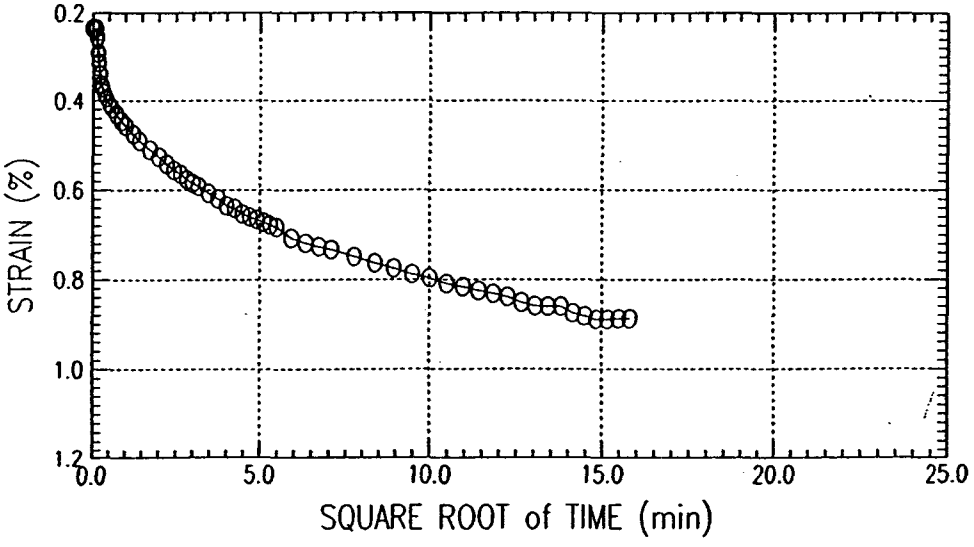


GeoTesting Express
Project Name : New Bedford Harbor Superfund Site
Project No : GTX-2409 Boring No : FA-1 Sample No : U0-1
Test Date : 12/22/99 Test No : CON25 Depth : 11-13 feet
Description : Moist, very dark brown organics with some silt
Remarks : ---

CONSOLIDATION TEST

TIME CURVES (STEP 4 OF 15)
STRESS : 0.1 (t/ft^2)

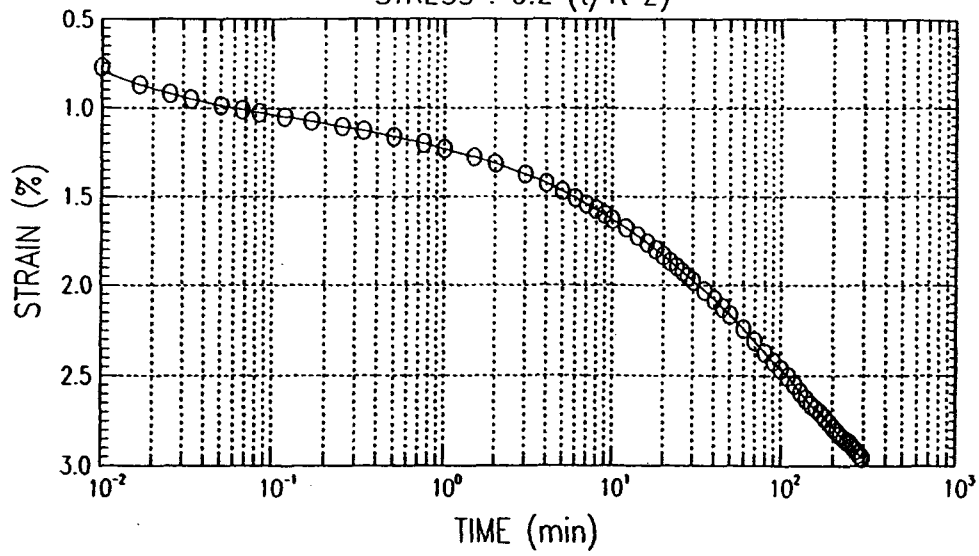


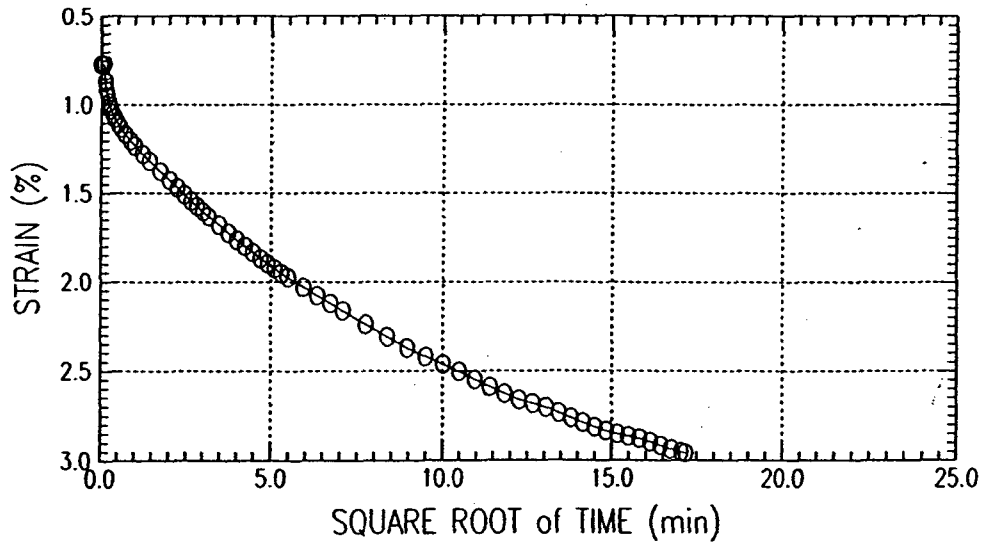


GeoTesting Express
Project Name : New Bedford Harbor Superfund Site
Project No : GTX-2409 Boring No : FA-1 Sample No : U0-1
Test Date : 12/22/99 Test No : CON25 Depth : 11-13 feet
Description : Moist, very dark brown organics with some silt
Remarks : ---

CONSOLIDATION TEST

TIME CURVES (STEP 5 OF 15)
STRESS : 0.2 (t/ft^2)

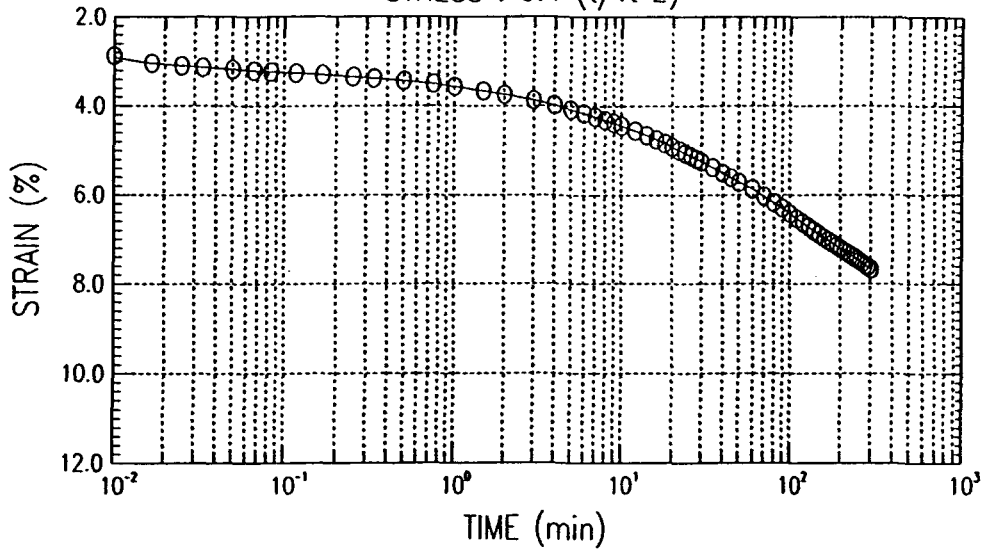


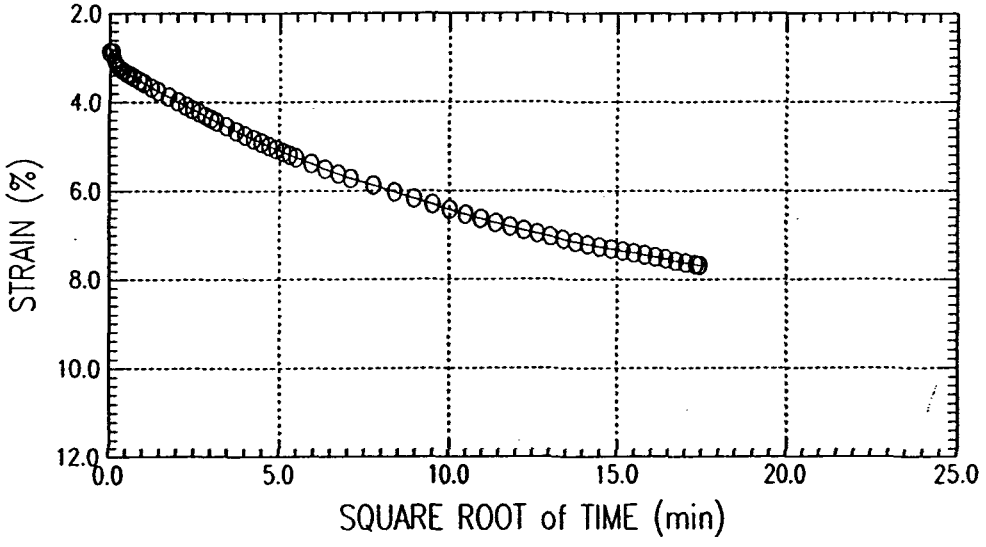


GeoTesting Express
Project Name : New Bedford Harbor Superfund Site
Project No : GTX-2409 Boring No : FA-1 Sample No : UO-1
Test Date : 12/22/99 Test No : CON25 Depth : 11-13 feet
Description : Moist, very dark brown organics with some silt
Remarks : ---

CONSOLIDATION TEST

TIME CURVES (STEP 6 OF 15)
STRESS : 0.4 (t/ft^2)

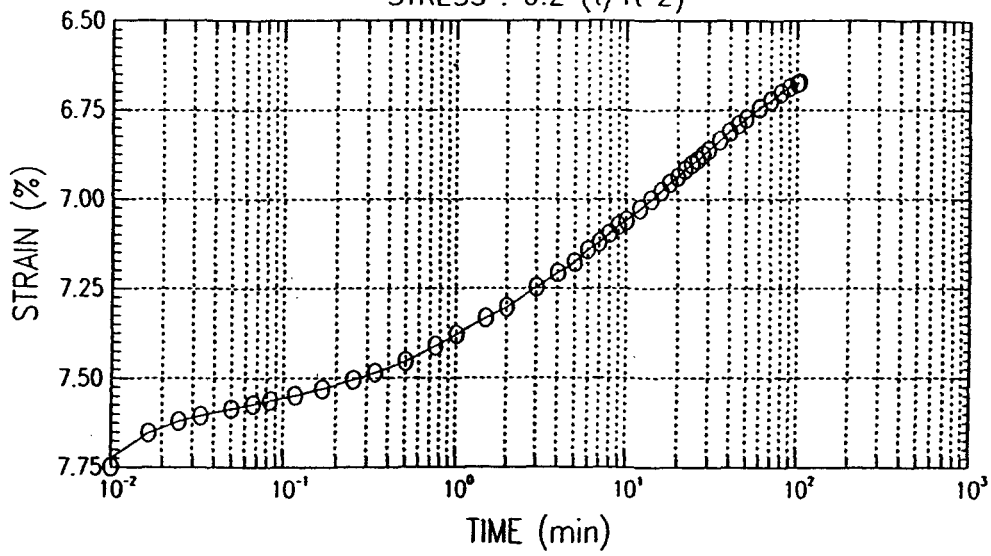


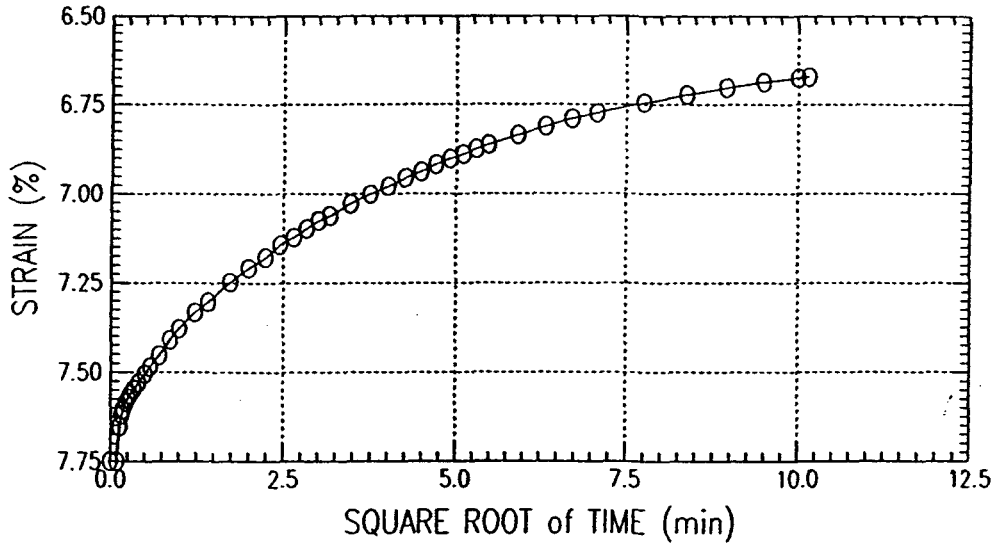


GeoTesting Express
Project Name : New Bedford Harbor Superfund Site
Project No : GTX-2409 Boring No : FA-1 Sample No : UO-1
Test Date : 12/22/99 Test No : CON25 Depth : 11-13 feet
Description : Moist, very dark brown organics with some silt
Remarks : ---

CONSOLIDATION TEST

TIME CURVES (STEP 7 OF 15)
STRESS : 0.2 (t/ft^2)

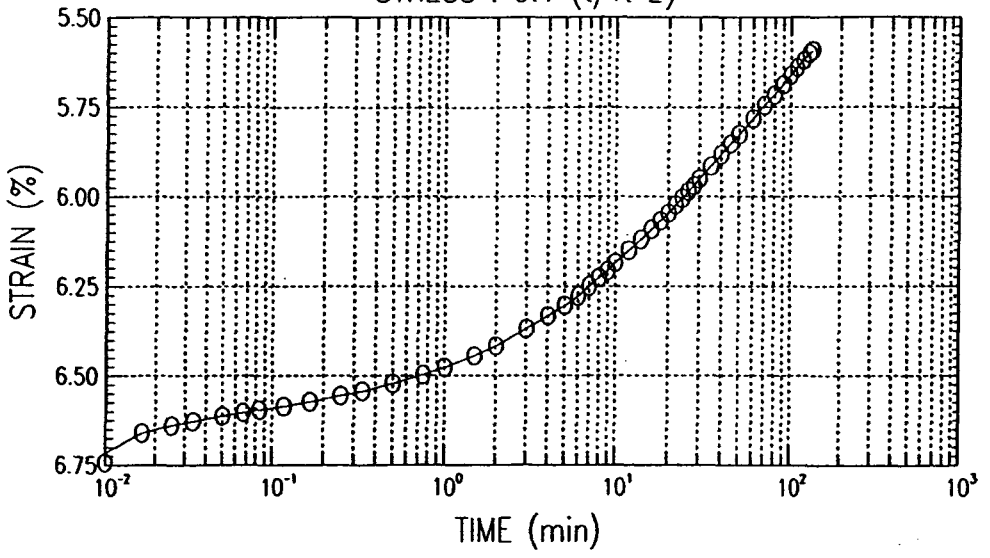


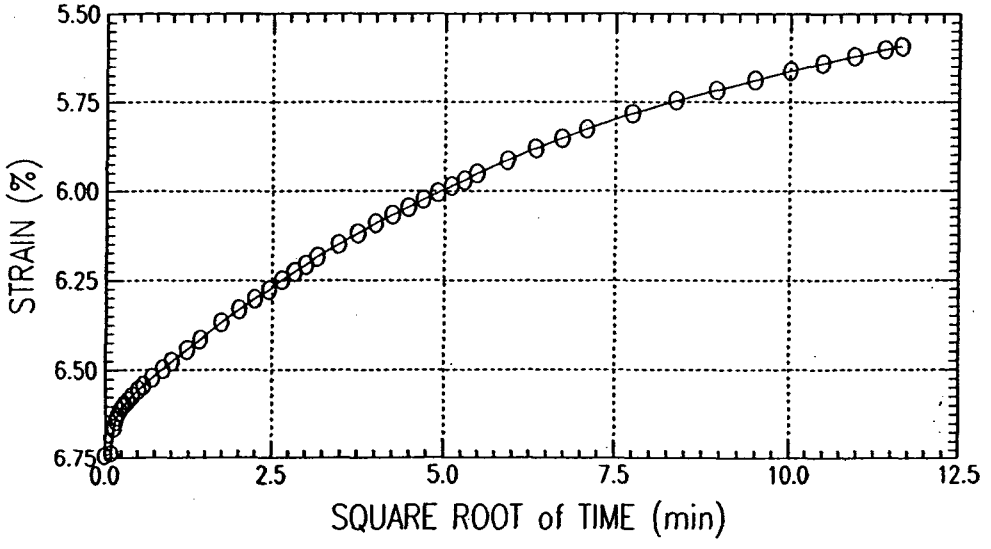


GeoTesting Express
Project Name : New Bedford Harbor Superfund Site
Project No : GTX-2409 Boring No : FA-1 Sample No : UO-1
Test Date : 12/22/99 Test No : CON25 Depth : 11-13 feet
Description : Moist, very dark brown organics with some silt
Remarks : ---

CONSOLIDATION TEST

TIME CURVES (STEP 8 OF 15)
STRESS : 0.1 (t/ft^2)

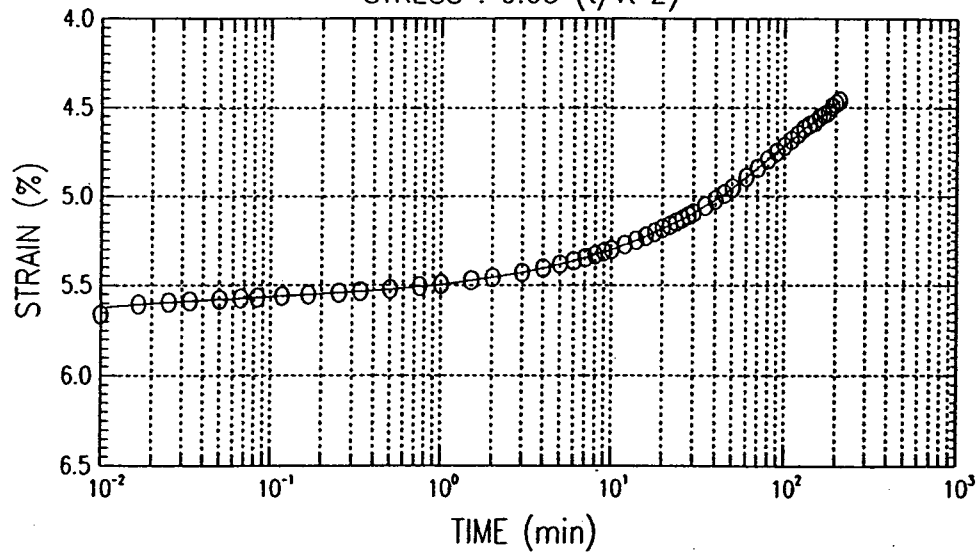


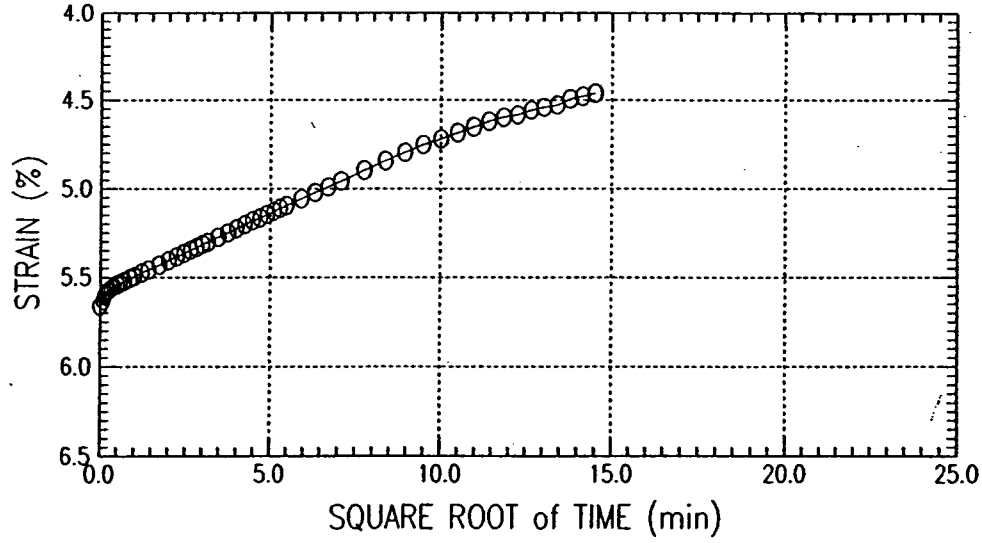


GeoTesting Express
Project Name : New Bedford Harbor Superfund Site
Project No : GTX-2409 Boring No : FA-1 Sample No : UO-1
Test Date : 12/22/99 Test No : CON25 Depth : 11-13 feet
Description : Moist, very dark brown organics with some silt
Remarks : ---

CONSOLIDATION TEST

TIME CURVES (STEP 9 OF 15)
STRESS : 0.05 (t/ft^2)

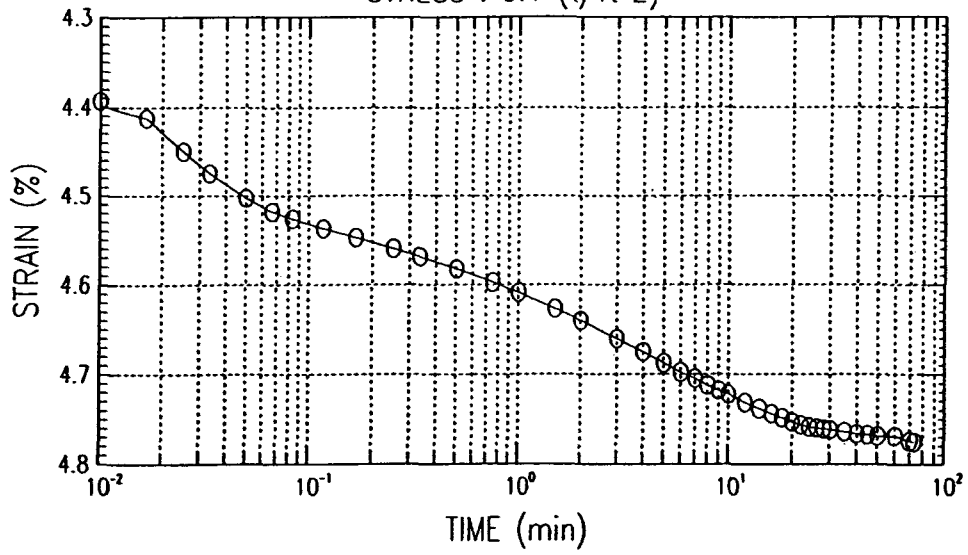


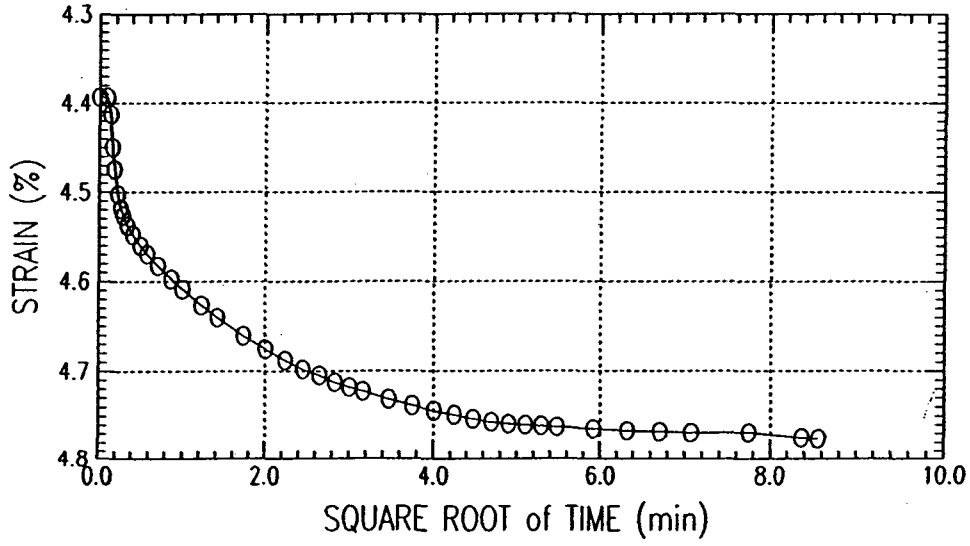


GeoTesting Express
Project Name : New Bedford Harbor Superfund Site
Project No : GTX-2409 Boring No : FA-1 Sample No : UO-1
Test Date : 12/22/99 Test No : CON25 Depth : 11-13 feet
Description : Moist, very dark brown organics with some silt
Remarks : ---

CONSOLIDATION TEST

TIME CURVES (STEP 10 OF 15)
STRESS : 0.1 (t/ft^2)

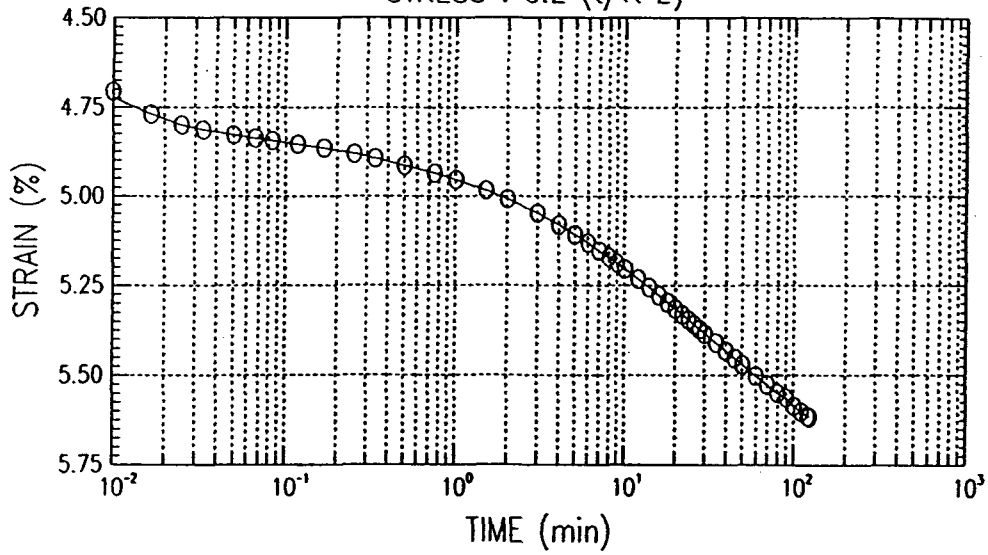


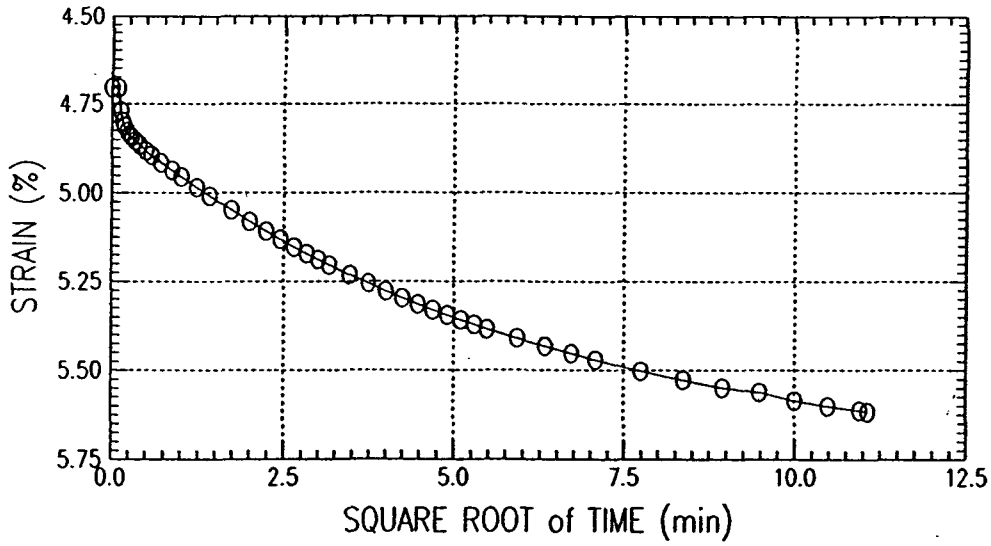


GeoTesting Express
Project Name : New Bedford Harbor Superfund Site
Project No : GTX-2409 Boring No : FA-1 Sample No : UO-1
Test Date : 12/22/99 Test No : CON25 Depth : 11-13 feet
Description : Moist, very dark brown organics with some silt
Remarks : ---

CONSOLIDATION TEST

TIME CURVES (STEP 11 OF 15)
STRESS : 0.2 (t/ft^2)

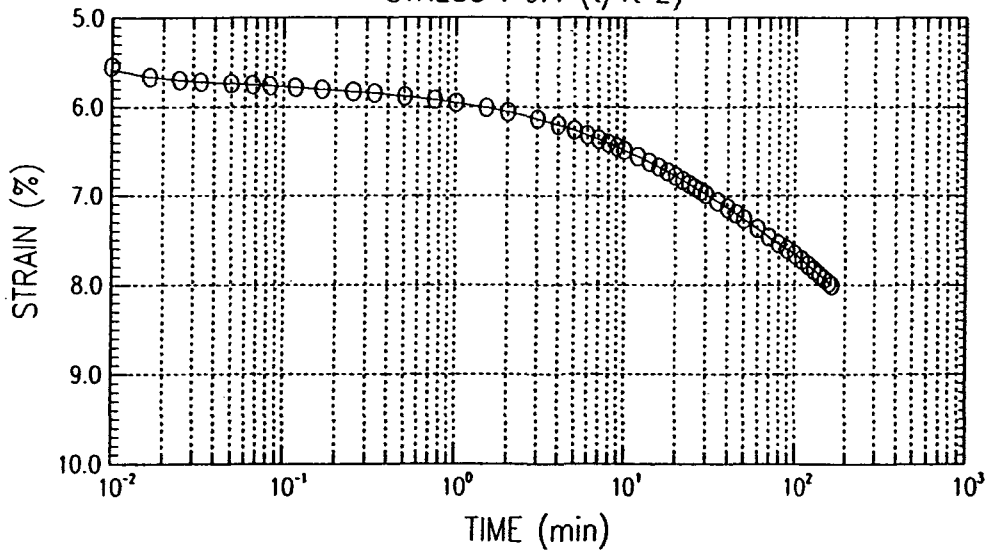


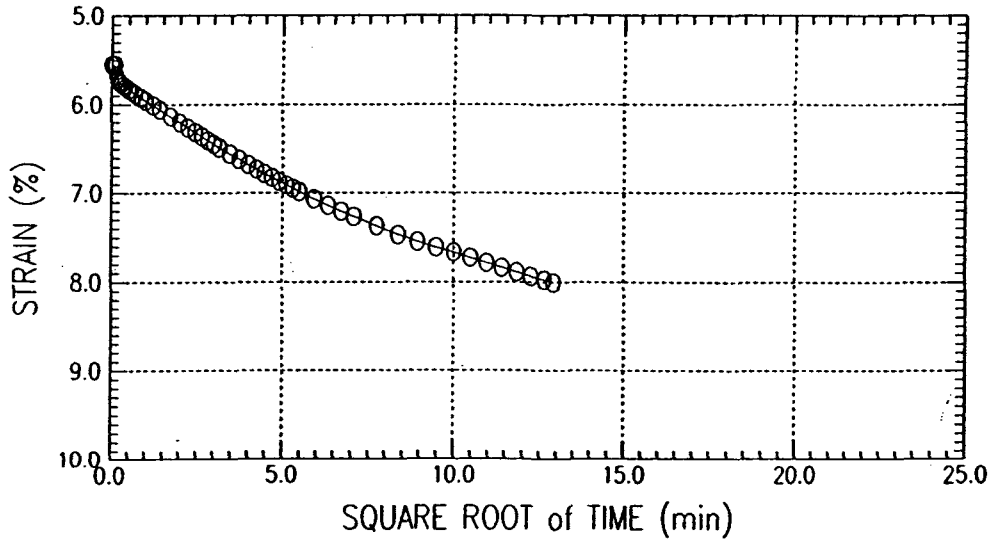


GeoTesting Express
Project Name : New Bedford Harbor Superfund Site
Project No : GTX-2409 Boring No : FA-1 Sample No : UO-1
Test Date : 12/22/99 Test No : CON25 Depth : 11-13 feet
Description : Moist, very dark brown organics with some silt
Remarks : ---

CONSOLIDATION TEST

TIME CURVES (STEP 12 OF 15)
STRESS : 0.4 (t/ft^2)

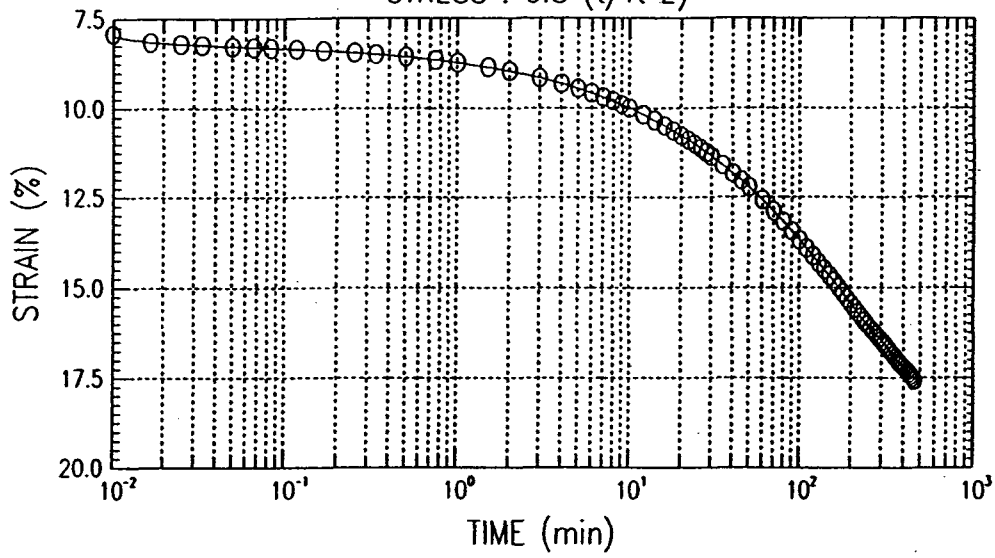


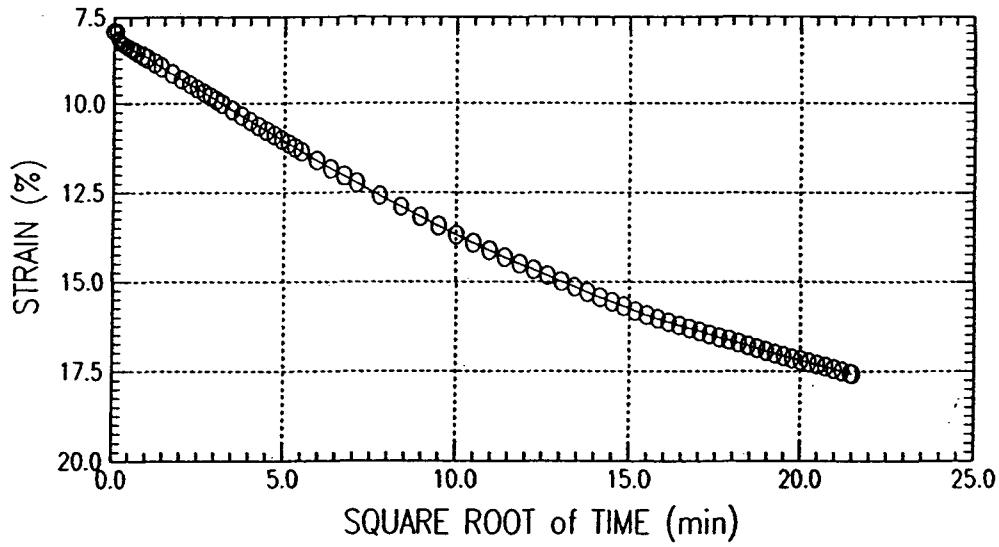


GeoTesting Express
Project Name : New Bedford Harbor Superfund Site
Project No : GTX-2409 Boring No : FA-1 Sample No : UO-1
Test Date : 12/22/99 Test No : CON25 Depth : 11-13 feet
Description : Moist, very dark brown organics with some silt
Remarks : ---

CONSOLIDATION TEST

TIME CURVES (STEP 13 OF 15)
STRESS : 0.8 (t/ft^2)

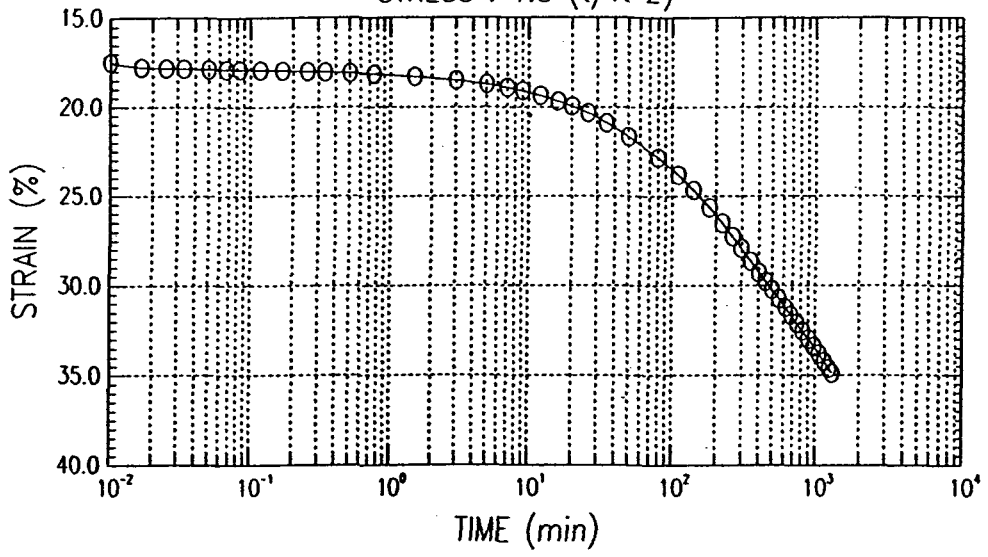


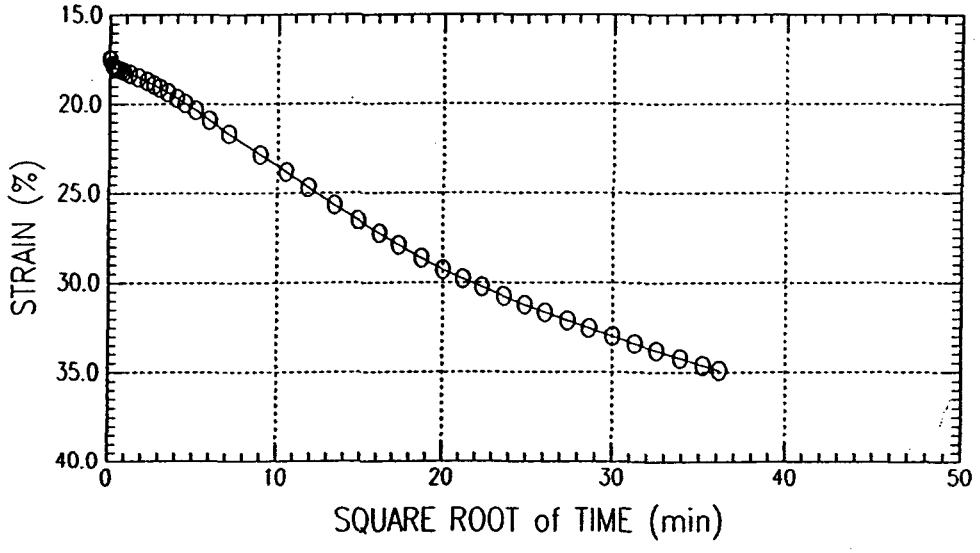


GeoTesting Express
Project Name : New Bedford Harbor Superfund Site
Project No : GTX-2409 Boring No : FA-1 Sample No : UO-1
Test Date : 12/22/99 Test No : CON25 Depth : 11-13 feet
Description : Moist, very dark brown organics with some silt
Remarks : ---

CONSOLIDATION TEST

TIME CURVES (STEP 14 OF 15)
STRESS : 1.5 (t/ft^2)

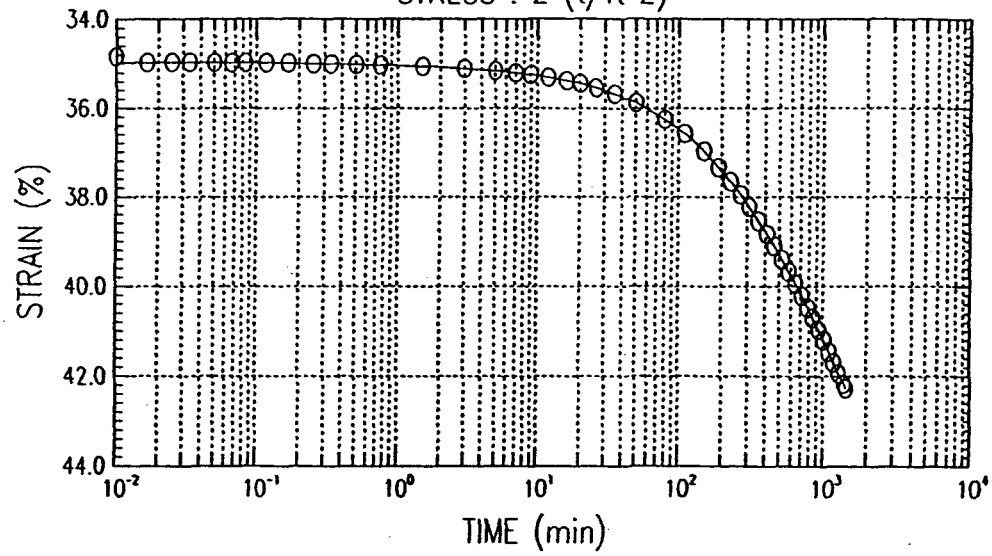


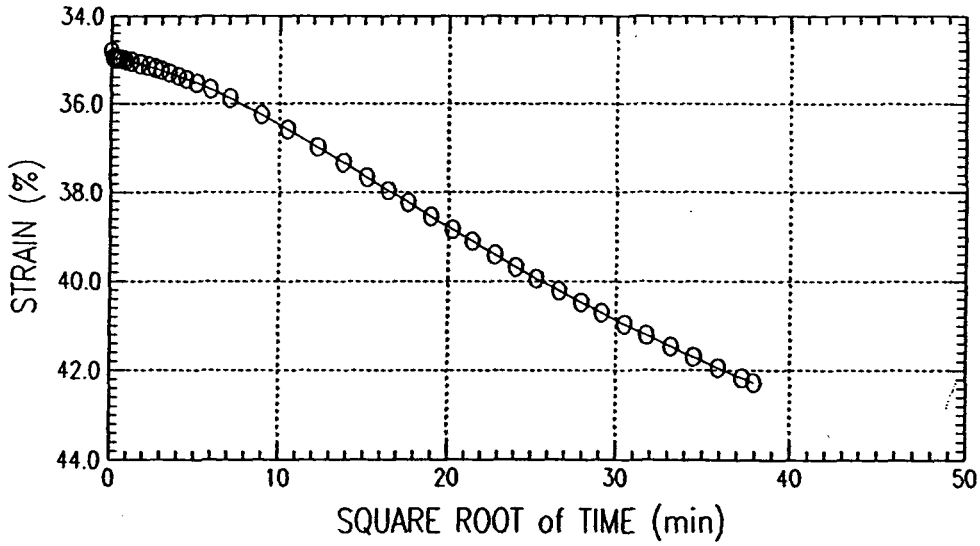


GeoTesting Express
Project Name : New Bedford Harbor Superfund Site
Project No : GTX-2409 Boring No : FA-1 Sample No : UO-1
Test Date : 12/22/99 Test No : CON25 Depth : 11-13 feet
Description : Moist, very dark brown organics with some silt
Remarks : ---

CONSOLIDATION TEST

TIME CURVES (STEP 15 OF 15)
STRESS : 2 (t/ft^2)

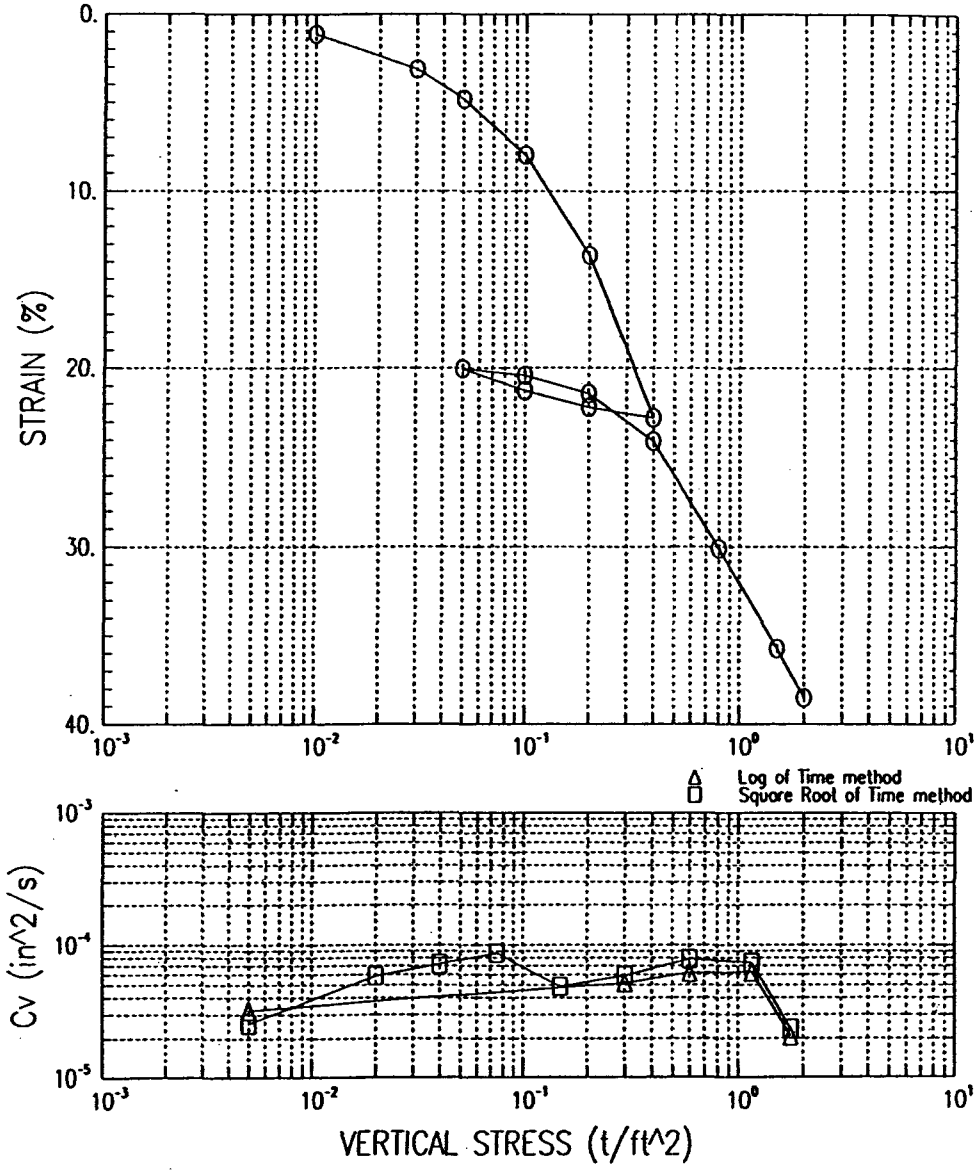




GeoTesting Express
Project Name : New Bedford Harbor Superfund Site
Project No : GTX-2409 Boring No : FA-1 Sample No : UO-1
Test Date : 12/22/99 Test No : CON25 Depth : 11-13 feet
Description : Moist, very dark brown organics with some silt
Remarks : ---

CONSOLIDATION TEST

SUMMARY REPORT



GeoTesting Express
Project Name : New Bedford Harbor Superfund Site
Project No : GTX-2409 Boring No : FA-9 Sample No : UO-1
Test Date : 01/03/00 Test No : CON29 Depth : 2-4 feet
Description : Moist, brown silty sand with gravel, organics
Remarks : ---

CONSOLIDATION TEST DATA

Project : New Bedford Harbor Superfund Site Location : New Bedford, MA Project No.: GTX-2409
Boring No.: FA-9 Tested by : FY Checked by : RH
Sample No.: UO-1 Test Date : 01/03/00 Depth : 2-4 feet
Test No. : CON29 Sample Type: Tube

Soil Description : Moist, brown silty sand with gravel, organics
Remarks : ---

Specific Gravity : 2.62 Liquid Limit : 49.8 Initial Height : 1.00 (in)
Initial Void Ratio : 3.18 Plastic Limit : 33.7 Sample Diameter : 2.49 (in)
Final Void Ratio : 1.57 Plasticity Index : 16.1

	BEFORE CONSOLIDATION		AFTER CONSOLIDATION	
	TRIMMINGS	SPECIMEN + RING	SPECIMEN + RING	TRIMMINGS
CONTAINER NO.	abc19	RING	RING	ma-7
WT CONTAINER + WET SOIL (gm)	327.03	320.00	294.87	90.00
WT CONTAINER + DRY SOIL (gm)	160.00	265.01	265.01	59.83
WT CONTAINER (gm)	8.91	214.83	214.83	9.12
WT DRY SOIL (gm)	151.09	50.18	50.18	50.71
WATER CONTENT (%)	110.55	109.57	59.50	59.50
VOID RATIO	------	3.18	1.57	------
DEGREE OF SATURATION (%)	------	90.29	99.29	------
DRY DENSITY (lb/ft^3)	------	39.13	63.64	------

CONSOLIDATION TEST DATA

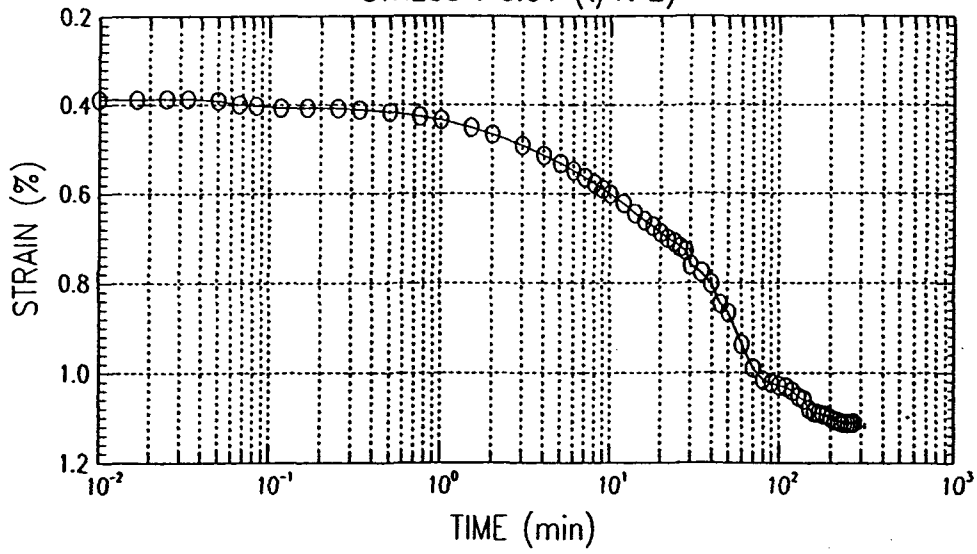
Project : New Bedford Harbor Superfund Site Location : New Bedford, MA Project No.: GTX-2409
Boring No.: FA-9 Tested by : FY Checked by : RH
Sample No.: UO-1 Test Date : 01/03/00 Depth : 2-4 feet
Test No. : CON29 Sample Type: Tube

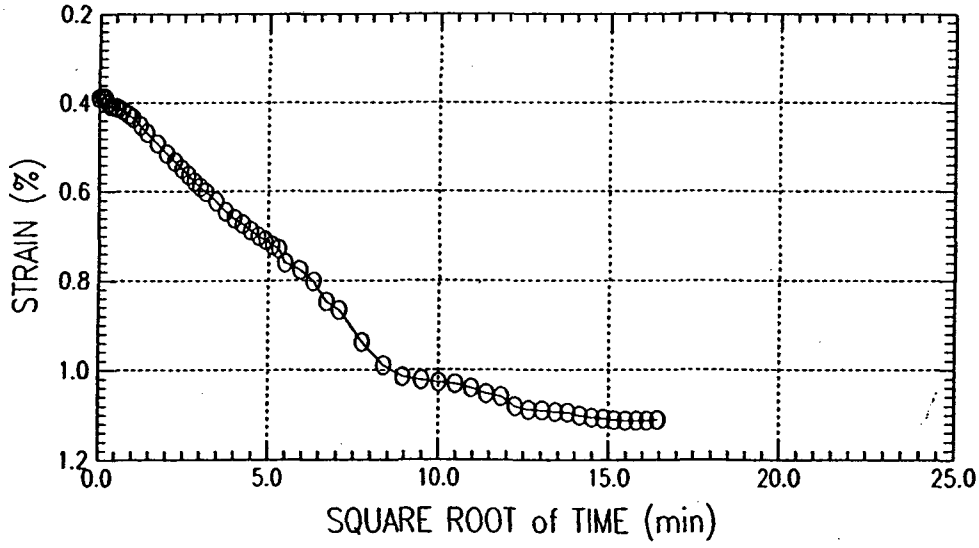
Soil Description : Moist, brown silty sand with gravel, organics
Remarks : ---

	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	0.011	3.133	1.12	31.5	25.1	2.58E-005	3.23E-005	2.90E-005
2)	0.03	0.031	3.050	3.10	13.5	0.0	5.84E-005	0.00E+000	5.84E-005
3)	0.05	0.048	2.979	4.80	10.5	0.0	7.21E-005	0.00E+000	7.21E-005
4)	0.10	0.080	2.846	7.98	8.3	0.0	8.69E-005	0.00E+000	8.69E-005
5)	0.20	0.137	2.609	13.65	13.4	0.0	4.87E-005	0.00E+000	4.87E-005
6)	0.40	0.228	2.227	22.79	9.3	10.6	5.89E-005	5.17E-005	5.53E-005
7)	0.20	0.222	2.251	22.21	0.0	0.0	0.00E+000	0.00E+000	3.70E-004
8)	0.10	0.213	2.291	21.27	0.0	0.0	0.00E+000	0.00E+000	1.25E-004
9)	0.05	0.200	2.342	20.04	0.0	0.0	0.00E+000	0.00E+000	4.45E-005
10)	0.10	0.204	2.326	20.43	0.0	0.0	0.00E+000	0.00E+000	2.18E-004
11)	0.20	0.215	2.283	21.45	0.0	0.0	0.00E+000	0.00E+000	1.70E-004
12)	0.40	0.241	2.174	24.07	0.0	0.0	0.00E+000	0.00E+000	8.01E-005
13)	0.80	0.301	1.921	30.11	5.6	7.0	7.85E-005	6.21E-005	7.03E-005
14)	1.50	0.357	1.686	35.74	5.0	5.9	7.37E-005	6.23E-005	6.80E-005
15)	2.00	0.385	1.570	38.52	13.8	15.6	2.36E-005	2.08E-005	2.22E-005

CONSOLIDATION TEST

TIME CURVES (STEP 1 OF 15)
STRESS : 0.01 (t/ft^2)

