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March 24, 2022

Mr. Benjamin Rung, PE
PE1 (Environmental)
New York State Department of Environmental Conservation
Division of Environmental Remediation
625 Broadway, 12th Floor
Albany, New York 12233-7012

Subject: NYSDEC Standby Contract No. D009805, Work Assignment No. 21
NYSDEC Site No. 130195, Former Aluminum Louvre Remedial Design
Geotechnical Data Summary and Evaluation Memorandum

Dear Mr. Rung:

Camp Dresser McKee & Smith (CDM Smith) is pleased to submit this Geotechnical Data Summary and Evaluation Memorandum, prepared as part of the Remedial Design for NYSDEC Site No. 130195 Former Aluminum Louvre Site in Old Bethpage, New York.

If you have any questions or comments, please do not hesitate to contact me.

Sincerely,

Amy E. Picunas, PE, PMP
Project Manager
CDM Smith Inc.

cc: Michael Cruden, PE, NYSDEC
Renata Ockerby, NYSDOH
Chris Gurr, PE, CDM Smith
Jeff Bamer, PE, CDM Smith
Meredith Passaro, PE, CDM Smith
Meryl Cherchia, PE, CDM Smith

Memorandum

To: *Amy Picunas, PE, PMP*
Chris Gurr, PE
Jeff Bamer, PE

From: *Meredith Passaro, PE*
Meryl Cherchia, PE

Reviewed By: Michael S. Schultz, PE

Date: *March 24, 2022*

Subject: *NYSDEC Site No. 130195 Former Aluminum Louvre*
Geotechnical Data Summary and Evaluation Memorandum
Old Bethpage, New York

Introduction

The New York State Department of Environmental Conservation (NYSDEC) Division of Environmental Remediation (DER) has requested assistance from Camp Dresser McKee & Smith (CDM Smith) to complete a geotechnical evaluation for the Remedial Design (RD) for implementation of a remedial action for Operable Unit (OU-1) of the Former Aluminum Louvre (FAL) Site No. 130195 (the Site) under Work Assignment D009805-21. This memorandum describes the investigation performed and presents the results from the investigation and evaluation.

Background

The FAL Site includes two parcels: 161 Bethpage-Sweet Hollow Road (tax parcel 47-A-265, approximately 2.14 acres) and 301 Winding Road (tax parcel 47-A-263, approximately 1.22 acres) in Old Bethpage, NY. The Site is in an industrial park surrounded by a suburban area. To the west and southwest of the Site is an inactive waste incinerator and the former Old Bethpage Landfill. **Figure 1** presents the site vicinity map and **Figure 2** presents the site location map.

The main features of the Site include two commercial buildings, which are surrounded by paved outdoor parking and storage. Each parcel contains one of the commercial buildings. Both properties on the Site are zoned for light industrial use. The building on 161 Bethpage-Sweet Hollow Road contains one tenant: New York Paving, a commercial paving company. The 161 Bethpage-Sweet Hollow Road building owner uses approximately 75 percent of the building for storage of drag racing vehicles/equipment and storage of other various vehicles. The 301 Winding Road property has one tenant, IntelliGen Power Systems LLC. IntelliGen Power Systems utilizes the building to maintain and fabricate cogeneration power units. The

surrounding properties are used for a combination of commercial and light industrial. The nearest residential area is 0.35-mile northwest of the Site.

Historical Use

The Aluminum Louvre Corporation formerly owned 161 Bethpage-Sweet Hollow Road and simultaneously occupied both lots that comprise the Site. Aluminum Louvre manufactured louvers, which involved stamping, cutting, and shaping of metal stock; degreasing parts and painting. From 1986 to 1993, Aluminum Louvre generated volatile organic compound (VOCs) solvent waste, including tetrachloroethylene (PCE), trichloroethylene (TCE) and 1,1,1-trichloroethane (1,1,1-TCA). Nassau County records also indicate that Aluminum Louvre used TCE and 1,1,1-TCA from 1983 to 1994. In 1997, a contaminated dry well at the 301 Winding Road property was remediated under a voluntary cleanup agreement (VCA). Dry well remediation was also conducted under a separate VCA at the 161 Bethpage-Sweet Hollow Road property from 1999 to 2000. In 2007, the United States Environmental Protection Agency (USEPA) collected soil and groundwater samples at the Site and found both media to be contaminated with TCE and other VOCs. NYSDEC investigated the properties from 2008 to 2009 as part of the Old Bethpage Industrial Area Site Characterization and determined that the Site should be listed on the Registry of Inactive Hazardous Waste Disposal Sites. The Site was divided into three OUs: OU-1 includes on-site contamination, OU-2 covers off-site contamination, and OU-3 consists of an area-wide groundwater evaluation.

Record of Decision

The primary contaminants of concern (COCs) in the soil are VOCs including TCE, PCE, cis-1,2-dichloroethene (cis-1,2-DCE), 1,1,1-TCA, toluene, and xylene.

Based on the HDR-issued 2013 RI and the 2013 Feasibility Study (HDR, 2013b), a Record of Decision (ROD) for OU-1 of the Site was issued in March 2013 (NYSDEC, 2013). The following is a list of the elements of the selected remedy:

- A Remedial Design (RD) program will be implemented to provide the details necessary for the construction, operation, optimization, maintenance, and monitoring of the remedial program. Green remediation principles and techniques shall be included in the RD program.
- In-situ thermal remediation (ISTR) treatment will be implemented to destroy or volatilize VOCs in the unsaturated soil on the east side of the site. The gasses produced will be collected by vapor extraction wells and treated in an ex-situ treatment unit.
- Both on-site buildings will be required to have sub-slab depressurization systems (SSDSs), or similar engineered systems, to prevent the migration of vapors into the building from soil and/or groundwater.
- Air sparging (AS) will be implemented to address the on-site groundwater plume contaminated by VOCs. Soil vapor extraction (SVE) will be used to collect the sparged vapors.

- An institutional control will be imposed at the Site in the form of environmental easement.
- A Site Management Plan including an Institutional and Engineering Control Plan, Monitoring Plan, and an Operation and Maintenance Plan will be required for the maintenance of the Site after the selected remedy has been implemented.

In-Situ Thermal Remediation

ISTR was selected as the primary remedy for addressing contamination in the alleyway behind 301 Winding Road. The following ISTR heat delivery technologies are under consideration:

1. Electrical Resistance Heating (ERH) – Soil serves as a conductor, passing electrical current between electrode systems through the soil, generating temperatures up to 100 to 120 degrees Celsius. An array of electrodes is installed within a borehole to vertically heat the target treatment zone. Contaminants are captured by extraction wells and delivered to the surface for collection and treatment.

2. Thermal Conductive Heating (TCH) – Heat is transferred to the subsurface using heater wells. Heater wells operate at temperatures of up to 750 to 900 degrees Celsius, with the soils immediately surrounding the wells reaching the hottest temperatures, and the temperature dissipating radially. Contaminants are captured by extraction wells and delivered to the surface for collection and treatment.

Geotechnical Investigation Purpose and Scope

The purpose of this investigation is to evaluate the engineering properties of the onsite soils.. The scope of work of the geotechnical investigation included the following:

- Conduct ground penetrating radar (GPR) in the vicinity of the subsurface investigation.
- Conduct a geotechnical subsurface investigation consisting of three (3) test borings within the proposed thermal remediation area to characterize the engineering properties of the soils near buildings 161 Bethpage Sweet-Hollow Road and 301 Winding Road.
- Conduct geotechnical laboratory tests on selected soil samples to assist with the characterization of subsurface conditions and selection of engineering properties.
- Prepare this memorandum presenting the results of the investigation and discussing the findings.

Deviations from the Work Plan

One boring (GEO-03) was eliminated from the investigation scope due to equipment malfunctions causing delays in the schedule. Approval of this deviation from the work plan was made by NYSDEC following discussions with the project team during the field investigation.

Site Location and Description

The Site is located in the Hamlet of Old Bethpage within the Town of Oyster Bay, New York. Old Bethpage is located within Nassau County but also directly west of the boundary between

Nassau and Suffolk County within central western Long Island. The Site is covered with pavement and buildings with the exception of narrow strips of vegetation trimming the parking areas. The Site lies at an elevation of between 127 and 135 feet above mean sea level (amsl) and generally slopes to the southeast. Overall, each tax lot is generally flat, however a 3 to 4-foot retaining wall separates the two parcels. The 161 Bethpage-Sweet Hollow Road property is the higher property in elevation of the two.

Site Geology and Hydrogeology

Long Island is comprised of Cretaceous and Pleistocene unconsolidated deposits underlain by Early Paleozoic to Precambrian bedrock. Pleistocene-aged deposits unconformably overlie the Cretaceous-aged deposits. In the vicinity of the Site, the Upper Pleistocene sediments are mostly absent and the Cretaceous sediments of the Magothy formation are more prevalent. The Pleistocene-aged deposits are those that comprise the upper glacial aquifer, the surficial water bearing unit on Long Island. These deposits are primarily comprised of glacial till of the terminal moraines along the central axis of Long Island, and outwash deposits of sand and gravel between and south of the Moraines. The Site is within central-western Long Island, within which the outwash deposits are dominated by fine to coarse sand and gravel. It is noted than some thin local lenses of clay or silty zones exist within the Upper Pleistocene sediments of the Old Bethpage area (Smolensky, et al. 1989). The dominant Magothy lithology generally is fine to medium quartz sand interbedded with coarse sand, sandy clay, and solid clay. Lignite, pyrite, and iron oxide concretions are also found in the Magothy. The top of the Magothy is approximately 35 feet amsl (approximately 85 feet bgs at the Site). The thickness of the Magothy is approximately 650 feet at the Site.

Previous Subsurface Investigations

The subsurface investigation performed during the Remedial Investigation (RI) and Pre-Design Investigation (PDI), indicated that observed materials at the Site mostly consisted of sand with interbedded layers of clay and silty sand, as shown on the cross-section in **Figure 3**. A layer of silty clay was noted between 11 and 16 feet bgs and ranged in thickness from approximately one to six feet. The silty clay layer coincided with some of the highest observed concentrations of VOCs in soil at the Site. The PDI investigation assisted in confirming and refining the site-specific geology.

The shallowest clay layer observed at the Site, referred to as Clay 1, is of primary importance for the RD because it is the first large clay layer that contaminants discharged to the environment (likely through dry wells) encountered. During the PDI, this low-permeability clay lens lies within the Upper Glacial Aquifer was observed approximately 17 feet bgs.

Two additional distinct clay layers (Clay 2 and Clay 3) were observed at the Site during the PDI, at approximately 60 and 80 feet bgs, respectively. The elevation of the clay surfaces was not consistently observed throughout the Site. The varying elevation of each of the clay surfaces indicates it is wrinkled or scoured, and therefore, not a flat surface.

Subsurface Exploration Investigation

Land Air Water Environmental Services, Inc. (LAWES) of Center Moriches, New York advanced two (2) borings, (GEO-01 and GEO-02) during the period from January 19 to January 25, 2022. Boring GEO-03 was removed from the scope following mechanical issues and schedule delays.

The boring locations were pre-marked in the field by a CDM Smith Geologist. The as-drilled boring locations are shown on **Figure 4A**. NAEVA Geophysics, Inc. of Congers, New York performed ground penetrating radar (GPR) at all proposed test boring locations to identify potential underground utilities prior to drilling.

LAWES advanced the borings to depths ranging from about 26 to 70 feet using a truck-mounted Mobile B61-HDX drill rig. LAWES advanced the borings through soil using mud-rotary drilling techniques. While drilling GEO-02, the roller bit came loose from the drilling rods and could not be retrieved. The original borehole was abandoned, grouted to 44 ft bgs, and offset approximately 2 feet. The offset hole was pre-drilled from 0 to 43 ft bgs where sampling was resumed to completion at 70 ft bgs.

Standard Penetration Tests (SPTs) with split-spoon sampling were conducted continuously in each boring from ground surface to 26 ft bgs, and at approximately 5-foot intervals thereafter. The SPTs were conducted in general accordance with ASTM D1586 using a 2-inch outside diameter (O.D.) sampler, driven 24 inches by blows from a 140-pound hammer falling freely for 30 inches. The number of blows required to drive the sampler each 6-inch increment was recorded and the SPT resistance (N-value) was calculated as the sum of the blows to drive the sampler from 6 to 18 inches of penetration.

”Undisturbed” (Shelby) tube samples of fine-grained cohesive soil were collected in general accordance with ASTM D1587. Two Shelby tubes were collected, one in each of the test borings. The tube samples were trimmed at both ends and sealed with wax, plastic caps, and tape for subsequent review and laboratory testing

All test borings were backfilled upon completion with grout and surface patches were made.

Geotechnical Laboratory Testing

Geotechnical laboratory tests were performed on selected soil samples obtained from the test borings. All laboratory tests were performed at the CDM Smith Geotechnical Testing Laboratory in Chelmsford, Massachusetts. The following laboratory tests were performed:

- Mechanical Sieve (ASTM D6913) - 7 tests
- Mechanical Sieve with Hydrometer (ASTM D6913 and D7928) – 7 tests
- Atterberg (Liquid and Plastic) Limits (ASTM D4318) – 7 tests
- Specific Gravity (D854) – 3 tests
- 1-Dimensional Consolidation (ASTM D2435) – 1 test

- Consolidated Isotropically Undrained (CIU) Triaxial Test (ASTM D4767) – 1 test
- 1-Dimensional Swell (ASTM D4546 Method C) – 2 tests
- Moisture Content (ASTM D2487) – 20 tests
- Organic Content (ASTM 2974) – 4 tests

Treatability Study

A treatability study was conducted at the CDM Smith Geotechnical Testing Laboratory in Chelmsford, Massachusetts on select Shelby tube samples to characterize the behavior of clay materials when subjected to temperatures expected as part of the remedial work. One sample from each boring was placed in an oven at temperatures of 70 degrees Celsius (°C), 90°C, and 110°C. The sample weight, diameter, and height were recorded at 0-hours, 4-hours, 8-hours, and 24-hours. In total, six samples were analyzed.

Subsurface Investigation Results

Descriptions of the soil layers encountered in the borings are provided below and summarized in **Table 1**. Test boring logs are included in **Attachment A.** A photographic log of the investigation is included in **Attachment B**. A cross-section of the subsurface conditions is shown on **Figure 4B**.

Subsurface Conditions

Fill

Fill was encountered at ground surface in both test borings. Fill consisted of approximately 2 inches of asphalt underlain by 4 inches of dry, medium dense, brown, fine to coarse SAND, with "some" to "and" amounts of fine to coarse gravel, and "trace" amounts of glass. Two SPTs were conducted in this layer and the N-values ranged from 12 to 14 blows per foot (bl/ft).

Sand 1

The Sand 1 layer was encountered beneath Fill in both test borings at 0.5 to 0.8 ft bgs and ranged in thickness from 12.2 to 13.5 feet. The Sand 1 layer consisted of dry, loose to medium dense, light brown, fine to medium SAND, with "trace" to "little" amounts of silt, and "none" to "little" amounts of fine to coarse gravel. The Unified Soil Classification System (USCS) designation was generally poorly graded sand with silt (SP-SM). SPT N-values ranged from 9 to 23 bl/ft with an average of 15 bl/ft.

Clay 1

The Clay 1 layer was encountered beneath the Sand 1 stratum in both test borings at depths of 13.0 to 14.0 ft bgs and ranged in thickness from 6.5 to 7.7 ft. The Clay 1 layer consisted of moist, stiff, gray-brown to dark gray, Slightly Organic to Organic CLAY & SILT, with none to "trace" amounts of fine sand. The USCS designation was generally high or low plasticity organic material (OH or OL). Where the organic content was slight or not measured, USCS designations were lean clay (CL), silt (ML), or elastic silt (MH). SPT N-values ranged from 7 to 15 bl/ft with an average of 11 bl/ft.

Sand 2

The Sand 2 layer was encountered beneath the Clay 1 stratum in both test borings at depths of 19.5 to 21.7 ft bgs. Boring GEO-01 terminated in this layer at 26 ft bgs and in GEO-02, the Sand 2 layer was 42 ft thick. The Sand 2 layer consisted of moist, light brown to brown, medium dense to very dense, fine to medium SAND, with "trace" to "little" amounts of silt, and none to "trace" amounts of fine gravel. The USCS designation generally ranged from poorly graded sand with silt (SP-SM) to silty sand (SM). SPT N-values ranged from 20 to 130 bl/ft with and average of 65 bl/ft.

Sandy Silt

The Sandy Silt layer was encountered beneath the Sand 2 layer in boring GEO-02 at 61.5 ft bgs. Boring GEO-02 was terminated in this layer at 70.0 ft bgs. The layer consisted of moist, very stiff to hard, light brown to dark gray, SILT & CLAY, with "some" to "and" amounts of fine to medium sand. The USCS designation was either sandy silty clay (CL-ML) or sandy silt (ML). Two SPT tests were conducted in this layer. SPT N-values ranged from 23 to 46 bl/ft.

Groundwater Conditions

Groundwater levels measured at the conclusion of drilling are noted on the boring logs and summarized in **Table 1**. Groundwater was not encountered in the boreholes at the time of drilling. It should be noted that water levels measured in nearby monitoring wells during previous investigations observed groundwater levels deeper than the termination depth of the borings conducted as part of this investigation.

Variation in Subsurface Conditions

Our interpretation of the subsurface conditions presented herein is based on soil and groundwater conditions observed in the test borings at the time of drilling. The subsurface conditions may vary from those described herein at other locations and times. These variations may not become evident until construction.

The water level measured in test borings during or upon completion of drilling may not represent stabilized levels. Groundwater levels can fluctuate with rainfall, time, season, temperature, climate, construction activities in the area, and other factors. Furthermore, the introduction of drilling fluids into the borehole during drilling may affect water level measurements conducted at the conclusion of drilling. Therefore, groundwater levels at the time of construction may be different from those observed at the time of the explorations.

Laboratory Test Results

A summary of the laboratory test results is included in **Table 2** and **Table 3.** Laboratory tests results are included in **Attachment C.** The following sections discuss the results of the laboratory testing as they relate to the subsurface strata.

Fill

No laboratory testing was conducted in the Fill layer.

Sand 1

Index test results on the Sand 1 layer consisted of the following:

- Gravel component: 0.0 to 0.1 percent, with an average of 0.1 percent
- Sand component: 88.5 to 91.9 percent, with an average of 90.2 percent
- Fines component: 8.1 to 11.4 percent, with an average of 9.8 percent
- In-situ moisture content: 8.9 to 9.5 percent

Clay 1

Index test results on the Clay 1 layer consisted of the following:

- Gravel component: 0.0 percent
- Sand component: 0.1 to 22.3 percent, with an average of 6.8 percent
- Fines component: 77.7 to 99.9 percent, with an average of 93.2 percent
- Liquid Limit (LL): 36 to 51, with an average of 44
- Plastic Limit (PL): 24 to 40, with an average of 32
- Plasticity Index (PI): 10 to 15 with an average of 12
- In-situ moisture content: 26.7 to 39.5 percent, with an average of 31.8 percent
- Organic content: 2.0 to 9.3 percent with an average of 6.1 percent
- Specific Gravity: 2.67 to 2.84 with an average of 2.76

The results of the triaxial and consolidation laboratory tests on the Clay 1 layer consisted of the following:

- Modified compression index: 0.15
- Modified recompression index: 0.02
- Undrained shear strength at 5 percent strain: 1200 pounds per square foot (psf)

No swell was observed during the 1-dimensional swell tests.

Sand 2

Index test results on the Sand 2 layer consisted of the following:

- Gravel component: 0.0 to 0.6 percent, with an average of 0.1 percent
- Sand component: 82.4 to 90.9 percent, with an average of 86.9 percent
- Fines component: 9.1 to 17.0 percent, with an average of 12.9 percent

- In-situ moisture content: 11.5 to 20.1 percent with an average of 16.3 percent

Sandy Silt

Index test results on the Sandy Silt layer consisted of the following:

- Gravel component: 0.0 percent
- Sand component: 33.9 to 39.7 percent, with an average of 36.8 percent
- Fines component: from 60.3 to 66.1 percent, with an average of 63.2 percent
- Liquid Limit (LL): 29 to 39
- Plastic Limit (PL): 22 to 34
- Plasticity Index (PI): 5 to 7
- In-situ moisture content: 26.7 to 40.3 percent

Treatability Study

Using the in-situ index properties from the laboratory testing program and the measurements of weight, diameter, height from the treatability study, the sample moisture content, density, and void ratio were calculated for each time increment. The final sample strain was determined. A summary of the results from the treatability study is included in **Table 4**. Plots of time versus moisture content and time versus void ratio are included in **Figure 5**.

In general, the reduction of moisture in the samples was observed to take place within the first 8 hours of heating, with the OL material (GEO-02) moisture loss occurring at a faster rate. As to be expected, the moisture reduction occurred quicker at higher temperatures. An overall reduction of void ratio in the OH material (GEO-01) was observed to be approximately 0.1, while the reduction of void ratio in the OL material (GEO-02) was observed to be approximately 0.2. The vertical strain over the 24-hour time-period was observed to be an average of -3.1 percent (i.e., contraction) for the OH (GEO-01) material and -3.5 percent for the OL (GEO-02) material. The resulting vertical strain for a 30 percent reduction in moisture content (which is a typical change in moisture content during vadose zone ISTR) for the OH and OL material is approximately -2.2 percent.

It should be noted that results from the treatability study may not represent full-scale behavior of the soil, as pressures induced on the Clay 1 from the overburden soils and building are not taken into consideration in this study. We would anticipate that taking the overburden pressures into account would further consolidate the Clay 1 after heating and increase the vertical deformation of the Clay 1 layer.

Discussion of Results

The results of the geotechnical investigation and evaluation as described in the previous sections were used to characterize the subsurface conditions at the Site. The observed characteristics of the Clay 1 layer are described as follows:

- Soils with organic matter more than 0.3 percent are at risk for in-situ smoldering from high temperatures associated with TCH (TRS Group, Inc., 2020). Additionally, the reduction of organic material in the soil may alter the grain-to-grain contact of the clay particles, causing a reduction in volume. The Clay 1 layer is observed to have an average organic content of 6.1 percent, with samples collected ranging from 2.0 to 9.0 percent organic content.

- Differential settlement risks are associated with soils that have a potential for swell or shrinkage. The swell test performed on the Clay 1 material indicated that the clay was not susceptible to swell under laboratory conditions (**Table 3**).

- The treatability study observed the Clay 1 potential for volumetric changes under various temperature exposures based on reduction of the material's moisture content. It was observed that the clay material experienced a vertical strain of up to -2.2 percent (i.e., contraction) in the laboratory setting after reduction of the in situ moisture content by 30 percent.

References

TRS Group, Inc. In Situ Thermal and Subsidence. 2020

USACE. 1990. Engineering Manual: Engineering and Design, Settlement Analysis. EM 1110-1-1904. Department of the Army, Washington DC. September 1990

USEPA. 2014. Engineering Paper: In Situ Thermal Treatment Technologies: Lessons Learned. EPA 542-R-14-2012. USEPA Office of Land and Emergency Management (5102G), May 2014.