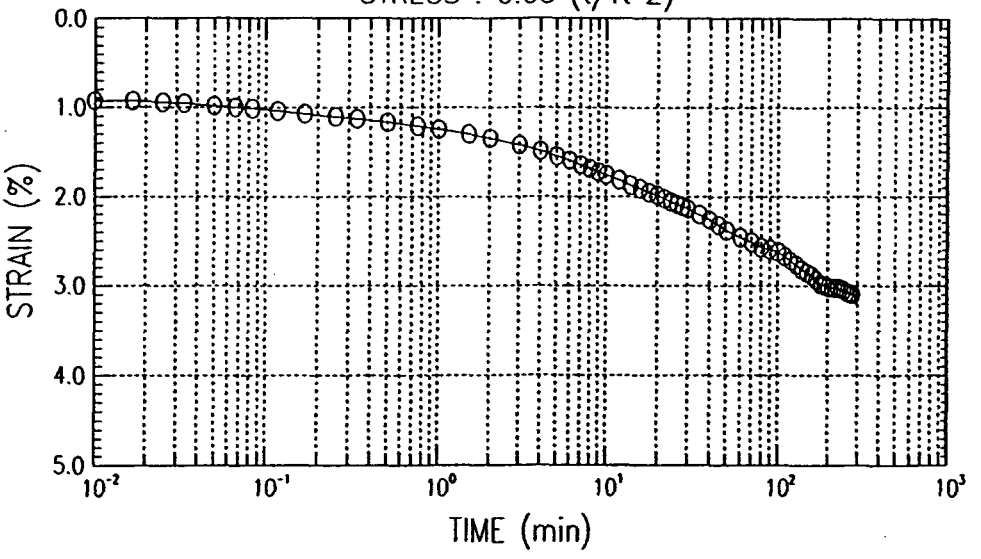


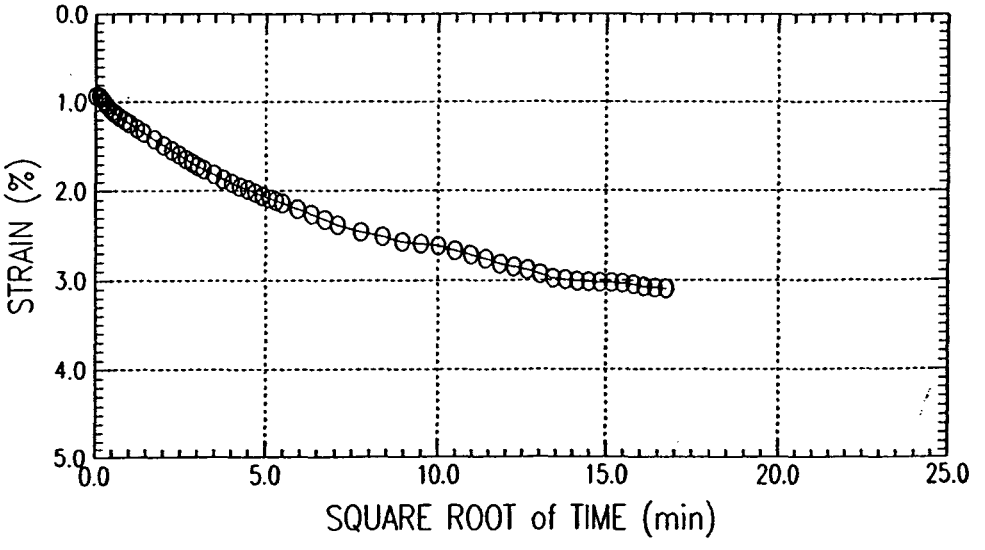


GeoTesting Express
Project Name : New Bedford Harbor Superfund Site
Project No : GTX-2409 Boring No : FA-9 Sample No : UO-1
Test Date : 01/03/00 Test No : CON29 Depth : 2-4 feet
Description : Moist, brown silty sand with gravel, organics
Remarks : ---

CONSOLIDATION TEST

TIME CURVES (STEP 2 OF 15)
STRESS : 0.03 (t/ft^2)



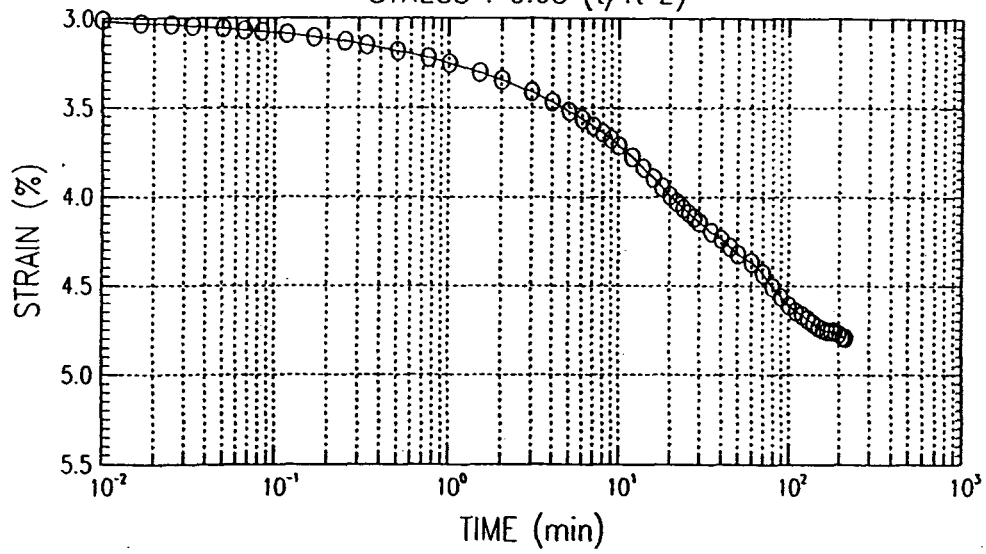


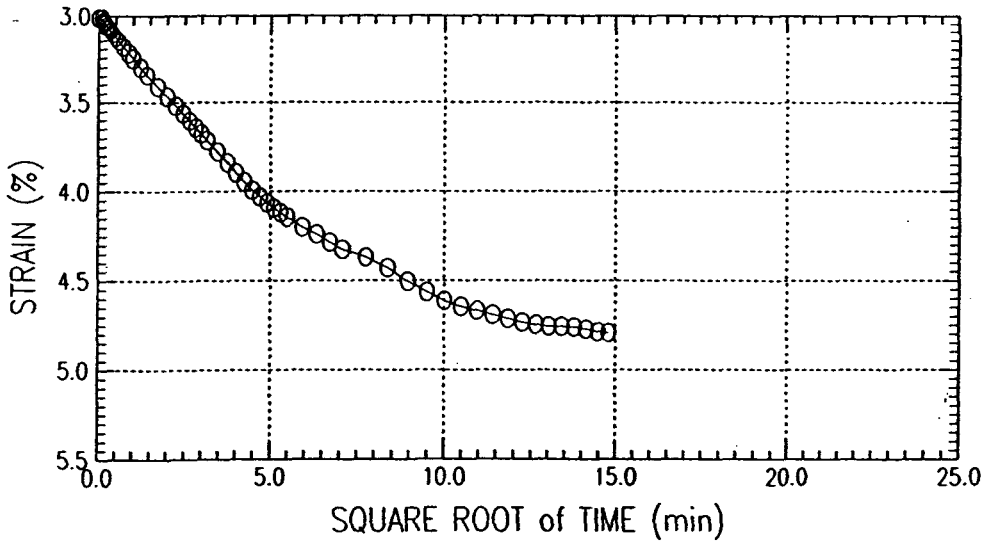
GeoTesting Express
Project Name : New Bedford Harbor Superfund Site
Project No : GTX-2409 Boring No : FA-9 Sample No : UO-1
Test Date : 01/03/00 Test No : CON29 Depth : 2-4 feet
Description : Moist, brown silty sand with gravel, organics
Remarks : ---

CONSOLIDATION TEST

TIME CURVES (STEP 3 OF 15)

STRESS : 0.05 (t/ft^2)

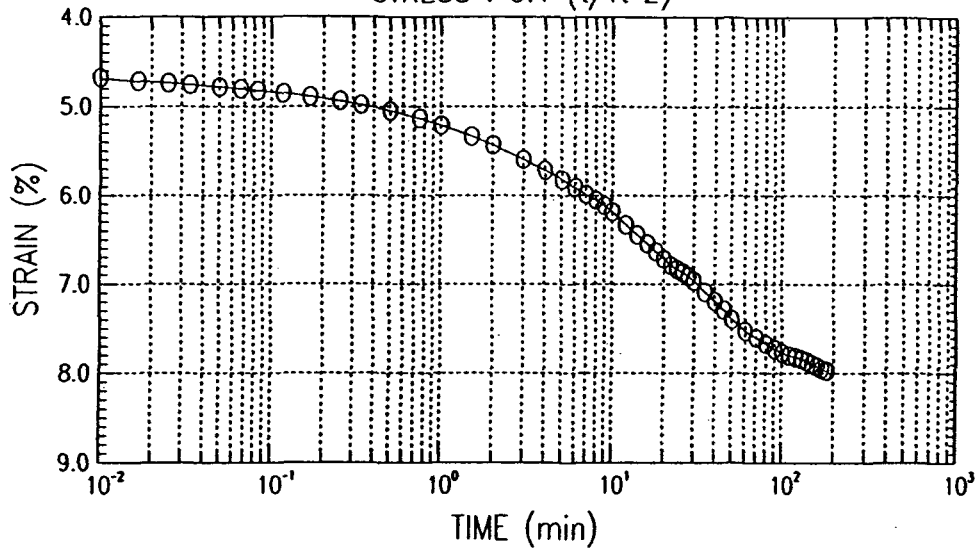


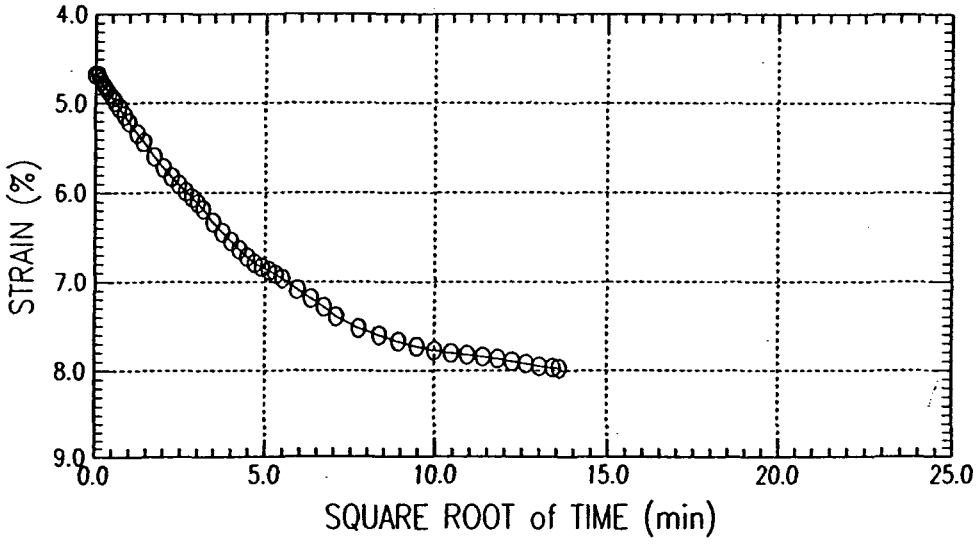


GeoTesting Express
Project Name : New Bedford Harbor Superfund Site
Project No : GTX-2409 Boring No : FA-9 Sample No : UO-1
Test Date : 01/03/00 Test No : CON29 Depth : 2-4 feet
Description : Moist, brown silty sand with gravel, organics
Remarks : ---

CONSOLIDATION TEST

TIME CURVES (STEP 4 OF 15)
STRESS : 0.1 (t/ft^2)

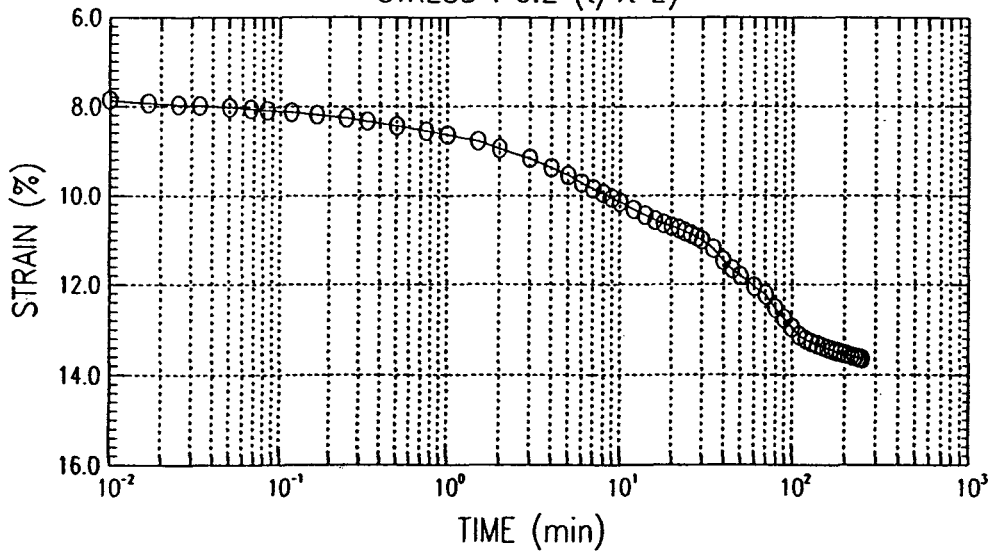


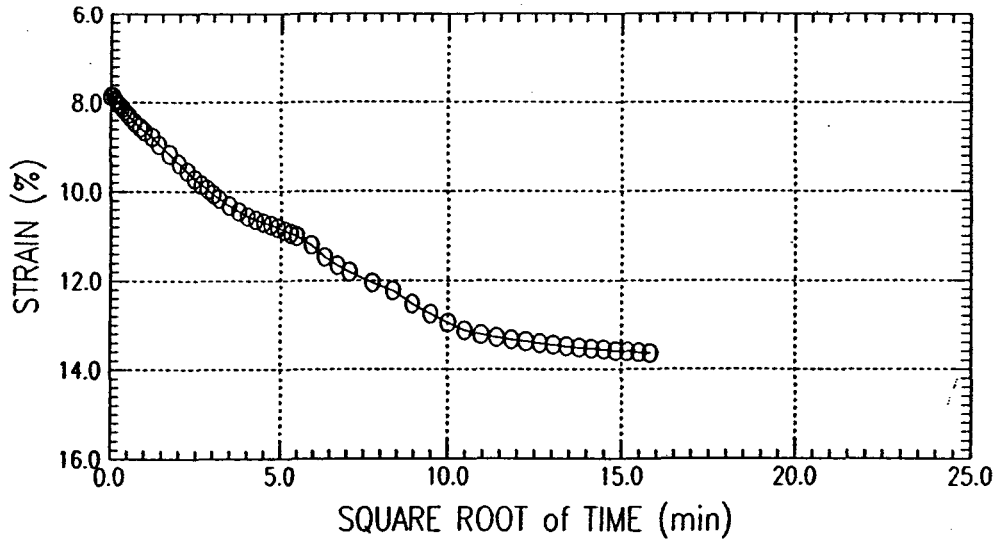


GeoTesting Express
Project Name : New Bedford Harbor Superfund Site
Project No : GTX-2409 Boring No : FA-9 Sample No : UO-1
Test Date : 01/03/00 Test No : CON29 Depth : 2-4 feet
Description : Moist, brown silty sand with gravel, organics
Remarks : ---

CONSOLIDATION TEST

TIME CURVES (STEP 5 OF 15)
STRESS : 0.2 (t/ft^2)

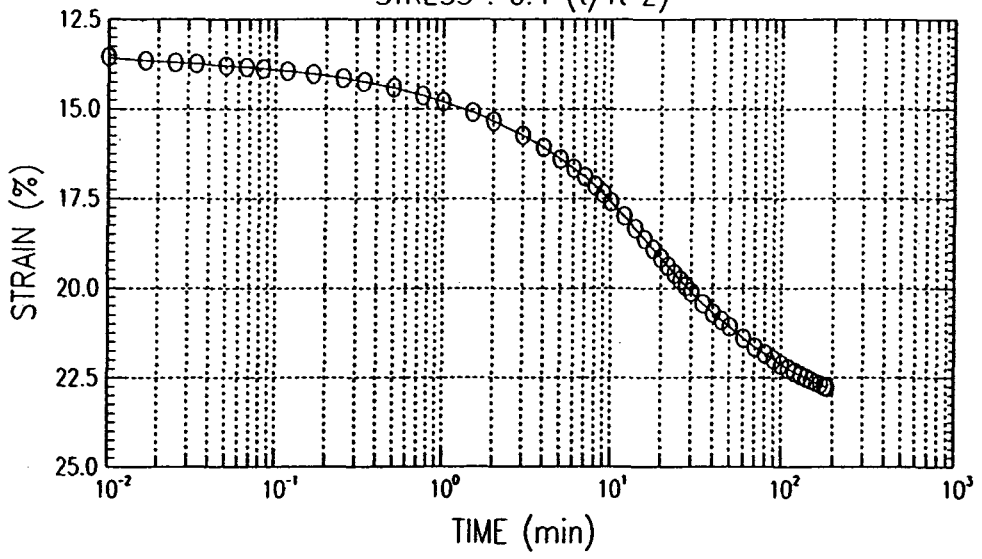


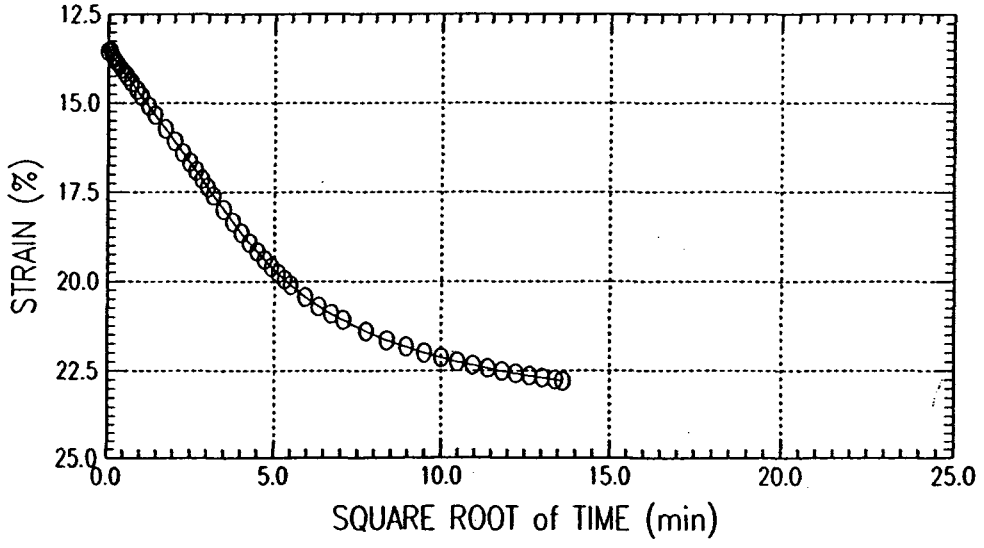


GeoTesting Express
Project Name : New Bedford Harbor Superfund Site
Project No : GTX-2409 Boring No : FA-9 Sample No : UO-1
Test Date : 01/03/00 Test No : CON29 Depth : 2-4 feet
Description : Moist, brown silty sand with gravel, organics
Remarks : ---

CONSOLIDATION TEST

TIME CURVES (STEP 6 OF 15)
STRESS : 0.4 (t/ft^2)

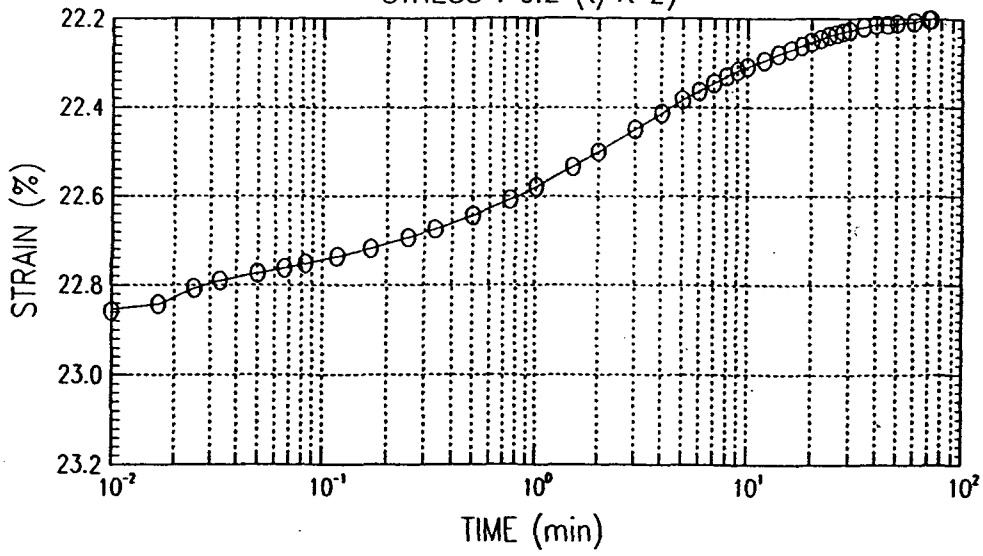


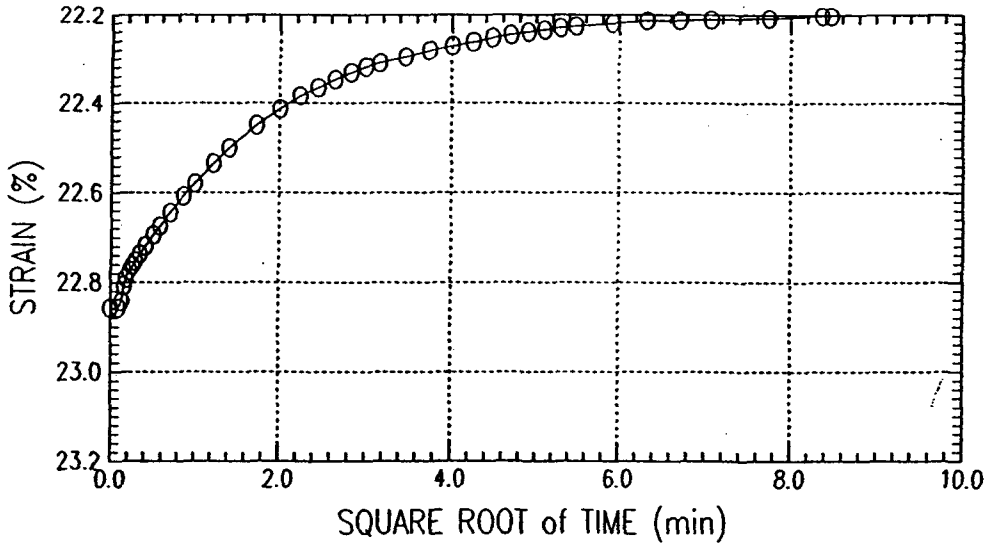


GeoTesting Express
Project Name : New Bedford Harbor Superfund Site
Project No : GTX-2409 Boring No : FA-9 Sample No : UO-1
Test Date : 01/03/00 Test No : CON29 Depth : 2-4 feet
Description : Moist, brown silty sand with gravel, organics
Remarks : ---

CONSOLIDATION TEST

TIME CURVES (STEP 7 OF 15)
STRESS : 0.2 (t/ft^2)

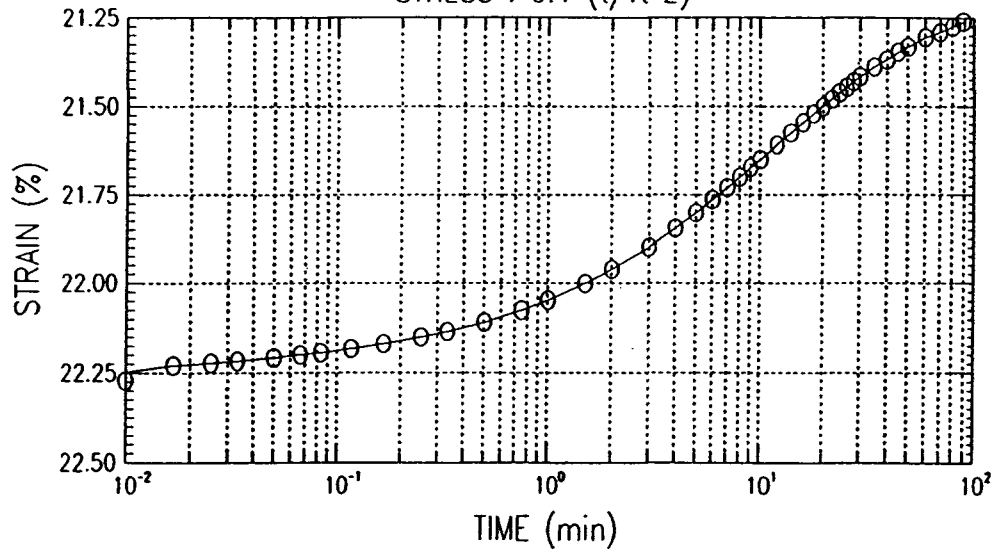


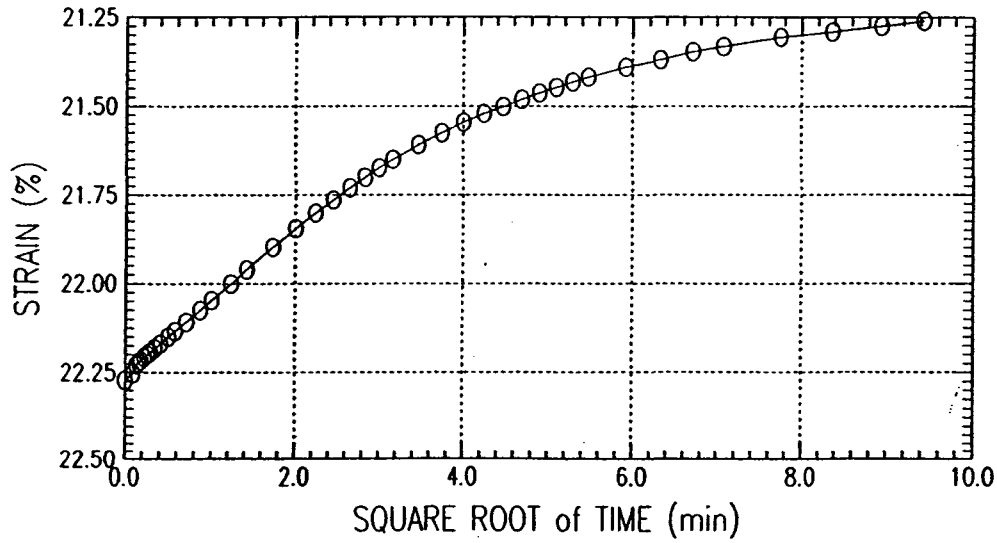


GeoTesting Express
Project Name : New Bedford Harbor Superfund Site
Project No : GTX-2409 Boring No : FA-9 Sample No : UO-1
Test Date : 01/03/00 Test No : CON29 Depth : 2-4 feet
Description : Moist, brown silty sand with gravel, organics
Remarks : ---

CONSOLIDATION TEST

TIME CURVES (STEP 8 OF 15)
STRESS : 0.1 (t/ft^2)

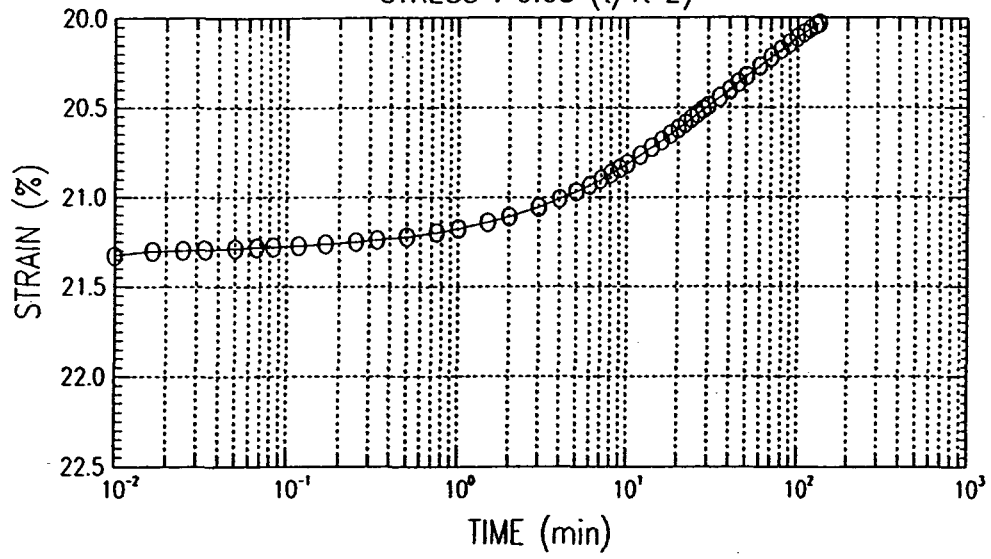


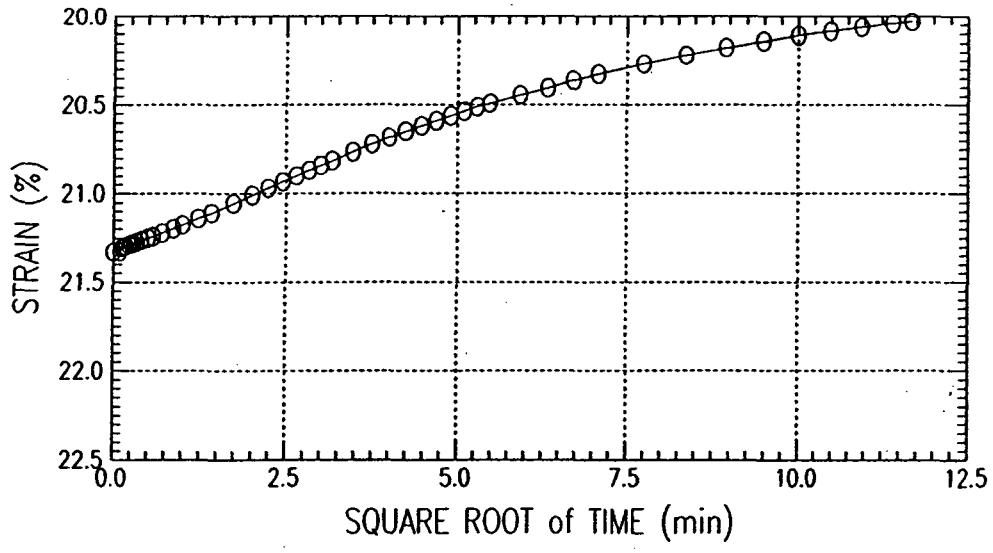


GeoTesting Express
Project Name : New Bedford Harbor Superfund Site
Project No : GTX-2409 Boring No : FA-9 Sample No : UO-1
Test Date : 01/03/00 Test No : CON29 Depth : 2-4 feet
Description : Moist, brown silty sand with gravel, organics
Remarks : ---

CONSOLIDATION TEST

TIME CURVES (STEP 9 OF 15)
STRESS : 0.05 (t/ft^2)

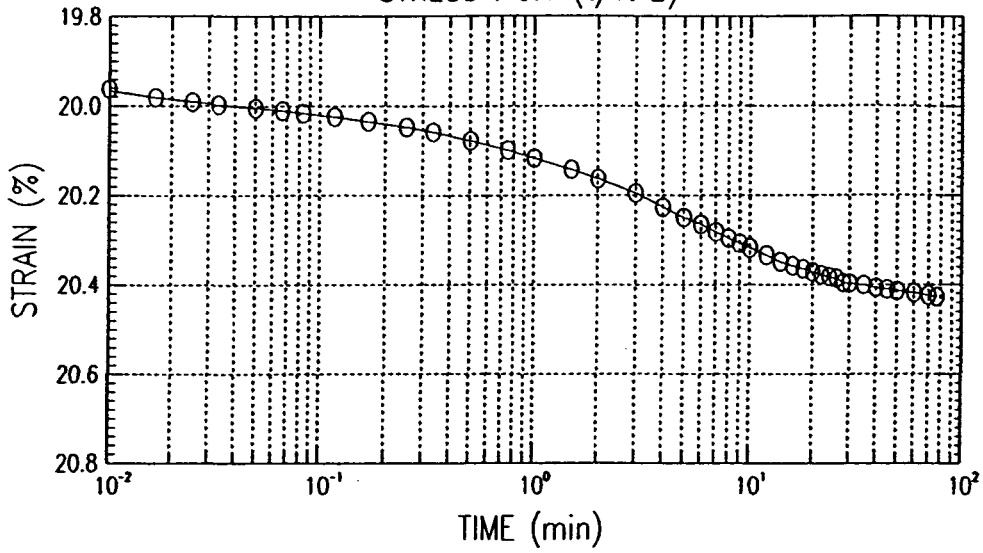


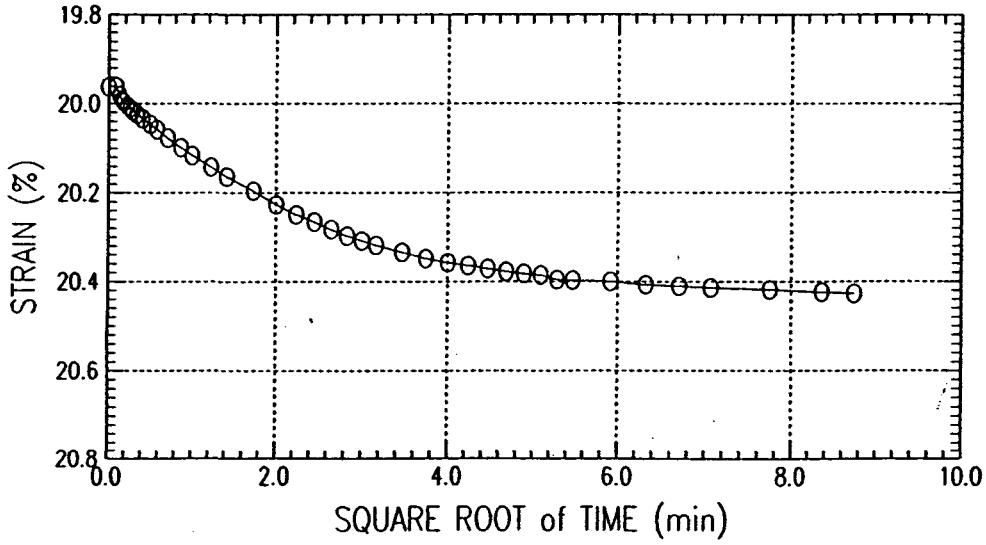


GeoTesting Express
Project Name : New Bedford Harbor Superfund Site
Project No : GTX-2409 Boring No : FA-9 Sample No : U0-1
Test Date : 01/03/00 Test No : CON29 Depth : 2-4 feet
Description : Moist, brown silty sand with gravel, organics
Remarks : ---

CONSOLIDATION TEST

TIME CURVES (STEP 10 OF 15)
STRESS : 0.1 (t/ft^2)

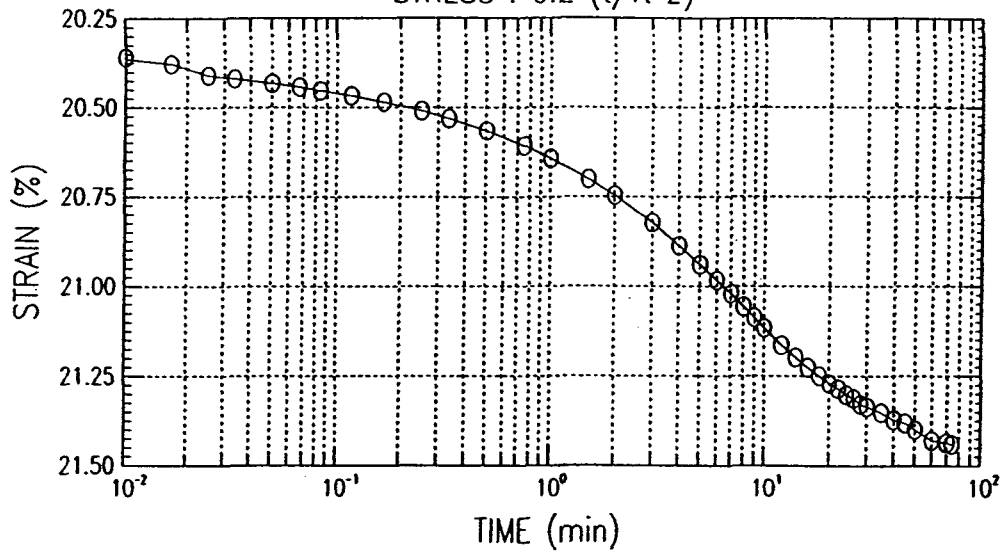


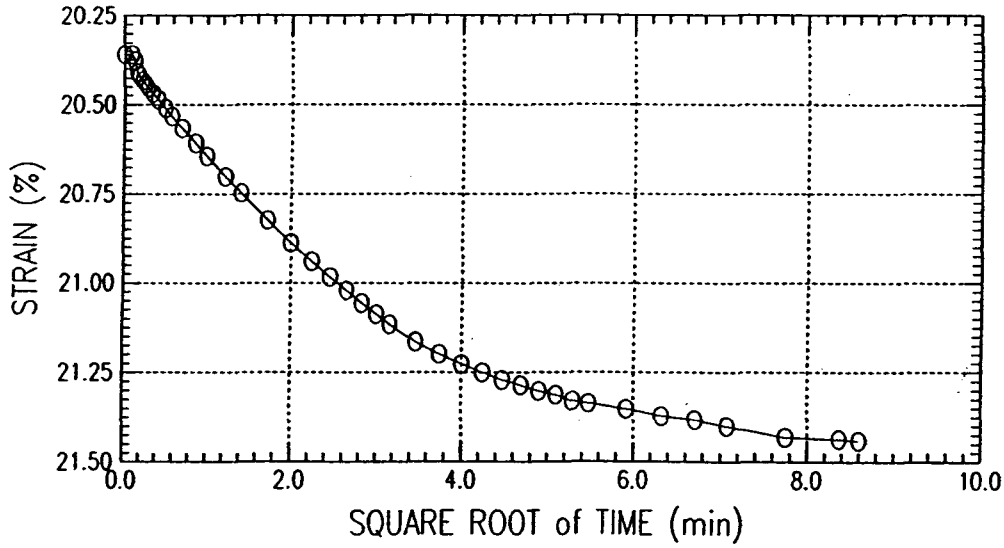


GeoTesting Express
Project Name : New Bedford Harbor Superfund Site
Project No : GTX-2409 Boring No : FA-9 Sample No : UO-1
Test Date : 01/03/00 Test No : CON29 Depth : 2-4 feet
Description : Moist, brown silty sand with gravel, organics
Remarks : ---

CONSOLIDATION TEST

TIME CURVES (STEP 11 OF 15)
STRESS : 0.2 (t/ft^2)

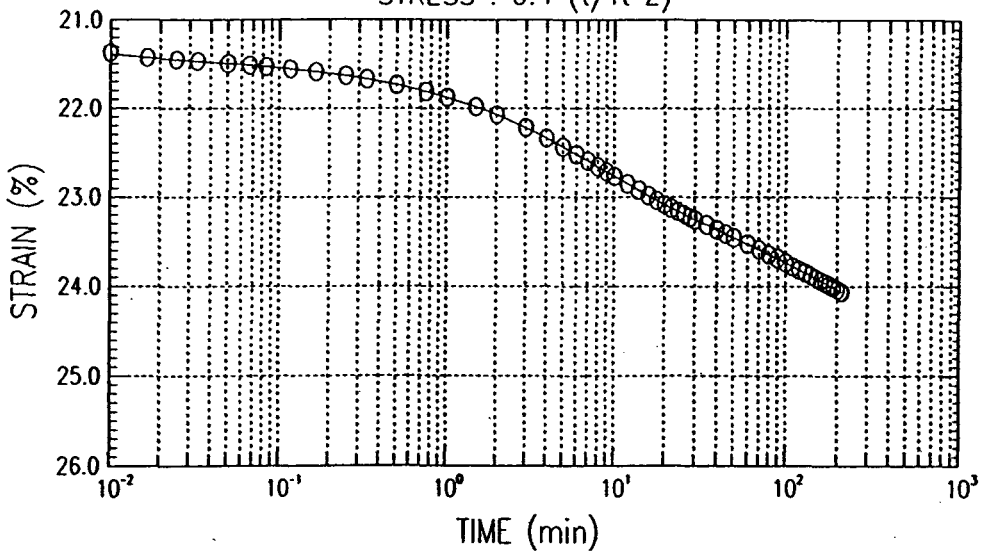


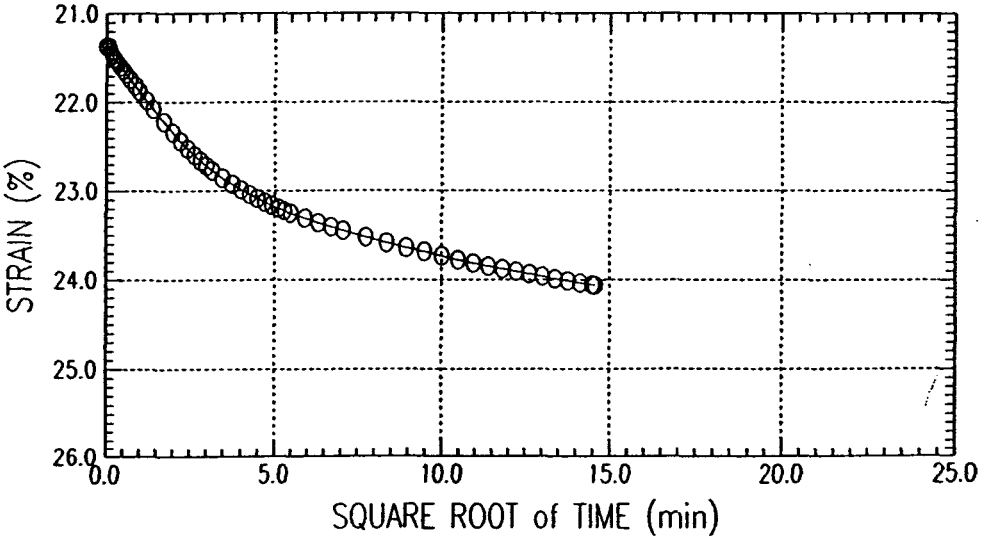


GeoTesting Express
Project Name : New Bedford Harbor Superfund Site
Project No : GTX-2409 Boring No : FA-9 Sample No : UO-1
Test Date : 01/03/00 Test No : CON29 Depth : 2-4 feet
Description : Moist, brown silty sand with gravel, organics
Remarks : ---

CONSOLIDATION TEST

TIME CURVES (STEP 12 OF 15)
STRESS : 0.4 (t/ft^2)

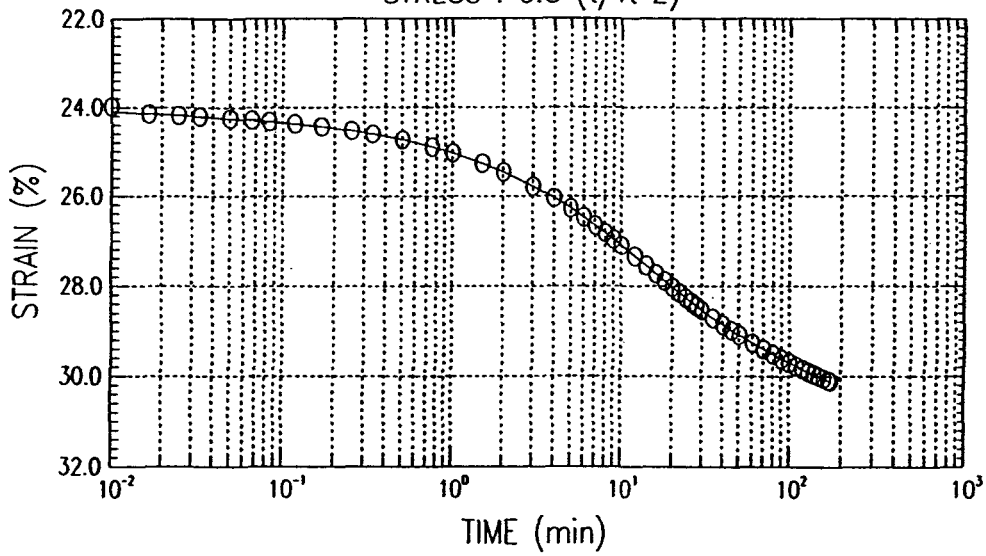


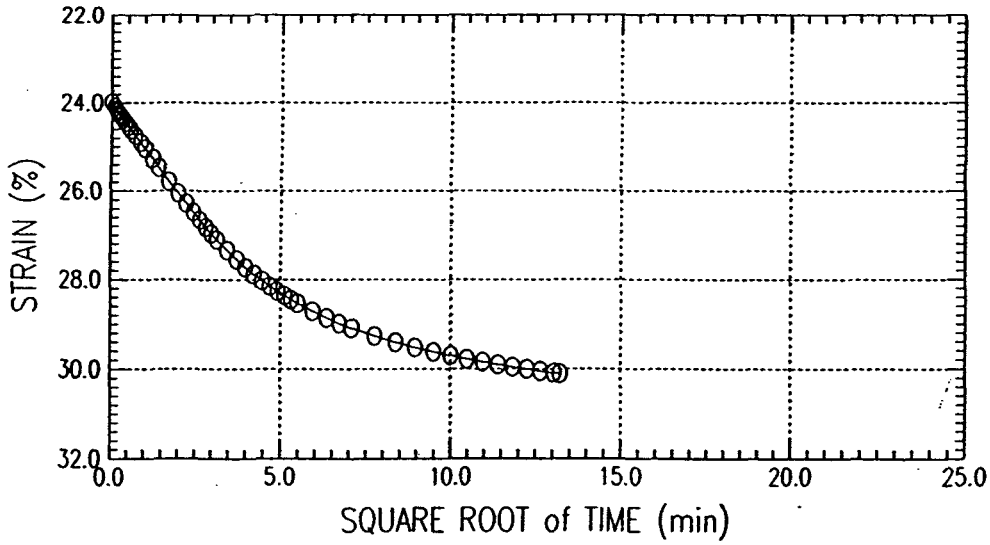


GeoTesting Express
Project Name : New Bedford Harbor Superfund Site
Project No : GTX-2409 Boring No : FA-9 Sample No : U0-1
Test Date : 01/03/00 Test No : CON29 Depth : 2-4 feet
Description : Moist, brown silty sand with gravel, organics
Remarks : ---

CONSOLIDATION TEST

TIME CURVES (STEP 13 OF 15)
STRESS : 0.8 (t/ft^2)



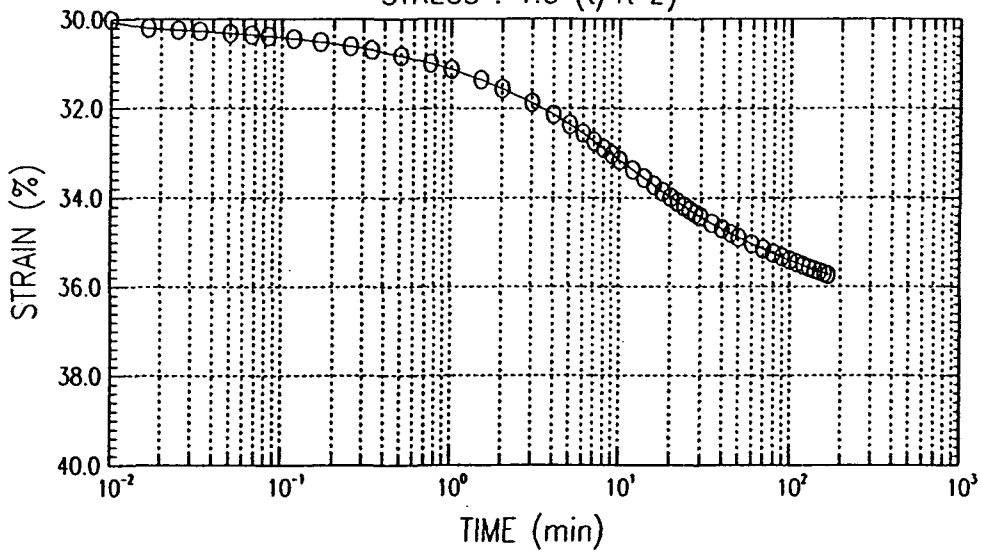


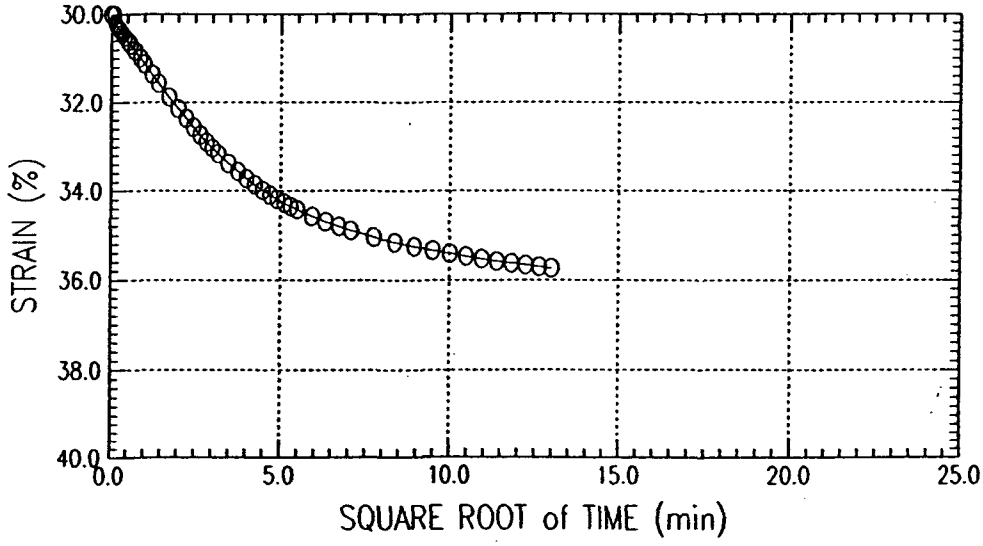
GeoTesting Express
Project Name : New Bedford Harbor Superfund Site
Project No : GTX-2409 Boring No : FA-9 Sample No : UO-1
Test Date : 01/03/00 Test No : CON29 Depth : 2-4 feet
Description : Moist, brown silty sand with gravel, organics
Remarks : ---

CONSOLIDATION TEST

TIME CURVES (STEP 14 OF 15)

STRESS : 1.5 (t/ft^2)

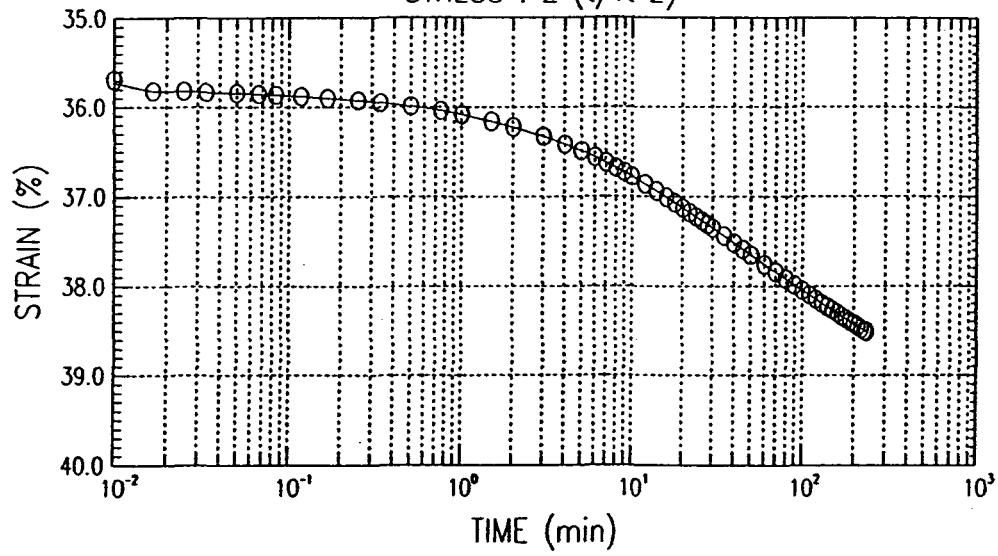


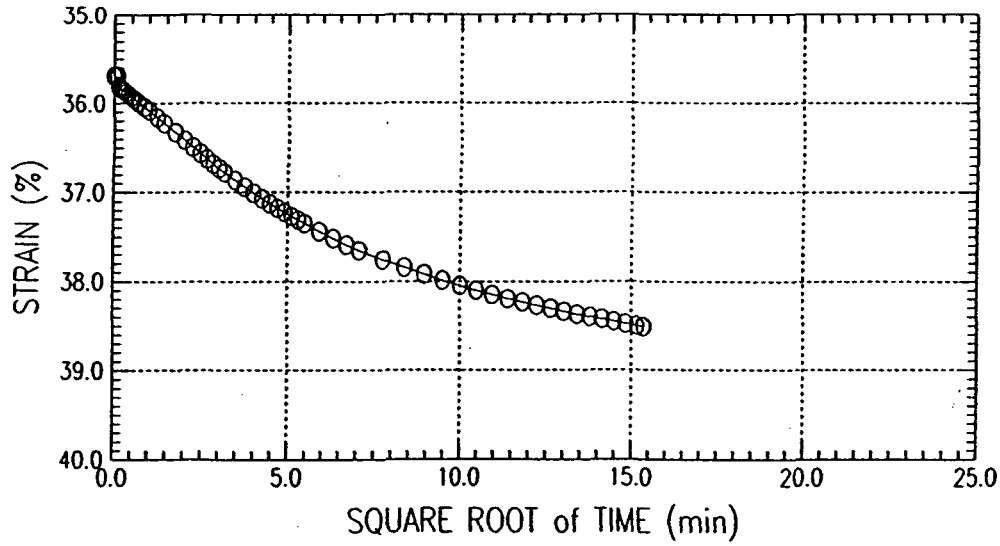


GeoTesting Express
Project Name : New Bedford Harbor Superfund Site
Project No : GTX-2409 Boring No : FA-9 Sample No : UO-1
Test Date : 01/03/00 Test No : CON29 Depth : 2-4 feet
Description : Moist, brown silty sand with gravel, organics
Remarks : ---

CONSOLIDATION TEST

TIME CURVES (STEP 15 OF 15)
STRESS : 2 (t/ft^2)

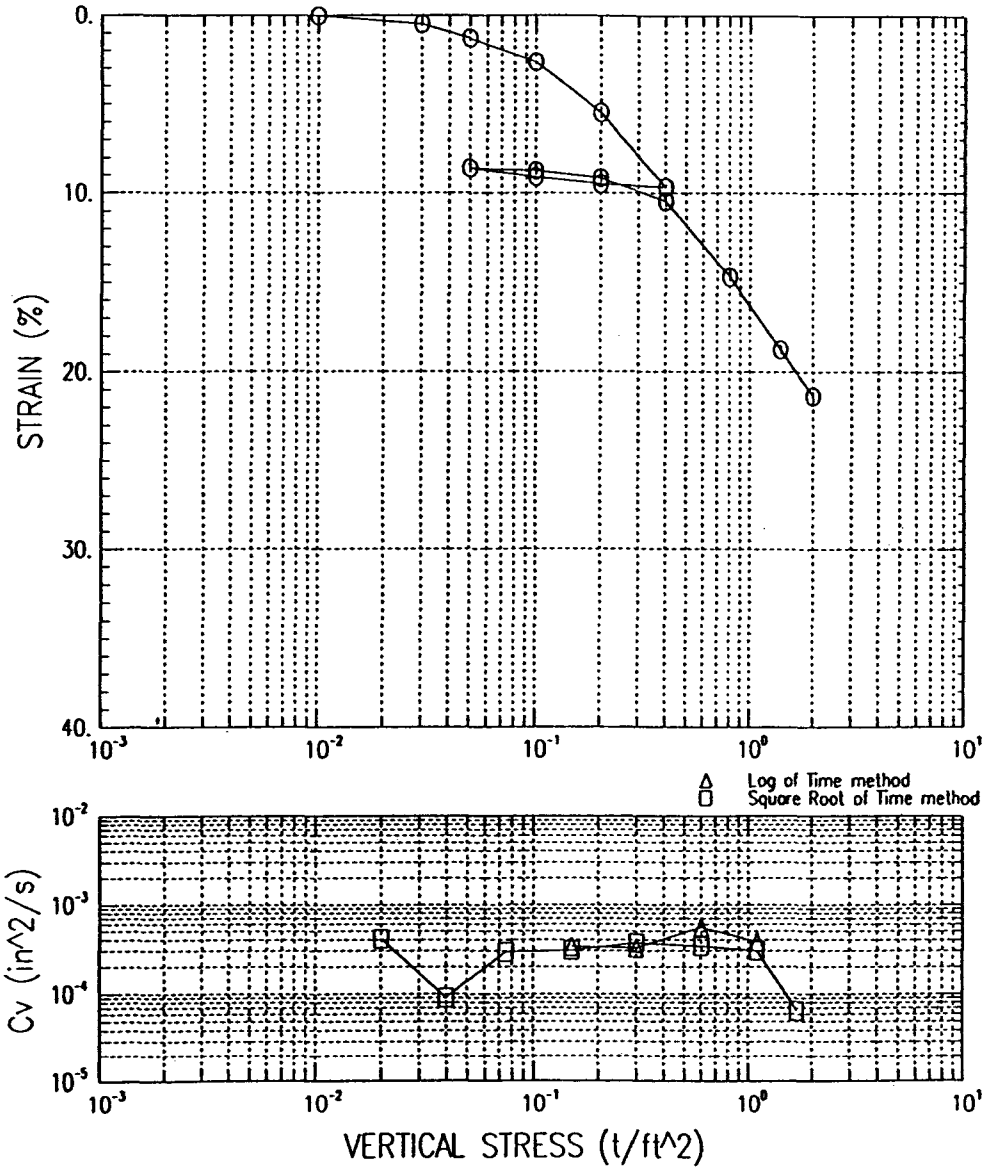




GeoTesting Express
Project Name : New Bedford Harbor Superfund Site
Project No : GTX-2409 Boring No : FA-9 Sample No : UO-1
Test Date : 01/03/00 Test No : CON29 Depth : 2-4 feet
Description : Moist, brown silty sand with gravel, organics
Remarks : ---

CONSOLIDATION TEST

SUMMARY REPORT



GeoTesting Express
Project Name : New Bedford Harbor Superfund Site
Project No : GTX-2409 Boring No : FA-12 Sample No : UO-1
Test Date : 01/05/00 Test No : CON26 Depth : 1-3 feet
Description : Moist, dark gray silty clay with trace shells
Remarks : ---

CONSOLIDATION TEST DATA

Project : New Bedford Harbor Superfund Site Location : New Bedford, MA Project No.: GTX-2409
Boring No.: FA-12 Tested by : YF Checked by : rh
Sample No.: UO-1 Test Date : 01/05/00 Depth : 1-3 feet
Test No. : CON26 Sample Type: Tube

Soil Description : Moist, dark gray silty clay with trace shells
Remarks : ---

Specific Gravity : 2.55 Liquid Limit : 0 Initial Height : 1.00 (in)
Initial Void Ratio : 1.78 Plastic Limit : 0 Sample Diameter : 2.49 (in)
Final Void Ratio : 1.19 Plasticity Index : 0

	BEFORE CONSOLIDATION		AFTER CONSOLIDATION	
	TRIMMINGS	SPECIMEN + RING	SPECIMEN + RING	TRIMMINGS
CONTAINER NO.	a48	RING	RING	zr-08
WT CONTAINER + WET SOIL (gm)	353.08	331.53	316.00	116.30
WT CONTAINER + DRY SOIL (gm)	213.00	282.05	282.05	82.39
WT CONTAINER (gm)	9.36	209.15	209.15	9.58
WT DRY SOIL (gm)	203.64	72.90	72.90	72.81
WATER CONTENT (%)	68.79	67.88	46.57	46.57
VOID RATIO	------	1.78	1.19	------
DEGREE OF SATURATION (%)	------	97.17	100.00	------
DRY DENSITY (lb/ft^3)	------	57.26	72.81	------

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

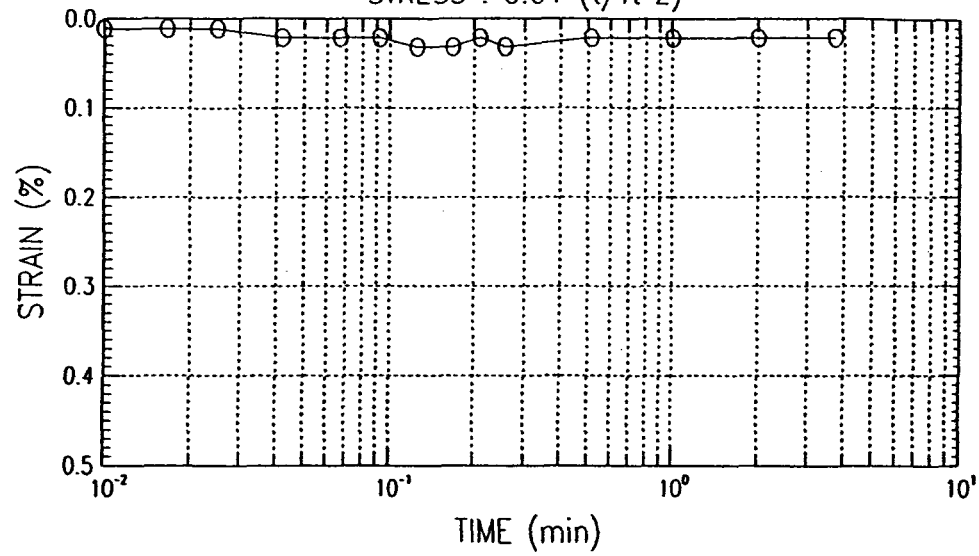
Project : New Bedford Harbor Superfund Site Location : New Bedford, MA Project No.: GTX-2409
Boring No.: FA-12 Tested by : YF Checked by : rh
Sample No.: UO-1 Test Date : 01/05/00 Depth : 1-3 feet
Test No. : CON26 Sample Type: Tube

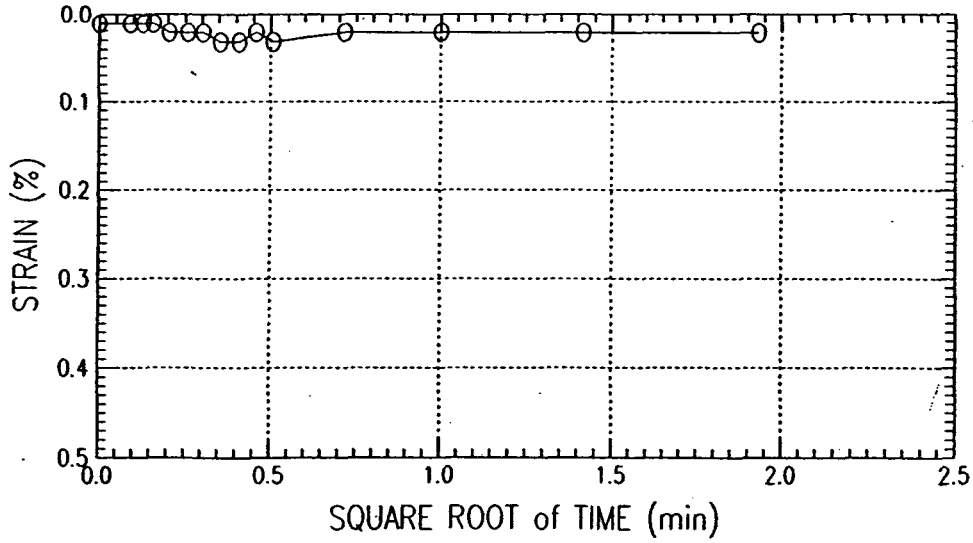
Soil Description : Moist, dark gray silty clay with trace shells
Remarks : ---

	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	0.000	1.783	0.03	0.0	0.0	0.00E+000	0.00E+000	0.00E+000
2)	0.03	0.005	1.770	0.48	2.0	0.0	4.10E-004	0.00E+000	4.10E-004
3)	0.05	0.013	1.747	1.29	8.9	0.0	9.08E-005	0.00E+000	9.08E-005
4)	0.10	0.027	1.709	2.67	2.7	0.0	2.90E-004	0.00E+000	2.90E-004
5)	0.20	0.055	1.631	5.49	2.5	2.3	3.06E-004	3.36E-004	3.21E-004
6)	0.40	0.097	1.514	9.68	1.9	2.2	3.67E-004	3.23E-004	3.45E-004
7)	0.20	0.095	1.520	9.48	0.0	0.0	0.00E+000	0.00E+000	5.80E-003
8)	0.10	0.091	1.530	9.10	0.0	0.0	0.00E+000	0.00E+000	9.64E-004
9)	0.05	0.086	1.544	8.60	0.0	0.0	0.00E+000	0.00E+000	3.90E-004
10)	0.10	0.087	1.540	8.74	0.0	0.0	0.00E+000	0.00E+000	1.68E-003
11)	0.20	0.092	1.529	9.15	0.0	0.0	0.00E+000	0.00E+000	1.78E-003
12)	0.40	0.105	1.492	10.46	0.0	0.0	0.00E+000	0.00E+000	9.52E-005
13)	0.80	0.147	1.374	14.70	1.9	1.1	3.39E-004	5.56E-004	4.47E-004
14)	1.40	0.187	1.262	18.74	1.9	1.5	3.03E-004	3.79E-004	3.41E-004
15)	2.00	0.214	1.189	21.36	8.0	0.0	6.56E-005	0.00E+000	6.56E-005

CONSOLIDATION TEST

TIME CURVES (STEP 1 OF 15)
STRESS : 0.01 (t/ft^2)

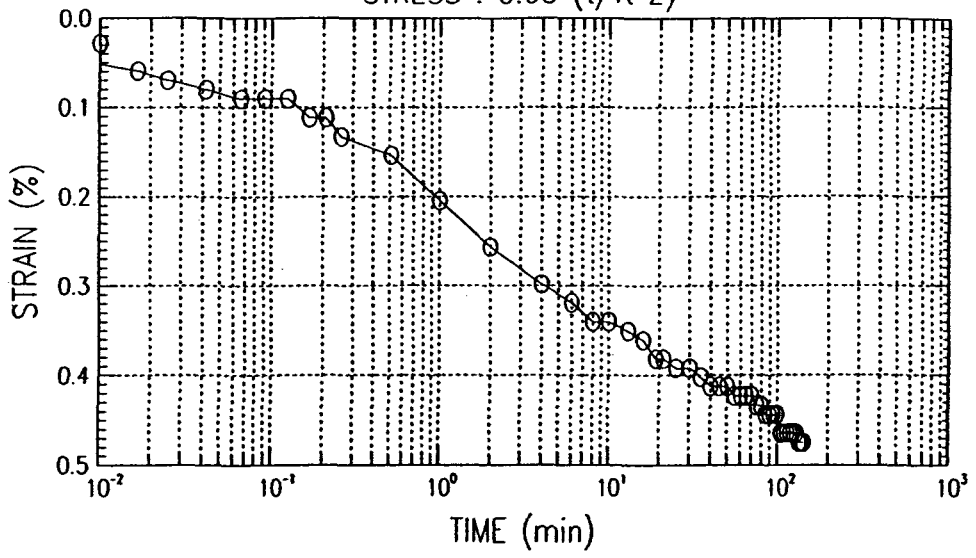


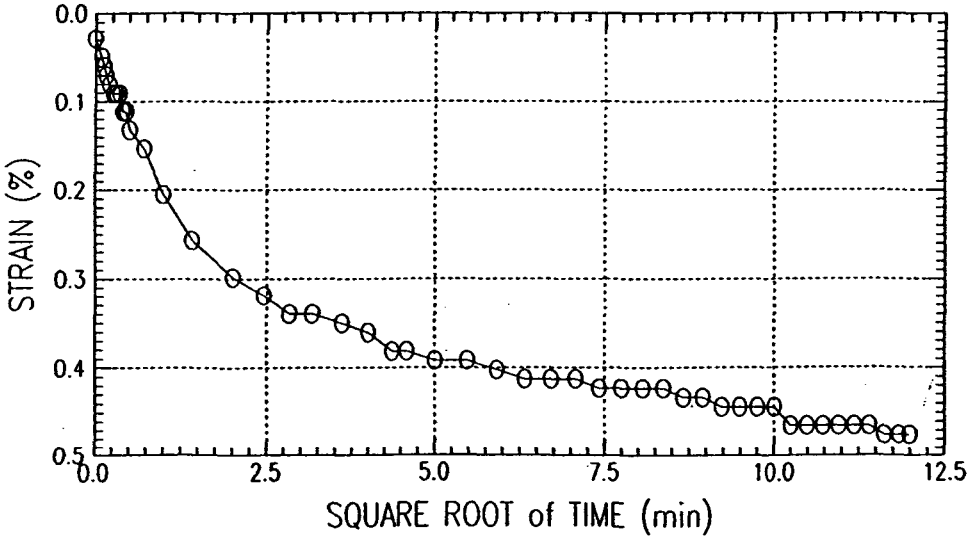


GeoTesting Express
Project Name : New Bedford Harbor Superfund Site
Project No : GTX-2409 Boring No : FA-12 Sample No : UO-1
Test Date : 01/05/00 Test No : CON26 Depth : 1-3 feet
Description : Moist, dark gray silty clay with trace shells
Remarks : ---

CONSOLIDATION TEST

TIME CURVES (STEP 2 OF 15)
STRESS : 0.03 (t/ft^2)

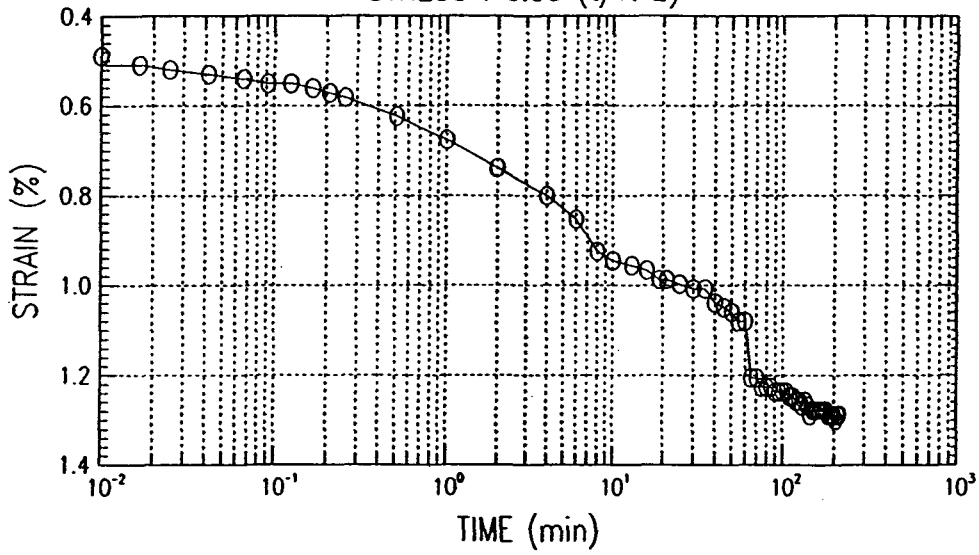


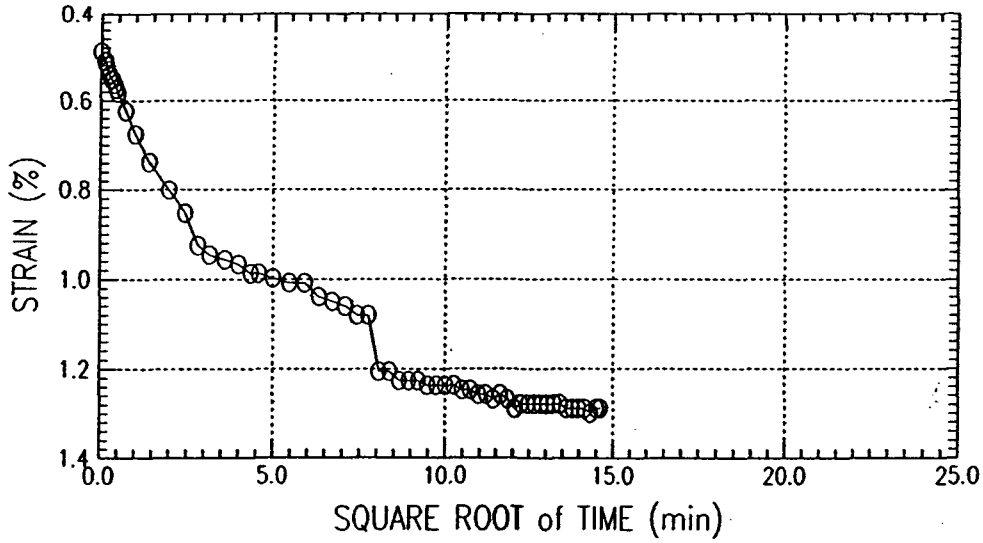


GeoTesting Express
Project Name : New Bedford Harbor Superfund Site
Project No : GTX-2409 Boring No : FA-12 Sample No : UO-1
Test Date : 01/05/00 Test No : CON26 Depth : 1-3 feet
Description : Moist, dark gray silty clay with trace shells
Remarks : ---

CONSOLIDATION TEST

TIME CURVES (STEP 3 OF 15)
STRESS : 0.05 (t/ft^2)

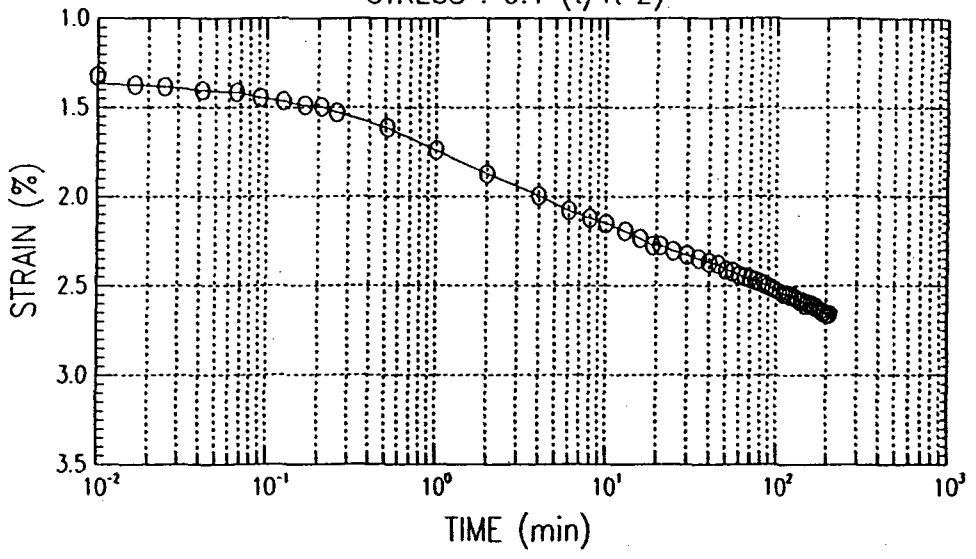


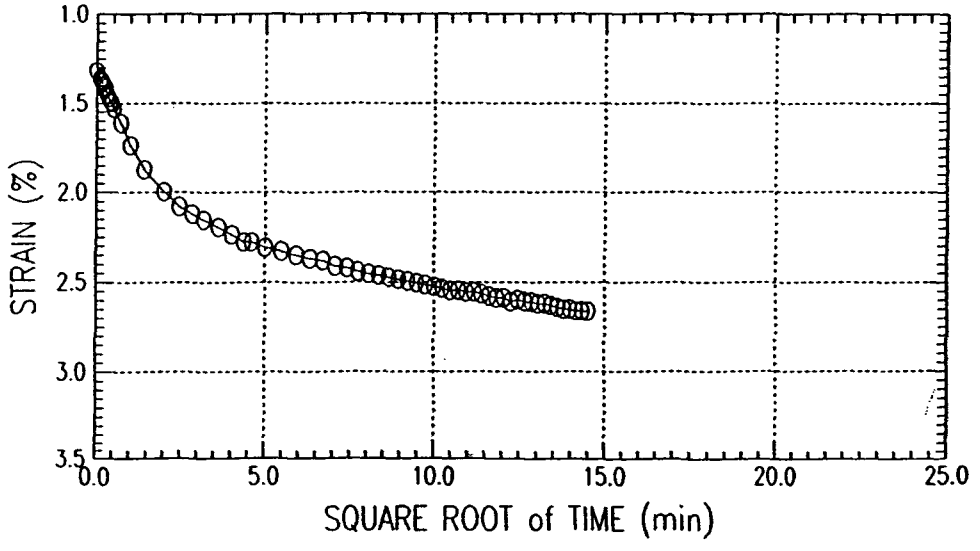


GeoTesting Express
Project Name : New Bedford Harbor Superfund Site
Project No : GTX-2409 Boring No : FA-12 Sample No : UO-1
Test Date : 01/05/00 Test No : CON26 Depth : 1-3 feet
Description : Moist, dark gray silty clay with trace shells
Remarks : ---

CONSOLIDATION TEST

TIME CURVES (STEP 4 OF 15)
STRESS : 0.1 (t/ft^2)

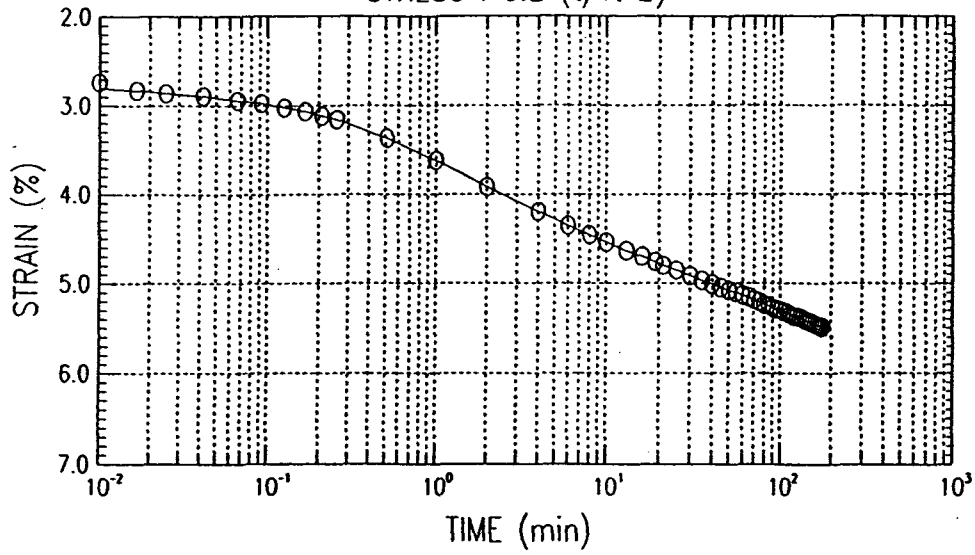


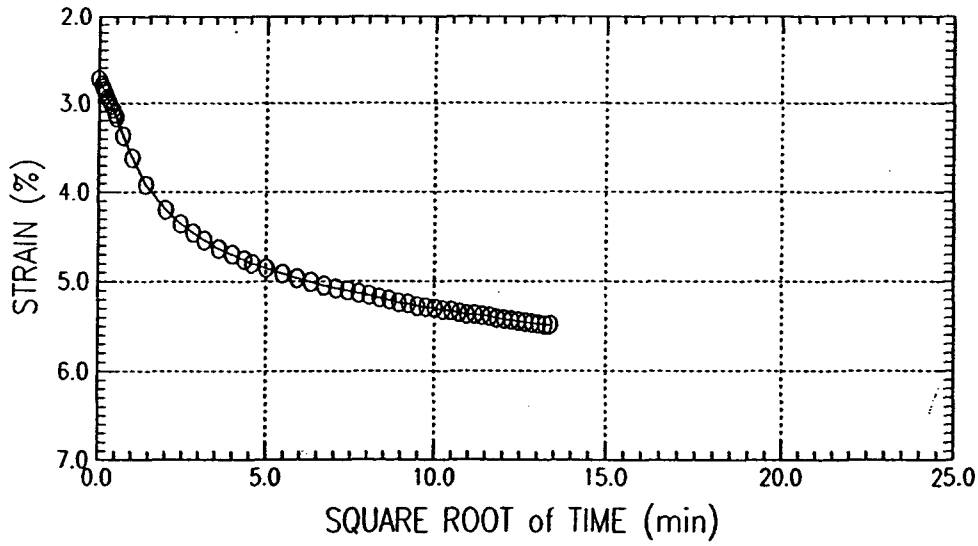


GeoTesting Express
Project Name : New Bedford Harbor Superfund Site
Project No : GTX-2409 Boring No : FA-12 Sample No : UO-1
Test Date : 01/05/00 Test No : CON26 Depth : 1-3 feet
Description : Moist, dark gray silty clay with trace shells
Remarks : ---

CONSOLIDATION TEST

TIME CURVES (STEP 5 OF 15)
STRESS : 0.2 (t/ft^2)



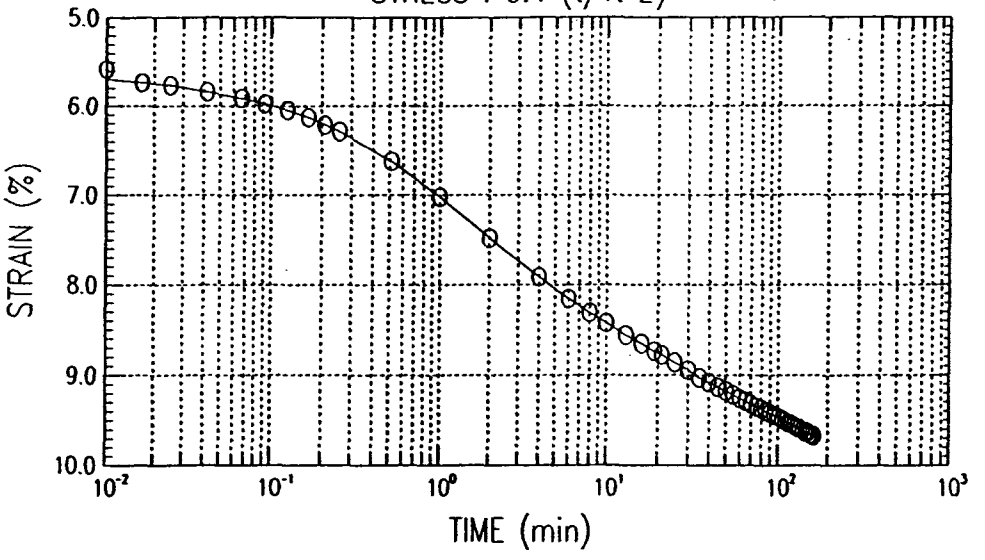


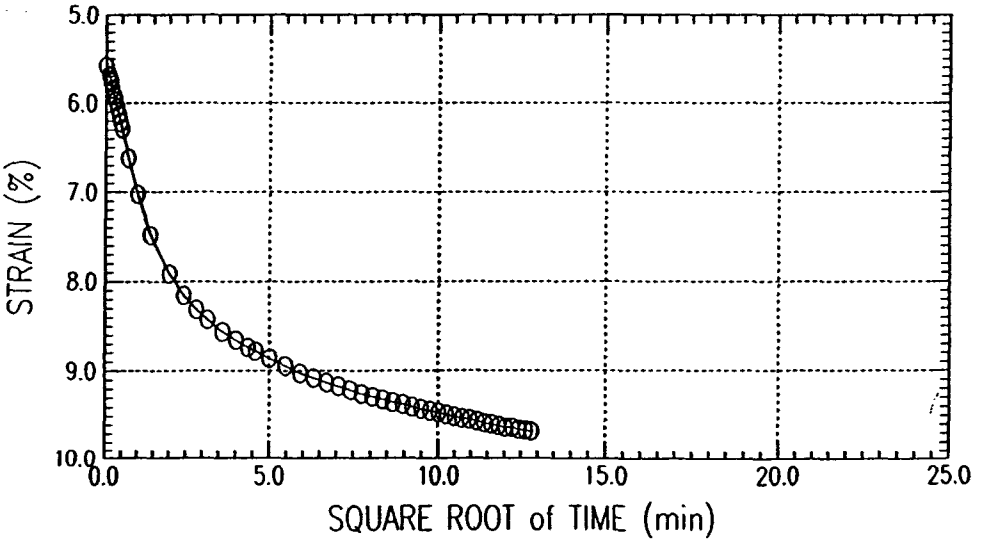
GeoTesting Express
Project Name : New Bedford Harbor Superfund Site
Project No : GTX-2409 Boring No : FA-12 Sample No : UO-1
Test Date : 01/05/00 Test No : CON26 Depth : 1-3 feet
Description : Moist, dark gray silty clay with trace shells
Remarks : ---

CONSOLIDATION TEST

TIME CURVES (STEP 6 OF 15)

STRESS : 0.4 (t/ft^2)

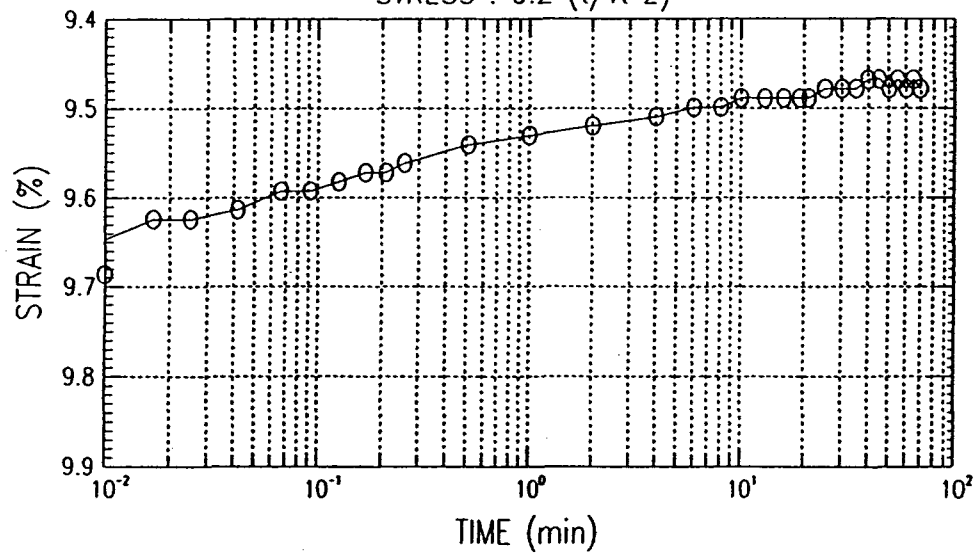


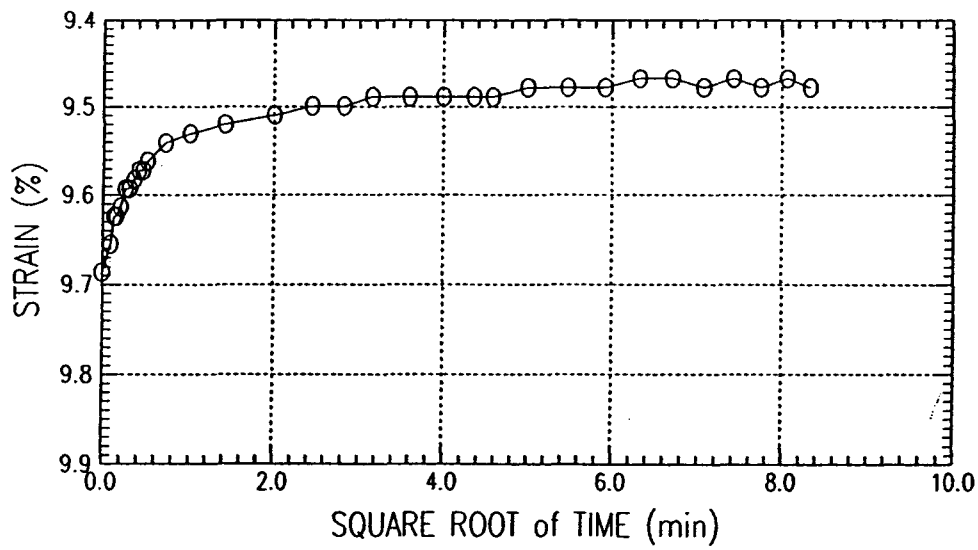


GeoTesting Express
Project Name : New Bedford Harbor Superfund Site
Project No : GTX-2409 Boring No : FA-12 Sample No : UO-1
Test Date : 01/05/00 Test No : CON26 Depth : 1-3 feet
Description : Moist, dark gray silty clay with trace shells
Remarks : ---

CONSOLIDATION TEST

TIME CURVES (STEP 7 OF 15)
STRESS : 0.2 (t/ft^2)

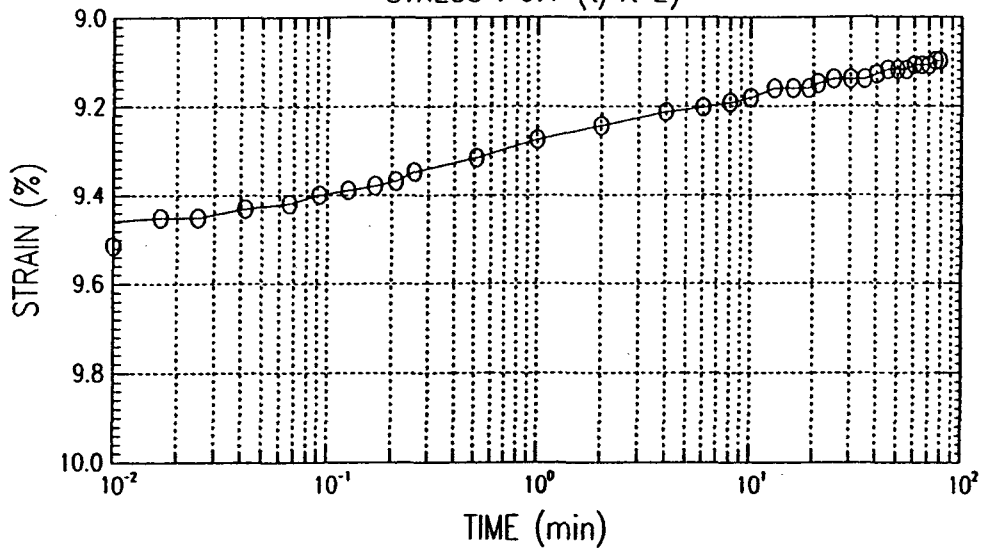


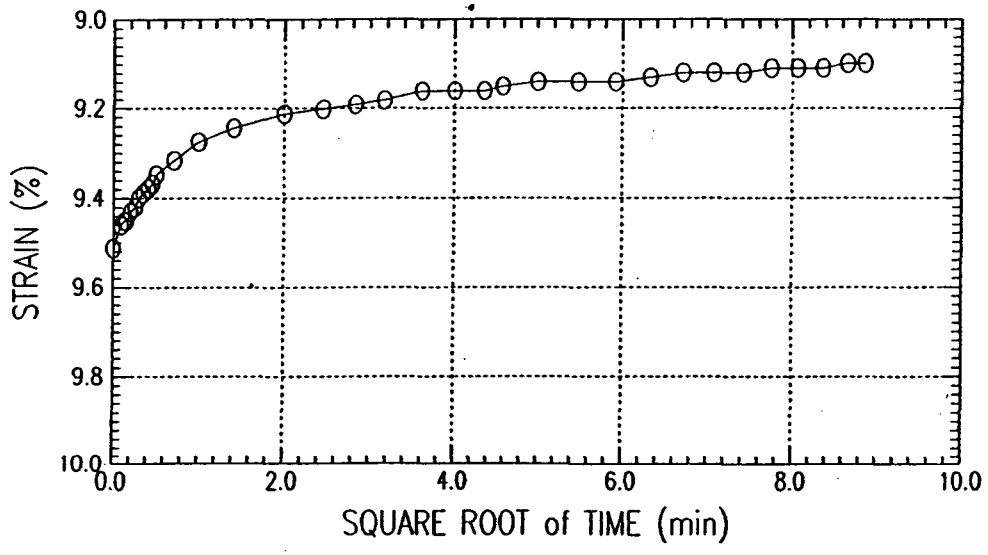


GeoTesting Express
Project Name : New Bedford Harbor Superfund Site
Project No : GTX-2409 Boring No : FA-12 Sample No : UO-1
Test Date : 01/05/00 Test No : CON26 Depth : 1-3 feet
Description : Moist, dark gray silty clay with trace shells
Remarks : ---

CONSOLIDATION TEST

TIME CURVES (STEP 8 OF 15)
STRESS : 0.1 (t/ft^2)

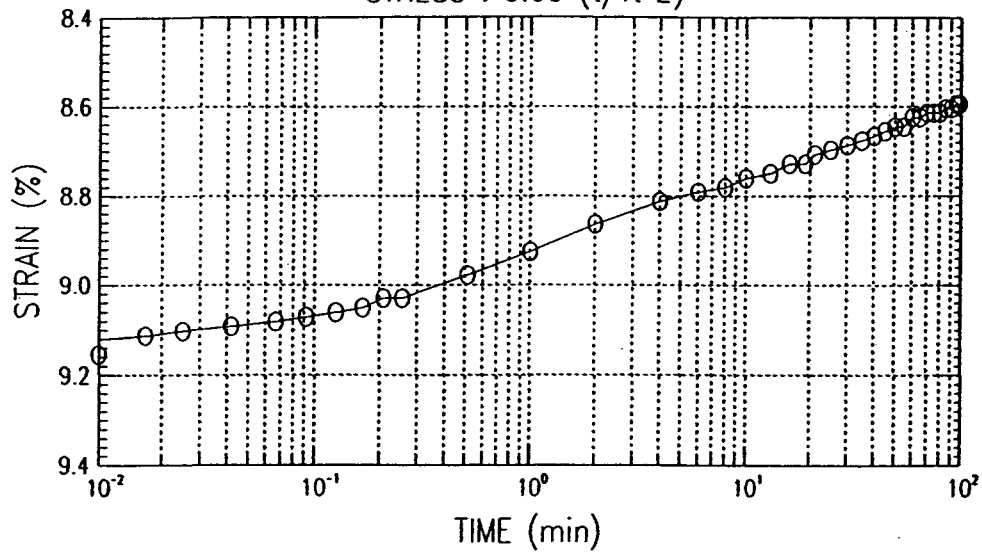


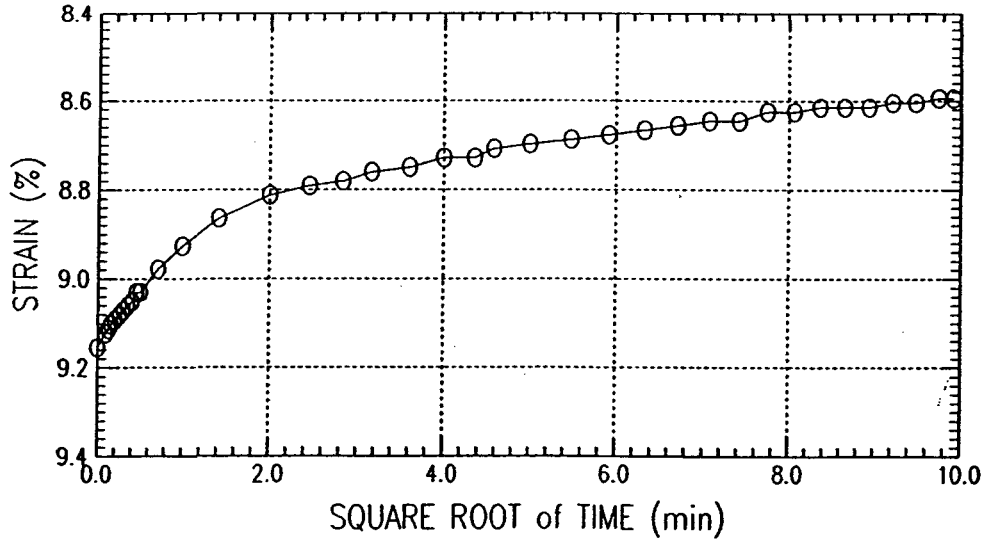


GeoTesting Express
Project Name : New Bedford Harbor Superfund Site
Project No : GTX-2409 Boring No : FA-12 Sample No : UO-1
Test Date : 01/05/00 Test No : CON26 Depth : 1-3 feet
Description : Moist, dark gray silty clay with trace shells
Remarks : ---

CONSOLIDATION TEST

TIME CURVES (STEP 9 OF 15)
STRESS : 0.05 (t/ft^2)

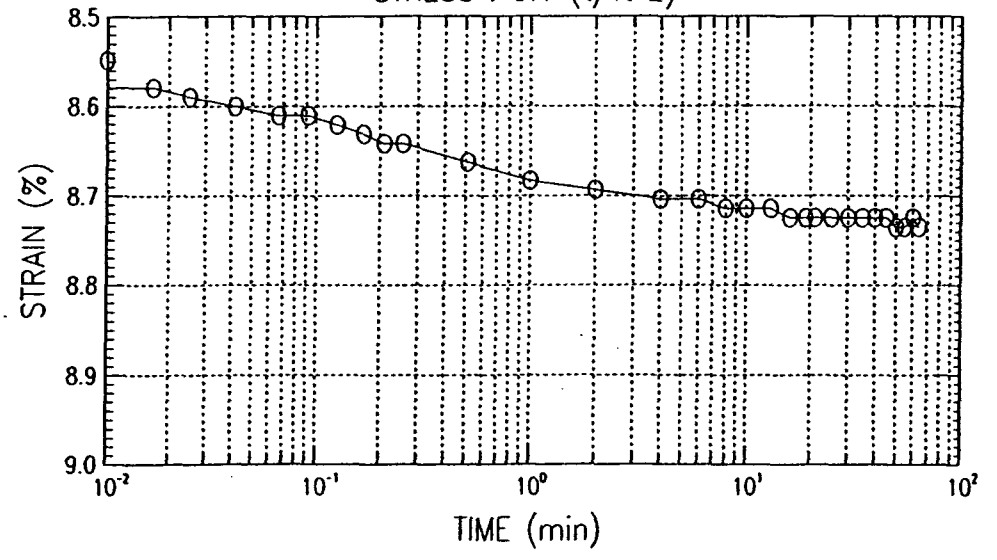


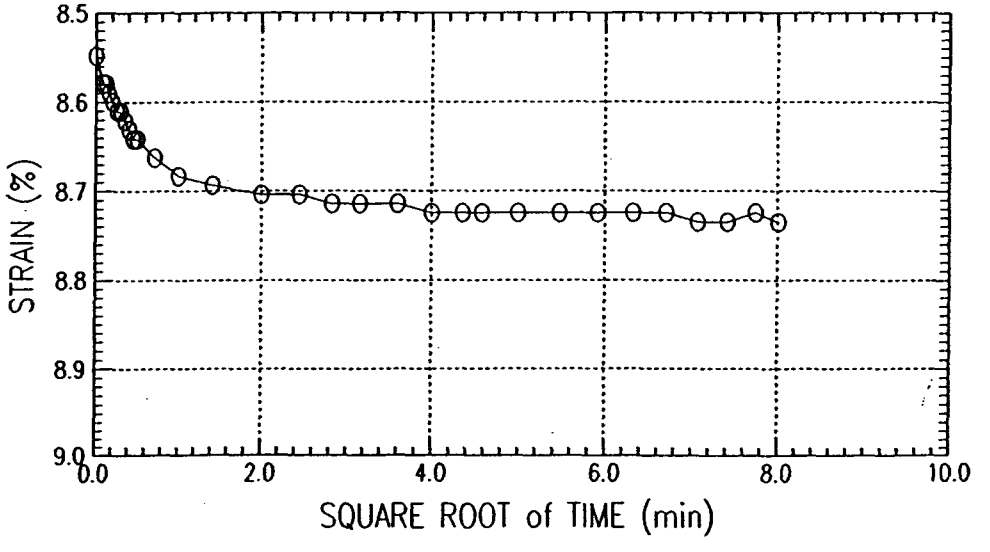


GeoTesting Express
Project Name : New Bedford Harbor Superfund Site
Project No : GTX-2409 Boring No : FA-12 Sample No : UO-1
Test Date : 01/05/00 Test No : CON26 Depth : 1-3 feet
Description : Moist, dark gray silty clay with trace shells
Remarks : ---

CONSOLIDATION TEST

TIME CURVES (STEP 10 OF 15)
STRESS : 0.1 (t/ft^2)

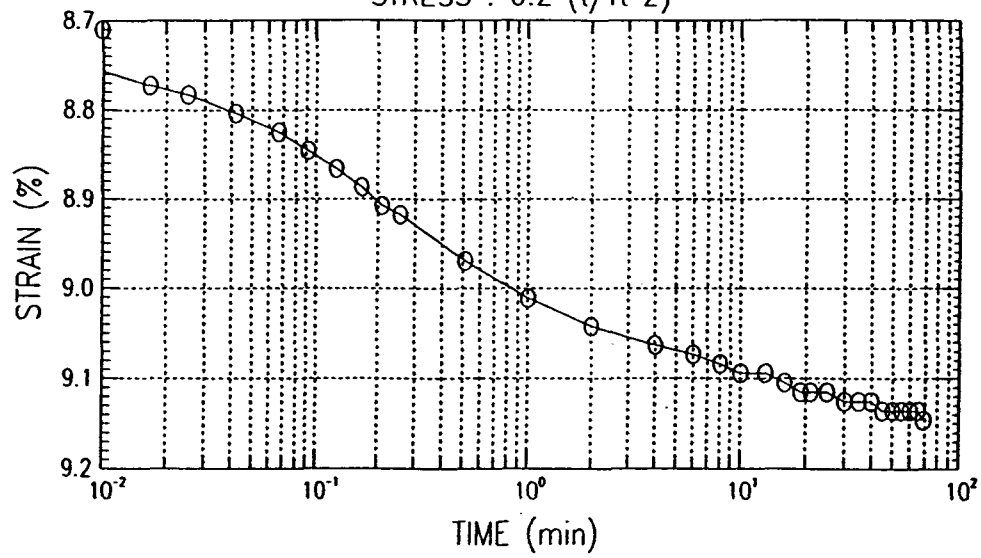


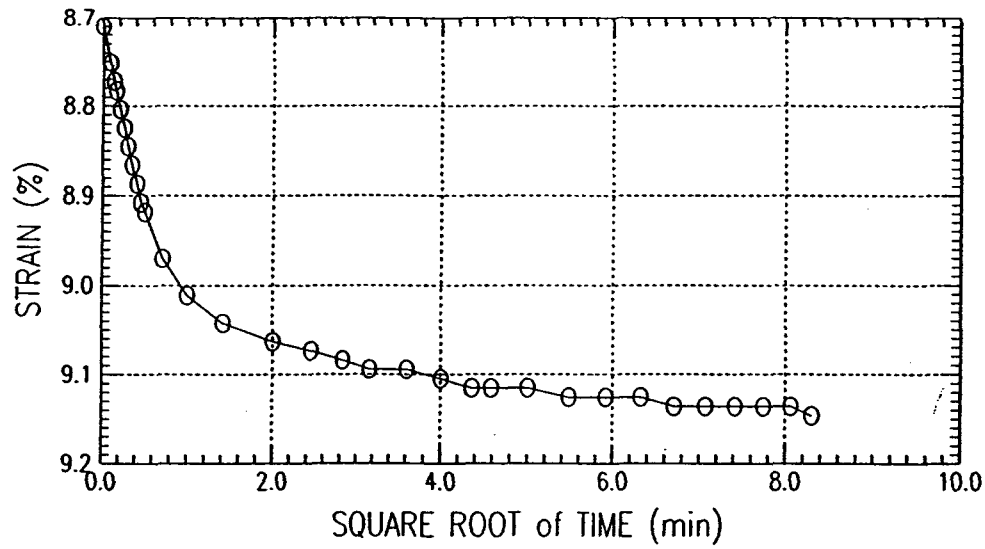


GeoTesting Express
Project Name : New Bedford Harbor Superfund Site
Project No : GTX-2409 Boring No : FA-12 Sample No : U0-1
Test Date : 01/05/00 Test No : CON26 Depth : 1-3 feet
Description : Moist, dark gray silty clay with trace shells
Remarks : ---

CONSOLIDATION TEST

TIME CURVES (STEP 11 OF 15)
STRESS : 0.2 (t/ft^2)



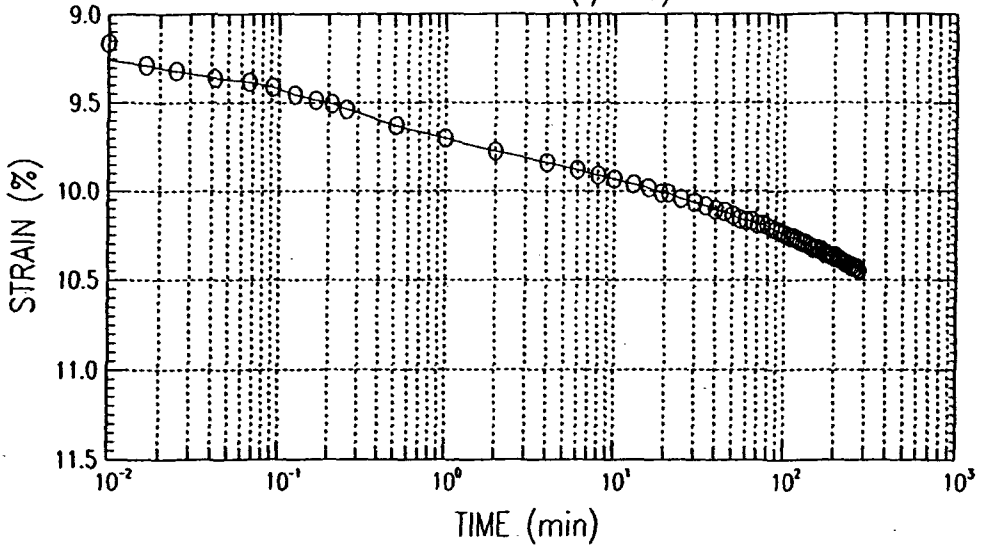


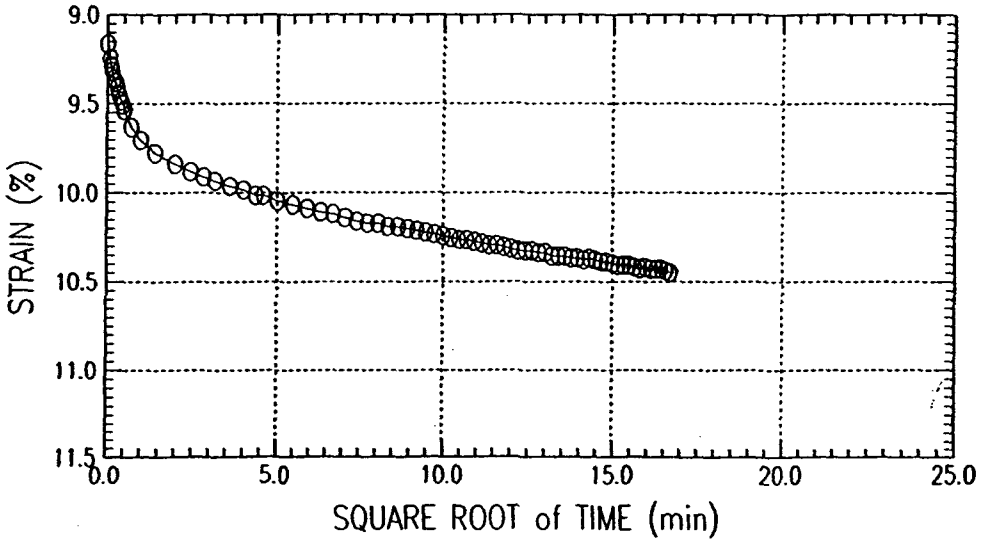
GeoTesting Express
Project Name : New Bedford Harbor Superfund Site
Project No : GTX-2409 Boring No : FA-12 Sample No : UO-1
Test Date : 01/05/00 Test No : CON26 Depth : 1-3 feet
Description : Moist, dark gray silty clay with trace shells
Remarks : ---

CONSOLIDATION TEST

TIME CURVES (STEP 12 OF 15)

STRESS : 0.4 (t/ft^2)

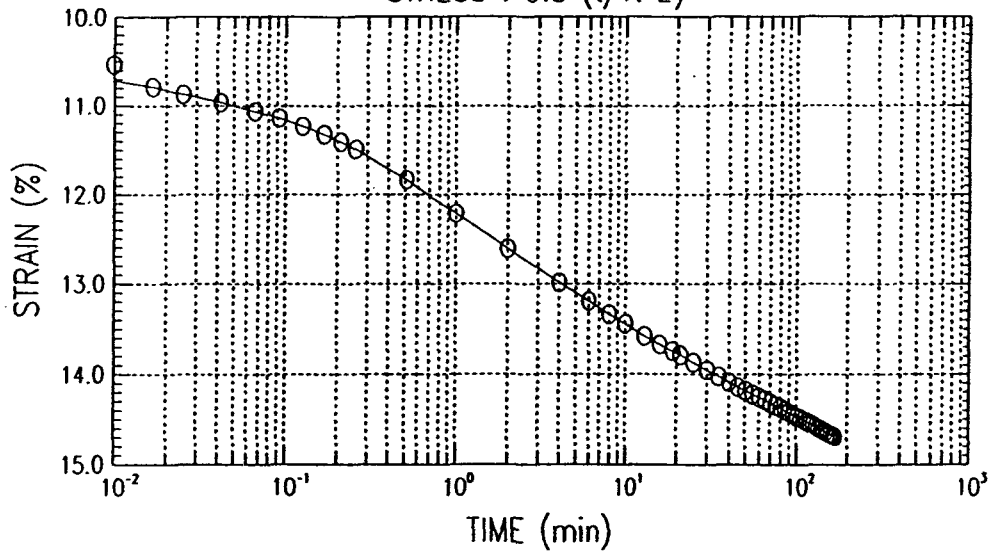


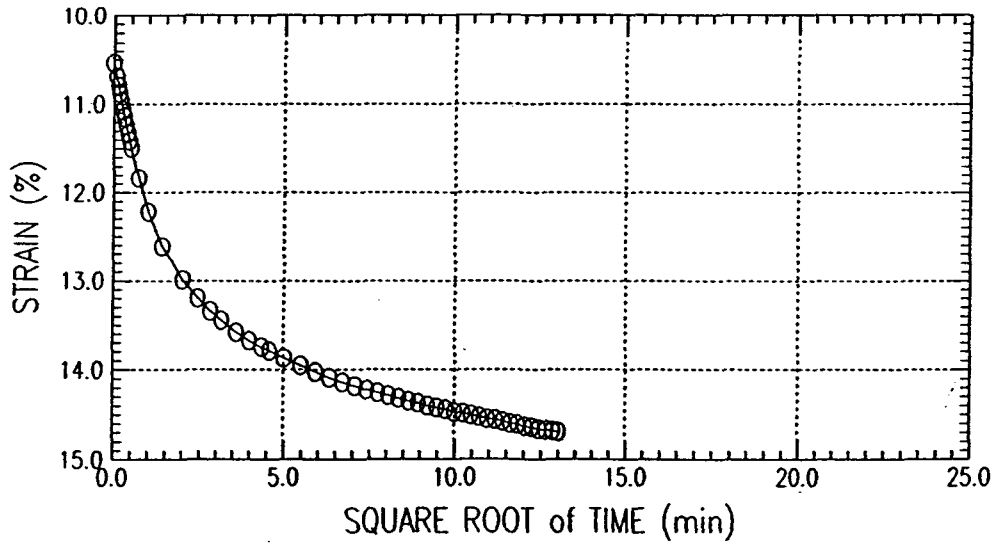


GeoTesting Express
Project Name : New Bedford Harbor Superfund Site
Project No : GTX-2409 Boring No : FA-12 Sample No : UO-1
Test Date : 01/05/00 Test No : CON26 Depth : 1-3 feet
Description : Moist, dark gray silty clay with trace shells
Remarks : ---

CONSOLIDATION TEST

TIME CURVES (STEP 13 OF 15)
STRESS : 0.8 (t/ft^2)

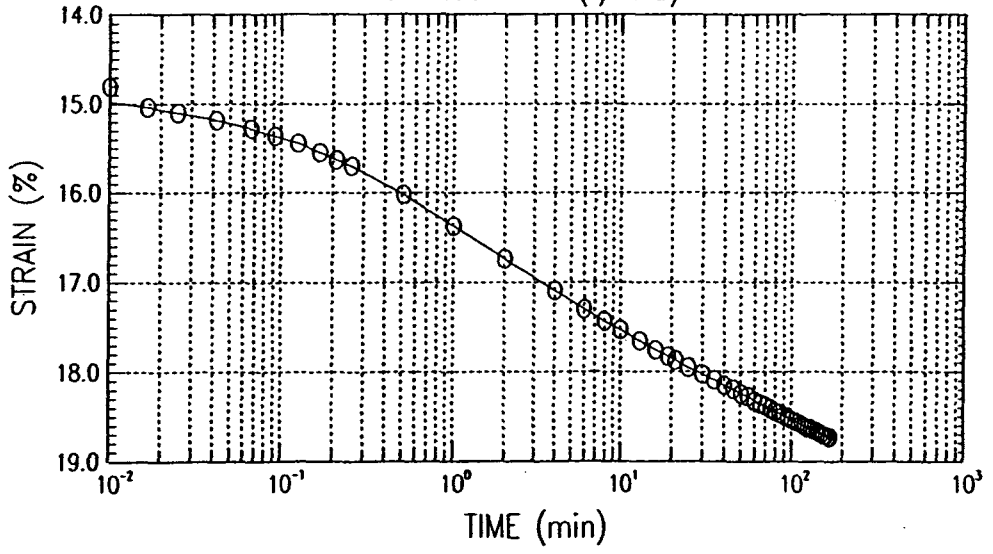


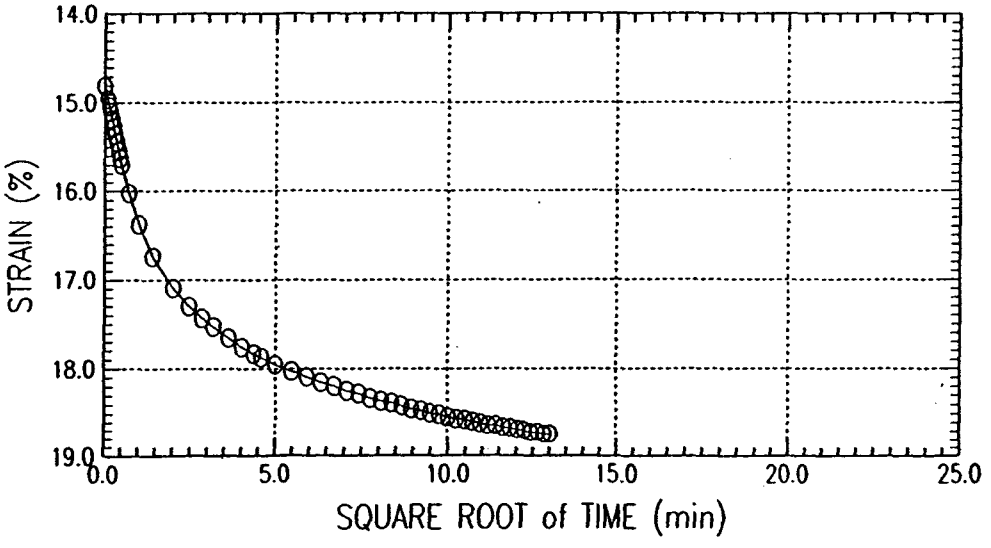


GeoTesting Express
Project Name : New Bedford Harbor Superfund Site
Project No : GTX-2409 Boring No : FA-12 Sample No : UO-1
Test Date : 01/05/00 Test No : CON26 Depth : 1-3 feet
Description : Moist, dark gray silty clay with trace shells
Remarks : ---