Figures

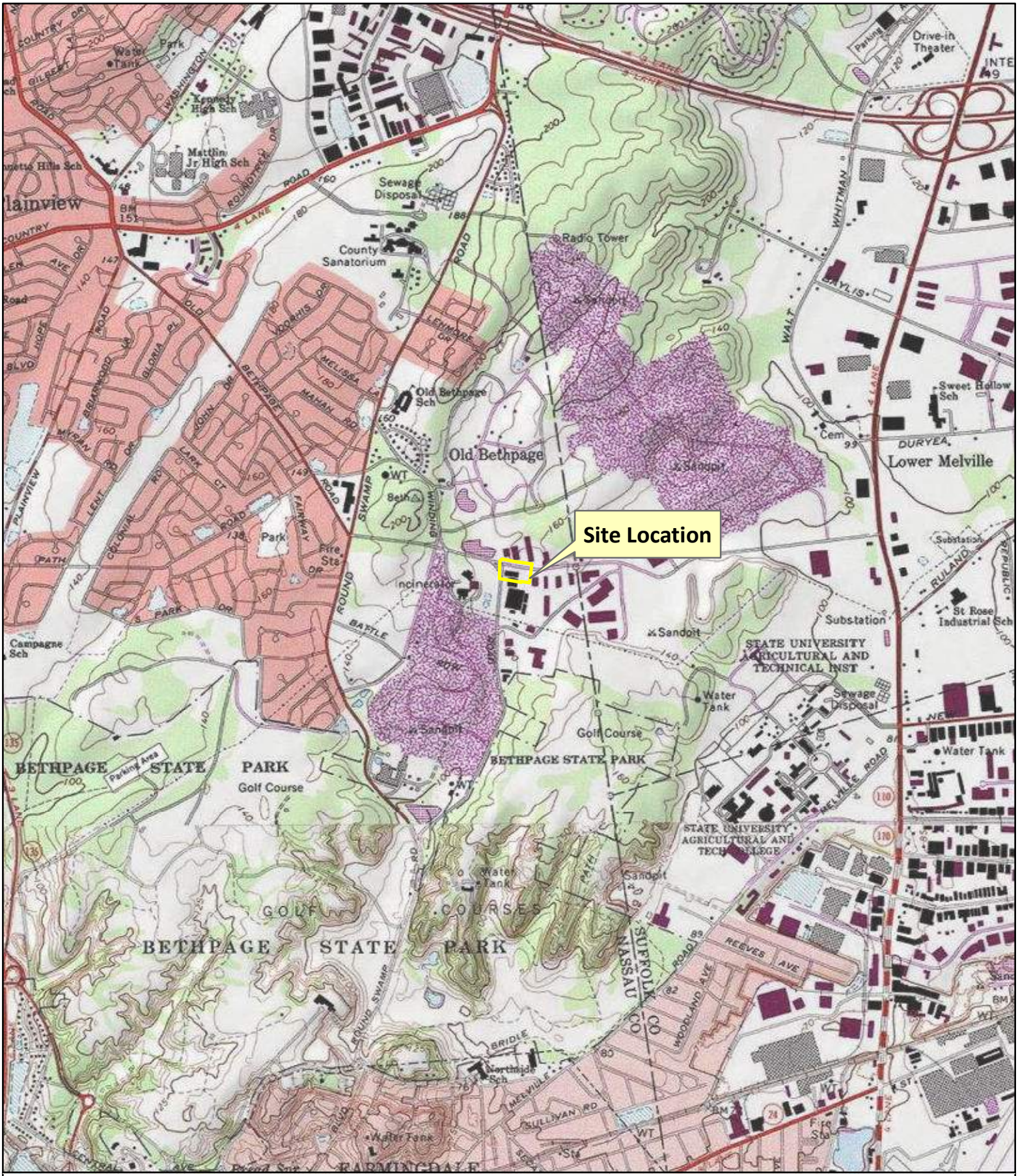
Figure 1 – Site Vicinity Map
Figure 2 – Site Location Map
Figure 3A – Pre-Design Investigation Cross Sections Plan
Figure 3B – Longitudinal Soil Profile – Section A-A'
Figure 3C – Longitudinal Soil Profile – Section B-B'
Figure 3D – Soil Profile Transect – Section C-C'
Figure 4A – Boring Location Plan
Figure 4B – Subsurface Conditions – Section 1
Figure 5 – Treatability Study Plots

Tables

Table 1 – Summary of Subsurface Exploration Program
Table 2 – Summary of Geotechnical Laboratory Index Test Results
Table 3 – Summary of Triaxial and Consolidation Laboratory Test Results
Table 4 – Summary of Treatability Study Results

Attachments

Attachment A – Test Boring Logs
Attachment B – Photographic Log
Attachment C – Laboratory Test Results



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Site Vicinity Map

1 inch = 2,000 feet

0 1,000 2,000 3,000 4,000 Feet

Former Aluminum Louvre
Old Bethpage, NY
Figure 1

CDM Smith

estradal C:\Users\estradal\Desktop\FAL PDI Figures\Fig1-1_Site_Vicinity.mxd 1/19/2018

N

Site Location Map

1 inch = 50 feet

0 25 50 100 Feet

Former Aluminum Louvre
Old Bethpage, NY
Figure 2

CDM Smith

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N

Pre-Design Investigation Cross Sections Plan

1 inch = 20 feet

0 10 20 40 Feet

Former Aluminum Louvre
Old Bethpage, NY
Figure 3A

CDM Smith

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South
A

North
A'

PDI-19 Offset = 8
PDI-2 Offset = 3
PDI-20 Offset = 1
PDI-8 Offset = - 1
PDI-1 Offset = - 12
DB-ALC-MW3-SE Offset = 5
ALC-MW3 Offset = 7
ALC-MW3-NE Offset = 1
PDI-9 Offset = - 11
PDI-3 Offset = - 20
PDI-23 Offset = 9

SO [111.8-111.3] ND (June 2018)
SO [114.8-114.3] 39000 (January 2011)
SO [110.8-110.3] 950000 (January 2011)
SO [104.8-104.3] 2.4 (January 2011)
SO [95.8-95.3] 3.9 (January 2011)
SO [90.8-90.3] 1.5 (January 2011)
SO [84.8-84.3] 2.3 (January 2011)
SO [110.8-110.3] 600000 (January 2011)
SO [115.2-114.7] ND (June 2018)
SO [114.2-113.7] 3.2 J (July 2018)
Clay 1
SO [62.3-61.8] 100 (June 2018)
WG [57.02-54.02] 2.3 (October 2017)
WG [51.8-49.3] 14 (June 2018)
Clay 2
Water Table Estimated HDR January 2012
Water Table Estimated CDM Smith July 2018
WG [57.04-54.04] 9.9 (November 2017)
SO [53.54-53.29] 10 (October 2017)
SO [52.54-52.29] 16 (October 2017)
SO [51.54-51.29] 29 J (October 2017)
SO [57-56.5] 9.8 (June 2018)
WG [51.8-49.3] 460 (June 2018)
SO [47.52-47.27] 120 (October 2017)
SO [46.52-46.27] 140 (October 2017)
SO [45.52-45.27] 320 (October 2017)
WG [52.9-47.9] 190 (October 2017)
Clay 3

Elevation (feet above mean sea level)

Distance Along Baseline (feet)

Cross Section Location
A'
A
PDI-23
PDI-3
PDI-9
ALC-MW3
ALC-MW3-NE
DB-ALC-MW3-SE
PDI-1
PDI-8
PDI-20
PDI-2
PDI-19
N
Site Map Scale:
1 inch equals 40 feet

LEGEND:
- Asphalt
- USCS Poorly-graded Sand
- Lignite-like Material
- USCS Clayey Sand
- USCS Silty Sand
- USCS Low Plasticity Clay
- Concrete
- USCS Well-graded Gravel
- Estimated Water Table

Groundwater (WG) and Soil (SO) Sample Results
[Sample Elevation Depth]
Trichloroethene (Date Sampled)

All GW sample results in micrograms per liter
All SO sample results in micrograms per kilogram
All GW elevations in feet above mean sea level

ND - not detected
J - estimated concentration

DB-ALC-MW3-SE, ALC-MW-3, and ALC-MW3-NE were soil boring and monitoring well locations sampled by HDR.
PDI-1, PDI-2, PDI-3, PDI-8, PDI-9, PDI-19, PDI-20, and PDI-23 were soil boring locations sampled by CDM Smith.

Horizontal Scale (feet) 0 8
Vertical Scale (feet) 0 16

Vertical Exaggeration: 0.5x

CDM Smith

Figure 3B
Longitudinal Soil Profile - Section A-A'
January 2011 through July 2018
Former Aluminum Louvre
301 Winding Road, Bethpage, NY

STANDARD CROSS SECTION: PLICHACK FIELD FAL2.GPJ STANDARD_ENVIRONMENTAL_PROJECT.GDT 9/19/18 REV.

West
B

East
B'

PDI-17 Offset = 0
PDI-18 Offset = 5
DB-301-2E Offset = 2
MW-301-1 Offset = 0
ALC-MW3 Offset = 0
ALC-MW3-NE Offset = 4
DB-MW3-E Offset = 0
PDI-6 Offset = 6
PDI-1 Offset = - 8

SO [107.8-107.3]
17 (June 2018)

SO [110.8-110.3]
430000 (January 2011)

SO [111.8-111.55]
140000 (January 2011)

SO [110.8-110.3]
950000 (January 2011)

SO [110.8-110.3]
600000 (January 2011)

SO [111.3-110.8]
1600 (January 2011)

SO [114.8-114.3]
1.2 JL (June 2018)

SO [112.8-112.3]
170 J (June 2018)

SO [90.8-90.3]
2.2 (January 2011)

SO [95.8-95.3]
3.9 (January 2011)

SO [84.8-84.3]
2.3 (January 2011)

SO [69.4-68.9]
1.10 (June 2018)

WG [57.7-55.2]
3.8 (June 2018)

WG [72.8-62.8]
1700 (May 2011)
WG [72.8-62.8]
2500 (July 2011)
WG [72.8-62.8]
NS (August 2011)

WG [57.02-54.02]
2.3 (October 2017)

SO [47.52-47.27]
120 (October 2017)
SO [46.52-46.27]
140 (October 2017)
SO [45.52-45.27]
320 (October 2017)

WG [43.8-33.8]
78 (May 2011)
WG [43.8-33.8]
45 (July 2011)
WG [43.8-33.8]
18 (August 2011)

WG [13.8-3.8]
66 (May 2011)
WG [13.8-3.8]
17 (July 2011)
WG [13.8-3.8]
5.1 (August 2011)

Clay 1
Clay 2
Clay 3

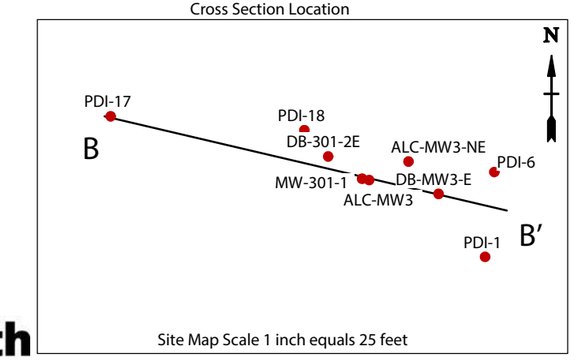
Water Table Estimated
HDR
January 2012

Water Table Estimated
CDM Smith
July 2018

Elevation (feet above mean sea level)

Distance Along Baseline (feet)

Cross Section Location



Site Map Scale 1 inch equals 25 feet

LEGEND:

- Asphalt
- USCS Poorly-graded Sand
- Lignite-like Material
- USCS Silt
- USCS Silty Sand
- USCS Low Plasticity Clay
- USCS Clayey Sand
- Estimated Water Table

Groundwater (WG) and Soil (SO) Sample Results
[Sample Elevation Depth]
Trichloroethene (Date Sampled)

All GW sample results in micrograms per liter
All SO sample results in micrograms per kilogram
All GW elevations in feet above mean sea level

NS - not sampled
J - estimated concentration
L - biased low

Monitoring well MW-301-1 was installed in April 2011 and sampled by HDR. DB-301-2E, ALC-MW3, ALC-MW3-NE, and DB-MW3-E were soil boring and monitoring well locations sampled by HDR. PDI-1, PDI-6, PDI-17, and PDI-18 were soil boring locations sampled by CDM Smith.

Horizontal Scale (feet) 0 5

Vertical Scale (feet) 0 22

Vertical Exaggeration: 0x

Figure 3C
Latitudinal Soil Profile - Section B-B'
January 2011 through July 2018
Former Aluminum Louvre
301 Winding Road, Bethpage, NY

CDM Smith

STANDARD CROSS SECTION: PUCHACK FIELD FAL2.GPJ STANDARD_ENVIRONMENTAL_PROJECT.GDT 9/19/18 REV.

South
C

North
C'

PDI-16 Offset = - 3
PDI-15 Offset = 4
PDI-14 Offset = 0
PDI-13 Offset = 2
PDI-12 Offset = - 4
PDI-11 Offset = 1
PDI-10 Offset = - 2

Clay 1
Clay 2

SO [77.2-76.7]
1.1 (June 2018)

SO [80.2-79.7]
0.38 J (June 2018)

SO [77.2-76.7]
8.5 JL (June 2018)

SO [79.2-78.7]
27 (June 2018)

SO [75.2-74.7]
17 JL (June 2018)

WG [59.7-57.2]
85 (June 2018)

WG [59.7-57.2]
15 (June 2018)

WG [59.7-57.2]
3.6 (June 2018)

WG [59.7-57.2]
8.5 (June 2018)

WG [59.7-57.2]
ND (June 2018)

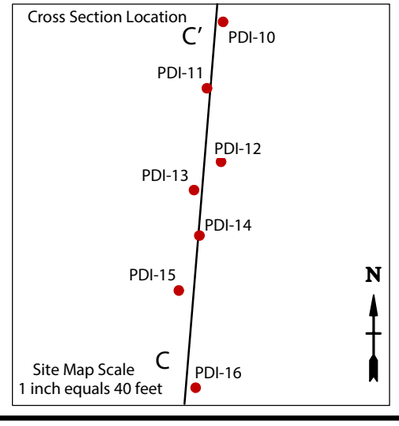
WG [59.7-57.2]
13 (June 2018)

WG [60.7-58.2]
9.4 (June 2018)

Elevation (feet above mean sea level)

Distance Along Baseline (feet)

Cross Section Location



Site Map Scale
1 inch equals 40 feet

LEGEND:

- Concrete
- USCS Clayey Sand
- USCS Low Plasticity Clay
- Lignite-Like Material
- USCS Silty Sand
- USCS Poorly-graded Sand
- USCS Well-graded Sand

Groundwater (WG) and Soil (SO) Sample Results
[Sample Elevation Depth]
Trichloroethene (Date Sampled)

All GW sample results in micrograms per liter
All SO sample results in micrograms per kilogram

ND - not detected
J - estimated concentration
L - biased low

PDI-10 through PDI-16 were soil boring locations sampled by CDM Smith and were not advanced to anticipated depth of Clay 3.

Horizontal Scale (feet) 0 8

Vertical Scale (feet) 0 14

Vertical Exaggeration: 0.5x

Figure 3D
Soil Profile Transect - Section C-C'
January 2011 through July 2018
Former Aluminum Louvre
301 Winding Road, Bethpage, NY

CDM Smith

STANDARD CROSS SECTION: PUCHACK FIELD FAL2.GPJ STANDARD_ENVIRONMENTAL_PROJECT.GDT 9/14/18 REV.

Location	Depth (ft bgs)	Total VOCs Concentration (µg/kg)
PDI-6	16	206.77
PDI-7	17	64480
PDI-8	17	8.1
PDI-9	17	1.7
PDI-18	21	78.98
PDI-23	18	21.2
PDI-24	18	37.91
PDI-25	14	15.5
PDI-26	17.5	40.44
PDI-27	17	4.9
PDI-28	16	11.6
PDI-29	17.5	13.7
PDI-30	17.5	51.39
PDI-31	17.5	36.31
PDI-32	16	7.8
PDI-33	13	18.7
PDI-34	15	52.16
PDI-35	14	16.55
PDI-36	13.5	11.55
161-DB-1	22	1044.3
161-DB-2	21	5.6
161-DB-3	21	3.6
301-DB-1	16	231
301-DB-2	17	1016000
301-DB-3	16	36040
301-DB-4	17	19
301-DB-5	16	1.2
301-DB-6	18	10
301-DB-7	16	9
301-DB-8	17	2.5
DB-301-2E	17	432630
DB-MW-3E	16.5	1890
DB-ALC-MW-3S	16	10710
DB-ALC-MW-3SE	13	50220
ALC-MW3	17	963000
ALC-MW-3W	16	384000
ALC-MW-3NE	17	600000
ALC-MW-3E	16	144500
ALC-MW-3SE	15	29100

NYS ITS GIS Program Office, Westchester County GIS

N

Notes:
1. All results in micrograms per kilogram (ug/kg)
2. VOCs - volatile organic compounds
3. ft bgs - feet below ground surface

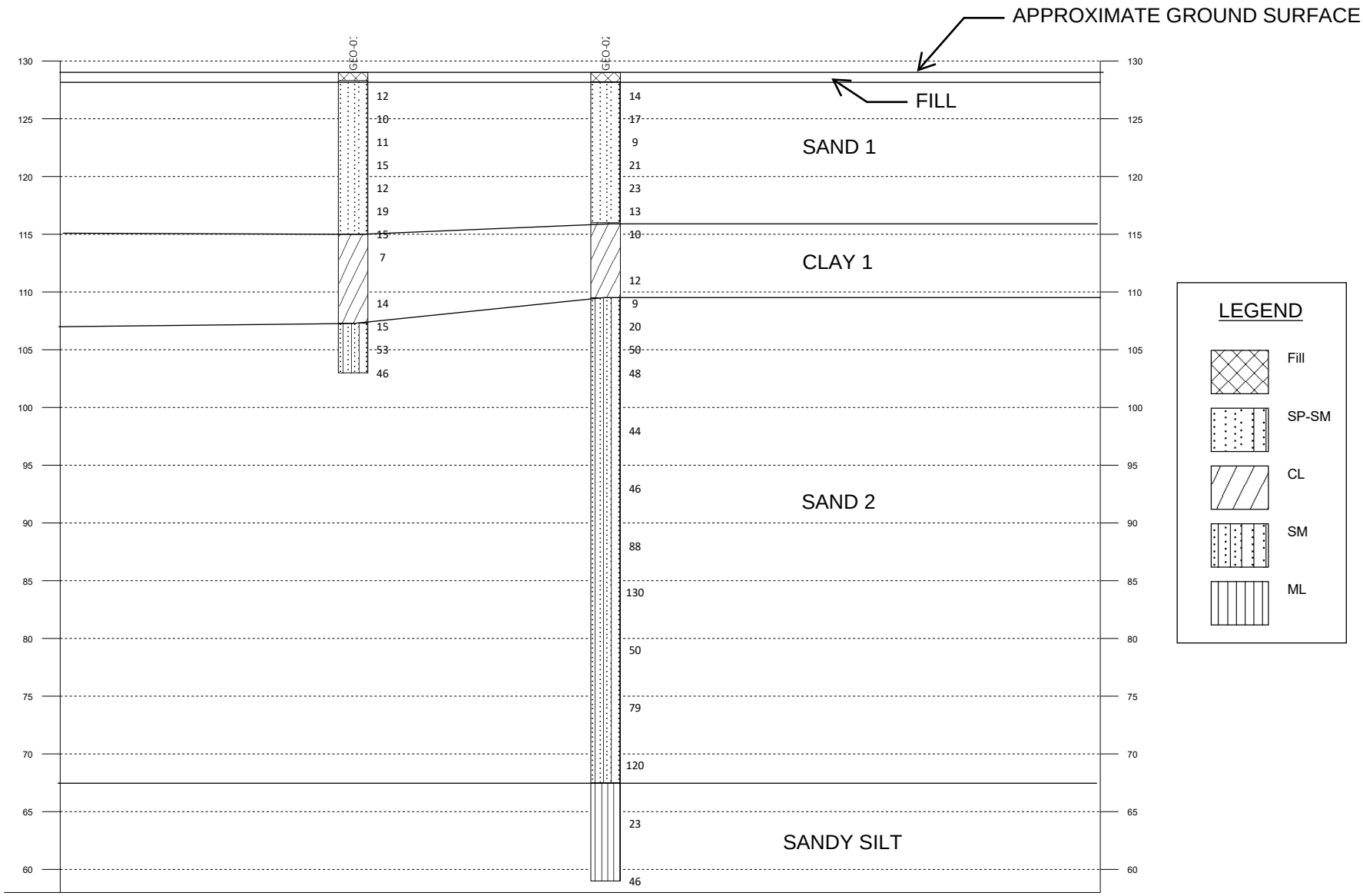
Boring Location Plan

1 inch = 13 feet

0 6.5 13 26 Feet

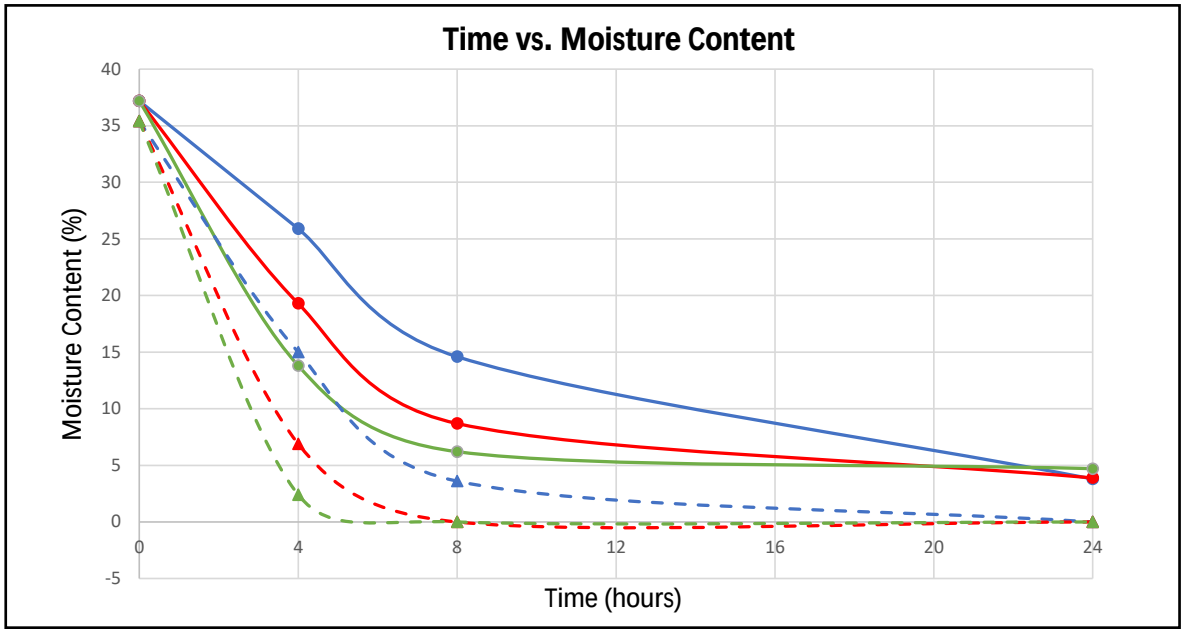
Former Aluminum Louvre
Old Bethpage, NY
Figure 4A

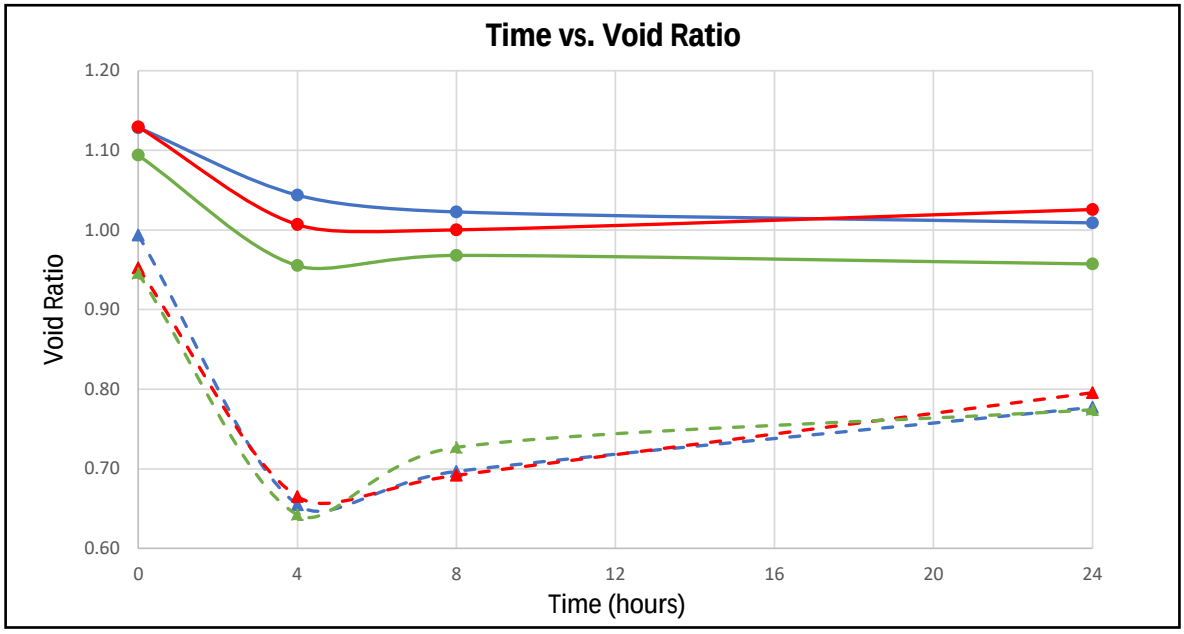
CDM Smith

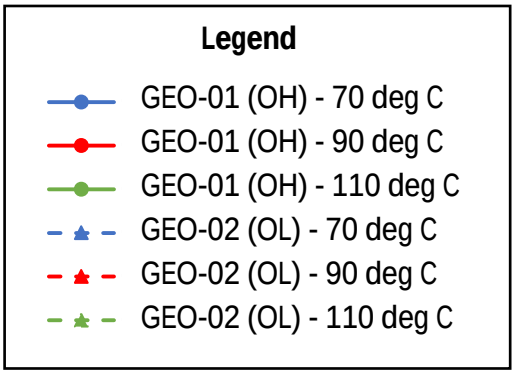


Subsurface Conditions - Section 1

Former Aluminum Louvre
Old Bethpage, NY
Figure 4B







CDM Smith

Treatability Study Plots

Former Aluminum Louvre
Old Bethpage, New York
Figure 5

NYSDEC
Site No. 130195 Former Aluminum Louvre
Old Bethpage, New York

Table 1 Summary of Subsurface Exploration Program

Exploration Number	Approximate Coordinates		Approximate Ground Surface Elevation (ft asl)[1]	Approximate Exploration Depth (ft)[2]	Depth to Top of Stratum (ft)					Approximate Depth to Groundwater (ft)	Approximate Groundwater Elevation (ft)
	Latitude[1]	Longitude[1]			Fill	Sand 1	Clay 1	Sand 2	Sandy Silt		
GEO-01	40.7612376	-73.4437182	129	26.0	0.0	0.5	14.0	21.7	--	--	--
GEO-02	40.7612216	-73.4436421	129	70.0	0.0	0.5	13.0	19.5	61.5	--	--

Notes:

1. Coordinates and elevations are approximate.
2. Indicated depths are referenced to ground surface at the time of drilling.

Abbreviations:

-- - Not Encountered

ft - Feet

asl - Above sea level

CDM Smith

NYSDEC
Site No. 130195 Former Aluminum Louvre
Old Bethpage, New York

Table 2 Summary of Geotechnical Laboratory Index Test Results

Exploration Number	Sample Number	Sample Depth (ft)	Stratum	USCS Classification [1]	Grain Size Analysis [2]							Atterberg Limits [3]			Organic Content (%) [4]	Moisture Content (%) [5]	Specific Gravity [6]
					Gravel (%)		Sand (%)			Fines (%)		LL (%)	PL (%)	PI (%)			
					Coarse	Fine	Coarse	Medium	Fine	Silt	Clay						
GEO-01	S-4	6-8	Sand 1	SP-SM	0.0	0.1	0.4	9.2	78.9	11.4		--	--	--	--	9.5	--
GEO-01	S-8	14-16	Clay 1	CL	0.0	0.0	0.1	1.9	20.3	39.5	38.2	39	24	15	--	28.7	--
GEO-01	U-1	16-18	Clay 1	OH	0.0	0.0	0.0	0.0	0.4	58.8	40.8	51	40	11	9.3	39.5	2.84
GEO-01	S-9	18-20	Clay 1	--	--	--	--	--	--	--	--	--	--	--	6.6	31.0	--
GEO-01	S-10B	20-20.7	Clay 1	ML	0.0	0.0	0.0	0.6	10.0	53.7	35.7	36	25	11	--	26.7	--
GEO-01	S-12	24-26	Sand 2	SP-SM	0.0	0.0	0.2	10.0	80.7	9.1		--	--	--	--	20.1	--
GEO-02	S-6	10-12	Sand 1	SP-SM	0.0	0.0	0.0	0.8	91.1	8.1		--	--	--	--	8.9	--
GEO-02	S-7B	13-14	Clay 1	--	--	--	--	--	--	--	--	--	--	--	2.0	28.0	--
GEO-02	U-1	14-16	Clay 1	OL	0.0	0.0	0.0	0.0	0.1	50.9	49.0	45	35	10	6.6	35.4	2.76
GEO-02	S-8	16-18	Clay 1	MH	0.0	0.0	0.0	0.1	0.4	56.2	43.3	50	35	15	--	33.5	2.67
GEO-02	S-10	20-22	Sand 2	SM	0.0	0.6	0.2	40.8	41.4	17.0		--	--	--	--	11.5	--
GEO-02	S-13	29-31	Sand 2	SM	0.0	0.0	0.2	19.8	67.8	12.2		--	--	--	--	18.0	--
GEO-02	S-15	39-41	Sand 2	SP-SM	0.0	0.0	0.1	33.7	55.0	11.2		--	--	--	--	16.5	--
GEO-02	S-17	48-50	Sand 2	SM	0.0	0.0	0.1	40.1	44.6	15.2		--	--	--	--	15.3	--
GEO-02	S-20	63-65	Sandy Silt	CL-ML	0.0	0.0	0.0	2.7	31.2	38.4	27.7	29	22	7	--	26.7	--
GEO-02	S-21	68-70	Sandy Silt	ML	0.0	0.0	0.0	1.6	38.1	36.1	24.2	39	34	5	--	40.3	--

Notes:

1. USCS classifications were performed in accordance with ASTM D2487.
2. Grain size analysis tests performed in accordance with ASTM D7928, D6913, and D1140.
3. Atterberg limit tests performed in accordance with ASTM D4318.
4. Organic content analysis performed in accordance with ASTM D2974.
5. Moisture content analysis performed in accordance with ASTM D2216.
6. Specific gravity analysis performed in accordance with ASTM D854.

Abbreviations:

SP-SM	Poorly Graded Sand with Silt
CL	Lean Clay
ML	Silt
MH	Elastic Silt
SM	Silty Sand
CL-ML	Silty Clay
OH	High Plasticity Organics
OL	Low Plasticity Organics
ft	Feet
%	Percentage

NYSDEC
Former Aluminum Louvre
Old Bethpage, New York

Table 3 Summary of Triaxial and Consolidation Laboratory Test Results

Exploration Number	Sample Number	Sample Depth (ft)	Stratum	USCS Classification [1]	Moisture Content (%) [2]	Consolidated Isotropically Undrained Triaxial Test[3]			1-Dimensional Consolidation[4]					1-Dimensional Swell[5]	
						Undrained Shear Strength at Failure, Su	Strain at Failure	Undrained Shear Strength at 5% Strain, $S_{u\ @\ 5\%\ Strain}$	Initial Void Ratio, e_o	Final Void Ratio, e_f	Modified Compression Index[8], $C_{c\varepsilon}$	Modified Recompression Index[8], $C_{r\varepsilon}$	Dry Unit Weight, Yd	Consolidation Pressure	Wetting-Induced Swell[6]
						(psf)	(%)	(psf)					(pcf)	tsf	(%)
GEO-01	U-1	17.7-17.8	Clay 1	OH	38.9	--	--	--	1.17	1.00	0.15	0.02	82	--	--
GEO-01	U-1	17.5-17.6	Clay 1	OH	32.7	--	--	--	--	--	--	--	89	1.0	-0.2
GEO-02	U-1	15.5-15.6	Clay 1	OL	34.2	--	--	--	--	--	--	--	88	0.8	-0.3
GEO-02	U-1	14.9-15.4	Clay 1	OL	33.3	1807	14.9	1200	--	--	--	--	--	--	--

Notes:

1. USCS classifications were performed in accordance with ASTM D2487.
2. Moisture content analysis performed in accordance with ASTM D2216.
3. Consolidated Isotropically Undrained Triaxial test performed in accordance with ASTM D4767.
4. 1-D Consolidation test performed in accordance with ASTM D2435 Method B.
5. Swell test performed in accordance with ASTM D4546 Method B.
6. Negative value indicates sample shrank after wetting under consolidation pressure.

Abreviations:

ft feet
psf pounds per square foot
pcf pounds per cubic foot
tsf tons per square foot

CDM Smith

NYSDEC
Former Aluminum Louvre
Old Bethpage, New York

Table 4 Summary of Treatability Study Results

Sample ID	Sample Depth (ft)	Stratum	USCS Classification [1]	Plasticity Index[2] (%)	Organic Content[3] (%)	Specific Gravity[4]	Moisture Content[5] (%)	Wet Density, ρ_{total} (pcf)	Dry Unit Weight, ρ_{dry} (pcf)	Void Ratio, e	Diametral Strain, $\varepsilon_{diametral}$ (%)	Vertical Strain, ε_v (%)	Volumetric Strain, $\varepsilon_{volumetric}$ (%)
GEO-01_A (70°C)													
0-hours	16-18	Clay 1	OH	11	9.3	2.84	39.5	116	83	1.13	--	--	--
4-hours							25.9	109	87	1.04	-0.9	-2.3	-4.0
8-hours							14.6	101	88	1.02	-1.4	-2.2	-5.0
24-hours							3.8	92	88	1.01	-1.5	-2.7	-5.6
GEO-01_B (90°C)													
0-hours	16-18	Clay 1	OH	11	9.3	2.84	39.5	116	83	1.13	--	--	--
4-hours							19.3	105	88	1.01	-1.3	-3.3	-5.8
8-hours							8.7	96	89	1.00	-1.4	-3.4	-6.1
24-hours							3.9	91	88	1.03	-1.6	-3.5	-4.9
GEO-01_C (110°C)													
0-hours	16-18	Clay 1	OH	11	9.3	2.84	39.5	118	85	1.09	--	--	--
4-hours							13.8	103	91	0.96	-1.8	-3.1	-6.6
8-hours							6.2	96	90	0.97	-1.5	-3.1	-6.0
24-hours							4.7	95	91	0.96	-1.9	-3.0	-6.5
GEO-02_A (70°C)													
0-hours	14-16	Clay 1	OL	10	6.6	2.76	35.4	121	89	0.94	--	--	--
4-hours							24.5	120	96	0.79	-2.3	-3.0	-7.4
8-hours							12.3	108	97	0.84	-2.2	-3.4	-7.7
24-hours							3.3	100	97	0.84	-2.5	-3.6	-7.8
GEO-02_B (90°C)													
0-hours	14-16	Clay 1	OL	10	6.6	2.76	35.4	120	88	0.95	--	--	--
4-hours							15.8	111	96	0.80	-2.1	-3.6	-7.6
8-hours							6.5	102	96	0.80	-2.1	-3.6	-7.7
24-hours							2.2	96	94	0.83	-2.1	-3.6	-6.0
GEO-02_C (110°C)													
0-hours	14-16	Clay 1	OL	10	6.6	2.76	35.4	120	89	0.95	--	--	--
4-hours							10.9	107	97	0.78	-2.7	-3.4	-8.6
8-hours							3.2	100	97	0.78	-2.7	-3.3	-8.4
24-hours							1.9	97	95	0.81	-2.9	-3.4	-7.1

Notes:

1. USCS classifications were performed in accordance with ASTM D2487.
2. Atterberg limit tests performed in accordance with ASTM D4318.
3. Organic content analysis performed in accordance with ASTM D2974.
4. Specific gravity analysis performed in accordance with ASTM D854.
5. Moisture content analysis performed in accordance with ASTM D2216. Due to the initial assumption that initial moisture content was the same for all samples within the same Shelby tube, calculations for moisture contet at each time interval may have a percent error. Zero values may not reflect actual moisture content.
6. Samples allowed to cool to room temperature.

Abreviations:

ft feet
pcf pounts per cubic foot

CDM Smith

Boring Number: GEO-01

Client: NYSDEC
Project Name: Former Aluminum Louvre
Project Location: Old Bethpage, New York
Project Number: 262392

Drilling Contractor/Driller: LAWES/C. Pedersen
Surface Elevation (ft): 129.0
Drilling Method/Bore Hole Diameter: Drive and Wash & Mud Rotary/8 in.
Total Depth (ft): 26.0
Hammer Style/Weight/Drop Height/Spoon Size: Automatic/140 lb/30 in./2 in.
Depth to Initial Water Level (ft):

Depth	Date	Time
NE		

Bore Hole Location:
Lat: 40.7612376 **Long:** -73.4437182
Abandonment Method: Backfilled with cement grout.
Drilling Date: **Start:** 1/19/2022 **End:** 1/19/2022
Logged By: R. Levinton

Elev. (ft)	Depth (ft)	Sample Type	Sample Number	Sample Length (in)	Blows per 6 inches	Sample Recovery (in)	N-Value	Graphic Log	Strata	Material Description	Remarks
129.0	0	SS	S-1	24	9 6 6 4	16	12		FILL	2" ASPHALT. Top 4" (A): Dry, medium dense, brown, fine to coarse SAND, some fine to coarse gravel, trace glass (FILL). Bottom 10" (B): Dry, medium dense, light brown, fine to coarse SAND, little fine gravel, little silt (SM).	
		SS	S-2	24	4 4 6 7	11	10		SAND 1	Dry, medium dense, light brown, fine to medium SAND, little silt (SP-SM).	
124.0	5	SS	S-3	24	3 4 7 6	10	11			Dry, medium dense, light brown, fine to medium SAND, little silt (SP-SM).	1" silt layer observed at 5 ft bgs.
		SS	S-4	24	7 7 8 9	16	15			Dry, medium dense, light brown, fine to medium SAND, little silt (SP-SM).	
		SS	S-5	24	2 5 7 9	12	12			Dry, medium dense, light brown, fine to medium SAND, little silt (SP-SM).	
119.0	10	SS	S-6	24	8 9 10 16	16	19			Dry, medium dense, light brown, fine to medium SAND, little silt (SP-SM).	Switched from 4" to 8" casing at 10 ft bgs.
		SS	S-7	24	8 8 7 5	10	15			Wet, medium dense, light brown, fine to medium SAND, little silt (SP-SM).	Introduced drilling mud at 12 ft bgs.
									CLAY 1	Wet, medium stiff, grayish brown, CLAY & SILT, some fine sand (CL).	

Sample Types

AS - Auger/Grab Sample
CS - California Sampler
NQ - 1.9" Rock Core
NX - 2.2" Rock Core
HP - Hydro Punch
SS - Split Spoon
ST - Shelby Tube
WS - Wash Sample
GP - Geoprobe

Consistency vs Blowcount/Foot

Granular (Sand):

V. Loose:	0-4	Dense:	30-50
Loose:	4-10	V. Dense:	>50
M. Dense:	10-30		

Fine Grained (Clay):

V. Soft:	<2	Stiff:	8-15
Soft:	2-4	V. Stiff:	15-30
M. Stiff:	4-8	Hard:	>30

Burmister Classification

and	50 - 35%
some	35 - 20%
little	20 - 10%
trace	< 10%

moisture, density, color

Reviewed by: Meredith Passaro **Date:** 2/23/2022 **Boring Number:** GEO-01

Boring Number: GEO-01

Client: NYSDEC

Project Name: Former Aluminum Louvre

Project Location: Old Bethpage, New York

Project Number: 262392

Elev. (ft)	Depth (ft)	Sample Type	Sample Number	Sample Length (in)	Blows per 6 inches	Sample Recovery (in)	N-Value	Graphic Log	Strata	Material Description	Remarks
114.0	15	SS	S-8	24	2 3 4 6	6	7		CLAY 1	Wet, medium stiff, grayish brown, CLAY & SILT, some fine sand (CL).	
		ST	U-1	24	PUSH	24	N/A			Wet, dark gray, Organic CLAY & SILT (OH).	
		SS	S-9	24	5 6 8 9	5	14			Wet, stiff, dark gray, Organic CLAY & SILT, trace fine sand (OH).	S-9 PID Reading: 20.5
109.0	20	SS	S-10	24	5 6 9 11	21	15			Top 6" (A): Moist, stiff, dark gray, Organic CLAY & SILT (OH). Middle 12" (B): Moist, stiff, grayish brown, SILT & CLAY, little fine sand (ML).	S-10B PID Reading: 0.6
		SS	S-11	24	16 24 29 29	10	53		SAND 2	Bottom 3" (C): Moist, medium dense, light brown, fine SAND, little silt (SM). Moist, very dense, light brown, fine to medium SAND, trace silt (SP-SM).	S-10C PID Reading: 4.5 S-11 PID Reading: 13.3
104.0	25	SS	S-12	24	13 17 29 29	12	46			Wet, dense, brown, fine to medium SAND, trace silt (SP-SM).	S-12 PID Reading: 3.3
99.0	30									Test boring terminated at 26.0 feet bgs.	

Boring Number: GEO-02

Client: NYSDEC
Project Name: Former Aluminum Louvre
Project Location: Old Bethpage, New York
Project Number: 262392

Drilling Contractor/Driller: LAWES/C. Pedersen
Surface Elevation (ft): 129.0
Drilling Method/Bore Hole Diameter: Drive and Wash & Mud Rotary/8 in.
Total Depth (ft): 70.0
Hammer Style/Weight/Drop Height/Spoon Size: Automatic/140 lb/30 in./2 in.
Depth to Initial Water Level (ft):

Depth	Date	Time
NE		

Bore Hole Location:
Lat: 40.7612216 **Long:** -73.4436421
Abandonment Method: Backfilled with cement grout.
Drilling Date: **Start:** 1/20/2022 **End:** 1/25/2022
Logged By: R. Levinton

Elev. (ft)	Depth (ft)	Sample Type	Sample Number	Sample Length (in)	Blows per 6 inches	Sample Recovery (in)	N-Value	Graphic Log	Strata	Material Description	Remarks
129.0	0	SS	S-1	24	9 8 6 5	12	14		FILL	2" ASPHALT. Top 4" (A): Dry, medium dense, brown, fine to coarse SAND and fine to coarse GRAVEL, little silt (FILL). Bottom 6" (B): Dry, medium dense, light brown, fine to medium SAND, little coarse gravel, trace silt (SP).	
		SS	S-2	24	8 8 9 9	14	17		SAND 1	Dry, medium dense, light brown, fine to medium SAND, trace silt (SP).	
124.0	5	SS	S-3	24	5 3 6 8	9	9			Dry, loose, light brown, fine to medium SAND, trace silt (SP).	
		SS	S-4	24	9 10 11 13	16	21			Dry, medium dense, light brown, fine SAND, trace silt (SP-SM).	
		SS	S-5	24	8 11 12 14	16	23			Dry, medium dense, light brown, fine SAND, trace silt (SP-SM).	
119.0	10	SS	S-6	24	5 6 7 10	15	13			Dry, medium dense, light brown, fine SAND, trace silt (SP-SM).	
		SS	S-7	24	6 6 4 5	18	10			Top 9" (A): Moist, medium dense, light brown, fine to medium SAND, little silt & clay (SM).	
									CLAY 1	Bottom 9" (B): Moist, stiff, grayish brown, Slightly Organic CLAY & SILT, trace fine sand (CL). Moist, dark gray, Organic CLAY & SILT (OL).	

Sample Types

AS - Auger/Grab Sample
CS - California Sampler
NQ - 1.9" Rock Core
NX - 2.2" Rock Core
HP - Hydro Punch
SS - Split Spoon
ST - Shelby Tube
WS - Wash Sample
GP - Geoprobe

Consistency vs Blowcount/Foot

Granular (Sand):

V. Loose:	0-4	Dense:	30-50
Loose:	4-10	V. Dense:	>50
M. Dense:	10-30		

Fine Grained (Clay):

V. Soft:	<2	Stiff:	8-15
Soft:	2-4	V. Stiff:	15-30
M. Stiff:	4-8	Hard:	>30

Burmister Classification

and	50 - 35%
some	35 - 20%
little	20 - 10%
trace	< 10%

moisture, density, color

Reviewed by: Meredith Passaro **Date:** 2/23/2022 **Boring Number:** GEO-02

Boring Number: GEO-02

Client: NYSDEC

Project Name: Former Aluminum Louvre

Project Location: Old Bethpage, New York

Project Number: 262392

Elev. (ft)	Depth (ft)	Sample Type	Sample Number	Sample Length (in)	Blows per 6 inches	Sample Recovery (in)	N-Value	Graphic Log	Strata	Material Description	Remarks
114.0	15	ST	U-1	24	PUSH	22	N/A		CLAY 1	Moist, dark gray, Organic CLAY & SILT (OL).	
		SS	S-8	24	4 5 7 8	18	12			Moist, stiff, dark gray, Organic CLAY & SILT (OH).	
		SS	S-9	24	2 3 6 10	23	9			Top 19" (A): Dry, stiff, grayish brown, CLAY & SILT, trace fine sand (CL).	
109.0	20	SS	S-10	24	10 11 9 14	15	20		SAND 2	Bottom 4" (B): Moist, loose, light brown, fine to coarse SAND, little silt (SM). Dry, medium dense, light brown, fine to medium SAND, little silt (SM).	S-9B PID Reading: 1.7 S-10 PID Reading: 1.7
		SS	S-11	24	12 23 27 26	10	50			Moist, very dense, light brown, fine to medium SAND, little silt (SM).	Switched from 4" to 8" casing at 22 ft bgs.
104.0	25	SS	S-12	24	15 24 24 28	11	48			Wet, dense, brown, fine to medium SAND, little silt (SM).	S-12 PID Reading: 4.7
99.0	30	SS	S-13	24	13 22 22 20	11	44			Wet, dense, brown, fine to medium SAND, little silt (SM).	S-13 PID Reading: 4.3
										Wet, dense, light brown, fine to medium SAND, little silt (SP-SM).	S-14 PID Reading: 3.9

Boring Number: GEO-02

Client: NYSDEC

Project Name: Former Aluminum Louvre

Project Location: Old Bethpage, New York

Project Number: 262392

Elev. (ft)	Depth (ft)	Sample Type	Sample Number	Sample Length (in)	Blows per 6 inches	Sample Recovery (in)	N-Value	Graphic Log	Strata	Material Description	Remarks
94.0	35	SS	S-14	24	15 21 25 31	10	46		SAND 2	Wet, dense, light brown, fine to medium SAND, little silt (SP-SM).	
89.0	40	SS	S-15	24	22 39 49 64	11	88			Wet, very dense, brown, fine to medium SAND, little silt (SP-SM).	
84.0	45	SS	S-16	24	5 47 83 84	10	130			Wet, very dense, brown, fine to medium SAND, little silt (SP-SM).	
79.0	50	SS	S-17	24	27 29 21 57	8	50			Wet, very dense, light brown, fine to medium SAND, little silt (SM).	S-17 PID Reading: 0.7
		SS	S-18	24	28 38 41 49	13	79			Wet, very dense, light brown, fine to medium SAND, little silt, trace fine gravel (SM).	S-18 PID Reading: 1.1

Boring Number: GEO-02

Client: NYSDEC

Project Name: Former Aluminum Louvre

Project Location: Old Bethpage, New York

Project Number: 262392

Elev. (ft)	Depth (ft)	Sample Type	Sample Number	Sample Length (in)	Blows per 6 inches	Sample Recovery (in)	N-Value	Graphic Log	Strata	Material Description	Remarks
74.0	55								SAND 2	Wet, very dense, light brown, fine to medium SAND, little silt, trace fine gravel (SM).	
		SS	S-19	24	48 46 74 70	13	120			Wet, very dense, light brown, fine to medium SAND, little silt (SM).	S-19 PID Reading: 0.5
69.0	60								SANDY SILT		
		SS	S-20	24	8 9 14 26	22	23			Moist, very stiff, light brown to dark grayish brown, SILT & CLAY, some fine to medium sand (CL-ML).	S-20 PID Reading: 16.5
64.0	65										
		SS	S-21	24	16 20 26 29	21	46			Moist, hard, dark gray to light brown, SILT & CLAY, and fine SAND (ML).	
59.0	70									Test boring terminated at 70.0 feet bgs.	

Attachment B - Photographic Log
NYSDEC Site No. 130195 - Former Aluminum Louvre

Photograph #1
Date: 01/18/2022
Description: Site upon arrival (facing east).

Photograph #2
Date: 01/18/2022
Description: Site upon arrival (facing north).

Attachment B - Photographic Log
NYSDEC Site No. 130195 - Former Aluminum Louvre

Photograph #3
Date: 01/18/2022
Description: GPR investigation.

Photograph #4
Date: 01/18/2022
Description: Utility markout.

Attachment B - Photographic Log
NYSDEC Site No. 130195 - Former Aluminum Louvre

Photograph #5
Date: 01/19/2022
Description: Drill rig setup at GEO-01.

Photograph #6
Date: 01/19/2022
Description: Split-spoon decontamination bucket.

Attachment B - Photographic Log
NYSDEC Site No. 130195 - Former Aluminum Louvre

Photograph #7
Date: 01/19/2022
Description: Drilling at GEO-01.