CONSOLIDATION TEST

TIME CURVES (STEP 14 OF 15)
STRESS : 1.4 (t/ft^2)

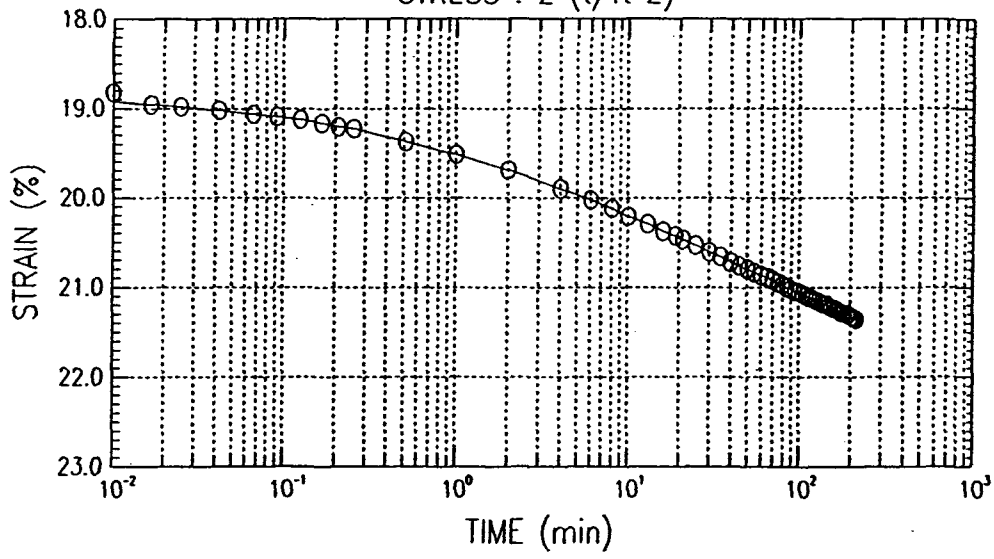


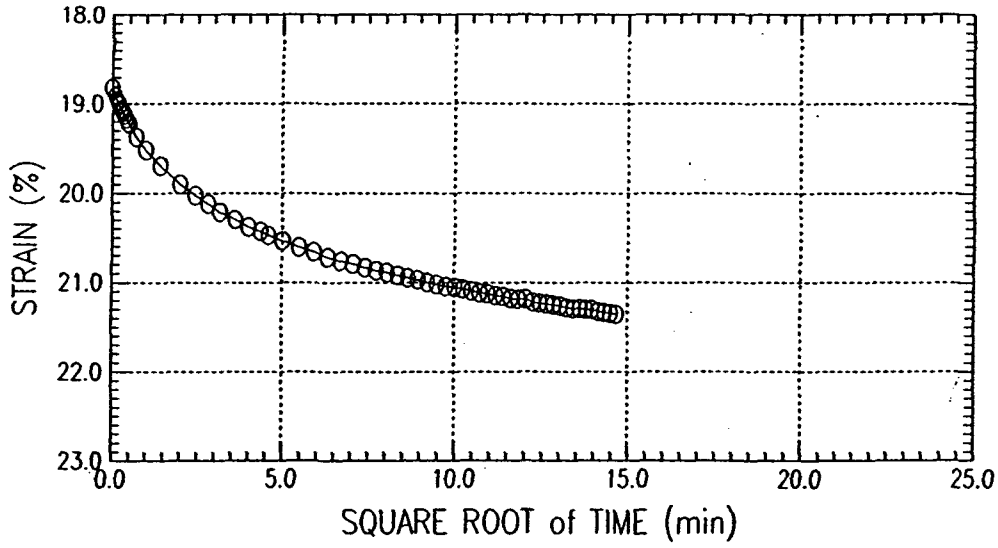


GeoTesting Express
Project Name : New Bedford Harbor Superfund Site
Project No : GTX-2409 Boring No : FA-12 Sample No : UO-1
Test Date : 01/05/00 Test No : CON26 Depth : 1-3 feet
Description : Moist, dark gray silty clay with trace shells
Remarks : ---

CONSOLIDATION TEST

TIME CURVES (STEP 15 OF 15)
STRESS : 2 (t/ft^2)

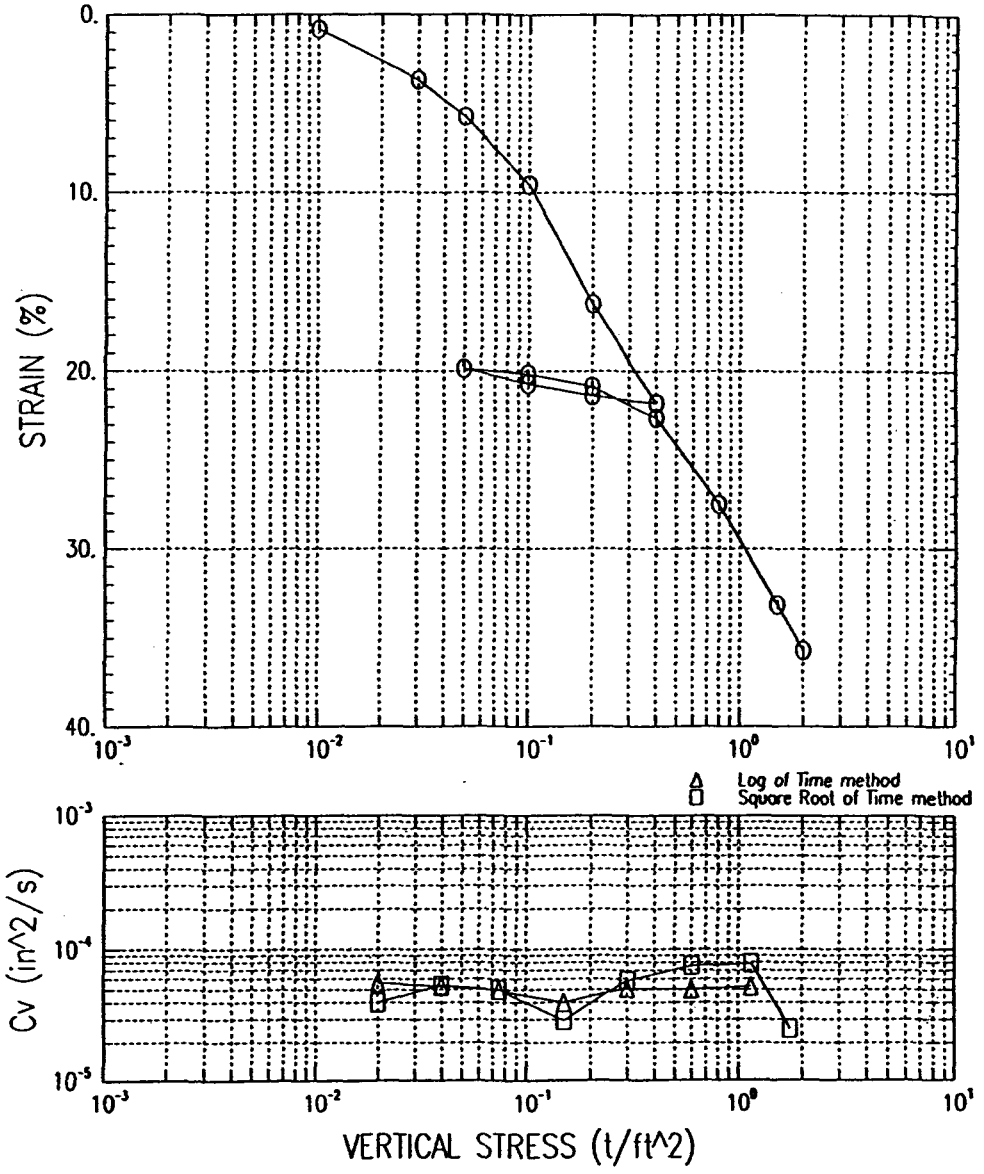




GeoTesting Express
Project Name : New Bedford Harbor Superfund Site
Project No : GTX-2409 Boring No : FA-12 Sample No : UO-1
Test Date : 01/05/00 Test No : CON26 Depth : 1-3 feet
Description : Moist, dark gray silty clay with trace shells
Remarks : ---

CONSOLIDATION TEST

SUMMARY REPORT



GeoTesting Express
Project Name : New Bedford Harbor Superfund Site
Project No : GTX-2409 Boring No : FA-19 Sample No : UO-1
Test Date : 12/27/99 Test No : CON27 Depth : 1-3 feet
Description : Moist, dark gray clay
Remarks : ---

CONSOLIDATION TEST DATA

Project : New Bedford Harbor Superfund Site Location : New Bedford, MA Project No.: GTX-2409
Boring No.: FA-19 Tested by : FY Checked by : RH
Sample No.: UO-1 Test Date : 12/27/99 Depth : 1-3 feet
Test No. : CON27 Sample Type: Tube

Soil Description : Moist, dark gray clay
Remarks : ---

Specific Gravity : 2.83 Liquid Limit : 0 Initial Height : 1.00 (in)
Initial Void Ratio : 2.93 Plastic Limit : 0 Sample Diameter : 2.49 (in)
Final Void Ratio : 1.53 Plasticity Index : 0

	BEFORE CONSOLIDATION		AFTER CONSOLIDATION	
	TRIMMINGS	SPECIMEN + RING	SPECIMEN + RING	TRIMMINGS
CONTAINER NO.	a1	RING	RING	abc-1
WT CONTAINER + WET SOIL (gm)	156.00	331.19	303.01	96.74
WT CONTAINER + DRY SOIL (gm)	81.00	271.98	271.98	65.90
WT CONTAINER (gm)	9.12	214.60	214.60	8.87
WT DRY SOIL (gm)	71.88	57.38	57.38	57.03
WATER CONTENT (%)	104.34	103.19	54.08	54.08
VOID RATIO	------	2.93	1.53	------
DEGREE OF SATURATION (%)	------	99.49	100.00	------
DRY DENSITY (lb/ft^3)	------	44.89	69.81	------

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

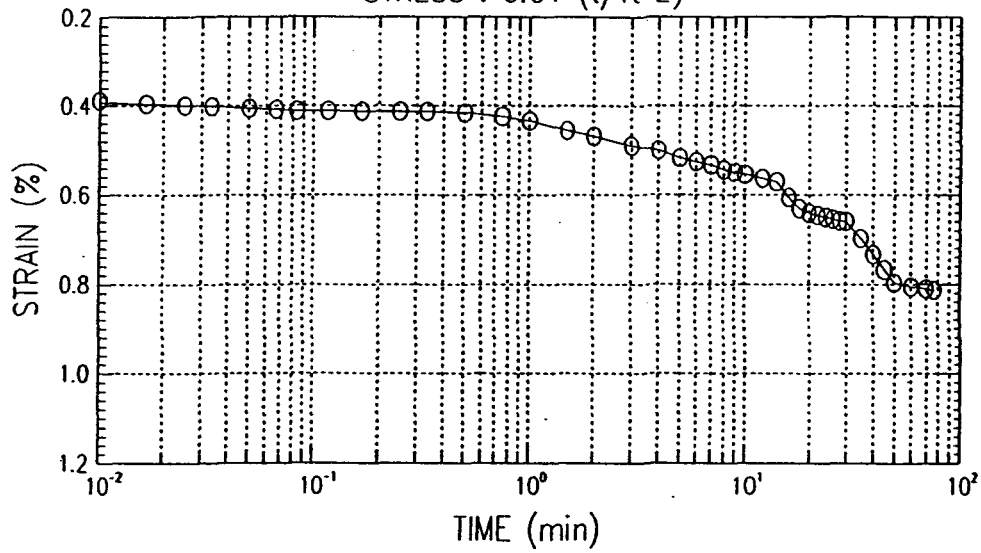
Project : New Bedford Harbor Superfund Site Location : New Bedford, MA Project No.: GTX-2409
Boring No.: FA-19 Tested by : FY Checked by : RH
Sample No.: UO-1 Test Date : 12/27/99 Depth : 1-3 feet
Test No. : CON27 Sample Type: Tube

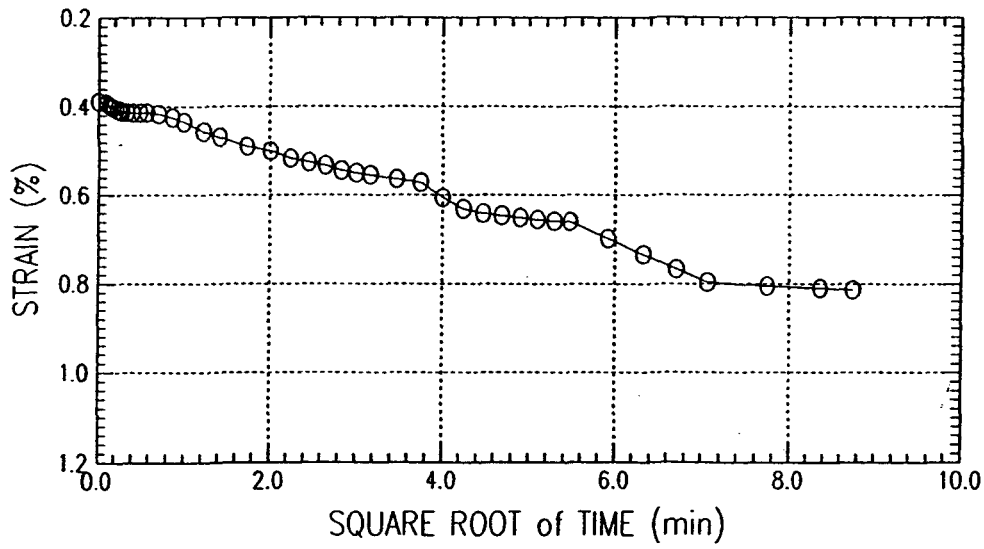
Soil Description : Moist, dark gray clay
Remarks : ---

	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	0.008	2.902	0.82	0.0	0.0	0.00E+000	0.00E+000	0.00E+000
2)	0.03	0.037	2.790	3.66	19.6	14.0	4.01E-005	5.62E-005	4.82E-005
3)	0.05	0.058	2.708	5.75	13.8	14.1	5.40E-005	5.28E-005	5.34E-005
4)	0.10	0.096	2.557	9.57	14.1	14.2	4.97E-005	4.93E-005	4.95E-005
5)	0.20	0.163	2.295	16.25	21.1	15.5	2.96E-005	4.01E-005	3.48E-005
6)	0.40	0.218	2.077	21.79	9.2	10.5	5.83E-005	5.11E-005	5.47E-005
7)	0.20	0.214	2.093	21.38	0.0	0.0	0.00E+000	0.00E+000	5.36E-004
8)	0.10	0.207	2.119	20.71	0.0	0.0	0.00E+000	0.00E+000	1.36E-004
9)	0.05	0.199	2.152	19.87	0.0	0.0	0.00E+000	0.00E+000	6.69E-005
10)	0.10	0.202	2.141	20.16	0.0	0.0	0.00E+000	0.00E+000	7.34E-004
11)	0.20	0.209	2.113	20.87	0.0	0.0	0.00E+000	0.00E+000	2.03E-004
12)	0.40	0.226	2.043	22.64	0.0	0.0	0.00E+000	0.00E+000	9.19E-005
13)	0.80	0.275	1.851	27.52	6.1	9.2	7.57E-005	5.01E-005	6.29E-005
14)	1.50	0.332	1.629	33.16	5.1	7.6	7.83E-005	5.28E-005	6.55E-005
15)	2.00	0.357	1.529	35.70	13.7	0.0	2.57E-005	0.00E+000	2.57E-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 : FA-19 Sample No : UO-1
Test Date : 12/27/99 Test No : CON27 Depth : 1-3 feet
Description : Moist, dark gray clay
Remarks : ---

CONSOLIDATION TEST DATA

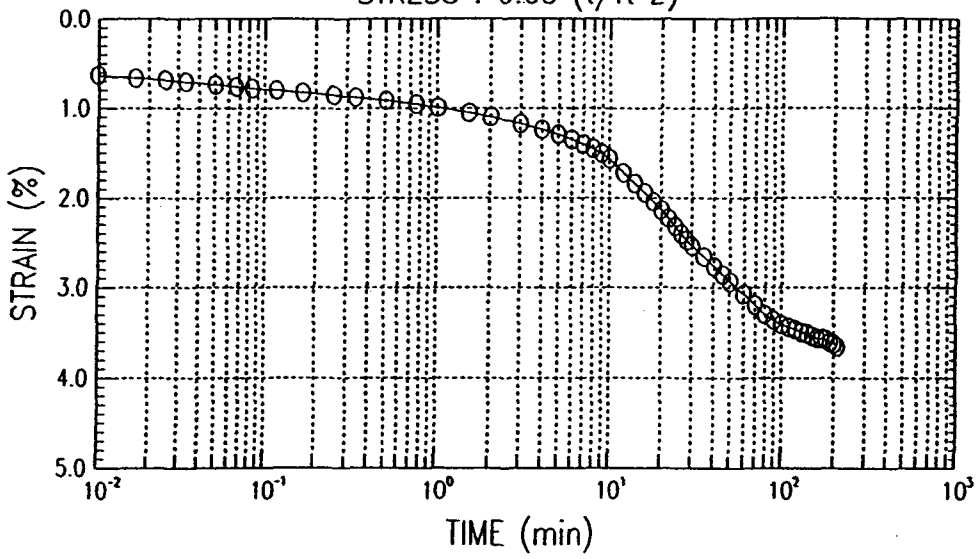
Project : New Bedford Harbor Superfund Site Location : New Bedford, MA Project No.: GTX-2409
Boring No.: FA-19 Tested by : FY Checked by : RH
Sample No.: UO-1 Test Date : 12/27/99 Depth : 1-3 feet
Test No. : CON27 Sample Type: Tube

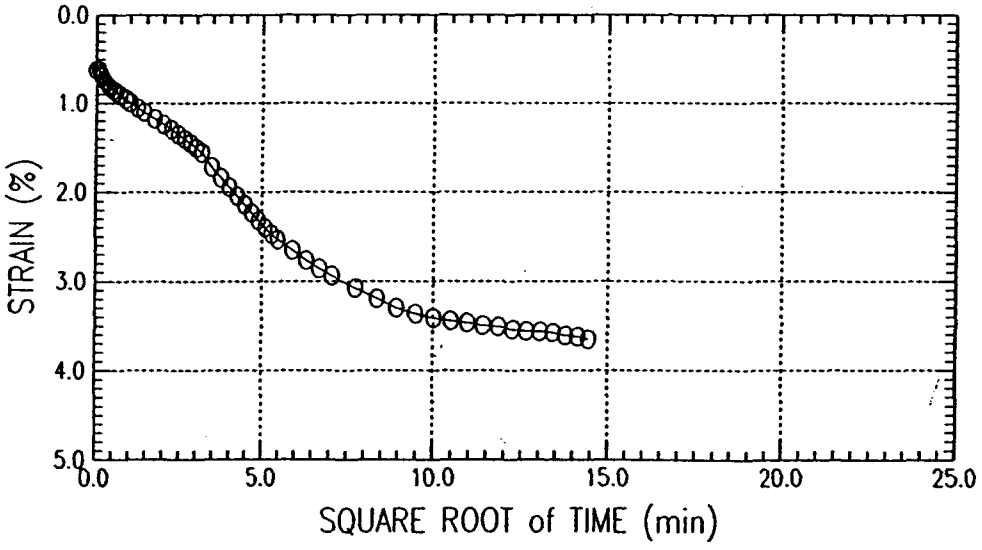
Soil Description : Moist, dark gray clay
Remarks : ---

	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	0.008	2.902	0.82	0.0	0.0	0.00E+000	0.00E+000	0.00E+000
2)	0.03	0.037	2.790	3.66	19.6	14.0	4.01E-005	5.62E-005	4.82E-005
3)	0.05	0.058	2.708	5.75	13.8	14.1	5.40E-005	5.28E-005	5.34E-005
4)	0.10	0.096	2.557	9.57	14.1	14.2	4.97E-005	4.93E-005	4.95E-005
5)	0.20	0.163	2.295	16.25	21.1	15.5	2.96E-005	4.01E-005	3.48E-005
6)	0.40	0.218	2.077	21.79	9.2	10.5	5.83E-005	5.11E-005	5.47E-005
7)	0.20	0.214	2.093	21.38	0.0	0.0	0.00E+000	0.00E+000	5.36E-004
8)	0.10	0.207	2.119	20.71	0.0	0.0	0.00E+000	0.00E+000	1.36E-004
9)	0.05	0.199	2.152	19.87	0.0	0.0	0.00E+000	0.00E+000	6.69E-005
10)	0.10	0.202	2.141	20.16	0.0	0.0	0.00E+000	0.00E+000	7.34E-004
11)	0.20	0.209	2.113	20.87	0.0	0.0	0.00E+000	0.00E+000	2.03E-004
12)	0.40	0.226	2.043	22.64	0.0	0.0	0.00E+000	0.00E+000	9.19E-005
13)	0.80	0.275	1.851	27.52	6.1	9.2	7.57E-005	5.01E-005	6.29E-005
14)	1.50	0.332	1.629	33.16	5.1	7.6	7.83E-005	5.28E-005	6.55E-005
15)	2.00	0.357	1.529	35.70	13.7	0.0	2.57E-005	0.00E+000	2.57E-005

CONSOLIDATION TEST

TIME CURVES (STEP 2 OF 15)
STRESS : 0.03 (t/ft^2)

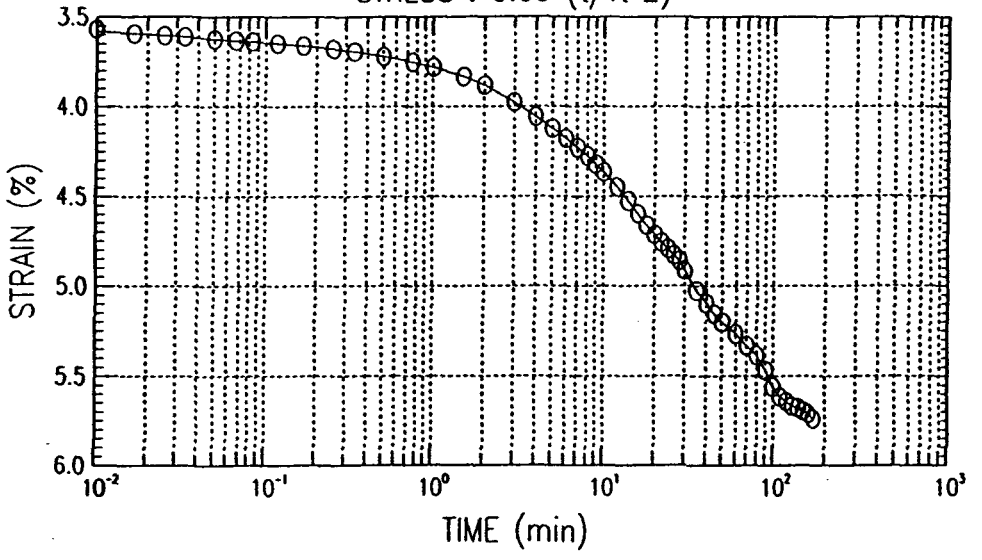


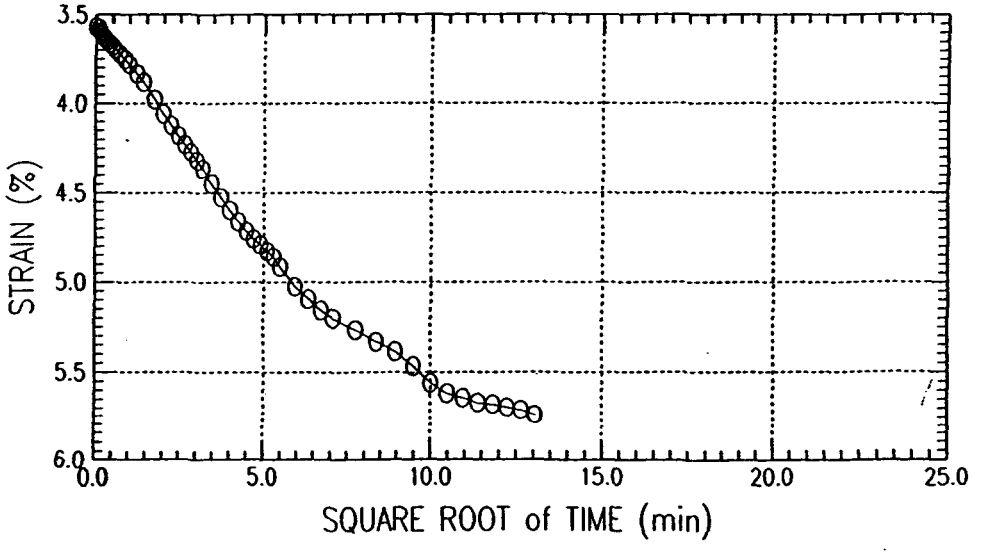


GeoTesting Express
Project Name : New Bedford Harbor Superfund Site
Project No : GTX-2409 Boring No : FA-19 Sample No : UO-1
Test Date : 12/27/99 Test No : CON27 Depth : 1-3 feet
Description : Moist, dark gray clay
Remarks : ---

CONSOLIDATION TEST

TIME CURVES (STEP 3 OF 15)
STRESS : 0.05 (t/ft^2)

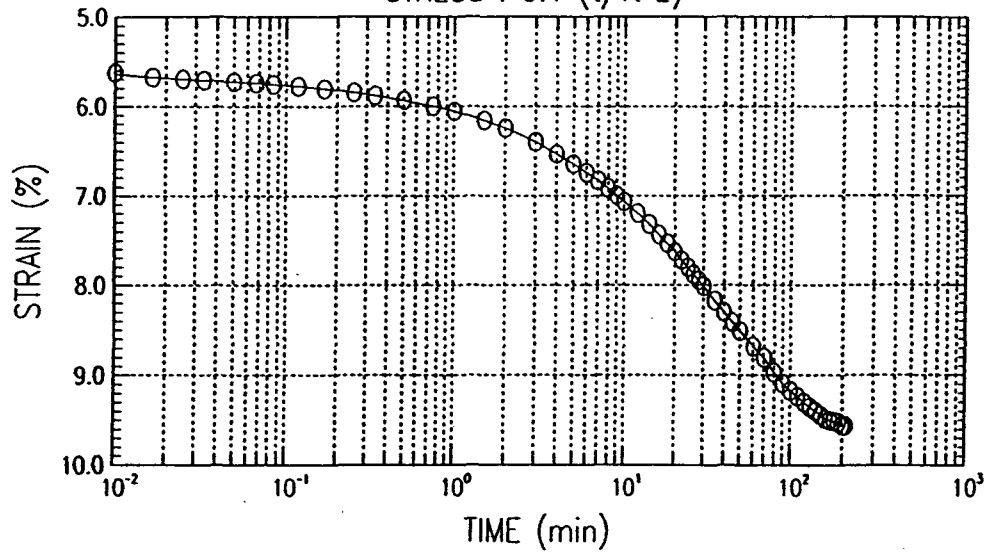


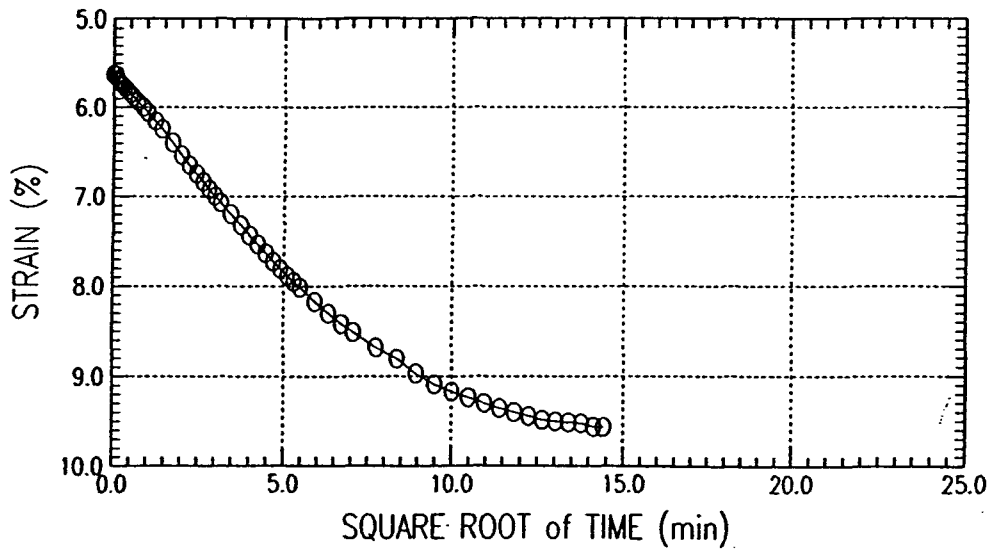


GeoTesting Express
Project Name : New Bedford Harbor Superfund Site
Project No : GTX-2409 Boring No : FA-19 Sample No : UO-1
Test Date : 12/27/99 Test No : CON27 Depth : 1-3 feet
Description : Moist, dark gray clay
Remarks : ---

CONSOLIDATION TEST

TIME CURVES (STEP 4 OF 15)
STRESS : 0.1 (t/ft^2)

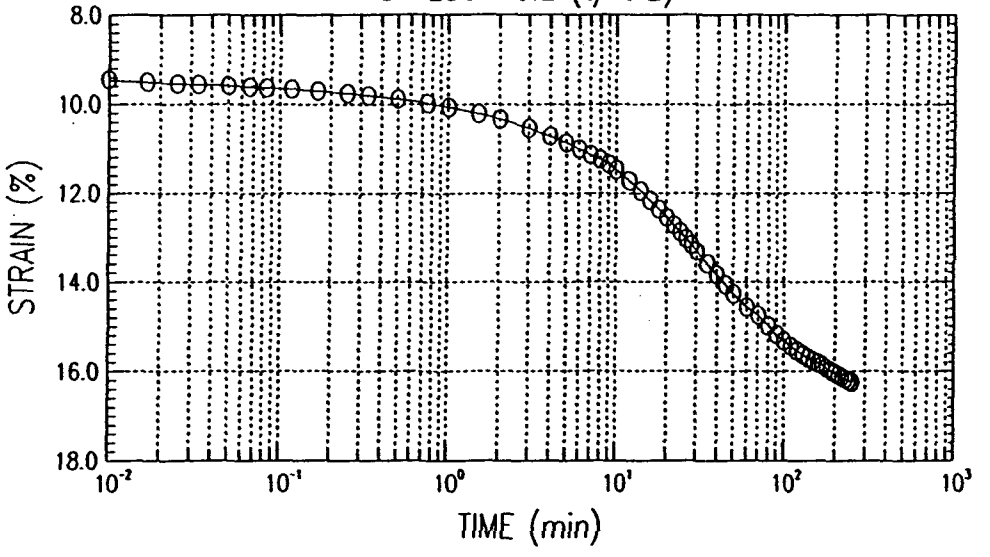


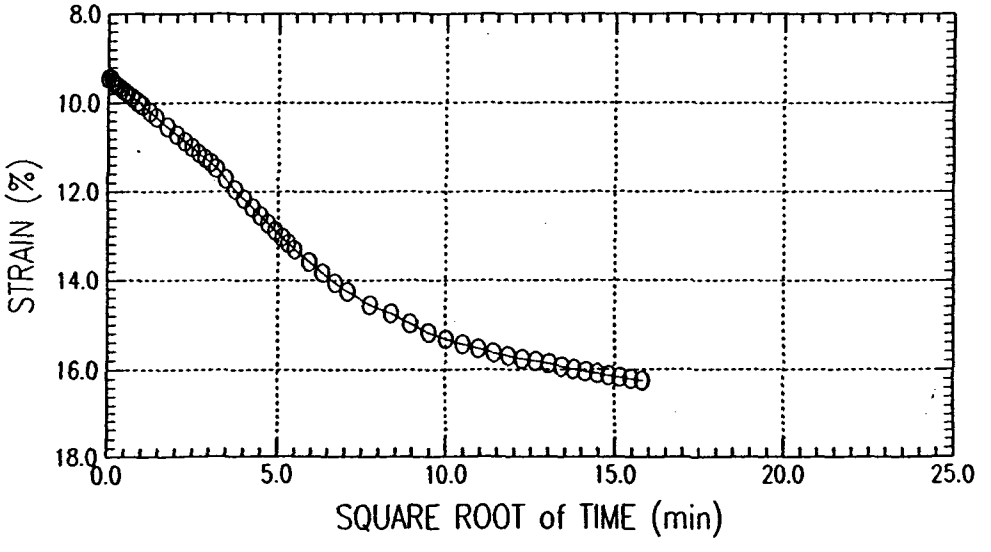


GeoTesting Express
Project Name : New Bedford Harbor Superfund Site
Project No : GTX-2409 Boring No : FA-19 Sample No : UO-1
Test Date : 12/27/99 Test No : CON27 Depth : 1-3 feet
Description : Moist, dark gray clay
Remarks : ---

CONSOLIDATION TEST

TIME CURVES (STEP 5 OF 15)
STRESS : 0.2 (t/ft^2)

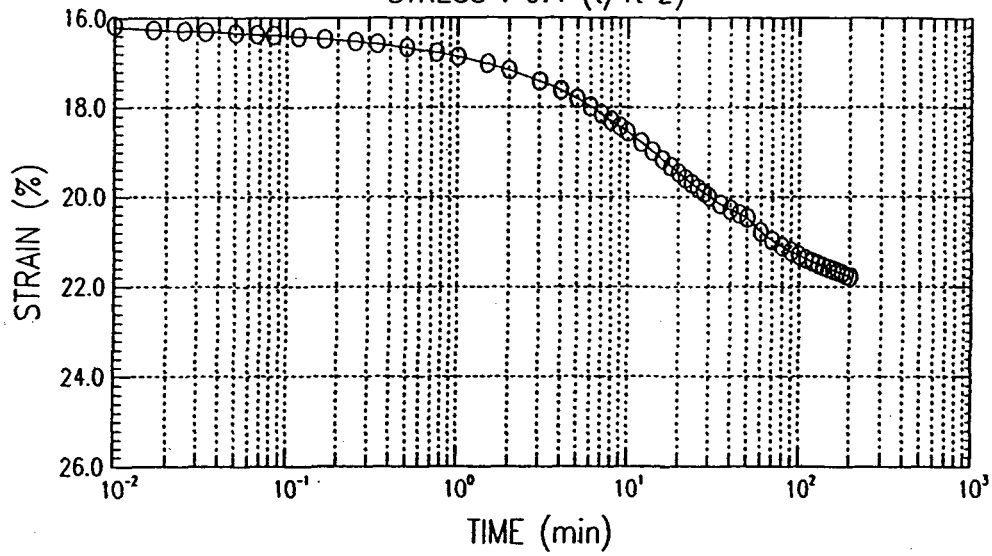


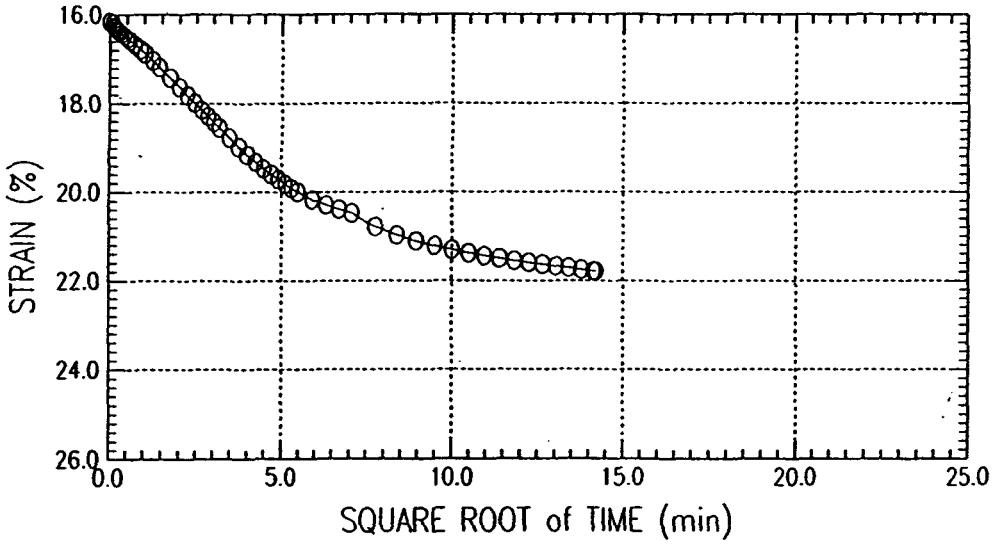


GeoTesting Express
Project Name : New Bedford Harbor Superfund Site
Project No : GTX-2409 Boring No : FA-19 Sample No : UO-1
Test Date : 12/27/99 Test No : CON27 Depth : 1-3 feet
Description : Moist, dark gray clay
Remarks : ---

CONSOLIDATION TEST

TIME CURVES (STEP 6 OF 15)
STRESS : 0.4 (t/ft^2)

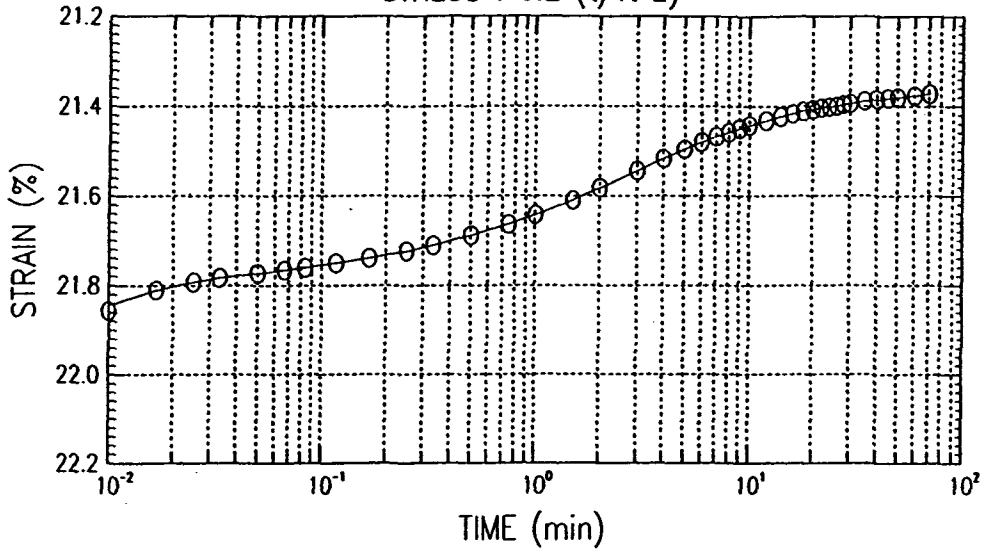


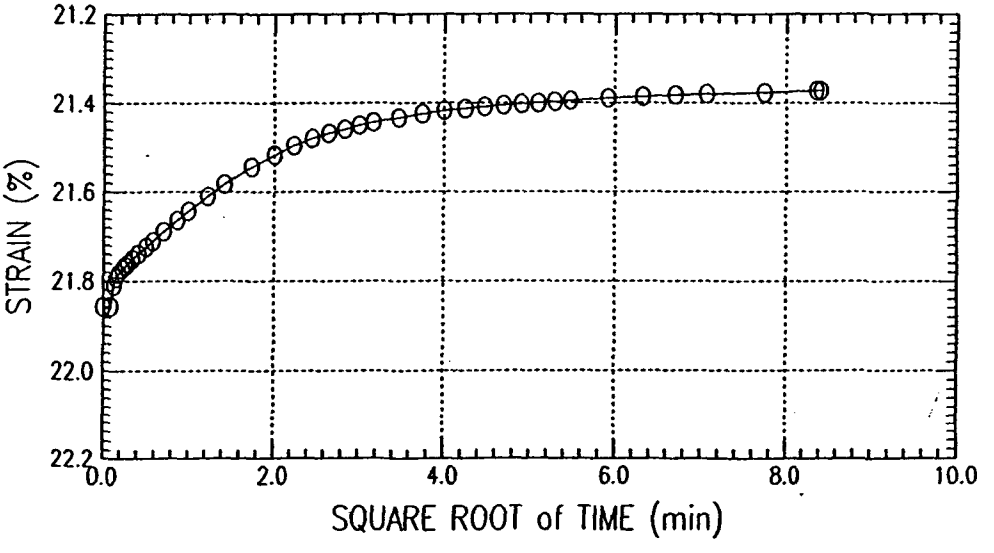


GeoTesting Express
Project Name : New Bedford Harbor Superfund Site
Project No : GTX-2409 Boring No : FA-19 Sample No : UO-1
Test Date : 12/27/99 Test No : CON27 Depth : 1-3 feet
Description : Moist, dark gray clay
Remarks : ---

CONSOLIDATION TEST

TIME CURVES (STEP 7 OF 15)
STRESS : 0.2 (t/ft^2)

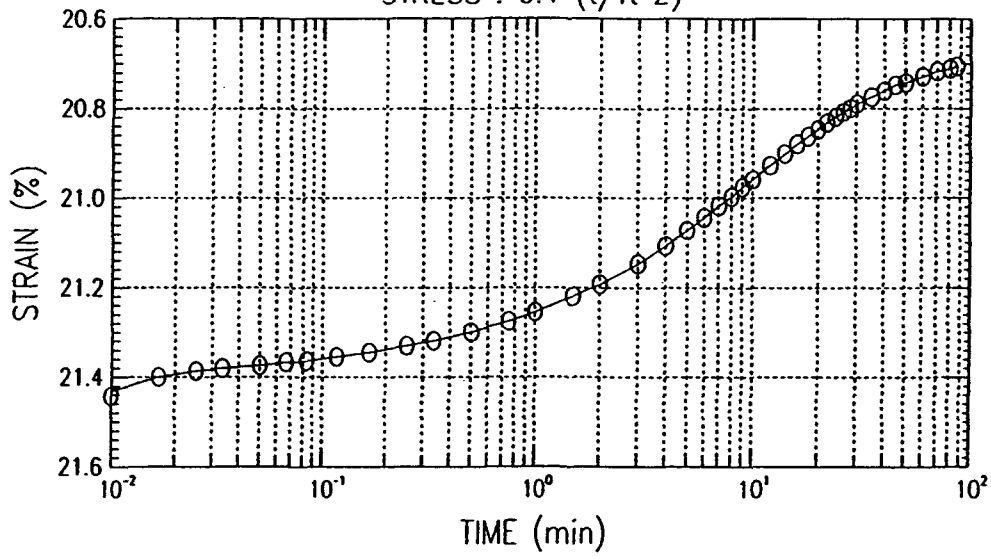


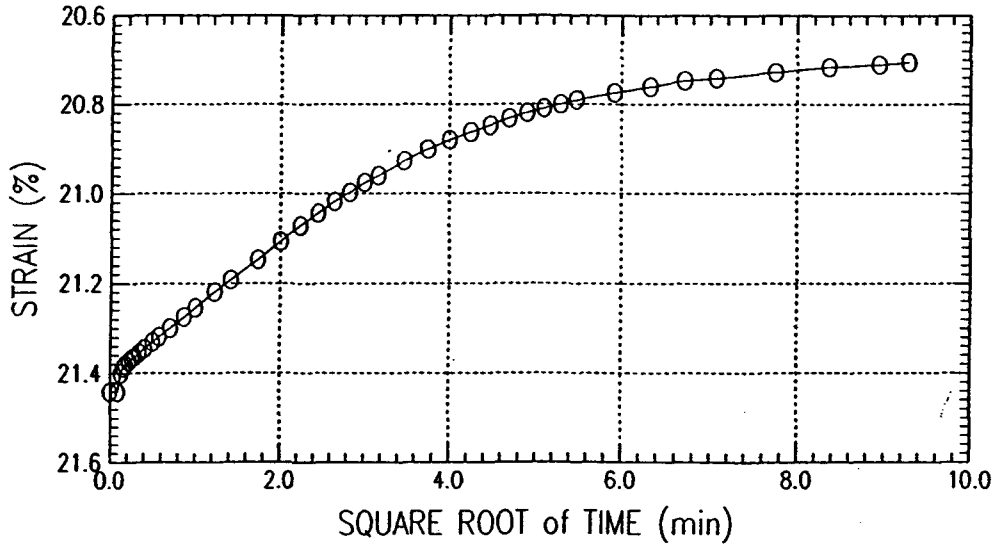


GeoTesting Express
Project Name : New Bedford Harbor Superfund Site
Project No : GTX-2409 Boring No : FA-19 Sample No : UO-1
Test Date : 12/27/99 Test No : CON27 Depth : 1-3 feet
Description : Moist, dark gray clay
Remarks : ---

CONSOLIDATION TEST

TIME CURVES (STEP 8 OF 15)
STRESS : 0.1 (t/ft^2)

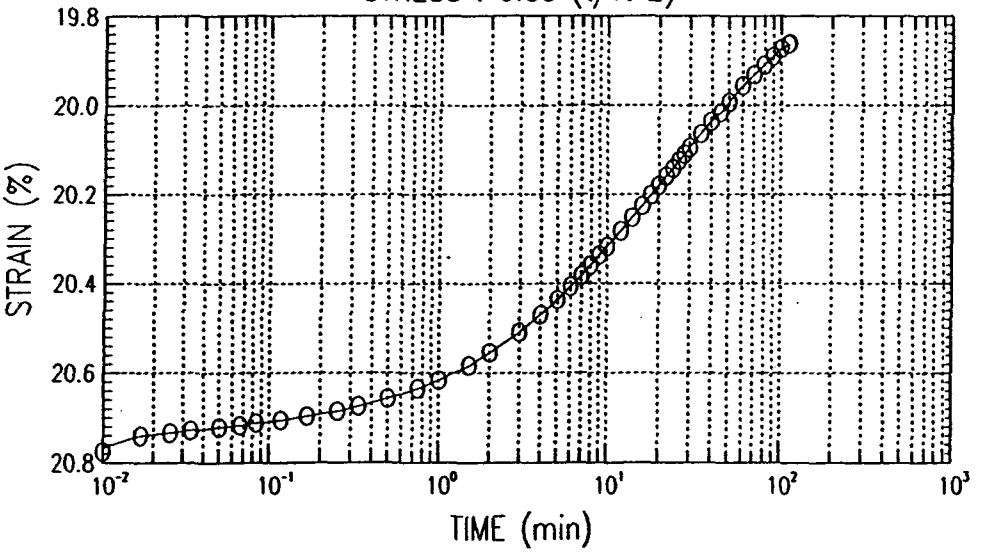


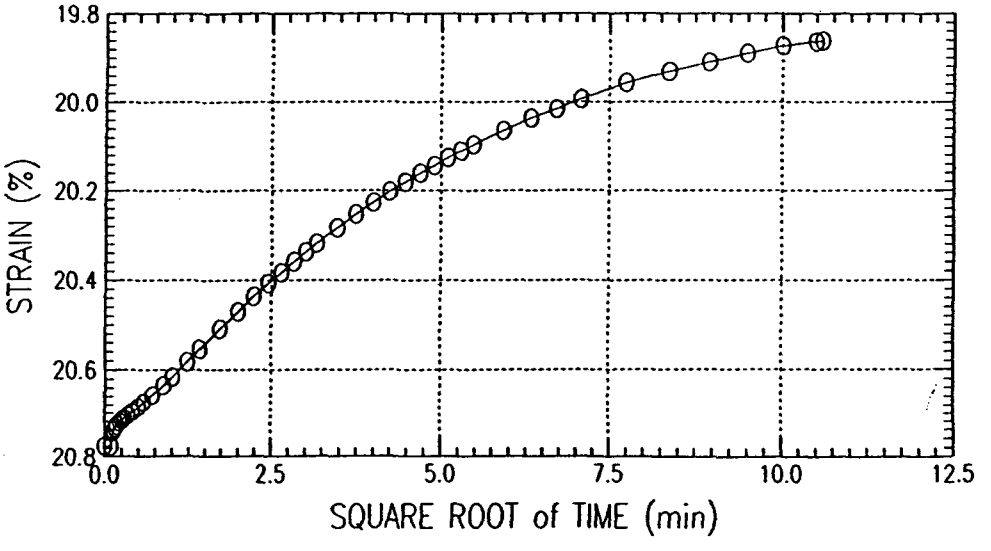


GeoTesting Express
Project Name : New Bedford Harbor Superfund Site
Project No : GTX-2409 Boring No : FA-19 Sample No : UO-1
Test Date : 12/27/99 Test No : CON27 Depth : 1-3 feet
Description : Moist, dark gray clay
Remarks : ---

CONSOLIDATION TEST

TIME CURVES (STEP 9 OF 15)
STRESS : 0.05 (t/ft^2)

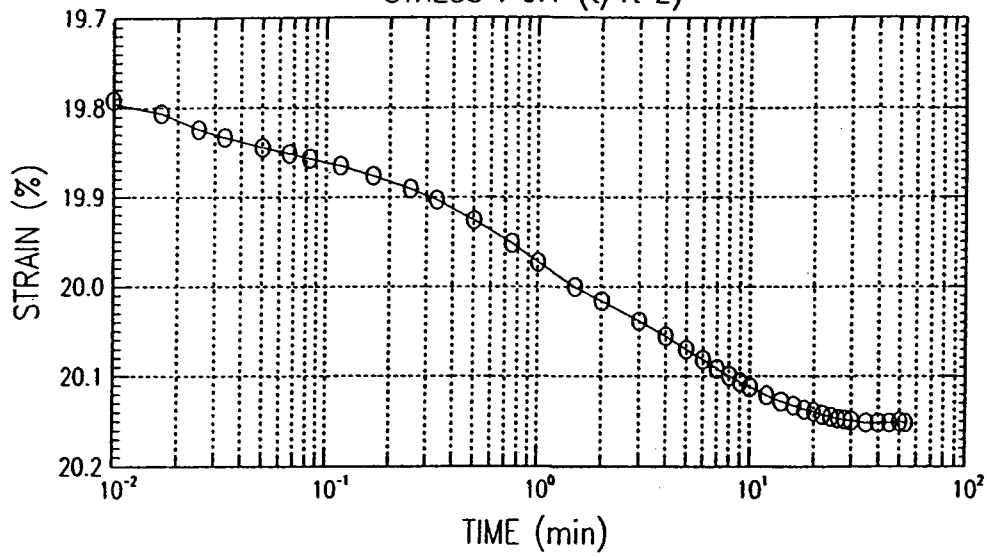


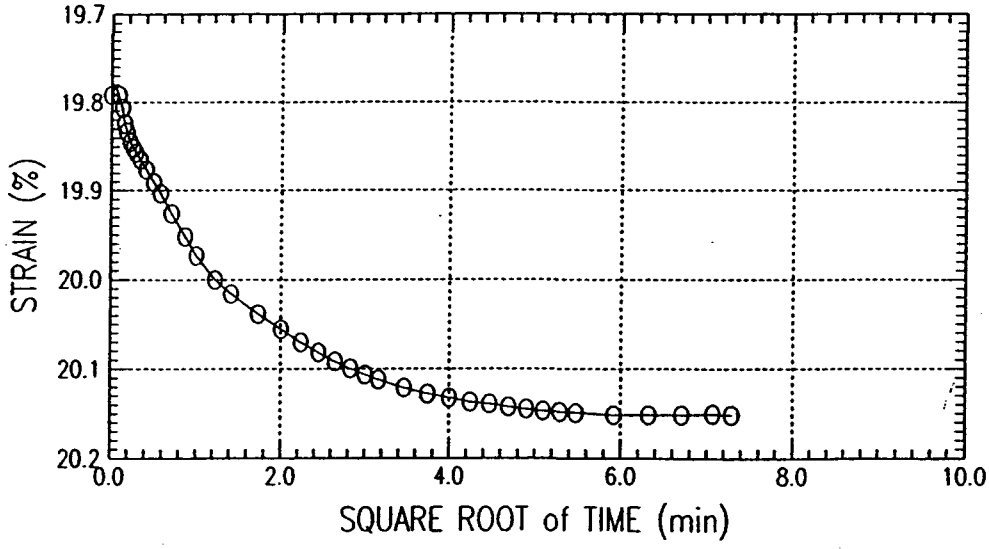


GeoTesting Express
Project Name : New Bedford Harbor Superfund Site
Project No : GTX-2409 Boring No : FA-19 Sample No : UO-1
Test Date : 12/27/99 Test No : CON27 Depth : 1-3 feet
Description : Moist, dark gray clay
Remarks : ---

CONSOLIDATION TEST

TIME CURVES (STEP 10 OF 15)
STRESS : 0.1 (t/ft^2)

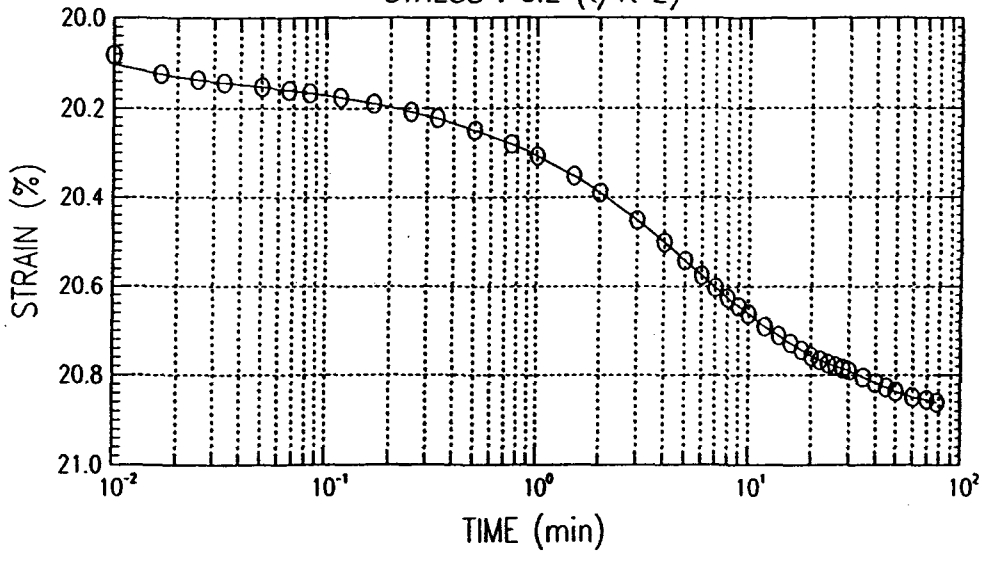


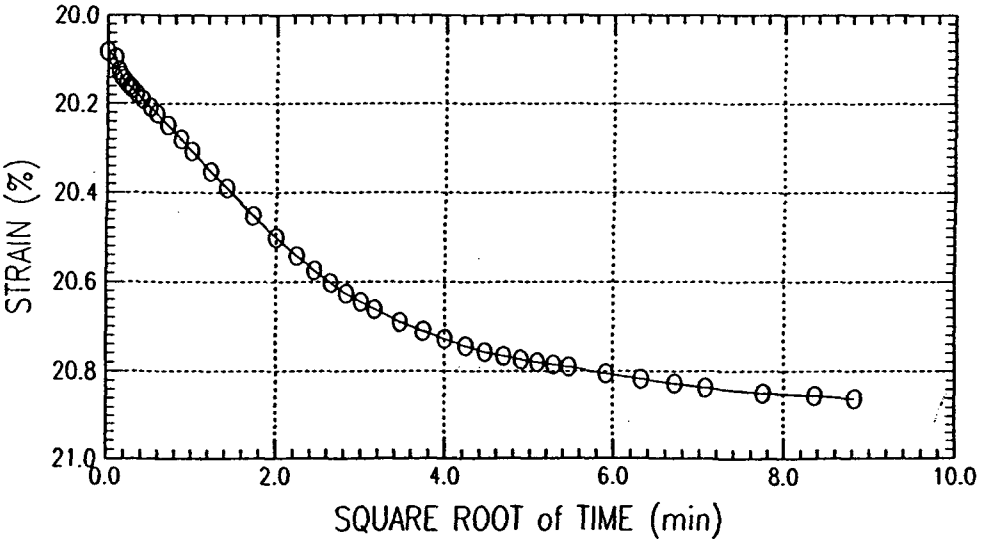


GeoTesting Express
Project Name : New Bedford Harbor Superfund Site
Project No : GTX-2409 Boring No : FA-19 Sample No : UO-1
Test Date : 12/27/99 Test No : CON27 Depth : 1-3 feet
Description : Moist, dark gray clay
Remarks : ---