Photograph #8
Date: 01/19/2022
Description: GEO-01, S-1 (0'-2')

Attachment B - Photographic Log
NYSDEC Site No. 130195 - Former Aluminum Louvre

Photograph #9
Date: 01/19/2022
Description: GEO-01, S-2 (2'-4')

Photograph #10
Date: 01/19/2022
Description: GEO-01, S-3 (4'-6')

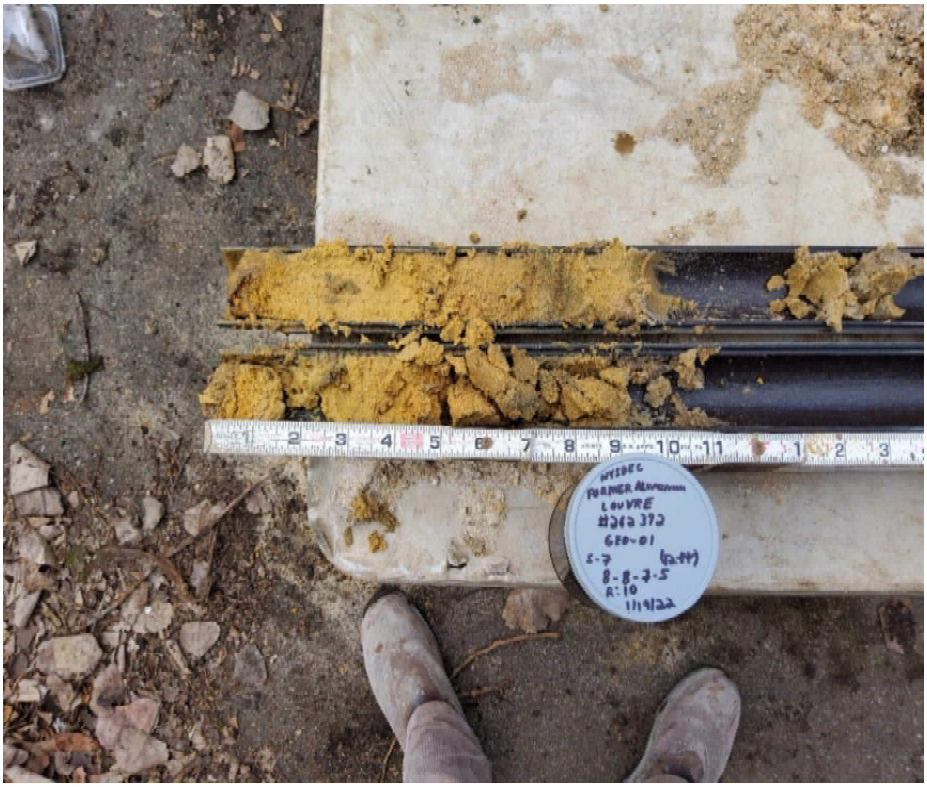
Attachment B - Photographic Log
NYSDEC Site No. 130195 - Former Aluminum Louvre

Photograph #11
Date: 01/19/2022
Description: GEO-01, S-4 (6'-8')

Photograph #12
Date: 01/19/2022
Description: GEO-01, S-5 (8'-10')

Attachment B - Photographic Log
NYSDEC Site No. 130195 - Former Aluminum Louvre

Photograph #13
Date: 01/19/2022
Description: GEO-01, S-6 (10'-12')



Photograph #14
Date: 01/19/2022
Description: GEO-01, S-7 (12'-14')

Attachment B - Photographic Log
NYSDEC Site No. 130195 - Former Aluminum Louvre

Photograph #15
Date: 01/19/2022
Description: GEO-01, S-8 (14'-16')

Photograph #16
Date: 01/19/2022
Description: GEO-01, U-1 (16'-18')

Attachment B - Photographic Log
NYSDEC Site No. 130195 - Former Aluminum Louvre

Photograph #17
Date: 01/19/2022
Description: GEO-01, S-9 (18'-20')

Photograph #18
Date: 01/19/2022
Description: GEO-01, S-10 (20'-22')

Attachment B - Photographic Log
NYSDEC Site No. 130195 - Former Aluminum Louvre

Photograph #19
Date: 01/19/2022
Description: GEO-01, S-11 (22'-24')

Photograph #20
Date: 01/19/2022
Description: GEO-01, S-12 (24'-26')

Attachment B - Photographic Log
NYSDEC Site No. 130195 - Former Aluminum Louvre

Photograph #21
Date: 01/20/2022
Description: GEO-02, S-1 (0'-2')

Photograph #22
Date: 01/20/2022
Description: GEO-02, S-2 (2'-4')

Attachment B - Photographic Log
NYSDEC Site No. 130195 - Former Aluminum Louvre

Photograph #23
Date: 01/20/2022
Description: GEO-02, S-3 (4'-6')

Photograph #24
Date: 01/20/2022
D

Attachment B - Photographic Log
NYSDEC Site No. 130195 - Former Aluminum Louvre

Photograph #25
Date: 01/20/2022
Description: GEO-02, S-5 (8'-10')

Photograph #26
Date: 01/20/2022
Description: GEO-02, S-6 (10'-12')

Attachment B - Photographic Log
NYSDEC Site No. 130195 - Former Aluminum Louvre

Photograph #27
Date: 01/20/2022
Description: GEO-02, S-7 (12'-14')

Photograph #28
Date: 01/20/2022
Description: GEO-02, U-1 (14'-16')

Attachment B - Photographic Log
NYSDEC Site No. 130195 - Former Aluminum Louvre

Photograph #29
Date: 01/20/2022
Description: GEO-02, S-8 (16'-18')

Photograph #30
Date: 01/20/2022
Description: GEO-02, S-9 (18'-20')

Attachment B - Photographic Log
NYSDEC Site No. 130195 - Former Aluminum Louvre

Photograph #31
Date: 01/20/2022
Description: GEO-02, S-10 (20'-22')

Photograph #32
Date: 01/20/2022
Description: GEO-02, S-11 (22'-24')

Attachment B - Photographic Log
NYSDEC Site No. 130195 - Former Aluminum Louvre

Photograph #33
Date: 01/20/2022
Description: GEO-02, S-12 (24'-26')

Photograph #34
Date: 01/20/2022
Description: GEO-02, S-13 (29'-31')

Attachment B - Photographic Log
NYSDEC Site No. 130195 - Former Aluminum Louvre

Photograph #35
Date: 01/20/2022
Description: GEO-02, S-14 (34'-36')

Photograph #36
Date: 01/21/2022
Description: GEO-02, S-15 (39'-41')

Attachment B - Photographic Log
NYSDEC Site No. 130195 - Former Aluminum Louvre

Photograph #37
Date: 01/24/2022
Description: Offset GEO-02 location.

Photograph #38
Date: 01/25/2022
Description: GEO-02, S-16 (43'-45')

Attachment B - Photographic Log
NYSDEC Site No. 130195 - Former Aluminum Louvre

Photograph #39
Date: 01/25/2022
Description: GEO-02, S-17 (48'-50')

Photograph #40
Date: 01/25/2022
Description: GEO-02, S-18 (53'-55')

Attachment B - Photographic Log
NYSDEC Site No. 130195 - Former Aluminum Louvre

Photograph #41
Date: 01/25/2022
Description: GEO-02, S-19 (58'-60')

Photograph #42
Date: 01/25/2022
Description: GEO-02, S-20 (63'-65')

Attachment B - Photographic Log
NYSDEC Site No. 130195 - Former Aluminum Louvre

Photograph #43
Date: 01/25/2022
Description: GEO-02, S-21 (68'-70')

Photograph #44
Date: 01/25/2022
Description: Grouting GEO-02.

Attachment B - Photographic Log
NYSDEC Site No. 130195 - Former Aluminum Louvre

Photograph #45
Date: 01/26/2022
Description: Surface repair at GEO-01.

Photograph #46
Date: 01/26/2022
Description: Surface repair at GEO-02.

Attachment B - Photographic Log
NYSDEC Site No. 130195 - Former Aluminum Louvre

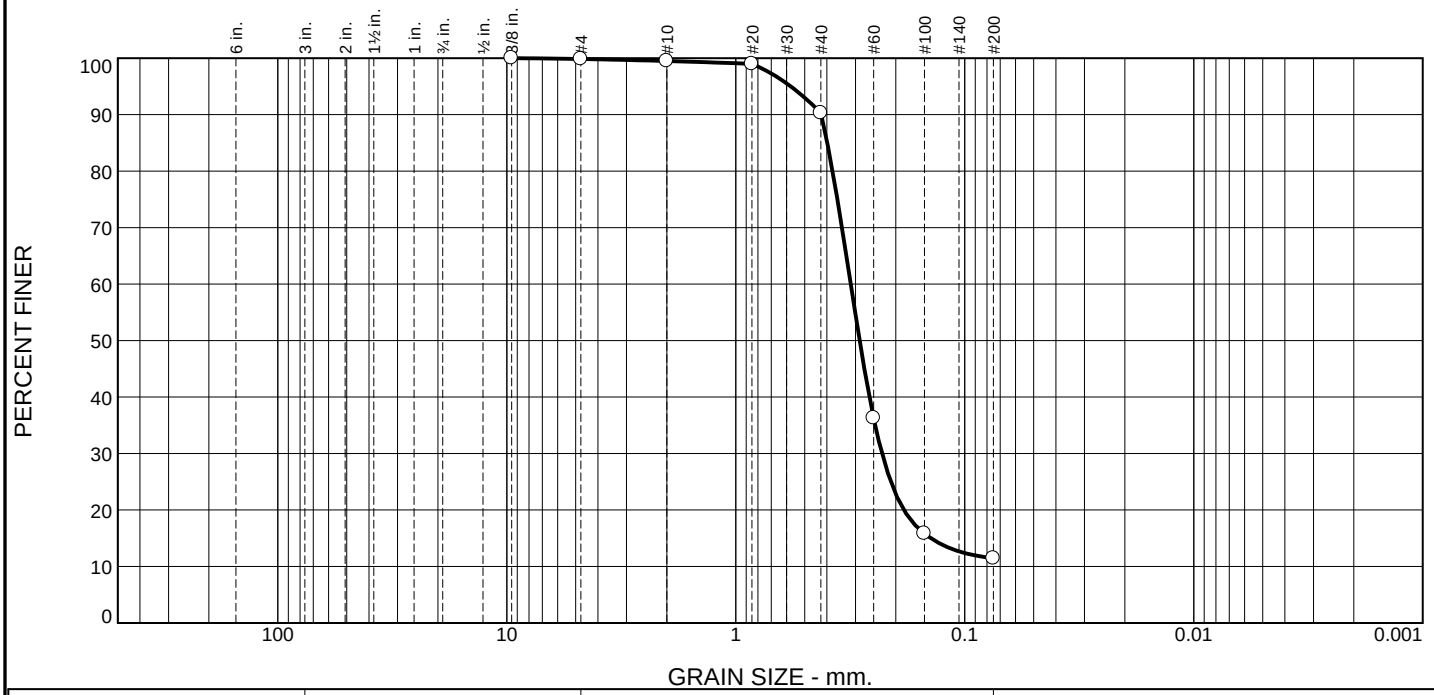
Photograph #47
Date: 01/26/2022
Description: Staging of IDW drums.

Photograph #48
Date: 01/26/2022
Description: Site at end of drilling (facing northwest).

Attachment B - Photographic Log
NYSDEC Site No. 130195 - Former Aluminum Louvre

Photograph #49
Date: 01/26/2022
Description: Site at end of drilling (facing east).

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	0.1	0.4	9.2	78.9	11.4	

Test Results (ASTM D6913 & ASTM D1140)

Opening Size	Percent Finer	Spec.* (Percent)	Pass? (X=Fail)
0.375"	100.0		
#4	99.9		
#10	99.5		
#20	99.0		
#40	90.3		
#60	36.3		
#100	15.8		
#200	11.4		

* (no specification provided)

Material Description

Brown poorly graded sand with silt

Atterberg Limits (ASTM D 4318)

PL= LL= PI=

Classification

USCS (D 2487)= SP-SM **AASHTO (M 145)=** A-2-4(0)

Coefficients

D_{90}= 0.4233 D_{85}= 0.3983 D_{60}= 0.3147
D_{50}= 0.2877 D_{30}= 0.2298 D_{15}= 0.1404
D_{10}= C_u= C_c=

Remarks

As Received Moisture Content = 9.5%

Date Received: 1/28/22 **Date Tested:** 2/2/22

Tested By: AS

Checked By: MP

Title: Laboratory Manager

Source of Sample: GEO-01 **Depth:** 6-8'
Sample Number: S-4

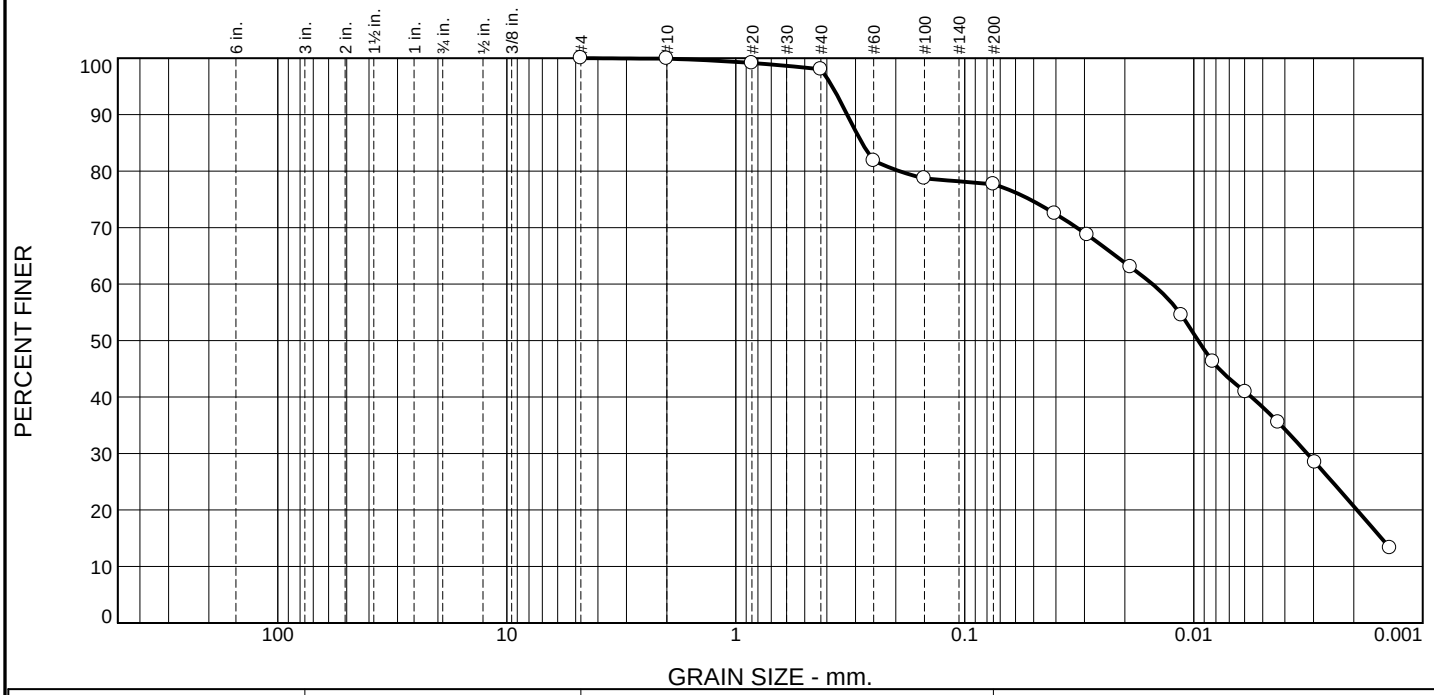
Date Sampled: 21/19/21

CDM Smith

Boston, Massachusetts

Client: NYSDEC
Project: Former Aluminum Louvre
Old Bethpage, NY
Project No: 897-262392

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	0.0	0.1	1.9	20.3	39.5	38.2

Test Results (ASTM D6913 & D7928 & ASTM D1140)

Opening Size	Percent Finer	Spec.* (Percent)	Pass? (X=Fail)
#4	100.0		
#10	99.9		
#20	99.1		
#40	98.0		
#60	81.8		
#100	78.7		
#200	77.7		
0.0405 mm.	72.5		
0.0292 mm.	68.7		
0.0189 mm.	63.0		
0.0113 mm.	54.5		
0.0083 mm.	46.3		
0.0059 mm.	40.9		
0.0043 mm.	35.5		
0.0030 mm.	28.4		
0.0014 mm.	13.3		

* (no specification provided)

Material Description

Gray and brown lean clay with sand

Atterberg Limits (ASTM D 4318)

PL= 24 **LL=** 39 **PI=** 15

Classification

USCS (D 2487)= CL **AASHTO (M 145)=** A-6(12)

Coefficients

D_{90}= 0.3263 D_{85}= 0.2810 D_{60}= 0.0151
D_{50}= 0.0096 D_{30}= 0.0032 D_{15}= 0.0015
D_{10}= C_u= C_c=

Remarks

As Received Moisture Content = 28.7%

Date Received: 1/28/22 **Date Tested:** 2/3/22

Tested By: AS/MP

Checked By: MP

Title: Laboratory Manager

Source of Sample: GEO-01 **Depth:** 14-16'
Sample Number: S-8

Date Sampled: 1/19/22

CDM Smith

Boston, Massachusetts

Client: NYSDEC
Project: Former Aluminum Louvre
Old Bethpage, NY
Project No: 897-262392

CDM Smith

Geotechnical Engineering Laboratory

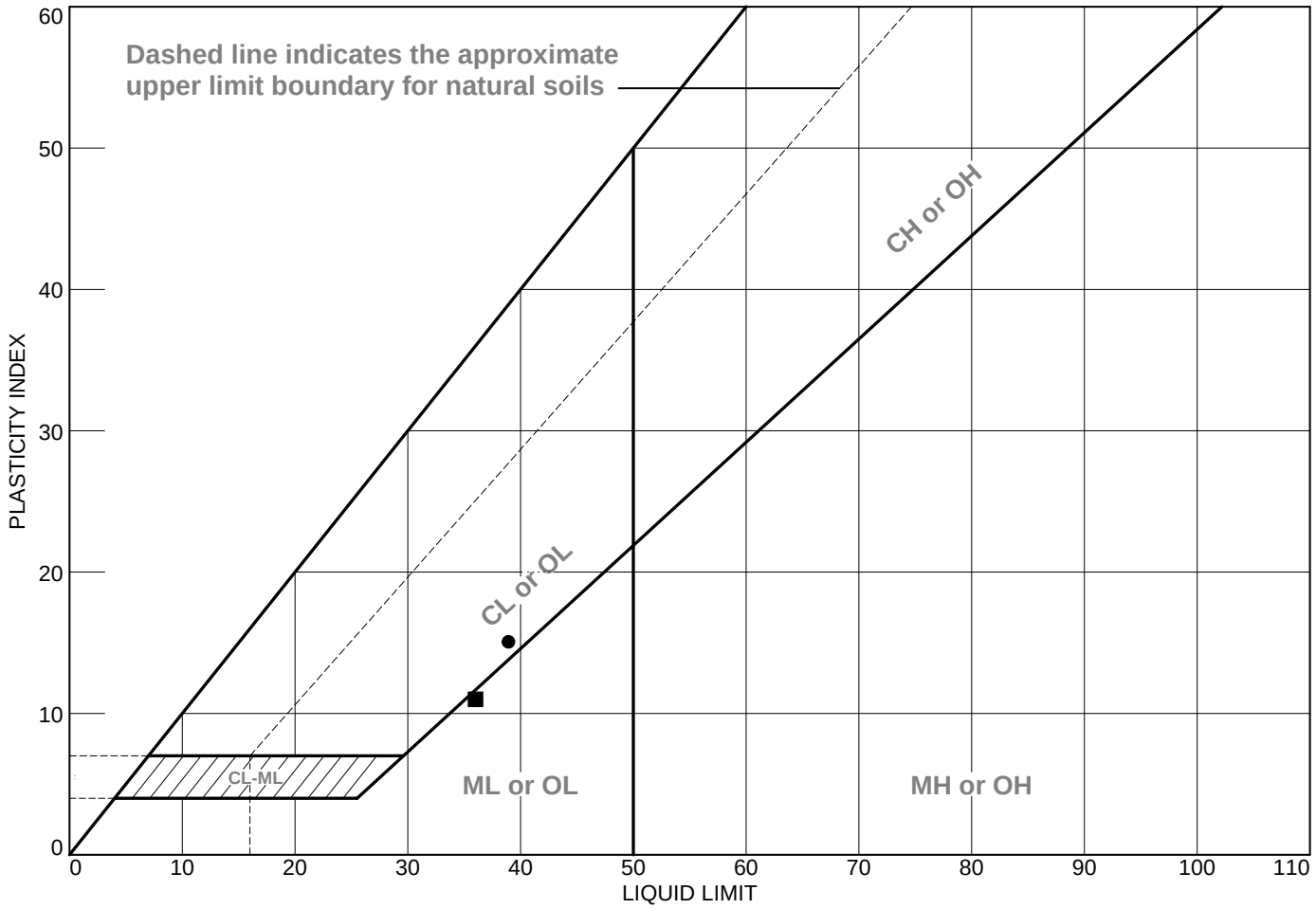
Standard Test Method for Moisture, Ash, and Organic Matter of Peat and Other Organic Soils (ASTM D2974)

Client:	NYSDEC		
Project Name:	Former Aluminum Louvre	Tested By:	AS
Project Location:	Old Bethpage, NY	Test Date:	2/1/2022
Project Number:	897-262392		
Boring Number:	GEO-01	Procedure:	C
Sample Number:	S-9	Temperature:	440° C
Sample Depth (ft):	18-20		
Sample Date:	1/19/2022		

AS RECEIVED MOISTURE CONTENT	
Tin Mass (g)	85.03
Wet Mass of Sample & Tin (g)	230.83
Dry Mass of Sample & Tin (g)	196.33
Mass of Water (g)	34.50
Mass of Dry Soil (g)	111.30
Moisture Content (%)	**31.0**

ASH CONTENT	
Porcelain Dish Mass (g)	85.03
Porcelain Dish + Oven Dried Soil (g)	196.33
Mass of Oven Dried Soil (g)	111.30
Mass of Dish & Burned Soil (g)	189.00
Mass of Burned Soil (g)	103.97
Mass of Organic Material (g)	7.33
Ash Content (%)	93.4
Organic Content (%)	**6.6**

LIQUID AND PLASTIC LIMITS TEST REPORT



SOIL DATA

SYMBOL	SOURCE	SAMPLE NO.	DEPTH	NATURAL WATER CONTENT (%)	PLASTIC LIMIT (%)	LIQUID LIMIT (%)	PLASTICITY INDEX (%)	USCS
●	GEO-01	S-8	14-16'	28.7	24	39	15	CL
■	GEO-01	S-10B	20-20.7'	26.7	25	36	11	ML

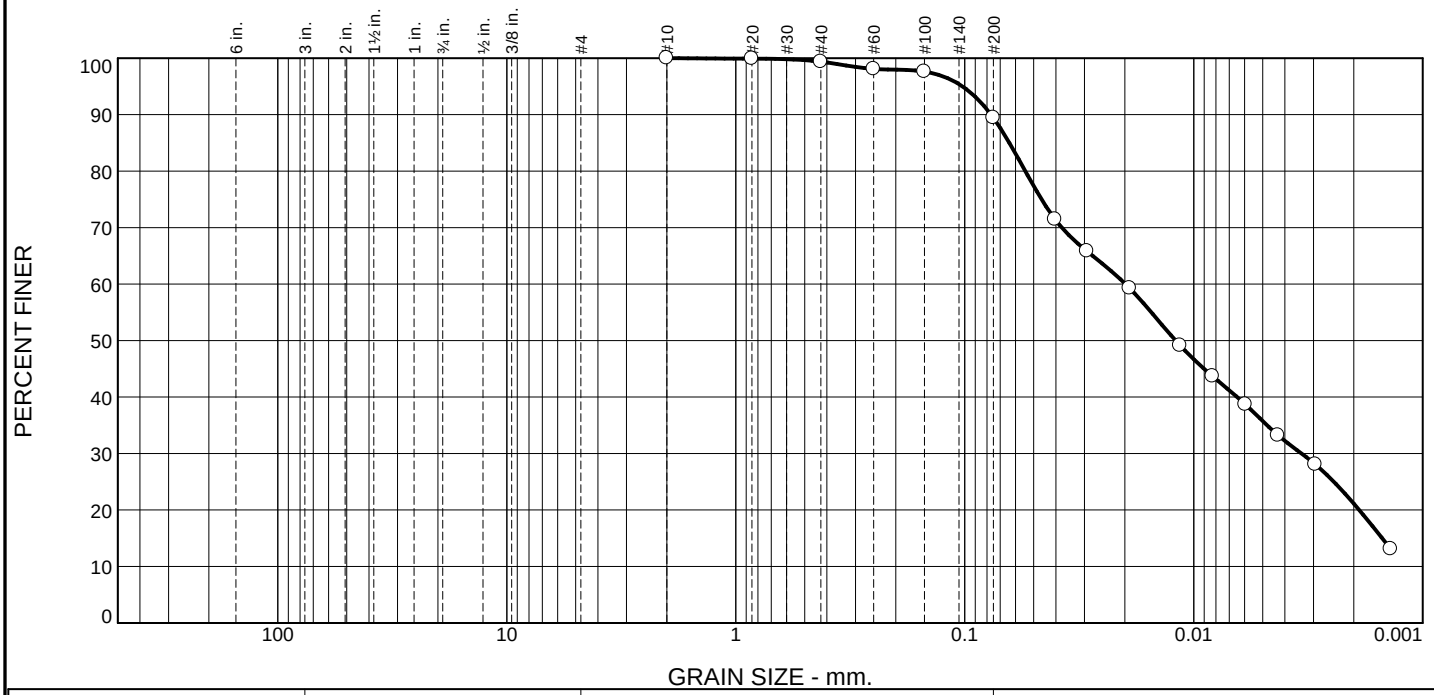
CDM Smith

Boston, Massachusetts

Client: NYSDEC
Project: Former Aluminum Louvre
Old Bethpage, NY
Project No.: 897-262392

Tested By: AS **Checked By:** MP

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	0.0	0.0	0.6	10.0	53.7	35.7

Test Results (ASTM D6913 & D7928 & ASTM D1140)

Opening Size	Percent Finer	Spec.* (Percent)	Pass? (X=Fail)
#10	100.0		
#20	99.9		
#40	99.4		
#60	98.1		
#100	97.6		
#200	89.4		
0.0403 mm.	71.4		
0.0293 mm.	65.8		
0.0191 mm.	59.3		
0.0115 mm.	49.1		
0.0083 mm.	43.7		
0.0059 mm.	38.7		
0.0043 mm.	33.2		
0.0029 mm.	28.1		
0.0014 mm.	13.1		

* (no specification provided)

Material Description

Mottled brown and gray silt

Atterberg Limits (ASTM D 4318)

PL= 25 **LL=** 36 **PI=** 11

Classification

USCS (D 2487)= ML **AASHTO (M 145)=** A-6(10)

Coefficients

D_{90}= 0.0767 D_{85}= 0.0639 D_{60}= 0.0199
D_{50}= 0.0120 D_{30}= 0.0034 D_{15}= 0.0015
D_{10}= C_u= C_c=

Remarks

As Received Moisture Content = 26.7%

Date Received: 1/28/22 **Date Tested:** 2/3/22

Tested By: AS/MP

Checked By: MP

Title: Laboratory Manager

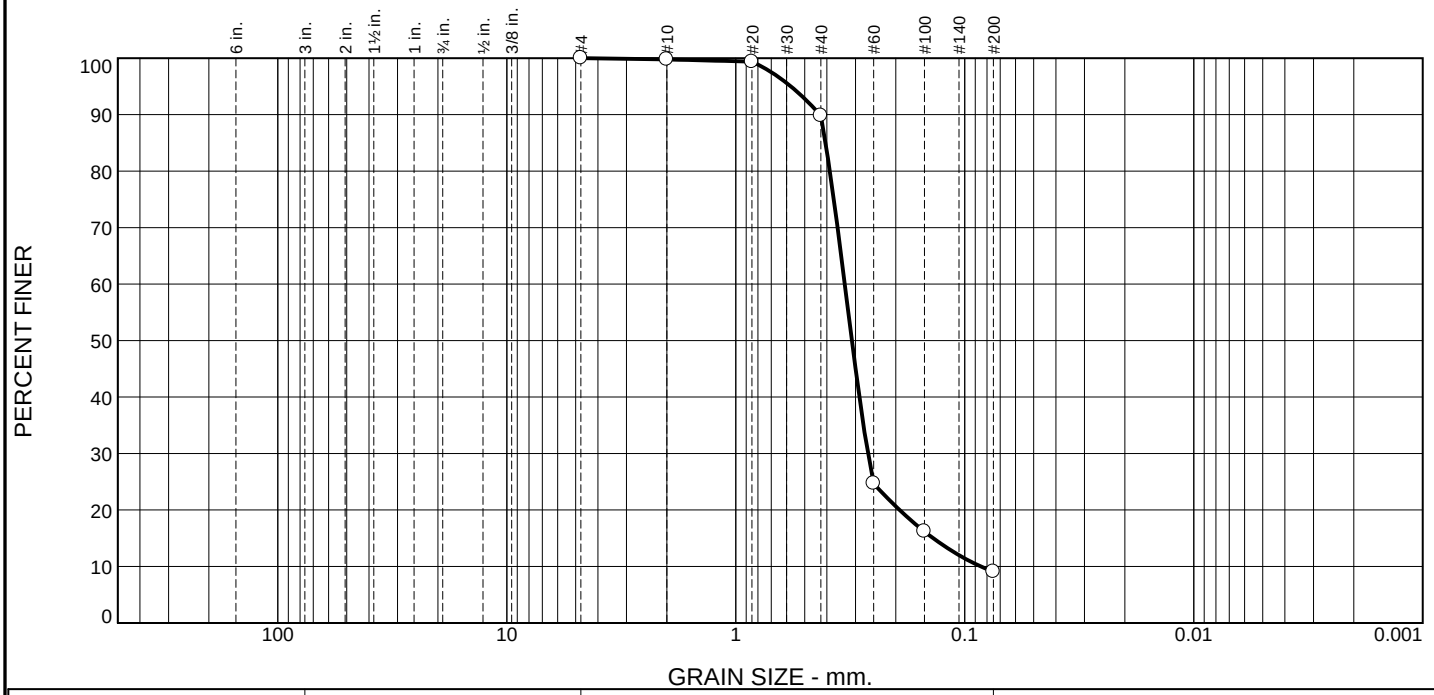
Source of Sample: GEO-01 **Depth:** 20-20.7' **Date Sampled:** 1/19/22
Sample Number: S-10B

CDM Smith

Boston, Massachusetts

Client: NYSDEC
Project: Former Aluminum Louvre
Old Bethpage, NY
Project No: 897-262392

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	0.0	0.2	10.0	80.7	9.1	

Test Results (ASTM D6913 & ASTM D1140)

Opening Size	Percent Finer	Spec.* (Percent)	Pass? (X=Fail)
#4	100.0		
#10	99.8		
#20	99.4		
#40	89.8		
#60	24.7		
#100	16.2		
#200	9.1		

* (no specification provided)

Material Description

Brown poorly graded sand with silt

Atterberg Limits (ASTM D 4318)

PL= **LL=** **PI=**

Classification

USCS (D 2487)= SP-SM **AASHTO (M 145)=** A-3

Coefficients

D_{90}= 0.4286 D_{85}= 0.4053 D_{60}= 0.3342
D_{50}= 0.3111 D_{30}= 0.2647 D_{15}= 0.1372
D_{10}= 0.0851 C_u= 3.93 C_c= 2.46

Remarks

As Received Moisture Content = 20.1%

Date Received: 1/28/22 **Date Tested:** 2/2/22

Tested By: AS

Checked By: MP

Title: Laboratory Manager

Source of Sample: GEO-01 **Depth:** 24-26'
Sample Number: S-12

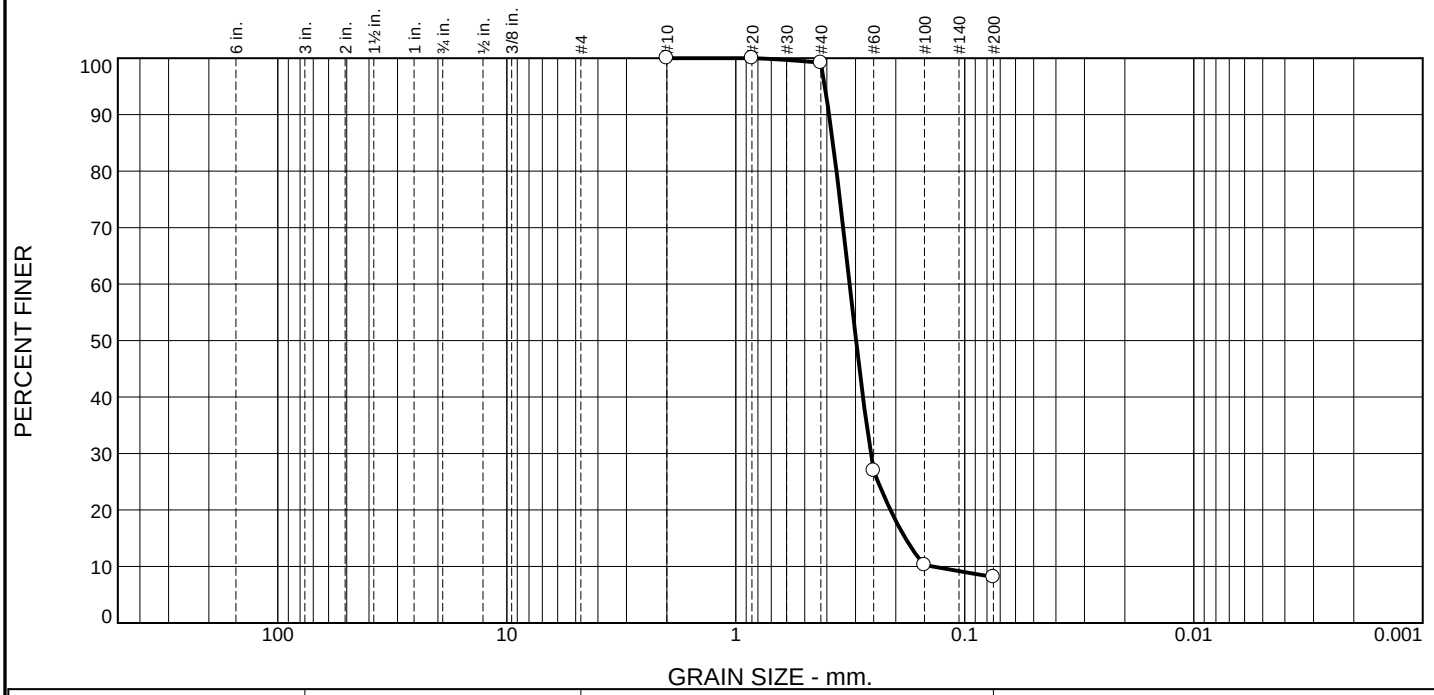
Date Sampled: 1/19/22

CDM Smith

Boston, Massachusetts

Client: NYSDEC
Project: Former Aluminum Louvre
Old Bethpage, NY
Project No: 897-262392

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	0.0	0.0	0.8	91.1	8.1	

Test Results (ASTM D6913 & ASTM D1140)

Opening Size	Percent Finer	Spec.* (Percent)	Pass? (X=Fail)
#10	100.0		
#20	100.0		
#40	99.2		
#60	27.0		
#100	10.2		
#200	8.1		

* (no specification provided)

Material Description

Light brown poorly graded sand with silt

Atterberg Limits (ASTM D 4318)

PL= **LL=** **PI=**

Classification

USCS (D 2487)= SP-SM **AASHTO (M 145)=** A-3

Coefficients

D_{90}= 0.3910 D_{85}= 0.3764 D_{60}= 0.3184
D_{50}= 0.2983 D_{30}= 0.2571 D_{15}= 0.1816
D_{10}= 0.1386 C_u= 2.30 C_c= 1.50

Remarks

As Received Moisture Content = 8.9%

Date Received: 1/28/22 **Date Tested:** 2/2/22

Tested By: AS

Checked By: MP

Title: Laboratory Manager

Source of Sample: GEO-02 **Depth:** 10-12'
Sample Number: S-6

Date Sampled: 1/20/22

CDM Smith

Boston, Massachusetts

Client: NYSDEC
Project: Former Aluminum Louvre
Old Bethpage, NY
Project No: 897-262392

CDM Smith

Geotechnical Engineering Laboratory

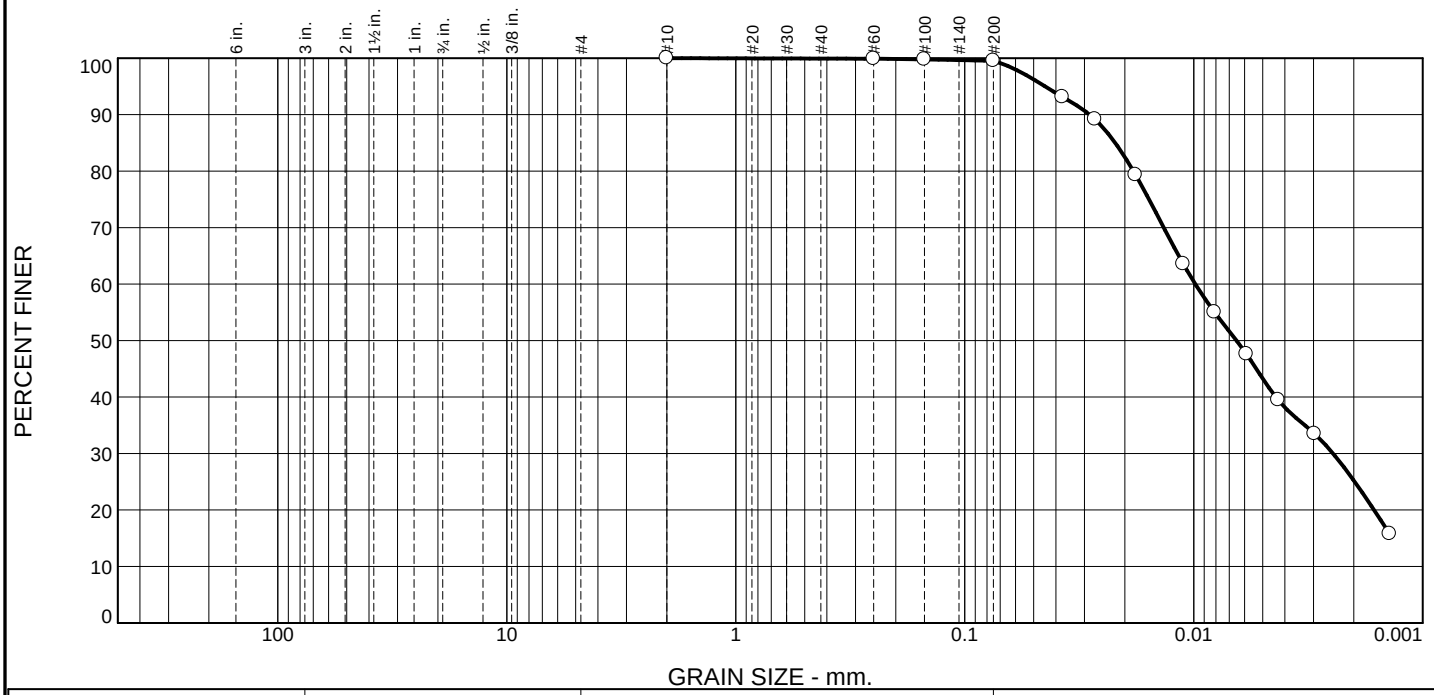
Standard Test Method for Moisture, Ash, and Organic Matter of Peat and Other Organic Soils (ASTM D2974)

Client:	NYSDEC		
Project Name:	Former Aluminum Louvre	Tested By:	AS
Project Location:	Old Bethpage, NY	Test Date:	2/1/2022
Project Number:	897-262392		
Boring Number:	GEO-02	Procedure:	C
Sample Number:	S-7B	Temperature:	440° C
Sample Depth (ft):	13-14		
Sample Date:	1/20/2022		

AS RECEIVED MOISTURE CONTENT	
Tin Mass (g)	64.50
Wet Mass of Sample & Tin (g)	164.50
Dry Mass of Sample & Tin (g)	142.62
Mass of Water (g)	21.88
Mass of Dry Soil (g)	78.12
Moisture Content (%)	**28.0**

ASH CONTENT	
Porcelain Dish Mass (g)	64.50
Porcelain Dish + Oven Dried Soil (g)	142.62
Mass of Oven Dried Soil (g)	78.12
Mass of Dish & Burned Soil (g)	141.02
Mass of Burned Soil (g)	76.52
Mass of Organic Material (g)	1.60
Ash Content (%)	98.0
Organic Content (%)	**2.0**

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	0.0	0.0	0.1	0.4	56.2	43.3

Test Results (ASTM D6913 & D7928 & ASTM D1140)

Opening Size	Percent Finer	Spec.* (Percent)	Pass? (X=Fail)
#10	100.0		
#60	99.9		
#100	99.8		
#200	99.5		
0.0374 mm.	93.1		
0.0270 mm.	89.2		
0.0179 mm.	79.3		
0.0111 mm.	63.6		
0.0081 mm.	55.0		
0.0059 mm.	47.6		
0.0043 mm.	39.5		
0.0030 mm.	33.5		
0.0014 mm.	15.8		

* (no specification provided)

Material Description

Dark gray elastic silt

Atterberg Limits (ASTM D 4318)

PL= 35 **LL=** 50 **PI=** 15

Classification

USCS (D 2487)= MH **AASHTO (M 145)=** A-7-5(20)

Coefficients

D_{90}= 0.0285 D_{85}= 0.0220 D_{60}= 0.0098
D_{50}= 0.0065 D_{30}= 0.0025 D_{15}=
D_{10}= C_u= C_c=

Remarks

As Received Moisture Content = 33.5%

Date Received: 1/28/22 **Date Tested:** 2/2/22

Tested By: AS/MP

Checked By: MP

Title: Laboratory Manager

Source of Sample: GEO-02 **Depth:** 16-18' **Date Sampled:** 1/20/22
Sample Number: S-8

CDM Smith

Boston, Massachusetts

Client: NYSDEC
Project: Former Aluminum Louvre
Old Bethpage, NY
Project No: 897-262392

CDM Smith

Geotechnical Engineering Laboratory

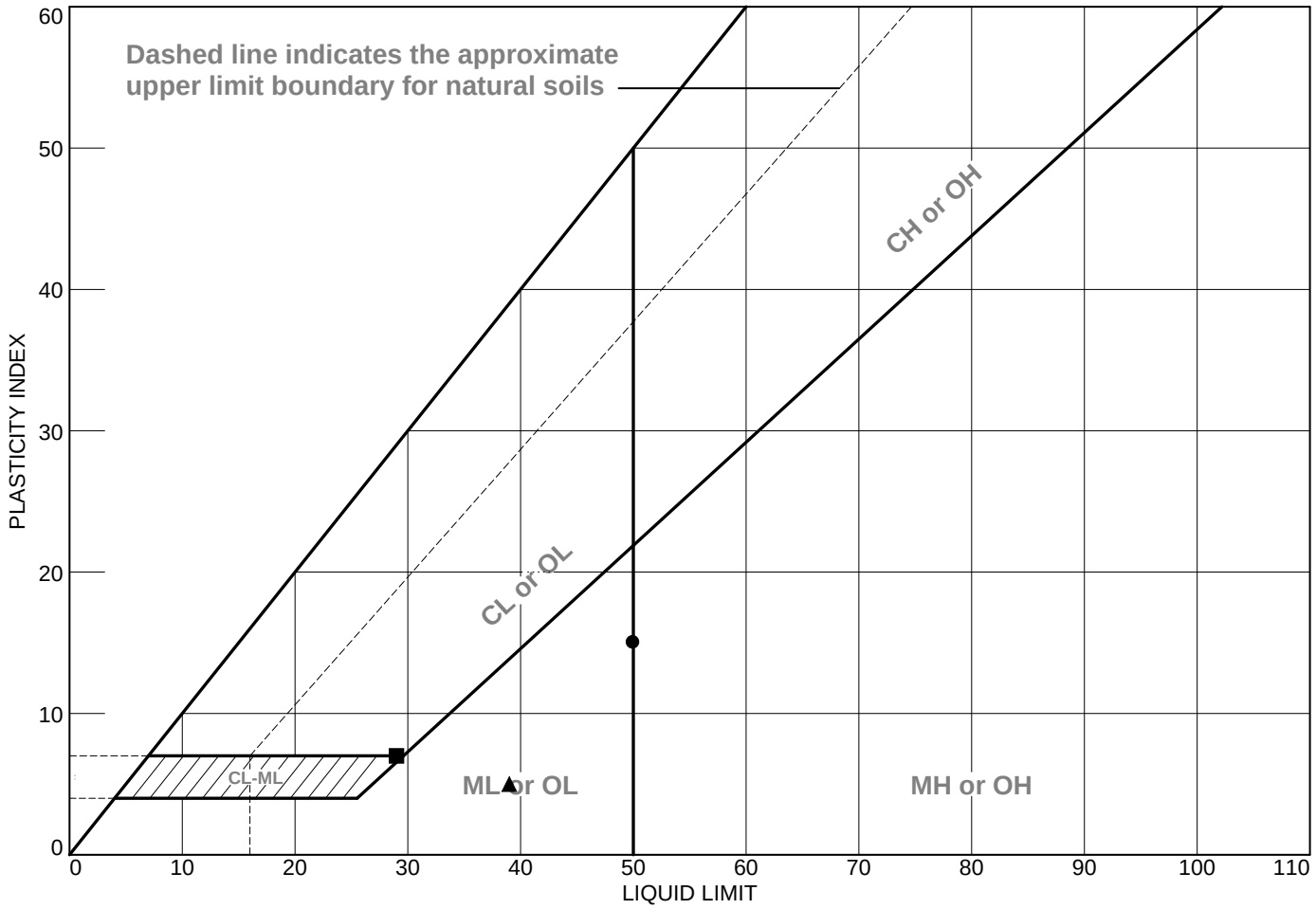
Standard Test Method for Specific Gravity of Soils
(ASTM D854)

Client:	NYSDEC		
Project Name:	Former Aluminum Louvre	Tested By:	MP
Project Location:	Old Bethpage, NY	Test Date:	1/31/2022
Project Number:	897-262392		
Boring Number:	GEO-02	Reviewed by:	MP
Sample Number:	S-8	Date:	2/4/2022
Sample Depth (ft):	16-18		
Sample Date:	1/20/2022		

HYDROSCOPIC MOISTURE CONTENT ADJUSTMENT	
Tin Mass (g)	23.22
Wet Mass of Sample & Tin (g)	57.18
Dry Mass of Sample & Tin (g)	48.66
Mass of Water (g)	8.52
Mass of Dry Soil (g)	25.44
Moisture Content (%)	**33.5%**

SPECIFIC GRAVITY			
Bottle #	D	D	
Wt Wet Soil	61.12	61.12	
Temp	20.0	21.0	
Wt bottle+water+soil	690.80	690.71	
Wt bottle+water	662.16	662.07	
wt soil	45.79	45.79	
K of water at temp	1.000	0.99979	
Specific Gravity	**2.670**	**2.670**	
Average Specific Gravity		**2.670**	

LIQUID AND PLASTIC LIMITS TEST REPORT



SOIL DATA

SYMBOL	SOURCE	SAMPLE NO.	DEPTH	NATURAL WATER CONTENT (%)	PLASTIC LIMIT (%)	LIQUID LIMIT (%)	PLASTICITY INDEX (%)	USCS
●	GEO-02	S-8	16-18'	33.5	35	50	15	MH
■	GEO-02	S-20	63-65'	26.7	22	29	7	CL-ML
▲	GEO-02	S-21	68-70'	40.3	34	39	5	ML