CONSOLIDATION TEST

TIME CURVES (STEP 11 OF 15)
STRESS : 0.2 (t/ft^2)

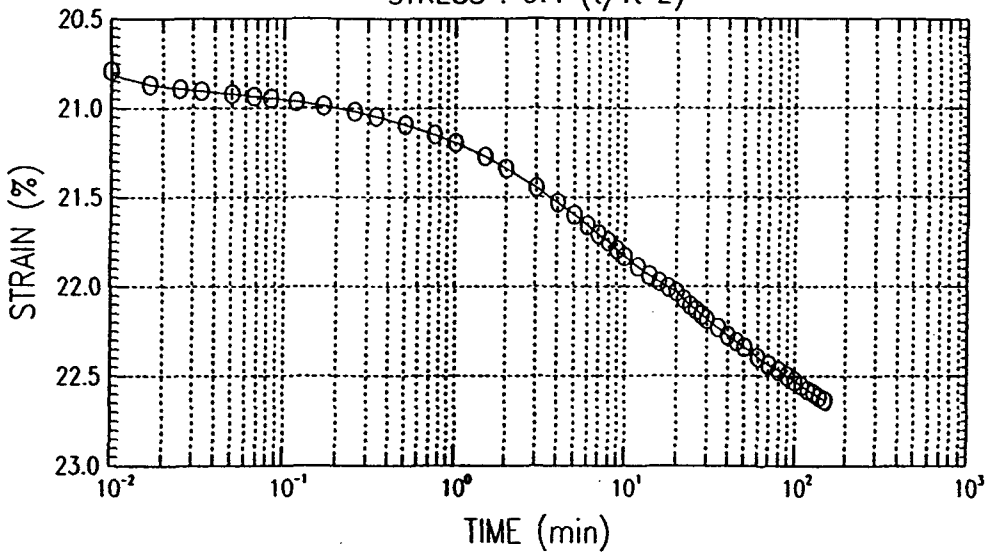


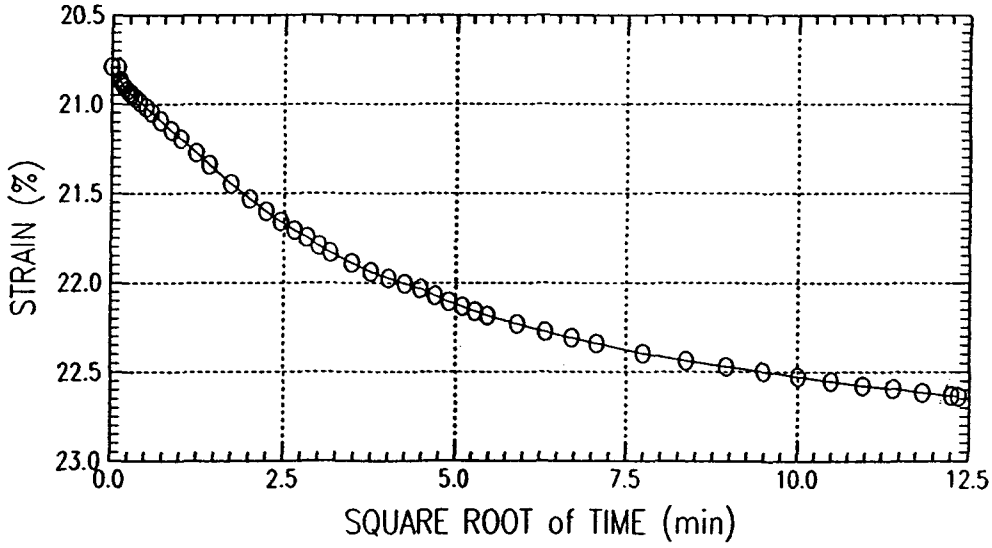


GeoTesting Express
Project Name : New Bedford Harbor Superfund Site
Project No : GTX-2409 Boring No : FA-19 Sample No : UO-1
Test Date : 12/27/99 Test No : CON27 Depth : 1-3 feet
Description : Moist, dark gray clay
Remarks : ---

CONSOLIDATION TEST

TIME CURVES (STEP 12 OF 15)
STRESS : 0.4 (t/ft^2)

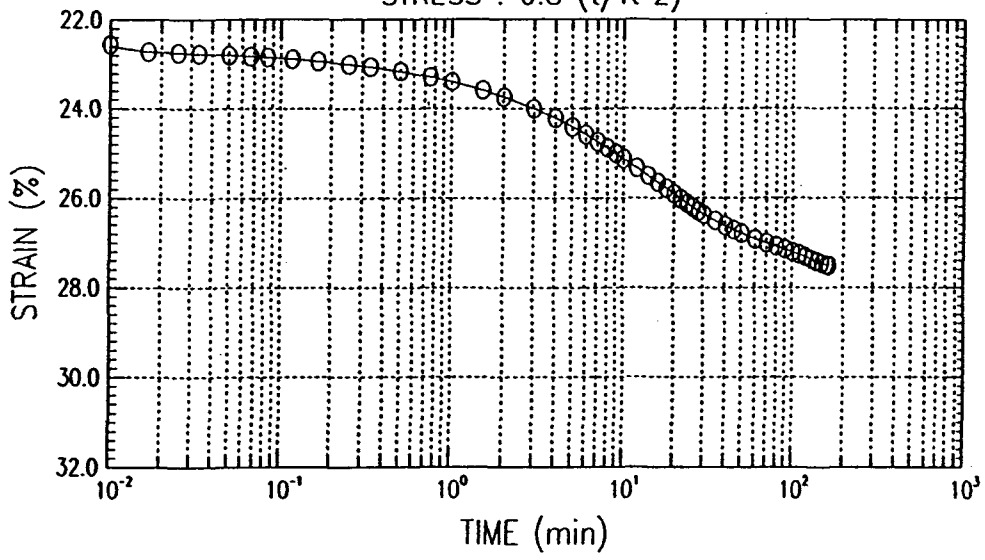


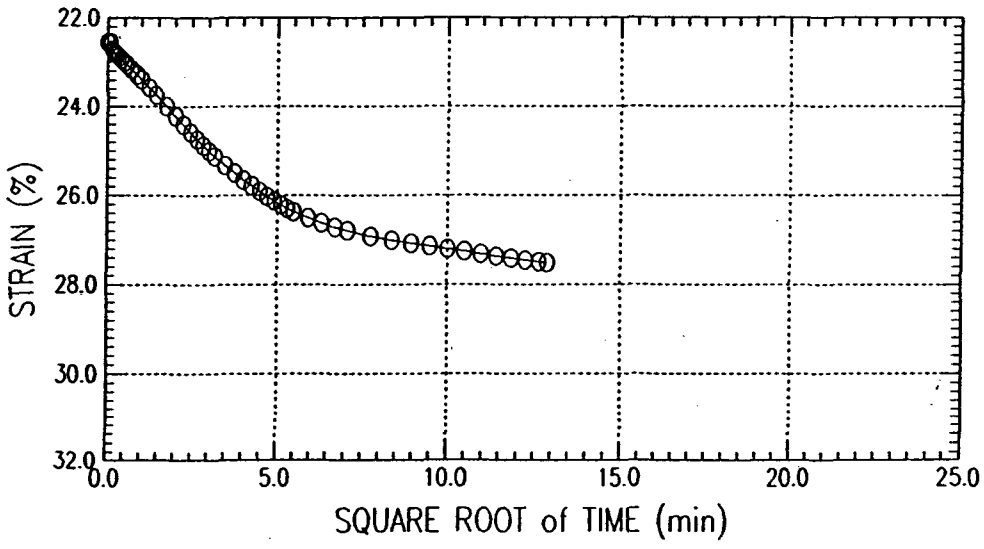


GeoTesting Express
Project Name : New Bedford Harbor Superfund Site
Project No : GTX-2409 Boring No : FA-19 Sample No : UO-1
Test Date : 12/27/99 Test No : CON27 Depth : 1-3 feet
Description : Moist, dark gray clay
Remarks : ---

CONSOLIDATION TEST

TIME CURVES (STEP 13 OF 15)
STRESS : 0.8 (t/ft^2)

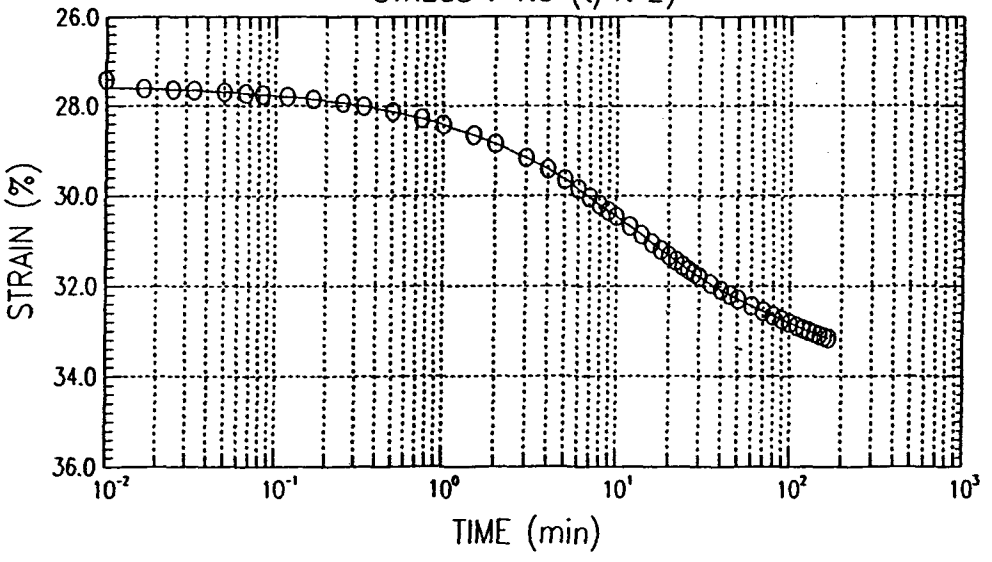


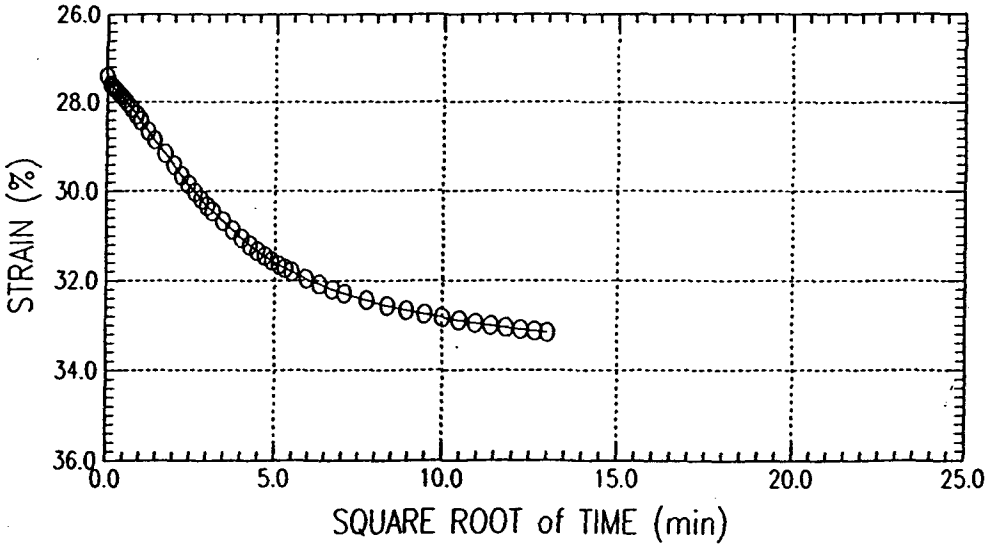


GeoTesting Express
Project Name : New Bedford Harbor Superfund Site
Project No : GTX-2409 Boring No : FA-19 Sample No : UO-1
Test Date : 12/27/99 Test No : CON27 Depth : 1-3 feet
Description : Moist, dark gray clay
Remarks : ---

CONSOLIDATION TEST

TIME CURVES (STEP 14 OF 15)
STRESS : 1.5 (t/ft^2)

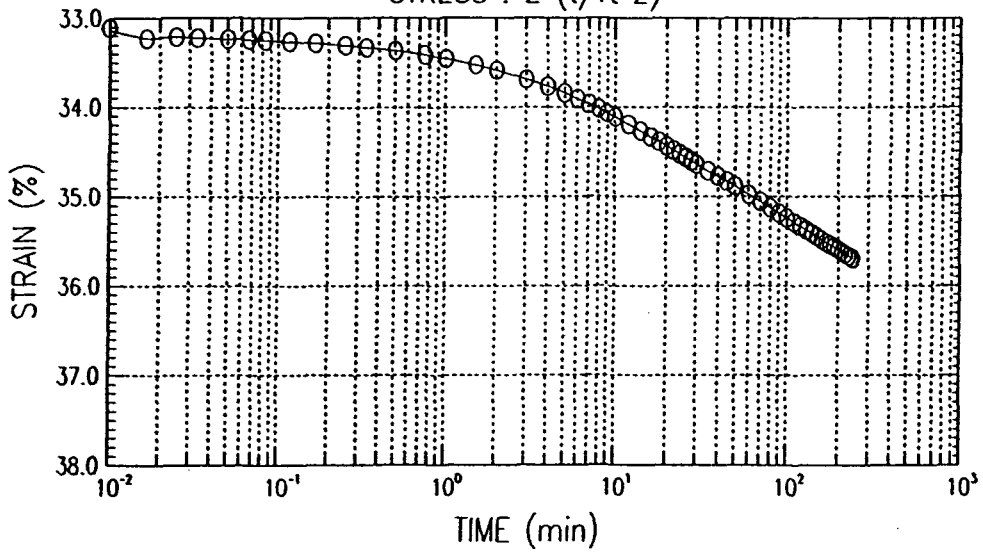


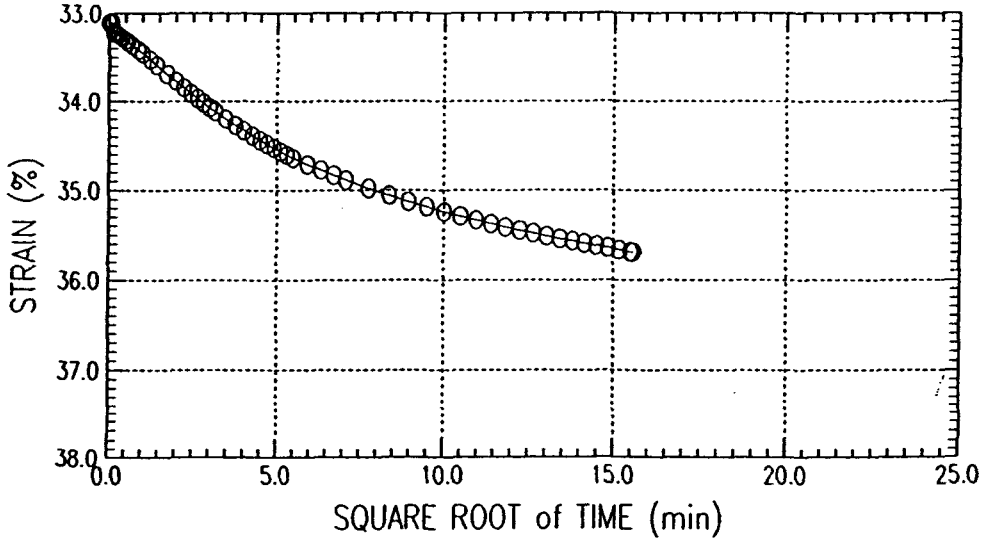


GeoTesting Express
Project Name : New Bedford Harbor Superfund Site
Project No : GTX-2409 Boring No : FA-19 Sample No : UO-1
Test Date : 12/27/99 Test No : CON27 Depth : 1-3 feet
Description : Moist, dark gray clay
Remarks : ---

CONSOLIDATION TEST

TIME CURVES (STEP 15 OF 15)
STRESS : 2 (t/ft^2)

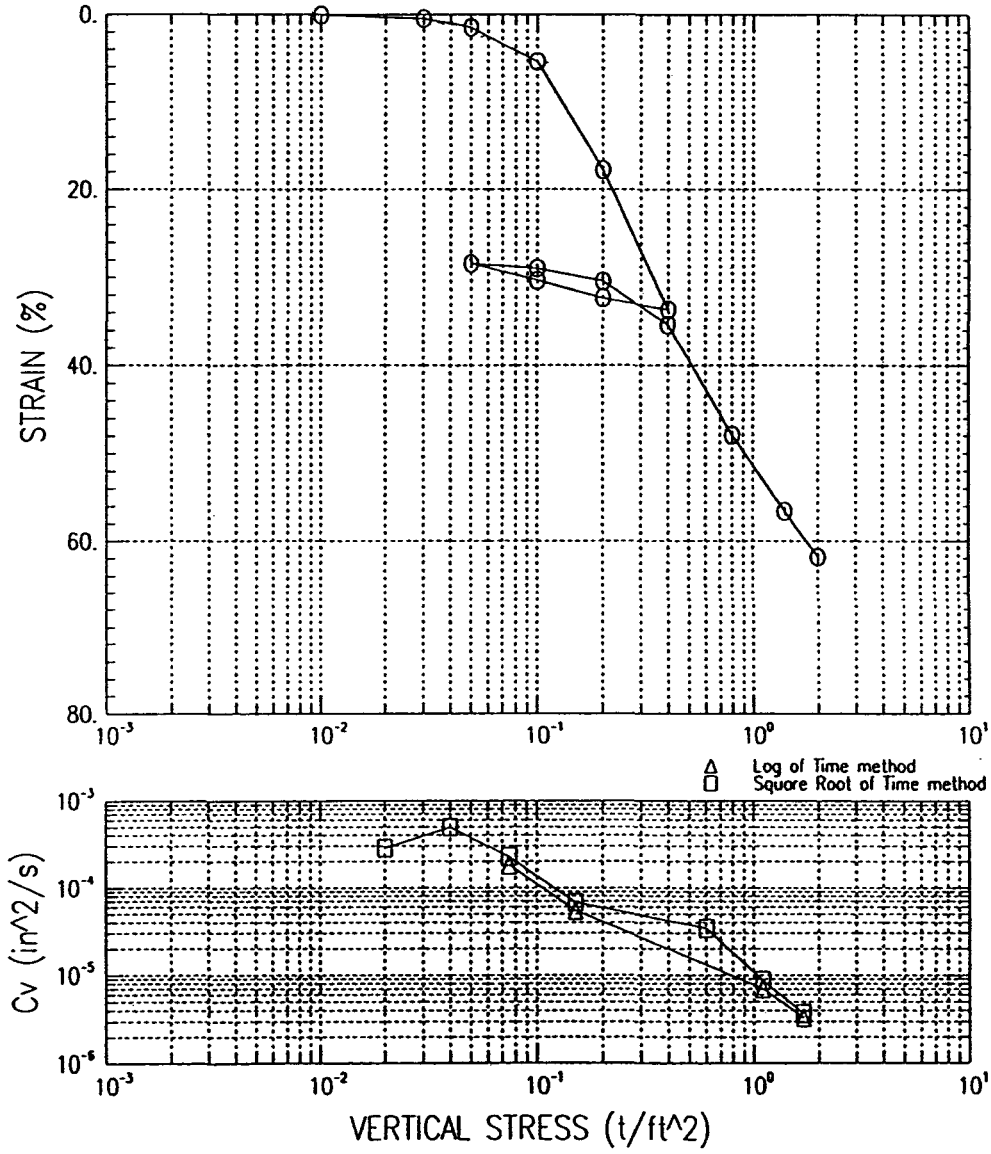




GeoTesting Express
Project Name : New Bedford Harbor Superfund Site
Project No : GTX-2409 Boring No : FA-19 Sample No : UO-1
Test Date : 12/27/99 Test No : CON27 Depth : 1-3 feet
Description : Moist, dark gray clay
Remarks : ---

CONSOLIDATION TEST

SUMMARY REPORT



GeoTesting Express
Project Name : New Bedford Harbor Superfund Site
Project No : GTX-2409 Boring No : FA-26 Sample No : UO-1
Test Date : 01/07/00 Test No : CON28 Depth : 3-5 feet
Description : Moist, dark brown organic clay and peat
Remarks : ---

CONSOLIDATION TEST DATA

Project : New Bedford Harbor Superfund Site Location : New Bedford, MA Project No.: GTX-2409
Boring No.: FA-26 Tested by : YF Checked by : rh
Sample No.: UO-1 Test Date : 01/07/00 Depth : 3-5 feet
Test No. : CON28 Sample Type: Tube

Soil Description : Moist, dark brown organic clay and peat
Remarks : ---

Specific Gravity : 2.66 Liquid Limit : 0 Initial Height : 1.00 (in)
Initial Void Ratio : 16.17 Plastic Limit : 0 Sample Diameter : 2.49 (in)
Final Void Ratio : 5.55 Plasticity Index : 0

	BEFORE CONSOLIDATION		AFTER CONSOLIDATION	
	TRIMMINGS	SPECIMEN + RING	SPECIMEN + RING	TRIMMINGS
CONTAINER NO.	a46	RING	RING	md-3
WT CONTAINER + WET SOIL (gm)	260.34	298.11	252.70	45.28
WT CONTAINER + DRY SOIL (gm)	46.54	226.98	226.98	21.10
WT CONTAINER (gm)	9.46	214.65	214.65	9.51
WT DRY SOIL (gm)	37.08	12.33	12.33	11.59
WATER CONTENT (%)	576.59	576.95	208.63	208.63
VOID RATIO	------	16.17	5.56	------
DEGREE OF SATURATION (%)	------	95.03	100.00	------
DRY DENSITY (lb/ft^3)	------	9.68	25.36	------

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

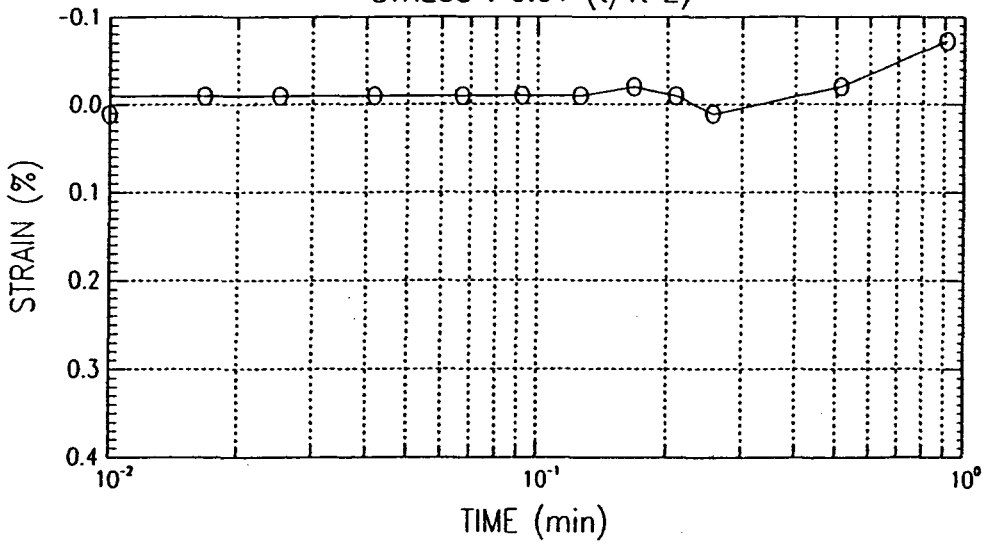
Project : New Bedford Harbor Superfund Site Location : New Bedford, MA Project No.: GTX-2409
Boring No.: FA-26 Tested by : YF Checked by : rh
Sample No.: UO-1 Test Date : 01/07/00 Depth : 3-5 feet
Test No. : CON28 Sample Type: Tube

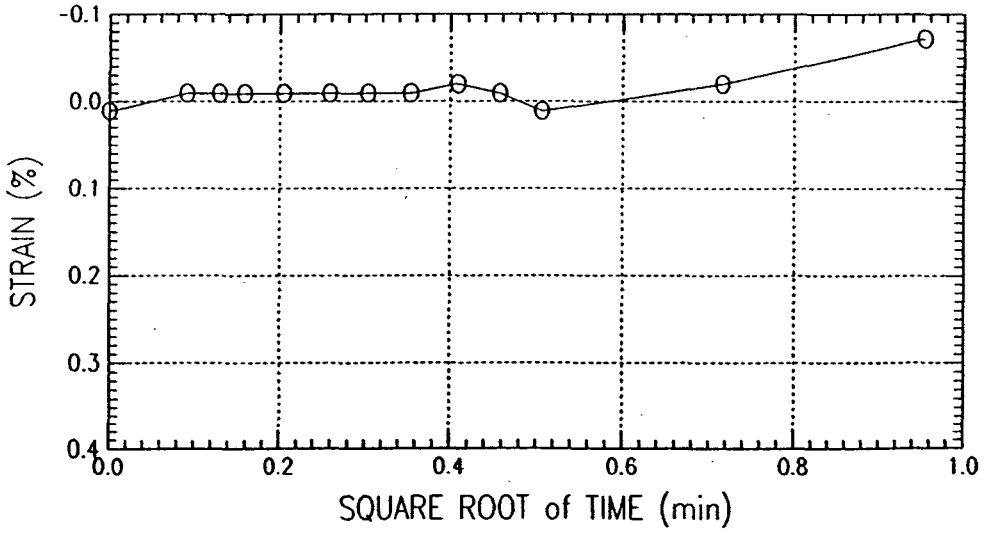
Soil Description : Moist, dark brown organic clay and peat
Remarks : ---

	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	0.001	16.151	0.10	0.0	0.0	0.00E+000	0.00E+000	0.00E+000
2)	0.03	0.005	16.083	0.50	2.9	0.0	2.82E-004	0.00E+000	2.82E-004
3)	0.05	0.015	15.914	1.48	1.6	0.0	4.97E-004	0.00E+000	4.97E-004
4)	0.10	0.054	15.238	5.42	3.4	4.2	2.25E-004	1.83E-004	2.04E-004
5)	0.20	0.178	13.119	17.76	9.5	11.7	6.77E-005	5.47E-005	6.12E-005
6)	0.40	0.337	10.388	33.67	0.0	0.0	0.00E+000	0.00E+000	3.56E-005
7)	0.20	0.323	10.616	32.34	0.0	0.0	0.00E+000	0.00E+000	1.37E-004
8)	0.10	0.304	10.954	30.37	0.0	0.0	0.00E+000	0.00E+000	5.17E-005
9)	0.05	0.284	11.288	28.43	0.0	0.0	0.00E+000	0.00E+000	2.90E-005
10)	0.10	0.290	11.188	29.01	0.0	0.0	0.00E+000	0.00E+000	5.29E-004
11)	0.20	0.305	10.941	30.45	0.0	0.0	0.00E+000	0.00E+000	1.70E-004
12)	0.40	0.354	10.093	35.39	0.0	0.0	0.00E+000	0.00E+000	4.53E-005
13)	0.80	0.479	7.950	47.87	8.2	0.0	3.43E-005	0.00E+000	3.43E-005
14)	1.40	0.566	6.458	56.56	21.6	26.6	8.68E-006	7.04E-006	7.86E-006
15)	2.00	0.618	5.555	61.82	37.1	41.3	3.68E-006	3.31E-006	3.50E-006

CONSOLIDATION TEST

TIME CURVES (STEP 1 OF 15)
STRESS : 0.01 (t/ft^2)

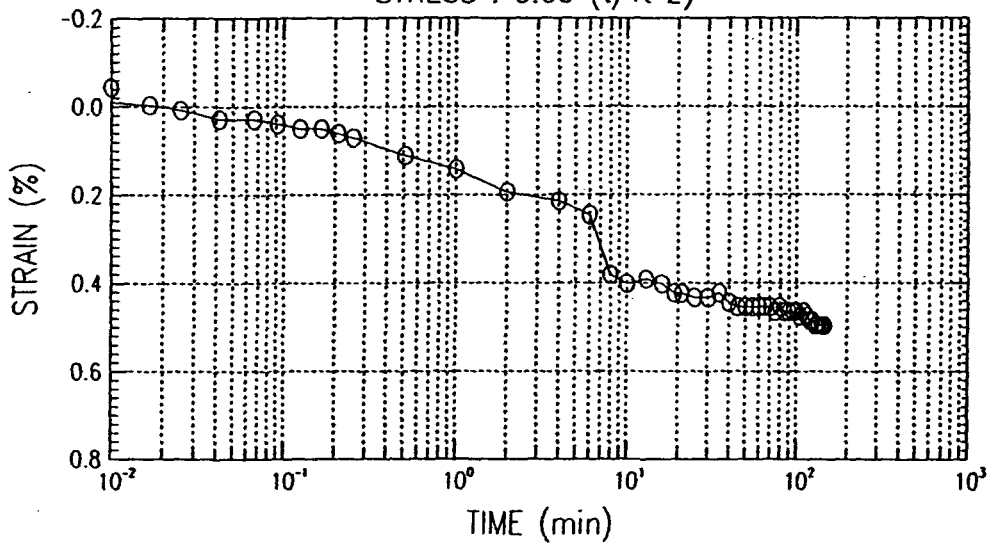


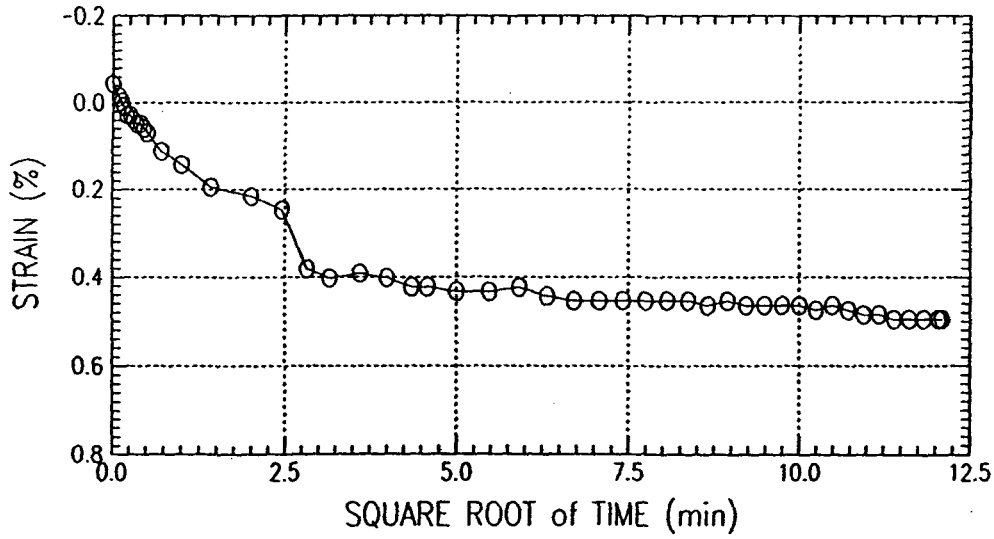


GeoTesting Express
Project Name : New Bedford Harbor Superfund Site
Project No : GTX-2409 Boring No : FA-26 Sample No : UO-1
Test Date : 01/07/00 Test No : CON28 Depth : 3-5 feet
Description : Moist, dark brown organic clay and peat
Remarks : ---

CONSOLIDATION TEST

TIME CURVES (STEP 2 OF 15)
STRESS : 0.03 (t/ft^2)

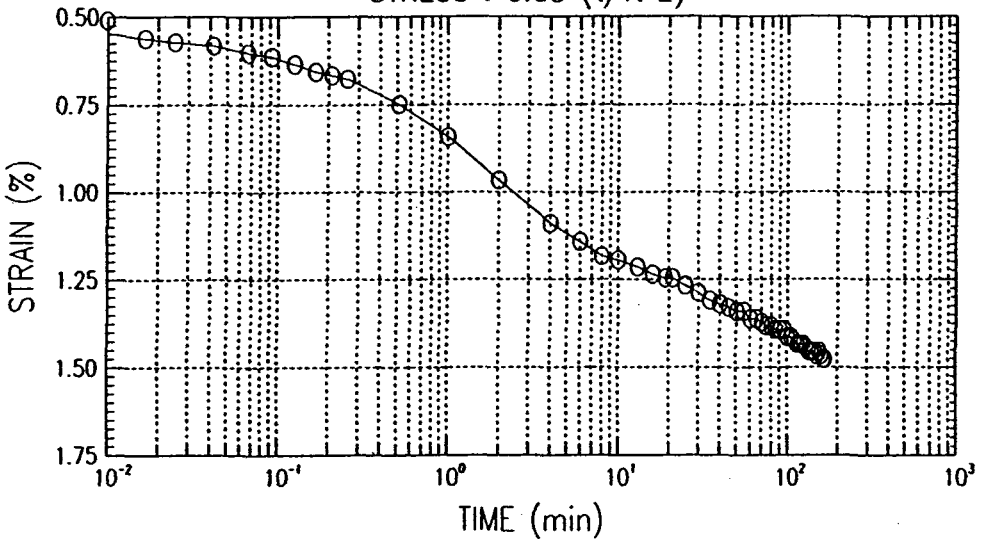


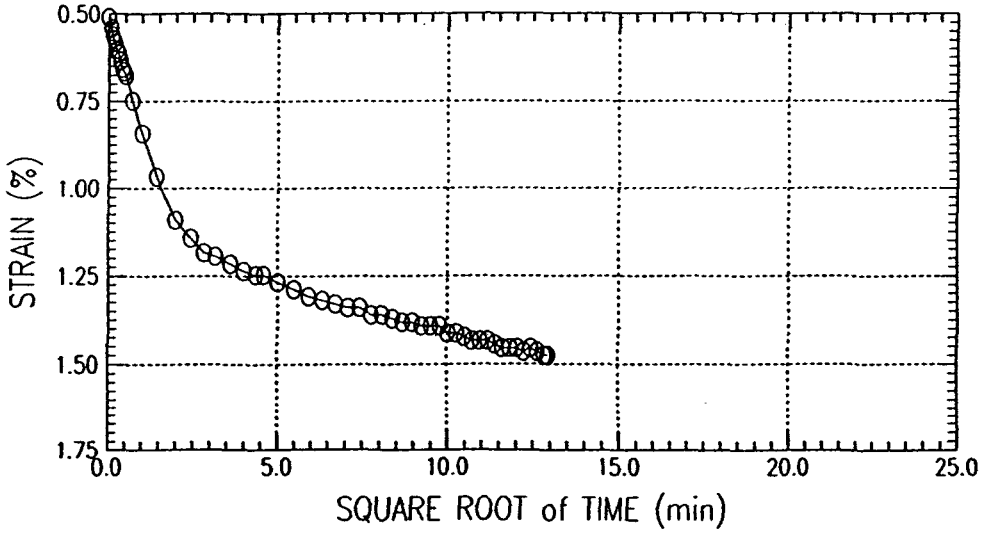


GeoTesting Express
Project Name : New Bedford Harbor Superfund Site
Project No : GTX-2409 Boring No : FA-26 Sample No : U0-1
Test Date : 01/07/00 Test No : CON28 Depth : 3-5 feet
Description : Moist, dark brown organic clay and peat
Remarks : ---

CONSOLIDATION TEST

TIME CURVES (STEP 3 OF 15)
STRESS : 0.05 (t/ft^2)

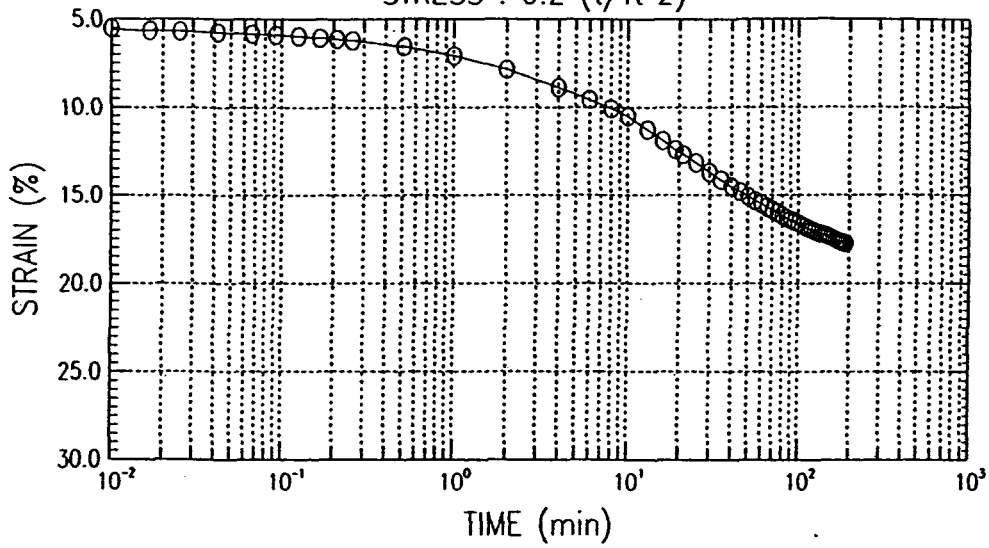


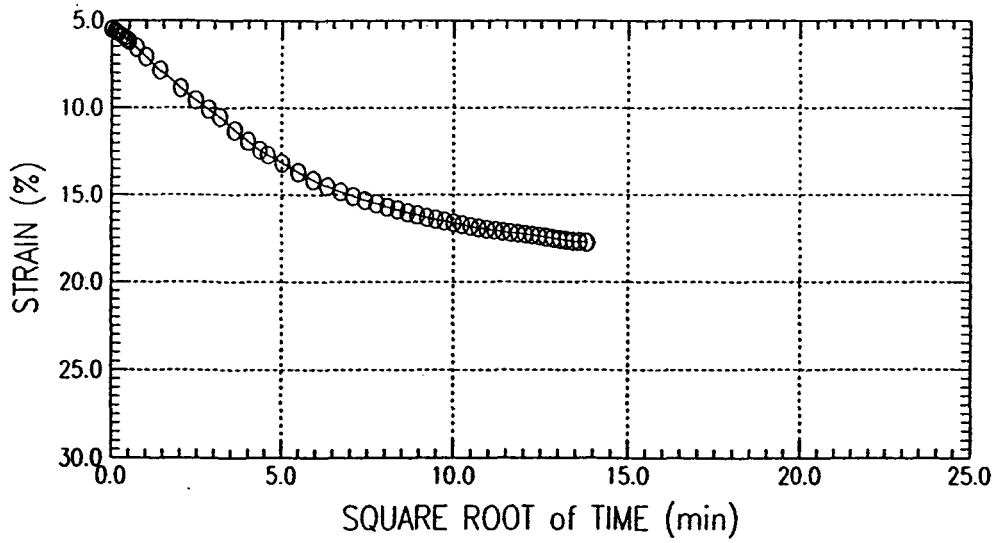


GeoTesting Express
Project Name : New Bedford Harbor Superfund Site
Project No : GTX-2409 Boring No : FA-26 Sample No : UO-1
Test Date : 01/07/00 Test No : CON28 Depth : 3-5 feet
Description : Moist, dark brown organic clay and peat
Remarks : ---

CONSOLIDATION TEST

TIME CURVES (STEP 5 OF 15)
STRESS : 0.2 (t/ft^2)

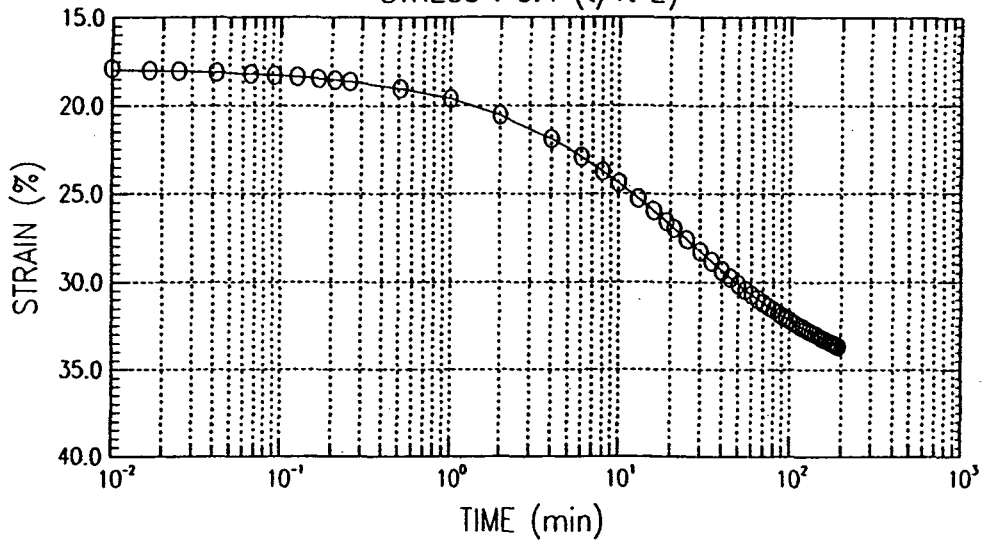


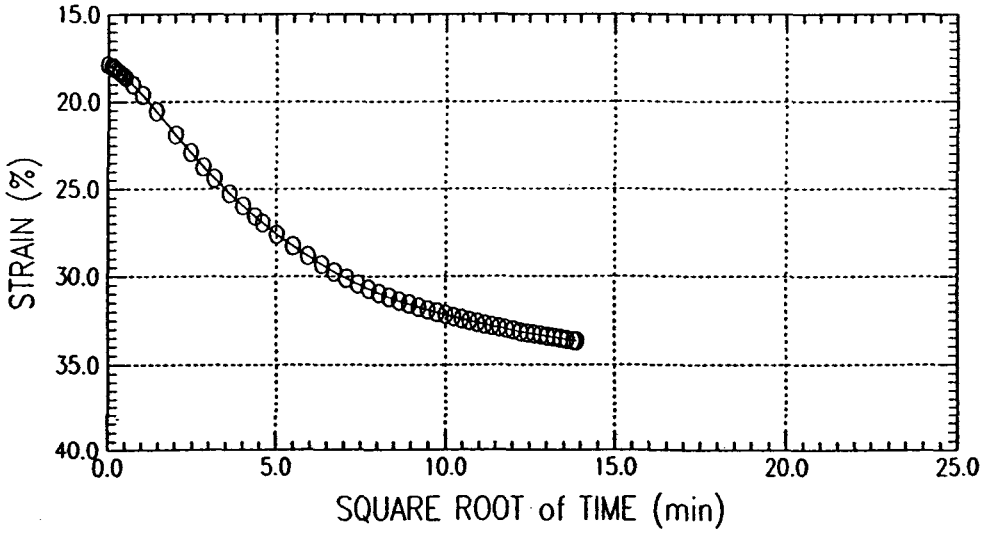


GeoTesting Express
Project Name : New Bedford Harbor Superfund Site
Project No : GTX-2409 Boring No : FA-26 Sample No : UO-1
Test Date : 01/07/00 Test No : CON28 Depth : 3-5 feet
Description : Moist, dark brown organic clay and peat
Remarks : ---

CONSOLIDATION TEST

TIME CURVES (STEP 6 OF 15)
STRESS : 0.4 (t/ft^2)

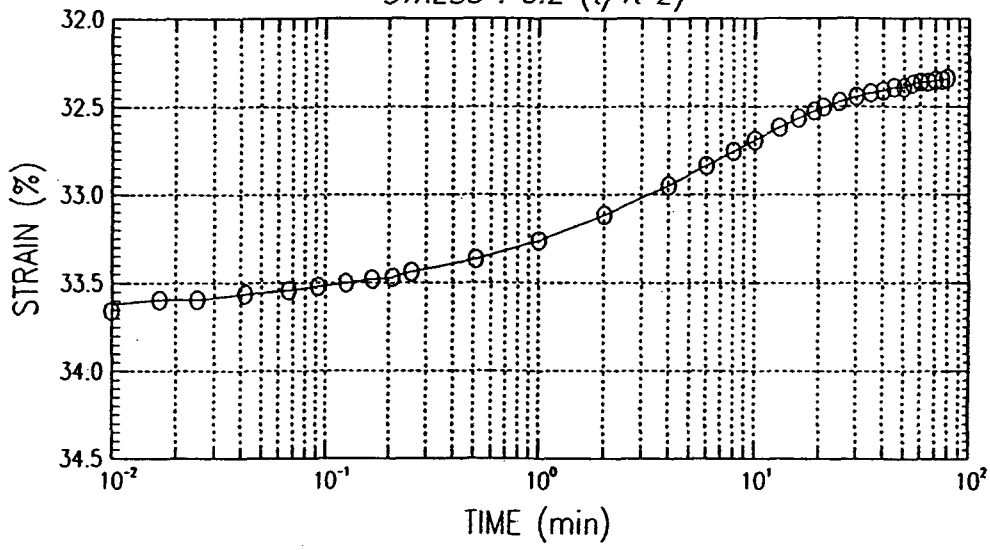


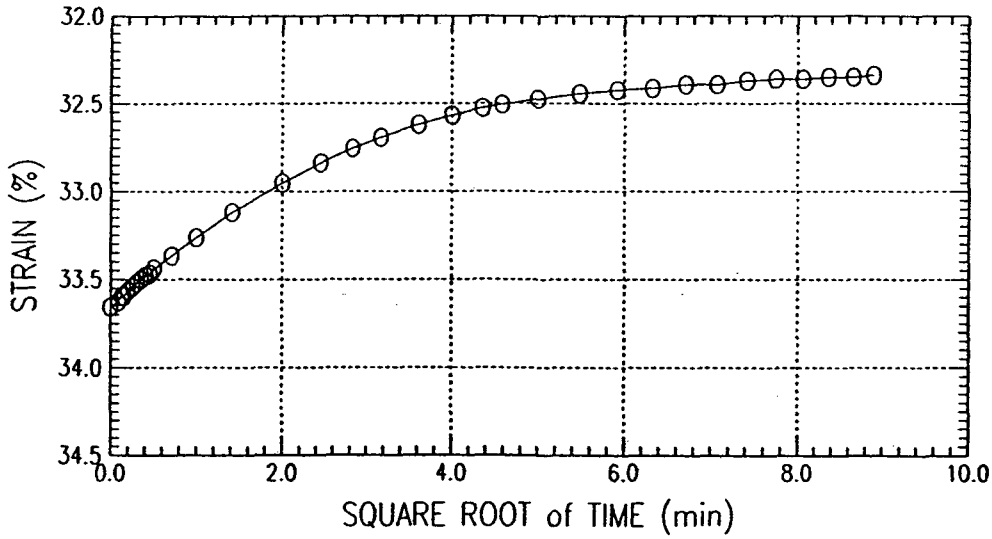


GeoTesting Express
Project Name : New Bedford Harbor Superfund Site
Project No : GTX-2409 Boring No : FA-26 Sample No : UO-1
Test Date : 01/07/00 Test No : CON28 Depth : 3-5 feet
Description : Moist, dark brown organic clay and peat
Remarks : ---

CONSOLIDATION TEST

TIME CURVES (STEP 7 OF 15)
STRESS : 0.2 (t/ft^2)

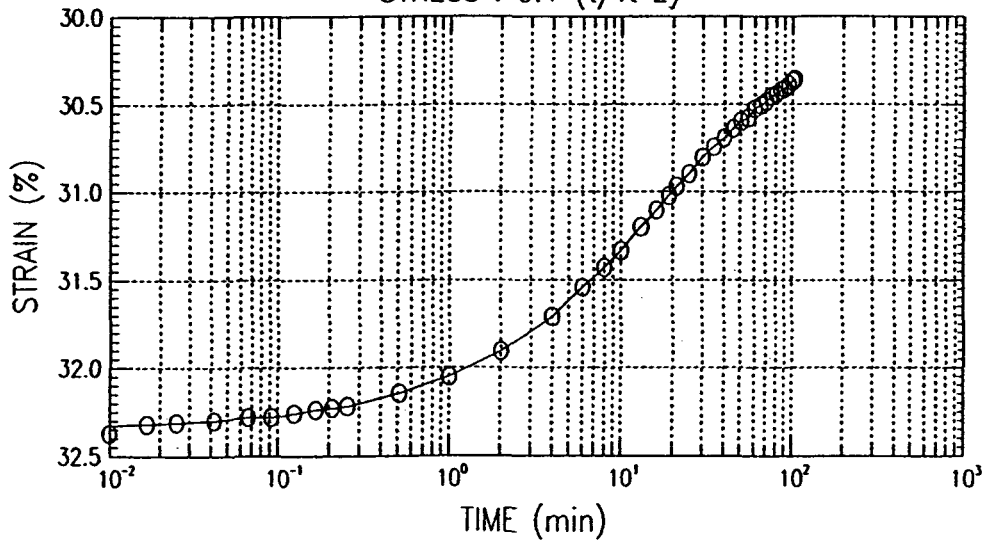


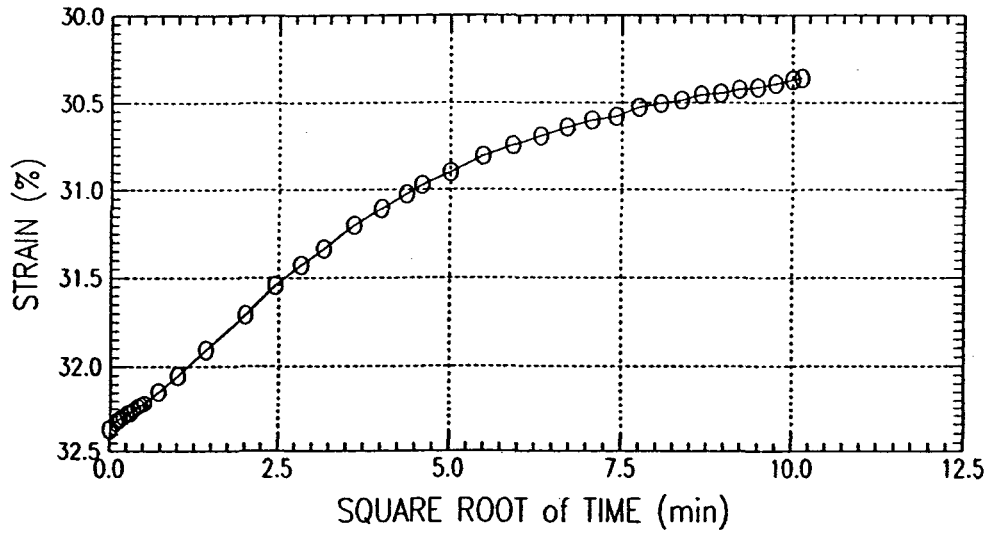


GeoTesting Express
Project Name : New Bedford Harbor Superfund Site
Project No : GTX-2409 Boring No : FA-26 Sample No : U0-1
Test Date : 01/07/00 Test No : CON28 Depth : 3-5 feet
Description : Moist, dark brown organic clay and peat
Remarks : ---

CONSOLIDATION TEST

TIME CURVES (STEP 8 OF 15)
STRESS : 0.1 (t/ft^2)

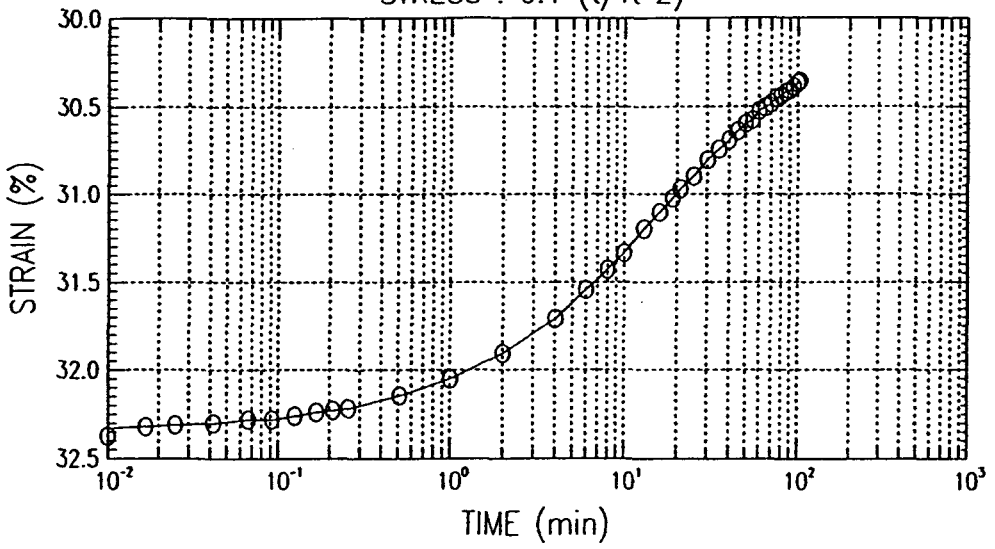


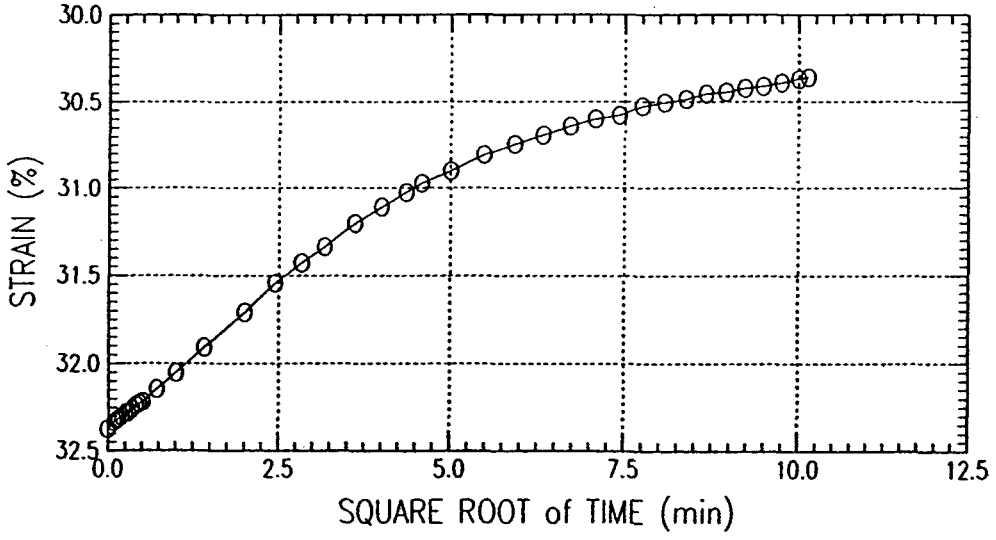


GeoTesting Express
Project Name : New Bedford Harbor Superfund Site
Project No : GTX-2409 Boring No : FA-26 Sample No : UO-1
Test Date : 01/07/00 Test No : CON28 Depth : 3-5 feet
Description : Moist, dark brown organic clay and peat
Remarks : ---

CONSOLIDATION TEST

TIME CURVES (STEP 8 OF 15)
STRESS : 0.1 (t/ft^2)

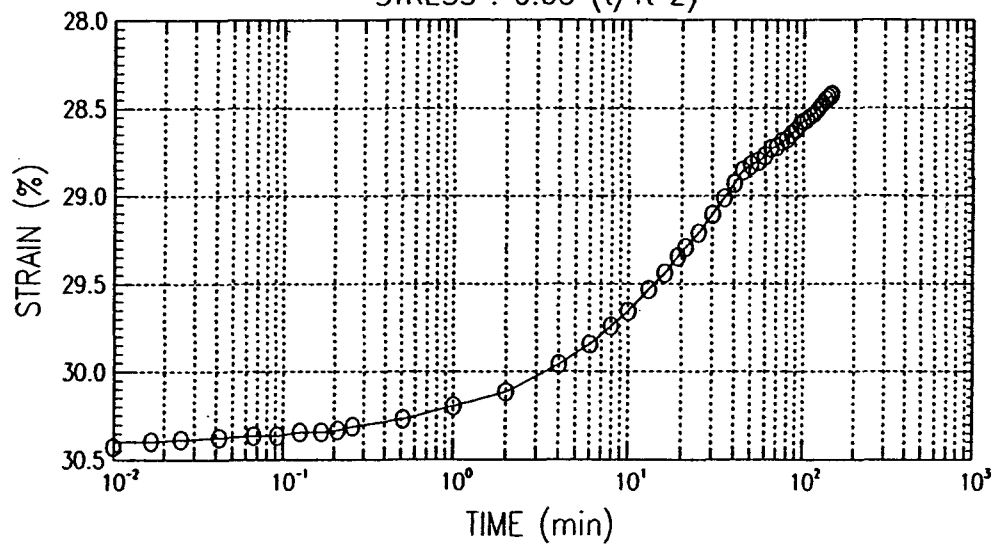


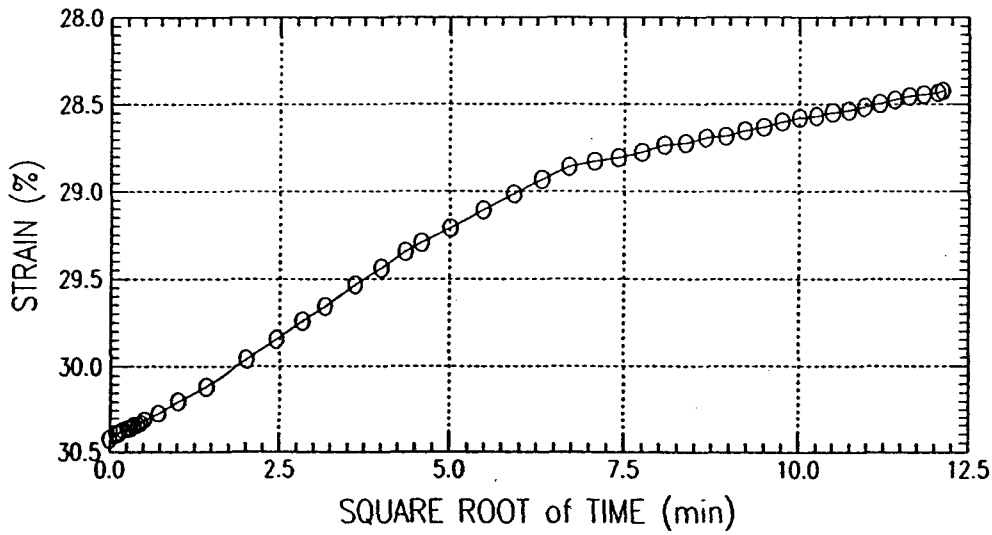


GeoTesting Express
Project Name : New Bedford Harbor Superfund Site
Project No : GTX-2409 Boring No : FA-26 Sample No : U0-1
Test Date : 01/07/00 Test No : CON28 Depth : 3-5 feet
Description : Moist, dark brown organic clay and peat
Remarks : ---