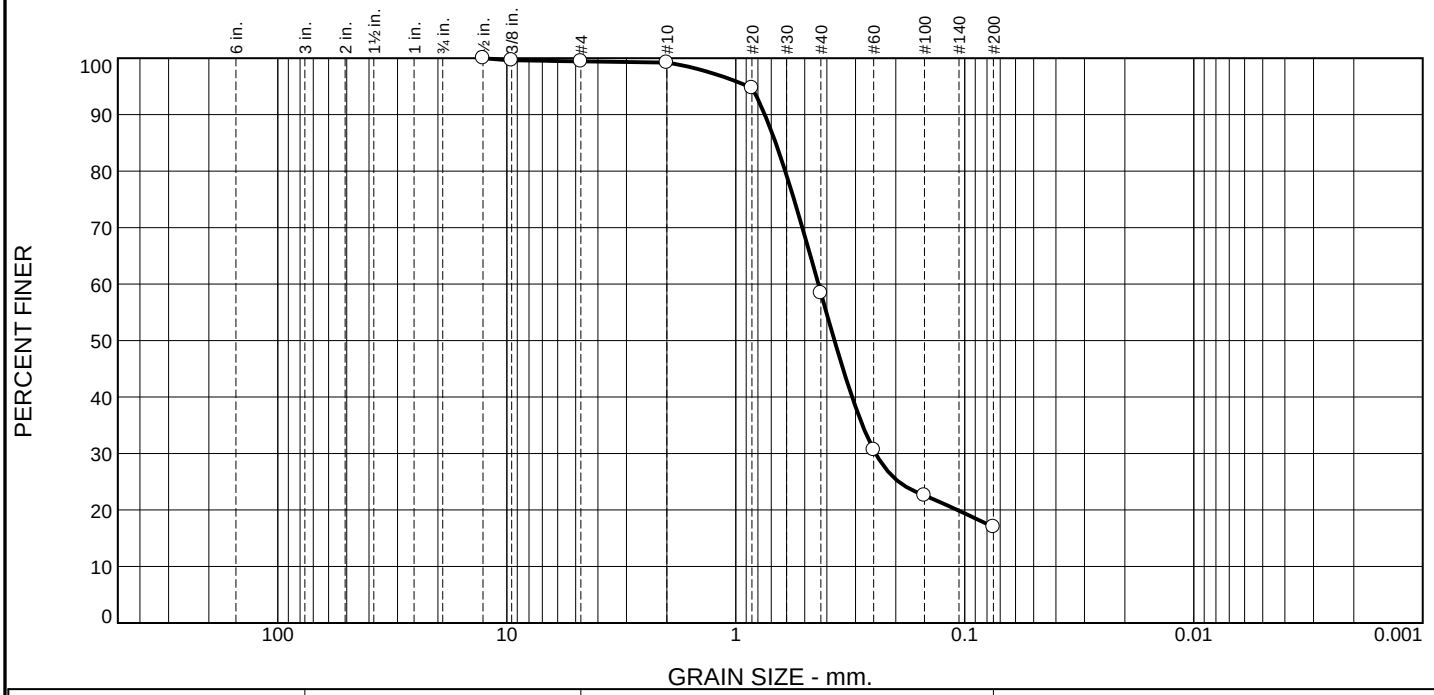
CDM Smith

Boston, Massachusetts

Client: NYSDEC
Project: Former Aluminum Louvre
Old Bethpage, NY
Project No.: 897-262392

Tested By: AS **Checked By:** MP

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	0.6	0.2	40.8	41.4	17.0	

Test Results (ASTM D6913 & ASTM D1140)

Opening Size	Percent Finer	Spec.* (Percent)	Pass? (X=Fail)
0.5"	100.0		
0.375"	99.6		
#4	99.4		
#10	99.2		
#20	94.7		
#40	58.4		
#60	30.7		
#100	22.6		
#200	17.0		

* (no specification provided)

Material Description

Gray and brown silty sand (trace clay)

Atterberg Limits (ASTM D 4318)

PL= **LL=** **PI=**

Classification

USCS (D 2487)= SM **AASHTO (M 145)=** A-2-4(0)

Coefficients

D_{90}= 0.7465 D_{85}= 0.6693 D_{60}= 0.4358
D_{50}= 0.3706 D_{30}= 0.2450 D_{15}=
D_{10}= C_u= C_c=

Remarks

As Received Moisture Content = 11.5%

Date Received: 1/28/22 **Date Tested:** 2/2/22

Tested By: AS

Checked By: MP

Title: Laboratory Manager

Source of Sample: GEO-02 **Depth:** 20-22'
Sample Number: S-10

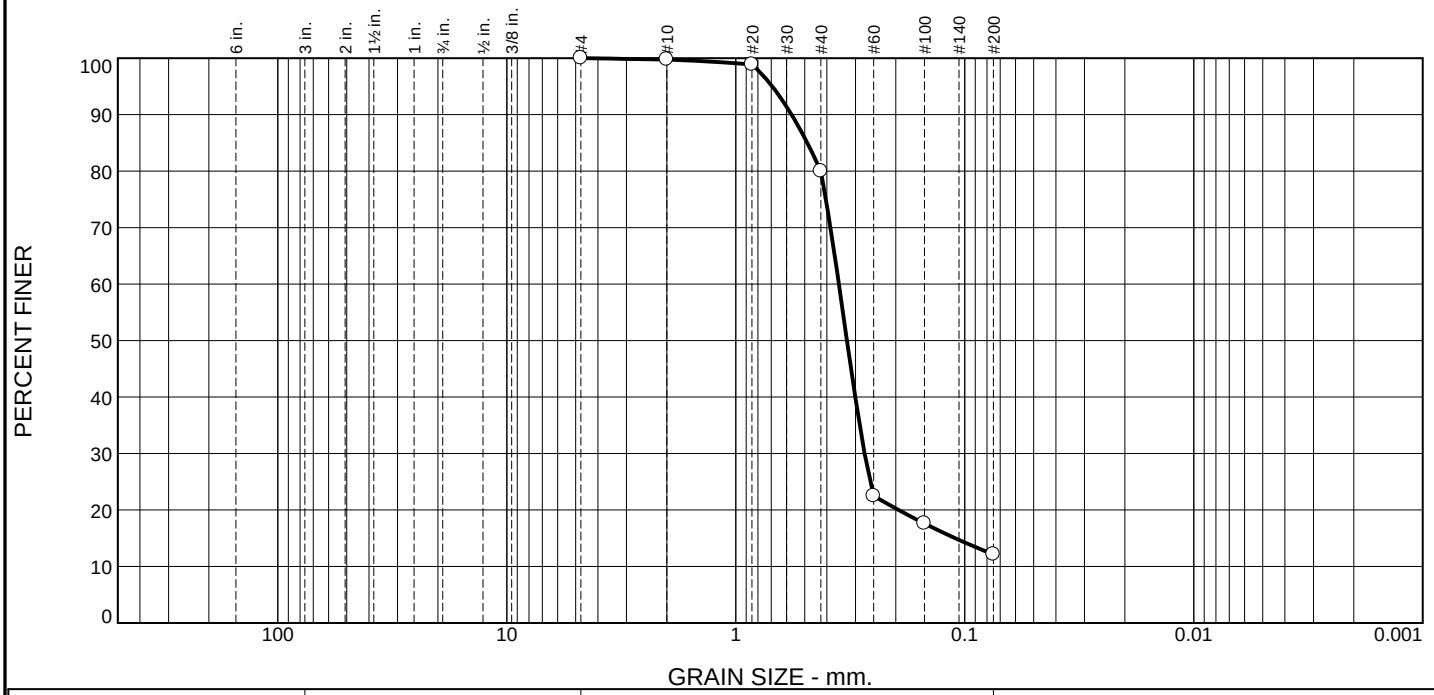
Date Sampled: 1/20/22

CDM Smith

Boston, Massachusetts

Client: NYSDEC
Project: Former Aluminum Louvre
Old Bethpage, NY
Project No: 897-262392

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	0.0	0.2	19.8	67.8	12.2	

Test Results (ASTM D6913 & ASTM D1140)

Opening Size	Percent Finer	Spec.* (Percent)	Pass? (X=Fail)
#4	100.0		
#10	99.8		
#20	98.9		
#40	80.0		
#60	22.5		
#100	17.6		
#200	12.2		

* (no specification provided)

Material Description

Brown and dark brown silty sand

Atterberg Limits (ASTM D 4318)

PL= **LL=** **PI=**

Classification

USCS (D 2487)= SM **AASHTO (M 145)=** A-2-4(0)

Coefficients

D_{90}= 0.5705 D_{85}= 0.4872 D_{60}= 0.3545
D_{50}= 0.3269 D_{30}= 0.2738 D_{15}= 0.1100
D_{10}= C_u= C_c=

Remarks

As Received Moisture Content = 18.0%

Date Received: 1/28/22 **Date Tested:** 2/2/22

Tested By: AS

Checked By: MP

Title: Laboratory Manager

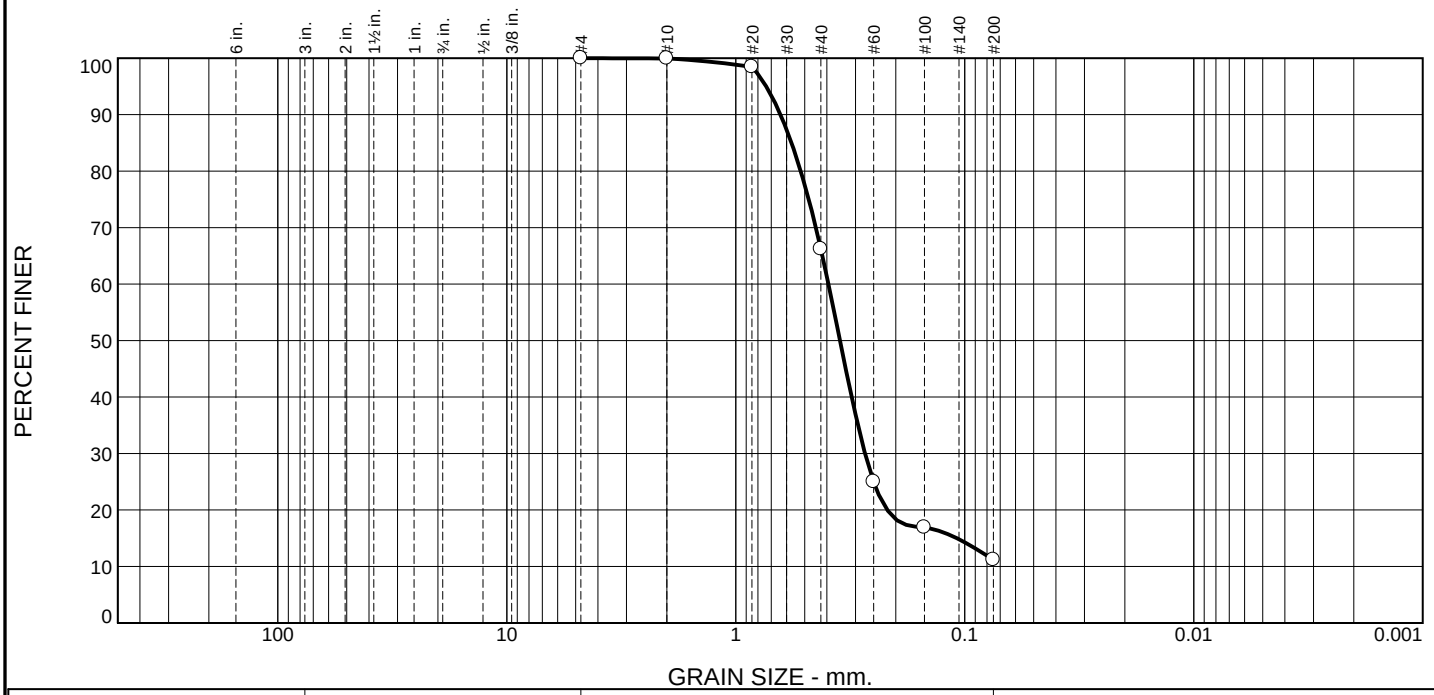
Source of Sample: GEO-02 **Depth:** 29-31' **Date Sampled:** 1/21/22
Sample Number: S-13

CDM Smith

Boston, Massachusetts

Client: NYSDEC
Project: Former Aluminum Louvre
Old Bethpage, NY
Project No: 897-262392

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	0.0	0.1	33.7	55.0	11.2	

Test Results (ASTM D6913 & ASTM D1140)

Opening Size	Percent Finer	Spec.* (Percent)	Pass? (X=Fail)
#4	100.0		
#10	99.9		
#20	98.4		
#40	66.2		
#60	25.0		
#100	16.9		
#200	11.2		

* (no specification provided)

Material Description

Mottled brown poorly graded sand with silt

Atterberg Limits (ASTM D 4318)

PL= **LL=** **PI=**

Classification

USCS (D 2487)= SP-SM **AASHTO (M 145)=** A-2-4(0)

Coefficients

D_{90}= 0.6378 D_{85}= 0.5710 D_{60}= 0.3938
D_{50}= 0.3507 D_{30}= 0.2726 D_{15}= 0.1082
D_{10}= C_u= C_c=

Remarks

As Received Moisture Content = 16.5%

Date Received: 1/28/22 **Date Tested:** 2/2/22

Tested By: AS

Checked By: MP

Title: Laboratory Manager

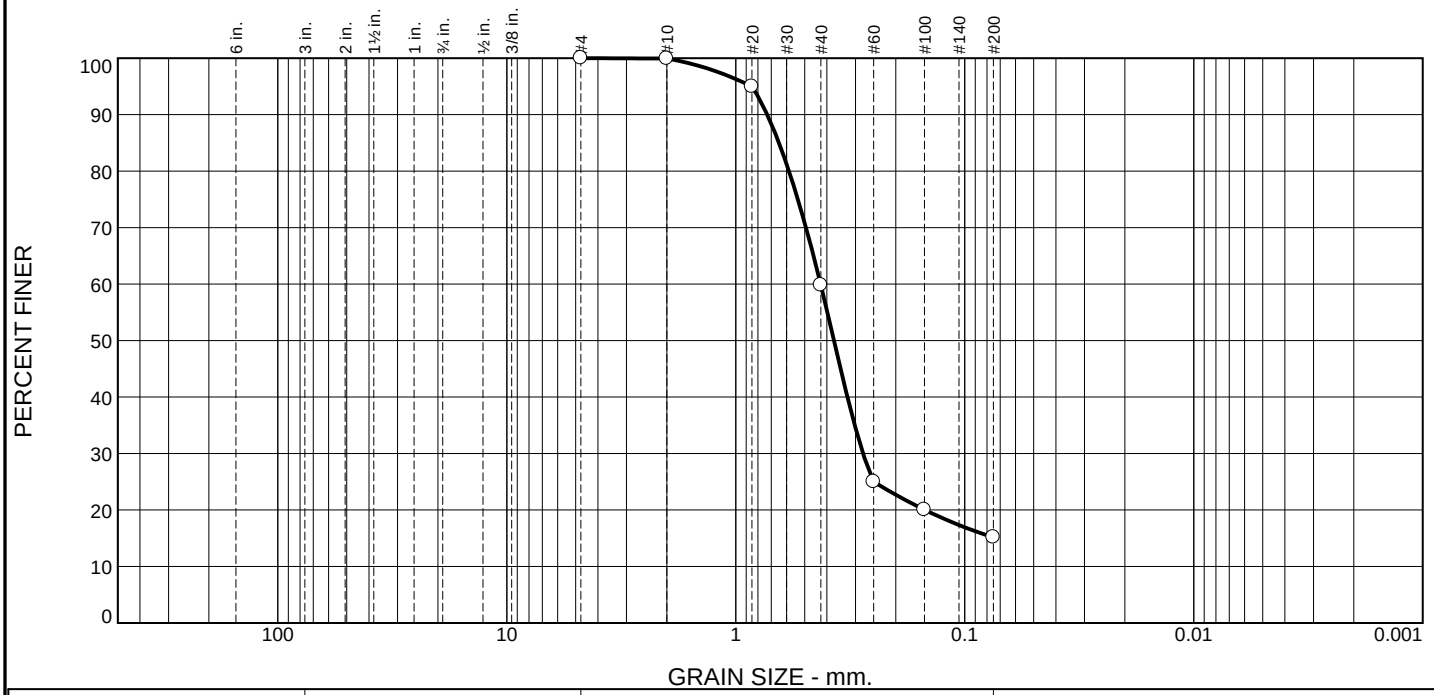
Source of Sample: GEO-02 **Depth:** 39-41' **Date Sampled:** 1/21/22
Sample Number: S-15

CDM Smith

Boston, Massachusetts

Client: NYSDEC
Project: Former Aluminum Louvre
Old Bethpage, NY
Project No: 897-262392

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	0.0	0.1	40.1	44.6	15.2	

Test Results (ASTM D6913 & ASTM D1140)

Opening Size	Percent Finer	Spec.* (Percent)	Pass? (X=Fail)
#4	100.0		
#10	99.9		
#20	95.0		
#40	59.8		
#60	25.0		
#100	20.0		
#200	15.2		

* (no specification provided)

Material Description

Mottled brown silty sand

Atterberg Limits (ASTM D 4318)

PL= **LL=** **PI=**

Classification

USCS (D 2487)= SM **AASHTO (M 145)=** A-2-4(0)

Coefficients

D_{90}= 0.7289 D_{85}= 0.6476 D_{60}= 0.4261
D_{50}= 0.3725 D_{30}= 0.2781 D_{15}=
D_{10}= C_u= C_c=

Remarks

As Received Moisture Content = 15.3%

Date Received: 1/28/22 **Date Tested:** 2/2/22

Tested By: AS

Checked By: MP

Title: Laboratory Manager

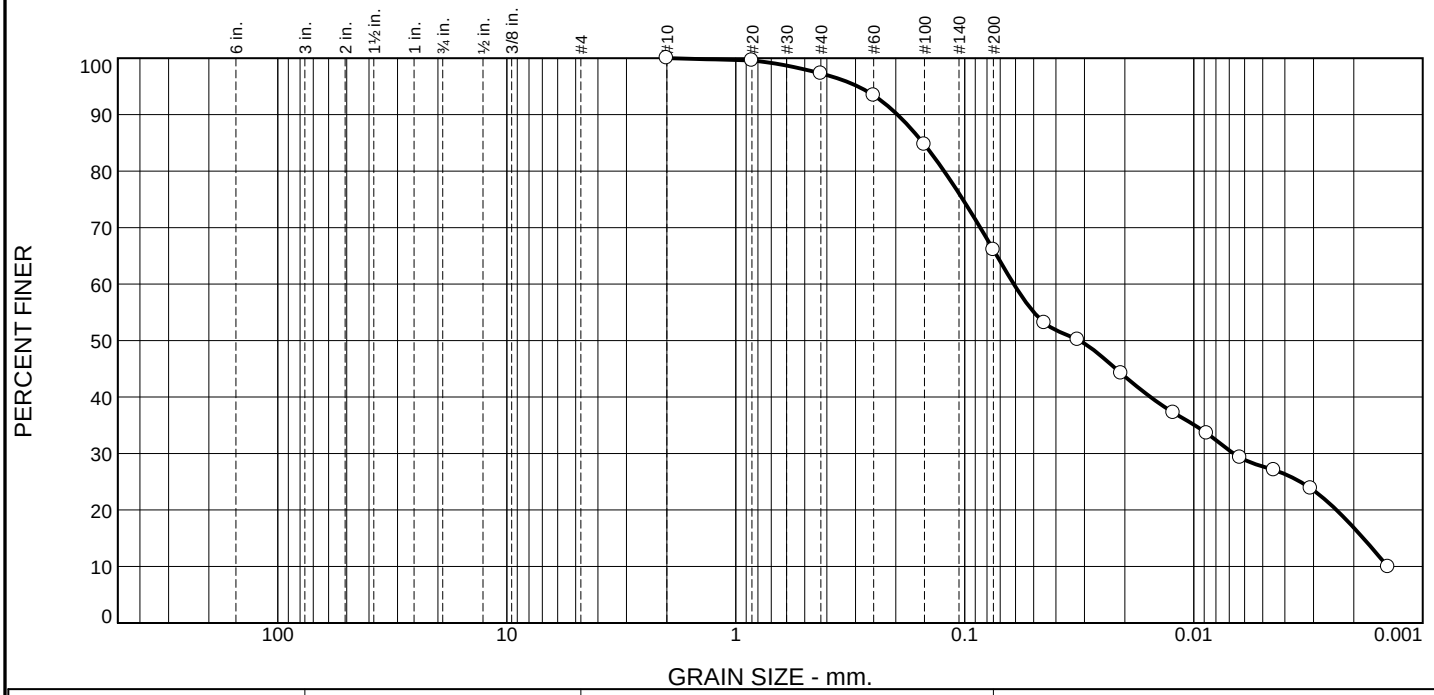
Source of Sample: GEO-02 **Depth:** 48-50' **Date Sampled:** 1/25/22
Sample Number: S-17

CDM Smith

Boston, Massachusetts

Client: NYSDEC
Project: Former Aluminum Louvre
Old Bethpage, NY
Project No: 897-262392

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	0.0	0.0	2.7	31.2	38.4	27.7

Test Results (ASTM D6913 & D7928 & ASTM D1140)

Opening Size	Percent Finer	Spec.* (Percent)	Pass? (X=Fail)
#10	100.0		
#20	99.6		
#40	97.3		
#60	93.4		
#100	84.7		
#200	66.1		
0.0449 mm.	53.1		
0.0321 mm.	50.2		
0.0208 mm.	44.2		
0.0123 mm.	37.2		
0.0088 mm.	33.6		
0.0063 mm.	29.3		
0.0045 mm.	27.1		
0.0031 mm.	23.8		
0.0014 mm.	9.9		

* (no specification provided)

Material Description

Mottled gray and brown sandy silty clay

Atterberg Limits (ASTM D 4318)

PL= 22 **LL=** 29 **PI=** 7

Classification

USCS (D 2487)= CL-ML **AASHTO (M 145)=** A-4(3)

Coefficients

D_{90}= 0.1967 D_{85}= 0.1519 D_{60}= 0.0611
D_{50}= 0.0316 D_{30}= 0.0067 D_{15}= 0.0018
D_{10}= 0.0014 C_u= 42.94 C_c= 0.51

Remarks

As Received Moisture Content = 26.7%

Date Received: 1/28/22 **Date Tested:** 2/2/22

Tested By: AS/MP

Checked By: MP

Title: Laboratory Manager

Source of Sample: GEO-02 **Depth:** 63-65'
Sample Number: S-20

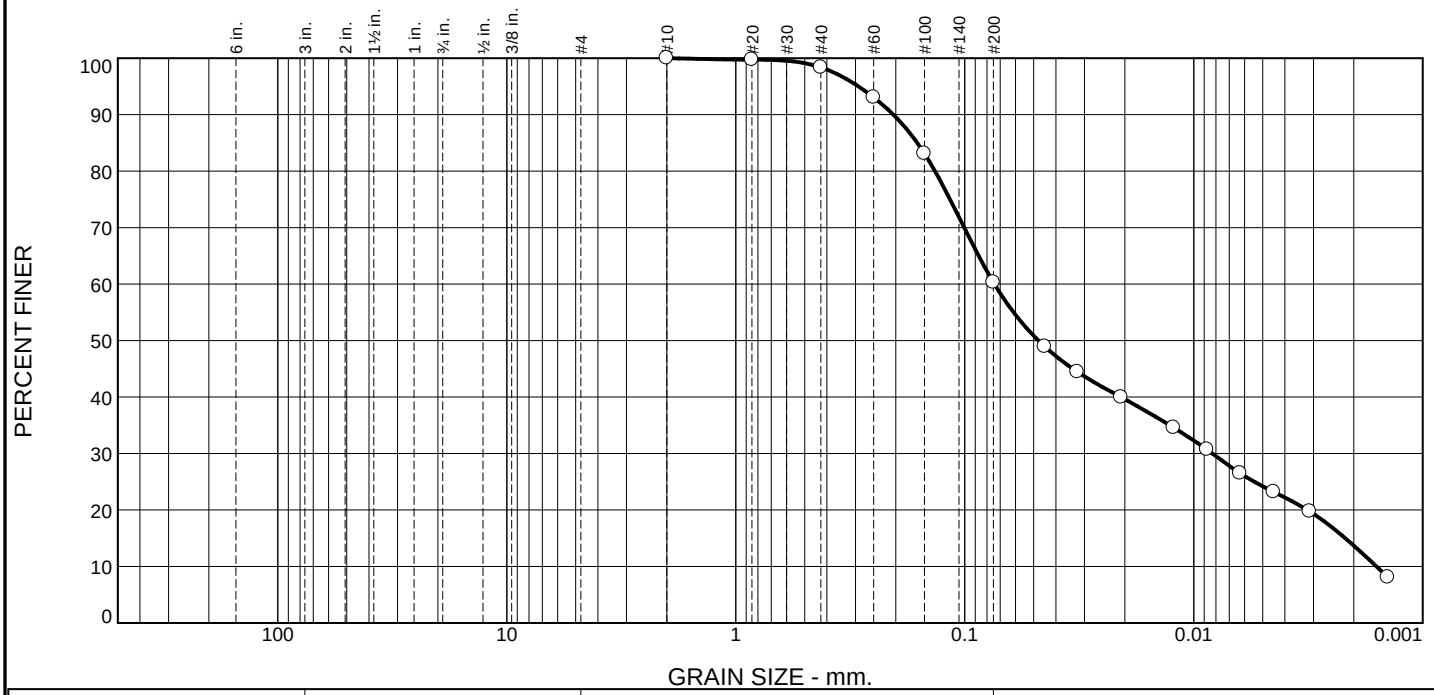
Date Sampled: 1/25/22

CDM Smith

Boston, Massachusetts

Client: NYSDEC
Project: Former Aluminum Louvre
Old Bethpage, NY
Project No: 897-262392

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	0.0	0.0	1.6	38.1	36.1	24.2

Test Results (ASTM D6913 & D7928 & ASTM D1140)

Opening Size	Percent Finer	Spec.* (Percent)	Pass? (X=Fail)
#10	100.0		
#20	99.7		
#40	98.4		
#60	93.1		
#100	83.1		
#200	60.3		
0.0447 mm.	48.9		
0.0322 mm.	44.5		
0.0208 mm.	40.0		
0.0122 mm.	34.6		
0.0087 mm.	30.7		
0.0063 mm.	26.5		
0.0045 mm.	23.2		
0.0031 mm.	19.8		
0.0014 mm.	8.1		

* (no specification provided)

Material Description

Black and tan sandy silt

Atterberg Limits (ASTM D 4318)

PL= 34 **LL=** 39 **PI=** 5

Classification

USCS (D 2487)= ML **AASHTO (M 145)=** A-4(3)

Coefficients

D_{90}= 0.2050 D_{85}= 0.1612 D_{60}= 0.0742
D_{50}= 0.0477 D_{30}= 0.0083 D_{15}= 0.0022
D_{10}= 0.0016 C_u= 46.60 C_c= 0.58

Remarks

As Received Moisture Content = 40.3%

Date Received: 1/28/22 **Date Tested:** 2/2/22

Tested By: AS/MP

Checked By: MP

Title: Laboratory Manager

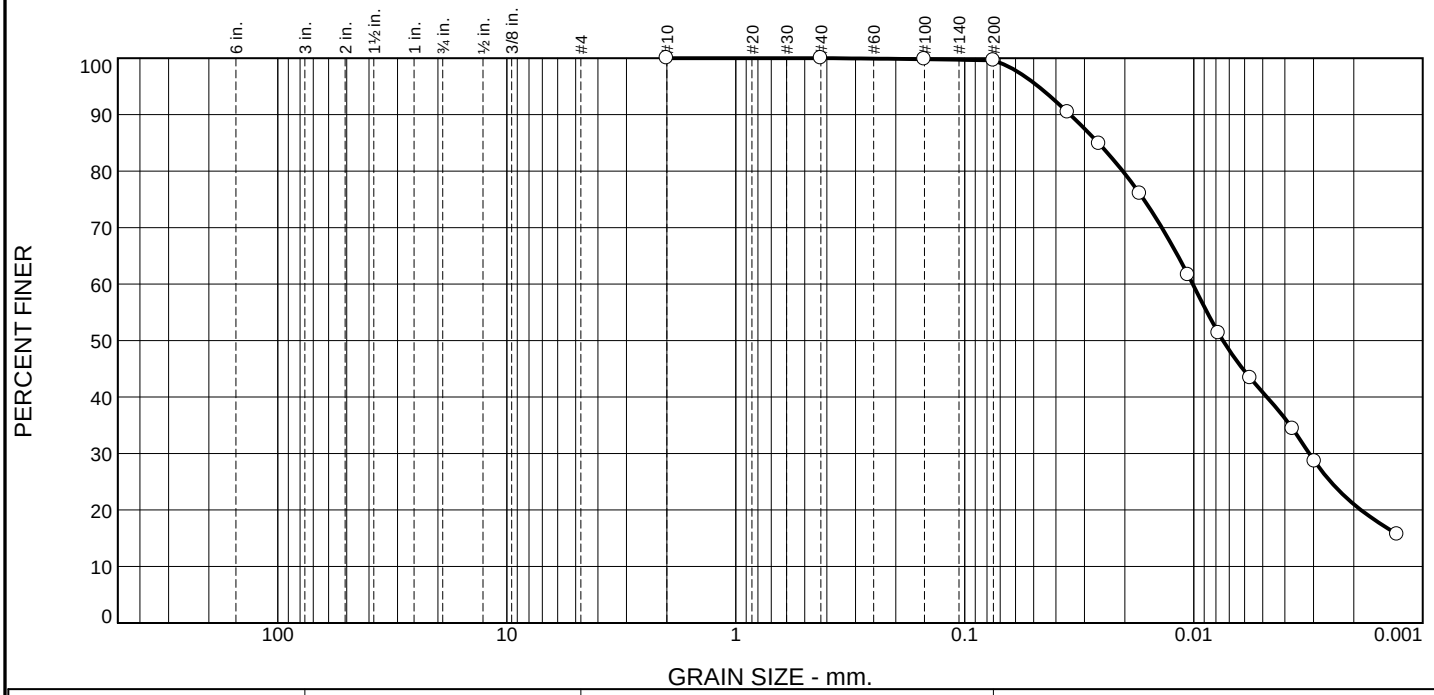
Source of Sample: GEO-02 **Depth:** 68-70' **Date Sampled:** 1/25/22
Sample Number: S-21

CDM Smith

Boston, Massachusetts

Client: NYSDEC
Project: Former Aluminum Louvre
Old Bethpage, NY
Project No: 897-262392

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	0.0	0.0	0.0	0.4	58.8	40.8

Test Results (ASTM D6913 & D7928 & ASTM D1140)

Opening Size	Percent Finer	Spec.* (Percent)	Pass? (X=Fail)
#10	100.0		
#40	100.0		
#100	99.8		
#200	99.6		
0.0355 mm.	90.4		
0.0259 mm.	84.9		
0.0172 mm.	76.0		
0.0106 mm.	61.7		
0.0078 mm.	51.4		
0.0057 mm.	43.4		
0.0037 mm.	34.4		
0.0030 mm.	28.6		
0.0013 mm.	15.7		

* (no specification provided)

Material Description

Dark brown organic silt

Atterberg Limits (ASTM D 4318)

PL= 40 **LL=** 51 **PI=** 11

Classification

USCS (D 2487)= OH **AASHTO (M 145)=** A-7-5(17)

Coefficients

D_{90}= 0.0347 D_{85}= 0.0261 D_{60}= 0.0101
D_{50}= 0.0075 D_{30}= 0.0031 D_{15}=
D_{10}= C_u= C_c=

Remarks

As Received Moisture Content = 39.5%

Date Received: 2/11/22 **Date Tested:** 2/16/22

Tested By: MP

Checked By: MP

Title: Laboratory Manager

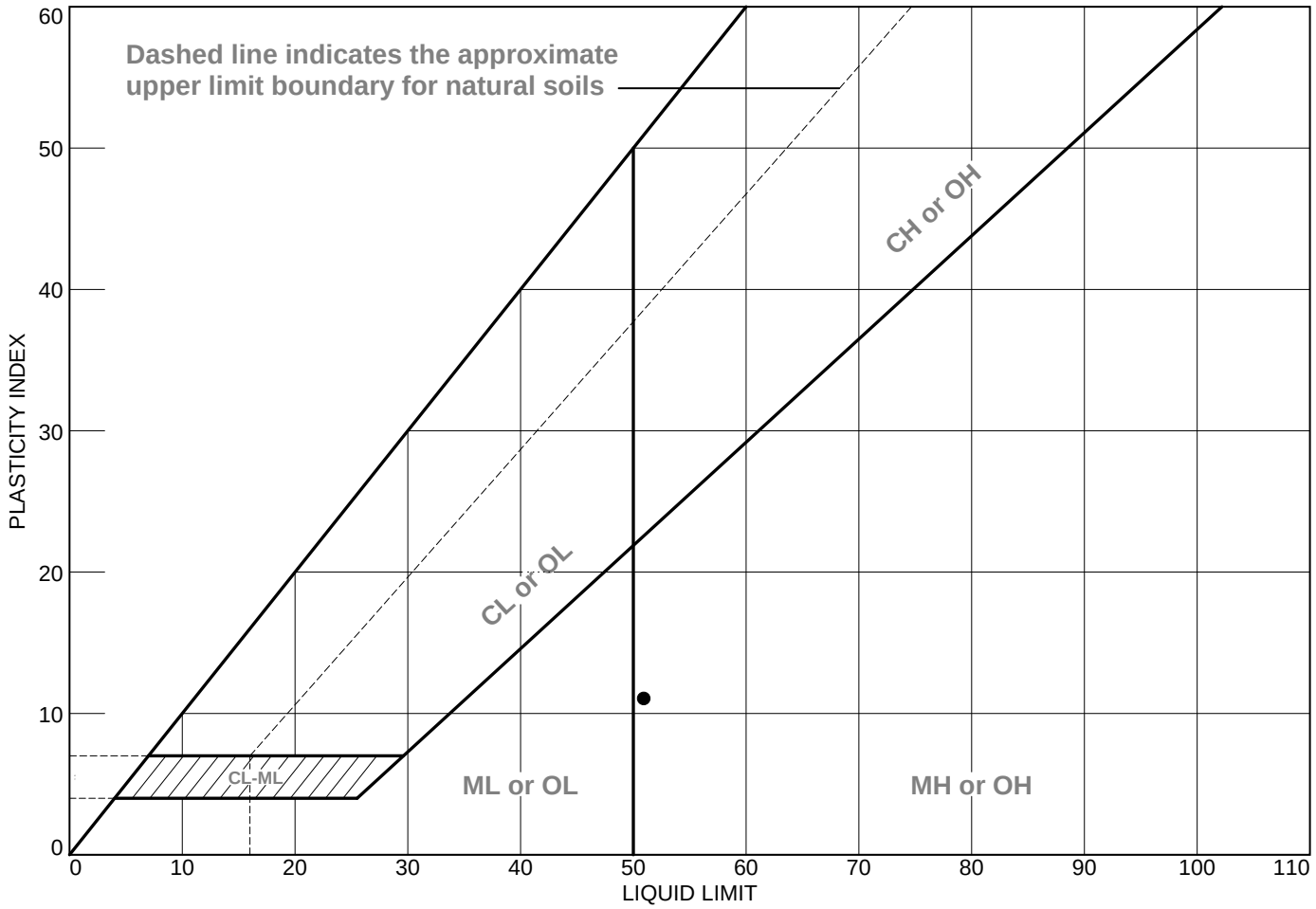
Source of Sample: GEO-01 **Depth:** 16-18' **Date Sampled:** 1/19/22
Sample Number: U-1

CDM Smith

Boston, Massachusetts

Client: NYSDEC
Project: Former Aluminum Louvre
Old Bethpage, NY
Project No: 897-262392

LIQUID AND PLASTIC LIMITS TEST REPORT



SOIL DATA

SYMBOL	SOURCE	SAMPLE NO.	DEPTH	NATURAL WATER CONTENT (%)	PLASTIC LIMIT (%)	LIQUID LIMIT (%)	PLASTICITY INDEX (%)	USCS
●	GEO-01	U-1	16-18'	39.5	40	51	11	OH

CDM Smith

Boston, Massachusetts

Client: NYSDEC
Project: Former Aluminum Louvre
Old Bethpage, NY
Project No.: 897-262392

Tested By: MP **Checked By:** MP

CDM Smith

Geotechnical Engineering Laboratory

Standard Test Method for Specific Gravity of Soils
(ASTM D854)

Client:	NYSDEC		
Project Name:	Former Aluminum Louvre	Tested By:	MP
Project Location:	Old Bethpage, NY	Test Date:	2/15/2022
Project Number:	897-262392		
Boring Number:	GEO-01	Reviewed by:	MP
Sample Number:	U-1	Date:	2/17/2022
Sample Depth (ft):	16-18		
Sample Date:	1/19/2022		

HYDROSCOPIC MOISTURE CONTENT ADJUSTMENT	
Tin Mass (g)	23.66
Wet Mass of Sample & Tin (g)	74.06
Dry Mass of Sample & Tin (g)	59.80
Mass of Water (g)	14.26
Mass of Dry Soil (g)	36.14
Moisture Content (%)	**39.5%**

SPECIFIC GRAVITY			
Bottle #	D		
Wt Wet Soil	56.96		
Temp	20.6		
Wt bottle+water+soil	687.37		
Wt bottle+water	660.90		
wt soil	40.84		
K of water at temp	1.000		
Specific Gravity	**2.842**		
Average Specific Gravity		**2.842**	

CDM Smith

Geotechnical Engineering Laboratory

Standard Test Method for Moisture, Ash, and Organic Matter of Peat and Other Organic Soils (ASTM D2974)

Client:	NYSDEC		
Project Name:	Former Aluminum Louvre	Tested By:	MP
Project Location:	Old Bethpage, NY	Test Date:	2/15/2022
Project Number:	897-262392		
Boring Number:	GEO-01	Procedure:	C
Sample Number:	U-1	Temperature:	440° C
Sample Depth (ft):	16-18		
Sample Date:	1/19/2022		

AS RECEIVED MOISTURE CONTENT	
Tin Mass (g)	85.05
Wet Mass of Sample & Tin (g)	188.05
Dry Mass of Sample & Tin (g)	160.15
Mass of Water (g)	27.90
Mass of Dry Soil (g)	75.10
Moisture Content (%)	**37.2**

ASH CONTENT	
Porcelain Dish Mass (g)	85.05
Porcelain Dish + Oven Dried Soil (g)	160.15
Mass of Oven Dried Soil (g)	75.10
Mass of Dish & Burned Soil (g)	153.13
Mass of Burned Soil (g)	68.08
Mass of Organic Material (g)	7.02
Ash Content (%)	90.7
Organic Content (%)	**9.3**

Soil Consolidation Test ASTM D2435-11

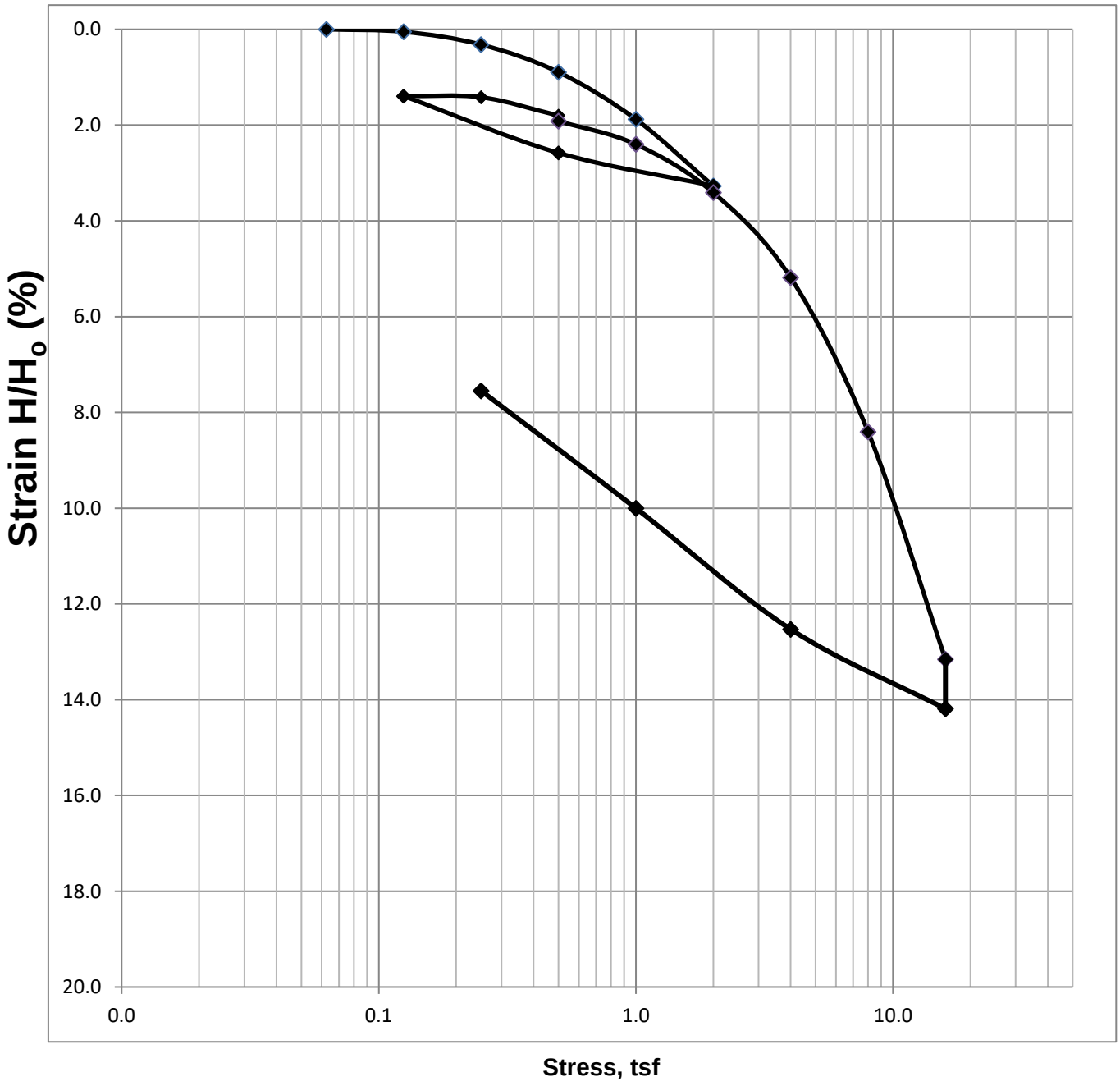
Project **Former Aluminum Louvre** Project Location **Old Bethpage, NY**

Project # **00176-257488**

Boring **GEO-01** Sample **U-1** Depth **17.7-17.8** ft. Set Up By **AS**

Description **D.brown organic silt (OH)** Water Content % **38.9%** γd (pcf) **81.8**

Compression Ratio, CR: 0.1520 **Recompression Ratio, RR: 0.0170**



CDM Smith Geotechnical Laboratory

One-Dimensional Consolidation Consolidation Testing Of Soil (ASTM D2435-11)
Method B (End of Primary Loading Cycle)

Project Name	Former Aluminum Louvre	Technician	AS
Location	Old Bethpage, NY	Reviewer	MP
Project Number	00176-257488		
Boring Number	GEO-01	Sample Number	U-1
Depth	17.7-17.8 ft.		

Specific Gravity	2.842 (measured)		
Initial Water Content	38.9%	Initial Dry Unit Weight (pcf)	81.8
Final Water Content	37.5%	Final Dry Unit Weight (pcf)	88.5
Initial Sample Height (in.)	0.783	Initial Void Ratio	1.167
Final Sample Height (in.)	0.724	Final Void Ratio	1.004

Notes:

Increment Number	Stress (tsf)	Cummulative Deflection (in)	Strain (%)	T_{90} (min)	Cv_{90} (cm^2/sec)	C_α
1	0	0	0			
2	0.0625	0.0000	0.000			
3	0.125	0.0004	0.051			
4	0.25	0.0025	0.319	1.0	1.37E-02	
5	0.5	0.0070	0.894	1.0	1.35E-02	
6	1	0.0147	1.877	1.0	1.31E-02	
7	2	0.0256	3.269	1.2	1.11E-02	
8	0.5	0.0202	2.580			
9	0.125	0.0109	1.392			
10	0.25	0.0111	1.418	1.0	1.35E-02	
11	0.5	0.0141	1.801	1.0	1.35E-02	0.00052
12	0.5	0.0150	1.916			
13	1	0.0188	2.401	0.8	1.61E-02	
14	2	0.0267	3.410	1.0	1.26E-02	
15	4	0.0406	5.185	0.9	1.30E-02	
16	8	0.0658	8.404	0.9	1.17E-02	
17	16	0.1030	13.155	1.0	1.03E-02	
18	16	0.1111	14.189			0.00341
19	4	0.0981	12.529			
20	1	0.0783	10.000			
21	0.25	0.0591	7.548			

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Soil SWELL Test ASTM D4546

Project **Former Aluminum Louvre** Project Location **Old Bethpage, NY**

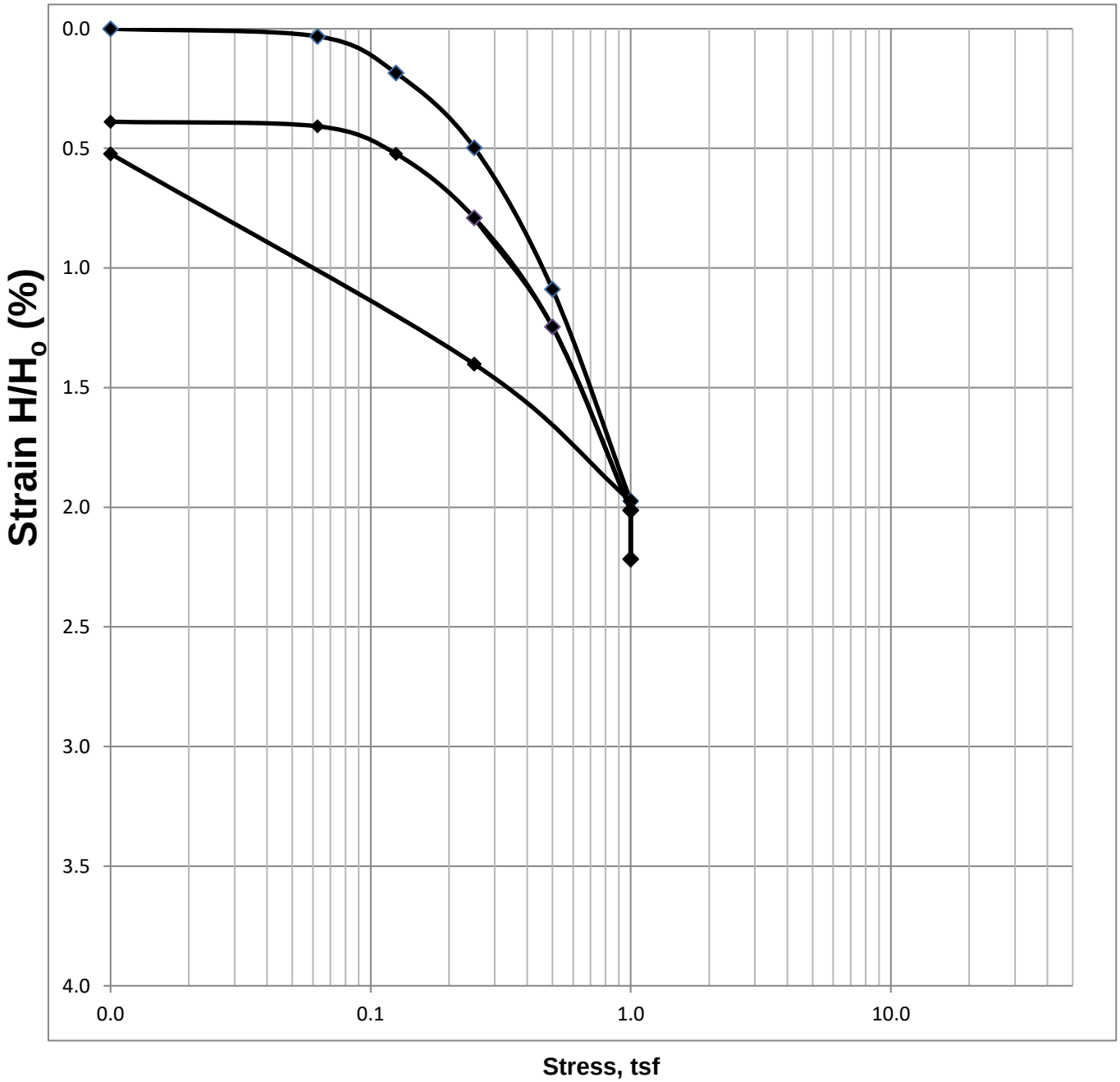
Project # **00176-257488**

Boring **GEO-01** Sample **U-1** Depth **17.5-17.6** ft. Set Up By **AS**

Description **Organic silt (OH)** Water Content % **32.7%** γd (pcf) **88.8**

Compression Ratio, CR: 0.0288 **Recompression Ratio, RR: 0.0088**

Swell % -0.20



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One-Dimensional Swell Testing Of Soil (ASTM D4546)
Method B

Project Name	Former Aluminum Louvre	Technician	AS
Location	Old Bethpage, NY	Reviewer	MP
Project Number	00176-257488		
Boring Number	GEO-01	Sample Number	U-1
Depth	17.5-17.6 ft.		