CONSOLIDATION TEST

TIME CURVES (STEP 9 OF 15)
STRESS : 0.05 (t/ft^2)

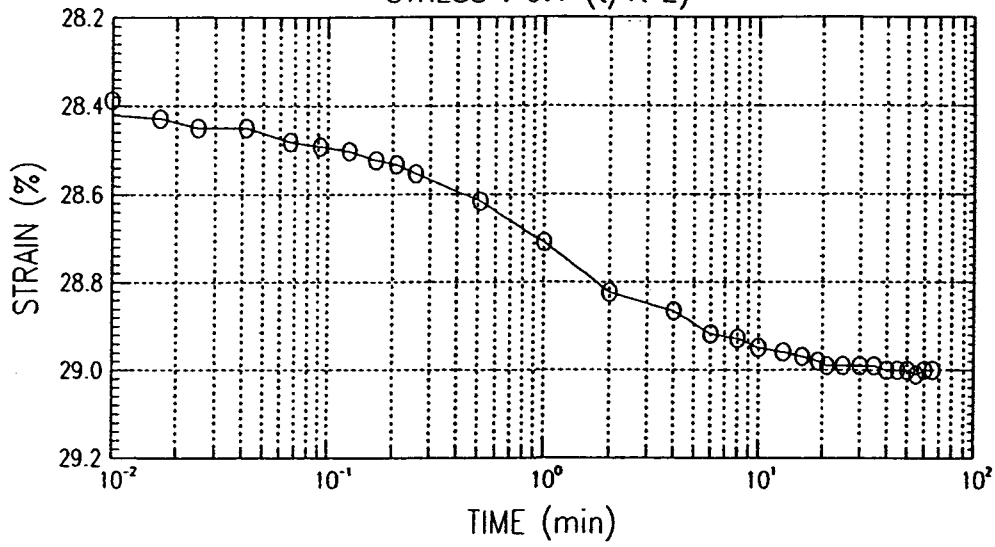


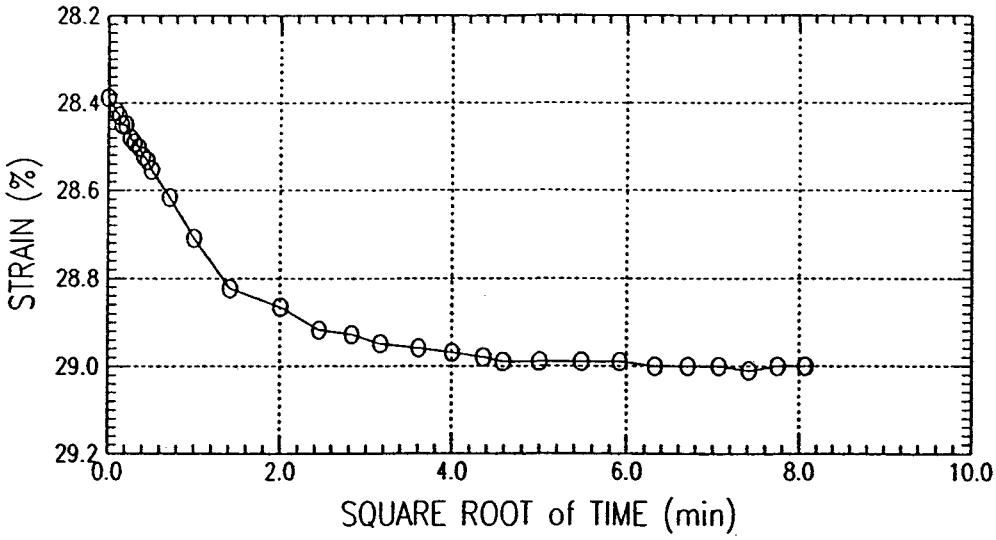


GeoTesting Express
Project Name : New Bedford Harbor Superfund Site
Project No : GTX-2409 Boring No : FA-26 Sample No : UO-1
Test Date : 01/07/00 Test No : CON28 Depth : 3-5 feet
Description : Moist, dark brown organic clay and peat
Remarks : ---

CONSOLIDATION TEST

TIME CURVES (STEP 10 OF 15)
STRESS : 0.1 (t/ft^2)

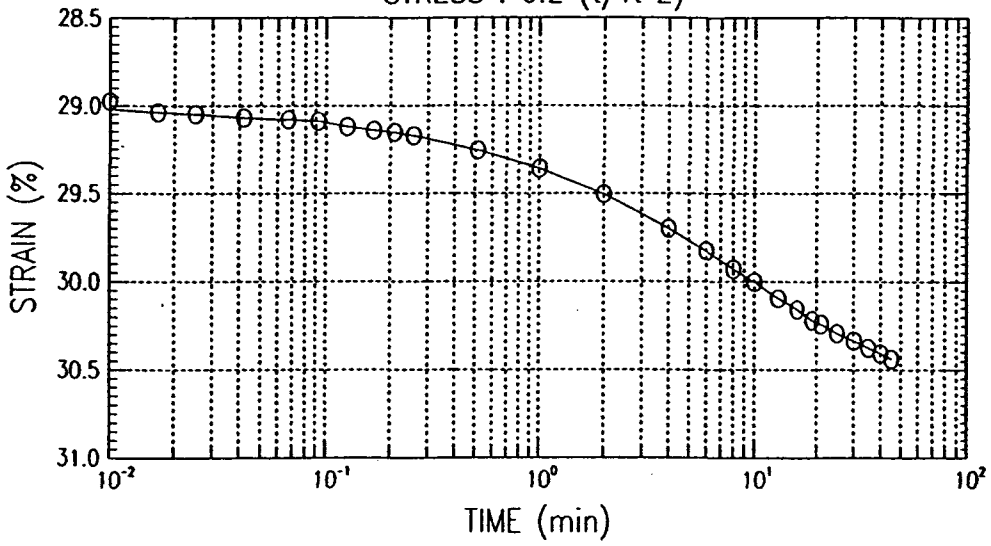


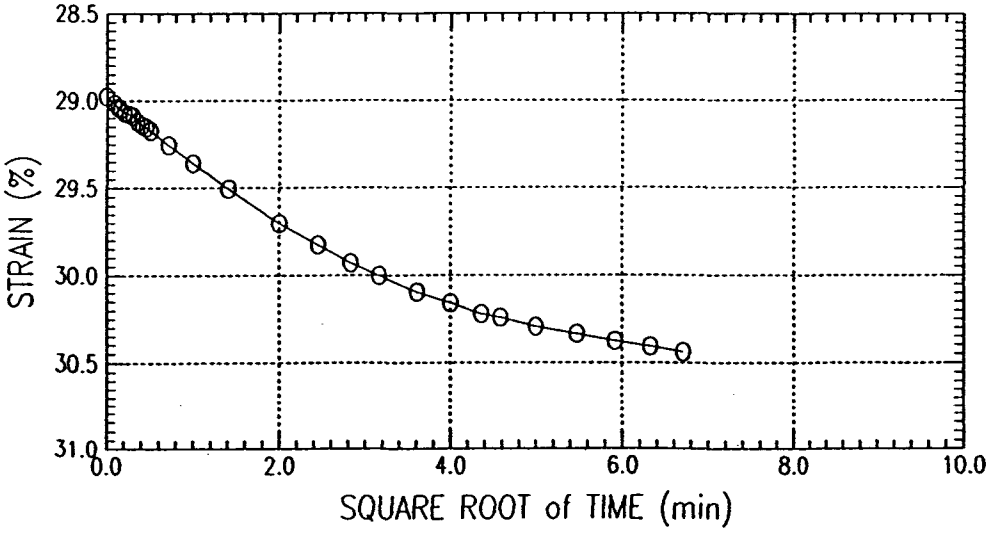


GeoTesting Express
Project Name : New Bedford Harbor Superfund Site
Project No : GTX-2409 Boring No : FA-26 Sample No : UO-1
Test Date : 01/07/00 Test No : CON28 Depth : 3-5 feet
Description : Moist, dark brown organic clay and peat
Remarks : ---

CONSOLIDATION TEST

TIME CURVES (STEP 11 OF 15)
STRESS : 0.2 (t/ft^2)



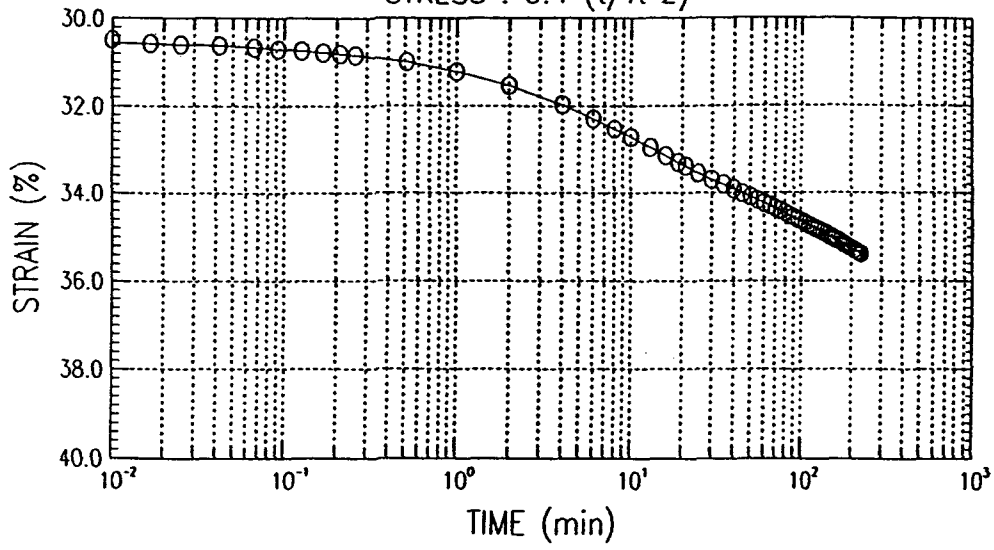


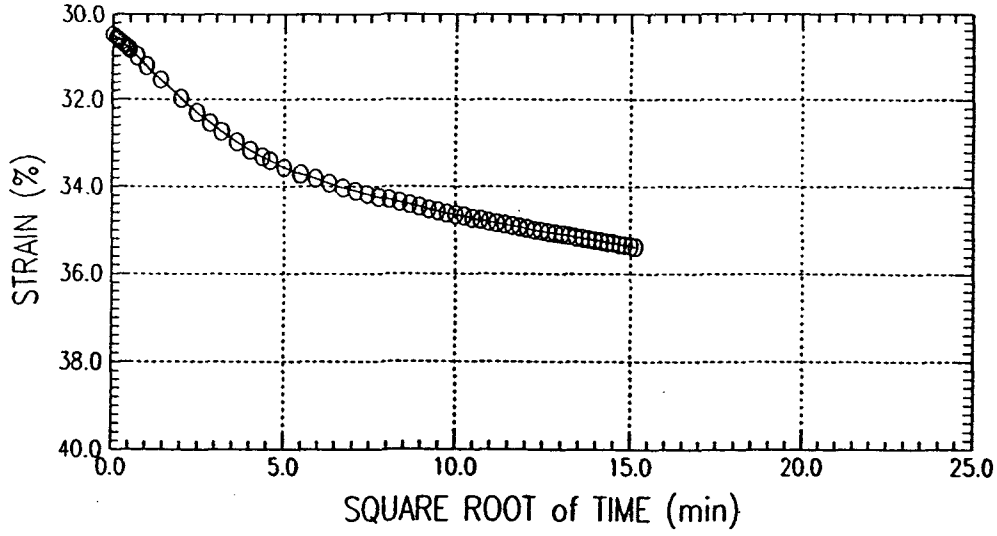
GeoTesting Express
Project Name : New Bedford Harbor Superfund Site
Project No : GTX-2409 Boring No : FA-26 Sample No : UO-1
Test Date : 01/07/00 Test No : CON28 Depth : 3-5 feet
Description : Moist, dark brown organic clay and peat
Remarks : ---

CONSOLIDATION TEST

TIME CURVES (STEP 12 OF 15)

STRESS : 0.4 (t/ft^2)

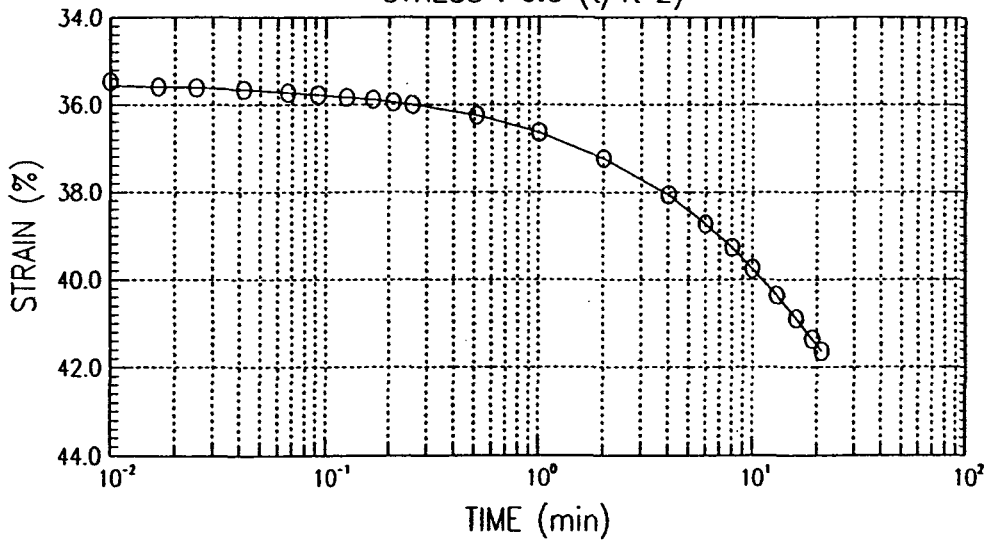


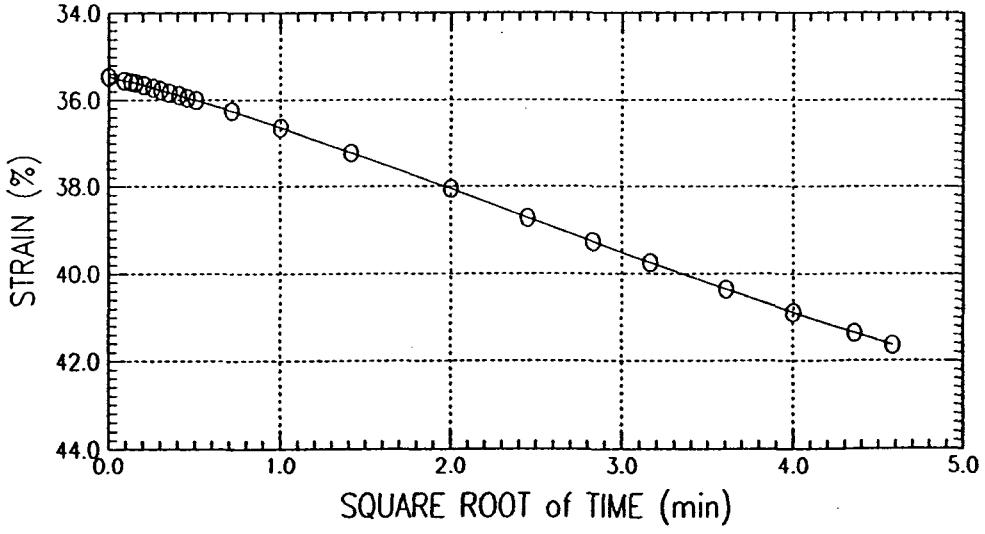


GeoTesting Express
Project Name : New Bedford Harbor Superfund Site
Project No : GTX-2409 Boring No : FA-26 Sample No : UO-1
Test Date : 01/07/00 Test No : CON28 Depth : 3-5 feet
Description : Moist, dark brown organic clay and peat
Remarks : ---

CONSOLIDATION TEST

TIME CURVES (STEP 13 OF 15)
STRESS : 0.8 (t/ft^2)

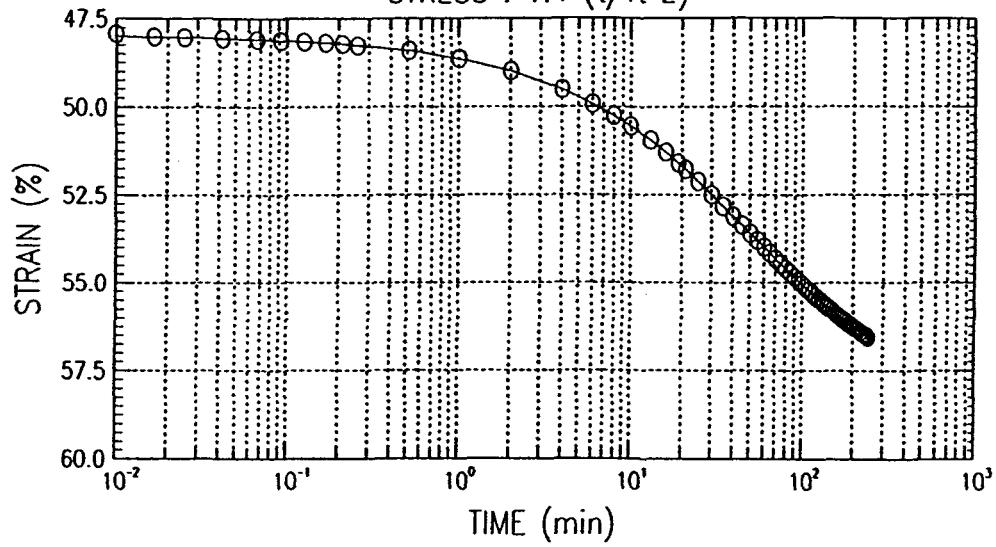


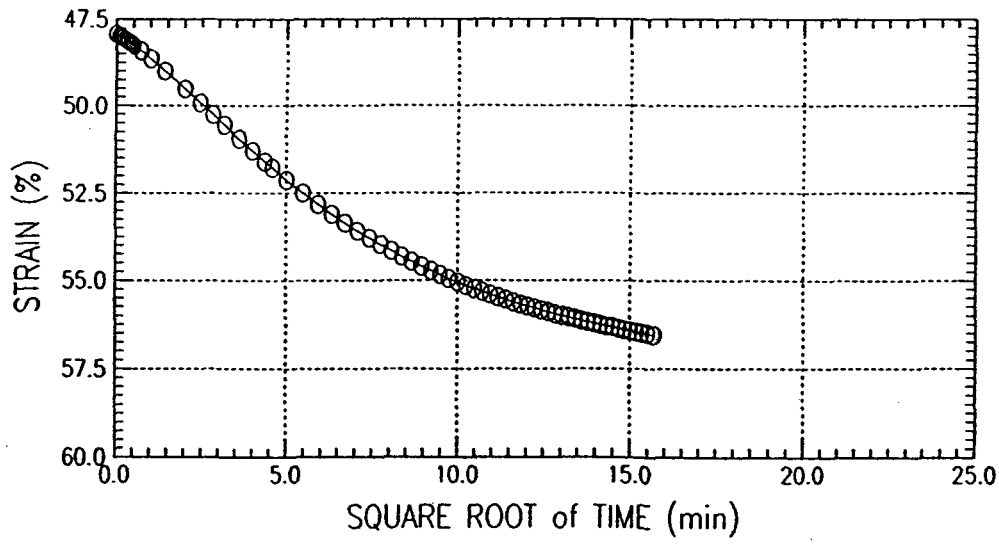


GeoTesting Express
Project Name : New Bedford Harbor Superfund Site
Project No : GTX-2409 Boring No : FA-26 Sample No : U0-1
Test Date : 01/07/00 Test No : CON28 Depth : 3-5 feet
Description : Moist, dark brown organic clay and peat
Remarks : ---

CONSOLIDATION TEST

TIME CURVES (STEP 14 OF 15)
STRESS : 1.4 (t/ft^2)

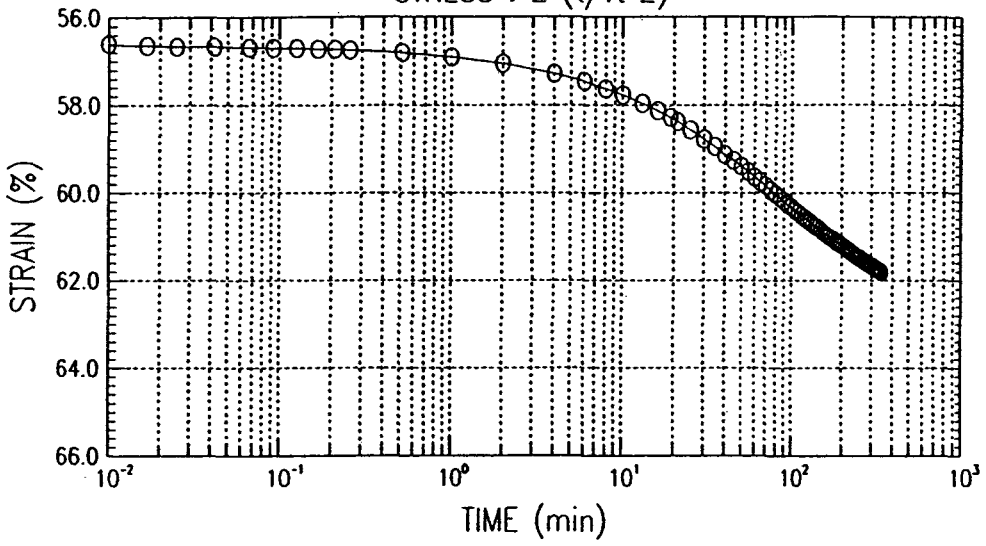


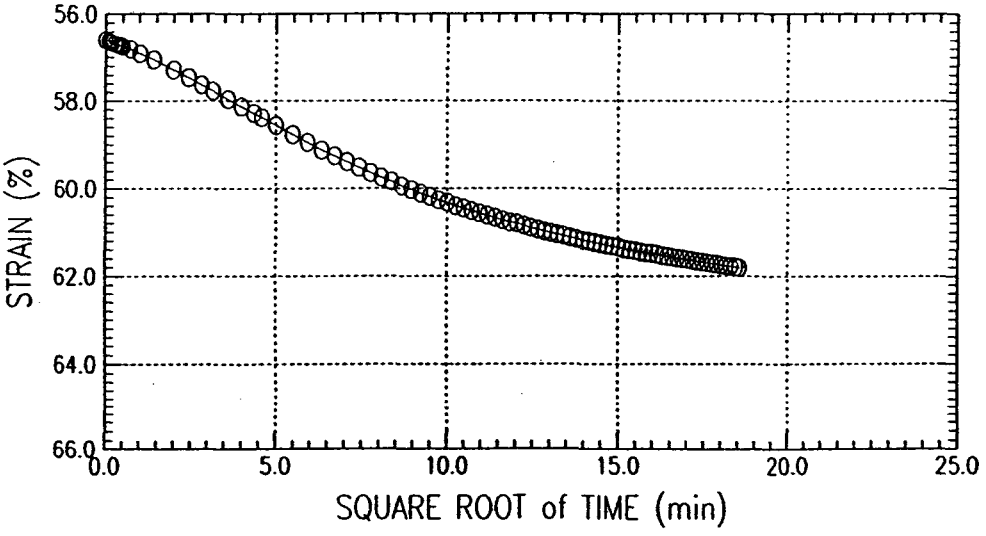


GeoTesting Express
Project Name : New Bedford Harbor Superfund Site
Project No : GTX-2409 Boring No : FA-26 Sample No : UO-1
Test Date : 01/07/00 Test No : CON28 Depth : 3-5 feet
Description : Moist, dark brown organic clay and peat
Remarks : ---

CONSOLIDATION TEST

TIME CURVES (STEP 15 OF 15)
STRESS : 2 (t/ft^2)





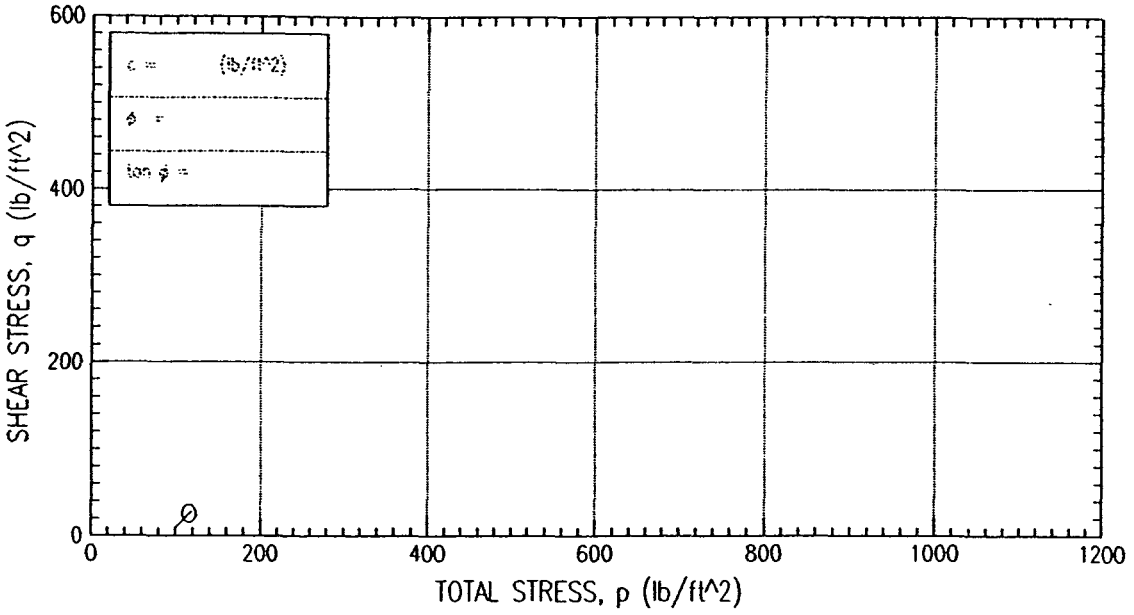
GeoTesting Express
Project Name : New Bedford Harbor Superfund Site
Project No : GTX-2409 Boring No : FA-26 Sample No : U0-1
Test Date : 01/07/00 Test No : CON28 Depth : 3-5 feet
Description : Moist, dark brown organic clay and peat
Remarks : ---

J

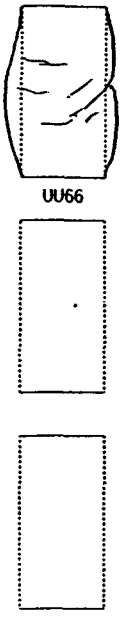
APPENDIX J

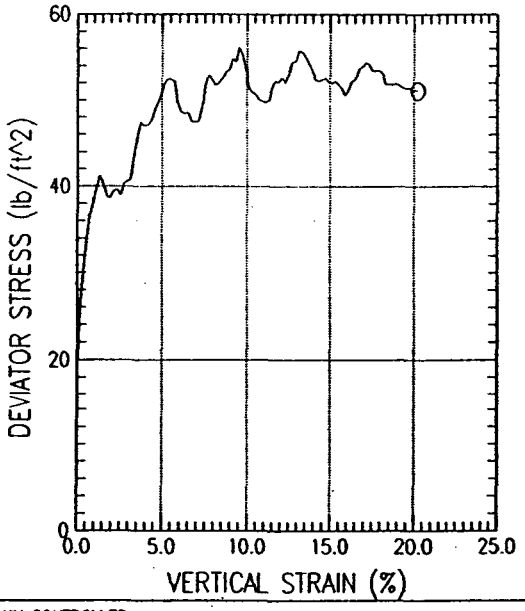
Triaxial Compression Testing – Q Test Results

UU Triaxial Test by ASTM D2850/T297



FAILURE SKETCHES





SYMBOL		O			
TEST NO.		UU66			
INITIAL	WATER CONTENT (%)	77.11			
	DRY DENSITY (lb/ft^3)	51.15			
	SATURATION (%)	93.15			
	VOID RATIO	2.111			
BEFORE SHEAR	WATER CONTENT (%)	77.11			
	DRY DENSITY (lb/ft^3)	51.15			
	SATURATION (%)	93.15			
	VOID RATIO	2.111			
	BACK PRESS. (lb/ft^2)	0.00			
MINOR PRIN. STRESS (lb/ft^2)		90.72			
MAX. DEV. STRESS (lb/ft^2)		56.14			
TIME TO FAILURE (min)		10.05			
RATE OF STRAIN INCR (%/min)		1.00			
INITIAL DIAMETER (in)		2.89			
INITIAL HEIGHT (in)		6.18			
B-VALUE		0.00			

STRAIN CONTROLLED

DESCRIPTION OF SPECIMENS:

1) Moist dark gray silty organic clay

LL	PL	PI	GS 2.55	TYPE OF SPECIMEN Tube	TYPE OF TEST UU (Q)

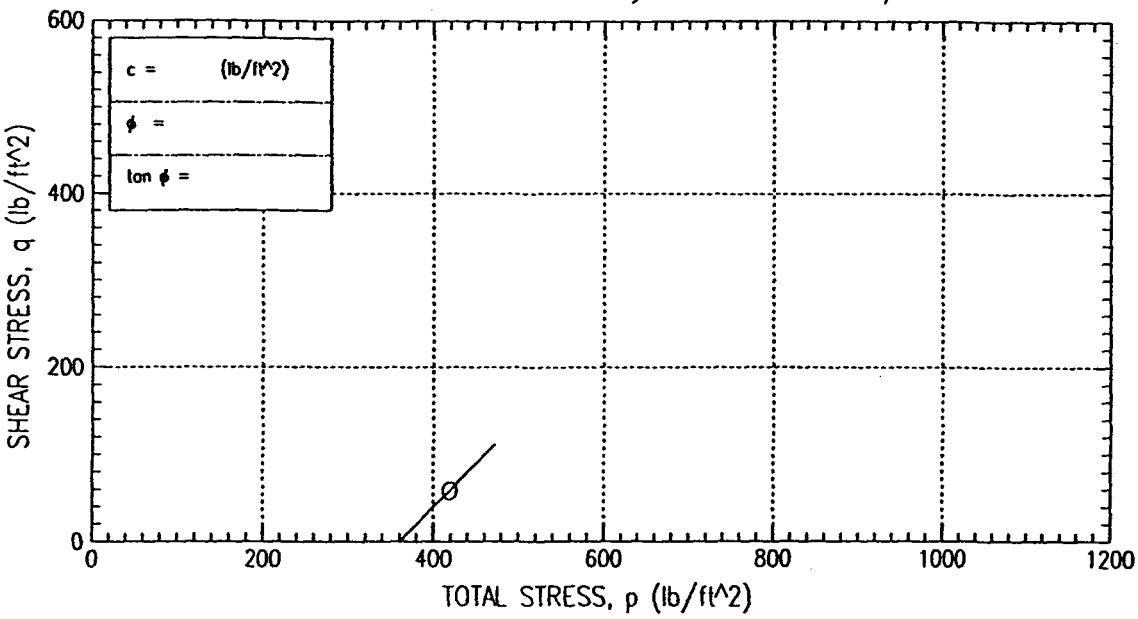
REMARKS:

1) Sample Condition=Soft

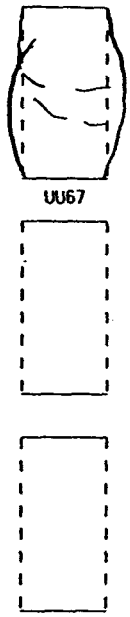
PROJECT New Bedford Harbor Superfund Site					
PROJECT NO.GTX-2409					
BORING NO. FA-12	SAMPLE NO.	U0-1			
TECH. FY	DEPTH/ELEV	1-3 feet			
LABORATORY	DATE	12/06/99			
TRIAXIAL COMPRESSION TEST REPORT					

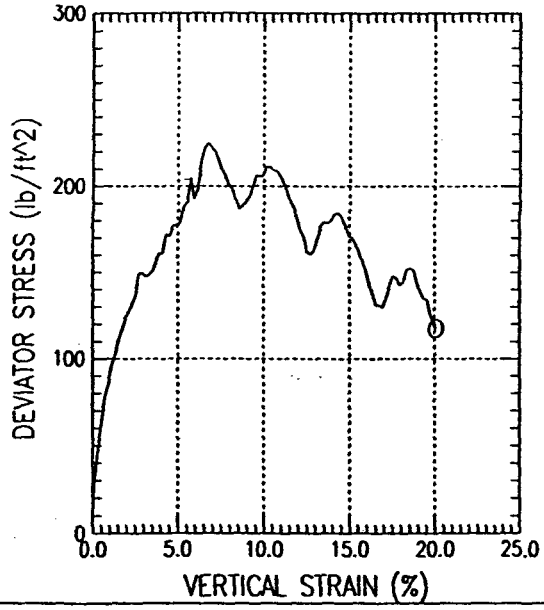
Tue 01-11-:0, 16:05:22

UU Triaxial Test by ASTM D2850/T297



FAILURE SKETCHES





SYMBOL		O				
TEST NO.		UU67				
INITIAL	WATER CONTENT (%)	98.61				
	DRY DENSITY (lb/ft^3)	44.45				
	SATURATION (%)	96.89				
	VOID RATIO	2.636				
BEFORE SHEAR	WATER CONTENT (%)	98.61				
	DRY DENSITY (lb/ft^3)	44.45				
	SATURATION (%)	96.89				
	VOID RATIO	2.636				
	BACK PRESS. (lb/ft^2)	0.00				
MINOR PRIN. STRESS (lb/ft^2)		360.00				
MAX. DEV. STRESS (lb/ft^2)		224.81				
TIME TO FAILURE (min)		7.14				
RATE OF STRAIN INCR (%/min)		1.00				
INITIAL DIAMETER (in)		2.89				
INITIAL HEIGHT (in)		6.23				
B-VALUE		0.00				

STRAIN CONTROLLED

DESCRIPTION OF SPECIMENS:

1) Moist, black sandy organic clay

LL 68.50	PL 29.20	PI 39.30	GS 2.59	TYPE OF SPECIMEN Tube	TYPE OF TEST UU (Q)

REMARKS:

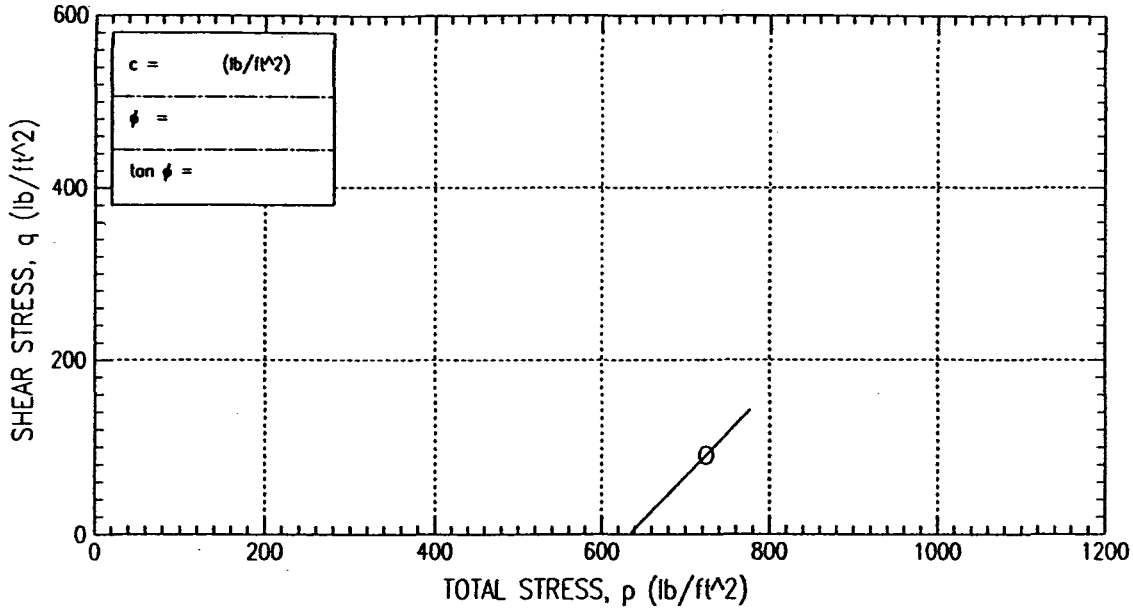
1) Sample Condition=Soft

PROJECT	New Bedford Harbor Superfund Site		
PROJECT NO.	GTX-2409		
BORING NO.	FA-12	SAMPLE NO.	UO-2
TECH.	FY	DEPTH/ELEV	4-6 feet
LABORATORY		DATE	12/06/99

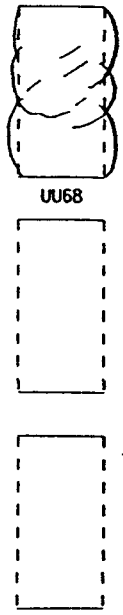
TRIAXIAL COMPRESSION TEST REPORT

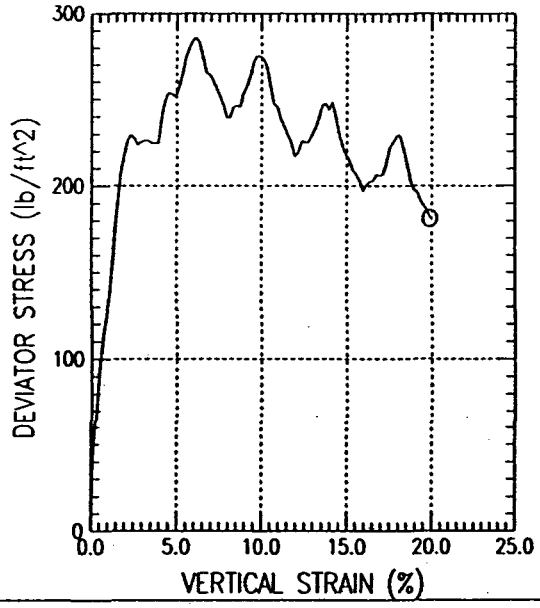
Thu 01-06-30, 10:19:47

UU Triaxial Test by ASTM D2850/T297



FAILURE SKETCHES





SYMBOL		O				
TEST NO.		UU68				
INITIAL	WATER CONTENT (%)	83.67				
	DRY DENSITY (lb/ft^3)	48.82				
	SATURATION (%)	92.89				
	VOID RATIO	2.387				
BEFORE SHEAR	WATER CONTENT (%)	83.67				
	DRY DENSITY (lb/ft^3)	48.82				
	SATURATION (%)	92.89				
	VOID RATIO	2.387				
	BACK PRESS. (lb/ft^2)	0.00				
MINOR PRIN. STRESS (lb/ft^2)		633.60				
MAX. DEV. STRESS (lb/ft^2)		285.85				
TIME TO FAILURE (min)		6.51				
RATE OF STRAIN INCR (%/min)		1.00				
INITIAL DIAMETER (in)		2.85				
INITIAL HEIGHT (in)		6.28				
B-VALUE		0.00				

STRAIN CONTROLLED

DESCRIPTION OF SPECIMENS:

1) Moist, dark gray silt with organics

LL 65.90	PL 41.90	PI 24.00	GS 2.65	TYPE OF SPECIMEN Tube	TYPE OF TEST UU (Q)

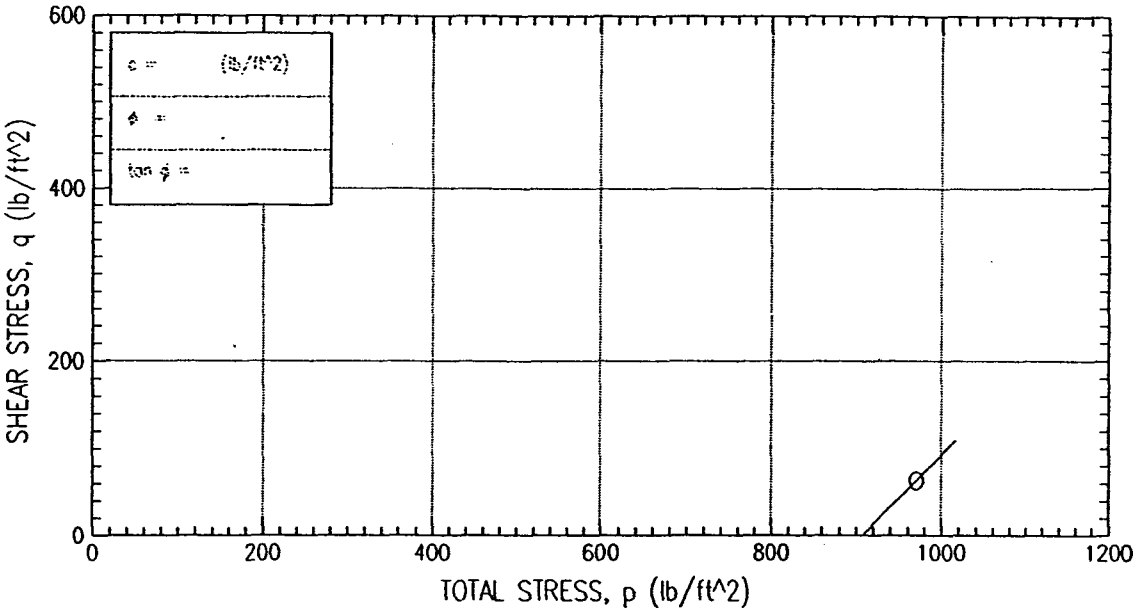
REMARKS:

1) Sample Condition=Soft

PROJECT New Bedford Harbor Superfund Site					
PROJECT NO.GTX-2409					
BORING NO. FA-12	SAMPLE NO.	UO-3			
TECH. FY	DEPTH/ELEV	7-9 feet			
LABORATORY	DATE	12/16/99			
TRIAXIAL COMPRESSION TEST REPORT					

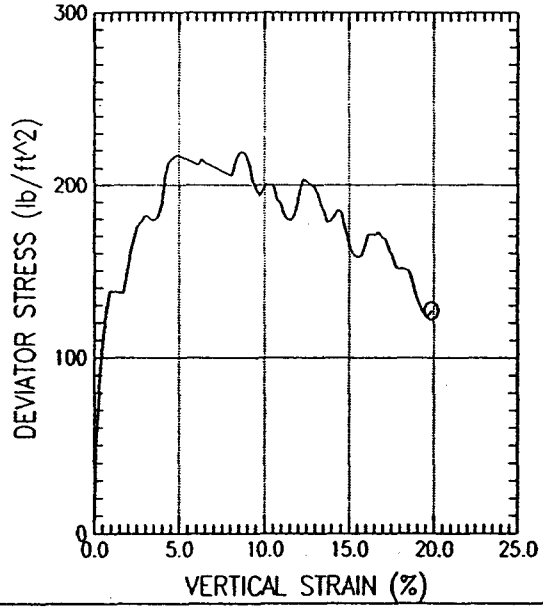
Thu 01-06-30, 10:26:35

UU Triaxial Test by ASTM D2850/T297



FAILURE SKETCHES

UU69



SYMBOL		O			
TEST NO.		UU69			
INITIAL	WATER CONTENT (%)	30.79			
	DRY DENSITY (lb/ft^3)	88.72			
	SATURATION (%)	98.94			
	VOID RATIO	0.793			
BEFORE SHEAR	WATER CONTENT (%)	30.79			
	DRY DENSITY (lb/ft^3)	88.72			
	SATURATION (%)	98.94			
	VOID RATIO	0.793			
	BACK PRESS. (lb/ft^2)	0.00			
MINOR PRIN. STRESS (lb/ft^2)		907.20			
MAX. DEV. STRESS (lb/ft^2)		219.25			
TIME TO FAILURE (min)		9.05			
RATE OF STRAIN INCR (%/min)		1.00			
INITIAL DIAMETER (in)		2.92			
INITIAL HEIGHT (in)		6.29			
B-VALUE		0.00			

STRAIN CONTROLLED

DESCRIPTION OF SPECIMENS:

1) Moist, dark gray sand

LL	PL	PI	GS 2.55	TYPE OF SPECIMEN Tube	TYPE OF TEST UU (Q)

REMARKS:

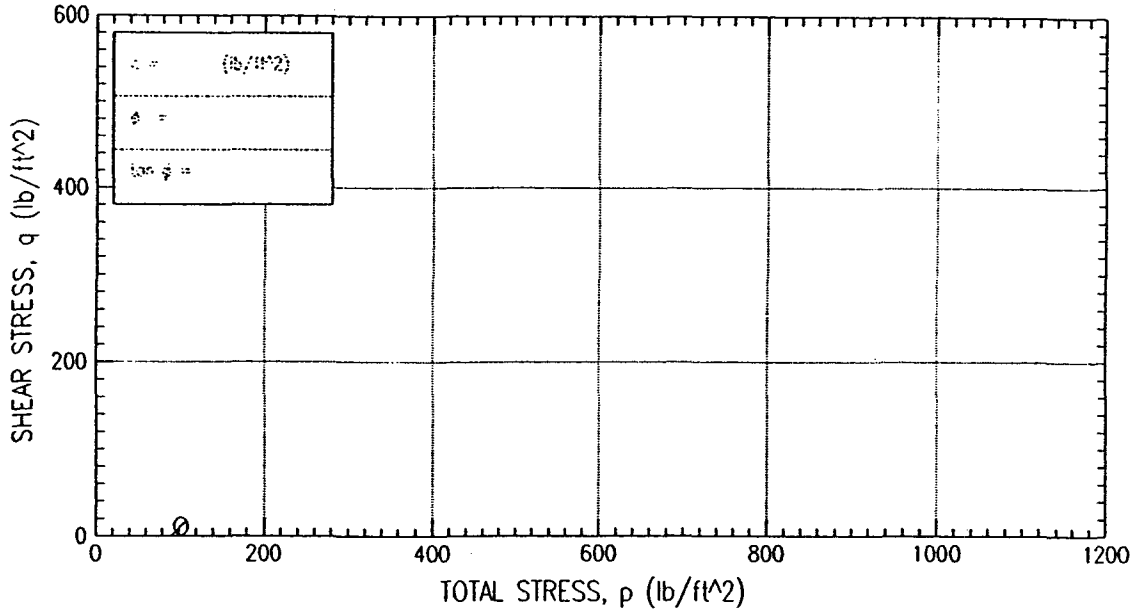
1) Sample Condition=Fair

PROJECT	New Bedford Harbor Superfund Site		
PROJECT NO.	GTX-2409		
BORING NO.	FA-12	SAMPLE NO.	U0-4
TECH.	FY	DEPTH/ELEV	10-12 feet
LABORATORY		DATE	12/16/99

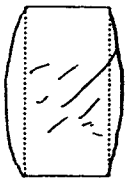
TRIAXIAL COMPRESSION TEST REPORT

Tue 01-11-30, 16:04:50

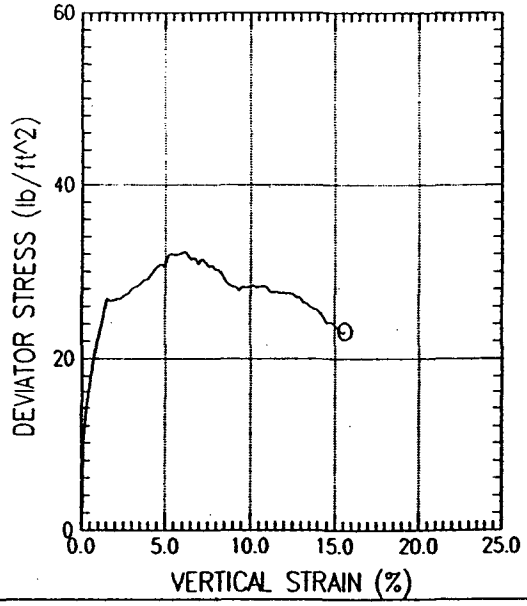
UU Triaxial Test by ASTM D2850/T297



FAILURE SKETCHES



UU70



SYMBOL		O				
TEST NO.		UU70				
INITIAL	WATER CONTENT (%)	104.42				
	DRY DENSITY (lb/ft^3)	40.70				
	SATURATION (%)	91.52				
	VOID RATIO	2.910				
BEFORE SHEAR	WATER CONTENT (%)	104.42				
	DRY DENSITY (lb/ft^3)	40.70				
	SATURATION (%)	91.52				
	VOID RATIO	2.910				
	BACK PRESS. (lb/ft^2)	0.00				
MINOR PRIN. STRESS (lb/ft^2)		90.72				
MAX. DEV. STRESS (lb/ft^2)		32.27				
TIME TO FAILURE (min)		6.35				
RATE OF STRAIN INCR (%/min)		1.00				
INITIAL DIAMETER (in)		2.92				
INITIAL HEIGHT (in)		6.40				
B-VALUE		0.00				

STRAIN CONTROLLED

DESCRIPTION OF SPECIMENS:

1) Moist, dark gray organic silty clay w/ trace shell

LL	PL	PI	GS 2.55	TYPE OF SPECIMEN Tube	TYPE OF TEST UU (Q)

REMARKS:

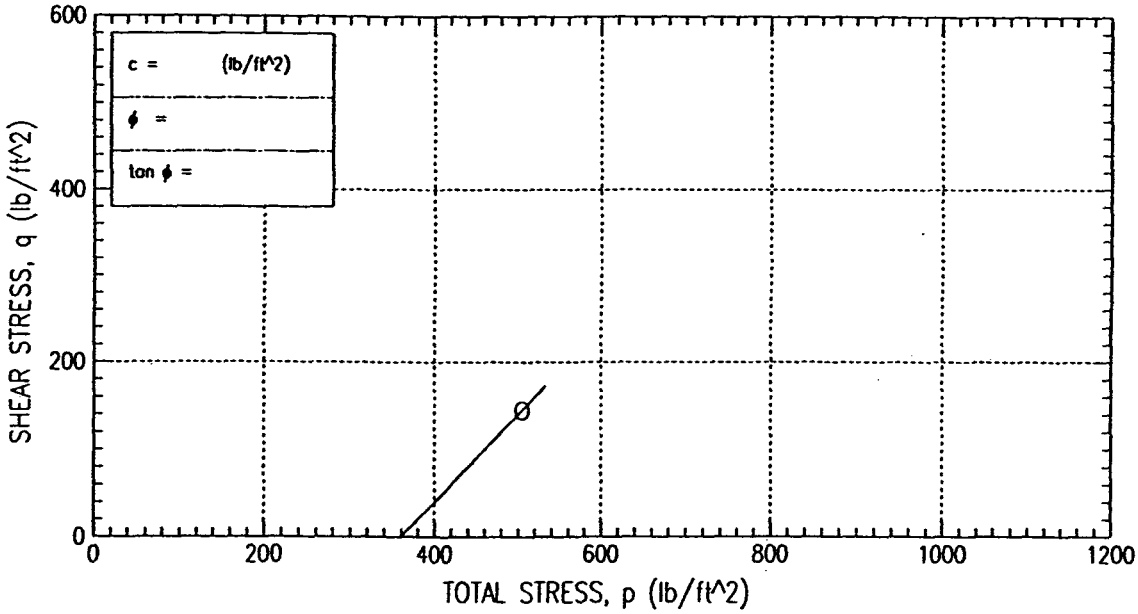
1) Sample Condition=Soft

PROJECT	New Bedford Harbor Superfund Site		
PROJECT NO.	GTX-2409		
BORING NO.	FA-19	SAMPLE NO.	UO-1
TECH.	fy	DEPTH/ELEV	1-3 feet
LABORATORY		DATE	12/23/99

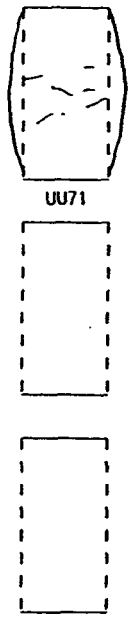
TRIAXIAL COMPRESSION TEST REPORT

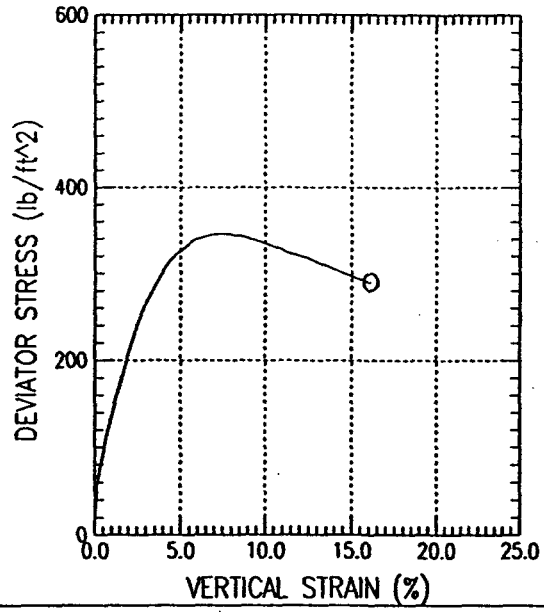
Tue 01-11-0, 16:03:59

UU Triaxial Test by ASTM D2850/T297



FAILURE SKETCHES





SYMBOL		O			
TEST NO.		UU71			
INITIAL	WATER CONTENT (%)	79.20			
	DRY DENSITY (lb/ft^3)	52.50			
	SATURATION (%)	98.35			
	VOID RATIO	2.102			
BEFORE SHEAR	WATER CONTENT (%)	79.20			
	DRY DENSITY (lb/ft^3)	52.50			
	SATURATION (%)	98.35			
	VOID RATIO	2.102			
	BACK PRESS. (lb/ft^2)	0.00			
MINOR PRIN. STRESS (lb/ft^2)		360.00			
MAX. DEV. STRESS (lb/ft^2)		345.71			
TIME TO FAILURE (min)		7.75			
RATE OF STRAIN INCR (%/min)		1.00			
INITIAL DIAMETER (in)		2.84			
INITIAL HEIGHT (in)		6.20			
B-VALUE		0.00			

STRAIN CONTROLLED

DESCRIPTION OF SPECIMENS:

1) Moist, very dark gray organic clay

LL 79.80	PL 33.50	PI 46.30	GS 2.61	TYPE OF SPECIMEN Tube	TYPE OF TEST UU (Q)

REMARKS:

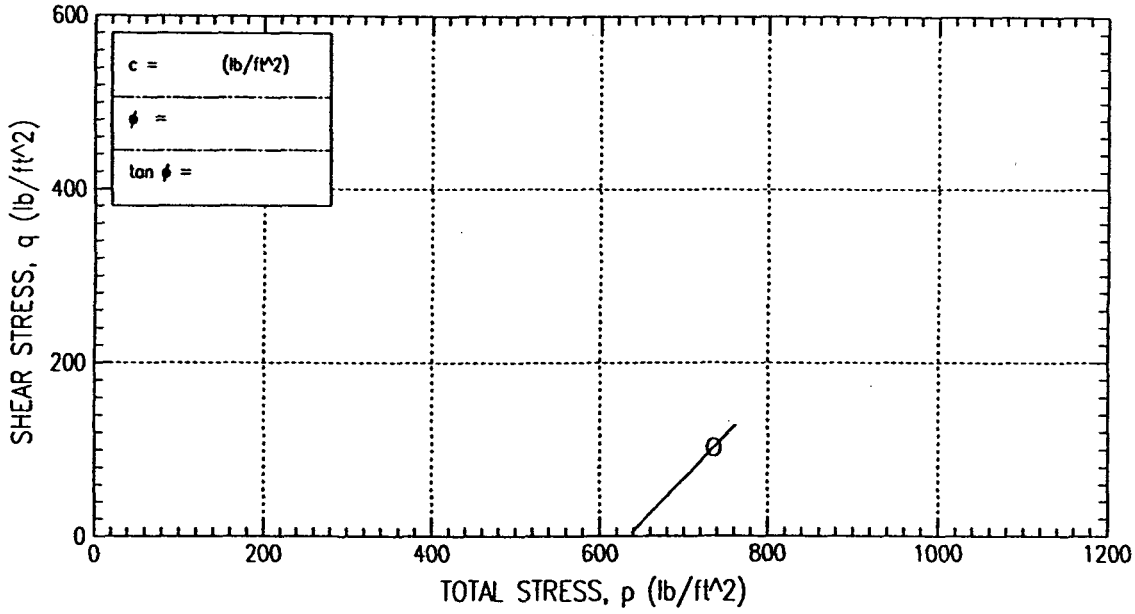
1) Sample Condition=Soft

PROJECT	New Bedford Harbor Superfund Site		
PROJECT NO.	GTX-2409		
BORING NO.	FA-19	SAMPLE NO.	UO-2
TECH.	fy	DEPTH/ELEV	4-6 feet
LABORATORY		DATE	12/23/99

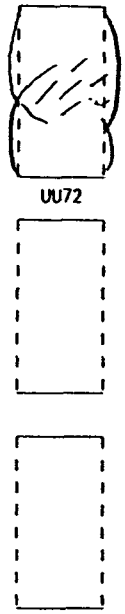
TRIAXIAL COMPRESSION TEST REPORT

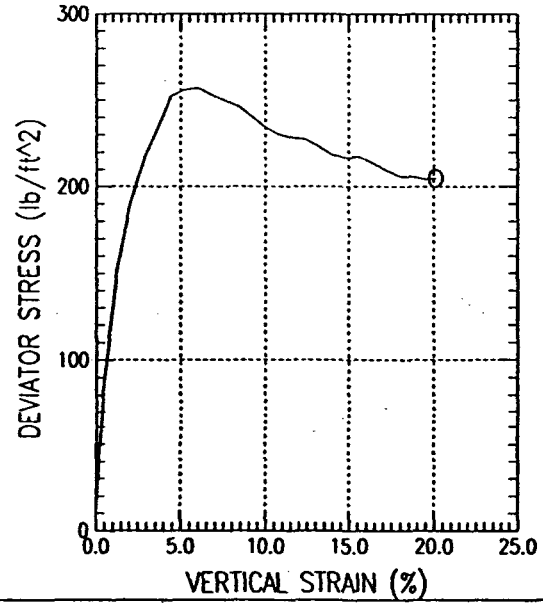
Thu 01-06-30, 12:15:48

UU Triaxial Test by ASTM D2850/T297



FAILURE SKETCHES





SYMBOL		O				
TEST NO.		UU72				
INITIAL	WATER CONTENT (%)	70.77				
	DRY DENSITY (lb/ft^3)	56.20				
	SATURATION (%)	97.51				
	VOID RATIO	1.887				
BEFORE SHEAR	WATER CONTENT (%)	70.77				
	DRY DENSITY (lb/ft^3)	56.20				
	SATURATION (%)	97.51				
	VOID RATIO	1.887				
	BACK PRESS. (lb/ft^2)	0.00				
MINOR PRIN. STRESS (lb/ft^2)		633.60				
MAX. DEV. STRESS (lb/ft^2)		257.07				
TIME TO FAILURE (min)		7.10				
RATE OF STRAIN INCR (%/min)		1.00				
INITIAL DIAMETER (in)		2.86				
INITIAL HEIGHT (in)		6.21				
B-VALUE		0.00				

STRAIN CONTROLLED

DESCRIPTION OF SPECIMENS:

1) Moist, dark gray organic silty clay

LL	PL	PI	GS 2.60	TYPE OF SPECIMEN Tube	TYPE OF TEST UU (0)

REMARKS:

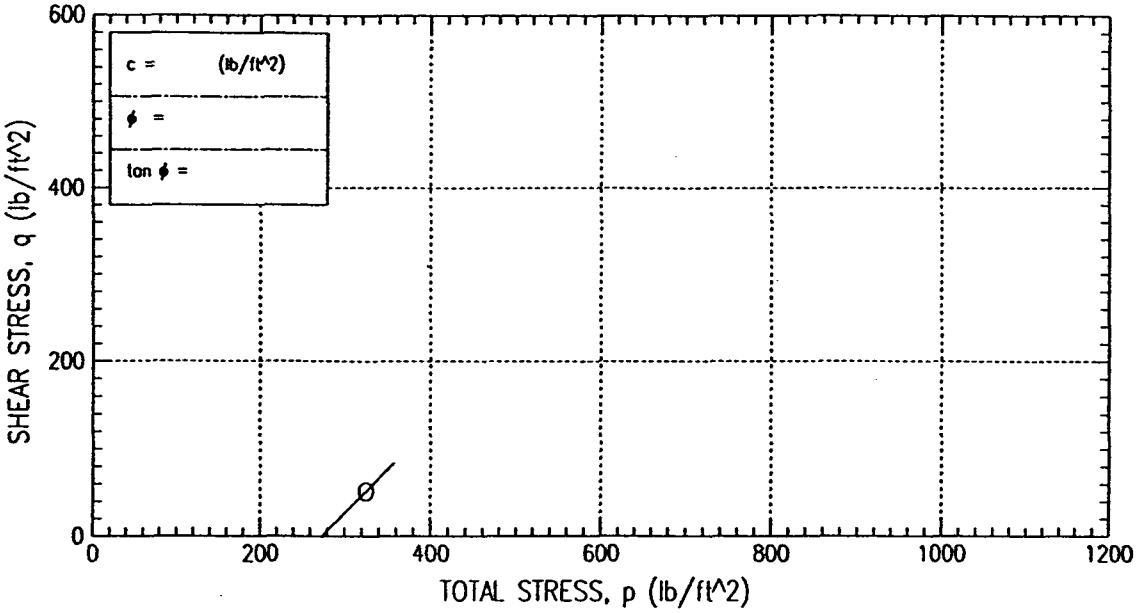
1) Sample Condition=Fair

PROJECT	New Bedford Harbor Superfund Site		
PROJECT NO.	GTX-2409		
BORING NO.	FA-19	SAMPLE NO.	UO-3
TECH.	FY	DEPTH/ELEV	7-9 feet
LABORATORY		DATE	12/29/99

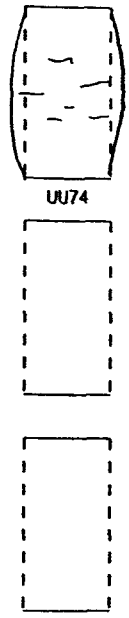
TRIAXIAL COMPRESSION TEST REPORT

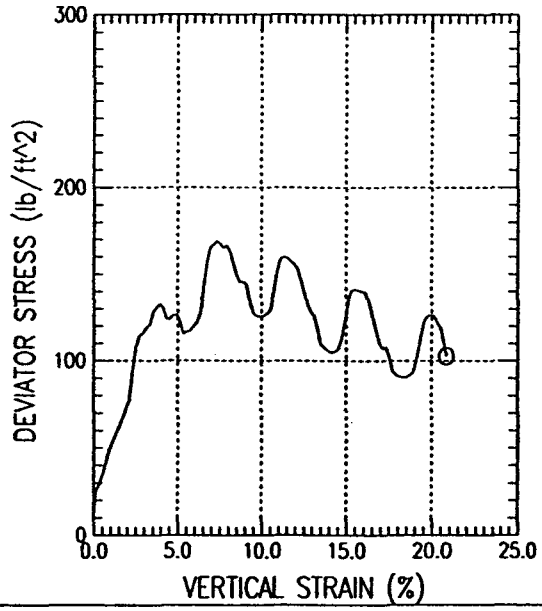
Thu 01-06-00, 14:30:41

UU Triaxial Test by ASTM D2850/T297



FAILURE SKETCHES





SYMBOL		O				
TEST NO.		UU74				
INITIAL	WATER CONTENT (%)	84.26				
	DRY DENSITY (lb/ft^3)	47.02				
	SATURATION (%)	89.56				
	VOID RATIO	2.437				
BEFORE SHEAR	WATER CONTENT (%)	84.26				
	DRY DENSITY (lb/ft^3)	47.02				
	SATURATION (%)	89.56				
	VOID RATIO	2.437				
	BACK PRESS. (lb/ft^2)	0.00				
MINOR PRIN. STRESS (lb/ft^2)		273.60				
MAX. DEV. STRESS (lb/ft^2)		168.73				
TIME TO FAILURE (min)		7.84				
RATE OF STRAIN INCR (%/min)		1.00				
INITIAL DIAMETER (in)		2.88				
INITIAL HEIGHT (in)		6.00				
B-VALUE		0.00				

STRAIN CONTROLLED

DESCRIPTION OF SPECIMENS:

1) Wet very dark gray organic clay

LL 87.20	PL 35.10	PI 52.10	GS 2.59	TYPE OF SPECIMEN Tube	TYPE OF TEST UU (Q)

REMARKS:

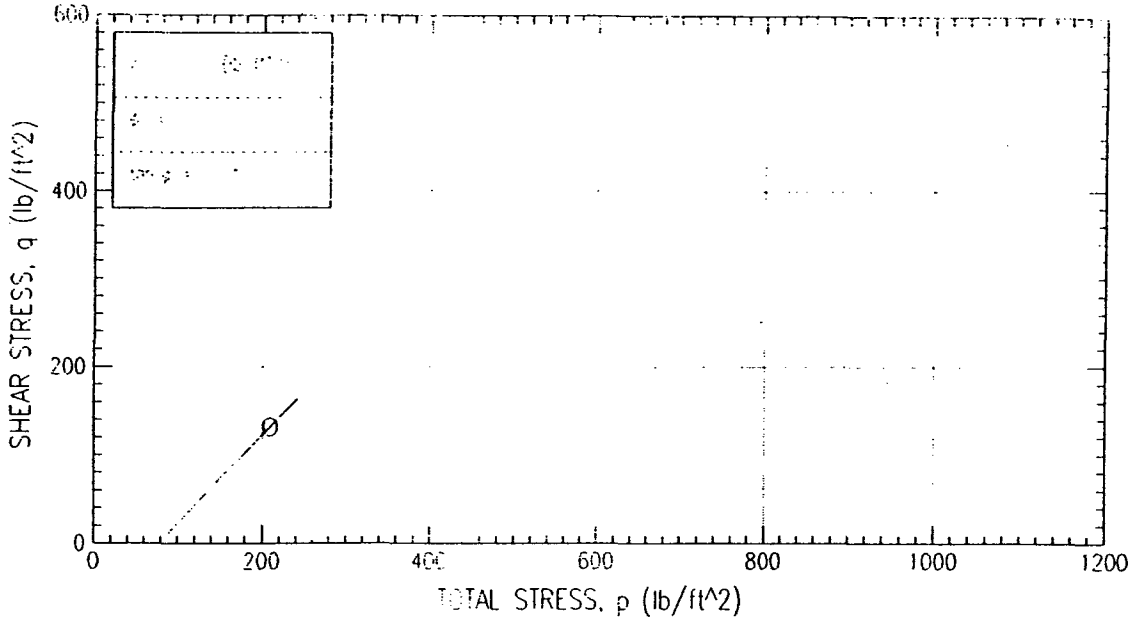
1) Sample Condition=Fair

PROJECT	New Bedford Harbor Superfund Site		
PROJECT NO.	GTX-2409		
BORING NO.	FA-23	SAMPLE NO.	UO-1
TECH.	FY	DEPTH/ELEV	3-5 feet
LABORATORY		DATE	12/29/99

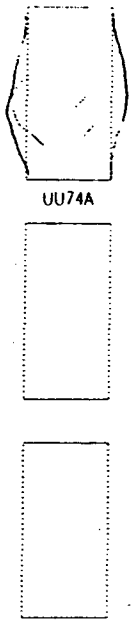
TRIAXIAL COMPRESSION TEST REPORT

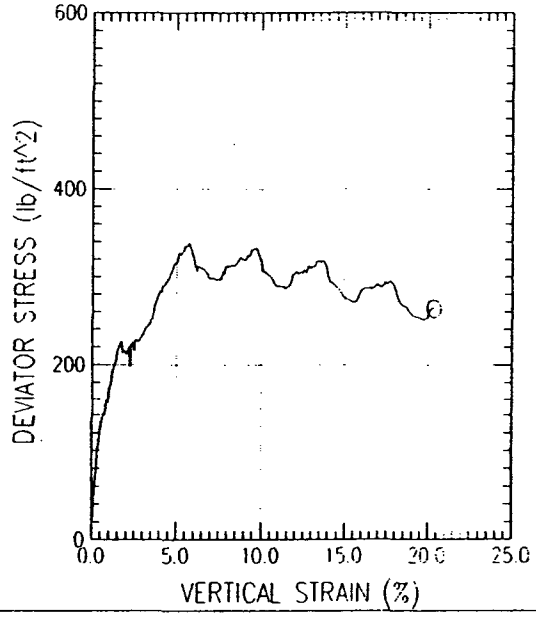
Thu 01-06-00, 12:40:12

UU Triaxial Test by ASTM D2850/T297



FAILURE SKETCHES





SYMBOL		O			
TEST NO.		UU74A			
INITIAL	WATER CONTENT (%)	85.26			
	DRY DENSITY (lb/ft^3)	49.07			
	SATURATION (%)	94.61			
	VOID RATIO	2.433			
BEFORE SHEAR	WATER CONTENT (%)	85.26			
	DRY DENSITY (lb/ft^3)	49.07			
	SATURATION (%)	94.61			
	VOID RATIO	2.433			
	BACK PRESS. (lb/ft^2)	0.00			
MINOR PRIN. STRESS (lb/ft^2)		77.76			
MAX. DEV. STRESS (lb/ft^2)		338.74			
TIME TO FAILURE (min)		6.28			
RATE OF STRAIN INCR (%/min)		1.00			
INITIAL DIAMETER (in)		2.83			
INITIAL HEIGHT (in)		6.15			
B-VALUE		0.00			

STRAIN CONTROLLED

DESCRIPTION OF SPECIMENS:

1) Moist,dark gray organic silt/shells w/small gravel

LL	PL	PI	GS 2.70	TYPE OF SPECIMEN Tube	TYPE OF TEST UU (O)

REMARKS:

1) Sample Condition=Fair

PROJECT New Bedford Harbor Superfund Site

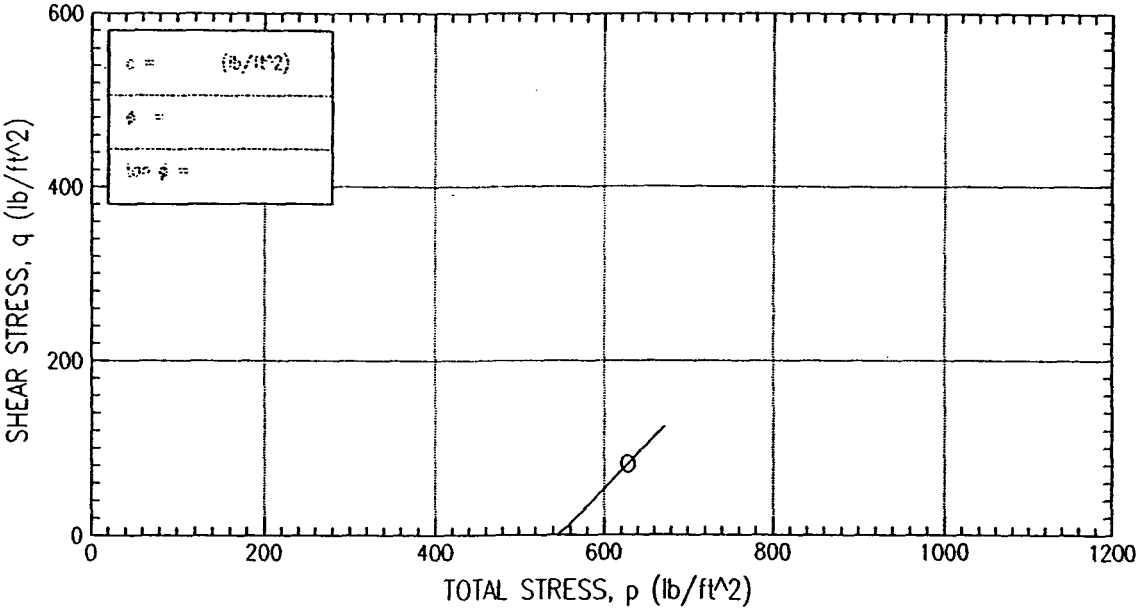
PROJECT NO.GTX-2409

BORING NO. FA-23	SAMPLE NO.	U0-1			
TECH. FY	DEPTH/ELEV	3-5 feet			
LABORATORY	DATE	05/10/00			

TRIAXIAL COMPRESSION TEST REPORT

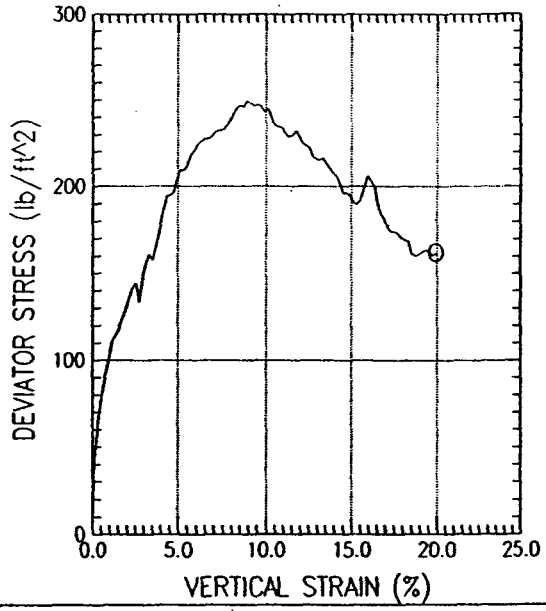
Tr 06 02-30, 10:02:16

UU Triaxial Test by ASTM D2850/T297



FAILURE SKETCHES

UU75



SYMBOL		O				
TEST NO.		UU75				
INITIAL	WATER CONTENT (%)	96.10				
	DRY DENSITY (lb/ft^3)	44.33				
	SATURATION (%)	94.63				
	VOID RATIO	2.590				
BEFORE SHEAR	WATER CONTENT (%)	96.10				
	DRY DENSITY (lb/ft^3)	44.33				
	SATURATION (%)	94.63				
	VOID RATIO	2.590				
	BACK PRESS. (lb/ft^2)	0.00				
MINOR PRIN. STRESS (lb/ft^2)		547.20				
MAX. DEV. STRESS (lb/ft^2)		249.74				
TIME TO FAILURE (min)		9.48				
RATE OF STRAIN INCR (%/min)		1.00				
INITIAL DIAMETER (in)		2.88				
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 2.55	TYPE OF SPECIMEN Tube	TYPE OF TEST UU (Q)

REMARKS:

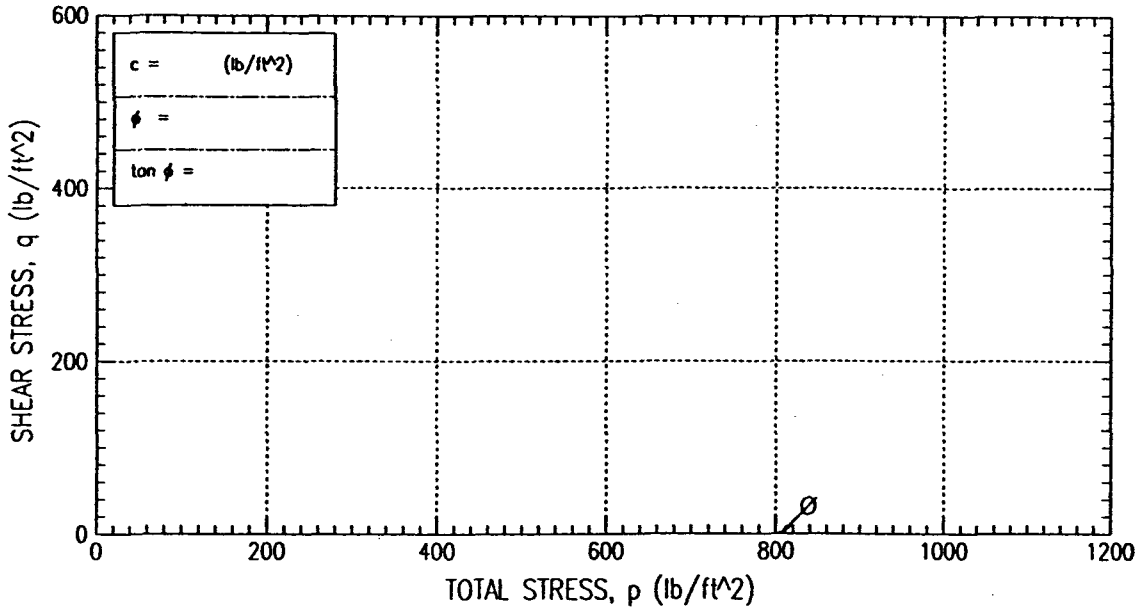
1) Sample Condition=Fair

PROJECT	New Bedford Harbor Superfund Site		
PROJECT NO.	GTX-2409		
BORING NO.	FA-23	SAMPLE NO.	UO-2
TECH.	FY	DEPTH/ELEV	6-8 feet
LABORATORY		DATE	12/29/99

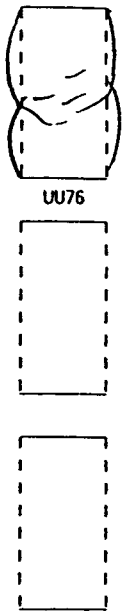
TRIAXIAL COMPRESSION TEST REPORT

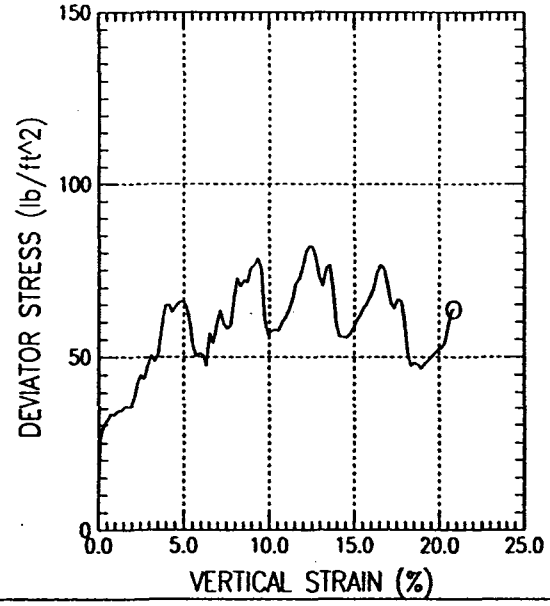
Tue 01-11-:0, 16:03:29

UU Triaxial Test by ASTM D2850/T297



FAILURE SKETCHES





SYMBOL		O			
TEST NO.		UU76			
INITIAL	WATER CONTENT (%)	106.16			
	DRY DENSITY (lb/ft^3)	39.44			
	SATURATION (%)	89.33			
	VOID RATIO	3.018			
BEFORE SHEAR	WATER CONTENT (%)	106.16			
	DRY DENSITY (lb/ft^3)	39.44			
	SATURATION (%)	89.33			
	VOID RATIO	3.018			
	BACK PRESS. (lb/ft^2)	0.00			
MINOR PRIN. STRESS (lb/ft^2)		806.40			
MAX. DEV. STRESS (lb/ft^2)		82.09			
TIME TO FAILURE (min)		12.83			
RATE OF STRAIN INCR (%/min)		1.00			
INITIAL DIAMETER (in)		2.85			
INITIAL HEIGHT (in)		6.00			
B-VALUE		0.00			

STRAIN CONTROLLED

DESCRIPTION OF SPECIMENS:

1) Moist, very dark gray organic clay

LL 93.40	PL 51.30	PI 42.10	GS 2.54	TYPE OF SPECIMEN Tube	TYPE OF TEST UU (Q)

REMARKS:

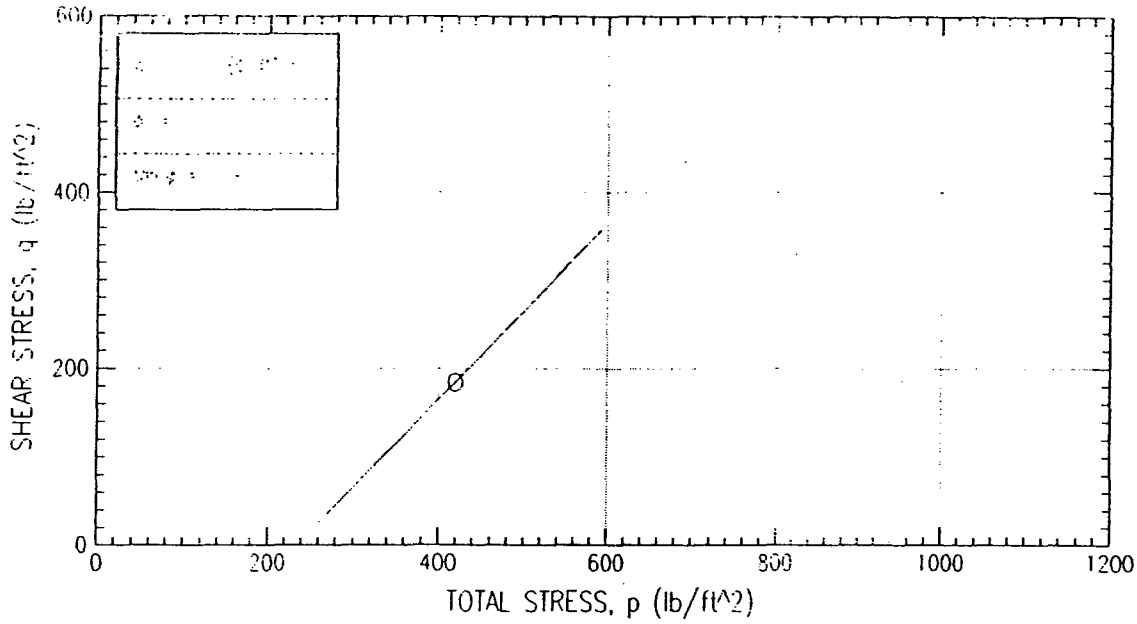
1) Sample Condition=Fair

PROJECT	New Bedford Harbor Superfund Site		
PROJECT NO.	GTX-2409		
BORING NO.	FA-23	SAMPLE NO.	UO-3
TECH.	FY	DEPTH/ELEV	9-11 feet
LABORATORY		DATE	12/29/99

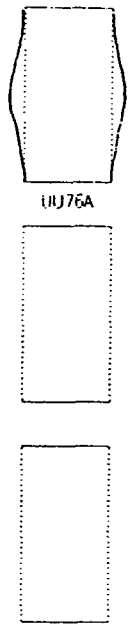
TRIAXIAL COMPRESSION TEST REPORT

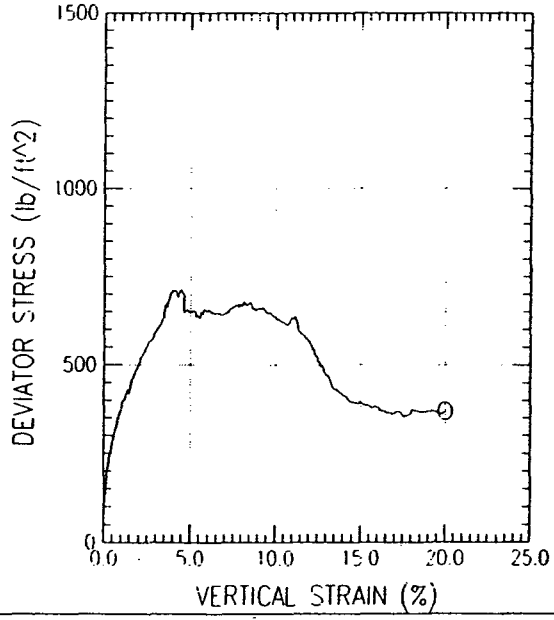
Thu 01-06-30, 14:36:56

UU Triaxial Test by ASTM D2850/T297



FAILURE SKETCHES





SYMBOL					
TEST NO.		UU76A			
INITIAL	WATER CONTENT (%)	91.35			
	DRY DENSITY (lb/ft^3)	45.30			
	SATURATION (%)	90.71			
	VOID RATIO	2.719			
BEFORE SHEAR	WATER CONTENT (%)	91.35			
	DRY DENSITY (lb/ft^3)	45.30			
	SATURATION (%)	90.71			
	VOID RATIO	2.719			
	BACK PRESS. (lb/ft^2)	0.00			
MINOR PRIN. STRESS (lb/ft^2)		234.72			
MAX. DEV. STRESS (lb/ft^2)		715.51			
TIME TO FAILURE (min)		5.06			
RATE OF STRAIN INCR (%/min)		1.00			
INITIAL DIAMETER (in)		2.81			
INITIAL HEIGHT (in)		6.25			
B-VALUE		0.00			

STRAIN CONTROLLED

DESCRIPTION OF SPECIMENS:

1) Moist,dark gray organic silt/shells w/small gravel

LL	PL	PI	GS 2.70	TYPE OF SPECIMEN Tube	TYPE OF TEST UU (Q)

REMARKS

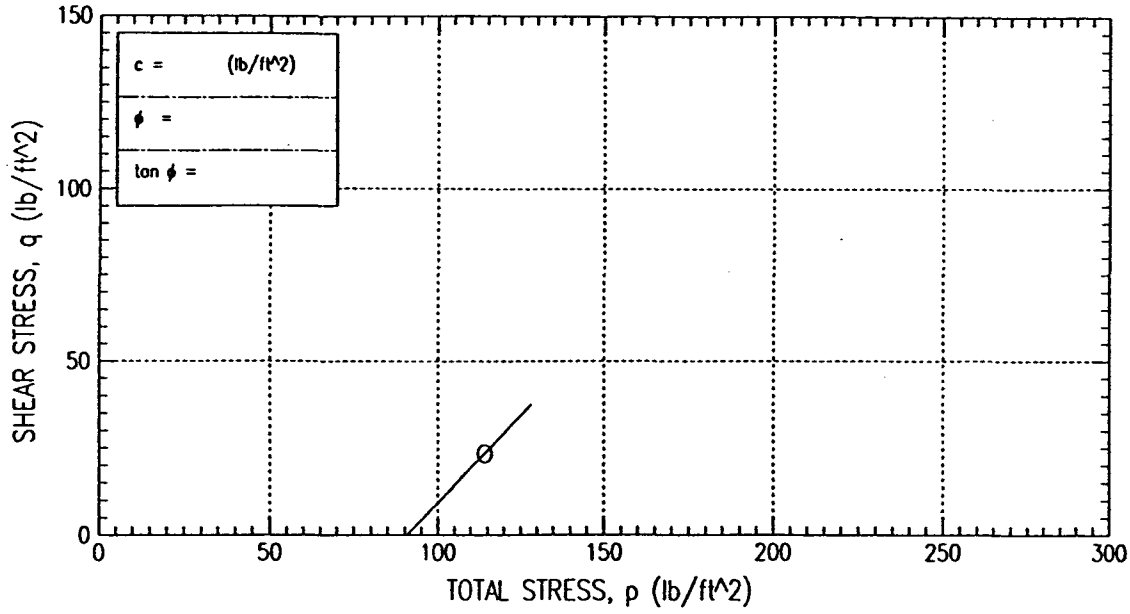
1) Sample Condition-Soft

PROJECT New Bedford Harbor Super					
PROJECT NO.GTX-2409					
BORING NO. FA-23	SAMPLE NO	UO-3			
TECH. FY	DEPTH/ELEV	9-11 feet			
LABORATORY	DATE	05/10/00			

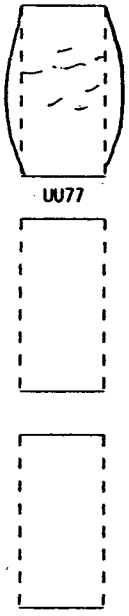
TRIAXIAL COMPRESSION TEST REPORT

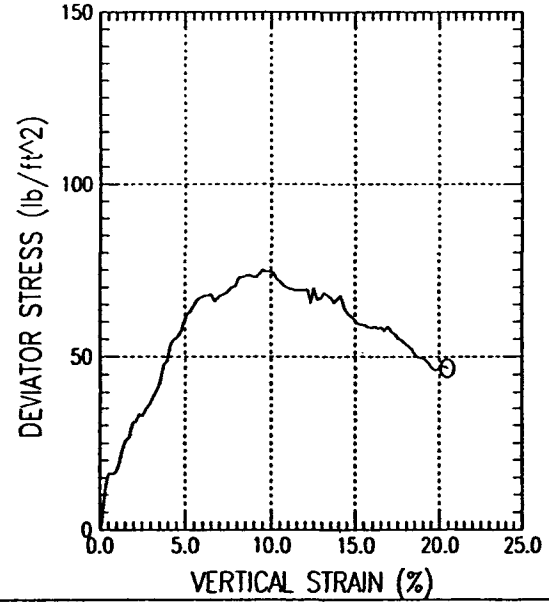
Fri 06-02-0, 10:04:57

UU Triaxial Test by ASTM D2850/T297



FAILURE SKETCHES





SYMBOL		O			
TEST NO.		UU77			
INITIAL	WATER CONTENT (%)	110.82			
	DRY DENSITY (lb/ft^3)	41.52			
	SATURATION (%)	99.51			
	VOID RATIO	2.862			
BEFORE SHEAR	WATER CONTENT (%)	110.82			
	DRY DENSITY (lb/ft^3)	41.52			
	SATURATION (%)	99.51			
	VOID RATIO	2.862			
	BACK PRESS. (lb/ft^2)	0.00			
MINOR PRIN. STRESS (lb/ft^2)		90.72			
MAX. DEV. STRESS (lb/ft^2)		75.12			
TIME TO FAILURE (min)		10.07			
RATE OF STRAIN INCR (%/min)		1.00			
INITIAL DIAMETER (in)		2.89			
INITIAL HEIGHT (in)		6.11			
B-VALUE		0.00			

STRAIN CONTROLLED

DESCRIPTION OF SPECIMENS:

1) Moist, very dark gray organic clay

LL 119.00	PL 38.40	PI 80.60	GS 2.57	TYPE OF SPECIMEN Tube	TYPE OF TEST UU (Q)

REMARKS:

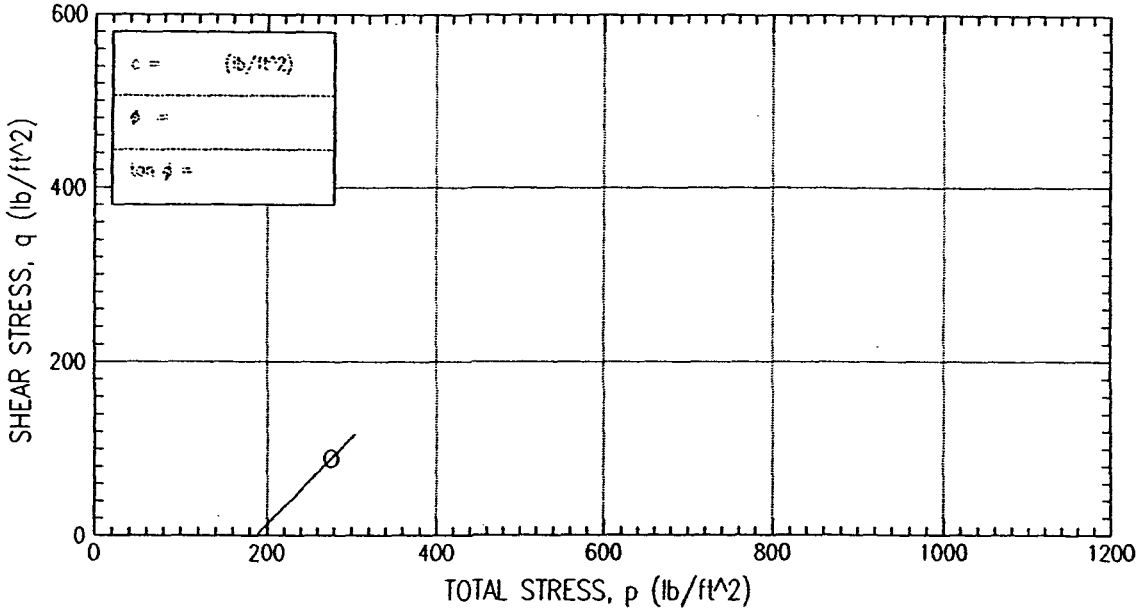
1) Sample Condition=Soft

PROJECT	New Bedford Harbor Superfund Site		
PROJECT NO.	GTX-2409		
BORING NO.	FA-25	SAMPLE NO.	UO-1
TECH.	FY	DEPTH/ELEV	0-2 feet
LABORATORY		DATE	12/29/99

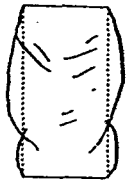
TRIAXIAL COMPRESSION TEST REPORT

Thu 01-06-00, 14:41:43

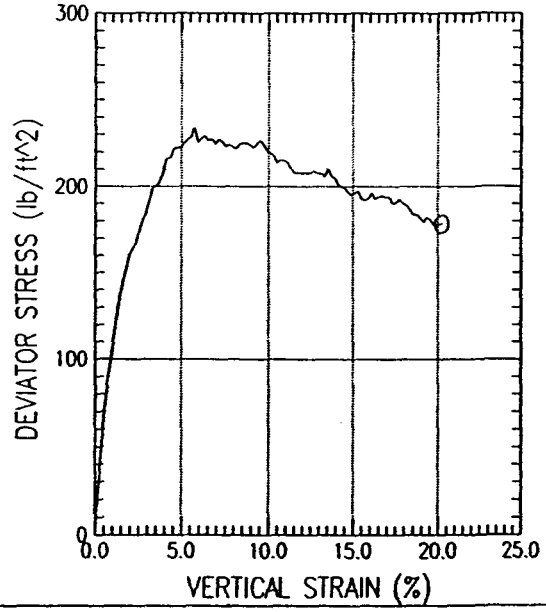
UU Triaxial Test by ASTM D2850/T297



FAILURE SKETCHES



UU78



SYMBOL		O				
TEST NO.		UU78				
INITIAL	WATER CONTENT (%)	77.21				
	DRY DENSITY (lb/ft^3)	53.72				
	SATURATION (%)	100.35				
	VOID RATIO	1.962				
BEFORE SHEAR	WATER CONTENT (%)	77.21				
	DRY DENSITY (lb/ft^3)	53.72				
	SATURATION (%)	100.35				
	VOID RATIO	1.962				
	BACK PRESS. (lb/ft^2)	0.00				
MINOR PRIN. STRESS (lb/ft^2)		187.20				
MAX. DEV. STRESS (lb/ft^2)		234.10				
TIME TO FAILURE (min)		6.14				
RATE OF STRAIN INCR (%/min)		1.00				
INITIAL DIAMETER (in)		2.89				
INITIAL HEIGHT (in)		6.18				
B-VALUE		0.00				

STRAIN CONTROLLED

DESCRIPTION OF SPECIMENS:

1) Moist, dark gray clay with trace shells

LL 38.20	PL 23.60	PI 14.60	GS 2.55	TYPE OF SPECIMEN Tube	TYPE OF TEST UU (Q)

REMARKS:

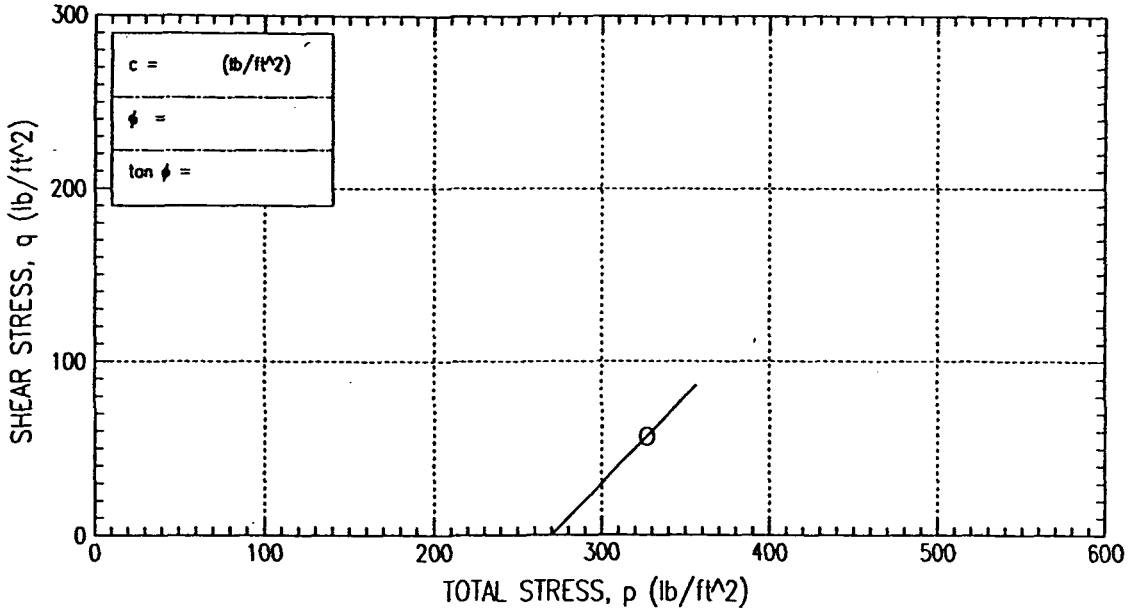
1) Sample Condition=Soft

PROJECT	New Bedford Harbor Superfund Site				
PROJECT NO.	GTX-2409				
BORING NO.	FA-25	SAMPLE NO.	U0-2		
TECH.	FY	DEPTH/ELEV	2-4 feet		
LABORATORY		DATE	12/29/99		

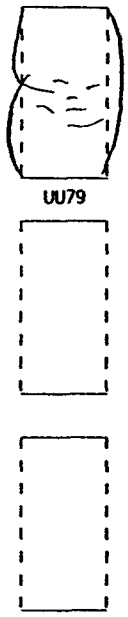
TRIAXIAL COMPRESSION TEST REPORT

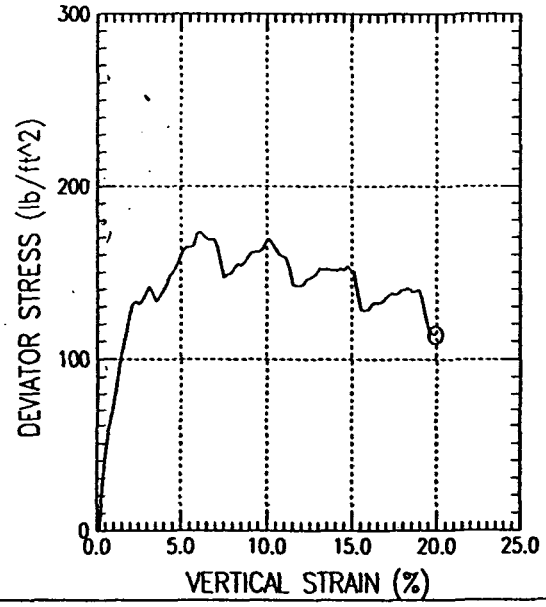
Tue 01-11-30, 16:02:47

UU Triaxial Test by ASTM-D2850/T297



FAILURE SKETCHES





SYMBOL		O			
TEST NO.		UU79			
INITIAL	WATER CONTENT (%)	103.33			
	DRY DENSITY (lb/ft^3)	41.63			
	SATURATION (%)	92.37			
	VOID RATIO	2.942			
BEFORE SHEAR	WATER CONTENT (%)	103.33			
	DRY DENSITY (lb/ft^3)	41.63			
	SATURATION (%)	92.37			
	VOID RATIO	2.942			
	BACK PRESS. (lb/ft^2)	0.00			
MINOR PRIN. STRESS (lb/ft^2)		270.00			
MAX. DEV. STRESS (lb/ft^2)		173.06			
TIME TO FAILURE (min)		6.65			
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, very dark gray organic clay with shells

LL 105.80	PL 35.70	PI 70.10	GS 2.63

TYPE OF SPECIMEN Tube

TYPE OF TEST UU (Q)

REMARKS:

1) Sample Condition=Soft

PROJECT New Bedford Harbor Superfund Site

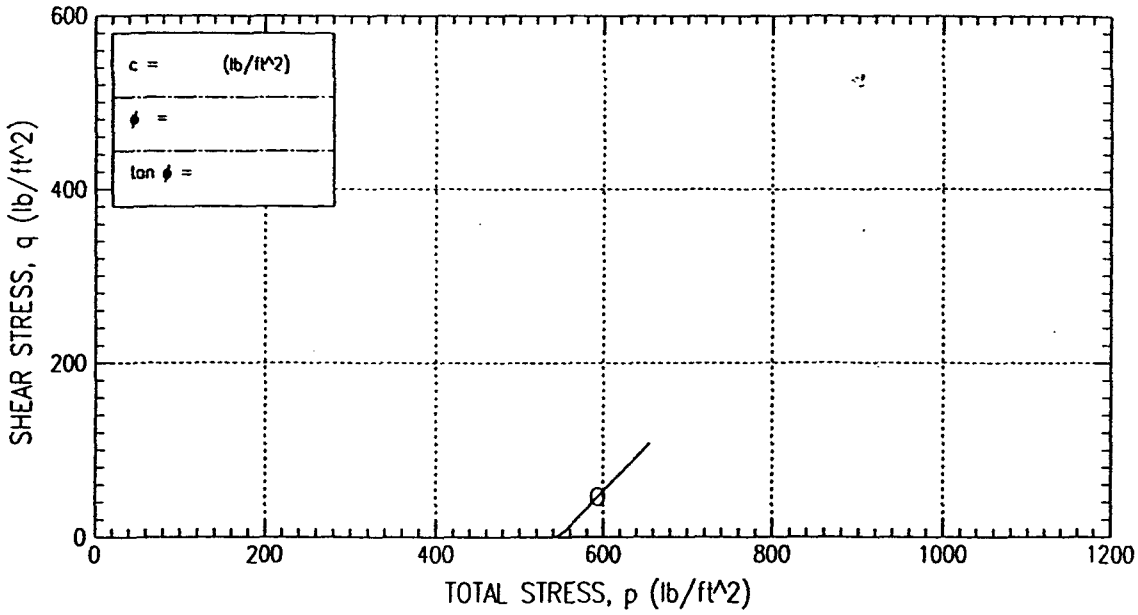
PROJECT NO.GTX-2409

BORING NO. FA-27	SAMPLE NO.	UO-1	
TECH. FY	DEPTH/ELEV	3-5 feet	
LABORATORY	DATE	12/29/99	

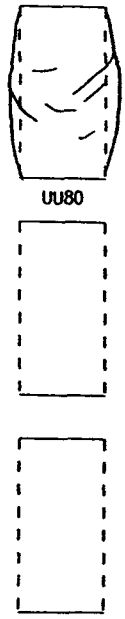
TRIAXIAL COMPRESSION TEST REPORT

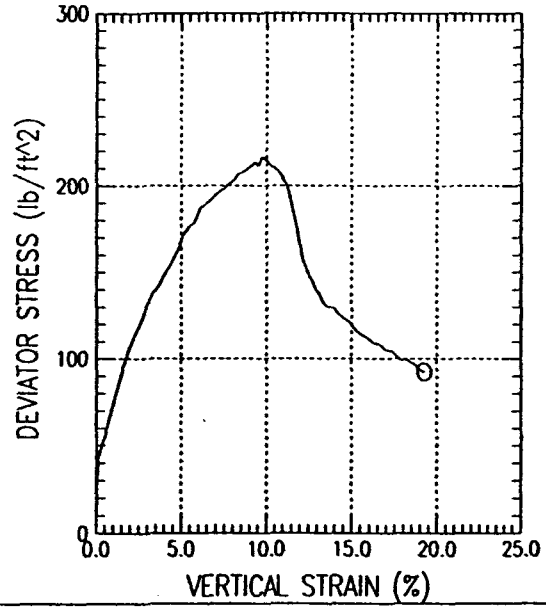
Thu 01-06-30, 14:51:57

UU Triaxial Test by ASTM D2850/T297



FAILURE SKETCHES





SYMBOL		O			
TEST NO.		UU80			
INITIAL	WATER CONTENT (%)	39.18			
	DRY DENSITY (lb/ft^3)	48.26			
	SATURATION (%)	43.13			
	VOID RATIO	2.362			
BEFORE SHEAR	WATER CONTENT (%)	39.18			
	DRY DENSITY (lb/ft^3)	48.26			
	SATURATION (%)	43.13			
	VOID RATIO	2.362			
	BACK PRESS. (lb/ft^2)	0.00			
MINOR PRIN. STRESS (lb/ft^2)		547.20			
MAX. DEV. STRESS (lb/ft^2)		216.45			
TIME TO FAILURE (min)		10.07			
RATE OF STRAIN INCR (%/min)		1.00			
INITIAL DIAMETER (in)		2.90			
INITIAL HEIGHT (in)		6.50			
B-VALUE		0.00			

STRAIN CONTROLLED

DESCRIPTION OF SPECIMENS:

1) Moist, black organic silty clay with peat

LL	PL	PI	GS 2.60	TYPE OF SPECIMEN Tube	TYPE OF TEST UU (Q)

REMARKS:

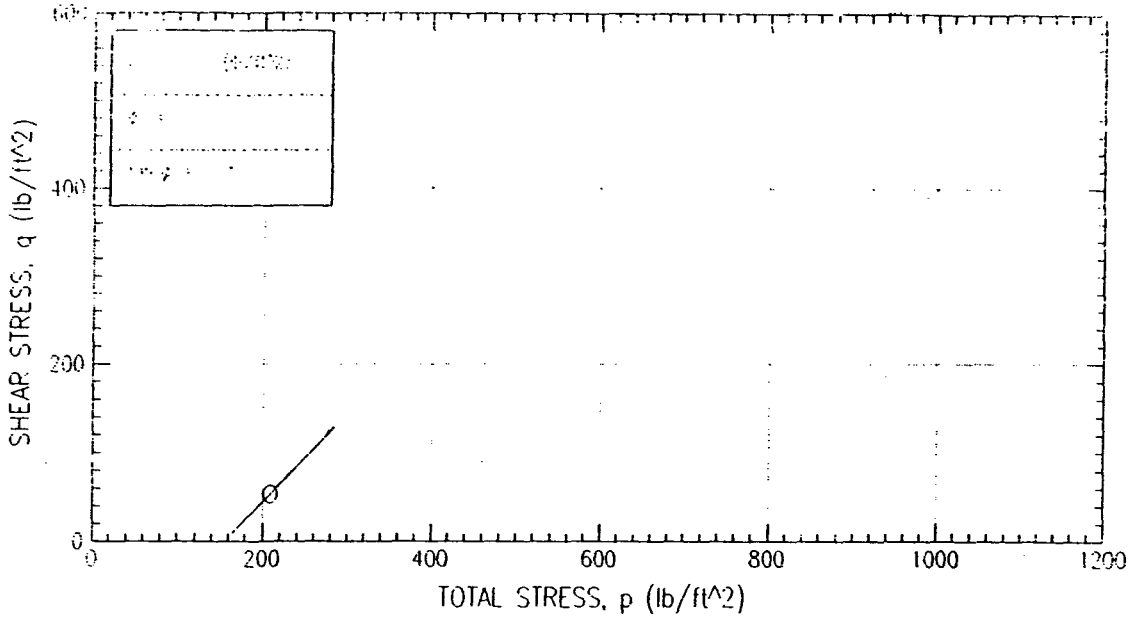
1) Sample Condition=Fair

PROJECT	New Bedford Harbor Superfund Site				
PROJECT NO.	GTX-2409				
BORING NO.	FA-27	SAMPLE NO.	UO-2		
TECH.	FY	DEPTH/ELEV	6-8 feet		
LABORATORY		DATE	12/29/99		

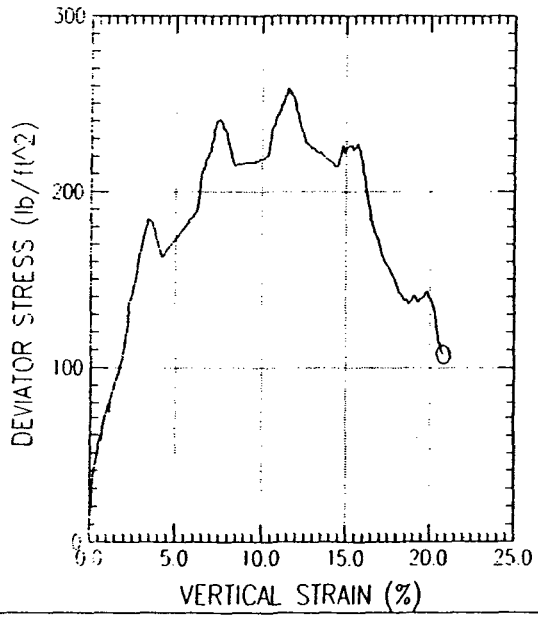
TRIAXIAL COMPRESSION TEST REPORT

Thu 01-06-:0, 14:57:29

UU Triaxial Test by ASTM D2850/T297



FAILURE SKETCHES



SYMBOL		O			
TEST NO.		UU80A			
INITIAL	WATER CONTENT (%)	41.18			
	DRY DENSITY (lb/ft^3)	45.47			
	SATURATION (%)	41.09			
	VOID RATIO	2.706			
BEFORE SHEAR	WATER CONTENT (%)	41.18			
	DRY DENSITY (lb/ft^3)	45.47			
	SATURATION (%)	41.09			
	VOID RATIO	2.706			
	BACK PRESS. (lb/ft^2)	0.00			
MINOR PRIN. STRESS (lb/ft^2)		155.52			
MAX. DEV. STRESS (lb/ft^2)		259.32			
TIME TO FAILURE (min)		12.01			
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 brown peat

LL	PL	PI	GS 2.70	TYPE OF SPECIMEN Tube	TYPE OF TEST UU (O)

REMARKS

1) Sample Condition=Soft

PROJECT New Bedford Harbor Superfund Site

PROJECT NO GTX-2409

BORING NO. FA-27	SAMPLE NO.	UO-2			
TECH. LY	DEPTH/ELEV	6-8 feet			
LABORATORY	DATE	05/11/00			

TRIAXIAL COMPRESSION TEST REPORT

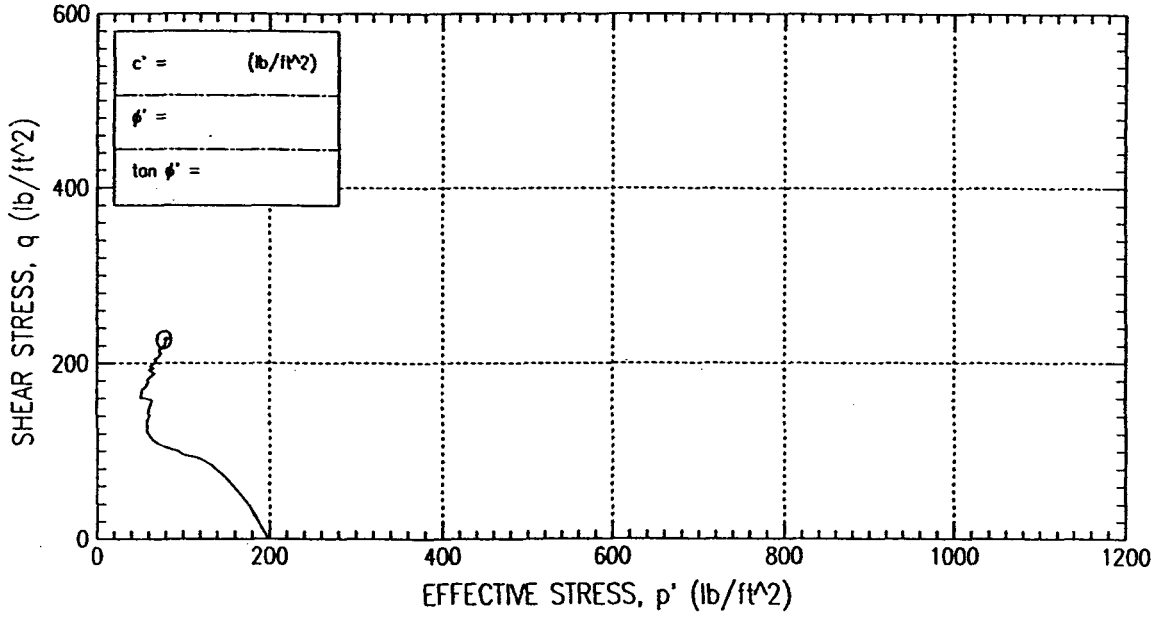
Tr 06-02-0, 10/06/96

K

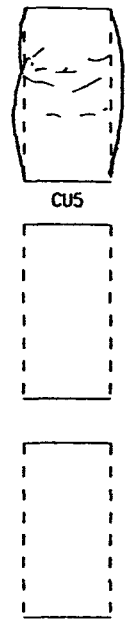
APPENDIX K

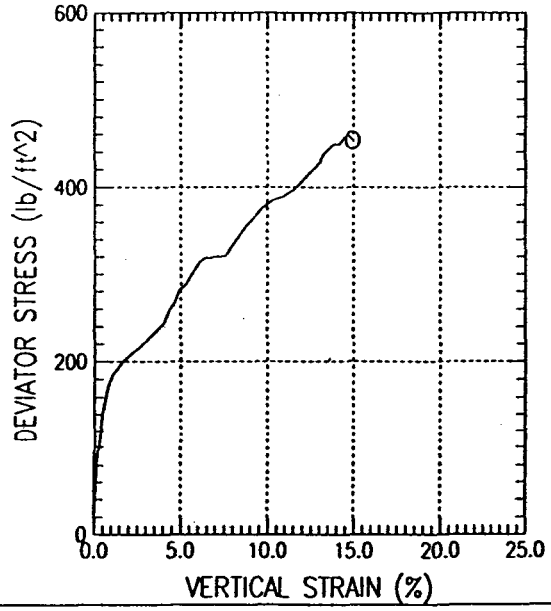
Triaxial Compression Testing – R Test Results

Consolidated Undrained Triaxial Test By ASTM D4767



FAILURE SKETCHES





SYMBOL		O			
TEST NO.		CU5			
INITIAL	WATER CONTENT (%)	106.92			
	DRY DENSITY (lb/ft^3)	37.55			
	SATURATION (%)	84.22			
	VOID RATIO	3.237			
BEFORE SHEAR	WATER CONTENT (%)	77.15			
	DRY DENSITY (lb/ft^3)	53.36			
	SATURATION (%)	99.25			
	VOID RATIO	1.982			
	BACK PRESS. (lb/ft^2)	3768.29			
MINOR PRIN. STRESS (lb/ft^2)		197.71			
MAX. DEV. STRESS (lb/ft^2)		458.56			
TIME TO FAILURE (min)		3524.55			
RATE OF STRAIN INCR (%/min)		0.02			
INITIAL DIAMETER (in)		2.87			
INITIAL HEIGHT (in)		6.29			
B-VALUE		0.95			

STRAIN CONTROLLED

DESCRIPTION OF SPECIMENS:

1) Moist, gray silty clay with organics and shells

LL	PL	PI	GS 2.55	TYPE OF SPECIMEN Tube	TYPE OF TEST CU (R)

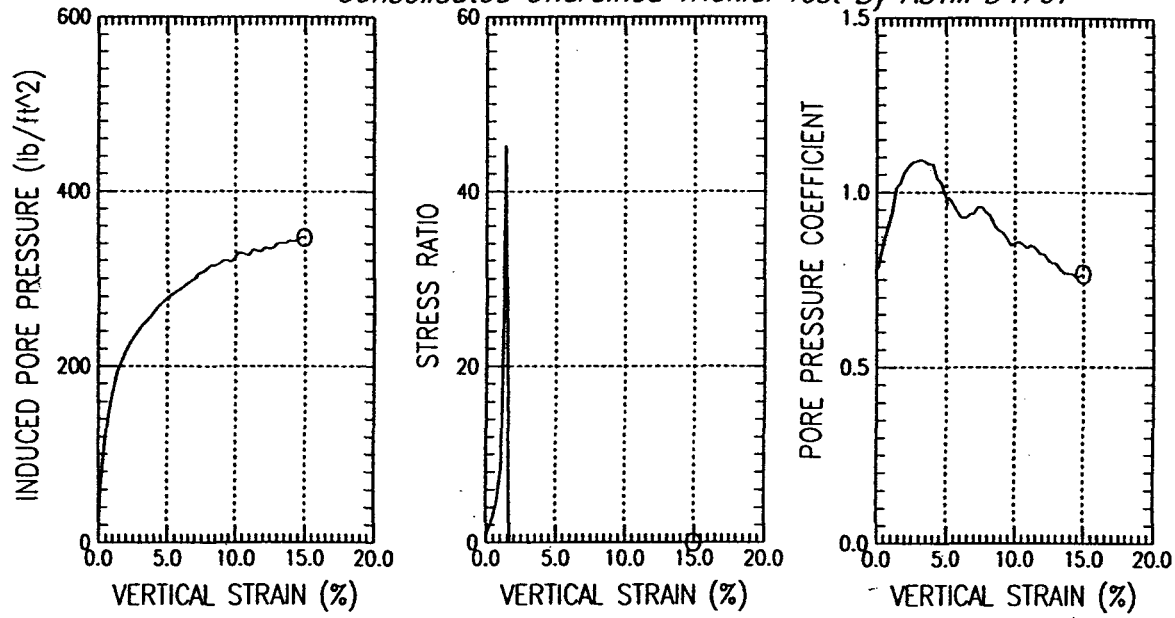
REMARKS:

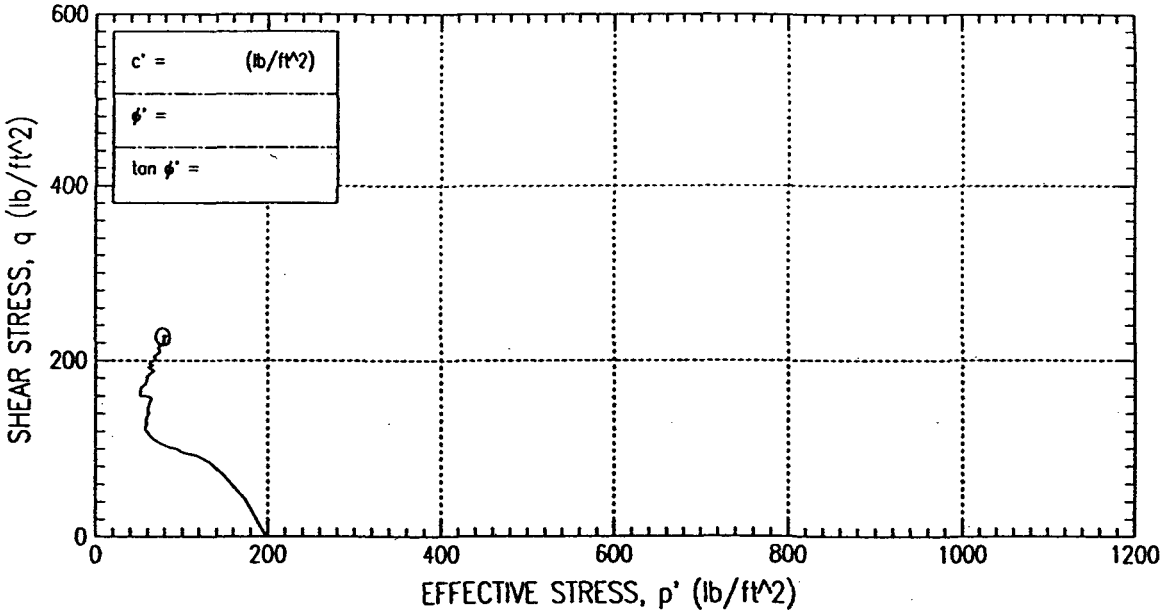
1) Sample Condition=Soft, (Use average value of GS)

PROJECT	New Bedford Harbor Superfund Site		
PROJECT NO.	GTX-2409		
BORING NO.	FA-15	SAMPLE NO.	U0-1
TECH.	FY	DEPTH/ELEV	1-3 feet
LABORATORY		DATE	12/07/99

TRIAXIAL COMPRESSION TEST REPORT

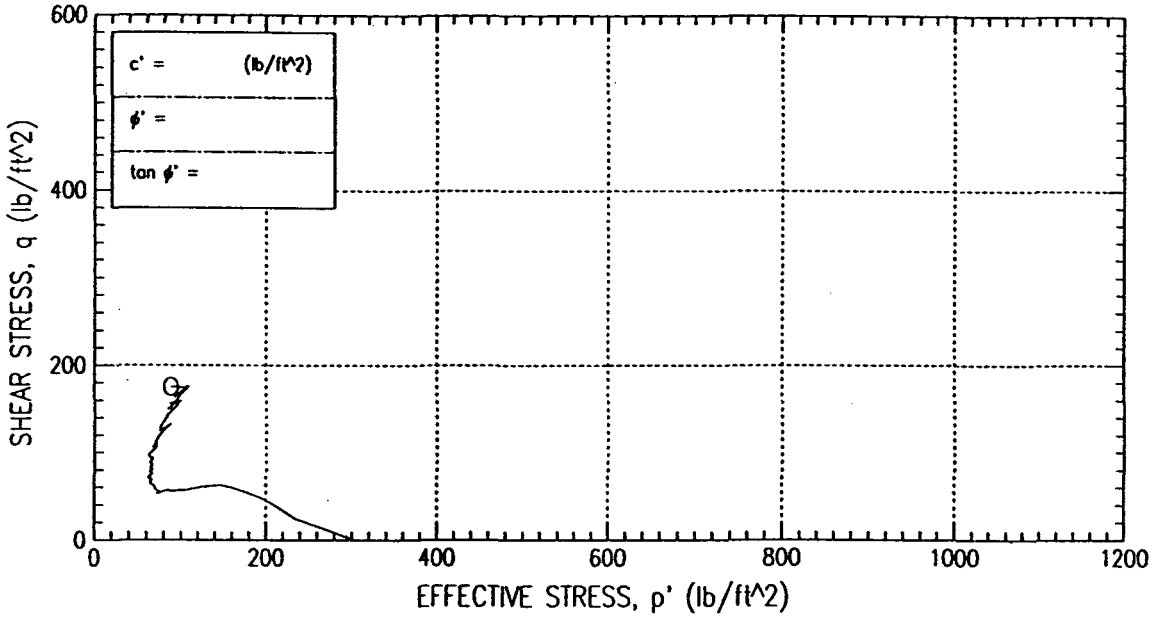
Consolidated Undrained Triaxial Test By ASTM D4767



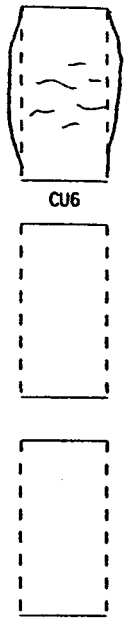


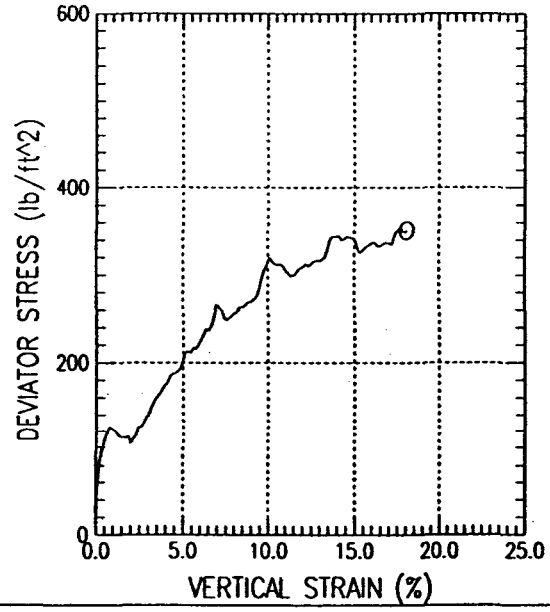
GeoTesting Express
Project Name : New Bedford Harbor Superfund Site
Project No : GTX-2409 Boring No : FA-15 Sample No : UO-1
Test Date : 12/07/99 Test No : CU5 Depth : 1-3 feet
Description : Moist, gray silty clay with organics and shells
Remarks : Sample Condition=Soft, (Use average value of GS)

Consolidated Undrained Triaxial Test By ASTM D4767



FAILURE SKETCHES





SYMBOL		O			
TEST NO.		CU6			
INITIAL	WATER CONTENT (%)	113.15			
	DRY DENSITY (lb/ft^3)	39.78			
	SATURATION (%)	96.19			
	VOID RATIO	3.000			
BEFORE SHEAR	WATER CONTENT (%)	95.13			
	DRY DENSITY (lb/ft^3)	46.33			
	SATURATION (%)	99.63			
	VOID RATIO	2.435			
	BACK PRESS. (lb/ft^2)	4178.69			
MINOR PRIN. STRESS (lb/ft^2)		289.97			
MAX. DEV. STRESS (lb/ft^2)		353.84			
TIME TO FAILURE (min)		1886.10			
RATE OF STRAIN INCR (%/min)		0.02			
INITIAL DIAMETER (in)		2.87			
INITIAL HEIGHT (in)		6.25			
B-VALUE		0.95			

STRAIN CONTROLLED

DESCRIPTION OF SPECIMENS:

1) Moist, very dark gray clay with organic & shells

LL	PL	PI	GS 2.55	TYPE OF SPECIMEN Tube	TYPE OF TEST CU (R)

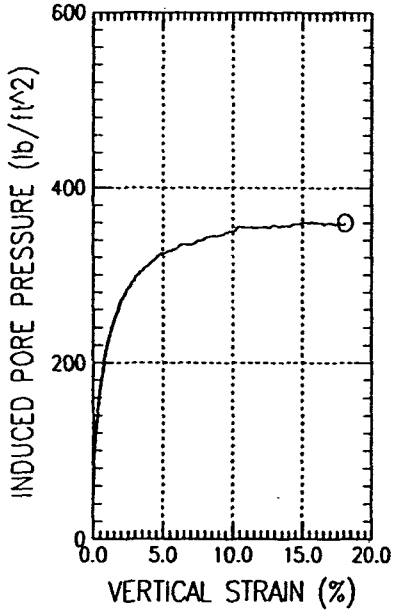
REMARKS:

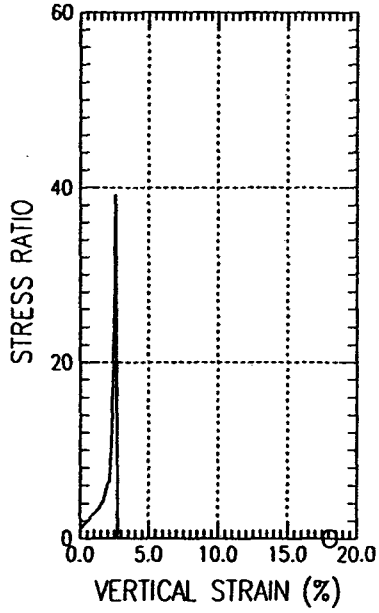
1) Sample Condition=Very Soft(use ave. value for GS)

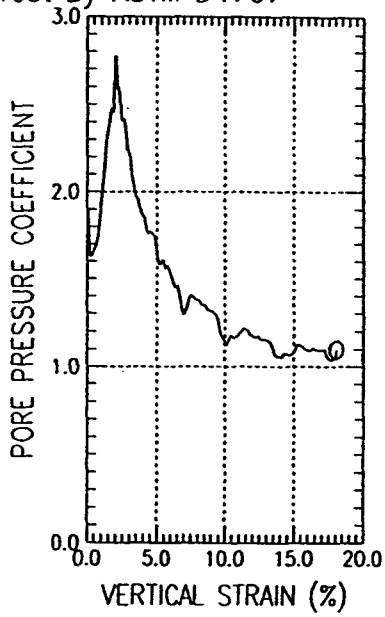
PROJECT	New Bedford Harbor Superfund Site		
PROJECT NO.	GTX-2409		
BORING NO.	FA-15	SAMPLE NO.	UO-1
TECH.	FY	DEPTH/ELEV	1-3 feet
LABORATORY		DATE	12/20/99

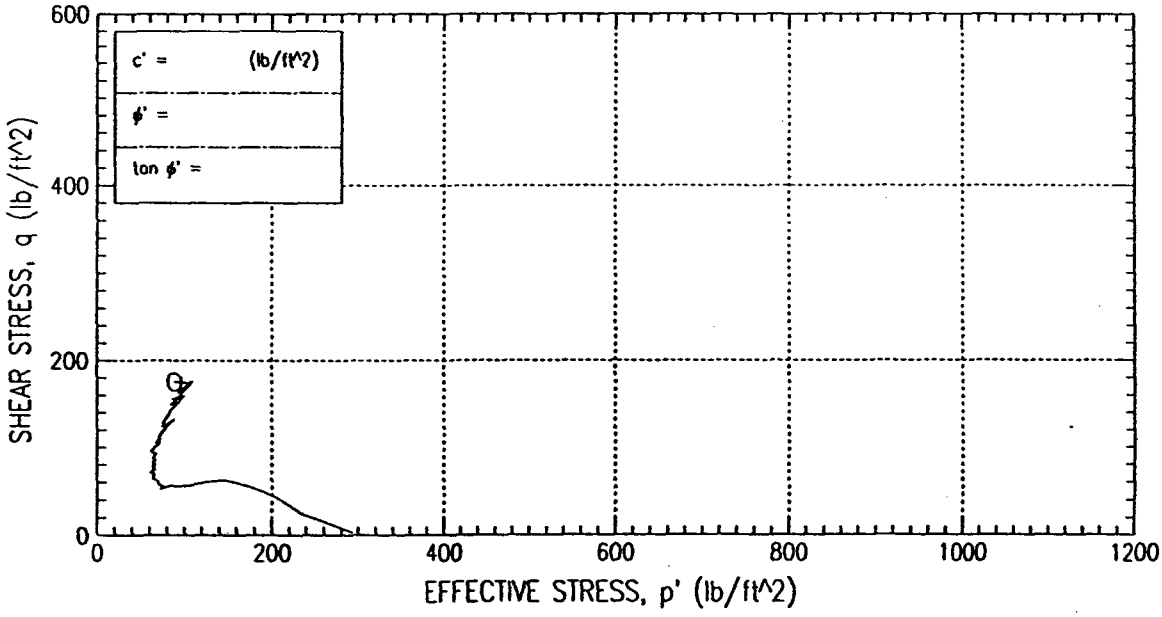
TRIAXIAL COMPRESSION TEST REPORT

Consolidated Undrained Triaxial Test By ASTM D4767



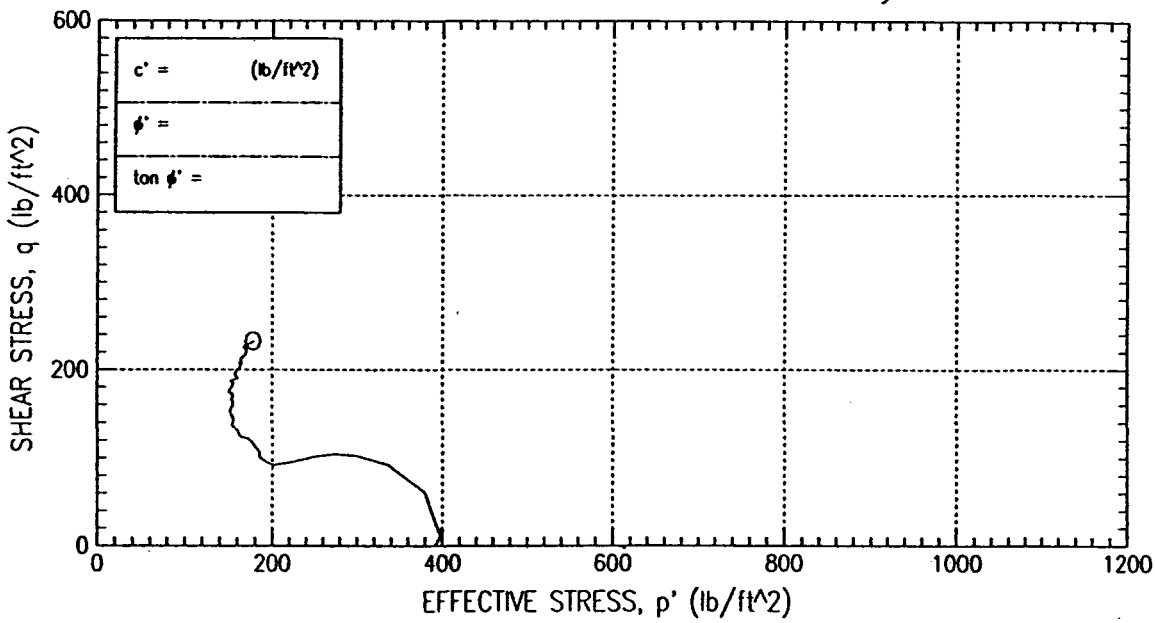




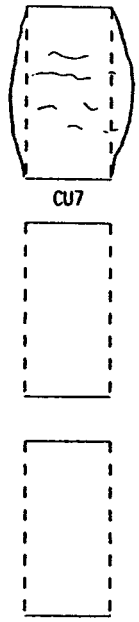


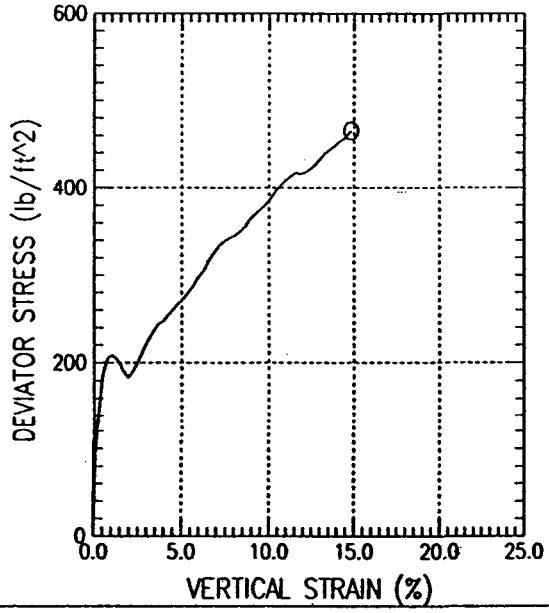
GeoTesting Express
Project Name : New Bedford Harbor Superfund Site
Project No : GTX-2409 Boring No : FA-15 Sample No : UO-1
Test Date : 12/20/99 Test No : CU6 Depth : 1-3 feet
Description : Moist, very dark gray clay with organic & shells
Remarks : Sample Condition=Very Soft(use ave. value for GS)

Consolidated Undrained Triaxial Test By ASTM D4767



FAILURE SKETCHES





SYMBOL		O			
TEST NO.		CU7			
INITIAL	WATER CONTENT (%)	99.55			
	DRY DENSITY (lb/ft^3)	44.24			
	SATURATION (%)	98.07			
	VOID RATIO	2.568			
BEFORE SHEAR	WATER CONTENT (%)	69.26			
	DRY DENSITY (lb/ft^3)	57.19			
	SATURATION (%)	99.53			
	VOID RATIO	1.761			
	BACK PRESS. (lb/ft^2)	2332.75			
MINOR PRIN. STRESS (lb/ft^2)		391.25			
MAX. DEV. STRESS (lb/ft^2)		465.47			
TIME TO FAILURE (min)		6871.63			
RATE OF STRAIN INCR (%/min)		0.02			
INITIAL DIAMETER (in)		2.90			
INITIAL HEIGHT (in)		6.01			
B-VALUE		0.95			

STRAIN CONTROLLED

DESCRIPTION OF SPECIMENS:

1) Moist, dark gray organic clay

LL 138.70	PL 45.50	PI 93.20	GS 2.53

TYPE OF SPECIMEN Tube

TYPE OF TEST CU (R)

REMARKS:

1) Sample Condition=Soft

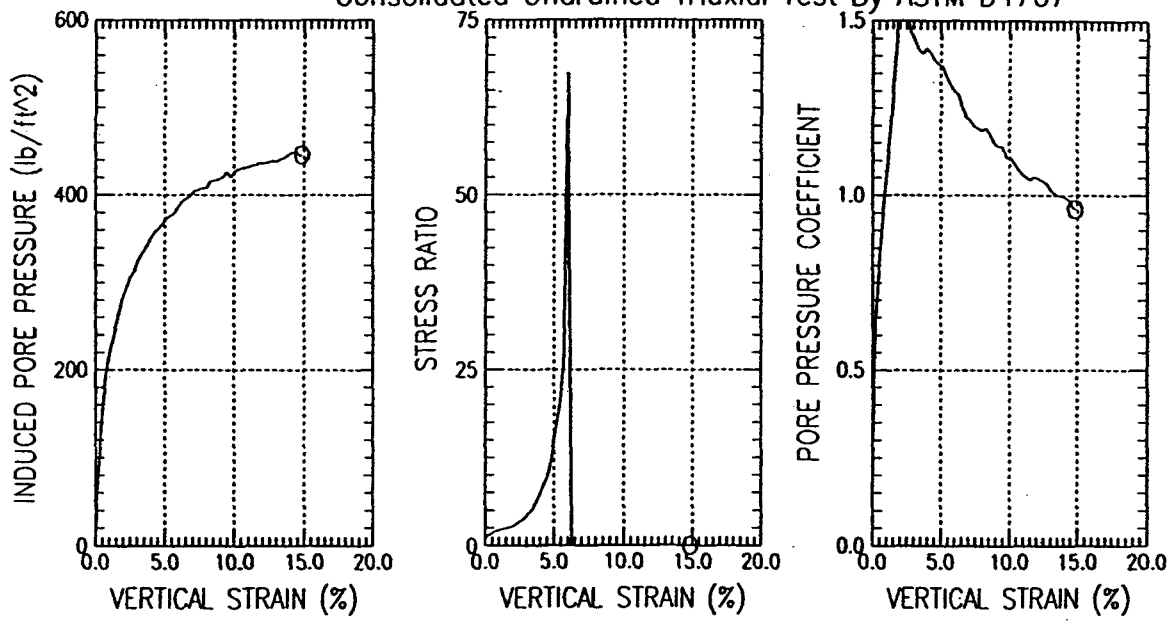
PROJECT New Bedford Harbor Superfund Site

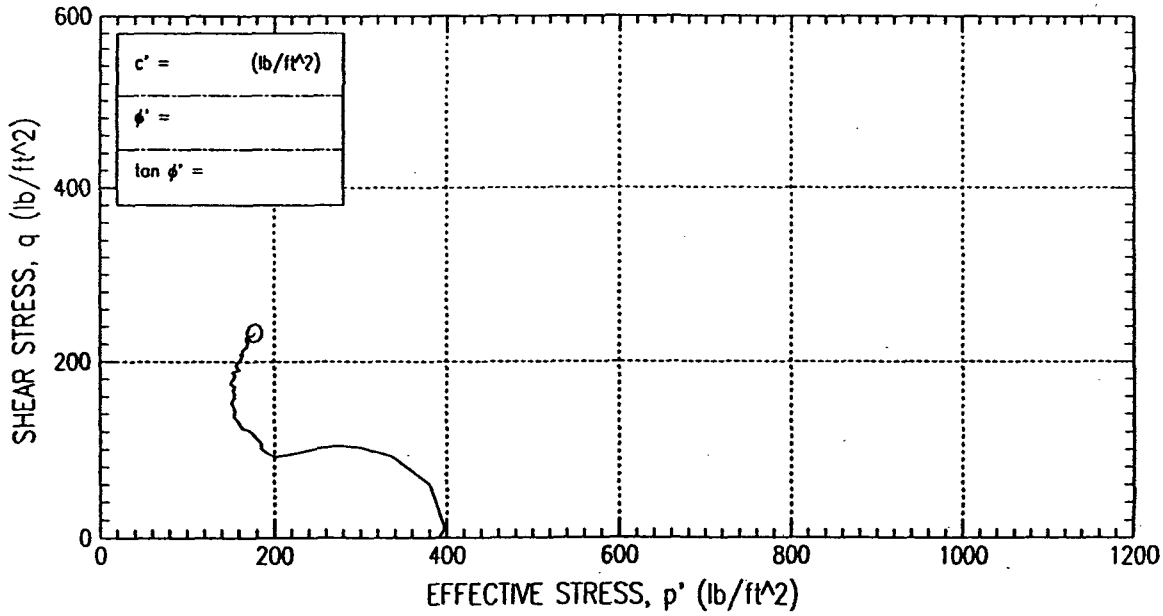
PROJECT NO.GTX-2409

BORING NO. FA-15	SAMPLE NO.	UO-2	
TECH. FY	DEPTH/ELEV	4-6 feet	
LABORATORY	DATE	12/10/99	

TRIAXIAL COMPRESSION TEST REPORT

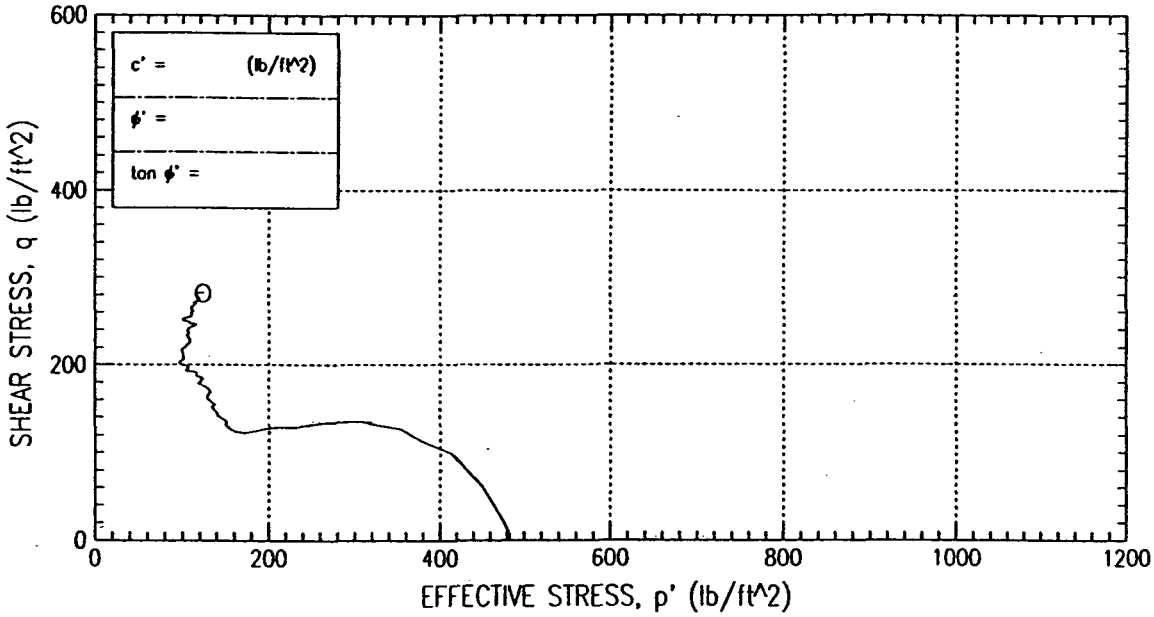
Consolidated Undrained Triaxial Test By ASTM D4767



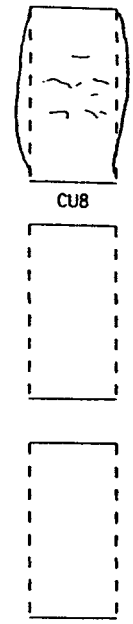


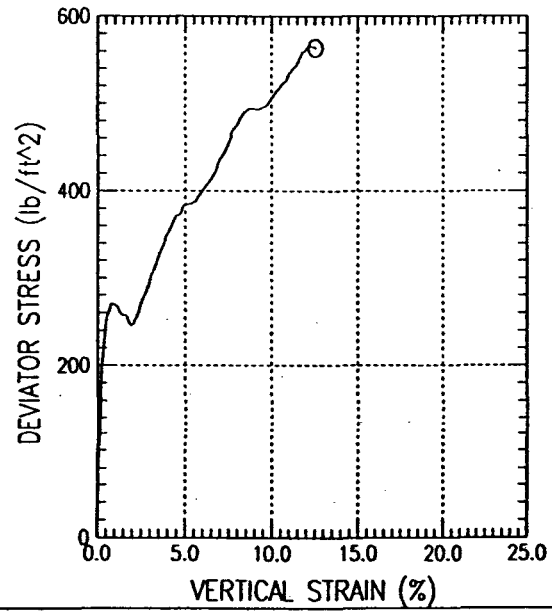
GeoTesting Express
Project Name : New Bedford Harbor Superfund Site
Project No : GTX-2409 Boring No : FA-15 Sample No : UO-2
Test Date : 12/10/99 Test No : CU7 Depth : 4-6 feet
Description : Moist, dark gray organic clay
Remarks : Sample Condition=Soft

Consolidated Undrained Triaxial Test By ASTM D4767



FAILURE SKETCHES





SYMBOL		O			
TEST NO.		CU8			
INITIAL	WATER CONTENT (%)	97.90			
	DRY DENSITY (lb/ft^3)	44.15			
	SATURATION (%)	95.30			
	VOID RATIO	2.661			
BEFORE SHEAR	WATER CONTENT (%)	77.64			
	DRY DENSITY (lb/ft^3)	53.57			
	SATURATION (%)	99.70			
	VOID RATIO	2.017			
	BACK PRESS. (lb/ft^2)	4185.37			
MINOR PRIN. STRESS (lb/ft^2)		482.03			
MAX. DEV. STRESS (lb/ft^2)		565.95			
TIME TO FAILURE (min)		2219.82			
RATE OF STRAIN INCR (%/min)		0.02			
INITIAL DIAMETER (in)		2.93			
INITIAL HEIGHT (in)		6.15			
B-VALUE		0.95			

STRAIN CONTROLLED

DESCRIPTION OF SPECIMENS:

1) Moist, dark gray organic clay

LL 138.70	PL 45.40	PI 93.30	GS 2.59

TYPE OF SPECIMEN Tube

TYPE OF TEST CU (R)

REMARKS:

1) Sample Condition=Soft

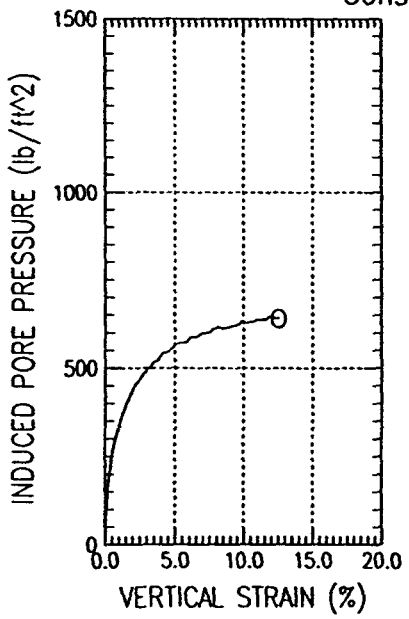
PROJECT New Bedford Harbor Superfund Site

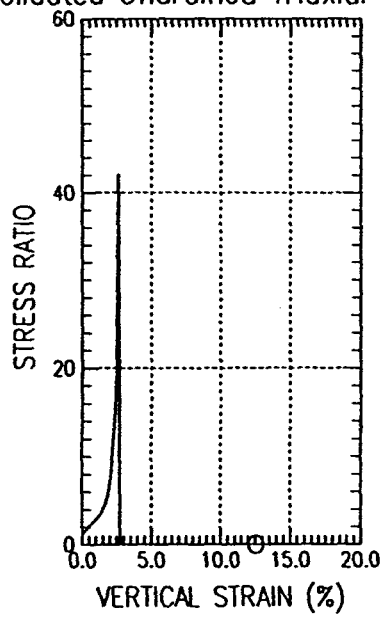
PROJECT NO.GTX-2409

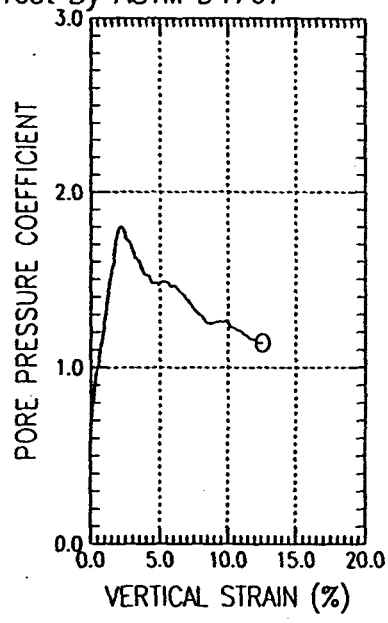
BORING NO. FA-15	SAMPLE NO.	UO-2	
TECH. FY	DEPTH/ELEV	4-6 feet	
LABORATORY	DATE	12/15/99	

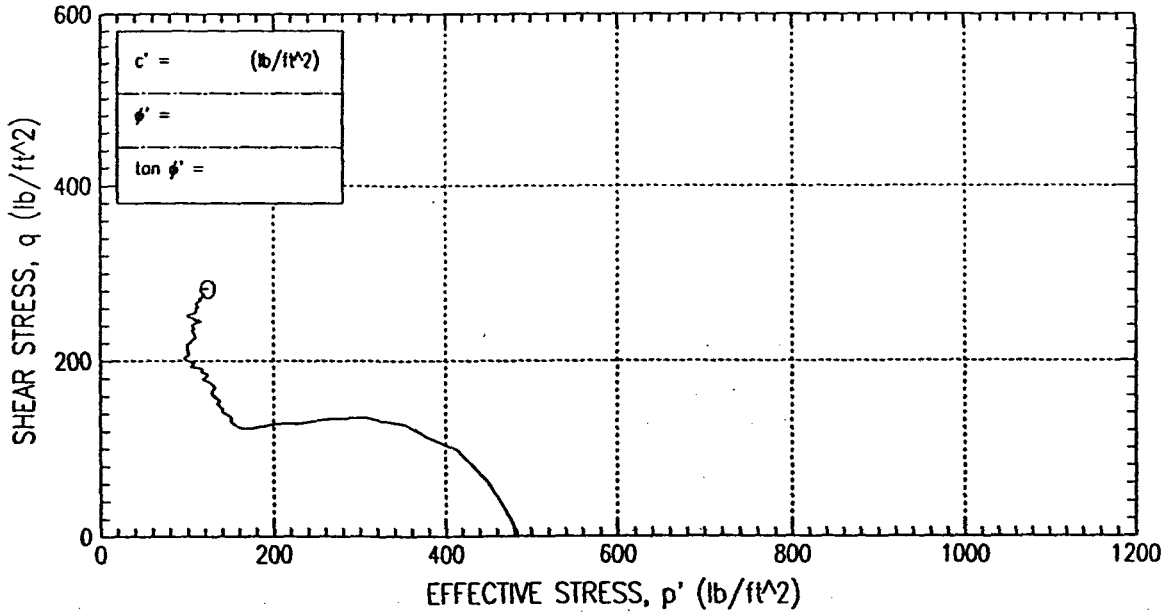
TRIAXIAL COMPRESSION TEST REPORT

Consolidated Undrained Triaxial Test By ASTM D4767



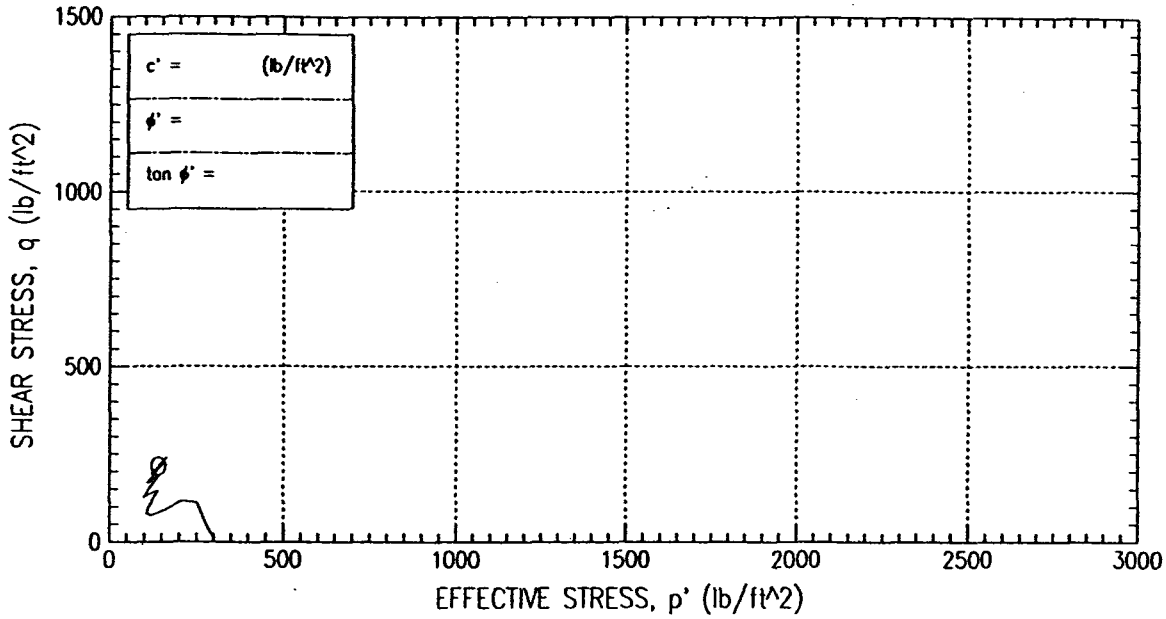




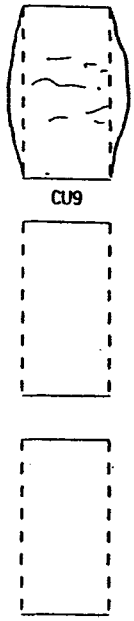


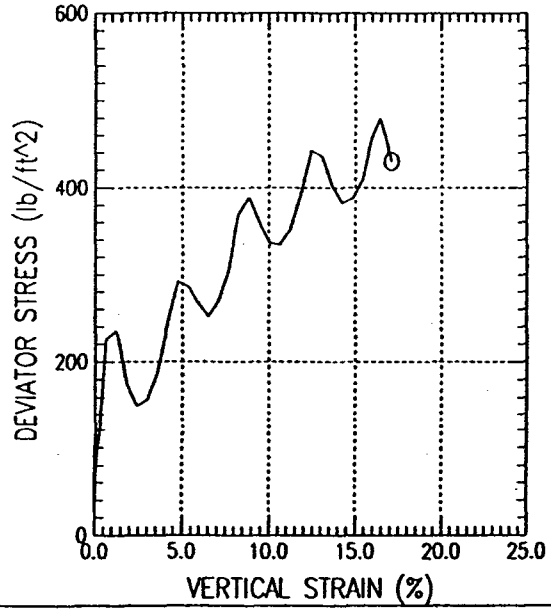
GeoTesting Express
Project Name : New Bedford Harbor Superfund Site
Project No : GTX-2409 Boring No : FA-15 Sample No : UO-2
Test Date : 12/15/99 Test No : CU8 Depth : 4-6 feet
Description : Moist, dark gray organic clay
Remarks : Sample Condition=Soft

Consolidated Undrained Triaxial Test By ASTM D4767



FAILURE SKETCHES





SYMBOL		O			
TEST NO.		CU9			
INITIAL	WATER CONTENT (%)	81.66			
	DRY DENSITY (lb/ft^3)	46.43			
	SATURATION (%)	87.26			
	VOID RATIO	2.293			
BEFORE SHEAR	WATER CONTENT (%)	86.87			
	DRY DENSITY (lb/ft^3)	48.86			
	SATURATION (%)	99.98			
	VOID RATIO	2.129			
	BACK PRESS. (lb/ft^2)	3560.00			
MINOR PRIN. STRESS (lb/ft^2)		291.50			
MAX. DEV. STRESS (lb/ft^2)		479.52			
TIME TO FAILURE (min)		3130.63			
RATE OF STRAIN INCR (%/min)		0.02			
INITIAL DIAMETER (in)		2.87			
INITIAL HEIGHT (in)		6.20			
B-VALUE		0.95			

STRAIN CONTROLLED

DESCRIPTION OF SPECIMENS:

1) Moist, very dark gray organic clay

LL 106.40	PL 43.30	PI 63.10	GS 2.45

TYPE OF SPECIMEN Tube

TYPE OF TEST CU (R)

REMARKS:

1) Sample Condition=Very Soft

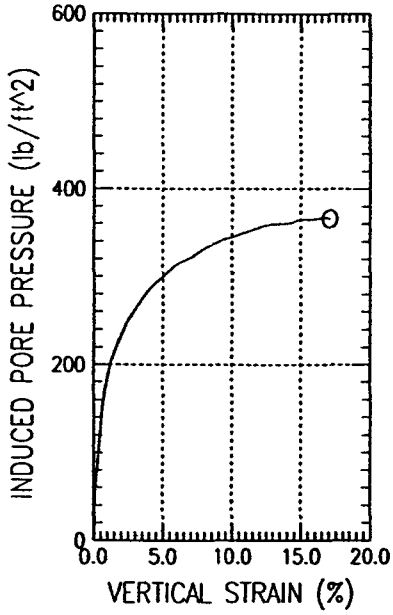
PROJECT New Bedford Harbor Superfund Site

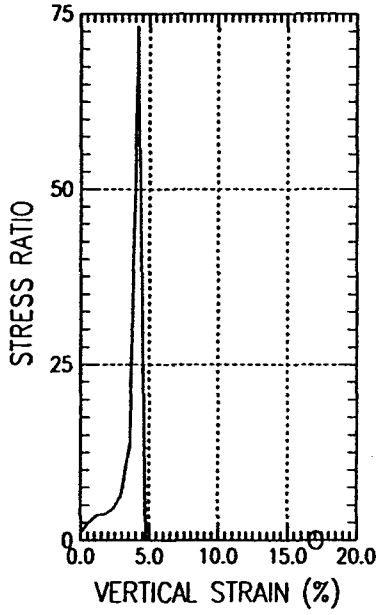
PROJECT NO.GTX-2409

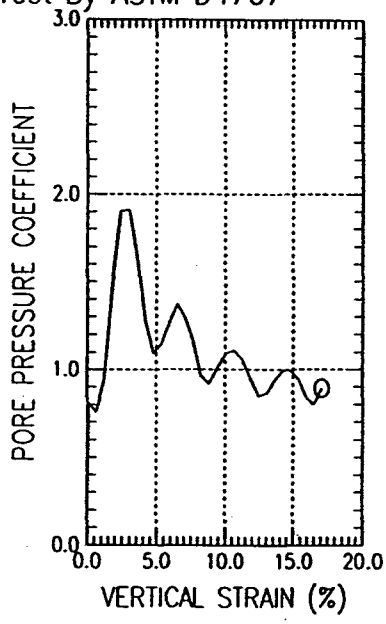
BORING NO. FA-18	SAMPLE NO.	U0-1	
TECH. FY	DEPTH/ELEV	0-2 feet	
LABORATORY	DATE	12/22/99	

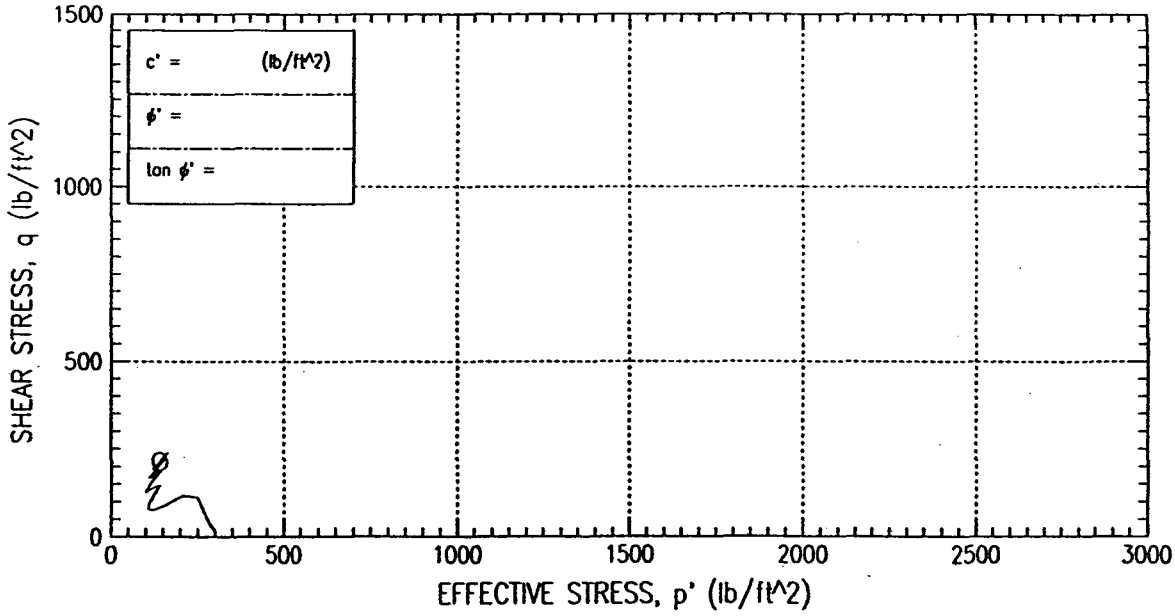
TRIAXIAL COMPRESSION TEST REPORT

Consolidated Undrained Triaxial Test By ASTM D4767









GeoTesting Express
Project Name : New Bedford Harbor Superfund Site
Project No : GTX-2409 Boring No : FA-18 Sample No : UO-1
Test Date : 12/22/99 Test No : CU9 Depth : 0-2 feet
Description : Moist, very dark gray organic clay
Remarks : Sample Condition=Very 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:**	12/29/99
Project Name:	New Bedford Harbor Superfund Site	**End Date:**	1/10/00
Project Location:	New Bedford, MA	**Tested By:**	SWJ
GTX #:	2409	**Checked By:**	GTT
Boring #:	FA-9	**Sample Type:**	Undisturbed
Sample #:	UO-1	**Orientation:**	Vertical
Depth:	2-4 ft	**Test #:**	K5
Visual Description:	Moist, brown silty sand with gravel, organics		

Sample Preparation: Extruded from Shelby tube, cut, trimmed and placed into permeameter at as received density and moisture content; trimmings moisture content = 104%

Permeant Fluid: de-aired tap water **Cell #:** —

Parameter	Initial	Final
Height, in	2.50	2.42
Diameter, in	2.85	2.73
Area, in^2	6.38	5.85
Volume, in^3	15.95	14.17
Mass, g	363	328
Bulk Density, pcf	86.5	88.0
Moisture Content, %	117	96.2
Dry Density, pcf	39.8	44.9

B COEFFICIENT DETERMINATION

Cell Pressure, psi:	27.9	**Press. Increment, psi:**	5
Sample Pressure, psi:	25.8	**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
01/10	—	29.0	27.5	26.5	11.4	9.75	15.00	—	—	—	—	—
01/10	3540	29.0	27.5	26.5	11.4	10.15	14.50	0.40	0.50	20	1.000	2.94E-07
01/10	7920	29.0	27.5	26.5	11.4	10.60	14.00	0.85	1.00	20	1.000	2.70E-07
01/10	7140	29.0	27.5	26.5	11.4	10.90	13.65	0.75	0.85	20	1.000	2.59E-07
01/10	7260	29.0	27.5	26.5	11.4	11.30	13.10	0.70	0.90	20	1.000	2.55E-07

PERMEABILITY AT 20 °C: 2.7×10^{-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:**	12/29/99
Project Name:	New Bedford Harbor Superfund Site	**End Date:**	1/4/00
Project Location:	New Bedford, MA	**Tested By:**	SWJ
GTX #:	2409	**Checked By:**	GTT
Boring #:	FA-12	**Sample Type:**	Undisturbed
Sample #:	UO-3	**Orientation:**	Vertical
Depth:	7-9 ft	**Test #:**	K6
Visual Description:	Moist, dark gray silt with organics		

Sample Preparation: Extruded from Shelby tube, cut, trimmed and placed into permeameter at as received density and moisture content; trimmings moisture content = 81.3%

Permeant Fluid: de-aired tap water **Cell #:** —

Parameter	Initial	Final
Height, in	3.49	3.43
Diameter, in	2.84	2.79
Area, in^2	6.33	6.11
Volume, in^3	22.11	20.97
Mass, g	545	527
Bulk Density, pcf	93.7	95.5
Moisture Content, %	76.8	70.9
Dry Density, pcf	53.0	55.9

B COEFFICIENT DETERMINATION

Cell Pressure, psi:	20	**Press. Increment, psi:**	5
Sample Pressure, psi:	18	**B Coefficient:**	0.96

FLOW DATA

Date	Elapsed Time, sec	Cell Pressure, psi	Inlet Pressure, psi	Outlet Pressure, psi	Gradient	Inflow V, cc	Outflow V, cc	Δ Inflow V, cc	Δ Outflow V, cc	Temp, °C	R_t	Permeability K @ 20 °C, cm/sec
01/04	—	20.0	19.0	17.0	16.1	12.10	13.00	—	—	—	—	—
01/04	2280	20.0	19.0	17.0	16.1	13.10	12.05	1.00	0.95	20	1.000	6.72E-07
01/04	2280	20.0	19.0	17.0	16.1	13.95	11.20	0.85	0.85	20	1.000	5.86E-07
01/04	—	20.0	19.0	17.0	16.1	9.40	15.25	—	—	—	—	—
01/04	1260	20.0	19.0	17.0	16.1	9.90	14.75	0.50	0.50	20	1.000	6.23E-07
01/04	1620	20.0	19.0	17.0	16.1	10.50	14.15	0.60	0.60	20	1.000	5.82E-07
01/04	2040	20.0	19.0	17.0	16.1	11.20	13.40	0.70	0.75	20	1.000	5.58E-07

PERMEABILITY AT 20 °C: 5.9 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:**	12/16/99
Project Name:	New Bedford Harbor Superfund Site	**End Date:**	1/5/00
Project Location:	New Bedford, MA	**Tested By:**	SWJ
GTX #:	2409	**Checked By:**	GTT
Boring #:	FA-15	**Sample Type:**	Undisturbed
Sample #:	UO-3	**Orientation:**	Vertical
Depth:	7-9 ft	**Test #:**	K7
Visual Description:	Moist, dark gray organic clay		

Sample Preparation: Extruded from Shelby tube, cut, trimmed and placed into permeameter at as received density and moisture content; trimmings moisture content = 90.9%

Permeant Fluid: de-aired tap water **Cell #:** ---

Parameter	Initial	Final
Height, in	3.50	3.42
Diameter, in	2.88	2.75
Area, in^2	6.51	5.94
Volume, in^3	22.80	20.31
Mass, g	538	492
Bulk Density, pcf	89.7	92.1
Moisture Content, %	97.7	80.8
Dry Density, pcf	45.4	50.9

B COEFFICIENT DETERMINATION

Cell Pressure, psi:	110.2	**Press. Increment, psi:**	5
Sample Pressure, psi:	107.9	**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
01/04	---	110.0	109.0	107.0	16.2	8.80	15.65	---	---	---	---	---
01/05	57600	110.0	109.0	107.0	16.2	11.80	11.95	3.00	3.70	20	1.000	9.38E-08
01/05	---	110.0	109.0	107.0	16.2	11.40	14.15	---	---	---	---	---
01/05	3120	110.0	109.0	107.0	16.2	11.55	13.95	0.15	0.20	20	1.000	9.04E-08
01/05	3240	110.0	109.0	107.0	16.2	11.75	13.80	0.20	0.15	20	1.000	8.71E-08
01/05	6120	110.0	109.0	107.0	16.2	11.90	13.60	0.35	0.35	20	1.000	9.22E-08

PERMEABILITY AT 20 °C: 9.1 x 10^{-8} 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 by ASTM D 5084

Saturation Verification

Client: Nobis Engineering
Project Name: New Bedford Harbor Superfund Site
Project Location: New Bedford, MA
GTX #: 2409

Sample ID	Pore Water Pressure, psi initial	Pore Water Pressure, psi final	Cell Pressure, psi initial	Cell Pressure, psi final	Δ Pressure, psi Pore Water	Δ Pressure, psi Cell	B Coefficient
FA-9, UO-1 (2-4 ft)	8.2	13.2	10.0	15.3	5.0	5.3	0.94
	14.6	19.3	16.5	21.5	4.7	5.0	0.94
	20.9	25.8	22.8	27.9	4.9	5.1	0.96
FA-12, UO-3 (7-9)	8.4	12.8	10.3	15.0	4.4	4.7	0.94
	13.2	17.9	15.3	20.2	4.7	4.9	0.96
FA-15, UO-3 (7-9)	102.8	107.9	105.1	110.2	5.1	5.1	1.00
FB-15, UO-1 (0-2)	9.0	13.7	10.9	15.9	4.7	5.0	0.94
	20.4	25.2	22.3	27.3	4.8	5.0	0.96
FB-26, UO-1 (3-5)	8.4	13.2	10.3	15.4	4.8	5.1	0.94
	14.3	19.2	16.3	21.3	4.9	5.0	0.98
FB-26, UO-2 (6-8)	8.5	13.8	10.5	15.8	5.3	5.3	1.00

B Coefficient is defined as the change in pore water pressure divided by the change in confining (cell) pressure

Hydraulic Conductivity by ASTM D 5084

Consolidation Check

Client: Nobis Engineering
Project Name: New Bedford Harbor Superfund Site
Project Location: New Bedford, MA
GTX #: 2409

Sample ID	Sample Pressure initial	Sample Pressure final	Cell Pressure, psi initial	Cell Pressure, psi final	Δ Outflow Volume, cc
FA-9, UO-1 (2-4 ft)	0.0	8.0	0.0	10.0	-24.8
	8.0	14.5	10.0	16.5	-1.3
	14.5	21.0	16.5	23.0	0.0
	21.0	26.0	23.0	28.0	1.0
FA-12, UO-3 (7-9)	0.0	8.0	0.0	10.0	-12.3
	8.0	13.0	10.0	15.0	-0.1
	13.0	18.0	15.0	20.0	-0.1
FA-15, UO-3 (7-9)			not recorded		
FB-15, UO-1 (0-2)	0.0	8.2	0.0	10.2	-33.0
	8.2	14.8	10.2	16.8	-0.3
	14.8	20.4	16.8	22.4	-0.1
	20.4	26.0	22.4	28.0	-0.5
FB-26, UO-1 (3-5)	0.0	8.0	0.0	10.0	-46.8
	8.0	14.0	10.0	16.0	0.2
	14.0	19.3	16.0	21.3	-0.2
FB-26, UO-2 (6-8)	0.0	8.0	0.0	10.0	-17.6
	8	13	10	15	-2.5