Specific Gravity	2.842 (measured)		
Initial Water Content	32.7%	Initial Dry Unit Weight (pcf)	88.8
Final Water Content	33.7%	Final Dry Unit Weight (pcf)	90.8
Initial Sample Height (in.)	0.785	Initial Void Ratio	0.997
Final Sample Height (in.)	0.768	Final Void Ratio	0.953

Notes: No Swelling occurred. Sample consolidated 0.2% at 1 tsf

Increment Number	Stress (tsf)	Cummulative Deflection (in)	Strain (%)	T_{90} (min)	Cv_{90} (cm^2/sec)	C_α
1	0	0	0			
2	0.0625	0.0003	0.032			
3	0.125	0.0015	0.185			
4	0.25	0.0039	0.497	1.7	8.14E-03	
5	0.5	0.0086	1.089	1.5	9.00E-03	
6	1	0.0155	1.975	1.7	8.08E-03	
7	0.25	0.0110	1.401			
8	0.01	0.0041	0.522			
9	0.01	0.0031	0.389			
10	0.0625	0.0032	0.408			
11	0.125	0.0041	0.522	1.5	9.22E-03	
12	0.25	0.0062	0.790	2.0	6.85E-03	
13	0.5	0.0098	1.246	1.2	1.12E-02	
14	1	0.0158	2.013	1.5	8.96E-03	
15	1	0.0174	2.217			0.00085
16						
17						
18						
19						
20						
21						

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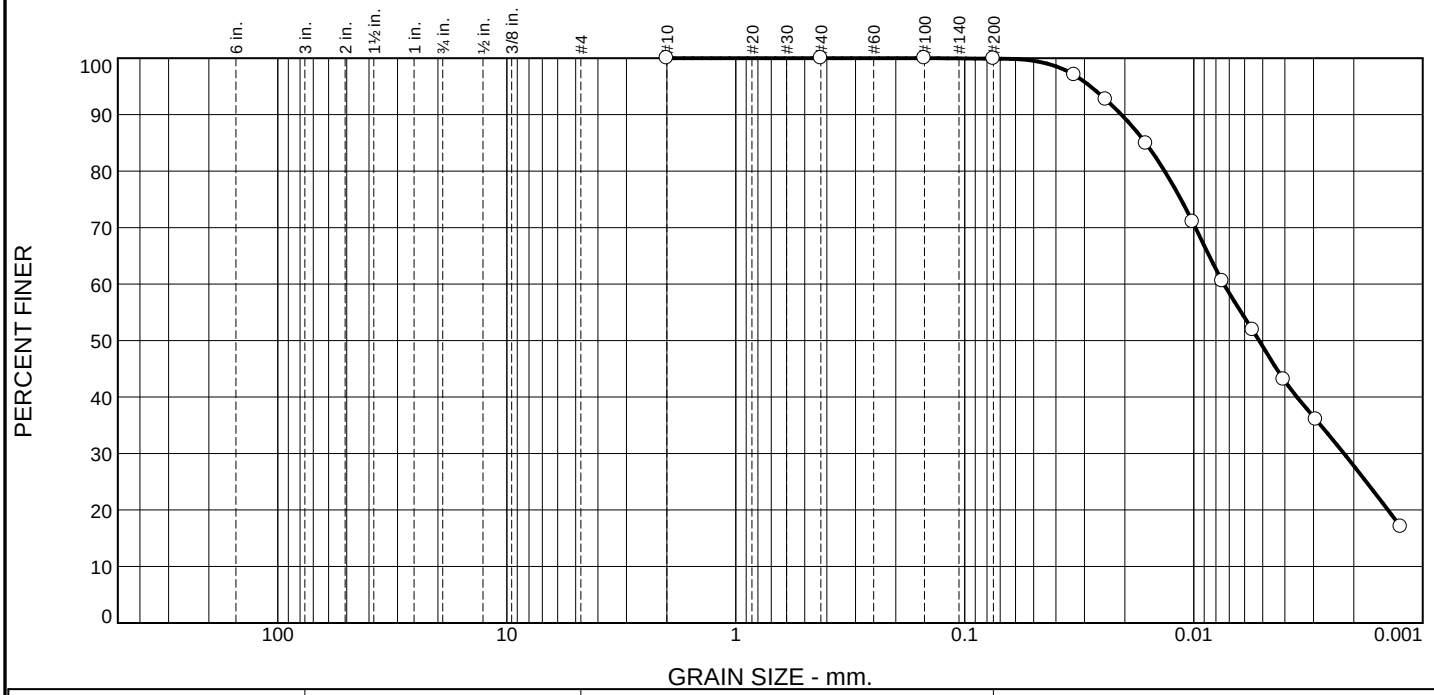
Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	0.0	0.0	0.0	0.1	50.9	49.0

Test Results (ASTM D6913 & D7928 & ASTM D1140)

Opening Size	Percent Finer	Spec.* (Percent)	Pass? (X=Fail)
#10	100.0		
#40	100.0		
#100	100.0		
#200	99.9		
0.0332 mm.	97.0		
0.0243 mm.	92.7		
0.0162 mm.	84.9		
0.0101 mm.	71.0		
0.0075 mm.	60.6		
0.0055 mm.	51.9		
0.0040 mm.	43.1		
0.0029 mm.	36.0		
0.0012 mm.	17.1		

* (no specification provided)

Material Description

Dark gray-brown organic silt

Atterberg Limits (ASTM D 4318)

PL= 35 **LL=** 45 **PI=** 10

Classification

USCS (D 2487)= OL **AASHTO (M 145)=** A-5(15)

Coefficients

D_{90}= 0.0207 D_{85}= 0.0162 D_{60}= 0.0074
D_{50}= 0.0052 D_{30}= 0.0022 D_{15}=
D_{10}= C_u= C_c=

Remarks

As Received Moisture Content = 35.4%

Date Received: 2/14/22 **Date Tested:** 2/18/22

Tested By: MP

Checked By: MP

Title: Laboratory Manager

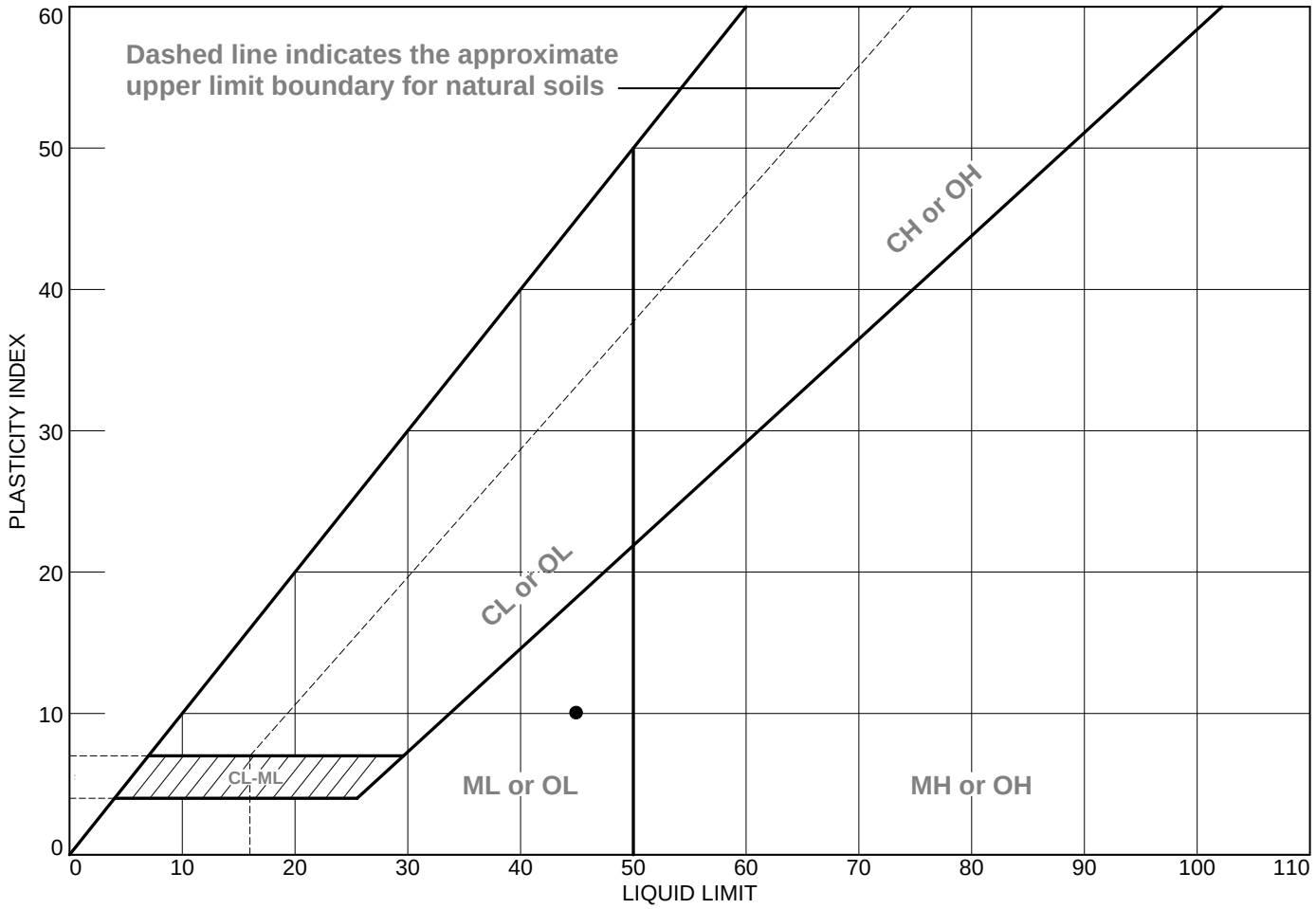
Source of Sample: GEO-02 **Depth:** 14-16' **Date Sampled:** 1/20/22
Sample Number: U-1

CDM Smith

Boston, Massachusetts

Client: NYSDEC
Project: Former Aluminum Louvre
Old Bethpage, NY
Project No: 897-262392

LIQUID AND PLASTIC LIMITS TEST REPORT



SOIL DATA

SYMBOL	SOURCE	SAMPLE NO.	DEPTH	NATURAL WATER CONTENT (%)	PLASTIC LIMIT (%)	LIQUID LIMIT (%)	PLASTICITY INDEX (%)	USCS
●	GEO-02	U-1	14-16'	35.4	35	45	10	OL

CDM Smith

Boston, Massachusetts

Client: NYSDEC
Project: Former Aluminum Louvre
Old Bethpage, NY
Project No.: 897-262392

Tested By: MP **Checked By:** MP

CDM Smith

Geotechnical Engineering Laboratory

Standard Test Method for Moisture, Ash, and Organic Matter of Peat and Other Organic Soils (ASTM D2974)

Client:	NYSDEC		
Project Name:	Former Aluminum Louvre	Tested By:	MP
Project Location:	Old Bethpage, NY	Test Date:	2/17/2022
Project Number:	897-262392		
Boring Number:	GEO-02	Procedure:	C
Sample Number:	U-1	Temperature:	440° C
Sample Depth (ft):	14-16		
Sample Date:	1/20/2022		

AS RECEIVED MOISTURE CONTENT	
Tin Mass (g)	85.05
Wet Mass of Sample & Tin (g)	187.95
Dry Mass of Sample & Tin (g)	161.05
Mass of Water (g)	26.90
Mass of Dry Soil (g)	76.00
Moisture Content (%)	**35.4**

ASH CONTENT	
Porcelain Dish Mass (g)	85.05
Porcelain Dish + Oven Dried Soil (g)	161.05
Mass of Oven Dried Soil (g)	76.00
Mass of Dish & Burned Soil (g)	156.06
Mass of Burned Soil (g)	71.01
Mass of Organic Material (g)	4.99
Ash Content (%)	93.4
Organic Content (%)	**6.6**

CDM Smith

Geotechnical Engineering Laboratory

Standard Test Method for Specific Gravity of Soils
(ASTM D854)

Client:	NYSDEC		
Project Name:	Former Aluminum Louvre	Tested By:	MP
Project Location:	Old Bethpage, NY	Test Date:	2/17/2022
Project Number:	897-262392		
Boring Number:	GEO-02	Reviewed by:	MP
Sample Number:	U-1	Date:	2/17/2022
Sample Depth (ft):	14-16		
Sample Date:	1/20/2022		

HYDROSCOPIC MOISTURE CONTENT ADJUSTMENT	
Tin Mass (g)	85.05
Wet Mass of Sample & Tin (g)	187.95
Dry Mass of Sample & Tin (g)	161.05
Mass of Water (g)	26.90
Mass of Dry Soil (g)	76.00
Moisture Content (%)	**35.4%**

SPECIFIC GRAVITY			
Bottle #	F	F	
Wt Wet Soil	56.58	56.58	
Temp	20.1	21.0	
Wt bottle+water+soil	687.60	687.52	
Wt bottle+water	660.94	660.85	
wt soil	41.79	41.79	
K of water at temp	0.99998	0.99979	
Specific Gravity	**2.762**	**2.763**	
Average Specific Gravity		**2.763**	

Soil SWELL Test ASTM D4546

Project **Former Aluminum Louvre** Project Location **Old Bethpage, NY**

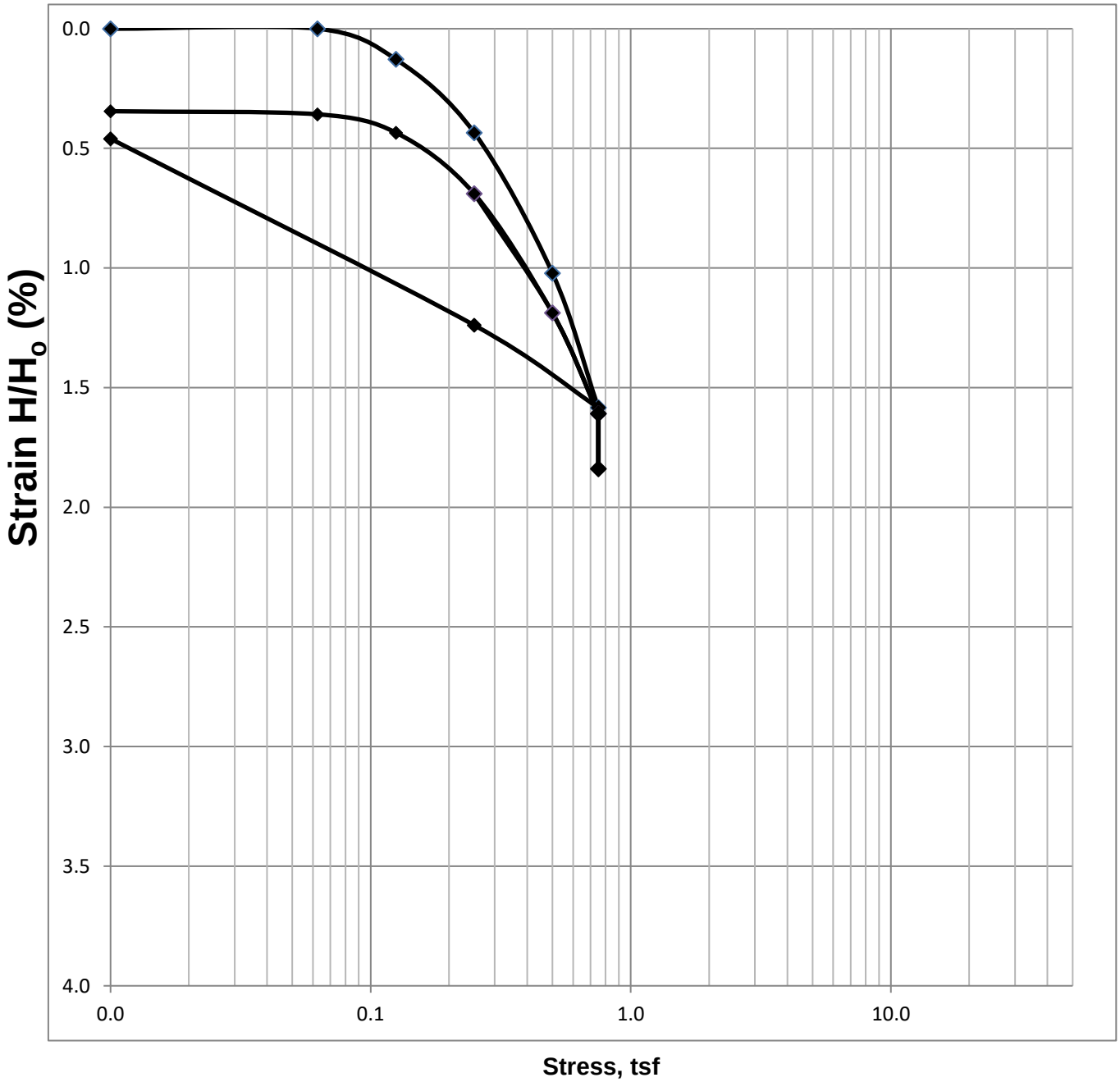
Project # **00176-257488**

Boring **GEO-02** Sample **U-1** Depth **15.5-15.6** ft. Set Up By **AS**

Description **Organic Silt (OL)** Water Content % **34.2%** γd (pcf) **87.6**

Compression Ratio, CR: 0.0315 **Recompression Ratio, RR: 0.0166**

Swell % -0.25



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One-Dimensional Swell Testing Of Soil (ASTM D4546)
Method B

Project Name	Former Aluminum Louvre	Technician	AS
Location	Old Bethpage, NY	Reviewer	MP
Project Number	00176-257488		
Boring Number	GEO-02	Sample Number	U-1
Depth	15.5-15.6 ft.		

Specific Gravity	2.763 (measured)		
Initial Water Content	34.2%	Initial Dry Unit Weight (pcf)	87.6
Final Water Content	34.0%	Final Dry Unit Weight (pcf)	87.6
Initial Sample Height (in.)	0.783	Initial Void Ratio	0.969
Final Sample Height (in.)	0.783	Final Void Ratio	0.968

Notes: No Swelling occurred. Sample consolidated 0.25% at 0.75 tsf

Increment Number	Stress (tsf)	Cummulative Deflection (in)	Strain (%)	T_{90} (min)	Cv_{90} (cm^2/sec)	C_α
1	0	0	0			
2	0.0625	0.0000	0.000			
3	0.125	0.0010	0.128			
4	0.25	0.0034	0.434	1.7	8.10E-03	
5	0.5	0.0080	1.022	3.0	4.51E-03	
6	0.75	0.0124	1.584	3.0	4.55E-03	
7	0.25	0.0097	1.239			
8	0.01	0.0036	0.460			
9	0.01	0.0027	0.345			
10	0.0625	0.0028	0.358			
11	0.125	0.0034	0.434	2.6	5.39E-03	
12	0.25	0.0054	0.690	2.6	5.33E-03	
13	0.5	0.0093	1.188	2.3	6.02E-03	
14	0.75	0.0126	1.609	3.2	4.16E-03	
15	0.75	0.0144	1.839			0.00084

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ISOTROPICALLY CONSOLIDATED UNDRAINED TRIAXIAL TEST SUMMARY - ASTM D4767

Client:	NYSDEC	**Test Date:**	2/16/2022	**LL :**	45
Project:	Former Aluminum Louvre	**Exploration No:**	GEO-02	**PL :**	35
Location:	Old Bethpage, NY	**Sample No:**	U-1	**PI :**	10
Project No:	00897-262391	**Depth (ft):**	14.9-15.4	**USCS:**	OL

Initial

Moisture Content (%):	33.3%
Dry Unit Weight (pcf):	88.4
Diameter (in):	2.845
Height (in):	5.748
Void Ratio (-):	0.94
Saturation (%):	97.3
Moisture Content (Trim.%):	33.3%
Cross Sectional Area (in^2):	6.357

Final

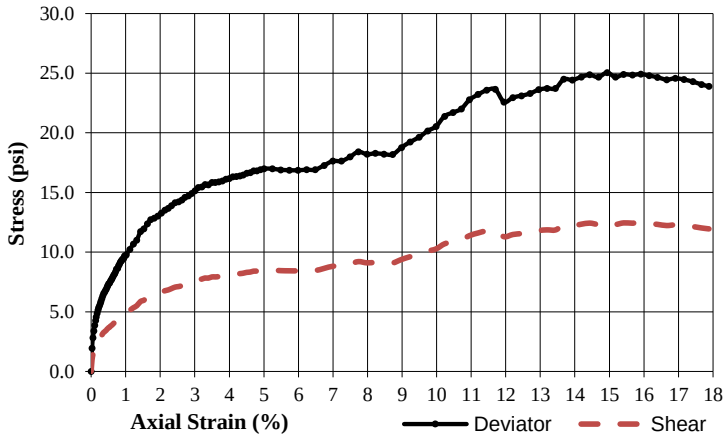
Moisture Content (%):	33.0%
Dry Unit Weight (pcf):	91.6
Height (in):	4.684
Void Ratio (-):	0.874
Saturation (%):	103.9
Cross Sectional Area (in^2):	7.533

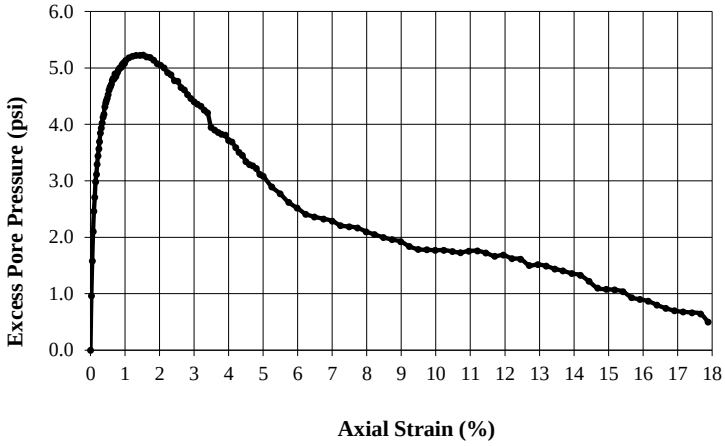
End of Consolidation Data

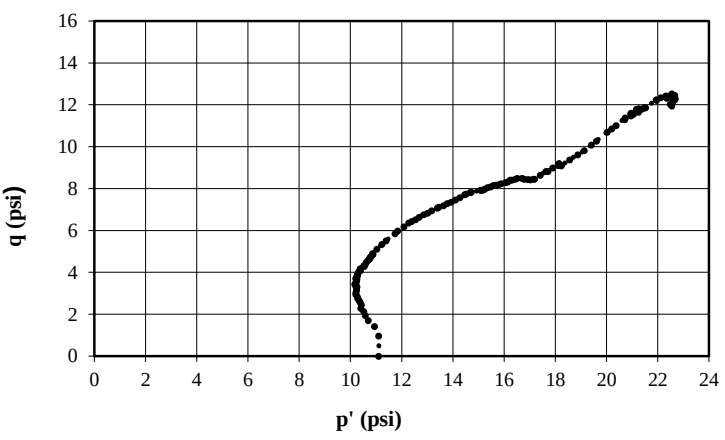
A_c Evaluated using Method	B
Sample Saturated using Methoc	B
Moisture Content (%):	33.0%
Dry Unit Weight (pcf):	91.6
Height (in):	5.704
Void Ratio (-):	0.874
Saturation (%):	103.9
Cross Sectional Area (in^2):	6.186
Pore Pressure Parameter B (-):	1.00
Final Back Pressure (psi):	50.0
Consolidation Pressure (psi):	11.1

Shear Data

Shear Strain Rate (%/hr):	0.75
Max. Deviator Stress(*) (psi):	25.1
Strain at Failure (%):	14.9
Minor Eff. Pr. Stress(*) (psi):	10.0
Major Eff. Pr. Stress(*) (psi):	36.4
Undrained Strength Ratio (-):	1.13







Notes:

(*) Failure criterion: max. deviator stress or max deviator stress at strain = 15%, whichever is obtained first.

Remarks: